



Design Standards Manual

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Design Standards Manual Executive Summary

These guidelines and standards have been developed to promote the efficient, predictable, and cost effective design and construction of all new and modernized buildings on the campus of California State University, Long Beach (CSULB). The document establishes a framework that combines previously developed University Standards, new sustainable design guidelines and specifications, and operational and maintenance requirements. This Standard has been developed to include best practices as well as contributions from the Facilities Management Maintenance and Operations Staff. The guidelines in this manual serve as supplementary requirements to the State University Administrative Manual (SUAM), Office of the Chancellor Guidelines, Public Contract Code and governing Building Codes that shall be adhered to on all California State University (CSU) campuses.

Use of Design Standards Manual

Policy

California State University (CSU) policy is to set forth a framework of criteria and standards that establishes a level of consistency and quality for all new and rehabilitated building projects.

Scope

The A/E/C firms retained to execute the design of new and remodeled buildings will be expected to follow the Design Standards Manual, meet or exceed the standards described herein, and provide the consistency required within each project. The guide will not only provide the tools to meet these goals, but will furthermore offer the time- saving benefit of clearly identifying the level of quality and consistency that will be acceptable by CSULB. Providing these consistencies will greatly enhance the long-term maintenance of these facilities. The criteria and standards are generic for the projects overall. Specific requirements related to each project will be addressed in individual project specifications and during the design process.

Updates and Issues

Design Criteria and Standards are developed, edited and reviewed by representatives from Design and Construction Services, Capital Planning and Facilities Management. The Design and Construction Services Department is responsible for the maintenance and updating of the Standards. Proposed variations to the Design Standards Manual must be submitted in writing to the Director of Design + Construction Services for review and written approval prior to depicting such variations in the design documents.

Summary

The Design Standards Manual provides technical standards that the design and construction teams will be expected to meet or exceed.

Please note that this document is not distributed to contractors. Therefore, items herein identified as part of Contractor or CM responsibility will only become known when shown on consultant's contract documents. The Designer's documents are to include information pertinent to the contractor's scope of work (such as as-built information) so that the standards may be consistently applied. Therefore, consultants' document coordination effort must include those items in the CSULB Design Standards Manual that impact a contractor's or CM's ability to conform as well. This requires that consultants include all such contractor requirements from this manual in respective CSI specification sections and/or

drawings prior to document release.

Sustainable Building Requirements

New construction shall be designed to be zero-net energy and benchmark against a LEED Silver rating. Major renovation projects shall be benchmarked against a LEED Silver rating. The University will determine if formal project certification will be sought. Early on in the project it will be determined if LEED is the appropriate third party certification system for the project, or if other systems will be sought in lieu of, or in addition to LEED (i.e. Sustainable Sites Initiative, Living Building Challenge).

Conscientious design is the first step towards controlling the generation of solid waste on a building project. Effective design-stage waste reduction strategies include existing building reuse, optimization of building program, envelope and systems energy efficiency, the use of alternative building materials (salvaged, recycled content and rapidly renewable materials), detailing and dimensioning to limit material waste, proper planning for the storage and collection of recyclables, and sustainability-oriented design specification language and contractor requirements.

Green Cleaning Policy

Carpet and hard flooring materials must be compatible with cleaning products that meet the Appendix L program sustainability criteria.

Pest Management Plan

Refer to Appendix M for a sample pest management plan used for LEED credit.

Design Specifications and Construction Waste Management

Establishing waste reduction goals and implementing cost-effective Construction Waste Management techniques can significantly reduce environmental impact and provide economic advantages for projects of all types and scales. Currently, the University's established goal is for the recycling of 95% of all eligible materials post-abatement.

Project specifications shall require the contractor to submit a Construction & Demolition Waste Management Plan for approval by the University at the beginning of the submittal and review period (or earlier when applicable). This plan must include but is not limited to:

1. Analysis of the proposed job site waste to be generated, including the types of recyclable and waste materials generated (by volume or weight).
2. A list of each material proposed to be salvaged, reused, or recycled during the project.
3. A list of proposed recycling facilities to be used in the project.
4. An outline of proposed Project Waste Management meetings (At a minimum, waste management goals and issues shall be discussed at the pre-bid meeting, pre-construction meeting and regular jobsite meetings).
5. Materials Handling Procedures for removal, separation, storage, and transportation.

6. A Communication Plan for informing subcontractors and crews about the Waste Management Plan, establishing job-site instruction, notification and signage procedures for waste management and providing a methodology for documenting and reporting quantities and types of materials reused, salvaged, recycled, and disposed.
7. Proof of distribution times, weights, etc. from trucks removing debris from the project site.

Division 00 – Procurement and Contracting Requirements

GENERAL CONDITIONS CRITERIA

- A. Contract General Conditions and Supplemental General Conditions (Special Conditions) have been prepared by CSU Office of the Chancellor, Department of Capital Planning Design and Construction (CPDC) and have been approved by the Office of the General Council. General Conditions are not to be modified except via the approved Supplemental General Conditions.
- B. REFER TO CSU GENERAL CONDITIONS

<https://www.calstate.edu/csu-system/doing-business-with-the-csu/capital-planning-design-construction/Pages/cpdc-resource-library.aspx?&FilterField1=FormType&FilterValue1=General+Conditions>

The State Fire Marshal “Triage” form shall be followed for all projects; and all information noted in this form shall be included in all construction documents. Example form is located in Appendix C, and should be verified at time of submission. All State Fire Marshall projects shall be uploaded online for review.

Division 01 – General Requirements

The following are the suggested Division 1 sections to be included in a minor capital project, and will be provided to the Consultant by CSULB.

011000	Summary of the Work <i>(need to edit for summary of work and time of completion / LD's)</i>
012100	Allowances Procedures
012300	Alternative Bid Procedures
012900	Contract Considerations
013300	Submittals
013529	Safety and Health
014100	Regulatory Requirements
014500	Quality Control
015000	Construction Facilities and Temporary Controls
015600	Environmental Controls
015639	Temporary Tree & Plant Protection
017419	Construction Waste Management and Disposal
017419A	Contractor's Construction Waste and Recycling Plan
017419B	Contractor's Reuse, Recycling, and Disposal Report
017700	Project Closeout <i>(use minor cap version)</i>
017823	Operating and Maintenance Data <i>(use minor cap version)</i>

General Conditions (Specific to delivery method)
Supplemental General Conditions (Specific to delivery method)

For Reference Documents:
Geotechnical Engineering Report
Hazmat Report

The following are the suggested Division 1 sections to be included in a major capital project CMAR:

011000	Summary of the Work <i>(need to edit for summary of work and time of completion / LD's)</i>
012100	Allowances Procedures
012300	Alternative Bid Procedures
012900	Contract Considerations
013119	Project Meetings
013300	Submittals
013500	Alteration Project Procedures
013529	Safety and Health
013553	Security
014100	Regulatory Requirements
014200	References Standards and Definitions
014301	Coordination
014500	Quality Control
015000	Temporary Construction Facilities
015600	Environmental Controls
015639	Temporary Tree & Plant Protection
016200	Alternatives or Equals
016600	Material and Equipment
017300	Cutting and Patching
017419	Construction Waste Management and Disposal
017419A	Contractor's Construction Waste and Recycling Plan
017419B	Contractor's Reuse, Recycling, and Disposal Report
017500	Starting of Systems
017700	Project Closeout <i>(use major cap version)</i>
017823	Operating and Maintenance Data <i>(use major cap version)</i>
019115	General Commissioning Requirements

Add customized Division 1 Commissioning specifications from Cx Agent.
General Conditions (Specific to delivery method).
Supplemental General Conditions (Specific to delivery method).

For Reference Documents:
Geotechnical Engineering Report
Hazmat Report

The following are the suggested Division 1 sections to be included in a major capital project CDB:

011000	Summary of the Work <i>(need to edit for summary of work and time of completion / LD's)</i>
012100	Allowances Procedures
012900	Contract Considerations
013119	Project Meetings
013300	Submittals
013500	Alteration Project Procedures
013529	Safety and Health
013553	Security
014100	Regulatory Requirements
014200	References Standards and Definitions
014301	Coordination
014500	Quality Control
015000	Construction Facilities and Temporary Controls
015500	Pedestrian Controls and Access
015600	Environmental Controls
015639	Temporary Tree & Plant Protection
016200	Alternatives or Equals
016600	Material and Equipment
017300	Cutting and Patching
017419	Construction Waste Management and Disposal
017419A	Contractor's Construction Waste and Recycling Plan
017419B	Contractor's Reuse, Recycling, and Disposal Report
017700	Project Closeout <i>(use major cap version)</i>
017823	Operating and Maintenance Data <i>(use major cap version)</i>
019115	General Commissioning Requirements

Add customized Division 1 Commissioning specifications from Cx Agent.
General Conditions (Specific to delivery method).
Supplemental General Conditions (Specific to delivery method).

