Channel Islands
CALIFORNIA STATE UNIVERSITY

Gateway Hall Project

100% SCHEMATIC DESIGN REPORT

JUNE 03, 2022

ACMARTIN

Introduction and Project Description
Gateway Hall shall provide California State University, Channel Islands with a new "front door" that is a beautiful and welcoming space for both campus and the surrounding community. These spaces will provide innovative, environments for learning, interaction, and collaboration.

The project will consolidate several departments and spaces into a centralized hub - providing a new building and renovated buildings that are intuitive, user-friendly, and easy to navigate.

The program for the new Gateway Hall provides approximately 80,000 square feet of renovated existing facilities and new construction. The project will house Student Services, University Instructional Space, Departmental Labs, Academic Workplace, Gathering Spaces, and Extended University. Along with Student Services and Extended University. The program also includes Mathematics and Computer Science / Mechatronics.

Schematic Design Process
Schematic Design was facilitated through three workshops. The workshops consisted of meetings with the Building Committee, Combined Collaborative Group, Student Focus Group, Laboratory Focus Groups and Outreach Focus Groups. The intent of these workshops was to create a line of communication with a range of stakeholders from across the university. The focus was on gathering design input, communicating process, and providing feedback. The following is a list of meetings during the Schematic Design and 50% Preliminary Design process.

- All Stakeholder Kick-off Meeting - SD Workshop #1 – March 4, 2022
    - Explore Site Concepts, focused on campus entry, movement through site, building placement and massing
    - Establish Site Plan
- SD Workshop #2 – April 4, 2022
    - Review Preferred Site Concept
    - Explore Building Concepts, focused on building entry, circulation and organization of program
    - Establish Building Floor Plans
- SD Workshop #3 – May 3, 2022
    - Review Schematic Building Design, Renderings, & Elevations

Key Project Objectives
CSUCI also identified the following vision concepts for the project:

- Gateway Front Door
  Create a new "gateway" to welcome the outside community into campus; create a beautiful and welcoming space with a "wow" factor.

- Innovative Spaces
  Serve students with innovative, teaching and learning environments. Embrace hybrid work environments in the faculty and staff workspaces. Maintain flexibility to meet evolving campus needs.

- Collaborative Environments
  Establish a central space to invite people from different departments to interact, collaborate, and socialize.

- Services & Community Oriented
  Be a "One-Stop Shop" for students, faculty, and the outside community.

- Iconic, Mission-style Design
  Develop an iconic design that reflects the historic "mission style" architectural language of the campus; honor the past, honor the future of the campus.

- Sustainable
  Utilize sustainable strategies to enhance the user experience and raise awareness of green design. Create beautiful outdoor spaces that will be heavily utilized hubs of interaction; ones that can host events and gatherings.

Site

Gateway Hall will greet all who arrive at the CSUCI campus with its welcoming façade. As a campus built in the Mission style, buildings were sited to define outdoor space. The new Gateway Hall building is sited to maintain that character. At the termination of University Drive, the visual corridor facing south towards the North Quad is preserved by siting Gateway Hall on the west side, in anticipation of a future theater to be located on the east side, and creating a paseo in between the two buildings. The Paseo serves as the main outdoor circulation through the Gateway site and into the North Quad and the rest of the campus. It is envisioned to have a leisurely quality as one moves through the site with Paseo-facing edges that are porous, providing visibility into interior activities.

The Paseo has an entry plaza on its north end, giving a sense of arrival to the campus. The middle section is intended for gathering or lingering with built-in seating and space for outdoor dining from the food truck. It is also an outdoor extension of the Welcome Center and the C-Store/ Cafe along the east side of Gateway Hall. The plaza at the south end of the Paseo marks an intersection where pathways diverge to the main entries into Extended University to the east and One-Stop Shop to the west. Palm trees line the vista through the Paseo, framing the Campus Portal into the North Quad.

A central portion of the existing buildings on axis with University Drive will be demolished to become the Campus Portal. This gap between the buildings will extend the visual corridor into the North Quad and provide opportunities for future development south of the renovated buildings to become the focal point at the terminus of the Paseo.

Fire access lanes for the project are located along the periphery to main. One is in between the existing building F17 and Gateway Hall. The other will be adjacent to the future theater. This allows the Paseo to be a flexible, pedestrian-oriented space with site furnishings and landscaping.

New Building Massing and Organization
Gateway Hall is a three-story building designed to complement the CSUCI's traditional Mission style architecture, using a simple building form with recessed openings and articulated entries. The massing is broken down on sides adjacent to the lower 2-story existing buildings, and architectural embellishments are placed only to emphasize important building features.

The new building provides a clearly visible and identifiable entry with large arched openings into the exterior lobby of the Welcome Center. This large-scale "front porch" is an inviting pre-function space with many opportunities for art within the arches and alcove walls to exhibit the university's rich history and cultural traditions. Arches are used to signify entries into the building, engaging both the public and campus edges of the project.

To further enhance the Paseo experience, the east elevation of Gateway Hall steps down into single-story colonnade. The colonnade connects main entry points along Paseo and provides a covered outdoor walkway, similar to the existing colonnade along the east and west sides of the North Quad.

Within the building, a central, linear circulation spine from which all the program elements are accessed, bisects the building. The spine connects the main public entry at the north and campus entry at the south end, as well as the two stair wells at each end. Additionally, there is a communicating stair connecting the first and second floors midway down the spine.

This central corridor, similar to the Paseo, is porous, allowing visibility into meeting rooms, classrooms and open workstation spaces. It is also lined with built-in wall displays to showcase student work and achievement, and various small spaces for study and collaboration.

Programmatically, large and extra-large classrooms are located on the First Floor, along with the Lobby, Reception, Welcome Center and the Admissions Department Suite. The remainder of the classrooms are located on the Second Floor along with open collaboration space overlooking the double-height lobby space. Labs and Mechatronics are grouped on the Third Floor. Mechatronics has a double height space that pops up above the roof level. This additional height in massing is pulled back from the face of the building to minimize its visibility from the Paseo.

Existing Building Renovation
The Gateway Hall project involves the demolition and renovation of an existing mission style (tile roof/plaster finish), concrete segmented hospital building. The existing building consists of smaller building units separated by seismic joints, built in 1941 and 1950. A new 2-hour fire resistive construction will separate the building renovation from the existing non-renovated/non-sprinklered building areas.

The scope of work of the existing buildings F12, F15, F16 and F17 consists of constructing new end walls and repairing existing roof at the building demolition line, patch / repair existing exterior wall finish/paint, replace existing windows and tile roof, new elevators, and new sprinklers. Modernizing non-compliant building components, such as stairs, handrails/ guardrails, interior and exterior ramps, site improvements to comply with code accessibility requirements and new doors for exit egress, will also be included.

In general, private offices line the perimeter walls with access or shared access to a window. Interior office walls will typically have glazed doors with sidelights to allow light into interior corridor spaces or open workstations.

Although most of the exterior composition of the existing building will remain, new architectural embellishments will be added to signify main entries into the One-Stop Shop (OSS) Lobby and the Extended University (EU) Reception. This also applies to the east entry into the One-Stop Shop at F17, connecting to the Admissions Office through an exterior walkway.

A pronounced arched entryway with glazed double doors and sidelights will highlight the EU main entry in its prominent location adjacent to and east of the Campus Portal at the south end of the Paseo. Adjacent to this is a new dedicated stairway and elevator tower to access the second-floor suite for the Computer Science Academic Workplace.

On the west side of the Campus Portal, the One-Stop Shop entry is more closely aligned to the south entry/exit of Gateway Hall. Unlike its east counterpart at F12, which is subdivided into small offices, the existing dayroom at F16 maintains its openness, exposing the round columns with arched tops and serving as the main lobby for the One-Stop Shop. The double-sided dayrooms with doors on both north and south facades allow a fluidity in circulation from the heart of the campus to the student serving spaces at the OSS and connecting into Gateway Hall.

New Classroom Addition
As part of the Extended University, an existing classroom will be demolished and a new one constructed in the same location. The proportion and ceiling height of the new classroom will be more conducive to a flexible and adaptable instructional and conferencing space. It will feature large, recessed windows and doors on the South elevation with access to an outdoor classroom/gathering space.

Building Materials
Gateway Hall will have a material and finish palette consistent within the campus. Painted white exterior cement plaster, red tile roofing and the CSUCI signature red door and window frames and mullions will be utilized in both new construction and renovation.

Overview
The Gateway Hall project scope includes renovation of existing building with an approximate total gross area of 41,571 GSF and a new building addition with an approximate total gross area of 38,445 GSF.

The existing building currently do not have any HVAC installed. The building renovation program will consist of the following rooms: faculty offices, enrollment services, academic advising, and student business services.

The new building program will consist of the following rooms: interdisciplinary instruction classrooms, welcome center, computer labs, mechanical labs, food service, and student gathering spaces.

Chilled water and heating water point of connection will be in a yard box from Vault#3 north of the project site. Vault #3 and yard box is part of the north hydronic loop project with CSUCI.

Renovated Building Air Handling
Ducted fan coil units (4 pipe) with heating water coil, chilled water coil, filter box with MERV 13 filters. Fan coil units will be mounted above the ceiling with spring vibration isolators.

Supply air will be fully ducted and return air will utilize ceiling return air plenum and sound lined transfer ducts.

Chilled water coil shall be selected to 44°F supply and 64°F return. Heating water coils shall be selected to 125°F supply and 105°F return.

Active chilled beam option for tight ceiling spaces. Dedicated air handling unit to provide primary air.

Multiple dedicated outside air fans with MERV-13 filter and air flow monitoring station. Constant air spring damper regulators will be used for each fan coil unit outside air connection.

New Building Air Handling
The building will be served by one (1) 80 Ton variable air volume custom built air handling units located at roof. The air handling unit shall have chilled water coil, pre-heating water coil, direct drive supply and return fans with variable frequency drives (VFDs), MERV-13 filter, economizer section, outside air flow monitoring station, acoustical roof curb and internal vibration spring isolators.

Supply air distribution shall be fully ducted and return air will utilize ceiling return air plenum and sound lined transfer ducts.

Chilled water coil shall be selected to 44°F supply and 64°F return. Heating water coils shall be selected to 125°F supply and 105°F return.

Each thermal zone will be provided with a dedicated variable air volume (VAV) terminal unit with hydronic reheat. The hydronic reheat will be provided with heating water from campus central plant.

Air Distribution
Supply air distribution will be fully ducted and distributed via medium pressure ductwork. The return air ductwork is fully ducted and/or utilizes the ceiling space as a return air plenum. Air distribution will be sized at low velocity to meet the sound criteria requirements by acoustical consultant.

Heating
Heating water will be tied into Vault#3 & yard box connected to existing campus heating water loop from central plant. Heating water will be distributed to air handling unit, VAV reheat coils, and fan coil unit heating coils.

This system will include booster pumps with N+1 redundancy to function as stand-by and shall be operated on a lead/lag sequence. Heating water piping shall be configured to bypass the booster pumps with control isolation valves when the central plant pressure is adequate for the required demand. Variable frequency drives (VFD) and BAS controls will be provided for each pump.

Heating water thermostatic mixing valve will be utilized to reduce central plant heating water temperature to achieve air handling unit, VAV reheat coils and fan coil unit hot water coil design temperature.

Cooling
Chilled water will be tied into a vault connected to existing campus chilled water loop from central plant. Chilled water will be distributed to air handling unit and fan coil unit cooling coils.

This system will include booster pumps with N+1 redundancy to function as stand-by and shall be operated on a lead/lag sequence. Chilled water piping shall be configured to bypass the booster pumps with control isolation valves when the central plant pressure is adequate for the required demand. Variable frequency drives (VFD) and BAS controls will be provided for each pump.

Building Automation
Provide new direct digital building automation system (BAS) to operate all system functions and schedules. Controls shall be Automated Logic Controls (ALC) per CSUCI standard. All controls shall be connected to, communicate with, and be controlled from the existing campus BAS. Ensure that all necessary control points are provided for commissioning, retro-commissioning, and troubleshooting. Ensure all necessary duct smoke detectors are provided where required and coordinate with fire alarm contractor for proper connection to fire alarm system. Provide animated graphical displays of equipment and systems viewable with monitored point information accessible from the campus building automation system.

