

Appendix A

Initial Study



CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood Project

Initial Study

prepared by

California State University, Channel Islands Site Authority
One University Drive
Camarillo, California 93012

prepared with the assistance of

Rincon Consultants
180 North Ashwood Avenue
Ventura, California 93003

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Appendix

Appendix A Geotechnical Study and Addendum

Initial Study

1 Project Title

CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood Project

2 Lead Agency Name and Address

The Trustees of the California State University
400 Golden Shore
Long Beach, California 90802-4275

3 Contact Person and Phone Number

Terry M. Tarr, AIA, LEED AP
CSUCI Facilities Services Department
Assoc. Architect / Project Manager / Planning Design & Construction Dept.
(805) 437-2018

4 Project Sponsor's Name and Address

Owner

The Trustees of the California State University
400 Golden Shore
Long Beach, California 90802-4275

Ground Lessee/Locally represented by

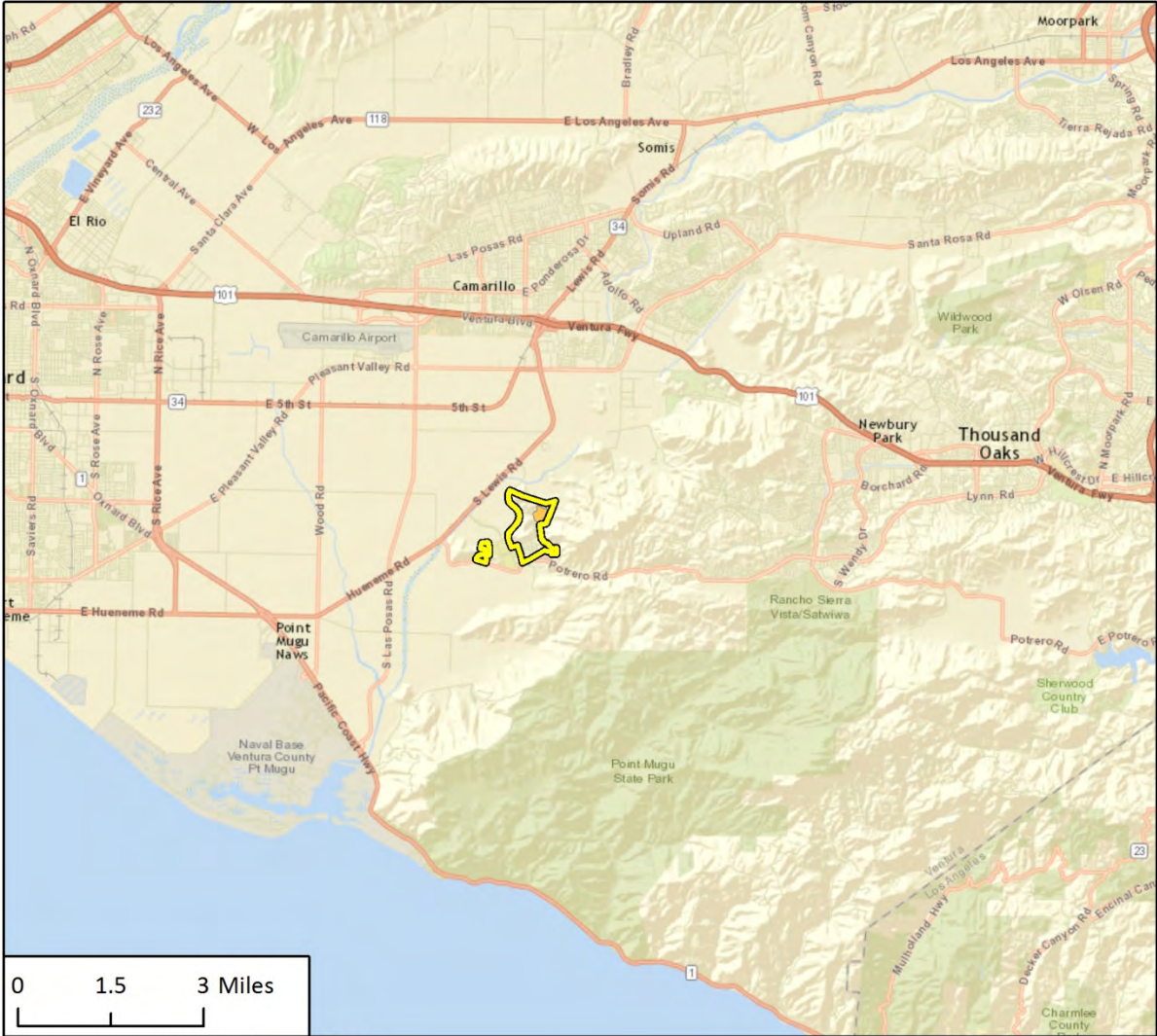
Site Authority
California State University, Channel Islands
P.O. Box 2862
Camarillo, California 93011-2862

5 Project Location

The portion of the project site to be developed (referred to as Phase Two of the East Campus Residential Neighborhood, also known as University Glen Phase 2) is located on the California State University, Channel Islands (CSUCI) campus in southern Ventura County at the eastern edge of the Oxnard Plain and at the western flank of the Santa Monica Mountains. The CSUCI campus lies 2.5 miles south of the city of Camarillo, northeast of the intersection of Lewis and Potrero Roads, and east of Calleguas Creek. Primary access to the CSUCI campus is provided by U.S. Highway 101 to the north, via Lewis Road and Camarillo Street, or by U.S. Highway 1 to the southwest, via Las Posas Road and Hueneme Road. The project site is included within the Specific Reuse Plan and is a part of the Community Development Area (CDA) designated within the plan. The CDA is planned for development of university-related support uses. Figure 1 shows the location of the Specific Reuse Plan area in its regional context. Figure 2 shows the geographic area of East Campus within which the Specific Reuse Plan amendment area and the proposed residential development are located. Figure 3 provides site photos.

California State University, Channel Islands Site Authority
CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential
Neighborhood Project

Figure 1 Regional Location



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-  Specific Reuse Plan Area
-  Phase Two Residential – Project Site



Figure 2 Project Location



Figure 3 Site Photos



Photo 1: Aerial from southwest looking northeast over project site.



Photo 2: Facing northeast near the Channel Islands Drive and Santa Rosa Islands Drive intersection.



Photo 3: Facing west toward western boundary of project site.



Photo 4: Facing south from Inspiration Point toward drainage and project site.

6 Existing Setting

The existing CSUCI campus is broadly organized into three areas of development: the Academic Core, which includes classrooms, administrative buildings, student housing, research facilities, offices, and Broome Library; a Town Center directly east of the Academic Core; and University Glen, which consists of residential areas to the east and north of the Town Center (Figure 4). Generally speaking, the Campus Master Plan guides development in the Academic Core area, while the Specific Reuse Plan guides development of University Glen (referred to as East Campus Residential Neighborhoods in prior documents, such as the Specific Reuse Plan), as well as two smaller areas, one to the west of the Academic Core (referred to as Business Campus or Research & Development Area in prior documents), and the far eastern end of the campus, which is planned for K-8 school facilities (CSUCI 2000).

University Glen is intended to provide a range of housing opportunities for faculty and staff near the Academic Core and create a community that invites pedestrian activity and bicycling (CSUCI 2000). Development of University Glen has been subdivided into two phases. The J-shaped area jutting east and then north of the Town Center constitutes Phase I. The undeveloped area that lies north of Phase I and extends eastward constitutes Phase 2 (Figure 4). Development of University Glen Phase 1 has already been completed. The proposed project involves development of Phase 2, the northernmost residential area. The majority of the 32-acre project site is level due to previous grading, and features level building pads, retaining walls, and an array of paved streets, curbs, and gutters.

The northern portion of the project site is accessed by an unpaved road called Inspiration Point that crosses an unnamed drainage feature. The area accessed by the unpaved Inspiration Point roadway (also referred to as Inspiration Point in this document) is at a higher elevation than the majority of the site and contains a eucalyptus tree grove.

Figure 4 Campus Master Plan

7 CSUCI Master Plan and Specific Reuse Plan Density Designation

Existing Designation: Low to Low-Medium (L/LM) Residential Density (0-10 dwellings/acre)
University Glen Master Planned Community Phase Two Residential Area

Proposed Designation: Low-Medium to Medium-High (LM/MH) Residential Density (10-20 dwellings/acre) – University Glen Master Planned Community Phase Two Residential Area

8 Description of Project

The proposed project consists of Phase 2 Development of the East Campus Residential Neighborhood, also referred to as University Glen. Development of the proposed project requires an amendment to the CSUCI Specific Reuse Plan, which is one of the documents governing land development for the non-academic portions of the CSUCI complex, including the West and East Campuses. Since the adoption of the Specific Reuse Plan by the CSUCI Site Authority in 2000, extensive development has occurred on the East Campus, resulting in a sizeable residential community and a mixed-use town center located at the pivot of the East Campus and the Academic Core, located east of the Broome Library.

Under the existing CSUCI Specific Reuse Plan, the project site is entitled for 242 single-family residential units. However, under the proposed project, up to 600 residential units would be developed on *the* 32 acres of vacant land. The increase in residential density requires an amendment to the Specific Reuse Plan, which currently designates the project site for low to low-medium residential density (0-10 units per acre) development. The amendment would allow for low-medium to medium-high residential density (10-20 units per acre) at the project site.

The proposed project offers a mix of multi-family apartments, for-sale single-family attached/detached homes, and income/age-restricted apartments (Figure 5). Table 1 provides further details on the types of proposed units, including approximate square footages and parking spaces. The site plan (Figure 5) also includes approximately 2.8 acres of recreation/ park area that consists of a central park and clubhouse, two vista parks along the northern periphery of the project site, and various paseos and courtyards.

To accommodate the increase in density, the number of lots, parcel and roadway configuration, and utility lines would be modified. Existing building pads and roads would be demolished and replaced in accordance with the site plan shown in Figure 5. Much of the existing utilities and infrastructure would also need to *be* replaced and/ or modified to serve the new site layout. Figure 6 shows the conceptual Domestic Water Master Plan; Figure 7 shows the conceptual Storm Drain Master Plan; Figure 8 shows the conceptual Recycled Water Master Plan; Figure 9 shows the conceptual Sewer Master Plan; Figure 10 shows the conceptual Street Light Master Plan; and Figure 11 shows the Circulation Plan. All infrastructure plans are conceptual in nature and will be refined as the project design progresses.

There is the potential that the existing 96-inch reinforced concrete pipe (RCP) running under Channel Islands Drive and the flood control basin it feeds into along Camarillo Street are undersized for a 100-year storm event (Huitt-Zollars 2016). A study is needed to determine whether modifications to the stormwater drain system beyond those shown in Figure 7 are required and will be completed prior to final design. For the purpose of this study, as well as the EIR, it is assumed that some modifications will be required to ensure that potential impacts to biological and hydrological resource areas, in particular, are considered as result of these infrastructure improvements.

Inspiration Point is physically separated from the main body of the project site by an unnamed drainage. The existing drainage crossing, consisting of an unpaved road and culvert, does not provide adequate access to Inspiration Point and the culvert is currently undersized to withstand a 100-year storm event. Consequently, as part of the proposed project, the existing crossing and drainage culvert leading to Inspiration Point would be demolished and replaced with a new culvert and crossing. The culvert would be approximately 75 feet long and 30 feet wide with concrete retaining walls and a corrugated steel culvert pipe and would be sized to accommodate a 100-year storm event.

Figure 5 Site Plan



California State University, Channel Islands Site Authority
 CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential
 Neighborhood Project

Table 1 Project Summary

Site Plan Totals				
Approximate Site Area (sf)		1,394,000 (32 acres)		
Approximate Building Footprint Area (sf)		343,000 (24.6 % site coverage)		
Approximate Landscape Area (sf)		460,000 (33% site coverage)		
Approximate Hardscape Area (sf)		607,000 (43.5% site coverage)		
Building Area				
Unit type	Bedrooms x Bathrooms	Unit Size (sf)	Number of Units	Total Area (sf)
Apartment rental	1x1	800	50	40,000
Apartment rental	2x2	950	180	171,000
Apartment rental	3x2	1,200	80	96,000
Income/Age-Restricted rental	1x1	552	85	46,920
Income/Age-Restricted rental	2x1	712	85	60,520
Townhome for sale	2x2.5	1,450	22	31,900
Townhome for sale	3x2.5	1,650	22	36,300
Townhome for sale	3x3	1,850	22	40,700
Single Family for sale	3x2.5	1,675	15	25,125
Single Family for sale	3x2.5	1,727	14	24,178
Single Family for sale	5x3	2,120	14	29,680
Single Family for sale	4x3	2,400	11	26,400
Total			600	628,283
Community Amenities				
Amenity Type			Area (sf)	
Central Park and Community Center			60,984	
Neighborhood Parks-Vistas			17,424	
Neighborhood Parks-Paseos and courtyards			47,916	
Total			126,324	
Parking				
Parking Type	Number of Spaces			
Enclosed/Covered	508			
Standard	519			
Handicap	TBD per California Building Code Standards			
Total	Approx. 1,027 spaces			
Notes: sf = square feet				

Figure 6 Conceptual Domestic Water Master Plan

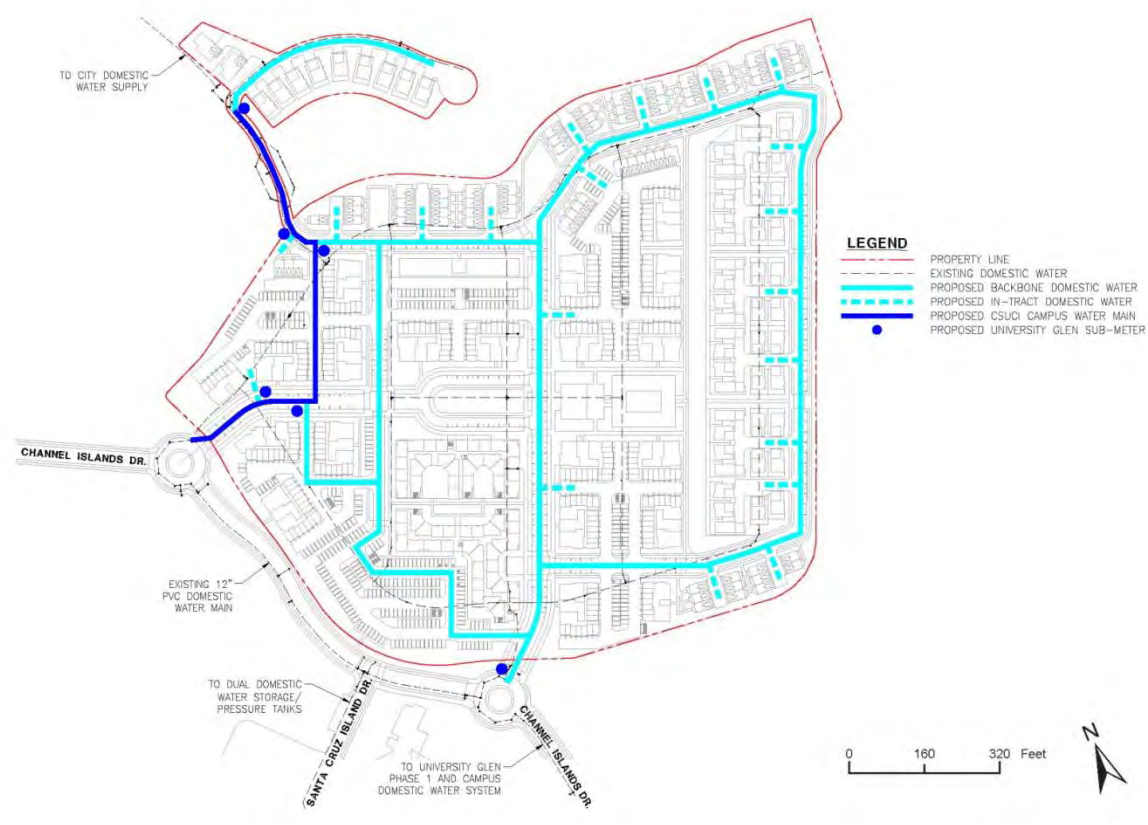


Figure 7 Conceptual Storm Drain Master Plan

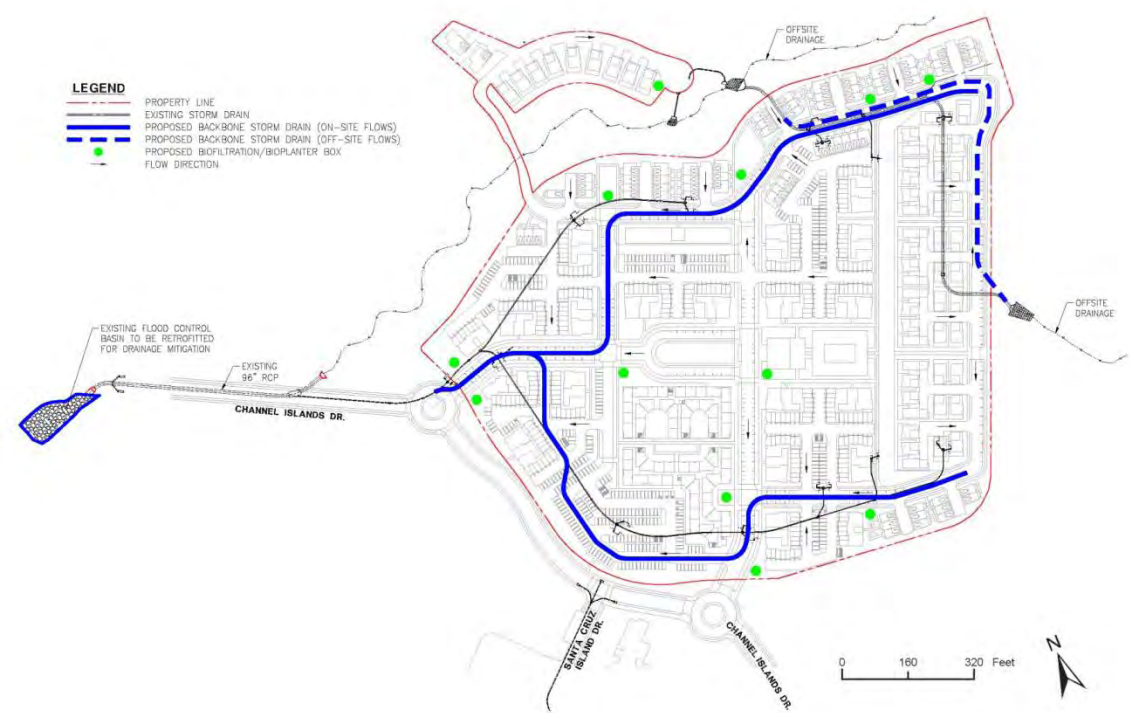


Figure 8 Conceptual Recycled Water Master Plan

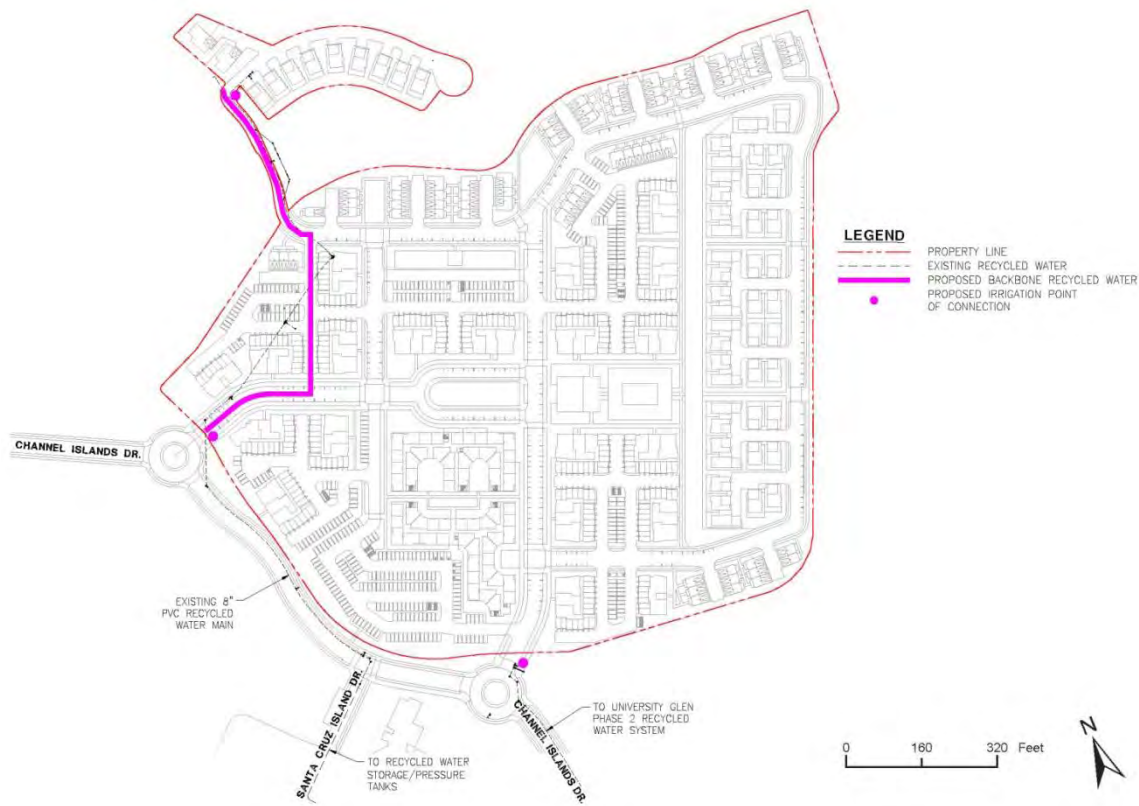


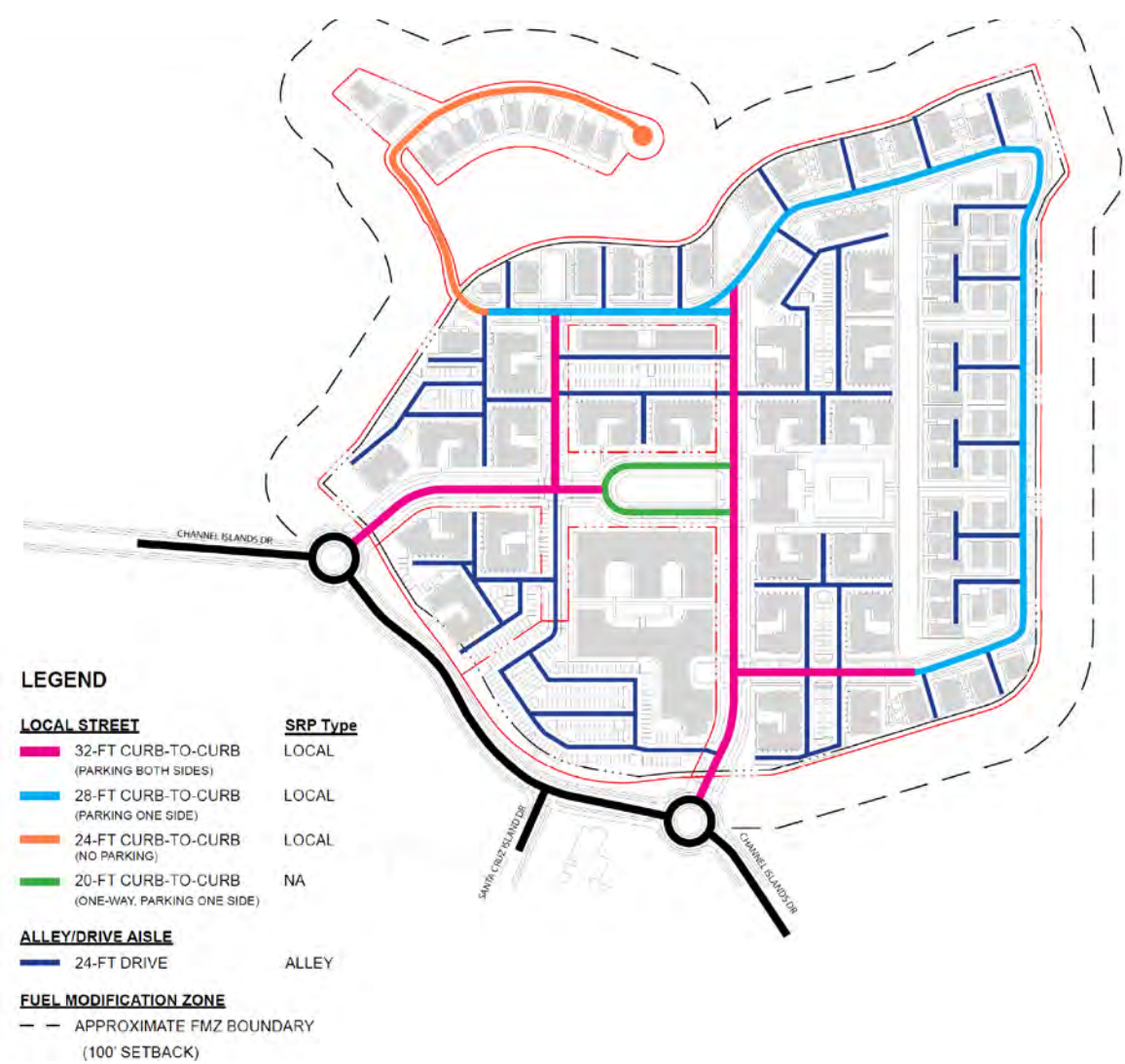
Figure 9 Conceptual Sewer Master Plan



Figure 10 Conceptual Street Light Master Plan



Figure 11 Circulation Plan



8. Description of Project (continued)

Construction

Construction of the proposed project is anticipated to start as early as Fall 2017 and continue until mid-2020.

Access and Parking

Regional access to the project site is provided by US 101 and Lewis Road from the north to Camarillo Street, and State Route (SR) 1 and Hueneme Road from the south. Local access is provided via Channel Islands Drive, which runs along the southwest border of the project site and provides access from the west and south. Access from the main campus north to the project site is provided by Channel Islands Drive.

The proposed project would provide approximately 1,027 new parking spaces, inclusive of accessible parking. Parking for apartment units would consist of a combination of garages, covered, and surface parking. Townhomes and single family homes would have onsite parking spaces, as well as individual one or two-car garages accessible via alleys.

Water Quality and Drainage

Onsite water quality treatment would be managed with multiple bio-filtration/bio-planter systems throughout the project site (Huitt-Zollars 2016). Bio-filtration/bio-planter systems would be provided at all inlet locations to the public storm drain system, which would be modified for the proposed project as shown in Figure 7 (Storm Drain Master Plan). Catch basin inserts would also be installed. Treated on-site water would flow downstream and then come in line with off-site water and ultimately be stored in the existing flood control basin along Camarillo Street.

9 Surrounding Land Uses and Setting

The CSUCI campus lies at the western edge of the Santa Monica Mountains, east of Calleguas Creek. The site is surrounded by open space to the north, east, and west, and residential development to the south. Less than 0.5 mile to the west is Camarillo Street and agricultural fields. The project site is located about one mile northeast of the eastern edge of the CSUCI Main Campus (Figure 4).

10 Public Agencies Whose Approval is Required

The Board of Trustees is the lead agency with responsibility for approving the proposed project. The Site Authority, U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, the Regional Water Quality Control Board, the U.S. Army Corps of Engineers, Ventura County Watershed Protection District, and Ventura County are all potential responsible agencies for the project.

The following approvals could be required for the proposed project:

- Amendment to the Campus Master Plan
- Specific Reuse Plan Amendment adoption and proposed project approval
- Schematic plan approval
- Final approval of real property public-private partnership
- Streambed Alteration Agreement
- Possible Clean Water Act (CWA) Section 404 permit
- Possible CWA Section 401 Certification
- Others, as may be necessary

Environmental Factors Potentially Affected

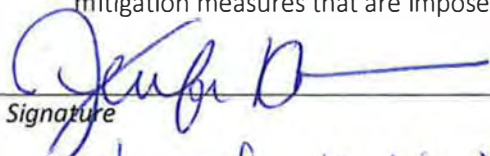
This project would potentially affect the environmental factors checked below, involving at least one impact that is "Potentially Significant" or "Potentially Significant Unless Mitigation Incorporated" as indicated by the checklist on the following pages.

- | | | |
|--|---|---|
| ☒ Aesthetics | ☐ Agriculture and Forest Resources | ☒ Air Quality |
| ☒ Biological Resources | ☒ Cultural Resources | ☒ Geology and Soils |
| ☒ Greenhouse Gas Emissions | ☐ Hazards and Hazardous Materials | ☒ Hydrology / Water Quality |
| ☒ Land Use/ Planning | ☐ Mineral Resources | ☒ Noise |
| ☐ Population / Housing | ☒ Public Services | ☒ Recreation |
| ☒ Transportation / Traffic | ☐ Tribal Cultural Resources | ☒ Utilities / Service Systems |
| ☒ Mandatory Findings of Significance | | |

Determination

Based on this initial evaluation:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions to the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potential significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.



Signature

Jennifer Haddow

Printed Name

11/23/2016

Date

Principal

Title

Environmental Checklist

1 Aesthetics

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project have any of the following impacts?				
a. Substantial adverse effect on a scenic vista	■	☐	☐	☐
b. Substantial damage to scenic resources, including but not limited to trees, rock outcroppings, and historic buildings along a state scenic highway	■	☐	☐	☐
c. Substantially degrade the existing visual character or quality of the site and its surroundings	■	☐	☐	☐
d. Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area	■	☐	☐	☐

- a. Would the project have a substantial adverse effect on a scenic vista?
- b. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings in a state scenic highway?

There are no scenic resource areas or scenic vistas designated by the Ventura County General Plan (hereafter referred to as the General Plan) in the area of the CSUCI campus (Ventura County 2011). However, the project site may be visible from Lewis Road, which is designated as an "Eligible County" scenic highway in the General Plan. Although the project site is buffered from view by agricultural fields, the development of the proposed project site may have significant impacts on vistas from Lewis Road. Further analysis will be conducted in an Environmental Impact Report (EIR).

POTENTIALLY SIGNIFICANT IMPACT

- c. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

The project site is currently vacant land that has been mowed and disced, with graded building pads and paved roads. The development of up to 600 multi-family and single-family residential units on the project site, which is currently entitled for 242 single-family residential units, would alter the visual character of the project site relative to what currently exists and relative to the visual character of the project site envisioned in the Specific Reuse Plan. The project site is currently designated for Low to Low-Medium Residential density (up to 10 units/acre) and would instead, under the proposed revision, be designated Low-Medium to Medium-High Residential density (10-20 units/acre).

The proposed building designs are consistent with the height and massing of residential development originally envisioned for the project site. The existing Specific Reuse Plan states:

The residential community is envisioned to be primarily two stories with one-story elements for massing relief. Three-story elements, if proposed, will tend to be located in interior or in vertical accent locations within the community.

The proposed project would include two to three story townhomes at heights of 28 feet to 40 feet, three-story senior and market rate apartments at a height of 40 feet, and two-story single-family detached homes at a height of 28 feet. The proposed project is consistent with the vision for three-story elements to be located in interior or vertical accent locations, as three-story townhomes and apartments are planned for the interior of the residential area and in areas adjacent to Channel Islands Drive, while single-family houses and two-story townhomes are located along the northern and eastern boundaries.

The northern boundary of the project site would include nine single-family homes on the southern side of the eastern portion of Inspiration Point area of the site and two townhomes on the southern side of the western portion of the Inspiration Point area. There are potentially significant visual impacts in relation to development adjacent to the hillside within the Inspiration Point area, which will be further analyzed in the EIR.

In addition, construction of the new Inspiration Point culvert and crossing would alter the visual character of the existing drainage crossing, which is part of an unpaved, perimeter road. The proposed culvert would be composed of retaining walls and a steel corrugated culvert. It would be approximately 75 feet long and 30 feet wide with a paved surface, and would include concrete sidewalks and a brick façade in portions of the retaining walls above grade level.

As the proposed project would involve the development of a currently undeveloped site and at a density higher than that identified in the Specific Reuse Plan, impacts would be potentially significant and warrant further analysis in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

d. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

The addition of up to 600 residential units in the northern portion of the East Campus could increase light and glare impacts during daytime and nighttime hours relative to existing site conditions and entitled site development. Potential new sources of lighting include reflections from windows, illumination of exterior building areas, glare from lighted signage, and indoor lights from residential structures. Headlights from vehicles entering and exiting the project site at night could cast light onto roadways and surrounding properties. Construction vehicles could also add glare impacts and contribute headlights when operating in darker conditions. The nearest sensitive receptors are the residential buildings immediately south of the project site. Impacts related to light and glare would be potentially significant and will be further analyzed in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

2 Agriculture and Forest Resources

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project have any of the following impacts?				
a. Convert Prime Farmland, Unique Farmland, Farmland of Statewide Importance (Farmland), as shown on maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use	☐	☐	☐	☒
b. Conflict with existing zoning for agricultural use or a Williamson Act contract	☐	☐	☐	☒
c. Conflict with existing zoning for or cause rezoning of forest land (as defined in Public Resources Code Section 12220(g)); timberland (as defined by Public Resources Code Section 4526); or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))	☐	☐	☐	☒
d. Result in the loss of forest land or conversion of forest land to non-forest use	☐	☐	☐	☒
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use	☐	☐	☐	☒

- a. Would the project convert Prime Farmland, Unique Farmland, Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?
- b. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?
- c. Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?
- d. Would the project result in the loss of forest land or conversion of forest land to non-forest use?
- e. Would the project involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?

The project site is mostly vacant, features an array of roads and existing infrastructure, and does not contain any designated farmland or forest land. The proposed project would not result in any changes to

the land use designation of any such lands. No impact would occur with respect to these issues and further analysis in an EIR is not warranted.

NO IMPACT

3 Air Quality

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project have any of the following impacts?				
a. Conflict with or obstruct implementation of the applicable air quality plan	■	☐	☐	☐
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation	■	☐	☐	☐
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)	■	☐	☐	☐
d. Expose sensitive receptors to substantial pollutant concentrations	■	☐	☐	☐
e. Create objectionable odors affecting a substantial number of people	☐	☐	■	☐

a. Would the project conflict with or obstruct implementation of the applicable air quality plan?

Vehicle use, energy consumption, and associated air pollutant emissions are directly related to growth. A project may be inconsistent with the Ventura County Air Quality Management Plan (AQMP) if it would generate population, housing, or employment growth that exceeds the forecasts used in the development of the AQMP.

The CSUCI campus lies in an aggregated non-growth area (AGA) of Ventura County. According to the Ventura County Air Quality Assessment Guidelines, a consistency determination with the AQMP for projects in a non-growth area is based on actual population growth relative to projected growth (VCAPCD 2003). If the current estimated population for the AGA is below the following year's target population, and the proposed project conforms to the applicable General Plan designation, or in this case the Campus Master Plan designation, the proposed project is consistent with the AQMP. The proposed project would increase the number of East Campus dwelling units by up to 358 units relative to entitled conditions, and 600 units relative to existing conditions, thereby inducing local population growth. The proposed project's consistency with the current AQMP will be analyzed in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

- b. Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?
- c. Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?

According to the Ventura County Air Quality Assessment Guidelines, if a project is proposed to generate emissions above two pounds per day of reactive organic compounds (ROC) or nitrous oxides (NO_x), an assessment to evaluate consistency with the AQMP is required (VCAPCD 2003). This issue will be further analyzed in an EIR.

The Ventura County Air Pollution Control District (VCAPCD) has set significance thresholds for temporary construction-related and long-term operational emissions of air pollutants (VCAPCD 2003). Projects that comply with these thresholds would not have an individually or cumulatively significant impact and would not jeopardize attainment of federal and/or state standards for Ventura County.

Appendix F of the Air Quality Assessment Guidelines (VCAPCD 2003) provides a Project Screening Analysis table to determine whether a proposed project would potentially exceed significance thresholds for criteria pollutants and thus require further analysis for determination of significance. Using the numbers provided for analysis year 2020, a project with only 345 condominium/townhouse units, or 331 low-rise apartment units, or 284 detached single family units would be within ROC or NO_x significance thresholds. The proposed project would involve construction of 120 attached and detached townhomes and houses and 480 low-rise apartment units. As the proposed project exceeds screening criteria guidelines, the proposed project merits further analysis to determine whether it would exceed significance thresholds. Impacts are potentially significant and warrant further analysis in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

- d. Would the project expose sensitive receptors to substantial pollutant concentrations?

Certain population groups, such as children, the elderly, and people with health problems, are particularly sensitive to air pollution. For the purposes of this analysis sensitive receptors are defined as land uses that are likely to be regularly used by these population groups and include health care facilities, retirement homes, school and playground facilities, and residential areas. Development of the proposed project would result in emissions associated with construction and operation. The project site is immediately adjacent to residential areas that may house children, the elderly, and people with health problems and would itself also include sensitive receptors once developed. Potential impacts to sensitive receptors may be significant and will be further reviewed in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

- e. Would the project create objectionable odors affecting a substantial number of people?

Residential uses typically do not create objectionable odors. However, odors would be generated by the operation of equipment during site preparation and the construction phases of the proposed residential units. Odors associated with construction would be emitted by diesel machinery, which includes oil or diesel fuel odors. The odors would be limited to the time that construction equipment is operating. Some of these odors may reach sensitive receptors south of the project site. All off-road construction equipment would be subject to the California Air Resources Board (ARB) anti-idling rule (SS2449(d)(2)), which limits idling to 5 minutes. Compliance with ARB rules would reduce impacts to less than significant levels.

LESS THAN SIGNIFICANT IMPACT

4 Biological Resources

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project have any of the following impacts?				
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service	■	☐	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service	☐	☐	☐	■
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means	■	☐	☐	☐
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites	☐	☐	☐	■
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance	☐	☐	☐	■
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	■

A reconnaissance-level site visit was conducted on November 10, 2016, to verify previously determined habitat conditions within the project area and identify potential biological resources within and adjacent to the project site for sensitive habitat and special-status species. The dominant plant species observed included wild fennel (*Foeniculum vulgare*), laurel sumac (*Malosma laurina*), brome (*Bromus* sp.), coyote bush (*Baccharis pilularis*), lemonade berry (*Rhus integrifolia*), white sage (*Salvia apiana*), and mallow

(*Malva* sp.). Additionally, one arroyo willow (*Salix lasiolepis*) and scattered mulefat (*Baccharis salicifolia*) shrubs were observed.

Federal, state, and local authorities under a variety of legislative acts share regulatory authority over biological resources. The primary authority for general biological resources lies within the land use control and planning authority of local jurisdictions, in this instance, the California State University. The California Department of Fish and Wildlife (CDFW) is a trustee agency for biological resources throughout the state under CEQA and also has direct jurisdiction under law through the California Fish and Game Code (CFGF). The state and federal Endangered Species Acts also provide direct regulatory authority over specially designated organisms and their habitats to CDFW and the U.S. Fish and Wildlife Service (USFWS). The U.S. Army Corps of Engineers (USACE) and Regional Water Quality Control Board (RWQCB) also have regulatory authority over specific resources, namely waters of the U.S., under Section 401 and 404 of the federal Clean Water Act (CWA). In response to their legislative mandates, regulatory authorities have designated sensitive biological resources to include those specific organisms that have regionally declining populations such that they may become extinct if population trends continue. Habitats are also considered sensitive biological resources if they have limited distributions, have high wildlife value, include sensitive species, or are particularly susceptible to disturbance.

a. Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as candidate, sensitive, or special status in local or regional plans, policies, or regulations, or by the CDFW or the USFWS?

The Specific Reuse Plan Amendment primarily involves the development of a modified residential project on land that has already been disturbed and graded, which would not adversely affect candidate, sensitive, or special status species. However, the proposed project also involves the demolition of a drainage culvert and crossing, and construction of a new approximately 75-foot long, 30-foot wide culvert with two reinforced concrete retaining walls. The Campus Master Plan FEIR (CSUCI 1998) identified the presence of arroyo willows adjacent to and downstream of the existing culvert, as well as several mulefat shrubs with an understory of cattails (*Typha* sp.) and sedges (*Carex* sp.). The Campus Master Plan FEIR determined that well-defined southern willow scrub habitat, which is a sensitive wetland plant community, was not present, but that this category best described the two areas. The 2016 reconnaissance-level site visit only identified one arroyo willow with scattered mulefat shrubs, confirming that this area has not developed into full southern willow scrub habitat. Plant species observed during the reconnaissance-level site visit were not indicative of an intact southern willow scrub community or other wetland habitat (i.e., cattail, sedges, or other hydrophytic vegetation were not observed), and were more typical of a dry river wash. Therefore, southern willow scrub habitat does not occur within the project site.

The Campus Master Plan FEIR did not identify any special-status species specifically within the drainage area. Additionally, the 2016 reconnaissance-level site visit did not identify any sensitive species or suitable habitat for sensitive species within the project site, including the area of Inspiration Point. However, the existing flood basin may provide suitable habitat for sensitive species including Least Bell's Vireo (*Vireo bellii pusillus*). Therefore, the proposed project could result in potentially significant impacts to sensitive species if modifications to the flood basin are required to accommodate stormwater flows.

Existing vegetation within and adjacent to the project areas could provide habitat for nesting birds that are protected under the Migratory Bird Treaty Act (MBTA) (16 United State Code Section 703-711) and CFGF (Section 3500). Protected birds include common songbirds, waterfowl, shorebirds, hawks, owls, eagles, ravens, crows, native doves and pigeons, swifts, martins, swallows, and others, including their body parts (e.g., feathers, plumes), nests, and eggs. The proposed project has the potential to impact migratory and other bird species if construction activities occur during the nesting/breeding/dispersal season, typically February 15 through September 15. Construction-related disturbances could result in

nest abandonment or premature fledging of the young. Therefore, the proposed project could result in potentially significant impacts to sensitive species unless mitigation is incorporated.

Mitigation Measure

The following mitigation measure, in compliance with MBTA and CFGC requirements, is required to reduce potential impacts to nesting birds to a less than significant level.

BIO-1 To avoid disturbance of nesting and special-status birds, including raptorial species protected by the MBTA and CFGC, activities related to construction of the proposed project, including, but not limited to vegetation removal, ground disturbance, and construction and demolition, shall occur outside of the nesting season (February 1 through September 15). If construction activities during the nesting season cannot be avoided, a pre-construction nesting bird survey shall be conducted no more than seven days prior to initiation of ground disturbance and vegetation removal activities. The survey shall be conducted on foot and visually assess the entire project area, including a 300-foot line-of-site buffer (500-foot for raptors) using binoculars to the extent practical. The survey shall be conducted by a qualified biologist familiar with the identification of avian species known to occur in southern California coastal communities. If nests are found, an avoidance buffer (dependent upon the species, the proposed work activity, and existing disturbances associated with land uses outside of the site) shall be determined and demarcated by the biologist using bright orange construction fencing, flagging, construction lathe, or other means to mark the boundary. All construction personnel shall be notified as to the existence of the buffer zone and instructed to avoid entering the buffer zone during the nesting season. No ground disturbing activities shall occur within this buffer until the biologist has confirmed that breeding / nesting is completed and the young have fledged. Encroachment into the buffer shall occur only at the discretion of the qualified biologist.

Impacts to nesting birds would be mitigated to a less than significant level. However, potential modifications to the existing flood basin and feeding pipe to meet 100-year storm design standards would result in potentially significant impacts to sensitive species, such as Least Bell's vireo. Therefore, impacts to sensitive species will be further analyzed in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

b. Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS?

Plant communities are considered sensitive biological resources if they have limited distributions, have high wildlife value, include sensitive species, or are particularly susceptible to disturbance. CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in CNDDDB.

Local or regional plans, policies, regulations, CDFW, and USFWS do not identify riparian habitat or other sensitive natural communities in the project site. Therefore, the proposed project would not have a substantial adverse effect on any sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

NO IMPACT

c. Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal) through direct removal, filling, hydrological interruption, or other means?

No wetland vegetation or hydric soils are associated with the unnamed northern drainage, and no wetlands as defined by the USACE were observed on the portion of the project site to be developed during the reconnaissance survey. However, the drainage channel contains approximately 0.009 acre of potential non-wetland waters of the U.S. (0.009 acre) and 0.025 acre of potential CDFW jurisdictional area, as defined by an ordinary high water mark, channel bed and bank, sediment sorting and deposition, wrack and debris, and/or shelving. Additionally, wetland habitat is expected to occur within the flood basin. Therefore, both the unnamed drainage and existing flood basin are potentially subject to USACE, RWQCB, and CDFW jurisdiction.

Impacts to wetlands and waters of the U.S. and State would be potentially significant and will be analyzed further in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

d. Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The project site has been previously disturbed by grading and does not provide for any substantial movement or nursery habitat. The proposed project would not interfere with the movement of any native resident or migratory fish or wildlife species or affect any nursery sites. No impact would occur and further analysis of this issue in an EIR is not warranted.

NO IMPACT

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The project site is part of a designated State and Federal facility and not legally subject to local planning or land use policies. Further discussion of this issue in the EIR is not warranted.

NO IMPACT

f. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The project site is not within an area of any adopted Habitat Conservation Plan (CDFW 2015, USFWS 2016). Therefore, the proposed Specific Reuse Plan Amendment would not have an effect on areas subject to an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Further discussion of this issue in the EIR is not warranted.

NO IMPACT

5 Cultural Resources

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project have any of the following impacts?				
a. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5	☐	☐	☐	☒
b. Cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5	☐	☒	☐	☐
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature	☐	☒	☐	☐
d. Disturb any human remains, including those interred outside of formal cemeteries	☐	☒	☐	☐

a. Would the project cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

The proposed project would not result in significant impacts to historical resources. No known historic resources exist onsite as the project site is vacant. Further discussion of this issue in the EIR is not warranted.

NO IMPACT

b. Would the project cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?

c. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

d. Would the project disturb any human remains, including those interred outside of formal cemeteries?

The project site has previously been disturbed and graded. Previous grading activities did not uncover any archaeological, paleontological, or cultural resources, or any human remains. The likelihood that intact archaeological resources, paleontological resources, or human remains are present in the surficial soil layer is low. In the unlikely event that archaeological or paleontological resources are identified, as defined by Section 2103.2 of the Public Resources Code, the project site would be required to be treated in accordance with the provisions of Section 21083.2 of the Public Resources Code as appropriate.

It is possible that unanticipated cultural resource remains are encountered during construction or land modification activities, and continuation of work may damage or destroy archaeological or paleontological resources or human remains. If human remains are unearthed, State Health and Safety Code Section 7050.5 requires that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code Section 5097.98. In

addition, mitigation measure CR-1 would also be required. With incorporation of mitigation measure CR-1, impacts of the proposed project on cultural resources would be less than significant.

Mitigation Measure

The following mitigation measure is required to reduce impacts to cultural resources to a less than significant level.

- CR-1** If unanticipated cultural deposits are encountered during any phase of project construction or land modification activities, work shall stop and the California State University, Board of Trustees shall be notified. A qualified archaeologist, defined as an archaeologist who meets the Secretary of the Interior's Standards for professional archaeology, shall be retained to assess the nature, extent, and potential significance of any cultural remains. If the resources are determined to be Native American in origin, the archaeologist would consult with the project proponent and the California State University, Board of Trustees to begin Native American consultation procedures, as appropriate (see Section 17, Tribal Cultural Resources, of the Environmental Checklist). If the discovery is determined to be not significant, work would be permitted to continue in the area. Potentially significant resources may require a Phase II subsurface testing program to determine the resource boundaries within the project site, assess the integrity of the resource, and evaluate the site's significance through a study of its features and artifacts. If, in consultation with the California State University, Board of Trustees, a discovery is determined to be significant, a mitigation plan would be prepared and carried out in accordance with State guidelines. If the resource cannot be avoided, a data recovery plan would be developed to ensure collection of sufficient information to address archaeological and historical research questions, with results presented in a technical report describing field methods, materials collected, and conclusions. Any cultural material collected as part of an assessment or data recovery effort would be curated at a qualified facility.

Impacts to cultural resources would be mitigated to a less than significant level by contacting an archaeologist to provide assessment of any cultural remains are unearthed during the project's construction. No further analysis of this issue in an EIR is warranted.

POTENTIALLY SIGNIFICANT UNLESS MITIGATION INCORPORATED

6 Geology and Soils

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project have any of the following impacts?				
a. Expose people or structures to potentially substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐
1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault	☐	☐	☒	☐
2. Strong seismic ground shaking	☐	☐	☒	☐
3. Seismic-related ground failure, including liquefaction	☐	☐	☒	☐
4. Landslides	☐	☒	☐	☐
b. Result in substantial soil erosion or the loss of topsoil	☐	☐	☒	☐
c. Be located on a geologic unit or soil that is made unstable as a result of the project, and potentially result in on or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse	☐	☒	☐	☐
d. Be located on expansive soil, as defined in Table 1-B of the <i>Uniform Building Code</i> , creating substantial risks to life or property	☐	☒	☐	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater	☐	☐	☐	☒

a.1. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

Alquist-Priolo Earthquake Fault Zones have been established throughout California by the California Geological Survey (CGS). These zones identify areas where potential surface rupture along an active fault

could prove hazardous and identify where special studies are required to characterize the fault rupture hazard potential to habitable structures (CGS 2016). Known active faults near the project site include the Camarillo fault and the Simi-Santa Rosa fault system. The Camarillo fault is approximately 2.5 miles from the project site, and the Simi-Santa Rosa fault is approximately 4.5 miles from the project site. Both of these faults are considered active, and the Camarillo fault is designated as an Alquist-Priolo fault zone. However, no known fault lines cross through the project site and the design and construction of the proposed project would be required to comply with California Building Code (CBC) standards. Exposure of people or structures to significant adverse effects resulting from fault rupture would be less than significant. Further analysis of this issue in an EIR is not warranted.

LESS THAN SIGNIFICANT IMPACT

a.2. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

The Camarillo and Simi-Santa Rosa faults could create substantial ground shaking if a seismic event occurred along either of those faults. Similarly, a strong seismic event on any other fault system in southern California has the potential to create considerable levels of ground shaking throughout the region. However, all new structures would be required to comply with all applicable provisions of the CBC. As a result the exposure of people or structures to significant adverse effects resulting from strong seismic ground shaking would be less than significant. Further analysis of this issue in an EIR is not warranted.

LESS THAN SIGNIFICANT IMPACT

a.3. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

Liquefaction is a process whereby soil is temporarily transformed to fluid form during intense and prolonged ground shaking or because of a sudden shock or strain. Liquefaction typically occurs in areas where the groundwater is less than 30 feet from the surface and where the soils are composed of poorly consolidated fine to medium sand.

Groundwater depths underlying the East Campus exceed 30 feet and soils above and below groundwater level contain considerable amounts of clay (CSUCI Site Authority 2000). Thus, there is a low potential for liquefaction and other seismic-related ground failure. Any new construction would be required to follow CBC standards that address liquefaction hazards. Thus, this impact would be less than significant. Further analysis of this issue in an EIR is not warranted.

LESS THAN SIGNIFICANT IMPACT

a.4. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

During an earthquake event, the seismic shaking forces applied to native hillside areas can result in "seismically induced landslides." These typically occur in areas of steeper hillsides, near the tops of ridges, where weathered surficial and bedrock materials are exposed on slopes, and in areas of prior landslides. The topography of the project site is relatively flat. The project site, however, is located near areas where earthquake-induced landslides are mapped and or/where landslide movement has occurred in the past according to the State of California Seismic Hazard Camarillo Quadrangle (California Department of Conservation 2002). There is a possibility for landslides, particularly if residual soils layered between flows of volcanic bedrock in the surrounding slopes are exposed by a slope excavation, as well as rockfalls and surface debris flows along natural slopes (Site Authority 2000).

Fugro West, Inc. conducted a geotechnical study in December 2000 for CSUCI that presents findings, conclusions, and recommendations concerning the geotechnical conditions in the East Campus Development area, including the proposed project site. Fugro West also prepared an addendum in 2007 that provides revised recommendations in anticipation of demolition of the existing Inspiration Point creek crossing and drainage culvert and construction of a new culvert and crossing, which would be included as part of the proposed project. Both documents are included in Appendix A.

The majority of the project site avoids hillside areas and slopes greater than 10 percent. Building pads along Inspiration Point and the road itself have been previously graded. Slopes adjacent to Inspiration Point crossing may exceed 10 percent. In addition, slopes occur to the north, and a landslide on adjacent lands could potentially expose people or structures to substantial adverse effects.

Mitigation Measures

The following mitigation measures are required to reduce geological and soil impacts to a less than significant level, including incorporating the recommendations of the Geotechnical Study: Cal State University Channel Islands East Campus Development (Site Authority 2000) in mitigation measure GEO-1 and potentially conducting a new geotechnical study, if needed in mitigation measure GEO-2.

GEO-1 Incorporate recommendations of Geotechnical Study: Cal State University Channel Islands East Campus Development (Site Authority 2000). Recommendations presented in the Geotechnical Study shall be incorporated at the project site. These recommendations include site preparation, excavation considerations, slope construction, subgrade stabilization measures, fill selection and compaction, shrinking and subsidence, shallow foundation design, retaining walls, bridge drilled pier foundation, utility trenching, pipe bedding, trench backfill, and pavements. A brief listing of the recommendations is below. A more detailed explanation of each recommendation is provided in the Geotechnical Report (Appendix A).

GEO-2 Updates Geotechnical Study, as needed. The applicability of the existing Geotechnical Study and Addendum for current site conditions and construction/ grading plan will be assessed by a geotechnical consultant. If recommendations in the existing Geotechnical Study and Addendum are no longer applicable to existing conditions, updates and/or a new geotechnical study will be required. Recommendations resulting from the new study shall be incorporated into the proposed project to mitigate geological hazards to a less than significant level.

Impacts to landslide and other geological hazards would be mitigated to a less than significant level once all recommendations by the Geotechnical Report (2000) and any future updates are incorporated. No further analysis of this issue in an EIR is warranted.

POTENTIALLY SIGNIFICANT UNLESS MITIGATION INCORPORATED

b. Would the project result in substantial soil erosion or the loss of topsoil?

Erosion is a normal and inevitable geologic process whereby earth materials are loosened, worn away, decomposed, or dissolved and are then removed from one place and transported to another. Preparing land for construction can remove ground cover, exposing soils to wind erosion.

The majority of the project site is generally flat and has been previously disturbed, which limits the potential for substantial soil erosion. However, construction of the Inspiration Point culvert and crossing could result in erosion along the banks of the drainage. Modifications to the flood basin and the RCP feeding to the flood basin would require excavation and construction along Channel Islands Drive and in the flood basin itself that could also result in erosion. The proposed project would be required to comply with the California State Construction General Permit (Order No. 2009-2009-DWQ) and implement a Stormwater Pollution Prevention Plan (SWPPP), which would include best management practices (BMP)

for erosion and sediment control during construction. Compliance with construction BMPs would reduce impacts associated with soil erosion and the loss of topsoil to less than significant levels. Further analysis of this issue in an EIR is not warranted.

LESS THAN SIGNIFICANT IMPACT

c. Would the project be located on a geologic unit or soil that is unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

Subsidence is the sudden sinking or gradual downward settling of the earth's surface with little or no horizontal movement. Subsidence is caused by a variety of activities that include, but are not limited to, withdrawal of groundwater, pumping of oil and gas from underground, the collapse of underground mines, liquefaction, and hydrocompaction. Lateral spreading is the horizontal movement or spread of soil toward an open face. The potential for failure from subsidence and lateral spreading is highest in areas where the groundwater table is high and where relatively soft and recent alluvial deposits exist. Lateral spreading hazards may also be present in areas with liquefaction risks.

The Ventura County General Plan Subsidence Zones Map does not identify the project site as being located in an area where subsidence is probable (Ventura County 2011). As discussed in item a.3. in this section of the Environmental Checklist, the project site is located on a geologic unit with low risk for lateral spreading, subsidence, liquefaction, collapse, or landslides, although it is near slopes that may experience landslides. Any new construction would be required to follow CBC standards that address liquefaction hazards, including strengthening the foundation and footings.

An existing culvert and its associated foundations are proposed to be demolished prior to construction of the new Inspiration Point crossing. Since foundation plans for the existing crossings are not available, only estimations of removal depths during demolition are provided. Excavation depths may be increased based on conditions. In addition, due to thick brush and difficult access during a field investigation, actual subsurface conditions are unknown at the exact locations of the proposed footings for the new crossing. It is also unknown if dewatering would be required during demolition or construction. Due to these unknown factors, there is potential for on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. Incorporation of Mitigation Measures GEO-1 and GEO-2 above and GEO-3 below, would reduce impacts to less than significant levels.

Mitigation Measure

The following mitigation measure is required to reduce impacts related to soil stability during construction of the Inspiration Point crossing to a less than significant level.

GEO-3 Incorporate recommendations of 2007 Geotechnical Study Addendum. The proposed project shall incorporate the recommendations presented in the Geotechnical Study Addendum (Site Authority 2007; attached as Appendix A), including, but not limited to observations during demolition, excavation and the use of appropriate backfill material, to mitigate geological hazards to a less than significant level.

Impacts to soil stability would be mitigated to a less than significant level with incorporation of the above mitigation measure. No further analysis of this issue in an EIR is warranted.

POTENTIALLY SIGNIFICANT UNLESS MITIGATION INCORPORATED

d. Would the project be located on expansive soil, as defined in Table 1-B of the Uniform Building Code, creating substantial risks to life or property?

Expansive soils generally contain high percentages of clay. The Geotechnical Study identified the presence of near-surface clay with medium and high to very high expansiveness at the project site. The study provided recommendations for mitigating the expansiveness of soils at the project site. All

development would be required to comply with the Uniform Building Code (UBC) and the CBC and incorporate Mitigation Measures GEO-1, GEO-2, and GEO-3. Compliance with building standards and incorporation of mitigation measures would reduce impacts related to expansive soils to a less than significant level. Further analysis of this issue in an EIR is not warranted.

POTENTIALLY SIGNIFICANT UNLESS MITIGATION INCORPORATED

e. Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

The CSUCI campus is serviced by two gravity-flow sewage collection systems, and wastewater generated onsite is currently treated at the adjacent Camrosa Wastewater Treatment Facility. The proposed project would connect into this system and would not utilize septic tanks. Therefore, further discussion of this issue in the EIR is not warranted.

NO IMPACT

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7 Greenhouse Gas Emissions

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project have any of the following impacts?				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment	■	☐	☐	☐
b. Conflict with any applicable plan, policy, or regulation adopted to reduce the emissions of greenhouse gases	■	☐	☐	☐

a. Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

b. Would the project conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Construction and operation of the proposed project would generate additional GHG emissions, primarily from vehicle trips that would result in the burning of fossil fuels. The adopted CEQA Guidelines provide regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, while giving lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts. While the VCAPCD has not yet set significant threshold options for Ventura County, it has stated a preference for GHG threshold consistency with the South Coast AQMD (SCAQMD) and the SCAG region in a white paper, "Greenhouse Gas Thresholds of Significance Options for Land Use Development Projects in Ventura County" (VCAPCD 2011). In the latest guidance provided by the SCAQMD's GHG CEQA Significance Threshold Working Group, SCAQMD considered a tiered approach to determine the significance of residential and commercial projects. The draft-tiered approach is outlined in the meeting minutes, dated September 28, 2010.

Tier 1 - If the project is exempt from further environmental analysis under existing statutory or categorical exemptions, there is a presumption of less than significant impacts with respect to climate change. If not, then the Tier 2 threshold should be considered.

Tier 2 - Consists of determining whether or not the project is consistent with a GHG reduction plan that may be part of a local general plan, for example. The concept embodied in this tier is equivalent to the existing concept of consistency in CEQA Guidelines section 15064(h)(3), 15125(d) or 15152(a). Under this Tier, if the proposed project is consistent with the qualifying local GHG reduction plan, it is not significant for GHG emissions. If there is not an adopted plan, then a Tier 3 approach would be appropriate.

Tier 3 - Establishes a screening significance threshold level to determine significance. The Working Group has provided a recommendation of 3,500 MT CO₂e per year for residential projects.

Further analysis in an EIR will estimate GHG emissions generated by the proposed project and compare project emissions to SCAQMD's Tier 3 threshold for residential projects. In addition, while CSUCI does not have a certified GHG reduction plan for the campus, the CSU has committed to reducing CO₂ emissions by 15 percent to reach 1990 levels by 2020, and 80 percent below 1990 levels by 2040 (CSU 2014). Further analysis in an EIR will assess whether the proposed project would impede achievement of

these goals and analyze the proposed project's consistency with relevant campus policies. Impacts to GHG emissions may be potentially significant and will be analyzed in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

8 Hazards and Hazardous Materials

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project have any of the following impacts?				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	☐	☐	☒	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment	☐	☐	☒	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school	☐	☐	☒	☐
d. Be located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e. For a project located in an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area	☐	☐	☐	☒
f. For a project near a private airstrip, would it result in a safety hazard for people residing or working in the project area	☐	☐	☐	☒
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan	☐	☐	☒	☐
h. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands	☐	☐	☒	☐

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

The proposed project would involve the construction of multi-family residential, age restricted apartments, and for-sale single family detached and townhomes units in East Campus. No production or manufacturing of any kind that would involve the use or transport of hazardous materials would occur on the project site and operation of the new residences and associated amenities would not involve the routine transport, use or disposal of hazardous substances, other than minor amounts typically used for maintenance. In the event that hazardous materials are used on site, their use, disposal, and transport would be subject to compliance with existing regulations, standards, and guidelines established by the Federal, State, and local agencies, such as the Hazardous Materials Transportation Act, Resource Conservation and Recovery Act, the California Hazardous Material Management Act, and the California Code of Regulations, Title 22. Adherence to these requirements would reduce impacts to a less than significant level. Further analysis of this issue in an EIR is not warranted.

LESS THAN SIGNIFICANT IMPACT

b. Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

The proposed project would involve the construction of new residential units and ancillary facilities on vacant land. This activity and resulting uses are unlikely to involve more than minor amounts of hazardous materials. Thus, the proposed project would not create a significant hazard to the public or the environment through the accidental release of hazardous materials, and impacts would be less than significant. Further analysis of this issue in an EIR is not warranted.

LESS THAN SIGNIFICANT IMPACT

c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?

The proposed project would occur on a university campus. The nearest K-12 schools are over three miles from the project site. Operation of the proposed project would not involve the use or transport of hazardous materials and development would not require any demolition of existing structures. Therefore, impacts related to hazardous emissions or materials affecting school sites would be less than significant and further analysis of this issue in an EIR is not warranted.

LESS THAN SIGNIFICANT IMPACT

d. Would the project be located on a site included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

The following databases were checked on August 30, 2016 for known hazardous materials contamination pursuant to Government Code Section 65962.5:

- GeoTracker (California State Water Resources Control Board)
- EnviroStor (California Department of Toxic Substances Control)
- Comprehensive Environmental Response, Compensation, and Liability Information System database
- Cortese list of Hazardous Waste and Substances Sites
- EnviroMapper (U.S. Environmental Protection Agency)

The following hazardous materials sites were located within 0.5 miles of the project site:

- Leaking Underground Storage Tank (LUST) Cleanup Site- Case Closed: Thornhill Ranch (2350 Portrero Road, Camarillo, California 93010)
- LUST Cleanup Site-Case Closed: Camarillo State Hospital (1878 Lewis Road, Camarillo, California 93010)
- WDR (waste discharge requirement): Highwest Nursery Inc., approved permit for small domestic wastewater treatment system (8620 Santa Rosa Road, Camarillo, California 93012)
- Permitted Underground Storage Tank: OLS Energy-Camarillo (1947 Portrero Road, Camarillo, California 93012)
- LUST Cleanup Site-Case closed: Camrosa Treatment Plant (1574 Lewis Road, Camarillo, California 93010)

None of these sites occur at the project site or within 1,000 feet of the project site. In addition, the nearest hazardous site (Thornhill Ranch) is a LUST site for which cleanup has already been completed. Impacts would be less than significant and further analysis of these issues is not warranted.

LESS THAN SIGNIFICANT IMPACT

e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

The nearest public airport is Camarillo Airport, which is located approximately 3.75 miles northwest of the project site. The project site is not located in an airport land use plan or within two miles of a public airport. Although the project site does occasionally get fly overs from the Naval Base at Port Hueneme, this would not pose a safety hazard for people residing or working in the project area. No impact would occur and further analysis of these issues is not warranted.

NO IMPACT

f. For a project near a private airstrip, would it result in a safety hazard for people residing or working in the project area?

There is no private airstrip within two miles of the project site. No impact would occur and further analysis of these issues is not warranted.

NO IMPACT

g. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

h. Would the project expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

The CSUCI campus lies in a Local Responsibility Area (LRA), meaning that the County is responsible for fire protection and not the federal or state government. The campus lies in an area designated as having Very High and High Fire Hazard Severity by Cal FIRE (Cal FIRE 2007). The campus lies within a mile of the Boney Mountains State Wilderness Area, at the foothills of the Santa Monica Mountains. To mitigate fire hazard, 35 acres along the eastern border of the campus were acquired and cleared of fuels to serve as a fire buffer zone. The Ventura County Fire Department Station 50 and Station 54 are located about 5.5 miles away by road, and the Point Mugu Fire Station is located 5.8 miles away by road.

The proposed project would not interfere with an adopted emergency response plan or emergency evacuation plan and would not increase the risk of fire hazard to people or structures. The impact is less than significant and discussion of this issue in the EIR is not warranted.

LESS THAN SIGNIFICANT IMPACT

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9 Hydrology and Water Quality

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project have any of the following impacts?				
a. Violate any water quality standards or waste discharge requirements	☐	☐	☒	☐
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)	☐	☐	☒	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site	☒	☐	☐	☐
d. Substantially alter the existing drainage pattern of the site or area, including the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or offsite	☒	☐	☐	☐
e. Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff	☒	☐	☐	☐
f. Otherwise substantially degrade water quality	☐	☐	☒	☐
g. Place housing in a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary, Flood Insurance Rate Map, or other flood hazard delineation map	☐	☐	☐	☒
h. Place structures in a 100-year flood hazard area that would impede or redirect flood flows	☐	☐	☐	☒

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
i. Expose people or structures to a significant risk of loss, injury, or death involving flooding, including that occurring as a result of the failure of a levee or dam	■	□	□	□
j. Result in inundation by seiche, tsunami, or mudflow	□	□	■	□

a. Would the project violate any water quality standards or waste discharge requirements?

Construction of the proposed project would include excavation and grading activities that may result in soil erosion and sedimentation that could degrade water quality without the implementation of existing laws and regulations.

Development of the proposed project would create more than 10,000 square feet of impervious surface, therefore, the proposed project would be subject to the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer Systems (MS4) Permit for non-traditional small entities, as set by Order No. 2013-0001-DWQ, and issued by the Los Angeles Regional Water Quality Control Board. This permit would require retention or biofiltration BMPs to capture or treat the stormwater quality design volume (or flow). The proposed project would also be required to comply with the California State Construction General Permit (Order No. 2009-2009-DWQ) and implement a SWPPP, which would include BMPs to prevent stormwater pollution during construction.

As previously described in Section 9, Description of Project, of the Initial Study, onsite water quality treatment would be managed with multiple bio-filtration/bio-planter systems throughout the project site to meet MS4 Phase II Permit requirements and the requirement set forth in the CSUCI Stormwater Implementation Program (Huitt-Zollars 2016). Bio-filtration/bio-planter systems would be required at all inlet locations to the public storm drain system. Catch basin inserts will also be installed to meet the California Zero Trash Policy. Treated on-site water would comingle with offsite water downstream from the project site and be stored in the existing flood control basin along Camarillo Street.

Overall, compliance with existing laws and regulations would ensure that impacts associated with water quality standards and waste discharge requirements would be less than significant. Therefore, further analysis of this issue in an EIR is not warranted.

LESS THAN SIGNIFICANT IMPACT

b. Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?

The project site does not overlie any groundwater basin. The Calleguas Creek, approximately one mile west of the project overlies the Pleasant Valley Groundwater Basin, designated a Critically Over Drafted Basin and a High Priority for groundwater management (DWR 2016). However, as the project site does not overlie a groundwater basin and all project related runoff would be directed to a drainage basin that allows percolation of stormwater, the proposed project would not substantially decrease groundwater

supplies nor interfere substantially with groundwater recharge. This impact would be less than significant. Further analysis of this issue in an EIR is not warranted.

LESS THAN SIGNIFICANT IMPACT

c. Would the project substantially alter the existing drainage pattern of the site or area, including by altering the course of a stream or river, in a manner that would result in substantial erosion or siltation on or offsite?

d. Would the project substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or offsite?

The proposed project may alter the existing drainage pattern on the project site and surrounding area. The existing RCP that feeds into the flood basin along Camarillo Street and the flood basin itself may require modifications to meet 100-year storm event design standards. Construction and modifications could alter the drainage pattern on or offsite.

The proposed project would also include alterations to the existing storm drain system at the project site (Figure 7, Storm Drain Master Plan) to accommodate the site layout, but would not change points of discharge into onsite and offsite drainages. The proposed project would also include replacement of the existing culvert on the northern unnamed drainage with a new culvert and crossing to access Inspiration Point. The existing culvert is undersized for a 100-year storm flow and could result in flooding in adjacent lots due to backflow. Thus, the proposed alterations to existing drainage would improve existing conditions with regards to flooding. Due to potential and required modifications to the existing drainage system on and offsite, impacts would be potentially significant and warrant further analysis in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

e. Would the project create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

The proposed project would create new impervious surfaces at a site that currently consists of open, unpaved lots and an unpaved access road at Inspiration Point. Currently entitled development at the project site would also result in paving of open lots in the main body of the project site. The proposed project would additionally involve the construction of a new paved crossing and culvert at Inspiration Point. Resident activities, such as vehicle use or car washing, would generate runoff and could contribute to contamination of runoff. The proposed project would include features to reduce runoff impacts. Bio-filtration/bio-planter systems would be provided at all inlet locations to the public storm drain system and catch basin inserts would also be installed to reduce runoff and contamination of stormwater. In addition, the proposed project may include upgrades to the existing RCP feeding into the flood control basin along Carrillo Street and the flood basin itself in order to increase capacity to handle a 100-year storm event. For this reason and because the proposed project would increase potential sources of runoff and contamination, impacts would potentially be significant and warrant further analysis in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

f. Otherwise substantially degrade water quality?

The proposed project would not provide substantial additional sources of polluted runoff that would degrade water quality. The proposed project would be required to comply with the campus MS4 Phase II permit and the California State Construction General Permit (Order No. 2009-2009-DWQ). The proposed project would be required to implement a SWPPP that would include BMPs to protect water quality. BMPs would reduce polluted runoff from the project site by retaining, treating, or infiltrating polluted runoff onsite. Adherence to MS4 and Construction General Permit requirements to capture and treat stormwater runoff would reduce the quantity and level of pollutants in runoff leaving the site. Because

the proposed project would be required to use BMPs, it would not cause a negative effect on Calleguas Creek to the west of the project site. Runoff from the project site would be channeled by a system of storm drains and curbs and gutters that discharge directly into, or into drainages that flow to, the existing flood control basin along Camarillo Street (Figure 7). Bio-filtration/bio-planter systems would be placed at all inlet locations to the public storm drain system and catch basin inserts would also be installed. The existing storm drain system would be modified to accommodate the site layout for the proposed project and would be designed to meet the needs of the proposed project. Therefore, the proposed project would not result in an exceedance of capacity for the planned storm drain system, provide substantial additional sources of polluted runoff, or otherwise degrade water quality. No significant impact would occur and further analysis of this issue in an EIR is not warranted.

LESS THAN SIGNIFICANT IMPACT

g. Would the project place housing in a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary, Flood Insurance Rate Map, or other flood hazard delineation map?

h. Would the project place in a 100-year flood hazard area structures that would impede or redirect flood flows?

The project site lies in Flood Zone X, an area outside of the Federal Emergency Management Agency (FEMA) 100-year flood. No housing or structures would be placed in a 100-year flood hazard area. There would be no impact.

NO IMPACT

i. Would the project expose people or structures to a significant risk of loss, injury, or death involving flooding including that occurs as a result of the failure of a levee or dam?

According to the Hazard Mitigation Plan for Ventura County (Ventura County 2010) the project site is not located in a dam inundation area and is not subject to flooding due to dam or levee failure. However, the existing culvert at Inspiration Point is currently undersized for a 100-year storm. There is also potential that the existing flood control basin along Camarillo Street and the 96-inch RCP that feeds into the basin are also inadequately designed for a 100-year storm (Huitt-Zollars 2016). To address these issues, the proposed project would include construction of a new crossing and culvert at Inspiration Point to ensure adjacent lots would not experience flooding during a 100-year storm event and to ensure safe access during a high flow storm event. The proposed project would also include an evaluation of the existing flood control basin along Camarillo Street and the RCP prior to construction to ensure they are adequately designed for a 100-year storm event given the proposed development. Modifications to the basin and RCP, if needed, would be implemented as part of the proposed project are included as part of the project evaluated in this Initial Study. Due to the potential for the existing RCP and flood control basin to be undersized for a 100-year storm event and the need to replace the existing culvert at Inspiration Point, the proposed project's impact on flood hazards may be potentially significant and warrant further analysis in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

j. Would the project result in inundation by seiche, tsunami, or mudflow?

A tsunami is a series of traveling ocean waves of extremely long length generated primarily by vertical movement on a fault (earthquake) occurring along the ocean floor. The project site is located approximately 5.2 miles from the coastline and approximately 2,000 feet from the Calleguas Creek. The project site is also not located near a large inland body of water that could generate a seiche during seismic ground shaking. According to the County of Ventura General Plan Hazards Appendix, the project

site is located in a low hazard area for tsunamis or seiches (Ventura County 2011). Therefore, impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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10 Land Use and Planning

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project have any of the following impacts?				
a. Physically divide an established community	☐	☐	☐	☒
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect	☒	☐	☐	☐
c. Conflict with an applicable habitat conservation plan or natural community conservation plan	☐	☐	☐	☒

a. Would the project physically divide an established community?

The proposed project involves the development of new residences within the CSUCI East Campus area. The proposed project would not involve a road or other facility that would physically divide an established community; rather, it would complete the final phase of this planned development area. The proposed development would blend into the fabric of the already established campus. Therefore, no impact would occur.

NO IMPACT

b. Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

The project site is currently designated Low to Low-Medium density residential in the Specific Reuse Plan. The Specific Reuse Plan Amendment would increase the density of development allowed on the project site to Low-Medium to Medium-High density residential development. This topic and the potential for any conflicts to occur will be reviewed further in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

c. Would the project conflict with an applicable habitat conservation plan or natural community conservation plan?

No Habitat Conservation Plan or Natural Community Conservation Plan applies to Ventura County. Therefore, the proposed project would not pose a conflict (CDFW 2015, USFWS 2016). No impact would occur, and further analysis of this issue is not warranted.

NO IMPACT

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11 Mineral Resources

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project have any of the following impacts:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	■	☐	☐	■
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	■

a. Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

b. Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

The project site is not designated as a known mineral resource site on the Ventura County General Plan Resource Protection Map (Ventura County 2011). No mineral resources that would be of value to the region and the residents of the state are known to exist. Likewise, no mineral recovery sites have been identified on the project site. Given the present residential and academic uses in the surrounding areas, mineral resource extraction would not be considered a compatible use. The proposed project would have no impact on mineral resources. Further discussion of this issue in the EIR is not warranted.

NO IMPACT

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12 Noise

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project result in any of the following impacts?				
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies	■	☐	☐	☐
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels	■	☐	☐	☐
c. A substantial permanent increase in ambient noise levels above those existing prior to implementation of the project	■	☐	☐	☐
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above those existing prior to implementation of the project	■	☐	☐	☐
e. For a project located in an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels	☐	☐	☐	■
f. For a project near a private airstrip, would it expose people residing or working in the project area to excessive noise	☐	☐	☐	■

a. Would the project result in exposure of persons to, or generation of noise levels in excess of, standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

c. Would the project result in a substantial permanent increase in ambient noise levels above levels existing without the project?

d. Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above those existing prior to implementation of the project?

The project site is currently vacant and lies in a part of East Campus that is as yet undeveloped. Consequently, the project site experiences minimal noise from pedestrians and transportation-related sounds from automobiles, trucks, and motorcycles. Construction and operation activities associated with the proposed project would increase noise levels in the vicinity of the project site and along

transportation corridors. Development of the project site would introduce new, temporary sources of noise due to construction and new long-term sources of noise due to project-generated traffic and operation. Operational noises would include sounds typically associated with residential communities, such as conversations, doors closing, music playing, cars starting, and trash hauling.

An increase in traffic associated with the proposed projects and operational noise generated onsite could impact nearby sensitive receptors. Temporary noises due to construction activities could also impact sensitive receptors. These receptors include residences located to the south of the project site. The proposed project is separated from adjacent residences by a two-lane roadway. Given the proximity of the project to nearby sensitive receptors, temporary and long-term noise impacts could potentially be significant and will be further analyzed in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

b. Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Vibration is a unique form of noise because its energy is carried through buildings, structures, and the ground, whereas noise is simply carried through the air. Thus, vibration is generally felt rather than heard.

The proposed project would involve construction activities, such as grading and excavation. These activities are anticipated to result in some vibration that could affect nearby residential receptors. Operation of the proposed project would not perceptibly increase ground-borne vibration or ground-borne noise above existing conditions. Due to the presence of residences near the project site, temporary groundborne vibration associated with construction activity could affect sensitive receptors. Impacts could be potentially significant and will be further analyzed in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

e. For a project located in an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The project site is not located in the jurisdiction of an airport land use plan and is more than two miles from the nearest public airport, Camarillo Airport (approximately 3.75 miles). There would be no impact related to proximity to an airport land use plan or within two miles of a public airport and further analysis in an EIR is not warranted.

NO IMPACT

f. For a project in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise?

There is no private air strip in or adjacent to the project site. There would be no impact relative to proximity to a private airstrip and further analysis in an EIR is not warranted.

NO IMPACT

13 Population and Housing

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project result in any of the following impacts?				
a. Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)	☐	☐	☒	☐
b. Displace substantial amounts of existing housing, necessitating the construction of replacement housing elsewhere	☐	☐	☐	☒
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere	☐	☐	☐	☒

a. Would the project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The proposed Specific Reuse Plan Amendment would increase available housing by up to 358 units above that which is currently entitled, increasing the number of potential residences from 242 single-family residences up to 600 multi-family, single-family, and income/age-restricted residential units. This would induce population growth on the CSUCI Campus.

The California Department of Finance (DOF) states that the population of Ventura County in 2016 is 856,508 persons (DOF 2016). The DOF estimates that there are approximately 3.05 persons per household in Ventura County (DOF 2016). Based on this average, a 600-unit project would accommodate approximately 1,830 people. Consequently, the proposed project alone would increase the population of Ventura County to approximately 858,338 persons. This falls within the 2040 population projection for Ventura County utilized by the Southern California Associate of Government (SCAG) 2016 Regional Transportation Plan-Sustainable Communities Strategy (RTP/SCS) document (SCAG 2016). Furthermore, the proposed project would not extend roads and infrastructure into an undeveloped area and thus, indirectly contribute to further population growth. Impacts to population growth would be less than significant. Further analysis of this issue in an EIR is not warranted.

LESS THAN SIGNIFICANT IMPACT

b. Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

c. Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

The proposed project would increase housing opportunities for the University Glen Community by up to 600 additional units. As the project site is currently vacant, it would not displace existing housing or any

people. No existing housing units would be removed as part of the project. Therefore, no impact to existing housing would occur and a further discussion of this issue in the EIR is not warranted.

NO IMPACT

14 Public Services

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
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Would the project result in any of the following impacts?

- a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

1. Fire protection	■	☐	☐	☐
2. Police protection	■	☐	☐	☐
3. Schools	☐	☐	■	☐
4. Parks	■	☐	☐	☐
5. Other public facilities	☐	☐	■	☐

a.1. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection?

Fire protection for the entire campus is presently provided by the Ventura County Fire Protection District (VCFPD). Station 54 is the nearest fire station, located approximately five miles from the campus, at Pickwick Drive and Arneill Road in the city of Camarillo. Station 50 is the second nearest station, approximately 5.7 miles from the campus, on Las Posas Road near Camarillo Center Drive. The proposed development would increase the local population by approximately 1,830 persons relative to existing conditions. The increase in population resulting from the proposed project and the distance of the campus from existing fire protection facilities could potentially result in a significant physical impact related to the need to provide new or physically altered facilities. This issue will be further analyzed in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

a.2. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for police protection?

Police protection services are provided by the University Police Department staffed by state police officers. The police station is on the main campus about one mile away on Camarillo Street near the Administration Building. The University provides and funds police protection and traffic law enforcement services for the campus and University Glen. Services would increase as development progresses and demand for protection rises. Additional staff may be necessary in the future as the entire campus continues to develop. Impacts may be potentially significant and further analysis in an EIR is warranted.

POTENTIALLY SIGNIFICANT IMPACT

a.3. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for schools?

As of January 1987, State law allows school districts to levy three different levels of development fees directly on new residential, commercial, and industrial development (Government Code Section 65995). School districts set their own fees within the limits set by the law, based on a nexus study establishing their funding requirements. Pursuant to Senate Bill 50 (Section 65995[h]), payment of mandatory impact fees by a private development partner to the affected school district for public-private developments would reduce school facility impact fees to a less than significant level under CEQA. Therefore, with payment of school facility impact fees, the proposed project would have a less than significant impact related to the need for construction of new schools or alteration of existing schools. Further analysis of this issue in an EIR is not warranted.

LESS THAN SIGNIFICANT IMPACT

a.4. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for parks?

The proposed project would result in a population increase (over the existing condition) of up to 1,830 persons. The proposed project includes 2.8 acres of recreation and park land. No specific trails are identified in the Campus Master Plan on the project site, but some hiking trails are expected to be developed at or connecting to the project site. Given the number of new residents when compared to the amount park area provided within the project site, the proposed project could have a potentially significant impact on existing recreational facilities and/or result in the need for new or expanded facilities. Impacts would be potentially significant and will be analyzed further in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

a.5. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for other public facilities?

Library services are provided by the John Spoor Broome Library located at 50 Camarillo Street, within walking distance of the project site. The proposed project would increase the population by an estimated 1,830 residents over existing conditions. Residents may use existing library facilities, but increased

demand would be nominal. This impact would be less than significant and further analysis of this issue in an EIR is not warranted.

No impacts to other governmental facilities are anticipated as a result of the proposed project. For a discussion of impacts to utilities (e.g., sewer, storm drains) and roadways, see Section 16, Transportation, and Section 17, Utilities and Services, of the Environmental Checklist.

LESS THAN SIGNIFICANT IMPACT

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15 Recreation

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project result in any of the following impacts?				
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated	■	☐	☐	☐
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment	■	☐	☐	☐

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

The proposed project would result in a population increase (over the existing condition) of up to 1,830 persons. The proposed project includes 2.8 acres of recreation and park land. No specific trails are identified in the Campus Master Plan on the project site, but some hiking trails are expected to be developed at or connecting to the project site. Given the number of new residents when compared to the amount park area provided within the project site, the proposed project could have a potentially significant impact on existing recreational facilities and/or result in the need for new or expanded facilities. Impacts would be potentially significant and will be analyzed further in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

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16 Transportation

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project result in any of the following impacts?				
a. Conflict with an applicable plan, ordinance or policy establishing a measure of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways, and freeways, pedestrian and bicycle paths, and mass transit?	■	☐	☐	☐
b. Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	■	☐	☐	☐
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	■
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)?	■	☐	☐	☐
e. Result in inadequate emergency access?	■	☐	☐	☐
f. Conflict with adopted policies, plans, or programs regarding public transit, bikeways, or pedestrian facilities, or otherwise substantially decrease the performance or safety of such facilities?	■	☐	☐	☐

The California State University system provides a Transportation Impact Study (TIS) Manual to guide the analysis of a proposed project's transportation impacts on the CSU campuses and adjacent transportation networks. The manual, prepared by Fehr and Peers in November 2012, provides a preferred methodology for level of service (LOS) analysis, as well as criteria to determine the significance

of transportation impacts under CEQA. The TIS Manual provides significance criteria for off-site traffic operations, on-site circulation, bicycle facilities, pedestrian facilities and Americans with Disabilities Act (ADA) compliance, transit, intersection traffic control, transportation plan consistency, safety, and construction. As required by the TIS Manual, the TIS will assess the proposed project's consistency with significance criteria. Consistency would indicate a less than significant impact to relevant transportation impacts. A TIS for the proposed project is in the process of being completed and will be incorporated into the EIR for the proposed project.

a. Would the project conflict with an applicable plan, ordinance or policy establishing a measure of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways, and freeways, pedestrian and bicycle paths, and mass transit?

The proposed project would increase traffic along site-adjacent roadways compared to existing levels. Additional temporary and long term traffic would be generated by construction activities and by the operation of the proposed project. Project-generated traffic during construction would include worker-related commuter trips, trucks used for delivering construction equipment, and trucks used for delivering and hauling construction materials and wastes. Project-generated traffic during operation would include resident traffic. The increase in traffic could adversely affect circulation system performance on the CSUCI campus and in adjacent areas, potentially exceeding thresholds in the TIS Manual. Adjacent areas include nearby communities that use highways and roads near the site, including SR 1, SR 34, U.S. Highway 101, Lewis Road, Cawelti Road, Hueneme Road, and Potrero Road. Impacts resulting from both project components would be potentially significant and will be analyzed further in an EIR in accordance with guidelines set forth in the TIS Manual.

POTENTIALLY SIGNIFICANT IMPACT

b. Would the project conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Ventura County prepares and updates a Congestion Management Plan (CMP) every two years to meet voluntary state congestion management regulations (Government Code sections 65088-65089) and mandatory federal regulations that require the development and implementation of a congestion management process (Title 23 CFR Part 450.320). The CMP is intended to address congestion and improve traffic primarily on highways, in urban areas, and on principal arteries in Ventura County (Ventura County 2009). The CMP identifies key roadways for monitoring and management, referred to as the CMP Network. The CSUCI campus lies outside of the County's main urban area, but is accessed via routes included in the CMP network, such as Lewis Road and U.S. Highway 101. Congestion impacts resulting from the proposed project could be potentially significant and will be analyzed further in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

c. Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

As discussed in Section 8, Hazards and Hazardous Materials, and Section 12, Noise, of the Environmental Checklist, the project site is more than three miles away from a public airport/private airstrip and would not affect air traffic patterns. There would be no impact, and further analysis is not warranted.

NO IMPACT

- d. Would the project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)?

A traffic study impact analysis will be prepared to evaluate potential traffic hazards. More information on the proposed project's residential driveway design is also forthcoming. The proposed project's impact on traffic hazards due to project design could be significant and will be analyzed further in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

- e. Would the project result in inadequate emergency access?

The project site is accessed via Channel Islands Drive, which intersects roads traversing the project at two points: at the western boundary of the project site and at the southern boundary of the project site (see Figure 11). The project site itself is serviced by an array of roads that vary from a 32-foot curb-to-curb roadway with parking on both sides to alleys with 24-foot drive aisles. The project would be required to comply with VCFPD Access Standards, as well as provisions of the International Fire Code Section 504, and California Code of Regulations Title 14, Sections 1270.00-1273.11 (VCFPD 2011). These regulations establish requirements for access design and construction that provide for emergency responders and public safety. In addition, construction plans for the proposed project would be subject to review by the Ventura County Fire Prevention Bureau (VCFPD 2016). Compliance with applicable codes and standards would reduce impacts to emergency access to less than significant levels.

LESS THAN SIGNIFICANT IMPACT

- f. Conflict with adopted policies, plans, or programs regarding public transit, bikeways, or pedestrian facilities, or otherwise substantially decrease the performance or safety of such facilities?

The proposed development would result in modifications to existing roadways and paths on the project site to accommodate a new lot configuration for 600 mixed residential units. More details regarding proposed pedestrian and bike facilities are forthcoming. Consequently, conflicts with policies and plans included in the Specific Reuse Plan and the Campus Master Plan regarding public transit, bikeways or pedestrian facilities could be potentially significant and warrant further analysis in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

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17 Tribal Cultural Resources

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
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Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or | ☐ | ☐ | ☐ | ☒ |
| b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Cod Section 2024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significant of the resource to a California Native American tribe. | ☐ | ☐ | ☐ | ☒ |

a. Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074 that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?

b. Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074 that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 2024.1?

Tribal cultural resources are defined in Public Resources Code 21074 as one of the following:

1. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
 - (a) Included or determined to be eligible for inclusion in the California Register of Historical Resources.
 - (b) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

The area on which the project site is located has been previously disturbed and has been evaluated for cultural resources in past environmental reviews (e.g., 2000 Campus Master Plan EIR). No tribal resources have been previously identified on the site and the proposed project does not affect a tribal cultural resource listed or eligible for listing in the state or local register of historical resources, or

California State University, Channel Islands Site Authority
CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential
Neighborhood Project

determined by the lead agency to be significant to a California Native American tribe. No impact would occur.

NO IMPACT

18 Utilities and Service Systems

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project result in any of the following impacts?				
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board	☐	☐	☒	☐
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects	☐	☐	☒	☐
c. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects	☒	☐	☐	☐
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed	☒	☐	☐	☐
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments	☒	☐	☐	☐
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs	☐	☐	☒	☐
g. Comply with federal, state, and local statutes and regulations related to solid waste	☐	☐	☒	☐

- a. Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?
- b. Would the project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?
- e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

CSUCI relies on the water and wastewater facilities provided by the Camrosa Water District (CWD; 2015), which provides wastewater treatment and potable and recycled water delivery to the campus. The existing campus water distribution system was reconstructed between 1990 and 1996. Two existing 1.0 million gallon storage tanks located on the hill northeast of the campus core provide additional storage for fire and peak flow demands on campus. Water and wastewater infrastructure would be developed onsite to serve the proposed project. Figure 6 shows the conceptual plan for domestic water facilities at the project site. Figure 8 and Figure 9 show the existing and proposed recycled water and sewer system for the project site, respectively.

The CWD provides the CSUCI campus with recycled water from its Water Reclamation Facility (WRF). The facility reclaims wastewater and provides tertiary treatment at a capacity of 1.5 million gallons per day (mgpd). It has a storage capacity of nearly 100 million gallons (CWD 2009). The sanitary sewer system in University Glen flows by gravity to the existing sewer system in the academic area, which in turn flows to the CWD wastewater treatment plant. The sewer system for the proposed project would connect into the sewer system serving existing University Glen residences and the main campus.

The CWD WRF is currently operating at close to capacity. As a result, CWD is in the process of expanding the capacity of the WRF to accommodate an average flow of 2.25 mgpd—an increase in capacity of 0.75 mgpd (CWD 2015). Based on wastewater generation estimates for different land uses provided in the Los Angeles CEQA Thresholds Guide (City of Los Angeles 2006), the proposed project would generate approximately 102,660 gallons of wastewater per day. This represents fourteen percent of available expanded capacity and less than five percent of total capacity. While the CWD is in the process of providing expanded treatment facilities, allocation of the increased capacity is unknown, and it is yet to be determined as to whether the proposed expansion could accommodate the increase in wastewater generation from the proposed project. The project may result in significant an exceedance of wastewater treatment requirements, or may require result additional wastewater treatment capacity beyond what is already underway. Impacts could be potentially significant and will be analyzed further in an EIR.

Table 2 Project Estimated Wastewater Generation

Land Use	Quantity (Dwelling Units)	Generation Factor (gallons/unit/day)	Amount (gpd)
Apartment-1 bedroom	135	120	16,200
Apartment-2 bedroom	265	160	42,400
Apartment-3 bedroom	80	200	16,000
Townhouse-2 bedroom	22	180	3,960
Townhouse/Single Family-3 bedroom	73	230	16,790
Townhouse/Single Family -4 bedroom	11	270	2,970
Townhouse/Single Family -5 bedroom	14	310	4,340
Total			102,660

Source: Los Angeles County Sanitation Districts, "Table 1: Loadings for Each Class of Land Use". Accessed October 5, 2016.
gpd = gallons per day

POTENTIALLY SIGNIFICANT IMPACT

c. Would the project require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

As previously discussed in Section 9, Description of Project, of the Initial Study, and Section 9, Hydrology, of the Environmental Checklist, the proposed project would extend the existing storm drain system onsite to serve a mix of 600 residential units (Figure 7). Impacts within the main project site boundaries associated with storm drain system improvements would be minimal. However, potential modifications to the existing 96-inch RCP pipe and flood control basin as well as the culvert on the unnamed drainage leading to Inspiration Point could potentially result in significant environmental effects, including in relation to hydrology and biological resources. These impacts will be evaluated further in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

The proposed project would include up to 600 new residential units and ancillary facilities and utilize potable and recycled water for construction, operations, and landscape maintenance. As previously mentioned, water supplies would be provided to the project site by the CWD. From 2010 through 2015, the CSUCI campus decreased potable water use despite a growing campus population by substituting recycled water. Campus potable water use fell from 275 acre feet (AF) in 2010 to 217 AF in 2015, while recycled water use rose from 131 AF to 256 AF over the same time period. In addition, CWD water demand projections, presented in CWD's 2015 Urban Water Management Plan (UWMP), factor in student count increases and future buildout of the CSUCI campus over the next 10-15 years (CWD 2016). As indicated in Table 3, CWD projects that it will have a surplus water supply of over 8,000 AF through 2035.

Water demand is estimated to be 120 percent of wastewater generated by a project. Based on wastewater generation rates used previously in this section of the Environmental Checklist, the proposed project would use approximately 123,192 gallons of water per day, or 138 AF per year. That is less than two percent of forecast water supply surplus for the forecast period, 2020-2035. Nonetheless, the proposed project would result in 358 more residential units than originally planned. Furthermore, California is entering a sixth year of drought, and Ventura County water supply in general remains

uncertain. Existing water supplies may not be adequate to serve the proposed project. Impacts could be potentially significant and will be analyzed further in an EIR.

Table 3 Camrosa Water District Projected Water Supply and Demand

	2020	2025	2030	2035
Supply totals (AF)	24,450	28,830	28,930	28,930
Demand totals (AF)	15,941	15,587	15,987	16,113
Difference (AF)	8,509	13,243	12,943	12,817

Source: CWD 2015

LESS THAN SIGNIFICANT IMPACT

f. Would the project be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal need?

g. Would the project comply with federal, state, and local statutes and regulations related to solid waste?

If a proposed project has a direct or indirect adverse effect on a landfill such that it impairs the landfill's disposal capacity in terms of reducing its useful life to less than 15 years, the project has a potentially significant impact on the demand for solid waste disposal capacity (VCRMA 2011).

Harrison Industries, a commercial vendor, provides solid waste disposal for CSUCI. It partners with the Gold Coast Recycling and Transfer Station, where recyclables are sorted, baled, and sold for reuse in compliance with Assembly Bill (AB) 341. It also partners with Agromin for the processing of green waste for reuse in agricultural products, fuel, and landscape materials. Refuse haulers are required to implement waste reduction and recycling programs consistent with the Ventura County General Plan's Source Reduction and Recycling Element. The two recycling and transfer centers that may be used are the Del Norte Regional Recycling and Transfer Station and the Gold Coast Recycling Center. The residual waste may be taken to either the Toland Landfill or the Simi Valley Landfill. Toland Landfill has a capacity of 1,500 tons per day with a maximum capacity of 30,000 cubic yards. Simi Valley Landfill has a daily capacity of 9,250 tons per day with a maximum capacity of 119,600,000 cubic yards and both landfills had most of their capacity remaining at the last inspection date (2006 and 2012, respectively) (CalRecycle 2016).

The proposed project has the potential to generate approximately 7,338 lbs (3.7 tons) per day based on a waste generation rate for residential uses of 12.23 lbs per household per day (City of Los Angeles 2006); as the resident amenities/community center would be used primarily by residents, solid waste generated by the community center would be largely captured by residential use estimates and was not estimated as a separate project component. This represents 0.2 percent of the daily capacity of Toland Landfill and less than 0.04 percent of the daily capacity of Simi Valley Landfill. In addition, solid waste generated by the proposed project would be minimized by campus efforts to reduce waste, and presents a nominal increase in capacity use for landfills serving the area. Furthermore, the proposed project would adhere to state and federal regulations pertaining to solid waste. Therefore, this increase would not reduce the landfills' useful lives to less than 15 years. Consequently, the proposed project would have less than significant impacts to landfill capacity and would not conflict with applicable guidelines regarding solid waste. No further analysis in an EIR is warranted.

LESS THAN SIGNIFICANT IMPACT

19 Mandatory Findings of Significance

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
a. Does the project have the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	■	□	□	□
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	■	□	□	□
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	■	□	□	□

a. Does the project have the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

The project site generally lacks native biological habitats, as discussed under Section 4, Biological Resources, of the Environmental Checklist but existing vegetation within and adjacent to the project could provide habitat for nesting birds. The project also includes ground disturbance activities that could impact the unnamed drainage that runs between the main part of the site and Inspiration Point. The proposed project could also include changes to the existing flood basin located west of the project site, which could impact wetland habitat and suitable habitat for the protected Least Bell's vireo.

As discussed under Section 5, Cultural Resources, of the Environmental Checklist, there are no known historic resources or known archaeological or paleontological resources onsite. Compliance with State law and incorporation of Mitigation Measure CR-1 would address potential impacts to any as yet undiscovered archaeological and paleontological resources. Based on this, the proposed project would not eliminate important examples of the major periods of California history or prehistory.

Given the potential impacts to special status species and their associated habitats, impacts related to these issues could be potentially significant and further analysis will be conducted in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

b. Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

In combination with other planned and pending development in the area, the proposed project could contribute to significant cumulative impacts. In particular, cumulative impacts could occur with respect to such issues as transportation, air quality, biological resources, greenhouse gases, water supply, and noise. The cumulative effects of the proposed project, in combination with other planned projects in the vicinity, will be evaluated in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

The proposed project may result in potential adverse impacts to human beings. Impacts related to aesthetics, air quality, geology and soils, greenhouse gas emissions, land use/planning, noise, public services, recreation, transportation, and utilities/service systems would be potentially significant. These impacts will be analyzed further in an EIR.

POTENTIALLY SIGNIFICANT IMPACT

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Rincon Consultants, Inc. prepared this IS under contract to the CSUCI and CSUCI Site Authority. Persons involved in data gathering analysis, project management, and quality control include the following.

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Appendix A

Geotechnical Study and Addendum

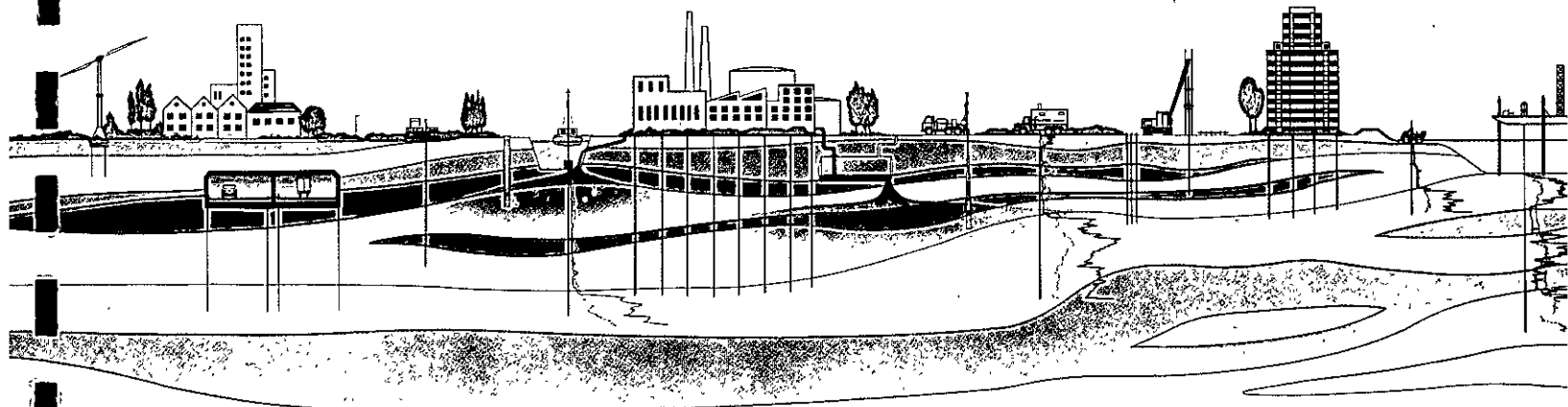
FUGRO WEST, INC.



**GEOTECHNICAL STUDY
CAL STATE UNIVERSITY CHANNEL ISLANDS
EAST CAMPUS DEVELOPMENT
CAMARILLO AREA
VENTURA COUNTY, CALIFORNIA**

Prepared for:
CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS
SITE AUTHORITY

December 2000



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December 14, 2000
Project No. 99-42-0384

California State University, Channel Islands Site Authority
401 Golden Shore
Long Beach, California 90802-4210

Attention: Mr. David Rosso

Subject: Geotechnical Study for Cal State University Channel Islands, Camarillo Area of Ventura County, California

Dear Mr. Rosso:

Fugro is pleased to submit this geotechnical report for the East Campus Development at California State University, Channel Islands (CSUCI). This study was completed in general accordance with Fugro's proposal dated June 6, 2000, and addendum dated October 3, 2000, and was authorized with the execution of a Service Agreement between CSUCI Site Authority and Fugro on June 30, 2000, and an Extra Service Authorization dated October 6, 2000.

This geotechnical study report presents findings, conclusions, and recommendations concerning the geotechnical conditions in the East Campus Development area.

As discussed in the report, we recommend that the potential for rockfall, debris flow, and bedding plane failure in slope areas adjacent to development areas be evaluated further.

We appreciate the opportunity to provide our services to the CSUCI Site Authority on this project. Please call if we can provide further information, or clarify any findings or recommendations.

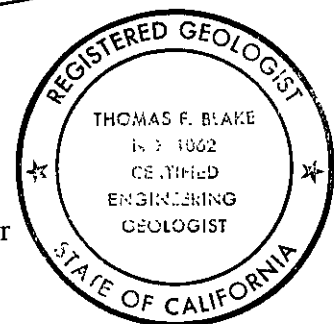
Sincerely,

FUGRO WEST, INC.



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INTRODUCTION

GENERAL STATEMENT

Fugro is pleased to submit this report presenting the results of a geotechnical study for the proposed East Campus Development at California State University, Channel Islands (CSUCI), in the Camarillo Area of Ventura County, California. The general location of the site is east and north of the former Camarillo State Hospital facility, which is currently being transformed into the CSUCI campus. The general location of the East Campus Development is shown on Plate 1 - Vicinity Map. The proposed site layout is shown on Plate 2 - Site Development Map.

As shown on Plate 2, the East Campus area consists of an "L"-shaped alluvial corridor located east of the main hospital facility that is bounded on both sides by the western foothills of the Santa Monica Mountains. A former California Conservation Corps housing facility is located at the northern end of the eastern corridor and an unoccupied cluster of structures, which we understand was formerly an elementary school site, is located at the east end of the southern corridor, just west of an existing debris dam. The main core of the former Camarillo State Hospital buildings are located at the west end of the south corridor and are being converted to educational facilities for the CSUCI campus.

PURPOSE

The purpose of this geotechnical study is to evaluate the general geotechnical conditions at the project location, and to develop geotechnical conclusions and recommendations for infrastructure development and for subgrade preparation and foundation design for the proposed residential structures. Specifically excluded from this study was the evaluation of potential environmental impairment or soil/groundwater contamination at the site.

AUTHORIZATION

The original scope of work for this study was set forth in the Fugro proposal dated April 15, 1999, to the Catellus Residential Group. A revised proposal was prepared on April 26, 1999, and an addendum to that revised proposal was prepared on May 7, 1999. This study was authorized with the execution of a Contract for Consultant Services by Catellus Residential Group dated July 1, 1999.

Supplemental studies, as outlined in our proposal to the California State University Chancellor's Office dated June 5, 2000 (revised June 6, 2000) and October 3, 2000, have been incorporated into this geotechnical study. The supplemental studies were authorized with the execution of a Service Agreement with the California State University Channel Islands (CSUCI) Site Authority dated June 30, 2000, and an Extra Service Authorization (No. 1) dated October 6, 2000.

KEY PERSONNEL

The following key personnel are associated with this project:

- Mr. David Rosso, Project Manager, California State University
- Mr. Jeffrey Minter, Vice President, UnivDev, LLC.
- Mr. Marc Haslinger, Senior Project Manager, Tetra Tech ASL Consulting Engineers
- Mr. Dan Novak, Bridge Design Engineer, Tetra Tech ASL Consulting Engineers

PROJECT DESCRIPTION

The information presented herein concerning the proposed East Campus Development at California State University, Channel Islands, is based on conversations with Mr. Rosso of California State University, Mr. Minter of UnivDev, LLC, and Mr. Haslinger of Tetra Tech ASL Consulting Engineers (ASL). The East Campus Development has been reduced in scope by the CSUCI Site Authority from that outlined in our draft preliminary geotechnical study (Fugro, 1999a), to essentially five phases of residential development with associated infrastructure. The revised project description consists of the following:

- **Residential.** About 900 residential units, consisting of single-family, paired homes, townhomes, and rental housing are planned for both the eastern corridor and the southern corridor. Phase I of the development will occur along the southern corridor between the future library at the western end and the elementary school site at the eastern end. Phase I will comprise alley-loaded single family units, townhomes, and multi-family and rental units, totaling about 200 units. The construction of Phases II through IV will continue northward along the eastern development corridor, with a composition of unit types generally consistent with Phase I. The final Phase V, to be located at the northernmost end of the eastern development corridor, will consist predominantly of single-family residences on individual lots. The residential structures for Phases I through V will be one to two stories of wood-frame construction.
- **Backbone Infrastructure.** The main access to the East Campus Development area from the CSUCI campus will be along the existing Rincon Drive, which will be widened between the bridge at Santa Barbara Avenue and Ojai Street. Rincon Drive will continue southward at what is currently Ojai Street, and then will end where the main arterial road ("A" Street) parallels the toe of the north-facing slope along the southern development corridor. The "backbone infrastructure" for the East Campus Development also will incorporate the widening of Rincon Drive and the construction of a new connector road between University Drive and the northern end of the eastern corridor. The new connector road will be constructed by filling the drainage channel at the base of the two slopes. The "backbone infrastructure" will also include the construction of a main arterial road ("A" Street) between the southern and eastern corridors. The main arterial road will traverse the eastern edge of the eastern corridor



and the southern edge of the southern corridor. Several traffic circles (i.e., "roundabouts") are planned at intersections of the main arterial road and neighborhood streets.

The "backbone infrastructure" also will include the installation of underground utilities for future residential development and the construction of a new bridge over the Long Grade Channel on the eastern side of the intersection of the eastern and southern development corridors. An approximately 10-foot-diameter concrete storm drain will be placed in the channel alignment beneath the proposed connector road. The storm drain will outlet into a "meadows" area adjacent to University Drive. A cosmetic bridge at the western end of the connector road will conceal the storm drain outlet. The bridge over the storm drain outlet will retain up to about 20 feet of earth materials.

The various development areas are shown on Plate 2.

FUTURE DEVELOPMENT

Future development that is not a part of this study but has been considered for later phases includes a retail/town square and an elementary school. Additionally, other development areas addressed in the draft preliminary study that have been postponed and/or deleted from the current project scope include the west campus research and development courtyard and corresponding alternate sites along Potrero Road. Field and laboratory data relevant to the future retail/town square and school sites and the (postponed) research and development areas are presented in this report for informational purposes only and should not be used for design. The proposed locations of the future development areas are as follows:

- **Retail/Town Square.** A future retail/town square development is planned for the far western end of the southern corridor of the East Campus area, north of the future library.
- **Elementary School.** An elementary school is planned at the eastern end of the southern corridor, between the existing debris dam and Phase I of the East Campus Development.

PROPOSED GRADING

According to the 90 percent grading plans (Tetra Tech ASL, 2000), we understand that for building development, site grading will range from a few feet of cut to a few feet of fill in the level areas with cuts near the slope toes increasing to about 10 feet and fills near drainage channels and in depressions increasing in thickness up to 20 feet, particularly along the connector road and on the single-family lots at the northwestern end of the eastern corridor. Along the northern edge of those fill lots and roughly parallel to the existing drainage channel, retaining walls up to about 13 feet high are planned.

Cuts into existing slopes on the order of about 10 to 20 feet high are proposed along the arterial road and north of the neighborhood street (e.g. "C" Street) and the northernmost residential lot at the northern end of the eastern development corridor.

WORK PERFORMED

The scope of work performed for this study was described in our proposal dated April 15, 1999, and was amended in subsequent revisions dated April 26 (i.e., revised proposal) and May 7, 1999 (amendment letter), and supplemented in subsequent proposals dated June 5, 2000 (revised June 6, 2000) and October 3, 2000. The scope of work consisted of the following tasks:

DATA AND AERIAL PHOTOGRAPH REVIEW

Existing available geologic and geotechnical data pertinent to the study were compiled from various sources and reviewed. Those data consist of published and unpublished geologic and geotechnical maps, geotechnical reports for adjacent properties, literature, and research data, along with pertinent well logs and historical stereo aerial photographs. References utilized and photographs reviewed are listed in the References section following the text.

Data from the following geotechnical reports (or portions thereof) for adjacent properties were reviewed:

1. A geologic reconnaissance study for Thornhill Ranch, located along the south side of Potrero Road south of the campus area (Fugro, 1999b).
2. A geotechnical study for the Camrosa Wastewater Treatment Plant Expansion (Fugro, 1994), located just west of the western end of the campus property (and the proposed research and development courtyard).
3. Logs of monitoring, sparging, and vapor extraction wells and borings at the former Camarillo State Hospital (SGD, 1988; Geosystem, 1996, 1997)

SUBSURFACE EXPLORATION

The subsurface exploration for this study includes the following:

- Seventeen cone penetrometer test (CPT) soundings to depths ranging from about 23 to 75 feet below the existing ground surface (completed June 29, 1999)
- Twenty-three hollow-stem-auger drill holes ranging from 19 feet to about 61 feet below the ground surface (original exploration completed August 4, 1999, and subsequent exploration completed August 8, 2000)
- Seventeen backhoe trenches excavated to depths ranging from about 4 to 11 feet on July 1 and 2, 1999, and an additional 18 backhoe trenches excavated on October 19 and 23, 2000 for the supplemental study

The approximate locations of the CPT soundings, drill holes, and backhoe test pits are shown on Plate 3 - Geologic Map. Descriptions of the field exploration and logs of the CPT soundings, drill holes, and backhoe test pits are presented in Appendix A - Subsurface Exploration. The CPT logs and associated soil classification chart are presented on Plates A-1.1 through A-1.18, the log of the drill holes and legend are presented as Plates A-2.1 through A-2.24, and the backhoe trench logs are presented on Plates A-3.1 through A-3.35.

Geologic cross sections utilizing the subsurface data obtained from the CPT soundings and drill holes are presented on Plates 4 and 5 - Geologic Cross Section A-A' and B-B'. A key to symbols used on the cross sections is presented on Plate 6 - Key to Cross Sections.

LABORATORY TESTING

Laboratory testing was performed on selected soil samples to estimate pertinent engineering properties for use in the geotechnical evaluation. The laboratory testing program consisted of the following:

- Unit weight and moisture content determinations,
- Index and classification (including grain size, Atterberg limits, and expansion index) tests,
- Direct shear tests,
- Compaction curves,
- One-dimensional consolidation tests,
- Collapse tests,
- Sand equivalent (SE) test,
- R-value tests, and
- Corrosion (limited soil chemical) tests.

The results of the laboratory analyses are presented in Appendix B - Laboratory Testing.

GEOTECHNICAL ENGINEERING AND REPORT

Geotechnical engineering evaluations were performed to develop recommendations to aid in the preliminary design of the proposed residential structures and associated infrastructure development. Engineering evaluations and recommendations summarized in this report consist of the following:

1. Generalized soil and groundwater conditions at the site.
2. Geologic setting and geologic hazards; including the potential for slope instability, rockfall, liquefaction, seismic shaking, fault rupture, seismically-induced settlement of dry sands, seismically-induced lateral movements, hydroconsolidation, and expansion potential.

3. Assessment of engineering properties of encountered soils, including consolidation potential of soils in development areas.
4. Excavation and trenching conditions.
5. Suitability of onsite soils for use as compacted fill, including corrosivity (limited soil chemistry testing: pH, resistivity, chlorides and sulfates).
6. Estimated shrinkage and subsidence from earthwork activities.
7. Subgrade preparation and compaction requirements for road construction and mass grading, including fill and backfill placement.
8. Construction considerations including groundwater, excavation, site preparation and grading, stripping, subgrade stabilization, structural fill, suitability of onsite materials, and pavement subgrade preparation.
9. Mitigation options for expansive soils.
10. Criteria for temporary excavations.
11. Foundation types with overexcavation requirements for the mass grading of the residential development in the east campus area.
12. Allowable bearing pressures for residential structures and retaining walls.
13. Allowable axial and lateral capacities for bridge drilled pier design, with recommended tip elevations.
14. Lateral earth pressures for cantilever and restrained retaining walls.
15. Asphalt-concrete pavement and interlocking paver section design.

SITE CONDITIONS

TOPOGRAPHY

The East Campus Development site is located at the southwestern end of the Santa Monica Mountains about 2-1/2 to 3-1/2 miles south of Camarillo, California, and about 3 miles north of the Pacific Ocean. The Santa Monica Mountains are an east-west-trending mountain range that extends from the Los Angeles basin on the east to the Oxnard Plain on the west, a distance of about 35 miles.

The residential development area comprises an "L"-shaped alluvial valley. The southern leg of the "L"-shaped valley is the western extension of Long Grade Canyon, and the eastern leg is surrounded by foothills of the western Santa Monica Mountains. The gradient of the southern half of the eastern alluvial corridor is less than 1 percent down to the south, the northern half is about 4 percent down to the west, and the southern alluvial valley is about 3 percent down to the west.



With the exception of several residential lots at the northern end of the eastern corridor, no development is planned on the surrounding slopes of the Santa Monica Mountains.

Elevations across the East Campus Development area range from about elevation (El.) 95 feet (mean sea level [MSL]) at the western end of the southern development corridor (Phase I) to about El. 155 feet at the eastern end of the northern half of the eastern corridor (Phase V). Along the connector road, elevations range from about El. 55 feet at the western end (i.e., at University Drive) to about El. 100 feet at the eastern end.

DRAINAGE

Drainage within the project area occurs as sheet flow and through small tributary drainages into several major drainages. The site drains toward the west along Long Grade Canyon and also across the northern end of the eastern corridor following the proposed connector road alignment to University Drive. Long Grade Canyon is channelized west of the debris dam and north of Rincon Drive, and ultimately flows into Calleguas Creek north of the Camrosa Wastewater Treatment Plant.

Before channelization, the natural course of Long Grade Canyon Wash was evident on historical topography maps (State of California DPW, 1941). The natural wash channel bisected the eastern end of the southern alluvial valley between the existing debris dam site and the southern leg of Rincon Drive. The wash channel was abandoned by filling it with artificial fill, which may be on the order of about 6 feet deep. The approximate trace of the original Long Grade Canyon Wash through the east half of the southern development corridor is shown on Plate 3.

The Long Grade Channel empties into another manmade drainage ditch that flows parallel to the northern edge of the west campus property in the western campus wetlands area and ultimately empties into Calleguas Creek.

GEOLOGIC CONDITIONS

REGIONAL GEOLOGY

The CSUCI campus area is situated in the southern portion of the Transverse Ranges geomorphic province of California. The province is characterized by east-west-trending mountain ranges composed of sedimentary and volcanic rocks ranging in age from Cretaceous to Recent. Major east-trending folds, reverse faults, and left-lateral strike-slip faults reflect regional north-south compression and are characteristic of the Transverse Ranges. The Transverse Ranges Geomorphic Province is bounded on the north by the Santa Ynez fault, on the east by the San Bernardino Mountains, on the south by the Transverse Ranges frontal fault zone, and on the west by the Pacific Ocean.

The Ventura basin, including its offshore continuation in the Santa Barbara Channel, is the dominant structural element of the western Transverse Ranges. The basin is filled with a thick sequence of Cenozoic sedimentary rocks estimated to be more than 20,000 feet in total thickness.

The Santa Monica Mountains, together with the northern Santa Barbara Channel Islands offshore to the west, constitute the western Transverse Range uplift south of the Ventura basin. The Santa Monica Mountains are uplifted generally anticlinally on the north-dipping Malibu Coast-Santa Monica fault zone (Dibblee and Ehrenspeck, 1993).

The Oxnard Plain at the western edge of the property represents the ancient delta of the Santa Clara River, formed at the end of the last glacial epoch when the Santa Clara was part of a much more extensive river system.

SITE GEOLOGY

The surficial geology of the CSUCI campus and the surrounding area has been mapped at a scale of 1 inch = 2,000 feet by Dibblee and Ehrenspeck (1990), and 1 inch = 4,000 feet by Weber et al. (1973). The geology presented on Plate 3 (1 inch = 500 feet) was modified, in part, from data presented by Dibblee and Ehrenspeck (1990). The site is underlain by surficial sediments that consist of alluvium (Q_{al}) and colluvium (Q_{col}). The surficial deposits range in age from late Pleistocene to Holocene. Bedrock units at the site consist of middle Miocene-age marine clastic rocks called the lower Topanga Formation that is overlain by middle Miocene Conejo Volcanics. The Conejo Volcanics are composed of both extrusive and intrusive materials.

Geologic Structure

Geologic structure refers to the orientation of layers and planes of weakness in a rock mass. The site is traversed by faults that appear as localized shear zones within the bedrock units. A northwest-trending normal fault appears on Dibblee and Ehrenspeck (1990) just west of the existing water tank above the California Conservation Corps campus. However, after recent reconnaissance mapping with Mr. Dibblee and Mr. Ehrenspeck for this project, the fault trace appears to have been mismapped on Dibblee and Ehrenspeck (1990), and should have been mapped with an east-west trend. The time of last movement on that fault is unknown, but at the present time, it is not thought to be a currently active structure. Recent correspondence by Dibblee and Ehrenspeck (1999) acknowledges the mismapped fault. Both the incorrectly and correctly mapped fault traces are shown on Plate 3.

On the basis of published geologic maps (Weber et al., 1973; and Dibblee and Ehrenspeck, 1990) and our field reconnaissance mapping, the bedding or flow layering in the Conejo Volcanics bedrock exposed on the slopes surrounding the site generally dip between about 10 and 30 degrees toward the north/northwest.

Earth Materials

On the basis of the CPT soundings, backhoe test pits, and drill holes advanced for this study, and on data from previous borings, monitoring wells, and CPTs for adjacent properties, the general soil profile consists predominantly of lean to fat clay, with thin layers of clayey to silty sand.

Ground squirrel burrows are abundant in the upper few feet of soil in most areas of the project site.

Plates 4 and 5 depict the generalized alluvial stratigraphy across the southern and eastern corridors inferred from our subsurface exploration. The locations of those cross-sections are shown on Plate 3.

Artificial Fill (Af). Artificial fill consisting of lean clay, sandy lean to fat clay, sand, and sandy silt (which locally contains construction debris such as concrete, bricks, and cable) was encountered in the wetlands area (drill hole DH-1); along the north-facing slope of the southern corridor (backhoe test pit BH-1A); along the original alignment of Long Grade Canyon Wash (drill hole DH-3 and test pit BH-214); along and adjacent to the embankments of the Long Grade Channel (drill holes DH-207 and DH-208); at the western end of the southern corridor (drill hole DH-2); in the debris dam at the east end of the southern corridor (drill hole DH-4); in the proposed Phase III, IV and V residential development areas (drill hole DH-6 and test pits BH-207 and BH-210); and adjacent to the drainage channel along the proposed connector road alignment (backhoe test pit BH-7A). The artificial fill varied in thickness from about 1 to 7 feet, and was about 10 feet thick at the debris dam location (drill hole DH-4). Near test pits BH-203 and BH-212, piles of trash were observed on the ground surface, and the approximate locations are shown on Plate 3. From our photo-reconnaissance observations, it appears that artificial fill is also present in and around the currently developed areas, and those areas are shown on Plate 3. Also, artificial fill may exist elsewhere within and beyond those areas explored for this study, and maximum thicknesses may exceed those encountered at the exploration locations.

Alluvium (Qal). Recent alluvium (Qal) was mapped along the southern corridor of the East Campus Development area as far west as the wetlands area and as far south as West Potrero Road below the Round Mountain Dam. Alluvium was also encountered at the northern end of the eastern corridor near the east-west trending drainage channel.

The alluvium consists primarily of lean to fat clay to sandy clay, underlain by clayey sand and a few discontinuous layers of silty sand. Fat clay alluvium was common in the upper 15 to 20 feet at the western end of the southern corridor of the East Campus Development area. At the eastern end of that corridor, the surficial clay commonly was lean, not fat (e.g., in drill hole DH-206), and was underlain at a depth of about 24 feet by an approximately 10-foot-thick layer of silty to clayey sand that was underlain by lean clay to a depth of about 5 feet (i.e., the maximum exploration depth in that area).

Recent alluvium in the west campus wetlands area north of Round Mountain Dam appears to consist primarily of a few feet of surficial sand underlain by fat to lean clay to the exploration depth of about 21 feet. Organic material was encountered in the lean to fat clay between depths of about 2-1/2 to 9-1/2 feet in drill hole DH-1. Toward the western end of the west campus wetlands area, clayey to silty sand (SC to SM) layers were encountered in the clay between depths of about 15 and 20 feet, 25 and 30 feet, and below 40 feet (i.e., drill hole DH-107).

South of Round Mountain Dam, the alluvial deposits encountered consist primarily of lean to fat clay and sandy clay (drill holes DH-102 and 103), with about 5 feet of surficial sand in drill hole DH-101 near the south CSUCI campus entrance along West Potrero Road. Silty sand to poorly-graded sand (SM to SP) was encountered from the ground surface to the exploration depth of 21 feet in drill hole DH-104, located about 500 feet southwest of the dam.

Colluvium (Q_{col}). Recent colluvial deposits were encountered in the drill holes and backhoe pits along the eastern corridor, and mapped near the base of the slopes surrounding the eastern corridor. Colluvium was also encountered in the backhoe pits adjacent to the north-facing slopes of the southern corridor, near the base of the slopes along the northern end of the eastern development corridor, connector road alignment, and in the meadow area where the connector road will join University Drive. The colluvium generally consists of lean clay with gravel, cobbles, and rock, and contains abundant visible voids in the upper 2 to 4 feet, with fewer voids between about 4 and 6 feet. In the nearly level eastern corridor areas south of the northern east-west trending drainage channel, fat clay colluvium was common in at least the upper 5-1/2 (or more) feet. (However, in drill hole DH-6, the upper 7 feet was fat clay *fill*, not colluvium.)

Conejo Volcanics Bedrock (T_{cvb} , T_{cvdb} , and T_{cvab}). The slopes surrounding the campus and east development site are composed of basalt, andesitic basalt, and dacitic breccia of the Conejo Volcanics Formation. The Conejo Volcanics were encountered in the backhoe test pits excavated near the slope toes, at a depth of about 14 feet in drill hole DH-103 located about 50 feet southwest of the Round Mountain Dam crest, and at a depth of about 35 feet in drill hole DH-7 located at the north end of the eastern corridor. Conejo Volcanics bedrock is believed to underlie the alluvium and colluvium in both the eastern and southern corridors (e.g., as encountered in drill holes DH-207 and DH-208 for the proposed bridge), the west campus wetlands area, and the potential campus development areas along West Potrero Road between the Round Mountain Dam and the south campus entrance, but most of our subsurface exploration did not extend deep enough to encounter it.

GROUNDWATER CONDITIONS

Groundwater was encountered at a depth of about 5 to 6 feet in the wetlands area north of the Round Mountain Dam. Further west, groundwater was encountered at a depth of about 15 feet in DH-107 located at the far western end of the wetlands area and adjacent to the east end of the Camrosa Wastewater Treatment Plant. Along the southern corridor, groundwater was



encountered between depths of about 36 and 42½ feet at drill hole DH-2 and CPT-2 locations, respectively. Groundwater was not encountered or measured in any of the exploration holes east of CPT-2 to the maximum depth explored (i.e., about 61 feet, or about El. 70 feet, in drill hole DH-207) in the southern corridor and was not encountered or measured in the exploration locations in the eastern corridor. Groundwater was encountered at a depth of between about 12 and 15 feet in the sand encountered in drill hole DH-104 located approximately 500 feet southwest of the Round Mountain Dam. Note that in an alluvial environment such as that in the wetlands, eastern and southern corridors, and the channel along the connector road alignment, the groundwater level likely will fluctuate significantly over the seasons and from one year to the next, depending on rainfall, runoff volumes, and irrigation. The groundwater levels across the site are likely to range from the ground surface near drainage channels and in wetlands areas to depths in excess of 50 feet. Groundwater level data from the drill holes and CPT dissipation tests are summarized in the following table:

Table 1. Groundwater Observations

CPT/Drill Hole	Estimated Depth to Groundwater (feet)	Elevation as/as not Encountered ¹	Drill Hole	Estimated Depth to Groundwater (feet)	Elevation as/as not Encountered
CPT-1 ¹	7	33	DH-103	not encountered	17
CPT-2 ²	42-1/2	32-1/2	DH-104	between 12 and 15	16 - 19
CPT-17	not detected	26	DH-105	5	30
DH-1	6	32	DH-106	6	31
DH-2	36	36	DH-201	not encountered	44-1/2
DH-3	not encountered	93-1/2	DH-202	not encountered	51-1/2
DH-4	not encountered	114-1/2	DH-203	not encountered	62-1/2
DH-5	not encountered	66-1/2	DH-204	not encountered	79-1/2
DH-6	not encountered	100-1/2	DH-205	not encountered	46-1/2
DH-7	not encountered	90-1/2	DH-206	not encountered	88-1/2
DH-8	not encountered	64-1/2	DH-207	not encountered	70-1/2
DH-101	13-1/2	19-1/2	DH-208	not encountered	74-1/2
DH-102	10	17			

¹ Groundwater measured with tape upon withdrawal of CPT probe.

² Groundwater depth measured from dissipation test.

³ Where groundwater level was not detected or encountered, elevation corresponds to maximum exploration depth where groundwater was not detected or encountered.

An existing abandoned water well was found approximately 200 feet east/northeast of drill hole DH-8. The well should be sounded to determine the current water level and to measure seasonal fluctuations, if possible.

ENGINEERING PROPERTIES

The surficial clay materials appear to vary in composition and engineering characteristics depending on their proximity to higher-energy depositional environments. Clay deposits closer to the mouth of the Long Grade Canyon Wash seem to be leaner than those further downstream along the southern corridor and in the wetlands area, and also in the lowlands of the south end of the eastern corridor. The expansive characteristics of the fat clay are a significant geotechnical concern for site development.

ARTIFICIAL FILL

The dry densities of the fat to lean sandy clay artificial fill encountered in the upper 5 to 7-1/2 feet of the East Campus Development and connector road areas generally ranged from about 78 to 97 pounds per cubic foot (pcf), with moisture contents between about 11 and 23 percent. The lean clay fill encountered in the upper 5 feet of drill hole DH-3 was low to moderately expansive, with an expansion index of 49. The sandy fat clay fill encountered in drill hole DH-6 located in the eastern corridor was expansive, with an expansion index (EI) of about 88. A sample of the sandy clay artificial fill encountered in test pit BH-207 located in the northern half of the eastern corridor was moderately expansive, with an EI of 62.

The peak friction angle of a sample of the sandy fat clay (from drill hole DH-6) compacted to about 90 percent of maximum dry density at optimum moisture content (according to ASTM D1557) was about 32 degrees, with a cohesion of about 600 pounds per square foot (psf).

ALLUVIUM/COLLUVIUM

Selected engineering properties of the subsurface alluvium/colluvium encountered in the eastern and southern corridors, and along the proposed connector and arterial road alignments are summarized below.

Expansion Potential

Expansive fat clay was encountered in drill hole DH-2 (west of the western end of the southern development corridor) below approximately 5-1/2 feet of artificial fill (sandy lean clay), in the upper 35 feet of drill hole DH-5 at the southern end of the eastern corridor, and in the upper 15 feet of drill hole DH-8 on the western half of the southern corridor. The expansion index of the fat clay encountered in DH-8 was about 131.

Expansion indices of 88 and 65 for samples of the lean clay encountered in drill hole DH-6 and test pit BH-208 (both located in the northern half of the eastern corridor), respectively, suggest moderate expansion potential for those surficial alluvial materials.

In-Place Moisture Densities

The dry densities of the fat clay encountered in the upper 5-1/2 to 35 feet at the western end of the southern corridor, and the eastern corridor ranged from about 79 to 105 pcf, with moisture contents between about 17 and 28 percent. The dry densities of the lean clay encountered at a depth of about 4 feet near the mouth of Long Grade Canyon at the eastern end of the southern corridor and surficially in the backhoe test pits near the base of the surrounding slopes and in the meadows area ranged from about 86 to 106 pcf, with moisture contents between about 9 and 25 percent. The dry densities of the clayey sand alluvium encountered in the upper 4 to 13 feet in the eastern half of the southern corridor, the eastern corridor, and on or near the surrounding slopes ranged from about 82 to 99 pcf, with moisture contents between about 11 and 22 percent.

Consolidation Coefficients

Consolidation test results (presented on Plates B-6.1 through B-6.15 in Appendix B) suggest that the clay layers in the upper 11 feet are overconsolidated, with overconsolidation ratios (OCRs) of about 1.5 to 10. The recompression ratios, C_{er} , for the clay tested range from about 0.01 to 0.03. The compression ratios, C_{ec} , for the clay tested typically range from about 0.1 to 0.15.

Shear Strength

The peak friction angle of a bulk sample of the surficial fat clay (from drill hole DH-8) compacted to about 90 percent of maximum dry density at optimum moisture content (according to ASTM D1557) was about 26 degrees, with a cohesion of about 1,000 pounds per square foot (psf). The peak friction angle of a bulk sample of the surficial sandy fat clay (from drill hole DH-3) compacted to about 90 percent of maximum dry density at optimum moisture content (according to ASTM D1557) was about 32 degrees, with a cohesion of about 600 pounds per square foot (psf). The ultimate friction angle of a liner sample of the sandy lean clay encountered in test pit BH-205 at a depth of about 3-1/2 feet was about 37 degrees, with a cohesion of about 100 psf.

SPT Blow Counts

Blow count data for the lean to fat clay encountered in the drill holes in the southern corridor and the southern half of the eastern corridor suggest that the surficial clayey soil is typically medium stiff, and generally becomes stiffer with depth. Blow count data for the surficial clay in the northern half of the eastern corridor suggest that those materials are stiff to very stiff.

Cone Tip Resistance

The cone tip resistance of the lean to fat clay in the upper 40 feet in the eastern and southern development corridors was typically between 15 and 40 tons per square foot (tsf). The values for tip resistance have been normalized (i.e., corrected to 1 tsf overburden stress).

GEOHAZARDS AND SEISMICITY

The project site is located in a seismically active region and, as such, it can be expected to be subjected to strong ground shaking during its design life. Analyses of seismicity for the project site were conducted to estimate strong ground motion hazards and to develop preliminary input parameters to be used for the seismic design of the proposed facilities. The analyses essentially consisted of: 1) estimating and tabulating the distance to nearby fault sources, 2) estimating ground motion from the State of California's published regional probabilistic seismic hazard evaluation, and 3) development of 1997 UBC seismic coefficients. Results of the analyses are summarized below.

POTENTIAL SEISMICITY

Ventura is the only county in southern California that has not directly experienced the effects of a devastating historical earthquake on a fault within its borders (Weber and Kiessling, 1975). That quiescence is in clear conflict with the active tectonic framework of the county, because there are numerous regional and local active faults in the county that pose a seismic risk to the area.

Geodetic surveys indicate that the Ventura basin is experiencing crustal shortening at a rate of about 1 centimeter (cm) per year in a north-south direction. Because no historical earthquakes have been recorded in the area over the course of at least 200 years (aside from the 1812 and 1857 earthquakes occurring on the San Andreas fault, occurrences that probably did little to relieve crustal strain in the Ventura basin), the Ventura region is likely to experience a large earthquake, or a cluster of large earthquakes, in the near future.

On the basis of the crustal shortening rate noted above, the Ventura region should have experienced the equivalent of two moment magnitude 7.5 earthquakes during the last 200 years. However, no large-magnitude earthquakes have occurred historically along the Simi-Santa Rosa, Oak Ridge, San Cayetano, Ventura, or any other fault in the county. Obviously, portions of Ventura County have been affected by earthquakes occurring in other geographic regions, such as the damage in Fillmore and Simi Valley that resulted from the January 17, 1994, Northridge earthquake (magnitude 6.7). However, no earthquakes with magnitudes larger than 6.0 have occurred historically on faults in Ventura County.

The relative earthquake quiescence in Ventura County is disconcerting because portions of Ventura County exhibit some of the greatest Quaternary deformation rates in California and the world. For instance, the Ventura anticline, located about 12 miles north of the project site,

has exhibited uplift rates of about 6 millimeters per year (mm/yr) for the last 40,000 to 100,000 years. That rate compares with typical coastal terrace uplift rates in other areas of California of about 0.1 to 0.5 mm/yr. That high deformation rate implies a high tectonic activity rate for the region, which has not been experienced historically.

NEARBY FAULT SOURCES

Table 2 - Summary of Deterministic Seismicity Analyses, presents a summary of the distances to the project site and the maximum magnitude of some of the nearby fault sources that may cause future shaking at the project site.

Table 2. Summary of Deterministic Seismicity Analyses

Fault Name	Distance Between Site and Surface Projection of Earthquake Rupture Area (miles)	Estimated Maximum Earthquake
Anacapa-Dume	1	7.3
Simi-Santa Rosa	5	6.7
Oak Ridge (Eastern Blind)	6	6.9
Malibu Coast	8-1/2	6.7
Oak Ridge (Blind Thrust) Offshore	12	6.9
Channel Islands Thrust (Eastern)	13	7.4
Ventura-Pitas Point	13	6.8
San Andreas	45	7.8

Ground Rupture Potential

Because the site is not located within a designated Alquist-Priolo Earthquake Hazard Zone and no known active or potentially active faults are believed to exist or trend toward the site, the potential for primary ground surface rupture due to faulting is considered to be low.

Potential for Strong Ground Motion

A published regional probabilistic seismic hazard map prepared by the California Division of Mines and Geology (CDMG, 1996) predicts that a peak ground acceleration (pga) on the order of 0.6 g should have a 10 percent probability of exceedance in a 50-year exposure period. That level of ground shaking generally corresponds to the level of ground motion that would have a return period of about 475 years and a probable moment magnitude between about 7.0 and 7.5. When the location and specific details of significant project components become available, we can develop site-specific probabilistic ground motion estimates, as needed.

Vertical Motions

Although specific analyses were not performed to evaluate vertical acceleration, typically, the vertical acceleration and spectral-ordinate components commonly are taken as two-

thirds of the horizontal component. However, recent studies associated with the 1994 Northridge earthquake have shown that near-field events can have vertical accelerations equal to or even greater than the horizontal accelerations (Bozorgnia et al., 1999). Considering that the site is located near the active Anacapa-Dume, Malibu Coast, Oak Ridge, and Simi-Santa Rosa faults, we suggest that the vertical acceleration be taken as equal to the horizontal component.

1997 Uniform Building Code Design Criteria

The project location is within Uniform Building Code (UBC) Seismic Zone 4 (Z factor of 0.4). Utilizing UBC (1997) descriptions, the soil profile at the site can be considered type S_D . The nearest Type A fault is the San Andreas, approximately 45 miles away. The nearest Type B fault is the Simi-Santa Rosa, approximately 5 miles away.

Considering those faults, the following 1997 UBC coefficients are applicable to this site:

- N_a : 1.0
- N_v : 1.1
- C_a : 0.44
- C_v : 0.68
- T_s : 0.621
- T_o : 0.124

Using those coefficients, we constructed the 1997 UBC response spectrum shown on Plate C-1 - Design Response Spectrum, in Appendix C.

Liquefaction Potential

General. Soil liquefaction results from the earthquake-induced temporary buildup of excess pore water pressure, which can result in a condition of near-zero effective stress and the temporary loss of strength. Soil materials considered susceptible to liquefaction include loose, saturated sands and non-plastic silts. Clay soil or sand and silt with more than 15 percent clay-sized particles (particles less than 0.005 mm) typically are considered to be non-liquefiable.

According to Seed (1979), two subsurface conditions have been observed to exist at most sites where liquefaction has occurred. Those conditions are: 1) groundwater is shallower than a depth of about 15 feet, and 2) the liquefied layer is shallower than a depth of about 45 feet. However, Seed (1979) states that those conditions should not be construed to indicate that liquefaction cannot be induced at greater depths in response to earthquake shaking.

East Campus Development Corridors. Groundwater was not detected in the upper 60 feet in the eastern corridor and the eastern half of the southern corridor. Beyond the western end of the southern development corridor, at the proposed future retail/town square site, groundwater was encountered between depths of about 36 and 42-1/2 feet in drill hole DH-2 and CPT-2, respectively. However, the soils encountered below the groundwater level at those exploration

locations appear to have a considerable clay-sized composition, and are not considered susceptible to liquefaction. Additionally, if the groundwater level were to rise in that area and also in the remaining East Campus Development corridor areas, because the upper 50 feet of soil is predominantly fat to lean clay, the liquefaction potential probably would remain low. For design purposes, estimated liquefaction-induced settlement associated with the few granular layers we encountered in the eastern and southern development corridors should be on the order of about 1/2 inch or less. For large footprint structures planned beyond the west end of the southern development corridor, such as the future retail/town square site, the liquefaction potential should be evaluated further with additional exploration locations to verify the continuity of the clay layers in that area.

Debris Dam Area. Silty sand was encountered between depths of about 25 and 35 feet in drill hole DH-4 and the adjacent CPT-4. The interpreted CPT data suggest N-values (corrected to an overburden pressure of 1 ton per square foot) for that layer range from about 33 to 44 blows per foot. After applying a correction for fines content, which, in that layer, was about 26 percent, the computed N-values would increase to over 40. On that basis, the potential for liquefaction of that layer (if submerged at the time of a seismic event), probably would be low. For preliminary design purposes, liquefaction-induced settlement in the debris dam area could be on the order of about 1/2 to 1 inch.

Lateral Spreading

Lateral spreading movement may occur when a soil mass "rides" on liquefied soil layers, moving downslope or toward a free face. Bartlett and Youd (1995) present empirical procedures for estimating large-scale lateral movements. Their empirically derived procedures for estimating lateral spreading movements depend on earthquake magnitude, distance between the site and the seismic event, thickness of the liquefied layer, ground slope or ratio of free-face height to distance between the free face and structure, fines content, the average particle size of the material comprising the liquefied layer, and N-value. We note that the Bartlett and Youd procedure is not applicable to fine-grained soil, nor to sandy soil where: 1) N-values are greater than about 15, and 2) where N-values are less than 15 and the potentially vulnerable layer is less than 1 meter thick. Because those conditions are generally present at the east campus site, we believe the potential for large earthquake-induced lateral spreading movements (i.e., several inches to feet) is low.

Seismically Induced Settlement

Seismically induced settlement can occur in sandy soils that are loose to medium dense and above the water table. Seismically induced settlement differs from settlement resulting from liquefaction of saturated granular materials. Because unsaturated soils extending down from the ground surface to the groundwater level consist predominantly of clayey soil, and because sandy surficial soils, where encountered as artificial fill in the eastern corridor (drill hole DH-6 and test pit BH-210) will be overexcavated and recompacted (as recommended later) during site grading,

the potential for seismically induced settlement at the project site is anticipated to be relatively minor.

Tsunamis and Seiches

According to the Ventura County Seismic Safety and Safety Element (1974), a tsunami runup elevation of about +15 feet was recorded in the Ormond Beach area from the 1812 Santa Barbara Channel earthquake. The project site is located generally above elevation +30 feet MSL datum and about 3 miles from the Pacific Ocean. Therefore, there is no historical basis for tsunami hazards to impact the site.

Other than the treatment ponds located west of the west end of the campus property, landlocked bodies of water are not known to exist in the vicinity of the site. Therefore, the potential for flooding due to an earthquake-induced seiche is considered to be low.

Hydroconsolidation

Hydroconsolidation is a phenomena whereby natural soil deposits or fill materials collapse (settle) when wetted. Natural deposits susceptible to hydroconsolidation are typically aeolian, alluvial, or colluvial materials, with high apparent strength when dry. That dry strength may be attributed to the clay and silt constituency of the soil, and the presence of salts. Additionally, capillary tension may act to "bond" soil grains. Once those soils are wetted, the constituency including any salts or "bonding" agents is weakened or dissolved; capillary tensions are reduced, and collapse occurs.

On the basis of collapse test results for the lean clay presented on Plates B-6.4, B-6.5, B-6.7, B-6.8, B-6.10, and B-6.11 - Hydroconsolidation Test Results (refer to Appendix B), the estimated strain for the silty sand encountered in drill holes DH-7 and DH-8 and the lean to fat clay encountered in drill holes DH-3 and DH-7, is less than 1/2 percent. The clay materials encountered in the East Campus Development area generally should have a low collapse potential because of their high moisture content. Soil with a high degree of saturation (i.e., over 60 percent) typically demonstrates a reduced potential for collapse, and once the degree of saturation reaches about 90 percent, the collapse potential has already been realized. The degree of saturation of the clay materials commonly ranged from 80 to 90 percent. Additionally, native clay layers with lower degrees of saturation typically did not demonstrate a significant collapse potential (i.e., they showed about 1/2 percent strain or less).

The estimated collapse strain in the sandy fat clay to sandy silt artificial fill encountered in the upper 7-1/2 feet of drill hole DH-6 was about 1-3/4 percent, resulting in a total collapse strain of about 1-1/2 inches in the fill.

Native, undisturbed alluvial soils generally have elevated moisture contents, and hydroconsolidation test results suggest little collapse potential. Therefore, collapse settlement appears to be insignificant (particularly when compared to other settlement and expansion phenomena) in those materials.

Landsliding/Slope Instability

Slope failures along bedding or flow layers were not observed on the slopes adjacent to the East Campus Development area. Because of the typically high strength of the volcanic rocks and the apparent absence of deep-seated slope failures on the property, the potential for bedding plane-related slope instability probably is low. However, there is a possibility that colluvial or residual soil horizons may have developed between flow events (or layers) of the Conejo Volcanic bedrock. Those soil layers sandwiched between flow beds could be weak and unstable, particularly if exposed by a slope excavation (i.e., cut slope face).

There also is a potential for rockfalls and surface debris flows to impact the development areas along the natural slopes adjacent to the southern and eastern development corridors and the connector road alignment.

Rockfall Hazard

Large boulders are located on the slopes adjacent to the southern and the southern end of the eastern development corridors. The irregularly shaped boulders vary in size, but generally are less than about 17 feet in average dimension. Loose boulders are a natural result of weathering on steep slopes underlain by volcanic rocks such as those that surround the proposed development. Rocks falling from steep slopes, cliffs, or cut slope faces usually travel down-slope in a combination of free fall, bouncing, and rolling movements. Rolling rocks can damage improvements located at or near the toes of slopes adjacent to potential rockfall areas. On the basis of field observations during geologic reconnaissance mapping, there appears to be a potential for rockfalls to impact the proposed structures located near the base of the slopes. Structural setbacks and/or catchment structures and/or restraint mechanisms (e.g., rock cables), are some options that could be considered to reduce the potential for rockfall damage.

Debris Flow Hazard

Surficial colluvium was observed on the slopes surrounding the development areas. The colluvium consists primarily of lean to fat clay with sand and is a weathered derivative of the underlying Conejo Volcanics bedrock. The colluvium has been displaced from its upslope origin through erosion, creep, and mass-wasting processes. Those displaced residual materials typically vary in thickness over the slope faces. Generally, colluvial deposits vary in thickness with the local slope gradients (i.e., they are thicker in areas of flatter gradients and thin out in areas of steeper gradients). Colluvial deposits, particularly those on steep slopes, may have a potential for debris flow. Although not evaluated specifically, there probably are areas on the slopes adjacent to the development areas where there is a potential for debris flow.

GEOTECHNICAL OVERVIEW

On the basis of the groundwater, soil, and geologic conditions encountered for this study, several geotechnical concerns should be addressed and evaluated prior to siting structures,

finalizing grading plans, and preparing construction documents. Those concerns, which include rockfall hazard, debris flows, subgrade stabilization during site grading, liquefaction-induced settlement, consolidation settlement, and expansive surficial soils are discussed below. Possible impacts and mitigative measures also are introduced below and their benefits are discussed in greater detail in subsequent sections.

ROCKFALL HAZARD

The rockfall hazard, as discussed in the preliminary draft study (Fugro, 1999a) (and subsequently in planning meetings between Fugro and CSUCI), is being evaluated by the CSUCI Site Authority. Possible mitigative options are being weighed by the Site Authority and their final decision is pending.

DEBRIS FLOWS

The thickness of colluvial deposits on the slopes surrounding the development area varies from one location to another, depending on the steepness of the slope. Consequently, the potential for debris flow of those deposits should be evaluated on a case-by-case basis. The evaluation should include the exploration of the colluvial deposits with excavating equipment such as a backhoe. However, most slope areas currently are inaccessible to exploration equipment for the following reasons:

- Dense brush/cactus on slopes, and/or
- Steep topography, necessitating the grading of a temporary access road, and/or
- Species-protected area (designated by biologist) restricts slope access.

Because of the difficulties noted above (and because the rockfall catchment basins that were previously planned along the slope toes would effectively catch debris flows as well), site-specific exploration to evaluate the potential for debris flow was not performed for this study.

We note that, in many slope areas, the proposed arterial road or bike trails/greenbelt areas provide a buffer zone, or setback from the slope toe, that should help reduce the potential for debris flow impacts to the proposed residences.

We recommend, however, that the potential for debris flow be evaluated by the geotechnical engineer and engineering geologist prior to site development. Areas where debris flows are likely may require the construction of diversion or containment walls or debris basins near the slope toe.

BEDDING OR FLOW PLANE FAILURE

We understand that cut slopes are planned at the following locations:

- Along the southwest-facing slope on the north side of the proposed neighborhood street ("C" Street) at the northern end of the eastern development corridor,
- Along the west-facing slope at the north end of the eastern development corridor,
- Along the west-facing slope along the arterial road ("A" Street) in the central area of the eastern development corridor,
- On the east/northeast-facing slope along the north end of "A" Street in the north half of the eastern development corridor,
- Along the north- and east-facing slope at the western end of the eastern development corridor (at the former California Conservation Corps dormitory site)
- Along the north-facing slope on the south side of Chapel Street at the western end of the southern development corridor (near the intersection of Fillmore Street).

Cuts excavated into north/northwest facing slopes may expose planes of weakness such as clayey soil layers sandwiched between individual flow layers. The potential for cut slope instability should be evaluated with site-specific exploration, including the excavation of bucket auger borings and/or backhoe pits at the proposed slope locations.

GROUNDWATER

Groundwater was encountered as shallow as about 42-1/2 feet below the ground surface beyond the western end of the southern East Campus Development corridor (i.e., the future retail/town center site) in CPT-2. That depth corresponds to a groundwater elevation of about El. 32 feet during the time field exploration was performed for this study. Groundwater was not encountered in the drill holes and backhoe test pits located in the eastern half of the southern corridor, the eastern corridor, and the connector road alignment area. However, the potential for groundwater to rise should be considered in the design and construction of structures located adjacent to the Long Grade Channel (i.e., the bridge abutment). The potential for flooding at the site is not addressed herein, but should be addressed by the project civil engineer.

Construction Impacts of Shallow Groundwater

Along the connector road alignment between University Drive and the eastern residential development corridor, excavations likely will expose wet, unstable subgrade. The impacts of shallow groundwater and/or wet subgrade on site grading, foundation construction, and foundation performance include the following:

- Wet subgrade soil hampers trafficability of site for earth-moving equipment.
- Instability of temporary excavations near or below the groundwater level.
- Difficulty achieving the minimum required degree of compaction.

- Moisture transmission from subgrade soil to slabs-on-grade, particularly interior floor slabs.
- Below-grade walls and slabs-on-grade below the groundwater level are subjected to hydrostatic pressure.
- Seepage and nuisance free-water may collect in work pits or on slabs and pavements.

Additionally, depending on the time of year grading commences, other areas in the East Campus Development also may experience wet subgrade conditions.

Mitigative Measures

The development of unstable conditions during grading (including along the connector road alignment and in the development corridors) may be mitigated with the implementation of the following:

- The use of a geosynthetic material placed beneath a minimum 1-foot-thick lift of gravel or rock fill,
- "Bridging" the unstable subgrade with about 1 to 2 feet of crushed rock (i.e., about 3 to 4 inches in maximum dimension),
- Working lime or cement into the subgrade, depending on the soil type to be stabilized.

Which of the measures noted above may be utilized depends on: 1) the elevation to which the subgrade is excavated, 2) the level to which groundwater is lowered prior to the start of construction (if needed), 3) the moisture content of the subgrade materials, the material type to be stabilized, and 4) the type of compactive effort applied to the fill (i.e., vibratory or wheel-rolled).

We recommend that unit costs for stabilization (including materials, labor, and equipment) be solicited in the bid documents.

SETTLEMENT FROM STATIC LOADS

The lean to fat clay commonly encountered in the near-surface in the East Campus Development area appears to be overconsolidated. Typically, overconsolidated soils are less compressible than normally consolidated soils. However, the additional foundation loads imposed by the proposed structures and fill to be placed in the development areas may exceed the past consolidation pressures, resulting in greater consolidation settlement potential for those soils.

Overconsolidated fine-grained soils may be slightly to moderately vulnerable to consolidation settlement from foundation loads, increases in effective vertical stress (e.g.,

lowering of the groundwater level), and the addition of surcharge loads such as placement of fill above existing grade.

In most areas, the proposed residential structures for the East Campus Development area will be constructed within a few feet of existing grade. Applied bearing pressures from the residential structures are anticipated to be relatively low (between 1,000 and 1,500 psf), as is typical for one- to two-story wood-frame construction. Existing soils are considered suitable for support of the residential structures, provided other geotechnical concerns such as expansive near-surface soils, artificial fill, and soft to loose, voided near-surface soils, are mitigated and/or accommodated during subgrade preparation and grading and/or in the foundation design.

Consolidation Settlement from Surcharge Loads

Consolidation settlement from surcharge loads induced by placing fill on the site or increasing the density of subgrade soils by compaction has been estimated at about 1/8 to 1/4 inch per foot of fill placed or per 4 feet of compacted subgrade due to the change in density of the compacted materials. However, because fill placement is anticipated to precede the construction of structures (including residences and retaining walls) by several months to years, most consolidation settlement should be realized prior to the construction of those structures.

Settlement from Hydroconsolidation

Settlement from hydroconsolidation of artificial fill materials could be on the order of about 2 percent or more of the fill thickness. Laboratory test results from selected native clay and silty sand samples did not suggest a significant collapse potential in those materials.

The abandoned, now-filled Long Grade Canyon Wash drainage channel, the estimated location of which is approximated on Plate 3, was filled sometime after 1941 with artificial materials. Hydroconsolidation of those fill materials could be significant, potentially resulting in inches of settlement. Consequently, those channel-fill soils should be removed and replaced with compacted fill.

Mitigative Measures

Reducing the potential for consolidation and hydroconsolidation settlement can be accomplished to varying degrees with the following (or combination of the following):

- Overexcavation and recompaction of compressible soils, in conjunction with foundation design to accommodate the resulting estimated differential settlements.
- Complete removal and recompaction of existing artificial fill materials.
- Placement of fills several months in advance of construction of structures, including residences and retaining walls.



EXPANSIVE SOILS

The near-surface fat clay encountered in drill hole DH-6 in the eastern development corridor and in drill hole DH-8 at the western half of the southern development corridor appears to be very expansive, falling in the "high" to "very high" expansion categories of Table 18-I-B of the Uniform Building Code (1997). The near-surface clay encountered in drill hole DH-3 located west of the mouth of Long Grade Canyon at the eastern end of the southern development corridor and in test pits BH-207 and BH-208 at the northern end of the eastern development corridor is less expansive, falling in the "medium" expansion category of Table 18-I-B.

The expansive characteristics of the fat clay can be reduced somewhat by replacement of the upper two or more feet of soil (relative to finish subgrade elevation) with select non-expansive materials generated from potential borrow areas east of the Long Grade Canyon debris dam. Alternatively, the expansive subgrade can be replaced with select non-expansive import or with the less expansive onsite lean clay materials encountered at the eastern end of the southern corridor or the northern half of the eastern corridor. The minimum requirements for select fill are presented in another section of this report. The deeper the subgrade removal and replacement with moderate to low to non-expansive materials, the lower the effective (or weighted) expansion potential of the subgrade. Design of foundations constructed on low expansive soils is less severe in terms of footing depth, footing and slab reinforcement, and premoistening requirements (of both footings and slab areas).

Alternatively, foundations could be designed to accommodate the high expansion pressure of the subgrade soil. Post-tensioned slabs-on-grade are recommended for foundations bearing on soils in the "high" to "very high" expansion categories; however, exterior slabs-on-grade, sidewalks, and pavements would be susceptible to heave and shrinkage, potentially resulting in cracks and uneven surfaces, particularly at slab edges.

RECOMMENDATIONS

The following recommendations are for earthwork for lightly-loaded residential structures (i.e., 1,000 to 2,000 pounds per lineal foot foundation loads) and the associated infrastructure improvements to be constructed in the East Campus Development area. Infrastructure improvements include roadways, particularly the connector road and culvert crossing between University Drive and the northern end of the eastern development corridor, the proposed bridge across Long Grade Channel, retaining walls along the northern end of the fill lots at the northeastern edge of the northern development corridor, and underground utilities.

GRADING, EARTHWORK, AND EXCAVATION

General

The grading recommendations presented below should be incorporated into the project plans and specifications, and should be adhered to during construction. Final grading plans



should be reviewed by Fugro for consistency with our recommendations prior to contract bidding.

Site Preparation

Organic material and vegetation, hazardous materials, old foundations from demolished structures, underground utilities, debris, unsuitable fill materials, or other deleterious materials should be stripped, removed, and wasted from construction areas. Abandoned below grade or underground structures such as wells, cesspools, pipelines, old foundations, etc., not relocated prior to grading should be removed or treated in a manner prescribed by the controlling governmental agencies. Excavation bottoms should be observed by Fugro prior to backfilling. Backfilling of excavations created as a result of the removal of below-grade or underground structures should be performed in accordance with recommendations presented herein.

Excavation Considerations

Equipment. We believe grading and excavation can be performed with conventional heavy-duty earthmoving equipment in good working order in the eastern and southern corridor areas. Excavations near the slopes for the arterial and neighborhood roads, cut slopes for the northernmost residential lots, and other improvements may encounter Conejo Volcanics bedrock, which would require the use of heavier equipment or even blasting.

Along the connector road alignment, because of the elevated moisture conditions, the use of equipment that imparts light loads to the soil should be considered. Minimizing the equipment and traffic loads in the excavation bottom may help avert "pumping" subgrade conditions.

Additionally, lightweight equipment may be advantageous for compacting backfill placed on the excavation bottom until "bridging" over potentially unstable pumping subgrade soil is accomplished.

Dewatering. Although not encountered in the backhoe test pits excavated along the proposed connector road alignment, groundwater may be encountered in the excavations within and near the existing drainage channel.

If dewatering is required, the contractor should be responsible for the design of the dewatering system. Appropriate design considerations should be included to prevent piping and soil migration or erosion. The dewatering system should draw down the water level a minimum of 5 feet below the bottom of an excavation.

Runoff should be directed away from temporary slopes (and should not be allowed to flow across slope faces) and excavations.

Temporary Slopes. Sloped excavations may be used as temporary access. Temporary slopes should be no steeper than 2h:1v. The temporary slopes should be continuously monitored



by the contractor and loose or unstable soil masses should be removed immediately. Temporary slopes and excavations should conform to federal Occupational Safety and Health Administration (OSHA) and/or California Division of Occupational Safety and Health (DOSH) regulations, and other applicable local ordinances and building codes, as required. However, the contractor should be made responsible for all safety issues affecting open excavations. Stockpiled material or equipment should not be placed within a distance from the slope crest equal to the height of the slope.

Runoff should be directed away from temporary slopes and should not be allowed to flow across slope faces and excavations. In addition, provisions should be made for collecting and pumping seepage or runoff water out of excavations, if water is encountered during construction.

On the basis of observations during the excavation of backhoe test pits BH-10 and BH-11, the gravel with sand (GW), sand with silt (SP/SM), and silty sand (SM) encountered east of the debris dam demonstrate a potential for caving and sloughing. Other material types also may be encountered during grading or construction that will have a potential for caving and sloughing.

Overexcavation Requirements

The following grading recommendations are applicable for foundations supporting lightweight wood-frame construction in the residential development areas. The recommendations below are predicated on mass grading of the entire residential development area, not individual pad areas.

Residential Development Areas. Overexcavation and recompaction of subgrade soils in residential development areas to a depth of 4 feet below existing grade or 2 feet below bottom of foundation, or entirely through existing artificial fill, whichever is deeper, is recommended to decrease the potential for adverse total and differential settlements. This overexcavation recommendation also applies to all areas to receive fill and should be implemented as subgrade preparation prior to placement of new fill. The bottom of the excavation should be observed by Fugro prior to placing backfill. Voided soil or soft conditions exposed in the excavation bottom may require localized deepening of the excavation bottom to firm or unvoided soil. If localized deepening of overexcavation areas is needed, sufficient adjacent area also will need to be overexcavated to soften the transition from shallow to deeper fill so that the variation in fill thickness does not exceed 15 percent. Additionally, unstable, pumping subgrade may require special stabilization measures as described below.

After the excavation bottom has been observed by Fugro, the exposed surface should be scarified to a depth of 8 inches, aerated or moistened as required to bring the soil to 2 to 3 percent over optimum moisture content, and compacted to a minimum of 90 percent relative compaction, according to ASTM D1557.



Former Long Grade Channel Alignment. A portion of the former natural alignment of Long Grade Canyon Wash was filled in sometime after 1941. The artificial fill materials should be removed to expose firm, native soil. The bottom of the removal excavation should be observed by Fugro. Unstable, soft, or otherwise unsuitable materials exposed in the excavation bottom will require deeper removals. After the removal excavation bottom has been observed by Fugro, the exposed surface should be scarified to a depth of 8 inches, aerated or moistened as required to bring the soil to 2 to 3 percent over optimum moisture content, and compacted to a minimum of 90 percent relative compaction, according to ASTM D1557.

Exploratory Trench Backfill. Backfilling of the exploration trenches excavated to date for this study was performed by the backhoe operator without compactive effort. Trench backfill should be removed during mass grading of the eastern campus development and connector road areas. We recommend that the trench locations be staked and excavated to the original exploration depth. The excavations should then be backfilled with compacted fill materials.

Connector Road Area. The subgrade for the connector road between University Drive and the Eastern Development Corridor should be prepared by overexcavating to a depth of 4 feet below existing grade, or 1 foot below pavement subgrade elevation, or entirely through existing artificial fill, whichever is deeper.

Along the drainage channel alignment and in the foundation area for the culvert crossing (to a horizontal distance of 10 feet beyond the foundation footprint), the excavation should be sufficiently deep to remove loose alluvium down to bedrock. The bottom of the excavation should be observed by Fugro. The excavation bottom should be firm and unyielding. Backfill in the culvert crossing foundation area should consist of Class II base compacted to a minimum of 95 percent of maximum dry density. The backfill over the bedrock in the remaining portions of the drainage channel alignment (i.e., outside the culvert crossing foundation area) should consist of onsite materials.

Beyond the existing drainage channel limits and the culvert crossing area, topsoil, colluvium, or voided soil exposed in the excavation bottom should be removed by deepening the excavation. To reduce differential settlements, areas adjacent to deepened removals also should be excavated to a depth such that the variation in fill thickness does not exceed 15 percent.

After observation of the excavation bottom by Fugro, the exposed surface should be scarified to a depth of 8 inches, aerated or moistened as required to bring the soil to 2 to 3 percent over optimum moisture content, and compacted to a minimum of 90 percent relative compaction, according to ASTM D1557.

The depth to bedrock along the drainage channel is not known; however, bedrock was not encountered to a depth of 9 feet in backhoe test pit BH-7A, located near (above) the south side of the channel. Closer to the slope toe, backhoe test pit BH-7 encountered Conejo Volcanics bedrock at a depth of 2 feet. To better estimate the depth to bedrock for channel bottom removals, exploration of the channel bottom with bucket auger borings and/or backhoe test pits

are recommended along that portion of the proposed connector road that coincides with the drainage channel.

We recommend that unit costs be solicited in the bid documents for additional removals down to bedrock.

Fill Slope Construction

Reconstructed fill slopes are planned at the Long Grade Channel bridge abutment locations to create an "Expansive Soil Exclusion Zone" as shown on Plate 7. Additionally, fills over natural slopes are planned along the drainage channel embankment at the northwestern end of the eastern corridor and along the connector road alignment.

When fill is to be placed on slopes steeper than 5h:1v, the fill should be keyed and benched as shown on Plate 8 - Sidehill Fill. A keyway should be excavated into firm native soil at the base of the proposed fill slope. The keyway should be at least one equipment width wide, centered at the toe of the proposed fill slope, founded into firm native material, and should be tilted into the slope. The keyway should be at least five feet deep at the outside edge and should be observed by Fugro prior to placement of fill. The fill should be placed in level benches that are cut into the existing natural slope face. The fill should be compacted to a minimum of 90 percent of maximum dry density. Fill slopes should be overfilled, then trimmed back to the compacted core. Fill slopes should not exceed 2h:1v.

Fill slopes should be constructed in accordance with the Ventura County grading ordinance and Chapter 33 of the Uniform Building Code (1997).

Cut Slopes

In general, natural slopes excavated into onsite alluvial/colluvial materials should not be cut steeper than 2h:1v. Cut slopes should be observed by the engineering geologist. Slope excavations that expose dip-slope bedding or flow layers may require buttressing or flattening. Other mitigative measures may be possible.

Cut slopes should be acceptable at 2h:1v to heights of up to 20 feet, provided planes of weakness oriented out of the proposed cut slope face (e.g., dip-slope conditions) are not exposed. On the basis of the geologic reconnaissance mapping, flow layering orientations suggest that dip-slope conditions may be encountered in north/northwest-facing natural slopes; however, those planes of weakness may not be well-developed. If that is the case in that area, the cut slope may be acceptable as proposed. Conversely, if well-developed planes of weakness are encountered with an out-of-slope or dip-slope orientation, further evaluation and possible mitigation of the slope may be necessary.

Provisions for unit costs for excavating the hard volcanic bedrock in some areas (if it is encountered) should be incorporated into the contract documents.

Special Subgrade Stabilization Measures

Special stabilization measures may be required if soft or pumping subgrade is encountered during construction (e.g., high moisture content and/or near groundwater level). Those measures may be required (and should be anticipated) to provide a firm and unyielding subgrade surface. Special subgrade stabilization measures may consist of:

- Use of a geosynthetic fabric, such as Mirafi 600X, or equivalent, placed beneath a minimum 1 foot lift of gravel or rock fill,
- Working of rock fill into clayey subgrade soils, or
- Working lime into the fine-grained subgrade.

Whether those measures are required or not will depend on the elevation of the excavation relative to the groundwater level, the moisture content of the subgrade materials, and the nature of the construction activities (e.g., vibratory compaction equipment, equipment wheel loads, number of equipment passes, trafficability, etc.).

Past experience with wet subgrade soils suggests that gravel or rock thicknesses between 1 and 3 feet may be required to provide a suitable subgrade surface (i.e., firm and unyielding) upon which fill materials may be placed and compacted.

A geosynthetic fabric placed beneath the gravel or rock fill is needed to separate those coarse materials from the underlying soft materials and a filter fabric should encapsulate the gravel or rock layer to reduce migration of fines into the gravel or rock. Rock fill materials successfully used in the past include filter rock materials in accordance with Ventura County specifications or quarry run rock available locally.

Such special measures suggested herein should be considered if soft or pumping subgrade becomes a nuisance during construction. We suggest that contract documents incorporate contingency items for procurement of geosynthetics, gravel or rock fill, labor, and equipment, in case the need arises.

Fill Selection and Compaction

In general, with the exception of base backfill in the culvert crossing area of the connector road, most of the onsite materials likely will be suitable for use as backfill. However, the expansive characteristics of onsite materials should result in more stringent foundation design recommendations. General fill should be placed in the upper 4 feet of finish grade. The general fill materials placed in the upper 4 feet of finish grade should have an expansion index less than 91. Selective grading involving the replacement of the upper few feet of expansive fat clay with select non-expansive import, sand or general fill could result in thinner pavement sections, shallower footing depths, less foundation reinforcement, and less stringent slab premoistening requirements. Select fill should be used as backfill behind retaining walls.

Fill soils should be free of organic material, hazardous material, debris, or any other deleterious materials.

Rock or gravel particles less than 4 inches in maximum dimension may be utilized in the fill, provided those materials are not placed in concentrated pockets and provided they have sufficient sand-sized material surrounding the individual rock fragments. Fill material should not contain more than 15 percent material larger than 2 inches.

General Fill. General fill should have an expansion index of less than 91 and a minimum R-value of 11, and conform to the general requirements for fill as described above.

Select Fill. Select fill should be used behind retaining walls and is desirable in the upper 1 foot of road and exterior slab-on-grade subgrade and in the upper 2 to 4 feet in the mass-graded areas:

- Non-expansive ($EI \leq 20$)
- Plasticity Index less than 15
- Amount of soil passing No. 200 sieve is less than 10 percent
- Angle of internal friction ≥ 35 degrees
- R-value (for pavement subgrade) greater than 50
- No rock greater than 4 inches in maximum dimension

Bridge Abutment Fill. Fill placed in the "Expansive Soil Exclusion Zone" shown on Plate 7 should have a sand equivalent (SE) greater than 20, expansion index (EI) less than 50, less than 10 percent of material finer than (i.e., passing) the No. 200 sieve, and an angle of friction of greater than or equal to 35 degrees.

Use of Onsite Soil. Some of the onsite soil may be used as select fill provided it meets the requirements of select fill. For example, samples of the gravel with sand, sand, and silty sand encountered in the upper 7 to 10 feet of backhoe test pits BH-10 and BH-11, located east of the debris dam, appear to meet the requirements of select fill.

Imported Fill. Imported fill materials may be used for general fill and select fill provided that the imported fill meets the characteristics for the particular fill presented above. Imported fill material should be evaluated by the geotechnical engineer to verify suitability for its intended use. Unit costs for imported fill materials should be included in the contract bid documents.

Class II Base or Processed Miscellaneous Base (PMB). Class II base materials to be used as fill in the culvert crossing area and pavement areas should consist of imported material conforming to Caltrans Standard Specifications for Class 2 aggregate base, Section 26-1.02A [Caltrans, 1995]. Processed miscellaneous base to be used in pavement areas should conform to the "Greenbook" (Standard Specifications for Public Works Construction, 1997) standards for Processed Miscellaneous Base (Section 200-2.5).

Compaction Requirements. The bottom of excavations should be observed by Fugro prior to placing fill. Fill materials should be placed in layers that do not exceed 6 to 8 inches in loose thickness. Each layer should be spread evenly, moisture-conditioned to about 2 to 3 percent above optimum moisture content (or within 2 percent above or below optimum for select fill), and processed and compacted to obtain a uniformly dense layer. The fill should be placed and compacted on near-horizontal planes to a minimum of 90 percent (relative compaction) of the maximum dry density determined from ASTM D1557 for general fill, and 92 percent for select fill and bridge abutment fill, and 95 percent for PMB or Class II base.

Shrinkage and Subsidence

A shrinkage factor of 15 percent may be used to estimate the amount of additional material necessary to compensate for volume losses when compacting existing artificial fills and surficial soils into a denser state. Our shrinkage estimate is based on a correlation of limited laboratory data from samples obtained from the drill holes and test pits and should be considered as a rough estimate.

Subsidence of underlying materials as a result of the mass-grading operation should be on the order of about 1 inch.

SHALLOW FOUNDATION DESIGN

GENERAL

A shallow foundation system consisting of either conventional continuous wall footings with interior column spread footings or post-tensioned slabs may be used to provide support for the east campus residential structures, provided that wall loads do not exceed 1,000 to 2,000 pounds per lineal foot (plf) and concentrated loads do not exceed 50 kips.

CONVENTIONAL FOOTING DESIGN CRITERIA

Minimum Footing Embedment

As previously noted, we recommend that continuous wall and isolated column footings be founded on compacted fill soils with an expansion index less than 91. The minimum embedment depth relative to the adjacent finished grade, excavation grade, or slab elevation, whichever is lower, should be 21 inches for single and two-story structures, and 24 inches for three-story structures. Isolated footings should be tied in both directions to adjacent footings. Alternatively, a post-tensioned foundation should be used in place of the conventional continuous and spread footings where expansive foundation subgrade soil has not been replaced with select fill or fill materials with an EI less than 91. Details of post-tensioned foundation design can be provided if it is determined that there is insufficient non-expansive select fill or fill materials with an EI less than 91 available to develop the project.

Minimum Footing Dimensions

Minimum footing widths of 12 and 24 inches are recommended for wall and column footings, respectively. The footing thickness should be determined by the structural engineer, but should not be less than 12 inches thick.

Allowable Bearing Pressure

Assuming footing elements are embedded to at least the minimum recommended depths noted above, and bear on reinforced compacted fill materials as recommended previously, wall and column footing elements can be proportioned for dead load plus probable maximum live loads using a maximum net (in excess of existing overburden stresses) allowable bearing pressure of 1,500 psf.

Safety Factors and Transient Loads

The recommended value for allowable bearing pressure provides a factor of safety against shear failure in excess of 3. A one-third increase in the allowable bearing pressure may be used for transient loads such as seismic or wind forces.

SLIDING AND PASSIVE RESISTANCE

Sliding Resistance

Ultimate sliding resistance generated through a soil/concrete interface can be computed by multiplying the total dead weight structural loads by a coefficient of 0.3, for foundations constructed on general fill subgrade and 0.4 for foundations constructed on select fill subgrade.

Passive Resistance

Ultimate passive resistance developed from lateral bearing of below-grade walls or footings bearing against compacted backfill below a depth of 1 foot below the lowest adjacent grade can be determined using an equivalent fluid weight of 300 pcf.

Safety Factors

Sliding and passive resistance may be used together without reduction, when used with the safety factors recommended below. For static conditions, minimum factors of safety of 1.5 and 2.0 are recommended for foundation overturning and sliding, respectively, where sliding resistance and passive resistance are combined. The safety factor for sliding can be reduced to 1.5 if passive resistance is neglected. The safety factor for transient (seismic, dynamic) conditions should be at least 1.1.

CORROSION CONSIDERATIONS AND CEMENT TYPE SELECTION

Test Results

Bulk samples of soil obtained from drill hole DH-3 and backhoe test pits BH-1, BH-5, BH-209, and BH-212 were tested for sulfates, chlorides, pH, and resistivity. The results are presented in the following table:

Table 3. Summary of Chemical Test Results

Sample	Depth (ft)	Material Description	Sulfates (ppm)	Chlorides (ppm)	Resistivity (ohm-cm)	pH
DH-3	1 - 5	Lean clay	27	68	3358	7.62
BH-1	2	Sandy fat clay	< 2	248	15,609	7.61
BH-5	2	Lean clay	5	97	4,175	7.47
BH-209	1 - 4	Clayey sand	51	108	26,499	6.98
BH-212	1 - 3	Clayey sand	60	145	17,424	7.26

Note: ppm = parts per million

Corrosion

The resistivity and pH values in the samples tested suggest that the existing onsite soil materials in the East Campus Development area range from mildly to fairly corrosive to underground steel. The test results should be evaluated by a corrosion engineer to determine how underground utilities should be protected from corrosion.

Cement Type

The soluble sulfate content in the samples tested is below a level where sulfate-resistant cement is typically required. Therefore, Type II cement probably can be used for concrete that will be placed in contact with onsite materials in the East Campus Development area.

RECOMMENDATIONS FOR RETAINING WALLS

Cantilever retaining walls up to about 13 feet high are planned along the north edge of the single-family lots at the northwestern end of the eastern corridor (Phase V) and restrained walls up to about 22 feet high are planned at the culvert crossing along the connector road. The lateral earth pressures for the cantilever and restrained retaining walls and the allowable bearing pressures for the wall footings are provided subsequently.

Cantilever Retaining Walls

Footings for the cantilever retaining walls should be bottomed a minimum depth of 3-1/2 feet below lowest adjacent grade and should maintain a minimum horizontal setback from the outside edge (toe) of the footing bottom to the adjacent descending slope face, equal to one-third the slope height (H/3) or 5 feet, whichever is greater. Footing areas should be overexcavated consistent with our recommendations for mass grading.

Allowable Bearing Pressure. Assuming retaining wall footings are embedded to at least the minimum recommended depths noted above, wall footings should be designed for dead load plus probable maximum live loads using an allowable bearing pressure of 3,500 psf. A one-third increase in the allowable bearing pressure may be used for transient loads such as seismic or wind forces.

Lateral Earth Pressures. Assuming drained backfill conditions, lateral earth pressures may be estimated using equivalent fluid weights of 35 pcf, for level backfill conditions, and 40 pcf for backfill sloping at 2h:1v.

Select backfill should be placed within a 45-degree envelope projected from the heel of the footing to the ground surface behind the wall.

Drained conditions are based on the assumption that hydrostatic pressures will not develop; recommendations for drainage behind the walls are provided subsequently.

The lateral pressure distributions should be applied along a vertical plane passing through the heel of the wall footing between the intersection of the line with the ground surface above the wall and a point defined by the elevation of the lower structural member of the wall.

Sliding Resistance. Ultimate sliding resistance generated through a soil/concrete interface may be estimated by multiplying the total dead weight structural loads by a coefficient of 0.3.

Passive Resistance. Passive resistance developed from lateral bearing of cantilever retaining wall footings bearing against compacted backfill may be estimated using an equivalent fluid weight of 300 pcf below a depth of 1 foot below lowest adjacent grade, for level conditions. Passive resistance should be neglected above the footing for sloping conditions below the wall.

Settlement. For the overexcavation, subgrade preparation, and backfilling recommendations presented previously, and assuming that maximum wall heights and allowable bearing pressures are not exceeded, the proposed cantilever retaining walls should be designed to accommodate a total settlement up to 1-1/2 inches and a distortion ratio of about 1/360. Construction joints should be spaced at least every 20 feet of wall length.

Restrained Retaining Walls

Footing Embedment and Subgrade Materials. Footings for the restrained retaining wall at the culvert crossing near the western end of the connector road should be bottomed a minimum depth of 3-1/2 feet below lowest adjacent grade. Footing areas should be overexcavated consistent with our recommendations for mass-grading in the connector road area (i.e., removals to bedrock). Backfill placed above the bedrock and within 10 feet of the proposed wall footing should consist of Class II base compacted to a minimum of 95 percent of maximum dry density. Excavated onsite earth materials may be used as backfill above the elevation of the footing bottoms.

Allowable Bearing Pressure. Assuming retaining wall footings are embedded to at least the minimum recommended depths noted above, and that the subgrade is prepared as recommended above, wall footings may be designed for dead load plus probable maximum live loads using an allowable bearing pressure of 5,000 psf.

Lateral Earth Pressure. An at-rest lateral earth pressure may be estimated for restrained walls using an equivalent fluid weight of 50 pcf for level, drained select backfill conditions.

Select backfill should be placed within a 45-degree envelope projected from the heel of the footing to the ground surface behind the restrained wall.

Drained conditions are based on the assumption that hydrostatic pressures will not develop; recommendations for drainage behind the walls are provided subsequently.

The lateral pressure distributions should be applied along a vertical plane through the heel of the wall footing between the intersection of the line with the ground surface above the wall and a point defined by the elevation of the lowest structural member of the wall.

Sliding Resistance. Ultimate sliding resistance generated through a Class II base/concrete interface can be computed by multiplying the total dead weight structural loads by a coefficient of 0.5.

Passive Resistance. Passive resistance developed from lateral bearing of restrained retaining wall footings bearing against compacted backfill can be determined using an equivalent fluid weight of 300 pcf below a depth of 1 foot below lowest adjacent grade, for level conditions.

Surcharge Pressures. Surcharge loads such as traffic loads, induce additional pressures on earth retaining structures and should be considered in the restrained wall design. Uniform area surcharge pressures for restrained or below-grade walls may be assumed equal to 0.5 of the applied surcharge pressure.

Settlement. For the overexcavation, subgrade preparation, and backfilling recommendations presented previously, and assuming that maximum wall heights and allowable bearing pressures are not exceeded, the proposed restrained retaining walls should be designed to accommodate a total settlement of about 1 inch and a distortion ratio of about 1/480. Construction joints should be spaced at least every 20 feet of wall length.

Seismic Conditions

For unrestrained walls, the increase in lateral earth pressure based on earthquake loading can be estimated using Mononobe-Okabe theory, as described by Seed and Whitman (1970). That theory is based on the assumption that sufficient wall movement occurs during seismic shaking to allow active earth pressure conditions to develop. For restrained walls, the increase in lateral earth pressure resulting from earthquake loading can also be estimated using the Mononobe-Okabe theory. Because that theory is based on the assumption that sufficient

movement occurs so that active earth pressure conditions develop during seismic shaking, the applicability of the theory to restrained walls is not direct; but there is at least one supporting reference (Nadim and Whitman, 1992) that suggests the theory can be used for such walls.

In the Mononobe-Okabe approach, the total dynamic pressure can be divided into static and dynamic components. The estimated dynamic lateral force increase (based on seismic loading conditions) for either unrestrained or restrained walls with level backfill surfaces may be taken as $45 \times \text{PHGA} \times H^2$ in pounds per linear foot of wall. In the above formula, PHGA equals the design peak horizontal ground acceleration (0.6 g) and H is the height of wall below the ground surface in feet.

If some movement of the wall is allowed under seismic conditions (i.e., on the order of 1 or 2 inches), the dynamic lateral force increase may be reduced somewhat by multiplying the PHGA by 0.65 to estimate the repeatable (instead of peak) ground acceleration.

The centroid of that dynamic lateral force increase should be applied at a distance of $0.6H$ above the base of the wall, where H is equal to the below-grade portion of the wall height in feet.

To estimate the total dynamic lateral forces, the dynamic lateral force increase (estimated using the formula presented above) should be added to the static active pressure of 35 pcf, equivalent fluid weight, for level granular backfill conditions, and 40 pcf for backfill sloping at 2h:1v.

Safety Factors

Sliding resistance and passive pressure for static conditions, may be used together without reduction, when used with the safety factors recommended below. For static conditions, minimum factors of safety of 1.5 and 2.0 are recommended for foundation overturning and sliding, respectively, where sliding resistance and passive resistance are combined. The safety factor for sliding can be reduced to 1.5 if passive resistance is neglected. For dynamic conditions, the factor of safety should be at least 1.1.

Retaining Wall Construction

Drainage Measures. A backdrain should be provided behind the retaining walls to reduce the potential for the development of hydrostatic pressures.

Drainage measures should consist of a 2-foot-wide zone of clean, coarse-grained material (with no more than 5 percent passing the No. 200 sieve) placed behind the wall. Acceptable backfill would be: a) "Pervious Backfill" conforming to Item 300-3.5.2, *Standard Specifications for Public Works Construction* ("Greenbook," 1997); b) "Permeable Material" conforming to Item 68-1.025, *Caltrans Standard Specifications*; or c) crushed stone, sized between 1/4 and 1/2 inch. The clean, coarse-grained material should be enveloped in a filter fabric such as Mirafi 140N. The free-draining material should be placed in layers along with and by the same

methods recommended for "Compacted Fill," and lightly vibrated with a small, hand-operated vibratory compactor.

In lieu of free-draining backfill materials of the types suggested above, manufactured drainage structures (e.g., Miradrain, manufactured by Mirafi, Inc., or similar) can be used against retaining walls. Manufacturer recommendations for the installation of any of those products should generally be followed, although they should be reviewed by the geotechnical engineer. In addition, manufactured drainage structures should be attached to the exterior of the retaining wall rather than on the excavated face.

The drainage material behind retaining walls should be hydraulically connected to a granular material with an embedded perforated drainpipe system, located at the base of the retaining wall. The entire drainage system should be tied to an exterior drainage exit.

Compaction Adjacent to Walls. Backfill within 5 feet, measured horizontally, behind the retaining structures should be compacted with lightweight hand-operated compaction equipment to reduce the potential for induction of large compaction-induced stresses. If large or heavy compaction equipment is used, compaction-induced stresses can result in increased lateral earth pressures on the retaining walls. If anything but lightweight, hand-operated compaction equipment is to be used, further evaluation of the potential for compaction-induced stresses may be warranted.

Backfill material should be brought up uniformly around the retaining walls (i.e., the backfill should be at about the same elevation all around the wall as the backfill is placed). That is, the elevation difference of the backfill surface around the wall should not be greater than about 2 feet, unless the wall is designed for those differences.

BRIDGE DRILLED PIER FOUNDATION

According to Mr. Novak, bridge design engineer with Tetra Tech ASL, the proposed bridge will straddle the existing Long Grade Channel at the approximate location shown on Plate 3. The channel will be recontoured by the removal of the rock rip-rap and construction of a new embankment. The approach area to the embankment is essentially level on each side of the channel. The proposed bridge length between opposite abutments is about 50 feet.

Based on information provided by Mr. Novak, the cast-in-drill-hole (CIDH) pile design will be based on an allowable load capacity of 40 tons. Mr. Novak indicated that the preferred pile diameter is less than or equal to 24 inches.

SUBSURFACE CONDITIONS

Two drill holes (DH-208 and DH-207) were excavated to depths of about 55 and 60 feet below existing grade adjacent to the north and south channel embankments, respectively.

Earth Materials

The data from the two drill hole logs (DH-207 and DH-208) suggest that subsurface conditions consist primarily of the following:

- Very stiff to hard sandy clay and medium dense to very dense clayey sand alluvium to a depth of about 39 to 53 feet below the ground surface.
- Very dense clayey sand materials of the (weathered) Conejo Formation below a depth of about 39 feet in DH-208 and 53 feet in DH-207.

Below the clayey sand materials of the weathered Conejo Formation, bedrock was encountered. The depth to bedrock varied between about 50 feet in drill hole DH-208 adjacent to the north channel embankment and below 60 feet in drill hole DH-207 adjacent to the south channel embankment. (High blow-count data at the bottom of DH-207 and DH-208 suggest refusal on bedrock.) The variation in depth to bedrock may be related to the proximity of DH-208 to the toe of the nearby rock slope and that of DH-207 to the alluvial fan of Long Grade Channel (see Plate 3).

Groundwater

Groundwater was not encountered in either of the drill holes (drilled in August 2000) to a maximum exploration depth of 51 to 61 feet below existing grade. Additionally, groundwater was not detected in the nearby drill holes DH-3 and DH-5 (advanced in June 1999) to depths of 31 and 51 feet, respectively.

Idealized Conditions

Based on our interpretations of the drill hole data for soil materials encountered in the upper 40 feet at the north channel embankment location (DH-208) and in the upper 55 feet at the south channel embankment location (DH-207), we have developed idealized soil conditions described in Table 4 - Summary of Idealized Subsurface Conditions.

Table 4. Summary of Idealized Subsurface Conditions

Drill Hole Location	Depth Interval ¹ (feet)	Material	Total Unit Weight (pcf) ²	Undrained Shear Strength (ksf) ³	Friction Angle (degrees)	c_{90} ⁴	k ⁵ (pci)
DH-207 (South)	0 to 21	Clayey Sand	125	NA	34		90
	21 to 28	Sandy Clay	125	2.8	NA	.005	60
	28 to 38	Clayey Sand	125	NA	29	.005	90
	38 to 50	Clayey Sand	125	NA	32		225
DH-208 (North)	0 to 3	Clayey Sand	125	NA	34		90
	3 to 10	Sandy Clay	125	1.8	NA	.007	500
	10 to 20	Clayey Sand	125	NA	31		225
	20 to 35	Sandy Clay	125	3.9	NA	.005	1,000

¹ Depth is below abutment, which is assumed to be 5 feet below existing grade

² Pounds per cubic foot

³ Kips per square foot

⁴ c_{90} equals the axial strain corresponding to one-half the compressive strength

⁵ k equals the lateral modulus of subgrade reaction in pounds per cubic inch (pci)

EMBANKMENT CONSTRUCTION

Soils with an expansion index (EI) greater than 50 and a sand equivalent (SE) less than 20 should be excluded from the foundation subgrade and the embankment face to the extent shown on Plate 7 - Expansive Soil Exclusion Zone. Placement of fill materials with a low expansion index (i.e., $EI < 50$) and an SE greater than 20 should be performed according to the recommendations in the "Fill Slope Construction" and "Fill Selection and Compaction" sections presented earlier.

CIDH PILE DESIGN RECOMMENDATIONS

CIDH Pile Embedment

We recommend that CIDH piles be embedded into weathered Conejo Formation materials. The recommended minimum pile tip elevation should correspond to an approximate depth of 55 feet (below existing grade), or about El. 76 feet, at the location of DH-207 adjacent to the south channel embankment and 40 feet (below existing grade), or about El. 90 feet, at the location of DH-208 adjacent to the north channel embankment.

Axial Pile Capacity

The ultimate capacity for the CIDH piles for the north and south bridge abutments were estimated based on side resistance, assuming idealized construction techniques during shaft excavation and concrete placement. Because of the variation in depth to dense or hard bearing strata between the north and south abutment locations, we recommend different embedment depths (relative to existing grade) at the two abutment locations.

Side Resistance. For the idealized clayey sand and sandy clay profile in the upper 40 feet at the north embankment location, the ultimate side resistance was estimated for the fine-grained soil layers using an adhesion factor of 0.35 to 0.5 times the undrained shear strength, which varied from about 1,800 psf in the very stiff layer between about 8 and 15 feet to about 3,900 psf in the hard clay (to weathered Conejo Formation materials) between about 25 and 40 feet below the existing ground surface. The ultimate side resistance value in the dense sand between depths of about 15 and 25 feet was estimated at about 650 psf.

For the idealized clayey sand and sandy clay profile in the upper 55 feet at the south embankment location, the ultimate side resistance was estimated for the fine-grained soil layers using an adhesion factor of 0.5 times the undrained shear strength, which was estimated at about 2,800 psf in the hard layer between about 26 and 33 feet below the existing ground surface. The ultimate side resistance value in the medium dense sand in the upper 26 feet was estimated at about 400 psf and in the dense sand below a depth of about 33 feet, that value was estimated at about 1,200 psf.

Summary. The allowable axial capacities for the proposed 24-inch-diameter CIDH piles, assuming embedment lengths of 40 feet at the north abutment and 55 feet at the south

abutment are 41 tons and 55 tons, respectively. The allowable capacities reflect a factor of safety of about 2.5.

Group Capacity. The axial capacity of CIDH pile groups may be assumed equal to the number of piles in the group times the capacity of a single pile provided the piles within a pile group are spaced no closer than three pile diameters (center-to-center). If piles are planned closer than three diameters to each other, the group capacity should be evaluated using group reduction factors. Those factors can be provided if necessary. However, for CIDH piles oriented in a single row and spaced between 2 and 3 diameters (center-to-center), the axial capacity of the "group" may be assumed equal to the sum of the individual pile capacities without reduction, provided the ratio of the average group width to the pile diameter is less than 2.

Dynamic Capacity for Single Piles. On the basis of the findings summarized earlier, soils in the vicinity of the proposed bridge are not susceptible to liquefaction or strength degradation with cyclic loading. The allowable axial pile capacities may be increased by one-third for transient dynamic conditions (i.e., earthquake or wind loadings), which effectively reduces the presumed factor of safety of about 2.5 to about 1.9.

Uplift Capacity

The CIDH piles can be designed to resist uplift loads using 70 percent of the estimated frictional resistance along the pile shaft (i.e., the allowable axial capacity) plus the dead weight of the pile. However, the factor of safety for transient uplift loads may be reduced from 2.5 (used for axial capacity) to 1.75. The uplift capacity should only be used over that portion of the pile that is appropriately longitudinally reinforced.

Settlement

Settlement of the CIDH piles from static allowable downward loads is not anticipated to exceed about 1/4 inch.

Lateral Pile Capacity

Laterally loaded pile analyses were performed for single 24-inch-diameter piles using the computer program LPILE^{PLUS} (Reese et al., 1997). The analyses using LPILE^{PLUS} were based on the following assumptions regarding pile properties and loading conditions.

Pile Characteristics. Pile characteristics used for the analyses were based on 24-inch-diameter, 40- and 55-foot-long piles with a free head located about 5 feet below the ground surface. An elastic modulus, E , for concrete of 3×10^6 pounds per square inch (psi) and a moment of inertia, I , equal to 50 percent of the gross shaft section (to model a cracked section), were used in the analyses.

We note that for concrete piles, the pile stiffness, EI , varies with pile curvature and bending moment. However, the simplifying assumptions used for the pile characteristics mean

the pile is modeled as an elastic pile with no behavioral characteristics associated with a variation in EI versus curvature or the development of an ultimate (or plastic) moment. In general, the assumptions used herein may be considered appropriate for small pile head displacements (e.g., about 1/4 inch), but they probably are not appropriate for greater pile head displacements. Hence, we have presented lateral capacities only for a head displacement of 1/4 inch. Use of a more refined model to characterize nonlinear performance of the pile would require much more study.

The use of pile capacities for small head displacements also reduces uncertainties pertaining to pile-to-cap connections (i.e., larger head displacements can result in distress to the connection) and interactions between pile in pile groups (i.e., as the pile head displacements increase, pile interactions within pile groups probably increase, resulting in the need for group capacity reduction factors).

Soil Parameters. Lateral load capacities were estimated using the idealized soil profile with the characteristics shown in Table 4.

Those parameters listed in Table 4 were used in the computer program LPILE^{PLUS} (Reese et al., 1997) to evaluate lateral load capacities. The program computes the p-y curves in accordance with procedures presented in Reese et al. (1997). The depth to fixity was estimated using procedures presented in the Caltrans (1986) Bridge Design Aid 12-0. The results of the lateral load analyses using LPILE^{PLUS} are summarized in the following table:

Table 5. Lateral Load Capacities for 24-Inch-Diameter CIDH Piles

Location	Pile Head Deflection (inches)	Lateral Load (kips)	Maximum Bending Moment (ft-kips)	Depth to Fixity (ft)
North Abutment	1/4	17	68	8.3
South Abutment	1/4	16	65	8.5

The loads and bending moments presented in Table 5 were estimated without using a factor of safety. Pile design should incorporate appropriate factors of safety. The depth to fixity is calculated as an equivalent column length between the pile head (where the lateral load is applied) and some fixed point at depth (below the ground surface) that results in the same head deflection and head rotation as the laterally loaded pile. The pile and the equivalent column have the same stiffness (EI).

PILE STRUCTURAL CAPACITY

The structural capacities of the piles should be checked for allowable stresses in the pile, total downward axial loads, tension forces, lateral forces, and bending moments produced by anticipated loads using appropriate load and performance factors designated by the structural engineer.

CIDH PILE CONSTRUCTION

CIDH piles with embedment depths of about 40 and 55 feet below existing grade are recommended for support of the proposed bridge. Because the soil profile is predominantly sandy clay and clayey sand and groundwater is not anticipated in the upper 60 feet of soils, the potential for caving of shaft sidewall is likely to be low. However, because conditions may vary, we recommend that the drilling contractor be prepared for caving conditions, should they arise. Recommendations for drilled shaft excavation and pier construction under dry and non-caving conditions are presented below, followed by recommendations for caving conditions, should they arise. In general, CIDH excavation and construction procedures should be in accordance with the latest edition of the standards and specifications prepared by The International Association of Foundation Drilling (ADSC, 1999).

Pier Excavation and Construction Under Dry Conditions

Shaft excavations should be drilled and reamed to the design diameter and depth. Drilled shafts should be cleaned out with a "clean-out" or "muck-bucket." Flight augers are not recommended for cleaning out the shaft bottom. A geologist from Fugro should observe the pile shafts during excavation.

During concreting, free fall of concrete should be avoided. A hopper or pipe should be used to prevent segregation of aggregate.

Pier Excavation and Construction Under Water or Caving Conditions

During shaft excavation, caving conditions should be mitigated by temporary casing. Casing should be of sufficient strength to withstand handling and driving stresses, concrete pressure, and surrounding earth and/or fluid pressure. Casing diameter should be at least equal to or greater than the design diameter of the pile. Permanent casing should not be allowed.

Concrete mix design should be appropriate for underwater conditions.

During pier construction, if groundwater has accumulated in the cased pier shaft, a tremie pipe and concrete pump should be used for underwater concrete placement. The pipe should be fitted with a valve on its lower end so that the inside of the tremie pipe is not contaminated. During concrete placement, the end of the pipe should be kept at least 6 inches below the top of the concrete. Recommended slump for underwater concrete placement is 7 to 9 inches. A retarder to prevent arching of concrete during casing removal also is recommended.

Casing should be removed during concreting in a manner such that a continuous concrete column is maintained. As casing is withdrawn, a concrete head at least equal to outside soil and water pressure at the bottom of the casing should be continuously maintained. During casing withdrawal, upward movement of the reinforcement steel should not exceed 6 inches (ADSC).

PASSIVE AND SLIDING RESISTANCE

To estimate ultimate sliding resistance for slabs and pile caps, dead weight structural loads may be multiplied by a sliding coefficient of 0.3, for select fill materials with the characteristics indicated on Plate 7 (i.e., sand equivalent > 20 and expansion index < 50). Ultimate sliding resistance should not exceed 300 psf.

Ultimate passive resistance for pile caps may be estimated using an equivalent fluid weight of 250 pcf. Passive resistance should not be used for the upper 1 foot of soil that is not constrained at the ground surface by a slab-on-grade. A one-third increase in the passive resistance value can be used when considering short-term wind or seismic loads.

For static conditions, minimum factors of safety of 1.5 and 2.0 are recommended for overturning and sliding, respectively, where sliding resistance and passive resistance are combined. The factor of safety for transient (i.e., seismic, dynamic) conditions should be at least 1.1.

LATERAL EARTH PRESSURES

We understand that the bridge abutments will be designed as retaining walls. Our recommended lateral earth pressures are for backfill materials that conform to the requirements of Plate 7 (i.e., fill materials with an SE > 20 and an EI < 50). The following equivalent fluid weights (based on a total soil unit weight of 125 pcf) may be used to estimate lateral earth pressures for the design of retaining walls, assuming the walls are drained:

Table 6. Equivalent Fluid Weights for Estimating Lateral Earth Pressures

Backfill Inclination	Lateral Earth Pressure Condition	Equivalent Fluid Weight (pcf)
Level	Active	35
Level	At-Rest	55

The values do not include hydrostatic forces (for example, standing water in the backfill material). Provisions for drainage should be provided to preclude the buildup of hydrostatic pressures behind the wall.

Also, the values do not include other surcharge loads resulting from foundations, other structure load, traffic loads, or compaction equipment. We recommend that lateral earth pressures resulting from an equivalent 2-foot soil surcharge be considered for traffic loads. If conditions such as surcharge resulting from footings or hydrostatic forces are to be expected, Fugro should be advised so that we can provide recommendations as needed.

SEISMIC DESIGN CRITERIA

Seismic design criteria for the proposed bridge has been developed based on the Caltrans California Seismic Hazard Map (Mualchin, 1996) in conjunction with recommendations presented in Applied Technology Council (ATC) - 32 (1996).

The design fault for the bridge site is the Simi-Santa Rosa fault, located about 5 kilometers north of the site. Mualchin (1996) indicates that the Simi-Santa Rosa fault zone has a reverse-oblique sense of motion, a maximum moment magnitude of 7.5, and a peak horizontal ground bedrock acceleration of about 0.6 g. We note that other active nearby faults include the Oak Ridge and Malibu Coast faults.

Caltrans seismic design criteria typically includes a 10 percent to 20 percent increase above the ATC-32 response spectrum curves if the controlling fault is located within 15 kilometers of the site and has an oblique-slip or reverse sense of motion. The Simi-Santa Rosa fault has a reverse-slip sense of motion and is located within 15 kilometers of the site; therefore, a 10 percent increase above the ATC-32 curves is recommended.

Subsurface soil conditions appear to correspond to those described for Soil Profile D in ATC-32. Soil type D is described as a "stiff soil" with N-values between 15 and 50.

Hence, in accordance with ATC-32, Caltrans seismic design criteria, and based on our subsurface exploration and evaluation, we recommend the following input values:

- Soil Type: D (stiff soil)
- Earthquake Magnitude: 7.5
- Bedrock Acceleration: 0.6 g
- Response Spectrum: Figure R3-8 of ATC-32 with 10 percent increase above a period of 1 second per Caltrans design criteria; see Plate 9 - Modified ARS Curve)

As a result of the statistical variation in attenuation relationships and geologic conditions, there is a potential that peak bedrock accelerations greater than 0.6 g would occur in response to an earthquake on one of the nearby faults discussed above.

UTILITY TRENCHES, PIPE BEDDING, AND TRENCH BACKFILL

UTILITY TRENCHES

Utility trenches greater than 5 feet deep should be braced and shored in accordance with good construction practice and all applicable safety ordinances.

The use of metal, plywood, and/or timber sheeting between shores or pipe jacks along trench sidewalls in excavations adjacent to or within paved areas may be necessary so that



sloughing of unconsolidated soils and undermining of paved areas can be minimized. Trench walls that are not provided with adequate sidewall support, in those areas, could fail, resulting in damage or loss of adjacent existing improvements.

Excavated soils should be stockpiled back from the edge of the trench a minimum distance equal to the depth of the trench or 10 feet, whichever is less. If the recommended distance cannot be maintained, a Fugro representative should be consulted to evaluate location-specific minimum distances needed between the edge of the trench and stockpiled soils, to minimize the potential for trench instability. Similarly, heavy equipment should not be operated within 10 feet of the edge of vertical trench sidewalls, unless the surcharge loads imposed by the equipment are accommodated in the design of trench shoring.

Trenches should be excavated no closer than 4 feet away from utility poles where overhead lines parallel the trench alignment. The minimum clear distance from utility poles should be evaluated by the contractor individually where overhead lines run at an angle to the trench alignment. Where the trench is closer than 4 feet from the poles, where the stability of the pole is in question, or where there is a potential for sloughing of the trench sidewalls adjacent to the poles, we recommend that the pole be supported by other means or the trench be shored to prevent loss of lateral support from the pole foundation.

Groundwater

The groundwater level encountered in the East Campus Development area was between El. 32 and 36 feet at the western end of the southern corridor.

Depending on the time of year that construction is scheduled, there may be a potential for groundwater to be encountered during utility excavations and other construction activities.

If groundwater or high moisture conditions are encountered, the excavation bottom could be locally wet, soft, and yielding. For those conditions, the bottom of the trench excavation should be stabilized prior to placement of pipe bedding so that the trench subgrade is firm and unyielding.

Special Subgrade Stabilization Measures

The contractor, after considering input from the design engineer, geotechnical engineer, and owner, should be responsible for design and implementation of trench stabilization techniques. However, contingencies should be included in the contract documents for implementing subgrade stabilization measures. Some methods that have previously been used to stabilize trench subgrade include:

- The use of 1-inch float-rock worked into the trench bottom and covered with a filter fabric such as Mirafi 180N prior to placement of pipe bedding materials;



- Geotextile fabric (such as Mirafi 600X) placed along trench subgrade and covered with at least 1 foot of compacted processed miscellaneous base (PMB) conforming to the requirements of Section 200-2.5 of the Standard Specifications for Public Works Construction (i.e., Greenbook), 1997 edition; and
- Overexcavation of trench subgrade and placement of two-sack sand-cement slurry.

We suggest that contract documents incorporate contingency items for procurement of geosynthetics, gravel or rock fill, labor, and equipment, in case the need for trench subgrade stabilization arises.

PIPE BEDDING

Pipe bedding for utilities should consist of sand having a minimum sand equivalent (SE) of 30; the SE should be evaluated during grading. The sand should be placed in a zone that extends a minimum of 4 inches below and 12 inches above the pipe for the full trench width for ductile iron pipe. The thickness of the bedding sand below the pipe should be increased to 6 inches for pipe materials other than ductile iron. The bedding material should be compacted to a minimum of 90 percent relative compaction. Jetting of the bedding material should not be permitted.

Any overexcavation below the minimum of 6 inches below the pipe also should be backfilled with bedding sand compacted to 95 percent relative compaction or a two-sack sand/cement slurry. However, bedding requirements presented herein should not supersede those required by pertinent code or ordinance requirements if those requirements are more restrictive (i.e., wider or thicker bedding limits).

On the basis of our observations, because of their fine-grained constituency, the soils encountered in the East Campus Development area during the subsurface exploration for the project generally appear unlikely to comply with the recommendations presented above for pipe bedding materials. However, the gravel with sand encountered in the upper 8 feet of backhoe test pit BH-10 located east of the debris dam appears likely to meet the requirements for pipe bedding materials. A sample of that material had a sand equivalent (SE) of 50.

TRENCH BACKFILL

Trench backfill above pipe bedding should consist of approved onsite soils that are equal to or better than surrounding soils at the same elevation. Backfill should be placed within 2 percent of optimum moisture content and compacted to the compaction standard of surrounding soils (e.g., 90 percent relative compaction for general fill, 92 percent relative compaction for select fill, and 95 percent relative compaction for aggregate base), as determined from ASTM D1557. Rock larger than 4 inches in maximum dimension should be excluded. Jetting of trench backfill materials should not be permitted.

BACKFILL LOADS ON PIPES

Backfill loads on pipes will depend on the pipe type (i.e., rigid or flexible), geometrical conditions (embankment or trench configuration), and on the characteristics of the backfill and in situ soils. For design purposes, we recommend that a total unit weight of 120 pcf be used to estimate backfill loads. Appropriate pipe design references should be consulted to determine other pipe design parameters.

PAVEMENTS

Two types of flexible pavement are planned for road improvements for the East Campus Development. Asphalt-concrete is proposed for the connector road from University Drive to the eastern development corridor, the arterial road through the East Campus Development, and the neighborhood streets and parking areas. Interlocking pavers are proposed for the traffic circles and bridge approaches. Additionally, a portion of University Drive and Rincon Drive will be replaced and widened with a new asphalt concrete pavement.

DESIGN BASIS

Asphalt-concrete (AC) and aggregate base (AB) pavement sections were estimated according to Ventura County Road Standards (1982). Pavement sections were estimated on the basis of an R-value of 11 for the clayey subgrade soil along the arterial road alignment, and on the Traffic Index (TI) values listed in Table 7 - Summary of Minimum Asphaltic Concrete Pavement Sections. An alternative pavement section for subgrade consisting of select fill with an R-value of at least 50 is also provided in Table 7. The alternative section thickness is recommended in areas to receive at least 1 foot of fill above existing grade. (Note that prior to fill placement, overexcavation and recompaction of existing materials should occur as recommended previously.) If select fill (imported from debris dam area or offsite source) with an R-value of at least 50 is used as fill in the upper 1 foot of pavement subgrade, the pavement section thickness decreases as shown in Table 7.

Interlocking paver sections will consist of an approximately 3-inch-thick paver set in a 1- to 2-inch-thick sand bed over an aggregate base course. The recommended base thicknesses were estimated using an R-value of 11 and a traffic index of 7.

If design TI values are different from the assumed values, Fugro should be notified accordingly for reevaluation of pavement section thickness. Alternately, the projected daily truck traffic (including number of axles and weight per axle) would need to be furnished to Fugro so that the TI could be estimated per Caltrans procedures.



DESIGN SECTION AND MATERIALS

Asphalt Concrete

The recommended minimum pavement sections, comprising asphaltic concrete over aggregate base, for the assumed TI and measured R-value, are as follows:

Table 7. Summary of Minimum Asphaltic Concrete Pavement Sections

R-Value	Traffic Index	Asphalt Concrete Thickness (inches)	Aggregate Base Thickness (inches)
11 ¹	5	3	9
	5-1/2	4	8-1/2
	6	4	10-1/2
	6-1/2	4	12-1/2
	7	4	14
	8	5	17-1/2
50 ²	7	3	6-1/2

¹ R-value of 11 is for native clayey subgrade.

² R-value of 50 requires upper 1 foot of pavement subgrade to comprise select fill materials.

The R-values of subgrade materials should be verified near the completion of rough grading. If minimum R-values are not achieved, pavement redesign (with a thicker section) will be necessary.

Interlocking Pavers

Base thicknesses for interlocking pavers have been estimated using the Lockpave[®] computer program (Shackel, 1998). The recommended aggregate base thickness under an approximate 4- to 5-inch-thick paver/sand bed is 9 inches at the Long Grade Channel bridge approach (where the upper 4 feet of subgrade will be granular "bridge abutment fill") and areas where the upper 1 foot of the subgrade consists of select fill, assuming a Traffic Index of 7. The recommended aggregate base thickness for paver sections placed over native clayey subgrade (i.e., in the traffic circle areas) is 12 inches.

MATERIALS

Aggregate base materials should meet the requirements for Processed Miscellaneous Base presented in section 200-2.5.2 of the Standard Specifications for Public Works Construction ("Greenbook," 1997) or Class II Base conforming to Caltrans Standard Specifications for Class 2 aggregate base, Section 26-1.02A [Caltrans, 1995].

CONSTRUCTION CONSIDERATIONS

Subgrade

Connector Road Alignment. Pavement areas along the connector road alignment should be stripped of vegetation, roots, and organics, and existing artificial fill down to a firm, stable surface (or bedrock along the existing channel alignment). Additionally, the culvert crossing area, to a distance of 10 feet beyond the proposed foundation footprint, should be excavated down to bedrock. After observation of the excavation bottom, the exposed surface should be scarified 12 inches, moisture-conditioned to within 2 percent of optimum moisture content, and compacted to a minimum of 90 percent of the maximum density determined from ASTM D1557, latest edition.

If the processed excavation bottom is below finish subgrade elevation, general fill may be used as backfill (refer to the "Fill Selection and Compaction" subsection in the "Grading, Earthwork, and Excavation" section of this report for requirements for general fill). If select fill is used as backfill in the upper 1 foot of subgrade, the pavement section thickness can be reduced as shown in Table 7. Select fill should have a minimum R-value of 50.

Rincon Road Replacement and Widening. The upper 1 foot of subgrade or the upper 1 foot below existing grade in the area along Rincon Road (between University Drive and Chapel Street) should be overexcavated. The bottom of the excavation should be observed by Fugro. Soft or unsuitable materials and artificial fill should be removed if exposed on the excavation bottom. After observation of the excavation bottom, the exposed surface should be scarified 12 inches, moisture-conditioned to within 2 percent of optimum moisture content, and compacted to a minimum of 90 percent of the maximum density determined from ASTM D1557, latest edition.

Interlocking Paver Areas. The subgrade in areas to receive interlocking pavers should be sloped to drain toward a perimeter collection system such as a French drain. The sloping subgrade surface should be covered with a geotextile such as Mirafi 600X prior to placement of the base course. (The base should be pushed onto the geotextile ahead of the spreading equipment [which should not drive directly over the geotextile].)

Aggregate Base

Class II base or processed miscellaneous base (PMB) should be compacted, in lifts not exceeding 8 inches in thickness, to at least 95 percent of the maximum dry density determined by ASTM D1557, latest edition. As-compacted moisture contents for aggregate base materials should be within 2 percent of the optimum moisture, as determined from ASTM D1557.

Drainage

Proper drainage of the paved and surrounding unpaved areas is essential. Grades should be established to expedite runoff away from the pavements and reduce moisture infiltration into



the base and subgrade. As recommended previously, the subgrade surface below interlocking pavers should be sloped to drain to a perimeter collection system.

Stabilization of Subgrade

Depending on the moisture content of subgrade soils at the time of grading subgrade, stabilization measures may be necessary. If a pumping condition develops, the following stabilization measures are possible:

- **Lime Treatment of Subgrade.** The upper 1 foot of subgrade could be mixed with lime (depending in the constituency of the subgrade soil, i.e., fine-grained soil is treated with lime, sand is treated with cement). For estimating purposes, about 6 percent lime, by dry weight of soil, usually is effective. The spreading, mixing, and compacting should be performed in accordance with Greenbook specifications.
- **Geotextile with Additional Base.** The subgrade should be excavated an additional 1 foot and a geotextile such as Mirafi 600X, or equivalent, should be placed on the bottom of the excavation. One foot of base should be pushed onto the fabric and compacted to a minimum of 90 percent of maximum dry density. (The base should be placed and compacted in one lift in the fewest passes possible.)

During construction, if trafficability is difficult, lime treatment may be a good option. However, trafficability is difficult to predict. If lime treatment is necessary for trafficability, the treatment thickness might increase to about 2 feet.

We suggest that contract documents incorporate contingency items for the procurement of geosynthetics and base materials, labor, and equipment, in case the need arises.

LIMITATIONS

This geotechnical report has been prepared for The California State University Channel Islands Site Authority solely for the planning and design of the backbone infrastructure and for the preliminary planning and design of the proposed residences, elementary school, and retail and office buildings for the East Campus Development at CSUCI. The applicability of this report is specifically limited to current considerations for the planned facilities.

In performing our professional services, we have used that degree of care and skill ordinarily exercised under similar circumstances by reputable geotechnical engineers currently practicing in this or similar localities. No other warranty, express or implied, is made as to the professional advice included in this report.

We recommend that Fugro West, Inc., be provided the opportunity to review geotechnical aspects of the final design drawings and specifications to evaluate whether the recommendations in this report have been properly interpreted and implemented in the design



and specifications. Additional design-level studies are recommended for the proposed structures, as the scope for the work performed for the residential, retail, research, and various support facilities was developed as a preliminary study. Our scope of services includes a review of the mass-grading plan for infrastructure development.

An investigation and discussion of potential subsurface contamination is beyond the scope of this geotechnical study, as are environmental assessments for the presence or absence of hazardous/toxic materials in the soil, surface water, ground water, or atmosphere. Any statements or absence of statements in this report or data presented herein regarding odors, unusual or suspicious items, or conditions observed are strictly for descriptive purposes and are not intended to convey engineering judgment regarding potential hazardous/toxic assessment.

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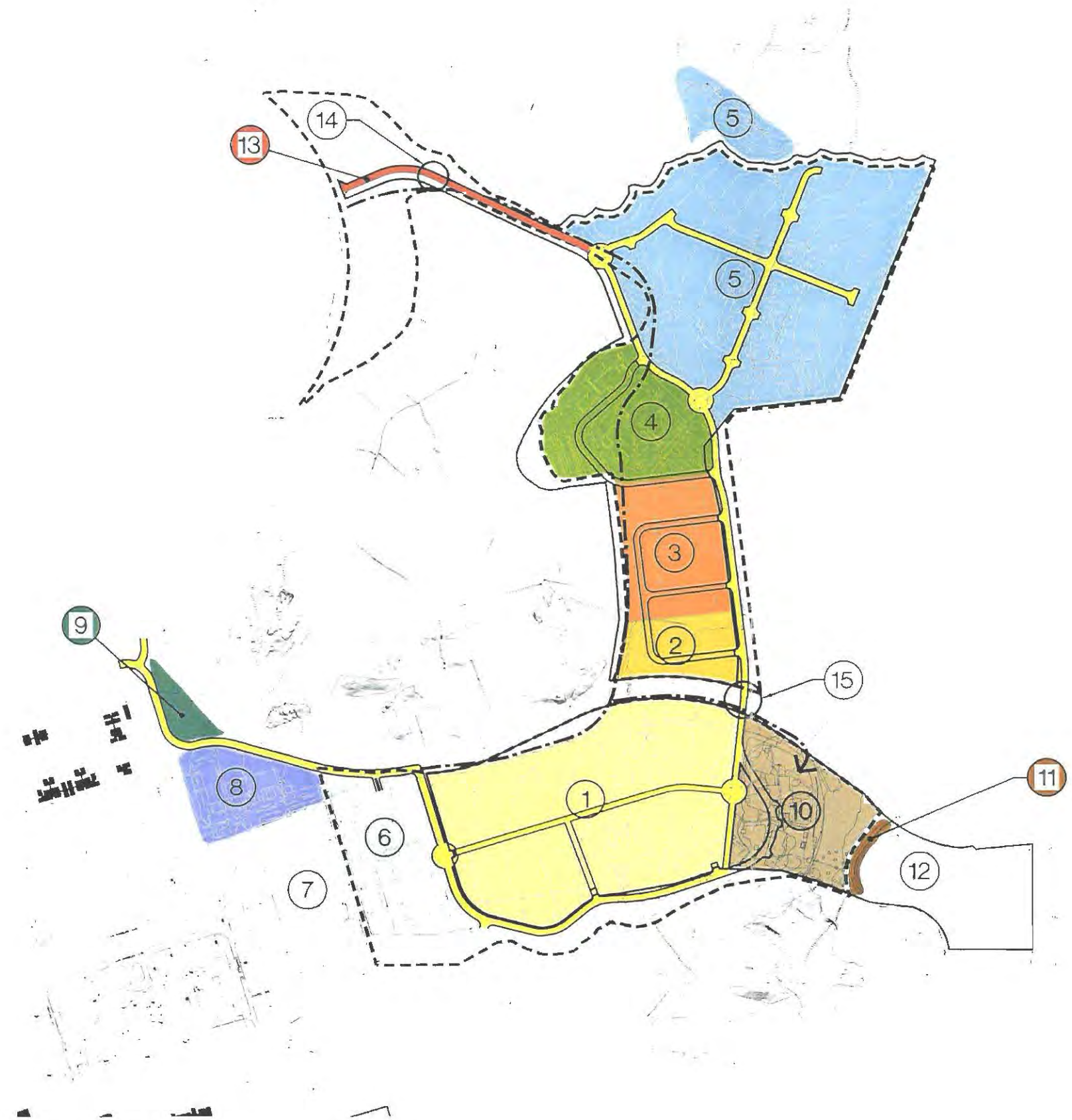
Weber, H.F., and Kiessling, E.W. (1975), General Hazards Study of Ventura County, California, in Seismic Hazards Study of Ventura County, California, CDMG Open File Report 76-5LA.

AERIAL PHOTOGRAPHS REVIEWED

Source	Flight No.	Date	Scale	Frame Nos.
USGS	GS-EM	1947	1:24,000	1-10, 1-11
USGS	GS-VBUK	1967	1:24,000	1-211, 1-212
U.S. Dept. of Agriculture	AXI 1959	1959	1:20,000	17W-101, 102, 104
U.S. Dept. of Agriculture	AXI 1955	1955	1:20,000	2FF-202, 203, 204
Pacific Western Aerial	PW-VEN	1994	1:24,000	11-32, 11-33

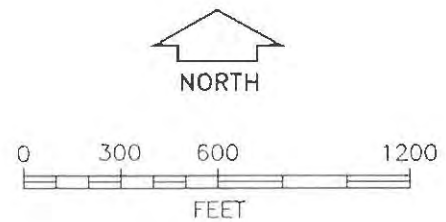
PLATES



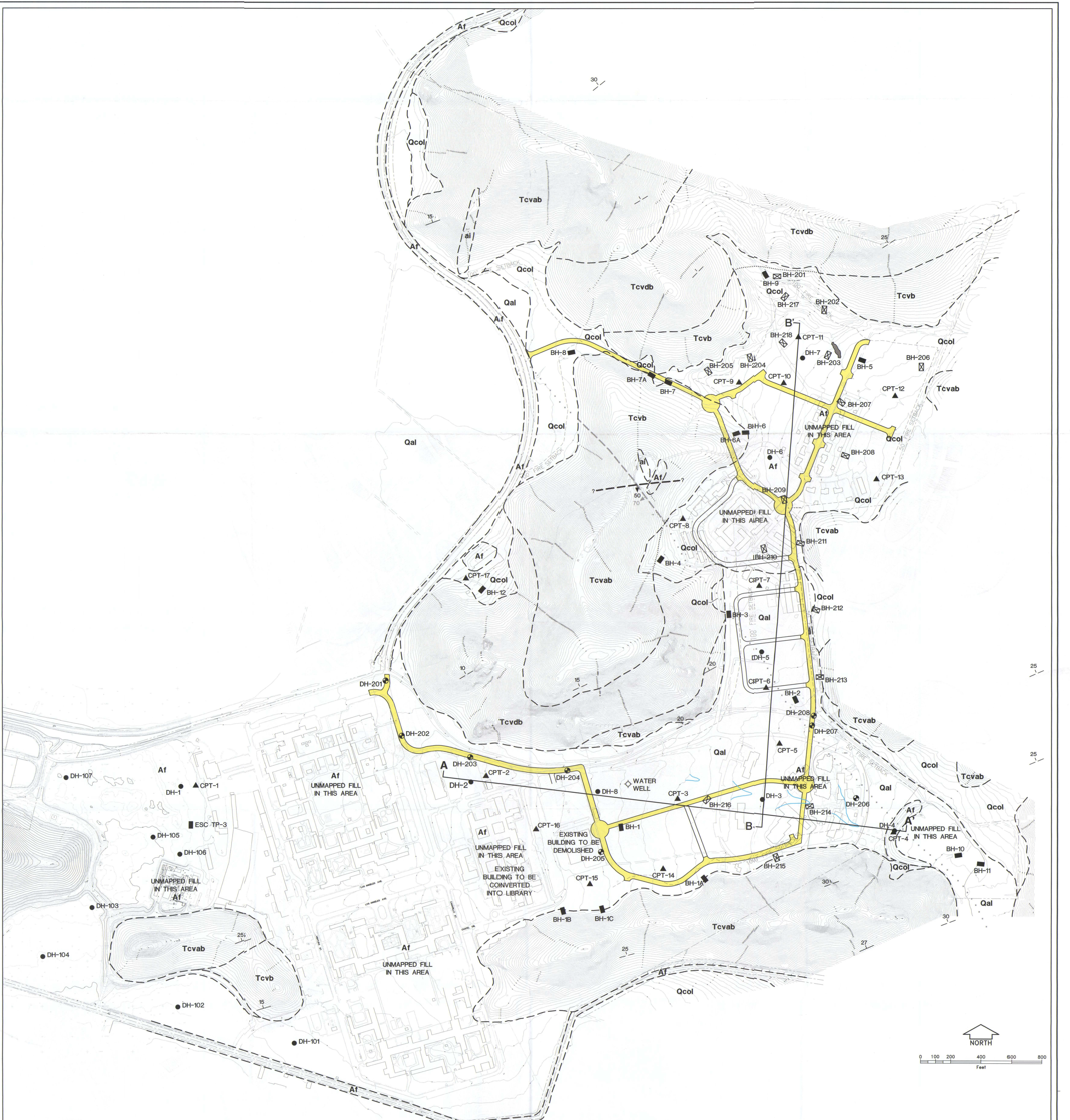


LEGEND

- 1 Phase I
- 2 Phase II
- 3 Phase III
- 4 Phase IV
- 5 Phase V
- 6 Existing structure to be demolished and area to be converted into a temporary parking lot
- 7 Existing structure to be converted into campus library (not a part of this study)
- 8 Retail/town square setting (not a part of this study)
- 9 Campus green/gateway
- 10 Future elementary school site (not a part of this study)
- 11 Existing debris dam
- 12 Borrow site
- 13 Connector road
- 14 Approximate location of culvert crossing
- 15 New bridge
- Revised arterial road alignment for "Backbone Infrastructure"



SITE DEVELOPMENT MAP
California State University
Channel Islands
East Campus Development



LEGEND

	Trash Pile
	Artificial Fill
	Alluvium
	Colluvium
Conejo Volcanics - Extrusive Volcanic Rocks:	
	Basaltic Flow Breccias
	Andesitic Breccias
	Dacitic Breccias
	Basaltic Rocks
Conejo Volcanics - Intrusive Volcanic Rocks:	
	Andesite
	Geologic Contact, Dashed where Approximate, Dotted where Concealed
	Fault, Dashed where Approximate, Short Arrow Indicates Dip of Fault Plane
	Incorrectly Mapped Fault Shown on Published Geologic Map by Dibblee & Ehrenspeck (1990), Dotted where Concealed, Short Arrow Indicates Dip of Fault Plane. See Text for Discussion of Fault.

Strike and Dip of Stratified Rocks:

	25
	0
	Inclined (Approximate)

DH-1 Approximate Drill Hole Location

DH-107 Approximate Supplemental Drill Hole Location (DH-101 to DH-107 and DH-201 to DH-208)

CPT-1 Approximate Cone Penetration Test (CPT) Location

BH-1 Approximate Backhoe Pit Location

BH-201 Approximate Supplemental Backhoe Pit Location (BH-201 to BH-218)

Water Well

Original Long-Grade Channel Topography Before Filling (State of California, D.P.W., 1941)

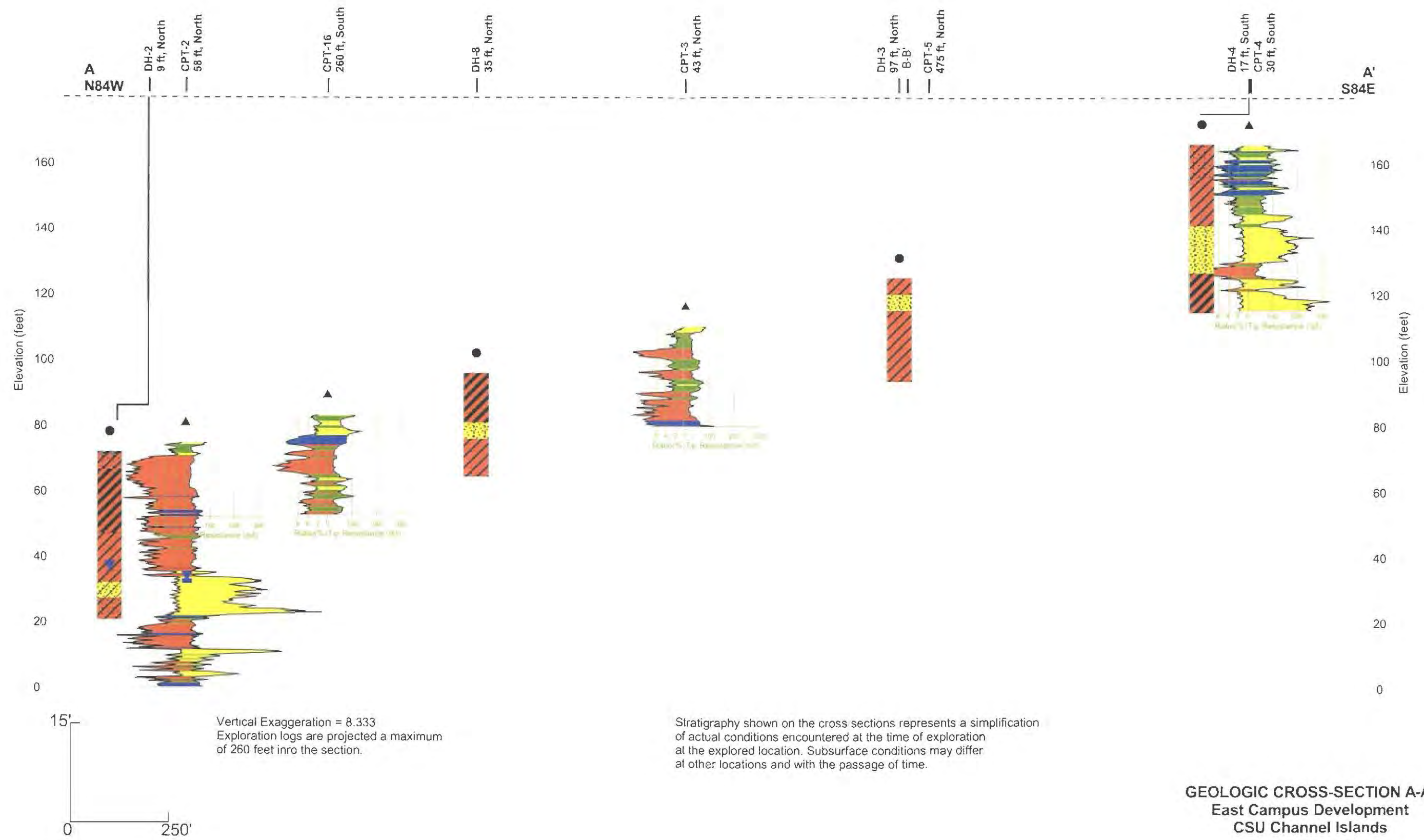
Cross Section

Revised Arterial Road Alignment (for "Backbone Infrastructure")

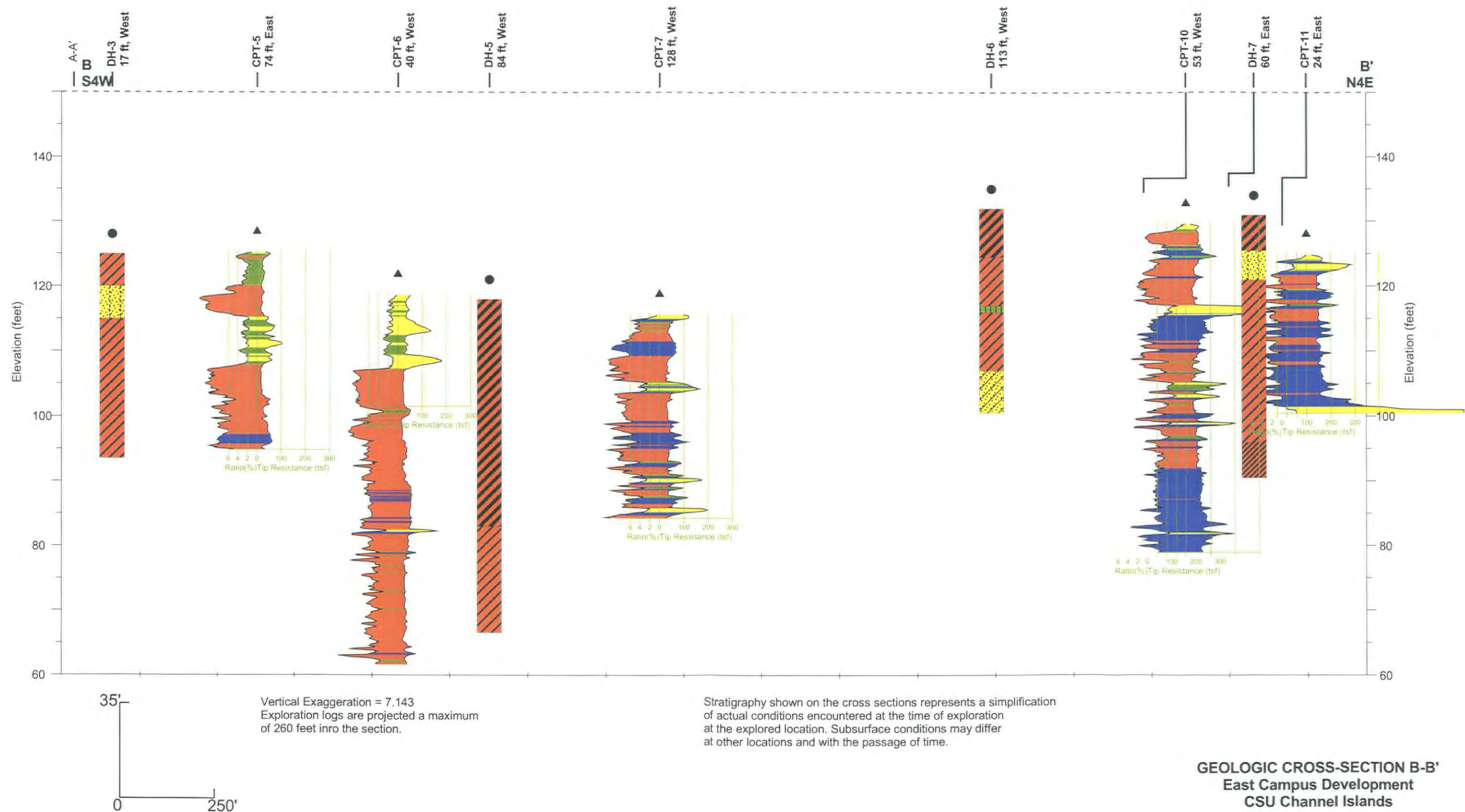
FUGRO WEST, INC.
5805 Oliver Park Drive, Ventura, California 93003
Tel: (805) 626-7000, Fax: (805) 626-7010

GEOLOGIC MAP
California State University Channel Islands
East Campus Development

Client: CSUCI
99-42-0384 December 2000 PLATE 3

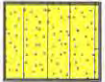
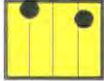
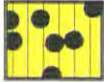
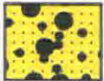


GEOLOGIC CROSS-SECTION A-A'
East Campus Development
CSU Channel Islands

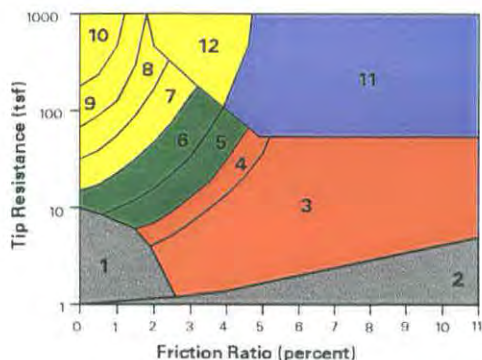


GEOLOGIC CROSS-SECTION B-B'
East Campus Development
CSU Channel Islands

Key to Soil Lithology Symbols

	Well graded GRAVEL (GW)		Clayey SAND (SC)		Clayey SILT (ML/CL)
	Poorly graded GRAVEL (GP)		SAND with silt (SP-SM)		Highly Plastic ORGANICS (OH)
	GRAVEL with sand (GP or GW)		Silty SAND (SM)		Low plasticity ORGANICS (OL)
	GRAVEL with clay (GP-GC)		Fat CLAY (CH)		SANDSTONE (Rx)
	Clayey GRAVEL (GC)		Sandy fat CLAY (CH)		SILTSTONE (Rx)
	GRAVEL with silt (GP-GM)		Lean CLAY (CL)		CLAYSTONE (Rx)
	Silty GRAVEL (GM)		Sandy lean CLAY (CL)		Interbedded Rock Strata (Rx)
	Well graded SAND (SW)		Silty CLAY (CL-ML)		CONGLOMERATE (Rx)
	Poorly graded SAND (SP)		Elastic SILT (MH)		Rock Fragments
	SAND with gravel (SP or SW)		SILT (ML)		PAVEMENT
	SAND with clay (SP-SC)		Sandy SILT (ML)		

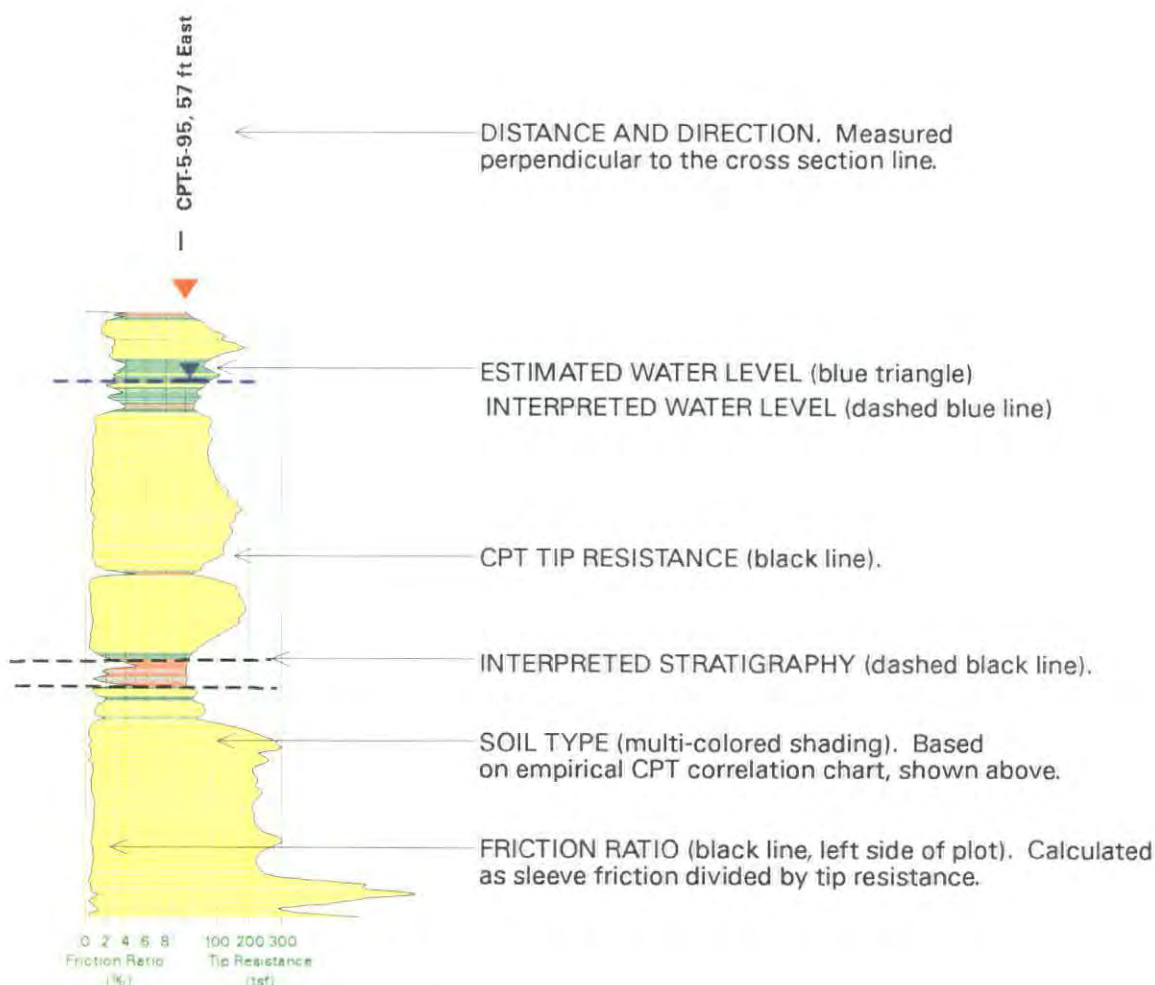
KEY TO CROSS SECTIONS DRILL HOLES East Campus Development CSU Channel Islands



Zone	Soil Behavior Type	U.S.C.S.
1	Sensitive Fine-grained	OL-CH
2	Organic Material	OL-OH
3	Clay	CH
4	Silty Clay to Clay	CL-CH
5	Clayey Silt to Silty Clay	MH-CL
6	Sandy Silt to Clayey Silt	ML-MH
7	Silty Sand to Sandy Silt	SM-ML
8	Sand to Silty Sand	SM-SP
9	Sand	SW-SP
10	Gravelly Sand to Sand	SW-GW
11	Very Stiff Fine-grained *	CH-CL
12	Sand to Clayey Sand *	SC-SM

* overconsolidated or cemented

CPT CORRELATION CHART (Robertson and Campanella, 1988)

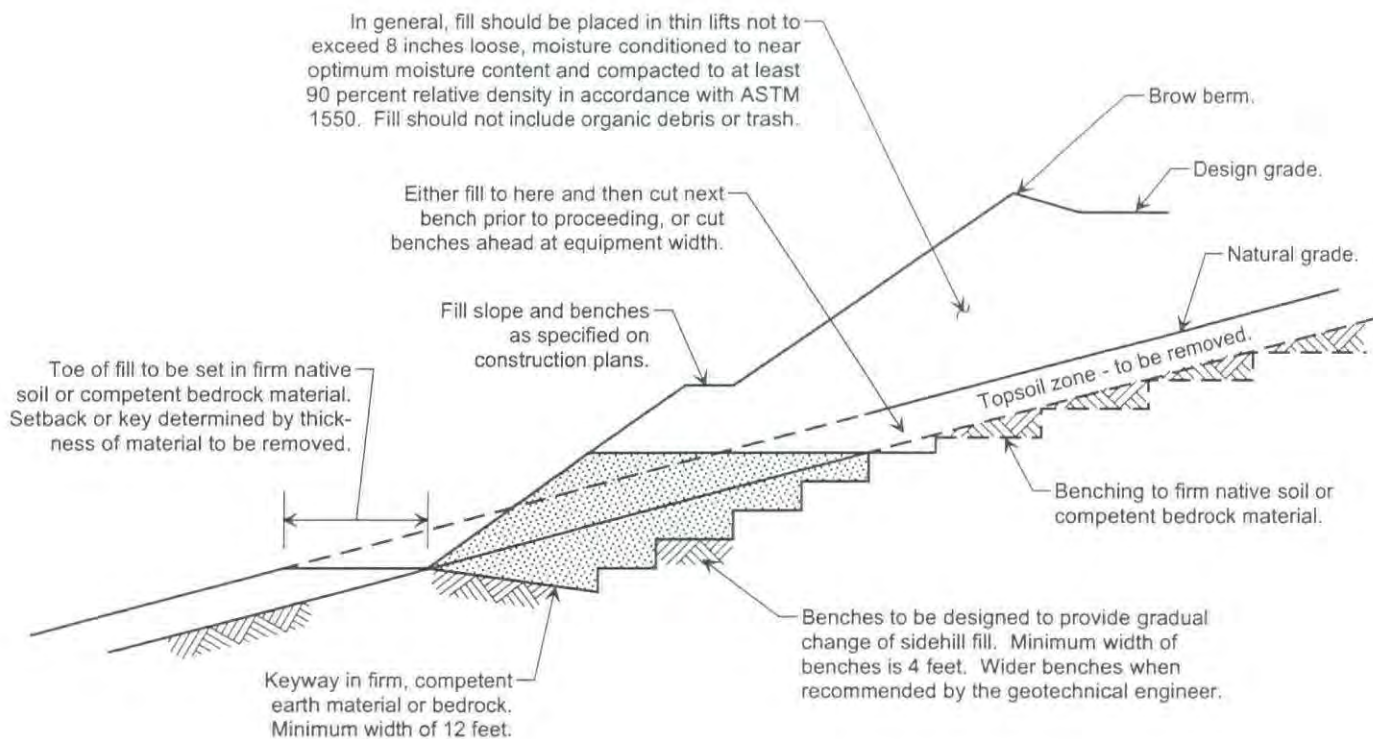


**KEY TO CROSS SECTIONS
CPT LOGS**
East Campus Development
CSU Channel Islands

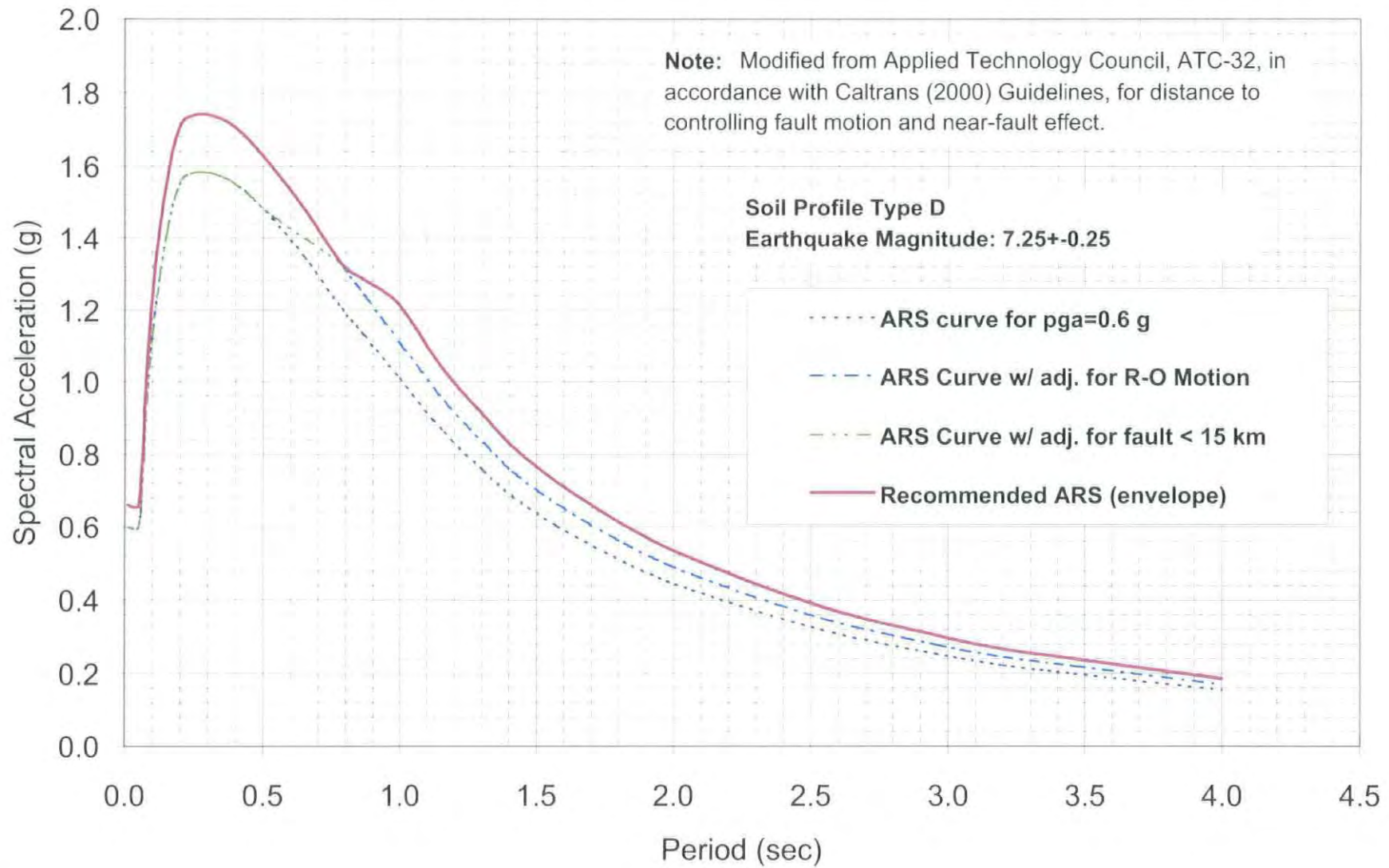
GUIDELINE FOR DEFINING EXPANSIVE SOIL AND THE ZONE AROUND BRIDGE ABUTMENTS IN WHICH EXPANSIVE SOIL IS TO BE EXCLUDED (ALSO APPLICABLE TO WINGWALLS AND RETAINING WALLS).

Figure 1 TYPICAL SECTION - EXPANSIVE SOIL EXCLUSION ZONE IN BRIDGE EMBANKMENT





SIDEHILL FILL
California State University
Channel Islands
East Campus Development



MODIFIED ARS CURVE
California State University
Channel Islands
East Campus Development

**APPENDIX A
SUBSURFACE EXPLORATION**

APPENDIX A SUBSURFACE EXPLORATION

Introduction

The contents of this appendix shall be integrated with the geotechnical engineering study of which it is a part. They shall not be used in whole or in part as a sole source for information or recommendations regarding the subject site.

Field Study

The subsurface conditions at the proposed CSUCI east campus development project site were explored by the excavation and sampling of 23 hollow-stem-auger drill holes, the advancement of 17 cone penetrometer test (CPT) soundings, and the excavation of 35 backhoe test pits. The approximate exploration locations are shown on Plate 3. CPT, drill holes, and backhoe pits were located using a Trimble Pathfinder PRO-XR GPS beacon receiver. Positions were estimated by averaging about 12 5-second measurements at each location. Carrier-phase processing techniques were used to differentially correct the data. The resulting locations have an estimated horizontal accuracy (95 percent probability) of about 2 to 4 feet. Their locations should be considered accurate only to the degree implied by the method used.

Cone Penetration Tests. The CPT soundings were performed by Fugro Geosciences of Santa Fe Springs, California, and ranged from about 23 to 75 feet in depth. The CPTs were performed to provide nearly continuous subsurface data at each location for evaluating the engineering characteristics of the subsurface soils. The logs of the CPT soundings are presented as Plates A-1.1 through A-1.17 - Log of CPT. A soil classification chart is presented on Plate A-1.18 - Soil Classification Chart.

The CPT is mounted on a 20-ton truck and consists of a 38 millimeter-diameter rod with a 10-square-centimeter, 60-degree-apex-angle cone at the base. The cone is equipped with electronic load cells that measure both point resistance and frictional resistance between the soils and the cylinder side of the cone. For this study, a cone equipped with a pore pressure transducer, known as a piezocone, was utilized to measure pore pressures during penetration. The pore pressure transducer is located on the friction sleeve part of the cone. The primary purpose of performing CPTs were to provide a nearly continuous log of the earth materials and soil stratigraphy between drill hole locations and sample depths.

Although many factors influence CPT profiles, including: physical cone properties, vertical effective stress, pore pressure, soil compressibility and fabric, and depositional characteristics, the classifications are generally consistent with the laboratory classification data and with the visual descriptions made during the soil borings (Plate A-1.18 presents one example of soil classification using CPT data).

Pore Pressure Dissipation Tests. Plate A-1.19 - Dissipation Test, presents the results of a pore pressure dissipation test that was performed in CPT No. 2. (A second dissipation test was attempted in CPT-17, but groundwater was not detected, and the test was aborted.) The dissipation tests are performed by stopping the advancement at a designated depth and measuring the pore pressure response with time until a relatively constant pressure is attained.

Drilling and Sampling. A total of 23 drill holes were advanced to depths ranging from about 19 to 60 feet on June 28 and 29, August 4, 1999, and August 7 and 8, 2000. The drill holes were excavated with a truck-mounted CME 85 drilling rig supplied by A&R Drilling, Inc., of Gardena, California. The drill holes were backfilled with the native cuttings.

The drill holes were sampled at approximate 2-1/2-foot intervals in the upper 5 feet and approximate 5-foot intervals below 10 feet to the completion depth. Samples were extracted from the subsurface using a 2-3/8-inch-inside-diameter (ID) Modified California sampler above the groundwater level (as encountered) and with a 1-1/2-inch-ID standard penetration test (SPT) split-spoon sampler below the groundwater level. The samplers were driven by a 140-pound automatic-trip hammer free falling from a height of 30 inches. Samples of fine-grained estuarine deposits were also obtained with 3-inch-O.D. Shelby tubes advanced by the hydraulic system of the drilling rig. With Shelby tubes, relatively undisturbed samples (relative to samples obtained using SPT or California liner samplers) can be obtained for laboratory testing. Minimizing sample disturbance of fine-grained soft soil samples is especially critical for consolidation testing.

The logs of the drill holes describe the earth materials encountered, sampling method used, and field and laboratory tests performed. The logs also show the location, drill hole number, date of start and completion, and the name of the logger and drilling subcontractor. The drill holes were logged by a staff geologist using ASTM D2487 for visual classification of soils. The boundaries between soil types shown on the logs are approximate because the transition between different soil layers may be gradual and may change with time. The logs of the drill holes are presented as Plates A-2.1 through A-2.23 - Log of Drill Hole. A legend to the logs is presented on Plate A-2.24 - Key to Terms & Symbols Used on Logs.

Backhoe Test Pits. Additionally for the project, 35 test pits were excavated to depths ranging from about 4 to 11 feet, on July 1 and 2, 1999, and October 19 and 23, 2000. Excavation was performed using a rubber-tired CASE 580E backhoe with a 24-inch-wide bucket supplied by Dennis Carroll Backhoe Rental, Inc., of Ventura, California. The test pits were performed under the observation of a staff geologist of Fugro, who prepared logs of the soil conditions encountered and obtained soil samples for laboratory observation and testing.

Following excavation, the test pits were backfilled loosely with the excavated material.

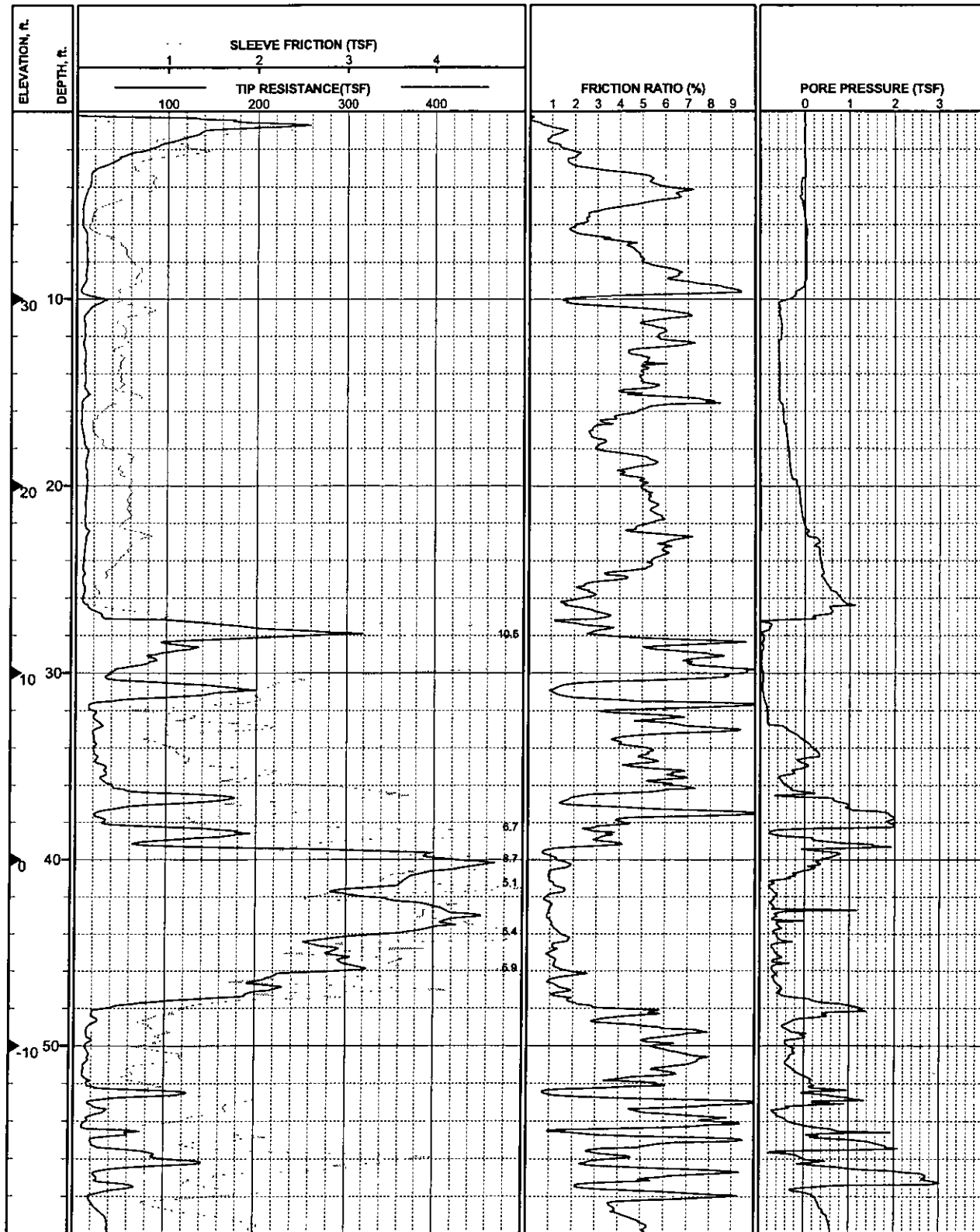
The test pit logs describe the materials encountered, soil profile, sampling methods and locations, and bedding attitudes where measured. The logs also show the date of the excavation,



name of contractor and logger, location, and test pit number. The logs of the test pits are presented on Plates A-3.1 through A-3.35 - Log of Test Pit. A key to the various terms and symbols used on the logs is presented as Plate A-2.24 - Key to Terms & Symbols Used on Logs.



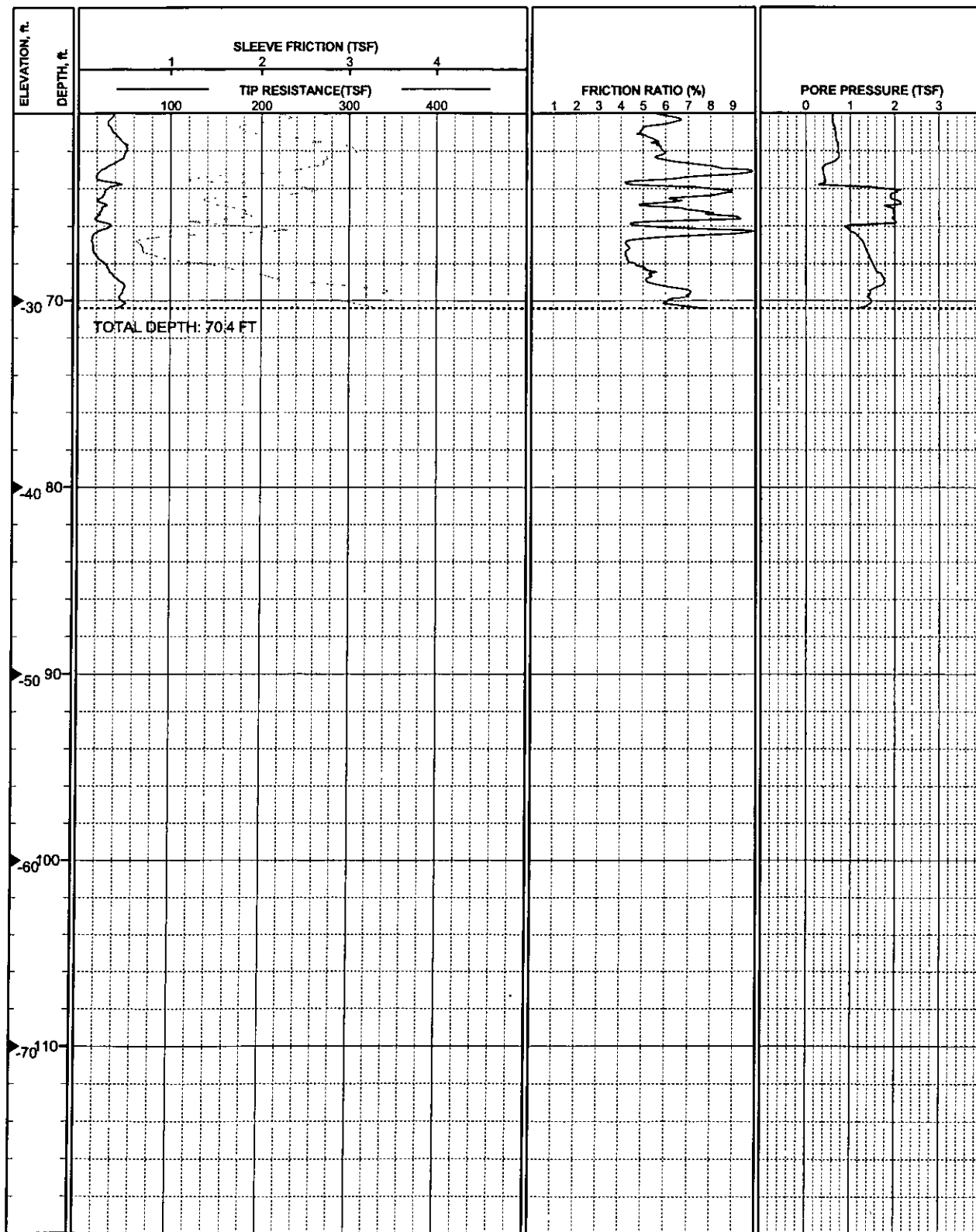
EXPLORATION NO.: CPT-1	COORDINATES: E1683419 96 N243257.33 CA State Plane Zone 5, NAD27, feet	VEHICLE: Fugro Geosciences
GROUND ELEVATION: 40.0 FT (MSL)	DEPTH TO WATER: 7.0 FT	TEST DATE: 6/22/99



Location Per Plate 3	LOG OF CPT-1
	East Campus Development
	CSU Channel Islands
Report Date: 10/04/99	



EXPLORATION NO.: CPT-1	COORDINATES: E1683419 96 N243257 33 CA State Plane Zone 5, NAD27, feet	VEHICLE: Fugro Geosciences
GROUND ELEVATION: 40.0 FT (MSL)	DEPTH TO WATER: 7.0 FT	TEST DATE: 6/22/99



Location Per Plate 3

LOG OF CPT-1 East Campus Development CSU Channel Islands

Report Date: 10/04/99

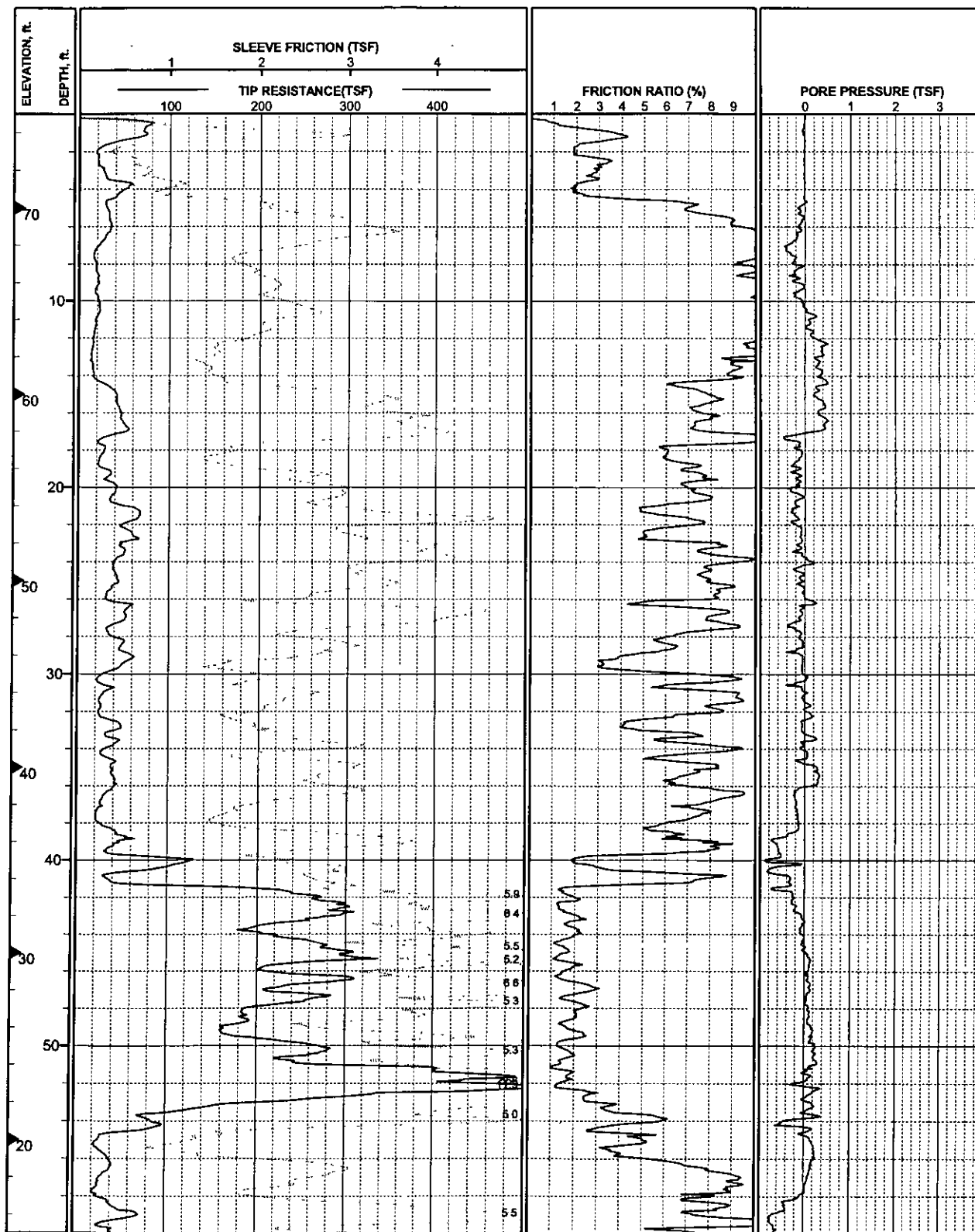
December 2000
Project No. 99-42-0384



EXPLORATION NO.: CPT-2
GROUND ELEVATION: 75.0 FT (MSL)

COORDINATES: E1685335 45 N243320.59 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: 42.5 FT

VEHICLE: Fugro Geosciences
TEST DATE: 6/22/99



Location Per Plate 3

LOG OF CPT-2 **Ease Campus Development** **CSU Channel Islands**

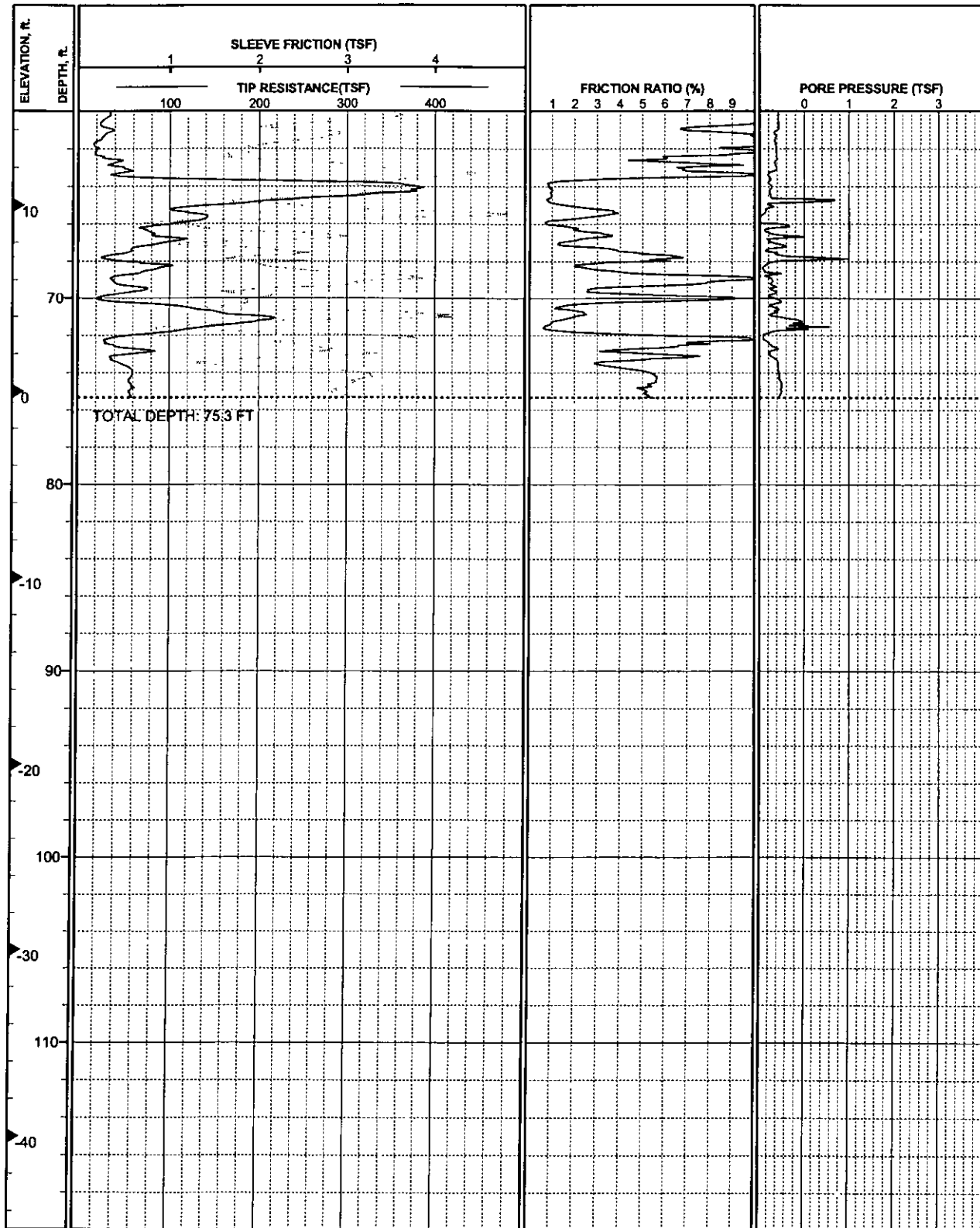
Report Date 10/04/99



EXPLORATION NO.: CPT-2
GROUND ELEVATION: 75.0 FT (MSL)

COORDINATES: E1685335.45 N243320 59 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: 42.5 FT

VEHICLE: Fugro Geosciences
TEST DATE: 6/22/99



Location Per Plate 3

LOG OF CPT-2
Ease Campus Development
CSU Channel Islands

Report Date: 10/04/99

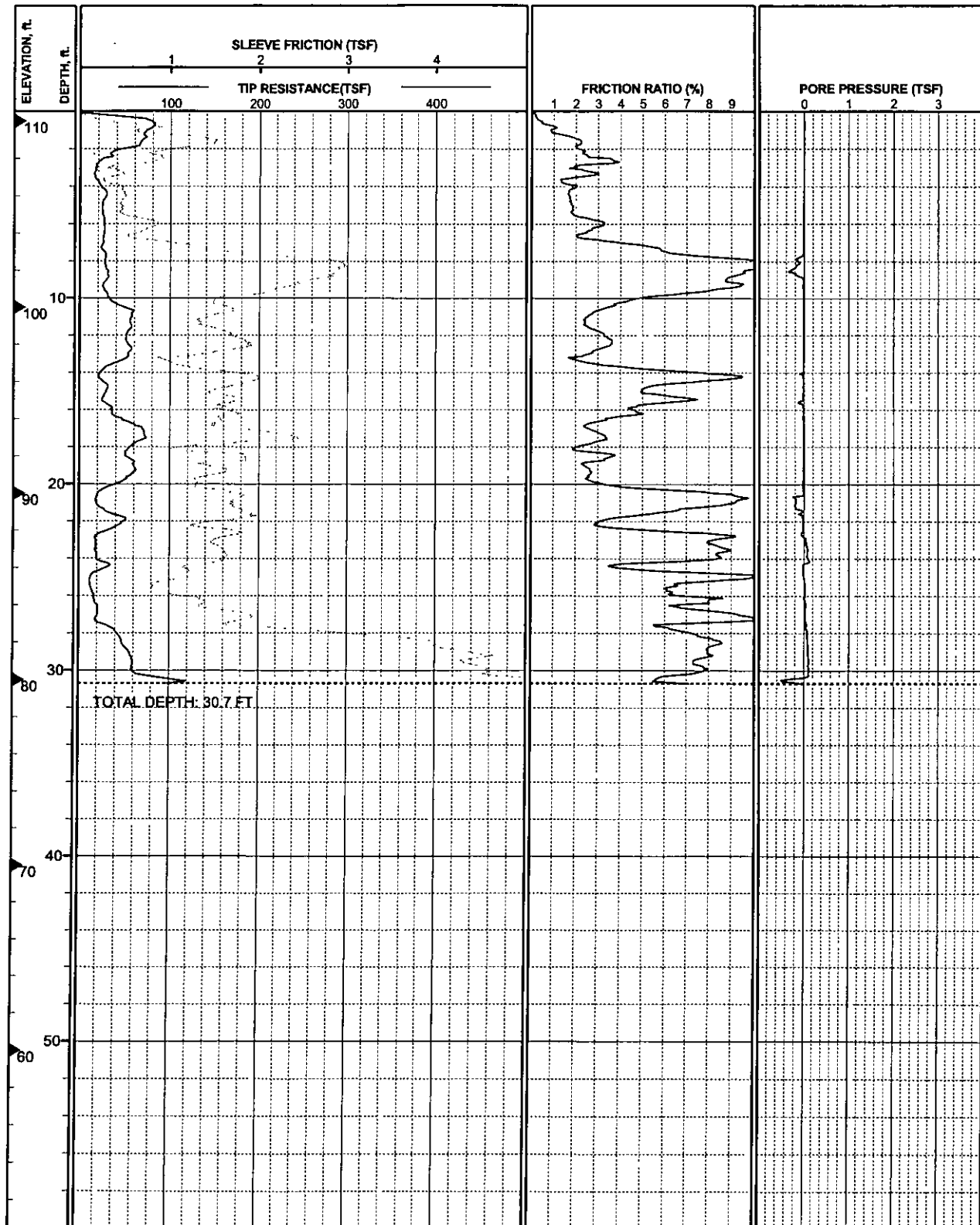
December 2000
Project No. 99-42-0384



EXPLORATION NO.: CPT-3
GROUND ELEVATION: 110.5 FT (MSL)

COORDINATES: E1686599.96 N243170.6 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: Not Measured

VEHICLE: Fugro Geosciences
TEST DATE: 6/29/99



Location Per Plate 3

LOG OF CPT-3

Ease Campus Development
CSU Channel Islands

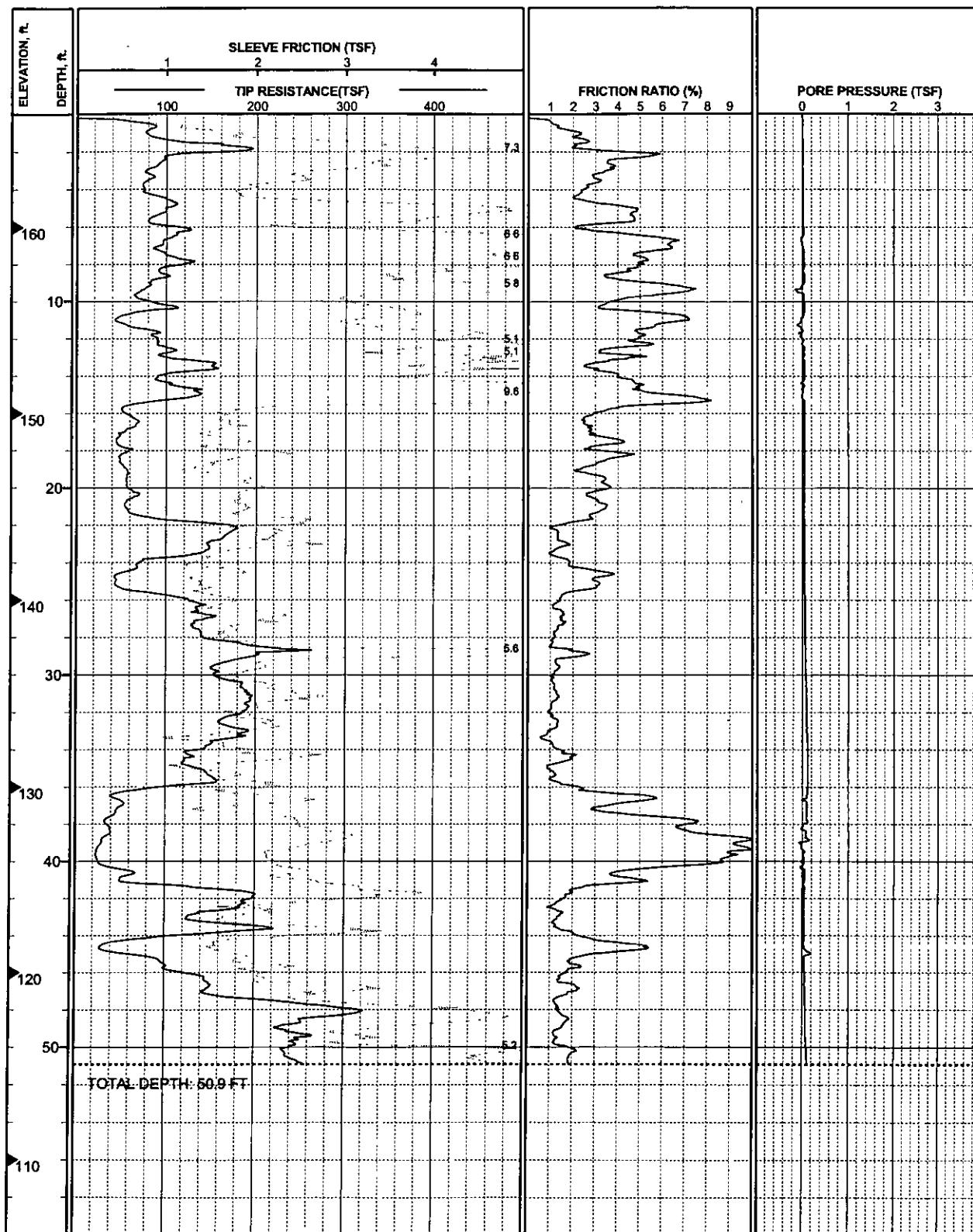
Report Date 10/04/99



EXPLORATION NO.: CPT-4
GROUND ELEVATION: 166.0 FT (MSL)

COORDINATES: E1688017.15 N242946.66 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: Not Measured

VEHICLE: Fugro Geosciences
TEST DATE: 6/22/99



Location Per Plate 3

LOG OF CPT-4 Ease Campus Development CSU Channel Islands

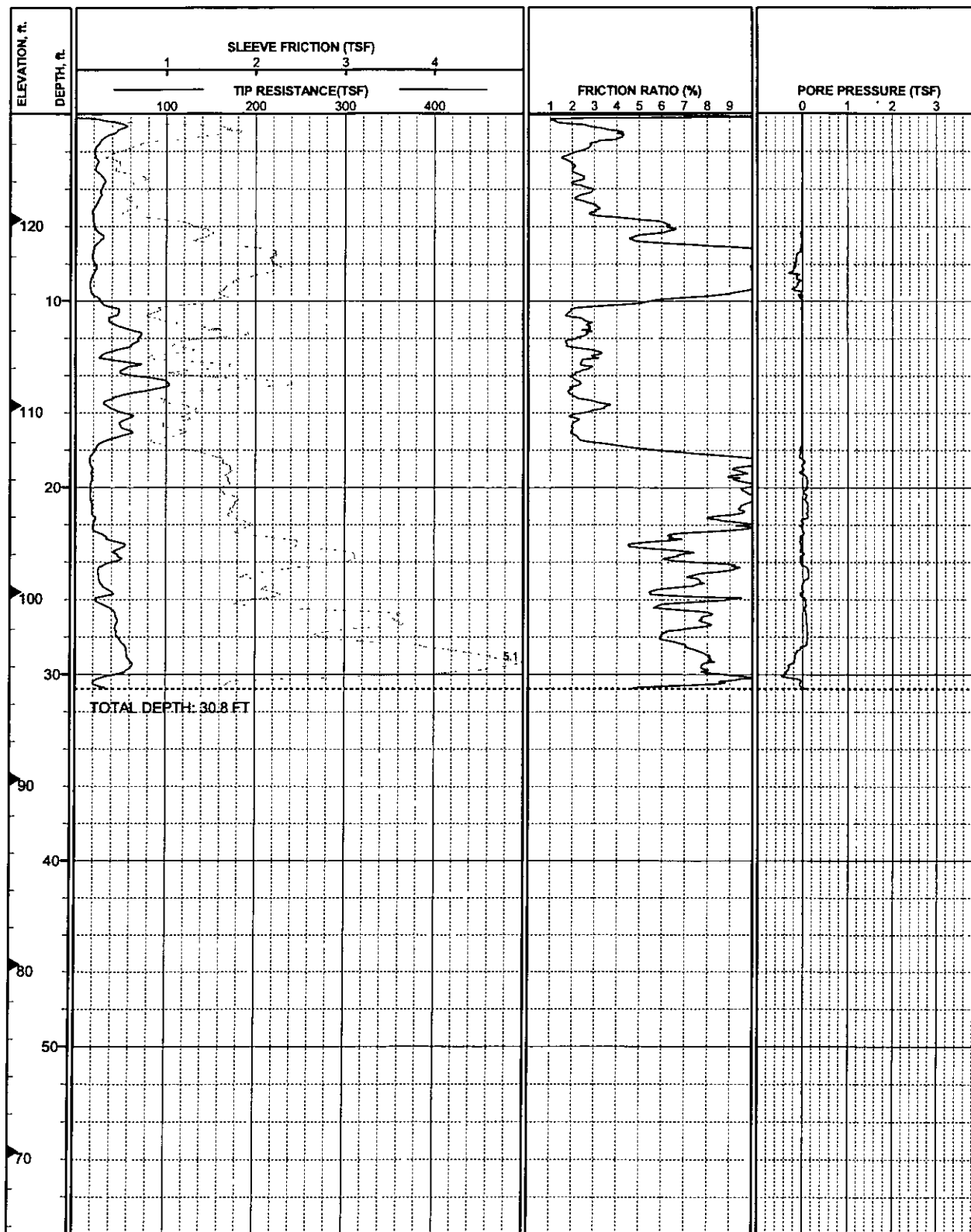
Report Date: 10/04/99



EXPLORATION NO.: CPT-5
GROUND ELEVATION: 125.6 FT (MSL)

COORDINATES: E1687260 81 N243534.72 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: Not Measured

VEHICLE: Fugro Geosciences
TEST DATE: 6/29/99



Location Per Plate 3

LOG OF CPT-5
Ease Campus Development
CSU Channel Islands

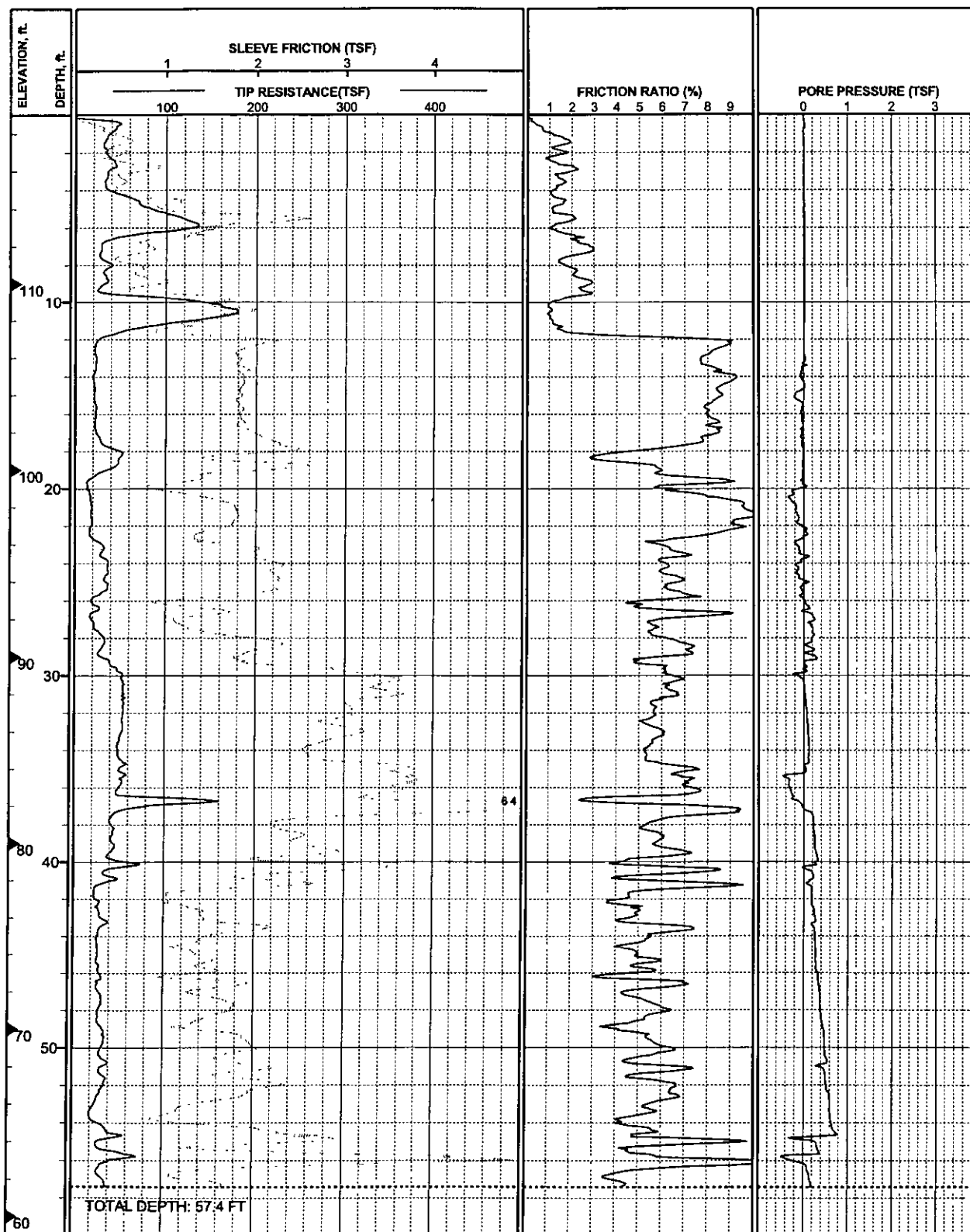
Report Date 10/04/99



EXPLORATION NO.: CPT-6
GROUND ELEVATION: 119.0 FT (MSL)

COORDINATES: E1687170.94 N243903.66 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: Not Measured

VEHICLE: Fugro Geosciences
TEST DATE: 6/22/99



Location Per Plate 3

LOG OF CPT-6 Ease Campus Development CSU Channel Islands

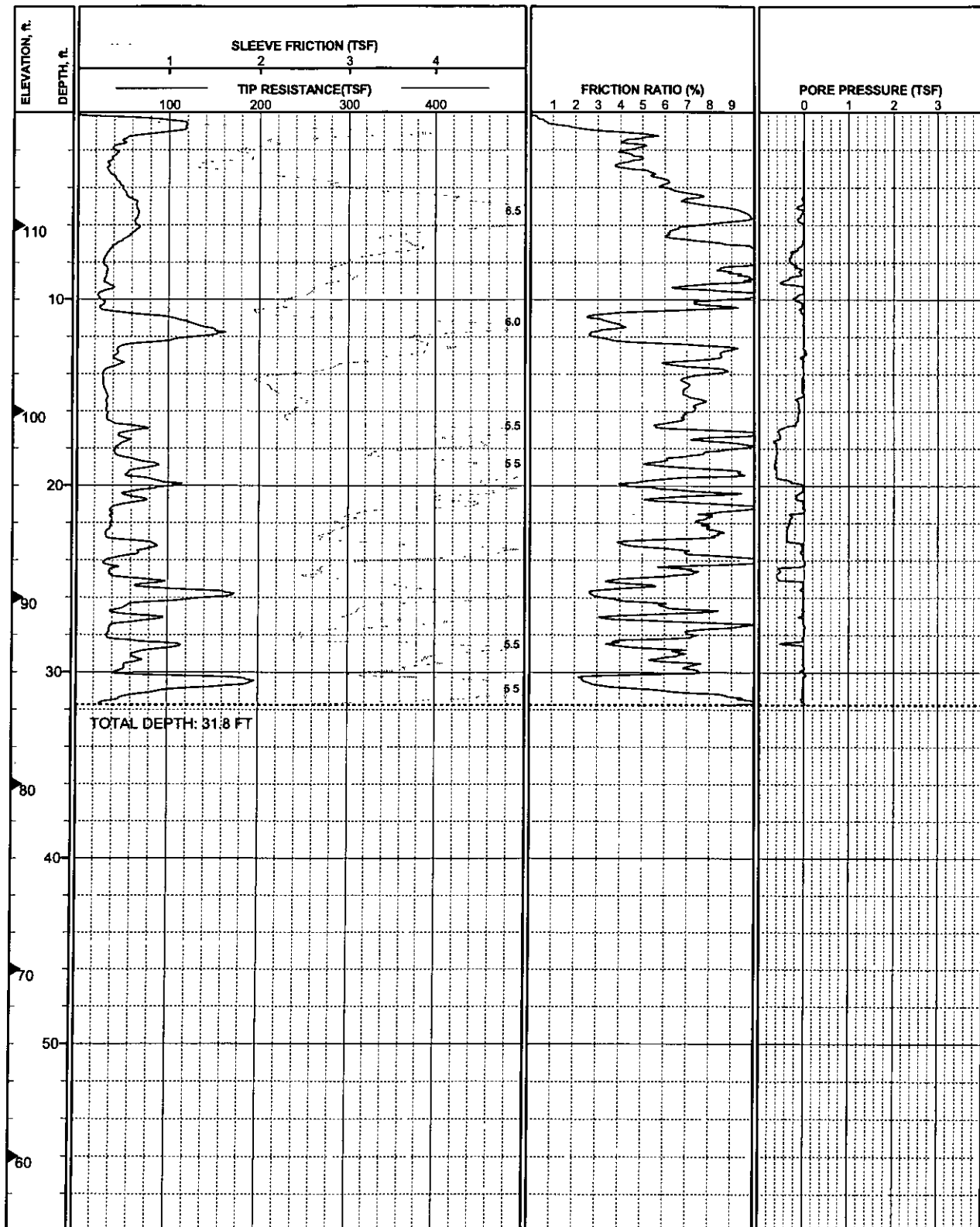
Report Date 10/04/99



EXPLORATION NO.: CPT-7
GROUND ELEVATION: 116.0 FT (MSL)

COORDINATES: E1687125 99 N244580 24 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: Not Measured

VEHICLE: Fugro Geosciences
TEST DATE: 6/29/99



Location Per Plate 3

LOG OF CPT-7
Ease Campus Development
CSU Channel Islands

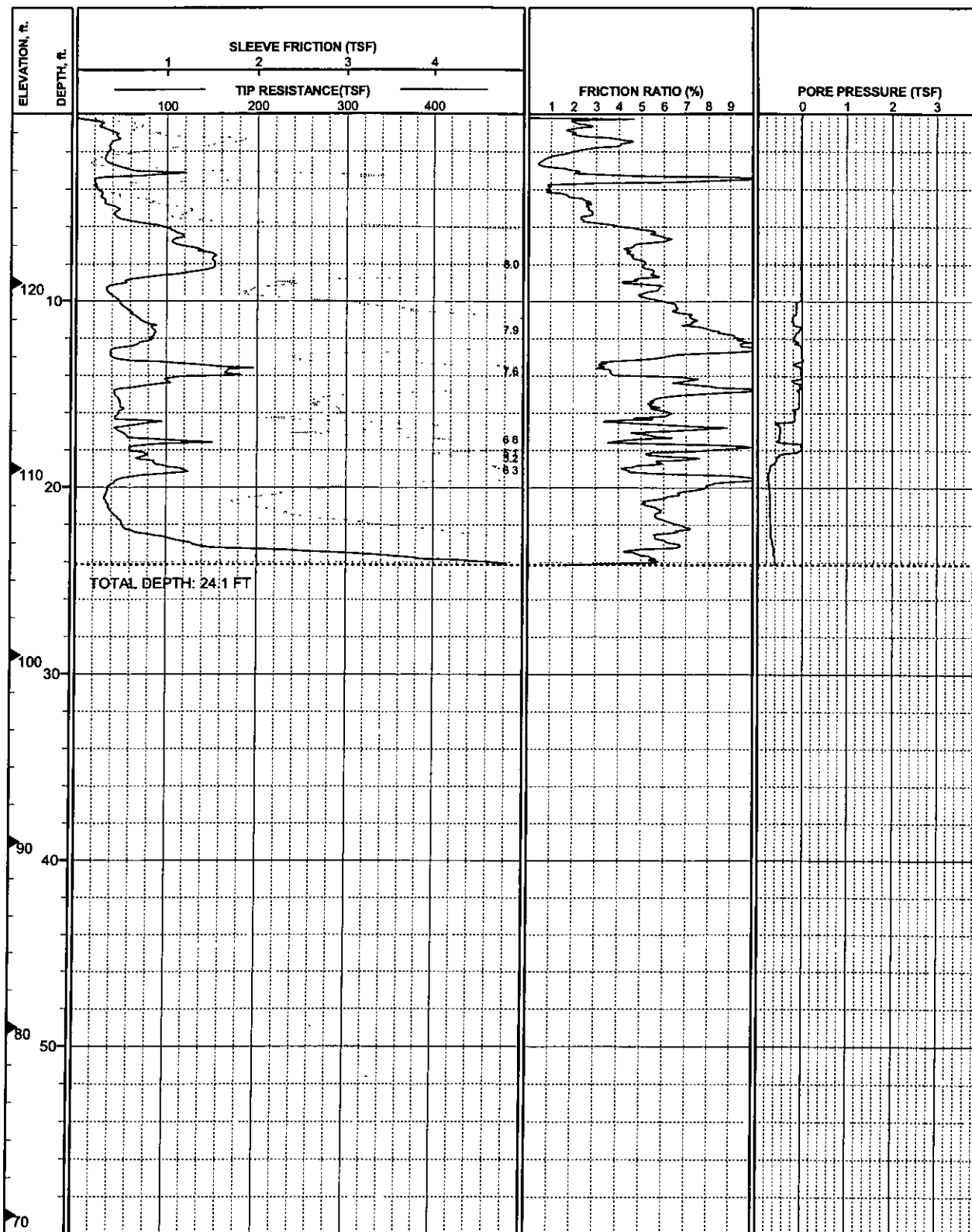
Report Date: 10/04/99



EXPLORATION NO.: CPT-8
GROUND ELEVATION: 129.0 FT (MSL)

COORDINATES: E1688633 01 N245024.6 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: Not Measured

VEHICLE: Fugro Geosciences
TEST DATE: 6/29/99



Location Per Plate 3

LOG OF CPT-8 Ease Campus Development CSU Channel Islands

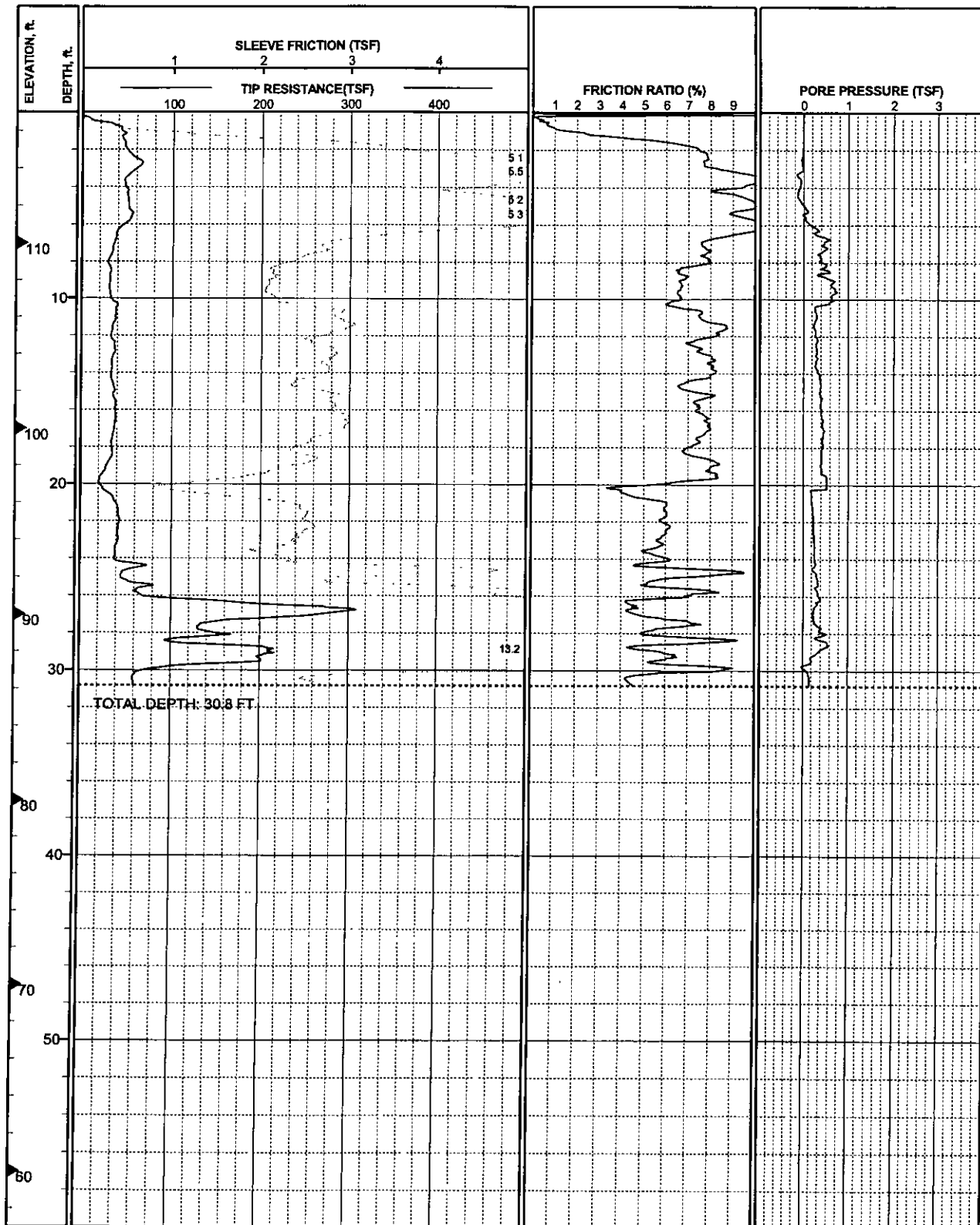
Report Date: 10/04/99



EXPLORATION NO.: CPT-9
GROUND ELEVATION: 117.0 FT (MSL)

COORDINATES: E1687003 41 N245929 42 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: Not Measured

VEHICLE: Fugro Geosciences
TEST DATE: 6/29/99



Location Per Plate 3

LOG OF CPT-9
Ease Campus Development
CSU Channel Islands

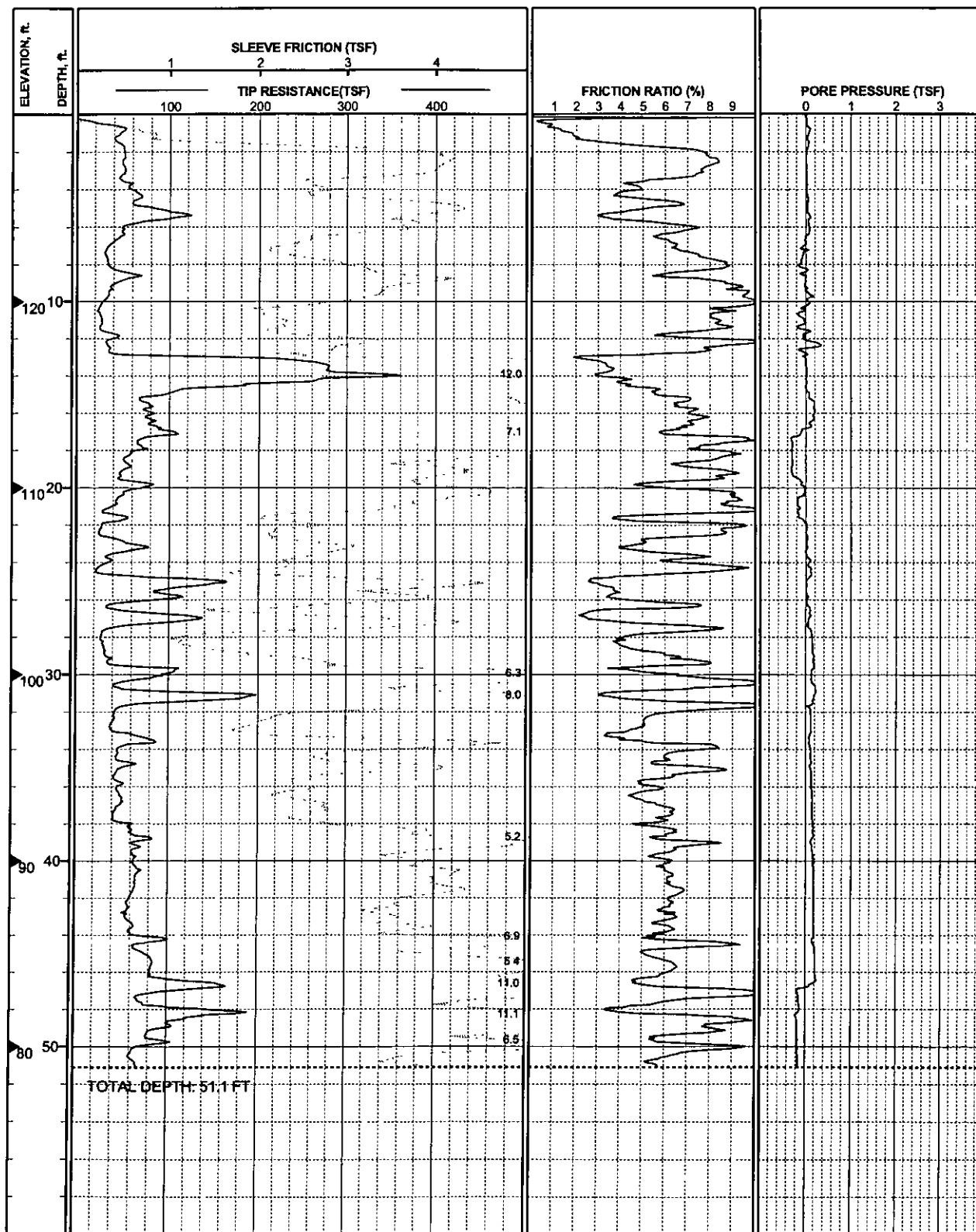
Report Date: 10/04/99



EXPLORATION NO.: CPT-10
GROUND ELEVATION: 130.0 FT (MSL)

COORDINATES: E1687287.32 N245923.55 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: Not Measured

VEHICLE: Fugro Geosciences
TEST DATE: 6/29/99



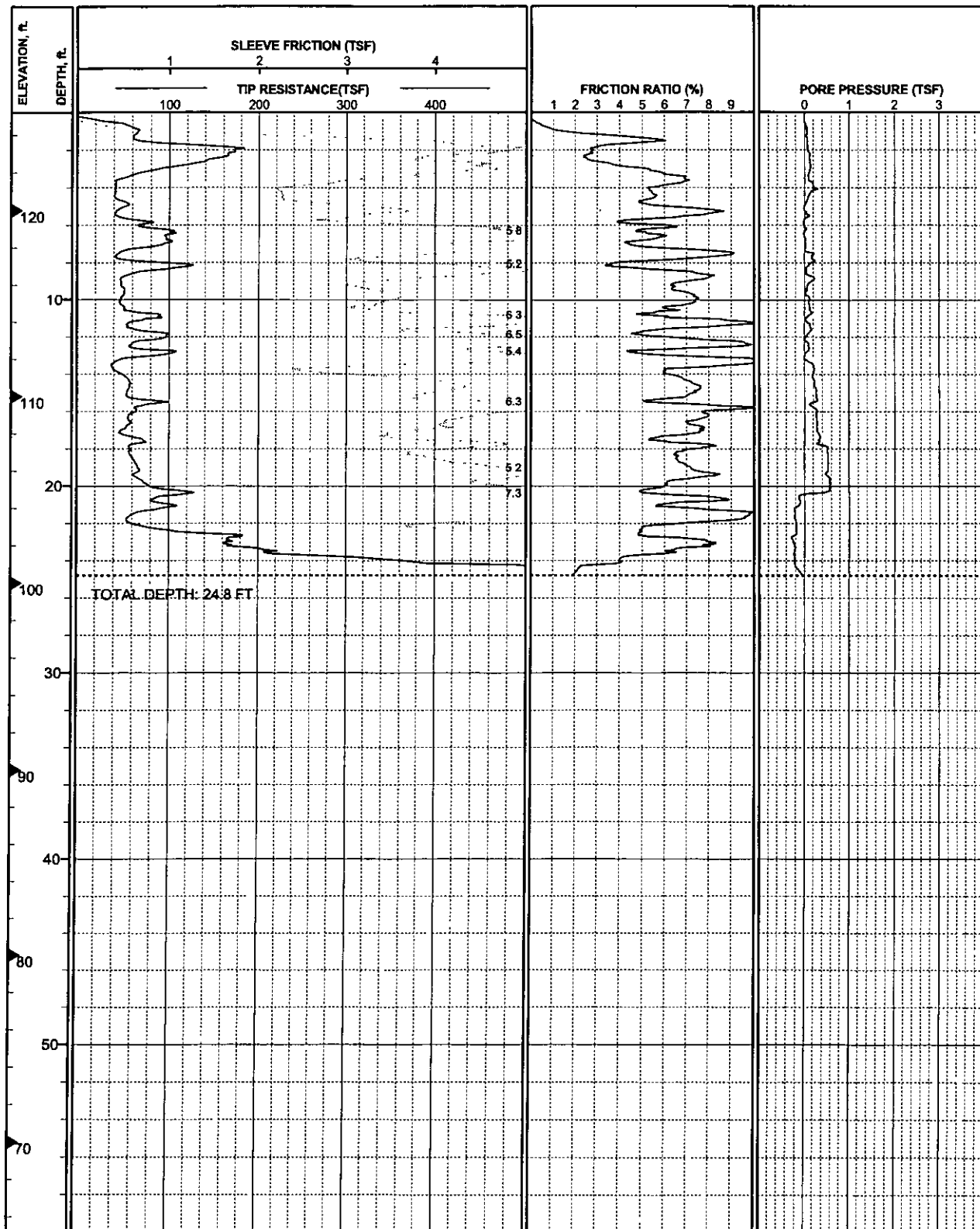
Location Per Plate 3

LOG OF CPT-10
East Campus Development
CSU Channel Islands

Report Date: 10/04/99



EXPLORATION NO.: CPT-11	COORDINATES: E1687383 68 N246225.79 CA State Plane Zone 5, NAD27, feet	VEHICLE: Fugro Geosciences
GROUND ELEVATION: 125.2 FT (MSL)	DEPTH TO WATER: Not Measured	TEST DATE: 6/29/99



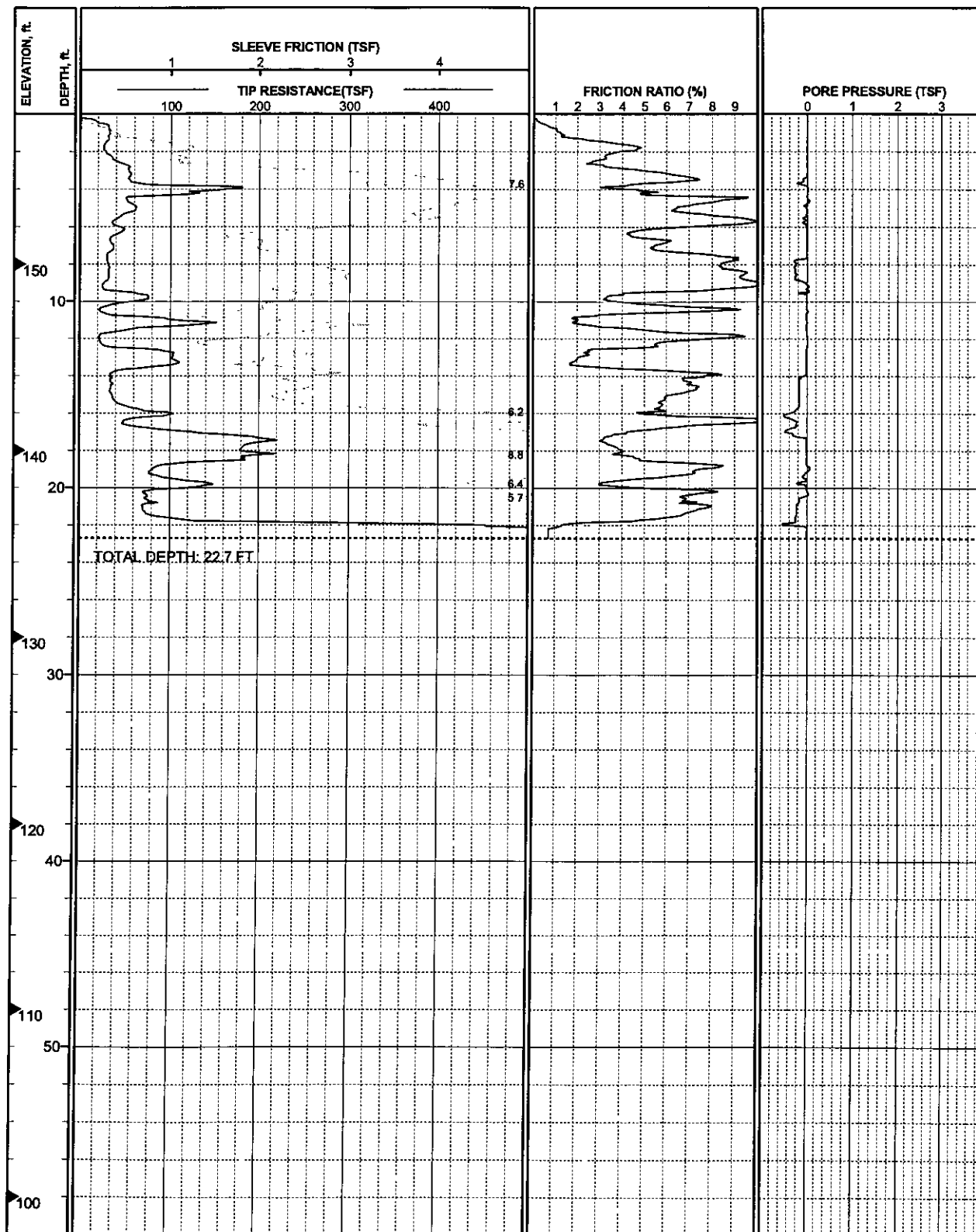
Location Per Plate 3	LOG OF CPT-11
	East Campus Development
	CSU Channel Islands
Report Date: 10/04/99	



EXPLORATION NO.: CPT-12
GROUND ELEVATION: 158.0 FT (MSL)

COORDINATES: E1688025 85 N245837 76 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: Not Measured

VEHICLE: Fugro Geosciences
TEST DATE: 6/29/99



Location Per Plate 3

LOG OF CPT-12

Ease Campus Development
CSU Channel Islands

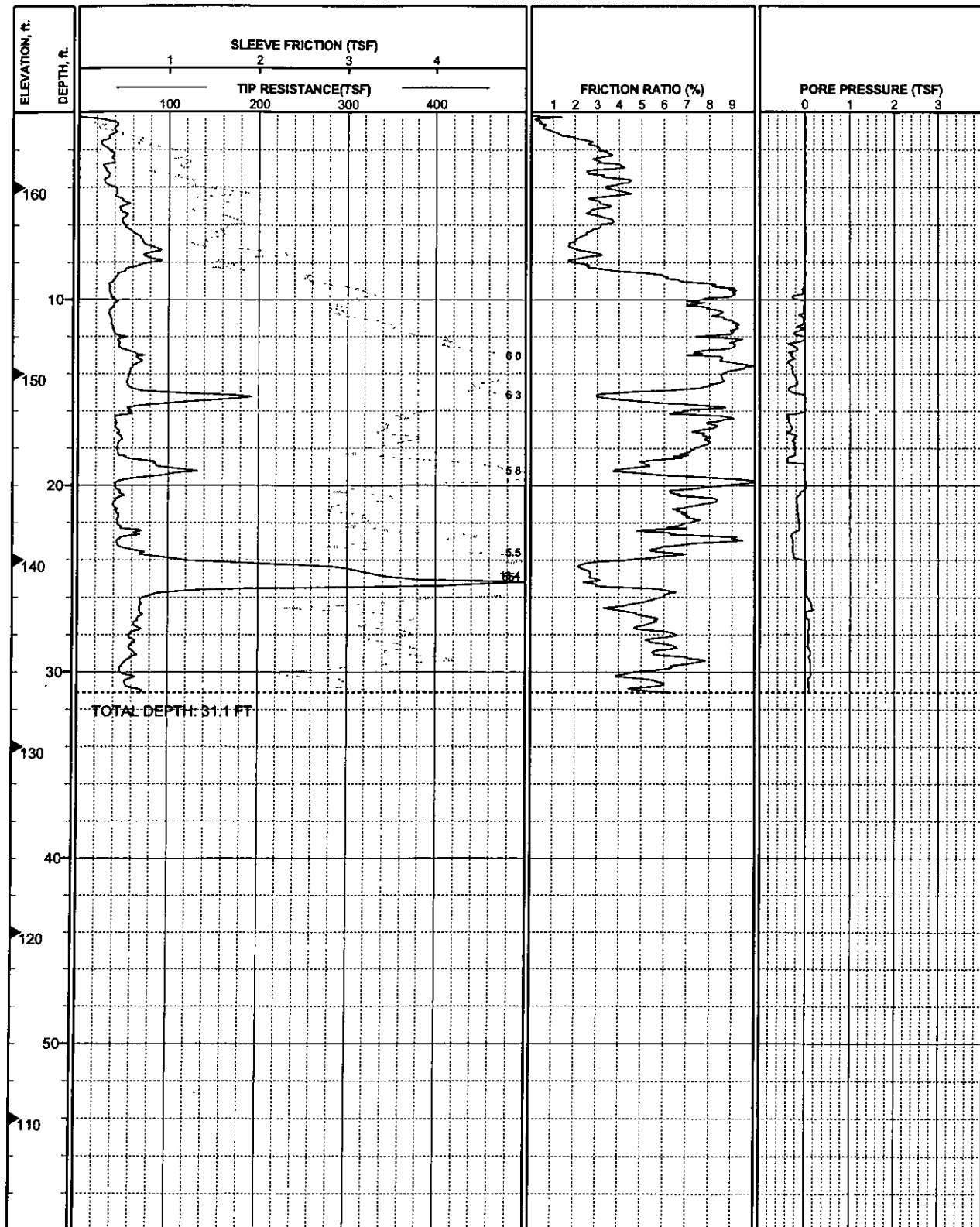
Report Date: 10/04/99



EXPLORATION NO.: CPT-13
GROUND ELEVATION: 164.0 FT (MSL)

COORDINATES: E1687802.42 N245284.38 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: Not Measured

VEHICLE: Fugro Geosciences
TEST DATE: 6/29/99



Location Per Plate 3

LOG OF CPT-13
Ease Campus Development
CSU Channel Islands

Report Date: 10/04/99

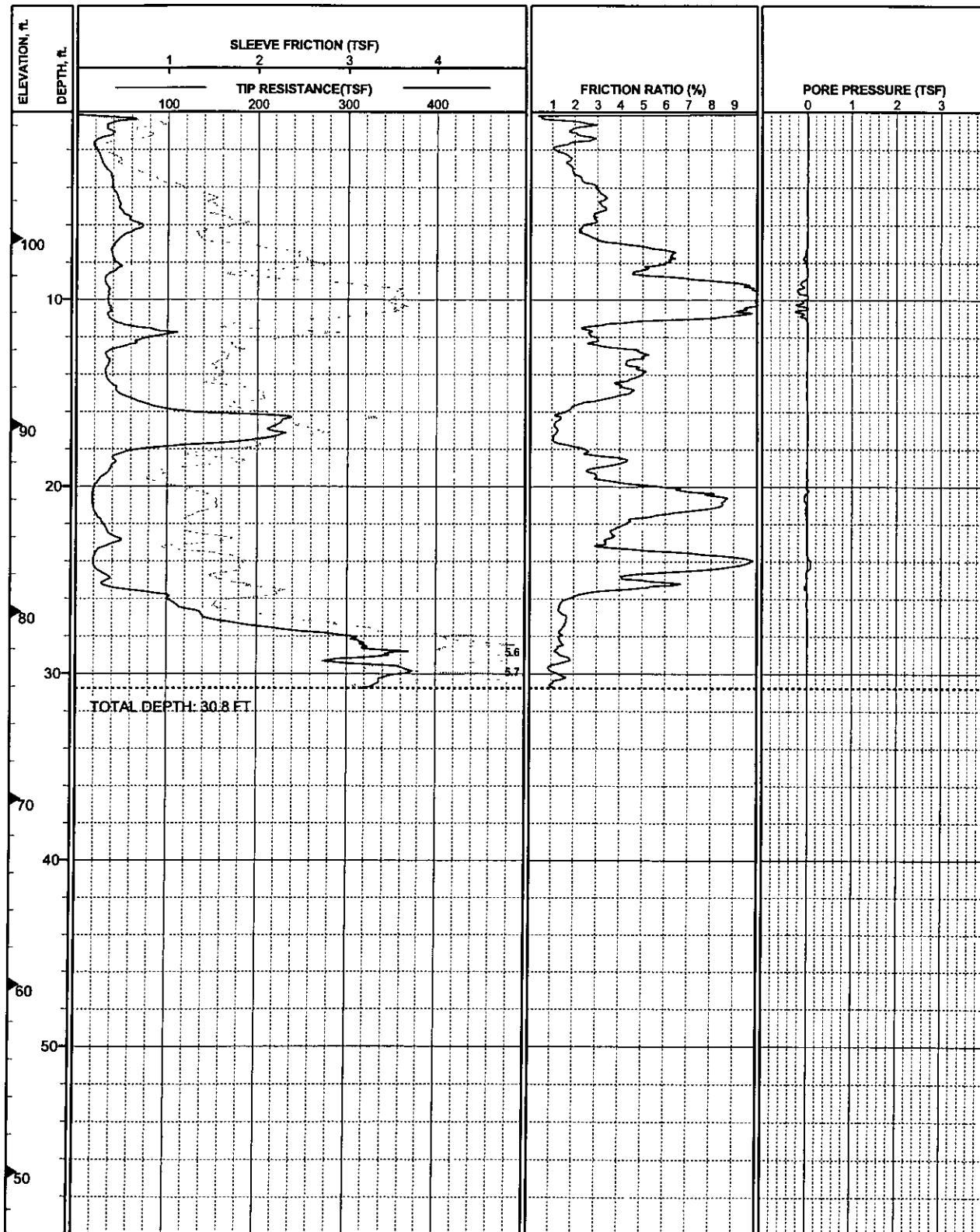
December 2000
Project No. 99-42-0384



EXPLORATION NO.: CPT-14
GROUND ELEVATION: 106.7 FT (MSL)

COORDINATES: E1686503.96 N242704 2 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: Not Measured

VEHICLE: Fugro Geosciences
TEST DATE: 6/29/99



Location Per Plate 3

LOG OF CPT-14

Ease Campus Development
CSU Channel Islands

Report Date: 10/04/99

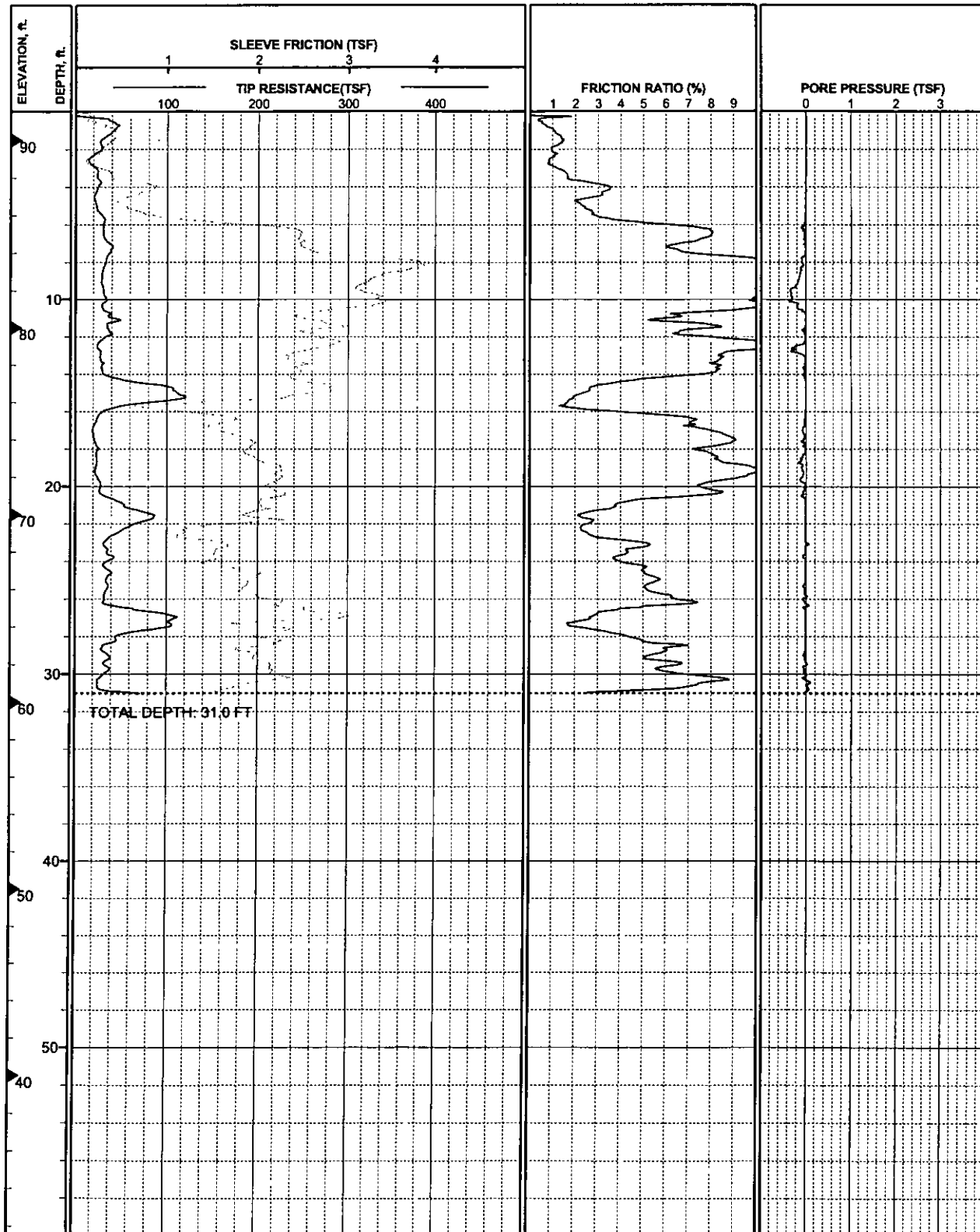
December 2000
Project No. 99-42-0384



EXPLORATION NO.: CPT-15
GROUND ELEVATION: 91.5 FT (MSL)

COORDINATES: E1686018.18 N242604.38 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: Not Measured

VEHICLE: Fugro Geosciences
TEST DATE: 6/29/99



Location Per Plate 3

LOG OF CPT-15

Ease Campus Development
CSU Channel Islands

Report Date: 10/04/99

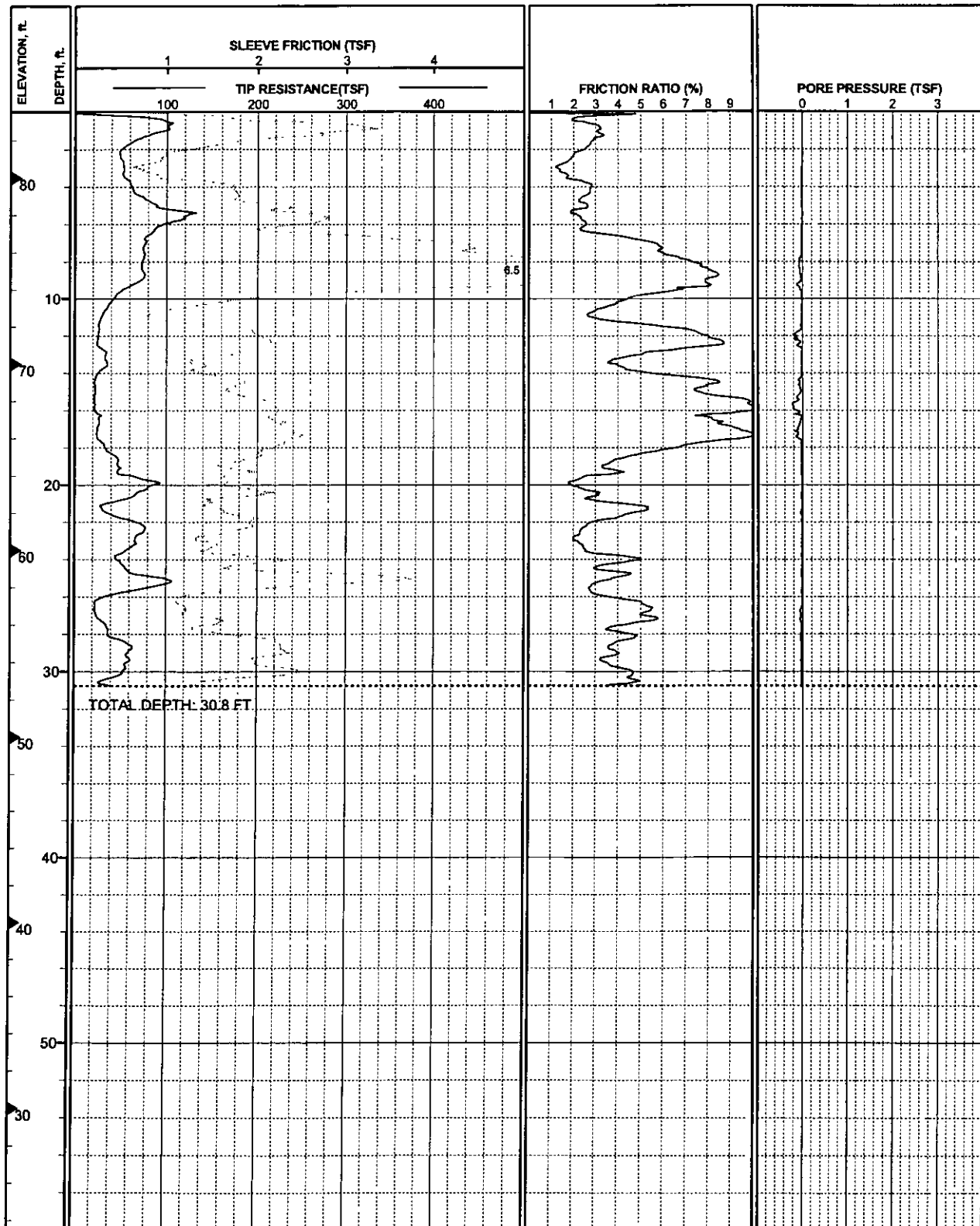
December 2000
Project No. 99-42-0384



EXPLORATION NO.: CPT-16
GROUND ELEVATION: 83.5 FT (MSL)

COORDINATES: E1685662.07 N242966.47 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: Not Measured

VEHICLE: Fugro Geosciences
TEST DATE: 6/29/99



Location Per Plate 3

LOG OF CPT-16
Ease Campus Development
CSU Channel Islands

Report Date: 10/04/99

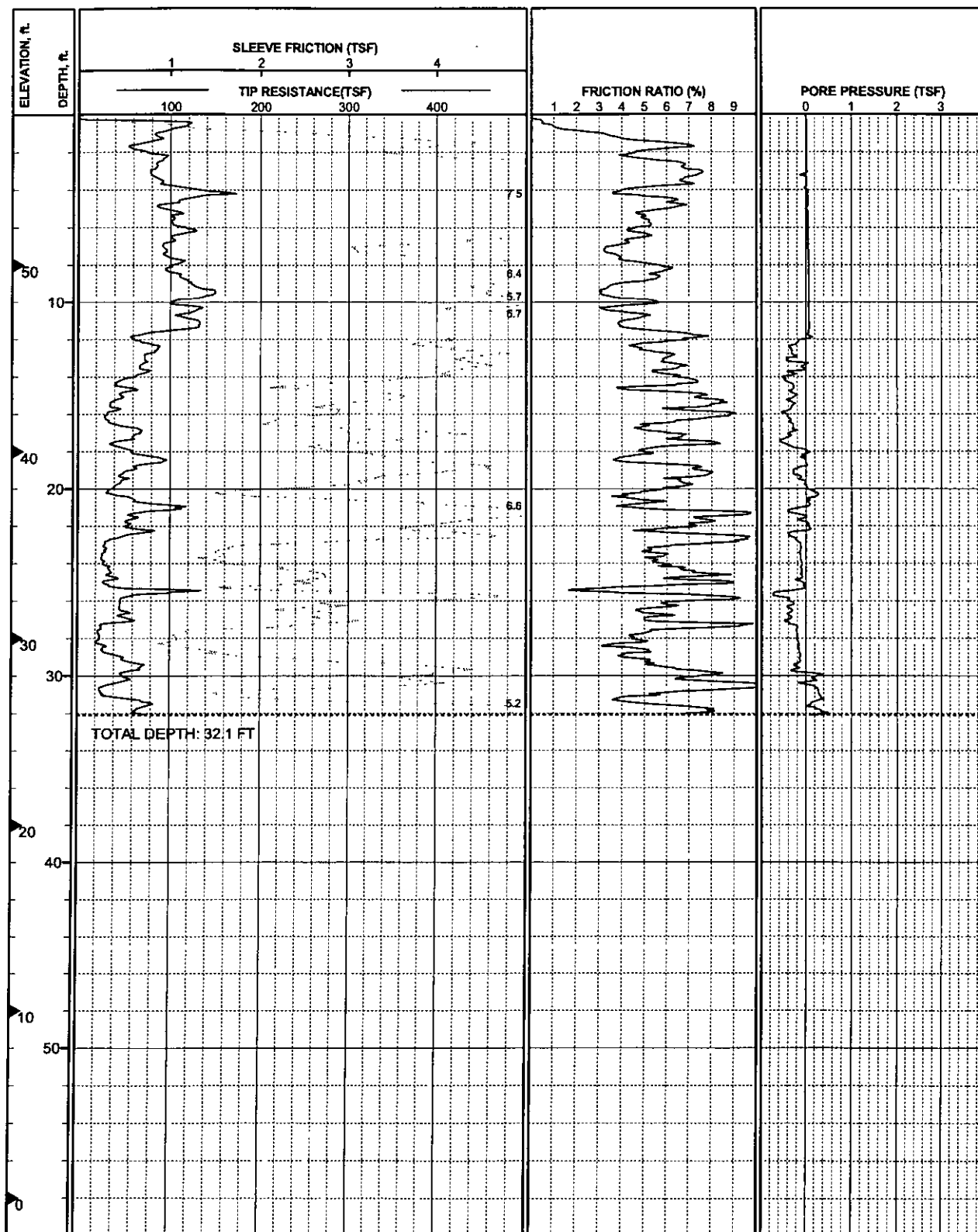
December 2000
Project No. 99-42-0384



EXPLORATION NO.: CPT-17
GROUND ELEVATION: 58.0 FT (MSL)

COORDINATES: E1685202.79 N244630.91 CA State Plane Zone 5, NAD27, feet
DEPTH TO WATER: Not Measured

VEHICLE: Fugro Geosciences
TEST DATE: 6/22/99

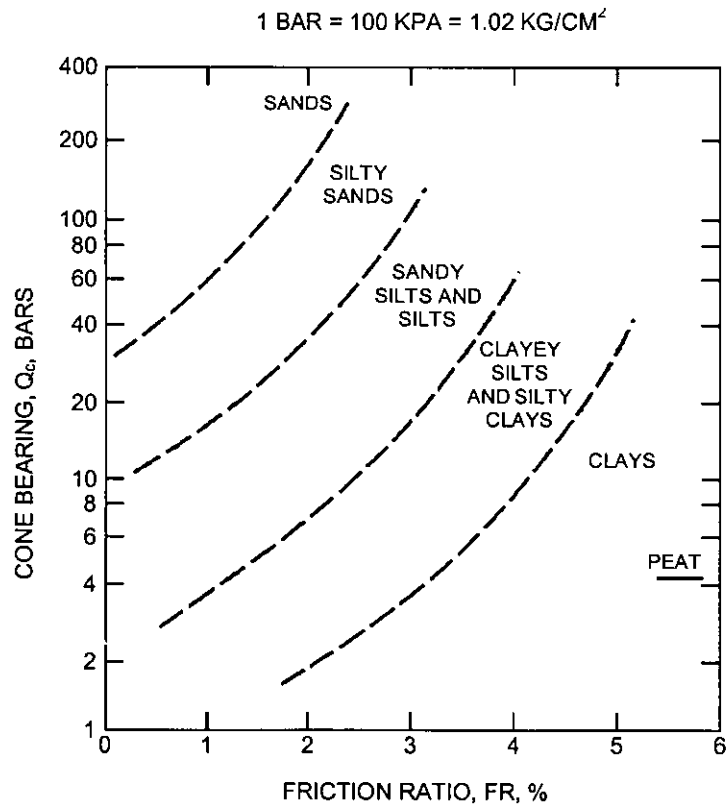


Location Per Plate 3

LOG OF CPT-17

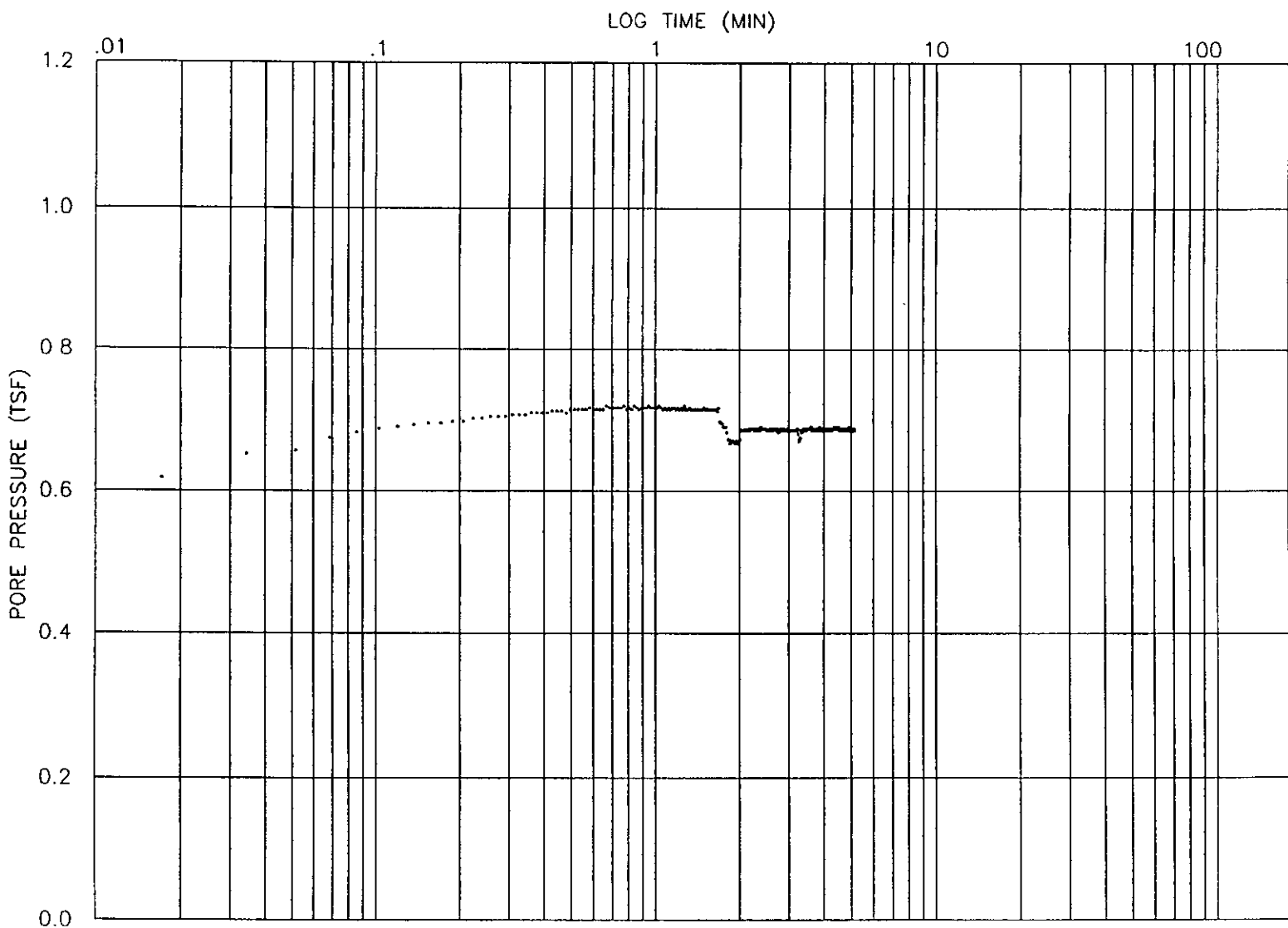
Ease Campus Development
CSU Channel Islands

Report Date: 10/04/99



CAMPANELLA AND ROBERTSON CLASSIFICATION CHART

SOIL CLASSIFICATION CHART



CPT NUMBER 2
JOB NUMBER: 99-0303

DISSIPATION TEST

DEPTH 64.6 FEET
DATE: 06-22-1999

FUGRO GEOSCIENCES, INC.