For Reference Documents:
Geotechnical Engineering Report
Hazmat Report

Geographic Information Systems (GIS)

All contracts are to include proper GIS as-built information. The following shall be included in the contract documents. At the end of the project this info shall be provided to the CSULB GIS Coordinator to incorporate into CSULB GIS mapping system. The following guideline shall also be included in Specification Section 017700:

Mark new information that is important to the University, but was not shown on Contract Drawings or Shop Drawings. Record actual construction, including:

1. GPS X, Y and Z coordinates of interior corner for utility manholes.
2. For underground utilities and valves installed and encountered:
 - a. Shoot horizontal centerline, width and vertical top of pipe/utility locations and valves, referenced to permanent ground improvements along with GPS X, Y and Z coordinates.
 - b. Service type.
 - c. Pipe/utility size.
 - d. Pipe/utility material
3. Field changes of dimension and detail.
4. Details not on original Contract Drawings. Applying copies of details produced and provided by Architect during construction will be accepted.

Mock Ups Required for Project

At the start of every project, the architect, contractor, and University shall determine the required mock ups for approval prior to installation.

Room Numbering

It is the intent of all projects to have permanent room numbers assigned during the Design Development Phase. It is the responsibility of the designer to initiate and complete this process; and the Project Manager's responsibility to gather required approvals. Campus Space Management must review and approve proposed room numbering before it is implemented in the project document set. All drawings shall include the University approved final room numbering system. Refer to Appendix D1 for room numbering requirements.

Classroom Acoustics

Classrooms should be spaces where listening conditions are excellent so that students can learn. Good listening conditions depend on four basic factors:

1. The amount of noise entering the room from outside sources.
2. The loudness of various sound sources within the room (with or without amplification).
3. The distribution of sound to all parts of the room.
4. The fidelity and clarity of the sound (lack of reverberation, distortion, etc.).

Reverberation time is the time it takes sounds to die down in a room. Speech intelligibility is better in a room with a lower reverberation time.

Reverberation is reduced through use of sound-absorbent finishes such as acoustical ceiling and wall finishes. Requirements for maximum reverberation times (500, 1000 and 2000 Hz octave band average) for unoccupied classrooms are .6 seconds for classrooms under 10,000 cubic feet and .7 seconds for classrooms from 10,000 to 20,000 cubic feet.

Speech intelligibility, critical for an effective presentation, is directly related to the acoustics of the room and the NC rating (background noise in the room). The best sound system cannot improve upon poor acoustics so it is essential to start with a relatively quiet room and good acoustics. The maximum NC rating is NC 25 for new construction and NC 30 for renovations. ANSI standard S12.60-2002 titled "Acoustical Performance Criteria, Design Requirement, and Guidelines for School" should be used as a guideline.

Division 02 – Existing Conditions - Hazardous Materials

The following are the campus standard specifications to be used for hazardous material abatement and will be provided to the Consultant by CSULB:

024119	Selective Demolition
028200	Nonfriable Asbestos Removal
028213	General Asbestos Removal
028300	Lead Specification

A hazardous material survey is required for all projects regardless of size.

Please note when submitting SCAQMD applications, the requestor shall not use the project address, but shall use the main campus address of:

1250 Bellflower Blvd.
Long Beach, CA 90840

The campus's EPA ID # CAD981414550.

Division 03 – Concrete

Concrete panels

1. For renovations, the requirement is to replace entire panel (joint to joint pending concrete layout) rather than a portion of the panel.
2. Standard details for sidewalks with rebar vs no rebar should be included in construction documents.

Division 04 – Masonry/Brick

Campus Standard Building Brick

Manufacturer:	Pacific Clay
Color:	Peach Modular Velour (AKA Imperial Peach)
Size:	Varies
Texture:	Wire Cut

Raked grout is preferred for installation and mock ups are mandatory prior to installation.

Please note this is not a standard product and custom manufacturing is required to produce this brick. Costs for minimum manufacturing are a typical issue as well as long lead times. It is suggested for very small projects that salvaged bricks from other areas of the project be used for minor patching.

Division 05 – Metals

Backing Requirements: 16GA metal studs shall be installed to provide backing for all bathroom partitions, Bath room accessories, or wall-hung items such as flat panel display screens. Maximum spacing of studs shall be 16" OC.

Exterior Metal Guardrails: See Appendix A – Hand Railing Design Guidelines

Division 06 – Wood, Plastics and Composites

No current CSULB design standard

Division 07 – Roofing, Thermal and Moisture Control

Campus Standard Roof

Manufacturer:	Tremco
Type:	Single Ply is standard but a built up roof can be considered, as it lasts longer, but the costs are usually prohibitive.

In order to maintain the lifetime warranty of existing roofs, the Tremco representative should be contacted to review all details of roof penetration.

Tremco contacts for CSULB work and design detailing:

Tremco Roofing and Building Maintenance
3060 E. 44th Street - Vernon, CA 90058
Contact is Steve Tolsma (714) 443-1744: stolsma@tremcoinc.com
John Weingarden (714) 287-3049 jweingarden@tremcoinc.com

Alternate manufacturer is Sarnafil: if needed for value engineering on new construction.

Building insulation materials must not contain formaldehyde in any form or amount, including phenol/formaldehyde or urea/formaldehyde binders.

Please note various manufacturers exist on campus and designer shall consult campus for confirmation of existing manufacturer prior to project.

Division 08 – Doors, Hardware, Openings, Glazing, Aluminum Storefronts and Window Wall

Aluminum Mullion Color

Arcadia - AB5 "Medium Dark Bronze"

Please note this is not a standard color and extended lead times are needed as well as increased costs.

Glazing

Solarban 70XL Solar Control Low-E Glass - Clear + Clear

This is a 1 inch unit with ½ inch airspace and two ¼ inch lites.

The campus historically does not want any glazing with a green tint to the glazing. This is why the clear was chosen in the past. As energy codes change, the exact model of the glazing may need to be revisited to meet building performance requirements.

Doors Hardware

CSULB Facilities Management will supply the cylinders for any upcoming projects. CSULB FM will key the cylinders in house. **CSULB Lock Shop will provide cylinders for contractor to install.**

1. Keyway: Medeco Biaxial E3 or Medeco HA
2. Panic exit hardware
 - a. Building doors: Von Duprin 99/98 rim panics
 - i. Fire rated doors: Must have 2SI indicator with Schlage Thumb XB11-979 turn on the inside
 - ii. Non-fire rated doors: Must have CDSI w/ADA mortise thumb turn.
Preferred thumb turn part # Ilco ADA-7181TK1-(finish either 26D (satin chrome) or 10B (dark bronze))
 - b. Outdoor gates: Von Duprin 98 rim panics. Closer is Locinox Mammoth HD
Ultra Heavy Duty 180. Outdoor gates must be Square Pole to accommodate Locinox closer or round post mounting bracket must be used.

This meets the Campus's requirements for safety and the ability to lock the doors from the inside without special tools.

3. Shelter in Place Hardware:
 - a. Shelter In Place for lever hardware is Schlage L Series mortise indicators with thumb turn.
 - b. Shelter In Place for panic hardware is Von Duprin Security Indicators with thumb turn.

Refer to Appendix N for applications and signage.