The BAS shall have the ability to monitor/set the temperature setpoint, read/set setback temperature setpoint, and monitor any alarms. Controls will consider ASHRAE 36 guidelines as

- Enclosed office: 1 person
- Conference room: 1 person/15 sq.ft.
- Classroom: 1 person/20 sq.ft.

Zoning criteria:

- Private offices: one zone (temperature sensor) per four (maximum) private offices and one per each corner/executive office.
- Open office spaces: one zone (temperature sensor) per 1,000 square feet.
- Conference rooms: one zone (temperature sensor) per room
- Lobby: one zone (temperature sensor)
- Data/telecom: one zone (temperature sensor) per room
- Classroom: one zone (temperature sensors) per room

Ductwork Design Criteria

Design ductwork to provide high efficiency operation with minimal acoustical noise. Duct static pressure friction loss shall not exceed 0.2" per 100 feet in mechanical rooms and shafts. Low pressure supply duct static pressure friction loss based on a maximum of 0.08" per 100 feet. Low pressure return and exhaust duct static pressure friction loss based on a maximum of 0.06" per 100 feet. Medium pressure ductwork shall not exceed a duct static pressure friction loss based on a maximum of 0.1" per 100 feet.

Maximum supply, return and exhaust duct air flow velocities, regardless of pressure drop, shall not exceed the following criteria:

- Mains above ceiling: 1750 fpm
- Mains above open occupied spaces: 1450 fpm
- Branches above ceiling: 1400 fpm
- Branches above open occupied spaces: 1150 fpm
- Run-outs to diffusers: 725 fpm
- In shafts: 2500 fpm
- In mechanical rooms: 3000 fpm

Acoustical

The following noise NC/RC criteria levels will be achieved and as defined in the ASHRAE HVAC Applications Handbook. These levels address the mechanical systems only. Actual sound performance requirements for each space must be verified with acoustical consultant.

- Open offices: 40
- Conference rooms: 30
- Private offices: 30
- Corridors: 40
- Lobbies: 35
- Classrooms: 30

Coils in Air Handling Units

- Maximum face velocity: 450 fpm
- Maximum fins per inch: 12
- Maximum air pressure drop-cooling coil: 0.75" w.c. (wet coil)
- Maximum air pressure drop–heating coil: 0.25" w.c.

Heating water booster pumps: provide N+1 pump redundancy
Fans: provide for duct leakage and 10% additional air capacity for future expansion

Future Capacity
Systems sized for 10% spare cooling/heating/chilled water/heating water capacity on the following systems:

- Air handling units
- Fan coil units
- Exhaust fans
- Chilled beams
- Booster pumps
- Supply and return ductwork – risers and mains
- Chilled/heating water hydronic service piping – risers and mains

Sustainable Design Features
The HVAC system includes the following sustainable design features:

- Demonstrate a 10% improvement in the proposed building performance rating compared to California Building Energy Efficiency Standards per CSU requirements.
- No CFC based refrigerants are used in the building HVAC systems.
- Select refrigerants and HVAC equipment that minimize and eliminate the emission of compounds that contribute to ozone depletion.
- Install the necessary metering and sub metering equipment to measure energy use.
- Provide indoor air quantities to meet minimum requirements of sections 4 through 7 of ASHRAE standard 62.1-2010.
- Install permanent carbon dioxide monitoring systems to ensure that ventilation systems maintain design minimum requirements.
- Use variable frequency drives to operate fans and pumps.
- All ductwork is sealed per SMACNA seal class a with maximum 5% leakage rate at 1.5x the operating pressure of the supply fans.
- Natural ventilation is provided with window micro switches interlocked with VAV terminal units.

HVAC Commissioning
CSUCI will engage an Independent Consultant to perform the role of a Commissioning Agent. During the Design Development the design team shall coordinate with the Commissioning Agent to develop criteria for test protocols to be included in the Construction Documents.

Distribution
Renovation and new construction spaces to be fed from new 480Y/277V distribution.

Reference E5.01, E5.02, and E5.03 for distribution equipment sizes and locations.

Power distribution equipment will be sized to support 20% spare capacity (amperes) as well as 20% spare circuit breaker spaces to accommodate functional changes over the life of the building.

Emergency Power System
Centralized lighting inverters will be utilized for egress lighting to provide back-up power in the incidence of a loss of normal power. A single inverter shall be used per building. Inverter shall be sized to provide back-up power for a minimum of a 90-minute run time.

Fire alarm panels shall be equipped with integral battery back-ups in both the renovation and new construction spaces.

No emergency generator will be provided.

Provide add alternate pricing for manual transfer switches 'MTS-GWR', 'MTS-GWA', and 'MTS-GER'. 'MTS-GWR', 'MTS-GWA', and 'MTS-GER' to be provided upstream 'MSB-GWR', 'MSB-GWA', and 'MSB-GER'. Transfer switches to be located at associated switchboard building exterior. Manual transfer switch intended to provide CSUCI the ability to connect a portable generator for full building optional-standby power.

Elevators
All elevator motor circuit feeders and overcurrent protection shall be sized based on the manufacturer's requirements. All equipment shall be fully rated for the available fault current. Automatic sprinklers shall not be installed in elevator machine rooms, control rooms or elevator hoist ways, where elevators are used for Fire Service Access Elevators (FSAE), per CBC 3007.2. Therefore a means for elevator shutdown (shunt trip) shall not be installed on the elevator systems used for the FSAE, per CBC 3007.3.

Grounding System
A low-impedance grounding electrode system to be provided and designed in accordance with NEC article 250. Grounding electrode system to include the main water service line, structural steel, (if any), and a ground triad. A separate equipment insulate ground wire will be run in each feeder conduit and each branch circuit conduit.

Lightning Protection System
A lightning protection system will not be provided.

Conduit
Conduit types shall be as follows:

Review the Mechanical Criteria for HVAC systems.

All motor starters will have integral solid-state relays.

MDF/IDF Room Electrical Requirements
The MDF/IDF Rooms will be equipped to provide adequate electrical power.

Where MDF or IDF rooms are required, provide the following: a dedicated 60 Amp, 208/120 volt, 3 phase, 4 wire electrical panel. The MDF will be provided with a minimum of (2) ceiling mounted 208 Volt, 1 phase, 30 amp receptacles located above the racks. Provide additional receptacles as needed if more than two racks are provided. Provide a minimum of (1) dedicated 120V, 20 Amp receptacle on each wall.

Provide separate duplex 120V AC convenience outlets (NEMA 5-20R) for tools, test sets, etc., located at least 18 in. above the finished floor, placed at approximately 6 ft. intervals around perimeter walls and identified and marked as such. All outlets must be on non-switched circuits.

Each MDF or IDF will be provided with Ground Bus Bars mounted at 15” above finished floor. Grounding will be done per EIA/TIA 607.

Lighting

The lighting power densities will exceed current requirements California Energy Code, Title 24, Part 6 where applicable.

Lighting Controls

In renovated and new construction areas, the lighting control system shall be Lutron for both interior and exterior lighting. All lighting controls to be compliant with CA Green Code, Tier 2, and Title 24 Energy Code requirements.

Interior lighting control devices shall include digitally-addressable photo-sensors for daylighting control, digitally-addressable wall switches, and digitally-addressable occupancy and vacancy sensors as required. Wall switches shall be labeled describing its use for ease of user interface. All lighting control devices shall be individually addressable and shall communicate with and be controlled by the centralized system.

Exterior lighting controls shall include motion sensors, photo-sensors, and programmable time schedules.

Fixtures in area of egress, both indoors and outdoors, shall have UL924 rated devices as required to provide 100% light output override upon loss of normal power.

New construction lighting control system shall be an integral part of the building automation system (BAS). All lighting control panels shall reside on the BAS communication network. The lighting control system shall be Lutron for both interior and exterior fixtures.

Emergency egress lighting and illuminated exit signs will be provided with unswitched branch circuits fed from the centralized lighting inverter.

SPACE	CONTROL
Private Offices <250SF	Dual technology ceiling mounted occupancy sensors with local override dimmers. Sensors will be set to vacancy mode and will be programmed to manual on via wall station control and automatic full off after 20 minutes of unoccupied space. Within daylight zone provide automatic continuous dimming via photocell controller. Provide four (4) button switch station with on, off, and up and down dimming buttons.
Meeting / Conference Rooms	Dual technology ceiling mounted occupancy sensors with local override dimmers or wall mounted multifunctional control stations. Sensors will be set to vacancy mode and will be programmed to manual on via wall station control and automatic full off after 20 minutes of unoccupied space. Within daylight zone provide automatic continuous dimming via photocell controller.
Restrooms	Dual technology ceiling mounted occupancy sensors with keyed override dimmers. Sensors shall automatically turn the lights off after 15 minutes maximum.
Corridor/Lobby	Dual technology ceiling mounted occupancy sensors with local override dimmers. Sensors will be programmed to reduce 50% output automatically when the area is vacated. After hours mode will be programmed to begin at specific timed as per client requirement. Within daylight zones provide automatic continuous dimming via photocell controller.
Storage / Utility Spaces <100SF	Wall mounted infrared occupancy sensor with integral override switch. Sensor to be programmed to 0% output automatic and 100% manual.
Storage / Utility Spaces >100SF	Dual technology ceiling mounted occupancy sensors with local override dimmers. Sensor to be programmed to 0% output automatic and 100% manual.
Task Lights	Luminaire to be fed from circuits controlled by the lighting control system so they turn off after space is vacated.
Open Office >250SF	Preprogrammed lighting control scenes via lighting control system with local 2-hour by-pass scene selection via wall keypad. Local dimmers with control zoning in compliance with minimum Title 24 requirements. Within daylight zone provide automatic continuous dimming via photocell controller. Task lighting shall be provided to allow individual users to have control of their personal light levels.
Classrooms	Dual technology ceiling mounted occupancy sensors with local override dimmers or wall mounted multifunctional control stations. Sensors will be programmed to 0% output automatic and 100% as manual. Within daylight zone provide automatic continuous dimming via photocell controller.

SPACE	CONTROL
Exterior light fixtures	Daylighting controls: • Automatic continuous dimming via photocell controller. Additional Controls: • After-hours mode will be programmed to begin at specific time, as per client requirement. • Motion sensors and time clock control in compliance with Title-24 minimum without compromising required light level. All luminaires are set at 20% lumen output during after-hours mode, except fixtures should be designed to minimize lighting emissions for Cal Green compliance. All lights should be full cut off, and energy efficient design.
Electrical/MDF/IDF Rooms	Provide manual line voltage switch.
Stairs	Dual tech occupancy sensors with automatic dimming shall be provided in stairs. Unoccupied statis shall dim lighting down to code minimum. Occupied status shall light stairwells to full on.

New Building

- Rainfall intensity 3 inches/hour (per local ordinance).
- The storm will sheet flow off of the roof which shall run surface to MS4 compliant system 85% 24hour storm within the project boundary. Refer to the new civil design for the use a combination of surface, pervious pavers with gravel storage under, piping storage underground, bioswales, planters, etc. to manage stormwater with overflow running to existing storm water main. Refer to the Civil design for new site storm water drainage systems.

Seismic

- Anchorage and restraints must be coordinated with structural engineer and authority having jurisdiction.

Sustainable Design Features

- Waterless urinals per Campus Standard, also consider the HYBRID type urinals with an automatic rinse cycle at each urinal.
- Low-flow water usage of 1.28 gallons per flush at each toilet.
- High efficiency electric, domestic hot water heaters.
- Electronic sensor type lavatory faucets for reduced water flow.
- Optional compressor free drinking fountains
- Optional heat pump water heaters

Site
The Gateway Hall project scope includes renovation of existing building with an approximate total gross area of 41,571 GSF and a new building addition with an approximate total gross area of 38,445 GSF.

Design Requirements
The project is targeting LEED Silver equivalent and is required to meet CSU's Title-24 performance threshold, which requires that the compliance margin for each building component (envelope, HVAC & DHW and lighting) meet or exceed the standard building's baseline compliance margin.

An Energy Usage Intensity (EUI) target has been developed as part of the Schematic Design process. This EUI target has been developed through creation of a preliminary energy model using the CBECC energy modeling software. To create this model, the anticipated internal gains (lighting, receptacle, occupancy), the preliminary equipment loads/air change requirements, and the Schematic Design MEP design have been modeled as designed. The target EUI has been developed assuming an operational schedule of Monday through Friday, 8:00AM – 6:00PM and Saturday, 8:00AM – 1:00PM

It is understood that the building operational schedule may differ from the times outlined above, however a finalized schedule is not available at this time. The EUI target outlined below is calculated using this assumed schedule and the final building EUI will differ as building occupancy and utilization alters

The project shall have a target EUI = 38 kBtu/sf-yr and achieve a minimum of 10% better than Title-24 2022 performance compliance.