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL: 38 ft +/- (rel. MSL datum)	MATERIAL DESCRIPTION	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [u]
36	2		1a		(9)		ARTIFICIAL FILL (Af) Interlayered SAND (SP) and Lean CLAY (CL): sand is loose, tan, dry to moist; clay is medium stiff, dark brown, moist * - shelly tube sample extracted from new drill hole, adjacent to DH-1	114	89	29				
34	4		1A		PUSH			123	103	19				4.8-7.5
32	6		1b		(5)		ALLUVIUM (Qal) Lean to Fat CLAY (CL/CH): soft, dark brown to black, moist - with organic odor, below 5'	121	98	24				2.5
30	8		2											0.5
28	10		3		(11)		Interlayered Silty to Clayey SAND (SM/SC) and Fat CLAY (CH): loose to medium stiff, tan with brown mottles, moist to wet	118	91	31				2.0
26	12													
24	14													
22	16		4		(10)					32	65			
20	18													
18	20		5		5					32				
16	22		6		(11)		- with 3" of flow sand on top of sample, at 23'			26				1.5
14	24													
12	26		7		8		Interlayered Clayey SAND (SC) to Sandy CLAY (CH): loose/medium stiff, brown, wet			36	43	48	24	1-1.5 0.8
10	28													
8	30		8		13		- with angular gravel to approx. 3/4", at 30'			20	50			2.3
6	32													
4	34													
2	36		9		11		- stiff/medium dense, at 35'			28	55			1.5
0	38													

COMPLETION DEPTH: 51.5 ft
DEPTH TO WATER: 6 ft
BACKFILLED WITH: Native Materials
DRILLING DATE: June 29, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A + R Drilling
LOGGED BY: NDerbidge
CHECKED BY: C Wockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time

LOG OF DRILL HOLE NO. DH-1 Cal State Channel Islands, East Campus Development Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL: 38 ft +/- (rel MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uul]
						MATERIAL DESCRIPTION							
-4	42		10	X	9	Interlayered sandy fat CLAY (CH) to clayey SAND (CH/SC): medium stiff/loose, brown, wet			27	44			
-6	44					Grades to silty SAND (SM): loose, brown, wet, with angular gravel							
-8	46		11	X	45								
-10	48					- dense, gravel stuck in sampler shoe, at 46-1/2'							
-12	50		12	X	40								
-14	52					- gravel stuck in sampler shoe, at 51-1/2'							
-16	54												
-18	56												
-20	58												
-22	60												
-24	62												
-26	64												
-28	66												
-30	68												
-32	70												
-34	72												
-36	74												
-38	76												
-40	78												

COMPLETION DEPTH: 51.5 ft
DEPTH TO WATER: 6 ft
BACKFILLED WITH: Native Materials
DRILLING DATE: June 29, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A + R Drilling
LOGGED BY: NDerbridge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. DH-1
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL. 72 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [du]
MATERIAL DESCRIPTION													
70	2		2a		(7)	ARTIFICIAL FILL (Af) 3" Asphalt concrete (AC) over 8" Aggregate Base							
68	4		1			Sandy lean CLAY (CL): loose, light brown, moist	112	91	23				1.5-2.0
66	6		2		(32)	ALLUVIUM (Qal) Fat CLAY (CH): very stiff, dark brown, moist	120	94	28				>4.5
64	8												
62	10		3		(15)	- stiff, light brown, at 10'	113	89	28				2.5->4.5
60	12												
58	14		4		(44)	- very stiff, interlayered light and dark brown, at 15'	128	105	22				>4.5
56	16												
54	18												
52	20		5		16	Sandy fat CLAY (CH): very stiff, light brown, moist, with few black pockets (possible organic)			24				3-4
50	22												
48	24		5		16	Sandy lean CLAY (CL): very stiff, light brown - with 1" sand seam, at 25-1/2'			22				
46	26												
44	28		7		24	- with sand seams from 1" to 3" thick and few angular pea size gravel, at 30'			24				3-3.5
42	30					- pieces of gravel stuck in sampler shoe, at 30'							
40	32												
38	34		8		17				22				3-3.5
36	36												
34	38												

COMPLETION DEPTH: 51.5 ft
DEPTH TO WATER: 36 ft
BACKFILLED WITH: Native Materials
DRILLING DATE: June 29, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A + R Drilling
LOGGED BY: NDerbidge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time

LOG OF DRILL HOLE NO. DH-2
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL: 72 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), (uu)
30	42		9	X	13	- brown, wet, with few angular pea size gravel, at 40'			21	53			
28	44												
26	46		10	X	10	Sandy CLAY (CL): stiff, brown, wet, with angular gravel to approx. 1", with seams and layers of sand - flowing sand and gravel observed between down-hole hammer and auger, at 45'							30
24	48												
22	50		11	X	18	- top 4" of sampler filled with flow sands that flowed into sampler prior to sampling, at 50' - piece of 1" gravel stuck in sampler shoe, at 51.5							15
20	52												
18	54												
16	56												
14	58												
12	60												
10	62												
8	64												
6	66												
4	68												
2	70												
0	72												
-2	74												
-4	76												
-6	78												

COMPLETION DEPTH: 51.5 ft
DEPTH TO WATER: 36 ft
BACKFILLED WITH: Native Materials
DRILLING DATE: June 29, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A+R Drilling
LOGGED BY: NDerbidge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. DH-2
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO	SAMPLERS	SAMPLER BLOW COUNT	LOCATION. per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uul]
						SURFACE EL: 125 ft +/- (rel MSL datum)							
						MATERIAL DESCRIPTION							
124	2		3a		(7)	ARTIFICIAL FILL (Af) Lean CLAY (CL): medium stiff, brown, dry to moist, with roots to approx. 1/16"	91	78	16				>4.5
122	4		1										
120	6		2		(30)	ALLUVIUM (Qal) Silty fine SAND (SM): dense, brown, moist, with angular gravel to approx. 1"	112	101	11	21			
118	8												
116	10		3		(19)	Lean CLAY (CL): brown, moist - very stiff, at 10'	112	92	22				>4.5
114	12												
112	14		4		(18)	- with few pieces of angular gravel to approx. 1/2", at 15'	124	104	20				>4.5
110	16												
108	18		5		30	- very stiff, angular gravel stuck in sampler shoe, at 20'			14				>4.5
106	20												
104	22		6		8	- medium stiff, at 25'			24				2.5-3
102	24												
100	26		7		20	- very stiff, with few angular gravel to 1", at 30'			22				>4.5
98	28												
96	30												
94	32												
92	34												
90	36												
88	38												
86													

COMPLETION DEPTH: 31.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: June 28, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A + R Drilling
LOGGED BY: NDerbridge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. DH-3
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uul]
						SURFACE EL: 166 ft +/- (rel. MSL datum)							
						MATERIAL DESCRIPTION							
164	2		4a		(20)	ARTIFICIAL FILL (Af) Sandy lean CLAY (CL): stiff, dry to moist, light brown, with gravel to approx. 3/4" and few roots to approx. 1/16"	110	98	12				
162	4		1										>4.5
160	6		2		(24)	- stiff, angular gravel to approx. 1" stuck in sampler shoe, at 6-1/2'	102	89	15	68			>4.5
158	8												
156	10		3		(38)	ALLUVIUM (Qal) Lean CLAY (CL): very stiff, moist, light brown to brown	127	110	15				>4.5
154	12												
152	14												
150	16		4		22	- very stiff, at 15'			14				>4.5
148	18												
146	20		5		13	- stiff, at 20'			15				
144	22												
142	24												
140	26		6		20	Silty SAND (SM): medium dense, brown, moist, with gravel to approx. 1"			8				
138	28												
136	30		7		8	- loose, at 30'			14	26			
134	32												
132	34												
130	36		8		18	- interlayered with medium dense clayey SAND (SM/SC) with angular gravel to approx. 1/2", at 35'			10	20			
128	38												

COMPLETION DEPTH: 51.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: June 28, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A + R Drilling
LOGGED BY: NDerbidge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. DH-4
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL: 166 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
MATERIAL DESCRIPTION													
124	42		9	X	15	Fat to lean CLAY (CH/CL): dark yellowish brown, very stiff - interlayered with sand, lean clay, at 40'			23	58			
122	44												
120	46		10	X	7	- lean, medium stiff, at 45'			25				
118	48												
116	50		11	X	18	- lean, very stiff, at 50'							
114	52								19				
112	54												
110	56												
108	58												
106	60												
104	62												
102	64												
100	66												
98	68												
96	70												
94	72												
92	74												
90	76												
88	78												

COMPLETION DEPTH: 51.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: June 28, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A + R Drilling
LOGGED BY: NDerbidge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. DH-4
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uul]
						SURFACE EL: 118 ft +/- (rel. MSL datum)							
						MATERIAL DESCRIPTION							
116	2		5a			ALLUVIUM (Qal) Fat CLAY (CH): medium stiff, dark brown, moist, with roots to 1/16"							
114	4		1		(12)		93	79	17				> 4.5
112	6		2		(22)	- stiff, mottled light and dark brown, at 5'	116	93	25				> 4.5
110	8												
108	10		3		(24)	- stiff, with few organic pockets to 1/8", at 10'	111	86	29				> 4.5
106	12												
104	14		4		(69)	- hard, with few caliche veins, at 15' to 20'							> 4.5
102	16												
100	18												
98	20		5		18	- very stiff, at 20'			29				3.0
96	22												
94	24		6		19	- with few pea size gravel, at 25'			18				4.5
92	26												
90	28												
88	30		7		30				22				> 4.5
86	32												
84	34												
82	36		8		15	Lean CLAY (CL) with sand: stiff, reddish brown, moist			26				2.0
80	38												

COMPLETION DEPTH: 51.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: June 29, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A+R Drilling
LOGGED BY: NDerbidge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. DH-5
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL: 118 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
						MATERIAL DESCRIPTION							
.76	42		9	X	19	Lean CLAY (CL) with sand interlayered with fat CLAY (CH): very stiff, light brown, moist			31				>4.5
.74	44												
.72	46		10	X	20								
.70	48												
.68	50		11	X	36	- hard, at 50'							>4.5
.66	52												
.64	54												
.62	56												
.60	58												
.58	60												
.56	62												
.54	64												
.52	66												
.50	68												
.48	70												
.46	72												
.44	74												
.42	76												
.40	78												

COMPLETION DEPTH: 51.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: June 29, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A + R Drilling
LOGGED BY: NDerbidge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. DH-5
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL: 132 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [luc]
MATERIAL DESCRIPTION													
130	2		6a		(16)	ARTIFICIAL FILL (Af) Sandy fat CLAY (CH) to sandy SILT (ML): stiff to medium dense, brown, dry to moist, with angular pea-size gravel	98	89	11				> 4.5
128	4		1		(25)		114	97	18				
126	6		2		(32)	ALLUVIUM (Qal) Lean CLAY (CL) to sandy SILT (ML): very stiff to dense, light brown, moist, with few gravel to 1"							
124	8		3		(29)		128	106	20				
122	10		4		(22)	- sandy silt layer, at 15'							
120	12		5		22		121	100	21	70			3.0
118	14		6		18	- driller notes gravel at 20' to 25'			20				> 4.5
116	16		7		34								
114	18		8		34	Interlayered clayey SAND (SC) and sandy CLAY (CL): medium dense to stiff, light to dark brown, moist, with angular pea-size gravel			16	28			> 4.5
112	20		9		34								
110	22		10		34	- dense to hard, abundant angular pea size gravel			10				
108	24		11		34								
106	26		12		34								
104	28		13		34								
102	30		14		34								
100	32		15		34								
98	34		16		34								
96	36		17		34								
94	38		18		34								
			19		34								

COMPLETION DEPTH: 31.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: June 28, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A + R Drilling
LOGGED BY: NDerbidge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. DH-6
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL: 131 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), (uol)
130	2		7a		(35)	ALLUVIUM (Qal) Fat CLAY (CH): very stiff to stiff, brown, dry to moist, with few angular pea size gravel	112	95	17				>4.5
128	4		1		(21)								
126	6		2		(30)	- stiff, at 5' Silty SAND (SM): medium dense, brown, moist, with few pea gravel	122	103	19	33			
124	8		3		(30)								
122	10		4		(44)	Lean CLAY (CL): very stiff, dark brown, moist, with seams of sand and angular gravel	118	98	21				
120	12		5		19								
118	14		6		(39)	- with sand, at 20'	129	105	23				
116	16		7		40								
114	18		8		(31: 1")	- hard, at 31'			24				4.0
112	20		9		(50: 1")								
110	22		10			CONEJO VOLCANICS (Tcv) BASALT (Rx): yellowish brown, highly weathered, blocky - refusal for sampling, at 35' - hard drilling, at 37'							
108	24		11										
106	26		12				123	98	25				>4.5
104	28		13										
102	30		14						23				>4.5
100	32		15										
98	34		16										
96	36		17										
94	38		18										
92	40		19										
90													

COMPLETION DEPTH: 40.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: June 29, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A + R Drilling
LOGGED BY: NDerbidge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time

LOG OF DRILL HOLE NO. DH-7 Cal State Channel Islands, East Campus Development Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL: 131 ft +/- (rel. MSL datum) MATERIAL DESCRIPTION	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
90	42		9		(50: 1")	BASALT (Rx)							
88	44												
86	46												
84	48												
82	50												
80	52												
78	54												
76	56												
74	58												
72	60												
70	62												
68	64												
66	66												
64	68												
62	70												
60	72												
58	74												
56	76												
54	78												
52													

COMPLETION DEPTH: 40.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: June 29, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A+R Drilling
LOGGED BY: NDerbidge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time

LOG OF DRILL HOLE NO. DH-7
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION. per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
						SURFACE EL. 96 ft +/- (rel MSL datum)							
						MATERIAL DESCRIPTION							
94	2		8	(9)		ALLUVIUM (Qal) Fat CLAY (CH): medium stiff, moist, brown, with roots to 1/8" to approx. 3'	104	86	21				2.5
92	4		1										
90	6		2	(11)			110	89	24				2.5
88	8												
86	10		3	(5)		- with few angular pea-size gravel, at 10'	125	109	15				2.8
84	12												
82	14												
80	16		4	(19)		Silty fine SAND (SM): medium dense, light brown, moist, with angular shale gravel to approx. 3/4"	103	87	18				
78	18												
76	20		5	(18)			115	90	29	46			3.5
74	22					Lean CLAY (CL): stiff, moist, brown, with angular pea size gravel							
72	24												
70	26		6	(44)		- hard, at 25'	121	98	24				>4.5
68	28												
66	30		7	(34)		- very stiff, more silty, at 30'	124	100	23				>4.5
64	32												
62	34												
60	36												
58	38												

COMPLETION DEPTH: 31.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: June 28, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A + R Drilling
LOGGED BY: NDerbidge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time

LOG OF DRILL HOLE NO. DH-8
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL: 33 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	S _u , ksf PP, (TV), [uu]
						MATERIAL DESCRIPTION							
32	2					ALLUVIUM (Qal) Silty SAND (SM): light gray, brown, moist							
30	4												
28	6		1		(31)	Lean to fat CLAY (CL/CH): very stiff, dark to light brown, moist	127	105	21				
26	8												
24	10		2		(13)	Lean CLAY (CL): stiff to very stiff, reddish brown, moist, with few gravel to 3/8"	118	94	25				
22	12												
20	14												
18	16		3		(19)								
16	18												
14	20		4		(40)								
12	22												
10	24												
8	26												
6	28												
4	30												
2	32												
0	34												
-2	36												
-4	38												
-6													

COMPLETION DEPTH: 21.5 ft
DEPTH TO WATER: 13.5 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: August 4, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A + R Drilling
LOGGED BY: NDerbidge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. DH-101
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL. 27 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), (uu)
26	2		2a			ALLUVIUM (Qal) Lean CLAY (CL): stiff, light gray brown, dry to 5-1/2', with some sand							
24	4		1		(17)	- moist, light brown to dark brown, below 5.5'							
22	6												
20	8												
18	10				(9)	- layer of Silty fine SAND (SM), from 10' to 11'							
16	12					- wet, at 10'							
14	14												
12	16		2		(7)	Fat CLAY (CH): medium stiff, blue-gray, wet - Note: flowing sand on top of sample							
10	18		3		PUSH								
8	20												
6	22												
4	24												
2	26												
0	28												
-2	30												
-4	32												
-6	34												
-8	36												
-10	38												
-12													

COMPLETION DEPTH: 19 ft
DEPTH TO WATER: 10 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: August 4, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A+R Drilling
LOGGED BY: NDerbridge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. DH-102
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL: 33 ft +/- (rel MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [u]
MATERIAL DESCRIPTION													
32	2		1	(11)		ALLUVIUM (Qal) Lean CLAY (CL): brown, dry to 3' then moist, with pea size gravel	109	83	31				
30	4												
28	6												
26	8												
24	10		2	(?)		Interlayered Lean CLAY (CL) and Silty SAND to SAND (SM/SP): loose to medium stiff, clay is brown, moist			29	37			
22	12												
20	14												
18	16												
16	18		3	PUSH		- Silty SAND layer, from 10' to 11.5' - with gravel, at 13' - very difficult drilling, below 14'							
14	20												
12	22												
10	24												
8	26		4	Ref/3"		CONEJO VOLCANICS (Tcvb)							
6	28												
4	30												
2	32												
0	34												
-2	36												
-4	38												
-6													

COMPLETION DEPTH: 16.25 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Cuttings
DRILLING DATE: August 4, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A + R Drilling
LOGGED BY: NDerbridge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. DH-103
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL: 31 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
						MATERIAL DESCRIPTION							
30	2		1		(15)	ALLUVIUM (Qal) Silty SAND (SM): loose, light gray brown, dry to approx. 3' then moist							
28	4												
26	6					SAND (SP) to SAND with SILT (SP-SM): loose to medium dense, very light yellowish gray, moist	97	93	5				
24	8												
22	10												
20	12		2		(12)				25	10			
18	14												
16	16												
14	18												
12	20												
10	22		3		(20)	- wet, at 15'							
8	24												
6	26												
4	28												
2	30												
0	32												
-2	34												
-4	36												
-6	38												
-8													
						Hole caved to 12' at completion of drilling; no water measured above 12'				10			

COMPLETION DEPTH: 21.5 ft
DEPTH TO WATER: Not Measured
BACKFILLED WITH: Cuttings
DRILLING DATE: August 4, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A+R Drilling
LOGGED BY: NDerbidge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. DH-104
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL: 35 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), (uu)
34	2		1	(4)		ALLUVIUM (Qal) Silty SAND (SM): loose, light gray, dry							
32	4		2	PUSH		Lean to fat CLAY (CL/CH): stiff, dark brown, moist below 3'	112	88	28				
30	6					- wet, below 5'	125	101	24				
28	8		3	(15)		- light brown, with gray and orange brown mottles	122	94	30				
26	10												
24	12		4	(14)									
22	14								36				
20	16												
18	18												
16	20		5?	9		- medium stiff, at 20'							
14	22												
12	24												
10	26												
8	28												
6	30												
4	32												
2	34												
0	36												
-2	38												
-4													

COMPLETION DEPTH: 20 ft
DEPTH TO WATER: 5 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: August 4, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A + R Drilling
LOGGED BY: NDerbidge
CHECKED BY: C Wockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. DH-105
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), (uul)
						SURFACE EL: 37 ft +/- (rel. MSL datum)							
						MATERIAL DESCRIPTION							
36	2		1	(15)		ALLUVIUM (Oal) Silty SAND (SM): loose, light brown gray, dry to 3'							
34	4		2	(7)		Lean CLAY (CL): medium stiff to stiff, dark brown, moist, with some sand and roots to 1/8"	127	107	19				
32	6		3			Sandy CLAY (CL): medium stiff to stiff, light brown, wet	128	106	21				
30	8						135	114	18				
28	10												
26	12		4	(8)		- grades to Fat CLAY (CH), medium stiff, brown, wet, at 12'				36			
24	14												
22	16		5	8		- with a few pieces of coarse sand, at 16'							
20	18												
18	20		6	(9)									
16	22												
14	24												
12	26												
10	28												
8	30												
6	32												
4	34												
2	36												
0	38												
-2													

COMPLETION DEPTH: 21.5 ft
DEPTH TO WATER: 6 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: August 4, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A + R Drilling
LOGGED BY: NDerbidge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. DH-106
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL: 35 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
MATERIAL DESCRIPTION													
34	2		A		(9)	ALLUVIUM (Qal) Sandy CLAY (CL): medium stiff to stiff, brown to light brown, dry to 2-1/2" then moist, with abundant caliche pockets and very few pieces of coarse sand	119	100	18				
32	4		1		(10)		118	94	25				
30	6		2		(7)		112	78	44				
28	8		3		PUSH	Fat CLAY (CH): medium stiff, light gray brown, moist, with traces of Iron Oxide mottling	120	94	29				
26	10		4										
24	12												
22	14		5		(11)	Clayey SAND (SC) to silty SAND (SM): loose, gray brown, wet			26	33			
20	16												
18	18												
16	20		6		7	Fat CLAY (CH): medium stiff, dark gray, wet, with few pieces of coarse sand			32				
14	22												
12	24												
10	26		7		(11)	SAND (SP): loose, light brown gray, wet			19	8			
8	28												
6	30												
4	32		8		26	Fat CLAY (CH): stiff to hard, dark gray, wet, with gravel in sampler shoe							
2	34												
0	36		9		(12)								
-2	38					- soft, at 40' Silty medium SAND (SM): medium dense, dark gray, wet, with few pieces of gravel							
-4	40		10		17								
-6	42												
-8													

COMPLETION DEPTH: 41.5 ft
DEPTH TO WATER: 15 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: August 4, 1999

DRILLING METHOD: Hollow Stem Auger
DRILLED BY: A+R Drilling
LOGGED BY: NDerbidge
CHECKED BY: CWockner

The log and data presented are a simplification of actual conditions encountered at the given location and time of drilling. Subsurface conditions may differ at other locations and with the passage of time.

LOG OF DRILL HOLE NO. DH-107
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
						SURFACE EL 55.0 ft +/- (rel MSL datum)							
						MATERIAL DESCRIPTION							
54	2		1			6" Asphalt concrete pavement, over 5" of deteriorated asphalt concrete (no base)							
52	4		2		(23)	ARTIFICIAL FILL (Af) Sandy Lean CLAY (CL) medium stiff, dark brown to brown, moist, some gravel							
50	6		3		(24)	ALLUVIUM (Qal) Clayey SAND with gravel (SC): dense, moderate brown, moist	117	101	16				
48	8					- more sand, at 5'	132	115	15				
46	10		4		(10)	Sandy Lean CLAY (CL): medium stiff, moderate brown, moist, with thin lenses of Silty SAND (SM)							
44													
42													
40													
38													
36													
34													
32													
30													
28													
26													
24													
22													
20													
18													
16													

COMPLETION DEPTH: 10.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: August 7, 2000

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

DRILLING METHOD: 8-in. dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: A & R Drilling
LOGGED BY: CWelke
CHECKED BY: CAWockner

LOG OF DRILL HOLE NO. DH-201
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-2.16



DRILLING METHOD: 8-in. dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: A & R Drilling
LOGGED BY: CWelke
CHECKED BY: CAWockner

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12/14/00/5 33 23 PM



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION, per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
						SURFACE EL 73.0 ft +/- (rel MSL datum)							
						MATERIAL DESCRIPTION							
72	0		1			5" Asphalt concrete pavement							
	2					ARTIFICIAL FILL (Af)							
70	4		2		(14)	Clayey SAND (SC): moderate brown, slightly moist, some gravel							
68	6		3		(35)	ALLUVIUM (Qal)	119	104	14				>4.5
66	8					Sandy Lean CLAY (CL): stiff to very stiff, light brown, damp, some gravel, slight caliche							
64	10		4		(37)	Clayey SAND with gravel (SC): dense, light brown, damp							
62						- lenses of Lean CLAY (CL), at 9'							
60													
58													
56													
54													
52													
50													
48													
46													
44													
42													
40													
38													
36													
34													

COMPLETION DEPTH: 10.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: August 7, 2000

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

DRILLING METHOD: 8-in. dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: A & R Drilling
LOGGED BY: CWelke
CHECKED BY: CAWockner

LOG OF DRILL HOLE NO. DH-203
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL: 90.0 ft +/- (rel MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [u]
						MATERIAL DESCRIPTION							
						3.5" Asphalt concrete pavement							
-88	2		1			ALLUVIUM (Qal)							>4.5
						Sandy Lean CLAY (CL): stiff to very stiff,							
						moderate brown, damp, trace to some gravel,							
						trace caliche							
-86	4		2		(12)								
-84	6		3		(33)		109	95	15				>4.5
-82	8												
-80	10		4		(16)								>4.5
-78	12												
-76	14												
-74	16												
-72	18												
-70	20												
-68	22												
-66	24												
-64	26												
-62	28												
-60	30												
-58	32												
-56	34												
-54	36												
-52	38												

COMPLETION DEPTH: 10.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: August 7, 2000
The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

DRILLING METHOD: 8-in. dia. Hollow Stem
Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: A & R Drilling
LOGGED BY: CWelke
CHECKED BY: CAWockner

LOG OF DRILL HOLE NO. DH-204
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-2.19



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL 98.0 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
						3.5" Asphalt concrete pavement over 6" Base materials							
-96	2		1		(10)	ALLUVIUM (Qal) Sandy Lean CLAY (CL): medium stiff to very stiff, moderate brown, damp to moist, some gravel, trace caliche							4.0
-94	4		2		(15)	- root up to 1/4" diameter, trace organics, trace gravel, at 5'							
-92	6		3		(28)	- lense of Clayey SAND with gravel (SC), dense, light brown damp, at 10'							
-90	8		4		(21)	- thin lenses of fine grained Silty SAND (SM), at 15'							
-88	10		5		(26)	- slightly lighter brown, damp, at 20'							3.8
-86	12		6		(28)	Clayey SAND (SC) dense, orangish brown, damp, trace gravel, weak CaCO3 (caliche)							
-84	14		7		(27)	- medium dense, damp to moist, some gravel, at 30'							
-82	16		8		(28)	Sandy Lean CLAY (CL): hard, moderate brown, damp							
-80	18		9		(27)	Clayey SAND with gravel (SC): dense, orangish brown, damp to moist, weak caliche							
-78	20												
-76	22												
-74	24												
-72	26												
-70	28												
-68	30												
-66	32												
-64	34												
-62	36												
-60	38												

COMPLETION DEPTH: 51.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: August 7, 2000
The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

DRILLING METHOD: 8-in. dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: A & R Drilling
LOGGED BY: CWelke
CHECKED BY: CAWockner

LOG OF DRILL HOLE NO. DH-205
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-2.20a



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO	SAMPLERS	SAMPLER BLOW COUNT	LOCATION per Plate 3 SURFACE EL. 98.0 ft +/- (rel MSL datum)	MATERIAL DESCRIPTION	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
-56	42		10		(58)									
-54	44													
-52	46		11		14		- with lens of Lean CLAY (CL); very stiff, at 45'							
-50	48													
-48	50		12		(30)		- medium dense, damp, mostly fine to medium grained sand, trace gravel, at 50'							
-46	52													
-44	54													
-42	56													
-40	58													
-38	60													
-36	62													
-34	64													
-32	66													
-30	68													
-28	70													
-26	72													
-24	74													
-22	76													
-20	78													

COMPLETION DEPTH: 51.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: August 7, 2000
The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

DRILLING METHOD: 8-in. dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: A & R Drilling
LOGGED BY: CWelke
CHECKED BY: CAWockner

LOG OF DRILL HOLE NO. DH-205
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-2.20b



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [u]
						SURFACE EL 140.0 ft +/- (rel. MSL datum)							
						MATERIAL DESCRIPTION							
-138	2		1			ALLUVIUM (Qal) Sandy Lean CLAY (CL) stiff to very stiff, moderate to dark brown, damp - numerous voids, rootlets, weak caliche, at 2'							
-136	4		2		(15)								>4.5
-134	6		3		(26)	- trace gravel, at 5'							>4.5
-132	8												
-130	10		4		(22)	- some voids, rootlets, at 10'							>4.5
-128	12												
-126	14												
-124	16		5		(23)	- more sand and some gravel, at 15'							>4.5
-122	18												
-120	20		6		8	medium stiff, moist, less sand, at 20'							
-118	22												
-116	24												
-114	26		7		(23)	Clayey SAND with gravel (SC): medium dense, dark orangish brown, damp to moist, includes thin lenses of Silty SAND (SM) and Lean CLAY (CL)							
-112	28												
-110	30		8		12								
-108	32												
-106	34					Sandy Lean CLAY (CL): very stiff, medium to dark brown, damp to moist							
-104	36		9		(30)								3.0
-102	38												

COMPLETION DEPTH: 51.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: August 8, 2000
The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

DRILLING METHOD: 8-in. dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: A & R Drilling
LOGGED BY: CWelke
CHECKED BY: CAWockner

LOG OF DRILL HOLE NO. DH-206
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-2.21a



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL: 140.0 ft +/- (rel MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
			10	X	30	- hard, more fine sands, at 40'							1.8
-98	42												
-96	44												
-94	46		11	(32)		- very stiff, moist, thin SILT (ML) lens, at 45'							>4.5
-92	48												
-90	50		12	X	12	- stiff, thin SILT (ML) lens, at 50'							
-88	52												
-86	54												
-84	56												
-82	58												
-80	60												
-78	62												
-76	64												
-74	66												
-72	68												
-70	70												
-68	72												
-66	74												
-64	76												
-62	78												

COMPLETION DEPTH: 51.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: August 8, 2000

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

DRILLING METHOD: 8-in. dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: A & R Drilling
LOGGED BY: CWelke
CHECKED BY: CAWockner

LOG OF DRILL HOLE NO. DH-206
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-2.21b



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION, per Plate 3 SURFACE EL: 131.0 ft +/- (rel MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
130	2		1			ARTIFICIAL FILL (Af) Sandy Lean CLAY (CL): medium stiff to stiff, moderate to dark brown, trace gravel							
128	4		2		(23)	ALLUVIUM (Qal) Silty SAND (SM): medium dense, light brown, damp							
126	6		3		(23)	Clayey SAND (SC) medium dense, dark orangish brown, moist							
124	8												
122	10		4		(16)								
120	12												
118	14												
116	16		5		30	- very dense, damp, at 15'							
114	18												
112	20		6		(50)	- very dense, moist, with gravel and trace cobbles, at 20'							
110	22												
108	24												
106	26		7		18	Sandy Lean CLAY (CL): very stiff, moderate brown, moist, trace gravel							
104	28												
102	30		8		(33)								>4.5
100	32												
98	34					Clayey SAND with gravel (SC): dense, dark orangish brown, damp							
96	36		9		27	- 6" layer of Lean CLAY (CL), at 40'							3.5
94	38												
92													

COMPLETION DEPTH: 60.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: August 8, 2000

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

DRILLING METHOD: 8-in. dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: A & R Drilling, Inc.
LOGGED BY: CWelke
CHECKED BY: CAWockner

LOG OF DRILL HOLE NO. DH-207
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-2.22a



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION per Plate 3 SURFACE EL: 131.0 ft +/- (rel MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
90	42		10		(27)	- medium dense, moist, at 40'							
88	44												
86	46		11		38	- dense, at 45'							
84	48												
82	50		12		27	- dense, damp, thin lenses of Lean CLAY (CL), at 50'							
80	52												
78	54												
76	56		13		52	CONEJO FORMATION (Tcv) Clayey SAND (SC): very dense, orangish brown							
74	58												
72	60		14		57/6"	- refusal on bedrock, at 60' CONEJO VOLCANICS BEDROCK (Tcv) Adesitic Breccia: very dense							
70	62												
68	64												
66	66												
64	68												
62	70												
60	72												
58	74												
56	76												
54	78												
52													

COMPLETION DEPTH: 60.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: August 8, 2000

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

DRILLING METHOD: 8-in. dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: A & R Drilling, Inc.
LOGGED BY: CWelke
CHECKED BY: CAWockner

LOG OF DRILL HOLE NO. DH-207
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-2.22b



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: per Plate 3 SURFACE EL 130.0 ft +/- (rel. MSL datum)	MATERIAL DESCRIPTION	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
-128	2		1				ARTIFICIAL FILL (Af) Sandy Lean CLAY (CL): stiff to very stiff, dark brown to moderate brown, damp							
-126	4		2		(16)		ALLUVIUM (Qal) Clayey fine SAND (SC): medium dense, light to moderate brown, trace gravel, rootlets - weak caliche cementation, at 5'							
-124	6		3		(22)									
-122	8						Sandy Lean CLAY (CL): stiff, medium brown, damp							
-120	10		4		(20)									>4.5
-118	12													
-116	14													
-114	16		5		(24)		Clayey SAND with gravel (SC): dense, light brown, damp							
-112	18													
-110	20		6		27									
-108	22													
-106	24													
-104	26		7		(59)		Sandy Lean CLAY (CL): hard, moderate brown, damp to moist, trace gravel, weak caliche cementation							4.5
-102	28													
-100	30		8		35									>4.5
-98	32													
-96	34													
-94	36		9		(52)		- with thin lenses of Silty fine SAND (SM), at 35'							>4.5
-92	38						CONEJO FORMATION (Tcv)							

COMPLETION DEPTH: 55.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: August 7, 2000
The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

DRILLING METHOD: 8-in. dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: A & R Drilling, Inc.
LOGGED BY: CWelke
CHECKED BY: CAWockner

LOG OF DRILL HOLE NO. DH-208
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-2.23a



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
						SURFACE EL: 130.0 ft +/- (rel MSL datum)							
						MATERIAL DESCRIPTION							
-88	42		10	X	67	Clayey SAND with gravel (SC): very dense, moderate brown to orangish brown, damp							
-86	44												
-84	46		11		(62)	- dense, grayish brown, moist, caliche veins, at 45'							>4.5
-82	48												
-80	50		12	X	81	CONEJO VOLCANICS BEDROCK (Tcv) Andesitic Breccia: moderately indurated, grayish blue, extremely fractured, damp							
-78	52												
-76	54												
-74	56		13	X	60/5"	- refusal on bedrock, at 55' 5"							
-72	58												
-70	60												
-68	62												
-66	64												
-64	66												
-62	68												
-60	70												
-58	72												
-56	74												
-54	76												
-52	78												

COMPLETION DEPTH: 55.5 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Native Materials
DRILLING DATE: August 7, 2000

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

DRILLING METHOD: 8-in dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: A & R Drilling, Inc.
LOGGED BY: CWelke
CHECKED BY: CAWockner

LOG OF DRILL HOLE NO. DH-208
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-2.23b



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLES	BLOW COUNT / REC'D/DRIVE	LOCATION. The drill hole location referencing local landmarks or coordinates SURFACE EL: Using local, MSL, MLLW or other datum	General Notes
						MATERIAL DESCRIPTION	
-12	2		1	25		Well graded GRAVEL (GW)	COARSE GRAINED Soil Texture Symbol Sloped line in symbol column indicates transitional boundary Samplers and sampler dimensions (unless otherwise noted in report text) are as follows: Symbol for: 1 SPT Sampler, driven 1 3/8" ID, 2" OD 2 CA Liner Sampler, driven 2 3/8" ID, 3" OD 3 CA Liner Sampler, disturbed 2 3/8" ID, 3" OD 4 Thin-walled Tube, pushed 2 7/8" ID, 3" OD 5 Bulk Bag Sample (from cuttings) 6 Hand Auger Sample 7 CME Core Sample 8 Lexan Sample 9 Pitcher Sample 10 Vibracore Sample 11 No Sample Recovered Sampler Driving Resistance Number of blows with 140 lb. hammer, falling 30-in. to drive sampler 1-ft after seating sampler 6-in.; for example, Blows/ft Description 25 25 blows drove sampler 12" after initial 6" of seating 86/11" After driving sampler the initial 6" of seating, 36 blows drove sampler through the second 6" interval, and 50 blows drove the sampler 5" into the third interval 50/6" 50 blows drove sampler 6" after initial 6" of seating Ref/3" 50 blows drove sampler 3" during initial 6" seating interval Blow counts for California Liner Sampler shown in () Length of sample symbol approximates recovery length Classification of Soils per ASTM D2487 or D2488 Geologic Formation noted in bold font at the top of interpreted interval Strength Legend Q = Unconfined Compression u = Unconsolidated Undrained Triaxial t = Torvane p = Pocket Penetrometer m = Miniature Vane Water Level Symbols Initial or perched water level Final ground water level Seepages encountered Rock Quality Designation (RQD) is the sum of recovered core pieces greater than 4 inches divided by the length of the cored interval.
-14	4		2	(25)		Poorly graded GRAVEL (GP)	
-16	6		3	(25)		Well graded SAND (SW)	
-18	8		4	(25)		Poorly graded SAND (SP)	
-20	10		5	18"/30"		Silty SAND (SM)	
-22	12		6			Clayey SAND (SC)	
-24	14		7			Silty, Clayey SAND (SC-SM)	
-26	16		8	20"/24"		Elastic SILT (MH)	
-28	18		9	(25)		SILT (ML)	
-30	20		10	30"/30"		Silty CLAY (CL-ML)	
-32	22		11	20"/24"		Fat CLAY (CH)	FINE GRAINED ROCK Blow counts for California Liner Sampler shown in () Length of sample symbol approximates recovery length Classification of Soils per ASTM D2487 or D2488 Geologic Formation noted in bold font at the top of interpreted interval Strength Legend Q = Unconfined Compression u = Unconsolidated Undrained Triaxial t = Torvane p = Pocket Penetrometer m = Miniature Vane Water Level Symbols Initial or perched water level Final ground water level Seepages encountered Rock Quality Designation (RQD) is the sum of recovered core pieces greater than 4 inches divided by the length of the cored interval.
-34	24					Lean CLAY (CL)	
-36	26					CONGLOMERATE	
-38	28					SANDSTONE	
-40	30					SILTSTONE	
-42	32					MUDSTONE	
-44	34					CLAYSTONE	
-46	36					SHALE	
-48	38					GRANITE	
						Paving and/or Base Materials	

KEY TO TERMS & SYMBOLS USED ON LOGS

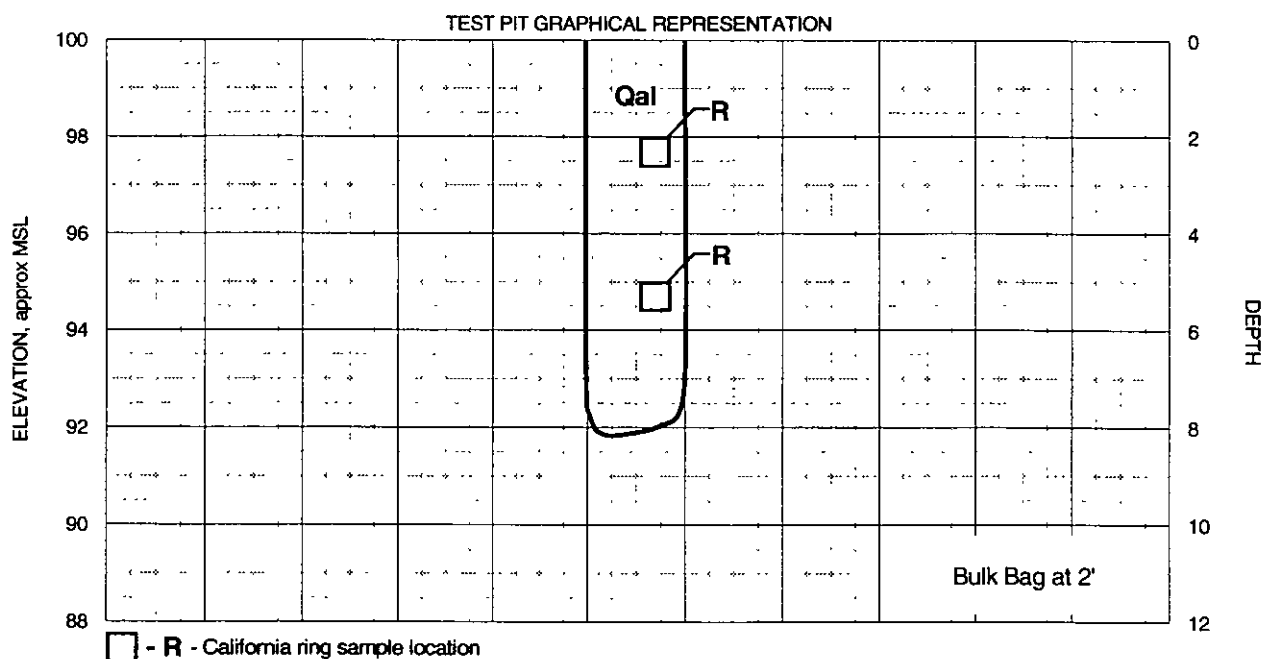


ELEV, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 100 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION										
98	2	Qal	ALLUVIUM (Qal) Fat sandy CLAY (CH): medium stiff, light brown, dry to approx. 2-1/2' then moist, layer of sand from 1" to 4" thick at approx 2-1/2' - with few gravel (angular and sub-rounded) - sand layer approx. 3" thick, at 7' and 8'	117	110	6	-	-	-	-
96	4			-	-	-	-	-	-	-
94	6			120	110	9	-	-	-	-
92	8			-	-	-	-	-	-	-
90	10			-	-	-	-	-	-	-
88	12			-	-	-	-	-	-	-
86	14			-	-	-	-	-	-	-

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 8 ft
DEPTH TO WATER: Not Encountered
EXPLORATION DATE: July 1, 1999

LOGGED BY: NDerbidge
CHECKED BY: CWockner



LOG OF TEST PIT NO. BH-1
 Cal State Channel Islands, East Campus Development
 Camarillo Area of Ventura County

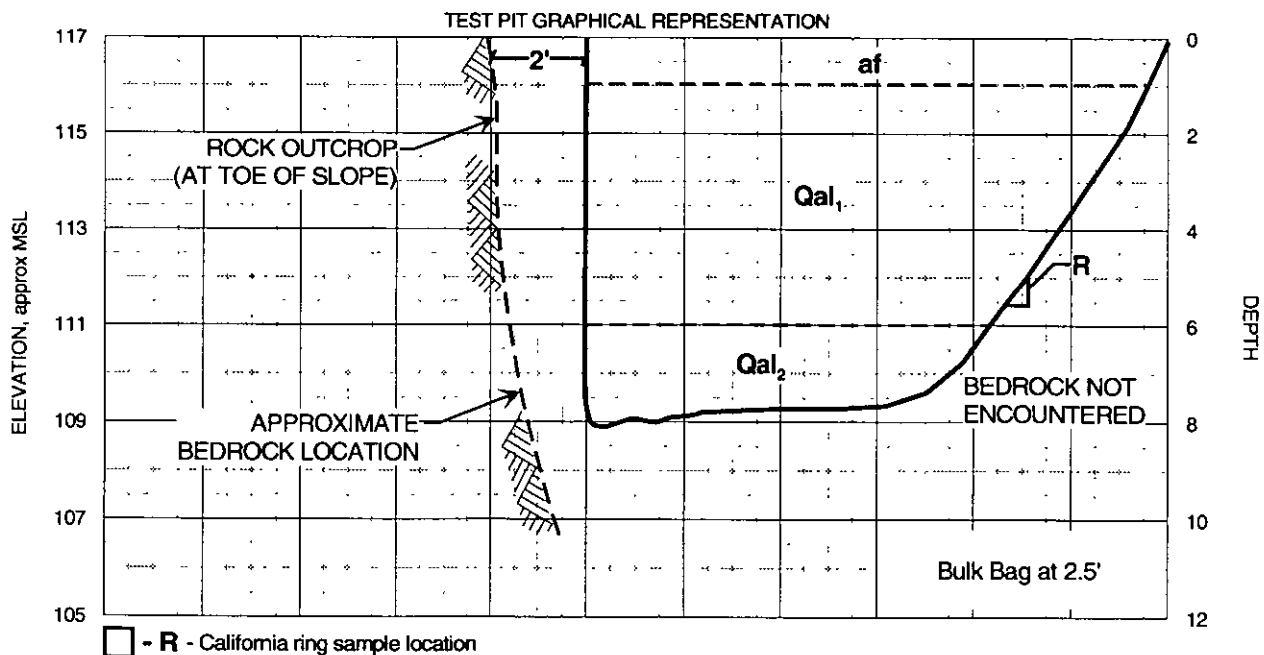


ELEV. ft	DEPTH ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 117 ft +/- (rel MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION										
116		af	ARTIFICIAL FILL (af) - Pile of pieces of RCP on surface and to about 1'							
114	2	Qal1	ALLUVIUM (Qal) Sandy CLAY (CL): loose to medium dense, dry to 2' then moist, with gravel and roots to 3/4", abundant voids to 1/16"							
112	4		- gravel layer (1' thick), at about 3'							
110	6	Qal2	Grades to Silty SAND (SM) or SAND with SILT (SP-SM): medium dense, light brown, moist fewer voids to 1/32", with roots to 1/4"	95	78	21				
108	8									
106	10									
104	12									
102	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 8 ft
DEPTH TO WATER: Not Encountered
EXPLORATION DATE: July 1, 1999

LOGGED BY: NDerbidge
CHECKED BY: CWockner



LOG OF TEST PIT NO. BH-1A
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

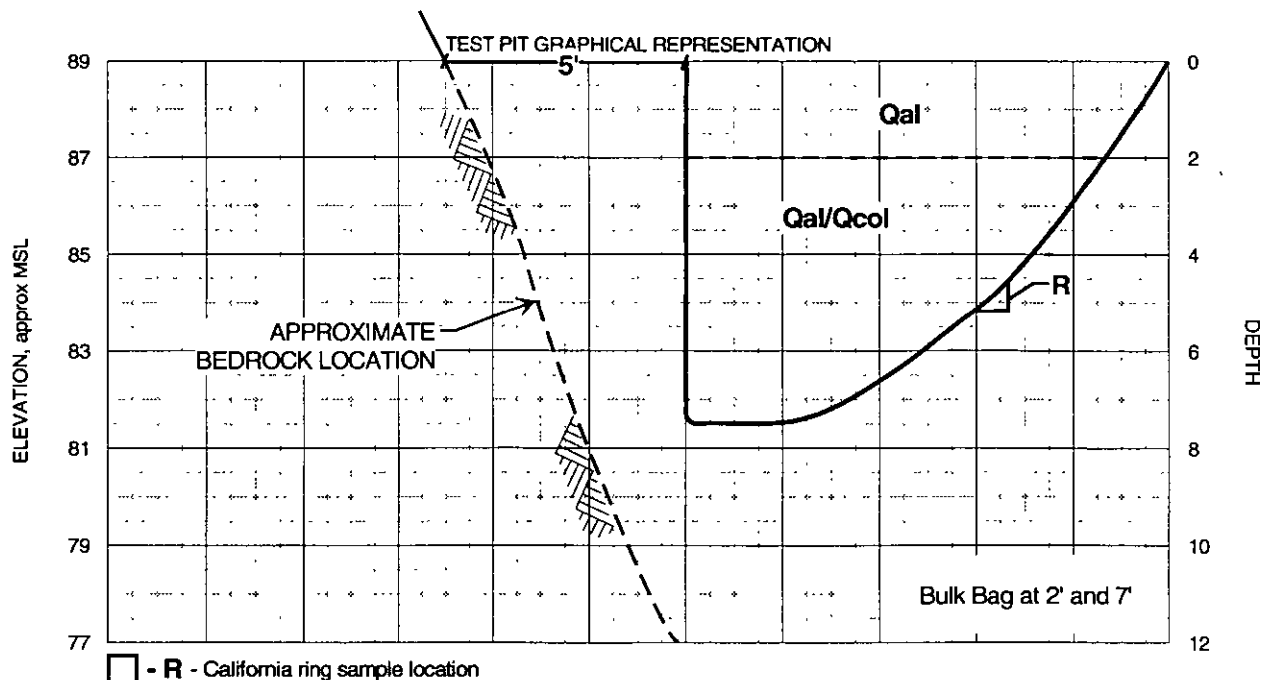


ELEV. ft	DEPTH. ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 89 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION										
88	0	Qal1	TOPSOIL (Qal) Lean CLAY (CL): soft, brown, dry, with minor sand and gravel and abundant roots to approx. 3/4", abundant voids to 1/6"							
86	2	Qal/Qcol	ALLUVIUM (Qal)/COLLUVIUM (Qcol) Lean CLAY (CL): soft, light brown, moist below approx. 2', with gravel and cobbles to approx. 5", with roots to 3/4" to approx. 6', fewer voids, below 2', very few voids below approx. 6' Note: operator notes soft digging.	108	103	5				
84	4									
82	6									
80	8									
78	10		Note: materials about 10' from top of slope is loose sand with silt to maximum depth explored of about 8' (see sample #3 at 5')							
76	12									
74	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 8 ft
DEPTH TO WATER: Not Encountered
EXPLORATION DATE: July 1, 1999

LOGGED BY: NDerbidge
CHECKED BY: CWockner



LOG OF TEST PIT NO. BH-1B
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEV, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 94 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION										
92	2	Qal	ALLUVIUM (Qal) Lean CLAY (CL): medium stiff, brown, dry to approx. 2' then moist, with roots to approx 3/4" one roots to approx. 3", with gravel, abundant voids to approx 1/16" to approx. 3' - grades to light brown, at 5'							
90	4									
88	6									
86	8									
84	10									
82	12									
80	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time.

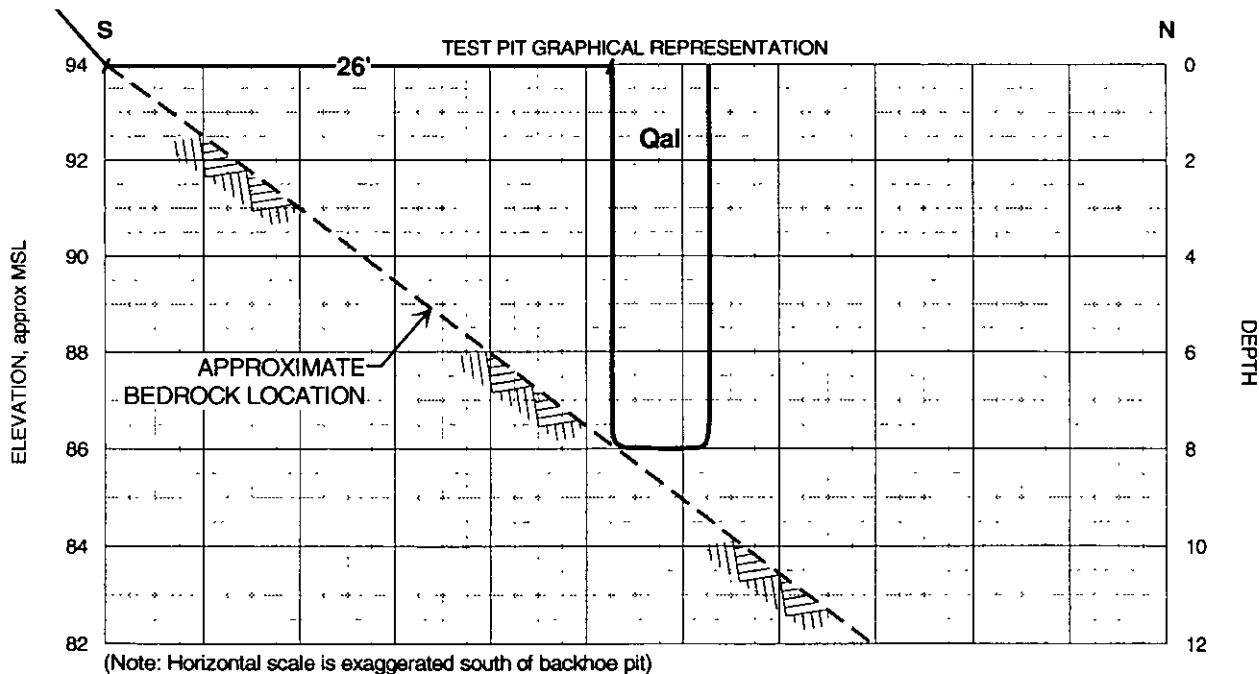
COMPLETION DEPTH: 8 ft

DEPTH TO WATER: Not Encountered

EXPLORATION DATE: July 2, 1999

LOGGED BY: NDerbidge

CHECKED BY: CWockner



LOG OF TEST PIT NO. BH-1C

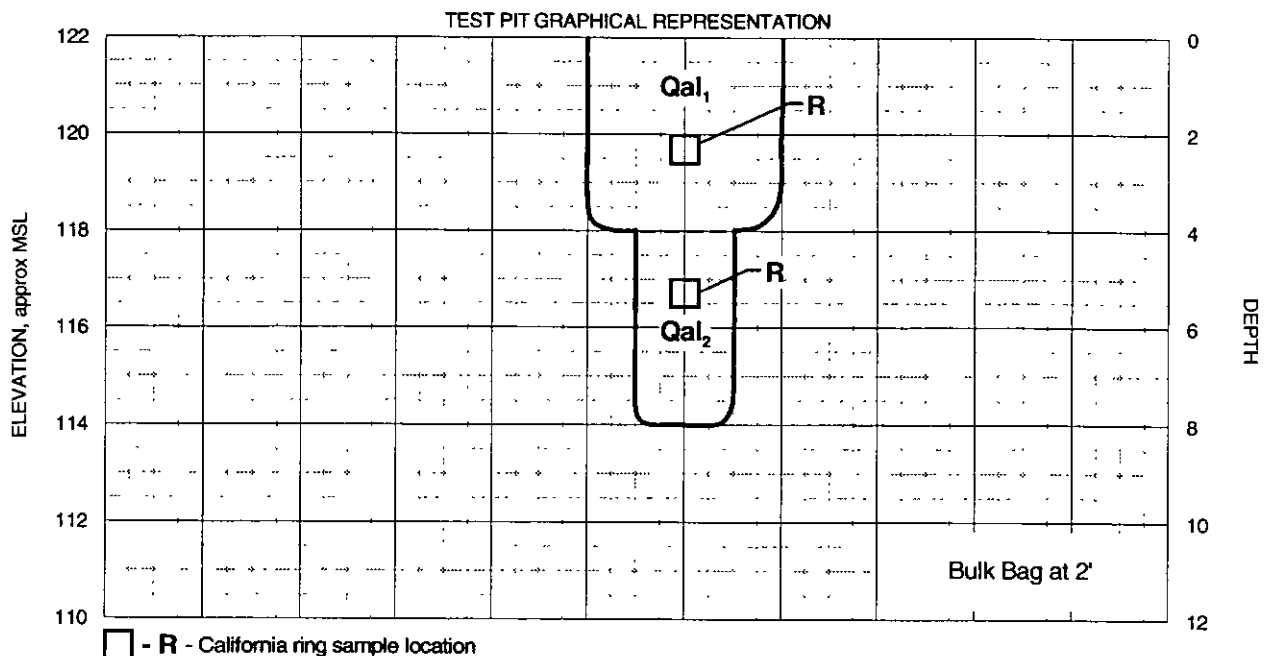
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

ELEV, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 122 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION										
120	2	Qal1	ALLUVIUM (Qal) Sandy lean CLAY (CL): stiff, light brown, dry to about 3', with gravelly sand layer from 1-1/2' to 2-1/2', moist, below 3', with abundant voids up to approx. 1/16" to approx. 4'	102	86	18				
118	4	Qal2	Lean CLAY (CL): stiff, brown, moist, few voids, some minor caliche veining	119	95	25				
116	6									
114	8									
112	10									
110	12									
108	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time

COMPLETION DEPTH: 8 ft
DEPTH TO WATER: Not Encountered
EXPLORATION DATE: July 1, 1999

LOGGED BY: NDerbidge
CHECKED BY: CWockner



LOG OF TEST PIT NO. BH-2
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEV. ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 117 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION										
116	2	Qal1	ALLUVIUM (Qal) Lean CLAY (CL): medium stiff, brown, dry to approx. 1/2' then moist, with frequent gravel and few cobbles, moderate veining to approx. 2-1/2'	118	97	22				
114	4	Qal2								
112	6		Lean to Fat CLAY (CL/CH): medium stiff, dark brown to black, moist, with very few voids to approx. 1/16" and few angular pea-size gravel	119	90	33				
110	8									
108	10		ALLUVIUM (Qal)/COLLUVIUM (Qcol) CLAY (CL): stiff, light brown, moist, with abundant gravel, Qcol or (pieces of conejo) to approx 3", excavator notes much firmer than above							
106	12	Qal3/Qcol								
104	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time.

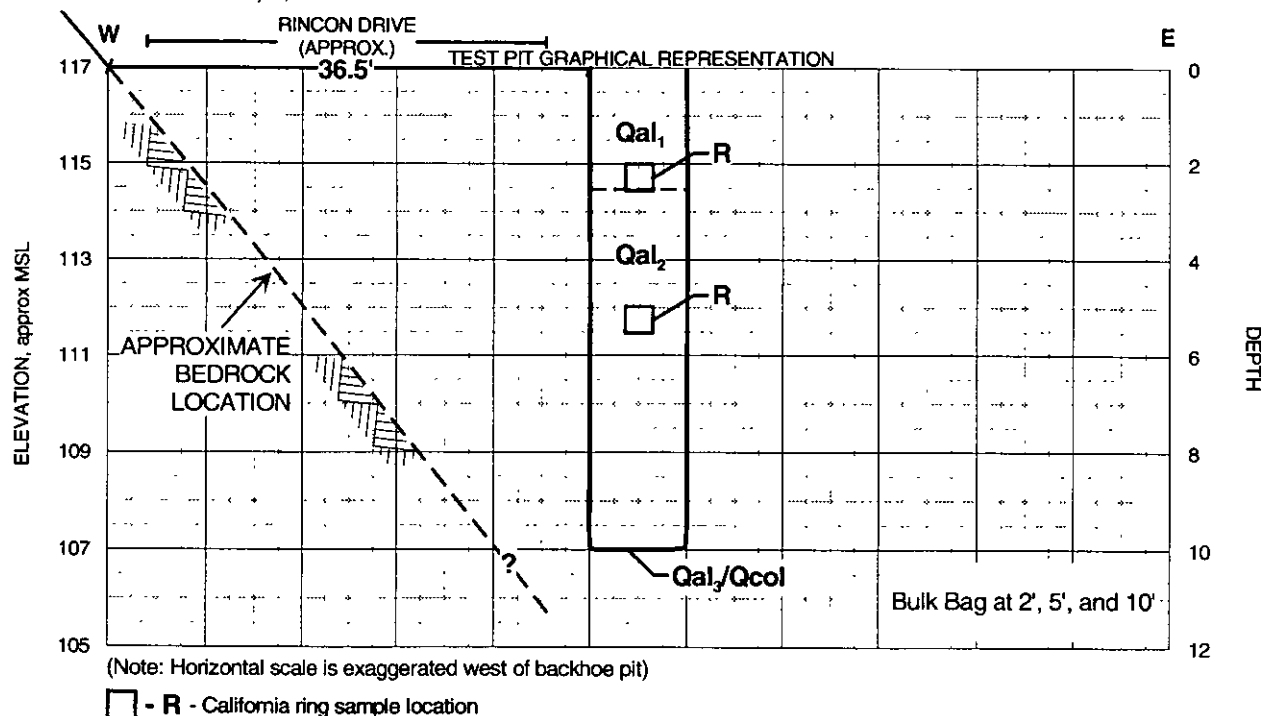
COMPLETION DEPTH: 10 ft

DEPTH TO WATER: Not Encountered

EXPLORATION DATE: July 2, 1999

LOGGED BY: NDerbidge

CHECKED BY: CWockner



LOG OF TEST PIT NO. BH-3

Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

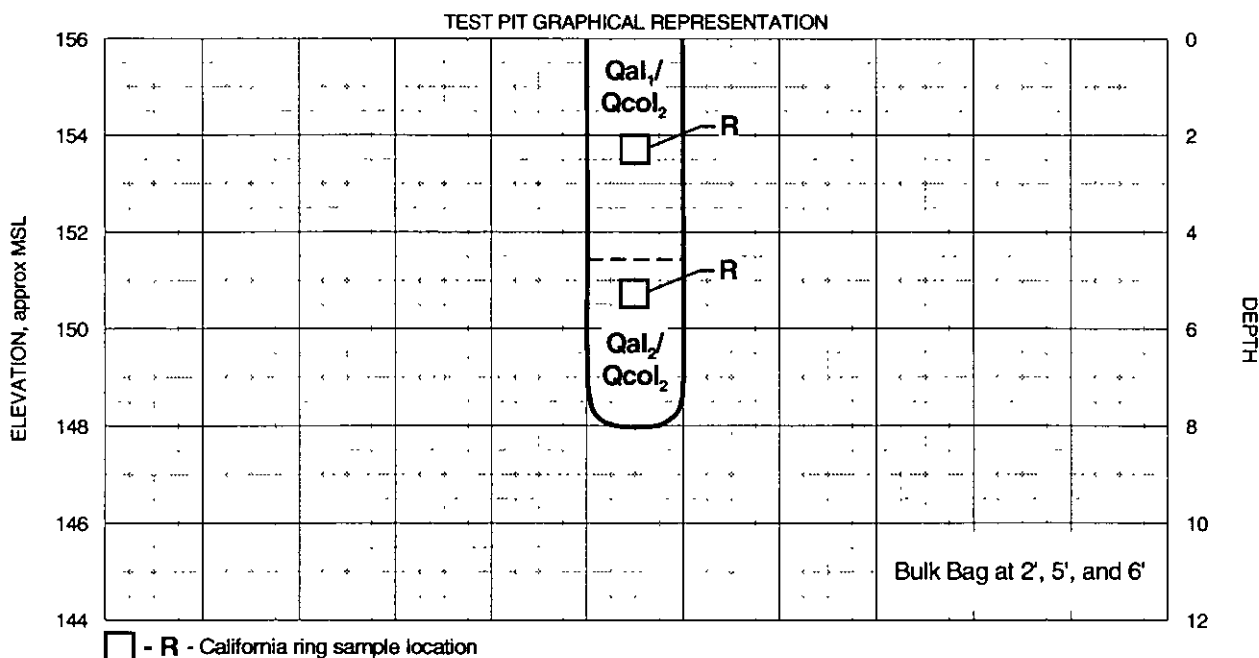


ELEV. ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 156 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION										
154	2	Qal/Qcol	ALLUVIUM (Qal)/COLLUVIUM (Qcol) Lean CLAY (CL): stiff, grayish brown, dry to approx 2-1/2' then moist, with frequent gravel and abundant roots to approx. 1/2", moderate voids to approx. 1/16" to approx. 2-1/2' - with gravel (pieces of conejo formation) to approx. 4", few voids, difficult excavating, at 4-1/2' - grades to light brown, fewer large gravel, minor pea size gravel, waxy luster, at approx. 6'	127	104	22				
152	4									
150	6			126	106	19				
148	8									
146	10									
144	12									
142	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time

COMPLETION DEPTH: 8 ft
DEPTH TO WATER: Not Encountered
EXPLORATION DATE: July 2, 1999

LOGGED BY: NDerbidge
CHECKED BY: CWockner



LOG OF TEST PIT NO. BH-4
 Cal State Channel Islands, East Campus Development
 Camarillo Area of Ventura County

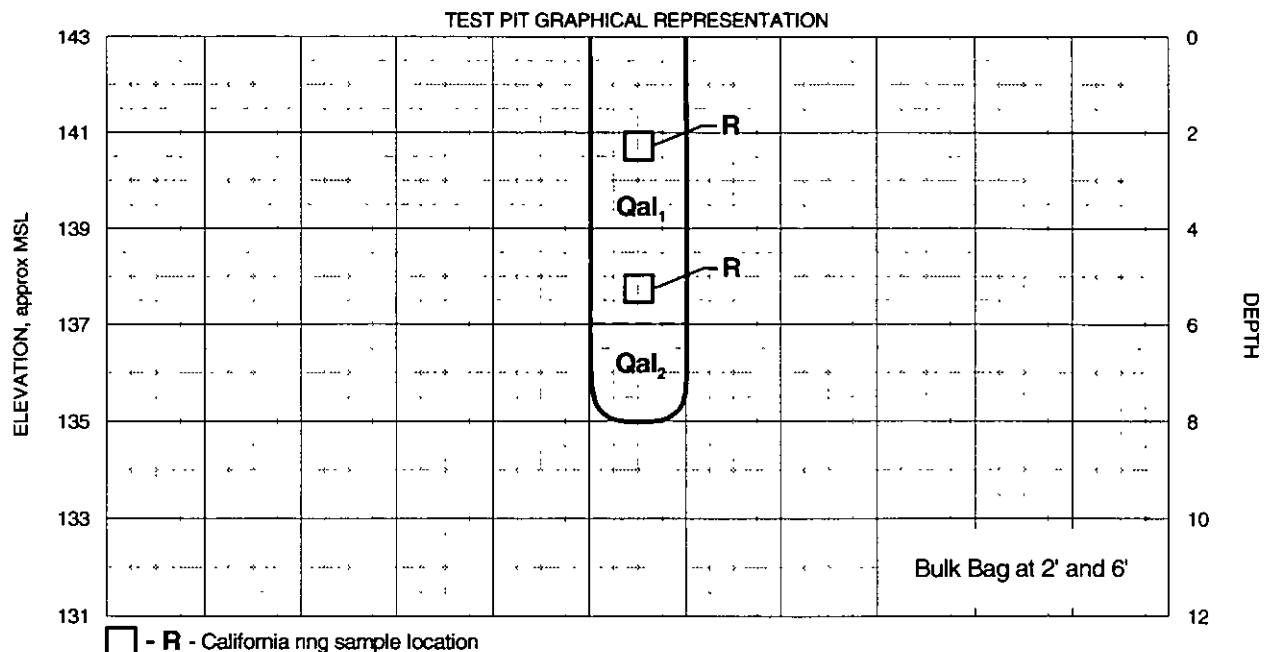


ELEV, ft DEPTH,ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 143 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION									
142 2 140 4 138 6 136 8 134 10 132 12 130 14	Qal1	ALLUVIUM (Qal) Lean CLAY (CL): medium stiff, brown, dry to approx 2-1/2' the moist, with abundant gravel to approx. 1', minor gravel below moderate voids, to approx. 1/16" with roots less than 1/32"	115	100	16				
	Qal2	Sandy CLAY (CL): very stiff, light brown, moist, with gravel and few cobbles to approx. 4"	116	100	16				

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 8 ft
DEPTH TO WATER: Not Encountered
EXPLORATION DATE: July 2, 1999

LOGGED BY: NDerbidge
CHECKED BY: CWockner



LOG OF TEST PIT NO. BH-5
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

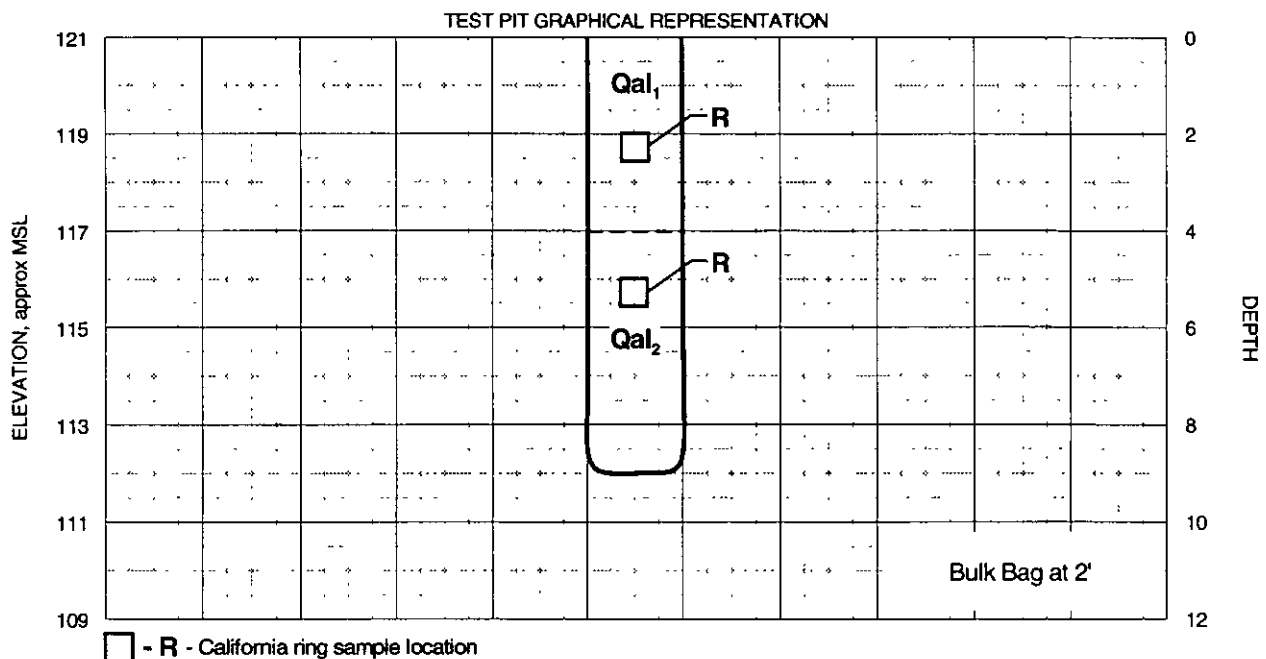


ELEV. ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 121 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION										
120	2	Qal1	ALLUVIUM (Qal) Sandy lean CLAY (CL): medium stiff, dark brown, dry to 1-1/2' with roots to approx 1/4", ?? voids, to approx. 1/16", with gravel to approx. 1"	108	91	19	7			
118	4	Qal2	Grades to Clayey SAND (SC): light brown, few voids	67	61	11				
116	6									
114	8									
112	10									
110	12									
108	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 9 ft
DEPTH TO WATER: Not Encountered
EXPLORATION DATE: July 2, 1999

LOGGED BY: NDerbridge
CHECKED BY: CWockner



LOG OF TEST PIT NO. BH-6
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

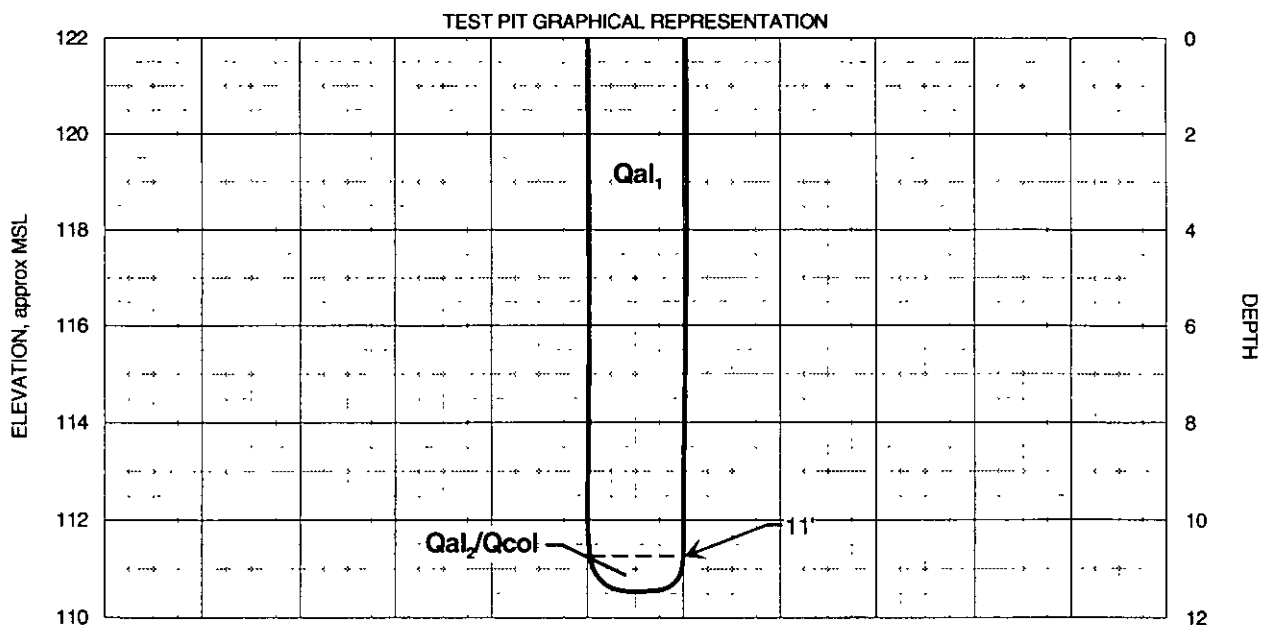


ELEV, ft DEPTH, ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 122 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION									
120 2	Qal1	ALLUVIUM (Qal) Lean CLAY (CL): medium stiff, dark brown, dry to approx. 2' with roots to approx 1/2", voids??, with few gravel							
118 4	Qal2	Grades to Clayey SAND (SC): very stiff, light brown							
116 6									
114 8									
112 10									
110 12	Qal3/Qco	ALLUVIUM (Qal)/COLLUVIUM (Qco) - with abundant cobbles to approx. 7", waxy luster - difficult excavating, below 11'							
108 14									

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 11 ft
DEPTH TO WATER: Not Encountered
EXPLORATION DATE: July 2, 1999

LOGGED BY: NDerbidge
CHECKED BY: CWorkner



LOG OF TEST PIT NO. BH-6A
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

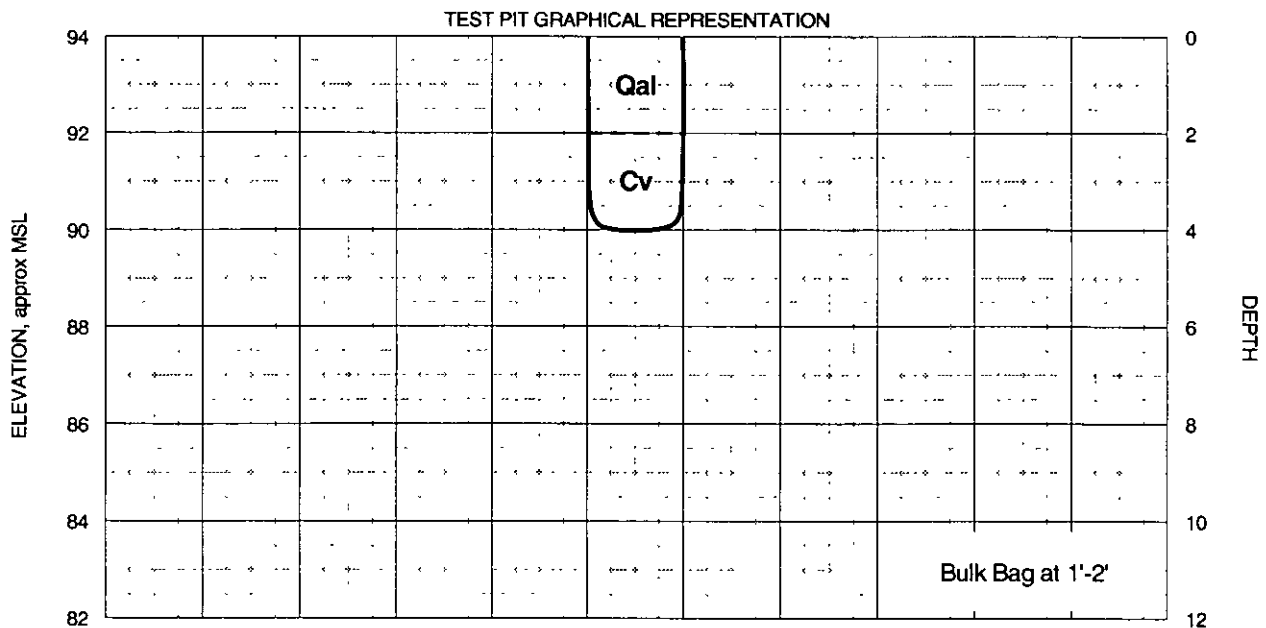


ELEV, ft DEPTH, ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 94 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION									
92	2' Qal1	ALLUVIUM (Qal) Lean CLAY (CL): stiff, reddish brown, dry to slightly moist, with sand few voids to approx. 1/32" with minor cobbles to approx 5", and abundant caliche veining to about 2'							
90	4' Qal2/Cv								
88	6'	CONEJO VOLCANICS (Tcv) Grades to extremely weathered conejo basalt with sandy clay, tan, from 2' to 3' - becoming less weathered, at 3' to 4' - dipping to the north, difficult excavating, at approx. 3'							
86	8'								
84	10'								
82	12'								
80	14'								

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 4 ft
DEPTH TO WATER: Not Encountered
EXPLORATION DATE: July 1, 1999

LOGGED BY: NDerbidge
CHECKED BY: CWockner



LOG OF TEST PIT NO. BH-7
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

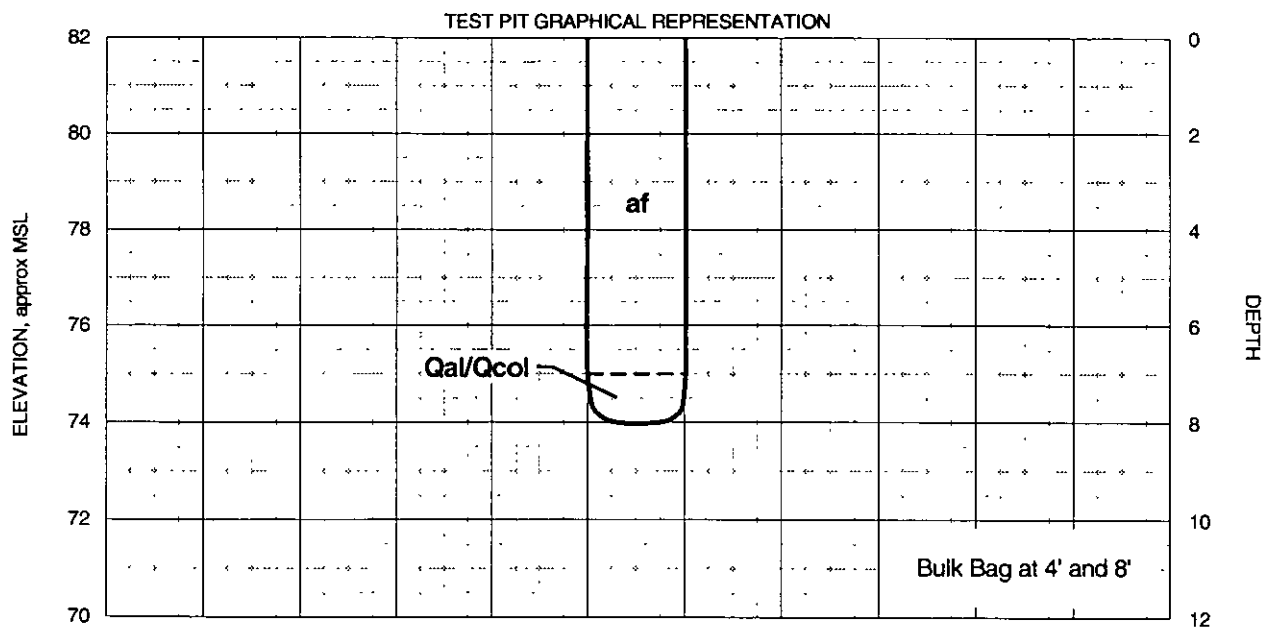


ELEV, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: See Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
			SURFACE EL: 82 ft +/- (rel. MSL datum)							
			MATERIAL DESCRIPTION							
80	2	af	ARTIFICIAL FILL (af) Lean CLAY (CL): medium stiff, dry to approx 2' then moist, with roots up to approx. 6", with cobbles to approx. 8", and pieces of brick							
78	4									
76	6									
74	8	Qal/Qcol	- with cable, at 6-1/2' ALLUVIUM (Qal)/COLLUVIUM (Qcol) Lean CLAY (CL) with sand and abundant pieces of Conejo Volcanic rock to about 9" - difficult excavating, at 9'							
72	10									
70	12									
68	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 9 ft
DEPTH TO WATER: Not Encountered
EXPLORATION DATE: July 2, 1999

LOGGED BY: NDerbidge
CHECKED BY: CWockner



LOG OF TEST PIT NO. BH-7A
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

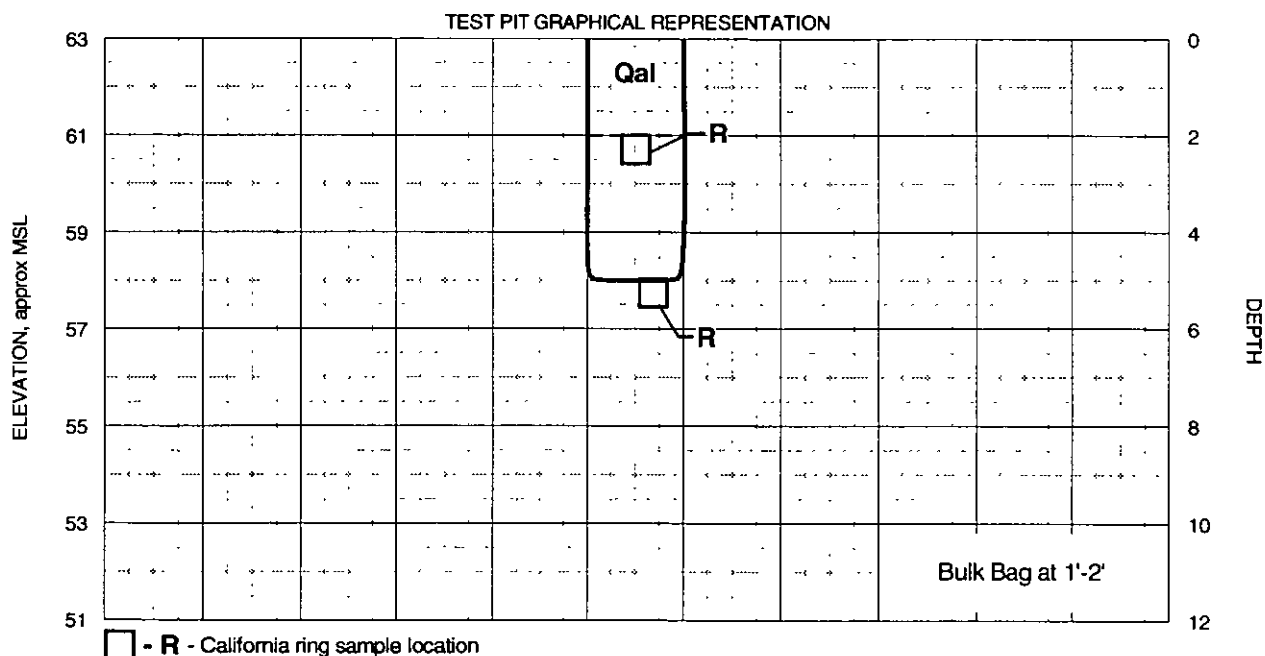


ELEV. ft	DEPTH. ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 63 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION										
62	2	Qal	ALLUVIUM (Qal) Lean CLAY (CL): stiff, brown, dry to approx. 2', moist, below 2', with gravel and few cobbles to approx. 4", few voids to about 1/32" - operator notes "firm" excavating	111	98	13				
60	4									
58	6			116	103	13				
56	8									
54	10									
52	12									
50	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 5 ft
DEPTH TO WATER: Not Encountered
EXPLORATION DATE: July 1, 1999

LOGGED BY: NDerbidge
CHECKED BY: CWockner



LOG OF TEST PIT NO. BH-8
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

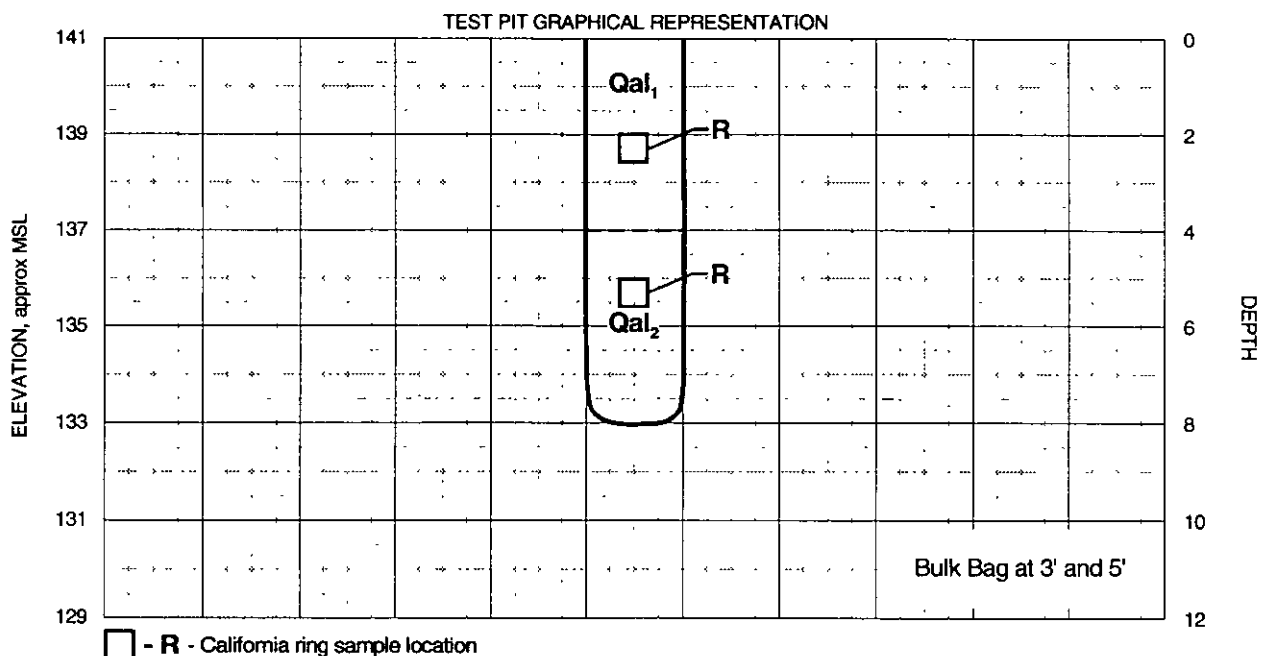


ELEV, ft DEPTH, ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 141 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION									
140	Qal1	ALLUVIUM (Qal) Clayey SAND (SC): medium stiff, grayish brown, moist below 1-1/2', with gravel and roots to approx. 1/2", minor voids to approx. 1/32" - grades to light brown, with roots to 1/8", at 2' to 4'	91	82	11				
138									
136	Qal2	Sandy SILT (ML): very dense, gray, moist, with abundant gravel - operator notes very difficult excavating, below 8'	70	61	14				
134									
132									
130									
128									
14									

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time

COMPLETION DEPTH: 8 ft
DEPTH TO WATER: Not Encountered
EXPLORATION DATE: July 2, 1999

LOGGED BY: NDerbidge
CHECKED BY: CWeekner



LOG OF TEST PIT NO. BH-9
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

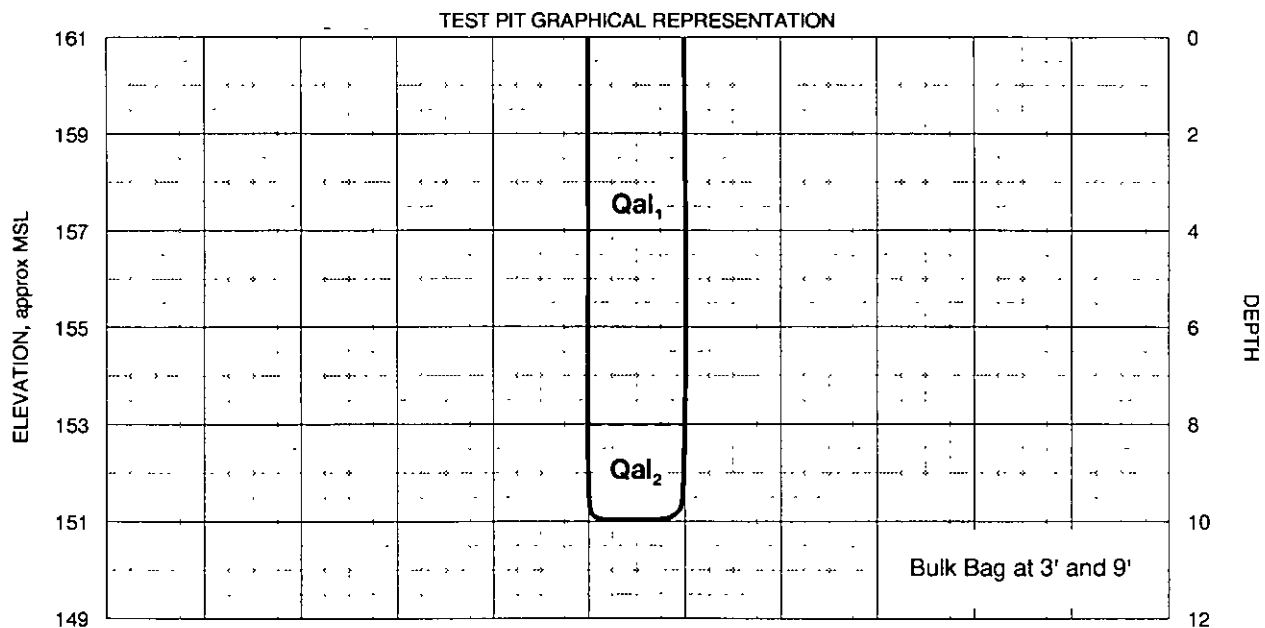


ELEV, ft DEPTH, ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 161 ft +/- (rel MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION									
160 2 158 4 156 6 154 8 152 10 150 12 148 14	Qal1	ALLUVIUM (Qal) Gravel with SAND (GW): loose, grayish brown, dry to 3' then moist				6			
	Qal2	Silty fine SAND (SM): loose, light brown, moist, no voids, few clay pockets							

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 10 ft
DEPTH TO WATER: Not Encountered
EXPLORATION DATE: July 1, 1999

LOGGED BY: NDerbridge
CHECKED BY: CWockner



LOG OF TEST PIT NO. BH-10
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

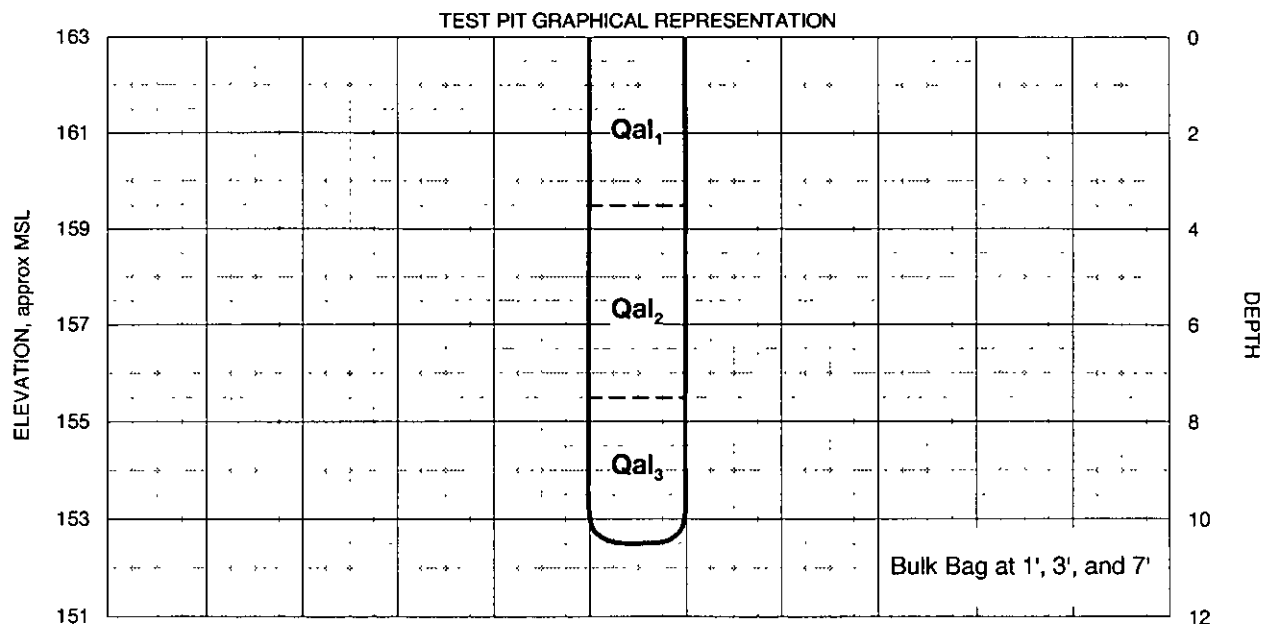


ELEV, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 163 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION										
162	2	Qal1	ALLUVIUM (Qal) SAND with SILT (SP-SM): loose, brown, dry to moist, with roots to approx 1/2"							
160	4	Qal2	Silty fine SAND (SM): loose, light brown, moist, no voids, roots to approx. 1/8"				46			
158	6									
156	8		Lean CLAY (CL): soft, very dark brown, mottled gray, blocky structure							
154	10	Qal3								
152	12									
150	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time

COMPLETION DEPTH: 10 ft
DEPTH TO WATER: Not Encountered
EXPLORATION DATE: July 1, 1999

LOGGED BY: NDerbidge
CHECKED BY: CWockner



LOG OF TEST PIT NO. BH-11
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

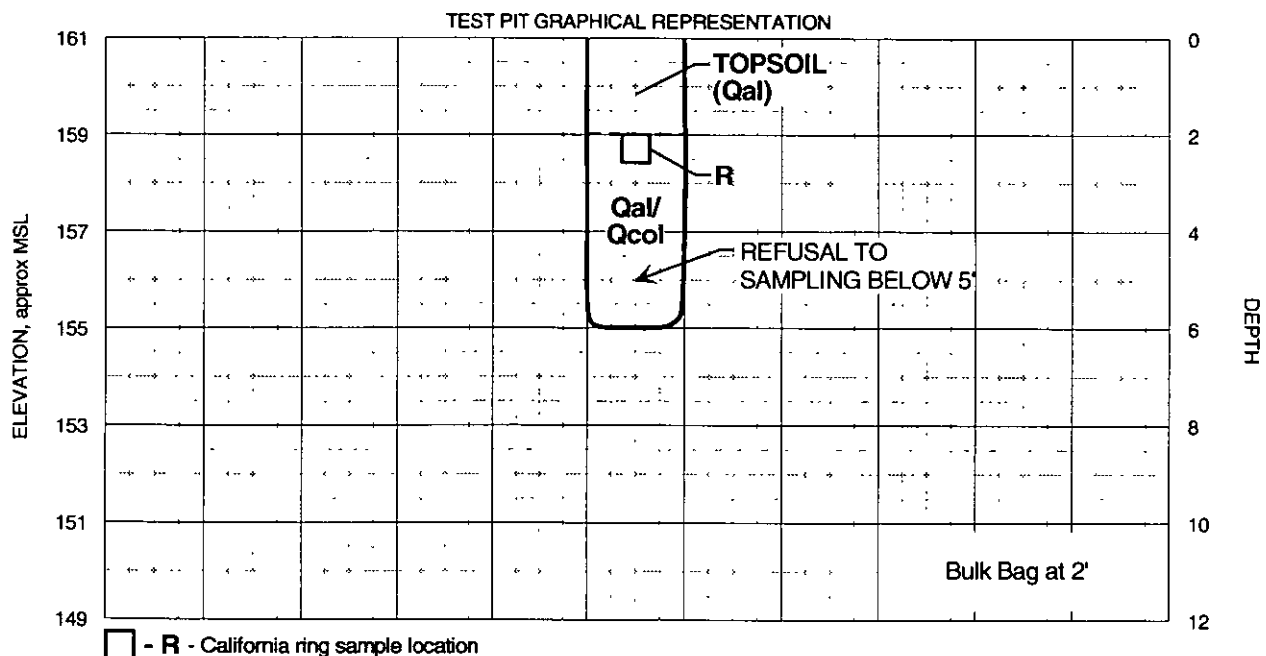


ELEV, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: See Plate 3 SURFACE EL: 76 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf
MATERIAL DESCRIPTION										
74	2	Qal1	TOPSOIL (Qal) Lean CLAY (CL): medium stiff, dark brown, dry, with gravel to approx. 1", with few voids to 1/32", with roots to 1/2"	115	102	12	-	-	-	-
72	4	Qal2/Qco	ALLUVIUM (Qal)/COLLUVIUM (Qcol) Gravel, Cobbles, boulders in a matrix of dark brown Lean CLAY (CL), hard dry, with abundant caliche veining							
70	6		- very difficult excavating (teeth on bucket rip bottom and then scoop), below 2'							
68	8		Termination at 6' due to difficult excavating and no sampling possibility							
66	10									
64	12									
62	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavation. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 6 ft
DEPTH TO WATER: Not Encountered
EXPLORATION DATE: July 1, 1999

LOGGED BY: NDerbidge
CHECKED BY: CWockner



LOG OF TEST PIT NO. BH-12
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

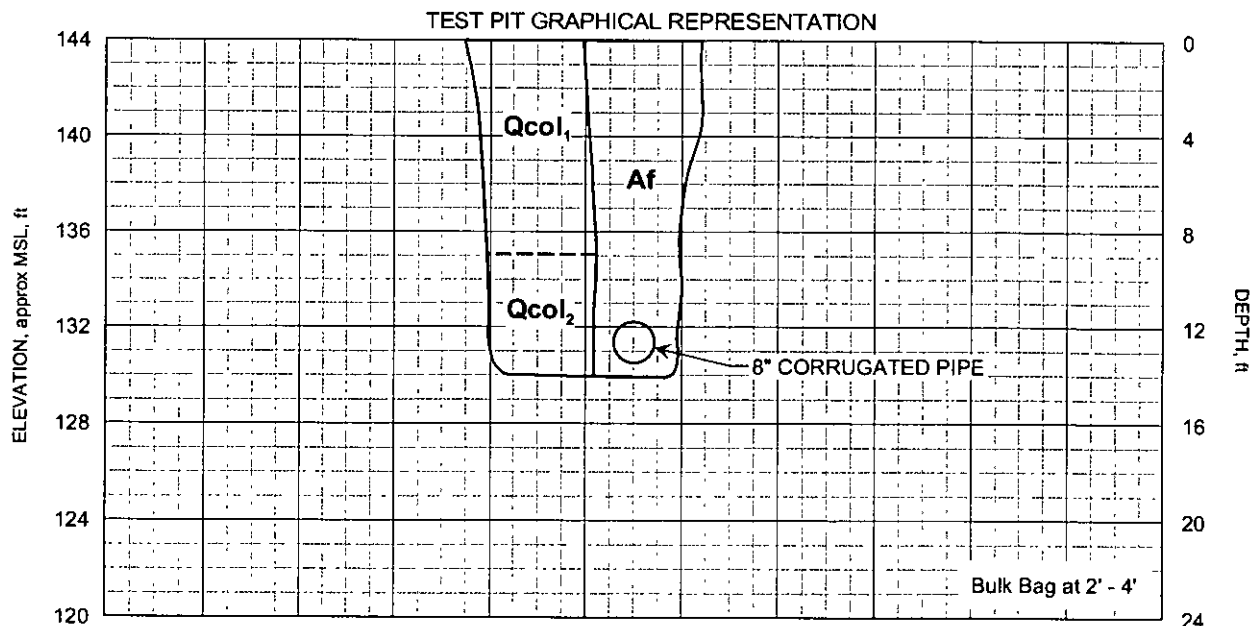


ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: per Plate 3 SURFACE EL: 144 ft +/- (rel MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), (uu)
			MATERIAL DESCRIPTION							
0		Qcol ₁	COLLUVIUM (Qcol) Sandy Lean CLAY (CL): medium stiff to stiff, grayish brown, damp, numerous voids							
142	2									
140	4									
138	6									
136	8									
134	10	Qcol ₂	COLLUVIUM (Qcol) Clayey GRAVEL with sand (GC): dense to very dense, pale yellowish brown, damp, some voids, not too difficult to excavate with 16" bucket, moderately to well cemented - harder digging, at 10'							
132	12									
130	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 13.5 ft
DEPTH TO WATER: Not encountered
EXPLORATION DATE: October 19, 2000

LOGGED BY: CWelke
BACKFILL: Excavated Materials
CHECKED BY: CAWockner



LOG OF TEST PIT NO. BH-201
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

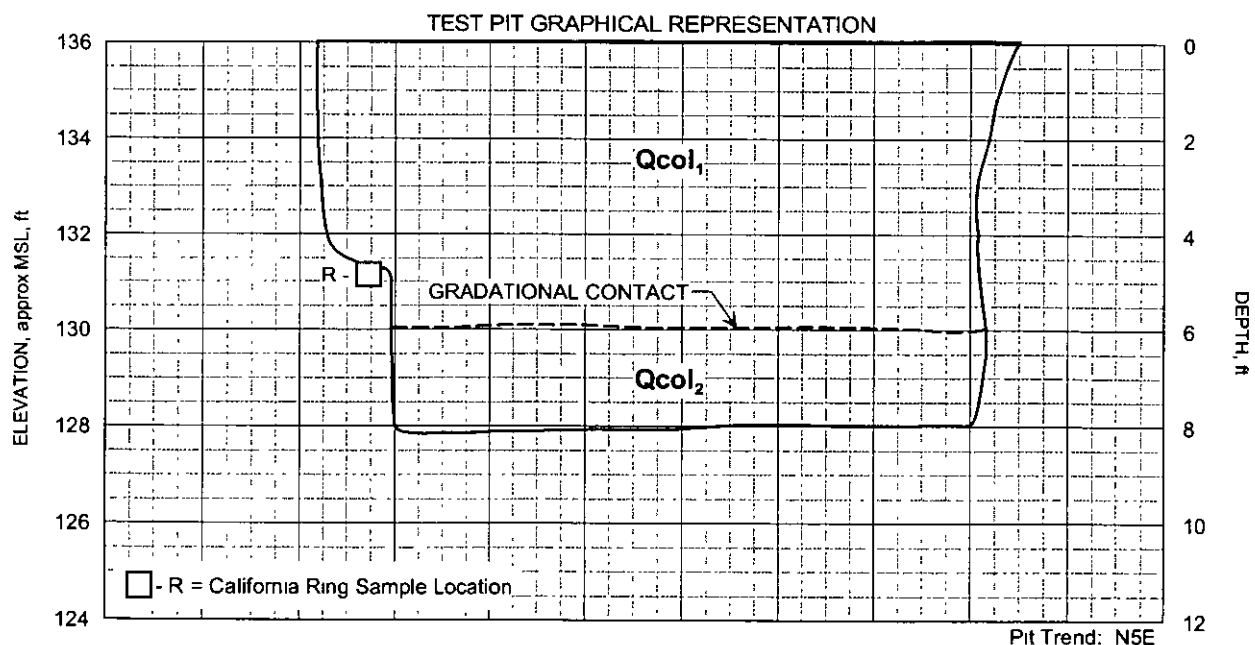


ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: per Plate 3 SURFACE EL: 136 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
MATERIAL DESCRIPTION										
0	0	Qcol ₁	COLLUVIUM (Qcol) Sandy Lean CLAY (CL) stiff, dark grayish brown, damp, slightly voided							
134	2									
132	4		- stiff, grayish brown, damp, at 4'							
130	6	Qcol ₂	Clayey GRAVEL with sand (GC) very dense, pale yellowish brown, damp to moist	159	140	14				
128	8									
126	10									
124	12									
122	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 8.0 ft
DEPTH TO WATER: Not encountered
EXPLORATION DATE: October 19, 2000

LOGGED BY: CWelke
BACKFILL: Excavated Materials
CHECKED BY: CAWockner



LOG OF TEST PIT NO. BH-202
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-3.19

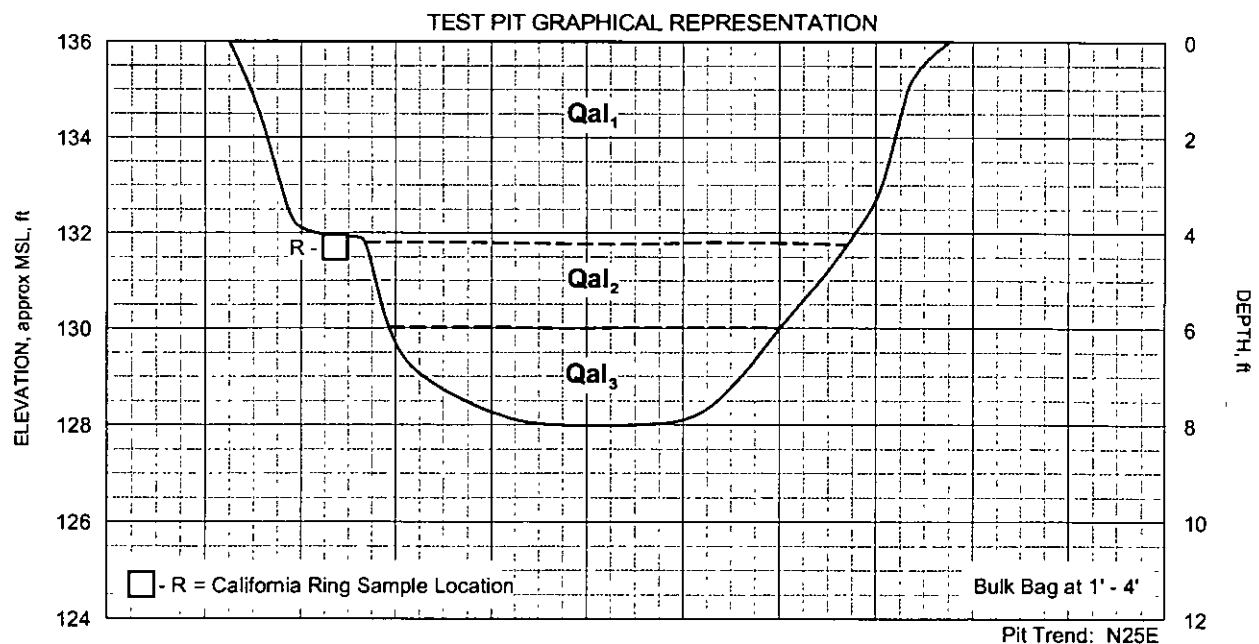


ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: per Plate 3 SURFACE EL: 136 ft +/- (rel MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), (uu)
			MATERIAL DESCRIPTION							
0		Qal ₁	ALLUVIUM (Qal) Sandy Lean CLAY (CL): stiff, dark grayish brown, damp, some voids							
134	2									
132	4	Qal ₂	Clayey SAND (SC): medium dense, moderate brown, some gravel, some voids	110	96	14				
130	6									
128	8	Qal ₃	Lean CLAY with sand (CL): soft, dark yellowish brown, moist							
126	10									
124	12									
122	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 8.0 ft
DEPTH TO WATER: Not encountered
EXPLORATION DATE: October 19, 2000

LOGGED BY: CWelke
BACKFILL: Excavated Materials
CHECKED BY: CAWockner



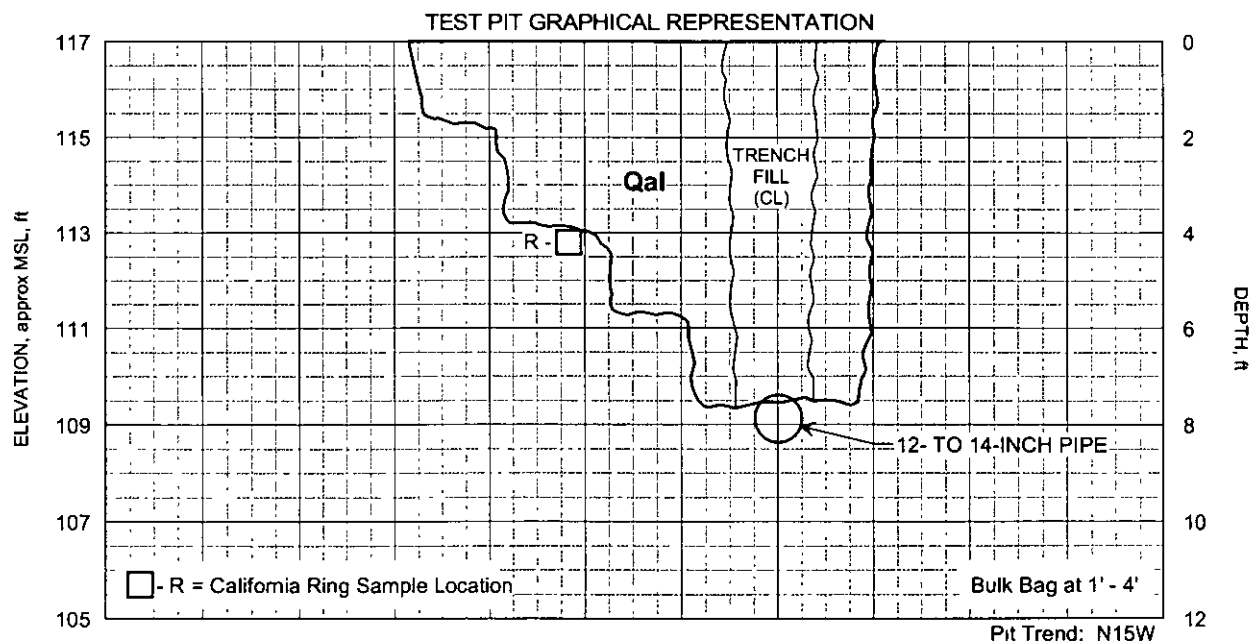
LOG OF TEST PIT NO. BH-203
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
			SURFACE EL: 117 ft +/- (rel. MSL datum)							
			MATERIAL DESCRIPTION							
116	0	Qal	ALLUVIUM (Qal)							
	2		Sandy Lean CLAY (CL). stiff, dark grayish brown, damp, roots at rootlets, some voids							
114										
	4		- weak calcium carbonate cementation, slight voids, at 3'							
112				111	95	17				
	6			107	95	13				
110										
	8									
108										
	10									
106										
	12									
104										
	14									
102										

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 7.5 ft
DEPTH TO WATER: Not encountered
EXPLORATION DATE: October 19, 2000

LOGGED BY: CWelke
BACKFILL: Excavated Materials
CHECKED BY: CAWockner



LOG OF TEST PIT NO. BH-204
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

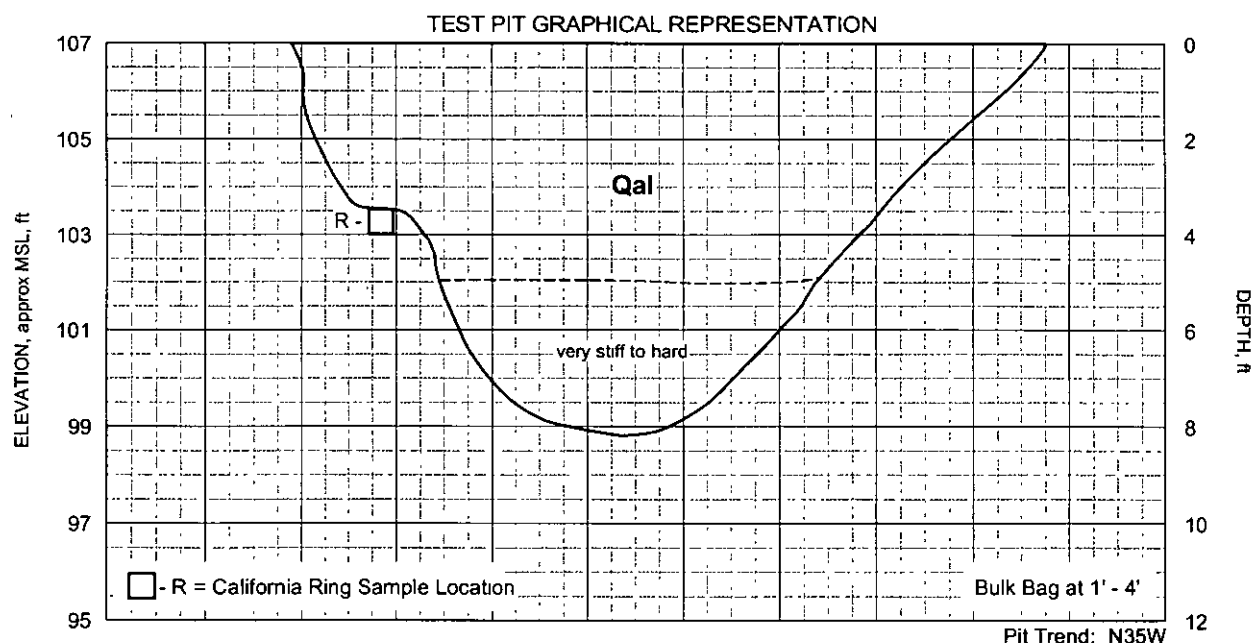


ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
			SURFACE EL: 107 ft +/- (rel. MSL datum)							
			MATERIAL DESCRIPTION							
106	0	Qal	ALLUVIUM (Qal)							
			Sandy Lean CLAY (CL): stiff to very stiff, dark grayish brown, damp, some voids							
104	2		- roots up to 1/2" diameter, weak to moderate cementation (caliche), at 2'	115	102	13				
			- few voids, at 3'							
102	4									
			- very stiff to hard, at 5'							
100	6									
98	8									
96	10									
94	12									
92	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 8.0 ft
DEPTH TO WATER: Not encountered
EXPLORATION DATE: October 19, 2000

LOGGED BY: CWelke
BACKFILL: Excavated Materials
CHECKED BY: CAWockner



LOG OF TEST PIT NO. BH-205
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

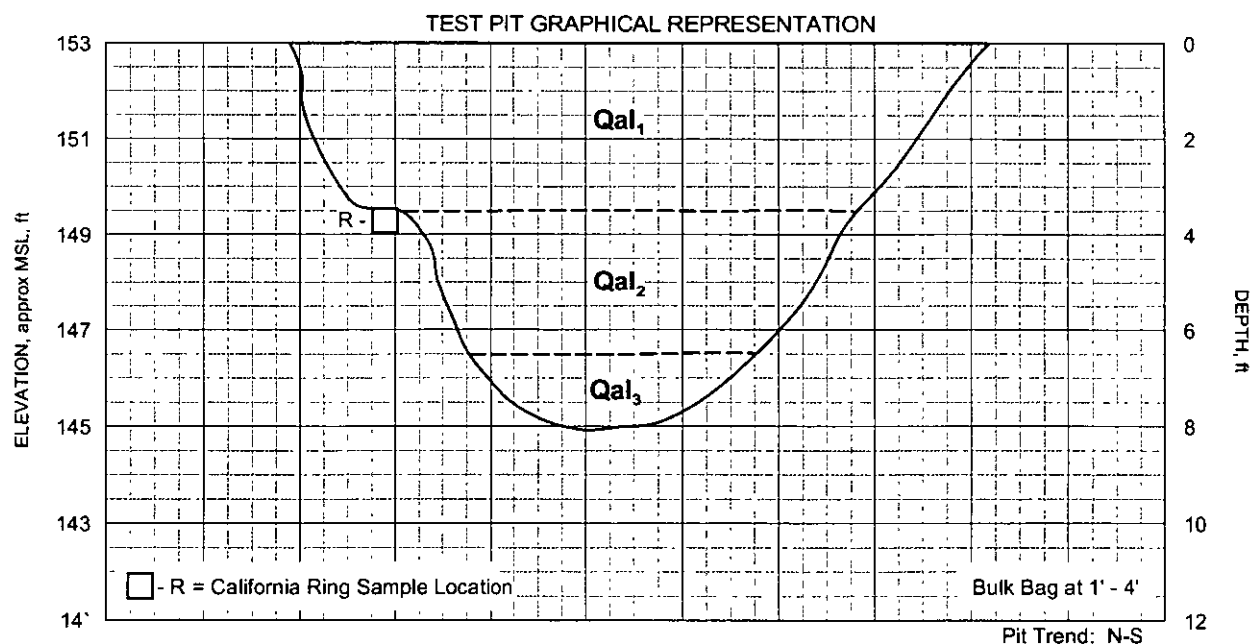


ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: per Plate 3 SURFACE EL: 153 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [u]
MATERIAL DESCRIPTION										
152	0	Qal ₁	ALLUVIUM (Qal) Sandy Lean CLAY (CL): stiff to very stiff, dark grayish brown, damp, some voids							
150	2									
148	4	Qal ₂	Clayey SAND (SC): medium dense, moderate brown, moist, some gravel	114	99	15				
146	6									
144	8	Qal ₃	Sandy Lean CLAY (CL) soft to stiff, dark yellowish brown, moist							
142	10									
140	12									
138	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 8.0 ft
DEPTH TO WATER: Not encountered
EXPLORATION DATE: October 19, 2000

LOGGED BY: CWelke
BACKFILL: Excavated Materials
CHECKED BY: CAWockner



LOG OF TEST PIT NO. BH-206
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-3.23

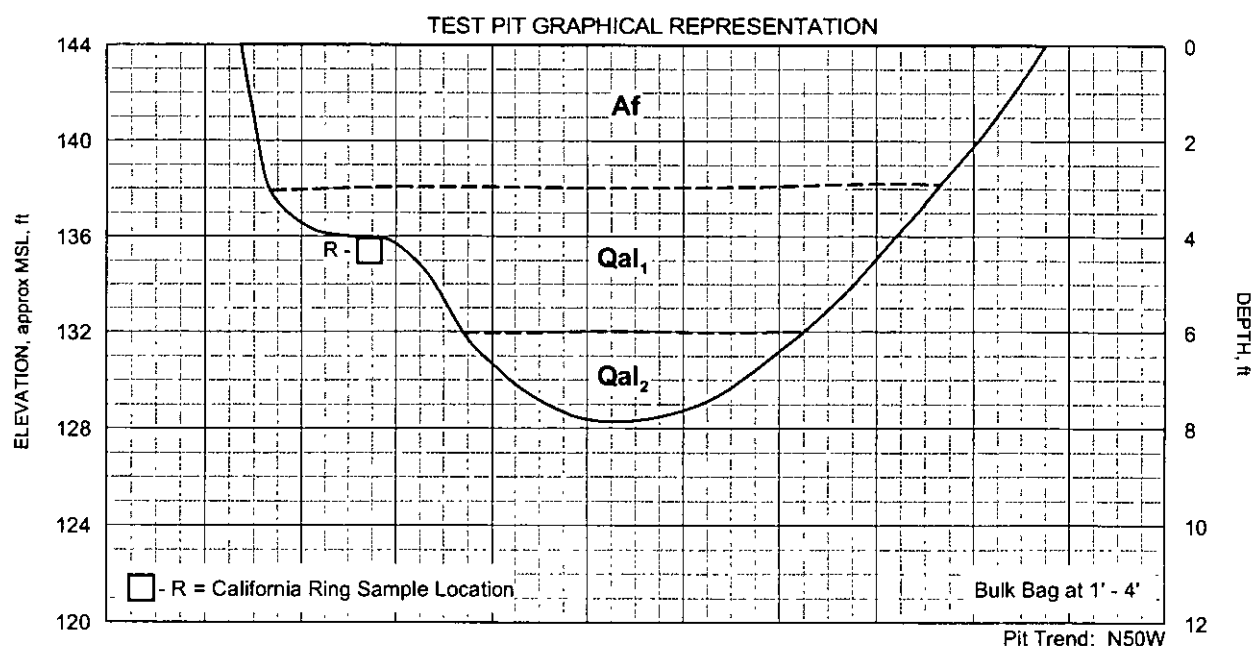


ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: per Plate 3 SURFACE EL: 146 ft +/- (rel MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
			MATERIAL DESCRIPTION							
0		Af	ARTIFICIAL FILL (Af) Sandy Lean CLAY (CL): stiff, dark grayish brown, moist, slight voids, trace gravel, 2" diameter roots							
144	2									
142	4	Qal ₁	ALLUVIUM (Qal) Sandy Lean CLAY (CL): stiff to very stiff, very slight voids, roots up to 1/2" diameter, at 3'	114	98	17				
140	6									
138	8	Qal ₂	Clayey SAND (SC): medium dense, moderate brown, moist, some gravel							
136	10									
134	12									
132	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH 8.0 ft
DEPTH TO WATER Not encountered
EXPLORATION DATE: October 19, 2000

LOGGED BY CWelke
BACKFILL Excavated Materials
CHECKED BY CAWockner



LOG OF TEST PIT NO. BH-207
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

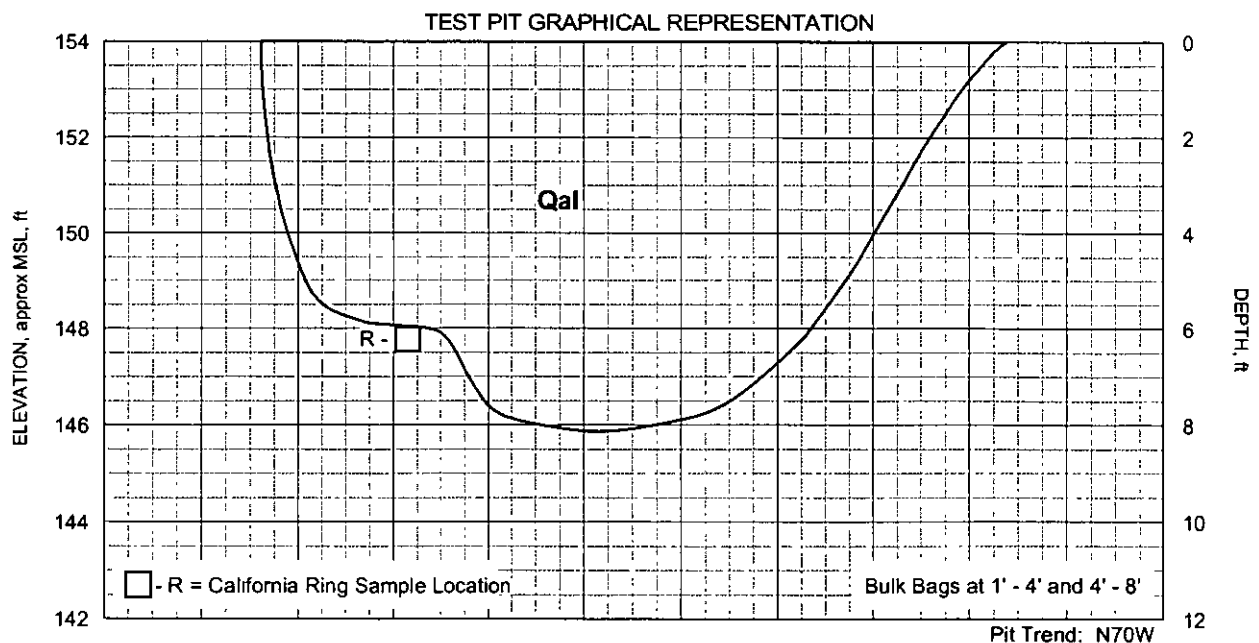


ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: per Plate 3 SURFACE EL 154 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
MATERIAL DESCRIPTION										
0		Qal	ALLUVIUM (Qal) Clayey SAND (SC): medium dense, grayish brown, damp to moist, some gravel - slightly lighter, at 6'							
152	2									
150	4									
148	6			103	88	18				
146	8									
144	10									
142	12									
140	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH 8.0 ft
DEPTH TO WATER Not encountered
EXPLORATION DATE October 19, 2000

LOGGED BY CWelke
BACKFILL Excavated Materials
CHECKED BY CAWockner



LOG OF TEST PIT NO. BH-208
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-3.25

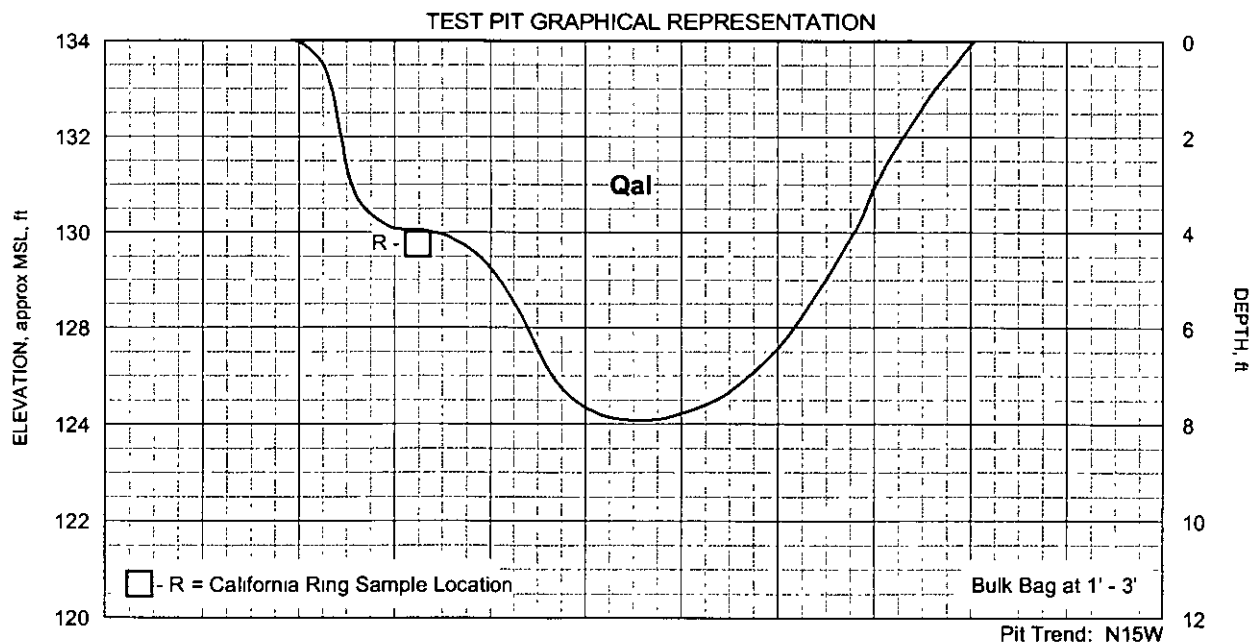


ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
			SURFACE EL: 134 ft +/- (rel. MSL datum)							
			MATERIAL DESCRIPTION							
0		Qal	ALLUVIUM (Qal)							
132	2		Clayey SAND (SC): medium dense, moderate brown, damp to moist, some gravel							
130	4		- slightly lighter brown, moist, at 4'	117	96	22				
128	6									
126	8									
124	10									
122	12									
120	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 8.0 ft
DEPTH TO WATER: Not encountered
EXPLORATION DATE: October 19, 2000

LOGGED BY: CWelke
BACKFILL: Excavated Materials
CHECKED BY: CAWockner



LOG OF TEST PIT NO. BH-209
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-3.26

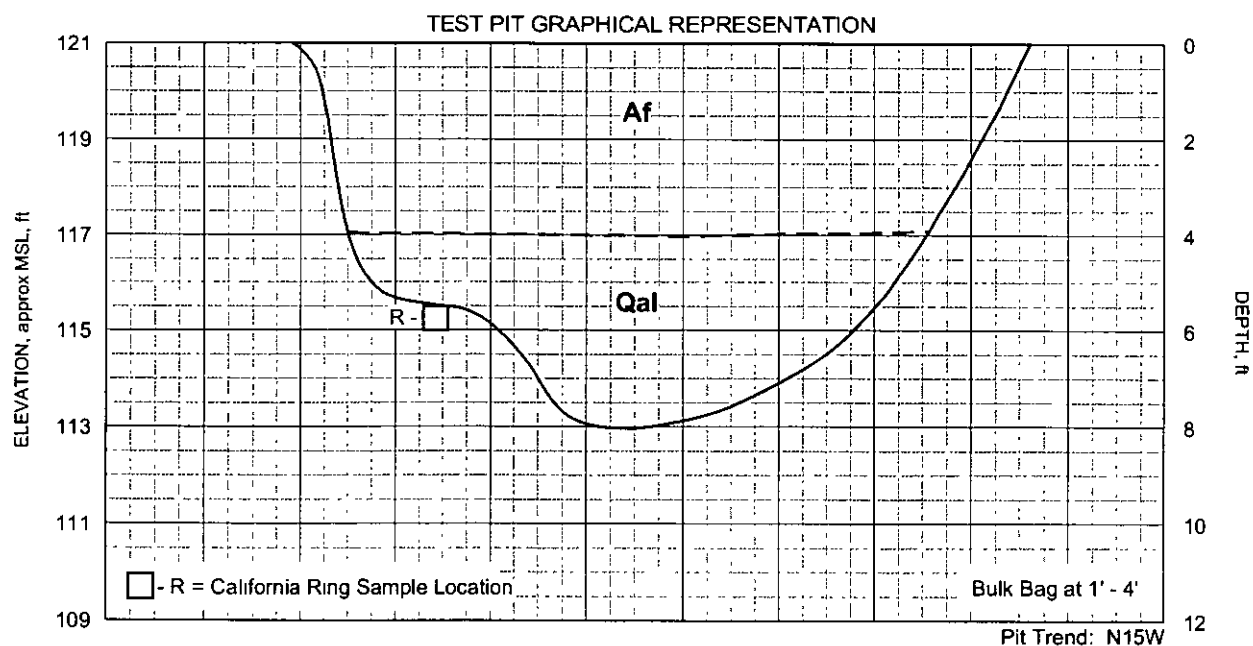


ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
			SURFACE EL: 121 ft +/- (rel. MSL datum)							
			MATERIAL DESCRIPTION							
120	0	Af	ARTIFICIAL FILL (af) Clayey SAND with gravel (SC): loose to medium dense							
118	2									
116	4	Qal	ALLUVIUM (Qal) Clayey SAND with gravel (SC): medium dense to dense, grayish brown, moist, slight voids	100	87	15				
114	6									
112	8									
110	10									
108	12									
106	14									

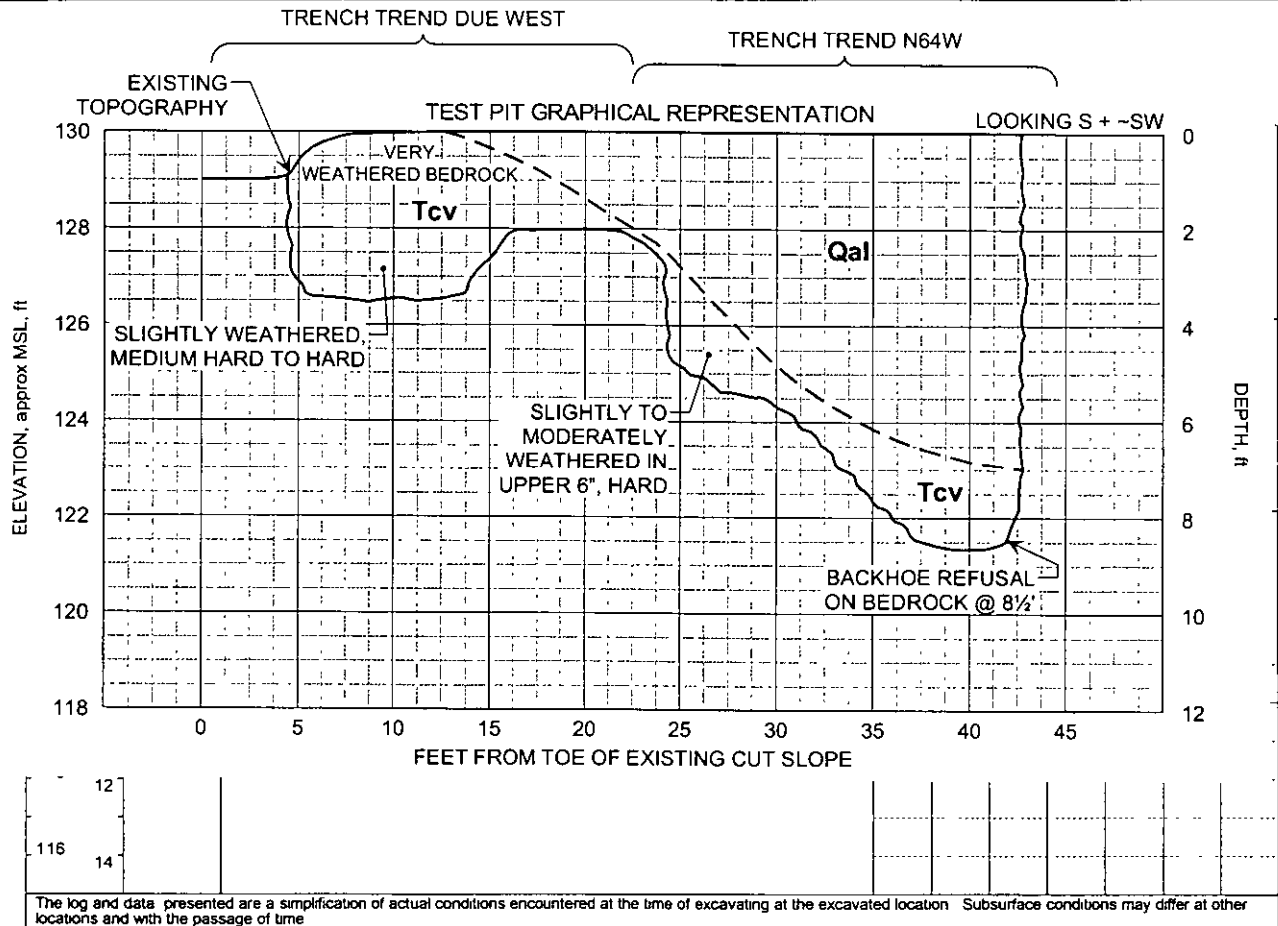
The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 8.0 ft
DEPTH TO WATER: Not encountered
EXPLORATION DATE: October 19, 2000

LOGGED BY: CWelke
BACKFILL: Excavated Materials
CHECKED BY: CAWockner

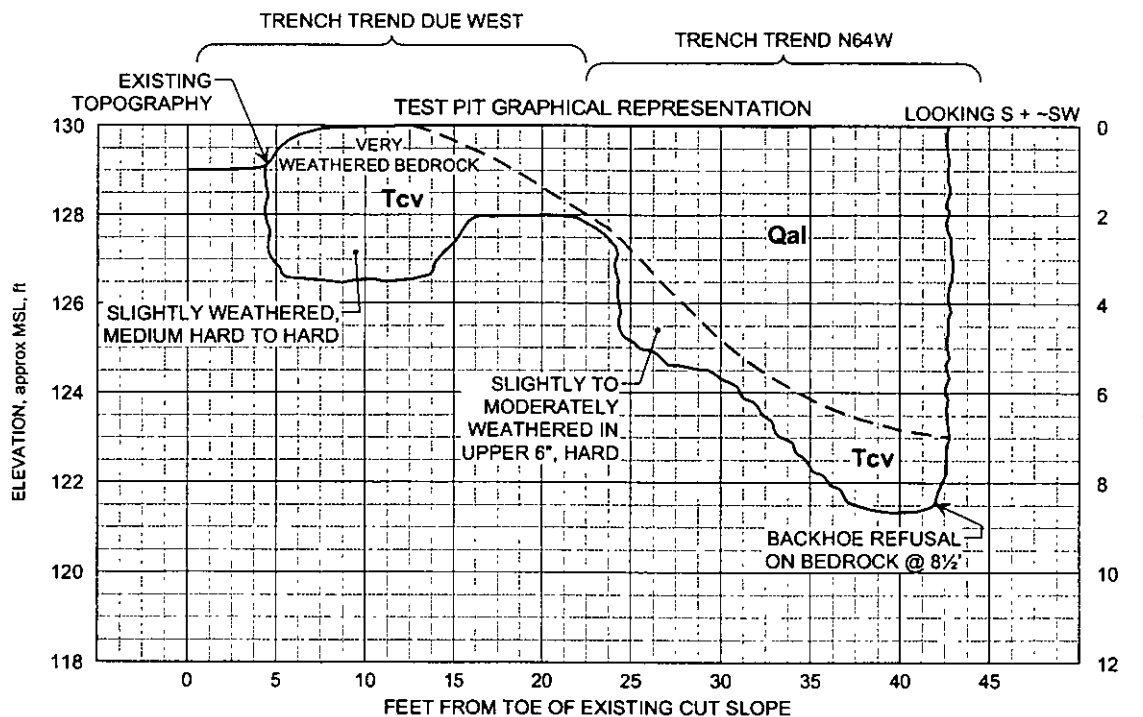


LOG OF TEST PIT NO. BH-210
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



COMPLETION DEPTH 8.5 ft
DEPTH TO WATER: Not encountered
EXPLORATION DATE October 19, 2000

LOGGED BY: CWeiKe
BACKFILL: Excavated Materials
CHECKED BY: CAWockner



LOG OF TEST PIT NO. BH-211
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

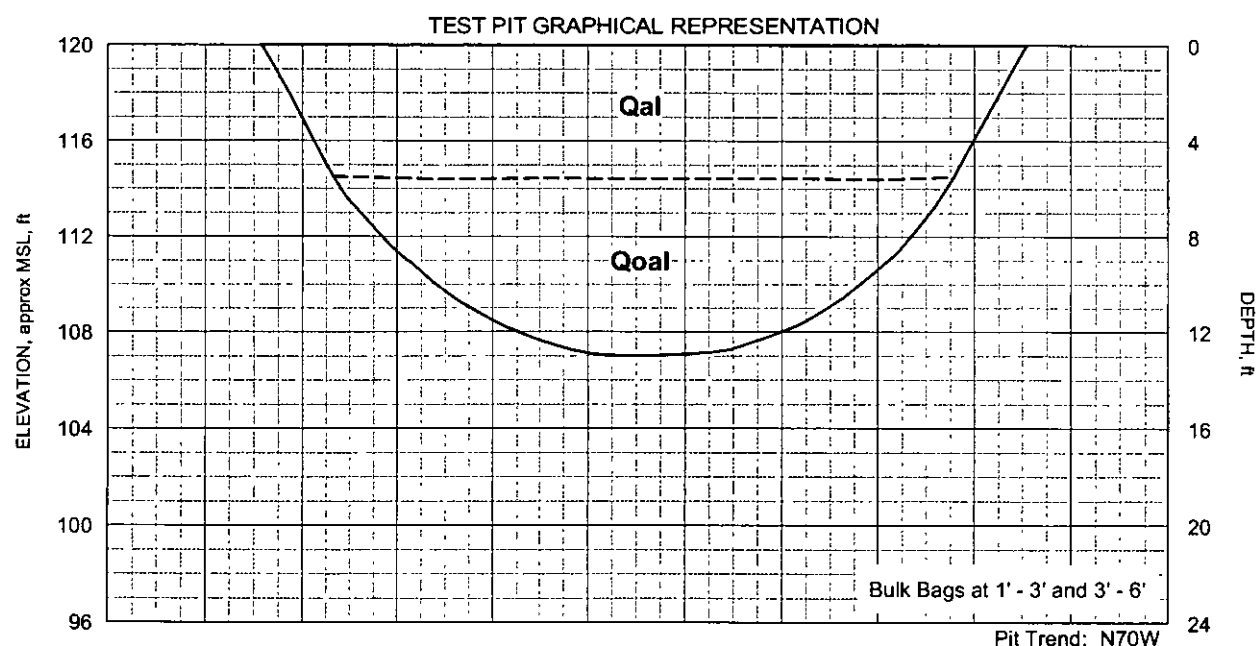


ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION, per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf	PP, (TV), [uu]
			SURFACE EL: 120 ft +/- (rel. MSL datum)								
			MATERIAL DESCRIPTION								
0		Qal	ALLUVIUM (Qal)								
118	2		Clayey SAND with gravel (SC). medium dense, moderate brown, damp to moist								
116	4										
114	6	Qoal	OLDER ALLUVIUM (Qoal)								
112	8		Clayey SAND with gravel (SC) dense to very dense, well cemented								
110	10										
108	12										
106	14										

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH 13.0 ft
DEPTH TO WATER: Not encountered
EXPLORATION DATE: October 19, 2000

LOGGED BY: CWelke
BACKFILL Excavated Materials
CHECKED BY: CAWockner



LOG OF TEST PIT NO. BH-212
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

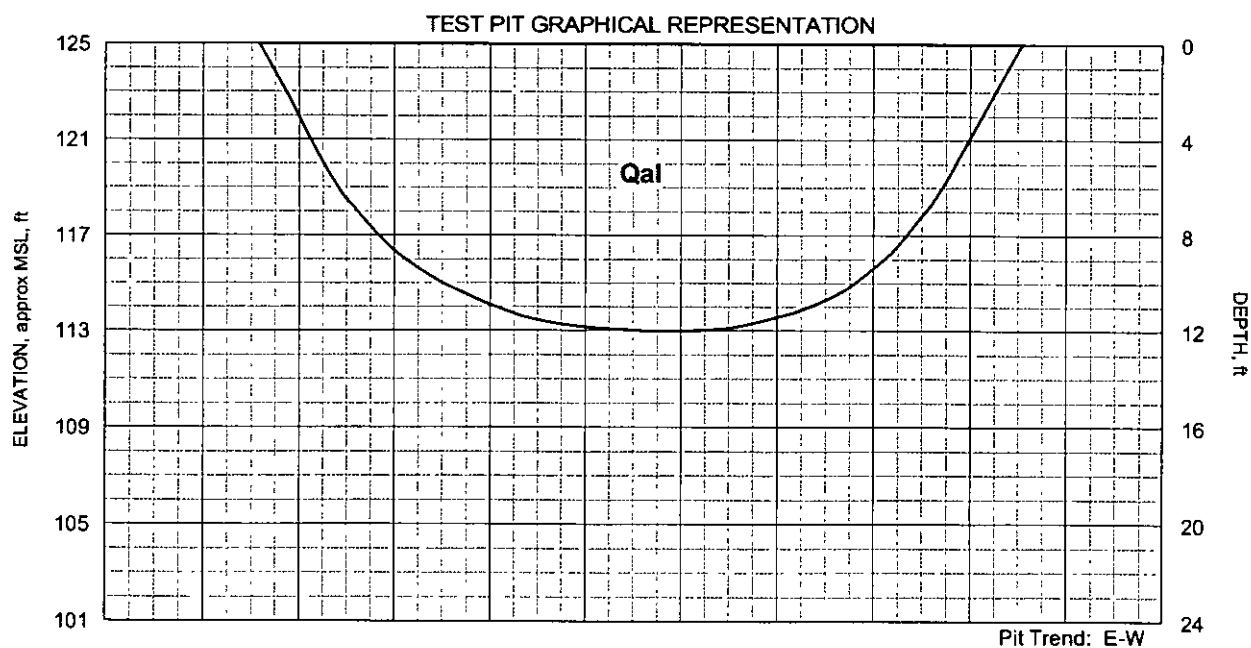


ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf	PP, (TV), [uu]
			SURFACE EL. 125 ft +/- (rel. MSL datum)								
			MATERIAL DESCRIPTION								
124	0	Qal	ALLUVIUM (Qal)								
	2		Sandy Lean CLAY (CL) stiff, dark grayish brown, damp, some gravel								
122											
	4		- very stiff to hard, moist, at 3'								
120											
	6										
118											
	8										
116											
	10										
114											
	12										
112											
	14										
110											

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 12.0 ft
DEPTH TO WATER: Not encountered
EXPLORATION DATE: October 19, 2000

LOGGED BY: CWelke
BACKFILL: Excavated Materials
CHECKED BY: CAWockner



LOG OF TEST PIT NO. BH-213
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

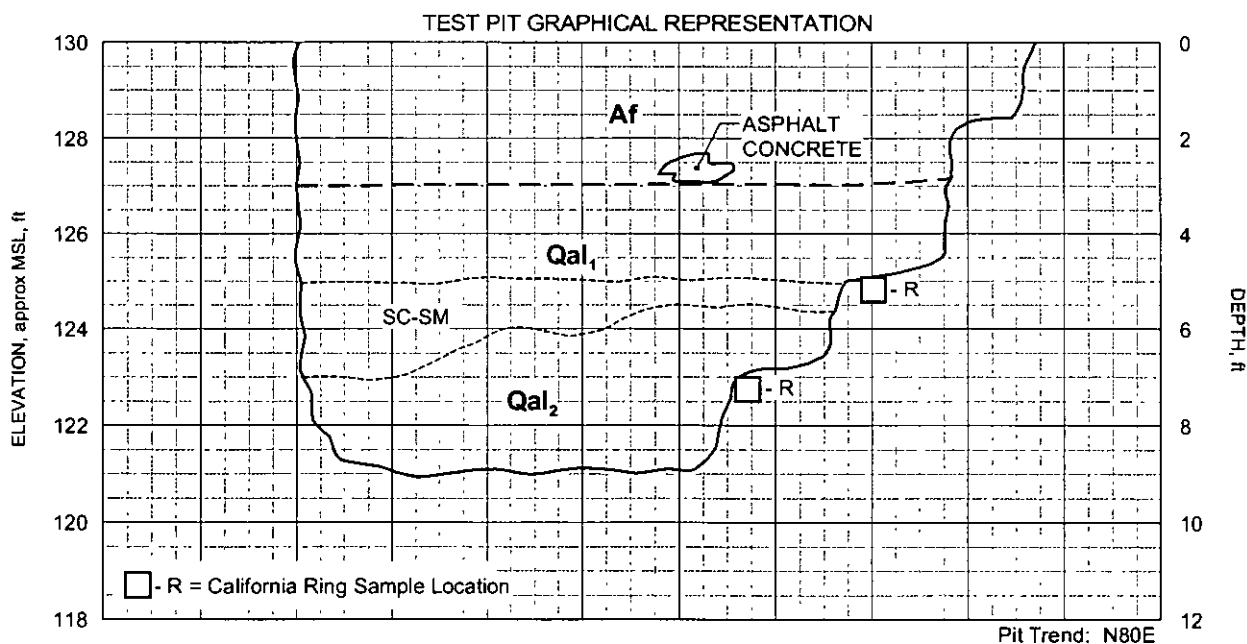


ELEVATION, ft DEPTH, ft	GEOLOGIC UNIT	LOCATION: per Plate 3 SURFACE EL: 130 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
MATERIAL DESCRIPTION									
0	Af	ARTIFICIAL FILL (af) Clayey SAND (SC): medium dense, moderate brown, damp, pieces of copper wire, plastic, and asphalt fragments up to approx. 6" diameter							
128 2	Qal ₁	ALLUVIUM (Qal) Clayey SAND with gravel (SC) medium dense, moderate brown, damp, some voids, lense of Silty, Clayey SAND with gravel (SC-SM) up to 2' thick							
126 4									
124 6	Qal ₂		102	89	14				
122 8		Sandy Lean CLAY (CL) soft to stiff, moderate to light brown, damp to moist, some voids	119	102	17				
120 10									
118 12									
116 14									

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 9.0 ft
DEPTH TO WATER: Not encountered
EXPLORATION DATE: October 23, 2000

LOGGED BY: CWelke
BACKFILL: Excavated Materials
CHECKED BY: CAWockner



LOG OF TEST PIT NO. BH-214
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: per Plate 3 SURFACE EL: 130 ft +/- (rel MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), (uu)
MATERIAL DESCRIPTION										
0		Qal ₁	ALLUVIUM (Qal) Silty, clayey SAND with gravel (SC-SM). loose to medium dense, damp, channel deposits							
128	2									
126	4									
124	6									
122	8		- more gravel, at 7'							
120	10	Qal ₂	Clayey SAND (SC): medium dense, grayish brown, moist							
118	12									
116	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH 13.5 ft

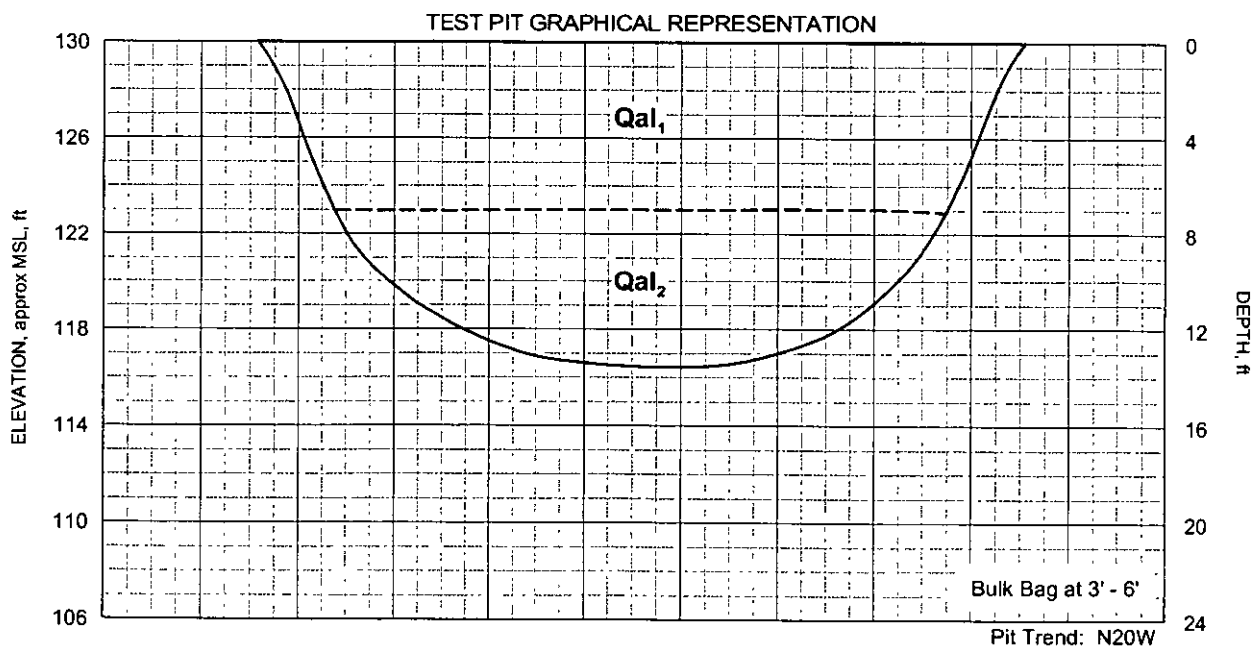
DEPTH TO WATER: Not encountered

EXPLORATION DATE: October 23, 2000

LOGGED BY: CWelke

BACKFILL Excavated Materials

CHECKED BY: CAWockner



LOG OF TEST PIT NO. BH-215
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

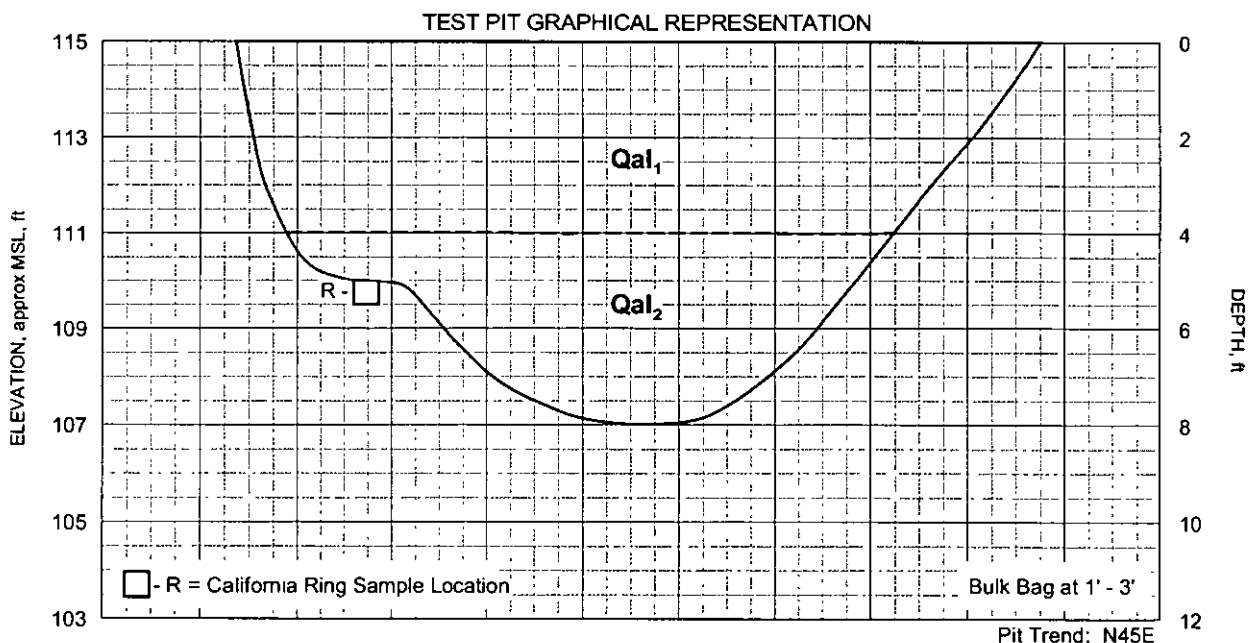


ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: per Plate 3 SURFACE EL: 115 ft +/- (rel MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
	0		MATERIAL DESCRIPTION							
114	0	Qal ₁	ALLUVIUM (Qal) Clayey SAND with gravel (SC). medium dense, moderate brown, moist, numerous voids							
112	2									
110	4	Qal ₂	Sandy Lean CLAY (CL). soft to stiff, moderate brown, damp, some voids to numerous voids to approx. 7', trace gravel							
108	6			96	88	9				
106	8									
104	10									
102	12									
100	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH 8.0 ft
DEPTH TO WATER Not encountered
EXPLORATION DATE: October 23, 2000

LOGGED BY: CWelke
BACKFILL: Excavated Materials
CHECKED BY: CAWockner



LOG OF TEST PIT NO. BH-216
 Cal State Channel Islands, East Campus Development
 Camarillo Area of Ventura County

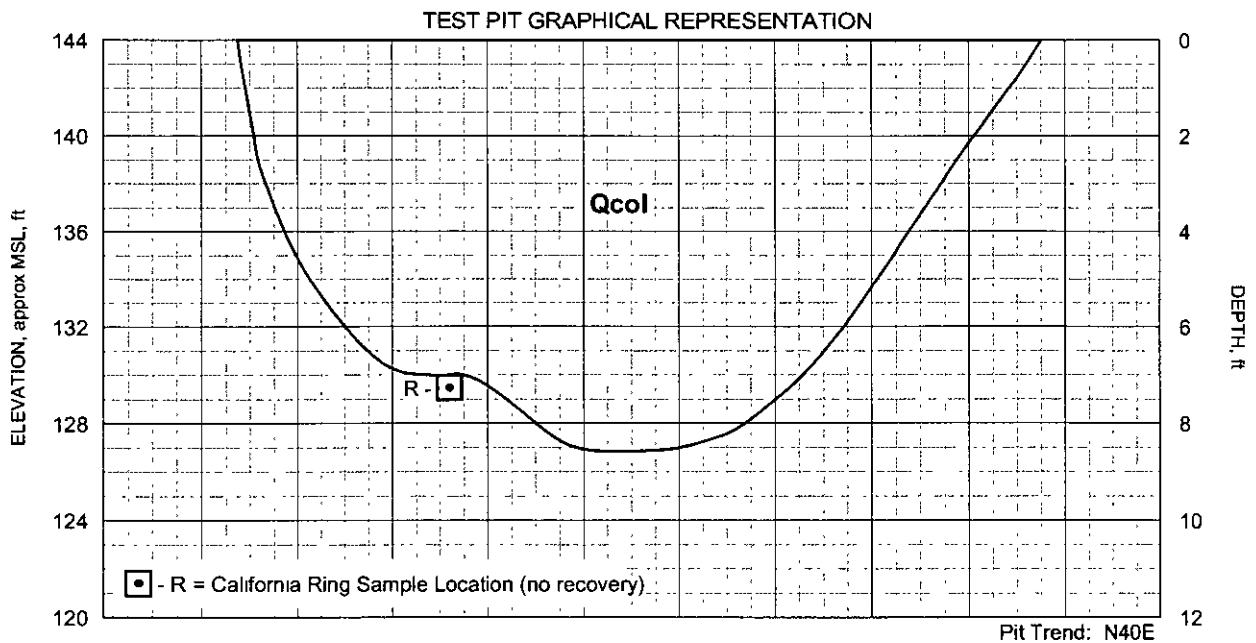


ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION. per Plate 3	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf	PP, (TV), [uu]
			SURFACE EL: 128 ft +/- (rel. MSL datum)								
			MATERIAL DESCRIPTION								
0		Qcol	COLLUVIUM (Qcol)								
126	2		Clayey SAND with gravel (SC) dense to very dense, pale yellowish brown, damp to moist, weak cementation (caliche), difficult excavating below 1'								
124	4										
122	6		- slightly increase in gravel, at approx. 6'								
120	8										
118	10										
116	12										
114	14										

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 8.5 ft
DEPTH TO WATER: Not encountered
EXPLORATION DATE: October 23, 2000

LOGGED BY: CWelke
BACKFILL: Excavated Materials
CHECKED BY: CAWockner



LOG OF TEST PIT NO. BH-217
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-3.34

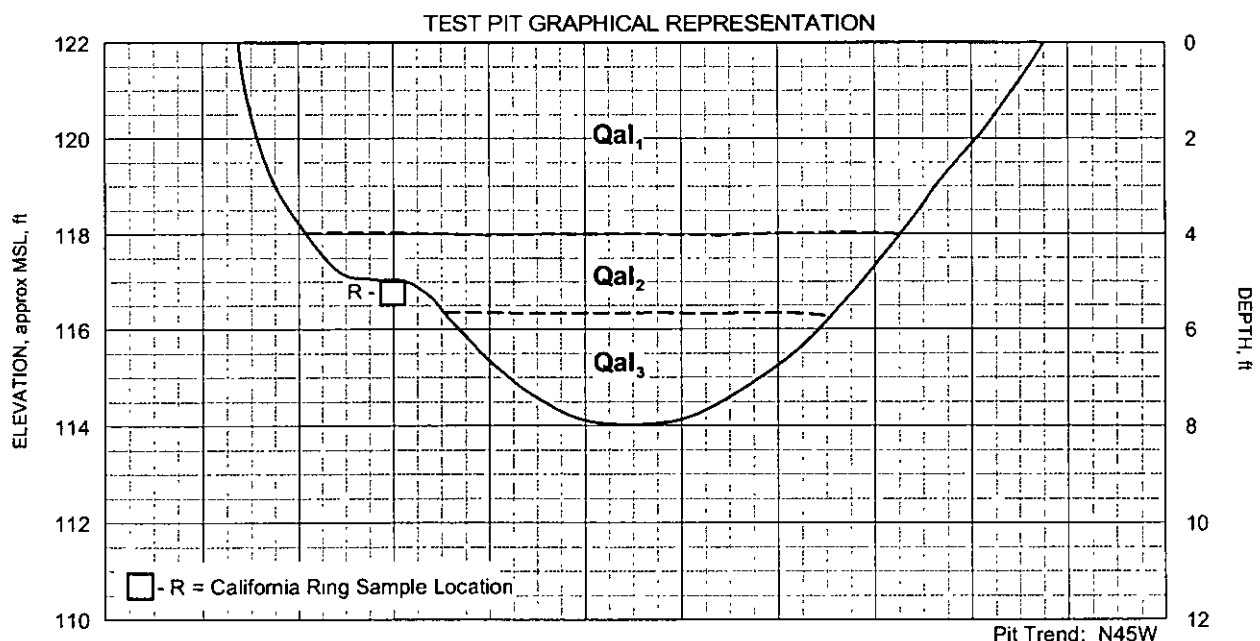


ELEVATION, ft	DEPTH, ft	GEOLOGIC UNIT	LOCATION: per Plate 3 SURFACE EL: 122 ft +/- (rel MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	Su, ksf PP, (TV), [uu]
MATERIAL DESCRIPTION										
0		Qal ₁	ALLUVIUM (Qal) Clayey SAND (SC): medium dense, dark grayish brown, damp, trace gravel, weak cementation (caliche) - moderate brown, at 2'							
120	2									
118	4	Qal ₂	Sandy Lean CLAY (CL): very stiff, dark grayish brown, moist, slight voids							
116	6	Qal ₃	Clayey SAND (SC): medium dense to dense, moderate brown, moist	117	99	18				
114	8									
112	10									
110	12									
108	14									

The log and data presented are a simplification of actual conditions encountered at the time of excavating at the excavated location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 8.0 ft
DEPTH TO WATER: Not encountered
EXPLORATION DATE: October 23, 2000

LOGGED BY: CWelke
BACKFILL: Excavated Materials
CHECKED BY: CAWockner



LOG OF TEST PIT NO. BH-218
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE A-3.35

APPENDIX B
LABORATORY TESTING

APPENDIX B LABORATORY TESTING

Laboratory tests were performed on selected undisturbed and bulk soil samples to estimate engineering characteristics of the various earth materials encountered. Testing was performed in accordance with ASTM Standards for Soil Testing, latest revision on as noted otherwise. The results of the laboratory analyses are summarized on Plates B-1.1 through B-1.6 - Summary of Laboratory Test Results.

Laboratory Moisture and Density Determinations

Moisture content and dry density determinations were performed on selected undisturbed samples collected to evaluate the natural water content and dry density of the various soils encountered. The results are presented on Plates A-2.1 through A-2.23 and A-3.1 through A-3.35, and on Plates B-1.1 through B-1.6.

Grain-Size Distribution

Grain size distribution with hydrometer were determined for nine soil samples in accordance with standard test method ASTM D422. In addition, we performed tests to determine the amount of material in soils finer than the No. 200 Sieve in accordance with ASTM test method D1140. The grain-size curves are presented on Plate B-2 - Grain Size Curves, and the results of percent passing the No. 200 sieve (or fines content) are presented on Plates A-2.1 through A-2.23 and A-3.1 through A-3.35, and Plates B-1.1 through B-1.6.

Atterberg Limits Tests

Atterberg limits tests were performed a selected sample of fine-grained materials from drill hole DH-1. Liquid and plastic limits were determined in accordance with standard test methods ASTM D423 and D424. The test results are shown on Plates B-1.1 through B-1.6 and Plate B-3 - Plasticity Chart.

Expansion Index Test

An expansion index test was performed on a sample of near-surface soil to estimate the expansion characteristics. The test was performed in accordance with ASTM D4329. The result is presented on Plates B-1.1 through B-1.6.

Sand Equivalent Test

One sand equivalent test was performed on a bulk sample of near-surface material encountered behind (east of) the debris dam. The test was performed in accordance with ASTM D2419. The result is presented on Plate B-1.1.

Compaction Tests

Three compaction tests were performed on selected samples of near-surface soil to assess compaction characteristics. The tests were performed in accordance with ASTM D1557 and the results of maximum dry density and optimum moisture content are presented on Plates B-1.1 through B-1.6 and Plates B-4.1 through B-4.5 - Compaction Test Results.

Direct Shear Tests

One set of three single-stage direct shear tests was performed on three selected bulk near-surface samples to evaluate the shear strength of the compacted onsite surficial soil. The tests were performed on samples compacted to about 90 percent of maximum dry density at about optimum moisture content. The direct shear tests were performed in general accordance with standard test method ASTM D3080 using a constant horizontal displacement shear machine with automatic data acquisition equipment. Summary plots of the direct shear data are presented on Plates B-1.1 through B-1.6 and Plates B-5.1 through B-5.4 - Direct Shear Test Results.

Consolidation Tests

Nine consolidation tests were performed on selected samples of the clayey alluvial/colluvial soils. Samples were incrementally loaded to the approximate overburden pressure and then inundated, followed by incremental loading to the maximum consolidation pressure. The tests were conducted in accordance with ASTM D2435, Standard Test Method for One-Dimensional Consolidation Properties of Soils.

Additionally, six modified one-dimensional consolidation tests were performed to estimate the hydroconsolidation (collapse) potential of the topsoil. Six samples were loaded to the approximate overburden pressure and then inundated with water. The collapse potential was measured after each sample had come to equilibrium after inundation. The results of the consolidation and hydroconsolidation tests are presented on Plates B-6.1 through B-6.20 - Consolidation Test Results.

R-Value Test

Two R-value tests were performed on samples of near-surface soil excavated in the backhoe test pits along the proposed connector road alignment. The tests were performed by BTC Laboratories, Inc., in accordance with standard test method ASTM D2844 and results of the tests are presented on Plates B-1.1 through B-1.6 and Plates B-7.1 through B-7.10- Report of "R" Value Test (BTC's report).

Soil Chemistry Tests/Corrosion Tests

Three soil samples were tested for resistivity, pH, sulfate, and chloride, to assess corrosion potential by Health Science Associates, Inc., of Los Alamitos, California. The results of the tests are presented on Plates B-1.1 through B-1.6 and Plates B-8.1 and 8.4 - Laboratory Report (Health Science Associates' reports), and are discussed in the report text.

DRILL HOLE	DEPTH, ft	MATERIAL DESCRIPTION	UWW	UDW	MC%	FINES %	ATTERBURG LIMITS		COMPACTION TEST		DIRECT SHEAR		COMPRESSIVE STRENGTH TESTS		CORROSIVITY TESTS				R-VALUE	EXPANSION INDEX (SAND EQUIVALENT)	TEST LISTING
							LL	PI	MAX DD pcf	OPT MC %	C ksf	PHI deg	Q _u ksf	S _u ksf	R	pH	Cl	SO ₄			
BH-1	2.0	Fat Sandy CLAY (CH)	117	110	6																T
BH-1	5.0	Fat Sandy CLAY (CH)	120	110	9										15609	7.6	248	2			T, Co
BH-1A	5.0	Sandy CLAY (CL)	95	78	21																T
BH-1B	5.0	Lean CLAY (CL)	108	103	5																T
BH-2	2.0	Sandy Lean CLAY (CL)	102	86	18																T
BH-2	5.0	Lean CLAY (CL)	119	95	25																T
BH-3	2.0	Lean CLAY (CL)	118	97	22																T
BH-3	5.0	Lean to Fat CLAY (CL)	119	90	33																T
BH-4	2.0	Lean CLAY (CL)	127	104	22																T
BH-4	5.0	Lean CLAY (CL)	126	106	19										4175	7.5	97	5			T, Co
BH-5	2.0	Lean CLAY (CL)	115	100	16																T
BH-5	5.0	Lean CLAY (CL)	116	100	16																T
BH-6	1.0	Sandy Lean CLAY (CL)				46													11		FC, R
BH-6	2.0	Sandy Lean CLAY (CL)	108	91	19																T
BH-6	5.0	Grades to Clayey SAND (SC)	67	61	11																T
BH-8	1.0	Lean CLAY (CL)																	11		R
BH-8	2.0	Lean CLAY (CL)	111	98	13																T
BH-8	5.0	Lean CLAY (CL)	116	103	13																T
BH-9	2.0	Clayey SAND (SC)	91	82	11																T
BH-9	5.0	Sandy SILT (ML)	70	61	14																T
BH-10	3.0	GRAVEL with SAND (SW)				6														(50)	SE, S
BH-11	3.0	Silty fine SAND (SM)				46															FC, S
BH-12	2.0	Lean CLAY (CL)	115	102	12																T
DH-1	3.0	Interlayered SAND (SP) and lean CLAY (CL)	114	89	29																T
DH-1	3.8	Lean to Fat CLAY (CL)	123	103	19																T, C
DH-1	6.0	Fat CLAY (CH)	121	98	24																T, C
DH-1	11.0	Interlayered Silty to Clayey SAND (SM/SC)	118	91	31																T, C
DH-1	16.0	Interlayered silty to clayey SAND (SM/SC)			32	65															M, FC
DH-1	21.0	Interlayered silty to clayey SAND (SM/SC)			32																M
DH-1	23.5	SAND (SP)			26																M

Classification Tests UWW = Unit Wet Weight UDW = Unit Dry Weight MC = Moisture Content Fines = % Passing #200 Sieve LL = Liquid Limit PI = Plasticity Index	Direct Shear Test C = Assigned Cohesion, ksf PHI = Assigned Friction Angle, degrees Compaction Test MAX DD = Maximum Dry Density OPT MC = Optimum Moisture Content	Compressive Strength Tests Q _u = Unconfined Compression S _u = Undrained Shear Strength u = Unconsolidated Undrained p = Pocket Penetrometer t = Torvane m = Miniature Vane	Corrosivity Tests R = Resistivity, phm-cm, satur. pH = pH Cl = Chloride, ppm SO ₄ = Sulfate, ppm	Test Listing Abbreviations M = Moisture Content T = Total Dry & Density S = Sieve Analysis FC = % Passing #200 Sieve H = Hydrometer Analysis A = Atterberg Limits P = Compaction Test D = Direct Shear Test C = Consolidation Test Co = Corrosivity Tests CU = CU Triaxial U = UU Triaxial R = R-Value (saturated) SE = Sand Equivalent
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SUMMARY OF LABORATORY TEST RESULTS

Cal State Channel Islands, East Campus Development, Camarillo Area of Ventura County



DRILL HOLE	DEPTH, ft	MATERIAL DESCRIPTION	UWW	UDW	MC%	FINES %	ATTERBURG LIMITS		COMPACTION TEST		DIRECT SHEAR		COMPRESSIVE STRENGTH TESTS		CORROSIVITY TESTS				R-VALUE	EXPANSION INDEX	TEST LISTING
							LL	PI	MAX DD pcf	OPT MC %	C ksf	PHI deg	Q _u ksf	S _u ksf	R	pH	Cl	SO ₄			
DH-1	26.0	Interlayered Sandy CLAY (CL) to Clayey SAND (CL)			36	43	48	24													M, A
DH-1	31.0	Sandy fat CLAY (CH) to clayey SAND (SC)			20	50															M, H
DH-1	36.0	Sandy fat CLAY (CH) to clayey SAND (SC)			28	55															M, H
DH-1	41.0	Silty SAND (SM)			27	44															M, H
DH-2	3.0	Sandy lean CLAY (CL)	112	91	23																T
DH-2	6.0	Fat CLAY (CH)	120	94	28																T
DH-2	11.0	Fat CLAY (CH)	113	89	28																T
DH-2	16.0	Fat CLAY (CH)	128	105	22																T
DH-2	21.0	Sandy fat CLAY (CH)			24																M
DH-2	26.0	Sandy lean CLAY (CL)			22																M
DH-2	31.0	Sandy lean CLAY (CL)			24																M
DH-2	36.0	Sandy lean CLAY (CL)			22																M
DH-2	41.0	Sandy CLAY (CL)			21	53															M, H
DH-3	1.0	Lean CLAY (CL)							119	15	0.73	32			3358	7.6	68	27	49		P, D, Co
DH-3	3.0	Lean CLAY (CL)	91	78	16																E
DH-3	6.0	Silty fine SAND (SM)	112	101	11	21															T
DH-3	11.0	Lean CLAY (CL)	112	92	22																T, FC
DH-3	16.0	Lean CLAY (CL)	124	104	20																T, C
DH-3	21.0	Lean CLAY (CL)			14																T
DH-3	26.0	Lean CLAY (CL)			24																M
DH-3	31.0	Lean CLAY (CL)			22																M
DH-4	3.0	Sandy CLAY (CL)	110	98	12																T
DH-4	6.0	Sandy lean CLAY (CL)	102	89	15	68															T, H, FC
DH-4	11.0	Lean CLAY (CL)	127	110	15																T
DH-4	16.0	Lean CLAY (CL)			14																M
DH-4	21.0	Lean CLAY (CL)			15																M
DH-4	26.0	Silty SAND (SM)			8																M
DH-4	31.0	Silty SAND (SM)			14	26															M, FC
DH-4	36.0	Silty SAND (SM) to clayey SAND (SC)			10	20															M, FC

Classification Tests UWW = Unit Wet Weight UDW = Unit Dry Weight MC = Moisture Content Fines = % Passing #200 Sieve LL = Liquid Limit PI = Plasticity Index	Direct Shear Test C = Assigned Cohesion, ksf PHI = Assigned Friction Angle, degrees Compaction Test MAX DD = Maximum Dry Density OPT MC = Optimum Moisture Content	Compressive Strength Tests Q _u = Unconfined Compression S _u = Undrained Shear Strength u = Unconsolidated Undrained p = Pocket Penetrometer t = Torvane m = Miniature Vane	Corrosivity Tests R = Resistivity, phm-cm, satur. pH = pH Cl = Chloride, ppm SO ₄ = Sulfate, ppm	Test Listing Abbreviations M = Moisture Content T = Total Dry & Density S = Sieve Analysis FC = % Passing #200 Sieve H = Hydrometer Analysis A = Atterberg Limits P = Compaction Test D = Direct Shear Test C = Consolidation Test Co = Corrosivity Tests CU = CU Triaxial U = UU Triaxial R = R-Value (saturated) SE = Sand Equivalent
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SUMMARY OF LABORATORY TEST RESULTS

Cal State Channel Islands, East Campus Development, Camarillo Area of Ventura County



DRILL HOLE	DEPTH, ft	MATERIAL DESCRIPTION	UWW	UDW	MC%	FINES %	ATTERBURG LIMITS		COMPACTION TEST		DIRECT SHEAR		COMPRESSIVE STRENGTH TESTS		CORROSIVITY TESTS				R-VALUE	EXPANSION INDEX	TEST LISTING
							LL	PI	MAX DD pcf	OPT MC %	C ksf	PHI deg	Q _u ksf	S _u ksf	R	pH	Cl	SO ₄			
DH-4	41.0	Fat to lean CLAY (CH/CL)			23	58															M, FC
DH-4	46.0	Lean CLAY (CL)			25																M
DH-4	51.0	Lean CLAY (CL)			19																M
DH-5	1.0	Fat CLAY (CH)													4175	7.5	5	97			Co
DH-5	3.0	Fat CLAY (CH)	93	79	17																T
DH-5	6.0	Fat CLAY (CH)	116	93	25																T
DH-5	11.0	Fat CLAY (CH)	111	86	29																T
DH-5	21.0	Fat CLAY (CH)			29																M
DH-5	26.0	Fat CLAY (CH)			18																M
DH-5	31.0	Fat CLAY (CH)			22																M
DH-5	36.0	Lean CLAY with sand (CL)			26																M
DH-5	41.0	Lean CLAY with sand to fat CLAY (CL/CH)			31																M
DH-6	1.0	Sandy fat CLAY (CH) to sandy SILT (ML)							115	15	0.60	32							88		P, D, E
DH-6	3.0	Sandy fat CLAY (CH) to sandy SILT (ML)	98	89	11																T
DH-6	6.0	Sandy Fat CLAY (CH) to Sandy SILT (ML)	114	97	18																T, C
DH-6	11.0	Lean CLAY (CL) to Sandy SILT (ML)	128	106	20																T, C
DH-6	16.0	Lean CLAY (CL) to sandy SILT (ML)	121	100	21	70															T, H
DH-6	21.0	Lean CLAY (CL) to sandy SILT (ML)			20																M
DH-6	26.0	Clayey SAND (SC) and sandy CLAY (CL)			16	28															M, FC
DH-6	31.0	Clayey SAND (SC) and sandy CLAY (CL)			10																M
DH-7	3.0	Fat CLAY (CH)	112	95	17																T
DH-7	6.0	Silty SAND (SM)	122	103	19	33															T, C, FC
DH-7	11.0	Lean CLAY (CL)	118	98	21																T
DH-7	16.0	Lean CLAY (CL)	129	105	23																T
DH-7	21.0	Lean CLAY (CL)			24																M
DH-7	26.0	Lean CLAY (CL)	123	98	25																T, C
DH-7	31.0	Lean CLAY (CL)			23																M
DH-8	2.0	Fat CLAY (CH)							113	17	1.01	26							131		P, D, E
DH-8	3.0	Fat CLAY (CH)	104	86	21																T
DH-8	6.0	Fat CLAY (CH)	110	89	24																T, C

Classification Tests
 UWW = Unit Wet Weight
 UDW = Unit Dry Weight
 MC = Moisture Content
 Fines = % Passing #200 Sieve
 LL = Liquid Limit
 PI = Plasticity Index

Direct Shear Test
 C = Assigned Cohesion, ksf
 PHI = Assigned Friction Angle, degrees

Compaction Test
 MAX DD = Maximum Dry Density
 OPT MC = Optimum Moisture Content

Compressive Strength Tests
 Q_u = Unconfined Compression
 S_u = Undrained Shear Strength
 u = Unconsolidated Undrained
 p = Pocket Penetrometer
 t = Torvane
 m = Miniature Vane

Corrosivity Tests
 R = Resistivity, phm-cm, satur.
 pH = pH
 Cl = Chloride, ppm
 SO₄ = Sulfate, ppm

Test Listing Abbreviations
 M = Moisture Content
 T = Total Dry & Density
 S = Sieve Analysis
 FC = % Passing #200 Sieve
 H = Hydrometer Analysis
 A = Atterberg Limits
 P = Compaction Test

D = Direct Shear Test
 C = Consolidation Test
 Co = Corrosivity Tests
 CU = CU Triaxial
 UU = UU Triaxial
 R = R-Value (saturated)
 SE = Sand Equivalent

SUMMARY OF LABORATORY TEST RESULTS

Cal State Channel Islands, East Campus Development, Camarillo Area of Ventura County



DRILL HOLE	DEPTH, ft	MATERIAL DESCRIPTION	UWW	UDW	MC%	FINES %	ATTERBURG LIMITS		COMPACTION TEST		DIRECT SHEAR		COMPRESSIVE STRENGTH		CORROSIVITY TESTS				R-VALUE	EXPANSION INDEX	TEST LISTING
							LL	PI	MAX DD pcf	OPT MC %	C ksf	PHI deg	Qu ksf	Su ksf	R	pH	Cl	SO ₄			
DH-8	11.0	Fat CLAY (CH)	125	109	15																T
DH-8	16.0	Silty fine SAND (SM)	103	87	18																T, C
DH-8	20.5	Silty SAND (SM)	115	90	29	46															T, C, H
DH-8	26.0	Lean CLAY (CL)	121	98	24																T
DH-8	30.0	Lean CLAY (CL)	124	100	23																T
DH-101	6.0	Lean to fat CLAY (CL/CH)	127	105	21																T, C
DH-101	11.0	Lean CLAY (CL)	118	95	25																T
DH-102	0.0	Lean CLAY (CL)																			E
DH-103	1.0	Lean CLAY (CL)													3358	7.6	27	68		51	Co
DH-103	6.0	Interlayered Lean CLAY (CL) and Silty SAND to SAND (SM/SP)	109	83	31																T
DH-103	11.0	Interlayered Lean CLAY (CL) and Silty SAND to SAND (SM/SP)			29	37															M, FC
DH-104	6.0	SAND (SP) to SAND with SILT (SP-SM)	97	93	5																T
DH-104	11.0	SAND (SP) to SAND with SILT (SP-SM)			25	10															M, FC
DH-104	21.0	SAND (SP) to SAND with SILT (SP-SM)				10															FC
DH-105	3.5	Lean to Fat CLAY (CL/CH)	112	88	28																T
DH-105	5.5	Lean to Fat CLAY (CL/CH)	125	101	24																T, C
DH-105	9.0	Lean to Fat CLAY (CL/CH)	122	94	30																T
DH-105	14.0	Lean to Fat CLAY (CL/CH)			36																M
DH-106	3.5	Lean CLAY (CL)	127	107	19																T
DH-106	6.0	Lean CLAY (CL)	128	106	21																T
DH-106	7.5	Sandy CLAY (CL)	135	114	18																T, C
DH-106	13.0	Sandy CLAY (CL)			36																M
DH-107	3.0	Sandy CLAY (CL)																			E
DH-107	3.5	Sandy CLAY (CL)	119	100	18																T
DH-107	6.0	Sandy CLAY (CL)	118	94	25																T
DH-107	8.5	Fat CLAY (CH)	112	78	44																T
DH-107	9.5	Fat CLAY (CH)	120	94	29																T, C
DH-107	16.0	Clayey SAND (SC) to Silty SAND (SM)			26	33															M

Classification Tests
UWW = Unit Wet Weight
UDW = Unit Dry Weight
MC = Moisture Content
Fines = % Passing #200 Sieve
LL = Liquid Limit
PI = Plasticity Index

Direct Shear Test
C = Assigned Cohesion, ksf
PHI = Assigned Friction Angle, degrees

Compressive Strength Tests
Qu = Unconfined Compression
Su = Undrained Shear Strength
u = Unconsolidated Undrained
p = Pocket Penetrometer
l = Torvane
m = Miniature Vane

Corrosivity Tests
R = Resistivity, phm-cm, satur.
pH = pH
Cl = Chloride, ppm
SO₄ = Sulfate, ppm

Test Listing Abbreviations
M = Moisture Content
T = Total Dry & Density
S = Sieve Analysis
FC = % Passing #200 Sieve
H = Hydrometer Analysis
A = Atterberg Limits
P = Compaction Test
D = Direct Shear Test
C = Consolidation Test
Co = Corrosivity Tests
CU = CU Triaxial
U = UU Triaxial
R = R-Value (saturated)
SE = Sand Equivalent

SUMMARY OF LABORATORY TEST RESULTS

Cal State Channel Islands, East Campus Development, Camarillo Area of Ventura County



DRILL HOLE	DEPTH, ft	MATERIAL DESCRIPTION	UWW	UDW	MC%	FINES %	ATTERBURG LIMITS		COMPACTION TEST		DIRECT SHEAR			COMPRESSIVE STRENGTH TESTS		CORROSIVITY TESTS				R-VALUE	EXPANSION INDEX	TEST LISTING
							LL	PI	MAX DD pcf	OPT MC %	C ksf	PHI deg		Q _u ksf	S _u ksf	R	pH	Cl	SO ₄			
DH-107	20.0	Fat CLAY (CH)			32																	M
DH-107	25.0	SAND (SP)			19																	M
DH-107	26.0	SAND (SP)				8																FC
DH-201	1.0	Sandy Lean CLAY (CL)																		16		R
DH-201	4.0	Clayey SAND with gravel (SC)	117	101	16																	T
DH-201	6.0	Clayey SAND with gravel (SC)	132	115	15																	T
DH-203	4.0	Sandy Lean CLAY (CL)	119	104	14																	T
DH-204	0.5	Sandy Lean CLAY (CL)																		17		R
DH-204	5.0	Sandy Lean CLAY (CL)	109	95	15																	T
BH-201	1.0	Sandy Lean CLAY (CL)																		18		R
BH-202	4.5	Sandy Lean CLAY (CL)	159	140	14																	T
BH-203	4.0	Sandy Lean CLAY (CL)	110	96	14																	T
BH-204	1.0	Sandy Lean CLAY (CL)																		5		R
BH-204	4.0	Sandy Lean CLAY (CL)	111	95	17																	T
BH-204	4.5	Sandy Lean CLAY (CL)	107	95	13																	T, C
BH-205	1.0	Sandy Lean CLAY (CL)							107	20												P
BH-205	3.0	Sandy Lean CLAY (CL)	115	102	13																	T
BH-205	3.5	Sandy Lean CLAY (CL)	115	102	13						0.10	37										T, C, D
BH-206	4.0	Clayey SAND (SC)	114	99	15																	T
BH-207	1.0	Sandy Lean CLAY (CL)																		62		E
BH-207	4.0	Sandy Lean CLAY (CL)	114	98	17																	T
BH-208	4.0	Clayey SAND (SC)																		65		E
BH-208	6.0	Clayey SAND (SC)	103	88	18																	T
BH-209	1.0	Clayey SAND (SC)														26499	7.0	108	51	5		Co, R
BH-209	4.5	Clayey SAND (SC)	117	96	22																	T
BH-210	5.0	Clayey SAND with gravel (SC)	100	87	15																	T
BH-210	5.5	Clayey SAND with gravel (SC)	100	87	15																	T, C
BH-212	1.0	Clayey SAND with gravel (SC)														17424	7.3	145	60	11		Co, R
BH-214	5.5	Clayey SAND with gravel (SC)	102	89	14																	T
BH-214	7.0	Clayey SAND with gravel (SC)	119	102	17																	T

PLATE B

Classification Tests	Direct Shear Test	Compressive Strength Tests	Corrosivity Tests	Test Listing Abbreviations	
UWW = Unit Wet Weight	C = Assigned Cohesion, ksf	Q _u = Unconfined Compression	R = Resistivity, phm-cm, satur	M = Moisture Content	D = Direct Shear Test
UDW = Unit Dry Weight	PHI = Assigned Friction Angle, degrees	S _u = Undrained Shear Strength	pH = pH	T = Total Dry & Density	C = Consolidation Test
MC = Moisture Content	Compaction Test	u = Unconsolidated Undrained	Cl = Chloride, ppm	S = Sieve Analysis	Co = Corrosivity Tests
Fines = % Passing #200 Sieve	MAX DD = Maximum Dry Density	p = Pocket Penetrometer	SO ₄ = Sulfate, ppm	FC = % Passing #200 Sieve	CU = CU Triaxial
LL = Liquid Limit	OPT MC = Optimum Moisture Content	t = Torvane		H = Hydrometer Analysis	U = UU Triaxial
PI = Plasticity Index		m = Miniature Vane		A = Atterberg Limits	R = R-Value (saturated)
				P = Compaction Test	SE = Sand Equivalent

SUMMARY OF LABORATORY TEST RESULTS

Cal State Channel Islands, East Campus Development, Camarillo Area of Ventura County

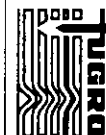
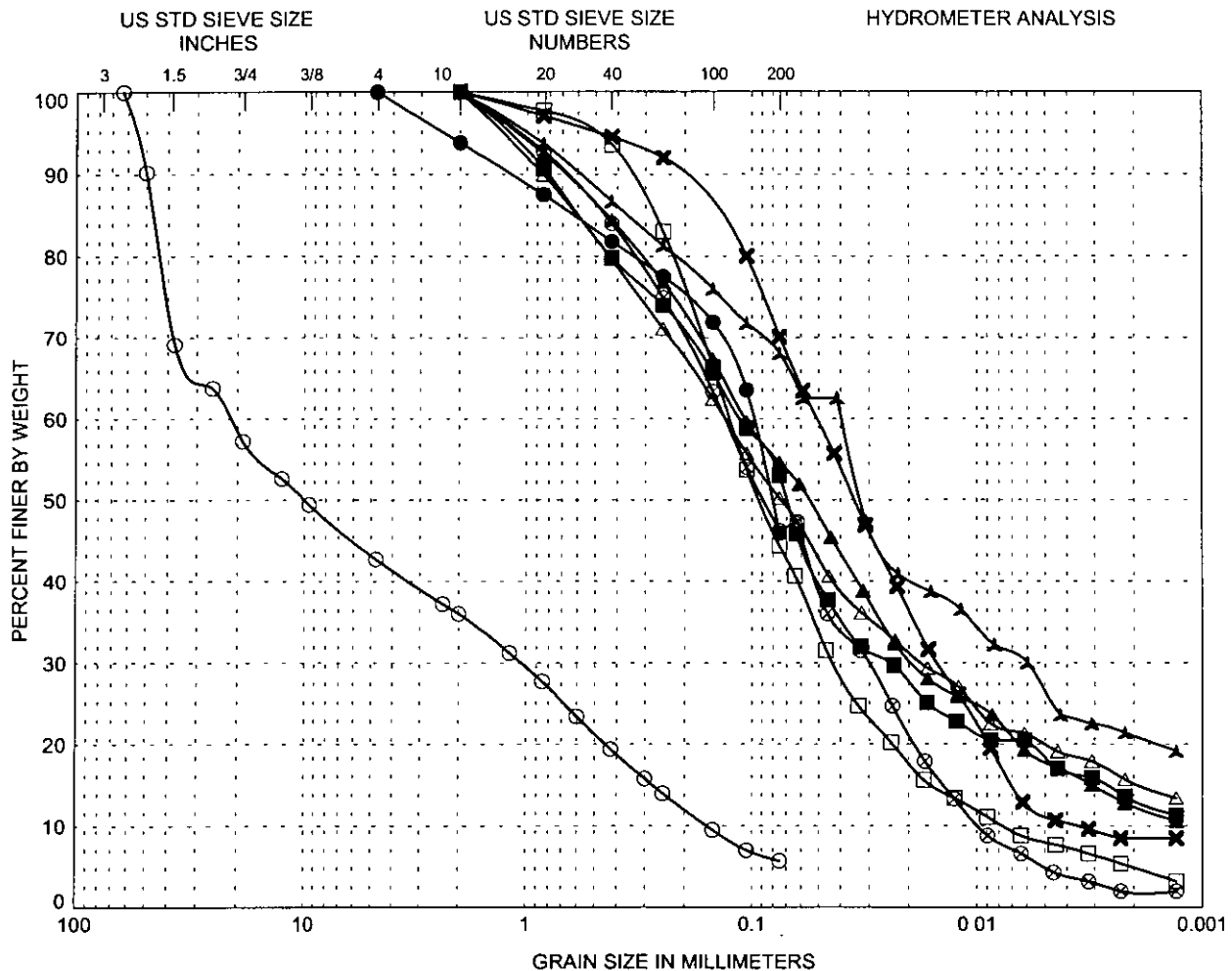


PLATE B-1.6

SUMMARY OF LABORATORY TEST RESULTS

Cal State Channel Islands, East Campus Development, Camarillo Area of Ventura County



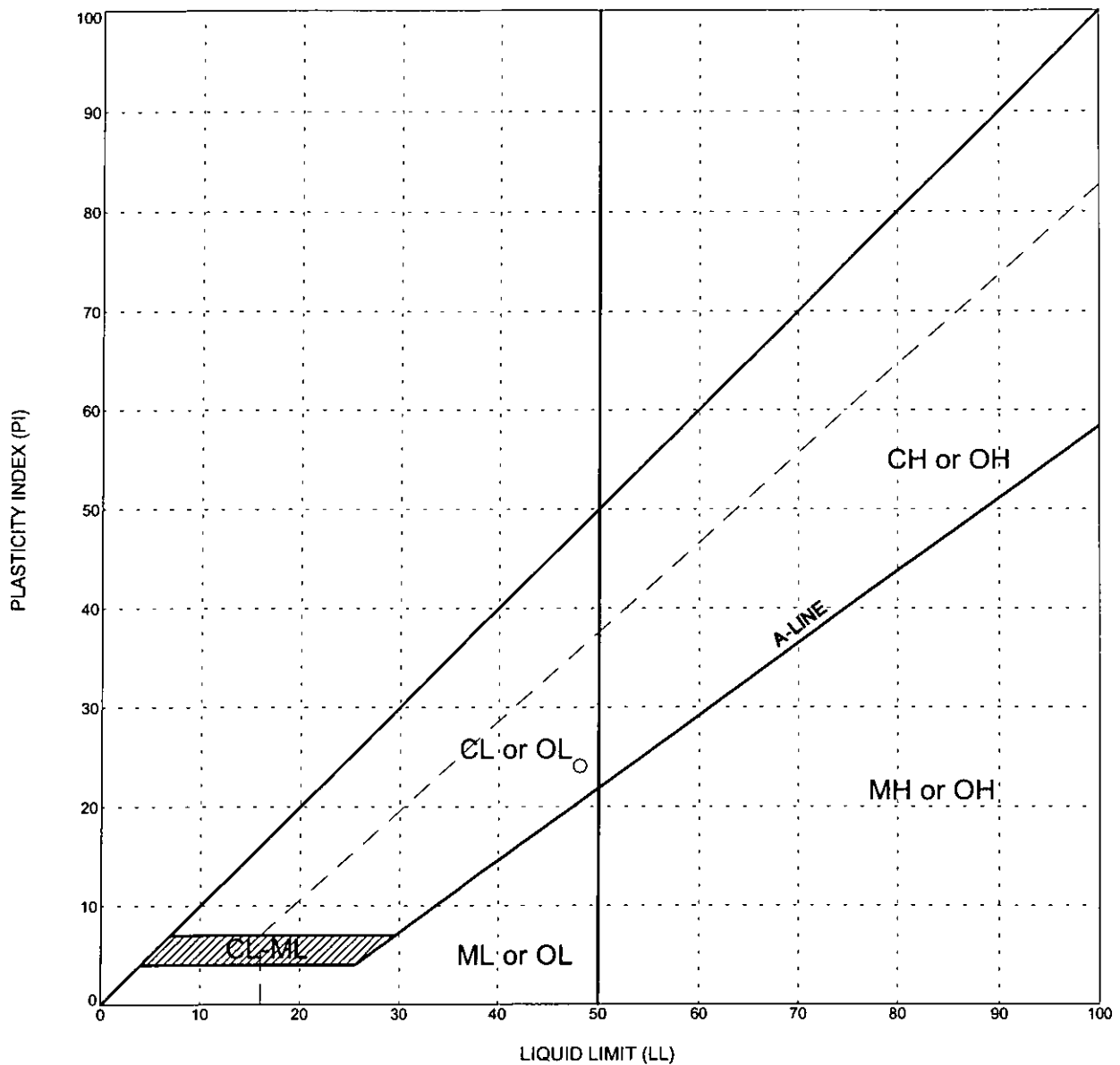
GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

LEGEND		
	(location)	(depth, ft)
○	BH-10	3.0
●	BH-11	3.0
△	DH-1	31.0
▲	DH-1	36.0
□	DH-1	41.0
■	DH-2	41.0
▲	DH-4	6.0
×	DH-6	16.0
⊗	DH-8	20.5

CLASSIFICATION
GRAVEL with SAND (SW)
Silty fine SAND (SM)
Sandy fat CLAY (CH) to clayey SAND (SC)
Sandy fat CLAY (CH) to clayey SAND (SC)
Silty SAND (SM)
Sandy CLAY (CL)
Sandy lean CLAY (CL)
Lean CLAY (CL) to sandy SILT (ML)
Silty SAND (SM)

Cc	Cu
0.3	136.3
1.9	16.5
1.2	14.1
0.7	13.5

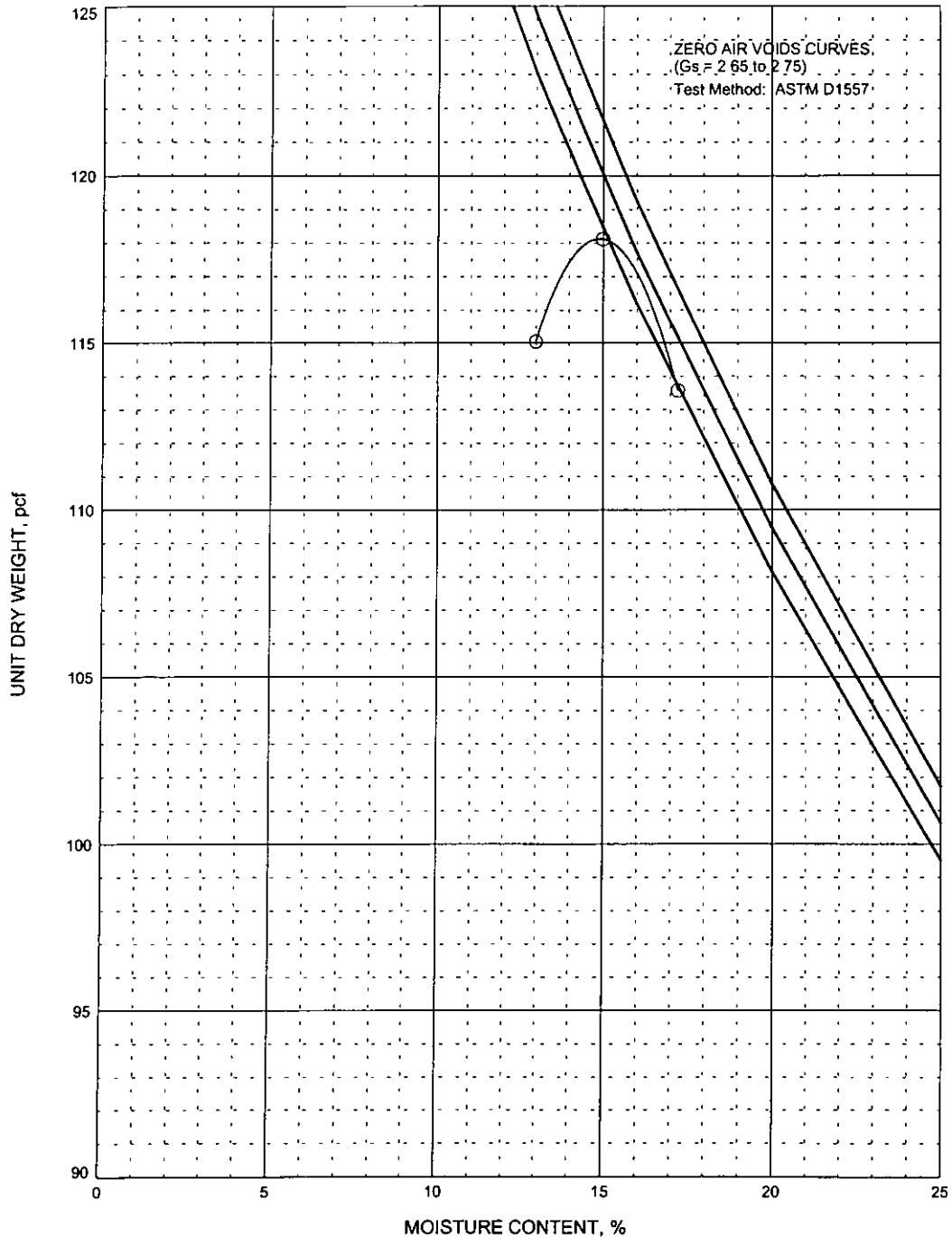
GRAIN SIZE CURVES Cal State Channel Islands, East Campus Development Camarillo Area of Ventura County



LEGEND		CLASSIFICATION	ATTERBERG LIMITS TEST RESULTS		
(location)	(depth, ft)		LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)
○ DH-1	26.0	Interlayered Sandy CLAY (CL) to Clayey SAND (CL)	48	24	24

PLASTICITY CHART
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

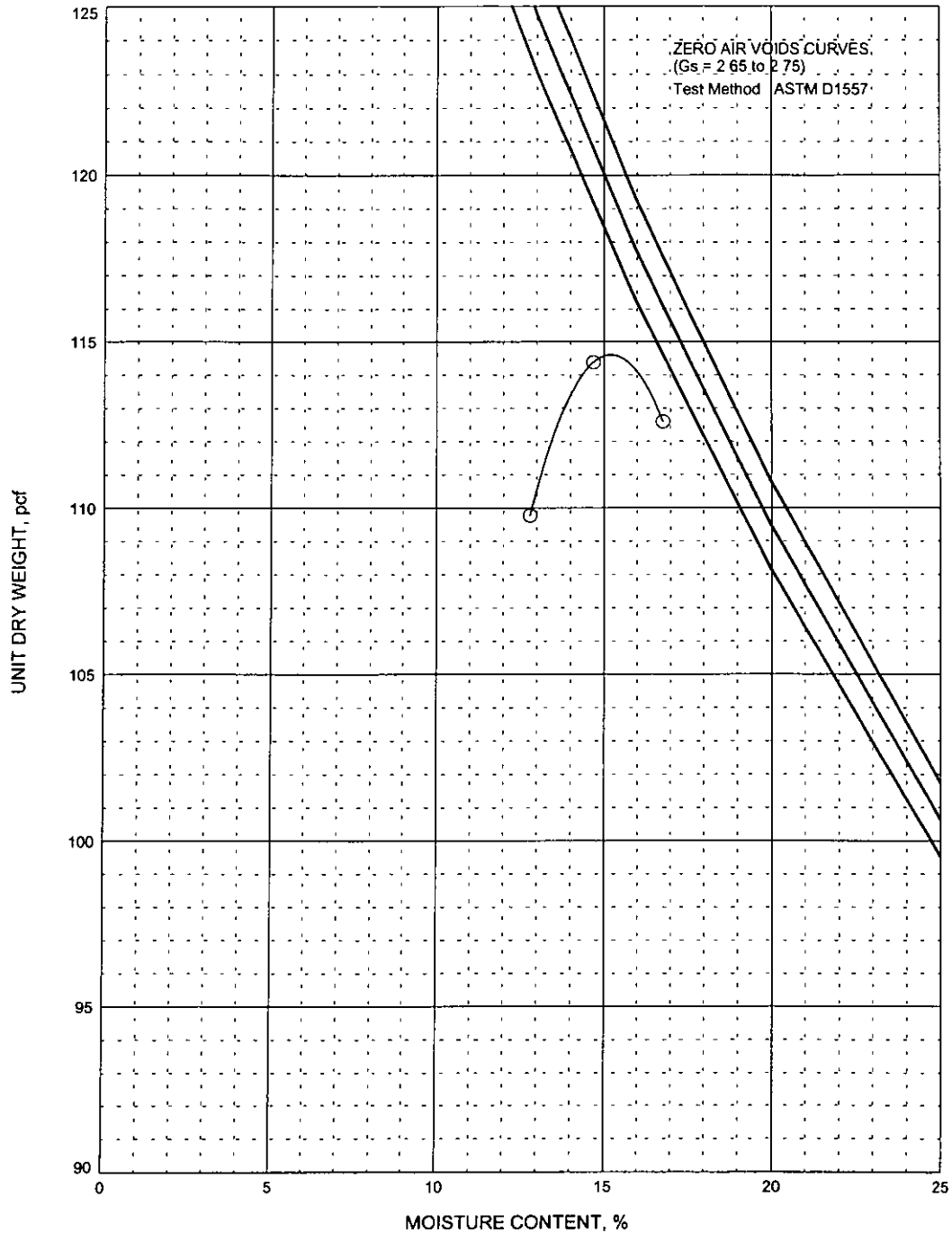
PLATE B-3



LEGEND		CLASSIFICATION	MAXIMUM UNIT DRY WEIGHT, pcf	OPTIMUM WATER CONTENT, %
(location)	(depth, ft)			
○ DH-3	1-5	Lean CLAY (CL)	118.5	15.0

COMPACTION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

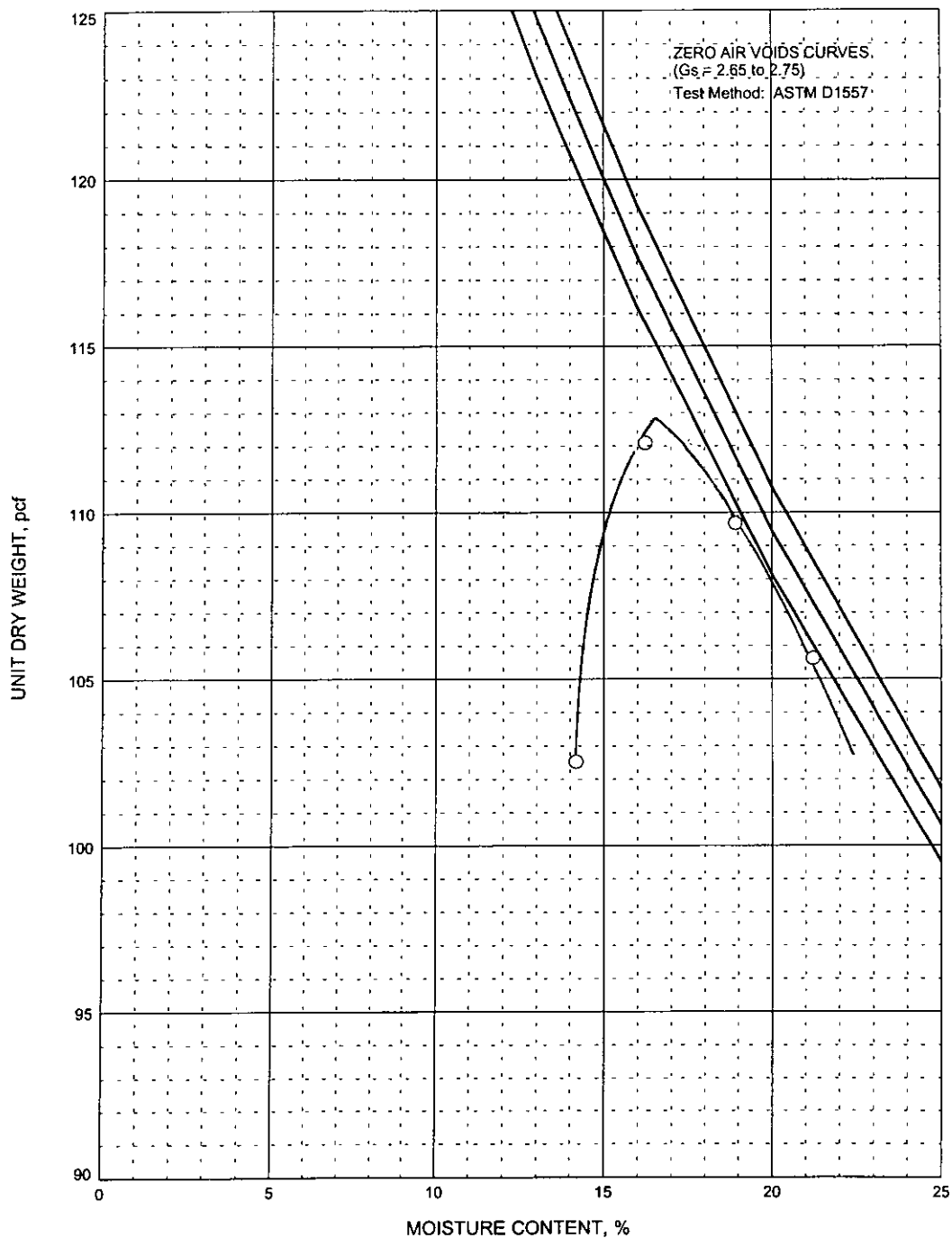
PLATE B-4.1



LEGEND		CLASSIFICATION	MAXIMUM UNIT DRY WEIGHT, pcf	OPTIMUM WATER CONTENT, %
○ (location)	(depth, ft)			
○ DH-6	1-5	Sandy fat CLAY (CH) to sandy SILT (ML)	115.0	15.0

COMPACTION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

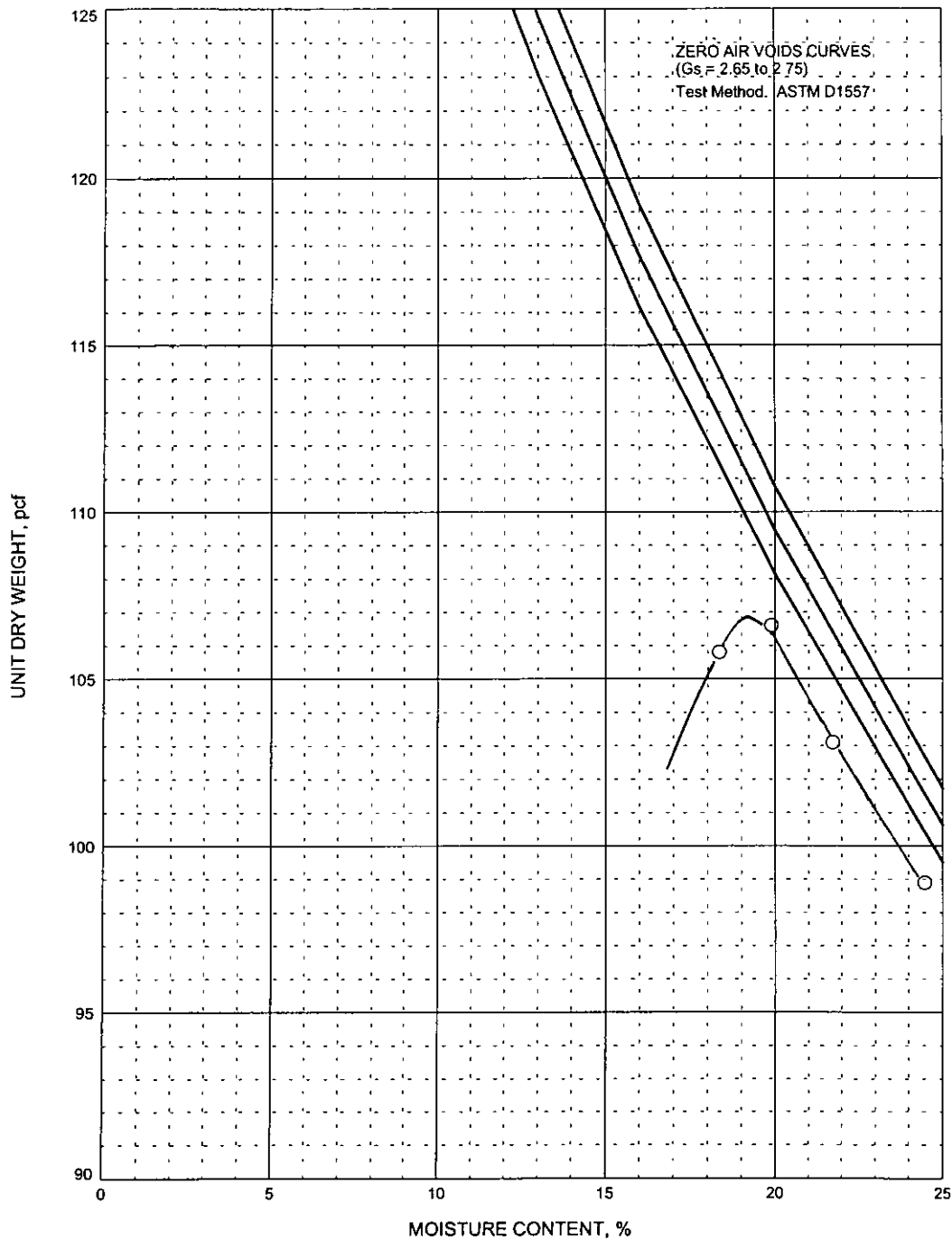
PLATE B-4.2



LEGEND		CLASSIFICATION	MAXIMUM UNIT DRY WEIGHT, pcf	OPTIMUM WATER CONTENT, %
○	(location) DH-8	(depth, ft) 2-7		
		Fat CLAY (CH)	113.0	16.5

COMPACTION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

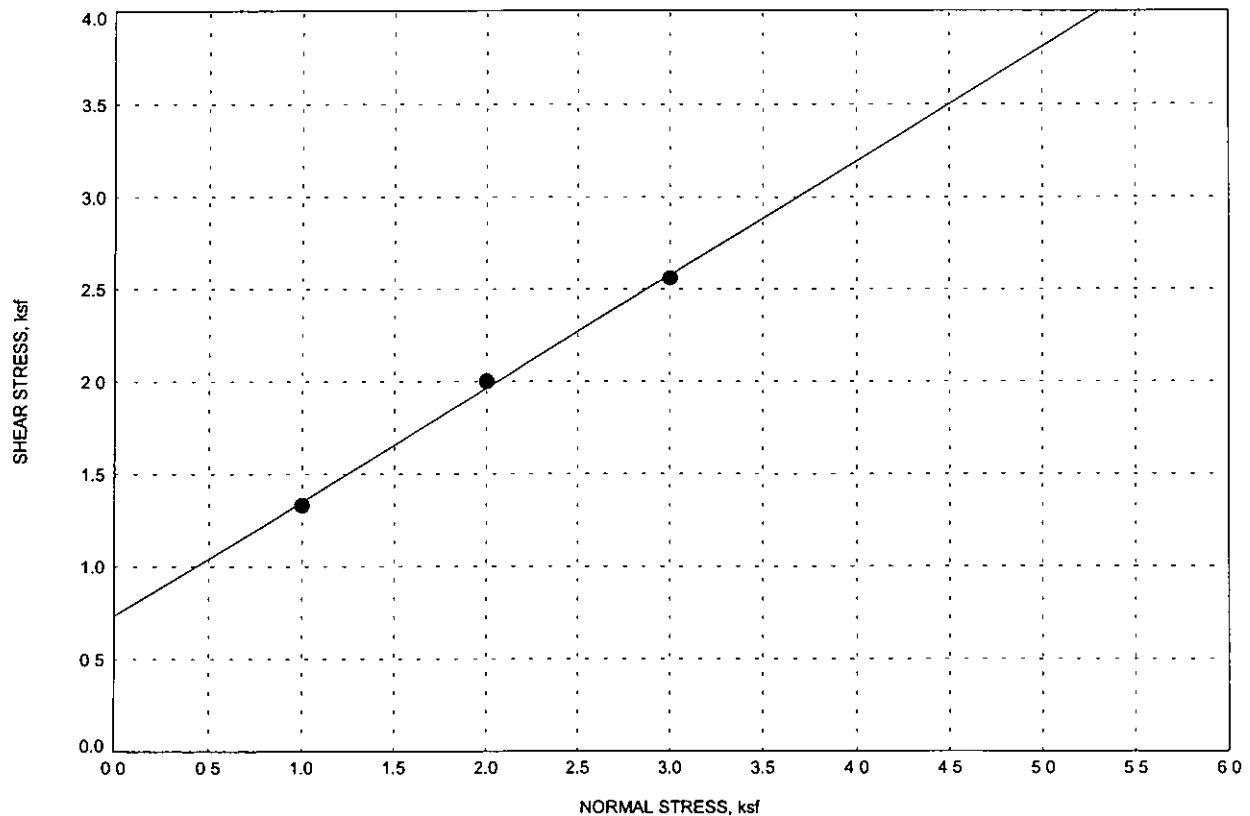
PLATE B-4.3



LEGEND		CLASSIFICATION	MAXIMUM UNIT DRY WEIGHT, pcf	OPTIMUM WATER CONTENT, %
○	(location) BH-205	(depth, ft) 1-4		
		Sandy Lean CLAY (CL)	106.5	20.0

COMPACTION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE B-4.4



EFFECTIVE COHESION, ksf 0.73

EFFECTIVE ANGLE OF
INTERNAL FRICTION, deg 32

LOCATION DH-3

DEPTH, ft 1-5

MOISTURE CONTENT, % 23.1

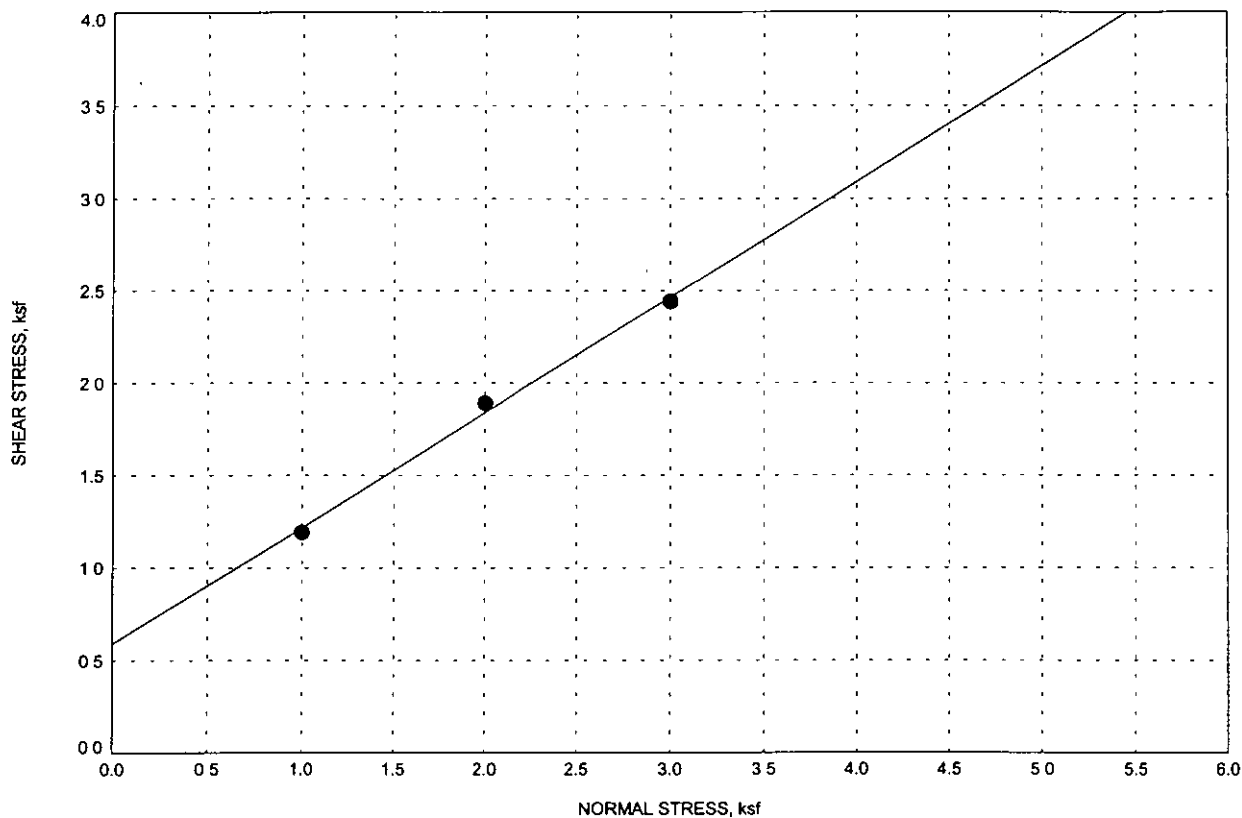
UNIT DRY WEIGHT, pcf 101.2

MATERIAL DESCRIPTION Lean CLAY (CL)

SAMPLE CONDITION Sample compacted to 90% of maximum dry
density at 12% moisture content

DIRECT SHEAR TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE B-5.1



EFFECTIVE COHESION, ksf 0.60

EFFECTIVE ANGLE OF
INTERNAL FRICTION, deg 32

LOCATION DH-6

DEPTH, ft 1-5

MOISTURE CONTENT, % 23.0

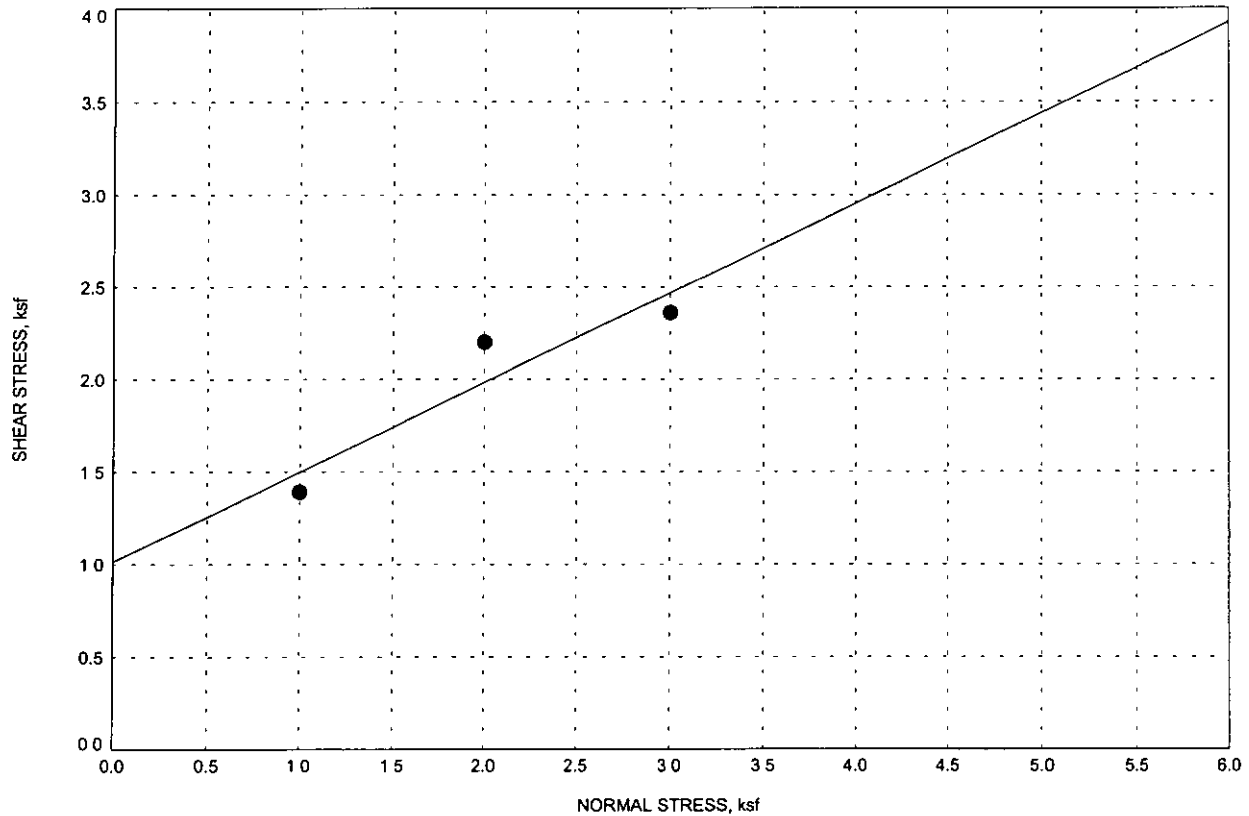
UNIT DRY WEIGHT, pcf 97.8

MATERIAL DESCRIPTION Sandy fat CLAY (CH) to sandy SILT (ML)

SAMPLE CONDITION Sample compacted to 90% of maximum dry
density at about optimum moisture content

DIRECT SHEAR TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE B-5.2



EFFECTIVE COHESION, ksf 1.01

EFFECTIVE ANGLE OF
INTERNAL FRICTION, deg 26

LOCATION DH-8

DEPTH, ft 2-7

MOISTURE CONTENT, % 26.5

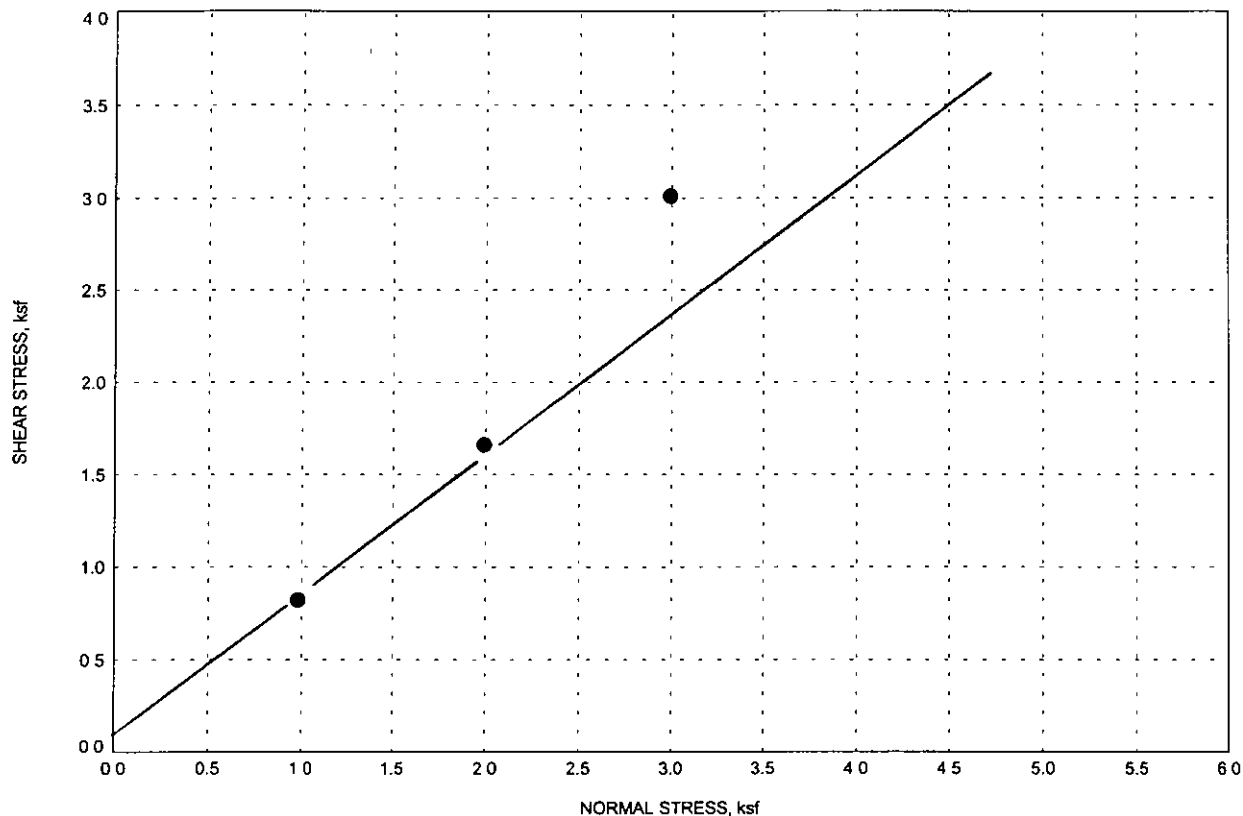
UNIT DRY WEIGHT, pcf 93.9

MATERIAL DESCRIPTION Fat CLAY (CH)

SAMPLE CONDITION Sample compacted to 90% of maximum dry
density at about optimum moisture content

DIRECT SHEAR TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE B-5.3



EFFECTIVE COHESION, ksf 0.10

EFFECTIVE ANGLE OF
INTERNAL FRICTION, deg 37

LOCATION BH-205

DEPTH, ft 3.5

MOISTURE CONTENT, % 20

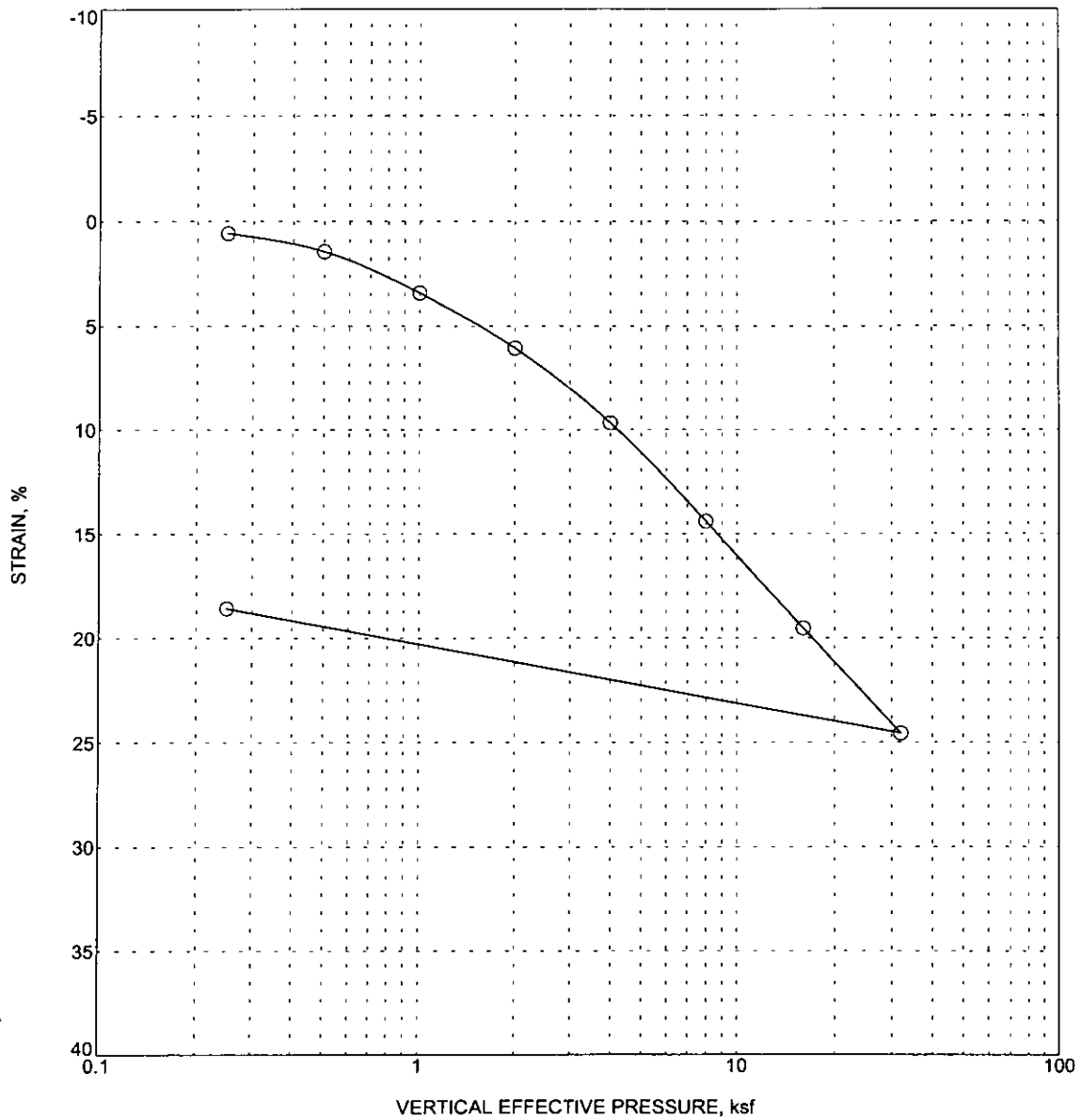
UNIT DRY WEIGHT, pcf 93

MATERIAL DESCRIPTION Sandy Lean CLAY (CL)

SAMPLE CONDITION Liner Sample

DIRECT SHEAR TEST RESULTS Cal State Channel Islands, East Campus Development Camarillo Area of Ventura County

PLATE B-5.4

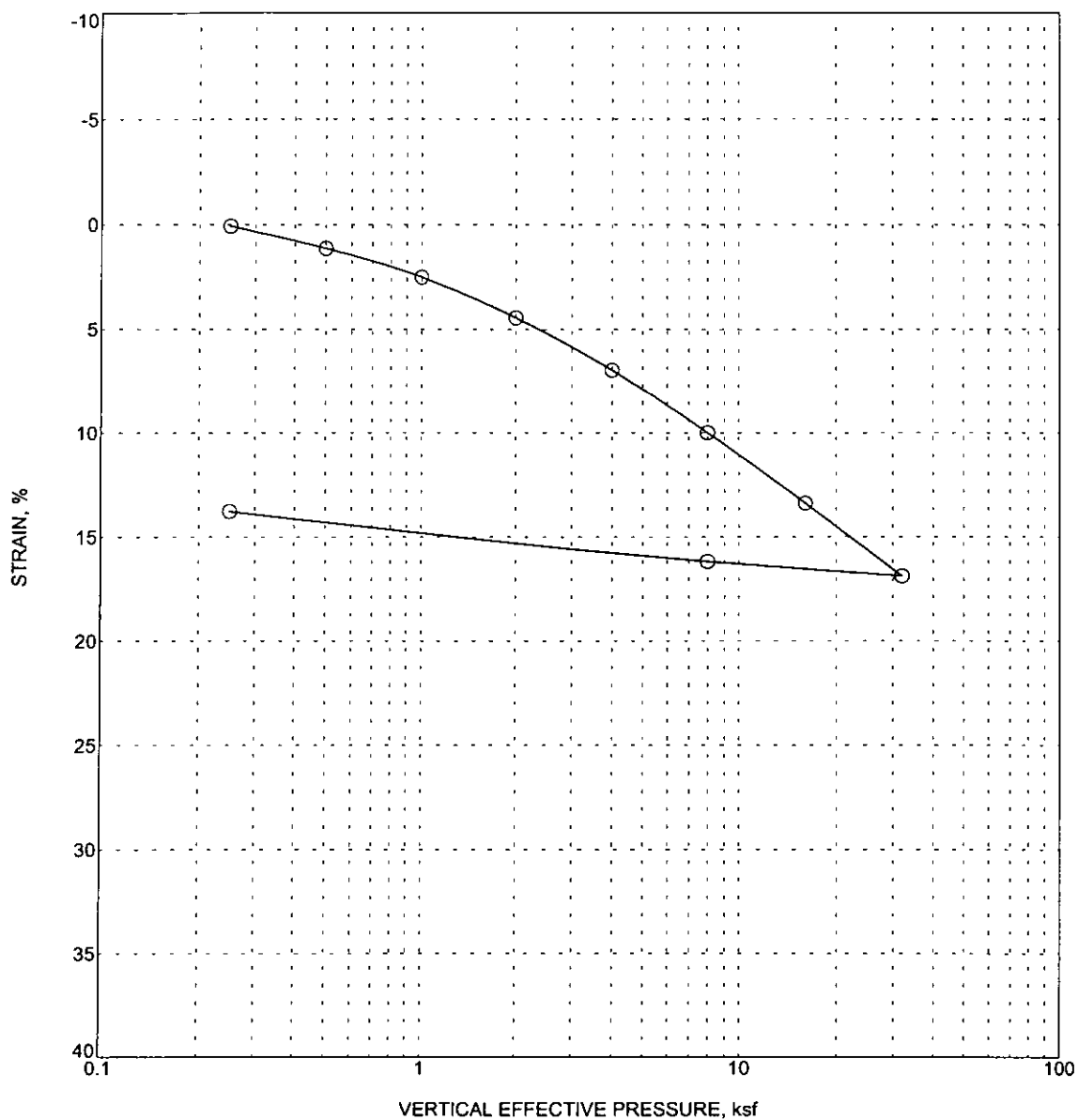


LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

DH-1
3.8
19
103
Lean to Fat CLAY (CL)
Shelby Tube Sample

CONSOLIDATION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

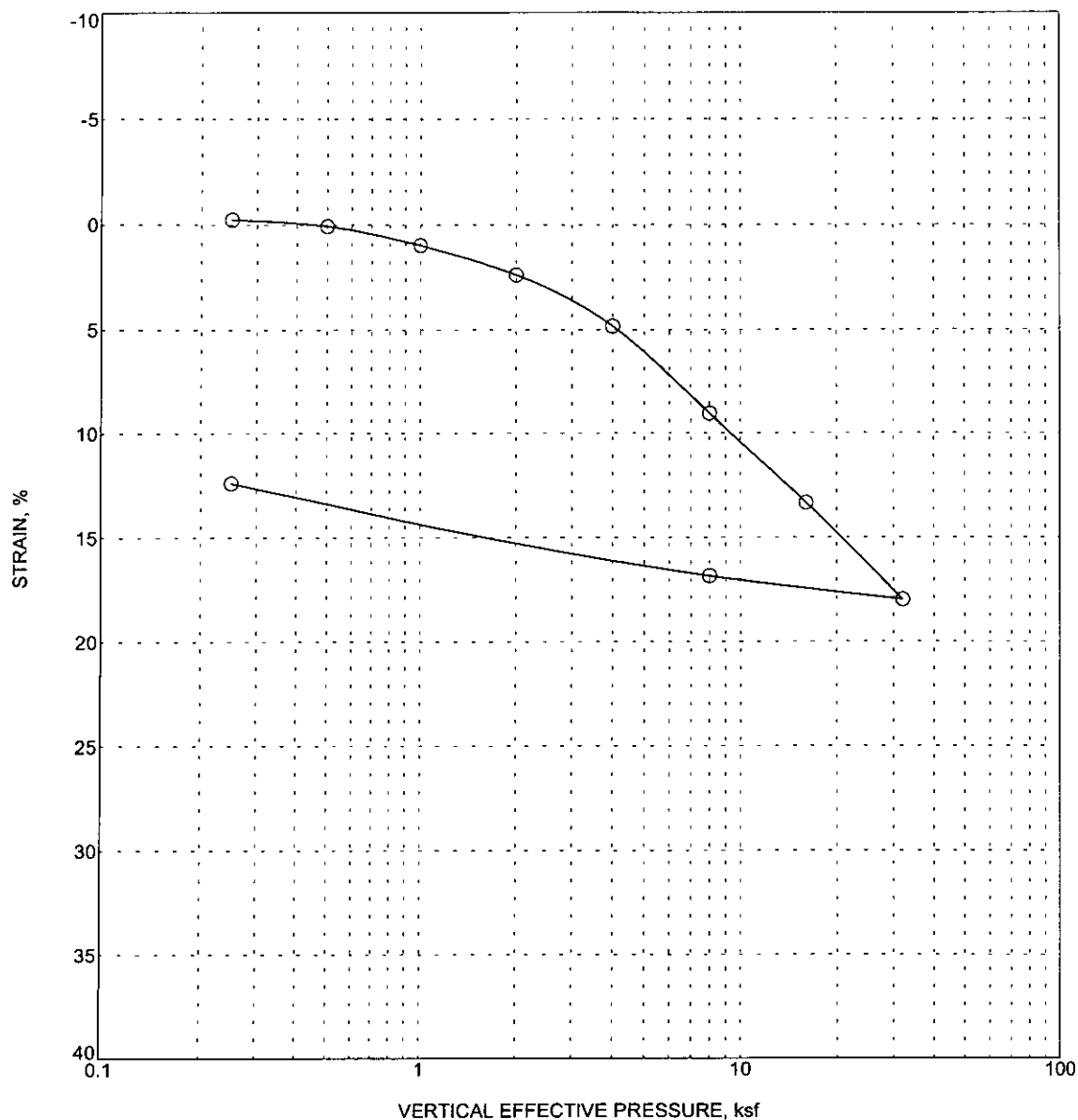
PLATE B-6.1



LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

DH-1
6.0
24
98
Fat CLAY (CH)
Liner Sample

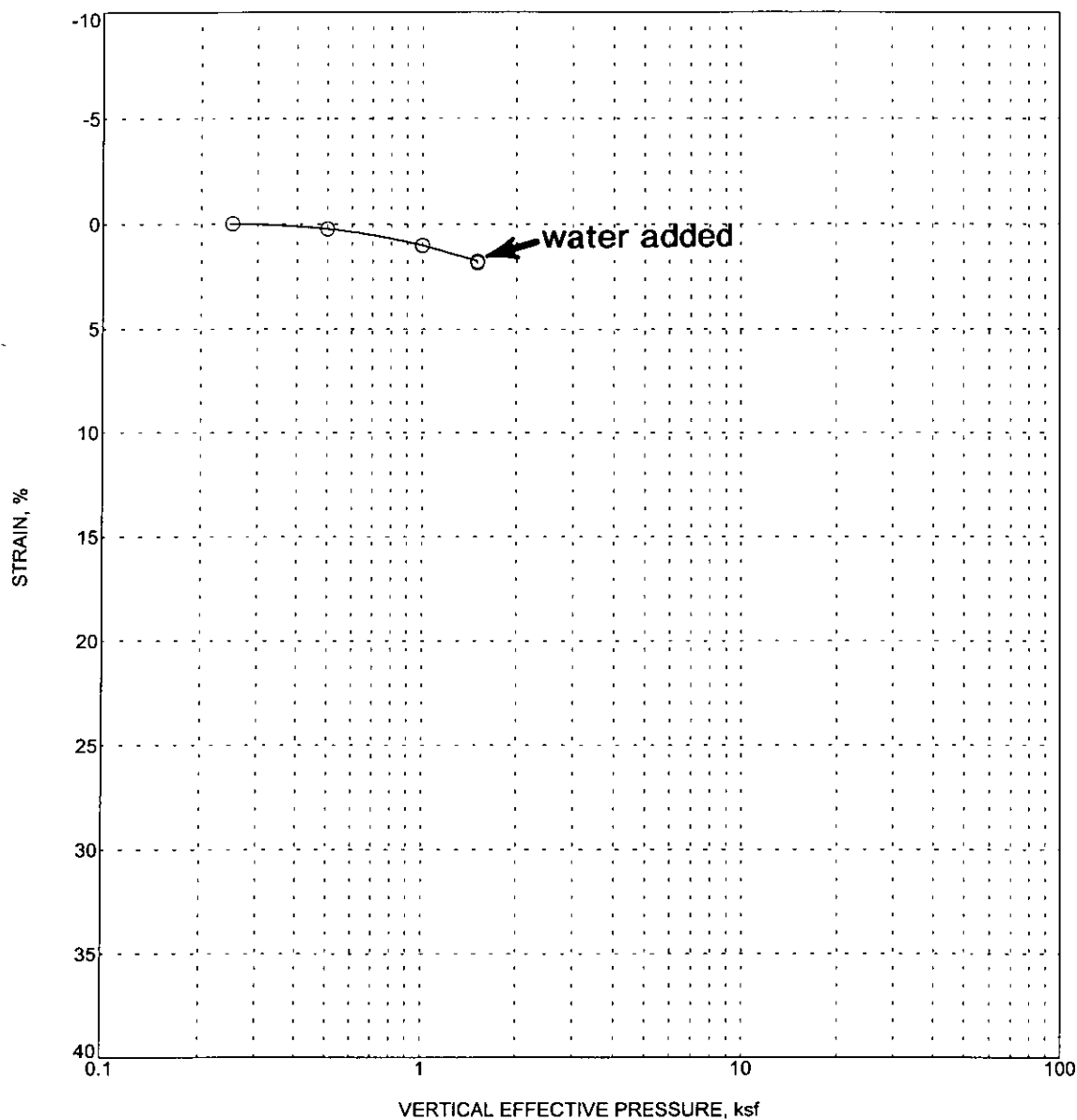
CONSOLIDATION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

DH-1
11.0
31
91
Interlayered Silty to Clayey SAND (SM/SC)
Liner Sample

CONSOLIDATION TEST RESULTS Cal State Channel Islands, East Campus Development Camarillo Area of Ventura County

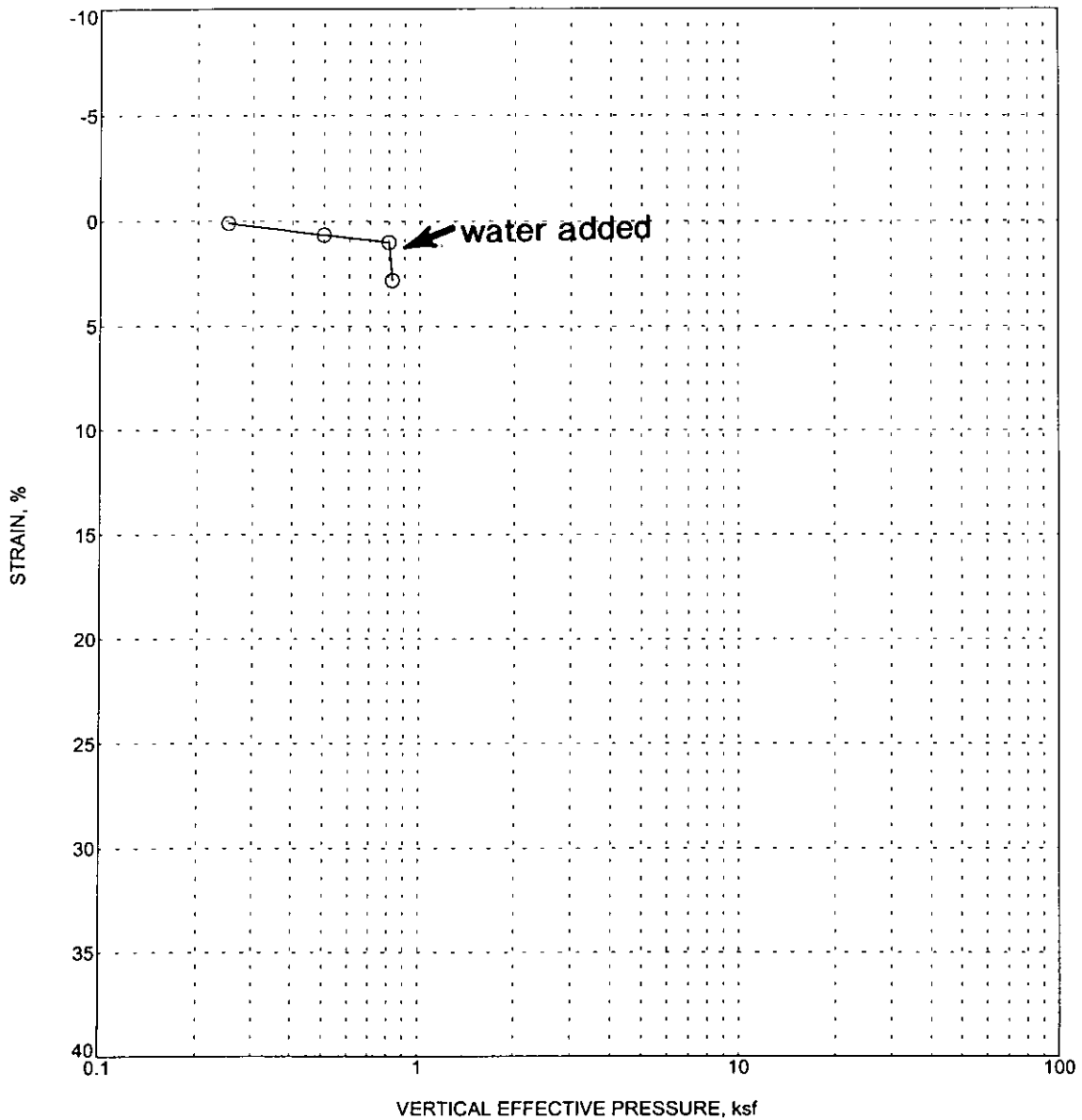


LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

DH-3
11.0
22
92
Lean CLAY (CL)
Liner Sample

HYDROCONSOLIDATION TEST RESULTS Cal State Channel Islands, East Campus Development Camarillo Area of Ventura County

PLATE B-6.4

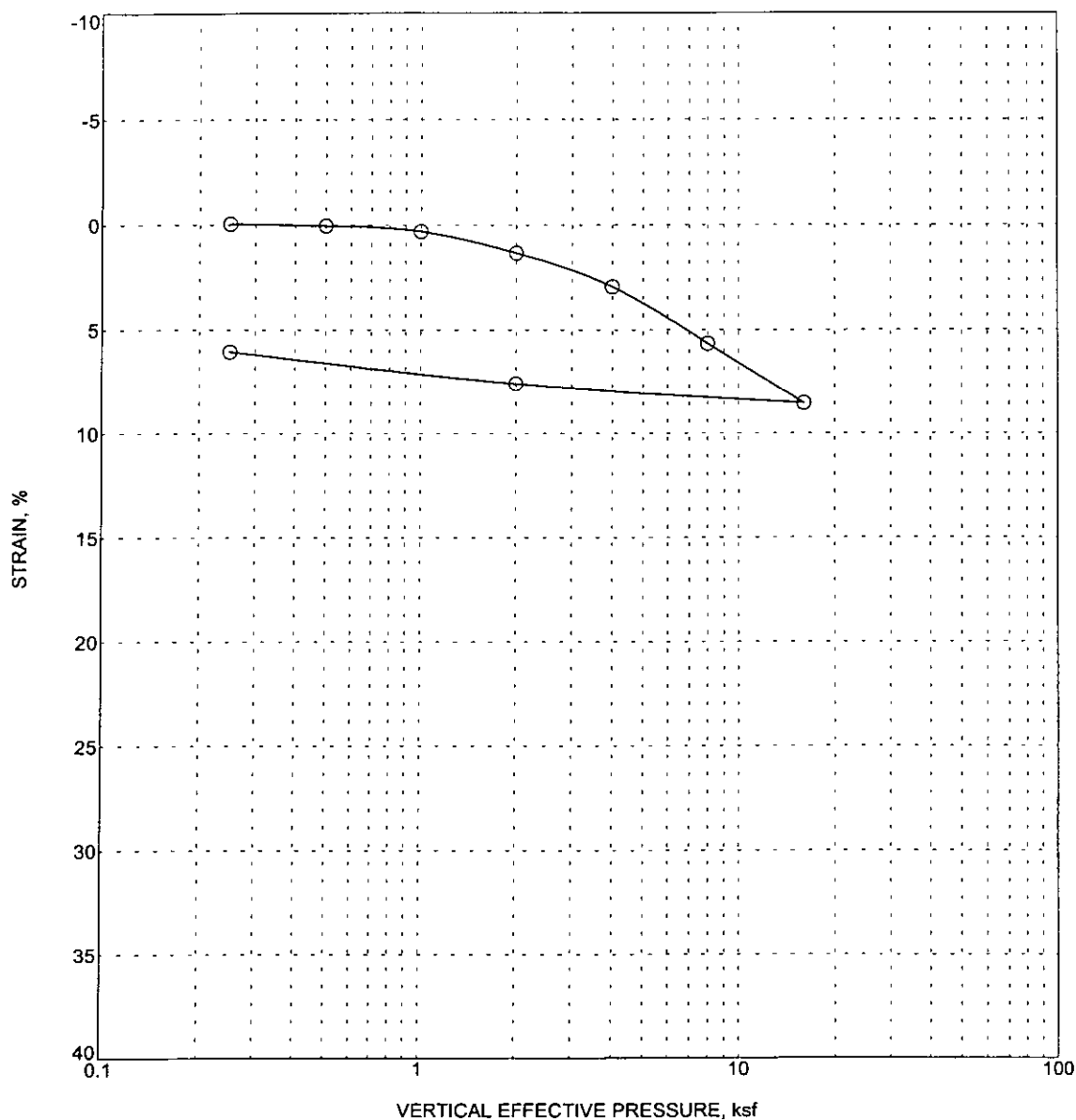


LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

DH-6
6.0
18
97
Sandy Fat CLAY (CH) to Sandy SILT (ML)
Liner Sample

HYDROCONSOLIDATION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

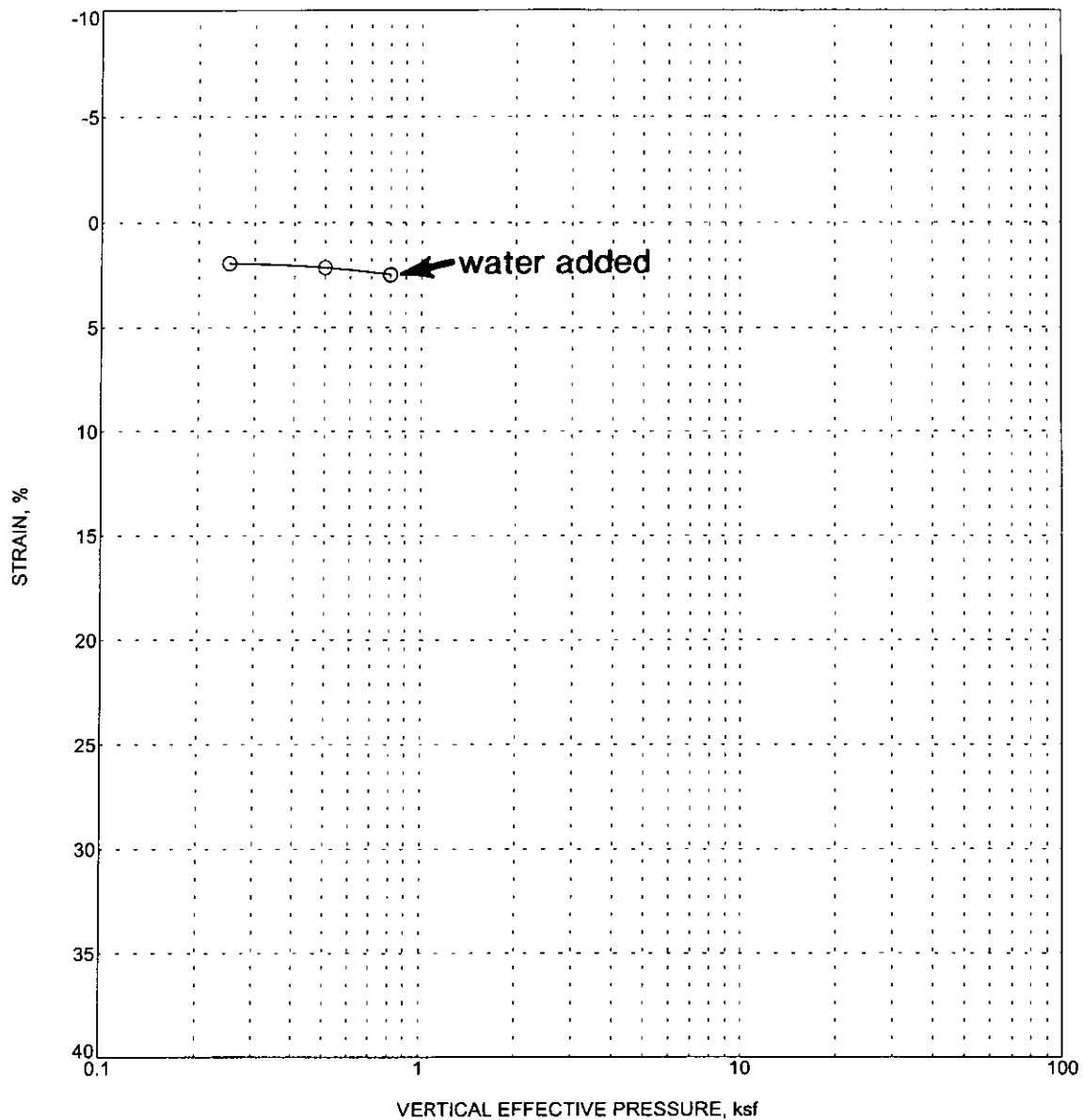
PLATE B-6.5



LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

DH-6
11.0
20
106
Lean CLAY (CL) to Sandy SILT (ML)
Liner Sample

CONSOLIDATION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

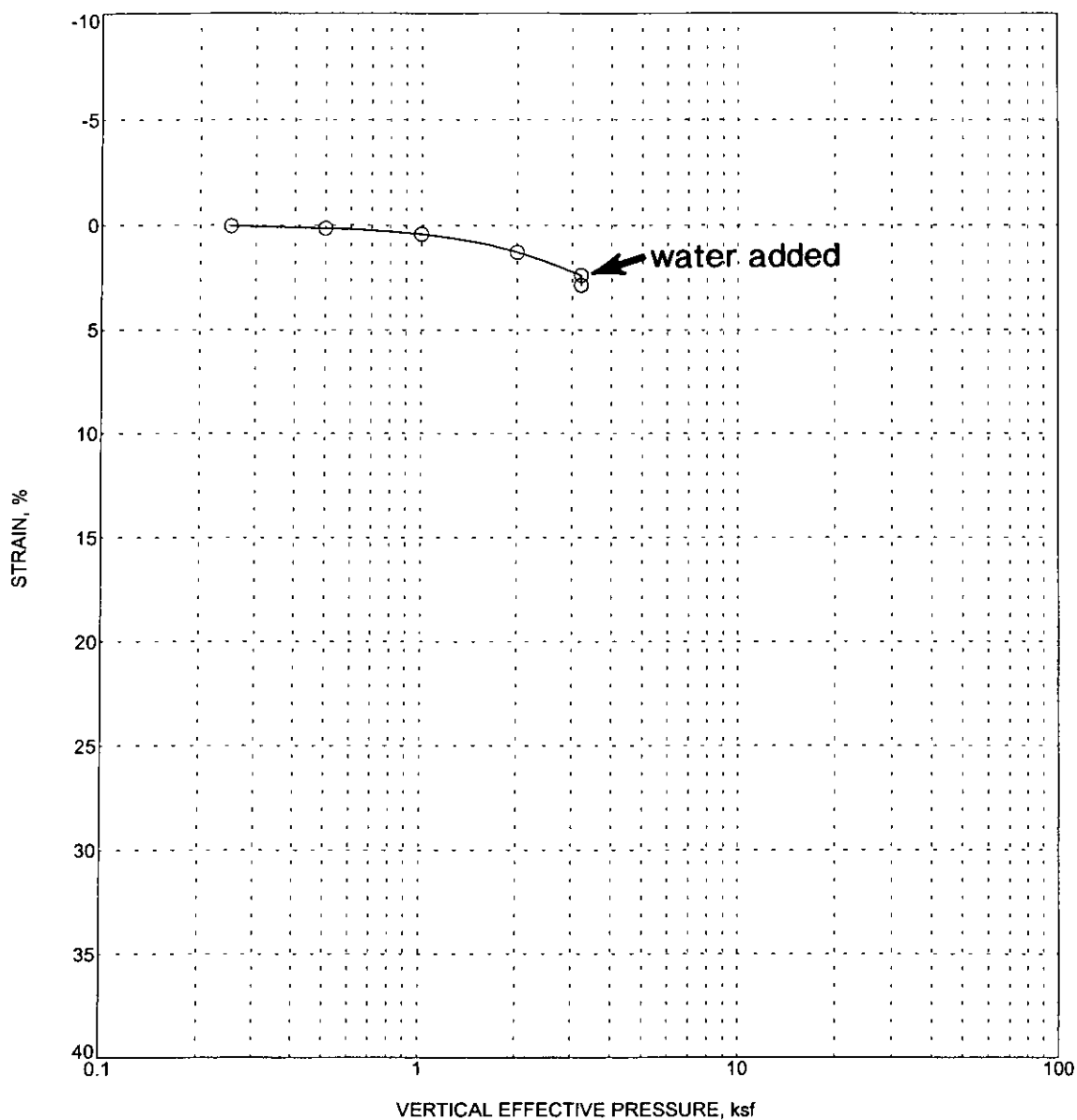


LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

DH-7
6.0
19
103
Silty SAND (SM)
Liner Sample

HYDROCONSOLIDATION TEST RESULTS Cal State Channel Islands, East Campus Development Camarillo Area of Ventura County

PLATE B-6.7

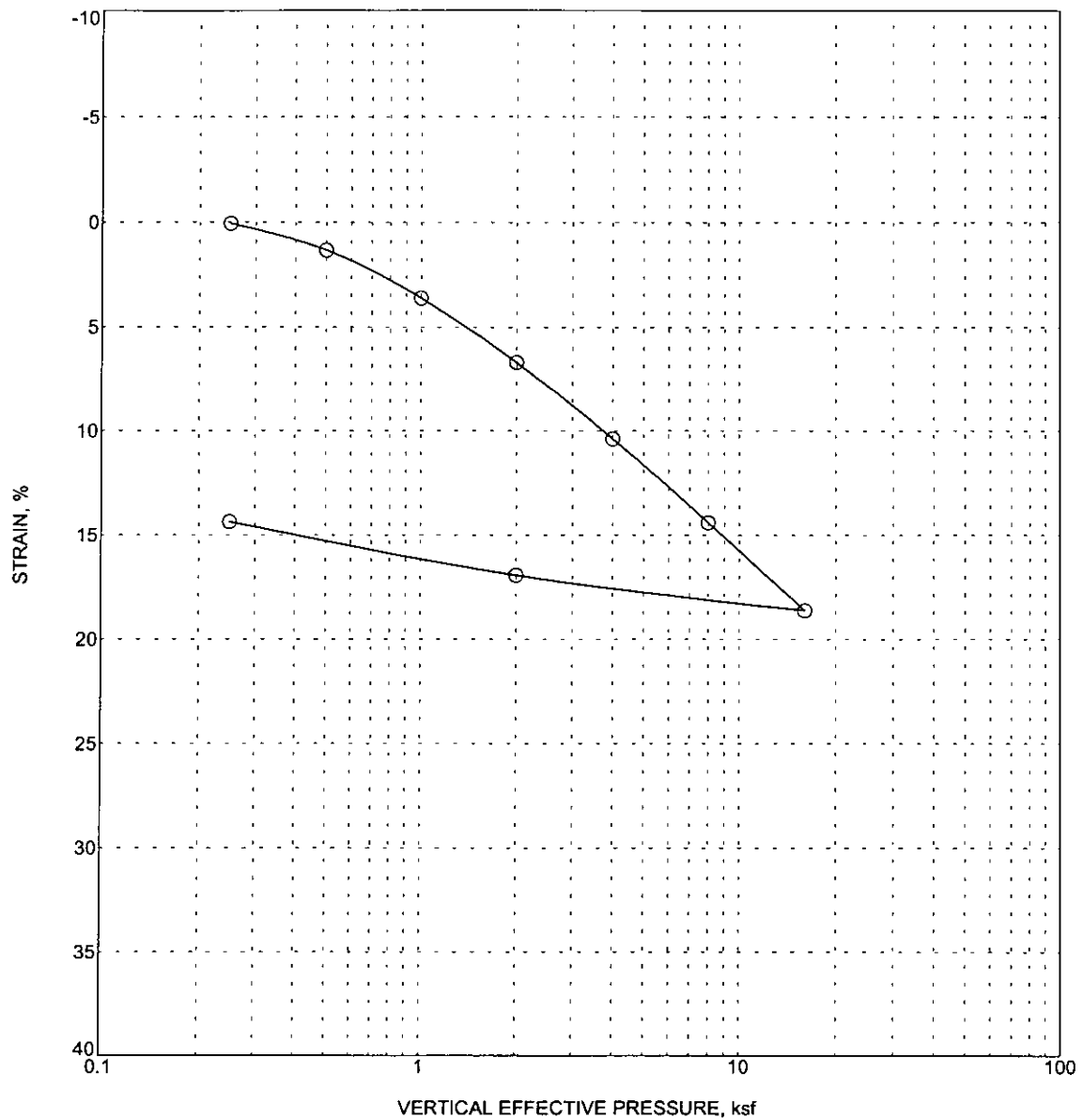


LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

DH-7
26.0
25
98
Lean CLAY (CL)
Liner Sample

CONSOLIDATION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

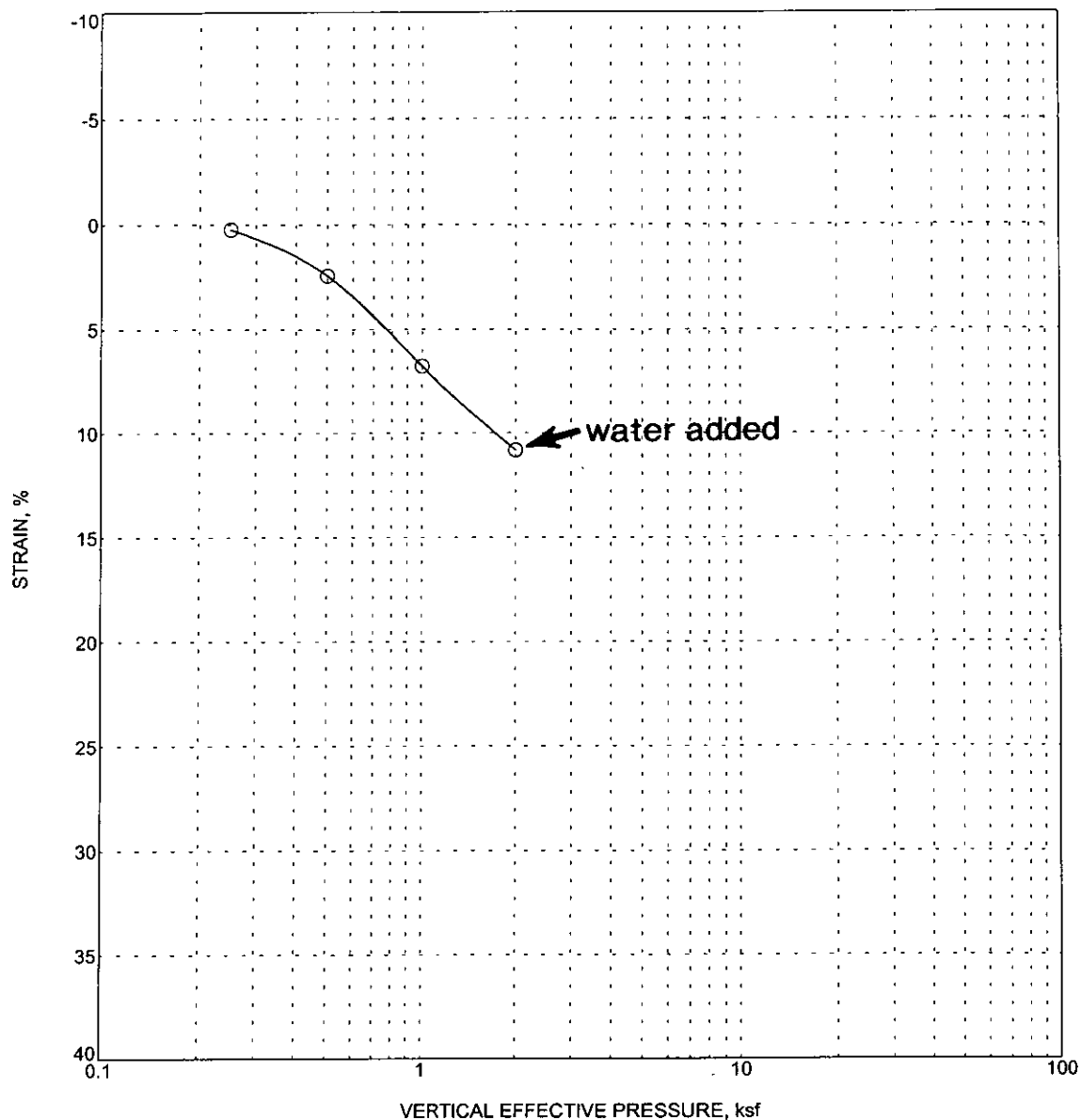
PLATE B-6.8



LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

DH-8
6.0
24
89
Fat CLAY (CH)
Liner Sample

CONSOLIDATION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County



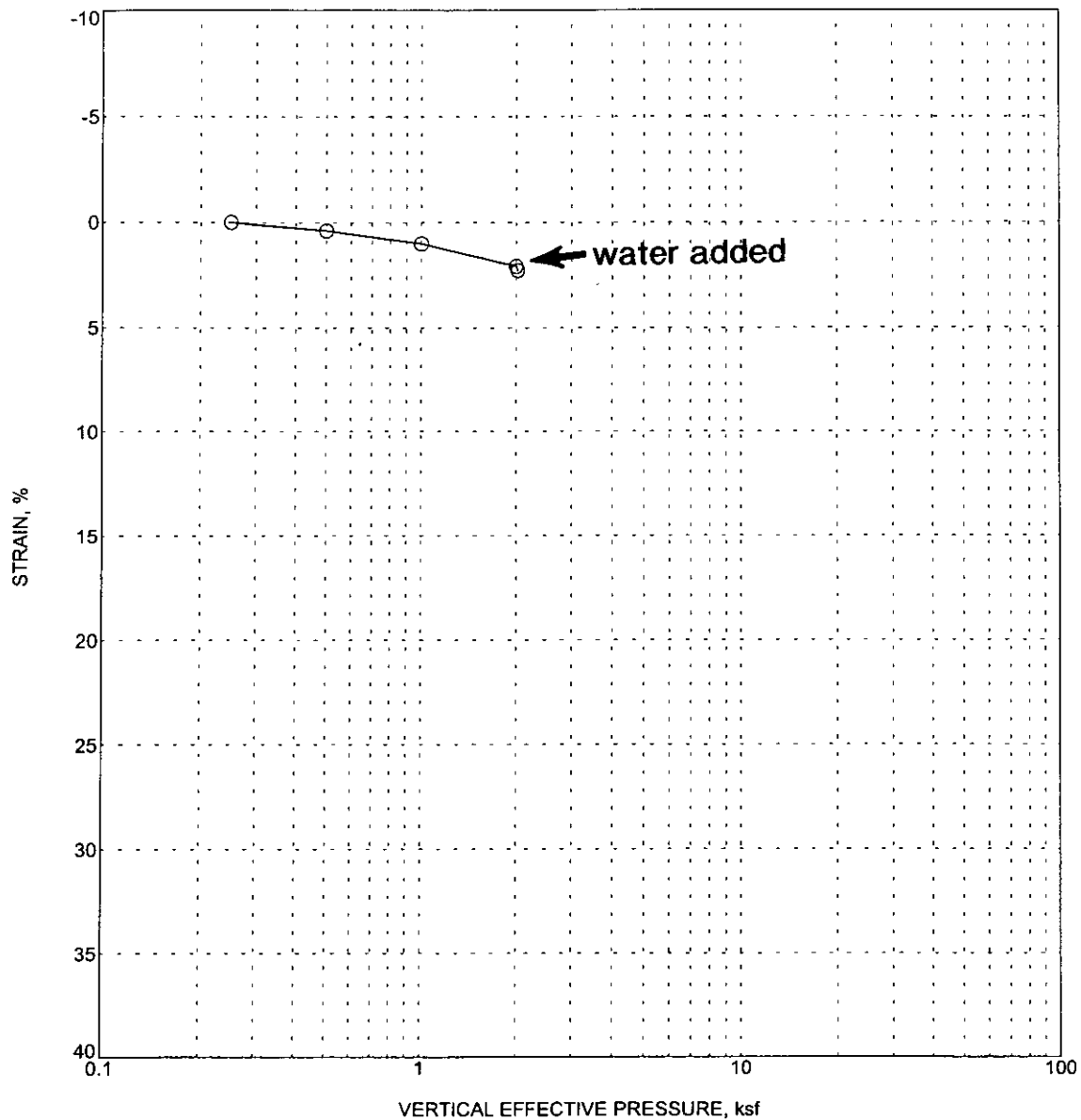
LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

DH-8
16.0
18
87
Silty fine SAND (SM)
Liner Sample

HYDROCONSOLIDATION TEST RESULTS

Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE B-6.10

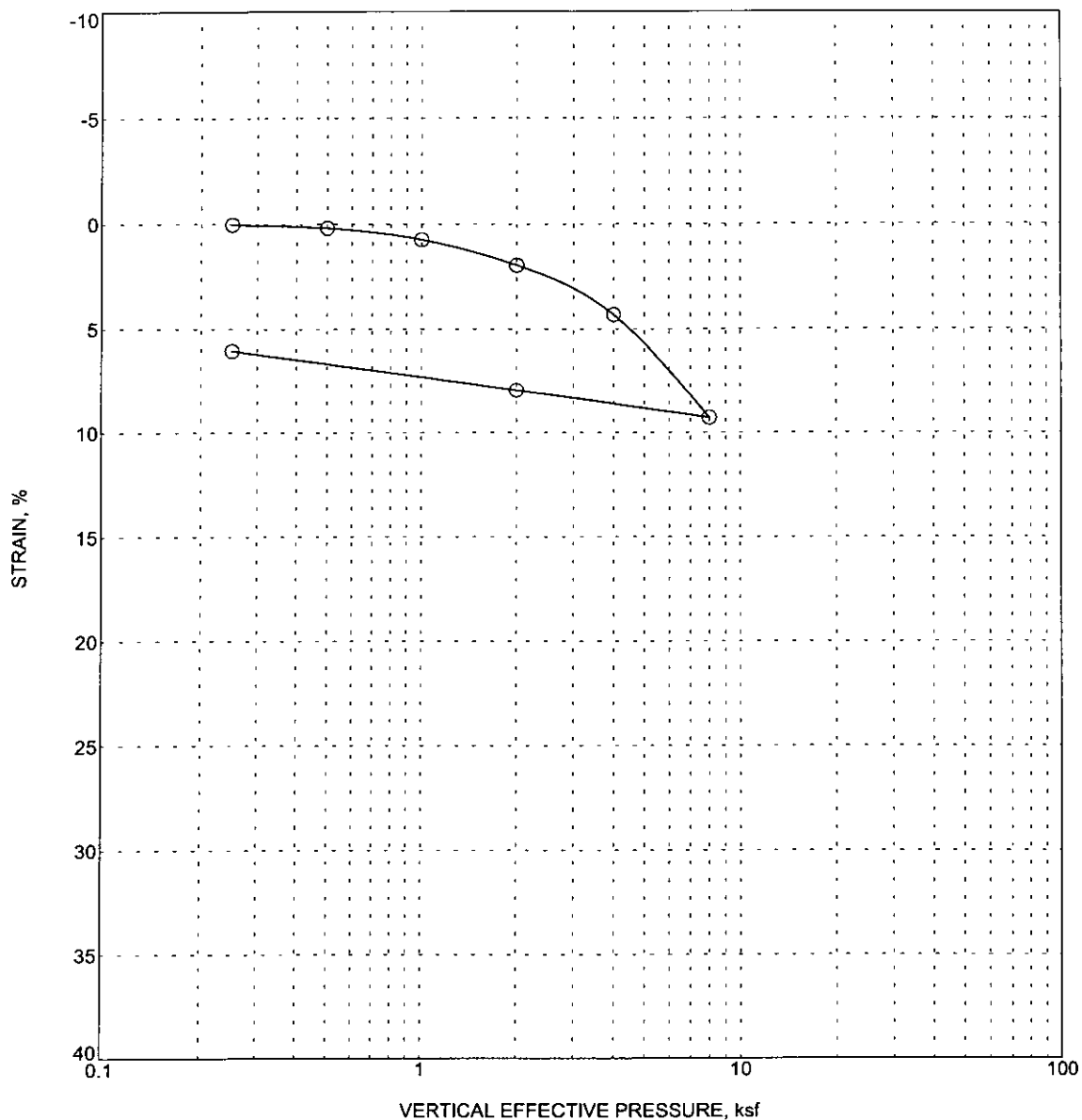


LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

DH-8
20.5
29
90
Silty SAND (SM)
Liner Sample

HYDROCONSOLIDATION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE B-6.11

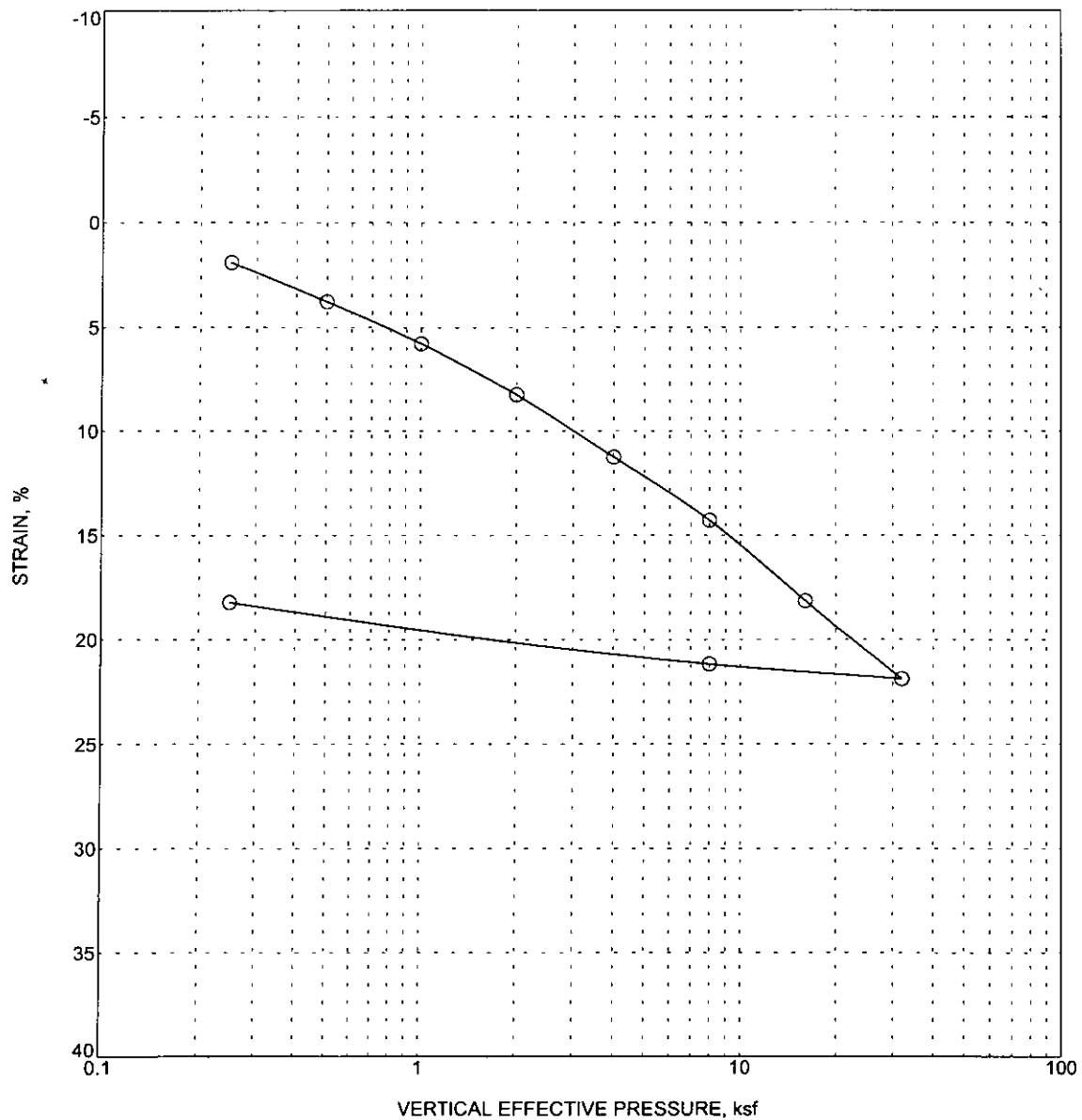


LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

DH-101
6.0
21
105
Lean to fat CLAY (CL/CH)
Liner Sample

CONSOLIDATION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE B-6.12

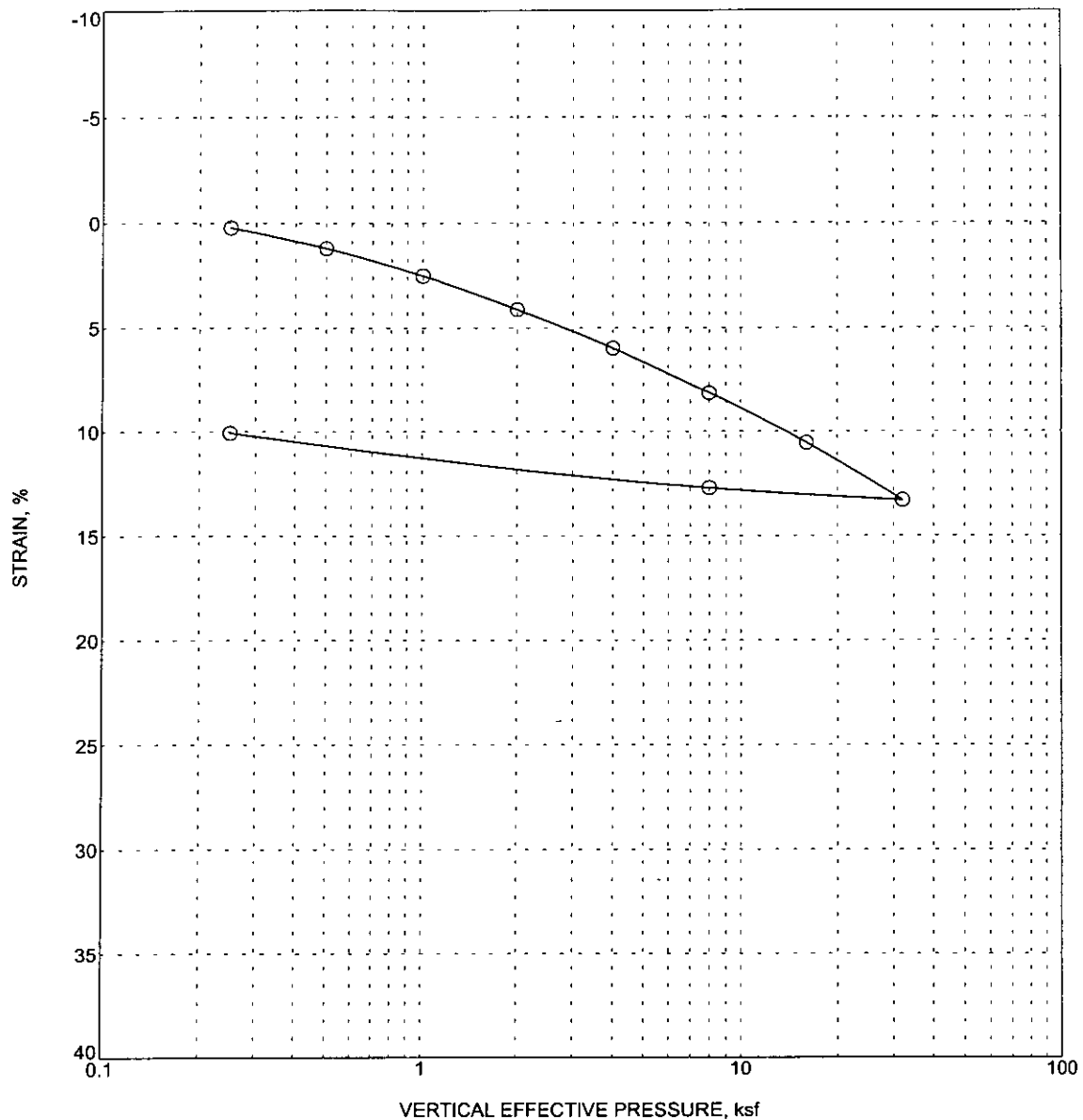


LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

DH-105
5.5
24
101
Lean to Fat CLAY (CL/CH)
Shelby Tube Sample

CONSOLIDATION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE B-6.13



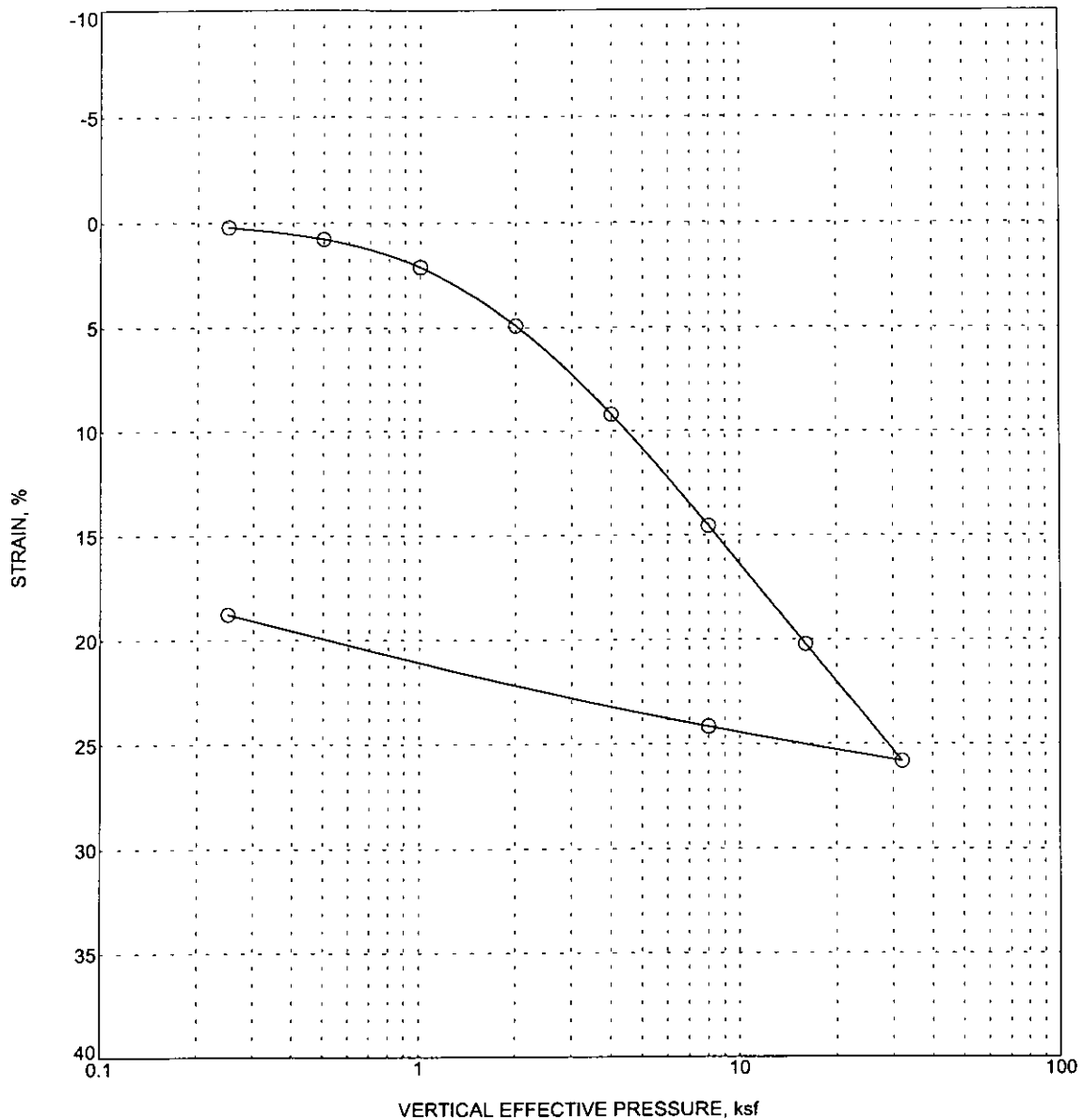
LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

DH-106
7.5
18
114
Sandy CLAY (CL)
Shelby Tube Sample

CONSOLIDATION TEST RESULTS

Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE B-6.14

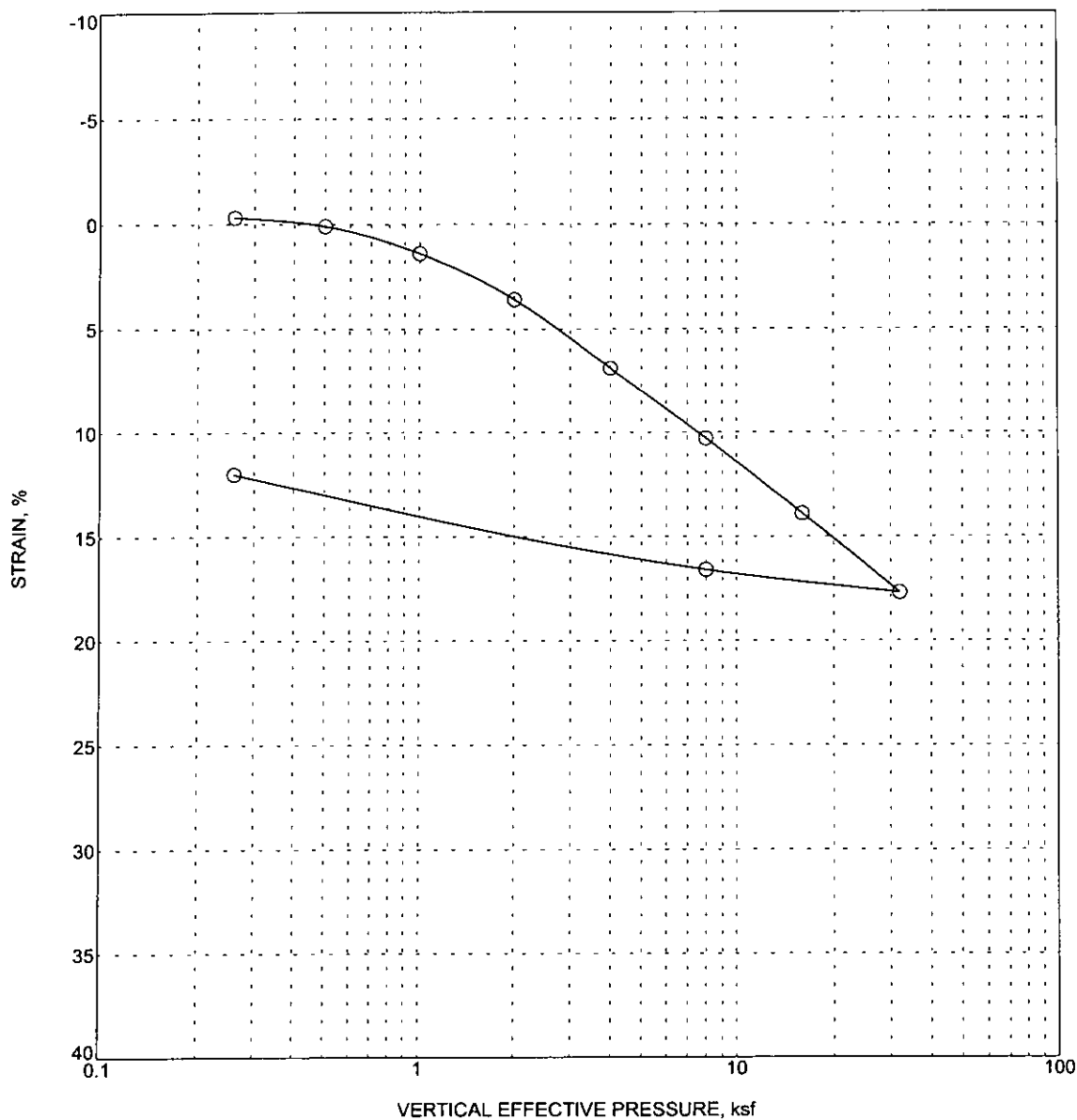


LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

DH-107
9.5
29
94
Fat CLAY (CH)
Shelby Tube Sample

CONSOLIDATION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE B-6.15

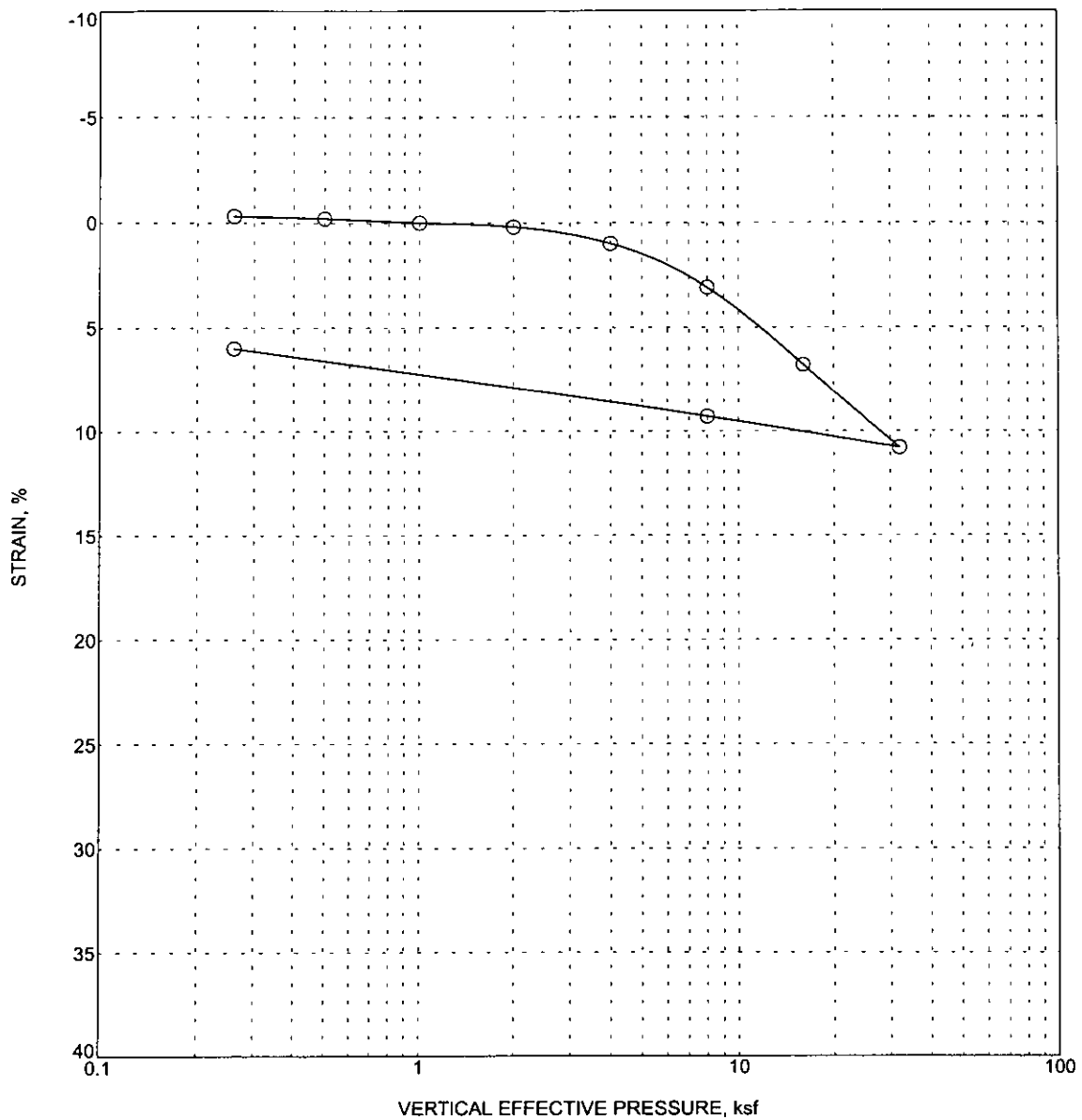


LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

BH-204
4.5
13
95
Sandy Lean CLAY (CL)
Liner Sample

CONSOLIDATION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE B-6.16

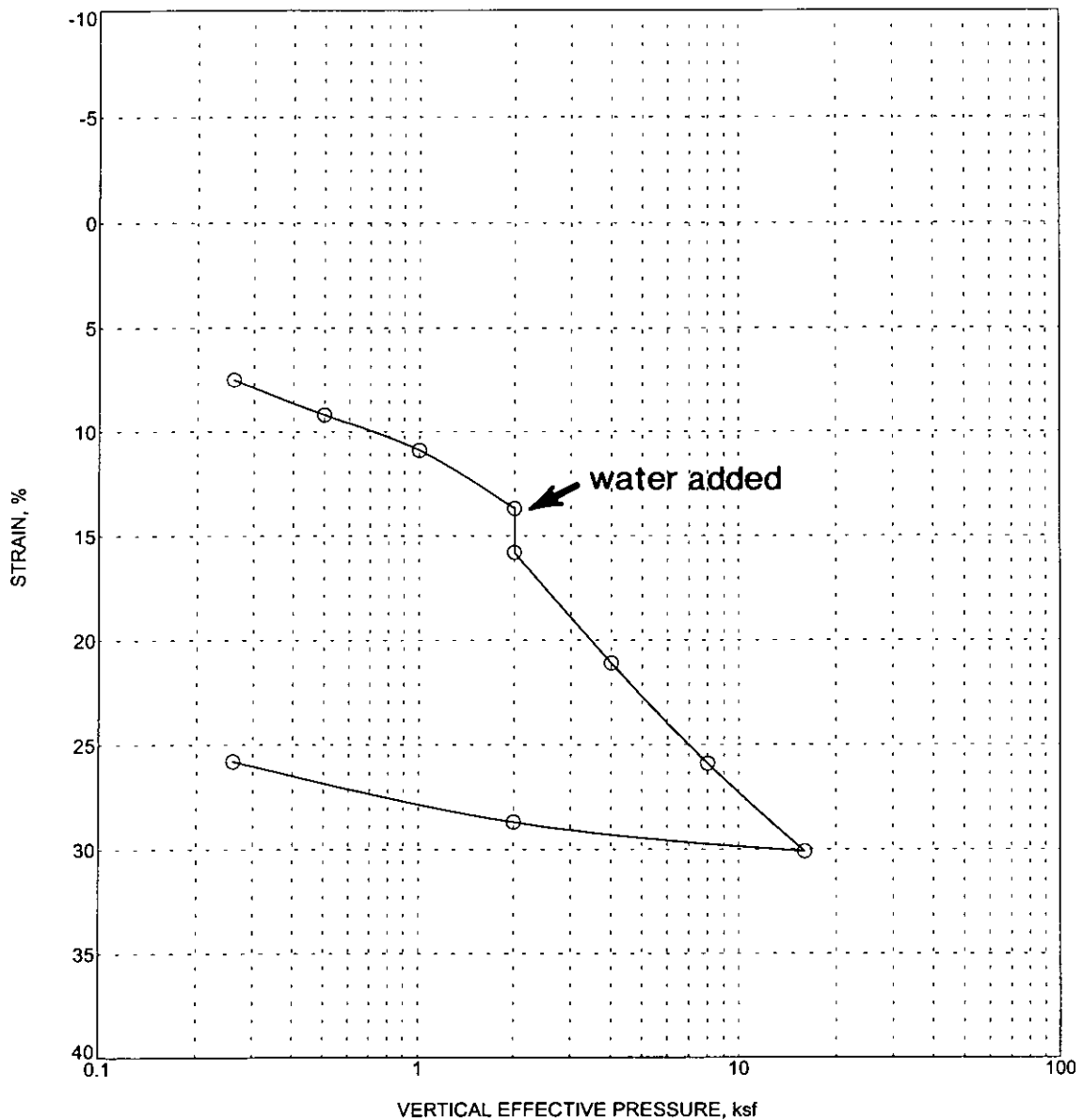


LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

BH-205
3.5
13
102
Sandy Lean CLAY (CL)
Liner Sample

CONSOLIDATION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE B-6.17

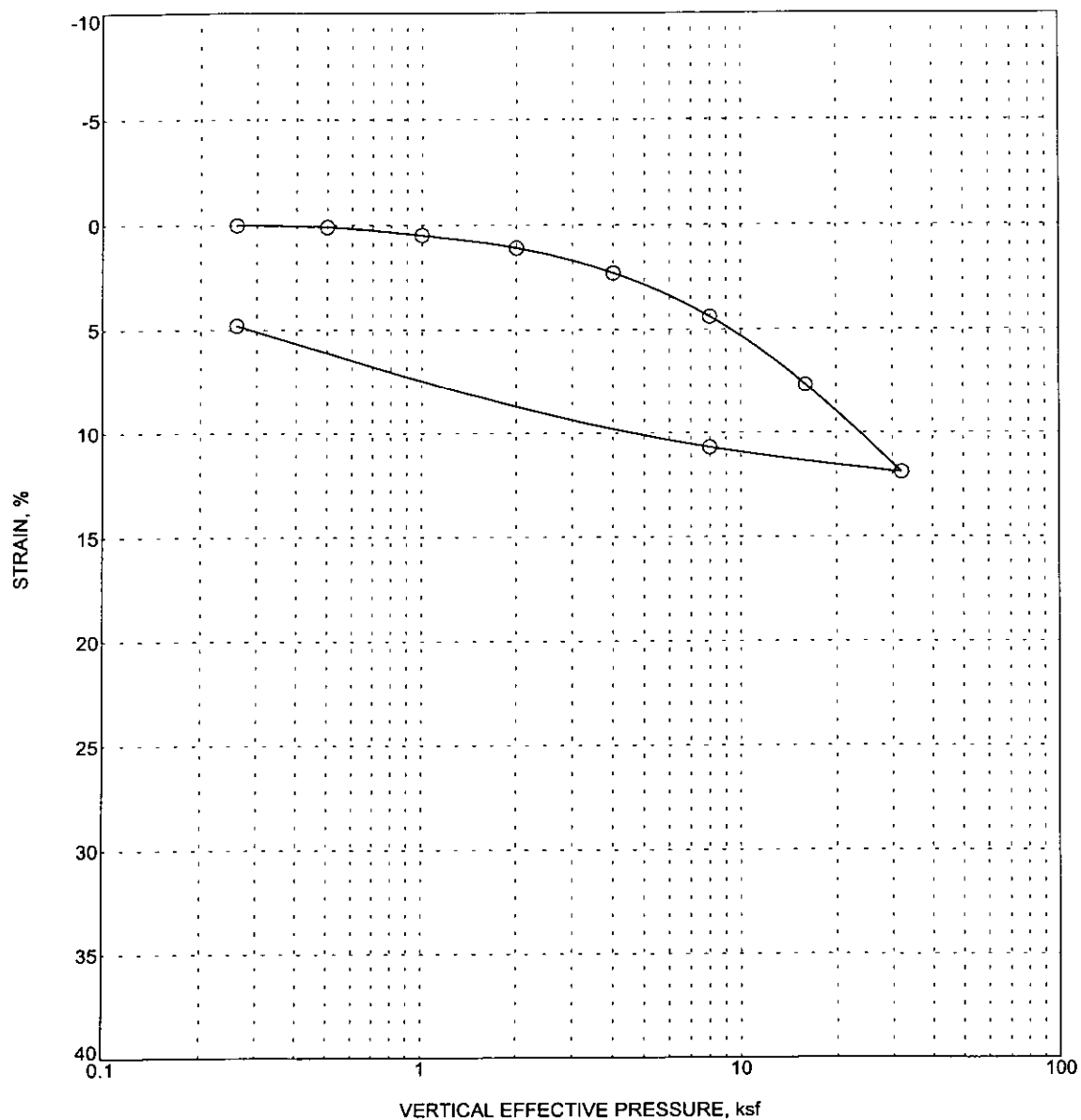


LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

BH-210
5.5
15
87
Clayey SAND with gravel (SC)
Liner Sample

CONSOLIDATION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE B-6.18

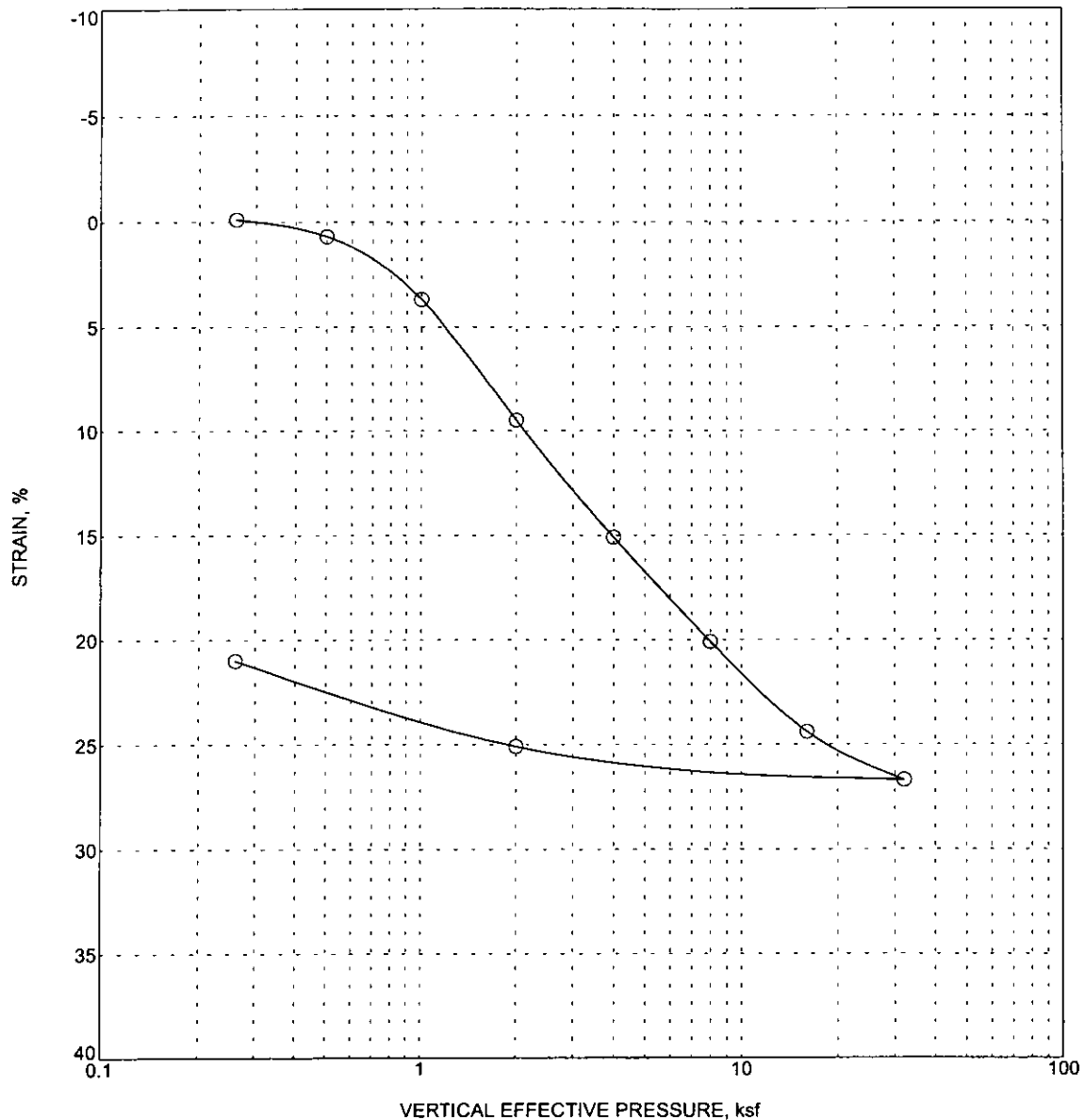


LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

BH-214
7.5
17
102
Sandy Lean CLAY (CL)
Liner Sample

CONSOLIDATION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE B-6.19



LOCATION
DEPTH, ft
INITIAL MOISTURE CONTENT, %
UNIT DRY WEIGHT, pcf
MATERIAL DESCRIPTION
SAMPLE CONDITION

BH-216
5.0
9
88
Sandy CLAY with gravel (CL)
Liner Sample

CONSOLIDATION TEST RESULTS
Cal State Channel Islands, East Campus Development
Camarillo Area of Ventura County

PLATE B-6.20



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2978 SEABORG AVENUE, VENTURA, CA 93003-7686 • 805-656-6074 • FUGRO WEST, INC.

REPORT OF "R" VALUE TEST
(California 301)

DATE: July 28, 1999

JOB NUMBER: 99-7000-VO1
LAB NUMBER: 990398

PROJECT: CSU Channel Islands (#99-42-0381)
OWNER:
SAMPLE OF: Soil
SAMPLED BY: Client
SAMPLED FROM: BH 6
MATERIAL FOR USE IN: DATE RECEIVED: July 13, 1999
DEPTH: 2'

(California 202)

GRADING ANALYSIS				TEST SPECIMEN				A	B	C	D
SIEVE	AS REC'D	AS USED	SPEC'S	COMP. FOOT PRESSURE PSI				260	170	120	
				INITIAL MOISTURE %				14.0	14.0	14.0	
				MOISTURE @ COMPACTION %				18.0	19.0	19.5	
				DRY DENS. OF BRIO. #/CF				105.6	101.8	100.0	
3"				STABILOMETER VALUE "R"				24	15	11	
2 1/2"				EXUDATION PRESSURE PSI				717	597	284	
2"				THICKNESS IND. BY STAB.							
1 1/2"				THICK. IND. BY EXP. PRESS.				0	0	0	
1"				L.L.	P.L.	P.I.	SPEC MAX	SUBASE:			
3/4"								BASE:			
1/2"								SURFACE:			
3/8"				SAND EQUIVALENT:				COHESION VALUE:			
#4	100			DURABILITY, COARSE:				TRAFFIC INDEX:			
#8	97.2			DURABILITY, FINE:				"R" BY EXUD. PRESSURE: 11			
#16	89.5			DURABILITY INDEX:				"R" BY EXPAN. PRESSURE:			
#30	73.9							"R" @ EQUILIBRIUM: 11			
#50	60.9			L.A. RATTLER							
#100	53.0			100 REV:				INDICATED MINIMUM THICKNESS OF			
#200	47.3		(washed)	500 REV:				COVER FOR ABOVE CONDITION:			

REMARKS:

Reviewed By:

M.B. (Ben) Lo, P.E.

Respectfully submitted,
BTC LABORATORIES, INC.

Charles N. Dunn, Lab Supervisor

Copies: 1-Fugro West
1-File



2978 SEABORG AVENUE, VENTURA, CA 93003-7686 • 805-656-6074 • FAX 805-656-1263

REPORT OF "R" VALUE TEST
(California 301)

DATE: July 28, 1999.

JOB NUMBER: 99-7000-VO1
LAB NUMBER: 990398

PROJECT: CSU Channel Islands (#99-42-0381)

OWNER:

SAMPLE OF: Soil

SAMPLED BY: Client

SAMPLED FROM: BH 8

DATE RECEIVED: July 13, 1999

MATERIAL FOR USE IN:

DEPTH: 1' - 2'

(California 202)

GRADING ANALYSIS				TEST SPECIMEN				A	B	C	D
SIEVE	AS	AS		COMP. FOOT PRESSURE PSI				290	250	170	
				INITIAL MOISTURE %				9.8	9.8	9.8	
				MOISTURE @ COMPACTION %				16.3	16.8	17.3	
				DRY DENS. OF BRIO. #/CF				109.5	107.9	102.7	
3"				STABILOMETER VALUE "R"				30	21	11	
2 1/2"				EXUDATION PRESSURE PSI				756	541	292	
2"				THICKNESS IND. BY STAB.							
1 1/2"				THICK. IND. BY EXP. PRESS.				0.60	0.30	0.07	
1"				L.L.	P.L.	P.I.	SPEC	SUBBASE:			
3/4"							MAX	BASE:			
1/2"								SURFACE:			
3/8"				SAND EQUIVALENT:				COHESION VALUE:			
#4	100			DURABILITY, COARSE:				TRAFFIC INDEX:			
#8	94.4			DURABILITY, FINE:				"R" BY EXUD. PRESSURE: 11			
#16	88.7			DURABILITY INDEX:				"R" BY EXPAN. PRESSURE:			
#30	82.9							"R" @ EQUILIBRIUM: 11			
#50	76.8			L.A. RATTLER							
#100	69.2			100 REV:				INDICATED MINIMUM THICKNESS OF			
#200	60.6		(washed)	500 REV:				COVER FOR ABOVE CONDITION:			

REMARKS:

Reviewed By:

M.B. (Ben) Lo, P.E.

Respectfully submitted,
BTC LABORATORIES, INC.

Charles N. Dunn, Lab Supervisor

Copies: 1-Fugro West
1-File

dwr/RV6

PLATE B-7.2



BTC LABORATORIES, INC.

2978 Seaborg Ave., Ventura, CA 93003 ■ (805) 656-6074 ■ (805) 656-1263 Fax

Established 1959

REPORT OF "R" VALUE TEST
(California 301)

November 22, 2000

JOB NUMBER: 00-7000-VO1

LAB NUMBER: 000767

PROJECT: CSUC I Supplemental Study (99-42-0384-510)

OWNER:

SAMPLE OF:

Soil

SAMPLED BY:

Client

SAMPLED FROM:

DH201-1

DATE RECEIVED: Nov. 16, 2000

MATERIAL FOR USE IN:

DEPTH: 0.5'-2.5'

(California 202)

GRADING ANALYSIS				TEST SPECIMEN				A	B	C	D
	AS	AS		COMP. FOOT PRESSURE PSI				350	350	350	
				INITIAL MOISTURE %				11.3	11.3	11.3	
SIEVE	REC'D	USED	SPEC'S	MOISTURE @ COMPACTION %				16.3	16.8	17.3	
				DRY DENS. OF BRIO. #/CF				110.1	108.6	106.6	
3"				STABILOMETER VALUE "R"				21	16	13	
2 1/2"				EXUDATION PRESSURE PSI				525	315	175	
2"				THICKNESS IND. BY STAB							
1 1/2"				THICK. IND. BY EXP. PRESS.				0	0	0	
1"				L.L.	P.L.	P.I.	SPEC.	SUBBASE			
3/4"		100						BASE:			
1/2"		98.5						SURFACE:			
3/8"		97.0		SAND EQUIVALENT:				COHESION VALUE:			
#4		89.6		DURABILITY, COARSE:				TRAFFIC INDEX:			
#8		80.6		DURABILITY FINE:				"R" BY EXUD. PRESSURE: 16			
#16		72.6		DURABILITY INDEX:				"R" BY EXPAN. PRESSURE:			
#30		64.8						"R" @ EQUILIBRIUM: 16			
#50		56.1		L.A. RATTLER							
#100		45.6		100 REV:				INDICATED MINIMUM THICKNESS OF			
#200		38.2	(washed)	500 REV:				COVER FOR ABOVE CONDITION:			

REMARKS:

Reviewed by:

M.B. (Ben) Lo, P.E.

Copies: 1-Fugro West, Ventura
1-File

Respectfully submitted,
BTC LABORATORIES, INC.

Charles N. Dunn, Lab Supervisor

CND:hra

PLATE B-7.3



BTC LABORATORIES, INC.

2978 Seaborg Ave., Ventura, CA 93003 ■ (805) 656-6074 ■ (805) 656-1263 Fax

Established 1959

REPORT OF "R" VALUE TEST
(California 301)

November 22, 2000

JOB NUMBER: 00-7000-VO1

LAB NUMBER: 000767

PROJECT: CSUC I Supplemental Study (99-42-0384-510)
OWNER:
SAMPLE OF: Soil
SAMPLED BY: Client
SAMPLED FROM: DH 204-1
MATERIAL FOR USE IN:

DATE RECEIVED: Nov. 16, 2000
DEPTH: 0.5'-2'

(California 202)

GRADING ANALYSIS				TEST SPECIMEN				A	B	C	D
AS	AS			COMP. FOOT PRESSURE PSI				350	350	350	
SIEVE	REC'D	USED	SPEC'S	INITIAL MOISTURE %				9.6	9.6	9.6	
				MOISTURE @ COMPACTION %				16.1	16.6	17.1	
				DRY DENS. OF BRIO. #/CF				110.9	109.4	108.5	
3"				STABILOMETER VALUE "R"				23	18	14	
2 1/2"				EXUDATION PRESSURE PSI				553	337	162	
2"				THICKNESS IND. BY STAB							
1 1/2"				THICK. IND. BY EXP. PRESS.				0.23	0.17	0.33	
1"				L.L.	P.L.	P.I.	SPEC.	SUBBASE			
3/4"	100							BASE:			
1/2"	98.2							SURFACE:			
3/8"	96.9			SAND EQUIVALENT:				COHESION VALUE:			
#4	87.9			DURABILITY, COARSE:				TRAFFIC INDEX:			
#8	79.4			DURABILITY FINE:				"R" BY EXUD. PRESSURE: 17			
#16	71.5			DURABILITY INDEX:				"R" BY EXPAN. PRESSURE:			
#30	63.8							"R" @ EQUILIBRIUM: 17			
#50	56.8			L.A. RATTLER							
#100	49.1			100 REV:				INDICATED MINIMUM THICKNESS OF			
#200	41.7		(washed)	500 REV:				COVER FOR ABOVE CONDITION:			

REMARKS:

Reviewed by:

M.B. (Ben) Lo, P.E.

Copies: 1-Fugro West, Ventura
1-File

RECEIVED
NOV 30 2000
FUGRO WEST, INC.

Respectfully submitted,
BTC LABORATORIES, INC.

Charles N. Dunn, Lab Supervisor

CND:hra

PLATE B-7.4



BTC LABORATORIES, INC.

2978 Seaborg Ave., Ventura, CA 93003 ■ (805) 656-6074 ■ (805) 656-1263 Fax

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REPORT OF "R" VALUE TEST
(California 301)

November 9, 2000

JOB NUMBER: 00-7000-VO1
LAB NUMBER: 000724

PROJECT: Fugro-West (99-42-0384-488)
OWNER:
SAMPLE OF: Soil
SAMPLED BY: Client
SAMPLED FROM: BH 201-1
MATERIAL FOR USE IN:

DATE RECEIVED: Oct. 24, 2000
DEPTH: 1'-2 1/2'

(California 202)

GRADING ANALYSIS				TEST SPECIMEN				A	B	C	D
SIEVE	AS	AS	SPEC'S	COMP. FOOT PRESSURE PSI				350	350	350	
	REC'D	USED		INITIAL MOISTURE %				14.0	14.0	14.0	
				MOISTURE @ COMPACTION %				18.0	18.5	19.0	
				DRY DENS. OF BRIO. #/CF				101.9	101.1	101.0	
3"				STABILOMETER VALUE "R"				29	20	17	
2 ½"				EXUDATION PRESSURE PSI				669	378	271	
2"				THICKNESS IND. BY STAB							
1 ½"				THICK. IND. BY EXP. PRESS.				0.20	0.13	0.03	
1"				L.L.	P.L.	P.I.	SPEC.	SUBBASE			
¾"	100							BASE:			
½"	96.6							SURFACE:			
3/8"	94.2			SAND EQUIVALENT:				COHESION VALUE:			
#4	89.1			DURABILITY, COARSE:				TRAFFIC INDEX:			
#8	84.5			DURABILITY FINE:				"R" BY EXUD. PRESSURE: 18			
#16	80.4			DURABILITY INDEX:				"R" BY EXPAN. PRESSURE:			
#30	76.5							"R" @ EQUILIBRIUM: 18			
#50	71.6			L.A. RATTLER							
#100	65.3			100 REV:				INDICATED MINIMUM THICKNESS OF			
#200	57.1		(washed)	500 REV:				COVER FOR ABOVE CONDITION:			

REMARKS:

Reviewed by:

M.B. (Ben) Lo, P.E.

Respectfully submitted,
BTC LABORATORIES, INC.

Charles N. Dunn, Lab Supervisor

Copies: 1-Fugro West, Ventura
1-File

CND:hra



BTC LABORATORIES, INC.

2978 Seaborg Ave., Ventura, CA 93003

Established 1959

(805) 656-6074 ■ (805) 656-1263 Fax

REPORT OF "R" VALUE TEST
(California 301)

November 9, 2000

JOB NUMBER: 00-7000-VO1

LAB NUMBER: 000724

PROJECT: Fugro-West (99-42-384-488)

OWNER:

SAMPLE OF:

Soil

SAMPLED BY:

Client

SAMPLED FROM:

BH 204-1

MATERIAL FOR USE IN:

DATE RECEIVED: Oct. 24, 2000

DEPTH: 1/2'-2'

(California 202)

GRADING ANALYSIS				TEST SPECIMEN				A	B	C	D
	AS	AS		COMP. FOOT PRESSURE PSI				350	350	350	
				INITIAL MOISTURE %				16.9	16.9	16.9	
SIEVE	REC'D	USED	SPEC'S	MOISTURE @ COMPACTION %				25.4	25.9	26.4	
				DRY DENS. OF BRIO. #/CF				91.9	91.7	91.5	
3"				STABILOMETER VALUE "R"				1	0	0	
2 1/2"				EXUDATION PRESSURE PSI				677	374	271	
1 1/2"				THICK. IND. BY EXP. PRESS.				0.40	0.67	0.47	
1"				L.L.	P.L.	P.I.	SPEC.	SUBBASE			
3/4"	100							BASE:			
1/2"	97.6							SURFACE:			
3/8"	96.5			SAND EQUIVALENT:				COHESION VALUE:			
#4	95.2			DURABILITY, COARSE:				TRAFFIC INDEX:			
#8	93.4			DURABILITY FINE:				"R" BY EXUD. PRESSURE: 5			
#16	91.4			DURABILITY INDEX:				"R" BY EXPAN. PRESSURE:			
#30	89.4							"R" @ EQUILIBRIUM: 5			
#50	85.6			L.A. RATTLER							
#100	77.8			100 REV:				INDICATED MINIMUM THICKNESS OF			
#200	70.5		(washed)	500 REV:				COVER FOR ABOVE CONDITION:			

REMARKS:

Reviewed by:

M.B. (Ben) Lo, P.E.

Copies: 1-Fugro West, Ventura
1-File

Respectfully submitted,
BTC LABORATORIES, INC.

Charles N. Dunn, Lab Supervisor

CND:hra



BTC LABORATORIES, INC.

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Established 1959

REPORT OF "R" VALUE TEST
(California 301)

October 31, 2000

JOB NUMBER: 00-7000-VO1
LAB NUMBER: 000723

PROJECT: CSUCI Supplemental Study (99-42-0384-487)
OWNER:
SAMPLE OF: Soil
SAMPLED BY: Client
SAMPLED FROM: BH 209
MATERIAL FOR USE IN:

DATE RECEIVED: Oct. 24, 2000
DEPTH: 1' - 4'

(California 202)

GRADING ANALYSIS				TEST SPECIMEN				A	B	C	D
SIEVE	REC'D	USED	SPEC'S	COMP. FOOT PRESSURE PSI	350			350	350	350	
				INITIAL MOISTURE %	14.3			14.3	14.3	14.3	
				MOISTURE @ COMPACTION %	19.3			20.3	21.3	21.3	
				DRY DENS. OF BRIO. #/CF	104.9			103.7	102.3	102.3	
3"				STABILOMETER VALUE "R"	2			1	0	0	
2 1/2"				EXUDATION PRESSURE PSI	669			435	271	271	
2"				THICKNESS IND. BY STAB							
1 1/2"				THICK. IND. BY EXP. PRESS.	0.37			0.17	0.03	0.03	
1"				L.L.	P.L.	P.I.	SPEC.	SUBBASE			
3/4"	100							BASE:			
1/2"	97.1							SURFACE:			
3/8"	93.8			SAND EQUIVALENT:				COHESION VALUE:			
#4	88.3			DURABILITY, COARSE:				TRAFFIC INDEX:			
#8	81.7			DURABILITY FINE:				"R" BY EXUD. PRESSURE: 5			
#16	75.1			DURABILITY INDEX:				"R" BY EXPAN. PRESSURE:			
#30	68.1							"R" @ EQUILIBRIUM: 5			
#50	60.9			L.A. RATTLER							
#100	52.6			100 REV:				INDICATED MINIMUM THICKNESS OF			
#200	44.9		(washed)	500 REV:				COVER FOR ABOVE CONDITION:			

REMARKS:

Reviewed by:

M.B. (Ben) Lo, P.E.

Copies: 1-Fugro West, Ventura
1-File

Respectfully submitted,
BTC LABORATORIES, INC.

Charles N. Dunn, Lab Supervisor

CND:hra



BTC LABORATORIES, INC.

2978 Seaborg Ave., Ventura, CA 93003

(805) 656-6074

Established 1959

(805) 656-1263 Fax

REPORT OF "R" VALUE TEST
(California 301)

October 31, 2000

JOB NUMBER: 00-7000-VO1

LAB NUMBER: 000723

PROJECT: CSUCI Supplemental Study (99-42-0384-487)

OWNER:

SAMPLE OF:

Soil

SAMPLED BY:

Client

SAMPLED FROM:

BH 212

MATERIAL FOR USE IN:

DATE RECEIVED: Oct. 24, 2000

DEPTH: 1' - 3'

(California 202)

GRADING ANALYSIS				TEST SPECIMEN				A	B	C	D
SIEVE	AS REC'D	AS USED	SPEC'S	COMP. FOOT PRESSURE PSI					350	350	350
				INITIAL MOISTURE %					13.7	13.7	13.7
				MOISTURE @ COMPACTION %					17.2	17.7	18.2
				DRY DENS. OF BRIO. #/CF					105.8	104.1	103.7
3"				STABILOMETER VALUE "R"					25	17	6
2 1/2"				EXUDATION PRESSURE PSI					661	458	167
2"				THICKNESS IND. BY STAB							
1 1/2"				THICK. IND. BY EXP. PRESS.					0.33	0.17	0.07
1"				L.L.	P.L.	P.I.	SPEC.	SUBBASE			
3/4"	100							BASE:			
1/2"	96.7							SURFACE:			
3/8"	94.6			SAND EQUIVALENT:					COHESION VALUE:		
#4	88.4			DURABILITY, COARSE:					TRAFFIC INDEX:		
#8	80.8			DURABILITY FINE:					"R" BY EXUD. PRESSURE: 11		
#16	75.0			DURABILITY INDEX:					"R" BY EXPAN. PRESSURE:		
#30	70.2								"R" @ EQUILIBRIUM: 11		
#50	65.6			L.A. RATTLER							
#100	60.0			100 REV:					INDICATED MINIMUM THICKNESS OF		
#200	52.8		(washed)	500 REV:					COVER FOR ABOVE CONDITION:		

REMARKS:

Reviewed by:

M.B. (Ben) Lo, P.E.

Copies: 1-Fugro West, Ventura
1-File

Respectfully submitted,
BTC LABORATORIES, INC.

Charles N. Dunn, Lab Supervisor

CND:hra



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Established 1959

(805) 656-1263 Fax

REPORT OF "R" VALUE TEST
(California 301)

October 31, 2000

JOB NUMBER: 00-7000-VO1

LAB NUMBER: 000723

PROJECT: CSUCI Supplemental Study (99-42-0384-487)

OWNER:

SAMPLE OF:

Soil

SAMPLED BY:

Client

SAMPLED FROM:

BH 215

DATE RECEIVED: Oct. 24, 2000

MATERIAL FOR USE IN:

DEPTH: 3' - 6'

(California 202)

GRADING ANALYSIS				TEST SPECIMEN				A	B	C	D
	AS	AS		COMP. FOOT PRESSURE PSI				350	350	350	
				INITIAL MOISTURE %				7.2	7.2	7.2	
SIEVE	REC'D	USED	SPEC'S	MOISTURE @ COMPACTION %				11.7	12.2	12.7	
				DRY DENS. OF BRIO. #/CF				118.4	118.4	117.3	
3"				STABILOMETER VALUE "R"				77	75	71	
2 1/2"				EXUDATION PRESSURE PSI				685	400	268	
2"				THICKNESS IND. BY STAB							
1 1/2"				THICK. IND. BY EXP. PRESS.				0	0	0	
1"				L.L.	P.L.	P.I.	SPEC.	SUBBASE			
3/4"		100						BASE:			
1/2"		97.1						SURFACE:			
3/8"		94.7		SAND EQUIVALENT:				COHESION VALUE:			
#4		87.7		DURABILITY, COARSE:				TRAFFIC INDEX:			
#8		74.2		DURABILITY FINE:				"R" BY EXUD. PRESSURE: 72			
#16		57.0		DURABILITY INDEX:				"R" BY EXPAN. PRESSURE:			
#30		42.2						"R" @ EQUILIBRIUM: 72			
#50		29.5		L.A. RATTLER							
#100		17.5		100 REV:				INDICATED MINIMUM THICKNESS OF			
#200		10.8	(washed)	500 REV:				COVER FOR ABOVE CONDITION:			

REMARKS:

Reviewed by:

M.B. (Ben) Lo, P.E.

Copies: 1-Fugro West, Ventura
1-File

Respectfully submitted,
BTC LABORATORIES, INC.

Charles N. Dunn, Lab Supervisor

CND:hra



BTC LABORATORIES, INC.

2978 Seaborg Ave., Ventura, CA 93003

(805) 656-6074

Established 1959

(805) 656-1263 Fax

REPORT OF "R" VALUE TEST
(California 301)

October 31, 2000

JOB NUMBER: 00-7000-VO1

LAB NUMBER: 000723

PROJECT: CSUCI Supplemental Study (99-42-0384-487)
OWNER:
SAMPLE OF: Soil
SAMPLED BY: Client
SAMPLED FROM: BH 216
MATERIAL FOR USE IN:

DATE RECEIVED: Oct. 24, 2000
DEPTH: 1' - 3'

(California 202)

GRADING ANALYSIS				TEST SPECIMEN				A	B	C	D
SIEVE	AS	AS	SPEC'S	COMP. FOOT PRESSURE PSI				350	350	350	
	REC'D	USED		INITIAL MOISTURE %				12.4	12.4	12.4	
				MOISTURE @ COMPACTION %				15.9	16.4	16.9	
				DRY DENS. OF BRIO. #/CF				108.5	107.0	107.1	
3"				STABILOMETER VALUE "R"				25	18	13	
2 ½"				EXUDATION PRESSURE PSI				605	414	272	
2"				THICKNESS IND. BY STAB							
1 ½"				THICK. IND. BY EXP. PRESS.				0.60	0.40	0.40	
1"				L.L.	P.L.	P.I.	SPEC.	SUBBASE			
¾"		100						BASE:			
½"		97.1						SURFACE:			
3/8"		94.6		SAND EQUIVALENT:				COHESION VALUE:			
#4		89.6		DURABILITY, COARSE:				TRAFFIC INDEX:			
#8		84.2		DURABILITY FINE:				"R" BY EXUD. PRESSURE: 14			
#16		78.6		DURABILITY INDEX:				"R" BY EXPAN. PRESSURE:			
#30		72.5						"R" @ EQUILIBRIUM: 14			
#50		65.8		L.A. RATTLER							
#100		56.6		100 REV:				INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITION:			
#200		45.1	(washed)	500 REV:							

REMARKS:

Reviewed by:

M.B. (Ben) Lo, P.E.

Copies: 1-Fugro West, Ventura
1-File

Respectfully submitted,
BTC LABORATORIES, INC.

Charles N. Dunn, Lab Supervisor

CND:hra

LABORATORY REPORT

Report Number : 994250
Purchase Order :
Job No. 99-42-0381

MATHEW BALLMER
FUGRO WEST INC.
5855 OLIVAS PARK DRIVE
VENTURA, CA. 93003-7672

Date Received : 06-JUL-99
Date Completed : 20-JUL-99
Date Sent : 20-JUL-99
Page # 1 of 1

Sample Description : 1 - Bulk Soil
Project : Cal State Channel Islands

California Test Methods : 532,643

Auto No.	Submitter Sample Number	Resistivity ohms/cm	pH Units	Chloride ppm	Sulfate ppm
196051	DH-3 B 1-5'	3358	7.62	67.8	27.3

Milliliters Water Added	50	100	150	200	250	300	350	400
	Resistivity Ohm-cm							
Sample No.								
3 B 1-5'	3358	3630	3993	4083	4175	4356	4447	4447

Remarks : Sample(s) and sampling data as provided :
by : Mathew Ballmer

Analyst(s) : TWS

Ref :

California ELAP No.: 1406
AIHA Accreditation No.: 172
NVLAP Accreditation No.: 101384
AIHA ELLAP Accreditation No.: 10985
LACSD Lab No.: 10125

Reviewed by:

Thomas Shultz
Thomas Shultz

Technical Approval:

Jamie Steedman-Lyde
Laboratory Director, Jamie Steedman-Lyde

PLATE B-8.1

10771 Noel St., Los Alamitos, CA 90720 714/220-3922 FAX 714/220-2081 e-mail hsa@earthlink.net

LABORATORY REPORT

Report Number : 994361
Purchase Order :
Job No. 99-42-0381

MATHEW BALLMER
FUGRO WEST INC.
5855 OLIVAS PARK DRIVE
VENTURA, CA. 93003-7672

Date Received : 14-JUL-99
Date Completed : 20-JUL-99
Date Sent : 20-JUL-99
Page # 1 of 1

Sample Description : 2 - Bulk Soils
Project : Cal State Channel Islands

California Test Methods : 532,643

Auto No.	Submitter Sample Number	Resistivity ohms/cm	pH Units	Chloride ppm	Sulfate ppm
196745	BH# 5 1 2' B	4175	7.47	97.1	4.91
196746	BH# 1 2 2' B	15609	7.61	248	<2.0

Milliliters Water Added	50	100	150	200	250	300	350	400
	Resistivity Ohm-cm							
Sample No.								
5 1 2' B	4175	4900	5445	6171	6353	7260	7260	
1 2 2' B	16336	15609	15609	15609	15972	15972		

Remarks : Sample(s) and sampling data as provided :
by : Mathew Ballmer

Analyst(s) : TWS

Ref :

California ELAP No.: 1406
AIHA Accreditation No.: 172
NVLAP Accreditation No.: 101384
AIHA ELLAP Accreditation No.: 10985
LACSD Lab No.: 10125

Reviewed by:

Thomas Shultz
Thomas Shultz

Technical Approval:

Jamie Steedman-Lyde
Laboratory Director, Jamie Steedman-Lyde

PLATE B-8.2

10771 Noel St., Los Alamitos, CA 90720 714/220-3922 FAX 714/220-2081 e-mail hsa@earthlink.net

LABORATORY REPORT

Report Number : 110440
Purchase Order :
Job No. 99-42-0384

CAROL WOLKNER
FUGRO WEST INC.
5855 OLIVAS PARK DR.
VENTURA, CA. 93003

Date Received : 25-OCT-00
Date Completed : 02-NOV-00
Date Sent : 02-NOV-00
Page # 1 of 1

Sample Description : 1 - Bulk Soil
Project : CSUCI Supplemental Study

California Test Methods : 532,643

Auto No.	Submitter Sample Number	Resistivity ohms/cm	pH Units	Chloride ppm	Sulfate ppm
232402	BH-209 1-4' B	26,499	6.98	108.3	51.4

Milliliters Water Added	50	100	150	200	250	300	350	400
Sample No.	Resistivity Ohm-cm							
232402	55450	41745	32670	26499	26499	26499	27225	28314

Remarks : Sample(s) and sampling data as provided :
by : Carol Wolkner

Analyst(s) : ED/TWS

Ref :

California ELAP No.: 1406
AIHA Accreditation No.: 172
NVLAP Accreditation No.: 101384
AIHA ELLAP Accreditation No.: 10985
LACSD Lab No.: 10125

Reviewed by:

Thomas Shultz
Thomas Shultz

Technical Approval:

Jamie Steedman-Lyde
Laboratory Director, Jamie Steedman-Lyde

RECEIVED
NOV 06 2000

FUGRO WEST, INC.

PLATE B-8.3

10771 Noel St., Los Alamitos, CA 90720 714/220-3922 FAX 714/220-2081 e-mail hsa@earthlink.net

This report pertains only to the samples investigated and does not necessarily apply to other apparently identical or similar materials. This report is submitted for the exclusive use of the client to whom it is addressed. Any reproduction of this report or use of this Laboratory's name for advertising or publicity purposes without written authorization is prohibited.

LABORATORY REPORT

Report Number : 110441
Purchase Order :
Job No. 99-42-0384

CAROL WOLKNER
FUGRO WEST INC.
5855 OLIVAS PARK DR.
VENTURA, CA. 93003

Date Received : 25-OCT-00
Date Completed : 02-NOV-00
Date Sent : 02-NOV-00
Page # 1 of 1

Sample Description : 1 - Bulk Soil
Project : CSUCI Supplemental Study

California Test Methods : 532,643

Auto No.	Submitter Sample Number	Resistivity ohms/cm	pH Units	Chloride ppm	Sulfate ppm
232403	BH-212 1-3' B	17,424	7.26	145.0	59.9

Milliliters Water Added	50	100	150	200	250	300	350	400
Sample No.	Resistivity Ohm-cm							
232403	28314	26499	20328	18513	17424	17424	17787	18150

Remarks : Sample(s) and sampling data as provided :
by : Carol Wolkner

Analyst(s) : ED/TWS

Ref :

California ELAP No.: 1406
AIHA Accreditation No.: 172
NVLAP Accreditation No.: 101384
AIHA ELLAP Accreditation No.: 10985
LACSD Lab No.: 10125

Reviewed by:

Thomas Shultz
Thomas Shultz

Technical Approval:

Jamie Steedman-Lyde
Laboratory Director, Jamie Steedman-Lyde

PLATE B-8.4

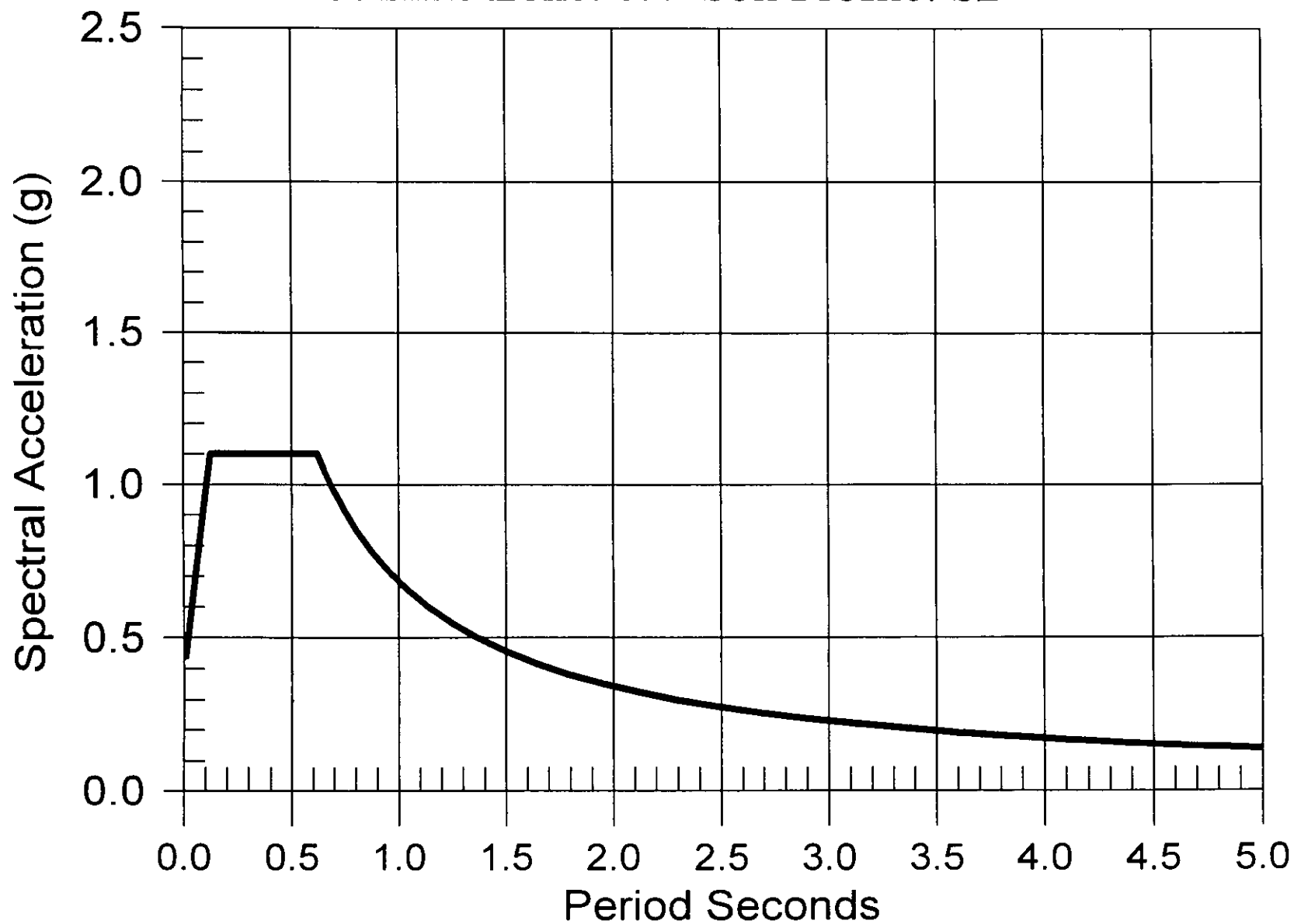
10771 Noel St., Los Alamitos, CA 90720 714/220-3922 FAX 714/220-2081 e-mail hsa@earthlink.net

This report pertains only to the samples investigated and does not necessarily apply to other apparently identical or similar materials. This report is submitted for the exclusive use of the client to whom it is addressed. Any reproduction of this report or use of this Laboratory's name for advertising or publicity purposes without written authorization is prohibited.

APPENDIX C
DESIGN RESPONSE SPECTRUM

DESIGN RESPONSE SPECTRUM

Seismic Zone: 0.4 Soil Profile: SD





4820 McGrath Street, Suite 100
Ventura, California 93003-7778
Tel: (805) 650-7000
Fax: (805) 650-7010

August 17, 2007
Project No. 3133.017.8B

California State University, Channel Islands Site Authority
401 Golden Shore, 2nd Floor
Long Beach, California 90802

Attention: Mr. Jim Corsar
Chief of Construction

Subject: Addendum to Geotechnical Study, Phase 2A/2B East Campus Housing, Inspiration
Point Bridge, California State University Channel Islands, Camarillo, California

Dear Mr. Corsar:

INTRODUCTION

This addendum geotechnical study for the East Campus Development at the California State University Channel Islands (CSUCI) in Camarillo, California (Fugro, 2000) presents revised recommendations for the Inspiration Point Bridge and Drainage Culvert. The bridge site is located as shown on Plate 1 - Vicinity Plan. The work was performed in general accordance with our proposal (Fugro, 2007a), which was prepared in response to design concepts presented on Sheets B-1, B-2, and B-3 of the Inspiration Point Bridge Plans (Huitt-Zollars, 2006), to assess unexplored subsurface conditions at the project location.