4. Key-Removable Mullion: Von Duprin KR 4954
5. Door lock sets: Schlage L 9000 Series
 - a. Offices/Small Classrooms: L9050-06A-L583-363 L283-711
(*finish dependent on application)
 - b. Store/Mechanical Rooms: L9080-06A
 - c. Single-use Restrooms/Lactation: L9056-06A I583-363 L283-722

6. Exterior gates: Von Duprin 98 rim panics. Closer is Locinox Mammoth HD Ultra Heavy Duty 180 series Ultra-HD. Outdoor gates must be square pole to accommodate Locinox closer or round post mounting bracket must be used.
7. Code/Proximity Locks: Alarm Trilogy ETPDL on panic hardware
PDL3500 or Networx PDL8600 with thumb turn on mortise lock
Cylindrical Locks: PDL 8200 WUSD
Panic Hardware: ETDLNI-RX WUSD
Gateway AL-IME3-POE GEN3
8. Thumb Turns: Schlage L583-263
9. Door Closer: LCN 4040XP-RW/PA
No concealed door closers, No floor closures, No cush arms. Overhead stops where needed(Ives 100S Preferred)
10. Door Pulls: VES VR910-NT or DL (No Off-Set Pulls)
11. Exterior Door Stops: IVES FS18 ("L" or tall may be required)
12. Interior Door Stops: IVES R14 dome floor stop (wall stops not allowed)
13. Door Coordinator: IVES COR Series Pemco Astragals
14. Handicap Operators: LCN Auto equalizer electro hydraulic 4630/4640
15. Handicap Operator Buttons: LCN 8310-836 TW w/8310-865 receiver or BEA 10LPR35-900MHZ buttons w/10RD900MHZ receiver
16. Hinges: All butt hinges to be HD ball bearing type
Continuous HD hinges required at heavy use doors. Butt hinges are to be Ives 5BB1HW plus finish.

Where interior or exterior doors are being removed or replaced, note that all locks, keypads, etc. are to be returned to CSULB.

Knox Box

Where required by LBFD, Knox Model 3202 should be used. Three sets of keys (labeled) are to be placed in the box. The box is shipped open for mounting purposes. Once ready, call or email LBFD Brian Weidman, brian.weidman@longbeach.gov, and they will meet someone on site and place the new sets of keys in the box and close it up.

Lock Policy

For the campus lock policy, refer to Appendix N.

Classroom technology equipment should be protected by individual equipment lockdowns and/or security cameras.

Doors:

1. Wood Doors: to be plain sliced white birch with a clear factory applied finish unless a different door is required architecturally. Wood door preferred for interior in lieu of painted for lower maintenance costs. All doors to have kick plates.
2. No sliding doors
3. Partitions: Any swing door in a partition shall be 1-3/4" thick. Door lock needs to be Schlage ND53LD-RHO, finish to be determined based upon application
4. Glass storefront doors: required to be wide style.
5. Restroom doors: required to have mop plates

ADA Requirements

The campus standard is to install an automatic ADA opener (LCN 4642) to the main entrance doors to a facility and/or high use areas regardless if the doors require them by code. Please review the location of auto openers with CSULB staff.

Division 09 – Finishes

Campus Colors

Campus Interior Palettes:

https://www.csulb.edu/sites/default/files/groups/physical-planning-and-facilities-management/DCS/campus_interior_finish_palettes.pdf

For University brand colors refer to Appendix V.

Paint

SCAQMD compliant Low VOC Paint and coatings are required. If the application is appropriate, zero VOC paint is recommended.

Sheen:

Accent walls:	Eggshell Sheen
All other walls and doors:	Semi-gloss
Door jambs:	Gloss

Manufacturer:

Dunn Edwards is the preferred paint manufacturer.
Sherwin-Williams and Vista are acceptable.

Standard Colors:

Exterior body:	Dunn Edwards “Bone” in flat or eggshell sheen
Metal, Doors and trim:	Dunn Edwards “Weathered Brown” or “Brown Owl”
Interior body:	New or renovations: refer to Campus Interior Finish Palettes: https://www.csulb.edu/sites/default/files/groups/physical-planning-and-facilities-management/DCS/campus_interior_finish_palettes.pdf
Red Bricks:	DEA 156 Cherry Cola

Coatings and Adhesives:

Materials on the AQMD pre-approved products lists are recommended:

<https://www.aqmd.gov/home/rules-compliance/compliance/vocs/architectural-coatings/supercompliant->

<https://www.aqmd.gov/home/rules-compliance/compliance/vocs/adhesive-and-sealants/rule-1168->

Products not identified on the list may be used (with EHS prior approval) provided they are below AQMD VOC limits::

<https://www.aqmd.gov/home/rules-compliance/compliance/vocs/architectural-coatings/tos>

<http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1168.pdf>

Carpet

Use of carpet tile is required. Rolled carpet is no longer preferred.

Laminate or vinyl type flooring

Minimum thickness of 2mm.

Exterior Plaster

Smooth acrylic plaster with fiberglass mesh for prevention of cracks and allowing lasting quality.

- Renovation/repair construction: Match existing conditions
- New Construction: Parex DPR Image Smooth Finish or Equal: Factory blended, exceptionally smooth, durable high-quality 100% acrylic polymer based finish, integrally colored
- Approved Manufacturers
 - <https://parex.com/tools/textures>
 - <https://www.lahabrastucco.com/>
 - <https://omega-products.com/acrylic-texture>
- Color: Parex Snowball(10400L), La Habra Stucco Solutions White(TK005222 Base 10, Color 533) or equal
- Finish: Steel trowel to achieve smooth texture with acrylic finish coat

Fire-Rated Walls

All fire-rated walls shall be labeled every 25ft with the verbiage “Fire-Rated Wall – Protect All Openings”. This shall apply to new walls being constructed. Any modifications to existing rated walls shall have this verbiage added to the walls.

Acoustical Ceiling Tile

Manufacturer: Armstrong
Series: Ultima
Style/Model: Beveled Tegular 9/16"/#1912
Tile Size: 24"x24"x3/4"
Finish: White
Suspended Grid: Silhouette XL9/16" Bolt Slot – 1/8" Reveal
Fire Rating: Class A Fire Rated
Acoustical Rating: NRC 0.75/CAC 35

Division 10 – Specialties

Automatic Defibrillators

Automatic External Defibrillators, shall be purchased through the Office of Environmental Health and Safety to maintain compliance with campus medical oversight provider guidelines.

https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=19300.&lawCode=HSC

Locations and quantities shall be coordinated with architect and the Office of Environmental Health and Safety.

Restroom Accessories

1. Toilet roll dispenser: Bobrick B-2892 (rolls only)
2. Paper towel only (rolls): San Jamar T1100TBK Classic Lever Black pearl
3. Toilet seat cover:
 - a. Preferred: Recessed on the wall behind/above the toilet Bobrick B-301
 - b. Alternate: Surface mounted Bobrick B-221
4. Sanitary napkin disposal:
 - a. Preferred: Recessed on the wall behind/above the toilet Bobrick B-353
 - b. We can do surface mounted as an alternate if needed Bobrick B-254
5. Mirrors: no preference
6. Soap Dispensers: To be provided by CSULB
7. Hand dryers: XCELERATOR Hand Dryer (if provided)

Model number XL-SB

8. Trash receptacle:
 - a. Single stall restrooms: Recessed or semi-recessed preferred
 - b. High use restrooms: Rubbermaid 3958 - 35gal gray bin
9. Baby changing station: Koala Kare KB110-SSWM Horizontal wall- mounted, stainless steel finish
(Refer to AB 1127 as applicable)
10. All Custodial closets/rooms shall have overhead shelving installed and a wall mounted mop/broom rack.

Restroom Partitions

Restroom partitions are to be ceiling hung in all new construction or major renovations if budget allows.

Partitions to be $\frac{3}{4}$ inch in thickness.

Stainless steel preferred in new construction but Trespa/Phenolic are also acceptable in renovations.

Coat hooks and/or purse shelves shall be installed in stalls.

Shower Partitions

Shower partitions are to be Phenolic and not Stainless Steel.

All-Gender Multi Compartment Restrooms

Compartments shall be arranged for left-hand or right-hand approach to the water closet. For compartments with width below 66 inches, at least one side partition shall provide a toe clearance of 9 inches (229 mm) minimum above the finish floor and 6 inches (152 mm) deep minimum beyond the compartment-side face of the partition, exclusive of partition support members. Partition components at toe clearances shall be smooth without sharp edges or abrasive surfaces. Compartments for children use shall provide a toe clearance of 12 inches (305 mm) minimum above the finish floor.

Please also reference CPDC - A/E Technical Bulletin A/E 17-004 "Inclusion of All-Gender Multi Compartment Toilet Room Facilities in CSU Facilities". This can be found here:

https://www.calstate.edu/csu-system/doing-business-with-the-csu/capital-planning-design-construction/Documents/TB-17-004_all-gender_inclusion.pdf

Lactation Rooms (Refer to AB 2785 and SB 142 as applicable)

New building constructions or building renovations costing five million dollars or more shall include a room, other than a restroom, for expressing breastmilk or breast-feeding an infant child.