Mechanical Systems design Criteria
Air Systems:

- The renovated building will be served by a dedicated outside air fan system and ducted fail coil units.
- The new building will be served by a variable air volume air handling unit with VAV boxes located within each thermal zone.

Hydronic Systems

- The campus central chilled water plant to provide low temperature 44ºF chilled water to all building Air Handling Units. It has been assumed the chilled water plant efficiency is 0.8 kW/ton. This includes all chiller, heat rejection and campus chilled water pumping energy
- The campus central hot water plant provides 180ºF hot water from the campus loop. However, it is recommended that building heating coils are sized to a lower temperature (120 – 140ºF) to allow for future electrification of the campus heating systems. It has been assumed the hot water plant efficiency is 82%, with distribution pumps operating at 22 W/gpm.

Exhaust Requirements

7 Telecom, Security, and Audio Visual

OVERVIEW

PROJECT DESCRIPTION

This project is located at the California State University Channel Islands Campus (CSUCI) in Camarillo, CA and includes construction of a new three story 56,000 GSF Gateway Hall. The newly constructed building will house a welcome center, enrollment, gathering spaces and café on the first floor, classrooms, and laboratories on the upper levels. The project involves two phases, phase one includes the demolition and complete gut/renovation of the existing buildings, phase two construction of the new Gateway Hall building.

The electronic security systems for this facility include video surveillance, access control, intrusion detection, duress alarm, mass communication, remote lockdown, intercom, visitor management, gunshot detection and emergency phone systems with related support spaces for these systems.

This report describes the requirements of the electronic security systems for the project. The assumptions, exclusions, decisions, and goals detailed herein form the basis of the design intent and should be reviewed carefully to ensure that this narrative meets the expectations of the entire project team.

The security program for this facility should incorporate elements of exterior perimeter security, security personnel, physical and operational security policies, and procedures, state-of-the-art electronic security systems, and cyber/network security considerations to provide an appropriate level of protection for the facility. The intent of this narrative is to establish the level and type of electronic security systems only.

DESIGN GUIDELINES & PHILOSOPHY

No campus security standards have been made available at the time this report was created. As the design progresses meetings will be conducted with public safety and the necessary stakeholders and any available standards will be incorporated into the project.

Where client design guidelines are not available or in cases where the guidelines do not address an issue, the following reference documents will be used:

BICSI Telecommunications Distribution Methods Manual, xx Edition.

- ASIS Facilities Physical Security Measures Guideline
- ASIS Workplace Violence Prevention and Response Guideline
- ASIS Protection of Assets: Physical Security
- ADA – Title 3 of the Americans with Disabilities Act
- FCC Regulations, Part 15 – Radio Frequency Devices & Radiation Limits
- NFPA 70, National Electric Code, 2017

- NFPA 730, Standard for the Installation of Electronic Premises Security Systems, 2017
- NFPA 3000PS, Standard for an Active Shooter/Hostile Event Response Program, 2018
- CCR Title 19, Public Safety, date
- CCR Title 24 Part 2, California Building Code, 2019
- CCR Title 24 Part 3, California Electrical Code, 2019
- CCR Title 24 Part 9, California Fire Code, 2019
- UL 294, Standard for Access Control System Units, 2018
- All national, state, and local binding building and fire codes

The systems shall be designed to meet the criteria laid out by the Owner's staff, including Security, Facilities, and IT personnel. Additionally, industry guidelines, standards, and best practices shall be applied as detailed in this report.

GENERAL DESIGN CONSIDERATIONS

The Electronic Security Systems for this facility shall be an expansion of existing systems. providing monitoring, alarming, and access control functionality throughout the building. To achieve this, the systems to be designed include video surveillance, access control, intrusion detection, duress alarm, mass communication (where applicable), remote lockdown, intercom, visitor management and emergency phone systems.

Of these systems, the access control, video surveillance, and intrusion detection systems shall be integrated with one another and managed from a single platform. The remaining systems are not required to be integrated on day 1, but the capability for future integration is required.

The Electronic Security Systems shall utilize the structured cabling system and pathways for distribution and connection to security devices. Using the structured cabling system allows flexibility for future changes.

Additional equipment space will be required in the TR Rooms to house these dedicated system components. During the design development phase, Vantage will review existing systems and standards and work with CSUCI to identify the systems that provides the most value.

It is assumed that the facility security systems will be monitored via the existing security command center/security control room.

LAYERED SECURITY

Security systems will be designed to provide a layered approach for protection from the exterior doors to select areas and openings on the interior of the buildings. This approach will allow for a welcoming yet secure environment.

CIRCULATION & FLOW

Circulation and flow can be defined by three general zones: public, internal, and restricted. The zones are increasingly secure and at each transition between zones, there shall be a control point. As part of this control, there must also be physical barriers in place to define the boundaries between areas. The paths of travel for the different users of the building (employees, guests, visitors, contractors, etc.) must be studied to provide access control points in adequate locations to provide a secure environment without impeding business operations.

The building perimeter will be defined by the physical building itself. This perimeter will be open during business hours (as determined by the stakeholders) and closed otherwise. Entries will be open during business hours to allow for a welcoming environment, while still layering other forms of security to provide a safe environment.

- Public Areas

  Public areas are accessible by all individuals on the property. This includes exterior building areas and the building lobby. There is free circulation between the outside and the lobby of the building. The main point of transition from public to internal space is at the back of the lobby.

- Internal Areas

  The student union expansion and renovation will include a diverse array of staff, student, and guest spaces. Areas will be secured based on the needs and limitations as determined in design development.

- Restricted Areas

  Restricted areas are accessible by authorized employees only and not the general employee population. These areas may include departments supporting sensitive functions such as IT, HR, Legal, and the Executive Suite for these spaces. Staff will require additional authorization for access to these areas. The boundary defining the restricted space is normally a wall with an access-controlled door.

CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED)

CPTED is a design strategy that leverages physical and environmental aspects to incorporate security within a campus. These principles aim to invoke security before the use of technology. This facility shall incorporate these principles, where possible, as recommended by Vantage and coordinated with the Architectural design team.

The four principles of CPTED include:

- Natural Surveillance
- Natural Access Control
- Territorial Reinforcement
- Maintenance and Management

From a high-level perspective, Natural Surveillance is ensuring that sightlines are open, and trees and bushes aren't obstructing views in strategic areas that could encourage crime or vandalism. The intent of natural surveillance is to increase the perception of observation, which can affect and alter the decision-making process concerning inappropriate and unauthorized behavior.

Natural Access Control is the thoughtful application of environmental designs (plants, trees, bollards, or benches) used to "control" or "funnel" access to certain areas. For example, properly located entrances, exits, fencing, landscaping, and lighting can subtly direct both foot and vehicular traffic in ways that decrease criminal opportunities and can be better predicted.

The last two principals – Territorial Reinforcement and Maintenance and Management – are related to invoking a sense of pride and investment within the campus so people feel this campus is their own, which naturally encourages them to protect the space. This is known to be related to a reduction in opportunities for aberrant or criminal behavior such as vandalism.

NETWORK SECURITY CONSIDERATIONS

Securing the facility undoubtedly requires security systems such as video surveillance and access control but protecting those systems themselves is also critical. To protect the systems, the data they contain, and not create a vulnerability or backdoor into the rest of your network, network security considerations should be implemented when adding cameras, access control panels, and any other security endpoints to the production IT network. Basic hardening procedures should be followed, which may include:

- Integrating security systems into the institutional IT support portfolio so that enterprise efficiencies and capabilities can be applied.
- Eliminating shared accounts. All accounts should be for named individuals and all default accounts should be disabled. Ensure account lifecycles are maintained through automated processes.
- Enforcing a strong user password policy and utilizing multi-factor authentication as well as enabling lockout after repeated failed login attempts.
- Changing the default admin password of all the systems installed.
- Restricting remote access to systems by anyone, including vendors and manufacturers. This should only be allowed when necessary. Utilize a bastion host where practical to further protect systems.
- Integrating authentication and authorization with the institutional standards (e.g., active directory).
- Activating auto-locking software features after a period of inactivity

- Utilizing a least-privilege model where network controls minimize communication (segmentation) to that required for the system to function. Minimizing and eliminating, where possible, the ability for one system to communicate with another to limit the north-south and east-west movement of an attacker.
- Utilizing trusted certificates on all servers signed via the institutional certificate authority standard, replacing the use of self-signed certificates.
- Keeping an accurate inventory of all hardware, firmware, software, and operating systems including their versions. Monitoring manufacture bulletins and keeping all components up to date and that manufacturer lifecycles are understood and managed.
- Activating https connections between cameras, mobile devices, and your servers.
- Logging all administrative access to systems and ensure key logs are replicated to the institutional log analytics platform.
- Encrypting video streams and communications between system servers and your databases.
- Refraining from connecting your security system servers to SQL utilizing administrative privileges.
- Synchronizing clocks within your system using the Network Time Protocol.
- Obtaining and implementing each system manufacturer's hardening guide.
- Configuring systems per Center for Internet Security (CIS) benchmarks and in conjunction with manufacturers guidelines.
- Restricting server admin access to local connections only.
- Keeping all firmware, software, and operating systems up to date.
- Activating any activity logging features available for your systems.
- Creating isolated logical networks for each sub-system (micro-segmentation).

This list contains minimum requirements. Additional network security auditing and provisioning is not currently part of our scope of work but can be provided by Vantage as needed.

ACCESS CONTROL SYSTEM

GENERAL

A new access control system will manage, control, and audit access into and within the building zones. This system will include card readers, electrified door hardware, door controllers, and a server to audit and control the system.

Related accessories and system components may include conduit, raceways, cables, back boxes, ID badge, and access cards, alarm contacts, help buttons, local exit alarm, local door propped alarms, and electrified locking door hardware.

The Access Control System components include:

- Card Readers
  - Shall be connected to the access control system via the structured cabling system.
  - Shall be mounted in a location such that the swing of the door shall not interfere with its use.
  - Shall be compatible with 13.56 MHz communication protocols as well as backward compatible with 125 kHz.
  - Shall be compatible with Bluetooth communication protocols to communicate with mobile phone credentials.
- Door Position Switches / Door Contacts
  - Shall be installed at each door leaf for access-controlled or monitored doors.
- Request to Exit Devices
  - Shall be incorporated within the electrified locking hardware.
- Access Control Panels
  - Shall contain the control, input, and output boards of the system and be mounted within the programmed Telecommunications rooms.
- Power Supplies
  - Access control and lock power supplies shall be mounted below the access control panels and be on a dedicated circuit. Where required by door hardware consultant local power supplies will be coordinated to assure infrastructure is present.

AREAS OF CONTROL

The main entrance will be equipped with doors controlled by the access control system on a time schedule. This door shall operate as controlled ingress after hours and free egress at all times and shall only release on automatic activation of the building's fire alarm system.

All emergency exit only doors shall be equipped with local exit alarm and/or local door prop alarm devices. Emergency exit only doors shall be flush doors with no exterior door hardware trim

Additional controlled doors include:

- Stairways
- Telecommunications rooms
- Office suites
- Meeting spaces
- Laboratories with high value equipment

SYSTEM PARAMETERS

Doors equipped with card readers shall be capable of being monitored for “door forced” and "door-held-open" alarms.

All access control card readers shall be integrated for use with the existing badging system. System requirements to be provided by the owner.

The access control system will be a networked system of controllers (including microprocessors, input/output boards, and door controllers) serving all access-controlled points. The components shall be mounted in a lockable enclosure mounted in the telecommunications rooms.

The access control system may be fully integrated with the video surveillance system for automatic camera call-up and digital video recording associated with access control events. Final requirements TBD.

CREDENTIALS & BADGING

Credentials for users to interface with the access control systems at the card readers shall be access control cards and mobile phones.

Access control cards will also function as the employee badge / ID.

It is assumed the creation and programming of credentials for users will be conducted by public safety on campus.

DOORS & DOOR HARDWARE

Door hardware to include tamper-resistant hinges and high-security hardware sets. Locks to be pick resistant and utilize a restricted keyway.