Revised recommendations presented herein supersede recommendations for site development, grading, and overexcavation, and foundation design recommendations presented on Sheet GP-0 of the East Campus Housing Phase 2A/2B Rough Grading Plans (Huitt-Zollars, 2007) and in Fugro (2000).

Services for this addendum were authorized by a pending task order to be executed by Ms. Valerie Patscheck with CSUCI, as part of our blanket Task Order Service Agreement No. 5179, dated July 3, 2007.

PROJECT DESCRIPTION

The layout of the proposed Inspiration Point Bridge and Drainage Culvert is presented on Plate 2 - Site Layout and Exploration Plan. An existing crossing and drainage culvert traverses an unnamed creek as part of an old, unpaved, perimeter road. This crossing will soon provide service to several residences being constructed as part of the Phase 2A/2B East Campus Housing Development.

Based on conversations with Mr. Marc Haslinger with Huitt-Zollars and Mr. Merlin Snider with Snider Construction Services, we understand that the proposed project will include

demolition of the existing crossing and culvert, and construction of a new crossing and new culvert. Although the existing alignment is not shown relative to the new alignment on the plans (Huitt-Zollars, 2006), based on conversation with Mr. Haslinger, in combination with observations during our field exploration, the location of the proposed alignment appear very similar to the existing crossing.

Based on the Huitt-Zollars (2006) bridge plans, the proposed Inspiration Point Bridge crossing will be about 75 feet long and 30 feet wide with two reinforced concrete retaining walls supporting the sides. The crossing road pavement will be asphalt, flanked by concrete sidewalks. The tops of the retaining walls extend 3 to 6 feet above the road surface, acting as a guard rail. Above-grade portions of the wall will have a brick façade covering the concrete. The corrugated steel drainage culvert, roughly 11-1/2 feet wide and 7-1/4 feet tall, will be located towards the base of the retaining walls, running perpendicular to the walls and road surface. Retaining wall foundations will consist of stepped, shear key footings; however, actual footing depths and dimensions are not shown on Huitt-Zollars (2006).

SITE CONDITIONS

The existing crossing and drainage culvert consists of two parallel retaining walls, each about 20 feet long and about 25 to 30 feet apart. A dirt road is located between the walls about 1 foot below the top of the walls, with a metal gate bounding the southern end of the crossing. A 5-foot-diameter corrugated steel circular drainage culvert runs perpendicular underneath the road at the creek level. Since the existing crossing is roughly 60 feet long, concrete and/or grout in combination with plastic sheeting and sand bags have been placed beyond the limits of the retaining walls on the slopes, likely to mitigate erosion. Concrete and/or grout has also been placed in the creek bottom at the inlet and outlet of the culvert.

At the time of our field exploration, the creek bed and side banks were overgrown with dense vegetation including bushes, cacti, and trees. The upstream (eastern) culvert inlet was mostly blocked by tree trunks and dense vegetation. Creek flow appears to have been restricted by the blockage, causing debris and sediments to accumulate at the inlet; thus, the creek bed elevation on the upstream side of the crossing was several feet higher than the creek bed elevation downstream at the culvert outlet. Also the vegetation was much denser upstream of the existing culvert crossing.

FIELD EXPLORATION AND LABORATORY TESTING

The supplemental field exploration program consisted of excavating three test pits in the vicinity of the proposed bridge and culvert crossing. The test pits are located as shown on Plate 2. Test pits were excavated by Granite Construction Company on July 27, 2007 using a CAT 330L excavator. Two test pits were excavated on the western (downstream) side of the existing crossing, and due to the thick brush and difficult access, only one test pit was excavated on the eastern (upstream) side. The test pits excavated as part of this exploration program ranged from 6 to 12 feet deep. Selected soil and bedrock formation samples were obtained from the tests pits for classification.

SUBSURFACE CONDITIONS

EARTH MATERIALS

Descriptions of soil conditions presented herein are based on visual classification of samples obtained from our field exploration and similar data reported in Fugro (2000). Logs of the test pits are presented in Appendix A.

Subsurface conditions encountered generally consisted of several feet of debris laden fill underlain by colluvium, and bedrock of the Conejo Volcanics. Elevations presented herein were estimated based on survey stakes provided by Granite Construction Company.

Artificial Fill (af)

Artificial fill was encountered in all three test pits, to depths ranging from 3 to 9 feet, with a corresponding basal contact elevations of +102 feet to +99 feet MSL (Appendix A). Fill consisted of clayey sand with gravel (SC), loosely intermixed with abundant trash and debris. The debris laden fill was easily excavated. Trash and debris encountered in the test pits consisted of roots, bricks, plastic and metal pipe sections, wires, bicycle and automobile tires, concrete and asphalt chunks, rebar pieces, glass bottles, and other miscellaneous trash/debris.

Colluvium (Qcol)

Colluvium encountered in test pits TP-2 and TP-3 consisted of clay with gravel and rock fragments. The layer of colluvium ranged from about 2 to 3 feet thick, corresponding to depths between elevations +96 feet and +100 feet MSL.

Conejo Volcanics (Tcvb)

The bedrock encountered in the test pits is composed of basalt, andesitic basalt, and dacitic breccia of the Conejo Volcanics Formation. The Conejo Volcanics were encountered in the backhoe test pits at depths ranging from 5 to 12 feet, corresponding to approximate elevations of +100 feet to +96 feet MSL. Based on subsurface conditions encountered in the test pits, the bedrock surface appears to dip from west to east.

GROUNDWATER

At the time of our field exploration, the creek bed was dry, and no groundwater was encountered in the test pit excavations. However, seasonal fluctuations in groundwater and runoff should be anticipated. If dewatering is required during demolition of the existing crossing and/or construction of the new crossing, applicable recommendations are presented in Fugro (2000).

SITE DEVELOPMENT AND GRADING RECOMMENDATIONS

Demolition of Existing Crossing

The existing bridge and culvert crossing and its associated foundations are to be demolished prior to construction of the new crossing. Old foundations, any below-grade structures, and soils disturbed during the demolition process should be removed in their entirety prior to commencing grading operations for new structures. All debris laden fill should be removed from the bridge crossing area to expose either bedrock materials or firm colluvium.

The geotechnical engineer or his representative should observe excavated areas and assess whether additional materials need to be removed. Since foundation plans for the existing crossing are not available, removal depths during demolition are unknown and can only be estimated from the nearby test pits. Excavation depths may be increased based on conditions encountered.

Excavation for New Crossing

Excavation depths described below are based on top-of-footing elevations presented in Huitt-Zollars (2006) and assuming wall footing depths of 2 feet. Because test pits were excavated 15 to 20 feet beyond the existing retaining walls, actual subsurface conditions are unknown at the exact locations of the proposed footings.

Areas beneath the proposed retaining wall footings should be overexcavated to expose competent Conejo Formation Bedrock. As noted above, all fill and debris should be removed from the bridge crossing. Excavation depths below the bottom of the retaining wall footings may be on the order of about 1 to 2 feet for the west retaining wall, and about 4 to 5 feet for the east retaining wall. Excavation for the culvert should expose bedrock or firm colluvium but should extend at least 1 foot below the bottom of the culvert pipe into competent material. Estimated overexcavation depths may need to be deepened based on actual conditions encountered in the field.

Excavation to bedrock or firm colluvium should extend to a distance of at least 5 feet beyond the outside edges of the wall footings, then back up to the creek bottom at a slope no steeper than 1h:1v. Excavations beneath new foundations should be completely inclusive of the space between the retaining walls. Since the excavation depths for the east and west retaining wall footings are likely to be different, excavation depths between the retaining walls should not exceed a slope of 3h:1v. Excavation bottoms should be fairly even without steep steps. Exposed bedrock materials do not have to be scarified and recompacted but colluvium materials should be scarified to a depth of 12 inches and moisture-conditioned to within 2 percent of optimum and compacted to a relative density of at least 92 percent.



Observation of Excavation Bottoms

Excavation bottoms should be observed by Fugro in accordance with our recommendations presented in Fugro (2000). Excavation bottoms may be deepened based on conditions encountered in the field.

Backfilling Below Wall Foundations

Backfill in overexcavations below footing bottoms should consist of Class II Aggregate Base or Processed Miscellaneous Base (PMB). Aggregate base should consist of imported material conforming to Caltrans (2006) Standard Specifications for Class II aggregate base, Section 26-1.02A or Section 200-2.5 of the Greenbook (2006) for PMB. Backfill below the footing and culvert bottoms should be compacted to at least 95 percent relative compaction as determined by ASTM D1557. Fill placement and compaction should conform to recommendations presented in Fugro (2000).

General Backfill

On-site material consisting of fill and debris excavated during the existing bridge demolition and during excavation for the new crossing should not be used as backfill. Based on laboratory testing performed during rough grading for the Phase 2A/2B East Campus Housing Project, excess on-site material from the Phase 2A/2B site should be suitable material to use as general fill. All imported fill, from the Phase 2A/2B site or elsewhere, should be observed by our representative and tested for compliance prior to transporting it to the site.

CLOSURE

This addendum is bound by the same terms, condition, and limitations as Fugro (2000) and should be attached to Fugro (2000). Please call if you questions about this addendum.

Sincerely,

FUGRO WEST, INC.

A handwritten signature in black ink that reads "Samuel M. Bryant". The signature is fluid and cursive, with the first name "Samuel" and last name "Bryant" clearly legible.

Samuel M. Bryant, P.E., G.E.
Associate Engineer

Attachments: Plate 1 - Vicinity Map
Plate 2 - Site Layout and Exploration Plan
Appendix A - Test Pit Logs

Copies Submitted: (1-Pdf) Addressee
(1-Pdf) Mr. Merlin Snider, Snider Construction Services



REFERENCES

Caltrans (2006), "Standard Specification," May.

Fugro West, Inc (2000), *Geotechnical Study, Cal State University Channel Islands East Campus Development, Camarillo area of Ventura, California*, prepared for California State University Channel Islands Site Authority, FWI Job No. 99-42-0384 , December 14.

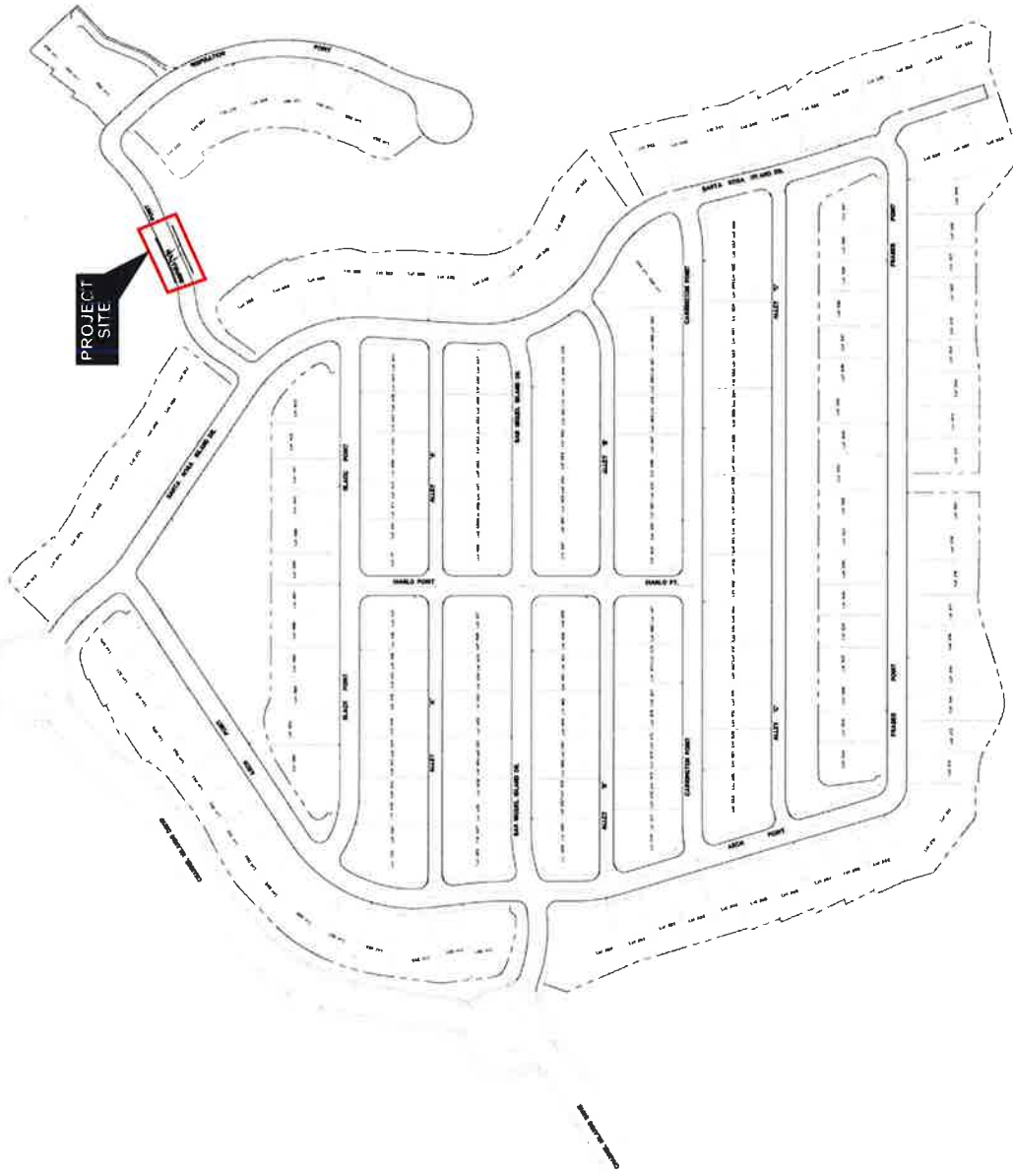
Fugro West, Inc. (2007a), *Proposal for Addendum to Geotechnical Study, Phase 2A/2B East Campus Housing, California State University Channel Islands, Camarillo, California*, prepared for Snider Construction, FWI Proposal No. 2007.233, July 23.

Fugro West, Inc. (2007b), *Results of Supplementary Corrosion Testing, Phase 2A/2B East Campus Housing, California State University Channel Islands, Camarillo, California*, prepared for California State University Channel Islands, FWI Project No. 3133.017, June 27 (revised July 26).

Greenbook (2006), "Standard Specification for Public Works Construction.

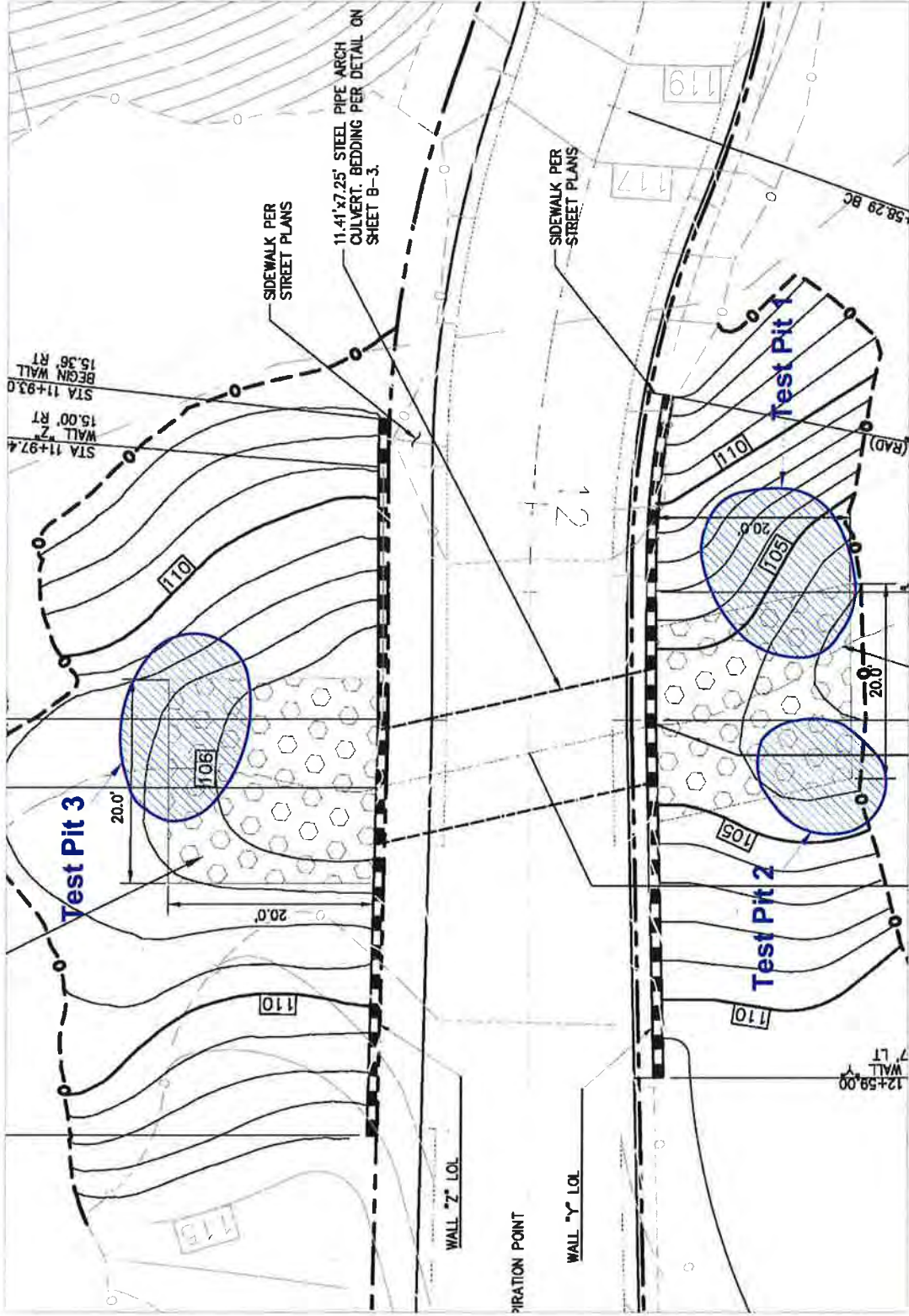
Huitt-Zollars (2006), Grading Sheet GP-0.

PLATES



VICINITY MAP
CSUCI Phase 2A/2B
East Campus Development
Inspiration Point Bridge
Camarillo, California

Base map source: Lot Numbering Map, CSUCI Phase 2A/2B East Campus Residential Development, Huitt-Zollars.



Base map source: General Plan, Inspiration Pt. Bridge, B-1 Sheet 56 of 59.
Hult-Zoller (5-11-06)

Site Layout and Exploration Plan
CSUCI Phase 2A/2B
East Campus Development
Inspiration Point Bridge
Camarillo, California

APPENDIX A



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: Downstream of the proposed bridge/culvert alignment, as shown on Plate 1. SURFACE EL: 108 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S_u , ksf
MATERIAL DESCRIPTION													
-106	2					ARTIFICIAL FILL (af) Clayey SAND with gravel (SC): loose, dark brown, fine to coarse sand, miscellaneous debris and trash, including roots, brick fragmetnts, pipes, tires, and glass bottles							
-104	4												
-102	6												
-100	8					CONEJO VOLCANICS (Tcvb) BASALT: highly weathered, light brown, some clay pockets							
-98	10												
-96	12												
-94	14												
-92	16												
-90	18												

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 10.0 ft
DEPTH TO WATER: Not Encountered

DRILLING DATE: July 27, 2007

DRILLING METHOD: CAT 330L Excavator
DRILLED BY: Granite Construction Company
LOGGED BY: J. Hutchins
CHECKED BY: S M Bryant P.E.

LOG OF NO. TP-1
CSUCI Phase 2A/2B Inspiration Point Bridge
Camarillo, California

PLATE A-1



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: Downstream of the proposed bridge/culvert alignment, as shown on Plate 1. SURFACE EL: 105 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S_u , ksf
MATERIAL DESCRIPTION													
-104	2					ARTIFICIAL FILL (af) Clayey SAND (SC): loose, dark brown, fine to coarse sand, with gravel, some intermixed debris and trash, roots, plastic and glass fragments, clothing.							
-102	4					COLLUVIUM (Qcol) highly weathered, randomly deposited, mixed with clay.							
-100	6					CONEJO VOLCANICS (Tcvb) BASALT: highly weathered, light brown to dark reddish brown, can be fractured with rock hammer.							
-98	8												
-96	10												
-94	12												
-92	14												
-90	16												
-88	18												
-86													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 10.0 ft
DEPTH TO WATER: Not Encountered
DRILLING DATE: July 27, 2007

DRILLING METHOD: CAT 330L Excavator
DRILLED BY: Granite Construction Company
LOGGED BY: J. Hutchins
CHECKED BY: S M Bryant P.E.

LOG OF NO. TP-2
CSUCI Phase 2A/2B Inspiration Point Bridge
Camarillo, California



ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE NO.	SAMPLERS	SAMPLER BLOW COUNT	LOCATION: Upstream of the proposed bridge/culvert alignment, as shown on Plate 1. SURFACE EL: 107.5 ft +/- (rel. MSL datum)	UNIT WET WEIGHT, pcf	UNIT DRY WEIGHT, pcf	WATER CONTENT, %	% PASSING #200 SIEVE	LIQUID LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, S_u , ksf
						MATERIAL DESCRIPTION							
-106	2					ARTIFICIAL FILL (af) Clayey SAND with gravel (SC): loose, dark brown, fine to coarse sand, miscellaneous debris and trash, including asphalt, roots, brick fragments, pipes, tires, and glass bottles							
-104	4												
-102	6												
-100	8												
-98	10					COLLUVIUM (Qcol) highly weathered, randomly deposited, mixed with clay.							
-96	12					CONEJO VOLCANICS (Tcvb) BASALT: highly weathered, light brown to dark brown, can be fractured with rock hammer.							
-94	14												
-92	16												
-90	18												
-88													

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 14.0 ft
DEPTH TO WATER: Not Encountered

DRILLING DATE: July 27, 2007

DRILLING METHOD: CAT 330L Excavator
DRILLED BY: Granite Construction Company
LOGGED BY: J. Hutchins
CHECKED BY: S M Bryant P.E.

LOG OF NO. TP-3
CSUCI Phase 2A/2B Inspiration Point Bridge
Camarillo, California

Appendix B

Notice of Preparation and Notice of Preparation Comments

**REVISED NOTICE of PREPARATION OF AN
ENVIRONMENTAL IMPACT REPORT
FOR**

**CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus
Residential Neighborhood**

California State University, Channel Islands

Ventura County, California

December 14, 2016

Lead Agency:

Board of Trustees
California State University
401 Golden Shore
Long Beach CA 90802

Consulting Firm:

Rincon Consultants, Inc.
180 South Ashwood Avenue
Ventura, California 93003

Contact:

Terry M. Tarr, AIA
Assoc. Architect/Project Manager
California State University, Channel Islands
One University Drive
Camarillo, California 93012
Telephone: (805) 437-2018
terry.tarr@csuci.edu

Contact:

Jennifer Haddow
Principal
Rincon Consultants, Inc.
Telephone: (805) 644-4455
jhaddow@rinconconsultants.com

This revised Notice of Preparation (NOP) has been prepared to notify agencies and interested parties that the Board of Trustees of the California State University (CSU) will serve as the Lead Agency and have designated the Site Authority as the responsible party, consistent with Section 15021 of the California Environmental Quality Act (CEQA) Guidelines, in preparing an Environmental Impact Report (EIR) for the proposed California State University Channel Islands (CI) Specific Reuse Plan Amendment (the "proposed project"). The Board of Trustees is soliciting the views of interested persons and agencies as to the scope and content of the environmental information to be studied in the EIR. The EIR will address the potential physical environmental effects of the proposed project for each of the environmental topics outlined in the CEQA Guidelines, Appendix G. In accordance with Section 15082 of the CEQA Guidelines, this NOP is being sent to the Office of Planning and Research, Responsible Agencies, Trustee Agencies, and other interested parties. Responsible Agencies are those public agencies, besides the Board of Trustees and the Site Authority, that also have a role in approving or carrying out the proposed project. Agencies are requested to review the project description provided in this NOP and provide comments on environmental issues related to the statutory responsibilities of the agency. If you are an authorized representative of a Responsible Agency, or a Trustee Agency, a transportation planning agency, agency with transportation facilities that may be affected, or a Federal agency involved in approving or funding the proposed project, the Board of Trustees encourages you to express the views of your agency as to the scope and content of the environmental information that is relevant to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR if it will consider a permit or other approval for the proposed project. In responding, please also provide the name, address, telephone number and e-mail address of the contact person for your agency. Notice of Preparation comments on the EIR should focus on discussing possible impacts of the proposed project on the physical environment, ways in which potential adverse

effects might be minimized, and alternatives to the proposed project in light of the EIR's purpose to provide useful and accurate information about such factors.

Project Location: The project site (also referred to as Phase Two of the East Campus Residential Neighborhood or University Glen) is located on the California State University, Channel Islands (CSUCI) campus in southern Ventura County. The CSUCI campus lies 2.5 miles south of the city of Camarillo, northeast of the intersection of Lewis and Potrero Roads, and east of Calleguas Creek. The project site is a part of the Specific Reuse Plan area (also referred to as the Community Development Area), which is intended for development of university-related support uses. See <http://www.csuci.edu/ci-2025/presentations-and-media.htm> for a map of the project location.

Project Applicant: California State University, Channel Islands Site Authority, One University Drive, Camarillo, California 93012

Project Description: The proposed project is an Amendment to the CSUCI Specific Reuse Plan, adopted by the CSUCI Site Authority in 2000 and the Phase 2 Development of the East Campus Residential Neighborhood. The Specific Reuse Plan is one of the documents governing land development for the non-academic portions of the CSUCI complex, including the West and East Campuses. Since its adoption, extensive development has occurred on the East Campus, resulting in a sizeable residential community and a mixed-use town center located at the pivot of the East Campus and the academic core, east of the Broome Library.

The proposed Specific Reuse Plan Amendment includes a revision to the northernmost residential area of the East Campus. Up to 600 residential units are proposed on 32 acres of vacant land that is currently entitled for 242 single-family residential units. The proposed units offer a mix of rental and for-sale, multi-family, single-family, and income/age-restricted units. The proposed project also includes approximately 2.9 acres of recreation/ park area that consists of a central park and clubhouse, two vista parks along the northern periphery of the project site, seven paseos, and 19 courtyards.

The increase in residential density requires an update to the Specific Reuse Plan, which designates the project site for low to low-medium residential density (0-10 units per acre) development. The proposed project would result in low-medium to medium-high residential density (10-20 units per acre). To accommodate the increase in density, the number of lots, parcel and roadway configuration, and utility lines would be modified. Existing building pads and roads would be demolished and replaced. Much of the existing utilities and infrastructure would also need to be replaced and/ or modified to serve the new site layout.

In addition, there is the potential that the existing 96-inch reinforced concrete pipe (RCP) running under Channel Islands Drive and the flood control basin it feeds into along Camarillo Street are undersized for a 100-year storm event. For the purpose of the EIR, it is assumed that some modifications will be required to ensure that potential impacts to biological and hydrological resource areas, in particular, are considered.

The project site also includes an area in the northwest portion of the project site that is physically separated from the majority of the project site by an unnamed drainage. As the existing drainage crossing does not provide adequate access to Inspiration Point, and the culvert is undersized to withstand a 100-year storm event, the existing crossing and drainage culvert would be demolished and replaced with a new 75-foot long, 30-foot wide bridge with concrete retaining walls and corrugated steel pipe culvert.

Potential Environmental Effects: Potentially significant environmental impacts have been identified in the following issue areas: Aesthetics, Air Quality, Biological Resources, Greenhouse Gas Emissions, Land Use/Planning, Noise, Public Services, Recreation, Transportation/Traffic, and Utilities. In addition, alternative development scenarios, including a "no project" alternative, will be examined as part of the Environmental Impact Report.

An Initial Study has been prepared and is available for public review at: <http://www.csuci.edu/ci-2025/presentations-and-media.htm> and on campus at the Broome Library during normal hours and at Ironwood Hall by appointment only. Email terry.tarr@csuci.edu or call (805) 437-2018 to request an appointment.

Public Scoping Meeting: The Site Authority will hold two public scoping meetings to provide an opportunity for the public and representatives of public agencies to address the scope of the Environmental Impact Report. The Scoping Meetings for the Environmental Impact Report for the project are scheduled for December 15th, 2016, at 6:00 p.m. at CSUCI Campus – Malibu Hall #100 and January 4th, 2017, at 4:00 p.m. at CSUCI Campus – Malibu Hall #100. For map see: <http://www.csuci.edu/maps/documents/master-campus-map-07-2016.pdf>. Parking Permit Dispensers are at A1 and A2 lots. Do not park on the street or at TOW (town center) to avoid a ticket.

Thirty-Day Comment Period: Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice. The Notice of Preparation comment period begins on December 14, 2016 and ends on January 17, 2017. Please send your comments by regular mail or email no later than January 17, 2017, to: Terry M. Tarr, AIA, Assoc. Architect/Project Manager, terry.tarr@csuci.edu.

**REVISED NOTICE of PREPARATION OF AN
ENVIRONMENTAL IMPACT REPORT
FOR
CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus
Residential Neighborhood
California State University, Channel Islands
Ventura County, California
December 12, 2016**

Lead Agency:

Board of Trustees
California State University
401 Golden Shore
Long Beach CA 90802

Consulting Firm:

Rincon Consultants, Inc.
180 South Ashwood Avenue
Ventura, California 93003

Contact:

Terry M. Tarr, AIA
Assoc. Architect/Project Manager
California State University, Channel Islands
One University Drive
Camarillo, California 93012
Telephone: (805) 437-2018
terry.tarr@csuci.edu

Contact:

Jennifer Haddow
Principal Environmental Scientist
Rincon Consultants, Inc.
Telephone: (805) 644-4455
jhaddow@rinconconsultants.com

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your agency. Notice of Preparation comments on the EIR should focus on discussing possible impacts of the proposed project on the physical environment, ways in which potential adverse effects might be minimized, and alternatives to the proposed project in light of the EIR's purpose to provide useful and accurate information about such factors.

Project Location:

The project site (also referred to as Phase Two of the East Campus Residential Neighborhood or University Glen) is located on the California State University, Channel Islands (CSUCI) campus in southern Ventura County at the eastern edge of the Oxnard Plain and at the western flank of the Santa Monica Mountains. The CSUCI campus lies 2.5 miles south of the city of Camarillo, northeast of the intersection of Lewis and Potrero Roads, and east of Calleguas Creek. Primary access to the CSUCI campus is provided by U.S. Highway 101 to the north, via Lewis Road and Camarillo Street, or by U.S. Highway 1 to the southwest, via Las Posas Road and Hueneme Road. The project site is a part of the Specific Reuse Plan area (also referred to as the Community Development Area), which is intended for development of university-related support uses. See Figure 1 for a map of the project location.



Figure 1 Project Location

Project Applicant:

California State University, Channel Islands Site Authority
One University Drive
Camarillo, California 93012

Project Description: The proposed project is an Amendment to the CSUCI Specific Reuse Plan, adopted by the CSUCI Site Authority in 2000 and the Phase 2 Development of the East Campus Residential Neighborhood. The Specific Reuse Plan is one of the documents governing land development for the non-academic portions of the CSUCI complex, including the West and East Campuses. Since its adoption, extensive development has occurred on the East Campus, resulting in a sizeable residential community and a mixed-use town center located at the pivot of the East Campus and the academic core, east of the Broome Library.

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The increase in residential density requires an update to the Specific Reuse Plan, which designates the project site for low to low-medium residential density (0-10 units per acre) development. The proposed project would result in low-medium to medium-high residential density (10-20 units per acre). To accommodate the increase in density, the number of lots, parcel and roadway configuration, and utility lines would be modified. Existing building pads and roads would be demolished and replaced. Much of the existing utilities and infrastructure would also need to be replaced and/ or modified to serve the new site layout.

In addition, there is the potential that the existing 96-inch reinforced concrete pipe (RCP) running under Channel Islands Drive and the flood control basin it feeds into along Camarillo Street are undersized for a 100-year storm event. For the purpose of the EIR, it is assumed that some modifications will be required to ensure that potential impacts to biological and hydrological resource areas, in particular, are considered.

The project site also includes an area in the northwest portion of the project site known as Inspiration Point, which is physically separated from the majority of the project site by an unnamed drainage. As the existing drainage crossing does not provide adequate access to Inspiration Point, and the culvert is undersized to withstand a 100-year storm event, the existing crossing and drainage culvert would be demolished and replaced with a new 75-foot long, 30-foot wide bridge with concrete retaining walls and corrugated steel pipe culvert.

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Potentially significant environmental impacts have been identified in the following issue areas: Aesthetics, Air Quality, Biological Resources, Greenhouse Gas Emissions, Land Use/Planning, Noise, Public Services, Recreation, Transportation/Traffic, and Utilities. In addition, alternative development scenarios, including a "no project" alternative, will be examined as part of the Environmental Impact Report.

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Public Scoping Meeting:

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December 15th, 2016, at 6:00 p.m. at the following location:
CSUCI Campus – Malibu Hall #100

January 4th, 2017, at 4:00 p.m. at the following location:
CSUCI Campus – Malibu Hall #100

For map see: <http://www.csuci.edu/maps/documents/master-campus-map-07-2016.pdf>

Look for MAL building. Parking Permit Dispensers are at A1 and A2 lots. Parking may also be available at A6, A8, AE, A7 and A10 lots. Do not park on the street or at TOW (town center) to avoid a ticket.

Thirty-Day Comment Period:

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice. The revised Notice of Preparation comment period begins on December 14, 2016 and ends on January 17, 2017. Please send your comments by regular mail or email no later than January 17, 2017, to: Terry M. Tarr, AIA, Assoc. Architect/Project Manager, terry.tarr@csuci.edu.

Prepared By:

RINCON CONSULTANTS, INC.



Jennifer Haddow, PhD
Principal Environmental Scientist
Telephone: (805) 644-4455
EMAIL: jhaddow@rinconconsultants.com

NATIVE AMERICAN HERITAGE COMMISSION

1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
Phone (916) 373-3710
Fax (916) 373-5471
Email: nahc@nahc.ca.gov
Website: <http://www.nahc.ca.gov>
Twitter: @CA_NAHC



December 1, 2016

Terry M. Tarr
California State University Board of Trustees
One University Drive
San Camarillo, CA 93012

sent via e-mail:
terry.tarr@csuci.edu

RE: SCH# 2016111068; CSUCI Specific Reuse Plan Amendment and Phase 2 Development of East Campus Residential Neighborhood Project, Notice of Preparation for Draft Environmental Impact Report, Ventura County, California

Dear Ms. Tarr:

The Native American Heritage Commission has received the Notice of Preparation (NOP) for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code § 21000 et seq.), specifically Public Resources Code section 21084.1, states that a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit. 14, § 15064.5 (b) (CEQA Guidelines Section 15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an environmental impact report (EIR) shall be prepared. (Pub. Resources Code § 21080 (d); Cal. Code Regs., tit. 14, § 15064 subd.(a)(1) (CEQA Guidelines § 15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources with the area of project effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a **separate category of cultural resources**, "tribal cultural resources" (Pub. Resources Code § 21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment (Pub. Resources Code § 21084.2). Please reference California Natural Resources Agency (2016) "Final Text for tribal cultural resources update to Appendix G: Environmental Checklist Form," <http://resources.ca.gov/ceqa/docs/ab52/Clean-final-AB-52-App-G-text-Submitted.pdf>. Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code § 21084.3 (a)). **AB 52 applies to any project for which a notice of preparation or a notice of negative declaration or mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. § 800 et seq.) may also apply.

The NAHC recommends **lead agencies consult with all California Native American tribes** that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments. **Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.**

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. **Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project:** Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a **lead agency** shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:
 - a. A brief description of the project.
 - b. The lead agency contact information.
 - c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code § 21080.3.1 (d)).

- d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code § 21073).
2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code § 21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or environmental impact report. (Pub. Resources Code § 21080.3.1(b)).
- a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code § 65352.4 (SB 18). (Pub. Resources Code § 21080.3.1 (b)).
3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
- a. Alternatives to the project.
- b. Recommended mitigation measures.
- c. Significant effects. (Pub. Resources Code § 21080.3.2 (a)).
4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
- a. Type of environmental review necessary.
- b. Significance of the tribal cultural resources.
- c. Significance of the project's impacts on tribal cultural resources.
- d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code § 21080.3.2 (a)).
5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code sections 6254 (r) and 6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code § 21082.3 (c)(1)).
6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
- a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
- b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code section 21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code § 21082.3 (b)).
7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
- a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
- b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code § 21080.3.2 (b)).
8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code section 21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code section 21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code § 21082.3 (a)).
9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code section 21084.3 (b). (Pub. Resources Code § 21082.3 (e)).
10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

- a. Avoidance and preservation of the resources in place, including, but not limited to:
 - i. Planning and construction to avoid the resources and protect the cultural and natural context.
 - ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
- b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
 - i. Protecting the cultural character and integrity of the resource.
 - ii. Protecting the traditional use of the resource.
 - iii. Protecting the confidentiality of the resource.
- c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
- d. Protecting the resource. (Pub. Resource Code § 21084.3 (b)).
- e. Please note that a federally recognized California Native American tribe or a nonfederally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code § 815.3 (c)).
- f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code § 5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An environmental impact report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
- a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code sections 21080.3.1 and 21080.3.2 and concluded pursuant to Public Resources Code section 21080.3.2.
 - b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
 - c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code section 21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code § 21082.3 (d)). *This process should be documented in the Cultural Resources section of your environmental document.*

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires **local governments** to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code § 65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code § 65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code section 65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code sections 5097.9 and 5097.993 that are within the city's or county's jurisdiction. (Gov. Code § 65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
 - a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
 - b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason,

we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: <http://nahc.ca.gov/resources/forms/>

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
 - a. If part or all of the APE has been previously surveyed for cultural resources.
 - b. If any known cultural resources have been already been recorded on or adjacent to the APE.
 - c. If the probability is low, moderate, or high that cultural resources are located in the APE.
 - d. If a survey is required to determine whether previously unrecorded cultural resources are present.
2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
 - a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
 - b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.
3. Contact the NAHC for:
 - a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
 - b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.
4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
 - a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, section 15064.5(f) (CEQA Guidelines section 15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
 - b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
 - c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code section 7050.5, Public Resources Code section 5097.98, and Cal. Code Regs., tit. 14, section 15064.5, subdivisions (d) and (e) (CEQA Guidelines section 15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

Please contact me if you need any additional information at gayle.totton@nahc.ca.gov.

Sincerely,



Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst

cc: State Clearinghouse



State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
South Coast Region
3883 Ruffin Road
San Diego, CA 92123
(858) 467-4201
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director



December 22, 2016

Terry M. Tarr, AIA, LEED, AP
California State University Board of Trustees
One University Drive
Camarillo, CA 93012

Subject: Comments on the Notice of Preparation of a Draft Environmental Impact Report for the California State University Channel Islands Specific Reuse Plan Amendment and Phase 2 Development of East Campus Residential Neighborhood Project

Dear Mr. Tarr:

The California Department of Fish and Wildlife (CDFW) has reviewed the above-referenced Notice of Preparation (NOP) for the California State University, Channel Islands Specific Reuse Plan Amendment and Phase 2 Development of East Campus Residential Neighborhood Project (Project). The Project area is located on the California State University, Channel Islands (CSUCI) campus in southern Ventura County at the eastern edge of the Oxnard Plain and at the western flank of the Santa Monica Mountains. The CSUCI campus lies 2.5 miles south of the city of Camarillo, northeast of the intersection of Lewis and Potrero Roads, and east of Calleguas Creek. Primary access to the CSUCI campus is provided by U.S. Highway 101 to the north, via Lewis Road and Camarillo Street, or by U.S. Highway 1 to the southwest, via Las Posas Road and Hueneme Road. The Project site is included within the Specific Reuse Plan and is a part of the Community Development Area (CDA) designated within the plan. The CDA is planned for development of university-related support uses.

The following comments and recommendations have been prepared pursuant to the Department's authority as a Responsible Agency under CEQA Guidelines section 15381 over those aspects of the proposed project that come under the purview of the California Endangered Species Act (Fish and Game Code § 2050 *et seq.*) and Fish and Game Code section 1600 *et seq.*, and pursuant to our authority as Trustee Agency with jurisdiction over natural resources affected by the Project (California Environmental Quality Act, [CEQA] Guidelines § 15386) to assist the Lead Agency in avoiding or minimizing potential Project impacts on biological resources.

Specific Comments

1. Coastal California Gnatcatcher, Least Bell's Vireo, and Coastal Cactus Wren: Coastal California gnatcatcher (*Polioptila californica californica*) is a federally listed endangered species and a California Species of Special Concern (SSC); least Bell's vireo (*Vireo bellii pusillus*), is a federal and state listed endangered species; and coastal cactus wren (*Campylorhynchus brunneicapillus*), is a California SSC. The coastal California gnatcatcher and coastal cactus wren species use the coastal sage scrub and cactus scrub habitats and are known to occur in close proximity to the Project site. The least Bell's vireo uses riparian habitat, some of which occurs on the Project site as documented in the NOP. CDFW recommends completing surveys for these species to better inform the Project's potential

impacts prior to the circulation of the CEQA document. The results of the surveys may influence the mitigation measures ultimately adopted within the final CEQA document. Survey protocol and guidelines for coastal California gnatcatcher and least Bell's vireo can be found at: <https://www.wildlife.ca.gov/Conservation/Survey-Protocols>.

General Comments

- 1) Project Description and Alternatives. To enable the Department to adequately review and comment on the proposed project from the standpoint of the protection of plants, fish, and wildlife, we recommend the following information be included in the DEIR:
 - a) A complete discussion of the purpose and need for, and description of, the proposed project, including all staging areas and access routes to the construction and staging areas; and,
 - b) A range of feasible alternatives to project component location and design features to ensure that alternatives to the proposed project are fully considered and evaluated. The alternatives should avoid or otherwise minimize direct and indirect impacts to sensitive biological resources and wildlife movement areas.
- 2) Lake and Streambed Alteration Agreements (LSA). As a Responsible Agency under CEQA Guidelines section 15381, the Department has authority over activities in streams and/or lakes that will divert or obstruct the natural flow, or change the bed, channel, or bank (including vegetation associated with the stream or lake) of a river or stream, or use material from a streambed. For any such activities, the project applicant (or "entity") must provide written notification to the Department pursuant to section 1600 *et seq.* of the Fish and Game Code. Based on this notification and other information, the Department determines whether a Lake and Streambed Alteration Agreement (LSA) with the applicant is required prior to conducting the proposed activities. The Department's issuance of a LSA for a project that is subject to CEQA will require CEQA compliance actions by the Department as a Responsible Agency. As a Responsible Agency, the Department may consider the Negative Declaration or Environmental Impact Report of the local jurisdiction (Lead Agency) for the project. To minimize additional requirements by the Department pursuant to section 1600 *et seq.* and/or under CEQA, the document should fully identify the potential impacts to the stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for issuance of the LSA.¹
 - a) The project area supports aquatic, riparian, and wetland habitats; therefore, a preliminary jurisdictional delineation of the streams and their associated riparian habitats should be included in the DEIR. The delineation should be conducted pursuant to the U. S. Fish and Wildlife Service wetland definition adopted by the Department.² Some wetland and riparian habitats subject to the Department's authority may extend beyond

¹ A notification package for a LSA may be obtained by accessing the Department's web site at www.wildlife.ca.gov/habcon/1600.

² Cowardin, Lewis M., et al. 1970. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service.

the jurisdictional limits of the U.S. Army Corps of Engineers' Section 404 permit and Regional Water Quality Control Board Section 401 Certification.

- b) In project areas which may support ephemeral streams, herbaceous vegetation, woody vegetation, and woodlands also serve to protect the integrity of ephemeral channels and help maintain natural sedimentation processes; therefore, the Department recommends effective setbacks be established to maintain appropriately-sized vegetated buffer areas adjoining ephemeral drainages.
 - c) Project-related changes in drainage patterns, runoff, and sedimentation should be included and evaluated in the environmental document.
- 3) Wetlands Resources. The Department, as described in Fish & Game Code § 703(a) is guided by the Fish and Game Commission's policies. The Wetlands Resources policy (<http://www.fgc.ca.gov/policy/>) of the Fish and Game Commission "...seek[s] to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California. Further, it is the policy of the Fish and Game Commission to strongly discourage development in or conversion of wetlands. It opposes, consistent with its legal authority, any development or conversion which would result in a reduction of wetland acreage or wetland habitat values. To that end, the Commission opposes wetland development proposals unless, at a minimum, project mitigation assures there will be "no net loss" of either wetland habitat values or acreage. The Commission strongly prefers mitigation which would achieve expansion of wetland acreage and enhancement of wetland habitat values".
- a) The Wetlands Resources policy provides a framework for maintaining wetland resources and establishes mitigation guidance. The Department encourages avoidance of wetland resources as a primary mitigation measure and discourages the development or type conversion of wetlands to uplands. The Department encourages activities that would avoid the reduction of wetland acreage, function, or habitat values. Once avoidance and minimization measures have been exhausted, the project must include mitigation measures to assure a "no net loss" of either wetland habitat values, or acreage, for unavoidable impacts to wetland resources. Conversions include, but are not limited to, conversion to subsurface drains, placement of fill or building of structures within the wetland, and channelization or removal of materials from the streambed. All wetlands and watercourses, whether ephemeral, intermittent, or perennial, should be retained and provided with substantial setbacks, which preserve the riparian and aquatic values and functions for the benefit to on-site and off-site wildlife populations. The Department recommends mitigation measures to compensate for unavoidable impacts be included in the DEIR and these measures should compensate for the loss of function and value.
 - b) The Fish and Game Commission's Water policy guides the Department to [insure] the quantity and quality of the waters of this state should be apportioned and maintained respectively so as to produce and sustain maximum numbers of fish and wildlife; to provide maximum protection and enhancement of fish and wildlife and their habitat; encourage and support programs to maintain or restore a high quality of the waters of this state, and prevent the degradation thereof caused by pollution and contamination; and endeavor to keep as much water as possible open and accessible to the public for the use and enjoyment of fish and wildlife. The Department recommends avoidance of water practices and structures that use excessive amounts of water, and minimization of impacts that negatively affect water quality, to the extent feasible.

- 4) California Endangered Species Act (CESA). The Department considers adverse impacts to a species protected by CESA, for the purposes of CEQA, to be significant without mitigation. As to CESA, take of any endangered, threatened, candidate species, or state-listed rare plant species that results from the Project is prohibited, except as authorized by state law (Fish and Game Code, §§ 2080, 2085; Cal. Code Regs., tit. 14, §786.9). Consequently, if the Project, Project construction, or any Project-related activity during the life of the Project will result in take of a species designated as endangered or threatened, or a candidate for listing under CESA, the Department recommends that the Project proponent seek appropriate take authorization under CESA prior to implementing the Project. Appropriate authorization from the Department may include an Incidental Take Permit (ITP) or a consistency determination in certain circumstances, among other options (Fish and Game Code §§ 2080.1, 2081, subds. (b),(c)). Early consultation is encouraged, as significant modification to a Project and mitigation measures may be required in order to obtain a CESA Permit. Revisions to the Fish and Game Code, effective January 1998, may require that the Department issue a separate CEQA document for the issuance of an ITP unless the Project CEQA document addresses all Project impacts to CESA-listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of an ITP. For these reasons, biological mitigation monitoring and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA ITP.
- 5) Biological Baseline Assessment. To provide a complete assessment of the flora and fauna within and adjacent to the project area, with particular emphasis upon identifying endangered, threatened, sensitive, regionally and locally unique species, and sensitive habitats, the DEIR should include the following information:
 - a) Information on the regional setting that is critical to an assessment of environmental impacts, with special emphasis on resources that are rare or unique to the region (CEQA Guidelines § 15125[c]);
 - b) A thorough, recent, floristic-based assessment of special status plants and natural communities, following the Department's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (see <http://www.dfg.ca.gov/habcon/plant/>);
 - c) Floristic, alliance- and/or association-based mapping and vegetation impact assessments conducted at the project site and within the neighboring vicinity. *The Manual of California Vegetation*, second edition, should also be used to inform this mapping and assessment (Sawyer et al. 2008³). Adjoining habitat areas should be included in this assessment where site activities could lead to direct or indirect impacts offsite. Habitat mapping at the alliance level will help establish baseline vegetation conditions;

³Sawyer, J. O., Keeler-Wolf, T., and Evens J.M. 2008. A manual of California Vegetation, 2nd ed. ISBN 978-0-943460-49-9.

- d) A complete, recent, assessment of the biological resources associated with each habitat type on site and within adjacent areas that could also be affected by the project. The Department's California Natural Diversity Data Base (CNDDDB) in Sacramento should be contacted to obtain current information on any previously reported sensitive species and habitat. The Department recommends that CNDDDB Field Survey Forms be completed and submitted to CNDDDB to document survey results. Online forms can be obtained and submitted at http://www.dfg.ca.gov/biogeodata/cnddb/submitting_data_to_cnddb.asp;
 - e) A complete, recent, assessment of rare, threatened, and endangered, and other sensitive species on site and within the area of potential effect, including California Species of Special Concern (CSSC) and California Fully Protected Species (Fish and Game Code § 3511). Species to be addressed should include all those which meet the CEQA definition (see CEQA Guidelines § 15380). Seasonal variations in use of the project area should also be addressed. Focused species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required. Acceptable species-specific survey procedures should be developed in consultation with the Department and the U.S. Fish and Wildlife Service; and,
 - f) A recent, wildlife and rare plant survey. CDFW generally considers biological field assessments for wildlife to be valid for a one-year period, and assessments for rare plants may be considered valid for a period of up to three years. Some aspects of the proposed project may warrant periodic updated surveys for certain sensitive taxa, particularly if build out could occur over a protracted time frame, or in phases.
- 6) Biological Direct, Indirect, and Cumulative Impacts. To provide a thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources, with specific measures to offset such impacts, the following should be addressed in the DEIR:
- a) A discussion of potential adverse impacts from lighting, noise, human activity, exotic species, and drainage. The latter subject should address project-related changes on drainage patterns and downstream of the project site; the volume, velocity, and frequency of existing and post-project surface flows; polluted runoff; soil erosion and/or sedimentation in streams and water bodies; and post-project fate of runoff from the project site. The discussion should also address the proximity of the extraction activities to the water table, whether dewatering would be necessary and the potential resulting impacts on the habitat, if any, supported by the groundwater. Mitigation measures proposed to alleviate such impacts should be included;
 - b) A discussion regarding indirect project impacts on biological resources, including resources in nearby public lands, open space, adjacent natural habitats, riparian ecosystems, and any designated and/or proposed or existing reserve lands (e.g., preserve lands associated with a NCCP). Impacts on, and maintenance of, wildlife corridor/movement areas, including access to undisturbed habitats in adjacent areas, should be fully evaluated in the DEIR;
 - c) The impacts of zoning of areas for development projects or other uses nearby or adjacent to natural areas, which may inadvertently contribute to wildlife-human

interactions. A discussion of possible conflicts and mitigation measures to reduce these conflicts should be included in the environmental document; and,

- d) A cumulative effects analysis, as described under CEQA Guidelines section 15130. General and specific plans, as well as past, present, and anticipated future projects, should be analyzed relative to their impacts on similar plant communities and wildlife habitats.
- 7) Avoidance, Minimization, and Mitigation for Sensitive Plants. The DEIR should include measures to fully avoid and otherwise protect sensitive plant communities from Project-related direct and indirect impacts. CDFW considers these communities to be imperiled habitats having both local and regional significance. Plant communities, alliances, and associations with a statewide ranking of S-1, S-2, S-3 and S-4 should be considered sensitive and declining at the local and regional level. These ranks can be obtained by querying the CNDDDB and are included in *The Manual of California Vegetation* (Sawyer et al. 2008).
- 8) Compensatory Mitigation. The DEIR should include mitigation measures for adverse Project-related impacts to sensitive plants, animals, and habitats. Mitigation measures should emphasize avoidance and reduction of project impacts. For unavoidable impacts, on-site habitat restoration or enhancement should be discussed in detail. If on-site mitigation is not feasible or would not be biologically viable and therefore not adequately mitigate the loss of biological functions and values, off-site mitigation through habitat creation and/or acquisition and preservation in perpetuity should be addressed.
- 9) Long-Term Management of Mitigation Lands. For proposed preservation and/or restoration, the DEIR should include measures to protect the targeted habitat values from direct and indirect negative impacts in perpetuity. The objective should be to offset the project-induced qualitative and quantitative losses of wildlife habitat values. Issues that should be addressed include, but are not limited to, restrictions on access, proposed land dedications, monitoring and management programs, control of illegal dumping, water pollution, and increased human intrusion. An appropriate non-wasting endowment should be set aside to provide for long-term management of mitigation lands.
- 10) Nesting Birds. CDFW recommends that measures be taken to avoid Project impacts to nesting birds. Migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (Title 50, § 10.13, Code of Federal Regulations). Sections 3503, 3503.5, and 3513 of the California Fish and Game Code prohibit take of all birds and their active nests including raptors and other migratory nongame birds (as listed under the Federal MBTA). Proposed Project activities (including, but not limited to, staging and disturbances to native and nonnative vegetation, structures, and substrates) should occur outside of the avian breeding season which generally runs from February 1st through September 1st (as early as January 1st for some raptors) to avoid take of birds or their eggs. If avoidance of the avian breeding season is not feasible, CDFW recommends surveys by a qualified biologist with experience in conducting breeding bird surveys to detect protected native birds occurring in suitable nesting habitat that is to be disturbed and (as access to adjacent areas allows) any other such habitat within 300 feet of the disturbance area (within 500 feet for raptors). Project personnel, including all contractors working on site, should be instructed on the sensitivity of the area. Reductions

in the nest buffer distance may be appropriate depending on the avian species involved, ambient levels of human activity, screening vegetation, or possibly other factors.

- 11) Translocation/Salvage of Plants and Animal Species. Translocation and transplantation is the process of moving an individual from the Project site and permanently moving it to a new location. CDFW generally does not support the use of, translocation or transplantation as the primary mitigation strategy for unavoidable impacts to rare, threatened, or endangered plant or animal species. Studies have shown that these efforts are experimental and the outcome unreliable. CDFW has found that permanent preservation and management of habitat capable of supporting these species is often a more effective long-term strategy for conserving sensitive plants and animals, and their habitats.
- 12) Moving out of Harm's Way. The proposed Project is anticipated to result in clearing of natural habitats that support many species of indigenous wildlife. To avoid direct mortality, CDFW recommends a qualified biological monitor approved by CDFW be on site prior to and during ground and habitat disturbing activities to move out of harm's way special status species or other wildlife of low mobility that would be injured or killed by grubbing or Project-related construction activities. It should be noted that the temporary relocation of on-site wildlife does not constitute effective mitigation for the purposes of offsetting project impacts associated with habitat loss.
- 13) Wildlife Movement and Connectivity. The Project area supports significant biological resources and is located adjacent to a regional wildlife movement corridor. The Project area contains habitat connections and supports movement across the broader landscape, sustaining both transitory and permanent wildlife populations. Onsite features, which contribute to habitat connectivity, should be evaluated and maintained. Aspects of the Project could create physical barriers to wildlife movement from direct or indirect project-related activities. Indirect impacts from lighting, noise, dust, and increased human activity may displace wildlife in the general area.
- 14) Revegetation/Restoration Plan. Plans for restoration and re-vegetation should be prepared by persons with expertise in southern California ecosystems and native plant restoration techniques. Plans should identify the assumptions used to develop the proposed restoration strategy. Each plan should include, at a minimum: (a) the location of restoration sites and assessment of appropriate reference sites; (b) the plant species to be used, sources of local propagules, container sizes, and seeding rates; (c) a schematic depicting the mitigation area; (d) a local seed and cuttings and planting schedule; (e) a description of the irrigation methodology; (f) measures to control exotic vegetation on site; (g) specific success criteria; (h) a detailed monitoring program; (i) contingency measures should the success criteria not be met; and (j) identification of the party responsible for meeting the success criteria and providing for conservation of the mitigation site in perpetuity. Monitoring of restoration areas should extend across a sufficient time frame to ensure that the new habitat is established, self-sustaining, and capable of surviving drought.
 - a) CDFW recommends that local onsite propagules from the Project area and nearby vicinity be collected and used for restoration purposes. Onsite seed collection should be initiated in the near future in order to accumulate sufficient propagule material for subsequent use in future years. Onsite vegetation mapping at the alliance and/or association level should be used to develop appropriate restoration goals and local plant palettes. Reference areas

should be identified to help guide restoration efforts. Specific restoration plans should be developed for various Project components as appropriate.

- b) Restoration objectives should include providing special habitat elements where feasible to benefit key wildlife species. These physical and biological features can include, for example, retention of woody material, logs, snags, rocks and brush piles (see Mayer and Laudenslayer, 1988⁴, for a more detailed discussion of special habitat elements).

We appreciate the opportunity to comment on the referenced NOP. Questions regarding this letter and further coordination on these issues should be directed to Dan Blankenship, Senior Environmental Scientist at (661-259-3750) or Daniel.Blankenship@wildlife.ca.gov.

Sincerely,



Betty J. Courtney
Environmental Program Manager I

ec: Christine Found-Jackson, CDFW, Westlake Village
Dan Blankenship, CDFW, Newhall
Brock Warmuth, CDFW, Ventura
Scott Morgan, State Clearinghouse, Sacramento

⁴Mayer, K. E. and W. F. Laudenslayer, Jr. 1988. Editors: A guide to wildlife habitats of California. State of California, The Resources Agency, Department of Forestry and Fire Protection, Sacramento, CA.

From: Tarr, Terry [<mailto:terry.tarr@csuci.edu>]
Sent: Thursday, January 05, 2017 8:28 AM
To: Jennifer Haddow
Cc: Gormley, John; Blaine, Erik; Doll, Caroline
Subject: FW: 2nd East Campus Scoping Mtg

Jennifer,

Here is the email that came in during the EIR scoping meeting and which I read the question out loud during the meeting for the record.

Rincon can include this in their meeting notes.

Thanks,

Terry M. Tarr

From: Sandi Boyd
Sent: Wednesday, January 4, 2017 2:35 PM
To: Tarr, Terry <terry.tarr@csuci.edu>
Subject: Re: 2nd East Campus Scoping Mtg

Thanks. We can't come at 4. Spouse missed the first meeting, which I was able attend most of.

I had a question I wasn't able to ask before I left:

What are the plans for enhanced public transportation given that the new development is likely to double the Glen's population?

Thanks!

sandi



VENTURA COUNTY WATERSHED PROTECTION DISTRICT
PLANNING AND REGULATORY DIVISION
800 South Victoria Avenue, Ventura, California 93009
E. Zia Hosseinipour – Manager, Advanced Planning (805) 654-2454

M E M O R A N D U M

DATE: January 11, 2017

TO: Terry M. Tarr, Associate Architect/Project Manager
California State University, Channel Islands
One University Drive
Camarillo, California 93012
Terry.tarr@csuci.edu

FROM: E. Zia Hosseinipour, Manager of Advanced Planning *S.V.*

SUBJECT: RMA 16-0026 – Revised Notice of Preparation (NOP) of an Environmental Impact Report for CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood; 32 Acres
Calleguas Creek, Calleguas Creek Watershed, Zone 3
Watershed Protection District Project Number: WC2017-0001

Pursuant to your request, this office has reviewed the subject Initial Study, dated November 2016, and the Revised Notice of Preparation (NOP) of an Environmental Impact Report for CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood, dated December 12, 2016.

PROJECT LOCATION

The project site (referred to as Phase 2 of the East Campus Residential Neighborhood, also known as University Glen Phase 2) is located on the California State University, Channel Islands (CSUCI) campus in southern Ventura County at the eastern edge of the Oxnard Plain.

PROJECT DESCRIPTION

The proposed project is an Amendment to the CSUCI Specific Reuse Plan, adopted by the CSUCI Site Authority in 2000 and the Phase 2 Development of the East Campus Residential Neighborhood. The proposed Specific Reuse Plan Amendment includes a revision to the northernmost residential area of the East Campus. Up to 600 residential units are proposed on 32 acres of vacant land that is currently entitled for 242 single-family residential units. The proposed units offer a mix of rental and for-sale multi-family, single-family, and income/age-restricted units and includes approximately 2.9 acres of recreation/park area.

WATERSHED PROTECTION DISTRICT PROJECT COMMENTS:

1. The proposed project would increase the flood flows by increasing the impervious areas up to 75% of the 32 acres. Provide an onsite detention system to detain any increase in peak flows as a result of development. The District's Standard is "No increase in peak flows for all storm frequencies.
2. Whenever a development results in an increase in impervious area, this increase must be mitigated. The project must include mitigation to ensure that the peak flow will not increase during storm events of the following frequencies: 10-year, 25-year, 50-year, and 100-year. The drainage report explaining the mitigation strategy employed must give details on how the flows and volumes were calculated as well as the mitigation strategy itself.
3. The drainage report documenting how mitigation will be provided must follow the VCWPD Guide for Hydrologic and Hydraulic Study Reports (http://pwportal.ventura.org/WPD/dept/WPD/divisions/planning_regulator/docs/Guide%20for%20Hydra.pdf). The District's methods for calculating the design hydrology for the project are contained in the 2010 Design Hydrology Manual. The manual can be obtained from: <http://vcwatershed.net/hydrology/>.
4. Page 45 of the Initial Study states that the proposed Specific Reuse Plan Amendment would include replacement of the existing culvert on the northern unnamed drainage with a new culvert and crossing to access Inspiration Point. The existing culvert is undersized for a 100-year storm flow and could result in flooding in adjacent lots due to backflow. The EIR should analyze the potential impacts of the proposed alterations to existing drainage.
5. The project description states that an existing 96-inch reinforced concrete pipe under Channel Islands Drive feeding into the flood control basin along Camarillo Street and the flood basin itself are undersized for a 100-year storm event. The existing detention basin volume could be enlarged to contain the post-development volume and the storm drain system between the project site and the existing detention basin should be modified to contain the 100-year storm flows.
6. Ordinance WP-2, which governs the Watershed Protection District, states in Article 2, Section 202 that a permit is required from the District if any actions or construction performed by the applicant will result in impairing, diverting, impeding, or altering the characteristics of the flow of water

January 11, 2017

RMA 16-0026 – Initial Study and NOP for CSUCI

Page 3 of 3

running in a watercourse. Generally speaking, any of the following improvements requires a permit from the District:

- bank protection
- planting of vegetation in the channel
- connection to the channel
- installation of utility lines under, over, or across the channel

Any other action that alters the characteristics of flow will also require a permit. Any construction in or proposed use of District right-of-way also requires a permit. More information on the requirements for District permits can be found here: <http://vcpublicworks.org/pwa/watercourse-permits>.

Thank you for the opportunity to review the Initial Study for this project.

END OF TEXT

VENTURA COUNTY
AIR POLLUTION CONTROL DISTRICT
Memorandum

TO: Terry M. Tarr, California State University, Channel Islands

DATE: January 13, 2017

FROM: Alicia Stratton

SUBJECT: Request for Review of Notice of Preparation for an Environmental Impact Report for the CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood, California State University Channel Islands (Reference No. 16-026)

Air Pollution Control District staff has reviewed the subject Notice of Preparation (NOP), which is a proposal for an amendment to the CSUCI Specific Reuse Plan and the Phase 2 Development of the East Campus Residential Neighborhood. The Reuse Plan is one of the documents governing land development for the non-academic portions of the university complex. The amendment includes a revision to the northernmost residential area of the campus. Up to 600 residential units are proposed on 32 acres of vacant land that is currently entitled for 242 single family residential units. The increase in density requires an update to the Specific Reuse Plan. To accommodate the increase in density, the number of lots, parcel and roadway configuration and utility lines would be modified. Existing building pads and roads would be demolished and replaced and much of the existing utilities and infrastructure would also need to be replaced and modified.

Air quality has been identified in the NOP as a potentially significant environmental impact. District staff recommends the draft environmental impact report (DEIR) evaluate all potential air quality impacts that may result from the project. Specifically, the air quality assessment should consider reactive organic compound emissions, nitrogen oxide emissions and particulate matter from all project-related motor vehicles and construction equipment.

We recommend that the potential for Valley Fever be addressed in the DEIR because of the recent fires and potential Valley Fever disturbance on the project site.

Because this project will involve a large amount of grading of soil, the earthmoving equipment has the potential to expose sensitive populations in the vicinity to elevated levels of diesel exhaust. The California Air Resources Board (CARB) has identified

diesel exhaust particulate matter as a Toxic Air Contaminant (TAC). Diesel exhaust includes hundreds of different gaseous and particulate components, many of which are toxic. We recommend that a screening health risk assessment be conducted for the project to assess the potential health risks on any nearby sensitive receptors, such as schools, hospitals, day care centers, retirement homes, and residences. Mitigation measures should also be identified and discussed if the assessment indicates a significant risk. Additional information on TACs can be obtained from the District's website at http://www.vcapcd.org/air_toxics.htm. If you have any general questions regarding air toxics, please contact Terri Thomas of the APCD at (805) 645-1405 or by email at terri@vcapcd.org.

If the project is determined to have a significant impact on regional and/or local air quality, the DEIR should include all feasible mitigation measures.

If you have any questions, please call me at (805) 645-1426.

Date: January 16, 2017

From: Joe Willingham
Planning and Data Systems
Camrosa Water District

To: Terry M. Tarr, AIA
Assoc. Architect/Project Manager
California State University, Channel Islands

Subject: Camrosa Comments to Scoping Meeting for the Revised Notice of Preparation of an Environmental Impact Report for CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood.

Dear Mr. Tarr,

Thank you for the opportunity to comment on the University's subject project. As you are aware, the Camrosa Water District provides water (potable and non-potable recycled) and waste-water services to CSUCI. The following are comments and recommendations related to environmental factors which, left unmitigated, may impact the ability of the District to provide increased project capacity for water and waste-water services.

1. Due to the continued drought, in August of 2014, the District established a permanent moratorium on any new development (in excess of a single-family residence with a meter size greater than one inch) that will result in unmitigated new demand upon all water, potable, non-potable and recycled, delivered by any water distribution system within the District. A copy of the moratorium can be found on the District's website at https://www.camrosa.com/public_info_pub.html.
2. Regarding item 1 above, the District works with new developers to identify potential infrastructure improvement projects that may assist them in meeting mitigation requirements of the moratorium. The District recommends a meeting with CSUCI and their constituents at their earliest convenience to investigate mitigation projects.
3. In order to quantify the increased water utility demand requirements, Camrosa will require a water (potable, non-potable and recycled) and waste-water collection system demand analysis for the proposed project. The analysis should also include any anticipated increases in fire-flow requirements and zone storage requirements. This plan should be prepared in accordance with the District's water and sewer design construction standards. The District's design construction standards can be found on the Camrosa website at https://www.camrosa.com/public_info_tech.html.

4. The current potable water agreement between Camrosa and CSUCI consists of the original August 1979 agreement with then Camarillo State Hospital. It is recommended that this agreement be reviewed and brought up-to-date to reflect both the current agreement entities and to include the current potable demand requirements of CSUCI. Camrosa also recommends incorporation of the existing separate Wastewater and Recycled Water Service Agreement (June 2008) into a single revised agreement which would include Potable, Non-Potable, Recycled and Waste Water Services.
5. Any single-family dwellings must be individually metered. On September 25, 2016, Governor Brown approved Senate Bill No. 7, requiring all new multifamily dwellings constructed after January 1, 2018 to include submeters on any "individual rental unit within a multiunit residential structure or mixed-use residential and commercial structure." To comply with existing legislation and evolving State emergency drought/conservation regulations, including the need to classify types of water usage, Camrosa will require the installation of new potable and non-potable services to the East Campus development.
6. The District assumes that the subsequent Environmental Impact Report (EIR) which will be prepared by the University as part of the CEQA process will be considered a Project EIR. In order to understand the cumulative effects of a project, CEQA requires an examination of all phases of the project, including planning, construction, operation, and reasonably foreseeable future phases (Guidelines sec. 15161). With this in mind, are there any foreseeable additional residential development phases anticipated for the subject project?

Should you have any questions please contact me via email or phone.

Sincerely,



Joe Willingham
Planning and Data Systems Manager
Camrosa Water District
Email: jwillingham@camrosa.com
Phone: (805) 482-0643

Julie Tumamait-Stenslie
Tribal chair Barbareno/Ventureno
Band of Mission Indians

1/17/2017

To Terry Tarr, CSUCI

Dear Mr. Tarr, I am submitting my comments on behalf of the Barbareno/Ventureno band of Mission Indians, (Chumash) regarding the CSUCI Specific Reuse Plan Amendment and Phase 2 of the east campus Residential Neighborhood.

We would like to know the specific impacts to Chumash Cultural Resources as this project goes forward. There will be added square footage of earth disturbance with the increase number of residential units. We would like to see an overlay of known sites in the area on the map. We want to discuss what plans are in place for further Archaeological study. We would like to see an extended Phase 1 testing for those areas that may need deeper footings than originally envisioned as a 242 Single Family residential site, and now proposing 3 story apartments and thus needing

deeper foundations when necessary where even though previously developed and graded, the new plan could exceed the previous testing and archaeological analysis from 1998 EIR and 2007 development efforts.

We would recommend that monitoring we conducted by both a qualified Archaeologist and a Native Monitor. We want the Native Monitor to have Ancestry to the Chumash culture and have extended experience in Cultural resource monitoring. At the end of the project we need a written report from both. All demolition as well as grubbing, staging should be monitored. Thank-you for the language of Accidental Discovery, but I am not really sure who within the contracting world would be the one to stop and identify any cultural material or Human remains. We would like to discuss the disposition of any finds. I will not discuss that here, but will add, that if there is an opportunity to educate the public there, we would be available.

We are deeply concerned about the amount of people of people that will reside in the area. The new amendment has nearly tripled the number of residential units. There will be a lot of activity and noise. There will be traffic, waste, lighting, we wonder if the environment can handle it all? We are in a drought, where will the water come from and what suffers in return. This Campus sits on sacred land all around it the Mountains, the plants and animals are all a part of the sacredness of this place. We have a known, and well documented shrine site, Satwiwa. I would add that although the Mountain is sacred, it

was the journey as well that was sacred. As people prepared to go to ceremony they planned that gathered, they prayed. The journey to the sacred ceremony started from the moment the People left their homes. They made their offerings along the way. We request that you close off this sacred place to the public. Do not allow hiking or biking or animals, dogs or horses.

With all the new People moving here from out of State or out of the Country, we are concerned with any efforts to educate them on proper etiquette. Will the Birds continue to nest, will poison be used to kill the rodents, which will kill all other species. Will the night sky interfere with the amphibians and all other night Creatures? If we are to make a recommendation it would be this; Scale down the number of units. There will be too many People there. We must remember People who will be driving in from outside the complex to go to classes. You must create a better Public transportation system.

Thank-you,

Julie Tumamait-Stenslie

DEPARTMENT OF TRANSPORTATION

District 7 – Office of Regional Planning
100 S. MAIN STREET, MS 16
LOS ANGELES, CA 90012
PHONE (213) 897-0673
FAX (213) 897-1337
www.dot.ca.gov



*Serious drought.
Help save water!*

January 17, 2017

Mr. Terry M. Tarr
Assoc. Architect/Project Manager
California State University, Channel Islands
One University Drive
Camarillo, CA 93012

RE: CSUCI Specific Reuse Plan Amendment
and Phase 2 Development of the East
Campus Residential Neighbor Project
Notice of Preparation of a Draft EIR
SCH#2016111068
IGR#07-VEN-2016-00022
Vic. LA/ 101/ PM 13.904

Dear Mr. Tarr:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project. The proposed project includes an update to the CSUCI Specific Reuse Plan, adopted by the CSUCI Site Authority in 2000. It is a revision to the northernmost residential area of the East Campus. Up to 600 residential units are proposed on 32 acres of vacant land that is currently entitled for 242 single-family residential units.

The nearest State facilities to the proposed project is US-101, SR-1, and SR-34. To assist us in our efforts to evaluate the impacts of this project on State transportation facilities, a traffic study should be prepared prior to preparing the Draft Environmental Impact Report (DEIR). Please refer the Project's traffic consultant to Caltrans' traffic study guide website: http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf. If one has already been prepared for the project, please forward a copy to Caltrans for review and comment.

Listed below are some elements of what should be included in the traffic study:

1. Presentations of assumptions and methods used to develop trip generation, trip assignments, and choice of travel mode to US-101, SR-1, and SR-34. An analysis of the freeway mainline, all on/off- ramps, parallel roadways, and freeway connector.

Such as the following on/off-ramps:

- a) US-101 on/off ramps: Pleasant Valley Road, Flynn Road, Dawson Drive, Lewis Road (SR-34), Carmen Drive, and Las Posas Road
- b) SR-1 on/off-ramps: Hueneme Road, Wood Road
- c) SR-34 on/off-ramps: Pleasant Valley, Lewis Road

2. A queuing analysis should be performed using Highway Capacity Manual (HCM) methodology. The capacity of the off-ramp should be calculated by the actual length of the off-ramp between the terminuses to the gore point with some safety factor. The queue length should be calculated from the traffic counts, actual signal timing and the percent of truck assignments to the ramp with a passenger car equivalent factor of 3.0 (worst case scenario). The analyzed result may determine whether project-related plus cumulative traffic is expected to cause long queues on the on- and off-ramps.
3. Analysis of ADT, AM and PM peak-hour volumes for both the existing and future conditions in the affected area with and without the project. Future conditions including built-out and plan-horizon years. It is also recommended that the report include AM/PM peak hour volumes for bicycle under the existing conditions.
4. A cumulative traffic analysis, which includes existing traffic, traffic generated by the project, cumulative traffic generated from all specific approved developments in the area, and traffic growth other than from the project and developments.
5. A discussion of multi-modal mitigation measures, including possible Active Transportation enhancements, appropriate to alleviate anticipated traffic impacts. Any mitigation involving transit or Transportation Demand Management (TDM) should be justified and the results conservatively estimated.
6. Fair share contributions toward pre-established or future improvements on the State Highway System is considered to be an acceptable form of mitigation. Please use the following ratio when estimating project equitable share responsibility: additional traffic volume due to project implementation is divided by the total increase in the traffic volume (see Appendix "B" of the Guide).

Caltrans continues to strive to improve its standards and processes to provide flexibility while maintaining the safety and integrity of the State's transportation system. It is our goal to implement strategies that are in keeping with our mission statement, which is to *"provide a safe, sustainable, integrated, and efficient transportation system to enhance California's economy and livability."*

Good geometric and traffic engineering design to accommodate bicyclists and pedestrians are critical at every on and off ramp and freeway terminus intersection with local streets. Caltrans recommends the traffic study to include the impact of the traffic from pedestrians and bicyclists and will work with the City to look for every opportunity to develop projects that improve safety and connectivity for pedestrians and bicyclists. Opportunities for improvements may exist on State facilities such as: freeway termini, on/off-ramp intersections, overcrossings, under crossings, tunnels, bridges, on both conventional state highways and freeways.

With regard to public transit, we recommend planning for gradual continual improvement of transit stops, bus bays, or other facilities, to accommodate traffic flow, especially on streets that are State Route locations or are near freeway intersections.

Mr. Terry M. Tarr
January 17, 2017
Page 2 of 3

In view of SB 743, the Governor's Office of Planning and Research (OPR) is working to develop an alternative to LOS for evaluating transportation impacts pursuant to CEQA. Once OPR provides new guidance, Caltrans hopes to collaborate with the City to adopt methods of traffic analysis and new thresholds that are mutually acceptable.

As a reminder, transportation of heavy construction equipment and/or materials, which requires the use of oversized-transport vehicles on State highways, will require a Caltrans transportation permit. Caltrans recommends that large size truck trips be limited to off-peak commute periods.

Storm water run-off is a sensitive issue for Los Angeles and Ventura counties. Please be mindful that project needs to be designed to discharge clean run-off water.

If you have any questions or concerns regarding these comments, please feel free to contact the project coordinator, Frances Lee at (213) 897-0673 or electronically at frances.lee@dot.ca.gov.

Sincerely,



DIANNA WATSON
Branch Chief, Community Planning & LD IGR Review
cc: Scott Morgan, State Clearinghouse

Appendix C

Hydrology, Hydraulics, and Water Quality Report

**HYDROLOGY, HYDRAULICS,
AND WATER QUALITY REPORT
FOR
UNIVERSITY GLEN PHASE 2
AT CSU CHANNEL ISLANDS
Camarillo, CA**

HZ PROJECT NO. R300668.01

Prepared for:

Kennedy Wilson
151 S. El Camino Drive
Beverly Hills, CA 90212



January 3, 2017

Prepared By:

HUITT-ZOLLARS

Huitt-Zollars, Inc. Irvine
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Phone (949) 988-5815 Fax (949) 988-5820

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1. INTRODUCTION

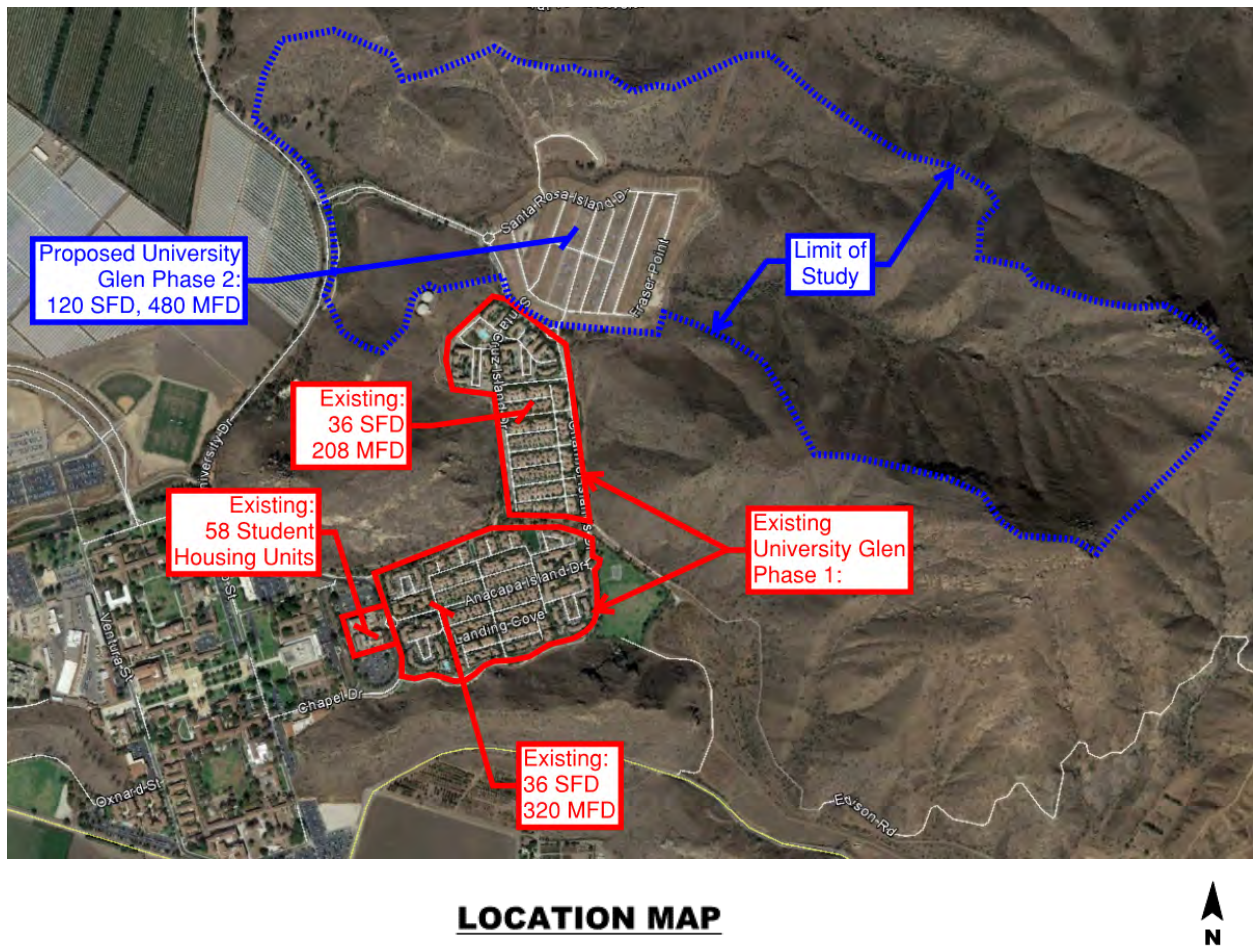
1.1 PROJECT DESCRIPTION

The proposed project (referred to as University Glen Phase 2) is located on the California State University, Channel Islands (CSUCI) campus in unincorporated Ventura County, near the City of Camarillo, California. The project aims to redevelop approximately 33.5 acres of land into 600 residential units consisting of market-rate apartments, age/income-restricted apartments, townhomes and single family homes. See Site Master Plan below.



Under the existing CSUCI Specific Reuse Plan, University Glen Phase 2 and the area to the south (referred to as University Glen Phase 1) were entitled for 900 single family and multifamily units. (See Location Map on the following page). University Glen Phase 1 has been built out and is comprised of 528 multifamily units, 72 single-family/townhome units and 58 student housing units. The remaining 242 units (900-658) dedicated to University Glen Phase 2 were partially developed in 2007 until construction was halted due to a downturn in economic conditions.

The partial development of University Glen Phase 2 consisted of the construction of streets, curbs & gutters, storm drain systems, sewer systems, domestic water systems and recycled water systems. The current project proposal of 600 units provides a net increase of 358 (600-242) additional units that will put increased demands on the existing sewer, domestic water and recycled water systems located in Channel Islands Drive.



1.2 REPORT OBJECTIVES

The purpose of this report is to define the Drainage Master Plan for both onsite and offsite areas of for the final phase of the University Glen project, in accordance with the University criteria and County of Ventura guidelines. Objectives of this report are as follows:

- Demonstrate that the developed, or proposed, site hydrologic conditions, including runoff rates expected from the 10-, 25-, 100-year, and debris flow storm events will not exceed those of the existing site hydrologic conditions.
- Validate a preliminary design of the main hydraulic storm conveyance systems, and provide hydraulic calculations.
- Develop a preliminary plan to provide stormwater quality treatment in accordance with the 2015 Ventura County Technical Guidance Manual and the Phase II Municipal Separate Storm Sewer System (MS4) Permit.

2. HYDROLOGIC IMPACTS ANALYSIS

2.1 REGIONAL HYDROLOGIC SETTING

The University Glen Phase 2 project falls within the Calleguas Creek Watershed. As identified in the 2014 Integrated Regional Water Management Plan (IRWMP), the Calleguas Creek Watershed encompasses an area of approximately 343 square miles, predominantly in southeastern Ventura County. The southern boundary is formed by the Simi Hills and Santa Monica Mountains. Presently 50 percent of the watershed is undeveloped open space, 25 percent is agricultural, and the remaining 25 percent is in urban land use. The watershed ultimately drains to the Pacific Ocean through Mugu Lagoon. Prior to the 1940s, Calleguas Creek and its main tributaries provided drainage for stormwater and irrigation discharge with rare occurrences of year-round flow. However, over the past 50 years, steadily increasing wastewater discharges and urban runoff now provide portions of Calleguas Creek and its tributaries with perennial flow.

Attachment A-1 includes an exhibit that identifies upstream and downstream reaches to the proposed project. Redline streams are within the jurisdiction of the Ventura County Watershed Protection District for flood control purposes. Blueline streams are shown on a United States Geological Survey 7.5 Minute Series (Topographic) map and represent perennial and intermittent streams.

Attachment B-1 includes an exhibit that shows the existing condition hydrology, including the existing storm drain lines, the existing drainage areas, and the location of the constructed wetlands. The existing condition hydrology is further described in Section 2.3.

“No Name Creek”, which bypasses the project through an existing 72” RCP is a natural stream that runs along the northern boundary of the project for approximately 1,500 feet, traverses Inspiration Point Road through an existing 5-foot CMP culvert, and is ultimately collected and conveyed through a 96” RCP running underneath Channel Islands Drive.

Runoff from the project generally sheet flows in a westerly direction before being captured and conveyed through an existing onsite storm drain infrastructure. Onsite flows are comingled with the bypassed runoff of “No Name Creek” and outlets into 3.78 acres of constructed wetlands located at the intersection of Camarillo Street and Channel Islands Drive. Overflows from the constructed wetlands are captured within an existing box culvert underneath Camarillo Street and flow in a southwesterly direction, ultimately discharging into Long Grade Creek. Long Grade Creek is an improved and engineered channel of earthen bed and riprap with banks that drain approximately 1,600 acres of tributary area, including a majority of the CSU Channel Islands campus.

Long Grade Creek confluences with Calleguas Creek, which runs for approximately 4.9 miles before reaching Point Mugu and the Pacific Ocean.

Further description of the local drainage patterns are described in Section 2.3.

2.2 CRITERIA AND METHODOLOGY

Hydrologic Criteria

Per the Ventura County Watershed Protection District (VCWPD) Standard:

- Peak flows, after development, cannot exceed the peak flow under existing conditions for any frequency of event;
- A project cannot impair, divert, impede or alter the characteristics of the flow of water running in any jurisdictional red line channel.

Hydrologic Computations

Hydrologic computations were performed for the 10-year, 25-year, and 100-year events based on the Modified Rational Method (MRM) as adopted by VCWPD. MRM computations were performed using the VCRat computer program that was developed by VCWPD to model partially- to fully-developed urbanized catchments of up to 5,000 acres. Input parameters include each catchment drainage area, rainfall intensity-duration curves, runoff coefficient curves, and time of concentration (Tc).

Time of concentration (Tc)

For each drainage area, a time of concentration was computed using the Tc Calculator developed by VCWPD. Existing condition drainage areas are shown in Attachment B-1. Proposed condition drainage areas are shown in Attachment C-1. The computation was based on the identification of the length, slope, and retardance coefficient for the following flows:

- Overland sheet flow;
- Concentrated street curb and open channel flow;
- Concentrated pipe flow.

The longitudinal slopes observed along the upper reaches exceed 40%, which are above the standard domain of application of Manning's equation for open channel hydraulics. Using existing longitudinal slopes would result in unrealistically high flow velocities. Exhibit 7 of the VCWPD Hydrology Manual provides a guideline to develop an adjustment factor that applies to the observed longitudinal slope and results in an effective longitudinal slope. Resulting effective longitudinal slopes were developed to meet the following criteria:

- Overland flow path of less than 1,000 feet for undeveloped areas;
- A maximum scouring velocity of 6 to 8 feet per second in natural mountain channels;
- A maximum overland flow of 200 feet for developed drainage areas.

Topography

A composite topographic dataset was created based on the best available data:

- An aerial topographic map was developed in May 2005 to generate 1-foot contour intervals based upon the CSU Channel Island Control Network. The contours were validated through topo check survey across the site to verify mapping accuracy. The May 2005 dataset extends to approximately 120 feet outside of the proposed project boundaries;
- 10-foot contours were obtained from the Camarillo Quadrangle (7.5-minute series) as published by the U.S. Geological Survey in March 2015. A copy of the topographic map is included in Attachment A-2. The extents of the Camarillo Quadrangle overlap with the May 2005 1-foot contours and extend outside of the project boundaries to cover the entire offsite, upstream, drainage areas. 10-foot contours were used to delineate upstream drainage areas that are not covered in the May 2005 dataset.

A comparison of the two separate topographic datasets shows that z-elevations are in the same vertical datum (NGVD29) and that contours at the interface are consistent. The composite topographic dataset covers the full extent of the all drainage areas that flow through the proposed project, and allows hydrologic computations to be performed.

The composite topographic dataset exhibits steep canyons upstream of the proposed project, with slopes averaging 20% to 45%. Because the project site was previously graded, the existing residential pads are generally flat (slope less than 2%). However, three levels of terraces were graded creating a vertical gradient of 34 feet between the highest terrace and the lowest terrace.

Soils

The amount of infiltration is related to the imperviousness of the surfaces, the permeability of the surficial soils, the local geomorphology, and the amount and type of vegetation cover or canopy.

Soil Survey maps prepared by NRCS and classified by Ventura County in its Hydrology Manual for Ventura County were used to determine the extent of Types A, B, C, and D hydrological soil groups within each existing and proposed drainage areas, as identified in Attachment B-1 and Attachment C-1, respectively. The underlying soils are mostly composed of igneous rock and Gilroy clay loam, which offer poor infiltration characteristics. Three VCWPD soil classifications are present in the vicinity of the project: D1 (64.6 %) and C2 (29.4 %), and C3 (6.0 %). An exhibit included in Attachment A-3 delineates the soil types within the project boundaries.

Land Uses

Hydrologic parameters were defined for the land uses present in the existing condition and in the proposed land use plan consistent with Exhibit 14a of the VCWPD Hydrology Manual. For planning purposes, hydrologic computations assumed a weighted average imperviousness of 30% and 70% in the existing and proposed conditions, respectively. Table 1 summarizes the hydrologic parameters associated with each land use.

Table 1 - Land Use Hydrologic Parameters

Land Use	% Impervious	Curve Number		
		C3	C2	D1
Chamise/Chaparral Vegetation (Fair Condition)	0	63	68	75
Open Space, Lawns, Parks (Good Condition)	0	71	76	80
Residential 1/8 ac. Lot	65	89	90	92
Residential Condos	69	90	92	93
Parking Lots, Roofs, Driveways, Paved Streets with Curbs & Drains	100	98	98	98

Reference: VCWPD Hydrology Manual, Exhibit 14a

Rainfall

Most precipitation in the Ventura County area results from winter storms during the months from November through April. Precipitation may occur over large areas and major storms last four days or more. The beginning of the storm is normally light and persistent at moderate intensity, while the latter portion is characterized by short periods of extremely high intensity. VCWPD classifies precipitation patterns within the County into a family of three intensity-duration curves labeled J, K, and L. Based on their hydrologic maps, the California State University Channel Islands project area lies within rainfall zone "K". An exhibit defining VCWPD Precipitation Zones in the vicinity of the project is included as Attachment A-4.

Hyetographs included in the VCRat model derive from the fourth-day 10-, 25-, and 100-year rainfalls for the Ventura County Precipitation Zone K, as defined in the VCWPD Hydrology Manual. Time series cumulate 5.53 inches, 6.41inches, and 10.6 inches of rainfall over 25 hours, respectively. Hyetographs are designed to produce 80% of the volume under the hydrograph at 80% of the hydrograph time for one-day simulation.

Bulking Factor

The upstream drainage area was subject to the Springs Fire Incident in May 2013. Cal Fire characterized the incident as burning 24,251 acres of chaparral on the Santa Monica Mountains, forcing the closure of parts of Highway 101 and threatening thousands of homes in Camarillo, Newbury Park, and Thousand Oaks. A satellite imagery of the area that shows the extents of the burn scar in red is included in Attachment A-5.

A Final Report of the "Sediment/Debris Bulking Factors and Post-Fire Hydrology for Ventura County" was adopted by Ventura County Watershed Protection District (VCWPD) in June 2011. Section 11 of the Final Report defines the methodology to compute a proposed Burn Severity Factor (BSF) that will be applied to the pre-burn hydrology peaks to derive post-fire peak discharges. Per Cal Fire, the burn severity condition of the upstream drainage areas is high (Hazard Class 3).

A BSF of 1.28 was computed based on the timing since the drainage area last burned (3.5 years) and the burn severity condition (high). Attachment A-6 includes a nomograph that correlates the factors to the computed BSF. The BSF will be applied to the clear-water 100-year peak discharge to result in a 100-year burn peak discharge. The 100-year burn peak discharge is used in this hydraulic analysis for conceptual design to demonstrate that the culvert inlets to Storm Drain Line A (See Attachment C-1), the proposed culvert running underneath Inspiration Point Road, and the inlet to the 96" RCP Storm Drain Line E are sized per VCWPD Criteria.

Constructed Wetlands

Currently, constructed wetlands are located at the southeast corner of University Drive and Channel Islands Drive. The constructed wetlands receive the entire runoff from the proposed project area and upstream tributaries, including "No Name Creek". The constructed wetlands area designed to retain runoff from a majority of storm events with the exception of exceeding large, rare, storms. As shown in Section 2.3, the capacity of the constructed wetlands is sufficient to contain the volume associated with a 25-year, 24-hour storm. Minor discharges from the constructed wetlands are observed during a 100-year, 24-hour storm.

The 2005 topographic mapping dataset included surveying points and 1-foot contours within the constructed wetlands. The invert of the basin is at elevation 48.00 feet NGVD29. Its total storage capacity is estimated to be 168.7 acre-feet. Flows are retained within the basin and controlled through a rectangular orifice as the water surface elevation reaches elevation 57.30 feet NGVD29. The top crest of the basin is elevation 60.60 feet NGVD29, over which flows would spill over University Drive.

The approved Storm Drain Plans¹, as developed by ASL in January 2001, include the dimensions of the existing outlet from the constructed wetlands. The outlet is a 10.3' by 2.8' rectangular orifice that outlets to an existing concrete box culvert of longitudinal slope 1.43%. The invert of the orifice (57.30 feet NGVD29) is set 9.3 feet above the invert of the basin (48.00 feet NGVD29).

A stage-storage-discharge (SSD) relationship was developed for inclusion into the hydrologic routing model (PondPack). The SSD is summarized in Table 2.

¹ Storm Drain Plans for CSU Channel Islands, East Campus Development, Prepared by ASL for California State University Office of the Chancellor, January 2001

Table 2 -Stage-Storage-Discharge for Constructed Wetlands

Stage (ft)	Pond Elevation (ft)	Surface Area (AC)	Volume (AF)	Basin Discharge (cfs)
48	0	0.14	0	0
50	2	0.74	0.877	0
52	4	1.53	5.418	0
54	6	2.75	18.271	0
56	8	3.29	42.445	0
58	10	3.59	76.869	14.8
60	12	3.78	121.103	111.9
60.6	12.6	3.78	168.697	151.3

Reference: Storm Drain Plans for CSU Channel Islands, East Campus Development, Prepared by ASL for California State University Office of the Chancellor, January 2001

The condition of the constructed wetlands was field verified during a site visit performed on October 19, 2016. Observations included in the extents of the constructed wetlands, verifying the location and dimensions of the outlet structure. Based on field observation, it appeared that both wetlands and the outlet structure have not been modified since constructed in 2001. Pictures taken during the field visit are included below:



10.3' Long x 2.8' High Rectangular Inlet Structure (10/2016)



Vegetation in existing 3.78-acre constructed wetlands (10/2016)

Detention Basin Computations

Pond Pack models were developed to model the impacts of detention routing through the constructed wetlands and determine the peak discharge mitigation provided by the constructed wetlands. Input parameters to the Pond Pack models include:

- VCRAT computations were performed to generate 10-year, 25-year, and 100-year hydrographs of 1-minute time step based on the results of the VCWPD TC Program to compute a Tc and the size and imperviousness of each drainage area, as defined above.
- The outlet structure includes the rectangular orifice defined above and its rating curve incorporated into the Pond Pack model used to perform detention routing computations.
- A stage-surface area for each detention basin as determined from the precise grading plans.
- Discharges from the basins were assumed to free flow in the Pond Pack model since the outlet structure will serve as the controlling device.

2.3 EXISTING HYDROLOGY

Onsite Drainage

A map that defines the existing condition hydrology is included in Attachment B-1. The existing onsite drainage can be split into two major drainage areas south of Inspiration Point Bridge, and two regional drainage areas north of Inspiration Point Bridge.

6.75 acres of drainage area (Drainage Area B) located at the northeast corner of the site will drain in northerly direction. Existing catch basin inlets along paved streets collect runoff and existing storm drain laterals convey it to the 72" RCP that is tributary to "No Name Creek".

Runoff from Drainage Area D1 (24.51 acres, see Attachment B-1) sheet flows in a westerly direction and is captured by catch basin inlets along paved streets. Catch basin inlets are connected to the main storm drain line (36" RCP) that connects with the 96" RCP running underneath Channel Islands Drive.

In addition, 2.03 acres have been rough graded north of the existing Inspiration Point crossing. The 2.03-acre are spilt between regional Drainage Area A6 (9.96 acres) and Drainage Area A7 (14.26 acres) that drain hillsides to *No Name Creek*.

The total tributary drainage area to the constructed wetlands, including drainage from the proposed project and other offsite tributaries, is 284 acres.

Results

Hydrologic computations from the Tc Calculator, VCRat, and PondPack for the existing condition are included as Attachment B-2, Attachment B-3, and Attachment B-4, respectively. The results indicate that the constructed wetlands currently suffices to retain the entire volume produced by the 25-year storm event. A peak discharge of 12.5 cfs is observed from the basin during the 100-year storm event.

100-year peak discharges from the two existing onsite drainage areas B and D1 are 29 cfs and 111 cfs, respectively. Table 3 provides a summary of the peak discharges from onsite drainage areas and to the constructed wetlands for the three frequencies of interest.

Table 3 - Existing Condition Peak Discharges

Storm Frequency (year)	Location			
	Onsite to Node 103	Onsite to Node 107	Upstream Basin (Node 108)	Downstream Basin (Node 109)
10-year	15	51	409	0
25-year	18	67	469	0
100-year	29	111	714	12.5

Reference: VCRAT Results for Existing Condition (See Attachment B-3)

2.4 PROPOSED HYDROLOGY

Onsite Drainage

A map that defines the proposed condition hydrology is included in Attachment C-1. The conceptual drainage plan for onsite storm drain infrastructure follows the same general drainage patterns as in the existing condition. Offsite drainage bypass the proposed project and run along the jurisdictional "No Name Creek".

The proposed project will modify the onsite hydrology and result in four distinct onsite drainage areas:

- Drainage area A7 (15.1 acres) includes the residential pads and streets that are located north of Inspiration Point Road bridge (2.03 acres), as well as offsite runoff from several tributaries (13.07 acres). Urban runoff generally sheet flows in a easterly direction before being collected by street curb inlets and convey to “No Name Creek” through Storm Drain Line D. The discharge location will not change from that in the existing condition. Terrace slope drains collect offsite runoff and allow offsite runoff to bypass the proposed project;
- Drainage area C1 (8.80 acres) is located in the northeast corner of the project. Runoff generally sheet flows in a northwesterly direction before being collected by street curb inlets and convey through Storm Drain Line B towards Channel Islands Drive. During final design of the proposed project, the feasibility to drain C1 to Storm Drain Line B will be evaluated based on grading and utility requirements. If unfeasible, Drainage Area C1 will discharge directly to Storm Drain Line A and “No Name Creek”, as in the existing conditions;
- Drainage area C2 (7.57 acres) is located in the northwest corner of the project. Runoff generally sheet flows in a westerly direction before being collected by street curb inlets and convey through Storm Drain Line B towards Channel Islands Drive;
- Drainage area C3 (15.20 acres) consists of the southern portion of the project. Runoff generally sheet flows in a southwesterly direction before being collected by street curb inlets and convey through Storm Drain Line B towards Channel Islands Drive.

Offsite drainage areas will remain unchanged. The total tributary drainage area (284 acres) to the constructed wetlands remains unchanged.

Results

Hydrologic computations from the Tc Calculator, VCRat, and PondPack for the proposed condition are included as Attachments C-2, C-3, and C-4, respectively. Similar to the existing condition, the results indicate that the constructed wetlands currently suffices to retain the entire volume produced by the 25-year storm event. Overall, the proposed project will slightly decrease the peak discharge from the existing condition for all frequency storm events because of the longer routing of the proposed Storm Drain Line C running through drainage area C3.

As described in Section 3.3 the resulting decrease of peak discharge confirms that the existing Storm Drain Line A (72” RCP) and Storm Drain Line E (96” RCP) are adequately sized and meet the VCWPD design criteria.

A peak discharge of 22.5 cfs would be observed from the existing basin during the 100-year storm event, which is higher than 12.5 cfs in the existing condition. The increase is due to the higher volume produced in the proposed condition (87.3 acre-feet) when compared to the existing condition (78.00 acre-feet).

To meet the VCWPD criteria, the proposed design includes a modification of the rectangular orifice outlet that results in a modified SSD relationship for the constructed wetlands.

Table 4 identifies the proposed SSD for a 5' long by 2.8' high rectangular orifice.

Table 4 - Constructed Wetlands Stage-Storage-Discharge with Modified Outlet

Stage (ft)	Pond Elevation (ft)	Surface Area (AC)	Volume (AF)	Basin Discharge (cfs)
48	0	0.14	0	0
50	2	0.74	0.877	0
52	4	1.53	5.418	0
54	6	2.75	18.271	0
56	8	3.29	42.445	0
58	10	3.59	76.869	7.17
60	12	3.78	121.103	54.34
60.6	12.6	3.78	168.697	73.44

The proposed modification to the outlet results in proposed 100-year peak discharge of 12.5 cfs from the constructed wetlands. In addition, the modification does not result in the 100-year water surface elevation to overtop the adjacent roadway. Table 5 summarizes the peak discharges at different hydrologic nodes for the 10-, 25-, and 100-year storm events.

100-year peak discharges from onsite drainage areas A7 and C1-C2-C3 are of 29 cfs and 111 cfs, respectively. Table 5 provides a summary of the peak discharges from onsite drainage areas and to the constructed wetlands for the three frequencies of interest.

Table 5 - Existing Condition Peak Discharges

Storm Frequency (year)	Location				
	Onsite to Node 105	Onsite to Node 801	Upstream Basin (Node 108)	Downstream Basin – Existing Outlet (Node 109)	Downstream Basin – Modified Outlet (Node 109)
10-year	42	15	387	0	0
25-year	53	72	460	0	0
100-year	72	111	652	22.2	12.5

Reference: VCRAT Results for Proposed Condition (See Attachment C-3)

Conclusion

The proposed project will have no hydrologic impacts. The analyses demonstrate that the VCWPD criteria is met through:

- A modification of the outlet structure from the constructed wetlands, which allows proposed peak discharges to be equal or less than those under the existing condition, for the 10-, 25-, and 100-year storm events;
- No modifications to the alignment and bed & banks of “No Name Creek” will be performed in the proposed design.

3. HYDRAULIC IMPACTS ANALYSIS

3.1 DRAINAGE PLAN

Attachment D-1 includes an exhibit that identifies the conceptual drainage plan and backbone storm drain infrastructure for the proposed project. Five main storm drain lines will allow adequate drainage of the proposed project consistent with the VCWPD criteria:

- Existing Line A allows “No Name Creek” to bypass the project through an existing 72” RCP that daylights to the north of the project. It is anticipated that no modifications will be made to Line A;
- Proposed Line B will successively collect and convey runoff from onsite drainage areas C1, C2, and C3 before connecting to the existing 30” RCP running underneath Channel Islands Drive;
- Proposed Line C will collect and convey runoff from onsite drainage area C3 before connecting to the existing 30” RCP running underneath Channel Islands Drive;
- Proposed Line D will collect and convey runoff from onsite drainage area A7.1 and discharge directly to an existing discharge location along “No Name Creek”. The existing discharge location is approximately 550 feet upstream of Inspiration Point bridge;
- Existing Line E was built during the 2001 improvements. It consists of a 96” RCP that captured all flows from “No Name Creek” and convey it to the 3.78-acre constructed wetlands for mitigation. The inlet to the 96”RCP includes a straight concrete headwall that is approximately 800 feet downstream of Inspiration Point Bridge. Conceptual hydraulic analyses show that no modifications will be made to Line E.

3.2 CRITERIA AND METHODOLOGY

Hydraulic Criteria

Per the VCWPD Standard:

- Overland flow shall be intercepted at the boundaries and directed through or around the development(Chapter 5-Drainage of the Ventura County Land Development Manual);
- Building pads must be protected from the 1% annual exceedance probability flooding hazard (Chapter 5-Drainage of the Ventura County Land Development Manual);

- Drainage facilities in sumps may combine side inlet catch basins for the ten percent flow, and overflow channels for the excess flow (Plate A-4 of the VCWPD Road Standards);
- Culvert, bridges shall be designed to accommodate the two percent (50 year average return period) storm flow. Additionally, flooding caused by clogged drainage facilities shall be taken into consideration (Plate A-4 of the VCWPD Road Standards).

Onsite Storm Drain Infrastructure

Storm Drain Lines B, C, and D are proposed to convey runoff from onsite drainage areas C1-C2, C3, and A7, respectively.

Hydraulic calculations for storm drain pipes were performed using the Water Surface Pressure Gradient (WSPG) software for the 10-year storm event demonstrating capacity for the onsite systems.

WSPG is a hydraulic analysis model that computes and plots uniform and non-uniform steady flow water surface profiles and pressure gradients in open channels or closed conduits with irregular or regular sections. VCWPD requires use of this model for hydraulic design.

The hydraulic grade line (HGL) for a 10-year event should be below finished grade over conduit. If the HGL is within the pipe, the water is flowing as partial flow. If the HGL is above the pipe, the water is flowing by pressure and if the HGL is above the finish grade, the water is overflowing at the inlets and catch basins into the street. The 100-year storm event hydraulics are included to demonstrate that elevation of the building pads as shown on the 2001 Storm Drain Plans² are above the Q100 water surface elevation.

For the upper portion of the proposed Storm Drain B (See Section 3.3), the proposed 100-year HGL exceeds the elevation of the finished surface of the street. The exceeding flowrate was computed as the difference between the 100-year peak discharge and the discharge that results in a HGL to be at the elevation of the finished surface of the street. Street hydraulics were performed using the Flowmaster program to demonstrate that the exceeding flowrate will be contained within the street, or the 6-inch tall curbs.

² Storm Drain Plans for CSU Channel Islands, East Campus Development, Prepared by ASL for California State University Office of the Chancellor, January 2001

“No Name Creek” Hydraulic Infrastructure

Existing Storm Drain Lines A and E currently allow “No Name Creek” to bypass the proposed project, and run underneath Channel Islands Drive. “No Name Creek” currently crosses



Existing 5' CMP through Inspiration Point Crossing

Inspiration Point Bridge through an existing 5-foot CMP with straight concrete headwalls on each end.

As identified in Section 2.2, the tributary drainage area to “No Name Creek” is classified as a zone of high severity with regards to wildfires. A BSF of 1.28 was computed and will be applied to clear-water peak discharges for design purposes.

VCWPD Criteria requires that the instream hydraulic structure capture and convey the 50-year burn peak discharge. However, “No Name Creek” runs alongside proposed residential pads that are required to be protected from the 100-year flood elevation. For the purpose of the conceptual analysis, the inline storm conveyance infrastructure is designed to convey the 100-year burn peak discharge. During the final design of the project, the 50-year peak burn discharge will be utilized as actual residential pad elevations will be included on the precise grading plans.

Hydraulic computations for all culvert inlets were performed using Federal Highway Administration (FHWA) HY- 8 program. HY-8 is designed based on the Design Charts included in *Hydraulic Design of Highway Culverts* (FHWA, 2005).

Regulatory Floodplain

Based on the Digital Flood Insurance Rate Map (DFIRM) Panel #06111C0941E effective since January 20, 2010, the proposed project lies within a FEMA-designated Zone X, i.e. outside the 0.2% annual chance floodplain. In addition, “No Name Creek” is not designated as a regulatory floodplain. A copy of the effective DFIRM is included as Attachment D-2.

3.3 RESULTS

The analyses demonstrate that the project will have no hydraulic impacts on properties and proposed infrastructure. Hydraulic analyses confirm that the existing Storm Drain Line A (72” RCP) and Storm Drain Line E (96” RCP) are adequately sized and meet the VCWPD design criteria.

However, the existing culvert underneath the Inspiration Point crossing will overtop in a 100-year burn storm event and must be redesigned to ensure the safety of adjacent properties.

Onsite Storm Drain Infrastructure

WSPG model runs for Storm Drain Lines B, C, and D were performed to demonstrate that the proposed storm drain lines meet the following:

- The 10-year HGLs fall below the finished surface of the streets;
- The 100-year HGLs are below the top of proposed 6" street curbs.

Table 6 summarizes the size and design flow rate for each main segment of onsite storm drain infrastructure. Copies of the WSPG model results are included as Attachments D-3 and D-4.

Table 6 - Onsite Backbone Storm Drain Infrastructure

Storm Drain Line	Begin Station	End Station	Q10 (cfs)	Proposed Size
B	1+05	4+69	60	30" RCP
B	4+69	23+52	31	36" RCP
C	20+00	35+53	29	36" RCP
D	30+00	34+15	2.88	18" RCP

Reference: WSPG Model Results (See Attachment D-3)

The 100-year HGL for Storm Drain Line B is higher than the finished surface of the street between stations 4+69 and 23+52. From the 100-year discharge of 31 cfs, 15 cfs would resurface through street inlets and manholes. Street hydraulics using Flowmaster demonstrate that the exceeding flowrate of 15 cfs would spread laterally over 18.1 feet and be as high as 0.46 feet. Attachment D-7 includes the results from the Flowmaster street hydraulics that demonstrate that the exceeding flows are contained within the 6-inch tall curbs.

Consistent with the VCWPD criteria, catch basins at low points will not utilize grate-only inlets.

"No Name Creek" Hydraulic Infrastructure

HY-8 model results are provided in Attachment D-5.

The existing culvert entrance to Storm Drain Line A is adequately sized to capture and convey the 100-year burn peak discharge of 408 cfs. The inlet becomes submerged and the resulting 100-year burn water surface culminates at 162.98 feet NGVD29, which is below the adjacent proposed pad elevation (163.00 feet NGVD29). The analysis shows that the existing culvert is adequately sized and will not result in flooding of the adjacent pad.

The existing culvert entrance to Storm Drain Line E is adequately sized to capture and convey the 100-year burn peak discharge of 653 cfs. The inlet becomes submerged and the resulting 100-year burn water surface culminates at 97.87 feet NGVD29 162.98 feet, which is 1.71 feet below the adjacent grade of Channel Islands Drive.

The existing culvert entrance to the 5-foot CMP culvert running underneath Inspiration Point crossing becomes submerged with peak discharges above 220.15 feet NGVD29. HY-8 results for the existing condition crossing show that 378.55 cfs will overtop the crossing during a 100-year burn storm event. The under-capacity of the culvert was identified in 2007, as construction plans of an improved culvert were developed. Proposed improvements included:

- A 11.14'x7.25' Corrugated Steel Pipe-Arch Culvert that runs for a longitudinal distance of 29.3 feet;
- A proposed vertical alignment of Inspiration Point Bridge with a sag elevation of 114.99 feet NGVD29.

A copy of the proposed culvert design and vertical alignment of Inspiration Point Bridge are included in Attachment D-6. The proposed design will utilize a design similar to that proposed in 2007. With the proposed bridge and culvert designs, the resulting 100-year burn water surface elevation is of 112.97 feet NGVD29, which is 2.02 feet below the lowest point along the bridge deck.

4. WATER QUALITY IMPACTS ANALYSIS

4.1 CONCEPTUAL WATER QUALITY PLAN

Attachment E-1 includes an exhibit that identifies the conceptual onsite water quality plan to meet the requirements of the Phase II Municipal Separate Storm Sewer Systems (MS4) Permit, as defined under Section 4.2.

The concept relies on a series of distributed Low Impact Development (LID) Best Management Practices (BMPs) that provide the required treatment to storm water runoff from the proposed project. Sources control measures are listed in this report for reference only and will be refined as construction documents are developed for this project.

4.2 CRITERIA AND METHODOLOGY

Water Quality Criteria

The proposed project is located within the campus of Cal State University Channel Islands and falls under the jurisdiction of the University. CSU Channel Islands is listed as a stakeholder under the Statewide Water Quality Order No. 2013-0001-DWQ for Small Municipal Separate Storm Sewer Systems (MS4). This Phase II MS4 Permit is effective since July 1, 2013 and requires priority development projects to comply with New Development and Redevelopment Projects requirements as defined by the University Local Implementation Plan (LIP).

Per the MS4 Permit, the proposed project is considered as a priority development project (PDP) because it *“creates or replace 5,000 square feet or more of impervious surface.”* It is required to implement measures for site design, source control, runoff reduction, storm water treatment and baseline hydromodification management.

Source Control Measures

The proposed project shall be designed to incorporate design measures consistent with recommendations from the *CASQA Stormwater BMP Handbook for New Development and Redevelopment* (CASQA, 2003) to mitigate the following applicable pollutant-generating activities and sources:

- Interior floor drains
- Parking/Storage area maintenance
- Indoor and structural pest control
- Landscape/outdoor pesticide use
- Pools, spas, ponds, decorative fountains, and other water features
- Storage and handling of solid waste
- Fire sprinkler test water
- Unauthorized non-storm water discharges
- Building and grounds maintenance

Runoff Reduction

As demonstrated under Section 2.4, all runoff from the proposed project will be retained in the constructed wetlands for storm event frequencies lower than the 25-year event. Additional runoff from the proposed project will allow for the preservation of beneficial uses within the constructed wetlands.

Storm Water Treatment

Based on the Phase II MS4 Permit, the proposed project is required to implement LID BMPs that are designed to evapotranspire, infiltrate, harvest/use, and biotreat storm water to meet at least one of the following hydraulic sizing design criteria:

1. Volumetric Criteria:
 - a) The maximized capture storm water volume for the tributary area, on the basis of historical rainfall records, determined using the formula and volume capture coefficients in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998) pages 175-178 (that is, approximately the 85th percentile 24-hour storm runoff event); or
 - b) The volume of annual runoff required to achieve 80 percent or more capture, determined in accordance with the methodology in Section 5 of CASQA's Stormwater Best Management Practice Handbook, New Development and Redevelopment (2003), using local rainfall data.
2. Flow-based Criteria
 - a) The flow of runoff produced from a rain event equal to at least 0.2 inches per hour intensity; or
 - b) The flow of runoff produced from a rain event equal to at least 2 times the 85th percentile hourly rainfall intensity as determined from local rainfall records.

Structural LID BMPs will be based on the BMP Fact Sheets included in Section 6 of the 2015 Technical Guidance Manual for Stormwater Quality Measures (2015 TGM), as developed by VCWPD.

Baseline Hydromodification Management

The project will not cause any hydromodification impacts to receiving waters because:

- A discussion on October 25, 2016 with Jennifer Lindquist, who leads MS4 Compliance for CSU Channel Islands, confirmed that the underlying soil of “No Name Creek” is composed of bedrock, which is not susceptible to hydromodification.
- As demonstrated under Section 2.4, all runoff from the proposed project will be retained in the constructed wetlands for storm event frequencies lower than the 25-year event. Based on multiple adopted Hydromodification Management Plans in Southern California, the higher threshold of geomorphically-significant flows is the 10-year event.
- All onsite improvements, with the exception of drainage area A7, will be conveyed directly to the constructed wetlands. The proposed drainage plan will result in no anthropogenic impacts to “No Name Creek”.

Flow-duration curve management and bed-sediment management are not required for this project because the project will not cause any hydromodification impacts.

4.3 RESULTS

The proposed water quality concept will meet the requirements of the MS4 Permit and result in will have no water quality impacts on the receiving waters.

Source Control Measures

Table 7 includes a list of potential pollutant-generating activities for the proposed project, along with a list of corresponding CASQA BMP Fact Sheets. A final assessment of potential pollutant-generating activities will be performed during the final design of the project and the list of applicable CASQA BMPs adjusted accordingly.

Table 7 - Source Control Measures and CASQA BMP Fact Sheet

Potential Pollutant-Generating Activity	Included?	Not Applicable?	CASQA Fact Sheet for BMP Implementation
Accidental spills or leaks	☐	☒	WM-4
Interior floor drains	☒	☐	SD-10 and SD-13
Parking/Storage area maintenance	☒	☐	SD-34
Indoor and structural pest control	☒	☐	SC-41
Landscape/outdoor pesticide use	☒	☐	WM-2
Pools, spas, ponds, decorative fountains, and other water features	☒	☐	BG-63

Potential Pollutant-Generating Activity	Included?	Not Applicable?	CASQA Fact Sheet for BMP Implementation
Restaurants, grocery stores, and other food service operations	☐	☒	
Storage and handling of solid waste	☒	☐	SD-32
Outdoor storage of equipment or materials		☒	
Vehicle and equipment cleaning	☐	☒	
Vehicle and equipment repair and maintenance	☐	☒	
Fuel dispensing areas	☐	☒	
Loading docks	☐	☒	
Fire sprinkler test water	☒	☐	NS-2 and NS-6
Drain or wash water from boiler drain lines, condensate drain lines, rooftop equipment, drainage sumps, and other sources	☐	☒	
Unauthorized non-storm water discharges	☒	☐	NS-7
Building and grounds maintenance	☒	☐	SC-41

Reference: CASQA Stormwater Best Management Practice Portal, Handbook, 2014

Storm Water Treatment

Infiltration-based BMPs are deemed infeasible for implementation. As identified under Section 2.2, the onsite soils are classified in the NRCS Hydrologic Soil Groups C and D, which result in limited infiltration potential and high runoff potential.

The Conceptual Water Quality Plan includes biofiltration LID BMPs that provide biotreatment to the runoff. Based on the existing site topography and proposed utility plan, two types of biofiltration BMPs were selected for proposed implementation:

- Bioretention with underdrains that are designed to biotreat the Storm Water Quality Volume (SQDV). Biofiltration planters were designed based on a 85th-percentile 24-hour storm depth of 0.75 inches, a saturated hydraulic conductivity of the amended filter media of 2.5 inch/hour, a ponding depth of 1.5 feet, and a storm duration of 3 hours for routing computations. A copy of the BIO-1 fact sheet from the 2015 TGM is included as Attachment E-2.
- Proprietary biofiltration boxes with underdrains that are designed to treat the Storm Water Quality Flowrate (SQDF). Proprietary biofiltration boxes were selected based a rainfall intensity of 0.2 inch per hour and the treatment flowrate capacity of each model. Modular Wetlands Systems by Contech, or industry-equivalent, were considered for the purposes of this analysis. A copy of the BIO-2 fact sheet from the 2015 TGM is included as Attachment E-2.

Table 8 provides a summary of both SQDV and SQDF for each onsite drainage area, as indicated on the Conceptual Water Quality Map. Table 9 identifies potential sizing and types of biofiltration BMPs for each drainage area, and shows that the design treatment capacity of the proposed biofiltration systems exceeds that required by the Phase II MS4 Permit. A copy of the computations is included as Attachment E-3.

Table 8 - SQDV and SQDF for Water Quality Treatment

Onsite Drainage Area	Acreage (ac)	% Imp.	WQ Storm Depth (in)	SQDV (CF)	WQ Storm Intensity (in/hr)	SQDF (cfs)
C1.1	3.68	70	n/a	-	0.2	0.51
C1.2	5.11	70	n/a	-	0.2	0.71
C2.1	3.22	70	n/a	-	0.2	0.45
C2.2	4.34	70	n/a	-	0.2	0.60
C3.1	9.42	70	0.75	11,591	n/a	
C3.2	4.38	70	0.75	5,386	n/a	
C3.3	1.41	70	n/a	-	0.2	0.20
A7.1	2.03	70	n/a	-	0.2	0.29

Reference: Attachment E-3 – Biotreatment BMPs Design Computations

Table 9 - Treatment Capacity of Selected LID BMPs

Onsite Drainage Area	Proposed Treatment BMPs	Required Footprint (SF)	Provided Treatment Surface (SF)	Required SQDF (cfs)	Provided Treatment Flow (cfs)
C1.1	MWS-L-8-20	-	-	0.51	0.58
C1.2	2 units of MWS-L-8-16	-	-	0.71	0.92
C2.1	MWS-L-8-16	-	-	0.45	0.46
C2.2	MWS-L-8-24	-	-	0.60	0.69
C3.1	Combined Bioretention with underdrains (BIO-1)	7,988	9,000	-	-
C3.2				-	-
C3.3	MWS-L-8-8	-	-	0.20	0.23
A7.1	MWS-L-8-12	-	-	0.29	0.35

Reference: Attachment E-3 – Biotreatment BMPs Design Computations

Potential locations and types are indicated in the Conceptual Water Quality Map in Attachment E-1. The planned locations and types of biofiltration systems will be adjusted during final consistent with the precise grading plan and the proposed storm drain infrastructure.

5. Attachments

Attachment A: General Supporting Documentation

- A-1: Regional Hydrology – Receiving Waters
- A-2: USGS Camarillo Quadrangle Topographic Map (March 2015)
- A-3: Hydrologic Soil Group
- A-4: VCWPD Precipitation Zones
- A-5: Landsat Imagery of Springs Fire (May 2013)
- A-6: Burn Severity Factor Nomograph

Attachment B: Supporting Documentation for Existing Condition Hydrology

- B-1: Existing Condition Hydrology Map
- B-2: Existing Condition – Tc Calculator Model Files
- B-3: Existing Condition – VCRat Model Files
- B-4: Existing Condition – Basin Routing Computations – PondPack

Attachment C: Supporting Documentation for Proposed Condition Hydrology

- C-1: Proposed Condition Hydrology Map
- C-2: Proposed Condition – Tc Calculator Model Files
- C-3: Proposed Condition – VCRat Model Files
- C-4: Proposed Condition – Basin Routing Computations – PondPack

Attachment D: Supporting Documentation for Hydraulic Analyses

- D-1: Conceptual Drainage Plan
- D-2: Effective DFIRM Panel #06111C0941E
- D-3: WSPG Model Results – Onsite Storm Drain Infrastructure
- D-4: WSPG Model Results – Bypass Storm Drain Infrastructure
- D-5: HY-8 Model Results – Culvert Entrances
- D-6: Proposed Inspiration Point Bridge Design (Circa 2007)
- D-7: Flowmaster Street Hydraulics for Storm Drain Line B

Attachment E: Supporting Documentation for Water Quality Analyses

- E-1: Conceptual Water Quality Plan
- E-2: TGM Fact Sheet for Biotreatment BMPs
- E-3: Biotreatment BMPs Design Computations
- E-4: Proprietary Biofiltration System Design Charts

Attachment A
General Supporting Documentation

Attachment A-1
Regional Hydrology – Receiving Waters

Attachment A-2
USGS Camarillo Quadrangle Topographic Map (March 2015)



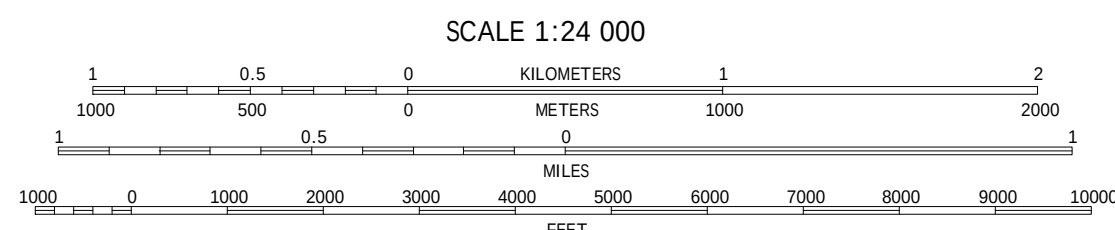
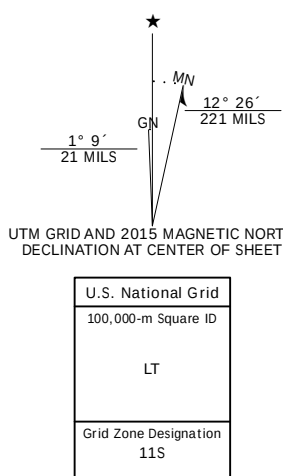
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY



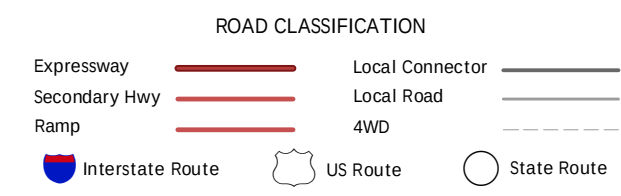
CAMARILLO QUADRANGLE
CALIFORNIA-VENTURA CO.
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: Universal Transverse Mercator, Zone 11S
10 000-foot ticks: California Coordinate System of 1983 (zone 5)
This map is not a legal document. Boundaries may be
generalized for this map scale. Private lands within government
reservations may not be shown. Obtain permission before
entering private lands.
Imagery NALP, May 2012
Roads HERE, ©2013 - 2014
Names GNIS, 2015
Hydrography National Hydrography Dataset, 2012
Contours National Elevation Dataset, 2001
Boundaries Multiple sources; see metadata file 1972 - 2015
Public Land Survey System BLM, 2011



CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.18



1	2	3
4	5	6
7	8	9

1 Saticoy
2 Santa Paula
3 Moorpark
4 Oxnard
5 Newbury Park
6 Point Mugu OE W
7 Point Mugu
8 Triunfo Pass

CAMARILLO, CA
2015



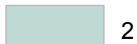
Attachment A-3
Hydrologic Soil Group

 University Glen Drainage Areas

VCWPD Soil Number



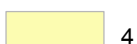
1



2



3



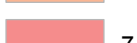
4



5



6



7

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

HUITT-ZOLIARS



0 0.075 0.15
Miles

Hydrology & Hydraulics Study - VCWPD Soil Group No.

Date: 12/14/2016

CSU Channel Islands - Univeristy Glen Phase 2 EIR

Attachment A-4
VCWPD Precipitation Zones

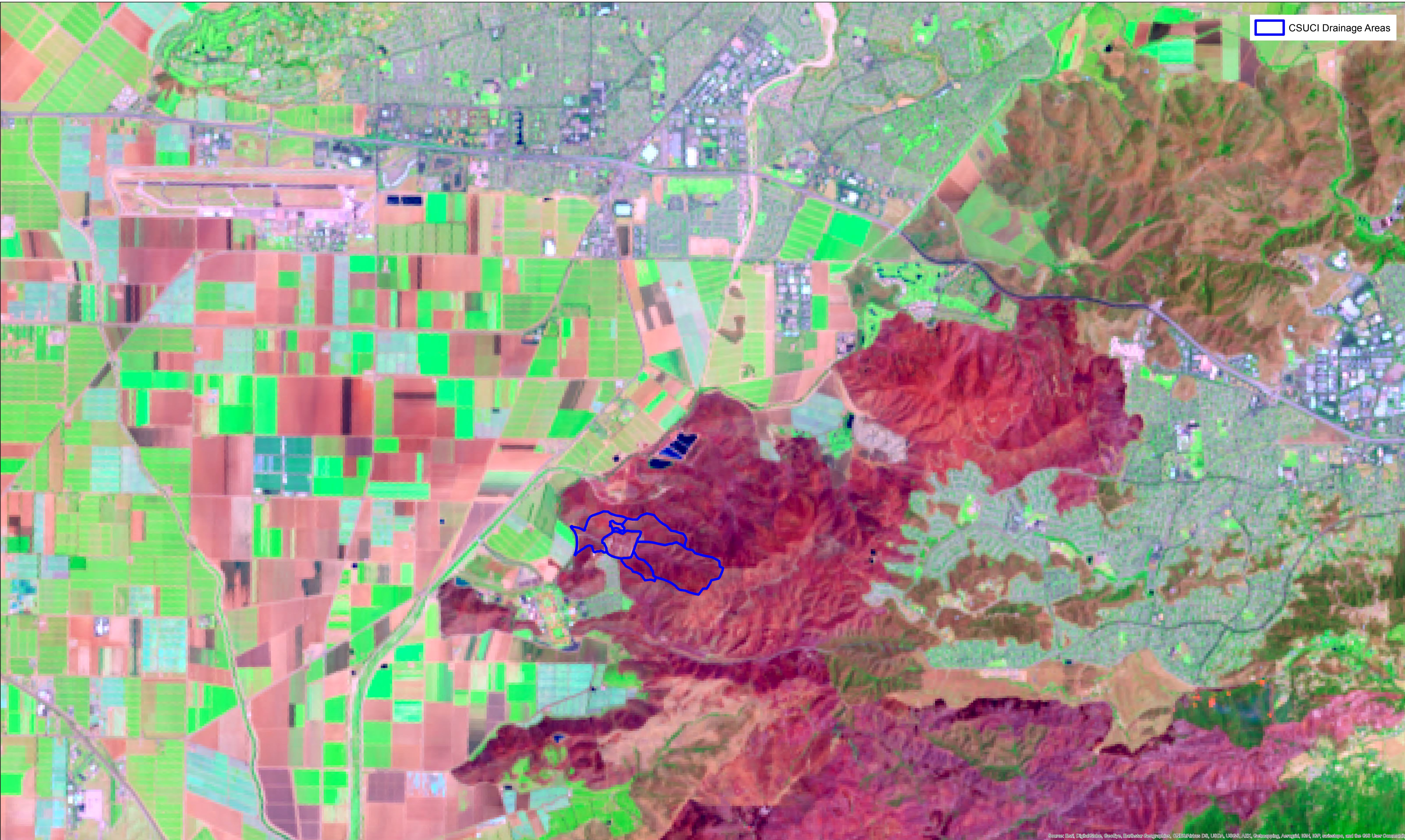
University Glen Drainage Area

VCWPD Rainfall Zones

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Attachment A-5
Landsat Imagery of Springs Fire (May 2013)



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, SVP, swisstopo, and the GIS User Community

Attachment A-6
Burn Severity Factor Nomograph

Last Fire : May 2013

Figure 11-1 shows the proposed burn severity factors vs. years since burn for the low, moderate, and high burn severity factors. These factors are summarized in Table 11-2. The BSF decreases at a rate similar to the VCWPD FF curve, both based on watershed recovery after eight wet seasons.

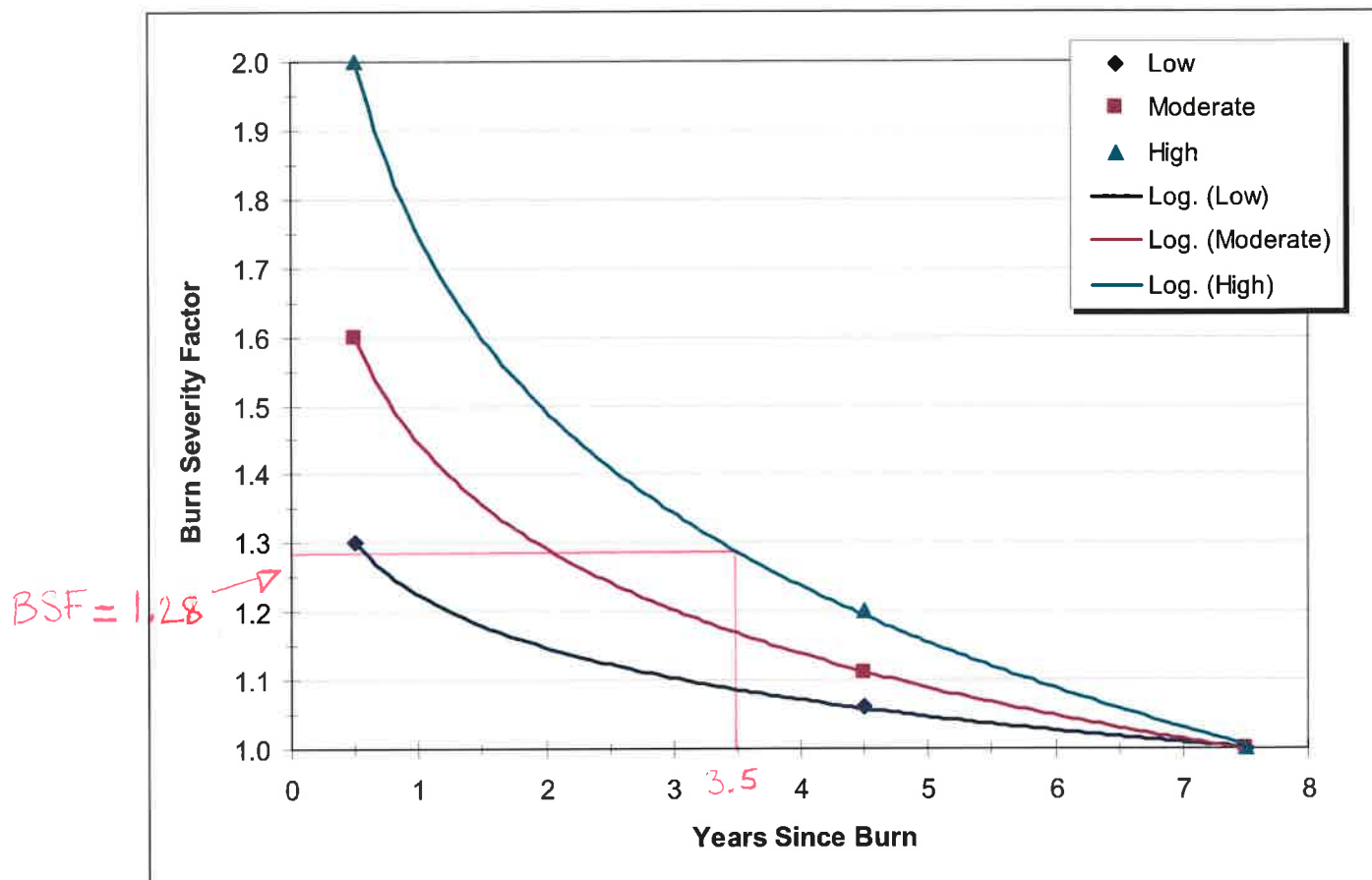


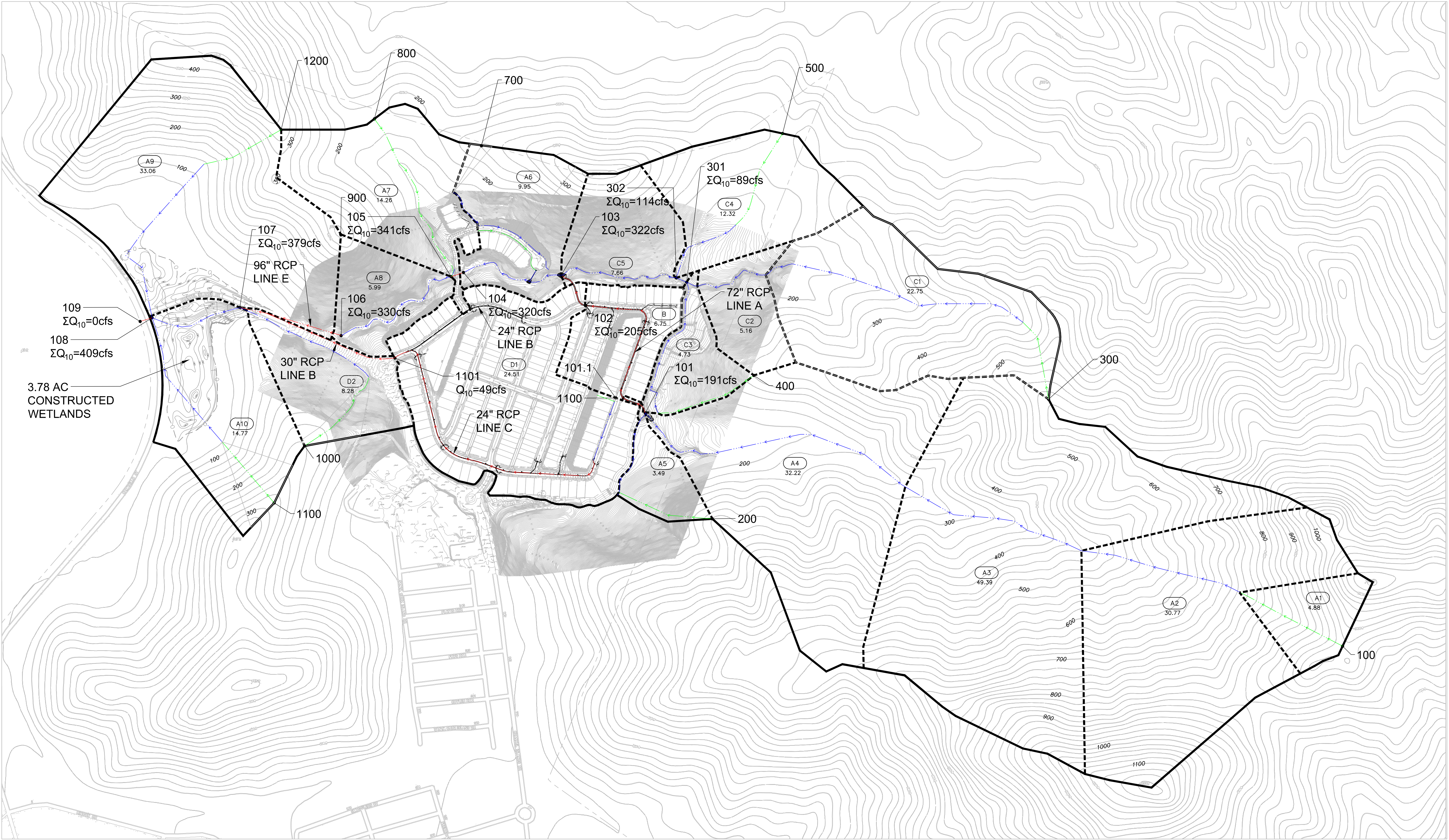
Figure 11-1. Proposed Burn Severity Factors vs. Years since Burn

Table 11-2. Proposed Burn Severity Factors vs. Years since Burn

Years Since Burn	FF	BURN CONDITION		
		Low Burn	Moderate Burn	High Burn
0.5 (after one wet season)	88	1.3	1.6	2.0
4.5 (after five wet seasons)	20	1.06	1.11	1.20
7.5 (after eight wet seasons)	1	1.0	1.0	1.0

Attachment B
Supporting Documentation for Existing Condition Hydrology

Attachment B-1
Existing Condition Hydrology Map



LEGEND

A
1.00 Ac

Q₁₀ = X.XX CFS

ΣQ₁₀ = X.XX CFS

—•—•—•—

—•—•—•—

—•—•—•—

—•—•—•—

MAJOR DRAINAGE BOUNDARY
MINOR DRAINAGE BOUNDARY

SUBAREA NAME
SUBAREA SIZE (ACRES)

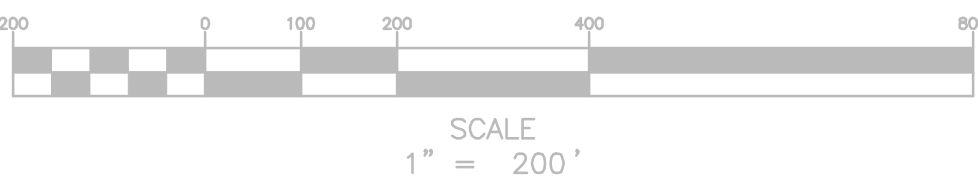
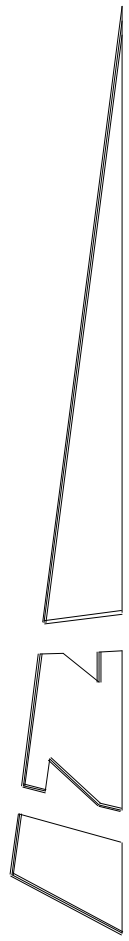
PEAK FLOW RATE

PEAK CONFLUENCED FLOW RATE

CURB\CHANNELIZED FLOW PATH

OVERLAND FLOW PATH

PIPE FLOW PATH



Attachment B-2
Existing Condition – Tc Calculator Model Files

CSUCI-Glenn Exist_10-yr.out

VENTURA COUNTY WATERSHED PROTECTION DISTRICT
 TIME OF CONCENTRATION
 TC Program Version: 2.6.2009.7
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 S U M M A R Y O F C O M P U T A T I O N S

Watershed Name: Existing Condition 10-yr

Name	Zone	Storm	Soil	Area (acres)	TC (min)
Area A	K	10	1.00	111.0 / 111	16.217 / 16
Area A5	K	10	2.00	3.5 / 3	6.165 / 6
Area B	K	10	2.00	6.8 / 7	9.782 / 10
Area C	K	10	1.00	27.9 / 28	7.213 / 7
Area C3	K	10	2.00	4.7 / 5	9.343 / 9
Area C4	K	10	1.00	12.3 / 12	11.022 / 11
Area C5	K	10	1.00	7.7 / 8	6.308 / 6
Area A6	K	10	1.00	10.0 / 10	6.083 / 6
Area A7	K	10	1.00	14.3 / 14	7.014 / 7
Area A8	K	10	1.00	6.0 / 6	6.871 / 7
Area D1	K	10	2.00	24.5 / 25	9.610 / 10
Area D2	K	10	2.00	8.3 / 8	7.368 / 7
Area A9	K	10	1.00	33.1 / 33	6.505 / 7
Area A10	K	10	2.00	14.8 / 15	7.281 / 7

♀

Watershed Name: Existing Condition 10-yr

Sub-Area Name: Area A
 Tc: 16.217 Minutes
 DATA FOR SUB AREA 1

SUB AREA TIME OF CONCENTRATION: 16.217 min. = 16 min.

SUB AREA INPUT DATA

Sub Area Name: Area A
 Total Area (ac): 111.04
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 1.976
 C Total: 0.848
 Sum Q Segments (cfs): 186.07
 Q Total (cfs): 186.07
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 972.99
 Time of Concentration (min): 16.217

DATA FOR FLOW PATH 1

Flow Path Name: A1
 FLOW PATH TRAVEL TIME (min): 11.6113
 Flow Type: Overland
 Length (ft): 1000
 Top Elevation (ft): 790
 Bottom Elevation (ft): 570
 Contributing Area (acres): 4.88
 Percent of Sub-Area (%): 4.4
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2200
 Effective Slope: 0.1685
 Q for Flow Path (cfs): 8.18
 Avg velocity (ft/s): 1.44
 Passed Scour Check: YES
 Scour velocity (ft/sec): 4.57

DATA FOR FLOW PATH 2

Flow Path Name: A2
 FLOW PATH TRAVEL TIME (min): 1.0263
 Flow Type: Natural Channel
 Length (ft): 600
 Top Elevation (ft): 570
 Bottom Elevation (ft): 440
 Contributing Area (acres): 24.55
 Percent of Sub-Area (%): 22.1
 Overland Type: Mountain
 Map Slope: 0.2167
 Effective Slope: 0.1671
 Q for Flow Path (cfs): 41.14
 Q Top (cfs): 8.18
 Q Bottom (cfs): 49.32
 Velocity Top (ft/s): 4.61
 Velocity Bottom (ft/s): 8.38
 Avg Velocity (ft/s): 6.50
 Wave velocity (ft/s): 9.74

DATA FOR FLOW PATH 3

Flow Path Name: A3
 FLOW PATH TRAVEL TIME (min): 1.1852
 Flow Type: Natural Channel
 Length (ft): 1020
 Top Elevation (ft): 440
 Bottom Elevation (ft): 250
 Contributing Area (acres): 49.39
 Percent of Sub-Area (%): 44.5
 Overland Type: Mountain
 Map Slope: 0.1863
 Effective Slope: 0.1525
 Q for Flow Path (cfs): 82.76
 Q Top (cfs): 49.32
 Q Bottom (cfs): 132.08
 Velocity Top (ft/s): 8.01
 Velocity Bottom (ft/s): 11.12
 Avg Velocity (ft/s): 9.56
 Wave velocity (ft/s): 14.34

DATA FOR FLOW PATH 4

Flow Path Name: A4
 FLOW PATH TRAVEL TIME (min): 2.3937
 Flow Type: Natural Channel
 Length (ft): 1590
 Top Elevation (ft): 250
 Bottom Elevation (ft): 155
 Contributing Area (acres): 32.22
 Percent of Sub-Area (%): 29.0
 Overland Type: Mountain
 Map Slope: 0.0597
 Effective Slope: 0.0597
 Q for Flow Path (cfs): 53.99
 Q Top (cfs): 132.08
 Q Bottom (cfs): 186.07
 Velocity Top (ft/s): 6.96
 Velocity Bottom (ft/s): 7.80
 Avg Velocity (ft/s): 7.38
 Wave velocity (ft/s): 11.07

‡

Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area A5
 Tc: 6.165 Minutes
 DATA FOR SUB AREA 2

SUB AREA TIME OF CONCENTRATION: 6.165 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area A5
 Total Area (ac): 3.49

Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 3.400
 C Total: 0.846
 Sum Q Segments (cfs): 10.04
 Q Total (cfs): 10.04
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 369.91
 Time of Concentration (min): 6.165

DATA FOR FLOW PATH 1

 Flow Path Name: A5 overland
 FLOW PATH TRAVEL TIME (min): 4.9248
 Flow Type: Overland
 Length (ft): 530
 Top Elevation (ft): 340
 Bottom Elevation (ft): 186
 Contributing Area (acres): 0.06
 Percent of Sub-Area (%): 1.7
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2906
 Effective Slope: 0.1935
 Q for Flow Path (cfs): 0.17
 Avg Velocity (ft/s): 1.79
 Passed Scour Check: YES
 Scour velocity (ft/sec): 1.32

DATA FOR FLOW PATH 2

 Flow Path Name: A5
 FLOW PATH TRAVEL TIME (min): 1.2403
 Flow Type: Channel
 Length (ft): 470
 Top Elevation (ft): 186
 Bottom Elevation (ft): 177
 Contributing Area (acres): 3.43
 Percent of Sub-Area (%): 98.3
 Bottom width (ft): 5
 Side Slope (H:V): 1
 Manning's N: 0.013
 Map Slope: 0.0191
 Q for Flow Path (cfs): 9.86
 Q Top (cfs): 0.17
 Q Bottom (cfs): 10.04
 Velocity Top (ft/s): 1.35
 Velocity Bottom (ft/s): 6.54
 Avg Velocity (ft/s): 3.95
 Wave velocity (ft/s): 6.32

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area B
 Tc: 9.782 Minutes
 DATA FOR SUB AREA 3

SUB AREA TIME OF CONCENTRATION: 9.782 min. = 10 min.

SUB AREA INPUT DATA

 Sub Area Name: Area B
 Total Area (ac): 6.75
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Residential
 Soil Type: 2.00
 Percent Impervious: 30

SUB AREA OUTPUT

Intensity (in/hr): 2.524
 C Total: 0.846
 Sum Q Segments (cfs): 14.41
 Q Total (cfs): 14.41
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 586.91
 Time of Concentration (min): 9.782

DATA FOR FLOW PATH 1

Flow Path Name: B overland
 FLOW PATH TRAVEL TIME (min): 3.9907
 Flow Type: Overland
 Length (ft): 100
 Top Elevation (ft): 159
 Bottom Elevation (ft): 157
 Contributing Area (acres): 0.14
 Percent of Sub-Area (%): 2.1
 Overland Type: valley
 Development Type: Residential
 Map Slope: 0.0200
 Effective Slope: 0.0200
 Q for Flow Path (cfs): 0.30
 Avg Velocity (ft/s): 0.42
 Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: B street
 FLOW PATH TRAVEL TIME (min): 2.1256
 Flow Type: Street
 Length (ft): 300
 Top Elevation (ft): 158
 Bottom Elevation (ft): 155
 Contributing Area (acres): 0.73
 Percent of Sub-Area (%): 10.8
 Street width (ft): 32
 Curb Height (in): 6
 Map Slope: 0.0100
 Q for Flow Path (cfs): 1.56
 Q Top (cfs): 0.30
 Q Bottom (cfs): 1.86
 Velocity Top (ft/s): 1.21
 Velocity Bottom (ft/s): 1.92
 Avg Velocity (ft/s): 1.57
 Wave velocity (ft/s): 2.35

DATA FOR FLOW PATH 3

Flow Path Name: B pipe
 FLOW PATH TRAVEL TIME (min): 3.6656
 Flow Type: Pipe
 Length (ft): 730
 Top Elevation (ft): 155
 Bottom Elevation (ft): 127
 Contributing Area (acres): 5.88
 Percent of Sub-Area (%): 87.1
 Initial Pipe Diameter (in): 36
 Calculated Pipe Diameter (in): 18
 Used Pipe Diameter (in): 36
 Manning's N: 0.015
 Map Slope: 0.0384
 Q for Flow Path (cfs): 12.55
 Q Top (cfs): 1.86
 Q Bottom (cfs): 14.41
 Avg Velocity (ft/s): 2.46
 Wave velocity (ft/s): 3.32

Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area C
 Tc: 7.213 Minutes
 DATA FOR SUB AREA 4

SUB AREA TIME OF CONCENTRATION: 7.213 min. = 7 min.

SUB AREA INPUT DATA

Sub Area Name: Area C
 Total Area (ac): 27.91
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 3.094
 C Total: 0.902
 Sum Q Segments (cfs): 77.93
 Q Total (cfs): 77.93
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 432.75
 Time of Concentration (min): 7.213

DATA FOR FLOW PATH 1

Flow Path Name: C1 overland
 FLOW PATH TRAVEL TIME (min): 3.9009
 Flow Type: Overland
 Length (ft): 450
 Top Elevation (ft): 570
 Bottom Elevation (ft): 400
 Contributing Area (acres): 1.68
 Percent of Sub-Area (%): 6.0
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.3778
 Effective Slope: 0.2114
 Q for Flow Path (cfs): 4.69
 Avg velocity (ft/s): 1.92
 Passed Scour Check: YES
 Scour velocity (ft/sec): 4.19

DATA FOR FLOW PATH 2

Flow Path Name: C1
 FLOW PATH TRAVEL TIME (min): 2.7694
 Flow Type: Natural Channel
 Length (ft): 1460
 Top Elevation (ft): 400
 Bottom Elevation (ft): 169
 Contributing Area (acres): 21.07
 Percent of Sub-Area (%): 75.5
 Overland Type: Mountain
 Map Slope: 0.1582
 Effective Slope: 0.1367
 Q for Flow Path (cfs): 58.83
 Q Top (cfs): 4.69
 Q Bottom (cfs): 63.52
 Velocity Top (ft/s): 3.46
 Velocity Bottom (ft/s): 8.25
 Avg velocity (ft/s): 5.86
 Wave velocity (ft/s): 8.79

DATA FOR FLOW PATH 3

Flow Path Name: C2
 FLOW PATH TRAVEL TIME (min): 0.5422
 Flow Type: Natural Channel
 Length (ft): 420
 Top Elevation (ft): 169
 Bottom Elevation (ft): 152
 Contributing Area (acres): 5.16
 Percent of Sub-Area (%): 18.5
 Overland Type: Valley
 Map Slope: 0.0405
 Effective Slope: 0.0405
 Q for Flow Path (cfs): 14.41
 Q Top (cfs): 63.52

Q Bottom (cfs): 77.93
 Velocity Top (ft/s): 8.35
 Velocity Bottom (ft/s): 8.87
 Avg Velocity (ft/s): 8.61
 Wave velocity (ft/s): 12.91

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area C3
 Tc: 9.343 Minutes
 DATA FOR SUB AREA 5

 SUB AREA TIME OF CONCENTRATION: 9.343 min. = 9 min.

 SUB AREA INPUT DATA

 Sub Area Name: Area C3
 Total Area (ac): 4.73
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 2.680
 C Total: 0.810
 Sum Q Segments (cfs): 10.27
 Q Total (cfs): 10.27
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 560.61
 Time of Concentration (min): 9.343

 DATA FOR FLOW PATH 1

 Flow Path Name: C3 overland
 FLOW PATH TRAVEL TIME (min): 7.7170
 Flow Type: Overland
 Length (ft): 560
 Top Elevation (ft): 280
 Bottom Elevation (ft): 177
 Contributing Area (acres): 0.18
 Percent of Sub-Area (%): 3.8
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.1839
 Effective Slope: 0.1512
 Q for Flow Path (cfs): 0.39
 Avg velocity (ft/s): 1.21
 Passed Scour Check: YES
 Scour velocity (ft/sec): 1.56

 DATA FOR FLOW PATH 2

 Flow Path Name: C3
 FLOW PATH TRAVEL TIME (min): 1.6265
 Flow Type: Channel
 Length (ft): 800
 Top Elevation (ft): 177
 Bottom Elevation (ft): 149
 Contributing Area (acres): 4.55
 Percent of Sub-Area (%): 96.2
 Bottom width (ft): 5
 Side Slope (H:V): 1
 Manning's N: 0.013
 Map Slope: 0.0350
 Q for Flow Path (cfs): 9.88
 Q Top (cfs): 0.39
 Q Bottom (cfs): 10.27
 Velocity Top (ft/s): 2.21
 Velocity Bottom (ft/s): 7.98
 Avg Velocity (ft/s): 5.09
 Wave velocity (ft/s): 8.20

♀

Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area C4
Tc: 11.022 Minutes
DATA FOR SUB AREA 6

SUB AREA TIME OF CONCENTRATION: 11.022 min. = 11 min.

SUB AREA INPUT DATA

Sub Area Name: Area C4
Total Area (ac): 12.32
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 1.00
Percent Impervious: 0
SUB AREA OUTPUT

Intensity (in/hr): 2.396
C Total: 0.874
Sum Q Segments (cfs): 25.79
Q Total (cfs): 25.79
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 661.31
Time of Concentration (min): 11.022

DATA FOR FLOW PATH 1

Flow Path Name: C4 overland
FLOW PATH TRAVEL TIME (min): 8.1898
Flow Type: Overland
Length (ft): 230
Top Elevation (ft): 210
Bottom Elevation (ft): 200
Contributing Area (acres): 1.11
Percent of Sub-Area (%): 9.0
Overland Type: Valley
Development Type: Undeveloped
Map Slope: 0.0435
Effective Slope: 0.0435
Q for Flow Path (cfs): 2.32
Avg velocity (ft/s): 0.47
Passed Scour Check: YES
Scour velocity (ft/sec): 3.66

DATA FOR FLOW PATH 2

Flow Path Name: C4
FLOW PATH TRAVEL TIME (min): 2.8319
Flow Type: Natural Channel
Length (ft): 800
Top Elevation (ft): 200
Bottom Elevation (ft): 145
Contributing Area (acres): 11.21
Percent of Sub-Area (%): 91.0
Overland Type: Mountain
Map Slope: 0.0688
Effective Slope: 0.0688
Q for Flow Path (cfs): 23.46
Q Top (cfs): 2.32
Q Bottom (cfs): 25.79
Velocity Top (ft/s): 1.94
Velocity Bottom (ft/s): 4.33
Avg velocity (ft/s): 3.14
Wave velocity (ft/s): 4.71

Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area C5
Tc: 6.308 Minutes

DATA FOR SUB AREA 7

SUB AREA TIME OF CONCENTRATION: 6.308 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area C5
 Total Area (ac): 7.66
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 3.400
 C Total: 0.910
 Sum Q Segments (cfs): 23.70
 Q Total (cfs): 23.70
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 378.47
 Time of Concentration (min): 6.308

DATA FOR FLOW PATH 1

Flow Path Name: C5 overland
 FLOW PATH TRAVEL TIME (min): 4.3343
 Flow Type: Overland
 Length (ft): 500
 Top Elevation (ft): 340
 Bottom Elevation (ft): 160
 Contributing Area (acres): 0.77
 Percent of Sub-Area (%): 10.1
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.3600
 Effective Slope: 0.2087
 Q for Flow Path (cfs): 2.38
 Avg Velocity (ft/s): 1.92
 Passed Scour Check: YES
 Scour velocity (ft/sec): 3.30

DATA FOR FLOW PATH 2

Flow Path Name: C5
 FLOW PATH TRAVEL TIME (min): 1.9735
 Flow Type: Natural Channel
 Length (ft): 840
 Top Elevation (ft): 160
 Bottom Elevation (ft): 129
 Contributing Area (acres): 6.89
 Percent of Sub-Area (%): 89.9
 Overland Type: valley
 Map Slope: 0.0369
 Effective Slope: 0.0369
 Q for Flow Path (cfs): 21.32
 Q Top (cfs): 2.38
 Q Bottom (cfs): 23.70
 Velocity Top (ft/s): 3.43
 Velocity Bottom (ft/s): 6.03
 Avg Velocity (ft/s): 4.73
 Wave velocity (ft/s): 7.09

Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area A6
 TC: 6.083 Minutes
 DATA FOR SUB AREA 8

SUB AREA TIME OF CONCENTRATION: 6.083 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area A6

Total Area (ac): 9.95
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 3
 SUB AREA OUTPUT

 Intensity (in/hr): 3.400
 C Total: 0.911
 Sum Q Segments (cfs): 30.83
 Q Total (cfs): 30.83
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 364.96
 Time of Concentration (min): 6.083

DATA FOR FLOW PATH 1

 Flow Path Name: A6 overland
 FLOW PATH TRAVEL TIME (min): 3.3023
 Flow Type: Overland
 Length (ft): 300
 Top Elevation (ft): 240
 Bottom Elevation (ft): 170
 Contributing Area (acres): 0.37
 Percent of Sub-Area (%): 3.7
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2333
 Effective Slope: 0.1741
 Q for Flow Path (cfs): 1.15
 Avg velocity (ft/s): 1.51
 Passed Scour Check: YES
 Scour velocity (ft/sec): 2.36

DATA FOR FLOW PATH 2

 Flow Path Name: A6
 FLOW PATH TRAVEL TIME (min): 2.7805
 Flow Type: Natural Channel
 Length (ft): 810
 Top Elevation (ft): 170
 Bottom Elevation (ft): 108
 Contributing Area (acres): 9.58
 Percent of Sub-Area (%): 96.3
 Overland Type: Mountain
 Map Slope: 0.0765
 Effective Slope: 0.0765
 Q for Flow Path (cfs): 29.68
 Q Top (cfs): 1.15
 Q Bottom (cfs): 30.83
 Velocity Top (ft/s): 1.62
 Velocity Bottom (ft/s): 4.85
 Avg velocity (ft/s): 3.24
 Wave velocity (ft/s): 4.86

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area A7
 Tc: 7.014 Minutes
 DATA FOR SUB AREA 9

SUB AREA TIME OF CONCENTRATION: 7.014 min. = 7 min.

SUB AREA INPUT DATA

 Sub Area Name: Area A7
 Total Area (ac): 14.26
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 3

SUB AREA OUTPUT

 Intensity (in/hr): 3.094
 C Total: 0.904
 Sum Q Segments (cfs): 39.88
 Q Total (cfs): 39.88
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 420.83
 Time of Concentration (min): 7.014

DATA FOR FLOW PATH 1

 Flow Path Name: A7 overland
 FLOW PATH TRAVEL TIME (min): 4.5504
 Flow Type: Overland
 Length (ft): 300
 Top Elevation (ft): 190
 Bottom Elevation (ft): 140
 Contributing Area (acres): 1.19
 Percent of Sub-Area (%): 8.3
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.1667
 Effective Slope: 0.1417
 Q for Flow Path (cfs): 3.33
 Avg Velocity (ft/s): 1.10
 Passed Scour Check: YES
 Scour velocity (ft/sec): 3.06

DATA FOR FLOW PATH 2

 Flow Path Name: A7
 FLOW PATH TRAVEL TIME (min): 2.4634
 Flow Type: Natural Channel
 Length (ft): 700
 Top Elevation (ft): 140
 Bottom Elevation (ft): 103
 Contributing Area (acres): 13.07
 Percent of Sub-Area (%): 91.7
 Overland Type: Mountain
 Map Slope: 0.0529
 Effective Slope: 0.0529
 Q for Flow Path (cfs): 36.55
 Q Top (cfs): 3.33
 Q Bottom (cfs): 39.88
 Velocity Top (ft/s): 1.92
 Velocity Bottom (ft/s): 4.39
 Avg Velocity (ft/s): 3.16
 Wave velocity (ft/s): 4.74

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area A8
 Tc: 6.871 Minutes
 DATA FOR SUB AREA 10

SUB AREA TIME OF CONCENTRATION: 6.871 min. = 7 min.

SUB AREA INPUT DATA

 Sub Area Name: Area A8
 Total Area (ac): 5.99
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 3.094
 C Total: 0.902
 Sum Q Segments (cfs): 16.72
 Q Total (cfs): 16.72
 Sum Percent Area (%): 100.0

Sum of Flow Path Travel Times (sec): 412.26

Time of Concentration (min): 6.871

DATA FOR FLOW PATH 1

 Flow Path Name: A8 overland
 FLOW PATH TRAVEL TIME (min): 4.6810
 Flow Type: Overland
 Length (ft): 540
 Top Elevation (ft): 320
 Bottom Elevation (ft): 100
 Contributing Area (acres): 0.34
 Percent of Sub-Area (%): 5.7
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.4074
 Effective Slope: 0.2150
 Q for Flow Path (cfs): 0.95
 Avg Velocity (ft/s): 1.92
 Passed Scour Check: YES
 Scour velocity (ft/sec): 2.48

DATA FOR FLOW PATH 2

 Flow Path Name: A8
 FLOW PATH TRAVEL TIME (min): 2.1900
 Flow Type: Natural Channel
 Length (ft): 650
 Top Elevation (ft): 100
 Bottom Elevation (ft): 85
 Contributing Area (acres): 5.65
 Percent of Sub-Area (%): 94.3
 Overland Type: Valley
 Map Slope: 0.0231
 Effective Slope: 0.0231
 Q for Flow Path (cfs): 15.78
 Q Top (cfs): 0.95
 Q Bottom (cfs): 16.72
 Velocity Top (ft/s): 2.26
 Velocity Bottom (ft/s): 4.34
 Avg Velocity (ft/s): 3.30
 Wave velocity (ft/s): 4.95

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area D1
 Tc: 9.610 Minutes
 DATA FOR SUB AREA 11

SUB AREA TIME OF CONCENTRATION: 9.610 min. = 10 min.

SUB AREA INPUT DATA

 Sub Area Name: Area D1
 Total Area (ac): 24.51
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 30
 SUB AREA OUTPUT

Intensity (in/hr): 2.524
 C Total: 0.846
 Sum Q Segments (cfs): 52.33
 Q Total (cfs): 52.33
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 576.59
 Time of Concentration (min): 9.610

DATA FOR FLOW PATH 1

 Flow Path Name: D1 overland
 FLOW PATH TRAVEL TIME (min): 3.9907

Flow Type: Overland
 Length (ft): 100
 Top Elevation (ft): 161
 Bottom Elevation (ft): 159
 Contributing Area (acres): 0.11
 Percent of Sub-Area (%): 0.4
 Overland Type: valley
 Development Type: Residential
 Map Slope: 0.0200
 Effective Slope: 0.0200
 Q for Flow Path (cfs): 0.23
 Avg Velocity (ft/s): 0.42
 Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: D1 street
 FLOW PATH TRAVEL TIME (min): 2.1344
 Flow Type: Street
 Length (ft): 300
 Top Elevation (ft): 159
 Bottom Elevation (ft): 156
 Contributing Area (acres): 0.87
 Percent of Sub-Area (%): 3.5
 Street width (ft): 32
 Curb Height (in): 6
 Map Slope: 0.0100
 Q for Flow Path (cfs): 1.86
 Q Top (cfs): 0.23
 Q Bottom (cfs): 2.09
 Velocity Top (ft/s): 1.14
 Velocity Bottom (ft/s): 1.98
 Avg Velocity (ft/s): 1.56
 Wave velocity (ft/s): 2.34

DATA FOR FLOW PATH 3

Flow Path Name: D1 pipe
 FLOW PATH TRAVEL TIME (min): 3.4847
 Flow Type: Pipe
 Length (ft): 1550
 Top Elevation (ft): 156
 Bottom Elevation (ft): 95
 Contributing Area (acres): 23.53
 Percent of Sub-Area (%): 96.0
 Initial Pipe Diameter (in): 42
 Calculated Pipe Diameter (in): 27
 Used Pipe Diameter (in): 42
 Manning's N: 0.015
 Map Slope: 0.0394
 Q for Flow Path (cfs): 50.23
 Q Top (cfs): 2.09
 Q Bottom (cfs): 52.33
 Avg Velocity (ft/s): 5.59
 Wave velocity (ft/s): 7.41

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area D2
 Tc: 7.368 Minutes
 DATA FOR SUB AREA 12

SUB AREA TIME OF CONCENTRATION: 7.368 min. = 7 min.

SUB AREA INPUT DATA

Sub Area Name: Area D2
 Total Area (ac): 8.28
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 30
 SUB AREA OUTPUT

Intensity (in/hr): 3.094
 C Total: 0.868
 Sum Q Segments (cfs): 22.24
 Q Total (cfs): 22.24
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 442.10
 Time of Concentration (min): 7.368

DATA FOR FLOW PATH 1

Flow Path Name: D2 overland
 FLOW PATH TRAVEL TIME (min): 5.4646
 Flow Type: Overland
 Length (ft): 520
 Top Elevation (ft): 240
 Bottom Elevation (ft): 112
 Contributing Area (acres): 1.19
 Percent of Sub-Area (%): 14.4
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2462
 Effective Slope: 0.1791
 Q for Flow Path (cfs): 3.20
 Avg Velocity (ft/s): 1.59
 Passed Scour Check: YES
 Scour velocity (ft/sec): 3.39

DATA FOR FLOW PATH 2

Flow Path Name: D2
 FLOW PATH TRAVEL TIME (min): 1.9037
 Flow Type: Natural Channel
 Length (ft): 790
 Top Elevation (ft): 112
 Bottom Elevation (ft): 85
 Contributing Area (acres): 7.09
 Percent of Sub-Area (%): 85.6
 Overland Type: valley
 Map Slope: 0.0342
 Effective Slope: 0.0342
 Q for Flow Path (cfs): 19.04
 Q Top (cfs): 3.20
 Q Bottom (cfs): 22.24
 Velocity Top (ft/s): 3.52
 Velocity Bottom (ft/s): 5.70
 Avg Velocity (ft/s): 4.61
 Wave velocity (ft/s): 6.92

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area A9
 Tc: 6.505 Minutes
 DATA FOR SUB AREA 13

SUB AREA TIME OF CONCENTRATION: 6.505 min. = 7 min.

SUB AREA INPUT DATA

Sub Area Name: Area A9
 Total Area (ac): 33.06
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 3.094
 C Total: 0.902
 Sum Q Segments (cfs): 92.31
 Q Total (cfs): 92.31
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 390.31

Time of Concentration (min): 6.505

DATA FOR FLOW PATH 1

Flow Path Name: A9 overland
 FLOW PATH TRAVEL TIME (min): 3.9442
 Flow Type: Overland
 Length (ft): 455
 Top Elevation (ft): 330
 Bottom Elevation (ft): 120
 Contributing Area (acres): 2.84
 Percent of Sub-Area (%): 8.6
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.4615
 Effective Slope: 0.2195
 Q for Flow Path (cfs): 7.93
 Avg Velocity (ft/s): 1.92
 Passed Scour Check: YES
 Scour velocity (ft/sec): 5.08

DATA FOR FLOW PATH 2

Flow Path Name: A9
 FLOW PATH TRAVEL TIME (min): 2.5609
 Flow Type: Natural Channel
 Length (ft): 1030
 Top Elevation (ft): 120
 Bottom Elevation (ft): 58
 Contributing Area (acres): 30.22
 Percent of Sub-Area (%): 91.4
 Overland Type: Mountain
 Map Slope: 0.0602
 Effective Slope: 0.0602
 Q for Flow Path (cfs): 84.38
 Q Top (cfs): 7.93
 Q Bottom (cfs): 92.31
 Velocity Top (ft/s): 2.74
 Velocity Bottom (ft/s): 6.20
 Avg Velocity (ft/s): 4.47
 Wave velocity (ft/s): 6.70

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 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area A10
 Tc: 7.281 Minutes
 DATA FOR SUB AREA 14

 SUB AREA TIME OF CONCENTRATION: 7.281 min. = 7 min.

SUB AREA INPUT DATA

Sub Area Name: Area A10
 Total Area (ac): 14.77
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 3.094
 C Total: 0.833
 Sum Q Segments (cfs): 38.07
 Q Total (cfs): 38.07
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 436.84
 Time of Concentration (min): 7.281

DATA FOR FLOW PATH 1

Flow Path Name: A10 overland
 FLOW PATH TRAVEL TIME (min): 5.4636
 Flow Type: Overland

Length (ft): 430
 Top Elevation (ft): 166
 Bottom Elevation (ft): 80
 Contributing Area (acres): 1.9
 Percent of Sub-Area (%): 12.9
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2000
 Effective Slope: 0.1594
 Q for Flow Path (cfs): 4.90
 Avg Velocity (ft/s): 1.31
 Passed Scour Check: YES
 Scour velocity (ft/sec): 3.68

DATA FOR FLOW PATH 2

Flow Path Name: A10
 FLOW PATH TRAVEL TIME (min): 1.8171
 Flow Type: Natural Channel
 Length (ft): 780
 Top Elevation (ft): 80
 Bottom Elevation (ft): 58
 Contributing Area (acres): 12.87
 Percent of Sub-Area (%): 87.1
 Overland Type: valley
 Map Slope: 0.0282
 Effective Slope: 0.0282
 Q for Flow Path (cfs): 33.17
 Q Top (cfs): 4.90
 Q Bottom (cfs): 38.07
 Velocity Top (ft/s): 3.53
 Velocity Bottom (ft/s): 6.01
 Avg Velocity (ft/s): 4.77
 Wave velocity (ft/s): 7.15

CSUCI-Glenn Exist_25-yr.out

VENTURA COUNTY WATERSHED PROTECTION DISTRICT
 TIME OF CONCENTRATION
 TC Program Version: 2.6.2009.7
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 S U M M A R Y O F C O M P U T A T I O N S

Watershed Name: Existing Condition 25-yr

Name	Zone	Storm	Soil	Area (acres)	TC (min)
Area A	K	25	1.00	111.0 / 111	15.115 / 15
Area A5	K	25	2.00	3.5 / 3	5.885 / 6
Area B	K	25	2.00	6.8 / 7	8.739 / 9
Area C	K	25	1.00	27.9 / 28	7.003 / 7
Area C3	K	25	2.00	4.7 / 5	8.551 / 9
Area C4	K	25	1.00	12.3 / 12	9.145 / 9
Area C5	K	25	1.00	7.7 / 8	6.156 / 6
Area A6	K	25	1.00	10.0 / 10	5.744 / 6
Area A7	K	25	1.00	14.3 / 14	6.364 / 6
Area A8	K	25	1.00	6.0 / 6	6.710 / 7
Area D1	K	25	2.00	24.5 / 25	7.787 / 8
Area D2	K	25	2.00	8.3 / 8	6.963 / 7
Area A9	K	25	1.00	33.1 / 33	6.237 / 6
Area A10	K	25	2.00	14.8 / 15	6.755 / 7

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Watershed Name: Existing Condition 25-yr

Sub-Area Name: Area A
 Tc: 15.115 Minutes
 DATA FOR SUB AREA 1

SUB AREA TIME OF CONCENTRATION: 15.115 min. = 15 min.

SUB AREA INPUT DATA

Sub Area Name: Area A
 Total Area (ac): 111.04
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 2.256
 C Total: 0.865
 Sum Q Segments (cfs): 216.78
 Q Total (cfs): 216.78
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 906.92
 Time of Concentration (min): 15.115

DATA FOR FLOW PATH 1

Flow Path Name: A1
 FLOW PATH TRAVEL TIME (min): 10.7386
 Flow Type: Overland
 Length (ft): 1000
 Top Elevation (ft): 790
 Bottom Elevation (ft): 570
 Contributing Area (acres): 4.88
 Percent of Sub-Area (%): 4.4
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2200
 Effective Slope: 0.1685
 Q for Flow Path (cfs): 9.53
 Avg velocity (ft/s): 1.55
 Passed Scour Check: YES
 Scour velocity (ft/sec): 4.81

DATA FOR FLOW PATH 2

Flow Path Name: A2
 FLOW PATH TRAVEL TIME (min): 0.9754
 Flow Type: Natural Channel
 Length (ft): 600
 Top Elevation (ft): 570
 Bottom Elevation (ft): 440
 Contributing Area (acres): 24.55
 Percent of Sub-Area (%): 22.1
 Overland Type: Mountain
 Map Slope: 0.2167
 Effective Slope: 0.1671
 Q for Flow Path (cfs): 47.93
 Q Top (cfs): 9.53
 Q Bottom (cfs): 57.45
 Velocity Top (ft/s): 4.85
 Velocity Bottom (ft/s): 8.82
 Avg Velocity (ft/s): 6.83
 Wave velocity (ft/s): 10.25

DATA FOR FLOW PATH 3

Flow Path Name: A3
 FLOW PATH TRAVEL TIME (min): 1.1264
 Flow Type: Natural Channel
 Length (ft): 1020
 Top Elevation (ft): 440
 Bottom Elevation (ft): 250
 Contributing Area (acres): 49.39
 Percent of Sub-Area (%): 44.5
 Overland Type: Mountain
 Map Slope: 0.1863
 Effective Slope: 0.1525
 Q for Flow Path (cfs): 96.42
 Q Top (cfs): 57.45
 Q Bottom (cfs): 153.88
 Velocity Top (ft/s): 8.43
 Velocity Bottom (ft/s): 11.70
 Avg Velocity (ft/s): 10.06
 Wave velocity (ft/s): 15.09

DATA FOR FLOW PATH 4

Flow Path Name: A4
 FLOW PATH TRAVEL TIME (min): 2.2750
 Flow Type: Natural Channel
 Length (ft): 1590
 Top Elevation (ft): 250
 Bottom Elevation (ft): 155
 Contributing Area (acres): 32.22
 Percent of Sub-Area (%): 29.0
 Overland Type: Mountain
 Map Slope: 0.0597
 Effective Slope: 0.0597
 Q for Flow Path (cfs): 62.90
 Q Top (cfs): 153.88
 Q Bottom (cfs): 216.78
 Velocity Top (ft/s): 7.32
 Velocity Bottom (ft/s): 8.21
 Avg Velocity (ft/s): 7.77
 Wave velocity (ft/s): 11.65

‡
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area A5
 Tc: 5.885 Minutes
 DATA FOR SUB AREA 2

SUB AREA TIME OF CONCENTRATION: 5.885 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area A5
 Total Area (ac): 3.49

Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 3.800
 C Total: 0.861
 Sum Q Segments (cfs): 11.42
 Q Total (cfs): 11.42
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 353.12
 Time of Concentration (min): 5.885

DATA FOR FLOW PATH 1

Flow Path Name: A5 overland
 FLOW PATH TRAVEL TIME (min): 4.7009
 Flow Type: Overland
 Length (ft): 530
 Top Elevation (ft): 340
 Bottom Elevation (ft): 186
 Contributing Area (acres): 0.06
 Percent of Sub-Area (%): 1.7
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2906
 Effective Slope: 0.1935
 Q for Flow Path (cfs): 0.20
 Avg Velocity (ft/s): 1.88
 Passed Scour Check: YES
 Scour velocity (ft/sec): 1.38

DATA FOR FLOW PATH 2

Flow Path Name: A5
 FLOW PATH TRAVEL TIME (min): 1.1844
 Flow Type: Channel
 Length (ft): 470
 Top Elevation (ft): 186
 Bottom Elevation (ft): 177
 Contributing Area (acres): 3.43
 Percent of Sub-Area (%): 98.3
 Bottom width (ft): 5
 Side Slope (H:V): 1
 Manning's N: 0.013
 Map Slope: 0.0191
 Q for Flow Path (cfs): 11.22
 Q Top (cfs): 0.20
 Q Bottom (cfs): 11.42
 Velocity Top (ft/s): 1.46
 Velocity Bottom (ft/s): 6.83
 Avg velocity (ft/s): 4.14
 Wave velocity (ft/s): 6.61

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Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area B
 Tc: 8.739 Minutes
 DATA FOR SUB AREA 3

SUB AREA TIME OF CONCENTRATION: 8.739 min. = 9 min.

SUB AREA INPUT DATA

Sub Area Name: Area B
 Total Area (ac): 6.75
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Residential
 Soil Type: 2.00
 Percent Impervious: 30

SUB AREA OUTPUT

Intensity (in/hr): 2.987
 C Total: 0.865
 Sum Q Segments (cfs): 17.43
 Q Total (cfs): 17.43
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 524.34
 Time of Concentration (min): 8.739

DATA FOR FLOW PATH 1

Flow Path Name: B overland
 FLOW PATH TRAVEL TIME (min): 3.1441
 Flow Type: Overland
 Length (ft): 100
 Top Elevation (ft): 159
 Bottom Elevation (ft): 157
 Contributing Area (acres): 0.14
 Percent of Sub-Area (%): 2.1
 Overland Type: valley
 Development Type: Residential
 Map Slope: 0.0200
 Effective Slope: 0.0200
 Q for Flow Path (cfs): 0.36
 Avg Velocity (ft/s): 0.53
 Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: B street
 FLOW PATH TRAVEL TIME (min): 2.0261
 Flow Type: Street
 Length (ft): 300
 Top Elevation (ft): 158
 Bottom Elevation (ft): 155
 Contributing Area (acres): 0.73
 Percent of Sub-Area (%): 10.8
 Street width (ft): 32
 Curb Height (in): 6
 Map Slope: 0.0100
 Q for Flow Path (cfs): 1.89
 Q Top (cfs): 0.36
 Q Bottom (cfs): 2.25
 Velocity Top (ft/s): 1.27
 Velocity Bottom (ft/s): 2.02
 Avg Velocity (ft/s): 1.65
 Wave velocity (ft/s): 2.47

DATA FOR FLOW PATH 3

Flow Path Name: B pipe
 FLOW PATH TRAVEL TIME (min): 3.5687
 Flow Type: Pipe
 Length (ft): 730
 Top Elevation (ft): 155
 Bottom Elevation (ft): 127
 Contributing Area (acres): 5.88
 Percent of Sub-Area (%): 87.1
 Initial Pipe Diameter (in): 36
 Calculated Pipe Diameter (in): 18
 Used Pipe Diameter (in): 36
 Manning's N: 0.015
 Map Slope: 0.0384
 Q for Flow Path (cfs): 15.19
 Q Top (cfs): 2.25
 Q Bottom (cfs): 17.43
 Avg Velocity (ft/s): 2.58
 Wave velocity (ft/s): 3.41

Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area C
 Tc: 7.003 Minutes
 DATA FOR SUB AREA 4

SUB AREA TIME OF CONCENTRATION: 7.003 min. = 7 min.

SUB AREA INPUT DATA

Sub Area Name: Area C
 Total Area (ac): 27.91
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 3.454
 C Total: 0.911
 Sum Q Segments (cfs): 87.86
 Q Total (cfs): 87.86
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 420.19
 Time of Concentration (min): 7.003

DATA FOR FLOW PATH 1

Flow Path Name: C1 overland
 FLOW PATH TRAVEL TIME (min): 3.8188
 Flow Type: Overland
 Length (ft): 450
 Top Elevation (ft): 570
 Bottom Elevation (ft): 400
 Contributing Area (acres): 1.68
 Percent of Sub-Area (%): 6.0
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.3778
 Effective Slope: 0.2114
 Q for Flow Path (cfs): 5.29
 Avg velocity (ft/s): 1.96
 Passed Scour Check: YES
 Scour velocity (ft/sec): 4.36

DATA FOR FLOW PATH 2

Flow Path Name: C1
 FLOW PATH TRAVEL TIME (min): 2.6609
 Flow Type: Natural Channel
 Length (ft): 1460
 Top Elevation (ft): 400
 Bottom Elevation (ft): 169
 Contributing Area (acres): 21.07
 Percent of Sub-Area (%): 75.5
 Overland Type: Mountain
 Map Slope: 0.1582
 Effective Slope: 0.1367
 Q for Flow Path (cfs): 66.33
 Q Top (cfs): 5.29
 Q Bottom (cfs): 71.62
 Velocity Top (ft/s): 3.61
 Velocity Bottom (ft/s): 8.59
 Avg velocity (ft/s): 6.10
 Wave velocity (ft/s): 9.14

DATA FOR FLOW PATH 3

Flow Path Name: C2
 FLOW PATH TRAVEL TIME (min): 0.5233
 Flow Type: Natural Channel
 Length (ft): 420
 Top Elevation (ft): 169
 Bottom Elevation (ft): 152
 Contributing Area (acres): 5.16
 Percent of Sub-Area (%): 18.5
 Overland Type: Valley
 Map Slope: 0.0405
 Effective Slope: 0.0405
 Q for Flow Path (cfs): 16.24
 Q Top (cfs): 71.62

Q Bottom (cfs): 87.86
 Velocity Top (ft/s): 8.65
 Velocity Bottom (ft/s): 9.19
 Avg Velocity (ft/s): 8.92
 Wave Velocity (ft/s): 13.38

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 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area C3
 Tc: 8.551 Minutes
 DATA FOR SUB AREA 5

 SUB AREA TIME OF CONCENTRATION: 8.551 min. = 9 min.

 SUB AREA INPUT DATA

 Sub Area Name: Area C3
 Total Area (ac): 4.73
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 2.987
 C Total: 0.828
 Sum Q Segments (cfs): 11.70
 Q Total (cfs): 11.70
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 513.04
 Time of Concentration (min): 8.551

 DATA FOR FLOW PATH 1

 Flow Path Name: C3 overland
 FLOW PATH TRAVEL TIME (min): 6.9947
 Flow Type: Overland
 Length (ft): 560
 Top Elevation (ft): 280
 Bottom Elevation (ft): 177
 Contributing Area (acres): 0.18
 Percent of Sub-Area (%): 3.8
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.1839
 Effective Slope: 0.1512
 Q for Flow Path (cfs): 0.45
 Avg Velocity (ft/s): 1.33
 Passed Scour Check: YES
 Scour Velocity (ft/sec): 1.62

 DATA FOR FLOW PATH 2

 Flow Path Name: C3
 FLOW PATH TRAVEL TIME (min): 1.5561
 Flow Type: Channel
 Length (ft): 800
 Top Elevation (ft): 177
 Bottom Elevation (ft): 149
 Contributing Area (acres): 4.55
 Percent of Sub-Area (%): 96.2
 Bottom width (ft): 5
 Side Slope (H:V): 1
 Manning's N: 0.013
 Map Slope: 0.0350
 Q for Flow Path (cfs): 11.26
 Q Top (cfs): 0.45
 Q Bottom (cfs): 11.70
 Velocity Top (ft/s): 2.32
 Velocity Bottom (ft/s): 8.36
 Avg Velocity (ft/s): 5.34
 Wave Velocity (ft/s): 8.57

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Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area C4
Tc: 9.145 Minutes
DATA FOR SUB AREA 6

SUB AREA TIME OF CONCENTRATION: 9.145 min. = 9 min.

SUB AREA INPUT DATA

Sub Area Name: Area C4
Total Area (ac): 12.32
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 1.00
Percent Impervious: 0
SUB AREA OUTPUT

Intensity (in/hr): 2.987
C Total: 0.899
Sum Q Segments (cfs): 33.10
Q Total (cfs): 33.10
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 548.68
Time of Concentration (min): 9.145

DATA FOR FLOW PATH 1

Flow Path Name: C4 overland
FLOW PATH TRAVEL TIME (min): 6.5385
Flow Type: Overland
Length (ft): 230
Top Elevation (ft): 210
Bottom Elevation (ft): 200
Contributing Area (acres): 1.11
Percent of Sub-Area (%): 9.0
Overland Type: Valley
Development Type: Undeveloped
Map Slope: 0.0435
Effective Slope: 0.0435
Q for Flow Path (cfs): 2.98
Avg velocity (ft/s): 0.59
Passed Scour Check: YES
Scour velocity (ft/sec): 3.85

DATA FOR FLOW PATH 2

Flow Path Name: C4
FLOW PATH TRAVEL TIME (min): 2.6061
Flow Type: Natural Channel
Length (ft): 800
Top Elevation (ft): 200
Bottom Elevation (ft): 145
Contributing Area (acres): 11.21
Percent of Sub-Area (%): 91.0
Overland Type: Mountain
Map Slope: 0.0688
Effective Slope: 0.0688
Q for Flow Path (cfs): 30.11
Q Top (cfs): 2.98
Q Bottom (cfs): 33.10
Velocity Top (ft/s): 2.11
Velocity Bottom (ft/s): 4.71
Avg velocity (ft/s): 3.41
Wave velocity (ft/s): 5.12

Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area C5
Tc: 6.156 Minutes

DATA FOR SUB AREA 7

SUB AREA TIME OF CONCENTRATION: 6.156 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area C5
 Total Area (ac): 7.66
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 3.800
 C Total: 0.920
 Sum Q Segments (cfs): 26.78
 Q Total (cfs): 26.78
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 369.39
 Time of Concentration (min): 6.156

DATA FOR FLOW PATH 1

Flow Path Name: C5 overland
 FLOW PATH TRAVEL TIME (min): 4.2431
 Flow Type: Overland
 Length (ft): 500
 Top Elevation (ft): 340
 Bottom Elevation (ft): 160
 Contributing Area (acres): 0.77
 Percent of Sub-Area (%): 10.1
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.3600
 Effective Slope: 0.2087
 Q for Flow Path (cfs): 2.69
 Avg Velocity (ft/s): 1.96
 Passed Scour Check: YES
 Scour velocity (ft/sec): 3.44

DATA FOR FLOW PATH 2

Flow Path Name: C5
 FLOW PATH TRAVEL TIME (min): 1.9133
 Flow Type: Natural Channel
 Length (ft): 840
 Top Elevation (ft): 160
 Bottom Elevation (ft): 129
 Contributing Area (acres): 6.89
 Percent of Sub-Area (%): 89.9
 Overland Type: valley
 Map Slope: 0.0369
 Effective Slope: 0.0369
 Q for Flow Path (cfs): 24.09
 Q Top (cfs): 2.69
 Q Bottom (cfs): 26.78
 Velocity Top (ft/s): 3.52
 Velocity Bottom (ft/s): 6.23
 Avg Velocity (ft/s): 4.88
 Wave velocity (ft/s): 7.32

Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area A6
 TC: 5.744 Minutes
 DATA FOR SUB AREA 8

SUB AREA TIME OF CONCENTRATION: 5.744 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area A6

Total Area (ac): 9.95
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 3
 SUB AREA OUTPUT

 Intensity (in/hr): 3.800
 C Total: 0.921
 Sum Q Segments (cfs): 34.82
 Q Total (cfs): 34.82
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 344.65
 Time of Concentration (min): 5.744

DATA FOR FLOW PATH 1

 Flow Path Name: A6 overland
 FLOW PATH TRAVEL TIME (min): 3.0742
 Flow Type: Overland
 Length (ft): 300
 Top Elevation (ft): 240
 Bottom Elevation (ft): 170
 Contributing Area (acres): 0.37
 Percent of Sub-Area (%): 3.7
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2333
 Effective Slope: 0.1741
 Q for Flow Path (cfs): 1.29
 Avg velocity (ft/s): 1.63
 Passed Scour Check: YES
 Scour velocity (ft/sec): 2.46

DATA FOR FLOW PATH 2

 Flow Path Name: A6
 FLOW PATH TRAVEL TIME (min): 2.6699
 Flow Type: Natural Channel
 Length (ft): 810
 Top Elevation (ft): 170
 Bottom Elevation (ft): 108
 Contributing Area (acres): 9.58
 Percent of Sub-Area (%): 96.3
 Overland Type: Mountain
 Map Slope: 0.0765
 Effective Slope: 0.0765
 Q for Flow Path (cfs): 33.52
 Q Top (cfs): 1.29
 Q Bottom (cfs): 34.82
 Velocity Top (ft/s): 1.69
 Velocity Bottom (ft/s): 5.05
 Avg velocity (ft/s): 3.37
 Wave velocity (ft/s): 5.06
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Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area A7
 Tc: 6.364 Minutes
 DATA FOR SUB AREA 9

SUB AREA TIME OF CONCENTRATION: 6.364 min. = 6 min.

SUB AREA INPUT DATA

 Sub Area Name: Area A7
 Total Area (ac): 14.26
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 3

SUB AREA OUTPUT

 Intensity (in/hr): 3.800
 C Total: 0.921
 Sum Q Segments (cfs): 49.90
 Q Total (cfs): 49.90
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 381.87
 Time of Concentration (min): 6.364

DATA FOR FLOW PATH 1

 Flow Path Name: A7 overland
 FLOW PATH TRAVEL TIME (min): 4.0783
 Flow Type: Overland
 Length (ft): 300
 Top Elevation (ft): 190
 Bottom Elevation (ft): 140
 Contributing Area (acres): 1.19
 Percent of Sub-Area (%): 8.3
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.1667
 Effective Slope: 0.1417
 Q for Flow Path (cfs): 4.16
 Avg Velocity (ft/s): 1.23
 Passed Scour Check: YES
 Scour velocity (ft/sec): 3.27

DATA FOR FLOW PATH 2

 Flow Path Name: A7
 FLOW PATH TRAVEL TIME (min): 2.2862
 Flow Type: Natural Channel
 Length (ft): 700
 Top Elevation (ft): 140
 Bottom Elevation (ft): 103
 Contributing Area (acres): 13.07
 Percent of Sub-Area (%): 91.7
 Overland Type: Mountain
 Map Slope: 0.0529
 Effective Slope: 0.0529
 Q for Flow Path (cfs): 45.74
 Q Top (cfs): 4.16
 Q Bottom (cfs): 49.90
 Velocity Top (ft/s): 2.07
 Velocity Bottom (ft/s): 4.73
 Avg Velocity (ft/s): 3.40
 Wave velocity (ft/s): 5.10

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area A8
 Tc: 6.710 Minutes
 DATA FOR SUB AREA 10

SUB AREA TIME OF CONCENTRATION: 6.710 min. = 7 min.

SUB AREA INPUT DATA

 Sub Area Name: Area A8
 Total Area (ac): 5.99
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 3.454
 C Total: 0.911
 Sum Q Segments (cfs): 18.86
 Q Total (cfs): 18.86
 Sum Percent Area (%): 100.0

Sum of Flow Path Travel Times (sec): 402.62
Time of Concentration (min): 6.710

DATA FOR FLOW PATH 1

Flow Path Name: A8 overland
FLOW PATH TRAVEL TIME (min): 4.5826
Flow Type: Overland
Length (ft): 540
Top Elevation (ft): 320
Bottom Elevation (ft): 100
Contributing Area (acres): 0.34
Percent of Sub-Area (%): 5.7
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4074
Effective Slope: 0.2150
Q for Flow Path (cfs): 1.07
Avg Velocity (ft/s): 1.96
Passed Scour Check: YES
Scour velocity (ft/sec): 2.58

DATA FOR FLOW PATH 2

Flow Path Name: A8
FLOW PATH TRAVEL TIME (min): 2.1278
Flow Type: Natural Channel
Length (ft): 650
Top Elevation (ft): 100
Bottom Elevation (ft): 85
Contributing Area (acres): 5.65
Percent of Sub-Area (%): 94.3
Overland Type: Valley
Map Slope: 0.0231
Effective Slope: 0.0231
Q for Flow Path (cfs): 17.79
Q Top (cfs): 1.07
Q Bottom (cfs): 18.86
Velocity Top (ft/s): 2.31
Velocity Bottom (ft/s): 4.48
Avg Velocity (ft/s): 3.39
Wave velocity (ft/s): 5.09
♀

Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area D1
Tc: 7.787 Minutes
DATA FOR SUB AREA 11

SUB AREA TIME OF CONCENTRATION: 7.787 min. = 8 min.

SUB AREA INPUT DATA

Sub Area Name: Area D1
Total Area (ac): 24.51
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 30
SUB AREA OUTPUT

Intensity (in/hr): 3.191
C Total: 0.871
Sum Q Segments (cfs): 68.12
Q Total (cfs): 68.12
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 467.25
Time of Concentration (min): 7.787

DATA FOR FLOW PATH 1

Flow Path Name: D1 overland
FLOW PATH TRAVEL TIME (min): 3.1441

Flow Type: Overland
 Length (ft): 100
 Top Elevation (ft): 161
 Bottom Elevation (ft): 159
 Contributing Area (acres): 0.11
 Percent of Sub-Area (%): 0.4
 Overland Type: Valley
 Development Type: Residential
 Map Slope: 0.0200
 Effective Slope: 0.0200
 Q for Flow Path (cfs): 0.31
 Avg Velocity (ft/s): 0.53
 Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: D1 street
 FLOW PATH TRAVEL TIME (min): 1.9974
 Flow Type: Street
 Length (ft): 300
 Top Elevation (ft): 159
 Bottom Elevation (ft): 156
 Contributing Area (acres): 0.87
 Percent of Sub-Area (%): 3.5
 Street width (ft): 32
 Curb Height (in): 6
 Map Slope: 0.0100
 Q for Flow Path (cfs): 2.42
 Q Top (cfs): 0.31
 Q Bottom (cfs): 2.72
 Velocity Top (ft/s): 1.22
 Velocity Bottom (ft/s): 2.12
 Avg Velocity (ft/s): 1.67
 Wave velocity (ft/s): 2.50

DATA FOR FLOW PATH 3

Flow Path Name: D1 pipe
 FLOW PATH TRAVEL TIME (min): 2.6460
 Flow Type: Pipe
 Length (ft): 1550
 Top Elevation (ft): 156
 Bottom Elevation (ft): 95
 Contributing Area (acres): 23.53
 Percent of Sub-Area (%): 96.0
 Initial Pipe Diameter (in): 42
 Calculated Pipe Diameter (in): 30
 Used Pipe Diameter (in): 42
 Manning's N: 0.015
 Map Slope: 0.0394
 Q for Flow Path (cfs): 65.40
 Q Top (cfs): 2.72
 Q Bottom (cfs): 68.12
 Avg Velocity (ft/s): 7.35
 Wave velocity (ft/s): 9.76

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area D2
 TC: 6.963 Minutes
 DATA FOR SUB AREA 12

SUB AREA TIME OF CONCENTRATION: 6.963 min. = 7 min.

SUB AREA INPUT DATA

Sub Area Name: Area D2
 Total Area (ac): 8.28
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 30
 SUB AREA OUTPUT

Intensity (in/hr): 3.454
C Total: 0.879
Sum Q Segments (cfs): 25.13
Q Total (cfs): 25.13
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 417.78
Time of Concentration (min): 6.963

DATA FOR FLOW PATH 1

Flow Path Name: D2 overland
FLOW PATH TRAVEL TIME (min): 5.1176
Flow Type: Overland
Length (ft): 520
Top Elevation (ft): 240
Bottom Elevation (ft): 112
Contributing Area (acres): 1.19
Percent of Sub-Area (%): 14.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2462
Effective Slope: 0.1791
Q for Flow Path (cfs): 3.61
Avg velocity (ft/s): 1.69
Passed Scour Check: YES
Scour velocity (ft/sec): 3.53

DATA FOR FLOW PATH 2

Flow Path Name: D2
FLOW PATH TRAVEL TIME (min): 1.8454
Flow Type: Natural Channel
Length (ft): 790
Top Elevation (ft): 112
Bottom Elevation (ft): 85
Contributing Area (acres): 7.09
Percent of Sub-Area (%): 85.6
Overland Type: valley
Map Slope: 0.0342
Effective Slope: 0.0342
Q for Flow Path (cfs): 21.52
Q Top (cfs): 3.61
Q Bottom (cfs): 25.13
Velocity Top (ft/s): 3.62
Velocity Bottom (ft/s): 5.89
Avg velocity (ft/s): 4.76
Wave velocity (ft/s): 7.13

♀
Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area A9
Tc: 6.237 Minutes
DATA FOR SUB AREA 13

SUB AREA TIME OF CONCENTRATION: 6.237 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area A9
Total Area (ac): 33.06
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 1.00
Percent Impervious: 0
SUB AREA OUTPUT

Intensity (in/hr): 3.800
C Total: 0.920
Sum Q Segments (cfs): 115.58
Q Total (cfs): 115.58
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 374.24

Time of Concentration (min): 6.237

DATA FOR FLOW PATH 1

Flow Path Name: A9 overland
 FLOW PATH TRAVEL TIME (min): 3.8612
 Flow Type: Overland
 Length (ft): 455
 Top Elevation (ft): 330
 Bottom Elevation (ft): 120
 Contributing Area (acres): 2.84
 Percent of Sub-Area (%): 8.6
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.4615
 Effective Slope: 0.2195
 Q for Flow Path (cfs): 9.93
 Avg Velocity (ft/s): 1.96
 Passed Scour Check: YES
 Scour velocity (ft/sec): 5.44

DATA FOR FLOW PATH 2

Flow Path Name: A9
 FLOW PATH TRAVEL TIME (min): 2.3762
 Flow Type: Natural Channel
 Length (ft): 1030
 Top Elevation (ft): 120
 Bottom Elevation (ft): 58
 Contributing Area (acres): 30.22
 Percent of Sub-Area (%): 91.4
 Overland Type: Mountain
 Map Slope: 0.0602
 Effective Slope: 0.0602
 Q for Flow Path (cfs): 105.65
 Q Top (cfs): 9.93
 Q Bottom (cfs): 115.58
 Velocity Top (ft/s): 2.95
 Velocity Bottom (ft/s): 6.68
 Avg Velocity (ft/s): 4.82
 Wave velocity (ft/s): 7.22

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area A10
 Tc: 6.755 Minutes
 DATA FOR SUB AREA 14

 SUB AREA TIME OF CONCENTRATION: 6.755 min. = 7 min.

SUB AREA INPUT DATA

Sub Area Name: Area A10
 Total Area (ac): 14.77
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 3.454
 C Total: 0.848
 Sum Q Segments (cfs): 43.27
 Q Total (cfs): 43.27
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 405.32
 Time of Concentration (min): 6.755

DATA FOR FLOW PATH 1

Flow Path Name: A10 overland
 FLOW PATH TRAVEL TIME (min): 4.9993
 Flow Type: Overland

Length (ft): 430
Top Elevation (ft): 166
Bottom Elevation (ft): 80
Contributing Area (acres): 1.9
Percent of Sub-Area (%): 12.9
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2000
Effective Slope: 0.1594
Q for Flow Path (cfs): 5.57
Avg Velocity (ft/s): 1.43
Passed Scour Check: YES
Scour velocity (ft/sec): 3.84

DATA FOR FLOW PATH 2

Flow Path Name: A10
FLOW PATH TRAVEL TIME (min): 1.7561
Flow Type: Natural Channel
Length (ft): 780
Top Elevation (ft): 80
Bottom Elevation (ft): 58
Contributing Area (acres): 12.87
Percent of Sub-Area (%): 87.1
Overland Type: valley
Map Slope: 0.0282
Effective Slope: 0.0282
Q for Flow Path (cfs): 37.70
Q Top (cfs): 5.57
Q Bottom (cfs): 43.27
Velocity Top (ft/s): 3.63
Velocity Bottom (ft/s): 6.24
Avg Velocity (ft/s): 4.94
Wave velocity (ft/s): 7.40

CSUCI-Glenn Exist_100-yr.out

VENTURA COUNTY WATERSHED PROTECTION DISTRICT
 TIME OF CONCENTRATION
 TC Program Version: 2.6.2009.7
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 S U M M A R Y O F C O M P U T A T I O N S

Watershed Name: Existing Condition 100-yr

Name	Zone	Storm	Soil	Area (acres)	TC (min)
Area A	K	100	1.00	111.0 / 111	12.911 / 13
Area A5	K	100	2.00	3.5 / 3	5.178 / 5
Area B	K	100	2.00	6.8 / 7	5.567 / 6
Area C	K	100	1.00	27.9 / 28	6.286 / 6
Area C3	K	100	2.00	4.7 / 5	7.041 / 7
Area C4	K	100	1.00	12.3 / 12	6.630 / 7
Area C5	K	100	1.00	7.7 / 8	5.602 / 6
Area A6	K	100	1.00	10.0 / 10	5.012 / 5
Area A7	K	100	1.00	14.3 / 14	5.321 / 5
Area A8	K	100	1.00	6.0 / 6	6.062 / 6
Area D1	K	100	2.00	24.5 / 25	5.406 / 5
Area D2	K	100	2.00	8.3 / 8	6.082 / 6
Area A9	K	100	1.00	33.1 / 33	5.666 / 6
Area A10	K	100	2.00	14.8 / 15	5.744 / 6

♀

Watershed Name: Existing Condition 100-yr

Sub-Area Name: Area A
 Tc: 12.911 Minutes
 DATA FOR SUB AREA 1

SUB AREA TIME OF CONCENTRATION: 12.911 min. = 13 min.

SUB AREA INPUT DATA

Sub Area Name: Area A
 Total Area (ac): 111.04
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 3.097
 C Total: 0.902
 Sum Q Segments (cfs): 310.33
 Q Total (cfs): 310.33
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 774.65
 Time of Concentration (min): 12.911

DATA FOR FLOW PATH 1

Flow Path Name: A1
 FLOW PATH TRAVEL TIME (min): 9.0269
 Flow Type: Overland
 Length (ft): 1000
 Top Elevation (ft): 790
 Bottom Elevation (ft): 570
 Contributing Area (acres): 4.88
 Percent of Sub-Area (%): 4.4
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2200
 Effective Slope: 0.1685
 Q for Flow Path (cfs): 13.64
 Avg velocity (ft/s): 1.85
 Passed Scour Check: YES
 Scour velocity (ft/sec): 5.42

DATA FOR FLOW PATH 2

Flow Path Name: A2
 FLOW PATH TRAVEL TIME (min): 0.8656
 Flow Type: Natural Channel
 Length (ft): 600
 Top Elevation (ft): 570
 Bottom Elevation (ft): 440
 Contributing Area (acres): 24.55
 Percent of Sub-Area (%): 22.1
 Overland Type: Mountain
 Map Slope: 0.2167
 Effective Slope: 0.1671
 Q for Flow Path (cfs): 68.61
 Q Top (cfs): 13.64
 Q Bottom (cfs): 82.25
 Velocity Top (ft/s): 5.46
 Velocity Bottom (ft/s): 9.94
 Avg Velocity (ft/s): 7.70
 Wave velocity (ft/s): 11.55

DATA FOR FLOW PATH 3

Flow Path Name: A3
 FLOW PATH TRAVEL TIME (min): 0.9996
 Flow Type: Natural Channel
 Length (ft): 1020
 Top Elevation (ft): 440
 Bottom Elevation (ft): 250
 Contributing Area (acres): 49.39
 Percent of Sub-Area (%): 44.5
 Overland Type: Mountain
 Map Slope: 0.1863
 Effective Slope: 0.1525
 Q for Flow Path (cfs): 138.03
 Q Top (cfs): 82.25
 Q Bottom (cfs): 220.28
 Velocity Top (ft/s): 9.50
 Velocity Bottom (ft/s): 13.18
 Avg Velocity (ft/s): 11.34
 Wave velocity (ft/s): 17.01

DATA FOR FLOW PATH 4

Flow Path Name: A4
 FLOW PATH TRAVEL TIME (min): 2.0188
 Flow Type: Natural Channel
 Length (ft): 1590
 Top Elevation (ft): 250
 Bottom Elevation (ft): 155
 Contributing Area (acres): 32.22
 Percent of Sub-Area (%): 29.0
 Overland Type: Mountain
 Map Slope: 0.0597
 Effective Slope: 0.0597
 Q for Flow Path (cfs): 90.05
 Q Top (cfs): 220.28
 Q Bottom (cfs): 310.33
 Velocity Top (ft/s): 8.25
 Velocity Bottom (ft/s): 9.25
 Avg Velocity (ft/s): 8.75
 Wave velocity (ft/s): 13.13

Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area A5
 Tc: 5.178 Minutes
 DATA FOR SUB AREA 2

SUB AREA TIME OF CONCENTRATION: 5.178 min. = 5 min.

SUB AREA INPUT DATA

Sub Area Name: Area A5
 Total Area (ac): 3.49

Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 5.100
 C Total: 0.891
 Sum Q Segments (cfs): 15.86
 Q Total (cfs): 15.86
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 310.69
 Time of Concentration (min): 5.178

DATA FOR FLOW PATH 1

 Flow Path Name: A5 overland
 FLOW PATH TRAVEL TIME (min): 4.1156
 Flow Type: Overland
 Length (ft): 530
 Top Elevation (ft): 340
 Bottom Elevation (ft): 186
 Contributing Area (acres): 0.06
 Percent of Sub-Area (%): 1.7
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2906
 Effective Slope: 0.1935
 Q for Flow Path (cfs): 0.27
 Avg Velocity (ft/s): 2.15
 Passed Scour Check: YES
 Scour velocity (ft/sec): 1.54

DATA FOR FLOW PATH 2

 Flow Path Name: A5
 FLOW PATH TRAVEL TIME (min): 1.0626
 Flow Type: Channel
 Length (ft): 470
 Top Elevation (ft): 186
 Bottom Elevation (ft): 177
 Contributing Area (acres): 3.43
 Percent of Sub-Area (%): 98.3
 Bottom width (ft): 5
 Side Slope (H:V): 1
 Manning's N: 0.013
 Map Slope: 0.0191
 Q for Flow Path (cfs): 15.59
 Q Top (cfs): 0.27
 Q Bottom (cfs): 15.86
 Velocity Top (ft/s): 1.61
 Velocity Bottom (ft/s): 7.71
 Avg Velocity (ft/s): 4.66
 Wave velocity (ft/s): 7.37

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area B
 Tc: 5.567 Minutes
 DATA FOR SUB AREA 3

SUB AREA TIME OF CONCENTRATION: 5.567 min. = 6 min.

SUB AREA INPUT DATA

 Sub Area Name: Area B
 Total Area (ac): 6.75
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Residential
 Soil Type: 2.00
 Percent Impervious: 30

SUB AREA OUTPUT

 Intensity (in/hr): 4.590
 C Total: 0.902
 Sum Q Segments (cfs): 27.94
 Q Total (cfs): 27.94
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 334.02
 Time of Concentration (min): 5.567

DATA FOR FLOW PATH 1

 Flow Path Name: B overland
 FLOW PATH TRAVEL TIME (min): 2.0317
 Flow Type: Overland
 Length (ft): 100
 Top Elevation (ft): 159
 Bottom Elevation (ft): 157
 Contributing Area (acres): 0.14
 Percent of Sub-Area (%): 2.1
 Overland Type: valley
 Development Type: Residential
 Map Slope: 0.0200
 Effective Slope: 0.0200
 Q for Flow Path (cfs): 0.58
 Avg Velocity (ft/s): 0.82
 Passed Scour Check: N/A

DATA FOR FLOW PATH 2

 Flow Path Name: B street
 FLOW PATH TRAVEL TIME (min): 1.7996
 Flow Type: Street
 Length (ft): 300
 Top Elevation (ft): 158
 Bottom Elevation (ft): 155
 Contributing Area (acres): 0.73
 Percent of Sub-Area (%): 10.8
 Street width (ft): 32
 Curb Height (in): 6
 Map Slope: 0.0100
 Q for Flow Path (cfs): 3.02
 Q Top (cfs): 0.58
 Q Bottom (cfs): 3.60
 Velocity Top (ft/s): 1.43
 Velocity Bottom (ft/s): 2.27
 Avg Velocity (ft/s): 1.85
 Wave velocity (ft/s): 2.78

DATA FOR FLOW PATH 3

 Flow Path Name: B pipe
 FLOW PATH TRAVEL TIME (min): 1.7358
 Flow Type: Pipe
 Length (ft): 730
 Top Elevation (ft): 155
 Bottom Elevation (ft): 127
 Contributing Area (acres): 5.88
 Percent of Sub-Area (%): 87.1
 Initial Pipe Diameter (in): 36
 Calculated Pipe Diameter (in): 24
 Used Pipe Diameter (in): 36
 Manning's N: 0.015
 Map Slope: 0.0384
 Q for Flow Path (cfs): 24.34
 Q Top (cfs): 3.60
 Q Bottom (cfs): 27.94
 Avg Velocity (ft/s): 5.16
 Wave velocity (ft/s): 7.01

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area C
 TC: 6.286 Minutes
 DATA FOR SUB AREA 4

SUB AREA TIME OF CONCENTRATION: 6.286 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area C
 Total Area (ac): 27.91
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 4.590
 C Total: 0.934
 Sum Q Segments (cfs): 119.63
 Q Total (cfs): 119.63
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 377.16
 Time of Concentration (min): 6.286

DATA FOR FLOW PATH 1

Flow Path Name: C1 overland
 FLOW PATH TRAVEL TIME (min): 3.4078
 Flow Type: Overland
 Length (ft): 450
 Top Elevation (ft): 570
 Bottom Elevation (ft): 400
 Contributing Area (acres): 1.68
 Percent of Sub-Area (%): 6.0
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.3778
 Effective Slope: 0.2114
 Q for Flow Path (cfs): 7.20
 Avg velocity (ft/s): 2.20
 Passed Scour Check: YES
 Scour velocity (ft/sec): 4.82

DATA FOR FLOW PATH 2

Flow Path Name: C1
 FLOW PATH TRAVEL TIME (min): 2.4010
 Flow Type: Natural Channel
 Length (ft): 1460
 Top Elevation (ft): 400
 Bottom Elevation (ft): 169
 Contributing Area (acres): 21.07
 Percent of Sub-Area (%): 75.5
 Overland Type: Mountain
 Map Slope: 0.1582
 Effective Slope: 0.1367
 Q for Flow Path (cfs): 90.31
 Q Top (cfs): 7.20
 Q Bottom (cfs): 97.51
 Velocity Top (ft/s): 4.00
 Velocity Bottom (ft/s): 9.52
 Avg velocity (ft/s): 6.76
 Wave velocity (ft/s): 10.13

DATA FOR FLOW PATH 3

Flow Path Name: C2
 FLOW PATH TRAVEL TIME (min): 0.4772
 Flow Type: Natural Channel
 Length (ft): 420
 Top Elevation (ft): 169
 Bottom Elevation (ft): 152
 Contributing Area (acres): 5.16
 Percent of Sub-Area (%): 18.5
 Overland Type: Valley
 Map Slope: 0.0405
 Effective Slope: 0.0405
 Q for Flow Path (cfs): 22.12
 Q Top (cfs): 97.51

Q Bottom (cfs): 119.63
 Velocity Top (ft/s): 9.48
 Velocity Bottom (ft/s): 10.08
 Avg Velocity (ft/s): 9.78
 Wave Velocity (ft/s): 14.67

♀

Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area C3
 Tc: 7.041 Minutes
 DATA FOR SUB AREA 5

 SUB AREA TIME OF CONCENTRATION: 7.041 min. = 7 min.

 SUB AREA INPUT DATA

 Sub Area Name: Area C3
 Total Area (ac): 4.73
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 4.226
 C Total: 0.873
 Sum Q Segments (cfs): 17.45
 Q Total (cfs): 17.45
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 422.49
 Time of Concentration (min): 7.041

 DATA FOR FLOW PATH 1

 Flow Path Name: C3 overland
 FLOW PATH TRAVEL TIME (min): 5.6990
 Flow Type: Overland
 Length (ft): 560
 Top Elevation (ft): 280
 Bottom Elevation (ft): 177
 Contributing Area (acres): 0.18
 Percent of Sub-Area (%): 3.8
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.1839
 Effective Slope: 0.1512
 Q for Flow Path (cfs): 0.66
 Avg Velocity (ft/s): 1.64
 Passed Scour Check: YES
 Scour Velocity (ft/sec): 1.85

 DATA FOR FLOW PATH 2

 Flow Path Name: C3
 FLOW PATH TRAVEL TIME (min): 1.3425
 Flow Type: Channel
 Length (ft): 800
 Top Elevation (ft): 177
 Bottom Elevation (ft): 149
 Contributing Area (acres): 4.55
 Percent of Sub-Area (%): 96.2
 Bottom width (ft): 5
 Side Slope (H:V): 1
 Manning's N: 0.013
 Map Slope: 0.0350
 Q for Flow Path (cfs): 16.78
 Q Top (cfs): 0.66
 Q Bottom (cfs): 17.45
 Velocity Top (ft/s): 2.81
 Velocity Bottom (ft/s): 9.68
 Avg Velocity (ft/s): 6.24
 Wave Velocity (ft/s): 9.93

♀

Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area C4
Tc: 6.630 Minutes
DATA FOR SUB AREA 6

SUB AREA TIME OF CONCENTRATION: 6.630 min. = 7 min.

SUB AREA INPUT DATA

Sub Area Name: Area C4
Total Area (ac): 12.32
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 1.00
Percent Impervious: 0
SUB AREA OUTPUT

Intensity (in/hr): 4.226
C Total: 0.928
Sum Q Segments (cfs): 48.33
Q Total (cfs): 48.33
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 397.80
Time of Concentration (min): 6.630

DATA FOR FLOW PATH 1

Flow Path Name: C4 overland
FLOW PATH TRAVEL TIME (min): 4.3326
Flow Type: Overland
Length (ft): 230
Top Elevation (ft): 210
Bottom Elevation (ft): 200
Contributing Area (acres): 1.11
Percent of Sub-Area (%): 9.0
Overland Type: Valley
Development Type: Undeveloped
Map Slope: 0.0435
Effective Slope: 0.0435
Q for Flow Path (cfs): 4.35
Avg velocity (ft/s): 0.88
Passed Scour Check: YES
Scour velocity (ft/sec): 4.19

DATA FOR FLOW PATH 2

Flow Path Name: C4
FLOW PATH TRAVEL TIME (min): 2.2974
Flow Type: Natural Channel
Length (ft): 800
Top Elevation (ft): 200
Bottom Elevation (ft): 145
Contributing Area (acres): 11.21
Percent of Sub-Area (%): 91.0
Overland Type: Mountain
Map Slope: 0.0688
Effective Slope: 0.0688
Q for Flow Path (cfs): 43.98
Q Top (cfs): 4.35
Q Bottom (cfs): 48.33
Velocity Top (ft/s): 2.40
Velocity Bottom (ft/s): 5.34
Avg velocity (ft/s): 3.87
Wave velocity (ft/s): 5.80

Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area C5
Tc: 5.602 Minutes

DATA FOR SUB AREA 7

SUB AREA TIME OF CONCENTRATION: 5.602 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area C5
 Total Area (ac): 7.66
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 4.590
 C Total: 0.934
 Sum Q Segments (cfs): 32.83
 Q Total (cfs): 32.83
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 336.12
 Time of Concentration (min): 5.602

DATA FOR FLOW PATH 1

Flow Path Name: C5 overland
 FLOW PATH TRAVEL TIME (min): 3.7864
 Flow Type: Overland
 Length (ft): 500
 Top Elevation (ft): 340
 Bottom Elevation (ft): 160
 Contributing Area (acres): 0.77
 Percent of Sub-Area (%): 10.1
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.3600
 Effective Slope: 0.2087
 Q for Flow Path (cfs): 3.30
 Avg Velocity (ft/s): 2.20
 Passed Scour Check: YES
 Scour velocity (ft/sec): 3.70

DATA FOR FLOW PATH 2

Flow Path Name: C5
 FLOW PATH TRAVEL TIME (min): 1.8155
 Flow Type: Natural Channel
 Length (ft): 840
 Top Elevation (ft): 160
 Bottom Elevation (ft): 129
 Contributing Area (acres): 6.89
 Percent of Sub-Area (%): 89.9
 Overland Type: valley
 Map Slope: 0.0369
 Effective Slope: 0.0369
 Q for Flow Path (cfs): 29.53
 Q Top (cfs): 3.30
 Q Bottom (cfs): 32.83
 Velocity Top (ft/s): 3.68
 Velocity Bottom (ft/s): 6.60
 Avg Velocity (ft/s): 5.14
 Wave velocity (ft/s): 7.71

Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area A6
 Tc: 5.012 Minutes
 DATA FOR SUB AREA 8

SUB AREA TIME OF CONCENTRATION: 5.012 min. = 5 min.

SUB AREA INPUT DATA

Sub Area Name: Area A6

Total Area (ac): 9.95
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 3
 SUB AREA OUTPUT

 Intensity (in/hr): 5.100
 C Total: 0.941
 Sum Q Segments (cfs): 47.76
 Q Total (cfs): 47.76
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 300.72
 Time of Concentration (min): 5.012

DATA FOR FLOW PATH 1

 Flow Path Name: A6 overland
 FLOW PATH TRAVEL TIME (min): 2.6089
 Flow Type: Overland
 Length (ft): 300
 Top Elevation (ft): 240
 Bottom Elevation (ft): 170
 Contributing Area (acres): 0.37
 Percent of Sub-Area (%): 3.7
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2333
 Effective Slope: 0.1741
 Q for Flow Path (cfs): 1.78
 Avg velocity (ft/s): 1.92
 Passed Scour Check: YES
 Scour velocity (ft/sec): 2.73

DATA FOR FLOW PATH 2

 Flow Path Name: A6
 FLOW PATH TRAVEL TIME (min): 2.4032
 Flow Type: Natural Channel
 Length (ft): 810
 Top Elevation (ft): 170
 Bottom Elevation (ft): 108
 Contributing Area (acres): 9.58
 Percent of Sub-Area (%): 96.3
 Overland Type: Mountain
 Map Slope: 0.0765
 Effective Slope: 0.0765
 Q for Flow Path (cfs): 45.99
 Q Top (cfs): 1.78
 Q Bottom (cfs): 47.76
 Velocity Top (ft/s): 1.88
 Velocity Bottom (ft/s): 5.61
 Avg velocity (ft/s): 3.75
 Wave velocity (ft/s): 5.62
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Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area A7
 Tc: 5.321 Minutes
 DATA FOR SUB AREA 9

SUB AREA TIME OF CONCENTRATION: 5.321 min. = 5 min.

SUB AREA INPUT DATA

 Sub Area Name: Area A7
 Total Area (ac): 14.26
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 3

SUB AREA OUTPUT

 Intensity (in/hr): 5.100
 C Total: 0.941
 Sum Q Segments (cfs): 68.45
 Q Total (cfs): 68.45
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 319.24
 Time of Concentration (min): 5.321

DATA FOR FLOW PATH 1

 Flow Path Name: A7 overland
 FLOW PATH TRAVEL TIME (min): 3.2629
 Flow Type: Overland
 Length (ft): 300
 Top Elevation (ft): 190
 Bottom Elevation (ft): 140
 Contributing Area (acres): 1.19
 Percent of Sub-Area (%): 8.3
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.1667
 Effective Slope: 0.1417
 Q for Flow Path (cfs): 5.71
 Avg Velocity (ft/s): 1.53
 Passed Scour Check: YES
 Scour velocity (ft/sec): 3.63

DATA FOR FLOW PATH 2

 Flow Path Name: A7
 FLOW PATH TRAVEL TIME (min): 2.0577
 Flow Type: Natural Channel
 Length (ft): 700
 Top Elevation (ft): 140
 Bottom Elevation (ft): 103
 Contributing Area (acres): 13.07
 Percent of Sub-Area (%): 91.7
 Overland Type: Mountain
 Map Slope: 0.0529
 Effective Slope: 0.0529
 Q for Flow Path (cfs): 62.74
 Q Top (cfs): 5.71
 Q Bottom (cfs): 68.45
 Velocity Top (ft/s): 2.30
 Velocity Bottom (ft/s): 5.26
 Avg Velocity (ft/s): 3.78
 Wave velocity (ft/s): 5.67

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area A8
 Tc: 6.062 Minutes
 DATA FOR SUB AREA 10

SUB AREA TIME OF CONCENTRATION: 6.062 min. = 6 min.

SUB AREA INPUT DATA

 Sub Area Name: Area A8
 Total Area (ac): 5.99
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 4.590
 C Total: 0.934
 Sum Q Segments (cfs): 25.68
 Q Total (cfs): 25.68
 Sum Percent Area (%): 100.0

Sum of Flow Path Travel Times (sec): 363.70
 Time of Concentration (min): 6.062

DATA FOR FLOW PATH 1

Flow Path Name: A8 overland
 FLOW PATH TRAVEL TIME (min): 4.0893
 Flow Type: Overland
 Length (ft): 540
 Top Elevation (ft): 320
 Bottom Elevation (ft): 100
 Contributing Area (acres): 0.34
 Percent of Sub-Area (%): 5.7
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.4074
 Effective Slope: 0.2150
 Q for Flow Path (cfs): 1.46
 Avg Velocity (ft/s): 2.20
 Passed Scour Check: YES
 Scour velocity (ft/sec): 2.86

DATA FOR FLOW PATH 2

Flow Path Name: A8
 FLOW PATH TRAVEL TIME (min): 1.9723
 Flow Type: Natural Channel
 Length (ft): 650
 Top Elevation (ft): 100
 Bottom Elevation (ft): 85
 Contributing Area (acres): 5.65
 Percent of Sub-Area (%): 94.3
 Overland Type: Valley
 Map Slope: 0.0231
 Effective Slope: 0.0231
 Q for Flow Path (cfs): 24.22
 Q Top (cfs): 1.46
 Q Bottom (cfs): 25.68
 Velocity Top (ft/s): 2.45
 Velocity Bottom (ft/s): 4.87
 Avg Velocity (ft/s): 3.66
 Wave velocity (ft/s): 5.49

Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area D1
 Tc: 5.406 Minutes
 DATA FOR SUB AREA 11

SUB AREA TIME OF CONCENTRATION: 5.406 min. = 5 min.

SUB AREA INPUT DATA

Sub Area Name: Area D1
 Total Area (ac): 24.51
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 30
 SUB AREA OUTPUT

Intensity (in/hr): 5.100
 C Total: 0.909
 Sum Q Segments (cfs): 113.61
 Q Total (cfs): 113.61
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 324.36
 Time of Concentration (min): 5.406

DATA FOR FLOW PATH 1

Flow Path Name: D1 overland
 FLOW PATH TRAVEL TIME (min): 2.0317

Flow Type: Overland
 Length (ft): 100
 Top Elevation (ft): 161
 Bottom Elevation (ft): 159
 Contributing Area (acres): 0.11
 Percent of Sub-Area (%): 0.4
 Overland Type: valley
 Development Type: Residential
 Map Slope: 0.0200
 Effective Slope: 0.0200
 Q for Flow Path (cfs): 0.51
 Avg Velocity (ft/s): 0.82
 Passed Scour Check: N/A

 DATA FOR FLOW PATH 2

Flow Path Name: D1 street
 FLOW PATH TRAVEL TIME (min): 1.7563
 Flow Type: Street
 Length (ft): 300
 Top Elevation (ft): 159
 Bottom Elevation (ft): 156
 Contributing Area (acres): 0.87
 Percent of Sub-Area (%): 3.5
 Street width (ft): 32
 Curb Height (in): 6
 Map Slope: 0.0100
 Q for Flow Path (cfs): 4.03
 Q Top (cfs): 0.51
 Q Bottom (cfs): 4.54
 Velocity Top (ft/s): 1.39
 Velocity Bottom (ft/s): 2.41
 Avg Velocity (ft/s): 1.90
 Wave velocity (ft/s): 2.85

 DATA FOR FLOW PATH 3

Flow Path Name: D1 pipe
 FLOW PATH TRAVEL TIME (min): 1.6180
 Flow Type: Pipe
 Length (ft): 1550
 Top Elevation (ft): 156
 Bottom Elevation (ft): 95
 Contributing Area (acres): 23.53
 Percent of Sub-Area (%): 96.0
 Initial Pipe Diameter (in): 42
 Calculated Pipe Diameter (in): 36
 Used Pipe Diameter (in): 42
 Manning's N: 0.015
 Map Slope: 0.0394
 Q for Flow Path (cfs): 109.07
 Q Top (cfs): 4.54
 Q Bottom (cfs): 113.61
 Avg Velocity (ft/s): 12.03
 Wave velocity (ft/s): 15.97

♀

Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area D2
 Tc: 6.082 Minutes
 DATA FOR SUB AREA 12

SUB AREA TIME OF CONCENTRATION: 6.082 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area D2
 Total Area (ac): 8.28
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 30
 SUB AREA OUTPUT

Intensity (in/hr): 4.590
C Total: 0.902
Sum Q Segments (cfs): 34.27
Q Total (cfs): 34.27
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 364.89
Time of Concentration (min): 6.082

DATA FOR FLOW PATH 1

Flow Path Name: D2 overland
FLOW PATH TRAVEL TIME (min): 4.3791
Flow Type: Overland
Length (ft): 520
Top Elevation (ft): 240
Bottom Elevation (ft): 112
Contributing Area (acres): 1.19
Percent of Sub-Area (%): 14.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2462
Effective Slope: 0.1791
Q for Flow Path (cfs): 4.93
Avg velocity (ft/s): 1.98
Passed Scour Check: YES
Scour velocity (ft/sec): 3.91

DATA FOR FLOW PATH 2

Flow Path Name: D2
FLOW PATH TRAVEL TIME (min): 1.7024
Flow Type: Natural Channel
Length (ft): 790
Top Elevation (ft): 112
Bottom Elevation (ft): 85
Contributing Area (acres): 7.09
Percent of Sub-Area (%): 85.6
Overland Type: valley
Map Slope: 0.0342
Effective Slope: 0.0342
Q for Flow Path (cfs): 29.34
Q Top (cfs): 4.93
Q Bottom (cfs): 34.27
Velocity Top (ft/s): 3.89
Velocity Bottom (ft/s): 6.43
Avg velocity (ft/s): 5.16
Wave velocity (ft/s): 7.73

♀
Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area A9
Tc: 5.666 Minutes
DATA FOR SUB AREA 13

SUB AREA TIME OF CONCENTRATION: 5.666 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area A9
Total Area (ac): 33.06
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 1.00
Percent Impervious: 0
SUB AREA OUTPUT

Intensity (in/hr): 4.590
C Total: 0.934
Sum Q Segments (cfs): 141.71
Q Total (cfs): 141.71
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 339.95

Time of Concentration (min): 5.666

DATA FOR FLOW PATH 1

Flow Path Name: A9 overland
 FLOW PATH TRAVEL TIME (min): 3.4456
 Flow Type: Overland
 Length (ft): 455
 Top Elevation (ft): 330
 Bottom Elevation (ft): 120
 Contributing Area (acres): 2.84
 Percent of Sub-Area (%): 8.6
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.4615
 Effective Slope: 0.2195
 Q for Flow Path (cfs): 12.17
 Avg Velocity (ft/s): 2.20
 Passed Scour Check: YES
 Scour velocity (ft/sec): 5.86

DATA FOR FLOW PATH 2

Flow Path Name: A9
 FLOW PATH TRAVEL TIME (min): 2.2202
 Flow Type: Natural Channel
 Length (ft): 1030
 Top Elevation (ft): 120
 Bottom Elevation (ft): 58
 Contributing Area (acres): 30.22
 Percent of Sub-Area (%): 91.4
 Overland Type: Mountain
 Map Slope: 0.0602
 Effective Slope: 0.0602
 Q for Flow Path (cfs): 129.53
 Q Top (cfs): 12.17
 Q Bottom (cfs): 141.71
 Velocity Top (ft/s): 3.16
 Velocity Bottom (ft/s): 7.15
 Avg Velocity (ft/s): 5.15
 Wave velocity (ft/s): 7.73

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area A10
 Tc: 5.744 Minutes
 DATA FOR SUB AREA 14

SUB AREA TIME OF CONCENTRATION: 5.744 min. = 6 min.
-----SUB AREA INPUT DATA

Sub Area Name: Area A10
 Total Area (ac): 14.77
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 4.590
 C Total: 0.881
 Sum Q Segments (cfs): 59.73
 Q Total (cfs): 59.73
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 344.61
 Time of Concentration (min): 5.744

DATA FOR FLOW PATH 1

Flow Path Name: A10 overland
 FLOW PATH TRAVEL TIME (min): 4.1347
 Flow Type: Overland

Length (ft): 430
Top Elevation (ft): 166
Bottom Elevation (ft): 80
Contributing Area (acres): 1.9
Percent of Sub-Area (%): 12.9
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2000
Effective Slope: 0.1594
Q for Flow Path (cfs): 7.68
Avg Velocity (ft/s): 1.73
Passed Scour Check: YES
Scour velocity (ft/sec): 4.28

DATA FOR FLOW PATH 2

Flow Path Name: A10
FLOW PATH TRAVEL TIME (min): 1.6089
Flow Type: Natural Channel
Length (ft): 780
Top Elevation (ft): 80
Bottom Elevation (ft): 58
Contributing Area (acres): 12.87
Percent of Sub-Area (%): 87.1
Overland Type: valley
Map Slope: 0.0282
Effective Slope: 0.0282
Q for Flow Path (cfs): 52.04
Q Top (cfs): 7.68
Q Bottom (cfs): 59.73
Velocity Top (ft/s): 3.93
Velocity Bottom (ft/s): 6.84
Avg Velocity (ft/s): 5.39
Wave velocity (ft/s): 8.08

Attachment B-3
Existing Condition – VCRat Model Files

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Modified Rational Model Results Report

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

Project Description

VCRat version: 2.6.2009.7
VCRain version: 200703

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

Page: 2

Model Results																
SUBAREA DATA AND RESULTS							ACCUMULATED DATA				ROUTING AFTER ACCUMULATION					
VEL	NODE	SOIL	RAIN	TC	%	AREA	FLOW	AREA	FLOW	TIME	CHANNEL	LENGTH	SLOPE	SIZE	H:V	N VALUES
(FT/S)	DEPTH	TYPE	ZONE	(MIN)	IMP	(AC)	(CFS)	(AC)	(CFS)	(MIN)	TYPE	(FT)	(FT/FT)	(FT)	(Z)	CHNL SIDES
	ID															
	100A :	Start						0	0							
	100A	---	---	--	--	---	---			----	-----	----	-----	---	----	-----
	101A :	Start - Area A														
	101A	010	K10	16	0	114	191	114	191	1154	-----	----	-----	---	----	-----
	102A	---	---	--	--	---	---	114	191	1154	PIPE	202	0.03860	3.50	----	-----
	103A	---	---	--	--	---	---	114	191	1154	PIPE	373	0.00800	4.75	----	-----
	104A	---	---	--	--	---	---	114	191	1156	PIPE	224	0.05600	3.25	----	-----
	105A	---	---	--	--	---	---	114	191	1156	PIPE	131	0.00400	5.25	----	-----
	106B :	Area B														

								Channel Islands_10yr_exist.out									
--	106B	020	K10	10	30	7	15	7	15	1154	-----	----	-----	---	----	-----	-----
--	107B	---	---	--	--	---	---	7	15	1154	PIPE	194	0.00400	2.00	----	-----	-----
--	108AB	*****															
	*	Peak in A:						190.10 cfs @ 1157 min	Q in B:			14.58 cfs	Combined Q:		204.69 cfs	*	
	*	Peak in B:						14.83 cfs @ 1155 min	Q in A:			184.55 cfs	Combined Q:		199.38 cfs	*	
	*	Combined Peak:						204.69 cfs @ 1157 min	Q in A:			190.10 cfs	Q in B:		14.58 cfs	*	

--	108AB	---	---	--	--	7	15	121	205	1157	-----	----	-----	---	----	-----	-----
--	109C :	Area C1 C2															
--	109C	010	K10	7	0	28	78	28	78	1153	-----	----	-----	---	----	-----	-----
--	110C	---	---	--	--	---	---	28	78	1153	MOUNTAIN	62	0.06666	---	----	-----	-----
--	111D :	Area C3															
--	111D	020	K10	9	0	5	11	5	11	1154	-----	----	-----	---	----	-----	-----
--	112CD	---	---	--	--	5	11	33	89	1154	-----	----	-----	---	----	-----	-----
--	113C	---	---	--	--	---	---	33	89	1154	MOUNTAIN	60	0.11660	---	----	-----	-----
--	114B :	Area C4															
--	114B	010	K10	11	0	12	25	12	25	1154	-----	----	-----	---	----	-----	-----
--	115BC	*****															
	*	Peak in B:						25.15 cfs @ 1154 min	Q in C:			88.77 cfs	Combined Q:		113.92 cfs	*	
	*	Peak in C:						88.77 cfs @ 1154 min	Q in B:			25.15 cfs	Combined Q:		113.92 cfs	*	
	*	Combined Peak:						113.92 cfs @ 1154 min	Q in B:			25.15 cfs	Q in C:		88.77 cfs	*	

--	115BC	---	---	--	--	33	89	45	114	1154	-----	----	-----	---	----	-----	-----
--	116B	---	---	--	--	---	---	45	114	1154	MOUNTAIN	660	0.02727	---	----	-----	-----
--	117B :	Area C5															
--	117B	010	K10	6	0	8	25	53	117	1157	-----	----	-----	---	----	-----	-----
--	118AB:	Confluence															
--	118AB	*****															
	*	Peak in A:						204.69 cfs @ 1157 min	Q in B:			116.85 cfs	Combined Q:		321.54 cfs	*	
	*	Peak in B:						116.85 cfs @ 1157 min	Q in A:			204.69 cfs	Combined Q:		321.54 cfs	*	
	*	Combined Peak:						321.54 cfs @ 1157 min	Q in A:			204.69 cfs	Q in B:		116.85 cfs	*	

--	118AB	---	---	--	--	53	117	174	322	1157	-----	----	-----	---	----	-----	-----
--	119A	---	---	--	--	---	---	174	322	1157	MOUNTAIN	600	0.02666	---	----	-----	-----
--	120A :	Area A6															
--	120A	010	K10	6	3	10	31	184	320	1159	-----	----	-----	---	----	-----	-----
--	121A	---	---	--	--	---	---	184	320	1159	MOUNTAIN	75	0.06660	---	----	-----	-----
--	122B :	Area A7															
--	122B	010	K10	7	0	14	39	14	39	1153	-----	----	-----	---	----	-----	-----

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Model Results																	
SUBAREA DATA AND RESULTS							ACCUMULATED DATA			ROUTING AFTER ACCUMULATION							
VEL	NODE	SOIL	RAIN	TC	%	AREA	FLOW	AREA	FLOW	TIME	CHANNEL	LENGTH	SLOPE	SIZE	H:V	N VALUES	
(FT/S)	ID	TYPE	ZONE	(MIN)	IMP	(AC)	(CFS)	(AC)	(CFS)	(MIN)	TYPE	(FT)	(FT/FT)	(FT)	(Z)	CHNL	SIDES
----- ----- -----																	
123AB: Confluence																	

* Peak in A: 320.12 cfs @ 1159 min Q in B: 14.57 cfs Combined Q: 334.70 cfs *																	
* Peak in B: 39.12 cfs @ 1153 min Q in A: 180.76 cfs Combined Q: 219.88 cfs *																	
* Combined Peak: 341.00 cfs @ 1158 min Q in A: 316.16 cfs Q in B: 24.84 cfs *																	

123AB	---	---	--	--		14	39	198	341	1158	-----	----	-----	---	----	-----	-----
124A	---	---	--	--		---	---	198	341	1158	MOUNTAIN	760	0.02368	---	----	-----	-----
125A : Area A8	125A	010	K10	7	0	6	17	204	330	1161	-----	----	-----	---	----	-----	-----
126A	---	---	--	--		---	---	204	330	1161	PIPE	560	0.03570	4.25	----	-----	-----
127B : Area D1	127B	020	K10	10	30	24	51	24	51	1154	-----	----	-----	---	----	-----	-----
128B	---	---	--	--		---	---	24	51	1154	PIPE	1550	0.02000	2.50	----	-----	-----
129B	---	---	--	--		---	---	24	49	1158	PIPE	730	0.02000	2.50	----	-----	-----
130AB *****																	
* Peak in A: 329.58 cfs @ 1162 min Q in B: 46.77 cfs Combined Q: 376.35 cfs *																	
* Peak in B: 48.74 cfs @ 1160 min Q in A: 312.52 cfs Combined Q: 361.27 cfs *																	
* Combined Peak: 376.35 cfs @ 1162 min Q in A: 329.58 cfs Q in B: 46.77 cfs *																	

130AB	---	---	--	--		24	49	228	376	1162	-----	----	-----	---	----	-----	-----
131A : Area D2	131A	020	K10	7	3	8	21	236	379	1162	-----	----	-----	---	----	-----	-----
132A : Area A9	132A	010	K10	7	0	33	92	269	395	1162	-----	----	-----	---	----	-----	-----
133A : Area A10	133A	020	K10	7	0	15	39	284	409	1158	-----	----	-----	---	----	-----	-----

TYPE	ERR NO	PROCEDURE	LOCATION	MESSAGE
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NO ISSUES OR WARNINGS DETECTED

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

Page: 4

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 101A

DESCRIPTION: Start - Area A
TOTAL AREA TO HYDROGRAPH: 114 acres
HYDROGRAPH PEAK: 191 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 11.14 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	10.40	1050	15.32	1100	19.56	1110	28.28	1120	37.36
1130	40.53	1131	41.90	1132	43.26	1133	44.63	1134	46.00
1135	47.37	1136	49.59	1137	51.73	1138	53.87	1139	56.00
1140	58.14	1141	61.39	1142	64.64	1143	67.89	1144	71.14
1145	74.39	1146	78.66	1147	81.70	1148	88.70	1149	97.89
1150	109.26	1151	132.63	1152	168.33	1153	189.36	1154	191.08
1155	190.65	1156	189.79	1157	187.82	1158	185.85	1159	183.87
1160	181.90	1161	177.99	1162	173.05	1163	168.12	1164	159.37
1165	148.51	1166	135.55	1167	110.31	1168	70.97	1169	47.24
1170	42.75	1171	39.46	1172	36.59	1173	33.73	1174	30.87
1175	28.00	1176	25.14	1177	24.20	1178	23.26	1179	22.32
1180	21.38	1181	20.22	1182	19.07	1183	17.91	1184	16.76
1185	15.60	1186	14.45	1187	14.24	1188	14.02	1189	13.81
1190	13.59	1191	13.27	1192	12.95	1193	12.63	1194	12.31
1195	11.99	1196	11.67	1197	11.56	1198	11.46	1199	11.35
1200	11.24	1201	11.14	1202	11.03	1203	10.92	1204	10.81
1205	10.71	1206	10.60	1207	10.60	1208	10.60	1209	10.60
1210	10.60	1211	9.92	1212	9.23	1213	8.55	1214	7.87
1215	7.18	1216	6.50	1217	5.81	1218	5.13	1219	4.45
1220	3.76	1221	3.08	1222	2.40	1223	1.71	1224	1.03
1225	0.34	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00

Channel Islands_10yr_exist.out
 1350 0.00 1360 0.00 1370 0.00 1380 0.00 1390 0.00
 1400 0.00 1420 0.00 1440 0.00 1460 0.00 1500 0.00

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Ventura County Watershed Protection District
 Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

Page: 5

Hydrograph Printouts

 HYDROGRAPH PRINTOUT AT: 106B

DESCRIPTION: Area B
 TOTAL AREA TO HYDROGRAPH: 7 acres
 HYDROGRAPH PEAK: 15 cfs
 TIME OF PEAK: 1154 minutes
 HYDROGRAPH VOLUME: 1.15 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.12	200	0.13	300	0.17	400	0.20
500	0.26	600	0.29	700	0.37	800	0.45	900	0.56
1000	0.78	1050	1.03	1100	1.28	1110	2.10	1120	2.46
1130	2.54	1131	2.66	1132	2.79	1133	2.91	1134	3.03
1135	3.15	1136	3.36	1137	3.57	1138	3.78	1139	3.98
1140	4.19	1141	4.39	1142	4.58	1143	4.77	1144	4.96
1145	5.14	1146	5.34	1147	5.54	1148	6.10	1149	6.86
1150	7.81	1151	9.82	1152	13.03	1153	14.89	1154	14.95
1155	14.80	1156	14.52	1157	14.24	1158	13.60	1159	12.76
1160	11.72	1161	9.35	1162	5.78	1163	3.50	1164	3.07
1165	2.85	1166	2.66	1167	2.48	1168	2.30	1169	2.12
1170	1.94	1171	1.85	1172	1.76	1173	1.67	1174	1.58
1175	1.50	1176	1.41	1177	1.32	1178	1.23	1179	1.14
1180	1.05	1181	1.03	1182	1.01	1183	0.99	1184	0.97
1185	0.95	1186	0.93	1187	0.91	1188	0.89	1189	0.87
1190	0.85	1191	0.84	1192	0.83	1193	0.82	1194	0.81
1195	0.80	1196	0.80	1197	0.79	1198	0.79	1199	0.79
1200	0.78	1201	0.78	1202	0.78	1203	0.78	1204	0.78
1205	0.78	1206	0.78	1207	0.78	1208	0.78	1209	0.78
1210	0.78	1211	0.76	1212	0.75	1213	0.73	1214	0.71
1215	0.69	1216	0.67	1217	0.65	1218	0.63	1219	0.61
1220	0.59	1221	0.59	1222	0.59	1223	0.59	1224	0.59
1225	0.59	1226	0.59	1227	0.59	1228	0.59	1229	0.59
1230	0.59	1231	0.58	1232	0.57	1233	0.55	1234	0.54
1235	0.53	1236	0.51	1237	0.50	1238	0.49	1239	0.47
1240	0.46	1241	0.46	1242	0.46	1243	0.46	1244	0.46
1245	0.46	1246	0.46	1247	0.46	1248	0.46	1249	0.46
1250	0.46	1251	0.46	1252	0.46	1253	0.46	1254	0.46
1255	0.46	1256	0.46	1257	0.46	1258	0.46	1259	0.46
1260	0.46	1261	0.45	1262	0.44	1263	0.44	1264	0.43
1265	0.42	1266	0.42	1267	0.41	1268	0.40	1269	0.40
1270	0.39	1271	0.39	1272	0.39	1273	0.39	1274	0.39
1275	0.39	1276	0.39	1277	0.39	1278	0.39	1279	0.39
1280	0.39	1281	0.39	1282	0.39	1283	0.39	1284	0.39
1285	0.39	1286	0.39	1287	0.39	1288	0.39	1289	0.39

Channel Islands_10yr_exist.out

1290	0.39	1291	0.39	1292	0.39	1293	0.39	1294	0.39
1295	0.39	1296	0.39	1297	0.39	1298	0.39	1299	0.39
1300	0.39	1310	0.28	1320	0.28	1330	0.28	1340	0.28
1350	0.18	1360	0.18	1370	0.18	1380	0.18	1390	0.18
1400	0.18	1420	0.12	1440	0.12	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

Page: 6

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 108AB

TOTAL AREA TO HYDROGRAPH: 121 acres
HYDROGRAPH PEAK: 205 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 13.20 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.80	200	0.80	300	0.80	400	0.80
500	0.80	600	0.80	700	0.80	800	0.85	900	0.96
1000	10.63	1050	16.31	1100	20.42	1110	27.86	1120	38.19
1130	42.54	1131	42.84	1132	43.54	1133	44.68	1134	46.11
1135	47.62	1136	49.21	1137	51.07	1138	53.27	1139	55.63
1140	58.00	1141	60.47	1142	63.26	1143	66.48	1144	69.97
1145	73.48	1146	77.06	1147	80.85	1148	85.12	1149	90.79
1150	99.05	1151	111.31	1152	131.07	1153	158.59	1154	184.32
1155	199.38	1156	204.52	1157	204.69	1158	203.43	1159	201.08
1160	198.25	1161	194.76	1162	189.59	1163	182.73	1164	175.42
1165	167.58	1166	157.93	1167	144.89	1168	125.47	1169	98.84
1170	72.78	1171	55.07	1172	46.06	1173	41.69	1174	38.56
1175	35.76	1176	32.92	1177	30.15	1178	27.80	1179	26.11
1180	24.85	1181	23.79	1182	22.76	1183	21.70	1184	20.59
1185	19.51	1186	18.40	1187	17.27	1188	16.28	1189	15.57
1190	15.13	1191	14.84	1192	14.59	1193	14.32	1194	14.02
1195	13.70	1196	13.37	1197	13.05	1198	12.75	1199	12.52
1200	12.35	1201	12.23	1202	12.11	1203	12.01	1204	11.90
1205	11.79	1206	11.69	1207	11.58	1208	11.49	1209	11.42
1210	11.39	1211	11.38	1212	11.29	1213	11.05	1214	10.67
1215	10.24	1216	9.64	1217	8.99	1218	8.32	1219	7.64
1220	6.97	1221	6.30	1222	5.65	1223	5.01	1224	4.38
1225	3.74	1226	3.13	1227	2.55	1228	2.03	1229	1.58
1230	1.23	1231	1.07	1232	1.01	1233	0.99	1234	0.97
1235	0.95	1236	0.94	1237	0.93	1238	0.91	1239	0.90
1240	0.89	1241	0.87	1242	0.87	1243	0.86	1244	0.86
1245	0.86	1246	0.86	1247	0.86	1248	0.86	1249	0.86
1250	0.86	1251	0.86	1252	0.86	1253	0.86	1254	0.86
1255	0.86	1256	0.86	1257	0.86	1258	0.86	1259	0.86
1260	0.86	1261	0.86	1262	0.86	1263	0.85	1264	0.85
1265	0.84	1266	0.83	1267	0.83	1268	0.82	1269	0.81
1270	0.81	1271	0.80	1272	0.80	1273	0.80	1274	0.80
1275	0.80	1276	0.80	1277	0.80	1278	0.80	1279	0.80

Channel Islands_10yr_exist.out

1280	0.80	1281	0.80	1282	0.80	1283	0.80	1284	0.80
1285	0.80	1286	0.80	1287	0.80	1288	0.80	1289	0.80
1290	0.80	1291	0.80	1292	0.80	1293	0.80	1294	0.80
1295	0.80	1296	0.80	1297	0.80	1298	0.80	1299	0.80
1300	0.80	1310	0.80	1320	0.80	1330	0.80	1340	0.80
1350	0.80	1360	0.80	1370	0.80	1380	0.80	1390	0.80
1400	0.80	1420	0.80	1440	0.80	1460	0.80	1500	0.80

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

Page: 7

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 109C

DESCRIPTION: Area C1 C2
TOTAL AREA TO HYDROGRAPH: 28 acres
HYDROGRAPH PEAK: 78 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 2.70 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	2.55	1050	3.76	1100	4.81	1110	8.23	1120	9.74
1130	10.08	1131	10.80	1132	11.52	1133	12.24	1134	12.96
1135	13.68	1136	14.88	1137	16.08	1138	16.56	1139	17.04
1140	17.52	1141	18.62	1142	19.73	1143	20.37	1144	21.01
1145	21.65	1146	22.88	1147	24.11	1148	26.90	1149	30.74
1150	35.80	1151	48.14	1152	67.68	1153	78.24	1154	78.00
1155	74.40	1156	69.36	1157	63.12	1158	49.68	1159	29.15
1160	16.80	1161	14.28	1162	12.96	1163	11.88	1164	10.80
1165	9.72	1166	8.64	1167	7.56	1168	7.56	1169	7.56
1170	7.56	1171	7.03	1172	6.50	1173	5.98	1174	5.45
1175	4.92	1176	4.39	1177	3.86	1178	3.86	1179	3.86
1180	3.86	1181	3.74	1182	3.62	1183	3.50	1184	3.38
1185	3.26	1186	3.14	1187	3.02	1188	3.02	1189	3.02
1190	3.02	1191	2.96	1192	2.90	1193	2.84	1194	2.78
1195	2.72	1196	2.66	1197	2.60	1198	2.60	1199	2.60
1200	2.60	1201	2.60	1202	2.60	1203	2.60	1204	2.60
1205	2.60	1206	2.60	1207	2.60	1208	2.60	1209	2.60
1210	2.60	1211	2.22	1212	1.84	1213	1.45	1214	1.07
1215	0.68	1216	0.30	1217	0.00	1218	0.00	1219	0.00
1220	0.00	1221	0.00	1222	0.00	1223	0.00	1224	0.00
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00

Channel Islands_10yr_exist.out

1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

Page: 8

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 111D

DESCRIPTION: Area C3
TOTAL AREA TO HYDROGRAPH: 5 acres
HYDROGRAPH PEAK: 11 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 0.30 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	0.00	1050	0.17	1100	0.34	1110	0.93	1120	1.19
1130	1.25	1131	1.35	1132	1.44	1133	1.54	1134	1.64
1135	1.74	1136	1.91	1137	2.07	1138	2.24	1139	2.41
1140	2.48	1141	2.64	1142	2.79	1143	2.95	1144	3.09
1145	3.18	1146	3.34	1147	3.49	1148	3.94	1149	4.54
1150	5.20	1151	6.78	1152	9.34	1153	10.83	1154	10.88
1155	10.68	1156	10.45	1157	9.94	1158	9.27	1159	8.45
1160	6.70	1161	3.89	1162	2.07	1163	1.72	1164	1.54
1165	1.40	1166	1.25	1167	1.11	1168	0.96	1169	0.82
1170	0.82	1171	0.75	1172	0.68	1173	0.61	1174	0.54
1175	0.47	1176	0.39	1177	0.32	1178	0.25	1179	0.18
1180	0.18	1181	0.17	1182	0.15	1183	0.13	1184	0.12
1185	0.10	1186	0.09	1187	0.07	1188	0.05	1189	0.04
1190	0.04	1191	0.03	1192	0.02	1193	0.01	1194	0.01
1195	0.00	1196	0.00	1197	0.00	1198	0.00	1199	0.00
1200	0.00	1201	0.00	1202	0.00	1203	0.00	1204	0.00
1205	0.00	1206	0.00	1207	0.00	1208	0.00	1209	0.00
1210	0.00	1211	0.00	1212	0.00	1213	0.00	1214	0.00
1215	0.00	1216	0.00	1217	0.00	1218	0.00	1219	0.00
1220	0.00	1221	0.00	1222	0.00	1223	0.00	1224	0.00
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00

Channel Islands_10yr_exist.out

1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 114B

DESCRIPTION: Area C4
TOTAL AREA TO HYDROGRAPH: 12 acres
HYDROGRAPH PEAK: 25 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 1.17 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	1.09	1050	1.61	1100	2.06	1110	3.39	1120	4.12
1130	4.31	1131	4.52	1132	4.71	1133	4.91	1134	5.11
1135	5.30	1136	5.63	1137	5.96	1138	6.28	1139	6.61
1140	6.94	1141	7.44	1142	7.74	1143	8.04	1144	8.34
1145	8.65	1146	9.11	1147	9.45	1148	10.39	1149	11.65
1150	13.19	1151	16.68	1152	22.02	1153	25.06	1154	25.15
1155	24.91	1156	24.61	1157	24.15	1158	23.69	1159	22.65
1160	21.27	1161	19.27	1162	15.31	1163	9.42	1164	5.76
1165	5.07	1166	4.71	1167	4.42	1168	4.12	1169	3.83
1170	3.53	1171	3.10	1172	2.95	1173	2.81	1174	2.66
1175	2.52	1176	2.38	1177	2.23	1178	2.09	1179	1.94
1180	1.80	1181	1.62	1182	1.59	1183	1.56	1184	1.53
1185	1.49	1186	1.46	1187	1.43	1188	1.39	1189	1.36
1190	1.33	1191	1.28	1192	1.26	1193	1.25	1194	1.23
1195	1.21	1196	1.20	1197	1.18	1198	1.16	1199	1.15
1200	1.13	1201	1.12	1202	1.12	1203	1.12	1204	1.12
1205	1.12	1206	1.12	1207	1.12	1208	1.12	1209	1.12
1210	1.12	1211	1.01	1212	0.91	1213	0.80	1214	0.70
1215	0.59	1216	0.49	1217	0.38	1218	0.28	1219	0.17
1220	0.07	1221	0.00	1222	0.00	1223	0.00	1224	0.00
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00

Channel Islands_10yr_exist.out

1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 115BC

TOTAL AREA TO HYDROGRAPH: 45 acres
HYDROGRAPH PEAK: 114 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 4.82 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	0.40	400	0.40
500	0.40	600	0.40	700	0.40	800	0.40	900	0.40
1000	3.60	1050	5.53	1100	7.17	1110	12.14	1120	15.11
1130	15.49	1131	16.18	1132	17.11	1133	18.15	1134	19.17
1135	20.19	1136	21.59	1137	23.28	1138	24.70	1139	25.72
1140	26.62	1141	27.99	1142	29.55	1143	30.92	1144	32.03
1145	33.08	1146	34.59	1147	36.32	1148	39.58	1149	44.77
1150	51.49	1151	65.36	1152	90.30	1153	110.36	1154	113.92
1155	111.57	1156	106.42	1157	99.84	1158	88.69	1159	70.01
1160	52.02	1161	40.20	1162	31.73	1163	23.86	1164	18.93
1165	17.03	1166	15.48	1167	13.99	1168	12.85	1169	12.26
1170	11.91	1171	11.28	1172	10.62	1173	9.88	1174	9.15
1175	8.41	1176	7.68	1177	6.98	1178	6.38	1179	6.02
1180	5.85	1181	5.63	1182	5.50	1183	5.34	1184	5.17
1185	5.00	1186	4.83	1187	4.66	1188	4.52	1189	4.43
1190	4.39	1191	4.33	1192	4.26	1193	4.18	1194	4.09
1195	4.01	1196	3.93	1197	3.85	1198	3.79	1199	3.75
1200	3.74	1201	3.72	1202	3.72	1203	3.72	1204	3.72
1205	3.72	1206	3.72	1207	3.72	1208	3.72	1209	3.72
1210	3.72	1211	3.55	1212	3.24	1213	2.80	1214	2.33
1215	1.87	1216	1.42	1217	1.03	1218	0.75	1219	0.58
1220	0.47	1221	0.40	1222	0.40	1223	0.40	1224	0.40

Channel Islands_10yr_exist.out

1225	0.40	1226	0.40	1227	0.40	1228	0.40	1229	0.40
1230	0.40	1231	0.40	1232	0.40	1233	0.40	1234	0.40
1235	0.40	1236	0.40	1237	0.40	1238	0.40	1239	0.40
1240	0.40	1241	0.40	1242	0.40	1243	0.40	1244	0.40
1245	0.40	1246	0.40	1247	0.40	1248	0.40	1249	0.40
1250	0.40	1251	0.40	1252	0.40	1253	0.40	1254	0.40
1255	0.40	1256	0.40	1257	0.40	1258	0.40	1259	0.40
1260	0.40	1261	0.40	1262	0.40	1263	0.40	1264	0.40
1265	0.40	1266	0.40	1267	0.40	1268	0.40	1269	0.40
1270	0.40	1271	0.40	1272	0.40	1273	0.40	1274	0.40
1275	0.40	1276	0.40	1277	0.40	1278	0.40	1279	0.40
1280	0.40	1281	0.40	1282	0.40	1283	0.40	1284	0.40
1285	0.40	1286	0.40	1287	0.40	1288	0.40	1289	0.40
1290	0.40	1291	0.40	1292	0.40	1293	0.40	1294	0.40
1295	0.40	1296	0.40	1297	0.40	1298	0.40	1299	0.40
1300	0.40	1310	0.40	1320	0.40	1330	0.40	1340	0.40
1350	0.40	1360	0.40	1370	0.40	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 117B

DESCRIPTION: Area C5
TOTAL AREA TO HYDROGRAPH: 53 acres
HYDROGRAPH PEAK: 117 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 5.60 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	0.40	400	0.40
500	0.40	600	0.40	700	0.40	800	0.40	900	0.40
1000	3.80	1050	6.33	1100	8.23	1110	11.27	1120	15.53
1130	18.00	1131	18.31	1132	18.61	1133	18.91	1134	19.28
1135	19.82	1136	20.73	1137	21.56	1138	22.51	1139	23.63
1140	24.97	1141	26.65	1142	28.16	1143	29.61	1144	31.11
1145	32.70	1146	34.53	1147	36.09	1148	38.35	1149	41.04
1150	44.45	1151	51.07	1152	61.20	1153	71.42	1154	83.83
1155	100.36	1156	112.99	1157	116.85	1158	112.74	1159	107.21
1160	101.59	1161	92.42	1162	80.49	1163	68.16	1164	57.76
1165	48.68	1166	40.94	1167	34.79	1168	30.01	1169	26.42
1170	23.64	1171	21.21	1172	19.23	1173	17.63	1174	16.34
1175	15.23	1176	14.24	1177	13.46	1178	12.72	1179	11.99
1180	11.28	1181	10.59	1182	9.91	1183	9.27	1184	8.70
1185	8.21	1186	7.79	1187	7.50	1188	7.23	1189	6.99
1190	6.76	1191	6.53	1192	6.30	1193	6.10	1194	5.93
1195	5.78	1196	5.63	1197	5.52	1198	5.42	1199	5.32
1200	5.22	1201	5.13	1202	5.04	1203	4.96	1204	4.88
1205	4.81	1206	4.75	1207	4.69	1208	4.65	1209	4.62

Channel Islands_10yr_exist.out

1210	4.59	1211	4.44	1212	4.29	1213	4.15	1214	4.01
1215	3.87	1216	3.74	1217	3.69	1218	3.60	1219	3.46
1220	3.32	1221	3.16	1222	2.98	1223	2.78	1224	2.58
1225	2.38	1226	2.18	1227	1.99	1228	1.80	1229	1.64
1230	1.48	1231	1.34	1232	1.21	1233	1.10	1234	1.00
1235	0.92	1236	0.85	1237	0.78	1238	0.73	1239	0.69
1240	0.65	1241	0.61	1242	0.58	1243	0.56	1244	0.54
1245	0.52	1246	0.50	1247	0.49	1248	0.47	1249	0.46
1250	0.46	1251	0.45	1252	0.44	1253	0.44	1254	0.43
1255	0.43	1256	0.42	1257	0.42	1258	0.42	1259	0.41
1260	0.41	1261	0.41	1262	0.41	1263	0.41	1264	0.41
1265	0.41	1266	0.41	1267	0.40	1268	0.40	1269	0.40
1270	0.40	1271	0.40	1272	0.40	1273	0.40	1274	0.40
1275	0.40	1276	0.40	1277	0.40	1278	0.40	1279	0.40
1280	0.40	1281	0.40	1282	0.40	1283	0.40	1284	0.40
1285	0.40	1286	0.40	1287	0.40	1288	0.40	1289	0.40
1290	0.40	1291	0.40	1292	0.40	1293	0.40	1294	0.40
1295	0.40	1296	0.40	1297	0.40	1298	0.40	1299	0.40
1300	0.40	1310	0.40	1320	0.40	1330	0.40	1340	0.40
1350	0.40	1360	0.40	1370	0.40	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 118AB

DESCRIPTION: Confluence
TOTAL AREA TO HYDROGRAPH: 174 acres
HYDROGRAPH PEAK: 322 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 18.80 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.20	200	1.20	300	1.20	400	1.20
500	1.20	600	1.20	700	1.20	800	1.25	900	1.36
1000	14.42	1050	22.64	1100	28.65	1110	39.12	1120	53.72
1130	60.54	1131	61.16	1132	62.16	1133	63.59	1134	65.39
1135	67.44	1136	69.93	1137	72.62	1138	75.78	1139	79.27
1140	82.97	1141	87.12	1142	91.41	1143	96.09	1144	101.08
1145	106.18	1146	111.59	1147	116.94	1148	123.46	1149	131.83
1150	143.51	1151	162.38	1152	192.26	1153	230.01	1154	268.15
1155	299.73	1156	317.51	1157	321.54	1158	316.17	1159	308.29
1160	299.84	1161	287.18	1162	270.08	1163	250.89	1164	233.18
1165	216.26	1166	198.87	1167	179.67	1168	155.47	1169	125.27
1170	96.42	1171	76.28	1172	65.29	1173	59.32	1174	54.89
1175	50.98	1176	47.15	1177	43.61	1178	40.52	1179	38.10
1180	36.13	1181	34.38	1182	32.67	1183	30.97	1184	29.30
1185	27.72	1186	26.19	1187	24.77	1188	23.51	1189	22.55
1190	21.89	1191	21.37	1192	20.89	1193	20.42	1194	19.95

Channel Islands_10yr_exist.out

1195	19.47	1196	19.01	1197	18.57	1198	18.17	1199	17.84
1200	17.57	1201	17.36	1202	17.16	1203	16.96	1204	16.78
1205	16.60	1206	16.43	1207	16.28	1208	16.14	1209	16.04
1210	15.98	1211	15.81	1212	15.58	1213	15.20	1214	14.68
1215	14.11	1216	13.38	1217	12.68	1218	11.91	1219	11.10
1220	10.29	1221	9.46	1222	8.63	1223	7.80	1224	6.96
1225	6.12	1226	5.30	1227	4.54	1228	3.84	1229	3.21
1230	2.72	1231	2.40	1232	2.22	1233	2.08	1234	1.97
1235	1.87	1236	1.79	1237	1.71	1238	1.65	1239	1.59
1240	1.53	1241	1.49	1242	1.45	1243	1.42	1244	1.40
1245	1.38	1246	1.36	1247	1.35	1248	1.33	1249	1.32
1250	1.31	1251	1.31	1252	1.30	1253	1.29	1254	1.29
1255	1.29	1256	1.28	1257	1.28	1258	1.28	1259	1.27
1260	1.27	1261	1.27	1262	1.27	1263	1.26	1264	1.25
1265	1.24	1266	1.24	1267	1.23	1268	1.22	1269	1.21
1270	1.21	1271	1.20	1272	1.20	1273	1.20	1274	1.20
1275	1.20	1276	1.20	1277	1.20	1278	1.20	1279	1.20
1280	1.20	1281	1.20	1282	1.20	1283	1.20	1284	1.20
1285	1.20	1286	1.20	1287	1.20	1288	1.20	1289	1.20
1290	1.20	1291	1.20	1292	1.20	1293	1.20	1294	1.20
1295	1.20	1296	1.20	1297	1.20	1298	1.20	1299	1.20
1300	1.20	1310	1.20	1320	1.20	1330	1.20	1340	1.20
1350	1.20	1360	1.20	1370	1.20	1380	1.20	1390	1.20
1400	1.20	1420	1.20	1440	1.20	1460	1.20	1500	1.20

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

Page: 13

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 120A

DESCRIPTION: Area A6
TOTAL AREA TO HYDROGRAPH: 184 acres
HYDROGRAPH PEAK: 320 cfs
TIME OF PEAK: 1159 minutes
HYDROGRAPH VOLUME: 19.91 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.22	200	1.22	300	1.22	400	1.23
500	1.24	600	1.24	700	1.25	800	1.31	900	1.43
1000	14.09	1050	23.50	1100	29.71	1110	37.35	1120	51.25
1130	61.91	1131	62.77	1132	63.69	1133	64.64	1134	65.69
1135	66.98	1136	68.78	1137	70.60	1138	72.76	1139	75.28
1140	78.17	1141	81.70	1142	85.39	1143	89.45	1144	93.85
1145	98.59	1146	103.91	1147	109.26	1148	115.74	1149	122.98
1150	131.45	1151	144.47	1152	163.44	1153	185.26	1154	211.02
1155	244.17	1156	279.31	1157	305.89	1158	317.71	1159	320.48
1160	318.89	1161	312.95	1162	304.08	1163	291.77	1164	276.14
1165	259.05	1166	242.05	1167	225.45	1168	209.05	1169	190.75
1170	170.10	1171	146.81	1172	123.80	1173	103.69	1174	87.96
1175	76.54	1176	68.30	1177	62.24	1178	57.41	1179	53.15

Channel Islands_10yr_exist.out									
1180	49.49	1181	46.20	1182	43.32	1183	40.82	1184	38.62
1185	36.71	1186	34.93	1187	33.25	1188	31.63	1189	30.07
1190	28.66	1191	27.35	1192	26.15	1193	25.11	1194	24.22
1195	23.47	1196	22.84	1197	22.30	1198	21.79	1199	21.29
1200	20.81	1201	20.36	1202	19.94	1203	19.56	1204	19.22
1205	18.93	1206	18.66	1207	18.42	1208	18.20	1209	17.99
1210	17.80	1211	17.46	1212	17.14	1213	16.85	1214	16.56
1215	16.25	1216	15.91	1217	15.64	1218	15.29	1219	14.86
1220	14.36	1221	13.87	1222	13.40	1223	12.86	1224	12.28
1225	11.65	1226	11.00	1227	10.33	1228	9.64	1229	8.95
1230	8.25	1231	7.56	1232	6.88	1233	6.24	1234	5.62
1235	5.04	1236	4.52	1237	4.06	1238	3.66	1239	3.33
1240	3.05	1241	2.80	1242	2.60	1243	2.42	1244	2.27
1245	2.14	1246	2.03	1247	1.93	1248	1.84	1249	1.77
1250	1.71	1251	1.65	1252	1.60	1253	1.56	1254	1.53
1255	1.50	1256	1.48	1257	1.45	1258	1.44	1259	1.42
1260	1.41	1261	1.40	1262	1.39	1263	1.38	1264	1.38
1265	1.37	1266	1.36	1267	1.36	1268	1.35	1269	1.35
1270	1.34	1271	1.34	1272	1.33	1273	1.33	1274	1.32
1275	1.32	1276	1.31	1277	1.30	1278	1.30	1279	1.29
1280	1.29	1281	1.28	1282	1.28	1283	1.28	1284	1.27
1285	1.27	1286	1.27	1287	1.27	1288	1.27	1289	1.26
1290	1.26	1291	1.26	1292	1.26	1293	1.26	1294	1.26
1295	1.26	1296	1.26	1297	1.26	1298	1.26	1299	1.26
1300	1.26	1310	1.24	1320	1.24	1330	1.24	1340	1.24
1350	1.23	1360	1.23	1370	1.23	1380	1.23	1390	1.23
1400	1.23	1420	1.22	1440	1.22	1460	1.20	1500	1.20

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 122B

DESCRIPTION: Area A7
TOTAL AREA TO HYDROGRAPH: 14 acres
HYDROGRAPH PEAK: 39 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 1.35 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	1.28	1050	1.88	1100	2.40	1110	4.12	1120	4.87
1130	5.04	1131	5.40	1132	5.76	1133	6.12	1134	6.48
1135	6.84	1136	7.44	1137	8.04	1138	8.28	1139	8.52
1140	8.76	1141	9.31	1142	9.87	1143	10.19	1144	10.50
1145	10.82	1146	11.44	1147	12.05	1148	13.45	1149	15.37
1150	17.90	1151	24.07	1152	33.84	1153	39.12	1154	39.00
1155	37.20	1156	34.68	1157	31.56	1158	24.84	1159	14.57
1160	8.40	1161	7.14	1162	6.48	1163	5.94	1164	5.40

Channel Islands_10yr_exist.out

1165	4.86	1166	4.32	1167	3.78	1168	3.78	1169	3.78
1170	3.78	1171	3.52	1172	3.25	1173	2.99	1174	2.72
1175	2.46	1176	2.20	1177	1.93	1178	1.93	1179	1.93
1180	1.93	1181	1.87	1182	1.81	1183	1.75	1184	1.69
1185	1.63	1186	1.57	1187	1.51	1188	1.51	1189	1.51
1190	1.51	1191	1.48	1192	1.45	1193	1.42	1194	1.39
1195	1.36	1196	1.33	1197	1.30	1198	1.30	1199	1.30
1200	1.30	1201	1.30	1202	1.30	1203	1.30	1204	1.30
1205	1.30	1206	1.30	1207	1.30	1208	1.30	1209	1.30
1210	1.30	1211	1.11	1212	0.92	1213	0.73	1214	0.53
1215	0.34	1216	0.15	1217	0.00	1218	0.00	1219	0.00
1220	0.00	1221	0.00	1222	0.00	1223	0.00	1224	0.00
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 123AB

DESCRIPTION: Confluence
TOTAL AREA TO HYDROGRAPH: 198 acres
HYDROGRAPH PEAK: 341 cfs
TIME OF PEAK: 1158 minutes
HYDROGRAPH VOLUME: 21.26 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.22	200	1.22	300	1.22	400	1.23
500	1.24	600	1.24	700	1.25	800	1.31	900	1.42
1000	15.26	1050	25.34	1100	32.05	1110	41.11	1120	55.67
1130	66.70	1131	67.90	1132	69.19	1133	70.48	1134	71.87
1135	73.44	1136	75.69	1137	78.14	1138	80.42	1139	83.11
1140	86.13	1141	90.04	1142	94.29	1143	98.56	1144	103.23
1145	108.21	1146	114.02	1147	120.02	1148	127.58	1149	136.66

Channel Islands_10yr_exist.out									
1150	147.35	1151	165.46	1152	193.05	1153	219.88	1154	244.79
1155	274.92	1156	307.78	1157	333.23	1158	341.00	1159	334.70
1160	327.69	1161	321.22	1162	312.14	1163	299.99	1164	284.36
1165	267.05	1166	249.45	1167	232.40	1168	215.95	1169	198.31
1170	178.16	1171	155.47	1172	132.19	1173	111.45	1174	94.54
1175	81.95	1176	72.71	1177	65.86	1178	60.76	1179	56.36
1180	52.54	1181	49.15	1182	46.05	1183	43.40	1184	41.04
1185	38.98	1186	37.14	1187	35.35	1188	33.73	1189	32.15
1190	30.70	1191	29.34	1192	28.06	1193	26.93	1194	25.96
1195	25.12	1196	24.43	1197	23.83	1198	23.31	1199	22.80
1200	22.32	1201	21.85	1202	21.42	1203	21.02	1204	20.67
1205	20.36	1206	20.08	1207	19.83	1208	19.59	1209	19.38
1210	19.18	1211	18.72	1212	18.20	1213	17.71	1214	17.22
1215	16.73	1216	16.21	1217	15.76	1218	15.45	1219	15.06
1220	14.59	1221	14.10	1222	13.67	1223	13.16	1224	12.60
1225	12.00	1226	11.37	1227	10.71	1228	10.04	1229	9.35
1230	8.66	1231	7.97	1232	7.30	1233	6.64	1234	6.01
1235	5.41	1236	4.86	1237	4.37	1238	3.93	1239	3.56
1240	3.25	1241	2.98	1242	2.75	1243	2.55	1244	2.39
1245	2.24	1246	2.12	1247	2.01	1248	1.91	1249	1.83
1250	1.76	1251	1.70	1252	1.64	1253	1.60	1254	1.56
1255	1.53	1256	1.50	1257	1.47	1258	1.45	1259	1.43
1260	1.42	1261	1.41	1262	1.40	1263	1.39	1264	1.39
1265	1.38	1266	1.37	1267	1.36	1268	1.36	1269	1.35
1270	1.35	1271	1.34	1272	1.34	1273	1.33	1274	1.33
1275	1.32	1276	1.32	1277	1.31	1278	1.31	1279	1.30
1280	1.29	1281	1.29	1282	1.28	1283	1.28	1284	1.28
1285	1.27	1286	1.27	1287	1.27	1288	1.27	1289	1.27
1290	1.27	1291	1.26	1292	1.26	1293	1.26	1294	1.26
1295	1.26	1296	1.26	1297	1.26	1298	1.26	1299	1.26
1300	1.26	1310	1.24	1320	1.24	1330	1.24	1340	1.24
1350	1.23	1360	1.22	1370	1.23	1380	1.22	1390	1.23
1400	1.23	1420	1.22	1440	1.22	1460	1.22	1500	1.22

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

Page: 16

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 125A

DESCRIPTION: Area A8
TOTAL AREA TO HYDROGRAPH: 204 acres
HYDROGRAPH PEAK: 330 cfs
TIME OF PEAK: 1161 minutes
HYDROGRAPH VOLUME: 21.91 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.22	200	1.22	300	1.22	400	1.23
500	1.24	600	1.24	700	1.25	800	1.30	900	1.40
1000	13.99	1050	25.03	1100	32.19	1110	37.79	1120	49.81
1130	63.25	1131	64.54	1132	65.82	1133	67.12	1134	68.46

Channel Islands_10yr_exist.out									
1135	69.84	1136	71.39	1137	73.00	1138	74.62	1139	76.51
1140	78.63	1141	81.08	1142	83.76	1143	86.72	1144	90.17
1145	94.05	1146	98.41	1147	103.15	1148	108.69	1149	114.97
1150	122.23	1151	132.21	1152	145.37	1153	160.19	1154	178.81
1155	201.87	1156	227.42	1157	255.81	1158	284.69	1159	308.39
1160	323.81	1161	330.37	1162	330.09	1163	326.10	1164	319.37
1165	309.78	1166	297.38	1167	283.07	1168	267.72	1169	252.05
1170	236.34	1171	220.34	1172	203.27	1173	185.31	1174	166.19
1175	147.27	1176	129.77	1177	114.38	1178	101.44	1179	90.69
1180	81.90	1181	74.68	1182	68.68	1183	63.68	1184	59.35
1185	55.46	1186	52.00	1187	49.05	1188	46.39	1189	43.98
1190	41.79	1191	39.75	1192	37.94	1193	36.28	1194	34.70
1195	33.21	1196	31.83	1197	30.61	1198	29.49	1199	28.45
1200	27.51	1201	26.67	1202	25.92	1203	25.23	1204	24.67
1205	24.13	1206	23.63	1207	23.15	1208	22.70	1209	22.28
1210	21.90	1211	21.46	1212	21.06	1213	20.68	1214	20.31
1215	19.93	1216	19.50	1217	19.05	1218	18.65	1219	18.23
1220	17.80	1221	17.36	1222	16.93	1223	16.53	1224	16.12
1225	15.70	1226	15.28	1227	14.85	1228	14.48	1229	14.12
1230	13.73	1231	13.30	1232	12.84	1233	12.35	1234	11.84
1235	11.32	1236	10.77	1237	10.22	1238	9.66	1239	9.11
1240	8.55	1241	8.01	1242	7.48	1243	6.97	1244	6.48
1245	6.02	1246	5.59	1247	5.18	1248	4.81	1249	4.47
1250	4.15	1251	3.86	1252	3.60	1253	3.36	1254	3.15
1255	2.95	1256	2.78	1257	2.62	1258	2.47	1259	2.34
1260	2.23	1261	2.12	1262	2.03	1263	1.95	1264	1.87
1265	1.81	1266	1.75	1267	1.70	1268	1.65	1269	1.61
1270	1.58	1271	1.55	1272	1.52	1273	1.50	1274	1.48
1275	1.46	1276	1.44	1277	1.43	1278	1.41	1279	1.41
1280	1.40	1281	1.39	1282	1.39	1283	1.38	1284	1.38
1285	1.37	1286	1.36	1287	1.36	1288	1.35	1289	1.35
1290	1.34	1291	1.33	1292	1.33	1293	1.32	1294	1.32
1295	1.31	1296	1.31	1297	1.31	1298	1.30	1299	1.30
1300	1.29	1310	1.27	1320	1.26	1330	1.25	1340	1.24
1350	1.24	1360	1.24	1370	1.23	1380	1.23	1390	1.23
1400	1.23	1420	1.22	1440	1.22	1460	1.22	1500	1.22

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

Page: 17

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 127B

DESCRIPTION: Area D1
TOTAL AREA TO HYDROGRAPH: 24 acres
HYDROGRAPH PEAK: 51 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 3.95 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.41	200	0.45	300	0.57	400	0.70

Channel Islands_10yr_exist.out									
500	0.88	600	1.01	700	1.27	800	1.56	900	1.93
1000	2.68	1050	3.53	1100	4.38	1110	7.20	1120	8.44
1130	8.72	1131	9.13	1132	9.55	1133	9.96	1134	10.38
1135	10.79	1136	11.51	1137	12.23	1138	12.94	1139	13.66
1140	14.38	1141	15.04	1142	15.70	1143	16.36	1144	17.01
1145	17.64	1146	18.32	1147	19.01	1148	20.92	1149	23.52
1150	26.76	1151	33.67	1152	44.69	1153	51.05	1154	51.25
1155	50.75	1156	49.79	1157	48.83	1158	46.64	1159	43.76
1160	40.20	1161	32.07	1162	19.83	1163	12.01	1164	10.52
1165	9.76	1166	9.13	1167	8.51	1168	7.89	1169	7.27
1170	6.65	1171	6.34	1172	6.04	1173	5.74	1174	5.43
1175	5.13	1176	4.83	1177	4.52	1178	4.22	1179	3.91
1180	3.61	1181	3.54	1182	3.47	1183	3.40	1184	3.33
1185	3.27	1186	3.20	1187	3.13	1188	3.06	1189	2.99
1190	2.92	1191	2.89	1192	2.85	1193	2.82	1194	2.78
1195	2.75	1196	2.73	1197	2.72	1198	2.71	1199	2.70
1200	2.69	1201	2.69	1202	2.69	1203	2.69	1204	2.69
1205	2.69	1206	2.69	1207	2.69	1208	2.69	1209	2.69
1210	2.69	1211	2.62	1212	2.56	1213	2.49	1214	2.43
1215	2.36	1216	2.29	1217	2.23	1218	2.16	1219	2.10
1220	2.03	1221	2.03	1222	2.03	1223	2.03	1224	2.03
1225	2.03	1226	2.03	1227	2.03	1228	2.03	1229	2.03
1230	2.03	1231	1.99	1232	1.94	1233	1.89	1234	1.85
1235	1.80	1236	1.76	1237	1.71	1238	1.66	1239	1.62
1240	1.57	1241	1.57	1242	1.57	1243	1.57	1244	1.57
1245	1.57	1246	1.57	1247	1.57	1248	1.57	1249	1.57
1250	1.57	1251	1.57	1252	1.57	1253	1.57	1254	1.57
1255	1.57	1256	1.57	1257	1.57	1258	1.57	1259	1.57
1260	1.57	1261	1.55	1262	1.53	1263	1.50	1264	1.48
1265	1.45	1266	1.43	1267	1.41	1268	1.38	1269	1.36
1270	1.33	1271	1.33	1272	1.33	1273	1.33	1274	1.33
1275	1.33	1276	1.33	1277	1.33	1278	1.33	1279	1.33
1280	1.33	1281	1.33	1282	1.33	1283	1.33	1284	1.33
1285	1.33	1286	1.33	1287	1.33	1288	1.33	1289	1.33
1290	1.33	1291	1.33	1292	1.33	1293	1.33	1294	1.33
1295	1.33	1296	1.33	1297	1.33	1298	1.33	1299	1.33
1300	1.33	1310	0.97	1320	0.97	1330	0.97	1340	0.97
1350	0.62	1360	0.62	1370	0.62	1380	0.62	1390	0.62
1400	0.62	1420	0.41	1440	0.41	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 130AB

TOTAL AREA TO HYDROGRAPH: 228 acres
HYDROGRAPH PEAK: 376 cfs
TIME OF PEAK: 1162 minutes
HYDROGRAPH VOLUME: 25.90 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
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Channel Islands_10yr_exist.out

0	0.00	100	1.63	200	1.66	300	1.78	400	1.91
500	2.09	600	2.24	700	2.48	800	2.84	900	3.28
1000	16.34	1050	28.24	1100	36.31	1110	42.56	1120	56.19
1130	70.79	1131	72.10	1132	73.45	1133	74.77	1134	76.13
1135	77.60	1136	79.24	1137	81.07	1138	83.01	1139	85.13
1140	87.58	1141	90.42	1142	93.60	1143	97.06	1144	100.89
1145	105.20	1146	110.03	1147	115.25	1148	120.98	1149	127.50
1150	134.94	1151	144.27	1152	156.94	1153	173.07	1154	193.40
1155	219.51	1156	249.98	1157	281.99	1158	313.46	1159	340.90
1160	361.27	1161	372.97	1162	376.35	1163	373.01	1164	364.27
1165	350.86	1166	333.47	1167	314.32	1168	295.08	1169	276.35
1170	258.61	1171	241.19	1172	223.68	1173	205.42	1174	186.36
1175	166.92	1176	148.30	1177	131.42	1178	116.71	1179	104.35
1180	94.07	1181	85.52	1182	78.41	1183	72.53	1184	67.38
1185	62.98	1186	58.96	1187	55.44	1188	52.40	1189	49.71
1190	47.23	1191	44.97	1192	42.90	1193	41.04	1194	39.37
1195	37.74	1196	36.21	1197	34.81	1198	33.57	1199	32.41
1200	31.34	1201	30.37	1202	29.49	1203	28.71	1204	28.02
1205	27.42	1206	26.88	1207	26.36	1208	25.88	1209	25.42
1210	25.00	1211	24.59	1212	24.18	1213	23.77	1214	23.39
1215	23.01	1216	22.61	1217	22.18	1218	21.72	1219	21.27
1220	20.82	1221	20.34	1222	19.86	1223	19.39	1224	18.93
1225	18.46	1226	17.99	1227	17.52	1228	17.07	1229	16.65
1230	16.26	1231	15.88	1232	15.49	1233	15.05	1234	14.57
1235	14.06	1236	13.54	1237	12.99	1238	12.43	1239	11.86
1240	11.29	1241	10.71	1242	10.14	1243	9.58	1244	9.03
1245	8.50	1246	7.99	1247	7.51	1248	7.06	1249	6.65
1250	6.28	1251	5.94	1252	5.63	1253	5.34	1254	5.09
1255	4.86	1256	4.65	1257	4.46	1258	4.30	1259	4.14
1260	4.01	1261	3.88	1262	3.77	1263	3.67	1264	3.58
1265	3.50	1266	3.43	1267	3.37	1268	3.30	1269	3.24
1270	3.19	1271	3.13	1272	3.08	1273	3.03	1274	2.99
1275	2.94	1276	2.90	1277	2.86	1278	2.83	1279	2.80
1280	2.78	1281	2.77	1282	2.75	1283	2.74	1284	2.74
1285	2.73	1286	2.72	1287	2.72	1288	2.71	1289	2.70
1290	2.70	1291	2.69	1292	2.68	1293	2.68	1294	2.67
1295	2.67	1296	2.66	1297	2.65	1298	2.65	1299	2.65
1300	2.64	1310	2.53	1320	2.37	1330	2.24	1340	2.22
1350	2.16	1360	2.00	1370	1.87	1380	1.84	1390	1.84
1400	1.84	1420	1.76	1440	1.65	1460	1.63	1500	1.63

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

Page: 19

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 131A

DESCRIPTION: Area D2
TOTAL AREA TO HYDROGRAPH: 236 acres
HYDROGRAPH PEAK: 379 cfs
TIME OF PEAK: 1162 minutes
HYDROGRAPH VOLUME: 26.46 acre-ft

Channel Islands_10yr_exist.out

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.64	200	1.68	300	1.80	400	1.94
500	2.12	600	2.27	700	2.52	800	2.89	900	3.34
1000	16.43	1050	28.59	1100	36.95	1110	44.14	1120	58.19
1130	72.88	1131	74.39	1132	75.94	1133	77.46	1134	79.02
1135	80.70	1136	82.69	1137	84.87	1138	86.94	1139	89.21
1140	91.79	1141	94.95	1142	98.45	1143	102.08	1144	106.08
1145	110.56	1146	115.71	1147	121.26	1148	127.74	1149	135.31
1150	144.11	1151	156.70	1152	174.72	1153	193.79	1154	214.05
1155	239.16	1156	268.23	1157	298.50	1158	326.31	1159	348.28
1160	365.27	1161	376.24	1162	379.24	1163	375.60	1164	366.56
1165	352.86	1166	335.17	1167	315.72	1168	296.48	1169	277.75
1170	260.01	1171	242.44	1172	224.79	1173	206.38	1174	187.18
1175	167.59	1176	148.83	1177	131.80	1178	117.10	1179	104.74
1180	94.46	1181	85.87	1182	78.73	1183	72.82	1184	67.63
1185	63.20	1186	59.15	1187	55.60	1188	52.55	1189	49.87
1190	47.38	1191	45.10	1192	43.02	1193	41.15	1194	39.46
1195	37.83	1196	36.30	1197	34.90	1198	33.66	1199	32.50
1200	31.43	1201	30.46	1202	29.58	1203	28.80	1204	28.11
1205	27.51	1206	26.97	1207	26.45	1208	25.97	1209	25.51
1210	25.09	1211	24.68	1212	24.26	1213	23.85	1214	23.47
1215	23.09	1216	22.68	1217	22.24	1218	21.79	1219	21.34
1220	20.89	1221	20.41	1222	19.93	1223	19.46	1224	18.99
1225	18.53	1226	18.06	1227	17.59	1228	17.13	1229	16.72
1230	16.32	1231	15.94	1232	15.56	1233	15.11	1234	14.63
1235	14.12	1236	13.59	1237	13.05	1238	12.49	1239	11.92
1240	11.34	1241	10.76	1242	10.19	1243	9.63	1244	9.08
1245	8.55	1246	8.04	1247	7.56	1248	7.12	1249	6.71
1250	6.33	1251	5.99	1252	5.68	1253	5.40	1254	5.14
1255	4.91	1256	4.70	1257	4.52	1258	4.35	1259	4.20
1260	4.06	1261	3.93	1262	3.82	1263	3.72	1264	3.63
1265	3.55	1266	3.48	1267	3.41	1268	3.35	1269	3.29
1270	3.23	1271	3.18	1272	3.13	1273	3.08	1274	3.03
1275	2.99	1276	2.95	1277	2.91	1278	2.88	1279	2.85
1280	2.83	1281	2.81	1282	2.80	1283	2.79	1284	2.78
1285	2.77	1286	2.77	1287	2.76	1288	2.75	1289	2.75
1290	2.74	1291	2.73	1292	2.73	1293	2.72	1294	2.72
1295	2.71	1296	2.70	1297	2.70	1298	2.69	1299	2.69
1300	2.69	1310	2.56	1320	2.40	1330	2.28	1340	2.25
1350	2.18	1360	2.02	1370	1.89	1380	1.86	1390	1.86
1400	1.86	1420	1.77	1440	1.66	1460	1.63	1500	1.63

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

Page: 20

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 132A

DESCRIPTION: Area A9
TOTAL AREA TO HYDROGRAPH: 269 acres

Channel Islands_10yr_exist.out
HYDROGRAPH PEAK: 395 cfs
TIME OF PEAK: 1162 minutes
HYDROGRAPH VOLUME: 29.64 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.64	200	1.68	300	1.80	400	1.94
500	2.12	600	2.27	700	2.52	800	2.89	900	3.34
1000	19.44	1050	33.03	1100	42.61	1110	53.85	1120	69.68
1130	84.76	1131	87.12	1132	89.52	1133	91.89	1134	94.30
1135	96.82	1136	100.23	1137	103.82	1138	106.46	1139	109.29
1140	112.44	1141	116.90	1142	121.70	1143	126.09	1144	130.84
1145	136.07	1146	142.67	1147	149.67	1148	159.44	1149	171.54
1150	186.30	1151	213.44	1152	254.48	1153	286.00	1154	305.98
1155	326.85	1156	349.97	1157	372.89	1158	384.86	1159	382.63
1160	385.07	1161	393.07	1162	394.52	1163	389.60	1164	379.29
1165	364.31	1166	345.35	1167	324.63	1168	305.39	1169	286.66
1170	268.92	1171	250.73	1172	232.45	1173	213.43	1174	193.60
1175	173.39	1176	154.01	1177	136.35	1178	121.65	1179	109.29
1180	99.01	1181	90.29	1182	83.00	1183	76.95	1184	71.62
1185	67.05	1186	62.85	1187	59.16	1188	56.12	1189	53.43
1190	50.95	1191	48.60	1192	46.45	1193	44.50	1194	42.74
1195	41.04	1196	39.44	1197	37.97	1198	36.73	1199	35.56
1200	34.49	1201	33.52	1202	32.65	1203	31.87	1204	31.18
1205	30.58	1206	30.04	1207	29.52	1208	29.03	1209	28.58
1210	28.16	1211	27.30	1212	26.43	1213	25.56	1214	24.72
1215	23.89	1216	23.04	1217	22.24	1218	21.79	1219	21.34
1220	20.89	1221	20.41	1222	19.93	1223	19.46	1224	18.99
1225	18.53	1226	18.06	1227	17.59	1228	17.13	1229	16.72
1230	16.32	1231	15.94	1232	15.56	1233	15.11	1234	14.63
1235	14.12	1236	13.59	1237	13.05	1238	12.49	1239	11.92
1240	11.34	1241	10.76	1242	10.19	1243	9.63	1244	9.08
1245	8.55	1246	8.04	1247	7.56	1248	7.12	1249	6.71
1250	6.33	1251	5.99	1252	5.68	1253	5.40	1254	5.14
1255	4.91	1256	4.70	1257	4.52	1258	4.35	1259	4.20
1260	4.06	1261	3.93	1262	3.82	1263	3.72	1264	3.63
1265	3.55	1266	3.48	1267	3.41	1268	3.35	1269	3.29
1270	3.23	1271	3.18	1272	3.13	1273	3.08	1274	3.03
1275	2.99	1276	2.95	1277	2.91	1278	2.88	1279	2.85
1280	2.83	1281	2.81	1282	2.80	1283	2.79	1284	2.78
1285	2.77	1286	2.77	1287	2.76	1288	2.75	1289	2.75
1290	2.74	1291	2.73	1292	2.73	1293	2.72	1294	2.72
1295	2.71	1296	2.70	1297	2.70	1298	2.69	1299	2.69
1300	2.69	1310	2.56	1320	2.40	1330	2.28	1340	2.25
1350	2.18	1360	2.02	1370	1.89	1380	1.86	1390	1.86
1400	1.86	1420	1.77	1440	1.66	1460	1.63	1500	1.63

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

Hydrograph Printouts

DESCRIPTION: Area A10
 TOTAL AREA TO HYDROGRAPH: 284 acres
 HYDROGRAPH PEAK: 409 cfs
 TIME OF PEAK: 1158 minutes
 HYDROGRAPH VOLUME: 30.52 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.64	200	1.68	300	1.80	400	1.94
500	2.12	600	2.27	700	2.52	800	2.89	900	3.34
1000	19.44	1050	33.52	1100	43.65	1110	56.65	1120	73.26
1130	88.52	1131	91.24	1132	94.02	1133	96.76	1134	99.55
1135	102.47	1136	106.52	1137	110.77	1138	113.67	1139	116.76
1140	120.18	1141	125.23	1142	130.63	1143	135.34	1144	140.41
1145	145.96	1146	153.17	1147	160.78	1148	171.94	1149	186.02
1150	203.34	1151	236.58	1152	287.66	1153	324.69	1154	344.54
1155	363.53	1156	384.02	1157	403.69	1158	408.78	1159	396.29
1160	392.41	1161	399.04	1162	399.77	1163	394.28	1164	383.42
1165	367.88	1166	348.36	1167	327.08	1168	307.84	1169	289.11
1170	271.38	1171	252.91	1172	234.36	1173	215.06	1174	194.96
1175	174.48	1176	154.83	1177	136.90	1178	122.20	1179	109.84
1180	99.56	1181	90.77	1182	83.42	1183	77.31	1184	71.92
1185	67.29	1186	63.03	1187	59.28	1188	56.23	1189	53.55
1190	51.06	1191	48.68	1192	46.50	1193	44.52	1194	42.74
1195	41.04	1196	39.44	1197	37.97	1198	36.73	1199	35.56
1200	34.49	1201	33.52	1202	32.65	1203	31.87	1204	31.18
1205	30.58	1206	30.04	1207	29.52	1208	29.03	1209	28.58
1210	28.16	1211	27.30	1212	26.43	1213	25.56	1214	24.72
1215	23.89	1216	23.04	1217	22.24	1218	21.79	1219	21.34
1220	20.89	1221	20.41	1222	19.93	1223	19.46	1224	18.99
1225	18.53	1226	18.06	1227	17.59	1228	17.13	1229	16.72
1230	16.32	1231	15.94	1232	15.56	1233	15.11	1234	14.63
1235	14.12	1236	13.59	1237	13.05	1238	12.49	1239	11.92
1240	11.34	1241	10.76	1242	10.19	1243	9.63	1244	9.08
1245	8.55	1246	8.04	1247	7.56	1248	7.12	1249	6.71
1250	6.33	1251	5.99	1252	5.68	1253	5.40	1254	5.14
1255	4.91	1256	4.70	1257	4.52	1258	4.35	1259	4.20
1260	4.06	1261	3.93	1262	3.82	1263	3.72	1264	3.63
1265	3.55	1266	3.48	1267	3.41	1268	3.35	1269	3.29
1270	3.23	1271	3.18	1272	3.13	1273	3.08	1274	3.03
1275	2.99	1276	2.95	1277	2.91	1278	2.88	1279	2.85
1280	2.83	1281	2.81	1282	2.80	1283	2.79	1284	2.78
1285	2.77	1286	2.77	1287	2.76	1288	2.75	1289	2.75
1290	2.74	1291	2.73	1292	2.73	1293	2.72	1294	2.72
1295	2.71	1296	2.70	1297	2.70	1298	2.69	1299	2.69
1300	2.69	1310	2.56	1320	2.40	1330	2.28	1340	2.25
1350	2.18	1360	2.02	1370	1.89	1380	1.86	1390	1.86
1400	1.86	1420	1.77	1440	1.66	1460	1.63	1500	1.63

Ventura County Watershed Protection District
 Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Existing Condition