The room shall include:

1. A comfortable place to sit
2. A table or shelf to place a breast pump or any other equipment used to express breastmilk
3. Access to a power source
4. A sink

5. A small refrigerator (not required but recommended)

Signage

Room and space numbering shall be done in accordance with CSULB standards. Refer to Appendix D1 for space numbering parameters.

All room identification signage shall follow the adopted standard from the campus as described in detail in attached Appendix D2. The choice of where to use each of the standard sign types shall be project specific and discussed with the customer at time of design.

All Gender restroom signage shall be provided per Appendix D3. All single use restrooms shall be noted as “all gender” per AB 1732. Please also reference CPDC - A/E Technical Bulletin A/E 17-001 “The California State University All Gender Facilities”. This can be found here

<https://www.calstate.edu/csu-system/doing-business-with-the-csu/capital-planning-design-construction/Documents/TB-17-001-All-Gender.pdf>

Exterior signage that is exposed to weather and sunlight is preferred to be stainless steel or aluminum. Exterior room identification signage should still maintain the current design standard.

ALL code signage shall be designed by the design architect as part of the project, and should match the same color, font and design of the campus standard room identification signage. Frames are not required on code EXIT, Restroom and EXIT ROUTE signage.

Sign posts are required to be round, instead of perforated metal posts.

Building Name Signage

Font:	Futura Medium
Company:	Machan Sign Company
Material:	063 Aluminum/vertical grain with stain protective clear coat. They shall be fully backed to prevent debris and insect nesting.
Height:	Varies from 8” – 12”
Depth:	+/-1.5” and designed to standoff from building approx. 1/8”.

Final size, depth and spacing of each letter should be determined on a case by case basis as building heights vary.

The “O”s need to have the metal grain installed in the same direction as the rest of the letters or it changes the perception of the metal color significantly.

As part of the design process, Campus Planning should specify the wording, letter size, and location.

Prior to letter fabrication, a paper template shall be put in place by vendor and approved by Campus Planning to ensure size and location is appropriate.

Fire Extinguishers

Manufacturer: Amerex 5lb ABC Extinguishers or equal Model number: B402/T

Certifications on the extinguishers shall be current when installed.

Fire Extinguisher Cabinet

Manufacturer: Potter Roemer
Do not use JL Industries Cabinet

Model: Recessed or Semi-recessed cabinets in public accessible areas.
No cabinet needed (just wall hook) in special access spaces (i.e. electrical, telecom, mechanical rooms).

Door Style: Break glass w/ lock or break rite handle.
All cabinets are to be a lockable type.

Cabinet Lock: LL24
Finish: Stainless Steel
Lettering: Red vertical letters on cabinet.

Window Treatments

Manufacturer: Mecho Shades or equal

Storage Containers

The following criteria must be met when installing storage containers:

1. Written approval from Campus Planning is required for any storage containers to be placed on campus property. Purchasing Department shall confirm approval prior to placing orders for storage containers.
2. The need for a container must be demonstrated and that there is no other reasonable alternative.
3. Storage of items beyond standard academic/athletic storage require approval from Facilities Management.
4. Storage of hazardous materials is not permitted.
5. Container must be painted to blend with environment.
6. Fencing is required so that container cannot be seen outside its area of use.
7. Owner is responsible for maintenance and disposal.
8. If permanent facilities are built to handle the storage need, the container must be removed.
9. Containers which are unopened over the course of a year shall be considered for removal.

Administrative Office Standards

Office space will be provided according to the following:

1. Campus President	300SF
2. Vice President or Dean	180SF*
3. Associate Dean, Division Chairman, Associate Vice Library Director	140SF*
4. Department Head or Librarian	140SF*
5. Professional Staff, one occupant (faculty or other basic)	90SF*
6. Professional Staff, two occupants	160SF
7. Professional Staff, three occupants	240SF
8. Professional Staff, more than three occupants	240SF+80SF/added occupant
9. Secretary or Receptionist	160SF
10. Clerical or Technical Support Staff, two occupants	160SF
11. Clerical or Technical Support Staff, three occupants	230SF
12. Clerical or Technical Support Staff, four occupants	300SF
13. Student Assistant	60SF
14. Five occupants or more	300SF+75SF/added occupant

*Indicates a sliding office door is required to attain both required meeting space and ADA clearances at room entry.

SUAM Standards: <https://calstate.policystat.com/policy/8567706/latest#autoid-nwrny>

Evacuation Chairs

Refer to campus standards in Appendix B.

Division 11 – Equipment

No current CSULB design standard

Division 12 – Furnishings

Campus Standard Bus-Stop

Manufacturer: Landscape Forms (Michigan)
Color: Black
Options: Solar Panel and Lights

Manufacturer's Rep: Kiri Miles
(800) 441-1945 Ext. 1206

Model: Kaleidoscope
Dealer: Chaparall (Studio City) (818) 761-0655

Website: <https://www.landscapeforms.com/en-US/product/Pages/Kaleidoscope-OS.aspx>

Campus Standard Bike Rack

Manufacturer: Ground Control Systems (Formally Park-a-Bike)
 Model: Varsity Bike Dock DV-215

Color: Duraplas Thermoplastic Finish- Black

Mounting: In ground mounting is preferred for new construction installations.
 Surface mount is acceptable at existing concrete.
 If surface mount is used, make sure stainless steel tamper proof bolts are specified.

*Please note all bike racks are to be specified to be shipped with CSULB “Go Beach” logo installed at the factory onto the bike friendly Smart Guards. CSULB has purchased these logo decals and the factory will install if requested when ordered.

Campus Standard Skate Board Rack:

Manufacturer: Ground Control Systems (Formally Park-a-Bike)
 Model: Skate Dock SM-10x
 Color: Hammer tone powder coat grey.
 Mounting: Surface mount is only option. Ensure tamper proof bolts are specified.

Campus Standard Waste/Recycling Bins

Reference Appendix G for “zero” waste bin requirements. Waste/Recycle bins shall be specified as part of the project contract documents providing coverage to all exterior areas of the project and public areas.

New break rooms and hallways must have space to accommodate the zero waste bins.

Furniture

Classrooms:

Student Chair with Tablet (intent is to promote active learning):

1. Chair/Tablet combo
2. With wheels/ castors (specify for hard surface or carpet)
3. No book/bag shelf below the seat or basket
4. 10% of the tablet arm chairs need to be left handed
5. The tablet also needs to be-large enough to comfortably support a laptop computer

Examples of current furniture that is well received on campus is located in Appendix I:

- KI L2 Strive Tablet Arm Chair
- Allseating Multiflex Tablet Arm
- ChairVery Task Chair

Classrooms / Lab Students Tables:

1. Seats 2-3 per table
2. Nests for storage

Attached please find examples in Appendix I.

1. Hon-Huddle3 nesting table
2. Planes-Nesting Table-Brochure

Teacher Stations:

Refer to Appendix H “Classroom Teacher Station” for what has recently been considered the campus standard.

Indoor/Outdoor Benches:

Refer to Appendix K for basis of design.

Division 13 – Special Construction

No current CSULB design standard

Division 14 – Conveying Equipment

Thyssen Krupp is not to be used as a basis of design on this campus.

Modular elevators are an acceptable solution where applicable.

LED lights are required within elevator cabs.

Cab interior and flooring shall be specified to match the building architecture.

Division 21 - Fire Suppression

Fire Sprinkler / Standpipe Systems

A line size approved backflow prevention device and shut-off valve shall be provided for the building fire sprinkler supply main at point of connection to the water main on site.

The system must conform to the latest California Building Codes, and current editions of NFPA-13, 14, 24. Fire sprinkler system design must be in accordance with the current editions of the California Building Code Volume 1, Chapter 9 and NFPA 13. Standpipe system design shall be in accordance with the current editions of the California Building Code Volume 1, Chapter 9 and NFPA 14.

The design team shall take new flow readings for each project to base design and be documented by NFPA 291. The flow tests may need to be witnessed and approved by the State Fire Marshal. Final design of the suppression system must include the underground piping and the riser piping.

Fire sprinkler and standpipe systems shall be listed as deferred approval submittals on the construction documents. When possible a design-build subcontractor shall be brought on board during the design process to complete these submittals prior to construction.

The system shall provide monitored control valves and water flow switches as well as a system drain/test connection on branches to individual sprinkler systems. All control valves and water flow switches must be individually addressed and annunciated at the fire alarm control panel.

All isolating and sectionalizing valves on the fire protection system must have tamper switches that are individually addressed and annunciated at the fire alarm control panel. Coordination with the campus Johnson Controls (formerly Simplex) fire alarm system and fire alarm shop drawings are required.