All exterior out-swinging door hinges are to be installed with concealed metal hinge pins, which inhibit exterior removal of the hinge pin.

All card reader doors will require a fixed exterior lever lockset or exit device, prepared with mechanical key override. All card reader locksets and exit devices must be electrified and interfaced to the access control system.

All doors with electrified locking door hardware installed by the General Contractor shall be pre-cored, including temporary doors. These doors, permanent and/or temporary, shall be installed with an electrified lockset, keyed to the building master key system, and a power transfer hinge. The General Contractor shall be responsible for connecting the security system to the frame side of the power transfer hinge and connecting the security cable between the electrified lockset and the power transfer hinge. The door manufacturer shall prep the doors and frames to meet all fire code requirements. The Door Hardware Contractor shall install a door closer adjusted so it shall close from any open position.

It is recommended that there is a minimum of twenty-four inches (24”) of sheetrock space between the doorframe and the nearest wall on all doors equipped with a card reader. The twenty-four inches (24”) shall be on the locking side of the door nearest the door handle. This space is required for the installation of a card reader, which shall be installed by the Security Contractor. If 24” of wall space is not possible, close coordination shall take place with the Architect to ensure proper mounting of a card reader is possible, especially for matters of ADA compliance.

Each security door leaf shall receive an integral request-to-exit switch (REX), integrated into the door hardware, to shunt the access control, door forced alarm.

Doors utilizing electrified hardware for entry control will use hardware that is rated as “fail secure” unless otherwise required by code. Doors shall always be free egress in the path of egress.

The Architect will specify all electrified and mechanical door locking hardware. Vantage will coordinate locations requiring electrified door locking hardware throughout the design.

VIDEO SURVEILLANCE SYSTEM

GENERAL

The video images captured from the security cameras will be stored to CSUCI IT provided video storage servers. The security system utilizes a server solely for the surveillance system. Network transportation of IP signals is supported via security VLAN running on the IT production network.

Cameras shall be IP-Based, allowing footage to be monitored from any network location, which means any desktop monitor can become a security surveillance monitoring location with the correct authorization and password. This is especially useful where video monitoring is sometimes requested by Guards, the Risk Control Manager, the Director of Security, the General Manager, as well as other designated personnel.

The system shall be wholly contained within the building, with the future capability to connect to a campus-wide system.

The system will be monitored via the existing public safety command center. Staffing requirements TBD and system capabilities shall befit of those requirements.

The cameras that are designed as part of this system shall be categorized into high, middle, and low priority cameras, based on the assessed risk and asset value of the area being viewed. These designations shall be coordinated with and approved by the Owner.

The Video Surveillance System components include:

- Cameras
- Mounting Accessories (brackets, housings, etc.)
- Storage Server
- Video Management Software
- Workstations

AREAS OF SURVEILLANCE

- Exterior building perimeter
  Cameras will be located on the building exterior to provide full perimeter coverage including driveways, sidewalks, and fire lanes. Specific camera coverage will be provided for all entrances including public entrances and service entrances such as the loading dock.
- Building entrances and exits.
- Corridors on opposite ends
- Main lobbies and lounges
- Transition points between building zones
- Telecommunications rooms
- Cash handling areas
- Blue phone locations

SYSTEM PARAMETERS

- The system shall provide the ability to record images received from cameras located throughout the facility in a digital format.
- The system shall allow operators to view live video images in single and multiple camera formats and retrieve the recorded video information, based on parameters requested by the user.
- The system shall comprise network video servers, video clients, digital storage devices, routers/switches, and ancillary equipment assembled into a fully operating system. Field Components shall comprise video cameras, positioning devices, lenses, video encoders, camera mounts, and housings.
- Video processing components shall comprise computer video servers, encoders/decoders, digital storage devices, computer video monitoring stations, and other video processing devices as needed to provide the required functionality.
- The initial quality/compression parameters shall be set as determined by the Engineer and the Owner at the time of commissioning. Minimum video quality shall be equivalent to 4CIF video quality, as judged by the Owner and Owner's representatives.
- Video Processing and Network Video Recorders (NVR) shall be distributed and located in Telecommunications Rooms or as directed by the Owner.
- Installation of IP network-based video surveillance systems requires close coordination between the building owner and end-user, the Security Contractor, and the IT department.
- Cameras shall have compatibility with the Video Management System software via camera-specific drivers written by the manufacturers. ONVIF compatibility alone will not suffice.
- Storage
    - Storage shall be provided by the Owner's IT department as part of their existing storage array standards.
- System Integrations
    - To create additional efficiencies, the video surveillance, access control, and intrusion detection systems shall be integrated into one platform to provide the following functions:
        - Automatic camera roll-up upon denied access at a card reader
        - Automatic camera roll-up upon door forced open alarm
        - Automatic camera roll-up upon door held open alarm

INTRUSION DETECTION SYSTEM

GENERAL

An intrusion detection system is a system of components whose function is to sense, control, and announce unauthorized entry into covered areas. This system is intended to sound alarms and alert response personnel of an intrusion. The system shall provide multiple levels of detection as far as possible from an asset being protected. Types of sensors shall be chosen based upon the application and environment.

Perimeter detection shall be part of the intrusion detection system (where applicable) using sensors communicating with the intrusion detection control system. Alarm conditions may be communicated through alerts on the intrusion detection workstation, local audible alarms, and light strobes.

The Intrusion Detection System components include:

- Motion detectors
- Door contacts
- Arming stations
- Panic buttons
- Local alarms

AREAS OF PROTECTION

- Elevator equipment rooms
- Emergency exit/perimeter door
- Loading docks
- Main entrance
- Pedestrian access point
- Rooftop access
- Restricted corridors
- Building lobby
- Elevator lobby
- Stairwells
- Telecom rooms
- Electrical room

SYSTEM PARAMETERS

- All IDS sensors shall terminate on the access control panel with an input to the intrusion detection panel. All devices shall be hardwired where possible. Wireless devices may only be used where the surrounding building construction and the environment will not degrade the effective range of the device's signal.
- Door contacts shall be recess mounted. Double doors shall have one contact on each leaf. Roll-up doors wider than 2 meters shall have a contact mounted on each side on the interior of the door.
- This intrusion alarm system shall be capable of supporting multiple discrete interior building zones that may be armed or disarmed independently. The intrusion alarm system shall be designed to provide alarm monitoring of all perimeter doors of each alarm zone. Unauthorized access would cause remote alarm transmission. Designated interior spaces within each alarm zone shall be equipped with secondary supporting intrusion sensor devices including motion detectors.

INTERCOM SYSTEM

GENERAL

The purpose of an intercom system is to allow direct communication via a private telephone (or IP-based) network consisting of intercom stations and one or more master stations. The system is also independent of the building voice communication system. Locations for intercom stations will be determined in the design development phase. Typically, stations will be located at loading docks, service doors, office suites and after hour entry points.

Intercom stations will be connected to the intercom master station located within the Security SCC. The purpose of this system is to allow a remote person to respond to an inquiry at the station by a person seeking to gain entrance to the facility. The operator at the SCC, with proper recognition, remotely releases the electrified door hardware to allow the person to enter the building. This system affords the operator time to distinguish the identity of the person at the station without prematurely opening the door for questions, thereby exposing themselves to possible attacks. A camera will be located to view the activity immediately adjacent to the door where the station is located.

EMERGENCY TELEPHONES

GENERAL

The emergency phones with surveillance cameras will be located as required on buildings and/or the site. The implementation of emergency telephones will provide a direct connection from the campus grounds to the security command center for faculty and students in distress.

The telephones come in analog and IP-based versions, the version to be specified will match campus standards as they are made available in the design development phase.

OVERVIEW

PROJECT DESCRIPTION

This project is located at the California State University Channel Islands Campus (CSUCI) in Camarillo, CA and includes construction of a new three story 56,000 GSF Gateway Hall. The newly constructed building will house a welcome center, enrollment, gathering spaces and café on the first floor, classrooms, and laboratories on the upper levels. The project involves two phases, phase one includes the demolition and complete gut/renovation of the existing buildings, phase two construction of the new Gateway Hall building.

The following is a breakdown of the various audiovisual rooms and their respective technology functionality found within each area. Each space is provisioned to accommodate the deployment of digital based High Definition (HD) technology including, at minimum, widescreen HD format display equipment and basic HD resolution for display devices. All systems will be based on a digital platform that will be provisioned to receive and support materials via HDMI, etc. and will manage protected content such as Blu-ray disc players and encrypted web-based or computer presentation materials.

Note that support for Assistive Listening System (ALS) equipment is to be provided in the classroom spaces with amplified audio. Refer to the ALS section below within this document.

Note that all Audiovisual spaces covered in this document shall be provisioned to accommodate ADA access for student use. All surface mounted equipment shall conform to ADA guidelines for protrusion and shall be under 4” from wall surface. Equipment can be located in niches to minimize protrusion. All hanging Audiovisual equipment shall be no lower than 7’-6” for clearance per ADA guidelines. All wall controls shall be no higher than 48” AFF to the top of the device. All surface controls and inputs located at the instructor desk shall be within accessible reach per ADA.

ROOM TYPE

SMALL CLASSROOM (MOBILE TABLET ARMCHAIRS & TABLES & CHAIRS)

In order to facilitate instruction in the 36-seat Small Classroom, a media presentation system will be provided comprising of comprising of a total of four ceiling-mounted video projectors casting dual images on the whiteboard surfaces at both the front and rear of the room to facilitate the video display of disparate materials and content as well as standard whiteboard annotation. These displays (two per wall on opposing walls) will support student viewing with a variety of seating layouts.

Ceiling-mounted loudspeakers are provided to reproduce media audio.

A small form factor computer with wireless keyboard, mouse and input interface will be provided in the instructor lectern. Additional input interfaces facilitate connection of portable devices such as laptop computers and to provide convenient control of the audiovisual

switcher/controller. A wireless presentation gateway shall be provided for wireless presentations.

Support for hybrid learning shall be included comprising of a USB media hub to interface with the room computer, a room camera and ceiling microphone to capture both the instructor and students.

Primary control of the audiovisual system for the room will be provided

via a touch control panel located at the instructor station.

A portable desktop color document camera located in the instructor station shall be included and will connect to the system for image magnification.

A mono RCA output connection for portable RF based assistive listening system shall be provided to accommodate ADA requirements and support all voice and program audio for the space.

Audiovisual equipment shall be housed in an equipment rack within the instructor station and shall house presentation source devices and other audiovisual processing and control equipment.

System Summary:

- Digital video projectors
  - WUXGA native resolution (1920 x 1200 pixels)
  - High light output (min. 5,000 ANSI lumens)
- Widescreen matte whiteboard surface
- Ceiling recessed loudspeakers
- Ceiling (or wall) mounted camera for web-conferencing
- Ceiling microphone array
- Small form factor computer
- Wireless presentation gateway
- Document camera
- AV system presentation switcher (controller, switcher, amplifier)

- Input for portable ALS transmitter
- Instructor station with preview monitor
- Auxiliary AV input panel

LARGE CLASSROOM

In order to facilitate instruction in the 48-seat Large Classroom a media presentation system will be provided comprising of a total of six ceiling-mounted video projectors casting dual images on the whiteboard surfaces at the front and both sides of the room to facilitate the video display of disparate materials and content as well as standard whiteboard annotation. . The other four displays (two per wall on two adjacent walls) will support student viewing with a variety of seating layouts.

Ceiling-mounted loudspeakers are provided to reproduce media audio and also voice-lift to support audibility throughout the larger classroom.

A small form factor computer with wireless keyboard, mouse and input interface will be provided in the instructor lectern. Additional input interfaces facilitate connection of portable devices such as laptop computers and to provide convenient control of the audiovisual switcher/controller. A wireless presentation gateway shall be provided for wireless presentations.

Support for hybrid learning shall be included comprising of a USB media hub to interface with the room computer, a room camera and ceiling microphones to capture both the instructor and students.

Primary control of the audiovisual system for the room will be provided via a touch control panel located at the instructor station.

A portable desktop color document camera located in the instructor station shall be included and will connect to the system for image magnification.

A fixed RF based assistive listening system shall be provided to accommodate ADA requirements and support all voice and program audio for the space.

Audiovisual equipment shall be housed in an equipment rack within the instructor station and shall house presentation source devices and other audiovisual processing and control equipment.