VCRat Model Input
 Page 22

Model Lines

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005 1 100A Header place holder
005 1 101A Header place holder
005 1 106B Header place holder
005 1 108ABHeader place holder
005 1 109C Header place holder
005 1 111D Header place holder
005 1 114B Header place holder
005 1 115BCHeader place holder
005 1 117B Header place holder
005 1 118ABHeader place holder
005 1 120A Header place holder
005 1 122B Header place holder
005 1 123ABHeader place holder
005 1 125A Header place holder
005 1 127B Header place holder
005 1 130ABHeader place holder
005 1 131A Header place holder
005 1 132A Header place holder
005 1 133A Header place holder
999
999
006 1 100A 010 099J10 G1
006 1 101A 010000011416K10 1
006 1 102A 010 099J10400202003860
006 1 103A 010 099J10400373000800
006 1 104A 010 099J10400224005600
006 1 105A 010 099J10400131000400
006 1 106B 020030000710K10 1
006 1 107B 010 099J10400194000400
006 1 108AB010 J10 11
006 1 109C 010000002807K10 1
006 1 110C 010 099J10100062006666
006 1 111D 020000000509K10 1
006 1 112CD010 J10
006 1 113C 010 099J10100060011660
006 1 114B 010000001211K10 1
006 1 115BC010 J10 11
006 1 116B 010 099J10100660002727
006 1 117B 010000000806K10 1
006 1 118AB010 J10 11
006 1 119A 010 099J10100600002666
006 1 120A 010003001006K10 1
006 1 121A 010 099J10100075006660
006 1 122B 010000001407K10 1
006 1 123AB010 J10 11
006 1 124A 010 099J10100760002368
006 1 125A 010000000607K10 1
006 1 126A 010 099J10400560003570
006 1 127B 020030002410K10 1
006 1 128B 010 099J10401550002000
006 1 129B 010 099J10400730002000
006 1 130AB010 J10 11

```

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Model Lines

006	1	131A	020003000807k10
006	1	132A	010000003307k10
006	1	133A	020000001507k10
999			

1
1
1 2

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Modified Rational Model Results Report

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

Project Description

VCRat version: 2.6.2009.7
VCRain version: 200703

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

Page: 2

Model Results																
SUBAREA DATA AND RESULTS							ACCUMULATED DATA				ROUTING AFTER ACCUMULATION					
VEL	NODE	SOIL	RAIN	TC	%	AREA	FLOW	AREA	FLOW	TIME	CHANNEL	LENGTH	SLOPE	SIZE	H:V	N VALUES
(FT/S)	DEPTH	TYPE	ZONE	(MIN)	IMP	(AC)	(CFS)	(AC)	(CFS)	(MIN)	TYPE	(FT)	(FT/FT)	(FT)	(Z)	CHNL SIDES
	ID															
	100A :	Start						0	0							
	100A	---	---	--	--	---	---			----	-----	----	-----	---	----	-----
	101A :	Start - Area A														
	101A	010	K25	15	0	114	223	114	223	1154	-----	----	-----	---	----	-----
	102A	---	---	--	--	---	---	114	223	1154	PIPE	202	0.03860	3.75	----	-----
	103A	---	---	--	--	---	---	114	223	1154	PIPE	373	0.00800	5.00	----	-----
	104A	---	---	--	--	---	---	114	222	1156	PIPE	224	0.05600	3.50	----	-----
	105A	---	---	--	--	---	---	114	222	1156	PIPE	131	0.00400	5.50	----	-----
	106B :	Area B														

Channel Islands_25yr_exist.out															
106B	020	K25	9	30	7	18	7	18	1154	-----	----	-----	---	----	-----
107B	---	---	--	--	---	---	7	18	1154	PIPE	194	0.00400	2.25	----	-----
108AB	***** * Peak in A: 221.52 cfs @ 1157 min Q in B: 17.48 cfs Combined Q: 239.00 cfs * * Peak in B: 17.97 cfs @ 1155 min Q in A: 215.61 cfs Combined Q: 233.58 cfs * * Combined Peak: 239.03 cfs @ 1156 min Q in A: 221.21 cfs Q in B: 17.81 cfs * *****														
108AB	---	---	--	--	7	18	121	239	1156	-----	----	-----	---	----	-----
109C : Area C1 C2															
109C	010	K25	7	0	28	88	28	88	1154	-----	----	-----	---	----	-----
110C	---	---	--	--	---	---	28	88	1154	MOUNTAIN	62	0.06666	---	----	-----
111D : Area C3															
111D	020	K25	9	0	5	12	5	12	1154	-----	----	-----	---	----	-----
112CD	---	---	--	--	5	12	33	101	1154	-----	----	-----	---	----	-----
113C	---	---	--	--	---	---	33	101	1154	MOUNTAIN	60	0.11660	---	----	-----
114B : Area C4															
114B	010	K25	9	0	12	32	12	32	1154	-----	----	-----	---	----	-----
115BC	***** * Peak in B: 32.24 cfs @ 1154 min Q in C: 100.42 cfs Combined Q: 132.66 cfs * * Peak in C: 100.42 cfs @ 1154 min Q in B: 32.24 cfs Combined Q: 132.66 cfs * * Combined Peak: 132.66 cfs @ 1154 min Q in B: 32.24 cfs Q in C: 100.42 cfs * *****														
115BC	---	---	--	--	33	100	45	133	1154	-----	----	-----	---	----	-----
116B	---	---	--	--	---	---	45	133	1154	MOUNTAIN	660	0.02727	---	----	-----
117B : Area C5															
117B	010	K25	6	0	8	28	53	136	1157	-----	----	-----	---	----	-----
118AB: Confluence															
118AB	***** * Peak in A: 239.03 cfs @ 1156 min Q in B: 132.90 cfs Combined Q: 371.93 cfs * * Peak in B: 135.96 cfs @ 1157 min Q in A: 239.00 cfs Combined Q: 374.97 cfs * * Combined Peak: 374.97 cfs @ 1157 min Q in A: 239.00 cfs Q in B: 135.96 cfs * *****														
118AB	---	---	--	--	53	136	174	375	1157	-----	----	-----	---	----	-----
119A	---	---	--	--	---	---	174	375	1157	MOUNTAIN	600	0.02666	---	----	-----
120A : Area A6															
120A	010	K25	6	3	10	35	184	377	1158	-----	----	-----	---	----	-----
121A	---	---	--	--	---	---	184	377	1158	MOUNTAIN	75	0.06660	---	----	-----
122B : Area A7															
122B	010	K25	6	0	14	49	14	49	1154	-----	----	-----	---	----	-----

Model Results																	
SUBAREA DATA AND RESULTS							ACCUMULATED DATA			ROUTING AFTER ACCUMULATION							
VEL	NODE	SOIL	RAIN	TC	%	AREA	FLOW	AREA	FLOW	TIME	CHANNEL	LENGTH	SLOPE	SIZE	H:V	N VALUES	
(FT/S)	ID	TYPE	ZONE	(MIN)	IMP	(AC)	(CFS)	(AC)	(CFS)	(MIN)	TYPE	(FT)	(FT/FT)	(FT)	(Z)	CHNL	SIDES
----- ----- -----																	
123AB: Confluence																	

* Peak in A: 376.15 cfs @ 1159 min Q in B: 9.83 cfs Combined Q: 385.98 cfs *																	
* Peak in B: 49.00 cfs @ 1154 min Q in A: 260.73 cfs Combined Q: 309.73 cfs *																	
* Combined Peak: 393.08 cfs @ 1158 min Q in A: 375.25 cfs Q in B: 17.83 cfs *																	

123AB	---	---	--	--		14	49	198	393	1158	-----	----	-----	---	----	-----	-----
124A	---	---	--	--		---	---	198	393	1158	MOUNTAIN	760	0.02368	---	----	-----	-----
125A : Area A8	125A	010	K25	7	0	6	19	204	385	1161	-----	----	-----	---	----	-----	-----
126A	---	---	--	--		---	---	204	385	1161	PIPE	560	0.03570	4.50	----	-----	-----
127B : Area D1	127B	020	K25	8	30	24	67	24	67	1154	-----	----	-----	---	----	-----	-----
128B	---	---	--	--		---	---	24	67	1154	PIPE	1550	0.02000	2.75	----	-----	-----
129B	---	---	--	--		---	---	24	64	1157	PIPE	730	0.02000	2.75	----	-----	-----
130AB *****																	
* Peak in A: 383.84 cfs @ 1162 min Q in B: 47.20 cfs Combined Q: 431.03 cfs *																	
* Peak in B: 62.48 cfs @ 1159 min Q in A: 356.26 cfs Combined Q: 418.74 cfs *																	
* Combined Peak: 436.46 cfs @ 1161 min Q in A: 382.01 cfs Q in B: 54.45 cfs *																	

130AB	---	---	--	--		24	62	228	436	1161	-----	----	-----	---	----	-----	-----
131A : Area D2	131A	020	K25	7	3	8	24	236	440	1161	-----	----	-----	---	----	-----	-----
132A : Area A9	132A	010	K25	6	0	33	116	269	458	1161	-----	----	-----	---	----	-----	-----
133A : Area A10	133A	020	K25	7	0	15	44	284	469	1158	-----	----	-----	---	----	-----	-----

TYPE	ERR NO	PROCEDURE	LOCATION	MESSAGE
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NO ISSUES OR WARNINGS DETECTED

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

Page: 4

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 101A

DESCRIPTION: Start - Area A
 TOTAL AREA TO HYDROGRAPH: 114 acres
 HYDROGRAPH PEAK: 223 cfs
 TIME OF PEAK: 1154 minutes
 HYDROGRAPH VOLUME: 14.34 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	11.97	1050	23.39	1100	36.80	1110	40.99	1120	44.46
1130	56.54	1131	58.55	1132	60.56	1133	62.56	1134	64.57
1135	66.58	1136	68.35	1137	70.13	1138	71.91	1139	73.69
1140	75.47	1141	77.98	1142	80.50	1143	83.07	1144	85.64
1145	88.21	1146	91.24	1147	94.28	1148	97.54	1149	122.56
1150	147.25	1151	171.37	1152	195.62	1153	220.25	1154	222.98
1155	222.53	1156	220.34	1157	218.15	1158	215.96	1159	213.77
1160	211.58	1161	206.39	1162	201.19	1163	195.76	1164	168.34
1165	141.11	1166	114.37	1167	86.66	1168	58.73	1169	52.85
1170	50.16	1171	47.61	1172	45.05	1173	42.50	1174	39.95
1175	37.39	1176	36.53	1177	35.66	1178	34.79	1179	33.93
1180	33.06	1181	31.56	1182	30.05	1183	28.55	1184	27.04
1185	25.54	1186	24.90	1187	24.26	1188	23.62	1189	22.98
1190	22.34	1191	21.11	1192	19.88	1193	18.65	1194	17.42
1195	16.19	1196	15.59	1197	15.00	1198	14.41	1199	13.82
1200	13.22	1201	12.63	1202	12.04	1203	11.44	1204	10.85
1205	10.26	1206	10.26	1207	10.26	1208	10.26	1209	10.26
1210	10.26	1211	9.78	1212	9.30	1213	8.82	1214	8.35
1215	7.87	1216	7.39	1217	6.91	1218	6.43	1219	5.95
1220	5.47	1221	5.00	1222	4.52	1223	4.04	1224	3.56
1225	3.08	1226	3.08	1227	3.08	1228	3.08	1229	3.08
1230	3.08	1231	2.69	1232	2.30	1233	1.91	1234	1.53
1235	1.14	1236	0.75	1237	0.36	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00

Channel Islands_25yr_exist.out
 1350 0.00 1360 0.00 1370 0.00 1380 0.00 1390 0.00
 1400 0.00 1420 0.00 1440 0.00 1460 0.00 1500 0.00

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Ventura County Watershed Protection District
 Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

Page: 5

Hydrograph Printouts

 HYDROGRAPH PRINTOUT AT: 106B

DESCRIPTION: Area B
 TOTAL AREA TO HYDROGRAPH: 7 acres
 HYDROGRAPH PEAK: 18 cfs
 TIME OF PEAK: 1154 minutes
 HYDROGRAPH VOLUME: 1.41 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.12	200	0.16	300	0.21	400	0.26
500	0.32	600	0.39	700	0.47	800	0.55	900	0.55
1000	0.83	1050	1.50	1100	2.29	1110	2.66	1120	2.79
1130	3.82	1131	3.91	1132	3.99	1133	4.08	1134	4.17
1135	4.26	1136	4.44	1137	4.62	1138	4.80	1139	4.98
1140	5.07	1141	5.23	1142	5.39	1143	5.55	1144	5.71
1145	5.78	1146	5.98	1147	6.18	1148	6.40	1149	8.72
1150	10.95	1151	13.22	1152	15.52	1153	17.88	1154	18.08
1155	17.83	1156	17.49	1157	17.12	1158	14.58	1159	12.09
1160	9.63	1161	7.02	1162	4.30	1163	3.70	1164	3.42
1165	3.25	1166	3.08	1167	2.91	1168	2.75	1169	2.58
1170	2.58	1171	2.50	1172	2.41	1173	2.33	1174	2.24
1175	2.16	1176	2.07	1177	1.99	1178	1.90	1179	1.82
1180	1.82	1181	1.76	1182	1.69	1183	1.63	1184	1.57
1185	1.51	1186	1.44	1187	1.38	1188	1.32	1189	1.25
1190	1.25	1191	1.20	1192	1.14	1193	1.08	1194	1.02
1195	0.96	1196	0.91	1197	0.85	1198	0.80	1199	0.78
1200	0.78	1201	0.78	1202	0.78	1203	0.78	1204	0.78
1205	0.78	1206	0.78	1207	0.78	1208	0.78	1209	0.78
1210	0.78	1211	0.76	1212	0.75	1213	0.74	1214	0.72
1215	0.71	1216	0.69	1217	0.68	1218	0.67	1219	0.65
1220	0.65	1221	0.65	1222	0.65	1223	0.65	1224	0.65
1225	0.65	1226	0.65	1227	0.65	1228	0.65	1229	0.65
1230	0.65	1231	0.64	1232	0.63	1233	0.62	1234	0.61
1235	0.60	1236	0.58	1237	0.57	1238	0.56	1239	0.55
1240	0.55	1241	0.55	1242	0.55	1243	0.55	1244	0.55
1245	0.55	1246	0.55	1247	0.55	1248	0.55	1249	0.55
1250	0.55	1251	0.55	1252	0.55	1253	0.55	1254	0.55
1255	0.55	1256	0.55	1257	0.55	1258	0.55	1259	0.55
1260	0.55	1261	0.54	1262	0.54	1263	0.53	1264	0.52
1265	0.51	1266	0.51	1267	0.50	1268	0.49	1269	0.48
1270	0.48	1271	0.48	1272	0.48	1273	0.48	1274	0.48
1275	0.48	1276	0.48	1277	0.48	1278	0.48	1279	0.48
1280	0.48	1281	0.48	1282	0.48	1283	0.48	1284	0.48
1285	0.48	1286	0.48	1287	0.48	1288	0.48	1289	0.48

Channel Islands_25yr_exist.out

1290	0.48	1291	0.48	1292	0.48	1293	0.48	1294	0.48
1295	0.48	1296	0.48	1297	0.48	1298	0.48	1299	0.48
1300	0.48	1310	0.35	1320	0.35	1330	0.35	1340	0.35
1350	0.22	1360	0.22	1370	0.22	1380	0.22	1390	0.22
1400	0.22	1420	0.13	1440	0.13	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

Page: 6

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 108AB

TOTAL AREA TO HYDROGRAPH:	121	acres
HYDROGRAPH PEAK:	239	cfs
TIME OF PEAK:	1156	minutes
HYDROGRAPH VOLUME:	16.61	acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.80	200	0.80	300	0.80	400	0.80
500	0.80	600	0.80	700	0.86	800	0.94	900	0.95
1000	12.18	1050	24.44	1100	38.36	1110	42.74	1120	46.60
1130	57.36	1131	59.10	1132	60.86	1133	62.86	1134	64.94
1135	67.06	1136	69.16	1137	71.25	1138	73.29	1139	75.30
1140	77.27	1141	79.26	1142	81.48	1143	84.02	1144	86.75
1145	89.48	1146	92.25	1147	95.20	1148	98.39	1149	104.50
1150	119.43	1151	143.66	1152	170.71	1153	196.81	1154	219.24
1155	233.58	1156	239.03	1157	239.00	1158	236.38	1159	232.16
1160	227.38	1161	222.47	1162	216.52	1163	209.69	1164	200.79
1165	184.78	1166	160.06	1167	133.26	1168	107.15	1169	83.42
1170	66.11	1171	56.95	1172	52.73	1173	49.94	1174	47.33
1175	44.80	1176	42.35	1177	40.30	1178	38.79	1179	37.74
1180	36.81	1181	35.87	1182	34.81	1183	33.51	1184	32.03
1185	30.49	1186	28.98	1187	27.64	1188	26.60	1189	25.81
1190	25.11	1191	24.44	1192	23.73	1193	22.77	1194	21.61
1195	20.37	1196	19.13	1197	17.97	1198	17.01	1199	16.24
1200	15.60	1201	14.99	1202	14.40	1203	13.82	1204	13.24
1205	12.71	1206	12.24	1207	11.88	1208	11.49	1209	11.23
1210	11.10	1211	11.05	1212	11.00	1213	10.87	1214	10.62
1215	10.24	1216	9.80	1217	9.32	1218	8.85	1219	8.37
1220	7.89	1221	7.41	1222	6.95	1223	6.49	1224	6.04
1225	5.58	1226	5.12	1227	4.67	1228	4.27	1229	3.98
1230	3.82	1231	3.76	1232	3.73	1233	3.66	1234	3.51
1235	3.26	1236	2.94	1237	2.61	1238	2.27	1239	1.92
1240	1.55	1241	1.23	1242	1.04	1243	0.98	1244	0.96
1245	0.95	1246	0.95	1247	0.95	1248	0.95	1249	0.95
1250	0.95	1251	0.95	1252	0.95	1253	0.95	1254	0.95
1255	0.95	1256	0.95	1257	0.95	1258	0.95	1259	0.95
1260	0.95	1261	0.95	1262	0.95	1263	0.94	1264	0.94
1265	0.93	1266	0.92	1267	0.91	1268	0.91	1269	0.90
1270	0.89	1271	0.89	1272	0.89	1273	0.89	1274	0.88
1275	0.88	1276	0.88	1277	0.88	1278	0.88	1279	0.88

Channel Islands_25yr_exist.out

1280	0.88	1281	0.88	1282	0.88	1283	0.88	1284	0.88
1285	0.88	1286	0.88	1287	0.88	1288	0.88	1289	0.88
1290	0.88	1291	0.88	1292	0.88	1293	0.88	1294	0.88
1295	0.88	1296	0.88	1297	0.88	1298	0.88	1299	0.88
1300	0.88	1310	0.82	1320	0.80	1330	0.80	1340	0.80
1350	0.80	1360	0.80	1370	0.80	1380	0.80	1390	0.80
1400	0.80	1420	0.80	1440	0.80	1460	0.80	1500	0.80

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

Page: 7

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 109C

DESCRIPTION: Area C1 C2
TOTAL AREA TO HYDROGRAPH: 28 acres
HYDROGRAPH PEAK: 88 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 3.46 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	2.94	1050	5.75	1100	9.04	1110	10.58	1120	11.09
1130	15.29	1131	15.74	1132	16.20	1133	16.66	1134	17.11
1135	17.57	1136	18.50	1137	19.44	1138	19.93	1139	20.42
1140	20.91	1141	21.80	1142	22.68	1143	23.07	1144	23.47
1145	23.86	1146	24.97	1147	26.07	1148	26.90	1149	39.05
1150	51.41	1151	63.74	1152	76.08	1153	87.96	1154	88.32
1155	86.88	1156	73.39	1157	59.90	1158	46.41	1159	32.94
1160	19.20	1161	16.10	1162	14.69	1163	13.80	1164	12.91
1165	12.02	1166	11.14	1167	10.25	1168	10.25	1169	10.25
1170	10.25	1171	9.79	1172	9.34	1173	8.88	1174	8.42
1175	7.97	1176	7.51	1177	7.06	1178	7.06	1179	7.06
1180	7.06	1181	6.72	1182	6.38	1183	6.05	1184	5.71
1185	5.38	1186	5.04	1187	4.70	1188	4.70	1189	4.70
1190	4.70	1191	4.39	1192	4.08	1193	3.77	1194	3.46
1195	3.14	1196	2.83	1197	2.52	1198	2.52	1199	2.52
1200	2.52	1201	2.52	1202	2.52	1203	2.52	1204	2.52
1205	2.52	1206	2.52	1207	2.52	1208	2.52	1209	2.52
1210	2.52	1211	2.27	1212	2.02	1213	1.76	1214	1.51
1215	1.26	1216	1.01	1217	0.76	1218	0.76	1219	0.76
1220	0.76	1221	0.76	1222	0.76	1223	0.76	1224	0.76
1225	0.76	1226	0.76	1227	0.76	1228	0.76	1229	0.76
1230	0.76	1231	0.55	1232	0.35	1233	0.14	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00

Channel Islands_25yr_exist.out

1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

Page: 8

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 111D

DESCRIPTION: Area C3
TOTAL AREA TO HYDROGRAPH: 5 acres
HYDROGRAPH PEAK: 12 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 0.42 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	0.02	1050	0.51	1100	1.07	1110	1.34	1120	1.43
1130	2.17	1131	2.24	1132	2.30	1133	2.37	1134	2.43
1135	2.49	1136	2.63	1137	2.76	1138	2.89	1139	3.02
1140	3.08	1141	3.20	1142	3.31	1143	3.42	1144	3.54
1145	3.59	1146	3.73	1147	3.88	1148	4.03	1149	5.68
1150	7.26	1151	8.88	1152	10.53	1153	12.23	1154	12.37
1155	12.19	1156	11.94	1157	11.68	1158	9.85	1159	8.07
1160	6.33	1161	4.48	1162	2.52	1163	2.08	1164	1.88
1165	1.76	1166	1.64	1167	1.52	1168	1.40	1169	1.28
1170	1.28	1171	1.22	1172	1.16	1173	1.10	1174	1.04
1175	0.98	1176	0.91	1177	0.85	1178	0.79	1179	0.73
1180	0.73	1181	0.69	1182	0.64	1183	0.60	1184	0.55
1185	0.51	1186	0.46	1187	0.42	1188	0.37	1189	0.33
1190	0.33	1191	0.29	1192	0.24	1193	0.20	1194	0.16
1195	0.12	1196	0.08	1197	0.04	1198	0.00	1199	0.00
1200	0.00	1201	0.00	1202	0.00	1203	0.00	1204	0.00
1205	0.00	1206	0.00	1207	0.00	1208	0.00	1209	0.00
1210	0.00	1211	0.00	1212	0.00	1213	0.00	1214	0.00
1215	0.00	1216	0.00	1217	0.00	1218	0.00	1219	0.00
1220	0.00	1221	0.00	1222	0.00	1223	0.00	1224	0.00
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00

Channel Islands_25yr_exist.out

1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 114B

DESCRIPTION: Area C4
TOTAL AREA TO HYDROGRAPH: 12 acres
HYDROGRAPH PEAK: 32 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 1.49 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	1.26	1050	2.46	1100	3.87	1110	4.54	1120	4.75
1130	6.55	1131	6.70	1132	6.86	1133	7.01	1134	7.16
1135	7.31	1136	7.62	1137	7.94	1138	8.25	1139	8.56
1140	8.73	1141	9.02	1142	9.32	1143	9.61	1144	9.91
1145	10.04	1146	10.41	1147	10.78	1148	11.19	1149	15.36
1150	19.47	1151	23.58	1152	27.70	1153	31.89	1154	32.24
1155	31.80	1156	31.18	1157	30.53	1158	26.03	1159	21.54
1160	17.03	1161	12.30	1162	7.38	1163	6.34	1164	5.87
1165	5.58	1166	5.28	1167	4.98	1168	4.69	1169	4.39
1170	4.39	1171	4.24	1172	4.09	1173	3.94	1174	3.78
1175	3.63	1176	3.48	1177	3.33	1178	3.18	1179	3.02
1180	3.02	1181	2.91	1182	2.80	1183	2.69	1184	2.58
1185	2.46	1186	2.35	1187	2.24	1188	2.13	1189	2.02
1190	2.02	1191	1.91	1192	1.81	1193	1.70	1194	1.60
1195	1.50	1196	1.39	1197	1.29	1198	1.18	1199	1.08
1200	1.08	1201	1.08	1202	1.08	1203	1.08	1204	1.08
1205	1.08	1206	1.08	1207	1.08	1208	1.08	1209	1.08
1210	1.08	1211	1.00	1212	0.91	1213	0.83	1214	0.74
1215	0.66	1216	0.58	1217	0.49	1218	0.41	1219	0.32
1220	0.32	1221	0.32	1222	0.32	1223	0.32	1224	0.32
1225	0.32	1226	0.32	1227	0.32	1228	0.32	1229	0.32
1230	0.32	1231	0.26	1232	0.19	1233	0.12	1234	0.05

Channel Islands_25yr_exist.out

1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 115BC

TOTAL AREA TO HYDROGRAPH: 45 acres
HYDROGRAPH PEAK: 133 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 6.03 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	0.40	400	0.40
500	0.40	600	0.40	700	0.40	800	0.40	900	0.40
1000	4.17	1050	8.66	1100	13.92	1110	16.31	1120	17.28
1130	23.54	1131	24.41	1132	25.03	1133	25.72	1134	26.40
1135	27.07	1136	28.16	1137	29.53	1138	30.73	1139	31.68
1140	32.42	1141	33.47	1142	34.77	1143	35.85	1144	36.66
1145	37.26	1146	38.46	1147	40.09	1148	41.63	1149	53.45
1150	72.39	1151	90.69	1152	109.19	1153	127.43	1154	132.66
1155	131.46	1156	122.15	1157	107.23	1158	88.63	1159	69.17
1160	50.24	1161	35.53	1162	26.07	1163	22.95	1164	21.33
1165	20.02	1166	18.70	1167	17.43	1168	16.46	1169	15.95
1170	15.92	1171	15.57	1172	14.95	1173	14.28	1174	13.63
1175	12.97	1176	12.31	1177	11.64	1178	11.12	1179	10.83
1180	10.81	1181	10.57	1182	10.13	1183	9.64	1184	9.15
1185	8.67	1186	8.20	1187	7.71	1188	7.31	1189	7.07
1190	7.05	1191	6.84	1192	6.46	1193	6.01	1194	5.56
1195	5.10	1196	4.65	1197	4.22	1198	3.88	1199	3.62
1200	3.60	1201	3.60	1202	3.60	1203	3.60	1204	3.60
1205	3.60	1206	3.60	1207	3.60	1208	3.60	1209	3.60
1210	3.60	1211	3.48	1212	3.25	1213	2.94	1214	2.61
1215	2.28	1216	1.96	1217	1.64	1218	1.34	1219	1.12
1220	1.08	1221	1.08	1222	1.08	1223	1.08	1224	1.08

Channel Islands_25yr_exist.out

1225	1.08	1226	1.08	1227	1.08	1228	1.08	1229	1.08
1230	1.08	1231	0.99	1232	0.85	1233	0.66	1234	0.49
1235	0.40	1236	0.40	1237	0.40	1238	0.40	1239	0.40
1240	0.40	1241	0.40	1242	0.40	1243	0.40	1244	0.40
1245	0.40	1246	0.40	1247	0.40	1248	0.40	1249	0.40
1250	0.40	1251	0.40	1252	0.40	1253	0.40	1254	0.40
1255	0.40	1256	0.40	1257	0.40	1258	0.40	1259	0.40
1260	0.40	1261	0.40	1262	0.40	1263	0.40	1264	0.40
1265	0.40	1266	0.40	1267	0.40	1268	0.40	1269	0.40
1270	0.40	1271	0.40	1272	0.40	1273	0.40	1274	0.40
1275	0.40	1276	0.40	1277	0.40	1278	0.40	1279	0.40
1280	0.40	1281	0.40	1282	0.40	1283	0.40	1284	0.40
1285	0.40	1286	0.40	1287	0.40	1288	0.40	1289	0.40
1290	0.40	1291	0.40	1292	0.40	1293	0.40	1294	0.40
1295	0.40	1296	0.40	1297	0.40	1298	0.40	1299	0.40
1300	0.40	1310	0.40	1320	0.40	1330	0.40	1340	0.40
1350	0.40	1360	0.40	1370	0.40	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 117B

DESCRIPTION: Area C5
TOTAL AREA TO HYDROGRAPH: 53 acres
HYDROGRAPH PEAK: 136 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 7.05 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	0.40	400	0.40
500	0.40	600	0.40	700	0.40	800	0.40	900	0.40
1000	4.40	1050	9.56	1100	15.77	1110	17.86	1120	19.75
1130	24.46	1131	25.19	1132	25.94	1133	26.72	1134	27.53
1135	28.38	1136	29.39	1137	30.27	1138	31.17	1139	32.18
1140	33.34	1141	34.72	1142	35.91	1143	37.06	1144	38.24
1145	39.48	1146	40.96	1147	42.22	1148	43.45	1149	48.59
1150	53.97	1151	61.09	1152	73.16	1153	91.21	1154	108.75
1155	122.86	1156	132.90	1157	135.96	1158	131.84	1159	121.35
1160	110.35	1161	96.80	1162	82.63	1163	69.20	1164	57.05
1165	47.24	1166	39.72	1167	34.67	1168	31.01	1169	28.23
1170	26.03	1171	24.10	1172	22.48	1173	21.19	1174	20.18
1175	19.30	1176	18.49	1177	17.85	1178	17.23	1179	16.62
1180	16.00	1181	15.29	1182	14.64	1183	14.06	1184	13.55
1185	13.10	1186	12.63	1187	12.26	1188	11.86	1189	11.45
1190	11.03	1191	10.50	1192	9.98	1193	9.48	1194	9.07
1195	8.73	1196	8.38	1197	8.12	1198	7.82	1199	7.51
1200	7.17	1201	6.83	1202	6.47	1203	6.13	1204	5.79
1205	5.50	1206	5.26	1207	5.07	1208	4.92	1209	4.79

Channel Islands_25yr_exist.out									
1210	4.70	1211	4.56	1212	4.43	1213	4.30	1214	4.19
1215	4.07	1216	3.96	1217	3.91	1218	3.84	1219	3.74
1220	3.62	1221	3.48	1222	3.32	1223	3.15	1224	2.97
1225	2.79	1226	2.61	1227	2.43	1228	2.27	1229	2.13
1230	2.01	1231	1.84	1232	1.68	1233	1.54	1234	1.46
1235	1.41	1236	1.36	1237	1.32	1238	1.29	1239	1.25
1240	1.20	1241	1.15	1242	1.09	1243	1.02	1244	0.95
1245	0.88	1246	0.82	1247	0.76	1248	0.71	1249	0.66
1250	0.62	1251	0.59	1252	0.56	1253	0.54	1254	0.52
1255	0.50	1256	0.49	1257	0.48	1258	0.46	1259	0.46
1260	0.45	1261	0.44	1262	0.43	1263	0.43	1264	0.43
1265	0.42	1266	0.42	1267	0.42	1268	0.41	1269	0.41
1270	0.41	1271	0.41	1272	0.41	1273	0.41	1274	0.41
1275	0.40	1276	0.40	1277	0.40	1278	0.40	1279	0.40
1280	0.40	1281	0.40	1282	0.40	1283	0.40	1284	0.40
1285	0.40	1286	0.40	1287	0.40	1288	0.40	1289	0.40
1290	0.40	1291	0.40	1292	0.40	1293	0.40	1294	0.40
1295	0.40	1296	0.40	1297	0.40	1298	0.40	1299	0.40
1300	0.40	1310	0.40	1320	0.40	1330	0.40	1340	0.40
1350	0.40	1360	0.40	1370	0.40	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

Page: 12

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 118AB

DESCRIPTION: Confluence
TOTAL AREA TO HYDROGRAPH: 174 acres
HYDROGRAPH PEAK: 375 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 23.65 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.20	200	1.20	300	1.20	400	1.20
500	1.20	600	1.20	700	1.26	800	1.34	900	1.35
1000	16.58	1050	34.00	1100	54.13	1110	60.60	1120	66.34
1130	81.81	1131	84.29	1132	86.80	1133	89.58	1134	92.47
1135	95.44	1136	98.56	1137	101.52	1138	104.47	1139	107.48
1140	110.61	1141	113.97	1142	117.39	1143	121.08	1144	124.99
1145	128.96	1146	133.21	1147	137.41	1148	141.84	1149	153.09
1150	173.39	1151	204.75	1152	243.87	1153	288.02	1154	327.99
1155	356.44	1156	371.93	1157	374.97	1158	368.22	1159	353.52
1160	337.73	1161	319.27	1162	299.15	1163	278.89	1164	257.84
1165	232.02	1166	199.79	1167	167.93	1168	138.16	1169	111.65
1170	92.14	1171	81.05	1172	75.21	1173	71.13	1174	67.51
1175	64.10	1176	60.84	1177	58.15	1178	56.02	1179	54.36
1180	52.81	1181	51.16	1182	49.46	1183	47.56	1184	45.58
1185	43.58	1186	41.61	1187	39.90	1188	38.46	1189	37.25
1190	36.14	1191	34.94	1192	33.70	1193	32.25	1194	30.68

Channel Islands_25yr_exist.out									
1195	29.09	1196	27.51	1197	26.09	1198	24.83	1199	23.75
1200	22.77	1201	21.82	1202	20.88	1203	19.94	1204	19.04
1205	18.21	1206	17.50	1207	16.95	1208	16.41	1209	16.02
1210	15.80	1211	15.61	1212	15.43	1213	15.18	1214	14.80
1215	14.31	1216	13.75	1217	13.23	1218	12.69	1219	12.11
1220	11.51	1221	10.89	1222	10.27	1223	9.64	1224	9.01
1225	8.37	1226	7.73	1227	7.10	1228	6.54	1229	6.11
1230	5.83	1231	5.60	1232	5.41	1233	5.20	1234	4.97
1235	4.67	1236	4.31	1237	3.93	1238	3.55	1239	3.17
1240	2.76	1241	2.38	1242	2.13	1243	2.00	1244	1.91
1245	1.84	1246	1.77	1247	1.71	1248	1.66	1249	1.61
1250	1.57	1251	1.54	1252	1.52	1253	1.49	1254	1.47
1255	1.45	1256	1.44	1257	1.43	1258	1.42	1259	1.41
1260	1.40	1261	1.39	1262	1.38	1263	1.37	1264	1.36
1265	1.35	1266	1.34	1267	1.33	1268	1.32	1269	1.31
1270	1.30	1271	1.30	1272	1.29	1273	1.29	1274	1.29
1275	1.29	1276	1.29	1277	1.29	1278	1.29	1279	1.29
1280	1.29	1281	1.29	1282	1.29	1283	1.29	1284	1.29
1285	1.29	1286	1.29	1287	1.29	1288	1.29	1289	1.29
1290	1.29	1291	1.29	1292	1.29	1293	1.29	1294	1.29
1295	1.28	1296	1.28	1297	1.28	1298	1.28	1299	1.28
1300	1.28	1310	1.22	1320	1.20	1330	1.20	1340	1.20
1350	1.20	1360	1.20	1370	1.20	1380	1.20	1390	1.20
1400	1.20	1420	1.20	1440	1.20	1460	1.20	1500	1.20

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

Page: 13

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 120A

DESCRIPTION: Area A6
TOTAL AREA TO HYDROGRAPH: 184 acres
HYDROGRAPH PEAK: 377 cfs
TIME OF PEAK: 1158 minutes
HYDROGRAPH VOLUME: 25.08 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.22	200	1.22	300	1.23	400	1.24
500	1.25	600	1.26	700	1.32	800	1.41	900	1.43
1000	16.21	1050	34.57	1100	55.75	1110	61.96	1120	68.33
1130	81.60	1131	83.52	1132	85.44	1133	87.58	1134	90.05
1135	92.77	1136	95.90	1137	98.99	1138	102.20	1139	105.46
1140	108.73	1141	112.18	1142	115.51	1143	118.96	1144	122.56
1145	126.33	1146	130.60	1147	134.87	1148	139.36	1149	148.71
1150	159.37	1151	174.26	1152	196.74	1153	229.63	1154	267.60
1155	305.55	1156	340.34	1157	365.04	1158	376.79	1159	376.10
1160	370.04	1161	357.94	1162	342.81	1163	325.23	1164	306.43
1165	286.62	1166	265.77	1167	241.49	1168	215.07	1169	187.74
1170	161.61	1171	137.86	1172	117.97	1173	102.64	1174	91.65
1175	83.87	1176	78.10	1177	73.51	1178	69.55	1179	66.17

Channel Islands_25yr_exist.out

1180	63.32	1181	60.80	1182	58.65	1183	56.69	1184	54.84
1185	53.05	1186	51.17	1187	49.35	1188	47.49	1189	45.66
1190	43.93	1191	42.22	1192	40.68	1193	39.24	1194	37.86
1195	36.46	1196	35.01	1197	33.71	1198	32.45	1199	31.13
1200	29.79	1201	28.50	1202	27.28	1203	26.15	1204	25.08
1205	24.07	1206	23.10	1207	22.16	1208	21.26	1209	20.42
1210	19.67	1211	18.88	1212	18.18	1213	17.58	1214	17.07
1215	16.64	1216	16.31	1217	16.08	1218	15.81	1219	15.48
1220	15.11	1221	14.70	1222	14.27	1223	13.81	1224	13.32
1225	12.81	1226	12.28	1227	11.74	1228	11.19	1229	10.63
1230	10.06	1231	9.41	1232	8.77	1233	8.15	1234	7.65
1235	7.22	1236	6.85	1237	6.51	1238	6.21	1239	5.93
1240	5.64	1241	5.35	1242	5.04	1243	4.74	1244	4.42
1245	4.11	1246	3.79	1247	3.48	1248	3.20	1249	2.95
1250	2.73	1251	2.55	1252	2.39	1253	2.26	1254	2.15
1255	2.05	1256	1.96	1257	1.89	1258	1.83	1259	1.77
1260	1.72	1261	1.68	1262	1.64	1263	1.61	1264	1.59
1265	1.56	1266	1.54	1267	1.52	1268	1.51	1269	1.50
1270	1.48	1271	1.47	1272	1.46	1273	1.45	1274	1.44
1275	1.43	1276	1.42	1277	1.41	1278	1.41	1279	1.40
1280	1.39	1281	1.39	1282	1.39	1283	1.38	1284	1.38
1285	1.38	1286	1.37	1287	1.37	1288	1.37	1289	1.37
1290	1.37	1291	1.36	1292	1.36	1293	1.36	1294	1.36
1295	1.36	1296	1.36	1297	1.36	1298	1.36	1299	1.36
1300	1.36	1310	1.33	1320	1.30	1330	1.26	1340	1.25
1350	1.23	1360	1.23	1370	1.23	1380	1.23	1390	1.23
1400	1.23	1420	1.22	1440	1.22	1460	1.20	1500	1.20

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 122B

DESCRIPTION: Area A7
TOTAL AREA TO HYDROGRAPH: 14 acres
HYDROGRAPH PEAK: 49 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 1.73 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	1.47	1050	2.87	1100	4.52	1110	5.29	1120	5.54
1130	7.64	1131	7.91	1132	8.18	1133	8.44	1134	8.71
1135	8.97	1136	9.52	1137	9.80	1138	10.09	1139	10.37
1140	10.66	1141	11.18	1142	11.41	1143	11.63	1144	11.86
1145	12.09	1146	12.74	1147	13.15	1148	13.63	1149	20.74
1150	27.94	1151	35.14	1152	41.93	1153	48.86	1154	49.00
1155	41.44	1156	33.57	1157	25.70	1158	17.83	1159	9.83
1160	8.54	1161	7.71	1162	7.20	1163	6.68	1164	6.16

Channel Islands_25yr_exist.out									
1165	5.64	1166	5.12	1167	5.12	1168	5.12	1169	5.12
1170	5.12	1171	4.86	1172	4.59	1173	4.33	1174	4.06
1175	3.79	1176	3.53	1177	3.53	1178	3.53	1179	3.53
1180	3.53	1181	3.33	1182	3.14	1183	2.94	1184	2.74
1185	2.55	1186	2.35	1187	2.35	1188	2.35	1189	2.35
1190	2.35	1191	2.17	1192	1.99	1193	1.81	1194	1.62
1195	1.44	1196	1.26	1197	1.26	1198	1.26	1199	1.26
1200	1.26	1201	1.26	1202	1.26	1203	1.26	1204	1.26
1205	1.26	1206	1.26	1207	1.26	1208	1.26	1209	1.26
1210	1.26	1211	1.11	1212	0.97	1213	0.82	1214	0.67
1215	0.53	1216	0.38	1217	0.38	1218	0.38	1219	0.38
1220	0.38	1221	0.38	1222	0.38	1223	0.38	1224	0.38
1225	0.38	1226	0.38	1227	0.38	1228	0.38	1229	0.38
1230	0.38	1231	0.26	1232	0.14	1233	0.02	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 123AB

DESCRIPTION: Confluence
TOTAL AREA TO HYDROGRAPH: 198 acres
HYDROGRAPH PEAK: 393 cfs
TIME OF PEAK: 1158 minutes
HYDROGRAPH VOLUME: 26.82 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.22	200	1.22	300	1.23	400	1.24
500	1.25	600	1.25	700	1.32	800	1.41	900	1.43
1000	17.56	1050	37.32	1100	60.12	1110	67.06	1120	73.70
1130	88.79	1131	90.95	1132	93.10	1133	95.46	1134	98.11
1135	101.05	1136	104.61	1137	108.02	1138	111.48	1139	115.04
1140	118.59	1141	122.52	1142	126.13	1143	129.77	1144	133.58
1145	137.54	1146	142.34	1147	147.07	1148	151.97	1149	167.16

Channel Islands_25yr_exist.out									
1150	185.12	1151	206.03	1152	233.95	1153	271.82	1154	309.73
1155	340.41	1156	368.27	1157	387.10	1158	393.08	1159	385.98
1160	379.85	1161	367.70	1162	352.59	1163	334.91	1164	315.81
1165	295.77	1166	274.63	1167	251.27	1168	225.20	1169	198.36
1170	172.11	1171	147.89	1172	127.02	1173	110.57	1174	98.36
1175	89.63	1176	83.14	1177	78.28	1178	74.16	1179	70.64
1180	67.66	1181	64.86	1182	62.42	1183	60.21	1184	58.14
1185	56.17	1186	54.11	1187	52.28	1188	50.45	1189	48.60
1190	46.84	1191	44.95	1192	43.17	1193	41.52	1194	39.94
1195	38.38	1196	36.77	1197	35.42	1198	34.20	1199	32.89
1200	31.56	1201	30.25	1202	29.01	1203	27.85	1204	26.76
1205	25.73	1206	24.75	1207	23.79	1208	22.88	1209	22.02
1210	21.24	1211	20.32	1212	19.44	1213	18.65	1214	17.96
1215	17.35	1216	16.83	1217	16.56	1218	16.34	1219	16.03
1220	15.69	1221	15.30	1222	14.88	1223	14.43	1224	13.96
1225	13.46	1226	12.95	1227	12.42	1228	11.87	1229	11.32
1230	10.76	1231	10.04	1232	9.28	1233	8.53	1234	7.95
1235	7.48	1236	7.07	1237	6.72	1238	6.40	1239	6.10
1240	5.82	1241	5.53	1242	5.23	1243	4.93	1244	4.63
1245	4.32	1246	4.00	1247	3.69	1248	3.40	1249	3.12
1250	2.89	1251	2.68	1252	2.51	1253	2.36	1254	2.23
1255	2.12	1256	2.03	1257	1.95	1258	1.87	1259	1.81
1260	1.76	1261	1.71	1262	1.67	1263	1.64	1264	1.61
1265	1.58	1266	1.56	1267	1.54	1268	1.52	1269	1.51
1270	1.49	1271	1.48	1272	1.47	1273	1.46	1274	1.45
1275	1.44	1276	1.43	1277	1.42	1278	1.41	1279	1.41
1280	1.40	1281	1.39	1282	1.39	1283	1.39	1284	1.38
1285	1.38	1286	1.38	1287	1.37	1288	1.37	1289	1.37
1290	1.37	1291	1.37	1292	1.36	1293	1.36	1294	1.36
1295	1.36	1296	1.36	1297	1.36	1298	1.36	1299	1.36
1300	1.36	1310	1.33	1320	1.30	1330	1.27	1340	1.25
1350	1.24	1360	1.23	1370	1.23	1380	1.23	1390	1.23
1400	1.23	1420	1.22	1440	1.22	1460	1.22	1500	1.22

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 125A

DESCRIPTION: Area A8
TOTAL AREA TO HYDROGRAPH: 204 acres
HYDROGRAPH PEAK: 385 cfs
TIME OF PEAK: 1161 minutes
HYDROGRAPH VOLUME: 27.66 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.22	200	1.22	300	1.23	400	1.24
500	1.24	600	1.25	700	1.30	800	1.40	900	1.43
1000	16.14	1050	36.10	1100	59.65	1110	65.88	1120	72.91
1130	85.11	1131	86.77	1132	88.42	1133	90.17	1134	92.09

Channel Islands_25yr_exist.out									
1135	94.22	1136	96.65	1137	99.32	1138	102.21	1139	105.42
1140	108.81	1141	112.43	1142	116.15	1143	119.92	1144	123.78
1145	127.64	1146	131.70	1147	135.87	1148	140.25	1149	147.37
1150	155.12	1151	165.78	1152	181.09	1153	200.88	1154	224.39
1155	255.05	1156	287.78	1157	320.26	1158	349.14	1159	370.78
1160	381.72	1161	385.14	1162	382.36	1163	374.72	1164	363.02
1165	348.50	1166	331.82	1167	313.98	1168	294.85	1169	274.69
1170	252.63	1171	229.90	1172	206.77	1173	184.44	1174	163.65
1175	145.05	1176	129.27	1177	116.23	1178	105.74	1179	97.30
1180	90.49	1181	84.89	1182	80.12	1183	75.98	1184	72.40
1185	69.30	1186	66.51	1187	64.03	1188	61.79	1189	59.67
1190	57.76	1191	55.83	1192	53.92	1193	52.04	1194	50.18
1195	48.33	1196	46.53	1197	44.79	1198	43.16	1199	41.56
1200	40.03	1201	38.58	1202	37.20	1203	35.99	1204	34.85
1205	33.69	1206	32.53	1207	31.38	1208	30.27	1209	29.18
1210	28.14	1211	27.08	1212	26.05	1213	25.07	1214	24.12
1215	23.18	1216	22.26	1217	21.37	1218	20.57	1219	19.82
1220	19.13	1221	18.53	1222	18.02	1223	17.57	1224	17.16
1225	16.86	1226	16.57	1227	16.25	1228	15.91	1229	15.55
1230	15.17	1231	14.72	1232	14.25	1233	13.77	1234	13.29
1235	12.82	1236	12.32	1237	11.79	1238	11.23	1239	10.68
1240	10.14	1241	9.62	1242	9.14	1243	8.68	1244	8.26
1245	7.86	1246	7.49	1247	7.13	1248	6.79	1249	6.47
1250	6.15	1251	5.85	1252	5.54	1253	5.25	1254	4.96
1255	4.68	1256	4.40	1257	4.14	1258	3.90	1259	3.66
1260	3.45	1261	3.25	1262	3.06	1263	2.90	1264	2.74
1265	2.60	1266	2.47	1267	2.36	1268	2.26	1269	2.16
1270	2.08	1271	2.01	1272	1.94	1273	1.88	1274	1.82
1275	1.77	1276	1.73	1277	1.69	1278	1.66	1279	1.63
1280	1.60	1281	1.58	1282	1.56	1283	1.54	1284	1.52
1285	1.50	1286	1.49	1287	1.47	1288	1.46	1289	1.45
1290	1.44	1291	1.43	1292	1.43	1293	1.42	1294	1.42
1295	1.41	1296	1.41	1297	1.40	1298	1.40	1299	1.40
1300	1.39	1310	1.37	1320	1.35	1330	1.32	1340	1.29
1350	1.27	1360	1.25	1370	1.24	1380	1.23	1390	1.23
1400	1.23	1420	1.23	1440	1.22	1460	1.22	1500	1.22

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 127B

DESCRIPTION: Area D1
TOTAL AREA TO HYDROGRAPH: 24 acres
HYDROGRAPH PEAK: 67 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 4.82 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.41	200	0.55	300	0.71	400	0.89

Channel Islands_25yr_exist.out									
500	1.11	600	1.32	700	1.60	800	1.87	900	1.90
1000	2.85	1050	5.16	1100	7.86	1110	9.13	1120	9.55
1130	13.09	1131	13.43	1132	13.77	1133	14.11	1134	14.45
1135	14.79	1136	15.49	1137	16.19	1138	16.88	1139	17.23
1140	17.57	1141	18.18	1142	18.80	1143	19.42	1144	19.69
1145	19.97	1146	20.74	1147	21.51	1148	22.36	1149	31.03
1150	39.65	1151	48.45	1152	57.36	1153	66.48	1154	66.75
1155	65.79	1156	64.36	1157	54.57	1158	44.89	1159	35.35
1160	25.92	1161	15.47	1162	13.16	1163	12.10	1164	11.44
1165	10.77	1166	10.14	1167	9.50	1168	8.86	1169	8.86
1170	8.86	1171	8.53	1172	8.20	1173	7.87	1174	7.55
1175	7.22	1176	6.89	1177	6.56	1178	6.23	1179	6.23
1180	6.23	1181	5.99	1182	5.75	1183	5.51	1184	5.27
1185	5.03	1186	4.78	1187	4.54	1188	4.30	1189	4.30
1190	4.30	1191	4.08	1192	3.85	1193	3.63	1194	3.40
1195	3.18	1196	2.95	1197	2.73	1198	2.67	1199	2.67
1200	2.67	1201	2.67	1202	2.67	1203	2.67	1204	2.67
1205	2.67	1206	2.67	1207	2.67	1208	2.67	1209	2.67
1210	2.67	1211	2.61	1212	2.56	1213	2.51	1214	2.45
1215	2.40	1216	2.34	1217	2.29	1218	2.24	1219	2.24
1220	2.24	1221	2.24	1222	2.24	1223	2.24	1224	2.24
1225	2.24	1226	2.24	1227	2.24	1228	2.24	1229	2.24
1230	2.24	1231	2.19	1232	2.15	1233	2.11	1234	2.06
1235	2.02	1236	1.97	1237	1.93	1238	1.89	1239	1.89
1240	1.89	1241	1.89	1242	1.89	1243	1.89	1244	1.89
1245	1.89	1246	1.89	1247	1.89	1248	1.89	1249	1.89
1250	1.89	1251	1.89	1252	1.89	1253	1.89	1254	1.89
1255	1.89	1256	1.89	1257	1.89	1258	1.89	1259	1.89
1260	1.89	1261	1.86	1262	1.83	1263	1.80	1264	1.77
1265	1.75	1266	1.72	1267	1.69	1268	1.66	1269	1.66
1270	1.66	1271	1.66	1272	1.66	1273	1.66	1274	1.66
1275	1.66	1276	1.66	1277	1.66	1278	1.66	1279	1.66
1280	1.66	1281	1.66	1282	1.66	1283	1.66	1284	1.66
1285	1.66	1286	1.66	1287	1.66	1288	1.66	1289	1.66
1290	1.66	1291	1.66	1292	1.66	1293	1.66	1294	1.66
1295	1.66	1296	1.66	1297	1.66	1298	1.66	1299	1.66
1300	1.66	1310	1.21	1320	1.21	1330	1.21	1340	1.21
1350	0.76	1360	0.76	1370	0.76	1380	0.76	1390	0.76
1400	0.76	1420	0.45	1440	0.45	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 130AB

TOTAL AREA TO HYDROGRAPH: 228 acres
HYDROGRAPH PEAK: 436 cfs
TIME OF PEAK: 1161 minutes
HYDROGRAPH VOLUME: 32.54 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
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Channel Islands_25yr_exist.out

0	0.00	100	1.63	200	1.75	300	1.92	400	2.10
500	2.33	600	2.55	700	2.87	800	3.25	900	3.33
1000	18.57	1050	40.48	1100	66.79	1110	73.71	1120	81.65
1130	95.14	1131	96.98	1132	98.88	1133	100.97	1134	103.16
1135	105.52	1136	108.11	1137	110.98	1138	114.10	1139	117.53
1140	121.29	1141	125.37	1142	129.62	1143	133.90	1144	138.20
1145	142.62	1146	147.18	1147	151.85	1148	156.60	1149	162.61
1150	170.49	1151	180.67	1152	195.97	1153	218.41	1154	247.16
1155	282.14	1156	321.33	1157	359.63	1158	393.22	1159	418.74
1160	433.23	1161	436.46	1162	431.03	1163	419.33	1164	402.84
1165	383.42	1166	362.81	1167	341.96	1168	321.24	1169	299.88
1170	277.73	1171	254.46	1172	230.86	1173	207.67	1174	185.77
1175	165.81	1176	148.26	1177	133.35	1178	121.13	1179	111.15
1180	103.01	1181	96.26	1182	90.76	1183	85.93	1184	81.75
1185	78.13	1186	74.95	1187	72.06	1188	69.49	1189	67.06
1190	64.80	1191	62.69	1192	60.56	1193	58.47	1194	56.45
1195	54.47	1196	52.50	1197	50.57	1198	48.70	1199	46.90
1200	45.14	1201	43.44	1202	41.82	1203	40.30	1204	38.94
1205	37.75	1206	36.51	1207	35.29	1208	34.11	1209	32.97
1210	31.88	1211	30.81	1212	29.76	1213	28.73	1214	27.74
1215	26.79	1216	25.85	1217	24.92	1218	24.03	1219	23.19
1220	22.41	1221	21.69	1222	21.05	1223	20.49	1224	20.00
1225	19.57	1226	19.21	1227	18.88	1228	18.55	1229	18.23
1230	17.91	1231	17.53	1232	17.10	1233	16.64	1234	16.17
1235	15.69	1236	15.21	1237	14.70	1238	14.17	1239	13.61
1240	13.04	1241	12.47	1242	11.92	1243	11.40	1244	10.90
1245	10.44	1246	10.01	1247	9.60	1248	9.23	1249	8.87
1250	8.53	1251	8.20	1252	7.89	1253	7.58	1254	7.28
1255	6.99	1256	6.71	1257	6.43	1258	6.17	1259	5.91
1260	5.68	1261	5.46	1262	5.25	1263	5.06	1264	4.89
1265	4.73	1266	4.58	1267	4.44	1268	4.31	1269	4.19
1270	4.07	1271	3.96	1272	3.86	1273	3.77	1274	3.68
1275	3.60	1276	3.53	1277	3.47	1278	3.42	1279	3.37
1280	3.33	1281	3.30	1282	3.27	1283	3.24	1284	3.22
1285	3.20	1286	3.18	1287	3.16	1288	3.15	1289	3.13
1290	3.12	1291	3.11	1292	3.10	1293	3.09	1294	3.09
1295	3.09	1296	3.08	1297	3.08	1298	3.08	1299	3.07
1300	3.07	1310	2.93	1320	2.72	1330	2.56	1340	2.51
1350	2.40	1360	2.18	1370	2.02	1380	1.99	1390	1.99
1400	1.99	1420	1.86	1440	1.69	1460	1.65	1500	1.63

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

Page: 19

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 131A

DESCRIPTION: Area D2
TOTAL AREA TO HYDROGRAPH: 236 acres
HYDROGRAPH PEAK: 440 cfs
TIME OF PEAK: 1161 minutes
HYDROGRAPH VOLUME: 33.30 acre-ft

Channel Islands_25yr_exist.out

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.64	200	1.77	300	1.94	400	2.12
500	2.36	600	2.59	700	2.92	800	3.31	900	3.39
1000	18.70	1050	41.38	1100	68.60	1110	75.94	1120	84.02
1130	98.71	1131	100.68	1132	102.71	1133	104.93	1134	107.25
1135	109.74	1136	112.61	1137	115.74	1138	119.00	1139	122.56
1140	126.45	1141	130.76	1142	135.25	1143	139.63	1144	144.05
1145	148.57	1146	153.42	1147	158.38	1148	163.35	1149	172.64
1150	183.81	1151	197.36	1152	216.09	1153	241.83	1154	270.68
1155	305.27	1156	340.70	1157	375.26	1158	405.19	1159	427.16
1160	437.93	1161	440.26	1162	434.42	1163	422.47	1164	405.72
1165	386.04	1166	365.19	1167	344.10	1168	323.38	1169	302.02
1170	279.87	1171	256.48	1172	232.75	1173	209.43	1174	187.41
1175	167.32	1176	149.65	1177	134.61	1178	122.39	1179	112.41
1180	104.27	1181	97.43	1182	91.84	1183	86.92	1184	82.64
1185	78.93	1186	75.65	1187	72.67	1188	70.11	1189	67.68
1190	65.41	1191	63.21	1192	61.00	1193	58.83	1194	56.72
1195	54.65	1196	52.60	1197	50.66	1198	48.79	1199	46.99
1200	45.23	1201	43.53	1202	41.90	1203	40.39	1204	39.03
1205	37.84	1206	36.60	1207	35.38	1208	34.20	1209	33.06
1210	31.97	1211	30.90	1212	29.84	1213	28.81	1214	27.82
1215	26.87	1216	25.93	1217	25.00	1218	24.10	1219	23.26
1220	22.49	1221	21.77	1222	21.13	1223	20.57	1224	20.07
1225	19.64	1226	19.28	1227	18.96	1228	18.62	1229	18.30
1230	17.98	1231	17.60	1232	17.17	1233	16.71	1234	16.24
1235	15.75	1236	15.27	1237	14.77	1238	14.23	1239	13.67
1240	13.10	1241	12.53	1242	11.98	1243	11.46	1244	10.96
1245	10.50	1246	10.07	1247	9.67	1248	9.29	1249	8.93
1250	8.59	1251	8.27	1252	7.95	1253	7.64	1254	7.34
1255	7.05	1256	6.77	1257	6.49	1258	6.23	1259	5.98
1260	5.74	1261	5.52	1262	5.31	1263	5.12	1264	4.94
1265	4.78	1266	4.63	1267	4.50	1268	4.37	1269	4.24
1270	4.13	1271	4.02	1272	3.92	1273	3.82	1274	3.74
1275	3.66	1276	3.59	1277	3.53	1278	3.47	1279	3.43
1280	3.39	1281	3.35	1282	3.32	1283	3.30	1284	3.27
1285	3.25	1286	3.23	1287	3.22	1288	3.20	1289	3.19
1290	3.18	1291	3.17	1292	3.16	1293	3.15	1294	3.15
1295	3.14	1296	3.14	1297	3.13	1298	3.13	1299	3.13
1300	3.12	1310	2.97	1320	2.76	1330	2.60	1340	2.55
1350	2.43	1360	2.20	1370	2.04	1380	2.02	1390	2.02
1400	2.02	1420	1.88	1440	1.70	1460	1.65	1500	1.63

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

Page: 20

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 132A

DESCRIPTION: Area A9
TOTAL AREA TO HYDROGRAPH: 269 acres

Channel Islands_25yr_exist.out
HYDROGRAPH PEAK: 458 cfs
TIME OF PEAK: 1161 minutes
HYDROGRAPH VOLUME: 37.37 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.64	200	1.77	300	1.94	400	2.12
500	2.36	600	2.59	700	2.92	800	3.31	900	3.39
1000	22.16	1050	48.15	1100	79.25	1110	88.42	1120	97.08
1130	116.73	1131	119.32	1132	121.98	1133	124.83	1134	127.78
1135	130.90	1136	135.05	1137	138.84	1138	142.77	1139	147.02
1140	151.58	1141	157.11	1142	162.14	1143	167.06	1144	172.01
1145	177.07	1146	183.45	1147	189.39	1148	195.48	1149	221.52
1150	249.67	1151	280.19	1152	314.93	1153	357.00	1154	386.18
1155	402.95	1156	419.84	1157	435.85	1158	447.22	1159	450.32
1160	458.06	1161	458.44	1162	451.39	1163	438.21	1164	420.24
1165	399.34	1166	377.27	1167	356.18	1168	335.46	1169	314.09
1170	291.95	1171	267.93	1172	243.58	1173	219.63	1174	196.98
1175	176.26	1176	157.96	1177	142.93	1178	130.71	1179	120.73
1180	112.58	1181	105.29	1182	99.23	1183	93.85	1184	89.11
1185	84.94	1186	81.20	1187	78.22	1188	75.65	1189	73.22
1190	70.96	1191	68.33	1192	65.69	1193	63.09	1194	60.55
1195	58.05	1196	55.57	1197	53.63	1198	51.76	1199	49.96
1200	48.20	1201	46.50	1202	44.87	1203	43.36	1204	42.00
1205	40.81	1206	39.57	1207	38.35	1208	37.17	1209	36.03
1210	34.94	1211	33.52	1212	32.12	1213	30.74	1214	29.41
1215	28.11	1216	26.82	1217	25.89	1218	24.99	1219	24.16
1220	23.38	1221	22.66	1222	22.02	1223	21.46	1224	20.96
1225	20.53	1226	20.17	1227	19.85	1228	19.52	1229	19.19
1230	18.87	1231	18.21	1232	17.50	1233	16.76	1234	16.24
1235	15.75	1236	15.27	1237	14.77	1238	14.23	1239	13.67
1240	13.10	1241	12.53	1242	11.98	1243	11.46	1244	10.96
1245	10.50	1246	10.07	1247	9.67	1248	9.29	1249	8.93
1250	8.59	1251	8.27	1252	7.95	1253	7.64	1254	7.34
1255	7.05	1256	6.77	1257	6.49	1258	6.23	1259	5.98
1260	5.74	1261	5.52	1262	5.31	1263	5.12	1264	4.94
1265	4.78	1266	4.63	1267	4.50	1268	4.37	1269	4.24
1270	4.13	1271	4.02	1272	3.92	1273	3.82	1274	3.74
1275	3.66	1276	3.59	1277	3.53	1278	3.47	1279	3.43
1280	3.39	1281	3.35	1282	3.32	1283	3.30	1284	3.27
1285	3.25	1286	3.23	1287	3.22	1288	3.20	1289	3.19
1290	3.18	1291	3.17	1292	3.16	1293	3.15	1294	3.15
1295	3.14	1296	3.14	1297	3.13	1298	3.13	1299	3.13
1300	3.12	1310	2.97	1320	2.76	1330	2.60	1340	2.55
1350	2.43	1360	2.20	1370	2.04	1380	2.02	1390	2.02
1400	2.02	1420	1.88	1440	1.70	1460	1.65	1500	1.63

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

Hydrograph Printouts

DESCRIPTION: Area A10
 TOTAL AREA TO HYDROGRAPH: 284 acres
 HYDROGRAPH PEAK: 470 cfs
 TIME OF PEAK: 1158 minutes
 HYDROGRAPH VOLUME: 38.63 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.64	200	1.77	300	1.94	400	2.12
500	2.36	600	2.59	700	2.92	800	3.31	900	3.39
1000	22.23	1050	49.67	1100	82.47	1110	92.43	1120	101.36
1130	123.24	1131	126.09	1132	128.99	1133	132.09	1134	135.29
1135	138.65	1136	143.32	1137	147.62	1138	151.80	1139	156.29
1140	161.10	1141	167.07	1142	172.54	1143	177.65	1144	182.80
1145	188.06	1146	194.99	1147	201.48	1148	207.98	1149	240.17
1150	274.48	1151	311.30	1152	352.48	1153	400.77	1154	430.14
1155	446.15	1156	455.99	1157	464.98	1158	469.50	1159	465.93
1160	466.71	1161	465.41	1162	457.58	1163	443.92	1164	425.46
1165	404.10	1166	381.57	1167	360.02	1168	339.30	1169	317.94
1170	295.79	1171	271.53	1172	246.95	1173	222.77	1174	199.88
1175	178.93	1176	160.39	1177	145.13	1178	132.90	1179	122.93
1180	114.78	1181	107.31	1182	101.08	1183	95.52	1184	90.61
1185	86.27	1186	82.35	1187	79.20	1188	76.63	1189	74.20
1190	71.94	1191	69.15	1192	66.35	1193	63.59	1194	60.89
1195	58.23	1196	55.59	1197	53.63	1198	51.76	1199	49.96
1200	48.20	1201	46.50	1202	44.87	1203	43.36	1204	42.00
1205	40.81	1206	39.57	1207	38.35	1208	37.17	1209	36.03
1210	34.94	1211	33.52	1212	32.12	1213	30.74	1214	29.41
1215	28.11	1216	26.82	1217	25.89	1218	24.99	1219	24.16
1220	23.38	1221	22.66	1222	22.02	1223	21.46	1224	20.96
1225	20.53	1226	20.17	1227	19.85	1228	19.52	1229	19.19
1230	18.87	1231	18.21	1232	17.50	1233	16.76	1234	16.24
1235	15.75	1236	15.27	1237	14.77	1238	14.23	1239	13.67
1240	13.10	1241	12.53	1242	11.98	1243	11.46	1244	10.96
1245	10.50	1246	10.07	1247	9.67	1248	9.29	1249	8.93
1250	8.59	1251	8.27	1252	7.95	1253	7.64	1254	7.34
1255	7.05	1256	6.77	1257	6.49	1258	6.23	1259	5.98
1260	5.74	1261	5.52	1262	5.31	1263	5.12	1264	4.94
1265	4.78	1266	4.63	1267	4.50	1268	4.37	1269	4.24
1270	4.13	1271	4.02	1272	3.92	1273	3.82	1274	3.74
1275	3.66	1276	3.59	1277	3.53	1278	3.47	1279	3.43
1280	3.39	1281	3.35	1282	3.32	1283	3.30	1284	3.27
1285	3.25	1286	3.23	1287	3.22	1288	3.20	1289	3.19
1290	3.18	1291	3.17	1292	3.16	1293	3.15	1294	3.15
1295	3.14	1296	3.14	1297	3.13	1298	3.13	1299	3.13
1300	3.12	1310	2.97	1320	2.76	1330	2.60	1340	2.55
1350	2.43	1360	2.20	1370	2.04	1380	2.02	1390	2.02
1400	2.02	1420	1.88	1440	1.70	1460	1.65	1500	1.63

Ventura County Watershed Protection District
 Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Existing Condition

VCRat Model Input
 Page 22

Model Lines

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005      1 100A Header place holder
005      1 101A Header place holder
005      1 106B Header place holder
005      1 108ABHeader place holder
005      1 109C Header place holder
005      1 111D Header place holder
005      1 114B Header place holder
005      1 115BCHeader place holder
005      1 117B Header place holder
005      1 118ABHeader place holder
005      1 120A Header place holder
005      1 122B Header place holder
005      1 123ABHeader place holder
005      1 125A Header place holder
005      1 127B Header place holder
005      1 130ABHeader place holder
005      1 131A Header place holder
005      1 132A Header place holder
005      1 133A Header place holder
999
999
006      1 100A 010      099J25      G1
006      1 101A 010000011415K25      1
006      1 102A 010      099J25400202003860
006      1 103A 010      099J25400373000800
006      1 104A 010      099J25400224005600
006      1 105A 010      099J25400131000400
006      1 106B 020030000709K25      1
006      1 107B 010      099J25400194000400
006      1 108AB010      J25      11
006      1 109C 010000002807K25      1
006      1 110C 010      099J25100062006666
006      1 111D 020000000509K25      1
006      1 112CD010      J25
006      1 113C 010      099J25100060011660
006      1 114B 010000001209K25      1
006      1 115BC010      J25      11
006      1 116B 010      099J25100660002727
006      1 117B 010000000806K25      1
006      1 118AB010      J25      11
006      1 119A 010      099J25100600002666
006      1 120A 010003001006K25      1
006      1 121A 010      099J25100075006660
006      1 122B 010000001406K25      1
006      1 123AB010      J25      11
006      1 124A 010      099J25100760002368
006      1 125A 010000000607K25      1
006      1 126A 010      099J25400560003570
006      1 127B 020030002408K25      1
006      1 128B 010      099J25401550002000
006      1 129B 010      099J25400730002000
006      1 130AB010      J25      11

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Model Lines

VCRat Model Input

006	1	131A	020003000807k25
006	1	132A	010000003306k25
006	1	133A	020000001507k25
999			

1
1
1 2

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Modified Rational Model Results Report

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

Project Description

VCRat version: 2.6.2009.7
VCRain version: 200703

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

Page: 2

Model Results																
SUBAREA DATA AND RESULTS							ACCUMULATED DATA				ROUTING AFTER ACCUMULATION					
VEL	NODE	SOIL	RAIN	TC	%	AREA	FLOW	AREA	FLOW	TIME	CHANNEL	LENGTH	SLOPE	SIZE	H:V	N VALUES
(FT/S)	DEPTH	TYPE	ZONE	(MIN)	IMP	(AC)	(CFS)	(AC)	(CFS)	(MIN)	TYPE	(FT)	(FT/FT)	(FT)	(Z)	CHNL SIDES
	ID															
	100A :	Start						0	0							
	100A	---	---	--	--	---	---			----	-----	----	-----	---	----	-----
	101A :	Start - Area A														
	101A	010	K100	13	0	114	319	114	319	1154	-----	----	-----	---	----	-----
	102A	---	---	--	--	---	---	114	319	1154	PIPE	202	0.03860	4.25	----	-----
	103A	---	---	--	--	---	---	114	319	1155	PIPE	373	0.00800	5.50	----	-----
	104A	---	---	--	--	---	---	114	318	1156	PIPE	224	0.05600	4.00	----	-----
	105A	---	---	--	--	---	---	114	318	1156	PIPE	131	0.00400	6.25	----	-----
	106B :	Area B														

								Channel Islands_100yr_exist.out													
--	106B	020	K100	6	30	7	29	7	29	1153	-----	----	-----	---	----	-----	-----				
--	107B	---	---	--	--	---	---	7	29	1153	PIPE	194	0.00400	2.75	----	-----	-----				
	108AB	*****																			
	*	Peak in A: 317.41 cfs @ 1157 min Q in B: 21.33 cfs Combined Q: 338.74 cfs *																			
	*	Peak in B: 28.50 cfs @ 1154 min Q in A: 286.77 cfs Combined Q: 315.27 cfs *																			
	*	Combined Peak: 340.66 cfs @ 1156 min Q in A: 316.38 cfs Q in B: 24.28 cfs *																			

--	108AB	---	---	--	--	7	29	121	341	1156	-----	----	-----	---	----	-----	-----				
	109C :	Area C1 C2																			
--	109C	010	K100	6	0	28	120	28	120	1153	-----	----	-----	---	----	-----	-----				
--	110C	---	---	--	--	---	---	28	120	1153	MOUNTAIN	62	0.06666	---	----	-----	-----				
	111D :	Area C3																			
--	111D	020	K100	7	0	5	18	5	18	1153	-----	----	-----	---	----	-----	-----				
--	112CD	---	---	--	--	5	18	33	138	1153	-----	----	-----	---	----	-----	-----				
--	113C	---	---	--	--	---	---	33	138	1153	MOUNTAIN	60	0.11660	---	----	-----	-----				
	114B :	Area C4																			
--	114B	010	K100	7	0	12	47	12	47	1153	-----	----	-----	---	----	-----	-----				
	115BC	*****																			
	*	Peak in B: 47.11 cfs @ 1153 min Q in C: 136.40 cfs Combined Q: 183.51 cfs *																			
	*	Peak in C: 137.59 cfs @ 1154 min Q in B: 47.11 cfs Combined Q: 184.69 cfs *																			
	*	Combined Peak: 184.69 cfs @ 1154 min Q in B: 47.11 cfs Q in C: 137.59 cfs *																			

--	115BC	---	---	--	--	33	138	45	185	1154	-----	----	-----	---	----	-----	-----				
--	116B	---	---	--	--	---	---	45	185	1154	MOUNTAIN	660	0.02727	---	----	-----	-----				
	117B :	Area C5																			
--	117B	010	K100	6	0	8	34	53	192	1157	-----	----	-----	---	----	-----	-----				
	118AB:	Confluence																			
	118AB	*****																			
	*	Peak in A: 340.66 cfs @ 1156 min Q in B: 189.82 cfs Combined Q: 530.48 cfs *																			
	*	Peak in B: 191.95 cfs @ 1157 min Q in A: 338.74 cfs Combined Q: 530.69 cfs *																			
	*	Combined Peak: 530.69 cfs @ 1157 min Q in A: 338.74 cfs Q in B: 191.95 cfs *																			

--	118AB	---	---	--	--	53	192	174	531	1157	-----	----	-----	---	----	-----	-----				
--	119A	---	---	--	--	---	---	174	531	1157	MOUNTAIN	600	0.02666	---	----	-----	-----				
	120A :	Area A6																			
--	120A	010	K100	5	3	10	48	184	534	1158	-----	----	-----	---	----	-----	-----				
--	121A	---	---	--	--	---	---	184	534	1158	MOUNTAIN	75	0.06660	---	----	-----	-----				
	122B :	Area A7																			
--	122B	010	K100	5	0	14	67	14	67	1153	-----	----	-----	---	----	-----	-----				

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Model Results																	
SUBAREA DATA AND RESULTS										ACCUMULATED DATA		ROUTING AFTER ACCUMULATION					
VEL	NODE	SOIL	RAIN	TC	%	AREA	FLOW	AREA	FLOW	TIME	CHANNEL	LENGTH	SLOPE	SIZE	H:V	N VALUES	
(FT/S)	DEPTH	TYPE	ZONE	(MIN)	IMP	(AC)	(CFS)	(AC)	(CFS)	(MIN)	TYPE	(FT)	(FT/FT)	(FT)	(Z)	CHNL	SIDES

123AB: Confluence																	

* Peak in A: 532.27 cfs @ 1158 min Q in B: 15.49 cfs Combined Q: 547.76 cfs *																	
* Peak in B: 67.20 cfs @ 1153 min Q in A: 338.26 cfs Combined Q: 405.46 cfs *																	
* Combined Peak: 552.17 cfs @ 1157 min Q in A: 525.29 cfs Q in B: 26.88 cfs *																	

123AB	---	---	---	---	---	14	67	198	552	1157	-----	----	-----	---	----	-----	-----
124A	---	---	---	---	---	---	---	198	552	1157	MOUNTAIN	760	0.02368	---	----	-----	-----
125A : Area A8	125A	010	K100	6	0	6	26	204	545	1160	-----	----	-----	---	----	-----	-----
126A	---	---	---	---	---	---	---	204	545	1160	PIPE	560	0.03570	5.25	----	-----	-----
127B : Area D1	127B	020	K100	5	30	24	111	24	111	1153	-----	----	-----	---	----	-----	-----
128B	---	---	---	---	---	---	---	24	111	1153	PIPE	1550	0.02000	3.25	----	-----	-----
129B	---	---	---	---	---	---	---	24	94	1156	PIPE	730	0.02000	3.00	----	-----	-----
130AB *****																	
* Peak in A: 543.20 cfs @ 1161 min Q in B: 51.82 cfs Combined Q: 595.02 cfs *																	
* Peak in B: 92.15 cfs @ 1157 min Q in A: 454.26 cfs Combined Q: 546.42 cfs *																	
* Combined Peak: 608.28 cfs @ 1160 min Q in A: 540.83 cfs Q in B: 67.45 cfs *																	

130AB	---	---	---	---	---	24	92	228	608	1160	-----	----	-----	---	----	-----	-----
131A : Area D2	131A	020	K100	6	3	8	32	236	615	1159	-----	----	-----	---	----	-----	-----
132A : Area A9	132A	010	K100	6	0	33	142	269	671	1157	-----	----	-----	---	----	-----	-----
133A : Area A10	133A	020	K100	6	0	15	61	284	714	1157	-----	----	-----	---	----	-----	-----

TYPE	ERR NO	PROCEDURE	LOCATION	MESSAGE
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NO ISSUES OR WARNINGS DETECTED

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 101A

DESCRIPTION: Start - Area A
TOTAL AREA TO HYDROGRAPH: 114 acres
HYDROGRAPH PEAK: 319 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 31.56 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	4.11	400	4.11
500	6.16	600	8.20	700	10.26	800	12.31	900	17.09
1000	25.31	1050	35.57	1100	39.27	1110	56.42	1120	55.77
1130	75.61	1131	77.77	1132	79.93	1133	83.75	1134	85.91
1135	87.52	1136	86.44	1137	89.14	1138	91.29	1139	93.45
1140	96.14	1141	100.99	1142	105.30	1143	109.58	1144	114.20
1145	122.93	1146	130.12	1147	136.80	1148	144.14	1149	180.95
1150	214.14	1151	212.04	1152	281.49	1153	314.64	1154	318.85
1155	318.85	1156	317.27	1157	313.59	1158	304.64	1159	295.17
1160	286.75	1161	275.70	1162	237.82	1163	199.94	1164	200.99
1165	125.50	1166	86.98	1167	74.19	1168	67.35	1169	64.72
1170	57.88	1171	55.25	1172	52.62	1173	48.41	1174	47.35
1175	45.78	1176	44.20	1177	38.94	1178	38.94	1179	37.88
1180	37.88	1181	36.83	1182	33.15	1183	34.73	1184	33.67
1185	33.15	1186	32.62	1187	32.10	1188	32.10	1189	32.10
1190	32.10	1191	32.62	1192	32.10	1193	32.10	1194	32.10
1195	32.10	1196	32.10	1197	32.10	1198	32.10	1199	32.10
1200	32.10	1201	31.04	1202	30.52	1203	29.99	1204	29.46
1205	28.94	1206	27.89	1207	27.36	1208	26.31	1209	26.31
1210	25.26	1211	24.20	1212	24.20	1213	23.68	1214	23.68
1215	23.15	1216	23.68	1217	23.68	1218	23.68	1219	23.68
1220	23.68	1221	24.20	1222	23.68	1223	23.68	1224	24.20
1225	24.20	1226	23.68	1227	23.68	1228	24.20	1229	24.20
1230	23.68	1231	23.68	1232	24.20	1233	23.68	1234	23.15
1235	23.68	1236	23.68	1237	23.15	1238	23.15	1239	23.15
1240	23.15	1241	23.15	1242	22.62	1243	22.62	1244	23.15
1245	22.63	1246	22.62	1247	23.15	1248	22.62	1249	22.63
1250	23.15	1251	22.62	1252	22.62	1253	23.15	1254	22.62
1255	22.62	1256	23.15	1257	22.62	1258	22.62	1259	23.15
1260	22.63	1261	22.62	1262	22.10	1263	21.05	1264	21.05
1265	21.05	1266	19.99	1267	19.47	1268	19.47	1269	18.94
1270	18.42	1271	17.89	1272	17.36	1273	17.36	1274	16.84
1275	16.84	1276	17.36	1277	17.36	1278	16.84	1279	16.84
1280	17.36	1281	17.36	1282	16.84	1283	16.84	1284	17.36
1285	17.36	1286	16.84	1287	16.84	1288	17.36	1289	17.36
1290	16.84	1291	16.84	1292	17.36	1293	16.84	1294	16.84
1295	16.84	1296	17.36	1297	17.36	1298	16.84	1299	16.84
1300	17.36	1310	10.00	1320	8.73	1330	8.89	1340	8.37

Channel Islands_100yr_exist.out
 1350 0.32 1360 0.00 1370 0.00 1380 0.00 1390 0.00
 1400 0.00 1420 0.00 1440 0.00 1460 0.00 1500 0.00

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Ventura County Watershed Protection District
 Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

Page: 5

Hydrograph Printouts

 HYDROGRAPH PRINTOUT AT: 106B

DESCRIPTION: Area B
 TOTAL AREA TO HYDROGRAPH: 7 acres
 HYDROGRAPH PEAK: 29 cfs
 TIME OF PEAK: 1153 minutes
 HYDROGRAPH VOLUME: 2.41 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.54	200	0.59	300	0.67	400	0.67
500	0.71	600	0.74	700	0.78	800	0.85	900	1.13
1000	1.62	1050	2.22	1100	2.44	1110	3.78	1120	3.31
1130	5.02	1131	5.02	1132	5.02	1133	5.22	1134	5.49
1135	5.69	1136	5.56	1137	5.89	1138	6.16	1139	6.22
1140	6.29	1141	6.69	1142	7.35	1143	7.54	1144	7.87
1145	8.72	1146	9.50	1147	10.02	1148	10.61	1149	14.59
1150	18.58	1151	17.43	1152	25.54	1153	29.00	1154	29.00
1155	24.92	1156	20.61	1157	20.75	1158	11.59	1159	7.08
1160	6.02	1161	5.22	1162	4.61	1163	4.19	1164	4.33
1165	3.84	1166	3.43	1167	3.22	1168	3.15	1169	3.43
1170	2.54	1171	2.74	1172	2.68	1173	2.68	1174	2.61
1175	2.14	1176	2.41	1177	2.21	1178	2.07	1179	2.07
1180	2.01	1181	2.01	1182	2.01	1183	2.01	1184	2.07
1185	2.07	1186	2.01	1187	2.01	1188	2.01	1189	2.07
1190	2.01	1191	2.01	1192	2.01	1193	2.01	1194	2.01
1195	2.01	1196	2.01	1197	2.01	1198	2.07	1199	2.01
1200	2.01	1201	1.87	1202	1.87	1203	1.74	1204	1.67
1205	1.60	1206	1.47	1207	1.54	1208	1.47	1209	1.54
1210	1.47	1211	1.47	1212	1.54	1213	1.54	1214	1.54
1215	1.47	1216	1.54	1217	1.60	1218	1.54	1219	1.47
1220	1.54	1221	1.60	1222	1.54	1223	1.47	1224	1.54
1225	1.60	1226	1.54	1227	1.47	1228	1.54	1229	1.60
1230	1.54	1231	1.47	1232	1.54	1233	1.54	1234	1.47
1235	1.47	1236	1.47	1237	1.47	1238	1.47	1239	1.47
1240	1.47	1241	1.47	1242	1.47	1243	1.47	1244	1.47
1245	1.47	1246	1.47	1247	1.47	1248	1.47	1249	1.47
1250	1.47	1251	1.47	1252	1.47	1253	1.47	1254	1.47
1255	1.47	1256	1.47	1257	1.47	1258	1.47	1259	1.47
1260	1.47	1261	1.47	1262	1.33	1263	1.27	1264	1.27
1265	1.20	1266	1.13	1267	1.07	1268	1.13	1269	1.20
1270	1.13	1271	1.07	1272	1.13	1273	1.20	1274	1.13
1275	1.07	1276	1.13	1277	1.20	1278	1.13	1279	1.07
1280	1.13	1281	1.20	1282	1.13	1283	1.07	1284	1.13
1285	1.20	1286	1.13	1287	1.07	1288	1.13	1289	1.20

Channel Islands_100yr_exist.out

1290	1.13	1291	1.07	1292	1.13	1293	1.13	1294	1.13
1295	1.07	1296	1.13	1297	1.20	1298	1.13	1299	1.13
1300	1.13	1310	0.74	1320	0.75	1330	0.75	1340	0.74
1350	0.56	1360	0.55	1370	0.56	1380	0.56	1390	0.55
1400	0.56	1420	0.39	1440	0.39	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Page: 6 Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition
Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 108AB

TOTAL AREA TO HYDROGRAPH: 121 acres
HYDROGRAPH PEAK: 341 cfs
TIME OF PEAK: 1156 minutes
HYDROGRAPH VOLUME: 34.23 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.94	200	0.98	300	4.52	400	4.95
500	6.58	600	9.09	700	10.77	800	13.28	900	17.88
1000	26.90	1050	37.03	1100	41.97	1110	55.42	1120	61.39
1130	73.99	1131	77.92	1132	80.92	1133	83.59	1134	86.44
1135	89.45	1136	91.58	1137	92.64	1138	93.82	1139	95.88
1140	98.29	1141	101.05	1142	104.95	1143	109.76	1144	114.59
1145	119.96	1146	127.09	1147	135.33	1148	143.25	1149	155.64
1150	181.12	1151	211.31	1152	238.59	1153	275.70	1154	315.27
1155	336.54	1156	340.66	1157	338.74	1158	333.62	1159	322.40
1160	309.52	1161	298.51	1162	283.79	1163	258.83	1164	227.20
1165	199.19	1166	162.67	1167	120.23	1168	91.61	1169	77.94
1170	70.85	1171	65.74	1172	61.18	1173	57.69	1174	54.68
1175	51.92	1176	49.66	1177	47.79	1178	45.40	1179	42.77
1180	41.07	1181	40.26	1182	39.50	1183	38.29	1184	36.98
1185	36.27	1186	35.86	1187	35.34	1188	34.78	1189	34.39
1190	34.20	1191	34.16	1192	34.21	1193	34.29	1194	34.25
1195	34.16	1196	34.11	1197	34.10	1198	34.11	1199	34.13
1200	34.13	1201	34.05	1202	33.75	1203	33.19	1204	32.50
1205	31.84	1206	31.21	1207	30.51	1208	29.74	1209	28.98
1210	28.29	1211	27.66	1212	26.97	1213	26.30	1214	25.79
1215	25.45	1216	25.17	1217	25.03	1218	25.07	1219	25.17
1220	25.18	1221	25.21	1222	25.33	1223	25.41	1224	25.37
1225	25.37	1226	25.51	1227	25.57	1228	25.44	1229	25.38
1230	25.51	1231	25.57	1232	25.44	1233	25.36	1234	25.37
1235	25.25	1236	25.05	1237	24.98	1238	24.97	1239	24.85
1240	24.70	1241	24.63	1242	24.60	1243	24.51	1244	24.35
1245	24.27	1246	24.28	1247	24.27	1248	24.25	1249	24.28
1250	24.27	1251	24.25	1252	24.28	1253	24.27	1254	24.25
1255	24.28	1256	24.27	1257	24.25	1258	24.28	1259	24.27
1260	24.25	1261	24.28	1262	24.23	1263	23.95	1264	23.46
1265	22.90	1266	22.43	1267	22.03	1268	21.51	1269	20.99
1270	20.62	1271	20.25	1272	19.76	1273	19.27	1274	18.87
1275	18.53	1276	18.25	1277	18.14	1278	18.25	1279	18.33

Channel Islands_100yr_exist.out

1280	18.22	1281	18.14	1282	18.25	1283	18.33	1284	18.22
1285	18.14	1286	18.25	1287	18.33	1288	18.22	1289	18.14
1290	18.25	1291	18.33	1292	18.22	1293	18.12	1294	18.14
1295	18.14	1296	18.05	1297	18.06	1298	18.23	1299	18.33
1300	18.24	1310	13.22	1320	9.36	1330	9.85	1340	9.21
1350	4.55	1360	1.19	1370	0.97	1380	1.01	1390	0.96
1400	0.96	1420	0.94	1440	0.94	1460	0.94	1500	0.94

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

Page: 7

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 109C

DESCRIPTION: Area C1 C2
TOTAL AREA TO HYDROGRAPH: 28 acres
HYDROGRAPH PEAK: 120 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 7.69 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	1.01	400	1.01
500	1.51	600	2.01	700	2.52	800	3.02	900	4.20
1000	6.22	1050	8.74	1100	9.65	1110	15.12	1120	13.27
1130	20.17	1131	20.17	1132	20.17	1133	21.03	1134	22.18
1135	23.04	1136	22.47	1137	23.90	1138	25.05	1139	25.33
1140	25.62	1141	27.31	1142	30.05	1143	30.87	1144	32.23
1145	35.83	1146	39.18	1147	41.42	1148	43.95	1149	60.76
1150	77.28	1151	72.52	1152	105.84	1153	120.12	1154	120.12
1155	103.32	1156	85.68	1157	86.24	1158	48.16	1159	28.95
1160	24.47	1161	21.03	1162	18.48	1163	16.80	1164	17.36
1165	15.40	1166	13.72	1167	12.88	1168	12.60	1169	13.72
1170	10.08	1171	10.92	1172	10.64	1173	10.64	1174	10.36
1175	8.40	1176	9.52	1177	8.68	1178	8.12	1179	8.12
1180	7.84	1181	7.84	1182	7.84	1183	7.84	1184	8.12
1185	8.12	1186	7.84	1187	7.84	1188	7.84	1189	8.12
1190	7.84	1191	7.84	1192	7.84	1193	7.84	1194	7.84
1195	7.84	1196	7.84	1197	7.84	1198	8.12	1199	7.84
1200	7.84	1201	7.28	1202	7.28	1203	6.72	1204	6.44
1205	6.16	1206	5.60	1207	5.88	1208	5.60	1209	5.88
1210	5.60	1211	5.60	1212	5.88	1213	5.88	1214	5.88
1215	5.60	1216	5.88	1217	6.16	1218	5.88	1219	5.60
1220	5.88	1221	6.16	1222	5.88	1223	5.60	1224	5.88
1225	6.16	1226	5.88	1227	5.60	1228	5.88	1229	6.16
1230	5.88	1231	5.60	1232	5.88	1233	5.88	1234	5.60
1235	5.60	1236	5.60	1237	5.60	1238	5.60	1239	5.60
1240	5.60	1241	5.60	1242	5.60	1243	5.60	1244	5.60
1245	5.60	1246	5.60	1247	5.60	1248	5.60	1249	5.60
1250	5.60	1251	5.60	1252	5.60	1253	5.60	1254	5.60
1255	5.60	1256	5.60	1257	5.60	1258	5.60	1259	5.60
1260	5.60	1261	5.60	1262	5.04	1263	4.76	1264	4.76

Channel Islands_100yr_exist.out

1265	4.48	1266	4.20	1267	3.92	1268	4.20	1269	4.48
1270	4.20	1271	3.92	1272	4.20	1273	4.48	1274	4.20
1275	3.92	1276	4.20	1277	4.48	1278	4.20	1279	3.92
1280	4.20	1281	4.48	1282	4.20	1283	3.92	1284	4.20
1285	4.48	1286	4.20	1287	3.92	1288	4.20	1289	4.48
1290	4.20	1291	3.92	1292	4.20	1293	4.20	1294	4.20
1295	3.92	1296	4.20	1297	4.48	1298	4.20	1299	4.20
1300	4.20	1310	2.02	1320	2.18	1330	2.18	1340	2.02
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

Page: 8

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 111D

DESCRIPTION: Area C3
TOTAL AREA TO HYDROGRAPH: 5 acres
HYDROGRAPH PEAK: 18 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 0.75 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.04	900	0.24
1000	0.59	1050	1.02	1100	1.18	1110	2.14	1120	1.81
1130	3.05	1131	3.05	1132	3.05	1133	3.17	1134	3.34
1135	3.46	1136	3.38	1137	3.58	1138	3.74	1139	3.91
1140	3.99	1141	4.19	1142	4.39	1143	4.79	1144	4.95
1145	5.47	1146	5.99	1147	6.46	1148	6.78	1149	9.20
1150	11.68	1151	11.31	1152	16.31	1153	18.46	1154	18.46
1155	18.09	1156	15.41	1157	12.64	1158	12.64	1159	7.01
1160	4.35	1161	3.50	1162	3.01	1163	2.62	1164	2.62
1165	2.27	1166	2.10	1167	1.75	1168	1.71	1169	1.88
1170	1.58	1171	1.29	1172	1.38	1173	1.29	1174	1.33
1175	1.25	1176	0.96	1177	1.09	1178	0.96	1179	0.92
1180	0.92	1181	0.88	1182	0.88	1183	0.84	1184	0.88
1185	0.92	1186	0.88	1187	0.88	1188	0.88	1189	0.88
1190	0.88	1191	0.88	1192	0.84	1193	0.88	1194	0.88
1195	0.88	1196	0.84	1197	0.88	1198	0.88	1199	0.88
1200	0.88	1201	0.80	1202	0.76	1203	0.72	1204	0.67
1205	0.59	1206	0.55	1207	0.51	1208	0.51	1209	0.51
1210	0.51	1211	0.47	1212	0.51	1213	0.55	1214	0.51
1215	0.51	1216	0.51	1217	0.55	1218	0.55	1219	0.51
1220	0.51	1221	0.55	1222	0.55	1223	0.51	1224	0.51
1225	0.55	1226	0.55	1227	0.51	1228	0.51	1229	0.55
1230	0.55	1231	0.51	1232	0.51	1233	0.51	1234	0.51
1235	0.51	1236	0.47	1237	0.47	1238	0.51	1239	0.47
1240	0.47	1241	0.51	1242	0.47	1243	0.47	1244	0.51
1245	0.47	1246	0.47	1247	0.51	1248	0.47	1249	0.47

Channel Islands_100yr_exist.out

1250	0.51	1251	0.47	1252	0.47	1253	0.51	1254	0.47
1255	0.47	1256	0.51	1257	0.47	1258	0.47	1259	0.51
1260	0.47	1261	0.47	1262	0.43	1263	0.34	1264	0.34
1265	0.34	1266	0.26	1267	0.22	1268	0.22	1269	0.26
1270	0.26	1271	0.22	1272	0.22	1273	0.26	1274	0.26
1275	0.22	1276	0.22	1277	0.26	1278	0.26	1279	0.22
1280	0.22	1281	0.26	1282	0.26	1283	0.22	1284	0.22
1285	0.26	1286	0.26	1287	0.22	1288	0.22	1289	0.26
1290	0.26	1291	0.22	1292	0.22	1293	0.22	1294	0.26
1295	0.22	1296	0.22	1297	0.26	1298	0.26	1299	0.22
1300	0.26	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

Page: 9

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 114B

DESCRIPTION: Area C4
TOTAL AREA TO HYDROGRAPH: 12 acres
HYDROGRAPH PEAK: 47 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 3.30 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.43	400	0.43
500	0.65	600	0.86	700	1.08	800	1.29	900	1.80
1000	2.67	1050	3.74	1100	4.13	1110	6.48	1120	5.69
1130	8.65	1131	8.65	1132	8.65	1133	8.96	1134	9.38
1135	9.70	1136	9.49	1137	10.01	1138	10.44	1139	10.86
1140	11.07	1141	11.59	1142	12.09	1143	13.09	1144	13.50
1145	14.81	1146	16.14	1147	17.37	1148	18.20	1149	24.38
1150	30.55	1151	29.62	1152	41.86	1153	47.11	1154	47.11
1155	46.18	1156	39.70	1157	32.91	1158	32.91	1159	18.82
1160	11.99	1161	9.80	1162	8.54	1163	7.61	1164	7.61
1165	6.79	1166	6.38	1167	5.55	1168	5.45	1169	5.86
1170	5.14	1171	4.42	1172	4.63	1173	4.42	1174	4.53
1175	4.32	1176	3.60	1177	3.91	1178	3.60	1179	3.50
1180	3.50	1181	3.39	1182	3.39	1183	3.29	1184	3.39
1185	3.50	1186	3.39	1187	3.39	1188	3.39	1189	3.39
1190	3.39	1191	3.39	1192	3.29	1193	3.39	1194	3.39
1195	3.39	1196	3.29	1197	3.39	1198	3.39	1199	3.39
1200	3.39	1201	3.19	1202	3.09	1203	2.98	1204	2.88
1205	2.67	1206	2.57	1207	2.47	1208	2.47	1209	2.47
1210	2.47	1211	2.37	1212	2.47	1213	2.57	1214	2.47
1215	2.47	1216	2.47	1217	2.57	1218	2.57	1219	2.47
1220	2.47	1221	2.57	1222	2.57	1223	2.47	1224	2.47
1225	2.57	1226	2.57	1227	2.47	1228	2.47	1229	2.57
1230	2.57	1231	2.47	1232	2.47	1233	2.47	1234	2.47

Channel Islands_100yr_exist.out

1235	2.47	1236	2.37	1237	2.37	1238	2.47	1239	2.37
1240	2.37	1241	2.47	1242	2.37	1243	2.37	1244	2.47
1245	2.37	1246	2.37	1247	2.47	1248	2.37	1249	2.37
1250	2.47	1251	2.37	1252	2.37	1253	2.47	1254	2.37
1255	2.37	1256	2.47	1257	2.37	1258	2.37	1259	2.47
1260	2.37	1261	2.37	1262	2.26	1263	2.06	1264	2.06
1265	2.06	1266	1.85	1267	1.75	1268	1.75	1269	1.85
1270	1.85	1271	1.75	1272	1.75	1273	1.85	1274	1.85
1275	1.75	1276	1.75	1277	1.85	1278	1.85	1279	1.75
1280	1.75	1281	1.85	1282	1.85	1283	1.75	1284	1.75
1285	1.85	1286	1.85	1287	1.75	1288	1.75	1289	1.85
1290	1.85	1291	1.75	1292	1.75	1293	1.75	1294	1.85
1295	1.75	1296	1.75	1297	1.85	1298	1.85	1299	1.75
1300	1.85	1310	0.86	1320	0.94	1330	0.94	1340	0.86
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

Page: 10

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 115BC

TOTAL AREA TO HYDROGRAPH: 45 acres
HYDROGRAPH PEAK: 185 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 11.94 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	1.42	400	1.45
500	2.14	600	2.89	700	3.58	800	4.36	900	6.20
1000	9.47	1050	13.43	1100	14.98	1110	23.14	1120	21.32
1130	30.77	1131	32.04	1132	31.80	1133	32.66	1134	34.20
1135	35.67	1136	35.67	1137	36.64	1138	38.57	1139	39.89
1140	40.49	1141	42.14	1142	45.05	1143	48.25	1144	49.94
1145	54.16	1146	59.64	1147	64.09	1148	67.68	1149	86.13
1150	113.02	1151	116.19	1152	148.68	1153	183.51	1154	184.69
1155	174.59	1156	146.98	1157	131.41	1158	110.77	1159	63.91
1160	44.19	1161	36.58	1162	31.57	1163	28.34	1164	27.23
1165	25.77	1166	23.30	1167	20.94	1168	19.99	1169	20.73
1170	19.13	1171	16.52	1172	16.65	1173	16.48	1174	16.33
1175	15.34	1176	13.66	1177	14.02	1178	13.26	1179	12.60
1180	12.46	1181	12.17	1182	12.11	1183	11.99	1184	12.18
1185	12.49	1186	12.33	1187	12.15	1188	12.11	1189	12.20
1190	12.26	1191	12.16	1192	11.98	1193	12.10	1194	12.12
1195	12.11	1196	11.99	1197	12.10	1198	12.21	1199	12.26
1200	12.16	1201	11.68	1202	11.22	1203	10.81	1204	10.30
1205	9.69	1206	9.19	1207	8.79	1208	8.72	1209	8.72
1210	8.72	1211	8.51	1212	8.63	1213	8.93	1214	8.88
1215	8.78	1216	8.71	1217	9.00	1218	9.15	1219	8.86
1220	8.71	1221	9.00	1222	9.15	1223	8.86	1224	8.71

Channel Islands_100yr_exist.out

1225	9.00	1226	9.15	1227	8.86	1228	8.71	1229	9.00
1230	9.15	1231	8.86	1232	8.71	1233	8.80	1234	8.78
1235	8.64	1236	8.45	1237	8.43	1238	8.56	1239	8.45
1240	8.43	1241	8.56	1242	8.45	1243	8.43	1244	8.56
1245	8.45	1246	8.43	1247	8.56	1248	8.45	1249	8.43
1250	8.56	1251	8.45	1252	8.43	1253	8.56	1254	8.45
1255	8.43	1256	8.56	1257	8.45	1258	8.43	1259	8.56
1260	8.45	1261	8.43	1262	8.16	1263	7.52	1264	7.22
1265	7.09	1266	6.62	1267	6.18	1268	6.04	1269	6.29
1270	6.46	1271	6.18	1272	6.03	1273	6.29	1274	6.46
1275	6.18	1276	6.03	1277	6.29	1278	6.46	1279	6.18
1280	6.03	1281	6.29	1282	6.46	1283	6.18	1284	6.03
1285	6.29	1286	6.46	1287	6.18	1288	6.03	1289	6.29
1290	6.46	1291	6.18	1292	6.03	1293	6.09	1294	6.29
1295	6.12	1296	6.03	1297	6.29	1298	6.46	1299	6.25
1300	6.29	1310	3.26	1320	2.92	1330	3.28	1340	2.78
1350	0.85	1360	0.40	1370	0.41	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 117B

DESCRIPTION: Area C5
TOTAL AREA TO HYDROGRAPH: 53 acres
HYDROGRAPH PEAK: 192 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 14.16 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	1.50	400	1.82
500	2.39	600	3.45	700	4.17	800	5.19	900	7.17
1000	11.01	1050	15.27	1100	17.74	1110	22.86	1120	25.77
1130	31.76	1131	32.64	1132	33.55	1133	34.75	1134	35.99
1135	37.00	1136	37.63	1137	39.05	1138	40.43	1139	41.42
1140	42.48	1141	44.16	1142	46.17	1143	47.59	1144	49.47
1145	52.55	1146	55.81	1147	59.05	1148	63.28	1149	72.32
1150	81.52	1151	88.72	1152	113.38	1153	134.58	1154	157.20
1155	178.76	1156	189.82	1157	191.95	1158	172.32	1159	153.28
1160	135.02	1161	111.95	1162	89.05	1163	71.43	1164	59.65
1165	50.53	1166	43.86	1167	39.22	1168	35.88	1169	33.50
1170	30.02	1171	28.15	1172	26.58	1173	25.41	1174	24.05
1175	22.25	1176	21.63	1177	20.68	1178	19.87	1179	19.09
1180	18.22	1181	17.57	1182	16.97	1183	16.43	1184	16.05
1185	15.65	1186	15.25	1187	15.02	1188	14.88	1189	14.90
1190	14.75	1191	14.67	1192	14.60	1193	14.56	1194	14.54
1195	14.50	1196	14.45	1197	14.41	1198	14.48	1199	14.38
1200	14.36	1201	14.19	1202	14.21	1203	14.08	1204	13.97
1205	13.78	1206	13.43	1207	13.26	1208	12.88	1209	12.60

Channel Islands_100yr_exist.out

1210	12.13	1211	11.74	1212	11.47	1213	11.21	1214	11.01
1215	10.77	1216	10.72	1217	10.75	1218	10.65	1219	10.53
1220	10.58	1221	10.65	1222	10.61	1223	10.54	1224	10.59
1225	10.66	1226	10.62	1227	10.54	1228	10.59	1229	10.67
1230	10.62	1231	10.55	1232	10.59	1233	10.59	1234	10.54
1235	10.55	1236	10.51	1237	10.48	1238	10.45	1239	10.42
1240	10.35	1241	10.29	1242	10.24	1243	10.21	1244	10.18
1245	10.16	1246	10.14	1247	10.12	1248	10.12	1249	10.11
1250	10.10	1251	10.10	1252	10.10	1253	10.09	1254	10.09
1255	10.09	1256	10.08	1257	10.08	1258	10.09	1259	10.08
1260	10.08	1261	10.09	1262	9.92	1263	9.84	1264	9.85
1265	9.75	1266	9.63	1267	9.42	1268	9.30	1269	9.17
1270	8.88	1271	8.54	1272	8.35	1273	8.21	1274	7.99
1275	7.81	1276	7.78	1277	7.76	1278	7.64	1279	7.54
1280	7.57	1281	7.60	1282	7.52	1283	7.44	1284	7.49
1285	7.54	1286	7.47	1287	7.41	1288	7.46	1289	7.52
1290	7.45	1291	7.39	1292	7.45	1293	7.43	1294	7.45
1295	7.39	1296	7.45	1297	7.49	1298	7.40	1299	7.40
1300	7.38	1310	5.93	1320	4.50	1330	3.73	1340	3.65
1350	2.61	1360	1.58	1370	0.84	1380	0.53	1390	0.44
1400	0.41	1420	0.40	1440	0.40	1460	0.40	1500	0.40

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

Page: 12

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 118AB

DESCRIPTION: Confluence
TOTAL AREA TO HYDROGRAPH: 174 acres
HYDROGRAPH PEAK: 531 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 48.39 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.34	200	1.38	300	6.02	400	6.78
500	8.97	600	12.54	700	14.94	800	18.47	900	25.04
1000	37.91	1050	52.29	1100	59.70	1110	78.28	1120	87.16
1130	105.76	1131	110.56	1132	114.47	1133	118.33	1134	122.43
1135	126.46	1136	129.21	1137	131.68	1138	134.25	1139	137.30
1140	140.76	1141	145.22	1142	151.12	1143	157.36	1144	164.06
1145	172.51	1146	182.89	1147	194.38	1148	206.53	1149	227.96
1150	262.64	1151	300.03	1152	351.98	1153	410.28	1154	472.47
1155	515.30	1156	530.48	1157	530.69	1158	505.93	1159	475.68
1160	444.54	1161	410.47	1162	372.84	1163	330.26	1164	286.85
1165	249.72	1166	206.52	1167	159.45	1168	127.48	1169	111.44
1170	100.87	1171	93.89	1172	87.76	1173	83.10	1174	78.73
1175	74.17	1176	71.29	1177	68.46	1178	65.27	1179	61.86
1180	59.29	1181	57.83	1182	56.47	1183	54.72	1184	53.02
1185	51.92	1186	51.12	1187	50.36	1188	49.67	1189	49.28
1190	48.95	1191	48.83	1192	48.81	1193	48.85	1194	48.79

Channel Islands_100yr_exist.out

1195	48.65	1196	48.55	1197	48.52	1198	48.59	1199	48.51
1200	48.48	1201	48.24	1202	47.97	1203	47.26	1204	46.47
1205	45.62	1206	44.64	1207	43.77	1208	42.62	1209	41.58
1210	40.42	1211	39.40	1212	38.44	1213	37.51	1214	36.80
1215	36.22	1216	35.90	1217	35.77	1218	35.72	1219	35.70
1220	35.76	1221	35.87	1222	35.94	1223	35.95	1224	35.96
1225	36.04	1226	36.13	1227	36.11	1228	36.03	1229	36.05
1230	36.13	1231	36.12	1232	36.03	1233	35.95	1234	35.91
1235	35.80	1236	35.56	1237	35.46	1238	35.42	1239	35.27
1240	35.05	1241	34.92	1242	34.85	1243	34.72	1244	34.53
1245	34.42	1246	34.43	1247	34.40	1248	34.37	1249	34.39
1250	34.37	1251	34.35	1252	34.38	1253	34.36	1254	34.34
1255	34.37	1256	34.36	1257	34.34	1258	34.37	1259	34.35
1260	34.34	1261	34.37	1262	34.15	1263	33.79	1264	33.31
1265	32.65	1266	32.06	1267	31.44	1268	30.81	1269	30.16
1270	29.50	1271	28.79	1272	28.11	1273	27.48	1274	26.86
1275	26.35	1276	26.03	1277	25.90	1278	25.90	1279	25.87
1280	25.78	1281	25.74	1282	25.77	1283	25.77	1284	25.71
1285	25.68	1286	25.72	1287	25.73	1288	25.68	1289	25.65
1290	25.70	1291	25.72	1292	25.67	1293	25.55	1294	25.59
1295	25.52	1296	25.49	1297	25.54	1298	25.63	1299	25.73
1300	25.62	1310	19.16	1320	13.86	1330	13.59	1340	12.85
1350	7.16	1360	2.77	1370	1.80	1380	1.54	1390	1.39
1400	1.37	1420	1.34	1440	1.34	1460	1.34	1500	1.34

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

Page: 13

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 120A

DESCRIPTION: Area A6
TOTAL AREA TO HYDROGRAPH: 184 acres
HYDROGRAPH PEAK: 534 cfs
TIME OF PEAK: 1158 minutes
HYDROGRAPH VOLUME: 51.35 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.42	200	1.46	300	5.88	400	7.45
500	9.15	600	13.33	700	15.63	800	19.55	900	26.12
1000	39.68	1050	54.08	1100	63.13	1110	76.34	1120	89.81
1130	106.32	1131	108.58	1132	110.99	1133	114.52	1134	118.73
1135	122.99	1136	126.78	1137	131.31	1138	134.92	1139	137.96
1140	141.10	1141	145.43	1142	149.18	1143	153.79	1144	159.44
1145	166.72	1146	174.39	1147	183.52	1148	194.25	1149	212.35
1150	232.56	1151	252.43	1152	297.85	1153	345.43	1154	392.54
1155	446.76	1156	504.86	1157	526.60	1158	534.04	1159	526.92
1160	505.45	1161	477.17	1162	446.53	1163	412.89	1164	377.43
1165	337.72	1166	299.81	1167	263.01	1168	225.13	1169	188.61
1170	158.33	1171	136.44	1172	121.15	1173	109.85	1174	100.91
1175	94.78	1176	88.99	1177	84.12	1178	79.92	1179	76.35

Channel Islands_100yr_exist.out									
1180	73.16	1181	69.99	1182	67.11	1183	64.59	1184	62.56
1185	60.83	1186	59.02	1187	57.47	1188	56.29	1189	55.21
1190	54.19	1191	53.57	1192	52.87	1193	52.42	1194	52.13
1195	52.07	1196	51.84	1197	51.85	1198	51.74	1199	51.52
1200	51.47	1201	51.32	1202	51.16	1203	50.84	1204	50.70
1205	50.18	1206	49.72	1207	49.13	1208	48.41	1209	47.62
1210	46.75	1211	45.81	1212	44.81	1213	43.90	1214	42.77
1215	41.79	1216	40.99	1217	40.16	1218	39.39	1219	38.90
1220	38.66	1221	38.41	1222	38.13	1223	38.06	1224	38.16
1225	38.16	1226	38.06	1227	38.07	1228	38.23	1229	38.28
1230	38.17	1231	38.17	1232	38.30	1233	38.20	1234	38.08
1235	38.18	1236	38.14	1237	37.97	1238	38.00	1239	37.88
1240	37.65	1241	37.67	1242	37.55	1243	37.29	1244	37.27
1245	37.15	1246	36.90	1247	36.88	1248	36.77	1249	36.57
1250	36.63	1251	36.58	1252	36.44	1253	36.53	1254	36.52
1255	36.39	1256	36.50	1257	36.49	1258	36.37	1259	36.48
1260	36.48	1261	36.36	1262	36.24	1263	36.12	1264	35.97
1265	35.87	1266	35.55	1267	35.23	1268	34.94	1269	34.45
1270	33.81	1271	33.25	1272	32.78	1273	32.16	1274	31.40
1275	30.76	1276	30.24	1277	29.62	1278	28.93	1279	28.46
1280	28.22	1281	27.98	1282	27.69	1283	27.56	1284	27.58
1285	27.52	1286	27.35	1287	27.31	1288	27.40	1289	27.38
1290	27.26	1291	27.24	1292	27.34	1293	27.22	1294	27.22
1295	27.21	1296	27.29	1297	27.26	1298	27.23	1299	27.08
1300	27.20	1310	23.29	1320	17.71	1330	14.81	1340	14.04
1350	10.76	1360	6.44	1370	3.56	1380	2.08	1390	1.67
1400	1.51	1420	1.40	1440	1.40	1460	1.34	1500	1.34

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

Page: 14

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 122B

DESCRIPTION: Area A7
TOTAL AREA TO HYDROGRAPH: 14 acres
HYDROGRAPH PEAK: 67 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 3.84 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.50	400	0.50
500	0.76	600	1.01	700	1.26	800	1.51	900	2.10
1000	3.11	1050	4.37	1100	4.82	1110	7.56	1120	6.64
1130	10.09	1131	10.09	1132	10.09	1133	10.60	1134	11.29
1135	11.81	1136	11.46	1137	12.32	1138	12.50	1139	12.50
1140	12.84	1141	14.67	1142	15.16	1143	15.82	1144	16.64
1145	18.64	1146	19.98	1147	21.49	1148	23.01	1149	32.93
1150	41.50	1151	38.64	1152	58.63	1153	67.20	1154	58.63
1155	48.55	1156	49.39	1157	26.88	1158	15.49	1159	12.50
1160	11.29	1161	9.74	1162	8.74	1163	8.06	1164	8.57

Channel Islands_100yr_exist.out

1165	7.06	1166	6.89	1167	6.38	1168	6.22	1169	5.88
1170	5.38	1171	5.38	1172	5.54	1173	5.21	1174	4.20
1175	4.87	1176	4.54	1177	4.20	1178	4.03	1179	3.86
1180	3.86	1181	3.86	1182	4.03	1183	4.03	1184	4.03
1185	4.03	1186	3.86	1187	3.86	1188	4.03	1189	4.03
1190	3.86	1191	4.03	1192	3.86	1193	3.86	1194	3.86
1195	4.03	1196	3.86	1197	4.03	1198	4.03	1199	3.86
1200	3.86	1201	3.70	1202	3.53	1203	3.19	1204	3.19
1205	2.86	1206	2.86	1207	2.86	1208	2.86	1209	2.86
1210	2.86	1211	2.86	1212	2.86	1213	3.02	1214	2.86
1215	2.86	1216	3.02	1217	3.02	1218	2.86	1219	2.86
1220	3.02	1221	3.02	1222	2.86	1223	2.86	1224	3.02
1225	3.02	1226	2.86	1227	2.86	1228	3.02	1229	3.02
1230	2.86	1231	2.86	1232	3.02	1233	2.86	1234	2.69
1235	2.86	1236	2.86	1237	2.69	1238	2.86	1239	2.86
1240	2.69	1241	2.86	1242	2.86	1243	2.69	1244	2.86
1245	2.86	1246	2.69	1247	2.86	1248	2.86	1249	2.69
1250	2.86	1251	2.86	1252	2.69	1253	2.86	1254	2.86
1255	2.69	1256	2.86	1257	2.86	1258	2.69	1259	2.86
1260	2.86	1261	2.69	1262	2.52	1263	2.35	1264	2.18
1265	2.18	1266	2.02	1267	2.02	1268	2.18	1269	2.18
1270	2.02	1271	2.02	1272	2.18	1273	2.18	1274	2.02
1275	2.02	1276	2.18	1277	2.18	1278	2.02	1279	2.02
1280	2.18	1281	2.18	1282	2.02	1283	2.02	1284	2.18
1285	2.18	1286	2.02	1287	2.02	1288	2.18	1289	2.18
1290	2.02	1291	2.02	1292	2.18	1293	2.02	1294	2.02
1295	2.02	1296	2.18	1297	2.18	1298	2.18	1299	2.02
1300	2.18	1310	1.01	1320	1.09	1330	1.09	1340	1.01
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Page: 15 Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition
Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 123AB

DESCRIPTION: Confluence
TOTAL AREA TO HYDROGRAPH: 198 acres
HYDROGRAPH PEAK: 552 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 55.21 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.42	200	1.46	300	6.34	400	7.97
500	9.87	600	14.34	700	16.86	800	21.06	900	28.18
1000	42.74	1050	58.33	1100	67.95	1110	83.34	1120	96.28
1130	115.79	1131	118.21	1132	120.44	1133	124.26	1134	129.00
1135	133.82	1136	137.38	1137	142.55	1138	146.68	1139	149.76
1140	153.25	1141	159.08	1142	163.59	1143	168.52	1144	174.87
1145	183.74	1146	192.81	1147	203.05	1148	215.10	1149	241.39

Channel Islands_100yr_exist.out

1150	270.37	1151	287.34	1152	347.31	1153	405.46	1154	443.15
1155	487.09	1156	545.55	1157	552.17	1158	547.76	1159	541.61
1160	519.61	1161	491.59	1162	459.59	1163	426.52	1164	391.43
1165	351.66	1166	312.89	1167	276.13	1168	238.34	1169	201.74
1170	169.77	1171	146.45	1172	130.04	1173	117.68	1174	107.26
1175	101.10	1176	95.04	1177	89.55	1178	85.07	1179	81.14
1180	77.91	1181	74.74	1182	71.94	1183	69.33	1184	67.15
1185	65.38	1186	63.43	1187	61.78	1188	60.67	1189	59.57
1190	58.36	1191	57.78	1192	56.97	1193	56.41	1194	56.09
1195	56.11	1196	55.79	1197	55.86	1198	55.82	1199	55.45
1200	55.35	1201	55.07	1202	54.74	1203	54.15	1204	53.92
1205	53.22	1206	52.71	1207	52.19	1208	51.50	1209	50.74
1210	49.89	1211	48.97	1212	47.99	1213	47.21	1214	46.01
1215	44.95	1216	44.27	1217	43.46	1218	42.50	1219	41.92
1220	41.76	1221	41.53	1222	41.09	1223	40.93	1224	41.14
1225	41.19	1226	40.95	1227	40.92	1228	41.20	1229	41.29
1230	41.07	1231	41.02	1232	41.28	1233	41.10	1234	40.81
1235	40.99	1236	41.02	1237	40.72	1238	40.83	1239	40.79
1240	40.42	1241	40.51	1242	40.46	1243	40.07	1244	40.12
1245	40.06	1246	39.68	1247	39.74	1248	39.67	1249	39.33
1250	39.45	1251	39.46	1252	39.18	1253	39.34	1254	39.39
1255	39.12	1256	39.31	1257	39.36	1258	39.10	1259	39.29
1260	39.35	1261	39.09	1262	38.80	1263	38.51	1264	38.21
1265	38.09	1266	37.69	1267	37.36	1268	37.23	1269	36.82
1270	36.06	1271	35.46	1272	35.13	1273	34.57	1274	33.70
1275	33.01	1276	32.61	1277	32.04	1278	31.20	1279	30.64
1280	30.49	1281	30.25	1282	29.81	1283	29.62	1284	29.75
1285	29.73	1286	29.43	1287	29.34	1288	29.55	1289	29.58
1290	29.32	1291	29.26	1292	29.49	1293	29.29	1294	29.23
1295	29.23	1296	29.44	1297	29.46	1298	29.42	1299	29.16
1300	29.33	1310	24.55	1320	18.99	1330	16.04	1340	15.04
1350	11.03	1360	6.63	1370	3.81	1380	2.14	1390	1.73
1400	1.50	1420	1.43	1440	1.42	1460	1.42	1500	1.42

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

Page: 16

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 125A

DESCRIPTION: Area A8
TOTAL AREA TO HYDROGRAPH: 204 acres
HYDROGRAPH PEAK: 545 cfs
TIME OF PEAK: 1160 minutes
HYDROGRAPH VOLUME: 56.93 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.42	200	1.45	300	5.76	400	8.35
500	9.74	600	14.55	700	17.15	800	21.40	900	28.53
1000	43.13	1050	58.37	1100	69.49	1110	79.16	1120	93.56
1130	111.81	1131	113.86	1132	115.88	1133	118.17	1134	120.63

Channel Islands_100yr_exist.out									
1135	123.44	1136	126.67	1137	130.97	1138	135.36	1139	139.74
1140	144.28	1141	148.79	1142	153.31	1143	157.83	1144	162.87
1145	168.53	1146	174.78	1147	182.00	1148	190.56	1149	203.36
1150	218.71	1151	235.29	1152	264.82	1153	296.04	1154	338.07
1155	384.94	1156	430.10	1157	481.76	1158	518.70	1159	538.45
1160	545.34	1161	540.84	1162	525.85	1163	503.15	1164	476.03
1165	445.99	1166	413.67	1167	379.45	1168	344.97	1169	310.78
1170	276.28	1171	244.37	1172	214.12	1173	187.86	1174	166.19
1175	148.39	1176	134.52	1177	123.07	1178	114.09	1179	106.72
1180	100.24	1181	94.69	1182	90.10	1183	86.02	1184	82.41
1185	79.18	1186	76.20	1187	73.57	1188	71.21	1189	69.12
1190	67.22	1191	65.58	1192	64.13	1193	62.82	1194	61.68
1195	60.70	1196	59.85	1197	59.19	1198	58.78	1199	58.36
1200	58.09	1201	57.76	1202	57.55	1203	57.22	1204	56.94
1205	56.61	1206	56.17	1207	55.88	1208	55.41	1209	55.02
1210	54.47	1211	53.94	1212	53.40	1213	52.73	1214	51.99
1215	51.13	1216	50.37	1217	49.54	1218	48.55	1219	47.59
1220	46.79	1221	46.00	1222	45.14	1223	44.43	1224	43.97
1225	43.58	1226	43.16	1227	42.86	1228	42.78	1229	42.70
1230	42.52	1231	42.41	1232	42.48	1233	42.46	1234	42.36
1235	42.36	1236	42.36	1237	42.30	1238	42.25	1239	42.23
1240	42.18	1241	42.12	1242	42.08	1243	42.00	1244	41.90
1245	41.83	1246	41.72	1247	41.60	1248	41.50	1249	41.37
1250	41.24	1251	41.14	1252	41.01	1253	40.89	1254	40.82
1255	40.73	1256	40.66	1257	40.63	1258	40.58	1259	40.53
1260	40.53	1261	40.50	1262	40.35	1263	40.30	1264	40.28
1265	40.12	1266	39.91	1267	39.66	1268	39.52	1269	39.36
1270	39.05	1271	38.74	1272	38.54	1273	38.25	1274	37.75
1275	37.24	1276	36.86	1277	36.41	1278	35.76	1279	35.12
1280	34.64	1281	34.11	1282	33.44	1283	32.83	1284	32.44
1285	32.08	1286	31.64	1287	31.28	1288	31.13	1289	31.02
1290	30.77	1291	30.59	1292	30.59	1293	30.53	1294	30.44
1295	30.33	1296	30.36	1297	30.37	1298	30.26	1299	30.25
1300	30.27	1310	27.86	1320	23.27	1330	18.90	1340	16.43
1350	13.87	1360	10.50	1370	7.01	1380	4.58	1390	2.90
1400	2.00	1420	1.48	1440	1.44	1460	1.42	1500	1.42

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Page: 17 Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition
Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 127B

DESCRIPTION: Area D1
TOTAL AREA TO HYDROGRAPH: 24 acres
HYDROGRAPH PEAK: 111 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 8.25 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.85	200	2.01	300	2.30	400	2.30

Channel Islands_100yr_exist.out									
500	2.42	600	2.54	700	2.67	800	2.92	900	3.88
1000	5.55	1050	7.62	1100	8.36	1110	12.94	1120	11.37
1130	17.23	1131	17.23	1132	17.23	1133	18.05	1134	19.14
1135	19.97	1136	19.42	1137	20.79	1138	21.06	1139	21.06
1140	21.61	1141	24.60	1142	25.41	1143	26.49	1144	27.85
1145	31.07	1146	33.21	1147	35.62	1148	38.03	1149	54.23
1150	68.44	1151	63.70	1152	97.05	1153	111.27	1154	97.05
1155	80.23	1156	81.64	1157	44.31	1158	25.95	1159	21.06
1160	19.14	1161	16.67	1162	14.95	1163	13.80	1164	14.66
1165	12.08	1166	11.80	1167	10.94	1168	10.65	1169	10.10
1170	9.27	1171	9.27	1172	9.55	1173	9.00	1174	7.34
1175	8.44	1176	7.89	1177	7.34	1178	7.06	1179	6.79
1180	6.79	1181	6.79	1182	7.06	1183	7.06	1184	7.06
1185	7.06	1186	6.79	1187	6.79	1188	7.06	1189	7.06
1190	6.79	1191	7.06	1192	6.79	1193	6.79	1194	6.79
1195	7.06	1196	6.79	1197	7.06	1198	7.06	1199	6.79
1200	6.79	1201	6.51	1202	6.23	1203	5.68	1204	5.68
1205	5.13	1206	5.13	1207	5.13	1208	5.13	1209	5.13
1210	5.13	1211	5.13	1212	5.13	1213	5.41	1214	5.13
1215	5.13	1216	5.41	1217	5.41	1218	5.13	1219	5.13
1220	5.41	1221	5.41	1222	5.13	1223	5.13	1224	5.41
1225	5.41	1226	5.13	1227	5.13	1228	5.41	1229	5.41
1230	5.13	1231	5.13	1232	5.41	1233	5.13	1234	4.85
1235	5.13	1236	5.13	1237	4.85	1238	5.13	1239	5.13
1240	4.85	1241	5.13	1242	5.13	1243	4.85	1244	5.13
1245	5.13	1246	4.85	1247	5.13	1248	5.13	1249	4.85
1250	5.13	1251	5.13	1252	4.85	1253	5.13	1254	5.13
1255	4.85	1256	5.13	1257	5.13	1258	4.85	1259	5.13
1260	5.13	1261	4.85	1262	4.58	1263	4.30	1264	4.02
1265	4.02	1266	3.75	1267	3.75	1268	4.02	1269	4.02
1270	3.75	1271	3.75	1272	4.02	1273	4.02	1274	3.75
1275	3.75	1276	4.02	1277	4.02	1278	3.75	1279	3.75
1280	4.02	1281	4.02	1282	3.75	1283	3.75	1284	4.02
1285	4.02	1286	3.75	1287	3.75	1288	4.02	1289	4.02
1290	3.75	1291	3.75	1292	4.02	1293	3.75	1294	3.75
1295	3.75	1296	4.02	1297	4.02	1298	4.02	1299	3.75
1300	4.02	1310	2.54	1320	2.59	1330	2.59	1340	2.54
1350	1.93	1360	1.89	1370	1.93	1380	1.93	1390	1.89
1400	1.93	1420	1.33	1440	1.33	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 130AB

TOTAL AREA TO HYDROGRAPH: 228 acres
HYDROGRAPH PEAK: 608 cfs
TIME OF PEAK: 1160 minutes
HYDROGRAPH VOLUME: 65.35 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
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Channel Islands_100yr_exist.out

0	0.00	100	3.26	200	3.43	300	7.92	400	10.68
500	12.07	600	17.06	700	19.75	800	24.26	900	32.22
1000	48.41	1050	65.34	1100	77.79	1110	88.40	1120	104.85
1130	124.42	1131	126.98	1132	129.44	1133	132.22	1134	135.13
1135	138.18	1136	141.54	1137	145.72	1138	150.72	1139	155.80
1140	160.79	1141	165.85	1142	170.86	1143	175.91	1144	181.50
1145	188.04	1146	195.33	1147	203.41	1148	212.96	1149	225.63
1150	242.11	1151	262.23	1152	292.09	1153	331.69	1154	379.14
1155	436.07	1156	493.45	1157	546.42	1158	587.96	1159	608.00
1160	608.28	1161	595.02	1162	573.74	1163	546.83	1164	516.33
1165	483.82	1166	449.72	1167	414.54	1168	378.90	1169	343.49
1170	308.33	1171	274.47	1172	242.94	1173	214.32	1174	189.78
1175	169.56	1176	153.28	1177	139.96	1178	129.35	1179	120.47
1180	113.22	1181	106.76	1182	101.23	1183	96.53	1184	92.36
1185	88.69	1186	85.45	1187	82.62	1188	80.04	1189	77.75
1190	75.68	1191	73.83	1192	72.21	1193	70.79	1194	69.53
1195	68.42	1196	67.45	1197	66.63	1198	66.00	1199	65.56
1200	65.21	1201	64.93	1202	64.67	1203	64.41	1204	64.08
1205	63.70	1206	63.22	1207	62.67	1208	62.08	1209	61.43
1210	60.73	1211	60.01	1212	59.32	1213	58.64	1214	57.90
1215	57.08	1216	56.24	1217	55.43	1218	54.57	1219	53.61
1220	52.71	1221	51.90	1222	51.11	1223	50.30	1224	49.64
1225	49.18	1226	48.78	1227	48.40	1228	48.14	1229	48.04
1230	47.93	1231	47.79	1232	47.71	1233	47.73	1234	47.71
1235	47.65	1236	47.61	1237	47.59	1238	47.51	1239	47.42
1240	47.36	1241	47.28	1242	47.21	1243	47.14	1244	47.05
1245	46.95	1246	46.86	1247	46.75	1248	46.63	1249	46.52
1250	46.40	1251	46.27	1252	46.16	1253	46.04	1254	45.93
1255	45.84	1256	45.76	1257	45.70	1258	45.65	1259	45.61
1260	45.58	1261	45.56	1262	45.50	1263	45.40	1264	45.34
1265	45.26	1266	45.07	1267	44.77	1268	44.42	1269	44.10
1270	43.74	1271	43.31	1272	42.90	1273	42.58	1274	42.19
1275	41.68	1276	41.17	1277	40.73	1278	40.23	1279	39.61
1280	39.00	1281	38.47	1282	37.92	1283	37.29	1284	36.71
1285	36.29	1286	35.92	1287	35.51	1288	35.18	1289	35.01
1290	34.86	1291	34.66	1292	34.50	1293	34.45	1294	34.41
1295	34.31	1296	34.23	1297	34.22	1298	34.19	1299	34.12
1300	34.09	1310	31.72	1320	26.60	1330	21.90	1340	19.25
1350	16.58	1360	13.03	1370	9.44	1380	6.84	1390	5.15
1400	4.03	1420	3.38	1440	3.28	1460	3.27	1500	3.26

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

Page: 19

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 131A

DESCRIPTION: Area D2
TOTAL AREA TO HYDROGRAPH: 236 acres
HYDROGRAPH PEAK: 615 cfs
TIME OF PEAK: 1159 minutes
HYDROGRAPH VOLUME: 66.70 acre-ft

Channel Islands_100yr_exist.out

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	3.32	200	3.50	300	8.00	400	10.76
500	12.15	600	17.15	700	19.84	800	24.41	900	32.70
1000	49.44	1050	67.07	1100	79.77	1110	91.92	1120	107.83
1130	129.38	1131	131.95	1132	134.41	1133	137.42	1134	140.63
1135	143.90	1136	147.12	1137	151.68	1138	156.98	1139	162.13
1140	167.21	1141	172.71	1142	178.48	1143	183.76	1144	189.72
1145	197.23	1146	205.40	1147	214.07	1148	224.29	1149	241.49
1150	262.57	1151	281.35	1152	320.57	1153	364.16	1154	411.61
1155	463.85	1156	516.24	1157	569.36	1158	600.39	1159	615.32
1160	614.39	1161	600.21	1162	578.22	1163	550.84	1164	520.49
1165	487.41	1166	452.83	1167	417.41	1168	381.69	1169	346.60
1170	310.43	1171	276.80	1172	245.19	1173	216.57	1174	191.95
1175	171.20	1176	155.22	1177	141.67	1178	130.90	1179	122.02
1180	114.70	1181	108.24	1182	102.70	1183	98.01	1184	93.91
1185	90.25	1186	86.93	1187	84.09	1188	81.51	1189	79.30
1190	77.16	1191	75.31	1192	73.69	1193	72.27	1194	71.01
1195	69.90	1196	68.93	1197	68.10	1198	67.56	1199	67.04
1200	66.68	1201	66.25	1202	66.00	1203	65.57	1204	65.17
1205	64.72	1206	64.09	1207	63.61	1208	62.94	1209	62.37
1210	61.60	1211	60.88	1212	60.26	1213	59.58	1214	58.84
1215	57.94	1216	57.18	1217	56.45	1218	55.51	1219	54.47
1220	53.64	1221	52.92	1222	52.05	1223	51.16	1224	50.58
1225	50.19	1226	49.72	1227	49.26	1228	49.08	1229	49.05
1230	48.87	1231	48.65	1232	48.65	1233	48.67	1234	48.57
1235	48.51	1236	48.48	1237	48.45	1238	48.37	1239	48.29
1240	48.22	1241	48.14	1242	48.07	1243	48.00	1244	47.91
1245	47.81	1246	47.72	1247	47.61	1248	47.49	1249	47.38
1250	47.26	1251	47.13	1252	47.02	1253	46.90	1254	46.79
1255	46.70	1256	46.62	1257	46.56	1258	46.52	1259	46.47
1260	46.44	1261	46.42	1262	46.21	1263	46.03	1264	45.97
1265	45.82	1266	45.55	1267	45.16	1268	44.90	1269	44.65
1270	44.22	1271	43.71	1272	43.38	1273	43.13	1274	42.67
1275	42.08	1276	41.65	1277	41.28	1278	40.71	1279	40.01
1280	39.47	1281	39.02	1282	38.40	1283	37.69	1284	37.19
1285	36.85	1286	36.39	1287	35.91	1288	35.66	1289	35.56
1290	35.34	1291	35.06	1292	34.98	1293	34.93	1294	34.88
1295	34.71	1296	34.71	1297	34.77	1298	34.67	1299	34.60
1300	34.56	1310	31.80	1320	26.69	1330	21.98	1340	19.33
1350	16.65	1360	13.09	1370	9.50	1380	6.91	1390	5.21
1400	4.09	1420	3.42	1440	3.32	1460	3.27	1500	3.26

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Page: 20 Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition
Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 132A

DESCRIPTION: Area A9
TOTAL AREA TO HYDROGRAPH: 269 acres

Channel Islands_100yr_exist.out
HYDROGRAPH PEAK: 671 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 75.77 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	3.32	200	3.50	300	9.19	400	11.95
500	13.93	600	19.52	700	22.81	800	27.97	900	37.64
1000	56.77	1050	77.36	1100	91.14	1110	109.74	1120	123.47
1130	153.16	1131	155.72	1132	158.19	1133	162.21	1134	166.77
1135	171.06	1136	173.60	1137	179.85	1138	186.50	1139	191.99
1140	197.40	1141	204.91	1142	213.89	1143	220.14	1144	227.71
1145	239.46	1146	251.57	1147	262.88	1148	276.08	1149	313.10
1150	353.65	1151	366.82	1152	445.31	1153	505.73	1154	553.18
1155	585.62	1156	617.22	1157	671.00	1158	657.15	1159	649.45
1160	643.24	1161	625.00	1162	600.00	1163	570.64	1164	540.95
1165	505.56	1166	469.00	1167	432.59	1168	396.54	1169	362.77
1170	322.31	1171	289.67	1172	257.73	1173	229.11	1174	204.16
1175	181.10	1176	166.44	1177	151.90	1178	140.47	1179	131.59
1180	123.94	1181	117.48	1182	111.94	1183	107.25	1184	103.48
1185	99.82	1186	96.17	1187	93.33	1188	90.75	1189	88.87
1190	86.40	1191	84.55	1192	82.93	1193	81.51	1194	80.25
1195	79.14	1196	78.17	1197	77.34	1198	77.13	1199	76.28
1200	75.92	1201	74.83	1202	74.58	1203	73.49	1204	72.76
1205	71.98	1206	70.69	1207	70.54	1208	69.54	1209	69.30
1210	68.20	1211	67.47	1212	67.19	1213	66.51	1214	65.77
1215	64.54	1216	64.11	1217	63.71	1218	62.44	1219	61.07
1220	60.57	1221	60.18	1222	58.98	1223	57.76	1224	57.51
1225	57.45	1226	56.65	1227	55.86	1228	56.01	1229	56.31
1230	55.80	1231	55.25	1232	55.58	1233	55.60	1234	55.17
1235	55.11	1236	55.08	1237	55.05	1238	54.97	1239	54.89
1240	54.82	1241	54.74	1242	54.67	1243	54.60	1244	54.51
1245	54.41	1246	54.32	1247	54.21	1248	54.09	1249	53.98
1250	53.86	1251	53.73	1252	53.62	1253	53.50	1254	53.39
1255	53.30	1256	53.23	1257	53.16	1258	53.12	1259	53.07
1260	53.04	1261	53.02	1262	52.15	1263	51.64	1264	51.58
1265	51.10	1266	50.50	1267	49.78	1268	49.85	1269	49.93
1270	49.17	1271	48.32	1272	48.33	1273	48.41	1274	47.62
1275	46.70	1276	46.60	1277	46.56	1278	45.66	1279	44.63
1280	44.42	1281	44.30	1282	43.35	1283	42.31	1284	42.14
1285	42.13	1286	41.34	1287	40.53	1288	40.61	1289	40.84
1290	40.29	1291	39.68	1292	39.93	1293	39.88	1294	39.83
1295	39.33	1296	39.66	1297	40.05	1298	39.62	1299	39.55
1300	39.51	1310	34.18	1320	29.26	1330	24.56	1340	21.71
1350	16.65	1360	13.09	1370	9.50	1380	6.91	1390	5.21
1400	4.09	1420	3.42	1440	3.32	1460	3.27	1500	3.26

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

Hydrograph Printouts

DESCRIPTION: Area A10
TOTAL AREA TO HYDROGRAPH: 284 acres
HYDROGRAPH PEAK: 714 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 78.00 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	3.32	200	3.50	300	9.19	400	11.95
500	13.93	600	19.52	700	22.81	800	28.08	900	38.36
1000	58.53	1050	80.42	1100	94.67	1110	116.16	1120	128.89
1130	162.31	1131	164.87	1132	167.34	1133	171.79	1134	176.92
1135	181.64	1136	183.89	1137	190.85	1138	198.08	1139	203.71
1140	209.27	1141	217.62	1142	228.01	1143	234.68	1144	242.95
1145	256.51	1146	270.28	1147	282.70	1148	297.14	1149	342.68
1150	391.83	1151	402.52	1152	498.56	1153	566.46	1154	613.91
1155	637.55	1156	659.79	1157	713.87	1158	680.30	1159	663.00
1160	654.53	1161	634.58	1162	608.26	1163	577.98	1164	548.60
1165	512.14	1166	474.66	1167	437.80	1168	401.59	1169	368.43
1170	326.06	1171	293.85	1172	261.77	1173	233.15	1174	208.06
1175	183.98	1176	169.91	1177	154.94	1178	143.22	1179	134.34
1180	126.54	1181	120.08	1182	114.54	1183	109.85	1184	106.23
1185	102.56	1186	98.77	1187	95.93	1188	93.35	1189	91.62
1190	89.00	1191	87.15	1192	85.53	1193	84.11	1194	82.85
1195	81.74	1196	80.77	1197	79.94	1198	79.87	1199	78.88
1200	78.52	1201	77.14	1202	76.89	1203	75.52	1204	74.64
1205	73.71	1206	72.13	1207	72.13	1208	70.98	1209	70.89
1210	69.64	1211	68.92	1212	68.78	1213	68.10	1214	67.36
1215	65.99	1216	65.70	1217	65.44	1218	64.02	1219	62.52
1220	62.16	1221	61.91	1222	60.56	1223	59.21	1224	59.10
1225	59.19	1226	58.24	1227	57.31	1228	57.60	1229	58.04
1230	57.39	1231	56.69	1232	57.17	1233	57.19	1234	56.62
1235	56.55	1236	56.52	1237	56.49	1238	56.41	1239	56.33
1240	56.26	1241	56.19	1242	56.11	1243	56.04	1244	55.95
1245	55.86	1246	55.77	1247	55.66	1248	55.54	1249	55.43
1250	55.30	1251	55.17	1252	55.06	1253	54.94	1254	54.83
1255	54.75	1256	54.67	1257	54.60	1258	54.56	1259	54.52
1260	54.48	1261	54.46	1262	53.30	1263	52.65	1264	52.59
1265	51.96	1266	51.22	1267	50.36	1268	50.57	1269	50.80
1270	49.89	1271	48.90	1272	49.05	1273	49.28	1274	48.34
1275	47.28	1276	47.32	1277	47.43	1278	46.38	1279	45.20
1280	45.14	1281	45.17	1282	44.07	1283	42.89	1284	42.86
1285	42.99	1286	42.07	1287	41.11	1288	41.33	1289	41.71
1290	41.01	1291	40.25	1292	40.65	1293	40.60	1294	40.56
1295	39.91	1296	40.38	1297	40.92	1298	40.34	1299	40.27
1300	40.24	1310	34.18	1320	29.26	1330	24.56	1340	21.71
1350	16.65	1360	13.09	1370	9.50	1380	6.91	1390	5.21
1400	4.09	1420	3.42	1440	3.32	1460	3.27	1500	3.26

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Existing Condition

VCRat Model Input
Page 22

Model Lines