System components must include:

1. Alarm check valve located inside the building with electric bell located on the exterior of the building.
2. Double detector check backflow preventer with a listed indicating OS&Y gate valves, check valve and fire department pumper connection; located outside the building.
3. The FDC located within 150' of a fire hydrant.
4. Valve and water-flow switch monitoring.
5. Audible sprinkler flow alarms on the exterior and interior of the building.
6. Capacity to drain the entire system to the appropriate line (sanitary).

Connect fire main to the existing underground potable water system. Design-Builder to verify existing pressure; an electric fire pump and jockey pump may be required if existing pressure is inadequate.

Exposed piping is unacceptable except in rooms without concealed spaces above ceilings or within walls.

Fire pumps must be protected by an enclosure with roof.

Sprinkler heads must be spaced for symmetry with ceiling features. Ceiling features include, but are not limited to, walls, lights, air inlets and outlets, ceiling tile edges, and other architectural ceiling features.

Sprinklers in telecommunication rooms must be protected by wire cages and shall not be located directly above equipment racks. Telecommunication rooms must be served by a pre-action type system.

Riser or cross mains will be ASTM A 795 Steel Piping schedule 40 black steel pipe. All other sprinkler piping will be either ASTM A 795 schedule 40 black steel pipe, or ASTM B 88 Type K copper tube installed in an approved manner. Connections or fittings shall be threaded, flanged, grooved or welded.

Division 22 - Plumbing

The plumbing systems described in some cases are recommendations or proposed approaches only and in some areas are prescriptive. Designer is responsible for final systems selection, design, engineering, installation, and performance for a complete and functional system that meets all requirements of the project and CSULB.

Hydration stations

Models:

Standard:	Elkay LZSTLDDWSVRSK
Outdoor:	Elkay LK4430BF1U – Black

Main Shut-off Valves

All restrooms, kitchens, mechanical rooms, laboratories or other areas will be provided with a main shut-off valve for each type of service, such that any area may be isolated without affecting services to other areas served by the distribution service. Shut-off valves shall be located in a consistent, accessible

manner for emergency shutoff. All shut off valves shall be Nibco full port ball valves (or equal).

Back Flow System

1. Backflow preventers installed inside must be a minimum distance of twelve (12) inches above the floor, and no higher than four (4) foot above the floor, with adequate clearance around the backflow preventer for testing and/or repair.
2. A minimum of 30 inches of clear space shall be maintained between the front side of the device and the nearest wall or obstruction. At least 8 inches clearance should be maintained from the back side of the device to the nearest wall or obstruction.

General Domestic Water Systems (CW, HW)

A new domestic water service line and backflow prevention will be provided for each building to provide for all domestic water demands, as well as industrial water (laboratory buildings) needs. The main building supply shall be designed with a parallel backflow system to ensure that if one backflow is down for maintenance, service can still be maintained. If this is not possible for extenuating circumstances, the backflow must be designed with a bypass line to supply minimum water needs in the case of maintenance of the back flow.

All backflow preventer assemblies shall be specified in the contract documents to be tested and certified. This certification shall be turned over to CSULB for submission to Long Beach Water Department.

Domestic hot water shall have a hot water recirculation pump provided. Water temperature within the hot water distribution system shall be maintained by means of a hot water return system designed to maintain a 5°F temperature differential between the hot water supply and return piping connections at the storage tanks. Bell and gusset circuit setting valves (or equal) shall be used for balancing valves in the hot water system.

Provide water meter connected to EMS for domestic water service. Water meter shall be Innov8-VNr with remote integral antenna or approved equal.

Groups of fixtures on each floor shall be provided with isolation valves for ease of maintenance. Each plumbing fixture shall also be provided with individual isolation valves (fixture stops) for maintenance purposes. Separate isolation valves are required for main supply to building, each toilet room, and each floor.

Tepid potable water will be supplied to drench hoses and safety shower/emergency eyewash fixtures in the laboratories. Water temperature shall be controlled by a thermostatic mixing valve at the water supply side of the fixture.

Local “insta-hot” heaters are acceptable only at an individual fixture that is in a remote location relative to the main hot water distribution piping. Heat tape is not acceptable.

Water hammer arrestors will be provided in the wall, as required, behind an access panel. Trap primers with isolation valves and access panels for new floor drains will also be provided.

Restroom Fixtures:

1. Lavatory: American Standard Lucerne Wall-Hung Lav
2. Lavatory Faucet: Milano auto faucet; 4" OC; Model 1818967
3. Water Closet: Wall-mounted American Standard AFWall Millennium
Flowise Elongated Flushometer Toilet (elongated bowl only, top spud)
If floor mounted is needed due to wall thickness, use:
American Standard MADERA FloWise 16-1/2" Height, Elongated
Flushometer toilet, Model 3541.001
4. Flushometer: Zurn model # ZTR6200EV-LL- Battery powered is preferred
5. Urinal: Zurn model # Z5755-U
6. Urinal valve: Valve must be 0.125gpf
7. Toilet seat: Use "Olsonite 10" toilet seat.
8. Insta-hots: Not allowed, only water tanks

Restroom fixtures shall be operated by hard wired infrared technology.

Urinals shall not be the waterless type.

Faucets and flush valves shall be provided with metal cap and manual bypass.

Isolation valves and unions at equipment connections are required.

Minimum supply pipe size is 1/2" for one plumbing fixture with a maximum flow of 2.0 gpm, 1-1/2" for a flush valve water closet, 3/4" for a shower or sink and 1-1/4" for a urinal.

Provide 3/4-inch hose bibs, with atmospheric vacuum breakers, to allow service to all areas of the exterior (including roof) with a 50-foot hose.

Provide at least one set of hose bibbs with vacuum breaker (hot and cold) under the lavatories in each public toilet room. Cold water hose bibb only is acceptable if a mop sink is within 100 feet of the restroom.

Floor type service sinks are required in custodial closets. Custodial mop sinks higher than 6" above floor level are unacceptable.

All restrooms shall have a floor drain.

Emergency Showers

Eye wash and emergency showers must comply with the regulations in CCR Title 8 and ANSI/ISEA Z358.1-2014. Emergency eye or eye/face wash equipment shall be provided in all work areas where, during routine operations or foreseeable emergencies, the eyes of an employee may come in contact with a substance which can cause corrosion, severe irritation or permanent tissue damage or which is toxic by absorption. Emergency eyewashes and/or showers must be within a travel distance no greater than 100 feet from hazard, and attached to soil system.

Manufacturer: WaterSaver

Models:

- Free Standing Safety Station with Eye/Face Wash: WaterSaver Model SS950
- Recessed Safety Station with
Wall Mounted Expose Shower Head: WaterSaver Model SSBF2372
w/ Speakman SE-350 E-Shower
Thermostatic Mixing Valve using a
Speakman SE-356 Cabinet

Natural Gas Systems (G)

Seismic shut-off valve(s) will be provided at all buildings' natural gas piping points of entry and at the point of connection to the site main. Gas meter is required to be installed and connected to the EMS.

Sanitary Sewer, Waste and Vent Systems (W, V):

Soil/waste drainage piping will be provided to each domestic plumbing fixture and at eye wash and emergency shower stations and shall discharge by gravity. Provide sewage ejector(s) only for fixtures located below the building's soil system main. Sewage ejector pumps shall be grinder type pumps.

Sanitary drainage ventilation piping will be provided to each domestic plumbing fixture or trap and will terminate at various locations on the roof.

Design horizontal sanitary, vent and drain piping for a uniform grade 2% ($\frac{1}{4}$ " per foot).

HVAC condensate drainage piping (CD) will be provided to each HVAC unit. Such piping will drain to an indirect waste connection to the sanitary soil/waste system via either tailpiece connection at the nearest lavatory or sink; to a fixed air gap mounted within a stainless steel panel in the wall (not preferred), or to a floor sink. All condensate piping interior to the building shall be insulated.

Roof air handler condensate shall drain to roof mounted receptors adjacent to air handlers. Receptors shall have elevated rims above roof level to prevent drainage of rainwater into the soil system.

Floor drains are required in toilet rooms, rooms housing chillers, boilers, pumps or open tanks; at safety showers, and at the filter section of an air handler if it is of the 'built up' type.