System Summary:

- Digital video projectors
  - WUXGA native resolution (1920 x 1200 pixels)
  - High light output (min. 6,000 ANSI lumens)
- Widescreen matte whiteboard surface
- Ceiling recessed loudspeakers
- Ceiling (or wall) mounted camera for web-conferencing
- Wireless instructor microphone
- Ceiling microphone array
- Small form factor computer
- Wireless presentation gateway
- Document camera
- AV system presentation switcher (controller, switcher, amplifier)

- Assistive Listening System transmitter and RF receiver units
- Instructor station with preview monitor
- Auxiliary AV input panel

75-SEAT CLASSROOM

In order to facilitate instruction in the 75-Seat Classroom a media presentation system will be provided comprising of two ceiling-mounted video projectors and ceiling recessed projection screens in the front and one additional ceiling-mounted video projector casting images on whiteboard surfaces on the adjacent wall to facilitate the video display of disparate materials and content as well as standard whiteboard annotation.

Ceiling-mounted loudspeakers are provided to reproduce media audio and also voice-lift to support audibility throughout the larger classroom along with a wireless handheld & lapel microphone. A small form factor computer with wireless keyboard, mouse and input interface will be provided in the instructor lectern. Additional input interfaces facilitate connection of portable devices such as laptop computers and to provide convenient control of the audiovisual switcher/controller. A wireless presentation gateway shall be provided for wireless presentations.

Support for hybrid learning shall be included comprising of a USB media hub to interface with the room computer, a room camera and ceiling microphones to capture both the instructor and students.

Primary control of the audiovisual system for the room will be provided via a touch control panel located at the instructor station.

A portable desktop color document camera located in the instructor station shall be included and will connect to the system for image magnification.

A fixed RF based assistive listening system shall be provided to accommodate ADA requirements and support all voice and program audio for the space.

Audiovisual equipment shall be housed in an equipment rack within the instructor station and shall house presentation source devices and other audiovisual processing and control equipment.

System Summary:

- Digital video projectors
  - WUXGA native resolution (1920 x 1200 pixels)
  - High light output (min. 7,500 ANSI lumens)
- Ceiling recessed projection screens
- Widescreen matte whiteboard surface
- Ceiling recessed loudspeakers
- Ceiling (or wall) mounted camera for web-conferencing
- Wireless instructor microphone
- Ceiling microphone arrays
- Small form factor computer
- Wireless presentation gateway
- Document camera
- AV system presentation switcher (controller, switcher, amplifier)

- Assistive Listening System transmitter and RF receiver units
- Instructor station with preview monitor
- Auxiliary AV input panel

36-SEAT ACTIVE LEARNING CLASSROOM

In order to facilitate instruction in the 36-Seat Active Learning Classroom a media presentation system will be provided comprising of two ceiling-mounted video projectors casting images on a whiteboard surface at the front of the room to facilitate the video display of disparate materials and content as well as standard whiteboard. These displays (on opposing walls) will support student viewing with a variety of seating layouts. Also included shall be nine wall mounted flat panel monitors to support student team stations around the room and provide options for future digital content annotation. The individual team stations shall have the ability to have their content routed and shared with the other stations as well as with the main instructor's displays and the main presentation content can be pushed to the individual team stations to supplement the instructor presented materials.

Ceiling-mounted loudspeakers are provided to reproduce media audio and also voice-lift to support audibility throughout the larger classroom.

A small form factor computer with wireless keyboard, mouse and input interface will be provided in the instructor lectern. Additional input interfaces facilitate connection of portable devices such as laptop computers and to provide convenient control of the audiovisual switcher/controller. A wireless presentation gateway shall be provided for wireless presentations.

Support for hybrid learning shall be included comprising of a USB media hub to interface with the room computer, room cameras and ceiling microphones to capture both the instructor and students.

Primary control of the audiovisual system for the room will be provided via a touch control panel located at the instructor station.

A portable desktop color document camera located in the instructor station shall be included and will connect to the system for image magnification.

A mono RCA output connection for portable RF based assistive listening system shall be provided to accommodate ADA requirements and support all voice and program audio for the space.

Audiovisual equipment shall be housed in a large free-standing equipment rack within the room and shall house presentation source devices and other audiovisual processing and control equipment.

System Summary:

- Digital video projectors
  - WUXGA native resolution (1920 x 1200 pixels)
  - High light output (min. 6,000 ANSI lumens)
- Widescreen matte whiteboard surfaces
- Wall monitors for team stations
- Ceiling recessed loudspeakers
- Ceiling (or wall) mounted cameras for web-conferencing

- Wireless instructor microphone
- Ceiling microphone arrays
- Small form factor computer
- Wireless presentation gateway
- Document camera
- AV system presentation equipment including video matrix switcher, audio processor, controller, audio amplifier
- Input for portable ALS transmitter
- Instructor station with preview monitor
- Auxiliary AV input panel

MATH LAB 1

In order to facilitate instruction in Math Lab #1, a media presentation system will be provided comprising of two ceiling-mounted video projectors casting images on a whiteboard surface at the front and one ceiling projector casting images to a projection screen at the rear of the room to facilitate the video display of disparate materials and content on opposing walls as well as standard whiteboard annotation. Also included shall be six wall mounted flat panel monitors to support student team stations around the room (three per side) and provide options for future digital content annotation. The individual team stations shall have the ability to have their content routed and shared with the other stations as well as with the main instructor's displays and the main presentation content can be pushed to the individual team stations to supplement the instructor presented materials.

Ceiling-mounted loudspeakers are provided to reproduce media audio.

A small form factor computer with wireless keyboard, mouse and input interface will be provided in the instructor lectern. Additional input interfaces facilitate connection of portable devices such as laptop computers and to provide convenient control of the audiovisual switcher/controller. A wireless presentation gateway shall be provided for wireless presentations.

Support for hybrid learning within the lab spaces shall be included comprising of a USB media hub to interface with the room computer, room cameras and ceiling microphones to capture both the instructor and students.

Primary control of the audiovisual system for the room will be provided via a touch control panel located on the instructor station.

A portable desktop color document camera located in the instructor station shall be included and will connect to the system for image magnification.

A mono RCA output connection for portable RF based assistive listening system shall be provided to accommodate ADA requirements and support all voice and program audio for the space.

Audiovisual equipment shall be housed in a free-standing equipment rack within the room and shall house presentation source devices and other audiovisual processing and control equipment.

System Summary:

- Digital video projectors
  - WUXGA native resolution (1920 x 1200 pixels)
  - High light output (min. 5,000 ANSI lumens)
- Widescreen matte whiteboard surface
- Projection Screen
- Ceiling recessed loudspeakers
- Ceiling (or wall) mounted camera for web-conferencing
- Ceiling microphone array
- Small form factor computer
- Wireless presentation gateway
- Document camera

- AV system presentation switcher (controller, switcher, amplifier)
- Input for portable ALS transmitter
- Instructor station with preview monitor
- Auxiliary AV input panel

MATH LAB 2

In order to facilitate instruction in Math Lab #2, a media presentation system will be provided comprising of two ceiling-mounted video projectors casting images on a whiteboard surface at the front and one ceiling-mounted video projector casing images on a projection screen at rear of the room to facilitate the video display of disparate materials and content on opposing walls as well as standard whiteboard annotation. Also included shall be six wall mounted flat panel monitors to support student team stations around the room (three per side) and provide options for future digital content annotation.

The individual team stations shall have the ability to have their content routed and shared with the other stations as well as with the main instructor's displays and the main presentation content can be pushed to the individual team stations to supplement the instructor presented materials. Each team station has a camera and microphone at the display that can be used to capture and record collaboration sessions to the cloud or local instructional PC locally supporting each team cluster.

Ceiling-mounted loudspeakers are provided to reproduce media audio.

A small form factor computer with wireless keyboard, mouse and input interface will be provided in the instructor lectern. Each team station shall be outfitted with a local ultra-small form factor PC mounted behind the display at each location. Additional input interfaces facilitate connection of portable devices such as laptop computers and to provide convenient control of the audiovisual switcher/controller. A wireless presentation gateway shall be provided for wireless presentations.
Support for hybrid learning within the lab spaces shall be included comprising of a USB media hub to interface with the room computer, room cameras and ceiling microphones to capture both the instructor and students. Each team station shall have local capture capability to record and interface back with the main room system. A separate yet parallel recording appliance will be included to support recording of activities within the Math Lab for research and analytic purposes. The intent on capturing not only the students at their stations but also the whiteboarding occurring during team collaboration.

Primary control of the audiovisual system for the room will be provided via a touch control panel located on the instructor station.

A portable desktop color document camera located in the instructor station shall be included and will connect to the system for image magnification.

A mono RCA output connection for portable RF based assistive listening system shall be provided to accommodate ADA requirements and support all voice and program audio for the space.

Audiovisual equipment shall be housed in a free-standing equipment rack within the room and shall house presentation source devices and other audiovisual processing and control equipment.

System Summary:

- Digital video projectors
  - WUXGA native resolution (1920 x 1200 pixels)
  - High light output (min. 5,000 ANSI lumens)
- Widescreen matte whiteboard surface
- Projection Screen
- Wall monitors for team stations
- Ceiling recessed loudspeakers
- Ceiling (or wall) mounted cameras for web-conferencing and recording
- Individual team station cameras for recording
- Ceiling microphone array
- Small form factor computer
- Recording appliance
- Wireless presentation gateway
- Document camera
- AV system presentation switcher (controller, switcher, amplifier)
- Input for portable ALS transmitter
- Instructor station with preview monitor
- Auxiliary AV input panel

MECHATRONICS LAB

In order to facilitate presentations in the Mechatronics Lab, a media presentation system will be provided comprising of a two ceiling-mounted video projector casting images on a whiteboard surface at the front of the room to facilitate the display of materials and content as well as standard whiteboard annotation.

Ceiling-mounted loudspeakers are provided to reproduce media audio.

A small form factor computer with wireless keyboard, mouse and input interface will be provided in the instructor lectern. Additional input interfaces facilitate connection of portable devices such as laptop computers and to provide convenient control of the audiovisual switcher/controller. A wireless presentation gateway shall be provided for wireless presentations.

Primary control of the audiovisual system for the room will be provided via a touch control panel located on the wall.

A portable desktop color document camera located in the instructor station shall be included and will connect to the system for image magnification.

A mono RCA output connection for portable RF based assistive listening system shall be provided to accommodate ADA requirements and support all voice and program audio for the space.

Audiovisual equipment shall be housed in an equipment rack within the room and shall house presentation source devices and other audiovisual processing and control equipment.

System Summary:

- Digital video projectors
  - WUXGA native resolution (1920 x 1200 pixels)
  - High light output (min. 5,000 ANSI lumens)
- Widescreen matte whiteboard surface
- Ceiling recessed loudspeakers
- Small form factor computer
- Wireless presentation gateway
- Document camera
- AV system presentation switcher (controller, switcher, amplifier)
- Input for portable ALS transmitter
- Auxiliary AV input panel

MECHATRONICS / CS TEACHING SPACE

In order to facilitate instruction in the Mechatronics / Computer Science Teaching Space, a media presentation system will be provided comprising of a total of three ceiling-mounted video projectors casting images on the whiteboard surfaces at both the front of the room and on both adjacent side walls to facilitate the video display of disparate materials and content as well as standard whiteboard annotation (one projector each wall).

Ceiling-mounted loudspeakers are provided to reproduce media audio.

A small form factor computer with wireless keyboard, mouse and input interface will be provided in the instructor lectern. Additional input interfaces facilitate connection of portable devices such as laptop computers and to provide convenient control of the audiovisual switcher/controller. A wireless presentation gateway shall be provided for wireless presentations.

Support for Virtual Reality (VR) and Augmented Reality (AR) connected devices shall be provided for including infrastructure for position-sensing cameras in a designated area within the instructional space.

Primary control of the audiovisual system for the room will be provided via a touch control panel located on front wall.

A mono RCA output connection for portable RF based assistive listening system shall be provided to accommodate ADA requirements and support all voice and program audio for the space.

Audiovisual equipment shall be housed in an equipment rack within the instructor station and shall house presentation source devices and other audiovisual processing and control equipment.