```

005 1 100A Header place holder
005 1 101A Header place holder
005 1 106B Header place holder
005 1 108ABHeader place holder
005 1 109C Header place holder
005 1 111D Header place holder
005 1 114B Header place holder
005 1 115BCHeader place holder
005 1 117B Header place holder
005 1 118ABHeader place holder
005 1 120A Header place holder
005 1 122B Header place holder
005 1 123ABHeader place holder
005 1 125A Header place holder
005 1 127B Header place holder
005 1 130ABHeader place holder
005 1 131A Header place holder
005 1 132A Header place holder
005 1 133A Header place holder
999
999
006 1 100A 010 099A97 G1
006 1 101A 010000011413B98 1
006 1 102A 010 099A97400202003860
006 1 103A 010 099A97400373000800
006 1 104A 010 099A97400224005600
006 1 105A 010 099A97400131000400
006 1 106B 020030000706B98 1
006 1 107B 010 099A97400194000400
006 1 108AB010 A97 11
006 1 109C 010000002806B98 1
006 1 110C 010 099A97100062006666
006 1 111D 020000000507B98 1
006 1 112CD010 A97
006 1 113C 010 099A97100060011660
006 1 114B 010000001207B98 1
006 1 115BC010 A97 11
006 1 116B 010 099A97100660002727
006 1 117B 010000000806B98 1
006 1 118AB010 A97 11
006 1 119A 010 099A97100600002666
006 1 120A 010003001005B98 1
006 1 121A 010 099A97100075006660
006 1 122B 010000001405B98 1
006 1 123AB010 A97 11
006 1 124A 010 099A97100760002368
006 1 125A 010000000606B98 1
006 1 126A 010 099A97400560003570
006 1 127B 020030002405B98 1
006 1 128B 010 099A97401550002000
006 1 129B 010 099A97400730002000
006 1 130AB010 A97 11

```

♀

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Model Lines

VCRat Model Input

006	1	131A	020003000806B98
006	1	132A	010000003306B98
006	1	133A	020000001506B98

1
1
1 2

Attachment B-4
Existing Condition – Basin Routing Computations – PondPack

10-Year Existing Condition

Project Summary

Title

Engineer

Company

Date 12/9/2016

Notes

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10-Year Existing Condition

Subsection: User Notifications

User Notifications?	No user notifications generated.
---------------------	----------------------------------

10-Year Existing Condition

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)
CM-1	Pre-Development 10-yr	0	30.626	1,158.000	408.80

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)
O-2	Pre-Development 10-yr	0	0.000	0.000	0.00

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
PO-1 (IN)	Pre-Development 10-yr	0	30.522	1,158.000	408.80	(N/A)	(N/A)
PO-1 (OUT)	Pre-Development 10-yr	0	0.000	0.000	0.00	7.01	30.522

10-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

Peak Discharge	408.80 ft ³ /s
Time to Peak	1,158.000 min
Hydrograph Volume	30.626 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.10	0.10	0.10	0.10
5.000	0.10	0.10	0.20	0.20	0.20
10.000	0.20	0.20	0.20	0.30	0.30
15.000	0.30	0.30	0.30	0.30	0.40
20.000	0.40	0.40	0.40	0.40	0.40
25.000	0.50	0.50	0.50	0.50	0.50
30.000	0.50	0.60	0.60	0.60	0.60
35.000	0.60	0.60	0.70	0.70	0.70
40.000	0.70	0.70	0.70	0.80	0.80
45.000	0.80	0.80	0.80	0.80	0.90
50.000	0.90	0.90	0.90	0.90	0.90
55.000	1.00	1.00	1.00	1.00	1.00
60.000	1.00	1.10	1.10	1.10	1.10
65.000	1.10	1.10	1.10	1.20	1.20
70.000	1.20	1.20	1.20	1.20	1.30
75.000	1.30	1.30	1.30	1.30	1.30
80.000	1.40	1.40	1.40	1.40	1.40
85.000	1.40	1.50	1.50	1.50	1.50
90.000	1.50	1.50	1.60	1.60	1.60
95.000	1.60	1.60	1.60	1.70	1.70
100.000	1.70	1.70	1.70	1.70	1.70
105.000	1.70	1.70	1.70	1.70	1.70
110.000	1.70	1.70	1.70	1.70	1.70
115.000	1.70	1.70	1.70	1.70	1.70
120.000	1.70	1.70	1.70	1.70	1.70
125.000	1.70	1.70	1.70	1.70	1.70
130.000	1.70	1.70	1.70	1.70	1.70
135.000	1.70	1.70	1.70	1.70	1.70
140.000	1.70	1.70	1.70	1.70	1.70
145.000	1.70	1.70	1.70	1.70	1.70
150.000	1.70	1.70	1.70	1.70	1.70
155.000	1.70	1.70	1.70	1.70	1.70
160.000	1.70	1.70	1.70	1.70	1.70
165.000	1.70	1.70	1.70	1.70	1.70
170.000	1.70	1.70	1.70	1.70	1.70
175.000	1.70	1.70	1.70	1.70	1.70
180.000	1.70	1.70	1.70	1.70	1.70

10-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
185.000	1.70	1.70	1.70	1.70	1.70
190.000	1.70	1.70	1.70	1.70	1.70
195.000	1.70	1.70	1.70	1.70	1.70
200.000	1.70	1.70	1.70	1.70	1.70
205.000	1.70	1.70	1.70	1.70	1.70
210.000	1.70	1.70	1.70	1.70	1.70
215.000	1.70	1.70	1.80	1.80	1.80
220.000	1.80	1.80	1.80	1.80	1.80
225.000	1.80	1.80	1.80	1.80	1.80
230.000	1.80	1.80	1.80	1.80	1.80
235.000	1.80	1.80	1.80	1.80	1.80
240.000	1.80	1.80	1.80	1.80	1.80
245.000	1.80	1.80	1.80	1.80	1.80
250.000	1.80	1.80	1.80	1.80	1.80
255.000	1.80	1.80	1.80	1.80	1.80
260.000	1.80	1.80	1.80	1.80	1.80
265.000	1.80	1.80	1.80	1.80	1.80
270.000	1.80	1.80	1.80	1.80	1.80
275.000	1.80	1.80	1.80	1.80	1.80
280.000	1.80	1.80	1.80	1.80	1.80
285.000	1.80	1.80	1.80	1.80	1.80
290.000	1.80	1.80	1.80	1.80	1.80
295.000	1.80	1.80	1.80	1.80	1.80
300.000	1.80	1.90	1.90	1.90	1.90
305.000	1.90	1.90	1.90	1.90	1.90
310.000	1.90	1.90	1.90	1.90	1.90
315.000	1.90	1.90	1.90	1.90	1.90
320.000	1.90	1.90	1.90	1.90	1.90
325.000	1.90	1.90	1.90	1.90	1.90
330.000	1.90	1.90	1.90	1.90	1.90
335.000	1.90	1.90	1.90	1.90	1.90
340.000	1.90	1.90	1.90	1.90	1.90
345.000	1.90	1.90	1.90	1.90	1.90
350.000	1.90	1.90	1.90	1.90	1.90
355.000	1.90	1.90	1.90	1.90	1.90
360.000	1.90	1.90	1.90	1.90	1.90
365.000	1.90	1.90	1.90	1.90	1.90
370.000	1.90	1.90	2.00	2.00	2.00
375.000	2.00	2.00	2.00	2.00	2.00
380.000	2.00	2.00	2.00	2.00	2.00
385.000	2.00	2.00	2.00	2.00	2.00
390.000	2.00	2.00	2.00	2.00	2.00

10-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
395.000	2.00	2.00	2.00	2.00	2.00
400.000	2.00	2.00	2.00	2.00	2.00
405.000	2.00	2.00	2.00	2.00	2.00
410.000	2.00	2.00	2.00	2.00	2.00
415.000	2.00	2.00	2.00	2.00	2.00
420.000	2.00	2.00	2.00	2.00	2.00
425.000	2.00	2.00	2.00	2.00	2.00
430.000	2.00	2.00	2.00	2.00	2.10
435.000	2.10	2.10	2.10	2.10	2.10
440.000	2.10	2.10	2.10	2.10	2.10
445.000	2.10	2.10	2.10	2.10	2.10
450.000	2.10	2.10	2.10	2.10	2.10
455.000	2.10	2.10	2.10	2.10	2.10
460.000	2.10	2.10	2.10	2.10	2.10
465.000	2.10	2.10	2.10	2.10	2.10
470.000	2.10	2.10	2.10	2.10	2.10
475.000	2.10	2.10	2.10	2.10	2.10
480.000	2.10	2.10	2.10	2.10	2.10
485.000	2.10	2.10	2.10	2.10	2.20
490.000	2.20	2.20	2.20	2.20	2.20
495.000	2.20	2.20	2.20	2.20	2.20
500.000	2.20	2.20	2.20	2.20	2.20
505.000	2.20	2.20	2.20	2.20	2.20
510.000	2.20	2.20	2.20	2.20	2.20
515.000	2.20	2.20	2.20	2.20	2.20
520.000	2.20	2.20	2.20	2.20	2.20
525.000	2.20	2.20	2.20	2.20	2.20
530.000	2.20	2.20	2.20	2.20	2.20
535.000	2.20	2.20	2.20	2.20	2.20
540.000	2.20	2.20	2.20	2.20	2.20
545.000	2.20	2.20	2.20	2.20	2.20
550.000	2.20	2.20	2.20	2.20	2.30
555.000	2.30	2.30	2.30	2.30	2.30
560.000	2.30	2.30	2.30	2.30	2.30
565.000	2.30	2.30	2.30	2.30	2.30
570.000	2.30	2.30	2.30	2.30	2.30
575.000	2.30	2.30	2.30	2.30	2.30
580.000	2.30	2.30	2.30	2.30	2.30
585.000	2.30	2.30	2.30	2.30	2.30
590.000	2.30	2.30	2.30	2.30	2.30
595.000	2.30	2.30	2.30	2.30	2.30
600.000	2.30	2.30	2.30	2.30	2.30

10-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
605.000	2.30	2.30	2.30	2.30	2.30
610.000	2.30	2.30	2.30	2.40	2.40
615.000	2.40	2.40	2.40	2.40	2.40
620.000	2.40	2.40	2.40	2.40	2.40
625.000	2.40	2.40	2.40	2.40	2.40
630.000	2.40	2.40	2.40	2.40	2.40
635.000	2.40	2.40	2.40	2.40	2.40
640.000	2.40	2.40	2.40	2.40	2.40
645.000	2.40	2.40	2.40	2.40	2.40
650.000	2.40	2.40	2.40	2.50	2.50
655.000	2.50	2.50	2.50	2.50	2.50
660.000	2.50	2.50	2.50	2.50	2.50
665.000	2.50	2.50	2.50	2.50	2.50
670.000	2.50	2.50	2.50	2.50	2.50
675.000	2.50	2.50	2.50	2.50	2.50
680.000	2.50	2.50	2.50	2.50	2.50
685.000	2.50	2.50	2.50	2.50	2.50
690.000	2.50	2.50	2.50	2.60	2.60
695.000	2.60	2.60	2.60	2.60	2.60
700.000	2.60	2.60	2.60	2.60	2.60
705.000	2.60	2.60	2.60	2.60	2.60
710.000	2.60	2.60	2.60	2.60	2.60
715.000	2.60	2.60	2.60	2.60	2.60
720.000	2.60	2.60	2.70	2.70	2.70
725.000	2.70	2.70	2.70	2.70	2.70
730.000	2.70	2.70	2.70	2.70	2.70
735.000	2.70	2.70	2.70	2.70	2.70
740.000	2.70	2.70	2.70	2.70	2.70
745.000	2.70	2.70	2.70	2.70	2.80
750.000	2.80	2.80	2.80	2.80	2.80
755.000	2.80	2.80	2.80	2.80	2.80
760.000	2.80	2.80	2.80	2.80	2.80
765.000	2.80	2.80	2.80	2.80	2.80
770.000	2.80	2.80	2.80	2.80	2.80
775.000	2.80	2.90	2.90	2.90	2.90
780.000	2.90	2.90	2.90	2.90	2.90
785.000	2.90	2.90	2.90	2.90	2.90
790.000	2.90	2.90	2.90	2.90	2.90
795.000	2.90	2.90	2.90	2.90	2.90
800.000	2.90	2.90	2.90	3.00	3.00
805.000	3.00	3.00	3.00	3.00	3.00
810.000	3.00	3.00	3.00	3.00	3.00

10-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
815.000	3.00	3.00	3.00	3.00	3.00
820.000	3.00	3.00	3.00	3.00	3.00
825.000	3.10	3.10	3.10	3.10	3.10
830.000	3.10	3.10	3.10	3.10	3.10
835.000	3.10	3.10	3.10	3.10	3.10
840.000	3.10	3.10	3.10	3.10	3.10
845.000	3.10	3.10	3.20	3.20	3.20
850.000	3.20	3.20	3.20	3.20	3.20
855.000	3.20	3.20	3.20	3.20	3.20
860.000	3.20	3.20	3.20	3.20	3.20
865.000	3.20	3.20	3.20	3.20	3.30
870.000	3.30	3.30	3.30	3.30	3.30
875.000	3.30	3.30	3.30	3.30	3.30
880.000	3.30	3.30	3.30	3.30	3.30
885.000	3.30	3.30	3.30	3.30	3.30
890.000	3.30	3.30	3.40	3.40	3.40
895.000	3.40	3.40	3.40	3.40	3.40
900.000	3.40	3.60	3.70	3.90	4.00
905.000	4.20	4.40	4.50	4.70	4.80
910.000	5.00	5.20	5.30	5.50	5.60
915.000	5.80	6.00	6.10	6.30	6.40
920.000	6.60	6.80	6.90	7.10	7.30
925.000	7.40	7.60	7.70	7.90	8.10
930.000	8.20	8.40	8.50	8.70	8.90
935.000	9.00	9.20	9.30	9.50	9.70
940.000	9.80	10.00	10.20	10.30	10.50
945.000	10.60	10.80	11.00	11.10	11.30
950.000	11.40	11.60	11.80	11.90	12.10
955.000	12.20	12.40	12.60	12.70	12.90
960.000	13.00	13.20	13.40	13.50	13.70
965.000	13.90	14.00	14.20	14.30	14.50
970.000	14.70	14.80	15.00	15.10	15.30
975.000	15.50	15.60	15.80	15.90	16.10
980.000	16.30	16.40	16.60	16.80	16.90
985.000	17.10	17.20	17.40	17.60	17.70
990.000	17.90	18.00	18.20	18.40	18.50
995.000	18.70	18.80	19.00	19.20	19.30
1,000.000	19.50	19.80	20.10	20.30	20.60
1,005.000	20.90	21.20	21.50	21.70	22.00
1,010.000	22.30	22.60	22.90	23.20	23.40
1,015.000	23.70	24.00	24.30	24.60	24.80
1,020.000	25.10	25.40	25.70	26.00	26.20

10-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,025.000	26.50	26.80	27.10	27.40	27.70
1,030.000	27.90	28.20	28.50	28.80	29.10
1,035.000	29.30	29.60	29.90	30.20	30.50
1,040.000	30.80	31.00	31.30	31.60	31.90
1,045.000	32.20	32.40	32.70	33.00	33.30
1,050.000	33.60	33.80	34.00	34.20	34.40
1,055.000	34.60	34.80	35.00	35.20	35.40
1,060.000	35.60	35.80	36.00	36.20	36.40
1,065.000	36.60	36.80	37.00	37.20	37.40
1,070.000	37.60	37.80	38.00	38.20	38.40
1,075.000	38.60	38.80	39.00	39.20	39.40
1,080.000	39.60	39.90	40.10	40.30	40.50
1,085.000	40.70	40.90	41.10	41.30	41.50
1,090.000	41.70	41.90	42.10	42.30	42.50
1,095.000	42.70	42.90	43.10	43.30	43.50
1,100.000	43.70	45.00	46.30	47.60	48.90
1,105.000	50.20	51.50	52.80	54.10	55.40
1,110.000	56.70	58.40	60.00	61.70	63.30
1,115.000	65.00	66.70	68.30	70.00	71.60
1,120.000	73.30	74.80	76.40	77.90	79.40
1,125.000	80.90	82.50	84.00	85.50	87.00
1,130.000	88.60	91.30	94.10	96.80	99.60
1,135.000	102.50	106.60	110.80	113.70	116.80
1,140.000	120.20	125.30	130.70	135.40	140.50
1,145.000	146.00	153.20	160.80	172.00	186.10
1,150.000	203.40	236.60	287.70	324.70	344.60
1,155.000	363.60	384.10	403.70	408.80	396.30
1,160.000	392.50	399.10	399.80	394.30	383.50
1,165.000	367.90	348.40	327.10	307.90	289.20
1,170.000	271.40	253.00	234.40	215.10	195.00
1,175.000	174.50	154.90	136.90	122.20	109.90
1,180.000	99.60	90.80	83.50	77.40	72.00
1,185.000	67.30	63.10	59.30	56.30	53.60
1,190.000	51.10	48.70	46.50	44.60	42.80
1,195.000	41.10	39.50	38.00	36.80	35.60
1,200.000	34.50	33.60	32.70	31.90	31.20
1,205.000	30.60	30.10	29.60	29.10	28.60
1,210.000	28.20	27.30	26.50	25.60	24.80
1,215.000	23.90	23.10	22.30	21.80	21.40
1,220.000	20.90	20.50	20.00	19.50	19.00
1,225.000	18.60	18.10	17.60	17.20	16.80
1,230.000	16.40	16.00	15.60	15.20	14.70

10-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,235.000	14.20	13.60	13.10	12.50	12.00
1,240.000	11.40	10.80	10.20	9.70	9.10
1,245.000	8.60	8.10	7.60	7.20	6.80
1,250.000	6.40	6.00	5.70	5.40	5.20
1,255.000	5.00	4.70	4.60	4.40	4.20
1,260.000	4.10	4.00	3.90	3.80	3.70
1,265.000	3.60	3.50	3.50	3.40	3.30
1,270.000	3.30	3.20	3.20	3.10	3.10
1,275.000	3.00	3.00	3.00	2.90	2.90
1,280.000	2.90	2.90	2.80	2.80	2.80
1,285.000	2.80	2.80	2.80	2.80	2.80
1,290.000	2.80	2.80	2.80	2.80	2.80
1,295.000	2.80	2.70	2.70	2.70	2.70
1,300.000	2.70	2.70	2.70	2.70	2.70
1,305.000	2.70	2.70	2.60	2.60	2.60
1,310.000	2.60	2.60	2.60	2.60	2.50
1,315.000	2.50	2.50	2.50	2.50	2.50
1,320.000	2.40	2.40	2.40	2.40	2.40
1,325.000	2.40	2.40	2.40	2.40	2.30
1,330.000	2.30	2.30	2.30	2.30	2.30
1,335.000	2.30	2.30	2.30	2.30	2.30
1,340.000	2.30	2.30	2.30	2.30	2.30
1,345.000	2.30	2.30	2.30	2.20	2.20
1,350.000	2.20	2.20	2.20	2.20	2.20
1,355.000	2.10	2.10	2.10	2.10	2.10
1,360.000	2.10	2.10	2.00	2.00	2.00
1,365.000	2.00	2.00	2.00	2.00	2.00
1,370.000	1.90	1.90	1.90	1.90	1.90
1,375.000	1.90	1.90	1.90	1.90	1.90
1,380.000	1.90	1.90	1.90	1.90	1.90
1,385.000	1.90	1.90	1.90	1.90	1.90
1,390.000	1.90	1.90	1.90	1.90	1.90
1,395.000	1.90	1.90	1.90	1.90	1.90
1,400.000	1.90	1.90	1.90	1.90	1.90
1,405.000	1.90	1.90	1.90	1.90	1.90
1,410.000	1.90	1.90	1.90	1.90	1.80
1,415.000	1.80	1.80	1.80	1.80	1.80
1,420.000	1.80	1.80	1.80	1.80	1.80
1,425.000	1.80	1.80	1.80	1.80	1.80
1,430.000	1.80	1.80	1.80	1.70	1.70
1,435.000	1.70	1.70	1.70	1.70	1.70
1,440.000	1.70	1.70	1.70	1.70	1.70

10-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,445.000	1.70	1.70	1.70	1.70	1.70
1,450.000	1.70	1.70	1.70	1.70	1.70
1,455.000	1.70	1.70	1.70	1.70	1.70
1,460.000	1.70	1.70	1.70	1.70	1.70
1,465.000	1.70	1.70	1.70	1.70	1.70
1,470.000	1.70	1.70	1.70	1.70	1.70
1,475.000	1.70	1.70	1.70	1.70	1.70
1,480.000	1.70	1.70	1.70	1.70	1.70
1,485.000	1.70	1.70	1.70	1.70	1.70
1,490.000	1.70	1.70	1.70	1.70	1.70
1,495.000	1.70	1.70	1.70	1.70	1.70
1,500.000	1.70	(N/A)	(N/A)	(N/A)	(N/A)

10-Year Existing Condition

Subsection: Addition Summary

Label: O-2

Summary for Hydrograph Addition at 'O-2'

Upstream Link	Upstream Node
Outlet-1	PO-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (min)	Flow (Peak) (ft ³ /s)
Flow (From)	Outlet-1	0.000	0.000	0.00
Flow (In)	O-2	0.000	0.000	0.00

10-Year Existing Condition

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	0.00	0.00	0.00	0.00	0.00
15.000	0.01	0.01	0.01	0.02	0.02
30.000	0.03	0.03	0.04	0.04	0.05
45.000	0.06	0.06	0.07	0.08	0.09
60.000	0.10	0.11	0.12	0.13	0.14
75.000	0.15	0.17	0.18	0.19	0.20
90.000	0.22	0.23	0.25	0.26	0.28
105.000	0.30	0.31	0.33	0.34	0.36
120.000	0.38	0.39	0.41	0.42	0.44
135.000	0.46	0.47	0.49	0.50	0.52
150.000	0.54	0.55	0.57	0.58	0.60
165.000	0.62	0.63	0.65	0.66	0.68
180.000	0.70	0.71	0.73	0.74	0.76
195.000	0.78	0.79	0.81	0.83	0.84
210.000	0.86	0.87	0.89	0.91	0.92
225.000	0.94	0.96	0.97	0.99	1.01
240.000	1.02	1.04	1.06	1.08	1.09
255.000	1.11	1.13	1.14	1.16	1.18
270.000	1.19	1.21	1.23	1.24	1.26
285.000	1.28	1.30	1.31	1.33	1.35
300.000	1.36	1.38	1.40	1.42	1.43
315.000	1.45	1.47	1.49	1.51	1.52
330.000	1.54	1.56	1.58	1.60	1.61
345.000	1.63	1.65	1.67	1.69	1.70
360.000	1.72	1.74	1.76	1.77	1.79
375.000	1.81	1.83	1.85	1.87	1.89
390.000	1.91	1.93	1.94	1.96	1.98
405.000	2.00	2.00	2.01	2.01	2.01
420.000	2.02	2.02	2.03	2.03	2.03
435.000	2.04	2.04	2.04	2.05	2.05
450.000	2.06	2.06	2.06	2.07	2.07
465.000	2.07	2.08	2.08	2.09	2.09
480.000	2.09	2.10	2.10	2.11	2.11
495.000	2.11	2.12	2.12	2.13	2.13
510.000	2.13	2.14	2.14	2.15	2.15
525.000	2.15	2.16	2.16	2.17	2.17
540.000	2.17	2.18	2.18	2.19	2.19
555.000	2.19	2.20	2.20	2.21	2.21
570.000	2.21	2.22	2.22	2.23	2.23
585.000	2.24	2.24	2.24	2.25	2.25
600.000	2.26	2.26	2.26	2.27	2.27

10-Year Existing Condition

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
615.000	2.28	2.28	2.29	2.29	2.29
630.000	2.30	2.30	2.31	2.31	2.32
645.000	2.32	2.33	2.33	2.33	2.34
660.000	2.34	2.35	2.35	2.36	2.36
675.000	2.37	2.37	2.38	2.38	2.38
690.000	2.39	2.39	2.40	2.40	2.41
705.000	2.41	2.42	2.42	2.43	2.43
720.000	2.44	2.44	2.45	2.45	2.46
735.000	2.46	2.47	2.47	2.48	2.48
750.000	2.49	2.49	2.50	2.50	2.51
765.000	2.51	2.52	2.52	2.53	2.53
780.000	2.54	2.54	2.55	2.55	2.56
795.000	2.56	2.57	2.57	2.58	2.58
810.000	2.59	2.60	2.60	2.61	2.61
825.000	2.62	2.62	2.63	2.63	2.64
840.000	2.65	2.65	2.66	2.66	2.67
855.000	2.67	2.68	2.69	2.69	2.70
870.000	2.70	2.71	2.72	2.72	2.73
885.000	2.73	2.74	2.75	2.75	2.76
900.000	2.76	2.77	2.78	2.79	2.80
915.000	2.81	2.82	2.83	2.84	2.86
930.000	2.87	2.88	2.90	2.92	2.94
945.000	2.96	2.98	3.00	3.02	3.04
960.000	3.06	3.09	3.11	3.14	3.17
975.000	3.19	3.22	3.25	3.28	3.31
990.000	3.34	3.38	3.41	3.45	3.48
1,005.000	3.52	3.56	3.60	3.64	3.68
1,020.000	3.73	3.77	3.82	3.87	3.92
1,035.000	3.98	4.01	4.03	4.05	4.07
1,050.000	4.09	4.11	4.14	4.16	4.18
1,065.000	4.21	4.23	4.25	4.28	4.30
1,080.000	4.33	4.35	4.38	4.41	4.43
1,095.000	4.46	4.49	4.52	4.55	4.58
1,110.000	4.61	4.65	4.69	4.74	4.79
1,125.000	4.84	4.89	4.95	5.01	5.08
1,140.000	5.15	5.23	5.33	5.43	5.59
1,155.000	5.80	6.02	6.16	6.30	6.42
1,170.000	6.52	6.60	6.67	6.71	6.74
1,185.000	6.77	6.79	6.81	6.82	6.84
1,200.000	6.85	6.86	6.87	6.88	6.89
1,215.000	6.90	6.91	6.92	6.92	6.93

10-Year Existing Condition

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
1,230.000	6.93	6.94	6.94	6.95	6.95
1,245.000	6.96	6.96	6.96	6.96	6.96
1,260.000	6.97	6.97	6.97	6.97	6.97
1,275.000	6.97	6.97	6.97	6.98	6.98
1,290.000	6.98	6.98	6.98	6.98	6.98
1,305.000	6.98	6.98	6.98	6.98	6.99
1,320.000	6.99	6.99	6.99	6.99	6.99
1,335.000	6.99	6.99	6.99	6.99	6.99
1,350.000	6.99	6.99	7.00	7.00	7.00
1,365.000	7.00	7.00	7.00	7.00	7.00
1,380.000	7.00	7.00	7.00	7.00	7.00
1,395.000	7.00	7.00	7.01	7.01	7.01
1,410.000	7.01	7.01	7.01	7.01	7.01
1,425.000	7.01	7.01	7.01	7.01	7.01
1,440.000	7.01	(N/A)	(N/A)	(N/A)	(N/A)

10-Year Existing Condition

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
0.000	0.000	0.000	0.001	0.001	0.002
15.000	0.003	0.004	0.006	0.007	0.009
30.000	0.011	0.014	0.016	0.019	0.022
45.000	0.025	0.028	0.032	0.035	0.039
60.000	0.043	0.048	0.052	0.057	0.062
75.000	0.067	0.073	0.078	0.084	0.090
90.000	0.096	0.102	0.109	0.116	0.123
105.000	0.130	0.137	0.144	0.151	0.158
120.000	0.165	0.172	0.179	0.186	0.193
135.000	0.200	0.207	0.214	0.221	0.228
150.000	0.235	0.242	0.249	0.256	0.263
165.000	0.270	0.277	0.285	0.292	0.299
180.000	0.306	0.313	0.320	0.327	0.334
195.000	0.341	0.348	0.355	0.362	0.369
210.000	0.376	0.383	0.390	0.397	0.405
225.000	0.412	0.419	0.427	0.434	0.442
240.000	0.449	0.457	0.464	0.471	0.479
255.000	0.486	0.494	0.501	0.509	0.516
270.000	0.524	0.531	0.538	0.546	0.553
285.000	0.561	0.568	0.576	0.583	0.590
300.000	0.598	0.606	0.613	0.621	0.629
315.000	0.637	0.645	0.653	0.661	0.668
330.000	0.676	0.684	0.692	0.700	0.708
345.000	0.715	0.723	0.731	0.739	0.747
360.000	0.755	0.763	0.770	0.778	0.786
375.000	0.795	0.803	0.811	0.819	0.828
390.000	0.836	0.844	0.852	0.861	0.869
405.000	0.877	0.886	0.894	0.902	0.910
420.000	0.919	0.927	0.935	0.943	0.952
435.000	0.960	0.969	0.977	0.986	0.995
450.000	1.004	1.012	1.021	1.030	1.038
465.000	1.047	1.056	1.064	1.073	1.082
480.000	1.090	1.099	1.108	1.117	1.126
495.000	1.135	1.144	1.153	1.162	1.171
510.000	1.180	1.189	1.198	1.207	1.217
525.000	1.226	1.235	1.244	1.253	1.262
540.000	1.271	1.280	1.289	1.298	1.307
555.000	1.317	1.326	1.336	1.345	1.355
570.000	1.364	1.374	1.383	1.393	1.402
585.000	1.412	1.421	1.431	1.440	1.450
600.000	1.459	1.469	1.478	1.488	1.497

10-Year Existing Condition

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
615.000	1.507	1.517	1.527	1.537	1.547
630.000	1.557	1.567	1.576	1.586	1.596
645.000	1.606	1.616	1.626	1.636	1.646
660.000	1.657	1.667	1.677	1.688	1.698
675.000	1.708	1.719	1.729	1.739	1.750
690.000	1.760	1.771	1.781	1.792	1.803
705.000	1.814	1.824	1.835	1.846	1.857
720.000	1.867	1.878	1.889	1.901	1.912
735.000	1.923	1.934	1.945	1.956	1.968
750.000	1.979	1.990	2.002	2.014	2.025
765.000	2.037	2.048	2.060	2.071	2.083
780.000	2.095	2.107	2.119	2.131	2.143
795.000	2.155	2.167	2.179	2.191	2.204
810.000	2.216	2.229	2.241	2.253	2.266
825.000	2.278	2.291	2.304	2.317	2.330
840.000	2.342	2.355	2.368	2.381	2.394
855.000	2.407	2.421	2.434	2.447	2.460
870.000	2.474	2.487	2.501	2.515	2.528
885.000	2.542	2.556	2.569	2.583	2.597
900.000	2.611	2.626	2.643	2.662	2.683
915.000	2.706	2.731	2.758	2.787	2.818
930.000	2.851	2.886	2.923	2.962	3.003
945.000	3.046	3.091	3.138	3.187	3.238
960.000	3.291	3.346	3.402	3.461	3.522
975.000	3.585	3.650	3.717	3.786	3.857
990.000	3.930	4.005	4.081	4.160	4.242
1,005.000	4.326	4.414	4.506	4.601	4.699
1,020.000	4.801	4.907	5.016	5.129	5.245
1,035.000	5.364	5.487	5.614	5.744	5.877
1,050.000	6.014	6.154	6.297	6.442	6.589
1,065.000	6.739	6.892	7.047	7.204	7.364
1,080.000	7.526	7.692	7.859	8.030	8.202
1,095.000	8.377	8.555	8.738	8.932	9.142
1,110.000	9.368	9.613	9.878	10.164	10.469
1,125.000	10.794	11.138	11.504	11.898	12.333
1,140.000	12.810	13.338	13.934	14.635	15.614
1,155.000	16.960	18.556	20.225	21.842	23.310
1,170.000	24.547	25.552	26.316	26.863	27.263
1,185.000	27.575	27.830	28.047	28.236	28.403
1,200.000	28.553	28.690	28.818	28.939	29.053
1,215.000	29.157	29.252	29.339	29.421	29.496

10-Year Existing Condition

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,230.000	29.567	29.632	29.691	29.744	29.790
1,245.000	29.829	29.862	29.889	29.912	29.932
1,260.000	29.950	29.967	29.982	29.996	30.009
1,275.000	30.022	30.034	30.046	30.058	30.069
1,290.000	30.081	30.093	30.104	30.115	30.126
1,305.000	30.137	30.148	30.159	30.170	30.180
1,320.000	30.190	30.200	30.210	30.220	30.229
1,335.000	30.239	30.248	30.258	30.267	30.277
1,350.000	30.286	30.295	30.304	30.313	30.321
1,365.000	30.329	30.338	30.346	30.354	30.361
1,380.000	30.369	30.377	30.385	30.393	30.401
1,395.000	30.408	30.416	30.424	30.432	30.440
1,410.000	30.448	30.456	30.463	30.471	30.478
1,425.000	30.486	30.493	30.500	30.508	30.515
1,440.000	30.522	(N/A)	(N/A)	(N/A)	(N/A)

10-Year Existing Condition

Subsection: Elevation vs. Volume Curve

Label: PO-1

Elevation-Volume

Pond Elevation (ft)	Pond Volume (ac-ft)
0.00	0.000
2.00	0.877
4.00	5.418
6.00	18.271
8.00	42.445
10.00	76.869
12.00	121.103

10-Year Existing Condition

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Requested Pond Water Surface Elevations

Minimum (Headwater)	0.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	12.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Box Tailwater Settings	Culvert - 1 Tailwater	Forward	TW	9.30 (N/A)	12.00 (N/A)

10-Year Existing Condition

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Structure ID: Culvert - 1	
Structure Type: Culvert-Box	
Number of Barrels	1
Width	10.30 ft
Height	2.80 ft
Length	77.00 ft
Length (Computed Barrel)	77.01 ft
Slope (Computed)	0.014 ft/ft
Outlet Control Data	
Manning's n	0.013
Ke	0.500
Kb	0.004
Kr	0.500
Convergence Tolerance	0.00 ft
Inlet Control Data	
Equation Form	Form 1
K	0.0260
M	1.0000
C	0.0347
Y	0.8100
T1 ratio (HW/D)	1.171
T2 ratio (HW/D)	1.358
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.

Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control, interpolate between flows at T1 & T2...

T1 Elevation	12.58 ft	T1 Flow	168.90 ft ³ /s
T2 Elevation	13.10 ft	T2 Flow	193.03 ft ³ /s

10-Year Existing Condition

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall
Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

10-Year Existing Condition

Subsection: Individual Outlet Curves

Label: Composite Outlet Structure - 1

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = Culvert - 1 (Culvert-Box)

Mannings open channel maximum capacity: 586.00 ft³/s

Upstream ID = (Pond Water Surface)

Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
0.00	0.00	(N/A)	0.00
0.50	0.00	(N/A)	0.00
1.00	0.00	(N/A)	0.00
1.50	0.00	(N/A)	0.00
2.00	0.00	(N/A)	0.00
2.50	0.00	(N/A)	0.00
3.00	0.00	(N/A)	0.00
3.50	0.00	(N/A)	0.00
4.00	0.00	(N/A)	0.00
4.50	0.00	(N/A)	0.00
5.00	0.00	(N/A)	0.00
5.50	0.00	(N/A)	0.00
6.00	0.00	(N/A)	0.00
6.50	0.00	(N/A)	0.00
7.00	0.00	(N/A)	0.00
7.50	0.00	(N/A)	0.00
8.00	0.00	(N/A)	0.00
8.50	0.00	(N/A)	0.00
9.00	0.00	(N/A)	0.00
9.30	0.00	(N/A)	0.00
9.50	2.25	(N/A)	0.00
10.00	14.81	(N/A)	0.00
10.50	33.17	(N/A)	0.00
11.00	55.94	(N/A)	0.00
11.50	82.35	(N/A)	0.00
12.00	111.94	(N/A)	0.00

Computation Messages

Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El

10-Year Existing Condition

Subsection: Individual Outlet Curves

Label: Composite Outlet Structure - 1

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = Culvert - 1 (Culvert-Box)

Mannings open channel maximum capacity: 586.00 ft³/s

Upstream ID = (Pond Water Surface)

Downstream ID = Tailwater (Pond Outfall)

Computation Messages

Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .057ft
Dcr= .114ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .200ft
Dcr= .400ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .343ft
Dcr= .686ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .486ft
Dcr= .971ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .629ft
Dcr= 1.257ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .771ft
Dcr= 1.543ft CRIT.DEPTH Hev= .00ft

10-Year Existing Condition

Subsection: Composite Rating Curve

Label: Composite Outlet Structure - 1

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
0.00	0.00	(N/A)	0.00
0.50	0.00	(N/A)	0.00
1.00	0.00	(N/A)	0.00
1.50	0.00	(N/A)	0.00
2.00	0.00	(N/A)	0.00
2.50	0.00	(N/A)	0.00
3.00	0.00	(N/A)	0.00
3.50	0.00	(N/A)	0.00
4.00	0.00	(N/A)	0.00
4.50	0.00	(N/A)	0.00
5.00	0.00	(N/A)	0.00
5.50	0.00	(N/A)	0.00
6.00	0.00	(N/A)	0.00
6.50	0.00	(N/A)	0.00
7.00	0.00	(N/A)	0.00
7.50	0.00	(N/A)	0.00
8.00	0.00	(N/A)	0.00
8.50	0.00	(N/A)	0.00
9.00	0.00	(N/A)	0.00
9.30	0.00	(N/A)	0.00
9.50	2.25	(N/A)	0.00
10.00	14.81	(N/A)	0.00
10.50	33.17	(N/A)	0.00
11.00	55.94	(N/A)	0.00
11.50	82.35	(N/A)	0.00
12.00	111.94	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing

10-Year Existing Condition

Subsection: Composite Rating Curve

Label: Composite Outlet Structure - 1

Composite Outflow Summary

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

10-Year Existing Condition

Subsection: Diverted Hydrograph

Label: Outlet-1

Peak Discharge	0.00 ft ³ /s
Time to Peak	480.000 min
Hydrograph Volume	0.000 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.00	(N/A)	(N/A)	(N/A)

10-Year Existing Condition

Subsection: Elevation-Volume-Flow Table (Pond)

Label: PO-1

Infiltration	
Infiltration Method (Computed)	No Infiltration
Initial Conditions	
Elevation (Water Surface, Initial)	0.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft ³ /s
Flow (Initial Infiltration)	0.00 ft ³ /s
Flow (Initial, Total)	0.00 ft ³ /s
Time Increment	3.000 min

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
0.00	0.00	0.000	0.000	0.00	0.00	0.00
0.50	0.00	0.219	0.000	0.00	0.00	106.12
1.00	0.00	0.439	0.000	0.00	0.00	212.23
1.50	0.00	0.658	0.000	0.00	0.00	318.35
2.00	0.00	0.877	0.000	0.00	0.00	424.47
2.50	0.00	2.012	0.000	0.00	0.00	973.93
3.00	0.00	3.148	0.000	0.00	0.00	1,523.39
3.50	0.00	4.283	0.000	0.00	0.00	2,072.85
4.00	0.00	5.418	0.000	0.00	0.00	2,622.31
4.50	0.00	8.631	0.000	0.00	0.00	4,177.53
5.00	0.00	11.845	0.000	0.00	0.00	5,732.74
5.50	0.00	15.058	0.000	0.00	0.00	7,287.95
6.00	0.00	18.271	0.000	0.00	0.00	8,843.16
6.50	0.00	24.314	0.000	0.00	0.00	11,768.22
7.00	0.00	30.358	0.000	0.00	0.00	14,693.27
7.50	0.00	36.402	0.000	0.00	0.00	17,618.33
8.00	0.00	42.445	0.000	0.00	0.00	20,543.38
8.50	0.00	51.051	0.000	0.00	0.00	24,708.68
9.00	0.00	59.657	0.000	0.00	0.00	28,873.99
9.30	0.00	64.821	0.000	0.00	0.00	31,373.17
9.50	2.25	68.263	0.000	0.00	2.25	33,041.54
10.00	14.81	76.869	0.000	0.00	14.81	37,219.40
10.50	33.17	87.928	0.000	0.00	33.17	42,590.08
11.00	55.94	98.986	0.000	0.00	55.94	47,965.16
11.50	82.35	110.044	0.000	0.00	82.35	53,343.89
12.00	111.94	121.103	0.000	0.00	111.94	58,725.80

10-Year Existing Condition

Subsection: Level Pool Pond Routing Summary

Label: PO-1 (IN)

Infiltration			
Infiltration Method (Computed)		No Infiltration	
Initial Conditions			
Elevation (Water Surface, Initial)		0.00 ft	
Volume (Initial)		0.000 ac-ft	
Flow (Initial Outlet)		0.00 ft³/s	
Flow (Initial Infiltration)		0.00 ft³/s	
Flow (Initial, Total)		0.00 ft³/s	
Time Increment		3.000 min	
Inflow/Outflow Hydrograph Summary			
Flow (Peak In)		408.80 ft³/s	Time to Peak (Flow, In)
Flow (Peak Outlet)		0.00 ft³/s	Time to Peak (Flow, Outlet)
			1,158.000 min
			0.000 min
Peak Conditions			
Elevation (Water Surface, Peak)		7.01 ft	
Volume (Peak)		30.522 ac-ft	
Mass Balance (ac-ft)			
Volume (Initial)		0.000 ac-ft	
Volume (Total Inflow)		30.522 ac-ft	
Volume (Total Infiltration)		0.000 ac-ft	
Volume (Total Outlet Outflow)		0.000 ac-ft	
Volume (Retained)		30.522 ac-ft	
Volume (Unrouted)		0.000 ac-ft	
Error (Mass Balance)		0.0 %	

10-Year Existing Condition

Subsection: Pond Routed Hydrograph (total out)

Label: PO-1 (OUT)

Peak Discharge	0.00 ft ³ /s
Time to Peak	480.000 min
Hydrograph Volume	0.000 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.00	(N/A)	(N/A)	(N/A)

10-Year Existing Condition

Subsection: Pond Inflow Summary

Label: PO-1 (IN)

Summary for Hydrograph Addition at 'PO-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	CM-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (min)	Flow (Peak) (ft ³ /s)
Flow (From)	CM-1	30.626	1,158.000	408.80
Flow (In)	PO-1	30.522	1,158.000	408.80

10-Year Existing Condition

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Project Summary

Title

Engineer

Company

Date 12/9/2016

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25-Year Existing Condition

Subsection: User Notifications

User Notifications?	No user notifications generated.
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25-Year Existing Condition

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)
CM-1	Pre-Development 25-yr	0	38.731	1,158.000	469.50

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)
O-2	Pre-Development 25-yr	0	0.000	0.000	0.00

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
PO-1 (IN)	Pre-Development 25-yr	0	38.597	1,158.000	469.50	(N/A)	(N/A)
PO-1 (OUT)	Pre-Development 25-yr	0	0.000	0.000	0.00	7.68	38.597

25-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

Peak Discharge	469.50 ft ³ /s
Time to Peak	1,158.000 min
Hydrograph Volume	38.731 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.10	0.10	0.10	0.10
5.000	0.10	0.10	0.20	0.20	0.20
10.000	0.20	0.20	0.20	0.30	0.30
15.000	0.30	0.30	0.30	0.30	0.40
20.000	0.40	0.40	0.40	0.40	0.40
25.000	0.50	0.50	0.50	0.50	0.50
30.000	0.50	0.60	0.60	0.60	0.60
35.000	0.60	0.60	0.70	0.70	0.70
40.000	0.70	0.70	0.70	0.80	0.80
45.000	0.80	0.80	0.80	0.80	0.90
50.000	0.90	0.90	0.90	0.90	0.90
55.000	1.00	1.00	1.00	1.00	1.00
60.000	1.00	1.10	1.10	1.10	1.10
65.000	1.10	1.10	1.10	1.20	1.20
70.000	1.20	1.20	1.20	1.20	1.30
75.000	1.30	1.30	1.30	1.30	1.30
80.000	1.40	1.40	1.40	1.40	1.40
85.000	1.40	1.50	1.50	1.50	1.50
90.000	1.50	1.50	1.60	1.60	1.60
95.000	1.60	1.60	1.60	1.70	1.70
100.000	1.70	1.70	1.70	1.70	1.70
105.000	1.70	1.70	1.70	1.70	1.70
110.000	1.70	1.70	1.70	1.70	1.70
115.000	1.70	1.70	1.70	1.70	1.70
120.000	1.70	1.70	1.70	1.70	1.70
125.000	1.70	1.70	1.70	1.70	1.70
130.000	1.70	1.70	1.70	1.70	1.70
135.000	1.70	1.70	1.70	1.70	1.70
140.000	1.70	1.70	1.70	1.70	1.70
145.000	1.70	1.70	1.80	1.80	1.80
150.000	1.80	1.80	1.80	1.80	1.80
155.000	1.80	1.80	1.80	1.80	1.80
160.000	1.80	1.80	1.80	1.80	1.80
165.000	1.80	1.80	1.80	1.80	1.80
170.000	1.80	1.80	1.80	1.80	1.80
175.000	1.80	1.80	1.80	1.80	1.80
180.000	1.80	1.80	1.80	1.80	1.80

25-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
185.000	1.80	1.80	1.80	1.80	1.80
190.000	1.80	1.80	1.80	1.80	1.80
195.000	1.80	1.80	1.80	1.80	1.80
200.000	1.80	1.80	1.80	1.80	1.80
205.000	1.80	1.80	1.80	1.80	1.80
210.000	1.80	1.80	1.80	1.80	1.80
215.000	1.80	1.80	1.80	1.90	1.90
220.000	1.90	1.90	1.90	1.90	1.90
225.000	1.90	1.90	1.90	1.90	1.90
230.000	1.90	1.90	1.90	1.90	1.90
235.000	1.90	1.90	1.90	1.90	1.90
240.000	1.90	1.90	1.90	1.90	1.90
245.000	1.90	1.90	1.90	1.90	1.90
250.000	1.90	1.90	1.90	1.90	1.90
255.000	1.90	1.90	1.90	1.90	1.90
260.000	1.90	1.90	1.90	1.90	1.90
265.000	1.90	1.90	1.90	1.90	1.90
270.000	1.90	1.90	1.90	1.90	1.90
275.000	1.90	1.90	2.00	2.00	2.00
280.000	2.00	2.00	2.00	2.00	2.00
285.000	2.00	2.00	2.00	2.00	2.00
290.000	2.00	2.00	2.00	2.00	2.00
295.000	2.00	2.00	2.00	2.00	2.00
300.000	2.00	2.00	2.00	2.00	2.00
305.000	2.00	2.00	2.00	2.00	2.00
310.000	2.00	2.00	2.00	2.00	2.00
315.000	2.00	2.00	2.00	2.00	2.00
320.000	2.00	2.00	2.00	2.00	2.00
325.000	2.00	2.00	2.00	2.00	2.00
330.000	2.00	2.00	2.00	2.00	2.10
335.000	2.10	2.10	2.10	2.10	2.10
340.000	2.10	2.10	2.10	2.10	2.10
345.000	2.10	2.10	2.10	2.10	2.10
350.000	2.10	2.10	2.10	2.10	2.10
355.000	2.10	2.10	2.10	2.10	2.10
360.000	2.10	2.10	2.10	2.10	2.10
365.000	2.10	2.10	2.10	2.10	2.10
370.000	2.10	2.10	2.10	2.10	2.10
375.000	2.10	2.10	2.10	2.10	2.10
380.000	2.10	2.10	2.10	2.10	2.10
385.000	2.10	2.10	2.10	2.10	2.20
390.000	2.20	2.20	2.20	2.20	2.20

25-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
395.000	2.20	2.20	2.20	2.20	2.20
400.000	2.20	2.20	2.20	2.20	2.20
405.000	2.20	2.20	2.20	2.20	2.20
410.000	2.20	2.20	2.20	2.20	2.20
415.000	2.20	2.20	2.20	2.20	2.20
420.000	2.20	2.20	2.20	2.20	2.20
425.000	2.20	2.20	2.20	2.20	2.20
430.000	2.20	2.20	2.20	2.20	2.30
435.000	2.30	2.30	2.30	2.30	2.30
440.000	2.30	2.30	2.30	2.30	2.30
445.000	2.30	2.30	2.30	2.30	2.30
450.000	2.30	2.30	2.30	2.30	2.30
455.000	2.30	2.30	2.30	2.30	2.30
460.000	2.30	2.30	2.30	2.30	2.30
465.000	2.30	2.30	2.30	2.30	2.30
470.000	2.30	2.30	2.30	2.30	2.30
475.000	2.30	2.40	2.40	2.40	2.40
480.000	2.40	2.40	2.40	2.40	2.40
485.000	2.40	2.40	2.40	2.40	2.40
490.000	2.40	2.40	2.40	2.40	2.40
495.000	2.40	2.40	2.40	2.40	2.40
500.000	2.40	2.40	2.40	2.40	2.40
505.000	2.40	2.40	2.40	2.40	2.40
510.000	2.40	2.40	2.40	2.40	2.40
515.000	2.40	2.40	2.40	2.50	2.50
520.000	2.50	2.50	2.50	2.50	2.50
525.000	2.50	2.50	2.50	2.50	2.50
530.000	2.50	2.50	2.50	2.50	2.50
535.000	2.50	2.50	2.50	2.50	2.50
540.000	2.50	2.50	2.50	2.50	2.50
545.000	2.50	2.50	2.50	2.50	2.50
550.000	2.50	2.50	2.50	2.50	2.50
555.000	2.50	2.50	2.50	2.50	2.50
560.000	2.50	2.60	2.60	2.60	2.60
565.000	2.60	2.60	2.60	2.60	2.60
570.000	2.60	2.60	2.60	2.60	2.60
575.000	2.60	2.60	2.60	2.60	2.60
580.000	2.60	2.60	2.60	2.60	2.60
585.000	2.60	2.60	2.60	2.60	2.60
590.000	2.60	2.60	2.60	2.60	2.60
595.000	2.60	2.60	2.60	2.60	2.60
600.000	2.60	2.60	2.60	2.60	2.70

25-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
605.000	2.70	2.70	2.70	2.70	2.70
610.000	2.70	2.70	2.70	2.70	2.70
615.000	2.70	2.70	2.70	2.70	2.70
620.000	2.70	2.70	2.70	2.70	2.70
625.000	2.70	2.70	2.70	2.70	2.70
630.000	2.70	2.70	2.70	2.70	2.80
635.000	2.80	2.80	2.80	2.80	2.80
640.000	2.80	2.80	2.80	2.80	2.80
645.000	2.80	2.80	2.80	2.80	2.80
650.000	2.80	2.80	2.80	2.80	2.80
655.000	2.80	2.80	2.80	2.80	2.80
660.000	2.80	2.80	2.80	2.80	2.90
665.000	2.90	2.90	2.90	2.90	2.90
670.000	2.90	2.90	2.90	2.90	2.90
675.000	2.90	2.90	2.90	2.90	2.90
680.000	2.90	2.90	2.90	2.90	2.90
685.000	2.90	2.90	2.90	2.90	2.90
690.000	2.90	2.90	2.90	2.90	3.00
695.000	3.00	3.00	3.00	3.00	3.00
700.000	3.00	3.00	3.00	3.00	3.00
705.000	3.00	3.00	3.00	3.00	3.00
710.000	3.00	3.00	3.00	3.00	3.00
715.000	3.00	3.00	3.00	3.00	3.00
720.000	3.00	3.10	3.10	3.10	3.10
725.000	3.10	3.10	3.10	3.10	3.10
730.000	3.10	3.10	3.10	3.10	3.10
735.000	3.10	3.10	3.10	3.10	3.10
740.000	3.10	3.10	3.10	3.10	3.10
745.000	3.10	3.10	3.20	3.20	3.20
750.000	3.20	3.20	3.20	3.20	3.20
755.000	3.20	3.20	3.20	3.20	3.20
760.000	3.20	3.20	3.20	3.20	3.20
765.000	3.20	3.20	3.20	3.20	3.20
770.000	3.20	3.20	3.30	3.30	3.30
775.000	3.30	3.30	3.30	3.30	3.30
780.000	3.30	3.30	3.30	3.30	3.30
785.000	3.30	3.30	3.30	3.30	3.30
790.000	3.30	3.30	3.30	3.30	3.30
795.000	3.30	3.30	3.30	3.40	3.40
800.000	3.40	3.40	3.40	3.40	3.40
805.000	3.40	3.40	3.40	3.40	3.40
810.000	3.40	3.40	3.40	3.40	3.40

25-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
815.000	3.40	3.40	3.40	3.40	3.40
820.000	3.40	3.40	3.40	3.40	3.40
825.000	3.40	3.40	3.40	3.40	3.40
830.000	3.40	3.40	3.40	3.40	3.40
835.000	3.40	3.40	3.40	3.40	3.40
840.000	3.40	3.40	3.40	3.40	3.40
845.000	3.40	3.40	3.40	3.40	3.40
850.000	3.40	3.40	3.40	3.40	3.40
855.000	3.40	3.40	3.40	3.40	3.40
860.000	3.40	3.40	3.40	3.40	3.40
865.000	3.40	3.40	3.40	3.40	3.40
870.000	3.40	3.40	3.40	3.40	3.40
875.000	3.40	3.40	3.40	3.40	3.40
880.000	3.40	3.40	3.40	3.40	3.40
885.000	3.40	3.40	3.40	3.40	3.40
890.000	3.40	3.40	3.40	3.40	3.40
895.000	3.40	3.40	3.40	3.40	3.40
900.000	3.40	3.60	3.80	4.00	4.20
905.000	4.40	4.60	4.80	4.90	5.10
910.000	5.30	5.50	5.70	5.90	6.10
915.000	6.30	6.50	6.60	6.80	7.00
920.000	7.20	7.40	7.60	7.80	8.00
925.000	8.10	8.30	8.50	8.70	8.90
930.000	9.10	9.30	9.50	9.70	9.80
935.000	10.00	10.20	10.40	10.60	10.80
940.000	11.00	11.20	11.40	11.50	11.70
945.000	11.90	12.10	12.30	12.50	12.70
950.000	12.90	13.00	13.20	13.40	13.60
955.000	13.80	14.00	14.20	14.40	14.60
960.000	14.70	14.90	15.10	15.30	15.50
965.000	15.70	15.90	16.10	16.30	16.40
970.000	16.60	16.80	17.00	17.20	17.40
975.000	17.60	17.80	17.90	18.10	18.30
980.000	18.50	18.70	18.90	19.10	19.30
985.000	19.50	19.60	19.80	20.00	20.20
990.000	20.40	20.60	20.80	21.00	21.10
995.000	21.30	21.50	21.70	21.90	22.10
1,000.000	22.30	22.80	23.40	23.90	24.50
1,005.000	25.00	25.60	26.10	26.70	27.20
1,010.000	27.80	28.30	28.90	29.40	30.00
1,015.000	30.50	31.10	31.60	32.20	32.70
1,020.000	33.30	33.80	34.40	34.90	35.50

25-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,025.000	36.00	36.50	37.10	37.60	38.20
1,030.000	38.70	39.30	39.80	40.40	40.90
1,035.000	41.50	42.00	42.60	43.10	43.70
1,040.000	44.20	44.80	45.30	45.90	46.40
1,045.000	47.00	47.50	48.10	48.60	49.20
1,050.000	49.70	50.40	51.00	51.70	52.30
1,055.000	53.00	53.70	54.30	55.00	55.60
1,060.000	56.30	56.90	57.60	58.20	58.90
1,065.000	59.60	60.20	60.90	61.50	62.20
1,070.000	62.80	63.50	64.20	64.80	65.50
1,075.000	66.10	66.80	67.40	68.10	68.70
1,080.000	69.40	70.10	70.70	71.40	72.00
1,085.000	72.70	73.30	74.00	74.60	75.30
1,090.000	76.00	76.60	77.30	77.90	78.60
1,095.000	79.20	79.90	80.60	81.20	81.90
1,100.000	82.50	83.50	84.50	85.50	86.50
1,105.000	87.50	88.50	89.50	90.50	91.50
1,110.000	92.50	93.40	94.30	95.20	96.10
1,115.000	96.90	97.80	98.70	99.60	100.50
1,120.000	101.40	103.60	105.80	108.00	110.20
1,125.000	112.30	114.50	116.70	118.90	121.10
1,130.000	123.30	126.10	129.00	132.10	135.30
1,135.000	138.70	143.40	147.70	151.80	156.30
1,140.000	161.10	167.10	172.60	177.70	182.80
1,145.000	188.10	195.00	201.50	208.00	240.20
1,150.000	274.50	311.30	352.50	400.80	430.20
1,155.000	446.20	456.00	465.00	469.50	466.00
1,160.000	466.80	465.50	457.60	444.00	425.50
1,165.000	404.10	381.60	360.10	339.30	318.00
1,170.000	295.80	271.60	247.00	222.80	199.90
1,175.000	179.00	160.40	145.20	132.90	123.00
1,180.000	114.80	107.40	101.10	95.60	90.70
1,185.000	86.30	82.40	79.20	76.70	74.20
1,190.000	72.00	69.20	66.40	63.60	60.90
1,195.000	58.30	55.60	53.70	51.80	50.00
1,200.000	48.20	46.50	44.90	43.40	42.00
1,205.000	40.90	39.60	38.40	37.20	36.10
1,210.000	35.00	33.60	32.20	30.80	29.50
1,215.000	28.20	26.90	25.90	25.00	24.20
1,220.000	23.40	22.70	22.10	21.50	21.00
1,225.000	20.60	20.20	19.90	19.60	19.20
1,230.000	18.90	18.30	17.50	16.80	16.30

25-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,235.000	15.80	15.30	14.80	14.30	13.70
1,240.000	13.10	12.60	12.00	11.50	11.00
1,245.000	10.50	10.10	9.70	9.30	9.00
1,250.000	8.60	8.30	8.00	7.70	7.40
1,255.000	7.10	6.80	6.50	6.30	6.00
1,260.000	5.80	5.60	5.40	5.20	5.00
1,265.000	4.80	4.70	4.50	4.40	4.30
1,270.000	4.20	4.10	4.00	3.90	3.80
1,275.000	3.70	3.60	3.60	3.50	3.50
1,280.000	3.40	3.40	3.40	3.30	3.30
1,285.000	3.30	3.30	3.30	3.20	3.20
1,290.000	3.20	3.20	3.20	3.20	3.20
1,295.000	3.20	3.20	3.20	3.20	3.20
1,300.000	3.20	3.20	3.10	3.10	3.10
1,305.000	3.10	3.10	3.10	3.00	3.00
1,310.000	3.00	3.00	3.00	3.00	2.90
1,315.000	2.90	2.90	2.90	2.90	2.80
1,320.000	2.80	2.80	2.80	2.80	2.70
1,325.000	2.70	2.70	2.70	2.70	2.70
1,330.000	2.60	2.60	2.60	2.60	2.60
1,335.000	2.60	2.60	2.60	2.60	2.60
1,340.000	2.60	2.60	2.60	2.60	2.60
1,345.000	2.50	2.50	2.50	2.50	2.50
1,350.000	2.50	2.50	2.40	2.40	2.40
1,355.000	2.40	2.30	2.30	2.30	2.30
1,360.000	2.20	2.20	2.20	2.20	2.20
1,365.000	2.20	2.20	2.10	2.10	2.10
1,370.000	2.10	2.10	2.10	2.10	2.10
1,375.000	2.10	2.10	2.10	2.10	2.10
1,380.000	2.10	2.10	2.10	2.10	2.10
1,385.000	2.10	2.10	2.10	2.10	2.10
1,390.000	2.10	2.10	2.10	2.10	2.10
1,395.000	2.10	2.10	2.10	2.10	2.10
1,400.000	2.10	2.10	2.10	2.00	2.00
1,405.000	2.00	2.00	2.00	2.00	2.00
1,410.000	2.00	2.00	2.00	2.00	2.00
1,415.000	2.00	2.00	2.00	1.90	1.90
1,420.000	1.90	1.90	1.90	1.90	1.90
1,425.000	1.90	1.90	1.90	1.90	1.80
1,430.000	1.80	1.80	1.80	1.80	1.80
1,435.000	1.80	1.80	1.80	1.80	1.80
1,440.000	1.70	1.70	1.70	1.70	1.70

25-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,445.000	1.70	1.70	1.70	1.70	1.70
1,450.000	1.70	1.70	1.70	1.70	1.70
1,455.000	1.70	1.70	1.70	1.70	1.70
1,460.000	1.70	1.70	1.70	1.70	1.70
1,465.000	1.70	1.70	1.70	1.70	1.70
1,470.000	1.70	1.70	1.70	1.70	1.70
1,475.000	1.70	1.70	1.70	1.70	1.70
1,480.000	1.70	1.70	1.70	1.70	1.70
1,485.000	1.70	1.70	1.70	1.70	1.70
1,490.000	1.70	1.70	1.70	1.70	1.70
1,495.000	1.70	1.70	1.70	1.70	1.70
1,500.000	1.70	(N/A)	(N/A)	(N/A)	(N/A)

25-Year Existing Condition

Subsection: Addition Summary

Label: O-2

Summary for Hydrograph Addition at 'O-2'

Upstream Link	Upstream Node
Outlet-1	PO-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (min)	Flow (Peak) (ft ³ /s)
Flow (From)	Outlet-1	0.000	0.000	0.00
Flow (In)	O-2	0.000	0.000	0.00

25-Year Existing Condition

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	0.00	0.00	0.00	0.00	0.00
15.000	0.01	0.01	0.01	0.02	0.02
30.000	0.03	0.03	0.04	0.04	0.05
45.000	0.06	0.06	0.07	0.08	0.09
60.000	0.10	0.11	0.12	0.13	0.14
75.000	0.15	0.17	0.18	0.19	0.20
90.000	0.22	0.23	0.25	0.26	0.28
105.000	0.30	0.31	0.33	0.34	0.36
120.000	0.38	0.39	0.41	0.42	0.44
135.000	0.46	0.47	0.49	0.50	0.52
150.000	0.54	0.56	0.57	0.59	0.61
165.000	0.62	0.64	0.66	0.67	0.69
180.000	0.71	0.72	0.74	0.76	0.78
195.000	0.79	0.81	0.83	0.84	0.86
210.000	0.88	0.89	0.91	0.93	0.95
225.000	0.96	0.98	1.00	1.02	1.04
240.000	1.05	1.07	1.09	1.11	1.13
255.000	1.14	1.16	1.18	1.20	1.22
270.000	1.23	1.25	1.27	1.29	1.31
285.000	1.32	1.34	1.36	1.38	1.40
300.000	1.42	1.44	1.46	1.48	1.49
315.000	1.51	1.53	1.55	1.57	1.59
330.000	1.61	1.63	1.65	1.67	1.69
345.000	1.71	1.72	1.74	1.76	1.78
360.000	1.80	1.82	1.84	1.86	1.88
375.000	1.90	1.92	1.94	1.96	1.98
390.000	2.00	2.00	2.01	2.01	2.02
405.000	2.02	2.02	2.03	2.03	2.04
420.000	2.04	2.04	2.05	2.05	2.06
435.000	2.06	2.06	2.07	2.07	2.08
450.000	2.08	2.09	2.09	2.09	2.10
465.000	2.10	2.11	2.11	2.12	2.12
480.000	2.12	2.13	2.13	2.14	2.14
495.000	2.15	2.15	2.15	2.16	2.16
510.000	2.17	2.17	2.18	2.18	2.19
525.000	2.19	2.19	2.20	2.20	2.21
540.000	2.21	2.22	2.22	2.23	2.23
555.000	2.24	2.24	2.24	2.25	2.25
570.000	2.26	2.26	2.27	2.27	2.28
585.000	2.28	2.29	2.29	2.30	2.30
600.000	2.31	2.31	2.32	2.32	2.33

25-Year Existing Condition

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
615.000	2.33	2.34	2.34	2.34	2.35
630.000	2.35	2.36	2.36	2.37	2.37
645.000	2.38	2.39	2.39	2.40	2.40
660.000	2.41	2.41	2.42	2.42	2.43
675.000	2.43	2.44	2.44	2.45	2.45
690.000	2.46	2.46	2.47	2.47	2.48
705.000	2.48	2.49	2.50	2.50	2.51
720.000	2.51	2.52	2.52	2.53	2.53
735.000	2.54	2.55	2.55	2.56	2.56
750.000	2.57	2.57	2.58	2.59	2.59
765.000	2.60	2.60	2.61	2.62	2.62
780.000	2.63	2.63	2.64	2.65	2.65
795.000	2.66	2.66	2.67	2.68	2.68
810.000	2.69	2.69	2.70	2.71	2.71
825.000	2.72	2.73	2.73	2.74	2.74
840.000	2.75	2.76	2.76	2.77	2.78
855.000	2.78	2.79	2.79	2.80	2.81
870.000	2.81	2.82	2.82	2.83	2.84
885.000	2.84	2.85	2.86	2.86	2.87
900.000	2.87	2.88	2.89	2.90	2.91
915.000	2.92	2.93	2.94	2.96	2.97
930.000	2.99	3.01	3.02	3.04	3.06
945.000	3.08	3.11	3.13	3.15	3.18
960.000	3.21	3.23	3.26	3.29	3.32
975.000	3.35	3.38	3.42	3.45	3.49
990.000	3.52	3.56	3.60	3.64	3.68
1,005.000	3.73	3.77	3.82	3.88	3.93
1,020.000	3.99	4.02	4.04	4.07	4.09
1,035.000	4.12	4.14	4.17	4.20	4.23
1,050.000	4.26	4.30	4.33	4.37	4.40
1,065.000	4.44	4.48	4.52	4.56	4.60
1,080.000	4.65	4.69	4.74	4.79	4.84
1,095.000	4.89	4.94	4.99	5.04	5.10
1,110.000	5.16	5.22	5.28	5.35	5.41
1,125.000	5.48	5.56	5.64	5.72	5.81
1,140.000	5.91	6.01	6.07	6.15	6.25
1,155.000	6.39	6.54	6.70	6.85	6.99
1,170.000	7.10	7.19	7.26	7.30	7.34
1,185.000	7.37	7.40	7.43	7.45	7.47
1,200.000	7.49	7.50	7.52	7.53	7.54
1,215.000	7.55	7.56	7.57	7.58	7.58

25-Year Existing Condition

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
1,230.000	7.59	7.60	7.60	7.61	7.61
1,245.000	7.61	7.62	7.62	7.62	7.63
1,260.000	7.63	7.63	7.63	7.63	7.63
1,275.000	7.64	7.64	7.64	7.64	7.64
1,290.000	7.64	7.64	7.64	7.64	7.65
1,305.000	7.65	7.65	7.65	7.65	7.65
1,320.000	7.65	7.65	7.65	7.65	7.66
1,335.000	7.66	7.66	7.66	7.66	7.66
1,350.000	7.66	7.66	7.66	7.66	7.66
1,365.000	7.66	7.67	7.67	7.67	7.67
1,380.000	7.67	7.67	7.67	7.67	7.67
1,395.000	7.67	7.67	7.67	7.67	7.67
1,410.000	7.68	7.68	7.68	7.68	7.68
1,425.000	7.68	7.68	7.68	7.68	7.68
1,440.000	7.68	(N/A)	(N/A)	(N/A)	(N/A)

25-Year Existing Condition

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
0.000	0.000	0.000	0.001	0.001	0.002
15.000	0.003	0.004	0.006	0.007	0.009
30.000	0.011	0.014	0.016	0.019	0.022
45.000	0.025	0.028	0.032	0.035	0.039
60.000	0.043	0.048	0.052	0.057	0.062
75.000	0.067	0.073	0.078	0.084	0.090
90.000	0.096	0.102	0.109	0.116	0.123
105.000	0.130	0.137	0.144	0.151	0.158
120.000	0.165	0.172	0.179	0.186	0.193
135.000	0.200	0.207	0.214	0.221	0.229
150.000	0.236	0.243	0.251	0.258	0.266
165.000	0.273	0.281	0.288	0.295	0.303
180.000	0.310	0.318	0.325	0.333	0.340
195.000	0.348	0.355	0.362	0.370	0.377
210.000	0.385	0.392	0.400	0.407	0.415
225.000	0.423	0.431	0.439	0.446	0.454
240.000	0.462	0.470	0.478	0.486	0.494
255.000	0.501	0.509	0.517	0.525	0.533
270.000	0.541	0.549	0.556	0.564	0.573
285.000	0.581	0.589	0.598	0.606	0.614
300.000	0.622	0.631	0.639	0.647	0.655
315.000	0.664	0.672	0.680	0.688	0.697
330.000	0.705	0.713	0.722	0.730	0.739
345.000	0.748	0.756	0.765	0.774	0.782
360.000	0.791	0.800	0.808	0.817	0.826
375.000	0.835	0.843	0.852	0.861	0.869
390.000	0.878	0.887	0.896	0.905	0.914
405.000	0.924	0.933	0.942	0.951	0.960
420.000	0.969	0.978	0.987	0.996	1.005
435.000	1.015	1.024	1.034	1.043	1.053
450.000	1.062	1.072	1.081	1.091	1.100
465.000	1.110	1.119	1.129	1.138	1.148
480.000	1.158	1.168	1.178	1.188	1.198
495.000	1.207	1.217	1.227	1.237	1.247
510.000	1.257	1.267	1.277	1.287	1.297
525.000	1.308	1.318	1.328	1.339	1.349
540.000	1.359	1.370	1.380	1.390	1.401
555.000	1.411	1.421	1.432	1.443	1.453
570.000	1.464	1.475	1.486	1.496	1.507
585.000	1.518	1.529	1.539	1.550	1.561
600.000	1.571	1.582	1.593	1.604	1.615

25-Year Existing Condition

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
615.000	1.627	1.638	1.649	1.660	1.671
630.000	1.682	1.694	1.705	1.717	1.728
645.000	1.740	1.751	1.763	1.774	1.786
660.000	1.798	1.809	1.821	1.833	1.845
675.000	1.857	1.869	1.881	1.893	1.905
690.000	1.917	1.929	1.941	1.953	1.966
705.000	1.978	1.990	2.003	2.015	2.028
720.000	2.040	2.053	2.065	2.078	2.091
735.000	2.104	2.117	2.130	2.142	2.155
750.000	2.169	2.182	2.195	2.208	2.221
765.000	2.235	2.248	2.261	2.275	2.288
780.000	2.302	2.315	2.329	2.343	2.356
795.000	2.370	2.384	2.398	2.412	2.426
810.000	2.440	2.454	2.468	2.482	2.496
825.000	2.510	2.524	2.538	2.552	2.567
840.000	2.581	2.595	2.609	2.623	2.637
855.000	2.651	2.665	2.679	2.693	2.707
870.000	2.721	2.735	2.749	2.763	2.777
885.000	2.791	2.805	2.819	2.833	2.848
900.000	2.862	2.877	2.895	2.915	2.937
915.000	2.962	2.989	3.018	3.050	3.084
930.000	3.120	3.159	3.200	3.244	3.290
945.000	3.338	3.388	3.441	3.496	3.553
960.000	3.613	3.675	3.739	3.806	3.875
975.000	3.947	4.020	4.096	4.175	4.256
990.000	4.339	4.424	4.512	4.602	4.696
1,005.000	4.796	4.903	5.017	5.137	5.264
1,020.000	5.399	5.539	5.687	5.841	6.002
1,035.000	6.170	6.345	6.527	6.715	6.911
1,050.000	7.113	7.322	7.540	7.766	8.000
1,065.000	8.242	8.492	8.750	9.017	9.291
1,080.000	9.574	9.865	10.164	10.471	10.786
1,095.000	11.110	11.441	11.781	12.132	12.496
1,110.000	12.872	13.260	13.659	14.068	14.495
1,125.000	14.945	15.423	15.929	16.469	17.054
1,140.000	17.692	18.392	19.162	20.061	21.286
1,155.000	22.936	24.828	26.760	28.601	30.224
1,170.000	31.579	32.650	33.442	34.028	34.491
1,185.000	34.878	35.215	35.516	35.785	36.022
1,200.000	36.232	36.421	36.593	36.749	36.890
1,215.000	37.015	37.125	37.224	37.314	37.399

25-Year Existing Condition

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,230.000	37.479	37.552	37.619	37.679	37.732
1,245.000	37.778	37.819	37.856	37.888	37.917
1,260.000	37.942	37.965	37.985	38.004	38.021
1,275.000	38.037	38.052	38.066	38.080	38.094
1,290.000	38.107	38.120	38.133	38.147	38.160
1,305.000	38.173	38.185	38.198	38.210	38.222
1,320.000	38.233	38.245	38.256	38.268	38.279
1,335.000	38.289	38.300	38.311	38.321	38.332
1,350.000	38.342	38.352	38.362	38.372	38.381
1,365.000	38.390	38.399	38.408	38.416	38.425
1,380.000	38.434	38.442	38.451	38.460	38.468
1,395.000	38.477	38.486	38.494	38.503	38.511
1,410.000	38.519	38.528	38.536	38.544	38.552
1,425.000	38.560	38.568	38.575	38.583	38.590
1,440.000	38.597	(N/A)	(N/A)	(N/A)	(N/A)

25-Year Existing Condition

Subsection: Elevation vs. Volume Curve

Label: PO-1

Elevation-Volume

Pond Elevation (ft)	Pond Volume (ac-ft)
0.00	0.000
2.00	0.877
4.00	5.418
6.00	18.271
8.00	42.445
10.00	76.869
12.00	121.103

25-Year Existing Condition

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Requested Pond Water Surface Elevations

Minimum (Headwater)	0.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	12.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Box Tailwater Settings	Culvert - 1 Tailwater	Forward	TW	9.30 (N/A)	12.00 (N/A)

25-Year Existing Condition

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Structure ID: Culvert - 1	
Structure Type: Culvert-Box	
Number of Barrels	1
Width	10.30 ft
Height	2.80 ft
Length	77.00 ft
Length (Computed Barrel)	77.01 ft
Slope (Computed)	0.014 ft/ft
Outlet Control Data	
Manning's n	0.013
Ke	0.500
Kb	0.004
Kr	0.500
Convergence Tolerance	0.00 ft
Inlet Control Data	
Equation Form	Form 1
K	0.0260
M	1.0000
C	0.0347
Y	0.8100
T1 ratio (HW/D)	1.171
T2 ratio (HW/D)	1.358
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.

Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	12.58 ft	T1 Flow	168.90 ft ³ /s
T2 Elevation	13.10 ft	T2 Flow	193.03 ft ³ /s

25-Year Existing Condition

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall
Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

25-Year Existing Condition

Subsection: Individual Outlet Curves

Label: Composite Outlet Structure - 1

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = Culvert - 1 (Culvert-Box)

Mannings open channel maximum capacity: 586.00 ft³/s

Upstream ID = (Pond Water Surface)

Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
0.00	0.00	(N/A)	0.00
0.50	0.00	(N/A)	0.00
1.00	0.00	(N/A)	0.00
1.50	0.00	(N/A)	0.00
2.00	0.00	(N/A)	0.00
2.50	0.00	(N/A)	0.00
3.00	0.00	(N/A)	0.00
3.50	0.00	(N/A)	0.00
4.00	0.00	(N/A)	0.00
4.50	0.00	(N/A)	0.00
5.00	0.00	(N/A)	0.00
5.50	0.00	(N/A)	0.00
6.00	0.00	(N/A)	0.00
6.50	0.00	(N/A)	0.00
7.00	0.00	(N/A)	0.00
7.50	0.00	(N/A)	0.00
8.00	0.00	(N/A)	0.00
8.50	0.00	(N/A)	0.00
9.00	0.00	(N/A)	0.00
9.30	0.00	(N/A)	0.00
9.50	2.25	(N/A)	0.00
10.00	14.81	(N/A)	0.00
10.50	33.17	(N/A)	0.00
11.00	55.94	(N/A)	0.00
11.50	82.35	(N/A)	0.00
12.00	111.94	(N/A)	0.00

Computation Messages

Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El

25-Year Existing Condition

Subsection: Individual Outlet Curves

Label: Composite Outlet Structure - 1

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = Culvert - 1 (Culvert-Box)

Mannings open channel maximum capacity: 586.00 ft³/s

Upstream ID = (Pond Water Surface)

Downstream ID = Tailwater (Pond Outfall)

Computation Messages

Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .057ft
Dcr= .114ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .200ft
Dcr= .400ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .343ft
Dcr= .686ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .486ft
Dcr= .971ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .629ft
Dcr= 1.257ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .771ft
Dcr= 1.543ft CRIT.DEPTH Hev= .00ft

25-Year Existing Condition

Subsection: Composite Rating Curve

Label: Composite Outlet Structure - 1

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
0.00	0.00	(N/A)	0.00
0.50	0.00	(N/A)	0.00
1.00	0.00	(N/A)	0.00
1.50	0.00	(N/A)	0.00
2.00	0.00	(N/A)	0.00
2.50	0.00	(N/A)	0.00
3.00	0.00	(N/A)	0.00
3.50	0.00	(N/A)	0.00
4.00	0.00	(N/A)	0.00
4.50	0.00	(N/A)	0.00
5.00	0.00	(N/A)	0.00
5.50	0.00	(N/A)	0.00
6.00	0.00	(N/A)	0.00
6.50	0.00	(N/A)	0.00
7.00	0.00	(N/A)	0.00
7.50	0.00	(N/A)	0.00
8.00	0.00	(N/A)	0.00
8.50	0.00	(N/A)	0.00
9.00	0.00	(N/A)	0.00
9.30	0.00	(N/A)	0.00
9.50	2.25	(N/A)	0.00
10.00	14.81	(N/A)	0.00
10.50	33.17	(N/A)	0.00
11.00	55.94	(N/A)	0.00
11.50	82.35	(N/A)	0.00
12.00	111.94	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing

25-Year Existing Condition

Subsection: Composite Rating Curve

Label: Composite Outlet Structure - 1

Composite Outflow Summary

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

25-Year Existing Condition

Subsection: Diverted Hydrograph

Label: Outlet-1

Peak Discharge	0.00 ft ³ /s
Time to Peak	480.000 min
Hydrograph Volume	0.000 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.00	(N/A)	(N/A)	(N/A)

25-Year Existing Condition

Subsection: Elevation-Volume-Flow Table (Pond)

Label: PO-1

Infiltration	
Infiltration Method (Computed)	No Infiltration
Initial Conditions	
Elevation (Water Surface, Initial)	0.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft ³ /s
Flow (Initial Infiltration)	0.00 ft ³ /s
Flow (Initial, Total)	0.00 ft ³ /s
Time Increment	3.000 min

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
0.00	0.00	0.000	0.000	0.00	0.00	0.00
0.50	0.00	0.219	0.000	0.00	0.00	106.12
1.00	0.00	0.439	0.000	0.00	0.00	212.23
1.50	0.00	0.658	0.000	0.00	0.00	318.35
2.00	0.00	0.877	0.000	0.00	0.00	424.47
2.50	0.00	2.012	0.000	0.00	0.00	973.93
3.00	0.00	3.148	0.000	0.00	0.00	1,523.39
3.50	0.00	4.283	0.000	0.00	0.00	2,072.85
4.00	0.00	5.418	0.000	0.00	0.00	2,622.31
4.50	0.00	8.631	0.000	0.00	0.00	4,177.53
5.00	0.00	11.845	0.000	0.00	0.00	5,732.74
5.50	0.00	15.058	0.000	0.00	0.00	7,287.95
6.00	0.00	18.271	0.000	0.00	0.00	8,843.16
6.50	0.00	24.314	0.000	0.00	0.00	11,768.22
7.00	0.00	30.358	0.000	0.00	0.00	14,693.27
7.50	0.00	36.402	0.000	0.00	0.00	17,618.33
8.00	0.00	42.445	0.000	0.00	0.00	20,543.38
8.50	0.00	51.051	0.000	0.00	0.00	24,708.68
9.00	0.00	59.657	0.000	0.00	0.00	28,873.99
9.30	0.00	64.821	0.000	0.00	0.00	31,373.17
9.50	2.25	68.263	0.000	0.00	2.25	33,041.54
10.00	14.81	76.869	0.000	0.00	14.81	37,219.40
10.50	33.17	87.928	0.000	0.00	33.17	42,590.08
11.00	55.94	98.986	0.000	0.00	55.94	47,965.16
11.50	82.35	110.044	0.000	0.00	82.35	53,343.89
12.00	111.94	121.103	0.000	0.00	111.94	58,725.80

25-Year Existing Condition

Subsection: Level Pool Pond Routing Summary

Label: PO-1 (IN)

Infiltration			
Infiltration Method (Computed)		No Infiltration	
Initial Conditions			
Elevation (Water Surface, Initial)		0.00 ft	
Volume (Initial)		0.000 ac-ft	
Flow (Initial Outlet)		0.00 ft³/s	
Flow (Initial Infiltration)		0.00 ft³/s	
Flow (Initial, Total)		0.00 ft³/s	
Time Increment		3.000 min	
Inflow/Outflow Hydrograph Summary			
Flow (Peak In)		469.50 ft³/s	Time to Peak (Flow, In)
Flow (Peak Outlet)		0.00 ft³/s	Time to Peak (Flow, Outlet)
			1,158.000 min
			0.000 min
Peak Conditions			
Elevation (Water Surface, Peak)		7.68 ft	
Volume (Peak)		38.597 ac-ft	
Mass Balance (ac-ft)			
Volume (Initial)		0.000 ac-ft	
Volume (Total Inflow)		38.597 ac-ft	
Volume (Total Infiltration)		0.000 ac-ft	
Volume (Total Outlet Outflow)		0.000 ac-ft	
Volume (Retained)		38.597 ac-ft	
Volume (Unrouted)		0.000 ac-ft	
Error (Mass Balance)		0.0 %	

25-Year Existing Condition

Subsection: Pond Routed Hydrograph (total out)

Label: PO-1 (OUT)

Peak Discharge	0.00 ft ³ /s
Time to Peak	480.000 min
Hydrograph Volume	0.000 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.00	(N/A)	(N/A)	(N/A)

25-Year Existing Condition

Subsection: Pond Inflow Summary

Label: PO-1 (IN)

Summary for Hydrograph Addition at 'PO-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	CM-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (min)	Flow (Peak) (ft ³ /s)
Flow (From)	CM-1	38.731	1,158.000	469.50
Flow (In)	PO-1	38.597	1,158.000	469.50

25-Year Existing Condition

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Project Summary

Title

Engineer

Company

Date 12/9/2016

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100-Year Existing Condition

Subsection: User Notifications

User Notifications?	No user notifications generated.
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100-Year Existing Condition

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)
CM-1	Pre-Development 100-yr	0	78.101	1,157.000	713.90

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)
O-2	Pre-Development 100-yr	0	3.265	1,362.000	12.47

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
PO-1 (IN)	Pre-Development 100-yr	0	77.826	1,158.000	680.30	(N/A)	(N/A)
PO-1 (OUT)	Pre-Development 100-yr	0	3.265	1,362.000	12.47	9.91	75.272

100-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

Peak Discharge	713.90 ft ³ /s
Time to Peak	1,157.000 min
Hydrograph Volume	78.101 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.10	0.10	0.10	0.20
5.000	0.20	0.20	0.30	0.30	0.30
10.000	0.40	0.40	0.40	0.50	0.50
15.000	0.50	0.60	0.60	0.60	0.70
20.000	0.70	0.70	0.80	0.80	0.80
25.000	0.90	0.90	0.90	1.00	1.00
30.000	1.00	1.10	1.10	1.10	1.20
35.000	1.20	1.20	1.30	1.30	1.30
40.000	1.40	1.40	1.40	1.50	1.50
45.000	1.50	1.60	1.60	1.60	1.70
50.000	1.70	1.70	1.80	1.80	1.80
55.000	1.90	1.90	1.90	2.00	2.00
60.000	2.00	2.10	2.10	2.10	2.20
65.000	2.20	2.20	2.30	2.30	2.30
70.000	2.40	2.40	2.40	2.50	2.50
75.000	2.50	2.60	2.60	2.60	2.70
80.000	2.70	2.70	2.80	2.80	2.80
85.000	2.90	2.90	2.90	3.00	3.00
90.000	3.00	3.10	3.10	3.10	3.20
95.000	3.20	3.20	3.30	3.30	3.30
100.000	3.40	3.40	3.40	3.40	3.40
105.000	3.40	3.40	3.40	3.40	3.40
110.000	3.40	3.40	3.40	3.40	3.40
115.000	3.40	3.40	3.40	3.40	3.40
120.000	3.40	3.40	3.40	3.40	3.40
125.000	3.40	3.40	3.40	3.40	3.40
130.000	3.40	3.40	3.40	3.40	3.40
135.000	3.40	3.40	3.40	3.40	3.40
140.000	3.40	3.40	3.40	3.40	3.40
145.000	3.50	3.50	3.50	3.50	3.50
150.000	3.50	3.50	3.50	3.50	3.50
155.000	3.50	3.50	3.50	3.50	3.50
160.000	3.50	3.50	3.50	3.50	3.50
165.000	3.50	3.50	3.50	3.50	3.50
170.000	3.50	3.50	3.50	3.50	3.50
175.000	3.50	3.50	3.50	3.50	3.50
180.000	3.50	3.50	3.50	3.50	3.50

100-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
185.000	3.50	3.50	3.50	3.50	3.50
190.000	3.50	3.50	3.50	3.50	3.50
195.000	3.50	3.50	3.50	3.50	3.50
200.000	3.50	3.60	3.70	3.70	3.80
205.000	3.80	3.90	3.90	4.00	4.10
210.000	4.10	4.20	4.20	4.30	4.30
215.000	4.40	4.50	4.50	4.60	4.60
220.000	4.70	4.70	4.80	4.90	4.90
225.000	5.00	5.00	5.10	5.10	5.20
230.000	5.30	5.30	5.40	5.40	5.50
235.000	5.50	5.60	5.70	5.70	5.80
240.000	5.80	5.90	5.90	6.00	6.10
245.000	6.10	6.20	6.20	6.30	6.30
250.000	6.40	6.50	6.50	6.60	6.60
255.000	6.70	6.70	6.80	6.90	6.90
260.000	7.00	7.00	7.10	7.10	7.20
265.000	7.20	7.30	7.40	7.40	7.50
270.000	7.50	7.60	7.60	7.70	7.80
275.000	7.80	7.90	7.90	8.00	8.00
280.000	8.10	8.20	8.20	8.30	8.30
285.000	8.40	8.40	8.50	8.60	8.60
290.000	8.70	8.70	8.80	8.80	8.90
295.000	9.00	9.00	9.10	9.10	9.20
300.000	9.20	9.30	9.30	9.30	9.40
305.000	9.40	9.40	9.40	9.50	9.50
310.000	9.50	9.50	9.60	9.60	9.60
315.000	9.70	9.70	9.70	9.70	9.80
320.000	9.80	9.80	9.80	9.90	9.90
325.000	9.90	10.00	10.00	10.00	10.00
330.000	10.10	10.10	10.10	10.20	10.20
335.000	10.20	10.20	10.30	10.30	10.30
340.000	10.30	10.40	10.40	10.40	10.50
345.000	10.50	10.50	10.50	10.60	10.60
350.000	10.60	10.60	10.70	10.70	10.70
355.000	10.80	10.80	10.80	10.80	10.90
360.000	10.90	10.90	11.00	11.00	11.00
365.000	11.00	11.10	11.10	11.10	11.10
370.000	11.20	11.20	11.20	11.30	11.30
375.000	11.30	11.30	11.40	11.40	11.40
380.000	11.40	11.50	11.50	11.50	11.60
385.000	11.60	11.60	11.60	11.70	11.70
390.000	11.70	11.80	11.80	11.80	11.80

100-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
395.000	11.90	11.90	11.90	11.90	12.00
400.000	12.00	12.00	12.00	12.10	12.10
405.000	12.10	12.10	12.10	12.20	12.20
410.000	12.20	12.20	12.20	12.30	12.30
415.000	12.30	12.30	12.30	12.40	12.40
420.000	12.40	12.40	12.40	12.50	12.50
425.000	12.50	12.50	12.50	12.60	12.60
430.000	12.60	12.60	12.60	12.70	12.70
435.000	12.70	12.70	12.70	12.80	12.80
440.000	12.80	12.80	12.80	12.90	12.90
445.000	12.90	12.90	12.90	13.00	13.00
450.000	13.00	13.00	13.00	13.00	13.10
455.000	13.10	13.10	13.10	13.10	13.20
460.000	13.20	13.20	13.20	13.20	13.30
465.000	13.30	13.30	13.30	13.30	13.40
470.000	13.40	13.40	13.40	13.40	13.50
475.000	13.50	13.50	13.50	13.50	13.60
480.000	13.60	13.60	13.60	13.60	13.70
485.000	13.70	13.70	13.70	13.70	13.80
490.000	13.80	13.80	13.80	13.80	13.90
495.000	13.90	13.90	13.90	13.90	14.00
500.000	14.00	14.00	14.10	14.10	14.20
505.000	14.30	14.30	14.40	14.40	14.50
510.000	14.50	14.60	14.70	14.70	14.80
515.000	14.80	14.90	14.90	15.00	15.00
520.000	15.10	15.20	15.20	15.30	15.30
525.000	15.40	15.40	15.50	15.50	15.60
530.000	15.70	15.70	15.80	15.80	15.90
535.000	15.90	16.00	16.00	16.10	16.20
540.000	16.20	16.30	16.30	16.40	16.40
545.000	16.50	16.60	16.60	16.70	16.70
550.000	16.80	16.80	16.90	16.90	17.00
555.000	17.10	17.10	17.20	17.20	17.30
560.000	17.30	17.40	17.40	17.50	17.60
565.000	17.60	17.70	17.70	17.80	17.80
570.000	17.90	17.90	18.00	18.10	18.10
575.000	18.20	18.20	18.30	18.30	18.40
580.000	18.50	18.50	18.60	18.60	18.70
585.000	18.70	18.80	18.80	18.90	19.00
590.000	19.00	19.10	19.10	19.20	19.20
595.000	19.30	19.30	19.40	19.50	19.50
600.000	19.60	19.60	19.60	19.70	19.70

100-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
605.000	19.70	19.80	19.80	19.80	19.90
610.000	19.90	19.90	20.00	20.00	20.00
615.000	20.10	20.10	20.10	20.20	20.20
620.000	20.20	20.30	20.30	20.30	20.40
625.000	20.40	20.40	20.50	20.50	20.50
630.000	20.60	20.60	20.60	20.70	20.70
635.000	20.70	20.80	20.80	20.80	20.90
640.000	20.90	20.90	21.00	21.00	21.00
645.000	21.10	21.10	21.10	21.10	21.20
650.000	21.20	21.20	21.30	21.30	21.30
655.000	21.40	21.40	21.40	21.50	21.50
660.000	21.50	21.60	21.60	21.60	21.70
665.000	21.70	21.70	21.80	21.80	21.80
670.000	21.90	21.90	21.90	22.00	22.00
675.000	22.00	22.10	22.10	22.10	22.20
680.000	22.20	22.20	22.30	22.30	22.30
685.000	22.40	22.40	22.40	22.50	22.50
690.000	22.50	22.60	22.60	22.60	22.70
695.000	22.70	22.70	22.80	22.80	22.80
700.000	22.90	22.90	23.00	23.00	23.10
705.000	23.10	23.20	23.20	23.30	23.30
710.000	23.40	23.40	23.50	23.50	23.60
715.000	23.70	23.70	23.80	23.80	23.90
720.000	23.90	24.00	24.00	24.10	24.10
725.000	24.20	24.20	24.30	24.30	24.40
730.000	24.40	24.50	24.50	24.60	24.70
735.000	24.70	24.80	24.80	24.90	24.90
740.000	25.00	25.00	25.10	25.10	25.20
745.000	25.20	25.30	25.30	25.40	25.40
750.000	25.50	25.50	25.60	25.70	25.70
755.000	25.80	25.80	25.90	25.90	26.00
760.000	26.00	26.10	26.10	26.20	26.20
765.000	26.30	26.30	26.40	26.40	26.50
770.000	26.50	26.60	26.70	26.70	26.80
775.000	26.80	26.90	26.90	27.00	27.00
780.000	27.10	27.10	27.20	27.20	27.30
785.000	27.30	27.40	27.40	27.50	27.60
790.000	27.60	27.70	27.70	27.80	27.80
795.000	27.90	27.90	28.00	28.00	28.10
800.000	28.10	28.20	28.30	28.40	28.50
805.000	28.60	28.70	28.80	29.00	29.10
810.000	29.20	29.30	29.40	29.50	29.60

100-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
815.000	29.70	29.80	29.90	30.00	30.10
820.000	30.20	30.30	30.40	30.50	30.60
825.000	30.70	30.80	30.90	31.00	31.10
830.000	31.20	31.30	31.40	31.50	31.60
835.000	31.70	31.80	31.90	32.00	32.10
840.000	32.20	32.30	32.40	32.60	32.70
845.000	32.80	32.90	33.00	33.10	33.20
850.000	33.30	33.40	33.50	33.60	33.70
855.000	33.80	33.90	34.00	34.10	34.20
860.000	34.30	34.40	34.50	34.60	34.70
865.000	34.80	34.90	35.00	35.10	35.20
870.000	35.30	35.40	35.50	35.60	35.70
875.000	35.80	35.90	36.00	36.10	36.30
880.000	36.40	36.50	36.60	36.70	36.80
885.000	36.90	37.00	37.10	37.20	37.30
890.000	37.40	37.50	37.60	37.70	37.80
895.000	37.90	38.00	38.10	38.20	38.30
900.000	38.40	38.60	38.80	39.00	39.20
905.000	39.40	39.60	39.80	40.00	40.20
910.000	40.40	40.60	40.80	41.00	41.20
915.000	41.40	41.60	41.80	42.00	42.20
920.000	42.40	42.60	42.80	43.00	43.30
925.000	43.50	43.70	43.90	44.10	44.30
930.000	44.50	44.70	44.90	45.10	45.30
935.000	45.50	45.70	45.90	46.10	46.30
940.000	46.50	46.70	46.90	47.10	47.30
945.000	47.50	47.70	47.90	48.10	48.30
950.000	48.50	48.70	48.90	49.10	49.30
955.000	49.50	49.70	49.90	50.10	50.30
960.000	50.50	50.70	50.90	51.10	51.30
965.000	51.50	51.70	51.90	52.10	52.30
970.000	52.50	52.70	52.90	53.10	53.30
975.000	53.50	53.70	53.90	54.10	54.30
980.000	54.50	54.70	54.90	55.20	55.40
985.000	55.60	55.80	56.00	56.20	56.40
990.000	56.60	56.80	57.00	57.20	57.40
995.000	57.60	57.80	58.00	58.20	58.40
1,000.000	58.60	59.00	59.50	59.90	60.30
1,005.000	60.80	61.20	61.60	62.10	62.50
1,010.000	63.00	63.40	63.80	64.30	64.70
1,015.000	65.10	65.60	66.00	66.50	66.90
1,020.000	67.30	67.80	68.20	68.60	69.10

100-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,025.000	69.50	70.00	70.40	70.80	71.30
1,030.000	71.70	72.20	72.60	73.00	73.50
1,035.000	73.90	74.30	74.80	75.20	75.70
1,040.000	76.10	76.50	77.00	77.40	77.80
1,045.000	78.30	78.70	79.20	79.60	80.00
1,050.000	80.50	80.80	81.00	81.30	81.60
1,055.000	81.90	82.20	82.50	82.70	83.00
1,060.000	83.30	83.60	83.90	84.20	84.50
1,065.000	84.70	85.00	85.30	85.60	85.90
1,070.000	86.20	86.50	86.70	87.00	87.30
1,075.000	87.60	87.90	88.20	88.40	88.70
1,080.000	89.00	89.30	89.60	89.90	90.20
1,085.000	90.40	90.70	91.00	91.30	91.60
1,090.000	91.90	92.20	92.40	92.70	93.00
1,095.000	93.30	93.60	93.90	94.10	94.40
1,100.000	94.70	96.90	99.00	101.20	103.30
1,105.000	105.50	107.60	109.80	111.90	114.10
1,110.000	116.20	117.50	118.80	120.00	121.30
1,115.000	122.60	123.80	125.10	126.40	127.70
1,120.000	128.90	132.30	135.60	139.00	142.30
1,125.000	145.60	149.00	152.30	155.70	159.00
1,130.000	162.40	164.90	167.40	171.80	177.00
1,135.000	181.70	183.90	190.90	198.10	203.80
1,140.000	209.30	217.70	228.10	234.70	243.00
1,145.000	256.60	270.30	282.70	297.20	342.70
1,150.000	391.90	402.60	498.60	566.50	614.00
1,155.000	637.60	659.80	713.90	680.30	663.00
1,160.000	654.60	634.60	608.30	578.00	548.60
1,165.000	512.20	474.70	437.80	401.60	368.50
1,170.000	326.10	293.90	261.80	233.20	208.10
1,175.000	184.00	170.00	155.00	143.30	134.40
1,180.000	126.60	120.10	114.60	109.90	106.30
1,185.000	102.60	98.80	96.00	93.40	91.70
1,190.000	89.00	87.20	85.60	84.20	82.90
1,195.000	81.80	80.80	80.00	79.90	78.90
1,200.000	78.60	77.20	76.90	75.60	74.70
1,205.000	73.80	72.20	72.20	71.00	70.90
1,210.000	69.70	69.00	68.80	68.10	67.40
1,215.000	66.00	65.70	65.50	64.10	62.60
1,220.000	62.20	62.00	60.60	59.30	59.10
1,225.000	59.20	58.30	57.40	57.60	58.10
1,230.000	57.40	56.70	57.20	57.20	56.70

100-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,235.000	56.60	56.60	56.50	56.50	56.40
1,240.000	56.30	56.20	56.20	56.10	56.00
1,245.000	55.90	55.80	55.70	55.60	55.50
1,250.000	55.30	55.20	55.10	55.00	54.90
1,255.000	54.80	54.70	54.60	54.60	54.60
1,260.000	54.50	54.50	53.30	52.70	52.60
1,265.000	52.00	51.30	50.40	50.60	50.80
1,270.000	49.90	48.90	49.10	49.30	48.40
1,275.000	47.30	47.40	47.50	46.40	45.20
1,280.000	45.20	45.20	44.10	42.90	42.90
1,285.000	43.00	42.10	41.20	41.40	41.80
1,290.000	41.10	40.30	40.70	40.60	40.60
1,295.000	40.00	40.40	41.00	40.40	40.30
1,300.000	40.30	39.70	39.10	38.50	37.90
1,305.000	37.30	36.70	36.00	35.40	34.80
1,310.000	34.20	33.70	33.20	32.80	32.30
1,315.000	31.80	31.30	30.80	30.30	29.80
1,320.000	29.30	28.80	28.40	27.90	27.40
1,325.000	27.00	26.50	26.00	25.50	25.10
1,330.000	24.60	24.30	24.00	23.80	23.50
1,335.000	23.20	22.90	22.60	22.30	22.00
1,340.000	21.80	21.30	20.70	20.20	19.70
1,345.000	19.20	18.70	18.20	17.70	17.20
1,350.000	16.70	16.30	16.00	15.60	15.30
1,355.000	14.90	14.60	14.20	13.90	13.50
1,360.000	13.10	12.80	12.40	12.10	11.70
1,365.000	11.30	11.00	10.60	10.30	9.90
1,370.000	9.50	9.30	9.00	8.80	8.50
1,375.000	8.30	8.00	7.70	7.50	7.20
1,380.000	7.00	6.80	6.60	6.40	6.30
1,385.000	6.10	5.90	5.80	5.60	5.40
1,390.000	5.30	5.10	5.00	4.90	4.80
1,395.000	4.70	4.60	4.50	4.40	4.30
1,400.000	4.10	4.10	4.10	4.00	4.00
1,405.000	4.00	3.90	3.90	3.90	3.80
1,410.000	3.80	3.80	3.70	3.70	3.70
1,415.000	3.60	3.60	3.60	3.50	3.50
1,420.000	3.50	3.50	3.50	3.50	3.40
1,425.000	3.40	3.40	3.40	3.40	3.40
1,430.000	3.40	3.40	3.40	3.40	3.40
1,435.000	3.40	3.40	3.40	3.40	3.40
1,440.000	3.40	3.40	3.40	3.40	3.40

100-Year Existing Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,445.000	3.40	3.40	3.40	3.30	3.30
1,450.000	3.30	3.30	3.30	3.30	3.30
1,455.000	3.30	3.30	3.30	3.30	3.30
1,460.000	3.30	3.30	3.30	3.30	3.30
1,465.000	3.30	3.30	3.30	3.30	3.30
1,470.000	3.30	3.30	3.30	3.30	3.30
1,475.000	3.30	3.30	3.30	3.30	3.30
1,480.000	3.30	3.30	3.30	3.30	3.30
1,485.000	3.30	3.30	3.30	3.30	3.30
1,490.000	3.30	3.30	3.30	3.30	3.30
1,495.000	3.30	3.30	3.30	3.30	3.30
1,500.000	3.30	(N/A)	(N/A)	(N/A)	(N/A)

100-Year Existing Condition

Subsection: Addition Summary

Label: O-2

Summary for Hydrograph Addition at 'O-2'

Upstream Link	Upstream Node
Outlet-1	PO-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (min)	Flow (Peak) (ft ³ /s)
Flow (From)	Outlet-1	3.265	1,362.000	12.47
Flow (In)	O-2	3.265	1,362.000	12.47

100-Year Existing Condition

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	0.00	0.00	0.00	0.00	0.01
15.000	0.01	0.02	0.02	0.03	0.04
30.000	0.05	0.06	0.07	0.08	0.09
45.000	0.11	0.12	0.14	0.15	0.17
60.000	0.19	0.21	0.23	0.25	0.27
75.000	0.29	0.32	0.34	0.37	0.40
90.000	0.42	0.45	0.48	0.51	0.54
105.000	0.58	0.61	0.64	0.67	0.70
120.000	0.74	0.77	0.80	0.83	0.87
135.000	0.90	0.93	0.96	0.99	1.03
150.000	1.06	1.09	1.12	1.16	1.19
165.000	1.22	1.26	1.29	1.32	1.36
180.000	1.39	1.42	1.45	1.49	1.52
195.000	1.55	1.59	1.62	1.65	1.69
210.000	1.73	1.77	1.81	1.85	1.90
225.000	1.94	1.99	2.01	2.02	2.03
240.000	2.04	2.05	2.06	2.07	2.08
255.000	2.10	2.11	2.12	2.13	2.15
270.000	2.16	2.17	2.19	2.20	2.22
285.000	2.23	2.25	2.26	2.28	2.30
300.000	2.31	2.33	2.35	2.36	2.38
315.000	2.40	2.42	2.43	2.45	2.47
330.000	2.49	2.51	2.53	2.54	2.56
345.000	2.58	2.60	2.62	2.64	2.66
360.000	2.68	2.70	2.72	2.74	2.76
375.000	2.78	2.80	2.82	2.84	2.86
390.000	2.88	2.91	2.93	2.95	2.97
405.000	2.99	3.02	3.04	3.06	3.08
420.000	3.10	3.13	3.15	3.17	3.20
435.000	3.22	3.24	3.27	3.29	3.31
450.000	3.34	3.36	3.38	3.41	3.43
465.000	3.46	3.48	3.50	3.53	3.55
480.000	3.58	3.60	3.63	3.65	3.68
495.000	3.70	3.73	3.75	3.78	3.80
510.000	3.83	3.86	3.88	3.91	3.94
525.000	3.97	4.00	4.01	4.02	4.03
540.000	4.04	4.05	4.06	4.07	4.08
555.000	4.09	4.10	4.11	4.13	4.14
570.000	4.15	4.16	4.17	4.18	4.20
585.000	4.21	4.22	4.23	4.24	4.26
600.000	4.27	4.28	4.29	4.31	4.32

100-Year Existing Condition

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
615.000	4.33	4.35	4.36	4.37	4.39
630.000	4.40	4.41	4.43	4.44	4.45
645.000	4.47	4.48	4.49	4.51	4.52
660.000	4.53	4.55	4.56	4.58	4.59
675.000	4.60	4.62	4.63	4.65	4.66
690.000	4.68	4.69	4.70	4.72	4.73
705.000	4.75	4.76	4.78	4.79	4.81
720.000	4.82	4.84	4.86	4.87	4.89
735.000	4.90	4.92	4.93	4.95	4.97
750.000	4.98	5.00	5.02	5.03	5.05
765.000	5.07	5.08	5.10	5.12	5.13
780.000	5.15	5.17	5.19	5.20	5.22
795.000	5.24	5.26	5.28	5.29	5.31
810.000	5.33	5.35	5.37	5.39	5.41
825.000	5.43	5.45	5.47	5.49	5.51
840.000	5.53	5.55	5.57	5.59	5.61
855.000	5.64	5.66	5.68	5.70	5.72
870.000	5.75	5.77	5.79	5.82	5.84
885.000	5.86	5.89	5.91	5.93	5.96
900.000	5.98	6.00	6.02	6.03	6.05
915.000	6.06	6.07	6.09	6.10	6.12
930.000	6.13	6.15	6.16	6.18	6.20
945.000	6.21	6.23	6.24	6.26	6.28
960.000	6.30	6.31	6.33	6.35	6.37
975.000	6.38	6.40	6.42	6.44	6.46
990.000	6.48	6.50	6.52	6.54	6.56
1,005.000	6.58	6.60	6.62	6.64	6.66
1,020.000	6.69	6.71	6.73	6.76	6.78
1,035.000	6.81	6.83	6.86	6.89	6.91
1,050.000	6.94	6.97	7.00	7.02	7.05
1,065.000	7.08	7.11	7.14	7.17	7.20
1,080.000	7.23	7.26	7.29	7.32	7.35
1,095.000	7.39	7.42	7.45	7.48	7.52
1,110.000	7.56	7.60	7.64	7.68	7.73
1,125.000	7.78	7.83	7.88	7.94	8.00
1,140.000	8.05	8.11	8.17	8.24	8.34
1,155.000	8.48	8.63	8.79	8.93	9.05
1,170.000	9.14	9.21	9.26	9.30	9.33
1,185.000	9.35	9.38	9.40	9.42	9.44
1,200.000	9.46	9.47	9.49	9.51	9.52
1,215.000	9.54	9.55	9.57	9.58	9.59

100-Year Existing Condition

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
1,230.000	9.61	9.62	9.63	9.64	9.66
1,245.000	9.67	9.68	9.69	9.70	9.71
1,260.000	9.73	9.74	9.75	9.76	9.77
1,275.000	9.78	9.79	9.79	9.80	9.81
1,290.000	9.82	9.83	9.83	9.84	9.85
1,305.000	9.85	9.86	9.86	9.87	9.87
1,320.000	9.88	9.88	9.89	9.89	9.89
1,335.000	9.90	9.90	9.90	9.90	9.90
1,350.000	9.91	9.91	9.91	9.91	9.91
1,365.000	9.91	9.91	9.91	9.91	9.90
1,380.000	9.90	9.90	9.90	9.90	9.90
1,395.000	9.90	9.89	9.89	9.89	9.89
1,410.000	9.89	9.88	9.88	9.88	9.88
1,425.000	9.88	9.87	9.87	9.87	9.87
1,440.000	9.87	(N/A)	(N/A)	(N/A)	(N/A)

100-Year Existing Condition

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
0.000	0.000	0.000	0.001	0.002	0.003
15.000	0.005	0.007	0.010	0.013	0.017
30.000	0.021	0.025	0.030	0.035	0.040
45.000	0.046	0.053	0.060	0.067	0.075
60.000	0.083	0.091	0.100	0.109	0.119
75.000	0.129	0.140	0.151	0.162	0.174
90.000	0.186	0.199	0.212	0.225	0.239
105.000	0.253	0.267	0.281	0.295	0.309
120.000	0.323	0.337	0.351	0.365	0.379
135.000	0.393	0.407	0.421	0.436	0.450
150.000	0.464	0.479	0.493	0.508	0.522
165.000	0.537	0.551	0.565	0.580	0.594
180.000	0.609	0.623	0.638	0.652	0.667
195.000	0.681	0.696	0.710	0.726	0.742
210.000	0.758	0.775	0.794	0.812	0.832
225.000	0.852	0.873	0.894	0.917	0.940
240.000	0.964	0.988	1.013	1.039	1.065
255.000	1.093	1.121	1.150	1.179	1.209
270.000	1.240	1.271	1.304	1.336	1.370
285.000	1.404	1.439	1.475	1.511	1.549
300.000	1.586	1.625	1.663	1.702	1.742
315.000	1.782	1.822	1.862	1.903	1.944
330.000	1.985	2.027	2.069	2.112	2.155
345.000	2.198	2.241	2.285	2.329	2.374
360.000	2.418	2.464	2.509	2.555	2.601
375.000	2.648	2.695	2.742	2.790	2.838
390.000	2.886	2.934	2.983	3.033	3.082
405.000	3.132	3.182	3.233	3.283	3.334
420.000	3.385	3.437	3.488	3.540	3.592
435.000	3.644	3.697	3.750	3.803	3.856
450.000	3.910	3.964	4.018	4.072	4.126
465.000	4.181	4.236	4.291	4.347	4.403
480.000	4.459	4.515	4.571	4.628	4.685
495.000	4.742	4.800	4.857	4.916	4.975
510.000	5.035	5.095	5.156	5.218	5.280
525.000	5.343	5.407	5.472	5.537	5.603
540.000	5.669	5.737	5.805	5.874	5.943
555.000	6.013	6.084	6.156	6.228	6.301
570.000	6.375	6.449	6.524	6.600	6.676
585.000	6.753	6.831	6.909	6.988	7.068
600.000	7.149	7.230	7.312	7.394	7.476

100-Year Existing Condition

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
615.000	7.559	7.642	7.726	7.810	7.894
630.000	7.979	8.065	8.150	8.237	8.323
645.000	8.410	8.497	8.585	8.673	8.761
660.000	8.849	8.938	9.028	9.118	9.208
675.000	9.299	9.390	9.481	9.573	9.666
690.000	9.758	9.852	9.945	10.039	10.134
705.000	10.229	10.325	10.421	10.519	10.617
720.000	10.715	10.814	10.914	11.014	11.115
735.000	11.217	11.320	11.423	11.526	11.631
750.000	11.736	11.842	11.948	12.055	12.163
765.000	12.271	12.380	12.489	12.600	12.711
780.000	12.822	12.934	13.047	13.161	13.275
795.000	13.390	13.505	13.621	13.739	13.857
810.000	13.977	14.098	14.221	14.344	14.469
825.000	14.596	14.723	14.852	14.982	15.113
840.000	15.245	15.379	15.515	15.651	15.789
855.000	15.928	16.068	16.210	16.353	16.497
870.000	16.642	16.788	16.936	17.085	17.236
885.000	17.388	17.541	17.695	17.851	18.008
900.000	18.166	18.326	18.488	18.653	18.820
915.000	18.990	19.162	19.337	19.515	19.695
930.000	19.877	20.063	20.250	20.440	20.633
945.000	20.828	21.025	21.225	21.428	21.633
960.000	21.840	22.050	22.263	22.477	22.695
975.000	22.915	23.137	23.362	23.589	23.819
990.000	24.052	24.287	24.525	24.765	25.008
1,005.000	25.257	25.511	25.770	26.035	26.305
1,020.000	26.580	26.861	27.148	27.439	27.737
1,035.000	28.039	28.348	28.661	28.980	29.304
1,050.000	29.634	29.968	30.306	30.648	30.992
1,065.000	31.341	31.693	32.048	32.407	32.770
1,080.000	33.136	33.506	33.879	34.255	34.636
1,095.000	35.019	35.406	35.801	36.215	36.655
1,110.000	37.122	37.610	38.114	38.633	39.177
1,125.000	39.758	40.381	41.043	41.750	42.510
1,140.000	43.337	44.254	45.297	46.564	48.302
1,155.000	50.650	53.373	56.089	58.534	60.572
1,170.000	62.150	63.306	64.139	64.768	65.282
1,185.000	65.729	66.130	66.500	66.846	67.177
1,200.000	67.498	67.809	68.105	68.392	68.669
1,215.000	68.935	69.190	69.435	69.668	69.890

100-Year Existing Condition

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,230.000	70.108	70.324	70.536	70.746	70.954
1,245.000	71.159	71.362	71.563	71.761	71.956
1,260.000	72.149	72.337	72.518	72.693	72.863
1,275.000	73.025	73.180	73.330	73.472	73.604
1,290.000	73.732	73.859	73.983	74.105	74.224
1,305.000	74.337	74.441	74.536	74.625	74.708
1,320.000	74.784	74.853	74.916	74.973	75.025
1,335.000	75.072	75.116	75.155	75.189	75.216
1,350.000	75.237	75.252	75.263	75.270	75.272
1,365.000	75.269	75.262	75.251	75.237	75.219
1,380.000	75.198	75.175	75.149	75.122	75.093
1,395.000	75.062	75.031	74.999	74.965	74.932
1,410.000	74.899	74.865	74.831	74.797	74.763
1,425.000	74.729	74.695	74.661	74.627	74.594
1,440.000	74.560	(N/A)	(N/A)	(N/A)	(N/A)

100-Year Existing Condition

Subsection: Elevation vs. Volume Curve

Label: PO-1

Elevation-Volume

Pond Elevation (ft)	Pond Volume (ac-ft)
0.00	0.000
2.00	0.877
4.00	5.418
6.00	18.271
8.00	42.445
10.00	76.869
12.00	121.103

100-Year Existing Condition

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Requested Pond Water Surface Elevations	
Minimum (Headwater)	0.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	12.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Box Tailwater Settings	Culvert - 1 Tailwater	Forward	TW	9.30 (N/A)	12.00 (N/A)

100-Year Existing Condition

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Structure ID: Culvert - 1	
Structure Type: Culvert-Box	
Number of Barrels	1
Width	10.30 ft
Height	2.80 ft
Length	77.00 ft
Length (Computed Barrel)	77.01 ft
Slope (Computed)	0.014 ft/ft
Outlet Control Data	
Manning's n	0.013
Ke	0.500
Kb	0.004
Kr	0.500
Convergence Tolerance	0.00 ft
Inlet Control Data	
Equation Form	Form 1
K	0.0260
M	1.0000
C	0.0347
Y	0.8100
T1 ratio (HW/D)	1.171
T2 ratio (HW/D)	1.358
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.

Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	12.58 ft	T1 Flow	168.90 ft ³ /s
T2 Elevation	13.10 ft	T2 Flow	193.03 ft ³ /s

100-Year Existing Condition

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall
Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

100-Year Existing Condition

Subsection: Individual Outlet Curves

Label: Composite Outlet Structure - 1

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = Culvert - 1 (Culvert-Box)

Mannings open channel maximum capacity: 586.00 ft³/s

Upstream ID = (Pond Water Surface)

Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
0.00	0.00	(N/A)	0.00
0.50	0.00	(N/A)	0.00
1.00	0.00	(N/A)	0.00
1.50	0.00	(N/A)	0.00
2.00	0.00	(N/A)	0.00
2.50	0.00	(N/A)	0.00
3.00	0.00	(N/A)	0.00
3.50	0.00	(N/A)	0.00
4.00	0.00	(N/A)	0.00
4.50	0.00	(N/A)	0.00
5.00	0.00	(N/A)	0.00
5.50	0.00	(N/A)	0.00
6.00	0.00	(N/A)	0.00
6.50	0.00	(N/A)	0.00
7.00	0.00	(N/A)	0.00
7.50	0.00	(N/A)	0.00
8.00	0.00	(N/A)	0.00
8.50	0.00	(N/A)	0.00
9.00	0.00	(N/A)	0.00
9.30	0.00	(N/A)	0.00
9.50	2.25	(N/A)	0.00
10.00	14.81	(N/A)	0.00
10.50	33.17	(N/A)	0.00
11.00	55.94	(N/A)	0.00
11.50	82.35	(N/A)	0.00
12.00	111.94	(N/A)	0.00

Computation Messages

Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El

100-Year Existing Condition

Subsection: Individual Outlet Curves

Label: Composite Outlet Structure - 1

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = Culvert - 1 (Culvert-Box)

Mannings open channel maximum capacity: 586.00 ft³/s

Upstream ID = (Pond Water Surface)

Downstream ID = Tailwater (Pond Outfall)

Computation Messages

Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .057ft
Dcr= .114ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .200ft
Dcr= .400ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .343ft
Dcr= .686ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .486ft
Dcr= .971ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .629ft
Dcr= 1.257ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .771ft
Dcr= 1.543ft CRIT.DEPTH Hev= .00ft

100-Year Existing Condition

Subsection: Composite Rating Curve

Label: Composite Outlet Structure - 1

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
0.00	0.00	(N/A)	0.00
0.50	0.00	(N/A)	0.00
1.00	0.00	(N/A)	0.00
1.50	0.00	(N/A)	0.00
2.00	0.00	(N/A)	0.00
2.50	0.00	(N/A)	0.00
3.00	0.00	(N/A)	0.00
3.50	0.00	(N/A)	0.00
4.00	0.00	(N/A)	0.00
4.50	0.00	(N/A)	0.00
5.00	0.00	(N/A)	0.00
5.50	0.00	(N/A)	0.00
6.00	0.00	(N/A)	0.00
6.50	0.00	(N/A)	0.00
7.00	0.00	(N/A)	0.00
7.50	0.00	(N/A)	0.00
8.00	0.00	(N/A)	0.00
8.50	0.00	(N/A)	0.00
9.00	0.00	(N/A)	0.00
9.30	0.00	(N/A)	0.00
9.50	2.25	(N/A)	0.00
10.00	14.81	(N/A)	0.00
10.50	33.17	(N/A)	0.00
11.00	55.94	(N/A)	0.00
11.50	82.35	(N/A)	0.00
12.00	111.94	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing

100-Year Existing Condition

Subsection: Composite Rating Curve

Label: Composite Outlet Structure - 1

Composite Outflow Summary

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

100-Year Existing Condition

Subsection: Diverted Hydrograph

Label: Outlet-1

Peak Discharge	12.47 ft ³ /s
Time to Peak	1,362.000 min
Hydrograph Volume	3.265 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,179.000	0.00	0.30	0.59	0.85	1.10
1,194.000	1.32	1.54	1.75	1.95	2.14
1,209.000	2.43	2.84	3.23	3.60	3.96
1,224.000	4.30	4.62	4.94	5.25	5.56
1,239.000	5.87	6.17	6.47	6.77	7.06
1,254.000	7.35	7.64	7.92	8.19	8.46
1,269.000	8.71	8.96	9.20	9.42	9.64
1,284.000	9.85	10.04	10.23	10.41	10.59
1,299.000	10.77	10.95	11.11	11.26	11.40
1,314.000	11.53	11.65	11.76	11.86	11.96
1,329.000	12.04	12.11	12.18	12.25	12.30
1,344.000	12.35	12.39	12.42	12.45	12.46
1,359.000	12.47	12.47	12.47	12.46	12.44
1,374.000	12.42	12.40	12.37	12.33	12.30
1,389.000	12.26	12.21	12.17	12.12	12.08
1,404.000	12.03	11.98	11.93	11.88	11.83
1,419.000	11.78	11.73	11.68	11.63	11.58
1,434.000	11.53	11.48	11.44	(N/A)	(N/A)

100-Year Existing Condition

Subsection: Elevation-Volume-Flow Table (Pond)

Label: PO-1

Infiltration	
Infiltration Method (Computed)	No Infiltration
Initial Conditions	
Elevation (Water Surface, Initial)	0.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft ³ /s
Flow (Initial Infiltration)	0.00 ft ³ /s
Flow (Initial, Total)	0.00 ft ³ /s
Time Increment	3.000 min

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
0.00	0.00	0.000	0.000	0.00	0.00	0.00
0.50	0.00	0.219	0.000	0.00	0.00	106.12
1.00	0.00	0.439	0.000	0.00	0.00	212.23
1.50	0.00	0.658	0.000	0.00	0.00	318.35
2.00	0.00	0.877	0.000	0.00	0.00	424.47
2.50	0.00	2.012	0.000	0.00	0.00	973.93
3.00	0.00	3.148	0.000	0.00	0.00	1,523.39
3.50	0.00	4.283	0.000	0.00	0.00	2,072.85
4.00	0.00	5.418	0.000	0.00	0.00	2,622.31
4.50	0.00	8.631	0.000	0.00	0.00	4,177.53
5.00	0.00	11.845	0.000	0.00	0.00	5,732.74
5.50	0.00	15.058	0.000	0.00	0.00	7,287.95
6.00	0.00	18.271	0.000	0.00	0.00	8,843.16
6.50	0.00	24.314	0.000	0.00	0.00	11,768.22
7.00	0.00	30.358	0.000	0.00	0.00	14,693.27
7.50	0.00	36.402	0.000	0.00	0.00	17,618.33
8.00	0.00	42.445	0.000	0.00	0.00	20,543.38
8.50	0.00	51.051	0.000	0.00	0.00	24,708.68
9.00	0.00	59.657	0.000	0.00	0.00	28,873.99
9.30	0.00	64.821	0.000	0.00	0.00	31,373.17
9.50	2.25	68.263	0.000	0.00	2.25	33,041.54
10.00	14.81	76.869	0.000	0.00	14.81	37,219.40
10.50	33.17	87.928	0.000	0.00	33.17	42,590.08
11.00	55.94	98.986	0.000	0.00	55.94	47,965.16
11.50	82.35	110.044	0.000	0.00	82.35	53,343.89
12.00	111.94	121.103	0.000	0.00	111.94	58,725.80

100-Year Existing Condition

Subsection: Level Pool Pond Routing Summary

Label: PO-1 (IN)

Infiltration			
Infiltration Method (Computed)		No Infiltration	
Initial Conditions			
Elevation (Water Surface, Initial)		0.00 ft	
Volume (Initial)		0.000 ac-ft	
Flow (Initial Outlet)		0.00 ft³/s	
Flow (Initial Infiltration)		0.00 ft³/s	
Flow (Initial, Total)		0.00 ft³/s	
Time Increment		3.000 min	
Inflow/Outflow Hydrograph Summary			
Flow (Peak In)		680.30 ft³/s	Time to Peak (Flow, In)
Flow (Peak Outlet)		12.47 ft³/s	Time to Peak (Flow, Outlet)
			1,158.000 min
			1,362.000 min
Peak Conditions			
Elevation (Water Surface, Peak)		9.91 ft	
Volume (Peak)		75.272 ac-ft	
Mass Balance (ac-ft)			
Volume (Initial)		0.000 ac-ft	
Volume (Total Inflow)		77.826 ac-ft	
Volume (Total Infiltration)		0.000 ac-ft	
Volume (Total Outlet Outflow)		3.265 ac-ft	
Volume (Retained)		74.513 ac-ft	
Volume (Unrouted)		-0.047 ac-ft	
Error (Mass Balance)		0.1 %	

100-Year Existing Condition

Subsection: Pond Routed Hydrograph (total out)

Label: PO-1 (OUT)

Peak Discharge	12.47 ft ³ /s
Time to Peak	1,362.000 min
Hydrograph Volume	3.265 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,179.000	0.00	0.30	0.59	0.85	1.10
1,194.000	1.32	1.54	1.75	1.95	2.14
1,209.000	2.43	2.84	3.23	3.60	3.96
1,224.000	4.30	4.62	4.94	5.25	5.56
1,239.000	5.87	6.17	6.47	6.77	7.06
1,254.000	7.35	7.64	7.92	8.19	8.46
1,269.000	8.71	8.96	9.20	9.42	9.64
1,284.000	9.85	10.04	10.23	10.41	10.59
1,299.000	10.77	10.95	11.11	11.26	11.40
1,314.000	11.53	11.65	11.76	11.86	11.96
1,329.000	12.04	12.11	12.18	12.25	12.30
1,344.000	12.35	12.39	12.42	12.45	12.46
1,359.000	12.47	12.47	12.47	12.46	12.44
1,374.000	12.42	12.40	12.37	12.33	12.30
1,389.000	12.26	12.21	12.17	12.12	12.08
1,404.000	12.03	11.98	11.93	11.88	11.83
1,419.000	11.78	11.73	11.68	11.63	11.58
1,434.000	11.53	11.48	11.44	(N/A)	(N/A)

100-Year Existing Condition

Subsection: Pond Inflow Summary

Label: PO-1 (IN)

Summary for Hydrograph Addition at 'PO-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	CM-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (min)	Flow (Peak) (ft ³ /s)
Flow (From)	CM-1	78.101	1,157.000	713.90
Flow (In)	PO-1	77.826	1,158.000	680.30

100-Year Existing Condition

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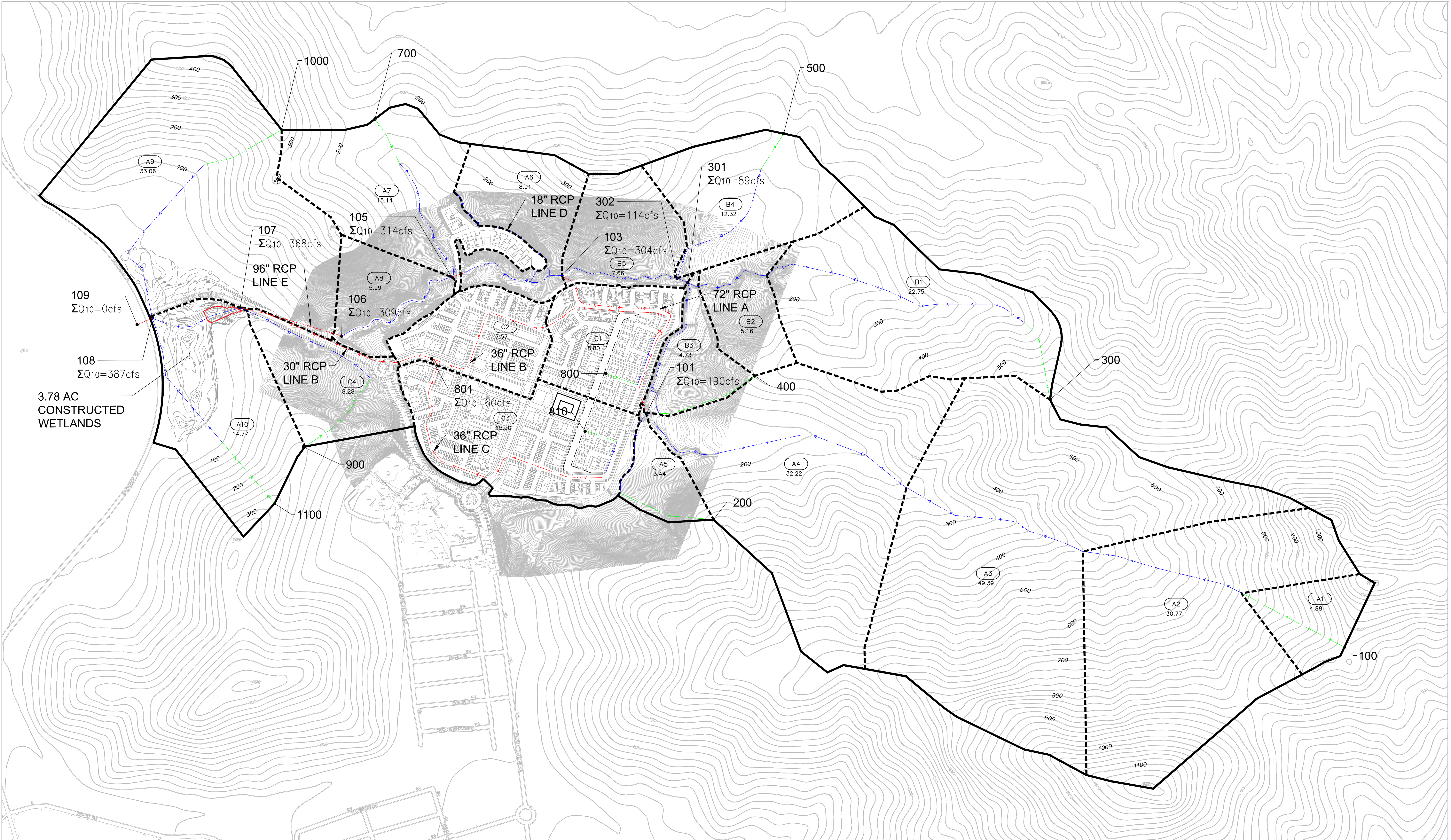
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Attachment C
Supporting Documentation for Proposed Condition Hydrology

Attachment C-1
Proposed Condition Hydrology Map



LEGEND

A
1.00 Ac

$Q_{10} = X.XX$ CFS

$\Sigma Q_{10} = X.XX$ CFS

MAJOR DRAINAGE BOUNDARY

MINOR DRAINAGE BOUNDARY

SUBAREA NAME

SUBAREA SIZE (ACRES)

PEAK FLOW RATE

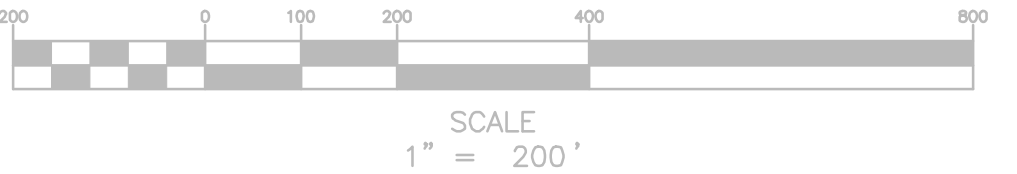
PEAK CONFLUENT FLOW RATE

CURB\CHANNELIZED FLOW PATH

OVERLAND FLOW PATH

PIPE FLOW PATH

MAJOR DRAINAGE BOUNDARY
MINOR DRAINAGE BOUNDARY
SUBAREA NAME
SUBAREA SIZE (ACRES)
PEAK FLOW RATE
PEAK CONFLUENT FLOW RATE
CURB\CHANNELIZED FLOW PATH
OVERLAND FLOW PATH
PIPE FLOW PATH



Attachment C-2
Proposed Condition – Tc Calculator Model Files

VENTURA COUNTY WATERSHED PROTECTION DISTRICT
 TIME OF CONCENTRATION
 TC Program Version: 2.6.2009.7
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

S U M M A R Y O F C O M P U T A T I O N S

Watershed Name: Proposed Condition 10-yr Storm Event

Name	Zone	Storm	Soil	Area (acres)	TC (min)
Area A	K	10	1.00	111.0 / 111	16.217 / 16
Area A5	K	10	2.00	3.4 / 3	6.169 / 6
Area B	K	10	1.00	27.9 / 28	7.213 / 7
Area B3	K	10	2.00	4.7 / 5	9.352 / 9
Area B4	K	10	1.00	12.3 / 12	11.022 / 11
Area B5	K	10	1.00	7.7 / 8	6.308 / 6
Area A6	K	10	1.00	8.9 / 9	6.160 / 6
Area A7	K	10	1.00	15.1 / 15	6.975 / 7
Area A8	K	10	1.00	6.0 / 6	6.871 / 7
Area C1	K	10	2.00	16.4 / 16	11.571 / 12
Area C3	K	10	2.00	15.2 / 15	11.657 / 12
Area C4	K	10	2.00	8.3 / 8	7.368 / 7
Area A9	K	10	1.00	33.1 / 33	6.505 / 7
Area A10	K	10	2.00	14.8 / 15	7.281 / 7

♀

Watershed Name: Proposed Condition 10-yr Storm Event

Sub-Area Name: Area A
 Tc: 16.217 Minutes
 DATA FOR SUB AREA 1

SUB AREA TIME OF CONCENTRATION: 16.217 min. = 16 min.

SUB AREA INPUT DATA

Sub Area Name: Area A
 Total Area (ac): 111.04
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 1.976
 C Total: 0.848
 Sum Q Segments (cfs): 186.07
 Q Total (cfs): 186.07
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 972.99
 Time of Concentration (min): 16.217

DATA FOR FLOW PATH 1

Flow Path Name: A1
FLOW PATH TRAVEL TIME (min): 11.6113
Flow Type: Overland
Length (ft): 1000
Top Elevation (ft): 790
Bottom Elevation (ft): 570
Contributing Area (acres): 4.88
Percent of Sub-Area (%): 4.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2200
Effective Slope: 0.1685
Q for Flow Path (cfs): 8.18
Avg velocity (ft/s): 1.44
Passed Scour Check: YES
Scour velocity (ft/sec): 4.57

DATA FOR FLOW PATH 2

Flow Path Name: A2
FLOW PATH TRAVEL TIME (min): 1.0263
Flow Type: Natural Channel
Length (ft): 600
Top Elevation (ft): 570
Bottom Elevation (ft): 440
Contributing Area (acres): 24.55
Percent of Sub-Area (%): 22.1
Overland Type: Mountain
Map Slope: 0.2167
Effective Slope: 0.1671
Q for Flow Path (cfs): 41.14
Q Top (cfs): 8.18
Q Bottom (cfs): 49.32
Velocity Top (ft/s): 4.61
Velocity Bottom (ft/s): 8.38
Avg velocity (ft/s): 6.50
Wave velocity (ft/s): 9.74

DATA FOR FLOW PATH 3

Flow Path Name: A3
FLOW PATH TRAVEL TIME (min): 1.1852
Flow Type: Natural Channel
Length (ft): 1020
Top Elevation (ft): 440
Bottom Elevation (ft): 250
Contributing Area (acres): 49.39
Percent of Sub-Area (%): 44.5
Overland Type: Mountain
Map Slope: 0.1863
Effective Slope: 0.1525
Q for Flow Path (cfs): 82.76
Q Top (cfs): 49.32
Q Bottom (cfs): 132.08
Velocity Top (ft/s): 8.01

Velocity Bottom (ft/s): 11.12
Avg Velocity (ft/s): 9.56
Wave Velocity (ft/s): 14.34

DATA FOR FLOW PATH 4

Flow Path Name: A4
FLOW PATH TRAVEL TIME (min): 2.3937
Flow Type: Natural Channel
Length (ft): 1590
Top Elevation (ft): 250
Bottom Elevation (ft): 155
Contributing Area (acres): 32.22
Percent of Sub-Area (%): 29.0
Overland Type: Mountain
Map Slope: 0.0597
Effective Slope: 0.0597
Q for Flow Path (cfs): 53.99
Q Top (cfs): 132.08
Q Bottom (cfs): 186.07
Velocity Top (ft/s): 6.96
Velocity Bottom (ft/s): 7.80
Avg Velocity (ft/s): 7.38
Wave Velocity (ft/s): 11.07

♀

Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area A5
Tc: 6.169 Minutes
DATA FOR SUB AREA 2

SUB AREA TIME OF CONCENTRATION: 6.169 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area A5
Total Area (ac): 3.44
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT

Intensity (in/hr): 3.400
C Total: 0.846
Sum Q Segments (cfs): 9.89
Q Total (cfs): 9.89
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 370.16
Time of Concentration (min): 6.169

DATA FOR FLOW PATH 1

Flow Path Name: A5 overland
FLOW PATH TRAVEL TIME (min): 4.9248
Flow Type: Overland
Length (ft): 530
Top Elevation (ft): 340
Bottom Elevation (ft): 186
Contributing Area (acres): 0.06
Percent of Sub-Area (%): 1.7
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2906
Effective Slope: 0.1935
Q for Flow Path (cfs): 0.17
Avg Velocity (ft/s): 1.79
Passed Scour Check: YES
Scour velocity (ft/sec): 1.32

DATA FOR FLOW PATH 2

Flow Path Name: A5
FLOW PATH TRAVEL TIME (min): 1.2445
Flow Type: Channel
Length (ft): 470
Top Elevation (ft): 186
Bottom Elevation (ft): 177
Contributing Area (acres): 3.38
Percent of Sub-Area (%): 98.3
Bottom width (ft): 5
Side Slope (H:V): 1
Manning's N: 0.013
Map Slope: 0.0191
Q for Flow Path (cfs): 9.72
Q Top (cfs): 0.17
Q Bottom (cfs): 9.89
Velocity Top (ft/s): 1.35
Velocity Bottom (ft/s): 6.51
Avg Velocity (ft/s): 3.93
Wave velocity (ft/s): 6.29

‡
Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area B
Tc: 7.213 Minutes
DATA FOR SUB AREA 3

SUB AREA TIME OF CONCENTRATION: 7.213 min. = 7 min.

SUB AREA INPUT DATA

Sub Area Name: Area B
Total Area (ac): 27.91
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped

Soil Type: 1.00
Percent Impervious: 0
SUB AREA OUTPUT

Intensity (in/hr): 3.094
C Total: 0.902
Sum Q Segments (cfs): 77.93
Q Total (cfs): 77.93
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 432.75
Time of Concentration (min): 7.213

DATA FOR FLOW PATH 1

Flow Path Name: B1 overland
FLOW PATH TRAVEL TIME (min): 3.9009
Flow Type: Overland
Length (ft): 450
Top Elevation (ft): 570
Bottom Elevation (ft): 400
Contributing Area (acres): 1.68
Percent of Sub-Area (%): 6.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3778
Effective Slope: 0.2114
Q for Flow Path (cfs): 4.69
Avg Velocity (ft/s): 1.92
Passed Scour Check: YES
Scour velocity (ft/sec): 4.19

DATA FOR FLOW PATH 2

Flow Path Name: B1
FLOW PATH TRAVEL TIME (min): 2.7694
Flow Type: Natural Channel
Length (ft): 1460
Top Elevation (ft): 400
Bottom Elevation (ft): 169
Contributing Area (acres): 21.07
Percent of Sub-Area (%): 75.5
Overland Type: Mountain
Map Slope: 0.1582
Effective Slope: 0.1367
Q for Flow Path (cfs): 58.83
Q Top (cfs): 4.69
Q Bottom (cfs): 63.52
Velocity Top (ft/s): 3.46
Velocity Bottom (ft/s): 8.25
Avg Velocity (ft/s): 5.86
Wave velocity (ft/s): 8.79

DATA FOR FLOW PATH 3

Flow Path Name: B2
FLOW PATH TRAVEL TIME (min): 0.5422
Flow Type: Natural Channel
Length (ft): 420

Top Elevation (ft): 169
Bottom Elevation (ft): 152
Contributing Area (acres): 5.16
Percent of Sub-Area (%): 18.5
Overland Type: valley
Map Slope: 0.0405
Effective Slope: 0.0405
Q for Flow Path (cfs): 14.41
Q Top (cfs): 63.52
Q Bottom (cfs): 77.93
Velocity Top (ft/s): 8.35
Velocity Bottom (ft/s): 8.87
Avg Velocity (ft/s): 8.61
Wave velocity (ft/s): 12.91

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Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area B3
Tc: 9.352 Minutes
DATA FOR SUB AREA 4

SUB AREA TIME OF CONCENTRATION: 9.352 min. = 9 min.

SUB AREA INPUT DATA

Sub Area Name: Area B3
Total Area (ac): 4.67
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT

Intensity (in/hr): 2.680
C Total: 0.810
Sum Q Segments (cfs): 10.14
Q Total (cfs): 10.14
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 561.12
Time of Concentration (min): 9.352

DATA FOR FLOW PATH 1

Flow Path Name: B3 overland
FLOW PATH TRAVEL TIME (min): 7.7170
Flow Type: Overland
Length (ft): 560
Top Elevation (ft): 280
Bottom Elevation (ft): 177
Contributing Area (acres): 0.18
Percent of Sub-Area (%): 3.9
Overland Type: Mountain
Development Type: Undeveloped

Map Slope: 0.1839
 Effective Slope: 0.1512
 Q for Flow Path (cfs): 0.39
 Avg Velocity (ft/s): 1.21
 Passed Scour Check: YES
 Scour velocity (ft/sec): 1.56

DATA FOR FLOW PATH 2

Flow Path Name: B3
 FLOW PATH TRAVEL TIME (min): 1.6350
 Flow Type: Channel
 Length (ft): 800
 Top Elevation (ft): 177
 Bottom Elevation (ft): 149
 Contributing Area (acres): 4.49
 Percent of Sub-Area (%): 96.1
 Bottom width (ft): 5
 Side Slope (H:V): 1
 Manning's N: 0.013
 Map Slope: 0.0350
 Q for Flow Path (cfs): 9.75
 Q Top (cfs): 0.39
 Q Bottom (cfs): 10.14
 Velocity Top (ft/s): 2.21
 Velocity Bottom (ft/s): 7.92
 Avg Velocity (ft/s): 5.07
 Wave velocity (ft/s): 8.15

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Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area B4
 Tc: 11.022 Minutes
 DATA FOR SUB AREA 5

SUB AREA TIME OF CONCENTRATION: 11.022 min. = 11 min.

SUB AREA INPUT DATA

Sub Area Name: Area B4
 Total Area (ac): 12.32
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 2.396
 C Total: 0.874
 Sum Q Segments (cfs): 25.79
 Q Total (cfs): 25.79
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 661.31

Time of Concentration (min): 11.022

DATA FOR FLOW PATH 1

Flow Path Name: B4 overland
FLOW PATH TRAVEL TIME (min): 8.1898
Flow Type: Overland
Length (ft): 230
Top Elevation (ft): 210
Bottom Elevation (ft): 200
Contributing Area (acres): 1.11
Percent of Sub-Area (%): 9.0
Overland Type: valley
Development Type: Undeveloped
Map Slope: 0.0435
Effective Slope: 0.0435
Q for Flow Path (cfs): 2.32
Avg Velocity (ft/s): 0.47
Passed Scour Check: YES
Scour velocity (ft/sec): 3.66

DATA FOR FLOW PATH 2

Flow Path Name: B4
FLOW PATH TRAVEL TIME (min): 2.8319
Flow Type: Natural Channel
Length (ft): 800
Top Elevation (ft): 200
Bottom Elevation (ft): 145
Contributing Area (acres): 11.21
Percent of Sub-Area (%): 91.0
Overland Type: Mountain
Map Slope: 0.0688
Effective Slope: 0.0688
Q for Flow Path (cfs): 23.46
Q Top (cfs): 2.32
Q Bottom (cfs): 25.79
Velocity Top (ft/s): 1.94
Velocity Bottom (ft/s): 4.33
Avg Velocity (ft/s): 3.14
Wave velocity (ft/s): 4.71
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Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area B5
Tc: 6.308 Minutes
DATA FOR SUB AREA 6

SUB AREA TIME OF CONCENTRATION: 6.308 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area B5
Total Area (ac): 7.66
Flood Zone: 3

Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 3.400
 C Total: 0.910
 Sum Q Segments (cfs): 23.70
 Q Total (cfs): 23.70
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 378.47
 Time of Concentration (min): 6.308

DATA FOR FLOW PATH 1

 Flow Path Name: B5 overland
 FLOW PATH TRAVEL TIME (min): 4.3343
 Flow Type: Overland
 Length (ft): 500
 Top Elevation (ft): 340
 Bottom Elevation (ft): 160
 Contributing Area (acres): 0.77
 Percent of Sub-Area (%): 10.1
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.3600
 Effective Slope: 0.2087
 Q for Flow Path (cfs): 2.38
 Avg Velocity (ft/s): 1.92
 Passed Scour Check: YES
 Scour velocity (ft/sec): 3.30

DATA FOR FLOW PATH 2

 Flow Path Name: B5
 FLOW PATH TRAVEL TIME (min): 1.9735
 Flow Type: Natural Channel
 Length (ft): 840
 Top Elevation (ft): 160
 Bottom Elevation (ft): 129
 Contributing Area (acres): 6.89
 Percent of Sub-Area (%): 89.9
 Overland Type: valley
 Map Slope: 0.0369
 Effective Slope: 0.0369
 Q for Flow Path (cfs): 21.32
 Q Top (cfs): 2.38
 Q Bottom (cfs): 23.70
 Velocity Top (ft/s): 3.43
 Velocity Bottom (ft/s): 6.03
 Avg Velocity (ft/s): 4.73
 Wave velocity (ft/s): 7.09

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 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:

Consultant:

 Sub-Area Name: Area A6
 Tc: 6.160 Minutes
 DATA FOR SUB AREA 7

SUB AREA TIME OF CONCENTRATION: 6.160 min. = 6 min.

SUB AREA INPUT DATA

 Sub Area Name: Area A6
 Total Area (ac): 8.91
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 3
 SUB AREA OUTPUT

Intensity (in/hr): 3.400
 C Total: 0.911
 Sum Q Segments (cfs): 27.60
 Q Total (cfs): 27.60
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 369.60
 Time of Concentration (min): 6.160

DATA FOR FLOW PATH 1

 Flow Path Name: A6 overland
 FLOW PATH TRAVEL TIME (min): 3.3023
 Flow Type: Overland
 Length (ft): 300
 Top Elevation (ft): 240
 Bottom Elevation (ft): 170
 Contributing Area (acres): 0.37
 Percent of Sub-Area (%): 4.2
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2333
 Effective Slope: 0.1741
 Q for Flow Path (cfs): 1.15
 Avg Velocity (ft/s): 1.51
 Passed Scour Check: YES
 Scour velocity (ft/sec): 2.36

DATA FOR FLOW PATH 2

 Flow Path Name: A6
 FLOW PATH TRAVEL TIME (min): 2.8578
 Flow Type: Natural Channel
 Length (ft): 810
 Top Elevation (ft): 170
 Bottom Elevation (ft): 108
 Contributing Area (acres): 8.54
 Percent of Sub-Area (%): 95.8
 Overland Type: Mountain

Map Slope: 0.0765
 Effective Slope: 0.0765
 Q for Flow Path (cfs): 26.46
 Q Top (cfs): 1.15
 Q Bottom (cfs): 27.60
 Velocity Top (ft/s): 1.62
 Velocity Bottom (ft/s): 4.68
 Avg Velocity (ft/s): 3.15
 Wave Velocity (ft/s): 4.72

Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area A7
 Tc: 6.975 Minutes
 DATA FOR SUB AREA 8

 SUB AREA TIME OF CONCENTRATION: 6.975 min. = 7 min.

 SUB AREA INPUT DATA

 Sub Area Name: Area A7
 Total Area (ac): 15.14
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 14
 SUB AREA OUTPUT

 Intensity (in/hr): 3.094
 C Total: 0.909
 Sum Q Segments (cfs): 42.59
 Q Total (cfs): 42.59
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 418.50
 Time of Concentration (min): 6.975

 DATA FOR FLOW PATH 1

 Flow Path Name: A7 overland
 FLOW PATH TRAVEL TIME (min): 4.5504
 Flow Type: Overland
 Length (ft): 300
 Top Elevation (ft): 190
 Bottom Elevation (ft): 140
 Contributing Area (acres): 1.19
 Percent of Sub-Area (%): 7.9
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.1667
 Effective Slope: 0.1417
 Q for Flow Path (cfs): 3.35
 Avg Velocity (ft/s): 1.10
 Passed Scour Check: YES

Scour Velocity (ft/sec): 3.06

DATA FOR FLOW PATH 2

Flow Path Name: A7
FLOW PATH TRAVEL TIME (min): 2.4247
Flow Type: Natural Channel
Length (ft): 700
Top Elevation (ft): 140
Bottom Elevation (ft): 103
Contributing Area (acres): 13.95
Percent of Sub-Area (%): 92.1
Overland Type: Mountain
Map Slope: 0.0529
Effective Slope: 0.0529
Q for Flow Path (cfs): 39.24
Q Top (cfs): 3.35
Q Bottom (cfs): 42.59
Velocity Top (ft/s): 1.93
Velocity Bottom (ft/s): 4.49
Avg Velocity (ft/s): 3.21
Wave Velocity (ft/s): 4.81

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Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area A8
Tc: 6.871 Minutes
DATA FOR SUB AREA 9

SUB AREA TIME OF CONCENTRATION: 6.871 min. = 7 min.

SUB AREA INPUT DATA

Sub Area Name: Area A8
Total Area (ac): 5.99
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 1.00
Percent Impervious: 0
SUB AREA OUTPUT

Intensity (in/hr): 3.094
C Total: 0.902
Sum Q Segments (cfs): 16.72
Q Total (cfs): 16.72
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 412.26
Time of Concentration (min): 6.871

DATA FOR FLOW PATH 1

Flow Path Name: A8 overland
FLOW PATH TRAVEL TIME (min): 4.6810

Flow Type: Overland
 Length (ft): 540
 Top Elevation (ft): 320
 Bottom Elevation (ft): 100
 Contributing Area (acres): 0.34
 Percent of Sub-Area (%): 5.7
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.4074
 Effective Slope: 0.2150
 Q for Flow Path (cfs): 0.95
 Avg Velocity (ft/s): 1.92
 Passed Scour Check: YES
 Scour velocity (ft/sec): 2.48

 DATA FOR FLOW PATH 2

Flow Path Name: A8
 FLOW PATH TRAVEL TIME (min): 2.1900
 Flow Type: Natural Channel
 Length (ft): 650
 Top Elevation (ft): 100
 Bottom Elevation (ft): 85
 Contributing Area (acres): 5.65
 Percent of Sub-Area (%): 94.3
 Overland Type: Valley
 Map Slope: 0.0231
 Effective Slope: 0.0231
 Q for Flow Path (cfs): 15.78
 Q Top (cfs): 0.95
 Q Bottom (cfs): 16.72
 Velocity Top (ft/s): 2.26
 Velocity Bottom (ft/s): 4.34
 Avg Velocity (ft/s): 3.30
 Wave velocity (ft/s): 4.95

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 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area C1
 Tc: 11.571 Minutes
 DATA FOR SUB AREA 10

SUB AREA TIME OF CONCENTRATION: 11.571 min. = 12 min.

SUB AREA INPUT DATA

Sub Area Name: Area C1
 Total Area (ac): 16.37
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Residential
 Soil Type: 2.00
 Percent Impervious: 70
 SUB AREA OUTPUT

Intensity (in/hr): 2.289
C Total: 0.900
Sum Q Segments (cfs): 33.73
Q Total (cfs): 33.73
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 694.24
Time of Concentration (min): 11.571

DATA FOR FLOW PATH 1

Flow Path Name: C1 overland
FLOW PATH TRAVEL TIME (min): 4.1002
Flow Type: Overland
Length (ft): 100
Top Elevation (ft): 159
Bottom Elevation (ft): 158
Contributing Area (acres): 0.57
Percent of Sub-Area (%): 3.5
Overland Type: Valley
Development Type: Residential
Map Slope: 0.0100
Effective Slope: 0.0100
Q for Flow Path (cfs): 1.17
Avg Velocity (ft/s): 0.41
Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: C1 street
FLOW PATH TRAVEL TIME (min): 1.6903
Flow Type: Street
Length (ft): 300
Top Elevation (ft): 158
Bottom Elevation (ft): 155
Contributing Area (acres): 1.06
Percent of Sub-Area (%): 6.5
Street width (ft): 32
Curb Height (in): 6
Map Slope: 0.0100
Q for Flow Path (cfs): 2.18
Q Top (cfs): 1.17
Q Bottom (cfs): 3.36
Velocity Top (ft/s): 1.71
Velocity Bottom (ft/s): 2.23
Avg Velocity (ft/s): 1.97
Wave velocity (ft/s): 2.96

DATA FOR FLOW PATH 3

Flow Path Name: C1 pipe
FLOW PATH TRAVEL TIME (min): 1.9395
Flow Type: Pipe
Length (ft): 800
Top Elevation (ft): 155
Bottom Elevation (ft): 126
Contributing Area (acres): 7.17
Percent of Sub-Area (%): 43.8

Initial Pipe Diameter (in): 30
 Calculated Pipe Diameter (in): 21
 Used Pipe Diameter (in): 30
 Manning's N: 0.015
 Map Slope: 0.0363
 Q for Flow Path (cfs): 14.77
 Q Top (cfs): 3.36
 Q Bottom (cfs): 18.13
 Avg Velocity (ft/s): 5.06
 Wave Velocity (ft/s): 6.87

 DATA FOR FLOW PATH 4

Flow Path Name: C2 pipe
 FLOW PATH TRAVEL TIME (min): 3.8408
 Flow Type: Pipe
 Length (ft): 1310
 Top Elevation (ft): 126
 Bottom Elevation (ft): 97
 Contributing Area (acres): 7.57
 Percent of Sub-Area (%): 46.2
 Initial Pipe Diameter (in): 42
 Calculated Pipe Diameter (in): 27
 Used Pipe Diameter (in): 42
 Manning's N: 0.015
 Map Slope: 0.0221
 Q for Flow Path (cfs): 15.60
 Q Top (cfs): 18.13
 Q Bottom (cfs): 33.73
 Avg Velocity (ft/s): 4.40
 Wave Velocity (ft/s): 5.68

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area C3
 Tc: 11.657 Minutes
 DATA FOR SUB AREA 11

SUB AREA TIME OF CONCENTRATION: 11.657 min. = 12 min.

SUB AREA INPUT DATA

Sub Area Name: Area C3
 Total Area (ac): 15.2
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 70
 SUB AREA OUTPUT

Intensity (in/hr): 2.289
 C Total: 0.900
 Sum Q Segments (cfs): 31.32

Q Total (cfs): 31.32
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 699.43
Time of Concentration (min): 11.657

DATA FOR FLOW PATH 1

Flow Path Name: C3 overland
FLOW PATH TRAVEL TIME (min): 7.1261
Flow Type: Overland
Length (ft): 180
Top Elevation (ft): 161
Bottom Elevation (ft): 157
Contributing Area (acres): 0.61
Percent of Sub-Area (%): 4.0
Overland Type: Valley
Development Type: Residential
Map Slope: 0.0222
Effective Slope: 0.0222
Q for Flow Path (cfs): 1.26
Avg Velocity (ft/s): 0.42
Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: C3 street
FLOW PATH TRAVEL TIME (min): 0.8544
Flow Type: Street
Length (ft): 160
Top Elevation (ft): 157
Bottom Elevation (ft): 155
Contributing Area (acres): 0.63
Percent of Sub-Area (%): 4.1
Street width (ft): 32
Curb Height (in): 6
Map Slope: 0.0125
Q for Flow Path (cfs): 1.30
Q Top (cfs): 1.26
Q Bottom (cfs): 2.56
Velocity Top (ft/s): 1.90
Velocity Bottom (ft/s): 2.27
Avg Velocity (ft/s): 2.08
Wave velocity (ft/s): 3.12

DATA FOR FLOW PATH 3

Flow Path Name: C3 pipe
FLOW PATH TRAVEL TIME (min): 3.6767
Flow Type: Pipe
Length (ft): 1550
Top Elevation (ft): 155
Bottom Elevation (ft): 97
Contributing Area (acres): 13.96
Percent of Sub-Area (%): 91.8
Initial Pipe Diameter (in): 36
Calculated Pipe Diameter (in): 24
Used Pipe Diameter (in): 36
Manning's N: 0.015

Map Slope: 0.0374
 Q for Flow Path (cfs): 28.77
 Q Top (cfs): 2.56
 Q Bottom (cfs): 31.32
 Avg Velocity (ft/s): 5.20
 Wave Velocity (ft/s): 7.03

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Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area C4
 Tc: 7.368 Minutes
 DATA FOR SUB AREA 12

 SUB AREA TIME OF CONCENTRATION: 7.368 min. = 7 min.

 SUB AREA INPUT DATA

 Sub Area Name: Area C4
 Total Area (ac): 8.28
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 30
 SUB AREA OUTPUT

 Intensity (in/hr): 3.094
 C Total: 0.868
 Sum Q Segments (cfs): 22.24
 Q Total (cfs): 22.24
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 442.10
 Time of Concentration (min): 7.368

 DATA FOR FLOW PATH 1

 Flow Path Name: C4 overland
 FLOW PATH TRAVEL TIME (min): 5.4646
 Flow Type: Overland
 Length (ft): 520
 Top Elevation (ft): 240
 Bottom Elevation (ft): 112
 Contributing Area (acres): 1.19
 Percent of Sub-Area (%): 14.4
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2462
 Effective Slope: 0.1791
 Q for Flow Path (cfs): 3.20
 Avg Velocity (ft/s): 1.59
 Passed Scour Check: YES
 Scour velocity (ft/sec): 3.39

 DATA FOR FLOW PATH 2

 Flow Path Name: C4
 FLOW PATH TRAVEL TIME (min): 1.9037
 Flow Type: Natural Channel
 Length (ft): 790
 Top Elevation (ft): 112
 Bottom Elevation (ft): 85
 Contributing Area (acres): 7.09
 Percent of Sub-Area (%): 85.6
 Overland Type: Valley
 Map Slope: 0.0342
 Effective Slope: 0.0342
 Q for Flow Path (cfs): 19.04
 Q Top (cfs): 3.20
 Q Bottom (cfs): 22.24
 Velocity Top (ft/s): 3.52
 Velocity Bottom (ft/s): 5.70
 Avg Velocity (ft/s): 4.61
 Wave Velocity (ft/s): 6.92

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area A9
 Tc: 6.505 Minutes
 DATA FOR SUB AREA 13

 SUB AREA TIME OF CONCENTRATION: 6.505 min. = 7 min.

SUB AREA INPUT DATA

 Sub Area Name: Area A9
 Total Area (ac): 33.06
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 10
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 3.094
 C Total: 0.902
 Sum Q Segments (cfs): 92.31
 Q Total (cfs): 92.31
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 390.31
 Time of Concentration (min): 6.505

DATA FOR FLOW PATH 1

 Flow Path Name: A9 overland
 FLOW PATH TRAVEL TIME (min): 3.9442
 Flow Type: Overland
 Length (ft): 455
 Top Elevation (ft): 330

Bottom Elevation (ft): 120
Contributing Area (acres): 2.84
Percent of Sub-Area (%): 8.6
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4615
Effective Slope: 0.2195
Q for Flow Path (cfs): 7.93
Avg Velocity (ft/s): 1.92
Passed Scour Check: YES
Scour velocity (ft/sec): 5.08

DATA FOR FLOW PATH 2

Flow Path Name: A9
FLOW PATH TRAVEL TIME (min): 2.5609
Flow Type: Natural Channel
Length (ft): 1030
Top Elevation (ft): 120
Bottom Elevation (ft): 58
Contributing Area (acres): 30.22
Percent of Sub-Area (%): 91.4
Overland Type: Mountain
Map Slope: 0.0602
Effective Slope: 0.0602
Q for Flow Path (cfs): 84.38
Q Top (cfs): 7.93
Q Bottom (cfs): 92.31
Velocity Top (ft/s): 2.74
Velocity Bottom (ft/s): 6.20
Avg Velocity (ft/s): 4.47
Wave velocity (ft/s): 6.70

♀

Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area A10
Tc: 7.281 Minutes
DATA FOR SUB AREA 14

SUB AREA TIME OF CONCENTRATION: 7.281 min. = 7 min.
-----SUB AREA INPUT DATA

Sub Area Name: Area A10
Total Area (ac): 14.77
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 10
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT

Intensity (in/hr): 3.094
C Total: 0.833

Sum Q Segments (cfs): 38.07
Q Total (cfs): 38.07
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 436.84
Time of Concentration (min): 7.281

DATA FOR FLOW PATH 1

Flow Path Name: A10 overland
FLOW PATH TRAVEL TIME (min): 5.4636
Flow Type: Overland
Length (ft): 430
Top Elevation (ft): 166
Bottom Elevation (ft): 80
Contributing Area (acres): 1.9
Percent of Sub-Area (%): 12.9
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2000
Effective Slope: 0.1594
Q for Flow Path (cfs): 4.90
Avg Velocity (ft/s): 1.31
Passed Scour Check: YES
Scour velocity (ft/sec): 3.68

DATA FOR FLOW PATH 2

Flow Path Name: A10
FLOW PATH TRAVEL TIME (min): 1.8171
Flow Type: Natural Channel
Length (ft): 780
Top Elevation (ft): 80
Bottom Elevation (ft): 58
Contributing Area (acres): 12.87
Percent of Sub-Area (%): 87.1
Overland Type: Valley
Map Slope: 0.0282
Effective Slope: 0.0282
Q for Flow Path (cfs): 33.17
Q Top (cfs): 4.90
Q Bottom (cfs): 38.07
Velocity Top (ft/s): 3.53
Velocity Bottom (ft/s): 6.01
Avg Velocity (ft/s): 4.77
Wave velocity (ft/s): 7.15

VENTURA COUNTY WATERSHED PROTECTION DISTRICT
 TIME OF CONCENTRATION
 TC Program Version: 2.6.2009.7
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

S U M M A R Y O F C O M P U T A T I O N S

Watershed Name: Proposed Condition 25-yr Storm Event

Name	Zone	Storm	Soil	Area (acres)	TC (min)
Area A	K	25	1.00	111.0 / 111	15.115 / 15
Area A5	K	25	2.00	3.4 / 3	5.890 / 6
Area B	K	25	1.00	27.9 / 28	7.003 / 7
Area B3	K	25	2.00	4.7 / 5	8.553 / 9
Area B4	K	25	1.00	12.3 / 12	9.145 / 9
Area B5	K	25	1.00	7.7 / 8	6.156 / 6
Area A6	K	25	1.00	8.9 / 9	5.818 / 6
Area A7	K	25	1.00	15.1 / 15	6.330 / 6
Area A8	K	25	1.00	6.0 / 6	6.710 / 7
Area C1	K	25	2.00	16.4 / 16	10.577 / 11
Area C3	K	25	2.00	15.2 / 15	9.116 / 9
Area C4	K	25	2.00	8.3 / 8	6.963 / 7
Area A9	K	25	1.00	33.1 / 33	6.237 / 6
Area A10	K	25	2.00	14.8 / 15	6.755 / 7

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Watershed Name: Proposed Condition 25-yr Storm Event

Sub-Area Name: Area A
 Tc: 15.115 Minutes
 DATA FOR SUB AREA 1

SUB AREA TIME OF CONCENTRATION: 15.115 min. = 15 min.

SUB AREA INPUT DATA

Sub Area Name: Area A
 Total Area (ac): 111.04
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 2.256
 C Total: 0.865
 Sum Q Segments (cfs): 216.78
 Q Total (cfs): 216.78
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 906.92
 Time of Concentration (min): 15.115

DATA FOR FLOW PATH 1

Flow Path Name: A1
FLOW PATH TRAVEL TIME (min): 10.7386
Flow Type: Overland
Length (ft): 1000
Top Elevation (ft): 790
Bottom Elevation (ft): 570
Contributing Area (acres): 4.88
Percent of Sub-Area (%): 4.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2200
Effective Slope: 0.1685
Q for Flow Path (cfs): 9.53
Avg velocity (ft/s): 1.55
Passed Scour Check: YES
Scour velocity (ft/sec): 4.81

DATA FOR FLOW PATH 2

Flow Path Name: A2
FLOW PATH TRAVEL TIME (min): 0.9754
Flow Type: Natural Channel
Length (ft): 600
Top Elevation (ft): 570
Bottom Elevation (ft): 440
Contributing Area (acres): 24.55
Percent of Sub-Area (%): 22.1
Overland Type: Mountain
Map Slope: 0.2167
Effective Slope: 0.1671
Q for Flow Path (cfs): 47.93
Q Top (cfs): 9.53
Q Bottom (cfs): 57.45
Velocity Top (ft/s): 4.85
Velocity Bottom (ft/s): 8.82
Avg velocity (ft/s): 6.83
Wave velocity (ft/s): 10.25

DATA FOR FLOW PATH 3

Flow Path Name: A3
FLOW PATH TRAVEL TIME (min): 1.1264
Flow Type: Natural Channel
Length (ft): 1020
Top Elevation (ft): 440
Bottom Elevation (ft): 250
Contributing Area (acres): 49.39
Percent of Sub-Area (%): 44.5
Overland Type: Mountain
Map Slope: 0.1863
Effective Slope: 0.1525
Q for Flow Path (cfs): 96.42
Q Top (cfs): 57.45
Q Bottom (cfs): 153.88
Velocity Top (ft/s): 8.43

Velocity Bottom (ft/s): 11.70
Avg Velocity (ft/s): 10.06
Wave Velocity (ft/s): 15.09

DATA FOR FLOW PATH 4

Flow Path Name: A4
FLOW PATH TRAVEL TIME (min): 2.2750
Flow Type: Natural Channel
Length (ft): 1590
Top Elevation (ft): 250
Bottom Elevation (ft): 155
Contributing Area (acres): 32.22
Percent of Sub-Area (%): 29.0
Overland Type: Mountain
Map Slope: 0.0597
Effective Slope: 0.0597
Q for Flow Path (cfs): 62.90
Q Top (cfs): 153.88
Q Bottom (cfs): 216.78
Velocity Top (ft/s): 7.32
Velocity Bottom (ft/s): 8.21
Avg Velocity (ft/s): 7.77
Wave Velocity (ft/s): 11.65

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Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area A5
Tc: 5.890 Minutes
DATA FOR SUB AREA 2

SUB AREA TIME OF CONCENTRATION: 5.890 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area A5
Total Area (ac): 3.44
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT

Intensity (in/hr): 3.800
C Total: 0.861
Sum Q Segments (cfs): 11.25
Q Total (cfs): 11.25
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 353.40
Time of Concentration (min): 5.890

DATA FOR FLOW PATH 1

Flow Path Name: A5 overland
 FLOW PATH TRAVEL TIME (min): 4.7009
 Flow Type: Overland
 Length (ft): 530
 Top Elevation (ft): 340
 Bottom Elevation (ft): 186
 Contributing Area (acres): 0.06
 Percent of Sub-Area (%): 1.7
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2906
 Effective Slope: 0.1935
 Q for Flow Path (cfs): 0.20
 Avg Velocity (ft/s): 1.88
 Passed Scour Check: YES
 Scour velocity (ft/sec): 1.38

 DATA FOR FLOW PATH 2

Flow Path Name: A5
 FLOW PATH TRAVEL TIME (min): 1.1891
 Flow Type: Channel
 Length (ft): 470
 Top Elevation (ft): 186
 Bottom Elevation (ft): 177
 Contributing Area (acres): 3.38
 Percent of Sub-Area (%): 98.3
 Bottom width (ft): 5
 Side Slope (H:V): 1
 Manning's N: 0.013
 Map Slope: 0.0191
 Q for Flow Path (cfs): 11.06
 Q Top (cfs): 0.20
 Q Bottom (cfs): 11.25
 Velocity Top (ft/s): 1.46
 Velocity Bottom (ft/s): 6.79
 Avg Velocity (ft/s): 4.13
 Wave velocity (ft/s): 6.59

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 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area B
 Tc: 7.003 Minutes
 DATA FOR SUB AREA 3

SUB AREA TIME OF CONCENTRATION: 7.003 min. = 7 min.

SUB AREA INPUT DATA

Sub Area Name: Area B
 Total Area (ac): 27.91
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped

Soil Type: 1.00
Percent Impervious: 0
SUB AREA OUTPUT

Intensity (in/hr): 3.454
C Total: 0.911
Sum Q Segments (cfs): 87.86
Q Total (cfs): 87.86
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 420.19
Time of Concentration (min): 7.003

DATA FOR FLOW PATH 1

Flow Path Name: B1 overland
FLOW PATH TRAVEL TIME (min): 3.8188
Flow Type: Overland
Length (ft): 450
Top Elevation (ft): 570
Bottom Elevation (ft): 400
Contributing Area (acres): 1.68
Percent of Sub-Area (%): 6.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3778
Effective Slope: 0.2114
Q for Flow Path (cfs): 5.29
Avg Velocity (ft/s): 1.96
Passed Scour Check: YES
Scour velocity (ft/sec): 4.36

DATA FOR FLOW PATH 2

Flow Path Name: B1
FLOW PATH TRAVEL TIME (min): 2.6609
Flow Type: Natural Channel
Length (ft): 1460
Top Elevation (ft): 400
Bottom Elevation (ft): 169
Contributing Area (acres): 21.07
Percent of Sub-Area (%): 75.5
Overland Type: Mountain
Map Slope: 0.1582
Effective Slope: 0.1367
Q for Flow Path (cfs): 66.33
Q Top (cfs): 5.29
Q Bottom (cfs): 71.62
Velocity Top (ft/s): 3.61
Velocity Bottom (ft/s): 8.59
Avg Velocity (ft/s): 6.10
Wave velocity (ft/s): 9.14

DATA FOR FLOW PATH 3

Flow Path Name: B2
FLOW PATH TRAVEL TIME (min): 0.5233
Flow Type: Natural Channel
Length (ft): 420

Top Elevation (ft): 169
 Bottom Elevation (ft): 152
 Contributing Area (acres): 5.16
 Percent of Sub-Area (%): 18.5
 Overland Type: valley
 Map Slope: 0.0405
 Effective Slope: 0.0405
 Q for Flow Path (cfs): 16.24
 Q Top (cfs): 71.62
 Q Bottom (cfs): 87.86
 Velocity Top (ft/s): 8.65
 Velocity Bottom (ft/s): 9.19
 Avg Velocity (ft/s): 8.92
 Wave Velocity (ft/s): 13.38

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Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area B3
 Tc: 8.553 Minutes
 DATA FOR SUB AREA 4

 SUB AREA TIME OF CONCENTRATION: 8.553 min. = 9 min.

 SUB AREA INPUT DATA

 Sub Area Name: Area B3
 Total Area (ac): 4.67
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 2.987
 C Total: 0.828
 Sum Q Segments (cfs): 11.55
 Q Total (cfs): 11.55
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 513.15
 Time of Concentration (min): 8.553

 DATA FOR FLOW PATH 1

 Flow Path Name: B3 overland
 FLOW PATH TRAVEL TIME (min): 6.9947
 Flow Type: Overland
 Length (ft): 560
 Top Elevation (ft): 280
 Bottom Elevation (ft): 177
 Contributing Area (acres): 0.18
 Percent of Sub-Area (%): 3.9
 Overland Type: Mountain
 Development Type: Undeveloped

Map Slope: 0.1839
 Effective Slope: 0.1512
 Q for Flow Path (cfs): 0.45
 Avg Velocity (ft/s): 1.33
 Passed Scour Check: YES
 Scour velocity (ft/sec): 1.62

 DATA FOR FLOW PATH 2

Flow Path Name: B3
 FLOW PATH TRAVEL TIME (min): 1.5578
 Flow Type: Channel
 Length (ft): 800
 Top Elevation (ft): 177
 Bottom Elevation (ft): 149
 Contributing Area (acres): 4.49
 Percent of Sub-Area (%): 96.1
 Bottom width (ft): 5
 Side Slope (H:V): 1
 Manning's N: 0.013
 Map Slope: 0.0350
 Q for Flow Path (cfs): 11.11
 Q Top (cfs): 0.45
 Q Bottom (cfs): 11.55
 Velocity Top (ft/s): 2.32
 Velocity Bottom (ft/s): 8.34
 Avg Velocity (ft/s): 5.33
 Wave velocity (ft/s): 8.56

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 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area B4
 Tc: 9.145 Minutes
 DATA FOR SUB AREA 5

SUB AREA TIME OF CONCENTRATION: 9.145 min. = 9 min.

 SUB AREA INPUT DATA

Sub Area Name: Area B4
 Total Area (ac): 12.32
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 2.987
 C Total: 0.899
 Sum Q Segments (cfs): 33.10
 Q Total (cfs): 33.10
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 548.68

Time of Concentration (min): 9.145

DATA FOR FLOW PATH 1

Flow Path Name: B4 overland
FLOW PATH TRAVEL TIME (min): 6.5385
Flow Type: Overland
Length (ft): 230
Top Elevation (ft): 210
Bottom Elevation (ft): 200
Contributing Area (acres): 1.11
Percent of Sub-Area (%): 9.0
Overland Type: valley
Development Type: Undeveloped
Map Slope: 0.0435
Effective Slope: 0.0435
Q for Flow Path (cfs): 2.98
Avg Velocity (ft/s): 0.59
Passed Scour Check: YES
Scour velocity (ft/sec): 3.85

DATA FOR FLOW PATH 2

Flow Path Name: B4
FLOW PATH TRAVEL TIME (min): 2.6061
Flow Type: Natural Channel
Length (ft): 800
Top Elevation (ft): 200
Bottom Elevation (ft): 145
Contributing Area (acres): 11.21
Percent of Sub-Area (%): 91.0
Overland Type: Mountain
Map Slope: 0.0688
Effective Slope: 0.0688
Q for Flow Path (cfs): 30.11
Q Top (cfs): 2.98
Q Bottom (cfs): 33.10
Velocity Top (ft/s): 2.11
Velocity Bottom (ft/s): 4.71
Avg Velocity (ft/s): 3.41
Wave velocity (ft/s): 5.12
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Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area B5
Tc: 6.156 Minutes
DATA FOR SUB AREA 6

SUB AREA TIME OF CONCENTRATION: 6.156 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area B5
Total Area (ac): 7.66
Flood Zone: 3

Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 3.800
 C Total: 0.920
 Sum Q Segments (cfs): 26.78
 Q Total (cfs): 26.78
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 369.39
 Time of Concentration (min): 6.156

DATA FOR FLOW PATH 1

 Flow Path Name: B5 overland
 FLOW PATH TRAVEL TIME (min): 4.2431
 Flow Type: Overland
 Length (ft): 500
 Top Elevation (ft): 340
 Bottom Elevation (ft): 160
 Contributing Area (acres): 0.77
 Percent of Sub-Area (%): 10.1
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.3600
 Effective Slope: 0.2087
 Q for Flow Path (cfs): 2.69
 Avg Velocity (ft/s): 1.96
 Passed Scour Check: YES
 Scour velocity (ft/sec): 3.44

DATA FOR FLOW PATH 2

 Flow Path Name: B5
 FLOW PATH TRAVEL TIME (min): 1.9133
 Flow Type: Natural Channel
 Length (ft): 840
 Top Elevation (ft): 160
 Bottom Elevation (ft): 129
 Contributing Area (acres): 6.89
 Percent of Sub-Area (%): 89.9
 Overland Type: valley
 Map Slope: 0.0369
 Effective Slope: 0.0369
 Q for Flow Path (cfs): 24.09
 Q Top (cfs): 2.69
 Q Bottom (cfs): 26.78
 Velocity Top (ft/s): 3.52
 Velocity Bottom (ft/s): 6.23
 Avg Velocity (ft/s): 4.88
 Wave velocity (ft/s): 7.32

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 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:

Consultant:

 Sub-Area Name: Area A6
 Tc: 5.818 Minutes
 DATA FOR SUB AREA 7

SUB AREA TIME OF CONCENTRATION: 5.818 min. = 6 min.

SUB AREA INPUT DATA

 Sub Area Name: Area A6
 Total Area (ac): 8.91
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 3
 SUB AREA OUTPUT

Intensity (in/hr): 3.800
 C Total: 0.921
 Sum Q Segments (cfs): 31.18
 Q Total (cfs): 31.18
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 349.10
 Time of Concentration (min): 5.818

DATA FOR FLOW PATH 1

 Flow Path Name: A6 overland
 FLOW PATH TRAVEL TIME (min): 3.0742
 Flow Type: Overland
 Length (ft): 300
 Top Elevation (ft): 240
 Bottom Elevation (ft): 170
 Contributing Area (acres): 0.37
 Percent of Sub-Area (%): 4.2
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2333
 Effective Slope: 0.1741
 Q for Flow Path (cfs): 1.29
 Avg Velocity (ft/s): 1.63
 Passed Scour Check: YES
 Scour velocity (ft/sec): 2.46

DATA FOR FLOW PATH 2

 Flow Path Name: A6
 FLOW PATH TRAVEL TIME (min): 2.7442
 Flow Type: Natural Channel
 Length (ft): 810
 Top Elevation (ft): 170
 Bottom Elevation (ft): 108
 Contributing Area (acres): 8.54
 Percent of Sub-Area (%): 95.8
 Overland Type: Mountain

Map Slope: 0.0765
 Effective Slope: 0.0765
 Q for Flow Path (cfs): 29.89
 Q Top (cfs): 1.29
 Q Bottom (cfs): 31.18
 Velocity Top (ft/s): 1.69
 Velocity Bottom (ft/s): 4.87
 Avg Velocity (ft/s): 3.28
 Wave Velocity (ft/s): 4.92

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 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area A7
 Tc: 6.330 Minutes
 DATA FOR SUB AREA 8

 SUB AREA TIME OF CONCENTRATION: 6.330 min. = 6 min.

 SUB AREA INPUT DATA

 Sub Area Name: Area A7
 Total Area (ac): 15.14
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 14
 SUB AREA OUTPUT

 Intensity (in/hr): 3.800
 C Total: 0.924
 Sum Q Segments (cfs): 53.17
 Q Total (cfs): 53.17
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 379.81
 Time of Concentration (min): 6.330

 DATA FOR FLOW PATH 1

 Flow Path Name: A7 overland
 FLOW PATH TRAVEL TIME (min): 4.0783
 Flow Type: Overland
 Length (ft): 300
 Top Elevation (ft): 190
 Bottom Elevation (ft): 140
 Contributing Area (acres): 1.19
 Percent of Sub-Area (%): 7.9
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.1667
 Effective Slope: 0.1417
 Q for Flow Path (cfs): 4.18
 Avg Velocity (ft/s): 1.23
 Passed Scour Check: YES

Scour Velocity (ft/sec): 3.28

DATA FOR FLOW PATH 2

Flow Path Name: A7
 FLOW PATH TRAVEL TIME (min): 2.2519
 Flow Type: Natural Channel
 Length (ft): 700
 Top Elevation (ft): 140
 Bottom Elevation (ft): 103
 Contributing Area (acres): 13.95
 Percent of Sub-Area (%): 92.1
 Overland Type: Mountain
 Map Slope: 0.0529
 Effective Slope: 0.0529
 Q for Flow Path (cfs): 48.99
 Q Top (cfs): 4.18
 Q Bottom (cfs): 53.17
 Velocity Top (ft/s): 2.07
 Velocity Bottom (ft/s): 4.83
 Avg Velocity (ft/s): 3.45
 Wave Velocity (ft/s): 5.18

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Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area A8
 Tc: 6.710 Minutes
 DATA FOR SUB AREA 9

SUB AREA TIME OF CONCENTRATION: 6.710 min. = 7 min.

SUB AREA INPUT DATA

Sub Area Name: Area A8
 Total Area (ac): 5.99
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 3.454
 C Total: 0.911
 Sum Q Segments (cfs): 18.86
 Q Total (cfs): 18.86
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 402.62
 Time of Concentration (min): 6.710

DATA FOR FLOW PATH 1

Flow Path Name: A8 overland
 FLOW PATH TRAVEL TIME (min): 4.5826

Flow Type: Overland
 Length (ft): 540
 Top Elevation (ft): 320
 Bottom Elevation (ft): 100
 Contributing Area (acres): 0.34
 Percent of Sub-Area (%): 5.7
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.4074
 Effective Slope: 0.2150
 Q for Flow Path (cfs): 1.07
 Avg Velocity (ft/s): 1.96
 Passed Scour Check: YES
 Scour velocity (ft/sec): 2.58

DATA FOR FLOW PATH 2

Flow Path Name: A8
 FLOW PATH TRAVEL TIME (min): 2.1278
 Flow Type: Natural Channel
 Length (ft): 650
 Top Elevation (ft): 100
 Bottom Elevation (ft): 85
 Contributing Area (acres): 5.65
 Percent of Sub-Area (%): 94.3
 Overland Type: Valley
 Map Slope: 0.0231
 Effective Slope: 0.0231
 Q for Flow Path (cfs): 17.79
 Q Top (cfs): 1.07
 Q Bottom (cfs): 18.86
 Velocity Top (ft/s): 2.31
 Velocity Bottom (ft/s): 4.48
 Avg Velocity (ft/s): 3.39
 Wave velocity (ft/s): 5.09

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 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

Sub-Area Name: Area C1
 Tc: 10.577 Minutes
 DATA FOR SUB AREA 10

SUB AREA TIME OF CONCENTRATION: 10.577 min. = 11 min.

SUB AREA INPUT DATA

Sub Area Name: Area C1
 Total Area (ac): 16.37
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Residential
 Soil Type: 2.00
 Percent Impervious: 70
 SUB AREA OUTPUT

Intensity (in/hr): 2.657
C Total: 0.908
Sum Q Segments (cfs): 39.49
Q Total (cfs): 39.49
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 634.62
Time of Concentration (min): 10.577

DATA FOR FLOW PATH 1

Flow Path Name: C1 overland
FLOW PATH TRAVEL TIME (min): 3.2287
Flow Type: Overland
Length (ft): 100
Top Elevation (ft): 159
Bottom Elevation (ft): 158
Contributing Area (acres): 0.57
Percent of Sub-Area (%): 3.5
Overland Type: Valley
Development Type: Residential
Map Slope: 0.0100
Effective Slope: 0.0100
Q for Flow Path (cfs): 1.37
Avg Velocity (ft/s): 0.52
Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: C1 street
FLOW PATH TRAVEL TIME (min): 1.6246
Flow Type: Street
Length (ft): 300
Top Elevation (ft): 158
Bottom Elevation (ft): 155
Contributing Area (acres): 1.06
Percent of Sub-Area (%): 6.5
Street width (ft): 32
Curb Height (in): 6
Map Slope: 0.0100
Q for Flow Path (cfs): 2.56
Q Top (cfs): 1.37
Q Bottom (cfs): 3.93
Velocity Top (ft/s): 1.78
Velocity Bottom (ft/s): 2.32
Avg Velocity (ft/s): 2.05
Wave velocity (ft/s): 3.08

DATA FOR FLOW PATH 3

Flow Path Name: C1 pipe
FLOW PATH TRAVEL TIME (min): 1.8828
Flow Type: Pipe
Length (ft): 800
Top Elevation (ft): 155
Bottom Elevation (ft): 126
Contributing Area (acres): 7.17
Percent of Sub-Area (%): 43.8

Initial Pipe Diameter (in): 30
Calculated Pipe Diameter (in): 21
Used Pipe Diameter (in): 30
Manning's N: 0.015
Map Slope: 0.0363
Q for Flow Path (cfs): 17.30
Q Top (cfs): 3.93
Q Bottom (cfs): 21.23
Avg Velocity (ft/s): 5.28
Wave velocity (ft/s): 7.08

DATA FOR FLOW PATH 4

Flow Path Name: C2 pipe
FLOW PATH TRAVEL TIME (min): 3.8408
Flow Type: Pipe
Length (ft): 1310
Top Elevation (ft): 126
Bottom Elevation (ft): 97
Contributing Area (acres): 7.57
Percent of Sub-Area (%): 46.2
Initial Pipe Diameter (in): 42
Calculated Pipe Diameter (in): 27
Used Pipe Diameter (in): 42
Manning's N: 0.015
Map Slope: 0.0221
Q for Flow Path (cfs): 18.26
Q Top (cfs): 21.23
Q Bottom (cfs): 39.49
Avg Velocity (ft/s): 4.56
Wave velocity (ft/s): 5.68

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Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area C3
Tc: 9.116 Minutes
DATA FOR SUB AREA 11

SUB AREA TIME OF CONCENTRATION: 9.116 min. = 9 min.

SUB AREA INPUT DATA

Sub Area Name: Area C3
Total Area (ac): 15.2
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 70
SUB AREA OUTPUT

Intensity (in/hr): 2.987
C Total: 0.913
Sum Q Segments (cfs): 41.47

Q Total (cfs): 41.47
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 546.95
Time of Concentration (min): 9.116

DATA FOR FLOW PATH 1

Flow Path Name: C3 overland
FLOW PATH TRAVEL TIME (min): 5.6176
Flow Type: Overland
Length (ft): 180
Top Elevation (ft): 161
Bottom Elevation (ft): 157
Contributing Area (acres): 0.61
Percent of Sub-Area (%): 4.0
Overland Type: Valley
Development Type: Residential
Map Slope: 0.0222
Effective Slope: 0.0222
Q for Flow Path (cfs): 1.66
Avg Velocity (ft/s): 0.53
Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: C3 street
FLOW PATH TRAVEL TIME (min): 0.7962
Flow Type: Street
Length (ft): 160
Top Elevation (ft): 157
Bottom Elevation (ft): 155
Contributing Area (acres): 0.63
Percent of Sub-Area (%): 4.1
Street width (ft): 32
Curb Height (in): 6
Map Slope: 0.0125
Q for Flow Path (cfs): 1.72
Q Top (cfs): 1.66
Q Bottom (cfs): 3.38
Velocity Top (ft/s): 2.03
Velocity Bottom (ft/s): 2.43
Avg Velocity (ft/s): 2.23
Wave velocity (ft/s): 3.35

DATA FOR FLOW PATH 3

Flow Path Name: C3 pipe
FLOW PATH TRAVEL TIME (min): 2.7020
Flow Type: Pipe
Length (ft): 1550
Top Elevation (ft): 155
Bottom Elevation (ft): 97
Contributing Area (acres): 13.96
Percent of Sub-Area (%): 91.8
Initial Pipe Diameter (in): 36
Calculated Pipe Diameter (in): 27
Used Pipe Diameter (in): 36
Manning's N: 0.015

Map Slope: 0.0374
Q for Flow Path (cfs): 38.09
Q Top (cfs): 3.38
Q Bottom (cfs): 41.47
Avg Velocity (ft/s): 7.06
Wave Velocity (ft/s): 9.56

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Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area C4
Tc: 6.963 Minutes
DATA FOR SUB AREA 12

SUB AREA TIME OF CONCENTRATION: 6.963 min. = 7 min.

SUB AREA INPUT DATA

Sub Area Name: Area C4
Total Area (ac): 8.28
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 30
SUB AREA OUTPUT

Intensity (in/hr): 3.454
C Total: 0.879
Sum Q Segments (cfs): 25.13
Q Total (cfs): 25.13
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 417.78
Time of Concentration (min): 6.963

DATA FOR FLOW PATH 1

Flow Path Name: C4 overland
FLOW PATH TRAVEL TIME (min): 5.1176
Flow Type: Overland
Length (ft): 520
Top Elevation (ft): 240
Bottom Elevation (ft): 112
Contributing Area (acres): 1.19
Percent of Sub-Area (%): 14.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2462
Effective Slope: 0.1791
Q for Flow Path (cfs): 3.61
Avg Velocity (ft/s): 1.69
Passed Scour Check: YES
Scour velocity (ft/sec): 3.53

DATA FOR FLOW PATH 2

 Flow Path Name: C4
 FLOW PATH TRAVEL TIME (min): 1.8454
 Flow Type: Natural Channel
 Length (ft): 790
 Top Elevation (ft): 112
 Bottom Elevation (ft): 85
 Contributing Area (acres): 7.09
 Percent of Sub-Area (%): 85.6
 Overland Type: Valley
 Map Slope: 0.0342
 Effective Slope: 0.0342
 Q for Flow Path (cfs): 21.52
 Q Top (cfs): 3.61
 Q Bottom (cfs): 25.13
 Velocity Top (ft/s): 3.62
 Velocity Bottom (ft/s): 5.89
 Avg Velocity (ft/s): 4.76
 Wave Velocity (ft/s): 7.13

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area A9
 TC: 6.237 Minutes
 DATA FOR SUB AREA 13

 SUB AREA TIME OF CONCENTRATION: 6.237 min. = 6 min.

 SUB AREA INPUT DATA

 Sub Area Name: Area A9
 Total Area (ac): 33.06
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 25
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 3.800
 C Total: 0.920
 Sum Q Segments (cfs): 115.58
 Q Total (cfs): 115.58
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 374.24
 Time of Concentration (min): 6.237

 DATA FOR FLOW PATH 1

 Flow Path Name: A9 overland
 FLOW PATH TRAVEL TIME (min): 3.8612
 Flow Type: Overland
 Length (ft): 455
 Top Elevation (ft): 330

Bottom Elevation (ft): 120
Contributing Area (acres): 2.84
Percent of Sub-Area (%): 8.6
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.4615
Effective Slope: 0.2195
Q for Flow Path (cfs): 9.93
Avg Velocity (ft/s): 1.96
Passed Scour Check: YES
Scour velocity (ft/sec): 5.44

DATA FOR FLOW PATH 2

Flow Path Name: A9
FLOW PATH TRAVEL TIME (min): 2.3762
Flow Type: Natural Channel
Length (ft): 1030
Top Elevation (ft): 120
Bottom Elevation (ft): 58
Contributing Area (acres): 30.22
Percent of Sub-Area (%): 91.4
Overland Type: Mountain
Map Slope: 0.0602
Effective Slope: 0.0602
Q for Flow Path (cfs): 105.65
Q Top (cfs): 9.93
Q Bottom (cfs): 115.58
Velocity Top (ft/s): 2.95
Velocity Bottom (ft/s): 6.68
Avg Velocity (ft/s): 4.82
Wave velocity (ft/s): 7.22

♀

Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area A10
Tc: 6.755 Minutes
DATA FOR SUB AREA 14

SUB AREA TIME OF CONCENTRATION: 6.755 min. = 7 min.
-----SUB AREA INPUT DATA

Sub Area Name: Area A10
Total Area (ac): 14.77
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 25
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 0
SUB AREA OUTPUT

Intensity (in/hr): 3.454
C Total: 0.848

Sum Q Segments (cfs): 43.27
Q Total (cfs): 43.27
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 405.32
Time of Concentration (min): 6.755

DATA FOR FLOW PATH 1

Flow Path Name: A10 overland
FLOW PATH TRAVEL TIME (min): 4.9993
Flow Type: Overland
Length (ft): 430
Top Elevation (ft): 166
Bottom Elevation (ft): 80
Contributing Area (acres): 1.9
Percent of Sub-Area (%): 12.9
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2000
Effective Slope: 0.1594
Q for Flow Path (cfs): 5.57
Avg Velocity (ft/s): 1.43
Passed Scour Check: YES
Scour velocity (ft/sec): 3.84

DATA FOR FLOW PATH 2

Flow Path Name: A10
FLOW PATH TRAVEL TIME (min): 1.7561
Flow Type: Natural Channel
Length (ft): 780
Top Elevation (ft): 80
Bottom Elevation (ft): 58
Contributing Area (acres): 12.87
Percent of Sub-Area (%): 87.1
Overland Type: Valley
Map Slope: 0.0282
Effective Slope: 0.0282
Q for Flow Path (cfs): 37.70
Q Top (cfs): 5.57
Q Bottom (cfs): 43.27
Velocity Top (ft/s): 3.63
Velocity Bottom (ft/s): 6.24
Avg Velocity (ft/s): 4.94
Wave velocity (ft/s): 7.40

VENTURA COUNTY WATERSHED PROTECTION DISTRICT
 TIME OF CONCENTRATION
 TC Program Version: 2.6.2009.7
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

S U M M A R Y O F C O M P U T A T I O N S

Watershed Name: Proposed Condition 100-yr Storm Event

Name	Zone	Storm	Soil	Area (acres)	TC (min)
Area A	K	100	1.00	111.0 / 111	12.911 / 13
Area A5	K	100	2.00	3.4 / 3	5.184 / 5
Area B	K	100	1.00	27.9 / 28	6.286 / 6
Area B3	K	100	2.00	4.7 / 5	7.045 / 7
Area B4	K	100	1.00	12.3 / 12	6.630 / 7
Area B5	K	100	1.00	7.7 / 8	5.602 / 6
Area A6	K	100	1.00	8.9 / 9	5.079 / 5
Area A7	K	100	1.00	15.1 / 15	5.292 / 5
Area A8	K	100	1.00	6.0 / 6	6.062 / 6
Area C1	K	100	2.00	16.4 / 16	7.064 / 7
Area C3	K	100	2.00	15.2 / 15	6.330 / 6
Area C4	K	100	2.00	8.3 / 8	6.082 / 6
Area A9	K	100	1.00	33.1 / 33	5.666 / 6
Area A10	K	100	2.00	14.8 / 15	5.744 / 6

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Watershed Name: Proposed Condition 100-yr Storm Event

Sub-Area Name: Area A
 Tc: 12.911 Minutes
 DATA FOR SUB AREA 1

SUB AREA TIME OF CONCENTRATION: 12.911 min. = 13 min.

SUB AREA INPUT DATA

Sub Area Name: Area A
 Total Area (ac): 111.04
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 3.097
 C Total: 0.902
 Sum Q Segments (cfs): 310.33
 Q Total (cfs): 310.33
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 774.65
 Time of Concentration (min): 12.911

DATA FOR FLOW PATH 1

Flow Path Name: A1
FLOW PATH TRAVEL TIME (min): 9.0269
Flow Type: Overland
Length (ft): 1000
Top Elevation (ft): 790
Bottom Elevation (ft): 570
Contributing Area (acres): 4.88
Percent of Sub-Area (%): 4.4
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2200
Effective Slope: 0.1685
Q for Flow Path (cfs): 13.64
Avg velocity (ft/s): 1.85
Passed Scour Check: YES
Scour velocity (ft/sec): 5.42

DATA FOR FLOW PATH 2

Flow Path Name: A2
FLOW PATH TRAVEL TIME (min): 0.8656
Flow Type: Natural Channel
Length (ft): 600
Top Elevation (ft): 570
Bottom Elevation (ft): 440
Contributing Area (acres): 24.55
Percent of Sub-Area (%): 22.1
Overland Type: Mountain
Map Slope: 0.2167
Effective Slope: 0.1671
Q for Flow Path (cfs): 68.61
Q Top (cfs): 13.64
Q Bottom (cfs): 82.25
Velocity Top (ft/s): 5.46
Velocity Bottom (ft/s): 9.94
Avg velocity (ft/s): 7.70
Wave velocity (ft/s): 11.55

DATA FOR FLOW PATH 3

Flow Path Name: A3
FLOW PATH TRAVEL TIME (min): 0.9996
Flow Type: Natural Channel
Length (ft): 1020
Top Elevation (ft): 440
Bottom Elevation (ft): 250
Contributing Area (acres): 49.39
Percent of Sub-Area (%): 44.5
Overland Type: Mountain
Map Slope: 0.1863
Effective Slope: 0.1525
Q for Flow Path (cfs): 138.03
Q Top (cfs): 82.25
Q Bottom (cfs): 220.28
Velocity Top (ft/s): 9.50

Velocity Bottom (ft/s): 13.18
 Avg Velocity (ft/s): 11.34
 Wave velocity (ft/s): 17.01

 DATA FOR FLOW PATH 4

Flow Path Name: A4
 FLOW PATH TRAVEL TIME (min): 2.0188
 Flow Type: Natural Channel
 Length (ft): 1590
 Top Elevation (ft): 250
 Bottom Elevation (ft): 155
 Contributing Area (acres): 32.22
 Percent of Sub-Area (%): 29.0
 Overland Type: Mountain
 Map Slope: 0.0597
 Effective Slope: 0.0597
 Q for Flow Path (cfs): 90.05
 Q Top (cfs): 220.28
 Q Bottom (cfs): 310.33
 Velocity Top (ft/s): 8.25
 Velocity Bottom (ft/s): 9.25
 Avg Velocity (ft/s): 8.75
 Wave velocity (ft/s): 13.13

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area A5
 Tc: 5.184 Minutes
 DATA FOR SUB AREA 2

SUB AREA TIME OF CONCENTRATION: 5.184 min. = 5 min.

 SUB AREA INPUT DATA

Sub Area Name: Area A5
 Total Area (ac): 3.44
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 5.100
 C Total: 0.891
 Sum Q Segments (cfs): 15.64
 Q Total (cfs): 15.64
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 311.02
 Time of Concentration (min): 5.184

DATA FOR FLOW PATH 1

Flow Path Name: A5 overland
 FLOW PATH TRAVEL TIME (min): 4.1156
 Flow Type: Overland
 Length (ft): 530
 Top Elevation (ft): 340
 Bottom Elevation (ft): 186
 Contributing Area (acres): 0.06
 Percent of Sub-Area (%): 1.7
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2906
 Effective Slope: 0.1935
 Q for Flow Path (cfs): 0.27
 Avg Velocity (ft/s): 2.15
 Passed Scour Check: YES
 Scour velocity (ft/sec): 1.54

 DATA FOR FLOW PATH 2

Flow Path Name: A5
 FLOW PATH TRAVEL TIME (min): 1.0681
 Flow Type: Channel
 Length (ft): 470
 Top Elevation (ft): 186
 Bottom Elevation (ft): 177
 Contributing Area (acres): 3.38
 Percent of Sub-Area (%): 98.3
 Bottom width (ft): 5
 Side Slope (H:V): 1
 Manning's N: 0.013
 Map Slope: 0.0191
 Q for Flow Path (cfs): 15.36
 Q Top (cfs): 0.27
 Q Bottom (cfs): 15.64
 Velocity Top (ft/s): 1.61
 Velocity Bottom (ft/s): 7.66
 Avg Velocity (ft/s): 4.63
 Wave velocity (ft/s): 7.33

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 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area B
 Tc: 6.286 Minutes
 DATA FOR SUB AREA 3

SUB AREA TIME OF CONCENTRATION: 6.286 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area B
 Total Area (ac): 27.91
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped

Soil Type: 1.00
Percent Impervious: 0
SUB AREA OUTPUT

Intensity (in/hr): 4.590
C Total: 0.934
Sum Q Segments (cfs): 119.63
Q Total (cfs): 119.63
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 377.16
Time of Concentration (min): 6.286

DATA FOR FLOW PATH 1

Flow Path Name: B1 overland
FLOW PATH TRAVEL TIME (min): 3.4078
Flow Type: Overland
Length (ft): 450
Top Elevation (ft): 570
Bottom Elevation (ft): 400
Contributing Area (acres): 1.68
Percent of Sub-Area (%): 6.0
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.3778
Effective Slope: 0.2114
Q for Flow Path (cfs): 7.20
Avg Velocity (ft/s): 2.20
Passed Scour Check: YES
Scour velocity (ft/sec): 4.82

DATA FOR FLOW PATH 2

Flow Path Name: B1
FLOW PATH TRAVEL TIME (min): 2.4010
Flow Type: Natural Channel
Length (ft): 1460
Top Elevation (ft): 400
Bottom Elevation (ft): 169
Contributing Area (acres): 21.07
Percent of Sub-Area (%): 75.5
Overland Type: Mountain
Map Slope: 0.1582
Effective Slope: 0.1367
Q for Flow Path (cfs): 90.31
Q Top (cfs): 7.20
Q Bottom (cfs): 97.51
Velocity Top (ft/s): 4.00
Velocity Bottom (ft/s): 9.52
Avg Velocity (ft/s): 6.76
Wave velocity (ft/s): 10.13

DATA FOR FLOW PATH 3

Flow Path Name: B2
FLOW PATH TRAVEL TIME (min): 0.4772
Flow Type: Natural Channel
Length (ft): 420

Top Elevation (ft): 169
 Bottom Elevation (ft): 152
 Contributing Area (acres): 5.16
 Percent of Sub-Area (%): 18.5
 Overland Type: valley
 Map Slope: 0.0405
 Effective Slope: 0.0405
 Q for Flow Path (cfs): 22.12
 Q Top (cfs): 97.51
 Q Bottom (cfs): 119.63
 Velocity Top (ft/s): 9.48
 Velocity Bottom (ft/s): 10.08
 Avg Velocity (ft/s): 9.78
 Wave Velocity (ft/s): 14.67

‡
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area B3
 Tc: 7.045 Minutes
 DATA FOR SUB AREA 4

 SUB AREA TIME OF CONCENTRATION: 7.045 min. = 7 min.

 SUB AREA INPUT DATA

 Sub Area Name: Area B3
 Total Area (ac): 4.67
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 4.226
 C Total: 0.873
 Sum Q Segments (cfs): 17.23
 Q Total (cfs): 17.23
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 422.72
 Time of Concentration (min): 7.045

 DATA FOR FLOW PATH 1

 Flow Path Name: B3 overland
 FLOW PATH TRAVEL TIME (min): 5.6990
 Flow Type: Overland
 Length (ft): 560
 Top Elevation (ft): 280
 Bottom Elevation (ft): 177
 Contributing Area (acres): 0.18
 Percent of Sub-Area (%): 3.9
 Overland Type: Mountain
 Development Type: Undeveloped

Map Slope: 0.1839
Effective Slope: 0.1512
Q for Flow Path (cfs): 0.66
Avg Velocity (ft/s): 1.64
Passed Scour Check: YES
Scour velocity (ft/sec): 1.85

DATA FOR FLOW PATH 2

Flow Path Name: B3
FLOW PATH TRAVEL TIME (min): 1.3463
Flow Type: Channel
Length (ft): 800
Top Elevation (ft): 177
Bottom Elevation (ft): 149
Contributing Area (acres): 4.49
Percent of Sub-Area (%): 96.1
Bottom width (ft): 5
Side Slope (H:V): 1
Manning's N: 0.013
Map Slope: 0.0350
Q for Flow Path (cfs): 16.56
Q Top (cfs): 0.66
Q Bottom (cfs): 17.23
Velocity Top (ft/s): 2.81
Velocity Bottom (ft/s): 9.64
Avg Velocity (ft/s): 6.22
Wave velocity (ft/s): 9.90

⚡

Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area B4
Tc: 6.630 Minutes
DATA FOR SUB AREA 5

SUB AREA TIME OF CONCENTRATION: 6.630 min. = 7 min.

SUB AREA INPUT DATA

Sub Area Name: Area B4
Total Area (ac): 12.32
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 1.00
Percent Impervious: 0
SUB AREA OUTPUT

Intensity (in/hr): 4.226
C Total: 0.928
Sum Q Segments (cfs): 48.33
Q Total (cfs): 48.33
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 397.80

Time of Concentration (min): 6.630

DATA FOR FLOW PATH 1

Flow Path Name: B4 overland
FLOW PATH TRAVEL TIME (min): 4.3326
Flow Type: Overland
Length (ft): 230
Top Elevation (ft): 210
Bottom Elevation (ft): 200
Contributing Area (acres): 1.11
Percent of Sub-Area (%): 9.0
Overland Type: valley
Development Type: Undeveloped
Map Slope: 0.0435
Effective Slope: 0.0435
Q for Flow Path (cfs): 4.35
Avg Velocity (ft/s): 0.88
Passed Scour Check: YES
Scour velocity (ft/sec): 4.19

DATA FOR FLOW PATH 2

Flow Path Name: B4
FLOW PATH TRAVEL TIME (min): 2.2974
Flow Type: Natural Channel
Length (ft): 800
Top Elevation (ft): 200
Bottom Elevation (ft): 145
Contributing Area (acres): 11.21
Percent of Sub-Area (%): 91.0
Overland Type: Mountain
Map Slope: 0.0688
Effective Slope: 0.0688
Q for Flow Path (cfs): 43.98
Q Top (cfs): 4.35
Q Bottom (cfs): 48.33
Velocity Top (ft/s): 2.40
Velocity Bottom (ft/s): 5.34
Avg Velocity (ft/s): 3.87
Wave velocity (ft/s): 5.80
♀

Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area B5
Tc: 5.602 Minutes
DATA FOR SUB AREA 6

SUB AREA TIME OF CONCENTRATION: 5.602 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area B5
Total Area (ac): 7.66
Flood Zone: 3

Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 4.590
 C Total: 0.934
 Sum Q Segments (cfs): 32.83
 Q Total (cfs): 32.83
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 336.12
 Time of Concentration (min): 5.602

DATA FOR FLOW PATH 1

 Flow Path Name: B5 overland
 FLOW PATH TRAVEL TIME (min): 3.7864
 Flow Type: Overland
 Length (ft): 500
 Top Elevation (ft): 340
 Bottom Elevation (ft): 160
 Contributing Area (acres): 0.77
 Percent of Sub-Area (%): 10.1
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.3600
 Effective Slope: 0.2087
 Q for Flow Path (cfs): 3.30
 Avg Velocity (ft/s): 2.20
 Passed Scour Check: YES
 Scour velocity (ft/sec): 3.70

DATA FOR FLOW PATH 2

 Flow Path Name: B5
 FLOW PATH TRAVEL TIME (min): 1.8155
 Flow Type: Natural Channel
 Length (ft): 840
 Top Elevation (ft): 160
 Bottom Elevation (ft): 129
 Contributing Area (acres): 6.89
 Percent of Sub-Area (%): 89.9
 Overland Type: valley
 Map Slope: 0.0369
 Effective Slope: 0.0369
 Q for Flow Path (cfs): 29.53
 Q Top (cfs): 3.30
 Q Bottom (cfs): 32.83
 Velocity Top (ft/s): 3.68
 Velocity Bottom (ft/s): 6.60
 Avg Velocity (ft/s): 5.14
 Wave velocity (ft/s): 7.71

⚡
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:

Consultant:

Sub-Area Name: Area A6
Tc: 5.079 Minutes
DATA FOR SUB AREA 7

SUB AREA TIME OF CONCENTRATION: 5.079 min. = 5 min.

SUB AREA INPUT DATA

Sub Area Name: Area A6
Total Area (ac): 8.91
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 1.00
Percent Impervious: 3
SUB AREA OUTPUT

Intensity (in/hr): 5.100
C Total: 0.941
Sum Q Segments (cfs): 42.77
Q Total (cfs): 42.77
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 304.73
Time of Concentration (min): 5.079

DATA FOR FLOW PATH 1

Flow Path Name: A6 overland
FLOW PATH TRAVEL TIME (min): 2.6089
Flow Type: Overland
Length (ft): 300
Top Elevation (ft): 240
Bottom Elevation (ft): 170
Contributing Area (acres): 0.37
Percent of Sub-Area (%): 4.2
Overland Type: Mountain
Development Type: Undeveloped
Map Slope: 0.2333
Effective Slope: 0.1741
Q for Flow Path (cfs): 1.78
Avg Velocity (ft/s): 1.92
Passed Scour Check: YES
Scour velocity (ft/sec): 2.73

DATA FOR FLOW PATH 2

Flow Path Name: A6
FLOW PATH TRAVEL TIME (min): 2.4700
Flow Type: Natural Channel
Length (ft): 810
Top Elevation (ft): 170
Bottom Elevation (ft): 108
Contributing Area (acres): 8.54
Percent of Sub-Area (%): 95.8
Overland Type: Mountain

Map Slope: 0.0765
 Effective Slope: 0.0765
 Q for Flow Path (cfs): 41.00
 Q Top (cfs): 1.78
 Q Bottom (cfs): 42.77
 Velocity Top (ft/s): 1.88
 Velocity Bottom (ft/s): 5.41
 Avg Velocity (ft/s): 3.64
 Wave Velocity (ft/s): 5.47

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area A7
 Tc: 5.292 Minutes
 DATA FOR SUB AREA 8

 SUB AREA TIME OF CONCENTRATION: 5.292 min. = 5 min.

 SUB AREA INPUT DATA

 Sub Area Name: Area A7
 Total Area (ac): 15.14
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 14
 SUB AREA OUTPUT

 Intensity (in/hr): 5.100
 C Total: 0.942
 Sum Q Segments (cfs): 72.76
 Q Total (cfs): 72.76
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 317.49
 Time of Concentration (min): 5.292

 DATA FOR FLOW PATH 1

 Flow Path Name: A7 overland
 FLOW PATH TRAVEL TIME (min): 3.2629
 Flow Type: Overland
 Length (ft): 300
 Top Elevation (ft): 190
 Bottom Elevation (ft): 140
 Contributing Area (acres): 1.19
 Percent of Sub-Area (%): 7.9
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.1667
 Effective Slope: 0.1417
 Q for Flow Path (cfs): 5.72
 Avg Velocity (ft/s): 1.53
 Passed Scour Check: YES

Scour Velocity (ft/sec): 3.63

DATA FOR FLOW PATH 2

Flow Path Name: A7
 FLOW PATH TRAVEL TIME (min): 2.0286
 Flow Type: Natural Channel
 Length (ft): 700
 Top Elevation (ft): 140
 Bottom Elevation (ft): 103
 Contributing Area (acres): 13.95
 Percent of Sub-Area (%): 92.1
 Overland Type: Mountain
 Map Slope: 0.0529
 Effective Slope: 0.0529
 Q for Flow Path (cfs): 67.04
 Q Top (cfs): 5.72
 Q Bottom (cfs): 72.76
 Velocity Top (ft/s): 2.30
 Velocity Bottom (ft/s): 5.37
 Avg Velocity (ft/s): 3.83
 Wave Velocity (ft/s): 5.75

‡

Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area A8
 Tc: 6.062 Minutes
 DATA FOR SUB AREA 9

SUB AREA TIME OF CONCENTRATION: 6.062 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area A8
 Total Area (ac): 5.99
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 4.590
 C Total: 0.934
 Sum Q Segments (cfs): 25.68
 Q Total (cfs): 25.68
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 363.70
 Time of Concentration (min): 6.062

DATA FOR FLOW PATH 1

Flow Path Name: A8 overland
 FLOW PATH TRAVEL TIME (min): 4.0893

Flow Type: Overland
 Length (ft): 540
 Top Elevation (ft): 320
 Bottom Elevation (ft): 100
 Contributing Area (acres): 0.34
 Percent of Sub-Area (%): 5.7
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.4074
 Effective Slope: 0.2150
 Q for Flow Path (cfs): 1.46
 Avg Velocity (ft/s): 2.20
 Passed Scour Check: YES
 Scour velocity (ft/sec): 2.86

 DATA FOR FLOW PATH 2

Flow Path Name: A8
 FLOW PATH TRAVEL TIME (min): 1.9723
 Flow Type: Natural Channel
 Length (ft): 650
 Top Elevation (ft): 100
 Bottom Elevation (ft): 85
 Contributing Area (acres): 5.65
 Percent of Sub-Area (%): 94.3
 Overland Type: Valley
 Map Slope: 0.0231
 Effective Slope: 0.0231
 Q for Flow Path (cfs): 24.22
 Q Top (cfs): 1.46
 Q Bottom (cfs): 25.68
 Velocity Top (ft/s): 2.45
 Velocity Bottom (ft/s): 4.87
 Avg Velocity (ft/s): 3.66
 Wave velocity (ft/s): 5.49

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area C1
 Tc: 7.064 Minutes
 DATA FOR SUB AREA 10

SUB AREA TIME OF CONCENTRATION: 7.064 min. = 7 min.

SUB AREA INPUT DATA

Sub Area Name: Area C1
 Total Area (ac): 16.37
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Residential
 Soil Type: 2.00
 Percent Impervious: 70
 SUB AREA OUTPUT

Intensity (in/hr): 4.226
C Total: 0.927
Sum Q Segments (cfs): 64.12
Q Total (cfs): 64.12
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 423.85
Time of Concentration (min): 7.064

DATA FOR FLOW PATH 1

Flow Path Name: C1 overland
FLOW PATH TRAVEL TIME (min): 2.0776
Flow Type: Overland
Length (ft): 100
Top Elevation (ft): 159
Bottom Elevation (ft): 158
Contributing Area (acres): 0.57
Percent of Sub-Area (%): 3.5
Overland Type: Valley
Development Type: Residential
Map Slope: 0.0100
Effective Slope: 0.0100
Q for Flow Path (cfs): 2.23
Avg Velocity (ft/s): 0.80
Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: C1 street
FLOW PATH TRAVEL TIME (min): 1.4381
Flow Type: Street
Length (ft): 300
Top Elevation (ft): 158
Bottom Elevation (ft): 155
Contributing Area (acres): 1.06
Percent of Sub-Area (%): 6.5
Street width (ft): 32
Curb Height (in): 6
Map Slope: 0.0100
Q for Flow Path (cfs): 4.15
Q Top (cfs): 2.23
Q Bottom (cfs): 6.38
Velocity Top (ft/s): 2.01
Velocity Bottom (ft/s): 2.62
Avg Velocity (ft/s): 2.32
Wave velocity (ft/s): 3.48

DATA FOR FLOW PATH 3

Flow Path Name: C1 pipe
FLOW PATH TRAVEL TIME (min): 1.2992
Flow Type: Pipe
Length (ft): 800
Top Elevation (ft): 155
Bottom Elevation (ft): 126
Contributing Area (acres): 7.17
Percent of Sub-Area (%): 43.8

Initial Pipe Diameter (in): 30
Calculated Pipe Diameter (in): 24
Used Pipe Diameter (in): 30
Manning's N: 0.015
Map Slope: 0.0363
Q for Flow Path (cfs): 28.08
Q Top (cfs): 6.38
Q Bottom (cfs): 34.47
Avg Velocity (ft/s): 7.75
Wave Velocity (ft/s): 10.26

DATA FOR FLOW PATH 4

Flow Path Name: C2 pipe
FLOW PATH TRAVEL TIME (min): 2.2492
Flow Type: Pipe
Length (ft): 1310
Top Elevation (ft): 126
Bottom Elevation (ft): 97
Contributing Area (acres): 7.57
Percent of Sub-Area (%): 46.2
Initial Pipe Diameter (in): 42
Calculated Pipe Diameter (in): 33
Used Pipe Diameter (in): 42
Manning's N: 0.015
Map Slope: 0.0221
Q for Flow Path (cfs): 29.65
Q Top (cfs): 34.47
Q Bottom (cfs): 64.12
Avg Velocity (ft/s): 7.72
Wave Velocity (ft/s): 9.71

♀
Project: CSUCI
Date: 12:00:00 AM
Engineer:
Consultant:

Sub-Area Name: Area C3
TC: 6.330 Minutes
DATA FOR SUB AREA 11

SUB AREA TIME OF CONCENTRATION: 6.330 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area C3
Total Area (ac): 15.2
Flood Zone: 3
Rainfall Zone: K
Storm Frequency (years): 100
Development Type: Undeveloped
Soil Type: 2.00
Percent Impervious: 70
SUB AREA OUTPUT

Intensity (in/hr): 4.590
C Total: 0.929
Sum Q Segments (cfs): 64.83

Q Total (cfs): 64.83
Sum Percent Area (%): 100.0
Sum of Flow Path Travel Times (sec): 379.78
Time of Concentration (min): 6.330

DATA FOR FLOW PATH 1

Flow Path Name: C3 overland
FLOW PATH TRAVEL TIME (min): 3.6356
Flow Type: Overland
Length (ft): 180
Top Elevation (ft): 161
Bottom Elevation (ft): 157
Contributing Area (acres): 0.61
Percent of Sub-Area (%): 4.0
Overland Type: Valley
Development Type: Residential
Map Slope: 0.0222
Effective Slope: 0.0222
Q for Flow Path (cfs): 2.60
Avg Velocity (ft/s): 0.83
Passed Scour Check: N/A

DATA FOR FLOW PATH 2

Flow Path Name: C3 street
FLOW PATH TRAVEL TIME (min): 0.7115
Flow Type: Street
Length (ft): 160
Top Elevation (ft): 157
Bottom Elevation (ft): 155
Contributing Area (acres): 0.63
Percent of Sub-Area (%): 4.1
Street width (ft): 32
Curb Height (in): 6
Map Slope: 0.0125
Q for Flow Path (cfs): 2.69
Q Top (cfs): 2.60
Q Bottom (cfs): 5.29
Velocity Top (ft/s): 2.28
Velocity Bottom (ft/s): 2.72
Avg Velocity (ft/s): 2.50
Wave velocity (ft/s): 3.75

DATA FOR FLOW PATH 3

Flow Path Name: C3 pipe
FLOW PATH TRAVEL TIME (min): 1.9824
Flow Type: Pipe
Length (ft): 1550
Top Elevation (ft): 155
Bottom Elevation (ft): 97
Contributing Area (acres): 13.96
Percent of Sub-Area (%): 91.8
Initial Pipe Diameter (in): 36
Calculated Pipe Diameter (in): 30
Used Pipe Diameter (in): 36
Manning's N: 0.015

Map Slope: 0.0374
 Q for Flow Path (cfs): 59.55
 Q Top (cfs): 5.29
 Q Bottom (cfs): 64.83
 Avg Velocity (ft/s): 9.82
 Wave Velocity (ft/s): 13.03

‡

Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area C4
 Tc: 6.082 Minutes
 DATA FOR SUB AREA 12

 SUB AREA TIME OF CONCENTRATION: 6.082 min. = 6 min.

 SUB AREA INPUT DATA

 Sub Area Name: Area C4
 Total Area (ac): 8.28
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 30
 SUB AREA OUTPUT

 Intensity (in/hr): 4.590
 C Total: 0.902
 Sum Q Segments (cfs): 34.27
 Q Total (cfs): 34.27
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 364.89
 Time of Concentration (min): 6.082

 DATA FOR FLOW PATH 1

 Flow Path Name: C4 overland
 FLOW PATH TRAVEL TIME (min): 4.3791
 Flow Type: Overland
 Length (ft): 520
 Top Elevation (ft): 240
 Bottom Elevation (ft): 112
 Contributing Area (acres): 1.19
 Percent of Sub-Area (%): 14.4
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2462
 Effective Slope: 0.1791
 Q for Flow Path (cfs): 4.93
 Avg Velocity (ft/s): 1.98
 Passed Scour Check: YES
 Scour velocity (ft/sec): 3.91

 DATA FOR FLOW PATH 2

 Flow Path Name: C4
 FLOW PATH TRAVEL TIME (min): 1.7024
 Flow Type: Natural Channel
 Length (ft): 790
 Top Elevation (ft): 112
 Bottom Elevation (ft): 85
 Contributing Area (acres): 7.09
 Percent of Sub-Area (%): 85.6
 Overland Type: Valley
 Map Slope: 0.0342
 Effective Slope: 0.0342
 Q for Flow Path (cfs): 29.34
 Q Top (cfs): 4.93
 Q Bottom (cfs): 34.27
 Velocity Top (ft/s): 3.89
 Velocity Bottom (ft/s): 6.43
 Avg Velocity (ft/s): 5.16
 Wave Velocity (ft/s): 7.73

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area A9
 TC: 5.666 Minutes
 DATA FOR SUB AREA 13

 SUB AREA TIME OF CONCENTRATION: 5.666 min. = 6 min.

SUB AREA INPUT DATA

 Sub Area Name: Area A9
 Total Area (ac): 33.06
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 1.00
 Percent Impervious: 0
 SUB AREA OUTPUT

 Intensity (in/hr): 4.590
 C Total: 0.934
 Sum Q Segments (cfs): 141.71
 Q Total (cfs): 141.71
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 339.95
 Time of Concentration (min): 5.666

DATA FOR FLOW PATH 1

 Flow Path Name: A9 overland
 FLOW PATH TRAVEL TIME (min): 3.4456
 Flow Type: Overland
 Length (ft): 455
 Top Elevation (ft): 330

Bottom Elevation (ft): 120
 Contributing Area (acres): 2.84
 Percent of Sub-Area (%): 8.6
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.4615
 Effective Slope: 0.2195
 Q for Flow Path (cfs): 12.17
 Avg Velocity (ft/s): 2.20
 Passed Scour Check: YES
 Scour velocity (ft/sec): 5.86

 DATA FOR FLOW PATH 2

Flow Path Name: A9
 FLOW PATH TRAVEL TIME (min): 2.2202
 Flow Type: Natural Channel
 Length (ft): 1030
 Top Elevation (ft): 120
 Bottom Elevation (ft): 58
 Contributing Area (acres): 30.22
 Percent of Sub-Area (%): 91.4
 Overland Type: Mountain
 Map Slope: 0.0602
 Effective Slope: 0.0602
 Q for Flow Path (cfs): 129.53
 Q Top (cfs): 12.17
 Q Bottom (cfs): 141.71
 Velocity Top (ft/s): 3.16
 Velocity Bottom (ft/s): 7.15
 Avg Velocity (ft/s): 5.15
 Wave velocity (ft/s): 7.73

♀
 Project: CSUCI
 Date: 12:00:00 AM
 Engineer:
 Consultant:

 Sub-Area Name: Area A10
 Tc: 5.744 Minutes
 DATA FOR SUB AREA 14

SUB AREA TIME OF CONCENTRATION: 5.744 min. = 6 min.

SUB AREA INPUT DATA

Sub Area Name: Area A10
 Total Area (ac): 14.77
 Flood Zone: 3
 Rainfall Zone: K
 Storm Frequency (years): 100
 Development Type: Undeveloped
 Soil Type: 2.00
 Percent Impervious: 0
 SUB AREA OUTPUT

Intensity (in/hr): 4.590
 C Total: 0.881

Sum Q Segments (cfs): 59.73
 Q Total (cfs): 59.73
 Sum Percent Area (%): 100.0
 Sum of Flow Path Travel Times (sec): 344.61
 Time of Concentration (min): 5.744

 DATA FOR FLOW PATH 1

Flow Path Name: A10 overland
 FLOW PATH TRAVEL TIME (min): 4.1347
 Flow Type: Overland
 Length (ft): 430
 Top Elevation (ft): 166
 Bottom Elevation (ft): 80
 Contributing Area (acres): 1.9
 Percent of Sub-Area (%): 12.9
 Overland Type: Mountain
 Development Type: Undeveloped
 Map Slope: 0.2000
 Effective Slope: 0.1594
 Q for Flow Path (cfs): 7.68
 Avg Velocity (ft/s): 1.73
 Passed Scour Check: YES
 Scour velocity (ft/sec): 4.28

 DATA FOR FLOW PATH 2

Flow Path Name: A10
 FLOW PATH TRAVEL TIME (min): 1.6089
 Flow Type: Natural Channel
 Length (ft): 780
 Top Elevation (ft): 80
 Bottom Elevation (ft): 58
 Contributing Area (acres): 12.87
 Percent of Sub-Area (%): 87.1
 Overland Type: Valley
 Map Slope: 0.0282
 Effective Slope: 0.0282
 Q for Flow Path (cfs): 52.04
 Q Top (cfs): 7.68
 Q Bottom (cfs): 59.73
 Velocity Top (ft/s): 3.93
 Velocity Bottom (ft/s): 6.84
 Avg Velocity (ft/s): 5.39
 Wave velocity (ft/s): 8.08

Attachment C-3
Proposed Condition – VCRat Model Files

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Modified Rational Model Results Report

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

Project Description

VCRat version: 2.6.2009.7
VCRain version: 200703

♀

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

Page: 2

Model Results																
SUBAREA DATA AND RESULTS							ACCUMULATED DATA				ROUTING AFTER ACCUMULATION					
VEL	NODE DEPTH	SOIL	RAIN	TC	%	AREA	FLOW	AREA	FLOW	TIME	CHANNEL	LENGTH	SLOPE	SIZE	H:V	N VALUES
(FT/S)	ID	TYPE	ZONE	(MIN)	IMP	(AC)	(CFS)	(AC)	(CFS)	(MIN)	TYPE	(FT)	(FT/FT)	(FT)	(Z)	CHNL SIDES
----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----																
	100A : Start							0	0							
--	100A	---	---	--	--	---	---			----	-----	----	-----	---	----	-----
	101A : Start - Area A															
--	101A	010	K10	16	0	114	191	114	191	1154	-----	----	-----	---	----	-----
--	102A	---	---	--	--	---	---	114	191	1154	PIPE	1070	0.02657	3.75	----	-----
--	103A	---	---	--	--	---	---	114	190	1157	PIPE	440	0.00400	5.25	----	-----
	104C : Area B2															
--	104C	010	K10	7	0	28	78	28	78	1153	-----	----	-----	---	----	-----
--	105C	---	---	--	--	---	---	28	78	1153	MOUNTAIN	62	0.06666	---	----	-----

channel Islands_10yr_prop.out															
106D :	Area B3														
106D	020 K10	9	0	5	11	5	11	1154	-----	----	-----	---	----	-----	-----
107CD	---	---	--	--	5	11	33	89	1154	-----	----	-----	---	----	-----
108C	---	---	--	--	---	---	33	89	1154	MOUNTAIN	60	0.11660	---	----	-----
109B :	Area B4														
109B	010 K10	11	0	12	25	12	25	1154	-----	----	-----	---	----	-----	-----
110BC	*****														
*	Peak in B:	25.15	cfs	@	1154	min	Q in C:	88.77	cfs	Combined Q:	113.92	cfs	*		
*	Peak in C:	88.77	cfs	@	1154	min	Q in B:	25.15	cfs	Combined Q:	113.92	cfs	*		
*	Combined Peak:	113.92	cfs	@	1154	min	Q in B:	25.15	cfs	Q in C:	88.77	cfs	*		
110BC	---	---	--	--	33	89	45	114	1154	-----	----	-----	---	----	-----
111B	---	---	--	--	---	---	45	114	1154	MOUNTAIN	660	0.02727	---	----	-----
112B :	Area B5														
112B	010 K10	6	0	8	25	53	117	1157	-----	----	-----	---	----	-----	-----
113AB:	Confluence														
113AB	*****														
*	Peak in A:	189.31	cfs	@	1158	min	Q in B:	112.74	cfs	Combined Q:	302.05	cfs	*		
*	Peak in B:	116.85	cfs	@	1157	min	Q in A:	187.42	cfs	Combined Q:	304.27	cfs	*		
*	Combined Peak:	304.27	cfs	@	1157	min	Q in A:	187.42	cfs	Q in B:	116.85	cfs	*		
113AB	---	---	--	--	53	117	167	304	1157	-----	----	-----	---	----	-----
114A	---	---	--	--	---	---	167	304	1157	MOUNTAIN	600	0.02666	---	----	-----
115A :	Area A6														
115A	010 K10	6	0	9	28	176	302	1160	-----	----	-----	---	----	-----	-----
116A	---	---	--	--	---	---	176	302	1160	MOUNTAIN	75	0.06660	---	----	-----
117B :	Area A7														
117B	010 K10	7	14	15	42	15	42	1153	-----	----	-----	---	----	-----	-----
118AB:	Confluence														
118AB	*****														
*	Peak in A:	302.00	cfs	@	1160	min	Q in B:	9.54	cfs	Combined Q:	311.54	cfs	*		
*	Peak in B:	42.22	cfs	@	1153	min	Q in A:	159.75	cfs	Combined Q:	201.97	cfs	*		
*	Combined Peak:	313.87	cfs	@	1159	min	Q in A:	297.77	cfs	Q in B:	16.10	cfs	*		
118AB	---	---	--	--	15	42	191	314	1159	-----	----	-----	---	----	-----
119A	---	---	--	--	---	---	191	314	1159	MOUNTAIN	760	0.02368	---	----	-----
120A :	Area A8														
120A	010 K10	7	0	6	17	197	309	1163	-----	----	-----	---	----	-----	-----
121A	---	---	--	--	---	---	197	309	1163	PIPE	560	0.03570	4.25	----	-----
122C :	Area C1														
122C	020 K10	12	70	16	33	16	33	1154	-----	----	-----	---	----	-----	-----

Channel Islands_10yr_prop.out
Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

Page: 3

Model Results																	
SUBAREA DATA AND RESULTS								ACCUMULATED DATA			ROUTING AFTER ACCUMULATION						
VEL	NODE	SOIL	RAIN	TC	%	AREA	FLOW	AREA	FLOW	TIME	CHANNEL	LENGTH	SLOPE	SIZE	H:V	N VALUES	
(FT/S)	DEPTH	TYPE	ZONE	(MIN)	IMP	(AC)	(CFS)	(AC)	(CFS)	(MIN)	TYPE	(FT)	(FT/FT)	(FT)	(Z)	CHNL	SIDES
	ID																
	123C	---	---	--	--	---	---	16	33	1154	PIPE	660	0.00500	2.75	----	-----	-----
	124C	---	---	--	--	---	---	16	32	1158	PIPE	1020	0.00500	2.75	----	-----	-----
	125B : Area C3																
	125B	020	K10	12	70	15	31	15	31	1154	-----	----	-----	---	----	-----	-----
	126B	---	---	--	--	---	---	15	31	1154	PIPE	1560	0.00500	2.50	----	-----	-----
	127BC	*****															
		* Peak in B:				28.55	cfs @ 1163 min	Q in C:			31.29	cfs	Combined Q:		59.84	cfs	*
		* Peak in C:				31.29	cfs @ 1163 min	Q in B:			28.55	cfs	Combined Q:		59.84	cfs	*
		* Combined Peak:				59.84	cfs @ 1163 min	Q in B:			28.55	cfs	Q in C:		31.29	cfs	*

	127BC	---	---	--	--	16	31	31	60	1163	-----	----	-----	---	----	-----	-----
	128B	---	---	--	--	---	---	31	60	1163	PIPE	700	0.00500	3.25	----	-----	-----
	129AB	*****															
		* Peak in A:				308.60	cfs @ 1163 min	Q in B:			56.83	cfs	Combined Q:		365.44	cfs	*
		* Peak in B:				59.05	cfs @ 1166 min	Q in A:			295.58	cfs	Combined Q:		354.63	cfs	*
		* Combined Peak:				366.07	cfs @ 1164 min	Q in A:			307.86	cfs	Q in B:		58.21	cfs	*

	129AB	---	---	--	--	31	59	228	366	1164	-----	----	-----	---	----	-----	-----
	130A : Area C4																
	130A	020	K10	7	3	8	21	236	368	1164	-----	----	-----	---	----	-----	-----
	131A : Area A9																
	131A	010	K10	7	0	33	92	269	382	1163	-----	----	-----	---	----	-----	-----
	132A : Area A10																
	132A	020	K10	7	0	15	39	284	387	1163	-----	----	-----	---	----	-----	-----

Issue/Warning Messages

TYPE	ERR NO	PROCEDURE	LOCATION	MESSAGE
NO ISSUES OR WARNINGS DETECTED				

Channel Islands_10yr_prop.out
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

Page: 4

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 101A

DESCRIPTION: Start - Area A
TOTAL AREA TO HYDROGRAPH: 114 acres
HYDROGRAPH PEAK: 191 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 11.14 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	10.40	1050	15.32	1100	19.56	1110	28.28	1120	37.36
1130	40.53	1131	41.90	1132	43.26	1133	44.63	1134	46.00
1135	47.37	1136	49.59	1137	51.73	1138	53.87	1139	56.00
1140	58.14	1141	61.39	1142	64.64	1143	67.89	1144	71.14
1145	74.39	1146	78.66	1147	81.70	1148	88.70	1149	97.89
1150	109.26	1151	132.63	1152	168.33	1153	189.36	1154	191.08
1155	190.65	1156	189.79	1157	187.82	1158	185.85	1159	183.87
1160	181.90	1161	177.99	1162	173.05	1163	168.12	1164	159.37
1165	148.51	1166	135.55	1167	110.31	1168	70.97	1169	47.24
1170	42.75	1171	39.46	1172	36.59	1173	33.73	1174	30.87
1175	28.00	1176	25.14	1177	24.20	1178	23.26	1179	22.32
1180	21.38	1181	20.22	1182	19.07	1183	17.91	1184	16.76
1185	15.60	1186	14.45	1187	14.24	1188	14.02	1189	13.81
1190	13.59	1191	13.27	1192	12.95	1193	12.63	1194	12.31
1195	11.99	1196	11.67	1197	11.56	1198	11.46	1199	11.35
1200	11.24	1201	11.14	1202	11.03	1203	10.92	1204	10.81
1205	10.71	1206	10.60	1207	10.60	1208	10.60	1209	10.60
1210	10.60	1211	9.92	1212	9.23	1213	8.55	1214	7.87
1215	7.18	1216	6.50	1217	5.81	1218	5.13	1219	4.45
1220	3.76	1221	3.08	1222	2.40	1223	1.71	1224	1.03
1225	0.34	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 104C

DESCRIPTION: Area B2
TOTAL AREA TO HYDROGRAPH: 28 acres
HYDROGRAPH PEAK: 78 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 2.70 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	2.55	1050	3.76	1100	4.81	1110	8.23	1120	9.74
1130	10.08	1131	10.80	1132	11.52	1133	12.24	1134	12.96
1135	13.68	1136	14.88	1137	16.08	1138	16.56	1139	17.04
1140	17.52	1141	18.62	1142	19.73	1143	20.37	1144	21.01
1145	21.65	1146	22.88	1147	24.11	1148	26.90	1149	30.74
1150	35.80	1151	48.14	1152	67.68	1153	78.24	1154	78.00
1155	74.40	1156	69.36	1157	63.12	1158	49.68	1159	29.15
1160	16.80	1161	14.28	1162	12.96	1163	11.88	1164	10.80
1165	9.72	1166	8.64	1167	7.56	1168	7.56	1169	7.56
1170	7.56	1171	7.03	1172	6.50	1173	5.98	1174	5.45
1175	4.92	1176	4.39	1177	3.86	1178	3.86	1179	3.86
1180	3.86	1181	3.74	1182	3.62	1183	3.50	1184	3.38
1185	3.26	1186	3.14	1187	3.02	1188	3.02	1189	3.02
1190	3.02	1191	2.96	1192	2.90	1193	2.84	1194	2.78
1195	2.72	1196	2.66	1197	2.60	1198	2.60	1199	2.60
1200	2.60	1201	2.60	1202	2.60	1203	2.60	1204	2.60
1205	2.60	1206	2.60	1207	2.60	1208	2.60	1209	2.60
1210	2.60	1211	2.22	1212	1.84	1213	1.45	1214	1.07
1215	0.68	1216	0.30	1217	0.00	1218	0.00	1219	0.00
1220	0.00	1221	0.00	1222	0.00	1223	0.00	1224	0.00
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00

Channel Islands_10yr_prop.out

1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 106D

DESCRIPTION: Area B3
TOTAL AREA TO HYDROGRAPH: 5 acres
HYDROGRAPH PEAK: 11 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 0.30 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	0.00	1050	0.17	1100	0.34	1110	0.93	1120	1.19
1130	1.25	1131	1.35	1132	1.44	1133	1.54	1134	1.64
1135	1.74	1136	1.91	1137	2.07	1138	2.24	1139	2.41
1140	2.48	1141	2.64	1142	2.79	1143	2.95	1144	3.09
1145	3.18	1146	3.34	1147	3.49	1148	3.94	1149	4.54
1150	5.20	1151	6.78	1152	9.34	1153	10.83	1154	10.88
1155	10.68	1156	10.45	1157	9.94	1158	9.27	1159	8.45
1160	6.70	1161	3.89	1162	2.07	1163	1.72	1164	1.54
1165	1.40	1166	1.25	1167	1.11	1168	0.96	1169	0.82
1170	0.82	1171	0.75	1172	0.68	1173	0.61	1174	0.54
1175	0.47	1176	0.39	1177	0.32	1178	0.25	1179	0.18
1180	0.18	1181	0.17	1182	0.15	1183	0.13	1184	0.12
1185	0.10	1186	0.09	1187	0.07	1188	0.05	1189	0.04
1190	0.04	1191	0.03	1192	0.02	1193	0.01	1194	0.01
1195	0.00	1196	0.00	1197	0.00	1198	0.00	1199	0.00
1200	0.00	1201	0.00	1202	0.00	1203	0.00	1204	0.00
1205	0.00	1206	0.00	1207	0.00	1208	0.00	1209	0.00
1210	0.00	1211	0.00	1212	0.00	1213	0.00	1214	0.00
1215	0.00	1216	0.00	1217	0.00	1218	0.00	1219	0.00
1220	0.00	1221	0.00	1222	0.00	1223	0.00	1224	0.00
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00

					Channel Islands_10yr_prop.out				
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 109B

DESCRIPTION: Area B4
TOTAL AREA TO HYDROGRAPH: 12 acres
HYDROGRAPH PEAK: 25 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 1.17 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	1.09	1050	1.61	1100	2.06	1110	3.39	1120	4.12
1130	4.31	1131	4.52	1132	4.71	1133	4.91	1134	5.11
1135	5.30	1136	5.63	1137	5.96	1138	6.28	1139	6.61
1140	6.94	1141	7.44	1142	7.74	1143	8.04	1144	8.34
1145	8.65	1146	9.11	1147	9.45	1148	10.39	1149	11.65
1150	13.19	1151	16.68	1152	22.02	1153	25.06	1154	25.15
1155	24.91	1156	24.61	1157	24.15	1158	23.69	1159	22.65
1160	21.27	1161	19.27	1162	15.31	1163	9.42	1164	5.76
1165	5.07	1166	4.71	1167	4.42	1168	4.12	1169	3.83
1170	3.53	1171	3.10	1172	2.95	1173	2.81	1174	2.66
1175	2.52	1176	2.38	1177	2.23	1178	2.09	1179	1.94
1180	1.80	1181	1.62	1182	1.59	1183	1.56	1184	1.53
1185	1.49	1186	1.46	1187	1.43	1188	1.39	1189	1.36
1190	1.33	1191	1.28	1192	1.26	1193	1.25	1194	1.23
1195	1.21	1196	1.20	1197	1.18	1198	1.16	1199	1.15
1200	1.13	1201	1.12	1202	1.12	1203	1.12	1204	1.12
1205	1.12	1206	1.12	1207	1.12	1208	1.12	1209	1.12
1210	1.12	1211	1.01	1212	0.91	1213	0.80	1214	0.70
1215	0.59	1216	0.49	1217	0.38	1218	0.28	1219	0.17
1220	0.07	1221	0.00	1222	0.00	1223	0.00	1224	0.00
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00

Channel Islands_10yr_prop.out

1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 110BC

TOTAL AREA TO HYDROGRAPH: 45 acres
HYDROGRAPH PEAK: 114 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 4.82 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	0.40	400	0.40
500	0.40	600	0.40	700	0.40	800	0.40	900	0.40
1000	3.60	1050	5.53	1100	7.17	1110	12.14	1120	15.11
1130	15.49	1131	16.18	1132	17.11	1133	18.15	1134	19.17
1135	20.19	1136	21.59	1137	23.28	1138	24.70	1139	25.72
1140	26.62	1141	27.99	1142	29.55	1143	30.92	1144	32.03
1145	33.08	1146	34.59	1147	36.32	1148	39.58	1149	44.77
1150	51.49	1151	65.36	1152	90.30	1153	110.36	1154	113.92
1155	111.57	1156	106.42	1157	99.84	1158	88.69	1159	70.01
1160	52.02	1161	40.20	1162	31.73	1163	23.86	1164	18.93
1165	17.03	1166	15.48	1167	13.99	1168	12.85	1169	12.26
1170	11.91	1171	11.28	1172	10.62	1173	9.88	1174	9.15
1175	8.41	1176	7.68	1177	6.98	1178	6.38	1179	6.02
1180	5.85	1181	5.63	1182	5.50	1183	5.34	1184	5.17
1185	5.00	1186	4.83	1187	4.66	1188	4.52	1189	4.43
1190	4.39	1191	4.33	1192	4.26	1193	4.18	1194	4.09
1195	4.01	1196	3.93	1197	3.85	1198	3.79	1199	3.75
1200	3.74	1201	3.72	1202	3.72	1203	3.72	1204	3.72
1205	3.72	1206	3.72	1207	3.72	1208	3.72	1209	3.72
1210	3.72	1211	3.55	1212	3.24	1213	2.80	1214	2.33
1215	1.87	1216	1.42	1217	1.03	1218	0.75	1219	0.58
1220	0.47	1221	0.40	1222	0.40	1223	0.40	1224	0.40
1225	0.40	1226	0.40	1227	0.40	1228	0.40	1229	0.40
1230	0.40	1231	0.40	1232	0.40	1233	0.40	1234	0.40
1235	0.40	1236	0.40	1237	0.40	1238	0.40	1239	0.40
1240	0.40	1241	0.40	1242	0.40	1243	0.40	1244	0.40
1245	0.40	1246	0.40	1247	0.40	1248	0.40	1249	0.40
1250	0.40	1251	0.40	1252	0.40	1253	0.40	1254	0.40
1255	0.40	1256	0.40	1257	0.40	1258	0.40	1259	0.40

Channel Islands_10yr_prop.out									
1260	0.40	1261	0.40	1262	0.40	1263	0.40	1264	0.40
1265	0.40	1266	0.40	1267	0.40	1268	0.40	1269	0.40
1270	0.40	1271	0.40	1272	0.40	1273	0.40	1274	0.40
1275	0.40	1276	0.40	1277	0.40	1278	0.40	1279	0.40
1280	0.40	1281	0.40	1282	0.40	1283	0.40	1284	0.40
1285	0.40	1286	0.40	1287	0.40	1288	0.40	1289	0.40
1290	0.40	1291	0.40	1292	0.40	1293	0.40	1294	0.40
1295	0.40	1296	0.40	1297	0.40	1298	0.40	1299	0.40
1300	0.40	1310	0.40	1320	0.40	1330	0.40	1340	0.40
1350	0.40	1360	0.40	1370	0.40	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 112B

DESCRIPTION: Area B5
TOTAL AREA TO HYDROGRAPH: 53 acres
HYDROGRAPH PEAK: 117 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 5.60 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	0.40	400	0.40
500	0.40	600	0.40	700	0.40	800	0.40	900	0.40
1000	3.80	1050	6.33	1100	8.23	1110	11.27	1120	15.53
1130	18.00	1131	18.31	1132	18.61	1133	18.91	1134	19.28
1135	19.82	1136	20.73	1137	21.56	1138	22.51	1139	23.63
1140	24.97	1141	26.65	1142	28.16	1143	29.61	1144	31.11
1145	32.70	1146	34.53	1147	36.09	1148	38.35	1149	41.04
1150	44.45	1151	51.07	1152	61.20	1153	71.42	1154	83.83
1155	100.36	1156	112.99	1157	116.85	1158	112.74	1159	107.21
1160	101.59	1161	92.42	1162	80.49	1163	68.16	1164	57.76
1165	48.68	1166	40.94	1167	34.79	1168	30.01	1169	26.42
1170	23.64	1171	21.21	1172	19.23	1173	17.63	1174	16.34
1175	15.23	1176	14.24	1177	13.46	1178	12.72	1179	11.99
1180	11.28	1181	10.59	1182	9.91	1183	9.27	1184	8.70
1185	8.21	1186	7.79	1187	7.50	1188	7.23	1189	6.99
1190	6.76	1191	6.53	1192	6.30	1193	6.10	1194	5.93
1195	5.78	1196	5.63	1197	5.52	1198	5.42	1199	5.32
1200	5.22	1201	5.13	1202	5.04	1203	4.96	1204	4.88
1205	4.81	1206	4.75	1207	4.69	1208	4.65	1209	4.62
1210	4.59	1211	4.44	1212	4.29	1213	4.15	1214	4.01
1215	3.87	1216	3.74	1217	3.69	1218	3.60	1219	3.46
1220	3.32	1221	3.16	1222	2.98	1223	2.78	1224	2.58
1225	2.38	1226	2.18	1227	1.99	1228	1.80	1229	1.64
1230	1.48	1231	1.34	1232	1.21	1233	1.10	1234	1.00
1235	0.92	1236	0.85	1237	0.78	1238	0.73	1239	0.69
1240	0.65	1241	0.61	1242	0.58	1243	0.56	1244	0.54

Channel Islands_10yr_prop.out									
1245	0.52	1246	0.50	1247	0.49	1248	0.47	1249	0.46
1250	0.46	1251	0.45	1252	0.44	1253	0.44	1254	0.43
1255	0.43	1256	0.42	1257	0.42	1258	0.42	1259	0.41
1260	0.41	1261	0.41	1262	0.41	1263	0.41	1264	0.41
1265	0.41	1266	0.41	1267	0.40	1268	0.40	1269	0.40
1270	0.40	1271	0.40	1272	0.40	1273	0.40	1274	0.40
1275	0.40	1276	0.40	1277	0.40	1278	0.40	1279	0.40
1280	0.40	1281	0.40	1282	0.40	1283	0.40	1284	0.40
1285	0.40	1286	0.40	1287	0.40	1288	0.40	1289	0.40
1290	0.40	1291	0.40	1292	0.40	1293	0.40	1294	0.40
1295	0.40	1296	0.40	1297	0.40	1298	0.40	1299	0.40
1300	0.40	1310	0.40	1320	0.40	1330	0.40	1340	0.40
1350	0.40	1360	0.40	1370	0.40	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 113AB

DESCRIPTION: Confluence
TOTAL AREA TO HYDROGRAPH: 167 acres
HYDROGRAPH PEAK: 304 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 17.41 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.80	200	0.80	300	0.80	400	0.80
500	0.80	600	0.80	700	0.80	800	0.80	900	0.80
1000	13.32	1050	21.55	1100	27.17	1110	35.99	1120	49.86
1130	57.70	1131	58.24	1132	58.88	1133	59.70	1134	60.98
1135	62.72	1136	64.96	1137	67.25	1138	69.89	1139	72.95
1140	76.38	1141	80.21	1142	84.00	1143	88.06	1144	92.54
1145	97.37	1146	102.55	1147	107.54	1148	113.43	1149	120.23
1150	128.98	1151	143.24	1152	164.90	1153	192.76	1154	228.22
1155	266.77	1156	293.92	1157	304.27	1158	302.05	1159	296.28
1160	289.34	1161	278.30	1162	264.19	1163	249.05	1164	234.70
1165	220.32	1166	205.62	1167	189.95	1168	171.89	1169	149.16
1170	121.68	1171	95.26	1172	76.10	1173	64.83	1174	58.15
1175	53.42	1176	49.41	1177	45.93	1178	42.50	1179	39.39
1180	36.89	1181	34.94	1182	33.18	1183	31.53	1184	29.93
1185	28.37	1186	26.89	1187	25.59	1188	24.27	1189	23.02
1190	21.99	1191	21.21	1192	20.60	1193	20.09	1194	19.63
1195	19.19	1196	18.75	1197	18.33	1198	17.91	1199	17.51
1200	17.16	1201	16.86	1202	16.61	1203	16.40	1204	16.20
1205	16.02	1206	15.85	1207	15.69	1208	15.54	1209	15.40
1210	15.30	1211	15.09	1212	14.92	1213	14.72	1214	14.42
1215	13.99	1216	13.49	1217	13.07	1218	12.50	1219	11.83
1220	11.11	1221	10.34	1222	9.55	1223	8.75	1224	7.93
1225	7.12	1226	6.32	1227	5.52	1228	4.76	1229	4.04

Channel Islands_10yr_prop.out									
1230	3.38	1231	2.81	1232	2.33	1233	1.96	1234	1.68
1235	1.49	1236	1.35	1237	1.25	1238	1.17	1239	1.11
1240	1.06	1241	1.02	1242	0.99	1243	0.96	1244	0.94
1245	0.92	1246	0.90	1247	0.89	1248	0.87	1249	0.86
1250	0.86	1251	0.85	1252	0.84	1253	0.84	1254	0.83
1255	0.83	1256	0.82	1257	0.82	1258	0.82	1259	0.81
1260	0.81	1261	0.81	1262	0.81	1263	0.81	1264	0.81
1265	0.81	1266	0.81	1267	0.80	1268	0.80	1269	0.80
1270	0.80	1271	0.80	1272	0.80	1273	0.80	1274	0.80
1275	0.80	1276	0.80	1277	0.80	1278	0.80	1279	0.80
1280	0.80	1281	0.80	1282	0.80	1283	0.80	1284	0.80
1285	0.80	1286	0.80	1287	0.80	1288	0.80	1289	0.80
1290	0.80	1291	0.80	1292	0.80	1293	0.80	1294	0.80
1295	0.80	1296	0.80	1297	0.80	1298	0.80	1299	0.80
1300	0.80	1310	0.80	1320	0.80	1330	0.80	1340	0.80
1350	0.80	1360	0.80	1370	0.80	1380	0.80	1390	0.80
1400	0.80	1420	0.80	1440	0.80	1460	0.80	1500	0.80

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 115A

DESCRIPTION: Area A6
TOTAL AREA TO HYDROGRAPH: 176 acres
HYDROGRAPH PEAK: 302 cfs
TIME OF PEAK: 1160 minutes
HYDROGRAPH VOLUME: 18.33 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.80	200	0.80	300	0.80	400	0.80
500	0.80	600	0.80	700	0.80	800	0.80	900	0.80
1000	12.80	1050	22.17	1100	28.03	1110	34.53	1120	47.08
1130	58.12	1131	59.08	1132	60.08	1133	61.06	1134	62.00
1135	63.00	1136	64.35	1137	65.74	1138	67.50	1139	69.61
1140	72.02	1141	75.04	1142	78.27	1143	81.89	1144	85.81
1145	89.99	1146	94.72	1147	99.58	1148	105.57	1149	112.23
1150	119.83	1151	131.04	1152	146.67	1153	163.26	1154	181.28
1155	206.11	1156	238.07	1157	269.18	1158	289.38	1159	299.29
1160	302.34	1161	299.38	1162	292.70	1163	282.57	1164	269.77
1165	255.98	1166	241.93	1167	227.99	1168	214.03	1169	199.18
1170	182.47	1171	163.19	1172	141.85	1173	120.55	1174	101.67
1175	86.55	1176	75.23	1177	67.06	1178	60.84	1179	55.95
1180	51.81	1181	48.05	1182	44.85	1183	42.01	1184	39.53
1185	37.34	1186	35.36	1187	33.67	1188	32.09	1189	30.58
1190	29.14	1191	27.76	1192	26.53	1193	25.37	1194	24.32
1195	23.40	1196	22.61	1197	21.94	1198	21.40	1199	20.90
1200	20.42	1201	19.96	1202	19.52	1203	19.11	1204	18.73
1205	18.38	1206	18.06	1207	17.78	1208	17.53	1209	17.30
1210	17.09	1211	16.75	1212	16.43	1213	16.13	1214	15.83

Channel Islands_10yr_prop.out									
1215	15.52	1216	15.23	1217	15.03	1218	14.79	1219	14.49
1220	14.14	1221	13.76	1222	13.32	1223	12.85	1224	12.44
1225	11.96	1226	11.44	1227	10.87	1228	10.26	1229	9.63
1230	8.99	1231	8.34	1232	7.68	1233	7.04	1234	6.41
1235	5.80	1236	5.22	1237	4.68	1238	4.18	1239	3.72
1240	3.31	1241	2.95	1242	2.64	1243	2.36	1244	2.13
1245	1.93	1246	1.76	1247	1.62	1248	1.49	1249	1.39
1250	1.30	1251	1.23	1252	1.17	1253	1.11	1254	1.07
1255	1.03	1256	1.00	1257	0.97	1258	0.94	1259	0.92
1260	0.91	1261	0.89	1262	0.88	1263	0.87	1264	0.86
1265	0.85	1266	0.84	1267	0.84	1268	0.83	1269	0.83
1270	0.82	1271	0.82	1272	0.82	1273	0.82	1274	0.81
1275	0.81	1276	0.81	1277	0.81	1278	0.81	1279	0.81
1280	0.81	1281	0.80	1282	0.80	1283	0.80	1284	0.80
1285	0.80	1286	0.80	1287	0.80	1288	0.80	1289	0.80
1290	0.80	1291	0.80	1292	0.80	1293	0.80	1294	0.80
1295	0.80	1296	0.80	1297	0.80	1298	0.80	1299	0.80
1300	0.80	1310	0.80	1320	0.80	1330	0.80	1340	0.80
1350	0.80	1360	0.80	1370	0.80	1380	0.80	1390	0.80
1400	0.80	1420	0.80	1440	0.80	1460	0.80	1500	0.80

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 117B

DESCRIPTION: Area A7
TOTAL AREA TO HYDROGRAPH: 15 acres
HYDROGRAPH PEAK: 42 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 2.10 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.12	200	0.13	300	0.17	400	0.20
500	0.26	600	0.29	700	0.37	800	0.45	900	0.56
1000	1.96	1050	2.60	1100	3.15	1110	4.98	1120	5.78
1130	5.96	1131	6.34	1132	6.73	1133	7.11	1134	7.49
1135	7.88	1136	8.51	1137	9.15	1138	9.41	1139	9.66
1140	9.92	1141	10.51	1142	11.09	1143	11.43	1144	11.77
1145	12.11	1146	12.76	1147	13.41	1148	14.90	1149	16.95
1150	19.64	1151	26.21	1152	36.60	1153	42.22	1154	42.09
1155	40.18	1156	37.50	1157	34.18	1158	27.03	1159	16.10
1160	9.54	1161	8.19	1162	7.49	1163	6.92	1164	6.34
1165	5.77	1166	5.19	1167	4.62	1168	4.62	1169	4.62
1170	4.62	1171	4.34	1172	4.06	1173	3.78	1174	3.50
1175	3.22	1176	2.93	1177	2.65	1178	2.65	1179	2.65
1180	2.65	1181	2.59	1182	2.53	1183	2.46	1184	2.40
1185	2.34	1186	2.27	1187	2.21	1188	2.21	1189	2.21
1190	2.21	1191	2.18	1192	2.14	1193	2.11	1194	2.08
1195	2.05	1196	2.02	1197	1.98	1198	1.98	1199	1.98

Channel Islands_10yr_prop.out									
1200	1.98	1201	1.98	1202	1.98	1203	1.98	1204	1.98
1205	1.98	1206	1.98	1207	1.98	1208	1.98	1209	1.98
1210	1.98	1211	1.78	1212	1.58	1213	1.37	1214	1.17
1215	0.96	1216	0.76	1217	0.59	1218	0.59	1219	0.59
1220	0.59	1221	0.59	1222	0.59	1223	0.59	1224	0.59
1225	0.59	1226	0.59	1227	0.59	1228	0.59	1229	0.59
1230	0.59	1231	0.57	1232	0.55	1233	0.54	1234	0.52
1235	0.50	1236	0.48	1237	0.46	1238	0.46	1239	0.46
1240	0.46	1241	0.46	1242	0.46	1243	0.46	1244	0.46
1245	0.46	1246	0.46	1247	0.46	1248	0.46	1249	0.46
1250	0.46	1251	0.46	1252	0.46	1253	0.46	1254	0.46
1255	0.46	1256	0.46	1257	0.46	1258	0.46	1259	0.46
1260	0.46	1261	0.45	1262	0.44	1263	0.43	1264	0.42
1265	0.41	1266	0.40	1267	0.39	1268	0.39	1269	0.39
1270	0.39	1271	0.39	1272	0.39	1273	0.39	1274	0.39
1275	0.39	1276	0.39	1277	0.39	1278	0.39	1279	0.39
1280	0.39	1281	0.39	1282	0.39	1283	0.39	1284	0.39
1285	0.39	1286	0.39	1287	0.39	1288	0.39	1289	0.39
1290	0.39	1291	0.39	1292	0.39	1293	0.39	1294	0.39
1295	0.39	1296	0.39	1297	0.39	1298	0.39	1299	0.39
1300	0.39	1310	0.28	1320	0.28	1330	0.28	1340	0.28
1350	0.18	1360	0.18	1370	0.18	1380	0.18	1390	0.18
1400	0.18	1420	0.12	1440	0.12	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 118AB

DESCRIPTION: Confluence
TOTAL AREA TO HYDROGRAPH: 191 acres
HYDROGRAPH PEAK: 314 cfs
TIME OF PEAK: 1159 minutes
HYDROGRAPH VOLUME: 20.44 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.92	200	0.93	300	0.97	400	1.00
500	1.06	600	1.09	700	1.17	800	1.25	900	1.36
1000	14.65	1050	24.72	1100	31.13	1110	39.20	1120	52.44
1130	63.80	1131	65.12	1132	66.52	1133	67.88	1134	69.23
1135	70.58	1136	72.46	1137	74.50	1138	76.39	1139	78.67
1140	81.26	1141	84.69	1142	88.49	1143	92.34	1144	96.55
1145	101.01	1146	106.26	1147	111.78	1148	118.93	1149	127.58
1150	137.64	1151	154.52	1152	179.68	1153	201.97	1154	219.56
1155	241.09	1156	269.37	1157	297.90	1158	313.29	1159	313.87
1160	311.54	1161	308.24	1162	301.42	1163	291.39	1164	278.45
1165	264.27	1166	249.72	1167	235.23	1168	221.36	1169	206.72
1170	190.57	1171	171.62	1172	150.63	1173	129.19	1174	109.66
1175	93.52	1176	81.11	1177	71.92	1178	65.25	1179	60.03
1180	55.73	1181	51.80	1182	48.39	1183	45.42	1184	42.75

Channel Islands_10yr_prop.out									
1185	40.41	1186	38.30	1187	36.46	1188	34.88	1189	33.33
1190	31.88	1191	30.45	1192	29.15	1193	27.94	1194	26.81
1195	25.81	1196	24.94	1197	24.19	1198	23.62	1199	23.10
1200	22.61	1201	22.15	1202	21.70	1203	21.28	1204	20.88
1205	20.51	1206	20.19	1207	19.89	1208	19.63	1209	19.39
1210	19.17	1211	18.69	1212	18.15	1213	17.64	1214	17.13
1215	16.62	1216	16.12	1217	15.71	1218	15.50	1219	15.22
1220	14.90	1221	14.53	1222	14.12	1223	13.66	1224	13.24
1225	12.83	1226	12.34	1227	11.79	1228	11.21	1229	10.60
1230	9.97	1231	9.31	1232	8.64	1233	7.98	1234	7.33
1235	6.69	1236	6.08	1237	5.50	1238	4.98	1239	4.50
1240	4.07	1241	3.68	1242	3.33	1243	3.03	1244	2.77
1245	2.55	1246	2.36	1247	2.19	1248	2.06	1249	1.94
1250	1.84	1251	1.75	1252	1.68	1253	1.62	1254	1.57
1255	1.52	1256	1.49	1257	1.45	1258	1.43	1259	1.40
1260	1.38	1261	1.35	1262	1.33	1263	1.31	1264	1.29
1265	1.27	1266	1.25	1267	1.23	1268	1.23	1269	1.22
1270	1.22	1271	1.21	1272	1.21	1273	1.21	1274	1.20
1275	1.20	1276	1.20	1277	1.20	1278	1.20	1279	1.20
1280	1.20	1281	1.19	1282	1.19	1283	1.19	1284	1.19
1285	1.19	1286	1.19	1287	1.19	1288	1.19	1289	1.19
1290	1.19	1291	1.19	1292	1.19	1293	1.19	1294	1.19
1295	1.19	1296	1.19	1297	1.19	1298	1.19	1299	1.19
1300	1.19	1310	1.08	1320	1.08	1330	1.08	1340	1.08
1350	0.98	1360	0.98	1370	0.98	1380	0.98	1390	0.98
1400	0.98	1420	0.92	1440	0.92	1460	0.80	1500	0.80

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 120A

DESCRIPTION: Area A8
TOTAL AREA TO HYDROGRAPH: 197 acres
HYDROGRAPH PEAK: 309 cfs
TIME OF PEAK: 1163 minutes
HYDROGRAPH VOLUME: 21.09 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.92	200	0.93	300	0.96	400	1.00
500	1.05	600	1.09	700	1.15	800	1.24	900	1.34
1000	13.43	1050	24.37	1100	31.33	1110	36.38	1120	47.20
1130	60.08	1131	61.40	1132	62.72	1133	64.06	1134	65.46
1135	66.93	1136	68.54	1137	70.17	1138	71.72	1139	73.42
1140	75.27	1141	77.39	1142	79.70	1143	82.23	1144	85.21
1145	88.60	1146	92.47	1147	96.69	1148	101.67	1149	107.37
1150	114.04	1151	123.42	1152	135.86	1153	149.55	1154	166.26
1155	186.07	1156	206.30	1157	227.70	1158	250.76	1159	273.14
1160	291.86	1161	303.85	1162	308.80	1163	309.14	1164	305.75
1165	298.98	1166	289.31	1167	277.71	1168	265.10	1169	251.91

Channel Islands_10yr_prop.out									
1170	238.71	1171	225.06	1172	210.79	1173	195.49	1174	178.83
1175	161.16	1176	143.64	1177	127.13	1178	112.57	1179	100.08
1180	89.63	1181	80.99	1182	73.88	1183	67.95	1184	62.93
1185	58.64	1186	54.81	1187	51.37	1188	48.38	1189	45.77
1190	43.39	1191	41.22	1192	39.26	1193	37.45	1194	35.86
1195	34.36	1196	32.93	1197	31.58	1198	30.39	1199	29.29
1200	28.27	1201	27.33	1202	26.49	1203	25.73	1204	25.05
1205	24.45	1206	23.94	1207	23.45	1208	22.98	1209	22.54
1210	22.12	1211	21.66	1212	21.22	1213	20.81	1214	20.41
1215	20.00	1216	19.54	1217	19.08	1218	18.65	1219	18.21
1220	17.76	1221	17.32	1222	16.91	1223	16.54	1224	16.19
1225	15.84	1226	15.49	1227	15.12	1228	14.74	1229	14.35
1230	13.99	1231	13.68	1232	13.34	1233	12.96	1234	12.54
1235	12.10	1236	11.64	1237	11.15	1238	10.64	1239	10.12
1240	9.59	1241	9.06	1242	8.54	1243	8.02	1244	7.51
1245	7.02	1246	6.55	1247	6.10	1248	5.67	1249	5.27
1250	4.90	1251	4.55	1252	4.22	1253	3.92	1254	3.65
1255	3.40	1256	3.17	1257	2.96	1258	2.78	1259	2.61
1260	2.46	1261	2.32	1262	2.20	1263	2.09	1264	1.99
1265	1.90	1266	1.83	1267	1.76	1268	1.70	1269	1.64
1270	1.60	1271	1.55	1272	1.51	1273	1.47	1274	1.44
1275	1.41	1276	1.38	1277	1.35	1278	1.34	1279	1.33
1280	1.32	1281	1.30	1282	1.29	1283	1.29	1284	1.28
1285	1.27	1286	1.26	1287	1.25	1288	1.25	1289	1.24
1290	1.24	1291	1.23	1292	1.23	1293	1.23	1294	1.22
1295	1.22	1296	1.22	1297	1.21	1298	1.21	1299	1.21
1300	1.21	1310	1.19	1320	1.15	1330	1.10	1340	1.09
1350	1.08	1360	1.05	1370	1.00	1380	0.99	1390	0.98
1400	0.98	1420	0.96	1440	0.93	1460	0.92	1500	0.92

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

Page: 15

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 122C

DESCRIPTION: Area C1
TOTAL AREA TO HYDROGRAPH: 16 acres
HYDROGRAPH PEAK: 33 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 4.88 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.64	200	0.70	300	0.89	400	1.09
500	1.37	600	1.56	700	1.98	800	2.43	900	3.00
1000	4.16	1050	4.78	1100	5.35	1110	6.91	1120	7.90
1130	8.19	1131	8.44	1132	8.68	1133	8.91	1134	9.14
1135	9.37	1136	9.75	1137	10.14	1138	10.53	1139	10.92
1140	11.30	1141	11.89	1142	12.48	1143	12.84	1144	13.20
1145	13.55	1146	14.09	1147	14.62	1148	15.68	1149	17.13
1150	18.94	1151	23.02	1152	29.36	1153	32.88	1154	32.99

Channel Islands_10yr_prop.out									
1155	32.72	1156	32.37	1157	32.02	1158	31.49	1159	30.95
1160	29.74	1161	27.80	1162	25.51	1163	20.95	1164	14.09
1165	9.79	1166	8.99	1167	8.57	1168	8.22	1169	7.88
1170	7.54	1171	7.03	1172	6.51	1173	6.35	1174	6.18
1175	6.01	1176	5.84	1177	5.68	1178	5.51	1179	5.34
1180	5.17	1181	4.97	1182	4.76	1183	4.72	1184	4.68
1185	4.65	1186	4.61	1187	4.57	1188	4.53	1189	4.49
1190	4.45	1191	4.40	1192	4.34	1193	4.32	1194	4.30
1195	4.28	1196	4.26	1197	4.25	1198	4.23	1199	4.22
1200	4.21	1201	4.19	1202	4.18	1203	4.18	1204	4.18
1205	4.18	1206	4.18	1207	4.18	1208	4.18	1209	4.18
1210	4.18	1211	4.10	1212	4.01	1213	3.93	1214	3.84
1215	3.76	1216	3.67	1217	3.59	1218	3.50	1219	3.42
1220	3.33	1221	3.25	1222	3.16	1223	3.16	1224	3.16
1225	3.16	1226	3.16	1227	3.16	1228	3.16	1229	3.16
1230	3.16	1231	3.10	1232	3.04	1233	2.98	1234	2.92
1235	2.86	1236	2.80	1237	2.74	1238	2.68	1239	2.63
1240	2.57	1241	2.51	1242	2.45	1243	2.45	1244	2.45
1245	2.45	1246	2.45	1247	2.45	1248	2.45	1249	2.45
1250	2.45	1251	2.45	1252	2.45	1253	2.45	1254	2.45
1255	2.45	1256	2.45	1257	2.45	1258	2.45	1259	2.45
1260	2.45	1261	2.42	1262	2.39	1263	2.35	1264	2.32
1265	2.29	1266	2.26	1267	2.23	1268	2.20	1269	2.17
1270	2.14	1271	2.11	1272	2.07	1273	2.07	1274	2.07
1275	2.07	1276	2.07	1277	2.07	1278	2.07	1279	2.07
1280	2.07	1281	2.07	1282	2.07	1283	2.07	1284	2.07
1285	2.07	1286	2.07	1287	2.07	1288	2.07	1289	2.07
1290	2.07	1291	2.07	1292	2.07	1293	2.07	1294	2.07
1295	2.07	1296	2.07	1297	2.07	1298	2.07	1299	2.07
1300	2.07	1310	1.61	1320	1.52	1330	1.52	1340	1.52
1350	1.05	1360	0.96	1370	0.96	1380	0.96	1390	0.96
1400	0.96	1420	0.64	1440	0.64	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Page: 16 Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition
Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 127BC

TOTAL AREA TO HYDROGRAPH: 31 acres
HYDROGRAPH PEAK: 60 cfs
TIME OF PEAK: 1163 minutes
HYDROGRAPH VOLUME: 9.55 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.24	200	1.33	300	1.67	400	2.06
500	2.57	600	3.00	700	3.71	800	4.63	900	5.67
1000	7.83	1050	9.06	1100	10.16	1110	11.27	1120	13.54
1130	15.28	1131	15.37	1132	15.46	1133	15.54	1134	15.62
1135	15.74	1136	15.92	1137	16.16	1138	16.45	1139	16.80
1140	17.21	1141	17.72	1142	18.30	1143	18.93	1144	19.61

Channel Islands_10yr_prop.out									
1145	20.38	1146	21.23	1147	22.11	1148	22.98	1149	23.83
1150	24.70	1151	25.69	1152	26.91	1153	28.54	1154	30.95
1155	34.73	1156	39.94	1157	45.72	1158	50.87	1159	54.61
1160	57.15	1161	58.74	1162	59.59	1163	59.84	1164	59.41
1165	58.08	1166	55.58	1167	51.45	1168	45.70	1169	39.40
1170	33.66	1171	29.03	1172	25.45	1173	22.71	1174	20.59
1175	18.90	1176	17.46	1177	16.28	1178	15.29	1179	14.46
1180	13.77	1181	13.18	1182	12.66	1183	12.19	1184	11.77
1185	11.37	1186	10.99	1187	10.63	1188	10.31	1189	10.04
1190	9.81	1191	9.61	1192	9.44	1193	9.30	1194	9.17
1195	9.06	1196	8.95	1197	8.84	1198	8.75	1199	8.66
1200	8.58	1201	8.52	1202	8.46	1203	8.40	1204	8.36
1205	8.31	1206	8.27	1207	8.24	1208	8.21	1209	8.19
1210	8.17	1211	8.15	1212	8.14	1213	8.13	1214	8.12
1215	8.11	1216	8.09	1217	8.04	1218	7.98	1219	7.90
1220	7.80	1221	7.69	1222	7.57	1223	7.45	1224	7.31
1225	7.17	1226	7.03	1227	6.88	1228	6.74	1229	6.62
1230	6.51	1231	6.43	1232	6.36	1233	6.31	1234	6.27
1235	6.24	1236	6.20	1237	6.16	1238	6.11	1239	6.05
1240	5.97	1241	5.89	1242	5.81	1243	5.72	1244	5.62
1245	5.52	1246	5.42	1247	5.32	1248	5.22	1249	5.13
1250	5.05	1251	4.99	1252	4.94	1253	4.89	1254	4.86
1255	4.84	1256	4.82	1257	4.80	1258	4.79	1259	4.78
1260	4.77	1261	4.76	1262	4.76	1263	4.76	1264	4.75
1265	4.75	1266	4.75	1267	4.74	1268	4.72	1269	4.70
1270	4.67	1271	4.63	1272	4.59	1273	4.55	1274	4.50
1275	4.46	1276	4.40	1277	4.35	1278	4.30	1279	4.25
1280	4.21	1281	4.17	1282	4.14	1283	4.12	1284	4.10
1285	4.08	1286	4.07	1287	4.06	1288	4.05	1289	4.05
1290	4.04	1291	4.04	1292	4.03	1293	4.03	1294	4.03
1295	4.03	1296	4.03	1297	4.02	1298	4.02	1299	4.02
1300	4.02	1310	3.83	1320	3.39	1330	3.03	1340	2.95
1350	2.79	1360	2.38	1370	2.00	1380	1.87	1390	1.86
1400	1.86	1420	1.63	1440	1.32	1460	1.24	1500	1.24

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 129AB

TOTAL AREA TO HYDROGRAPH: 228 acres
HYDROGRAPH PEAK: 366 cfs
TIME OF PEAK: 1164 minutes
HYDROGRAPH VOLUME: 30.66 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	2.16	200	2.26	300	2.61	400	3.04
500	3.59	600	4.08	700	4.82	800	5.85	900	6.96
1000	20.93	1050	33.20	1100	41.27	1110	46.70	1120	59.04
1130	73.91	1131	75.35	1132	76.85	1133	78.31	1134	79.78

Channel Islands_10yr_prop.out									
1135	81.29	1136	82.89	1137	84.61	1138	86.36	1139	88.17
1140	90.16	1141	92.44	1142	95.00	1143	97.85	1144	101.06
1145	104.75	1146	108.95	1147	113.69	1148	119.04	1149	125.11
1150	132.08	1151	140.71	1152	152.15	1153	166.06	1154	182.35
1155	201.99	1156	224.35	1157	248.64	1158	275.22	1159	302.78
1160	327.98	1161	347.54	1162	359.77	1163	365.44	1164	366.07
1165	362.35	1166	354.63	1167	343.47	1168	329.35	1169	312.90
1170	294.51	1171	275.31	1172	255.88	1173	236.42	1174	216.76
1175	196.76	1176	176.91	1177	158.06	1178	140.89	1179	125.90
1180	113.20	1181	102.55	1182	93.62	1183	86.24	1184	80.05
1185	74.68	1186	70.11	1187	66.00	1188	62.27	1189	58.99
1190	56.11	1191	53.49	1192	51.09	1193	48.92	1194	46.96
1195	45.22	1196	43.61	1197	42.06	1198	40.62	1199	39.34
1200	38.14	1201	37.03	1202	36.01	1203	35.10	1204	34.27
1205	33.54	1206	32.89	1207	32.32	1208	31.79	1209	31.29
1210	30.81	1211	30.35	1212	29.88	1213	29.42	1214	28.99
1215	28.57	1216	28.14	1217	27.69	1218	27.22	1219	26.75
1220	26.27	1221	25.77	1222	25.26	1223	24.76	1224	24.29
1225	23.83	1226	23.36	1227	22.88	1228	22.38	1229	21.87
1230	21.35	1231	20.86	1232	20.41	1233	19.96	1234	19.57
1235	19.11	1236	18.62	1237	18.11	1238	17.59	1239	17.06
1240	16.50	1241	15.93	1242	15.35	1243	14.76	1244	14.18
1245	13.59	1246	13.02	1247	12.45	1248	11.91	1249	11.38
1250	10.87	1251	10.39	1252	9.94	1253	9.53	1254	9.15
1255	8.80	1256	8.49	1257	8.21	1258	7.97	1259	7.74
1260	7.54	1261	7.37	1262	7.21	1263	7.07	1264	6.94
1265	6.83	1266	6.73	1267	6.65	1268	6.57	1269	6.50
1270	6.43	1271	6.36	1272	6.30	1273	6.23	1274	6.16
1275	6.09	1276	6.01	1277	5.94	1278	5.87	1279	5.80
1280	5.73	1281	5.68	1282	5.62	1283	5.57	1284	5.52
1285	5.48	1286	5.44	1287	5.41	1288	5.38	1289	5.35
1290	5.33	1291	5.32	1292	5.30	1293	5.29	1294	5.28
1295	5.27	1296	5.26	1297	5.25	1298	5.25	1299	5.24
1300	5.24	1310	5.11	1320	4.74	1330	4.31	1340	4.07
1350	3.95	1360	3.63	1370	3.21	1380	2.92	1390	2.85
1400	2.84	1420	2.67	1440	2.34	1460	2.17	1500	2.16

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

Page: 18

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 130A

DESCRIPTION: Area C4
TOTAL AREA TO HYDROGRAPH: 236 acres
HYDROGRAPH PEAK: 368 cfs
TIME OF PEAK: 1164 minutes
HYDROGRAPH VOLUME: 31.21 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	2.17	200	2.27	300	2.63	400	3.06

Channel Islands_10yr_prop.out									
500	3.62	600	4.11	700	4.86	800	5.90	900	7.02
1000	21.02	1050	33.56	1100	41.92	1110	48.28	1120	61.04
1130	76.00	1131	77.65	1132	79.34	1133	81.00	1134	82.67
1135	84.39	1136	86.34	1137	88.40	1138	90.29	1139	92.24
1140	94.38	1141	96.97	1142	99.85	1143	102.87	1144	106.25
1145	110.11	1146	114.63	1147	119.70	1148	125.80	1149	132.92
1150	141.25	1151	153.14	1152	169.93	1153	186.78	1154	203.00
1155	221.64	1156	242.60	1157	265.15	1158	288.07	1159	310.15
1160	331.98	1161	350.82	1162	362.66	1163	368.02	1164	368.36
1165	364.34	1166	356.33	1167	344.87	1168	330.75	1169	314.30
1170	295.91	1171	276.56	1172	256.99	1173	237.39	1174	217.58
1175	197.43	1176	177.44	1177	158.44	1178	141.28	1179	126.29
1180	113.58	1181	102.90	1182	93.94	1183	86.52	1184	80.30
1185	74.90	1186	70.29	1187	66.15	1188	62.42	1189	59.14
1190	56.26	1191	53.63	1192	51.21	1193	49.02	1194	47.05
1195	45.31	1196	43.71	1197	42.15	1198	40.71	1199	39.43
1200	38.23	1201	37.12	1202	36.10	1203	35.19	1204	34.36
1205	33.63	1206	32.97	1207	32.41	1208	31.88	1209	31.38
1210	30.90	1211	30.43	1212	29.96	1213	29.50	1214	29.06
1215	28.64	1216	28.21	1217	27.75	1218	27.29	1219	26.82
1220	26.34	1221	25.84	1222	25.33	1223	24.83	1224	24.36
1225	23.90	1226	23.43	1227	22.95	1228	22.45	1229	21.94
1230	21.42	1231	20.93	1232	20.48	1233	20.03	1234	19.63
1235	19.16	1236	18.67	1237	18.17	1238	17.65	1239	17.11
1240	16.55	1241	15.98	1242	15.40	1243	14.82	1244	14.23
1245	13.64	1246	13.07	1247	12.51	1248	11.96	1249	11.43
1250	10.93	1251	10.45	1252	10.00	1253	9.58	1254	9.20
1255	8.86	1256	8.55	1257	8.27	1258	8.02	1259	7.79
1260	7.59	1261	7.42	1262	7.26	1263	7.12	1264	6.99
1265	6.88	1266	6.78	1267	6.69	1268	6.61	1269	6.54
1270	6.47	1271	6.41	1272	6.34	1273	6.27	1274	6.20
1275	6.13	1276	6.06	1277	5.98	1278	5.91	1279	5.84
1280	5.78	1281	5.72	1282	5.67	1283	5.61	1284	5.56
1285	5.52	1286	5.48	1287	5.45	1288	5.42	1289	5.40
1290	5.38	1291	5.36	1292	5.35	1293	5.33	1294	5.32
1295	5.31	1296	5.31	1297	5.30	1298	5.29	1299	5.29
1300	5.28	1310	5.14	1320	4.78	1330	4.34	1340	4.10
1350	3.97	1360	3.65	1370	3.23	1380	2.94	1390	2.87
1400	2.86	1420	2.68	1440	2.35	1460	2.17	1500	2.16

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

Page: 19

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 131A

DESCRIPTION: Area A9
TOTAL AREA TO HYDROGRAPH: 269 acres
HYDROGRAPH PEAK: 382 cfs
TIME OF PEAK: 1163 minutes
HYDROGRAPH VOLUME: 34.39 acre-ft

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
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Channel Islands_10yr_prop.out									
(min)	(cfs)	(min)	(cfs)	(min)	(cfs)	(min)	(cfs)	(min)	(cfs)
0	0.00	100	2.17	200	2.27	300	2.63	400	3.06
500	3.62	600	4.11	700	4.86	800	5.90	900	7.02
1000	24.03	1050	37.99	1100	47.58	1110	57.98	1120	72.52
1130	87.88	1131	90.37	1132	92.91	1133	95.42	1134	97.94
1135	100.51	1136	103.88	1137	107.35	1138	109.81	1139	112.33
1140	115.02	1141	118.92	1142	123.11	1143	126.87	1144	131.01
1145	135.62	1146	141.59	1147	148.11	1148	157.50	1149	169.15
1150	183.44	1151	209.88	1152	249.70	1153	278.99	1154	294.93
1155	309.32	1156	324.34	1157	339.55	1158	346.62	1159	344.51
1160	351.78	1161	367.65	1162	377.94	1163	382.03	1164	381.09
1165	375.80	1166	366.51	1167	353.78	1168	339.66	1169	323.21
1170	304.82	1171	284.85	1172	264.65	1173	244.43	1174	224.00
1175	203.23	1176	182.62	1177	162.99	1178	145.83	1179	130.84
1180	118.13	1181	107.31	1182	98.21	1183	90.65	1184	84.29
1185	78.75	1186	74.00	1187	69.72	1188	65.99	1189	62.70
1190	59.82	1191	57.12	1192	54.63	1193	52.37	1194	50.33
1195	48.52	1196	46.84	1197	45.22	1198	43.78	1199	42.50
1200	41.30	1201	40.19	1202	39.17	1203	38.26	1204	37.43
1205	36.70	1206	36.04	1207	35.48	1208	34.95	1209	34.45
1210	33.97	1211	33.05	1212	32.13	1213	31.21	1214	30.32
1215	29.45	1216	28.57	1217	27.75	1218	27.29	1219	26.82
1220	26.34	1221	25.84	1222	25.33	1223	24.83	1224	24.36
1225	23.90	1226	23.43	1227	22.95	1228	22.45	1229	21.94
1230	21.42	1231	20.93	1232	20.48	1233	20.03	1234	19.63
1235	19.16	1236	18.67	1237	18.17	1238	17.65	1239	17.11
1240	16.55	1241	15.98	1242	15.40	1243	14.82	1244	14.23
1245	13.64	1246	13.07	1247	12.51	1248	11.96	1249	11.43
1250	10.93	1251	10.45	1252	10.00	1253	9.58	1254	9.20
1255	8.86	1256	8.55	1257	8.27	1258	8.02	1259	7.79
1260	7.59	1261	7.42	1262	7.26	1263	7.12	1264	6.99
1265	6.88	1266	6.78	1267	6.69	1268	6.61	1269	6.54
1270	6.47	1271	6.41	1272	6.34	1273	6.27	1274	6.20
1275	6.13	1276	6.06	1277	5.98	1278	5.91	1279	5.84
1280	5.78	1281	5.72	1282	5.67	1283	5.61	1284	5.56
1285	5.52	1286	5.48	1287	5.45	1288	5.42	1289	5.40
1290	5.38	1291	5.36	1292	5.35	1293	5.33	1294	5.32
1295	5.31	1296	5.31	1297	5.30	1298	5.29	1299	5.29
1300	5.28	1310	5.14	1320	4.78	1330	4.34	1340	4.10
1350	3.97	1360	3.65	1370	3.23	1380	2.94	1390	2.87
1400	2.86	1420	2.68	1440	2.35	1460	2.17	1500	2.16

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Page: 20 Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition
Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 132A

DESCRIPTION: Area A10
TOTAL AREA TO HYDROGRAPH: 284 acres
HYDROGRAPH PEAK: 387 cfs
TIME OF PEAK: 1163 minutes

Channel Islands_10yr_prop.out
HYDROGRAPH VOLUME: 35.28 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	2.17	200	2.27	300	2.63	400	3.06
500	3.62	600	4.11	700	4.86	800	5.90	900	7.02
1000	24.03	1050	38.49	1100	48.62	1110	60.79	1120	76.11
1130	91.64	1131	94.50	1132	97.41	1133	100.29	1134	103.19
1135	106.15	1136	110.17	1137	114.30	1138	117.02	1139	119.80
1140	122.76	1141	127.25	1142	132.04	1143	136.12	1144	140.58
1145	145.51	1146	152.09	1147	159.22	1148	170.00	1149	183.63
1150	200.48	1151	233.02	1152	282.87	1153	317.68	1154	333.49
1155	346.00	1156	358.39	1157	370.34	1158	370.54	1159	358.17
1160	359.13	1161	373.61	1162	383.19	1163	386.71	1164	385.21
1165	379.37	1166	369.52	1167	356.23	1168	342.12	1169	325.66
1170	307.27	1171	287.03	1172	266.56	1173	246.07	1174	225.37
1175	204.32	1176	183.44	1177	163.54	1178	146.38	1179	131.39
1180	118.68	1181	107.80	1182	98.63	1183	91.01	1184	84.59
1185	78.98	1186	74.18	1187	69.83	1188	66.10	1189	62.82
1190	59.94	1191	57.20	1192	54.69	1193	52.40	1194	50.33
1195	48.52	1196	46.84	1197	45.22	1198	43.78	1199	42.50
1200	41.30	1201	40.19	1202	39.17	1203	38.26	1204	37.43
1205	36.70	1206	36.04	1207	35.48	1208	34.95	1209	34.45
1210	33.97	1211	33.05	1212	32.13	1213	31.21	1214	30.32
1215	29.45	1216	28.57	1217	27.75	1218	27.29	1219	26.82
1220	26.34	1221	25.84	1222	25.33	1223	24.83	1224	24.36
1225	23.90	1226	23.43	1227	22.95	1228	22.45	1229	21.94
1230	21.42	1231	20.93	1232	20.48	1233	20.03	1234	19.63
1235	19.16	1236	18.67	1237	18.17	1238	17.65	1239	17.11
1240	16.55	1241	15.98	1242	15.40	1243	14.82	1244	14.23
1245	13.64	1246	13.07	1247	12.51	1248	11.96	1249	11.43
1250	10.93	1251	10.45	1252	10.00	1253	9.58	1254	9.20
1255	8.86	1256	8.55	1257	8.27	1258	8.02	1259	7.79
1260	7.59	1261	7.42	1262	7.26	1263	7.12	1264	6.99
1265	6.88	1266	6.78	1267	6.69	1268	6.61	1269	6.54
1270	6.47	1271	6.41	1272	6.34	1273	6.27	1274	6.20
1275	6.13	1276	6.06	1277	5.98	1278	5.91	1279	5.84
1280	5.78	1281	5.72	1282	5.67	1283	5.61	1284	5.56
1285	5.52	1286	5.48	1287	5.45	1288	5.42	1289	5.40
1290	5.38	1291	5.36	1292	5.35	1293	5.33	1294	5.32
1295	5.31	1296	5.31	1297	5.30	1298	5.29	1299	5.29
1300	5.28	1310	5.14	1320	4.78	1330	4.34	1340	4.10
1350	3.97	1360	3.65	1370	3.23	1380	2.94	1390	2.87
1400	2.86	1420	2.68	1440	2.35	1460	2.17	1500	2.16

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

VCRat Model Input

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Model Lines

005 1 100A Header place holder
005 1 101A Header place holder
005 1 104C Header place holder

005 1 106D Header place holder
 005 1 109B Header place holder
 005 1 110BCHeader place holder
 005 1 112B Header place holder
 005 1 113ABHeader place holder
 005 1 115A Header place holder
 005 1 117B Header place holder
 005 1 118ABHeader place holder
 005 1 120A Header place holder
 005 1 122C Header place holder
 005 1 127BCHeader place holder
 005 1 129ABHeader place holder
 005 1 130A Header place holder
 005 1 131A Header place holder
 005 1 132A Header place holder
 999
 999
 006 1 100A 010 099J10
 006 1 101A 010000011416K10
 006 1 102A 010 099J10401070002657
 006 1 103A 010 099J10400440000400
 006 1 104C 010000002807K10
 006 1 105C 010 099J10100062006666
 006 1 106D 020000000509K10
 006 1 107CD010 J10
 006 1 108C 010 099J10100060011660
 006 1 109B 0100000001211K10
 006 1 110BC010 J10
 006 1 111B 010 099J10100660002727
 006 1 112B 010000000806K10
 006 1 113AB010 J10
 006 1 114A 010 099J10100600002666
 006 1 115A 010000000906K10
 006 1 116A 010 099J10100075006660
 006 1 117B 010014001507K10
 006 1 118AB010 J10
 006 1 119A 010 099J10100760002368
 006 1 120A 010000000607K10
 006 1 121A 010 099J10400560003570
 006 1 122C 020070001612K10
 006 1 123C 010 099J10400660000500
 006 1 124C 010 099J10401020000500
 006 1 125B 020070001512K10
 006 1 126B 010 099J10401560000500
 006 1 127BC010 J10
 006 1 128B 010 099J10400700000500
 006 1 129AB010 J10
 006 1 130A 020003000807K10
 006 1 131A 010000003307K10

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Ventura County Watershed Protection District
 Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 10-yr Proposed Condition

VCRat Model Input

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Model Lines

006 1 132A 020000001507K10

1 2

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Modified Rational Model Results Report

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

Project Description

VCRat version: 2.6.2009.7
VCRain version: 200703

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

Page: 2

Model Results																
SUBAREA DATA AND RESULTS							ACCUMULATED DATA				ROUTING AFTER ACCUMULATION					
VEL	NODE DEPTH	SOIL	RAIN	TC	%	AREA	FLOW	AREA	FLOW	TIME	CHANNEL	LENGTH	SLOPE	SIZE	H:V	N VALUES
(FT/S)	ID	TYPE	ZONE	(MIN)	IMP	(AC)	(CFS)	(AC)	(CFS)	(MIN)	TYPE	(FT)	(FT/FT)	(FT)	(Z)	CHNL SIDES
----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----																
	100A : Start							0	0							
--	100A	---	---	--	--	---	---			----	-----	----	-----	---	----	-----
	101A : Start - Area A															
--	101A	010	K25	15	0	114	223	114	223	1154	-----	----	-----	---	----	-----
--	102A	---	---	--	--	---	---	114	223	1154	PIPE	1070	0.02657	4.00	----	-----
--	103A	---	---	--	--	---	---	114	222	1156	PIPE	440	0.00400	5.50	----	-----
	104C : Area B2															
--	104C	010	K25	6	0	28	98	28	98	1154	-----	----	-----	---	----	-----
--	105C	---	---	--	--	---	---	28	98	1154	MOUNTAIN	62	0.06666	---	----	-----

Channel Islands_25yr_prop.out

106D :	Area B3																
106D	020	K25	7	0	5	15	5	15	1154	-----	----	-----	---	----	-----	-----	
107CD	---	---	--	--	5	15	33	113	1154	-----	----	-----	---	----	-----	-----	
108C	---	---	--	--	---	---	33	113	1154	MOUNTAIN	60	0.11660	---	----	-----	-----	
109B :	Area B4																
109B	010	K25	9	0	12	32	12	32	1154	-----	----	-----	---	----	-----	-----	
110BC	*****																
*	Peak in B:		32.24 cfs @ 1154 min		Q in C:		112.38 cfs		Combined Q:		144.62 cfs		*				
*	Peak in C:		112.38 cfs @ 1154 min		Q in B:		32.24 cfs		Combined Q:		144.62 cfs		*				
*	Combined Peak:		144.62 cfs @ 1154 min		Q in B:		32.24 cfs		Q in C:		112.38 cfs		*				
110BC	---	---	--	--	33	112	45	145	1154	-----	----	-----	---	----	-----	-----	
111B	---	---	--	--	---	---	45	145	1154	MOUNTAIN	660	0.02727	---	----	-----	-----	
112B :	Area B5																
112B	010	K25	6	0	8	28	53	143	1157	-----	----	-----	---	----	-----	-----	
113AB:	Confluence																
113AB	*****																
*	Peak in A:		220.62 cfs @ 1158 min		Q in B:		134.17 cfs		Combined Q:		354.79 cfs		*				
*	Peak in B:		143.23 cfs @ 1157 min		Q in A:		219.06 cfs		Combined Q:		362.29 cfs		*				
*	Combined Peak:		362.29 cfs @ 1157 min		Q in A:		219.06 cfs		Q in B:		143.23 cfs		*				
113AB	---	---	--	--	53	143	167	362	1157	-----	----	-----	---	----	-----	-----	
114A	---	---	--	--	---	---	167	362	1157	MOUNTAIN	600	0.02666	---	----	-----	-----	
115A :	Area A6																
115A	010	K25	6	0	9	32	176	360	1159	-----	----	-----	---	----	-----	-----	
116A	---	---	--	--	---	---	176	360	1159	MOUNTAIN	75	0.06660	---	----	-----	-----	
117B :	Area A7																
117B	010	K25	6	14	15	53	15	53	1154	-----	----	-----	---	----	-----	-----	
118AB:	Confluence																
118AB	*****																
*	Peak in A:		359.61 cfs @ 1159 min		Q in B:		11.06 cfs		Combined Q:		370.67 cfs		*				
*	Peak in B:		52.73 cfs @ 1154 min		Q in A:		223.28 cfs		Combined Q:		276.01 cfs		*				
*	Combined Peak:		372.73 cfs @ 1158 min		Q in A:		353.16 cfs		Q in B:		19.57 cfs		*				
118AB	---	---	--	--	15	53	191	373	1158	-----	----	-----	---	----	-----	-----	
119A	---	---	--	--	---	---	191	373	1158	MOUNTAIN	760	0.02368	---	----	-----	-----	
120A :	Area A8																
120A	010	K25	7	0	6	19	197	365	1162	-----	----	-----	---	----	-----	-----	
121A	---	---	--	--	---	---	197	365	1162	PIPE	560	0.03570	4.50	----	-----	-----	
122C :	Area C1																
122C	020	K25	11	70	16	39	16	39	1154	-----	----	-----	---	----	-----	-----	

Channel Islands_25yr_prop.out
Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

Page: 3

Model Results																	
SUBAREA DATA AND RESULTS								ACCUMULATED DATA			ROUTING AFTER ACCUMULATION						
VEL	NODE	SOIL	RAIN	TC	%	AREA	FLOW	AREA	FLOW	TIME	CHANNEL	LENGTH	SLOPE	SIZE	H:V	N VALUES	
(FT/S)	DEPTH ID (FT)	TYPE	ZONE	(MIN)	IMP	(AC)	(CFS)	(AC)	(CFS)	(MIN)	TYPE	(FT)	(FT/FT)	(FT)	(Z)	CHNL	SIDES

--	123C	---	---	--	--	---	---	16	39	1154	PIPE	660	0.00500	2.75	----	-----	-----
--	124C	---	---	--	--	---	---	16	38	1158	PIPE	1020	0.00500	2.75	----	-----	-----
--	125B : Area C3	020	K25	9	70	15	41	15	41	1154	-----	----	-----	---	----	-----	-----
--	125B																
--	126B	---	---	--	--	---	---	15	41	1154	PIPE	1560	0.00500	3.00	----	-----	-----
--	127BC	*****															
		* Peak in B:					37.10 cfs @ 1160 min	Q in C:			34.65 cfs	Combined Q:		71.75 cfs	*		
		* Peak in C:					36.50 cfs @ 1163 min	Q in B:			31.79 cfs	Combined Q:		68.30 cfs	*		
		* Combined Peak:					72.36 cfs @ 1161 min	Q in B:			36.62 cfs	Q in C:		35.74 cfs	*		

--	127BC	---	---	--	--	16	37	31	72	1161	-----	----	-----	---	----	-----	-----
--	128B	---	---	--	--	---	---	31	72	1161	PIPE	700	0.00500	3.50	----	-----	-----
--	129AB	*****															
		* Peak in A:					364.31 cfs @ 1162 min	Q in B:			69.28 cfs	Combined Q:		433.59 cfs	*		
		* Peak in B:					70.68 cfs @ 1163 min	Q in A:			363.08 cfs	Combined Q:		433.75 cfs	*		
		* Combined Peak:					433.75 cfs @ 1163 min	Q in A:			363.08 cfs	Q in B:		70.68 cfs	*		

--	129AB	---	---	--	--	31	71	228	434	1163	-----	----	-----	---	----	-----	-----
--	130A : Area C4	020	K25	7	3	8	24	236	437	1162	-----	----	-----	---	----	-----	-----
--	130A																
--	131A : Area A9	010	K25	6	0	33	116	269	454	1162	-----	----	-----	---	----	-----	-----
--	131A																
--	132A : Area A10	020	K25	7	0	15	44	284	460	1162	-----	----	-----	---	----	-----	-----
--	132A																

Issue/Warning Messages

TYPE	ERR NO	PROCEDURE	LOCATION	MESSAGE

NO ISSUES OR WARNINGS DETECTED				

Channel Islands_25yr_prop.out
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

Page: 4

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 101A

DESCRIPTION: Start - Area A
TOTAL AREA TO HYDROGRAPH: 114 acres
HYDROGRAPH PEAK: 223 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 14.34 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	11.97	1050	23.39	1100	36.80	1110	40.99	1120	44.46
1130	56.54	1131	58.55	1132	60.56	1133	62.56	1134	64.57
1135	66.58	1136	68.35	1137	70.13	1138	71.91	1139	73.69
1140	75.47	1141	77.98	1142	80.50	1143	83.07	1144	85.64
1145	88.21	1146	91.24	1147	94.28	1148	97.54	1149	122.56
1150	147.25	1151	171.37	1152	195.62	1153	220.25	1154	222.98
1155	222.53	1156	220.34	1157	218.15	1158	215.96	1159	213.77
1160	211.58	1161	206.39	1162	201.19	1163	195.76	1164	168.34
1165	141.11	1166	114.37	1167	86.66	1168	58.73	1169	52.85
1170	50.16	1171	47.61	1172	45.05	1173	42.50	1174	39.95
1175	37.39	1176	36.53	1177	35.66	1178	34.79	1179	33.93
1180	33.06	1181	31.56	1182	30.05	1183	28.55	1184	27.04
1185	25.54	1186	24.90	1187	24.26	1188	23.62	1189	22.98
1190	22.34	1191	21.11	1192	19.88	1193	18.65	1194	17.42
1195	16.19	1196	15.59	1197	15.00	1198	14.41	1199	13.82
1200	13.22	1201	12.63	1202	12.04	1203	11.44	1204	10.85
1205	10.26	1206	10.26	1207	10.26	1208	10.26	1209	10.26
1210	10.26	1211	9.78	1212	9.30	1213	8.82	1214	8.35
1215	7.87	1216	7.39	1217	6.91	1218	6.43	1219	5.95
1220	5.47	1221	5.00	1222	4.52	1223	4.04	1224	3.56
1225	3.08	1226	3.08	1227	3.08	1228	3.08	1229	3.08
1230	3.08	1231	2.69	1232	2.30	1233	1.91	1234	1.53
1235	1.14	1236	0.75	1237	0.36	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 104C

DESCRIPTION: Area B2
TOTAL AREA TO HYDROGRAPH: 28 acres
HYDROGRAPH PEAK: 98 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 3.45 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	2.94	1050	5.75	1100	9.04	1110	10.58	1120	11.09
1130	15.29	1131	15.82	1132	16.35	1133	16.88	1134	17.42
1135	17.95	1136	19.04	1137	19.60	1138	20.17	1139	20.75
1140	21.32	1141	22.35	1142	22.81	1143	23.27	1144	23.73
1145	24.19	1146	25.48	1147	26.31	1148	27.26	1149	41.47
1150	55.89	1151	70.28	1152	83.86	1153	97.72	1154	98.00
1155	82.88	1156	67.14	1157	51.41	1158	35.66	1159	19.66
1160	17.08	1161	15.43	1162	14.39	1163	13.36	1164	12.32
1165	11.28	1166	10.25	1167	10.25	1168	10.25	1169	10.25
1170	10.25	1171	9.72	1172	9.18	1173	8.65	1174	8.12
1175	7.59	1176	7.06	1177	7.06	1178	7.06	1179	7.06
1180	7.06	1181	6.66	1182	6.27	1183	5.88	1184	5.49
1185	5.10	1186	4.70	1187	4.70	1188	4.70	1189	4.70
1190	4.70	1191	4.34	1192	3.98	1193	3.61	1194	3.25
1195	2.88	1196	2.52	1197	2.52	1198	2.52	1199	2.52
1200	2.52	1201	2.52	1202	2.52	1203	2.52	1204	2.52
1205	2.52	1206	2.52	1207	2.52	1208	2.52	1209	2.52
1210	2.52	1211	2.23	1212	1.93	1213	1.64	1214	1.35
1215	1.05	1216	0.76	1217	0.76	1218	0.76	1219	0.76
1220	0.76	1221	0.76	1222	0.76	1223	0.76	1224	0.76
1225	0.76	1226	0.76	1227	0.76	1228	0.76	1229	0.76
1230	0.76	1231	0.52	1232	0.28	1233	0.04	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00

Channel Islands_25yr_prop.out

1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

Page: 6

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 106D

DESCRIPTION: Area B3
TOTAL AREA TO HYDROGRAPH: 5 acres
HYDROGRAPH PEAK: 15 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 0.42 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	0.02	1050	0.51	1100	1.07	1110	1.34	1120	1.43
1130	2.17	1131	2.26	1132	2.34	1133	2.42	1134	2.50
1135	2.59	1136	2.76	1137	2.93	1138	3.01	1139	3.09
1140	3.17	1141	3.32	1142	3.47	1143	3.53	1144	3.60
1145	3.66	1146	3.85	1147	4.03	1148	4.17	1149	6.22
1150	8.27	1151	10.37	1152	12.52	1153	14.59	1154	14.65
1155	14.40	1156	12.05	1157	9.71	1158	7.43	1159	5.20
1160	2.88	1161	2.32	1162	2.06	1163	1.90	1164	1.74
1165	1.59	1166	1.43	1167	1.28	1168	1.28	1169	1.28
1170	1.28	1171	1.20	1172	1.12	1173	1.05	1174	0.97
1175	0.89	1176	0.81	1177	0.73	1178	0.73	1179	0.73
1180	0.73	1181	0.67	1182	0.62	1183	0.56	1184	0.50
1185	0.44	1186	0.39	1187	0.33	1188	0.33	1189	0.33
1190	0.33	1191	0.27	1192	0.22	1193	0.17	1194	0.11
1195	0.06	1196	0.01	1197	0.00	1198	0.00	1199	0.00
1200	0.00	1201	0.00	1202	0.00	1203	0.00	1204	0.00
1205	0.00	1206	0.00	1207	0.00	1208	0.00	1209	0.00
1210	0.00	1211	0.00	1212	0.00	1213	0.00	1214	0.00
1215	0.00	1216	0.00	1217	0.00	1218	0.00	1219	0.00
1220	0.00	1221	0.00	1222	0.00	1223	0.00	1224	0.00
1225	0.00	1226	0.00	1227	0.00	1228	0.00	1229	0.00
1230	0.00	1231	0.00	1232	0.00	1233	0.00	1234	0.00
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00
1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00

Channel Islands_25yr_prop.out

1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 109B

DESCRIPTION: Area B4
TOTAL AREA TO HYDROGRAPH: 12 acres
HYDROGRAPH PEAK: 32 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 1.49 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.00	900	0.00
1000	1.26	1050	2.46	1100	3.87	1110	4.54	1120	4.75
1130	6.55	1131	6.70	1132	6.86	1133	7.01	1134	7.16
1135	7.31	1136	7.62	1137	7.94	1138	8.25	1139	8.56
1140	8.73	1141	9.02	1142	9.32	1143	9.61	1144	9.91
1145	10.04	1146	10.41	1147	10.78	1148	11.19	1149	15.36
1150	19.47	1151	23.58	1152	27.70	1153	31.89	1154	32.24
1155	31.80	1156	31.18	1157	30.53	1158	26.03	1159	21.54
1160	17.03	1161	12.30	1162	7.38	1163	6.34	1164	5.87
1165	5.58	1166	5.28	1167	4.98	1168	4.69	1169	4.39
1170	4.39	1171	4.24	1172	4.09	1173	3.94	1174	3.78
1175	3.63	1176	3.48	1177	3.33	1178	3.18	1179	3.02
1180	3.02	1181	2.91	1182	2.80	1183	2.69	1184	2.58
1185	2.46	1186	2.35	1187	2.24	1188	2.13	1189	2.02
1190	2.02	1191	1.91	1192	1.81	1193	1.70	1194	1.60
1195	1.50	1196	1.39	1197	1.29	1198	1.18	1199	1.08
1200	1.08	1201	1.08	1202	1.08	1203	1.08	1204	1.08
1205	1.08	1206	1.08	1207	1.08	1208	1.08	1209	1.08
1210	1.08	1211	1.00	1212	0.91	1213	0.83	1214	0.74
1215	0.66	1216	0.58	1217	0.49	1218	0.41	1219	0.32
1220	0.32	1221	0.32	1222	0.32	1223	0.32	1224	0.32
1225	0.32	1226	0.32	1227	0.32	1228	0.32	1229	0.32
1230	0.32	1231	0.26	1232	0.19	1233	0.12	1234	0.05
1235	0.00	1236	0.00	1237	0.00	1238	0.00	1239	0.00
1240	0.00	1241	0.00	1242	0.00	1243	0.00	1244	0.00
1245	0.00	1246	0.00	1247	0.00	1248	0.00	1249	0.00
1250	0.00	1251	0.00	1252	0.00	1253	0.00	1254	0.00
1255	0.00	1256	0.00	1257	0.00	1258	0.00	1259	0.00
1260	0.00	1261	0.00	1262	0.00	1263	0.00	1264	0.00
1265	0.00	1266	0.00	1267	0.00	1268	0.00	1269	0.00

Channel Islands_25yr_prop.out

1270	0.00	1271	0.00	1272	0.00	1273	0.00	1274	0.00
1275	0.00	1276	0.00	1277	0.00	1278	0.00	1279	0.00
1280	0.00	1281	0.00	1282	0.00	1283	0.00	1284	0.00
1285	0.00	1286	0.00	1287	0.00	1288	0.00	1289	0.00
1290	0.00	1291	0.00	1292	0.00	1293	0.00	1294	0.00
1295	0.00	1296	0.00	1297	0.00	1298	0.00	1299	0.00
1300	0.00	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 110BC

TOTAL AREA TO HYDROGRAPH: 45 acres
HYDROGRAPH PEAK: 145 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 6.01 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	0.40	400	0.40
500	0.40	600	0.40	700	0.40	800	0.40	900	0.40
1000	4.17	1050	8.66	1100	13.92	1110	16.31	1120	17.28
1130	23.54	1131	24.45	1132	25.17	1133	25.96	1134	26.72
1135	27.49	1136	28.72	1137	30.07	1138	31.07	1139	32.03
1140	32.87	1141	34.06	1142	35.29	1143	36.14	1144	36.95
1145	37.62	1146	38.97	1147	40.62	1148	42.06	1149	55.33
1150	77.07	1151	97.95	1152	118.63	1153	138.90	1154	144.62
1155	135.27	1156	116.52	1157	98.69	1158	76.81	1159	55.19
1160	39.59	1161	31.15	1162	24.73	1163	22.27	1164	20.75
1165	19.18	1166	17.77	1167	16.65	1168	16.21	1169	15.93
1170	15.92	1171	15.54	1172	14.83	1173	14.07	1174	13.34
1175	12.57	1176	11.82	1177	11.22	1178	10.96	1179	10.82
1180	10.81	1181	10.55	1182	10.05	1183	9.48	1184	8.93
1185	8.40	1186	7.85	1187	7.39	1188	7.16	1189	7.05
1190	7.05	1191	6.82	1192	6.39	1193	5.88	1194	5.36
1195	4.85	1196	4.35	1197	3.98	1198	3.73	1199	3.60
1200	3.60	1201	3.60	1202	3.60	1203	3.60	1204	3.60
1205	3.60	1206	3.60	1207	3.60	1208	3.60	1209	3.60
1210	3.60	1211	3.47	1212	3.22	1213	2.88	1214	2.51
1215	2.14	1216	1.78	1217	1.45	1218	1.21	1219	1.08
1220	1.08	1221	1.08	1222	1.08	1223	1.08	1224	1.08
1225	1.08	1226	1.08	1227	1.08	1228	1.08	1229	1.08
1230	1.08	1231	0.99	1232	0.84	1233	0.64	1234	0.48
1235	0.40	1236	0.40	1237	0.40	1238	0.40	1239	0.40
1240	0.40	1241	0.40	1242	0.40	1243	0.40	1244	0.40
1245	0.40	1246	0.40	1247	0.40	1248	0.40	1249	0.40
1250	0.40	1251	0.40	1252	0.40	1253	0.40	1254	0.40
1255	0.40	1256	0.40	1257	0.40	1258	0.40	1259	0.40

Channel Islands_25yr_prop.out									
1260	0.40	1261	0.40	1262	0.40	1263	0.40	1264	0.40
1265	0.40	1266	0.40	1267	0.40	1268	0.40	1269	0.40
1270	0.40	1271	0.40	1272	0.40	1273	0.40	1274	0.40
1275	0.40	1276	0.40	1277	0.40	1278	0.40	1279	0.40
1280	0.40	1281	0.40	1282	0.40	1283	0.40	1284	0.40
1285	0.40	1286	0.40	1287	0.40	1288	0.40	1289	0.40
1290	0.40	1291	0.40	1292	0.40	1293	0.40	1294	0.40
1295	0.40	1296	0.40	1297	0.40	1298	0.40	1299	0.40
1300	0.40	1310	0.40	1320	0.40	1330	0.40	1340	0.40
1350	0.40	1360	0.40	1370	0.40	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 112B

DESCRIPTION: Area B5
TOTAL AREA TO HYDROGRAPH: 53 acres
HYDROGRAPH PEAK: 143 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 7.03 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	0.40	400	0.40
500	0.40	600	0.40	700	0.40	800	0.40	900	0.40
1000	4.40	1050	9.56	1100	15.77	1110	17.86	1120	19.75
1130	24.46	1131	25.19	1132	25.94	1133	26.72	1134	27.55
1135	28.42	1136	29.49	1137	30.44	1138	31.43	1139	32.52
1140	33.74	1141	35.13	1142	36.32	1143	37.49	1144	38.71
1145	39.96	1146	41.40	1147	42.62	1148	43.86	1149	49.03
1150	54.44	1151	61.86	1152	75.19	1153	95.64	1154	115.87
1155	132.38	1156	142.99	1157	143.23	1158	134.17	1159	119.24
1160	104.83	1161	89.14	1162	74.44	1163	61.51	1164	51.22
1165	43.05	1166	36.95	1167	32.72	1168	29.52	1169	26.99
1170	24.98	1171	23.21	1172	21.80	1173	20.70	1174	19.83
1175	19.04	1176	18.27	1177	17.64	1178	17.00	1179	16.35
1180	15.69	1181	14.99	1182	14.37	1183	13.84	1184	13.39
1185	12.96	1186	12.51	1187	12.13	1188	11.72	1189	11.29
1190	10.84	1191	10.28	1192	9.75	1193	9.30	1194	8.95
1195	8.62	1196	8.29	1197	8.03	1198	7.73	1199	7.40
1200	7.04	1201	6.67	1202	6.31	1203	5.96	1204	5.64
1205	5.37	1206	5.16	1207	4.99	1208	4.85	1209	4.74
1210	4.67	1211	4.53	1212	4.41	1213	4.29	1214	4.17
1215	4.06	1216	3.95	1217	3.90	1218	3.83	1219	3.72
1220	3.59	1221	3.44	1222	3.27	1223	3.09	1224	2.91
1225	2.72	1226	2.53	1227	2.36	1228	2.21	1229	2.08
1230	1.96	1231	1.80	1232	1.65	1233	1.51	1234	1.44
1235	1.39	1236	1.34	1237	1.31	1238	1.27	1239	1.24
1240	1.19	1241	1.14	1242	1.08	1243	1.01	1244	0.94

Channel Islands_25yr_prop.out									
1245	0.88	1246	0.81	1247	0.75	1248	0.70	1249	0.66
1250	0.62	1251	0.59	1252	0.56	1253	0.54	1254	0.52
1255	0.50	1256	0.49	1257	0.47	1258	0.46	1259	0.45
1260	0.45	1261	0.44	1262	0.43	1263	0.43	1264	0.43
1265	0.42	1266	0.42	1267	0.42	1268	0.41	1269	0.41
1270	0.41	1271	0.41	1272	0.41	1273	0.41	1274	0.41
1275	0.40	1276	0.40	1277	0.40	1278	0.40	1279	0.40
1280	0.40	1281	0.40	1282	0.40	1283	0.40	1284	0.40
1285	0.40	1286	0.40	1287	0.40	1288	0.40	1289	0.40
1290	0.40	1291	0.40	1292	0.40	1293	0.40	1294	0.40
1295	0.40	1296	0.40	1297	0.40	1298	0.40	1299	0.40
1300	0.40	1310	0.40	1320	0.40	1330	0.40	1340	0.40
1350	0.40	1360	0.40	1370	0.40	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 113AB

DESCRIPTION: Confluence
TOTAL AREA TO HYDROGRAPH: 167 acres
HYDROGRAPH PEAK: 362 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 22.06 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.80	200	0.80	300	0.80	400	0.80
500	0.80	600	0.80	700	0.80	800	0.80	900	0.80
1000	15.38	1050	32.20	1100	51.45	1110	57.43	1120	63.11
1130	76.71	1131	78.79	1132	80.96	1133	83.39	1134	86.07
1135	88.92	1136	92.02	1137	94.99	1138	97.94	1139	100.91
1140	103.98	1141	107.20	1142	110.30	1143	113.56	1144	117.13
1145	120.91	1146	124.94	1147	128.83	1148	132.89	1149	141.44
1150	153.15	1151	173.84	1152	207.89	1153	252.14	1154	295.31
1155	331.38	1156	355.58	1157	362.29	1158	354.79	1159	339.10
1160	322.82	1161	304.96	1162	287.75	1163	271.43	1164	256.03
1165	239.43	1166	217.40	1167	189.79	1168	160.51	1169	132.67
1170	108.23	1171	89.86	1172	78.76	1173	72.52	1174	68.31
1175	64.77	1176	61.48	1177	58.48	1178	55.84	1179	53.69
1180	51.91	1181	50.30	1182	48.78	1183	47.26	1184	45.63
1185	43.87	1186	42.00	1187	40.19	1188	38.46	1189	36.97
1190	35.69	1191	34.43	1192	33.24	1193	32.09	1194	30.99
1195	29.70	1196	28.28	1197	26.88	1198	25.48	1199	24.18
1200	23.02	1201	21.96	1202	20.97	1203	20.02	1204	19.12
1205	18.27	1206	17.48	1207	16.80	1208	16.21	1209	15.80
1210	15.48	1211	15.16	1212	14.90	1213	14.67	1214	14.43
1215	14.13	1216	13.75	1217	13.37	1218	12.91	1219	12.40
1220	11.84	1221	11.25	1222	10.64	1223	10.01	1224	9.37
1225	8.74	1226	8.11	1227	7.49	1228	6.90	1229	6.34

Channel Islands_25yr_prop.out									
1230	5.86	1231	5.42	1232	5.07	1233	4.80	1234	4.63
1235	4.46	1236	4.25	1237	4.00	1238	3.71	1239	3.41
1240	3.09	1241	2.74	1242	2.37	1243	2.01	1244	1.72
1245	1.51	1246	1.35	1247	1.23	1248	1.15	1249	1.09
1250	1.04	1251	1.00	1252	0.97	1253	0.94	1254	0.92
1255	0.90	1256	0.89	1257	0.87	1258	0.86	1259	0.85
1260	0.85	1261	0.84	1262	0.83	1263	0.83	1264	0.83
1265	0.82	1266	0.82	1267	0.82	1268	0.81	1269	0.81
1270	0.81	1271	0.81	1272	0.81	1273	0.81	1274	0.81
1275	0.80	1276	0.80	1277	0.80	1278	0.80	1279	0.80
1280	0.80	1281	0.80	1282	0.80	1283	0.80	1284	0.80
1285	0.80	1286	0.80	1287	0.80	1288	0.80	1289	0.80
1290	0.80	1291	0.80	1292	0.80	1293	0.80	1294	0.80
1295	0.80	1296	0.80	1297	0.80	1298	0.80	1299	0.80
1300	0.80	1310	0.80	1320	0.80	1330	0.80	1340	0.80
1350	0.80	1360	0.80	1370	0.80	1380	0.80	1390	0.80
1400	0.80	1420	0.80	1440	0.80	1460	0.80	1500	0.80

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 115A

DESCRIPTION: Area A6
TOTAL AREA TO HYDROGRAPH: 176 acres
HYDROGRAPH PEAK: 360 cfs
TIME OF PEAK: 1159 minutes
HYDROGRAPH VOLUME: 23.25 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.80	200	0.80	300	0.80	400	0.80
500	0.80	600	0.80	700	0.80	800	0.80	900	0.80
1000	14.83	1050	32.51	1100	52.71	1110	58.49	1120	64.59
1130	76.51	1131	78.19	1132	79.86	1133	81.69	1134	83.80
1135	86.16	1136	88.93	1137	91.77	1138	94.82	1139	97.98
1140	101.18	1141	104.56	1142	107.82	1143	111.15	1144	114.52
1145	117.97	1146	121.87	1147	125.83	1148	130.01	1149	138.56
1150	147.95	1151	159.49	1152	174.92	1153	198.42	1154	229.32
1155	265.34	1156	303.62	1157	336.18	1158	356.00	1159	359.93
1160	355.10	1161	343.08	1162	328.03	1163	311.64	1164	294.98
1165	279.29	1166	263.46	1167	246.39	1168	226.67	1169	203.26
1170	179.04	1171	154.84	1172	132.83	1173	114.14	1174	99.44
1175	88.62	1176	80.81	1177	75.20	1178	70.68	1179	66.82
1180	63.51	1181	60.59	1182	58.06	1183	55.90	1184	53.94
1185	52.14	1186	50.49	1187	48.92	1188	47.28	1189	45.58
1190	43.87	1191	42.09	1192	40.42	1193	38.86	1194	37.39
1195	36.00	1196	34.67	1197	33.48	1198	32.27	1199	31.20
1200	30.04	1201	28.83	1202	27.61	1203	26.42	1204	25.28
1205	24.20	1206	23.17	1207	22.19	1208	21.26	1209	20.38
1210	19.57	1211	18.72	1212	17.97	1213	17.32	1214	16.74

Channel Islands_25yr_prop.out									
1215	16.23	1216	15.78	1217	15.46	1218	15.16	1219	14.95
1220	14.70	1221	14.41	1222	14.09	1223	13.73	1224	13.32
1225	12.89	1226	12.41	1227	11.92	1228	11.40	1229	10.87
1230	10.33	1231	9.70	1232	9.08	1233	8.46	1234	7.93
1235	7.43	1236	6.96	1237	6.53	1238	6.14	1239	5.80
1240	5.50	1241	5.22	1242	4.95	1243	4.69	1244	4.42
1245	4.16	1246	3.89	1247	3.61	1248	3.34	1249	3.06
1250	2.79	1251	2.54	1252	2.31	1253	2.10	1254	1.91
1255	1.75	1256	1.61	1257	1.49	1258	1.39	1259	1.30
1260	1.22	1261	1.16	1262	1.11	1263	1.06	1264	1.02
1265	0.99	1266	0.96	1267	0.94	1268	0.92	1269	0.90
1270	0.89	1271	0.87	1272	0.86	1273	0.85	1274	0.85
1275	0.84	1276	0.83	1277	0.83	1278	0.83	1279	0.82
1280	0.82	1281	0.82	1282	0.81	1283	0.81	1284	0.81
1285	0.81	1286	0.81	1287	0.81	1288	0.81	1289	0.80
1290	0.80	1291	0.80	1292	0.80	1293	0.80	1294	0.80
1295	0.80	1296	0.80	1297	0.80	1298	0.80	1299	0.80
1300	0.80	1310	0.80	1320	0.80	1330	0.80	1340	0.80
1350	0.80	1360	0.80	1370	0.80	1380	0.80	1390	0.80
1400	0.80	1420	0.80	1440	0.80	1460	0.80	1500	0.80

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 117B

DESCRIPTION: Area A7
TOTAL AREA TO HYDROGRAPH: 15 acres
HYDROGRAPH PEAK: 53 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 2.58 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.12	200	0.16	300	0.21	400	0.26
500	0.32	600	0.39	700	0.47	800	0.55	900	0.55
1000	2.16	1050	3.66	1100	5.41	1110	6.23	1120	6.50
1130	8.73	1131	9.01	1132	9.30	1133	9.58	1134	9.86
1135	10.15	1136	10.73	1137	11.03	1138	11.33	1139	11.63
1140	11.94	1141	12.48	1142	12.73	1143	12.97	1144	13.21
1145	13.46	1146	14.14	1147	14.58	1148	15.09	1149	22.66
1150	30.33	1151	37.98	1152	45.21	1153	52.58	1154	52.73
1155	44.69	1156	36.32	1157	27.95	1158	19.57	1159	11.06
1160	9.68	1161	8.81	1162	8.25	1163	7.70	1164	7.15
1165	6.60	1166	6.05	1167	6.05	1168	6.05	1169	6.05
1170	6.05	1171	5.77	1172	5.48	1173	5.20	1174	4.92
1175	4.64	1176	4.35	1177	4.35	1178	4.35	1179	4.35
1180	4.35	1181	4.14	1182	3.93	1183	3.73	1184	3.52
1185	3.31	1186	3.10	1187	3.10	1188	3.10	1189	3.10
1190	3.10	1191	2.91	1192	2.71	1193	2.52	1194	2.33
1195	2.13	1196	1.94	1197	1.94	1198	1.94	1199	1.94

Channel Islands_25yr_prop.out									
1200	1.94	1201	1.94	1202	1.94	1203	1.94	1204	1.94
1205	1.94	1206	1.94	1207	1.94	1208	1.94	1209	1.94
1210	1.94	1211	1.78	1212	1.63	1213	1.47	1214	1.31
1215	1.16	1216	1.00	1217	1.00	1218	1.00	1219	1.00
1220	1.00	1221	1.00	1222	1.00	1223	1.00	1224	1.00
1225	1.00	1226	1.00	1227	1.00	1228	1.00	1229	1.00
1230	1.00	1231	0.87	1232	0.75	1233	0.62	1234	0.58
1235	0.57	1236	0.55	1237	0.55	1238	0.55	1239	0.55
1240	0.55	1241	0.55	1242	0.55	1243	0.55	1244	0.55
1245	0.55	1246	0.55	1247	0.55	1248	0.55	1249	0.55
1250	0.55	1251	0.55	1252	0.55	1253	0.55	1254	0.55
1255	0.55	1256	0.55	1257	0.55	1258	0.55	1259	0.55
1260	0.55	1261	0.54	1262	0.53	1263	0.52	1264	0.51
1265	0.50	1266	0.48	1267	0.48	1268	0.48	1269	0.48
1270	0.48	1271	0.48	1272	0.48	1273	0.48	1274	0.48
1275	0.48	1276	0.48	1277	0.48	1278	0.48	1279	0.48
1280	0.48	1281	0.48	1282	0.48	1283	0.48	1284	0.48
1285	0.48	1286	0.48	1287	0.48	1288	0.48	1289	0.48
1290	0.48	1291	0.48	1292	0.48	1293	0.48	1294	0.48
1295	0.48	1296	0.48	1297	0.48	1298	0.48	1299	0.48
1300	0.48	1310	0.35	1320	0.35	1330	0.35	1340	0.35
1350	0.22	1360	0.22	1370	0.22	1380	0.22	1390	0.22
1400	0.22	1420	0.13	1440	0.13	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 118AB

DESCRIPTION: Confluence
TOTAL AREA TO HYDROGRAPH: 191 acres
HYDROGRAPH PEAK: 373 cfs
TIME OF PEAK: 1158 minutes
HYDROGRAPH VOLUME: 25.85 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.92	200	0.96	300	1.01	400	1.06
500	1.12	600	1.19	700	1.27	800	1.35	900	1.35
1000	16.87	1050	36.05	1100	57.98	1110	64.54	1120	70.92
1130	84.84	1131	86.77	1132	88.69	1133	90.78	1134	93.09
1135	95.68	1136	98.92	1137	102.07	1138	105.36	1139	108.82
1140	112.32	1141	116.21	1142	119.77	1143	123.31	1144	126.93
1145	130.61	1146	135.08	1147	139.50	1148	144.12	1149	159.09
1150	176.30	1151	194.83	1152	216.83	1153	245.94	1154	276.01
1155	303.32	1156	333.29	1157	358.96	1158	372.73	1159	370.67
1160	365.76	1161	354.08	1162	338.79	1163	322.21	1164	304.95
1165	288.67	1166	272.32	1167	255.67	1168	236.48	1169	214.03
1170	189.92	1171	165.77	1172	143.09	1173	123.64	1174	107.82
1175	95.93	1176	87.15	1177	81.02	1178	76.28	1179	72.23
1180	68.79	1181	65.59	1182	62.72	1183	60.27	1184	58.05

Channel Islands_25yr_prop.out									
1185	56.00	1186	54.13	1187	52.52	1188	50.92	1189	49.23
1190	47.54	1191	45.59	1192	43.69	1193	41.90	1194	40.21
1195	38.60	1196	37.06	1197	35.82	1198	34.63	1199	33.55
1200	32.43	1201	31.24	1202	30.03	1203	28.83	1204	27.68
1205	26.57	1206	25.53	1207	24.53	1208	23.58	1209	22.68
1210	21.84	1211	20.86	1212	19.91	1213	19.06	1214	18.30
1215	17.61	1216	16.97	1217	16.60	1218	16.29	1219	16.04
1220	15.81	1221	15.58	1222	15.27	1223	14.93	1224	14.55
1225	14.13	1226	13.68	1227	13.20	1228	12.70	1229	12.18
1230	11.64	1231	10.94	1232	10.20	1233	9.45	1234	8.84
1235	8.30	1236	7.80	1237	7.35	1238	6.94	1239	6.57
1240	6.24	1241	5.95	1242	5.67	1243	5.41	1244	5.15
1245	4.89	1246	4.62	1247	4.35	1248	4.08	1249	3.81
1250	3.54	1251	3.28	1252	3.03	1253	2.81	1254	2.61
1255	2.43	1256	2.28	1257	2.14	1258	2.02	1259	1.92
1260	1.84	1261	1.76	1262	1.68	1263	1.62	1264	1.57
1265	1.52	1266	1.47	1267	1.45	1268	1.42	1269	1.40
1270	1.39	1271	1.37	1272	1.36	1273	1.35	1274	1.34
1275	1.33	1276	1.32	1277	1.32	1278	1.31	1279	1.31
1280	1.31	1281	1.30	1282	1.30	1283	1.30	1284	1.30
1285	1.29	1286	1.29	1287	1.29	1288	1.29	1289	1.29
1290	1.29	1291	1.29	1292	1.29	1293	1.29	1294	1.29
1295	1.29	1296	1.29	1297	1.29	1298	1.29	1299	1.29
1300	1.29	1310	1.15	1320	1.15	1330	1.15	1340	1.15
1350	1.02	1360	1.02	1370	1.02	1380	1.02	1390	1.02
1400	1.02	1420	0.93	1440	0.93	1460	0.80	1500	0.80

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 120A

DESCRIPTION: Area A8
TOTAL AREA TO HYDROGRAPH: 197 acres
HYDROGRAPH PEAK: 365 cfs
TIME OF PEAK: 1162 minutes
HYDROGRAPH VOLUME: 26.70 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.92	200	0.95	300	1.00	400	1.05
500	1.11	600	1.17	700	1.25	800	1.33	900	1.35
1000	15.50	1050	34.86	1100	57.59	1110	63.50	1120	70.21
1130	81.62	1131	83.16	1132	84.68	1133	86.28	1134	88.03
1135	89.94	1136	92.12	1137	94.49	1138	97.05	1139	99.92
1140	103.01	1141	106.39	1142	109.93	1143	113.56	1144	117.32
1145	121.10	1146	125.04	1147	129.03	1148	133.17	1149	140.01
1150	147.39	1151	157.57	1152	172.18	1153	190.31	1154	209.93
1155	234.10	1156	259.51	1157	286.64	1158	314.30	1159	339.16
1160	355.78	1161	364.57	1162	365.29	1163	359.58	1164	349.07
1165	335.65	1166	320.61	1167	305.21	1168	289.70	1169	274.00

Channel Islands_25yr_prop.out									
1170	257.10	1171	238.62	1172	218.68	1173	198.01	1174	177.64
1175	158.38	1176	140.94	1177	125.93	1178	113.45	1179	103.26
1180	95.05	1181	88.33	1182	82.83	1183	78.16	1184	74.04
1185	70.39	1186	67.28	1187	64.46	1188	62.04	1189	59.84
1190	57.83	1191	56.02	1192	54.25	1193	52.49	1194	50.70
1195	48.87	1196	47.05	1197	45.26	1198	43.57	1199	41.95
1200	40.41	1201	38.98	1202	37.66	1203	36.41	1204	35.24
1205	34.24	1206	33.19	1207	32.12	1208	31.05	1209	29.98
1210	28.94	1211	27.86	1212	26.82	1213	25.81	1214	24.82
1215	23.85	1216	22.89	1217	21.94	1218	21.09	1219	20.28
1220	19.53	1221	18.85	1222	18.26	1223	17.76	1224	17.32
1225	16.94	1226	16.59	1227	16.29	1228	16.04	1229	15.77
1230	15.47	1231	15.10	1232	14.71	1233	14.29	1234	13.87
1235	13.44	1236	12.98	1237	12.49	1238	11.96	1239	11.43
1240	10.90	1241	10.38	1242	9.88	1243	9.39	1244	8.93
1245	8.49	1246	8.08	1247	7.70	1248	7.33	1249	6.99
1250	6.67	1251	6.36	1252	6.07	1253	5.78	1254	5.50
1255	5.23	1256	4.97	1257	4.71	1258	4.46	1259	4.21
1260	3.98	1261	3.75	1262	3.54	1263	3.33	1264	3.14
1265	2.97	1266	2.80	1267	2.65	1268	2.51	1269	2.38
1270	2.27	1271	2.16	1272	2.06	1273	1.97	1274	1.89
1275	1.82	1276	1.75	1277	1.69	1278	1.64	1279	1.60
1280	1.56	1281	1.52	1282	1.49	1283	1.47	1284	1.44
1285	1.42	1286	1.40	1287	1.39	1288	1.37	1289	1.36
1290	1.35	1291	1.35	1292	1.34	1293	1.34	1294	1.33
1295	1.33	1296	1.32	1297	1.32	1298	1.32	1299	1.32
1300	1.31	1310	1.29	1320	1.24	1330	1.18	1340	1.16
1350	1.15	1360	1.10	1370	1.05	1380	1.03	1390	1.02
1400	1.02	1420	1.00	1440	0.95	1460	0.92	1500	0.92

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 122C

DESCRIPTION: Area C1
TOTAL AREA TO HYDROGRAPH: 16 acres
HYDROGRAPH PEAK: 39 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 5.72 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.64	200	0.86	300	1.10	400	1.38
500	1.72	600	2.06	700	2.49	800	2.91	900	2.95
1000	4.33	1050	5.86	1100	7.66	1110	8.42	1120	8.75
1130	10.88	1131	11.25	1132	11.41	1133	11.57	1134	11.73
1135	11.89	1136	12.22	1137	12.55	1138	12.88	1139	13.21
1140	13.54	1141	14.00	1142	14.30	1143	14.59	1144	14.89
1145	15.19	1146	15.73	1147	16.10	1148	16.52	1149	20.90
1150	25.25	1151	29.62	1152	33.88	1153	38.24	1154	38.61

Channel Islands_25yr_prop.out									
1155	38.39	1156	37.99	1157	37.35	1158	36.71	1159	36.02
1160	31.36	1161	26.41	1162	21.49	1163	16.54	1164	11.45
1165	10.36	1166	9.86	1167	9.55	1168	9.24	1169	8.93
1170	8.62	1171	8.16	1172	8.00	1173	7.84	1174	7.68
1175	7.52	1176	7.37	1177	7.21	1178	7.05	1179	6.89
1180	6.73	1181	6.46	1182	6.34	1183	6.23	1184	6.11
1185	5.99	1186	5.88	1187	5.76	1188	5.64	1189	5.53
1190	5.41	1191	5.19	1192	5.08	1193	4.97	1194	4.86
1195	4.75	1196	4.64	1197	4.54	1198	4.43	1199	4.32
1200	4.22	1201	4.15	1202	4.15	1203	4.15	1204	4.15
1205	4.15	1206	4.15	1207	4.15	1208	4.15	1209	4.15
1210	4.15	1211	4.09	1212	4.03	1213	3.97	1214	3.91
1215	3.85	1216	3.78	1217	3.72	1218	3.66	1219	3.60
1220	3.54	1221	3.48	1222	3.48	1223	3.48	1224	3.48
1225	3.48	1226	3.48	1227	3.48	1228	3.48	1229	3.48
1230	3.48	1231	3.43	1232	3.38	1233	3.33	1234	3.28
1235	3.23	1236	3.18	1237	3.13	1238	3.08	1239	3.04
1240	2.99	1241	2.94	1242	2.94	1243	2.94	1244	2.94
1245	2.94	1246	2.94	1247	2.94	1248	2.94	1249	2.94
1250	2.94	1251	2.94	1252	2.94	1253	2.94	1254	2.94
1255	2.94	1256	2.94	1257	2.94	1258	2.94	1259	2.94
1260	2.94	1261	2.90	1262	2.87	1263	2.84	1264	2.81
1265	2.78	1266	2.74	1267	2.71	1268	2.68	1269	2.65
1270	2.62	1271	2.59	1272	2.59	1273	2.59	1274	2.59
1275	2.59	1276	2.59	1277	2.59	1278	2.59	1279	2.59
1280	2.59	1281	2.59	1282	2.59	1283	2.59	1284	2.59
1285	2.59	1286	2.59	1287	2.59	1288	2.59	1289	2.59
1290	2.59	1291	2.59	1292	2.59	1293	2.59	1294	2.59
1295	2.59	1296	2.59	1297	2.59	1298	2.59	1299	2.59
1300	2.59	1310	1.95	1320	1.88	1330	1.88	1340	1.88
1350	1.24	1360	1.18	1370	1.18	1380	1.18	1390	1.18
1400	1.18	1420	0.70	1440	0.70	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 127BC

TOTAL AREA TO HYDROGRAPH: 31 acres
HYDROGRAPH PEAK: 72 cfs
TIME OF PEAK: 1161 minutes
HYDROGRAPH VOLUME: 11.19 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.24	200	1.58	300	2.08	400	2.59
500	3.27	600	3.90	700	4.73	800	5.56	900	5.73
1000	8.02	1050	10.84	1100	14.26	1110	15.27	1120	16.39
1130	18.46	1131	18.79	1132	19.13	1133	19.48	1134	19.88
1135	20.30	1136	20.73	1137	21.16	1138	21.58	1139	22.00
1140	22.46	1141	22.98	1142	23.56	1143	24.16	1144	24.78

Channel Islands_25yr_prop.out									
1145	25.42	1146	26.09	1147	26.76	1148	27.41	1149	28.06
1150	28.75	1151	29.50	1152	31.07	1153	34.39	1154	39.41
1155	45.90	1156	53.16	1157	60.03	1158	65.44	1159	69.30
1160	71.75	1161	72.36	1162	71.03	1163	68.30	1164	64.19
1165	58.62	1166	51.97	1167	45.27	1168	39.06	1169	33.78
1170	29.55	1171	26.26	1172	23.77	1173	21.87	1174	20.40
1175	19.26	1176	18.31	1177	17.52	1178	16.85	1179	16.28
1180	15.79	1181	15.35	1182	14.94	1183	14.55	1184	14.21
1185	13.89	1186	13.58	1187	13.27	1188	12.97	1189	12.68
1190	12.40	1191	12.13	1192	11.86	1193	11.61	1194	11.36
1195	11.14	1196	10.92	1197	10.69	1198	10.46	1199	10.23
1200	10.00	1201	9.77	1202	9.54	1203	9.32	1204	9.10
1205	8.91	1206	8.74	1207	8.59	1208	8.46	1209	8.36
1210	8.29	1211	8.23	1212	8.18	1213	8.15	1214	8.12
1215	8.10	1216	8.07	1217	8.03	1218	7.97	1219	7.90
1220	7.81	1221	7.72	1222	7.62	1223	7.52	1224	7.41
1225	7.30	1226	7.20	1227	7.12	1228	7.04	1229	6.98
1230	6.92	1231	6.88	1232	6.85	1233	6.82	1234	6.81
1235	6.79	1236	6.77	1237	6.74	1238	6.69	1239	6.64
1240	6.57	1241	6.50	1242	6.42	1243	6.34	1244	6.25
1245	6.16	1246	6.08	1247	6.01	1248	5.94	1249	5.89
1250	5.85	1251	5.81	1252	5.78	1253	5.76	1254	5.74
1255	5.73	1256	5.72	1257	5.71	1258	5.71	1259	5.70
1260	5.70	1261	5.70	1262	5.70	1263	5.70	1264	5.69
1265	5.69	1266	5.69	1267	5.68	1268	5.66	1269	5.63
1270	5.59	1271	5.55	1272	5.50	1273	5.45	1274	5.39
1275	5.34	1276	5.28	1277	5.24	1278	5.19	1279	5.16
1280	5.13	1281	5.10	1282	5.08	1283	5.07	1284	5.05
1285	5.04	1286	5.04	1287	5.03	1288	5.03	1289	5.02
1290	5.02	1291	5.02	1292	5.02	1293	5.01	1294	5.01
1295	5.01	1296	5.01	1297	5.01	1298	5.01	1299	5.01
1300	5.01	1310	4.72	1320	4.10	1330	3.71	1340	3.65
1350	3.42	1360	2.83	1370	2.38	1380	2.29	1390	2.29
1400	2.29	1420	1.94	1440	1.48	1460	1.26	1500	1.24

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 129AB

TOTAL AREA TO HYDROGRAPH: 228 acres
HYDROGRAPH PEAK: 434 cfs
TIME OF PEAK: 1163 minutes
HYDROGRAPH VOLUME: 37.91 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	2.16	200	2.50	300	3.06	400	3.60
500	4.35	600	5.05	700	5.94	800	6.87	900	7.09
1000	23.11	1050	45.17	1100	71.24	1110	78.00	1120	85.76
1130	98.53	1131	100.19	1132	101.90	1133	103.74	1134	105.71

Channel Islands_25yr_prop.out									
1135	107.87	1136	110.27	1137	112.90	1138	115.75	1139	118.85
1140	122.22	1141	125.85	1142	129.75	1143	133.87	1144	138.11
1145	142.46	1146	146.93	1147	151.56	1148	156.30	1149	162.23
1150	169.80	1151	179.11	1152	191.81	1153	208.81	1154	229.32
1155	254.07	1156	283.30	1157	315.41	1158	349.12	1159	381.35
1160	407.42	1161	424.86	1162	433.59	1163	433.75	1164	426.29
1165	412.83	1166	395.10	1167	374.47	1168	352.72	1169	330.59
1170	308.31	1171	285.49	1172	262.08	1173	238.44	1174	215.32
1175	193.43	1176	173.44	1177	155.82	1178	140.81	1179	128.40
1180	118.25	1181	109.87	1182	103.00	1183	97.40	1184	92.40
1185	88.02	1186	84.18	1187	80.85	1188	77.82	1189	75.14
1190	72.69	1191	70.43	1192	68.39	1193	66.34	1194	64.31
1195	62.26	1196	60.20	1197	58.15	1198	56.17	1199	54.26
1200	52.44	1201	50.71	1202	49.08	1203	47.54	1204	46.08
1205	44.73	1206	43.51	1207	42.30	1208	41.04	1209	39.80
1210	38.60	1211	37.41	1212	36.25	1213	35.13	1214	34.06
1215	33.03	1216	32.02	1217	31.03	1218	30.08	1219	29.18
1220	28.34	1221	27.53	1222	26.80	1223	26.14	1224	25.54
1225	25.01	1226	24.52	1227	24.08	1228	23.68	1229	23.32
1230	22.96	1231	22.57	1232	22.21	1233	21.80	1234	21.35
1235	20.89	1236	20.43	1237	19.96	1238	19.45	1239	18.92
1240	18.37	1241	17.80	1242	17.23	1243	16.67	1244	16.12
1245	15.58	1246	15.06	1247	14.56	1248	14.09	1249	13.64
1250	13.22	1251	12.82	1252	12.45	1253	12.10	1254	11.76
1255	11.45	1256	11.15	1257	10.86	1258	10.59	1259	10.32
1260	10.06	1261	9.82	1262	9.58	1263	9.36	1264	9.15
1265	8.96	1266	8.77	1267	8.60	1268	8.44	1269	8.29
1270	8.15	1271	8.01	1272	7.87	1273	7.74	1274	7.61
1275	7.48	1276	7.35	1277	7.23	1278	7.12	1279	7.01
1280	6.91	1281	6.82	1282	6.74	1283	6.67	1284	6.61
1285	6.56	1286	6.52	1287	6.49	1288	6.46	1289	6.43
1290	6.41	1291	6.39	1292	6.38	1293	6.37	1294	6.37
1295	6.36	1296	6.35	1297	6.35	1298	6.34	1299	6.34
1300	6.33	1310	6.13	1320	5.61	1330	5.05	1340	4.83
1350	4.68	1360	4.21	1370	3.65	1380	3.37	1390	3.32
1400	3.31	1420	3.05	1440	2.55	1460	2.25	1500	2.16

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Page: 18 Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition
Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 130A

DESCRIPTION: Area C4
TOTAL AREA TO HYDROGRAPH: 236 acres
HYDROGRAPH PEAK: 437 cfs
TIME OF PEAK: 1162 minutes
HYDROGRAPH VOLUME: 38.67 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	2.17	200	2.52	300	3.09	400	3.63

Channel Islands_25yr_prop.out									
500	4.38	600	5.09	700	6.00	800	6.93	900	7.15
1000	23.24	1050	46.07	1100	73.05	1110	80.23	1120	88.13
1130	102.10	1131	103.88	1132	105.72	1133	107.70	1134	109.80
1135	112.10	1136	114.76	1137	117.67	1138	120.65	1139	123.88
1140	127.39	1141	131.25	1142	135.39	1143	139.60	1144	143.96
1145	148.41	1146	153.16	1147	158.09	1148	163.06	1149	172.27
1150	183.12	1151	195.80	1152	211.93	1153	232.24	1154	252.85
1155	277.20	1156	302.66	1157	331.04	1158	361.09	1159	389.76
1160	412.12	1161	428.66	1162	436.98	1163	436.89	1164	429.17
1165	415.45	1166	397.48	1167	376.61	1168	354.86	1169	332.73
1170	310.45	1171	287.51	1172	263.97	1173	240.21	1174	216.96
1175	194.95	1176	174.82	1177	157.08	1178	142.07	1179	129.66
1180	119.52	1181	111.04	1182	104.07	1183	98.38	1184	93.29
1185	88.82	1186	84.88	1187	81.46	1188	78.44	1189	75.76
1190	73.30	1191	70.96	1192	68.83	1193	66.70	1194	64.58
1195	62.44	1196	60.30	1197	58.24	1198	56.25	1199	54.35
1200	52.53	1201	50.80	1202	49.17	1203	47.63	1204	46.17
1205	44.82	1206	43.60	1207	42.38	1208	41.13	1209	39.89
1210	38.69	1211	37.50	1212	36.34	1213	35.21	1214	34.14
1215	33.11	1216	32.10	1217	31.10	1218	30.15	1219	29.26
1220	28.41	1221	27.61	1222	26.87	1223	26.21	1224	25.62
1225	25.09	1226	24.60	1227	24.15	1228	23.75	1229	23.39
1230	23.03	1231	22.64	1232	22.28	1233	21.86	1234	21.41
1235	20.96	1236	20.50	1237	20.02	1238	19.52	1239	18.98
1240	18.43	1241	17.86	1242	17.30	1243	16.74	1244	16.18
1245	15.65	1246	15.13	1247	14.63	1248	14.15	1249	13.70
1250	13.28	1251	12.88	1252	12.51	1253	12.16	1254	11.83
1255	11.51	1256	11.21	1257	10.93	1258	10.65	1259	10.38
1260	10.13	1261	9.88	1262	9.64	1263	9.42	1264	9.21
1265	9.01	1266	8.83	1267	8.66	1268	8.50	1269	8.35
1270	8.20	1271	8.07	1272	7.93	1273	7.80	1274	7.66
1275	7.53	1276	7.41	1277	7.29	1278	7.17	1279	7.06
1280	6.96	1281	6.87	1282	6.80	1283	6.73	1284	6.67
1285	6.62	1286	6.58	1287	6.54	1288	6.51	1289	6.49
1290	6.46	1291	6.45	1292	6.44	1293	6.43	1294	6.42
1295	6.41	1296	6.41	1297	6.40	1298	6.40	1299	6.39
1300	6.39	1310	6.17	1320	5.65	1330	5.09	1340	4.87
1350	4.70	1360	4.24	1370	3.68	1380	3.39	1390	3.34
1400	3.34	1420	3.06	1440	2.56	1460	2.25	1500	2.16

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 131A

DESCRIPTION: Area A9
TOTAL AREA TO HYDROGRAPH: 269 acres
HYDROGRAPH PEAK: 454 cfs
TIME OF PEAK: 1162 minutes
HYDROGRAPH VOLUME: 42.74 acre-ft

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
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Channel Islands_25yr_prop.out									
(min)	(cfs)	(min)	(cfs)	(min)	(cfs)	(min)	(cfs)	(min)	(cfs)
0	0.00	100	2.17	200	2.52	300	3.09	400	3.63
500	4.38	600	5.09	700	6.00	800	6.93	900	7.15
1000	26.70	1050	52.85	1100	83.70	1110	92.70	1120	101.20
1130	120.11	1131	122.53	1132	125.00	1133	127.60	1134	130.33
1135	133.25	1136	137.20	1137	140.77	1138	144.43	1139	148.34
1140	152.51	1141	157.60	1142	162.27	1143	167.03	1144	171.92
1145	176.91	1146	183.19	1147	189.10	1148	195.18	1149	221.14
1150	248.98	1151	278.63	1152	310.76	1153	347.41	1154	368.35
1155	374.88	1156	381.80	1157	391.63	1158	403.12	1159	412.93
1160	432.25	1161	446.84	1162	453.94	1163	452.63	1164	443.69
1165	428.75	1166	409.56	1167	388.68	1168	366.94	1169	344.81
1170	322.53	1171	298.96	1172	274.79	1173	250.41	1174	226.53
1175	203.89	1176	183.14	1177	165.40	1178	150.39	1179	137.98
1180	127.83	1181	118.89	1182	111.47	1183	105.31	1184	99.76
1185	94.83	1186	90.43	1187	87.01	1188	83.98	1189	81.30
1190	78.85	1191	76.08	1192	73.52	1193	70.96	1194	68.41
1195	65.84	1196	63.27	1197	61.21	1198	59.22	1199	57.32
1200	55.50	1201	53.77	1202	52.14	1203	50.60	1204	49.14
1205	47.79	1206	46.57	1207	45.35	1208	44.10	1209	42.86
1210	41.66	1211	40.13	1212	38.62	1213	37.15	1214	35.73
1215	34.34	1216	32.99	1217	32.00	1218	31.04	1219	30.15
1220	29.30	1221	28.50	1222	27.77	1223	27.10	1224	26.51
1225	25.98	1226	25.49	1227	25.04	1228	24.64	1229	24.28
1230	23.92	1231	23.25	1232	22.61	1233	21.91	1234	21.41
1235	20.96	1236	20.50	1237	20.02	1238	19.52	1239	18.98
1240	18.43	1241	17.86	1242	17.30	1243	16.74	1244	16.18
1245	15.65	1246	15.13	1247	14.63	1248	14.15	1249	13.70
1250	13.28	1251	12.88	1252	12.51	1253	12.16	1254	11.83
1255	11.51	1256	11.21	1257	10.93	1258	10.65	1259	10.38
1260	10.13	1261	9.88	1262	9.64	1263	9.42	1264	9.21
1265	9.01	1266	8.83	1267	8.66	1268	8.50	1269	8.35
1270	8.20	1271	8.07	1272	7.93	1273	7.80	1274	7.66
1275	7.53	1276	7.41	1277	7.29	1278	7.17	1279	7.06
1280	6.96	1281	6.87	1282	6.80	1283	6.73	1284	6.67
1285	6.62	1286	6.58	1287	6.54	1288	6.51	1289	6.49
1290	6.46	1291	6.45	1292	6.44	1293	6.43	1294	6.42
1295	6.41	1296	6.41	1297	6.40	1298	6.40	1299	6.39
1300	6.39	1310	6.17	1320	5.65	1330	5.09	1340	4.87
1350	4.70	1360	4.24	1370	3.68	1380	3.39	1390	3.34
1400	3.34	1420	3.06	1440	2.56	1460	2.25	1500	2.16

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 132A

DESCRIPTION: Area A10
TOTAL AREA TO HYDROGRAPH: 284 acres
HYDROGRAPH PEAK: 460 cfs
TIME OF PEAK: 1162 minutes

Channel Islands_25yr_prop.out
HYDROGRAPH VOLUME: 44.00 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	2.17	200	2.52	300	3.09	400	3.63
500	4.38	600	5.09	700	6.00	800	6.93	900	7.15
1000	26.77	1050	54.36	1100	86.92	1110	96.72	1120	105.48
1130	126.63	1131	129.30	1132	132.01	1133	134.86	1134	137.84
1135	141.01	1136	145.47	1137	149.55	1138	153.45	1139	157.61
1140	162.03	1141	167.55	1142	172.67	1143	177.62	1144	182.71
1145	187.90	1146	194.73	1147	201.19	1148	207.69	1149	239.79
1150	273.79	1151	309.74	1152	348.32	1153	391.18	1154	412.30
1155	418.08	1156	417.95	1157	420.76	1158	425.40	1159	428.54
1160	440.90	1161	453.80	1162	460.13	1163	458.33	1164	448.91
1165	433.51	1166	413.86	1167	392.53	1168	370.78	1169	348.65
1170	326.37	1171	302.57	1172	278.16	1173	253.54	1174	229.43
1175	206.56	1176	185.57	1177	167.60	1178	152.58	1179	140.17
1180	130.03	1181	120.91	1182	113.31	1183	106.99	1184	101.26
1185	96.16	1186	91.58	1187	87.99	1188	84.96	1189	82.29
1190	79.83	1191	76.90	1192	74.18	1193	71.46	1194	68.75
1195	66.02	1196	63.28	1197	61.21	1198	59.22	1199	57.32
1200	55.50	1201	53.77	1202	52.14	1203	50.60	1204	49.14
1205	47.79	1206	46.57	1207	45.35	1208	44.10	1209	42.86
1210	41.66	1211	40.13	1212	38.62	1213	37.15	1214	35.73
1215	34.34	1216	32.99	1217	32.00	1218	31.04	1219	30.15
1220	29.30	1221	28.50	1222	27.77	1223	27.10	1224	26.51
1225	25.98	1226	25.49	1227	25.04	1228	24.64	1229	24.28
1230	23.92	1231	23.25	1232	22.61	1233	21.91	1234	21.41
1235	20.96	1236	20.50	1237	20.02	1238	19.52	1239	18.98
1240	18.43	1241	17.86	1242	17.30	1243	16.74	1244	16.18
1245	15.65	1246	15.13	1247	14.63	1248	14.15	1249	13.70
1250	13.28	1251	12.88	1252	12.51	1253	12.16	1254	11.83
1255	11.51	1256	11.21	1257	10.93	1258	10.65	1259	10.38
1260	10.13	1261	9.88	1262	9.64	1263	9.42	1264	9.21
1265	9.01	1266	8.83	1267	8.66	1268	8.50	1269	8.35
1270	8.20	1271	8.07	1272	7.93	1273	7.80	1274	7.66
1275	7.53	1276	7.41	1277	7.29	1278	7.17	1279	7.06
1280	6.96	1281	6.87	1282	6.80	1283	6.73	1284	6.67
1285	6.62	1286	6.58	1287	6.54	1288	6.51	1289	6.49
1290	6.46	1291	6.45	1292	6.44	1293	6.43	1294	6.42
1295	6.41	1296	6.41	1297	6.40	1298	6.40	1299	6.39
1300	6.39	1310	6.17	1320	5.65	1330	5.09	1340	4.87
1350	4.70	1360	4.24	1370	3.68	1380	3.39	1390	3.34
1400	3.34	1420	3.06	1440	2.56	1460	2.25	1500	2.16

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

VCRat Model Input

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Model Lines

005 1 100A Header place holder
005 1 101A Header place holder
005 1 104C Header place holder

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005 1 106D Header place holder
005 1 109B Header place holder
005 1 110BCHeader place holder
005 1 112B Header place holder
005 1 113ABHeader place holder
005 1 115A Header place holder
005 1 117B Header place holder
005 1 118ABHeader place holder
005 1 120A Header place holder
005 1 122C Header place holder
005 1 127BCHeader place holder
005 1 129ABHeader place holder
005 1 130A Header place holder
005 1 131A Header place holder
005 1 132A Header place holder
999
999
006 1 100A 010 099J25
006 1 101A 010000011415K25
006 1 102A 010 099J25401070002657
006 1 103A 010 099J25400440000400
006 1 104C 010000002806K25
006 1 105C 010 099J25100062006666
006 1 106D 020000000507K25
006 1 107CD010 J25
006 1 108C 010 099J25100060011660
006 1 109B 0100000001209K25
006 1 110BC010 J25
006 1 111B 010 099J25100660002727
006 1 112B 010000000806K25
006 1 113AB010 J25
006 1 114A 010 099J25100600002666
006 1 115A 010000000906K25
006 1 116A 010 099J25100075006660
006 1 117B 010014001506K25
006 1 118AB010 J25
006 1 119A 010 099J25100760002368
006 1 120A 010000000607K25
006 1 121A 010 099J25400560003570
006 1 122C 020070001611K25
006 1 123C 010 099J25400660000500
006 1 124C 010 099J25401020000500
006 1 125B 020070001509K25
006 1 126B 010 099J25401560000500
006 1 127BC010 J25
006 1 128B 010 099J25400700000500
006 1 129AB010 J25
006 1 130A 020003000807K25
006 1 131A 010000003306K25

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 25-yr Proposed Condition

VCRat Model Input

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Model Lines

006 1 132A 020000001507K25

1 2

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Modified Rational Model Results Report

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

Project Description

VCRat version: 2.6.2009.7
VCRain version: 200703

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

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Model Results																
SUBAREA DATA AND RESULTS							ACCUMULATED DATA				ROUTING AFTER ACCUMULATION					
VEL	NODE DEPTH	SOIL	RAIN	TC	%	AREA	FLOW	AREA	FLOW	TIME	CHANNEL	LENGTH	SLOPE	SIZE	H:V	N VALUES
(FT/S)	ID	TYPE	ZONE	(MIN)	IMP	(AC)	(CFS)	(AC)	(CFS)	(MIN)	TYPE	(FT)	(FT/FT)	(FT)	(Z)	CHNL SIDES
----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----																
	100A : Start							0	0							
--	100A	---	---	--	--	---	---			----	-----	----	-----	---	----	-----
	101A : Start - Area A															
--	101A	010	K100	13	0	114	319	114	319	1154	-----	----	-----	---	----	-----
	102A	---	---	--	--	---	---	114	319	1154	PIPE	1070	0.02657	4.50	----	-----
--	103A	---	---	--	--	---	---	114	318	1156	PIPE	440	0.00400	6.25	----	-----
	104C : Area B2															
--	104C	010	K100	6	0	28	120	28	120	1153	-----	----	-----	---	----	-----
	105C	---	---	--	--	---	---	28	120	1153	MOUNTAIN	62	0.06666	---	----	-----
--																

Channel Islands_100yr_prop.out

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106D : Area B3
106D 020 K100 7 0 5 18 5 18 1153 ----- ---- ----- --- ----
--
107CD --- --- -- -- 5 18 33 138 1153 ----- ---- ----- --- ----
--
108C --- --- -- -- --- --- 33 138 1153 MOUNTAIN 60 0.11660 --- ----
--
109B : Area B4
109B 010 K100 7 0 12 47 12 47 1153 ----- ---- ----- --- ----
--
110BC *****
* Peak in B: 47.11 cfs @ 1153 min Q in C: 136.40 cfs Combined Q: 183.51 cfs *
* Peak in C: 137.59 cfs @ 1154 min Q in B: 47.11 cfs Combined Q: 184.69 cfs *
* Combined Peak: 184.69 cfs @ 1154 min Q in B: 47.11 cfs Q in C: 137.59 cfs *
*****
110BC --- --- -- -- 33 138 45 185 1154 ----- ---- ----- --- ----
--
111B --- --- -- -- --- --- 45 185 1154 MOUNTAIN 660 0.02727 --- ----
--
112B : Area B5
112B 010 K100 6 0 8 34 53 192 1157 ----- ---- ----- --- ----
--
113AB: Confluence
113AB *****
* Peak in A: 316.27 cfs @ 1158 min Q in B: 172.32 cfs Combined Q: 488.58 cfs *
* Peak in B: 191.95 cfs @ 1157 min Q in A: 314.12 cfs Combined Q: 506.08 cfs *
* Combined Peak: 506.08 cfs @ 1157 min Q in A: 314.12 cfs Q in B: 191.95 cfs *
*****
113AB --- --- -- -- 53 192 167 506 1157 ----- ---- ----- --- ----
--
114A --- --- -- -- --- --- 167 506 1157 MOUNTAIN 600 0.02666 --- ----
--
115A : Area A6
115A 010 K100 5 0 9 43 176 501 1159 ----- ---- ----- --- ----
--
116A --- --- -- -- --- --- 176 501 1159 MOUNTAIN 75 0.06660 --- ----
--
117B : Area A7
117B 010 K100 5 14 15 72 15 72 1153 ----- ---- ----- --- ----
--
118AB: Confluence
118AB *****
* Peak in A: 501.13 cfs @ 1159 min Q in B: 13.88 cfs Combined Q: 515.01 cfs *
* Peak in B: 72.09 cfs @ 1153 min Q in A: 292.72 cfs Combined Q: 364.82 cfs *
* Combined Peak: 515.01 cfs @ 1159 min Q in A: 501.13 cfs Q in B: 13.88 cfs *
*****
118AB --- --- -- -- 15 72 191 515 1159 ----- ---- ----- --- ----
--
119A --- --- -- -- --- --- 191 515 1159 MOUNTAIN 760 0.02368 --- ----
--
120A : Area A8
120A 010 K100 6 0 6 26 197 510 1161 ----- ---- ----- --- ----
--
121A --- --- -- -- --- --- 197 510 1161 PIPE 560 0.03570 5.00 ----
--
122C : Area C1
122C 020 K100 6 70 16 68 16 68 1153 ----- ---- ----- --- ----
--

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Channel Islands_100yr_prop.out
Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

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Model Results																	
SUBAREA DATA AND RESULTS								ACCUMULATED DATA			ROUTING AFTER ACCUMULATION						
VEL	NODE	SOIL	RAIN	TC	%	AREA	FLOW	AREA	FLOW	TIME	CHANNEL	LENGTH	SLOPE	SIZE	H:V	N VALUES	
(FT/S)	DEPTH ID (FT)	TYPE	ZONE	(MIN)	IMP	(AC)	(CFS)	(AC)	(CFS)	(MIN)	TYPE	(FT)	(FT/FT)	(FT)	(Z)	CHNL	SIDES
	123C	---	---	--	--	---	---	16	68	1153	PIPE	660	0.00500	3.50	----	-----	-----
	124C	---	---	--	--	---	---	16	64	1156	PIPE	1020	0.00500	3.50	----	-----	-----
	125B : Area C3																
	125B 020	K100		6	70	15	64	15	64	1153	-----	----	-----	---	----	-----	-----
	126B	---	---	--	--	---	---	15	64	1153	PIPE	1560	0.00500	3.50	----	-----	-----
	127BC	***** * Peak in B: 53.37 cfs @ 1158 min Q in C: 57.38 cfs Combined Q: 110.75 cfs * * Peak in C: 58.48 cfs @ 1159 min Q in B: 51.95 cfs Combined Q: 110.43 cfs * * Combined Peak: 110.75 cfs @ 1158 min Q in B: 53.37 cfs Q in C: 57.38 cfs * *****															
	127BC	---	---	--	--	16	58	31	111	1158	-----	----	-----	---	----	-----	-----
	128B	---	---	--	--	---	---	31	111	1158	PIPE	700	0.00500	4.25	----	-----	-----
	129AB	***** * Peak in A: 507.27 cfs @ 1162 min Q in B: 103.25 cfs Combined Q: 610.52 cfs * * Peak in B: 107.78 cfs @ 1161 min Q in A: 504.51 cfs Combined Q: 612.30 cfs * * Combined Peak: 612.30 cfs @ 1161 min Q in A: 504.51 cfs Q in B: 107.78 cfs * *****															
	129AB	---	---	--	--	31	108	228	612	1161	-----	----	-----	---	----	-----	-----
	130A : Area C4																
	130A 020	K100		6	3	8	32	236	617	1161	-----	----	-----	---	----	-----	-----
	131A : Area A9																
	131A 010	K100		6	0	33	142	269	642	1161	-----	----	-----	---	----	-----	-----
	132A : Area A10																
	132A 020	K100		6	0	15	61	284	652	1161	-----	----	-----	---	----	-----	-----

Issue/Warning Messages

TYPE	ERR NO	PROCEDURE	LOCATION	MESSAGE
------	--------	-----------	----------	---------

NO ISSUES OR WARNINGS DETECTED

Channel Islands_100yr_prop.out
Modified Rational Method Hydrology Program (VCRat v2.6)

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Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 101A

DESCRIPTION: Start - Area A
TOTAL AREA TO HYDROGRAPH: 114 acres
HYDROGRAPH PEAK: 319 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 31.56 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	4.11	400	4.11
500	6.16	600	8.20	700	10.26	800	12.31	900	17.09
1000	25.31	1050	35.57	1100	39.27	1110	56.42	1120	55.77
1130	75.61	1131	77.77	1132	79.93	1133	83.75	1134	85.91
1135	87.52	1136	86.44	1137	89.14	1138	91.29	1139	93.45
1140	96.14	1141	100.99	1142	105.30	1143	109.58	1144	114.20
1145	122.93	1146	130.12	1147	136.80	1148	144.14	1149	180.95
1150	214.14	1151	212.04	1152	281.49	1153	314.64	1154	318.85
1155	318.85	1156	317.27	1157	313.59	1158	304.64	1159	295.17
1160	286.75	1161	275.70	1162	237.82	1163	199.94	1164	200.99
1165	125.50	1166	86.98	1167	74.19	1168	67.35	1169	64.72
1170	57.88	1171	55.25	1172	52.62	1173	48.41	1174	47.35
1175	45.78	1176	44.20	1177	38.94	1178	38.94	1179	37.88
1180	37.88	1181	36.83	1182	33.15	1183	34.73	1184	33.67
1185	33.15	1186	32.62	1187	32.10	1188	32.10	1189	32.10
1190	32.10	1191	32.62	1192	32.10	1193	32.10	1194	32.10
1195	32.10	1196	32.10	1197	32.10	1198	32.10	1199	32.10
1200	32.10	1201	31.04	1202	30.52	1203	29.99	1204	29.46
1205	28.94	1206	27.89	1207	27.36	1208	26.31	1209	26.31
1210	25.26	1211	24.20	1212	24.20	1213	23.68	1214	23.68
1215	23.15	1216	23.68	1217	23.68	1218	23.68	1219	23.68
1220	23.68	1221	24.20	1222	23.68	1223	23.68	1224	24.20
1225	24.20	1226	23.68	1227	23.68	1228	24.20	1229	24.20
1230	23.68	1231	23.68	1232	24.20	1233	23.68	1234	23.15
1235	23.68	1236	23.68	1237	23.15	1238	23.15	1239	23.15
1240	23.15	1241	23.15	1242	22.62	1243	22.62	1244	23.15
1245	22.63	1246	22.62	1247	23.15	1248	22.62	1249	22.63
1250	23.15	1251	22.62	1252	22.62	1253	23.15	1254	22.62
1255	22.62	1256	23.15	1257	22.62	1258	22.62	1259	23.15
1260	22.63	1261	22.62	1262	22.10	1263	21.05	1264	21.05
1265	21.05	1266	19.99	1267	19.47	1268	19.47	1269	18.94
1270	18.42	1271	17.89	1272	17.36	1273	17.36	1274	16.84
1275	16.84	1276	17.36	1277	17.36	1278	16.84	1279	16.84
1280	17.36	1281	17.36	1282	16.84	1283	16.84	1284	17.36
1285	17.36	1286	16.84	1287	16.84	1288	17.36	1289	17.36
1290	16.84	1291	16.84	1292	17.36	1293	16.84	1294	16.84
1295	16.84	1296	17.36	1297	17.36	1298	16.84	1299	16.84
1300	17.36	1310	10.00	1320	8.73	1330	8.89	1340	8.37
1350	0.32	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 104C

DESCRIPTION: Area B2
TOTAL AREA TO HYDROGRAPH: 28 acres
HYDROGRAPH PEAK: 120 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 7.69 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	1.01	400	1.01
500	1.51	600	2.01	700	2.52	800	3.02	900	4.20
1000	6.22	1050	8.74	1100	9.65	1110	15.12	1120	13.27
1130	20.17	1131	20.17	1132	20.17	1133	21.03	1134	22.18
1135	23.04	1136	22.47	1137	23.90	1138	25.05	1139	25.33
1140	25.62	1141	27.31	1142	30.05	1143	30.87	1144	32.23
1145	35.83	1146	39.18	1147	41.42	1148	43.95	1149	60.76
1150	77.28	1151	72.52	1152	105.84	1153	120.12	1154	120.12
1155	103.32	1156	85.68	1157	86.24	1158	48.16	1159	28.95
1160	24.47	1161	21.03	1162	18.48	1163	16.80	1164	17.36
1165	15.40	1166	13.72	1167	12.88	1168	12.60	1169	13.72
1170	10.08	1171	10.92	1172	10.64	1173	10.64	1174	10.36
1175	8.40	1176	9.52	1177	8.68	1178	8.12	1179	8.12
1180	7.84	1181	7.84	1182	7.84	1183	7.84	1184	8.12
1185	8.12	1186	7.84	1187	7.84	1188	7.84	1189	8.12
1190	7.84	1191	7.84	1192	7.84	1193	7.84	1194	7.84
1195	7.84	1196	7.84	1197	7.84	1198	8.12	1199	7.84
1200	7.84	1201	7.28	1202	7.28	1203	6.72	1204	6.44
1205	6.16	1206	5.60	1207	5.88	1208	5.60	1209	5.88
1210	5.60	1211	5.60	1212	5.88	1213	5.88	1214	5.88
1215	5.60	1216	5.88	1217	6.16	1218	5.88	1219	5.60
1220	5.88	1221	6.16	1222	5.88	1223	5.60	1224	5.88
1225	6.16	1226	5.88	1227	5.60	1228	5.88	1229	6.16
1230	5.88	1231	5.60	1232	5.88	1233	5.88	1234	5.60
1235	5.60	1236	5.60	1237	5.60	1238	5.60	1239	5.60
1240	5.60	1241	5.60	1242	5.60	1243	5.60	1244	5.60
1245	5.60	1246	5.60	1247	5.60	1248	5.60	1249	5.60
1250	5.60	1251	5.60	1252	5.60	1253	5.60	1254	5.60
1255	5.60	1256	5.60	1257	5.60	1258	5.60	1259	5.60
1260	5.60	1261	5.60	1262	5.04	1263	4.76	1264	4.76
1265	4.48	1266	4.20	1267	3.92	1268	4.20	1269	4.48
1270	4.20	1271	3.92	1272	4.20	1273	4.48	1274	4.20
1275	3.92	1276	4.20	1277	4.48	1278	4.20	1279	3.92
1280	4.20	1281	4.48	1282	4.20	1283	3.92	1284	4.20
1285	4.48	1286	4.20	1287	3.92	1288	4.20	1289	4.48
1290	4.20	1291	3.92	1292	4.20	1293	4.20	1294	4.20
1295	3.92	1296	4.20	1297	4.48	1298	4.20	1299	4.20

					Channel Islands_100yr_prop.out				
1300	4.20	1310	2.02	1320	2.18	1330	2.18	1340	2.02
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 106D

DESCRIPTION: Area B3
TOTAL AREA TO HYDROGRAPH: 5 acres
HYDROGRAPH PEAK: 18 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 0.75 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.00	400	0.00
500	0.00	600	0.00	700	0.00	800	0.04	900	0.24
1000	0.59	1050	1.02	1100	1.18	1110	2.14	1120	1.81
1130	3.05	1131	3.05	1132	3.05	1133	3.17	1134	3.34
1135	3.46	1136	3.38	1137	3.58	1138	3.74	1139	3.91
1140	3.99	1141	4.19	1142	4.39	1143	4.79	1144	4.95
1145	5.47	1146	5.99	1147	6.46	1148	6.78	1149	9.20
1150	11.68	1151	11.31	1152	16.31	1153	18.46	1154	18.46
1155	18.09	1156	15.41	1157	12.64	1158	12.64	1159	7.01
1160	4.35	1161	3.50	1162	3.01	1163	2.62	1164	2.62
1165	2.27	1166	2.10	1167	1.75	1168	1.71	1169	1.88
1170	1.58	1171	1.29	1172	1.38	1173	1.29	1174	1.33
1175	1.25	1176	0.96	1177	1.09	1178	0.96	1179	0.92
1180	0.92	1181	0.88	1182	0.88	1183	0.84	1184	0.88
1185	0.92	1186	0.88	1187	0.88	1188	0.88	1189	0.88
1190	0.88	1191	0.88	1192	0.84	1193	0.88	1194	0.88
1195	0.88	1196	0.84	1197	0.88	1198	0.88	1199	0.88
1200	0.88	1201	0.80	1202	0.76	1203	0.72	1204	0.67
1205	0.59	1206	0.55	1207	0.51	1208	0.51	1209	0.51
1210	0.51	1211	0.47	1212	0.51	1213	0.55	1214	0.51
1215	0.51	1216	0.51	1217	0.55	1218	0.55	1219	0.51
1220	0.51	1221	0.55	1222	0.55	1223	0.51	1224	0.51
1225	0.55	1226	0.55	1227	0.51	1228	0.51	1229	0.55
1230	0.55	1231	0.51	1232	0.51	1233	0.51	1234	0.51
1235	0.51	1236	0.47	1237	0.47	1238	0.51	1239	0.47
1240	0.47	1241	0.51	1242	0.47	1243	0.47	1244	0.51
1245	0.47	1246	0.47	1247	0.51	1248	0.47	1249	0.47
1250	0.51	1251	0.47	1252	0.47	1253	0.51	1254	0.47
1255	0.47	1256	0.51	1257	0.47	1258	0.47	1259	0.51
1260	0.47	1261	0.47	1262	0.43	1263	0.34	1264	0.34
1265	0.34	1266	0.26	1267	0.22	1268	0.22	1269	0.26
1270	0.26	1271	0.22	1272	0.22	1273	0.26	1274	0.26
1275	0.22	1276	0.22	1277	0.26	1278	0.26	1279	0.22
1280	0.22	1281	0.26	1282	0.26	1283	0.22	1284	0.22

Channel Islands_100yr_prop.out

1285	0.26	1286	0.26	1287	0.22	1288	0.22	1289	0.26
1290	0.26	1291	0.22	1292	0.22	1293	0.22	1294	0.26
1295	0.22	1296	0.22	1297	0.26	1298	0.26	1299	0.22
1300	0.26	1310	0.00	1320	0.00	1330	0.00	1340	0.00
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

Page: 7

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 109B

DESCRIPTION: Area B4
TOTAL AREA TO HYDROGRAPH: 12 acres
HYDROGRAPH PEAK: 47 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 3.30 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.00	200	0.00	300	0.43	400	0.43
500	0.65	600	0.86	700	1.08	800	1.29	900	1.80
1000	2.67	1050	3.74	1100	4.13	1110	6.48	1120	5.69
1130	8.65	1131	8.65	1132	8.65	1133	8.96	1134	9.38
1135	9.70	1136	9.49	1137	10.01	1138	10.44	1139	10.86
1140	11.07	1141	11.59	1142	12.09	1143	13.09	1144	13.50
1145	14.81	1146	16.14	1147	17.37	1148	18.20	1149	24.38
1150	30.55	1151	29.62	1152	41.86	1153	47.11	1154	47.11
1155	46.18	1156	39.70	1157	32.91	1158	32.91	1159	18.82
1160	11.99	1161	9.80	1162	8.54	1163	7.61	1164	7.61
1165	6.79	1166	6.38	1167	5.55	1168	5.45	1169	5.86
1170	5.14	1171	4.42	1172	4.63	1173	4.42	1174	4.53
1175	4.32	1176	3.60	1177	3.91	1178	3.60	1179	3.50
1180	3.50	1181	3.39	1182	3.39	1183	3.29	1184	3.39
1185	3.50	1186	3.39	1187	3.39	1188	3.39	1189	3.39
1190	3.39	1191	3.39	1192	3.29	1193	3.39	1194	3.39
1195	3.39	1196	3.29	1197	3.39	1198	3.39	1199	3.39
1200	3.39	1201	3.19	1202	3.09	1203	2.98	1204	2.88
1205	2.67	1206	2.57	1207	2.47	1208	2.47	1209	2.47
1210	2.47	1211	2.37	1212	2.47	1213	2.57	1214	2.47
1215	2.47	1216	2.47	1217	2.57	1218	2.57	1219	2.47
1220	2.47	1221	2.57	1222	2.57	1223	2.47	1224	2.47
1225	2.57	1226	2.57	1227	2.47	1228	2.47	1229	2.57
1230	2.57	1231	2.47	1232	2.47	1233	2.47	1234	2.47
1235	2.47	1236	2.37	1237	2.37	1238	2.47	1239	2.37
1240	2.37	1241	2.47	1242	2.37	1243	2.37	1244	2.47
1245	2.37	1246	2.37	1247	2.47	1248	2.37	1249	2.37
1250	2.47	1251	2.37	1252	2.37	1253	2.47	1254	2.37
1255	2.37	1256	2.47	1257	2.37	1258	2.37	1259	2.47
1260	2.37	1261	2.37	1262	2.26	1263	2.06	1264	2.06
1265	2.06	1266	1.85	1267	1.75	1268	1.75	1269	1.85

Channel Islands_100yr_prop.out									
1270	1.85	1271	1.75	1272	1.75	1273	1.85	1274	1.85
1275	1.75	1276	1.75	1277	1.85	1278	1.85	1279	1.75
1280	1.75	1281	1.85	1282	1.85	1283	1.75	1284	1.75
1285	1.85	1286	1.85	1287	1.75	1288	1.75	1289	1.85
1290	1.85	1291	1.75	1292	1.75	1293	1.75	1294	1.85
1295	1.75	1296	1.75	1297	1.85	1298	1.85	1299	1.75
1300	1.85	1310	0.86	1320	0.94	1330	0.94	1340	0.86
1350	0.00	1360	0.00	1370	0.00	1380	0.00	1390	0.00
1400	0.00	1420	0.00	1440	0.00	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

Page: 8

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 110BC

TOTAL AREA TO HYDROGRAPH: 45 acres
HYDROGRAPH PEAK: 185 cfs
TIME OF PEAK: 1154 minutes
HYDROGRAPH VOLUME: 11.94 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	1.42	400	1.45
500	2.14	600	2.89	700	3.58	800	4.36	900	6.20
1000	9.47	1050	13.43	1100	14.98	1110	23.14	1120	21.32
1130	30.77	1131	32.04	1132	31.80	1133	32.66	1134	34.20
1135	35.67	1136	35.67	1137	36.64	1138	38.57	1139	39.89
1140	40.49	1141	42.14	1142	45.05	1143	48.25	1144	49.94
1145	54.16	1146	59.64	1147	64.09	1148	67.68	1149	86.13
1150	113.02	1151	116.19	1152	148.68	1153	183.51	1154	184.69
1155	174.59	1156	146.98	1157	131.41	1158	110.77	1159	63.91
1160	44.19	1161	36.58	1162	31.57	1163	28.34	1164	27.23
1165	25.77	1166	23.30	1167	20.94	1168	19.99	1169	20.73
1170	19.13	1171	16.52	1172	16.65	1173	16.48	1174	16.33
1175	15.34	1176	13.66	1177	14.02	1178	13.26	1179	12.60
1180	12.46	1181	12.17	1182	12.11	1183	11.99	1184	12.18
1185	12.49	1186	12.33	1187	12.15	1188	12.11	1189	12.20
1190	12.26	1191	12.16	1192	11.98	1193	12.10	1194	12.12
1195	12.11	1196	11.99	1197	12.10	1198	12.21	1199	12.26
1200	12.16	1201	11.68	1202	11.22	1203	10.81	1204	10.30
1205	9.69	1206	9.19	1207	8.79	1208	8.72	1209	8.72
1210	8.72	1211	8.51	1212	8.63	1213	8.93	1214	8.88
1215	8.78	1216	8.71	1217	9.00	1218	9.15	1219	8.86
1220	8.71	1221	9.00	1222	9.15	1223	8.86	1224	8.71
1225	9.00	1226	9.15	1227	8.86	1228	8.71	1229	9.00
1230	9.15	1231	8.86	1232	8.71	1233	8.80	1234	8.78
1235	8.64	1236	8.45	1237	8.43	1238	8.56	1239	8.45
1240	8.43	1241	8.56	1242	8.45	1243	8.43	1244	8.56
1245	8.45	1246	8.43	1247	8.56	1248	8.45	1249	8.43
1250	8.56	1251	8.45	1252	8.43	1253	8.56	1254	8.45
1255	8.43	1256	8.56	1257	8.45	1258	8.43	1259	8.56

Channel Islands_100yr_prop.out									
1260	8.45	1261	8.43	1262	8.16	1263	7.52	1264	7.22
1265	7.09	1266	6.62	1267	6.18	1268	6.04	1269	6.29
1270	6.46	1271	6.18	1272	6.03	1273	6.29	1274	6.46
1275	6.18	1276	6.03	1277	6.29	1278	6.46	1279	6.18
1280	6.03	1281	6.29	1282	6.46	1283	6.18	1284	6.03
1285	6.29	1286	6.46	1287	6.18	1288	6.03	1289	6.29
1290	6.46	1291	6.18	1292	6.03	1293	6.09	1294	6.29
1295	6.12	1296	6.03	1297	6.29	1298	6.46	1299	6.25
1300	6.29	1310	3.26	1320	2.92	1330	3.28	1340	2.78
1350	0.85	1360	0.40	1370	0.41	1380	0.40	1390	0.40
1400	0.40	1420	0.40	1440	0.40	1460	0.40	1500	0.40

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

Page: 9

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 112B

DESCRIPTION: Area B5
TOTAL AREA TO HYDROGRAPH: 53 acres
HYDROGRAPH PEAK: 192 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 14.16 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.40	200	0.40	300	1.50	400	1.82
500	2.39	600	3.45	700	4.17	800	5.19	900	7.17
1000	11.01	1050	15.27	1100	17.74	1110	22.86	1120	25.77
1130	31.76	1131	32.64	1132	33.55	1133	34.75	1134	35.99
1135	37.00	1136	37.63	1137	39.05	1138	40.43	1139	41.42
1140	42.48	1141	44.16	1142	46.17	1143	47.59	1144	49.47
1145	52.55	1146	55.81	1147	59.05	1148	63.28	1149	72.32
1150	81.52	1151	88.72	1152	113.38	1153	134.58	1154	157.20
1155	178.76	1156	189.82	1157	191.95	1158	172.32	1159	153.28
1160	135.02	1161	111.95	1162	89.05	1163	71.43	1164	59.65
1165	50.53	1166	43.86	1167	39.22	1168	35.88	1169	33.50
1170	30.02	1171	28.15	1172	26.58	1173	25.41	1174	24.05
1175	22.25	1176	21.63	1177	20.68	1178	19.87	1179	19.09
1180	18.22	1181	17.57	1182	16.97	1183	16.43	1184	16.05
1185	15.65	1186	15.25	1187	15.02	1188	14.88	1189	14.90
1190	14.75	1191	14.67	1192	14.60	1193	14.56	1194	14.54
1195	14.50	1196	14.45	1197	14.41	1198	14.48	1199	14.38
1200	14.36	1201	14.19	1202	14.21	1203	14.08	1204	13.97
1205	13.78	1206	13.43	1207	13.26	1208	12.88	1209	12.60
1210	12.13	1211	11.74	1212	11.47	1213	11.21	1214	11.01
1215	10.77	1216	10.72	1217	10.75	1218	10.65	1219	10.53
1220	10.58	1221	10.65	1222	10.61	1223	10.54	1224	10.59
1225	10.66	1226	10.62	1227	10.54	1228	10.59	1229	10.67
1230	10.62	1231	10.55	1232	10.59	1233	10.59	1234	10.54
1235	10.55	1236	10.51	1237	10.48	1238	10.45	1239	10.42
1240	10.35	1241	10.29	1242	10.24	1243	10.21	1244	10.18

Channel Islands_100yr_prop.out									
1245	10.16	1246	10.14	1247	10.12	1248	10.12	1249	10.11
1250	10.10	1251	10.10	1252	10.10	1253	10.09	1254	10.09
1255	10.09	1256	10.08	1257	10.08	1258	10.09	1259	10.08
1260	10.08	1261	10.09	1262	9.92	1263	9.84	1264	9.85
1265	9.75	1266	9.63	1267	9.42	1268	9.30	1269	9.17
1270	8.88	1271	8.54	1272	8.35	1273	8.21	1274	7.99
1275	7.81	1276	7.78	1277	7.76	1278	7.64	1279	7.54
1280	7.57	1281	7.60	1282	7.52	1283	7.44	1284	7.49
1285	7.54	1286	7.47	1287	7.41	1288	7.46	1289	7.52
1290	7.45	1291	7.39	1292	7.45	1293	7.43	1294	7.45
1295	7.39	1296	7.45	1297	7.49	1298	7.40	1299	7.40
1300	7.38	1310	5.93	1320	4.50	1330	3.73	1340	3.65
1350	2.61	1360	1.58	1370	0.84	1380	0.53	1390	0.44
1400	0.41	1420	0.40	1440	0.40	1460	0.40	1500	0.40

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Page: 10 Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition
Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 113AB

DESCRIPTION: Confluence
TOTAL AREA TO HYDROGRAPH: 167 acres
HYDROGRAPH PEAK: 506 cfs
TIME OF PEAK: 1157 minutes
HYDROGRAPH VOLUME: 45.94 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.80	200	0.80	300	5.20	400	6.19
500	8.12	600	11.83	700	14.07	800	17.63	900	23.78
1000	36.21	1050	49.73	1100	57.29	1110	72.67	1120	83.46
1130	99.31	1131	102.67	1132	106.30	1133	110.39	1134	114.24
1135	117.98	1136	121.25	1137	124.65	1138	127.24	1139	129.42
1140	132.24	1141	136.15	1142	140.87	1143	145.81	1144	151.88
1145	159.52	1146	167.97	1147	177.60	1148	189.12	1149	206.40
1150	228.53	1151	257.25	1152	307.94	1153	356.34	1154	410.52
1155	463.62	1156	495.47	1157	506.08	1158	488.58	1159	468.31
1160	445.03	1161	414.40	1162	380.56	1163	347.53	1164	310.85
1165	272.45	1166	235.17	1167	194.52	1168	154.21	1169	125.43
1170	107.43	1171	97.43	1172	90.56	1173	84.87	1174	79.86
1175	74.99	1176	71.67	1177	68.60	1178	65.89	1179	62.81
1180	59.51	1181	57.12	1182	55.56	1183	54.22	1184	52.66
1185	50.99	1186	49.82	1187	49.09	1188	48.41	1189	47.90
1190	47.32	1191	46.97	1192	46.79	1193	46.77	1194	46.81
1195	46.74	1196	46.61	1197	46.54	1198	46.59	1199	46.48
1200	46.45	1201	46.29	1202	46.28	1203	45.96	1204	45.44
1205	44.70	1206	43.81	1207	43.10	1208	42.11	1209	41.14
1210	39.93	1211	38.85	1212	37.96	1213	37.01	1214	36.11
1215	35.33	1216	34.88	1217	34.58	1218	34.27	1219	34.10
1220	34.18	1221	34.30	1222	34.28	1223	34.28	1224	34.42
1225	34.50	1226	34.45	1227	34.48	1228	34.59	1229	34.59

Channel Islands_100yr_prop.out

1230	34.50	1231	34.50	1232	34.59	1233	34.51	1234	34.41
1235	34.43	1236	34.29	1237	34.09	1238	34.02	1239	33.96
1240	33.77	1241	33.57	1242	33.46	1243	33.38	1244	33.26
1245	33.09	1246	32.99	1247	32.97	1248	32.93	1249	32.90
1250	32.92	1251	32.90	1252	32.88	1253	32.91	1254	32.89
1255	32.88	1256	32.90	1257	32.88	1258	32.87	1259	32.90
1260	32.88	1261	32.87	1262	32.74	1263	32.63	1264	32.48
1265	32.06	1266	31.46	1267	30.85	1268	30.38	1269	29.80
1270	29.01	1271	28.27	1272	27.69	1273	27.11	1274	26.42
1275	25.79	1276	25.39	1277	25.06	1278	24.76	1279	24.67
1280	24.74	1281	24.71	1282	24.56	1283	24.54	1284	24.65
1285	24.64	1286	24.51	1287	24.50	1288	24.62	1289	24.62
1290	24.49	1291	24.49	1292	24.61	1293	24.53	1294	24.48
1295	24.43	1296	24.47	1297	24.44	1298	24.34	1299	24.45
1300	24.52	1310	19.27	1320	13.79	1330	12.61	1340	12.30
1350	7.49	1360	2.83	1370	1.24	1380	0.93	1390	0.84
1400	0.81	1420	0.80	1440	0.80	1460	0.80	1500	0.80

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

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Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 115A

DESCRIPTION: Area A6
TOTAL AREA TO HYDROGRAPH: 176 acres
HYDROGRAPH PEAK: 501 cfs
TIME OF PEAK: 1159 minutes
HYDROGRAPH VOLUME: 48.47 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.80	200	0.80	300	4.92	400	6.72
500	8.20	600	12.42	700	14.62	800	18.48	900	24.68
1000	37.64	1050	51.22	1100	60.20	1110	71.30	1120	84.54
1130	100.21	1131	102.02	1132	103.92	1133	106.67	1134	110.21
1135	114.10	1136	117.66	1137	121.99	1138	125.75	1139	129.20
1140	132.51	1141	136.47	1142	139.72	1143	143.62	1144	148.28
1145	154.37	1146	160.96	1147	168.82	1148	177.86	1149	193.66
1150	211.15	1151	225.55	1152	260.25	1153	298.94	1154	338.76
1155	384.76	1156	441.59	1157	475.64	1158	497.54	1159	501.41
1160	489.24	1161	469.71	1162	445.33	1163	415.91	1164	385.76
1165	352.48	1166	318.68	1167	284.08	1168	249.07	1169	213.97
1170	180.85	1171	153.35	1172	132.41	1173	117.03	1174	105.52
1175	97.88	1176	91.14	1177	85.32	1178	80.66	1179	76.71
1180	73.33	1181	70.26	1182	67.34	1183	64.47	1184	62.03
1185	60.02	1186	58.22	1187	56.60	1188	55.18	1189	53.90
1190	52.75	1191	51.99	1192	51.18	1193	50.59	1194	50.12
1195	49.90	1196	49.59	1197	49.57	1198	49.45	1199	49.24
1200	49.16	1201	49.00	1202	48.83	1203	48.54	1204	48.46
1205	48.14	1206	47.91	1207	47.54	1208	47.00	1209	46.37
1210	45.65	1211	44.85	1212	43.94	1213	43.07	1214	41.97

Channel Islands_100yr_prop.out									
1215	41.01	1216	40.18	1217	39.28	1218	38.36	1219	37.71
1220	37.34	1221	36.94	1222	36.54	1223	36.37	1224	36.39
1225	36.33	1226	36.20	1227	36.22	1228	36.36	1229	36.38
1230	36.30	1231	36.34	1232	36.46	1233	36.35	1234	36.25
1235	36.37	1236	36.35	1237	36.21	1238	36.28	1239	36.21
1240	36.00	1241	36.02	1242	35.92	1243	35.68	1244	35.65
1245	35.52	1246	35.30	1247	35.28	1248	35.15	1249	34.93
1250	34.95	1251	34.89	1252	34.73	1253	34.81	1254	34.78
1255	34.65	1256	34.75	1257	34.74	1258	34.63	1259	34.73
1260	34.73	1261	34.62	1262	34.51	1263	34.40	1264	34.27
1265	34.22	1266	34.03	1267	33.90	1268	33.77	1269	33.41
1270	32.88	1271	32.42	1272	32.02	1273	31.43	1274	30.70
1275	30.08	1276	29.58	1277	28.96	1278	28.25	1279	27.70
1280	27.34	1281	26.95	1282	26.55	1283	26.36	1284	26.34
1285	26.22	1286	26.02	1287	25.99	1288	26.07	1289	26.02
1290	25.89	1291	25.89	1292	25.99	1293	25.86	1294	25.85
1295	25.85	1296	25.95	1297	25.93	1298	25.91	1299	25.78
1300	25.87	1310	22.56	1320	17.58	1330	14.20	1340	13.15
1350	10.44	1360	6.49	1370	3.48	1380	1.71	1390	1.04
1400	0.87	1420	0.80	1440	0.80	1460	0.80	1500	0.80

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

Page: 12

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 117B

DESCRIPTION: Area A7
TOTAL AREA TO HYDROGRAPH: 15 acres
HYDROGRAPH PEAK: 72 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 5.22 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	0.54	200	0.59	300	1.14	400	1.14
500	1.40	600	1.67	700	1.94	800	2.20	900	2.83
1000	3.91	1050	5.25	1100	5.73	1110	8.64	1120	7.66
1130	11.33	1131	11.33	1132	11.33	1133	11.88	1134	12.61
1135	13.15	1136	12.79	1137	13.70	1138	13.88	1139	13.88
1140	14.25	1141	16.20	1142	16.72	1143	17.42	1144	18.30
1145	20.43	1146	21.86	1147	23.47	1148	25.08	1149	35.63
1150	44.75	1151	41.71	1152	62.98	1153	72.09	1154	62.98
1155	52.25	1156	53.15	1157	29.20	1158	17.07	1159	13.88
1160	12.61	1161	10.97	1162	9.89	1163	9.18	1164	9.71
1165	8.11	1166	7.93	1167	7.39	1168	7.21	1169	6.85
1170	6.32	1171	6.32	1172	6.50	1173	6.14	1174	5.07
1175	5.78	1176	5.42	1177	5.07	1178	4.89	1179	4.71
1180	4.71	1181	4.71	1182	4.89	1183	4.89	1184	4.89
1185	4.89	1186	4.71	1187	4.71	1188	4.89	1189	4.89
1190	4.71	1191	4.89	1192	4.71	1193	4.71	1194	4.71
1195	4.89	1196	4.71	1197	4.89	1198	4.89	1199	4.71

Channel Islands_100yr_prop.out									
1200	4.71	1201	4.53	1202	4.35	1203	3.99	1204	3.99
1205	3.64	1206	3.64	1207	3.64	1208	3.64	1209	3.64
1210	3.64	1211	3.64	1212	3.64	1213	3.82	1214	3.64
1215	3.64	1216	3.82	1217	3.82	1218	3.64	1219	3.64
1220	3.82	1221	3.82	1222	3.64	1223	3.64	1224	3.82
1225	3.82	1226	3.64	1227	3.64	1228	3.82	1229	3.82
1230	3.64	1231	3.64	1232	3.82	1233	3.64	1234	3.46
1235	3.64	1236	3.64	1237	3.46	1238	3.64	1239	3.64
1240	3.46	1241	3.64	1242	3.64	1243	3.46	1244	3.64
1245	3.64	1246	3.46	1247	3.64	1248	3.64	1249	3.46
1250	3.64	1251	3.64	1252	3.46	1253	3.64	1254	3.64
1255	3.46	1256	3.64	1257	3.64	1258	3.46	1259	3.64
1260	3.64	1261	3.46	1262	3.28	1263	3.10	1264	2.92
1265	2.92	1266	2.74	1267	2.74	1268	2.92	1269	2.92
1270	2.74	1271	2.74	1272	2.92	1273	2.92	1274	2.74
1275	2.74	1276	2.92	1277	2.92	1278	2.74	1279	2.74
1280	2.92	1281	2.92	1282	2.74	1283	2.74	1284	2.92
1285	2.92	1286	2.74	1287	2.74	1288	2.92	1289	2.92
1290	2.74	1291	2.74	1292	2.92	1293	2.74	1294	2.74
1295	2.74	1296	2.92	1297	2.92	1298	2.92	1299	2.74
1300	2.92	1310	1.67	1320	1.76	1330	1.76	1340	1.67
1350	0.56	1360	0.55	1370	0.56	1380	0.56	1390	0.55
1400	0.56	1420	0.39	1440	0.39	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

Page: 13

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 118AB

DESCRIPTION: Confluence
TOTAL AREA TO HYDROGRAPH: 191 acres
HYDROGRAPH PEAK: 515 cfs
TIME OF PEAK: 1159 minutes
HYDROGRAPH VOLUME: 53.69 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.34	200	1.39	300	6.01	400	7.87
500	9.56	600	14.09	700	16.53	800	20.68	900	27.48
1000	41.50	1050	56.35	1100	65.91	1110	79.47	1120	91.98
1130	111.00	1131	112.98	1132	114.73	1133	117.86	1134	121.93
1135	126.32	1136	129.62	1137	134.63	1138	138.82	1139	142.27
1140	146.02	1141	151.73	1142	155.78	1143	160.10	1144	165.57
1145	173.41	1146	181.43	1147	190.56	1148	201.07	1149	225.78
1150	252.62	1151	264.57	1152	315.82	1153	364.82	1154	394.65
1155	429.65	1156	485.51	1157	501.21	1158	510.90	1159	515.01
1160	504.15	1161	483.52	1162	459.18	1163	429.67	1164	400.22
1165	366.16	1166	332.18	1167	297.60	1168	262.58	1169	227.56
1170	193.71	1171	165.31	1172	143.40	1173	126.60	1174	113.27
1175	105.43	1176	98.33	1177	91.82	1178	86.78	1179	82.46
1180	78.95	1181	75.81	1182	73.07	1183	70.17	1184	67.60

Channel Islands_100yr_prop.out									
1185	65.48	1186	63.47	1187	61.79	1188	60.50	1189	59.17
1190	57.80	1191	57.10	1192	56.15	1193	55.47	1194	54.98
1195	54.85	1196	54.41	1197	54.45	1198	54.39	1199	54.01
1200	53.89	1201	53.59	1202	53.23	1203	52.64	1204	52.47
1205	51.90	1206	51.61	1207	51.31	1208	50.81	1209	50.21
1210	49.52	1211	48.75	1212	47.88	1213	47.17	1214	45.98
1215	44.96	1216	44.27	1217	43.40	1218	42.31	1219	41.56
1220	41.28	1221	40.90	1222	40.31	1223	40.06	1224	40.19
1225	40.17	1226	39.89	1227	39.85	1228	40.13	1229	40.19
1230	39.97	1231	39.96	1232	40.23	1233	40.04	1234	39.74
1235	39.96	1236	40.00	1237	39.72	1238	39.89	1239	39.88
1240	39.54	1241	39.64	1242	39.60	1243	39.23	1244	39.29
1245	39.21	1246	38.84	1247	38.92	1248	38.85	1249	38.47
1250	38.58	1251	38.56	1252	38.25	1253	38.41	1254	38.43
1255	38.16	1256	38.35	1257	38.39	1258	38.13	1259	38.32
1260	38.37	1261	38.12	1262	37.83	1263	37.54	1264	37.24
1265	37.15	1266	36.85	1267	36.69	1268	36.74	1269	36.47
1270	35.82	1271	35.33	1272	35.09	1273	34.57	1274	33.71
1275	33.05	1276	32.69	1277	32.12	1278	31.26	1279	30.65
1280	30.40	1281	30.02	1282	29.45	1283	29.17	1284	29.27
1285	29.19	1286	28.84	1287	28.74	1288	28.96	1289	28.97
1290	28.68	1291	28.63	1292	28.87	1293	28.66	1294	28.59
1295	28.60	1296	28.83	1297	28.87	1298	28.83	1299	28.58
1300	28.75	1310	24.45	1320	19.52	1330	16.13	1340	14.82
1350	11.24	1360	7.23	1370	4.30	1380	2.37	1390	1.68
1400	1.42	1420	1.21	1440	1.19	1460	0.80	1500	0.80

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Page: 14 Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition
Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 120A

DESCRIPTION: Area A8
TOTAL AREA TO HYDROGRAPH: 197 acres
HYDROGRAPH PEAK: 510 cfs
TIME OF PEAK: 1161 minutes
HYDROGRAPH VOLUME: 55.45 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	1.34	200	1.38	300	5.47	400	8.19
500	9.49	600	14.25	700	16.87	800	20.99	900	27.89
1000	41.88	1050	56.49	1100	67.40	1110	76.12	1120	89.32
1130	107.13	1131	109.12	1132	111.08	1133	113.25	1134	115.43
1135	117.81	1136	120.49	1137	124.22	1138	128.13	1139	132.12
1140	136.44	1141	140.93	1142	145.55	1143	150.12	1144	155.05
1145	160.39	1146	166.06	1147	172.47	1148	180.05	1149	191.72
1150	205.59	1151	220.26	1152	247.47	1153	274.27	1154	308.75
1155	346.96	1156	383.23	1157	426.43	1158	460.68	1159	486.22
1160	503.07	1161	509.56	1162	504.74	1163	490.91	1164	471.02
1165	446.35	1166	418.61	1167	389.15	1168	358.76	1169	328.06

Channel Islands_100yr_prop.out									
1170	295.69	1171	264.66	1172	234.75	1173	207.00	1174	182.58
1175	161.64	1176	144.80	1177	130.96	1178	120.11	1179	111.31
1180	103.92	1181	97.61	1182	92.20	1183	87.73	1184	83.92
1185	80.45	1186	77.24	1187	74.42	1188	71.85	1189	69.57
1190	67.42	1191	65.66	1192	64.07	1193	62.61	1194	61.33
1195	60.20	1196	59.22	1197	58.41	1198	57.82	1199	57.25
1200	56.89	1201	56.50	1202	56.24	1203	55.86	1204	55.55
1205	55.19	1206	54.74	1207	54.45	1208	54.02	1209	53.71
1210	53.30	1211	52.91	1212	52.53	1213	52.02	1214	51.43
1215	50.71	1216	50.07	1217	49.34	1218	48.41	1219	47.50
1220	46.73	1221	45.91	1222	44.99	1223	44.19	1224	43.63
1225	43.12	1226	42.55	1227	42.15	1228	41.98	1229	41.84
1230	41.60	1231	41.45	1232	41.48	1233	41.44	1234	41.32
1235	41.31	1236	41.31	1237	41.25	1238	41.20	1239	41.19
1240	41.15	1241	41.11	1242	41.10	1243	41.04	1244	40.97
1245	40.92	1246	40.83	1247	40.72	1248	40.64	1249	40.52
1250	40.39	1251	40.30	1252	40.17	1253	40.04	1254	39.96
1255	39.86	1256	39.77	1257	39.72	1258	39.66	1259	39.60
1260	39.59	1261	39.55	1262	39.40	1263	39.34	1264	39.32
1265	39.16	1266	38.95	1267	38.70	1268	38.57	1269	38.43
1270	38.17	1271	37.95	1272	37.86	1273	37.69	1274	37.30
1275	36.90	1276	36.61	1277	36.23	1278	35.65	1279	35.06
1280	34.62	1281	34.12	1282	33.46	1283	32.84	1284	32.41
1285	31.99	1286	31.46	1287	31.03	1288	30.81	1289	30.63
1290	30.33	1291	30.11	1292	30.07	1293	29.98	1294	29.87
1295	29.74	1296	29.76	1297	29.77	1298	29.65	1299	29.63
1300	29.66	1310	27.47	1320	23.38	1330	19.20	1340	16.47
1350	13.82	1360	10.73	1370	7.41	1380	4.95	1390	3.19
1400	2.09	1420	1.35	1440	1.34	1460	1.34	1500	1.34

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

Page: 15

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 122C

DESCRIPTION: Area C1
TOTAL AREA TO HYDROGRAPH: 16 acres
HYDROGRAPH PEAK: 68 cfs
TIME OF PEAK: 1153 minutes
HYDROGRAPH VOLUME: 9.66 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	2.87	200	3.13	300	3.58	400	3.58
500	3.77	600	3.96	700	4.15	800	4.38	900	5.02
1000	6.12	1050	7.49	1100	7.99	1110	10.99	1120	9.97
1130	13.78	1131	13.78	1132	13.78	1133	14.24	1134	14.85
1135	15.30	1136	15.00	1137	15.76	1138	16.37	1139	16.52
1140	16.67	1141	17.58	1142	19.10	1143	19.55	1144	20.31
1145	22.27	1146	24.08	1147	25.28	1148	26.64	1149	35.74
1150	44.78	1151	42.17	1152	60.45	1153	68.27	1154	68.27

Channel Islands_100yr_prop.out									
1155	59.07	1156	49.37	1157	49.68	1158	28.90	1159	18.49
1160	16.06	1161	14.24	1162	12.86	1163	11.93	1164	12.24
1165	11.15	1166	10.22	1167	9.75	1168	9.60	1169	10.22
1170	8.22	1171	8.68	1172	8.53	1173	8.53	1174	8.38
1175	7.31	1176	7.92	1177	7.46	1178	7.16	1179	7.16
1180	7.00	1181	7.00	1182	7.00	1183	7.00	1184	7.16
1185	7.16	1186	7.00	1187	7.00	1188	7.00	1189	7.16
1190	7.00	1191	7.00	1192	7.00	1193	7.00	1194	7.00
1195	7.00	1196	7.00	1197	7.00	1198	7.16	1199	7.00
1200	7.00	1201	6.70	1202	6.70	1203	6.39	1204	6.24
1205	6.09	1206	5.78	1207	5.93	1208	5.78	1209	5.93
1210	5.78	1211	5.78	1212	5.93	1213	5.93	1214	5.93
1215	5.78	1216	5.93	1217	6.09	1218	5.93	1219	5.78
1220	5.93	1221	6.09	1222	5.93	1223	5.78	1224	5.93
1225	6.09	1226	5.93	1227	5.78	1228	5.93	1229	6.09
1230	5.93	1231	5.78	1232	5.93	1233	5.93	1234	5.78
1235	5.78	1236	5.78	1237	5.78	1238	5.78	1239	5.78
1240	5.78	1241	5.78	1242	5.78	1243	5.78	1244	5.78
1245	5.78	1246	5.78	1247	5.78	1248	5.78	1249	5.78
1250	5.78	1251	5.78	1252	5.78	1253	5.78	1254	5.78
1255	5.78	1256	5.78	1257	5.78	1258	5.78	1259	5.78
1260	5.78	1261	5.78	1262	5.48	1263	5.32	1264	5.32
1265	5.17	1266	5.02	1267	4.87	1268	5.02	1269	5.17
1270	5.02	1271	4.87	1272	5.02	1273	5.17	1274	5.02
1275	4.87	1276	5.02	1277	5.17	1278	5.02	1279	4.87
1280	5.02	1281	5.17	1282	5.02	1283	4.87	1284	5.02
1285	5.17	1286	5.02	1287	4.87	1288	5.02	1289	5.17
1290	5.02	1291	4.87	1292	5.02	1293	5.02	1294	5.02
1295	4.87	1296	5.02	1297	5.17	1298	5.02	1299	5.02
1300	5.02	1310	3.96	1320	4.02	1330	4.02	1340	3.96
1350	3.00	1360	2.94	1370	3.00	1380	3.00	1390	2.94
1400	3.00	1420	2.07	1440	2.07	1460	0.00	1500	0.00

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Page: 16 Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition
Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 127BC

TOTAL AREA TO HYDROGRAPH: 31 acres
HYDROGRAPH PEAK: 111 cfs
TIME OF PEAK: 1158 minutes
HYDROGRAPH VOLUME: 19.20 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	5.57	200	5.99	300	6.85	400	6.95
500	7.23	600	7.66	700	7.98	800	8.46	900	9.57
1000	11.69	1050	13.98	1100	15.48	1110	17.49	1120	19.92
1130	22.39	1131	22.83	1132	23.29	1133	23.84	1134	24.46
1135	25.03	1136	25.55	1137	26.11	1138	26.78	1139	27.44
1140	28.05	1141	28.74	1142	29.47	1143	30.16	1144	30.88

Channel Islands_100yr_prop.out									
1145	31.89	1146	33.17	1147	34.60	1148	36.30	1149	38.47
1150	40.96	1151	43.92	1152	49.09	1153	57.16	1154	66.62
1155	78.47	1156	92.58	1157	104.62	1158	110.75	1159	110.43
1160	105.41	1161	95.42	1162	81.45	1163	67.46	1164	55.74
1165	46.74	1166	40.04	1167	35.08	1168	31.47	1169	28.69
1170	26.34	1171	24.47	1172	22.99	1173	21.84	1174	20.74
1175	19.73	1176	18.95	1177	18.30	1178	17.76	1179	17.18
1180	16.63	1181	16.17	1182	15.71	1183	15.30	1184	14.95
1185	14.64	1186	14.39	1187	14.19	1188	14.06	1189	13.99
1190	13.92	1191	13.85	1192	13.80	1193	13.77	1194	13.75
1195	13.71	1196	13.69	1197	13.66	1198	13.64	1199	13.62
1200	13.61	1201	13.60	1202	13.61	1203	13.63	1204	13.62
1205	13.57	1206	13.48	1207	13.35	1208	13.16	1209	12.94
1210	12.68	1211	12.42	1212	12.19	1213	12.00	1214	11.84
1215	11.70	1216	11.60	1217	11.55	1218	11.52	1219	11.49
1220	11.46	1221	11.47	1222	11.50	1223	11.49	1224	11.48
1225	11.49	1226	11.51	1227	11.50	1228	11.48	1229	11.49
1230	11.51	1231	11.50	1232	11.48	1233	11.49	1234	11.51
1235	11.50	1236	11.48	1237	11.48	1238	11.46	1239	11.42
1240	11.38	1241	11.34	1242	11.31	1243	11.28	1244	11.26
1245	11.25	1246	11.24	1247	11.23	1248	11.22	1249	11.22
1250	11.21	1251	11.21	1252	11.21	1253	11.21	1254	11.21
1255	11.21	1256	11.20	1257	11.20	1258	11.20	1259	11.20
1260	11.20	1261	11.20	1262	11.20	1263	11.20	1264	11.20
1265	11.20	1266	11.17	1267	11.08	1268	10.95	1269	10.81
1270	10.64	1271	10.46	1272	10.27	1273	10.14	1274	10.05
1275	9.97	1276	9.89	1277	9.84	1278	9.83	1279	9.80
1280	9.77	1281	9.75	1282	9.76	1283	9.76	1284	9.73
1285	9.73	1286	9.74	1287	9.74	1288	9.72	1289	9.72
1290	9.74	1291	9.74	1292	9.72	1293	9.72	1294	9.73
1295	9.73	1296	9.72	1297	9.70	1298	9.70	1299	9.69
1300	9.67	1310	9.09	1320	8.15	1330	7.76	1340	7.76
1350	7.23	1360	6.24	1370	5.77	1380	5.78	1390	5.78
1400	5.75	1420	5.60	1440	5.57	1460	5.57	1500	5.57

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

Page: 17

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 129AB

TOTAL AREA TO HYDROGRAPH: 228 acres
HYDROGRAPH PEAK: 612 cfs
TIME OF PEAK: 1161 minutes
HYDROGRAPH VOLUME: 74.67 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	6.90	200	7.34	300	12.17	400	15.17
500	16.64	600	21.88	700	24.79	800	29.39	900	37.33
1000	53.35	1050	70.02	1100	82.75	1110	92.06	1120	107.76
1130	127.47	1131	129.80	1132	132.01	1133	134.45	1134	137.05

Channel Islands_100yr_prop.out									
1135	139.87	1136	142.95	1137	146.61	1138	150.91	1139	155.43
1140	160.18	1141	165.19	1142	170.39	1143	175.74	1144	181.22
1145	187.03	1146	193.29	1147	200.31	1148	208.43	1149	219.19
1150	233.51	1151	249.92	1152	272.95	1153	303.32	1154	339.52
1155	383.44	1156	430.55	1157	481.80	1158	532.53	1159	572.09
1160	599.03	1161	612.30	1162	610.52	1163	593.52	1164	564.70
1165	529.71	1166	492.18	1167	454.57	1168	417.72	1169	381.91
1170	346.55	1171	311.89	1172	279.06	1173	248.48	1174	220.86
1175	196.85	1176	176.72	1177	160.21	1178	146.85	1179	135.93
1180	127.22	1181	119.57	1182	113.03	1183	107.44	1184	102.77
1185	98.66	1186	94.88	1187	91.47	1188	88.41	1189	85.69
1190	83.25	1191	81.12	1192	79.34	1193	77.69	1194	76.21
1195	74.92	1196	73.79	1197	72.81	1198	72.03	1199	71.39
1200	70.87	1201	70.45	1202	70.09	1203	69.77	1204	69.44
1205	69.10	1206	68.72	1207	68.30	1208	67.88	1209	67.42
1210	66.92	1211	66.36	1212	65.75	1213	65.10	1214	64.35
1215	63.52	1216	62.66	1217	61.82	1218	60.91	1219	59.93
1220	58.99	1221	58.14	1222	57.27	1223	56.39	1224	55.64
1225	55.05	1226	54.51	1227	54.01	1228	53.65	1229	53.46
1230	53.28	1231	53.09	1232	52.98	1233	52.96	1234	52.91
1235	52.84	1236	52.81	1237	52.79	1238	52.74	1239	52.69
1240	52.65	1241	52.59	1242	52.53	1243	52.47	1244	52.38
1245	52.29	1246	52.19	1247	52.09	1248	51.97	1249	51.86
1250	51.73	1251	51.61	1252	51.49	1253	51.37	1254	51.25
1255	51.15	1256	51.06	1257	50.97	1258	50.91	1259	50.86
1260	50.81	1261	50.78	1262	50.72	1263	50.61	1264	50.55
1265	50.48	1266	50.33	1267	50.11	1268	49.88	1269	49.68
1270	49.43	1271	49.09	1272	48.77	1273	48.47	1274	48.09
1275	47.58	1276	47.09	1277	46.65	1278	46.14	1279	45.52
1280	44.93	1281	44.40	1282	43.84	1283	43.20	1284	42.61
1285	42.13	1286	41.67	1287	41.18	1288	40.79	1289	40.54
1290	40.32	1291	40.06	1292	39.87	1293	39.78	1294	39.70
1295	39.58	1296	39.50	1297	39.49	1298	39.46	1299	39.38
1300	39.35	1310	37.05	1320	32.26	1330	27.51	1340	24.50
1350	21.58	1360	17.73	1370	13.83	1380	11.05	1390	9.32
1400	8.02	1420	7.04	1440	6.90	1460	6.91	1500	6.90

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Page: 18 Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition
Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 130A

DESCRIPTION: Area C4
TOTAL AREA TO HYDROGRAPH: 236 acres
HYDROGRAPH PEAK: 617 cfs
TIME OF PEAK: 1161 minutes
HYDROGRAPH VOLUME: 76.02 acre-ft

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	6.97	200	7.41	300	12.25	400	15.25

Channel Islands_100yr_prop.out									
500	16.72	600	21.96	700	24.87	800	29.54	900	37.80
1000	54.38	1050	71.74	1100	84.72	1110	95.58	1120	110.74
1130	132.44	1131	134.76	1132	136.98	1133	139.64	1134	142.55
1135	145.60	1136	148.52	1137	152.57	1138	157.17	1139	161.77
1140	166.60	1141	172.06	1142	178.01	1143	183.58	1144	189.44
1145	196.22	1146	203.36	1147	210.96	1148	219.75	1149	235.06
1150	253.97	1151	269.05	1152	301.43	1153	335.79	1154	371.99
1155	411.22	1156	453.35	1157	504.75	1158	544.97	1159	579.41
1160	605.14	1161	617.49	1162	615.01	1163	597.53	1164	568.86
1165	533.31	1166	495.29	1167	457.44	1168	420.51	1169	385.02
1170	348.64	1171	314.22	1172	281.31	1173	250.73	1174	223.03
1175	198.48	1176	178.66	1177	161.92	1178	148.40	1179	137.48
1180	128.70	1181	121.05	1182	114.50	1183	108.92	1184	104.33
1185	100.22	1186	96.36	1187	92.95	1188	89.88	1189	87.24
1190	84.73	1191	82.60	1192	80.82	1193	79.17	1194	77.69
1195	76.40	1196	75.27	1197	74.29	1198	73.58	1199	72.87
1200	72.35	1201	71.77	1202	71.41	1203	70.94	1204	70.53
1205	70.12	1206	69.58	1207	69.24	1208	68.74	1209	68.36
1210	67.78	1211	67.22	1212	66.69	1213	66.04	1214	65.29
1215	64.38	1216	63.60	1217	62.83	1218	61.85	1219	60.79
1220	59.93	1221	59.15	1222	58.20	1223	57.25	1224	56.57
1225	56.07	1226	55.45	1227	54.87	1228	54.59	1229	54.48
1230	54.22	1231	53.95	1232	53.92	1233	53.90	1234	53.77
1235	53.70	1236	53.68	1237	53.66	1238	53.60	1239	53.55
1240	53.51	1241	53.45	1242	53.39	1243	53.33	1244	53.24
1245	53.15	1246	53.06	1247	52.95	1248	52.83	1249	52.72
1250	52.60	1251	52.47	1252	52.36	1253	52.23	1254	52.11
1255	52.01	1256	51.92	1257	51.84	1258	51.78	1259	51.72
1260	51.67	1261	51.64	1262	51.42	1263	51.24	1264	51.18
1265	51.03	1266	50.80	1267	50.51	1268	50.36	1269	50.23
1270	49.90	1271	49.49	1272	49.24	1273	49.03	1274	48.56
1275	47.98	1276	47.57	1277	47.20	1278	46.61	1279	45.92
1280	45.40	1281	44.96	1282	44.31	1283	43.60	1284	43.08
1285	42.68	1286	42.15	1287	41.58	1288	41.27	1289	41.09
1290	40.79	1291	40.46	1292	40.35	1293	40.26	1294	40.17
1295	39.98	1296	39.98	1297	40.04	1298	39.93	1299	39.86
1300	39.82	1310	37.14	1320	32.35	1330	27.60	1340	24.59
1350	21.65	1360	17.79	1370	13.90	1380	11.11	1390	9.38
1400	8.08	1420	7.08	1440	6.95	1460	6.91	1500	6.90

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 131A

DESCRIPTION: Area A9
TOTAL AREA TO HYDROGRAPH: 269 acres
HYDROGRAPH PEAK: 642 cfs
TIME OF PEAK: 1161 minutes
HYDROGRAPH VOLUME: 85.08 acre-ft

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
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Channel Islands_100yr_prop.out									
(min)	(cfs)	(min)	(cfs)	(min)	(cfs)	(min)	(cfs)	(min)	(cfs)
0	0.00	100	6.97	200	7.41	300	13.44	400	16.44
500	18.50	600	24.33	700	27.84	800	33.10	900	42.75
1000	61.71	1050	82.04	1100	96.09	1110	113.40	1120	126.38
1130	156.21	1131	158.54	1132	160.75	1133	164.43	1134	168.69
1135	172.75	1136	175.00	1137	180.74	1138	186.69	1139	191.63
1140	196.79	1141	204.25	1142	213.42	1143	219.96	1144	227.43
1145	238.45	1146	249.53	1147	259.78	1148	271.55	1149	306.67
1150	345.05	1151	354.52	1152	426.17	1153	477.36	1154	513.56
1155	532.99	1156	554.32	1157	606.39	1158	601.73	1159	613.54
1160	633.98	1161	642.28	1162	636.79	1163	617.33	1164	589.32
1165	551.46	1166	511.47	1167	472.62	1168	435.36	1169	401.19
1170	360.52	1171	327.09	1172	293.85	1173	263.27	1174	235.24
1175	208.38	1176	189.88	1177	172.15	1178	157.97	1179	147.05
1180	137.94	1181	130.29	1182	123.74	1183	118.16	1184	113.90
1185	109.79	1186	105.60	1187	102.19	1188	99.12	1189	96.81
1190	93.97	1191	91.84	1192	90.06	1193	88.41	1194	86.93
1195	85.64	1196	84.51	1197	83.53	1198	83.15	1199	82.11
1200	81.59	1201	80.35	1202	79.99	1203	78.86	1204	78.12
1205	77.38	1206	76.18	1207	76.17	1208	75.34	1209	75.29
1210	74.38	1211	73.82	1212	73.62	1213	72.97	1214	72.22
1215	70.98	1216	70.53	1217	70.09	1218	68.78	1219	67.39
1220	66.86	1221	66.41	1222	65.13	1223	63.85	1224	63.50
1225	63.33	1226	62.38	1227	61.47	1228	61.52	1229	61.74
1230	61.15	1231	60.55	1232	60.85	1233	60.83	1234	60.37
1235	60.30	1236	60.28	1237	60.26	1238	60.20	1239	60.15
1240	60.11	1241	60.05	1242	59.99	1243	59.93	1244	59.84
1245	59.75	1246	59.66	1247	59.55	1248	59.43	1249	59.32
1250	59.20	1251	59.07	1252	58.96	1253	58.83	1254	58.71
1255	58.61	1256	58.52	1257	58.44	1258	58.38	1259	58.32
1260	58.27	1261	58.24	1262	57.36	1263	56.85	1264	56.79
1265	56.31	1266	55.75	1267	55.13	1268	55.31	1269	55.51
1270	54.85	1271	54.11	1272	54.19	1273	54.31	1274	53.51
1275	52.60	1276	52.52	1277	52.48	1278	51.56	1279	50.54
1280	50.35	1281	50.24	1282	49.26	1283	48.22	1284	48.03
1285	47.97	1286	47.10	1287	46.20	1288	46.22	1289	46.37
1290	45.74	1291	45.08	1292	45.30	1293	45.21	1294	45.12
1295	44.60	1296	44.93	1297	45.32	1298	44.88	1299	44.81
1300	44.77	1310	39.51	1320	34.92	1330	30.17	1340	26.96
1350	21.65	1360	17.79	1370	13.90	1380	11.11	1390	9.38
1400	8.08	1420	7.08	1440	6.95	1460	6.91	1500	6.90

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

Hydrograph Printouts

HYDROGRAPH PRINTOUT AT: 132A

DESCRIPTION: Area A10
TOTAL AREA TO HYDROGRAPH: 284 acres
HYDROGRAPH PEAK: 652 cfs
TIME OF PEAK: 1161 minutes

Channel Islands_100yr_prop.out
87.32 acre-ft

HYDROGRAPH VOLUME:

TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)	TIME (min)	FLOW (cfs)
0	0.00	100	6.97	200	7.41	300	13.44	400	16.44
500	18.50	600	24.33	700	27.84	800	33.21	900	43.47
1000	63.48	1050	85.10	1100	99.62	1110	119.82	1120	131.80
1130	165.36	1131	167.69	1132	169.90	1133	174.01	1134	178.84
1135	183.33	1136	185.30	1137	191.75	1138	198.27	1139	203.35
1140	208.66	1141	216.97	1142	227.54	1143	234.50	1144	242.67
1145	255.50	1146	268.25	1147	279.59	1148	292.61	1149	336.24
1150	383.23	1151	390.22	1152	479.43	1153	538.09	1154	574.30
1155	584.92	1156	596.90	1157	649.26	1158	624.87	1159	627.09
1160	645.27	1161	651.86	1162	645.05	1163	624.67	1164	596.97
1165	558.04	1166	517.13	1167	477.82	1168	440.41	1169	406.86
1170	364.28	1171	331.28	1172	297.90	1173	267.31	1174	239.14
1175	211.27	1176	193.34	1177	175.19	1178	160.71	1179	149.80
1180	140.54	1181	132.89	1182	126.34	1183	120.76	1184	116.64
1185	112.53	1186	108.20	1187	104.79	1188	101.72	1189	99.56
1190	96.57	1191	94.44	1192	92.65	1193	91.01	1194	89.53
1195	88.24	1196	87.11	1197	86.13	1198	85.90	1199	84.71
1200	84.19	1201	82.66	1202	82.30	1203	80.88	1204	80.00
1205	79.11	1206	77.62	1207	77.76	1208	76.79	1209	76.88
1210	75.83	1211	75.26	1212	75.21	1213	74.55	1214	73.81
1215	72.43	1216	72.12	1217	71.82	1218	70.37	1219	68.83
1220	68.45	1221	68.15	1222	66.72	1223	65.29	1224	65.09
1225	65.06	1226	63.97	1227	62.91	1228	63.11	1229	63.47
1230	62.74	1231	62.00	1232	62.44	1233	62.42	1234	61.81
1235	61.74	1236	61.72	1237	61.70	1238	61.64	1239	61.59
1240	61.55	1241	61.50	1242	61.44	1243	61.37	1244	61.28
1245	61.19	1246	61.10	1247	60.99	1248	60.88	1249	60.77
1250	60.64	1251	60.52	1252	60.40	1253	60.28	1254	60.16
1255	60.06	1256	59.96	1257	59.88	1258	59.82	1259	59.76
1260	59.72	1261	59.69	1262	58.52	1263	57.87	1264	57.80
1265	57.18	1266	56.47	1267	55.71	1268	56.03	1269	56.38
1270	55.58	1271	54.69	1272	54.92	1273	55.17	1274	54.24
1275	53.18	1276	53.24	1277	53.35	1278	52.29	1279	51.12
1280	51.07	1281	51.10	1282	49.99	1283	48.79	1284	48.76
1285	48.83	1286	47.82	1287	46.78	1288	46.94	1289	47.24
1290	46.46	1291	45.65	1292	46.02	1293	45.93	1294	45.85
1295	45.18	1296	45.65	1297	46.19	1298	45.60	1299	45.53
1300	45.50	1310	39.51	1320	34.92	1330	30.17	1340	26.96
1350	21.65	1360	17.79	1370	13.90	1380	11.11	1390	9.38
1400	8.08	1420	7.08	1440	6.95	1460	6.91	1500	6.90

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

VCRat Model Input

Page: 21

Model Lines

005 1 100A Header place holder
005 1 101A Header place holder
005 1 104C Header place holder


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005 1 106D Header place holder
005 1 109B Header place holder
005 1 110BCHeader place holder
005 1 112B Header place holder
005 1 113ABHeader place holder
005 1 115A Header place holder
005 1 117B Header place holder
005 1 118ABHeader place holder
005 1 120A Header place holder
005 1 122C Header place holder
005 1 127BCHeader place holder
005 1 129ABHeader place holder
005 1 130A Header place holder
005 1 131A Header place holder
005 1 132A Header place holder
999
999
006 1 100A 010 099A97
006 1 101A 010000011413B98
006 1 102A 010 099A97401070002657
006 1 103A 010 099A97400440000400
006 1 104C 010000002806B98
006 1 105C 010 099A97100062006666
006 1 106D 020000000507B98
006 1 107CD010 A97
006 1 108C 010 099A97100060011660
006 1 109B 0100000001207B98
006 1 110BC010 A97
006 1 111B 010 099A97100660002727
006 1 112B 010000000806B98
006 1 113AB010 A97
006 1 114A 010 099A97100600002666
006 1 115A 010000000905B98
006 1 116A 010 099A97100075006660
006 1 117B 010014001505B98
006 1 118AB010 A97
006 1 119A 010 099A97100760002368
006 1 120A 010000000606B98
006 1 121A 010 099A97400560003570
006 1 122C 020070001606B98
006 1 123C 010 099A97400660000500
006 1 124C 010 099A97401020000500
006 1 125B 020070001506B98
006 1 126B 010 099A97401560000500
006 1 127BC010 A97
006 1 128B 010 099A97400700000500
006 1 129AB010 A97
006 1 130A 020003000806B98
006 1 131A 010000003306B98

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Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: CSUCI - Glenn - 100-yr Proposed Condition

VCRat Model Input

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Model Lines

006 1 132A 020000001506B98

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Attachment C-4
Proposed Condition – Basin Routing Computations – PondPack

10-YR Proposed Condition

Project Summary

Title

Engineer

Company

Date 12/9/2016

Notes

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10-YR Proposed Condition

Subsection: User Notifications

User Notifications?	No user notifications generated.
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10-YR Proposed Condition

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)
CM-1	Post-Development 10 -yr	0	35.381	1,163.000	386.80

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)
O-2	Post-Development 10 -yr	0	0.000	0.000	0.00

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
PO-1 (IN)	Post-Development 10-yr	0	35.233	1,164.000	385.30	(N/A)	(N/A)
PO-1 (OUT)	Post-Development 10-yr	0	0.000	0.000	0.00	7.40	35.233

10-YR Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

Peak Discharge	386.80 ft ³ /s
Time to Peak	1,163.000 min
Hydrograph Volume	35.381 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.10	0.10	0.10	0.10
5.000	0.20	0.20	0.20	0.20	0.20
10.000	0.30	0.30	0.30	0.30	0.40
15.000	0.40	0.40	0.40	0.40	0.50
20.000	0.50	0.50	0.50	0.50	0.60
25.000	0.60	0.60	0.60	0.70	0.70
30.000	0.70	0.70	0.70	0.80	0.80
35.000	0.80	0.80	0.90	0.90	0.90
40.000	0.90	0.90	1.00	1.00	1.00
45.000	1.00	1.00	1.10	1.10	1.10
50.000	1.10	1.20	1.20	1.20	1.20
55.000	1.20	1.30	1.30	1.30	1.30
60.000	1.40	1.40	1.40	1.40	1.40
65.000	1.50	1.50	1.50	1.50	1.50
70.000	1.60	1.60	1.60	1.60	1.70
75.000	1.70	1.70	1.70	1.70	1.80
80.000	1.80	1.80	1.80	1.90	1.90
85.000	1.90	1.90	1.90	2.00	2.00
90.000	2.00	2.00	2.00	2.10	2.10
95.000	2.10	2.10	2.20	2.20	2.20
100.000	2.20	2.20	2.20	2.20	2.20
105.000	2.20	2.20	2.20	2.20	2.20
110.000	2.20	2.20	2.20	2.20	2.20
115.000	2.20	2.20	2.20	2.20	2.20
120.000	2.20	2.20	2.20	2.20	2.20
125.000	2.20	2.20	2.20	2.20	2.20
130.000	2.20	2.30	2.30	2.30	2.30
135.000	2.30	2.30	2.30	2.30	2.30
140.000	2.30	2.30	2.30	2.30	2.30
145.000	2.30	2.30	2.30	2.30	2.30
150.000	2.30	2.30	2.30	2.30	2.30
155.000	2.30	2.30	2.30	2.30	2.30
160.000	2.30	2.30	2.30	2.30	2.30
165.000	2.30	2.30	2.30	2.30	2.30
170.000	2.30	2.30	2.30	2.30	2.30
175.000	2.30	2.30	2.30	2.30	2.30
180.000	2.30	2.30	2.30	2.30	2.30

10-YR Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
185.000	2.30	2.30	2.30	2.30	2.30
190.000	2.30	2.30	2.30	2.30	2.30
195.000	2.30	2.30	2.30	2.30	2.30
200.000	2.30	2.30	2.30	2.30	2.30
205.000	2.30	2.30	2.30	2.30	2.40
210.000	2.40	2.40	2.40	2.40	2.40
215.000	2.40	2.40	2.40	2.40	2.40
220.000	2.40	2.40	2.40	2.40	2.40
225.000	2.40	2.40	2.40	2.40	2.40
230.000	2.40	2.40	2.40	2.40	2.40
235.000	2.40	2.40	2.50	2.50	2.50
240.000	2.50	2.50	2.50	2.50	2.50
245.000	2.50	2.50	2.50	2.50	2.50
250.000	2.50	2.50	2.50	2.50	2.50
255.000	2.50	2.50	2.50	2.50	2.50
260.000	2.50	2.50	2.50	2.50	2.60
265.000	2.60	2.60	2.60	2.60	2.60
270.000	2.60	2.60	2.60	2.60	2.60
275.000	2.60	2.60	2.60	2.60	2.60
280.000	2.60	2.60	2.60	2.60	2.60
285.000	2.60	2.60	2.60	2.60	2.60
290.000	2.60	2.60	2.70	2.70	2.70
295.000	2.70	2.70	2.70	2.70	2.70
300.000	2.70	2.70	2.70	2.70	2.70
305.000	2.70	2.70	2.70	2.70	2.70
310.000	2.70	2.70	2.70	2.70	2.70
315.000	2.70	2.70	2.80	2.80	2.80
320.000	2.80	2.80	2.80	2.80	2.80
325.000	2.80	2.80	2.80	2.80	2.80
330.000	2.80	2.80	2.80	2.80	2.80
335.000	2.80	2.80	2.80	2.80	2.80
340.000	2.90	2.90	2.90	2.90	2.90
345.000	2.90	2.90	2.90	2.90	2.90
350.000	2.90	2.90	2.90	2.90	2.90
355.000	2.90	2.90	2.90	2.90	2.90
360.000	2.90	2.90	2.90	3.00	3.00
365.000	3.00	3.00	3.00	3.00	3.00
370.000	3.00	3.00	3.00	3.00	3.00
375.000	3.00	3.00	3.00	3.00	3.00
380.000	3.00	3.00	3.00	3.00	3.00
385.000	3.00	3.00	3.10	3.10	3.10
390.000	3.10	3.10	3.10	3.10	3.10

10-YR Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
395.000	3.10	3.10	3.10	3.10	3.10
400.000	3.10	3.10	3.10	3.10	3.10
405.000	3.10	3.10	3.10	3.20	3.20
410.000	3.20	3.20	3.20	3.20	3.20
415.000	3.20	3.20	3.20	3.20	3.20
420.000	3.20	3.20	3.20	3.20	3.20
425.000	3.20	3.30	3.30	3.30	3.30
430.000	3.30	3.30	3.30	3.30	3.30
435.000	3.30	3.30	3.30	3.30	3.30
440.000	3.30	3.30	3.30	3.40	3.40
445.000	3.40	3.40	3.40	3.40	3.40
450.000	3.40	3.40	3.40	3.40	3.40
455.000	3.40	3.40	3.40	3.40	3.40
460.000	3.40	3.50	3.50	3.50	3.50
465.000	3.50	3.50	3.50	3.50	3.50
470.000	3.50	3.50	3.50	3.50	3.50
475.000	3.50	3.50	3.50	3.50	3.60
480.000	3.60	3.60	3.60	3.60	3.60
485.000	3.60	3.60	3.60	3.60	3.60
490.000	3.60	3.60	3.60	3.60	3.60
495.000	3.60	3.60	3.70	3.70	3.70
500.000	3.70	3.70	3.70	3.70	3.70
505.000	3.70	3.70	3.70	3.70	3.70
510.000	3.70	3.70	3.70	3.70	3.70
515.000	3.70	3.70	3.80	3.80	3.80
520.000	3.80	3.80	3.80	3.80	3.80
525.000	3.80	3.80	3.80	3.80	3.80
530.000	3.80	3.80	3.80	3.80	3.80
535.000	3.80	3.80	3.90	3.90	3.90
540.000	3.90	3.90	3.90	3.90	3.90
545.000	3.90	3.90	3.90	3.90	3.90
550.000	3.90	3.90	3.90	3.90	3.90
555.000	3.90	3.90	3.90	4.00	4.00
560.000	4.00	4.00	4.00	4.00	4.00
565.000	4.00	4.00	4.00	4.00	4.00
570.000	4.00	4.00	4.00	4.00	4.00
575.000	4.00	4.00	4.00	4.10	4.10
580.000	4.10	4.10	4.10	4.10	4.10
585.000	4.10	4.10	4.10	4.10	4.10
590.000	4.10	4.10	4.10	4.10	4.10
595.000	4.10	4.10	4.10	4.20	4.20
600.000	4.20	4.20	4.20	4.20	4.20

10-YR Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
605.000	4.20	4.20	4.20	4.20	4.20
610.000	4.20	4.20	4.20	4.30	4.30
615.000	4.30	4.30	4.30	4.30	4.30
620.000	4.30	4.30	4.30	4.30	4.30
625.000	4.30	4.40	4.40	4.40	4.40
630.000	4.40	4.40	4.40	4.40	4.40
635.000	4.40	4.40	4.40	4.40	4.50
640.000	4.50	4.50	4.50	4.50	4.50
645.000	4.50	4.50	4.50	4.50	4.50
650.000	4.50	4.50	4.50	4.60	4.60
655.000	4.60	4.60	4.60	4.60	4.60
660.000	4.60	4.60	4.60	4.60	4.60
665.000	4.60	4.70	4.70	4.70	4.70
670.000	4.70	4.70	4.70	4.70	4.70
675.000	4.70	4.70	4.70	4.70	4.80
680.000	4.80	4.80	4.80	4.80	4.80
685.000	4.80	4.80	4.80	4.80	4.80
690.000	4.80	4.80	4.80	4.90	4.90
695.000	4.90	4.90	4.90	4.90	4.90
700.000	4.90	4.90	4.90	4.90	5.00
705.000	5.00	5.00	5.00	5.00	5.00
710.000	5.00	5.00	5.00	5.00	5.10
715.000	5.10	5.10	5.10	5.10	5.10
720.000	5.10	5.10	5.10	5.10	5.20
725.000	5.20	5.20	5.20	5.20	5.20
730.000	5.20	5.20	5.20	5.30	5.30
735.000	5.30	5.30	5.30	5.30	5.30
740.000	5.30	5.30	5.30	5.40	5.40
745.000	5.40	5.40	5.40	5.40	5.40
750.000	5.40	5.40	5.50	5.50	5.50
755.000	5.50	5.50	5.50	5.50	5.50
760.000	5.50	5.50	5.60	5.60	5.60
765.000	5.60	5.60	5.60	5.60	5.60
770.000	5.60	5.60	5.70	5.70	5.70
775.000	5.70	5.70	5.70	5.70	5.70
780.000	5.70	5.80	5.80	5.80	5.80
785.000	5.80	5.80	5.80	5.80	5.80
790.000	5.80	5.90	5.90	5.90	5.90
795.000	5.90	5.90	5.90	5.90	5.90
800.000	5.90	6.00	6.00	6.00	6.00
805.000	6.00	6.00	6.00	6.00	6.10
810.000	6.10	6.10	6.10	6.10	6.10

10-YR Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
815.000	6.10	6.10	6.10	6.20	6.20
820.000	6.20	6.20	6.20	6.20	6.20
825.000	6.20	6.20	6.30	6.30	6.30
830.000	6.30	6.30	6.30	6.30	6.30
835.000	6.30	6.40	6.40	6.40	6.40
840.000	6.40	6.40	6.40	6.40	6.40
845.000	6.50	6.50	6.50	6.50	6.50
850.000	6.50	6.50	6.50	6.50	6.60
855.000	6.60	6.60	6.60	6.60	6.60
860.000	6.60	6.60	6.60	6.70	6.70
865.000	6.70	6.70	6.70	6.70	6.70
870.000	6.70	6.70	6.80	6.80	6.80
875.000	6.80	6.80	6.80	6.80	6.80
880.000	6.80	6.90	6.90	6.90	6.90
885.000	6.90	6.90	6.90	6.90	6.90
890.000	7.00	7.00	7.00	7.00	7.00
895.000	7.00	7.00	7.00	7.00	7.10
900.000	7.10	7.20	7.40	7.60	7.80
905.000	7.90	8.10	8.30	8.40	8.60
910.000	8.80	8.90	9.10	9.30	9.50
915.000	9.60	9.80	10.00	10.10	10.30
920.000	10.50	10.60	10.80	11.00	11.20
925.000	11.30	11.50	11.70	11.80	12.00
930.000	12.20	12.30	12.50	12.70	12.90
935.000	13.00	13.20	13.40	13.50	13.70
940.000	13.90	14.00	14.20	14.40	14.60
945.000	14.70	14.90	15.10	15.20	15.40
950.000	15.60	15.70	15.90	16.10	16.30
955.000	16.40	16.60	16.80	16.90	17.10
960.000	17.30	17.40	17.60	17.80	18.00
965.000	18.10	18.30	18.50	18.60	18.80
970.000	19.00	19.10	19.30	19.50	19.70
975.000	19.80	20.00	20.20	20.30	20.50
980.000	20.70	20.80	21.00	21.20	21.40
985.000	21.50	21.70	21.90	22.00	22.20
990.000	22.40	22.50	22.70	22.90	23.10
995.000	23.20	23.40	23.60	23.70	23.90
1,000.000	24.10	24.40	24.70	24.90	25.20
1,005.000	25.50	25.80	26.10	26.40	26.70
1,010.000	27.00	27.30	27.60	27.80	28.10
1,015.000	28.40	28.70	29.00	29.30	29.60
1,020.000	29.90	30.20	30.40	30.70	31.00

10-YR Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,025.000	31.30	31.60	31.90	32.20	32.50
1,030.000	32.80	33.00	33.30	33.60	33.90
1,035.000	34.20	34.50	34.80	35.10	35.40
1,040.000	35.60	35.90	36.20	36.50	36.80
1,045.000	37.10	37.40	37.70	38.00	38.30
1,050.000	38.50	38.70	38.90	39.10	39.40
1,055.000	39.60	39.80	40.00	40.20	40.40
1,060.000	40.60	40.80	41.00	41.20	41.40
1,065.000	41.60	41.80	42.00	42.20	42.40
1,070.000	42.60	42.80	43.00	43.20	43.40
1,075.000	43.60	43.80	44.00	44.20	44.40
1,080.000	44.60	44.80	45.00	45.20	45.40
1,085.000	45.60	45.80	46.00	46.20	46.40
1,090.000	46.60	46.80	47.00	47.30	47.50
1,095.000	47.70	47.90	48.10	48.30	48.50
1,100.000	48.70	49.90	51.10	52.30	53.50
1,105.000	54.80	56.00	57.20	58.40	59.60
1,110.000	60.80	62.40	63.90	65.40	67.00
1,115.000	68.50	70.00	71.60	73.10	74.60
1,120.000	76.20	77.70	79.30	80.80	82.40
1,125.000	83.90	85.50	87.00	88.60	90.10
1,130.000	91.70	94.50	97.50	100.30	103.20
1,135.000	106.20	110.20	114.30	117.10	119.80
1,140.000	122.80	127.30	132.10	136.20	140.60
1,145.000	145.60	152.10	159.30	170.00	183.70
1,150.000	200.50	233.10	282.90	317.70	333.50
1,155.000	346.00	358.40	370.40	370.60	358.20
1,160.000	359.20	373.70	383.20	386.80	385.30
1,165.000	379.40	369.60	356.30	342.20	325.70
1,170.000	307.30	287.10	266.60	246.10	225.40
1,175.000	204.40	183.50	163.60	146.40	131.40
1,180.000	118.70	107.80	98.70	91.10	84.60
1,185.000	79.00	74.20	69.90	66.10	62.90
1,190.000	60.00	57.20	54.70	52.40	50.40
1,195.000	48.60	46.90	45.30	43.80	42.50
1,200.000	41.30	40.20	39.20	38.30	37.50
1,205.000	36.70	36.10	35.50	35.00	34.50
1,210.000	34.00	33.10	32.20	31.30	30.40
1,215.000	29.50	28.60	27.80	27.30	26.90
1,220.000	26.40	25.90	25.40	24.90	24.40
1,225.000	23.90	23.50	23.00	22.50	22.00
1,230.000	21.50	21.00	20.50	20.10	19.70

10-YR Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,235.000	19.20	18.70	18.20	17.70	17.20
1,240.000	16.60	16.00	15.40	14.90	14.30
1,245.000	13.70	13.10	12.60	12.00	11.50
1,250.000	11.00	10.50	10.00	9.60	9.20
1,255.000	8.90	8.60	8.30	8.10	7.80
1,260.000	7.60	7.50	7.30	7.20	7.00
1,265.000	6.90	6.80	6.70	6.70	6.60
1,270.000	6.50	6.50	6.40	6.30	6.20
1,275.000	6.20	6.10	6.00	6.00	5.90
1,280.000	5.80	5.80	5.70	5.70	5.60
1,285.000	5.60	5.50	5.50	5.50	5.40
1,290.000	5.40	5.40	5.40	5.40	5.40
1,295.000	5.40	5.40	5.30	5.30	5.30
1,300.000	5.30	5.30	5.30	5.30	5.30
1,305.000	5.30	5.20	5.20	5.20	5.20
1,310.000	5.20	5.20	5.10	5.10	5.00
1,315.000	5.00	5.00	4.90	4.90	4.90
1,320.000	4.80	4.80	4.70	4.70	4.70
1,325.000	4.60	4.60	4.50	4.50	4.40
1,330.000	4.40	4.40	4.30	4.30	4.30
1,335.000	4.30	4.20	4.20	4.20	4.20
1,340.000	4.10	4.10	4.10	4.10	4.10
1,345.000	4.10	4.10	4.10	4.00	4.00
1,350.000	4.00	4.00	4.00	3.90	3.90
1,355.000	3.90	3.80	3.80	3.80	3.70
1,360.000	3.70	3.70	3.60	3.60	3.50
1,365.000	3.50	3.40	3.40	3.40	3.30
1,370.000	3.30	3.30	3.20	3.20	3.20
1,375.000	3.10	3.10	3.10	3.00	3.00
1,380.000	3.00	3.00	3.00	3.00	3.00
1,385.000	3.00	2.90	2.90	2.90	2.90
1,390.000	2.90	2.90	2.90	2.90	2.90
1,395.000	2.90	2.90	2.90	2.90	2.90
1,400.000	2.90	2.90	2.90	2.90	2.90
1,405.000	2.90	2.90	2.80	2.80	2.80
1,410.000	2.80	2.80	2.80	2.80	2.80
1,415.000	2.80	2.80	2.80	2.70	2.70
1,420.000	2.70	2.70	2.70	2.70	2.70
1,425.000	2.60	2.60	2.60	2.60	2.60
1,430.000	2.60	2.50	2.50	2.50	2.50
1,435.000	2.50	2.50	2.40	2.40	2.40
1,440.000	2.40	2.40	2.40	2.40	2.40

10-YR Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,445.000	2.40	2.30	2.30	2.30	2.30
1,450.000	2.30	2.30	2.30	2.30	2.30
1,455.000	2.30	2.30	2.20	2.20	2.20
1,460.000	2.20	2.20	2.20	2.20	2.20
1,465.000	2.20	2.20	2.20	2.20	2.20
1,470.000	2.20	2.20	2.20	2.20	2.20
1,475.000	2.20	2.20	2.20	2.20	2.20
1,480.000	2.20	2.20	2.20	2.20	2.20
1,485.000	2.20	2.20	2.20	2.20	2.20
1,490.000	2.20	2.20	2.20	2.20	2.20
1,495.000	2.20	2.20	2.20	2.20	2.20
1,500.000	2.20	(N/A)	(N/A)	(N/A)	(N/A)

10-YR Proposed Condition

Subsection: Addition Summary

Label: O-2

Summary for Hydrograph Addition at 'O-2'

Upstream Link	Upstream Node
Outlet-1	PO-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (min)	Flow (Peak) (ft ³ /s)
Flow (From)	Outlet-1	0.000	0.000	0.00
Flow (In)	O-2	0.000	0.000	0.00

10-YR Proposed Condition

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	0.00	0.00	0.00	0.00	0.01
15.000	0.01	0.01	0.02	0.02	0.03
30.000	0.03	0.04	0.05	0.06	0.07
45.000	0.08	0.09	0.10	0.11	0.12
60.000	0.13	0.15	0.16	0.17	0.19
75.000	0.20	0.22	0.24	0.25	0.27
90.000	0.29	0.31	0.33	0.35	0.37
105.000	0.39	0.41	0.43	0.45	0.47
120.000	0.49	0.51	0.54	0.56	0.58
135.000	0.60	0.62	0.64	0.66	0.69
150.000	0.71	0.73	0.75	0.77	0.79
165.000	0.82	0.84	0.86	0.88	0.90
180.000	0.92	0.95	0.97	0.99	1.01
195.000	1.03	1.05	1.08	1.10	1.12
210.000	1.14	1.16	1.19	1.21	1.23
225.000	1.25	1.28	1.30	1.32	1.35
240.000	1.37	1.39	1.42	1.44	1.46
255.000	1.49	1.51	1.53	1.56	1.58
270.000	1.61	1.63	1.66	1.68	1.70
285.000	1.73	1.75	1.78	1.80	1.83
300.000	1.85	1.88	1.90	1.93	1.96
315.000	1.98	2.00	2.01	2.01	2.02
330.000	2.02	2.03	2.03	2.04	2.04
345.000	2.05	2.05	2.06	2.06	2.07
360.000	2.07	2.08	2.08	2.09	2.10
375.000	2.10	2.11	2.11	2.12	2.12
390.000	2.13	2.13	2.14	2.15	2.15
405.000	2.16	2.16	2.17	2.17	2.18
420.000	2.19	2.19	2.20	2.20	2.21
435.000	2.22	2.22	2.23	2.23	2.24
450.000	2.25	2.25	2.26	2.26	2.27
465.000	2.28	2.28	2.29	2.30	2.30
480.000	2.31	2.32	2.32	2.33	2.34
495.000	2.34	2.35	2.36	2.36	2.37
510.000	2.38	2.38	2.39	2.40	2.40
525.000	2.41	2.42	2.42	2.43	2.44
540.000	2.44	2.45	2.46	2.47	2.47
555.000	2.48	2.49	2.49	2.50	2.51
570.000	2.52	2.52	2.53	2.54	2.55
585.000	2.55	2.56	2.57	2.58	2.58
600.000	2.59	2.60	2.61	2.61	2.62

10-YR Proposed Condition

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
615.000	2.63	2.64	2.64	2.65	2.66
630.000	2.67	2.68	2.68	2.69	2.70
645.000	2.71	2.72	2.73	2.73	2.74
660.000	2.75	2.76	2.77	2.78	2.78
675.000	2.79	2.80	2.81	2.82	2.83
690.000	2.84	2.85	2.85	2.86	2.87
705.000	2.88	2.89	2.90	2.91	2.92
720.000	2.93	2.94	2.95	2.95	2.96
735.000	2.97	2.98	2.99	3.00	3.01
750.000	3.02	3.03	3.04	3.05	3.06
765.000	3.07	3.08	3.09	3.10	3.11
780.000	3.12	3.13	3.15	3.16	3.17
795.000	3.18	3.19	3.20	3.21	3.22
810.000	3.23	3.24	3.25	3.26	3.28
825.000	3.29	3.30	3.31	3.32	3.33
840.000	3.35	3.36	3.37	3.38	3.39
855.000	3.40	3.42	3.43	3.44	3.45
870.000	3.46	3.48	3.49	3.50	3.51
885.000	3.53	3.54	3.55	3.56	3.58
900.000	3.59	3.60	3.62	3.63	3.65
915.000	3.67	3.68	3.70	3.72	3.74
930.000	3.77	3.79	3.81	3.84	3.86
945.000	3.89	3.91	3.94	3.97	4.00
960.000	4.01	4.02	4.03	4.05	4.06
975.000	4.07	4.08	4.10	4.11	4.12
990.000	4.14	4.15	4.17	4.18	4.20
1,005.000	4.22	4.23	4.25	4.27	4.29
1,020.000	4.30	4.32	4.34	4.36	4.39
1,035.000	4.41	4.43	4.45	4.48	4.50
1,050.000	4.52	4.55	4.57	4.60	4.63
1,065.000	4.65	4.68	4.71	4.74	4.76
1,080.000	4.79	4.82	4.85	4.88	4.91
1,095.000	4.94	4.97	5.00	5.04	5.07
1,110.000	5.11	5.15	5.19	5.24	5.29
1,125.000	5.34	5.40	5.46	5.52	5.59
1,140.000	5.67	5.75	5.84	5.95	6.05
1,155.000	6.16	6.28	6.41	6.54	6.67
1,170.000	6.78	6.87	6.95	7.00	7.04
1,185.000	7.07	7.10	7.12	7.14	7.15
1,200.000	7.17	7.18	7.19	7.21	7.22
1,215.000	7.23	7.24	7.25	7.26	7.26

10-YR Proposed Condition

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
1,230.000	7.27	7.28	7.28	7.29	7.30
1,245.000	7.30	7.31	7.31	7.31	7.32
1,260.000	7.32	7.32	7.32	7.33	7.33
1,275.000	7.33	7.33	7.33	7.34	7.34
1,290.000	7.34	7.34	7.34	7.35	7.35
1,305.000	7.35	7.35	7.35	7.35	7.36
1,320.000	7.36	7.36	7.36	7.36	7.36
1,335.000	7.37	7.37	7.37	7.37	7.37
1,350.000	7.37	7.37	7.38	7.38	7.38
1,365.000	7.38	7.38	7.38	7.38	7.38
1,380.000	7.38	7.39	7.39	7.39	7.39
1,395.000	7.39	7.39	7.39	7.39	7.39
1,410.000	7.39	7.40	7.40	7.40	7.40
1,425.000	7.40	7.40	7.40	7.40	7.40
1,440.000	7.40	(N/A)	(N/A)	(N/A)	(N/A)

10-YR Proposed Condition

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
0.000	0.000	0.000	0.001	0.002	0.003
15.000	0.004	0.006	0.008	0.010	0.012
30.000	0.015	0.018	0.021	0.025	0.029
45.000	0.033	0.037	0.042	0.047	0.052
60.000	0.058	0.064	0.070	0.076	0.082
75.000	0.089	0.096	0.103	0.111	0.119
90.000	0.127	0.135	0.144	0.153	0.162
105.000	0.171	0.180	0.189	0.198	0.207
120.000	0.217	0.226	0.235	0.244	0.253
135.000	0.263	0.272	0.282	0.291	0.301
150.000	0.310	0.320	0.329	0.339	0.348
165.000	0.358	0.367	0.377	0.386	0.396
180.000	0.405	0.415	0.424	0.434	0.443
195.000	0.453	0.462	0.472	0.481	0.491
210.000	0.500	0.510	0.520	0.530	0.540
225.000	0.550	0.560	0.570	0.580	0.590
240.000	0.600	0.611	0.621	0.631	0.642
255.000	0.652	0.662	0.673	0.683	0.694
270.000	0.705	0.715	0.726	0.737	0.748
285.000	0.758	0.769	0.780	0.791	0.802
300.000	0.813	0.824	0.835	0.846	0.858
315.000	0.869	0.880	0.892	0.903	0.915
330.000	0.926	0.938	0.950	0.961	0.973
345.000	0.985	0.997	1.009	1.021	1.033
360.000	1.045	1.057	1.069	1.082	1.094
375.000	1.107	1.119	1.131	1.144	1.156
390.000	1.169	1.182	1.195	1.208	1.220
405.000	1.233	1.246	1.260	1.273	1.286
420.000	1.299	1.312	1.326	1.339	1.353
435.000	1.367	1.380	1.394	1.408	1.422
450.000	1.436	1.450	1.464	1.478	1.492
465.000	1.507	1.521	1.536	1.550	1.565
480.000	1.579	1.594	1.609	1.624	1.639
495.000	1.654	1.669	1.684	1.699	1.715
510.000	1.730	1.745	1.761	1.776	1.792
525.000	1.807	1.823	1.839	1.855	1.870
540.000	1.887	1.903	1.919	1.935	1.951
555.000	1.967	1.983	2.000	2.017	2.033
570.000	2.050	2.066	2.083	2.099	2.116
585.000	2.133	2.150	2.167	2.184	2.201
600.000	2.218	2.236	2.253	2.270	2.288

10-YR Proposed Condition

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
615.000	2.305	2.323	2.341	2.358	2.376
630.000	2.395	2.413	2.431	2.449	2.468
645.000	2.487	2.505	2.524	2.543	2.562
660.000	2.581	2.600	2.619	2.638	2.658
675.000	2.677	2.696	2.716	2.736	2.756
690.000	2.776	2.796	2.816	2.836	2.856
705.000	2.877	2.898	2.918	2.939	2.960
720.000	2.981	3.002	3.024	3.045	3.067
735.000	3.088	3.110	3.132	3.154	3.176
750.000	3.199	3.221	3.244	3.267	3.290
765.000	3.313	3.336	3.359	3.382	3.406
780.000	3.430	3.453	3.477	3.501	3.525
795.000	3.550	3.574	3.599	3.624	3.648
810.000	3.673	3.699	3.724	3.749	3.775
825.000	3.800	3.826	3.852	3.878	3.905
840.000	3.931	3.957	3.984	4.011	4.038
855.000	4.065	4.092	4.119	4.147	4.175
870.000	4.202	4.230	4.258	4.286	4.315
885.000	4.343	4.372	4.400	4.429	4.458
900.000	4.487	4.518	4.550	4.585	4.621
915.000	4.660	4.701	4.743	4.788	4.836
930.000	4.885	4.937	4.990	5.046	5.103
945.000	5.163	5.225	5.289	5.355	5.423
960.000	5.494	5.566	5.641	5.717	5.796
975.000	5.877	5.960	6.045	6.132	6.221
990.000	6.313	6.406	6.502	6.600	6.700
1,005.000	6.804	6.911	7.022	7.137	7.255
1,020.000	7.376	7.501	7.630	7.763	7.899
1,035.000	8.038	8.181	8.328	8.478	8.632
1,050.000	8.789	8.950	9.113	9.279	9.447
1,065.000	9.617	9.790	9.966	10.144	10.325
1,080.000	10.508	10.693	10.881	11.072	11.265
1,095.000	11.461	11.659	11.862	12.075	12.304
1,110.000	12.548	12.809	13.088	13.387	13.705
1,125.000	14.042	14.399	14.777	15.186	15.635
1,140.000	16.125	16.660	17.256	17.949	18.913
1,155.000	20.213	21.693	23.231	24.799	26.332
1,170.000	27.703	28.846	29.734	30.384	30.860
1,185.000	31.227	31.527	31.781	32.004	32.201
1,200.000	32.380	32.545	32.699	32.844	32.982
1,215.000	33.110	33.227	33.337	33.441	33.539

10-YR Proposed Condition

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,230.000	33.631	33.717	33.797	33.871	33.938
1,245.000	33.999	34.052	34.098	34.139	34.175
1,260.000	34.208	34.238	34.267	34.295	34.322
1,275.000	34.348	34.373	34.398	34.421	34.444
1,290.000	34.467	34.489	34.511	34.533	34.555
1,305.000	34.577	34.599	34.620	34.641	34.662
1,320.000	34.682	34.701	34.721	34.739	34.757
1,335.000	34.775	34.793	34.810	34.827	34.844
1,350.000	34.860	34.877	34.893	34.908	34.923
1,365.000	34.938	34.952	34.966	34.979	34.992
1,380.000	35.005	35.017	35.030	35.042	35.054
1,395.000	35.065	35.077	35.089	35.101	35.113
1,410.000	35.125	35.136	35.148	35.159	35.170
1,425.000	35.181	35.192	35.203	35.213	35.223
1,440.000	35.233	(N/A)	(N/A)	(N/A)	(N/A)

10-YR Proposed Condition

Subsection: Elevation vs. Volume Curve

Label: PO-1

Elevation-Volume

Pond Elevation (ft)	Pond Volume (ac-ft)
0.00	0.000
2.00	0.877
4.00	5.418
6.00	18.271
8.00	42.445
10.00	76.869
12.00	121.103

10-YR Proposed Condition

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Requested Pond Water Surface Elevations	
Minimum (Headwater)	0.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	12.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Box Tailwater Settings	Culvert - 1 Tailwater	Forward	TW	9.30 (N/A)	12.00 (N/A)

10-YR Proposed Condition

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Structure ID: Culvert - 1	
Structure Type: Culvert-Box	
Number of Barrels	1
Width	10.30 ft
Height	2.80 ft
Length	77.00 ft
Length (Computed Barrel)	77.01 ft
Slope (Computed)	0.014 ft/ft
Outlet Control Data	
Manning's n	0.013
Ke	0.500
Kb	0.004
Kr	0.500
Convergence Tolerance	0.00 ft
Inlet Control Data	
Equation Form	Form 1
K	0.0260
M	1.0000
C	0.0347
Y	0.8100
T1 ratio (HW/D)	1.171
T2 ratio (HW/D)	1.358
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.

Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control, interpolate between flows at T1 & T2...

T1 Elevation	12.58 ft	T1 Flow	168.90 ft ³ /s
T2 Elevation	13.10 ft	T2 Flow	193.03 ft ³ /s

10-YR Proposed Condition

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall
Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

10-YR Proposed Condition

Subsection: Individual Outlet Curves

Label: Composite Outlet Structure - 1

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = Culvert - 1 (Culvert-Box)

Mannings open channel maximum capacity: 586.00 ft³/s

Upstream ID = (Pond Water Surface)

Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
0.00	0.00	(N/A)	0.00
0.50	0.00	(N/A)	0.00
1.00	0.00	(N/A)	0.00
1.50	0.00	(N/A)	0.00
2.00	0.00	(N/A)	0.00
2.50	0.00	(N/A)	0.00
3.00	0.00	(N/A)	0.00
3.50	0.00	(N/A)	0.00
4.00	0.00	(N/A)	0.00
4.50	0.00	(N/A)	0.00
5.00	0.00	(N/A)	0.00
5.50	0.00	(N/A)	0.00
6.00	0.00	(N/A)	0.00
6.50	0.00	(N/A)	0.00
7.00	0.00	(N/A)	0.00
7.50	0.00	(N/A)	0.00
8.00	0.00	(N/A)	0.00
8.50	0.00	(N/A)	0.00
9.00	0.00	(N/A)	0.00
9.30	0.00	(N/A)	0.00
9.50	2.25	(N/A)	0.00
10.00	14.81	(N/A)	0.00
10.50	33.17	(N/A)	0.00
11.00	55.94	(N/A)	0.00
11.50	82.35	(N/A)	0.00
12.00	111.94	(N/A)	0.00

Computation Messages

Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El

10-YR Proposed Condition

Subsection: Individual Outlet Curves

Label: Composite Outlet Structure - 1

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = Culvert - 1 (Culvert-Box)

Mannings open channel maximum capacity: 586.00 ft³/s

Upstream ID = (Pond Water Surface)

Downstream ID = Tailwater (Pond Outfall)

Computation Messages

Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .057ft
Dcr= .114ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .200ft
Dcr= .400ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .343ft
Dcr= .686ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .486ft
Dcr= .971ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .629ft
Dcr= 1.257ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .771ft
Dcr= 1.543ft CRIT.DEPTH Hev= .00ft

10-YR Proposed Condition

Subsection: Composite Rating Curve

Label: Composite Outlet Structure - 1

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
0.00	0.00	(N/A)	0.00
0.50	0.00	(N/A)	0.00
1.00	0.00	(N/A)	0.00
1.50	0.00	(N/A)	0.00
2.00	0.00	(N/A)	0.00
2.50	0.00	(N/A)	0.00
3.00	0.00	(N/A)	0.00
3.50	0.00	(N/A)	0.00
4.00	0.00	(N/A)	0.00
4.50	0.00	(N/A)	0.00
5.00	0.00	(N/A)	0.00
5.50	0.00	(N/A)	0.00
6.00	0.00	(N/A)	0.00
6.50	0.00	(N/A)	0.00
7.00	0.00	(N/A)	0.00
7.50	0.00	(N/A)	0.00
8.00	0.00	(N/A)	0.00
8.50	0.00	(N/A)	0.00
9.00	0.00	(N/A)	0.00
9.30	0.00	(N/A)	0.00
9.50	2.25	(N/A)	0.00
10.00	14.81	(N/A)	0.00
10.50	33.17	(N/A)	0.00
11.00	55.94	(N/A)	0.00
11.50	82.35	(N/A)	0.00
12.00	111.94	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing

10-YR Proposed Condition

Subsection: Composite Rating Curve

Label: Composite Outlet Structure - 1

Composite Outflow Summary

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

10-YR Proposed Condition

Subsection: Diverted Hydrograph

Label: Outlet-1

Peak Discharge	0.00 ft ³ /s
Time to Peak	480.000 min
Hydrograph Volume	0.000 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.00	(N/A)	(N/A)	(N/A)

10-YR Proposed Condition

Subsection: Elevation-Volume-Flow Table (Pond)

Label: PO-1

Infiltration	
Infiltration Method (Computed)	No Infiltration
Initial Conditions	
Elevation (Water Surface, Initial)	0.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft ³ /s
Flow (Initial Infiltration)	0.00 ft ³ /s
Flow (Initial, Total)	0.00 ft ³ /s
Time Increment	3.000 min

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
0.00	0.00	0.000	0.000	0.00	0.00	0.00
0.50	0.00	0.219	0.000	0.00	0.00	106.12
1.00	0.00	0.439	0.000	0.00	0.00	212.23
1.50	0.00	0.658	0.000	0.00	0.00	318.35
2.00	0.00	0.877	0.000	0.00	0.00	424.47
2.50	0.00	2.012	0.000	0.00	0.00	973.93
3.00	0.00	3.148	0.000	0.00	0.00	1,523.39
3.50	0.00	4.283	0.000	0.00	0.00	2,072.85
4.00	0.00	5.418	0.000	0.00	0.00	2,622.31
4.50	0.00	8.631	0.000	0.00	0.00	4,177.53
5.00	0.00	11.845	0.000	0.00	0.00	5,732.74
5.50	0.00	15.058	0.000	0.00	0.00	7,287.95
6.00	0.00	18.271	0.000	0.00	0.00	8,843.16
6.50	0.00	24.314	0.000	0.00	0.00	11,768.22
7.00	0.00	30.358	0.000	0.00	0.00	14,693.27
7.50	0.00	36.402	0.000	0.00	0.00	17,618.33
8.00	0.00	42.445	0.000	0.00	0.00	20,543.38
8.50	0.00	51.051	0.000	0.00	0.00	24,708.68
9.00	0.00	59.657	0.000	0.00	0.00	28,873.99
9.30	0.00	64.821	0.000	0.00	0.00	31,373.17
9.50	2.25	68.263	0.000	0.00	2.25	33,041.54
10.00	14.81	76.869	0.000	0.00	14.81	37,219.40
10.50	33.17	87.928	0.000	0.00	33.17	42,590.08
11.00	55.94	98.986	0.000	0.00	55.94	47,965.16
11.50	82.35	110.044	0.000	0.00	82.35	53,343.89
12.00	111.94	121.103	0.000	0.00	111.94	58,725.80

10-YR Proposed Condition

Subsection: Level Pool Pond Routing Summary

Label: PO-1 (IN)

Infiltration			
Infiltration Method (Computed)		No Infiltration	
Initial Conditions			
Elevation (Water Surface, Initial)		0.00 ft	
Volume (Initial)		0.000 ac-ft	
Flow (Initial Outlet)		0.00 ft³/s	
Flow (Initial Infiltration)		0.00 ft³/s	
Flow (Initial, Total)		0.00 ft³/s	
Time Increment		3.000 min	
Inflow/Outflow Hydrograph Summary			
Flow (Peak In)		385.30 ft³/s	Time to Peak (Flow, In)
Flow (Peak Outlet)		0.00 ft³/s	Time to Peak (Flow, Outlet)
			1,164.000 min
			0.000 min
Peak Conditions			
Elevation (Water Surface, Peak)		7.40 ft	
Volume (Peak)		35.233 ac-ft	
Mass Balance (ac-ft)			
Volume (Initial)		0.000 ac-ft	
Volume (Total Inflow)		35.233 ac-ft	
Volume (Total Infiltration)		0.000 ac-ft	
Volume (Total Outlet Outflow)		0.000 ac-ft	
Volume (Retained)		35.233 ac-ft	
Volume (Unrouted)		0.000 ac-ft	
Error (Mass Balance)		0.0 %	

10-YR Proposed Condition

Subsection: Pond Routed Hydrograph (total out)

Label: PO-1 (OUT)

Peak Discharge	0.00 ft ³ /s
Time to Peak	480.000 min
Hydrograph Volume	0.000 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.00	(N/A)	(N/A)	(N/A)

10-YR Proposed Condition

Subsection: Pond Inflow Summary

Label: PO-1 (IN)

Summary for Hydrograph Addition at 'PO-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	CM-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (min)	Flow (Peak) (ft ³ /s)
Flow (From)	CM-1	35.381	1,163.000	386.80
Flow (In)	PO-1	35.233	1,164.000	385.30

10-YR Proposed Condition

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Project Summary

Title

Engineer

Company

Date 12/9/2016

Notes

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25-Yr Proposed Condition

Subsection: User Notifications

User Notifications?	No user notifications generated.
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25-Yr Proposed Condition

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)
CM-1	Post-Development 25-yr	0	44.098	1,162.000	460.20

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)
O-2	Post-Development 25-yr	0	0.000	0.000	0.00

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
PO-1 (IN)	Post-Development 25-yr	0	43.914	1,161.000	453.80	(N/A)	(N/A)
PO-1 (OUT)	Post-Development 25-yr	0	0.000	0.000	0.00	8.09	43.914

25-Yr Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

Peak Discharge	460.20 ft ³ /s
Time to Peak	1,162.000 min
Hydrograph Volume	44.098 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.10	0.10	0.10	0.10
5.000	0.20	0.20	0.20	0.20	0.20
10.000	0.30	0.30	0.30	0.30	0.40
15.000	0.40	0.40	0.40	0.40	0.50
20.000	0.50	0.50	0.50	0.50	0.60
25.000	0.60	0.60	0.60	0.70	0.70
30.000	0.70	0.70	0.70	0.80	0.80
35.000	0.80	0.80	0.90	0.90	0.90
40.000	0.90	0.90	1.00	1.00	1.00
45.000	1.00	1.00	1.10	1.10	1.10
50.000	1.10	1.20	1.20	1.20	1.20
55.000	1.20	1.30	1.30	1.30	1.30
60.000	1.40	1.40	1.40	1.40	1.40
65.000	1.50	1.50	1.50	1.50	1.50
70.000	1.60	1.60	1.60	1.60	1.70
75.000	1.70	1.70	1.70	1.70	1.80
80.000	1.80	1.80	1.80	1.90	1.90
85.000	1.90	1.90	1.90	2.00	2.00
90.000	2.00	2.00	2.00	2.10	2.10
95.000	2.10	2.10	2.20	2.20	2.20
100.000	2.20	2.20	2.20	2.20	2.20
105.000	2.20	2.20	2.20	2.20	2.30
110.000	2.30	2.30	2.30	2.30	2.30
115.000	2.30	2.30	2.30	2.30	2.30
120.000	2.30	2.30	2.30	2.30	2.30
125.000	2.30	2.30	2.30	2.30	2.30
130.000	2.30	2.30	2.30	2.30	2.30
135.000	2.30	2.30	2.30	2.40	2.40
140.000	2.40	2.40	2.40	2.40	2.40
145.000	2.40	2.40	2.40	2.40	2.40
150.000	2.40	2.40	2.40	2.40	2.40
155.000	2.40	2.40	2.40	2.40	2.40
160.000	2.40	2.40	2.40	2.40	2.40
165.000	2.40	2.50	2.50	2.50	2.50
170.000	2.50	2.50	2.50	2.50	2.50
175.000	2.50	2.50	2.50	2.50	2.50
180.000	2.50	2.50	2.50	2.50	2.50

25-Yr Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
185.000	2.50	2.50	2.50	2.50	2.50
190.000	2.50	2.50	2.50	2.50	2.50
195.000	2.60	2.60	2.60	2.60	2.60
200.000	2.60	2.60	2.60	2.60	2.60
205.000	2.60	2.60	2.60	2.60	2.60
210.000	2.60	2.60	2.60	2.60	2.60
215.000	2.70	2.70	2.70	2.70	2.70
220.000	2.70	2.70	2.70	2.70	2.70
225.000	2.70	2.70	2.70	2.70	2.70
230.000	2.70	2.70	2.80	2.80	2.80
235.000	2.80	2.80	2.80	2.80	2.80
240.000	2.80	2.80	2.80	2.80	2.80
245.000	2.80	2.80	2.80	2.80	2.80
250.000	2.90	2.90	2.90	2.90	2.90
255.000	2.90	2.90	2.90	2.90	2.90
260.000	2.90	2.90	2.90	2.90	2.90
265.000	2.90	2.90	3.00	3.00	3.00
270.000	3.00	3.00	3.00	3.00	3.00
275.000	3.00	3.00	3.00	3.00	3.00
280.000	3.00	3.00	3.00	3.00	3.00
285.000	3.10	3.10	3.10	3.10	3.10
290.000	3.10	3.10	3.10	3.10	3.10
295.000	3.10	3.10	3.10	3.10	3.10
300.000	3.10	3.10	3.20	3.20	3.20
305.000	3.20	3.20	3.20	3.20	3.20
310.000	3.20	3.20	3.20	3.20	3.20
315.000	3.20	3.20	3.20	3.20	3.20
320.000	3.20	3.30	3.30	3.30	3.30
325.000	3.30	3.30	3.30	3.30	3.30
330.000	3.30	3.30	3.30	3.30	3.30
335.000	3.30	3.30	3.30	3.30	3.40
340.000	3.40	3.40	3.40	3.40	3.40
345.000	3.40	3.40	3.40	3.40	3.40
350.000	3.40	3.40	3.40	3.40	3.40
355.000	3.40	3.40	3.40	3.50	3.50
360.000	3.50	3.50	3.50	3.50	3.50
365.000	3.50	3.50	3.50	3.50	3.50
370.000	3.50	3.50	3.50	3.50	3.50
375.000	3.50	3.60	3.60	3.60	3.60
380.000	3.60	3.60	3.60	3.60	3.60
385.000	3.60	3.60	3.60	3.60	3.60
390.000	3.60	3.60	3.60	3.60	3.60

25-Yr Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
395.000	3.70	3.70	3.70	3.70	3.70
400.000	3.70	3.70	3.70	3.70	3.70
405.000	3.70	3.70	3.70	3.70	3.70
410.000	3.80	3.80	3.80	3.80	3.80
415.000	3.80	3.80	3.80	3.80	3.80
420.000	3.80	3.80	3.80	3.90	3.90
425.000	3.90	3.90	3.90	3.90	3.90
430.000	3.90	3.90	3.90	3.90	3.90
435.000	3.90	3.90	4.00	4.00	4.00
440.000	4.00	4.00	4.00	4.00	4.00
445.000	4.00	4.00	4.00	4.00	4.00
450.000	4.10	4.10	4.10	4.10	4.10
455.000	4.10	4.10	4.10	4.10	4.10
460.000	4.10	4.10	4.10	4.20	4.20
465.000	4.20	4.20	4.20	4.20	4.20
470.000	4.20	4.20	4.20	4.20	4.20
475.000	4.20	4.20	4.30	4.30	4.30
480.000	4.30	4.30	4.30	4.30	4.30
485.000	4.30	4.30	4.30	4.30	4.30
490.000	4.40	4.40	4.40	4.40	4.40
495.000	4.40	4.40	4.40	4.40	4.40
500.000	4.40	4.40	4.40	4.50	4.50
505.000	4.50	4.50	4.50	4.50	4.50
510.000	4.50	4.50	4.50	4.50	4.50
515.000	4.50	4.50	4.60	4.60	4.60
520.000	4.60	4.60	4.60	4.60	4.60
525.000	4.60	4.60	4.60	4.60	4.60
530.000	4.60	4.70	4.70	4.70	4.70
535.000	4.70	4.70	4.70	4.70	4.70
540.000	4.70	4.70	4.70	4.70	4.70
545.000	4.70	4.80	4.80	4.80	4.80
550.000	4.80	4.80	4.80	4.80	4.80
555.000	4.80	4.80	4.80	4.80	4.80
560.000	4.90	4.90	4.90	4.90	4.90
565.000	4.90	4.90	4.90	4.90	4.90
570.000	4.90	4.90	4.90	4.90	5.00
575.000	5.00	5.00	5.00	5.00	5.00
580.000	5.00	5.00	5.00	5.00	5.00
585.000	5.00	5.00	5.00	5.10	5.10
590.000	5.10	5.10	5.10	5.10	5.10
595.000	5.10	5.10	5.10	5.10	5.10
600.000	5.10	5.10	5.20	5.20	5.20

25-Yr Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
605.000	5.20	5.20	5.20	5.20	5.20
610.000	5.20	5.20	5.20	5.30	5.30
615.000	5.30	5.30	5.30	5.30	5.30
620.000	5.30	5.30	5.30	5.30	5.40
625.000	5.40	5.40	5.40	5.40	5.40
630.000	5.40	5.40	5.40	5.40	5.40
635.000	5.50	5.50	5.50	5.50	5.50
640.000	5.50	5.50	5.50	5.50	5.50
645.000	5.50	5.60	5.60	5.60	5.60
650.000	5.60	5.60	5.60	5.60	5.60
655.000	5.60	5.60	5.70	5.70	5.70
660.000	5.70	5.70	5.70	5.70	5.70
665.000	5.70	5.70	5.70	5.80	5.80
670.000	5.80	5.80	5.80	5.80	5.80
675.000	5.80	5.80	5.80	5.80	5.90
680.000	5.90	5.90	5.90	5.90	5.90
685.000	5.90	5.90	5.90	5.90	5.90
690.000	6.00	6.00	6.00	6.00	6.00
695.000	6.00	6.00	6.00	6.00	6.00
700.000	6.00	6.10	6.10	6.10	6.10
705.000	6.10	6.10	6.10	6.10	6.10
710.000	6.10	6.20	6.20	6.20	6.20
715.000	6.20	6.20	6.20	6.20	6.20
720.000	6.20	6.20	6.30	6.30	6.30
725.000	6.30	6.30	6.30	6.30	6.30
730.000	6.30	6.30	6.30	6.40	6.40
735.000	6.40	6.40	6.40	6.40	6.40
740.000	6.40	6.40	6.40	6.40	6.50
745.000	6.50	6.50	6.50	6.50	6.50
750.000	6.50	6.50	6.50	6.50	6.60
755.000	6.60	6.60	6.60	6.60	6.60
760.000	6.60	6.60	6.60	6.60	6.60
765.000	6.70	6.70	6.70	6.70	6.70
770.000	6.70	6.70	6.70	6.70	6.70
775.000	6.70	6.80	6.80	6.80	6.80
780.000	6.80	6.80	6.80	6.80	6.80
785.000	6.80	6.80	6.90	6.90	6.90
790.000	6.90	6.90	6.90	6.90	6.90
795.000	6.90	6.90	7.00	7.00	7.00
800.000	7.00	7.00	7.00	7.00	7.00
805.000	7.00	7.00	7.00	7.00	7.00
810.000	7.00	7.00	7.00	7.00	7.00

25-Yr Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
815.000	7.00	7.00	7.00	7.00	7.00
820.000	7.00	7.00	7.00	7.00	7.00
825.000	7.00	7.00	7.00	7.00	7.00
830.000	7.00	7.00	7.10	7.10	7.10
835.000	7.10	7.10	7.10	7.10	7.10
840.000	7.10	7.10	7.10	7.10	7.10
845.000	7.10	7.10	7.10	7.10	7.10
850.000	7.10	7.10	7.10	7.10	7.10
855.000	7.10	7.10	7.10	7.10	7.10
860.000	7.10	7.10	7.10	7.10	7.10
865.000	7.10	7.10	7.10	7.10	7.10
870.000	7.10	7.10	7.10	7.10	7.10
875.000	7.10	7.10	7.10	7.20	7.20
880.000	7.20	7.20	7.20	7.20	7.20
885.000	7.20	7.20	7.20	7.20	7.20
890.000	7.20	7.20	7.20	7.20	7.20
895.000	7.20	7.20	7.20	7.20	7.20
900.000	7.20	7.40	7.60	7.80	8.00
905.000	8.20	8.40	8.60	8.80	9.00
910.000	9.20	9.40	9.60	9.80	9.90
915.000	10.10	10.30	10.50	10.70	10.90
920.000	11.10	11.30	11.50	11.70	11.90
925.000	12.10	12.30	12.50	12.70	12.90
930.000	13.10	13.30	13.50	13.70	13.90
935.000	14.10	14.30	14.50	14.70	14.90
940.000	15.00	15.20	15.40	15.60	15.80
945.000	16.00	16.20	16.40	16.60	16.80
950.000	17.00	17.20	17.40	17.60	17.80
955.000	18.00	18.20	18.40	18.60	18.80
960.000	19.00	19.20	19.40	19.60	19.80
965.000	20.00	20.10	20.30	20.50	20.70
970.000	20.90	21.10	21.30	21.50	21.70
975.000	21.90	22.10	22.30	22.50	22.70
980.000	22.90	23.10	23.30	23.50	23.70
985.000	23.90	24.10	24.30	24.50	24.70
990.000	24.90	25.10	25.30	25.40	25.60
995.000	25.80	26.00	26.20	26.40	26.60
1,000.000	26.80	27.40	27.90	28.50	29.00
1,005.000	29.60	30.10	30.70	31.20	31.80
1,010.000	32.30	32.90	33.40	34.00	34.50
1,015.000	35.10	35.60	36.20	36.80	37.30
1,020.000	37.90	38.40	39.00	39.50	40.10

25-Yr Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,025.000	40.60	41.20	41.70	42.30	42.80
1,030.000	43.40	43.90	44.50	45.00	45.60
1,035.000	46.10	46.70	47.20	47.80	48.30
1,040.000	48.90	49.40	50.00	50.50	51.10
1,045.000	51.70	52.20	52.80	53.30	53.90
1,050.000	54.40	55.10	55.70	56.40	57.00
1,055.000	57.70	58.30	59.00	59.60	60.30
1,060.000	60.90	61.60	62.20	62.90	63.50
1,065.000	64.20	64.80	65.50	66.10	66.80
1,070.000	67.40	68.10	68.70	69.40	70.00
1,075.000	70.70	71.30	72.00	72.60	73.30
1,080.000	73.90	74.60	75.20	75.90	76.60
1,085.000	77.20	77.90	78.50	79.20	79.80
1,090.000	80.50	81.10	81.80	82.40	83.10
1,095.000	83.70	84.40	85.00	85.70	86.30
1,100.000	87.00	87.90	88.90	89.90	90.90
1,105.000	91.90	92.80	93.80	94.80	95.80
1,110.000	96.80	97.60	98.50	99.40	100.30
1,115.000	101.10	102.00	102.90	103.80	104.70
1,120.000	105.50	107.60	109.80	111.90	114.00
1,125.000	116.10	118.20	120.30	122.40	124.60
1,130.000	126.70	129.30	132.10	134.90	137.90
1,135.000	141.10	145.50	149.60	153.50	157.70
1,140.000	162.10	167.60	172.70	177.70	182.80
1,145.000	187.90	194.80	201.20	207.70	239.80
1,150.000	273.80	309.80	348.40	391.20	412.30
1,155.000	418.10	418.00	420.80	425.40	428.60
1,160.000	440.90	453.80	460.20	458.40	449.00
1,165.000	433.60	413.90	392.60	370.80	348.70
1,170.000	326.40	302.60	278.20	253.60	229.50
1,175.000	206.60	185.60	167.60	152.60	140.20
1,180.000	130.10	121.00	113.40	107.00	101.30
1,185.000	96.20	91.60	88.00	85.00	82.30
1,190.000	79.90	76.90	74.20	71.50	68.80
1,195.000	66.10	63.30	61.30	59.30	57.40
1,200.000	55.50	53.80	52.20	50.60	49.20
1,205.000	47.80	46.60	45.40	44.10	42.90
1,210.000	41.70	40.20	38.70	37.20	35.80
1,215.000	34.40	33.00	32.00	31.10	30.20
1,220.000	29.30	28.50	27.80	27.10	26.60
1,225.000	26.00	25.50	25.10	24.70	24.30
1,230.000	24.00	23.30	22.70	22.00	21.50

25-Yr Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,235.000	21.00	20.50	20.10	19.60	19.00
1,240.000	18.50	17.90	17.30	16.80	16.20
1,245.000	15.70	15.20	14.70	14.20	13.70
1,250.000	13.30	12.90	12.60	12.20	11.90
1,255.000	11.60	11.30	11.00	10.70	10.40
1,260.000	10.20	9.90	9.70	9.50	9.30
1,265.000	9.10	8.90	8.70	8.50	8.40
1,270.000	8.20	8.10	8.00	7.80	7.70
1,275.000	7.60	7.50	7.30	7.20	7.10
1,280.000	7.00	6.90	6.80	6.80	6.70
1,285.000	6.70	6.60	6.60	6.60	6.50
1,290.000	6.50	6.50	6.50	6.50	6.50
1,295.000	6.50	6.50	6.40	6.40	6.40
1,300.000	6.40	6.40	6.40	6.40	6.40
1,305.000	6.30	6.30	6.30	6.30	6.20
1,310.000	6.20	6.20	6.10	6.10	6.00
1,315.000	6.00	5.90	5.90	5.80	5.80
1,320.000	5.70	5.60	5.60	5.50	5.50
1,325.000	5.40	5.40	5.30	5.30	5.20
1,330.000	5.10	5.10	5.10	5.10	5.10
1,335.000	5.00	5.00	5.00	5.00	4.90
1,340.000	4.90	4.90	4.90	4.90	4.90
1,345.000	4.80	4.80	4.80	4.80	4.80
1,350.000	4.70	4.70	4.70	4.60	4.60
1,355.000	4.50	4.50	4.40	4.40	4.30
1,360.000	4.30	4.20	4.20	4.10	4.10
1,365.000	4.00	4.00	3.90	3.80	3.80
1,370.000	3.70	3.70	3.70	3.60	3.60
1,375.000	3.60	3.60	3.50	3.50	3.50
1,380.000	3.40	3.40	3.40	3.40	3.40
1,385.000	3.40	3.40	3.40	3.40	3.40
1,390.000	3.40	3.40	3.40	3.40	3.40
1,395.000	3.40	3.40	3.40	3.40	3.40
1,400.000	3.40	3.40	3.40	3.30	3.30
1,405.000	3.30	3.30	3.30	3.30	3.30
1,410.000	3.20	3.20	3.20	3.20	3.20
1,415.000	3.20	3.20	3.20	3.10	3.10
1,420.000	3.10	3.10	3.10	3.00	3.00
1,425.000	3.00	3.00	2.90	2.90	2.90
1,430.000	2.90	2.80	2.80	2.80	2.80
1,435.000	2.70	2.70	2.70	2.70	2.60
1,440.000	2.60	2.60	2.60	2.60	2.50

25-Yr Proposed Condition

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,445.000	2.50	2.50	2.50	2.50	2.50
1,450.000	2.50	2.40	2.40	2.40	2.40
1,455.000	2.40	2.40	2.30	2.30	2.30
1,460.000	2.30	2.30	2.30	2.30	2.30
1,465.000	2.30	2.30	2.30	2.30	2.30
1,470.000	2.30	2.30	2.30	2.30	2.30
1,475.000	2.30	2.30	2.30	2.30	2.30
1,480.000	2.30	2.30	2.30	2.20	2.20
1,485.000	2.20	2.20	2.20	2.20	2.20
1,490.000	2.20	2.20	2.20	2.20	2.20
1,495.000	2.20	2.20	2.20	2.20	2.20
1,500.000	2.20	(N/A)	(N/A)	(N/A)	(N/A)

25-Yr Proposed Condition

Subsection: Addition Summary

Label: O-2

Summary for Hydrograph Addition at 'O-2'

Upstream Link	Upstream Node
Outlet-1	PO-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (min)	Flow (Peak) (ft ³ /s)
Flow (From)	Outlet-1	0.000	0.000	0.00
Flow (In)	O-2	0.000	0.000	0.00

25-Yr Proposed Condition

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	0.00	0.00	0.00	0.00	0.01
15.000	0.01	0.01	0.02	0.02	0.03
30.000	0.03	0.04	0.05	0.06	0.07
45.000	0.08	0.09	0.10	0.11	0.12
60.000	0.13	0.15	0.16	0.17	0.19
75.000	0.20	0.22	0.24	0.25	0.27
90.000	0.29	0.31	0.33	0.35	0.37
105.000	0.39	0.41	0.43	0.45	0.48
120.000	0.50	0.52	0.54	0.56	0.58
135.000	0.61	0.63	0.65	0.67	0.70
150.000	0.72	0.74	0.76	0.79	0.81
165.000	0.83	0.85	0.88	0.90	0.92
180.000	0.95	0.97	1.00	1.02	1.04
195.000	1.07	1.09	1.12	1.14	1.16
210.000	1.19	1.21	1.24	1.26	1.29
225.000	1.32	1.34	1.37	1.39	1.42
240.000	1.44	1.47	1.50	1.52	1.55
255.000	1.58	1.61	1.63	1.66	1.69
270.000	1.72	1.74	1.77	1.80	1.83
285.000	1.86	1.89	1.92	1.95	1.97
300.000	2.00	2.01	2.01	2.02	2.02
315.000	2.03	2.04	2.04	2.05	2.05
330.000	2.06	2.07	2.07	2.08	2.08
345.000	2.09	2.10	2.10	2.11	2.11
360.000	2.12	2.13	2.13	2.14	2.15
375.000	2.15	2.16	2.17	2.17	2.18
390.000	2.19	2.19	2.20	2.21	2.21
405.000	2.22	2.23	2.23	2.24	2.25
420.000	2.25	2.26	2.27	2.27	2.28
435.000	2.29	2.30	2.30	2.31	2.32
450.000	2.33	2.33	2.34	2.35	2.35
465.000	2.36	2.37	2.38	2.39	2.39
480.000	2.40	2.41	2.42	2.42	2.43
495.000	2.44	2.45	2.46	2.46	2.47
510.000	2.48	2.49	2.50	2.51	2.51
525.000	2.52	2.53	2.54	2.55	2.56
540.000	2.56	2.57	2.58	2.59	2.60
555.000	2.61	2.62	2.63	2.63	2.64
570.000	2.65	2.66	2.67	2.68	2.69
585.000	2.70	2.71	2.72	2.73	2.73
600.000	2.74	2.75	2.76	2.77	2.78

25-Yr Proposed Condition

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
615.000	2.79	2.80	2.81	2.82	2.83
630.000	2.84	2.85	2.86	2.87	2.88
645.000	2.89	2.90	2.91	2.92	2.93
660.000	2.94	2.95	2.96	2.97	2.98
675.000	2.99	3.00	3.01	3.03	3.04
690.000	3.05	3.06	3.07	3.08	3.09
705.000	3.10	3.11	3.12	3.14	3.15
720.000	3.16	3.17	3.18	3.19	3.20
735.000	3.22	3.23	3.24	3.25	3.26
750.000	3.27	3.29	3.30	3.31	3.32
765.000	3.33	3.35	3.36	3.37	3.38
780.000	3.39	3.41	3.42	3.43	3.44
795.000	3.46	3.47	3.48	3.50	3.51
810.000	3.52	3.53	3.55	3.56	3.57
825.000	3.58	3.60	3.61	3.62	3.64
840.000	3.65	3.66	3.67	3.69	3.70
855.000	3.71	3.73	3.74	3.75	3.77
870.000	3.78	3.79	3.80	3.82	3.83
885.000	3.84	3.86	3.87	3.88	3.90
900.000	3.91	3.92	3.94	3.95	3.97
915.000	3.99	4.00	4.01	4.02	4.02
930.000	4.03	4.04	4.05	4.06	4.07
945.000	4.08	4.09	4.10	4.11	4.12
960.000	4.14	4.15	4.16	4.17	4.19
975.000	4.20	4.22	4.23	4.25	4.26
990.000	4.28	4.29	4.31	4.33	4.34
1,005.000	4.36	4.38	4.40	4.42	4.45
1,020.000	4.47	4.50	4.52	4.55	4.58
1,035.000	4.61	4.64	4.67	4.70	4.73
1,050.000	4.77	4.80	4.84	4.88	4.92
1,065.000	4.96	5.00	5.04	5.09	5.13
1,080.000	5.18	5.23	5.28	5.33	5.38
1,095.000	5.43	5.49	5.54	5.60	5.66
1,110.000	5.72	5.79	5.85	5.92	5.99
1,125.000	6.03	6.07	6.11	6.16	6.21
1,140.000	6.26	6.32	6.38	6.46	6.56
1,155.000	6.69	6.83	6.98	7.14	7.28
1,170.000	7.41	7.51	7.58	7.64	7.68
1,185.000	7.71	7.75	7.77	7.80	7.82
1,200.000	7.84	7.86	7.88	7.89	7.90
1,215.000	7.92	7.93	7.94	7.95	7.96

25-Yr Proposed Condition

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
1,230.000	7.97	7.97	7.98	7.99	7.99
1,245.000	8.00	8.00	8.01	8.01	8.01
1,260.000	8.01	8.02	8.02	8.02	8.02
1,275.000	8.02	8.03	8.03	8.03	8.03
1,290.000	8.03	8.03	8.04	8.04	8.04
1,305.000	8.04	8.04	8.04	8.05	8.05
1,320.000	8.05	8.05	8.05	8.05	8.05
1,335.000	8.05	8.06	8.06	8.06	8.06
1,350.000	8.06	8.06	8.06	8.06	8.06
1,365.000	8.07	8.07	8.07	8.07	8.07
1,380.000	8.07	8.07	8.07	8.07	8.07
1,395.000	8.07	8.08	8.08	8.08	8.08
1,410.000	8.08	8.08	8.08	8.08	8.08
1,425.000	8.08	8.08	8.08	8.08	8.08
1,440.000	8.09	(N/A)	(N/A)	(N/A)	(N/A)

25-Yr Proposed Condition

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
0.000	0.000	0.000	0.001	0.002	0.003
15.000	0.004	0.006	0.008	0.010	0.012
30.000	0.015	0.018	0.021	0.025	0.029
45.000	0.033	0.037	0.042	0.047	0.052
60.000	0.058	0.064	0.070	0.076	0.082
75.000	0.089	0.096	0.103	0.111	0.119
90.000	0.127	0.135	0.144	0.153	0.162
105.000	0.171	0.180	0.189	0.199	0.208
120.000	0.218	0.227	0.237	0.246	0.256
135.000	0.265	0.275	0.285	0.295	0.305
150.000	0.315	0.325	0.335	0.345	0.355
165.000	0.364	0.375	0.385	0.395	0.406
180.000	0.416	0.426	0.437	0.447	0.457
195.000	0.468	0.479	0.489	0.500	0.511
210.000	0.521	0.532	0.543	0.554	0.565
225.000	0.577	0.588	0.599	0.610	0.622
240.000	0.633	0.645	0.657	0.668	0.680
255.000	0.692	0.704	0.716	0.728	0.740
270.000	0.752	0.765	0.777	0.790	0.802
285.000	0.815	0.827	0.840	0.853	0.866
300.000	0.879	0.892	0.905	0.918	0.931
315.000	0.945	0.958	0.971	0.985	0.999
330.000	1.012	1.026	1.039	1.053	1.067
345.000	1.081	1.095	1.110	1.124	1.138
360.000	1.152	1.166	1.181	1.195	1.210
375.000	1.224	1.239	1.254	1.269	1.283
390.000	1.298	1.313	1.328	1.344	1.359
405.000	1.374	1.389	1.405	1.421	1.436
420.000	1.452	1.468	1.484	1.500	1.516
435.000	1.532	1.549	1.565	1.582	1.598
450.000	1.615	1.632	1.649	1.666	1.683
465.000	1.700	1.717	1.735	1.752	1.770
480.000	1.787	1.805	1.823	1.841	1.859
495.000	1.877	1.895	1.913	1.932	1.950
510.000	1.969	1.987	2.006	2.025	2.044
525.000	2.063	2.082	2.101	2.120	2.140
540.000	2.159	2.179	2.198	2.218	2.238
555.000	2.258	2.278	2.298	2.318	2.338
570.000	2.358	2.379	2.399	2.420	2.440
585.000	2.461	2.482	2.503	2.524	2.545
600.000	2.566	2.588	2.609	2.631	2.652

25-Yr Proposed Condition

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
615.000	2.674	2.696	2.718	2.740	2.762
630.000	2.784	2.807	2.829	2.852	2.875
645.000	2.897	2.920	2.943	2.967	2.990
660.000	3.013	3.037	3.061	3.084	3.108
675.000	3.132	3.156	3.180	3.205	3.229
690.000	3.254	3.279	3.303	3.328	3.353
705.000	3.378	3.404	3.429	3.455	3.480
720.000	3.506	3.532	3.558	3.584	3.610
735.000	3.636	3.662	3.689	3.715	3.742
750.000	3.769	3.796	3.823	3.850	3.878
765.000	3.905	3.933	3.961	3.988	4.016
780.000	4.044	4.072	4.100	4.129	4.157
795.000	4.186	4.214	4.243	4.272	4.301
810.000	4.330	4.359	4.388	4.417	4.446
825.000	4.475	4.504	4.533	4.562	4.591
840.000	4.620	4.650	4.679	4.708	4.738
855.000	4.767	4.796	4.826	4.855	4.885
870.000	4.914	4.943	4.973	5.002	5.032
885.000	5.062	5.091	5.121	5.151	5.181
900.000	5.210	5.241	5.275	5.311	5.349
915.000	5.390	5.433	5.478	5.526	5.577
930.000	5.630	5.685	5.743	5.803	5.866
945.000	5.931	5.998	6.068	6.140	6.215
960.000	6.292	6.372	6.454	6.538	6.625
975.000	6.714	6.806	6.900	6.997	7.096
990.000	7.198	7.302	7.408	7.517	7.629
1,005.000	7.748	7.874	8.006	8.145	8.291
1,020.000	8.444	8.604	8.771	8.945	9.125
1,035.000	9.312	9.506	9.707	9.915	10.129
1,050.000	10.351	10.580	10.817	11.062	11.315
1,065.000	11.576	11.845	12.123	12.408	12.701
1,080.000	13.003	13.312	13.630	13.956	14.290
1,095.000	14.632	14.982	15.340	15.710	16.091
1,110.000	16.485	16.890	17.307	17.734	18.177
1,125.000	18.644	19.136	19.656	20.208	20.802
1,140.000	21.446	22.149	22.918	23.816	25.031
1,155.000	26.615	28.358	30.174	32.040	33.779
1,170.000	35.264	36.462	37.370	38.043	38.567
1,185.000	39.000	39.374	39.709	40.010	40.279
1,200.000	40.520	40.739	40.940	41.125	41.294
1,215.000	41.445	41.580	41.703	41.817	41.924

25-Yr Proposed Condition

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,230.000	42.025	42.120	42.208	42.290	42.365
1,245.000	42.433	42.495	42.551	42.602	42.649
1,260.000	42.693	42.734	42.772	42.807	42.841
1,275.000	42.874	42.904	42.933	42.961	42.989
1,290.000	43.016	43.043	43.070	43.096	43.123
1,305.000	43.149	43.175	43.201	43.226	43.251
1,320.000	43.275	43.298	43.320	43.342	43.363
1,335.000	43.384	43.405	43.425	43.446	43.466
1,350.000	43.485	43.505	43.523	43.542	43.559
1,365.000	43.576	43.592	43.608	43.623	43.637
1,380.000	43.652	43.666	43.680	43.694	43.708
1,395.000	43.722	43.736	43.750	43.764	43.777
1,410.000	43.791	43.804	43.817	43.830	43.843
1,425.000	43.856	43.868	43.880	43.891	43.903
1,440.000	43.914	(N/A)	(N/A)	(N/A)	(N/A)

25-Yr Proposed Condition

Subsection: Elevation vs. Volume Curve

Label: PO-1

Elevation-Volume

Pond Elevation (ft)	Pond Volume (ac-ft)
0.00	0.000
2.00	0.877
4.00	5.418
6.00	18.271
8.00	42.445
10.00	76.869
12.00	121.103

25-Yr Proposed Condition

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Requested Pond Water Surface Elevations	
Minimum (Headwater)	0.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	12.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Box Tailwater Settings	Culvert - 1 Tailwater	Forward	TW	9.30 (N/A)	12.00 (N/A)

25-Yr Proposed Condition

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Structure ID: Culvert - 1	
Structure Type: Culvert-Box	
Number of Barrels	1
Width	10.30 ft
Height	2.80 ft
Length	77.00 ft
Length (Computed Barrel)	77.01 ft
Slope (Computed)	0.014 ft/ft
Outlet Control Data	
Manning's n	0.013
Ke	0.500
Kb	0.004
Kr	0.500
Convergence Tolerance	0.00 ft
Inlet Control Data	
Equation Form	Form 1
K	0.0260
M	1.0000
C	0.0347
Y	0.8100
T1 ratio (HW/D)	1.171
T2 ratio (HW/D)	1.358
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.

Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control, interpolate between flows at T1 & T2...

T1 Elevation	12.58 ft	T1 Flow	168.90 ft ³ /s
T2 Elevation	13.10 ft	T2 Flow	193.03 ft ³ /s

25-Yr Proposed Condition

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall
Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

25-Yr Proposed Condition

Subsection: Individual Outlet Curves

Label: Composite Outlet Structure - 1

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = Culvert - 1 (Culvert-Box)

Mannings open channel maximum capacity: 586.00 ft³/s

Upstream ID = (Pond Water Surface)

Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
0.00	0.00	(N/A)	0.00
0.50	0.00	(N/A)	0.00
1.00	0.00	(N/A)	0.00
1.50	0.00	(N/A)	0.00
2.00	0.00	(N/A)	0.00
2.50	0.00	(N/A)	0.00
3.00	0.00	(N/A)	0.00
3.50	0.00	(N/A)	0.00
4.00	0.00	(N/A)	0.00
4.50	0.00	(N/A)	0.00
5.00	0.00	(N/A)	0.00
5.50	0.00	(N/A)	0.00
6.00	0.00	(N/A)	0.00
6.50	0.00	(N/A)	0.00
7.00	0.00	(N/A)	0.00
7.50	0.00	(N/A)	0.00
8.00	0.00	(N/A)	0.00
8.50	0.00	(N/A)	0.00
9.00	0.00	(N/A)	0.00
9.30	0.00	(N/A)	0.00
9.50	2.25	(N/A)	0.00
10.00	14.81	(N/A)	0.00
10.50	33.17	(N/A)	0.00
11.00	55.94	(N/A)	0.00
11.50	82.35	(N/A)	0.00
12.00	111.94	(N/A)	0.00

Computation Messages

Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El

25-Yr Proposed Condition

Subsection: Individual Outlet Curves

Label: Composite Outlet Structure - 1

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = Culvert - 1 (Culvert-Box)

Mannings open channel maximum capacity: 586.00 ft³/s

Upstream ID = (Pond Water Surface)

Downstream ID = Tailwater (Pond Outfall)

Computation Messages

Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .057ft
Dcr= .114ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .200ft
Dcr= .400ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .343ft
Dcr= .686ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .486ft
Dcr= .971ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .629ft
Dcr= 1.257ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .771ft
Dcr= 1.543ft CRIT.DEPTH Hev= .00ft

25-Yr Proposed Condition

Subsection: Composite Rating Curve

Label: Composite Outlet Structure - 1

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
0.00	0.00	(N/A)	0.00
0.50	0.00	(N/A)	0.00
1.00	0.00	(N/A)	0.00
1.50	0.00	(N/A)	0.00
2.00	0.00	(N/A)	0.00
2.50	0.00	(N/A)	0.00
3.00	0.00	(N/A)	0.00
3.50	0.00	(N/A)	0.00
4.00	0.00	(N/A)	0.00
4.50	0.00	(N/A)	0.00
5.00	0.00	(N/A)	0.00
5.50	0.00	(N/A)	0.00
6.00	0.00	(N/A)	0.00
6.50	0.00	(N/A)	0.00
7.00	0.00	(N/A)	0.00
7.50	0.00	(N/A)	0.00
8.00	0.00	(N/A)	0.00
8.50	0.00	(N/A)	0.00
9.00	0.00	(N/A)	0.00
9.30	0.00	(N/A)	0.00
9.50	2.25	(N/A)	0.00
10.00	14.81	(N/A)	0.00
10.50	33.17	(N/A)	0.00
11.00	55.94	(N/A)	0.00
11.50	82.35	(N/A)	0.00
12.00	111.94	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing

25-Yr Proposed Condition

Subsection: Composite Rating Curve

Label: Composite Outlet Structure - 1

Composite Outflow Summary

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

25-Yr Proposed Condition

Subsection: Diverted Hydrograph

Label: Outlet-1

Peak Discharge	0.00 ft ³ /s
Time to Peak	480.000 min
Hydrograph Volume	0.000 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.00	(N/A)	(N/A)	(N/A)

25-Yr Proposed Condition

Subsection: Elevation-Volume-Flow Table (Pond)

Label: PO-1

Infiltration	
Infiltration Method (Computed)	No Infiltration
Initial Conditions	
Elevation (Water Surface, Initial)	0.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft ³ /s
Flow (Initial Infiltration)	0.00 ft ³ /s
Flow (Initial, Total)	0.00 ft ³ /s
Time Increment	3.000 min

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
0.00	0.00	0.000	0.000	0.00	0.00	0.00
0.50	0.00	0.219	0.000	0.00	0.00	106.12
1.00	0.00	0.439	0.000	0.00	0.00	212.23
1.50	0.00	0.658	0.000	0.00	0.00	318.35
2.00	0.00	0.877	0.000	0.00	0.00	424.47
2.50	0.00	2.012	0.000	0.00	0.00	973.93
3.00	0.00	3.148	0.000	0.00	0.00	1,523.39
3.50	0.00	4.283	0.000	0.00	0.00	2,072.85
4.00	0.00	5.418	0.000	0.00	0.00	2,622.31
4.50	0.00	8.631	0.000	0.00	0.00	4,177.53
5.00	0.00	11.845	0.000	0.00	0.00	5,732.74
5.50	0.00	15.058	0.000	0.00	0.00	7,287.95
6.00	0.00	18.271	0.000	0.00	0.00	8,843.16
6.50	0.00	24.314	0.000	0.00	0.00	11,768.22
7.00	0.00	30.358	0.000	0.00	0.00	14,693.27
7.50	0.00	36.402	0.000	0.00	0.00	17,618.33
8.00	0.00	42.445	0.000	0.00	0.00	20,543.38
8.50	0.00	51.051	0.000	0.00	0.00	24,708.68
9.00	0.00	59.657	0.000	0.00	0.00	28,873.99
9.30	0.00	64.821	0.000	0.00	0.00	31,373.17
9.50	2.25	68.263	0.000	0.00	2.25	33,041.54
10.00	14.81	76.869	0.000	0.00	14.81	37,219.40
10.50	33.17	87.928	0.000	0.00	33.17	42,590.08
11.00	55.94	98.986	0.000	0.00	55.94	47,965.16
11.50	82.35	110.044	0.000	0.00	82.35	53,343.89
12.00	111.94	121.103	0.000	0.00	111.94	58,725.80

25-Yr Proposed Condition

Subsection: Level Pool Pond Routing Summary

Label: PO-1 (IN)

Infiltration			
Infiltration Method (Computed)		No Infiltration	
Initial Conditions			
Elevation (Water Surface, Initial)		0.00 ft	
Volume (Initial)		0.000 ac-ft	
Flow (Initial Outlet)		0.00 ft³/s	
Flow (Initial Infiltration)		0.00 ft³/s	
Flow (Initial, Total)		0.00 ft³/s	
Time Increment		3.000 min	
Inflow/Outflow Hydrograph Summary			
Flow (Peak In)		453.80 ft³/s	Time to Peak (Flow, In)
Flow (Peak Outlet)		0.00 ft³/s	Time to Peak (Flow, Outlet)
			1,161.000 min
			0.000 min
Peak Conditions			
Elevation (Water Surface, Peak)		8.09 ft	
Volume (Peak)		43.914 ac-ft	
Mass Balance (ac-ft)			
Volume (Initial)		0.000 ac-ft	
Volume (Total Inflow)		43.914 ac-ft	
Volume (Total Infiltration)		0.000 ac-ft	
Volume (Total Outlet Outflow)		0.000 ac-ft	
Volume (Retained)		43.914 ac-ft	
Volume (Unrouted)		0.000 ac-ft	
Error (Mass Balance)		0.0 %	

25-Yr Proposed Condition

Subsection: Pond Routed Hydrograph (total out)

Label: PO-1 (OUT)

Peak Discharge	0.00 ft ³ /s
Time to Peak	480.000 min
Hydrograph Volume	0.000 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.00	(N/A)	(N/A)	(N/A)

25-Yr Proposed Condition

Subsection: Pond Inflow Summary

Label: PO-1 (IN)

Summary for Hydrograph Addition at 'PO-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	CM-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (min)	Flow (Peak) (ft ³ /s)
Flow (From)	CM-1	44.098	1,162.000	460.20
Flow (In)	PO-1	43.914	1,161.000	453.80

25-Yr Proposed Condition

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Project Summary

Title

Engineer

Company

Date 12/9/2016

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100-Year Proposed Condition Existing Outlet

Subsection: User Notifications

User Notifications?	No user notifications generated.
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100-Year Proposed Condition Existing Outlet

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)
CM-1	Post-Development 100-yr	0	87.419	1,161.000	651.90

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)
O-2	Post-Development 100-yr	0	6.822	1,350.000	22.23

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
PO-1 (IN)	Post-Development 100-yr	0	86.848	1,161.000	651.90	(N/A)	(N/A)
PO-1 (OUT)	Post-Development 100-yr	0	6.822	1,350.000	22.23	10.20	81.338

100-Year Proposed Condition Existing Outlet

Subsection: Read Hydrograph

Label: CM-1

Peak Discharge	651.90 ft ³ /s
Time to Peak	1,161.000 min
Hydrograph Volume	87.419 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.10	0.20	0.30	0.30
5.000	0.40	0.50	0.50	0.60	0.70
10.000	0.70	0.80	0.90	1.00	1.00
15.000	1.10	1.20	1.20	1.30	1.40
20.000	1.40	1.50	1.60	1.70	1.70
25.000	1.80	1.90	1.90	2.00	2.10
30.000	2.10	2.20	2.30	2.40	2.40
35.000	2.50	2.60	2.60	2.70	2.80
40.000	2.80	2.90	3.00	3.00	3.10
45.000	3.20	3.30	3.30	3.40	3.50
50.000	3.50	3.60	3.70	3.70	3.80
55.000	3.90	4.00	4.00	4.10	4.20
60.000	4.20	4.30	4.40	4.40	4.50
65.000	4.60	4.70	4.70	4.80	4.90
70.000	4.90	5.00	5.10	5.10	5.20
75.000	5.30	5.30	5.40	5.50	5.60
80.000	5.60	5.70	5.80	5.80	5.90
85.000	6.00	6.00	6.10	6.20	6.30
90.000	6.30	6.40	6.50	6.50	6.60
95.000	6.70	6.70	6.80	6.90	7.00
100.000	7.00	7.00	7.00	7.00	7.00
105.000	7.00	7.00	7.10	7.10	7.10
110.000	7.10	7.10	7.10	7.10	7.10
115.000	7.10	7.10	7.10	7.10	7.10
120.000	7.10	7.10	7.10	7.10	7.10
125.000	7.10	7.10	7.10	7.10	7.10
130.000	7.20	7.20	7.20	7.20	7.20
135.000	7.20	7.20	7.20	7.20	7.20
140.000	7.20	7.20	7.20	7.20	7.20
145.000	7.20	7.20	7.20	7.20	7.20
150.000	7.20	7.20	7.20	7.30	7.30
155.000	7.30	7.30	7.30	7.30	7.30
160.000	7.30	7.30	7.30	7.30	7.30
165.000	7.30	7.30	7.30	7.30	7.30
170.000	7.30	7.30	7.30	7.30	7.30
175.000	7.30	7.40	7.40	7.40	7.40
180.000	7.40	7.40	7.40	7.40	7.40

100-Year Proposed Condition Existing Outlet

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
185.000	7.40	7.40	7.40	7.40	7.40
190.000	7.40	7.40	7.40	7.40	7.40
195.000	7.40	7.40	7.40	7.50	7.50
200.000	7.50	7.50	7.60	7.60	7.70
205.000	7.80	7.80	7.90	7.90	8.00
210.000	8.10	8.10	8.20	8.20	8.30
215.000	8.40	8.40	8.50	8.50	8.60
220.000	8.70	8.70	8.80	8.80	8.90
225.000	9.00	9.00	9.10	9.10	9.20
230.000	9.30	9.30	9.40	9.40	9.50
235.000	9.60	9.60	9.70	9.80	9.80
240.000	9.90	9.90	10.00	10.10	10.10
245.000	10.20	10.20	10.30	10.40	10.40
250.000	10.50	10.50	10.60	10.70	10.70
255.000	10.80	10.80	10.90	11.00	11.00
260.000	11.10	11.10	11.20	11.30	11.30
265.000	11.40	11.40	11.50	11.60	11.60
270.000	11.70	11.70	11.80	11.90	11.90
275.000	12.00	12.00	12.10	12.20	12.20
280.000	12.30	12.30	12.40	12.50	12.50
285.000	12.60	12.60	12.70	12.80	12.80
290.000	12.90	12.90	13.00	13.10	13.10
295.000	13.20	13.20	13.30	13.40	13.40
300.000	13.50	13.50	13.50	13.60	13.60
305.000	13.60	13.70	13.70	13.70	13.80
310.000	13.80	13.80	13.80	13.90	13.90
315.000	13.90	14.00	14.00	14.00	14.10
320.000	14.10	14.10	14.10	14.20	14.20
325.000	14.20	14.30	14.30	14.30	14.40
330.000	14.40	14.40	14.40	14.50	14.50
335.000	14.50	14.60	14.60	14.60	14.70
340.000	14.70	14.70	14.70	14.80	14.80
345.000	14.80	14.90	14.90	14.90	15.00
350.000	15.00	15.00	15.00	15.10	15.10
355.000	15.10	15.20	15.20	15.20	15.30
360.000	15.30	15.30	15.30	15.40	15.40
365.000	15.40	15.50	15.50	15.50	15.60
370.000	15.60	15.60	15.60	15.70	15.70
375.000	15.70	15.80	15.80	15.80	15.90
380.000	15.90	15.90	15.90	16.00	16.00
385.000	16.00	16.10	16.10	16.10	16.20
390.000	16.20	16.20	16.20	16.30	16.30

100-Year Proposed Condition Existing Outlet

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
395.000	16.30	16.40	16.40	16.40	16.50
400.000	16.50	16.50	16.50	16.60	16.60
405.000	16.60	16.60	16.60	16.70	16.70
410.000	16.70	16.70	16.70	16.80	16.80
415.000	16.80	16.80	16.80	16.90	16.90
420.000	16.90	16.90	16.90	17.00	17.00
425.000	17.00	17.00	17.00	17.10	17.10
430.000	17.10	17.10	17.10	17.20	17.20
435.000	17.20	17.20	17.30	17.30	17.30
440.000	17.30	17.30	17.40	17.40	17.40
445.000	17.40	17.40	17.50	17.50	17.50
450.000	17.50	17.50	17.60	17.60	17.60
455.000	17.60	17.60	17.70	17.70	17.70
460.000	17.70	17.70	17.80	17.80	17.80
465.000	17.80	17.80	17.90	17.90	17.90
470.000	17.90	18.00	18.00	18.00	18.00
475.000	18.00	18.10	18.10	18.10	18.10
480.000	18.10	18.20	18.20	18.20	18.20
485.000	18.20	18.30	18.30	18.30	18.30
490.000	18.30	18.40	18.40	18.40	18.40
495.000	18.40	18.50	18.50	18.50	18.50
500.000	18.50	18.60	18.70	18.70	18.80
505.000	18.80	18.90	19.00	19.00	19.10
510.000	19.10	19.20	19.20	19.30	19.40
515.000	19.40	19.50	19.50	19.60	19.70
520.000	19.70	19.80	19.80	19.90	19.90
525.000	20.00	20.10	20.10	20.20	20.20
530.000	20.30	20.40	20.40	20.50	20.50
535.000	20.60	20.60	20.70	20.80	20.80
540.000	20.90	20.90	21.00	21.10	21.10
545.000	21.20	21.20	21.30	21.30	21.40
550.000	21.50	21.50	21.60	21.60	21.70
555.000	21.80	21.80	21.90	21.90	22.00
560.000	22.00	22.10	22.20	22.20	22.30
565.000	22.30	22.40	22.50	22.50	22.60
570.000	22.60	22.70	22.70	22.80	22.90
575.000	22.90	23.00	23.00	23.10	23.20
580.000	23.20	23.30	23.30	23.40	23.40
585.000	23.50	23.60	23.60	23.70	23.70
590.000	23.80	23.90	23.90	24.00	24.00
595.000	24.10	24.10	24.20	24.30	24.30
600.000	24.40	24.40	24.50	24.50	24.50

100-Year Proposed Condition Existing Outlet

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
605.000	24.60	24.60	24.60	24.70	24.70
610.000	24.70	24.80	24.80	24.80	24.90
615.000	24.90	24.90	25.00	25.00	25.00
620.000	25.10	25.10	25.20	25.20	25.20
625.000	25.30	25.30	25.30	25.40	25.40
630.000	25.40	25.50	25.50	25.50	25.60
635.000	25.60	25.60	25.70	25.70	25.70
640.000	25.80	25.80	25.90	25.90	25.90
645.000	26.00	26.00	26.00	26.10	26.10
650.000	26.10	26.20	26.20	26.20	26.30
655.000	26.30	26.30	26.40	26.40	26.50
660.000	26.50	26.50	26.60	26.60	26.60
665.000	26.70	26.70	26.70	26.80	26.80
670.000	26.80	26.90	26.90	26.90	27.00
675.000	27.00	27.00	27.10	27.10	27.20
680.000	27.20	27.20	27.30	27.30	27.30
685.000	27.40	27.40	27.40	27.50	27.50
690.000	27.50	27.60	27.60	27.60	27.70
695.000	27.70	27.70	27.80	27.80	27.90
700.000	27.90	27.90	28.00	28.10	28.10
705.000	28.20	28.20	28.30	28.30	28.40
710.000	28.40	28.50	28.50	28.60	28.60
715.000	28.70	28.70	28.80	28.90	28.90
720.000	29.00	29.00	29.10	29.10	29.20
725.000	29.20	29.30	29.30	29.40	29.40
730.000	29.50	29.60	29.60	29.70	29.70
735.000	29.80	29.80	29.90	29.90	30.00
740.000	30.00	30.10	30.10	30.20	30.30
745.000	30.30	30.40	30.40	30.50	30.50
750.000	30.60	30.60	30.70	30.70	30.80
755.000	30.80	30.90	31.00	31.00	31.10
760.000	31.10	31.20	31.20	31.30	31.30
765.000	31.40	31.40	31.50	31.50	31.60
770.000	31.60	31.70	31.80	31.80	31.90
775.000	31.90	32.00	32.00	32.10	32.10
780.000	32.20	32.20	32.30	32.30	32.40
785.000	32.50	32.50	32.60	32.60	32.70
790.000	32.70	32.80	32.80	32.90	32.90
795.000	33.00	33.00	33.10	33.20	33.20
800.000	33.30	33.40	33.50	33.60	33.70
805.000	33.80	33.90	34.00	34.10	34.20
810.000	34.30	34.40	34.50	34.60	34.70

100-Year Proposed Condition Existing Outlet

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
815.000	34.80	34.90	35.00	35.10	35.20
820.000	35.30	35.40	35.50	35.60	35.70
825.000	35.80	35.90	36.00	36.10	36.20
830.000	36.30	36.40	36.50	36.60	36.70
835.000	36.90	37.00	37.10	37.20	37.30
840.000	37.40	37.50	37.60	37.70	37.80
845.000	37.90	38.00	38.10	38.20	38.30
850.000	38.40	38.50	38.60	38.70	38.80
855.000	38.90	39.00	39.10	39.20	39.30
860.000	39.40	39.50	39.60	39.70	39.80
865.000	39.90	40.00	40.10	40.20	40.30
870.000	40.40	40.50	40.60	40.70	40.90
875.000	41.00	41.10	41.20	41.30	41.40
880.000	41.50	41.60	41.70	41.80	41.90
885.000	42.00	42.10	42.20	42.30	42.40
890.000	42.50	42.60	42.70	42.80	42.90
895.000	43.00	43.10	43.20	43.30	43.40
900.000	43.50	43.70	43.90	44.10	44.30
905.000	44.50	44.70	44.90	45.10	45.30
910.000	45.50	45.70	45.90	46.10	46.30
915.000	46.50	46.70	46.90	47.10	47.30
920.000	47.50	47.70	47.90	48.10	48.30
925.000	48.50	48.70	48.90	49.10	49.30
930.000	49.50	49.70	49.90	50.10	50.30
935.000	50.50	50.70	50.90	51.10	51.30
940.000	51.50	51.70	51.90	52.10	52.30
945.000	52.50	52.70	52.90	53.10	53.30
950.000	53.50	53.70	53.90	54.10	54.30
955.000	54.50	54.70	54.90	55.10	55.30
960.000	55.50	55.70	55.90	56.10	56.30
965.000	56.50	56.70	56.90	57.10	57.30
970.000	57.50	57.70	57.90	58.10	58.30
975.000	58.50	58.70	58.90	59.10	59.30
980.000	59.50	59.70	59.90	60.10	60.30
985.000	60.50	60.70	60.90	61.10	61.30
990.000	61.50	61.70	61.90	62.10	62.30
995.000	62.50	62.70	62.90	63.10	63.30
1,000.000	63.50	64.00	64.40	64.80	65.30
1,005.000	65.70	66.10	66.60	67.00	67.40
1,010.000	67.90	68.30	68.70	69.20	69.60
1,015.000	70.00	70.40	70.90	71.30	71.70
1,020.000	72.20	72.60	73.00	73.50	73.90

100-Year Proposed Condition Existing Outlet

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,025.000	74.30	74.80	75.20	75.60	76.10
1,030.000	76.50	76.90	77.40	77.80	78.20
1,035.000	78.70	79.10	79.50	80.00	80.40
1,040.000	80.80	81.30	81.70	82.10	82.60
1,045.000	83.00	83.40	83.90	84.30	84.70
1,050.000	85.10	85.40	85.70	86.00	86.30
1,055.000	86.60	86.90	87.20	87.50	87.80
1,060.000	88.10	88.30	88.60	88.90	89.20
1,065.000	89.50	89.80	90.10	90.40	90.70
1,070.000	91.00	91.20	91.50	91.80	92.10
1,075.000	92.40	92.70	93.00	93.30	93.60
1,080.000	93.90	94.20	94.40	94.70	95.00
1,085.000	95.30	95.60	95.90	96.20	96.50
1,090.000	96.80	97.10	97.30	97.60	97.90
1,095.000	98.20	98.50	98.80	99.10	99.40
1,100.000	99.70	101.70	103.70	105.70	107.70
1,105.000	109.80	111.80	113.80	115.80	117.80
1,110.000	119.90	121.10	122.30	123.50	124.70
1,115.000	125.90	127.10	128.30	129.50	130.70
1,120.000	131.80	135.20	138.60	141.90	145.30
1,125.000	148.60	152.00	155.30	158.70	162.10
1,130.000	165.40	167.70	169.90	174.10	178.90
1,135.000	183.40	185.30	191.80	198.30	203.40
1,140.000	208.70	217.00	227.60	234.50	242.70
1,145.000	255.50	268.30	279.60	292.70	336.30
1,150.000	383.30	390.30	479.50	538.10	574.30
1,155.000	585.00	596.90	649.30	624.90	627.10
1,160.000	645.30	651.90	645.10	624.70	597.00
1,165.000	558.10	517.20	477.90	440.50	406.90
1,170.000	364.30	331.30	297.90	267.40	239.20
1,175.000	211.30	193.40	175.20	160.80	149.80
1,180.000	140.60	132.90	126.40	120.80	116.70
1,185.000	112.60	108.20	104.80	101.80	99.60
1,190.000	96.60	94.50	92.70	91.10	89.60
1,195.000	88.30	87.20	86.20	85.90	84.80
1,200.000	84.20	82.70	82.30	80.90	80.00
1,205.000	79.20	77.70	77.80	76.80	76.90
1,210.000	75.90	75.30	75.30	74.60	73.90
1,215.000	72.50	72.20	71.90	70.40	68.90
1,220.000	68.50	68.20	66.80	65.30	65.10
1,225.000	65.10	64.00	63.00	63.20	63.50
1,230.000	62.80	62.00	62.50	62.50	61.90

100-Year Proposed Condition Existing Outlet

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,235.000	61.80	61.80	61.70	61.70	61.60
1,240.000	61.60	61.50	61.50	61.40	61.30
1,245.000	61.20	61.10	61.00	60.90	60.80
1,250.000	60.70	60.60	60.40	60.30	60.20
1,255.000	60.10	60.00	59.90	59.90	59.80
1,260.000	59.80	59.70	58.60	57.90	57.80
1,265.000	57.20	56.50	55.80	56.10	56.40
1,270.000	55.60	54.70	55.00	55.20	54.30
1,275.000	53.20	53.30	53.40	52.30	51.20
1,280.000	51.10	51.10	50.00	48.80	48.80
1,285.000	48.90	47.90	46.80	47.00	47.30
1,290.000	46.50	45.70	46.10	46.00	45.90
1,295.000	45.20	45.70	46.20	45.60	45.60
1,300.000	45.50	45.00	44.40	43.80	43.20
1,305.000	42.60	42.00	41.40	40.80	40.20
1,310.000	39.60	39.10	38.60	38.20	37.70
1,315.000	37.30	36.80	36.30	35.90	35.40
1,320.000	35.00	34.50	34.00	33.50	33.10
1,325.000	32.60	32.10	31.60	31.20	30.70
1,330.000	30.20	29.90	29.60	29.30	28.90
1,335.000	28.60	28.30	28.00	27.70	27.30
1,340.000	27.00	26.50	25.90	25.40	24.90
1,345.000	24.40	23.80	23.30	22.80	22.20
1,350.000	21.70	21.30	20.90	20.50	20.20
1,355.000	19.80	19.40	19.00	18.60	18.20
1,360.000	17.80	17.50	17.10	16.70	16.30
1,365.000	15.90	15.50	15.10	14.70	14.30
1,370.000	13.90	13.70	13.40	13.10	12.80
1,375.000	12.60	12.30	12.00	11.70	11.40
1,380.000	11.20	11.00	10.80	10.60	10.50
1,385.000	10.30	10.10	9.90	9.80	9.60
1,390.000	9.40	9.30	9.20	9.00	8.90
1,395.000	8.80	8.60	8.50	8.40	8.30
1,400.000	8.10	8.10	8.00	8.00	7.90
1,405.000	7.90	7.80	7.80	7.70	7.70
1,410.000	7.60	7.60	7.50	7.50	7.40
1,415.000	7.40	7.30	7.30	7.20	7.20
1,420.000	7.10	7.10	7.10	7.10	7.10
1,425.000	7.10	7.10	7.10	7.10	7.10
1,430.000	7.10	7.10	7.10	7.00	7.00
1,435.000	7.00	7.00	7.00	7.00	7.00
1,440.000	7.00	7.00	7.00	7.00	7.00

100-Year Proposed Condition Existing Outlet

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,445.000	7.00	7.00	7.00	7.00	7.00
1,450.000	7.00	7.00	7.00	7.00	7.00
1,455.000	7.00	7.00	7.00	7.00	7.00
1,460.000	7.00	7.00	7.00	7.00	7.00
1,465.000	7.00	7.00	7.00	7.00	7.00
1,470.000	7.00	7.00	7.00	7.00	7.00
1,475.000	7.00	7.00	7.00	7.00	7.00
1,480.000	7.00	7.00	7.00	7.00	7.00
1,485.000	7.00	7.00	7.00	7.00	7.00
1,490.000	7.00	7.00	7.00	7.00	7.00
1,495.000	7.00	7.00	7.00	7.00	7.00
1,500.000	7.00	(N/A)	(N/A)	(N/A)	(N/A)

100-Year Proposed Condition Existing Outlet

Subsection: Addition Summary

Label: O-2

Summary for Hydrograph Addition at 'O-2'

Upstream Link	Upstream Node
Outlet-1	PO-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (min)	Flow (Peak) (ft ³ /s)
Flow (From)	Outlet-1	6.822	1,350.000	22.23
Flow (In)	O-2	6.822	1,350.000	22.23

100-Year Proposed Condition Existing Outlet

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	0.00	0.00	0.01	0.01	0.02
15.000	0.03	0.04	0.05	0.07	0.08
30.000	0.10	0.12	0.15	0.17	0.20
45.000	0.23	0.26	0.29	0.33	0.37
60.000	0.40	0.44	0.49	0.53	0.58
75.000	0.63	0.68	0.73	0.79	0.84
90.000	0.90	0.96	1.02	1.09	1.16
105.000	1.22	1.29	1.35	1.42	1.49
120.000	1.56	1.62	1.69	1.76	1.82
135.000	1.89	1.96	2.01	2.02	2.03
150.000	2.04	2.06	2.07	2.08	2.10
165.000	2.11	2.12	2.14	2.15	2.16
180.000	2.18	2.19	2.20	2.22	2.23
195.000	2.24	2.26	2.27	2.29	2.30
210.000	2.31	2.33	2.34	2.36	2.38
225.000	2.39	2.41	2.43	2.44	2.46
240.000	2.48	2.50	2.51	2.53	2.55
255.000	2.57	2.59	2.61	2.63	2.65
270.000	2.67	2.70	2.72	2.74	2.76
285.000	2.78	2.81	2.83	2.85	2.88
300.000	2.90	2.93	2.95	2.98	3.00
315.000	3.03	3.05	3.08	3.10	3.13
330.000	3.16	3.18	3.21	3.24	3.26
345.000	3.29	3.32	3.34	3.37	3.40
360.000	3.43	3.45	3.48	3.51	3.54
375.000	3.57	3.60	3.63	3.65	3.68
390.000	3.71	3.74	3.77	3.80	3.83
405.000	3.86	3.89	3.92	3.95	3.98
420.000	4.01	4.02	4.03	4.04	4.05
435.000	4.06	4.07	4.08	4.09	4.10
450.000	4.12	4.13	4.14	4.15	4.16
465.000	4.17	4.18	4.20	4.21	4.22
480.000	4.23	4.24	4.25	4.27	4.28
495.000	4.29	4.30	4.31	4.33	4.34
510.000	4.35	4.36	4.37	4.39	4.40
525.000	4.41	4.43	4.44	4.45	4.46
540.000	4.48	4.49	4.51	4.52	4.53
555.000	4.55	4.56	4.57	4.59	4.60
570.000	4.62	4.63	4.65	4.66	4.68
585.000	4.69	4.71	4.72	4.74	4.75
600.000	4.77	4.79	4.80	4.82	4.83

100-Year Proposed Condition Existing Outlet

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
615.000	4.85	4.86	4.88	4.90	4.91
630.000	4.93	4.95	4.96	4.98	5.00
645.000	5.01	5.03	5.05	5.06	5.08
660.000	5.10	5.11	5.13	5.15	5.17
675.000	5.18	5.20	5.22	5.23	5.25
690.000	5.27	5.29	5.31	5.32	5.34
705.000	5.36	5.38	5.40	5.41	5.43
720.000	5.45	5.47	5.49	5.51	5.53
735.000	5.55	5.56	5.58	5.60	5.62
750.000	5.64	5.66	5.68	5.70	5.72
765.000	5.74	5.76	5.78	5.80	5.82
780.000	5.84	5.87	5.89	5.91	5.93
795.000	5.95	5.97	5.99	6.01	6.02
810.000	6.03	6.04	6.05	6.07	6.08
825.000	6.09	6.10	6.11	6.13	6.14
840.000	6.15	6.17	6.18	6.19	6.20
855.000	6.22	6.23	6.24	6.26	6.27
870.000	6.29	6.30	6.31	6.33	6.34
885.000	6.36	6.37	6.39	6.40	6.41
900.000	6.43	6.44	6.46	6.47	6.49
915.000	6.51	6.52	6.54	6.55	6.57
930.000	6.59	6.61	6.62	6.64	6.66
945.000	6.68	6.69	6.71	6.73	6.75
960.000	6.77	6.79	6.81	6.83	6.85
975.000	6.87	6.89	6.91	6.93	6.95
990.000	6.97	6.99	7.01	7.03	7.05
1,005.000	7.08	7.10	7.12	7.15	7.17
1,020.000	7.19	7.22	7.24	7.27	7.30
1,035.000	7.32	7.35	7.38	7.41	7.43
1,050.000	7.46	7.49	7.52	7.55	7.58
1,065.000	7.61	7.64	7.67	7.71	7.74
1,080.000	7.77	7.80	7.83	7.87	7.90
1,095.000	7.93	7.97	8.00	8.03	8.05
1,110.000	8.08	8.11	8.14	8.17	8.20
1,125.000	8.24	8.27	8.31	8.36	8.40
1,140.000	8.45	8.50	8.56	8.63	8.73
1,155.000	8.86	9.00	9.16	9.31	9.44
1,170.000	9.54	9.61	9.67	9.71	9.74
1,185.000	9.76	9.79	9.81	9.83	9.85
1,200.000	9.86	9.88	9.90	9.91	9.93
1,215.000	9.94	9.96	9.97	9.98	9.99

100-Year Proposed Condition Existing Outlet

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
1,230.000	10.00	10.01	10.02	10.03	10.04
1,245.000	10.05	10.06	10.06	10.07	10.08
1,260.000	10.09	10.10	10.10	10.11	10.12
1,275.000	10.12	10.13	10.14	10.14	10.15
1,290.000	10.15	10.16	10.16	10.17	10.17
1,305.000	10.17	10.18	10.18	10.18	10.19
1,320.000	10.19	10.19	10.19	10.20	10.20
1,335.000	10.20	10.20	10.20	10.20	10.20
1,350.000	10.20	10.20	10.20	10.20	10.20
1,365.000	10.20	10.20	10.20	10.19	10.19
1,380.000	10.19	10.19	10.19	10.18	10.18
1,395.000	10.18	10.18	10.18	10.17	10.17
1,410.000	10.17	10.17	10.16	10.16	10.16
1,425.000	10.16	10.15	10.15	10.15	10.15
1,440.000	10.14	(N/A)	(N/A)	(N/A)	(N/A)

100-Year Proposed Condition Existing Outlet

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
0.000	0.000	0.001	0.002	0.005	0.008
15.000	0.012	0.017	0.023	0.030	0.037
30.000	0.045	0.055	0.065	0.076	0.088
45.000	0.101	0.114	0.129	0.144	0.160
60.000	0.177	0.195	0.214	0.234	0.254
75.000	0.276	0.298	0.321	0.345	0.370
90.000	0.396	0.422	0.449	0.478	0.507
105.000	0.536	0.565	0.594	0.623	0.653
120.000	0.682	0.711	0.741	0.770	0.800
135.000	0.829	0.859	0.889	0.919	0.948
150.000	0.978	1.008	1.038	1.068	1.099
165.000	1.129	1.159	1.189	1.219	1.250
180.000	1.280	1.311	1.341	1.372	1.402
195.000	1.433	1.464	1.495	1.526	1.558
210.000	1.592	1.625	1.660	1.695	1.731
225.000	1.767	1.805	1.843	1.882	1.921
240.000	1.962	2.003	2.045	2.088	2.131
255.000	2.175	2.220	2.266	2.312	2.359
270.000	2.407	2.456	2.505	2.555	2.606
285.000	2.658	2.710	2.763	2.817	2.872
300.000	2.927	2.983	3.039	3.096	3.153
315.000	3.211	3.268	3.326	3.385	3.444
330.000	3.503	3.563	3.623	3.683	3.744
345.000	3.805	3.866	3.928	3.990	4.053
360.000	4.116	4.179	4.243	4.307	4.372
375.000	4.437	4.502	4.567	4.633	4.699
390.000	4.766	4.833	4.901	4.969	5.037
405.000	5.105	5.174	5.243	5.312	5.382
420.000	5.451	5.521	5.592	5.662	5.733
435.000	5.804	5.875	5.946	6.018	6.090
450.000	6.163	6.235	6.308	6.381	6.454
465.000	6.528	6.601	6.676	6.750	6.825
480.000	6.899	6.974	7.050	7.125	7.201
495.000	7.277	7.354	7.430	7.507	7.586
510.000	7.664	7.744	7.824	7.905	7.986
525.000	8.069	8.152	8.236	8.320	8.405
540.000	8.491	8.578	8.665	8.753	8.842
555.000	8.932	9.022	9.113	9.205	9.297
570.000	9.390	9.484	9.579	9.674	9.770
585.000	9.867	9.965	10.063	10.162	10.262
600.000	10.362	10.463	10.564	10.666	10.769

100-Year Proposed Condition Existing Outlet

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
615.000	10.871	10.974	11.078	11.182	11.286
630.000	11.391	11.496	11.602	11.708	11.814
645.000	11.921	12.029	12.137	12.246	12.355
660.000	12.464	12.574	12.684	12.794	12.905
675.000	13.017	13.128	13.240	13.353	13.466
690.000	13.580	13.693	13.808	13.923	14.038
705.000	14.154	14.271	14.388	14.506	14.625
720.000	14.744	14.864	14.985	15.106	15.228
735.000	15.351	15.474	15.598	15.723	15.848
750.000	15.974	16.101	16.228	16.356	16.485
765.000	16.614	16.744	16.875	17.006	17.138
780.000	17.271	17.404	17.538	17.673	17.808
795.000	17.944	18.081	18.219	18.357	18.497
810.000	18.638	18.781	18.924	19.069	19.215
825.000	19.362	19.511	19.661	19.812	19.964
840.000	20.118	20.273	20.430	20.587	20.746
855.000	20.906	21.068	21.230	21.394	21.559
870.000	21.726	21.893	22.062	22.233	22.404
885.000	22.577	22.751	22.927	23.104	23.281
900.000	23.461	23.642	23.825	24.011	24.199
915.000	24.390	24.584	24.780	24.978	25.179
930.000	25.382	25.588	25.796	26.007	26.220
945.000	26.436	26.654	26.875	27.098	27.323
960.000	27.551	27.782	28.015	28.251	28.489
975.000	28.729	28.972	29.218	29.465	29.716
990.000	29.969	30.224	30.482	30.742	31.006
1,005.000	31.275	31.549	31.829	32.114	32.404
1,020.000	32.700	33.001	33.307	33.619	33.936
1,035.000	34.258	34.586	34.920	35.258	35.602
1,050.000	35.951	36.305	36.662	37.023	37.388
1,065.000	37.756	38.127	38.502	38.881	39.264
1,080.000	39.650	40.039	40.433	40.830	41.230
1,095.000	41.634	42.042	42.456	42.889	43.347
1,110.000	43.830	44.332	44.850	45.383	45.939
1,125.000	46.533	47.168	47.842	48.558	49.324
1,140.000	50.151	51.067	52.106	53.355	55.041
1,155.000	57.240	59.740	62.378	64.958	67.176
1,170.000	68.906	70.194	71.122	71.803	72.341
1,185.000	72.800	73.205	73.570	73.908	74.227
1,200.000	74.533	74.826	75.104	75.372	75.634
1,215.000	75.885	76.124	76.353	76.570	76.774

100-Year Proposed Condition Existing Outlet

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,230.000	76.973	77.169	77.362	77.552	77.740
1,245.000	77.926	78.109	78.290	78.468	78.643
1,260.000	78.816	78.984	79.145	79.301	79.452
1,275.000	79.596	79.734	79.866	79.991	80.105
1,290.000	80.214	80.321	80.425	80.528	80.627
1,305.000	80.720	80.804	80.881	80.950	81.014
1,320.000	81.071	81.123	81.168	81.207	81.240
1,335.000	81.269	81.294	81.314	81.329	81.337
1,350.000	81.338	81.333	81.324	81.310	81.291
1,365.000	81.268	81.240	81.207	81.171	81.132
1,380.000	81.090	81.045	80.998	80.949	80.899
1,395.000	80.848	80.795	80.741	80.687	80.632
1,410.000	80.577	80.522	80.466	80.410	80.355
1,425.000	80.299	80.244	80.189	80.134	80.080
1,440.000	80.026	(N/A)	(N/A)	(N/A)	(N/A)

100-Year Proposed Condition Existing Outlet

Subsection: Elevation vs. Volume Curve

Label: PO-1

Elevation-Volume

Pond Elevation (ft)	Pond Volume (ac-ft)
0.00	0.000
2.00	0.877
4.00	5.418
6.00	18.271
8.00	42.445
10.00	76.869
12.00	121.103
12.60	168.670

100-Year Proposed Condition Existing Outlet

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Requested Pond Water Surface Elevations	
Minimum (Headwater)	0.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	12.60 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Box Tailwater Settings	Culvert - 1 Tailwater	Forward	TW	9.30 (N/A)	12.60 (N/A)

100-Year Proposed Condition Existing Outlet

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Structure ID: Culvert - 1	
Structure Type: Culvert-Box	
Number of Barrels	1
Width	10.30 ft
Height	2.80 ft
Length	77.00 ft
Length (Computed Barrel)	77.01 ft
Slope (Computed)	0.014 ft/ft
Outlet Control Data	
Manning's n	0.013
Ke	0.500
Kb	0.004
Kr	0.500
Convergence Tolerance	0.00 ft
Inlet Control Data	
Equation Form	Form 1
K	0.0260
M	1.0000
C	0.0347
Y	0.8100
T1 ratio (HW/D)	1.171
T2 ratio (HW/D)	1.358
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.

Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control, interpolate between flows at T1 & T2...

T1 Elevation	12.58 ft	T1 Flow	168.90 ft ³ /s
T2 Elevation	13.10 ft	T2 Flow	193.03 ft ³ /s

100-Year Proposed Condition Existing Outlet

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall
Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

100-Year Proposed Condition Existing Outlet

Subsection: Individual Outlet Curves

Label: Composite Outlet Structure - 1

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = Culvert - 1 (Culvert-Box)

Mannings open channel maximum capacity: 586.00 ft³/s

Upstream ID = (Pond Water Surface)

Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
0.00	0.00	(N/A)	0.00
0.50	0.00	(N/A)	0.00
1.00	0.00	(N/A)	0.00
1.50	0.00	(N/A)	0.00
2.00	0.00	(N/A)	0.00
2.50	0.00	(N/A)	0.00
3.00	0.00	(N/A)	0.00
3.50	0.00	(N/A)	0.00
4.00	0.00	(N/A)	0.00
4.50	0.00	(N/A)	0.00
5.00	0.00	(N/A)	0.00
5.50	0.00	(N/A)	0.00
6.00	0.00	(N/A)	0.00
6.50	0.00	(N/A)	0.00
7.00	0.00	(N/A)	0.00
7.50	0.00	(N/A)	0.00
8.00	0.00	(N/A)	0.00
8.50	0.00	(N/A)	0.00
9.00	0.00	(N/A)	0.00
9.30	0.00	(N/A)	0.00
9.50	2.25	(N/A)	0.00
10.00	14.81	(N/A)	0.00
10.50	33.17	(N/A)	0.00
11.00	55.94	(N/A)	0.00
11.50	82.35	(N/A)	0.00
12.00	111.94	(N/A)	0.00
12.50	144.45	(N/A)	0.00
12.60	151.30	(N/A)	0.00

Computation Messages

Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El

100-Year Proposed Condition Existing Outlet

Subsection: Individual Outlet Curves

Label: Composite Outlet Structure - 1

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = Culvert - 1 (Culvert-Box)

Mannings open channel maximum capacity: 586.00 ft³/s

Upstream ID = (Pond Water Surface)

Downstream ID = Tailwater (Pond Outfall)

Computation Messages

Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .057ft
Dcr= .114ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .200ft
Dcr= .400ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .343ft
Dcr= .686ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .486ft
Dcr= .971ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .629ft
Dcr= 1.257ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .771ft
Dcr= 1.543ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .914ft
Dcr= 1.828ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .943ft
Dcr= 1.886ft CRIT.DEPTH Hev= .00ft

100-Year Proposed Condition Existing Outlet

Subsection: Composite Rating Curve

Label: Composite Outlet Structure - 1

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
0.00	0.00	(N/A)	0.00
0.50	0.00	(N/A)	0.00
1.00	0.00	(N/A)	0.00
1.50	0.00	(N/A)	0.00
2.00	0.00	(N/A)	0.00
2.50	0.00	(N/A)	0.00
3.00	0.00	(N/A)	0.00
3.50	0.00	(N/A)	0.00
4.00	0.00	(N/A)	0.00
4.50	0.00	(N/A)	0.00
5.00	0.00	(N/A)	0.00
5.50	0.00	(N/A)	0.00
6.00	0.00	(N/A)	0.00
6.50	0.00	(N/A)	0.00
7.00	0.00	(N/A)	0.00
7.50	0.00	(N/A)	0.00
8.00	0.00	(N/A)	0.00
8.50	0.00	(N/A)	0.00
9.00	0.00	(N/A)	0.00
9.30	0.00	(N/A)	0.00
9.50	2.25	(N/A)	0.00
10.00	14.81	(N/A)	0.00
10.50	33.17	(N/A)	0.00
11.00	55.94	(N/A)	0.00
11.50	82.35	(N/A)	0.00
12.00	111.94	(N/A)	0.00
12.50	144.45	(N/A)	0.00
12.60	151.30	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing

100-Year Proposed Condition Existing Outlet

Subsection: Composite Rating Curve

Label: Composite Outlet Structure - 1

Composite Outflow Summary

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1
Culvert - 1

100-Year Proposed Condition Existing Outlet

Subsection: Diverted Hydrograph

Label: Outlet-1

Peak Discharge	22.23 ft ³ /s
Time to Peak	1,350.000 min
Hydrograph Volume	6.822 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,161.000	0.00	0.09	1.54	3.18	5.06
1,176.000	6.42	7.41	8.20	8.87	9.46
1,191.000	9.99	10.49	10.95	11.40	11.82
1,206.000	12.23	12.62	13.00	13.37	13.72
1,221.000	14.05	14.37	14.67	14.98	15.30
1,236.000	15.62	15.94	16.25	16.56	16.86
1,251.000	17.16	17.46	17.75	18.04	18.32
1,266.000	18.58	18.84	19.09	19.33	19.56
1,281.000	19.78	19.99	20.18	20.36	20.54
1,296.000	20.71	20.88	21.05	21.20	21.34
1,311.000	21.47	21.58	21.69	21.78	21.87
1,326.000	21.94	22.01	22.06	22.11	22.15
1,341.000	22.19	22.21	22.22	22.23	22.22
1,356.000	22.20	22.18	22.15	22.11	22.06
1,371.000	22.01	21.95	21.88	21.81	21.74
1,386.000	21.66	21.58	21.50	21.41	21.32
1,401.000	21.23	21.14	21.05	20.96	20.87
1,416.000	20.78	20.69	20.59	20.50	20.41
1,431.000	20.32	20.23	20.14	20.05	(N/A)

100-Year Proposed Condition Existing Outlet

Subsection: Elevation-Volume-Flow Table (Pond)

Label: PO-1

Infiltration	
Infiltration Method (Computed)	No Infiltration
Initial Conditions	
Elevation (Water Surface, Initial)	0.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft ³ /s
Flow (Initial Infiltration)	0.00 ft ³ /s
Flow (Initial, Total)	0.00 ft ³ /s
Time Increment	3.000 min

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
0.00	0.00	0.000	0.000	0.00	0.00	0.00
0.50	0.00	0.219	0.000	0.00	0.00	106.12
1.00	0.00	0.439	0.000	0.00	0.00	212.23
1.50	0.00	0.658	0.000	0.00	0.00	318.35
2.00	0.00	0.877	0.000	0.00	0.00	424.47
2.50	0.00	2.012	0.000	0.00	0.00	973.93
3.00	0.00	3.148	0.000	0.00	0.00	1,523.39
3.50	0.00	4.283	0.000	0.00	0.00	2,072.85
4.00	0.00	5.418	0.000	0.00	0.00	2,622.31
4.50	0.00	8.631	0.000	0.00	0.00	4,177.53
5.00	0.00	11.845	0.000	0.00	0.00	5,732.74
5.50	0.00	15.058	0.000	0.00	0.00	7,287.95
6.00	0.00	18.271	0.000	0.00	0.00	8,843.16
6.50	0.00	24.314	0.000	0.00	0.00	11,768.22
7.00	0.00	30.358	0.000	0.00	0.00	14,693.27
7.50	0.00	36.402	0.000	0.00	0.00	17,618.33
8.00	0.00	42.445	0.000	0.00	0.00	20,543.38
8.50	0.00	51.051	0.000	0.00	0.00	24,708.68
9.00	0.00	59.657	0.000	0.00	0.00	28,873.99
9.30	0.00	64.821	0.000	0.00	0.00	31,373.17
9.50	2.25	68.263	0.000	0.00	2.25	33,041.54
10.00	14.81	76.869	0.000	0.00	14.81	37,219.40
10.50	33.17	87.928	0.000	0.00	33.17	42,590.08
11.00	55.94	98.986	0.000	0.00	55.94	47,965.16
11.50	82.35	110.044	0.000	0.00	82.35	53,343.89
12.00	111.94	121.103	0.000	0.00	111.94	58,725.80
12.50	144.45	160.742	0.000	0.00	144.45	77,943.65
12.60	151.30	168.670	0.000	0.00	151.30	81,787.58

100-Year Proposed Condition Existing Outlet

Subsection: Level Pool Pond Routing Summary

Label: PO-1 (IN)

Infiltration			
Infiltration Method (Computed)		No Infiltration	
Initial Conditions			
Elevation (Water Surface, Initial)		0.00 ft	
Volume (Initial)		0.000 ac-ft	
Flow (Initial Outlet)		0.00 ft³/s	
Flow (Initial Infiltration)		0.00 ft³/s	
Flow (Initial, Total)		0.00 ft³/s	
Time Increment		3.000 min	
Inflow/Outflow Hydrograph Summary			
Flow (Peak In)		651.90 ft³/s	Time to Peak (Flow, In)
Flow (Peak Outlet)		22.23 ft³/s	Time to Peak (Flow, Outlet)
			1,161.000 min
			1,350.000 min
Peak Conditions			
Elevation (Water Surface, Peak)		10.20 ft	
Volume (Peak)		81.338 ac-ft	
Mass Balance (ac-ft)			
Volume (Initial)		0.000 ac-ft	
Volume (Total Inflow)		86.848 ac-ft	
Volume (Total Infiltration)		0.000 ac-ft	
Volume (Total Outlet Outflow)		6.822 ac-ft	
Volume (Retained)		79.943 ac-ft	
Volume (Unrouted)		-0.083 ac-ft	
Error (Mass Balance)		0.1 %	

100-Year Proposed Condition Existing Outlet

Subsection: Pond Routed Hydrograph (total out)

Label: PO-1 (OUT)

Peak Discharge	22.23 ft ³ /s
Time to Peak	1,350.000 min
Hydrograph Volume	6.822 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,161.000	0.00	0.09	1.54	3.18	5.06
1,176.000	6.42	7.41	8.20	8.87	9.46
1,191.000	9.99	10.49	10.95	11.40	11.82
1,206.000	12.23	12.62	13.00	13.37	13.72
1,221.000	14.05	14.37	14.67	14.98	15.30
1,236.000	15.62	15.94	16.25	16.56	16.86
1,251.000	17.16	17.46	17.75	18.04	18.32
1,266.000	18.58	18.84	19.09	19.33	19.56
1,281.000	19.78	19.99	20.18	20.36	20.54
1,296.000	20.71	20.88	21.05	21.20	21.34
1,311.000	21.47	21.58	21.69	21.78	21.87
1,326.000	21.94	22.01	22.06	22.11	22.15
1,341.000	22.19	22.21	22.22	22.23	22.22
1,356.000	22.20	22.18	22.15	22.11	22.06
1,371.000	22.01	21.95	21.88	21.81	21.74
1,386.000	21.66	21.58	21.50	21.41	21.32
1,401.000	21.23	21.14	21.05	20.96	20.87
1,416.000	20.78	20.69	20.59	20.50	20.41
1,431.000	20.32	20.23	20.14	20.05	(N/A)

100-Year Proposed Condition Existing Outlet

Subsection: Pond Inflow Summary

Label: PO-1 (IN)

Summary for Hydrograph Addition at 'PO-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	CM-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (min)	Flow (Peak) (ft ³ /s)
Flow (From)	CM-1	87.419	1,161.000	651.90
Flow (In)	PO-1	86.848	1,161.000	651.90

100-Year Proposed Condition Existing Outlet

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100-Yr Proposed Condition Modified Outlet Structure

Project Summary

Title

Engineer

Company

Date 12/9/2016

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100-Yr Proposed Condition Modified Outlet Structure

Subsection: User Notifications

User Notifications?	No user notifications generated.
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100-Yr Proposed Condition Modified Outlet Structure

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)
CM-1	Post-Development 100-yr	0	87.419	1,161.000	651.90

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)
O-2	Post-Development 100-yr	0	3.734	1,374.000	12.51

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (min)	Peak Flow (ft ³ /s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
PO-1 (IN)	Post-Development 100-yr	0	86.848	1,161.000	651.90	(N/A)	(N/A)
PO-1 (OUT)	Post-Development 100-yr	0	3.734	1,374.000	12.51	10.30	83.473

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Read Hydrograph

Label: CM-1

Peak Discharge	651.90 ft ³ /s
Time to Peak	1,161.000 min
Hydrograph Volume	87.419 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
0.000	0.00	0.10	0.20	0.30	0.30
5.000	0.40	0.50	0.50	0.60	0.70
10.000	0.70	0.80	0.90	1.00	1.00
15.000	1.10	1.20	1.20	1.30	1.40
20.000	1.40	1.50	1.60	1.70	1.70
25.000	1.80	1.90	1.90	2.00	2.10
30.000	2.10	2.20	2.30	2.40	2.40
35.000	2.50	2.60	2.60	2.70	2.80
40.000	2.80	2.90	3.00	3.00	3.10
45.000	3.20	3.30	3.30	3.40	3.50
50.000	3.50	3.60	3.70	3.70	3.80
55.000	3.90	4.00	4.00	4.10	4.20
60.000	4.20	4.30	4.40	4.40	4.50
65.000	4.60	4.70	4.70	4.80	4.90
70.000	4.90	5.00	5.10	5.10	5.20
75.000	5.30	5.30	5.40	5.50	5.60
80.000	5.60	5.70	5.80	5.80	5.90
85.000	6.00	6.00	6.10	6.20	6.30
90.000	6.30	6.40	6.50	6.50	6.60
95.000	6.70	6.70	6.80	6.90	7.00
100.000	7.00	7.00	7.00	7.00	7.00
105.000	7.00	7.00	7.10	7.10	7.10
110.000	7.10	7.10	7.10	7.10	7.10
115.000	7.10	7.10	7.10	7.10	7.10
120.000	7.10	7.10	7.10	7.10	7.10
125.000	7.10	7.10	7.10	7.10	7.10
130.000	7.20	7.20	7.20	7.20	7.20
135.000	7.20	7.20	7.20	7.20	7.20
140.000	7.20	7.20	7.20	7.20	7.20
145.000	7.20	7.20	7.20	7.20	7.20
150.000	7.20	7.20	7.20	7.30	7.30
155.000	7.30	7.30	7.30	7.30	7.30
160.000	7.30	7.30	7.30	7.30	7.30
165.000	7.30	7.30	7.30	7.30	7.30
170.000	7.30	7.30	7.30	7.30	7.30
175.000	7.30	7.40	7.40	7.40	7.40
180.000	7.40	7.40	7.40	7.40	7.40

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
185.000	7.40	7.40	7.40	7.40	7.40
190.000	7.40	7.40	7.40	7.40	7.40
195.000	7.40	7.40	7.40	7.50	7.50
200.000	7.50	7.50	7.60	7.60	7.70
205.000	7.80	7.80	7.90	7.90	8.00
210.000	8.10	8.10	8.20	8.20	8.30
215.000	8.40	8.40	8.50	8.50	8.60
220.000	8.70	8.70	8.80	8.80	8.90
225.000	9.00	9.00	9.10	9.10	9.20
230.000	9.30	9.30	9.40	9.40	9.50
235.000	9.60	9.60	9.70	9.80	9.80
240.000	9.90	9.90	10.00	10.10	10.10
245.000	10.20	10.20	10.30	10.40	10.40
250.000	10.50	10.50	10.60	10.70	10.70
255.000	10.80	10.80	10.90	11.00	11.00
260.000	11.10	11.10	11.20	11.30	11.30
265.000	11.40	11.40	11.50	11.60	11.60
270.000	11.70	11.70	11.80	11.90	11.90
275.000	12.00	12.00	12.10	12.20	12.20
280.000	12.30	12.30	12.40	12.50	12.50
285.000	12.60	12.60	12.70	12.80	12.80
290.000	12.90	12.90	13.00	13.10	13.10
295.000	13.20	13.20	13.30	13.40	13.40
300.000	13.50	13.50	13.50	13.60	13.60
305.000	13.60	13.70	13.70	13.70	13.80
310.000	13.80	13.80	13.80	13.90	13.90
315.000	13.90	14.00	14.00	14.00	14.10
320.000	14.10	14.10	14.10	14.20	14.20
325.000	14.20	14.30	14.30	14.30	14.40
330.000	14.40	14.40	14.40	14.50	14.50
335.000	14.50	14.60	14.60	14.60	14.70
340.000	14.70	14.70	14.70	14.80	14.80
345.000	14.80	14.90	14.90	14.90	15.00
350.000	15.00	15.00	15.00	15.10	15.10
355.000	15.10	15.20	15.20	15.20	15.30
360.000	15.30	15.30	15.30	15.40	15.40
365.000	15.40	15.50	15.50	15.50	15.60
370.000	15.60	15.60	15.60	15.70	15.70
375.000	15.70	15.80	15.80	15.80	15.90
380.000	15.90	15.90	15.90	16.00	16.00
385.000	16.00	16.10	16.10	16.10	16.20
390.000	16.20	16.20	16.20	16.30	16.30

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
395.000	16.30	16.40	16.40	16.40	16.50
400.000	16.50	16.50	16.50	16.60	16.60
405.000	16.60	16.60	16.60	16.70	16.70
410.000	16.70	16.70	16.70	16.80	16.80
415.000	16.80	16.80	16.80	16.90	16.90
420.000	16.90	16.90	16.90	17.00	17.00
425.000	17.00	17.00	17.00	17.10	17.10
430.000	17.10	17.10	17.10	17.20	17.20
435.000	17.20	17.20	17.30	17.30	17.30
440.000	17.30	17.30	17.40	17.40	17.40
445.000	17.40	17.40	17.50	17.50	17.50
450.000	17.50	17.50	17.60	17.60	17.60
455.000	17.60	17.60	17.70	17.70	17.70
460.000	17.70	17.70	17.80	17.80	17.80
465.000	17.80	17.80	17.90	17.90	17.90
470.000	17.90	18.00	18.00	18.00	18.00
475.000	18.00	18.10	18.10	18.10	18.10
480.000	18.10	18.20	18.20	18.20	18.20
485.000	18.20	18.30	18.30	18.30	18.30
490.000	18.30	18.40	18.40	18.40	18.40
495.000	18.40	18.50	18.50	18.50	18.50
500.000	18.50	18.60	18.70	18.70	18.80
505.000	18.80	18.90	19.00	19.00	19.10
510.000	19.10	19.20	19.20	19.30	19.40
515.000	19.40	19.50	19.50	19.60	19.70
520.000	19.70	19.80	19.80	19.90	19.90
525.000	20.00	20.10	20.10	20.20	20.20
530.000	20.30	20.40	20.40	20.50	20.50
535.000	20.60	20.60	20.70	20.80	20.80
540.000	20.90	20.90	21.00	21.10	21.10
545.000	21.20	21.20	21.30	21.30	21.40
550.000	21.50	21.50	21.60	21.60	21.70
555.000	21.80	21.80	21.90	21.90	22.00
560.000	22.00	22.10	22.20	22.20	22.30
565.000	22.30	22.40	22.50	22.50	22.60
570.000	22.60	22.70	22.70	22.80	22.90
575.000	22.90	23.00	23.00	23.10	23.20
580.000	23.20	23.30	23.30	23.40	23.40
585.000	23.50	23.60	23.60	23.70	23.70
590.000	23.80	23.90	23.90	24.00	24.00
595.000	24.10	24.10	24.20	24.30	24.30
600.000	24.40	24.40	24.50	24.50	24.50

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
605.000	24.60	24.60	24.60	24.70	24.70
610.000	24.70	24.80	24.80	24.80	24.90
615.000	24.90	24.90	25.00	25.00	25.00
620.000	25.10	25.10	25.20	25.20	25.20
625.000	25.30	25.30	25.30	25.40	25.40
630.000	25.40	25.50	25.50	25.50	25.60
635.000	25.60	25.60	25.70	25.70	25.70
640.000	25.80	25.80	25.90	25.90	25.90
645.000	26.00	26.00	26.00	26.10	26.10
650.000	26.10	26.20	26.20	26.20	26.30
655.000	26.30	26.30	26.40	26.40	26.50
660.000	26.50	26.50	26.60	26.60	26.60
665.000	26.70	26.70	26.70	26.80	26.80
670.000	26.80	26.90	26.90	26.90	27.00
675.000	27.00	27.00	27.10	27.10	27.20
680.000	27.20	27.20	27.30	27.30	27.30
685.000	27.40	27.40	27.40	27.50	27.50
690.000	27.50	27.60	27.60	27.60	27.70
695.000	27.70	27.70	27.80	27.80	27.90
700.000	27.90	27.90	28.00	28.10	28.10
705.000	28.20	28.20	28.30	28.30	28.40
710.000	28.40	28.50	28.50	28.60	28.60
715.000	28.70	28.70	28.80	28.90	28.90
720.000	29.00	29.00	29.10	29.10	29.20
725.000	29.20	29.30	29.30	29.40	29.40
730.000	29.50	29.60	29.60	29.70	29.70
735.000	29.80	29.80	29.90	29.90	30.00
740.000	30.00	30.10	30.10	30.20	30.30
745.000	30.30	30.40	30.40	30.50	30.50
750.000	30.60	30.60	30.70	30.70	30.80
755.000	30.80	30.90	31.00	31.00	31.10
760.000	31.10	31.20	31.20	31.30	31.30
765.000	31.40	31.40	31.50	31.50	31.60
770.000	31.60	31.70	31.80	31.80	31.90
775.000	31.90	32.00	32.00	32.10	32.10
780.000	32.20	32.20	32.30	32.30	32.40
785.000	32.50	32.50	32.60	32.60	32.70
790.000	32.70	32.80	32.80	32.90	32.90
795.000	33.00	33.00	33.10	33.20	33.20
800.000	33.30	33.40	33.50	33.60	33.70
805.000	33.80	33.90	34.00	34.10	34.20
810.000	34.30	34.40	34.50	34.60	34.70

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
815.000	34.80	34.90	35.00	35.10	35.20
820.000	35.30	35.40	35.50	35.60	35.70
825.000	35.80	35.90	36.00	36.10	36.20
830.000	36.30	36.40	36.50	36.60	36.70
835.000	36.90	37.00	37.10	37.20	37.30
840.000	37.40	37.50	37.60	37.70	37.80
845.000	37.90	38.00	38.10	38.20	38.30
850.000	38.40	38.50	38.60	38.70	38.80
855.000	38.90	39.00	39.10	39.20	39.30
860.000	39.40	39.50	39.60	39.70	39.80
865.000	39.90	40.00	40.10	40.20	40.30
870.000	40.40	40.50	40.60	40.70	40.90
875.000	41.00	41.10	41.20	41.30	41.40
880.000	41.50	41.60	41.70	41.80	41.90
885.000	42.00	42.10	42.20	42.30	42.40
890.000	42.50	42.60	42.70	42.80	42.90
895.000	43.00	43.10	43.20	43.30	43.40
900.000	43.50	43.70	43.90	44.10	44.30
905.000	44.50	44.70	44.90	45.10	45.30
910.000	45.50	45.70	45.90	46.10	46.30
915.000	46.50	46.70	46.90	47.10	47.30
920.000	47.50	47.70	47.90	48.10	48.30
925.000	48.50	48.70	48.90	49.10	49.30
930.000	49.50	49.70	49.90	50.10	50.30
935.000	50.50	50.70	50.90	51.10	51.30
940.000	51.50	51.70	51.90	52.10	52.30
945.000	52.50	52.70	52.90	53.10	53.30
950.000	53.50	53.70	53.90	54.10	54.30
955.000	54.50	54.70	54.90	55.10	55.30
960.000	55.50	55.70	55.90	56.10	56.30
965.000	56.50	56.70	56.90	57.10	57.30
970.000	57.50	57.70	57.90	58.10	58.30
975.000	58.50	58.70	58.90	59.10	59.30
980.000	59.50	59.70	59.90	60.10	60.30
985.000	60.50	60.70	60.90	61.10	61.30
990.000	61.50	61.70	61.90	62.10	62.30
995.000	62.50	62.70	62.90	63.10	63.30
1,000.000	63.50	64.00	64.40	64.80	65.30
1,005.000	65.70	66.10	66.60	67.00	67.40
1,010.000	67.90	68.30	68.70	69.20	69.60
1,015.000	70.00	70.40	70.90	71.30	71.70
1,020.000	72.20	72.60	73.00	73.50	73.90

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,025.000	74.30	74.80	75.20	75.60	76.10
1,030.000	76.50	76.90	77.40	77.80	78.20
1,035.000	78.70	79.10	79.50	80.00	80.40
1,040.000	80.80	81.30	81.70	82.10	82.60
1,045.000	83.00	83.40	83.90	84.30	84.70
1,050.000	85.10	85.40	85.70	86.00	86.30
1,055.000	86.60	86.90	87.20	87.50	87.80
1,060.000	88.10	88.30	88.60	88.90	89.20
1,065.000	89.50	89.80	90.10	90.40	90.70
1,070.000	91.00	91.20	91.50	91.80	92.10
1,075.000	92.40	92.70	93.00	93.30	93.60
1,080.000	93.90	94.20	94.40	94.70	95.00
1,085.000	95.30	95.60	95.90	96.20	96.50
1,090.000	96.80	97.10	97.30	97.60	97.90
1,095.000	98.20	98.50	98.80	99.10	99.40
1,100.000	99.70	101.70	103.70	105.70	107.70
1,105.000	109.80	111.80	113.80	115.80	117.80
1,110.000	119.90	121.10	122.30	123.50	124.70
1,115.000	125.90	127.10	128.30	129.50	130.70
1,120.000	131.80	135.20	138.60	141.90	145.30
1,125.000	148.60	152.00	155.30	158.70	162.10
1,130.000	165.40	167.70	169.90	174.10	178.90
1,135.000	183.40	185.30	191.80	198.30	203.40
1,140.000	208.70	217.00	227.60	234.50	242.70
1,145.000	255.50	268.30	279.60	292.70	336.30
1,150.000	383.30	390.30	479.50	538.10	574.30
1,155.000	585.00	596.90	649.30	624.90	627.10
1,160.000	645.30	651.90	645.10	624.70	597.00
1,165.000	558.10	517.20	477.90	440.50	406.90
1,170.000	364.30	331.30	297.90	267.40	239.20
1,175.000	211.30	193.40	175.20	160.80	149.80
1,180.000	140.60	132.90	126.40	120.80	116.70
1,185.000	112.60	108.20	104.80	101.80	99.60
1,190.000	96.60	94.50	92.70	91.10	89.60
1,195.000	88.30	87.20	86.20	85.90	84.80
1,200.000	84.20	82.70	82.30	80.90	80.00
1,205.000	79.20	77.70	77.80	76.80	76.90
1,210.000	75.90	75.30	75.30	74.60	73.90
1,215.000	72.50	72.20	71.90	70.40	68.90
1,220.000	68.50	68.20	66.80	65.30	65.10
1,225.000	65.10	64.00	63.00	63.20	63.50
1,230.000	62.80	62.00	62.50	62.50	61.90

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,235.000	61.80	61.80	61.70	61.70	61.60
1,240.000	61.60	61.50	61.50	61.40	61.30
1,245.000	61.20	61.10	61.00	60.90	60.80
1,250.000	60.70	60.60	60.40	60.30	60.20
1,255.000	60.10	60.00	59.90	59.90	59.80
1,260.000	59.80	59.70	58.60	57.90	57.80
1,265.000	57.20	56.50	55.80	56.10	56.40
1,270.000	55.60	54.70	55.00	55.20	54.30
1,275.000	53.20	53.30	53.40	52.30	51.20
1,280.000	51.10	51.10	50.00	48.80	48.80
1,285.000	48.90	47.90	46.80	47.00	47.30
1,290.000	46.50	45.70	46.10	46.00	45.90
1,295.000	45.20	45.70	46.20	45.60	45.60
1,300.000	45.50	45.00	44.40	43.80	43.20
1,305.000	42.60	42.00	41.40	40.80	40.20
1,310.000	39.60	39.10	38.60	38.20	37.70
1,315.000	37.30	36.80	36.30	35.90	35.40
1,320.000	35.00	34.50	34.00	33.50	33.10
1,325.000	32.60	32.10	31.60	31.20	30.70
1,330.000	30.20	29.90	29.60	29.30	28.90
1,335.000	28.60	28.30	28.00	27.70	27.30
1,340.000	27.00	26.50	25.90	25.40	24.90
1,345.000	24.40	23.80	23.30	22.80	22.20
1,350.000	21.70	21.30	20.90	20.50	20.20
1,355.000	19.80	19.40	19.00	18.60	18.20
1,360.000	17.80	17.50	17.10	16.70	16.30
1,365.000	15.90	15.50	15.10	14.70	14.30
1,370.000	13.90	13.70	13.40	13.10	12.80
1,375.000	12.60	12.30	12.00	11.70	11.40
1,380.000	11.20	11.00	10.80	10.60	10.50
1,385.000	10.30	10.10	9.90	9.80	9.60
1,390.000	9.40	9.30	9.20	9.00	8.90
1,395.000	8.80	8.60	8.50	8.40	8.30
1,400.000	8.10	8.10	8.00	8.00	7.90
1,405.000	7.90	7.80	7.80	7.70	7.70
1,410.000	7.60	7.60	7.50	7.50	7.40
1,415.000	7.40	7.30	7.30	7.20	7.20
1,420.000	7.10	7.10	7.10	7.10	7.10
1,425.000	7.10	7.10	7.10	7.10	7.10
1,430.000	7.10	7.10	7.10	7.00	7.00
1,435.000	7.00	7.00	7.00	7.00	7.00
1,440.000	7.00	7.00	7.00	7.00	7.00

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Read Hydrograph

Label: CM-1

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 1.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,445.000	7.00	7.00	7.00	7.00	7.00
1,450.000	7.00	7.00	7.00	7.00	7.00
1,455.000	7.00	7.00	7.00	7.00	7.00
1,460.000	7.00	7.00	7.00	7.00	7.00
1,465.000	7.00	7.00	7.00	7.00	7.00
1,470.000	7.00	7.00	7.00	7.00	7.00
1,475.000	7.00	7.00	7.00	7.00	7.00
1,480.000	7.00	7.00	7.00	7.00	7.00
1,485.000	7.00	7.00	7.00	7.00	7.00
1,490.000	7.00	7.00	7.00	7.00	7.00
1,495.000	7.00	7.00	7.00	7.00	7.00
1,500.000	7.00	(N/A)	(N/A)	(N/A)	(N/A)

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Addition Summary

Label: O-2

Summary for Hydrograph Addition at 'O-2'

Upstream Link	Upstream Node
Outlet-1	PO-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (min)	Flow (Peak) (ft ³ /s)
Flow (From)	Outlet-1	3.734	1,374.000	12.51
Flow (In)	O-2	3.734	1,374.000	12.51

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	0.00	0.00	0.01	0.01	0.02
15.000	0.03	0.04	0.05	0.07	0.08
30.000	0.10	0.12	0.15	0.17	0.20
45.000	0.23	0.26	0.29	0.33	0.37
60.000	0.40	0.44	0.49	0.53	0.58
75.000	0.63	0.68	0.73	0.79	0.84
90.000	0.90	0.96	1.02	1.09	1.16
105.000	1.22	1.29	1.35	1.42	1.49
120.000	1.56	1.62	1.69	1.76	1.82
135.000	1.89	1.96	2.01	2.02	2.03
150.000	2.04	2.06	2.07	2.08	2.10
165.000	2.11	2.12	2.14	2.15	2.16
180.000	2.18	2.19	2.20	2.22	2.23
195.000	2.24	2.26	2.27	2.29	2.30
210.000	2.31	2.33	2.34	2.36	2.38
225.000	2.39	2.41	2.43	2.44	2.46
240.000	2.48	2.50	2.51	2.53	2.55
255.000	2.57	2.59	2.61	2.63	2.65
270.000	2.67	2.70	2.72	2.74	2.76
285.000	2.78	2.81	2.83	2.85	2.88
300.000	2.90	2.93	2.95	2.98	3.00
315.000	3.03	3.05	3.08	3.10	3.13
330.000	3.16	3.18	3.21	3.24	3.26
345.000	3.29	3.32	3.34	3.37	3.40
360.000	3.43	3.45	3.48	3.51	3.54
375.000	3.57	3.60	3.63	3.65	3.68
390.000	3.71	3.74	3.77	3.80	3.83
405.000	3.86	3.89	3.92	3.95	3.98
420.000	4.01	4.02	4.03	4.04	4.05
435.000	4.06	4.07	4.08	4.09	4.10
450.000	4.12	4.13	4.14	4.15	4.16
465.000	4.17	4.18	4.20	4.21	4.22
480.000	4.23	4.24	4.25	4.27	4.28
495.000	4.29	4.30	4.31	4.33	4.34
510.000	4.35	4.36	4.37	4.39	4.40
525.000	4.41	4.43	4.44	4.45	4.46
540.000	4.48	4.49	4.51	4.52	4.53
555.000	4.55	4.56	4.57	4.59	4.60
570.000	4.62	4.63	4.65	4.66	4.68
585.000	4.69	4.71	4.72	4.74	4.75
600.000	4.77	4.79	4.80	4.82	4.83

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
615.000	4.85	4.86	4.88	4.90	4.91
630.000	4.93	4.95	4.96	4.98	5.00
645.000	5.01	5.03	5.05	5.06	5.08
660.000	5.10	5.11	5.13	5.15	5.17
675.000	5.18	5.20	5.22	5.23	5.25
690.000	5.27	5.29	5.31	5.32	5.34
705.000	5.36	5.38	5.40	5.41	5.43
720.000	5.45	5.47	5.49	5.51	5.53
735.000	5.55	5.56	5.58	5.60	5.62
750.000	5.64	5.66	5.68	5.70	5.72
765.000	5.74	5.76	5.78	5.80	5.82
780.000	5.84	5.87	5.89	5.91	5.93
795.000	5.95	5.97	5.99	6.01	6.02
810.000	6.03	6.04	6.05	6.07	6.08
825.000	6.09	6.10	6.11	6.13	6.14
840.000	6.15	6.17	6.18	6.19	6.20
855.000	6.22	6.23	6.24	6.26	6.27
870.000	6.29	6.30	6.31	6.33	6.34
885.000	6.36	6.37	6.39	6.40	6.41
900.000	6.43	6.44	6.46	6.47	6.49
915.000	6.51	6.52	6.54	6.55	6.57
930.000	6.59	6.61	6.62	6.64	6.66
945.000	6.68	6.69	6.71	6.73	6.75
960.000	6.77	6.79	6.81	6.83	6.85
975.000	6.87	6.89	6.91	6.93	6.95
990.000	6.97	6.99	7.01	7.03	7.05
1,005.000	7.08	7.10	7.12	7.15	7.17
1,020.000	7.19	7.22	7.24	7.27	7.30
1,035.000	7.32	7.35	7.38	7.41	7.43
1,050.000	7.46	7.49	7.52	7.55	7.58
1,065.000	7.61	7.64	7.67	7.71	7.74
1,080.000	7.77	7.80	7.83	7.87	7.90
1,095.000	7.93	7.97	8.00	8.03	8.05
1,110.000	8.08	8.11	8.14	8.17	8.20
1,125.000	8.24	8.27	8.31	8.36	8.40
1,140.000	8.45	8.50	8.56	8.63	8.73
1,155.000	8.86	9.00	9.16	9.31	9.44
1,170.000	9.54	9.61	9.67	9.71	9.74
1,185.000	9.77	9.79	9.82	9.84	9.86
1,200.000	9.87	9.89	9.91	9.93	9.94
1,215.000	9.96	9.98	9.99	10.00	10.02

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Time vs. Elevation

Label: PO-1 (OUT)

Time vs. Elevation (ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
1,230.000	10.03	10.04	10.05	10.06	10.07
1,245.000	10.08	10.09	10.10	10.10	10.11
1,260.000	10.12	10.13	10.14	10.15	10.16
1,275.000	10.17	10.18	10.18	10.19	10.20
1,290.000	10.20	10.21	10.22	10.22	10.23
1,305.000	10.24	10.24	10.25	10.25	10.26
1,320.000	10.26	10.27	10.27	10.27	10.28
1,335.000	10.28	10.28	10.29	10.29	10.29
1,350.000	10.29	10.29	10.29	10.30	10.30
1,365.000	10.30	10.30	10.30	10.30	10.30
1,380.000	10.30	10.30	10.30	10.30	10.30
1,395.000	10.30	10.30	10.29	10.29	10.29
1,410.000	10.29	10.29	10.29	10.29	10.29
1,425.000	10.29	10.29	10.29	10.28	10.28
1,440.000	10.28	(N/A)	(N/A)	(N/A)	(N/A)

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
0.000	0.000	0.001	0.002	0.005	0.008
15.000	0.012	0.017	0.023	0.030	0.037
30.000	0.045	0.055	0.065	0.076	0.088
45.000	0.101	0.114	0.129	0.144	0.160
60.000	0.177	0.195	0.214	0.234	0.254
75.000	0.276	0.298	0.321	0.345	0.370
90.000	0.396	0.422	0.449	0.478	0.507
105.000	0.536	0.565	0.594	0.623	0.653
120.000	0.682	0.711	0.741	0.770	0.800
135.000	0.829	0.859	0.889	0.919	0.948
150.000	0.978	1.008	1.038	1.068	1.099
165.000	1.129	1.159	1.189	1.219	1.250
180.000	1.280	1.311	1.341	1.372	1.402
195.000	1.433	1.464	1.495	1.526	1.558
210.000	1.592	1.625	1.660	1.695	1.731
225.000	1.767	1.805	1.843	1.882	1.921
240.000	1.962	2.003	2.045	2.088	2.131
255.000	2.175	2.220	2.266	2.312	2.359
270.000	2.407	2.456	2.505	2.555	2.606
285.000	2.658	2.710	2.763	2.817	2.872
300.000	2.927	2.983	3.039	3.096	3.153
315.000	3.211	3.268	3.326	3.385	3.444
330.000	3.503	3.563	3.623	3.683	3.744
345.000	3.805	3.866	3.928	3.990	4.053
360.000	4.116	4.179	4.243	4.307	4.372
375.000	4.437	4.502	4.567	4.633	4.699
390.000	4.766	4.833	4.901	4.969	5.037
405.000	5.105	5.174	5.243	5.312	5.382
420.000	5.451	5.521	5.592	5.662	5.733
435.000	5.804	5.875	5.946	6.018	6.090
450.000	6.163	6.235	6.308	6.381	6.454
465.000	6.528	6.601	6.676	6.750	6.825
480.000	6.899	6.974	7.050	7.125	7.201
495.000	7.277	7.354	7.430	7.507	7.586
510.000	7.664	7.744	7.824	7.905	7.986
525.000	8.069	8.152	8.236	8.320	8.405
540.000	8.491	8.578	8.665	8.753	8.842
555.000	8.932	9.022	9.113	9.205	9.297
570.000	9.390	9.484	9.579	9.674	9.770
585.000	9.867	9.965	10.063	10.162	10.262
600.000	10.362	10.463	10.564	10.666	10.769

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
615.000	10.871	10.974	11.078	11.182	11.286
630.000	11.391	11.496	11.602	11.708	11.814
645.000	11.921	12.029	12.137	12.246	12.355
660.000	12.464	12.574	12.684	12.794	12.905
675.000	13.017	13.128	13.240	13.353	13.466
690.000	13.580	13.693	13.808	13.923	14.038
705.000	14.154	14.271	14.388	14.506	14.625
720.000	14.744	14.864	14.985	15.106	15.228
735.000	15.351	15.474	15.598	15.723	15.848
750.000	15.974	16.101	16.228	16.356	16.485
765.000	16.614	16.744	16.875	17.006	17.138
780.000	17.271	17.404	17.538	17.673	17.808
795.000	17.944	18.081	18.219	18.357	18.497
810.000	18.638	18.781	18.924	19.069	19.215
825.000	19.362	19.511	19.661	19.812	19.964
840.000	20.118	20.273	20.430	20.587	20.746
855.000	20.906	21.068	21.230	21.394	21.559
870.000	21.726	21.893	22.062	22.233	22.404
885.000	22.577	22.751	22.927	23.104	23.281
900.000	23.461	23.642	23.825	24.011	24.199
915.000	24.390	24.584	24.780	24.978	25.179
930.000	25.382	25.588	25.796	26.007	26.220
945.000	26.436	26.654	26.875	27.098	27.323
960.000	27.551	27.782	28.015	28.251	28.489
975.000	28.729	28.972	29.218	29.465	29.716
990.000	29.969	30.224	30.482	30.742	31.006
1,005.000	31.275	31.549	31.829	32.114	32.404
1,020.000	32.700	33.001	33.307	33.619	33.936
1,035.000	34.258	34.586	34.920	35.258	35.602
1,050.000	35.951	36.305	36.662	37.023	37.388
1,065.000	37.756	38.127	38.502	38.881	39.264
1,080.000	39.650	40.039	40.433	40.830	41.230
1,095.000	41.634	42.042	42.456	42.889	43.347
1,110.000	43.830	44.332	44.850	45.383	45.939
1,125.000	46.533	47.168	47.842	48.558	49.324
1,140.000	50.151	51.067	52.106	53.355	55.041
1,155.000	57.240	59.740	62.378	64.958	67.177
1,170.000	68.913	70.210	71.150	71.845	72.400
1,185.000	72.877	73.301	73.687	74.046	74.388
1,200.000	74.717	75.034	75.337	75.631	75.919
1,215.000	76.197	76.464	76.722	76.968	77.202

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Time vs. Volume

Label: PO-1

Time vs. Volume (ac-ft)

Output Time increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)	Volume (ac-ft)
1,230.000	77.431	77.658	77.882	78.103	78.324
1,245.000	78.542	78.759	78.974	79.186	79.397
1,260.000	79.606	79.810	80.006	80.199	80.388
1,275.000	80.570	80.746	80.916	81.079	81.233
1,290.000	81.381	81.527	81.671	81.814	81.954
1,305.000	82.087	82.212	82.329	82.440	82.544
1,320.000	82.643	82.735	82.821	82.902	82.976
1,335.000	83.046	83.112	83.174	83.229	83.278
1,350.000	83.320	83.356	83.387	83.413	83.434
1,365.000	83.451	83.463	83.470	83.473	83.472
1,380.000	83.468	83.462	83.453	83.442	83.429
1,395.000	83.415	83.399	83.382	83.363	83.345
1,410.000	83.325	83.305	83.285	83.264	83.242
1,425.000	83.221	83.199	83.178	83.156	83.135
1,440.000	83.113	(N/A)	(N/A)	(N/A)	(N/A)

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Elevation vs. Volume Curve

Label: PO-1

Elevation-Volume

Pond Elevation (ft)	Pond Volume (ac-ft)
0.00	0.000
2.00	0.877
4.00	5.418
6.00	18.271
8.00	42.445
10.00	76.869
12.00	121.103
12.60	168.670

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Requested Pond Water Surface Elevations	
Minimum (Headwater)	0.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	12.60 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Box Tailwater Settings	Culvert - 1 Tailwater	Forward	TW	9.30 (N/A)	12.60 (N/A)

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Structure ID: Culvert - 1	
Structure Type: Culvert-Box	
Number of Barrels	1
Width	5.00 ft
Height	2.80 ft
Length	77.00 ft
Length (Computed Barrel)	77.01 ft
Slope (Computed)	0.014 ft/ft
Outlet Control Data	
Manning's n	0.013
Ke	0.500
Kb	0.006
Kr	0.500
Convergence Tolerance	0.00 ft
Inlet Control Data	
Equation Form	Form 1
K	0.0260
M	1.0000
C	0.0347
Y	0.8100
T1 ratio (HW/D)	1.171
T2 ratio (HW/D)	1.358
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.

Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control, interpolate between flows at T1 & T2...

T1 Elevation	12.58 ft	T1 Flow	81.99 ft ³ /s
T2 Elevation	13.10 ft	T2 Flow	93.71 ft ³ /s

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Outlet Input Data

Label: Composite Outlet Structure - 1

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall
Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Individual Outlet Curves

Label: Composite Outlet Structure - 1

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = Culvert - 1 (Culvert-Box)

Mannings open channel maximum capacity: 230.24 ft³/s

Upstream ID = (Pond Water Surface)

Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
0.00	0.00	(N/A)	0.00
0.50	0.00	(N/A)	0.00
1.00	0.00	(N/A)	0.00
1.50	0.00	(N/A)	0.00
2.00	0.00	(N/A)	0.00
2.50	0.00	(N/A)	0.00
3.00	0.00	(N/A)	0.00
3.50	0.00	(N/A)	0.00
4.00	0.00	(N/A)	0.00
4.50	0.00	(N/A)	0.00
5.00	0.00	(N/A)	0.00
5.50	0.00	(N/A)	0.00
6.00	0.00	(N/A)	0.00
6.50	0.00	(N/A)	0.00
7.00	0.00	(N/A)	0.00
7.50	0.00	(N/A)	0.00
8.00	0.00	(N/A)	0.00
8.50	0.00	(N/A)	0.00
9.00	0.00	(N/A)	0.00
9.30	0.00	(N/A)	0.00
9.50	1.09	(N/A)	0.00
10.00	7.17	(N/A)	0.00
10.50	16.11	(N/A)	0.00
11.00	27.16	(N/A)	0.00
11.50	39.98	(N/A)	0.00
12.00	54.34	(N/A)	0.00
12.50	70.11	(N/A)	0.00
12.60	73.44	(N/A)	0.00

Computation Messages

Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Individual Outlet Curves

Label: Composite Outlet Structure - 1

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = Culvert - 1 (Culvert-Box)

Mannings open channel maximum capacity: 230.24 ft³/s

Upstream ID = (Pond Water Surface)

Downstream ID = Tailwater (Pond Outfall)

Computation Messages

Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .057ft
Dcr= .114ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .200ft
Dcr= .400ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .343ft
Dcr= .686ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .486ft
Dcr= .971ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .629ft
Dcr= 1.257ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .771ft
Dcr= 1.543ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .914ft
Dcr= 1.828ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .943ft
Dcr= 1.886ft CRIT.DEPTH Hev= .00ft

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Composite Rating Curve

Label: Composite Outlet Structure - 1

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
0.00	0.00	(N/A)	0.00
0.50	0.00	(N/A)	0.00
1.00	0.00	(N/A)	0.00
1.50	0.00	(N/A)	0.00
2.00	0.00	(N/A)	0.00
2.50	0.00	(N/A)	0.00
3.00	0.00	(N/A)	0.00
3.50	0.00	(N/A)	0.00
4.00	0.00	(N/A)	0.00
4.50	0.00	(N/A)	0.00
5.00	0.00	(N/A)	0.00
5.50	0.00	(N/A)	0.00
6.00	0.00	(N/A)	0.00
6.50	0.00	(N/A)	0.00
7.00	0.00	(N/A)	0.00
7.50	0.00	(N/A)	0.00
8.00	0.00	(N/A)	0.00
8.50	0.00	(N/A)	0.00
9.00	0.00	(N/A)	0.00
9.30	0.00	(N/A)	0.00
9.50	1.09	(N/A)	0.00
10.00	7.17	(N/A)	0.00
10.50	16.11	(N/A)	0.00
11.00	27.16	(N/A)	0.00
11.50	39.98	(N/A)	0.00
12.00	54.34	(N/A)	0.00
12.50	70.11	(N/A)	0.00
12.60	73.44	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Composite Rating Curve

Label: Composite Outlet Structure - 1

Composite Outflow Summary

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Culvert - 1
Culvert - 1
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Culvert - 1
Culvert - 1

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Diverted Hydrograph

Label: Outlet-1

Peak Discharge	12.51 ft ³ /s
Time to Peak	1,374.000 min
Hydrograph Volume	3.734 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,161.000	0.00	0.04	0.75	1.55	2.47
1,176.000	3.13	3.62	4.01	4.35	4.65
1,191.000	4.92	5.18	5.42	5.65	5.88
1,206.000	6.09	6.30	6.50	6.70	6.89
1,221.000	7.07	7.25	7.44	7.63	7.81
1,236.000	7.99	8.17	8.35	8.53	8.70
1,251.000	8.87	9.05	9.22	9.38	9.55
1,266.000	9.71	9.86	10.02	10.16	10.30
1,281.000	10.44	10.57	10.70	10.82	10.94
1,296.000	11.05	11.17	11.28	11.39	11.49
1,311.000	11.58	11.67	11.76	11.84	11.91
1,326.000	11.98	12.05	12.11	12.16	12.22
1,341.000	12.27	12.31	12.35	12.38	12.41
1,356.000	12.44	12.46	12.48	12.49	12.50
1,371.000	12.50	12.51	12.51	12.50	12.50
1,386.000	12.49	12.48	12.47	12.46	12.45
1,401.000	12.43	12.42	12.40	12.39	12.37
1,416.000	12.36	12.34	12.32	12.30	12.29
1,431.000	12.27	12.25	12.23	12.22	(N/A)

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Elevation-Volume-Flow Table (Pond)

Label: PO-1

Infiltration	
Infiltration Method (Computed)	No Infiltration
Initial Conditions	
Elevation (Water Surface, Initial)	0.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft ³ /s
Flow (Initial Infiltration)	0.00 ft ³ /s
Flow (Initial, Total)	0.00 ft ³ /s
Time Increment	3.000 min

Elevation (ft)	Outflow (ft ³ /s)	Storage (ac-ft)	Area (acres)	Infiltration (ft ³ /s)	Flow (Total) (ft ³ /s)	2S/t + O (ft ³ /s)
0.00	0.00	0.000	0.000	0.00	0.00	0.00
0.50	0.00	0.219	0.000	0.00	0.00	106.12
1.00	0.00	0.439	0.000	0.00	0.00	212.23
1.50	0.00	0.658	0.000	0.00	0.00	318.35
2.00	0.00	0.877	0.000	0.00	0.00	424.47
2.50	0.00	2.012	0.000	0.00	0.00	973.93
3.00	0.00	3.148	0.000	0.00	0.00	1,523.39
3.50	0.00	4.283	0.000	0.00	0.00	2,072.85
4.00	0.00	5.418	0.000	0.00	0.00	2,622.31
4.50	0.00	8.631	0.000	0.00	0.00	4,177.53
5.00	0.00	11.845	0.000	0.00	0.00	5,732.74
5.50	0.00	15.058	0.000	0.00	0.00	7,287.95
6.00	0.00	18.271	0.000	0.00	0.00	8,843.16
6.50	0.00	24.314	0.000	0.00	0.00	11,768.22
7.00	0.00	30.358	0.000	0.00	0.00	14,693.27
7.50	0.00	36.402	0.000	0.00	0.00	17,618.33
8.00	0.00	42.445	0.000	0.00	0.00	20,543.38
8.50	0.00	51.051	0.000	0.00	0.00	24,708.68
9.00	0.00	59.657	0.000	0.00	0.00	28,873.99
9.30	0.00	64.821	0.000	0.00	0.00	31,373.17
9.50	1.09	68.263	0.000	0.00	1.09	33,040.38
10.00	7.17	76.869	0.000	0.00	7.17	37,211.77
10.50	16.11	87.928	0.000	0.00	16.11	42,573.02
11.00	27.16	98.986	0.000	0.00	27.16	47,936.38
11.50	39.98	110.044	0.000	0.00	39.98	53,301.52
12.00	54.34	121.103	0.000	0.00	54.34	58,668.20
12.50	70.11	160.742	0.000	0.00	70.11	77,869.32
12.60	73.44	168.670	0.000	0.00	73.44	81,709.73

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Level Pool Pond Routing Summary

Label: PO-1 (IN)

Infiltration			
Infiltration Method (Computed)		No Infiltration	
Initial Conditions			
Elevation (Water Surface, Initial)		0.00 ft	
Volume (Initial)		0.000 ac-ft	
Flow (Initial Outlet)		0.00 ft³/s	
Flow (Initial Infiltration)		0.00 ft³/s	
Flow (Initial, Total)		0.00 ft³/s	
Time Increment		3.000 min	
Inflow/Outflow Hydrograph Summary			
Flow (Peak In)		651.90 ft³/s	Time to Peak (Flow, In)
Flow (Peak Outlet)		12.51 ft³/s	Time to Peak (Flow, Outlet)
			1,161.000 min
			1,374.000 min
Peak Conditions			
Elevation (Water Surface, Peak)		10.30 ft	
Volume (Peak)		83.473 ac-ft	
Mass Balance (ac-ft)			
Volume (Initial)		0.000 ac-ft	
Volume (Total Inflow)		86.848 ac-ft	
Volume (Total Infiltration)		0.000 ac-ft	
Volume (Total Outlet Outflow)		3.734 ac-ft	
Volume (Retained)		83.063 ac-ft	
Volume (Unrouted)		-0.050 ac-ft	
Error (Mass Balance)		0.1 %	

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Pond Routed Hydrograph (total out)

Label: PO-1 (OUT)

Peak Discharge	12.51 ft ³ /s
Time to Peak	1,374.000 min
Hydrograph Volume	3.734 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 3.000 min

Time on left represents time for first value in each row.

Time (min)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)	Flow (ft ³ /s)
1,161.000	0.00	0.04	0.75	1.55	2.47
1,176.000	3.13	3.62	4.01	4.35	4.65
1,191.000	4.92	5.18	5.42	5.65	5.88
1,206.000	6.09	6.30	6.50	6.70	6.89
1,221.000	7.07	7.25	7.44	7.63	7.81
1,236.000	7.99	8.17	8.35	8.53	8.70
1,251.000	8.87	9.05	9.22	9.38	9.55
1,266.000	9.71	9.86	10.02	10.16	10.30
1,281.000	10.44	10.57	10.70	10.82	10.94
1,296.000	11.05	11.17	11.28	11.39	11.49
1,311.000	11.58	11.67	11.76	11.84	11.91
1,326.000	11.98	12.05	12.11	12.16	12.22
1,341.000	12.27	12.31	12.35	12.38	12.41
1,356.000	12.44	12.46	12.48	12.49	12.50
1,371.000	12.50	12.51	12.51	12.50	12.50
1,386.000	12.49	12.48	12.47	12.46	12.45
1,401.000	12.43	12.42	12.40	12.39	12.37
1,416.000	12.36	12.34	12.32	12.30	12.29
1,431.000	12.27	12.25	12.23	12.22	(N/A)

100-Yr Proposed Condition Modified Outlet Structure

Subsection: Pond Inflow Summary

Label: PO-1 (IN)

Summary for Hydrograph Addition at 'PO-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	CM-1

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (min)	Flow (Peak) (ft ³ /s)
Flow (From)	CM-1	87.419	1,161.000	651.90
Flow (In)	PO-1	86.848	1,161.000	651.90

100-Yr Proposed Condition Modified Outlet Structure

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Attachment D
Supporting Documentation for Hydraulics Analyses

Attachment D-1
Conceptual Drainage Plan



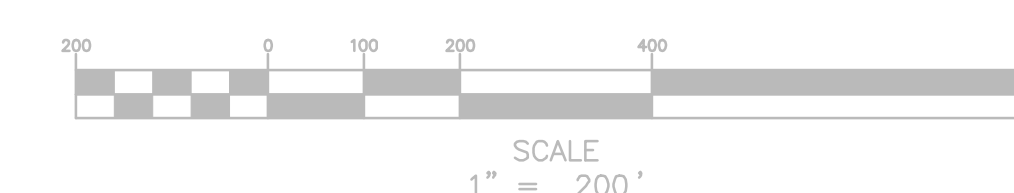
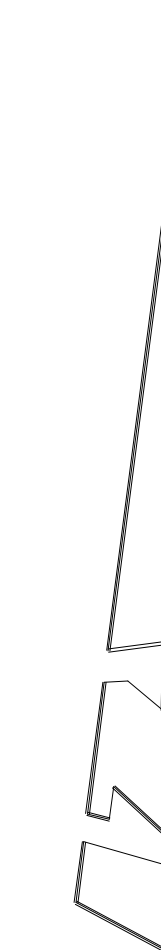
LEGEND



PROJECT DRAINAGE BOUNDARY
PROJECT SUBAREA NAME
SUBAREA SIZE (ACRES)
NATURAL DRAINAGE WATERCOURSE
STORM DRAIN FLOW

QXX=XXXcfs
XXX.X

DESIGN PEAK FLOW RATE
HYDROLOGIC NODE FOR
HYDRAULIC STRUCTURE DESIGN



Attachment D-2
Effective DFIRM Panel #06111C0941E

Attachment D-3
WSPG Model Results – Onsite Storm Drain Infrastructure

CSUCI Univ Glen EIR
10-year Storm
On-Site Drainage Line B

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
105.010	79.340	1.077	80.417	60.00	29.66	13.66	94.08	.00	2.39	2.48	2.500	.000	.00	1 .0
26.320	.1619					.1401	3.69	1.08	5.78	1.04	.013	.00	.00	PIPE
131.330	83.600	1.094	84.694	60.00	29.04	13.09	97.79	.00	2.39	2.48	2.500	.000	.00	1 .0
12.732	.1733					.1323	1.68	1.09	5.61	1.02	.013	.00	.00	PIPE
144.062	85.806	1.111	86.917	60.00	28.44	12.56	99.48	.00	2.39	2.48	2.500	.000	.00	1 .0
20.946	.1733					.1208	2.53	1.11	5.44	1.02	.013	.00	.00	PIPE
165.008	89.436	1.153	90.589	60.00	27.12	11.42	102.01	.00	2.39	2.49	2.500	.000	.00	1 .0
14.838	.1733					.1062	1.58	1.15	5.07	1.02	.013	.00	.00	PIPE
179.845	92.007	1.196	93.203	60.00	25.86	10.38	103.58	.00	2.39	2.50	2.500	.000	.00	1 .0
11.256	.1733					.0935	1.05	1.20	4.73	1.02	.013	.00	.00	PIPE
191.102	93.958	1.241	95.199	60.00	24.65	9.44	104.64	.00	2.39	2.50	2.500	.000	.00	1 .0
8.898	.1733					.0823	.73	1.24	4.40	1.02	.013	.00	.00	PIPE
200.000	95.500	1.289	96.789	60.00	23.51	8.58	105.37	.00	2.39	2.50	2.500	.000	.00	1 .0
22.844	.0864					.0755	1.73	1.29	4.10	1.25	.013	.00	.00	PIPE
222.844	97.473	1.305	98.778	60.00	23.14	8.31	107.09	.00	2.39	2.50	2.500	.000	.00	1 .0
41.892	.0864					.0696	2.91	1.31	4.00	1.25	.013	.00	.00	PIPE
264.736	101.092	1.356	102.448	60.00	22.06	7.56	110.00	.00	2.39	2.49	2.500	.000	.00	1 .0
25.349	.0864					.0614	1.56	1.36	3.72	1.25	.013	.00	.00	PIPE

CSUCI Univ Glen EIR
10-year Storm
On-Site Drainage Line B

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch

Line_B_10-yr.OUT														
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
290.084	103.282	1.409	104.691	60.00	21.03	6.87	111.56	.00	2.39	2.48	2.500	.000	.00	1 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.640	.0864					.0542	.96	1.41	3.46	1.25	.013	.00	.00	PIPE
307.724	104.805	1.466	106.272	60.00	20.05	6.25	112.52	.00	2.39	2.46	2.500	.000	.00	1 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.235	.0864					.0479	.63	1.47	3.21	1.25	.013	.00	.00	PIPE
320.959	105.949	1.525	107.474	60.00	19.12	5.68	113.15	.00	2.39	2.44	2.500	.000	.00	1 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.314	.0864					.0424	.44	1.53	2.97	1.25	.013	.00	.00	PIPE
331.273	106.840	1.588	108.428	60.00	18.23	5.16	113.59	.00	2.39	2.41	2.500	.000	.00	1 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.235	.0864					.0377	.31	1.59	2.75	1.25	.013	.00	.00	PIPE
339.509	107.551	1.656	109.207	60.00	17.38	4.69	113.90	.00	2.39	2.36	2.500	.000	.00	1 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.701	.0864					.0335	.22	1.66	2.54	1.25	.013	.00	.00	PIPE
346.210	108.130	1.728	109.858	60.00	16.57	4.27	114.12	.00	2.39	2.31	2.500	.000	.00	1 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.670	.0321					.0315	.15	1.73	2.33	1.72	.013	.00	.00	PIPE
350.880	108.280	1.729	110.009	60.00	16.57	4.26	114.27	2.50	2.39	2.31	2.500	.000	.00	1 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.000	.0320					.0315	.16	2.50	2.33	1.72	.013	.00	.00	PIPE
355.880	108.440	1.729	110.169	60.00	16.56	4.26	114.43	.11	2.39	2.31	2.500	.000	.00	1 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113.920	.0317					.0312	3.55	1.84	2.33	1.73	.013	.00	.00	PIPE
469.800	112.050	1.742	113.792	60.00	16.43	4.19	117.98	.00	2.39	2.30	2.500	.000	.00	1 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29.230	.0318					.0307	.90	1.74	2.30	1.72	.013	.00	.00	PIPE

♀ FILE: Line_B_10-yr.WSW

W S P G W - CIVILDESIGN Version 14.08

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Program Package Serial Number: 1404

WATER SURFACE PROFILE LISTING

Date:12-21-2016 Time:11:13:27

CSUCI Univ Glen EIR

10-year Storm

On-Site Drainage Line B

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
499.030	112.980	1.750	114.730	60.00	16.35	4.15	118.88	2.50	2.39	2.29	2.500	.000	.00	1 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.260	.0317					.0305	.04	2.50	2.28	1.72	.013	.00	.00	PIPE
500.290	113.020	1.750	114.770	60.00	16.35	4.15	118.92	.00	2.39	2.29	2.500	.000	.00	1 .0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35.340	.0317					.0303	1.07	1.75	2.28	1.73	.013	.00	.00	PIPE

Line_B_10-yr.OUT

535.630	114.140	1.762	115.902	60.00	16.23	4.09	119.99	.16	2.39	2.28	2.500	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80.120	.0317					.0287	2.30	1.92	2.25	1.73	.013	.00	.00	PIPE	
615.750	116.680	1.828	118.508	60.00	15.60	3.78	122.29	.00	2.39	2.22	2.500	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.082	.0317					.0265	.75	1.83	2.09	1.72	.013	.00	.00	PIPE	
643.832	117.571	1.874	119.445	60.00	15.19	3.58	123.03	.00	2.39	2.17	2.500	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32.190	.0317					.0244	.79	1.87	1.98	1.72	.013	.00	.00	PIPE	
676.022	118.591	1.966	120.557	60.00	14.49	3.26	123.82	.00	2.39	2.05	2.500	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.138	.0317					.0221	.45	1.97	1.80	1.72	.013	.00	.00	PIPE	
696.160	119.230	2.069	121.299	60.00	13.81	2.96	124.26	.00	2.39	1.89	2.500	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.930	.0313					.0208	.08	2.07	1.61	1.73	.013	.00	.00	PIPE	
700.090	119.353	2.096	121.449	60.00	13.65	2.89	124.34	.00	2.39	1.84	2.500	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.006	.0313					.0198	.24	2.10	1.56	1.73	.013	.00	.00	PIPE	
712.096	119.729	2.221	121.950	60.00	13.02	2.63	124.58	.00	2.39	1.57	2.500	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.464	.0313					.0188	.10	2.22	1.34	1.73	.013	.00	.00	PIPE	

♀ FILE: Line_B_10-yr.WSW

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Program Package Serial Number: 1404

WATER SURFACE PROFILE LISTING

Date:12-21-2016 Time:11:13:27

CSUCI Univ Glen EIR

10-year Storm

On-Site Drainage Line B

*****															*****	

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip		
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch		
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****		
717.560	119.900	2.393	122.293	60.00	12.41	2.39	124.68	.00	2.39	1.01	2.500	.000	.00	1 .0		
JUNCT STR	.0320					.0122	.03	2.39	1.00		.013	.00	.00	PIPE		
720.060	119.980	5.841	125.821	31.00	6.32	.62	126.44	.00	1.90	.00	2.500	.000	.00	1 .0		
2.500	.0320					.0057	.01	5.84	.00	1.13	.013	.00	.00	PIPE		
722.560	120.060	5.775	125.835	31.00	6.32	.62	126.45	.00	1.90	.00	2.500	.000	.00	1 .0		
151.670	.0100					.0057	.87	.00	.00	1.62	.013	.00	.00	PIPE		
874.230	121.580	5.245	126.825	31.00	6.32	.62	127.44	.00	1.90	.00	2.500	.000	.00	1 .0		
70.690	.0100					.0057	.40	5.24	.00	1.62	.013	.00	.00	PIPE		
944.920	122.290	4.939	127.229	31.00	6.32	.62	127.85	.00	1.90	.00	2.500	.000	.00	1 .0		

Line_B_10-yr.OUT														
248.830	.0100					.0057	1.42	.00	.00	1.63	.013	.00	.00	PIPE
1193.750	124.770	4.004	128.774	31.00	6.32	.62	129.39	.00	1.90	.00	2.500	.000	.00	1 .0
70.690	.0100					.0057	.40	4.00	.00	1.62	.013	.00	.00	PIPE
1264.440	125.480	3.698	129.178	31.00	6.32	.62	129.80	.00	1.90	.00	2.500	.000	.00	1 .0
191.880	.0100					.0057	1.10	.00	.00	1.62	.013	.00	.00	PIPE
1456.320	127.400	2.969	130.369	31.00	6.32	.62	130.99	.00	1.90	.00	2.500	.000	.00	1 .0
109.854	.0100					.0057	.62	2.97	.00	1.63	.013	.00	.00	PIPE
1566.174	128.496	2.500	130.996	31.00	6.32	.62	131.62	.00	1.90	.00	2.500	.000	.00	1 .0
13.396	.0100					.0053	.07	2.50	.00	1.63	.013	.00	.00	PIPE
♀ FILE: Line_B_10-yr.WSW														
W S P G W - CIVILDESIGN Version 14.08														
Program Package Serial Number: 1404														
WATER SURFACE PROFILE LISTING														
Date:12-21-2016 Time:11:13:27														

CSUCI Univ Glen EIR
10-year Storm
On-Site Drainage Line B

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1579.570	128.630	2.426	131.056	31.00	6.37	.63	131.69	.00	1.90	.85	2.500	.000	.00	1 .0
24.068	.0101					.0050	.12	2.43	.47	1.62	.013	.00	.00	PIPE
1603.638	128.873	2.241	131.114	31.00	6.68	.69	131.81	.00	1.90	1.52	2.500	.000	.00	1 .0
1.768	.0101					.0050	.01	2.25	.67	1.62	.013	.00	.00	PIPE
1605.406	128.891	2.241	131.132	31.00	6.68	.69	131.83	.00	1.90	1.52	2.500	.000	.00	1 .0
HYDRAULIC JUMP														
1605.406	128.891	1.599	130.490	31.00	9.35	1.36	131.85	.01	1.90	2.40	2.500	.000	.00	1 .0
34.504	.0101					.0105	.36	1.61	1.40	1.62	.013	.00	.00	PIPE
1639.910	129.240	1.599	130.839	31.00	9.35	1.36	132.20	.00	1.90	2.40	2.500	.000	.00	1 .0
25.060	.0100					.0106	.27	1.60	1.40	1.63	.013	.00	.00	PIPE
1664.970	129.490	1.583	131.073	31.00	9.46	1.39	132.46	.23	1.90	2.41	2.500	.000	.00	1 .0
23.670	.0097					.0111	.26	1.81	1.43	1.64	.013	.00	.00	PIPE
1688.640	129.720	1.553	131.273	31.00	9.67	1.45	132.73	.00	1.90	2.43	2.500	.000	.00	1 .0
22.803	.0101					.0117	.27	1.55	1.48	1.62	.013	.00	.00	PIPE

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1711.443	129.949	1.523	131.472	31.00	9.90	1.52	132.99	.00	1.90	2.44	2.500	.000	.00	1	.0
32.851	.0101					.0129	.42	1.52	1.54	1.62	.013	.00	.00	PIPE	
1744.294	130.279	1.463	131.742	31.00	10.38	1.67	133.42	.00	1.90	2.46	2.500	.000	.00	1	.0
24.936	.0101					.0145	.36	1.46	1.66	1.62	.013	.00	.00	PIPE	

♀ FILE: Line_B_10-yr.WSW W S P G W - CIVILDESIGN Version 14.08
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 CSUCI Univ Glen EIR
 10-year Storm
 On-Site Drainage Line B

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1769.230	130.530	1.408	131.938	31.00	10.89	1.84	133.78	.00	1.90	2.48	2.500	.000	.00	1 .0
14.078	.0100					.0161	.23	1.41	1.79	1.63	.013	.00	.00	PIPE
1783.308	130.671	1.371	132.042	31.00	11.24	1.96	134.00	.00	1.90	2.49	2.500	.000	.00	1 .0
18.325	.0100					.0179	.33	1.37	1.88	1.63	.013	.00	.00	PIPE
1801.633	130.853	1.320	132.173	31.00	11.79	2.16	134.33	.00	1.90	2.50	2.500	.000	.00	1 .0
16.151	.0100					.0203	.33	1.32	2.02	1.63	.013	.00	.00	PIPE
1817.784	131.015	1.271	132.286	31.00	12.36	2.37	134.66	.00	1.90	2.50	2.500	.000	.00	1 .0
14.568	.0100					.0230	.34	1.27	2.18	1.63	.013	.00	.00	PIPE
1832.352	131.160	1.224	132.384	31.00	12.97	2.61	135.00	.00	1.90	2.50	2.500	.000	.00	1 .0
13.345	.0100					.0262	.35	1.22	2.34	1.63	.013	.00	.00	PIPE
1845.697	131.293	1.179	132.472	31.00	13.60	2.87	135.34	.00	1.90	2.50	2.500	.000	.00	1 .0
12.401	.0100					.0298	.37	1.18	2.51	1.63	.013	.00	.00	PIPE
1858.098	131.417	1.137	132.554	31.00	14.26	3.16	135.71	.00	1.90	2.49	2.500	.000	.00	1 .0
11.520	.0100					.0338	.39	1.14	2.69	1.63	.013	.00	.00	PIPE
1869.618	131.532	1.096	132.628	31.00	14.96	3.48	136.10	.00	1.90	2.48	2.500	.000	.00	1 .0
10.832	.0100					.0385	.42	1.10	2.89	1.63	.013	.00	.00	PIPE
1880.450	131.640	1.058	132.698	31.00	15.69	3.82	136.52	.01	1.90	2.47	2.500	.000	.00	1 .0
84.590	.0410					.0410	3.47	1.07	3.09	1.06	.013	.00	.00	PIPE

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10-year Storm
On-Site Drainage Line B

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1965.040	135.110	1.058	136.168	31.00	15.69	3.82	139.99	.00	1.90	2.47	2.500	.000	.00	1 .0
30.790	.0409					.0410	1.26	1.06	3.09	1.06	.013	.00	.00	PIPE
1995.830	136.370	1.057	137.427	31.00	15.70	3.83	141.25	.04	1.90	2.47	2.500	.000	.00	1 .0
24.553	.0411					.0411	1.01	1.10	3.09	1.06	.013	.00	.00	PIPE
2020.383	137.379	1.057	138.436	31.00	15.70	3.83	142.26	.04	1.90	2.47	2.500	.000	.00	1 .0
122.957	.0411					.0405	4.98	1.10	3.09	1.06	.013	.00	.00	PIPE
2143.340	142.430	1.066	143.496	31.00	15.53	3.74	147.24	.00	1.90	2.47	2.500	.000	.00	1 .0
38.770	.0410					.0393	1.53	1.07	3.04	1.06	.013	.00	.00	PIPE
2182.110	144.020	1.074	145.094	31.00	15.38	3.67	148.77	.86	1.90	2.48	2.500	.000	.00	1 .0
32.650	.0410					.0381	1.24	1.94	3.00	1.06	.013	.00	.00	PIPE
2214.760	145.360	1.086	146.446	31.00	15.15	3.56	150.01	.00	1.90	2.48	2.500	.000	.00	1 .0
23.560	.0412					.0364	.86	1.09	2.94	1.06	.013	.00	.00	PIPE
2238.320	146.330	1.101	147.431	31.00	14.88	3.44	150.87	.39	1.90	2.48	2.500	.000	.00	1 .0
17.220	.0407					.0347	.60	1.49	2.86	1.06	.013	.00	.00	PIPE
2255.540	147.030	1.115	148.145	31.00	14.64	3.33	151.47	.08	1.90	2.49	2.500	.000	.00	1 .0
18.096	.0412					.0327	.59	1.19	2.79	1.06	.013	.00	.00	PIPE
2273.636	147.775	1.138	148.913	31.00	14.24	3.15	152.06	.08	1.90	2.49	2.500	.000	.00	1 .0
20.994	.0412					.0296	.62	1.21	2.68	1.06	.013	.00	.00	PIPE

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Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch

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2294.630	148.640	1.182	149.822	31.00	13.58	2.86	152.68	.00	1.90	2.50	2.500	.000	.00	1	.0
11.157	.0410					.0265	.30	1.18	2.50	1.06	.013	.00	.00	PIPE	
2305.787	149.097	1.214	150.311	31.00	13.11	2.67	152.98	.00	1.90	2.50	2.500	.000	.00	1	.0
11.406	.0410					.0237	.27	1.21	2.37	1.06	.013	.00	.00	PIPE	
2317.193	149.564	1.260	150.824	31.00	12.50	2.43	153.25	.00	1.90	2.50	2.500	.000	.00	1	.0
8.597	.0410					.0209	.18	1.26	2.21	1.06	.013	.00	.00	PIPE	
2325.791	149.916	1.308	151.225	31.00	11.92	2.21	153.43	.00	1.90	2.50	2.500	.000	.00	1	.0
6.630	.0410					.0184	.12	1.31	2.06	1.06	.013	.00	.00	PIPE	
2332.421	150.188	1.359	151.547	31.00	11.36	2.00	153.55	.00	1.90	2.49	2.500	.000	.00	1	.0
5.191	.0410					.0163	.08	1.36	1.91	1.06	.013	.00	.00	PIPE	
2337.612	150.401	1.413	151.814	31.00	10.83	1.82	153.64	.00	1.90	2.48	2.500	.000	.00	1	.0
4.123	.0410					.0144	.06	1.41	1.78	1.06	.013	.00	.00	PIPE	
2341.734	150.570	1.469	152.039	31.00	10.33	1.66	153.70	.00	1.90	2.46	2.500	.000	.00	1	.0
3.206	.0410					.0127	.04	1.47	1.65	1.06	.013	.00	.00	PIPE	
2344.941	150.701	1.529	152.230	31.00	9.85	1.51	153.74	.00	1.90	2.44	2.500	.000	.00	1	.0
2.455	.0410					.0112	.03	1.53	1.53	1.06	.013	.00	.00	PIPE	
2347.395	150.801	1.593	152.395	31.00	9.39	1.37	153.76	.00	1.90	2.40	2.500	.000	.00	1	.0
1.855	.0410					.0100	.02	1.59	1.41	1.06	.013	.00	.00	PIPE	

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On-Site Drainage Line B

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2349.251	150.877	1.660	152.538	31.00	8.95	1.24	153.78	.00	1.90	2.36	2.500	.000	.00	1 .0
1.252	.0410					.0089	.01	1.66	1.30	1.06	.013	.00	.00	PIPE
2350.503	150.929	1.733	152.662	31.00	8.54	1.13	153.79	.00	1.90	2.31	2.500	.000	.00	1 .0
.753	.0410					.0079	.01	1.73	1.20	1.06	.013	.00	.00	PIPE
2351.256	150.960	1.811	152.771	31.00	8.14	1.03	153.80	.00	1.90	2.23	2.500	.000	.00	1 .0

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 100-year Storm
 On-Site Drainage Line B

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
105.010	79.340	1.402	80.742	91.00	32.13	16.03	96.77	.00	2.48	2.48	2.500	.000	.00	1 .0
26.320	.1619					.1302	3.43	1.40	5.30	1.33	.013	.00	.00	PIPE
131.330	83.600	1.434	85.034	91.00	31.25	15.17	100.20	.00	2.48	2.47	2.500	.000	.00	1 .0
10.255	.1733					.1225	1.26	1.43	5.08	1.30	.013	.00	.00	PIPE
141.585	85.377	1.455	86.832	91.00	30.67	14.61	101.44	.00	2.48	2.47	2.500	.000	.00	1 .0
20.919	.1733					.1126	2.36	1.46	4.93	1.30	.013	.00	.00	PIPE
162.504	89.002	1.514	90.516	91.00	29.24	13.28	103.80	.00	2.48	2.44	2.500	.000	.00	1 .0
15.556	.1733					.0997	1.55	1.51	4.57	1.30	.013	.00	.00	PIPE
178.060	91.698	1.577	93.275	91.00	27.88	12.07	105.35	.00	2.48	2.41	2.500	.000	.00	1 .0
12.150	.1733					.0885	1.08	1.58	4.23	1.30	.013	.00	.00	PIPE
190.210	93.804	1.644	95.448	91.00	26.59	10.97	106.42	.00	2.48	2.37	2.500	.000	.00	1 .0
9.790	.1733					.0786	.77	1.64	3.90	1.30	.013	.00	.00	PIPE
200.000	95.500	1.715	97.215	91.00	25.35	9.98	107.19	.00	2.48	2.32	2.500	.000	.00	1 .0
31.218	.0864					.0718	2.24	1.72	3.59	1.62	.013	.00	.00	PIPE
231.218	98.197	1.755	99.952	91.00	24.71	9.48	109.43	.00	2.48	2.29	2.500	.000	.00	1 .0
38.262	.0864					.0659	2.52	1.76	3.43	1.62	.013	.00	.00	PIPE
269.480	101.502	1.835	103.337	91.00	23.56	8.62	111.96	.00	2.48	2.21	2.500	.000	.00	1 .0
25.515	.0864					.0591	1.51	1.84	3.14	1.62	.013	.00	.00	PIPE

CSUCI Univ Glen EIR
 100-year Storm
 On-Site Drainage Line B

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch

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L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
294.995	103.706	1.922	105.628	91.00	22.46	7.84	113.46	.00	2.48	2.11	2.500	.000	.00	1 .0
18.557	.0864					.0532	.99	1.92	2.86	1.62	.013	.00	.00	PIPE
313.552	105.309	2.019	107.328	91.00	21.42	7.12	114.45	.00	2.48	1.97	2.500	.000	.00	1 .0
14.115	.0864					.0484	.68	2.02	2.57	1.62	.013	.00	.00	PIPE
327.667	106.528	2.130	108.658	91.00	20.42	6.48	115.13	.00	2.48	1.78	2.500	.000	.00	1 .0
10.920	.0864					.0447	.49	2.13	2.27	1.62	.013	.00	.00	PIPE
338.587	107.472	2.263	109.735	91.00	19.47	5.89	115.62	.00	2.48	1.46	2.500	.000	.00	1 .0
7.623	.0864					.0444	.34	2.26	1.92	1.62	.013	.00	.00	PIPE
346.210	108.130	2.479	110.609	91.00	18.56	5.35	115.96	.00	2.48	.46	2.500	.000	.00	1 .0
.505	.0321					.0461	.02	2.48	1.00	2.50	.013	.00	.00	PIPE
346.715	108.146	2.500	110.646	91.00	18.54	5.34	115.98	.00	2.48	.00	2.500	.000	.00	1 .0
4.165	.0321					.0479	.20	2.50	.00	2.50	.013	.00	.00	PIPE
350.880	108.280	2.571	110.851	91.00	18.54	5.34	116.19	.00	2.48	.00	2.500	.000	.00	1 .0
5.000	.0320					.0492	.25	.00	.00	2.50	.013	.00	.00	PIPE
355.880	108.440	3.332	111.772	91.00	18.54	5.34	117.11	.00	2.48	.00	2.500	.000	.00	1 .0
113.920	.0317					.0492	5.61	.00	.00	2.50	.013	.00	.00	PIPE
469.800	112.050	6.014	118.064	91.00	12.87	2.57	120.64	.00	2.85	.00	3.000	.000	.00	1 .0
29.230	.0318					.0186	.54	6.01	.00	1.97	.013	.00	.00	PIPE

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CSUCI Univ Glen EIR

100-year Storm

On-Site Drainage Line B

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
499.030	112.980	5.628	118.608	91.00	12.87	2.57	121.18	.00	2.85	.00	3.000	.000	.00	1 .0
1.260	.0317					.0186	.02	.00	.00	1.97	.013	.00	.00	PIPE
500.290	113.020	5.975	118.995	91.00	12.87	2.57	121.57	.00	2.85	.00	3.000	.000	.00	1 .0
35.340	.0317					.0186	.66	5.98	.00	1.97	.013	.00	.00	PIPE

Line_B_100-yr.OUT

535.630	114.140	5.513	119.653	91.00	12.87	2.57	122.23	.00	2.85	.00	3.000	.000	.00	1	.0
80.120	.0317					.0186	1.49	.00	.00	1.97	.013	.00	.00	PIPE	
615.750	116.680	4.808	121.488	91.00	12.87	2.57	124.06	.00	2.85	.00	3.000	.000	.00	1	.0
80.410	.0317					.0186	1.50	4.81	.00	1.97	.013	.00	.00	PIPE	
696.160	119.230	3.755	122.985	91.00	12.87	2.57	125.56	.00	2.85	.00	3.000	.000	.00	1	.0
21.400	.0313					.0186	.40	3.75	.00	1.98	.013	.00	.00	PIPE	
717.560	119.900	3.483	123.383	91.00	12.87	2.57	125.96	.00	2.85	.00	3.000	.000	.00	1	.0
JUNCT STR	.0320					.0093	.02	3.48	.00		.013	.00	.00	PIPE	
720.060	119.980	5.972	125.952	38.00	5.38	.45	126.40	.00	2.01	.00	3.000	.000	.00	1	.0
2.500	.0320					.0032	.01	5.97	.00	1.16	.013	.00	.00	PIPE	
722.560	120.060	5.900	125.960	38.00	5.38	.45	126.41	.00	2.01	.00	3.000	.000	.00	1	.0
151.670	.0100					.0032	.49	.00	.00	1.62	.013	.00	.00	PIPE	
874.230	121.580	4.962	126.542	38.00	5.38	.45	126.99	.00	2.01	.00	3.000	.000	.00	1	.0
70.690	.0100					.0032	.23	4.96	.00	1.62	.013	.00	.00	PIPE	

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100-year Storm

On-Site Drainage Line B

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
944.920	122.290	4.482	126.772	38.00	5.38	.45	127.22	.00	2.01	.00	3.000	.000	.00	1 .0
233.430	.0100					.0032	.75	.00	.00	1.62	.013	.00	.00	PIPE
1178.350	124.617	3.000	127.617	38.00	5.38	.45	128.07	3.00	2.01	.00	3.000	.000	.00	1 .0
15.400	.0100					.0030	.05	3.00	.00	1.62	.013	.00	.00	PIPE
1193.750	124.770	2.880	127.650	38.00	5.45	.46	128.11	.00	2.01	1.18	3.000	.000	.00	1 .0
22.624	.0100					.0029	.06	2.88	.39	1.62	.013	.00	.00	PIPE
1216.374	124.997	2.671	127.668	38.00	5.72	.51	128.18	.00	2.01	1.87	3.000	.000	.00	1 .0
14.231	.0100					.0030	.04	2.67	.53	1.62	.013	.00	.00	PIPE
1230.605	125.140	2.520	127.660	38.00	5.99	.56	128.22	.00	2.01	2.20	3.000	.000	.00	1 .0

Line_B_100-yr.OUT

5.286	.0100					.0032	.02	2.52	.62	1.62	.013	.00	.00	PIPE
1235.892	125.193	2.460	127.653	38.00	6.13	.58	128.24	.00	2.01	2.31	3.000	.000	.00	1 .0
HYDRAULIC JUMP														
1235.892	125.193	1.621	126.814	38.00	9.75	1.48	128.29	.00	2.01	2.99	3.000	.000	.00	1 .0
28.548	.0100					.0100	.29	1.62	1.51	1.62	.013	.00	.00	PIPE
1264.440	125.480	1.622	127.102	38.00	9.75	1.47	128.58	.04	2.01	2.99	3.000	.000	.00	1 .0
55.938	.0100					.0100	.56	1.66	1.50	1.62	.013	.00	.00	PIPE
1320.378	126.040	1.622	127.662	38.00	9.75	1.47	129.14	.04	2.01	2.99	3.000	.000	.00	1 .0
135.942	.0100					.0100	1.36	1.66	1.50	1.62	.013	.00	.00	PIPE
♀ FILE: Line_B_100-yr.WSW														
W S P G W - CIVILDESIGN Version 14.08														
Program Package Serial Number: 1404														
WATER SURFACE PROFILE LISTING														
Date:12-21-2016 Time:12:23:48														
CSUCI Univ Glen EIR														
100-year Storm														
On-Site Drainage Line B														

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1456.320	127.400	1.623	129.023	38.00	9.74	1.47	130.50	.00	2.01	2.99	3.000	.000	.00	1 .0
123.250	.0100					.0102	1.26	1.62	1.50	1.62	.013	.00	.00	PIPE
1579.570	128.630	1.603	130.233	38.00	9.89	1.52	131.75	.02	2.01	2.99	3.000	.000	.00	1 .0
60.340	.0101					.0107	.64	1.62	1.54	1.62	.013	.00	.00	PIPE
1639.910	129.240	1.579	130.819	38.00	10.07	1.58	132.40	.00	2.01	3.00	3.000	.000	.00	1 .0
25.060	.0100					.0111	.28	1.58	1.58	1.62	.013	.00	.00	PIPE
1664.970	129.490	1.560	131.050	38.00	10.23	1.62	132.67	.33	2.01	3.00	3.000	.000	.00	1 .0
23.670	.0097					.0117	.28	1.89	1.62	1.64	.013	.00	.00	PIPE
1688.640	129.720	1.533	131.253	38.00	10.46	1.70	132.95	.00	2.01	3.00	3.000	.000	.00	1 .0
19.717	.0101					.0124	.24	1.53	1.68	1.62	.013	.00	.00	PIPE
1708.357	129.918	1.508	131.426	38.00	10.67	1.77	133.19	.00	2.01	3.00	3.000	.000	.00	1 .0
34.465	.0101					.0136	.47	1.51	1.73	1.62	.013	.00	.00	PIPE
1742.822	130.265	1.453	131.718	38.00	11.19	1.95	133.66	.00	2.01	3.00	3.000	.000	.00	1 .0
26.408	.0101					.0154	.41	1.45	1.85	1.62	.013	.00	.00	PIPE

Line_B_100-yr.OUT

1769.230	130.530	1.401	131.931	38.00	11.74	2.14	134.07	.00	2.01	2.99	3.000	.000	.00	1	.0
.760	.0100					.0165	.01	1.40	1.99	1.62	.013	.00	.00	PIPE	
1769.990	130.538	1.399	131.937	38.00	11.76	2.15	134.08	.00	2.01	2.99	3.000	.000	.00	1	.0
21.396	.0100					.0176	.38	1.40	1.99	1.62	.013	.00	.00	PIPE	

♀ FILE: Line_B_100-yr.WSW W S P G W - CIVILDESIGN Version 14.08
 Program Package Serial Number: 1404
 WATER SURFACE PROFILE LISTING
 Date:12-21-2016 Time:12:23:48
 CSUCI Univ Glen EIR
 100-year Storm
 On-Site Drainage Line B

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1791.385	130.751	1.348	132.099	38.00	12.33	2.36	134.46	.00	2.01	2.98	3.000	.000	.00	1 .0
18.677	.0100					.0201	.37	1.35	2.14	1.62	.013	.00	.00	PIPE
1810.063	130.938	1.300	132.238	38.00	12.93	2.60	134.84	.00	2.01	2.97	3.000	.000	.00	1 .0
16.639	.0100					.0228	.38	1.30	2.29	1.62	.013	.00	.00	PIPE
1826.701	131.104	1.254	132.358	38.00	13.56	2.86	135.21	.00	2.01	2.96	3.000	.000	.00	1 .0
15.092	.0100					.0260	.39	1.25	2.46	1.62	.013	.00	.00	PIPE
1841.793	131.254	1.210	132.464	38.00	14.23	3.14	135.61	.00	2.01	2.94	3.000	.000	.00	1 .0
13.863	.0100					.0296	.41	1.21	2.63	1.62	.013	.00	.00	PIPE
1855.656	131.393	1.168	132.561	38.00	14.92	3.46	136.02	.00	2.01	2.93	3.000	.000	.00	1 .0
12.814	.0100					.0338	.43	1.17	2.82	1.62	.013	.00	.00	PIPE
1868.470	131.520	1.127	132.648	38.00	15.65	3.80	136.45	.00	2.01	2.91	3.000	.000	.00	1 .0
11.980	.0100					.0385	.46	1.13	3.02	1.62	.013	.00	.00	PIPE
1880.450	131.640	1.088	132.728	38.00	16.41	4.18	136.91	.02	2.01	2.88	3.000	.000	.00	1 .0
84.590	.0410					.0410	3.47	1.11	3.23	1.09	.013	.00	.00	PIPE
1965.040	135.110	1.088	136.198	38.00	16.41	4.18	140.38	.00	2.01	2.88	3.000	.000	.00	1 .0
30.790	.0409					.0411	1.26	1.09	3.23	1.09	.013	.00	.00	PIPE
1995.830	136.370	1.088	137.458	38.00	16.42	4.19	141.65	.05	2.01	2.88	3.000	.000	.00	1 .0
12.268	.0411					.0411	.50	1.14	3.23	1.09	.013	.00	.00	PIPE

♀ FILE: Line_B_100-yr.WSW W S P G W - CIVILDESIGN Version 14.08
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WATER SURFACE PROFILE LISTING

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CSUCI Univ Glen EIR
100-year Storm
On-Site Drainage Line B

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2008.098	136.874	1.088	137.962	38.00	16.42	4.19	142.15	.05	2.01	2.88	3.000	.000	.00	1 .0
135.242	.0411					.0402	5.44	1.14	3.23	1.09	.013	.00	.00	PIPE
2143.340	142.430	1.101	143.531	38.00	16.17	4.06	147.59	.00	2.01	2.89	3.000	.000	.00	1 .0
38.770	.0410					.0387	1.50	1.10	3.16	1.09	.013	.00	.00	PIPE
2182.110	144.020	1.111	145.131	38.00	15.97	3.96	149.09	1.09	2.01	2.90	3.000	.000	.00	1 .0
32.650	.0410					.0371	1.21	2.20	3.11	1.09	.013	.00	.00	PIPE
2214.760	145.360	1.126	146.486	38.00	15.68	3.82	150.30	.00	2.01	2.91	3.000	.000	.00	1 .0
23.560	.0412					.0352	.83	1.13	3.03	1.09	.013	.00	.00	PIPE
2238.320	146.330	1.143	147.473	38.00	15.36	3.67	151.14	.48	2.01	2.91	3.000	.000	.00	1 .0
17.220	.0407					.0333	.57	1.63	2.94	1.09	.013	.00	.00	PIPE
2255.540	147.030	1.159	148.189	38.00	15.07	3.53	151.72	.10	2.01	2.92	3.000	.000	.00	1 .0
20.400	.0412					.0309	.63	1.26	2.86	1.09	.013	.00	.00	PIPE
2275.940	147.870	1.190	149.060	38.00	14.54	3.28	152.34	.09	2.01	2.94	3.000	.000	.00	1 .0
18.690	.0412					.0276	.52	1.28	2.72	1.09	.013	.00	.00	PIPE
2294.630	148.640	1.234	149.874	38.00	13.86	2.98	152.86	.00	2.01	2.95	3.000	.000	.00	1 .0
9.765	.0410					.0247	.24	1.23	2.54	1.09	.013	.00	.00	PIPE
2304.395	149.040	1.265	150.305	38.00	13.41	2.79	153.10	.00	2.01	2.96	3.000	.000	.00	1 .0
10.981	.0410					.0221	.24	1.27	2.42	1.09	.013	.00	.00	PIPE

♀ FILE: Line_B_100-yr.WSW

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WATER SURFACE PROFILE LISTING

Date:12-21-2016 Time:12:23:48

CSUCI Univ Glen EIR
100-year Storm
On-Site Drainage Line B

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch

Line_B_100-yr.OUT

2315.376	149.490	1.312	150.802	38.00	12.79	2.54	153.34	.00	2.01	2.98	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.492	.0410					.0194	.17	1.31	2.25	1.09	.013	.00	.00	PIPE	
2323.869	149.838	1.360	151.198	38.00	12.19	2.31	153.51	.00	2.01	2.99	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.651	.0410					.0171	.11	1.36	2.10	1.09	.013	.00	.00	PIPE	
2330.520	150.110	1.411	151.521	38.00	11.62	2.10	153.62	.00	2.01	2.99	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.311	.0410					.0150	.08	1.41	1.96	1.09	.013	.00	.00	PIPE	
2335.830	150.328	1.464	151.792	38.00	11.08	1.91	153.70	.00	2.01	3.00	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.233	.0410					.0132	.06	1.46	1.83	1.09	.013	.00	.00	PIPE	
2340.063	150.501	1.520	152.021	38.00	10.57	1.73	153.75	.00	2.01	3.00	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.365	.0410					.0117	.04	1.52	1.70	1.09	.013	.00	.00	PIPE	
2343.428	150.639	1.579	152.218	38.00	10.07	1.58	153.79	.00	2.01	3.00	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.682	.0410					.0103	.03	1.58	1.58	1.09	.013	.00	.00	PIPE	
2346.110	150.749	1.640	152.389	38.00	9.61	1.43	153.82	.00	2.01	2.99	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.046	.0410					.0091	.02	1.64	1.47	1.09	.013	.00	.00	PIPE	
2348.156	150.833	1.705	152.538	38.00	9.16	1.30	153.84	.00	2.01	2.97	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.530	.0410					.0080	.01	1.71	1.37	1.09	.013	.00	.00	PIPE	
2349.686	150.895	1.773	152.668	38.00	8.73	1.18	153.85	.00	2.01	2.95	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.023	.0410					.0071	.01	1.77	1.27	1.09	.013	.00	.00	PIPE	

♀ FILE: Line_B_100-yr.WSW

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WATER SURFACE PROFILE LISTING

Date:12-21-2016 Time:12:23:48

CSUCI Univ Glen EIR

100-year Storm

On-Site Drainage Line B

*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip	
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
2350.709	150.937	1.846	152.783	38.00	8.33	1.08	153.86	.00	2.01	2.92	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.602	.0410					.0063	.00	1.85	1.17	1.09	.013	.00	.00	PIPE	
2351.311	150.962	1.923	152.885	38.00	7.94	.98	153.86	.00	2.01	2.88	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
.199	.0410					.0056	.00	1.92	1.08	1.09	.013	.00	.00	PIPE	
2351.510	150.970	2.006	152.976	38.00	7.57	.89	153.86	.00	2.01	2.82	3.000	.000	.00	1	.0

Line_B_100-yr.OUT

0	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
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CSUCI Univ Glen EIR
10-year Storm
On-Site Drainage Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2000.000	125.530	1.836	127.366	29.00	7.51	.87	128.24	.04	1.84	2.21	2.500	.000	.00	1 .0
4.814	.0044					.0060	.03	1.88	1.00	2.26	.013	.00	.00	PIPE
2004.814	125.551	1.923	127.474	29.00	7.16	.80	128.27	.04	1.84	2.11	2.500	.000	.00	1 .0
24.224	.0044					.0054	.13	1.96	.91	2.26	.013	.00	.00	PIPE
2029.038	125.657	2.020	127.677	29.00	6.82	.72	128.40	.03	1.84	1.97	2.500	.000	.00	1 .0
41.652	.0044					.0050	.21	2.05	.82	2.26	.013	.00	.00	PIPE
2070.690	125.840	2.087	127.927	29.00	6.62	.68	128.61	.01	1.84	1.86	2.500	.000	.00	1 .0
119.200	.0044					.0047	.56	2.09	.76	2.22	.013	.00	.00	PIPE
2189.890	126.370	2.158	128.528	29.00	6.44	.64	129.17	.00	1.84	1.72	2.500	.000	.00	1 .0
26.800	.0041					.0046	.12	2.16	.70	2.50	.013	.00	.00	PIPE
2216.690	126.480	2.182	128.662	29.00	6.38	.63	129.29	.01	1.84	1.67	2.500	.000	.00	1 .0
70.050	.0044					.0045	.32	2.19	.68	2.24	.013	.00	.00	PIPE
2286.740	126.790	2.196	128.986	29.00	6.35	.63	129.61	.00	1.84	1.63	2.500	.000	.00	1 .0
35.340	.0045					.0045	.16	2.20	.67	2.19	.013	.00	.00	PIPE
2322.080	126.950	2.195	129.145	29.00	6.35	.63	129.77	.02	1.84	1.64	2.500	.000	.00	1 .0
38.760	.0044					.0045	.17	2.22	.67	2.26	.013	.00	.00	PIPE
2360.840	127.120	2.203	129.323	29.00	6.33	.62	129.95	.00	1.84	1.62	2.500	.000	.00	1 .0
35.340	.0042					.0045	.16	2.20	.66	2.50	.013	.00	.00	PIPE

CSUCI Univ Glen EIR
10-year Storm
On-Site Drainage Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip

Line_C_10-yr.OUT														
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2396.180	127.270	2.218	129.488	29.00	6.30	.62	130.10	.01	1.84	1.58	2.500	.000	.00	1 .0
25.691	.0071					.0046	.12	2.22	.65	1.75	.013	.00	.00	PIPE
2421.871	127.452	2.093	129.545	29.00	6.61	.68	130.22	.01	1.84	1.85	2.500	.000	.00	1 .0
18.756	.0071					.0051	.09	2.10	.76	1.75	.013	.00	.00	PIPE
2440.627	127.585	1.987	129.572	29.00	6.93	.75	130.32	.01	1.84	2.02	2.500	.000	.00	1 .0
9.679	.0071					.0056	.05	2.00	.85	1.75	.013	.00	.00	PIPE
2450.306	127.654	1.894	129.548	29.00	7.27	.82	130.37	.01	1.84	2.14	2.500	.000	.00	1 .0
HYDRAULIC JUMP														
2450.306	127.654	1.753	129.407	29.00	7.88	.97	130.37	.01	1.84	2.29	2.500	.000	.00	1 .0
25.938	.0071					.0071	.18	1.77	1.10	1.75	.013	.00	.00	PIPE
2476.244	127.838	1.753	129.591	29.00	7.88	.97	130.56	.01	1.84	2.29	2.500	.000	.00	1 .0
39.746	.0071					.0071	.28	1.77	1.10	1.75	.013	.00	.00	PIPE
2515.990	128.120	1.744	129.864	29.00	7.93	.98	130.84	.00	1.84	2.30	2.500	.000	.00	1 .0
16.590	.0072					.0072	.12	1.74	1.11	1.74	.013	.00	.00	PIPE
2532.580	128.240	1.748	129.988	29.00	7.91	.97	130.96	.06	1.84	2.29	2.500	.000	.00	1 .0
10.473	.0072					.0072	.07	1.80	1.10	1.75	.013	.00	.00	PIPE
2543.053	128.315	1.748	130.063	29.00	7.91	.97	131.03	.06	1.84	2.29	2.500	.000	.00	1 .0
37.027	.0072					.0071	.26	1.80	1.10	1.75	.013	.00	.00	PIPE

♀ FILE: Line_C_10-yr.WSW

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Program Package Serial Number: 1404

WATER SURFACE PROFILE LISTING

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CSUCI Univ Glen EIR

10-year Storm

On-Site Drainage Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2580.080	128.580	1.765	130.345	29.00	7.83	.95	131.30	.00	1.84	2.28	2.500	.000	.00	1 .0
27.300	.0070					.0070	.19	1.76	1.08	1.77	.013	.00	.00	PIPE
2607.380	128.770	1.754	130.524	29.00	7.88	.96	131.49	.02	1.84	2.29	2.500	.000	.00	1 .0
212.102	.0071					.0071	1.50	1.78	1.10	1.75	.013	.00	.00	PIPE

Line_C_10-yr.OUT

2819.482	130.273	1.754	132.027	29.00	7.88	.96	132.99	.02	1.84	2.29	2.500	.000	.00	1	.0
36.248	.0071					.0070	.25	1.78	1.10	1.75	.013	.00	.00	PIPE	
2855.730	130.530	1.765	132.295	29.00	7.83	.95	133.25	.02	1.84	2.28	2.500	.000	.00	1	.0
21.561	.0070					.0070	.15	1.79	1.08	1.76	.013	.00	.00	PIPE	
2877.291	130.680	1.765	132.445	29.00	7.83	.95	133.40	.02	1.84	2.28	2.500	.000	.00	1	.0
35.759	.0070					.0070	.25	1.79	1.08	1.76	.013	.00	.00	PIPE	
2913.050	130.930	1.753	132.683	29.00	7.89	.97	133.65	.00	1.84	2.29	2.500	.000	.00	1	.0
9.937	.0071					.0071	.07	1.75	1.10	1.75	.013	.00	.00	PIPE	
2922.987	131.001	1.753	132.753	29.00	7.89	.97	133.72	.00	1.84	2.29	2.500	.000	.00	1	.0
39.353	.0071					.0071	.28	1.75	1.10	1.75	.013	.00	.00	PIPE	
2962.340	131.280	1.746	133.026	29.00	7.92	.97	134.00	.30	1.84	2.29	2.500	.000	.00	1	.0
23.600	.0072					.0071	.17	2.04	1.10	1.74	.013	.00	.00	PIPE	
2985.940	131.450	1.755	133.205	29.00	7.88	.96	134.17	.00	1.84	2.29	2.500	.000	.00	1	.0
30.194	.0071					.0071	.21	1.76	1.09	1.76	.013	.00	.00	PIPE	

♀ FILE: Line_C_10-yr.WSW

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WATER SURFACE PROFILE LISTING

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CSUCI Univ Glen EIR

10-year Storm

On-Site Drainage Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3016.134	131.664	1.755	133.419	29.00	7.88	.96	134.38	.00	1.84	2.29	2.500	.000	.00	1 .0
40.486	.0071					.0072	.29	1.76	1.09	1.76	.013	.00	.00	PIPE
3056.620	131.950	1.738	133.688	29.00	7.96	.98	134.67	.01	1.84	2.30	2.500	.000	.00	1 .0
13.149	.0071					.0073	.10	1.74	1.12	1.76	.013	.00	.00	PIPE
3069.769	132.043	1.724	133.767	29.00	8.03	1.00	134.77	.01	1.84	2.31	2.500	.000	.00	1 .0
34.691	.0071					.0079	.27	1.73	1.13	1.76	.013	.00	.00	PIPE
3104.460	132.288	1.652	133.940	29.00	8.42	1.10	135.04	.01	1.84	2.37	2.500	.000	.00	1 .0
24.056	.0071					.0089	.21	1.66	1.23	1.76	.013	.00	.00	PIPE
3128.515	132.458	1.585	134.043	29.00	8.83	1.21	135.25	.01	1.84	2.41	2.500	.000	.00	1 .0

Line_C_10-yr.OUT

19.914	.0071					.0100	.20	1.59	1.33	1.76	.013	.00	.00	PIPE
3148.429	132.598	1.522	134.120	29.00	9.27	1.33	135.45	.01	1.84	2.44	2.500	.000	.00	1 .0
17.413	.0071					.0113	.20	1.53	1.44	1.76	.013	.00	.00	PIPE
3165.842	132.721	1.462	134.183	29.00	9.72	1.47	135.65	.01	1.84	2.46	2.500	.000	.00	1 .0
15.948	.0071					.0127	.20	1.47	1.56	1.76	.013	.00	.00	PIPE
3181.790	132.834	1.406	134.240	29.00	10.19	1.61	135.85	.01	1.84	2.48	2.500	.000	.00	1 .0
14.693	.0071					.0144	.21	1.41	1.68	1.76	.013	.00	.00	PIPE
3196.483	132.938	1.353	134.291	29.00	10.69	1.77	136.07	.01	1.84	2.49	2.500	.000	.00	1 .0
13.601	.0071					.0164	.22	1.36	1.81	1.76	.013	.00	.00	PIPE

♀ FILE: Line_C_10-yr.WSW

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WATER SURFACE PROFILE LISTING

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CSUCI Univ Glen EIR

10-year Storm

On-Site Drainage Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3210.083	133.034	1.302	134.336	29.00	11.21	1.95	136.29	.01	1.84	2.50	2.500	.000	.00	1 .0
12.804	.0071					.0186	.24	1.31	1.94	1.76	.013	.00	.00	PIPE
3222.887	133.124	1.254	134.378	29.00	11.76	2.15	136.53	.01	1.84	2.50	2.500	.000	.00	1 .0
12.042	.0071					.0211	.25	1.27	2.09	1.76	.013	.00	.00	PIPE
3234.930	133.209	1.208	134.417	29.00	12.33	2.36	136.78	.01	1.84	2.50	2.500	.000	.00	1 .0
11.386	.0071					.0239	.27	1.22	2.24	1.76	.013	.00	.00	PIPE
3246.316	133.290	1.164	134.454	29.00	12.93	2.60	137.05	.01	1.84	2.49	2.500	.000	.00	1 .0
10.850	.0071					.0272	.30	1.18	2.40	1.76	.013	.00	.00	PIPE
3257.166	133.366	1.123	134.489	29.00	13.57	2.86	137.35	.02	1.84	2.49	2.500	.000	.00	1 .0
10.274	.0071					.0310	.32	1.14	2.58	1.76	.013	.00	.00	PIPE
3267.440	133.439	1.083	134.522	29.00	14.23	3.14	137.67	.02	1.84	2.48	2.500	.000	.00	1 .0
9.765	.0071					.0353	.34	1.10	2.76	1.76	.013	.00	.00	PIPE
3277.205	133.508	1.044	134.552	29.00	14.92	3.46	138.01	.02	1.84	2.47	2.500	.000	.00	1 .0
9.335	.0071					.0401	.37	1.06	2.96	1.76	.013	.00	.00	PIPE

Line_C_10-yr.OUT

3286.540	133.574	1.007	134.581	29.00	15.65	3.80	138.38	.02	1.84	2.45	2.500	.000	.00	1	.0
8.931	.0071					.0457	.41	1.03	3.17	1.76	.013	.00	.00	PIPE	
3295.471	133.637	.972	134.609	29.00	16.42	4.18	138.79	.02	1.84	2.44	2.500	.000	.00	1	.0
8.531	.0071					.0521	.44	.99	3.40	1.76	.013	.00	.00	PIPE	

♀ FILE: Line_C_10-yr.WSW W S P G W - CIVILDESIGN Version 14.08
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 WATER SURFACE PROFILE LISTING
 Date:12-21-2016 Time:11:18:16
 CSUCI Univ Glen EIR
 10-year Storm
 On-Site Drainage Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3304.001	133.697	.938	134.635	29.00	17.22	4.60	139.24	.02	1.84	2.42	2.500	.000	.00	1 .0
8.176	.0071					.0594	.49	.96	3.64	1.76	.013	.00	.00	PIPE
3312.177	133.755	.906	134.661	29.00	18.06	5.06	139.72	.03	1.84	2.40	2.500	.000	.00	1 .0
7.823	.0071					.0678	.53	.93	3.89	1.76	.013	.00	.00	PIPE
3320.000	133.810	.875	134.685	29.00	18.94	5.57	140.25	.00	1.84	2.38	2.500	.000	.00	1 .0
38.080	.0733					.0718	2.73	.88	4.16	.87	.013	.00	.00	PIPE
3358.080	136.600	.878	137.478	29.00	18.85	5.51	142.99	.00	1.84	2.39	2.500	.000	.00	1 .0
13.160	.0729					.0711	.94	.88	4.14	.87	.013	.00	.00	PIPE
3371.240	137.560	.880	138.440	29.00	18.81	5.49	143.93	.23	1.84	2.39	2.500	.000	.00	1 .0
42.505	.0730					.0694	2.95	1.11	4.12	.87	.013	.00	.00	PIPE
3413.745	140.665	.889	141.554	29.00	18.51	5.32	146.88	.22	1.84	2.39	2.500	.000	.00	1 .0
48.255	.0730					.0637	3.07	1.11	4.03	.87	.013	.00	.00	PIPE
3462.000	144.190	.922	145.112	29.00	17.65	4.84	149.95	.00	1.84	2.41	2.500	.000	.00	1 .0
2.930	.0751					.0591	.17	.92	3.77	.87	.013	.00	.00	PIPE