Drip pans are required wherever drainage or piping passes over the top of electrical equipment or other sensitive areas. All drip pans must discharge to an indirect waste receptor or tie into the tailpiece of a lavatory or sink. When the discharge piping is larger than 1" it shall terminate at an indirect waste receptor. Draining to floor surfaces is unacceptable unless specifically approved by CSULB.

Cleanouts are required to be the same nominal size as the pipe they serve, except where they occur in piping eight inches and larger; six inches size is acceptable. All cleanouts are required to be accessible. Cleanout locations must be approved by CSULB before installation.

Cleanouts are required at all of the following locations minimum:

1. Horizontal offsets
2. End of soil, waste, water or storm drains more than five feet in length

3. Maximum of 100 foot intervals of horizontal runs within the building
4. Base of vertical sanitary stacks and storm drain leader lines
5. Each change of direction if the total aggregate change exceeds 135°
6. Main sewer connection outside of building. 2-way cleanout with dual access plugs (threaded bronze, thermoplastic, or PVC) is required at this location. Cleanout shall be installed in round cast iron valve box marked "Sewer"

Drainage Systems (RD, OD):

The roof drainage system of the building will be connected to the storm drain system. Overflow drains will discharge to a visible location.

Sump pumps for general building drainage are not preferred but acceptable only if gravity flow cannot be achieved, in which case duplex submersible style intrinsically safe units equipped with automatic float controls and high water alarms are required. All basins must be designed for full immersion.

Domestic Systems Piping Materials:

HW, CW:	Type L copper pipe, with wrought copper fittings and brazed or soldered joints. Pro-press is acceptable.
G:	Schedule 40 black steel with threaded galvanized malleable iron fittings as required.
W, V:	Heavy duty cast iron. No hub, minimum 1/4" per foot slope. 4 band couplers required at all locations below or above grade.
CD:	Type "L" copper, insulated, minimum 1/4" per foot slope.
RD, OD:	Heavy duty cast iron. No hub, minimum 1/4" per foot slope.

When connecting to existing storm or sewer piping, utilize shielded couplings such as Fernco RC 1000 Series Couplings or equal.

Laboratory Systems

De-ionized (DI) water will be generated utilizing centrally located equipment provided on a leased basis from a vendor approved by the University. A recirculating loop shall be provided at each floor. Piping distribution and outlet services will be extended to the laboratories and laboratory classrooms. Looped piping will be provided to the outlets.

Equipment sizing shall be based on laboratory DI outlets and equipment demand (glass washers, etc.) as well as distribution/recirculation pipe routing and configuration. One meg ohm purity water resulting from deionization will meet the requirements of most laboratories but this shall be confirmed during programming. Owner furnished local units fed from the central system will be provided where higher purity water is required typically.

Central compressed air system shall consist of duplex oil-less type air compressors, air receiver tank, refrigerated air dryer and associated appurtenances. Piping distribution and outlet services will be extended to the laboratories and laboratory classrooms. Oil-free instrument grade compressed air (A) of

100 PSIG, dried to 2.1 grams of water per pound of dry air (37°F pressure dew point) is required for distribution but this to be confirmed during design. Pressure reducing valves at laboratory point of connection above the ceiling will be required to provide typical 15 PSIG, or other required pressure at laboratory services (LA). Control will be lead/lag operation. Auto condensate blow-down is to be installed on all receiver tanks.

Preferred Manufacturers:

BEACON MEDICAL AIR, POWEREX and INGERSOLL-RAND.

Preferred Manufacturers for Refrigerated air dryers:

INGERSOLL-RAND, HANKISON and SPEEDAIRE

Central vacuum (VAC) system shall consist of duplex vacuum pumps, air receiver tank and associated appurtenances. Piping distribution and outlet services will be extended to the laboratories and laboratory classrooms. A minimum 23 inch Hg negative pressure at the point of use is required but this to be confirmed during design. Vacuum pumps utilizing an air purge feature to protect internal components from possible chemical corrosion are required. Control will be lead/lag operation. Vacuum exhaust venting must be taken up to the roof away from walk-ways, air intakes, and operable windows.

Preferred Manufacturers: BECKER, BUSCH and DEKKER.

Industrial cold water (ICW) will be supplied from the building domestic cold water (CW) system. A central backflow prevention device with bypass, is required to isolate the industrial cold water system from the main potable water system supply entering the building. Industrial grade water will be routed throughout the building to serve each laboratory with industrial cold water requirements.

Industrial hot water (IHW) will be supplied from the building industrial cold water (ICW) system. IHW may be generated from boiler(s) or heat exchangers utilizing heating hot water. All IHW systems shall have a hot water return system.

Laboratories will be provided with a corrosion resistant drainage system without neutralization tank(s) prior to the connection to the sanitary sewer outside the building. CSULB does not want to be licensed as a treatment facility therefore these neutralization tanks are not to be installed. We have procedures that prevent the dumping of chemicals within the SS system.

Laboratory Systems Piping Materials

LA, A: Cleaned for oxygen use and capped Type L copper pipe, with wrought copper fittings and brazed joints; nitrogen-purged. Valves cleaned for oxygen use.

VAC: Cleaned and capped Type L copper pipe, with wrought copper fittings and brazed joints. Vacuum piping larger than 3 inches in diameter will be Schedule 40 PVC with solvent joints.

DI: Schedule 80 PVC or SDR-11 Polypropylene (socket fusion) designed for pure water applications with true union ball valves.

IHW, ICW: Type L copper pipe, with wrought copper fittings and brazed or soldered joints.

LW, LV: Mechanical joint polypropylene above grade. High silicon iron Duriron/Novacast or Bonstrand below grade.

Piping and valve material for the sea water system shall be polypropylene. Piping and valve material for the aeration system shall be PVC.

Piping insulation materials must not contain formaldehyde in any form or amount, including phenol/formaldehyde or urea/formaldehyde binders.

All electrical equipment in sea water and aeration systems shall be on emergency power.

All piping components subject to sweating or heat loss will be insulated with appropriate thickness of insulation and fire-retardant jacket.

All electrical equipment in sea water and aeration systems shall be on emergency power.

Break Rooms

New break rooms must have a sink.

Valve Boxes

Slip can valve boxes are not allowed. Models with easy-to-remove covers are required such as Oldcastle models G04, F14 or G05T.

There should be a 6 in-wide mow strip around valve box.

Pneumatic Systems

Permanent capping of air compressor pneumatic lines:

- If it's copper- either solder a cap on the end or secure with a compression fitting.
- If it's nylon tubing- secure with a brass plug or a compression fitting.
- If a compression fitting is used on nylon tubing- must have a plastic tube insert.

The following campus standard specifications are to be used and will be provided to the Consultant by CSULB:

220719	Plumbing Piping Insulation
221116	Domestic Water Piping

Division 23 - Heating, Ventilating, and Air Conditioning

The mechanical systems described in some cases are recommendations or proposed approaches only and in some areas are prescriptive. Designer is responsible for final systems selection, design, engineering, installation, and performance for a complete and functional system that meets all requirements of the project.

	Cooling	Heating
<u>Indoor Design Conditions</u>	<u>Temp/RH</u>	<u>Temp/RH</u>
Offices	76°F/50%	70°F/30%

Classrooms	76°F/50%	70°F/30%
Telecommunications spaces	76°F/50%	70°F/50%
Laboratories	76°F/50%	70°F/30%
Support Spaces	76°F/50%	70°F/30%

*Please note these values shall be reviewed with the project team for confirmation on each project. This is a suggested baseline.

External Loads

External loads must be based on actual material and construction proposed using design temperatures. Internal shading may not be used to reduce the load calculated. Fixed exterior shading may be allowed to reduce calculated cooling load.

General HVAC System Design Criteria

Arrange and orient the outdoor air intakes to minimize contamination from undesirable sources such as plumbing vents, boiler exhaust, garage exhaust, general building exhaust, fume hood exhaust, emergency generator exhaust, trash areas and vehicular traffic.

Designer to select zoning. Zone for exposure, usage and occupancy. Subzone interior areas to provide even distribution and temperature control throughout occupied space. Individual zone for rooms over 600 square feet is preferred. Individual zones for each faculty office are not required but are preferred. Where offices are grouped together as zones, the preferred maximum number of offices per zone should be limited to three (3). Motors for pumps and fans must be non-overloading.

Return air registers in plenum areas must have lined sound boots or be linear slot type with factory lined plenums unless acoustic report can justify the removal of these features.

BDF Telecommunication rooms shall be served by a separate DX system to provide 24 hour heating and cooling. IDF rooms shall be exhaust controlled temperature spaces.