System Summary:

- Digital video projectors
  - WUXGA native resolution (1920 x 1200 pixels)
  - High light output (min. 5,000 ANSI lumens)
- Widescreen matte whiteboard surface
- Ceiling recessed loudspeakers
- Ceiling (or wall) mounted camera for web-conferencing
- Ceiling microphone array
- Small form factor computer
- Wireless presentation gateway
- AV system presentation switcher (controller, switcher, amplifier)
- Input for portable ALS transmitter
- Instructor station with preview monitor
- Auxiliary AV input panel

CYBER SECURITY LAB

In order to facilitate instruction in the Cyber Security Lab, a media presentation system will be provided comprising of a ceiling-mounted video projector casting images on a whiteboard surface at the front of the room to facilitate the video display of materials and content as well as standard whiteboard annotation.

Ceiling-mounted loudspeakers are provided to reproduce media audio.

A small form factor computer with wireless keyboard, mouse and input interface will be provided in the instructor lectern. Additional input interfaces facilitate connection of portable devices such as laptop computers and to provide convenient control of the audiovisual switcher/controller. A wireless presentation gateway shall be provided for wireless presentations.

Optional support for hybrid learning within the lab spaces shall be included comprising of a USB media hub to interface with the room computer, a room camera and ceiling microphone to capture both the instructor and students.

Primary control of the audiovisual system for the room will be provided via a touch control panel located on the instructor station.

A portable desktop color document camera located in the instructor station shall be included and will connect to the system for image magnification. Provisions for a ceiling-mounted document camera or visualizer shall be included for viewing over the rear presentation table area (to support smart city topographical plan or other larger materials).

A mono RCA output connection for portable RF based assistive listening system shall be provided to accommodate ADA requirements and support all voice and program audio for the space.

Audiovisual equipment shall be housed in an equipment rack within the instructor station and shall house presentation source devices and other audiovisual processing and control equipment.

System Summary:

- Digital video projectors
  - WUXGA native resolution (1920 x 1200 pixels)
  - High light output (min. 5,000 ANSI lumens)
- Widescreen matte whiteboard surface
- Ceiling recessed loudspeakers
- Optional ceiling (or wall) mounted camera for web-conferencing
- Optional ceiling microphone array
- Small form factor computer
- Wireless presentation gateway
- Document camera
- Optional ceiling-mounted document camera
- AV system presentation switcher (controller, switcher, amplifier)
- Input for portable ALS transmitter
- Instructor station with preview monitor
- Auxiliary AV input panel

GAME DESIGN / VIRTUAL REALITY SPACE

The Game Design / Virtual Reality Space, shall include a media presentation system to support and facilitate presentation and development of content. This shall include a 2 tall by 2 wide display wall of 4 seamless or narrow bezel video monitors to display video materials. Wall mounted speakers shall be included to support a 5.1 surround audio experience for content playback.

A desktop gaming computer with keyboard, mouse and input interface will be provided at each development station. Additional input interfaces facilitate connection of portable or other devices such as laptop and Virtual Reality computers as well as gaming consoles.

Support for Virtual Reality (VR) and Augmented Reality (AR) connected devices shall be provided for including infrastructure for position-sensing cameras in a designated area within the instructional space.

Primary control of the audiovisual system for the room will be provided via a touch control panel located on the wall.

A mono RCA output connection for portable RF based assistive listening system shall be provided to accommodate ADA requirements and support all voice and program audio for the space.

Audiovisual equipment shall be housed in an equipment rack within a separate enclosure and shall house presentation source devices and other audiovisual processing and control equipment.

System Summary:

- Four (4) digital video wall monitors
  - 4K resolution+
  - Minimum of 300 NIT brightness
- Consumer-grade displays
- Wall mounted or recessed loudspeakers and subwoofer
- Desktop computer
- AV system presentation switcher (controller, switcher, amplifier)
- Input for portable ALS transmitter
- Control console with dual monitors
- Auxiliary AV input panel

EXTENDED UNIVERSITY CLASSROOM

In order to facilitate instruction in the Extended University Classroom a media presentation system will be provided comprising of two ceiling-mounted video projectors casting images on a whiteboard surface at the front of the room to facilitate the video display of disparate materials and content as well as standard whiteboard annotation.

Ceiling-mounted loudspeakers are provided to reproduce media audio.

A small form factor computer with wireless keyboard, mouse and input interface will be provided in the instructor lectern. Additional input interfaces facilitate connection of portable devices such as laptop computers and to provide convenient control of the audiovisual switcher/controller. A wireless presentation gateway shall be provided for wireless presentations.

Support for hybrid learning shall be included comprising of a USB media hub to interface with the room computer, a room camera and ceiling microphone to capture both the instructor and students.

Primary control of the audiovisual system for the room will be provided via a touch control panel located at the instructor station.

A portable desktop color document camera located in the instructor station shall be included and will connect to the system for image magnification.

A fixed RF based assistive listening system shall be provided to accommodate ADA requirements and support all voice and program audio for the space.

Audiovisual equipment shall be housed in an equipment rack within the instructor station and shall house presentation source devices and other audiovisual processing and control equipment.

System Summary:

- Digital video projectors
  - WUXGA native resolution (1920 x 1200 pixels)
  - High light output (min. 5,000 ANSI lumens)
- Widescreen matte whiteboard surface
- Ceiling recessed loudspeakers
- Ceiling (or wall) mounted camera for web-conferencing
- Ceiling microphone array
- Small form factor computer
- Wireless presentation gateway
- Document camera
- AV system presentation switcher (controller, switcher, amplifier)
- Assistive Listening System transmitter and RF receiver units
- Instructor station with preview monitor
- Auxiliary AV input panel

WELCOME CENTER MEETING ROOM

In order to facilitate presentation in the Welcome Center Meeting Room, a media presentation system will be provided comprising of a ceiling-mounted video projector and ceiling recessed projection screen to facilitate video display.

Ceiling-mounted loudspeakers are provided to reproduce media audio and also voice-lift to support audibility throughout the larger space along with a wireless handheld & lapel microphone.

A small form factor computer with wireless keyboard, mouse and input interface will be provided in the equipment rack for the use of playback of orientation materials, etc. Additional input interfaces facilitate connection of portable devices such as laptop computers microphones and to provide convenient control of the audiovisual switcher/controller. A wireless presentation gateway shall be provided for wireless presentations.

Primary control of the audiovisual system for the room will be provided via a wall mounted touch control panel located at the front of the room.

A fixed RF based assistive listening system shall be provided to accommodate ADA requirements and support all voice and program audio for the space.

Audiovisual equipment shall be housed in an equipment rack located in a dedicated closet and shall house presentation source devices and other audiovisual processing and control equipment.

System Summary:

- Digital video projector
  - WUXGA native resolution (1920 x 1200 pixels)
  - High light output (min. 7,500 ANSI lumens)
- Ceiling recessed projection screen
- Ceiling recessed loudspeakers
- Wireless instructor microphone
- Small form factor computer
- Wireless presentation gateway
- AV system presentation switcher (controller, switcher, amplifier)
- Assistive Listening System transmitter and RF receiver units
- Auxiliary AV input panel

LARGE CONFERENCE ROOM

The Large Conference Room will comprise of a large wall mounted flat panel HD TV as the main video display.

A floor box will be located under the table to accommodate table surface AV input, power and data connections in a flip-up well.

A wall mounted touch-control panel will select the source and control system functions.

A front camera and room microphone system will facilitate web-conferencing through the dedicated room computer.

The system will be equipped with a wireless presentation gateway mounted behind the display.

System Summary:

- Large format 1920x1080, 90” display
- Ceiling speakers
- Wall touch control panel
- Wireless presentation gateway
- Ceiling microphone array
- Front wall HD camera
- Media-to-USB converter appliance
- Equipment Rack
- Dedicated computer

MEDIUM CONFERENCE ROOM

The Medium Conference Room will comprise of a large wall mounted flat panel HD TV as the main video display.

A floor box will be located under the table to accommodate table surface AV input, power and data connections in a flip-up well.

A wall mounted touch-control panel will select the source and control

microphone system will facilitate web-conferencing through the dedicated room computer.

The system will be equipped with a wireless presentation gateway mounted behind the display.

System Summary:

- Large format 1920x1080, 75”-85” display
- Ceiling speakers
- Wall touch control panel
- Wireless presentation gateway
- Table (or ceiling) microphone
- Front wall HD camera
- Media-to-USB converter appliance
- Equipment Rack
- Dedicated computer

SMALL AND EXTRA SMALL CONFERENCE ROOMS

The Small Conference Rooms will comprise of a wall mounted flat panel HD TV as the main video display.

A floor box will be located under the table to accommodate table surface AV input, power and data connections in a flip-up well.

A wall mounted touch-control panel will select the source and control system functions.

A front camera and room microphone system will facilitate web-conferencing through the dedicated room computer.

The system will be equipped with a wireless presentation gateway mounted behind the display.

System Summary:

- Medium format 1920x1080, 65-75” display
- Ceiling speakers (or display speakers)
- Wall touch control panel
- Wireless presentation gateway
- Table (or ceiling) microphone
- Front wall HD camera
- Media-to-USB converter appliance
- Equipment Rack
- Dedicated computer

COLLABORATION AREAS

These areas shall comprise of a wall mounted flat panel HD TV as the main video display.

System Summary:

- Small-medium format 1920x1080, 55”-65” display
- Wireless presentation gateway

ROOM SCHEDULING & SIGNAGE SYSTEM

Each instructional space (classrooms and labs) and conference or meeting space include shall include support for a 10” landscape monitor (non-interactive) that is used for the display of room information and availability status via side red/green indicator lights. The monitor will be connected via the data network connection at operator height.

The system will tie back into the CSUCI Microsoft Exchange ™ system for calendar linking and room booking.

DIGITAL SIGNAGE

These areas shall comprise of a wall mounted flat panel HD TV as the main video display.

The digital signage source will activate the display during normal building hours. A digital signage appliance will be located behind the display for program or department content playback.

System Summary:

- Flat panel display, 1920x1080 resolution, sized for the viewing area
- Networked digital Signage appliance

REMOTE NETWORK MANAGEMENT SOFTWARE

Remote network management system software is required to control, manage and support all attached AV control systems and their related networked AV peripheral devices. This will tie into any University building management systems that may be required.

This system can be configured to monitor and manage (but not limited to):

- System or individual peripheral status including power on/off state, network status (disconnected)
- Projector total operating. Must be configured to notify by email the appropriate CSUCI staff or service technician when to clean any projector filters (if required).
- System or peripheral temperature. An email notification will also be sent to the appropriate Campus staff or service technician when critical limits are triggered.
- Archival server capacity status (if applicable).
- Room scheduling and helpdesk support.
- Projector or device operating / usage hours (for service tracking)
- Online status. If a device included within the AV system is taken offline (disconnected from the system or network), a notification will be issued to the appropriate Campus staff to verify that a theft has not taken place.
- Other key elements included within each room that are tied to the AV system and can be controlled or monitored.

EQUIPMENT STANDARDS

For consistency purposes, the building project will match (based on specific room requirements) the campus standards for manufacturers for all equipment in order to maintain a level of consistency in stocking of consumables (e.g. lamps-if applicable, filters, etc.) and spare units. This may be changed based on specific programmatic requirements for special room features such as display brightness and distance education / recording.

CONTROL EQUIPMENT

- For consistency purposes, the building project will match (based on specific room requirements) the campus standards for all AV control systems and user control panels and devices. The current campus standard is Extron flip-up 7" control panels for the typical classroom spaces and a larger desktop touch control screen (10"-15") in larger spaces requiring more functionality. Extron flip-up 4" control panels shall be used in conference and meeting spaces. The systems will tie into the existing Extron Global Viewer Enterprise™ remote control network-based application that has previously been deployed on the campus to support the central AV/IT helpdesk in servicing the staff support requests.

AV SWITCHING, MATRIXING AND INTERFACING EQUIPMENT

- For consistency purposes, the building project will match (based on specific room requirements) the campus standards for all video and high-resolution graphics matrixing and switching equipment. The standard for all user interfacing and processing equipment will be Extron with a touch control panel configured for a standard "look and feel" to operate the spaces.
- All base signal switching equipment will accommodate a digital platform utilizing a single shielded CAT6 cable and will bring in al analog and digital signals into a common platform. A scaling receiver will be used at display devices to accommodate disparate signal resolutions to match each display parameters for all images show properly.