3464.930	144.410	.925	145.335	29.00	17.56	4.79	150.12	.00	1.84	2.41	2.500	.000	.00	1 .0
19.237	.0730					.0557	1.07	.93	3.74	.87	.013	.00	.00	PIPE
3484.167	145.815	.952	146.767	29.00	16.89	4.43	151.19	.00	1.84	2.43	2.500	.000	.00	1 .0
15.616	.0730					.0494	.77	.95	3.54	.87	.013	.00	.00	PIPE

♀ FILE: Line_C_10-yr.WSW W S P G W - CIVILDESIGN Version 14.08
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Line_C_10-yr.OUT
WATER SURFACE PROFILE LISTING

Date:12-21-2016 Time:11:18:16

CSUCI Univ Glen EIR
10-year Storm
On-Site Drainage Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3499.783	146.955	.986	147.941	29.00	16.10	4.03	151.97	.00	1.84	2.44	2.500	.000	.00	1 .0
11.124	.0730					.0434	.48	.99	3.30	.87	.013	.00	.00	PIPE
3510.907	147.768	1.022	148.790	29.00	15.35	3.66	152.45	.00	1.84	2.46	2.500	.000	.00	1 .0
8.432	.0730					.0381	.32	1.02	3.09	.87	.013	.00	.00	PIPE
3519.340	148.383	1.060	149.443	29.00	14.64	3.33	152.77	.00	1.84	2.47	2.500	.000	.00	1 .0
6.657	.0730					.0335	.22	1.06	2.88	.87	.013	.00	.00	PIPE
3525.996	148.869	1.099	149.969	29.00	13.96	3.02	152.99	.00	1.84	2.48	2.500	.000	.00	1 .0
5.384	.0730					.0294	.16	1.10	2.69	.87	.013	.00	.00	PIPE
3531.380	149.263	1.139	150.402	29.00	13.31	2.75	153.15	.00	1.84	2.49	2.500	.000	.00	1 .0
4.385	.0730					.0258	.11	1.14	2.51	.87	.013	.00	.00	PIPE
3535.765	149.583	1.182	150.765	29.00	12.69	2.50	153.26	.00	1.84	2.50	2.500	.000	.00	1 .0
3.623	.0730					.0227	.08	1.18	2.34	.87	.013	.00	.00	PIPE
3539.387	149.847	1.227	151.074	29.00	12.10	2.27	153.35	.00	1.84	2.50	2.500	.000	.00	1 .0
3.010	.0730					.0200	.06	1.23	2.18	.87	.013	.00	.00	PIPE
3542.397	150.067	1.274	151.341	29.00	11.53	2.07	153.41	.00	1.84	2.50	2.500	.000	.00	1 .0
2.505	.0730					.0176	.04	1.27	2.03	.87	.013	.00	.00	PIPE
3544.903	150.250	1.323	151.573	29.00	11.00	1.88	153.45	.00	1.84	2.50	2.500	.000	.00	1 .0
2.083	.0730					.0155	.03	1.32	1.89	.87	.013	.00	.00	PIPE

♀ FILE: Line_C_10-yr.WSW

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WATER SURFACE PROFILE LISTING

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CSUCI Univ Glen EIR
10-year Storm
On-Site Drainage Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch

Line_C_10-yr.OUT														
3546.985	150.402	1.374	151.776	29.00	10.48	1.71	153.48	.00	1.84	2.49	2.500	.000	.00	1 .0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
1.689	.0730					.0137	.02	1.37	1.75	.87	.013	.00	.00	PIPE
3548.674	150.526	1.429	151.955	29.00	10.00	1.55	153.51	.00	1.84	2.47	2.500	.000	.00	1 .0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
1.381	.0730					.0121	.02	1.43	1.63	.87	.013	.00	.00	PIPE
3550.055	150.626	1.486	152.112	29.00	9.53	1.41	153.52	.00	1.84	2.46	2.500	.000	.00	1 .0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
1.079	.0730					.0107	.01	1.49	1.51	.87	.013	.00	.00	PIPE
3551.134	150.705	1.547	152.252	29.00	9.09	1.28	153.53	.00	1.84	2.43	2.500	.000	.00	1 .0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
.812	.0730					.0095	.01	1.55	1.40	.87	.013	.00	.00	PIPE
3551.947	150.765	1.612	152.377	29.00	8.67	1.17	153.54	.00	1.84	2.39	2.500	.000	.00	1 .0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
.588	.0730					.0084	.00	1.61	1.29	.87	.013	.00	.00	PIPE
3552.535	150.807	1.680	152.488	29.00	8.26	1.06	153.55	.00	1.84	2.35	2.500	.000	.00	1 .0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
.341	.0730					.0075	.00	1.68	1.19	.87	.013	.00	.00	PIPE
3552.876	150.832	1.754	152.587	29.00	7.88	.96	153.55	.00	1.84	2.29	2.500	.000	.00	1 .0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

Line_C_10-yr.WSW

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T1	CSUCI Univ Glen EIR								
T2	10-year Storm								
T3	On-Site Drainage Line C								
SO	2000.000 125.530 1				122.293				
R	2070.690 125.840 1	.013				90.000	.000	0	
R	2189.890 126.370 1	.013				-34.120	.000	0	
R	2216.690 126.480 1	.013				.000	.000	0	
R	2286.740 126.790 1	.013				45.000	.000	0	
R	2322.080 126.950 1	.013				.000	.000	0	
R	2360.840 127.120 1	.013				-45.000	.000	0	
R	2396.180 127.270 1	.013				.000	.000	0	
R	2515.990 128.120 1	.013				-21.117	.000	0	
R	2532.580 128.240 1	.013				.000	.000	0	
R	2580.080 128.580 1	.013				-34.764	.000	0	
R	2607.380 128.770 1	.013				.000	.000	0	
R	2855.730 130.530 1	.013				-72.989	.000	0	
R	2913.050 130.930 1	.013				-17.011	.000	0	
R	2962.340 131.280 1	.013				.000	.000	0	
R	2985.940 131.450 1	.013				90.000	.000	0	
R	3056.620 131.950 1	.013				.000	.000	0	
R	3320.000 133.810 1	.013				-16.744	.000	0	
R	3358.080 136.600 1	.013				.000	.000	0	
R	3371.240 137.560 1	.013				.000	.000	0	
R	3462.000 144.190 1	.013				-45.000	.000	0	
R	3464.930 144.410 1	.013				.000	.000	0	
R	3552.980 150.840 1	.013				.000	.000	0	
SH	3552.980 150.840 1				150.840				
CD	1 4 1 .000	2.500	.000	.000	.000	.00			
Q	29.000 .0								

CSUCI Univ Glen EIR
100-year Storm
On-Site Drainage Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2000.000	125.530	2.366	127.896	53.00	8.86	1.22	129.12	.07	2.37	2.45	3.000	.000	.00	1 .0
5.801	.0044					.0065	.04	2.43	1.00	3.00	.013	.00	.00	PIPE
2005.801	125.555	2.489	128.045	53.00	8.45	1.11	129.15	.06	2.37	2.26	3.000	.000	.00	1 .0
28.536	.0044					.0059	.17	2.54	.89	3.00	.013	.00	.00	PIPE
2034.337	125.681	2.634	128.315	53.00	8.06	1.01	129.32	.04	2.37	1.96	3.000	.000	.00	1 .0
36.353	.0044					.0056	.20	2.68	.78	3.00	.013	.00	.00	PIPE
2070.690	125.840	2.731	128.571	53.00	7.84	.96	129.53	.01	2.37	1.71	3.000	.000	.00	1 .0
119.200	.0044					.0056	.67	2.74	.70	3.00	.013	.00	.00	PIPE
2189.890	126.370	2.943	129.313	53.00	7.53	.88	130.19	.00	2.37	.82	3.000	.000	.00	1 .0
26.800	.0041					.0057	.15	2.94	.45	3.00	.013	.00	.00	PIPE
2216.690	126.480	2.943	129.423	53.00	7.53	.88	130.30	.01	2.37	.82	3.000	.000	.00	1 .0
35.168	.0044					.0058	.21	2.95	.45	3.00	.013	.00	.00	PIPE
2251.858	126.636	3.000	129.636	53.00	7.50	.87	130.51	3.00	2.37	.00	3.000	.000	.00	1 .0
34.882	.0044					.0062	.21	3.00	.00	3.00	.013	.00	.00	PIPE
2286.740	126.790	3.153	129.943	53.00	7.50	.87	130.82	.00	2.37	.00	3.000	.000	.00	1 .0
35.340	.0045					.0063	.22	3.15	.00	3.00	.013	.00	.00	PIPE
2322.080	126.950	3.216	130.166	53.00	7.50	.87	131.04	.00	2.37	.00	3.000	.000	.00	1 .0
38.760	.0044					.0063	.24	.00	.00	3.00	.013	.00	.00	PIPE

CSUCI Univ Glen EIR
100-year Storm
On-Site Drainage Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip

Line_C_100-yr.OUT

L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type	Ch
2360.840	127.120	3.414	130.534	53.00	7.50	.87	131.41	.00	2.37	.00	3.000	.000	.00	1	.0
35.340	.0042					.0063	.22	3.41	.00	3.00	.013	.00	.00	PIPE	
2396.180	127.270	3.487	130.757	53.00	7.50	.87	131.63	.00	2.37	.00	3.000	.000	.00	1	.0
119.810	.0071					.0063	.76	.00	.00	2.32	.013	.00	.00	PIPE	
2515.990	128.120	3.479	131.599	53.00	7.50	.87	132.47	.00	2.37	.00	3.000	.000	.00	1	.0
16.590	.0072					.0063	.10	3.48	.00	2.30	.013	.00	.00	PIPE	
2532.580	128.240	3.463	131.703	53.00	7.50	.87	132.58	.00	2.37	.00	3.000	.000	.00	1	.0
47.500	.0072					.0063	.30	.00	.00	2.31	.013	.00	.00	PIPE	
2580.080	128.580	3.532	132.112	53.00	7.50	.87	132.98	.00	2.37	.00	3.000	.000	.00	1	.0
27.300	.0070					.0063	.17	3.53	.00	2.34	.013	.00	.00	PIPE	
2607.380	128.770	3.514	132.284	53.00	7.50	.87	133.16	.00	2.37	.00	3.000	.000	.00	1	.0
248.350	.0071					.0063	1.57	.00	.00	2.32	.013	.00	.00	PIPE	
2855.730	130.530	3.480	134.010	53.00	7.50	.87	134.88	.00	2.37	.00	3.000	.000	.00	1	.0
57.320	.0070					.0063	.36	.00	.00	2.34	.013	.00	.00	PIPE	
2913.050	130.930	3.517	134.447	53.00	7.50	.87	135.32	.00	2.37	.00	3.000	.000	.00	1	.0
49.290	.0071					.0063	.31	3.52	.00	2.32	.013	.00	.00	PIPE	
2962.340	131.280	3.479	134.759	53.00	7.50	.87	135.63	.00	2.37	.00	3.000	.000	.00	1	.0
23.600	.0072					.0063	.15	.00	.00	2.30	.013	.00	.00	PIPE	

♀ FILE: Line_C_100-yr.WSW

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CSUCI Univ Glen EIR

100-year Storm

On-Site Drainage Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2985.940	131.450	3.632	135.082	53.00	7.50	.87	135.96	.00	2.37	.00	3.000	.000	.00	1 .0
70.680	.0071					.0063	.45	3.63	.00	2.32	.013	.00	.00	PIPE
3056.620	131.950	3.578	135.528	53.00	7.50	.87	136.40	.00	2.37	.00	3.000	.000	.00	1 .0
156.556	.0071					.0063	.99	.00	.00	2.32	.013	.00	.00	PIPE

Line_C_100-yr.OUT

3213.176	133.056	3.506	136.561	53.00	7.50	.87	137.43	.00	2.37	.00	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HYDRAULIC JUMP															
3213.176	133.056	1.523	134.579	53.00	14.71	3.36	137.94	.02	2.37	3.00	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.385	.0071					.0244	.13	1.55	2.36	2.32	.013	.00	.00	PIPE	
3218.561	133.094	1.505	134.599	53.00	14.92	3.46	138.06	.02	2.37	3.00	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.878	.0071					.0266	.40	1.53	2.42	2.32	.013	.00	.00	PIPE	
3233.439	133.199	1.450	134.649	53.00	15.65	3.80	138.45	.03	2.37	3.00	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.168	.0071					.0302	.43	1.48	2.59	2.32	.013	.00	.00	PIPE	
3247.607	133.299	1.398	134.697	53.00	16.41	4.18	138.88	.03	2.37	2.99	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.450	.0071					.0344	.46	1.43	2.78	2.32	.013	.00	.00	PIPE	
3261.057	133.394	1.347	134.741	53.00	17.21	4.60	139.34	.03	2.37	2.98	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.866	.0071					.0391	.50	1.38	2.99	2.32	.013	.00	.00	PIPE	
3273.923	133.485	1.299	134.784	53.00	18.05	5.06	139.84	.03	2.37	2.97	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.291	.0071					.0445	.55	1.33	3.20	2.32	.013	.00	.00	PIPE	

♀ FILE: Line_C_100-yr.WSW

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CSUCI Univ Glen EIR

100-year Storm

On-Site Drainage Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip	
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	

3286.214	133.571	1.253	134.824	53.00	18.94	5.57	140.39	.04	2.37	2.96	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.756	.0071					.0507	.60	1.29	3.43	2.32	.013	.00	.00	PIPE	
3297.969	133.654	1.209	134.864	53.00	19.86	6.12	140.99	.04	2.37	2.94	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.254	.0071					.0577	.65	1.25	3.68	2.32	.013	.00	.00	PIPE	
3309.224	133.734	1.167	134.901	53.00	20.83	6.74	141.64	.04	2.37	2.93	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.776	.0071					.0658	.71	1.21	3.94	2.32	.013	.00	.00	PIPE	
3320.000	133.810	1.127	134.937	53.00	21.85	7.41	142.35	.00	2.37	2.91	3.000	.000	.00	1	.0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38.080	.0733					.0691	2.63	1.13	4.21	1.11	.013	.00	.00	PIPE	
3358.080	136.600	1.136	137.736	53.00	21.60	7.24	144.98	.00	2.37	2.91	3.000	.000	.00	1	.0

Line_C_100-yr.OUT

13.160	.0729					.0675	.89	1.14	4.14	1.11	.013	.00	.00	PIPE
3371.240	137.560	1.141	138.701	53.00	21.49	7.17	145.87	.36	2.37	2.91	3.000	.000	.00	1 .0
59.406	.0730					.0630	3.74	1.50	4.11	1.11	.013	.00	.00	PIPE
3430.646	141.900	1.180	143.080	53.00	20.52	6.54	149.62	.33	2.37	2.93	3.000	.000	.00	1 .0
31.354	.0730					.0555	1.74	1.51	3.85	1.11	.013	.00	.00	PIPE
3462.000	144.190	1.223	145.413	53.00	19.57	5.95	151.36	.00	2.37	2.95	3.000	.000	.00	1 .0
2.930	.0751					.0514	.15	1.22	3.60	1.11	.013	.00	.00	PIPE
3464.930	144.410	1.229	145.639	53.00	19.45	5.87	151.51	.00	2.37	2.95	3.000	.000	.00	1 .0
10.140	.0730					.0494	.50	1.23	3.57	1.11	.013	.00	.00	PIPE

♀ FILE: Line_C_100-yr.WSW

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WATER SURFACE PROFILE LISTING

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CSUCI Univ Glen EIR
100-year Storm

On-Site Drainage Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3475.069	145.150	1.250	146.401	53.00	19.01	5.61	152.01	.00	2.37	2.96	3.000	.000	.00	1 .0
16.543	.0730					.0450	.74	1.25	3.45	1.11	.013	.00	.00	PIPE
3491.612	146.359	1.296	147.655	53.00	18.12	5.10	152.75	.00	2.37	2.97	3.000	.000	.00	1 .0
12.403	.0730					.0395	.49	1.30	3.22	1.11	.013	.00	.00	PIPE
3504.015	147.264	1.344	148.608	53.00	17.28	4.64	153.24	.00	2.37	2.98	3.000	.000	.00	1 .0
9.701	.0730					.0347	.34	1.34	3.00	1.11	.013	.00	.00	PIPE
3513.716	147.973	1.394	149.367	53.00	16.47	4.21	153.58	.00	2.37	2.99	3.000	.000	.00	1 .0
7.795	.0730					.0305	.24	1.39	2.80	1.11	.013	.00	.00	PIPE
3521.511	148.542	1.446	149.988	53.00	15.71	3.83	153.82	.00	2.37	3.00	3.000	.000	.00	1 .0
6.356	.0730					.0269	.17	1.45	2.61	1.11	.013	.00	.00	PIPE
3527.867	149.006	1.501	150.507	53.00	14.98	3.48	153.99	.00	2.37	3.00	3.000	.000	.00	1 .0
5.241	.0730					.0237	.12	1.50	2.43	1.11	.013	.00	.00	PIPE
3533.108	149.389	1.559	150.948	53.00	14.28	3.17	154.11	.00	2.37	3.00	3.000	.000	.00	1 .0
4.368	.0730					.0209	.09	1.56	2.26	1.11	.013	.00	.00	PIPE

Line_C_100-yr.OUT

3537.476	149.708	1.619	151.327	53.00	13.62	2.88	154.21	.00	2.37	2.99	3.000	.000	.00	1	.0
3.619	.0730					.0184	.07	1.62	2.10	1.11	.013	.00	.00	PIPE	
3541.096	149.972	1.683	151.655	53.00	12.98	2.62	154.27	.00	2.37	2.98	3.000	.000	.00	1	.0
3.010	.0730					.0163	.05	1.68	1.95	1.11	.013	.00	.00	PIPE	

♀ FILE: Line_C_100-yr.WSW W S P G W - CIVILDESIGN Version 14.08
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 WATER SURFACE PROFILE LISTING
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 CSUCI Univ Glen EIR
 100-year Storm
 On-Site Drainage Line C

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3544.106	150.192	1.750	151.942	53.00	12.38	2.38	154.32	.00	2.37	2.96	3.000	.000	.00	1 .0
2.477	.0730					.0144	.04	1.75	1.81	1.11	.013	.00	.00	PIPE
3546.583	150.373	1.821	152.194	53.00	11.80	2.16	154.36	.00	2.37	2.93	3.000	.000	.00	1 .0
2.017	.0730					.0127	.03	1.82	1.68	1.11	.013	.00	.00	PIPE
3548.600	150.520	1.896	152.416	53.00	11.25	1.97	154.38	.00	2.37	2.89	3.000	.000	.00	1 .0
1.599	.0730					.0113	.02	1.90	1.55	1.11	.013	.00	.00	PIPE
3550.199	150.637	1.976	152.613	53.00	10.73	1.79	154.40	.00	2.37	2.84	3.000	.000	.00	1 .0
1.214	.0730					.0100	.01	1.98	1.43	1.11	.013	.00	.00	PIPE
3551.414	150.726	2.062	152.788	53.00	10.23	1.62	154.41	.00	2.37	2.78	3.000	.000	.00	1 .0
.869	.0730					.0089	.01	2.06	1.32	1.11	.013	.00	.00	PIPE
3552.283	150.789	2.154	152.943	53.00	9.75	1.48	154.42	.00	2.37	2.70	3.000	.000	.00	1 .0
.527	.0730					.0080	.00	2.15	1.21	1.11	.013	.00	.00	PIPE
3552.810	150.828	2.254	153.082	53.00	9.30	1.34	154.42	.00	2.37	2.59	3.000	.000	.00	1 .0
.170	.0730					.0072	.00	2.25	1.11	1.11	.013	.00	.00	PIPE
3552.980														

Line_C_100-yr.WSW

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T1	CSUCI Univ Glen EIR								
T2	100-year Storm								
T3	On-Site Drainage Line C								
SO	2000.000 125.530 1				122.755				
R	2070.690 125.840 1	.013				90.000	.000	0	
R	2189.890 126.370 1	.013				-34.120	.000	0	
R	2216.690 126.480 1	.013				.000	.000	0	
R	2286.740 126.790 1	.013				45.000	.000	0	
R	2322.080 126.950 1	.013				.000	.000	0	
R	2360.840 127.120 1	.013				-45.000	.000	0	
R	2396.180 127.270 1	.013				.000	.000	0	
R	2515.990 128.120 1	.013				-21.117	.000	0	
R	2532.580 128.240 1	.013				.000	.000	0	
R	2580.080 128.580 1	.013				-34.764	.000	0	
R	2607.380 128.770 1	.013				.000	.000	0	
R	2855.730 130.530 1	.013				-72.989	.000	0	
R	2913.050 130.930 1	.013				-17.011	.000	0	
R	2962.340 131.280 1	.013				.000	.000	0	
R	2985.940 131.450 1	.013				90.000	.000	0	
R	3056.620 131.950 1	.013				.000	.000	0	
R	3320.000 133.810 1	.013				-16.744	.000	0	
R	3358.080 136.600 1	.013				.000	.000	0	
R	3371.240 137.560 1	.013				.000	.000	0	
R	3462.000 144.190 1	.013				-45.000	.000	0	
R	3464.930 144.410 1	.013				.000	.000	0	
R	3552.980 150.840 1	.013				.000	.000	0	
SH	3552.980 150.840 1				150.840				
CD	1 4 1	.000	3.000	.000	.000	.000	.00		
CD	2 4 1	.000	2.500	.000	.000	.000	.00		
Q		53.000	.0						

CSUCI Univ Glen EIR

10-year Storm

On-Site Drainage Line D

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3000.000	130.300	.645	130.945	2.88	3.97	.24	131.19	.00	.64	1.49	1.500	.000	.00	1 .0
1.691	.0040					.0048	.01	.64	1.00	.69	.013	.00	.00	PIPE
3001.691	130.307	.668	130.975	2.88	3.78	.22	131.20	.00	.64	1.49	1.500	.000	.00	1 .0
19.399	.0040					.0042	.08	.67	.93	.69	.013	.00	.00	PIPE
3021.089	130.384	.691	131.075	2.88	3.62	.20	131.28	.00	.64	1.50	1.500	.000	.00	1 .0
14.011	.0040					.0039	.06	.69	.88	.69	.013	.00	.00	PIPE
3035.100	130.440	.691	131.131	2.88	3.62	.20	131.33	.00	.64	1.50	1.500	.000	.00	1 .0
1.836	.0040					.0040	.01	.69	.88	.69	.013	.00	.00	PIPE
3036.936	130.447	.691	131.138	2.88	3.62	.20	131.34	.00	.64	1.50	1.500	.000	.00	1 .0
98.344	.0040					.0039	.39	.69	.88	.69	.013	.00	.00	PIPE
3135.280	130.840	.691	131.531	2.88	3.62	.20	131.73	.00	.64	1.50	1.500	.000	.00	1 .0
3.353	.0040					.0040	.01	.69	.88	.69	.013	.00	.00	PIPE
3138.633	130.853	.690	131.544	2.88	3.63	.20	131.75	.00	.64	1.50	1.500	.000	.00	1 .0
276.577	.0040					.0040	1.09	.69	.88	.69	.013	.00	.00	PIPE
3415.210	131.960	.690	132.650	2.88	3.63	.20	132.85	.00	.64	1.50	1.500	.000	.00	1 .0

Line_D_10-yr.WSW 0

T1	CSUCI Univ Glen EIR									
T2	10-year Storm									
T3	On-Site Drainage Line D									
SO	3000.000	130.300	1					130.300		
R	3035.100	130.440	1		.013				.000	28.246 0
R	3135.280	130.840	1		.013				-50.868	.000 0
R	3415.210	131.960	1		.013				.000	.000 0
SH	3415.210	131.960	1					131.960		
CD	1 4 1	.000	1.500		.000	.000	.000	.00		
Q		2.880	.0							

CSUCI Univ Glen EIR

100-year Storm

On-Site Drainage Line D

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3000.000	130.300	.824	131.124	4.61	4.63	.33	131.46	.00	.82	1.49	1.500	.000	.00	1 .0
1.823	.0040					.0053	.01	.82	1.00	.92	.013	.00	.00	PIPE
3001.823	130.307	.857	131.164	4.61	4.42	.30	131.47	.00	.82	1.48	1.500	.000	.00	1 .0
9.319	.0040					.0047	.04	.86	.93	.92	.013	.00	.00	PIPE
3011.141	130.344	.891	131.236	4.61	4.21	.28	131.51	.00	.82	1.47	1.500	.000	.00	1 .0
23.959	.0040					.0042	.10	.89	.86	.92	.013	.00	.00	PIPE
3035.100	130.440	.913	131.353	4.61	4.10	.26	131.61	.00	.82	1.46	1.500	.000	.00	1 .0
85.837	.0040					.0040	.35	.92	.82	.92	.013	.00	.00	PIPE
3120.938	130.783	.920	131.703	4.61	4.06	.26	131.96	.00	.82	1.46	1.500	.000	.00	1 .0
14.343	.0040					.0040	.06	.92	.81	.92	.013	.00	.00	PIPE
3135.280	130.840	.920	131.760	4.61	4.06	.26	132.02	.00	.82	1.46	1.500	.000	.00	1 .0
9.816	.0040					.0040	.04	.92	.81	.92	.013	.00	.00	PIPE
3145.096	130.879	.919	131.799	4.61	4.06	.26	132.05	.00	.82	1.46	1.500	.000	.00	1 .0
270.114	.0040													

										Line_D_100-yr.WSW	
T1	CSUCI Univ Glen EIR									0	
T2	100-year Storm										
T3	On-Site Drainage Line D										
SO	3000.000	130.300	1					130.300			
R	3035.100	130.440	1	.013				.000	28.246	0	
R	3135.280	130.840	1	.013				-50.868	.000	0	
R	3415.210	131.960	1	.013				.000	.000	0	
SH	3415.210	131.960	1								
CD	1	4	1	.000	1.500	.000	.000	.000	131.960		
Q				4.610	.0				.00		

Attachment D-4
WSPG Model Results – Bypass Storm Drain Infrastructure

CSUCI Univ Glen EIR
 100-year Burned and Bulk Storm
 Off-Site Drainage Line A

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1002.880	125.000	3.821	128.821	408.00	21.48	7.16	135.98	1.90	5.37	5.77	6.000	.000	.00	1 .0
13.950	.0043					.0176	.25	5.72	2.09	6.00	.013	.00	.00	PIPE
1016.830	125.060	3.767	128.827	408.00	21.83	7.40	136.23	.00	5.37	5.80	6.000	.000	.00	1 .0
28.850	.0038					.0188	.54	3.77	2.14	6.00	.013	.00	.00	PIPE
1045.680	125.170	3.655	128.825	408.00	22.62	7.94	136.77	.87	5.37	5.86	6.000	.000	.00	1 .0
16.510	.0042					.0201	.33	4.53	2.27	6.00	.013	.00	.00	PIPE
1062.190	125.240	3.595	128.835	408.00	23.07	8.27	137.10	.00	5.37	5.88	6.000	.000	.00	1 .0
13.940	.0036					.0211	.29	3.59	2.35	6.00	.013	.00	.00	PIPE
1076.130	125.290	3.542	128.832	408.00	23.49	8.57	137.40	1.06	5.37	5.90	6.000	.000	.00	1 .0
20.352	.0040					.0223	.45	4.60	2.41	6.00	.013	.00	.00	PIPE
1096.482	125.371	3.468	128.839	408.00	24.09	9.01	137.85	1.12	5.37	5.93	6.000	.000	.00	1 .0
37.298	.0040					.0246	.92	4.58	2.51	6.00	.013	.00	.00	PIPE
1133.780	125.520	3.336	128.856	408.00	25.27	9.91	138.77	.00	5.37	5.96	6.000	.000	.00	1 .0
260.020	.0261					.0261	6.79	3.34	2.71	3.34	.013	.00	.00	PIPE
1393.800	132.310	3.336	135.646	408.00	25.27	9.91	145.56	.00	5.37	5.96	6.000	.000	.00	1 .0
186.230	.0261					.0262	4.87	3.34	2.71	3.34	.013	.00	.00	PIPE
1580.030	137.170	3.334	140.504	408.00	25.28	9.93	150.43	6.00	5.37	5.96	6.000	.000	.00	1 .0
49.900	.0261					.0262	1.31	6.00	2.71	3.34	.013	.00	.00	PIPE

CSUCI Univ Glen EIR
 100-year Burned and Bulk Storm
 Off-Site Drainage Line A

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip

Line_A_100B-yr.OUT															
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type	Ch
1629.930	138.470	3.333	141.803	408.00	25.30	9.94	151.74	.00	5.37	5.96	6.000	.000	.00	1	.0
35.730	.0260					.0262	.94	3.33	2.71	3.34	.013	.00	.00	PIPE	
1665.660	139.400	3.331	142.731	408.00	25.31	9.95	152.68	.00	5.37	5.96	6.000	.000	.00	1	.0
59.580	.0262					.0263	1.56	3.33	2.71	3.33	.013	.00	.00	PIPE	
1725.240	140.960	3.330	144.290	408.00	25.32	9.96	154.25	.00	5.37	5.96	6.000	.000	.00	1	.0
50.940	.0261					.0263	1.34	3.33	2.71	3.34	.013	.00	.00	PIPE	
1776.180	142.290	3.328	145.618	408.00	25.34	9.97	155.59	.00	5.37	5.96	6.000	.000	.00	1	.0
38.930	.0259					.0264	1.03	3.33	2.72	3.34	.013	.00	.00	PIPE	
1815.110	143.300	3.326	146.626	408.00	25.36	9.99	156.61	.30	5.37	5.96	6.000	.000	.00	1	.0
261.900	.0261					.0267	6.99	3.63	2.72	3.34	.013	.00	.00	PIPE	
2077.010	150.140	3.302	153.442	408.00	25.59	10.17	163.61	.00	5.37	5.97	6.000	.000	.00	1	.0
29.860	.0261					.0271	.81	3.30	2.76	3.34	.013	.00	.00	PIPE	
2106.870	150.920	3.297	154.217	408.00	25.63	10.20	164.42	.00	5.37	5.97	6.000	.000	.00	1	.0
49.070	.0261					.0273	1.34	3.30	2.77	3.34	.013	.00	.00	PIPE	
2155.940	152.200	3.288	155.488	408.00	25.72	10.27	165.76	.00	5.37	5.97	6.000	.000	.00	1	.0
12.004	.0876					.0259	.31	3.29	2.78	2.36	.013	.00	.00	PIPE	
2167.945	153.252	3.407	156.659	408.00	24.62	9.41	166.07	.00	5.37	5.94	6.000	.000	.00	1	.0
11.139	.0876					.0230	.26	3.41	2.60	2.36	.013	.00	.00	PIPE	

♀ FILE: Line_A_100B-yr.WSW

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WATER SURFACE PROFILE LISTING

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CSUCI Univ Glen EIR
100-year Burned and Bulk Storm
Off-Site Drainage Line A

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2179.084	154.227	3.543	157.770	408.00	23.47	8.56	166.33	.00	5.37	5.90	6.000	.000	.00	1 .0
9.409	.0876					.0203	.19	3.54	2.41	2.36	.013	.00	.00	PIPE
2188.493	155.052	3.688	158.740	408.00	22.38	7.78	166.52	.00	5.37	5.84	6.000	.000	.00	1 .0
7.964	.0876					.0180	.14	3.69	2.23	2.36	.013	.00	.00	PIPE

Line_A_100B-yr.OUT

2196.457	155.749	3.841	159.590	408.00	21.34	7.07	166.66	.00	5.37	5.76	6.000	.000	.00	1	.0
6.687	.0876					.0160	.11	3.84	2.06	2.36	.013	.00	.00	PIPE	
2203.144	156.335	4.005	160.340	408.00	20.35	6.43	166.77	.00	5.37	5.65	6.000	.000	.00	1	.0
5.580	.0876					.0142	.08	4.01	1.90	2.36	.013	.00	.00	PIPE	
2208.723	156.824	4.180	161.004	408.00	19.40	5.84	166.85	.00	5.37	5.52	6.000	.000	.00	1	.0
4.569	.0876					.0127	.06	4.18	1.75	2.36	.013	.00	.00	PIPE	
2213.292	157.224	4.369	161.593	408.00	18.50	5.31	166.91	.00	5.37	5.34	6.000	.000	.00	1	.0
3.633	.0876					.0114	.04	4.37	1.60	2.36	.013	.00	.00	PIPE	
2216.925	157.542	4.575	162.117	408.00	17.64	4.83	166.95	.00	5.37	5.11	6.000	.000	.00	1	.0
2.728	.0876					.0102	.03	4.58	1.46	2.36	.013	.00	.00	PIPE	
2219.653	157.781	4.803	162.584	408.00	16.82	4.39	166.97	.00	5.37	4.80	6.000	.000	.00	1	.0
1.802	.0876					.0093	.02	4.80	1.32	2.36	.013	.00	.00	PIPE	
2221.455	157.939	5.061	163.000	408.00	16.03	3.99	166.99	.00	5.37	4.36	6.000	.000	.00	1	.0
.695	.0876					.0085	.01	5.06	1.17	2.36	.013	.00	.00	PIPE	

♀ FILE: Line_A_100B-yr.WSW

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WATER SURFACE PROFILE LISTING

Date:12-20-2016 Time:11:17: 1

CSUCI Univ Glen EIR
100-year Burned and Bulk Storm
Off-Site Drainage Line A

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****

Line_A_100B-yr.WSW

0

T1	CSUCI Univ Glen EIR								
T2	100-year Burned and Bulk Storm								
T3	Off-Site Drainage Line A								
SO	1002.880 125.000 1					128.390			
R	1016.830 125.060 1			.013			36.735	.000	0
R	1045.680 125.170 1			.013			.000	.000	0
R	1062.190 125.240 1			.013			17.747	.000	0
R	1076.130 125.290 1			.013			.000	.000	0
R	1133.780 125.520 1			.013			-68.960	.000	0
R	1393.800 132.310 1			.013			.000	-3.237	0
R	1580.030 137.170 1			.013			.000	17.667	0
R	1629.930 138.470 1			.013			90.995	.000	0
R	1665.660 139.400 1			.013			.000	.000	0
R	1725.240 140.960 1			.013			.000	24.240	0
R	1776.180 142.290 1			.013			.000	-15.837	0
R	1815.110 143.300 1			.013			.000	-9.344	0
R	2077.010 150.140 1			.013			-38.024	.000	0
R	2106.870 150.920 1			.013			.000	.000	0
R	2155.940 152.200 1			.013			.000	.000	0
R	2222.150 158.000 1			.013			.000	.000	0
SH	2222.150 158.000 1								
CD	1 4 1 .000	6.000	.000	.000	.000	158.000	.00		
Q		408.000	.0						

CSUCI Univ Glen EIR
 100-year Burned and Bulk Storm
 Off-Site Drainage Line E

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1094.580	63.500	3.713	67.213	653.00	28.60	12.70	79.91	.00	6.48	7.98	8.000	.000	.00	1 .0
37.230	.0177					.0271	1.01	3.71	2.98	4.18	.013	.00	.00	PIPE
1131.810	64.160	3.669	67.829	653.00	29.03	13.09	80.92	.00	6.48	7.97	8.000	.000	.00	1 .0
13.594	.0208					.0278	.38	3.67	3.05	3.98	.013	.00	.00	PIPE
1145.404	64.443	3.658	68.101	653.00	29.15	13.19	81.29	.00	6.48	7.97	8.000	.000	.00	1 .0
131.606	.0208					.0298	3.93	3.66	3.06	3.98	.013	.00	.00	PIPE
1277.010	67.180	3.528	70.708	653.00	30.57	14.51	85.22	.00	6.48	7.94	8.000	.000	.00	1 .0
62.516	.0400					.0308	1.93	3.53	3.29	3.31	.013	.00	.00	PIPE
1339.526	69.681	3.588	73.269	653.00	29.89	13.88	87.15	.00	6.48	7.96	8.000	.000	.00	1 .0
94.713	.0400					.0281	2.66	3.59	3.18	3.31	.013	.00	.00	PIPE
1434.240	73.469	3.721	77.191	653.00	28.50	12.62	89.81	.00	6.48	7.98	8.000	.000	.00	1 .0
65.760	.0400					.0247	1.62	3.72	2.96	3.31	.013	.00	.00	PIPE
1500.000	76.100	3.862	79.962	653.00	27.18	11.47	91.43	1.02	6.48	8.00	8.000	.000	.00	1 .0
7.584	.0484					.0228	.17	4.89	2.76	3.14	.013	.00	.00	PIPE
1507.584	76.467	3.891	80.358	653.00	26.91	11.24	91.60	1.00	6.48	8.00	8.000	.000	.00	1 .0
32.106	.0484					.0212	.68	4.89	2.72	3.14	.013	.00	.00	PIPE
1539.690	78.020	4.040	82.060	653.00	25.66	10.22	92.28	1.62	6.48	8.00	8.000	.000	.00	1 .0
1.379	.0485					.0198	.03	5.66	2.53	3.14	.013	.00	.00	PIPE

CSUCI Univ Glen EIR
 100-year Burned and Bulk Storm
 Off-Site Drainage Line E

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt/or I.D.	ZL	No Wth Prs/Pip
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Line_E_100B-yr.OUT														
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1541.069	78.087	4.047	82.134	653.00	25.59	10.17	92.31	1.61	6.48	8.00	8.000	.000	.00	1 .0
25.621	.0485					.0185	.47	5.65	2.53	3.14	.013	.00	.00	PIPE
1566.690	79.330	4.203	83.533	653.00	24.40	9.25	92.78	1.19	6.48	7.99	8.000	.000	.00	1 .0
12.744	.0464					.0168	.21	5.40	2.35	3.18	.013	.00	.00	PIPE
1579.434	79.922	4.291	84.213	653.00	23.78	8.78	92.99	1.13	6.48	7.98	8.000	.000	.00	1 .0
20.196	.0464					.0153	.31	5.42	2.26	3.18	.013	.00	.00	PIPE
1599.630	80.860	4.459	85.319	653.00	22.67	7.98	93.30	.00	6.48	7.95	8.000	.000	.00	1 .0
7.353	.0496					.0139	.10	4.46	2.10	3.12	.013	.00	.00	PIPE
1606.983	81.225	4.540	85.765	653.00	22.18	7.64	93.40	.00	6.48	7.93	8.000	.000	.00	1 .0
13.876	.0496					.0127	.18	4.54	2.03	3.12	.013	.00	.00	PIPE
1620.860	81.914	4.722	86.636	653.00	21.14	6.94	93.58	.00	6.48	7.87	8.000	.000	.00	1 .0
11.410	.0496					.0113	.13	4.72	1.88	3.12	.013	.00	.00	PIPE
1632.270	82.480	4.915	87.395	653.00	20.16	6.31	93.71	.00	6.48	7.79	8.000	.000	.00	1 .0
2.458	.0498					.0104	.03	4.92	1.74	3.11	.013	.00	.00	PIPE
1634.728	82.603	4.964	87.567	653.00	19.92	6.16	93.73	.00	6.48	7.76	8.000	.000	.00	1 .0
8.773	.0498					.0097	.08	4.96	1.71	3.11	.013	.00	.00	PIPE
1643.501	83.040	5.172	88.212	653.00	19.00	5.60	93.82	.00	6.48	7.65	8.000	.000	.00	1 .0
6.992	.0498					.0086	.06	5.17	1.58	3.11	.013	.00	.00	PIPE

♀ FILE: Line_E_100B-yr.WSW

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Program Package Serial Number: 1404

WATER SURFACE PROFILE LISTING

Date:12-20-2016 Time:10:27:33

CSUCI Univ Glen EIR
100-year Burned and Bulk Storm
Off-Site Drainage Line E

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1650.493	83.388	5.393	88.781	653.00	18.11	5.09	93.88	.00	6.48	7.50	8.000	.000	.00	1 .0
5.335	.0498					.0076	.04	5.39	1.46	3.11	.013	.00	.00	PIPE
1655.828	83.654	5.631	89.285	653.00	17.27	4.63	93.92	.00	6.48	7.30	8.000	.000	.00	1 .0
3.813	.0498					.0068	.03	5.63	1.34	3.11	.013	.00	.00	PIPE

Line_E_100B-yr.OUT															
1659.640	83.844	5.888	89.732	653.00	16.47	4.21	93.94	.00	6.48	7.05	8.000	.000	.00	1	.0
2.326	.0498					.0061	.01	5.89	1.22	3.11	.013	.00	.00	PIPE	
1661.967	83.960	6.169	90.129	653.00	15.70	3.83	93.96	.00	6.48	6.72	8.000	.000	.00	1	.0
.803	.0498					.0055	.00	6.17	1.11	3.11	.013	.00	.00	PIPE	
1662.770	84.000	6.482													

Line_E_100B-yr.wsw									
T1	CSUCI Univ Glen EIR								0
T2	100-year Burned and Bulk Storm								
T3	Off-Site Drainage Line E								
SO	1094.580	63.500	1					63.500	
R	1131.810	64.160	1	.013				.000	.000 0
R	1277.010	67.180	1	.013				.000	.000 0
R	1500.000	76.100	1	.013				.000	.000 0
R	1539.690	78.020	1	.013				-12.693	.000 0
R	1566.690	79.330	1	.013				-15.283	.000 0
R	1599.630	80.860	1	.013				-15.236	.000 0
R	1632.270	82.480	1	.013				.000	.000 0
R	1662.770	84.000	1	.013				.000	.000 0
SH	1662.770	84.000	1						
CD	1 4 1	.000	8.000	.000	.000	.000	.000	.00	
Q		653.000	.0						

Attachment D-5
HY-8 Model Results – Culvert Entrances

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: User Defined

Table 1 - Summary of Culvert Flows at Crossing: University Drive

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
92.52	10-yr	309.00	309.00	0.00	1
93.27	25-yr	365.00	365.00	0.00	1
95.34	100-yr	510.00	510.00	0.00	1
97.87	100-yr BB	652.80	652.80	0.00	1
99.58	Overtopping	732.61	732.61	0.00	Overtopping

Rating Curve Plot for Crossing: University Drive

Total Rating Curve

Crossing: University Drive

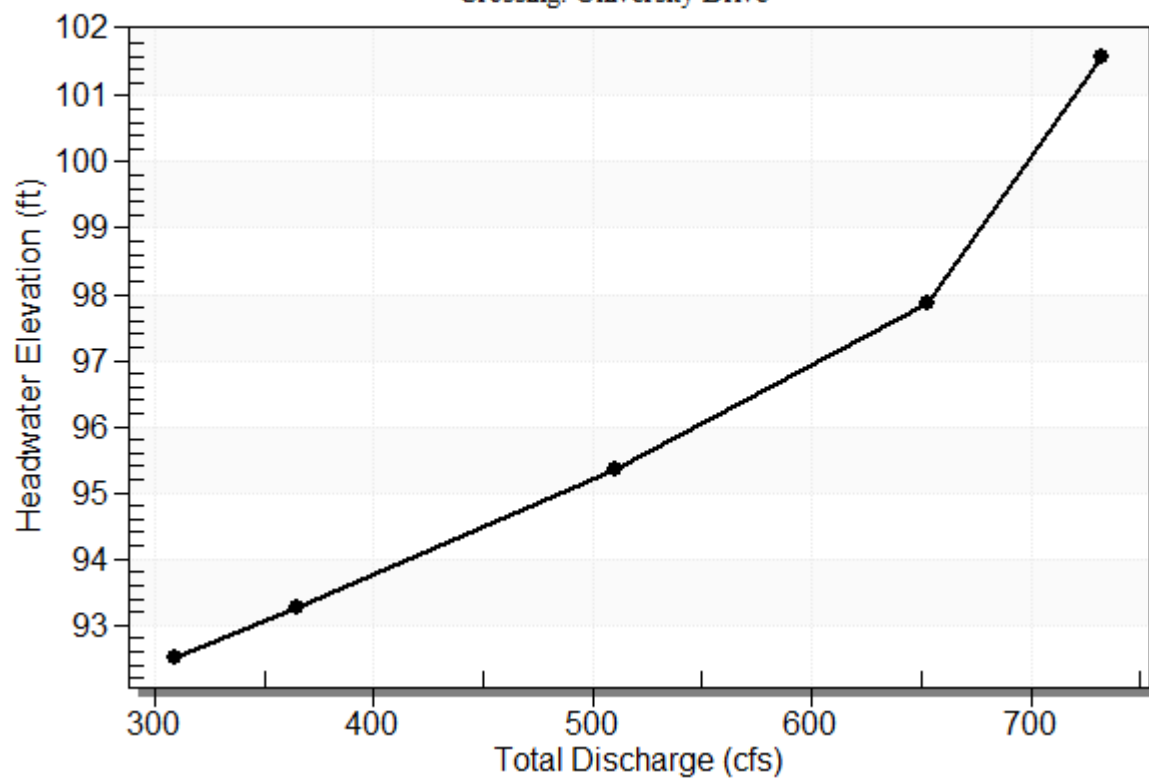


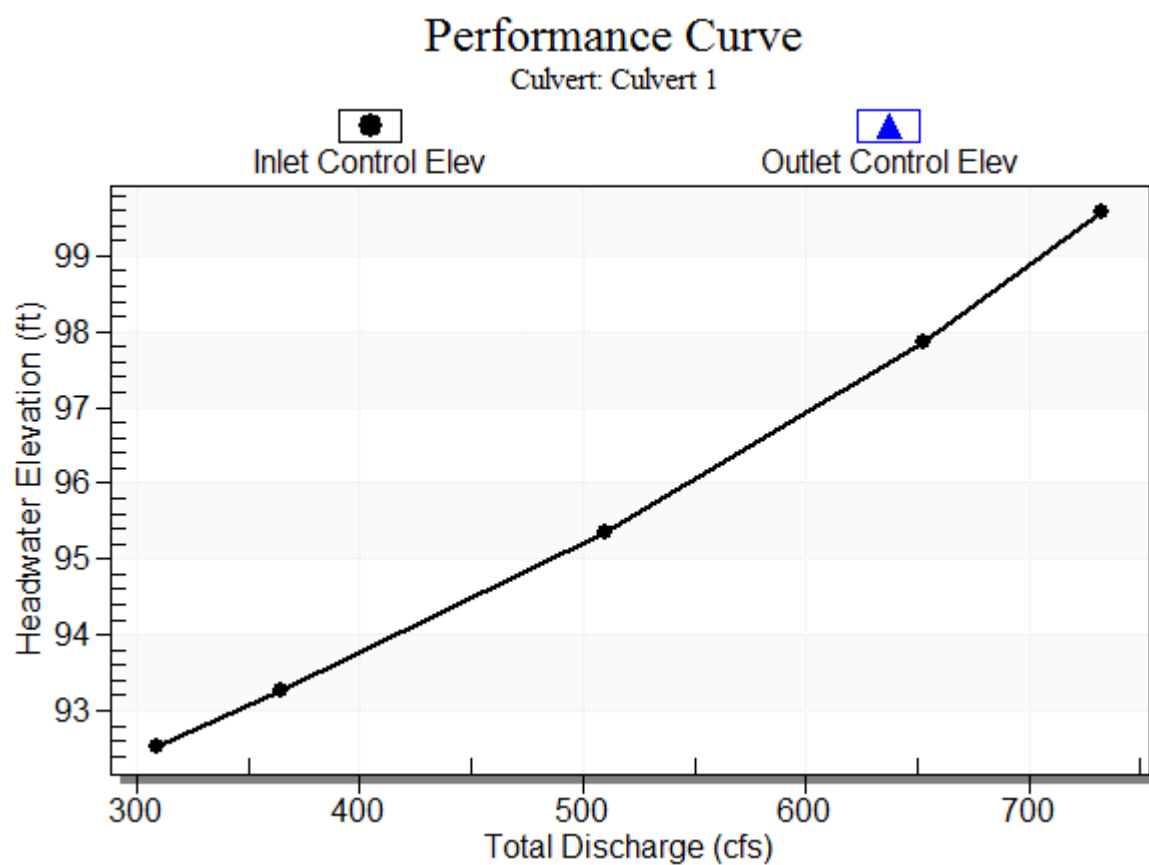
Table 2 - Culvert Summary Table: Culvert 1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)
10-yr	309.00	309.00	92.52	6.523	0.0*	1-S2n	1.968	4.441	2.282	9.000	22.044
25-yr	365.00	365.00	93.27	7.270	0.0*	1-S2n	2.138	4.845	2.492	9.000	23.154
100-yr	510.00	510.00	95.34	9.340	0.0*	5-S2n	2.580	5.755	3.003	9.000	25.233
100-yr BB	652.80	652.80	97.87	11.873	0.0*	5-S2n	2.948	6.480	3.471	9.000	26.774

* Full Flow Headwater elevation is below inlet invert.

Straight Culvert
Inlet Elevation (invert): 86.00 ft, Outlet Elevation (invert): 63.50 ft
Culvert Length: 580.44 ft, Culvert Slope: 0.0388

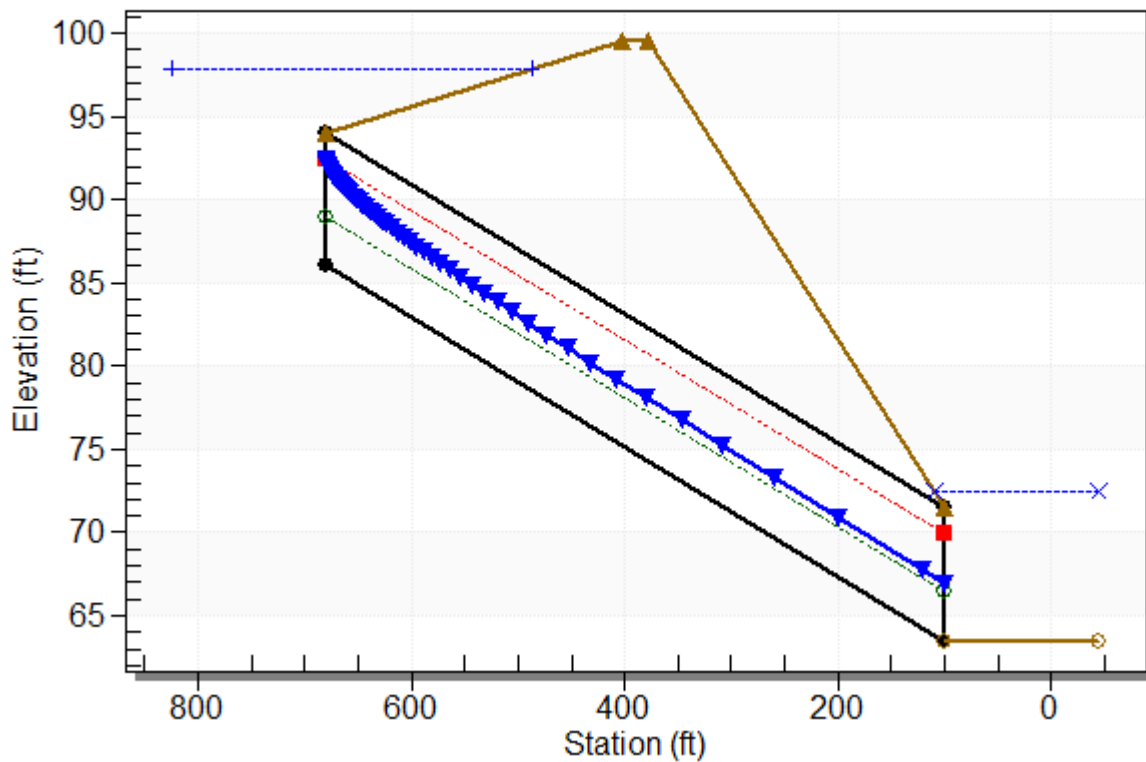
Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1

Crossing - University Drive, Design Discharge - 652.8 cfs

Culvert - Culvert 1, Culvert Discharge - 652.8 cfs



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 680.00 ft

Inlet Elevation: 86.00 ft

Outlet Station: 100.00 ft

Outlet Elevation: 63.50 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 8.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: University Drive)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
309.00	72.50	9.00
365.00	72.50	9.00
510.00	72.50	9.00
652.80	72.50	9.00

Tailwater Channel Data - University Drive

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 72.50 ft

Roadway Data for Crossing: University Drive

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 99.58 ft

Roadway Surface: Paved

Roadway Top Width: 24.00 ft

Crossing Discharge Data

Discharge Selection Method: User Defined

Table 4 - Summary of Culvert Flows at Crossing: Inspiration Point Bridge - Proposed

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
110.67	10-yr	302.00	302.00	0.00	1
110.95	25-yr	360.00	360.00	0.00	1
111.83	100-yr	501.00	501.00	0.00	1
112.97	100-yr BB	641.30	641.30	0.00	1
115.04	Overtopping	843.53	843.53	0.00	Overtopping

Rating Curve Plot for Crossing: Inspiration Point Bridge - Proposed

Total Rating Curve

Crossing: Inspiration Point Bridge - Proposed

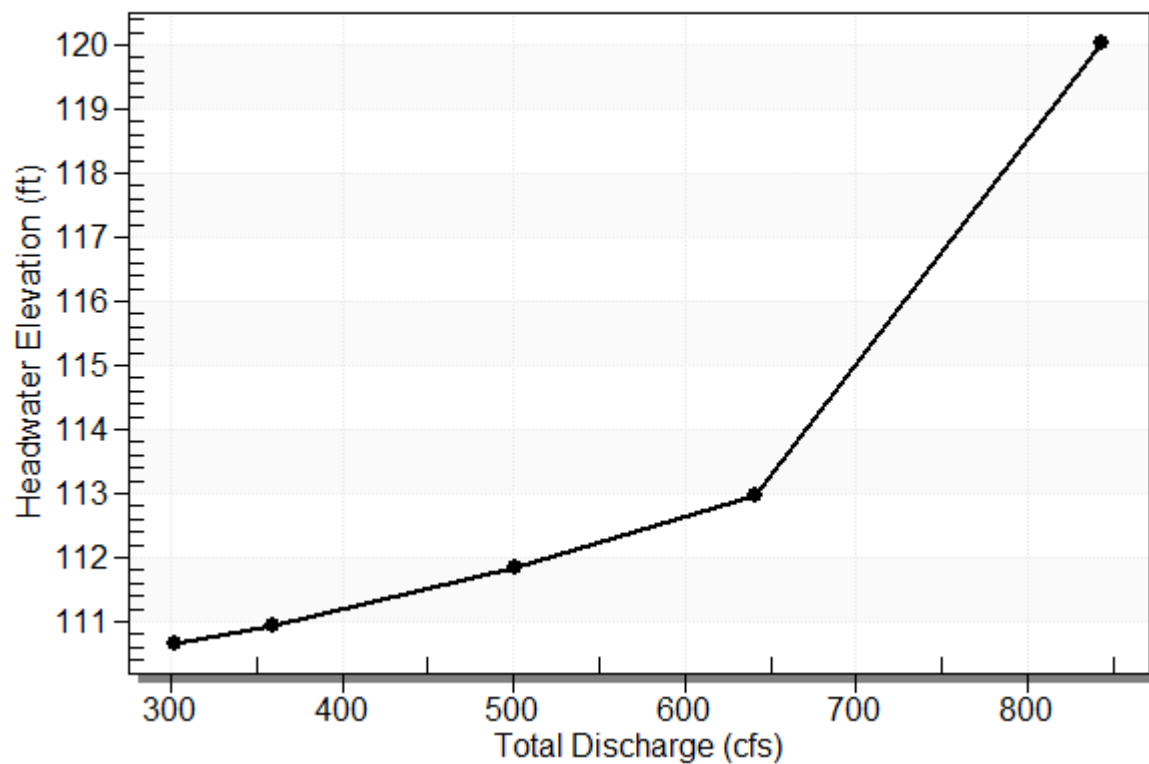
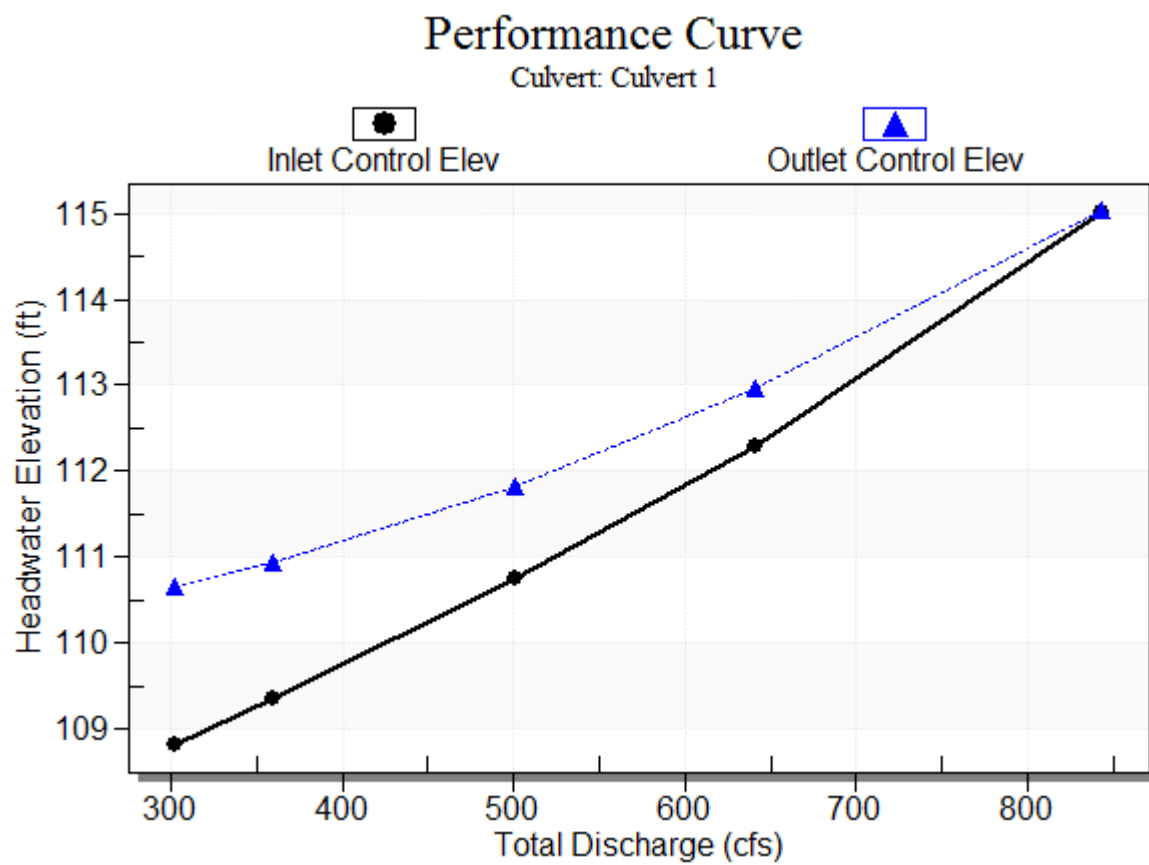


Table 5 - Culvert Summary Table: Culvert 1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)
10-yr	302.00	302.00	110.67	5.048	6.900	1-S1t	3.132	3.300	6.500	5.000	4.804
25-yr	360.00	360.00	110.95	5.580	7.180	1-S1t	3.533	3.644	6.500	5.000	5.727
100-yr	501.00	501.00	111.83	6.987	8.058	7-M1t	4.613	4.382	6.500	5.000	8.347
100-yr BB	641.30	641.30	112.97	8.521	9.196	3-M2t	7.250	4.986	6.500	5.000	10.685

Straight Culvert
Inlet Elevation (invert): 103.77 ft, Outlet Elevation (invert): 103.50 ft
Culvert Length: 29.34 ft, Culvert Slope: 0.0092
Inlet Throat Elevation: 103.77 ft, Inlet Crest Elevation: 105.86 ft

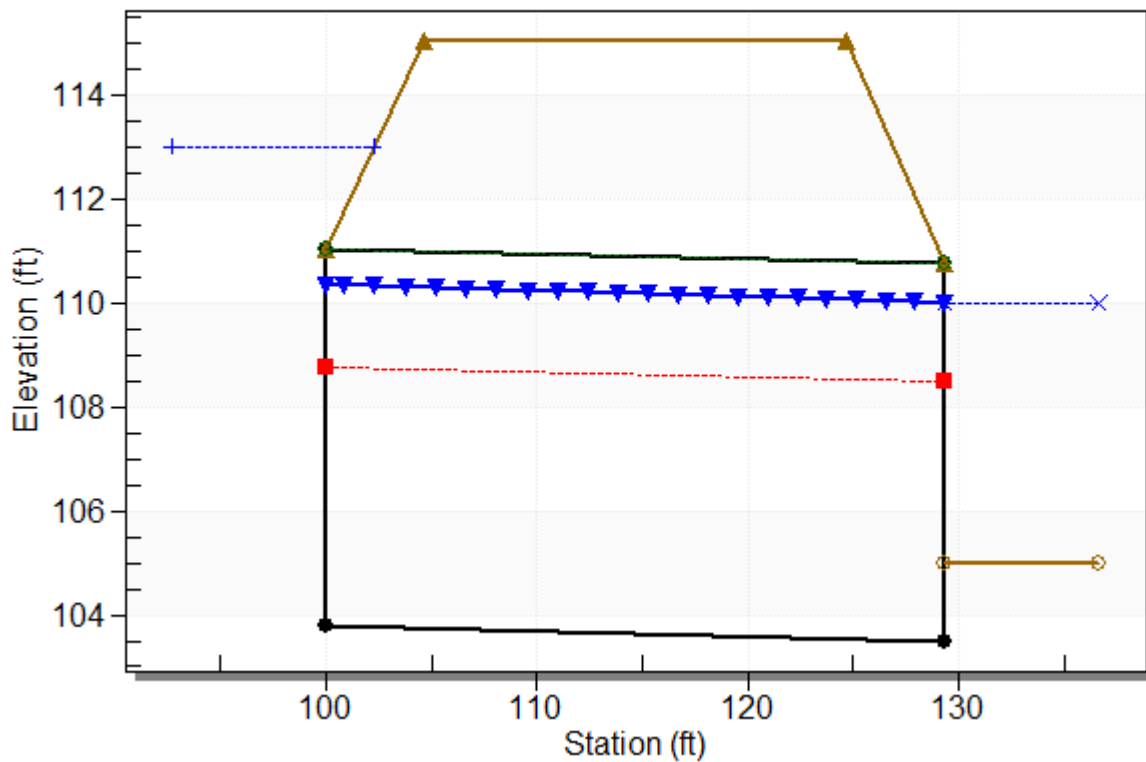
Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1

Crossing - Inspiration Point Bridge - Proposed, Design Discharge - 641.3 cfs

Culvert - Culvert 1, Culvert Discharge - 641.3 cfs



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 100.00 ft

Inlet Elevation: 105.27 ft

Outlet Station: 129.33 ft

Outlet Elevation: 103.50 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Pipe Arch

Barrel Span: 137.00 in

Barrel Rise: 87.00 in

Barrel Material: Steel or Aluminum

Embedment: 0.00 in

Barrel Manning's n: 0.0270

Culvert Type: Straight

Inlet Configuration: Headwall

Inlet Depression: Yes

**Table 6 - Downstream Channel Rating Curve (Crossing: Inspiration Point Bridge -
Proposed)**

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
302.00	110.00	5.00
360.00	110.00	5.00
501.00	110.00	5.00
641.30	110.00	5.00

Tailwater Channel Data - Inspiration Point Bridge - Proposed

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 110.00 ft

Roadway Data for Crossing: Inspiration Point Bridge - Proposed

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 25.00 ft

Crest Elevation: 115.04 ft

Roadway Surface: Paved

Roadway Top Width: 20.00 ft

Crossing Discharge Data

Discharge Selection Method: User Defined

Table 7 - Summary of Culvert Flows at Crossing: Bypass Drainage Area A

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	LineA Discharge (cfs)	Roadway Discharge (cfs)	Iterations
156.58	10-yr	191.00	191.00	0.00	1
157.27	25-yr	223.00	223.00	0.00	1
159.78	100-yr	318.90	318.90	0.00	1
162.98	100-yr BB	408.20	408.20	0.00	1
163.00	Overtopping	408.60	408.60	0.00	Overtopping

Rating Curve Plot for Crossing: Bypass Drainage Area A

Total Rating Curve
Crossing: Bypass Drainage Area A

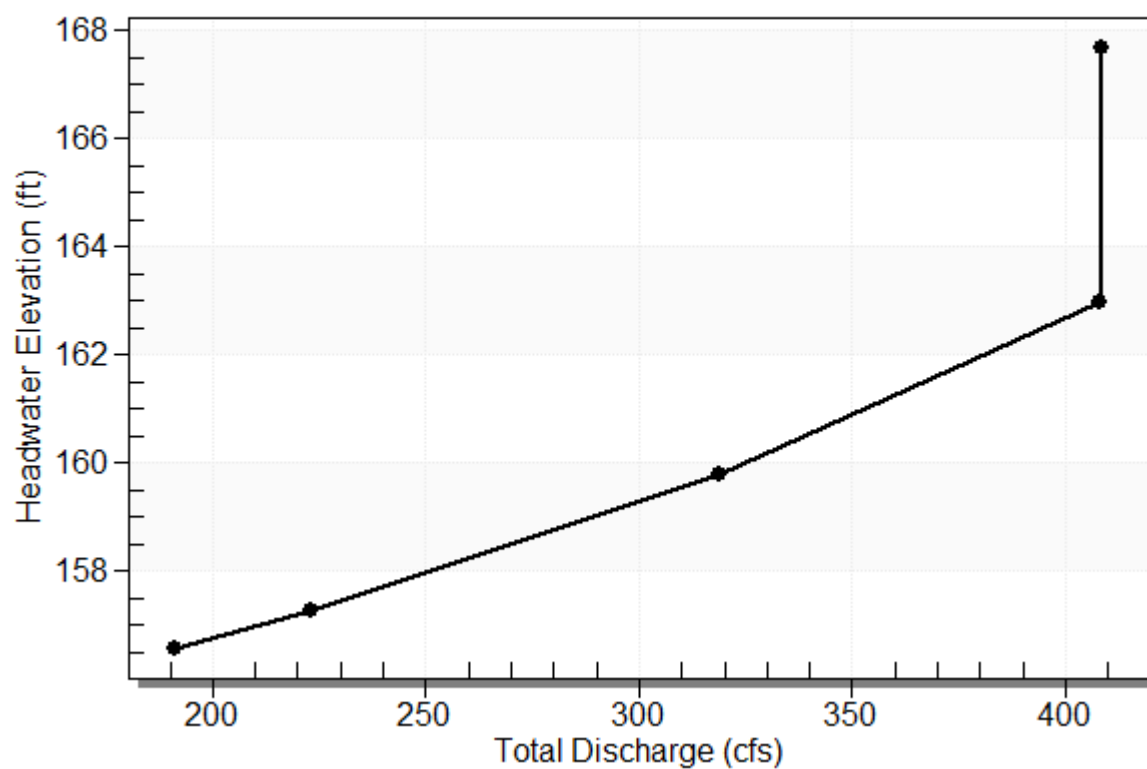


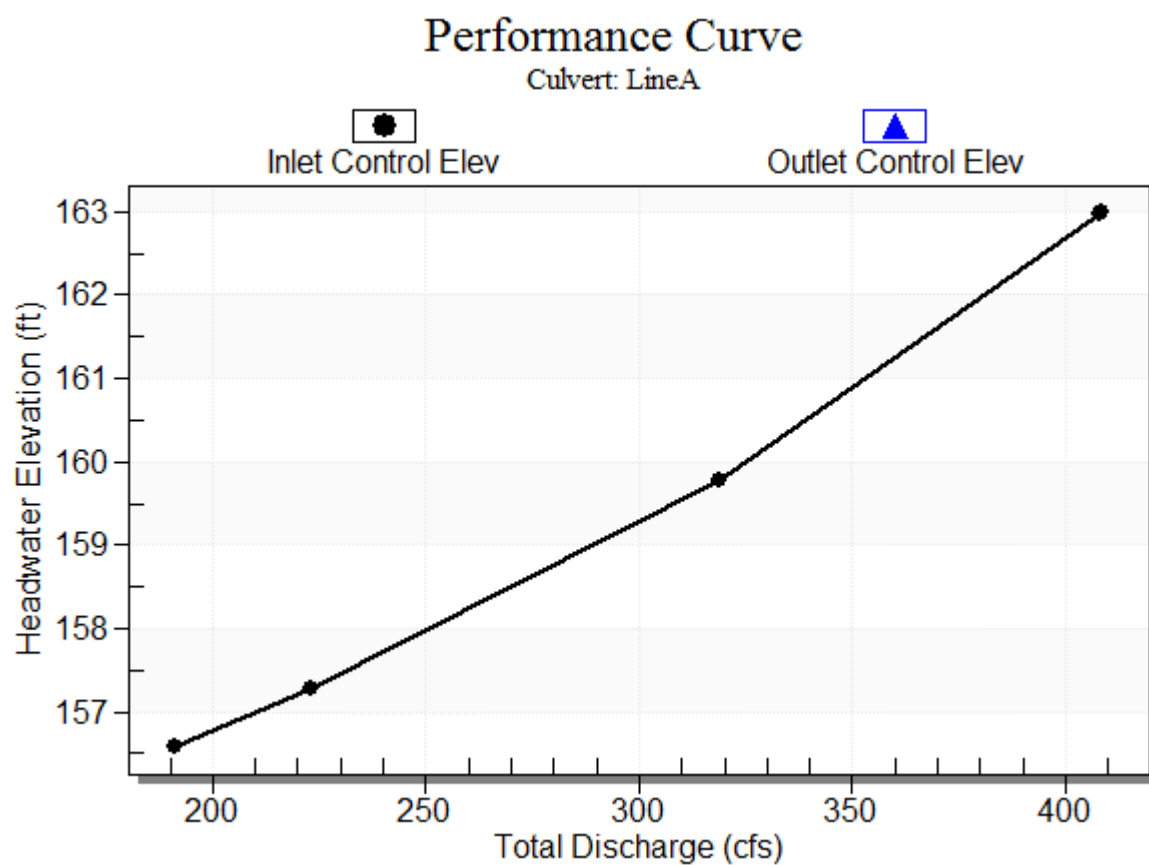
Table 8 - Culvert Summary Table: LineA

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)
10-yr	191.00	191.00	156.58	5.777	0.0*	1-S2n	2.024	3.771	2.271	6.000	16.612
25-yr	223.00	223.00	157.27	6.466	0.0*	5-S2n	2.195	4.084	2.394	6.000	18.111
100-yr	318.90	318.90	159.78	8.984	0.0*	5-S2n	2.703	4.866	2.971	6.000	19.721
100-yr BB	408.20	408.20	162.98	12.184	0.0*	5-S2n	3.149	5.371	3.476	6.000	20.958

* Full Flow Headwater elevation is below inlet invert.

Straight Culvert
Inlet Elevation (invert): 150.80 ft, Outlet Elevation (invert): 126.00 ft
Culvert Length: 1150.57 ft, Culvert Slope: 0.0216

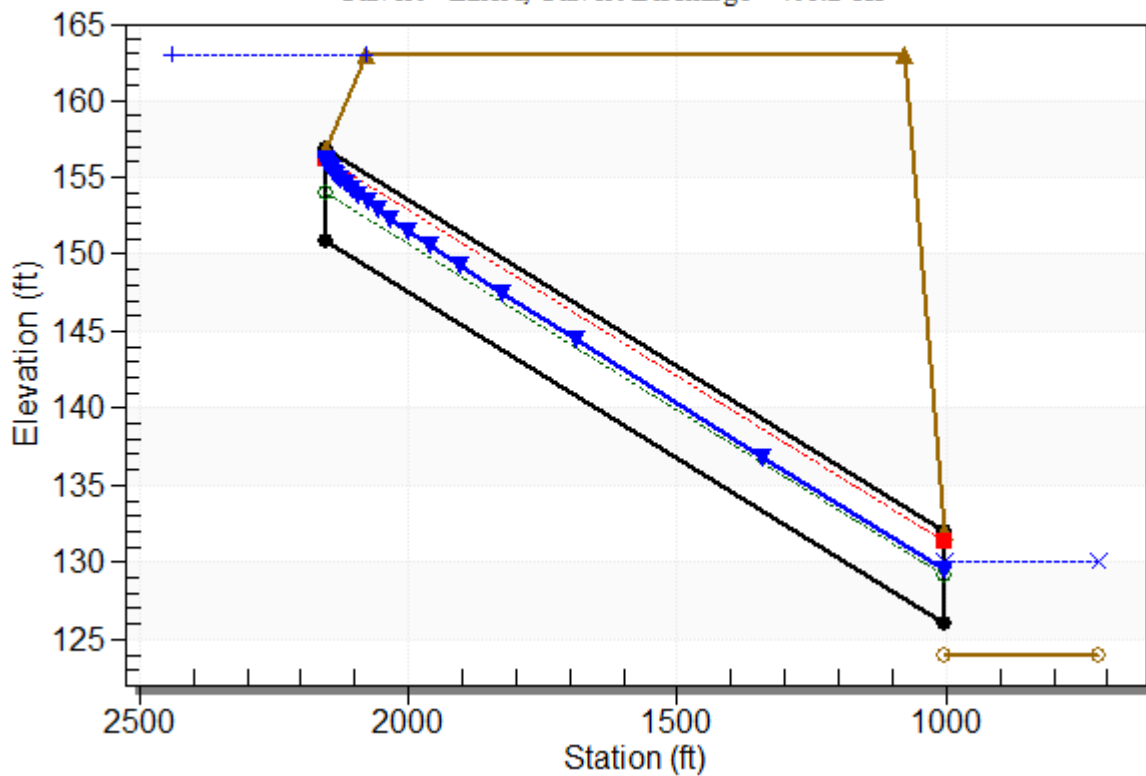
Culvert Performance Curve Plot: LineA



Water Surface Profile Plot for Culvert: LineA

Crossing - Bypass Drainage Area A, Design Discharge - 408.2 cfs

Culvert - LineA, Culvert Discharge - 408.2 cfs



Site Data - LineA

Site Data Option: Culvert Invert Data

Inlet Station: 2153.18 ft

Inlet Elevation: 150.80 ft

Outlet Station: 1002.88 ft

Outlet Elevation: 126.00 ft

Number of Barrels: 1

Culvert Data Summary - LineA

Barrel Shape: Circular

Barrel Diameter: 6.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 9 - Downstream Channel Rating Curve (Crossing: Bypass Drainage Area A)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
191.00	130.00	6.00
223.00	130.00	6.00
318.90	130.00	6.00
408.20	130.00	6.00

Tailwater Channel Data - Bypass Drainage Area A

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 130.00 ft

Roadway Data for Crossing: Bypass Drainage Area A

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 50.00 ft

Crest Elevation: 163.00 ft

Roadway Surface: Paved

Roadway Top Width: 1000.00 ft

Crossing Discharge Data

Discharge Selection Method: User Defined

Table 10 - Summary of Culvert Flows at Crossing: Inspiration Point Bridge - Existing

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
115.96	10-yr	302.00	234.67	67.31	8
116.39	25-yr	360.00	241.02	118.95	4
117.24	100-yr	501.00	253.09	247.87	3
117.96	100-yr BB	641.30	262.74	378.55	4
115.04	Overtopping	220.15	220.15	0.00	Overtopping

Rating Curve Plot for Crossing: Inspiration Point Bridge - Existing

Total Rating Curve

Crossing: Inspiration Point Bridge - Existing

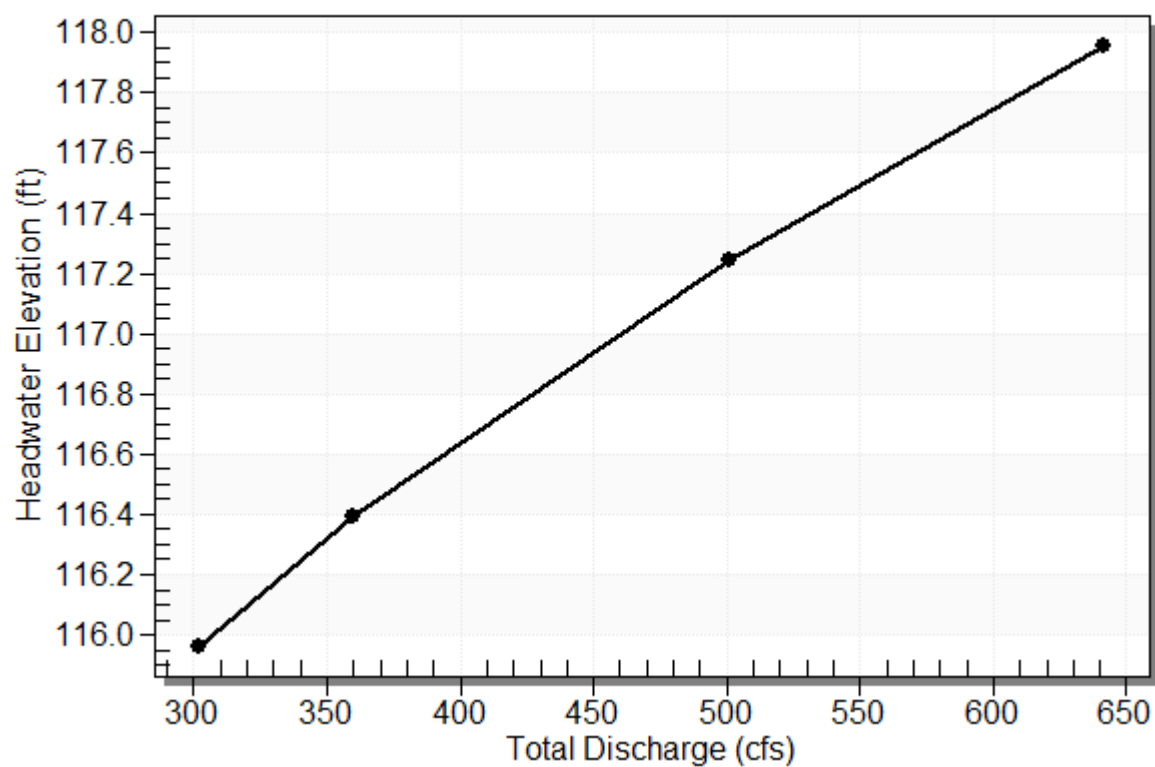
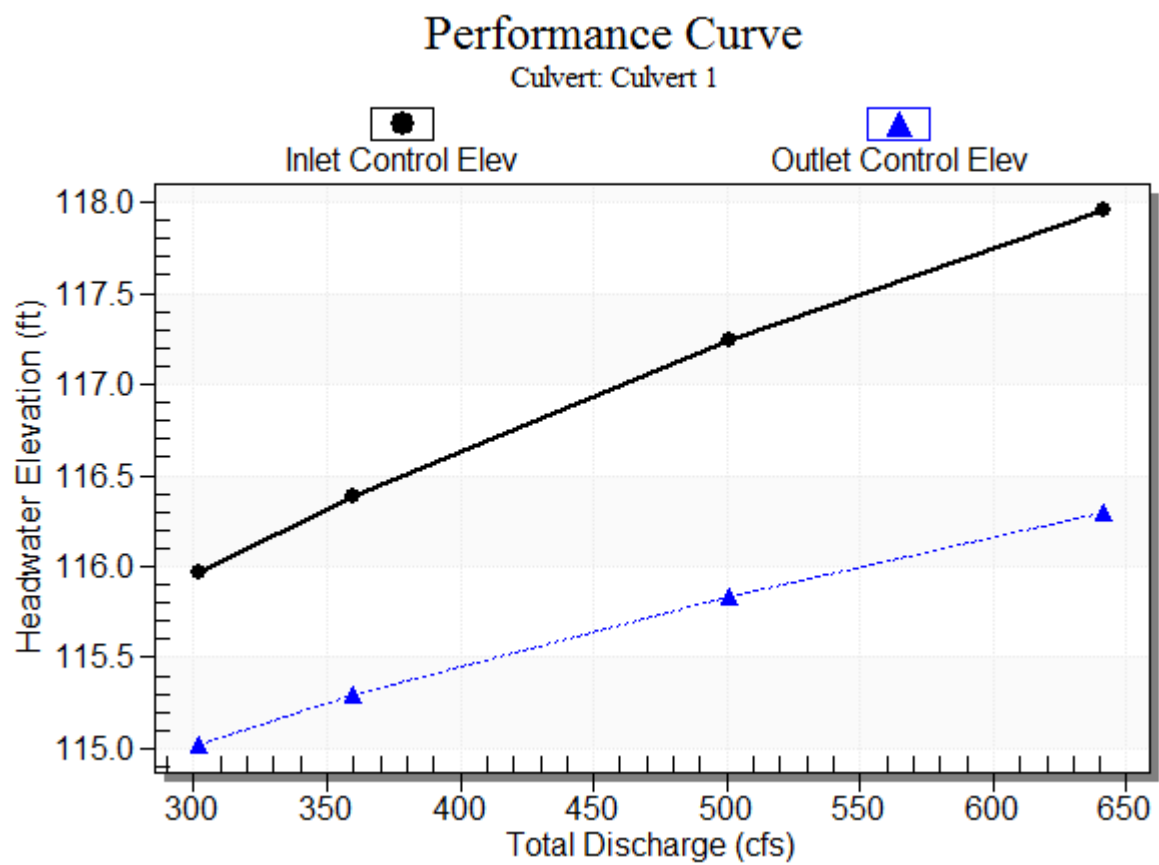


Table 11 - Culvert Summary Table: Culvert 1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)
10-yr	302.00	234.67	115.96	10.694	9.750	5-S2n	2.678	4.319	3.391	5.000	14.623
25-yr	360.00	241.02	116.39	11.120	10.025	5-S2n	2.725	4.363	3.448	5.000	14.789
100-yr	501.00	253.09	117.24	11.971	10.569	5-S2n	2.818	4.442	3.556	5.000	15.094
100-yr BB	641.30	262.74	117.96	12.688	11.023	5-S2n	2.897	4.498	3.641	5.000	15.331

Straight Culvert
Inlet Elevation (invert): 105.27 ft, Outlet Elevation (invert): 103.50 ft
Culvert Length: 29.39 ft, Culvert Slope: 0.0603

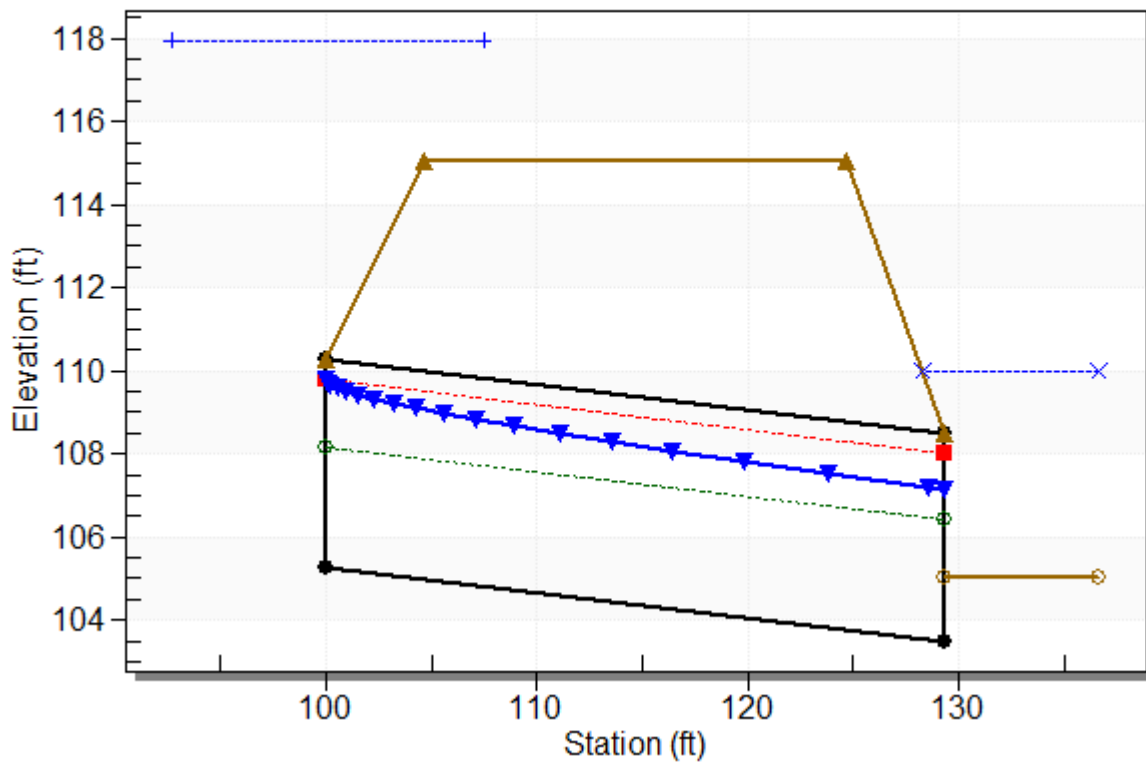
Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1

Crossing - Inspiration Point Bridge - Existing, Design Discharge - 641.3 cfs

Culvert - Culvert 1, Culvert Discharge - 262.7 cfs



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 100.00 ft

Inlet Elevation: 105.27 ft

Outlet Station: 129.33 ft

Outlet Elevation: 103.50 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 5.00 ft

Barrel Material: Corrugated Steel

Embedment: 0.00 in

Barrel Manning's n: 0.0240

Culvert Type: Straight

Inlet Configuration: Thin Edge Projecting

Inlet Depression: NONE

Table 12 - Downstream Channel Rating Curve (Crossing: Inspiration Point Bridge - Existing)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
302.00	110.00	5.00
360.00	110.00	5.00
501.00	110.00	5.00
641.30	110.00	5.00

Tailwater Channel Data - Inspiration Point Bridge - Existing

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 110.00 ft

Roadway Data for Crossing: Inspiration Point Bridge - Existing

Roadway Profile Shape: Constant Roadway Elevation

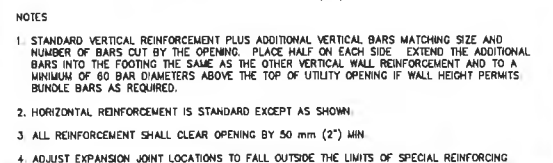
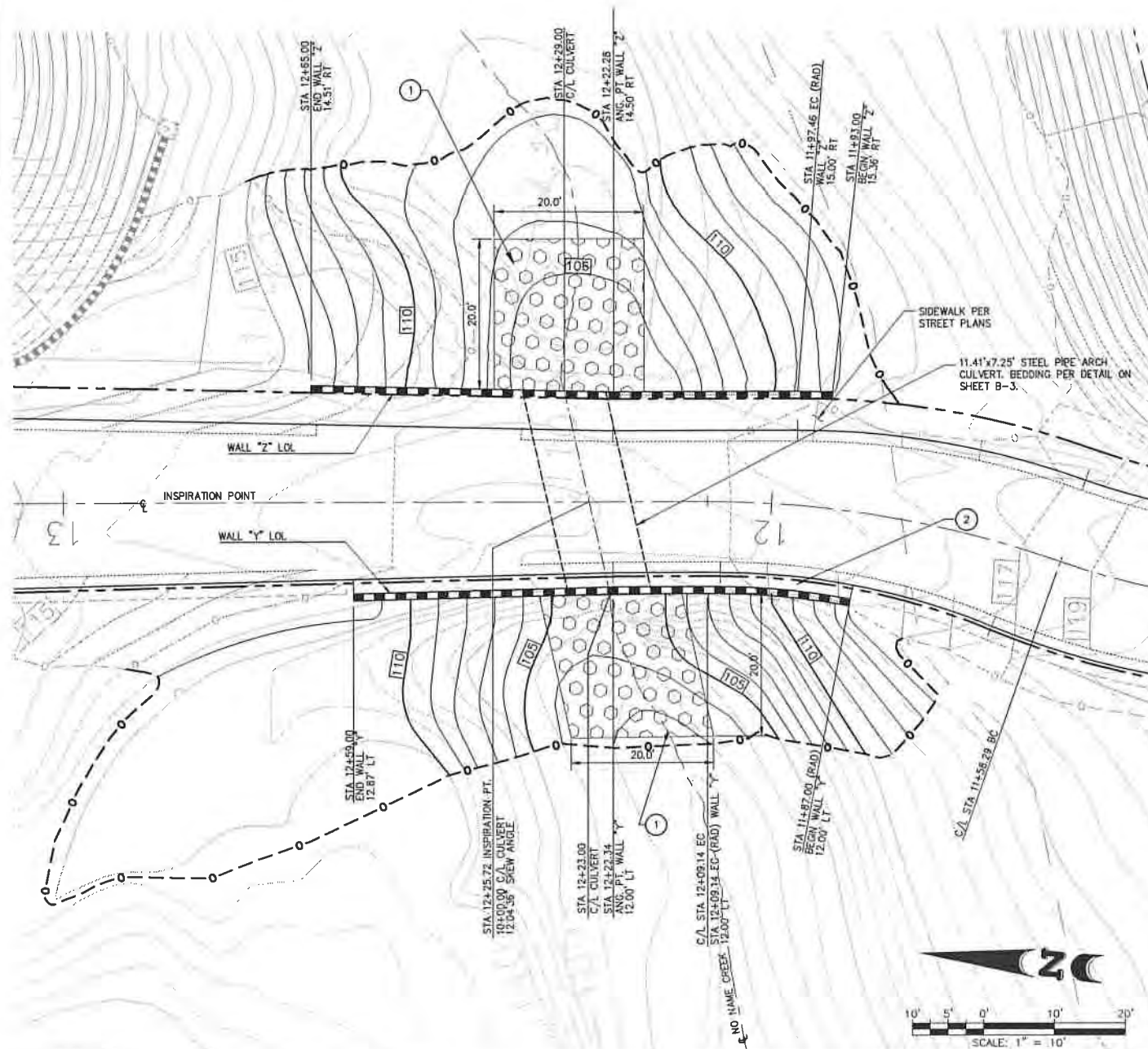
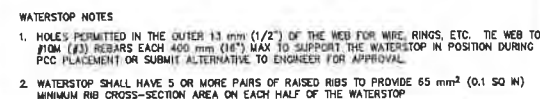
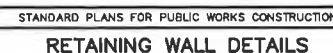
Crest Length: 25.00 ft

Crest Elevation: 115.04 ft

Roadway Surface: Paved

Roadway Top Width: 20.00 ft

Attachment D-6
Proposed Inspiration Point Bridge Design (Circa 2007)



- ① CONSTRUCT RIP RAP PAD PER DIMENSIONS & DETAILS HEREON.
PLACEMENT METHOD "B" PER CALTRANS SPECIFICATIONS SECTION 72.
ROCK FOR RIP-RAP SHALL BE "LIGHT". THICKNESS SHALL BE 24"
- ② CONSTRUCT 4" PCC WALK WITH SCORING PER LANDSCAPE PLANS (ON
12" PMB)

STREET PLANS
FOR
EAST CAMPUS RESIDENTIAL DEVELOPMENT
PHASE 2A AND 2B
INSPIRATION PT. BRIDGE
GENERAL PLAN
AND
GRADING PLAN



PREPARED FOR
California State University
Office of the Chancellor
401 Golden Shore
Long Beach, CA 90802-4210

RECEIVED FOR:

DESIGN BY:

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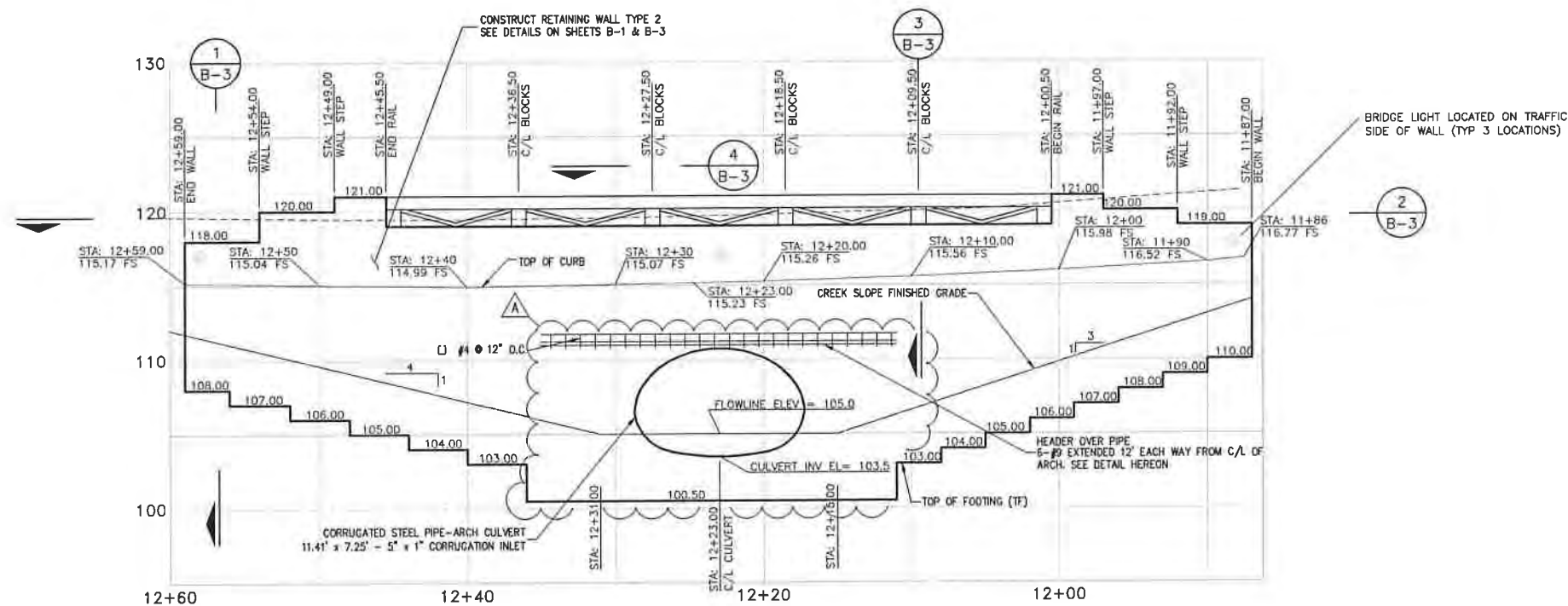
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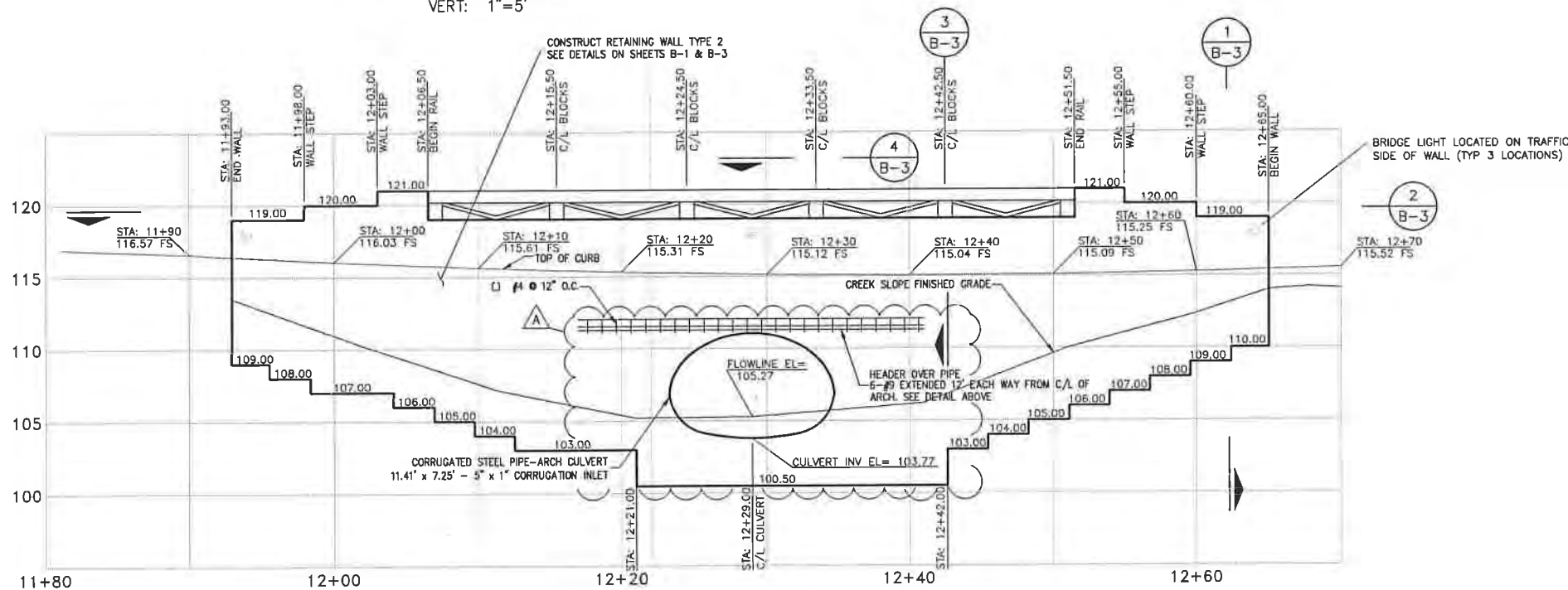
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SHEET 56 OF 59

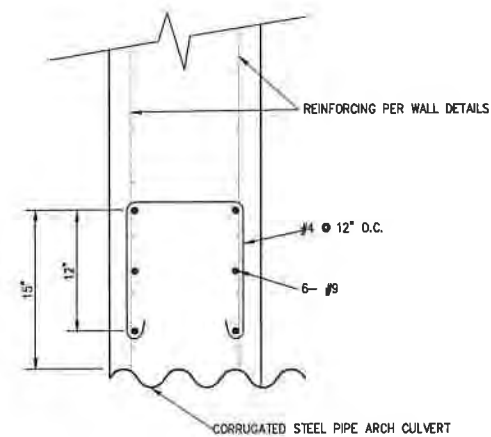


SCALE:
HORIZ: 1"=5'
VERT: 1"=5'

WALL "Y"
(DOWNSTREAM)



WALL "Z"
(UPSTREAM)



HEADER DETAIL

BID SET - 11/21/07

STREET PLANS
FOR
EAST CAMPUS RESIDENTIAL DEVELOPMENT
PHASE 2A AND 2B
INSPIRATION PT. BRIDGE
WALL PROFILES



PREPARED BY:
HUNT-ZOLARS
Hunt-Zolars Inc.
400 Exchange, Suite 200
Irvine, California 92602-1009
Phone (714) 734-5100 Fax (714) 734-5155

DATE: 9-30-08
R.C.E. No. C49158

PREPARED FOR:
California State University
Office of the Chancellor
401 Golden Shore
Long Beach, CA 90802-4210

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B-2

SHEET 57 OF 59

Attachment D-7
Flowmaster Street Hydraulics for Storm Drain Line B

Cross Section for Gutter -100-yr

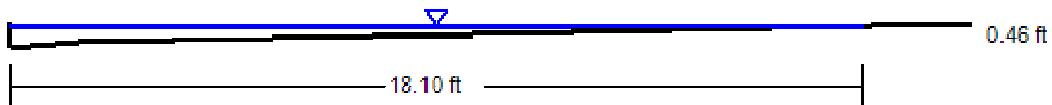
Project Description

Solve For Spread

Input Data

Channel Slope	0.01000	ft/ft
Discharge	15.00	ft ³ /s
Gutter Width	1.50	ft
Gutter Cross Slope	0.08	ft/ft
Road Cross Slope	0.02	ft/ft
Spread	18.10	ft
Roughness Coefficient	0.013	

Cross Section Image



V: 1
H: 1

Worksheet for Gutter -100-yr

Project Description

Solve For Spread

Input Data

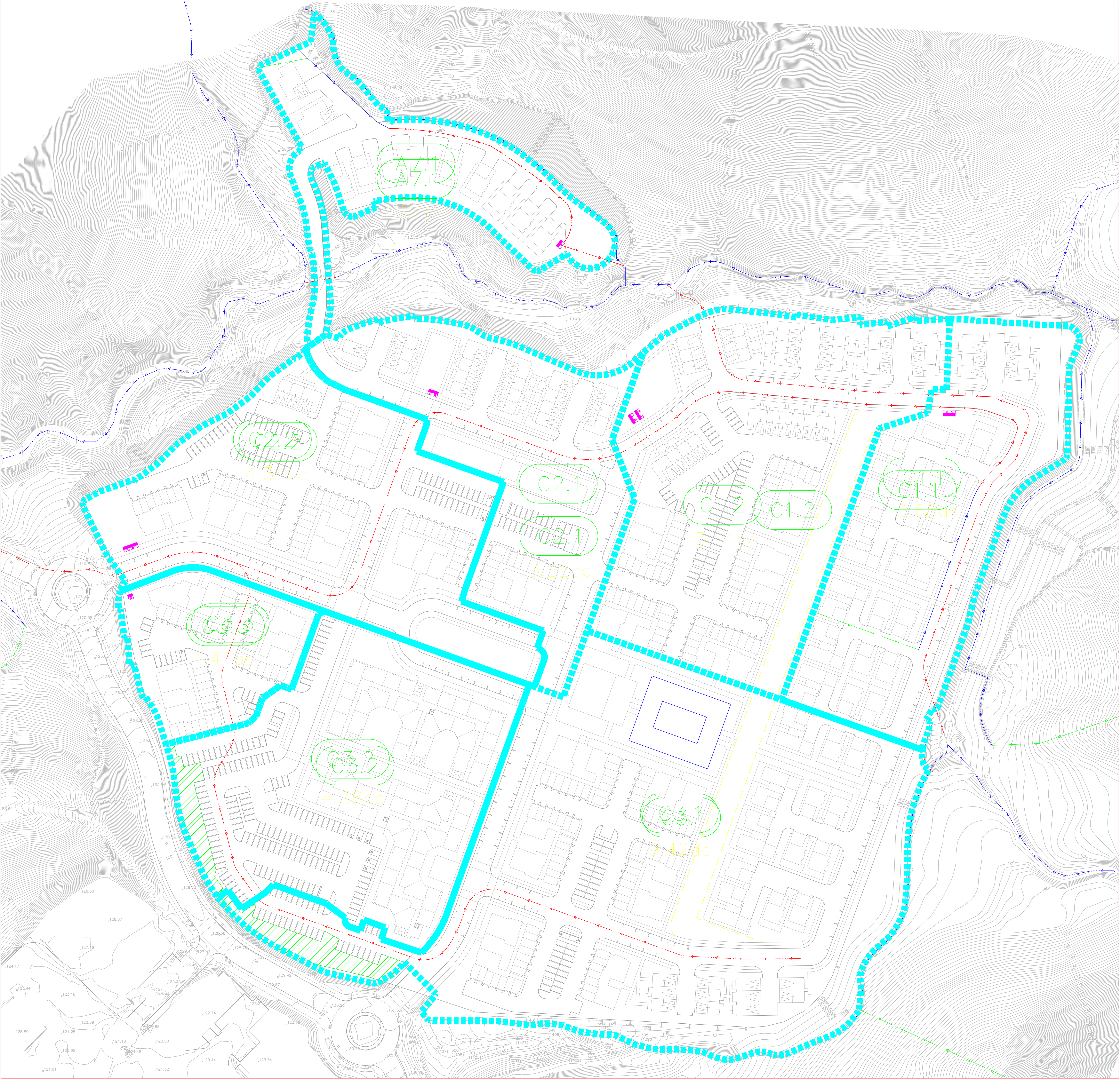
Channel Slope	0.01000	ft/ft
Discharge	15.00	ft ³ /s
Gutter Width	1.50	ft
Gutter Cross Slope	0.08	ft/ft
Road Cross Slope	0.02	ft/ft
Roughness Coefficient	0.013	

Results

Spread	18.10	ft
Flow Area	3.35	ft ²
Depth	0.46	ft
Gutter Depression	0.09	ft
Velocity	4.48	ft/s

Attachment E
Supporting Documentation for Water Quality Analyses

Attachment E-1
Conceptual Water Quality Plan



LEGEND

- ON-SITE DRAINAGE BOUNDARY
- SUBAREA NAME
- SUBAREA SIZE (ACRES)
- CURB\CHANNELIZED FLOW PATH
- OVERLAND FLOW PATH
- PIPE FLOW PATH
- BIOFILTRATION SYSTEM
- BIOFILTRATION BOX SYSTEM

LID BMP Sizing				
Drainage Area #	Area (ac)	SQDV (CF)	SQDF (cfs)	Proposed BMP
C1.1	3.68	—	0.51	MWS-L-8-20
C1.2	5.11	—	0.71	2x(MWS-L-8-16)
C2.1	3.22	—	0.45	MWS-L-8-16
C2.2	4.34	—	0.60	MWS-L-8-24
C3.1	9.42	17,386	—	Bioretention
C3.2	4.38	8,079	—	w/ underdrains
C3.3	1.41	—	0.23	MWS-L-8-8
A7.1	2.03	—	0.35	MWS-L-8-12

Attachment E-2
TGM Fact Sheet for Biotreatment BMPs

BIO-1: Bioretention with Underdrain

Bioretention stormwater treatment facilities are landscaped shallow depressions that capture and filter stormwater runoff. These facilities function as a soil and plant based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, and plantings. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, and biodegraded by the soil and plants. Bioretention with an underdrain is a treatment control measures that can be used for areas with low permeability native soils or steep slopes. Bioretention may be designed without an underdrain to serve as a retention BMP in areas of high soil permeability (see [INF-3 Bioretention](#)) or partial retention/ partial biofiltration BMP (see [INF-7: Bioinfiltration](#)).



Bioretention in Parking Lots

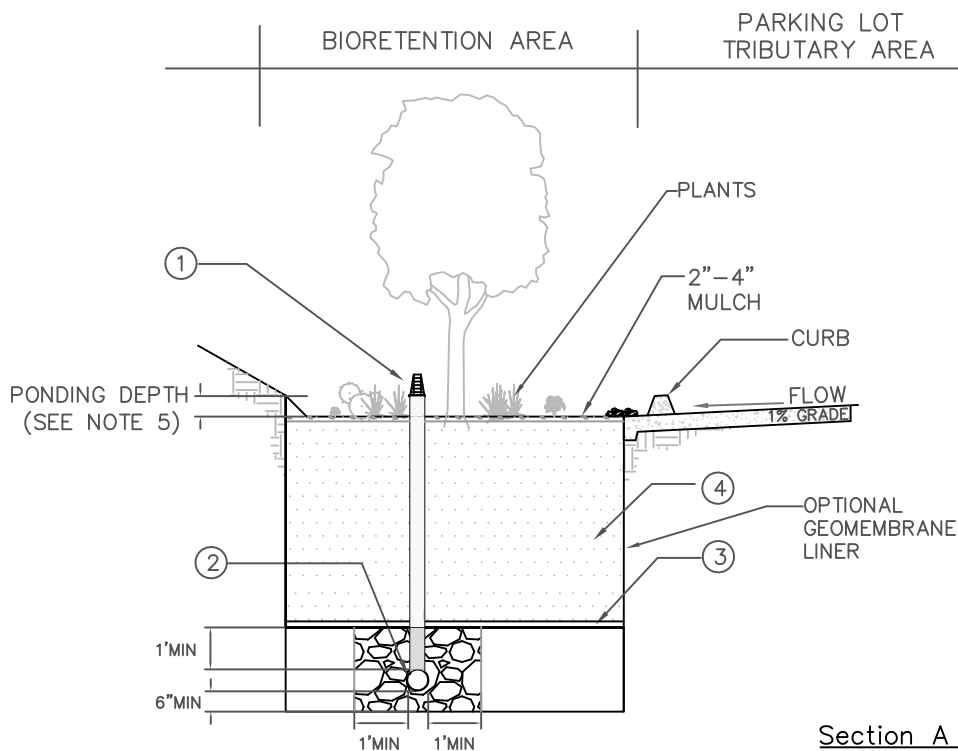
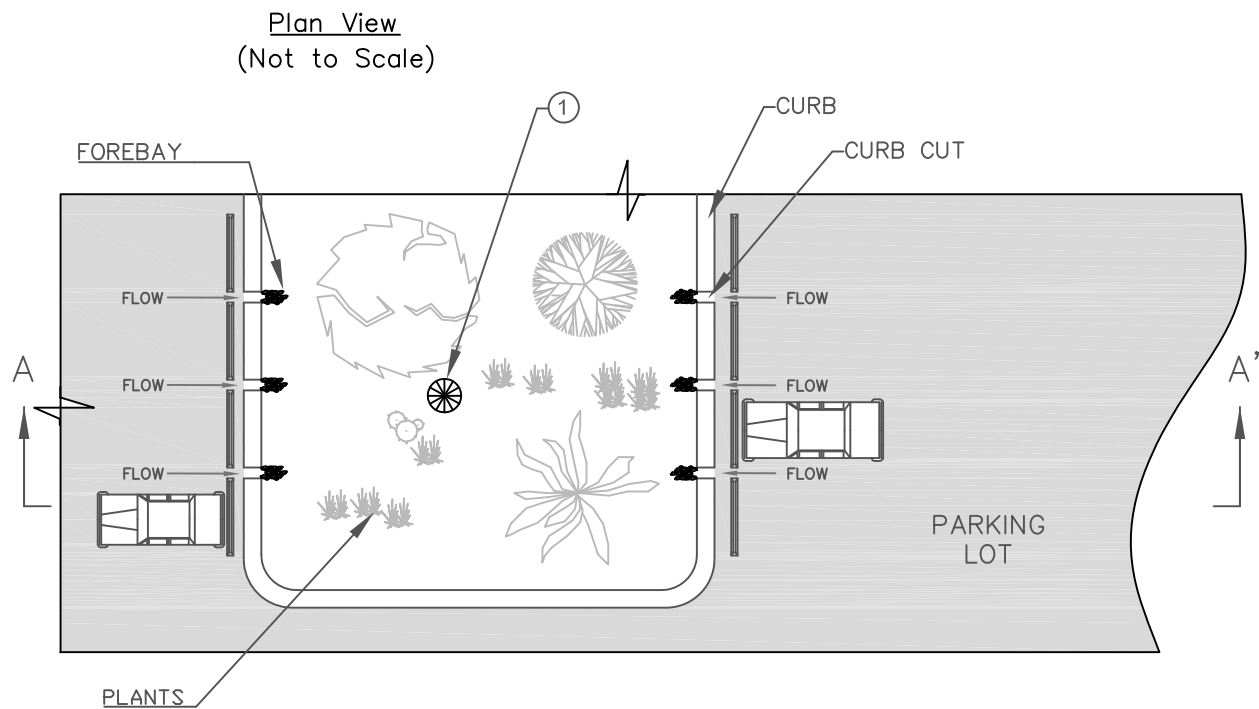
Photo Credits: Geosyntec Consultants

Application

- Parking lots
- Roadway parkways and medians
- School entrances, courtyards, and walkways
- Playgrounds and sports fields

Preventative Maintenance

- Repair small eroded areas
- Remove trash and debris and rake surface soils
- Remove accumulated fine sediments, dead leaves, and trash
- Remove weeds and prune back excess plant growth
- Remove sediment and debris accumulation near inlet and outlet structures
- Periodically observe function under wet weather conditions



Section A - A'
(Not to Scale)

NOTES:

- ① OVERFLOW DEVICE: VERTICAL RISER OR EQUIVALENT.
- ② PERFORATED 6" MIN PVC PIPE UNDERDRAIN.
- ③ OPTIONAL CHOKING GRAVEL LAYER.
- ④ 2' MIN PLANTING MIX; 3' PREFERRED.
- ⑤ PONDING DEPTH 18" WITH FENCE; 6" WITHOUT FENCE.

Geosyntec
consultants

Figure 6-10: Bioretention
with Underdrain

Limitations

- 1) Vertical relief and proximity to storm drain - site must have adequate relief between land surface and storm drain to permit vertical percolation through the soil media and collection and conveyance in underdrain to storm drain system.
- 2) Depth to groundwater - shallow groundwater table may not permit complete drawdown between storms.

Design Criteria

Bioretention with an underdrain should be designed according to the requirements listed in Table 6-18 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-18: Bioretention with an Underdrain Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Forebay	-	Forebay should be provided for all tributary surfaces that contain landscaped areas. Forebays should be designed to prevent standing water during dry weather and should be planted with a plant palette that is tolerant of wet conditions.
Maximum drawdown time of water ponded on surface	hours	72
Maximum drawdown time of surface ponding plus subsurface pores	hours	96 (72 preferred)
Maximum ponding depth	inches	18 inches
Minimum thickness of amended soils layer	feet	2 (3 preferred)
Minimum thickness of stabilized mulch	inches	2 to 4
Planting mix composition	-	60 to 80% fine sand, 20 to 40% compost
Underdrain sizing	-	6 inch minimum diameter; 0.5% minimum slope; slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent); spacing shall be determined to provide capacity for maximum rate filtered through amended media

Design Parameter	Unit	Design Criteria
Gravel layer	-	A gravel bed should be provided around underdrain. Underdrain should have at least 1 foot of gravel installed to the sides and on top of the underdrain, and at least 0.5 feet of gravel installed below underdrain.
Overflow device	-	Required

Sizing Criteria

Bioretention facilities with underdrains shall be designed to capture and treat the SQDV. However because these systems commonly have a relatively high amended soil infiltration rate and shallow depth, these systems are typically capable of filtering a significant portion of the SQDV during a storm event. Therefore, a simplified routing approach is described in the following steps that accounts for the portion of the SQDV that is filtered during the storm event.

Step 1: Calculate the Design Volume

Bioretention facilities shall be sized to capture and biofilter the SQDV (see Section 2.3 and Appendix E).

Step 2: Determine the Design Percolation Rate

Sizing is based on the design saturated hydraulic conductivity (K_{sat}) of the amended soil layer. A target K_{sat} of 5 inches per hour is recommended for non-proprietary amended soil media. The media K_{sat} will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the amended soil layer. A factor of safety of 2.0 should be applied such that the resulting recommended design K_{sat} is 2.5 inches per hour. This value should be used for sizing unless sufficient rationale is provided to justify a higher design K_{sat} .

Step 3: Calculate the surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus the void spaces in the media, based on the computed porosity of the filter media and aggregate layer.

- 1) Select a surface ponding depth (d_p) that satisfies geometric criteria and is congruent with the constraints of the site. Selecting a deeper ponding depth (18 inches maximum) generally yields a smaller footprint, however, it requires greater consideration for public safety, energy dissipation, and plant selection.
- 2) Compute time for selected ponding depth to filter through media:

$$t_{ponding} = \frac{d_p}{K_{design}} 12 \frac{in}{ft} \quad (\text{Equation 6-24})$$

Where:

- $t_{ponding}$ = required drain time of surface ponding (≤ 72 hrs)
- d_p = selected surface ponding water depth (ft)
- K_{design} = media design saturated hydraulic conductivity (in/hr)
(see Step 2, above)

If $t_{ponding}$ exceeds 72 hours, return to (1) and reduce surface ponding or increase media K_{design} . Otherwise, proceed to next step.

Note: In nearly all cases, $t_{ponding}$ will not approach 72 hours unless a low K_{design} is specified.

- 3) Compute depth of water that may be filtered during the design storm event as follows:

$$d_{filtered} = \text{Minimum} \left[\frac{K_{design} \times T_{routing}}{12 \frac{in}{ft}}, d_p \right] \quad (\text{Equation 6-25})$$

Where:

- $d_{filtered}$ = depth of water that may be considered to be filtered during the design storm event (ft) for routing calculations; this value should not exceed the surface ponding depth (d_p)
- K_{design} = design saturated hydraulic conductivity (in/hr) (see Step 2, above)
- $T_{routing}$ = storm duration that may be assumed for routing calculations; this should be assumed to be 3 hours unless rationale for an alternative assumption is provided
- d_p = selected surface ponding water depth (ft)

The intention is that routing is important in the appropriate sizing of bioretention with underdrains. However, the depth of water considered to be filtered during the storm should be limited to the maximum ponding depth. This

results in designs that are robust to account for a variety of storm depths and durations. This limitation is for sizing calculations only. In reality, the depth that is filtered during a storm will vary based on storm depth, duration, and intensity. This TGM does not intend to limit the amount that may actually be filtered.

- 4) Calculate required infiltrating surface area (filter bottom area):

$$A_{req} = \frac{SQDV}{d_p + d_{filtered}} \quad \text{(Equation 6-26)}$$

Where:

A_{req}	=	required infiltrating area (ft ²). Should be calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility)
$SQDV$	=	stormwater quality design volume (ft ³)
d_p	=	selected surface ponding water depth (ft)
$d_{filtered}$	=	depth of water that can be considered to be filtered during the design storm event (ft) for routing calculations (See Equation 6-15)

- 5) Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility).

Geometry

- 1) Minimum planting soil depth should be 2 feet, although 3 feet is preferred.

The intention is that the minimum planting soil depth should provide a beneficial root zone for the chosen plant palette and adequate water storage for the stormwater quality design volume. A deeper soil depth will provide a smaller surface area footprint.

- 2) Bioretention should be designed to drain below the planting soil in less than 72 hours and completely drain from the underdrain in 96 hours (both starting from the end of inflow).

The intention is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate soil oxygen levels for healthy soil biota and vegetation, and to provide proper soil conditions for biodegradation and retention of pollutants.

Flow Entrance and Energy Dissipation

The following types of flow entrance can be used for bioretention cells:

- 1) Dispersed, low velocity flow across a landscape area. Dispersed flow may not be possible given space limitations or if the facility is controlling roadway or parking lot flows where curbs are mandatory.
- 2) Dispersed flow across pavement or gravel and past wheel stops for parking areas.
- 3) Curb cuts for roadside or parking lot areas: Curb cuts should include rock or other erosion protection material in the channel entrance to dissipate energy. Flow entrance should drop 2 to 3 inches from curb line and provide an area for settling and periodic removal of sediment and coarse material before flow dissipates to the remainder of the cell.
- 4) Pipe flow entrance: Piped entrances, such as roof downspouts, should include rock, splash blocks, or other appropriate measures at the entrance to dissipate energy and disperse flows.
- 5) Woody plants (trees, shrubs, etc.) can restrict or concentrate flows and can be damaged by erosion around the root ball and should not be placed directly in the entrance flow path.

Underdrains

Underdrains should meet the following criteria:

- 1) 6-inch minimum diameter.
- 2) Underdrains should be made of slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent). *The intention is that compared to round-hole perforated pipe, slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.*
- 3) Slotted pipe should have 2 to 4 rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inches and should have a length of 1 to 1.25 inches. Slots should be longitudinally spaced such that the pipe has a minimum of one square inch of slot per lineal foot of pipe and should be placed with slots facing the bottom of the pipe.
- 4) Underdrains should be sloped at a minimum of 0.5%.
- 5) Rigid non-perforated observation pipes with a diameter equal to the underdrain diameter should be connected to the underdrain every 100 feet to provide a clean-out port as well as an observation well to monitor dewatering rates. The wells/cleanouts should be connected to the perforated underdrain with the appropriate manufactured connections. The wells/cleanouts should extend 6 inches above the top elevation of the

bioretention facility mulch, and should be capped with a lockable screw cap. The ends of the underdrain pipes not terminating in an observation well/cleanout should also be capped.

- 6) The following aggregate should be used to provide a gravel blanket and bedding for the underdrain pipe. Place the underdrain on a bed of washed aggregate at a minimum thickness of 6 inches and cover it with the same aggregate to provide a 1 foot minimum depth around the top and sides of the slotted pipe.

Sieve size	Percent Passing
¾ inch	100
¼ inch	30-60
US No. 8	20-50
US No. 50	3-12
US No. 200	0-1

- 7) At the option of the designer/geotechnical engineer, a geotextile fabric may be placed between the planting media and the drain rock. If a geotextile fabric is used, it should meet a minimum permittivity rate of 75 gal/min/ft², should not impede the infiltration rate of the soil medium, and should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Preferably, aggregate should be used in place of filter fabric to reduce the potential for clogging. This aggregate layer should consist of 2 to 4 inches of washed sand underlain with 2 inches of choking stone (Typically #8 or #89 washed).

- 8) For bioretention facilities enhanced to remove address nitrogen as the primary pollutant class, the underdrain should be elevated from the bottom of the bioretention facility by at least 6 inches within the gravel blanket to create a fluctuating anaerobic/aerobic zone below the drain pipe. *The intention is that denitrification within the anaerobic/anoxic zone is facilitated by microbes using forms of nitrogen (NO₂ and NO₃) instead of oxygen for respiration.*

An alternative enhanced nitrogen removal design is to include an internal water storage layer by adding a 90-degree elbow to the underdrain to raise the outlet. This design feature provides additional storage in the media. The bioretention facility must have at least 30 inches of planting media. The top of the elbow should be at least 12 inches below the top of the planting media, and in poorly draining soils, should

preferably be 18 to 24 inches below the top of the planting media. The top of the water storage layer should not be less than 12 inches from the bottom of the planting media layer. (For more information, see [Urban Waterways](#) publication).

- 9) The underdrain should drain freely to an acceptable discharge point. The underdrain can be connected to a downstream open conveyance (vegetated swale), to another bioretention cell as part of a connected treatment system, to a storm drain, daylight to a vegetated dispersion area using an effective flow dispersion device, or to a storage facility for rainwater harvesting.

Overflow

An overflow device is required at the maximum ponding depth. The following, or equivalent, should be provided:

- 1) A vertical PVC pipe (SDR 35) should be connected to the underdrain.
- 2) The overflow riser(s) should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe. The vertical pipe will provide access to cleaning the underdrains.
- 3) The inlet to the riser should be at the ponding depth (maximum 18 inches for fenced bioretention areas and 6 inches for areas that are not fenced), and be capped with a spider cap to exclude floating mulch and debris. Spider caps should be screwed in or glued (i.e., not removable).

Hydraulic Restriction Layers

Infiltration pathways may need to be restricted due to the close proximity of roads, foundations, or other infrastructure. A geomembrane liner, or other equivalent water proofing, may be placed along the vertical walls to reduce lateral flows. This liner should have a minimum thickness of 30 mils.

Planting/Storage Media

- 1) The planting media placed in the cell should achieve a long-term, in-place infiltration rate of at least 1 inch per hour. Higher infiltration rates are permissible. If the design long-term, in-place infiltration rate of the soil exceeds 12 inches per hour, documentation should be provided to demonstrate that the media will adequately address pollutants of concern at a higher flowrate. Bioretention soil shall also support vigorous plant growth.
- 2) Planting media should consist of 60 to 80% fine sand and 20 to 40% compost.
- 3) Sand should be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for bioretention should be analyzed by an accredited lab using #200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by

the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements below):

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
3/8 inch	100	100
#4	90	100
#8	70	100
#16	40	95
#30	15	70
#40	5	55
#100	0	15
#200	0	5

Note: the gradation of the sand component of the media is believed to be a major factor in the hydraulic conductivity of the media mix. If the desired hydraulic conductivity of the media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified in above (“minimum” column).

- 4) Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing Assurance (STA) Program (a compost testing and information disclosure program). Compost quality should be verified via a lab analysis to be:
 - Feedstock materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
 - Organic matter: 35-75% dry weight basis.
 - Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1
 - Maturity/Stability: shall have dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120 F) upon delivery or rewetting is not acceptable.
 - Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
 - $\text{NH}_4:\text{NH}_3 < 3$
 - Ammonium < 500 ppm, dry weight basis
 - Seed Germination > 80% of control

- Plant trials > 80% of control
- Solvita® > 5 index value
- Nutrient content:
 - Total Nitrogen content 0.9% or above preferred
 - Total Boron should be <80 ppm, soluble boron < 2.5 ppm
- Salinity: < 6.0 mmhos/cm
- pH between 6.5 and 8 (may vary with plant palette)

Compost for bioretention should be analyzed by an accredited lab using #200, ¼ inch, ½ inch, and 1 inch sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation:

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
1 inch	99	100
½ inch	90	100
¼ inch	40	90
#200	2	10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

Note: the gradation of compost used in bioretention media is believed to play an important role in the saturated hydraulic conductivity of the media. To achieve a higher saturated hydraulic conductivity, it may be necessary to utilize compost at the coarser end of this range (“minimum” column). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, a coarser compost mix provides more heterogeneity of the bioretention media, which is believed to be advantageous for more rapid development of soil structure needed to support health biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

- 5) The bioretention area should be covered with 2 to 4 inches (average 3 inches) of mulch at the start and an additional placement of 1 to 2 inches of mulch should be added annually. *The intention is that to help sustain the nutrient levels, suppress weeds, retain moisture, and maintain infiltration capacity.*

Plants

Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 96 hours.

It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.

Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent practicable.

Operations and Maintenance

Bioretention areas require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, bioretention maintenance requirements are typical landscape care procedures and include:

- 1) **Watering:** Plants should be selected to be drought-tolerant and not require watering after establishment (2 to 3 years). Watering may be required during prolonged dry periods after plants are established.
- 2) **Erosion control:** Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix I for a bioretention inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems except perhaps in extreme events. If erosion problems occur, the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the pretreatment area and flow entrance. If sediment is deposited in the bioretention area, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.
- 3) **Plant material:** Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants have been excluded.
- 4) **Nutrient and pesticides:** The soil mix and plants are selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the bioretention area, as well as contribute pollutant loads to receiving waters. By design, bioretention facilities are located in areas where phosphorous and nitrogen levels are often elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.

- 5) **Mulch:** Replace mulch annually in bioretention facilities where high trash, sediment load, and heavy metal deposition is likely (e.g., heavy metal contributing areas include industrial and auto dealer/repair parking lots and roads). In residential lots or other areas where metal deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.
- 6) **Soil:** Soil mixes for bioretention facilities are designed to maintain long-term fertility and pollutant processing capability. Replacing mulch in bioretention facilities where high trash, sediment load, and heavy metal deposition are likely provides an additional level of protection for prolonged performance. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental concern for at least 20 years in bioretention systems. However, the saturated hydraulic conductivity should be assessed at least annually to ensure that the design water quality event is being treated. If in question, have soil analyzed for fertility and pollutant levels.

BIO-2: Planter Box

Planter boxes are bioretention treatment control measures that are completely contained within an impermeable structure with an underdrain (they do not infiltrate). These facilities function as a soil and plant based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, plantings, and an underdrain within the planter box. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, and biodegraded by the soil and plants. Planter boxes are comprised of a variety of materials, usually chosen to be the same material as the adjacent building or sidewalk.

Planter boxes may be placed adjacent to or near buildings, other structures, or sidewalks. Planter boxes can be used directly adjacent to buildings beneath downspouts as long as the boxes are properly lined on the building side and the overflow outlet discharges away from the building to ensure water does not percolate into footings or foundations. They can also be placed further away from buildings by conveying roof runoff in shallow engineered open conveyances, shallow pipes, or other innovative drainage structures.



Planter boxes extending along a building wall

Photo Credit: Geosyntec Consultants

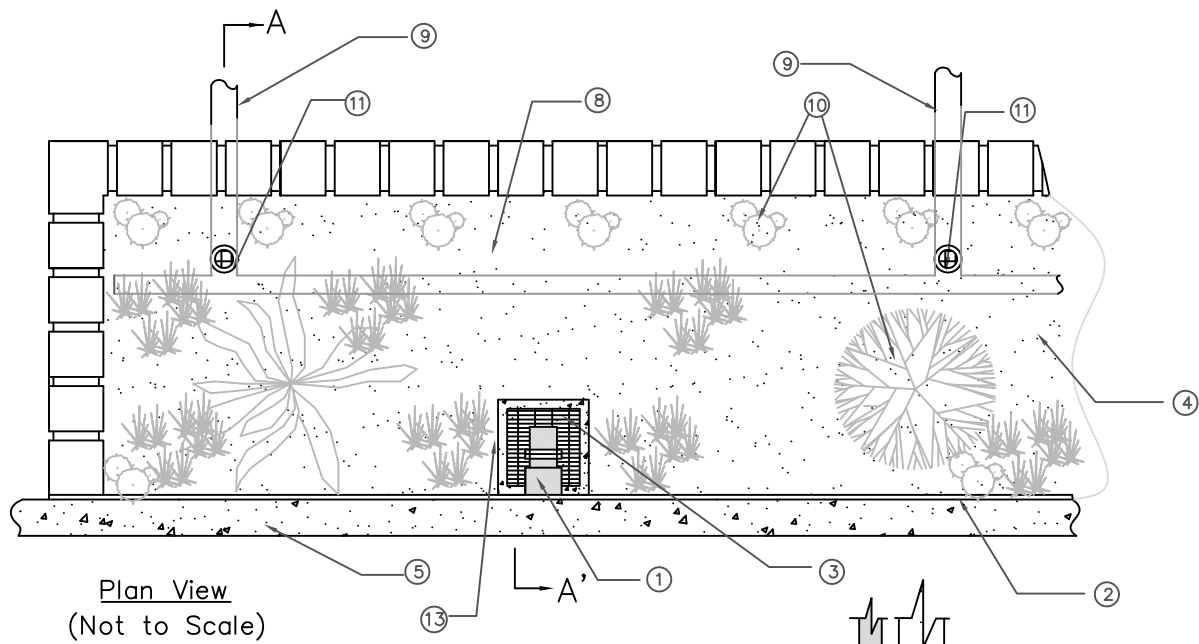
Application

- Areas adjacent to buildings and sidewalks
- Building entrances, courtyards, and walkways

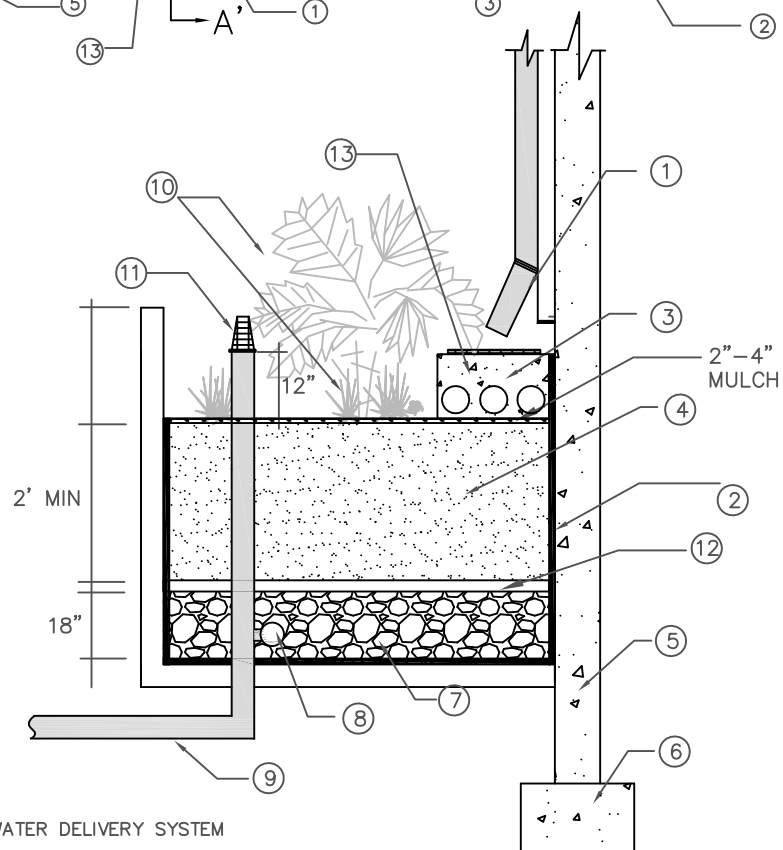
Preventative Maintenance

- Repair small eroded areas
- Remove trash and debris and rake surface soils
- Remove accumulated fine sediments, dead leaves, and trash
- Remove weeds and prune back excess plant growth
- Remove sediment and debris accumulation near inlet and outlet structures

Periodically observe function under wet weather conditions



Section A – A'
(Not to Scale)



NOTES:

- ① ROOF DOWNSPOUT OR OTHER STORMWATER DELIVERY SYSTEM
- ② WATERPROOF BARRIER
- ③ SHALLOW ENERGY DISSIPATOR BASIN DISPERSES FLOW AT SOIL SURFACE
- ④ SOIL MIX (SEE PLANTING MEDIA SECTION)
- ⑤ BUILDING
- ⑥ FOUNDATION. INSTALL FOUNDATION DRAINS AS NEEDED
- ⑦ GRAVEL BEDDING (SEE UNDERDRAIN)
- ⑧ PERFORATED PIPE SHALL RUN ENTIRE LENGTH OF PLANTER
- ⑨ CONNECTION TO DOWNSTREAM CONVEYANCE SYSTEM
- ⑩ PLANTS
- ⑪ SET OVERFLOW 2" BELOW THE TOP OF THE PLANTER
- ⑫ OPTIONAL CHOKING GRAVEL LAYER

Geosyntec
consultants

Figure 6-11: Planter Box

Limitations

The applicability of stormwater planter boxes is limited by the following site characteristics:

- 1) The tributary area (area draining to the planter box area) should be less than 15,000 ft².
- 2) Groundwater levels should be at least 2 ft lower than the bottom of the planter box.
- 3) Site must have adequate vertical relief between land surface and the stormwater conveyance system to permit connection of the underdrain to the stormwater conveyance system.
- 4) Planter boxes should not be located in areas with excessive shade to avoid poor vegetative growth. For moderately shaded areas, shade tolerant plants should be used.

Design Criteria

Planter boxes should be designed according to the requirements listed in Table 6-19 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-19: Planter Box Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Drawdown time of planting soil	hours	12
Maximum ponding depth	inches	12
Minimum soil depth	feet	2; 3 preferred
Stabilized mulch depth	inches	2 to 3
Planting soil composition	-	60 to 70% sand, 30 to 40% compost
Underdrain	-	6 inch minimum diameter; 0.5% minimum slope; slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent)
Overflow device	-	Required

Sizing Criteria

See [Sizing Criteria](#) section in the BIO-1: Bioretention with underdrains fact sheet.

Geometry and Size

- 1) Planter boxes areas should be sized to capture and treat the SQDV with a 12 inch maximum ponding depth. The mulch layer should be included as part of the ponding depth.
- 2) Minimum soil depth should be 2 feet, although 3 feet is preferred. *The intention is that a minimum soil depth should provide a beneficial root zone for the chosen plant palette and adequate water storage for the SQDV. A deeper planting soil depth will provide a smaller surface area footprint.*
- 3) Planter boxes should be designed to drain to below the planting soil depth in less than 48 hours. *The intention is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, prevent long periods of saturation for plant health, maintain adequate soil oxygen levels for healthy soil biota and vegetation, reduce potential for vector breeding, and provide proper soil conditions for biodegradation and retention of pollutants.*
- 4) Any planter box shape configuration is possible as long as other design criteria are met.
- 5) The distance between the downspouts and the overflow outlet should be maximized. *The intention is to increase the opportunity for stormwater retention and filtration.*
- 6) Off-line configurations should be considered to minimize the possibility of scouring and resuspension of previously captured pollutants during large storms.

Structural Materials

- 1) Planter boxes should be constructed out of stone, concrete, brick, recycled plastic, or other permanent materials. Pressure-treated wood or other materials that may leach pollutants (e.g., arsenic, copper, zinc, etc.) should not be allowed.
- 2) The structure should be adequately sealed or a waterproof membrane installed to ensure water only exits the structure via the underdrain.

Flow Entrance and Energy Dissipation

The following types of flow entrance can be used for planter boxes:

- 1) Pipe flow entrance: Piped entrances, such as roof downspouts, should include rock, splash blocks, or other appropriate measures at the entrance to dissipate energy and disperse flows.

- 2) Woody plants (e.g., trees, shrubs, etc.) can restrict or concentrate flows and can be damaged by erosion around the root ball and should not be placed directly in the entrance flow path.

Underdrains

Underdrains are required and should meet the following criteria:

- 1) 6-inch minimum diameter.
- 2) Underdrains should be made of slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent). *The intention is that in comparison to round-hole perforated pipe, slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.*
- 3) Slotted pipe should have 2 to 4 rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inch and should have a length of 1 to 1.25 inches. Slots should be longitudinally spaced such that the pipe has a minimum of one square inch opening per lineal foot and should face down.
- 4) Underdrains should be sloped at a minimum of 0.5%.
- 5) Rigid non-perforated observation pipes with a diameter equal to the underdrain diameter should be connected to the underdrain every 100 feet to provide a clean-out port as well as an observation well to monitor dewatering rates. The wells/cleanouts should be connected to the perforated underdrain with the appropriate manufactured connections. The wells/cleanouts should extend 6 inches above the top elevation of the bioretention facility mulch, and should be capped with a lockable screw cap. The ends of underdrain pipes not terminating in an observation well/cleanout should also be capped.
- 6) The following aggregate should be used to provide a gravel blanket and bedding for the underdrain pipe. Place the underdrain on a bed of washed aggregate at a minimum thickness of 6 inches and cover it with the same aggregate to provide a 1 foot minimum depth around the top and sides of the slotted pipe.

Sieve size	Percent Passing
¾ inch	100
¼ inch	30-60
US No. 8	20-50
US No. 50	3-12
US No. 200	0-1

- 7) At the option of the designer/geotechnical engineer, a geotextile fabric may be placed between the planting media and the drain rock. If a geotextile fabric is used, it should

meet a minimum permittivity rate of 75 gal/min/ft², should not impede the infiltration rate of the soil medium, and should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Preferably, aggregate should be used in place of filter fabric to reduce the potential for clogging. This aggregate layer should consist of 2 to 4 inches of washed sand underlain with 2 inches of choking stone (Typically #8 or #89 washed).

- 8) The underdrain should be elevated from the bottom of the bioretention facility by 6 inches within the gravel blanket to create a fluctuating anaerobic/aerobic zone below the drain pipe. *The intention is that denitrification within the anaerobic/anoxic zone is facilitated by microbes using forms of nitrogen (NO₂ and NO₃) instead of oxygen for respiration.*
- 9) The underdrain must drain freely to an acceptable discharge point. The underdrain can be connected to a downstream open conveyance (vegetated swale), to another bioretention cell as part of a connected treatment system, to a storm drain, daylight to a vegetated dispersion area using an effective flow dispersion device, or to a storage facility for rainwater harvesting.

Overflow

An overflow device is required to be set at 2 inches below the top of the planter and no more than 12 inches above the soil surface. The most common option is a vertical riser, described below.

Vertical riser

- 1) A vertical PVC pipe (SDR 35) should be connected to the underdrain.
- 2) The overflow riser(s) should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe. The vertical pipe will provide access to cleaning the underdrains.
- 3) The inlet to the riser should be a maximum of 12 inches above the planting soil, and be capped with a spider cap. Spider caps should be screwed in or glued (i.e., not removable).

Hydraulic Restriction Layers

A waterproof barrier should be provided to restrict moisture away from foundations. Geomembrane liners should have a minimum thickness of 30 mils. Equivalent waterproofing measures may be used.

Planting/Storage Media

- 1) The planting media placed in the cell should achieve a long-term, in-place infiltration rate of at least 1 inch per hour. Higher infiltration rates are permissible. If the design long-term, in-place infiltration rate of the soil exceeds 12 inches per hour, documentation should be provided to demonstrate that the media will adequately address pollutants of concern at a higher flowrate. Planter box soil shall also support vigorous plant growth.
- 2) Planting media should consist of 60 to 80% fine sand and 20 to 40% compost.
- 3) Sand should be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for the planter box should be analyzed by an accredited lab using #200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements below):

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
3/8 inch	100	100
#4	90	100
#8	70	100
#16	40	95
#30	15	70
#40	5	55
#100	0	15
#200	0	5

Note: the gradation of the sand component of the media is believed to be a major factor in the hydraulic conductivity of the media mix. If the desired hydraulic conductivity of the media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified in above ("minimum" column).

- 4) Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing

Assurance (STA) Program (a compost testing and information disclosure program). Compost quality should be verified via a lab analysis to be:

- Feedstock materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
- Organic matter: 35-75% dry weight basis.
- Carbon and Nitrogen Ratio: $15:1 < C:N < 25:1$
- Maturity/Stability: shall have dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120 F) upon delivery or rewetting is not acceptable.
- Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
 - $NH_4:NH_3 < 3$
 - Ammonium < 500 ppm, dry weight basis
 - Seed Germination $> 80\%$ of control
 - Plant trials $> 80\%$ of control
 - Solvita® > 5 index value
- Nutrient content:
 - Total Nitrogen content 0.9% or above preferred
 - Total Boron should be < 80 ppm, soluble boron < 2.5 ppm
- Salinity: < 6.0 mmhos/cm
- pH between 6.5 and 8 (may vary with plant palette)

Compost for planter box should be analyzed by an accredited lab using #200, 1/4 inch, 1/2 inch, and 1 inch sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation:

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
1 inch	99	100
1/2 inch	90	100
1/4 inch	40	90
#200	2	10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

Note: the gradation of compost used in planter box media is believed to play an important role in the saturated hydraulic conductivity of the media. To achieve a higher saturated hydraulic conductivity, it may be necessary to utilize compost at the coarser end of this range (“minimum” column). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, a coarser compost mix provides more heterogeneity of the planter box media, which is believed to be advantageous for more rapid development of soil structure needed to support health biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

- 5) The planter box should be covered with 2 to 4 inches (average 3 inches) of mulch at the start and an additional placement of 1 to 2 inches of mulch should be added annually. *The intention is that to help sustain the nutrient levels, suppress weeds, retain moisture, and maintain infiltration capacity.*

Plants

- 1) Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 96 hours.
- 2) It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.
- 3) Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent practicable.
- 4) Plants should be selected carefully to minimize maintenance and function properly.

Operations and Maintenance

Planter boxes require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, planter box maintenance requirements are typical of landscape care procedures and include:

- 1) Watering: Plants should be selected to be drought-tolerant and do not require watering after establishment (2 to 3 years). Watering may be required during prolonged dry periods after plants are established.
- 2) Erosion control: Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix I for an inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems

- except perhaps in extreme events. If erosion problems occur, the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the flow entrance. If sediment is deposited in the planter box, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.
- 3) Plant material: Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants have been excluded.
 - 4) Nutrients and pesticides: The soil mix and plants are selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the planter box area, as well as contribute pollutant loads to receiving waters. By design, planter boxes are located in areas where phosphorous and nitrogen levels are often elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.
 - 5) Mulch: Replace mulch annually in planter boxes where high trash, sediment load, and heavy metal deposition is likely (e.g., heavy metal contributing areas include industrial, auto dealer/repair, parking lots, and roads). In residential lots or other areas where metal deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.
 - 6) Soil: Soil mixes for planter boxes are designed to maintain long-term fertility and pollutant processing capability. Replacing mulch in planter boxes where high trash, sediment load, and heavy metal deposition are likely provides an additional level of protection for prolonged performance. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental concern for at least 20 years in planter boxes. However, the saturated hydraulic conductivity should be assessed at least annually to ensure that the design water quality event is being treated. If in question, have soil analyzed for fertility and pollutant levels.

Attachment E-3
Biotreatment BMPs Design Computations

R300652.01 CSUCI University Glen
SQDF Calculations
Drainage Area C-1.1

Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), <i>Aproject</i>	<i>Aproject</i> =	3.68	acres
1-2.	Enter the impervious fraction, <i>Imp</i>	<i>Imp</i> =	0.70	
1-3.	Determine pervious runoff coefficient using Table E-1, <i>Cp</i>	<i>Cp</i> =	0.1	(Soil Type #2)
1-4.	Calculate runoff coefficient, <i>C = 0.95*Imp + Cp (1-Imp)</i>	<i>C</i> =	0.70	
1-5.	Enter design rainfall intensity (in/hr), <i>I</i> (<i>Tc=8min</i>)	<i>i</i> =	0.2	in/hr
1-6.	Calculate Water Quality Design Flow (cfs), <i>SQDF = CiA</i>	<i>SQDF</i> =	0.51	cfs

R300652.01 CSUCI University Glen

SQDF Calculations

Drainage Area C-1.2

Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), <i>A_{project}</i>	<i>A_{project}</i> =	5.11	acres
1-2.	Enter the impervious fraction, <i>Imp</i>	<i>Imp</i> =	0.70	
1-3.	Determine pervious runoff coefficient using Table E-1, <i>C_p</i>	<i>C_p</i> =	0.1	(Soil Type #2)
1-4.	Calculate runoff coefficient, <i>C = 0.95*Imp + C_p (1-Imp)</i>	<i>C</i> =	0.70	
1-5.	Enter design rainfall intensity (in/hr), <i>I</i> (<i>T_c</i> =8min)	<i>i</i> =	0.2	in/hr
1-6.	Calculate Water Quality Design Flow (cfs), <i>SQDF = CiA</i>	<i>SQDF</i> =	0.71	cfs

R300652.01 CSUCI University Glen

SQDF Calculations

Drainage Area C-2.1

Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), <i>Aproject</i>	<i>Aproject</i> =	3.22	acres
1-2.	Enter the impervious fraction, <i>Imp</i>	<i>Imp</i> =	0.70	
1-3.	Determine pervious runoff coefficient using Table E-1, <i>Cp</i>	<i>Cp</i> =	0.1	(Soil Type #2)
1-4.	Calculate runoff coefficient, $C = 0.95 * Imp + Cp (1 - Imp)$	<i>C</i> =	0.70	
1-5.	Enter design rainfall intensity (in/hr), <i>I</i> (<i>Tc</i> =8min)	<i>i</i> =	0.2	in/hr
1-6.	Calculate Water Quality Design Flow (cfs), $SQDF = CiA$	<i>SQDF</i> =	0.45	cfs

R300652.01 CSUCI University Glen

SQDF Calculations

Drainage Area C-2.2

Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), $A_{project}$	$A_{project} =$	4.34	acres
1-2.	Enter the impervious fraction, Imp	$Imp =$	0.70	
1-3.	Determine pervious runoff coefficient using Table E-1, C_p	$C_p =$	0.1	(Soil Type #2)
1-4.	Calculate runoff coefficient, $C = 0.95 * Imp + C_p (1 - Imp)$	$C =$	0.70	
1-5.	Enter design rainfall intensity (in/hr), I ($T_c = 8min$)	$i =$	0.2	in/hr
1-6.	Calculate Water Quality Design Flow (cfs), $SQDF = CiA$	$SQDF =$	0.60	cfs

R300652.01 CSUCI University Glen

SQDF Calculations

Drainage Area C-3.1

Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), <i>Aproject</i>	<i>Aproject</i> =	9.24	acres
1-2.	Enter the impervious fraction, <i>Imp</i>	<i>Imp</i> =	0.70	
1-3.	Determine pervious runoff coefficient using Table E-1, <i>Cp</i>	<i>Cp</i> =	0.1	(Soil Type #2)
1-4.	Calculate runoff coefficient, $C = 0.95 * Imp + Cp (1 - Imp)$	<i>C</i> =	0.70	
1-5.	Enter design rainfall intensity (in/hr), <i>I</i> (<i>Tc</i> =10min)	<i>i</i> =	0.2	in/hr
1-6.	Calculate Water Quality Design Flow (cfs), $SQDF = CiA$	<i>SQDF</i> =	1.28	cfs

R300652.01 CSUCI University Glen

SQDF Calculations

Drainage Area C-3.2

Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), <i>A_{project}</i>	<i>A_{project}</i> =	4.38	acres
1-2.	Enter the impervious fraction, <i>Imp</i>	<i>Imp</i> =	0.70	
1-3.	Determine pervious runoff coefficient using Table E-1, <i>C_p</i>	<i>C_p</i> =	0.1	(Soil Type #2)
1-4.	Calculate runoff coefficient, <i>C = 0.95*Imp + C_p (1-Imp)</i>	<i>C</i> =	0.70	
1-5.	Enter design rainfall intensity (in/hr), <i>I</i> (<i>T_c</i> =8min)	<i>i</i> =	0.2	in/hr
1-6.	Calculate Water Quality Design Flow (cfs), <i>SQDF = CiA</i>	<i>SQDF</i> =	0.61	cfs

R300652.01 CSUCI University Glen

SQDF Calculations

Drainage Area C-3.3

Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), <i>Aproject</i>	<i>Aproject</i> =	1.41	acres
1-2.	Enter the impervious fraction, <i>Imp</i>	<i>Imp</i> =	0.70	
1-3.	Determine pervious runoff coefficient using Table E-1, <i>Cp</i>	<i>Cp</i> =	0.1	(Soil Type #2)
1-4.	Calculate runoff coefficient, $C = 0.95 * Imp + Cp (1 - Imp)$	<i>C</i> =	0.70	
1-5.	Enter design rainfall intensity (in/hr), <i>I</i> (<i>Tc</i> =8min)	<i>i</i> =	0.2	in/hr
1-6.	Calculate Water Quality Design Flow (cfs), $SQDF = CiA$	<i>SQDF</i> =	0.20	cfs

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SQDF Calculations
Drainage Area A7.1

Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), <i>A_{project}</i>	<i>A_{project}</i> =	2.03	acres
1-2.	Enter the impervious fraction, <i>Imp</i>	<i>Imp</i> =	0.70	
1-3.	Determine pervious runoff coefficient using Table E-1, <i>C_p</i>	<i>C_p</i> =	0.15	(Soil Type #1)
1-4.	Calculate runoff coefficient, <i>C = 0.95*Imp + C_p (1-Imp)</i>	<i>C</i> =	0.71	
1-5.	Enter design rainfall intensity (in/hr), <i>I</i> (<i>T_c</i> =6min)	<i>i</i> =	0.2	in/hr
1-6.	Calculate Water Quality Design Flow (cfs), <i>SQDF = CiA</i>	<i>SQDF</i> =	0.288	cfs

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SQDV Calculations

Drainage Area C-1.1

Step 1: Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), $A_{project}$	$A_{project} =$	3.68	acres
1-2.	Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} =$	5	%
1-3.	Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$	0.18	acres
1-4.	Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp =	0.70	
1-5.	Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	TIA =	2.58	acres
1-6.	Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$	2.39	acres
1-7.	Determine pervious runoff coefficient using Table E-1, C_p	$C_p =$	0.1	(Soil Type #2)
1-8.	Calculate runoff coefficient, $C = 0.95 * imp + C_p(1 - imp)$	C =	0.70	
1-9.	Enter design rainfall depth of the storm (in), P_i	$P_i =$	0.75	in
1-10.	Calculate rainfall depth (ft), $P = P_i / 12$	P =	0.06	ft
1-11.	Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$ - Includes 50% factor for biofiltration for technical infeasibility	SQDV	6794	ft ³
Step 2: Determine Water Quality Design Flow				
2-1.	Enter the design saturated hydraulic conductivity of the amended filter media (2.5 in/hr recommended rate, K_{design})	$K_{design} =$	2.5	in/hr
Step 3: Calculate Bioretention / Planter Box surface area				
3-1.	Enter water quality design volume (ft ³), SQDV	SQDV =	6794	ft ³
3-2.	Enter design saturated hydraulic conductivity (in/hr), K_{design}	$K_{design} =$	2.50	in/hr
3-3.	Enter ponding depth (max 1.5 ft for Bioretention, 1 ft for Planter Box) above area, d_p	$d_p =$	1.5	ft
3-4.	Calculate the drawdown time for the ponded water to filter through media (hours), $t_{ponding} = (d_p / K_{design}) * 12$	$t_{ponding} =$	7.20	hrs
3-5.	Enter the storm duration for routing calculations (use 3 hours unless there is rationale for an alternative), $T_{routing}$	$T_{routing} =$	3	hrs
3-6a.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,1} = (K_{design} * T_{routing}) / 12$	$d_{filtered,1} =$	0.63	ft
3-6b.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,2} = d_p / 2$	$d_{filtered,2} =$	0.75	ft
3-7.	Enter the resultant depth (ft) (the lesser of the two calculated above), $d_{filtered}$	$d_{filtered} =$	0.63	ft

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SQDV Calculations

Drainage Area C-1.1

3-8.	Calculate the infiltrating surface area as follows (ft ²): $A_{req} = SQDV / (D_p + d_{filtered})$	$A_{req} =$	3197	ft ²
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Step 4: Calculate Bioretention Area Total Footprint

4-1.	Available footprint	$A_{tot} =$	5030	ft ²
<i>OK</i>				

Step 5: Calculate Underdrain System Capacity

5-1.	Calculated filtered flow rate to be conveyed by the longitudinal drain pipe, $Q_f = K_{design} A_{req} / 43,200$	$Q_f =$	0.19	cfs
5-2.	Enter minimum slope for energy gradient, S_e	$S_e =$	0.005	
5-3.	Enter Hazen-Williams coefficient for plastic, C_{HW}	$C_{HW} =$	140	
5-4.	Enter pipe diameter (min 6 inches), D	$D =$	6	in
5-5.	Calculate pipe hydraulic radius (ft), $R_h = D/48$	$R_h =$	0.13	ft
5-6.	Calculate velocity at the outlet of the pipe (ft/s), $V_p = 1.318 C_{HW} R_h^{0.63} S_e^{0.54}$	$V_p =$	2.85	ft/s
5-7.	Calculate pipe capacity (cfs), $Q_{cap} = 0.25\pi(D/12)^2 V_p$	$Q_{cap} =$	0.56	cfs

Note: A 6" underdrain pipe is provided in the design. The 6" pipe provides a longer residence time, which benefits pollutant removal in the media. The drawdown time for the 85th percentile storm is still less than 48 hours (7.4 hours).

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SQDV Calculations

Drainage Area C-1.2

Step 1: Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), $A_{project}$	$A_{project} =$	5.11	acres
1-2.	Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} =$	5	%
1-3.	Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$	0.26	acres
1-4.	Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp =	0.70	
1-5.	Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	TIA =	3.58	acres
1-6.	Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$	3.32	acres
1-7.	Determine pervious runoff coefficient using Table E-1, C_p	$C_p =$	0.1	(Soil Type #2)
1-8.	Calculate runoff coefficient, $C = 0.95 * imp + C_p(1 - imp)$	C =	0.70	
1-9.	Enter design rainfall depth of the storm (in), P_i	$P_i =$	0.75	in
1-10.	Calculate rainfall depth (ft), $P = P_i / 12$	P =	0.06	ft
1-11.	Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$ - Includes 50% factor for biofiltration for technical infeasibility	SQDV	9424	ft ³
Step 2: Determine Water Quality Design Flow				
2-1.	Enter the design saturated hydraulic conductivity of the amended filter media (2.5 in/hr recommended rate, K_{design})	$K_{design} =$	2.5	in/hr
Step 3: Calculate Bioretention / Planter Box surface area				
3-1.	Enter water quality design volume (ft ³), SQDV	SQDV =	9424	ft ³
3-2.	Enter design saturated hydraulic conductivity (in/hr), K_{design}	$K_{design} =$	2.50	in/hr
3-3.	Enter ponding depth (max 1.5 ft for Bioretention, 1 ft for Planter Box) above area, d_p	$d_p =$	1.5	ft
3-4.	Calculate the drawdown time for the ponded water to filter through media (hours), $t_{ponding} = (d_p / K_{design}) * 12$	$t_{ponding} =$	7.20	hrs
3-5.	Enter the storm duration for routing calculations (use 3 hours unless there is rationale for an alternative), $T_{routing}$	$T_{routing} =$	3	hrs
3-6a.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,1} = (K_{design} * T_{routing}) / 12$	$d_{filtered,1} =$	0.63	ft
3-6b.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,2} = d_p / 2$	$d_{filtered,2} =$	0.75	ft
3-7.	Enter the resultant depth (ft) (the lesser of the two calculated above), $d_{filtered}$	$d_{filtered} =$	0.63	ft

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SQDV Calculations

Drainage Area C-1.2

3-8.	Calculate the infiltrating surface area as follows (ft ²): $A_{req} = SQDV / (D_p + d_{filtered})$	$A_{req} =$	4435	ft ²
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Step 4: Calculate Bioretention Area Total Footprint

4-1.	Available footprint	$A_{tot} =$	7117	ft ²
<i>OK</i>				

Step 5: Calculate Underdrain System Capacity

5-1.	Calculated filtered flow rate to be conveyed by the longitudinal drain pipe, $Q_f = K_{design} A_{req} / 43,200$	$Q_f =$	0.26	cfs
5-2.	Enter minimum slope for energy gradient, S_e	$S_e =$	0.005	
5-3.	Enter Hazen-Williams coefficient for plastic, C_{HW}	$C_{HW} =$	140	
5-4.	Enter pipe diameter (min 6 inches), D	$D =$	6	in
5-5.	Calculate pipe hydraulic radius (ft), $R_h = D/48$	$R_h =$	0.13	ft
5-6.	Calculate velocity at the outlet of the pipe (ft/s), $V_p = 1.318 C_{HW} R_h^{0.63} S_e^{0.54}$	$V_p =$	2.85	ft/s
5-7.	Calculate pipe capacity (cfs), $Q_{cap} = 0.25\pi(D/12)^2 V_p$	$Q_{cap} =$	0.56	cfs

Note: A 6" underdrain pipe is provided in the design. The 6" pipe provides a longer residence time, which benefits pollutant removal in the media. The drawdown time for the 85th percentile storm is still less than 48 hours (7.4 hours).

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SQDV Calculations

Drainage Area C-2.1

Step 1: Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), $A_{project}$	$A_{project} =$	3.22	acres
1-2.	Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} =$	5	%
1-3.	Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$	0.16	acres
1-4.	Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp =	0.70	
1-5.	Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	TIA =	2.26	acres
1-6.	Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$	2.09	acres
1-7.	Determine pervious runoff coefficient using Table E-1, C_p	$C_p =$	0.1	(Soil Type #2)
1-8.	Calculate runoff coefficient, $C = 0.95 * imp + C_p(1 - imp)$	C =	0.70	
1-9.	Enter design rainfall depth of the storm (in), P_i	$P_i =$	0.75	in
1-10.	Calculate rainfall depth (ft), $P = P_i / 12$	P =	0.06	ft
1-11.	Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$ - Includes 50% factor for biofiltration for technical infeasibility	SQDV	5945	ft ³
Step 2: Determine Water Quality Design Flow				
2-1.	Enter the design saturated hydraulic conductivity of the amended filter media (2.5 in/hr recommended rate, K_{design})	$K_{design} =$	2.5	in/hr
Step 3: Calculate Bioretention / Planter Box surface area				
3-1.	Enter water quality design volume (ft ³), SQDV	SQDV =	5945	ft ³
3-2.	Enter design saturated hydraulic conductivity (in/hr), K_{design}	$K_{design} =$	2.50	in/hr
3-3.	Enter ponding depth (max 1.5 ft for Bioretention, 1 ft for Planter Box) above area, d_p	$d_p =$	1.25	ft
3-4.	Calculate the drawdown time for the ponded water to filter through media (hours), $t_{ponding} = (d_p / K_{design}) * 12$	$t_{ponding} =$	6.00	hrs
3-5.	Enter the storm duration for routing calculations (use 3 hours unless there is rationale for an alternative), $T_{routing}$	$T_{routing} =$	3	hrs
3-6a.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,1} = (K_{design} * T_{routing}) / 12$	$d_{filtered,1} =$	0.63	ft
3-6b.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,2} = d_p / 2$	$d_{filtered,2} =$	0.63	ft
3-7.	Enter the resultant depth (ft) (the lesser of the two calculated above), $d_{filtered}$	$d_{filtered} =$	0.63	ft

SQDV Calculations

Drainage Area C-2.1

3-8.	Calculate the infiltrating surface area as follows (ft ²): $A_{req} = SQDV / (D_p + d_{filtered})$	$A_{req} =$	3171	ft ²
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Step 4: Calculate Bioretention Area Total Footprint

4-1.	Calculate total footprint required by including a buffer for side slopes and freeboard (ft ²) [A_{req} is measured as the filter bottom area (toe of side slopes)], A_{tot}	$A_{tot} =$	3945	ft ²
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Step 5: Calculate Underdrain System Capacity

5-1.	Calculated filtered flow rate to be conveyed by the longitudinal drain pipe, $Q_f = K_{design} A_{req} / 43,200$	$Q_f =$	0.18	cfs
5-2.	Enter minimum slope for energy gradient, S_e	$S_e =$	0.005	
5-3.	Enter Hazen-Williams coefficient for plastic, C_{HW}	$C_{HW} =$	140	
5-4.	Enter pipe diameter (min 6 inches), D	$D =$	6	in
5-5.	Calculate pipe hydraulic radius (ft), $R_h = D/48$	$R_h =$	0.13	ft
5-6.	Calculate velocity at the outlet of the pipe (ft/s), $V_p = 1.318 C_{HW} R_h^{0.63} S_e^{0.54}$	$V_p =$	2.85	ft/s
5-7.	Calculate pipe capacity (cfs), $Q_{cap} = 0.25\pi(D/12)^2 V_p$	$Q_{cap} =$	0.56	cfs

Note: A 6" underdrain pipe is provided in the design. The 6" pipe provides a longer residence time, which benefits pollutant removal in the media. The drawdown time for the 85th percentile storm is still less than 48 hours (7.4 hours).

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SQDV Calculations

Drainage Area C-2.2

Step 1: Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), $A_{project}$	$A_{project} =$	4.34	acres
1-2.	Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} =$	5	%
1-3.	Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$	0.22	acres
1-4.	Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp =	0.70	
1-5.	Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	TIA =	3.04	acres
1-6.	Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$	2.82	acres
1-7.	Determine pervious runoff coefficient using Table E-1, C_p	$C_p =$	0.1	(Soil Type #2)
1-8.	Calculate runoff coefficient, $C = 0.95 * imp + C_p(1 - imp)$	C =	0.70	
1-9.	Enter design rainfall depth of the storm (in), P_i	$P_i =$	0.75	in
1-10.	Calculate rainfall depth (ft), $P = P_i / 12$	P =	0.06	ft
1-11.	Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$ - Includes 50% factor for biofiltration for technical infeasibility	SQDV	8015	ft ³
Step 2: Determine Water Quality Design Flow				
2-1.	Enter the design saturated hydraulic conductivity of the amended filter media (2.5 in/hr recommended rate, K_{design})	$K_{design} =$	2.5	in/hr
Step 3: Calculate Bioretention / Planter Box surface area				
3-1.	Enter water quality design volume (ft ³), SQDV	SQDV =	8015	ft ³
3-2.	Enter design saturated hydraulic conductivity (in/hr), K_{design}	$K_{design} =$	2.50	in/hr
3-3.	Enter ponding depth (max 1.5 ft for Bioretention, 1 ft for Planter Box) above area, d_p	$d_p =$	1	ft
3-4.	Calculate the drawdown time for the ponded water to filter through media (hours), $t_{ponding} = (d_p / K_{design}) * 12$	$t_{ponding} =$	4.80	hrs
3-5.	Enter the storm duration for routing calculations (use 3 hours unless there is rationale for an alternative), $T_{routing}$	$T_{routing} =$	3	hrs
3-6a.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,1} = (K_{design} * T_{routing}) / 12$	$d_{filtered,1} =$	0.63	ft
3-6b.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,2} = d_p / 2$	$d_{filtered,2} =$	0.50	ft
3-7.	Enter the resultant depth (ft) (the lesser of the two calculated above), $d_{filtered}$	$d_{filtered} =$	0.50	ft

SQDV Calculations

Drainage Area C-2.2

3-8.	Calculate the infiltrating surface area as follows (ft ²): $A_{\text{req}} = \text{SQDV} / (D_p + d_{\text{filtered}})$	$A_{\text{req}} =$	5343	ft ²
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Step 4: Calculate Bioretention Area Total Footprint

4-1.	Calculate total footprint required by including a buffer for side slopes and freeboard (ft ²) [A_{req} is measured as the filter bottom area (toe of side slopes)], A_{tot}	$A_{\text{tot}} =$	5835	ft ²
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Step 5: Calculate Underdrain System Capacity

5-1.	Calculated filtered flow rate to be conveyed by the longitudinal drain pipe, $Q_f = K_{\text{design}} A_{\text{req}} / 43,200$	$Q_f =$	0.31	cfs
5-2.	Enter minimum slope for energy gradient, S_e	$S_e =$	0.005	
5-3.	Enter Hazen-Williams coefficient for plastic, C_{HW}	$C_{\text{HW}} =$	140	
5-4.	Enter pipe diameter (min 6 inches), D	$D =$	6	in
5-5.	Calculate pipe hydraulic radius (ft), $R_h = D/48$	$R_h =$	0.13	ft
5-6.	Calculate velocity at the outlet of the pipe (ft/s), $V_p = 1.318 C_{\text{HW}} R_h^{0.63} S_e^{0.54}$	$V_p =$	2.85	ft/s
5-7.	Calculate pipe capacity (cfs), $Q_{\text{cap}} = 0.25\pi(D/12)^2 V_p$	$Q_{\text{cap}} =$	0.56	cfs

Note: A 6" underdrain pipe is provided in the design. The 6" pipe provides a longer residence time, which benefits pollutant removal in the media. The drawdown time for the 85th percentile storm is still less than 48 hours (7.4 hours).

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SQDV Calculations

Drainage Area C-3.1

Step 1: Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), $A_{project}$	$A_{project} =$	9.42	acres
1-2.	Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} =$	5	%
1-3.	Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$	0.47	acres
1-4.	Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp =	0.70	
1-5.	Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	TIA =	6.60	acres
1-6.	Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$	6.13	acres
1-7.	Determine pervious runoff coefficient using Table E-1, C_p	$C_p =$	0.1	(Soil Type #2)
1-8.	Calculate runoff coefficient, $C = 0.95 * imp + C_p(1 - imp)$	C =	0.70	
1-9.	Enter design rainfall depth of the storm (in), P_i	$P_i =$	0.75	in
1-10.	Calculate rainfall depth (ft), $P = P_i / 12$	P =	0.06	ft
1-11.	Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$	SQDV	11591	ft ³
Step 2: Determine Water Quality Design Flow				
2-1.	Enter the design saturated hydraulic conductivity of the amended filter media (2.5 in/hr recommended rate, K_{design})	$K_{design} =$	2.5	in/hr
Step 3: Calculate Bioretention / Planter Box surface area				
3-1.	Enter water quality design volume (ft ³), SQDV	SQDV =	11591	ft ³
3-2.	Enter design saturated hydraulic conductivity (in/hr), K_{design}	$K_{design} =$	2.50	in/hr
3-3.	Enter ponding depth (max 1.5 ft for Bioretention, 1 ft for Planter Box) above area, d_p	$d_p =$	1.5	ft
3-4.	Calculate the drawdown time for the ponded water to filter through media (hours), $t_{ponding} = (d_p / K_{design}) * 12$	$t_{ponding} =$	7.20	hrs
3-5.	Enter the storm duration for routing calculations (use 3 hours unless there is rationale for an alternative), $T_{routing}$	$T_{routing} =$	3	hrs
3-6a.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,1} = (K_{design} * T_{routing}) / 12$	$d_{filtered,1} =$	0.63	ft
3-6b.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,2} = d_p / 2$	$d_{filtered,2} =$	0.75	ft
3-7.	Enter the resultant depth (ft) (the lesser of the two calculated above), $d_{filtered}$	$d_{filtered} =$	0.63	ft

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SQDV Calculations

Drainage Area C-3.1

3-8.	Calculate the infiltrating surface area as follows (ft ²): $A_{req} = SQDV / (D_p + d_{filtered})$	$A_{req} =$	5454	ft ²
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Step 4: Calculate Bioretention Area Total Footprint

4-1.	Available footprint	$A_{tot} =$	11573	ft ²
OK				

Step 5: Calculate Underdrain System Capacity

5-1.	Calculated filtered flow rate to be conveyed by the longitudinal drain pipe, $Q_f = K_{design} A_{req} / 43,200$	$Q_f =$	0.32	cfs
5-2.	Enter minimum slope for energy gradient, S_e	$S_e =$	0.005	
5-3.	Enter Hazen-Williams coefficient for plastic, C_{HW}	$C_{HW} =$	140	
5-4.	Enter pipe diameter (min 6 inches), D	$D =$	6	in
5-5.	Calculate pipe hydraulic radius (ft), $R_h = D/48$	$R_h =$	0.13	ft
5-6.	Calculate velocity at the outlet of the pipe (ft/s), $V_p = 1.318 C_{HW} R_h^{0.63} S_e^{0.54}$	$V_p =$	2.85	ft/s
5-7.	Calculate pipe capacity (cfs), $Q_{cap} = 0.25\pi(D/12)^2 V_p$	$Q_{cap} =$	0.56	cfs

Note: A 6" underdrain pipe is provided in the design. The 6" pipe provides a longer residence time, which benefits pollutant removal in the media. The drawdown time for the 85th percentile storm is still less than 48 hours (7.4 hours).

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SQDV Calculations

Drainage Area C-3.2

Step 1: Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), $A_{project}$	$A_{project} =$	4.38	acres
1-2.	Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} =$	5	%
1-3.	Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$	0.22	acres
1-4.	Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp =	0.70	
1-5.	Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	TIA =	3.07	acres
1-6.	Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$	2.85	acres
1-7.	Determine pervious runoff coefficient using Table E-1, C_p	$C_p =$	0.1	(Soil Type #2)
1-8.	Calculate runoff coefficient, $C = 0.95 * imp + C_p(1 - imp)$	C =	0.70	
1-9.	Enter design rainfall depth of the storm (in), P_i	$P_i =$	0.75	in
1-10.	Calculate rainfall depth (ft), $P = P_i / 12$	P =	0.06	ft
1-11.	Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$	SQDV	5386	ft ³
Step 2: Determine Water Quality Design Flow				
2-1.	Enter the design saturated hydraulic conductivity of the amended filter media (2.5 in/hr recommended rate, K_{design})	$K_{design} =$	2.5	in/hr
Step 3: Calculate Bioretention / Planter Box surface area				
3-1.	Enter water quality design volume (ft ³), SQDV	SQDV =	5386	ft ³
3-2.	Enter design saturated hydraulic conductivity (in/hr), K_{design}	$K_{design} =$	2.50	in/hr
3-3.	Enter ponding depth (max 1.5 ft for Bioretention, 1 ft for Planter Box) above area, d_p	$d_p =$	1.5	ft
3-4.	Calculate the drawdown time for the ponded water to filter through media (hours), $t_{ponding} = (d_p / K_{design}) * 12$	$t_{ponding} =$	7.20	hrs
3-5.	Enter the storm duration for routing calculations (use 3 hours unless there is rationale for an alternative), $T_{routing}$	$T_{routing} =$	3	hrs
3-6a.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,1} = (K_{design} * T_{routing}) / 12$	$d_{filtered,1} =$	0.63	ft
3-6b.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,2} = d_p / 2$	$d_{filtered,2} =$	0.75	ft
3-7.	Enter the resultant depth (ft) (the lesser of the two calculated above), $d_{filtered}$	$d_{filtered} =$	0.63	ft

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SQDV Calculations

Drainage Area C-3.2

3-8.	Calculate the infiltrating surface area as follows (ft ²): $A_{req} = SQDV / (D_p + d_{filtered})$	$A_{req} =$	2534	ft ²
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Step 4: Calculate Bioretention Area Total Footprint

4-1.	Available footprint	$A_{tot} =$	11293	ft ²
<i>OK</i>				

Step 5: Calculate Underdrain System Capacity

5-1.	Calculated filtered flow rate to be conveyed by the longitudinal drain pipe, $Q_f = K_{design} A_{req} / 43,200$	$Q_f =$	0.15	cfs
5-2.	Enter minimum slope for energy gradient, S_e	$S_e =$	0.005	
5-3.	Enter Hazen-Williams coefficient for plastic, C_{HW}	$C_{HW} =$	140	
5-4.	Enter pipe diameter (min 6 inches), D	$D =$	6	in
5-5.	Calculate pipe hydraulic radius (ft), $R_h = D/48$	$R_h =$	0.13	ft
5-6.	Calculate velocity at the outlet of the pipe (ft/s), $V_p = 1.318 C_{HW} R_h^{0.63} S_e^{0.54}$	$V_p =$	2.85	ft/s
5-7.	Calculate pipe capacity (cfs), $Q_{cap} = 0.25\pi(D/12)^2 V_p$	$Q_{cap} =$	0.56	cfs

Note: A 6" underdrain pipe is provided in the design. The 6" pipe provides a longer residence time, which benefits pollutant removal in the media. The drawdown time for the 85th percentile storm is still less than 48 hours (7.4 hours).

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SQDV Calculations

Drainage Area C-3.3

Step 1: Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), $A_{project}$	$A_{project} =$	1.41	acres
1-2.	Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} =$	5	%
1-3.	Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$	0.07	acres
1-4.	Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp =	0.70	
1-5.	Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	TIA =	0.99	acres
1-6.	Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$	0.92	acres
1-7.	Determine pervious runoff coefficient using Table E-1, C_p	$C_p =$	0.1	(Soil Type #2)
1-8.	Calculate runoff coefficient, $C = 0.95 * imp + C_p(1 - imp)$	C =	0.70	
1-9.	Enter design rainfall depth of the storm (in), P_i	$P_i =$	0.75	in
1-10.	Calculate rainfall depth (ft), $P = P_i / 12$	P =	0.06	ft
1-11.	Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$ - Includes 50% factor for biofiltration for technical infeasibility	SQDV	2603	ft ³
Step 2: Determine Water Quality Design Flow				
2-1.	Enter the design saturated hydraulic conductivity of the amended filter media (2.5 in/hr recommended rate, K_{design})	$K_{design} =$	2.5	in/hr
Step 3: Calculate Bioretention / Planter Box surface area				
3-1.	Enter water quality design volume (ft ³), SQDV	SQDV =	2603	ft ³
3-2.	Enter design saturated hydraulic conductivity (in/hr), K_{design}	$K_{design} =$	2.50	in/hr
3-3.	Enter ponding depth (max 1.5 ft for Bioretention, 1 ft for Planter Box) above area, d_p	$d_p =$	1.5	ft
3-4.	Calculate the drawdown time for the ponded water to filter through media (hours), $t_{ponding} = (d_p / K_{design}) * 12$	$t_{ponding} =$	7.20	hrs
3-5.	Enter the storm duration for routing calculations (use 3 hours unless there is rationale for an alternative), $T_{routing}$	$T_{routing} =$	3	hrs
3-6a.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,1} = (K_{design} * T_{routing}) / 12$	$d_{filtered,1} =$	0.63	ft
3-6b.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,2} = d_p / 2$	$d_{filtered,2} =$	0.75	ft
3-7.	Enter the resultant depth (ft) (the lesser of the two calculated above), $d_{filtered}$	$d_{filtered} =$	0.63	ft

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SQDV Calculations

Drainage Area C-3.3

3-8.	Calculate the infiltrating surface area as follows (ft ²): $A_{req} = SQDV / (D_p + d_{filtered})$	$A_{req} =$	1225	ft ²
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Step 4: Calculate Bioretention Area Total Footprint

4-1.	Available footprint	$A_{tot} =$	2331	ft ²
<i>OK</i>				

Step 5: Calculate Underdrain System Capacity

5-1.	Calculated filtered flow rate to be conveyed by the longitudinal drain pipe, $Q_f = K_{design} A_{req} / 43,200$	$Q_f =$	0.07	cfs
5-2.	Enter minimum slope for energy gradient, S_e	$S_e =$	0.005	
5-3.	Enter Hazen-Williams coefficient for plastic, C_{HW}	$C_{HW} =$	140	
5-4.	Enter pipe diameter (min 6 inches), D	$D =$	6	in
5-5.	Calculate pipe hydraulic radius (ft), $R_h = D/48$	$R_h =$	0.13	ft
5-6.	Calculate velocity at the outlet of the pipe (ft/s), $V_p = 1.318 C_{HW} R_h^{0.63} S_e^{0.54}$	$V_p =$	2.85	ft/s
5-7.	Calculate pipe capacity (cfs), $Q_{cap} = 0.25\pi(D/12)^2 V_p$	$Q_{cap} =$	0.56	cfs

Note: A 6" underdrain pipe is provided in the design. The 6" pipe provides a longer residence time, which benefits pollutant removal in the media. The drawdown time for the 85th percentile storm is still less than 48 hours (7.4 hours).

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SQDV Calculations

Drainage Area A-7.1

Step 1: Determine Water Quality Design Flow				
1-1.	Enter Project Area (acres), $A_{project}$	$A_{project} =$	2.03	acres
1-2.	Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable} =$	5	%
1-3.	Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project}) * (\%_{allowable})$	$EIA_{allowable} =$	0.10	acres
1-4.	Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp =	0.70	
1-5.	Determine the Project Total Impervious area (acres), $TIA = A_{project} * Imp$	TIA =	1.42	acres
1-6.	Determine the total area from which runoff must be retained (acres), $A_{retain} = TIA - EIA_{allowable}$	$A_{retain} =$	1.32	acres
1-7.	Determine pervious runoff coefficient using Table E-1, C_p	$C_p =$	0.1	(Soil Type #2)
1-8.	Calculate runoff coefficient, $C = 0.95 * imp + C_p(1 - imp)$	C =	0.70	
1-9.	Enter design rainfall depth of the storm (in), P_i	$P_i =$	0.75	in
1-10.	Calculate rainfall depth (ft), $P = P_i / 12$	P =	0.06	ft
1-11.	Calculate water quality design volume (ft ³), $SQDV = 43560 * C * P * A_{retain}$ - Includes 50% factor for biofiltration for technical infeasibility	SQDV	3745	ft ³
Step 2: Determine Water Quality Design Flow				
2-1.	Enter the design saturated hydraulic conductivity of the amended filter media (2.5 in/hr recommended rate, K_{design})	$K_{design} =$	2.5	in/hr
Step 3: Calculate Bioretention / Planter Box surface area				
3-1.	Enter water quality design volume (ft ³), SQDV	SQDV =	3745	ft ³
3-2.	Enter design saturated hydraulic conductivity (in/hr), K_{design}	$K_{design} =$	2.50	in/hr
3-3.	Enter ponding depth (max 1.5 ft for Bioretention, 1 ft for Planter Box) above area, d_p	$d_p =$	1.5	ft
3-4.	Calculate the drawdown time for the ponded water to filter through media (hours), $t_{ponding} = (d_p / K_{design}) * 12$	$t_{ponding} =$	7.20	hrs
3-5.	Enter the storm duration for routing calculations (use 3 hours unless there is rationale for an alternative), $T_{routing}$	$T_{routing} =$	3	hrs
3-6a.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,1} = (K_{design} * T_{routing}) / 12$	$d_{filtered,1} =$	0.63	ft
3-6b.	Calculate depth of water (ft) filtered using the following equation: $d_{filtered,2} = d_p / 2$	$d_{filtered,2} =$	0.75	ft
3-7.	Enter the resultant depth (ft) (the lesser of the two calculated above), $d_{filtered}$	$d_{filtered} =$	0.63	ft

R300652.01 CSUCI University Glen

SQDV Calculations

Drainage Area A-7.1

3-8.	Calculate the infiltrating surface area as follows (ft ²): $A_{req} = SQDV / (D_p + d_{filtered})$	$A_{req} =$	1762	ft ²
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Step 4: Calculate Bioretention Area Total Footprint

4-1.	Calculate total footprint required by including a buffer for side slopes and freeboard (ft ²) [A_{req} is measured as the filter bottom area (toe of side slopes)], A_{tot}	$A_{tot} =$	2302	ft ²
------	--	-------------	-------------	-----------------

Step 5: Calculate Underdrain System Capacity

5-1.	Calculated filtered flow rate to be conveyed by the longitudinal drain pipe, $Q_f = K_{design} A_{req} / 43,200$	$Q_f =$	0.10	cfs
5-2.	Enter minimum slope for energy gradient, S_e	$S_e =$	0.005	
5-3.	Enter Hazen-Williams coefficient for plastic, C_{HW}	$C_{HW} =$	140	
5-4.	Enter pipe diameter (min 6 inches), D	$D =$	6	in
5-5.	Calculate pipe hydraulic radius (ft), $R_h = D/48$	$R_h =$	0.13	ft
5-6.	Calculate velocity at the outlet of the pipe (ft/s), $V_p = 1.318 C_{HW} R_h^{0.63} S_e^{0.54}$	$V_p =$	2.85	ft/s
5-7.	Calculate pipe capacity (cfs), $Q_{cap} = 0.25\pi(D/12)^2 V_p$	$Q_{cap} =$	0.56	cfs

Note: A 6" underdrain pipe is provided in the design. The 6" pipe provides a longer residence time, which benefits pollutant removal in the media. The drawdown time for the 85th percentile storm is still less than 48 hours (7.4 hours).

Attachment E-4
Proprietary Biofiltration System Design Charts



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MWS Linear | *Sizing Options*



Flow Based Sizing

The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

Model #	Dimensions	WetlandMEDIA Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-4	4' x 4'	23 sq. ft.	0.052
MWS-L-4-6	4' x 6'	32 sq. ft.	0.073

Model #	Dimensions	WetlandMEDIA Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-8	4' x 8'	50 sq. ft.	0.115
MWS-L-4-13	4' x 13'	63 sq. ft.	0.144
MWS-L-4-15	4' x 15'	76 sq. ft.	0.175
MWS-L-4-17	4' x 17'	90 sq. ft.	0.206
MWS-L-4-19	4' x 19'	103 sq. ft.	0.237
MWS-L-4-21	4' x 21'	117 sq. ft.	0.268
MWS-L-6-8	7' x 9'	64 sq. ft.	0.147
MWS-L-8-8	8' x 8'	100 sq. ft.	0.230
MWS-L-8-12	8' x 12'	151 sq. ft.	0.346
MWS-L-8-16	8' x 16'	201 sq. ft.	0.462
MWS-L-8-20	9' x 21'	252 sq. ft.	0.577
MWS-L-8-24	9' x 25'	302 sq. ft.	0.693



Volume Based Sizing

Many states require treatment of a water quality volume and do not offer the option of flow based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume based design installed downstream of ponds, detention basins, and underground storage systems.

Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down	Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-4	1140	2280
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036
MWS-L-4-13	3131	6261

Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down	Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-15	3811	7623
MWS-L-4-17	4492	8984
MWS-L-4-19	5172	10345
MWS-L-4-21	5853	11706
MWS-L-6-8	3191	6382
MWS-L-8-8	5036	10072
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145
MWS-L-8-20	12560	25120
MWS-L-8-24	15108	30216



398 Via El Centro
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Phone: (855) 566-3938

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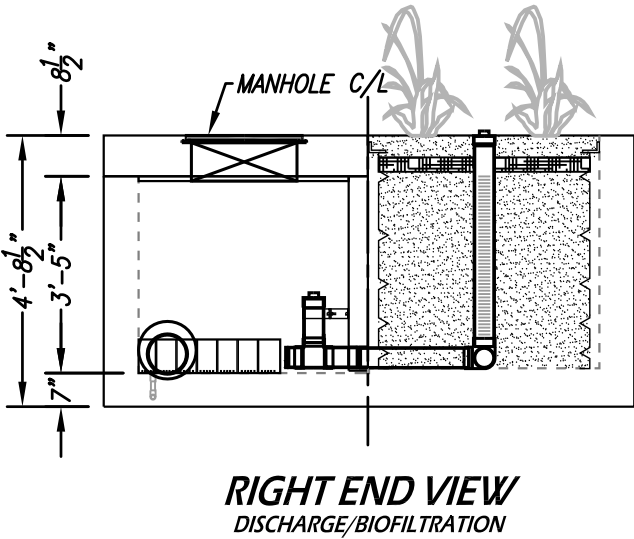
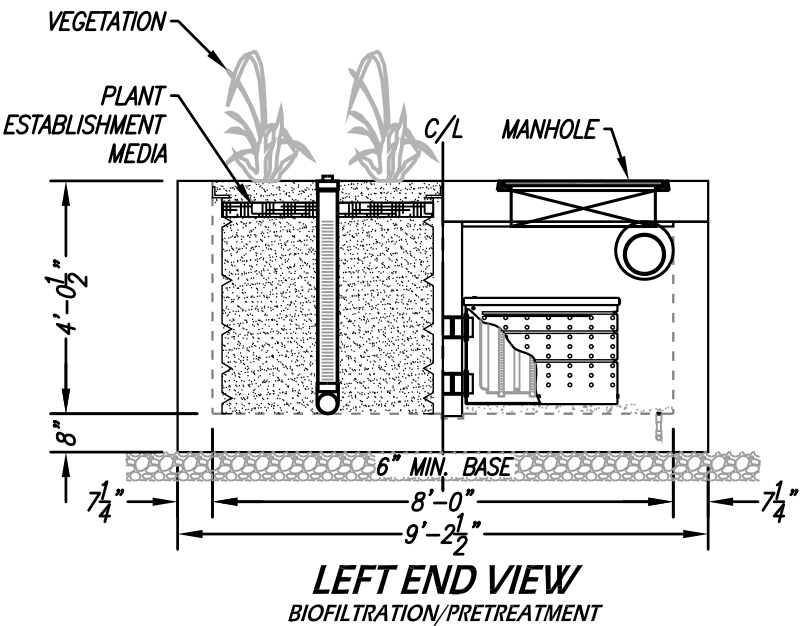
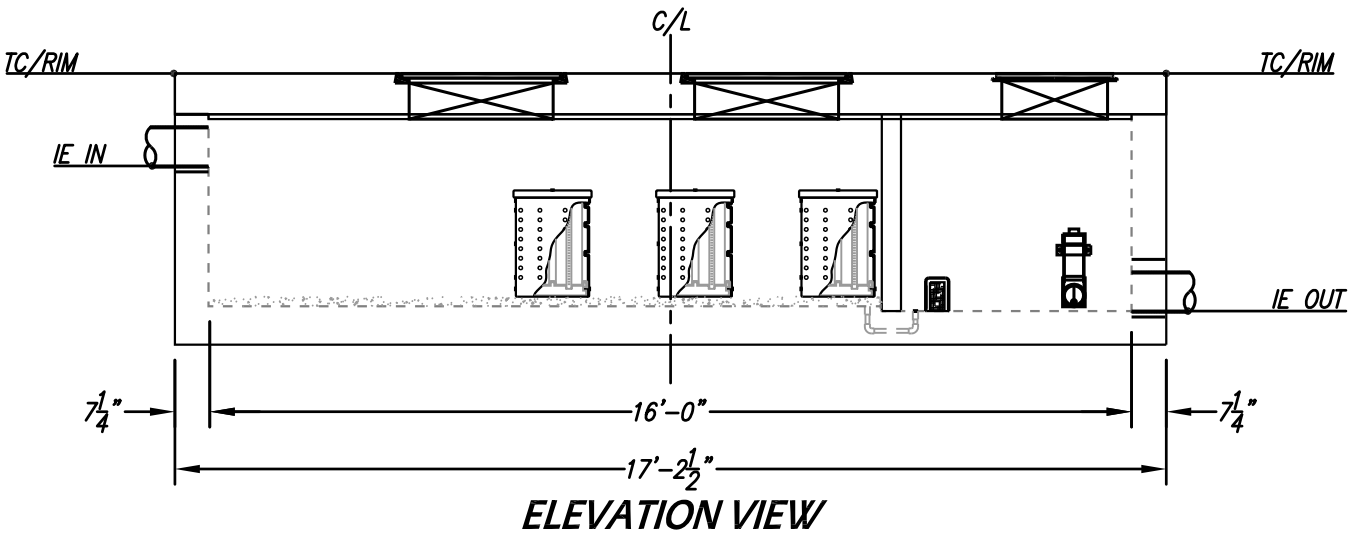
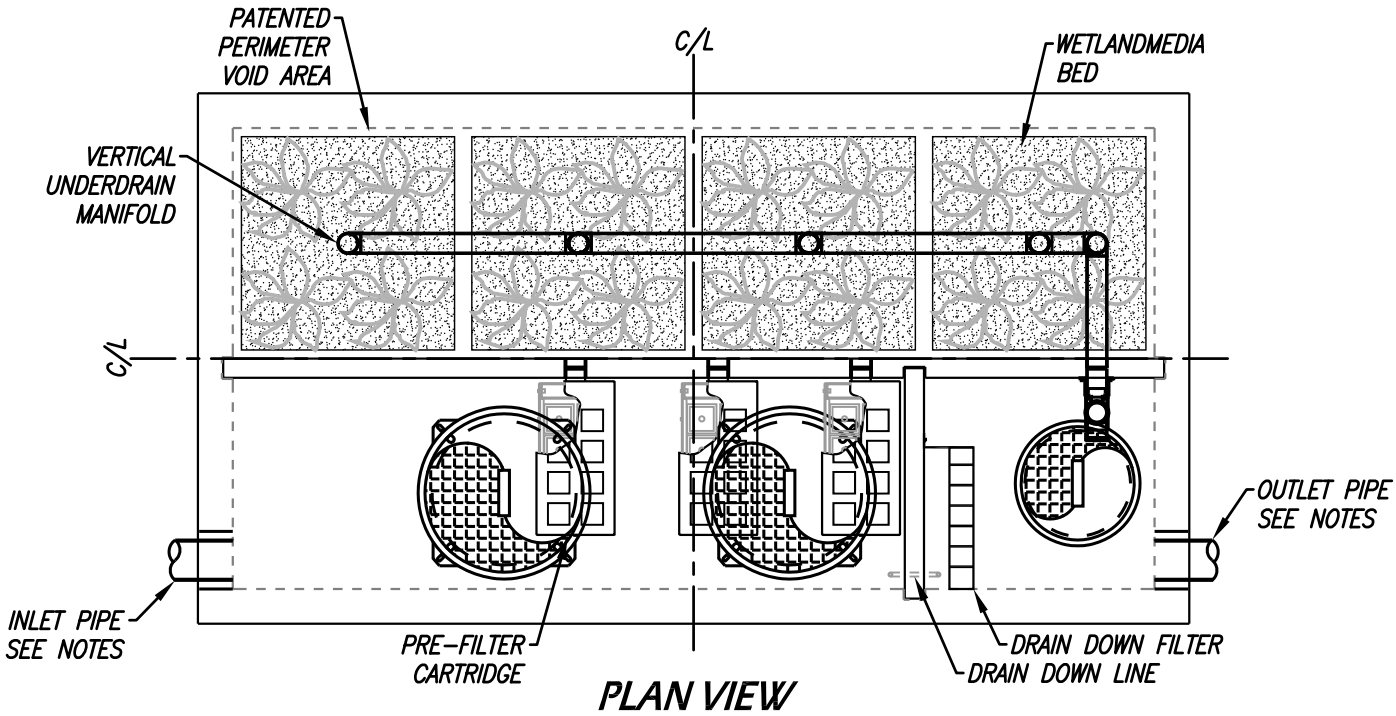
SITE SPECIFIC DATA			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PARKWAY	OPEN PLANTER	PARKWAY
FRAME & COVER	ø30"	N/A	ø24"
WETLANDMEDIA VOLUME (CY)			7.26
WETLANDMEDIA DELIVERY METHOD			TBD
ORIFICE SIZE (DIA. INCHES)			ø3.07"
MAXIMUM PICK WEIGHT (LBS)			TBD
NOTES:			

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
3. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURERS STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.

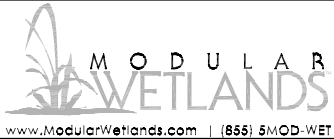


TREATMENT FLOW (CFS)	0.462
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	TBD
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MWS-L-8-16-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

THE PRODUCT DESCRIBED MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING US PATENTS: 7,425,262; 7,470,362; 7,674,378; 8,303,816; RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING

PROPRIETARY AND CONFIDENTIAL:
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MODULAR WETLANDS SYSTEMS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF MODULAR WETLANDS SYSTEMS IS PROHIBITED.



Appendix D

CalEEMod Calculations

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

CSUCI University Glen Phase 2 and Amendment

Ventura County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	607.00	1000sqft	13.93	607,000.00	0
City Park	10.56	Acre	10.56	459,993.60	0
Apartments Low Rise	170.00	Dwelling Unit	1.28	170,000.00	520
Apartments Mid Rise	310.00	Dwelling Unit	3.67	310,000.00	949
Condo/Townhouse High Rise	66.00	Dwelling Unit	1.30	66,000.00	202
Single Family Housing	54.00	Dwelling Unit	1.26	97,200.00	165

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MW hr)	702.44	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Project Characteristics -

Land Use - The remaining area (total area - hardscape -landscape) was divided among the different residential uses in proportion to the total building area for each residential land use type.

Construction Phase - The default for architectural coating-35 days at the very end of all construction-was adjusted to 190 days, beginning a little over halfway through construction and ending one week after paving, to better reflect actual construction practices (residences would be painted as building construction of each building is completed).

Vehicle Trips - Trip gen rates adjusted in accordance with ITE rates used in Traffic study. Landscape area (City Park) would not generate new trips as it would be used by residents.

Woodstoves - Based on existing University Glen single-family homes, it was assumed single-family homes would have a gas fireplace.

Mobile Land Use Mitigation -

Area Mitigation - Rule 74.2 limits VOC content of flat coatings to 100 g/L and non-flat coatings to 150 g/L

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	150.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	150.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaCoating	Area_EF_Nonresidential_Interior	250	150
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	75	100
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblConstructionPhase	NumDays	35.00	190.00
tblConstructionPhase	PhaseEndDate	4/6/2021	7/21/2020
tblConstructionPhase	PhaseStartDate	7/15/2020	10/30/2019
tblFireplaces	FireplaceDayYear	0.00	10.00
tblFireplaces	FireplaceHourDay	0.00	3.00
tblFireplaces	NumberGas	0.00	54.00
tblFireplaces	NumberNoFireplace	54.00	0.00
tblLandUse	LotAcreage	10.63	1.28
tblLandUse	LotAcreage	8.16	3.67
tblLandUse	LotAcreage	1.03	1.30
tblLandUse	LotAcreage	17.53	1.26
tblProjectCharacteristics	OperationalYear	2018	2021
tblVehicleTrips	ST_TR	7.16	3.44
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	SU_TR	6.07	3.44
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	WD_TR	6.59	3.44
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	4.18	9.52

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

2.0 Emissions Summary

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

2.1 Overall Construction (Maximum Daily Emission)**Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	7.9834	59.5869	54.9496	0.1573	18.2141	2.6349	20.7921	9.9699	2.4241	12.3417	0.0000	16,055.81 61	16,055.81 61	1.9491	0.0000	16,092.88 03
2019	47.9622	56.3625	78.3397	0.2253	40.3126	1.7559	42.0685	10.2431	1.6606	11.9036	0.0000	22,795.82 21	22,795.82 21	1.6484	0.0000	22,837.03 16
2020	46.9792	50.9298	72.4977	0.2206	40.3127	1.4853	41.7980	10.2431	1.4039	11.6470	0.0000	22,302.22 11	22,302.22 11	1.5567	0.0000	22,341.13 75
Maximum	47.9622	59.5869	78.3397	0.2253	40.3127	2.6349	42.0685	10.2431	2.4241	12.3417	0.0000	22,795.82 21	22,795.82 21	1.9491	0.0000	22,837.03 16

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	7.9834	59.5869	54.9496	0.1573	8.6882	2.6349	10.8557	4.5080	2.4241	6.8798	0.0000	16,055.81 61	16,055.81 61	1.9491	0.0000	16,092.88 03
2019	47.9622	56.3625	78.3397	0.2253	40.3126	1.7559	42.0685	10.2431	1.6606	11.9036	0.0000	22,795.82 21	22,795.82 21	1.6484	0.0000	22,837.03 16
2020	46.9792	50.9298	72.4977	0.2206	40.3127	1.4853	41.7980	10.2431	1.4039	11.6470	0.0000	22,302.22 11	22,302.22 11	1.5567	0.0000	22,341.13 75
Maximum	47.9622	59.5869	78.3397	0.2253	40.3127	2.6349	42.0685	10.2431	2.4241	11.9036	0.0000	22,795.82 21	22,795.82 21	1.9491	0.0000	22,837.03 16

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	9.64	0.00	9.49	17.93	0.00	15.22	0.00	0.00	0.00	0.00	0.00	0.00

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

2.2 Overall Operational**Unmitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	17.5244	1.4690	50.0528	8.3400e-003		0.3461	0.3461		0.3461	0.3461	0.0000	1,232.7960	1,232.7960	0.1087	0.0210	1,241.7597
Energy	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445
Mobile	5.6325	23.5684	72.7248	0.2386	22.2834	0.2053	22.4887	5.9513	0.1916	6.1429		24,137.5152	24,137.5152	1.0316		24,163.3049
Total	23.4429	27.4816	123.8177	0.2625	22.2834	0.7490	23.0324	5.9513	0.7354	6.6866	0.0000	28,490.6133	28,490.6133	1.2001	0.0782	28,543.9091

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	28.9274	1.4690	50.0528	8.3400e-003		0.3461	0.3461		0.3461	0.3461	0.0000	1,232.7960	1,232.7960	0.1087	0.0210	1,241.7597
Energy	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445
Mobile	5.4225	22.0153	66.8548	0.2138	19.8545	0.1859	20.0404	5.3026	0.1735	5.4760		21,634.6282	21,634.6282	0.9459		21,658.2761
Total	34.6359	25.9286	117.9477	0.2378	19.8545	0.7296	20.5841	5.3026	0.7172	6.0198	0.0000	25,987.7263	25,987.7263	1.1144	0.0782	26,038.8803

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	-47.75	5.65	4.74	9.42	10.90	2.60	10.63	10.90	2.47	9.97	0.00	8.78	8.78	7.14	0.00	8.78

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/11/2018	9/25/2018	5	20	
2	Grading	Grading	9/26/2018	12/11/2018	5	45	
3	Building Construction	Building Construction	12/12/2018	5/26/2020	5	500	
4	Paving	Paving	5/27/2020	7/14/2020	5	35	
5	Architectural Coating	Architectural Coating	10/30/2019	7/21/2020	5	190	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 13.93

Residential Indoor: 1,302,480; Residential Outdoor: 434,160; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 36,420 (Architectural Coating – sqft)

OffRoad Equipment

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	861.00	239.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2018**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708		3,831.623 9	3,831.623 9	1.1928		3,861.444 8
Total	4.5627	48.1988	22.4763	0.0380	18.0663	2.5769	20.6432	9.9307	2.3708	12.3014		3,831.623 9	3,831.623 9	1.1928		3,861.444 8

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.2 Site Preparation - 2018**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0874	0.0586	0.5951	1.4500e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		144.3135	144.3135	4.6200e-003		144.4291
Total	0.0874	0.0586	0.5951	1.4500e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		144.3135	144.3135	4.6200e-003		144.4291

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708	0.0000	3,831.6239	3,831.6239	1.1928		3,861.4448
Total	4.5627	48.1988	22.4763	0.0380	8.1298	2.5769	10.7067	4.4688	2.3708	6.8396	0.0000	3,831.6239	3,831.6239	1.1928		3,861.4448

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.2 Site Preparation - 2018**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0874	0.0586	0.5951	1.4500e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		144.3135	144.3135	4.6200e-003		144.4291
Total	0.0874	0.0586	0.5951	1.4500e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		144.3135	144.3135	4.6200e-003		144.4291

3.3 Grading - 2018**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	5.0901	59.5218	35.0894	0.0620		2.6337	2.6337		2.4230	2.4230		6,244.4284	6,244.4284	1.9440		6,293.0278
Total	5.0901	59.5218	35.0894	0.0620	8.6733	2.6337	11.3071	3.5965	2.4230	6.0195		6,244.4284	6,244.4284	1.9440		6,293.0278

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.3 Grading - 2018**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0971	0.0652	0.6612	1.6100e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		160.3484	160.3484	5.1400e-003		160.4768
Total	0.0971	0.0652	0.6612	1.6100e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		160.3484	160.3484	5.1400e-003		160.4768

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	5.0901	59.5218	35.0894	0.0620		2.6337	2.6337		2.4230	2.4230	0.0000	6,244.4284	6,244.4284	1.9440		6,293.0278
Total	5.0901	59.5218	35.0894	0.0620	3.9030	2.6337	6.5367	1.6184	2.4230	4.0415	0.0000	6,244.4284	6,244.4284	1.9440		6,293.0278

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.3 Grading - 2018**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0971	0.0652	0.6612	1.6100e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		160.3484	160.3484	5.1400e-003		160.4768
Total	0.0971	0.0652	0.6612	1.6100e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		160.3484	160.3484	5.1400e-003		160.4768

3.4 Building Construction - 2018**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.9351	2,620.9351	0.6421		2,636.9883
Total	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.9351	2,620.9351	0.6421		2,636.9883

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3.4 Building Construction - 2018**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.1259	30.2599	8.9040	0.0610	1.6153	0.2735	1.8888	0.4648	0.2617	0.7265		6,531.884 6	6,531.884 6	0.6193		6,547.366 1
Worker	4.1781	2.8045	28.4652	0.0694	7.0729	0.0513	7.1242	1.8761	0.0473	1.9234		6,902.996 4	6,902.996 4	0.2212		6,908.526 0
Total	5.3039	33.0644	37.3691	0.1304	8.6882	0.3248	9.0130	2.3409	0.3090	2.6498		13,434.88 10	13,434.88 10	0.8404		13,455.89 20

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099	0.0000	2,620.935 1	2,620.935 1	0.6421		2,636.988 3
Total	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099	0.0000	2,620.935 1	2,620.935 1	0.6421		2,636.988 3

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3.4 Building Construction - 2018**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.1259	30.2599	8.9040	0.0610	1.6153	0.2735	1.8888	0.4648	0.2617	0.7265		6,531.884 6	6,531.884 6	0.6193		6,547.366 1
Worker	4.1781	2.8045	28.4652	0.0694	7.0729	0.0513	7.1242	1.8761	0.0473	1.9234		6,902.996 4	6,902.996 4	0.2212		6,908.526 0
Total	5.3039	33.0644	37.3691	0.1304	8.6882	0.3248	9.0130	2.3409	0.3090	2.6498		13,434.88 10	13,434.88 10	0.8404		13,455.89 20

3.4 Building Construction - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.580 2	2,591.580 2	0.6313		2,607.363 5
Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.580 2	2,591.580 2	0.6313		2,607.363 5

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3.4 Building Construction - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.0264	28.4870	8.2512	0.0606	1.6154	0.2355	1.8509	0.4648	0.2253	0.6901		6,498.6853	6,498.6853	0.5976		6,513.6240
Worker	3.8350	2.4821	25.5565	0.0675	7.0729	0.0509	7.1239	1.8761	0.0469	1.9230		6,715.9544	6,715.9544	0.1980		6,720.9038
Total	4.8614	30.9691	33.8078	0.1281	8.6883	0.2864	8.9747	2.3409	0.2722	2.6131		13,214.6397	13,214.6397	0.7955		13,234.5278

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635
Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.4 Building Construction - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.0264	28.4870	8.2512	0.0606	1.6154	0.2355	1.8509	0.4648	0.2253	0.6901		6,498.6853	6,498.6853	0.5976		6,513.6240
Worker	3.8350	2.4821	25.5565	0.0675	7.0729	0.0509	7.1239	1.8761	0.0469	1.9230		6,715.9544	6,715.9544	0.1980		6,720.9038
Total	4.8614	30.9691	33.8078	0.1281	8.6883	0.2864	8.9747	2.3409	0.2722	2.6131		13,214.6397	13,214.6397	0.7955		13,234.5278

3.4 Building Construction - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.4 Building Construction - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.8465	25.6320	7.3785	0.0602	1.6155	0.1575	1.7730	0.4649	0.1507	0.6155		6,467.688 1	6,467.688 1	0.5597		6,481.680 1
Worker	3.5661	2.2153	23.2331	0.0653	7.0729	0.0499	7.1229	1.8761	0.0460	1.9221		6,503.787 8	6,503.787 8	0.1763		6,508.194 5
Total	4.4126	27.8473	30.6117	0.1255	8.6884	0.2074	8.8959	2.3410	0.1967	2.5376		12,971.47 60	12,971.47 60	0.7360		12,989.87 46

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.063 1	2,553.063 1	0.6229		2,568.634 5
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.063 1	2,553.063 1	0.6229		2,568.634 5

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.4 Building Construction - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.8465	25.6320	7.3785	0.0602	1.6155	0.1575	1.7730	0.4649	0.1507	0.6155		6,467.688 1	6,467.688 1	0.5597		6,481.680 1
Worker	3.5661	2.2153	23.2331	0.0653	7.0729	0.0499	7.1229	1.8761	0.0460	1.9221		6,503.787 8	6,503.787 8	0.1763		6,508.194 5
Total	4.4126	27.8473	30.6117	0.1255	8.6884	0.2074	8.8959	2.3410	0.1967	2.5376		12,971.47 60	12,971.47 60	0.7360		12,989.87 46

3.5 Paving - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.733 4	2,207.733 4	0.7140		2,225.584 1
Paving	1.0428					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	2.3993	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.733 4	2,207.733 4	0.7140		2,225.584 1

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.5 Paving - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0621	0.0386	0.4048	1.1400e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		113.3064	113.3064	3.0700e-003		113.3832
Total	0.0621	0.0386	0.4048	1.1400e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		113.3064	113.3064	3.0700e-003		113.3832

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	1.0428					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	2.3993	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.5 Paving - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0621	0.0386	0.4048	1.1400e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		113.3064	113.3064	3.0700e-003		113.3832
Total	0.0621	0.0386	0.4048	1.1400e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		113.3064	113.3064	3.0700e-003		113.3832

3.6 Architectural Coating - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	36.9090	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.6 Architectural Coating - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.8306	2.4792	25.5269	0.0674	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		6,708.154 2	6,708.154 2	0.1978		6,713.097 9
Total	3.8306	2.4792	25.5269	0.0674	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		6,708.154 2	6,708.154 2	0.1978		6,713.097 9

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423
Total	36.9090	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.6 Architectural Coating - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.8306	2.4792	25.5269	0.0674	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		6,708.154 2	6,708.154 2	0.1978		6,713.097 9
Total	3.8306	2.4792	25.5269	0.0674	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		6,708.154 2	6,708.154 2	0.1978		6,713.097 9

3.6 Architectural Coating - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	36.8848	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.6 Architectural Coating - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.5620	2.2127	23.2061	0.0652	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,496.234 1	6,496.234 1	0.1761		6,500.635 6
Total	3.5620	2.2127	23.2061	0.0652	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,496.234 1	6,496.234 1	0.1761		6,500.635 6

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	36.8848	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.6 Architectural Coating - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.5620	2.2127	23.2061	0.0652	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,496.234 1	6,496.234 1	0.1761		6,500.635 6
Total	3.5620	2.2127	23.2061	0.0652	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,496.234 1	6,496.234 1	0.1761		6,500.635 6

4.0 Operational Detail - Mobile**4.1 Mitigation Measures Mobile**

Increase Density

Improve Destination Accessibility

Increase Transit Accessibility

Integrate Below Market Rate Housing

Improve Pedestrian Network

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	5.4225	22.0153	66.8548	0.2138	19.8545	0.1859	20.0404	5.3026	0.1735	5.4760		21,634.6282	21,634.6282	0.9459		21,658.2761
Unmitigated	5.6325	23.5684	72.7248	0.2386	22.2834	0.2053	22.4887	5.9513	0.1916	6.1429		24,137.5152	24,137.5152	1.0316		24,163.3049

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	584.80	584.80	584.80	1,615,845	1,439,718
Apartments Mid Rise	2,061.50	1,980.90	1816.60	5,567,591	4,960,724
City Park	0.00	0.00	0.00		
Condo/Townhouse High Rise	628.32	284.46	226.38	1,441,708	1,284,562
Parking Lot	0.00	0.00	0.00		
Single Family Housing	514.08	535.14	465.48	1,409,570	1,255,927
Total	3,788.70	3,385.30	3,093.26	10,034,714	8,940,930

4.3 Trip Type Information

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Apartments Mid Rise	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Condo/Townhouse High Rise	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Single Family Housing	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
City Park	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Apartments Low Rise	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Apartments Mid Rise	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Condo/Townhouse High Rise	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Single Family Housing	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.302 1	3,120.302 1	0.0598	0.0572	3,138.844 5
NaturalGas Unmitigated	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.302 1	3,120.302 1	0.0598	0.0572	3,138.844 5

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

5.2 Energy by Land Use - NaturalGas**Unmitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7437.39	0.0802	0.6854	0.2917	4.3700e-003		0.0554	0.0554		0.0554	0.0554		874.9869	874.9869	0.0168	0.0160	880.1865
Apartments Mid Rise	11929.7	0.1287	1.0994	0.4678	7.0200e-003		0.0889	0.0889		0.0889	0.0889		1,403.4932	1,403.4932	0.0269	0.0257	1,411.8334
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse High Rise	2539.87	0.0274	0.2341	0.0996	1.4900e-003		0.0189	0.0189		0.0189	0.0189		298.8082	298.8082	5.7300e-003	5.4800e-003	300.5839
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	4615.62	0.0498	0.4254	0.1810	2.7200e-003		0.0344	0.0344		0.0344	0.0344		543.0139	543.0139	0.0104	9.9600e-003	546.2408
Total		0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

5.2 Energy by Land Use - NaturalGas**Mitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7.43739	0.0802	0.6854	0.2917	4.3700e-003		0.0554	0.0554		0.0554	0.0554		874.9869	874.9869	0.0168	0.0160	880.1865
Apartments Mid Rise	11.9297	0.1287	1.0994	0.4678	7.0200e-003		0.0889	0.0889		0.0889	0.0889		1,403.4932	1,403.4932	0.0269	0.0257	1,411.8334
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse High Rise	2.53987	0.0274	0.2341	0.0996	1.4900e-003		0.0189	0.0189		0.0189	0.0189		298.8082	298.8082	5.7300e-003	5.4800e-003	300.5839
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	4.61562	0.0498	0.4254	0.1810	2.7200e-003		0.0344	0.0344		0.0344	0.0344		543.0139	543.0139	0.0104	9.9600e-003	546.2408
Total		0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445

6.0 Area Detail**6.1 Mitigation Measures Area**

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

Use Low VOC Cleaning Supplies

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	28.9274	1.4690	50.0528	8.3400e-003		0.3461	0.3461		0.3461	0.3461	0.0000	1,232.7960	1,232.7960	0.1087	0.0210	1,241.7597
Unmitigated	17.5244	1.4690	50.0528	8.3400e-003		0.3461	0.3461		0.3461	0.3461	0.0000	1,232.7960	1,232.7960	0.1087	0.0210	1,241.7597

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.9074					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	14.0032					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.1048	0.8958	0.3812	5.7200e-003		0.0724	0.0724		0.0724	0.0724	0.0000	1,143.5294	1,143.5294	0.0219	0.0210	1,150.3248
Landscaping	1.5090	0.5732	49.6716	2.6200e-003		0.2737	0.2737		0.2737	0.2737		89.2666	89.2666	0.0867		91.4349
Total	17.5244	1.4690	50.0528	8.3400e-003		0.3461	0.3461		0.3461	0.3461	0.0000	1,232.7960	1,232.7960	0.1087	0.0210	1,241.7597

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

6.2 Area by SubCategory**Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.3209					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	24.9927					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.1048	0.8958	0.3812	5.7200e-003		0.0724	0.0724		0.0724	0.0724	0.0000	1,143.5294	1,143.5294	0.0219	0.0210	1,150.3248
Landscaping	1.5090	0.5732	49.6716	2.6200e-003		0.2737	0.2737		0.2737	0.2737		89.2666	89.2666	0.0867		91.4349
Total	28.9274	1.4690	50.0528	8.3400e-003		0.3461	0.3461		0.3461	0.3461	0.0000	1,232.7960	1,232.7960	0.1087	0.0210	1,241.7597

7.0 Water Detail**7.1 Mitigation Measures Water****8.0 Waste Detail****8.1 Mitigation Measures Waste****9.0 Operational Offroad**

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

CSUCI University Glen Phase 2 and Amendment

Ventura County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	607.00	1000sqft	13.93	607,000.00	0
City Park	10.56	Acre	10.56	459,993.60	0
Apartments Low Rise	170.00	Dwelling Unit	1.28	170,000.00	520
Apartments Mid Rise	310.00	Dwelling Unit	3.67	310,000.00	949
Condo/Townhouse High Rise	66.00	Dwelling Unit	1.30	66,000.00	202
Single Family Housing	54.00	Dwelling Unit	1.26	97,200.00	165

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MW hr)	702.44	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Project Characteristics -

Land Use - The remaining area (total area - hardscape -landscape) was divided among the different residential uses in proportion to the total building area for each residential land use type.

Construction Phase - The default for architectural coating-35 days at the very end of all construction-was adjusted to 190 days, beginning a little over halfway through construction and ending one week after paving, to better reflect actual construction practices (residences would be painted as building construction of each building is completed).

Vehicle Trips - Trip gen rates adjusted in accordance with ITE rates used in Traffic study. Landscape area (City Park) would not generate new trips as it would be used by residents.

Woodstoves -

Mobile Land Use Mitigation -

Area Mitigation - Rule 74.2 limits VOC content of flat coatings to 100 g/L and non-flat coatings to 150 g/L

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	150.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	150.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaCoating	Area_EF_Nonresidential_Interior	250	150
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	75	100
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblConstructionPhase	NumDays	35.00	190.00
tblConstructionPhase	PhaseEndDate	4/6/2021	7/21/2020
tblConstructionPhase	PhaseStartDate	7/15/2020	10/30/2019
tblLandUse	LotAcreage	10.63	1.28
tblLandUse	LotAcreage	8.16	3.67
tblLandUse	LotAcreage	1.03	1.30
tblLandUse	LotAcreage	17.53	1.26
tblProjectCharacteristics	OperationalYear	2018	2021
tblVehicleTrips	ST_TR	7.16	3.44
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	SU_TR	6.07	3.44
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	WD_TR	6.59	3.44
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	4.18	9.52

2.0 Emissions Summary

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

2.1 Overall Construction (Maximum Daily Emission)**Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	7.9834	59.5869	54.9496	0.1573	18.2141	2.6349	20.7921	9.9699	2.4241	12.3417	0.0000	16,055.81 61	16,055.81 61	1.9491	0.0000	16,092.88 03
2019	47.9622	56.3625	78.3397	0.2253	40.3126	1.7559	42.0685	10.2431	1.6606	11.9036	0.0000	22,795.82 21	22,795.82 21	1.6484	0.0000	22,837.03 16
2020	46.9792	50.9298	72.4977	0.2206	40.3127	1.4853	41.7980	10.2431	1.4039	11.6470	0.0000	22,302.22 11	22,302.22 11	1.5567	0.0000	22,341.13 75
Maximum	47.9622	59.5869	78.3397	0.2253	40.3127	2.6349	42.0685	10.2431	2.4241	12.3417	0.0000	22,795.82 21	22,795.82 21	1.9491	0.0000	22,837.03 16

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	7.9834	59.5869	54.9496	0.1573	8.6882	2.6349	10.8557	4.5080	2.4241	6.8798	0.0000	16,055.81 61	16,055.81 61	1.9491	0.0000	16,092.88 03
2019	47.9622	56.3625	78.3397	0.2253	40.3126	1.7559	42.0685	10.2431	1.6606	11.9036	0.0000	22,795.82 21	22,795.82 21	1.6484	0.0000	22,837.03 16
2020	46.9792	50.9298	72.4977	0.2206	40.3127	1.4853	41.7980	10.2431	1.4039	11.6470	0.0000	22,302.22 11	22,302.22 11	1.5567	0.0000	22,341.13 75
Maximum	47.9622	59.5869	78.3397	0.2253	40.3127	2.6349	42.0685	10.2431	2.4241	11.9036	0.0000	22,795.82 21	22,795.82 21	1.9491	0.0000	22,837.03 16

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	9.64	0.00	9.49	17.93	0.00	15.22	0.00	0.00	0.00	0.00	0.00	0.00

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

2.2 Overall Operational**Unmitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	17.4196	0.5732	49.6716	2.6200e-003		0.2737	0.2737		0.2737	0.2737	0.0000	89.2666	89.2666	0.0867	0.0000	91.4349
Energy	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445
Mobile	5.6325	23.5684	72.7248	0.2386	22.2834	0.2053	22.4887	5.9513	0.1916	6.1429		24,137.5152	24,137.5152	1.0316		24,163.3049
Total	23.3381	26.5859	123.4365	0.2568	22.2834	0.6766	22.9600	5.9513	0.6629	6.6142	0.0000	27,347.0839	27,347.0839	1.1781	0.0572	27,393.5843

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	17.8331	0.5732	49.6716	2.6200e-003		0.2737	0.2737		0.2737	0.2737	0.0000	89.2666	89.2666	0.0867	0.0000	91.4349
Energy	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445
Mobile	5.4225	22.0153	66.8548	0.2138	19.8545	0.1859	20.0404	5.3026	0.1735	5.4760		21,634.6282	21,634.6282	0.9459		21,658.2761
Total	23.5416	25.0328	117.5665	0.2321	19.8545	0.6572	20.5117	5.3026	0.6448	5.9473	0.0000	24,844.1968	24,844.1968	1.0925	0.0572	24,888.5555

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	-0.87	5.84	4.76	9.63	10.90	2.87	10.66	10.90	2.74	10.08	0.00	9.15	9.15	7.27	0.00	9.14

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/11/2018	9/25/2018	5	20	
2	Grading	Grading	9/26/2018	12/11/2018	5	45	
3	Building Construction	Building Construction	12/12/2018	5/26/2020	5	500	
4	Paving	Paving	5/27/2020	7/14/2020	5	35	
5	Architectural Coating	Architectural Coating	10/30/2019	7/21/2020	5	190	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 13.93

Residential Indoor: 1,302,480; Residential Outdoor: 434,160; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 36,420 (Architectural Coating – sqft)

OffRoad Equipment

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	861.00	239.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708		3,831.623 9	3,831.623 9	1.1928		3,861.444 8
Total	4.5627	48.1988	22.4763	0.0380	18.0663	2.5769	20.6432	9.9307	2.3708	12.3014		3,831.623 9	3,831.623 9	1.1928		3,861.444 8

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.2 Site Preparation - 2018**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0874	0.0586	0.5951	1.4500e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		144.3135	144.3135	4.6200e-003		144.4291
Total	0.0874	0.0586	0.5951	1.4500e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		144.3135	144.3135	4.6200e-003		144.4291

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708	0.0000	3,831.6239	3,831.6239	1.1928		3,861.4448
Total	4.5627	48.1988	22.4763	0.0380	8.1298	2.5769	10.7067	4.4688	2.3708	6.8396	0.0000	3,831.6239	3,831.6239	1.1928		3,861.4448

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.2 Site Preparation - 2018**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0874	0.0586	0.5951	1.4500e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		144.3135	144.3135	4.6200e-003		144.4291
Total	0.0874	0.0586	0.5951	1.4500e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		144.3135	144.3135	4.6200e-003		144.4291

3.3 Grading - 2018**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	5.0901	59.5218	35.0894	0.0620		2.6337	2.6337		2.4230	2.4230		6,244.4284	6,244.4284	1.9440		6,293.0278
Total	5.0901	59.5218	35.0894	0.0620	8.6733	2.6337	11.3071	3.5965	2.4230	6.0195		6,244.4284	6,244.4284	1.9440		6,293.0278

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3.3 Grading - 2018**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0971	0.0652	0.6612	1.6100e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		160.3484	160.3484	5.1400e-003		160.4768
Total	0.0971	0.0652	0.6612	1.6100e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		160.3484	160.3484	5.1400e-003		160.4768

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	5.0901	59.5218	35.0894	0.0620		2.6337	2.6337		2.4230	2.4230	0.0000	6,244.4284	6,244.4284	1.9440		6,293.0278
Total	5.0901	59.5218	35.0894	0.0620	3.9030	2.6337	6.5367	1.6184	2.4230	4.0415	0.0000	6,244.4284	6,244.4284	1.9440		6,293.0278

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3.3 Grading - 2018**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0971	0.0652	0.6612	1.6100e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		160.3484	160.3484	5.1400e-003		160.4768
Total	0.0971	0.0652	0.6612	1.6100e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		160.3484	160.3484	5.1400e-003		160.4768

3.4 Building Construction - 2018**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.9351	2,620.9351	0.6421		2,636.9883
Total	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.9351	2,620.9351	0.6421		2,636.9883

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3.4 Building Construction - 2018**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.1259	30.2599	8.9040	0.0610	1.6153	0.2735	1.8888	0.4648	0.2617	0.7265		6,531.884 6	6,531.884 6	0.6193		6,547.366 1
Worker	4.1781	2.8045	28.4652	0.0694	7.0729	0.0513	7.1242	1.8761	0.0473	1.9234		6,902.996 4	6,902.996 4	0.2212		6,908.526 0
Total	5.3039	33.0644	37.3691	0.1304	8.6882	0.3248	9.0130	2.3409	0.3090	2.6498		13,434.88 10	13,434.88 10	0.8404		13,455.89 20

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099	0.0000	2,620.935 1	2,620.935 1	0.6421		2,636.988 3
Total	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099	0.0000	2,620.935 1	2,620.935 1	0.6421		2,636.988 3

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.4 Building Construction - 2018**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.1259	30.2599	8.9040	0.0610	1.6153	0.2735	1.8888	0.4648	0.2617	0.7265		6,531.884 6	6,531.884 6	0.6193		6,547.366 1
Worker	4.1781	2.8045	28.4652	0.0694	7.0729	0.0513	7.1242	1.8761	0.0473	1.9234		6,902.996 4	6,902.996 4	0.2212		6,908.526 0
Total	5.3039	33.0644	37.3691	0.1304	8.6882	0.3248	9.0130	2.3409	0.3090	2.6498		13,434.88 10	13,434.88 10	0.8404		13,455.89 20

3.4 Building Construction - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.580 2	2,591.580 2	0.6313		2,607.363 5
Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.580 2	2,591.580 2	0.6313		2,607.363 5

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3.4 Building Construction - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.0264	28.4870	8.2512	0.0606	1.6154	0.2355	1.8509	0.4648	0.2253	0.6901		6,498.6853	6,498.6853	0.5976		6,513.6240
Worker	3.8350	2.4821	25.5565	0.0675	7.0729	0.0509	7.1239	1.8761	0.0469	1.9230		6,715.9544	6,715.9544	0.1980		6,720.9038
Total	4.8614	30.9691	33.8078	0.1281	8.6883	0.2864	8.9747	2.3409	0.2722	2.6131		13,214.6397	13,214.6397	0.7955		13,234.5278

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635
Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635

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3.4 Building Construction - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.0264	28.4870	8.2512	0.0606	1.6154	0.2355	1.8509	0.4648	0.2253	0.6901		6,498.6853	6,498.6853	0.5976		6,513.6240
Worker	3.8350	2.4821	25.5565	0.0675	7.0729	0.0509	7.1239	1.8761	0.0469	1.9230		6,715.9544	6,715.9544	0.1980		6,720.9038
Total	4.8614	30.9691	33.8078	0.1281	8.6883	0.2864	8.9747	2.3409	0.2722	2.6131		13,214.6397	13,214.6397	0.7955		13,234.5278

3.4 Building Construction - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345

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3.4 Building Construction - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.8465	25.6320	7.3785	0.0602	1.6155	0.1575	1.7730	0.4649	0.1507	0.6155		6,467.688 1	6,467.688 1	0.5597		6,481.680 1
Worker	3.5661	2.2153	23.2331	0.0653	7.0729	0.0499	7.1229	1.8761	0.0460	1.9221		6,503.787 8	6,503.787 8	0.1763		6,508.194 5
Total	4.4126	27.8473	30.6117	0.1255	8.6884	0.2074	8.8959	2.3410	0.1967	2.5376		12,971.47 60	12,971.47 60	0.7360		12,989.87 46

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.063 1	2,553.063 1	0.6229		2,568.634 5
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.063 1	2,553.063 1	0.6229		2,568.634 5

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3.4 Building Construction - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.8465	25.6320	7.3785	0.0602	1.6155	0.1575	1.7730	0.4649	0.1507	0.6155		6,467.688 1	6,467.688 1	0.5597		6,481.680 1
Worker	3.5661	2.2153	23.2331	0.0653	7.0729	0.0499	7.1229	1.8761	0.0460	1.9221		6,503.787 8	6,503.787 8	0.1763		6,508.194 5
Total	4.4126	27.8473	30.6117	0.1255	8.6884	0.2074	8.8959	2.3410	0.1967	2.5376		12,971.47 60	12,971.47 60	0.7360		12,989.87 46

3.5 Paving - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.733 4	2,207.733 4	0.7140		2,225.584 1
Paving	1.0428					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	2.3993	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.733 4	2,207.733 4	0.7140		2,225.584 1

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3.5 Paving - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0621	0.0386	0.4048	1.1400e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		113.3064	113.3064	3.0700e-003		113.3832
Total	0.0621	0.0386	0.4048	1.1400e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		113.3064	113.3064	3.0700e-003		113.3832

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	1.0428					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	2.3993	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841

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3.5 Paving - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0621	0.0386	0.4048	1.1400e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		113.3064	113.3064	3.0700e-003		113.3832
Total	0.0621	0.0386	0.4048	1.1400e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		113.3064	113.3064	3.0700e-003		113.3832

3.6 Architectural Coating - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	36.9090	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423

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3.6 Architectural Coating - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.8306	2.4792	25.5269	0.0674	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		6,708.154 2	6,708.154 2	0.1978		6,713.097 9
Total	3.8306	2.4792	25.5269	0.0674	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		6,708.154 2	6,708.154 2	0.1978		6,713.097 9

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423
Total	36.9090	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.6 Architectural Coating - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.8306	2.4792	25.5269	0.0674	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		6,708.154 2	6,708.154 2	0.1978		6,713.097 9
Total	3.8306	2.4792	25.5269	0.0674	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		6,708.154 2	6,708.154 2	0.1978		6,713.097 9

3.6 Architectural Coating - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	36.8848	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.6 Architectural Coating - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.5620	2.2127	23.2061	0.0652	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,496.234 1	6,496.234 1	0.1761		6,500.635 6
Total	3.5620	2.2127	23.2061	0.0652	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,496.234 1	6,496.234 1	0.1761		6,500.635 6

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	36.8848	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.6 Architectural Coating - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.5620	2.2127	23.2061	0.0652	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,496.234 1	6,496.234 1	0.1761		6,500.635 6
Total	3.5620	2.2127	23.2061	0.0652	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,496.234 1	6,496.234 1	0.1761		6,500.635 6

4.0 Operational Detail - Mobile**4.1 Mitigation Measures Mobile**

Increase Density

Improve Destination Accessibility

Increase Transit Accessibility

Integrate Below Market Rate Housing

Improve Pedestrian Network

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	5.4225	22.0153	66.8548	0.2138	19.8545	0.1859	20.0404	5.3026	0.1735	5.4760		21,634.6282	21,634.6282	0.9459		21,658.2761
Unmitigated	5.6325	23.5684	72.7248	0.2386	22.2834	0.2053	22.4887	5.9513	0.1916	6.1429		24,137.5152	24,137.5152	1.0316		24,163.3049

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	584.80	584.80	584.80	1,615,845	1,439,718
Apartments Mid Rise	2,061.50	1,980.90	1816.60	5,567,591	4,960,724
City Park	0.00	0.00	0.00		
Condo/Townhouse High Rise	628.32	284.46	226.38	1,441,708	1,284,562
Parking Lot	0.00	0.00	0.00		
Single Family Housing	514.08	535.14	465.48	1,409,570	1,255,927
Total	3,788.70	3,385.30	3,093.26	10,034,714	8,940,930

4.3 Trip Type Information

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Apartments Mid Rise	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Condo/Townhouse High Rise	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Single Family Housing	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
City Park	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Apartments Low Rise	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Apartments Mid Rise	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Condo/Townhouse High Rise	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Single Family Housing	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.302 1	3,120.302 1	0.0598	0.0572	3,138.844 5
NaturalGas Unmitigated	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.302 1	3,120.302 1	0.0598	0.0572	3,138.844 5

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

5.2 Energy by Land Use - NaturalGas**Unmitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7437.39	0.0802	0.6854	0.2917	4.3700e-003		0.0554	0.0554		0.0554	0.0554		874.9869	874.9869	0.0168	0.0160	880.1865
Apartments Mid Rise	11929.7	0.1287	1.0994	0.4678	7.0200e-003		0.0889	0.0889		0.0889	0.0889		1,403.4932	1,403.4932	0.0269	0.0257	1,411.8334
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse High Rise	2539.87	0.0274	0.2341	0.0996	1.4900e-003		0.0189	0.0189		0.0189	0.0189		298.8082	298.8082	5.7300e-003	5.4800e-003	300.5839
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	4615.62	0.0498	0.4254	0.1810	2.7200e-003		0.0344	0.0344		0.0344	0.0344		543.0139	543.0139	0.0104	9.9600e-003	546.2408
Total		0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

5.2 Energy by Land Use - NaturalGas**Mitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7.43739	0.0802	0.6854	0.2917	4.3700e-003		0.0554	0.0554		0.0554	0.0554		874.9869	874.9869	0.0168	0.0160	880.1865
Apartments Mid Rise	11.9297	0.1287	1.0994	0.4678	7.0200e-003		0.0889	0.0889		0.0889	0.0889		1,403.4932	1,403.4932	0.0269	0.0257	1,411.8334
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse High Rise	2.53987	0.0274	0.2341	0.0996	1.4900e-003		0.0189	0.0189		0.0189	0.0189		298.8082	298.8082	5.7300e-003	5.4800e-003	300.5839
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	4.61562	0.0498	0.4254	0.1810	2.7200e-003		0.0344	0.0344		0.0344	0.0344		543.0139	543.0139	0.0104	9.9600e-003	546.2408
Total		0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445

6.0 Area Detail**6.1 Mitigation Measures Area**

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

No Hearths Installed

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	17.8331	0.5732	49.6716	2.6200e-003		0.2737	0.2737		0.2737	0.2737	0.0000	89.2666	89.2666	0.0867	0.0000	91.4349
Unmitigated	17.4196	0.5732	49.6716	2.6200e-003		0.2737	0.2737		0.2737	0.2737	0.0000	89.2666	89.2666	0.0867	0.0000	91.4349

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.9074					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	14.0032					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.5090	0.5732	49.6716	2.6200e-003		0.2737	0.2737		0.2737	0.2737		89.2666	89.2666	0.0867		91.4349
Total	17.4196	0.5732	49.6716	2.6200e-003		0.2737	0.2737		0.2737	0.2737	0.0000	89.2666	89.2666	0.0867	0.0000	91.4349

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

6.2 Area by SubCategory**Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.3209					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	14.0032					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.5090	0.5732	49.6716	2.6200e-003		0.2737	0.2737		0.2737	0.2737		89.2666	89.2666	0.0867		91.4349
Total	17.8331	0.5732	49.6716	2.6200e-003		0.2737	0.2737		0.2737	0.2737	0.0000	89.2666	89.2666	0.0867	0.0000	91.4349

7.0 Water Detail**7.1 Mitigation Measures Water****8.0 Waste Detail****8.1 Mitigation Measures Waste****9.0 Operational Offroad**

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

CSUCI University Glen Phase 2 and Amendment

Ventura County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	607.00	1000sqft	13.93	607,000.00	0
City Park	10.56	Acre	10.56	459,993.60	0
Apartments Low Rise	170.00	Dwelling Unit	1.28	170,000.00	520
Apartments Mid Rise	310.00	Dwelling Unit	3.67	310,000.00	949
Condo/Townhouse High Rise	66.00	Dwelling Unit	1.30	66,000.00	202
Single Family Housing	54.00	Dwelling Unit	1.26	97,200.00	165

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MW hr)	702.44	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Project Characteristics -

Land Use - The remaining area (total area - hardscape -landscape) was divided among the different residential uses in proportion to the total building area for each residential land use type.

Construction Phase - The default for architectural coating-35 days at the very end of all construction-was adjusted to 190 days, beginning a little over halfway through construction and ending one week after paving, to better reflect actual construction practices (residences would be painted as building construction of each building is completed).

Vehicle Trips - Trip gen rates adjusted in accordance with ITE rates used in Traffic study. Landscape area (City Park) would not generate new trips as it would be used by residents.

Woodstoves - Based on existing University Glen single-family homes, it was assumed single-family homes would have a gas fireplace.

Mobile Land Use Mitigation -

Area Mitigation - Rule 74.2 limits VOC content of flat coatings to 100 g/L and non-flat coatings to 150 g/L

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	150.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	150.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaCoating	Area_EF_Nonresidential_Interior	250	150
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	75	100
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblConstructionPhase	NumDays	35.00	190.00
tblConstructionPhase	PhaseEndDate	4/6/2021	7/21/2020
tblConstructionPhase	PhaseStartDate	7/15/2020	10/30/2019
tblFireplaces	FireplaceDayYear	0.00	10.00
tblFireplaces	FireplaceHourDay	0.00	3.00
tblFireplaces	NumberGas	0.00	54.00
tblFireplaces	NumberNoFireplace	54.00	0.00
tblLandUse	LotAcreage	10.63	1.28
tblLandUse	LotAcreage	8.16	3.67
tblLandUse	LotAcreage	1.03	1.30
tblLandUse	LotAcreage	17.53	1.26
tblProjectCharacteristics	OperationalYear	2018	2021
tblVehicleTrips	ST_TR	7.16	3.44
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	SU_TR	6.07	3.44
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	WD_TR	6.59	3.44
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	4.18	9.52

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

2.0 Emissions Summary

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

2.1 Overall Construction (Maximum Daily Emission)**Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	7.9834	59.5869	54.9496	0.1573	18.2141	2.6349	20.7921	9.9699	2.4241	12.3417	0.0000	16,055.81 61	16,055.81 61	1.9491	0.0000	16,092.88 03
2019	47.9622	56.3625	78.3397	0.2253	40.3126	1.7559	42.0685	10.2431	1.6606	11.9036	0.0000	22,795.82 21	22,795.82 21	1.6484	0.0000	22,837.03 16
2020	46.9792	50.9298	72.4977	0.2206	40.3127	1.4853	41.7980	10.2431	1.4039	11.6470	0.0000	22,302.22 11	22,302.22 11	1.5567	0.0000	22,341.13 75
Maximum	47.9622	59.5869	78.3397	0.2253	40.3127	2.6349	42.0685	10.2431	2.4241	12.3417	0.0000	22,795.82 21	22,795.82 21	1.9491	0.0000	22,837.03 16

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	7.9834	59.5869	54.9496	0.1573	8.6882	2.6349	10.8557	4.5080	2.4241	6.8798	0.0000	16,055.81 61	16,055.81 61	1.9491	0.0000	16,092.88 03
2019	47.9622	56.3625	78.3397	0.2253	40.3126	1.7559	42.0685	10.2431	1.6606	11.9036	0.0000	22,795.82 21	22,795.82 21	1.6484	0.0000	22,837.03 16
2020	46.9792	50.9298	72.4977	0.2206	40.3127	1.4853	41.7980	10.2431	1.4039	11.6470	0.0000	22,302.22 11	22,302.22 11	1.5567	0.0000	22,341.13 75
Maximum	47.9622	59.5869	78.3397	0.2253	40.3127	2.6349	42.0685	10.2431	2.4241	11.9036	0.0000	22,795.82 21	22,795.82 21	1.9491	0.0000	22,837.03 16

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	9.64	0.00	9.49	17.93	0.00	15.22	0.00	0.00	0.00	0.00	0.00	0.00

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

2.2 Overall Operational**Unmitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	17.5244	1.4690	50.0528	8.3400e-003		0.3461	0.3461		0.3461	0.3461	0.0000	1,232.7960	1,232.7960	0.1087	0.0210	1,241.7597
Energy	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445
Mobile	5.6325	23.5684	72.7248	0.2386	22.2834	0.2053	22.4887	5.9513	0.1916	6.1429		24,137.5152	24,137.5152	1.0316		24,163.3049
Total	23.4429	27.4816	123.8177	0.2625	22.2834	0.7490	23.0324	5.9513	0.7354	6.6866	0.0000	28,490.6133	28,490.6133	1.2001	0.0782	28,543.9091

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	17.2270	1.3486	38.1060	7.4200e-003		0.2760	0.2760		0.2760	0.2760	0.0000	1,205.9722	1,205.9722	0.0672	0.0210	1,213.8988
Energy	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445
Mobile	5.4225	22.0153	66.8548	0.2138	19.8545	0.1859	20.0404	5.3026	0.1735	5.4760		21,634.6282	21,634.6282	0.9459		21,658.2761
Total	22.9356	25.8081	106.0008	0.2369	19.8545	0.6595	20.5140	5.3026	0.6471	5.9497	0.0000	25,960.9025	25,960.9025	1.0729	0.0782	26,011.0194

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	2.16	6.09	14.39	9.77	10.90	11.95	10.93	10.90	12.00	11.02	0.00	8.88	8.88	10.60	0.00	8.87

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/11/2018	9/25/2018	5	20	
2	Grading	Grading	9/26/2018	12/11/2018	5	45	
3	Building Construction	Building Construction	12/12/2018	5/26/2020	5	500	
4	Paving	Paving	5/27/2020	7/14/2020	5	35	
5	Architectural Coating	Architectural Coating	10/30/2019	7/21/2020	5	190	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 13.93

Residential Indoor: 1,302,480; Residential Outdoor: 434,160; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 36,420 (Architectural Coating – sqft)

OffRoad Equipment

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	861.00	239.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2018**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708		3,831.623 9	3,831.623 9	1.1928		3,861.444 8
Total	4.5627	48.1988	22.4763	0.0380	18.0663	2.5769	20.6432	9.9307	2.3708	12.3014		3,831.623 9	3,831.623 9	1.1928		3,861.444 8

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.2 Site Preparation - 2018**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0874	0.0586	0.5951	1.4500e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		144.3135	144.3135	4.6200e-003		144.4291
Total	0.0874	0.0586	0.5951	1.4500e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		144.3135	144.3135	4.6200e-003		144.4291

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708	0.0000	3,831.6239	3,831.6239	1.1928		3,861.4448
Total	4.5627	48.1988	22.4763	0.0380	8.1298	2.5769	10.7067	4.4688	2.3708	6.8396	0.0000	3,831.6239	3,831.6239	1.1928		3,861.4448

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.2 Site Preparation - 2018**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0874	0.0586	0.5951	1.4500e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		144.3135	144.3135	4.6200e-003		144.4291
Total	0.0874	0.0586	0.5951	1.4500e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		144.3135	144.3135	4.6200e-003		144.4291

3.3 Grading - 2018**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	5.0901	59.5218	35.0894	0.0620		2.6337	2.6337		2.4230	2.4230		6,244.4284	6,244.4284	1.9440		6,293.0278
Total	5.0901	59.5218	35.0894	0.0620	8.6733	2.6337	11.3071	3.5965	2.4230	6.0195		6,244.4284	6,244.4284	1.9440		6,293.0278

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.3 Grading - 2018**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0971	0.0652	0.6612	1.6100e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		160.3484	160.3484	5.1400e-003		160.4768
Total	0.0971	0.0652	0.6612	1.6100e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		160.3484	160.3484	5.1400e-003		160.4768

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	5.0901	59.5218	35.0894	0.0620		2.6337	2.6337		2.4230	2.4230	0.0000	6,244.4284	6,244.4284	1.9440		6,293.0278
Total	5.0901	59.5218	35.0894	0.0620	3.9030	2.6337	6.5367	1.6184	2.4230	4.0415	0.0000	6,244.4284	6,244.4284	1.9440		6,293.0278

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.3 Grading - 2018**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0971	0.0652	0.6612	1.6100e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		160.3484	160.3484	5.1400e-003		160.4768
Total	0.0971	0.0652	0.6612	1.6100e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		160.3484	160.3484	5.1400e-003		160.4768

3.4 Building Construction - 2018**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.9351	2,620.9351	0.6421		2,636.9883
Total	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.9351	2,620.9351	0.6421		2,636.9883

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.4 Building Construction - 2018**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.1259	30.2599	8.9040	0.0610	1.6153	0.2735	1.8888	0.4648	0.2617	0.7265		6,531.884 6	6,531.884 6	0.6193		6,547.366 1
Worker	4.1781	2.8045	28.4652	0.0694	7.0729	0.0513	7.1242	1.8761	0.0473	1.9234		6,902.996 4	6,902.996 4	0.2212		6,908.526 0
Total	5.3039	33.0644	37.3691	0.1304	8.6882	0.3248	9.0130	2.3409	0.3090	2.6498		13,434.88 10	13,434.88 10	0.8404		13,455.89 20

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099	0.0000	2,620.935 1	2,620.935 1	0.6421		2,636.988 3
Total	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099	0.0000	2,620.935 1	2,620.935 1	0.6421		2,636.988 3

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3.4 Building Construction - 2018**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.1259	30.2599	8.9040	0.0610	1.6153	0.2735	1.8888	0.4648	0.2617	0.7265		6,531.884 6	6,531.884 6	0.6193		6,547.366 1
Worker	4.1781	2.8045	28.4652	0.0694	7.0729	0.0513	7.1242	1.8761	0.0473	1.9234		6,902.996 4	6,902.996 4	0.2212		6,908.526 0
Total	5.3039	33.0644	37.3691	0.1304	8.6882	0.3248	9.0130	2.3409	0.3090	2.6498		13,434.88 10	13,434.88 10	0.8404		13,455.89 20

3.4 Building Construction - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.580 2	2,591.580 2	0.6313		2,607.363 5
Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.580 2	2,591.580 2	0.6313		2,607.363 5

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3.4 Building Construction - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.0264	28.4870	8.2512	0.0606	1.6154	0.2355	1.8509	0.4648	0.2253	0.6901		6,498.6853	6,498.6853	0.5976		6,513.6240
Worker	3.8350	2.4821	25.5565	0.0675	7.0729	0.0509	7.1239	1.8761	0.0469	1.9230		6,715.9544	6,715.9544	0.1980		6,720.9038
Total	4.8614	30.9691	33.8078	0.1281	8.6883	0.2864	8.9747	2.3409	0.2722	2.6131		13,214.6397	13,214.6397	0.7955		13,234.5278

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635
Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.5802	2,591.5802	0.6313		2,607.3635

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.4 Building Construction - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.0264	28.4870	8.2512	0.0606	1.6154	0.2355	1.8509	0.4648	0.2253	0.6901		6,498.6853	6,498.6853	0.5976		6,513.6240
Worker	3.8350	2.4821	25.5565	0.0675	7.0729	0.0509	7.1239	1.8761	0.0469	1.9230		6,715.9544	6,715.9544	0.1980		6,720.9038
Total	4.8614	30.9691	33.8078	0.1281	8.6883	0.2864	8.9747	2.3409	0.2722	2.6131		13,214.6397	13,214.6397	0.7955		13,234.5278

3.4 Building Construction - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.4 Building Construction - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.8465	25.6320	7.3785	0.0602	1.6155	0.1575	1.7730	0.4649	0.1507	0.6155		6,467.688 1	6,467.688 1	0.5597		6,481.680 1
Worker	3.5661	2.2153	23.2331	0.0653	7.0729	0.0499	7.1229	1.8761	0.0460	1.9221		6,503.787 8	6,503.787 8	0.1763		6,508.194 5
Total	4.4126	27.8473	30.6117	0.1255	8.6884	0.2074	8.8959	2.3410	0.1967	2.5376		12,971.47 60	12,971.47 60	0.7360		12,989.87 46

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.063 1	2,553.063 1	0.6229		2,568.634 5
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.063 1	2,553.063 1	0.6229		2,568.634 5

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.4 Building Construction - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.8465	25.6320	7.3785	0.0602	1.6155	0.1575	1.7730	0.4649	0.1507	0.6155		6,467.688 1	6,467.688 1	0.5597		6,481.680 1
Worker	3.5661	2.2153	23.2331	0.0653	7.0729	0.0499	7.1229	1.8761	0.0460	1.9221		6,503.787 8	6,503.787 8	0.1763		6,508.194 5
Total	4.4126	27.8473	30.6117	0.1255	8.6884	0.2074	8.8959	2.3410	0.1967	2.5376		12,971.47 60	12,971.47 60	0.7360		12,989.87 46

3.5 Paving - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.733 4	2,207.733 4	0.7140		2,225.584 1
Paving	1.0428					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	2.3993	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.733 4	2,207.733 4	0.7140		2,225.584 1

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.5 Paving - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0621	0.0386	0.4048	1.1400e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		113.3064	113.3064	3.0700e-003		113.3832
Total	0.0621	0.0386	0.4048	1.1400e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		113.3064	113.3064	3.0700e-003		113.3832

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	1.0428					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	2.3993	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.5 Paving - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0621	0.0386	0.4048	1.1400e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		113.3064	113.3064	3.0700e-003		113.3832
Total	0.0621	0.0386	0.4048	1.1400e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		113.3064	113.3064	3.0700e-003		113.3832

3.6 Architectural Coating - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	36.9090	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.6 Architectural Coating - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.8306	2.4792	25.5269	0.0674	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		6,708.154 2	6,708.154 2	0.1978		6,713.097 9
Total	3.8306	2.4792	25.5269	0.0674	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		6,708.154 2	6,708.154 2	0.1978		6,713.097 9

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423
Total	36.9090	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.6 Architectural Coating - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.8306	2.4792	25.5269	0.0674	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		6,708.154 2	6,708.154 2	0.1978		6,713.097 9
Total	3.8306	2.4792	25.5269	0.0674	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		6,708.154 2	6,708.154 2	0.1978		6,713.097 9

3.6 Architectural Coating - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	36.8848	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.6 Architectural Coating - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.5620	2.2127	23.2061	0.0652	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,496.234 1	6,496.234 1	0.1761		6,500.635 6
Total	3.5620	2.2127	23.2061	0.0652	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,496.234 1	6,496.234 1	0.1761		6,500.635 6

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	36.8848	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

3.6 Architectural Coating - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.5620	2.2127	23.2061	0.0652	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,496.234 1	6,496.234 1	0.1761		6,500.635 6
Total	3.5620	2.2127	23.2061	0.0652	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,496.234 1	6,496.234 1	0.1761		6,500.635 6

4.0 Operational Detail - Mobile**4.1 Mitigation Measures Mobile**

Increase Density

Improve Destination Accessibility

Increase Transit Accessibility

Integrate Below Market Rate Housing

Improve Pedestrian Network

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	5.4225	22.0153	66.8548	0.2138	19.8545	0.1859	20.0404	5.3026	0.1735	5.4760		21,634.6282	21,634.6282	0.9459		21,658.2761
Unmitigated	5.6325	23.5684	72.7248	0.2386	22.2834	0.2053	22.4887	5.9513	0.1916	6.1429		24,137.5152	24,137.5152	1.0316		24,163.3049

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	584.80	584.80	584.80	1,615,845	1,439,718
Apartments Mid Rise	2,061.50	1,980.90	1816.60	5,567,591	4,960,724
City Park	0.00	0.00	0.00		
Condo/Townhouse High Rise	628.32	284.46	226.38	1,441,708	1,284,562
Parking Lot	0.00	0.00	0.00		
Single Family Housing	514.08	535.14	465.48	1,409,570	1,255,927
Total	3,788.70	3,385.30	3,093.26	10,034,714	8,940,930

4.3 Trip Type Information

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Apartments Mid Rise	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Condo/Townhouse High Rise	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Single Family Housing	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
City Park	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Apartments Low Rise	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Apartments Mid Rise	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Condo/Townhouse High Rise	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Single Family Housing	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445
NaturalGas Unmitigated	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

5.2 Energy by Land Use - NaturalGas**Unmitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7437.39	0.0802	0.6854	0.2917	4.3700e-003		0.0554	0.0554		0.0554	0.0554		874.9869	874.9869	0.0168	0.0160	880.1865
Apartments Mid Rise	11929.7	0.1287	1.0994	0.4678	7.0200e-003		0.0889	0.0889		0.0889	0.0889		1,403.4932	1,403.4932	0.0269	0.0257	1,411.8334
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse High Rise	2539.87	0.0274	0.2341	0.0996	1.4900e-003		0.0189	0.0189		0.0189	0.0189		298.8082	298.8082	5.7300e-003	5.4800e-003	300.5839
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	4615.62	0.0498	0.4254	0.1810	2.7200e-003		0.0344	0.0344		0.0344	0.0344		543.0139	543.0139	0.0104	9.9600e-003	546.2408
Total		0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

5.2 Energy by Land Use - NaturalGas**Mitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7.43739	0.0802	0.6854	0.2917	4.3700e-003		0.0554	0.0554		0.0554	0.0554		874.9869	874.9869	0.0168	0.0160	880.1865
Apartments Mid Rise	11.9297	0.1287	1.0994	0.4678	7.0200e-003		0.0889	0.0889		0.0889	0.0889		1,403.4932	1,403.4932	0.0269	0.0257	1,411.8334
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse High Rise	2.53987	0.0274	0.2341	0.0996	1.4900e-003		0.0189	0.0189		0.0189	0.0189		298.8082	298.8082	5.7300e-003	5.4800e-003	300.5839
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	4.61562	0.0498	0.4254	0.1810	2.7200e-003		0.0344	0.0344		0.0344	0.0344		543.0139	543.0139	0.0104	9.9600e-003	546.2408
Total		0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445

6.0 Area Detail**6.1 Mitigation Measures Area**

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	17.2270	1.3486	38.1060	7.4200e-003		0.2760	0.2760		0.2760	0.2760	0.0000	1,205.9722	1,205.9722	0.0672	0.0210	1,213.8988
Unmitigated	17.5244	1.4690	50.0528	8.3400e-003		0.3461	0.3461		0.3461	0.3461	0.0000	1,232.7960	1,232.7960	0.1087	0.0210	1,241.7597

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

6.2 Area by SubCategory**Unmitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.9074					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	14.0032					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.1048	0.8958	0.3812	5.7200e-003		0.0724	0.0724		0.0724	0.0724	0.0000	1,143.5294	1,143.5294	0.0219	0.0210	1,150.3248
Landscaping	1.5090	0.5732	49.6716	2.6200e-003		0.2737	0.2737		0.2737	0.2737		89.2666	89.2666	0.0867		91.4349
Total	17.5244	1.4690	50.0528	8.3400e-003		0.3461	0.3461		0.3461	0.3461	0.0000	1,232.7960	1,232.7960	0.1087	0.0210	1,241.7597

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

6.2 Area by SubCategory**Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.3209					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	14.0032					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.1048	0.8958	0.3812	5.7200e-003		0.0724	0.0724		0.0724	0.0724	0.0000	1,143.5294	1,143.5294	0.0219	0.0210	1,150.3248
Landscaping	0.7981	0.4528	37.7248	1.7000e-003		0.2036	0.2036		0.2036	0.2036		62.4428	62.4428	0.0453		63.5740
Total	17.2271	1.3485	38.1060	7.4200e-003		0.2760	0.2760		0.2760	0.2760	0.0000	1,205.9722	1,205.9722	0.0672	0.0210	1,213.8988

7.0 Water Detail**7.1 Mitigation Measures Water****8.0 Waste Detail****8.1 Mitigation Measures Waste****9.0 Operational Offroad**

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

CSUCI University Glen Phase 2 and Amendment - Ventura County, Winter

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

CSUCI University Glen Phase 2 and Amendment

Ventura County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	607.00	1000sqft	13.93	607,000.00	0
City Park	10.56	Acre	10.56	459,993.60	0
Apartments Low Rise	170.00	Dwelling Unit	1.28	170,000.00	520
Apartments Mid Rise	310.00	Dwelling Unit	3.67	310,000.00	949
Condo/Townhouse High Rise	66.00	Dwelling Unit	1.30	66,000.00	202
Single Family Housing	54.00	Dwelling Unit	1.26	97,200.00	165

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MW hr)	702.44	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

Project Characteristics -

Land Use - The remaining area (total area - hardscape -landscape) was divided among the different residential uses in proportion to the total building area for each residential land use type.

Construction Phase - The default for architectural coating-35 days at the very end of all construction-was adjusted to 190 days, beginning a little over halfway through construction and ending one week after paving, to better reflect actual construction practices (residences would be painted as building construction of each building is completed).

Vehicle Trips - Trip gen rates adjusted in accordance with ITE rates used in Traffic study. Landscape area (City Park) would not generate new trips as it would be used by residents.

Woodstoves - Based on existing University Glen single-family homes, it was assumed single-family homes would have a gas fireplace.

Mobile Land Use Mitigation -

Area Mitigation - Rule 74.2 limits VOC content of flat coatings to 100 g/L and non-flat coatings to 150 g/L

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	150.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	150.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaCoating	Area_EF_Nonresidential_Interior	250	150
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	75	100
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblConstructionPhase	NumDays	35.00	190.00
tblConstructionPhase	PhaseEndDate	4/6/2021	7/21/2020
tblConstructionPhase	PhaseStartDate	7/15/2020	10/30/2019
tblFireplaces	FireplaceDayYear	0.00	10.00
tblFireplaces	FireplaceHourDay	0.00	3.00
tblFireplaces	NumberGas	0.00	54.00
tblFireplaces	NumberNoFireplace	54.00	0.00
tblLandUse	LotAcreage	10.63	1.28
tblLandUse	LotAcreage	8.16	3.67
tblLandUse	LotAcreage	1.03	1.30
tblLandUse	LotAcreage	17.53	1.26
tblProjectCharacteristics	OperationalYear	2018	2021
tblVehicleTrips	ST_TR	7.16	3.44
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	SU_TR	6.07	3.44
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	WD_TR	6.59	3.44
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	4.18	9.52

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

2.0 Emissions Summary

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

2.1 Overall Construction (Maximum Daily Emission)**Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	7.4357	59.5774	54.4380	0.1623	18.2141	2.6349	20.7921	9.9699	2.4241	12.3417	0.0000	16,564.0579	16,564.0579	1.9493	0.0000	16,600.2815
2019	47.0100	55.5465	78.5016	0.2336	40.3126	1.7501	42.0626	10.2431	1.6550	11.8980	0.0000	23,637.5029	23,637.5029	1.6231	0.0000	23,678.0816
2020	46.0931	50.2574	72.7832	0.2287	40.3127	1.4812	41.7939	10.2431	1.4000	11.6431	0.0000	23,125.9039	23,125.9039	1.5348	0.0000	23,164.2723
Maximum	47.0100	59.5774	78.5016	0.2336	40.3127	2.6349	42.0626	10.2431	2.4241	12.3417	0.0000	23,637.5029	23,637.5029	1.9493	0.0000	23,678.0816

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	7.4357	59.5774	54.4380	0.1623	8.6882	2.6349	10.8557	4.5080	2.4241	6.8798	0.0000	16,564.0579	16,564.0579	1.9493	0.0000	16,600.2814
2019	47.0100	55.5465	78.5016	0.2336	40.3126	1.7501	42.0626	10.2431	1.6550	11.8980	0.0000	23,637.5029	23,637.5029	1.6231	0.0000	23,678.0816
2020	46.0931	50.2574	72.7832	0.2287	40.3127	1.4812	41.7939	10.2431	1.4000	11.6431	0.0000	23,125.9039	23,125.9039	1.5348	0.0000	23,164.2723
Maximum	47.0100	59.5774	78.5016	0.2336	40.3127	2.6349	42.0626	10.2431	2.4241	11.8980	0.0000	23,637.5029	23,637.5029	1.9493	0.0000	23,678.0816

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	9.64	0.00	9.50	17.93	0.00	15.22	0.00	0.00	0.00	0.00	0.00	0.00

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

2.2 Overall Operational**Unmitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	17.5244	1.4690	50.0528	8.3400e-003		0.3461	0.3461		0.3461	0.3461	0.0000	1,232.7960	1,232.7960	0.1087	0.0210	1,241.7597
Energy	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445
Mobile	5.9283	22.5292	72.0253	0.2489	22.2834	0.2033	22.4866	5.9513	0.1897	6.1409		25,183.8645	25,183.8645	1.0178		25,209.3094
Total	23.7387	26.4424	123.1182	0.2729	22.2834	0.7470	23.0304	5.9513	0.7334	6.6846	0.0000	29,536.9626	29,536.9626	1.1863	0.0782	29,589.9136

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	17.9379	1.4690	50.0528	8.3400e-003		0.3461	0.3461		0.3461	0.3461	0.0000	1,232.7960	1,232.7960	0.1087	0.0210	1,241.7597
Energy	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445
Mobile	5.7158	21.0945	65.7272	0.2232	19.8545	0.1838	20.0383	5.3026	0.1715	5.4741		22,576.9197	22,576.9197	0.9298		22,600.1635
Total	23.9398	25.0077	116.8201	0.2471	19.8545	0.7275	20.5820	5.3026	0.7152	6.0178	0.0000	26,930.0178	26,930.0178	1.0982	0.0782	26,980.7677

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	-0.85	5.43	5.12	9.45	10.90	2.60	10.63	10.90	2.48	9.98	0.00	8.83	8.83	7.42	0.00	8.82

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/11/2018	9/25/2018	5	20	
2	Grading	Grading	9/26/2018	12/11/2018	5	45	
3	Building Construction	Building Construction	12/12/2018	5/26/2020	5	500	
4	Paving	Paving	5/27/2020	7/14/2020	5	35	
5	Architectural Coating	Architectural Coating	10/30/2019	7/21/2020	5	190	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 13.93

Residential Indoor: 1,302,480; Residential Outdoor: 434,160; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 36,420 (Architectural Coating – sqft)

OffRoad Equipment

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	861.00	239.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2018**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708		3,831.623 9	3,831.623 9	1.1928		3,861.444 8
Total	4.5627	48.1988	22.4763	0.0380	18.0663	2.5769	20.6432	9.9307	2.3708	12.3014		3,831.623 9	3,831.623 9	1.1928		3,861.444 8

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

3.2 Site Preparation - 2018**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0771	0.0500	0.6054	1.5200e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		151.6486	151.6486	4.7600e-003		151.7675
Total	0.0771	0.0500	0.6054	1.5200e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		151.6486	151.6486	4.7600e-003		151.7675

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	4.5627	48.1988	22.4763	0.0380		2.5769	2.5769		2.3708	2.3708	0.0000	3,831.6239	3,831.6239	1.1928		3,861.4448
Total	4.5627	48.1988	22.4763	0.0380	8.1298	2.5769	10.7067	4.4688	2.3708	6.8396	0.0000	3,831.6239	3,831.6239	1.1928		3,861.4448

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

3.2 Site Preparation - 2018**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0771	0.0500	0.6054	1.5200e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		151.6486	151.6486	4.7600e-003		151.7675
Total	0.0771	0.0500	0.6054	1.5200e-003	0.1479	1.0700e-003	0.1489	0.0392	9.9000e-004	0.0402		151.6486	151.6486	4.7600e-003		151.7675

3.3 Grading - 2018**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	5.0901	59.5218	35.0894	0.0620		2.6337	2.6337		2.4230	2.4230		6,244.4284	6,244.4284	1.9440		6,293.0278
Total	5.0901	59.5218	35.0894	0.0620	8.6733	2.6337	11.3071	3.5965	2.4230	6.0195		6,244.4284	6,244.4284	1.9440		6,293.0278

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3.3 Grading - 2018**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0857	0.0556	0.6727	1.6900e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		168.4984	168.4984	5.2900e-003		168.6306
Total	0.0857	0.0556	0.6727	1.6900e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		168.4984	168.4984	5.2900e-003		168.6306

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	5.0901	59.5218	35.0894	0.0620		2.6337	2.6337		2.4230	2.4230	0.0000	6,244.4284	6,244.4284	1.9440		6,293.0278
Total	5.0901	59.5218	35.0894	0.0620	3.9030	2.6337	6.5367	1.6184	2.4230	4.0415	0.0000	6,244.4284	6,244.4284	1.9440		6,293.0278

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3.3 Grading - 2018**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0857	0.0556	0.6727	1.6900e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		168.4984	168.4984	5.2900e-003		168.6306
Total	0.0857	0.0556	0.6727	1.6900e-003	0.1643	1.1900e-003	0.1655	0.0436	1.1000e-003	0.0447		168.4984	168.4984	5.2900e-003		168.6306

3.4 Building Construction - 2018**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.9351	2,620.9351	0.6421		2,636.9883
Total	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099		2,620.9351	2,620.9351	0.6421		2,636.9883

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3.4 Building Construction - 2018**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.0682	30.1332	7.8998	0.0625	1.6153	0.2671	1.8824	0.4648	0.2555	0.7203		6,689.2670	6,689.2670	0.5792		6,703.7477
Worker	3.6880	2.3926	28.9578	0.0729	7.0729	0.0513	7.1242	1.8761	0.0473	1.9234		7,253.8558	7,253.8558	0.2276		7,259.5455
Total	4.7562	32.5258	36.8576	0.1354	8.6882	0.3184	9.0066	2.3409	0.3028	2.6437		13,943.1228	13,943.1228	0.8068		13,963.2932

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099	0.0000	2,620.9351	2,620.9351	0.6421		2,636.9883
Total	2.6795	23.3900	17.5804	0.0269		1.4999	1.4999		1.4099	1.4099	0.0000	2,620.9351	2,620.9351	0.6421		2,636.9883

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

3.4 Building Construction - 2018**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.0682	30.1332	7.8998	0.0625	1.6153	0.2671	1.8824	0.4648	0.2555	0.7203		6,689.2670	6,689.2670	0.5792		6,703.7477
Worker	3.6880	2.3926	28.9578	0.0729	7.0729	0.0513	7.1242	1.8761	0.0473	1.9234		7,253.8558	7,253.8558	0.2276		7,259.5455
Total	4.7562	32.5258	36.8576	0.1354	8.6882	0.3184	9.0066	2.3409	0.3028	2.6437		13,943.1228	13,943.1228	0.8068		13,963.2932

3.4 Building Construction - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635
Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635

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3.4 Building Construction - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.9736	28.4008	7.3130	0.0621	1.6154	0.2297	1.8450	0.4648	0.2197	0.6845		6,657.473 6	6,657.473 6	0.5596		6,671.464 4
Worker	3.3851	2.1170	26.1069	0.0709	7.0729	0.0509	7.1239	1.8761	0.0469	1.9230		7,057.599 1	7,057.599 1	0.2043		7,062.707 2
Total	4.3587	30.5178	33.4199	0.1329	8.6883	0.2806	8.9689	2.3409	0.2666	2.6075		13,715.07 26	13,715.07 26	0.7640		13,734.17 15

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.580 2	2,591.580 2	0.6313		2,607.363 5
Total	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.580 2	2,591.580 2	0.6313		2,607.363 5

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3.4 Building Construction - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.9736	28.4008	7.3130	0.0621	1.6154	0.2297	1.8450	0.4648	0.2197	0.6845		6,657.473 6	6,657.473 6	0.5596		6,671.464 4
Worker	3.3851	2.1170	26.1069	0.0709	7.0729	0.0509	7.1239	1.8761	0.0469	1.9230		7,057.599 1	7,057.599 1	0.2043		7,062.707 2
Total	4.3587	30.5178	33.4199	0.1329	8.6883	0.2806	8.9689	2.3409	0.2666	2.6075		13,715.07 26	13,715.07 26	0.7640		13,734.17 15

3.4 Building Construction - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.063 1	2,553.063 1	0.6229		2,568.634 5
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.063 1	2,553.063 1	0.6229		2,568.634 5

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3.4 Building Construction - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.8004	25.6101	6.5441	0.0617	1.6155	0.1534	1.7689	0.4649	0.1467	0.6116		6,629.8238	6,629.8238	0.5254		6,642.9595
Worker	3.1459	1.8898	23.7934	0.0686	7.0729	0.0499	7.1229	1.8761	0.0460	1.9221		6,834.7535	6,834.7535	0.1824		6,839.3145
Total	3.9462	27.4999	30.3375	0.1303	8.6884	0.2033	8.8918	2.3410	0.1928	2.5337		13,464.5774	13,464.5774	0.7079		13,482.2740

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345

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3.4 Building Construction - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.8004	25.6101	6.5441	0.0617	1.6155	0.1534	1.7689	0.4649	0.1467	0.6116		6,629.8238	6,629.8238	0.5254		6,642.9595
Worker	3.1459	1.8898	23.7934	0.0686	7.0729	0.0499	7.1229	1.8761	0.0460	1.9221		6,834.7535	6,834.7535	0.1824		6,839.3145
Total	3.9462	27.4999	30.3375	0.1303	8.6884	0.2033	8.8918	2.3410	0.1928	2.5337		13,464.5774	13,464.5774	0.7079		13,482.2740

3.5 Paving - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	1.0428					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	2.3993	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.7334	2,207.7334	0.7140		2,225.5841

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3.5 Paving - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0548	0.0329	0.4145	1.2000e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		119.0724	119.0724	3.1800e-003		119.1518
Total	0.0548	0.0329	0.4145	1.2000e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		119.0724	119.0724	3.1800e-003		119.1518

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	1.0428					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	2.3993	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841

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3.5 Paving - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0548	0.0329	0.4145	1.2000e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		119.0724	119.0724	3.1800e-003		119.1518
Total	0.0548	0.0329	0.4145	1.2000e-003	0.1232	8.7000e-004	0.1241	0.0327	8.0000e-004	0.0335		119.0724	119.0724	3.1800e-003		119.1518

3.6 Architectural Coating - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	36.9090	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423

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3.6 Architectural Coating - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.3811	2.1145	26.0766	0.0708	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		7,049.402 1	7,049.402 1	0.2041		7,054.504 2
Total	3.3811	2.1145	26.0766	0.0708	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		7,049.402 1	7,049.402 1	0.2041		7,054.504 2

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423
Total	36.9090	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

3.6 Architectural Coating - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.3811	2.1145	26.0766	0.0708	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		7,049.402 1	7,049.402 1	0.2041		7,054.504 2
Total	3.3811	2.1145	26.0766	0.0708	31.6242	0.0509	31.6751	7.9021	0.0469	7.9490		7,049.402 1	7,049.402 1	0.2041		7,054.504 2

3.6 Architectural Coating - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	36.8848	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

3.6 Architectural Coating - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.1422	1.8876	23.7658	0.0685	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,826.815 4	6,826.815 4	0.1822		6,831.371 0
Total	3.1422	1.8876	23.7658	0.0685	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,826.815 4	6,826.815 4	0.1822		6,831.371 0

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.6426					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	36.8848	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

3.6 Architectural Coating - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.1422	1.8876	23.7658	0.0685	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,826.815 4	6,826.815 4	0.1822		6,831.371 0
Total	3.1422	1.8876	23.7658	0.0685	31.6242	0.0499	31.6741	7.9021	0.0460	7.9481		6,826.815 4	6,826.815 4	0.1822		6,831.371 0

4.0 Operational Detail - Mobile**4.1 Mitigation Measures Mobile**

Increase Density

Improve Destination Accessibility

Increase Transit Accessibility

Integrate Below Market Rate Housing

Improve Pedestrian Network

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	5.7158	21.0945	65.7272	0.2232	19.8545	0.1838	20.0383	5.3026	0.1715	5.4741		22,576.91 97	22,576.91 97	0.9298		22,600.16 35
Unmitigated	5.9283	22.5292	72.0253	0.2489	22.2834	0.2033	22.4866	5.9513	0.1897	6.1409		25,183.86 45	25,183.86 45	1.0178		25,209.30 94

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	584.80	584.80	584.80	1,615,845	1,439,718
Apartments Mid Rise	2,061.50	1,980.90	1816.60	5,567,591	4,960,724
City Park	0.00	0.00	0.00		
Condo/Townhouse High Rise	628.32	284.46	226.38	1,441,708	1,284,562
Parking Lot	0.00	0.00	0.00		
Single Family Housing	514.08	535.14	465.48	1,409,570	1,255,927
Total	3,788.70	3,385.30	3,093.26	10,034,714	8,940,930

4.3 Trip Type Information

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Apartments Mid Rise	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Condo/Townhouse High Rise	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Single Family Housing	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
City Park	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Apartments Low Rise	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Apartments Mid Rise	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Condo/Townhouse High Rise	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Single Family Housing	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.302 1	3,120.302 1	0.0598	0.0572	3,138.844 5
NaturalGas Unmitigated	0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.302 1	3,120.302 1	0.0598	0.0572	3,138.844 5

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

5.2 Energy by Land Use - NaturalGas**Unmitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7437.39	0.0802	0.6854	0.2917	4.3700e-003		0.0554	0.0554		0.0554	0.0554		874.9869	874.9869	0.0168	0.0160	880.1865
Apartments Mid Rise	11929.7	0.1287	1.0994	0.4678	7.0200e-003		0.0889	0.0889		0.0889	0.0889		1,403.4932	1,403.4932	0.0269	0.0257	1,411.8334
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse High Rise	2539.87	0.0274	0.2341	0.0996	1.4900e-003		0.0189	0.0189		0.0189	0.0189		298.8082	298.8082	5.7300e-003	5.4800e-003	300.5839
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	4615.62	0.0498	0.4254	0.1810	2.7200e-003		0.0344	0.0344		0.0344	0.0344		543.0139	543.0139	0.0104	9.9600e-003	546.2408
Total		0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

5.2 Energy by Land Use - NaturalGas**Mitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7.43739	0.0802	0.6854	0.2917	4.3700e-003		0.0554	0.0554		0.0554	0.0554		874.9869	874.9869	0.0168	0.0160	880.1865
Apartments Mid Rise	11.9297	0.1287	1.0994	0.4678	7.0200e-003		0.0889	0.0889		0.0889	0.0889		1,403.4932	1,403.4932	0.0269	0.0257	1,411.8334
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse High Rise	2.53987	0.0274	0.2341	0.0996	1.4900e-003		0.0189	0.0189		0.0189	0.0189		298.8082	298.8082	5.7300e-003	5.4800e-003	300.5839
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	4.61562	0.0498	0.4254	0.1810	2.7200e-003		0.0344	0.0344		0.0344	0.0344		543.0139	543.0139	0.0104	9.9600e-003	546.2408
Total		0.2860	2.4442	1.0401	0.0156		0.1976	0.1976		0.1976	0.1976		3,120.3021	3,120.3021	0.0598	0.0572	3,138.8445

6.0 Area Detail**6.1 Mitigation Measures Area**

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	17.9379	1.4690	50.0528	8.3400e-003		0.3461	0.3461		0.3461	0.3461	0.0000	1,232.7960	1,232.7960	0.1087	0.0210	1,241.7597
Unmitigated	17.5244	1.4690	50.0528	8.3400e-003		0.3461	0.3461		0.3461	0.3461	0.0000	1,232.7960	1,232.7960	0.1087	0.0210	1,241.7597

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.9074					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	14.0032					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.1048	0.8958	0.3812	5.7200e-003		0.0724	0.0724		0.0724	0.0724	0.0000	1,143.5294	1,143.5294	0.0219	0.0210	1,150.3248
Landscaping	1.5090	0.5732	49.6716	2.6200e-003		0.2737	0.2737		0.2737	0.2737		89.2666	89.2666	0.0867		91.4349
Total	17.5244	1.4690	50.0528	8.3400e-003		0.3461	0.3461		0.3461	0.3461	0.0000	1,232.7960	1,232.7960	0.1087	0.0210	1,241.7597

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6.2 Area by SubCategory**Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.3209					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	14.0032					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.1048	0.8958	0.3812	5.7200e-003		0.0724	0.0724		0.0724	0.0724	0.0000	1,143.5294	1,143.5294	0.0219	0.0210	1,150.3248
Landscaping	1.5090	0.5732	49.6716	2.6200e-003		0.2737	0.2737		0.2737	0.2737		89.2666	89.2666	0.0867		91.4349
Total	17.9379	1.4690	50.0528	8.3400e-003		0.3461	0.3461		0.3461	0.3461	0.0000	1,232.7960	1,232.7960	0.1087	0.0210	1,241.7597

7.0 Water Detail**7.1 Mitigation Measures Water****8.0 Waste Detail****8.1 Mitigation Measures Waste****9.0 Operational Offroad**

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summer

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

CSUCI University Glen Phase 2 and Amendment - Ventura County, Annual

CSUCI University Glen Phase 2 and Amendment

Ventura County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	607.00	1000sqft	13.93	607,000.00	0
City Park	10.56	Acre	10.56	459,993.60	0
Apartments Low Rise	170.00	Dwelling Unit	1.28	170,000.00	520
Apartments Mid Rise	310.00	Dwelling Unit	3.67	310,000.00	949
Condo/Townhouse High Rise	66.00	Dwelling Unit	1.30	66,000.00	202
Single Family Housing	54.00	Dwelling Unit	1.26	97,200.00	165

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MW hr)	702.44	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

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Project Characteristics -

Land Use - The remaining area (total area - hardscape -landscape) was divided among the different residential uses in proportion to the total building area for each residential land use type.

Construction Phase - The default for architectural coating-35 days at the very end of all construction-was adjusted to 190 days, beginning a little over halfway through construction and ending one week after paving, to better reflect actual construction practices (residences would be painted as building construction of each building is completed).

Vehicle Trips - Trip gen rates adjusted in accordance with ITE rates used in Traffic study. Landscape area (City Park) would not generate new trips as it would be used by residents.

Woodstoves - Based on existing University Glen single-family homes, it was assumed single-family homes would have a gas fireplace.

Mobile Land Use Mitigation -

Area Mitigation - Rule 74.2 limits VOC content of flat coatings to 100 g/L and non-flat coatings to 150 g/L

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Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	150.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	150.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaCoating	Area_EF_Nonresidential_Interior	250	150
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	75	100
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblConstructionPhase	NumDays	35.00	190.00
tblConstructionPhase	PhaseEndDate	4/6/2021	7/21/2020
tblConstructionPhase	PhaseStartDate	7/15/2020	10/30/2019
tblFireplaces	FireplaceDayYear	0.00	10.00
tblFireplaces	FireplaceHourDay	0.00	3.00
tblFireplaces	NumberGas	0.00	54.00
tblFireplaces	NumberNoFireplace	54.00	0.00
tblLandUse	LotAcreage	10.63	1.28
tblLandUse	LotAcreage	8.16	3.67
tblLandUse	LotAcreage	1.03	1.30
tblLandUse	LotAcreage	17.53	1.26
tblProjectCharacteristics	OperationalYear	2018	2021
tblVehicleTrips	ST_TR	7.16	3.44
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	SU_TR	6.07	3.44
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	WD_TR	6.59	3.44
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	4.18	9.52

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2.0 Emissions Summary

CSUCI University Glen Phase 2 and Amendment - Ventura County, Annual

2.1 Overall Construction**Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.3225	3.3627	1.9956	3.9500e-003	0.8035	0.1561	0.9596	0.3904	0.1439	0.5343	0.0000	361.9291	361.9291	0.0878	0.0000	364.1234
2019	1.7915	6.9227	7.1584	0.0220	1.8105	0.2093	2.0198	0.4747	0.1973	0.6720	0.0000	2,032.3855	2,032.3855	0.1710	0.0000	2,036.6595
2020	3.2683	3.0061	4.5167	0.0135	2.6956	0.0943	2.7899	0.6828	0.0889	0.7716	0.0000	1,232.4804	1,232.4804	0.0883	0.0000	1,234.6866
Maximum	3.2683	6.9227	7.1584	0.0220	2.6956	0.2093	2.7899	0.6828	0.1973	0.7716	0.0000	2,032.3855	2,032.3855	0.1710	0.0000	2,036.6595

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.3225	3.3627	1.9955	3.9500e-003	0.3991	0.1561	0.5552	0.1858	0.1439	0.3297	0.0000	361.9288	361.9288	0.0878	0.0000	364.1231
2019	1.7915	6.9227	7.1584	0.0220	1.8105	0.2093	2.0198	0.4747	0.1973	0.6720	0.0000	2,032.3851	2,032.3851	0.1710	0.0000	2,036.6591
2020	3.2683	3.0061	4.5167	0.0135	2.6956	0.0943	2.7899	0.6828	0.0889	0.7716	0.0000	1,232.4802	1,232.4802	0.0883	0.0000	1,234.6864
Maximum	3.2683	6.9227	7.1584	0.0220	2.6956	0.2093	2.7899	0.6828	0.1973	0.7716	0.0000	2,032.3851	2,032.3851	0.1710	0.0000	2,036.6591

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	7.62	0.00	7.01	13.22	0.00	10.34	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	7-11-2018	10-10-2018	1.8014	1.8014
2	10-11-2018	1-10-2019	2.1062	2.1062
3	1-11-2019	4-10-2019	1.9017	1.9017
4	4-11-2019	7-10-2019	1.8953	1.8953
5	7-11-2019	10-10-2019	1.9195	1.9195
6	10-11-2019	1-10-2020	3.0992	3.0992
7	1-11-2020	4-10-2020	3.1765	3.1765
8	4-11-2020	7-10-2020	2.5496	2.5496
9	7-11-2020	9-30-2020	0.1949	0.1949
		Highest	3.1765	3.1765

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2.2 Overall Operational**Unmitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.0400	0.0561	4.4724	2.6000e-004		0.0250	0.0250		0.0250	0.0250	0.0000	12.4753	12.4753	7.1800e-003	1.0000e-004	12.6831
Energy	0.0522	0.4461	0.1898	2.8500e-003		0.0361	0.0361		0.0361	0.0361	0.0000	1,586.9976	1,586.9976	0.0541	0.0186	1,593.8969
Mobile	0.9671	4.0794	12.3383	0.0417	3.7956	0.0354	3.8310	1.0152	0.0330	1.0482	0.0000	3,826.7847	3,826.7847	0.1601	0.0000	3,830.7860
Waste						0.0000	0.0000		0.0000	0.0000	64.9003	0.0000	64.9003	3.8355	0.0000	160.7877
Water						0.0000	0.0000		0.0000	0.0000	12.4022	293.9656	306.3678	1.2860	0.0326	348.2284
Total	4.0593	4.5816	17.0005	0.0448	3.7956	0.0964	3.8921	1.0152	0.0941	1.1093	77.3025	5,720.2232	5,797.5256	5.3428	0.0513	5,946.3820

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2.2 Overall Operational**Mitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.1155	0.0561	4.4724	2.6000e-004		0.0250	0.0250		0.0250	0.0250	0.0000	12.4753	12.4753	7.1800e-003	1.0000e-004	12.6831
Energy	0.0522	0.4461	0.1898	2.8500e-003		0.0361	0.0361		0.0361	0.0361	0.0000	1,586.9976	1,586.9976	0.0541	0.0186	1,593.8969
Mobile	0.9307	3.8120	11.3150	0.0374	3.3819	0.0320	3.4139	0.9046	0.0299	0.9344	0.0000	3,430.7147	3,430.7147	0.1465	0.0000	3,434.3778
Waste						0.0000	0.0000		0.0000	0.0000	64.9003	0.0000	64.9003	3.8355	0.0000	160.7877
Water						0.0000	0.0000		0.0000	0.0000	12.4022	293.9656	306.3678	1.2860	0.0326	348.2284
Total	4.0984	4.3142	15.9772	0.0405	3.3819	0.0931	3.4750	0.9046	0.0909	0.9955	77.3025	5,324.1532	5,401.4556	5.3293	0.0513	5,549.9739

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	-0.96	5.84	6.02	9.62	10.90	3.49	10.72	10.90	3.35	10.26	0.00	6.92	6.83	0.25	0.00	6.67

3.0 Construction Detail**Construction Phase**

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/11/2018	9/25/2018	5	20	
2	Grading	Grading	9/26/2018	12/11/2018	5	45	
3	Building Construction	Building Construction	12/12/2018	5/26/2020	5	500	
4	Paving	Paving	5/27/2020	7/14/2020	5	35	
5	Architectural Coating	Architectural Coating	10/30/2019	7/21/2020	5	190	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 13.93

Residential Indoor: 1,302,480; Residential Outdoor: 434,160; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 36,420 (Architectural Coating – sqft)

OffRoad Equipment

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Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

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Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	861.00	239.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	172.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2018**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4968	0.0000	0.4968	0.2731	0.0000	0.2731	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1255	1.3255	0.6181	1.0500e-003		0.0709	0.0709		0.0652	0.0652	0.0000	95.5897	95.5897	0.0298	0.0000	96.3337
Total	0.1255	1.3255	0.6181	1.0500e-003	0.4968	0.0709	0.5677	0.2731	0.0652	0.3383	0.0000	95.5897	95.5897	0.0298	0.0000	96.3337

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3.2 Site Preparation - 2018**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1400e-003	1.5600e-003	0.0162	4.0000e-005	3.9900e-003	3.0000e-005	4.0200e-003	1.0600e-003	3.0000e-005	1.0900e-003	0.0000	3.6294	3.6294	1.2000e-004	0.0000	3.6323
Total	2.1400e-003	1.5600e-003	0.0162	4.0000e-005	3.9900e-003	3.0000e-005	4.0200e-003	1.0600e-003	3.0000e-005	1.0900e-003	0.0000	3.6294	3.6294	1.2000e-004	0.0000	3.6323

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2236	0.0000	0.2236	0.1229	0.0000	0.1229	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1255	1.3255	0.6181	1.0500e-003		0.0709	0.0709		0.0652	0.0652	0.0000	95.5896	95.5896	0.0298	0.0000	96.3336
Total	0.1255	1.3255	0.6181	1.0500e-003	0.2236	0.0709	0.2944	0.1229	0.0652	0.1881	0.0000	95.5896	95.5896	0.0298	0.0000	96.3336

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3.2 Site Preparation - 2018**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1400e-003	1.5600e-003	0.0162	4.0000e-005	3.9900e-003	3.0000e-005	4.0200e-003	1.0600e-003	3.0000e-005	1.0900e-003	0.0000	3.6294	3.6294	1.2000e-004	0.0000	3.6323
Total	2.1400e-003	1.5600e-003	0.0162	4.0000e-005	3.9900e-003	3.0000e-005	4.0200e-003	1.0600e-003	3.0000e-005	1.0900e-003	0.0000	3.6294	3.6294	1.2000e-004	0.0000	3.6323

3.3 Grading - 2018**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2385	0.0000	0.2385	0.0989	0.0000	0.0989	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1400	1.6369	0.9650	1.7100e-003		0.0724	0.0724		0.0666	0.0666	0.0000	155.7834	155.7834	0.0485	0.0000	156.9958
Total	0.1400	1.6369	0.9650	1.7100e-003	0.2385	0.0724	0.3110	0.0989	0.0666	0.1655	0.0000	155.7834	155.7834	0.0485	0.0000	156.9958

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3.3 Grading - 2018**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3800e-003	1.7300e-003	0.0180	4.0000e-005	4.4300e-003	3.0000e-005	4.4700e-003	1.1800e-003	3.0000e-005	1.2100e-003	0.0000	4.0327	4.0327	1.3000e-004	0.0000	4.0359
Total	2.3800e-003	1.7300e-003	0.0180	4.0000e-005	4.4300e-003	3.0000e-005	4.4700e-003	1.1800e-003	3.0000e-005	1.2100e-003	0.0000	4.0327	4.0327	1.3000e-004	0.0000	4.0359

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1073	0.0000	0.1073	0.0445	0.0000	0.0445	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1400	1.6369	0.9650	1.7100e-003		0.0724	0.0724		0.0666	0.0666	0.0000	155.7832	155.7832	0.0485	0.0000	156.9956
Total	0.1400	1.6369	0.9650	1.7100e-003	0.1073	0.0724	0.1798	0.0445	0.0666	0.1111	0.0000	155.7832	155.7832	0.0485	0.0000	156.9956

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3.3 Grading - 2018**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3800e-003	1.7300e-003	0.0180	4.0000e-005	4.4300e-003	3.0000e-005	4.4700e-003	1.1800e-003	3.0000e-005	1.2100e-003	0.0000	4.0327	4.0327	1.3000e-004	0.0000	4.0359
Total	2.3800e-003	1.7300e-003	0.0180	4.0000e-005	4.4300e-003	3.0000e-005	4.4700e-003	1.1800e-003	3.0000e-005	1.2100e-003	0.0000	4.0327	4.0327	1.3000e-004	0.0000	4.0359

3.4 Building Construction - 2018**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0188	0.1637	0.1231	1.9000e-004		0.0105	0.0105		9.8700e-003	9.8700e-003	0.0000	16.6437	16.6437	4.0800e-003	0.0000	16.7457
Total	0.0188	0.1637	0.1231	1.9000e-004		0.0105	0.0105		9.8700e-003	9.8700e-003	0.0000	16.6437	16.6437	4.0800e-003	0.0000	16.7457

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3.4 Building Construction - 2018**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.6400e-003	0.2144	0.0586	4.3000e-004	0.0111	1.8900e-003	0.0130	3.2100e-003	1.8100e-003	5.0200e-003	0.0000	42.0591	42.0591	3.7900e-003	0.0000	42.1538
Worker	0.0261	0.0190	0.1967	4.9000e-004	0.0486	3.6000e-004	0.0490	0.0129	3.3000e-004	0.0132	0.0000	44.1911	44.1911	1.4100e-003	0.0000	44.2262
Total	0.0337	0.2334	0.2553	9.2000e-004	0.0597	2.2500e-003	0.0620	0.0161	2.1400e-003	0.0183	0.0000	86.2502	86.2502	5.2000e-003	0.0000	86.3800

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0188	0.1637	0.1231	1.9000e-004		0.0105	0.0105		9.8700e-003	9.8700e-003	0.0000	16.6437	16.6437	4.0800e-003	0.0000	16.7456
Total	0.0188	0.1637	0.1231	1.9000e-004		0.0105	0.0105		9.8700e-003	9.8700e-003	0.0000	16.6437	16.6437	4.0800e-003	0.0000	16.7456

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3.4 Building Construction - 2018**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.6400e-003	0.2144	0.0586	4.3000e-004	0.0111	1.8900e-003	0.0130	3.2100e-003	1.8100e-003	5.0200e-003	0.0000	42.0591	42.0591	3.7900e-003	0.0000	42.1538
Worker	0.0261	0.0190	0.1967	4.9000e-004	0.0486	3.6000e-004	0.0490	0.0129	3.3000e-004	0.0132	0.0000	44.1911	44.1911	1.4100e-003	0.0000	44.2262
Total	0.0337	0.2334	0.2553	9.2000e-004	0.0597	2.2500e-003	0.0620	0.0161	2.1400e-003	0.0183	0.0000	86.2502	86.2502	5.2000e-003	0.0000	86.3800

3.4 Building Construction - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3081	2.7508	2.2399	3.5100e-003		0.1683	0.1683		0.1583	0.1583	0.0000	306.8110	306.8110	0.0747	0.0000	308.6795
Total	0.3081	2.7508	2.2399	3.5100e-003		0.1683	0.1683		0.1583	0.1583	0.0000	306.8110	306.8110	0.0747	0.0000	308.6795

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3.4 Building Construction - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1299	3.7638	1.0120	8.0200e-003	0.2076	0.0303	0.2379	0.0599	0.0290	0.0889	0.0000	780.2672	780.2672	0.0682	0.0000	781.9726
Worker	0.4461	0.3129	3.2973	8.8700e-003	0.9060	6.6500e-003	0.9126	0.2407	6.1300e-003	0.2468	0.0000	801.5285	801.5285	0.0235	0.0000	802.1153
Total	0.5761	4.0767	4.3093	0.0169	1.1136	0.0369	1.1505	0.3005	0.0351	0.3356	0.0000	1,581.7956	1,581.7956	0.0917	0.0000	1,584.0879

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3081	2.7508	2.2399	3.5100e-003		0.1683	0.1683		0.1583	0.1583	0.0000	306.8106	306.8106	0.0747	0.0000	308.6792
Total	0.3081	2.7508	2.2399	3.5100e-003		0.1683	0.1683		0.1583	0.1583	0.0000	306.8106	306.8106	0.0747	0.0000	308.6792

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3.4 Building Construction - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1299	3.7638	1.0120	8.0200e-003	0.2076	0.0303	0.2379	0.0599	0.0290	0.0889	0.0000	780.2672	780.2672	0.0682	0.0000	781.9726
Worker	0.4461	0.3129	3.2973	8.8700e-003	0.9060	6.6500e-003	0.9126	0.2407	6.1300e-003	0.2468	0.0000	801.5285	801.5285	0.0235	0.0000	802.1153
Total	0.5761	4.0767	4.3093	0.0169	1.1136	0.0369	1.1505	0.3005	0.0351	0.3356	0.0000	1,581.7956	1,581.7956	0.0917	0.0000	1,584.0879

3.4 Building Construction - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1113	1.0073	0.8846	1.4100e-003		0.0587	0.0587		0.0551	0.0551	0.0000	121.5952	121.5952	0.0297	0.0000	122.3369
Total	0.1113	1.0073	0.8846	1.4100e-003		0.0587	0.0587		0.0551	0.0551	0.0000	121.5952	121.5952	0.0297	0.0000	122.3369

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3.4 Building Construction - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0430	1.3626	0.3643	3.2100e-003	0.0835	8.1400e-003	0.0917	0.0241	7.7900e-003	0.0319	0.0000	312.5167	312.5167	0.0257	0.0000	313.1602
Worker	0.1668	0.1124	1.2069	3.4600e-003	0.3645	2.6200e-003	0.3671	0.0968	2.4200e-003	0.0992	0.0000	312.2681	312.2681	8.4200e-003	0.0000	312.4785
Total	0.2098	1.4750	1.5712	6.6700e-003	0.4480	0.0108	0.4588	0.1209	0.0102	0.1311	0.0000	624.7848	624.7848	0.0342	0.0000	625.6387

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1113	1.0073	0.8846	1.4100e-003		0.0586	0.0586		0.0551	0.0551	0.0000	121.5951	121.5951	0.0297	0.0000	122.3367
Total	0.1113	1.0073	0.8846	1.4100e-003		0.0586	0.0586		0.0551	0.0551	0.0000	121.5951	121.5951	0.0297	0.0000	122.3367

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3.4 Building Construction - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0430	1.3626	0.3643	3.2100e-003	0.0835	8.1400e-003	0.0917	0.0241	7.7900e-003	0.0319	0.0000	312.5167	312.5167	0.0257	0.0000	313.1602
Worker	0.1668	0.1124	1.2069	3.4600e-003	0.3645	2.6200e-003	0.3671	0.0968	2.4200e-003	0.0992	0.0000	312.2681	312.2681	8.4200e-003	0.0000	312.4785
Total	0.2098	1.4750	1.5712	6.6700e-003	0.4480	0.0108	0.4588	0.1209	0.0102	0.1311	0.0000	624.7848	624.7848	0.0342	0.0000	625.6387

3.5 Paving - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0237	0.2462	0.2564	4.0000e-004		0.0132	0.0132		0.0121	0.0121	0.0000	35.0494	35.0494	0.0113	0.0000	35.3328
Paving	0.0183					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0420	0.2462	0.2564	4.0000e-004		0.0132	0.0132		0.0121	0.0121	0.0000	35.0494	35.0494	0.0113	0.0000	35.3328

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3.5 Paving - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.7000e-004	6.5000e-004	7.0100e-003	2.0000e-005	2.1200e-003	2.0000e-005	2.1300e-003	5.6000e-004	1.0000e-005	5.8000e-004	0.0000	1.8134	1.8134	5.0000e-005	0.0000	1.8146
Total	9.7000e-004	6.5000e-004	7.0100e-003	2.0000e-005	2.1200e-003	2.0000e-005	2.1300e-003	5.6000e-004	1.0000e-005	5.8000e-004	0.0000	1.8134	1.8134	5.0000e-005	0.0000	1.8146

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0237	0.2462	0.2564	4.0000e-004		0.0132	0.0132		0.0121	0.0121	0.0000	35.0493	35.0493	0.0113	0.0000	35.3327
Paving	0.0183					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0420	0.2462	0.2564	4.0000e-004		0.0132	0.0132		0.0121	0.0121	0.0000	35.0493	35.0493	0.0113	0.0000	35.3327

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3.5 Paving - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.7000e-004	6.5000e-004	7.0100e-003	2.0000e-005	2.1200e-003	2.0000e-005	2.1300e-003	5.6000e-004	1.0000e-005	5.8000e-004	0.0000	1.8134	1.8134	5.0000e-005	0.0000	1.8146
Total	9.7000e-004	6.5000e-004	7.0100e-003	2.0000e-005	2.1200e-003	2.0000e-005	2.1300e-003	5.6000e-004	1.0000e-005	5.8000e-004	0.0000	1.8134	1.8134	5.0000e-005	0.0000	1.8146

3.6 Architectural Coating - 2019**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8245					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.9900e-003	0.0413	0.0414	7.0000e-005		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003	0.0000	5.7448	5.7448	4.9000e-004	0.0000	5.7570
Total	0.8305	0.0413	0.0414	7.0000e-005		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003	0.0000	5.7448	5.7448	4.9000e-004	0.0000	5.7570

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3.6 Architectural Coating - 2019**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0768	0.0539	0.5678	1.5300e-003	0.6969	1.1400e-003	0.6980	0.1742	1.0500e-003	0.1753	0.0000	138.0341	138.0341	4.0400e-003	0.0000	138.1351
Total	0.0768	0.0539	0.5678	1.5300e-003	0.6969	1.1400e-003	0.6980	0.1742	1.0500e-003	0.1753	0.0000	138.0341	138.0341	4.0400e-003	0.0000	138.1351

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8245					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.9900e-003	0.0413	0.0414	7.0000e-005		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003	0.0000	5.7448	5.7448	4.9000e-004	0.0000	5.7569
Total	0.8305	0.0413	0.0414	7.0000e-005		2.9000e-003	2.9000e-003		2.9000e-003	2.9000e-003	0.0000	5.7448	5.7448	4.9000e-004	0.0000	5.7569

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3.6 Architectural Coating - 2019**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0768	0.0539	0.5678	1.5300e-003	0.6969	1.1400e-003	0.6980	0.1742	1.0500e-003	0.1753	0.0000	138.0341	138.0341	4.0400e-003	0.0000	138.1351
Total	0.0768	0.0539	0.5678	1.5300e-003	0.6969	1.1400e-003	0.6980	0.1742	1.0500e-003	0.1753	0.0000	138.0341	138.0341	4.0400e-003	0.0000	138.1351

3.6 Architectural Coating - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.6566					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1221	0.1328	2.2000e-004		8.0400e-003	8.0400e-003		8.0400e-003	8.0400e-003	0.0000	18.5111	18.5111	1.4300e-003	0.0000	18.5469
Total	2.6742	0.1221	0.1328	2.2000e-004		8.0400e-003	8.0400e-003		8.0400e-003	8.0400e-003	0.0000	18.5111	18.5111	1.4300e-003	0.0000	18.5469

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3.6 Architectural Coating - 2020**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2301	0.1550	1.6647	4.7700e-003	2.2455	3.6200e-003	2.2491	0.5613	3.3300e-003	0.5646	0.0000	430.7265	430.7265	0.0116	0.0000	431.0168
Total	0.2301	0.1550	1.6647	4.7700e-003	2.2455	3.6200e-003	2.2491	0.5613	3.3300e-003	0.5646	0.0000	430.7265	430.7265	0.0116	0.0000	431.0168

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.6566					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1221	0.1328	2.2000e-004		8.0400e-003	8.0400e-003		8.0400e-003	8.0400e-003	0.0000	18.5111	18.5111	1.4300e-003	0.0000	18.5469
Total	2.6742	0.1221	0.1328	2.2000e-004		8.0400e-003	8.0400e-003		8.0400e-003	8.0400e-003	0.0000	18.5111	18.5111	1.4300e-003	0.0000	18.5469

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3.6 Architectural Coating - 2020**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.2301	0.1550	1.6647	4.7700e-003	2.2455	3.6200e-003	2.2491	0.5613	3.3300e-003	0.5646	0.0000	430.7265	430.7265	0.0116	0.0000	431.0168
Total	0.2301	0.1550	1.6647	4.7700e-003	2.2455	3.6200e-003	2.2491	0.5613	3.3300e-003	0.5646	0.0000	430.7265	430.7265	0.0116	0.0000	431.0168

4.0 Operational Detail - Mobile**4.1 Mitigation Measures Mobile**

Increase Density

Improve Destination Accessibility

Increase Transit Accessibility

Integrate Below Market Rate Housing

Improve Pedestrian Network

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.9307	3.8120	11.3150	0.0374	3.3819	0.0320	3.4139	0.9046	0.0299	0.9344	0.0000	3,430.714 7	3,430.714 7	0.1465	0.0000	3,434.377 8
Unmitigated	0.9671	4.0794	12.3383	0.0417	3.7956	0.0354	3.8310	1.0152	0.0330	1.0482	0.0000	3,826.784 7	3,826.784 7	0.1601	0.0000	3,830.786 0

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	584.80	584.80	584.80	1,615,845	1,439,718
Apartments Mid Rise	2,061.50	1,980.90	1816.60	5,567,591	4,960,724
City Park	0.00	0.00	0.00		
Condo/Townhouse High Rise	628.32	284.46	226.38	1,441,708	1,284,562
Parking Lot	0.00	0.00	0.00		
Single Family Housing	514.08	535.14	465.48	1,409,570	1,255,927
Total	3,788.70	3,385.30	3,093.26	10,034,714	8,940,930

4.3 Trip Type Information

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Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Apartments Mid Rise	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Condo/Townhouse High Rise	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Single Family Housing	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
City Park	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Apartments Low Rise	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Apartments Mid Rise	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Condo/Townhouse High Rise	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Single Family Housing	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,070.3966	1,070.3966	0.0442	9.1400e-003	1,074.2260
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,070.3966	1,070.3966	0.0442	9.1400e-003	1,074.2260
NaturalGas Mitigated	0.0522	0.4461	0.1898	2.8500e-003		0.0361	0.0361		0.0361	0.0361	0.0000	516.6010	516.6010	9.9000e-003	9.4700e-003	519.6709
NaturalGas Unmitigated	0.0522	0.4461	0.1898	2.8500e-003		0.0361	0.0361		0.0361	0.0361	0.0000	516.6010	516.6010	9.9000e-003	9.4700e-003	519.6709

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5.2 Energy by Land Use - NaturalGas**Unmitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.71465e+006	0.0146	0.1251	0.0532	8.0000e-004		0.0101	0.0101		0.0101	0.0101	0.0000	144.8639	144.8639	2.7800e-003	2.6600e-003	145.7247
Apartments Mid Rise	4.35434e+006	0.0235	0.2006	0.0854	1.2800e-003		0.0162	0.0162		0.0162	0.0162	0.0000	232.3640	232.3640	4.4500e-003	4.2600e-003	233.7449
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse High Rise	927053	5.0000e-003	0.0427	0.0182	2.7000e-004		3.4500e-003	3.4500e-003		3.4500e-003	3.4500e-003	0.0000	49.4711	49.4711	9.5000e-004	9.1000e-004	49.7650
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	1.6847e+006	9.0800e-003	0.0776	0.0330	5.0000e-004		6.2800e-003	6.2800e-003		6.2800e-003	6.2800e-003	0.0000	89.9020	89.9020	1.7200e-003	1.6500e-003	90.4363
Total		0.0522	0.4461	0.1898	2.8500e-003		0.0361	0.0361		0.0361	0.0361	0.0000	516.6010	516.6010	9.9000e-003	9.4800e-003	519.6709

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5.2 Energy by Land Use - NaturalGas**Mitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.71465e+006	0.0146	0.1251	0.0532	8.0000e-004		0.0101	0.0101		0.0101	0.0101	0.0000	144.8639	144.8639	2.7800e-003	2.6600e-003	145.7247
Apartments Mid Rise	4.35434e+006	0.0235	0.2006	0.0854	1.2800e-003		0.0162	0.0162		0.0162	0.0162	0.0000	232.3640	232.3640	4.4500e-003	4.2600e-003	233.7449
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse High Rise	927053	5.0000e-003	0.0427	0.0182	2.7000e-004		3.4500e-003	3.4500e-003		3.4500e-003	3.4500e-003	0.0000	49.4711	49.4711	9.5000e-004	9.1000e-004	49.7650
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	1.6847e+006	9.0800e-003	0.0776	0.0330	5.0000e-004		6.2800e-003	6.2800e-003		6.2800e-003	6.2800e-003	0.0000	89.9020	89.9020	1.7200e-003	1.6500e-003	90.4363
Total		0.0522	0.4461	0.1898	2.8500e-003		0.0361	0.0361		0.0361	0.0361	0.0000	516.6010	516.6010	9.9000e-003	9.4800e-003	519.6709

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5.3 Energy by Land Use - Electricity**Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	754368	240.3579	9.9200e-003	2.0500e-003	241.2178
Apartments Mid Rise	1.31145e+006	417.8557	0.0173	3.5700e-003	419.3506
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse High Rise	296349	94.4232	3.9000e-003	8.1000e-004	94.7610
Parking Lot	534160	170.1948	7.0300e-003	1.4500e-003	170.8037
Single Family Housing	463136	147.5650	6.0900e-003	1.2600e-003	148.0929
Total		1,070.3966	0.0442	9.1400e-003	1,074.2260

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5.3 Energy by Land Use - Electricity**Mitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	754368	240.3579	9.9200e-003	2.0500e-003	241.2178
Apartments Mid Rise	1.31145e+006	417.8557	0.0173	3.5700e-003	419.3506
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse High Rise	296349	94.4232	3.9000e-003	8.1000e-004	94.7610
Parking Lot	534160	170.1948	7.0300e-003	1.4500e-003	170.8037
Single Family Housing	463136	147.5650	6.0900e-003	1.2600e-003	148.0929
Total		1,070.3966	0.0442	9.1400e-003	1,074.2260

6.0 Area Detail**6.1 Mitigation Measures Area**

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.1155	0.0561	4.4724	2.6000e-004		0.0250	0.0250		0.0250	0.0250	0.0000	12.4753	12.4753	7.1800e-003	1.0000e-004	12.6831
Unmitigated	3.0400	0.0561	4.4724	2.6000e-004		0.0250	0.0250		0.0250	0.0250	0.0000	12.4753	12.4753	7.1800e-003	1.0000e-004	12.6831

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.3481					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.5556					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	5.2000e-004	4.4800e-003	1.9100e-003	3.0000e-005		3.6000e-004	3.6000e-004		3.6000e-004	3.6000e-004	0.0000	5.1870	5.1870	1.0000e-004	1.0000e-004	5.2178
Landscaping	0.1358	0.0516	4.4705	2.4000e-004		0.0246	0.0246		0.0246	0.0246	0.0000	7.2883	7.2883	7.0800e-003	0.0000	7.4654
Total	3.0400	0.0561	4.4724	2.7000e-004		0.0250	0.0250		0.0250	0.0250	0.0000	12.4753	12.4753	7.1800e-003	1.0000e-004	12.6831

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6.2 Area by SubCategory**Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.4236					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.5556					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	5.2000e-004	4.4800e-003	1.9100e-003	3.0000e-005		3.6000e-004	3.6000e-004		3.6000e-004	3.6000e-004	0.0000	5.1870	5.1870	1.0000e-004	1.0000e-004	5.2178
Landscaping	0.1358	0.0516	4.4705	2.4000e-004		0.0246	0.0246		0.0246	0.0246	0.0000	7.2883	7.2883	7.0800e-003	0.0000	7.4654
Total	3.1155	0.0561	4.4724	2.7000e-004		0.0250	0.0250		0.0250	0.0250	0.0000	12.4753	12.4753	7.1800e-003	1.0000e-004	12.6831

7.0 Water Detail**7.1 Mitigation Measures Water**

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	306.3678	1.2860	0.0326	348.2284
Unmitigated	306.3678	1.2860	0.0326	348.2284

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7.2 Water by Land Use**Unmitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	11.0762 / 6.98281	74.1848	0.3638	9.1300e-003	86.0002
Apartments Mid Rise	20.1977 / 12.7334	135.2782	0.6635	0.0166	156.8239
City Park	0 / 12.582	44.5390	1.8400e-003	3.8000e-004	44.6983
Condo/Townhouse High Rise	4.30017 / 2.71097	28.8012	0.1413	3.5400e-003	33.3883
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	3.51832 / 2.21807	23.5646	0.1156	2.9000e-003	27.3177
Total		306.3678	1.2860	0.0326	348.2284

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7.2 Water by Land Use**Mitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	11.0762 / 6.98281	74.1848	0.3638	9.1300e-003	86.0002
Apartments Mid Rise	20.1977 / 12.7334	135.2782	0.6635	0.0166	156.8239
City Park	0 / 12.582	44.5390	1.8400e-003	3.8000e-004	44.6983
Condo/Townhouse High Rise	4.30017 / 2.71097	28.8012	0.1413	3.5400e-003	33.3883
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	3.51832 / 2.21807	23.5646	0.1156	2.9000e-003	27.3177
Total		306.3678	1.2860	0.0326	348.2284

8.0 Waste Detail**8.1 Mitigation Measures Waste**

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Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	64.9003	3.8355	0.0000	160.7877
Unmitigated	64.9003	3.8355	0.0000	160.7877

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8.2 Waste by Land Use**Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	78.2	15.8739	0.9381	0.0000	39.3269
Apartments Mid Rise	142.6	28.9465	1.7107	0.0000	71.7138
City Park	0.91	0.1847	0.0109	0.0000	0.4576
Condo/Townhouse High Rise	30.36	6.1628	0.3642	0.0000	15.2681
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	67.65	13.7323	0.8116	0.0000	34.0213
Total		64.9003	3.8355	0.0000	160.7877

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8.2 Waste by Land Use**Mitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	78.2	15.8739	0.9381	0.0000	39.3269
Apartments Mid Rise	142.6	28.9465	1.7107	0.0000	71.7138
City Park	0.91	0.1847	0.0109	0.0000	0.4576
Condo/Townhouse High Rise	30.36	6.1628	0.3642	0.0000	15.2681
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	67.65	13.7323	0.8116	0.0000	34.0213
Total		64.9003	3.8355	0.0000	160.7877

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment**Fire Pumps and Emergency Generators**

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

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Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

CSUCI University Glen Phase 2 and Amendment
Ventura County, Mitigation Report

Construction Mitigation Summary

Phase	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Preparation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OFFROAD Equipment Mitigation

Equipment Type	Fuel Type	Tier	Number Mitigated	Total Number of Equipment	DPF	Oxidation Catalyst
Air Compressors	Diesel	No Change	0	1	No Change	0.00
Cranes	Diesel	No Change	0	1	No Change	0.00
Excavators	Diesel	No Change	0	2	No Change	0.00
Forklifts	Diesel	No Change	0	3	No Change	0.00
Generator Sets	Diesel	No Change	0	1	No Change	0.00
Graders	Diesel	No Change	0	1	No Change	0.00
Pavers	Diesel	No Change	0	2	No Change	0.00
Paving Equipment	Diesel	No Change	0	2	No Change	0.00
Rollers	Diesel	No Change	0	2	No Change	0.00
Rubber Tired Dozers	Diesel	No Change	0	4	No Change	0.00
Scrapers	Diesel	No Change	0	2	No Change	0.00
Tractors/Loaders/Backhoes	Diesel	No Change	0	9	No Change	0.00
Welders	Diesel	No Change	0	1	No Change	0.00

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Unmitigated tons/yr							Unmitigated mt/yr					
Air Compressors	2.35500E-002	1.63370E-001	1.74210E-001	2.80000E-004	1.09400E-002	1.09400E-002	0.00000E+000	2.42559E+001	2.42559E+001	1.92000E-003	0.00000E+000	2.43039E+001
Cranes	8.18800E-002	9.75370E-001	3.74460E-001	9.60000E-004	4.10900E-002	3.78100E-002	0.00000E+000	8.56842E+001	8.56842E+001	2.72600E-002	0.00000E+000	8.63656E+001
Excavators	1.59000E-002	1.70270E-001	1.80160E-001	2.80000E-004	8.26000E-003	7.60000E-003	0.00000E+000	2.59248E+001	2.59248E+001	8.07000E-003	0.00000E+000	2.61266E+001
Forklifts	8.90400E-002	7.96600E-001	6.78850E-001	8.70000E-004	6.11800E-002	5.62900E-002	0.00000E+000	7.78241E+001	7.78241E+001	2.47600E-002	0.00000E+000	7.84430E+001
Generator Sets	8.24300E-002	7.04440E-001	7.06630E-001	1.25000E-003	4.16100E-002	4.16100E-002	0.00000E+000	1.07389E+002	1.07389E+002	6.63000E-003	0.00000E+000	1.07555E+002
Graders	1.42900E-002	1.96010E-001	5.26500E-002	1.80000E-004	6.37000E-003	5.86000E-003	0.00000E+000	1.67133E+001	1.67133E+001	5.20000E-003	0.00000E+000	1.68433E+001
Pavers	9.19000E-003	9.83600E-002	1.01440E-001	1.60000E-004	4.78000E-003	4.40000E-003	0.00000E+000	1.44556E+001	1.44556E+001	4.68000E-003	0.00000E+000	1.45724E+001
Paving Equipment	7.26000E-003	7.49500E-002	8.87000E-002	1.40000E-004	3.75000E-003	3.45000E-003	0.00000E+000	1.25269E+001	1.25269E+001	4.05000E-003	0.00000E+000	1.26281E+001
Rollers	7.29000E-003	7.28400E-002	6.62700E-002	9.00000E-005	4.64000E-003	4.27000E-003	0.00000E+000	8.06698E+000	8.06698E+000	2.61000E-003	0.00000E+000	8.13221E+000
Rubber Tired Dozers	1.28270E-001	1.38159E+000	4.81410E-001	9.40000E-004	6.71600E-002	6.17900E-002	0.00000E+000	8.58370E+001	8.58370E+001	2.67200E-002	0.00000E+000	8.65050E+001
Scrapers	6.30800E-002	7.80540E-001	4.83270E-001	8.30000E-004	3.07600E-002	2.83000E-002	0.00000E+000	7.60801E+001	7.60801E+001	2.36800E-002	0.00000E+000	7.66722E+001
Tractors/Loaders/ Backhoes	1.57420E-001	1.57304E+000	1.53148E+000	2.06000E-003	1.05960E-001	9.74900E-002	0.00000E+000	1.85208E+002	1.85208E+002	5.86000E-002	0.00000E+000	1.86673E+002
Welders	7.13200E-002	3.06240E-001	3.41620E-001	4.90000E-004	1.83600E-002	1.83600E-002	0.00000E+000	3.57619E+001	3.57619E+001	5.82000E-003	0.00000E+000	3.59074E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Mitigated tons/yr							Mitigated mt/yr					
Air Compressors	2.35500E-002	1.63370E-001	1.74210E-001	2.80000E-004	1.09400E-002	1.09400E-002	0.00000E+000	2.42559E+001	2.42559E+001	1.92000E-003	0.00000E+000	2.43038E+001
Cranes	8.18800E-002	9.75370E-001	3.74460E-001	9.60000E-004	4.10900E-002	3.78100E-002	0.00000E+000	8.56841E+001	8.56841E+001	2.72600E-002	0.00000E+000	8.63655E+001
Excavators	1.59000E-002	1.70270E-001	1.80160E-001	2.80000E-004	8.26000E-003	7.60000E-003	0.00000E+000	2.59248E+001	2.59248E+001	8.07000E-003	0.00000E+000	2.61265E+001
Forklifts	8.90400E-002	7.96600E-001	6.78850E-001	8.70000E-004	6.11800E-002	5.62900E-002	0.00000E+000	7.78240E+001	7.78240E+001	2.47600E-002	0.00000E+000	7.84429E+001
Generator Sets	8.24300E-002	7.04440E-001	7.06630E-001	1.25000E-003	4.16100E-002	4.16100E-002	0.00000E+000	1.07389E+002	1.07389E+002	6.63000E-003	0.00000E+000	1.07555E+002
Graders	1.42900E-002	1.96010E-001	5.26500E-002	1.80000E-004	6.37000E-003	5.86000E-003	0.00000E+000	1.67133E+001	1.67133E+001	5.20000E-003	0.00000E+000	1.68433E+001
Pavers	9.19000E-003	9.83600E-002	1.01440E-001	1.60000E-004	4.78000E-003	4.40000E-003	0.00000E+000	1.44555E+001	1.44555E+001	4.68000E-003	0.00000E+000	1.45724E+001
Paving Equipment	7.26000E-003	7.49500E-002	8.87000E-002	1.40000E-004	3.75000E-003	3.45000E-003	0.00000E+000	1.25268E+001	1.25268E+001	4.05000E-003	0.00000E+000	1.26281E+001
Rollers	7.29000E-003	7.28400E-002	6.62700E-002	9.00000E-005	4.64000E-003	4.27000E-003	0.00000E+000	8.06697E+000	8.06697E+000	2.61000E-003	0.00000E+000	8.13220E+000
Rubber Tired Dozers	1.28270E-001	1.38159E+000	4.81410E-001	9.40000E-004	6.71600E-002	6.17900E-002	0.00000E+000	8.58369E+001	8.58369E+001	2.67200E-002	0.00000E+000	8.65049E+001
Scrapers	6.30800E-002	7.80530E-001	4.83270E-001	8.30000E-004	3.07600E-002	2.83000E-002	0.00000E+000	7.60800E+001	7.60800E+001	2.36800E-002	0.00000E+000	7.66721E+001
Tractors/Loaders/Balckhoes	1.57420E-001	1.57303E+000	1.53148E+000	2.06000E-003	1.05960E-001	9.74900E-002	0.00000E+000	1.85208E+002	1.85208E+002	5.86000E-002	0.00000E+000	1.86673E+002
Welders	7.13200E-002	3.06230E-001	3.41620E-001	4.90000E-004	1.83600E-002	1.83600E-002	0.00000E+000	3.57619E+001	3.57619E+001	5.82000E-003	0.00000E+000	3.59074E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Air Compressors	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.23681E-006	1.23681E-006	0.00000E+000	0.00000E+000	1.23437E-006
Cranes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.28378E-006	1.28378E-006	0.00000E+000	0.00000E+000	1.15787E-006
Excavators	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.15719E-006	1.15719E-006	0.00000E+000	0.00000E+000	1.14826E-006
Forklifts	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.15645E-006	1.15645E-006	0.00000E+000	0.00000E+000	1.27481E-006
Generator Sets	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.21055E-006	1.21055E-006	0.00000E+000	0.00000E+000	1.11571E-006
Graders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.19665E-006	1.19665E-006	0.00000E+000	0.00000E+000	1.18741E-006
Pavers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.38355E-006	1.38355E-006	0.00000E+000	0.00000E+000	1.37245E-006
Paving Equipment	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.59657E-006	1.59657E-006	0.00000E+000	0.00000E+000	7.91883E-007
Rollers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.23962E-006	1.23962E-006	0.00000E+000	0.00000E+000	1.22968E-006
Rubber Tired Dozers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.16500E-006	1.16500E-006	0.00000E+000	0.00000E+000	1.15600E-006
Scrapers	0.00000E+000	1.28116E-005	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.18296E-006	1.18296E-006	0.00000E+000	0.00000E+000	1.17383E-006
Tractors/Loaders/Balckhoes	0.00000E+000	6.35712E-006	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.18785E-006	1.18785E-006	0.00000E+000	0.00000E+000	1.23210E-006
Welders	0.00000E+000	3.26541E-005	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.11851E-006	1.11851E-006	0.00000E+000	0.00000E+000	1.11398E-006

Fugitive Dust Mitigation

Yes/No	Mitigation Measure	Mitigation Input	Mitigation Input	Mitigation Input			
No	Soil Stabilizer for unpaved Roads	PM10 Reduction	0.00	PM2.5 Reduction	0.00		
No	Replace Ground Cover of Area Disturbed	PM10 Reduction	0.00	PM2.5 Reduction	0.00		
Yes	Water Exposed Area	PM10 Reduction	55.00	PM2.5 Reduction	55.00	Frequency (per day)	2.00

No	Unpaved Road Mitigation	Moisture Content %	0.00	Vehicle Speed (mph)	0.00		
No	Clean Paved Road	% PM Reduction	0.00				

Phase	Source	Unmitigated		Mitigated		Percent Reduction	
		PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Architectural Coating	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Architectural Coating	Roads	2.94	0.74	2.94	0.74	0.00	0.00
Building Construction	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	Roads	1.62	0.44	1.62	0.44	0.00	0.00
Grading	Fugitive Dust	0.24	0.10	0.11	0.04	0.55	0.55
Grading	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Paving	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Site Preparation	Fugitive Dust	0.50	0.27	0.22	0.12	0.55	0.55
Site Preparation	Roads	0.00	0.00	0.00	0.00	0.00	0.00

Operational Percent Reduction Summary

Category	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	-21.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	3.76	6.56	8.29	10.34	9.53	9.54	0.00	10.35	10.35	8.45	0.00	10.35
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Indoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Outdoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Operational Mobile Mitigation

Project Setting: Suburban Center

Mitigation	Category	Measure	% Reduction	Input Value 1	Input Value 2	Input Value
Yes	Land Use	Increase Density	0.00	18.75	0.00	
No	Land Use	Increase Diversity	0.25	0.57		
No	Land Use	Improve Walkability Design	0.00	0.00		
Yes	Land Use	Improve Destination Accessibility	0.18	1.00		
Yes	Land Use	Increase Transit Accessibility	0.06	1.00		
Yes	Land Use	Integrate Below Market Rate Housing	0.01	28.30		
	Land Use	Land Use SubTotal	0.10			

Yes	Neighborhood Enhancements	Improve Pedestrian Network	1.00	Project Site		
No	Neighborhood Enhancements	Provide Traffic Calming Measures	0.00			
No	Neighborhood Enhancements	Implement NEV Network	0.00			
	Neighborhood Enhancements	Neighborhood Enhancements Subtotal	0.01			
No	Parking Policy Pricing	Limit Parking Supply	0.00	0.00		
No	Parking Policy Pricing	Unbundle Parking Costs	0.00	0.00		
No	Parking Policy Pricing	On-street Market Pricing	0.00	0.00		
	Parking Policy Pricing	Parking Policy Pricing Subtotal	0.00			
No	Transit Improvements	Provide BRT System	0.00	0.00		
No	Transit Improvements	Expand Transit Network	0.00	0.00		
No	Transit Improvements	Increase Transit Frequency	0.00		0.00	
	Transit Improvements	Transit Improvements Subtotal	0.00			
		Land Use and Site Enhancement Subtotal	0.11			
No	Commute	Implement Trip Reduction Program				
No	Commute	Transit Subsidy				
No	Commute	Implement Employee Parking "Cash Out"	4.50			
No	Commute	Workplace Parking Charge		0.00		
No	Commute	Encourage Telecommuting and Alternative Work Schedules	0.00			
No	Commute	Market Commute Trip Reduction Option	0.00			
No	Commute	Employee Vanpool/Shuttle	0.00		2.00	
No	Commute	Provide Ride Sharing Program	10.00			
	Commute	Commute Subtotal	0.00			

No	School Trip	Implement School Bus Program	0.00		
		Total VMT Reduction	0.11		

Area Mitigation

Measure Implemented	Mitigation Measure	Input Value
Yes	Only Natural Gas Hearth	
No	No Hearth	
No	Use Low VOC Cleaning Supplies	
Yes	Use Low VOC Paint (Residential Interior)	100.00
Yes	Use Low VOC Paint (Residential Exterior)	100.00
Yes	Use Low VOC Paint (Non-residential Interior)	150.00
Yes	Use Low VOC Paint (Non-residential Exterior)	150.00
Yes	Use Low VOC Paint (Parking)	250.00
No	% Electric Lawnmower	0.00
No	% Electric Leafblower	0.00
No	% Electric Chainsaw	0.00

Energy Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Exceed Title 24		
No	Install High Efficiency Lighting		
No	On-site Renewable		

Appliance Type	Land Use Subtype	% Improvement
ClothWasher		30.00
DishWasher		15.00
Fan		50.00
Refrigerator		15.00

Water Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Apply Water Conservation on Strategy		
No	Use Reclaimed Water		
No	Use Grey Water		
No	Install low-flow bathroom faucet	32.00	
No	Install low-flow Kitchen faucet	18.00	
No	Install low-flow Toilet	20.00	
No	Install low-flow Shower	20.00	
No	Turf Reduction		
No	Use Water Efficient Irrigation Systems	6.10	
No	Water Efficient Landscape		

Solid Waste Mitigation

Mitigation Measures	Input Value
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Institute Recycling and Composting Services Percent Reduction in Waste Disposed	
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CSUCI University Glen Phase 2 and Amendment - Ventura County, Summary Report

CSUCI University Glen Phase 2 and Amendment

Ventura, Summary Report

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	607.00	1000sqft	13.93	607,000.00	0
City Park	10.56	Acre	10.56	459,993.60	0
Apartments Low Rise	170.00	Dwelling Unit	1.28	170,000.00	520
Apartments Mid Rise	310.00	Dwelling Unit	3.67	310,000.00	949
Condo/Townhouse High Rise	66.00	Dwelling Unit	1.30	66,000.00	202
Single Family Housing	54.00	Dwelling Unit	1.26	97,200.00	165

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MW hr)	702.44	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments

Only CalEEMod defaults were used.

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summary Report

Project Characteristics -

Land Use - The remaining area (total area - hardscape -landscape) was divided among the different residential uses in proportion to the total building area for each residential land use type.

Construction Phase - The default for architectural coating-35 days at the very end of all construction-was adjusted to 190 days, beginning a little over halfway through construction and ending one week after paving, to better reflect actual construction practices (residences would be painted as building construction of each building is completed).

Vehicle Trips - Trip gen rates adjusted in accordance with ITE rates used in Traffic study. Landscape area (City Park) would not generate new trips as it would be used by residents.

Woodstoves - Based on existing University Glen single-family homes, it was assumed single-family homes would have a gas fireplace.

Mobile Land Use Mitigation -

Area Mitigation - Rule 74.2 limits VOC content of flat coatings to 100 g/L and non-flat coatings to 150 g/L

2.0 Peak Daily Emissions

Peak Daily Construction Emissions

Peak Daily Construction Emissions

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summary Report

[illegible]

Peak Daily Operational Emissions

Peak Daily Operational Emissions

[illegible]

CSUCI University Glen Phase 2 and Amendment - Ventura County, Summary Report

3.0 Annual GHG Emissions**Annual GHG****Annual GHG**

		Unmitigated				Mitigated			
		CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
GHG Activity	Year	MT/yr							
Construction	2018	361.9291	0.0878	0.0000	364.1234	361.9288	0.0878	0.0000	364.1230
Construction	2019	2,032.3855	0.1710	0.0000	2,036.6595	2,032.3851	0.1710	0.0000	2,036.6591
Construction	2020	1,232.4804	0.0883	0.0000	1,234.6867	1,232.4802	0.0883	0.0000	1,234.6865
Operational	2021	5,797.5257	5.3428	0.0513	5,946.3805	5,401.4557	5.3293	0.0513	5,549.9724
	Total								
	Significance Threshold								
	Exceed Significance?								

Greenhouse Gas Emission Worksheet

N2O Mobile Emissions

Annual VMT*:

10,034,714

From CalEEMod 2016 Vehicle Fleet Mix Output:

Vehicle Type	Percent Type	CH4 Emission Factor (g/mile)**	CH4 Emission (g/mile)***	N2O Emission Factor (g/mile)**	N2O Emission (g/mile)***
Light Auto	58.3%	0.04	0.02332	0.04	0.02332
Light Truck < 3750 lbs	4.2%	0.05	0.0021	0.06	0.00252
Light Truck 3751-5750 lbs	18.9%	0.05	0.00945	0.06	0.01134
Med Truck 5751-8500 lbs	11.4%	0.12	0.01368	0.2	0.0228
Lite-Heavy Truck 8501-10,000 lbs	2.0%	0.12	0.0024	0.2	0.004
Lite-Heavy Truck 10,001-14,000 lbs	0.7%	0.09	0.000585	0.125	0.000813
Med-Heavy Truck 14,001-33,000 lbs	1.9%	0.06	0.00114	0.05	0.00095
Heavy-Heavy Truck 33,001-60,000 lbs	1.8%	0.06	0.00108	0.05	0.0009
Other Bus	0.1%	0.06	0.00006	0.05	0.00005
Urban Bus	0.1%	0.06	0.00006	0.05	0.00005
Motorcycle	0.4%	0.09	0.00036	0.01	0.00004
School Bus	0.0%	0.06	0.000024	0.05	0.00002
Motor Home	0.2%	0.09	0.000144	0.125	0.0002
Total	100.0%		0.054403		0.067003

10

Total Emissions (metric tons) =

Emission Factor by Vehicle Mix (g/mi) x Annual VMT(mi) x 0.000001 metric tons/g

Conversion to Carbon Dioxide Equivalency (CO2e) Units based on Global Warming Potential (GWP)***

CH4 25 GWP
N2O 298 GWP
1 ton (short, US) = 0.90718474 metric ton

Annual Mobile Emissions:

	Total Emissions	Total CO2e units
N2O Emissions:	0.6724 metric tons N2O	200.36 metric tons CO2e
Project Total:	200.36 metric tons CO2e	

References

* From CalEEMod 2016 results for mobile sources

** Table C.4: Methane and Nitrous Oxide Emission Factors for Mobile Sources by Vehicle and Fuel Type (g/mile).
in California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.
Assume Model year 2000-present, gasoline fueled.

*** California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.

**** Global warming potentials from IPCC Fourth Assessment Report

Appendix E

Jurisdictional Delineation



Rincon Consultants, Inc.

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January 26, 2017
Project No: 15-01732

Terry Tarr
California State University Channel Islands
1 University Drive
Camarillo, California 93012-8599

Subject: Jurisdictional Delineation, Inspiration Point Bridge Project, California State University Channel Islands, Ventura County, California

Dear Mr. Tarr:

This letter documents the findings of a Jurisdictional Delineation performed for the Inspiration Point Bridge Project (Project) which is part of the University Glen Project (referred to as Phase Two of the East Campus Residential Neighborhood Development), located at California State University at Channel Islands (CSU Channel Islands). A prior jurisdictional delineation for this project was conducted by Rincon Consultants, Inc. (Rincon) in 2007. The purpose of this report is to identify and evaluate any changes to site conditions as they relate to the delineation of jurisdictional waters of the United States and State of California within the project footprint.

Project Location and Description

The proposed project is located approximately 2.5 miles south of the City of Camarillo in Ventura County along the western foothills of the Santa Monica Mountains and the eastern edge of the Oxnard Plain. The project site is located in Sections 23 and 24, Township 1 North, and Range 21 West of the U.S. Geological Survey (USGS) Camarillo, California 7.5-minute topographic quadrangle. The project area is bordered to the north by steep undeveloped terrain and to the south with flat land that was historically utilized for agriculture. Adjacent land uses include the CSU Channel Islands campus and housing, and Camarillo Regional Park. Other adjacent lands are undeveloped vacant land and agricultural fields. The regional location is depicted in Figure 1, while Figure 2 depicts the project location in its neighborhood context.

The northern portion of the project site is accessed by an unpaved road called Inspiration Point that crosses an unnamed drainage feature and culvert. The drainage crossing does not provide adequate access to Inspiration Point and the culvert is currently undersized to withstand a 100-year storm event. Consequently, as part of the proposed project, the existing crossing and drainage culvert leading to Inspiration Point would be demolished and replaced with a new culvert and crossing. The culvert would be approximately 75 feet long and 30 feet wide with concrete retaining walls and a corrugated steel culvert pipe and would be sized to accommodate a 100-year storm event.

Project Background

A preliminary jurisdictional determination and wetland delineation was prepared by Rincon for the CSU Channel Islands campus in October 2000 (Rincon 2000), to identify and provide federal jurisdictional boundaries potentially subject to United States Army Corps of Engineers (USACE) and California

Department of Fish and Wildlife (CDFW) jurisdiction. In 2001, USACE issued a permit with the understanding that the proposed University Glen Project would impact 0.49 acres of non-wetland waters of the U.S., of which approximately 0.001 acre of impact was associated with the construction of the Inspiration Point Bridge culvert.

As part of the University Glen Project design process proceeded into the final engineering design plans, it was determined that the current box culvert crossing that conveys water from the “unnamed” blue line stream is undersized, resulting in calculated bulked flows overtopping the structure. The proposed Inspiration Point Bridge Project design will replace the existing box culvert crossing with a new bridge design.

To address the new Inspiration Point Road bridge design, Rincon conducted an updated jurisdictional delineation (Rincon 2007) of the project site to determine the location and extent of jurisdictional waters or wetlands within the footprint of the new project design. CSU Channel Islands subsequently requested amendments to their USACE, CDFW, and Regional Water Quality Control Board (RWQCB) permits. These amendments were granted. The purpose of this report is to update the findings of the 2007 delineation by assessing any changes to the extent of jurisdictional waters and to evaluate the potential project impacts to these waters.

Methodology

This jurisdictional delineation was conducted using the most currently accepted regulatory guidance and methodologies. The final determination regarding jurisdictional resources will be made by the resource agencies upon their review of this report and their assessment of its findings. For this reason, the term “potential” has been added prior to discussion of jurisdictional waters.

Within the limits of the project site, waters and wetlands potentially subject to USACE jurisdiction were delineated in accordance with the following:

- *Wetlands Delineation Manual* (Environmental Laboratory 1987)
- *Guidelines for Jurisdictional Determinations for Waters of the United States in the Arid Southwest* (USACE 2001)
- *Regulatory Guidance Letter No. 05-05: Ordinary High Water Mark Identification* (USACE 2005)
- *Distribution of Ordinary High Water Mark (OHWM) Indicators and Their Reliability in Identifying the Limits of “Waters of the United States” in Arid Southwestern Channels* (USACE 2006)
- *Jurisdictional Determination Form Instructional Guidebook* (United States Environmental Protection Agency [USEPA] and USACE 2007)
- *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE 2008a)
- *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2008b)
- *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2010)
- *Clean Water Rule: Definition of Waters of the United States*. Federal Register Volume 80, Number 124 (80 FR 124: 37054-37127) (USEPA and USACE 2015)

The extent of USACE and RWQCB jurisdiction was established by the limits of the incised channel representing the OHWM. Potential RWQCB jurisdiction was determined in accordance with the previously listed methodologies to identify waters of the U.S. (WOUS) and thus, mirrors the jurisdictional limits of federal jurisdiction pursuant to Section 401 of the CWA. The determination of RWQCB jurisdiction will follow such methods until the State Water Resources Control Board’s Wetland and Riparian Area Protection Policy is fully developed and officially implemented.

Under Sections 1600-1607 of the CFGC, CDFW regulates activities that would divert or obstruct the natural flow or substantially alter the bed, bank or channel of any river, stream, or lake system that supports fish or wildlife. CDFW jurisdiction was delineated in accordance with Section 1602(a) of the CFGC. CDFW has jurisdiction over riparian habitats associated with watercourses. For this reason CDFW jurisdiction is delineated by the outer edge of riparian vegetation or at the top of the bank, whichever is wider.

Wetland hydrology was examined for positive field indicators. Positive primary indicators of wetland hydrology included observations of a distinct drainage pattern represented by an incised channel, sediment deposits consisting of salt deposits from the highly alkaline soils, and visual observations of soil saturation relative to upland areas. Vegetation classification was based on the systems provided in *A Manual of California Vegetation, Second Edition* (MCV2) (Sawyer et al. 2009) and modified as appropriate to reflect the existing site conditions. Plant identification and nomenclature follows *The Jepson Manual* (Baldwin, ed. 2012) and online Jepson eFlora (Jepson Flora Project 2016).

Literature and Data Review

Prior to the field survey, Rincon conducted a literature review to initially characterize the nature and extent of potentially jurisdictional features at the site. The literature review included a review of a preliminary wetland delineation for the CSU Channel Islands campus conducted by Rincon (2000) and the subsequent wetland delineation conducted for Inspiration Point (Rincon 2007) to address the new bridge design. In addition, Rincon evaluated recent and historical aerial photographs of the site (Google Earth 2016), regional and site-specific topographic maps (Camarillo, California, USGS 7.5-minute topographic quadrangle), soil survey maps (USDA, NRCS 2016b), geologic maps, and other available background information. The National Wetlands Inventory (NWI) (United States Department of the Interior, Fish and Wildlife Service 2016) was also reviewed to determine if any wetland and/or non-wetland waters had been previously documented and mapped on or in the vicinity of the project site. The National Hydric Soils List (USDA, NRCS 2016a) was also reviewed to determine if any soil map unit types mapped on or in the vicinity of the proposed project site were classified as hydric. References used in this report are listed on page 9.

Field Survey

Rincon Senior Biologist Robin Murray conducted a reconnaissance-level field survey on December 28, 2016, to map the current boundaries of jurisdictional waters or wetlands. Jurisdictional boundaries were recorded using field measurements and a Trimble Geo7X global positioning unit to calculate the acres of waters currently present onsite. The survey area included 100 feet upstream and downstream of the existing bridge (Figure 3). The indicators of hydrophytic vegetation and hydric soils were also documented. Vegetation communities were identified using the *Manual of California Vegetation, Second Edition* (Sawyer et. al., 2009). Adjacent areas were also observed to provide context for the assessment. The survey area was photographed and site photos are presented on page 11.

Delineation Results

The current observed project site conditions are consistent with project site conditions as described in the Inspiration Point Wetland Delineation (Rincon 2007). Descriptions of soil conditions, hydrology, and vegetation within the project area are provided in the following section.

Geology and Soils

The general vicinity of the project site is of volcanic origin generally classified as Conejo Volcanics (NCGMP 2016). Specifically the steep hillsides to the north are classified as basaltic rocks. The flatland area bordering the drainage feature to the south are classified as alluvium with gravel, sand and clay.

According to the USDA Web Soil Survey (USDA 2016b), the project site is situated on soil unit type mapped as the Gilroy clay loam 15 to 30 percent slopes. This series is generally found on the California Coast Ranges and consists of moderately deep, well drained soils that formed in material weathered from basic igneous and metamorphic rocks (USDA, 1970). Surface runoff is medium to rapid, and the erosion hazard is moderate to severe. The available water holding capacity is 4 to 6 inches in the 24 to 36 inches of effective rooting depth. Soils within the drainage feature were described as typically sandy, relatively porous, and well drained. This mapped soil is not classified as hydric.

Topography, Watershed and Drainages

The unnamed blue line stream is shown as an unnamed solid blue line stream on the Camarillo, California, USGS quadrangle. The elevations at the site range from approximately 110 to 120 feet above mean sea level. The topography of the project site is characterized by a minor gradual downward slope westward towards the Oxnard Plain. The unnamed blue line stream is part of a relatively small watershed with headwaters that originate approximately 0.5 miles to the east in the surrounding foothills of the Santa Monica Mountains. The unnamed blue line stream is the primary conveyance for this watershed. The stream flows within an incised drainage feature and observations indicate that the stream typically produces an ephemeral flow regime, with flows rapidly increasing in response to high intensity rainfall.

To the south lies a level area of approximately 35 acres where the last phase of residential housing is proposed. The unnamed stream collects flows from the upper reaches of the watershed offsite and the proposed residential area to the south. Flows travel from east to west through the project site and a gap between two large hills, and subsequently discharging into discharge field, east of University Drive, that was previously restored and included in the Campus Habitat Restoration Program. In the 2000 preliminary delineation it was noted that University Drive serves as a partial barrier to the continued flow, and the water mostly percolates within the discharge field. However, higher flows reach the agricultural fields to the west under University Drive via a double-barreled box culvert under University Drive, off the campus property, and into the adjacent agricultural fields. Subsequently flows spread out and sheet flow to the southwest corner of the agriculture fields where they are stored in a 1.1-acre irrigation ditch adjacent to Long Grade Canyon Creek. Depending on agricultural needs the water from this ditch is pumped through a culvert pipe under Lewis Road and into Calleguas Creek which reaches the Pacific Ocean approximately 5.5 miles south at Mugu Lagoon.

Hydrology

Rincon did not observe any primary indicators of wetland hydrology. However, two secondary indicators (sediment deposits and drift deposits) were present. Current observations of soil and debris deposition indicate that the creek typically produces an ephemeral flow regime, with flows rapidly increasing in response to high intensity rainfall. Low volume surface flow was observed within the box culvert and subsequently filtered into the streambed at the outflow. This is likely residual flow associated with a 1.5-inch rain event from the week previous.

Vegetation

The project site contains a mosaic of native vegetation communities. The hillsides in the vicinity of the project site have relatively undisturbed prickly pear shrubland vegetation with scattered lemonade berry shrubs. Although native vegetation communities are present in these areas, herbaceous ruderal species with a mix of native and non-native plant species are ubiquitous between native shrubs and trees, as well as in the understory. The vegetation within the drainage feature is consistent with the surrounding vegetation.

In 2013, the Springs Fire burned the vegetation in the surrounding hillsides and drainage feature within the project site which resulted in changes of the relative cover and abundance of several dominant species. Most notably the long lived woody shrubs and trees including lemonade berry (*Rhus integrifolia*) and laurel sumac (*Malosma laurina*). Consequently these species mostly survived the intensity of the fire, re-sprouted, and remained dominant species in the project site.

In the 2007 delineation it was noted that the drainage supported riparian habitat dominated by willow (*Salix* sp.), laurel sumac, and mulefat (*Baccharis salicifolia*). The vegetation is now dominated by lemonade berry and laurel sumac, and is more accurately categorized as lemonade berry scrub. The southern bank of the drainage feature is dominated by various species of non-native grasses (*Bromus* spp.) and invasive ruderal species including fennel (*Foeniculum vulgare*). Numerous native species such as chaparral bush mallow (*Malacothamnus fasciculatus*) are present throughout the project site, reflecting the recent post fire changes to the site's vegetation due to the Springs Fire. All plant species observed during the reconnaissance survey are presented in Table 1. Although arroyo willow (*Salix lasiolepis*) is a component of this vegetation community, it no longer functions as a co-dominant species as was noted in the 2007 delineation. Currently only one large individual was recorded on the eastern edge of the project site, outside the proposed area of impacts.

Although isolated individuals of hydrophytic plants are present onsite, including facultative wetland species such as arroyo willow and mulefat, they are not found in sufficient abundance to categorize the site as dominated by hydrophytic vegetation.

Table1. Plant Species Observed within the Project Site (2016)

Scientific Name	Common Name	Native or Introduced
Plants		
<i>Acmispon glaber</i>	deer weed	Native
<i>Artemisia californica</i>	California sagebrush	Native
<i>Artemisia douglasiana</i>	mugwort	Native
<i>Asparagus asparagoides</i>	African asparagus fern	Non-native
<i>Atriplex suberecta</i>	peregrine saltbush	Non-native
<i>Avena</i> sp.	wild oats	Non-native
<i>Baccharis pilularis</i>	coyote brush	Native
<i>Baccharis salicifolia</i>	mulefat	Native
<i>Bromus</i> sp.	brome	Non-native
<i>Encelia californica</i>	California brittlebush	Native
<i>Elymus condensatus</i>	giant wild rye	Native
<i>Eriogonum cinereum</i>	coastal buckwheat	Native
<i>Erodium cicutarium</i>	red-stemmed filaree	Non-native

Scientific Name	Common Name	Native or Introduced
<i>Foeniculum vulgare</i>	fennel	Non-native
<i>Hesperoyucca whipplei</i>	chaparral yucca	Native
<i>Hirschfeldia incana</i>	short podded mustard	Non-native
<i>Hordeum murinum</i>	horehound	Non-native
<i>Malacothamnus fasciculatus</i>	chaparral bush mallow	Native
<i>Malosma laurina</i>	laurel sumac	Native
<i>Malva parviflora</i>	cheeseweed mallow	Non-native
<i>Nicotiana glauca</i>	tree tobacco	Non-native
<i>Opuntia littoralis</i>	coast prickly pear	Native
<i>Oxalis pes-caprae</i>	Bermuda buttercup	Non-native
<i>Plantago lanceolata</i>	English plantain	Non-native
<i>Rafinesquia californica</i>	California chicory	Native
<i>Ricinus communis</i>	castor bean	Non-native
<i>Rumex sp.</i>	dock	Native
<i>Rhus integrifolia</i>	lemonade berry	Native
<i>Salix lasiolepis</i>	arroyo willow	Native
<i>Salsola tragus</i>	prickly Russian thistle	Non-native
<i>Salvia mellifera</i>	black sage	Native
<i>Salvia leucophylla</i>	purple sage	Native

Assessment of Jurisdictional Waters and Wetlands

The delineation of jurisdictional waters within the project area identified non-wetland waters as well as streambed/banks and associated riparian habitat. Table 2 below summarizes the total approximate area (acres) and linear feet of potential jurisdictional features within the project site, as well as the total area that will be temporarily or permanently impacted. Figure 3 depicts the location and boundaries of USACE and RWQCB non-wetland waters, and the location and boundaries of CDFW streambed and banks within the project site.

Table 2: Potential Resource Agency Jurisdiction within the Survey Area

Resource Agency	Total Jurisdiction	Temporary Impacts	Permanent Impacts
USACE/RWQCB	0.019 acre (836 ft ²) / 90 linear feet	0.004 acre (196 ft ²) / 75 linear feet	0.008 acre (362 ft ²) / 20 linear feet
CDFW	0.043 acre (1,882 ft ²) / 90 linear feet	0.015 acre (649 ft ²) / 75 linear feet	0.014 acre (602 ft ²) / 20 linear feet

USACE and RWQCB Jurisdiction

Based on the results of the field investigation, no potential wetlands are present onsite due to the absence of hydric soils and the dominance of non-hydrophytic vegetation. The survey area contains non-wetland waters potentially subject to USACE and RWQCB jurisdiction. Approximately 0.019 acre of potential jurisdictional non-wetland waters of the U.S./State were delineated onsite. Of these jurisdictional waters, approximately

0.004 acre will be subject to temporary disturbance, and 0.015 acre will be subject to permanent disturbance as a result of project implementation (Figure 3).

Jurisdictional waters must have a significant nexus connection to downstream navigable waters. A significant nexus is defined as a waterway that “either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of traditional navigable or interstate waters.” In other words, if a waterway has potential to affect chemical, physical, or biological factors of a Traditional Navigable Water (TNW), it can be regulated under the significant nexus determination. The unnamed blue line stream exhibits evidence of ordinary hydrologic flows (i.e., OHWM) during and following storm events, for at least a number of weeks during an average rainy season. The drainage’s connection to a downstream waterbody (Calleguas Creek) to the southwest is not well established, as the water typically percolates via sheet flow into agricultural fields, and any overflow is transmitted into agricultural ditches which then may be pumped into Long Canyon Creek (which conveys water to Calleguas Creek and eventually into the Pacific Ocean at Mugu Lagoon). The Pacific Ocean is a Traditional Navigable Water (TNW). Given these factors it is reasonable to conclude that the drainage does not have a significant nexus with a TNW, and would thereby not be considered jurisdictional. However, the USACE and RWQCB have asserted jurisdiction over this drainage in the past. The USACE and USEPA make the final determination regarding the presence of a significant nexus.

As noted above, if impacts to potential USACE waters are proposed, the project will require a new Section 404 permit from the USACE, as the previous permit has expired. The impact threshold for a Section 404 Nationwide General Permit for Residential Developments (NWP 29) is less than 0.5 acre and 300 linear feet; if proposed project impacts exceed the length threshold, a Section 404 Individual Permit could be required. Concurrence from the USACE on the jurisdictional delineation results of this report is recommended.

Potential RWQCB jurisdiction was determined in accordance with the previously listed methodologies to identify USACE jurisdictional waters and therefore mirrors the potential jurisdictional limits of federal jurisdiction (approximately 0.019 acre within the project site) pursuant to Section 401 of the Clean Water Act. Of these jurisdictional waters, approximately 0.004 acre will be subject to temporary disturbance, and 0.015 acre will be subject to permanent disturbance as a result of project implementation (Figure 3). Under Section 401 of the CWA, certification of compliance with state water quality standards by the State Water Quality Agency is required for any discharge of pollutants into waters of the United States; therefore, proposed development within RWQCB jurisdiction will require a Section 401 Water Quality Certification. Concurrence from the RWQCB is recommended.

CDFW Jurisdiction

Approximately 0.043 acre of potential CDFW jurisdictional areas were delineated in the project site (Figure 3). Of these jurisdictional waters, approximately 0.015 acre will be subject to temporary disturbance, and 0.014 acre will be subject to permanent disturbance as a result of project implementation. Because impacts to potential areas of CDFW jurisdiction are proposed, the project would require a CFGC Section 1602 Streambed Alteration Agreement from the CDFW. Concurrence from the CDFW is recommended.

Conclusions

Since impacts to jurisdictional areas are proposed, the project will likely require a new CWA Section 404 permit from the USACE, a RWQCB CWA Section 401 Water Quality Certification, and California Fish and Game Code Section 1602 Streambed Alteration Agreement from the CDFW. Compensatory mitigation for permanent impacts to jurisdictional resources would be negotiated with the individual agencies during the regulatory permit application process. As noted previously, this report presents Rincon’s

professional delineation of potential jurisdictional areas at the site using the most up-to-date regulations and written policy and guidance from the regulatory agencies. The regulatory agencies make a final determination of their respective jurisdictional boundaries.

Limitations

This Jurisdictional Delineation was prepared for use solely and exclusively by Rincon for CSU Channel Islands. No other use or disclosure is intended or authorized by Rincon, nor shall this analysis be relied upon or transferred to any other party without the express written consent of Rincon. CSU Channel Islands agrees to hold Rincon harmless for any inverse condemnation or devaluation of said property that may result if Rincon's report or information generated is used for other purposes.

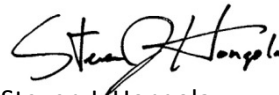
The findings and opinions conveyed in this analysis are based on the material reviewed and the limited field reconnaissance assessment. Although Rincon believes the data sources are reasonably reliable, Rincon cannot and does not guarantee the authenticity or reliability of the data sources reviewed. Thank you for selecting Rincon to provide you with this biological technical study. Please call if you have questions, or if we can be of further assistance.

Sincerely,

Rincon Consultants, Inc.



Robin Murray
Senior Biologist



Steven J. Hongola
Principal / Senior Ecologist

Attachments

References

Site Photographs

Figure 1 Regional Location

Figure 2 Project Location USGS Topographic Map

Figure 3 Potential Jurisdictional Features

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Representative Site Photographs



Photograph 1. Typical view of current conditions and landscape. View looking east from the central portion of the culvert crossing.



Photograph 3. View facing west southwest. Photo showing current conditions and vegetation west of the culvert.

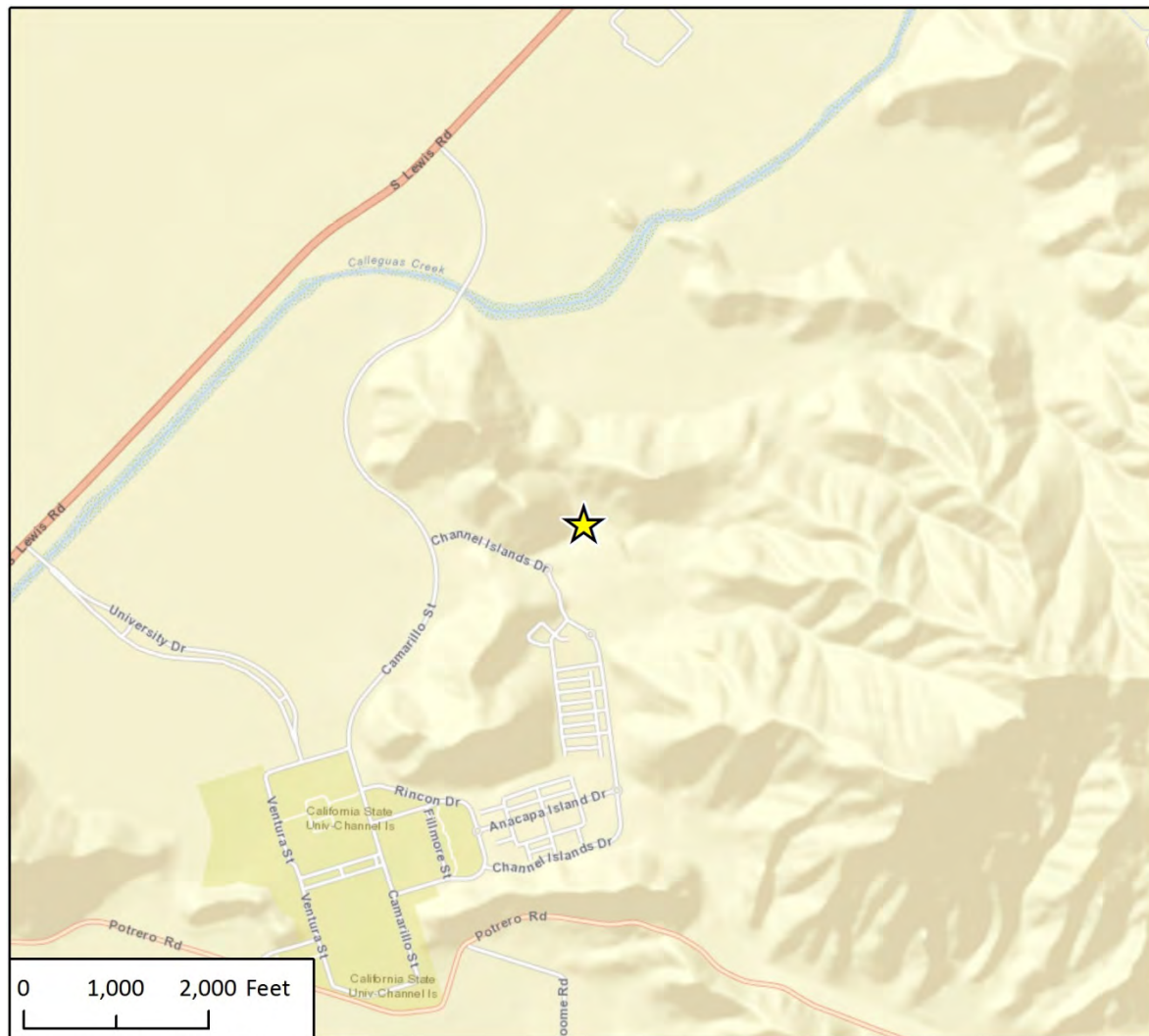


Photograph 2. Typical view of the vegetation on eastern side of the culvert. View facing northwest.



Photograph 4. Typical view of drainage with upland vegetation. View looking east northeast from the western portion of the site.

Figure 1 Regional Location



Imagery provided by ESRI and its licensors © 2016.

★ Project Location



Figure 2 Project Location on USGS Topographic Map

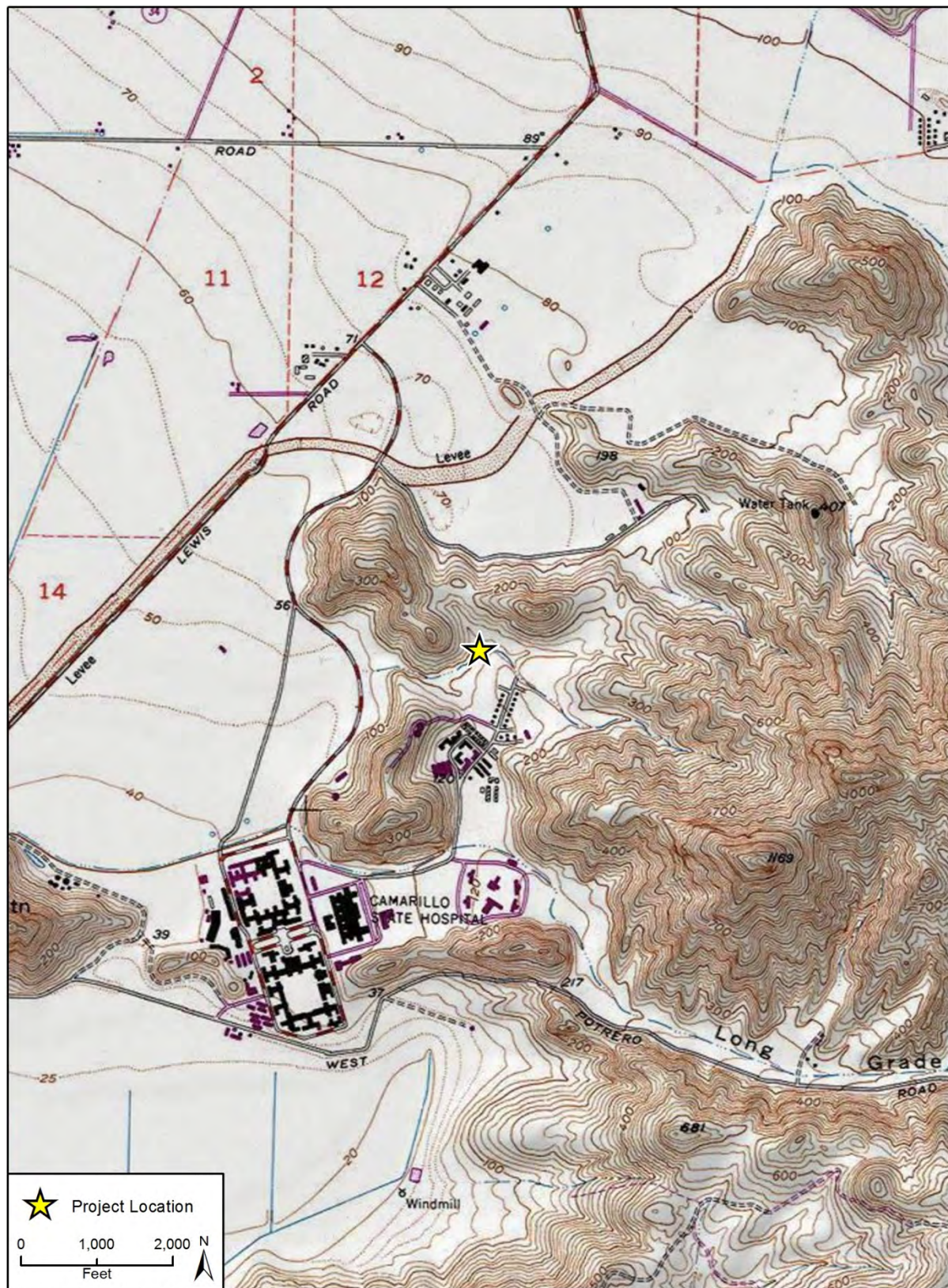
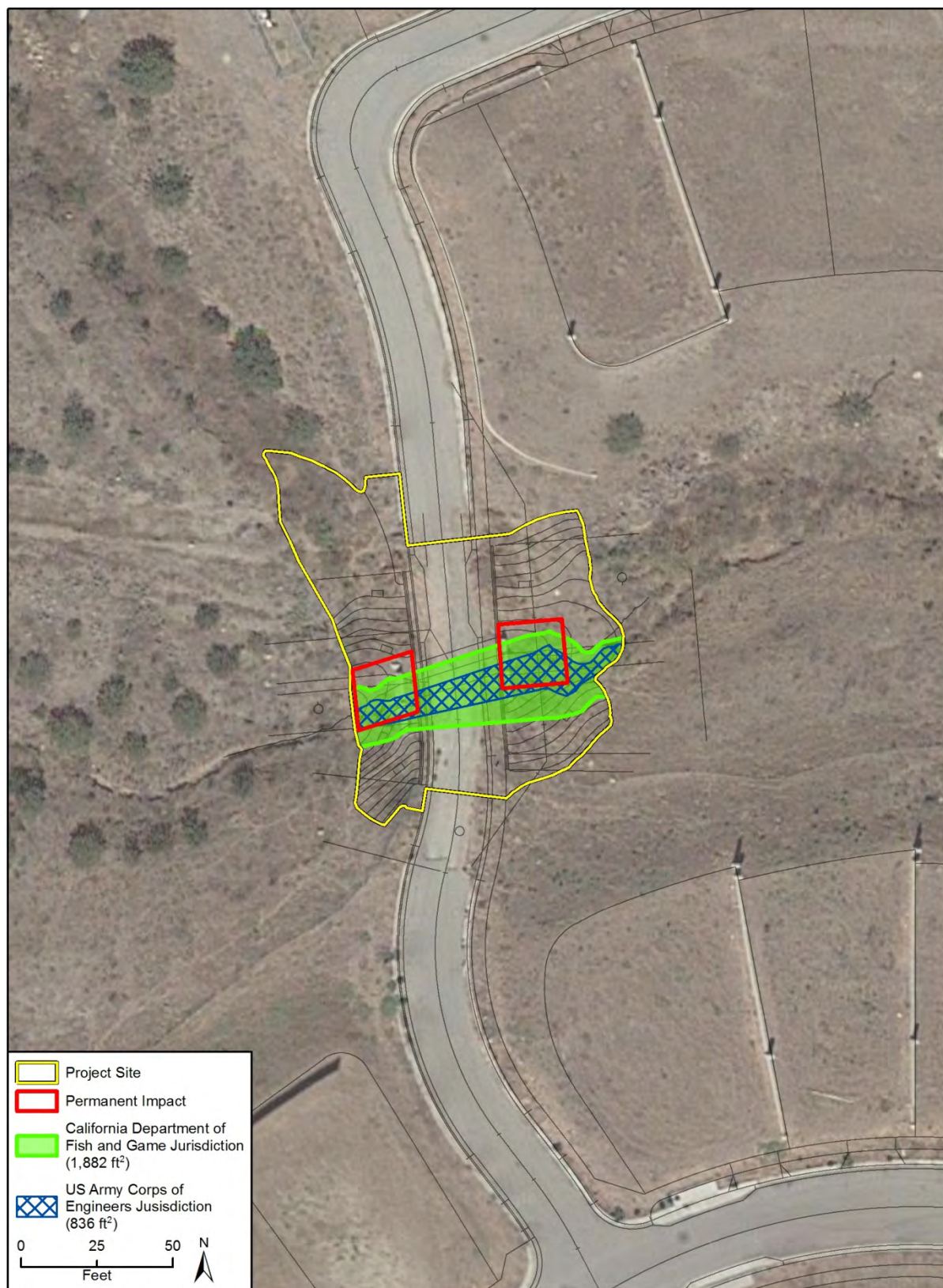


Figure 3 Potential Jurisdictional Resources



Imagery provided by Google and its licensors © 2017.
Additional data provided by Huitt-Zollars, June 13, 2007.

Appendix F

Sound Level Measurement Data Sheets

AMBIENT NOISE SURVEY DATA SHEET

Project: CSU
 Date: 11/22/16
 Operator: Abagail Taylor

Job Number: 15-01732

Station: _____ Begin: 7:11am
 Measurement No. (1) Finish: 7:26am
 Wind: 4 mph Direction: _____
 Temperature: 47°
 Cloud Cover Class
 Daytime ☐ 1 - Overcast >80%
☐ 2 - Light 20-80%
☒ 3 - Sunny <20%
 Nighttime ☐ 4 - Clear <50%
☐ 5 - Overcast >50%
 Primary Noise Source: Carmelite St. / S Lewis Rd.
 Distance: ~15 ft ~60 ft
 Secondary Noise Sources: Air production (piling southwest of meters) + outflow west of meters (15 ft)
 Notes: Birds in trees 30 ft away
Traffic on Cam →
Bus x1
 Traffic LDA/T: |||||
 MDT: ||
 HDT: ||||
 Leq: 66.7 L(10): 70.5
 Lmin: 51.6 L(33): _____
 Lmax: 83.4 L(50): 61.8
 Peak: _____ L(90): 56.9
 PH 95.0
 SEL 96.2
 Calibration Start: 94.0 dB End: 94.3 dB
 Response: ☐ Slow ☒ Fast
☐ Peak ☐ Impulse
 Weighting: ☒ A ☐ B
☐ C ☐ Linear
 Octave Filter: ☒ NA ☐ _____ Hz

Station: _____ Begin: 7:45am
 Measurement No. (2) Finish: 8:26am
 Wind: 2 mph Direction: _____
 Temperature: 50°
 Cloud Cover Class
 Daytime ☐ 1 - Overcast >80%
☐ 2 - Light 20-80%
☒ 3 - Sunny <20%
 Nighttime ☐ 4 - Clear <50%
☐ 5 - Overcast >50%
 Primary Noise Source: S. Lewis Rd (University Drive)
 Distance: 100ft? least 100ft?
 Secondary Noise Sources: Bus x1
 Notes: Traffic on University
 Traffic LDA/T: |||||
 MDT: ||
 HDT: ||||
 Leq: 67.6 L(10): 70.8
 Lmin: 50.7 L(33): _____
 Lmax: 91.1 L(50): 59.2
 Peak: _____ L(90): 54.2
 PH 103.4
 SEL 97.1
 Calibration Start: 94.0 dB End: 94.1 dB
 Response: ☐ Slow ☒ Fast
☐ Peak ☐ Impulse
 Weighting: ☒ A ☐ B
☐ C ☐ Linear
 Octave Filter: ☒ NA ☐ _____ Hz

Note: Provide Sketch of Location on Back.

AMBIENT NOISE SURVEY DATA SHEET

Project: CSUCI
 Date: 11/22/16
 Operator: Abigail Taylor

Job Number: 15-01732

Station: _____ Begin: 8:11am
 Measurement No. (3) Finish: 8:29am
 Wind: 3 mph Direction: _____
 Temperature: 52
 Cloud Cover Class
 Daytime ☐ 1 - Overcast >80%
☐ 2 - Light 20-80%
☒ 3 - Sunny <20%
 Nighttime ☐ 4 - Clear <50%
☐ 5 - Overcast >50%
 Primary Noise Source: Channel Island Blvd / Camarillo
 Distance: ~15 ft centerline ~45 ft
 Secondary Noise Sources: W/B Bred's in trees ~20-70 ft away
 Notes: Dike x1
Jogger ~ 20 ft south of
cars on Channel Island
 Traffic LDA/T: |||||
|||||
|||||
 Bus x1 MDT: I
 Motor cycle x1 HDT: I
 Bike x1 center heavy hand + 1 motorcycle from Lewis
 Leq: 58.4 L(10): 60.5
 PH Lmin: 32.9 L(33): _____
 91.5 Lmax: 79.1 L(50): 46.7
 SEC Peak: _____ L(90): 38.4
 87.9
 Calibration Start: 94.0 dB
 End: 94.0 dB
 Response: ☐ Slow ☒ Fast
☐ Peak ☐ Impulse
 Weighting: ☒ A ☐ B
☐ C ☐ Linear
 Octave Filter: ☒ NA ☐ _____ Hz

Station: _____ Begin: 8:41am
 Measurement No. (4) Finish: 8:56am
 Wind: 3 mph Direction: _____
 Temperature: 55
 Cloud Cover Class
 Daytime ☐ 1 - Overcast >80%
☐ 2 - Light 20-80%
☒ 3 - Sunny <20%
 Nighttime ☐ 4 - Clear <50%
☐ 5 - Overcast >50%
 Primary Noise Source: Channel Island Blvd
 Distance: ~10 ft from centerline
 Secondary Noise Sources: I had a conversation with my dog.
 Notes: Walking class /
feeding in park
passing by Aircraft overheard x1 Bred's
Jogger near motor x1
 Traffic LDA/T: |||||
|||||
|||||
 Channel Island Blvd MDT: _____
 HDT: |||
 PH Leq: 61.4 L(10): 62.4
 95.0 Lmin: 33.4 L(33): _____
 Lmax: 82.2 L(50): 45.0
 SEC Peak: _____ L(90): 36.6
 90.9
 Calibration Start: 94.0 dB
 End: 94.1 dB
 Response: ☐ Slow ☒ Fast
☐ Peak ☐ Impulse
 Weighting: ☒ A ☐ B
☐ C ☐ Linear
 Octave Filter: ☒ NA ☐ _____ Hz

Note: Provide Sketch of Location on Back.

AMBIENT NOISE SURVEY DATA SHEET

Project: C8004
 Date: 11/22/16
 Operator: Abigail Taylor

Job Number: 15-01732

Station: _____ Begin: 4:12pm
 Measurement No. (5) Finish: 4:27pm
 Wind: 0 mph Direction: _____
 Temperature: 75
 Cloud Cover Class
 Daytime ☐ 1 - Overcast >80%
☐ 2 - Light 20-80%
☒ 3 - Sunny <20%
 Nighttime ☐ 4 - Clear <50%
☐ 5 - Overcast >50%
 Primary Noise Source: Channel Island Blvd.
 Distance: 10 ft from centerline
 Secondary Noise Sources: Birds / Families inside / parking + getting out of cars
 Notes: Airplane overhead x1
 Traffic LDA/T: ||||
 MDT: _____
 HDT: _____
 PH 104.3 Leq: 57.4 L(10): 56.5
 Lmin: 29.1 L(33): _____
 SEL 86.9 Lmax: 77.3 L(50): 37.7
 Peak: _____ L(90): 0
 Calibration Start: 94.0 dB
 End: 94.0 dB
 Response: ☐ Slow ☒ Fast
☐ Peak ☐ Impulse
 Weighting: ☒ A ☐ B
☐ C ☐ Linear
 Octave Filter: ☒ NA ☐ _____ Hz

Station: _____ Begin: 4:58pm
 Measurement No. (6) Finish: 5:13pm
 Wind: 2 mph Direction: _____
 Temperature: 60
 Cloud Cover Class
 Daytime ☐ 1 - Overcast >80%
☐ 2 - Light 20-80%
☒ 3 - Sunny <20%
 Nighttime ☐ 4 - Clear <50%
☐ 5 - Overcast >50%
 Primary Noise Source: Lewis Road / Channel Island Blvd
 Distance: _____
 Secondary Noise Sources: Birds, Airplane overhead x1
 Notes: Jet in the distance
 Traffic LDA/T: _____
 MDT: _____
 HDT: _____
 PH 82 Leq: 43.6 L(10): 41.9
 Lmin: 33.0 L(33): _____
 SEL 73.1 Lmax: 61.6 L(50): 36.7
 Peak: _____ L(90): _____
 Calibration Start: 94.0 dB
 End: 94.1 dB
 Response: ☐ Slow ☒ Fast
☐ Peak ☐ Impulse
 Weighting: ☒ A ☐ B
☐ C ☐ Linear
 Octave Filter: ☒ NA ☐ _____ Hz

Note: Provide Sketch of Location on Back.

Data Logger

Freq Weight A

Time Weight FAST

Level Range: 40-100

Max dB 11/22/2016 7:24:22 AM 83.4

SEL 96.2

Leq 66.7

No.s	Date Time		dB
1	11/22/2016 7:11		65.3
2	11/22/2016 7:11		61.5
3	11/22/2016 7:11		63.5
4	11/22/2016 7:11		60.2
5	11/22/2016 7:11		64.8
6	11/22/2016 7:11		70.3
7	11/22/2016 7:11		76.1
8	11/22/2016 7:11		75.5
9	11/22/2016 7:11		67.5
10	11/22/2016 7:11		69.3
11	11/22/2016 7:11		72.1
12	11/22/2016 7:11		66.1
13	11/22/2016 7:11		64.1
14	11/22/2016 7:11		62.7
15	11/22/2016 7:11		63.8
16	11/22/2016 7:11		61.7
17	11/22/2016 7:11		64
18	11/22/2016 7:11		63.4
19	11/22/2016 7:11		68.1
20	11/22/2016 7:11		70.1
21	11/22/2016 7:11		69.4
22	11/22/2016 7:11		61.3
23	11/22/2016 7:11		63.1
24	11/22/2016 7:11		59.8
25	11/22/2016 7:11		58.4
26	11/22/2016 7:11		58.5
27	11/22/2016 7:11		55.7
28	11/22/2016 7:11		57.3
29	11/22/2016 7:11		64.8
30	11/22/2016 7:11		72.7
31	11/22/2016 7:12		61.1
32	11/22/2016 7:12		61.7
33	11/22/2016 7:12		69.8
34	11/22/2016 7:12		73.4
35	11/22/2016 7:12		68.3
36	11/22/2016 7:12		64.5
37	11/22/2016 7:12		62.3
38	11/22/2016 7:12		63.3
39	11/22/2016 7:12		62.2

40	11/22/2016 7:12	62.8
41	11/22/2016 7:12	62.1
42	11/22/2016 7:12	60.8
43	11/22/2016 7:12	57.8
44	11/22/2016 7:12	57.3
45	11/22/2016 7:12	56.9
46	11/22/2016 7:12	56
47	11/22/2016 7:12	55.2
48	11/22/2016 7:12	57.6
49	11/22/2016 7:12	66.6
50	11/22/2016 7:12	67.4
51	11/22/2016 7:12	59.3
52	11/22/2016 7:12	60.8
53	11/22/2016 7:12	67.1
54	11/22/2016 7:12	69.3
55	11/22/2016 7:12	67
56	11/22/2016 7:12	63
57	11/22/2016 7:12	60.4
58	11/22/2016 7:12	60.8
59	11/22/2016 7:12	63.1
60	11/22/2016 7:12	62.5
61	11/22/2016 7:13	62
62	11/22/2016 7:13	65.1
63	11/22/2016 7:13	63.1
64	11/22/2016 7:13	62.9
65	11/22/2016 7:13	63.6
66	11/22/2016 7:13	62.2
67	11/22/2016 7:13	60.3
68	11/22/2016 7:13	61
69	11/22/2016 7:13	60.8
70	11/22/2016 7:13	60.2
71	11/22/2016 7:13	59.5
72	11/22/2016 7:13	58.1
73	11/22/2016 7:13	58.1
74	11/22/2016 7:13	60.1
75	11/22/2016 7:13	62.3
76	11/22/2016 7:13	75.6
77	11/22/2016 7:13	77.3
78	11/22/2016 7:13	72.8
79	11/22/2016 7:13	75.2
80	11/22/2016 7:13	70.6
81	11/22/2016 7:13	74.8
82	11/22/2016 7:13	62.5
83	11/22/2016 7:13	58.2
84	11/22/2016 7:13	56.7
85	11/22/2016 7:13	57.2
86	11/22/2016 7:13	58.1

87	11/22/2016 7:13	59.7
88	11/22/2016 7:13	56.7
89	11/22/2016 7:13	61.2
90	11/22/2016 7:13	60.4
91	11/22/2016 7:14	61
92	11/22/2016 7:14	61
93	11/22/2016 7:14	60.6
94	11/22/2016 7:14	60.7
95	11/22/2016 7:14	59.6
96	11/22/2016 7:14	58.4
97	11/22/2016 7:14	58.4
98	11/22/2016 7:14	55.6
99	11/22/2016 7:14	57
100	11/22/2016 7:14	56.9
101	11/22/2016 7:14	58.5
102	11/22/2016 7:14	55.3
103	11/22/2016 7:14	54.7
104	11/22/2016 7:14	56.9
105	11/22/2016 7:14	55.8
106	11/22/2016 7:14	56.1
107	11/22/2016 7:14	57.5
108	11/22/2016 7:14	62.3
109	11/22/2016 7:14	59.7
110	11/22/2016 7:14	62.5
111	11/22/2016 7:14	66.6
112	11/22/2016 7:14	62.3
113	11/22/2016 7:14	62.5
114	11/22/2016 7:14	65
115	11/22/2016 7:14	63.1
116	11/22/2016 7:14	63.7
117	11/22/2016 7:14	61.6
118	11/22/2016 7:14	61.5
119	11/22/2016 7:14	63.4
120	11/22/2016 7:14	68.5
121	11/22/2016 7:15	70.6
122	11/22/2016 7:15	57.9
123	11/22/2016 7:15	53.9
124	11/22/2016 7:15	56.4
125	11/22/2016 7:15	62.8
126	11/22/2016 7:15	69.9
127	11/22/2016 7:15	66.5
128	11/22/2016 7:15	71.2
129	11/22/2016 7:15	71.4
130	11/22/2016 7:15	73.9
131	11/22/2016 7:15	61.3
132	11/22/2016 7:15	67.4
133	11/22/2016 7:15	61.9

134	11/22/2016 7:15	62.2
135	11/22/2016 7:15	63.4
136	11/22/2016 7:15	62.6
137	11/22/2016 7:15	63.4
138	11/22/2016 7:15	65.3
139	11/22/2016 7:15	67.5
140	11/22/2016 7:15	72.3
141	11/22/2016 7:15	69.3
142	11/22/2016 7:15	65.5
143	11/22/2016 7:15	63.3
144	11/22/2016 7:15	63.7
145	11/22/2016 7:15	63.5
146	11/22/2016 7:15	61.6
147	11/22/2016 7:15	60.6
148	11/22/2016 7:15	63.4
149	11/22/2016 7:15	70.9
150	11/22/2016 7:15	65.4
151	11/22/2016 7:16	61.6
152	11/22/2016 7:16	60.6
153	11/22/2016 7:16	60.7
154	11/22/2016 7:16	62
155	11/22/2016 7:16	58.2
156	11/22/2016 7:16	57.8
157	11/22/2016 7:16	55.8
158	11/22/2016 7:16	56.2
159	11/22/2016 7:16	57.1
160	11/22/2016 7:16	56.9
161	11/22/2016 7:16	56.3
162	11/22/2016 7:16	57.4
163	11/22/2016 7:16	57.4
164	11/22/2016 7:16	57.1
165	11/22/2016 7:16	55.9
166	11/22/2016 7:16	56.3
167	11/22/2016 7:16	59
168	11/22/2016 7:16	63.2
169	11/22/2016 7:16	67.4
170	11/22/2016 7:16	76.3
171	11/22/2016 7:16	75.2
172	11/22/2016 7:16	74.7
173	11/22/2016 7:16	62.6
174	11/22/2016 7:16	61.7
175	11/22/2016 7:16	62.2
176	11/22/2016 7:16	61.4
177	11/22/2016 7:16	64.1
178	11/22/2016 7:16	63.9
179	11/22/2016 7:16	62.4
180	11/22/2016 7:16	64.2

181	11/22/2016 7:17	67.1
182	11/22/2016 7:17	60.8
183	11/22/2016 7:17	60.3
184	11/22/2016 7:17	58.8
185	11/22/2016 7:17	59.7
186	11/22/2016 7:17	61.2
187	11/22/2016 7:17	71.6
188	11/22/2016 7:17	72.6
189	11/22/2016 7:17	65.5
190	11/22/2016 7:17	66.3
191	11/22/2016 7:17	71.2
192	11/22/2016 7:17	68.6
193	11/22/2016 7:17	60.6
194	11/22/2016 7:17	60.9
195	11/22/2016 7:17	63
196	11/22/2016 7:17	65.4
197	11/22/2016 7:17	70.8
198	11/22/2016 7:17	72.4
199	11/22/2016 7:17	63
200	11/22/2016 7:17	62.8
201	11/22/2016 7:17	67.6
202	11/22/2016 7:17	65.2
203	11/22/2016 7:17	66.8
204	11/22/2016 7:17	62.8
205	11/22/2016 7:17	61.7
206	11/22/2016 7:17	58.9
207	11/22/2016 7:17	59.5
208	11/22/2016 7:17	62.6
209	11/22/2016 7:17	77.7
210	11/22/2016 7:17	70.7
211	11/22/2016 7:18	65.6
212	11/22/2016 7:18	59.6
213	11/22/2016 7:18	56.5
214	11/22/2016 7:18	58.5
215	11/22/2016 7:18	57.2
216	11/22/2016 7:18	57.8
217	11/22/2016 7:18	56.9
218	11/22/2016 7:18	56.1
219	11/22/2016 7:18	57.1
220	11/22/2016 7:18	57.5
221	11/22/2016 7:18	58.4
222	11/22/2016 7:18	62.2
223	11/22/2016 7:18	60.4
224	11/22/2016 7:18	60.7
225	11/22/2016 7:18	58.3
226	11/22/2016 7:18	62
227	11/22/2016 7:18	64.8

228	11/22/2016 7:18	69.2
229	11/22/2016 7:18	62.7
230	11/22/2016 7:18	60.6
231	11/22/2016 7:18	62
232	11/22/2016 7:18	64.1
233	11/22/2016 7:18	74.9
234	11/22/2016 7:18	65.3
235	11/22/2016 7:18	63.1
236	11/22/2016 7:18	64
237	11/22/2016 7:18	68.9
238	11/22/2016 7:18	63.8
239	11/22/2016 7:18	60.3
240	11/22/2016 7:18	58.9
241	11/22/2016 7:19	57.8
242	11/22/2016 7:19	56.9
243	11/22/2016 7:19	55.2
244	11/22/2016 7:19	54.3
245	11/22/2016 7:19	56.7
246	11/22/2016 7:19	57.2
247	11/22/2016 7:19	60.4
248	11/22/2016 7:19	65
249	11/22/2016 7:19	72.8
250	11/22/2016 7:19	68.6
251	11/22/2016 7:19	69.7
252	11/22/2016 7:19	67.5
253	11/22/2016 7:19	61.6
254	11/22/2016 7:19	61.2
255	11/22/2016 7:19	60.9
256	11/22/2016 7:19	61.3
257	11/22/2016 7:19	60.4
258	11/22/2016 7:19	59.7
259	11/22/2016 7:19	59.3
260	11/22/2016 7:19	59.5
261	11/22/2016 7:19	60.7
262	11/22/2016 7:19	59.4
263	11/22/2016 7:19	62.1
264	11/22/2016 7:19	61.2
265	11/22/2016 7:19	61.1
266	11/22/2016 7:19	64
267	11/22/2016 7:19	69.8
268	11/22/2016 7:19	74.3
269	11/22/2016 7:19	74.3
270	11/22/2016 7:19	72
271	11/22/2016 7:20	67.6
272	11/22/2016 7:20	66.9
273	11/22/2016 7:20	63.7
274	11/22/2016 7:20	60.3

275	11/22/2016 7:20	61.3
276	11/22/2016 7:20	61.5
277	11/22/2016 7:20	62.2
278	11/22/2016 7:20	61.4
279	11/22/2016 7:20	60.4
280	11/22/2016 7:20	58
281	11/22/2016 7:20	60.2
282	11/22/2016 7:20	65.1
283	11/22/2016 7:20	61.2
284	11/22/2016 7:20	56.6
285	11/22/2016 7:20	58.1
286	11/22/2016 7:20	58.4
287	11/22/2016 7:20	61.4
288	11/22/2016 7:20	62.9
289	11/22/2016 7:20	59.6
290	11/22/2016 7:20	59.6
291	11/22/2016 7:20	58.5
292	11/22/2016 7:20	61.9
293	11/22/2016 7:20	58.7
294	11/22/2016 7:20	58.3
295	11/22/2016 7:20	62.3
296	11/22/2016 7:20	58.6
297	11/22/2016 7:20	59
298	11/22/2016 7:20	59.4
299	11/22/2016 7:20	59.5
300	11/22/2016 7:20	60.6
301	11/22/2016 7:21	63.9
302	11/22/2016 7:21	76.9
303	11/22/2016 7:21	71.3
304	11/22/2016 7:21	63.7
305	11/22/2016 7:21	62.6
306	11/22/2016 7:21	60.7
307	11/22/2016 7:21	61.7
308	11/22/2016 7:21	62.6
309	11/22/2016 7:21	60.7
310	11/22/2016 7:21	60.9
311	11/22/2016 7:21	58.1
312	11/22/2016 7:21	57.1
313	11/22/2016 7:21	56.7
314	11/22/2016 7:21	59.6
315	11/22/2016 7:21	64.3
316	11/22/2016 7:21	72.2
317	11/22/2016 7:21	74.1
318	11/22/2016 7:21	66.8
319	11/22/2016 7:21	69.8
320	11/22/2016 7:21	72.9
321	11/22/2016 7:21	73.6

322	11/22/2016 7:21	71.5
323	11/22/2016 7:21	59.4
324	11/22/2016 7:21	55.6
325	11/22/2016 7:21	55.8
326	11/22/2016 7:21	54.3
327	11/22/2016 7:21	60.1
328	11/22/2016 7:21	63.7
329	11/22/2016 7:21	68
330	11/22/2016 7:21	63.7
331	11/22/2016 7:22	60.2
332	11/22/2016 7:22	60.1
333	11/22/2016 7:22	59.3
334	11/22/2016 7:22	62.8
335	11/22/2016 7:22	60.7
336	11/22/2016 7:22	62.4
337	11/22/2016 7:22	63.3
338	11/22/2016 7:22	61.5
339	11/22/2016 7:22	67.4
340	11/22/2016 7:22	67.3
341	11/22/2016 7:22	59.9
342	11/22/2016 7:22	58.2
343	11/22/2016 7:22	58.9
344	11/22/2016 7:22	59.3
345	11/22/2016 7:22	60.1
346	11/22/2016 7:22	67.1
347	11/22/2016 7:22	68.8
348	11/22/2016 7:22	59.5
349	11/22/2016 7:22	58.5
350	11/22/2016 7:22	60.7
351	11/22/2016 7:22	70.2
352	11/22/2016 7:22	62.7
353	11/22/2016 7:22	69
354	11/22/2016 7:22	60.5
355	11/22/2016 7:22	56.7
356	11/22/2016 7:22	55.7
357	11/22/2016 7:22	57.3
358	11/22/2016 7:22	56.8
359	11/22/2016 7:22	62.3
360	11/22/2016 7:22	65.3
361	11/22/2016 7:23	66.7
362	11/22/2016 7:23	67.8
363	11/22/2016 7:23	64
364	11/22/2016 7:23	60.9
365	11/22/2016 7:23	61.6
366	11/22/2016 7:23	60.9
367	11/22/2016 7:23	60.6
368	11/22/2016 7:23	61.1

369	11/22/2016 7:23	61.3
370	11/22/2016 7:23	61.6
371	11/22/2016 7:23	65.7
372	11/22/2016 7:23	73.7
373	11/22/2016 7:23	63.7
374	11/22/2016 7:23	65.6
375	11/22/2016 7:23	74.8
376	11/22/2016 7:23	75.3
377	11/22/2016 7:23	74.4
378	11/22/2016 7:23	76
379	11/22/2016 7:23	67.6
380	11/22/2016 7:23	71.6
381	11/22/2016 7:23	69
382	11/22/2016 7:23	76.4
383	11/22/2016 7:23	62.2
384	11/22/2016 7:23	58.1
385	11/22/2016 7:23	57.9
386	11/22/2016 7:23	56.9
387	11/22/2016 7:23	59.4
388	11/22/2016 7:23	62.4
389	11/22/2016 7:23	65.7
390	11/22/2016 7:23	66.5
391	11/22/2016 7:24	68.4
392	11/22/2016 7:24	69.6
393	11/22/2016 7:24	65.6
394	11/22/2016 7:24	58.7
395	11/22/2016 7:24	61.5
396	11/22/2016 7:24	60.6
397	11/22/2016 7:24	62.5
398	11/22/2016 7:24	68.5
399	11/22/2016 7:24	65.4
400	11/22/2016 7:24	66.6
401	11/22/2016 7:24	82.6
402	11/22/2016 7:24	70.3
403	11/22/2016 7:24	64.4
404	11/22/2016 7:24	68.2
405	11/22/2016 7:24	60.6
406	11/22/2016 7:24	60.9
407	11/22/2016 7:24	63.9
408	11/22/2016 7:24	70.3
409	11/22/2016 7:24	58.2
410	11/22/2016 7:24	54.7
411	11/22/2016 7:24	52.7
412	11/22/2016 7:24	53.1
413	11/22/2016 7:24	54.5
414	11/22/2016 7:24	55.3
415	11/22/2016 7:24	58.1

416	11/22/2016 7:24	65.8
417	11/22/2016 7:24	65.2
418	11/22/2016 7:24	69.2
419	11/22/2016 7:24	65.1
420	11/22/2016 7:24	75
421	11/22/2016 7:25	62
422	11/22/2016 7:25	58.1
423	11/22/2016 7:25	58
424	11/22/2016 7:25	59.1
425	11/22/2016 7:25	64.1
426	11/22/2016 7:25	57.2
427	11/22/2016 7:25	55.6
428	11/22/2016 7:25	56.5
429	11/22/2016 7:25	57.7
430	11/22/2016 7:25	62.4
431	11/22/2016 7:25	69.7
432	11/22/2016 7:25	71.1
433	11/22/2016 7:25	62.6
434	11/22/2016 7:25	61.7
435	11/22/2016 7:25	60.5
436	11/22/2016 7:25	60.9
437	11/22/2016 7:25	60.3
438	11/22/2016 7:25	60.9
439	11/22/2016 7:25	61.6
440	11/22/2016 7:25	60.8
441	11/22/2016 7:25	63.5
442	11/22/2016 7:25	68.8
443	11/22/2016 7:25	63.4
444	11/22/2016 7:25	60.7
445	11/22/2016 7:25	59.4
446	11/22/2016 7:25	60.6
447	11/22/2016 7:25	61.4
448	11/22/2016 7:25	62.4
449	11/22/2016 7:25	66.2
450	11/22/2016 7:25	67.3

Data Logger

Freq Weight A

Time Weight FAST

Level Range: 40-100

Max dB 11/22/2016 7:50:34 AM 91.1

SEL 97.1

Leq 67.6

No.s	Date Time	dB
1	11/22/2016 7:44	55.8
2	11/22/2016 7:44	53.9
3	11/22/2016 7:44	51.7
4	11/22/2016 7:44	52
5	11/22/2016 7:44	52.5
6	11/22/2016 7:44	53.5
7	11/22/2016 7:44	52.7
8	11/22/2016 7:44	55.8
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13	11/22/2016 7:44	60.3
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21	11/22/2016 7:45	78.3
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312	11/22/2016 7:54	57.4
313	11/22/2016 7:54	57.4
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321	11/22/2016 7:55	70.7

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336	11/22/2016 7:55	54.5
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344	11/22/2016 7:56	55.3
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347	11/22/2016 7:56	58.7
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353	11/22/2016 7:56	70.3
354	11/22/2016 7:56	61.2
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363	11/22/2016 7:56	57.4
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366	11/22/2016 7:56	67.4
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385	11/22/2016 7:57	56.5
386	11/22/2016 7:57	54.7
387	11/22/2016 7:57	53
388	11/22/2016 7:57	52.4
389	11/22/2016 7:57	51.7
390	11/22/2016 7:57	52.1
391	11/22/2016 7:57	52.2
392	11/22/2016 7:57	52.6
393	11/22/2016 7:57	54.1
394	11/22/2016 7:57	56.4
395	11/22/2016 7:57	56.1
396	11/22/2016 7:57	57.5
397	11/22/2016 7:57	59.7
398	11/22/2016 7:57	66.2
399	11/22/2016 7:57	69
400	11/22/2016 7:57	73.1
401	11/22/2016 7:57	75
402	11/22/2016 7:57	67.9
403	11/22/2016 7:57	73.4
404	11/22/2016 7:58	73.1
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409	11/22/2016 7:58	70.5
410	11/22/2016 7:58	84.9
411	11/22/2016 7:58	69
412	11/22/2016 7:58	71.6
413	11/22/2016 7:58	71.7
414	11/22/2016 7:58	69.8
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443	11/22/2016 7:59	55.1
444	11/22/2016 7:59	58.6
445	11/22/2016 7:59	64.6
446	11/22/2016 7:59	77.5
447	11/22/2016 7:59	61.8
448	11/22/2016 7:59	61.2
449	11/22/2016 7:59	67.5
450	11/22/2016 7:59	56.1

Data Logger

Freq Weight A

Time Weight FAST

Level Range: 40-100

Max dB 11/22/2016 8:15:34 AM 79.1

SEL 87.9

Leq 58.4

No.s	Date Time	dB
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4	11/22/2016 8:14	62.5
5	11/22/2016 8:14	54.4
6	11/22/2016 8:14	51.9
7	11/22/2016 8:14	52.5
8	11/22/2016 8:14	49.5
9	11/22/2016 8:14	47
10	11/22/2016 8:14	49.2
11	11/22/2016 8:14	45.6
12	11/22/2016 8:14	57
13	11/22/2016 8:14	56.1
14	11/22/2016 8:14	48.4
15	11/22/2016 8:14	53.8
16	11/22/2016 8:14	56.9
17	11/22/2016 8:14	54.4
18	11/22/2016 8:14	48.9
19	11/22/2016 8:14	52
20	11/22/2016 8:14	52.7
21	11/22/2016 8:14	57.2
22	11/22/2016 8:14	65.5
23	11/22/2016 8:14	66.1
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26	11/22/2016 8:14	49.3
27	11/22/2016 8:14	49.7
28	11/22/2016 8:14	47.9
29	11/22/2016 8:14	46.3
30	11/22/2016 8:14	50.3
31	11/22/2016 8:14	48.1
32	11/22/2016 8:14	47.1
33	11/22/2016 8:15	46.4
34	11/22/2016 8:15	45.1
35	11/22/2016 8:15	45
36	11/22/2016 8:15	45.9
37	11/22/2016 8:15	45.6
38	11/22/2016 8:15	46.7
39	11/22/2016 8:15	50.2

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42	11/22/2016 8:15	46.9
43	11/22/2016 8:15	46.2
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46	11/22/2016 8:15	55.9
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60	11/22/2016 8:15	48.7
61	11/22/2016 8:15	52.8
62	11/22/2016 8:15	65.2
63	11/22/2016 8:16	66.1
64	11/22/2016 8:16	57.5
65	11/22/2016 8:16	61.8
66	11/22/2016 8:16	51.4
67	11/22/2016 8:16	52.4
68	11/22/2016 8:16	49.8
69	11/22/2016 8:16	51.2
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245	11/22/2016 8:22	38.3
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321	11/22/2016 8:24	39.7

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328	11/22/2016 8:24	41.7
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363	11/22/2016 8:26	39.4
364	11/22/2016 8:26	40.9
365	11/22/2016 8:26	42.1
366	11/22/2016 8:26	43.4
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385	11/22/2016 8:26	57.8
386	11/22/2016 8:26	66.2
387	11/22/2016 8:26	61
388	11/22/2016 8:26	52.2
389	11/22/2016 8:26	47
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391	11/22/2016 8:26	48
392	11/22/2016 8:26	45.6
393	11/22/2016 8:27	51.9
394	11/22/2016 8:27	53.5
395	11/22/2016 8:27	64.6
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401	11/22/2016 8:27	41.6
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404	11/22/2016 8:27	42.1
405	11/22/2016 8:27	42.7
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408	11/22/2016 8:27	66
409	11/22/2016 8:27	65.9
410	11/22/2016 8:27	56.2
411	11/22/2016 8:27	50
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413	11/22/2016 8:27	46.1
414	11/22/2016 8:27	49.3
415	11/22/2016 8:27	49.9

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418	11/22/2016 8:27	51
419	11/22/2016 8:27	43.7
420	11/22/2016 8:27	42.2
421	11/22/2016 8:27	43.7
422	11/22/2016 8:27	42.3
423	11/22/2016 8:28	42.7
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425	11/22/2016 8:28	46
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428	11/22/2016 8:28	43.3
429	11/22/2016 8:28	44.4
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431	11/22/2016 8:28	46.6
432	11/22/2016 8:28	50
433	11/22/2016 8:28	47
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441	11/22/2016 8:28	43.6
442	11/22/2016 8:28	43.9
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445	11/22/2016 8:28	43.9
446	11/22/2016 8:28	53.6
447	11/22/2016 8:28	45.2
448	11/22/2016 8:28	45.5
449	11/22/2016 8:28	48
450	11/22/2016 8:28	49.3

Data Logger

Freq Weight A

Time Weight FAST

Level Range: 40-100

Max dB 11/22/2016 8:52:14 AM 82.2

SEL 90.9

Leq 61.4

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6	11/22/2016 8:40		39.2
7	11/22/2016 8:40		40.3
8	11/22/2016 8:40		39
9	11/22/2016 8:40		39.4
10	11/22/2016 8:40		36.1
11	11/22/2016 8:40		36.6
12	11/22/2016 8:40		35.7
13	11/22/2016 8:40		36.1
14	11/22/2016 8:40		39
15	11/22/2016 8:40		43.7
16	11/22/2016 8:40		43.3
17	11/22/2016 8:40		50.3
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32	11/22/2016 8:41		50.3
33	11/22/2016 8:41		43.6
34	11/22/2016 8:41		47.7
35	11/22/2016 8:41		53
36	11/22/2016 8:41		57.8
37	11/22/2016 8:41		65
38	11/22/2016 8:41		58.2
39	11/22/2016 8:41		55.2

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44	11/22/2016 8:41	36.4
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81	11/22/2016 8:42	39.3
82	11/22/2016 8:42	37.5
83	11/22/2016 8:42	50.9
84	11/22/2016 8:42	37.3
85	11/22/2016 8:42	39.4
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88	11/22/2016 8:43	42
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91	11/22/2016 8:43	57.9
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113	11/22/2016 8:43	38.5
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115	11/22/2016 8:43	40.2
116	11/22/2016 8:44	39
117	11/22/2016 8:44	40.1
118	11/22/2016 8:44	40.2
119	11/22/2016 8:44	38.2
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450	11/22/2016 8:55	34

Freq Weight : A
Time Weight : FAST
Level Range : 40-100
Max dB : 77.3 - 2016/11/22 16:23:55
Level Range : 40-100
SEL : 86.9
Leq : 57.4

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4	2016/11/22 16:12:36	33.1
5	2016/11/22 16:12:38	33.8
6	2016/11/22 16:12:40	32.5
7	2016/11/22 16:12:42	31.8
8	2016/11/22 16:12:44	35.1
9	2016/11/22 16:12:46	36.6
10	2016/11/22 16:12:48	31.0
11	2016/11/22 16:12:50	31.7
12	2016/11/22 16:12:52	33.4
13	2016/11/22 16:12:54	30.4
14	2016/11/22 16:12:56	30.8
15	2016/11/22 16:12:58	31.3
16	2016/11/22 16:13:00	33.6
17	2016/11/22 16:13:02	31.2
18	2016/11/22 16:13:04	30.9
19	2016/11/22 16:13:06	31.2
20	2016/11/22 16:13:08	30.1
21	2016/11/22 16:13:10	32.0
22	2016/11/22 16:13:12	31.3
23	2016/11/22 16:13:14	32.6
24	2016/11/22 16:13:16	33.2
25	2016/11/22 16:13:18	31.0
26	2016/11/22 16:13:20	30.0
27	2016/11/22 16:13:22	31.3
28	2016/11/22 16:13:24	34.8
29	2016/11/22 16:13:26	33.4
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36	2016/11/22 16:13:40	36.9
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85	2016/11/22 16:15:18	49.8

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166	2016/11/22	16:18:00	43.2
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Freq Weight : A
Time Weight : FAST
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Max dB : 61.6 - 2016/11/22 17:00:07
Level Range : 40-100
SEL : 73.1
Leq : 43.6

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10	2016/11/22 16:57:44	37.4
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13	2016/11/22 16:57:50	36.8
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141	2016/11/22	17:02:06	44.8
142	2016/11/22	17:02:08	43.7
143	2016/11/22	17:02:10	43.0
144	2016/11/22	17:02:12	45.8
145	2016/11/22	17:02:14	41.5
146	2016/11/22	17:02:16	41.9
147	2016/11/22	17:02:18	43.1
148	2016/11/22	17:02:20	38.1
149	2016/11/22	17:02:22	37.0
150	2016/11/22	17:02:24	36.6
151	2016/11/22	17:02:26	36.4
152	2016/11/22	17:02:28	34.4
153	2016/11/22	17:02:30	34.8
154	2016/11/22	17:02:32	34.5
155	2016/11/22	17:02:34	35.2
156	2016/11/22	17:02:36	34.5
157	2016/11/22	17:02:38	34.9
158	2016/11/22	17:02:40	34.4
159	2016/11/22	17:02:42	34.6
160	2016/11/22	17:02:44	34.3
161	2016/11/22	17:02:46	35.5
162	2016/11/22	17:02:48	35.0
163	2016/11/22	17:02:50	34.9
164	2016/11/22	17:02:52	37.2
165	2016/11/22	17:02:54	35.7
166	2016/11/22	17:02:56	35.9
167	2016/11/22	17:02:58	36.3
168	2016/11/22	17:03:00	35.5
169	2016/11/22	17:03:02	36.0
170	2016/11/22	17:03:04	34.5
171	2016/11/22	17:03:06	35.3
172	2016/11/22	17:03:08	35.8
173	2016/11/22	17:03:10	36.5
174	2016/11/22	17:03:12	35.3
175	2016/11/22	17:03:14	35.0
176	2016/11/22	17:03:16	35.6
177	2016/11/22	17:03:18	35.5
178	2016/11/22	17:03:20	36.3
179	2016/11/22	17:03:22	36.2
180	2016/11/22	17:03:24	36.0
181	2016/11/22	17:03:26	36.4
182	2016/11/22	17:03:28	37.3
183	2016/11/22	17:03:30	38.9
184	2016/11/22	17:03:32	44.9

185	2016/11/22	17:03:34	39.1
186	2016/11/22	17:03:36	39.0
187	2016/11/22	17:03:38	42.7
188	2016/11/22	17:03:40	39.5
189	2016/11/22	17:03:42	38.3
190	2016/11/22	17:03:44	37.8
191	2016/11/22	17:03:46	37.6
192	2016/11/22	17:03:48	39.3
193	2016/11/22	17:03:50	37.6
194	2016/11/22	17:03:52	39.4
195	2016/11/22	17:03:54	37.6
196	2016/11/22	17:03:56	38.1
197	2016/11/22	17:03:58	38.5
198	2016/11/22	17:04:00	38.8
199	2016/11/22	17:04:02	36.7
200	2016/11/22	17:04:04	36.9
201	2016/11/22	17:04:06	37.0
202	2016/11/22	17:04:08	37.0
203	2016/11/22	17:04:10	37.2
204	2016/11/22	17:04:12	38.4
205	2016/11/22	17:04:14	39.9
206	2016/11/22	17:04:16	39.0
207	2016/11/22	17:04:18	40.9
208	2016/11/22	17:04:20	39.5
209	2016/11/22	17:04:22	39.6
210	2016/11/22	17:04:24	41.1
211	2016/11/22	17:04:26	39.4
212	2016/11/22	17:04:28	37.7
213	2016/11/22	17:04:30	38.4
214	2016/11/22	17:04:32	39.2
215	2016/11/22	17:04:34	38.4
216	2016/11/22	17:04:36	37.7
217	2016/11/22	17:04:38	36.9
218	2016/11/22	17:04:40	38.1
219	2016/11/22	17:04:42	36.0
220	2016/11/22	17:04:44	35.3
221	2016/11/22	17:04:46	36.0
222	2016/11/22	17:04:48	36.6
223	2016/11/22	17:04:50	37.1
224	2016/11/22	17:04:52	36.2
225	2016/11/22	17:04:54	35.5
226	2016/11/22	17:04:56	34.7
227	2016/11/22	17:04:58	35.1
228	2016/11/22	17:05:00	34.8
229	2016/11/22	17:05:02	34.6
230	2016/11/22	17:05:04	34.8
231	2016/11/22	17:05:06	35.4
232	2016/11/22	17:05:08	34.9
233	2016/11/22	17:05:10	35.3
234	2016/11/22	17:05:12	36.0
235	2016/11/22	17:05:14	36.2
236	2016/11/22	17:05:16	35.7
237	2016/11/22	17:05:18	35.2
238	2016/11/22	17:05:20	35.1
239	2016/11/22	17:05:22	35.9
240	2016/11/22	17:05:24	34.4
241	2016/11/22	17:05:26	35.6
242	2016/11/22	17:05:28	36.3
243	2016/11/22	17:05:30	37.0
244	2016/11/22	17:05:32	35.6
245	2016/11/22	17:05:34	35.7
246	2016/11/22	17:05:36	35.4
247	2016/11/22	17:05:38	35.3
248	2016/11/22	17:05:40	35.6
249	2016/11/22	17:05:42	33.7
250	2016/11/22	17:05:44	34.0
251	2016/11/22	17:05:46	34.2
252	2016/11/22	17:05:48	33.7
253	2016/11/22	17:05:50	33.5
254	2016/11/22	17:05:52	35.7
255	2016/11/22	17:05:54	33.3
256	2016/11/22	17:05:56	35.6
257	2016/11/22	17:05:58	34.5
258	2016/11/22	17:06:00	35.5
259	2016/11/22	17:06:02	34.8
260	2016/11/22	17:06:04	34.7
261	2016/11/22	17:06:06	34.5
262	2016/11/22	17:06:08	35.6
263	2016/11/22	17:06:10	34.6
264	2016/11/22	17:06:12	35.0
265	2016/11/22	17:06:14	35.7
266	2016/11/22	17:06:16	35.7
267	2016/11/22	17:06:18	34.4
268	2016/11/22	17:06:20	35.0
269	2016/11/22	17:06:22	35.2
270	2016/11/22	17:06:24	35.3
271	2016/11/22	17:06:26	35.7
272	2016/11/22	17:06:28	34.7
273	2016/11/22	17:06:30	35.5
274	2016/11/22	17:06:32	36.8
275	2016/11/22	17:06:34	38.7
276	2016/11/22	17:06:36	36.9
277	2016/11/22	17:06:38	36.6
278	2016/11/22	17:06:40	35.5
279	2016/11/22	17:06:42	35.2
280	2016/11/22	17:06:44	34.8
281	2016/11/22	17:06:46	34.3
282	2016/11/22	17:06:48	35.3
283	2016/11/22	17:06:50	37.9

284	2016/11/22	17:06:52	36.1
285	2016/11/22	17:06:54	35.5
286	2016/11/22	17:06:56	35.5
287	2016/11/22	17:06:58	35.6
288	2016/11/22	17:07:00	36.6
289	2016/11/22	17:07:02	36.2
290	2016/11/22	17:07:04	35.2
291	2016/11/22	17:07:06	36.0
292	2016/11/22	17:07:08	36.3
293	2016/11/22	17:07:10	35.4
294	2016/11/22	17:07:12	35.9
295	2016/11/22	17:07:14	36.7
296	2016/11/22	17:07:16	36.7
297	2016/11/22	17:07:18	37.1
298	2016/11/22	17:07:20	36.3
299	2016/11/22	17:07:22	36.2
300	2016/11/22	17:07:24	36.6
301	2016/11/22	17:07:26	37.1
302	2016/11/22	17:07:28	36.9
303	2016/11/22	17:07:30	37.2
304	2016/11/22	17:07:32	37.4
305	2016/11/22	17:07:34	37.7
306	2016/11/22	17:07:36	38.6
307	2016/11/22	17:07:38	37.7
308	2016/11/22	17:07:40	38.4
309	2016/11/22	17:07:42	37.4
310	2016/11/22	17:07:44	37.3
311	2016/11/22	17:07:46	37.0
312	2016/11/22	17:07:48	37.6
313	2016/11/22	17:07:50	37.0
314	2016/11/22	17:07:52	36.5
315	2016/11/22	17:07:54	36.5
316	2016/11/22	17:07:56	35.8
317	2016/11/22	17:07:58	36.7
318	2016/11/22	17:08:00	36.5
319	2016/11/22	17:08:02	36.1
320	2016/11/22	17:08:04	35.3
321	2016/11/22	17:08:06	35.0
322	2016/11/22	17:08:08	35.2
323	2016/11/22	17:08:10	35.0
324	2016/11/22	17:08:12	35.5
325	2016/11/22	17:08:14	34.9
326	2016/11/22	17:08:16	35.3
327	2016/11/22	17:08:18	34.7
328	2016/11/22	17:08:20	36.9
329	2016/11/22	17:08:22	34.3
330	2016/11/22	17:08:24	33.7
331	2016/11/22	17:08:26	34.7
332	2016/11/22	17:08:28	35.1
333	2016/11/22	17:08:30	34.5
334	2016/11/22	17:08:32	34.8
335	2016/11/22	17:08:34	34.6
336	2016/11/22	17:08:36	35.3
337	2016/11/22	17:08:38	34.7
338	2016/11/22	17:08:40	34.2
339	2016/11/22	17:08:42	35.0
340	2016/11/22	17:08:44	35.4
341	2016/11/22	17:08:46	34.8
342	2016/11/22	17:08:48	34.8
343	2016/11/22	17:08:50	34.8
344	2016/11/22	17:08:52	34.5
345	2016/11/22	17:08:54	34.9
346	2016/11/22	17:08:56	34.3
347	2016/11/22	17:08:58	35.1
348	2016/11/22	17:09:00	35.6
349	2016/11/22	17:09:02	35.1
350	2016/11/22	17:09:04	35.7
351	2016/11/22	17:09:06	35.1
352	2016/11/22	17:09:08	34.7
353	2016/11/22	17:09:10	37.7
354	2016/11/22	17:09:12	34.8
355	2016/11/22	17:09:14	35.2
356	2016/11/22	17:09:16	35.9
357	2016/11/22	17:09:18	36.3
358	2016/11/22	17:09:20	36.0
359	2016/11/22	17:09:22	36.9
360	2016/11/22	17:09:24	35.9
361	2016/11/22	17:09:26	37.1
362	2016/11/22	17:09:28	38.3
363	2016/11/22	17:09:30	38.2
364	2016/11/22	17:09:32	37.7
365	2016/11/22	17:09:34	39.7
366	2016/11/22	17:09:36	37.7
367	2016/11/22	17:09:38	38.2
368	2016/11/22	17:09:40	35.8
369	2016/11/22	17:09:42	35.9
370	2016/11/22	17:09:44	35.9
371	2016/11/22	17:09:46	36.7
372	2016/11/22	17:09:48	36.6
373	2016/11/22	17:09:50	35.7
374	2016/11/22	17:09:52	37.1
375	2016/11/22	17:09:54	36.0
376	2016/11/22	17:09:56	37.4
377	2016/11/22	17:09:58	35.9
378	2016/11/22	17:10:00	36.2
379	2016/11/22	17:10:02	38.0
380	2016/11/22	17:10:04	36.2
381	2016/11/22	17:10:06	35.9
382	2016/11/22	17:10:08	36.1

383	2016/11/22	17:10:10	35.2
384	2016/11/22	17:10:12	36.0
385	2016/11/22	17:10:14	35.6
386	2016/11/22	17:10:16	35.6
387	2016/11/22	17:10:18	37.3
388	2016/11/22	17:10:20	36.5
389	2016/11/22	17:10:22	36.5
390	2016/11/22	17:10:24	35.7
391	2016/11/22	17:10:26	36.8
392	2016/11/22	17:10:28	36.9
393	2016/11/22	17:10:30	34.8
394	2016/11/22	17:10:32	35.0
395	2016/11/22	17:10:34	35.2
396	2016/11/22	17:10:36	35.0
397	2016/11/22	17:10:38	36.7
398	2016/11/22	17:10:40	36.6
399	2016/11/22	17:10:42	36.2
400	2016/11/22	17:10:44	36.1
401	2016/11/22	17:10:46	35.4
402	2016/11/22	17:10:48	35.8
403	2016/11/22	17:10:50	35.5
404	2016/11/22	17:10:52	36.6
405	2016/11/22	17:10:54	35.8
406	2016/11/22	17:10:56	35.1
407	2016/11/22	17:10:58	34.8
408	2016/11/22	17:11:00	34.5
409	2016/11/22	17:11:02	35.7
410	2016/11/22	17:11:04	35.3
411	2016/11/22	17:11:06	34.6
412	2016/11/22	17:11:08	34.8
413	2016/11/22	17:11:10	34.2
414	2016/11/22	17:11:12	33.6
415	2016/11/22	17:11:14	35.1
416	2016/11/22	17:11:16	36.6
417	2016/11/22	17:11:18	37.1
418	2016/11/22	17:11:20	34.4
419	2016/11/22	17:11:22	36.2
420	2016/11/22	17:11:24	37.0
421	2016/11/22	17:11:26	36.7
422	2016/11/22	17:11:28	37.9
423	2016/11/22	17:11:30	36.8
424	2016/11/22	17:11:32	39.0
425	2016/11/22	17:11:34	42.6
426	2016/11/22	17:11:36	38.6
427	2016/11/22	17:11:38	40.4
428	2016/11/22	17:11:40	39.5
429	2016/11/22	17:11:42	38.3
430	2016/11/22	17:11:44	38.4
431	2016/11/22	17:11:46	37.4
432	2016/11/22	17:11:48	34.7
433	2016/11/22	17:11:50	35.7
434	2016/11/22	17:11:52	34.9
435	2016/11/22	17:11:54	34.1
436	2016/11/22	17:11:56	35.4
437	2016/11/22	17:11:58	34.8
438	2016/11/22	17:12:00	35.8
439	2016/11/22	17:12:02	36.5
440	2016/11/22	17:12:04	37.6
441	2016/11/22	17:12:06	36.1
442	2016/11/22	17:12:08	36.8
443	2016/11/22	17:12:10	36.7
444	2016/11/22	17:12:12	36.7
445	2016/11/22	17:12:14	37.2
446	2016/11/22	17:12:16	37.6
447	2016/11/22	17:12:18	37.9
448	2016/11/22	17:12:20	37.9
449	2016/11/22	17:12:22	37.6
450	2016/11/22	17:12:24	36.5

Appendix G

Construction Phasing Noise Calculations

Estimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus R

Scenario: Site Preparation

Receptor Location: Multi-Family Residential

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Rubber Tired Dozers [2]	85	3	0.8	0.5	70	83
Tractor/Loader/Backhoe [2]	85	4	0.8	0.5	70	84

TOTAL Leq DURING NORMAL OPE **87** **dBA**

Daytime Ambient without Equipment **61** dBA

Nighttime Ambient without Equipmen **0** dBA

Daytime Hours Operating: **8**

Evening Hours Operating: **0**

Nighttime Hours Operating: **0**

Combined Daytime Hourly Leq: **87** dBA

Combined Nighttime Hourly Leq: **0** dBA

ESTIMATED Ldn: **82** **dBA**

ESTIMATED CNEL: **82** **dBA**

Distance attenuation assumed at: 6 dBA per doubling of distance

Notes: #N/A = Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.

* Equipment type per assumed equipment type and duration

Estimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus R

Scenario: Site Preparation

Receptor Location: Community Pool

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Rubber Tired Dozers [2]	85	3	0.8	0.5	350	69
Tractor/Loader/Backhoe [2]	85	4	0.8	0.5	350	70

TOTAL Leq DURING NORMAL OPE **73** **dBA**

Daytime Ambient without Equipment **61** dBA

Nighttime Ambient without Equipmen **0** dBA

Daytime Hours Operating: **8**

Evening Hours Operating: **0**

Nighttime Hours Operating: **0**

Combined Daytime Hourly Leq: **73** dBA

Combined Nighttime Hourly Leq: **0** dBA

ESTIMATED Ldn: **68** **dBA**

ESTIMATED CNEL: **68** **dBA**

Distance attenuation assumed at: 6 dBA per doubling of distance

Notes: #N/A = Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.

* Equipment type per assumed equipment type and duration

Estimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus R

Scenario: Site Preparation

Receptor Location: Single-Family Residential

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Rubber Tired Dozers [2]	85	3	0.8	0.5	450	67
Tractor/Loader/Backhoe [2]	85	4	0.8	0.5	450	68

TOTAL Leq DURING NORMAL OPE **70** **dBA**

Daytime Ambient without Equipment **57** dBA

Nighttime Ambient without Equipmen **0** dBA

Daytime Hours Operating: **8**

Evening Hours Operating: **0**

Nighttime Hours Operating: **0**

Combined Daytime Hourly Leq: **71** dBA

Combined Nighttime Hourly Leq: **0** dBA

ESTIMATED Ldn: **66** **dBA**

ESTIMATED CNEL: **66** **dBA**

Distance attenuation assumed at: 6 dBA per doubling of distance

Notes: #N/A = Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.

* Equipment type per assumed equipment type and duration

Estimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus R

Scenario: Site Preparation

Receptor Location: Library

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Rubber Tired Dozers [2]	85	3	0.8	0.5	2800	51
Tractor/Loader/Backhoe [2]	85	4	0.8	0.5	2800	52

TOTAL Leq DURING NORMAL OPE **55** **dBA**

Daytime Ambient without Equipment **57** dBA

Nighttime Ambient without Equipmen **0** dBA

Daytime Hours Operating: **8**

Evening Hours Operating: **0**

Nighttime Hours Operating: **0**

Combined Daytime Hourly Leq: **59** dBA

Combined Nighttime Hourly Leq: **0** dBA

ESTIMATED Ldn: **56** **dBA**

ESTIMATED CNEL: **56** **dBA**

Distance attenuation assumed at: 6 dBA per doubling of distance

Notes: #N/A = Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.

* Equipment type per assumed equipment type and duration

Estimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus R

Scenario: Grading

Receptor Location: Multi-Family Residential

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Graders [3]	85	1	0.8	0.5	70	78
Rubber Tired Dozers [2]	85	1	0.8	0.5	70	78
Tractor/Loader/Backhoe [2]	85	2	0.8	0.5	70	81
Excavators [3]	85	1	0.8	0.5	70	78
Scrapers [3]	85	2	0.8	0.5	70	81
TOTAL Leq DURING NORMAL OPE	87	dBA				
Daytime Ambient without Equipment	61	dBA				
Nighttime Ambient without Equipmen	0	dBA				
Daytime Hours Operating:	8					
Evening Hours Operating:	0					
Nighttime Hours Operating:	0					
Combined Daytime Hourly Leq:	87	dBA				
Combined Nighttime Hourly Leq:	0	dBA				
ESTIMATED Ldn:	82	dBA				
ESTIMATED CNEL:	82	dBA				

Distance attenuation assumed at: 6 dBA per doubling of distance

Notes: #N/A = Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.

* Equipment type per assumed equipment type and duration

Estimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus R

Scenario: Grading

Receptor Location: Community Pool

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Graders [3]	85	1	0.8	0.5	350	64
Rubber Tired Dozers [2]	85	1	0.8	0.5	350	64
Tractor/Loader/Backhoe [2]	85	2	0.8	0.5	350	67
Excavators [3]	85	1	0.8	0.5	350	64
Scrapers [3]	85	2	0.8	0.5	350	67
TOTAL Leq DURING NORMAL OPE	73	dBA				
Daytime Ambient without Equipment	61	dBA				
Nighttime Ambient without Equipmen	0	dBA				
Daytime Hours Operating:	8					
Evening Hours Operating:	0					
Nighttime Hours Operating:	0					
Combined Daytime Hourly Leq:	73	dBA				
Combined Nighttime Hourly Leq:	0	dBA				
ESTIMATED Ldn:	68	dBA				
ESTIMATED CNEL:	68	dBA				

Distance attenuation assumed at: 6 dBA per doubling of distance

Notes: #N/A = Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.

* Equipment type per assumed equipment type and duration

Estimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus R

Scenario: Grading

Receptor Location: Single-Family Residential

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Graders [3]	85	1	0.8	0.5	450	62
Rubber Tired Dozers [2]	85	1	0.8	0.5	450	62
Tractor/Loader/Backhoe [2]	85	2	0.8	0.5	450	65
Excavators [3]	85	1	0.8	0.5	450	62
Scrapers [3]	85	2	0.8	0.5	450	65
TOTAL Leq DURING NORMAL OPE	70	dBA				
Daytime Ambient without Equipment	57	dBA				
Nighttime Ambient without Equipmen	0	dBA				
Daytime Hours Operating:	8					
Evening Hours Operating:	0					
Nighttime Hours Operating:	0					
Combined Daytime Hourly Leq:	71	dBA				
Combined Nighttime Hourly Leq:	0	dBA				
ESTIMATED Ldn:	66	dBA				
ESTIMATED CNEL:	66	dBA				

Distance attenuation assumed at: 6 dBA per doubling of distance

Notes: #N/A = Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.

* Equipment type per assumed equipment type and duration

Estimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus R

Scenario: Grading
Receptor Location: Library

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours In Use	Effective Use Factor *	Distance, Ft.	Leq, dBA
Graders [3]	85	1	0.8	0.5	2800	46
Rubber Tired Dozers [2]	85	1	0.8	0.5	2800	46
Tractor/Loader/Backhoe [2]	85	2	0.8	0.5	2800	49
Excavators [3]	85	1	0.8	0.5	2800	46
Scrapers [3]	85	2	0.8	0.5	2800	49
TOTAL Leq DURING NORMAL OPE	55	dBA				
Daytime Ambient without Equipment	57	dBA				
Nighttime Ambient without Equipmen	0	dBA				
Daytime Hours Operating:	8					
Evening Hours Operating:	0					
Nighttime Hours Operating:	0					
Combined Daytime Hourly Leq:	59	dBA				
Combined Nighttime Hourly Leq:	0	dBA				
ESTIMATED Ldn:	56	dBA				
ESTIMATED CNEL:	56	dBA				

Distance attenuation assumed at: 6 dBA per doubling of distance

Notes: #N/A = Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.

* Equipment type per assumed equipment type and duration

istimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood Project

Scenario: Building Construction
 Receptor Location: Multi-Family Residential

234.56

Noise Source	Avg. Maximum SPL @ 50 Ft., dBA	Number	Percentage of Workday - Effective Hours in Loudest Position	Distance, Ft.	Leq, dBA
Cranes [1]	85	1	0.7	0.5	78
Generative Sets [2]	82	1	0.8	0.5	75
Welders [3]	73	1	0.8	0.5	70
Tractor/Loader/Backhoe[2]	85	3	0.7	0.5	75
Forklifts [4]	89	3	0.8	0.5	77

TOTAL Leq DURING NORMAL OF 89 dBA

Daytime Ambient without Equipment 61 dBA

Nighttime Ambient without Equipment 0 dBA

Daytime Hours Operating 8

Evening Hours Operating 0

Nighttime Hours Operating 0

Combined Daytime Hourly Leq 89 dBA

Combined Nighttime Hourly Leq 0 dBA

ESTIMATED LdL 84 dBA

ESTIMATED CNEL 84 dBA

Distance attenuation assumed at: 6

Noise: N/A - Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.

* Equipment type per assumed equipment type and duration.

Equipment Use Source:

https://www.fhwa.dot.gov/infrastructure/infrastructure/TTA_Noise_and_Vibration_Manual.pdf

[1] Federal Highway Administration (FHWA) (2006). Construction Noise Handbook.

https://www.fhwa.dot.gov/environment/noise/construction_noise_handbook/

[4] University of Washington Construction Industry Noise Exposure: Operating Engineers (2004) <http://depts.washington.edu/accnoise/content/opening2web.pdf>

stimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood Project

Scenario: Building Construction
 Receptor Location: Community Pool

2

3

4.5

6

1

1.5

2

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday		Effective Use Factor *	Distance, Ft.	Leq, dBA		
	Hours		Effective						
Cranes [1]	85	1	0.7	0.5	350	64	110679718	2258709.8	
Generator Sets [1]	82	1	0.8	0.5	350	61	63395728	1293790.4	
Welders [3]	73	1	0.8	0.5	350	52	7081049.3	162878.6	
Tractor/Loader/Backhoe[2]	85	3	0.7	0.5	350	68	332520915	6776303.4	
Forklifts [4]	89	3	0.8	0.5	350	73	953183882	19452936	

TOTAL Leq DURING NORMAL OF 75 dBA

Daytime Ambient without Equipment 61 dBA

Nighttime Ambient without Equipment 0 dBA

Daytime Hours Operating 8

Evening Hours Operating 0

Nighttime Hours Operating 0

Combined Daytime Hourly Leq 75 dBA

Combined Nighttime Hourly Leq 0 dBA

ESTIMATED LdL 70 dBA

ESTIMATED CNEL 70 dBA

Distance attenuation assumed at: 6 dBA per doubling of distance

Notes: N/A = Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.

* Equipment type per assumed equipment type and duration.

Equipment Use Source:

https://www.fhwa.dot.gov/infrastructure/infrastructure/TTA/Noise_and_Vibration_Manual.pdf

[2] Federal Highway Administration (FHWA) (2008). Construction Noise Handbook.

https://www.fhwa.dot.gov/environment/noise/construction_noise_handbook/

[4] University of Washington Construction Industry Noise Exposure: Operating Engineers (2004) <http://depts.washington.edu/accross/content/openingCweb.pdf>



stimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood Project

Scenario: Building Construction
 Receptor Location: Single-Family Residential

2

3

4.5

6

1

1.5

2

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday		Effective Use Factor *	Distance, Ft.	Leq, dBA		
			Hours in						
Cranes [1]	85	1	0.7	0.5	450	61	110679718	1366416.3	
Generator Sets [3]	82	1	0.8	0.5	450	59	63395728	782893.3	
Welders [3]	73	1	0.8	0.5	450	50	7981049.3	98531.472	
Tractor/Loader/Backhoe[2]	85	3	0.7	0.5	450	66	332039154	4099248.8	
Forklifts [4]	89	3	0.8	0.5	450	71	953183882	11767826	

TOTAL Leq DURING NORMAL OF 73 dBA

Daytime Ambient without Equipment 57 dBA

Nighttime Ambient without Equipment 0 dBA

Daytime Hours Operating 8 dBA

Evening Hours Operating 0 dBA

Nighttime Hours Operating 0 dBA

Combined Daytime Hourly Leq 73 dBA

Combined Nighttime Hourly Leq 0 dBA

ESTIMATED LdL 68 dBA

ESTIMATED CNEL 68 dBA

Distance attenuation assumed at: 6 dBA per doubling of distance

Notes: N/A = Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.

* Equipment type per assumed equipment type and duration.

Equipment Use Source:

https://www.fhwa.dot.gov/infrastructure/infrastructure/TTA/Noise_and_Vibration_Manual.pdf

[2] Federal Highway Administration (FHWA) (2008). Construction Noise Handbook.

https://www.fhwa.dot.gov/environment/noise/construction_noise_handbook/

[4] University of Washington Construction Industry Noise Exposure: Operating Engineers (2004) <http://depts.washington.edu/ucce/noise/content/opening2web.pdf>



Estimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood Project

Scenario: Building Construction
 Receptor Location: Library

2

3

4.5

6

1

1.5

2

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours in Use	Effective Factor *	Distance, Ft.	Leq, dBA		
Cranes [1]	85	1	0.7	0.5	2600	45	110679718	35293.277
Generator Sets [1]	82	1	0.8	0.5	2600	43	63395728	32215.474
Welders [3]	73	1	0.8	0.5	2600	34	7981049.3	2544.9774
Tractor/Loader/Backhoe[2]	85	3	0.7	0.5	2600	50	332329154	159579.83
Forklifts [4]	89	3	0.8	0.5	2600	55	953193882	303952.13

TOTAL Leq DURING NORMAL OF 57 dBA 467885.60

Daytime Ambient without Equipment 57 dBA

Nighttime Ambient without Equipment 0 dBA

Daytime Hours Operating 8

Evening Hours Operating 0

Nighttime Hours Operating 0

Combined Daytime Hourly Leq 60 dBA

Combined Nighttime Hourly Leq 0 dBA

ESTIMATED LdL 57 dBA

ESTIMATED CNEL 57 dBA

Distance attenuation assumed at: 6 dBA per doubling of distance

Noise: N/A - Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.

* Equipment type per assumed equipment type and duration.

Equipment Use Source:

https://www.fhwa.dot.gov/infrastructure/infrastructure/TTA_Noise_and_Vibration_Manual.pdf

[2] Federal Highway Administration (FHWA) (2008). Construction Noise Handbook.

https://www.fhwa.dot.gov/environment/noise/construction_noisehandbook/

[4] University of Washington Construction Industry Noise Exposure. Operating Engineers (2004) <http://depts.washington.edu/accross/content/openingCwebb.pdf>

Estimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood Project

Scenario: Architectural Coating
Receptor Location: Multi-Family Residential

Noise Source	Ave. Maximum	Percentage of		Effective	Distance, Ft.	Leq, dBA		
	SPL @ 50 ft., dBA	Number	Hours in Use	Use Factor *				
Air Compressor[2]	61	1	0.5	0.5	70	73	37767762.4	19269266.5

TOTAL Leq DURING NORMAL OPE	73	dBA						19269266.5
Daytime Ambient without Equipment C	61	dBA						
Nighttime Ambient without Equipment	0	dBA						
Daytime Hours Operating	6							
Evening Hours Operating	0							
Nighttime Hours Operating	0							
Combined Daytime Hourly Leq	73	dBA						
Combined Nighttime Hourly Leq	0	dBA						
ESTIMATED Ldn	69	dBA						
ESTIMATED CNEL	69	dBA						

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

- * Assumed percentage of time that equipment is operating at near maximum sound level.
- * Equipment type per assumed equipment type and duration

Equipment Use Source:
[2] Federal Transit Administration (FTA) (2006), Transit Noise and Vibration Assessment
[3] Federal Highway Administration (FHWA) (2008), Construction Noise Handbook. Accessed at
https://www.fhwa.dot.gov/innovativednoise/construction_noise_handbook/

Estimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood Project

Scenario: Architectural Coating	2	3	4.5	6
Receptor Location: Community Pool		1	1.5	2

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Percentage of Workday Number	Effective Hours in Use	Use Factor *	Distance, Ft.	Leq, dBA	
Air Compressor[2]	61	1	0.5	0.5	350	59	37767762.4 770770.66

TOTAL Leq DURING NORMAL OPE	59	dBA					770770.66
Daytime Ambient without Equipment C	61	dBA					
Nighttime Ambient without Equipment	0	dBA					
Daytime Hours Operating	6						
Evening Hours Operating	0						
Nighttime Hours Operating	0						
Combined Daytime Hourly Leq	63	dBA					
Combined Nighttime Hourly Leq	0	dBA					
ESTIMATED Ldn	60	dBA					
ESTIMATED CNEL	60	dBA					

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

- * Assumed percentage of time that equipment is operating at near maximum sound level.
- * Equipment type per assumed equipment type and duration

Equipment Use Source:
[2] Federal Transit Administration (FTA) (2006), Transit Noise and Vibration Assessment
[3] Federal Highway Administration (FHWA) (2008), Construction Noise Handbook. Accessed at
https://www.fhwa.dot.gov/environment/noise/construction_noise_handbook/

Estimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood Project

Scenario: Architectural Coating	2	3	4.5	6
Receptor Location: Single-Family Residential		1	1.5	2

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours in Use	Effective Use Factor *	Distance, Ft.	Leq, dBA	
Air Compressor[2]	81	1	0.5	0.5	450	57	37767762.4 466268.671
TOTAL Leq DURING NORMAL OPE	57						
Daytime Ambient without Equipment C	57						466268.671
Nighttime Ambient without Equipment	0						
Daytime Hours Operating	8						
Evening Hours Operating	0						
Nighttime Hours Operating	0						
Combined Daytime Hourly Leq	60						
Combined Nighttime Hourly Leq	0						
ESTIMATED Ldn	57						
ESTIMATED CNEL	57						

Distance attenuation assumed at: 6 dBA per doubling of distance

Notes: #N/A = Not Applicable

- * Assumed percentage of time that equipment is operating at near maximum sound level.
- * Equipment type per assumed equipment type and duration

Equipment Use Source:
[2] Federal Transit Administration (FTA) (2006), Transit Noise and Vibration Assessment
[3] Federal Highway Administration (FHWA) (2008), Construction Noise Handbook. Accessed at
https://www.fhwa.dot.gov/innovativednoise/construction_noise_handbook/

† Estimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood Project

Scenario: Architectural Coating	2	3	4.5	6
Receptor location: Library		1	1.5	2

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday Hours in Use	Effective Use Factor *	Distance, Ft.	Leq, dBA		
Air Compressor[2]	81	1	0.6	0.5	2800	41	37767762.4	12043.2916

TOTAL Leq DURING NORMAL OPE	41	dBA	12042 2016
-----------------------------	----	-----	------------

Daytime Ambient without Equipment C	57	dBA
Nighttime Ambient without Equipment	0	dBA
Daytime Hours Operating:	8	
Evening Hours Operating:	0	
Nighttime Hours Operating:	0	
Combined Daytime Hourly Leq:	57	dBA
Combined Nighttime Hourly Leq:	0	dBA
ESTIMATED Ldn:	55	dBA
ESTIMATED CNEL:	55	dBA

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: #N/A = Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per assumed equipment type and duration

Equipment Use Source:
 [2] Federal Transit Administration (FTA) (2006), Transit Noise and Vibration Assessment
 [3] Federal Highway Administration (FHWA) (2008), Construction Noise Handbook. Accessed at https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/

Estimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood Project

Scenario: Paving	2	3	4.5	6
Receptor Location: Multi-Family Residential		1	1.5	2

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Percentage of Workday			Distance, Ft.	Leq. dBA		
		Number	Hours in Use	Effective Factor				
Paving(2)	88	2	0.8	0.5	70	85	635462588	324215606
Paving Equipment(3)	85	2	0.8	0.5	70	81	225862213	120722558
Rollers(2)	74	2	0.8	0.5	70	70	200955901	10252298

TOTAL Leq DURING NORMAL OF 87 dBA 463540781

Daytime Ambient without Equipment 61 dBA

Nighttime Ambient without Equipment 0 dBA

Daytime Hours Operating 8

Evening Hours Operating 0

Nighttime Hours Operating 0

Combined Daytime Hourly Leq 87 dBA

Combined Nighttime Hourly Leq 0 dBA

ESTIMATED Leq: 82 dBA

ESTIMATED CNEL: 82 dBA

Distance attenuation assumed at: 6 dBA per doubling of distance

Notes: N/A - Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.

* Equipment type per assumed equipment type and duration.

Equipment Use Source:

[2] Federal Transit Administration (FTA) (2006). Transit Noise and Vibration Assessment

[3] Federal Highway Administration (FHWA) (2006). Construction Noise Handbook

Accessed at https://www.fhwa.dot.gov/environment/noise/construction_noisehandbook/

stimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood Project

Scenario: Paving
 Receptor Location: Community Pool

234.56

Noise Source	Avg. Maximum SPL @ 50 Ft., dBA	Number	Percentage of Workdays - Effective Hours in Loudness Factor*	Distance, Ft.	Leq, dBA		
Paving[C]	88	2	0.8	0.5	350	71	635462588 12686024
Paving Equipment[C]	85	2	0.8	0.5	350	67	225862213 5163862.3
Roller[C]	74	2	0.8	0.5	350	56	20095591 410103.91

TOTAL Leq DURING NORMAL OF 73 dBA

15541630

Daytime Ambient without Equipment
 Nighttime Ambient without Equipment
 Daytime Hours Operating
 Evening Hours Operating
 Nighttime Hours Operating
 Combined Daytime Hourly Leq
 Combined Nighttime Hourly Leq
 ESTIMATED Leq
 ESTIMATED CNEL

61 dBA
 0 dBA
 8
 0
 0
 73 dBA
 0 dBA
 68 dBA
 68 dBA

Distance attenuation assumed at: 6 dBA per doubling of distance
 Notes: N/A - Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.
 * Equipment type per assumed equipment type and duration

Equipment Use Source:
 [2] Federal Transit Administration (FTA) (2006). Transit Noise and Vibration Assessment
 [3] Federal Highway Administration (FHWA) (2006). Construction Noise Handbook
 Accessed at https://www.fhwa.dot.gov/environment/noise/construction_noisehandbook/

stimation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood Project

Scenario: Paving
 Receptor Location: Single-Family Residential

234.56

Noise Source	Avg. Maximum SPL @ 50 Ft., dBA	Number	Percentage of Workday - Effective Hours in Loudness Factor*	Distance, Ft.	Leq, dBA
Paving[C]	88	2	0.8	0.5	450
Paving Equipment[C]	85	2	0.8	0.5	450
Roller[C]	74	2	0.8	0.5	450

TOTAL Leq DURING NORMAL OF 70 dBA

11216542

Daytime Ambient without Equipment
 Nighttime Ambient without Equipment
 Daytime Hours Operating
 Evening Hours Operating
 Nighttime Hours Operating
 Combined Daytime Hourly Leq
 Combined Nighttime Hourly Leq
 ESTIMATED Leq
 ESTIMATED CNEL

57
 0
 8
 0
 0
 71
 0
 66
 66

dBA
 dBA
 dBA
 dBA
 dBA
 dBA
 dBA
 dBA

Distance attenuation assumed at: 6 dBA per doubling of distance
 Notes: N/A - Not Applicable

* Assumed percentage of time that equipment is operating at near maximum sound level.
 * Equipment type per assumed equipment type and duration

Equipment Use Source:

[2] Federal Transit Administration (FTA) (2006). Transit Noise and Vibration Assessment
 [3] Federal Highway Administration (FHWA) (2006). Construction Noise Handbook
 Accessed at https://www.fhwa.dot.gov/environment/noise/construction_noisehandbook/

stimulation CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood Project

Scenario: Paving	2	3	4.5	6
Receptor Location: Library		1	1.5	2

Noise Source	Ave. Maximum SPL @ 50 ft., dBA	Number	Percentage of Workday		Effective Factor *	Distance, Ft.	Leq. dBA		
			Hours in Use	Effective					
Pavers(2)	88	2	0.8	0.5	2800	53	635462588	202634.75	
Paving Equipment(3)	85	2	0.8	0.5	2800	49	225862213	82070.345	
Rollers(2)	74	2	0.8	0.5	2800	38	20095591	8407.8735	

TOTAL Leq DURING NORMAL OF 55 dBA 269712.56

Daytime Ambient without Equipment	57	dBA
Nighttime Ambient without Equipment	0	dBA
Daytime Hours Operating	8	
Evening Hours Operating	0	
Nighttime Hours Operating	0	
Combined Daytime Hourly Leq	59	dBA
Combined Nighttime Hourly Leq	0	dBA
ESTIMATED Leq:	56	dBA
ESTIMATED CNEL:	56	dBA

Distance attenuation assumed at: 6 dBA per doubling of distance
Notes: N/A = Not Applicable
* Assumed percentage of time that equipment is operating at near maximum sound level.
* Equipment type per assumed equipment type and duration.

Equipment Use Source:
[2] Federal Transit Administration (FTA) (2006). Transit Noise and Vibration Assessment.
[3] Federal Highway Administration (FHWA) (2006). Construction Noise Handbook.
Accessed at https://www.fhwa.dot.gov/environment/noise/construction_noisehandbook/

Appendix H

Traffic Noise Modeling Results

RESULTS: SOUND LEVELS

<Project Name?>

<Organization?>													
<Analysis By?>													
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:													
RUN:													
BARRIER DESIGN:													
ATMOSPHERICS:													
Receiver													
Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal	
			dB	dB	dB	dB	dB		dB	dB	dB	dB	
Multi-Family Housing	2	1	0.0	49.8	66	49.8	10	----	49.8	0.0	8	-8.0	
Single-Family Housing	4	1	0.0	52.0	66	52.0	10	----	52.0	0.0	8	-8.0	
Community Pool	6	1	0.0	41.3	66	41.3	10	----	41.3	0.0	8	-8.0	
Library	8	1	0.0	27.2	66	27.2	10	----	27.2	0.0	8	-8.0	
Noise Measurement Loc. 4	12	1	0.0	58.5	66	58.5	10	----	58.5	0.0	8	-8.0	
Noise Measurement Loc. 5	14	1	0.0	58.3	66	58.3	10	----	58.3	0.0	8	-8.0	
Noise Measurement Loc. 6	16	1	0.0	41.6	66	41.6	10	----	41.6	0.0	8	-8.0	
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		7	0.0	0.0	0.0								
All Impacted		0	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

RESULTS: SOUND LEVELS

<Project Name?>

<Organization?>								16 January 2017					
<Analysis By?>								TNM 2.5					
								Calculated with TNM 2.5					
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:		<Project Name?>											
RUN:		CSUCI U Glen Phase 2 Proj Existing + Proj											
BARRIER DESIGN:		INPUT HEIGHTS							Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.				
ATMOSPHERICS:		20 deg C, 50% RH											
Receiver													
Name	No.	#DUs	Existing	No Barrier					With Barrier				
			LAeq1h	LAeq1h			Increase over existing	Type Impact	Calculated LAeq1h	Noise Reduction			
				Calculated	Crit'n	Calculated	Crit'n			Calculated	Calculated	Goal	Calculated
							Sub'l Inc						minus Goal
			dBA	dBA	dBA					dBA			dBA
Multi-Family Housing	2	1	0.0	50.3	66	50.3	10	----	50.3	0.0	8	-8.0	
Single-Family Housing	4	1	0.0	52.1	66	52.1	10	----	52.1	0.0	8	-8.0	
Community Pool	6	1	0.0	41.8	66	41.8	10	----	41.8	0.0	8	-8.0	
Library	8	1	0.0	27.4	66	27.4	10	----	27.4	0.0	8	-8.0	
Noise Measurement Loc. 4	12	1	0.0	59.4	66	59.4	10	----	59.4	0.0	8	-8.0	
Noise Measurement Loc. 5	14	1	0.0	58.7	66	58.7	10	----	58.7	0.0	8	-8.0	
Noise Measurement Loc. 6	16	1	0.0	39.6	66	39.6	10	----	39.6	0.0	8	-8.0	
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		7	0.0	0.0	0.0								
All Impacted		0	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								

RESULTS: SOUND LEVELS

<Project Name?>

<Organization?>								16 January 2017					
<Analysis By?>								TNM 2.5					
								Calculated with TNM 2.5					
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:		<Project Name?>											
RUN:		CSUCI U Glen Phase 2 Proj Cumulative											
BARRIER DESIGN:		INPUT HEIGHTS											
		Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.											
ATMOSPHERICS:		20 deg C, 50% RH											
Receiver													
Name		No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		With Barrier				
					Calculated	Crit'n	Calculated	Crit'n	Type Impact	Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus
								Sub'l Inc					Goal
				dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Multi-Family Housing		2	1	0.0	50.9	66	50.9	10	----	50.9	0.0	8	-8.0
Single-Family Housing		4	1	0.0	52.2	66	52.2	10	----	52.2	0.0	8	-8.0
Community Pool		6	1	0.0	42.3	66	42.3	10	----	42.3	0.0	8	-8.0
Library		8	1	0.0	27.5	66	27.5	10	----	27.5	0.0	8	-8.0
Noise Measurement Loc. 4		12	1	0.0	58.7	66	58.7	10	----	58.7	0.0	8	-8.0
Noise Measurement Loc. 5		14	1	0.0	58.4	66	58.4	10	----	58.4	0.0	8	-8.0
Noise Measurement Loc. 6		16	1	0.0	42.1	66	42.1	10	----	42.1	0.0	8	-8.0
Dwelling Units			# DUs	Noise Reduction									
				Min	Avg	Max							
				dB	dB	dB							
All Selected			7	0.0	0.0	0.0							
All Impacted			0	0.0	0.0	0.0							
All that meet NR Goal			0	0.0	0.0	0.0							

Appendix I

Traffic Study

Traffic Impact Study for the CSU Channel Islands Specific Reuse Plan Update

Prepared for:
California State University Channel Islands

February 2017

LA16-2884

FEHR  PEERS

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EXECUTIVE SUMMARY

This study was undertaken to analyze the potential off-site traffic impacts of a new planned development in the eastern area of the California State University Channel Islands campus (CSUCI):

1. The project proposes the development of a mix of ownership (condominium) and rental (apartments): 120 single-family residential (SFR), 310 apartment units, and 170 units of senior adult attached townhomes on vacant land.
2. 11 intersections located within the City of Camarillo and/or unincorporated Ventura County were analyzed for this project. The analyzed intersections lie along key access routes. Eight internal roadway segments located in unincorporated Ventura County were also analyzed for this project.
3. The proposed project is expected to generate a net increase of 3,789 daily vehicle trips, 282 AM peak hour trips, and 321 PM peak hour trips.
4. Analysis of Existing (Year 2016) plus Project conditions indicates that all of the study intersections will continue to operate at LOS D or better in the AM and PM peak hours. According to the significance criteria established by CSU, none of the examined study intersections and segments would be significantly impacted by project-related trips under Existing (Year 2016) plus Project conditions. The CSU significance criteria was used for the purposes of significance determination, while the local jurisdiction significance criteria are included for purposes of disclosure.
5. The Cumulative (Year 2022) without Project base conditions include ambient growth and 17 related projects in the City of Camarillo and unincorporated Ventura County. The analysis of the Cumulative (Year 2022) without project arrival peak hour conditions indicates that each examined intersections would continue to operate at acceptable LOS levels. According to the significance criteria established by CSU, none of the examined study intersections and segments would be cumulatively impacted under Cumulative (Year 2022) plus Project conditions. The CSU significance criteria was used for the purposes of significance determination, while the local jurisdiction significance criteria are included for purposes of disclosure.
6. Additional analysis of potential impacts on the regional transportation system conducted in accordance with Ventura County CMP requirements determined that the project would not have a significant impact on the CMP arterial highway network.
7. Additional analysis of Caltrans facilities located within in the study area was conducted using the methodology and target thresholds set forth by Caltrans. The analysis of two intersections under Caltrans jurisdiction indicates that thresholds set forth by Caltrans would be exceeded based on the addition of project traffic at the intersection of US-101 Southbound Ramps/Ventura Boulevard under Existing (Year 2016) plus Project conditions. The optimization of signal timing at this intersection would mitigate this impact below a level of significance for Existing (Year 2016) plus Project conditions.



8. An analysis of four Caltrans freeway segments to determine passengers per mile per lane and corresponding level of service indicates that Caltrans thresholds would not be exceeded under Existing (Year 2016) or Cumulative (Year 2022) conditions due to the addition of project traffic. These Caltrans locations operate at LOS D, exceeding Caltrans target thresholds under Existing (Year 2016) and Cumulative (Year 2022) without project conditions, therefore resulting in cumulative impacts.
9. Finally, a queuing analysis of two Caltrans freeway off-ramps at Daily Road and Ventura Boulevard along US-101 indicates that none of the freeway off-ramp queues forecasted would exceed the available storage under Existing (2016) with Project conditions or under Cumulative (2022) with Project conditions.



1. INTRODUCTION

Fehr & Peers conducted a transportation impact analysis to assess the potential traffic impacts that may occur with the development of residential housing in eastern area of the CSU Channel Islands campus.

This report identifies the base data and projections, explains the methodologies used, and summarizes the findings of the study. The traffic impact analysis conducted for this report includes analysis of Existing (Year 2016) conditions and Cumulative (Year 2022) conditions.

PROJECT DESCRIPTION

The proposed project includes a mix of ownership (single-family residential [SFR]) and rental (apartment units), located on vacant land on the eastern area of the CSUCI campus. The project site is located several miles south of the City of Camarillo in unincorporated Ventura County, California. One-hundred twenty SFR units and 480 apartments are proposed for development on the project site.

VEHICULAR SITE ACCESS

CSUCI is located in unincorporated Ventura County, south of the Ventura Freeway (US-101) and northeast of the Pacific Coast Highway (SR-1 or PCH). The primary access to the project site would be provided via Camarillo Street from Lewis Road, as shown on Figure 1.

NON-AUTO ACCESS

VISTA transit, operated by the Ventura County Transportation Commission (VCTC), provides service to CSUCI via two routes. Service hours extend from about 7:00 AM to 10:00 PM. Service from the Camarillo Metrolink station runs along Lewis Road with 30-minute headways. Service from the Centerpoint Mall in Oxnard runs along PCH with 60-minute headways.





\\fla03\data\jobs\Active\2800s\2884_CSUCI_East_Campus\Graphics\GIS\MXD\FX_CampusRoadsandGateways_v2.mxd



Figure 1
CSUCI Campus Roads & Gateways

STUDY SCOPE

The study analyzes potential project-generated off-site traffic impacts on the nearby Ventura County and City of Camarillo street system for existing conditions (2016) and a horizon year (2022).

- Existing (Year 2016) Conditions – The analysis of existing Year 2016 traffic conditions provides a basis for the remainder of the study. The existing conditions analysis includes an assessment of streets, traffic volumes, and operating conditions. The existing traffic conditions are the baseline for assessing the significance of project impacts.
- Existing (Year 2016) plus Project Conditions – This is an analysis of existing traffic conditions with traffic expected from the proposed project added to the traffic volumes.
- Cumulative (Year 2022) without Project Conditions – Cumulative traffic conditions are projected without the addition of the proposed project. The objective of this phase of analysis is to forecast future traffic growth and operating conditions that could be expected to result from regional ambient growth and known cumulative projects if the proposed project were not developed. The Cumulative without Project traffic forecasts provide the basis for determining cumulative project impacts.
- Cumulative (Year 2022) plus Project Conditions – This is an analysis of cumulative traffic conditions with traffic expected from the proposed project added to the cumulative without project traffic forecasts to identify potential impacts.

The study examined 11 intersections and eight internal roadway segments in the vicinity of the project site for each of the above traffic scenarios. The study locations are listed below and illustrated in Figure 2.

1. Lewis Road & University Drive
2. Lewis Road & Camarillo Street
3. Lewis Road & Cawelti Road
4. Lewis Road & Pleasant Valley Road
5. US-101 Southbound Ramps & Ventura Boulevard
6. Lewis Road & Ventura Boulevard
7. US-101 Northbound Ramps & Daily Drive
8. Lewis Road & Daily Drive
9. Camarillo Street & Channel Islands Drive
10. Santa Rosa Island Drive & Channel Islands Drive
11. San Miguel Island Drive & Channel Islands Drive

Four of the study intersections are located in the City of Camarillo, six are located in unincorporated Ventura County, and one is located on the boundary between the two jurisdictions.



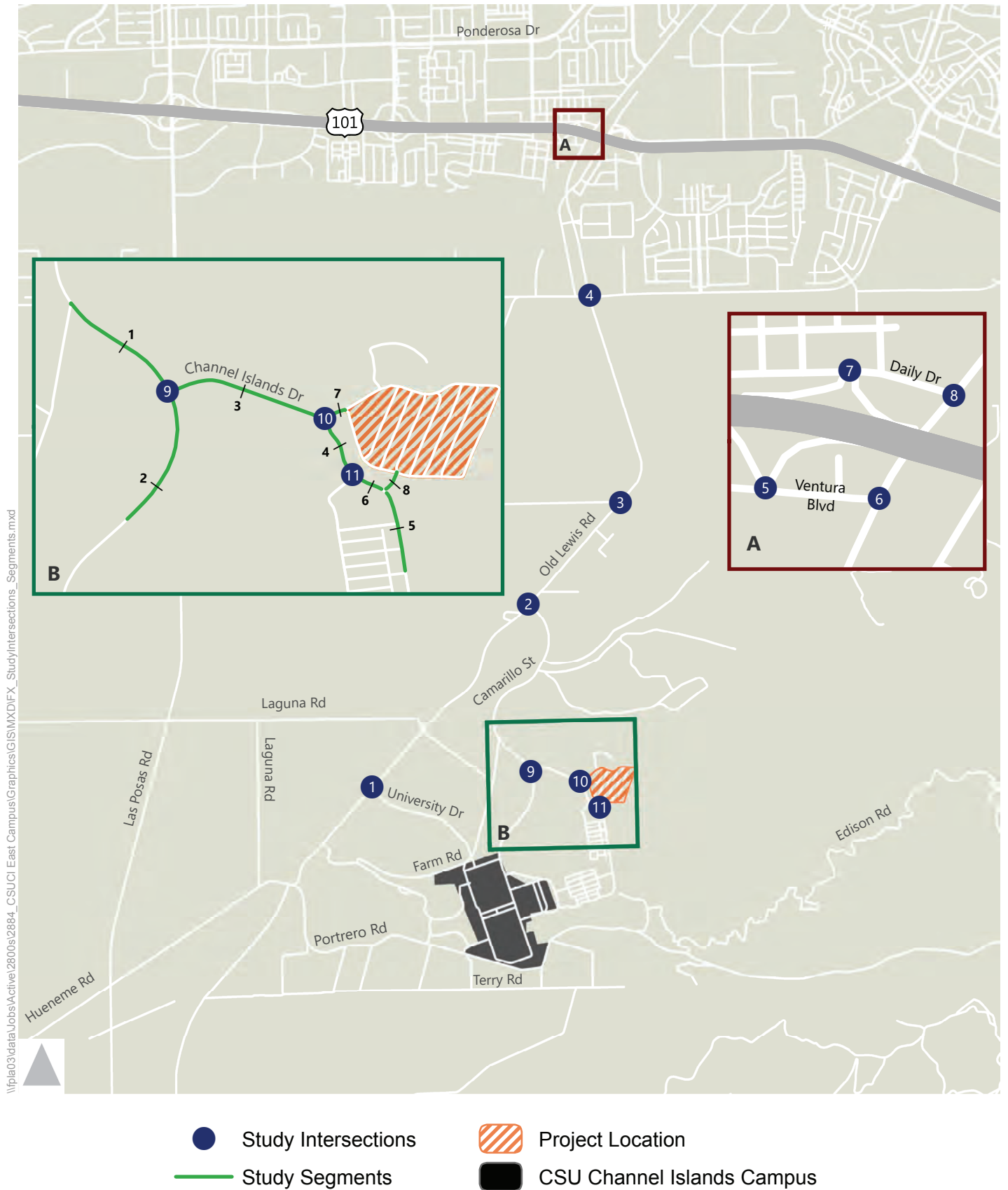


Figure 2
Study Intersections/Segments

SEGMENT ANALYSIS:

Utilizing the trip distribution from the traffic impact analysis and assumptions for internal vehicular circulation within CSUCI, a segment analysis was conducted. The following eight segments, illustrated in Figure 2, were identified to be analyzed as part of the scope of work for this project:

1. Camarillo Street between Lewis Road and Channel Islands Drive
2. Camarillo Street between Channel Islands Drive and Santa Barbara Avenue
3. Channel Islands Drive between Camarillo Street and Santa Rosa Island Drive
4. Channel Islands Drive between Santa Rosa Island Drive and Santa Cruz Island Drive
5. Channel Islands Drive between San Miguel Island Drive and Anacapa Island Drive
6. Channel Island Drive between Santa Cruz Island Drive and San Miguel Island Drive
7. Channel Island Drive between Channel Islands Drive and Arch Drive
8. San Miguel Island Drive between Arch Point and Channel Islands Drive

ORGANIZATION OF REPORT

This report is divided into seven chapters, including this introduction. Chapter 2 describes the existing circulation system, traffic volumes, intersection and roadway operating conditions of the street system, as well as existing public transit service in the study area. Chapter 3 describes the methodologies used to develop rates project traffic generation rates and distribute project traffic. Chapter 3 also presents Existing (Year 2016) plus Project intersection and roadway segment operating conditions. Chapter 4 describes the methodologies used to develop Cumulative (Year 2022) without and with Project traffic forecasts, and presents Cumulative (Year 2022) without and with Project intersection and roadway segment operating conditions. Chapter 5 presents an assessment of potential project traffic impacts for the proposed project on intersection and roadway segment operations in the vicinity of the project site. Chapter 6 includes discussion and analysis of Caltrans facilities. Chapter 7 includes the summary and conclusions of the study. Details of the technical analysis are included in the appendices.



2. EXISTING CONDITIONS

A comprehensive data collection effort was undertaken to develop a detailed evaluation of existing transportation conditions in the study area. The assessment of existing conditions in the project study area includes a description of the street and highway system, available public transit services, and operating conditions of the analyzed intersections and roadway segments.

EXISTING HIGHWAY AND STREET SYSTEM

CSUCI is located between Santa Barbara and Los Angeles, several miles south of the City of Camarillo in unincorporated Ventura County. The campus borders Lewis Road on the north and west, and Potrero Road on the south. Directly east of the campus is the unincorporated University Glen community and protected open space. Regional access to the University is provided via US-101 and PCH. The campus currently has three public entrances, as shown in Figure 1. CSUCI's primary entrance is from Lewis Road via University Drive. Another public access route to CSUCI is also available to the lower campus from Potrero Road via Oxnard Road. The third entrance and primary access point to the Project is via Camarillo Street from Lewis Road.

Within the study area, the existing street network consists of a roadway system including freeways, arterials, collectors, and local roads. The following provides a general discussion of roadway types in the study area:

- Freeways/Highways – Freeways and state highways are high-capacity facilities that primarily serve longer distance travel. Access is limited to interchanges typically spaced at least one mile apart.
- Arterials/Thoroughfares – Roadways designated as arterials or thoroughfares are intended to provide maximum movement of traffic to and from major traffic generators, such as commercial centers. They also collect and distribute traffic to and from freeways.
- Collectors – Collector streets are intended as the intermediate route to convey traffic between local area streets, which contain either origins or destinations, and arterial streets.
- Local Streets – The primary functions of local streets are to provide vehicular access to abutting properties and to move smaller amounts of traffic in and out of specific neighborhoods. Local streets should not carry through-traffic or buses and heavy trucks, except in commercial and industrial districts. Higher-density residential areas and commercial areas should not use local roads for access where they go through lower-density residential neighborhoods.

The following provides additional detail for the local roadway system.



FREEWAYS/HIGHWAYS

- Ventura Freeway (US-101) – US-101, located north of the campus site, is a multi-lane east-west freeway that serves as the principal inter-city route in Ventura County. Primary access between the freeway and the proposed project site is provided via the interchanges at Lewis Road and Las Posas Road.
- Pacific Coast Highway (SR-1 or PCH) – PCH between Rice Avenue and Las Posas Road is a multi-lane north-south highway that serves as the secondary or coastal inter-city route in Ventura County. Primary access between the freeway and the proposed project site is provided via the interchange at Hueneme Road.
- East 5th Street (SR-34) – East 5th Street originates at PCH in the City of Oxnard and extends eastward to its terminus at Pleasant Valley Road. One travel lane is provided in each direction. The roadway provides an access route between the project site and the Oxnard-Port Hueneme areas.

ARTERIALS

- Lewis Road – Lewis Road, located immediately west of the project site, extends north from Potrero Road to Upland Road in the northern end of the City of Camarillo. In the City of Camarillo, Lewis Road is designated as SR-34. Between Pleasant Valley Road and University Drive, Lewis Road provides two travel lanes in each direction, left-turn pockets, and some right-turn pockets. South of University Drive, Lewis Road narrows to one travel lane in each direction. Posted speeds are 50 mph. Lewis Road provides direct access to the proposed project via its connection to Camarillo Street.
- Las Posas Road – Las Posas Road extends westerly from Lewis Road through residential areas in northern Camarillo and then proceeds on a southerly alignment to US-101 and ultimately to its terminus at PCH adjacent to Point Mugu State Park in unincorporated Ventura County. North of Pleasant Valley Road, Las Posas Road provides two travel lanes in each direction. South of Ventura Boulevard, posted speeds are 55 mph. Las Posas Road provides a connection between the proposed project and points in northern Ventura County and Santa Barbara County.
- Pleasant Valley Road – Pleasant Valley Road extends between Port Hueneme and US-101, at which point it becomes Santa Rosa Road. The roadway provides just one travel lane in each direction with the exception of the section between Lewis Road and East 5th Street, where the roadway widens to accommodate two travel lanes in each direction. The posted speed limit is 55 mph. In the study area, the border between the City of Camarillo and unincorporated Ventura County runs down the middle of Pleasant Valley Road.
- Ventura Boulevard – Ventura Boulevard originates at Lewis Road and extends west to the Camarillo west city limit. Ventura Boulevard provides a southerly frontage road to US-101. There is one travel lane in each direction and a shared center turn lane or left-turn pockets. The posted speed limit is 35 mph.



- Cawelti Road – Cawelti Road is a 2-lane roadway located north of the proposed project site. The roadway extends between Lewis Road on the east and Las Posas Road on the west.
- Hueneme Road – Hueneme Road is a 2-lane roadway located south of the proposed project site. The roadway extends from PCH to Potrero Road. Hueneme Road provides an access route between PCH and the project site.
- Potrero Road – Potrero Road is located adjacent to the south side of the CSUCI campus. The roadway provides a secondary access route between the proposed project site and southern Ventura County. It extends east from Lewis Road through the Santa Monica Mountains almost to the Los Angeles County line, and provides one travel lane in each direction. The posted speed limit is 30 mph.

COLLECTOR AND LOCAL ROADS

- Daily Drive – Daily Drive originates at Lewis Road and extends west to just beyond the US-101 Las Posas Road interchange. Daily Drive is a northerly frontage road to US-101. There is one travel lane in each direction and a shared center turn lane or left-turn pockets. The posted speed limit is 35 mph.
- Camarillo Street – Camarillo Street is located adjacent to the north of the CSUCI campus. Camarillo Street is the primary access route to the proposed project site. It extends east from Lewis Road to the proposed project site and provides one travel lane in each direction. The posted speed limit is 35 mph.

EXISTING PUBLIC TRANSIT SERVICE

The study area is served by public transit provided by Ventura County Transportation Commission's (VCTC) VISTA Transit. Metrolink provides regional service to Camarillo.

- VISTA CSUCI Camarillo – The CSUCI Camarillo line provides bus service between the Camarillo Metrolink station and CSUCI along Lewis Road. Weekday service is provided from 7:00 AM to 10:30 PM with 30-minute headways. Weekend and CSUCI school holiday service terminates at 5:30 PM.
- VISTA CSUCI Oxnard – The CSUCI Oxnard line provides bus service between the Centerpoint Mall in Oxnard and CSUCI along PCH. Weekday service is provided between 7:00 AM and 10:00 PM with 60-minute headways and a travel time of 25 minutes. Weekend and CSUCI school holiday service is provided between 7:45 AM and 6:00 PM.
- Metrolink Ventura Line – The Metrolink Ventura line provides commuter/regional rail service between Los Angeles Union Station and East Ventura. Weekday inbound service (Ventura to LA) is provided on four trains that depart Camarillo between 5:50 and 7:50 AM with headways of approximately 40 minutes. Weekday outbound service is provided on one morning train and three evening trains that arrive in Camarillo between 5:50 and 8:40 PM. There is no weekend service.



BICYCLE FACILITIES

The study area has a limited bicycle network. Existing facilities surrounding the proposed project are identified below.

CLASS II BICYCLE LANES

Class II bicycle facilities, known as bike lanes, are lanes on the outside edge of roadways reserved for the exclusive use of bicycles, and designated with special signing and pavement markings. The following roadway segments in the project study area have Class II bicycle facilities:

- Lewis Road – There are Class II bicycle facilities between Pleasant Valley Road and Potrero Road.
- Pleasant Valley Road – There are Class II bicycle facilities between Lewis Road and Santa Rosa Road.
- Las Posas Road – There are Class II bicycle facilities north of Pleasant Valley Road.
- Ventura Boulevard – There are Class II bicycle facilities between Carmen Drive and Camarillo Center Drive.
- Daily Drive – There are Class II bicycle facilities between Lewis Road and Calle La Roda.

CLASS III BICYCLE ROUTES

Class III bicycle facilities, also known as bike routes, are roadways recommended for bicycle use and often connect to bike lanes and bike paths. Routes are designated with signs only and may not include additional pavement width. Las Posas Road has Class III bicycle facilities between Pleasant Valley Road and East 5th Street.

EXISTING (YEAR 2016) TRAFFIC VOLUMES AND LEVELS OF SERVICE

This section presents the Existing (Year 2016) peak hour turning movement traffic volumes for the analyzed intersections and internal roadway segments, describes the methodology used to assess the traffic conditions at each intersection, and analyzes the resulting operating conditions at each, indicating volume-to-capacity (V/C) ratios and level of service (LOS).



EXISTING (YEAR 2016) INTERSECTION TRAFFIC VOLUMES

New traffic counts were conducted for the extended weekday morning (7:00 to 9:00 AM) and afternoon (4:00 to 6:00 PM) peak periods in November 2016 at the 11 intersections. Twenty-four-hour machine counts were also collected on eight internal roadway segments within the project site to evaluate the anticipated demand from the proposed project against the capacity of those roadways.

The machine counts present a snapshot of trip-making patterns and of the average daily traffic volumes on the roadways immediately adjacent to the project site. Traffic count data sheets are provided in Appendix A. The Existing (Year 2016) weekday morning and afternoon peak hour turning movement volumes at the study intersections are provided in Appendix B.

INTERSECTION CLASSIFICATION

Eight signalized intersections, one side-street stop-controlled intersection, and two yield-controlled roundabouts were analyzed as part of this study.

Signalized Intersections

Traffic impact study guidelines prepared for the California State University system were consulted for this analysis. This analysis is consistent with the guidance of the *California State University Transportation Impact Study Manual* (CSU TISM) (California State University, 2012) and applies the CSU system impact criteria, while utilizing the intersection analysis methodologies from local jurisdictions.

The following eight signalized intersections were analyzed as part of the scope of work for this project:

1. Lewis Road & University Drive
2. Lewis Road & Camarillo Street
3. Lewis Road & Cawelti Road
4. Lewis Road & Pleasant Valley Road
5. US-101 Southbound Ramps & Ventura Boulevard
6. Lewis Road & Ventura Boulevard
7. US-101 Northbound Ramps & Daily Drive
8. Lewis Road & Daily Drive

Both the City of Camarillo and Ventura County require the ICU method of intersection capacity analysis for signalized intersections. The ICU method determines the intersection V/C ratio and corresponding LOS for the turning movements and intersection characteristics at signalized intersections. "Capacity" represents the maximum volume of vehicles in the critical lanes that have a reasonable expectation of passing through an intersection in one hour under prevailing roadway and traffic conditions. The ICU ratios used in this study



were calculated by dividing critical traffic movement volumes at an intersection by the capacity per number of lanes for the movement. A capacity of 1,600 vehicles per lane per hour was used for the analysis.

Unsignalized Intersections

The following three unsignalized intersections were analyzed as part of this study:

1. Camarillo Street & Channel Islands Drive (side-street stop-controlled intersection)
2. Santa Rosa Island Drive & Channel Islands Drive (yield-controlled roundabout)
3. San Miguel Island Drive & Channel Islands Drive (yield-controlled roundabout)

For the purposes of this report, the unsignalized intersections located in unincorporated Ventura County have been analyzed using HCM unsignalized methodology. The HCM method characterizes intersection operations in terms of seconds of delay. At side-street stop-controlled intersections such as the intersection at Camarillo Street & Channel Islands Drive, the delay reported is that for the worst approach.

INTERSECTION LEVEL OF SERVICE

Level of service categories range from excellent, nearly free-flow traffic at LOS A to overloaded, stop-and-go conditions at LOS F. Table 1A provides LOS definitions for signalized intersections using the ICU methodology. Table 1B provides definitions for LOS unsignalized intersections using the HCM methodology. Table 1C provides LOS definitions for signalized intersections using the HCM methodology.

SEGMENT LEVEL OF SERVICE

Level of service for the roadway segments were determined based on the roadway capacities adopted by Ventura County. In determining the operational characteristics of the roadway segments, LOS A through F were applied, with LOS A indicating freeflow conditions and LOS F indicating severe congestion. Table 2A provides LOS definitions for segment roadways according to Ventura County.

FREEWAY/HIGHWAY SEGMENT LEVEL OF SERVICE

Level of service for the freeway/highway segments were determined based on the Freeway and Multilane Highway methodologies as described in the HCM. The Freeway and Multilane Highway methodologies as described in the HCM were used to determine the vehicle density on each analyzed segment (passenger cars per mile per lane) by direction and the corresponding level of service. Table 2B provides LOS definitions for freeway/highway segments according to the HCM.



TABLE 1A
LEVEL OF SERVICE DEFINITIONS
FOR SIGNALIZED INTERSECTIONS

Level of Service	Intersection Capacity Utilization	Definition
A	0.000-0.600	EXCELLENT. No Vehicle waits longer than one red light and no approach phase is fully used.
B	0.601-0.700	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	0.701-0.800	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	0.801-0.900	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	0.901-1.000	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 1.000	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths.
Source: <i>Transportation Research Circular No. 212, Interim Materials on Highway Capacity</i> , Transportation Research Board, 1980.		

TABLE 1B
LEVEL OF SERVICE DEFINITIONS FOR
STOP-CONTROLLED INTERSECTIONS

Level of Service	Average Control Delay (seconds/vehicle)
A	≤ 10.0
B	> 10.0 and ≤ 15.0
C	> 15.0 and ≤ 25.0
D	> 25.0 and ≤ 35.0
E	> 35.0 and ≤ 50.0
F	> 50.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

TABLE 2 AVERAGE ANNUAL DAILY TRAFFIC (ADT) LEVEL OF SERVICE (LOS) THRESHOLDS	
Level of Service	Class II
	2 Lanes
A	1,500
B	3,900
C	7,000
D	11,000
E	21,000

Source: Ventura County General Plan

EXISTING (YEAR 2016) WITHOUT PROJECT TRAFFIC PROJECTIONS

The results of the analysis of Existing (Year 2016) weekday morning and afternoon peak hour conditions at the study intersections across the AM and PM periods in which counts were collected are presented in Appendix B.

As presented in Table 3, under Existing (Year 2016) conditions, all intersections operate at LOS C or better during the AM and PM peak periods. During morning and afternoon peak periods, all 11 intersections operate at LOS C or better. Figure 3 presents the estimated Existing (Year 2016) traffic volumes at each of the analyzed intersections during the AM and PM weekday peak periods. Detailed LOS calculations are provided in Appendix C.

EXISTING (YEAR 2016) WITHOUT PROJECT SEGMENT PROJECTIONS

The data presented in Table 4 indicate that each of the study-area roadway segments currently operate at LOS D or better, which is considered the minimum acceptable LOS based on the CSU TISM (California State University, 2012).



TABLE 3
CSUCI SPECIFIC REUSE PLAN UPDATE
EXISTING (2016) INTERSECTION LEVEL OF SERVICE

NO.	INTERSECTION	JURISDICTION	PEAK HOUR	EXISTING (2016)	
				V/C or Delay	LOS
1	Lewis Road & University Drive (new campus entrance) <i>Signalized</i>	Ventura County	AM	0.339	A
			PM	0.359	A
2	Lewis Road & Camarillo Street (old campus entrance) <i>Signalized</i>	Ventura County	AM	0.470	A
			PM	0.615	B
3	Lewis Road & Cawelti Road <i>Signalized</i>	Ventura County	AM	0.381	A
			PM	0.342	A
4	Lewis Road & Pleasant Valley Road <i>Signalized</i>	Camarillo/Ventura County	AM	0.548	A
			PM	0.607	B
5	US-101 SB Ramps (Lewis Interchange) & Ventura Boulevard <i>Signalized</i>	Camarillo	AM	0.592	A
			PM	0.501	A
6	Lewis Road & Ventura Boulevard <i>Signalized</i>	Camarillo	AM	0.518	A
			PM	0.418	A
7	US-101 NB Ramps (Lewis Interchange) & Daily Drive <i>Signalized</i>	Camarillo	AM	0.403	A
			PM	0.553	A
8	Lewis Road & Daily Drive <i>Signalized</i>	Camarillo	AM	0.538	A
			PM	0.469	A
9	Camarillo Street & Channel Islands Drive <i>Side-Street Stop-Controlled*</i>	Ventura County	AM	10**	B
			PM	10.7**	B
10	Channel Islands Drive & Santa Rosa Island Drive <i>Yield-Controlled Roundabout *</i>	Ventura County	AM	3.3	A
			PM	3.4	A
11	Channel Islands Drive & San Miguel Island Drive <i>Yield-Controlled Roundabout*</i>	Ventura County	AM	3.3	A
			PM	3.3	A

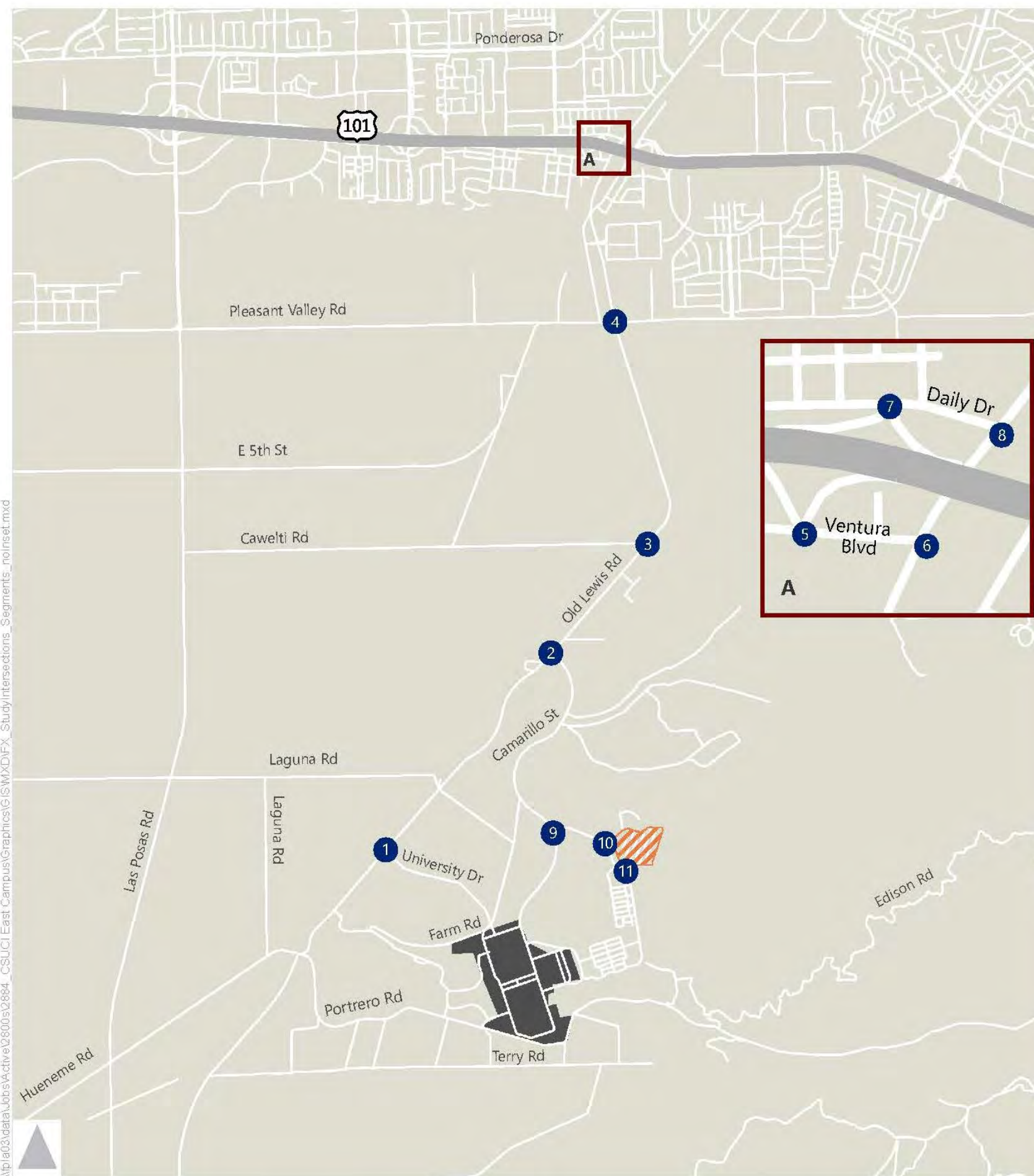
Notes:

Analysis performed using ICU methodology.

* For unsignalized intersections, HCM methodology was used

**For Side-Street Stop-Controlled intersections, vehicular delay reported is for worst case approach.

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● Study Intersections ▨ Project Location ■ CSUCI Campus

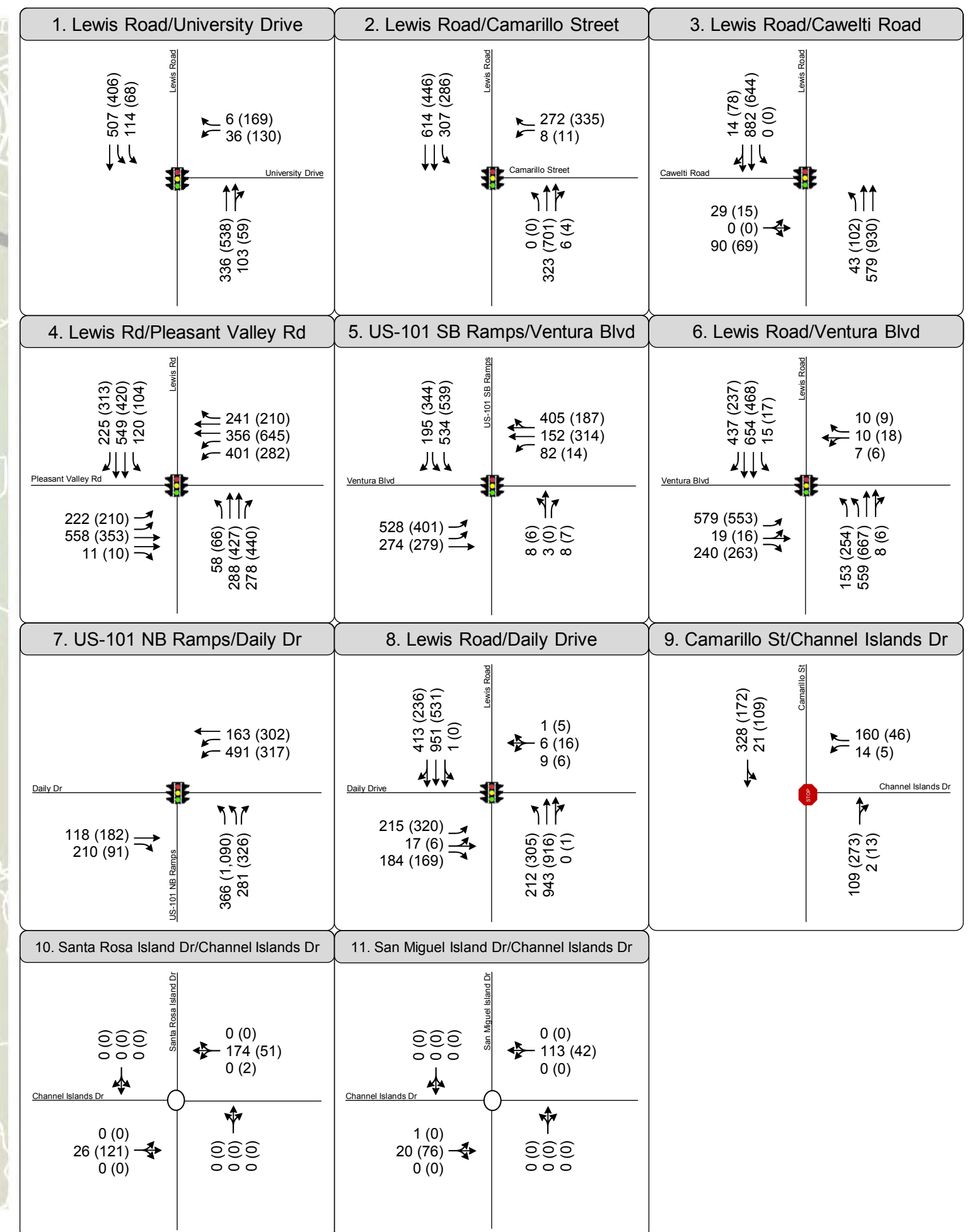


Figure 3
Existing (Year 2016)
AM & PM Peak Hour Traffic Volumes



TABLE 4
CSUCI SPECIFIC REUSE PLAN UPDATE
EXISTING (YEAR 2016) SEGMENT LEVEL OF SERVICE

Segment #	Roadway Segment	Classification/Geometry	Existing (2016) 24 Hour Volumes	LOS
1	Camarillo Street between Lewis Road and Channel Islands Drive	Class II / 2-Lane	6,249	C
2	Camarillo Street between Channel Islands Drive and Santa Barbara Avenue	Class II / 2-Lane	4,614	C
3	Channel Islands Drive between Camarillo Street and Santa Rosa Island Drive	Class II / 2-Lane	1,943	B
4	Channel Islands Drive between Santa Rosa Island Drive and Santa Cruz Island Drive	Class II / 2-Lane	2,009	B
5	Channel Islands Drive between San Miguel Island Drive and Anacapa Island Drive	Class II / 2-Lane	1,156	A
6	Channel Islands Drive between Santa Cruz Island Drive and San Miguel Island Drive	Class II / 2-Lane	1,209	A
7	Santa Rosa Island Drive Between Channel Islands Drive and Arch Drive	Class II / 2-Lane	38	A
8	San Miguel Island Drive between Arch Point and Channel Islands Drive	Class II / 2-Lane	0	A

3. PROJECT TRAFFIC GENERATION AND DISTRIBUTION

PROJECT TRAFFIC VOLUMES

The development of trip generation estimates for the proposed project involved a 3-step process including traffic generation, trip distribution, and traffic assignment.

PROJECT TRIP GENERATION ESTIMATES

As discussed in Chapter 1, the proposed project consists of 120 SFR homes, 310 apartment units, and 170 attached senior adult housing units. Trip generation rates from *Trip Generation, 9th Edition* (Institute of Transportation [ITE], 2012) were used to estimate the number of trips associated with the project and are presented in Table 5.

To provide a conservative analysis, the trip generation estimates in this study assume that all trips will be made by vehicle and does not apply any internal capture or walk/bike trip credits for the proposed Project. There is the potential that a number of residents of the proposed project will be associated with CSUCI and would not drive to CSUCI. If residents of the proposed project walk or bike to CSUCI, the assumptions applied may result in the overestimation of vehicle trip generation for the project.

As shown in Table 5, the project would generate an estimated net increase of 3,789 daily trips, including 282 trips (67 inbound/215 outbound) during the AM peak hour and 321 trips (202 inbound/119 outbound) trips during the PM peak hour.

PROJECT TRAFFIC DISTRIBUTION

The project distribution patterns to and from the proposed project used in this study, illustrated in Figure 4, were based on a combination of the street system serving the project site; the level of accessibility of routes to and from the proposed project site; and the locations of employment and commercial centers to which residents of the project would be drawn. A select zone analysis was also conducted for the proposed project using the Southern California Association of Governments' (SCAG) Regional Travel Demand Model to inform the general distribution pattern for this study.

It is estimated that:

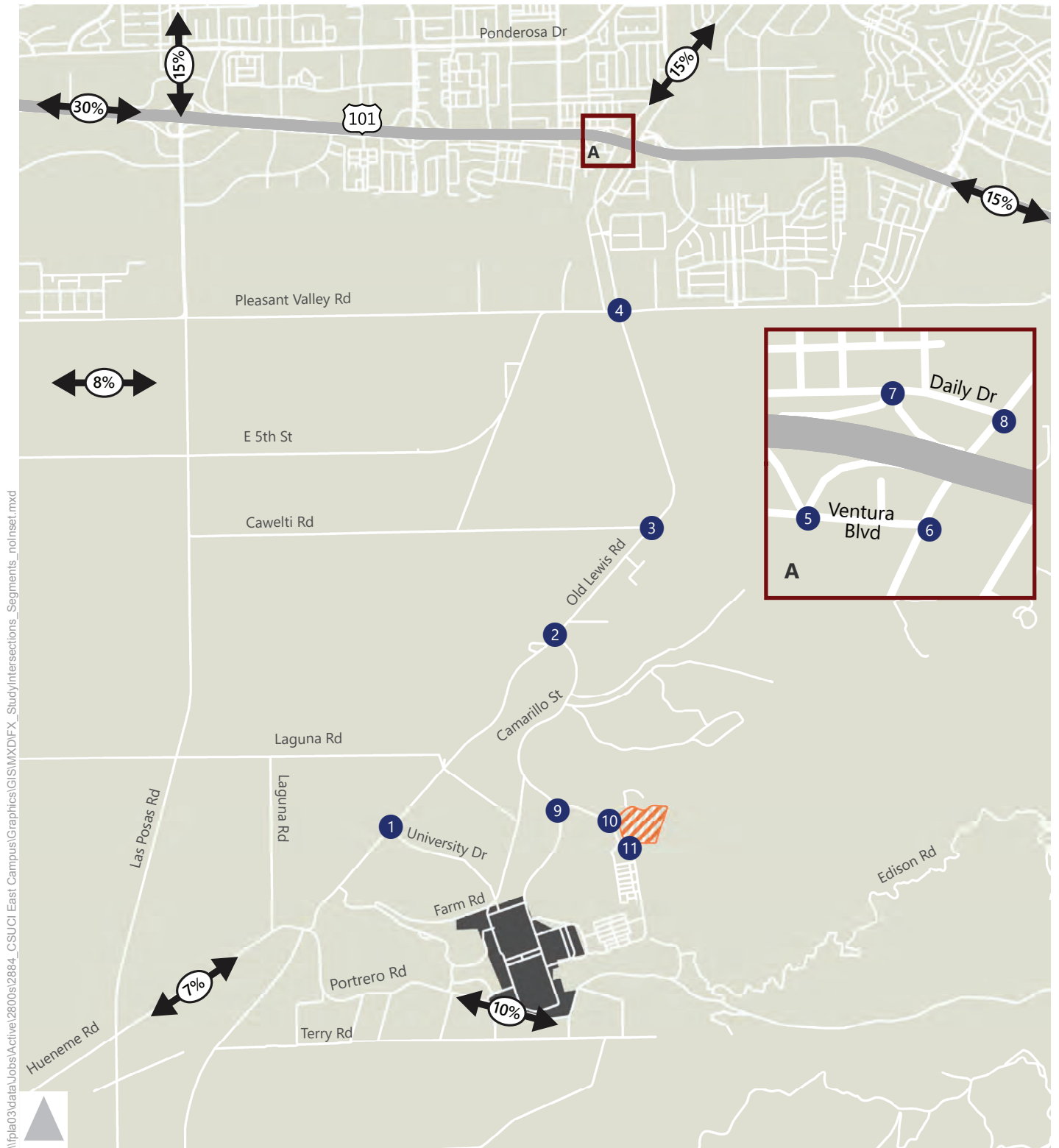
- 30% of project traffic will travel to points north in the City of Camarillo
- 15% of project traffic will travel to points west in the City of Oxnard



TABLE 5 SUMMARY OF TRIP GENERATION ESTIMATES CSUCI SPECIFIC REUSE PLAN UPDATE

Land Use	ITE Land Use Code [a]	Size	Units	Daily Trips		Weekday Trips							
						AM Peak Hour				PM Peak Hour			
				Rate	Total	Rate	In	Out	Total	Rate	In	Out	Total
East Campus Development Project													
Residential - Single Family	210	120	DU	9.52	1,142	0.75	23	67	90	1.00	76	44	120
Residential - Apartment	220	310	DU	6.65	2,062	0.51	32	126	158	0.51	103	55	158
Residential - Senior Adult Housing Attached	252	170	DU	3.44	585	0.20	12	22	34	0.25	23	20	43
East Campus Development Total		600			3,789		67	215	282		202	119	321

[a] Trip generation estimates based on "Trip Generation" (9th Edition, ITE, 2012) unless otherwise noted.



Study Intersections ◀(%)▶ Trip Distribution [Orange Hatched Box] Project Location [Dark Grey Box] CSUCI Campus



Figure 4
Generalized Trip Distribution

- 25% of project traffic will travel to points south and east including Thousand Oaks, Simi Valley, and Los Angeles
- 30% of project traffic will travel to points northwest including the City of Ventura and Santa Barbara County

PROJECT TRAFFIC ASSIGNMENT

Using the trip generation estimates summarized in Table 5 and the trip distribution patterns, project traffic was assigned through the study intersections. Figure 5 presents the estimated project-generated traffic volumes at each of the analyzed intersections during the AM and PM weekday peak periods.

EXISTING (YEAR 2016) PLUS PROJECT TRAFFIC PROJECTIONS

The project traffic estimated and assigned to the study intersections was added to the existing traffic volumes to estimate Existing (Year 2016) plus Project traffic volumes. Turning movement traffic volumes for the Existing plus Project scenario are provided in Appendix B. Project volumes were added to the existing (Year 2016) traffic volumes for the AM and PM peak periods to develop the Existing (Year 2016) plus Project traffic volumes. Figure 6 presents the estimated Existing (Year 2016) plus Project traffic volumes at each of the analyzed intersections during the AM and PM weekday peak periods.

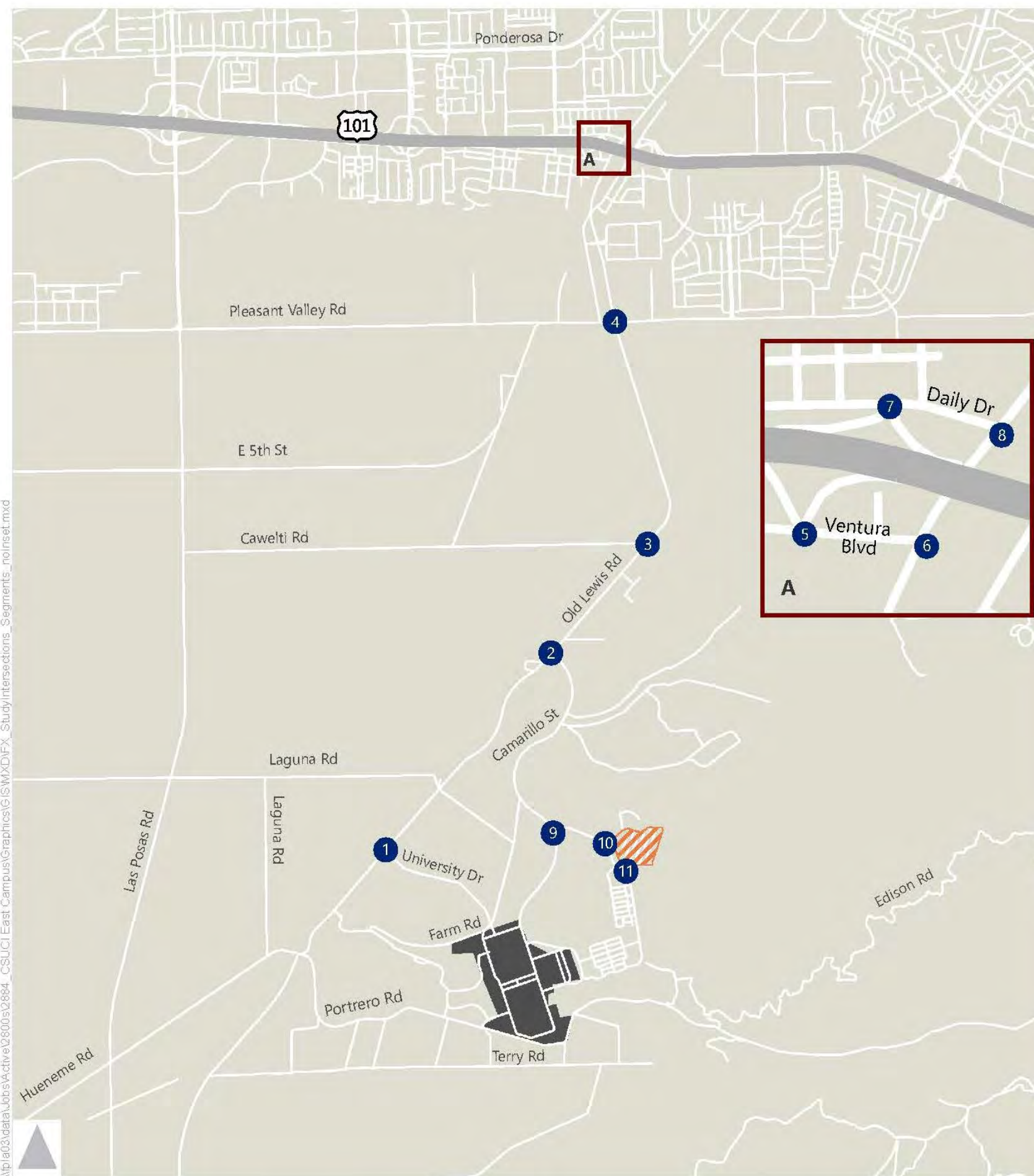
Table 6 summarizes the results of the analysis of the Existing (Year 2016) plus Project weekday morning and afternoon peak hour V/C ratio and corresponding LOS at each of the analyzed intersections. As indicated, 10 of the 11 intersections operate at LOS C or better during the AM and PM peak periods. One intersection (Lewis Road & Camarillo Street) is projected to operate at LOS D during the PM peak period under Existing (Year 2016) plus Project conditions. Detailed LOS calculations are provided in Appendix C.

EXISTING (YEAR 2016) PLUS PROJECT SEGMENT DAILY TRAFFIC PROJECTIONS

All eight segments were evaluated in the Existing (Year 2016) plus Project scenario. The 24-hour volumes include traffic from the proposed project. As shown in Table 7, all of the studied roadways are projected to operate at a LOS D or better under Existing (Year 2016) plus Project conditions.



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● Study Intersections ▨ Project Location ■ CSUCI Campus

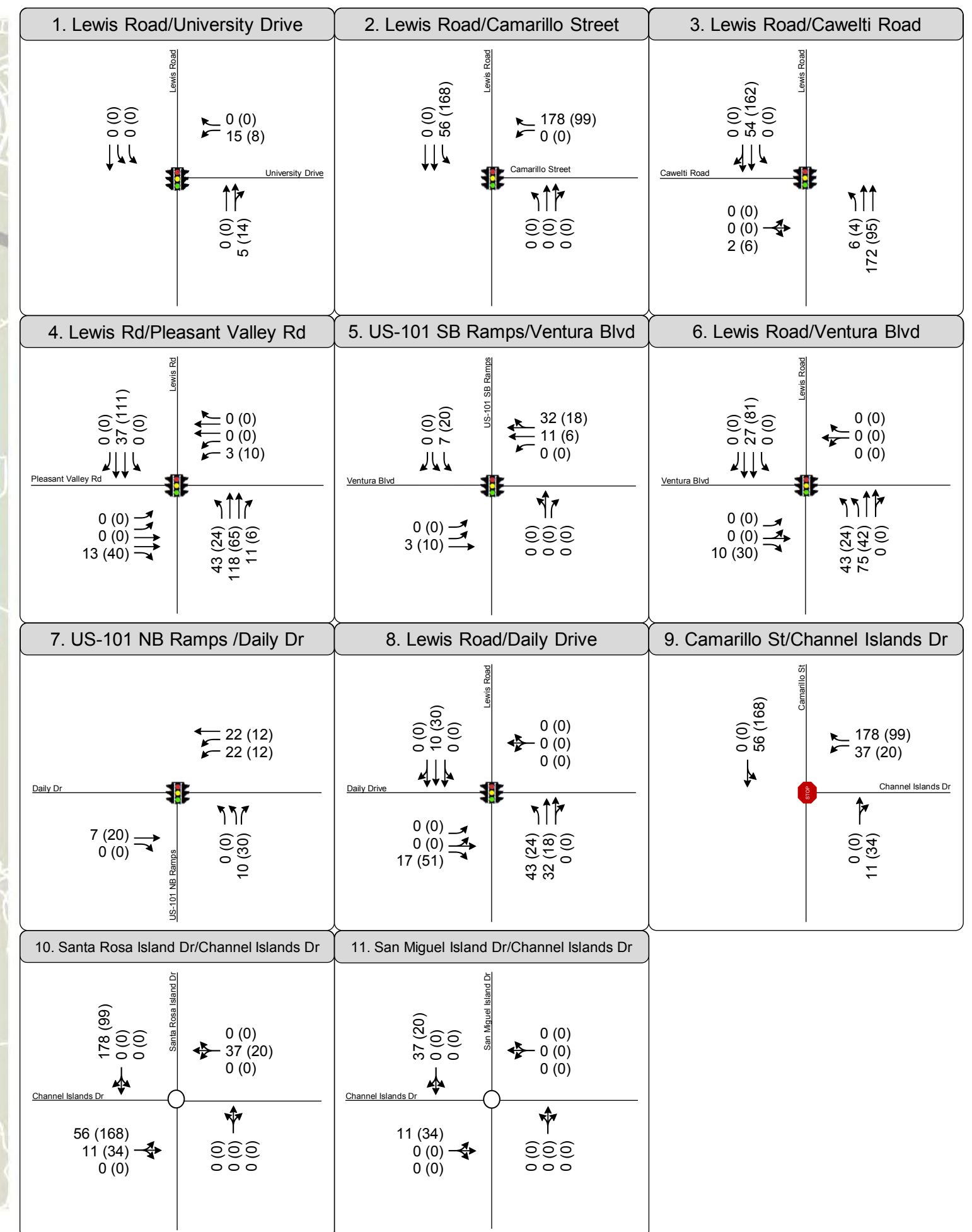


Figure 5
Project Only
AM & PM Peak Hour Traffic Volumes



TABLE 6
CSUCI SPECIFIC REUSE PLAN UPDATE
EXISTING (YEAR 2016) PLUS PROJECT INTERSECTION LEVEL OF SERVICE

NO.	INTERSECTION	JURISDICTION	PEAK HOUR	EXISTING (2016) PLUS PROJECT	
				V/C or Delay	LOS
1	Lewis Road & University Drive (new campus entrance) <i>Signalized</i>	Ventura County	AM	0.349	A
			PM	0.359	A
2	Lewis Road & Camarillo Street (old campus entrance) <i>Signalized</i>	Ventura County	AM	0.616	B
			PM	0.782	D
3	Lewis Road & Cawelti Road <i>Signalized</i>	Ventura County	AM	0.403	A
			PM	0.399	A
4	Lewis Road & Pleasant Valley Road <i>Signalized</i>	Camarillo/Ventura County	AM	0.556	A
			PM	0.611	B
5	US-101 SB Ramps (Lewis Interchange) & Ventura Boulevard <i>Signalized</i>	Camarillo	AM	0.614	B
			PM	0.509	A
6	Lewis Road & Ventura Boulevard <i>Signalized</i>	Camarillo	AM	0.532	A
			PM	0.457	A
7	US-101 NB Ramps (Lewis Interchange) & Daily Drive <i>Signalized</i>	Camarillo	AM	0.420	A
			PM	0.570	A
8	Lewis Road & Daily Drive <i>Signalized</i>	Camarillo	AM	0.577	A
			PM	0.513	A
9	Camarillo Street & Channel Islands Drive <i>Side-Street Stop-Controlled*</i>	Ventura County	AM	11.9**	B
			PM	14.2**	B
10	Channel Islands Drive & Santa Rosa Island Drive <i>Yield-Controlled Roundabout *</i>	Ventura County	AM	2.6	A
			PM	3.7	A
11	Channel Islands Drive & San Miguel Island Drive <i>Yield-Controlled Roundabout*</i>	Ventura County	AM	3.6	A
			PM	3.6	A

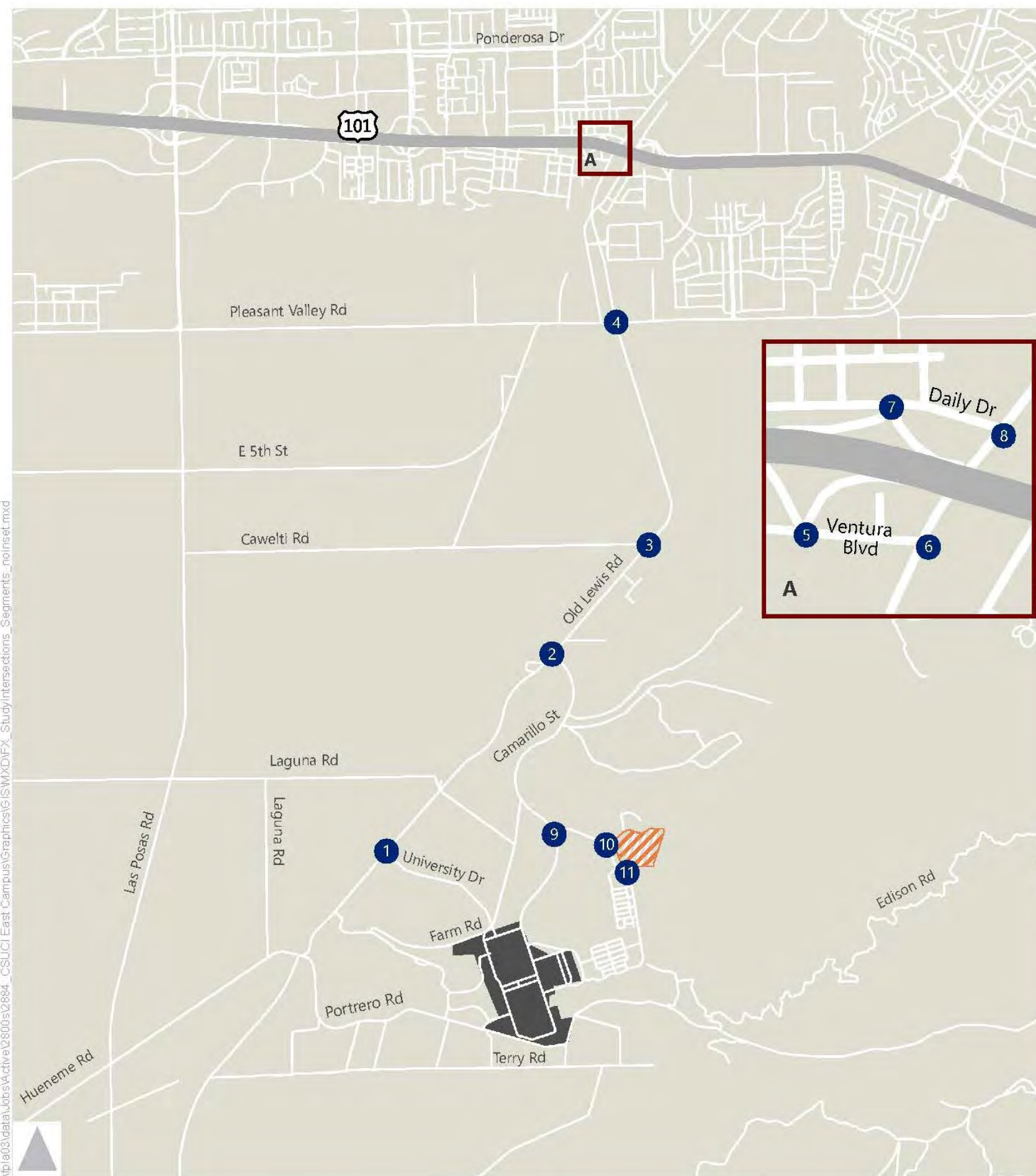
Notes:

Analysis performed using ICU methodology.

* For unsignalized intersections, HCM methodology was used

**For Side-Street Stop-Controlled intersections, vehicular delay reported is for worst case approach.

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● Study Intersections ▨ Project Location ■ CSUCI Campus

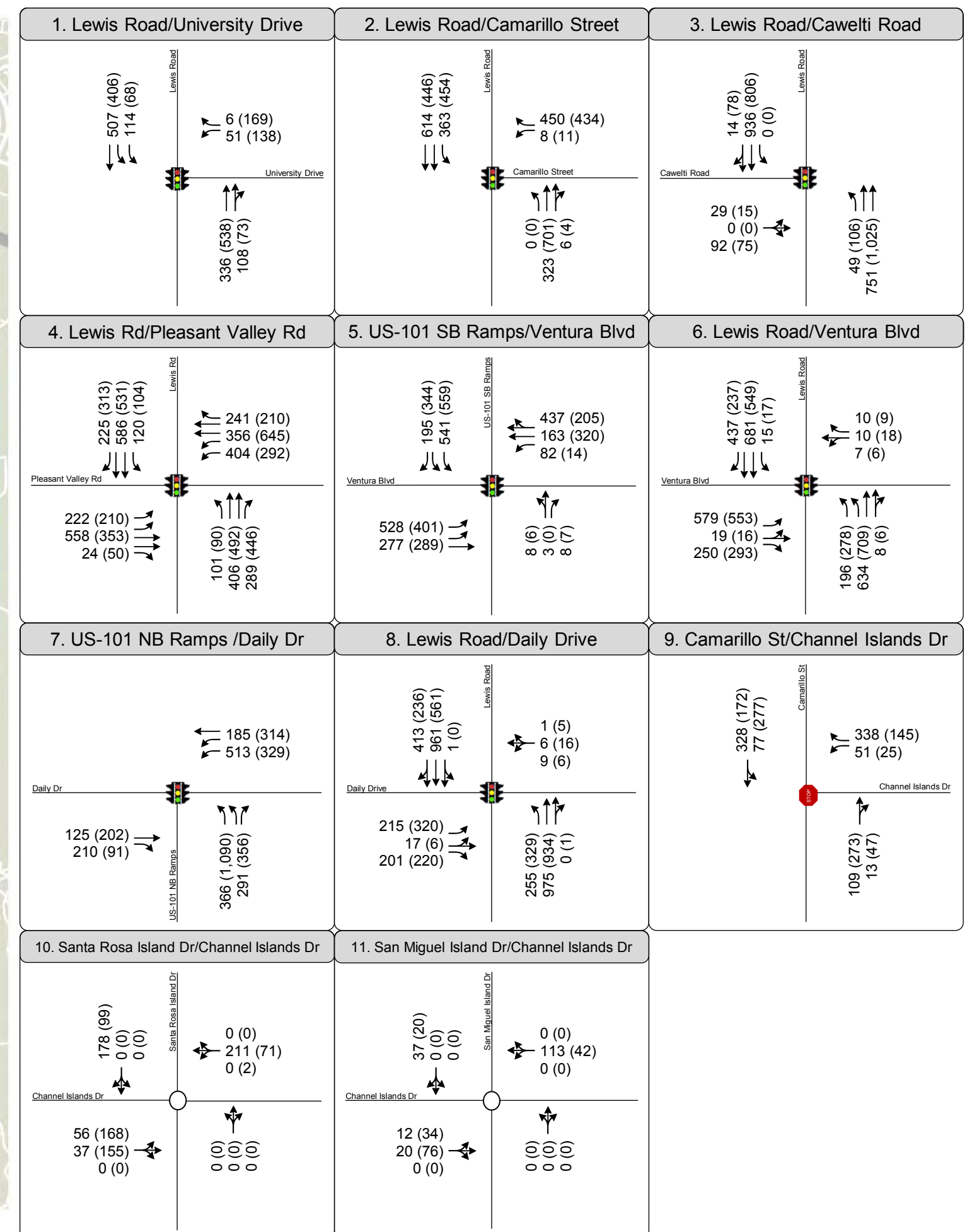


Figure 6
Existing (Year 2016) plus Project
AM & PM Peak Hour Traffic Volumes



TABLE 7
CSUCI SPECIFIC REUSE PLAN UPDATE
EXISTING (YEAR 2016) PLUS PROJECT SEGMENT LEVEL OF SERVICE

Segment #	Roadway Segment	Classification/Geometry	Existing (2016) Plus Project 24 Hour Volumes	LOS
1	Camarillo Street between Lewis Road and Channel Islands Drive	Class II / 2-Lane	9,395	D
2	Camarillo Street between Channel Islands Drive and Santa Barbara Avenue	Class II / 2-Lane	5,259	C
3	Channel Islands Drive between Camarillo Street and Santa Rosa Island Drive	Class II / 2-Lane	5,732	C
4	Channel Islands Drive between Santa Rosa Island Drive and Santa Cruz Island Drive	Class II / 2-Lane	2,652	B
5	Channel Islands Drive between San Miguel Island Drive and Anacapa Island Drive	Class II / 2-Lane	1,156	A
6	Channel Islands Drive between Santa Cruz Island Drive and San Miguel Island Drive	Class II / 2-Lane	1,852	B
7	Santa Rosa Island Drive Between Channel Islands Drive and Arch Drive	Class II / 2-Lane	681	A
8	San Miguel Island Drive between Arch Point and Channel Islands Drive	Class II / 2-Lane	643	A

4. CUMULATIVE (YEAR 2022) TRAFFIC CONDITIONS

CUMULATIVE (YEAR 2022) WITHOUT PROJECT TRAFFIC VOLUMES

The Cumulative (Year 2022) without Project traffic projections reflect the changes to Existing (Year 2016) traffic conditions that can be expected from three primary sources. The first source is the ambient growth in traffic, which reflects increases in traffic because of regional growth and development. The second source is traffic generated by specific development projects located within, or in the vicinity of, the study area. The third source is roadway or intersection capacity enhancements. These factors are described below.

FUTURE AMBIENT GROWTH

Based on projected traffic growth in the area, the SCAG regional ambient growth factor of 1% per year (a total of 6.15 percent compounded growth across six years) was applied to the Existing (Year 2016) traffic volumes to reflect the effects of regional growth and development to Cumulative (Year 2022) conditions.

RELATED PROJECTS

Cumulative (Year 2022) without Project traffic forecasts include the effects of specific cumulative development projects (i.e., related projects) expected to be built in the vicinity of the proposed project site. The list of related projects was prepared based on data from Ventura County and the City of Camarillo. Projected CSUCI growth of full-time equivalent (FTE) students is also included as a related project.

A total of 17 related projects were identified; these projects are listed in Table 8 and illustrated in Figure 7.

The trip generation rates developed for the related projects are intended to reflect trip-making during the AM and PM peak hours, which is defined as the highest 1-hour period between 7:00 AM and 9:00 AM and 4:00 and 6:00 PM.

CUMULATIVE (YEAR 2022) BASELINE STREET IMPROVEMENTS

There are no infrastructure changes in the study area planned for implementation by year 2022 per confirmation by City and County staff.



TABLE 8
CSUCI SPECIFIC REUSE PLAN UPDATE
RELATED PROJECTS TRIP GENERATION ESTIMATES

No.	Description/Land Use	Size		Estimated Trip Generation [a]						
				Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
					In	Out	Total	In	Out	Total
City of Camarillo										
1	High-Turnover (Sit-Down) Restaurant	10.99	ksf	1,397	65	53	119	65	43	108
2	Single Family	26	units	248	5	15	20	16	10	26
3	Apartments	10	units	67	1	4	5	3	2	5
4	Apartments	368	units	2,447	38	150	188	122	66	188
4	Apartments	82	units	545	8	33	42	27	15	42
4	Apartments	83	units	552	8	34	42	28	15	42
5	Condominium	87	units	505	7	32	38	30	15	45
6	Apartments	22	units	146	2	9	11	7	4	11
7	Condominium	129	units	749	10	47	57	45	22	67
8	Single Family	9	units	86	2	5	7	6	3	9
8	Single Family	4	units	38	1	2	3	3	1	4
9	Single Family	4	units	38	1	2	3	3	1	4
10	Specialty Retail Center	42.36	ksf	1,877	51	64	115	139	151	290
10	Specialty Retail Center	8	ksf	355	10	12	22	26	28	55
11	Specialty Retail Center	5	ksf	222	6	8	14	16	18	34
12	Specialty Retail Center	2.49	ksf	110	3	4	7	8	9	17
13	General Light Industrial	68.2	ksf	475	55	8	63	8	58	66
13	General Light Industrial	70.615	ksf	492	57	8	65	8	60	68
13	General Light Industrial	56.45	ksf	393	46	6	52	7	48	55
13	General Light Industrial	88.185	ksf	615	71	10	81	10	75	86
13	General Light Industrial	20.832	ksf	145	17	2	19	2	18	20
13	General Light Industrial	23.602	ksf	165	19	3	22	3	20	23
13	General Light Industrial	14.43	ksf	101	12	2	13	2	12	14
14	General Light Industrial	129.016	ksf	899	104	14	119	15	110	125
15	General Light Industrial	31.386	ksf	219	25	3	29	4	27	30
Ventura County										
16	Assisted Living	205	beds	545	19	10	29	20	25	45
California State University - Channel Islands (CSUCI)										
17	CSUCI FTE Campus Growth	1,000	students	1,710	109	31	140	54	116	170
Total Related Projects Trip Generation				15,142	752	571	1,322	677	972	1,650

[a] Project Source: City of Camarillo and Ventura County, October 2016. Trip generation estimates based on "Trip Generation" (9th Edition, ITE, 2012) unless otherwise noted.

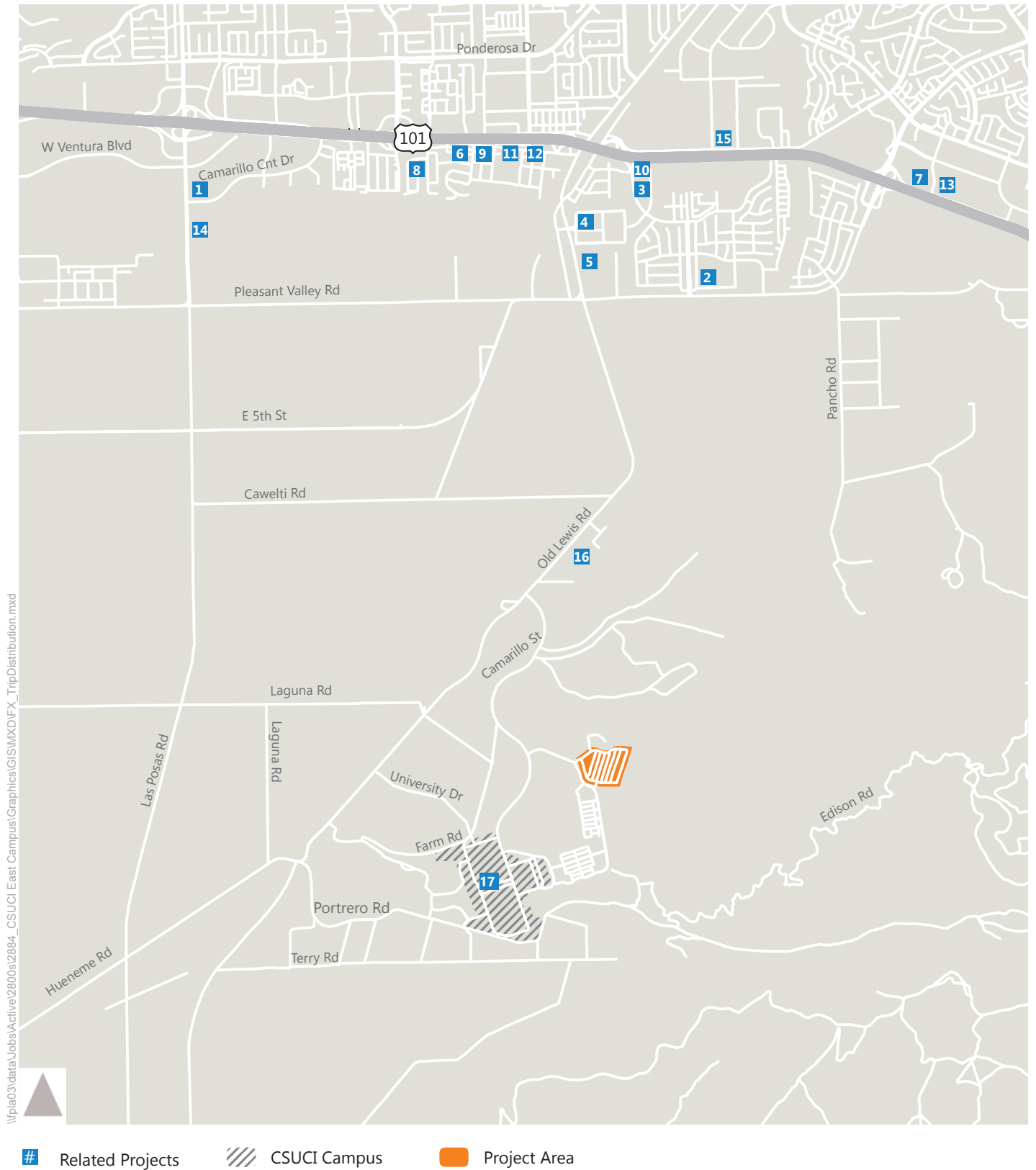


Figure 7
Related Projects



Related Project Traffic Distribution and Assignment

The geographic distribution of the traffic generated by the related projects is dependent on several factors. These factors include the type and density of the proposed land uses, the geographic distribution of population from which employees and potential patrons of proposed commercial developments may be drawn, the locations of employment and commercial centers to which residents of residential projects may be drawn, and the location of the projects in relation to the surrounding street system.

CUMULATIVE (YEAR 2022) WITHOUT PROJECT TRAFFIC PROJECTIONS

Cumulative (Year 2022) without Project weekday traffic volumes, presented in Appendix B, for all analyzed intersections were used to establish cumulative operating conditions without the project. Cumulative (Year 2022) without Project levels of service are presented below in Table 9. All intersections are projected to operate at a LOS C or better across the AM and PM peak periods under Cumulative (Year 2022) without Project conditions. Figure 8 presents the Cumulative (Year 2022) without Project AM and PM peak hour volumes at the analyzed intersections. Detailed LOS calculations are included in Appendix C.

CUMULATIVE (YEAR 2022) WITHOUT PROJECT SEGMENT DAILY TRAFFIC PROJECTIONS

The 24-hour volumes shown in Table 10 are the sum of the Existing (Year 2016) ADT and the forecasted trips made from the anticipated CSUCI FTE growth. Each of the eight segments are projected to operate at LOS D or better under Cumulative (Year 2022) without Project conditions.



TABLE 9 CSUCI SPECIFIC REUSE PLAN UPDATE CUMULATIVE (YEAR 2022) INTERSECTION LEVEL OF SERVICE					
NO.	INTERSECTION	JURISDICTION	PEAK HOUR	CUMULATIVE (2022)	
				V/C or Delay	LOS
1	Lewis Road & University Drive (new campus entrance) <i>Signalized</i>	Ventura County	AM PM	0.364 0.445	A A
2	Lewis Road & Camarillo Street (old campus entrance) <i>Signalized</i>	Ventura County	AM PM	0.508 0.686	A B
3	Lewis Road & Cawelti Road <i>Signalized</i>	Ventura County	AM PM	0.439 0.400	A A
4	Lewis Road & Pleasant Valley Road <i>Signalized</i>	Camarillo/Ventura County	AM PM	0.59 0.664	A B
5	US-101 SB Ramps (Lewis Interchange) & Ventura Boulevard <i>Signalized</i>	Camarillo	AM PM	0.735 0.642	C B
6	Lewis Road & Ventura Boulevard <i>Signalized</i>	Camarillo	AM PM	0.661 0.628	B B
7	US-101 NB Ramps (Lewis Interchange) & Daily Drive <i>Signalized</i>	Camarillo	AM PM	0.594 0.676	A B
8	Lewis Road & Daily Drive <i>Signalized</i>	Camarillo	AM PM	0.743 0.730	C C
9	Camarillo Street & Channel Islands Drive <i>Side-Street Stop-Controlled*</i>	Ventura County	AM PM	10.1** 10.9**	B B
10	Channel Islands Drive & Santa Rosa Island Drive <i>Yield-Controlled Roundabout*</i>	Ventura County	AM PM	3.9 3.6	A A
11	Channel Islands Drive & San Miguel Island Drive <i>Yield-Controlled Roundabout*</i>	Ventura County	AM PM	3.6 3.5	A A

Notes:

Analysis performed using ICU methodology.

* For unsignalized intersections, HCM methodology was used

**For Side-Street Stop-Controlled intersections, vehicular delay reported is for worst case approach.

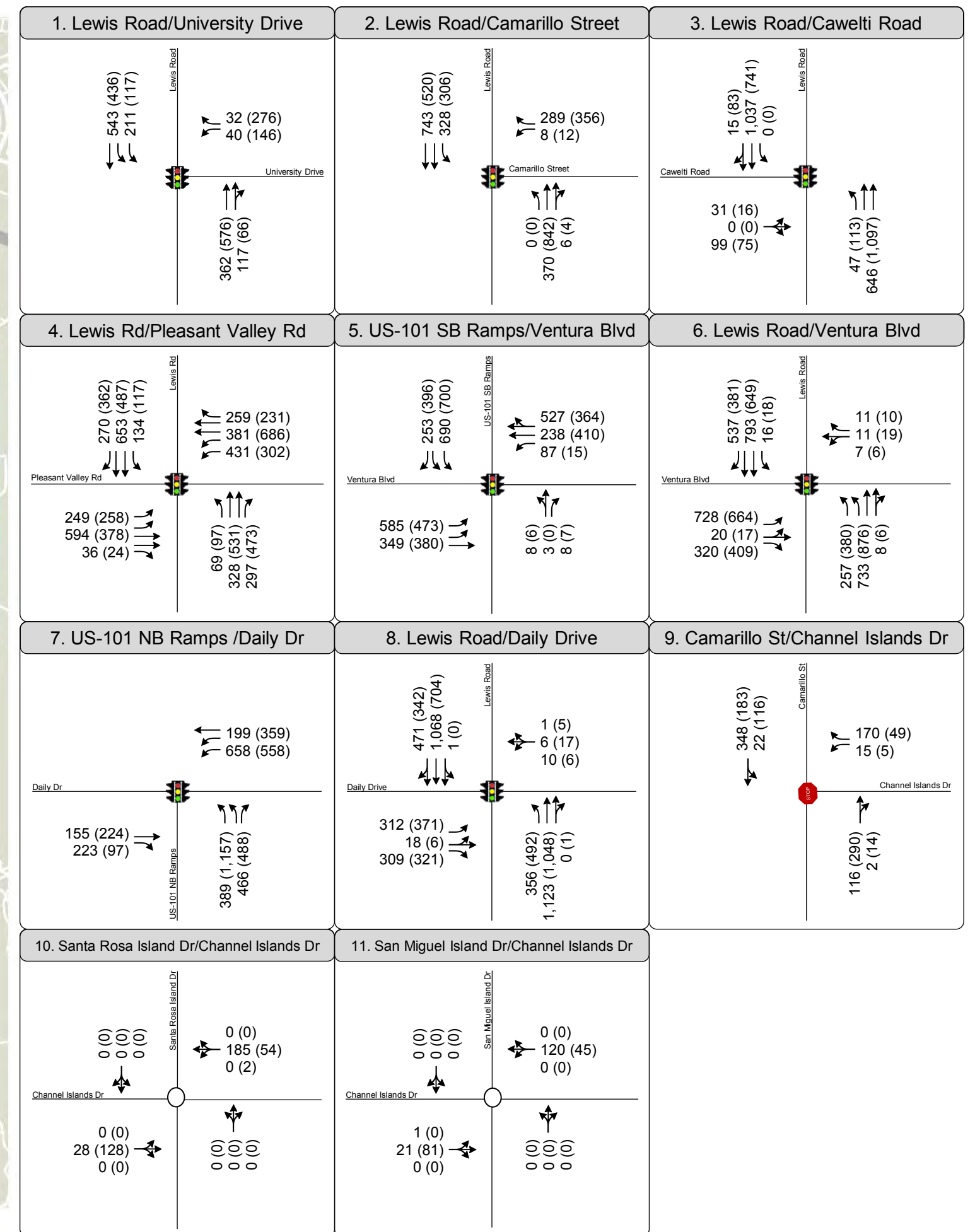
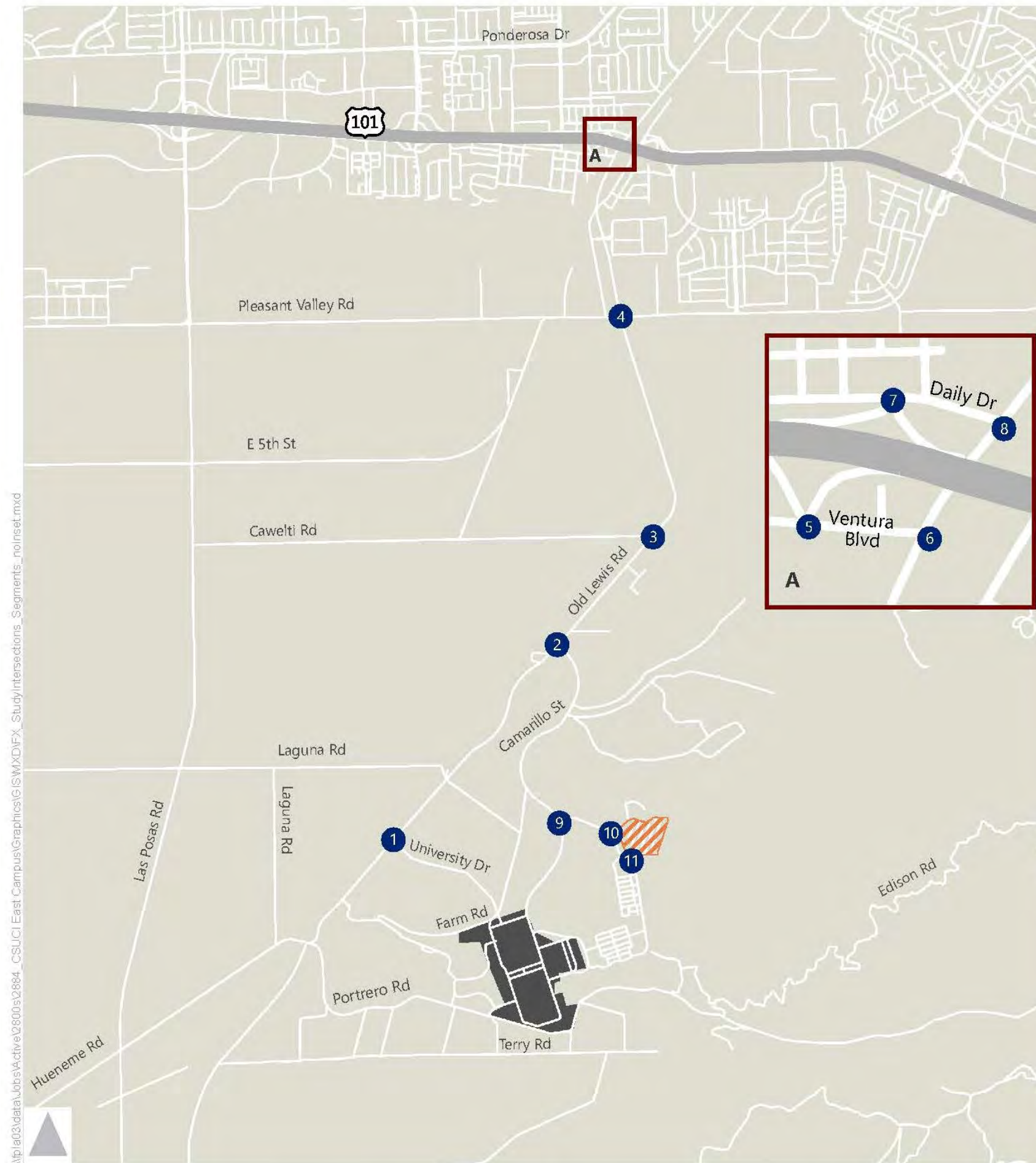


Figure 8
Cumulative (Year 2022) without Project
AM & PM Peak Hour Traffic Volumes



TABLE 10
CSUCI SPECIFIC REUSE PLAN UPDATE
CUMULATIVE (YEAR 2022) SEGMENT LEVEL OF SERVICE

Segment #	Roadway Segment	Classification/Geometry	Cumulative (2022) 24 Hour Volumes	LOS
1	Camarillo Street between Lewis Road and Channel Islands Drive	Class II / 2-Lane	7,186	D
2	Camarillo Street between Channel Islands Drive and Santa Barbara Avenue	Class II / 2-Lane	5,306	C
3	Channel Islands Drive between Camarillo Street and Santa Rosa Island Drive	Class II / 2-Lane	2,234	B
4	Channel Islands Drive between Santa Rosa Island Drive and Santa Cruz Island Drive	Class II / 2-Lane	2,310	B
5	Channel Islands Drive between San Miguel Island Drive and Anacapa Island Drive	Class II / 2-Lane	1,329	A
6	Channel Islands Drive between Santa Cruz Island Drive and San Miguel Island Drive	Class II / 2-Lane	1,390	A
7	Santa Rosa Island Drive Between Channel Islands Drive and Arch Drive	Class II / 2-Lane	44	A
8	San Miguel Island Drive between Arch Point and Channel Islands Drive	Class II / 2-Lane	0	A

CUMULATIVE (YEAR 2022) PLUS PROJECT TRAFFIC PROJECTIONS

The proposed project traffic volumes were then added to the Cumulative (Year 2022) without Project traffic projections for the AM and PM peak periods hour to develop the Cumulative (Year 2022) plus Project traffic forecasts. Figure 9 presents the Cumulative (Year 2022) plus Project AM and PM peak hour volumes at the analyzed intersections.

The Cumulative (Year 2022) plus Project peak hour traffic volumes, presented in Appendix B, were analyzed to determine the projected operating conditions with the addition of the proposed project traffic. The level of service results for the Cumulative (Year 2022) plus Project condition are presented in Table 11.

Under Cumulative (Year 2022) plus Project conditions, seven of the intersections are projected to operate at LOS C or better in both the AM and PM peak periods. One intersection (Lewis Road & Camarillo Street) is projected to operate at a LOS D during the PM peak period under a Cumulative (Year 2022) plus Project Conditions. Detailed LOS calculations are included in Appendix C.

CUMULATIVE (YEAR 2022) PLUS PROJECT SEGMENT DAILY TRAFFIC PROJECTIONS

The project's daily trips were then added to the Cumulative (Year 2022) without Project ADT volumes to develop the Cumulative (Year 2022) plus Project ADT forecast. The LOS results for the Cumulative (Year 2022) plus Project conditions are presented in Table 12. All eight segments are projected to operate at LOS D or better under Cumulative (Year 2022) plus Project conditions.



TABLE 11 CSUCI SPECIFIC REUSE PLAN UPDATE CUMULATIVE (YEAR 2022) PLUS PROJECT INTERSECTION LEVEL OF SERVICE					
NO.	INTERSECTION	JURISDICTION	PEAK HOUR	CUMULATIVE (2022) PLUS PROJECT	
				V/C or Delay	LOS
1	Lewis Road & University Drive (new campus entrance) <i>Signalized</i>	Ventura County	AM PM	0.374 0.445	A A
2	Lewis Road & Camarillo Street (old campus entrance) <i>Signalized</i>	Ventura County	AM PM	0.654 0.851	B D
3	Lewis Road & Cawelti Road <i>Signalized</i>	Ventura County	AM PM	0.461 0.442	A A
4	Lewis Road & Pleasant Valley Road <i>Signalized</i>	Camarillo/Ventura County	AM PM	0.607 0.668	B B
5	US-101 SB Ramps (Lewis Interchange) & Ventura Boulevard <i>Signalized</i>	Camarillo	AM PM	0.757 0.649	C B
6	Lewis Road & Ventura Boulevard <i>Signalized</i>	Camarillo	AM PM	0.674 0.654	B B
7	US-101 NB Ramps (Lewis Interchange) & Daily Drive <i>Signalized</i>	Camarillo	AM PM	0.611 0.692	B B
8	Lewis Road & Daily Drive <i>Signalized</i>	Camarillo	AM PM	0.782 0.782	C C
9	Camarillo Street & Channel Islands Drive <i>Side-Street Stop-Controlled*</i>	Ventura County	AM PM	12.2** 15.7**	B C
10	Channel Islands Drive & Santa Rosa Island Drive <i>Yield-Controlled Roundabout*</i>	Ventura County	AM PM	2.7 3.2	A A
11	Channel Islands Drive & San Miguel Island Drive <i>Yield-Controlled Roundabout*</i>	Ventura County	AM PM	3.7 3.6	A A

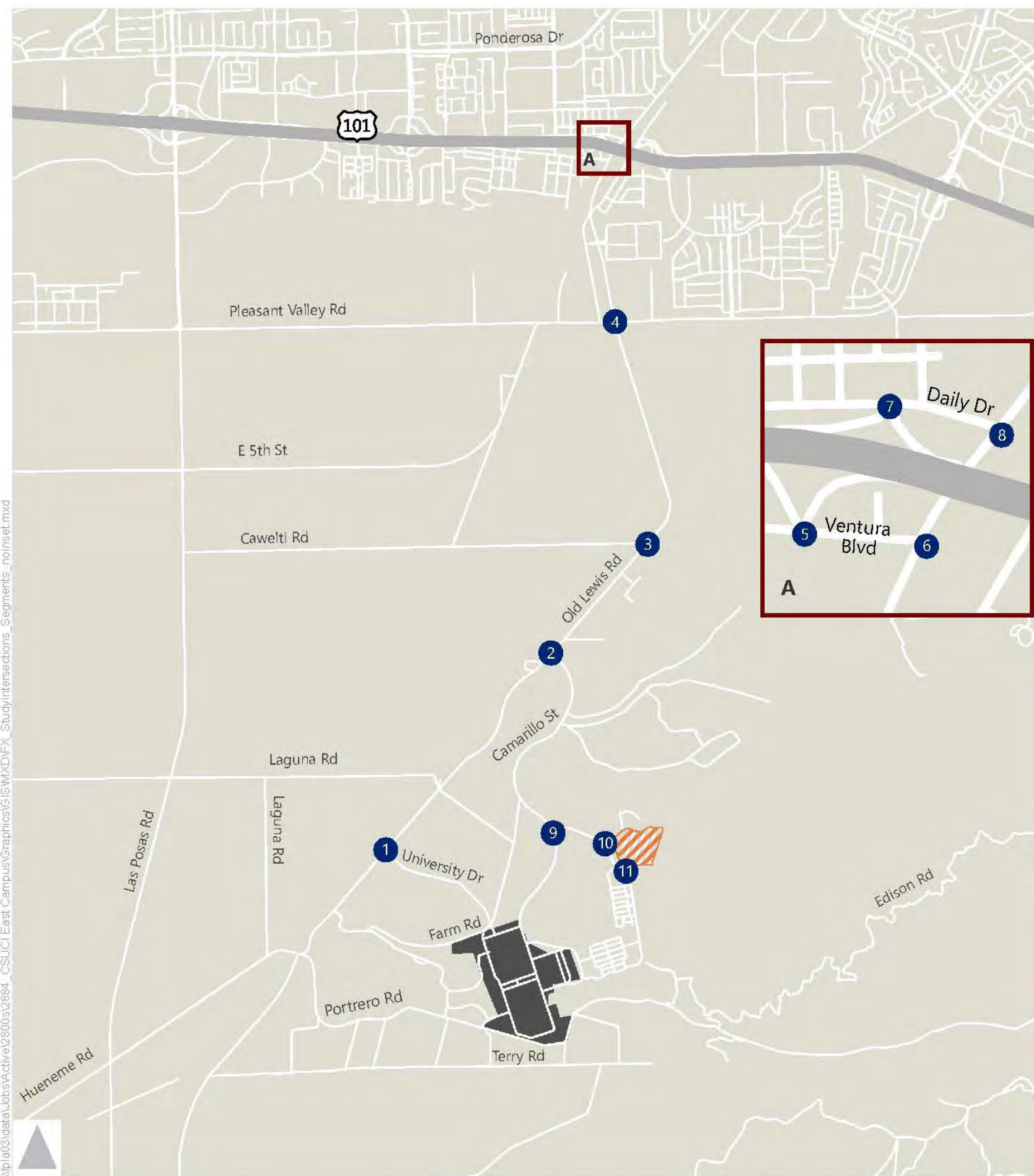
Notes:

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* For unsignalized intersections, HCM methodology was used

**For Side-Street Stop-Controlled intersections, vehicular delay reported is for worst case approach.

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● Study Intersections ▨ Project Location ■ CSUCI Campus

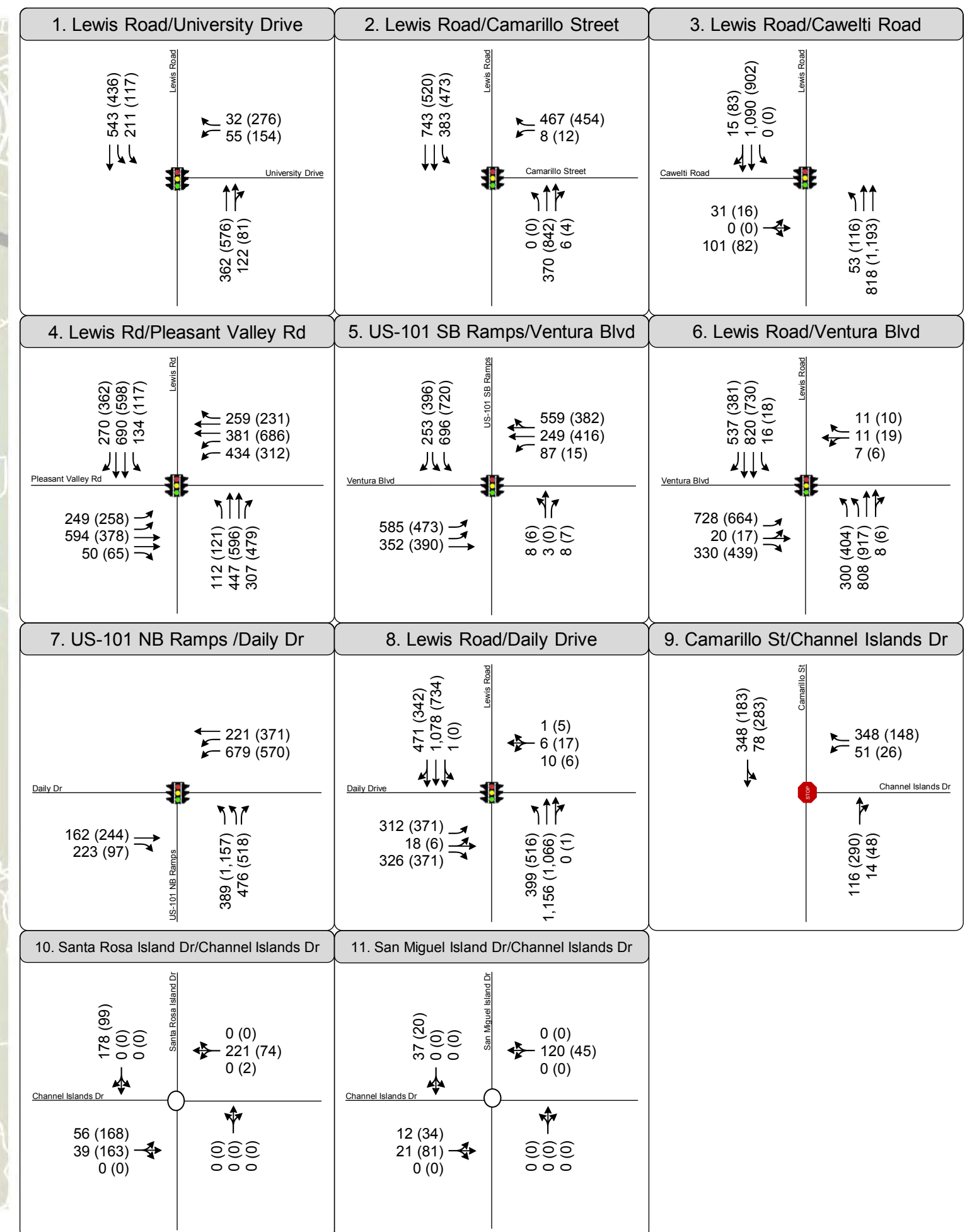


Figure 9
Cumulative (Year 2022) plus Project
AM & PM Peak Hour Traffic Volumes



TABLE 12
CSUCI SPECIFIC REUSE PLAN UPDATE
CUMULATIVE (YEAR 2022) PLUS PROJECT SEGMENT LEVEL OF SERVICE

Segment #	Roadway Segment	Classification/Geometry	Cumulative (2022) plus Project 24 Hour Volumes	LOS
1	Camarillo Street between Lewis Road and Channel Islands Drive	Class II / 2-Lane	10,332	D
2	Camarillo Street between Channel Islands Drive and Santa Barbara Avenue	Class II / 2-Lane	5,951	C
3	Channel Islands Drive between Camarillo Street and Santa Rosa Island Drive	Class II / 2-Lane	6,024	C
4	Channel Islands Drive between Santa Rosa Island Drive and Santa Cruz Island Drive	Class II / 2-Lane	2,954	B
5	Channel Islands Drive between San Miguel Island Drive and Anacapa Island Drive	Class II / 2-Lane	1,329	A
6	Channel Islands Drive between Santa Cruz Island Drive and San Miguel Island Drive	Class II / 2-Lane	2,034	B
7	Santa Rosa Island Drive Between Channel Islands Drive and Arch Drive	Class II / 2-Lane	687	A
8	San Miguel Island Drive between Arch Point and Channel Islands Drive	Class II / 2-Lane	643	A

5. SIGNIFICANT IMPACT ANALYSIS

This section presents an analysis of the Existing (Year 2016) and Cumulative (Year 2022) without and with project volumes to assess the potential traffic impacts of the proposed project on the operating conditions of the surrounding street system. The traffic impact analysis compares the projected LOS at each study intersection and segment under with Project conditions to the without Project conditions to estimate the incremental increase in the V/C ratio or change in LOS caused by the proposed project. This provides the information needed to assess the potential impact of the project using significance criteria established by the CSU TISM. Detailed LOS calculations are included in Appendix C.

CRITERIA FOR DETERMINATION OF SIGNIFICANT IMPACTS

TRAFFIC IMPACT CRITERIA

Significance criteria established by the CSU TISM were used to assess the potential for significant project impacts at the study intersections. The CSU TISM criteria was developed based on a review of the significance criteria utilized by each of the local jurisdictions that surround the 23 CSU campuses. This study applies the impact threshold criteria consistent with the CSU TISM. The CSU TISM identifies any intersection or roadway segment operating at LOS D or better under a no Project scenario that is projected to operate at LOS E or F with the addition of project trips to be significantly impacted.

Table 13 summarizes the significant impact criteria on off-site traffic operations under the CSU Traffic Impact Study Manual.



TABLE 13 - CSU SIGNIFICANCE CRITERIA FOR OFF-SITE TRAFFIC OPERATIONS	
Elements	Significant Impact Determination
Off-Site Traffic Operations	· A roadway segment or intersection operates at LOS D or better under a no project scenario and the addition of project trips causes overall traffic operations on the facility to operate at LOS E or F. · A roadway segment or intersection operates at LOS E or F under a no project scenario and the project adds <u>both</u> 10 or more peak hour trips <u>and</u> 5 seconds or more of peak hour delay, during the same peak hour. · If an intersection operates at a very poor LOS F (control delay of 120 seconds or more), the significance criterion shall be an increase in v/c ratio of 0.20 or more.
Source: California State University Transportation Impact Study Manual	

While this impact analysis was performed based on the significance criteria required in the CSU TISM, this analysis also reviewed the adopted significance thresholds adopted by Ventura County and the City of Camarillo. Tables 14 and 15 illustrate the significance threshold criteria established by Ventura County and the City of Camarillo. The significance criteria adopted by Ventura County and City of Camarillo are provided for the purposes of disclosure, while the CSU TISM significance criteria, shown in Table 13 above, were used to determine significant intersection and segment impacts in this study. The CSU TISM identifies any intersection operating at LOS D or better under a no project scenario that is projected to operate at LOS E or F with the addition of project trips to be significantly impacted.



TABLE 14 – CITY OF CAMARILLO INTERSECTION SIGNIFICANT IMPACT CRITERIA

LOS	Final V/C Ratio	Project-Related Increase in Peak Hour Trips
D	0.801 – 0.900	30 or more project trips in the critical movement lane
E	0.901 – 1.000	20 or more project trips in the critical movement lane
F	>1.000	10 or more project trips in the critical movement lane

TABLE 15 – VENTURA COUNTY INTERSECTION SIGNIFICANT IMPACT THRESHOLD

Intersection LOS (Existing)	Final V/C Ratio	Project-Related Increase in V/C Ratio or Peak Hour Trips	
		Existing Conditions	Cumulative Conditions
A	0.000 - 0.600	0.20 V/C ratio	-
B	0.601 - 0.700	0.15 V/C ratio	-
C	0.701 - 0.800	0.10 V/C ratio	-
D	0.801 - 0.900	10 or more trips to critical movements	-
E	0.901 - 1.000	5 or more trips to critical movements	1 or more trips to critical movements 10 or more trips to the intersection
F	>1.000	1 or more trips to critical movements	1 or more trips to critical movements 10 or more trips to the intersection

Based on the analysis, the impact thresholds set forth by these agencies would be exceeded at the following locations under the following scenarios:

- Existing (Year 2016) plus Project
 - Intersection: Lewis Road & Camarillo Street
 - Segment: Camarillo Street between Lewis Road and Channel Islands Drive



- Cumulative (Year 2022) plus Project
 - Intersection: Lewis Road & Camarillo Street

EXISTING (YEAR 2016) PLUS PROJECT INTERSECTION IMPACTS

The CSU TISM significance criteria, shown in Table 13 above, were used to determine significant impacts in this study. To assess whether significant impacts would occur at the study intersections, the Existing (Year 2016) plus Project operating conditions were compared to the Existing (Year 2016) without Project operating conditions. According to the significance criteria established by CSU, an intersection is significantly impacted if it operates acceptably (D or better) without the project and the increase in project traffic causes an intersection to operate at LOS E or F with the addition of project traffic. As shown in Table 16, no project impacts have been identified at the study intersections.

EXISTING (YEAR 2016) PLUS PROJECT SEGMENT DAILY TRAFFIC IMPACTS

The CSU TISM significance criteria, shown in Table 13, were used to determine significant impacts in this study. According to the significance criteria established by CSU, a segment is significantly impacted if it operates acceptably (D or better) without the project and the increase in project traffic causes a segment to operate at LOS E or F with the addition of project traffic. As shown in Table 17, no significant impacts are identified at the study segments under Existing (Year 2016) plus Project conditions.

TABLE 16 CSUCI SPECIFIC REUSE PLAN UPDATE EXISTING (YEAR 2016) PLUS PROJECT INTERSECTION LEVELS OF SERVICE AND IMPACT ANALYSIS										
NO.	INTERSECTION	JURISDICTION	PEAK HOUR	EXISTING (2016)		EXISTING (2016) + PROJECT		IMPACTS		
				V/C or Delay	LOS	V/C or Delay	LOS	Change in V/C or Delay	No. of Crit Move Project Trips per Lane	Project Impact?
1	Lewis Road & University Drive (new campus entrance) <i>Signalized</i>	Ventura County	AM	0.339	A	0.349	A	0.010	0	NO
			PM	0.359	A	0.359	A	0.000	0	NO
2	Lewis Road & Camarillo Street (old campus entrance) <i>Signalized</i>	Ventura County	AM	0.470	A	0.616	B	0.146	206	NO
			PM	0.615	B	0.782	D	0.190	231	NO
3	Lewis Road & Cawelti Road <i>Signalized</i>	Ventura County	AM	0.381	A	0.403	A	0.022	51	NO
			PM	0.342	A	0.399	A	0.065	151	NO
4	Lewis Road & Pleasant Valley Road <i>Signalized</i>	Camarillo/Ventura County	AM	0.548	A	0.556	A	0.008	10	NO
			PM	0.607	B	0.611	B	0.005	5	NO
5	US-101 SB Ramps (Lewis Interchange) & Ventura Boulevard <i>Signalized</i>	Camarillo	AM	0.592	A	0.614	B	0.022	10	NO
			PM	0.501	A	0.509	A	0.009	5	NO
6	Lewis Road & Ventura Boulevard <i>Signalized</i>	Camarillo	AM	0.518	A	0.532	A	0.014	61	NO
			PM	0.418	A	0.457	A	0.046	91	NO
7	US-101 NB Ramps (Lewis Interchange) & Daily Drive <i>Signalized</i>	Camarillo	AM	0.403	A	0.420	A	0.017	25	NO
			PM	0.553	A	0.570	A	0.020	28	NO
8	Lewis Road & Daily Drive <i>Signalized</i>	Camarillo	AM	0.538	A	0.577	A	0.039	47	NO
			PM	0.469	A	0.513	A	0.051	47	NO
9	Camarillo Street & Channel Islands Drive <i>Side-Street Stop-Controlled*</i>	Ventura County	AM	10**	B	11.9**	B	-	-	NO
			PM	10.7**	B	14.2**	B	-	-	NO
10	Channel Islands Drive & Santa Rosa Island Drive <i>Yield-Controlled Roundabout *</i>	Ventura County	AM	3.3	A	3.3	A	-	-	NO
			PM	3.4	A	3.7	A	-	-	NO
11	Channel Islands Drive & San Miguel Island Drive <i>Yield-Controlled Roundabout*</i>	Ventura County	AM	3.3	A	3.6	A	-	-	NO
			PM	3.3	A	3.6	A	-	-	NO

Notes:

Analysis performed using ICU methodology.

* For unsignalized intersections, HCM methodology was used

**For Side-Street Stop-Controlled intersections, vehicular delay reported is for worst case approach.

TABLE 17
CSUCI SPECIFIC REUSE PLAN UPDATE
EXISTING (YEAR 2016) PLUS PROJECT SEGMENT SIGNIFICANT IMPACT ANALYSIS

Segment #	Roadway Segment	Classification/ Geometry	Existing (2016) Plus Project 24 Hour Volumes	LOS	Project Impact?
1	Camarillo Street between Lewis Road and Channel Islands Drive	Class II / 2-Lane	9,847	D	NO
2	Camarillo Street between Channel Islands Drive and Santa Barbara Avenue	Class II / 2-Lane	5,352	C	NO
3	Channel Islands Drive between Camarillo Street and Santa Rosa Island Drive	Class II / 2-Lane	6,277	C	NO
4	Channel Islands Drive between Santa Rosa Island Drive and Santa Cruz Island Drive	Class II / 2-Lane	2,745	B	NO
5	Channel Islands Drive between San Miguel Island Drive and Anacapa Island Drive	Class II / 2-Lane	1,156	A	NO
6	Channel Islands Drive between Santa Cruz Island Drive and San Miguel Island Drive	Class II / 2-Lane	1,945	B	NO
7	Santa Rosa Island Drive Between Channel Islands Drive and Arch Drive	Class II / 2-Lane	774	A	NO
8	San Miguel Island Drive between Arch Point and Channel Islands Drive	Class II / 2-Lane	736	A	NO

CUMULATIVE (YEAR 2022) PLUS PROJECT INTERSECTION IMPACTS

The CSU TISM significance criteria, shown in Table 13, were used to determine cumulative intersection impacts in this study. To assess whether cumulative impacts would occur at the study intersections, the Cumulative (Year 2022) plus Project operating conditions were compared to the Cumulative (Year 2022) without Project operating conditions. According to the significance criteria established by CSU, an intersection is significantly impacted if it operates acceptably (D or better) without the project and the increase in project traffic causes an intersection to operate at LOS E or F with the addition of project traffic. As shown in Table 18, no cumulative impacts are identified at the study intersections under Cumulative (Year 2022) plus Project conditions.

CUMULATIVE (YEAR 2022) PLUS PROJECT SEGMENT DAILY TRAFFIC IMPACTS

The CSU TISM significance criteria, shown in Table 13 above, were used to determine cumulative segment impacts in this study. According to the significance criteria established by CSU, a segment is significantly impacted if it operates acceptably (D or better) without the project and the increase in project traffic causes a segment to operate at LOS E or F with the addition of project traffic. As shown in Table 19, no significant impacts are identified at the study segments under Cumulative (Year 2022) plus Project conditions.

MITIGATION MEASURES

No mitigation measures were identified as no significant impacts were found in this analysis.

CONGESTION MANAGEMENT PLAN ANALYSIS

An analysis was completed to comply with the monitoring requirements found in the Ventura County Transportation Commission's (VCTC) 2009 Ventura County Congestion Management Program (VCCMP). The VCTC has adopted LOS E as a minimum system wide level of service on all VCCMP. In the study area, Lewis Road & Pleasant Valley Road (study intersection 4) are part of the CMP roadway network.

The results of the intersection analysis in Table 18 indicate that these facilities would operate at LOS D or better. As the analyzed roadway segments do not fall within the Ventura County 2020 Regional Road Network, no significant impacts are identified at the roadway segments under Cumulative (Year 2022) plus Project conditions.



TABLE 18 CSUCI SPECIFIC PLAN REUSE UPDATE CUMULATIVE (YEAR 2022) PLUS PROJECT INTERSECTION LEVELS OF SERVICE AND IMPACT ANALYSIS										
NO.	INTERSECTION	JURISDICTION	PEAK HOUR	CUMULATIVE (2022)		CUMULATIVE (2022) + PROJECT		IMPACTS		
				V/C or Delay	LOS	V/C or Delay	LOS	Change in V/C or Delay	No. of Crit Move Project Trips per Lane	Cumulative Impact?
1	Lewis Road & University Drive (new campus entrance) <i>Signalized</i>	Ventura County	AM PM	0.364 0.445	A A	0.374 0.445	A A	0.010 0.000	0 0	NO NO
2	Lewis Road & Camarillo Street (old campus entrance) <i>Signalized</i>	Ventura County	AM PM	0.508 0.686	A B	0.654 0.851	B D	0.146 0.165	206 231	NO NO
3	Lewis Road & Cawelti Road <i>Signalized</i>	Ventura County	AM PM	0.439 0.400	A A	0.461 0.442	A A	0.022 0.042	51 151	NO NO
4	Lewis Road & Pleasant Valley Road <i>Signalized</i>	Camarillo/Ventura County	AM PM	0.59 0.664	A B	0.607 0.668	B B	0.017 0.004	10 5	NO NO
5	US-101 SB Ramps (Lewis Interchange) & Ventura Boulevard <i>Signalized</i>	Camarillo	AM PM	0.735 0.642	C B	0.757 0.649	C B	0.022 0.007	10 5	NO NO
6	Lewis Road & Ventura Boulevard <i>Signalized</i>	Camarillo	AM PM	0.661 0.628	B B	0.674 0.654	B B	0.013 0.026	61 91	NO NO
7	US-101 NB Ramps (Lewis Interchange) & Daily Drive <i>Signalized</i>	Camarillo	AM PM	0.594 0.676	A B	0.611 0.692	B B	0.017 0.016	25 28	NO NO
8	Lewis Road & Daily Drive <i>Signalized</i>	Camarillo	AM PM	0.743 0.73	C C	0.782 0.782	C C	0.039 0.052	47 47	NO NO
9	Camarillo Street & Channel Islands Drive <i>Side-Street Stop-Controlled*</i>	Ventura County	AM PM	10.1** 10.9**	B B	12.2** 15.7**	B C	- -	- -	NO NO
10	Channel Islands Drive & Santa Rosa Island Drive <i>Yield-Controlled Roundabout*</i>	Ventura County	AM PM	3.9 3.6	A A	3.9 3.2	A A	- -	- -	NO NO
11	Channel Islands Drive & San Miguel Island Drive <i>Yield-Controlled Roundabout*</i>	Ventura County	AM PM	3.6 3.5	A A	3.7 3.6	A A	- -	- -	NO NO

Notes:

Analysis performed using ICU methodology.

* For unsignalized intersections, HCM methodology was used

**For Side-Street Stop-Controlled intersections, vehicular delay reported is for worst case approach.

TABLE 19
CSU SPECIFIC PLAN REUSE UPDATE
CUMULATIVE (YEAR 2022) PLUS PROJECT SEGMENT IMPACT ANALYSIS

Segment #	Roadway Segment	Classification/Geometry	Cumulative (2022) with Project 24 Hour Volumes	LOS	Cumulative Impact?
1	Camarillo Street between Lewis Road and Channel Islands Drive	Class II / 2-Lane	10,784	D	NO
2	Camarillo Street between Channel Islands Drive and Santa Barbara Avenue	Class II / 2-Lane	6,044	C	NO
3	Channel Islands Drive between Camarillo Street and Santa Rosa Island Drive	Class II / 2-Lane	6,568	C	NO
4	Channel Islands Drive between Santa Rosa Island Drive and Santa Cruz Island Drive	Class II / 2-Lane	3,046	B	NO
5	Channel Islands Drive between San Miguel Island Drive and Anacapa Island Drive	Class II / 2-Lane	1,329	A	NO
6	Channel Islands Drive between Santa Cruz Island Drive and San Miguel Island Drive	Class II / 2-Lane	2,126	B	NO
7	Santa Rosa Island Drive Between Channel Islands Drive and Arch Drive	Class II / 2-Lane	780	A	NO
8	San Miguel Island Drive between Arch Point and Channel Islands Drive	Class II / 2-Lane	736	A	NO

6. CALTRANS FACILITIES ANALYSIS

This chapter presents the performance thresholds and analysis performed for California Department of Transportation (Caltrans) facilities, per the guidance provided in the CSU TISM (California State University, 2012). The methodologies and LOS measures of effectiveness from Caltrans guidelines were used to study facilities that fall under the jurisdiction of Caltrans. The Caltrans analysis is presented below.

CALTRANS MEASURES OF EFFECTIVENESS

Caltrans *Guide for the Preparation of Traffic Impact Studies* (Caltrans, 2002) identifies the transition of LOS C/D threshold as the target operating condition for signalized ramp intersections and freeway segment operations and. Table 20A and Table 20 B below show the Caltrans target thresholds for signalized intersections and for freeway segments, as identified by Caltrans. For the off-ramp queuing analysis, the 95th percentile queue estimates are compared against the available storage to assess if the estimated queue exceeds available storage, resulting in queues backing onto the freeway mainline.

TABLE 20A MEASURE OF EFFECTIVENESS AT SIGNALIZED INTERSECTIONS AND RAMP TERMINALS	
Level of Service	Control Delay per Vehicle (sec/veh)
A	<10
B	> 10 - 20
C	> 20 - 35
D	> 35 - 55
E	> 55 - 80
F	> 80

*Dashed line represents transition between LOS C and LOS D

Source: *Highway Capacity Manual, Caltrans Guide for the Preparation of Traffic Impact Studies* (Caltrans, 2002)



TABLE 20B MEASURE OF EFFECTIVENESS AT FREEWAY SEGMENTS	
Level of Service	Maximum Density (pc/mi/ln)
A	11
B	18
C	26
D	35
E	45

*Dashed line represents transition between LOS C and LOS D

Source: *Highway Capacity Manual, Caltrans Guide for the Preparation of Traffic Impact Studies, (Caltrans, 2002)*

HCM INTERSECTION ANALYSIS

Applying the same study assumptions as the traffic impact analysis, including existing counts and future cumulative and project trip forecasts, the following study intersections were analyzed using the *Highway Capacity Manual* (HCM) (Transportation Research Board, 2000) signalized methodology:

- 5. US-101 Southbound Ramps & Ventura Boulevard
- 7. US-101 Northbound Ramps & Daily Drive

To assess whether Caltrans thresholds would be exceeded at the study intersections, the Existing (Year 2016) plus Project operating conditions were compared to the Existing (Year 2016) without Project operating conditions. Based on this analysis, the target performance threshold is exceeded due to the addition of project traffic at the intersection of US-101 Southbound Ramps & Ventura Boulevard (AM peak hour only). Because the project causes the LOS to degrade from LOS C to LOS D with the addition of project traffic, this is determined to be a project impact for Existing (Year 2016) plus Project analysis scenario. Table 21 displays the results of this analysis. Detailed LOS calculations for this analysis are provided in Appendix C.

Additionally, the Cumulative (Year 2022) plus Project operating conditions were compared to the Cumulative (Year 2022) without project operating conditions. As shown in Table 22, the thresholds set forth by Caltrans would be exceeded based solely on the cumulative without project conditions, resulting in a cumulative impact for the intersection of US-101 Southbound Ramps & Ventura Boulevard (AM peak hour only).



TABLE 21
CSUCI SPECIFIC PLAN REUSE UPDATE
EXISTING (YEAR 2016) PLUS PROJECT INTERSECTION LEVELS OF SERVICE AND IMPACT ANALYSIS

NO.	INTERSECTION	PEAK HOUR	EXISTING (2016)		EXISTING (2016) + PROJECT			EXCEEDS CALTRANS THRESHOLDS		EXISTING (2016) + PROJECT + MITIGATION			EXCEEDS CALTRANS THRESHOLDS	
			Delay	LOS	Delay	LOS	Change in Delay	Without Project?	With Project?	Delay	LOS	Change in Delay	Without Project?	With Project + Mitigation?
5	US 101 Southbound Ramps/Ventura Boulevard <i>Signalized [a]</i>	AM	34	C	35.5	D	1.5	NO	YES	34.8	C	0.8	NO	NO
		PM	28.7	C	29.9	C	1.2	NO	NO	29.9	C	1.2	NO	NO
7	US 101 Northbound Ramps/Daily Drive <i>Signalized</i>	AM	20	B	20.3	B	0.3	NO	NO	-	-	-	-	-
		PM	20.9	B	21.9	C	1.0	NO	NO	-	-	-	-	-

Notes:

Analysis performed using Highway Capacity Manual (HCM), 2000 methodology.

[a] The impact at this location is mitigated to a level below significance with implementation of signal timing modifications.

TABLE 22
CSUCI SPECIFIC PLAN REUSE UPDATE
CUMULATIVE (YEAR 2022) PLUS PROJECT INTERSECTION LEVELS OF SERVICE AND IMPACT ANALYSIS

NO.	INTERSECTION	PEAK HOUR	CUMULATIVE (2022)		CUMULATIVE (2022) + PROJECT		EXCEEDS CALTRANS THRESHOLDS?		
			Delay	LOS	Change in Delay?	LOS	Change in Delay	Without Project?	With Project?
5	US 101 Southbound Ramps/Ventura Boulevard <i>Signalized</i>	AM	50	D	53.8	D	3.8	YES	NO
		PM	92.5	F	92.5	F	0.0	YES	NO
7	US 101 Northbound Ramps/Daily Drive <i>Signalized</i>	AM	19.9	B	20.4	C	0.5	NO	NO
		PM	28	C	29.6	C	1.6	NO	NO

Notes:

Analysis performed using Highway Capacity Manual (HCM), 2000 methodology.

Mitigation measures, including operational and physical improvements, were considered and tested to reduce the project impact below a level of significance. Therefore, the project sponsor shall request that Caltrans optimize cycle length and signal timing splits. With this improvement, the intersection would operate at an acceptable LOS C and the impact would be reduced to a less-than-significant level. Table 21 illustrates the results of the mitigation analysis. Detailed LOS calculations for the mitigation analysis are provided in Appendix C.

Please note that this improvement is outside of the control of the Cal State System and is controlled by Caltrans. However, implementation of improved signal timing is part of Caltrans maintenance of their facilities. As such, the mitigation is considered feasible for the purposes of this assessment.

FREEWAY SEGMENT DAILY TRAFFIC VOLUME ANALYSIS

Utilizing the study assumptions described in Chapter 3, four freeway segments were also analyzed using the HCM methodology to determine passenger cars per mile per lane and the corresponding level of service, as requested by Caltrans:

1. US-101 Southbound – West of Lewis Road
2. US-101 Southbound – East of Lewis Road
3. US-101 Northbound – West of Lewis Road
4. US-101 Northbound – East of Lewis Road

Peak hour traffic volumes were derived from the Caltrans Traffic Census Program. To assess whether Caltrans thresholds would be exceeded at the study intersections, the Existing (Year 2015) plus Project operating freeway highway segment operating conditions were compared to the Existing (Year 2015) without Project operating conditions. Additionally, the Cumulative (Year 2022) plus Project operating freeway highway segment operating conditions were compared to the Cumulative (Year 2022) without Project operating conditions.

The Caltrans *Guide for the Preparation of Traffic Impact Studies* identifies the LOS C as the target operation LOS for freeway segment operations. As shown in Tables 23 and 24, the Caltrans thresholds would be exceeded under the without project conditions for both Existing (Year 2016) and Cumulative (Year 2022) conditions at each of the analyzed segments in the AM peak hour, PM peak hour, or both. Detailed LOS calculations are provided in Appendix C.

Analyzed freeway segments do not fall below LOS C due to the addition of the Project traffic under Existing (Year 2016) plus Project conditions or under Cumulative (Year 2022) plus Project conditions, therefore there are no project impacts and all locations reflect cumulative impacts.



TABLE 23
CSUCI SPECIFIC PLAN REUSE UPDATE
EXISTING (YEAR 2016) LEVEL OF SERVICE ANALYSIS - FREEWAY HIGHWAY SEGMENTS

ROADWAY SEGMENT	PEAK HOUR	EXISTING (2016)		EXISTING (2016) PLUS PROJECT		EXCEEDS CALTRANS THRESHOLDS?	
		Density (pc/mi/ln)*	LOS	Density (pc/mi/ln)*	LOS	Without Project?	With Project?
1 US 101 Southbound - West of Lewis Road	AM	25	C	25	C	YES	NO
	PM	22	C	22	C	NO	NO
2 US 101 Southbound - East of Lewis Road	AM	27	D	27	D	YES	NO
	PM	22	C	22	C	NO	NO
3 US 101 Northbound - West of Lewis Road	AM	25	C	25	C	NO	NO
	PM	29	D	29	D	YES	NO
4 US 101 Northbound - East of Lewis Road	AM	27	D	27	D	YES	NO
	PM	29	D	29	D	NO	NO

Notes:

* pc/mi/ln denotes passenger cars per mile per lane

TABLE 24
CSUCI SPECIFIC PLAN REUSE UPDATE
CUMULATIVE (YEAR 2022) LEVEL OF SERVICE ANALYSIS - FREEWAY HIGHWAY SEGMENTS

ROADWAY SEGMENT	PEAK HOUR	CUMULATIVE (2022)		CUMULATIVE (2022) PLUS PROJECT		EXCEEDS CALTRANS THRESHOLDS?	
		Density (pc/mi/ln)*	LOS	Density (pc/mi/ln)*	LOS	Without Project?	With Project?
1 US 101 Southbound - West of Lewis Road	AM	28	D	28	D	YES	NO
	PM	24	C	24	C	NO	NO
2 US 101 Southbound - East of Lewis Road	AM	30	D	30	D	YES	NO
	PM	25	C	25	C	NO	NO
3 US 101 Northbound - West of Lewis Road	AM	27	D	27	D	YES	NO
	PM	33	D	33	D	YES	NO
4 US 101 Northbound - East of Lewis Road	AM	30	D	30	D	YES	NO
	PM	33	D	33	D	YES	NO

Notes:

* pc/mi/ln denotes passenger cars per mile per lane

FREEWAY OFF-RAMP QUEUING ANALYSIS

Two freeway off-ramp intersections along US-101 were also analyzed to determine queue lengths at the off-ramps:

1. US-101 Southbound Off-Ramp at Daily Drive
2. US-101 Northbound Off-Ramp at Ventura Boulevard

This analysis presents the calculated 95th Percentile queues in feet for the AM and PM peak hour traffic volumes under each scenario and compares it with the available storage on the freeway off-ramps.

As shown in Table 25 and Table 26, none of the analyzed freeway off-ramp queues exceed the available storage based on 95th percentile queues under Existing (2016) with Project conditions or under Cumulative (2022) with Project conditions, therefore no project or cumulative impacts are found at the freeway off-ramps analyzed. Detailed queuing reports are provided in Appendix C.

TABLE 25
CSUCI SPECIFIC PLAN REUSE UPDATE
EXISTING (YEAR 2016) OFF-RAMP QUEUEING ANALYSIS

RAMP	EXISTING (2016)				EXISTING (2016) PLUS PROJECT				95th Percentile Queue Exceeds Available Storage without Project?	95th Percentile Queue Exceeds Available Storage with Project?
	AM		PM		AM		PM			
	95th Percentile Queue Length (ft)	Available Storage Length (ft)	95th Percentile Queue Length (ft)	Available Storage Length (ft)	95th Percentile Queue Length (ft)	Available Storage Length (ft)	95th Percentile Queue Length (ft)	Available Storage Length (ft)		
US 101 Southbound Off-Ramp at Daily Dr										
Southbound-left	309	800	275	800	317	800	310	800	NO	NO
Southbound-right	42	400	81	400	42	400	81	400	NO	NO
US 101 Northbound Off-Ramp at Ventura Blvd										
Northbound #1 Lane (left-turn lane)	108	950	427	950	112	950	446	950	NO	NO
Northbound #2 Lane (left and right-turn lanes)	50	950	124	950	52	950	142	950	NO	NO

TABLE 26
CSUCI SPECIFIC PLAN REUSE UPDATE
CUMULATIVE (YEAR 2022) OFF-RAMP QUEUEING ANALYSIS

RAMP	CUMULATIVE (2022)				CUMULATIVE (2022) PLUS PROJECT				95th Percentile Queue Exceeds Available Storage without Project?	95th Percentile Queue Exceeds Available Storage with Project?
	AM		PM		AM		PM			
	95th Percentile Queue Length (ft)	Available Storage Length (ft)	95th Percentile Queue Length (ft)	Available Storage Length (ft)	95th Percentile Queue Length (ft)	Available Storage Length (ft)	95th Percentile Queue Length (ft)	Available Storage Length (ft)		
US 101 Southbound Off-Ramp at Daily Dr										
Southbound-left	426	800	310	800	394	800	324	800	NO	NO
Southbound-right	42	400	70	400	41	400	94	400	NO	NO
US 101 Northbound Off-Ramp at Ventura Blvd										
Northbound #1 Lane (left-turn lane)	107	950	456	950	108	950	456	950	NO	NO
Northbound #2 Lane (left and right-turn lanes)	63	950	150	950	63	950	162	950	NO	NO

7. SUMMARY AND CONCLUSIONS

This study was undertaken to analyze the potential traffic impacts of the new planned residential development in the eastern area of CSU Channel Islands campus. The following summarizes the results of the analysis:

- The project proposes the development of a mix of ownership (condominium) and rental (apartments): 120 SFR, 310 apartment units, and 170 senior adult attached townhomes on vacant land.
- Eleven intersections located within the City of Camarillo and/or unincorporated Ventura County were analyzed for this project. The analyzed intersections lie along key access routes. Eight internal roadway segments located in unincorporated Ventura County were also analyzed for this project.
- The proposed project is expected to generate a net increase of 3,789 daily vehicle trips, 282 AM peak hour trips, and 321 PM peak hour trips.
- Analysis of Existing (Year 2016) plus Project conditions indicates that all study intersections will continue to operate at LOS D or better in the AM and PM peak hours. According to the significance criteria used by CSU, no intersections or segments examined in this study would be significantly impacted by project-related trips under Existing (Year 2016) plus Project conditions. The CSU significance criteria was used for the purposes of significance determination, while the local jurisdiction significance criteria are included for purposes of disclosure.
- The Cumulative (Year 2022) without Project base conditions include ambient growth and 17 related projects in the City of Camarillo and unincorporated Ventura County. The analysis of the Cumulative (Year 2022) with Project peak hour conditions indicates that the intersections and segments examined in this study would continue to operate at LOS D or better. According to the significance criteria established by CSU, no study intersections or segments would be significantly impacted under Cumulative (Year 2022) plus Project conditions. The CSU significance criteria was used for the purposes of significance determination, while the local jurisdiction significance criteria are included for purposes of disclosure.
- Additional analysis of potential impacts on the regional transportation system conducted in accordance with VCCMP requirements determined that the project would not have a significant impact on either the CMP arterial highway network or the mainline freeway system.
- Additional analysis of Caltrans facilities located within in the study area was conducted using the methodology and target thresholds set forth by Caltrans. The analysis of two intersections under Caltrans jurisdiction indicates that thresholds set forth by Caltrans would be exceeded based on the addition of project traffic at the intersection of US-101 Southbound Ramps/Ventura Boulevard under Existing (Year 2016) plus Project conditions. The optimization of signal timing at this intersection would mitigate this impact below a level of significance for Existing (Year 2016) plus Project conditions.



- An analysis of four Caltrans freeway segments to determine passengers per mile per lane and corresponding level of service indicates that Caltrans thresholds would not be exceeded under Existing (Year 2016) or Cumulative (Year 2022) conditions due to the addition of project traffic. These Caltrans locations operate at LOS D, exceeding Caltrans target thresholds under Existing (Year 2016) and Cumulative (Year 2022) without project conditions, therefore resulting in cumulative impacts.
- Finally, a queuing analysis of two Caltrans freeway off-ramps at Daily Road and Ventura Boulevard along US-101 indicates that none of the freeway off-ramp queues forecasted would exceed the available storage under Existing (2016) with Project conditions or under Cumulative (2022) with Project conditions.

APPENDIX A COUNTS



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-001

Day: Tuesday

City: Camarillo

Date: 10/25/2016

AM													
NS/EW Streets:	Lewis Rd			Lewis Rd			University Dr			University Dr			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	0	2	0	2	1	0	0	0	0	1	0	1	
7:00 AM	0	59	14	14	135	0	0	0	0	9	0	1	232
7:15 AM	0	59	27	24	134	0	0	0	0	14	0	2	260
7:30 AM	0	109	12	24	134	0	0	0	0	7	0	0	286
7:45 AM	0	93	40	36	126	0	0	0	0	13	0	2	310
8:00 AM	0	75	24	30	113	0	0	0	0	2	0	2	246
8:15 AM	0	78	34	64	97	0	0	0	0	3	0	2	278
8:30 AM	0	35	65	151	95	0	0	0	0	6	0	3	355
8:45 AM	0	46	56	130	61	0	0	0	0	11	0	2	306
TOTAL VOLUMES :	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
APPROACH %'s :	0	554	272	473	895	0	0	0	0	65	0	14	2273
	0.00%	67.07%	32.93%	34.58%	65.42%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	82.28%	0.00%	17.72%	
PEAK HR START TIME :	745 AM												TOTAL
PEAK HR VOL :	0	281	163	281	431	0	0	0	0	24	0	9	1189
PEAK HR FACTOR :	0.835			0.724			0.000			0.550			0.837

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-001

Day: Tuesday

City: Camarillo

Date: 10/25/2016

PM													
NS/EW Streets:	Lewis Rd			Lewis Rd			University Dr			University Dr			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	0	2	0	2	1	0	0	0	0	1	0	1	
4:00 PM	0	140	20	35	65	0	0	0	0	21	0	38	319
4:15 PM	0	159	18	36	76	0	0	0	0	34	0	59	382
4:30 PM	0	164	8	14	69	0	0	0	0	44	0	51	350
4:45 PM	0	142	13	13	92	0	0	0	0	17	0	21	298
5:00 PM	0	151	13	11	111	0	0	0	0	31	0	29	346
5:15 PM	0	154	17	9	118	0	0	0	0	18	0	24	340
5:30 PM	0	140	21	27	109	0	0	0	0	21	0	29	347
5:45 PM	0	93	8	21	68	0	0	0	0	60	0	87	337
TOTAL VOLUMES :	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
APPROACH %'s :	0	1143	118	166	708	0	0	0	0	246	0	338	2719
	0.00%	90.64%	9.36%	18.99%	81.01%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	42.12%	0.00%	57.88%	
PEAK HR START TIME :	415 PM												TOTAL
PEAK HR VOL :	0	616	52	74	348	0	0	0	0	126	0	160	1376
PEAK HR FACTOR :	0.944			0.865			0.000			0.753			0.901

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-002

Day: Tuesday

City: Camarillo

Date: 10/25/2016

AM													
NS/EW Streets:	Lewis Rd			Lewis Rd			Camarillo Dr			Camarillo Dr			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 0	ET 0	ER 0	WL 0	WT 1	WR 0	TOTAL
7:00 AM	0	59	0	47	163	0	0	0	0	3	0	51	323
7:15 AM	0	59	0	74	147	0	0	0	0	1	0	71	352
7:30 AM	0	96	1	68	168	0	0	0	0	4	0	76	413
7:45 AM	0	89	3	91	153	0	0	0	0	2	0	77	415
8:00 AM	0	79	2	74	146	0	0	0	0	1	0	48	350
8:15 AM	0	65	0	111	170	0	0	0	0	0	0	24	370
8:30 AM	0	46	1	109	212	0	0	0	0	3	0	33	404
8:45 AM	0	55	1	88	203	0	0	0	0	2	0	57	406
TOTAL VOLUMES :	NL 0	NT 548	NR 8	SL 662	ST 1362	SR 0	EL 0	ET 0	ER 0	WL 16	WT 0	WR 437	TOTAL 3033
APPROACH %'s :	0.00%	98.56%	1.44%	32.71%	67.29%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	3.53%	0.00%	96.47%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	0	329	6	344	637	0	0	0	0	7	0	225	1548
PEAK HR FACTOR :	0.863			0.873			0.000			0.725			0.933

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-002

Day: Tuesday

City: Camarillo

Date: 10/25/2016

PM													
NS/EW Streets:	Lewis Rd			Lewis Rd			Camarillo Dr			Camarillo Dr			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 0	ET 0	ER 0	WL 0	WT 1	WR 0	TOTAL
4:00 PM	0	154	0	43	106	0	0	0	0	2	0	45	350
4:15 PM	0	219	3	68	122	0	0	0	0	3	0	74	489
4:30 PM	0	223	0	48	103	0	0	0	0	3	0	65	442
4:45 PM	0	163	1	59	103	0	0	0	0	3	0	47	376
5:00 PM	0	186	1	42	115	0	0	0	0	4	0	79	427
5:15 PM	0	183	1	70	115	0	0	0	0	2	0	73	444
5:30 PM	0	162	1	90	114	0	0	0	0	2	0	93	462
5:45 PM	0	170	1	84	102	0	0	0	0	3	0	90	450
TOTAL VOLUMES :	0	1460	8	504	880	0	0	0	0	22	0	566	3440
APPROACH %'s :	0.00%	99.46%	0.54%	36.42%	63.58%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	3.74%	0.00%	96.26%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	701	4	286	446	0	0	0	0	11	0	335	1783
PEAK HR FACTOR :	0.943			0.897			0.000			0.911			0.965

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-003

Day: Tuesday

City: Camarillo

Date: 10/25/2016

NS/EW Streets:		AM												
		Lewis Rd			Lewis Rd			Cawelti Rd			Cawelti Rd			
NORTHBOUND						SOUTHBOUND			EASTBOUND			WESTBOUND		
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL	
7:00 AM	5	82	0	0	207	2	2	0	13	0	0	0	311	
7:15 AM	10	123	0	0	196	3	4	0	16	0	0	0	352	
7:30 AM	11	182	0	0	225	3	8	0	22	0	0	0	451	
7:45 AM	17	163	0	0	243	4	7	0	32	0	0	0	466	
8:00 AM	5	111	0	0	218	4	10	0	20	0	0	0	368	
8:15 AM	3	114	0	0	256	1	1	0	40	0	0	0	415	
8:30 AM	8	83	0	0	327	1	3	0	33	0	0	0	455	
8:45 AM	13	88	0	0	219	2	5	0	24	0	0	1	352	
TOTAL VOLUMES :	NL 72	NT 946	NR 0	SL 0	ST 1891	SR 20	EL 40	ET 0	ER 200	WL 0	WT 0	WR 1	TOTAL 3170	
APPROACH %'s :	7.07%	92.93%	0.00%	0.00%	98.95%	1.05%	16.67%	0.00%	83.33%	0.00%	0.00%	100.00%		
PEAK HR START TIME :	745 AM												TOTAL	
PEAK HR VOL :	33	471	0	0	1044	10	21	0	125	0	0	0	1704	
PEAK HR FACTOR :	0.700			0.803			0.890			0.000			0.914	

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-003

Day: Tuesday

City: Camarillo

Date: 10/25/2016

PM													
NS/EW Streets:	Lewis Rd			Lewis Rd			Cawelti Rd			Cawelti Rd			
NORTHBOUND				SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
4:00 PM	18	185	0	0	158	3	2	0	22	0	0	0	388
4:15 PM	18	260	0	0	167	7	4	0	14	0	0	0	470
4:30 PM	20	253	0	0	129	9	5	0	9	0	0	0	425
4:45 PM	13	215	0	0	152	13	3	0	12	0	0	0	408
5:00 PM	35	213	0	0	140	16	5	0	12	0	0	0	421
5:15 PM	19	253	0	0	160	27	5	0	12	0	0	0	476
5:30 PM	25	221	0	0	189	19	3	0	26	0	0	0	483
5:45 PM	23	243	0	0	155	16	2	0	19	0	0	0	458
TOTAL VOLUMES :	NL 171	NT 1843	NR 0	SL 0	ST 1250	SR 110	EL 29	ET 0	ER 126	WL 0	WT 0	WR 0	TOTAL 3529
APPROACH %'s :	8.49%	91.51%	0.00%	0.00%	91.91%	8.09%	18.71%	0.00%	81.29%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	102	930	0	0	644	78	15	0	69	0	0	0	1838
PEAK HR FACTOR :	0.949			0.868			0.724			0.000			0.951

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-004

Day: Tuesday

City: Camarillo

Date: 10/25/2016

AM													
NS/EW Streets:	Lewis Rd			Lewis Rd			Pleasant Valley Rd			Pleasant Valley Rd			
NORTHBOUND				SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 2	ET 2	ER 1	WL 2	WT 2	WR 1	TOTAL
7:00 AM	16	45	43	18	137	21	39	93	3	80	62	27	584
7:15 AM	12	51	55	22	145	59	60	107	0	87	85	45	728
7:30 AM	13	93	69	30	130	57	47	155	0	131	93	58	876
7:45 AM	18	80	83	34	133	63	75	161	7	102	89	63	908
8:00 AM	15	64	71	34	141	46	40	135	4	81	89	75	795
8:15 AM	13	44	45	29	171	53	47	118	3	87	64	30	704
8:30 AM	10	37	40	42	189	36	48	82	3	109	58	31	685
8:45 AM	11	42	31	21	140	32	51	84	7	73	57	30	579
TOTAL VOLUMES :	NL 108	NT 456	NR 437	SL 230	ST 1186	SR 367	EL 407	ET 935	ER 27	WL 750	WT 597	WR 359	TOTAL 5859
APPROACH %'s :	10.79%	45.55%	43.66%	12.90%	66.52%	20.58%	29.73%	68.30%	1.97%	43.96%	34.99%	21.04%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	58	288	278	120	549	225	222	558	11	401	356	241	3307
PEAK HR FACTOR :	0.862			0.972			0.814			0.885			0.911

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-004

Day: Tuesday

City: Camarillo

Date: 10/25/2016

NS/EW Streets:		PM												
		Lewis Rd			Lewis Rd			Pleasant Valley Rd			Pleasant Valley Rd			
NORTHBOUND				SOUTHBOUND			EASTBOUND			WESTBOUND				
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 2	ET 2	ER 1	WL 2	WT 2	WR 1	TOTAL	
4:00 PM	9	98	87	17	103	56	44	69	3	66	183	54	789	
4:15 PM	11	144	129	35	104	49	50	99	8	48	148	53	878	
4:30 PM	22	145	115	32	98	76	44	97	8	69	211	67	984	
4:45 PM	16	100	75	33	80	77	44	105	6	65	189	55	845	
5:00 PM	19	101	91	27	88	99	55	101	2	71	187	59	900	
5:15 PM	15	108	125	21	108	87	56	87	3	84	167	72	933	
5:30 PM	18	104	97	26	132	65	63	78	2	66	149	32	832	
5:45 PM	14	114	127	30	92	62	36	87	3	61	142	47	815	
TOTAL VOLUMES :	NL 124	NT 914	NR 846	SL 221	ST 805	SR 571	EL 392	ET 723	ER 35	WL 530	WT 1376	WR 439	TOTAL 6976	
APPROACH %'s :	6.58%	48.51%	44.90%	13.84%	50.41%	35.75%	34.09%	62.87%	3.04%	22.60%	58.68%	18.72%		
PEAK HR START TIME :	430 PM													TOTAL
PEAK HR VOL :	72	454	406	113	374	339	199	390	19	289	754	253	3662	
PEAK HR FACTOR :	0.826			0.956			0.962			0.934			0.930	

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-007

Day: Tuesday

City: Camarillo

Date: 10/25/2016

AM													
NS/EW Streets:	US 101 SB Ramps (Lewis I/C)			US 101 SB Ramps (Lewis I/C)			Ventura Blvd			Ventura Blvd			
NORTHBOUND				SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 2	ST 0	SR 1	EL 2	ET 1	ER 0	WL 1	WT 1.5	WR 0.5	TOTAL
7:00 AM	3	2	7	89	0	31	96	63	6	2	19	53	371
7:15 AM	5	1	1	111	3	31	119	42	6	12	20	95	446
7:30 AM	1	1	1	112	9	53	151	64	13	21	31	121	578
7:45 AM	0	1	4	167	13	61	147	91	20	42	50	111	707
8:00 AM	2	0	2	144	1	50	111	77	4	7	51	78	527
8:15 AM	2	0	0	152	1	53	85	67	8	7	33	82	490
8:30 AM	0	0	0	147	2	54	110	83	1	1	49	66	513
8:45 AM	0	0	0	134	1	70	83	50	0	0	55	57	450
TOTAL VOLUMES :	NL 13	NT 5	NR 15	SL 1056	ST 30	SR 403	EL 902	ET 537	ER 58	WL 92	WT 308	WR 663	TOTAL 4082
APPROACH %'s :	39.39%	15.15%	45.45%	70.92%	2.01%	27.07%	60.25%	35.87%	3.87%	8.65%	28.97%	62.37%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	5	2	7	575	24	217	494	299	45	77	165	392	2302
PEAK HR FACTOR :	0.700			0.846			0.812			0.781			0.814

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-007

Day: Tuesday

City: Camarillo

Date: 10/25/2016

NS/EW Streets:		PM											
		US 101 SB Ramps (Lewis I/C)			US 101 SB Ramps (Lewis I/C)			Ventura Blvd			Ventura Blvd		
NORTHBOUND				SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 2	ST 0	SR 1	EL 2	ET 1	ER 0	WL 1	WT 1.5	WR 0.5	TOTAL
4:00 PM	2	1	0	124	0	78	91	60	3	1	62	41	463
4:15 PM	0	0	2	112	1	86	78	73	6	8	67	65	498
4:30 PM	0	0	3	115	0	83	95	69	2	3	96	58	524
4:45 PM	1	1	3	109	0	70	79	78	5	4	74	50	474
5:00 PM	1	0	3	126	0	86	98	74	7	7	86	43	531
5:15 PM	1	0	3	143	2	88	101	76	0	4	86	58	562
5:30 PM	3	0	0	154	1	77	101	67	1	1	90	44	539
5:45 PM	1	0	1	116	0	93	101	62	2	2	52	42	472
TOTAL VOLUMES :	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	9	2	15	999	4	661	744	559	26	30	613	401	4063
APPROACH %'s :	34.62%	7.69%	57.69%	60.04%	0.24%	39.72%	55.98%	42.06%	1.96%	2.87%	58.72%	38.41%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	6	1	9	532	3	321	379	295	13	16	336	195	2106
PEAK HR FACTOR :	0.800			0.918			0.959			0.924			0.937

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-005

Day: Tuesday

City: Camarillo

Date: 10/25/2016

AM													
NS/EW Streets:	Lewis Rd			Lewis Rd			Ventura Blvd			Ventura Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1.5	ET 0.5	ER 1	WL 0.5	WT 0.5	WR 1	TOTAL
7:00 AM	19	105	1	2	160	79	123	5	26	1	2	4	527
7:15 AM	23	125	2	3	201	82	126	4	22	2	3	2	595
7:30 AM	29	193	1	5	169	119	133	7	51	1	3	2	713
7:45 AM	48	124	2	3	155	129	179	0	77	2	3	5	727
8:00 AM	53	117	3	4	129	107	141	8	90	2	1	1	656
8:15 AM	47	79	2	7	141	89	106	5	102	2	2	0	582
8:30 AM	31	68	2	1	130	67	108	6	108	3	3	0	527
8:45 AM	34	77	1	2	89	64	87	5	69	0	2	0	430
TOTAL VOLUMES :	284	888	14	27	1174	736	1003	40	545	13	19	14	4757
APPROACH %'s :	23.95%	74.87%	1.18%	1.39%	60.61%	38.00%	63.16%	2.52%	34.32%	28.26%	41.30%	30.43%	

PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	153	559	8	15	654	437	579	19	240	7	10	10	2691
PEAK HR FACTOR :	0.807			0.944			0.818			0.675			0.925

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-005

Day: Tuesday

City: Camarillo

Date: 10/25/2016

PM														
NS/EW Streets:	Lewis Rd			Lewis Rd			Ventura Blvd			Ventura Blvd				
NORTHBOUND				SOUTHBOUND			EASTBOUND			WESTBOUND				
LANES:	NL 2	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1.5	ET 0.5	ER 1	WL 0.5	WT 0.5	WR 1	TOTAL	
4:00 PM	58	184	4	4	137	67	117	6	54	1	2	5	639	
4:15 PM	61	184	6	1	131	63	103	3	68	0	2	1	623	
4:30 PM	67	210	5	1	138	65	127	6	47	4	10	0	680	
4:45 PM	60	196	1	0	129	53	142	4	57	2	8	0	652	
5:00 PM	67	204	1	3	133	71	119	3	64	1	3	2	671	
5:15 PM	74	171	4	3	134	67	172	0	67	0	4	4	700	
5:30 PM	64	179	0	4	122	62	137	6	80	0	3	0	657	
5:45 PM	49	113	1	7	79	37	125	7	52	5	8	3	486	
TOTAL VOLUMES :	NL 500	NT 1441	NR 22	SL 23	ST 1003	SR 485	EL 1042	ET 35	ER 489	WL 13	WT 40	WR 15	TOTAL 5108	
APPROACH %'s :	25.47%	73.41%	1.12%	1.52%	66.38%	32.10%	66.54%	2.23%	31.23%	19.12%	58.82%	22.06%		
PEAK HR START TIME :	430 PM													TOTAL
PEAK HR VOL :	268	781	11	7	534	256	560	13	235	7	25	6	2703	
PEAK HR FACTOR :	0.940			0.963			0.845			0.679			0.965	

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-008

Day: Tuesday

City: Camarillo

Date: 10/25/2016

NS/EW Streets:		AM												
		US 101 NB Ramps (Lewis I/C)			US 101 NB Ramps (Lewis I/C)			Daily Dr			Daily Dr			
NORTHBOUND						SOUTHBOUND			EASTBOUND			WESTBOUND		
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	
	2	0	1	0	0	0	0	1	1	2	1	0		
7:00 AM	41	0	28	0	0	0	0	26	43	96	27	0	261	
7:15 AM	51	0	66	0	0	0	0	27	40	122	24	0	330	
7:30 AM	97	0	75	0	0	0	0	37	63	139	31	0	442	
7:45 AM	138	0	90	0	0	0	0	27	59	108	53	0	475	
8:00 AM	80	0	50	0	0	0	0	27	48	122	55	0	382	
8:15 AM	227	0	65	0	0	0	0	39	36	85	37	0	489	
8:30 AM	268	0	84	0	0	0	0	30	20	63	35	0	500	
8:45 AM	132	0	66	0	0	0	0	24	34	77	40	0	373	
TOTAL VOLUMES :	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	
	1034	0	524	0	0	0	0	237	343	812	302	0	3252	
APPROACH %'s :	66.37%	0.00%	33.63%	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	40.86%	59.14%	72.89%	27.11%	0.00%		
PEAK HR START TIME :	745 AM													TOTAL
PEAK HR VOL :	713	0	289	0	0	0	0	123	163	378	180	0	1846	
PEAK HR FACTOR :	0.712			0.000			0.831			0.788			0.923	

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-008

Day: Tuesday

City: Camarillo

Date: 10/25/2016

PM													
NS/EW Streets:	US 101 NB Ramps (Lewis I/C)			US 101 NB Ramps (Lewis I/C)			Daily Dr			Daily Dr			
NORTHBOUND				SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	2	0	1	0	0	0	0	1	1	2	1	0	
4:00 PM	243	0	64	0	0	0	0	48	11	62	61	0	489
4:15 PM	223	0	65	0	0	0	0	46	30	76	67	0	507
4:30 PM	227	0	80	0	0	0	0	58	26	106	62	0	559
4:45 PM	261	0	67	0	0	0	0	46	31	60	57	0	522
5:00 PM	252	0	93	0	0	0	0	41	26	86	80	0	578
5:15 PM	314	0	96	0	0	0	0	49	16	86	77	0	638
5:30 PM	259	0	67	0	0	0	0	53	25	70	72	0	546
5:45 PM	265	0	70	0	0	0	0	39	24	75	73	0	546
TOTAL VOLUMES :	NL 2044	NT 0	NR 602	SL 0	ST 0	SR 0	EL 0	ET 380	ER 189	WL 621	WT 549	WR 0	TOTAL 4385
APPROACH %'s :	77.25%	0.00%	22.75%	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	66.78%	33.22%	53.08%	46.92%	0.00%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	1090	0	326	0	0	0	0	182	91	317	302	0	2308
PEAK HR FACTOR :	0.863			0.000			0.875			0.932			0.904

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-006

Day: Tuesday

City: Camarillo

Date: 10/25/2016

AM													
NS/EW Streets:	Lewis Rd			Lewis Rd			Daily Dr			Daily Dr			
NORTHBOUND				SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 0	ST 3	SR 0	EL 1.5	ET 0.5	ER 1	WL 0	WT 1	WR 0	TOTAL
7:00 AM	30	186	0	0	185	94	41	2	36	1	1	1	577
7:15 AM	46	226	0	0	254	109	49	3	55	1	2	0	745
7:30 AM	61	283	0	1	271	101	48	6	38	5	2	0	816
7:45 AM	53	241	0	0	217	98	61	1	45	3	1	1	721
8:00 AM	52	193	0	0	209	105	57	7	46	0	1	0	670
8:15 AM	32	149	0	0	183	91	41	3	41	1	2	0	543
8:30 AM	47	143	0	1	168	83	56	3	40	0	3	0	544
8:45 AM	41	115	2	0	110	48	53	1	19	3	1	0	393
TOTAL VOLUMES :	NL 362	NT 1536	NR 2	SL 2	ST 1597	SR 729	EL 406	ET 26	ER 320	WL 14	WT 13	WR 2	TOTAL 5009
APPROACH %'s :	19.05%	80.84%	0.11%	0.09%	68.60%	31.31%	53.99%	3.46%	42.55%	48.28%	44.83%	6.90%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	212	943	0	1	951	413	215	17	184	9	6	1	2952
PEAK HR FACTOR :	0.839			0.915			0.945			0.571			0.904

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-006

Day: Tuesday

City: Camarillo

Date: 10/25/2016

PM													
NS/EW Streets:	Lewis Rd			Lewis Rd			Daily Dr			Daily Dr			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 0	ST 3	SR 0	EL 1.5	ET 0.5	ER 1	WL 0	WT 1	WR 0	TOTAL
4:00 PM	73	223	0	0	152	65	59	1	48	3	3	2	629
4:15 PM	69	257	1	0	162	84	62	1	39	2	7	0	684
4:30 PM	74	243	2	0	157	78	87	2	39	2	1	0	685
4:45 PM	67	260	1	1	148	70	88	0	47	1	4	1	688
5:00 PM	88	262	0	0	150	51	74	1	41	1	1	0	669
5:15 PM	67	255	1	0	166	64	84	5	66	2	6	0	716
5:30 PM	91	255	0	0	127	60	89	0	45	0	1	0	668
5:45 PM	59	144	0	0	88	61	73	0	17	3	8	5	458
TOTAL VOLUMES :	588	1899	5	1	1150	533	616	10	342	14	31	8	5197
APPROACH %'s :	23.60%	76.20%	0.20%	0.06%	68.29%	31.65%	63.64%	1.03%	35.33%	26.42%	58.49%	15.09%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	296	1020	4	1	621	263	333	8	193	6	12	1	2758
PEAK HR FACTOR :	0.943			0.941			0.861			0.594			0.963

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-009

Day: Tuesday

City: Camarillo

Date: 10/25/2016

AM													
NS/EW Streets:	University Dr			University Dr			Channel Islands Dr			Channel Islands Dr			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	0	1	0	1	1	0	0	0	0	0	1	0	
7:00 AM	0	16	1	6	34	0	0	0	0	3	0	26	86
7:15 AM	0	25	0	2	80	0	0	0	0	6	0	48	161
7:30 AM	0	38	0	3	69	0	0	0	0	4	0	43	157
7:45 AM	0	33	2	8	97	0	0	0	0	3	0	48	191
8:00 AM	0	13	0	8	82	0	0	0	0	1	0	21	125
8:15 AM	0	24	1	7	99	0	0	0	0	3	0	16	150
8:30 AM	0	35	0	15	92	0	0	0	0	0	0	17	159
8:45 AM	0	30	0	2	58	0	0	0	0	0	0	14	104
TOTAL VOLUMES :	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
APPROACH %'s :	0	214	4	51	611	0	0	0	0	20	0	233	1133
	0.00%	98.17%	1.83%	7.70%	92.30%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	7.91%	0.00%	92.09%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	0	109	2	21	328	0	0	0	0	14	0	160	634
PEAK HR FACTOR :	0.730			0.831			0.000			0.806			0.830

CONTROL : 1-Way stop(WB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-009

Day: Tuesday

City: Camarillo

Date: 10/25/2016

PM													
NS/EW Streets:	University Dr			University Dr			Channel Islands Dr			Channel Islands Dr			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	0	1	0	1	1	0	0	0	0	0	1	0	
4:00 PM	0	51	1	20	47	0	0	0	0	1	0	12	132
4:15 PM	0	60	2	23	40	0	0	0	0	1	0	9	135
4:30 PM	0	49	2	17	22	0	0	0	0	3	0	10	103
4:45 PM	0	50	1	24	28	0	0	0	0	1	0	16	120
5:00 PM	0	56	3	21	40	0	0	0	0	1	0	14	135
5:15 PM	0	47	6	27	28	0	0	0	0	1	0	7	116
5:30 PM	0	49	3	32	51	0	0	0	0	1	0	11	147
5:45 PM	0	121	1	29	53	0	0	0	0	2	0	14	220
TOTAL VOLUMES :	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
APPROACH %'s :	0	483	19	193	309	0	0	0	0	11	0	93	1108
	0.00%	96.22%	3.78%	38.45%	61.55%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	10.58%	0.00%	89.42%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	273	13	109	172	0	0	0	0	5	0	46	618
PEAK HR FACTOR :	0.586			0.846			0.000			0.797			0.702

CONTROL : 1-Way stop(WB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-010

Day: Tuesday

City: Camarillo

Date: 10/25/2016

AM													
NS/EW Streets:	Santa Rosa Island Dr			Santa Rosa Island Dr			Channel Islands Dr			Channel Islands Dr			
NORTHBOUND				SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	0	0	0	0	1	0	0	1	0	0	1	0	
7:00 AM	0	0	0	0	0	0	0	5	0	0	29	0	34
7:15 AM	0	0	0	0	0	0	0	4	0	0	56	0	60
7:30 AM	0	0	0	0	0	0	0	4	0	0	47	0	51
7:45 AM	0	0	0	0	0	0	0	9	0	0	49	0	58
8:00 AM	0	0	0	0	0	0	0	9	0	0	22	0	31
8:15 AM	0	0	0	0	0	0	0	8	0	0	21	0	29
8:30 AM	0	0	0	0	0	0	0	13	0	0	16	0	29
8:45 AM	0	0	0	0	0	0	0	4	0	0	15	0	19
TOTAL VOLUMES :	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	0	0	0	0	0	0	0	56	0	0	255	0	311
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	22	0	0	181	0	203
PEAK HR FACTOR :	0.000			0.000			0.611			0.808			0.846

CONTROL : 3-Way yield

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-010

Day: Tuesday

City: Camarillo

Date: 10/25/2016

NS/EW Streets:		PM												
		Santa Rosa Island Dr			Santa Rosa Island Dr			Channel Islands Dr			Channel Islands Dr			
NORTHBOUND						SOUTHBOUND			EASTBOUND			WESTBOUND		
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	
	0	0	0	0	1	0	0	1	0	0	1	0		
4:00 PM	0	0	0	0	0	0	0	21	0	0	13	0	34	
4:15 PM	0	0	0	0	0	0	0	27	0	0	10	0	37	
4:30 PM	0	0	0	0	0	0	0	20	0	0	13	0	33	
4:45 PM	0	0	0	0	0	0	0	23	0	0	17	0	40	
5:00 PM	0	0	0	0	0	0	0	26	0	0	15	0	41	
5:15 PM	0	0	0	0	0	0	0	30	0	1	8	0	39	
5:30 PM	0	0	0	0	0	0	0	37	0	1	12	0	50	
5:45 PM	0	0	0	0	0	0	0	28	0	0	16	0	44	
TOTAL VOLUMES :	NL 0	NT 0	NR 0	SL 0	ST 0	SR 0	EL 0	ET 212	ER 0	WL 2	WT 104	WR 0	TOTAL 318	
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	100.00%	0.00%	1.89%	98.11%	0.00%		
PEAK HR START TIME :	500 PM													TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	121	0	2	51	0	174	
PEAK HR FACTOR :	0.000			0.000			0.818			0.828			0.870	

CONTROL : 3-Way yield

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-011

Day: Tuesday

City: Camarillo

Date: 10/25/2016

AM													
NS/EW Streets:	San Miguel Island Dr			San Miguel Island Dr			Channel Islands Dr			Channel Islands Dr			
NORTHBOUND				SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	0	0	0	0	1	0	0	1	0	0	1	0	
7:00 AM	0	0	0	0	0	0	0	4	0	0	19	0	23
7:15 AM	0	0	0	0	0	0	1	5	0	0	37	0	43
7:30 AM	0	0	0	0	0	0	0	2	0	0	27	0	29
7:45 AM	0	0	0	0	0	0	0	8	0	0	34	0	42
8:00 AM	0	0	0	0	0	0	0	5	0	0	15	0	20
	0	0	0	0	0	0	1	20	0	0	113	0	
8:15 AM	0	0	0	0	0	0	0	8	0	0	16	0	24
8:30 AM	0	0	0	0	0	0	0	11	0	0	9	0	20
8:45 AM	0	0	0	0	0	0	0	2	0	0	6	0	8
TOTAL VOLUMES :	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	0	0	0	0	0	0	2	65	0	0	276	0	343
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.99%	97.01%	0.00%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	0	0	0	0	0	0	1	19	0	0	117	0	137
PEAK HR FACTOR :	0.000			0.000			0.625			0.791			0.797

CONTROL : 3-Way yield

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5704-011

Day: Tuesday

City: Camarillo

Date: 10/25/2016

NS/EW Streets:		PM												
		San Miguel Island Dr			San Miguel Island Dr			Channel Islands Dr			Channel Islands Dr			
NORTHBOUND						SOUTHBOUND			EASTBOUND			WESTBOUND		
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	
	0	0	0	0	1	0	0	1	0	0	1	0		
4:00 PM	0	0	0	0	0	0	0	9	0	0	7	0	16	
4:15 PM	0	0	0	0	0	0	0	14	0	0	6	0	20	
4:30 PM	0	0	0	0	0	0	0	13	0	0	7	0	20	
4:45 PM	0	0	0	0	0	0	0	16	0	0	6	0	22	
5:00 PM	0	0	0	0	0	0	0	19	0	0	12	0	31	
5:15 PM	0	0	0	0	0	0	0	20	0	0	9	0	29	
5:30 PM	0	0	0	0	0	0	0	20	0	0	8	0	28	
5:45 PM	0	0	0	0	0	0	0	17	0	0	13	0	30	
TOTAL VOLUMES :	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	
	0	0	0	0	0	0	0	128	0	0	68	0	196	
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%		
PEAK HR START TIME :	500 PM												TOTAL	
PEAK HR VOL :	0	0	0	0	0	0	0	76	0	0	42	0	118	
PEAK HR FACTOR :	0.000			0.000			0.950			0.808			0.952	

CONTROL : 3-Way yield

APPENDIX B
TURNING MOVEMENT VOLUMES



CSU SPECIFIC PLAN REUSE UPDATE
EXISTING (YEAR 2016) TURNING MOVEMENT COUNT SUMMARY

Intersection	N-S Street	E-W Street	AM											
			SB_R	SB_T	SB_L	WB_R	WB_T	WB_L	NB_R	NB_T	NB_L	EB_R	EB_T	EB_L
			1	2	3	4	5	6	7	8	9	10	11	12
1	Lewis Road	University Dr	0	507	114	6	0	36	103	336	0	0	0	0
2	Lewis Road	Camarillo Street	0	614	307	272	0	8	6	323	0	0	0	0
3	Lewis Road	Cawelti Road	14	882	0	0	0	0	0	579	43	90	0	29
4	Lewis Rd	Pleasant Valley Rd	225	549	120	241	356	401	278	288	58	11	558	222
5	US-101 SB Ramps	Ventura Blvd	195	26	534	405	152	82	8	3	8	43	274	528
6	Lewis Road	Ventura Blvd	437	654	15	10	10	7	8	559	153	240	19	579
7	US-101 NB Ramps	Daily Dr	0	0	0	0	163	491	281	0	366	210	118	0
8	Lewis Road	Daily Dr	413	951	1	1	6	9	0	943	212	184	17	215
9	Camarillo Street	Channel Islands Dr	0	328	21	160	0	14	2	109	0	0	0	0
10	Santa Rosa Island Dr	Channel Islands Dr	0	0	0	0	174	0	0	0	0	0	26	0
11	San Miguel Island Dr	Channel Islands Dr	0	0	0	0	113	0	0	0	0	0	20	1

Intersection	N-S Street	E-W Street	PM											
			SB_R	SB_T	SB_L	WB_R	WB_T	WB_L	NB_R	NB_T	NB_L	EB_R	EB_T	EB_L
			1	2	3	4	5	6	7	8	9	10	11	12
1	Lewis Road	University Dr	0	406	68	169	0	130	59	538	0	0	0	0
2	Lewis Road	Camarillo Street	0	446	286	335	0	11	4	701	0	0	0	0
3	Lewis Road	Cawelti Road	78	644	0	0	0	0	0	930	102	69	0	15
4	Lewis Rd	Pleasant Valley Rd	313	420	104	210	645	282	440	427	66	10	353	210
5	US-101 SB Ramps	Ventura Blvd	344	3	539	187	314	14	7	0	6	10	279	401
6	Lewis Road	Ventura Blvd	237	468	17	9	18	6	6	667	254	263	16	553
7	US-101 NB Ramps	Daily Dr	0	0	0	0	302	317	326	0	1090	91	182	0
8	Lewis Road	Daily Dr	236	531	0	5	16	6	1	916	305	169	6	320
9	Camarillo Street	Channel Islands Dr	0	172	109	46	0	5	13	273	0	0	0	0
10	Santa Rosa Island Dr	Channel Islands Dr	0	0	0	0	51	2	0	0	0	0	121	0
11	San Miguel Island Dr	Channel Islands Dr	0	0	0	0	42	0	0	0	0	0	76	0

CSU SPECIFIC PLAN REUSE UPDATE EXISTING (YEAR 2016) PLUS PROJECT TURNING MOVEMENT COUNT SUMMARY														
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Intersection	N-S Street	E-W Street	AM											
			SB_R	SB_T	SB_L	WB_R	WB_T	WB_L	NB_R	NB_T	NB_L	EB_R	EB_T	EB_L
			1	2	3	4	5	6	7	8	9	10	11	12
1	Lewis Road	University Dr	0	507	114	6	0	51	108	336	0	0	0	0
2	Lewis Road	Camarillo Street	0	614	363	450	0	8	6	323	0	0	0	0
3	Lewis Road	Cawelti Road	14	936	0	0	0	0	0	751	49	92	0	29
4	Lewis Rd	Pleasant Valley Rd	225	586	120	241	356	404	289	406	101	24	558	222
5	US-101 SB Ramps	Ventura Blvd	195	26	541	437	163	82	8	3	8	43	277	528
6	Lewis Road	Ventura Blvd	437	681	15	10	10	7	8	634	196	250	19	579
7	US-101 NB Ramps	Daily Dr	0	0	0	0	185	513	291	0	366	210	125	0
8	Lewis Road	Daily Dr	413	961	1	1	6	9	0	975	255	201	17	215
9	Camarillo Street	Channel Islands Dr	0	328	77	338	0	51	13	109	0	0	0	0
10	Santa Rosa Island Dr	Channel Islands Dr	178	0	0	0	211	0	0	0	0	0	37	56
11	San Miguel Island Dr	Channel Islands Dr	37	0	0	0	113	0	0	0	0	0	20	12

Intersection	N-S Street	E-W Street	PM											
			SB_R	SB_T	SB_L	WB_R	WB_T	WB_L	NB_R	NB_T	NB_L	EB_R	EB_T	EB_L
			1	2	3	4	5	6	7	8	9	10	11	12
1	Lewis Road	University Dr	0	406	68	169	0	138	73	538	0	0	0	0
2	Lewis Road	Camarillo Street	0	446	454	434	0	11	4	701	0	0	0	0
3	Lewis Road	Cawelti Road	78	806	0	0	0	0	0	1025	106	75	0	15
4	Lewis Rd	Pleasant Valley Rd	313	531	104	210	645	292	446	492	90	50	353	210
5	US-101 SB Ramps	Ventura Blvd	344	3	559	205	320	14	7	0	6	10	289	401
6	Lewis Road	Ventura Blvd	237	549	17	9	18	6	6	709	278	293	16	553
7	US-101 NB Ramps	Daily Dr	0	0	0	0	314	329	356	0	1090	91	202	0
8	Lewis Road	Daily Dr	236	561	0	5	16	6	1	934	329	220	6	320
9	Camarillo Street	Channel Islands Dr	0	172	277	145	0	25	47	273	0	0	0	0
10	Santa Rosa Island Dr	Channel Islands Dr	99	0	0	0	71	2	0	0	0	0	155	168
11	San Miguel Island Dr	Channel Islands Dr	20	0	0	0	42	0	0	0	0	0	76	34

CSU SPECIFIC PLAN REUSE UPDATE														
CUMULATIVE (2022) TURNING MOVEMENT COUNT SUMMARY														
Intersection	N-S Street	E-W Street	AM											
			SB_R	SB_T	SB_L	WB_R	WB_T	WB_L	NB_R	NB_T	NB_L	EB_R	EB_T	EB_L
			1	2	3	4	5	6	7	8	9	10	11	12
1	Lewis Road	University Dr	0	543	211	32	0	40	117	362	0	0	0	0
2	Lewis Road	Camarillo Street	0	743	328	289	0	8	6	370	0	0	0	0
3	Lewis Road	Cawelti Road	15	1037	0	0	0	0	0	646	47	99	0	31
4	Lewis Rd	Pleasant Valley Rd	270	653	134	259	381	431	297	328	69	36	594	249
5	US-101 SB Ramps	Ventura Blvd	253	28	690	527	238	87	8	3	8	46	349	585
6	Lewis Road	Ventura Blvd	537	793	16	11	11	7	8	733	257	320	20	728
7	US-101 NB Ramps	Daily Dr	0	0	0	0	199	658	466	0	389	223	155	0
8	Lewis Road	Daily Dr	471	1068	1	1	6	10	0	1123	356	309	18	312
9	Camarillo Street	Channel Islands Dr	0	348	22	170	0	15	2	116	0	0	0	0
10	Santa Rosa Island Dr	Channel Islands Dr	0	0	0	0	185	0	0	0	0	0	28	0
11	San Miguel Island Dr	Channel Islands Dr	0	0	0	0	120	0	0	0	0	0	21	1

Intersection	N-S Street	E-W Street	PM											
			SB_R	SB_T	SB_L	WB_R	WB_T	WB_L	NB_R	NB_T	NB_L	EB_R	EB_T	EB_L
			1	2	3	4	5	6	7	8	9	10	11	12
1	Lewis Road	University Dr	0	436	117	276	0	146	66	576	0	0	0	0
2	Lewis Road	Camarillo Street	0	520	306	356	0	12	4	842	0	0	0	0
3	Lewis Road	Cawelti Road	83	741	0	0	0	0	0	1097	113	75	0	16
4	Lewis Rd	Pleasant Valley Rd	362	487	117	231	686	302	473	531	97	24	378	258
5	US-101 SB Ramps	Ventura Blvd	396	3	700	364	410	15	7	0	6	11	380	473
6	Lewis Road	Ventura Blvd	381	649	18	10	19	6	6	876	380	409	17	664
7	US-101 NB Ramps	Daily Dr	0	0	0	0	359	558	488	0	1157	97	224	0
8	Lewis Road	Daily Dr	342	704	0	5	17	6	1	1048	492	321	6	371
9	Camarillo Street	Channel Islands Dr	0	183	116	49	0	5	14	290	0	0	0	0
10	Santa Rosa Island Dr	Channel Islands Dr	0	0	0	0	54	2	0	0	0	0	128	0
11	San Miguel Island Dr	Channel Islands Dr	0	0	0	0	45	0	0	0	0	0	81	0

CSU SPECIFIC PLAN REUSE UPDATE CUMULATIVE (2022) PLUS PROJECT TURNING MOVEMENT COUNT SUMMARY														
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Intersection	N-S Street	E-W Street	AM											
			SB_R	SB_T	SB_L	WB_R	WB_T	WB_L	NB_R	NB_T	NB_L	EB_R	EB_T	EB_L
			1	2	3	4	5	6	7	8	9	10	11	12
1	Lewis Road	University Dr	0	543	211	32	0	55	122	362	0	0	0	0
2	Lewis Road	Camarillo Street	0	743	383	467	0	8	6	370	0	0	0	0
3	Lewis Road	Cawelti Road	15	1090	0	0	0	0	0	818	53	101	0	31
4	Lewis Rd	Pleasant Valley Rd	270	690	134	259	381	434	307	447	112	50	594	249
5	US-101 SB Ramps	Ventura Blvd	253	28	696	559	249	87	8	3	8	46	352	585
6	Lewis Road	Ventura Blvd	537	820	16	11	11	7	8	808	300	330	20	728
7	US-101 NB Ramps	Daily Dr	0	0	0	0	221	679	476	0	389	223	162	0
8	Lewis Road	Daily Dr	471	1078	1	1	6	10	0	1156	399	326	18	312
9	Camarillo Street	Channel Islands Dr	0	348	78	348	0	51	14	116	0	0	0	0
10	Santa Rosa Island Dr	Channel Islands Dr	178	0	0	0	221	0	0	0	0	0	39	56
11	San Miguel Island Dr	Channel Islands Dr	37	0	0	0	120	0	0	0	0	0	21	12

Intersection	N-S Street	E-W Street	PM											
			SB_R	SB_T	SB_L	WB_R	WB_T	WB_L	NB_R	NB_T	NB_L	EB_R	EB_T	EB_L
			1	2	3	4	5	6	7	8	9	10	11	12
1	Lewis Road	University Dr	0	436	117	276	0	154	81	576	0	0	0	0
2	Lewis Road	Camarillo Street	0	520	473	454	0	12	4	842	0	0	0	0
3	Lewis Road	Cawelti Road	83	902	0	0	0	0	0	1193	116	82	0	16
4	Lewis Rd	Pleasant Valley Rd	362	598	117	231	686	312	479	596	121	65	378	258
5	US-101 SB Ramps	Ventura Blvd	396	3	720	382	416	15	7	0	6	11	390	473
6	Lewis Road	Ventura Blvd	381	730	18	10	19	6	6	917	404	439	17	664
7	US-101 NB Ramps	Daily Dr	0	0	0	0	371	570	518	0	1157	97	244	0
8	Lewis Road	Daily Dr	342	734	0	5	17	6	1	1066	516	371	6	371
9	Camarillo Street	Channel Islands Dr	0	183	283	148	0	26	48	290	0	0	0	0
10	Santa Rosa Island Dr	Channel Islands Dr	99	0	0	0	74	2	0	0	0	0	163	168
11	San Miguel Island Dr	Channel Islands Dr	20	0	0	0	45	0	0	0	0	0	81	34

APPENDIX C
LEVEL OF SERVICE AND ANALYSIS WORKSHEETS



Scenario Report

Scenario: E

Command: E

Volume: E

Geometry: Base

Impact Fee: Default Impact Fee

Trip Generation: Default Trip Generation

Trip Distribution: Default Trip Distribution

Paths: Default Path

Routes: Default Route

Configuration: Default Configuration

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Impact Analysis Report
 Level Of Service

Intersection	Base Del/ LOS Veh	V/ C	Future Del/ LOS Veh	V/ C	Change in
# 1 Lewis Rd & University Dr	A xxxxx	0.339	A xxxxx	0.339	+ 0.000 V/C
# 2 Lewis Rd & Camarillo St	A xxxxx	0.470	A xxxxx	0.470	+ 0.000 V/C
# 3 Lewis Rd & Cawelti Rd	A xxxxx	0.381	A xxxxx	0.381	+ 0.000 V/C
# 4 Lewis Rd & Pleasant Valley Rd	A xxxxx	0.548	A xxxxx	0.548	+ 0.000 V/C
# 5 US-101 SB Ramps & Ventura Bl	A xxxxx	0.592	A xxxxx	0.592	+ 0.000 V/C
# 6 Lewis Rd & Ventura Bl	A xxxxx	0.518	A xxxxx	0.518	+ 0.000 V/C
# 7 US-101 NB Ramps & Daily Dr	A xxxxx	0.403	A xxxxx	0.403	+ 0.000 V/C
# 8 Lewis Rd & Daily Dr	A xxxxx	0.538	A xxxxx	0.538	+ 0.000 V/C

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Lewis Rd & University Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.339
 Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 36 Level Of Service: A

Street Name:	Lewis Rd						University Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	1	1	0	0	2	0	1	0	0	1

Volume Module:

Base Vol:	0	336	103	114	507	0	0	0	0	36	0	6
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	336	103	114	507	0	0	0	0	36	0	6
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	336	103	114	507	0	0	0	0	36	0	6
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	336	103	114	507	0	0	0	0	36	0	6
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	336	103	114	507	0	0	0	0	36	0	6

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	1.53	0.47	2.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00

E_AM.txt

Final Sat.:	0	2449	751	3200	1600	0	0	0	0	1600	0	1600
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Capacity Analysis Module:

Vol/Sat:	0.00	0.14	0.14	0.04	0.32	0.00	0.00	0.00	0.00	0.02	0.00	0.00
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Crit Moves: ****

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Level Of Service Computation Report
 ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 Lewis Rd & Camarillo St

Cycle (sec):	100	Critical Vol./Cap.(X):	0.470
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	35	Level Of Service:	A

Street Name:	Lewis Rd						Camarillo St								
Approach:	North Bound			South Bound			East Bound			West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Permitted			Protected			Permitted			Permitted					
Rights:	Include			Include			Include			Include					
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0			
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Lanes:	1	0	1	1	0	1	0	1	1	0	0	0	1	0	0

Volume Module:

Base Vol:	0	323	6	307	614	0	0	0	0	8	0	272
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	323	6	307	614	0	0	0	0	8	0	272
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

E_AM.txt

PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	323	6	307	614	0	0	0	0	8	0	272
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	323	6	307	614	0	0	0	0	8	0	272
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	323	6	307	614	0	0	0	0	8	0	272

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Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.96	0.04	1.00	2.00	0.00	0.00	1.00	0.00	0.03	0.00	0.97
Final Sat.:	1600	3142	58	1600	3200	0	0	1600	0	46	0	1554

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Capacity Analysis Module:

Vol/Sat:	0.00	0.10	0.10	0.19	0.19	0.00	0.00	0.00	0.00	0.01	0.00	0.18
Crit Moves:	****		****		****							

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 Lewis Rd & Cawelti Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.381
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	30	Level Of Service:	A

Street Name:	Lewis Rd	Cawelti Rd
Approach:	North Bound	South Bound
Movement:	L - T - R	L - T - R

E_AM.txt

Control:	Protected					Permitted					Permitted					Permitted				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	0	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0

Volume Module:

Base Vol:	43	579	0	0	882	14	29	0	90	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	43	579	0	0	882	14	29	0	90	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	43	579	0	0	882	14	29	0	90	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	43	579	0	0	882	14	29	0	90	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	43	579	0	0	882	14	29	0	90	0	0	0

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	1.00	1.97	0.03	0.24	0.00	0.76	0.00	1.00	0.00
Final Sat.:	1600	3200	0	1600	3150	50	390	0	1210	0	1600	0

Capacity Analysis Module:

Vol/Sat:	0.03	0.18	0.00	0.00	0.28	0.28	0.02	0.00	0.07	0.00	0.00	0.00
Crit Moves:	****				****				****			

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #4 Lewis Rd & Pleasant Valley Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.548

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 50 Level Of Service: A

Street Name: Lewis Rd

Pleasant Valley Rd

Approach: North Bound

South Bound

East Bound

West Bound

Movement: L - T - R

L - T - R

L - T - R

L - T - R

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Control: Protected

Protected

Protected

Protected

Rights: Include

Ovl

Include

Ovl

Min. Green: 0 0 0

0 0 0

0 0 0

0 0 0

Y+R: 4.0 4.0 4.0

4.0 4.0 4.0

4.0 4.0 4.0

4.0 4.0 4.0

Lanes: 1 0 2 0 1

1 0 2 0 1

2 0 2 0 1

2 0 2 0 1

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Volume Module:

Base Vol: 58 288 278 120 549 225 222 558 11 401 356 241

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 58 288 278 120 549 225 222 558 11 401 356 241

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 58 288 278 120 549 225 222 558 11 401 356 241

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 58 288 278 120 549 225 222 558 11 401 356 241

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

FinalVolume: 58 288 278 120 549 225 222 558 11 401 356 241

OvlAdjVol: 114 121

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Saturation Flow Module:

Sat/Lane: 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 1.00 2.00 1.00 1.00 2.00 1.00 2.00 2.00 1.00 2.00 2.00 1.00

Final Sat.: 1600 3200 1600 1600 3200 1600 3200 3200 1600 3200 3200 1600

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Capacity Analysis Module:

Vol/Sat: 0.04 0.09 0.17 0.08 0.17 0.14 0.07 0.17 0.01 0.13 0.11 0.15

OvlAdjV/S: 0.07 0.08

Crit Moves: **** *

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #5 US-101 SB Ramps & Ventura Bl

Cycle (sec): 100 Critical Vol./Cap.(X): 0.592
 Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 56 Level Of Service: A

Street Name:	US-101 SB Ramps						Ventura Bl										
Approach:	North Bound			South Bound			East Bound			West Bound							
Movement:	L	T	R	L	T	R	L	T	R	L	T	R					
Control:	Split Phase			Split Phase			Protected			Protected							
Rights:	Include			Include			Include			Include							
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0					
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0					
Lanes:	0	1	0	0	1	1	1	0	1	0	2	0	0	1	0	1	0

Volume Module:

Base Vol:	8	3	8	534	26	195	528	274	43	82	152	405
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	8	3	8	534	26	195	528	274	43	82	152	405
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	8	3	8	534	26	195	528	274	43	82	152	405
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	3	8	534	26	195	528	274	43	82	152	405
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	8	3	8	534	26	195	528	274	43	82	152	405

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.73	0.27	1.00	2.00	0.12	0.88	2.00	0.86	0.14	1.00	1.00	1.00

E_AM.txt

Final Sat.:	1164	436	1600	3200	188	1412	3200	1383	217	1600	1600	1600
-------------	------	-----	------	------	-----	------	------	------	-----	------	------	------

Capacity Analysis Module:

Vol/Sat:	0.01	0.01	0.01	0.17	0.14	0.14	0.17	0.20	0.20	0.05	0.10	0.25
Crit Moves:	****			****			****					****

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Level Of Service Computation Report
 ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #6 Lewis Rd & Ventura Bl

Cycle (sec):	100	Critical Vol./Cap.(X):	0.518
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	47	Level Of Service:	A

Street Name:	Lewis Rd						Ventura Bl								
Approach:	North Bound			South Bound			East Bound			West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected			Protected			Split Phase			Split Phase					
Rights:	Include			Include			Include			Include					
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0			
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Lanes:	2	0	1	1	0	1	0	2	0	1	1	1	0	0	1

Volume Module:

Base Vol:	153	559	8	15	654	437	579	19	240	7	10	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	153	559	8	15	654	437	579	19	240	7	10	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

E_AM.txt

PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	153	559	8	15	654	437	579	19	240	7	10	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	153	559	8	15	654	437	579	19	240	7	10	10
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	153	559	8	15	654	437	579	19	240	7	10	10

-----|-----|-----|-----|-----|

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	1.97	0.03	1.00	2.00	1.00	1.94	0.06	1.00	0.41	0.59	1.00
Final Sat.:	3200	3155	45	1600	3200	1600	3098	102	1600	659	941	1600

-----|-----|-----|-----|-----|

Capacity Analysis Module:

Vol/Sat:	0.05	0.18	0.18	0.01	0.20	0.27	0.19	0.19	0.15	0.01	0.01	0.01
Crit Moves:	****					****		****			****	

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #7 US-101 NB Ramps & Daily Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.403
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	31	Level Of Service:	A

Street Name:	US-101 NB Ramps				Daily Dr			
Approach:	North Bound		South Bound		East Bound		West Bound	
Movement:	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R