Variable Frequency Drives are required starting at 5HP and shall be manufactured by Danfoss. Dual drives are required on critical units. Manual bypass should be specified on all other units.

Noise and vibration control are required for all mechanical systems. Noise and vibration are detrimental to the instructional environment. Designer shall retain an acoustical consultant to review mechanical systems compliance with required noise criteria.

Concrete housekeeping pads are required for all floor-mounted mechanical equipment, both interior and exterior. All equipment enclosures must have adequate working and safety egress space without including areas impacted by door swings.

Custodial rooms/closets shall be ventilated as they charge batteries within this space.

Mechanical labeling: Specify AHU or AC to zones/rooms directly on unit. For VAV boxes, note directly on VAV which AHU or AC unit serves VAV box. For Split systems, note directly condensing unit to fan coil unit on units and vice versa.

HVAC Systems

Air handling units shall be located inside when possible, preferably on the lowest level of the building.

All of the air handling units will be provided with variable speed drives.

Cooling for the main building shall be provided by chilled water air handlers with preheat coils as needed.

The campus preferred manufacturer for all air handler units is Energy Labs. Please use this manufacturer as basis of design for projects.

When conditions permit, utilize natural ventilation as much as possible while maintaining compliance with temperature and humidity criteria. Direct outside air system is preferred whenever possible to reduce energy consumption. Operable windows shall be provided with a red light / green light system which indicates when the optimum conditions exist where windows can be opened and direct outside air utilized in the space. It is preferred to have the windows connected to the BMS and automatically controlled with local over-ride to close windows. If windows are manual control the system shall be interlocked to the HVAC system.

Filters and pre-filters will be provided on all of the air handlers. A universal holding frame shall be provided. Minimum MERV Rating 13 is required.

Conditioned air will be distributed using medium pressure ductwork for the mains and low pressure ductwork after the VAV terminal boxes or supply air valves. Low air velocity will be applied at acoustically sensitive rooms. High loss fittings shall not be utilized at intake and outlet of fans.

All coils will have copper fins and copper tubes.

Hydronic Systems

The project shall be served from the campus central chilled and heating hot water systems wherever feasible. The building distribution system shall be designed without the use of building pumps. Provide valve pit at connection to campus mains. **Provide Setra wet DP with 5-Valve manifold to allow testing and validation of inlet water pressure.**

Chilled water coils will be designed to perform with a minimum 18°F temperature rise at a design supply temperature of 38°F-42°F. Chilled water coils will be sized for a maximum face velocity of 400 fpm, a minimum of 8 rows, 10 fins per inch maximum, and having a minimum wall thickness of 0.02". Coils will have copper fins and copper tubes and stainless steel casing and condensate pans. Pressure gauges and thermometer on the inlet and outlet of the coil are required. Coil isolation valves shall be provided at all AHU connections. **Provide BAS-integrated Belimo Energy valves at chilled water coils.**

The hot water service will provide the heating for VAV boxes. All reheat coils will be designed to perform with a minimum 40°F temperature rise at a design supply temperature of 160°F, with the ability to reduce supply water temperature to 140°F. The reheat coils will be sized for a maximum face velocity of 600 fpm and a minimum of 1 row, 6 fins per inch maximum.

A four-pipe hydronic system is required. Provide valves for isolation of major areas, at inlet and outlet of each piece of equipment; on all branches serving more than one piece of equipment; for shutoff of mains on equipment drains and on each strainer. **Provide balance valves on any 3-way bypass legs with appropriate accessories to validate and adjust flow.**

Extend drains to an indirect waste receptor unless otherwise directed. Full port ball type valves are required for drains and vents.

Central Plant Operating Hours:

CP HEATING:

Mon-Sun 6AM - 10PM

CP COOLING:

Mon-Fri 5AM - 9:30PM

Sat 7AM - 8PM

Sun 8AM - 8PM

Piping Materials Above Grade

No grooved piping for HVAC hydronic piping.

Hydronic piping components and installation shall be capable of withstanding the following minimum working pressure and temperature: Working pressure is equal to the relief pressure plus the static height of the system and pumping head. The only working pressure mandated by authorities having jurisdiction is for makeup water:

- Hot-Water Heating Piping 125 psig at 200 deg F.
- Chilled-Water Piping 125 psig at 200 deg F.
- Air-Vent Piping: 200 deg F.

Chilled-water and Hot-water heating piping (above grade): 2-1/2" and smaller, shall be the following Type L drawn-temper copper tubing, wrought-copper fittings, and soldered brazed joints, with 1" thick heavy density fiberglass thermal insulation with vapor barrier jacket to minimize heat gain loss and prevent condensation. Piping located outdoors shall be covered with an aluminum jacket.

Chilled water and heating hot water piping (above grade): 3" and larger, Schedule 40 black welded or flanged steel pipe ASTM A53, with 1" thick heavy density fiberglass thermal insulation with vapor barrier jacket to minimize heat gain loss and prevent condensation. Piping located outdoors shall be covered with an aluminum jacket.

Refrigerant, chilled water and heating hot water piping (above grade): 2-1/2" and smaller Type "L", hard drawn copper tube with brazed joints only. Insulation and jacketing will be the same as the larger piping systems. Piping shall be labeled to indicate system and flow direction.

Underground Chilled Water Piping

Chilled water underground pipe lines shall be cased pipe systems. The pipe systems shall consist of a carrier pipe, annular pipe insulations and a jacket pipe. The pipe shall be joined by welding and weld fittings. The system pressure is 120-PSI.

Carrier pipe shall be high density polyethylene (HDPE), conforming to ASTM D-3350 and the

specification standards listed below. Pipe and fittings shall be manufactured from extra high molecular weight polyethylene compound and fabricated to Standard Dimensional Ratio (SDR) wall thickness in standard IPS sizes. Chilled water service pipe shall be SDR 11 and have a pressure rating of 160-PSI at 73°F, with operating temperatures from 40°F to 140°F by applying an appropriate design factor. The ASTM D-3350 cell classification shall be 345434C and the polyethylene pipe shall be rated as PE3408 by the Plastics Pipe Institute. The pipe shall be classified as Type III, Grade P34, Class C, and Category 5 by ASTM D-1248

Provide magnetic tracer tape 12" above the CHWS pipe and detection tape 12" below grade. Connection of all joints shall be thermal butt fusion welded per manufacturer's installation manual. All fittings shall be provided loose for field installation. Joints shall be thermal butt fusion welded per manufacturer's installation instructions.

Insulation shall be polyurethane foam either spray applied or injected with one shot into the annular space between carrier pipe and jacket with a minimum thickness of one inch. Insulation shall be rigid, 90-95% closed cell polyurethane with a 2.0 to 3.0 pounds per cubic foot density and coefficient of thermal conductivity (K-Factor) of 0.16 and shall conform to ASTM C-591. Maximum operating temperature shall not exceed 250°F. Insulation thickness shall be specified by calling out appropriate carrier pipe and jacket size combinations; and shall not result in less than 1" thickness.

Jacketing material shall be extruded, black, high density polyethylene (HDPE), having a minimum wall thickness of:

- 100 mils for pipe sizes equal to or less than 12"
- 125 mils for jacket sizes greater than 12" to 24"
- 150 mils for jacket sizes greater than 24"

The inner surface of the HDPE jacket shall be oxidized by means of corona treatment, flame treatment or other approved methods. This will ensure a secure bond between the jacket and foam insulation preventing any ingress of water at the jacket / foam interface.

Straight run joints consisting of pipe and jacket are butt fusion welded and field insulated using urethane foam to the thickness specified and jacketed with a heat shrinkable sleeve over the HDPE sleeve mold. Joints can be made beside the trench or inside the trench.

Carrier pipe fittings shall be heat fusion butt-welded to adjacent pipe sections. Fittings that are butt fusion welded in the field are not insulated. End seals at uninsulated fittings shall be field applied heat shrinkable end seals. If fittings are factory manufactured, fittings are pre-insulated using factory PE fitting covers welded to the jackets.

Service valves shall be butterfly valves, 4" and larger.

Within vaults:	Class 150, Single-Flange, Butterfly Valves:
Standard:	MSS SP-68
CWP Rating:	200-PSI
Body Design:	Lug type; suitable for bi-directional dead-end service at rated pressure without use of downstream flange.

Body Material: Ductile iron, or stainless steel.
Seat: EPDM
Stem: Stainless steel; offset from seat plane.
Disc: Aluminum Bronze. Bi-directional service.