PROJECTION EQUIPMENT

- CSUCI has standardized on using Panasonic for all projection equipment to maintain a level of consistency. All projectors shall use laser light engines with 20,000 hours of "lamp" life and operation.
- The minimum brightness for projectors for the campus will be 5,000 ANSI lumens for typical classroom and lab projectors working in concert with light control shades to help minimize projector screen image washout but will use higher lumen projectors (6,500+) as required based on room photometrics and screen size. A base native resolution of 1920 x 1200 (WUXGA) will be used. Projectors shall have both Ethernet and serial RS232 ports for control.
- Da-lite ceiling-mounted and ceiling recessed projection screens shall be used. All screens shall be motorized type with a quiet motor with wall switch and parallel low voltage control in the rack for AV system operation. Any screens larger than 200" diagonal shall be tab-tensioned while all screens under 200" diagonal shall not have tab-tensioning.
- Wireless Presentation / Portable Device Mirroring

- CSUCI has standardized on using Extron ShareLink to support device mirroring and content sharing for iOS, Android, MAC OS, and Windows platforms. This will be connected to the Ethernet network.

ASSISTIVE LISTENING SYSTEM (ALS) EQUIPMENT

- All classrooms and AV spaces with occupancy levels of 50 seats or greater shall include fixed RF (72 MHz) ALS transmitters as well as portable RF receivers (no less than 2) to accommodate 4% of the occupancy level. All AV enabled spaces under 50 seat occupancy (including all conference and meeting rooms) will be outfitted with a monaural RCA output to accommodate the connection of a portable ALS kit that can be checked out as needed. A minimum of one portable kit per floor shall be allocated unless directed otherwise by CSUCI. All AV enabled spaces shall be outfitted with proper ALS signage. Note: All signs must conform to campus signage standards.

AUDIO SUPPORT

- In larger spaces, Extron Digital Audio Signal Processors (DSP) with Dante™ capability shall be used to better accommodate multiple microphones and speaker zones for digital audio signal processing and audio matrixing as well as Shure ULX-D wireless microphones and extension antenna(s) as required for signal distribution.
- Shure multi-element microphone array ceiling units shall also be used for room voice capture.

ROOM SCHEDULING SYSTEM

- Extron room 7” and 10” (depending on type of space) scheduling panels deployed outside of each main audiovisual and conference space.
- This system shall be connected to the data network via PoE cabling and mounted at +42” for ADA compatibility for easy height access. The system shall be interfaced to the existing Microsoft Exchange™ system for schedule and calendar interface.

WEB-CONFERENCING SUPPORT

- To support web-based conferencing and collaboration, the Extron MediaPort system shall be used to accommodate the conversion of AV signals to a USB format for connection and use with the room’s dedicated PC in larger spaces. In the Medium Meeting Rooms and typical Large Meeting Rooms, table or ceiling microphones shall be used. This unit has built-in audio echo cancellation for use in spaces that do not include audio DSP support.
- Logitech Pro HD USB cameras shall be used and connected to the system along with the microphone and program audio in the medium and larger spaces and the Logitech BC9000 series desktop cameras will be used in smaller meeting spaces.
- Web collaboration software (WebEx, Skype, Zoom, etc.) shall be installed on the room PC for conferencing and distance education support but may connect via portable laptop PC via USB but shall support other similar competing platforms

that may be needed to connect with as well as conference bridging services like BlueJeans.

8 Acoustical

ACOUSTICS BASIS OF DESIGN

This 100% Schematic Design Report (Acoustics Basis of Design, BoD) for California State University, Channel Islands (CSUCI) Gateway Hall Building (Project) is prepared based on the review of the Project 100% Schematic Design Architectural Drawings (ACM 6/03/2022), team meetings and the review of the California State University Procedure Manual for capital Projects.

This Acoustics Basis oof Design report provides the Project acoustics design intent, for interior sound isolations, architectural room acoustics, building services noise and vibration control, and floor structure vibration limit with respect to laboratory spaces. In particular, the report addresses the Project acoustical criteria and associated construction systems

A. Architectural Acoustics

1. Room Finishes

The type of room finish selected is the primary determinant of the room acoustics, or how lively or dead a space sound. In spaces such as the conference/meeting rooms, classrooms, and in the teaching laboratory (where some degree of speech communication is desired) the room finishes must be selected to maximize ease of speech/ communication between occupants.

Table 1 (below) provides recommended room finishes schedule.

Area	Wall	Ceiling	Floor
Lobby	d	b	c
Meeting / Conference Rooms	d	b	c
Large & Extra-Large Classrooms	d	b	c
Consultation Rooms / Counselor	a	b	c
Director Offices	d	d	a
Open Plan / Workstations	d	b	c
Private Offices	a	b	c
Huddle Room	a	b	a
Public Area (Corridor)	a	b	a
Student Services	d	d	a
Welcome Center	d	a	a

Notes:

a. Acoustical Treatment not required.
b. Sound Absorptive Ceiling Systems (suspended or attached to underside of floor structure)
c. Carpet or equally sound absorbing covering.
d. Acoustical Treatment (i.e., sound absorbing panel).

Table 1 – Recommended Room Finishes

2. Internal Sound Insulation

Project interior spaces, such as Welcome Center and Large Classrooms will require a high level of acoustics separation from adjoining spaces. Classrooms, Consultation Rooms, Counselor Offices will, also require high level of sound isolations.

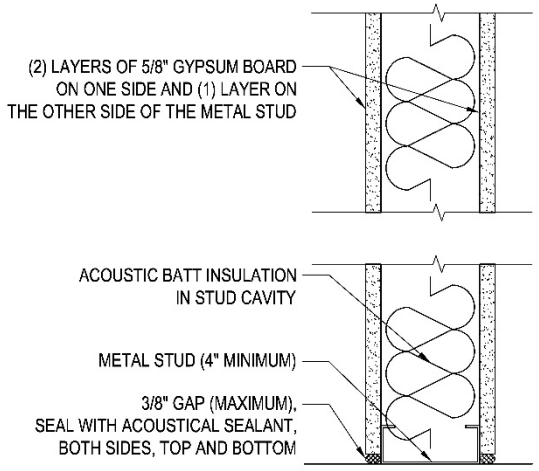
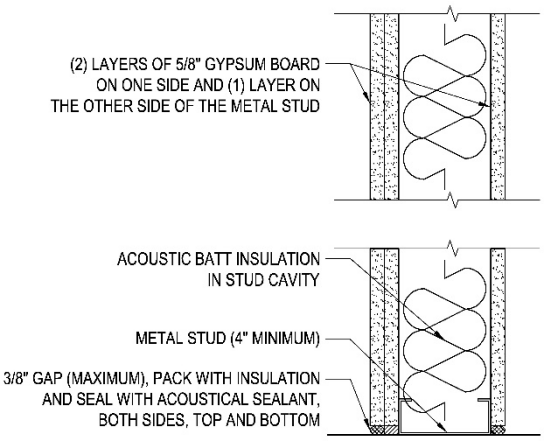
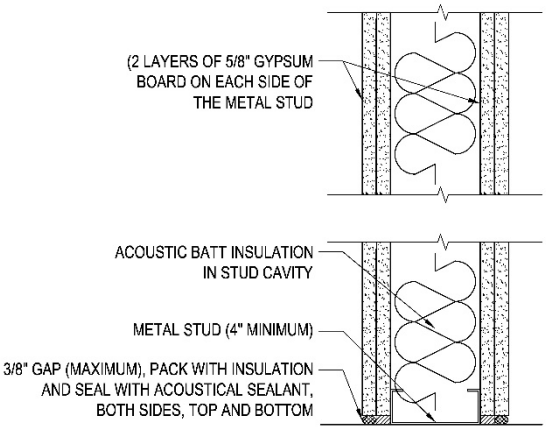
The sound reduction performance of conventional walls, doors, and floor/ceiling assemblies is described in terms of a criterion commonly referred to as Sound Transmission Class (STC). In addition to the acoustical privacy requirement, higher STC rating walls, doors, and floor/ ceiling assemblies are used to contain the building mechanical/electrical system and provide acoustical insulation between adjoining spaces.

The project minimum interior sound isolation, STC Ratings, are provided in Table 2 (below), and depicted, as markups on project architectural floor plans, A-201.1, A-201.2, A-201.3, A-201.4, A-202.1, A-202.3, A-202.4, and A-203.1 (included in the Appendix).

Room/Adjacency	STC Ratings[a]	Partition Height (Full Height; slab-to-slab)
Private Offices	45	Partial
Director Offices	50	Full
Faculty Offices, F/T Lecturer Offices	50	Full
Counselor Office, Huddle Rooms, Meeting Rooms and Consultation Rooms	50	Full
Huddle Room / Huddle Room Huddle Room / Open Study	50	Full
Welcome Center	55	Full
Large and Extra-large Classrooms	55	Full
Main electrical Room / Mechanical Equipment Rooms	55	Full

Table 2 – Recommended STC Ratings for Interior Partitions

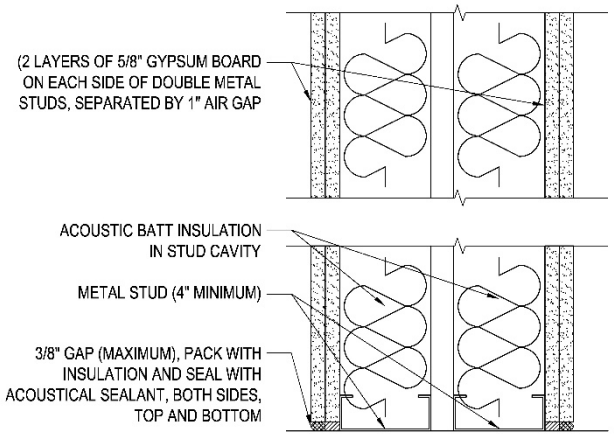
Table 3 (below and on the following pages) shows the recommended Sound Transmission Class, STC, ratings for various partition walls and constructions systems.

STC 45 Metal studs with a single layer of 5/8-inch thick gypsum board and fiberglass sound insulation blanket in the wall cavity. The gypsum board panels should be constructed from slab to slab. The gap between the gypsum board and slab should be filled with non-hardening acoustical sealant. Wall Thickness Minimum 5-1/4”.	 STC 45
STC 50 Metal studs with three layers of 5/8-inch thick gypsum board (two and one) and fiberglass sound insulation blanket in the wall cavity. The gypsum board panels should be constructed from slab to slab. The gap between the gypsum board and slab should be filled with non-hardening acoustical sealant. Wall Thickness Minimum 5-7/8”.	 STC 50
STC 55 Metal Studs with four layers (two on each side of stud). The gypsum board panels should be constructed from slab to slab. The gap between the gypsum board and slab should be filled with non-hardening acoustical sealant. Wall Thickness Minimum 6-1/2”.	 STC 55

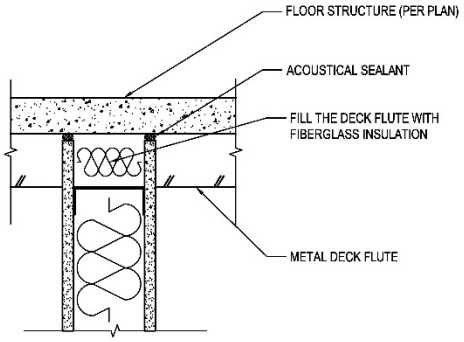
STC 60

Double studs with four layers of 5/8-inch thick gypsum board and fiberglass sound insulation in the stud cavity. The gypsum board panels should be constructed from slab to slab. The gap between the gypsum board and slab should be filled with non-hardening acoustical sealant.

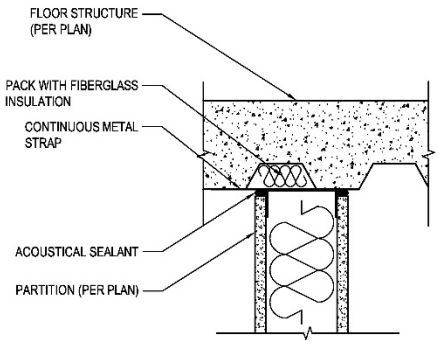
Wall Thickness Minimum 11-1/2”.