```

-----|-----|-----|-----|-----|
E_AM.txt
Control:      Permitted      Permitted      Permitted      Protected
Rights:      Include      Include      Ignore      Include
Min. Green:   0    0    0      0    0    0      0    0    0      0    0    0
Y+R:         4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0
Lanes:        2    0    0    0    1    0    0    0    0    0    0    1    0    1    2    0    1    0    0
-----|-----|-----|-----|-----|
Volume Module:
Base Vol:     366    0    281      0    0    0      0  118  210  491  163    0
Growth Adj:   1.00  1.00  1.00    1.00  1.00  1.00    1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:  366    0    281      0    0    0      0  118  210  491  163    0
User Adj:     1.00  1.00  1.00    1.00  1.00  1.00    1.00  1.00  0.00  1.00  1.00  1.00
PHF Adj:      1.00  1.00  1.00    1.00  1.00  1.00    1.00  1.00  0.00  1.00  1.00  1.00
PHF Volume:   366    0    281      0    0    0      0  118    0  491  163    0
Reduct Vol:   0    0    0      0    0    0      0    0    0    0    0    0
Reduced Vol:  366    0    281      0    0    0      0  118    0  491  163    0
PCE Adj:      1.00  1.00  1.00    1.00  1.00  1.00    1.00  1.00  0.00  1.00  1.00  1.00
MLF Adj:      1.00  1.00  1.00    1.00  1.00  1.00    1.00  1.00  0.00  1.00  1.00  1.00
FinalVolume:  366    0    281      0    0    0      0  118    0  491  163    0
-----|-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane:     1600  1600  1600    1600  1600  1600    1600  1600  1600  1600  1600  1600
Adjustment:   1.00  1.00  1.00    1.00  1.00  1.00    1.00  1.00  1.00  1.00  1.00  1.00
Lanes:        2.00  0.00  1.00    0.00  0.00  0.00    0.00  1.00  1.00  2.00  1.00  0.00
Final Sat.:   3200    0  1600      0    0    0      0  1600  1600  3200  1600    0
-----|-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:      0.11  0.00  0.18  0.00  0.00  0.00    0.00  0.07  0.00  0.15  0.10  0.00
Crit Moves:          ****                      ****          ****
*****

```

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #8 Lewis Rd & Daily Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.538

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 40 Level Of Service: A

Street Name: Lewis Rd

Daily Dr

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

-----|-----|-----|-----|-----|

Control: Protected Permitted Permitted Permitted

Rights: Include Include Ovl Include

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0 0

Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Lanes: 1 0 1 1 0 0 1 1 1 0 1 1 0 0 1 0 0 0

-----|-----|-----|-----|-----|

Volume Module:

Base Vol: 212 943 0 1 951 413 215 17 184 9 6 1

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 212 943 0 1 951 413 215 17 184 9 6 1

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 212 943 0 1 951 413 215 17 184 9 6 1

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 212 943 0 1 951 413 215 17 184 9 6 1

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

FinalVolume: 212 943 0 1 951 413 215 17 184 9 6 1

-----|-----|-----|-----|-----|

Saturation Flow Module:

Sat/Lane: 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 1.00 2.00 0.00 0.01 2.09 0.90 1.85 0.15 1.00 0.56 0.38 0.06

Final Sat.: 1600 3200 0 4 3344 1452 2966 234 1600 900 600 100

-----|-----|-----|-----|-----|

Capacity Analysis Module:

Vol/Sat: 0.13 0.29 0.00 0.00 0.28 0.28 0.07 0.07 0.12 0.01 0.01 0.01

Crit Moves: **** **** **** ****

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Intersection

Int Delay, s/veh 3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	160	109	2	21	328
Future Vol, veh/h	14	160	109	2	21	328
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	174	118	2	23	357

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	522	120	0	0	121	0
Stage 1	120	-	-	-	-	-
Stage 2	402	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	515	931	-	-	1467	-
Stage 1	905	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	505	931	-	-	1467	-
Mov Cap-2 Maneuver	505	-	-	-	-	-
Stage 1	905	-	-	-	-	-
Stage 2	662	-	-	-	-	-

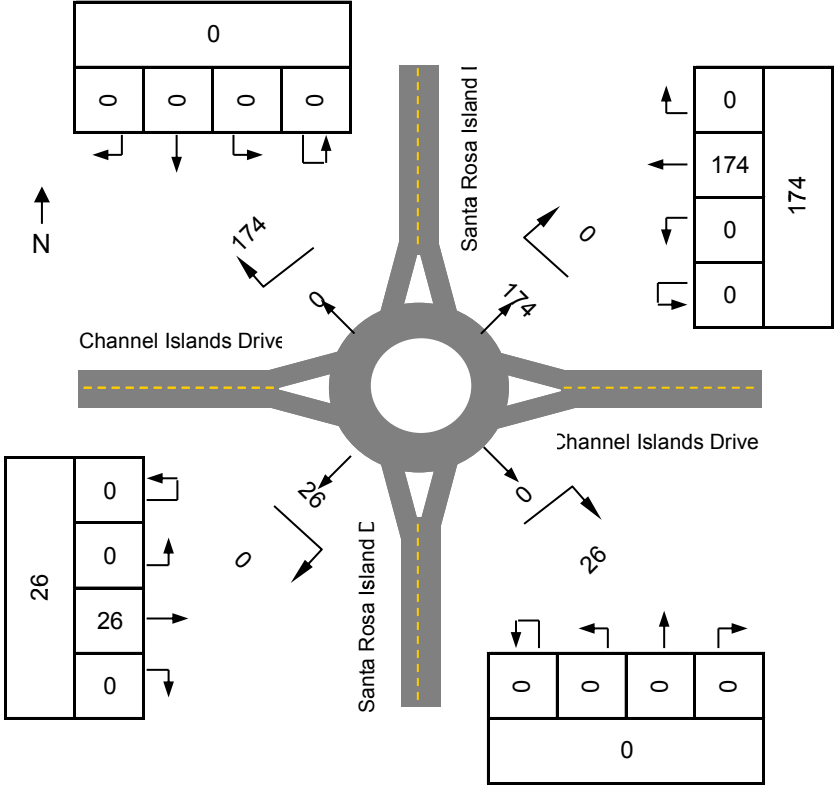
Approach	WB	NB	SB
HCM Control Delay, s	10	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	505	931	1467	-
HCM Lane V/C Ratio	-	-	0.03	0.187	0.016	-
HCM Control Delay (s)	-	-	12.4	9.8	7.5	0
HCM Lane LOS	-	-	B	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.7	0	-

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	csuci 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	Existing AM							N-S Street	Santa Rosa Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North	1	1	LTR	100%	100%	100%	0	26	1	1,101	0.00	3.3	A	0
	Bypass?													
	No													
	Total			100%	100%	100%								
South	0													
	Bypass?													
	No													
	Total													
East	1	1	L	100%	100%	100%	26	0	1	1,130	0.02	3.3	A	2
	Bypass?													
	No													
	Total			100%	100%	100%	26					3.3	A	
West	1	1	LTR	100%	100%	100%	174	0	1	1,130	0.15	3.9	A	14
	Bypass?													
	No													
	Total			100%	100%	100%	174					3.9	A	
All							200					3.8	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)	0	0	0	0	0	0	0	0	0	0	26	0	0	0	174	0
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	0	0	0	26	0	0	0	174	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	0	0	0	26	0	0	0	174	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

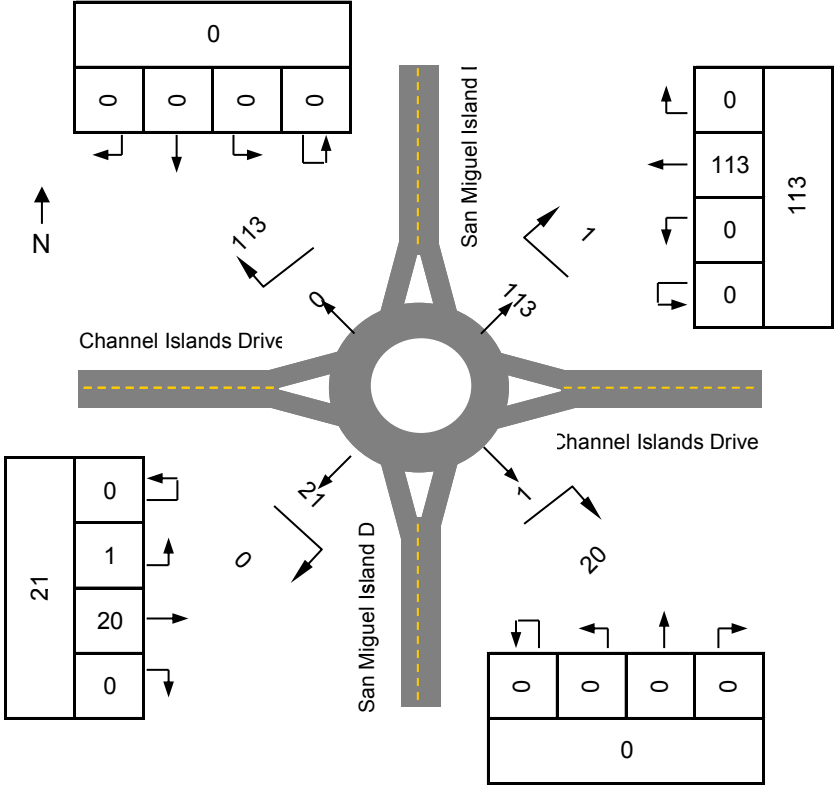
* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	CSUCI 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	Existing AM							N-S Street	San Miguel Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North														
	Bypass?													
	No													
	Total													
South	1		LT	100%	100%	100%	0	113		1,009	0.00	3.6	A	0
	Bypass?													
	No													
	Total			100%	100%	100%								
East	1	1	L	100%	100%	100%	21	0	1	1,130	0.02	3.3	A	1
	Bypass?													
	No													
	Total			100%	100%	100%	21					3.3	A	
West	1	1	LTR	100%	100%	100%	113	1	1	1,129	0.10	3.6	A	8
	Bypass?													
	No													
	Total			100%	100%	100%	113					3.6	A	
All							134					3.6	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)	0	0	0	0	0	0	0	0	0	1	20	0	0	0	113	0
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	0	0	1	20	0	0	0	113	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	0	0	1	20	0	0	0	113	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

Scenario Report

Scenario: E

Command: E

Volume: E

Geometry: Base

Impact Fee: Default Impact Fee

Trip Generation: Default Trip Generation

Trip Distribution: Default Trip Distribution

Paths: Default Path

Routes: Default Route

Configuration: Default Configuration

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Impact Analysis Report
 Level Of Service

Intersection	Base Del/ LOS Veh	V/ C	Future Del/ LOS Veh	V/ C	Change in
# 1 Lewis Rd & University Dr	A xxxxx	0.359	A xxxxx	0.359	+ 0.000 V/C
# 2 Lewis Rd & Camarillo St	B xxxxx	0.615	B xxxxx	0.615	+ 0.000 V/C
# 3 Lewis Rd & Cawelti Rd	A xxxxx	0.342	A xxxxx	0.342	+ 0.000 V/C
# 4 Lewis Rd & Pleasant Valley Rd	B xxxxx	0.607	B xxxxx	0.607	+ 0.000 V/C
# 5 US-101 SB Ramps & Ventura Bl	A xxxxx	0.501	A xxxxx	0.501	+ 0.000 V/C
# 6 Lewis Rd & Ventura Bl	A xxxxx	0.418	A xxxxx	0.418	+ 0.000 V/C
# 7 US-101 NB Ramps & Daily Dr	A xxxxx	0.553	A xxxxx	0.553	+ 0.000 V/C
# 8 Lewis Rd & Daily Dr	A xxxxx	0.469	A xxxxx	0.469	+ 0.000 V/C

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Lewis Rd & University Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.359
 Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 41 Level Of Service: A

Street Name:	Lewis Rd						University Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	1	1	0	0	2	0	1	0	0	1

Volume Module:

Base Vol:	0	538	59	68	406	0	0	0	0	130	0	169
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	538	59	68	406	0	0	0	0	130	0	169
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	538	59	68	406	0	0	0	0	130	0	169
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	538	59	68	406	0	0	0	0	130	0	169
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	538	59	68	406	0	0	0	0	130	0	169

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	1.80	0.20	2.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00

E_PM.txt

Final Sat.:	0	2884	316	3200	1600	0	0	0	0	1600	0	1600
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Capacity Analysis Module:

Vol/Sat:	0.00	0.19	0.19	0.02	0.25	0.00	0.00	0.00	0.00	0.08	0.00	0.11
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Crit Moves: ****

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Level Of Service Computation Report
 ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 Lewis Rd & Camarillo St

Cycle (sec):	100	Critical Vol./Cap.(X):	0.615
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	48	Level Of Service:	B

Street Name:	Lewis Rd						Camarillo St								
Approach:	North Bound			South Bound			East Bound			West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Permitted			Protected			Permitted			Permitted					
Rights:	Include			Include			Include			Include					
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0		
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Lanes:	1	0	1	1	0	1	0	1	1	0	0	0	1	0	0

Volume Module:

Base Vol:	0	701	4	286	446	0	0	0	0	11	0	335
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	701	4	286	446	0	0	0	0	11	0	335
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	701	4	286	446	0	0	0	0	11	0	335
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	701	4	286	446	0	0	0	0	11	0	335
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	701	4	286	446	0	0	0	0	11	0	335
----- ----- ----- ----- -----												
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	2.00	0.00	0.00	1.00	0.00	0.03	0.00	0.97
Final Sat.:	1600	3182	18	1600	3200	0	0	1600	0	51	0	1549
----- ----- ----- ----- -----												
Capacity Analysis Module:												
Vol/Sat:	0.00	0.22	0.22	0.18	0.14	0.00	0.00	0.00	0.00	0.01	0.00	0.22
Crit Moves:	****		****				****					

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ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Cycle (sec):	100	Critical Vol./Cap.(X):	0.342
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	28	Level Of Service:	A

Street Name:	Lewis Rd				Cawelti Rd															
Approach:	North Bound		South Bound		East Bound		West Bound													
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R

E_PM.txt

Control:	Protected					Permitted					Permitted					Permitted				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	0	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0

Volume Module:

Base Vol:	102	930	0	0	644	78	15	0	69	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	102	930	0	0	644	78	15	0	69	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	102	930	0	0	644	78	15	0	69	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	102	930	0	0	644	78	15	0	69	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	102	930	0	0	644	78	15	0	69	0	0	0

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	1.00	1.78	0.22	0.18	0.00	0.82	0.00	1.00	0.00
Final Sat.:	1600	3200	0	1600	2854	346	286	0	1314	0	1600	0

Capacity Analysis Module:

Vol/Sat:	0.06	0.29	0.00	0.00	0.23	0.23	0.01	0.00	0.05	0.00	0.00	0.00
Crit Moves:	****				****				****			

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #4 Lewis Rd & Pleasant Valley Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.607

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 58 Level Of Service: B

Street Name: Lewis Rd

Pleasant Valley Rd

Approach: North Bound

South Bound

East Bound

West Bound

Movement: L - T - R

L - T - R

L - T - R

L - T - R

-----|-----|-----|-----|-----|

Control: Protected

Protected

Protected

Protected

Rights: Include

Ovl

Include

Ovl

Min. Green: 0 0 0

0 0 0

0 0 0

0 0 0

Y+R: 4.0 4.0 4.0

4.0 4.0 4.0

4.0 4.0 4.0

4.0 4.0 4.0

Lanes: 1 0 2 0 1

1 0 2 0 1

2 0 2 0 1

2 0 2 0 1

-----|-----|-----|-----|-----|

Volume Module:

Base Vol: 66 427 440 104 420 313 210 353 10 282 645 210

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 66 427 440 104 420 313 210 353 10 282 645 210

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 66 427 440 104 420 313 210 353 10 282 645 210

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 66 427 440 104 420 313 210 353 10 282 645 210

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

FinalVolume: 66 427 440 104 420 313 210 353 10 282 645 210

OvlAdjVol: 208 106

-----|-----|-----|-----|-----|

Saturation Flow Module:

Sat/Lane: 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 1.00 2.00 1.00 1.00 2.00 1.00 2.00 2.00 1.00 2.00 2.00 1.00

Final Sat.: 1600 3200 1600 1600 3200 1600 3200 3200 1600 3200 3200 1600

-----|-----|-----|-----|-----|

Capacity Analysis Module:

Vol/Sat: 0.04 0.13 0.28 0.07 0.13 0.20 0.07 0.11 0.01 0.09 0.20 0.13

OvlAdjV/S: 0.13 0.07

Crit Moves: **** * **** *

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #5 US-101 SB Ramps & Ventura Bl

Cycle (sec): 100 Critical Vol./Cap.(X): 0.501
 Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 46 Level Of Service: A

Street Name:	US-101 SB Ramps						Ventura Bl										
Approach:	North Bound			South Bound			East Bound			West Bound							
Movement:	L	T	R	L	T	R	L	T	R	L	T	R					
Control:	Split Phase			Split Phase			Protected			Protected							
Rights:	Include			Include			Include			Include							
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0					
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0					
Lanes:	0	1	0	0	1	1	1	0	1	0	2	0	0	1	0	1	0

Volume Module:

Base Vol:	6	0	7	539	3	344	401	279	10	14	314	187
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	0	7	539	3	344	401	279	10	14	314	187
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	6	0	7	539	3	344	401	279	10	14	314	187
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	6	0	7	539	3	344	401	279	10	14	314	187
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	6	0	7	539	3	344	401	279	10	14	314	187

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	1.99	0.01	1.00	2.00	0.97	0.03	1.00	1.25	0.75

E_PM.txt

PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	254	667	6	17	468	237	553	16	263	6	18	9
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	254	667	6	17	468	237	553	16	263	6	18	9
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	254	667	6	17	468	237	553	16	263	6	18	9

-----|-----|-----|-----|-----|

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	1.98	0.02	1.00	2.00	1.00	1.94	0.06	1.00	0.25	0.75	1.00
Final Sat.:	3200	3171	29	1600	3200	1600	3110	90	1600	400	1200	1600

-----|-----|-----|-----|-----|

Capacity Analysis Module:

Vol/Sat:	0.08	0.21	0.21	0.01	0.15	0.15	0.18	0.18	0.16	0.02	0.02	0.01
Crit Moves:	****				****		****				****	

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #7 US-101 NB Ramps & Daily Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.553
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	42	Level Of Service:	A

Street Name:	US-101 NB Ramps	Daily Dr
Approach:	North Bound	South Bound
Movement:	L - T - R	L - T - R

	East Bound	West Bound
	L - T - R	L - T - R