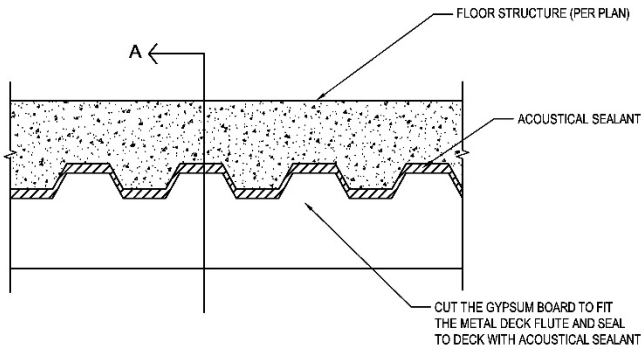
STC 60



SECTION A



PARALLEL TO FLUTE



PERPENDICULAR TO FLUTE

Acoustic-Rated Wall Head Detail

Table 3 – Wall STC Construction Descriptions (Minimum Metal Studs: 4”)

B. Building Services

The following provides guidelines on limiting noise and vibration from Project Mechanical HVAC and Electrical systems:

1. Mechanical System

Uncontrolled levels of continuous noise, such as that generated by the operating of mechanical services, can interfere with speech communication and cause annoyance inside the building and exterior to the building. If incorrectly isolated, vibration induced by HVAC equipment can cause floors to vibrate in excess of the Project floor vibration criteria. Design noise criteria for continuous background noise are established to act as design constraints for noise control in mechanical services systems. The Project design noise criteria (NC levels) have been established for each type of area and are presented in Table 4 (below). Actual NC design levels for various interior spaces will be based on the ASHRAE latest guidelines.

Occupied Space	Design Noise Criteria (NC)
Open Offices / Workstations	40
Welcome Center / Large and Extra-Large Classrooms	30
Private Offices	35
Meeting Rooms / Large Conference Room	30
Lobbies / Reception Lounge	35
Public Area	40

Table 4 – HVAC Noise Criteria

The following provides guidelines on limiting noise and vibration from HVAC systems, and as markups on project mechanical drawings, M-001, M-002, M-003, and M-204.1 (included in the Appendix)::

1. Air Handling Units (AHUs) and Exhaust Fans (EFs) will be located at the building roof elevation and/or within sound isolated interior rooms or at the roof level. The project mechanical equipment will be fitted with appropriate vibration isolations, as required to meet Project vibration limits. Roof mounted mechanical equipment noise emission to the exterior environment will be mitigated through the acoustical shielding provided, as required.
2. Project Emergency Generator, Electrical Switch Gears and Transformers location (outside and adjacent to the project building) will incorporate outdoor noise barrier walls and appropriate acoustical housings, in order to limit the potential noise impacts on the neighboring campus buildings.
3. Air Movement – Table 5 (on the following page) presents the recommended maximum air velocity (fpm) for ductwork. In addition to the duct air velocity, an aerodynamically efficient ductwork design will be employed following the applicable guidelines provided by HVAC industry and SMACNA.[1]

[1] Sheet Metal and Air-Conditioning Contractor's National Association, Inc.

Primary Ductwork	**Maximum Air Velocity (fpm)[1]**	
Main Supply/Return Riser (Above roof and within mechanical shaft	2,000	
Secondary Ductwork	**Maximum Air Velocity (fpm)**	
NC	**Branch Duct**	**Final Runout**
30	1,100	550
35	1,300	650
40	1,500	750
45	1,700	850

Table 5 – Recommended Air Velocity for Ductwork

4. Duct Noise Breakout - Wherever possible ductwork leaving Mechanical Equipment Rooms will be routed through non-noise-sensitive spaces. Where ducts must be routed through noise sensitive areas, wrapping the ducts with a noise attenuation blanket or placing them above hard-lid ceiling systems such as plaster or gypsum board will be considered. Ducts penetrating floors or walls structures near air handling units and passing immediately through or over noise sensitive spaces will be acoustically treated.
5. Sound Attenuators – the project mechanical HAVC design scheme will incorporate, as required, sound traps or silencers, in all the supply and return air systems serving occupied areas.
6. Variable Air Volume (VAV) Boxes – To control duct borne noise produced by the VAV boxes, duct sound attenuators or long lengths of 2-inch-thick duct lining (acoustic plenum) may be necessary where VAV boxes serve rooms with an NC30 or lower noise criteria.

12 Lighting

12 Lighting

Lighting Basis of Design

Design Approach

Lighting design shall be in accordance with the recognized professional standards of the International Association of Lighting Designers (IALD), the Illuminating Engineering Society (IES) and the American Institute of Architects (AIA).

In addition to state codes and regulations regarding energy efficiency, the lighting design shall contribute to the overall reduction of energy use with the goal of achieving LEED Gold status. In order to achieve targeted LEED credits,

- For all regularly occupied spaces, light fixtures shall have a luminance of less than 7,000 candela per square meter $(cd/m)^2$ between 45 and 90 degrees from nadir, OR achieve a Unified Glare Rating (UGR) rating of <19 using software modelling calculations of the designed lighting. Exceptions include wall wash fixtures properly aimed at walls, indirect uplight fixtures provided there is no view down into these uplights from a regularly occupied space above, and any other specific applications (i.e. adjustable fixtures).
- All light sources shall have a CRI of 90 or higher. Exceptions include lamps or fixtures specifically designed to provide colored lighting for effect or other special use.
- Dimmable or multilevel lighting will be specified for at least 90% of regularly occupied spaces.

In accordance with the California State University Indoor Lighting Design Guide and Campus Standards, the lighting design shall

- Provide visual comfort and attractive interior spaces, compatible with building and campus aesthetics and coordinated with interior architectural spaces and features,
- Provide light levels and uniformity appropriate for each area and task,
- Utilize low-maintenance, energy-efficient LED fixtures and sources,
- Minimize fixture, driver and lamp types for ease of maintenance,
- Provide dimming controls sophisticated enough to conserve energy, but intuitive enough for occupants to operate easily; these may include
    - Preset scene selectors,
    - Astronomical timeclocks,
    - Occupancy sensors,
    - Vacancy sensors,
    - Daylight sensors,
    - Wallbox dimmers,
    - Switches,
    - Integration with a broader Energy Management System;
- LED lighting for interior applications may range between 3000K and 3500K depending on the application, with some specialty lighting up to 4000K.

In accordance with the California State University Outdoor Lighting Design Guide and Campus Standards, the lighting design shall

- Provide good nighttime visibility,
- Provide light levels and uniformity appropriate for each area,
- Utilize low-maintenance, energy-efficient LED fixtures and sources,
- Minimize fixture, driver and lamp types for ease of maintenance,
- Minimize light pollution with fully shielded, full-cutoff luminaires for area and roadway lighting,

- Minimize light trespass and nuisance glare,
- Enhance wayfinding through illumination of buildings, landmarks, and signage,
- Switch or otherwise control feature, landscape, and art lighting separately from pathway, building façade, and security lighting, for potential load-shedding during late-night and campus holiday hours,
- Provide integration of exterior lighting controls with the campus energy management system, and/or other means as prescribed by Title 24 (2019) and Cal Green (photosensors, timeclocks, etc.),
- LED lighting for exterior applications is generally to be 3000K, although some specialty fixtures may be specified up to 4000K.

Interior areas and exterior lighting shall follow the non-residential lighting standards in accordance with Title 24 2019. Per CSUCI guidelines, energy use will be reduced below Title 24 allowances by at least 10%. Wattage use per area shall not exceed averages shown in Table A, at the end of this section.

Systems and Materials
Luminaires, components, and installation shall be in accordance with the American National Standards Institute, the latest revision of the National Electrical Code (NEC) and applicable federal, state, and local codes and regulations, including Title 24 2019 and Cal Green.

Luminaires, drivers, transformers, and other electrical components shall be manufactured in strict compliance with the appropriate requirements of the Underwriter's Laboratories, Inc. and/or others that may be applicable. The appropriate testing agency labels shall be affixed to luminaires.

Luminaires shall utilize low-maintenance, energy-efficient fixtures and sources, such as LED.

Lamps and integral LED light sources shall maintain a consistent correlated color temperature, and high color rendering index value. All LED light fixtures are to range between 3000K and 4000K depending on application.

The lighting design shall provide integration of exterior lighting controls with the campus energy management system, interior lighting control systems, and/or other means as prescribed by Title 24 2019 and Cal Green (photosensors, timeclocks, etc.). Interior lighting shall provide controls sophisticated enough to conserve energy, but intuitive enough for occupants to operate easily.

Luminaires for each area and room type will be determined based on the requirements of the space, the architecture and ceiling systems, as well as other aesthetic factors. Likely fixtures include the following by space type:

- Lobby – decorative luminaires, downlights and accents, linear lights,
- Corridor – downlights, linear fixtures,
- Auditorium – downlights, directional accents, decorative accents,
- Classrooms – 2x2 lay-in luminaires, linear pendants, wallwashers,
- Laboratories – 2x2 lay-in luminaires, linear pendants, wallwashers,
- Meeting Rooms – downlights, perimeter accents and/or slots, linear lights,
- Offices and Tutoring Rooms – 2x2 lay-in luminaires, task lights,
- Food/Vendor Services – track lights, downlights, wallwashers, decorative accents,
- Restrooms – downlights, wall-mounted linear lights,

- Exteriors – decorative Spanish-style luminaires, wall-mounted downlights, campus-standard pedestrian poles, accent lights.

Table A

Space Type (per Title 24)	**T-24 LPD (W/SF)**	**10% Reduction LPD (W/SF)**
Classroom	0.60	0.54
Corridor	0.40	0.36
Laboratory Spaces	0.90	0.81
Large Meeting / Multipurpose Areas	0.75	0.675
Lobby	0.70	0.63
Office / Small Meeting Room	0.60	0.54
Restrooms	0.65	0.585
Stairway	0.60	0.54
Storage Areas	0.40	0.36

End of Section

13 Signage

Introduction
The site and building signage for the CSU Channel Islands, Gateway Hall Project will be integral with the architectural design, while incorporating CSU-CI Identity Brand Standards where applicable. A well-planned approach to the programming and design of identity, wayfinding and code compliant signage will provide a user-friendly, CSU-CI branded experience for students, faculty and guests that utilize the Gateway buildings. All signage will adhere to the California Building Code (CBC) and California Fire Code (CFC) guidelines. Sign materials will be appropriately sustainable, durable and budget sensitive.

The following sign type categories have been identified for the project.

- Sign Type A: Exterior Site/Building Signs
- Sign Type B: Interior Identity & Wayfinding Signs
- Sign Type C: Code Signs

Exterior Site/Building Signs (Sign Type A)
The Exterior Site and Building Signs will provide identity and wayfinding for the project upon approach to the building. The exterior signage design will complement the CSU-CI Gateway architectural design and incorporate CSU-CI Brand Standards.

- A1 Building Name
- A2 Building Address Monument
- A3 Campus Directory
- A4 Pedestrian Direction
- A5 Accessible Entrance ID/Information

Interior Identity & Wayfinding Signs (Sign Type B)
Interior signage will provide identity and wayfinding within the building, including building directories, meeting/classroom identity, office identity and amenity identification where needed. The signage design will complement the CSU-CI Gateway interior architectural design and will be CBC code compliant where applicable.

- B1 Lobby Identification
- B2 Office Identification
- B2 Meeting / Multi-Purpose Room Identification
- B4 Building Directory
- B5 Blade Sign (Restroom & Stair Identification)

Code/Regulatory Signs (Sign Type C)
Code and Regulatory Signs will provide a level of information that is required by the California Building Code (CBC) and California Fire Code (CFC). This includes tactile signs for exit and exit routes, back-of-house rooms and restrooms, as well as fire and life egress safety signage.

- C1 Exit / Exit Route
- C2 BOH Room Identification
- C3 Restrooms (all Gender where applicable)
- C4 Emergency Evacuation @ Elevator
- C5 Stairwell Egress ID

- C6 Stairwell Level ID
- C7 Fire Code Stair & Level ID
- C8 Maximum Occupancy
- C9 Assistive Listening

Key Signage Objectives

The goal of signage is to provide clear and consistent wayfinding that is intuitive for the user and unobtrusive for those who know the way. The following wayfinding guiding principles are a useful tool.

- Consistency, use of message, placement and design
- Visual hierarchy, avoid over signing and clutter
- Direct line of site, consider sign placement, esp. at decision points
- Graphic landmarks, establish orientation via memorable visual cues
- Lighting, ensure the path is clearly seen
- You are here, clearly identifying the destination

Our team will use these basic wayfinding design principles to achieve wayfinding success for the CSU Channel Islands Gateway Project.