```

-----|-----|-----|-----|-----|
E_PM.txt
Control:      Permitted      Permitted      Permitted      Protected
Rights:      Include      Include      Ignore      Include
Min. Green:   0    0    0      0    0    0      0    0    0      0    0    0
Y+R:         4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0    4.0  4.0  4.0
Lanes:        2    0    0    0    1    0    0    0    0    0    0    1    0    1    2    0    1    0    0
-----|-----|-----|-----|-----|
Volume Module:
Base Vol:    1090    0    326    0    0    0      0    182    91    317    302    0
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse: 1090    0    326    0    0    0      0    182    91    317    302    0
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  0.00  1.00  1.00  1.00
PHF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  0.00  1.00  1.00  1.00
PHF Volume:  1090    0    326    0    0    0      0    182    0    317    302    0
Reduct Vol:   0    0    0      0    0    0      0    0    0      0    0    0
Reduced Vol: 1090    0    326    0    0    0      0    182    0    317    302    0
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  0.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  0.00  1.00  1.00  1.00
FinalVolume: 1090    0    326    0    0    0      0    182    0    317    302    0
-----|-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane:    1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600  1600
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       2.00  0.00  1.00  0.00  0.00  0.00  0.00  1.00  1.00  2.00  1.00  0.00
Final Sat.:  3200    0  1600    0    0    0      0  1600  1600  3200  1600    0
-----|-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:     0.34  0.00  0.20  0.00  0.00  0.00  0.00  0.11  0.00  0.10  0.19  0.00
Crit Moves:  ****                      ****          ****
*****

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #8 Lewis Rd & Daily Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.469

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 35 Level Of Service: A

Street Name: Lewis Rd

Daily Dr

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

-----|-----|-----|-----|-----|

Control: Protected Permitted Permitted Permitted

Rights: Include Include Ovl Include

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0 0

Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Lanes: 1 0 1 1 0 0 1 1 1 0 1 1 0 0 1 0 0 0

-----|-----|-----|-----|-----|

Volume Module:

Base Vol: 305 916 1 0 531 236 320 6 169 6 16 5

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 305 916 1 0 531 236 320 6 169 6 16 5

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 305 916 1 0 531 236 320 6 169 6 16 5

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 305 916 1 0 531 236 320 6 169 6 16 5

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

FinalVolume: 305 916 1 0 531 236 320 6 169 6 16 5

-----|-----|-----|-----|-----|

Saturation Flow Module:

Sat/Lane: 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 1.00 1.99 0.01 0.00 2.08 0.92 1.96 0.04 1.00 0.22 0.59 0.19

Final Sat.: 1600 3197 3 0 3323 1477 3141 59 1600 356 948 296

-----|-----|-----|-----|-----|

Capacity Analysis Module:

Vol/Sat: 0.19 0.29 0.29 0.00 0.16 0.16 0.10 0.10 0.11 0.00 0.02 0.02

Crit Moves: **** **** **** ****

Intersection

Int Delay, s/veh 2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	46	273	13	109	172
Future Vol, veh/h	5	46	273	13	109	172
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	50	297	14	118	187

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	728	304	0	0	311	0
Stage 1	304	-	-	-	-	-
Stage 2	424	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	390	736	-	-	1249	-
Stage 1	748	-	-	-	-	-
Stage 2	660	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	349	736	-	-	1249	-
Mov Cap-2 Maneuver	349	-	-	-	-	-
Stage 1	748	-	-	-	-	-
Stage 2	591	-	-	-	-	-

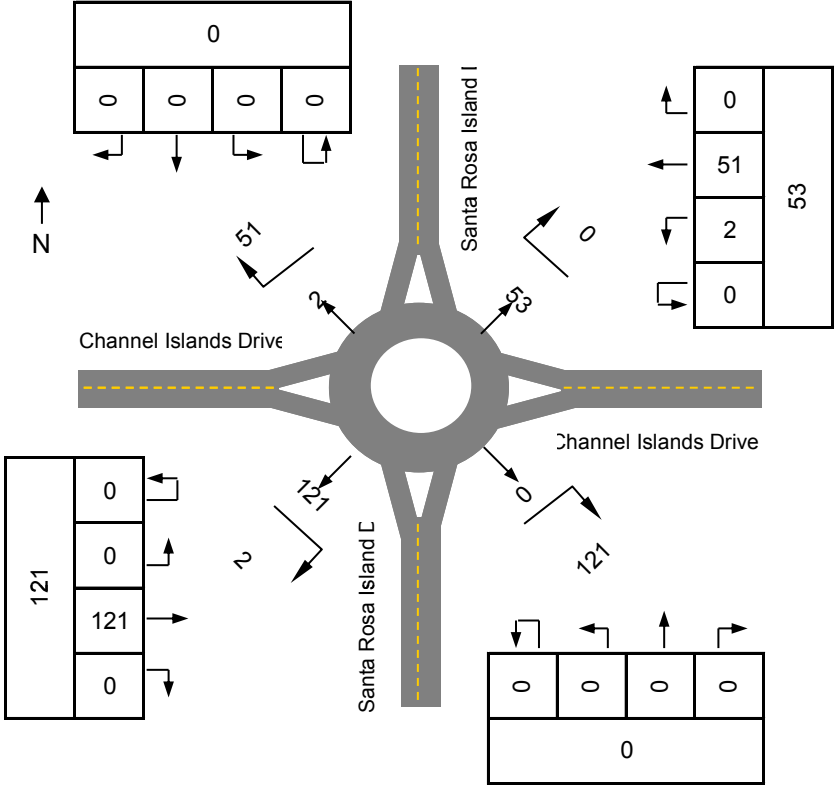
Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	3.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	349	736	1249	-
HCM Lane V/C Ratio	-	-	0.016	0.068	0.095	-
HCM Control Delay (s)	-	-	15.5	10.2	8.2	0
HCM Lane LOS	-	-	C	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0.2	0.3	-

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	CSUCI 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	Existing PM							N-S Street	Santa Rosa Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North	1	1	LTR	100%	100%	100%	0	121	1	1,001	0.00	3.6	A	0
	Bypass?													
	No													
	Total			100%	100%	100%								
South	0													
	Bypass?													
	No													
	Total													
East	1	1	L	100%	100%	100%	121	2	1	1,128	0.11	3.7	A	9
	Bypass?													
	No													
	Total			100%	100%	100%	121					3.7	A	
West	1	1	LTR	100%	100%	100%	53	0	1	1,130	0.05	3.4	A	4
	Bypass?													
	No													
	Total			100%	100%	100%	53					3.4	A	
All							174					3.6	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)											121			2	51	
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	0	0	0	121	0	0	2	51	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	0	0	0	121	0	0	2	51	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

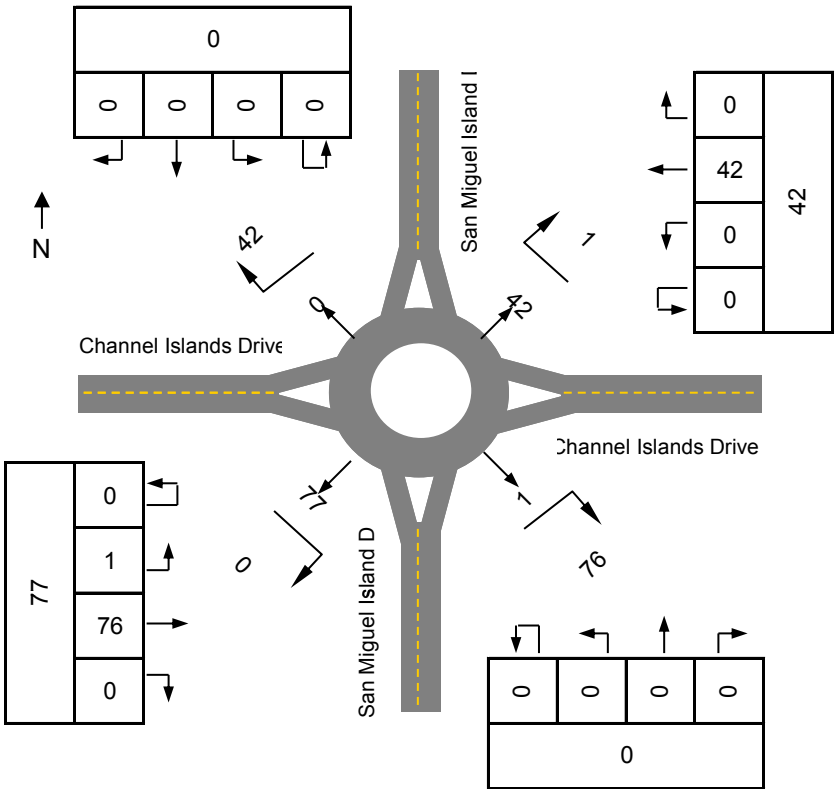
* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	CSUCI 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	Existing PM							N-S Street	San Miguel Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North														
	Bypass?													
	No													
	Total													
South	1		LT	100%	100%	100%	0	42		1,084	0.00	3.3	A	0
	Bypass?													
	No													
	Total			100%	100%	100%								
East	1	1	L	100%	100%	100%	77	0	1	1,130	0.07	3.5	A	5
	Bypass?													
	No													
	Total			100%	100%	100%	77					3.5	A	
West	1	1	LTR	100%	100%	100%	42	1	1	1,129	0.04	3.3	A	3
	Bypass?													
	No													
	Total			100%	100%	100%	42					3.3	A	
All							119					3.4	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)	0	0	0	0	0	0	0	0	0	1	76	0	0	0	42	0
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	0	0	1	76	0	0	0	42	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	0	0	1	76	0	0	0	42	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

Scenario Report

Scenario:	EP1
Command:	EP1
Volume:	EP1
Geometry:	Base
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

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Impact Analysis Report
 Level Of Service

Intersection	Base		Future		Change in
	Del/ LOS	V/ Veh C	Del/ LOS	V/ Veh C	
# 1 Lewis Rd & University Dr	A	xxxxx 0.349	A	xxxxx 0.349	+ 0.000 V/C
# 2 Lewis Rd & Camarillo St	B	xxxxx 0.616	B	xxxxx 0.616	+ 0.000 V/C
# 3 Lewis Rd & Cawelti Rd	A	xxxxx 0.403	A	xxxxx 0.403	+ 0.000 V/C
# 4 Lewis Rd & Pleasant Valley Rd	A	xxxxx 0.556	A	xxxxx 0.556	+ 0.000 V/C
# 5 US-101 SB Ramps & Ventura Bl	B	xxxxx 0.614	B	xxxxx 0.614	+ 0.000 V/C
# 6 Lewis Rd & Ventura Bl	A	xxxxx 0.532	A	xxxxx 0.532	+ 0.000 V/C
# 7 US-101 NB Ramps & Daily Dr	A	xxxxx 0.420	A	xxxxx 0.420	+ 0.000 V/C
# 8 Lewis Rd & Daily Dr	A	xxxxx 0.577	A	xxxxx 0.577	+ 0.000 V/C

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Lewis Rd & University Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.349
 Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 36 Level Of Service: A

Street Name:	Lewis Rd						University Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	1	1	0	0	2	0	1	0	0	1

Volume Module:

Base Vol:	0	336	108	114	507	0	0	0	0	51	0	6
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	336	108	114	507	0	0	0	0	51	0	6
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	336	108	114	507	0	0	0	0	51	0	6
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	336	108	114	507	0	0	0	0	51	0	6
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	336	108	114	507	0	0	0	0	51	0	6

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	1.51	0.49	2.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00

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Final Sat.: 0 2422 778 3200 1600 0 0 0 0 1600 0 1600
 -----|-----|-----|-----|-----|
 Capacity Analysis Module:
 Vol/Sat: 0.00 0.14 0.14 0.04 0.32 0.00 0.00 0.00 0.00 0.03 0.00 0.00
 Crit Moves: ****

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Level Of Service Computation Report ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 Lewis Rd & Camarillo St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.616
 Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 48 Level Of Service: B

Street Name:	Lewis Rd						Camarillo St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	0	1	0	0	1	0	0	0

Volume Module:

Base Vol:	0	323	6	363	614	0	0	0	0	8	0	450
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	323	6	363	614	0	0	0	0	8	0	450
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	323	6	363	614	0	0	0	0	8	0	450
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	323	6	363	614	0	0	0	0	8	0	450
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	323	6	363	614	0	0	0	0	8	0	450
----- ----- ----- ----- -----												
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.96	0.04	1.00	2.00	0.00	0.00	1.00	0.00	0.02	0.00	0.98
Final Sat.:	1600	3142	58	1600	3200	0	0	1600	0	28	0	1572
----- ----- ----- ----- -----												
Capacity Analysis Module:												
Vol/Sat:	0.00	0.10	0.10	0.23	0.19	0.00	0.00	0.00	0.00	0.01	0.00	0.29
Crit Moves:	****		****		****							

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ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 Lewis Rd & Cawelti Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.403
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	31	Level Of Service:	A

Street Name:	Lewis Rd				Cawelti Rd															
Approach:	North Bound		South Bound		East Bound		West Bound													
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R

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Control:	Protected			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	0	1	0	0	1	0	0	1

Volume Module:

Base Vol:	49	751	0	0	936	14	29	0	92	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	49	751	0	0	936	14	29	0	92	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	49	751	0	0	936	14	29	0	92	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	49	751	0	0	936	14	29	0	92	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	49	751	0	0	936	14	29	0	92	0	0	0

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	1.00	1.97	0.03	0.24	0.00	0.76	0.00	1.00	0.00
Final Sat.:	1600	3200	0	1600	3153	47	383	0	1217	0	1600	0

Capacity Analysis Module:

Vol/Sat:	0.03	0.23	0.00	0.00	0.30	0.30	0.02	0.00	0.08	0.00	0.00	0.00
Crit Moves:	****			****			****					

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #4 Lewis Rd & Pleasant Valley Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.556

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 51 Level Of Service: A

Street Name:	Lewis Rd						Pleasant Valley Rd								
Approach:	North Bound			South Bound			East Bound			West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
-----	-----			-----			-----			-----					
Control:	Protected			Protected			Protected			Protected					
Rights:	Include			Ovl			Include			Ovl					
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0		
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Lanes:	1	0	2	0	1	1	0	2	0	1	2	0	2	0	1
-----	-----			-----			-----			-----					

Volume Module:

Base Vol:	101	406	289	120	586	225	222	558	24	404	356	241
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	101	406	289	120	586	225	222	558	24	404	356	241
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	101	406	289	120	586	225	222	558	24	404	356	241
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	101	406	289	120	586	225	222	558	24	404	356	241
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	101	406	289	120	586	225	222	558	24	404	356	241
OvlAdjVol:	114						121					

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	1600	3200	1600	1600	3200	1600	3200	3200	1600	3200	3200	1600

Capacity Analysis Module:

Vol/Sat:	0.06	0.13	0.18	0.08	0.18	0.14	0.07	0.17	0.02	0.13	0.11	0.15
OvlAdjV/S:	0.07						0.08					
Crit Moves:	****			****			****			****		

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #5 US-101 SB Ramps & Ventura Bl

Cycle (sec): 100 Critical Vol./Cap.(X): 0.614
 Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 59 Level Of Service: B

Street Name:	US-101 SB Ramps						Ventura Bl								
Approach:	North Bound			South Bound			East Bound			West Bound					
Movement:	L	T	R	L	T	R	L	T	R	L	T	R			
Control:	Split Phase			Split Phase			Protected			Protected					
Rights:	Include			Include			Include			Include					
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0			
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Lanes:	0	1	0	0	1	1	1	0	1	0	2	0	0	1	0

Volume Module:

Base Vol:	8	3	8	541	26	195	528	277	43	82	163	437
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	8	3	8	541	26	195	528	277	43	82	163	437
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	8	3	8	541	26	195	528	277	43	82	163	437
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	3	8	541	26	195	528	277	43	82	163	437
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	8	3	8	541	26	195	528	277	43	82	163	437

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.73	0.27	1.00	2.00	0.12	0.88	2.00	0.87	0.13	1.00	1.00	1.00

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Final Sat.: 1164 436 1600 3200 188 1412 3200 1385 215 1600 1600 1600
 -----|-----|-----|-----|-----|
 Capacity Analysis Module:
 Vol/Sat: 0.01 0.01 0.01 0.17 0.14 0.14 0.17 0.20 0.20 0.05 0.10 0.27
 Crit Moves: **** **** **** ****

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #6 Lewis Rd & Ventura Bl

Cycle (sec): 100 Critical Vol./Cap.(X): 0.532
 Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 49 Level Of Service: A

Street Name:	Lewis Rd						Ventura Bl						
Approach:	North Bound			South Bound			East Bound			West Bound			
Movement:	L	T	R	L	T	R	L	T	R	L	T	R	
Control:	Protected			Protected			Split Phase			Split Phase			
Rights:	Include			Include			Include			Include			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lanes:	2	0	1	1	0	1	1	1	0	0	1	0	1

Volume Module:

Base Vol:	196	634	8	15	681	437	579	19	250	7	10	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	196	634	8	15	681	437	579	19	250	7	10	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	196	634	8	15	681	437	579	19	250	7	10	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	196	634	8	15	681	437	579	19	250	7	10	10
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	196	634	8	15	681	437	579	19	250	7	10	10

-----|-----|-----|-----|-----|

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	1.98	0.02	1.00	2.00	1.00	1.94	0.06	1.00	0.41	0.59	1.00
Final Sat.:	3200	3160	40	1600	3200	1600	3098	102	1600	659	941	1600

-----|-----|-----|-----|-----|

Capacity Analysis Module:

Vol/Sat:	0.06	0.20	0.20	0.01	0.21	0.27	0.19	0.19	0.16	0.01	0.01	0.01
Crit Moves:	****					****		****			****	

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #7 US-101 NB Ramps & Daily Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.420
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	32	Level Of Service:	A

Street Name:	US-101 NB Ramps	Daily Dr
Approach:	North Bound	South Bound
Movement:	L - T - R	L - T - R

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Control:	Permitted			Permitted			Permitted			Protected		
Rights:	Include			Include			Ignore			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	2	0	0	0	0	0	0	0	1	0	1	0

Volume Module:

Base Vol:	366	0	291	0	0	0	0	125	210	513	185	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	366	0	291	0	0	0	0	125	210	513	185	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	366	0	291	0	0	0	0	125	0	513	185	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	366	0	291	0	0	0	0	125	0	513	185	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	366	0	291	0	0	0	0	125	0	513	185	0

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	2.00	1.00	0.00
Final Sat.:	3200	0	1600	0	0	0	0	1600	1600	3200	1600	0

Capacity Analysis Module:

Vol/Sat:	0.11	0.00	0.18	0.00	0.00	0.00	0.00	0.08	0.00	0.16	0.12	0.00
Crit Moves:	****						****			****		

EP1_AM_UPDATED_17.txt

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #8 Lewis Rd & Daily Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.577

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 44 Level Of Service: A

Street Name:	Lewis Rd						Daily Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	-	T	-	R		L	-	T	-	R	
Control:	Protected			Permitted			Permitted			Permitted		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	0	0	1	1	0	0	1	0
	0	0	1	0	0	0	0	0	1	0	0	0

Volume Module:												
Base Vol:	255	975	0	1	961	413	215	17	201	9	6	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	255	975	0	1	961	413	215	17	201	9	6	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	255	975	0	1	961	413	215	17	201	9	6	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	255	975	0	1	961	413	215	17	201	9	6	1
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	255	975	0	1	961	413	215	17	201	9	6	1

Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.01	2.09	0.90	1.85	0.15	1.00	0.56	0.38	0.06
Final Sat.:	1600	3200	0	3	3355	1442	2966	234	1600	900	600	100

Capacity Analysis Module:												
Vol/Sat:	0.16	0.30	0.00	0.00	0.29	0.29	0.07	0.07	0.13	0.01	0.01	0.01
Crit Moves:	****				****				****	****		

Intersection

Int Delay, s/veh 5.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	51	338	109	13	77	328
Future Vol, veh/h	51	338	109	13	77	328
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	55	367	118	14	84	357

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	650	126	0	0	133	0
Stage 1	126	-	-	-	-	-
Stage 2	524	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	434	924	-	-	1452	-
Stage 1	900	-	-	-	-	-
Stage 2	594	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	403	924	-	-	1452	-
Mov Cap-2 Maneuver	403	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	551	-	-	-	-	-

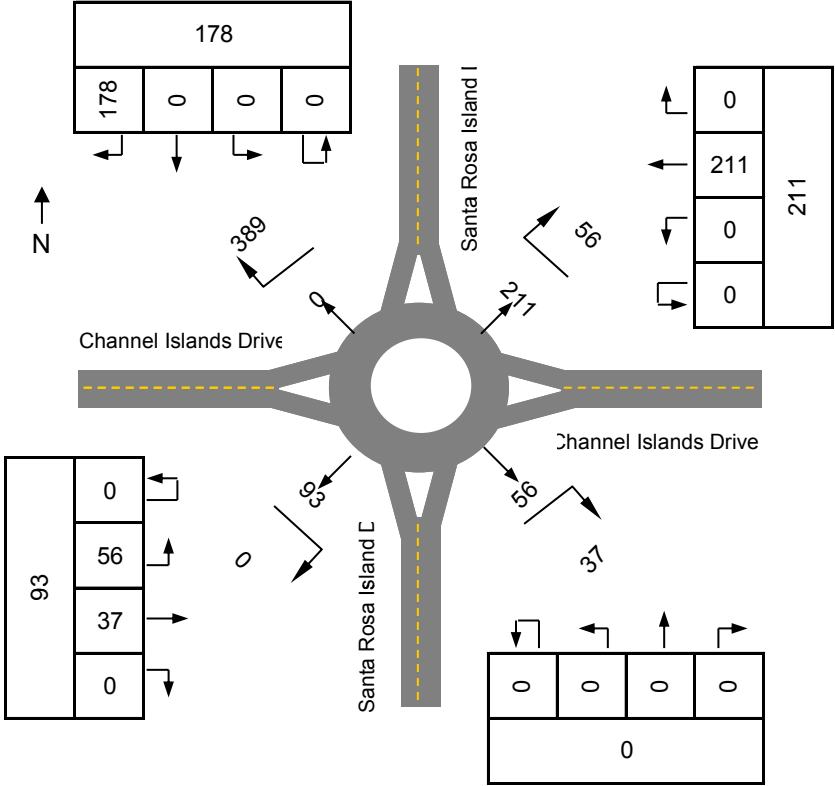
Approach	WB		NB		SB
HCM Control Delay, s	11.9		0		1.5
HCM LOS	B				

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	403	924	1452	-
HCM Lane V/C Ratio	-	-	0.138	0.398	0.058	-
HCM Control Delay (s)	-	-	15.4	11.4	7.6	0
HCM Lane LOS	-	-	C	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	1.9	0.2	-

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	CSUCI 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	Existing plus Project AM							N-S Street	Santa Rosa Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North	1	1	LTR	100%	100%	100%	0	93	1	1,030	0.00	3.5	A	0
	Bypass?													
	No													
	Total			100%	100%	100%								
South	0													
	Bypass?													
	No													
	Total						178					0.0	A	
East	1	1	L	100%	100%	100%	93	0	1	1,130	0.08	3.6	A	7
	Bypass?													
	No													
	Total			100%	100%	100%	93					3.6	A	
West	1	1	LTR	100%	100%	100%	211	56	1	1,068	0.20	4.4	A	18
	Bypass?													
	No													
	Total			100%	100%	100%	211					4.4	A	
All							482					2.6	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)								178		56	37				211	
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	178	0	56	37	0	0	0	211	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	178	0	56	37	0	0	0	211	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

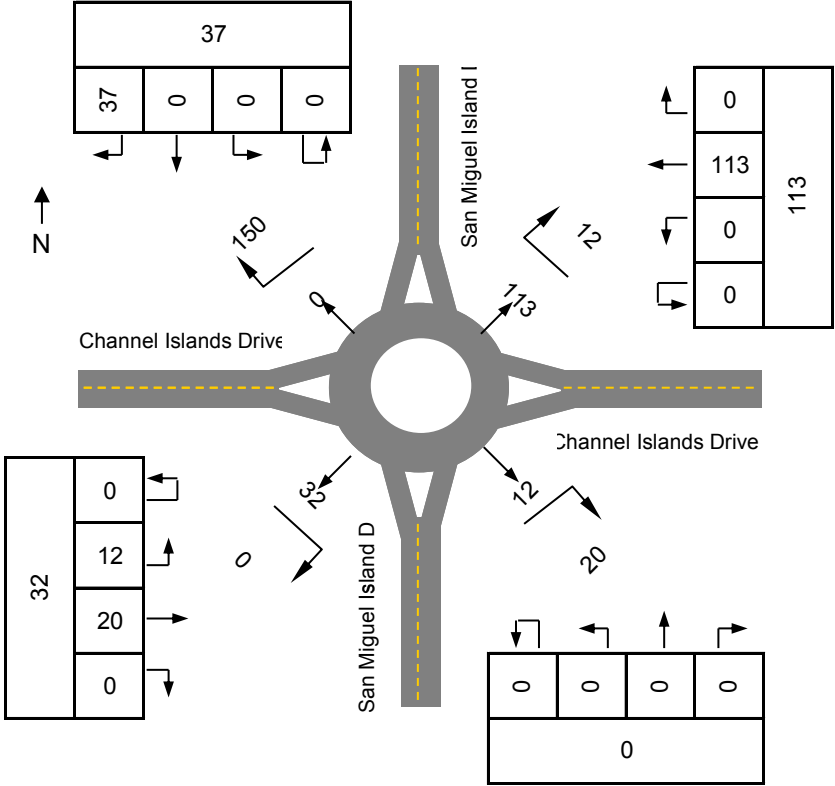
* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	CSUCI 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	Existing plus Project AM							N-S Street	San Miguel Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North														
	Bypass?													
	No													
	Total													
South	1		LT	100%	100%	100%	37	113		1,009	0.04	3.7	A	3
	Bypass?													
	No													
	Total			100%	100%	100%	37					3.7	A	
East	1	1	L	100%	100%	100%	32	0	1	1,130	0.03	3.3	A	2
	Bypass?													
	No													
	Total			100%	100%	100%	32					3.3	A	
West	1	1	LTR	100%	100%	100%	113	12	1	1,117	0.10	3.7	A	8
	Bypass?													
	No													
	Total			100%	100%	100%	113					3.7	A	
All							182					3.6	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)	0	0	0	0	0	0	0	37	0	12	20		0	0	113	0
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	37	0	12	20	0	0	0	113	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	37	0	12	20	0	0	0	113	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

Scenario Report

Scenario:	EP1
Command:	EP1
Volume:	EP1
Geometry:	Base
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

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Impact Analysis Report
 Level Of Service

Intersection	Base		Future		Change in
	Del/ LOS	V/ Veh C	Del/ LOS	V/ Veh C	
# 1 Lewis Rd & University Dr	A	xxxxx 0.359	A	xxxxx 0.359	+ 0.000 V/C
# 2 Lewis Rd & Camarillo St	C	xxxxx 0.782	C	xxxxx 0.782	+ 0.000 V/C
# 3 Lewis Rd & Cawelti Rd	A	xxxxx 0.399	A	xxxxx 0.399	+ 0.000 V/C
# 4 Lewis Rd & Pleasant Valley Rd	B	xxxxx 0.611	B	xxxxx 0.611	+ 0.000 V/C
# 5 US-101 SB Ramps & Ventura Bl	A	xxxxx 0.509	A	xxxxx 0.509	+ 0.000 V/C
# 6 Lewis Rd & Ventura Bl	A	xxxxx 0.457	A	xxxxx 0.457	+ 0.000 V/C
# 7 US-101 NB Ramps & Daily Dr	A	xxxxx 0.570	A	xxxxx 0.570	+ 0.000 V/C
# 8 Lewis Rd & Daily Dr	A	xxxxx 0.513	A	xxxxx 0.513	+ 0.000 V/C

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Lewis Rd & University Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.359
 Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 41 Level Of Service: A

Street Name:	Lewis Rd						University Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	1	1	0	0	2	0	1	0	0	1

Volume Module:

Base Vol:	0	538	73	68	406	0	0	0	0	138	0	169
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	538	73	68	406	0	0	0	0	138	0	169
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	538	73	68	406	0	0	0	0	138	0	169
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	538	73	68	406	0	0	0	0	138	0	169
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	538	73	68	406	0	0	0	0	138	0	169

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	1.76	0.24	2.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00

EP1_PM_UPDATED_17.txt

Final Sat.: 0 2818 382 3200 1600 0 0 0 0 1600 0 1600
 -----|-----|-----|-----|-----|
 Capacity Analysis Module:
 Vol/Sat: 0.00 0.19 0.19 0.02 0.25 0.00 0.00 0.00 0.00 0.09 0.00 0.11
 Crit Moves: ****

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Level Of Service Computation Report ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 Lewis Rd & Camarillo St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.782
 Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 85 Level Of Service: C

Street Name:	Lewis Rd						Camarillo St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	0	1	0	0	1	0	0	0

Volume Module:
 Base Vol: 0 701 4 454 446 0 0 0 0 11 0 434
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bse: 0 701 4 454 446 0 0 0 0 11 0 434
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	701	4	454	446	0	0	0	0	11	0	434
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	701	4	454	446	0	0	0	0	11	0	434
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	701	4	454	446	0	0	0	0	11	0	434
----- ----- ----- ----- -----												
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	2.00	0.00	0.00	1.00	0.00	0.02	0.00	0.98
Final Sat.:	1600	3182	18	1600	3200	0	0	1600	0	40	0	1560
----- ----- ----- ----- -----												
Capacity Analysis Module:												
Vol/Sat:	0.00	0.22	0.22	0.28	0.14	0.00	0.00	0.00	0.00	0.01	0.00	0.28
Crit Moves:	****		****		****							

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ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

```

*****
Intersection #3 Lewis Rd & Cawelti Rd
*****
Cycle (sec):          100          Critical Vol./Cap.(X):          0.399
Loss Time (sec):       0          Average Delay (sec/veh):          xxxxxx
Optimal Cycle:         31          Level Of Service:              A
*****
Street Name:          Lewis Rd          Cawelti Rd
Approach:              North Bound      South Bound      East Bound      West Bound
Movement:              L - T - R        L - T - R        L - T - R        L - T - R

```

EP1_PM_UPDATED_17.txt

Control:	Protected			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	0	1	0	0	1	0	0	1

Volume Module:

Base Vol:	106	1025	0	0	806	78	15	0	75	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	106	1025	0	0	806	78	15	0	75	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	106	1025	0	0	806	78	15	0	75	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	106	1025	0	0	806	78	15	0	75	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	106	1025	0	0	806	78	15	0	75	0	0	0

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	1.00	1.82	0.18	0.17	0.00	0.83	0.00	1.00	0.00
Final Sat.:	1600	3200	0	1600	2918	282	267	0	1333	0	1600	0

Capacity Analysis Module:

Vol/Sat:	0.07	0.32	0.00	0.00	0.28	0.28	0.01	0.00	0.06	0.00	0.00	0.00
Crit Moves:	****			****			****					

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #4 Lewis Rd & Pleasant Valley Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.611

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 59 Level Of Service: B

Street Name:	Lewis Rd						Pleasant Valley Rd						
Approach:	North Bound			South Bound			East Bound			West Bound			
Movement:	L	T	R	L	T	R	L	T	R	L	T	R	
Control:	Protected			Protected			Protected			Protected			
Rights:	Include			Ovl			Include			Ovl			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lanes:	1	0	2	0	1	1	0	2	0	1	2	0	2

Volume Module:

Base Vol:	90	492	446	104	531	313	210	353	50	292	645	210
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	90	492	446	104	531	313	210	353	50	292	645	210
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	90	492	446	104	531	313	210	353	50	292	645	210
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	90	492	446	104	531	313	210	353	50	292	645	210
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	90	492	446	104	531	313	210	353	50	292	645	210
OvlAdjVol:	208						106					

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	1600	3200	1600	1600	3200	1600	3200	3200	1600	3200	3200	1600

Capacity Analysis Module:

Vol/Sat:	0.06	0.15	0.28	0.07	0.17	0.20	0.07	0.11	0.03	0.09	0.20	0.13
OvlAdjV/S:	0.13						0.07					
Crit Moves:	****			****			****			****		

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #5 US-101 SB Ramps & Ventura Bl

Cycle (sec): 100 Critical Vol./Cap.(X): 0.509
 Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 46 Level Of Service: A

Street Name:	US-101 SB Ramps						Ventura Bl										
Approach:	North Bound			South Bound			East Bound			West Bound							
Movement:	L	T	R	L	T	R	L	T	R	L	T	R					
Control:	Split Phase			Split Phase			Protected			Protected							
Rights:	Include			Include			Include			Include							
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0					
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0					
Lanes:	0	1	0	0	1	1	1	0	1	0	2	0	0	1	0	1	0

Volume Module:

Base Vol:	6	0	7	559	3	344	401	289	10	14	320	205
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	0	7	559	3	344	401	289	10	14	320	205
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	6	0	7	559	3	344	401	289	10	14	320	205
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	6	0	7	559	3	344	401	289	10	14	320	205
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	6	0	7	559	3	344	401	289	10	14	320	205

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	1.99	0.01	1.00	2.00	0.97	0.03	1.00	1.22	0.78

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Final Sat.: 1600 0 1600 3183 17 1600 3200 1546 54 1600 1950 1250
 -----|-----|-----|-----|-----|
 Capacity Analysis Module:
 Vol/Sat: 0.00 0.00 0.00 0.18 0.18 0.22 0.13 0.19 0.19 0.01 0.16 0.16
 Crit Moves: **** **** **** ****

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Level Of Service Computation Report
 ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #6 Lewis Rd & Ventura Bl

Cycle (sec): 100 Critical Vol./Cap.(X): 0.457
 Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 42 Level Of Service: A

Street Name:	Lewis Rd						Ventura Bl						
Approach:	North Bound			South Bound			East Bound			West Bound			
Movement:	L	T	R	L	T	R	L	T	R	L	T	R	
Control:	Protected			Protected			Split Phase			Split Phase			
Rights:	Include			Include			Include			Include			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lanes:	2	0	1	1	0	1	1	1	0	0	1	0	1

Volume Module:

Base Vol:	278	709	6	17	549	237	553	16	293	6	18	9
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	278	709	6	17	549	237	553	16	293	6	18	9
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	278	709	6	17	549	237	553	16	293	6	18	9
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	278	709	6	17	549	237	553	16	293	6	18	9
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	278	709	6	17	549	237	553	16	293	6	18	9

-----|-----|-----|-----|-----|

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	1.98	0.02	1.00	2.00	1.00	1.94	0.06	1.00	0.25	0.75	1.00
Final Sat.:	3200	3173	27	1600	3200	1600	3110	90	1600	400	1200	1600

-----|-----|-----|-----|-----|

Capacity Analysis Module:

Vol/Sat:	0.09	0.22	0.22	0.01	0.17	0.15	0.18	0.18	0.18	0.02	0.02	0.01
Crit Moves:	****				****				****		****	

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #7 US-101 NB Ramps & Daily Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.570
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	43	Level Of Service:	A

Street Name:	US-101 NB Ramps				Daily Dr			
Approach:	North Bound		South Bound		East Bound		West Bound	
Movement:	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R

EP1_PM_UPDATED_17.txt

Control:	Permitted			Permitted			Permitted			Protected		
Rights:	Include			Include			Ignore			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	2	0	0	0	0	0	0	0	1	0	1	0

Volume Module:

Base Vol:	1090	0	356	0	0	0	0	202	91	329	314	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1090	0	356	0	0	0	0	202	91	329	314	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	1090	0	356	0	0	0	0	202	0	329	314	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1090	0	356	0	0	0	0	202	0	329	314	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	1090	0	356	0	0	0	0	202	0	329	314	0

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	2.00	1.00	0.00
Final Sat.:	3200	0	1600	0	0	0	0	1600	1600	3200	1600	0

Capacity Analysis Module:

Vol/Sat:	0.34	0.00	0.22	0.00	0.00	0.00	0.00	0.13	0.00	0.10	0.20	0.00
Crit Moves:	****							****		****		

EP1_PM_UPDATED_17.txt

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #8 Lewis Rd & Daily Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.513

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 38 Level Of Service: A

Street Name: Lewis Rd Daily Dr

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Permitted			Permitted			Permitted		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	0	0	1	1	0	0	1	0

Volume Module:

Base Vol:	329	934	1	0	561	236	320	6	220	6	16	5
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	329	934	1	0	561	236	320	6	220	6	16	5
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	329	934	1	0	561	236	320	6	220	6	16	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	329	934	1	0	561	236	320	6	220	6	16	5
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	329	934	1	0	561	236	320	6	220	6	16	5

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	0.00	2.11	0.89	1.96	0.04	1.00	0.22	0.59	0.19
Final Sat.:	1600	3197	3	0	3379	1421	3141	59	1600	356	948	296

Capacity Analysis Module:

Vol/Sat:	0.21	0.29	0.29	0.00	0.17	0.17	0.10	0.10	0.14	0.00	0.02	0.02
Crit Moves:	****				****				****	****		

Intersection

Int Delay, s/veh 5.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	145	273	47	277	172
Future Vol, veh/h	25	145	273	47	277	172
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	158	297	51	301	187

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1111	322	0	0	348	0
Stage 1	322	-	-	-	-	-
Stage 2	789	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	231	719	-	-	1211	-
Stage 1	735	-	-	-	-	-
Stage 2	448	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	167	719	-	-	1211	-
Mov Cap-2 Maneuver	167	-	-	-	-	-
Stage 1	735	-	-	-	-	-
Stage 2	324	-	-	-	-	-

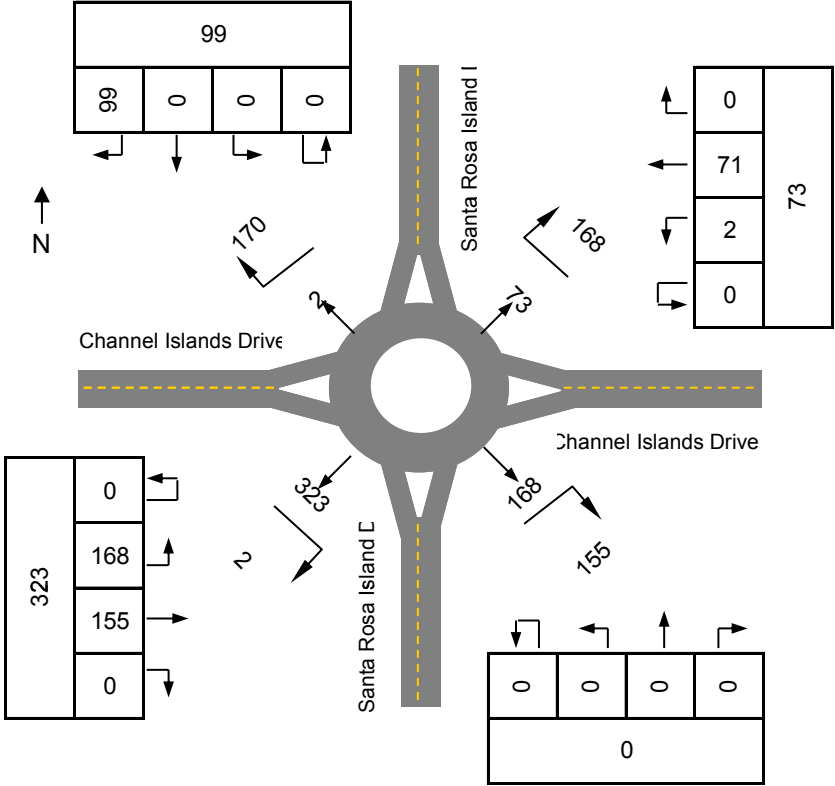
Approach	WB		NB		SB
HCM Control Delay, s	14.2		0		5.5
HCM LOS	B				

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	167	719	1211	-
HCM Lane V/C Ratio	-	-	0.163	0.219	0.249	-
HCM Control Delay (s)	-	-	30.7	11.4	9	0
HCM Lane LOS	-	-	D	B	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.8	1	-

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	CSUCI 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	Existing plus Project PM							N-S Street	Santa Rosa Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North	1	1	LTR	100%	100%	100%	0	323	1	818	0.00	4.4	A	0
	Bypass?													
	No													
	Total			100%	100%	100%								
South	0													
	Bypass?													
	No													
	Total						99					0.0	A	
East	1	1	L	100%	100%	100%	323	2	1	1,128	0.29	4.8	A	30
	Bypass?													
	No													
	Total			100%	100%	100%	323					4.8	A	
West	1	1	LTR	100%	100%	100%	73	168	1	955	0.08	4.2	A	6
	Bypass?													
	No													
	Total			100%	100%	100%	73					4.2	A	
All							495					3.7	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)								99		168	155			2	71	0
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	99	0	168	155	0	0	2	71	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	99	0	168	155	0	0	2	71	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

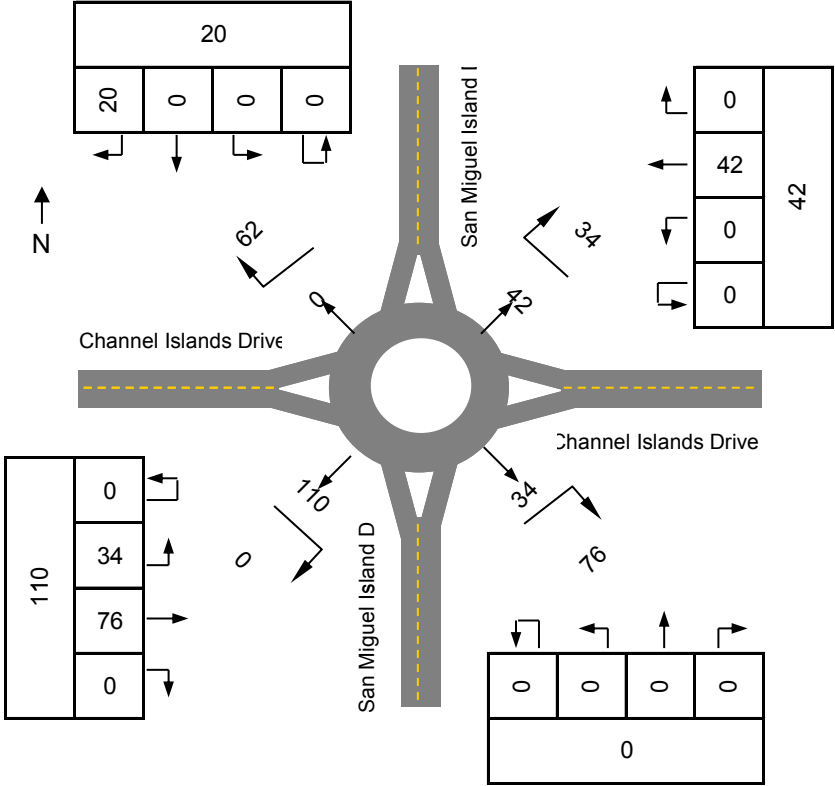
* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	CSUCI 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	Existing plus Project PM							N-S Street	San Miguel Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North														
	Bypass?													
	No													
	Total													
South	1		LT	100%	100%	100%	20	42		1,084	0.02	3.4	A	1
	Bypass?													
	No													
	Total			100%	100%	100%	20					3.4	A	
East	1	1	L	100%	100%	100%	110	0	1	1,130	0.10	3.6	A	8
	Bypass?													
	No													
	Total			100%	100%	100%	110					3.6	A	
West	1	1	LTR	100%	100%	100%	42	34	1	1,092	0.04	3.5	A	3
	Bypass?													
	No													
	Total			100%	100%	100%	42					3.5	A	
All							172					3.6	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)	0	0	0	0	0	0	0	20	0	34	76	0	0	0	42	0
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	20	0	34	76	0	0	0	42	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	20	0	34	76	0	0	0	42	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

Scenario Report

Scenario: C

Command: C

Volume: C

Geometry: Base

Impact Fee: Default Impact Fee

Trip Generation: Default Trip Generation

Trip Distribution: Default Trip Distribution

Paths: Default Path

Routes: Default Route

Configuration: Default Configuration

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Impact Analysis Report
 Level Of Service

Intersection	Base Del/ LOS Veh	V/ C	Future Del/ LOS Veh	V/ C	Change in
# 1 Lewis Rd & University Dr	A xxxxx	0.364	A xxxxx	0.364	+ 0.000 V/C
# 2 Lewis Rd & Camarillo St	A xxxxx	0.508	A xxxxx	0.508	+ 0.000 V/C
# 3 Lewis Rd & Cawelti Rd	A xxxxx	0.439	A xxxxx	0.439	+ 0.000 V/C
# 4 Lewis Rd & Pleasant Valley Rd	A xxxxx	0.590	A xxxxx	0.590	+ 0.000 V/C
# 5 US-101 SB Ramps & Ventura Bl	C xxxxx	0.735	C xxxxx	0.735	+ 0.000 V/C
# 6 Lewis Rd & Ventura Bl	B xxxxx	0.661	B xxxxx	0.661	+ 0.000 V/C
# 7 US-101 NB Ramps & Daily Dr	A xxxxx	0.594	A xxxxx	0.594	+ 0.000 V/C
# 8 Lewis Rd & Daily Dr	C xxxxx	0.743	C xxxxx	0.743	+ 0.000 V/C

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Lewis Rd & University Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.364

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 38 Level Of Service: A

Street Name:	Lewis Rd						University Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	1	1	0	0	2	0	1	0	0	1

Volume Module:

Base Vol:	0	362	117	211	543	0	0	0	0	40	0	32
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	362	117	211	543	0	0	0	0	40	0	32
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	362	117	211	543	0	0	0	0	40	0	32
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	362	117	211	543	0	0	0	0	40	0	32
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	362	117	211	543	0	0	0	0	40	0	32

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	1.51	0.49	2.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat.:	0	2418	782	3200	1600	0	0	0	0	1600	0	1600

```

-----|-----||-----||-----|
Capacity Analysis Module:
Vol/Sat:    0.00 0.15  0.15  0.07 0.34  0.00  0.00 0.00  0.00  0.03 0.00  0.02
Crit Moves:                ****                ****
*****

```

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 Lewis Rd & Camarillo St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.508

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 38 Level Of Service: A

Street Name:	Lewis Rd						Camarillo St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	0	1	0	0	0	1	0	0

Volume Module:

Base Vol:	0	370	6	328	743	0	0	0	0	8	0	289
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	370	6	328	743	0	0	0	0	8	0	289
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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PHF Volume:	0	370	6	328	743	0	0	0	0	8	0	289
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	370	6	328	743	0	0	0	0	8	0	289
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	370	6	328	743	0	0	0	0	8	0	289

-----|-----|-----|-----|-----|

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.97	0.03	1.00	2.00	0.00	0.00	1.00	0.00	0.03	0.00	0.97
Final Sat.:	1600	3149	51	1600	3200	0	0	1600	0	43	0	1557

-----|-----|-----|-----|-----|

Capacity Analysis Module:

Vol/Sat:	0.00	0.12	0.12	0.21	0.23	0.00	0.00	0.00	0.00	0.01	0.00	0.19
Crit Moves:	****		****		****							

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 Lewis Rd & Cawelti Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.439
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	33	Level Of Service:	A

Street Name:	Lewis Rd	Cawelti Rd
Approach:	North Bound South Bound	East Bound West Bound
Movement:	L - T - R L - T - R	L - T - R L - T - R

-----|-----|-----|-----|-----|

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Control:	Protected					Permitted					Permitted					Permitted				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Lanes:	1	0	1	1	0	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
----- ----- ----- ----- -----																				
Volume Module:																				
Base Vol:	47	646	0	0	1037	15	31	0	99	0	0	0								
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
Initial Bse:	47	646	0	0	1037	15	31	0	99	0	0	0								
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
PHF Volume:	47	646	0	0	1037	15	31	0	99	0	0	0								
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0								
Reduced Vol:	47	646	0	0	1037	15	31	0	99	0	0	0								
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
FinalVolume:	47	646	0	0	1037	15	31	0	99	0	0	0								
----- ----- ----- ----- -----																				
Saturation Flow Module:																				
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600								
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
Lanes:	1.00	2.00	0.00	1.00	1.97	0.03	0.24	0.00	0.76	0.00	1.00	0.00								
Final Sat.:	1600	3200	0	1600	3154	46	382	0	1218	0	1600	0								
----- ----- ----- ----- -----																				
Capacity Analysis Module:																				
Vol/Sat:	0.03	0.20	0.00	0.00	0.33	0.33	0.02	0.00	0.08	0.00	0.00	0.00								
Crit Moves:	****				****				****											

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ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #4 Lewis Rd & Pleasant Valley Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.590

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 56 Level Of Service: A

Street Name: Lewis Rd

Pleasant Valley Rd

Approach: North Bound

South Bound

East Bound

West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

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Control: Protected Protected Protected Protected

Rights: Include Ovl Include Ovl

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0 0

Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Lanes: 1 0 2 0 1 1 0 2 0 1 2 0 2 0 1 2 0 2 0 1

-----|-----|-----|-----|-----|

Volume Module:

Base Vol: 69 328 297 134 653 270 249 594 36 431 381 259

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 69 328 297 134 653 270 249 594 36 431 381 259

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 69 328 297 134 653 270 249 594 36 431 381 259

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 69 328 297 134 653 270 249 594 36 431 381 259

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

FinalVolume: 69 328 297 134 653 270 249 594 36 431 381 259

OvlAdjVol: 146 125

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Saturation Flow Module:

Sat/Lane: 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 1.00 2.00 1.00 1.00 2.00 1.00 2.00 2.00 1.00 2.00 2.00 1.00

Final Sat.: 1600 3200 1600 1600 3200 1600 3200 3200 1600 3200 3200 1600

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Capacity Analysis Module:

Vol/Sat: 0.04 0.10 0.19 0.08 0.20 0.17 0.08 0.19 0.02 0.13 0.12 0.16

OvlAdjV/S: 0.09 0.08

Crit Moves: **** **** **** ****

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #5 US-101 SB Ramps & Ventura Bl

Cycle (sec): 100 Critical Vol./Cap.(X): 0.735

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 86 Level Of Service: C

Street Name:	US-101 SB Ramps						Ventura Bl					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	-	T	-	R		L	-	T	-	R	
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	1	0	0	1	1	1	0	1	0	2	0

Volume Module:

Base Vol:	8	3	8	690	28	253	585	349	46	87	238	527
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	8	3	8	690	28	253	585	349	46	87	238	527
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	8	3	8	690	28	253	585	349	46	87	238	527
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	3	8	690	28	253	585	349	46	87	238	527
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	8	3	8	690	28	253	585	349	46	87	238	527

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.73	0.27	1.00	2.00	0.10	0.90	2.00	0.88	0.12	1.00	1.00	1.00
Final Sat.:	1164	436	1600	3200	159	1441	3200	1414	186	1600	1600	1600

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Capacity Analysis Module:
Vol/Sat:    0.01 0.01  0.01  0.22 0.18  0.18  0.18 0.25  0.25  0.05 0.15  0.33
Crit Moves:  ****                ****                ****                ****
*****

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #6 Lewis Rd & Ventura Bl

Cycle (sec): 100 Critical Vol./Cap.(X): 0.661

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 67 Level Of Service: B

Street Name:	Lewis Rd						Ventura Bl					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	2	0	1	1	0	2	1	1	0	0	1	0

Volume Module:

Base Vol:	257	733	8	16	793	537	728	20	320	7	11	11
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	257	733	8	16	793	537	728	20	320	7	11	11
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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PHF Volume:	257	733	8	16	793	537	728	20	320	7	11	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	257	733	8	16	793	537	728	20	320	7	11	11
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	257	733	8	16	793	537	728	20	320	7	11	11

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Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	1.98	0.02	1.00	2.00	1.00	1.95	0.05	1.00	0.39	0.61	1.00
Final Sat.:	3200	3165	35	1600	3200	1600	3114	86	1600	622	978	1600

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Capacity Analysis Module:

Vol/Sat:	0.08	0.23	0.23	0.01	0.25	0.34	0.23	0.23	0.20	0.01	0.01	0.01
Crit Moves:	****					****	****			****		

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #7 US-101 NB Ramps & Daily Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.594
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	46	Level Of Service:	A

Street Name:	US-101 NB Ramps	Daily Dr
Approach:	North Bound	South Bound
Movement:	L - T - R	L - T - R

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Control:	Permitted			Permitted			Permitted			Protected		
Rights:	Include			Include			Ignore			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	2	0	0	0	0	0	0	0	1	2	0	1
----- ----- ----- -----												
Volume Module:												
Base Vol:	389	0	466	0	0	0	0	155	223	658	199	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	389	0	466	0	0	0	0	155	223	658	199	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	389	0	466	0	0	0	0	155	0	658	199	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	389	0	466	0	0	0	0	155	0	658	199	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	389	0	466	0	0	0	0	155	0	658	199	0
----- ----- ----- -----												
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	2.00	1.00	0.00
Final Sat.:	3200	0	1600	0	0	0	0	1600	1600	3200	1600	0
----- ----- ----- -----												
Capacity Analysis Module:												
Vol/Sat:	0.12	0.00	0.29	0.00	0.00	0.00	0.00	0.10	0.00	0.21	0.12	0.00
Crit Moves:	****						****			****		

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ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #8 Lewis Rd & Daily Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.743

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 72 Level Of Service: C

Street Name: Lewis Rd Daily Dr

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

-----|-----|-----|-----|-----|

Control: Protected Permitted Permitted Permitted

Rights: Include Include Ovl Include

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Lanes: 1 0 1 1 0 0 1 1 1 0 1 0 0 1 0 0 0 0

-----|-----|-----|-----|-----|

Volume Module:

Base Vol: 356 1123 0 1 1068 471 312 18 309 10 6 1

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 356 1123 0 1 1068 471 312 18 309 10 6 1

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 356 1123 0 1 1068 471 312 18 309 10 6 1

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 356 1123 0 1 1068 471 312 18 309 10 6 1

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

FinalVolume: 356 1123 0 1 1068 471 312 18 309 10 6 1

-----|-----|-----|-----|-----|

Saturation Flow Module:

Sat/Lane: 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 1.00 2.00 0.00 0.01 2.08 0.91 1.89 0.11 1.00 0.59 0.35 0.06

Final Sat.: 1600 3200 0 3 3329 1468 3025 175 1600 941 565 94

-----|-----|-----|-----|-----|

Capacity Analysis Module:

Vol/Sat: 0.22 0.35 0.00 0.00 0.32 0.32 0.10 0.10 0.19 0.01 0.01 0.01

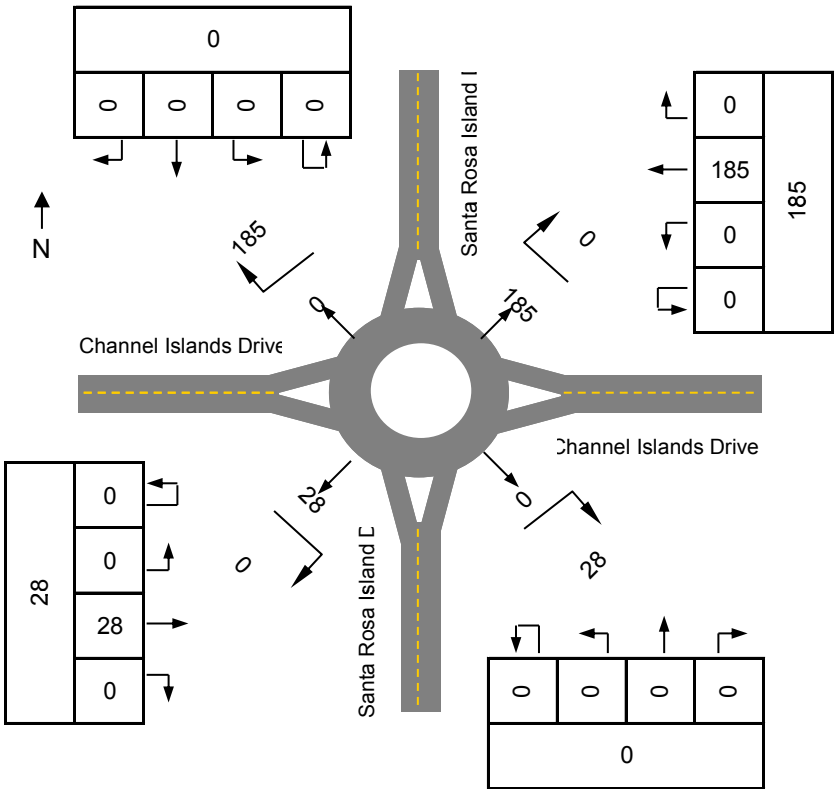
Crit Moves: **** **** **** ****

Intersection						
Int Delay, s/veh	3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	170	116	2	22	348
Future Vol, veh/h	15	170	116	2	22	348
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	185	126	2	24	378
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	553	127	0	0	128	0
Stage 1	127	-	-	-	-	-
Stage 2	426	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	494	923	-	-	1458	-
Stage 1	899	-	-	-	-	-
Stage 2	659	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	484	923	-	-	1458	-
Mov Cap-2 Maneuver	484	-	-	-	-	-
Stage 1	899	-	-	-	-	-
Stage 2	645	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.1	0		0.4		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 484 923 1458	-	-		
HCM Lane V/C Ratio	-	- 0.034 0.2 0.016	-	-		
HCM Control Delay (s)	-	- 12.7 9.9 7.5	0			
HCM Lane LOS	-	- B A A	A			
HCM 95th %tile Q(veh)	-	- 0.1 0.7 0.1	-			

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	CSUCI 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	CUMULATIVE AM							N-S Street	Santa Rosa Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North	1	1	LTR	100%	100%	100%	0	28	1	1,099	0.00	3.3	A	0
	Bypass?													
	No													
	Total			100%	100%	100%								
South	0													
	Bypass?													
	No													
	Total													
East	1	1	L	100%	100%	100%	28	0	1	1,130	0.02	3.3	A	2
	Bypass?													
	No													
	Total			100%	100%	100%	28					3.3	A	
West	1	1	LTR	100%	100%	100%	185	0	1	1,130	0.16	4.0	A	15
	Bypass?													
	No													
	Total			100%	100%	100%	185					4.0	A	
All							213					3.9	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)											28				185	
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	0	0	0	28	0	0	0	185	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	0	0	0	28	0	0	0	185	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

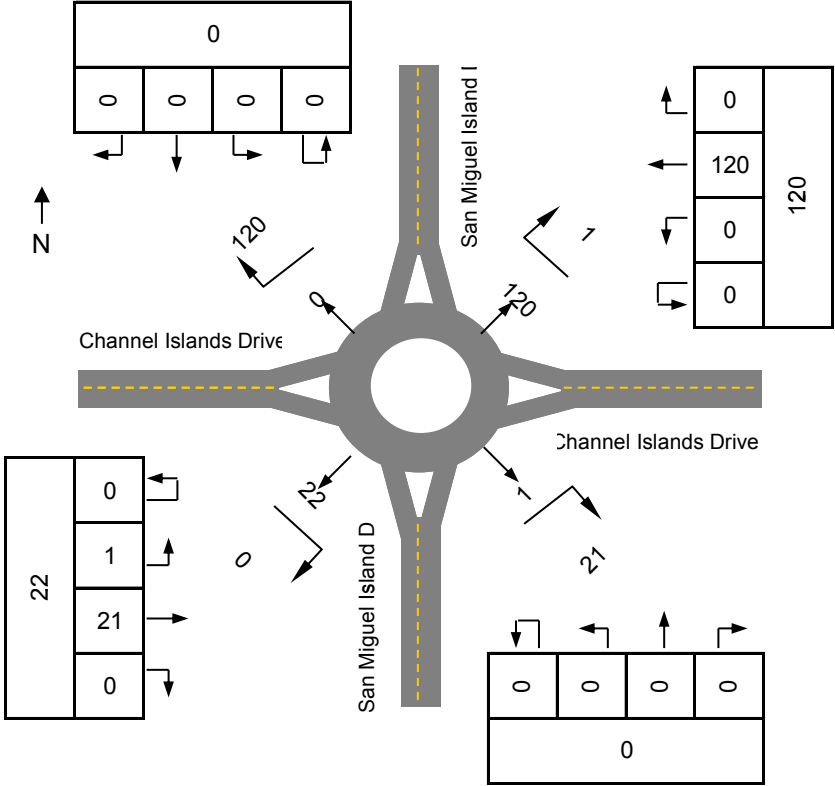
* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	CSUCI 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	Cumulative AM							N-S Street	San Miguel Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North														
	Bypass?													
	No													
	Total													
South	1		LT	100%	100%	100%	0	120		1,002	0.00	3.6	A	0
	Bypass?													
	No													
	Total			100%	100%	100%								
East	1	1	L	100%	100%	100%	22	0	1	1,130	0.02	3.3	A	1
	Bypass?													
	No													
	Total			100%	100%	100%	22					3.3	A	
West	1	1	LTR	100%	100%	100%	120	1	1	1,129	0.11	3.7	A	9
	Bypass?													
	No													
	Total			100%	100%	100%	120					3.7	A	
All							142					3.6	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)	0	0	0	0	0	0	0	0	0	1	21	0	0	0	120	0
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	0	0	1	21	0	0	0	120	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	0	0	1	21	0	0	0	120	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

Scenario Report

Scenario:	C
Command:	C
Volume:	C
Geometry:	Base
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

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Impact Analysis Report
 Level Of Service

Intersection	Base Del/ LOS Veh	V/ C	Future Del/ LOS Veh	V/ C	Change in
# 1 Lewis Rd & University Dr	A xxxxx	0.445	A xxxxx	0.445	+ 0.000 V/C
# 2 Lewis Rd & Camarillo St	B xxxxx	0.686	B xxxxx	0.686	+ 0.000 V/C
# 3 Lewis Rd & Cawelti Rd	A xxxxx	0.400	A xxxxx	0.400	+ 0.000 V/C
# 4 Lewis Rd & Pleasant Valley Rd	B xxxxx	0.664	B xxxxx	0.664	+ 0.000 V/C
# 5 US-101 SB Ramps & Ventura Bl	B xxxxx	0.642	B xxxxx	0.642	+ 0.000 V/C
# 6 Lewis Rd & Ventura Bl	B xxxxx	0.628	B xxxxx	0.628	+ 0.000 V/C
# 7 US-101 NB Ramps & Daily Dr	B xxxxx	0.676	B xxxxx	0.676	+ 0.000 V/C
# 8 Lewis Rd & Daily Dr	C xxxxx	0.730	C xxxxx	0.730	+ 0.000 V/C

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Lewis Rd & University Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.445

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 52 Level Of Service: A

Street Name:	Lewis Rd						University Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	1	1	0	0	2	0	1	0	0	1

Volume Module:

Base Vol:	0	576	66	117	436	0	0	0	0	146	0	276
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	576	66	117	436	0	0	0	0	146	0	276
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	576	66	117	436	0	0	0	0	146	0	276
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	576	66	117	436	0	0	0	0	146	0	276
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	576	66	117	436	0	0	0	0	146	0	276

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	1.79	0.21	2.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat.:	0	2871	329	3200	1600	0	0	0	0	1600	0	1600

Capacity Analysis Module:

Vol/Sat:	0.00	0.20	0.20	0.04	0.27	0.00	0.00	0.00	0.00	0.09	0.00	0.17
----------	------	------	------	------	------	------	------	------	------	------	------	------

Crit Moves:

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 Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 Lewis Rd & Camarillo St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.686

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 59 Level Of Service: B

Street Name:	Lewis Rd						Camarillo St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	0	1	0	0	1	0	0	1

Volume Module:

Base Vol:	0	842	4	306	520	0	0	0	0	12	0	356
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	842	4	306	520	0	0	0	0	12	0	356
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	842	4	306	520	0	0	0	0	12	0	356
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	842	4	306	520	0	0	0	0	12	0	356

C_PM_csuci.txt

PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	842	4	306	520	0	0	0	0	12	0	356

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Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	2.00	0.00	0.00	1.00	0.00	0.03	0.00	0.97
Final Sat.:	1600	3185	15	1600	3200	0	0	1600	0	52	0	1548

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Capacity Analysis Module:

Vol/Sat:	0.00	0.26	0.26	0.19	0.16	0.00	0.00	0.00	0.00	0.01	0.00	0.23
Crit Moves:	****		****						****			

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #3 Lewis Rd & Cawelti Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.400
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	54	Level Of Service:	A

Street Name:	Lewis Rd				Cawelti Rd			
Approach:	North Bound		South Bound		East Bound		West Bound	
Movement:	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R

-----|-----|-----|-----|-----|

Control:	Protected		Permitted		Permitted		Permitted	
Rights:	Include		Include		Include		Include	
Min. Green:	0	0	0	0	0	0	0	0

C_PM_csuci.txt

Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Lanes:	1	0	1	1	0	1	0	1	1	0	0	0	1! 0 0	0	0	1! 0 0

-----|-----|-----|-----|-----|

Volume Module:

Base Vol:	113	1097	0	0	741	83	16	0	75	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	113	1097	0	0	741	83	16	0	75	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	113	1097	0	0	741	83	16	0	75	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	113	1097	0	0	741	83	16	0	75	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	113	1097	0	0	741	83	16	0	75	0	0	0

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Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	1.00	1.80	0.20	0.18	0.00	0.82	0.00	1.00	0.00
Final Sat.:	1600	3200	0	1600	2878	322	281	0	1319	0	1600	0

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Capacity Analysis Module:

Vol/Sat:	0.07	0.34	0.00	0.00	0.26	0.26	0.01	0.00	0.06	0.00	0.00	0.00
Crit Moves:	****			****								

C_PM_csuci.txt

```

*****
Cycle (sec):          100          Critical Vol./Cap.(X):          0.664
Loss Time (sec):      0          Average Delay (sec/veh):          xxxxxx
Optimal Cycle:        68          Level Of Service:              B
*****

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Street Name:          Lewis Rd          Pleasant Valley Rd
Approach:             North Bound      South Bound      East Bound      West Bound
Movement:             L - T - R        L - T - R        L - T - R        L - T - R
-----|-----|-----|-----|
Control:              Protected        Protected        Protected        Protected
Rights:               Include          Ov1             Include          Ov1
Min. Green:           0    0    0        0    0    0        0    0    0        0    0    0
Y+R:                  4.0  4.0  4.0      4.0  4.0  4.0      4.0  4.0  4.0      4.0  4.0  4.0
Lanes:                1  0  2  0  1      1  0  2  0  1      2  0  2  0  1      2  0  2  0  1
-----|-----|-----|-----|

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Volume Module:
Base Vol:             97  531  473  117  487  362  258  378  24  302  686  231
Growth Adj:           1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:          97  531  473  117  487  362  258  378  24  302  686  231
User Adj:             1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:              1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:           97  531  473  117  487  362  258  378  24  302  686  231
Reduct Vol:           0    0    0        0    0    0        0    0    0        0    0    0
Reduced Vol:          97  531  473  117  487  362  258  378  24  302  686  231
PCE Adj:              1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:              1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:          97  531  473  117  487  362  258  378  24  302  686  231
OvlAdjVol:                                233                                114
-----|-----|-----|-----|

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Saturation Flow Module:
Sat/Lane:             1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600
Adjustment:           1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:                1.00 2.00 1.00 1.00 2.00 1.00 2.00 2.00 1.00 2.00 2.00 1.00
Final Sat.:           1600 3200 1600 1600 3200 1600 3200 3200 1600 3200 3200 1600
-----|-----|-----|-----|

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Capacity Analysis Module:
Vol/Sat:              0.06 0.17 0.30 0.07 0.15 0.23 0.08 0.12 0.02 0.09 0.21 0.14
OvlAdjV/S:                                0.15                                0.07
Crit Moves:          ****    ****          ****          ****
*****

```

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #5 US-101 SB Ramps & Ventura Bl

Cycle (sec): 100 Critical Vol./Cap.(X): 0.642

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 64 Level Of Service: B

Street Name: US-101 SB Ramps

Ventura Bl

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

-----|-----|-----|-----|

Control: Split Phase Split Phase Protected Protected

Rights: Include Include Include Include

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0 0

Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Lanes: 0 1 0 0 1 1 1 0 1 0 2 0 0 1 0 1 0 1 1 0

-----|-----|-----|-----|

Volume Module:

Base Vol: 6 0 7 700 3 396 473 380 11 15 410 364

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 6 0 7 700 3 396 473 380 11 15 410 364

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 6 0 7 700 3 396 473 380 11 15 410 364

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Reduced Vol: 6 0 7 700 3 396 473 380 11 15 410 364

PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

FinalVolume: 6 0 7 700 3 396 473 380 11 15 410 364

-----|-----|-----|-----|

Saturation Flow Module:

Sat/Lane: 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600 1600

Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Lanes: 1.00 0.00 1.00 1.99 0.01 1.00 2.00 0.97 0.03 1.00 1.06 0.94

Final Sat.: 1600 0 1600 3186 14 1600 3200 1555 45 1600 1695 1505

-----|-----|-----|-----|

Capacity Analysis Module:

Vol/Sat: 0.00 0.00 0.00 0.22 0.22 0.25 0.15 0.24 0.24 0.01 0.24 0.24

Crit Moves:

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 Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #6 Lewis Rd & Ventura Bl

Cycle (sec): 100 Critical Vol./Cap.(X): 0.628

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 61 Level Of Service: B

Street Name:	Lewis Rd						Ventura Bl					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	2	0	1	1	0	0	1	1	0	0	1	0

Volume Module:

Base Vol:	380	876	6	18	649	381	664	17	409	6	19	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	380	876	6	18	649	381	664	17	409	6	19	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	380	876	6	18	649	381	664	17	409	6	19	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	380	876	6	18	649	381	664	17	409	6	19	10

C_PM_csuci.txt

PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	380	876	6	18	649	381	664	17	409	6	19	10

-----|-----|-----|-----|-----|

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	1.99	0.01	1.00	2.00	1.00	1.95	0.05	1.00	0.24	0.76	1.00
Final Sat.:	3200	3178	22	1600	3200	1600	3120	80	1600	384	1216	1600

-----|-----|-----|-----|-----|

Capacity Analysis Module:

Vol/Sat:	0.12	0.28	0.28	0.01	0.20	0.24	0.21	0.21	0.26	0.02	0.02	0.01
Crit Moves:	****					****			****		****	

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #7 US-101 NB Ramps & Daily Dr

Cycle (sec):	100	Critical Vol./Cap.(X):	0.676
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	57	Level Of Service:	B

Street Name:	US-101 NB Ramps				Daily Dr			
Approach:	North Bound		South Bound		East Bound		West Bound	
Movement:	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R

-----|-----|-----|-----|-----|

Control:	Permitted		Permitted		Permitted		Protected	
Rights:	Include		Include		Ignore		Include	
Min. Green:	0	0	0	0	0	0	0	0

C_PM_csuci.txt

Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0								
Lanes:	2	0	0	0	1	0	0	0	0	0	0	0	1	0	1	2	0	1	0	0

-----|-----|-----|-----|-----|

Volume Module:

Base Vol:	1157	0	488	0	0	0	0	224	97	558	359	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1157	0	488	0	0	0	0	224	97	558	359	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	1157	0	488	0	0	0	0	224	0	558	359	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1157	0	488	0	0	0	0	224	0	558	359	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	1157	0	488	0	0	0	0	224	0	558	359	0

-----|-----|-----|-----|-----|

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	2.00	1.00	0.00
Final Sat.:	3200	0	1600	0	0	0	0	1600	1600	3200	1600	0

-----|-----|-----|-----|-----|

Capacity Analysis Module:

Vol/Sat:	0.36	0.00	0.31	0.00	0.00	0.00	0.00	0.14	0.00	0.17	0.22	0.00
Crit Moves:	****							****		****		

C_PM_csuci.txt

```

*****
Cycle (sec):          100          Critical Vol./Cap.(X):          0.730
Loss Time (sec):      0           Average Delay (sec/veh):        xxxxxx
Optimal Cycle:        69          Level Of Service:              C
*****

```

```

Street Name:          Lewis Rd          Daily Dr
Approach:             North Bound      South Bound      East Bound      West Bound
Movement:             L - T - R        L - T - R        L - T - R        L - T - R
-----|-----|-----|-----|
Control:              Protected        Permitted        Permitted        Permitted
Rights:               Include          Include          Ovl             Include
Min. Green:           0    0    0        0    0    0        0    0    0        0    0    0
Y+R:                  4.0  4.0  4.0      4.0  4.0  4.0      4.0  4.0  4.0      4.0  4.0  4.0
Lanes:                1  0  1  1  0      0  1  1  1  0      1  1  0  0  1      0  0  1! 0  0
-----|-----|-----|-----|

```

```

Volume Module:
Base Vol:             492 1048      1    0  704  342  371  6  321    6  17    5
Growth Adj:           1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:          492 1048      1    0  704  342  371  6  321    6  17    5
User Adj:             1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:              1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:           492 1048      1    0  704  342  371  6  321    6  17    5
Reduct Vol:           0    0    0        0    0    0        0    0    0        0    0    0
Reduced Vol:          492 1048      1    0  704  342  371  6  321    6  17    5
PCE Adj:              1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:              1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:          492 1048      1    0  704  342  371  6  321    6  17    5
-----|-----|-----|-----|

```

```

Saturation Flow Module:
Sat/Lane:             1600 1600  1600  1600 1600  1600  1600 1600  1600  1600 1600  1600
Adjustment:           1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:                1.00 1.99  0.01  0.00 2.02  0.98  1.97 0.03  1.00  0.21 0.61  0.18
Final Sat.:           1600 3197      3    0 3231  1569  3149  51  1600    343  971  286
-----|-----|-----|-----|

```

```

Capacity Analysis Module:
Vol/Sat:              0.31 0.33  0.33  0.00 0.22  0.22  0.12 0.12  0.20  0.00 0.02  0.02
Crit Moves:          ****              ****              ****  ****
*****

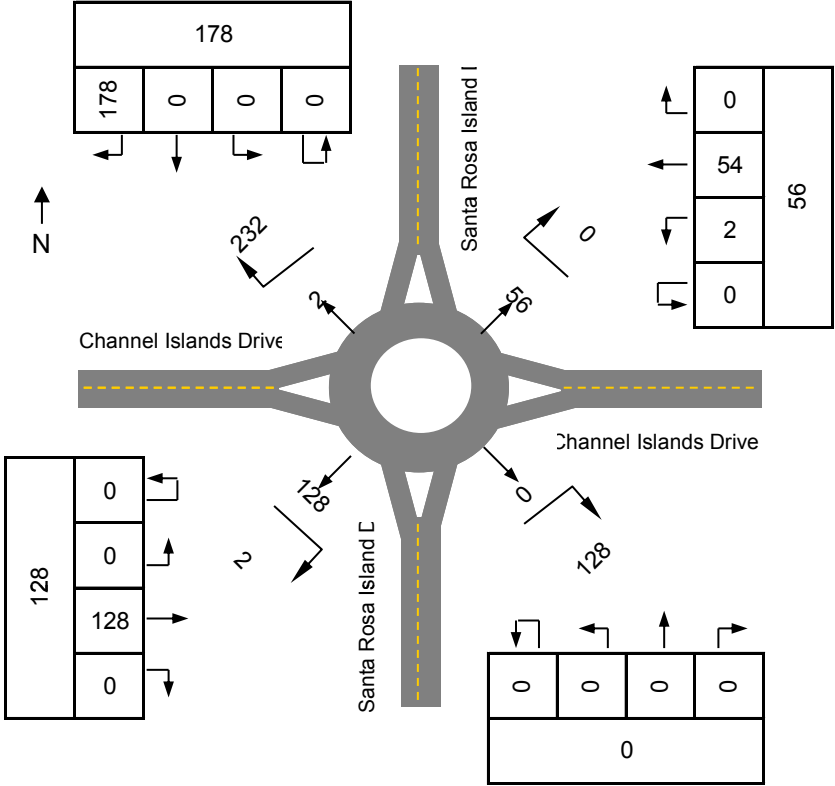
```

Intersection						
Int Delay, s/veh	2.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	49	290	14	116	183
Future Vol, veh/h	5	49	290	14	116	183
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	53	315	15	126	199
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	774	323	0	0	330	0
Stage 1	323	-	-	-	-	-
Stage 2	451	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	367	718	-	-	1229	-
Stage 1	734	-	-	-	-	-
Stage 2	642	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	325	718	-	-	1229	-
Mov Cap-2 Maneuver	325	-	-	-	-	-
Stage 1	734	-	-	-	-	-
Stage 2	568	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	10.9		0		3.2	
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 325 718 1229	-	-		
HCM Lane V/C Ratio	-	- 0.017 0.074 0.103	-	-		
HCM Control Delay (s)	-	- 16.3 10.4 8.3	0			
HCM Lane LOS	-	- C B A	A			
HCM 95th %tile Q(veh)	-	- 0.1 0.2 0.3	-			

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	CSUCI 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	CUMULATIVE PM							N-S Street	Santa Rosa Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North	1	1	LTR	100%	100%	100%	0	128	1	994	0.00	3.6	A	0
	Bypass?													
	No													
	Total			100%	100%	100%								
South	0													
	Bypass?													
	No													
	Total						178					0.0	A	
East	1	1	L	100%	100%	100%	128	2	1	1,128	0.11	3.7	A	10
	Bypass?													
	No													
	Total			100%	100%	100%	128					3.7	A	
West	1	1	LTR	100%	100%	100%	56	0	1	1,130	0.05	3.4	A	4
	Bypass?													
	No													
	Total			100%	100%	100%	56					3.4	A	
All							362					1.8	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)	0	0	0	0	0	0	0	178			128			2	54	
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	178	0	0	128	0	0	2	54	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	178	0	0	128	0	0	2	54	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

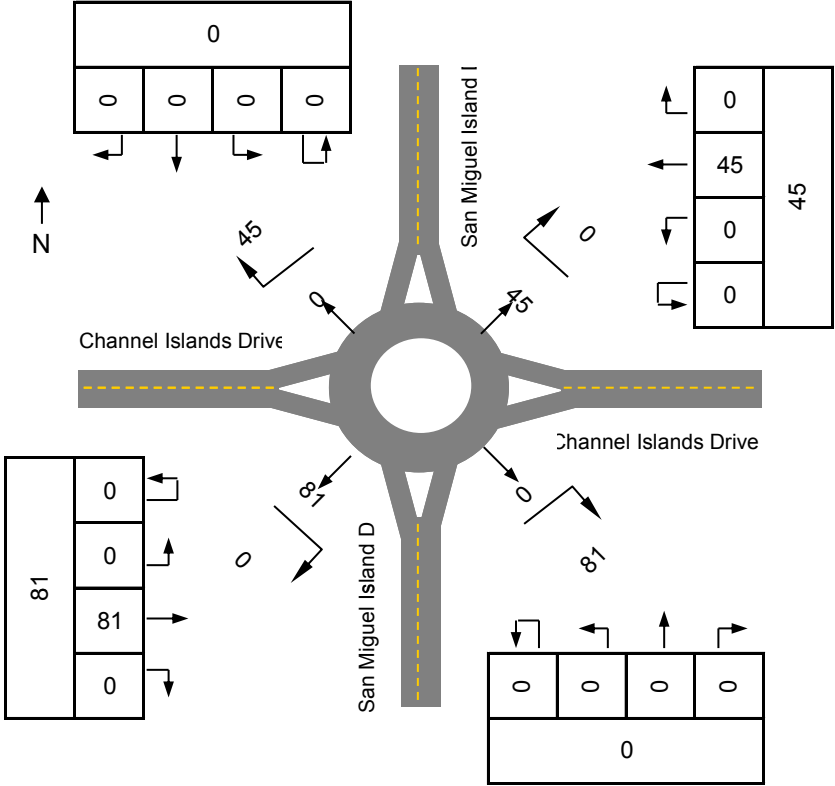
* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	CSUCI 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	Cumulative PM							N-S Street	San Miguel Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North														
	Bypass?													
	No													
	Total													
South	1		LT	100%	100%	100%	0	45		1,080	0.00	3.3	A	0
	Bypass?													
	No													
	Total			100%	100%	100%								
East	1	1	L	100%	100%	100%	81	0	1	1,130	0.07	3.5	A	6
	Bypass?													
	No													
	Total			100%	100%	100%	81					3.5	A	
West	1	1	LTR	100%	100%	100%	45	0	1	1,130	0.04	3.4	A	3
	Bypass?													
	No													
	Total			100%	100%	100%	45					3.4	A	
All							126					3.5	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)	0	0	0	0	0	0	0	0	0	0	81	0	0	0	45	0
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	0	0	0	81	0	0	0	45	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	0	0	0	81	0	0	0	45	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

Scenario Report

Scenario:	CP1
Command:	CP1
Volume:	CP1
Geometry:	Base
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

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 CP1 Tue Jan 17, 2017 15:28:32 Page 2-1

Impact Analysis Report
 Level Of Service

Intersection	Base Del/ LOS Veh	V/ C	Future Del/ LOS Veh	V/ C	Change in
# 1 Lewis Rd & University Dr	A xxxxx	0.374	A xxxxx	0.374	+ 0.000 V/C
# 2 Lewis Rd & Camarillo St	B xxxxx	0.654	B xxxxx	0.654	+ 0.000 V/C
# 3 Lewis Rd & Cawelti Rd	A xxxxx	0.461	A xxxxx	0.461	+ 0.000 V/C
# 4 Lewis Rd & Pleasant Valley Rd	B xxxxx	0.607	B xxxxx	0.607	+ 0.000 V/C
# 5 US-101 SB Ramps & Ventura Bl	C xxxxx	0.757	C xxxxx	0.757	+ 0.000 V/C
# 6 Lewis Rd & Ventura Bl	B xxxxx	0.674	B xxxxx	0.674	+ 0.000 V/C
# 7 US-101 NB Ramps & Daily Dr	B xxxxx	0.611	B xxxxx	0.611	+ 0.000 V/C
# 8 Lewis Rd & Daily Dr	C xxxxx	0.782	C xxxxx	0.782	+ 0.000 V/C

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 CP1 Tue Jan 17, 2017 15:28:32 Page 3-1

Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Lewis Rd & University Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.374

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 39 Level Of Service: A

Street Name:	Lewis Rd						University Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	1	1	0	0	2	0	1	0	0	1

Volume Module:

Base Vol:	0	362	122	211	543	0	0	0	0	55	0	32
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	362	122	211	543	0	0	0	0	55	0	32
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	362	122	211	543	0	0	0	0	55	0	32
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	362	122	211	543	0	0	0	0	55	0	32
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	362	122	211	543	0	0	0	0	55	0	32

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	1.50	0.50	2.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat.:	0	2393	807	3200	1600	0	0	0	0	1600	0	1600

Capacity Analysis Module:

Vol/Sat: 0.00 0.15 0.15 0.07 0.34 0.00 0.00 0.00 0.00 0.03 0.00 0.02

Crit Moves: ****

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 Lewis Rd & Camarillo St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.654

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 54 Level Of Service: B

Street Name: Lewis Rd Camarillo St

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

-----|-----|-----|-----|-----|

Control: Permitted Protected Permitted Permitted

Rights: Include Include Include Include

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0

Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Lanes: 1 0 1 1 0 1 0 1 1 0 0 0 1! 0 0 0 0 1! 0 0

-----|-----|-----|-----|-----|

Volume Module:

Base Vol: 0 370 6 383 743 0 0 0 0 8 0 467

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 0 370 6 383 743 0 0 0 0 8 0 467

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

CP1_AM_UPDATED_17.txt												
PHF Volume:	0	370	6	383	743	0	0	0	0	8	0	467
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	370	6	383	743	0	0	0	0	8	0	467
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	370	6	383	743	0	0	0	0	8	0	467
----- ----- ----- ----- -----												
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.97	0.03	1.00	2.00	0.00	0.00	1.00	0.00	0.02	0.00	0.98
Final Sat.:	1600	3149	51	1600	3200	0	0	1600	0	27	0	1573
----- ----- ----- ----- -----												
Capacity Analysis Module:												
Vol/Sat:	0.00	0.12	0.12	0.24	0.23	0.00	0.00	0.00	0.00	0.01	0.00	0.30
Crit Moves:	****			****						****		

Level Of Service Computation Report

Intersection #3 Lewis Rd & Cawelti Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.461

Street Name: Lewis Rd Cawelti Rd

CP1_AM_UPDATED_17.txt

Control:	Protected			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1 1 0	1	0	1 1 0	0	0	1! 0 0	0	0	1! 0 0
----- ----- ----- ----- -----												
Volume Module:												
Base Vol:	53	818	0	0	1090	15	31	0	101	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	53	818	0	0	1090	15	31	0	101	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	53	818	0	0	1090	15	31	0	101	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	53	818	0	0	1090	15	31	0	101	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	53	818	0	0	1090	15	31	0	101	0	0	0
----- ----- ----- ----- -----												
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	1.00	1.97	0.03	0.23	0.00	0.77	0.00	1.00	0.00
Final Sat.:	1600	3200	0	1600	3157	43	376	0	1224	0	1600	0
----- ----- ----- ----- -----												
Capacity Analysis Module:												
Vol/Sat:	0.03	0.26	0.00	0.00	0.35	0.35	0.02	0.00	0.08	0.00	0.00	0.00
Crit Moves:	****			****			****					

CP1_AM_UPDATED_17.txt

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #4 Lewis Rd & Pleasant Valley Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.607

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 58 Level Of Service: B

Street Name:	Lewis Rd						Pleasant Valley Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	2	0	1		1	0	2	0	1	

Volume Module:

Base Vol:	112	447	307	134	690	270	249	594	50	434	381	259
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	112	447	307	134	690	270	249	594	50	434	381	259
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	112	447	307	134	690	270	249	594	50	434	381	259
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	112	447	307	134	690	270	249	594	50	434	381	259
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	112	447	307	134	690	270	249	594	50	434	381	259
OvlAdjVol:	146						125					

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	1600	3200	1600	1600	3200	1600	3200	3200	1600	3200	3200	1600

Capacity Analysis Module:

Vol/Sat:	0.07	0.14	0.19	0.08	0.22	0.17	0.08	0.19	0.03	0.14	0.12	0.16
OvlAdjV/S:	0.09						0.08					
Crit Moves:	****			****			****			****		

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #5 US-101 SB Ramps & Ventura Bl

Cycle (sec): 100 Critical Vol./Cap.(X): 0.757

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 94 Level Of Service: C

Street Name:	US-101 SB Ramps						Ventura Bl													
Approach:	North Bound			South Bound			East Bound			West Bound										
Movement:	L	T	R	L	T	R	L	T	R	L	T	R								
Control:	Split Phase			Split Phase			Protected			Protected										
Rights:	Include			Include			Include			Include										
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0								
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0								
Lanes:	0	1	0	0	1	1	1	0	1	0	2	0	0	1	0	1	0	1	1	0

Volume Module:

Base Vol:	8	3	8	696	28	253	585	352	46	87	249	559
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	8	3	8	696	28	253	585	352	46	87	249	559
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	8	3	8	696	28	253	585	352	46	87	249	559
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	3	8	696	28	253	585	352	46	87	249	559
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	8	3	8	696	28	253	585	352	46	87	249	559

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.73	0.27	1.00	2.00	0.10	0.90	2.00	0.88	0.12	1.00	1.00	1.00
Final Sat.:	1164	436	1600	3200	159	1441	3200	1415	185	1600	1600	1600

Capacity Analysis Module:

Vol/Sat:	0.01	0.01	0.01	0.22	0.18	0.18	0.18	0.25	0.25	0.05	0.16	0.35
----------	------	------	------	------	------	------	------	------	------	------	------	------

Crit Moves:	****			****			****				****	
-------------	------	--	--	------	--	--	------	--	--	--	------	--

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #6 Lewis Rd & Ventura Bl

Cycle (sec): 100 Critical Vol./Cap.(X): 0.674

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 70 Level Of Service: B

Street Name: Lewis Rd Ventura Bl

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Split Phase Split Phase

Rights: Include Include Include Include

Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0 0

Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Lanes: 2 0 1 1 0 1 0 2 0 1 1 1 0 0 1 0 1 0 0 1

-----|-----|-----|-----|-----|

Volume Module:

Base Vol: 300 808 8 16 820 537 728 20 330 7 11 11

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 300 808 8 16 820 537 728 20 330 7 11 11

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume:	300	808	8	16	820	537	728	20	330	7	11	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	300	808	8	16	820	537	728	20	330	7	11	11
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	300	808	8	16	820	537	728	20	330	7	11	11
----- ----- ----- ----- -----												
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	1.98	0.02	1.00	2.00	1.00	1.95	0.05	1.00	0.39	0.61	1.00
Final Sat.:	3200	3169	31	1600	3200	1600	3114	86	1600	622	978	1600
----- ----- ----- ----- -----												
Capacity Analysis Module:												
Vol/Sat:	0.09	0.26	0.25	0.01	0.26	0.34	0.23	0.23	0.21	0.01	0.01	0.01
Crit Moves:	****					****	****			****		

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ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

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*****
Intersection #7 US-101 NB Ramps & Daily Dr
*****
Cycle (sec):          100          Critical Vol./Cap.(X):          0.611
Loss Time (sec):       0          Average Delay (sec/veh):          xxxxxx
Optimal Cycle:         48          Level Of Service:              B
*****
Street Name:          US-101 NB Ramps          Daily Dr
Approach:              North Bound          South Bound          East Bound          West Bound
Movement:              L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|-----|

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CP1_AM_UPDATED_17.txt

Control:	Permitted			Permitted			Permitted			Protected		
Rights:	Include			Include			Ignore			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	2	0	0	0	0	0	0	0	1	0	1	0
----- ----- ----- ----- -----												
Volume Module:												
Base Vol:	389	0	476	0	0	0	0	162	223	679	221	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	389	0	476	0	0	0	0	162	223	679	221	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	389	0	476	0	0	0	0	162	0	679	221	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	389	0	476	0	0	0	0	162	0	679	221	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	389	0	476	0	0	0	0	162	0	679	221	0
----- ----- ----- ----- -----												
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	2.00	1.00	0.00
Final Sat.:	3200	0	1600	0	0	0	0	1600	1600	3200	1600	0
----- ----- ----- ----- -----												
Capacity Analysis Module:												
Vol/Sat:	0.12	0.00	0.30	0.00	0.00	0.00	0.00	0.10	0.00	0.21	0.14	0.00
Crit Moves:	****						****			****		

CP1_AM_UPDATED_17.txt

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #8 Lewis Rd & Daily Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.782
 Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 85 Level Of Service: C

Street Name:	Lewis Rd						Daily Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Permitted			Permitted			Permitted		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	1	0	1	1	0	0	0	1

Volume Module:	Lewis Rd			Lewis Rd			Daily Dr			Daily Dr		
Base Vol:	399	1156	0	1	1078	471	312	18	326	10	6	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	399	1156	0	1	1078	471	312	18	326	10	6	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	399	1156	0	1	1078	471	312	18	326	10	6	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	399	1156	0	1	1078	471	312	18	326	10	6	1
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	399	1156	0	1	1078	471	312	18	326	10	6	1

Saturation Flow Module:	Lewis Rd			Lewis Rd			Daily Dr			Daily Dr		
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	0.01	2.08	0.91	1.89	0.11	1.00	0.59	0.35	0.06
Final Sat.:	1600	3200	0	3	3338	1459	3025	175	1600	941	565	94

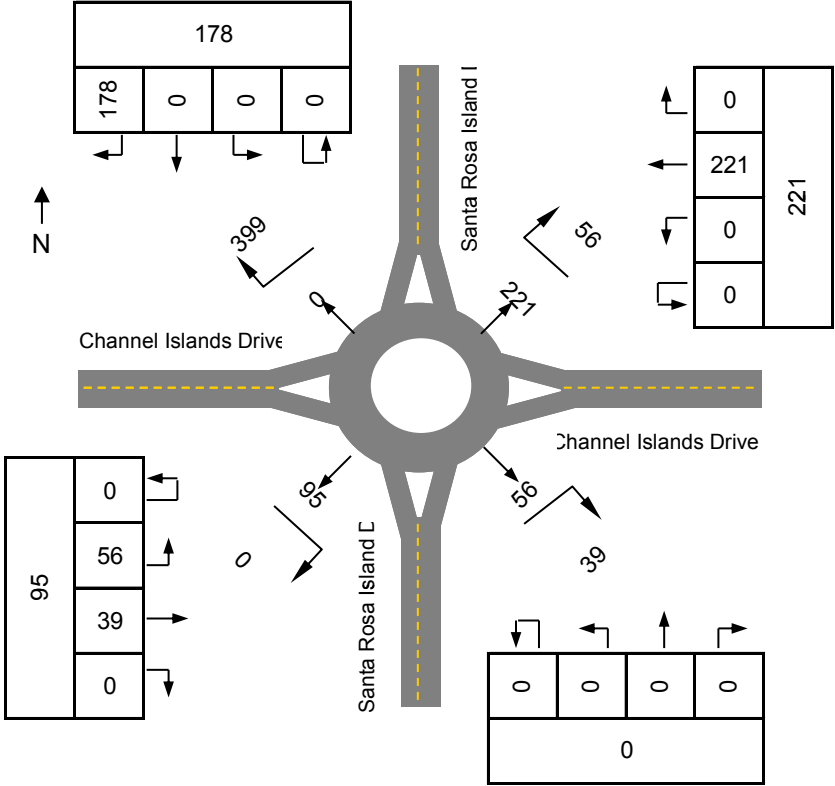
Capacity Analysis Module:	Lewis Rd			Lewis Rd			Daily Dr			Daily Dr		
Vol/Sat:	0.25	0.36	0.00	0.00	0.32	0.32	0.10	0.10	0.20	0.01	0.01	0.01
Crit Moves:	****			****			****			****		

Intersection						
Int Delay, s/veh	5.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	51	348	116	14	78	348
Future Vol, veh/h	51	348	116	14	78	348
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	55	378	126	15	85	378
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	682	134	0	0	141	0
Stage 1	134	-	-	-	-	-
Stage 2	548	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	415	915	-	-	1442	-
Stage 1	892	-	-	-	-	-
Stage 2	579	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	384	915	-	-	1442	-
Mov Cap-2 Maneuver	384	-	-	-	-	-
Stage 1	892	-	-	-	-	-
Stage 2	536	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	12.2	0		1.4		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 384 915 1442	-	-		
HCM Lane V/C Ratio	-	- 0.144 0.413 0.059	-	-		
HCM Control Delay (s)	-	- 16 11.7 7.7	0			
HCM Lane LOS	-	- C B A	A			
HCM 95th %tile Q(veh)	-	- 0.5 2.1 0.2	-			

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	CSUCI 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	Cumulative plus project AM							N-S Street	Santa Rosa Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North	1	1	LTR	100%	100%	100%	0	95	1	1,028	0.00	3.5	A	0
	Bypass?													
	No													
	Total			100%	100%	100%								
South	0													
	Bypass?													
	No													
	Total						178					0.0	A	
East	1	1	L	100%	100%	100%	95	0	1	1,130	0.08	3.6	A	7
	Bypass?													
	No													
	Total			100%	100%	100%	95					3.6	A	
West	1	1	LTR	100%	100%	100%	221	56	1	1,068	0.21	4.5	A	19
	Bypass?													
	No													
	Total			100%	100%	100%	221					4.5	A	
All							494					2.7	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)								178		56	39				221	
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	178	0	56	39	0	0	0	221	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	178	0	56	39	0	0	0	221	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

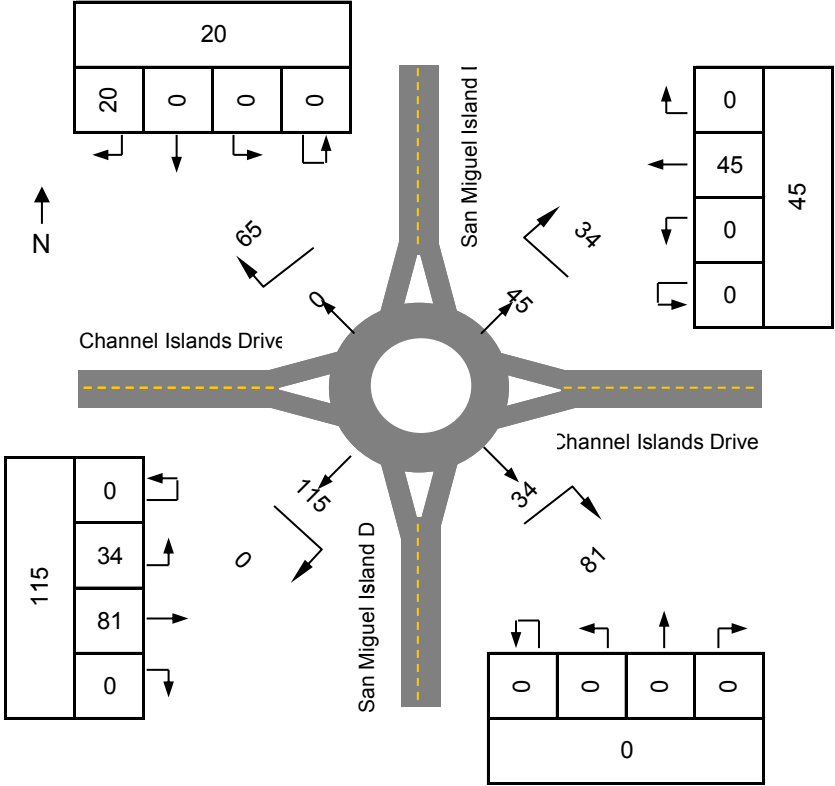
* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	CSUCI 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	Cumulative plus Project PM							N-S Street	San Miguel Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North														
	Bypass?													
	No													
	Total													
South	1		LT	100%	100%	100%	20	45		1,080	0.02	3.4	A	1
	Bypass?													
	No													
	Total			100%	100%	100%	20					3.4	A	
East	1	1	L	100%	100%	100%	115	0	1	1,130	0.10	3.6	A	8
	Bypass?													
	No													
	Total			100%	100%	100%	115					3.6	A	
West	1	1	LTR	100%	100%	100%	45	34	1	1,092	0.04	3.5	A	3
	Bypass?													
	No													
	Total			100%	100%	100%	45					3.5	A	
All							180					3.6	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)								20		34	81				45	
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	20	0	34	81	0	0	0	45	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	20	0	34	81	0	0	0	45	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

Scenario Report

Scenario:	CP1
Command:	CP1
Volume:	CP1
Geometry:	Base
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

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Impact Analysis Report
 Level Of Service

Intersection	Base		Future		Change in
	Del/ LOS	V/ Veh C	Del/ LOS	V/ Veh C	
# 1 Lewis Rd & University Dr	A	xxxxx 0.445	A	xxxxx 0.445	+ 0.000 V/C
# 2 Lewis Rd & Camarillo St	D	xxxxx 0.851	D	xxxxx 0.851	+ 0.000 V/C
# 3 Lewis Rd & Cawelti Rd	A	xxxxx 0.442	A	xxxxx 0.442	+ 0.000 V/C
# 4 Lewis Rd & Pleasant Valley Rd	B	xxxxx 0.668	B	xxxxx 0.668	+ 0.000 V/C
# 5 US-101 SB Ramps & Ventura Bl	B	xxxxx 0.649	B	xxxxx 0.649	+ 0.000 V/C
# 6 Lewis Rd & Ventura Bl	B	xxxxx 0.654	B	xxxxx 0.654	+ 0.000 V/C
# 7 US-101 NB Ramps & Daily Dr	B	xxxxx 0.692	B	xxxxx 0.692	+ 0.000 V/C
# 8 Lewis Rd & Daily Dr	C	xxxxx 0.782	C	xxxxx 0.782	+ 0.000 V/C

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #1 Lewis Rd & University Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.445

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 53 Level Of Service: A

Street Name:	Lewis Rd						University Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0	0	1 1 0	2	0	1 0 0	0	0	0 0 0	1	0	0 0 1

Volume Module:

Base Vol:	0	576	81	117	436	0	0	0	0	154	0	276
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	576	81	117	436	0	0	0	0	154	0	276
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	576	81	117	436	0	0	0	0	154	0	276
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	576	81	117	436	0	0	0	0	154	0	276
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	576	81	117	436	0	0	0	0	154	0	276

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	1.75	0.25	2.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat.:	0	2805	395	3200	1600	0	0	0	0	1600	0	1600

Capacity Analysis Module:

Vol/Sat: 0.00 0.21 0.21 0.04 0.27 0.00 0.00 0.00 0.00 0.10 0.00 0.17

Crit Moves: ****

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #2 Lewis Rd & Camarillo St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.851

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 125 Level Of Service: D

Street Name:	Lewis Rd						Camarillo St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	0	1	0	0	0	1!	0	0

Volume Module:

Base Vol:	0	842	4	473	520	0	0	0	0	12	0	454
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	842	4	473	520	0	0	0	0	12	0	454
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	842	4	473	520	0	0	0	0	12	0	454

CP1_PM_UPDATED_17.txt											
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	842	4	473	520	0	0	0	0	12	454
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	842	4	473	520	0	0	0	0	12	454
----- ----- ----- ----- -----											
Saturation Flow Module:											
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	1.00	2.00	0.00	0.00	1.00	0.00	0.03	0.97
Final Sat.:	1600	3185	15	1600	3200	0	0	1600	0	41	1559
----- ----- ----- ----- -----											
Capacity Analysis Module:											
Vol/Sat:	0.00	0.26	0.26	0.30	0.16	0.00	0.00	0.00	0.00	0.01	0.29
Crit Moves:	****		****				****				

Level Of Service Computation Report

Intersection #3 Lewis Rd & Cawelti Rd

```

Cycle (sec):          100          Critical Vol./Cap.(X):          0.442
Loss Time (sec):       0          Average Delay (sec/veh):          xxxxxx
Optimal Cycle:         33          Level Of Service:              A
*****

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Street Name:	Lewis Rd				Cawelti Rd				
Approach:	North Bound		South Bound		East Bound		West Bound		
Movement:	L	T	R	L	T	R	L	T	R
Control:	Protected		Permitted		Permitted		Permitted		

CP1_PM_UPDATED_17.txt

Rights:	Include			Include			Include			Include			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lanes:	1	0	1	1	0	1	1	0	0	0	1	0	0

-----|-----|-----|-----|

Volume Module:

Base Vol:	116	1193	0	0	902	83	16	0	82	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	116	1193	0	0	902	83	16	0	82	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	116	1193	0	0	902	83	16	0	82	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	116	1193	0	0	902	83	16	0	82	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	116	1193	0	0	902	83	16	0	82	0	0	0

-----|-----|-----|-----|

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	1.00	1.83	0.17	0.16	0.00	0.84	0.00	1.00	0.00
Final Sat.:	1600	3200	0	1600	2930	270	261	0	1339	0	1600	0

-----|-----|-----|-----|

Capacity Analysis Module:

Vol/Sat:	0.07	0.37	0.00	0.00	0.31	0.31	0.01	0.00	0.06	0.00	0.00	0.00
Crit Moves:	****				****				****			

CP1_PM_UPDATED_17.txt

Intersection #4 Lewis Rd & Pleasant Valley Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.668

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 69 Level Of Service: B

Street Name:	Lewis Rd						Pleasant Valley Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	2	0	1		2	0	2	0	1	

Volume Module:	Lewis Rd			Lewis Rd			Pleasant Valley Rd			Pleasant Valley Rd		
Base Vol:	121	596	479	117	598	362	258	378	65	312	686	231
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	121	596	479	117	598	362	258	378	65	312	686	231
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	121	596	479	117	598	362	258	378	65	312	686	231
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	121	596	479	117	598	362	258	378	65	312	686	231
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	121	596	479	117	598	362	258	378	65	312	686	231
OvlAdjVol:	233						114					

Saturation Flow Module:	Lewis Rd			Lewis Rd			Pleasant Valley Rd			Pleasant Valley Rd		
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	1600	3200	1600	1600	3200	1600	3200	3200	1600	3200	3200	1600

Capacity Analysis Module:	Lewis Rd			Lewis Rd			Pleasant Valley Rd			Pleasant Valley Rd		
Vol/Sat:	0.08	0.19	0.30	0.07	0.19	0.23	0.08	0.12	0.04	0.10	0.21	0.14
OvlAdjV/S:	0.15						0.07					

Crit Moves: **** * **** *

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #5 US-101 SB Ramps & Ventura Bl

Cycle (sec): 100 Critical Vol./Cap.(X): 0.649

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 65 Level Of Service: B

Street Name:	US-101 SB Ramps						Ventura Bl							
Approach:	North Bound			South Bound			East Bound			West Bound				
Movement:	L	T	R	L	T	R	L	T	R	L	T	R		
Control:	Split Phase			Split Phase			Protected			Protected				
Rights:	Include			Include			Include			Include				
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0		
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Lanes:	0	1	0	0	1	1	0	1	0	2	0	0	1	0

Volume Module:

Base Vol:	6	0	7	720	3	396	473	390	11	15	416	382
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	0	7	720	3	396	473	390	11	15	416	382
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	6	0	7	720	3	396	473	390	11	15	416	382
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	6	0	7	720	3	396	473	390	11	15	416	382
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	6	0	7	720	3	396	473	390	11	15	416	382

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	1.99	0.01	1.00	2.00	0.97	0.03	1.00	1.04	0.96
Final Sat.:	1600	0	1600	3187	13	1600	3200	1556	44	1600	1668	1532

CP1_PM_UPDATED_17.txt

Capacity Analysis Module:

Vol/Sat: 0.00 0.00 0.00 0.23 0.23 0.25 0.15 0.25 0.25 0.01 0.25 0.25

Crit Moves: **** **** **** ****

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Level Of Service Computation Report

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #6 Lewis Rd & Ventura Bl

Cycle (sec): 100 Critical Vol./Cap.(X): 0.654

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 66 Level Of Service: B

Street Name:	Lewis Rd						Ventura Bl					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	-	T	-	R		L	-	T	-	R	
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	2	0	1	1	0	1	1	1	0	0	1	1

Volume Module:

Base Vol:	404	917	6	18	730	381	664	17	439	6	19	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	404	917	6	18	730	381	664	17	439	6	19	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	404	917	6	18	730	381	664	17	439	6	19	10

Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	404	917	6	18	730	381	664	17	439	6	19	10
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	404	917	6	18	730	381	664	17	439	6	19	10
----- ----- ----- ----- -----												
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	1.99	0.01	1.00	2.00	1.00	1.95	0.05	1.00	0.24	0.76	1.00
Final Sat.:	3200	3179	21	1600	3200	1600	3120	80	1600	384	1216	1600
----- ----- ----- ----- -----												
Capacity Analysis Module:												
Vol/Sat:	0.13	0.29	0.29	0.01	0.23	0.24	0.21	0.21	0.27	0.02	0.02	0.01
Crit Moves:	****					****			****		****	

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CP1 Tue Jan 17, 2017 15:32:42 Page 9-1

ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)

Intersection #7 US-101 NB Ramps & Daily Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.692

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 60 Level Of Service: B

Street Name: US-101 NB Ramps Daily Dr

Approach:	North Bound	South Bound	East Bound	West Bound
-----------	-------------	-------------	------------	------------

Movement: L - T - R L - T - R L - T - R L - T - R

-----|-----|-----|-----|-----|

Control: Permitted Permitted Permitted Protected

CP1_PM_UPDATED_17.txt

Rights:	Include			Include			Ignore			Include									
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0							
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0							
Lanes:	2	0	0	0	1	0	0	0	0	0	0	1	0	1	2	0	1	0	0

-----|-----|-----|-----|

Volume Module:

Base Vol:	1157	0	518	0	0	0	0	244	97	570	371	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1157	0	518	0	0	0	0	244	97	570	371	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	1157	0	518	0	0	0	0	244	0	570	371	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1157	0	518	0	0	0	0	244	0	570	371	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
FinalVolume:	1157	0	518	0	0	0	0	244	0	570	371	0

-----|-----|-----|-----|

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	2.00	1.00	0.00
Final Sat.:	3200	0	1600	0	0	0	0	1600	1600	3200	1600	0

-----|-----|-----|-----|

Capacity Analysis Module:

Vol/Sat:	0.36	0.00	0.32	0.00	0.00	0.00	0.00	0.15	0.00	0.18	0.23	0.00
Crit Moves:	****							****		****		

CP1_PM_UPDATED_17.txt

Intersection #8 Lewis Rd & Daily Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.782

Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx

Optimal Cycle: 85 Level Of Service: C

Street Name:	Lewis Rd						Daily Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Permitted			Permitted			Permitted		
Rights:	Include			Include			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0	1	1	0	0	1	1	0	0	1	0
	0	0	1	0	0	1	0	0	1	0	0	1

Volume Module:

Base Vol:	516	1066	1	0	734	342	371	6	371	6	17	5
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	516	1066	1	0	734	342	371	6	371	6	17	5
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	516	1066	1	0	734	342	371	6	371	6	17	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	516	1066	1	0	734	342	371	6	371	6	17	5
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	516	1066	1	0	734	342	371	6	371	6	17	5

Saturation Flow Module:

Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.99	0.01	0.00	2.05	0.95	1.97	0.03	1.00	0.21	0.61	0.18
Final Sat.:	1600	3197	3	0	3274	1526	3149	51	1600	343	971	286

Capacity Analysis Module:

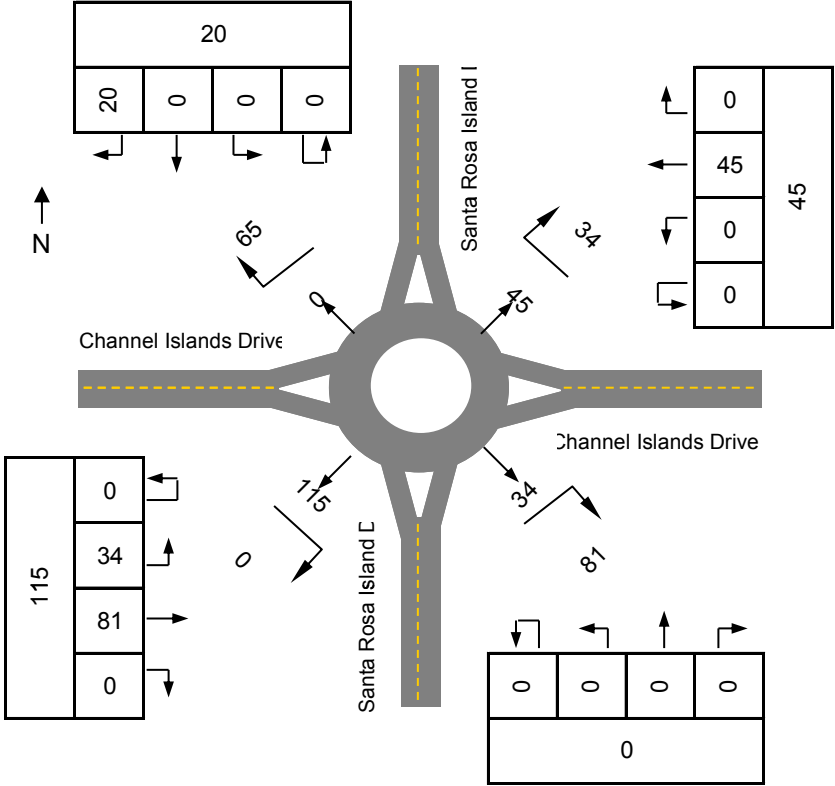
Vol/Sat:	0.32	0.33	0.33	0.00	0.22	0.22	0.12	0.12	0.23	0.00	0.02	0.02
Crit Moves:	****			****			****		****	****		

Intersection						
Int Delay, s/veh	5.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	26	148	290	48	283	183
Future Vol, veh/h	26	148	290	48	283	183
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	161	315	52	308	199
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1155	341	0	0	367	0
Stage 1	341	-	-	-	-	-
Stage 2	814	-	-	-	-	-
Critical Hdwy	7.12	6.22	-	-	4.12	-
Critical Hdwy Stg 1	6.12	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	174	701	-	-	1192	-
Stage 1	674	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	135	701	-	-	1192	-
Mov Cap-2 Maneuver	135	-	-	-	-	-
Stage 1	674	-	-	-	-	-
Stage 2	264	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	15.7		0		5.5	
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 135 701 1192	-	-		
HCM Lane V/C Ratio	-	- 0.209 0.229 0.258	-	-		
HCM Control Delay (s)	-	- 38.6 11.7 9.1	0			
HCM Lane LOS	-	- E B A A				
HCM 95th %tile Q(veh)	-	- 0.8 0.9 1	-			

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	CSUCI 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	Cumulative plus project PM							N-S Street	Santa Rosa Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North	1	1	LTR	100%	100%	100%	0	115	1	1,007	0.00	3.6	A	0
	Bypass?													
	No													
	Total			100%	100%	100%								
South	0													
	Bypass?													
	No													
	Total						20					0.0	A	
East	1	1	L	100%	100%	100%	115	0	1	1,130	0.10	3.6	A	8
	Bypass?													
	No													
	Total			100%	100%	100%	115					3.6	A	
West	1	1	LTR	100%	100%	100%	45	34	1	1,092	0.04	3.5	A	3
	Bypass?													
	No													
	Total			100%	100%	100%	45					3.5	A	
All							180					3.2	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)								20		34	81				45	0
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	20	0	34	81	0	0	0	45	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	20	0	34	81	0	0	0	45	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

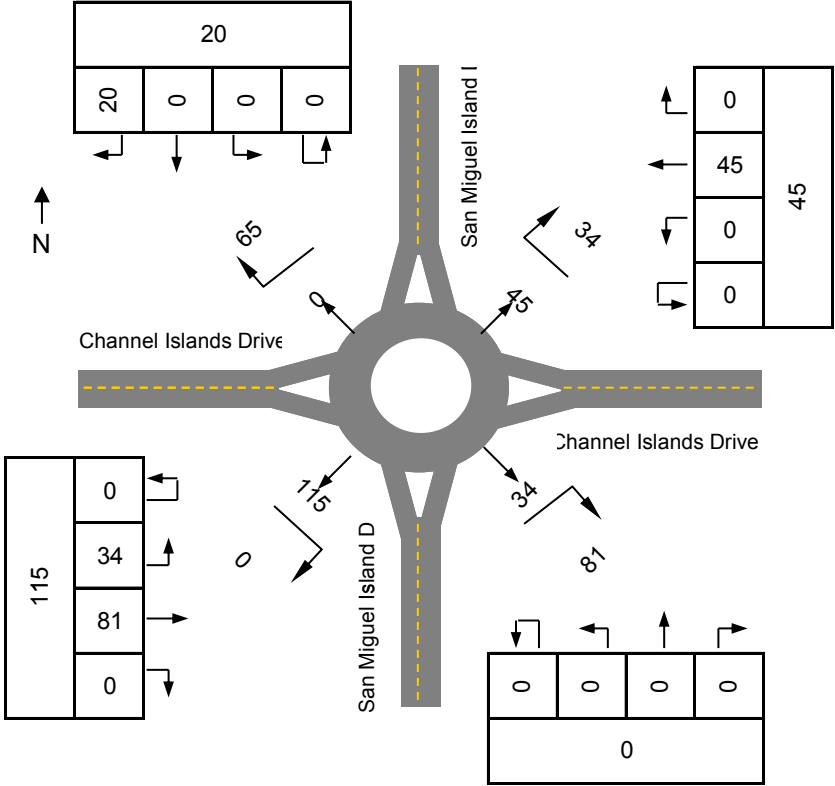
* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

ROUNDABOUT CAPACITY ANALYSIS - HCM 2010

Period (hr)	0.25	Project	CSUCI 2884							E-W Street	Channel Islands Drive			
PHF	1	Scenario	Cumulative plus Project PM							N-S Street	San Miguel Island Drive			
Approach		Lane	Lane Config.	Percentage			Flow (pcph)	Conflicting		Capacity (pcph)	v/c	Control Delay (sec)	LOS*	95th Queue** (ft)
Direction	Lanes			L	T	R		Flow	Lanes					
North														
	Bypass?													
	No													
	Total													
South	1		LT	100%	100%	100%	20	45		1,080	0.02	3.4	A	1
	Bypass?													
	No													
	Total			100%	100%	100%	20					3.4	A	
East	1	1	L	100%	100%	100%	115	0	1	1,130	0.10	3.6	A	8
	Bypass?													
	No													
	Total			100%	100%	100%	115					3.6	A	
West	1	1	LTR	100%	100%	100%	45	34	1	1,092	0.04	3.5	A	3
	Bypass?													
	No													
	Total			100%	100%	100%	45					3.5	A	
All							180					3.6	A	

Diagram



Volumes

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Total (vph)								20		34	81				45	
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars	0	0	0	0	0	0	0	20	0	34	81	0	0	0	45	0
f _{HV}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total (pcph)	0	0	0	0	0	0	0	20	0	34	81	0	0	0	45	0

	Northbound				Southbound				Eastbound				Westbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Truck %																
Trucks (vph)																

Source: NCHRP Report 672 - Roundabouts: An Informational Guide, Second Edition (TRB, 2010)

* Does not include the effect of conflicting pedestrians

** Assumes a queued vehicle length of 25 feet

Caltrans Analysis
Level of Service Worksheets

HCM Signalized Intersection Capacity Analysis

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	528	317	0	82	152	405	8	3	8	560	0	195
Future Volume (vph)	528	317	0	82	152	405	8	3	8	560	0	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Lane Util. Factor	0.97	1.00		1.00	0.95			1.00	1.00	0.97		1.00
Frt	1.00	1.00		1.00	0.89			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95		1.00
Satd. Flow (prot)	3090	1676		1593	2838			1619	1425	3090		1425
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95		1.00
Satd. Flow (perm)	3090	1676		1593	2838			1619	1425	3090		1425
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	652	391	0	101	188	500	10	4	10	691	0	241
RTOR Reduction (vph)	0	0	0	0	401	0	0	0	10	0	0	165
Lane Group Flow (vph)	652	391	0	101	287	0	0	14	0	691	0	76
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Prot		Perm
Protected Phases	7	4		3	8		2	2		6		
Permitted Phases									2			6
Actuated Green, G (s)	26.5	33.0		10.2	16.7			2.5	2.5	30.1		30.1
Effective Green, g (s)	26.5	33.0		10.2	16.7			2.5	2.5	30.1		30.1
Actuated g/C Ratio	0.28	0.34		0.11	0.17			0.03	0.03	0.31		0.31
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	854	577		169	494			42	37	970		447
v/s Ratio Prot	c0.21	c0.23		0.06	0.10			c0.01		c0.22		
v/s Ratio Perm									0.00			0.05
v/c Ratio	0.76	0.68		0.60	0.58			0.33	0.01	0.71		0.17
Uniform Delay, d1	31.8	26.9		40.8	36.3			45.8	45.4	29.0		23.8
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Incremental Delay, d2	4.1	3.2		5.6	1.7			4.6	0.1	2.5		0.2
Delay (s)	35.9	30.0		46.4	38.1			50.5	45.5	31.5		24.0
Level of Service	D	C		D	D			D	D	C		C
Approach Delay (s)		33.7			39.1			48.4			29.6	
Approach LOS		C			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			34.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			95.8			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			72.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	401	289	0	14	314	187	6	0	7	542	0	344
Future Volume (vph)	401	289	0	14	314	187	6	0	7	542	0	344
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Lane Util. Factor	0.97	1.00		1.00	0.95			1.00	1.00	0.97		1.00
Frt	1.00	1.00		1.00	0.94			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	0.95		1.00
Satd. Flow (prot)	3090	1676		1593	3007			1593	1425	3090		1425
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	0.95		1.00
Satd. Flow (perm)	3090	1676		1593	3007			1593	1425	3090		1425
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	427	307	0	15	334	199	6	0	7	577	0	366
RTOR Reduction (vph)	0	0	0	0	63	0	0	0	7	0	0	270
Lane Group Flow (vph)	427	307	0	15	470	0	0	6	0	577	0	96
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Prot		Perm
Protected Phases	7	4		3	8		2	2		6		
Permitted Phases									2			6
Actuated Green, G (s)	18.3	40.8		2.3	24.8			2.0	2.0	23.1		23.1
Effective Green, g (s)	18.3	40.8		2.3	24.8			2.0	2.0	23.1		23.1
Actuated g/C Ratio	0.21	0.46		0.03	0.28			0.02	0.02	0.26		0.26
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	641	775		41	845			36	32	809		373
v/s Ratio Prot	c0.14	0.18		0.01	c0.16			c0.00		c0.19		
v/s Ratio Perm									0.00			0.07
v/c Ratio	0.67	0.40		0.37	0.56			0.17	0.00	0.71		0.26
Uniform Delay, d1	32.1	15.6		42.2	27.0			42.3	42.1	29.5		25.8
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Incremental Delay, d2	2.6	0.3		5.5	0.8			2.2	0.1	3.0		0.4
Delay (s)	34.8	15.9		47.7	27.8			44.5	42.2	32.5		26.1
Level of Service	C	B		D	C			D	D	C		C
Approach Delay (s)		26.9			28.4			43.2			30.1	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM 2000 Control Delay	28.7			HCM 2000 Level of Service					C			
HCM 2000 Volume to Capacity ratio	0.63											
Actuated Cycle Length (s)	88.2			Sum of lost time (s)					20.0			
Intersection Capacity Utilization	64.5%			ICU Level of Service					C			
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	528	320	0	82	163	437	8	3	8	567	0	195
Future Volume (vph)	528	320	0	82	163	437	8	3	8	567	0	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Lane Util. Factor	0.97	1.00		1.00	0.95			1.00	1.00	0.97		1.00
Frt	1.00	1.00		1.00	0.89			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95		1.00
Satd. Flow (prot)	3090	1676		1593	2837			1619	1425	3090		1425
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95		1.00
Satd. Flow (perm)	3090	1676		1593	2837			1619	1425	3090		1425
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	652	395	0	101	201	540	10	4	10	700	0	241
RTOR Reduction (vph)	0	0	0	0	393	0	0	0	10	0	0	166
Lane Group Flow (vph)	652	395	0	101	348	0	0	14	0	700	0	75
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Prot		Perm
Protected Phases	7	4		3	8		2	2		6		
Permitted Phases									2			6
Actuated Green, G (s)	26.9	35.7		10.1	18.9			2.6	2.6	30.9		30.9
Effective Green, g (s)	26.9	35.7		10.1	18.9			2.6	2.6	30.9		30.9
Actuated g/C Ratio	0.27	0.36		0.10	0.19			0.03	0.03	0.31		0.31
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	837	602		162	539			42	37	961		443
v/s Ratio Prot	c0.21	c0.24		0.06	0.12			c0.01		c0.23		
v/s Ratio Perm									0.00			0.05
v/c Ratio	0.78	0.66		0.62	0.64			0.33	0.01	0.73		0.17
Uniform Delay, d1	33.5	26.7		42.8	37.1			47.5	47.1	30.5		24.9
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Incremental Delay, d2	4.6	2.6		7.3	2.6			4.6	0.1	2.8		0.2
Delay (s)	38.1	29.2		50.0	39.7			52.1	47.2	33.3		25.0
Level of Service	D	C		D	D			D	D	C		C
Approach Delay (s)		34.7			41.0			50.1			31.2	
Approach LOS		C			D			D			C	
Intersection Summary												
HCM 2000 Control Delay	35.5			HCM 2000 Level of Service			D					
HCM 2000 Volume to Capacity ratio	0.74											
Actuated Cycle Length (s)	99.3			Sum of lost time (s)			20.0					
Intersection Capacity Utilization	73.7%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	401	299	0	14	320	205	6	0	7	602	0	344
Future Volume (vph)	401	299	0	14	320	205	6	0	7	602	0	344
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Lane Util. Factor	0.97	1.00		1.00	0.95			1.00	1.00	0.97		1.00
Frt	1.00	1.00		1.00	0.94			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	0.95		1.00
Satd. Flow (prot)	3090	1676		1593	2999			1593	1425	3090		1425
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	0.95		1.00
Satd. Flow (perm)	3090	1676		1593	2999			1593	1425	3090		1425
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	427	318	0	15	340	218	6	0	7	640	0	366
RTOR Reduction (vph)	0	0	0	0	75	0	0	0	7	0	0	262
Lane Group Flow (vph)	427	318	0	15	483	0	0	6	0	640	0	104
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Prot		Perm
Protected Phases	7	4		3	8		2	2		6		
Permitted Phases									2			6
Actuated Green, G (s)	18.4	41.2		2.4	25.2			2.1	2.1	26.2		26.2
Effective Green, g (s)	18.4	41.2		2.4	25.2			2.1	2.1	26.2		26.2
Actuated g/C Ratio	0.20	0.45		0.03	0.27			0.02	0.02	0.29		0.29
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	618	751		41	822			36	32	880		406
v/s Ratio Prot	c0.14	0.19		0.01	c0.16			c0.00		c0.21		
v/s Ratio Perm									0.00			0.07
v/c Ratio	0.69	0.42		0.37	0.59			0.17	0.00	0.73		0.26
Uniform Delay, d1	34.1	17.3		44.0	28.9			44.0	43.9	29.6		25.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Incremental Delay, d2	3.3	0.4		5.5	1.1			2.2	0.1	3.0		0.3
Delay (s)	37.4	17.6		49.5	29.9			46.2	43.9	32.7		25.7
Level of Service	D	B		D	C			D	D	C		C
Approach Delay (s)		29.0			30.4			45.0			30.1	
Approach LOS		C			C			D			C	
Intersection Summary												
HCM 2000 Control Delay			29.9	HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			91.9	Sum of lost time (s)			20.0					
Intersection Capacity Utilization			67.3%	ICU Level of Service			C					
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	585	395	0	87	238	527	8	3	8	718	0	253
Future Volume (vph)	585	395	0	87	238	527	8	3	8	718	0	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Lane Util. Factor	0.97	1.00		1.00	0.95			1.00	1.00	0.97		1.00
Frt	1.00	1.00		1.00	0.90			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95		1.00
Satd. Flow (prot)	3090	1676		1593	2856			1619	1425	3090		1425
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95		1.00
Satd. Flow (perm)	3090	1676		1593	2856			1619	1425	3090		1425
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	722	488	0	107	294	651	10	4	10	886	0	312
RTOR Reduction (vph)	0	0	0	0	379	0	0	0	10	0	0	221
Lane Group Flow (vph)	722	488	0	107	566	0	0	14	0	886	0	91
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Prot		Perm
Protected Phases	7	4		3	8		2	2		6		
Permitted Phases									2			6
Actuated Green, G (s)	25.4	41.4		10.2	26.2			2.7	2.7	30.5		30.5
Effective Green, g (s)	25.4	41.4		10.2	26.2			2.7	2.7	30.5		30.5
Actuated g/C Ratio	0.24	0.40		0.10	0.25			0.03	0.03	0.29		0.29
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	748	662		155	714			41	36	899		414
v/s Ratio Prot	c0.23	c0.29		0.07	0.20			c0.01		c0.29		
v/s Ratio Perm									0.00			0.06
v/c Ratio	0.97	0.74		0.69	0.88dr			0.34	0.01	0.99		0.22
Uniform Delay, d1	39.3	27.1		45.8	36.8			50.2	49.7	36.9		28.1
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Incremental Delay, d2	24.4	4.3		12.5	6.0			4.9	0.1	26.2		0.3
Delay (s)	63.7	31.3		58.2	42.8			55.1	49.8	63.2		28.4
Level of Service	E	C		E	D			E	D	E		C
Approach Delay (s)		50.6			44.4			52.9			54.1	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			50.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			104.8			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			85.8%			ICU Level of Service			E			
Analysis Period (min)			15									
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	473	391	0	15	410	364	6	0	7	703	0	369
Future Volume (vph)	473	391	0	15	410	364	6	0	7	703	0	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Lane Util. Factor	0.97	1.00		1.00	0.95			1.00	1.00	0.97		1.00
Frt	1.00	1.00		1.00	0.93			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	0.95		1.00
Satd. Flow (prot)	3090	1676		1593	2961			1593	1425	3090		1425
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	0.95		1.00
Satd. Flow (perm)	3090	1676		1593	2961			1593	1425	3090		1425
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	509	420	0	16	441	391	6	0	8	756	0	397
RTOR Reduction (vph)	0	0	0	0	175	0	0	0	8	0	0	281
Lane Group Flow (vph)	509	420	0	16	657	0	0	6	0	756	0	116
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Prot		Perm
Protected Phases	7	4		3	8		2	2		6		
Permitted Phases									2			6
Actuated Green, G (s)	7.4	34.3		0.8	27.7			1.6	1.6	23.4		23.4
Effective Green, g (s)	7.4	34.3		0.8	27.7			1.6	1.6	23.4		23.4
Actuated g/C Ratio	0.09	0.43		0.01	0.35			0.02	0.02	0.29		0.29
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	285	717		15	1023			31	28	902		416
v/s Ratio Prot	c0.16	0.25		0.01	c0.22			c0.00		c0.24		
v/s Ratio Perm									0.00			0.08
v/c Ratio	1.79	0.59		1.07	0.64			0.19	0.01	0.84		0.28
Uniform Delay, d1	36.3	17.5		39.6	22.0			38.6	38.5	26.6		21.8
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Incremental Delay, d2	367.5	1.2		255.5	1.4			3.0	0.1	6.9		0.4
Delay (s)	403.8	18.7		295.1	23.4			41.7	38.6	33.4		22.2
Level of Service	F	B		F	C			D	D	C		C
Approach Delay (s)		229.7			28.6			39.9			29.6	
Approach LOS		F			C			D			C	
Intersection Summary												
HCM 2000 Control Delay			92.5			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			80.1			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			81.2%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	585	398	0	87	249	559	8	3	8	724	0	253
Future Volume (vph)	585	398	0	87	249	559	8	3	8	724	0	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Lane Util. Factor	0.97	1.00		1.00	0.95			1.00	1.00	0.97		1.00
Frt	1.00	1.00		1.00	0.90			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95		1.00
Satd. Flow (prot)	3090	1676		1593	2855			1619	1425	3090		1425
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95		1.00
Satd. Flow (perm)	3090	1676		1593	2855			1619	1425	3090		1425
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	722	491	0	107	307	690	10	4	10	894	0	312
RTOR Reduction (vph)	0	0	0	0	376	0	0	0	10	0	0	223
Lane Group Flow (vph)	722	491	0	107	621	0	0	14	0	894	0	89
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Prot		Perm
Protected Phases	7	4		3	8		2	2		6		
Permitted Phases									2			6
Actuated Green, G (s)	25.3	43.0		10.2	27.9			2.8	2.8	30.4		30.4
Effective Green, g (s)	25.3	43.0		10.2	27.9			2.8	2.8	30.4		30.4
Actuated g/C Ratio	0.24	0.40		0.10	0.26			0.03	0.03	0.29		0.29
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	734	677		152	748			42	37	882		407
v/s Ratio Prot	c0.23	0.29		0.07	c0.22			c0.01		c0.29		
v/s Ratio Perm									0.00			0.06
v/c Ratio	0.98	0.73		0.70	0.92dr			0.33	0.01	1.01		0.22
Uniform Delay, d1	40.3	26.7		46.6	37.0			50.9	50.4	38.0		29.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Incremental Delay, d2	28.9	3.9		13.8	7.8			4.6	0.1	33.7		0.3
Delay (s)	69.3	30.6		60.4	44.8			55.5	50.5	71.7		29.2
Level of Service	E	C		E	D			E	D	E		C
Approach Delay (s)		53.6			46.3			53.4			60.7	
Approach LOS		D			D			D			E	
Intersection Summary												
HCM 2000 Control Delay		53.8			HCM 2000 Level of Service				D			
HCM 2000 Volume to Capacity ratio		0.92										
Actuated Cycle Length (s)		106.4			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		87.5%			ICU Level of Service			E				
Analysis Period (min)		15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 				 					 		
Traffic Volume (vph)	479	401	0	15	416	382	6	0	7	723	0	396
Future Volume (vph)	479	401	0	15	416	382	6	0	7	723	0	396
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Lane Util. Factor	0.97	1.00		1.00	0.95			1.00	1.00	0.97		1.00
Frt	1.00	1.00		1.00	0.93			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	0.95		1.00
Satd. Flow (prot)	3090	1676		1593	2956			1593	1425	3090		1425
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	0.95		1.00
Satd. Flow (perm)	3090	1676		1593	2956			1593	1425	3090		1425
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	515	431	0	16	447	411	6	0	8	777	0	426
RTOR Reduction (vph)	0	0	0	0	183	0	0	0	8	0	0	281
Lane Group Flow (vph)	515	431	0	16	675	0	0	6	0	777	0	145
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Prot		Perm
Protected Phases	7	4		3	8		2	2		6		
Permitted Phases									2			6
Actuated Green, G (s)	7.4	33.1		1.6	27.3			1.6	1.6	23.9		23.9
Effective Green, g (s)	7.4	33.1		1.6	27.3			1.6	1.6	23.9		23.9
Actuated g/C Ratio	0.09	0.41		0.02	0.34			0.02	0.02	0.30		0.30
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	285	691		31	1006			31	28	920		424
v/s Ratio Prot	c0.17	c0.26		0.01	0.23			c0.00		c0.25		
v/s Ratio Perm									0.00			0.10
v/c Ratio	1.81	0.62		0.52	0.67			0.19	0.01	0.84		0.34
Uniform Delay, d1	36.4	18.6		38.9	22.6			38.7	38.5	26.4		22.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Incremental Delay, d2	376.8	1.8		13.7	1.8			3.0	0.1	7.2		0.5
Delay (s)	413.2	20.4		52.7	24.4			41.7	38.6	33.6		22.5
Level of Service	F	C		D	C			D	D	C		C
Approach Delay (s)		234.2			24.9			39.9			29.7	
Approach LOS		F			C			D			C	
Intersection Summary												
HCM 2000 Control Delay			92.1			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			80.2			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			82.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

7: 101 NB Ramps & Daily Drive

02/17/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			 		 	
Traffic Volume (vph)	118	210	491	163	366	281
Future Volume (vph)	118	210	491	163	366	281
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.97	1.00	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	3433	1863	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	3433	1863	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	128	228	534	177	398	305
RTOR Reduction (vph)	0	194	0	0	0	175
Lane Group Flow (vph)	128	34	534	177	398	130
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	10.4	10.4	16.2	31.1	29.8	29.8
Effective Green, g (s)	10.4	10.4	16.2	31.1	29.8	29.8
Actuated g/C Ratio	0.15	0.15	0.23	0.44	0.43	0.43
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	277	235	795	828	1463	674
v/s Ratio Prot	c0.07		c0.16	0.10	c0.12	
v/s Ratio Perm		0.02				0.08
v/c Ratio	0.46	0.14	0.67	0.21	0.27	0.19
Uniform Delay, d1	27.2	25.9	24.4	11.9	13.0	12.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.3	2.2	0.1	0.5	0.6
Delay (s)	28.4	26.2	26.7	12.0	13.5	13.2
Level of Service	C	C	C	B	B	B
Approach Delay (s)	27.0			23.0	13.3	
Approach LOS	C			C	B	
Intersection Summary						
HCM 2000 Control Delay			20.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.42			
Actuated Cycle Length (s)			69.9		Sum of lost time (s)	13.5
Intersection Capacity Utilization			38.6%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

7: 101 NB Ramps & Daily Drive

02/17/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			 		 	
Traffic Volume (vph)	182	91	317	302	1090	326
Future Volume (vph)	182	91	317	302	1090	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.97	1.00	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	3433	1863	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	3433	1863	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	202	101	352	336	1211	362
RTOR Reduction (vph)	0	82	0	0	0	119
Lane Group Flow (vph)	202	19	352	336	1211	243
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	12.9	12.9	12.4	29.8	29.8	29.8
Effective Green, g (s)	12.9	12.9	12.4	29.8	29.8	29.8
Actuated g/C Ratio	0.19	0.19	0.18	0.43	0.43	0.43
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	350	297	620	809	1491	687
v/s Ratio Prot	c0.11		c0.10	0.18	c0.35	
v/s Ratio Perm		0.01				0.15
v/c Ratio	0.58	0.06	0.57	0.42	0.81	0.35
Uniform Delay, d1	25.4	22.9	25.7	13.4	17.0	13.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.1	1.2	0.3	4.9	1.4
Delay (s)	27.7	23.0	26.9	13.7	21.9	14.4
Level of Service	C	C	C	B	C	B
Approach Delay (s)	26.1			20.4	20.2	
Approach LOS	C			C	C	
Intersection Summary						
HCM 2000 Control Delay			20.9		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.70			
Actuated Cycle Length (s)			68.6		Sum of lost time (s)	13.5
Intersection Capacity Utilization			61.0%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

7: 101 NB Ramps & Daily Drive

02/17/2017

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖↗	↑	↖↗	↗
Traffic Volume (vph)	125	210	513	185	366	291
Future Volume (vph)	125	210	513	185	366	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.97	1.00	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	3433	1863	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	3433	1863	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	136	228	558	201	398	316
RTOR Reduction (vph)	0	193	0	0	0	183
Lane Group Flow (vph)	136	35	558	201	398	133
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	10.8	10.8	16.8	32.1	29.8	29.8
Effective Green, g (s)	10.8	10.8	16.8	32.1	29.8	29.8
Actuated g/C Ratio	0.15	0.15	0.24	0.45	0.42	0.42
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	283	241	813	843	1442	665
v/s Ratio Prot	c0.07		c0.16	0.11	c0.12	
v/s Ratio Perm		0.02				0.08
v/c Ratio	0.48	0.14	0.69	0.24	0.28	0.20
Uniform Delay, d1	27.5	26.0	24.6	11.9	13.5	13.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.3	2.4	0.1	0.5	0.7
Delay (s)	28.8	26.3	27.1	12.0	14.0	13.7
Level of Service	C	C	C	B	B	B
Approach Delay (s)	27.2			23.1	13.8	
Approach LOS	C			C	B	
Intersection Summary						
HCM 2000 Control Delay			20.3	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.43			
Actuated Cycle Length (s)			70.9	Sum of lost time (s)		13.5
Intersection Capacity Utilization			42.9%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

7: 101 NB Ramps & Daily Drive

02/17/2017

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘↙	↑	↘↙	↗
Traffic Volume (vph)	202	91	329	314	1090	356
Future Volume (vph)	202	91	329	314	1090	356
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.97	1.00	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	3433	1863	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	3433	1863	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	224	101	366	349	1211	396
RTOR Reduction (vph)	0	81	0	0	0	132
Lane Group Flow (vph)	224	20	366	349	1211	264
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	13.8	13.8	12.8	31.1	29.8	29.8
Effective Green, g (s)	13.8	13.8	12.8	31.1	29.8	29.8
Actuated g/C Ratio	0.20	0.20	0.18	0.44	0.43	0.43
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	367	312	628	828	1463	674
v/s Ratio Prot	c0.12		c0.11	0.19	c0.35	
v/s Ratio Perm		0.01				0.17
v/c Ratio	0.61	0.06	0.58	0.42	0.83	0.39
Uniform Delay, d1	25.6	22.8	26.1	13.3	17.8	13.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	0.1	1.4	0.3	5.5	1.7
Delay (s)	28.6	22.9	27.5	13.6	23.3	15.5
Level of Service	C	C	C	B	C	B
Approach Delay (s)	26.8			20.7	21.4	
Approach LOS	C			C	C	
Intersection Summary						
HCM 2000 Control Delay			21.9	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.72			
Actuated Cycle Length (s)			69.9	Sum of lost time (s)		13.5
Intersection Capacity Utilization			62.4%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

7: 101 NB Ramps & Daily Drive

02/17/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			 		 	
Traffic Volume (vph)	155	223	658	199	389	466
Future Volume (vph)	155	223	658	199	389	466
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.97	1.00	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	3433	1863	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	3433	1863	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	168	242	715	216	423	507
RTOR Reduction (vph)	0	197	0	0	0	337
Lane Group Flow (vph)	168	45	715	216	423	170
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	11.3	11.3	15.9	31.7	20.6	20.6
Effective Green, g (s)	11.3	11.3	15.9	31.7	20.6	20.6
Actuated g/C Ratio	0.18	0.18	0.26	0.52	0.34	0.34
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	343	291	890	963	1153	531
v/s Ratio Prot	c0.09		c0.21	0.12	c0.12	
v/s Ratio Perm		0.03				0.11
v/c Ratio	0.49	0.15	0.80	0.22	0.37	0.32
Uniform Delay, d1	22.4	21.0	21.2	8.1	15.4	15.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.2	5.3	0.1	0.9	1.6
Delay (s)	23.5	21.2	26.5	8.2	16.3	16.7
Level of Service	C	C	C	A	B	B
Approach Delay (s)	22.2			22.3	16.5	
Approach LOS	C			C	B	
Intersection Summary						
HCM 2000 Control Delay			19.9		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			61.3		Sum of lost time (s)	13.5
Intersection Capacity Utilization			49.3%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

7: 101 NB Ramps & Daily Drive

02/17/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			 		 	
Traffic Volume (vph)	224	97	558	359	1157	488
Future Volume (vph)	224	97	558	359	1157	488
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.97	1.00	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	3433	1863	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	3433	1863	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	249	108	620	399	1286	542
RTOR Reduction (vph)	0	87	0	0	0	225
Lane Group Flow (vph)	249	21	620	399	1286	317
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	14.8	14.8	15.5	34.8	31.6	31.6
Effective Green, g (s)	14.8	14.8	15.5	34.8	31.6	31.6
Actuated g/C Ratio	0.20	0.20	0.21	0.46	0.42	0.42
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	365	310	705	859	1438	663
v/s Ratio Prot	c0.13		c0.18	0.21	c0.37	
v/s Ratio Perm		0.01				0.20
v/c Ratio	0.68	0.07	0.88	0.46	0.89	0.48
Uniform Delay, d1	28.1	24.7	29.0	13.9	20.3	15.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.2	0.1	12.1	0.4	8.9	2.5
Delay (s)	33.3	24.8	41.1	14.3	29.3	18.4
Level of Service	C	C	D	B	C	B
Approach Delay (s)	30.7			30.6	26.0	
Approach LOS	C			C	C	
Intersection Summary						
HCM 2000 Control Delay			28.0		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.84			
Actuated Cycle Length (s)			75.4		Sum of lost time (s)	13.5
Intersection Capacity Utilization			72.0%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

7: 101 NB Ramps & Daily Drive

02/17/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	162	223	679	221	389	476
Future Volume (vph)	162	223	679	221	389	476
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.97	1.00	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	3433	1863	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	3433	1863	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	176	242	738	240	423	517
RTOR Reduction (vph)	0	197	0	0	0	344
Lane Group Flow (vph)	176	45	738	240	423	173
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	11.5	11.5	16.1	32.1	20.6	20.6
Effective Green, g (s)	11.5	11.5	16.1	32.1	20.6	20.6
Actuated g/C Ratio	0.19	0.19	0.26	0.52	0.33	0.33
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	347	295	895	969	1146	528
v/s Ratio Prot	c0.09		c0.21	0.13	c0.12	
v/s Ratio Perm		0.03				0.11
v/c Ratio	0.51	0.15	0.82	0.25	0.37	0.33
Uniform Delay, d1	22.6	21.0	21.5	8.2	15.6	15.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.2	6.2	0.1	0.9	1.6
Delay (s)	23.7	21.3	27.7	8.3	16.5	17.0
Level of Service	C	C	C	A	B	B
Approach Delay (s)	22.3			22.9	16.8	
Approach LOS	C			C	B	
Intersection Summary						
HCM 2000 Control Delay			20.4		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.55			
Actuated Cycle Length (s)			61.7		Sum of lost time (s)	13.5
Intersection Capacity Utilization			50.2%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

7: 101 NB Ramps & Daily Drive

02/17/2017

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			 		 	
Traffic Volume (vph)	244	97	570	371	1157	518
Future Volume (vph)	244	97	570	371	1157	518
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.97	1.00	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	3433	1863	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	3433	1863	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	271	108	633	412	1286	576
RTOR Reduction (vph)	0	86	0	0	0	242
Lane Group Flow (vph)	271	22	633	412	1286	334
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	15.7	15.7	15.5	35.7	31.6	31.6
Effective Green, g (s)	15.7	15.7	15.5	35.7	31.6	31.6
Actuated g/C Ratio	0.21	0.21	0.20	0.47	0.41	0.41
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	383	325	697	871	1421	655
v/s Ratio Prot	c0.15		c0.18	0.22	c0.37	
v/s Ratio Perm		0.01				0.21
v/c Ratio	0.71	0.07	0.91	0.47	0.90	0.51
Uniform Delay, d1	28.2	24.4	29.7	13.9	20.9	16.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.9	0.1	15.6	0.4	9.8	2.8
Delay (s)	34.0	24.5	45.3	14.3	30.8	19.4
Level of Service	C	C	D	B	C	B
Approach Delay (s)	31.3			33.1	27.3	
Approach LOS	C			C	C	
Intersection Summary						
HCM 2000 Control Delay			29.6		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.86			
Actuated Cycle Length (s)			76.3		Sum of lost time (s)	13.5
Intersection Capacity Utilization			73.4%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	528	320	0	82	163	437	8	3	8	567	0	195
Future Volume (vph)	528	320	0	82	163	437	8	3	8	567	0	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Lane Util. Factor	0.97	1.00		1.00	0.95			1.00	1.00	0.97		1.00
Frt	1.00	1.00		1.00	0.89			1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95		1.00
Satd. Flow (prot)	3090	1676		1593	2837			1619	1425	3090		1425
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95		1.00
Satd. Flow (perm)	3090	1676		1593	2837			1619	1425	3090		1425
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	652	395	0	101	201	540	10	4	10	700	0	241
RTOR Reduction (vph)	0	0	0	0	413	0	0	0	10	0	0	174
Lane Group Flow (vph)	652	395	0	101	328	0	0	14	0	700	0	67
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Prot		Perm
Protected Phases	7	4		3	8		2	2		6		
Permitted Phases									2			6
Actuated Green, G (s)	18.2	29.0		8.4	19.2			1.5	1.5	22.8		22.8
Effective Green, g (s)	18.2	29.0		8.4	19.2			1.5	1.5	22.8		22.8
Actuated g/C Ratio	0.22	0.35		0.10	0.24			0.02	0.02	0.28		0.28
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0	5.0		5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	688	594		163	666			29	26	862		397
v/s Ratio Prot	c0.21	c0.24		0.06	0.12			c0.01		c0.23		
v/s Ratio Perm									0.00			0.05
v/c Ratio	0.95	0.66		0.62	0.49			0.48	0.01	0.81		0.17
Uniform Delay, d1	31.3	22.2		35.1	27.0			39.7	39.4	27.5		22.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Incremental Delay, d2	22.1	2.8		6.8	0.6			12.1	0.1	5.9		0.2
Delay (s)	53.4	25.1		42.0	27.6			51.8	39.5	33.3		22.5
Level of Service	D	C		D	C			D	D	C		C
Approach Delay (s)		42.7			29.3			46.7			30.5	
Approach LOS		D			C			D			C	
Intersection Summary												
HCM 2000 Control Delay	34.8			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.82											
Actuated Cycle Length (s)	81.7			Sum of lost time (s)			20.0					
Intersection Capacity Utilization	73.7%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

7: 101 NB Ramps & Daily Drive

02/17/2017

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↘↙	↑	↘↙	↑
Traffic Volume (vph)	125	210	513	185	366	291
Future Volume (vph)	125	210	513	185	366	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.97	1.00	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	3433	1863	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	3433	1863	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	136	228	558	201	398	316
RTOR Reduction (vph)	0	193	0	0	0	183
Lane Group Flow (vph)	136	35	558	201	398	133
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	10.8	10.8	16.8	32.1	29.8	29.8
Effective Green, g (s)	10.8	10.8	16.8	32.1	29.8	29.8
Actuated g/C Ratio	0.15	0.15	0.24	0.45	0.42	0.42
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	283	241	813	843	1442	665
v/s Ratio Prot	c0.07		c0.16	0.11	c0.12	
v/s Ratio Perm		0.02				0.08
v/c Ratio	0.48	0.14	0.69	0.24	0.28	0.20
Uniform Delay, d1	27.5	26.0	24.6	11.9	13.5	13.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.3	2.4	0.1	0.5	0.7
Delay (s)	28.8	26.3	27.1	12.0	14.0	13.7
Level of Service	C	C	C	B	B	B
Approach Delay (s)	27.2			23.1	13.8	
Approach LOS	C			C	B	
Intersection Summary						
HCM 2000 Control Delay			20.3		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.43			
Actuated Cycle Length (s)			70.9		Sum of lost time (s)	13.5
Intersection Capacity Utilization			42.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Phone:
E-mail:

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Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: AM Peak Hour
 Freeway/Direction: US-101 SB
 From/To: West of Ventura Blvd
 Jurisdiction:
 Analysis Year: 2015
 Description: Existing

Flow Inputs and Adjustments

Volume, V	3788	veh/h
Peak-hour factor, PHF	0.81	
Peak 15-min volume, v15	1169	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1585	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1585	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.5	mi/h
Number of lanes, N	3	
Density, D	24.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

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Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: PM Peak Hour
 Freeway/Direction: US-101 SB
 From/To: West of Ventura Blvd
 Jurisdiction:
 Analysis Year: 2015
 Description: Existing

Flow Inputs and Adjustments

Volume, V	3888	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1045	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1417	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

101_SB_westofVentura_PM_EX.txt

Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1417	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	21.8	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

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Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: AM Peak Hour
 Freeway/Direction: US-101 SB
 From/To: West of Ventura
 Jurisdiction:
 Analysis Year: EP
 Description: Existing with Project

Flow Inputs and Adjustments

Volume, V	3795	veh/h
Peak-hour factor, PHF	0.81	
Peak 15-min volume, v15	1171	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1588	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1588	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.5	mi/h
Number of lanes, N	3	
Density, D	24.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: PM Peak Hour
 Freeway/Direction: US-101 SB
 From/To: West of Ventura
 Jurisdiction:
 Analysis Year: EP
 Description: Existing with Project

Flow Inputs and Adjustments

Volume, V	3908	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1051	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1425	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

101_SB_WestofVentura_PM_EP.txt

Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1425	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	21.9	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: AM Peak Hour
 Freeway/Direction: US-101 SB
 From/To: West of Ventura
 Jurisdiction:
 Analysis Year: C
 Description: Cumulative

Flow Inputs and Adjustments

Volume, V	4190	veh/h
Peak-hour factor, PHF	0.81	
Peak 15-min volume, v15	1293	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1754	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1754	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.2	mi/h
Number of lanes, N	3	
Density, D	27.7	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: PM Peak Hour
 Freeway/Direction: US-101 SB
 From/To: West of Ventura
 Jurisdiction:
 Analysis Year: C
 Description: Cumulative

Flow Inputs and Adjustments

Volume, V	4285	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1152	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1562	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

101_SB_West of Ventura_PM_C.txt

Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1562	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.6	mi/h
Number of lanes, N	3	
Density, D	24.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: AM Peak Hour
 Freeway/Direction: US-101 SB
 From/To: East of Lewis
 Jurisdiction:
 Analysis Year: CP
 Description: Cumulative with Project

Flow Inputs and Adjustments

Volume, V	4197	veh/h
Peak-hour factor, PHF	0.81	
Peak 15-min volume, v15	1295	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1757	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1757	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.2	mi/h
Number of lanes, N	3	
Density, D	27.8	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: PM Peak Hour
 Freeway/Direction: US-101 SB
 From/To: West of Ventura
 Jurisdiction:
 Analysis Year: CP
 Description: Cumulative with Project

Flow Inputs and Adjustments

Volume, V	4305	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1157	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1569	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

101_SB_West of Ventura_PM_CP.txt

Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1569	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.6	mi/h
Number of lanes, N	3	
Density, D	24.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: AM Peak Hour
 Freeway/Direction: US-101 SB
 From/To: East of Lewis Rd
 Jurisdiction:
 Analysis Year: 2015
 Description: Existing

Flow Inputs and Adjustments

Volume, V	4066	veh/h
Peak-hour factor, PHF	0.81	
Peak 15-min volume, v15	1255	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1702	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

101_SB_eastofLewis_AM_EX.txt

Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1702	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.7	mi/h
Number of lanes, N	3	
Density, D	26.7	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: PM Peak Hour
 Freeway/Direction: US-101 SB
 From/To: East of Lewis Rd
 Jurisdiction:
 Analysis Year: 2015
 Description: Existing

Flow Inputs and Adjustments

Volume, V	3921	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1054	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1429	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1429	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	22.0	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
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Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: AM Peak Hour
 Freeway/Direction: US-101 SB
 From/To: East of Lewis
 Jurisdiction:
 Analysis Year: EP
 Description: Existing with Project

Flow Inputs and Adjustments

Volume, V	4098	veh/h
Peak-hour factor, PHF	0.81	
Peak 15-min volume, v15	1259	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1707	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1707	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.7	mi/h
Number of lanes, N	3	
Density, D	26.8	pc/mi/ln
Level of service, LOS	D	

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 From/To: East of Lewis
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 Analysis Year: EP
 Description: Existing with Project

Flow Inputs and Adjustments

Volume, V	3939	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1059	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1436	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1436	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	22.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

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 E-mail: _____

Operational Analysis

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 Date Performed: 2/3/2017
 Analysis Time Period: AM Peak Hour
 Freeway/Direction: US-101 SB
 From/To: East of Lewis
 Jurisdiction:
 Analysis Year: C
 Description: Cumulative

Flow Inputs and Adjustments

Volume, V	4437	veh/h
Peak-hour factor, PHF	0.81	
Peak 15-min volume, v15	1369	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1857	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1857	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.0	mi/h
Number of lanes, N	3	
Density, D	29.9	pc/mi/ln
Level of service, LOS	D	

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 From/To: East of Lewis
 Jurisdiction:
 Analysis Year: C
 Description: Cumulative

Flow Inputs and Adjustments

Volume, V	4374	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1176	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1594	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1594	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.5	mi/h
Number of lanes, N	3	
Density, D	24.7	pc/mi/ln
Level of service, LOS	C	

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 Analysis Time Period: AM Peak Hour
 Freeway/Direction: US-101 SB
 From/To: East of Lewis
 Jurisdiction:
 Analysis Year: CP
 Description: Cumulative with Project

Flow Inputs and Adjustments

Volume, V	4469	veh/h
Peak-hour factor, PHF	0.81	
Peak 15-min volume, v15	1379	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1870	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1870	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	61.9	mi/h
Number of lanes, N	3	
Density, D	30.2	pc/mi/ln
Level of service, LOS	D	

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 From/To: East of Lewis
 Jurisdiction:
 Analysis Year: CP
 Description: Cumulative with Project

Flow Inputs and Adjustments

Volume, V	4392	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1181	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1601	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1601	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.4	mi/h
Number of lanes, N	3	
Density, D	24.8	pc/mi/ln
Level of service, LOS	C	

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Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: AMPeak Hour
 Freeway/Direction: US-101 NB
 From/To: West of Daily
 Jurisdiction:
 Analysis Year: 2015
 Description: Existing

Flow Inputs and Adjustments

Volume, V	4290	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1166	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1581	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1581	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.5	mi/h
Number of lanes, N	3	
Density, D	24.5	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

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Operational Analysis

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 Date Performed: 2/3/2017
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 Freeway/Direction: US-101 NB
 From/To: West of Daily
 Jurisdiction:
 Analysis Year: 2015
 Description: Existing

Flow Inputs and Adjustments

Volume, V	4752	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1320	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1790	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1790	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.8	mi/h
Number of lanes, N	3	
Density, D	28.5	pc/mi/ln
Level of service, LOS	D	

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Operational Analysis

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 Freeway/Direction: US-101 NB
 From/To: West of Daily
 Jurisdiction:
 Analysis Year: EP
 Description: Existing with Project

Flow Inputs and Adjustments

Volume, V	4312	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1172	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1589	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1589	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.5	mi/h
Number of lanes, N	3	
Density, D	24.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
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Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: PM Peak Hour
 Freeway/Direction: US-101 NB
 From/To: West of Daily
 Jurisdiction:
 Analysis Year: EP
 Description: Existing with Project

Flow Inputs and Adjustments

Volume, V	4764	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1323	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1794	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1794	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.8	mi/h
Number of lanes, N	3	
Density, D	28.6	pc/mi/ln
Level of service, LOS	D	

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Operational Analysis

Analyst: VN
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 Date Performed: 2/3/2017
 Analysis Time Period: AM Peak Hour
 Freeway/Direction: US-101 NB
 From/To: West of Daily
 Jurisdiction:
 Analysis Year: C
 Description: Cumulative

Flow Inputs and Adjustments

Volume, V	4691	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1275	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1729	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1729	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.5	mi/h
Number of lanes, N	3	
Density, D	27.2	pc/mi/ln
Level of service, LOS	D	

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 E-mail: _____

Operational Analysis

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 Date Performed: 2/3/2017
 Analysis Time Period: PM Peak Hour
 Freeway/Direction: US-101 NB
 From/To: West of Daily
 Jurisdiction:
 Analysis Year: C
 Description: Cumulative

Flow Inputs and Adjustments

Volume, V	5266	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1463	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1984	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1984	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	60.2	mi/h
Number of lanes, N	3	
Density, D	33.0	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

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Operational Analysis

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 Analysis Time Period: AM Peak Hour
 Freeway/Direction: US-101 NB
 From/To: West of Daily
 Jurisdiction:
 Analysis Year: CP
 Description: Cumulative with Project

Flow Inputs and Adjustments

Volume, V	4713	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1281	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1737	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1737	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.4	mi/h
Number of lanes, N	3	
Density, D	27.4	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

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 Freeway/Direction: US-101 NB
 From/To: West of Daily
 Jurisdiction:
 Analysis Year: CP
 Description: Cumulative with Project

Flow Inputs and Adjustments

Volume, V	5278	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1466	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1988	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

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Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1988	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	60.1	mi/h
Number of lanes, N	3	
Density, D	33.1	pc/mi/ln
Level of service, LOS	D	

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Operational Analysis

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 Date Performed: 2/3/2017
 Analysis Time Period: AM Peak Hour
 Freeway/Direction: US-101 NB
 From/To: East of Daily
 Jurisdiction:
 Analysis Year: 2015
 Description: Existing

Flow Inputs and Adjustments

Volume, V	4606	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1252	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1697	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

101_NB_EasttoDaily_AM_EX.txt

Lateral clearance adjustment, FLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1697	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.7	mi/h
Number of lanes, N	3	
Density, D	26.6	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: PM Peak Hour
 Freeway/Direction: US-101 NB
 From/To: East of Daily
 Jurisdiction:
 Analysis Year: 2015
 Description: Existing

Flow Inputs and Adjustments

Volume, V	4795	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1332	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1806	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

101_NB_EasttoDaily_PM_EX.txt

Lateral clearance adjustment, FLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1806	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.7	mi/h
Number of lanes, N	3	
Density, D	28.8	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

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Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: AM Peak Hour
 Freeway/Direction: US-101 NB
 From/To: East of Daily
 Jurisdiction:
 Analysis Year: EP
 Description: Existing with Project

Flow Inputs and Adjustments

Volume, V	4616	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1254	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1701	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

101_NB_East of Daily_AM_EP.txt

Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1701	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.7	mi/h
Number of lanes, N	3	
Density, D	26.7	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

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Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: PM Peak Hour
 Freeway/Direction: US-101 NB
 From/To: East of Daily
 Jurisdiction:
 Analysis Year: EP
 Description: Existing with Project

Flow Inputs and Adjustments

Volume, V	4825	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1340	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1817	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

101_NB_East of Daily_PM_EP.txt

Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1817	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.5	mi/h
Number of lanes, N	3	
Density, D	29.1	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone: _____ Fax: _____
 E-mail: _____

Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: AMPeak Hour
 Freeway/Direction: US-101 NB
 From/To: East of Daily
 Jurisdiction:
 Analysis Year: C
 Description: Cumulative

Flow Inputs and Adjustments

Volume, V	5057	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1374	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1863	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1863	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	62.0	mi/h
Number of lanes, N	3	
Density, D	30.1	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone: _____ Fax: _____
 E-mail: _____

Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: PM Peak Hour
 Freeway/Direction: US-101 NB
 From/To: East of Daily
 Jurisdiction:
 Analysis Year: C
 Description: Cumulative

Flow Inputs and Adjustments

Volume, V	5232	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1453	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1971	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1971	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	60.4	mi/h
Number of lanes, N	3	
Density, D	32.6	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: AM Peak Hour
 Freeway/Direction: US-101 NB
 From/To: East of Daily
 Jurisdiction:
 Analysis Year: CP
 Description: Cumulative with Project

Flow Inputs and Adjustments

Volume, V	5067	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1377	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1867	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

101_NB_East of Daily_AM_CP.txt

Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

Flow rate, vp	1867	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	61.9	mi/h
Number of lanes, N	3	
Density, D	30.2	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: VN
 Agency or Company: Fehr & Peers
 Date Performed: 2/3/2017
 Analysis Time Period: PM Peak Hour
 Freeway/Direction: US-101 NB
 From/To: East of Daily
 Jurisdiction:
 Analysis Year: CP
 Description: Cumulative with Project

Flow Inputs and Adjustments

Volume, V	5262	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1462	v
Trucks and buses	3	%
Recreational vehicles	1	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.983	
Driver population factor, fp	1.00	
Flow rate, vp	1982	pc/h/ln

Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h

101_NB_East of Daily_PM_CP.txt

Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

LOS and Performance Measures

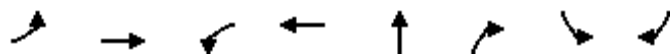
Flow rate, vp	1982	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	60.2	mi/h
Number of lanes, N	3	
Density, D	32.9	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Queues

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	652	391	101	688	14	10	691	241
v/c Ratio	0.74	0.66	0.58	0.76	0.12	0.04	0.69	0.39
Control Delay	38.3	30.9	59.8	16.7	51.5	0.4	35.4	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	30.9	59.8	16.7	51.5	0.4	35.4	6.5
Queue Length 50th (ft)	161	174	55	54	8	0	171	0
Queue Length 95th (ft)	289	274	#148	91	30	0	309	42
Internal Link Dist (ft)		170		315	504			
Turn Bay Length (ft)			88					
Base Capacity (vph)	1042	1036	179	1411	363	426	1042	640
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.38	0.56	0.49	0.04	0.02	0.66	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

7: 101 NB Ramps & Daily Drive

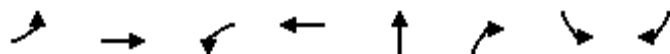
02/17/2017

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	128	228	534	177	398	305
v/c Ratio	0.46	0.53	0.67	0.21	0.27	0.36
Control Delay	33.7	9.4	29.3	12.1	15.1	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.7	9.4	29.3	12.1	15.1	3.6
Queue Length 50th (ft)	50	0	106	44	53	0
Queue Length 95th (ft)	107	57	168	77	108	50
Internal Link Dist (ft)	468			569	496	
Turn Bay Length (ft)			265			135
Base Capacity (vph)	578	648	1411	1465	1461	849
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.35	0.38	0.12	0.27	0.36
Intersection Summary						

Queues

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	427	307	15	533	6	7	577	366
v/c Ratio	0.62	0.37	0.11	0.64	0.05	0.03	0.66	0.55
Control Delay	36.2	18.2	47.9	28.2	48.2	0.3	33.0	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.2	18.2	47.9	28.2	48.2	0.3	33.0	7.2
Queue Length 50th (ft)	89	68	6	93	3	0	114	0
Queue Length 95th (ft)	207	231	34	209	19	0	275	81
Internal Link Dist (ft)		170		315	504			
Turn Bay Length (ft)			88					
Base Capacity (vph)	1230	1206	211	1444	423	479	1230	787
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.25	0.07	0.37	0.01	0.01	0.47	0.47

Intersection Summary

Queues

7: 101 NB Ramps & Daily Drive

02/17/2017

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	202	101	352	336	1211	362
v/c Ratio	0.58	0.27	0.57	0.42	0.81	0.45
Control Delay	32.9	7.8	29.9	14.7	24.5	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	7.8	29.9	14.7	24.5	8.7
Queue Length 50th (ft)	78	0	69	93	217	38
Queue Length 95th (ft)	147	36	118	148	#427	124
Internal Link Dist (ft)	468			569	496	
Turn Bay Length (ft)			265			135
Base Capacity (vph)	588	569	1437	1492	1488	804
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.18	0.24	0.23	0.81	0.45

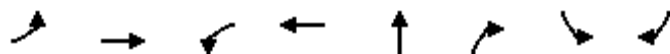
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	652	395	101	741	14	10	700	241
v/c Ratio	0.76	0.64	0.60	0.78	0.13	0.04	0.71	0.39
Control Delay	40.4	30.0	62.9	18.7	52.6	0.4	37.0	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.4	30.0	62.9	18.7	52.6	0.4	37.0	6.6
Queue Length 50th (ft)	169	176	58	72	8	0	185	0
Queue Length 95th (ft)	289	277	#148	115	30	0	#317	42
Internal Link Dist (ft)		170		315	504			
Turn Bay Length (ft)			88					
Base Capacity (vph)	996	991	171	1371	348	413	996	622
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.40	0.59	0.54	0.04	0.02	0.70	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

7: 101 NB Ramps & Daily Drive

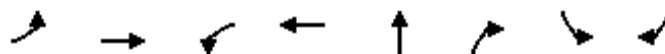
02/17/2017

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	136	228	558	201	398	316
v/c Ratio	0.48	0.53	0.69	0.24	0.28	0.37
Control Delay	34.3	9.2	29.7	12.2	15.6	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	9.2	29.7	12.2	15.6	3.7
Queue Length 50th (ft)	54	0	113	51	55	0
Queue Length 95th (ft)	114	57	177	87	112	52
Internal Link Dist (ft)	468			569	496	
Turn Bay Length (ft)			265			135
Base Capacity (vph)	570	642	1392	1445	1441	847
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.36	0.40	0.14	0.28	0.37
Intersection Summary						

Queues

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	427	318	15	558	6	7	640	366
v/c Ratio	0.64	0.40	0.12	0.68	0.05	0.03	0.68	0.53
Control Delay	38.0	19.2	48.8	29.2	49.0	0.3	33.2	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	19.2	48.8	29.2	49.0	0.3	33.2	6.7
Queue Length 50th (ft)	98	85	7	106	3	0	131	0
Queue Length 95th (ft)	207	241	34	215	19	0	#310	81
Internal Link Dist (ft)		170		315	504			
Turn Bay Length (ft)			88					
Base Capacity (vph)	1156	1150	198	1367	397	458	1156	762
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.28	0.08	0.41	0.02	0.02	0.55	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

7: 101 NB Ramps & Daily Drive

02/17/2017



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	224	101	366	349	1211	396
v/c Ratio	0.61	0.26	0.58	0.42	0.83	0.49
Control Delay	33.6	7.5	30.7	14.6	26.0	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	7.5	30.7	14.6	26.0	9.4
Queue Length 50th (ft)	88	0	74	97	225	43
Queue Length 95th (ft)	162	36	125	154	#446	142
Internal Link Dist (ft)	468			569	496	
Turn Bay Length (ft)			265			135
Base Capacity (vph)	577	560	1411	1464	1460	805
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.18	0.26	0.24	0.83	0.49

Intersection Summary

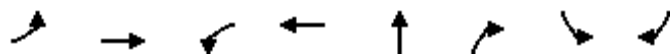
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	722	488	107	945	14	10	886	312
v/c Ratio	0.95	0.72	0.68	0.88dr	0.18	0.04	0.97	0.49
Control Delay	62.3	33.6	69.3	25.0	57.5	0.4	60.9	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.3	33.6	69.3	25.0	57.5	0.4	60.9	6.7
Queue Length 50th (ft)	~265	287	73	161	10	0	~342	0
Queue Length 95th (ft)	#357	351	#135	186	29	0	#426	42
Internal Link Dist (ft)		170		315	504			
Turn Bay Length (ft)			88					
Base Capacity (vph)	763	811	173	1318	79	223	916	642
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.60	0.62	0.72	0.18	0.04	0.97	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Queues

7: 101 NB Ramps & Daily Drive

02/17/2017



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	168	242	715	216	423	507
v/c Ratio	0.49	0.50	0.80	0.22	0.37	0.58
Control Delay	27.5	7.2	30.7	8.5	17.5	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	7.2	30.7	8.5	17.5	5.2
Queue Length 50th (ft)	57	0	125	40	60	0
Queue Length 95th (ft)	107	49	#234	71	107	63
Internal Link Dist (ft)	468			569	496	
Turn Bay Length (ft)			265			135
Base Capacity (vph)	595	670	927	1235	1152	868
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.36	0.77	0.17	0.37	0.58

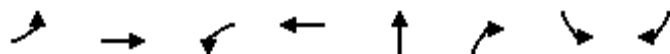
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	509	420	16	832	6	8	756	397
v/c Ratio	1.63	0.53	0.14	0.74	0.05	0.03	0.76	0.55
Control Delay	323.0	19.4	43.0	19.7	41.3	0.3	30.3	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	323.0	19.4	43.0	19.7	41.3	0.3	30.3	6.0
Queue Length 50th (ft)	~162	110	6	107	2	0	137	0
Queue Length 95th (ft)	#358	308	31	214	17	0	#310	70
Internal Link Dist (ft)		170		315	504			
Turn Bay Length (ft)			88					
Base Capacity (vph)	313	916	115	1634	115	231	1253	814
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.63	0.46	0.14	0.51	0.05	0.03	0.60	0.49

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

7: 101 NB Ramps & Daily Drive

02/17/2017



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	249	108	620	399	1286	542
v/c Ratio	0.68	0.27	0.88	0.46	0.89	0.61
Control Delay	38.0	7.4	45.9	15.8	31.2	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	7.4	45.9	15.8	31.2	8.6
Queue Length 50th (ft)	109	0	146	122	281	45
Queue Length 95th (ft)	181	37	#257	191	#456	150
Internal Link Dist (ft)	468			569	496	
Turn Bay Length (ft)			265			135
Base Capacity (vph)	482	490	707	978	1437	888
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.22	0.88	0.41	0.89	0.61

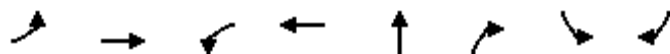
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	722	491	107	997	14	10	894	312
v/c Ratio	0.96	0.71	0.69	0.92dr	0.18	0.05	0.99	0.49
Control Delay	66.3	32.8	71.0	27.3	58.0	0.4	67.5	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.3	32.8	71.0	27.3	58.0	0.4	67.5	6.7
Queue Length 50th (ft)	~287	290	75	185	10	0	~365	0
Queue Length 95th (ft)	#357	353	#135	210	29	0	#432	42
Internal Link Dist (ft)		170		315	504			
Turn Bay Length (ft)			88					
Base Capacity (vph)	750	797	170	1305	78	222	900	636
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.62	0.63	0.76	0.18	0.05	0.99	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Queues

7: 101 NB Ramps & Daily Drive

02/17/2017



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	176	242	738	240	423	517
v/c Ratio	0.51	0.49	0.83	0.25	0.37	0.59
Control Delay	27.7	7.1	32.2	8.7	17.7	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	7.1	32.2	8.7	17.7	5.2
Queue Length 50th (ft)	60	0	131	45	60	0
Queue Length 95th (ft)	112	49	#247	79	108	63
Internal Link Dist (ft)	468			569	496	
Turn Bay Length (ft)			265			135
Base Capacity (vph)	590	667	921	1227	1144	872
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.36	0.80	0.20	0.37	0.59

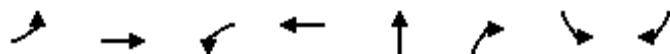
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

5: School Driveway/101 SB Ramps & Ventura Blvd

02/17/2017



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	515	431	16	858	6	8	777	426
v/c Ratio	1.67	0.57	0.14	0.76	0.05	0.03	0.78	0.58
Control Delay	343.5	22.3	43.3	20.1	41.7	0.3	31.0	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	343.5	22.3	43.3	20.1	41.7	0.3	31.0	7.3
Queue Length 50th (ft)	~171	118	7	114	3	0	144	7
Queue Length 95th (ft)	#363	318	31	223	17	0	#324	94
Internal Link Dist (ft)		170		315	504			
Turn Bay Length (ft)			88					
Base Capacity (vph)	308	883	113	1612	113	229	1232	808
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.67	0.49	0.14	0.53	0.05	0.03	0.63	0.53

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

7: 101 NB Ramps & Daily Drive

02/17/2017



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	271	108	633	412	1286	576
v/c Ratio	0.71	0.26	0.91	0.47	0.91	0.64
Control Delay	39.0	7.2	49.6	15.8	32.8	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	7.2	49.6	15.8	32.8	9.1
Queue Length 50th (ft)	120	0	153	127	288	50
Queue Length 95th (ft)	198	37	#265	198	#456	162
Internal Link Dist (ft)	468			569	496	
Turn Bay Length (ft)			265			135
Base Capacity (vph)	477	486	699	966	1420	897
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.22	0.91	0.43	0.91	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Appendix J

Sewer, Domestic Water and Recycled Water Report

**SEWER, DOMESTIC WATER
AND RECYCLED WATER REPORT
FOR
UNIVERSITY GLEN PHASE 2
AT CSU CHANNEL ISLANDS
Camarillo, CA**

HZ PROJECT NO. R300668.01

Prepared for:

Kennedy Wilson
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January 3, 2017

Prepared By:

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1. INTRODUCTION

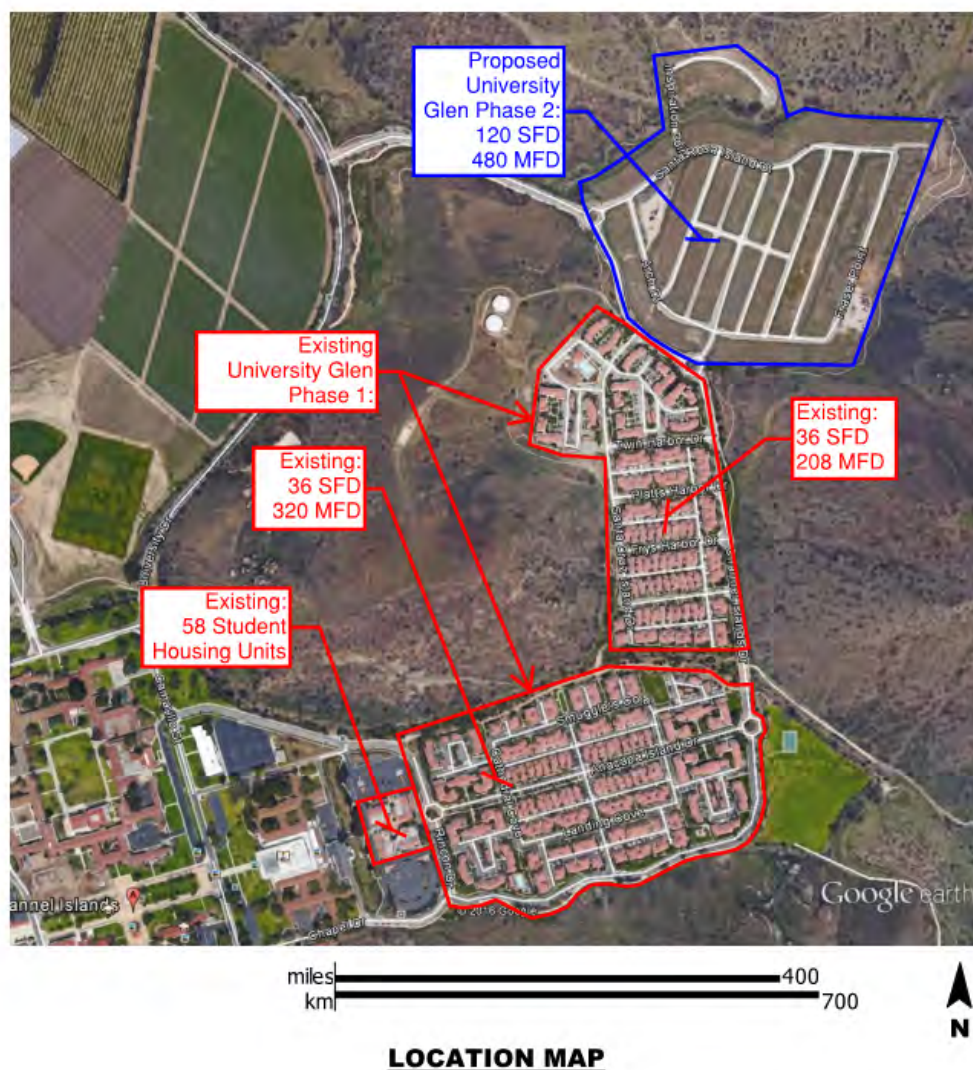
1.1 PROJECT DESCRIPTION

The proposed project (referred to as University Glen Phase 2) is located on the California State University, Channel Islands (CSUCI) campus in unincorporated Ventura County, near the City of Camarillo. The project aims to redevelop approximately 33.5 acres of land into 600 residential units consisting of apartments, age/income restricted apartments, townhomes and single family homes. See Site Master Plan below.



Under the existing CSUCI Specific Reuse Plan, University Glen Phase 2 and the area to the south (referred to as University Glen Phase 1) were entitled for 900 single family and multifamily units. (See Location Map on the following page). University Glen Phase 1 has been built out and is comprised of 528 multifamily units, 72 single-family/townhome units and 58 student housing units. The remaining 242 units (900-658) dedicated to University Glen Phase 2 were partially developed in 2007 until construction was halted due to a downturn in economic conditions.

The partial development of University Glen Phase 2 consisted of the construction of streets, curbs & gutters, storm drain systems, sewer systems, domestic water systems and recycled water systems. The current project proposal of 600 units provides a net increase of 358 (600-242) additional units that will put increased demands on the existing sewer, domestic water and recycled water systems located in Channel Islands Drive.



1.2 REPORT OBJECTIVES

The purpose of this report is to analyze the sewer generation, domestic water and recycled water demand for the final phase of the University Glen project. Objectives of this report are as follows:

- Determine the sewer generation, domestic water and recycled water demand for the proposed 600 unit project using the Camrosa Water District Design Criteria.
- Determine the service generation/demand difference between the proposed 600 unit project and the previously entitled 242 unit project and analyze any downstream affects to the existing 658 units located in University Glen Phase 1.

1.3 DESIGN CRITERIA

Calculations and design criteria contained within this report are consistent with the Camrosa Water District Standards.

2. SEWER GENERATION

2.1 OVERVIEW

The existing and proposed sewer conditions have been analyzed to determine the net increase in sewer generation between the previously entitled 242 unit project and the proposed 600 unit project. Understanding this difference was critical in determining whether or not the existing downstream sewer had sufficient capacity to handle the increase in flows due to the larger development project being proposed. Ultimately, it was determined that the existing sewer has sufficient capacity to handle the increase in flows.

2.2 EXISTING CONDITIONS

The existing backbone sewer system that services the proposed project site will convey flows through an existing 12" PVC line located within Channel Islands Drive, which extends through University Glen Phase 1 and into the Camrosa Waste Water Treatment Facility. See Appendix A for the Existing Sanitary Sewer System.

The existing in-tract sewer lines from the partially developed 242 unit single family residential project will be demolished and a new sewer system will be designed to fit the current project site plan. However, in order to understand the net sewer generation increase due to the new 600 unit development, the existing conditions must first be analyzed for Average Daily Flow and Peak Flow.

Flow rates to analyze sewer generation for the previously entitled 242 units project were obtained using criteria set forth by the Camrosa Water District Sanitary Sewer Design and Construction Standards for single and multiple family dwellings, see Table 2.2-1 below.

Table 2.2-1 (Flow Rates*)

Single Family Dwelling	3.64 persons/SFD	100 gal/capita/day
Multiple Family Dwelling	2.15 persons/MFD	100 gal/capita/day

*Per Camrosa Water District Sanitary Sewer Design and Construction Standards

The average flow rate and peak daily flow rate was calculated with an assumed Peak Flow factor of 5 (most conservative value). The results for the previously entitled 242 unit project can be found in Table 2.2-2 below.

Table 2.2-2 (Average and Peak Flows for the previously entitled 242 unit SFD project)

POC #1 - Intersection of Channel Islands Drive and Project Outlet Location			
Land Use	Cumulative Number of Units	Computed Average Flow	Computed Peak Flow ^[1]
Single Family Dwelling	242	88,088 gal/day	440,440 gal/day
Multiple Family Dwelling	0	0 gal/day	0 gal/day
Total	0	88,088 gal/day 61 gal/min	-- 306 gal/min

[1] Assumed Peak Flow Factor of 5

2.3 PROPOSED CONDITIONS

The proposed on-site sewer collection system will accommodate the new project's 600 dwelling units and feed into the existing 12" PVC backbone line located within Channel Islands Drive. Per the Camrosa Water District Sanitary Sewer Design and Construction Standards the minimum diameter of the in-tract main line shall be 8" and increase up to 12" in size as needed. See Appendix B for the Proposed On-Site Sewer Master Plan.

Flow rates to analyze sewer generation for the proposed 600 unit project were obtained using criteria set forth by the Camrosa Water District Sanitary Sewer Design and Construction Standards for single and multiple family dwellings as identified in Table 2.2-1

The average flow rate and peak daily flow rate were calculated with an assumed Peak Flow factor of 5 (most conservative value). The results for the proposed 600 unit project can be found in Table 2.3-1.

Table 2.3-1 (Average and Peak Flows for the proposed 600 unit project)

POC #1 - Intersection of Channel Islands Drive and Project Outlet Location			
Land Use	Cumulative Number of Units	Computed Average Flow	Computed Peak Flow ^[1]
Single Family Dwelling	120	43,680 gal/day	218,400 gal/day
Multiple Family Dwelling	480	103,200 gal/day	516,000 gal/day
Total	600	146,880 gal/day 102 gal/min	-- 510 gal/min

[1] Assumed Peak Flow Factor of 5

When comparing the Peak Flow Rates for the previously entitled 242 unit project and the proposed 600 unit project, the results indicate that the current planned development will generate a net increase of 204 gal/min (510-306) during the peak hour.

2.4 DOWN STREAM HYDRAULIC ANALYSIS

In order to verify that the existing downstream backbone sewer has sufficient capacity to handle the increased number of dwelling units, average flow rates and peak flow rates were also calculated at additional downstream locations. Each location took into consideration the increase in sewer generation due to the existing units draining into the same backbone system. Each location is identified below and the corresponding results can be found in Table 2.4-1.

- POC # 1: Intersection of Channel Islands Drive and Project Outlet Location*
- POC # 2: Intersection of Channel Islands Drive and Culyer Harbor Drive*
- POC # 3: Intersection of Camarillo Street and Rincon Drive*

*See Appendix A "Existing Sanitary Sewer System" for POC locations

Table 2.4-1 (Average and Peak Flows Downstream from Project)

POC #2 - Intersection of Channel Islands Drive and Culyer Harbor Drive			
Land Use	Cumulative Number of Units	Computed Average Flow	Computed Peak Flow ^[1]
Single Family Dwelling	156	56,784 gal/day	283,920 gal/day
Multiple Family Dwelling	688	147,920 gal/day	739,600 gal/day
Total	844	204,704 gal/day 142 gal/min	-- 711 gal/min

POC #3 - Intersection of Channel Islands Drive and Rincon Drive			
Land Use	Cumulative Number of Units	Computed Average Flow	Computed Peak Flow ^[1]
Single Family Dwelling	250	91,000 gal/day	455,000 gal/day
Multiple Family Dwelling	1,008	216,720 gal/day	1,083,600 gal/day
Total	1,258	307,720 gal/day 214 gal/min	-- 1,068 gal/min

[1] Assumed Peak Flow Factor of 5

2.5 RESULTS

Downstream pipe capacities for the proposed project shall be determined for peak flow rates using a manning's roughness coefficient (n) of 0.13 and the resulting depth to diameter (d/D) ratio shall not exceed .67 for 12" pipes as specified in the Camrosa Water District Standards,. For this project, pipe capacities were calculated using Bentley FlowMaster v8i. The hydraulic analysis for the proposed project can be found in Appendix C and its results can be found in Table 2.5-1 below:

Table 2.5-1 (Hydraulic Analysis: Downstream Pipe Capacities for the Proposed 600 Unit Project)

Location	Manning's Coeff- icient	Slope	Pipe Diam.	Peak Flow	Normal Depth	Maximum allowed d/D Ratio	Calculated d/D Ratio	Status
POC #1	0.013	0.0064	12 in	734,400 gal/day	5.27 in	0.67	0.44	OK
POC #2	0.013	0.0032	12 in	1,023,520 gal/day	8.02 in	0.67	0.67	OK
POC #3	0.013	0.0220	12 in	1,538,600 gal/day	5.65 in	0.67	0.47	OK

The results indicate that the proposed 600 unit development will generate a net increase of 204 gal/min during peak flows as compared to the previously entitled 242 unit project identified in the CSUCI Specific Reuse Plan. However, despite the increase, the existing backbone sewer has sufficient capacity to handle the increase in flows.

3. DOMESTIC WATER DEMAND

3.1 OVERVIEW

The existing and proposed domestic water conditions have been analyzed to determine the net increase in domestic water demand between the previously entitled 242 unit project and the proposed 600 unit project. Understanding the peak hour demand was critical in determining whether or not the existing 12" PVC backbone water line located in Channel Islands Drive was sized adequately. Ultimately, it was determined that the existing 12" line has sufficient capacity to handle the increased demand.

3.2 EXISTING CONDITIONS

The existing backbone domestic water system that services the project site will convey demand through an existing 12" PVC line that runs within Channel Islands Drive and through the northwest corner of the proposed project site along Santa Rosa Island Drive and Inspiration Point. This water line, which is fed from the city domestic water supply, also services the dual domestic water storage/pressure tanks, located southwest of the project site.

The existing in-tract domestic water lines from the partially developed 242 unit single family residential project will be demolished and a new domestic water system will be designed to fit the current project site plan. However, in order to understand the net domestic water demand increase due to the new 600 unit development, the existing conditions must first be analyzed for average and peak hour demand.

Average daily and peak hour domestic water demand rates for the previously entitled 242 unit project were obtained using design criteria set forth in the Camrosa Water District Water Design and Construction Standards. See Table 3.2.-1 and 3.2-2 below.

Table 3.2-1 (Flow Rates*)

Single Family Dwelling	3.38 persons/SFD	220 gal/capita/day
Multiple Family Dwelling	2.1 persons/MFD	220 gal/capita/day

**Camrosa Water District Water Design and Construction Standards*

Table 3.2-2 (Peaking Factors*)

Maximum Month Demand	1.60
Maximum Day Demand	2.15
Peak Hour Demand	4.50

**Table 2.6, Camrosa Water District Water Design and Construction Standards*

Average daily flows were calculated using the given flow rates and a peak hour demand factor of 4.5. The results for the previously entitled 242 unit project can be found in Table 3.2-3.

Table 3.2-3 (Average and Peak Demands for the previously entitled 242 unit project)

Land Use	Computed Average Domestic Water Demand	Computed Peak Hour Domestic Water Demand
Single Family Dwelling	179,951 gal/day	809,780 gal/day
Multiple Family Dwelling	0 gal/day	0 gal/day
Total	179,951 gal/day 201.57 acre-ft/yr	809,780 gal/day 33,741 gal/hr

3.3 PROPOSED CONDITIONS

The proposed on-site domestic water system will accommodate the new project's 600 dwelling units and will be supplied from the existing 12" PVC backbone line within Channel Islands Drive and Inspiration Point. Per the Camrosa Water District Water Design and Construction Standards, water mains shall be 8" in diameter and increase in size as needed. The water mains shall be designed to provide for service pressures between 45 psi and 150 psi. Ideally the water pressures will be kept between 45 psi and 80 psi. The water mains shall also be designed to provide a mean velocity of no more than 5 ft/sec, under maximum daily flow conditions. See Appendix D for the Proposed On-site Domestic Water Master Plan.

Average daily and peak hour domestic water demand rates for the proposed 600 unit project were obtained using design criteria set forth in the Camrosa Water District Water Design and Construction Standards as identified in Table 3.2-1 and Table 3.2-2. The results for the proposed project can be found in Table 3.3-1 below.

Table 3.3-1 (Average and Peak Demands for the proposed 600 unit project)

Land Use	Computed Average Domestic Water Demand	Computed Peak Hour Domestic Water Demand
Single Family Dwelling	89,232 gal/day	401,544 gal/day
Multiple Family Dwelling	221,760 gal/day	997,920 gal/day
Total	310,992 gal/day 348.36 acre-ft/yr	1,399,464 gal/day 58,311 gal/hr

When comparing the Peak Hour Demand for the previously entitled 242 unit project and the proposed 600 unit project, the results indicate that the current planned development will generate a net increase of 24,570 gal/hr (58,311-33,741) during the peak hour. The results also indicate that the proposed development will require 146.79 additional acre-ft/yr, which represents a 173% increase in domestic water demand.

3.4 RESULTS

In order to verify that the existing 12" domestic water mainline located in Channel Islands Drive has sufficient capacity to handle the increased number of dwelling units, a flow calculation was performed to determine the maximum required pipe size for the proposed peak hour flow with a maximum velocity of 5ft/sec as specified in Section 2.2D of the Camrosa Water District Water Design and Construction Standards. The following calculation was implemented:

$$Q = V * \pi * (D^2/4)$$

Where,

Q = Peak Hour Flow (ft³/sec)

V = Max Velocity (ft/sec)

D = Diameter of Pipe (ft²)

$$(58,311 \text{ gal/hr}) = (2.165 \text{ ft}^3/\text{sec}) = (5 \text{ ft/sec}) * (\pi * (D^2/4) \text{ ft}^2)$$

$$D = 0.74' = 9" < 12" \text{ (OK)}$$

The results indicate that the existing 12" domestic water line located in Channel Islands Drive has sufficient capacity to handle the increased domestic demand due to the proposed development.

4. RECYCLED WATER DEMAND

4.1 OVERVIEW

The existing and proposed recycled water conditions have been analyzed to determine the net increase in recycled water demand between the previously entitled 242 unit project and the proposed 600 unit project. Understanding this difference was critical in determining whether or not the existing 8" PVC backbone recycled water line located in Channel Islands Drive was sized adequately. Ultimately, it was determined that the existing 8" line has sufficient capacity to handle the change in demand.

4.2 EXISTING CONDITIONS

The existing backbone recycled water system that services the project site will convey demand through an existing 8" PVC line that runs through Channel Islands Drive and through the Northwest corner of the proposed project site along Santa Rosa Island Dr. and Inspiration Point.

The existing in-tract recycled water irrigation lines from the partially developed 242 unit single family residential project will be demolished and a new recycled water system will be designed to fit the current project site plan. However, in order to understand the net recycled water demand change due to the new 600 unit development, the existing conditions must first be analyzed for average and peak hour demand.

Average daily and peak hour flows were calculated using an assumed consumption rate of 1.80 acre-ft/year (AFY) per acre, an average daily demand factor of 2.5 and a peak hour demand factor of 7.5. The irrigated percentage is based off the existing land use and the percent impervious values set forth in Exhibit 14B of the Ventura County Watershed Protection District (VCWPD) Hydrology Manual. The two primary land uses identified in Exhibit 14B that accurately represent the previously entitled 242 unit project are Single Family Homes with 1/8 acre lots and Single Family Homes with 1/6 acre lots which have percent impervious averages of 65% and 56% respectively. With the inclusion of existing parks/open space (0% impervious) and streets/parking lots (100% impervious), the overall average impervious area was assumed to be 60%, which designates the remaining 40% of the site as pervious and irrigated area. The results for the previously entitled 242 unit project can be found in Table 4.2-1.

Table 4.2-1 (Avg. and Peak Irrigation Demands for the previously entitled 242 unit project)

Consumption Rate (AFY per acre) ^[1]	Size	Irrigated % ^[2]	Total Demand	Average Daily Demand	Maximum Daily Demand ^[3]	Peak Hour Demand ^[4]
1.80 AFY per acre	33.5 acres	40%	24.12 acre-ft/yr	15.0 gpm	37.4 gpm	112.2 gpm

[1] Assumed Consumption Rate of 1.80 AFY per acre (Average for Ventura County)

[2] Irrigated % taken as avg. % pervious from VCWPD Hydrology Manual for various land uses

[3] Assumed Maximum Daily Demand Factor (Average for Ventura County)

[4] Assumed Peak Hour Demand Factor (Average for Ventura County)

4.3 PROPOSED CONDITIONS

The proposed on-site recycled water system will accommodate the new project's 600 dwelling units and be supplied from the existing 8" PVC backbone line within Channel Islands Drive and Inspiration Point. Per the Camrosa Water District Non-Potable Water Design, Construction & Use Standards the water mains shall be PVC Class 200, C900 and shall be designed to provide for service pressures between 45 psi and 150 psi. Ideally the water pressures will be kept between 45 psi and 80 psi. The water mains shall also be designed to provide a mean velocity of no more than 5 ft/sec, under maximum daily flow conditions. The main line minimum diameter shall be 8" and increase in size as needed. See Appendix E for the Proposed On-site Recycled Water Master Plan.

Average daily and peak hour irrigation water demand rates for the proposed 600 unit project were calculated using an assumed consumption rate of 1.80 acre-ft/year (AFY) per acre, an average daily demand factor of 2.5 and a peak hour demand factor of 7.5. The irrigated percentage is based off the proposed land use and the percent impervious values set forth in Exhibit 14B of the Ventura County Watershed Protection District (VCWPD) Hydrology Manual. The two primary land uses identified in Exhibit 14B that accurately represent the 600 unit project are Single Family Homes with 1/8 acre lots and Condos (Apartments) which have percent impervious averages of 65% and 69% respectively. With the inclusion of existing parks/open space (0% impervious) and streets/parking lots (100% impervious), the overall average impervious area was assumed to be 70%, which designates the remaining 30% of the site as pervious and irrigated area. The results for the proposed 600 unit project can be found in Table 4.3-1.

Table 4.3-1 (Average and Peak Irrigation Demands for the proposed 600 unit project)

Consumption Rate (AFY per acre) ^[1]	Size	Irrigated % ^[2]	Total Demand	Average Daily Demand	Maximum Daily Demand ^[3]	Peak Hour Demand ^[4]
1.80 AFY per acre	33.5 acres	30%	18.09 acre-ft/yr	11.2 gpm	28.0 gpm	84.1 gpm

[1] Assumed Consumption Rate of 1.80 AFY per acre (Average for Ventura County)

[2] Irrigated % taken as avg. % pervious from VCWPD Hydrology Manual for various land uses

[3] Assumed Maximum Daily Demand Factor (Average for Ventura County)

[4] Assumed Peak Hour Demand Factor (Average for Ventura County)

When comparing the Peak Hour Demand for the previously entitled 242 unit single family project and the proposed 600 unit project, the results indicate that the current planned development will generate a net decrease of 18.1 gal/min (112.2-84.1) during the peak hour. The results also indicate that the proposed development will require 6.03 less acre-ft/yr, which represents a 25% decrease in recycled water (irrigation) demand.

4.4 RESULTS

In order to verify that the existing 8" recycled water mainline has sufficient capacity to handle the proposed 600 units, a flow calculation was performed to determine the maximum required pipe size for the proposed peak hour flow with a maximum velocity of 5ft/sec as specified in Section 2.2E of the Camrosa Non-Potable Water District Water Design, Construction and Use Standards. The following calculation was implemented:

$$Q = V * \pi * (D^2/4)$$

Where,

Q = Peak Hour Flow (ft³/sec)

V = Max Velocity (ft/sec)

D = Diameter of Pipe (ft²)

$$(84.1 \text{ gal/min}) = (0.1874 \text{ ft}^3/\text{sec}) = (5 \text{ ft/sec}) * (\pi * (D^2/4) \text{ ft}^2)$$

$$D = 0.22' = 3" < 8" \text{ (OK)}$$

The results indicate that the existing 8" recycled water line located in Channel Islands Drive has sufficient capacity to handle the required demand due to the proposed development.

5. Appendices

Appendix A: Existing Sanitary Sewer System

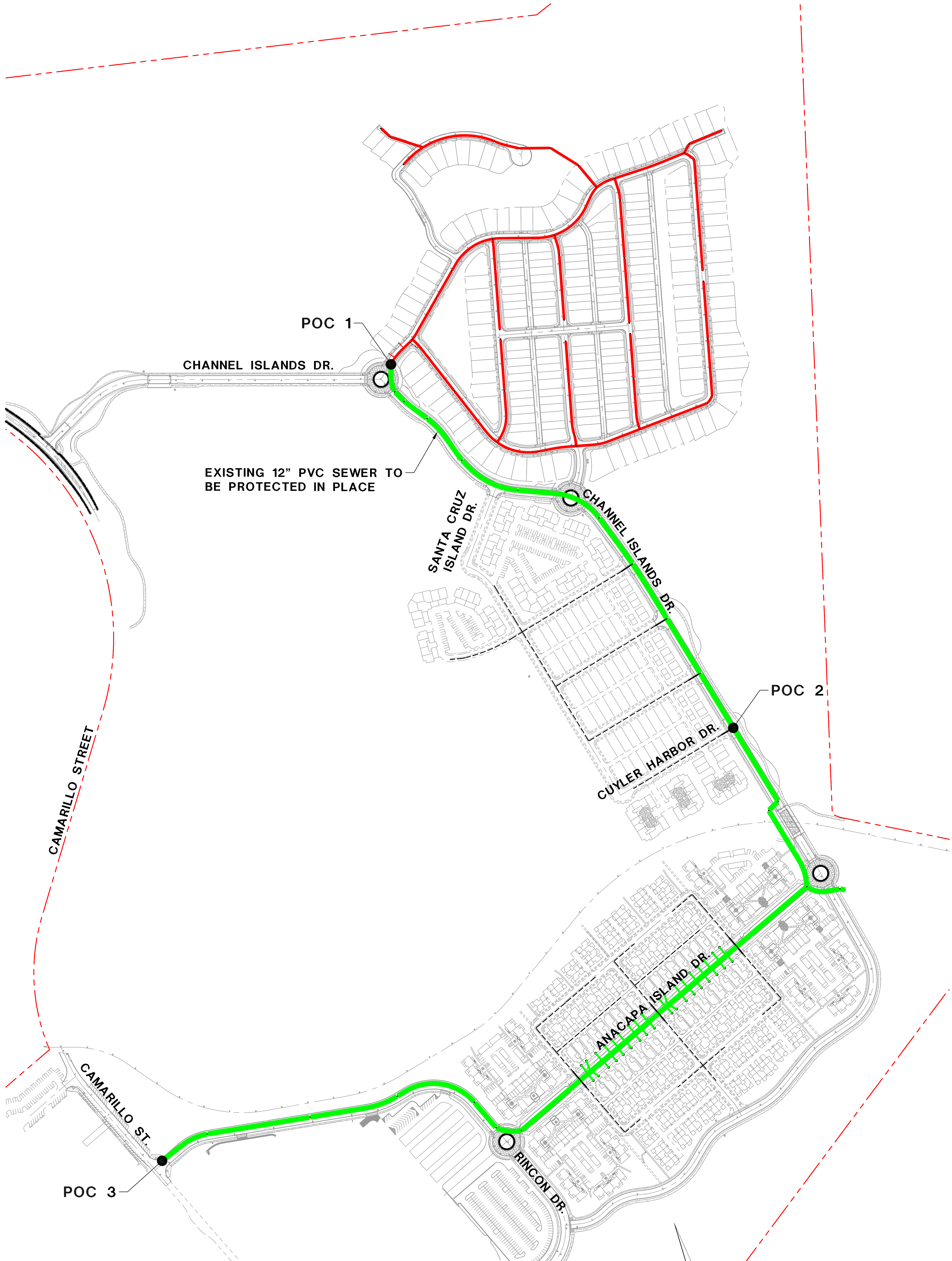
Appendix B: Proposed On-site Sewer Master Plan

Appendix C: Proposed Sanitary Sewer Hydraulics

- At POC #1
- At POC #2
- At POC #3

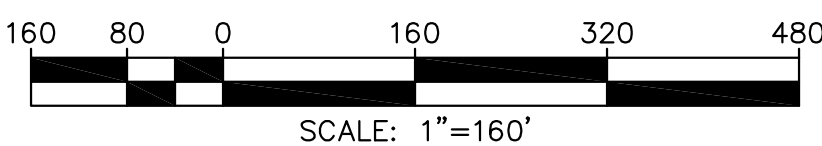
Appendix D: Proposed On-site Domestic Water Master Plan

Appendix E: Proposed On-site Recycled Water Master Plan



LEGEND

- PROPERTY LINE
- EXISTING 8" PVC SEWER
- EXISTING 12" PVC SEWER BACKBONE
- EXISTING IN-TRACT SEWER



Appendix B
Proposed On-site Sewer Master Plan

LEGEND

- PROPERTY LINE
- EXISTING 8" PVC SEWER
(TO BE DEMOLISHED/RECYCLED)
- EXISTING 12" PVC SEWER
(TO BE PROTECTED IN PLACE)
- PROPOSED 8" PVC BACKBONE SEWER
- PROPOSED 8" PVC IN-TRACT SEWER

JOIN EXISTING
12" PVC SEWER

CHANNEL ISLANDS DR.

EXISTING 12" PVC SEWER
TO BE PROTECTED IN PLACE

SANTA CRUZ ISLAND DR.

TO UNIVERSITY GLEN
PHASE 1 AND CAMPUS
SEWER SYSTEM

SEWER MASTER PLAN

UNIVERSITY GLEN PHASE II

CSU CHANNEL ISLANDS

Appendix C
Proposed Sanitary Sewer Hydraulics

Worksheet for At POC 1, University Glen Outlet

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00640	ft/ft
Diameter	12.00	in
Discharge	734400.00	gal/day

Results

Normal Depth	5.27	in
Flow Area	0.33	ft²
Wetted Perimeter	1.45	ft
Hydraulic Radius	2.75	in
Top Width	0.99	ft
Critical Depth	0.45	ft
Percent Full	43.9	%
Critical Slope	0.00591	ft/ft
Velocity	3.42	ft/s
Velocity Head	0.18	ft
Specific Energy	0.62	ft
Froude Number	1.04	
Maximum Discharge	3.07	ft³/s
Discharge Full	2.85	ft³/s
Slope Full	0.00102	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	in
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	in
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	43.93	%
Downstream Velocity	Infinity	ft/s

Worksheet for At POC 1, University Glen Outlet

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	5.27	in
Critical Depth	0.45	ft
Channel Slope	0.00640	ft/ft
Critical Slope	0.00591	ft/ft

Worksheet for At POC 2, Channel Islands Dr. & Cuyler Harbor Dr.

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00320	ft/ft
Diameter	12.00	in
Discharge	1023520.00	gal/day

Results

Normal Depth	8.02	in
Flow Area	0.56	ft ²
Wetted Perimeter	1.91	ft
Hydraulic Radius	3.50	in
Top Width	0.94	ft
Critical Depth	0.53	ft
Percent Full	66.8	%
Critical Slope	0.00634	ft/ft
Velocity	2.84	ft/s
Velocity Head	0.13	ft
Specific Energy	0.79	ft
Froude Number	0.65	
Maximum Discharge	2.17	ft ³ /s
Discharge Full	2.02	ft ³ /s
Slope Full	0.00198	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	in
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	in
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	66.81	%
Downstream Velocity	Infinity	ft/s

Worksheet for At POC 2, Channel Islands Dr. & Cuyler Harbor Dr.

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	8.02	in
Critical Depth	0.53	ft
Channel Slope	0.00320	ft/ft
Critical Slope	0.00634	ft/ft

Worksheet for At POC 3, Camarillo St. & Rincon Dr.

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.02200	ft/ft
Diameter	12.00	in
Discharge	1538600.00	gal/day

Results

Normal Depth	5.65	in
Flow Area	0.36	ft²
Wetted Perimeter	1.51	ft
Hydraulic Radius	2.88	in
Top Width	1.00	ft
Critical Depth	0.66	ft
Percent Full	47.1	%
Critical Slope	0.00745	ft/ft
Velocity	6.55	ft/s
Velocity Head	0.67	ft
Specific Energy	1.14	ft
Froude Number	1.92	
Maximum Discharge	5.68	ft³/s
Discharge Full	5.28	ft³/s
Slope Full	0.00447	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	in
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	in
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	47.06	%
Downstream Velocity	Infinity	ft/s

Worksheet for At POC 3, Camarillo St. & Rincon Dr.

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	5.65	in
Critical Depth	0.66	ft
Channel Slope	0.02200	ft/ft
Critical Slope	0.00745	ft/ft

Appendix D
Proposed On-site Domestic Water Master Plan

TO CITY DOMESTIC
WATER SUPPLY

JOIN EXISTING 12"
CAMPUS WATER MAIN

PROPOSED 12" PVC CAMPUS
WATER MAIN TO BE REROUTED
THROUGH SITE ALLEYS/STREETS

EXISTING 12" PVC
CAMPUS WATER MAIN
TO BE DEMOLISHED

JOIN EXISTING 12"
CAMPUS WATER MAIN

CHANNEL ISLANDS DR.

EXISTING 12" PVC
CAMPUS WATER MAIN
TO BE PROTECTED IN
PLACE

TO DUAL DOMESTIC
WATER STORAGE/
PRESSURE TANKS

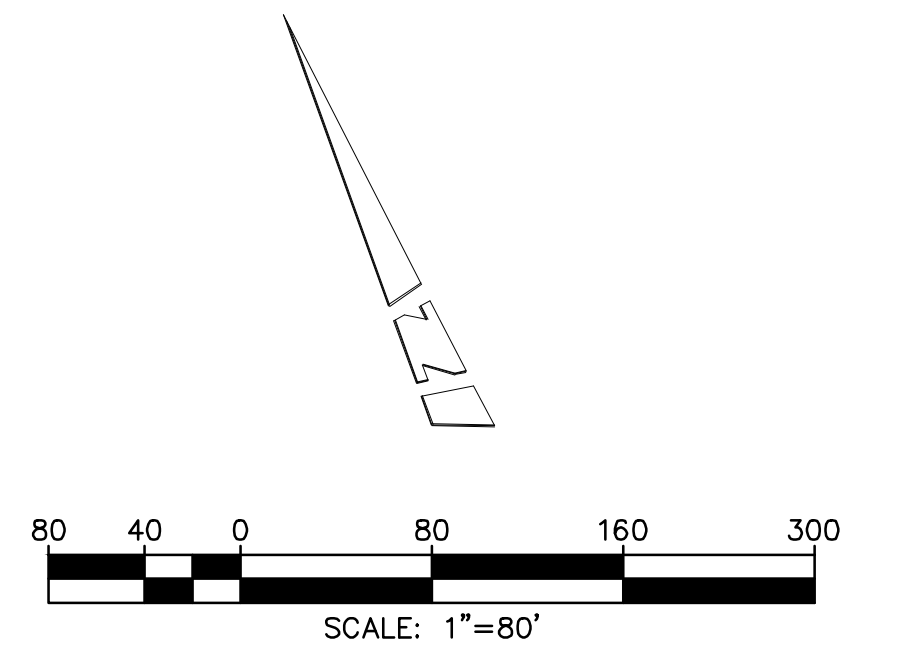
SANTA CRUZ ISLAND DR.

TO UNIVERSITY GLEN
PHASE 1 AND CAMPUS
DOMESTIC WATER SYSTEM

CHANNEL ISLANDS DR.

LEGEND

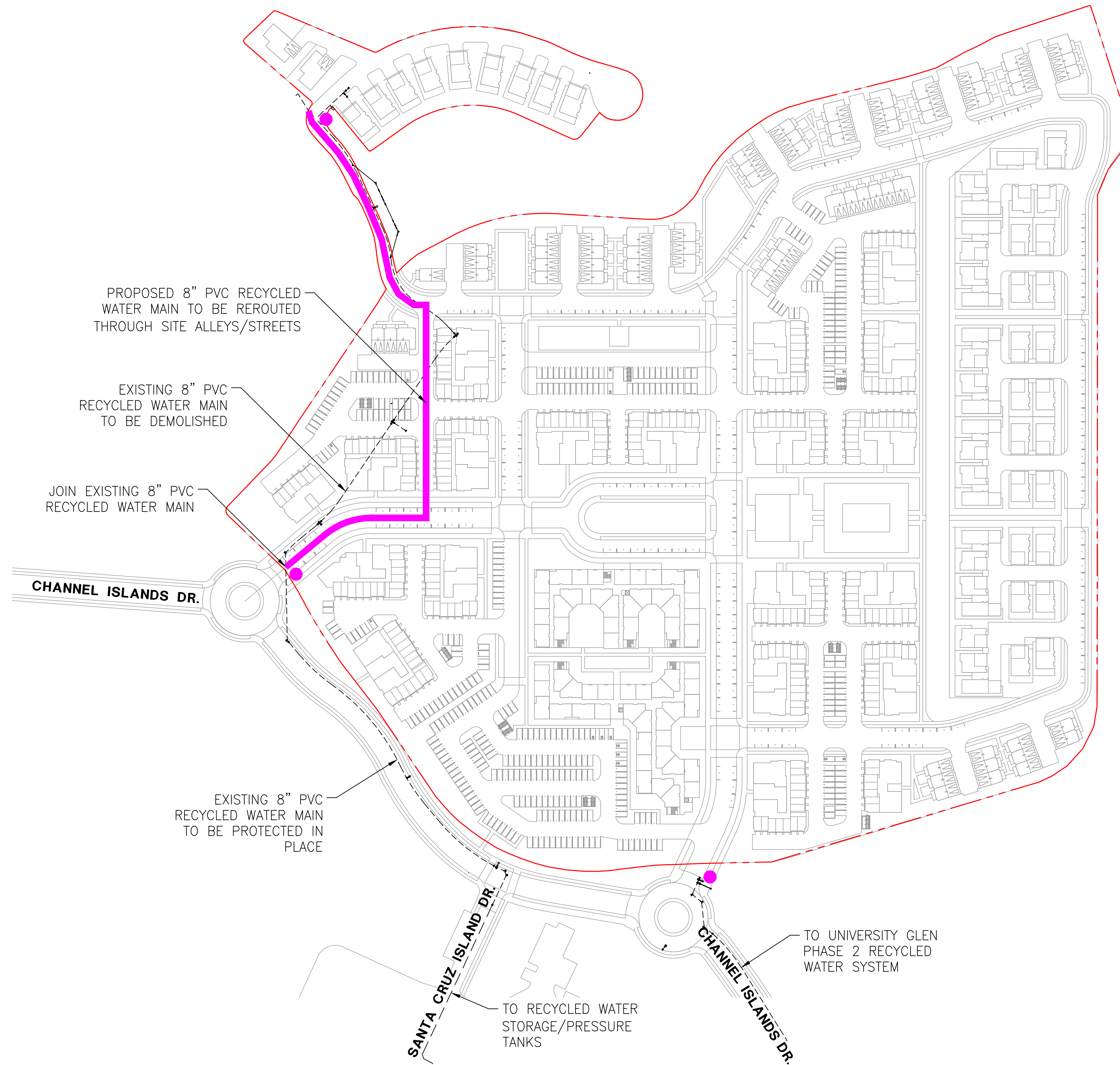
- PROPERTY LINE
- EXISTING 8" PVC DOMESTIC WATER
(TO BE DEMOLISHED/RECYCLED)
- EXISTING 12" PVC CAMPUS WATER MAIN
- PROPOSED 8" PVC BACKBONE DOMESTIC WATER
- PROPOSED 8" PVC IN-TRACT DOMESTIC WATER
- PROPOSED 12" PVC CAMPUS WATER MAIN
- PROPOSED UNIVERSITY GLEN SUB-METER



Appendix E
Proposed On-site Recycled Water Master Plan

LEGEND

- PROPERTY LINE
- EXISTING 8" PVC RECYCLED WATER (TO BE DEMOLISHED/RECYCLED)
- PROPOSED 8" PVC BACKBONE RECYCLED WATER
- PROPOSED IRRIGATION POINT OF CONNECTION



RECYCLED WATER MASTER PLAN UNIVERSITY GLEN PHASE II CSU CHANNEL ISLANDS

Appendix K

Water Supply Assessment



CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood Project

Water Supply Assessment

prepared by

California State University, Channel Islands Site Authority

One University Drive

Camarillo, CA 93012

prepared with the assistance of

Rincon Consultants, Inc.

180 North Ashwood Avenue

Ventura, California 93001

February 2017

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Acronyms and Abbreviations

AFY	Acre-Feet per Year
BMP	Best Management Practices
CASGEM	California Statewide Groundwater Elevation Model
CDA	Community Development Area
CEQA	California Environmental Quality Act
CSUCI	California State University Channel Islands
CUP	Conditional Use Permit
CWA	Clean Water Act
CWD	Camrosa Water District
CWRF	Camrosa Water Reclamation Facility
EIR	Environmental Report
EPA	(United States) Environmental Protection Agency
FCGMA	Fox Canyon Groundwater Management Agency
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
MGD	million gallons per day
MSL	Mean Sea Level
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
psi	pounds per square inch
PVCWD	Pleasant Valley County Water District
ROW	Right of Way
RWQCB	Regional Water Quality Control Board
SDWA	Safe Drinking Water Act
SGMA	Sustainable Groundwater Management Act
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TEA	Temporary Extraction Allocations
TMDL	Total Maximum Daily Loads

Water Supply Assessment

USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UWMP	Urban Water Management Plan
WSA	Water Supply Assessment
WQS	Water Quality Standards

1 Introduction

Senate Bill 610 (SB 610) was passed on January 1, 2002, amending California Water Code to require detailed analysis of water supply availability for certain types of development projects. The primary purpose of SB 610 is to improve the linkage between water and land use planning by ensuring greater communication between water providers and local planning agencies, and ensuring that land use decisions for certain large development projects are fully informed as to whether sufficient water supplies are available to meet project demands. SB 610 requires the preparation of a Water Supply Assessment (WSA) for a project that is subject to CEQA and meets certain requirements; each of which is discussed in detail in Chapter 3 of this WSA.

Based upon the *Sewer, Domestic Water, and Recycled Water Report* (Huitt-Zollars 2017), water requirements associated with the proposed CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood project (“proposed project”) would include 18.09 acre-feet per year (AFY) of recycled water (for irrigation) and 348.36 AFY of domestic (potable) water to serve the new residential development. An estimated 1.8 acre-feet per acre of recycled water required for irrigation was based upon Huitt-Zollars experience with similar prior projects. The report used the design criteria of Camrosa Water District Water Design and Construction Standards for potable water flow to residential units, which is 220 gallons per capita per day (gpcd).

Using data from CSUCI campus sources of actual usage based on a period of the previous five years, actual water uses were only an average of 1.56 acre-feet per acre of recycled water for irrigation, and 34 gpcd, respectively. Proposed project water requirements for the 600 unit development calculated with these values would be approx. 15.68 AFY of recycled water (for irrigation) and 54.06 AFY for domestic (potable) water to serve new residential development. See Attachment B for further details.

The University understands that the State will be issuing updated water design numbers and, although not final, 55 gpcd is the anticipated new number for calculating new residential developments. The existing residential development at University Glen Phase 1 is well below the anticipated 55 gpcd design value at 34 gpcd. It is anticipated that the proposed project (University Glen Phase 2) would be as, if not more efficient, due to compliance with the CALGreen standards and improvements in technology for fixtures, metering/monitoring, and controls since University Glen Phase 1 was constructed.

A temporary water source would also be required during project construction for dust abatement, concrete manufacturing, equipment washing, landscape establishment, and other miscellaneous uses. Due to the nature of the project being a residential development, and the quantity of water required for project operations, the proposed project is considered a “project” under SB 610. The proposed project site is located within the service area of the Camrosa Water District (CWD), which is proposed as the potential water provider for construction and operation of the project.

When a WSA is required per California Water Code, it must examine the availability of an identified water supply under normal-year, single-dry-year, and multiple-dry-year conditions over a 20-year projection, accounting for the projected water demand of the proposed project in addition to other existing and planned future uses of the identified water supply, including agricultural and manufacturing uses. This analysis relies on all available data pertaining to the water supplies available to the CWD, as well as the current and projected demands on those resources.

The steps followed to ensure compliance of this WSA with California Water Code are described in Attachment A (DWR Guidebook for Implementation of Senate Bill 610 and Senate Bill 221).

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2 Project Description

2.1 Project Applicant

Owner

The Trustees of the California State University

400 Golden Shore

Long Beach, California 90802-4275

Ground Lessee/Locally represented by

Site Authority

California State University, Channel Islands

P.O. Box 2862

Camarillo, California 93011-2862

Contact

Terry M. Tarr, AIA, LEED AP

CSUCI Facilities Services Department

Assoc. Architect / Project Manager / Planning Design & Construction Dept.

(805) 437-2018

2.2 Project Location

The proposed project is located on the California State University, Channel Islands (CSUCI) campus in southern Ventura County, at the eastern edge of the Oxnard Plain and at the western flank of the Santa Monica Mountains. The CSUCI campus lies 2.5 miles south of the city of Camarillo, northeast of the intersection of Lewis and Potrero Roads, and east of Calleguas Creek. As described in the Initial Study for the proposed project, the portion of the project site to be developed is referred to as Phase Two of the East Campus Residential Neighborhood, also known as University Glen Phase 2.

Primary access to the CSUCI campus is provided by U.S. Highway 101 to the north, via Lewis Road and Camarillo Street, or by State Route 1 to the southwest, via Las Posas Road and Hueneme Road. The project site is included within the CSUCI Specific Reuse Plan and is a part of the Community Development Area (CDA) designated within the plan. The CDA is planned for development of university-related support uses.

2.3 Physical Development

The proposed project consists of development of Phase 2 of the East Campus Residential Neighborhood, also referred to as University Glen. Development of the proposed project requires an amendment to the CSUCI Specific Reuse Plan, which is one of the documents governing land development for the non-academic portions of the CSUCI complex, including the West and East Campuses. Under the existing CSUCI Specific Reuse Plan, the project site is entitled for 242 single-family residential units on a 32-acre site, which is currently vacant; under the proposed project, up to 600 residential units would be developed on the same 32-acre site. In addition, the project site is currently designated for low- to low-medium residential density (zero to 10 units per acre) development, while the amendment required for

the proposed project would allow for low-medium to medium-high residential density (10 to 20 units per acre).

The proposed project would require a water supply for both potable and non-potable purposes. Recycled water would be utilized to the maximum extent practicable.

Based on actual water usage values over the previous five years, project operations would require 15.68 AFY of recycled water for irrigation and 54.06 AFY of domestic (potable) water. Comparatively using Camrosa design demand, per the HZ report, during project operations, 18.09 AFY of recycled water would be used for irrigation, and 348.36 AFY of domestic (potable) water would be used in the residential units.

These water supplies would be provided by CWD.

This WSA assesses the water use requirements and water supply availability associated with increasing the number of approved residential units on the project site from 242 to 600 under the proposed project, an increase of 358 residential units. Although this increase is less than the 500-unit threshold requiring a WSA under California Water Code (discussed below in Section 3.2.1), this WSA is prepared to assess the full 600-unit development in order to provide a conservative and accurate analysis of water supply reliability.

2.3.1 Domestic Water Demand

The proposed on-site domestic water system has been designed accommodate the proposed project's 600-residential-unit development, and will be supplied via an existing 12-inch PVC backbone pipeline within Channel Islands Drive and Inspiration Point. Per the Camrosa Water District Water Design and Construction Standards, water mains shall be at least eight inches in diameter and increase in size as needed. The Water Design and Construction Standards also include specifications for service pressures in pounds per square inch (psi). Average daily and peak hour domestic water demand rates for the proposed 600-unit-project were obtained using design criteria set forth in the Camrosa Water District Water Design and Construction Standards; results are shown in the table below. (Huitt-Zollars 2017)

Table 1 Domestic Water Demand- Average and Peak Hour

Land Use	Computed Average		Computed Peak Hour	
	242-Unit Project ¹ (previously entitled)	600-Unit Project (proposed project)	242-Unit Project ¹ (previously entitled)	600-Unit Project (proposed project)
Single Family Dwelling	179,951 gal/day	89,232 gal/day	809,780 gal/day	401,544 gal/day
Multiple Family Dwelling	0 gal/day	221,760 gal/day	0 gal/day	997,920 gal/day
Total	179,951 gal/day	310,992 gal/day	809,780 gal/day	1,399,464 gal/day
	210.57 AFY	348.36 AFY	33,741 gal/hr	58,311 gal/hr

¹ The 242-unit project represents the previously entitled project, whereas the 600-unit project is the current proposed project; this WSA is not assessing the previously-entitled 242-unit project and only presents this information for purpose of comparison.

Source: Huitt-Zollars 2017

Based on Camrosa's water usage per person numbers, the proposed project's 600 residential units would increase peak hour domestic water demand by approximately 24,570 gallons per hour, compared to peak hour water demand associated with the currently entitled 242-unit development. The 600-unit development would also require 146.79 additional AFY of domestic water (348.46 AFY total), an increase of approximately 73 percent compared to the currently entitled development.

Based on actual water usage over the past five years, a lower actual demand per person would occur than shown in Table 1. The proposed project would require 54.06 AFY of domestic water rather than the calculated 348.36 AFY.

2.3.2 Recycled Water Demand

The existing backbone recycled water system that services the project site will convey demand through an existing eight-inch PVC line that runs through Channel Islands Drive and through the northwest corner of the proposed project site along Santa Rosa Island Drive and Inspiration Point. A new recycled water system will be designed to fit the proposed project site plan.

Average daily and peak hour flows were calculated using an assumed consumption rate of 1.80 AFY per acre, an average daily demand factor of 2.5, and a peak hour demand factor of 7.5. These calculations, presented in the *Sewer, Domestic Water, and Recycled Water Report* (Huitt-Zollars 2017), indicate that the proposed on-site recycled water system will accommodate the new project's 600 dwelling units and be supplied from the existing eight-inch PVC backbone line within Channel Islands Drive and Inspiration Point. Per the Camrosa Water District Non-Potable Water Design, Construction & Use Standards, the water mains shall be PVC Class 200, C900 and shall be designed to provide for service pressures between 45 psi and 150 psi (ideally the water pressures will be kept between 45 psi and 80 psi). (Huitt-Zollars 2017)

By comparison, based on usage data collected by the University, actual recycled water use at the campus has been on average 1.56 acre feet/acre. The campus currently is only partially drought tolerant with a number of turf areas remaining. The proposed project would be almost entirely designed and planted with drought tolerant and native plantings. Therefore, it is anticipated that recycled water demand factors at the project site would be as low, if not lower, than the current actual recycled water demand factor of 1.59 acre-feet/acre.

Recycled water demands of the previously entitled 242-acre development and the currently proposed 600-unit development are presented in the table below.

Table 2 Recycled Water Demand for Irrigation- Average and Peak Hour

Water Use Factor	242-Unit Project ¹ (previously entitled)	600-Unit Project (proposed project)
Consumption Rate (AFY per acre) ¹	1.80	1.80
Size	33.5 acres	33.5 acres
Irrigated area ²	40%	30%
Total Demand	24.12 AFY	18.09 AFY
Average Daily Demand	15.0 gal/min	11.2 gal/min
Maximum Daily Demand ³	37.4 gal/min	28.0 gal/min
Peak Hour Demand ⁴	112.2 gal/min	84.1 gal/min

¹ Assumed Consumption Rate of 1.80 AFY per acre (Average for Ventura County)

² Irrigated percent taken as average percent of pervious coverage from VCWPD Hydrology Manual for various land uses

³ Assumed Maximum Daily Demand Factor (Average for Ventura County)

⁴ Assumed Peak Hour Demand Factor (Average for Ventura County)

Source: Huitt-Zollars 2017

The proposed project would introduce a peak hour demand net decrease of 18.1 gallons per minute, and require approximately 6.03 less AFY, a 25 percent decrease in recycled water (irrigation) demand.

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3 Senate Bill 610 Applicability

Senate Bill 610 was passed in 2002 and amended the California Water Code by requiring a WSA to be completed for certain projects subject to CEQA, as discussed below in Sections 3.1 and 3.2. California Water Code, as amended by SB 610, requires that a WSA must address the following questions: Is there a public water system that will service the proposed project (Section 3.3); Is there a current UWMP that accounts for the project demand (Section 3.4); Is groundwater a component of the supplies for the project (Section 3.5); and are there sufficient supplies to serve the project over the next twenty years (Section 3.6). The primary question to be answered in a WSA is:

Will the total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection meet the projected water demand of the proposed project, in addition to existing and planned future uses of the identified water supplies, including agricultural and manufacturing uses?

The following sections address the SB 610 WSA questions as they relate to the proposed project.

3.1 Is the Proposed Project Subject to CEQA?

California Water Code Section 10910(a) states that any city or county that determines that a project, as defined in Section 10912, is subject to CEQA, which applies to projects requiring an issuance of a discretionary permit by a public agency, projects undertaken by a public agency, or projects funded by a public agency. The proposed project requires a discretionary action for approval, and is therefore subject to CEQA.

3.2 Is the Proposed Project a “Project” Under SB 610?

California Water Code Section 10912(a) states that any proposed action which meets the definition of “project” under SB 610 is required to prepare a WSA to demonstrate whether sufficient water supplies are available to meet requirements of the proposed project under normal and drought conditions. SB 610 defines a “project” as any one of six different development types with certain water use requirements, as specified in the Water Code revised by SB 610. Each identified development type and associated water requirements are addressed below. Any mixed-use project which incorporates one of the six development types described below is also defined as a “project” under SB 610.

3.2.1 Residential Development

A proposed residential development of more than 500 dwelling units is defined as a “project” under SB 610. The proposed project would allow the construction of up to 600 residential units on 32 acres of vacant land within the plan area. Buildout of the proposed project would construct over 500 dwelling units. Therefore, this WSA has been prepared to satisfy the requirements of SB 610.

3.2.2 Shopping Center or Business Establishment

A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space is defined as a “project” under SB 610. The proposed project is not a shopping center or residential development.

3.2.3 Commercial Office Building

A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space is defined as a “project” under SB 610. The proposed project is not a commercial office building.

3.2.4 Hotel or Motel

A proposed hotel or motel, or both, having more than 500 rooms is defined as a “project” under SB 610. The proposed project is not a hotel or motel.

3.2.5 Industrial, Manufacturing, or Processing Plant or Industrial Park

A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area is defined as a “project” under SB 610. The proposed project is not an industrial, manufacturing, or processing plant.

3.3 Is There a Public Water System that Will Serve the Proposed Project?

California Water Code Section 10912 defines a “public water system” as a system that has 3,000 or more service connections and provides piped water to the public for human consumption. The project site is within the jurisdiction of the CWD, which provides potable water, non-potable water, and recycled water to users within its jurisdiction. All potable and non-potable water required during construction and operation of the proposed project would be provided by the CWD.

3.4 Is There a Current UWMP that Accounts for the Project Demand?

Urban Water Management Plans (UWMPs) are prepared by California’s urban water suppliers to support long-term resource planning and ensure adequate water supplies. Every urban water supplier that either delivers more than 3,000 AFY of water annually or serves more than 3,000 connections is required to assess the reliability of its water sources over a 20-year period under normal-, dry-, and multiple dry-year scenarios; these are the same requirements of a WSA, as specified by SB 610.

The CWD provides water to approximately 8,500 service connections, and is an “urban water provider”. Therefore, the CWD produced a 2015 UWMP to assess the reliability of its water sources. However, water demand projections within CWD’s 2015 UWMP did not incorporate projected water demand from the proposed project. Therefore, the project is not incorporated into a current UWMP.

3.5 Is Groundwater a Component of the Supplies for the Project?

Water supply requirements for the proposed project would be met by water provided by the CWD, which partially relies upon local groundwater resources. The CWD overlies four groundwater basins: the northeast Pleasant Valley, Santa Rosa, Tierra Rejada, and the Perched Aquifer, which currently provide approximately 40 percent of the CWD potable water supply. The CWD currently has one well in the Pleasant Valley and Tierra Rejada Basins. Eight wells draw from the Santa Rosa Basin: five that are

connected to the potable system, one of which is being rehabilitated after more than a decade offline; and three that contribute to the nonpotable system. The Perched Aquifer provides the supply for the Round Mountain Water Treatment Plant, a 1 MGD desalination facility.

3.6 Are There Sufficient Supplies to Serve the Project Over the Next Twenty Years?

The sufficiency of water supplies identified as potential sources to serve the project is assessed in the following sections, which address both groundwater and surface water supplies in the project area.

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4 Camrosa Water District Water Supplies

The project site would be served by the CWD, which provides potable and non-potable water to approximately 8,500 service connections. CWD potable water supplies are composed of 40 percent local groundwater resources and 60 percent imported surface waters purchased by Calleguas Municipal Water District. Non-potable water is provided from surface waters from Calleguas Creek and recycled water from the Camrosa Water Reclamation Facility and the Camarillo Sanitation District.

The CWD service area has a temperate coastal southern California/Mediterranean climate, with approximately 275 sunny days a year, mild summers and winters, and moderate rainfall. Average annual precipitation from 2000 to 2015 was 10.37 inches, the latter part of which experience severe drought. On average, more than 90 percent of the annual rainfall occurs during the six-month period extending from October through March. The average temperature fluctuates between an average low of about 43 degrees (January) and an average high of about 78 degrees (August) (Camrosa Water District 2016).

4.1 Local Groundwater Supplies

The CWD overlies four groundwater basins: the northeast Pleasant Valley, Santa Rosa, Tierra Rejada, and the Perched Aquifer, which account for approximately 40 percent of CWD's potable water supply.

a Pleasant Valley Groundwater Basin

The Pleasant Valley Groundwater Basin is located in the Pleasant Valley in southern Ventura County, encompassing a surface area of approximately 21,600 acres (33.7 square miles) (Camrosa Water District 2016).

Basin Characteristics

The Pleasant Valley Groundwater Basin is bound to the north by the Camarillo and Las Posas Hills, to the east by a constriction in Arroyo Santa Rosa, to the south by the Santa Monica Mountains, and to the west by the Oxnard Subbasin of the Santa Clara River Groundwater Basin. Calleguas Creek and other tributary creeks drain the surface waters of the area westward toward the Pacific Ocean (DWR 2003b).

WATER BEARING FORMATIONS

The primary water-bearing materials in the Pleasant Valley Groundwater Basin are alluvial sands and gravels of upper Pleistocene to Holocene age and the lower Pleistocene San Pedro Formation. Permeable deposits within the upper Santa Barbara Formation underlie the San Pedro Formation and contain fresh groundwater of minor importance (DWR 2003b).

Alluvium. The Pleistocene to Holocene age alluvium consists of silts and clays with lenses of more permeable sand and gravel. The aquifers in this zone are generally unconfined and vary in thickness from a few feet to several hundred feet. The permeable lenses yield little water to wells owing to rapid thinning and predominance of fine-grained materials. The shallow aquifers in the Pleasant Valley Basin are equivalent, but not connected with, the Oxnard aquifer lying to the West (Camrosa Water District 2016).

San Pedro Formation. The Pleistocene age San Pedro Formation is located at depths of 400 to 1,500 feet. This formation consists of an upper unit of fine silt and clay that forms an impermeable layer over an

extensive 100 to 300 foot thick gravel unit in the lower San Pedro Formation called the Fox Canyon Aquifer (DWR 2003b). The Fox Canyon Aquifer is the lowermost member of the Pleistocene San Pedro formation and forms the major producing zone of the Pleasant Valley Ground water Basin (Camrosa Water District 2016).

RECHARGE AND CONNECTIVITY

Recharge to the basin occurs primarily through subsurface flow across the Springville fault zone, through Fox Canyon gravels from the Arroyo Santa Rosa Valley Groundwater Basin, and through fractures in the volcanic rocks that comprise the Santa Monica Mountains to the south. A modest amount of irrigation water from overlying agricultural uses and septic system effluent also contribute to basin recharge. For 1999, it was estimated the applied water recharge to be 8,100 AFY for irrigation return, approximately 18 AFY for septic systems, and 3,300 AFY from subsurface inflow (DWR 2003b).

Additionally, despite the fault barrier to the west, the Lower Aquifer System is in hydrologic continuity with the adjacent southern portion of the Oxnard Plain basin. Additionally rising water levels in the northern adjacent basins directly impact recharge rates, water quality, and water levels in the northeast portion of the Pleasant Valley Basin. However, the extent of recharge in this area remains uncertain (Fox Canyon Groundwater Management Agency [FCGMA] 2007).

GROUNDWATER LEVEL TRENDS

During 1980 through 1999, groundwater levels fluctuated over a range of about 130 feet. Hydrographs show an annual cyclic rise and fall of water level of up to 70 feet with longer-term variations apparently following precipitation cycles. The basin was at a low level in 1991 and 1992, then recovered to moderate levels and has remained stable in the upper range of water level since then. In October 1999, the basin was estimated nearly 60 percent full (DWR 2003b). Currently, however, the Pleasant Valley Groundwater Basin is considered to be in a condition of critical overdraft. Water levels generally decline from east to west, with water levels highest in the eastern portion of the Pleasant Valley Groundwater Basin, where the CWD withdraws water from the Pleasant Valley Groundwater Basin (FCGMA 2014). During the past five years, water levels at both locations have fluctuated but are roughly equivalent the average water level in 1993 (FCGMA 2015). The FCGMA has established basin management objectives for the Pleasant Valley Groundwater Basin that call for an average groundwater level of 20 above mean sea level. Currently water levels at two wells indicate water levels ranging from 47 feet to 52 feet below mean sea level (FCGMA 2007).

The CWD plans to reduce dependence on imported water resources through the development of more groundwater resources. This includes the construction of additional wells in the Pleasant Valley Groundwater Basin (Camrosa Water District 2016). Increased withdrawal by the CWD allowed by the construction of additional wells would allow the CWD to increase withdrawal, which could potentially result in a decline in water levels in the northeastern portion of the Pleasant Valley Groundwater Basin.

STORAGE CHARACTERISTICS

Storage capacity of the Pleasant Valley Groundwater Basin has been estimated to be approximately 1,886,000 acre-feet. Between 198,000 and 247,000 AF are recoverable. The primary water bearing formation in the Pleasant Valley Groundwater Basin is the confined Fox Canyon Aquifer in the San Pedro Formation. The average specific yield of the gravels within the Fox Canyon Aquifer is roughly 10.5 percent (DWR 2003b).

It is important to note that estimates of storage capacity rely on assumptions regarding the thickness of subsurface layers and specific yield (the ratio of the volume of water a subsurface material will yield by gravity drainage). Storage capacity is not an estimate of the quantity of groundwater actually available

for use, but rather of the quantity of water that could potentially be stored within a certain area, under maximum capacity conditions.

SAFE YIELD / BUDGET

The “safe yield” of a groundwater basin is the maximum quantity of water that can be continuously withdrawn from a groundwater basin without adverse effect, while groundwater “budget” is an accounting of all inflows to a basin compared to all outflows from the basin. Safe yield is ideally determined by consideration of the groundwater budget; however, often sufficient data is not available to compile a reasonable budget. For instance, private landowners and groundwater users are typically not required to report rates of usage, which need to be accounted for or at least estimated in a groundwater budget. Other factors that a groundwater budget may account for include evapotranspiration, infiltration of precipitation, underflow to/from other groundwater basins, and extractions from private wells, as well as groundwater management and supply reliability efforts such as banking and conservation programs.

The FCGMA has summed all water inputs and outputs to determine the yield from the basins in the region. To attain basin management objectives established for the region, the sustainable yield of the region has been determined to be 100,000 AFY. This budget accounts for a 25,000 AFY reduction in groundwater withdrawal from the Oxnard Plain and Pleasant Valley basins (an 85 percent reduction). Additionally, the budget of 100,000 AFY accounts for attainment of basin management objectives 50 percent of the time, which would limit movement of seawater within the aquifers (FCGMA 2007). Although the perennial yield specific to the Pleasant Groundwater Valley Basin has not yet been determined, in 1999 it was estimated the applied water recharge of the basin to be approximately 11,400 AF while the average annual extractions was estimated at 18,500 AF (Camrosa Water District 2016).

WATER QUALITY AND DRAINAGE CONSIDERATIONS

The Pleasant Valley Groundwater Basin is located within the jurisdiction of the Los Angeles Regional Water Quality Control Board (RWQCB), and is subject to management direction of the Basin Plan for the Coastal Water Sheds of Los Angeles and Ventura Counties (Basin Plan). Designated beneficial uses of the Pleasant Valley Groundwater Basin, as identified in the Basin Plan, include the following:

- MUN (Municipal and Domestic Supply) – Uses of water for community, military, or individual water supply systems, including but not limited to drinking water supply.
- AGR (Agricultural Supply) – Uses of water for farming, horticulture, or ranching, including but not limited to irrigation, stock watering, or support of vegetation for range grazing.
- IND (Industrial Service Supply) – Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.
- PROC (Industrial Process Supply) – Uses of water for industrial activities that depend primarily on water quality (Los Angeles RWQCB 1994).

Saline intrusion from surrounding sediments and salinity associated with high groundwater levels are the primary water quality concern in the Pleasant Valley Groundwater Basin. The potential for saline intrusion exists in the depressed groundwater elevations in the western and southern portions of the basin, extending from the city of Camarillo to the ocean. Chloride levels within the Pleasant Valley Groundwater Basin are generally less than 150 mg/L, but some areas show increased levels of chloride. Additionally, where Arroyo Las Posas crosses into the Pleasant Valley Groundwater Basin in the northern area of the city of Camarillo, the increased flows in the arroyo have coincided with a degradation of water quality, especially for the constituents sulfate, chloride, iron, and manganese. (FCGMA 2007)

The CWD well within the Pleasant Valley Groundwater Basin (Woodcreek Well) meets all Title 22 requirements; however there are elevated levels of iron and manganese in its water. Additionally, due to past issues with brown water complaints in the area, imported water is currently blended with water from this well in a 1:1 ratio to prevent future brown water complaints. Further, the CWD is currently constructing a second well in the Pleasant Valley Groundwater Basin (Lynwood Well). Samples from the Lynwood Well show iron and manganese levels that exceed secondary MCL levels. Furthermore, an analysis of arsenic concentrations shows the constituent as exceeding the primary MCL. Methods for mitigating these contaminant levels are currently being evaluated (Camrosa Water District 2016).

Water Rights and Adjudication

The state of California does not have a singular comprehensive groundwater permit process to regulate the withdrawal of groundwater resources, although the Sustainable Groundwater Management Act of requires every groundwater basin within the state to be managed by a Groundwater Sustainability Agency per a Groundwater Sustainability Plan on a schedule determined based on priority. Historically groundwater basins may be adjudicated by court decision, wherein a court determines the quantity of groundwater allotted to each landowner with respective rights to the underlying resource. Most groundwater basins in California are not adjudicated, which means that landowners may extract groundwater underlying their property without a permit process for regulation of groundwater use. Groundwater basins that have been adjudicated by court decision, of which there are 22 such basins in California, are subject to management by a court-designated Watermaster. Adjudicated basins are exempt from management requirements of the SGMA, because implementation of the adjudication order achieves the same management goals as the SGMA.

The Pleasant Valley Groundwater Basin is not adjudicated, which means that overlying land owners may use the groundwater on an “equal and correlative” basis, such that all property owners above a common aquifer possess a shared right to reasonable use of the aquifer, and a user cannot take unlimited quantities without regard to the needs of other users. Surplus groundwater may be appropriated for use on non-overlying lands, provided such use will not create overdraft conditions; permits are not required for the use of underlying groundwater, but the appropriation of surplus groundwater is subordinate to the correlative rights of overlying users.

Groundwater Management

FOX CANYON GROUNDWATER MANAGEMENT AGENCY (FCGMA)

The Pleasant Valley Groundwater Basin is not adjudicated but is within the jurisdiction of the FCGMA, which was created to manage groundwater in both the overdrafted and potentially seawater intruded areas of Ventura County. The primary objectives and purposes of the FCGMA are to preserve groundwater resources for agricultural, municipal, and industrial uses in the best interests of the public and for the common benefit of all water users (FCGMA 2007).

As of 2015, CWD’s allocation is approximately 806 AFY (currently reduced as per Fox Canyon Groundwater Management Agency Emergency Ordinance E, which implements a phased-in limitation of 20 percent on M&I extractors). Because this is an annual allocation, water not pumped cannot be carried over from one year to the next. Additionally, CWD has an agreement for the sale of Conejo Creek surface water to Pleasant Valley County Water District (PVCWD) in exchange for FCGMA pumping credits from the Pleasant Valley Groundwater Basin. This program, codified under FCGMA Resolution 2014-01, stipulates that PVCWD retire, and CWD accrue, one acre foot of pumping allocations for each acre foot of nonpotable Conejo Creek surface water CWD delivers to PVCWD, up to 4,500 AFY. The term of the agreement is forty years, and pumping allocations do not expire. CWD is required to submit an annual report detailing deliveries to PVCWD, pumping allocations accumulated and retired, and the balance of

pumping allocations remaining. As of 2015, CWD had accumulated 3,385 AF under the Conejo Creek Water Pumping Program, and exercised 77 AF of its extraction allocations earned under the program. The agreement stipulates that CWD's historical allocation (of 806 AFY, reduced of late under Emergency Ordinance E) is to be extracted first.

FCGMA Emergency Ordinance E was adopted April 11, 2014 to address ongoing drought conditions. Under Emergency Ordinance E, Temporary Extraction Allocations (TEA) for municipal and industrial purposes would be reduced by 20 percent in order to eliminate overdraft from the aquifer system within the FCGMA boundary. The reductions are phased in as follows:

- July 1, 2014 – 10 percent
- January 1, 2015 – 15 percent
- July 1, 2015 – 20 percent
- January 1, 2016 – 20 percent

SUSTAINABLE GROUNDWATER MANAGEMENT ACT

Because the PV Basin is considered by the State Water Resources Control Board to be a high-priority groundwater basin in critical overdraft, the Sustainable Groundwater Management Act (SGMA) of 2014 requires that a groundwater sustainability agency (GSA) develop and implement a groundwater sustainability plan (GSP). As the FCGMA is the default and exclusive GSA for the areas under its jurisdiction, that agency will be writing the plan. A draft of the GSP is in development, and the FCGMA expects to have the plan completed by the end of 2017.

b Santa Rosa Groundwater Basin

The Arroyo Santa Rosa Groundwater Basin (Santa Rosa Groundwater Basin) underlies about 3,800 acres (5.9 square miles) and is wholly contained within the CWD boundaries.

Basin Characteristics

The Santa Rosa Groundwater Basin underlies the Arroyo Santa Rosa Valley, located in southern Ventura County. The basin is bounded on the north by the Santa Rosa fault, which cuts through the Las Posas Hills, on the south and east by the Santa Monica Mountains, and on the west by Pleasant Valley Groundwater Basin where a constriction occurs in the Holocene alluvium (DWR 2006b).

WATER BEARING FORMATIONS

There are four major water-bearing zones within the basin: conglomerate beds within the Conejo Volcanics, conglomerate and sandstone within the Santa Margarita Formation, sand and gravel in the Saugus Formation, and alluvium. Structurally, the Conejo Volcanics underlie the basin and form the base on which the formations lie. The Santa Margarita Formation is peculiar to the area of the basin lying east of the Bailey Fault and lies atop the Conejo Volcanics. Over the Santa Margarita Formation lies a confining layer and over that, the alluvium. The area west of the Bailey Fault consists primarily of the Saugus Formation, a combination of Fox Canyon and San Pedro Formations. The Saugus Formation evident within the Santa Rosa Basin is the result of an outcropping of the larger Fox Canyon and San Pedro Formations west of the valley. This outcropping pinches off at the western end of the valley and then fans out into the valley, stopping at the Bailey Fault barrier. Due to the pinching off of the Saugus Formation, the Santa Rosa Groundwater Basin is considered to be a confined basin, separate from the larger western water bearing zones (Camrosa Water District 2016).

RECHARGE AND CONNECTIVITY

Recharge to the basin occurs primarily through penetration of precipitation, subsurface flow from the Tierra Rejada Basin, river leakage from Conejo Creek and Arroyo Santa Rosa, agricultural return flow, and residential wastewater return (Camrosa Water District 2013). Residential wastewater return consists of return flows from residential septic systems, return flows from residential landscaping, and return flows from open space and park areas within the Santa Rosa Valley. The table below shows the estimated annual volumes of recharge inflows to the Santa Rosa Basin.

Table 3 Estimated Recharge Inflows to the Santa Rosa Basin

Component	Annual Volume (Acre-Feet/yr)
Precipitation (Valley Floor)	450
Precipitation (Watershed)	360
Subsurface Inflow (From Tierra Rejada Basin)	240
River Leakage (Conejo Creek)	1,030
River Leakage (Arroyo Santa Rosa)	600
Agricultural Return Flow	200
Residential Wastewater Return Flow (Indoor Wastewater)	715
Residential Wastewater Return Flow (Exterior)	765
Residential Wastewater Return Flow (Public and Others)	30
Total Inflow	4,390

Source: Camrosa Water District 2013

GROUNDWATER LEVEL TRENDS

During the early 1950s to the early 1960s groundwater levels experienced a steady decline at an average of approximately five feet per year. This was due to groundwater pumping in combination with lower than average recharge. However, when the Hill Canyon WWTP came on line in 1964 and began discharging treated effluent into the Arroyo Conejo Creek, water levels in the basin began to rise rapidly. While water levels in the central portion of the Basin rose at an average rate of 10 feet per year from 1964 to 1972, water levels rose in the eastern portion of the basin at a rate of 5 feet per year from 1964 to 1980. Through the early 1980s water levels remained flat with a decreasing trend in groundwater pumping and then in the mid-1980s to early 1990s water levels began to decline during a period of lower than average precipitation. In the late 1990s water levels experienced a steady increase correlated with a period of higher than average precipitation. The eastern portion of the basin shows a strong correlation between precipitation and groundwater levels, while levels in the western basin are far less variable (Camrosa Water District 2013).

Pumping in the Santa Rosa Groundwater Basin varies significantly year to year, from a low of 1,924 in 1998 to a high of 3,931 in 2013 (Camrosa Water District 2016). High levels of pumping combined with lower than average precipitation could result in increased drawdown of aquifer levels. However, while the Santa Rosa Groundwater basin is listed as a medium-priority basin by the State due to its salt impairments, the basin is not currently in overdraft (Camrosa Water District 2016).

STORAGE CHARACTERISTICS

Storage capacity of the Santa Rosa Groundwater Basin has been estimated to be approximately 94,000 acre-feet. The average specific yield is roughly 5 percent. Additionally, in 1999, the basin was estimated at around 70 to 80 percent full, implying groundwater in storage of about 70,500 acre-feet (DWR 2006b).

It is important to note that estimates of storage capacity rely on assumptions regarding the thickness of subsurface layers and specific yield (the ratio of the volume of water a subsurface material will yield by gravity drainage). Storage capacity is not an estimate of the quantity of groundwater actually available for use, but rather of the quantity of water that could potentially be stored within a certain area, under maximum capacity conditions.

SAFE YIELD / BUDGET

The CWD Santa Rosa Basin Management Plan (2013) developed a safe yield for the Santa Rosa Groundwater Basin to the east of the Bailey Fault, which is where CWD wells are located. The estimated safe yield of the Santa Rosa Groundwater Basin is 3,320 AFY for long-term pumping without overdraft (Camrosa Water District 2013).

Outflows from the basin include pumping of groundwater, evapotranspiration, and outflow to adjacent subbasin across the Bailey Fault. The table below shows the estimated water balance of the Santa Rosa Groundwater Basin with the estimated inputs and outputs to the basin. As shown, the Santa Rosa Groundwater Basin is a developed system with pumping that is in near equilibrium or steady state.

Table 4 Estimated Water Budget of the Santa Rosa Basin

Component	Annual Volume (Acre-Feet/yr)
Inflow into the Basin (recharge)	
Precipitation (Valley Floor)	450
Precipitation (Watershed)	360
Subsurface Inflow (From Tierra Rejada Basin)	240
River Leakage (Conejo Creek)	1,030
River Leakage (Arroyo Santa Rosa)	600
Agricultural Return Flow	200
Residential Wastewater Return Flow (Indoor Wastewater)	715
Residential Wastewater Return Flow (Exterior)	765
Residential Wastewater Return Flow (Public and Others)	30
Total Inflow	4,390
Outflow from the Basin (discharge)	
Pumping	3,320
Evapotranspiration	775
Outflow to Adjacent Subbasin (Bailey Fault)	290
Total Outflows	4,390

Source: Camrosa Water District 2013

WATER QUALITY AND DRAINAGE CONSIDERATIONS

The Santa Rosa Groundwater Basin is located within the jurisdiction of the Los Angeles RWQCB, and is subject to management direction of the Basin Plan for the Coastal Water Sheds of Los Angeles and Ventura Counties (Basin Plan). Designated beneficial uses of the Santa Rosa Groundwater Basin, as identified in the Basin Plan, include the following:

- **MUN (Municipal and Domestic Supply)** – Uses of water for community, military, or individual water supply systems, including but not limited to drinking water supply.

- AGR (Agricultural Supply) – Uses of water for farming, horticulture, or ranching, including but not limited to irrigation, stock watering, or support of vegetation for range grazing.
- IND (Industrial Service Supply) – Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.
- PROC (Industrial Process Supply) – Uses of water for industrial activities that depend primarily on water quality (LARWQCB 1994).

Concentrations of Total Dissolved Solids (TDS) and nitrate within the Santa Rosa Groundwater Basin have been rising since the mid-1950s. The rise of TDS concentrations reflect a basin wide trend and have remained consistent since the 1980s with concentrations ranging between 600 and 1,500 mg/L. High nitrate levels appear to be more localized. Additionally, concentrations of various minerals in groundwater have increased since 1987. The primary influences over groundwater quality within the basin are agricultural operations, residential use with septic systems, and Hill Canyon Wastewater Treatment Plant (WWTP) effluent (Camrosa Water District 2013).

The CWD conducted a summary of basin wide water quality for the period of 1997 to 2011. The summary indicated that chloride, nitrate, sulfate, and TDS exceed the Basin Plan water quality objectives. The table below shows the summary of contaminant concentrations that exceed Basin Plan water quality objectives.

Table 5 Santa Rosa Basin Groundwater Quality Summary (1997-2011)

Constituent	Primary MCL (mg/L)	Secondary MCL (mg/L)	Basin Plan Objective	Results (mg/L)		Exceed MCL?	Exceed Basin Plan Objectives?
				Maximum	Minimum		
Chloride	--	250	150	249	100	Yes	Yes
Nitrate	45	--	45	179	6.7	Yes	Yes
Sulfate	250	250	300	480	104	Yes	Yes
TDS	500	500	900	1,492	670	Yes	Yes

Source Camrosa Water District 2013

The Santa Rosa Groundwater Basin is currently considered a medium priority basin by the California Statewide Groundwater Elevation Model Basin Prioritization List due to salt impairments. To compensate for high levels of nitrates and other minerals water from the Santa Rosa Groundwater Basin is currently blended with imported surface water at a rate of one to one. To ensure continued reliability of groundwater from the Santa Rosa Groundwater Basin, the CWD is currently considering basin recharge and reverse-osmosis treatment of wells with high contamination levels. Treatment of Santa Rosa Groundwater Basin groundwater would further reduce dependence on imported water (Camrosa Water District 2016).

Water Rights and Adjudication

Water rights and adjudication for the Santa Rosa Groundwater Basin are the same as described above for the Pleasant Valley Groundwater Basin. The basin is not adjudicated, and is subject to the management requirements of the SGMA.

Groundwater Management

CAMROSA WATER DISTRICT

The CWD developed the voluntary AB 3030 Santa Rosa Groundwater Management Plan (SRGMP) to manage groundwater resources in the Santa Rosa Basin. The SRGMP covers the eastern portion of the Santa Rosa Groundwater Basin, east of the Bailey Fault, where all the CWD wells are located. The management goal for the Santa Rosa Basin is to optimize the beneficial uses of groundwater, preserve and enhance water quality, understand and operate within the yield of the Basin, and assure preservation of groundwater and environmental resources for future generations. The CWD safe yield estimated in the SRGMP is 3,320 AFY. Additionally, the SRGMP established the basin management objectives listed below:

1. Protect and enhance groundwater quality
2. Sustain safe, reliable local groundwater supply
3. Improve understanding of groundwater elevations, basin yields, and hydrogeology
4. Maintain public awareness and confidence, and honor the public trust

FOX CANYON GROUNDWATER MANAGEMENT AGENCY (FCGMA)

The western fifth of the Santa Rosa Groundwater Basin, west of the Bailey Fault, falls under the jurisdiction of the FCGMA. As discussed above, the CWD does not have any wells within this portion of the basin. Therefore, Santa Rosa Groundwater Basin groundwater resources available to the proposed project would not be managed by the FCGMA.

SUSTAINABLE GROUNDWATER MANAGEMENT ACT

The Santa Rosa Groundwater Basin is designated as a medium priority basin under the California Statewide Groundwater Elevation Model (CASGEM) Priority List. Therefore, a GSA and a GSP are required to be developed. While the SRGMP outlines a number of management strategies and objectives for groundwater resources in the Santa Rosa Groundwater Basin, the eastern portion of the basin will fall under the jurisdiction of the Santa Rosa GSA. The Santa Rosa GSA is a Joint Power Association between CWD, the City of Camarillo, and the County of Ventura, which is currently being developed. The Santa Rosa GSA is required to produce a GSP to manage groundwater resources within the Santa Rosa Groundwater Basin by 2020.

c Tierra Rejada Groundwater Basin

The Tierra Rejada Groundwater Basin underlies about 4,390 acres (6.9 square miles).

Basin Characteristics

Tierra Rejada Groundwater Basin is near the headwaters of Arroyo Santa Rosa in southern Ventura County. This basin is bounded on the south and east by surface drainage divides and on the north and west by faults that restrict groundwater flow. An unnamed north-trending fault forms the western boundary and the east-trending Simi fault is the northern boundary (*DWR 2006c*).

WATER BEARING FORMATIONS

Groundwater in the basin is found in alluvium and the Modelo, Topanga, Conejo, and Sespe Formations.

Alluvium. Quaternary age alluvium is generally found only near the center of the valley where it is interpreted as about 25 feet thick. This unit can bear water, but is not the major producer in the basin.

Modelo Formation. The Miocene age Modelo Formation consists of marine sandstone and shale. The unit reaches a thickness of 6,500 feet regionally and overlies the Topanga and Conejo Formations.

Topanga and Conejo Formations. The Miocene age Topanga Formation and Conejo Formation underlie the entire basin south of the Simi Fault. The Topanga Formation contains sandstone, conglomerate and shale in this basin. The Conejo Formation consists of volcanic tuff, debris flow, and basaltic flow and breccia deposits that reach 2,000 feet thick in this basin. The high porosity in the fractured basalt flows allows moderate production from these units (DWR 2006c).

Sespe Formation. The oldest Sespe Formation is water-bearing and generally underlies the Conejo Formation. The Sespe Formation outcrops on the northern and southern ridges. The compacted formation is mostly sandstone of various colors and contains metavolcanic and quartzitic rocks. This base formation is estimated to be a mile thick.

RECHARGE AND CONNECTIVITY

The Tierra Rejada Groundwater Basin is replenished by percolation of rainfall to the valley floor, stream flow, and irrigation return. Percolation of effluent from septic systems and the Hill Canyon WWTP add a minor amount of water to the basin (DWR 2006c). Percolation of rainfall is the principal source of recharge to the basin, accounting for roughly 85 percent of the approximately 6,200 AFY of total inflow. Further, the basin's structural geology, which forms the principal aquifers, suggests that the basin's recharge area is larger than the basin's surface watershed. Therefore, basin recharge is subject to uncertainty (Camrosa Water District 2009).

GROUNDWATER LEVEL TRENDS

Groundwater moves westward through the basin. Most hydrographs of wells monitored in the basin display a marked rise in water levels since the 1970s, with some hydrographs indicating more than 100 feet of rise. Most hydrographs show 15 to 20 feet of annual variation about a stable mean water level between 1995 and 2001 (DWR 2006c). Wells in the eastern and southern portions of the Tierra Rejada Groundwater Basin generally exhibit less annual variation in water levels, while other areas experience greater variation. However, many wells with long-term historic water level records indicate that current conditions are at or near historical high water levels, even for wells which experience the greatest declines in water level from 1945 to 1970 (Camrosa Water District 2009).

STORAGE CHARACTERISTICS

Storage capacity of the Tierra Rejada Groundwater Basin has been estimated to be between 39,320 acre-feet and 80,000 acre-feet. The most recent studies (1999) estimate the Tierra Rejada Groundwater Basin to be approximately 75 percent full with 29,490 acre-feet in storage. Average specific yield has been estimated at 11 percent (DWR 2006c).

It is important to note that estimates of storage capacity rely on assumptions regarding the thickness of subsurface layers and specific yield (the ratio of the volume of water a subsurface material will yield by gravity drainage). Storage capacity is not an estimate of the quantity of groundwater actually available for use, but rather of the quantity of water that could potentially be stored within a certain area, under maximum capacity conditions.

SAFE YIELD / BUDGET

Inflows and outflows for the Tierra Rejada Basin currently total about 6,200 AF in an average rainfall year (Camrosa Water District 2016). Of the 6,200 AFY of inflow, approximately 5,250 AFY is estimated from precipitation, 50 AFY from stream flow, 280 AFY from treated wastewater and 150 AFY from imported water. Outflow includes about 5,075 AFY from evapotranspiration and consumptive use, 540 AFY as

surface outflow, 225 AFY as subsurface outflow, and 370 AFY as exported domestic supply water (DWR 2006c).

There is currently no safe yield established for the Tierra Rejada Groundwater Basin.

WATER QUALITY AND DRAINAGE CONSIDERATIONS

The Santa Rosa Groundwater Basin is located within the jurisdiction of the Los Angeles RWQCB, and is subject to management direction of the Basin Plan for the Coastal Water Sheds of Los Angeles and Ventura Counties (Basin Plan). Designated beneficial uses of the Santa Rosa Groundwater Basin, as identified in the Basin Plan, include the following:

- MUN (Municipal and Domestic Supply) – Uses of water for community, military, or individual water supply systems, including but not limited to drinking water supply.
- AGR (Agricultural Supply) – Uses of water for farming, horticulture, or ranching, including but not limited to irrigation, stock watering, or support of vegetation for range grazing.
- IND (Industrial Service Supply) – Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.
- PROC (Industrial Process Supply) – Uses of water for industrial activities that depend primarily on water quality (LARWQCB 1994).

Groundwater in the Tierra Rejada Groundwater Basin is characterized as magnesium-calcium bicarbonate, though the basin is also reported to contain calcium, magnesium and sodium in roughly equal amounts, with bicarbonate and sulfate as dominate anions (DWR 2006c). Available data indicates groundwater in the basin is generally acceptable for non-potable uses. However, recent data shows nitrate concentrations above the 45 mg/L drinking water standard. Therefore, the County of Ventura considers the basin “nitrate impacted” (Camrosa Water District 2009).

Water Rights and Adjudication

Water rights and adjudication for the Tierra Rejada Groundwater Basin are the same as described above for the Pleasant Valley Groundwater Basin. The basin is not adjudicated, and is subject to the management requirements of the SGMA.

Groundwater Management

There is no groundwater management plan currently in place for the Tierra Rejada Groundwater Basin. The Tierra Rejada Basin is currently listed as a low-priority basin in the CASGEM Priority List, so a GSP is not required. However, should a groundwater management plan be written on the basin, it would need to conform to the GSP requirements of the Sustainable Groundwater Management Act. As discussed above the CWD well in the Tierra Rejada Groundwater Basin is offline, awaiting rehabilitation. The basin is small, and there are few other pumpers, all of whom are agricultural producers and have a long history of sustainable self-management. The Tierra Rejada Basin responds predictably to precipitation and the behavior of other pumpers, and CWD adjusts its extractions accordingly (Camrosa Water District 2016).

d Perched Aquifer

The Perched Aquifer is part of a collection of the uppermost water-bearing units overlying the eastern Pleasant Valley basin in hydraulic connection with the surface and associated stream flow of Calleguas and Conejo Creeks. The aquifer fluctuates according to surface flows and precipitation, and as such, its exact extent is difficult to judge.

Over the latter half of the 20th century the aquifer grew increasingly high in concentrations of salt and has not been used or monitored regularly for several decades prior to CWD's development of the resource in 2014. There is no defined capacity or safe yield for the Perched Aquifer. Therefore, the usable capacity of the Perched Aquifer is based on the pumping test results carried out on the CWD's University Well for the Round Mountain Treatment Plant, and is not meant to apply to the entire shallow aquifer system. The Round Mountain Treatment Plant is designed to produce 1 million gallons per day and in 2015 349 acre-feet of water was extracted from the Perched Aquifer through the University Well (Camrosa Water District 2016). Well tests for the University Well found that the designed production rate of 870 gallons per minute could be sustained with no long term impacts to water levels within the Perched Aquifer (Brown 2010).

The Perched Aquifer is not a defined groundwater basin by the State of California and there is currently no groundwater management plan for groundwater within the aquifer. Additionally, because the Perched Aquifer is not a defined groundwater basin, there is no planned management by a GSA of GSP under the Sustainable Groundwater Management Act. However, because the Round Mountain Treatment Plant is an integral facility to the CWD's strategy for long term reduced demand on imported water, the CWD has a vested interest in sustainably managing the water resources within the Perched Aquifer.

4.2 Local Surface Water Supplies

Surface water available to the CWD is effluent from the City of Thousand Oak's Hill Canyon WWTP that is discharged into Conejo Creek.

Water Rights

Through an agreement with the City of Thousand Oaks, CWD exercises the city's water right to divert flows in Conejo Creek. The CWD must return a minimum of 6 cubic feet per second (CFS) via bypass pumps for downstream beneficial uses. The quantity of water able to be diverted from Conejo Creek is dependent on the effluent discharge from the Hill Canyon WWTP. When agreements were initially made for Conejo Creek water, it was generally assumed that the City of Thousand Oaks would eventually discharge 15,000 AFY of effluent into Conejo Creek. However, due to ongoing conservation efforts by the City of Thousand Oaks, flows have proven to be substantially lower. Therefore, for planning purposes the CWD assumes the availability of 9,000 AFY from Conejo Creek (Camrosa Water District 2016).

Surface Water Management

After water is diverted for Conejo Creek, it is pumped to CWD storage ponds and then into the CWD distribution system for non-potable use. Water within the non-potable distribution system is delivered to agricultural and landscape irrigation water users within the CWD. Any surplus non-potable water is then transferred to the Pleasant Valley County Water District (PVCWD), an adjoining agricultural water district.

Non-potable water users within CWD have continued to grow as more users transfer their demands to the non-potable system. However, the CWD non-potable water system has reached its capacity of what can reliably be delivered to customers throughout the year. Currently, an average of 5,000 AFY of non-potable water from Conejo Creek is used within CWD (Camrosa Water District 2016).

Surplus water that is not consumed by CWD users is transferred to PVCWD. In 2013 the CWD, City of Thousand Oaks, PVCWD, and the FCGMA have entered into a 40 year agreement for the transfer of excess Conejo Creek water from CWD to PVCWD in exchange for groundwater pumping credits from the Pleasant Valley Groundwater Basin. This program, codified under FCGMA Resolution 2014-01, stipulates

that PVCWD retire, and CWD accrue, one acre foot of pumping allocations for each acre foot of non-potable Conejo Creek surface water CWD delivers to PVCWD, up to 4,500 AFY. The table below shows the total diversions from Conejo Creek from 2003 to 2015 as well as the distribution of water to CWD and PVCWD.

Table 6 Diversions and Transfers of Conejo Creek Surface Water (2003-2015)

Year	Non-potable Surface Water Diversions (acre-feet)		
	Diverted from Conejo Creek	Used By CWD	Sent to PVCWD
2003	2,110	136	6,218
2004	8,436	1,852	6,518
2005	6,769	2,326	4,756
2006	8,810	2,567	6,561
2007	10,027	3,241	6,802
2008	8,405	3,154	5,590
2009	7,789	4,025	3,561
2010	8,906	4,475	4,273
2011	9,462	3,744	5,610
2012	10,229	4,061	6,112
2013	8,701	4,930	3,563
2014	8,351	5,736	2,017
2015	8,397	5,109	2,759

Source: Camrosa Water District 2016

Surface Water Quality

Surface water from Conejo Creek is used solely for non-potable water supply and is not treated to meet drinking water quality standards. The table below shows water quality data for Conejo Creek relative to LQRWCQB water quality objectives. Further, Conejo Creek is subject to the Calleguas Creek Watershed's Salts TMDL, which requires a 70 percent reduction in the mass of stranded salts (TDS, chloride, sulfate) from an estimated baseline.

Table 7 Conejo Creek Water Quality

Constituent	Concentration (mg/L)	LARWQCB Water Quality Objective ¹
Total Dissolved Solids (TDS)	846	850
Chloride (Cl)	163	150
Nitrate	42	10
Sulfate	199	250

¹Water Quality objectives from LARWQCB Basin Plan (1994)

Source: Camrosa Water District 2015b

4.3 Imported Surface Water Supplies

The CWD currently imports potable water supplies exclusively from the Calleguas Municipal Water District (Calleguas MWD), a Metropolitan Water District of Southern California (Metropolitan)

wholesaler. Water purchased by Calleguas MWD currently accounts for approximately 60 percent of CWD potable water supply (Camrosa Water District 2016).

Water Delivery and Storage

Under normal water conditions, Calleguas MWD receives Metropolitan water exclusively from the State Water Project (SWP), which is a 700 mile network of reservoirs, aqueducts, and pumping facilities that convey water from the northern regions of California to the central and southern portions of the State. Water delivered to Calleguas MWD is delivered through MWD's West Valley Feeder No. 2 Pipeline, which is capable of delivering up to 300 cubic feet per second to Calleguas MWD's Perliter Tunnel. Water in the Perliter Tunnel is then delivered to Simi Valley, where it is distributed through Calleguas MWD's distribution system, stored in Lake Bard, or injected into the Fox Canyon Aquifer through the Las Posas Aquifer Storage and Recovery Project (ASR) (Calleguas Metropolitan Water District 2016).

Water stored in the Lake Bard Reservoir and in the Fox Canyon Aquifer provide a reliable resource to Calleguas MWD water customers during planned or emergency shut offs of imported water from MWD. Lake Bard is capable of storing approximately 10,500 acre-feet of water, with 7,500 acre-feet readily available. The Las Posas ASR is capable of storing approximately 50,000 acre-feet of water in the Fox Canyon Aquifer. Water stored through the Las Posas ASR is not currently available to the CWD. However, a pump station is currently under construction to make this water available to all Calleguas MWD customers (Calleguas Metropolitan Water District 2016). The Las Posas ASR has a goal of maintaining at least 20,000 acre-feet of water in storage in the Las Posas Basin, with an estimated extraction capacity of approximately 70 cubic feet per second. Currently, Calleguas MWD has 12,000 acre-feet of groundwater stored in the East Las Posas Basin (Camrosa Water District 2016).

In addition to local storage of imported water, Metropolitan has developed groundwater storage programs with Semitropic Water Storage District and Arvin-Edison Water Storage District to increase Metropolitan's out-of-region storage capacity of SWP water by 600,000 acre-feet. Additional groundwater storage programs have been established with the San Bernardino Valley MWD, and Kern-Delta Water District that will expand that capacity further. The completion of Diamond Valley Reservoir has added 800,000 acre-feet of supply to southern California's mix of resources available to meet dry year needs. However, in 2015, Metropolitan instituted its Water Supply Allocation Plan, instituting on Calleguas and its member agencies a 16.5 percent reduction in imported water allocations (Camrosa Water District 2016).

Water Allocation

Calleguas MWD purchases approximately an average of 110,216 acre-feet of water per year from Metropolitan (Metropolitan Water District 2016). Of this water, approximately 5.8 percent is delivered to CWD (Calleguas Municipal Water District 2016). As mentioned above, imported water from Calleguas MWD currently accounts for approximately 60 percent of CWD potable water supply. CWD's allocation from Calleguas MWD varies slightly every year, but is typically around 9,000 AFY. Over the last ten years, CWD has purchased an average of 7,471 AFY from Calleguas MWD, with imports as high as 10,265 acre-feet in 2007, and as low as 5,566 acre-feet in 2015 (Camrosa Water District 2016). In 2008 the CWD set a not-to-exceed amount of 7,900 AFY amount for imported water (Camrosa Water District 2008). CWD uses 7,900 AFY as the projected available imported water supply for planning purposes (Camrosa Water District 2015).

Water Quality

Water delivered to Calleguas MWD from Metropolitan is treated by Metropolitan at the Joseph Jensen Filtration Plant in Granada Hills. The Joseph Jensen Filtration Plant is an ozone treatment plant with a

capacity of 750 million gallons per day. Water that is stored in Lake Bard or through the Las Posas ASR requires treatment by Calleguas MWD prior to redistribution. Water stored in Lake Bard is treated at the Lake Bard Water Filtration Plant. The Lake Bard Water Filtration Plan has a capacity of 65 million gallons per day. Stored water extracted through the Las Posas ASR is treated at the individual well sites prior to distribution to the potable water system (Calleguas Municipal Water District 2016).

4.4 Recycled Water

Recycled water is produced at the CWD owned and operated Camrosa Water Reclamation Facility (CWRF). The CWRF has a capacity of 1.5 million gallons per day (MGD) and is currently operating at approximately 1.4 MGD. About two thirds of the tertiary-treated Tittle-22 water produced at the CWRF is delivered to agricultural customers, and the rest is delivered to California State University Channel Islands (CSUCI). Water not delivered directly to customers is sent for storage to CWD's storage lakes, which have a storage capacity of 300 acre-feet. Approximately two-thirds of the recycled water produced at the CRWF is used within the CWD boundaries by agricultural customers and CSUCI. Surplus recycled water is provided to properties outside of the CWD boundaries to help fulfill the CWD goal to put all recycled water to a beneficial use (Camrosa Water District 2016).

The CWRF currently produces approximately 1,500 acre-feet of recycled water per year from an average influent of approximately 1.4 MGD. In 2015 approximately 1,323 acre-feet of recycled water from the CRWF was used within the CWD boundaries, approximately 1,067 acre-feet by agricultural users and 256 acre-feet by CSUCI. Because the CRWF is currently operating close to its design capacity of 1.6 MGD, the CWD is in the process of increasing plant capacity of 2.25 MGD to accommodate increased wastewater flows from buildout of the CSUCI and continued growth within the CWD boundaries. Accordingly, forecasted recycled water availability within CWD is 1,570 AFY through 2035 (Camrosa Water District 2016).

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5 Water Supply Reliability

As described in Chapter 2 of this WSA, the proposed project would require between 15.68 and 18.09 AFY of recycled water for irrigation, based on actual water usage and Camrosa design demand, respectively. Similarly, the Hewitt-Zollars report calculates 348.36 AFY of domestic (potable) water for the residential units, while the campus data for the previous five years indicates a domestic (potable) water demand of 58.93 AFY.

As described above, the Camrosa potable water supply is currently made up of 60 percent imported surface water from Calleguas MWD and 40 percent local groundwater. Non-potable water supplies are provided by local groundwater, local surface water, and recycled water. Camrosa plans to further develop local groundwater supplies to reduce dependence on imported surface water. Camrosa has established a goal to reduce dependence on imported water to less than 50 percent in 2020 and less than 33 percent in 2025 (Camrosa Water District 2016). Table 8 shows projected average water supply and demand through the year 2035, assuming a multiple-dry year scenario.

Table 8 Camrosa Water District Multiple Dry Years Supply and Demand Comparison

Supply and Demand from Retail Sector		2020	2025	2030	2035
First Year	Supply Totals	24,450	28,830	28,930	28,930
	Demand Totals	15,941	15,587	15,987	16,113
	Difference	8,509	13,243	12,943	12,817
Second Year	Supply Totals	23,931	25,995	26,082	26,082
	Demand Totals	15,941	15,587	15,987	16,113
	Difference	7,990	10,408	10,095	9,969
Third Year	Supply Totals	21,385	23,458	23,543	23,543
	Demand Totals	15,941	15,587	15,987	16,113
	Difference	5,444	7,871	7,556	7,430

Source: Camrosa Water District 2016

As shown in Table 8, the Camrosa 2015 Urban Water Management Plan indicates that, based on existing water allocations and groundwater supplies, an adequate supply of water should be available to meet projected demand through 2035 even during a multiple-dry year scenario, where project demand as described above would be as much as an additional 348.36 AFY.

As described in the Initial Study for the proposed project, between 2010 and 2015, the CSUCI campus decreased potable water use despite a campus population that increased by over 50%. The potable savings were achieved by substituting recycled water for irrigation applications, and by substantial change out of fixtures such as low-flow toilets, low-flow shower heads, waterless urinals, and low-flow faucets. Efficiency measures to reduce the demand for recycled water for irrigation are also progressively being implemented, including removing turf, installation of more efficient irrigation systems, and installing weather stations to reduce watering schedules. Campus potable water use fell from 275 AF in 2010 to 217 AF in 2015, while recycled water use rose from 131 AF to 256 AF over the same time period. In addition, CWD water demand projections, presented in CWD's 2015 UWMP, account for increased student population and future buildout of the CSUCI campus over the next 10 to 15 years. Further, CWD projects that it will have a surplus water supply of over 8,000 AF through 2035. However, California is

entering a sixth year of drought, and Ventura County water supply in general remains uncertain. (Camrosa Water District 2016)

On February 8, 2017, University personnel met with Camrosa representatives regarding issues associated with the proposed project, campus water management, and current agreements, regulations, etc. among other items. CSUCI and Camrosa will work directly together to develop understanding of current needs, practices, and conditions and to develop strategies for the future. The first steps in that process are for the University to provide detailed, historical usage data, to demonstrate to Camrosa the level of metering currently in place, and to show examples of water conservation efforts already enacted. Evaluation and analysis will help further goals and actions to be developed.

In reaction to the ongoing drought, in August of 2014 Camrosa established a permanent moratorium on any new development (in excess of a single-family residence with a meter size greater than one inch) that will result in unmitigated new demand upon all water, potable, non-potable and recycled, delivered by any water distribution system within the District (Camrosa Water District 2017). The University currently has an agreement in place with Camrosa which allows for the campus to be provided up to 900,000 gallons of potable water per day. Usage data from the past year indicates less than 450,000 gpd of demand on any given day; this included usage during construction activity. Prior daily consumption may be available from CWD.

Adding the estimated daily usage from the proposed project (310,992 gpd) based on the Camrosa design factors to the current actual daily use at the campus of 450,000 gpd demonstrates that the campus would remain within the 900,000 gpd volume identified in its current agreement with Camrosa. It should be noted that the University's potable water demand, including the recently constructed 600 bed student housing unit, the proposed project, and anticipated growth of the University to 2025, would still remain well below the 1979 agreement for water provision based on actual water demand factors, rather than the more conservative Camrosa demand factors used to derive the estimate daily use from the proposed project in Table 1. Therefore, the proposed project would not represent "new development" under the moratorium as it would not exceed the existing supply agreement with Camrosa.

In order to quantify the increased water demands of a proposed project, Camrosa requires an analysis of water (potable, non-potable and recycled) and wastewater collection system demands (Camrosa Water District 2017). This analysis has been prepared for the proposed project, in the form of the *Sewer, Domestic Water, and Recycled Water Report* (Huitt-Zollars 2017), with results provided above in Chapter 2 of this WSA. CSUCI has also prepared an analysis of potable and recycled water demands for the proposed project based upon current usage data of University Glen Phase 1 residences, using the design unit populations as specified by Camrosa Water District *Water Design and Construction Standards*. These numbers are also provided in Chapter 2 of this WSA. Also, the University has already instituted many measures for water conservation that have resulted in a significant decrease of potable water use, and it will continue to pursue additional opportunities for conservation as well as possibilities for water capture and re-use of various means.

Further, Senate Bill No. 7 was approved in 2016, requiring new multifamily dwellings constructed after January 1, 2018 to include submeters on any "individual rental unit within a multiunit residential structure or mixed-use residential and commercial structure." To comply with existing legislation and evolving State emergency drought and conservation regulations, including the need to classify types of water usage. Camrosa will require installation of additional meters for the proposed project so as to monitor the usage of the overall complex.

6 Conclusions

This WSA assessed the capacity of water supply infrastructure as well as the reliability of local water supplies.

Regarding domestic (potable) water requirements, the existing 12-inch domestic water line located in Channel Islands Drive has sufficient capacity to handle the increased domestic demand due to the proposed development (Huitt-Zollars 2017), and thus has more than enough capacity to handle the lesser amount anticipated based on actual water demand factors over the past five years. Similarly, regarding recycled water requirements, the existing eight-inch recycled water line located in Channel Islands Drive has sufficient capacity to handle the required demand due to the proposed development (Huitt-Zollars 2017). Therefore, the existing infrastructure is sufficient to provide water supply for the project.

The reliability of the physical water supply would be guaranteed through coordination between the project applicant and the CWD, as discussed in Chapter 5 of this WSA. This coordination, as well as ongoing effective management of the local water supplies by the CWD, would ensure that sufficient water supply is available in the project area to meet project requirements under varying climatic (drought) conditions.

This WSA has been prepared in compliance with California Water Code, as amended by SB 610. Attachment A provides a detailed description of the steps followed to prepare this WSA.

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7 References

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Attachment A

DWR Guidelines for Implementation of Senate Bill 610

The Water Supply Assessment (WSA) for the proposed CSUCI Specific Reuse Plan Amendment and Phase 2 Development of the East Campus Residential Neighborhood project (“proposed project”) was prepared using guidance contained in the California Department of Water Resources’ (DWR) Guidebook for Implementation of Senate Bill (SB) 610 and SB 221 of 2001 (DWR Guidebook). The California DWR prepared the Guidebook to assist water suppliers in preparation of the water assessments and the written verification of water supply availability required by SB 610 and SB 221; the DWR has no regulatory or permitting approval authority concerning water assessments or verifications of sufficient water supply, and provides the Guidebook purely as an assistance tool (DWR, 2003a). The following table provides a detailed description of how the DWR Guidebook was used in preparing this WSA for the proposed project.

Table A-1 DWR Guidelines for Implementation of Senate Bill 610

Guidelines Section Number and Title (DWR, 2003a)	Guidelines Direction	Relevant WSA Section and Response
Section 1 (page 2). Does SB 610 or SB 221 apply to the proposed project?	Is the project subject to SB 610? Is the project subject to CEQA (Water Code §10910(a))? <i>If yes, continue.</i>	WSA Section 3.1 Yes, the project is subject to CEQA.
	Is it a “Project” as defined by Water Code §10912(a) or (b)? <i>If yes, to comply with SB 610 go to Section 2, page 4.</i>	WSA Section 3.2 Yes, the proposed Project is considered to meet the definition of “project” per Water Code §10912(a) or (b).
	Is the project subject to SB 221? Does the tentative map include a “subdivision” as defined by Government Code §66473.7(a)(1) ¹ ? <i>If yes, the agency shall not approve any final map prepared for the subdivision until the agency governing body has received a written verification that satisfies the condition regarding a sufficient water supply that was placed on the tentative map.</i>	Yes the project includes a “subdivision;” and SB 221 applies.
Section 2 (page 4). Who will prepare the SB 610 analysis?	Is there a public water system (“water supplier”) for the project (Water Code § 10910(b))? <i>If yes, lead agency shall request the water supplier to determine whether the projected water demand associated with the proposed project was accounted for in the most recently adopted Urban Water Management Plan. If not, or if the water supplier has no Urban Water Management Plan, the lead agency shall request the water supplier to prepare an SB 610 assessment.</i>	WSA Section 3.3 Yes, there is a water system present that would be used to meet the proposed project’s water supply requirements. The CWD would serve the proposed project. There is a current UWMP in place.
Section 3 (page 6). Has an assessment already been prepared that includes this project?	Has this project already been the subject of an assessment (Water Code §10910(h))? <i>If no, go to Section 4, page 8.</i>	No, the proposed project has not been the subject of an assessment.
Section 4 (page 8). Is there a current Urban Water Management Plan?	Is there an adopted urban water management plan (Water Code §10910(c))? <i>If yes, continue. Information from the UWMP related to the proposed water demand for the project may also be used for carrying out Section 5, Steps 1 and 2, and Section 7; proceed to Section 5, page 10 of the</i>	WSA Section 3.4 There is an existing UWMP for the project area, but the proposed project water requirements are not specifically addressed in the UWMP.

Guidelines Section Number and Title (DWR, 2003a)	Guidelines Direction	Relevant WSA Section and Response
	<u>Guidelines.</u>	
	Is the projected water demand for the project accounted for in the most recent UWMP (Water Code §10910(c)(2))? <i>If no, go to Section 5, page 10.</i>	WSA Section 3.4 The proposed Project site is not addressed in the existing UWMP.
Section 5 (page 10). What information should be included in an assessment?	Step One (page 13). Documenting wholesale water supplies.	The proposed project does not include the use of any wholesale water supplies.
	Step Two (page 17). Documenting Supply if Groundwater is a Source*.	The CWD would provide the project's water supply; a portion of that supply may come from groundwater resources.
	a) <i>Specify if a groundwater management plan or any other specific authorization for groundwater management for the basin has been adopted and how it affects the water supplier's use of the basin.</i>	WSA Section 4.3
	b) <i>The description of the groundwater basin may be excerpted from the groundwater management plan, from DWR Bulletin 118, California's Ground Water, or from some other document that has been published and that discusses the basin boundaries, type of rock that constitutes the aquifer, variability of the aquifer material, and total groundwater in storage (average specific yield times the volume of the aquifer).</i>	WSA Chapter 4 of the WSA provides a description of the groundwater basin characteristics using all available resources, including DWR Bulletin 118.
	c) <i>In an adjudicated basin the amount of water the urban supplier has the legal right to pump should be enumerated in the court decision.</i>	WSA Section 4.2
	d) <i>The Department of Water Resources has projected estimates of overdraft, or "water shortage," based on projected amounts of water supply and demand (basin management), at the hydrologic region level in Bulletin 160, California Water Plan Update. Estimates at the basin or subbasin level will be projected for some basins in Bulletin 118. If the basin has not been evaluated by DWR, data that indicate groundwater level trends over a period of time should be collected and evaluated.</i>	WSA Section 4.1
	e) <i>If the evaluation indicates an overdraft due to existing groundwater extraction, or projected increases in groundwater extraction, describe actions and/or program designed to eliminate the long term overdraft condition</i>	WSA Section 4.1

Guidelines Section Number and Title (DWR, 2003a)	Guidelines Direction	Relevant WSA Section and Response
	f) <i>If water supplier wells are plotted on a map, or are available from a geographic information system, the amount of water extracted by the water supplier for the past five years can be obtained from the Department of Health Services, Office of Drinking Water and Environmental Management.</i>	On-site water wells are not proposed to be included as part of the project.
	g) <i>Description and analysis of the amount and location of groundwater pumped by the water supplier for the past five years. Include information on proposed pumping locations and quantities. The description and analysis is to be based on information that is reasonably available, including, but not limited to, historic use records from DWR.</i>	WSA Section 4.1. The project applicant does not proposed to pump groundwater resources for this project. However, water supply would be provided by CWD, and a portion of that supply may come from groundwater resources.
	h) <i>Analysis of the location, amount, and sufficiency of groundwater that is projected to be pumped by the water supplier.</i>	WSA Chapter 2 and Section 4.1
	Step 3 (page 21). Documenting project demand (Project Demand Analysis).	WSA Chapter 2
	Step 4 (page 26). Documenting dry year(s) supply.	The project applicant and the local water purveyor (CWD) are coordinating to ensure reliable water supply availability under varying climatic conditions.
	Step 5 (page 31). Documenting dry year(s) demand.	Project water demands would be the same under varying climatic conditions.
Section 6 (page 33). Is the projected water supply sufficient or insufficient for the proposed project?		WSA Chapters 5 and 6 summarize why the identified water supply/supplies are considered sufficient for the proposed project.
Section 7 (page 35). If the projected supply is determined to be insufficient.	Does the assessment conclude that supply is “sufficient”? <i>If no, continue.</i>	WSA Chapters 5 and 6. It is reasonable assumed that sufficient water supplies are available for the proposed project.
Section 8 (page 38). Final SB 610 assessment actions by lead agencies.	The lead agency shall review the WSA and must decide whether additional water supply information is needed for its consideration of the proposed project. The lead agency “shall determine, based on the entire record, whether projected water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses.”	The WSA for the proposed project will be included as part of the Draft EIR for the proposed project. Per SB 610, the lead agency will approve or disapprove a project based on a number of factors, including but not limited to the WSA.

¹ Government Code section 66473.7(a): “Subdivision” means a proposed residential development of more than 500 dwelling units, except that for a public water system that has fewer than 5,000 service connections, “subdivision” means any proposed residential development that would account for an increase of 10 percent or more in the number of the public water system’s existing service connections

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Attachment B

CI demand analysis charts

Existing **72** (36+36) SFD and **528**
(320 + 208) MFD in UGlen Phase 1

Proposed **120** SFD + **480** MFD in
UGlen Phase 2

CAMROSA Design & Construction Stds.

SFD	3.64 ppl/SFD	100 g/cap/dy
MFD	2.15 ppl/MFD	100 g/cap/dy

Previous 242 unit SFD project:

SFD	3.64 ppl/SFD	100 g/cap/dy
MFD	2.15 ppl/MFD	100 g/cap/dy

POC #1 - Intersection of Channel Islands Drive and Project Outlet Location

Land Use	Cumulative Number of Units	Computed Average Flow	Computed Peak Flow [1]
Single Family Dwelling	242	88,088 gal/day	440,440 gal/day
Multiple Family Dwelling	0	0 gal/day	0 gal/day
Total	0	88,088 gal/day 61 gal/min	-- 306 gal/min

[1] Assumed Peak Flow Factor of 5

Currently Proposed 600 unit SFD project:

SFD	3.64 ppl/SFD	100 g/cap/dy
MFD	2.15 ppl/MFD	100 g/cap/dy

POC #1 - Intersection of Channel Islands Drive and Project Outlet Location

Land Use	Cumulative Number of Units	Computed Average Flow	Computed Peak Flow [1]
Single Family Dwelling	120	43,680 gal/day	218,400 gal/day
Multiple Family Dwelling	480	103,200 gal/day	516,000 gal/day
Total	600	146,880 gal/day 102 gal/min	-- 510 gal/min

[1] Assumed Peak Flow Factor of 5

Existing **72** (36+36) SFD and **528** (320 + 208) MFD in UGlen Phase 1

Proposed **120** SFD + **480** MFD in UGlen Phase 2

CAMROSA Design & Construction Stds.				
Flow Rates			Peaking Factors	
SFD	3.38 ppl/SFD	220 g/cap/dy	Maximum Month Demand	1.6
MFD	2.1 ppl/MFD	220 g/cap/dy	Maximum Day Demand	2.15
			Peak Hour Demand	4.5

Previous 242 unit SFD project:

SFD 3.38 ppl/SFD 220 g/cap/dy
MFD 2.1 ppl/MFD 220 g/cap/dy

Land Use	Cumulative Number of Units	Computed Average Domestic Water Demand	Computed Peak Hour Domestic Water Demand
Single Family Dwelling	242	179,951 gal/day	809,780 gal/day
Multiple Family Dwelling	0	0 gal/day	0 gal/day
Total	0	179,951 gal/day 201.57 a-f/yr	809,780 gal/day 33,741 gal/hr

Currently Proposed 600 unit SFD project:

SFD 3.38 ppl/SFD 220 g/cap/dy
MFD 2.1 ppl/MFD 220 g/cap/dy

Land Use	Cumulative Number of Units	Computed Average Domestic Water Demand	Computed Peak Hour Domestic Water Demand
Single Family Dwelling	120	89,232 gal/day	401,544 gal/day
Multiple Family Dwelling	480	221,760 gal/day	997,920 gal/day
Total	600	310,992 gal/day 348.36 a-f/yr	1,399,464 gal/day 58,311 gal/hr

Existing 72 (36+36) SFD and 528 (320 + 208) MFD in UGlen Phase 1 + 58 MFD in Town Center
Proposed 120 SFD + 480 MFD in UGlen Phase 2

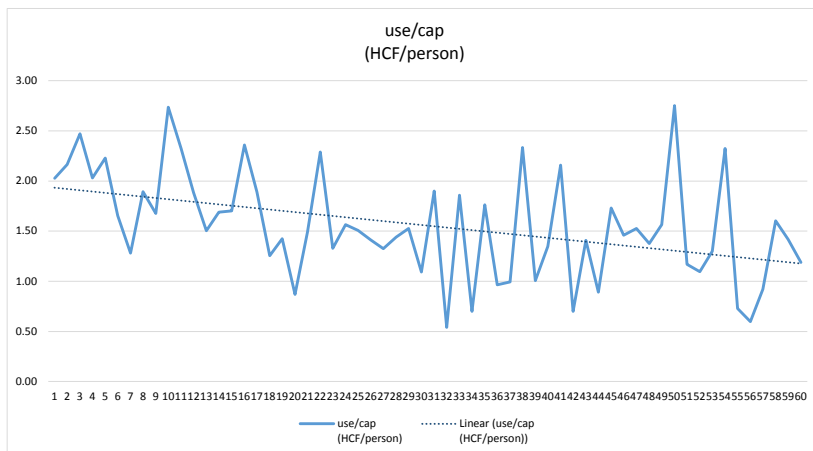
CAMROSA Design & Construction Stds. (POTABLE)				
Flow Rates			Peaking Factors	
SFD	3.38 persons/SFD	220 g/cap/dy	Maximum Month Demand	1.6
MFD	2.1 persons/MFD	220 g/cap/dy	Maximum Day Demand	2.15
			Peak Hour Demand	4.5

Current Design Population			
	persons/unit	# units	Total persons design
SFD	3.38	72	243.36
MFD	2.1	586	1230.6
			1473.96

Average monthly use per person over last 12 months= **1.388 HCF/person/month**

34.140 g/cap/dy

acre-feet/year (avg. past five years) **63.18**



University Glen		
Month	Use (HCF)	use/cap (HCF/person)
Jan-2012	2,988	2.027
Feb-2012	3,192	2.166
Mar-2012	3,642	2.471
Apr-2012	2,991	2.029
May-2012	3,283	2.227
Jun-2012	2,437	1.653
Jul-2012	1,886	1.280
Aug-2012	2,793	1.895
Sep-2012	2,472	1.677
Oct-2012	4,031	2.735
Nov-2012	3,427	2.325
Dec-2012	2,778	1.885
Jan-2013	2,218	1.505
Feb-2013	2,489	1.689
Mar-2013	2,509	1.702
Apr-2013	3,477	2.359
May-2013	2,787	1.891
Jun-2013	1,852	1.256
Jul-2013	2,097	1.423
Aug-2013	1,281	0.869
Sep-2013	2,196	1.490
Oct-2013	3,372	2.288
Nov-2013	1,960	1.330
Dec-2013	2,308	1.566
Jan-2014	2,222	1.508
Feb-2014	2,080	1.411
Mar-2014	1,955	1.326
Apr-2014	2,123	1.440
May-2014	2,251	1.527
Jun-2014	1,610	1.092
Jul-2014	2,800	1.900
Aug-2014	794	0.539
Sep-2014	2,740	1.859
Oct-2014	1,030	0.699
Nov-2014	2,596	1.761
Dec-2014	1,423	0.965
Jan-2015	1,465	0.994
Feb-2015	3,441	2.335
Mar-2015	1,484	1.007
Apr-2015	1,986	1.347
May-2015	3,180	2.157
Jun-2015	1,029	0.698
Jul-2015	2,074	1.407
Aug-2015	1,314	0.891
Sep-2015	2,553	1.732
Oct-2015	2,149	1.458
Nov-2015	2,249	1.526
Dec-2015	2,027	1.375
Jan-2016	2,305	1.564
Feb-2016	4,055	2.751
Mar-2016	1,722	1.168
Apr-2016	1,615	1.096
May-2016	1,917	1.301
Jun-2016	3,427	2.325
Jul-2016	1,074	0.729
Aug-2016	882	0.598
Sep-2016	1,356	0.920
Oct-2016	2,363	1.603
Nov-2016	2,088	1.417
Dec-2016	1,751	1.188
Total for Period	137,596	

Existing 72 (36+36) SFD and 528 (320 + 208) MFD in UGlen Phase 1 + 58 MFD in Town Center
Proposed 120 SFD + 480 MFD in UGlen Phase 2

Unit type	Proposed # units	Design persons / unit	Water Use per capita	Total water use (gal/dy)
SFD	120	3.38	34.14	13,847.17
MFD	480	2.1	34.14	34,413.08
				48,260.24

Use per day (gal)	Days/ Year	gals / acre-foot	Acre-ft /yr
48,260.24	365	325,851	54.06

Average monthly use per person over last 12 months=

1.388 HCF/person/month

34.140 g/cap/dy

Existing **72** (36+36) SFD and **528** (320 + 208) MFD in UGlen Phase 1

Proposed **120** SFD + **480** MFD in UGlen Phase 2

Table 4.2-1 (Average and Peak Irrigation Demands for the previously entitled 242 unit project)

Consumption Rate (AFY per acre) ^[1]	Size	Irrigated % ^[2]	Total Demand	Average Daily Demand	Maximum Daily Demand ^[3]	Peak Hour Demand ^[4]
1.80 AFY per acre	33.5 acres	40%	24.12 acre ft/yr	15.0 gpm	37.4 gpm	112.2 gpm

[1] Assumed Consumption Rate of 1.80 AFY per acre (Average for Ventura County)

[2] Irrigated % taken as avg. % pervious from VCWPD Hydrology Manual for various land uses

[3] Assumed Maximum Daily Demand Factor (Average for Ventura County)

[4] Assumed Peak Hour Demand Factor (Average for Ventura County)

Table 4.3-1 (Average and Peak Irrigation Demands for the proposed 600 unit project)

Consumption Rate (AFY per acre) ^[1]	Size	Irrigated % ^[2]	Total Demand	Average Daily Demand	Maximum Daily Demand ^[3]	Peak Hour Demand ^[4]
1.80 AFY per acre	33.5 acres	30%	18.09 acre ft/yr	11.2 gpm	28.04 gpm	84.1 gpm

[1] Assumed Consumption Rate of 1.80 AFY per acre (Average for Ventura County)

[2] Irrigated % taken as avg. % pervious from VCWPD Hydrology Manual for various land uses

[3] Assumed Maximum Daily Demand Factor (Average for Ventura County)

[4] Assumed Peak Hour Demand Factor (Average for Ventura County)

University Glen Recycled Usage for 52.8 acres - combination of turf and planters			HCF/acre
Jan-2012	1,890	\$ 1,039.50	35.80
Feb-2012	1,395	\$ 767.25	26.42
Mar-2012	2,425	\$ 1,333.75	45.93
Apr-2012	1,165	\$ 640.75	22.06
May-2012	1,870	\$ 1,028.50	35.42
Jun-2012	3,295	\$ 1,812.25	62.41
Jul-2012	3,585	\$ 1,971.75	67.90
Aug-2012	3,560	\$ 1,958.00	67.42
Sep-2012	3,835	\$ 2,109.25	72.63
Oct-2012	2,810	\$ 1,545.50	53.22
Nov-2012	3,575	\$ 1,966.25	67.71
Dec-2012	1,110	\$ 610.50	21.02
Jan-2013	710	\$ 390.50	13.45
Feb-2013	2,105	\$ 1,157.75	39.87
Mar-2013	2,525	\$ 1,388.75	47.82
Apr-2013	2,190	\$ 1,204.50	41.48
May-2013	2,355	\$ 1,295.25	44.60
Jun-2013	2,905	\$ 1,597.75	55.02
Jul-2013	2,220	\$ 1,975.80	42.05
Aug-2013	3,990	\$ 3,551.10	75.57
Sep-2013	3,200	\$ 2,848.00	60.61
Oct-2013	2,590	\$ 2,305.10	49.05
Nov-2013	2,785	\$ 2,478.65	52.75
Dec-2013	2,050	\$ 1,824.50	38.83
Jan-2014	2,505	\$ 2,229.45	47.44
Feb-2014	2,720	\$ 2,420.80	51.52
Mar-2014	1,145	\$ 1,019.05	21.69
Apr-2014	3,240	\$ 2,883.60	61.36
May-2014	3,880	\$ 3,453.20	73.48
Jun-2014	4,980	\$ 4,432.20	94.32
Jul-2014	3,750	\$ 4,050.00	71.02
Aug-2014	5,080	\$ 5,486.40	96.21
Sep-2014	4,020	\$ 4,341.60	76.14
Oct-2014	4,420	\$ 4,773.60	83.71
Nov-2014	3,385	\$ 3,655.80	64.11
Dec-2014	1,330	\$ 1,436.40	25.19
Jan-2015	1,882	\$ 1,209.60	35.64
Feb-2015	2,910	\$ 3,142.80	55.11
Mar-2015	2,905	\$ 3,137.40	55.02
Apr-2015	3,050	\$ 3,294.00	57.77
May-2015	3,620	\$ 3,909.60	68.56
Jun-2015	4,010	\$ 4,330.80	75.95
Jul-2015	4,040	\$ 5,090.40	76.52
Aug-2015	4,190	\$ 5,279.40	79.36
Sep-2015	1,835	\$ 2,312.10	34.75
Oct-2015	2,145	\$ 2,702.70	40.63
Nov-2015	2,910	\$ 3,666.60	55.11
Dec-2015	2,410	\$ 3,036.60	45.64
Jan-2016	3,660	\$ 4,611.60	69.32
Feb-2016	1,300	\$ 1,638.00	24.62
Mar-2016	1,715	\$ 2,160.90	32.48
Apr-2016	4,480	\$ 5,644.80	84.85
May-2016	3,310	\$ 4,170.60	62.69
Jun-2016	3,179	\$ 4,005.69	60.21
Jul-2016	5,591	\$ 8,106.95	105.89
Aug-2016	4,944	\$ 7,168.68	93.64
Sep-2016	5,143	\$ 7,457.64	97.41
Oct-2016	4,664	\$ 6,763.38	88.33
Nov-2016	2,473	\$ 3,585.85	46.84
Dec-2016	2,060	\$ 2,986.86	39.02

Entire Property Recycled Usage for 90.0 acres - combination of turf and planters; higher proportion of turf than UGlen			HCF/acre
Jan-2012	5,032	\$ 2,767.60	55.91
Feb-2012	5,313	\$ 2,922.15	59.03
Mar-2012	6,503	\$ 3,576.65	72.26
Apr-2012	4,891	\$ 2,690.05	54.34
May-2012	4,573	\$ 2,515.15	50.81
Jun-2012	4,538	\$ 2,495.90	50.42
Jul-2012	20,895	\$ 11,492.25	232.17
Aug-2012	14,046	\$ 7,725.30	156.07
Sep-2012	11,651	\$ 6,408.05	129.46
Oct-2012	10,099	\$ 5,554.45	112.21
Nov-2012	8,814	\$ 4,847.70	97.93
Dec-2012	3,994	\$ 2,196.70	44.38
Jan-2013	1,533	\$ 843.15	17.03
Feb-2013	5,681	\$ 3,124.55	63.12
Mar-2013	6,166	\$ 3,391.30	68.51
Apr-2013	9,395	\$ 5,167.25	104.39
May-2013	12,443	\$ 6,843.65	138.26
Jun-2013	12,019	\$ 6,610.45	133.54
Jul-2013	12,340	\$ 10,982.60	137.11
Aug-2013	12,868	\$ 11,452.52	142.98
Sep-2013	12,903	\$ 11,483.67	143.37
Oct-2013	13,104	\$ 11,662.56	145.60
Nov-2013	11,252	\$ 10,014.28	125.02
Dec-2013	7,239	\$ 6,442.71	80.43
Jan-2014	10,209	\$ 9,086.01	113.43
Feb-2014	8,363	\$ 7,443.07	92.92
Mar-2014	5,222	\$ 4,647.58	58.02
Apr-2014	8,101	\$ 7,209.89	90.01
May-2014	14,730	\$ 13,109.70	163.67
Jun-2014	14,392	\$ 12,808.88	159.91
Jul-2014	14,400	\$ 15,552.00	160.00
Aug-2014	11,087	\$ 11,973.96	123.19
Sep-2014	15,026	\$ 16,228.08	166.96
Oct-2014	11,651	\$ 12,583.08	129.46
Nov-2014	8,986	\$ 9,704.88	99.84
Dec-2014	5,019	\$ 5,420.52	55.77
Jan-2015	2,228	\$ 2,406.24	24.76
Feb-2015	6,608	\$ 7,136.64	73.42
Mar-2015	5,047	\$ 5,450.76	56.08
Apr-2015	9,020	\$ 9,741.60	100.22
May-2015	12,777	\$ 13,799.16	141.97
Jun-2015	9,585	\$ 10,351.80	106.50
Jul-2015	10,992	\$ 13,849.92	122.13
Aug-2015	11,143	\$ 14,040.18	123.81
Sep-2015	8,068	\$ 10,165.68	89.64
Oct-2015	7,827	\$ 9,862.02	86.97
Nov-2015	7,355	\$ 9,267.30	81.72
Dec-2015	5,137	\$ 6,472.62	57.08
Jan-2016	5,680	\$ 7,156.80	63.11
Feb-2016	3,937	\$ 4,960.62	43.74
Mar-2016	3,831	\$ 4,827.06	42.57
Apr-2016	7,766	\$ 9,785.16	86.29
May-2016	7,880	\$ 9,928.80	87.56
Jun-2016	11,239	\$ 14,161.14	124.88
Jul-2016	9,107	\$ 13,205.15	101.19
Aug-2016	11,414	\$ 16,550.30	126.82
Sep-2016	15,712	\$ 22,782.40	174.58
Oct-2016	8,782	\$ 12,733.90	97.58
Nov-2016	7,612	\$ 11,037.40	84.58
Dec-2016	4,310	\$ 6,249.50	47.89

ADJUSTED Average and Peak Irrigation Demands for the proposed 600 unit project

Consumption Rate (AFY per acre) ^[1]	Size (acres)	Irrigated % ^[2]	Total Demand (acre-feet/year)	Average Daily Demand (gpm)	Maximum Daily Demand ^[3] (gpm)	Peak Hour Demand ^[4] (gpm)
1.56	33.50	30%	15.68	9.72	24.30	72.90

[1] Assumed Consumption Rate of 1.80 AFY per acre (Average for Ventura County)

[2] Irrigated % taken as avg. % pervious from VCWPD Hydrology Manual for various land uses

[3] Assumed Maximum Daily Demand Factor (Average for Ventura County)

[4] Assumed Peak Hour Demand Factor (Average for Ventura County)