Air vents shall be provided at high points in the system exceeding 1-6" foot in rise.

Underground Heating Hot Water Piping

Heating hot water underground pipe lines shall be cased pipe systems. The pipe systems shall consist of a carrier pipe, annular pipe insulations and a jacket pipe. The pipe shall be joined by welding and weld fittings. The operating temperature for HHW piping is 60°F to 190°F. The system pressure is 125-PSI.

B31.1 calculations shall be submitted for each section of pipe showing thermal expansion compliance and anchor locations. Anchors shall be designed to accommodate appropriate loads and stamped and signed by a professional engineer.

The carrier pipe shall be steel ASTM A-53, Grade B, ERW (Type-E) or seamless (Type-S) standard weight for pipe sizes 2" and larger. All pipe shall be domestically produced. Where pipe sizes smaller than 2" are required the carrier pipe shall be ASTM A-106/A-53 Grade F (Type-F). All carbon steel pipe ends shall be beveled for weld connections.

Pipe Insulation

Insulation shall be polyurethane foam spray applied (not pressure injected) and shall be bonded to both. Insulation shall be rigid, 90-95% closed cell polyurethane with a 2.0 to 3.0 pounds per cubic foot density and a coefficient of thermal conductivity (K-factor) of 1.16 and shall conform to ASTM C-591. Insulation thickness shall be specified by calling out the appropriate carrier pipe and jacket size combinations.

An aluminum diffusion barrier shall be provided between the insulation and the jacketing system.

Jacketing material shall be extruded, black, high density polyethylene (HDPE), having a minimum wall thickness of 100 mils for pipe sizes equal to or less than 12", 125 mils for jacket sizes greater than 12" to 24", and 150 mils for jacket sizes greater than 24". The inner surface of the HDPE jacket shall be oxidized by means of corona treatment, flame treatment or other approved methods. Insulation thickness shall be specified by calling out appropriate carrier pipe and jacket size combinations, and shall not result in less than 1.5" thickness.

All fittings shall be insulated with closed cell foam as specified above and jacketing with a fusion welded, pressure tested HDPE jacket. Each joint shall be tested and inspected with documentation being submitted to the University.

Wrought steel fittings for butt weld connections shall conform to ASTM A 234/A 234M, ASME B16.9 and MSS SP-43. The fitting thickness shall match the adjoining pipe.

Wrought cast and forged-steel flanges and flanged fittings shall conform to ASME B16.5.

Service valves shall be butterfly valves, 4" and larger.

Within vaults:	Class 150, Single-Flange, Butterfly Valves:
Standard:	MSS SP-68
CWP Rating:	200-PSI
Body Design	Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
Body Material:	Ductile iron, or stainless steel
Seat:	EPDM
Stem:	Stainless steel; offset from seat plane.
Disc:	Aluminum Bronze. Bi-directional service.

Direct buried service valves are not permitted. Where takeoffs are to occur from main lines, valves at the main and the branch shall be provided.

Air vents shall be provided at all high points in the system exceeding 1 inch in rise.

Pipe Cleaning

Refer to University specification 232513 Water Treatment Closed-Loop System and Appendix U for Passivation Process.

Ductwork

Design ductwork system in accordance with the latest edition and printing of the SMACNA HVAC Systems Duct Design Manual. Design ductwork with operating economy in mind as a priority. Obtain lowest cost-beneficial pressure loss by limiting certain duct velocities, avoiding dynamic loss components where possible and utilization of low dynamic loss components. Avoid high-loss fittings, such as mitered elbows, abrupt transitions, and takeoffs and obstructions, including scoops. Avoid fan entry and exit conditions that result in increased system effect. Fibrous duct lining is unacceptable.

Sheet metal gages must be minimum 22 gage and in accordance with CMC, not SMACNA. Construct ductwork, except for gage thickness, in accordance with SMACNA HVAC Duct Construction Standards-Metal and Flexible (second edition) for the appropriate duct pressure classification. Vary duct size and add duct fittings to clear obstructions and maintain clearances.

Return air system may, where allowed, be un-ducted throughout but where return air path is via a shaft, the shaft is preferred to be lined with sheet metal.

Painting inside of ducts black, behind grilles, is preferred but not required. All new ductwork shall be 100% duct leakage tested.

Fittings

Except for connection of terminal discharge duct to air outlets, 90° taps are unacceptable. Takeoff feeding terminals must be conical branch; 45 wye, conical branch; low loss tee; bell mouth, or branch with a loss coefficient equivalent to that for the conical branch. The slopes of transitions must be approximately one to five. Abrupt changes or offsets of any kind in the duct system are unacceptable.

Flexible Ducts

Avoid flexible ducts whenever possible; flexible duct has twice the resistance of smooth duct.

Flexible duct connections to air inlets have an allowable maximum length of 6 feet and must be supported to prevent sags and kinks. Hard turns, offsets, or kinks are unacceptable in flexible duct. Flexible ducts may not be used instead of elbows. Use rigid duct of adequate diameter to reduce resistance.

Dampers

Manual volume damper in the upstream ductwork from a terminal unit to reduce pressure entering the VAV box is acceptable in order to provide a lower sound level for the unit; especially for terminal units closer to the AHU, which sense a higher duct system pressure. Splitter dampers are unacceptable. Manual volume dampers located in hard ceilings shall have an access panel for means of maintenance.

Avoid noise generation by locating dampers as far as possible from air inlets and air outlets.

Actuators for all dampers shall be manufactured by “Belimo”. Honeywell actuators are not preferred on campus.

Duct Materials

The supply/return air duct system will be galvanized steel of minimum 4-inch water gauge pressure class for mains. Branch ducts will be minimum 2 inch class. Sealing, reinforcing and supporting will be according to SMACNA standards. Ductwork shall have foil faced thermal insulation to minimize heat gain, loss, and prevent condensation.

Fume exhaust ducts will be constructed of materials compatible with the chemicals to be carried in the air stream. Type 304 welded stainless steel will be used for fume hood exhaust ductwork to the mainline ducting minimum. Sound absorbing interior lining or other sound absorbing devices should not be used in the exhaust ductwork. All fume hood exhaust ductwork will be under negative pressure. Ventilation system failure alarms will be provided in laboratories or other hazardous areas.

The general exhaust duct system will be galvanized steel of minimum 2-inch water gauge pressure class. There will be no insulation required for general exhaust ductwork.

Ductwork and/or piping insulation materials must not contain formaldehyde in any form or amount, including phenol/formaldehyde or urea/formaldehyde binders.

Approved manufacturers for formaldehyde free ductwork insulation are: Johns Manville, Thermal Ceramics, Knauf, and Certaineed.

Controls

The building automation/energy management system will be a totally native BACnet- based system. The control system shall be Distech BACnet-IP. Refer to University specification 230900 Building Automation Systems, and Appendix W – HVAC Controls

The system will be able to integrate multiple building functions, including: equipment supervision and control, alarm management, energy management, historical data management and archiving, and monitoring of laboratory controls. All BMS cable shall be the color grey.

Permanent capping of air compressor pneumatic lines:

- If it's copper- either solder a cap on the end or secure with a compression fitting.
- If it's nylon tubing- secure with a brass plug or a compression fitting.
- If a compression fitting is used on nylon tubing- must have a plastic tube insert.

The BMS system shall monitor all CW meters, HHW meters, electrical meters (HVAC to be a separate meter from receptacle power meters), gas meters, water meters, lighting control panels and shall have any laboratory systems integrated to communicate with this system.

CHW and HHW Main Building BTU Metering

- Manufacturer: Flexim (Local rep is JPR)
- Model: Flexus 721 Dual Channel Thermal Energy Meter with: BACnet enabled
- Also acceptable: Onicon, line sized magnetic flow meter

Fire Water Meter (4" line size)

- Manufacturer: Metron Farnier
- Spectrum or Enduro
- Model: Flanged Spec 5000D
- 13.75" lay length
- Fire service strainer
- Equipped with Innov8 VNR

Domestic Water Meter (3" line size)

- Manufacturer: Metron Farnier
- Spectrum or Enduro
- Model: Flanged Spec 175D
- 11.8" lay length (12" nominal)
- Equipped with Innov8 VNR

Irrigation Water Meter (2.5" line size)

- Manufacturer: Metron Farnier
- Spectrum or Enduro
- Model: Flanged Spec 130
- With 10.0" lay length
- Equipped with Innov8 VNR

Main Gas Metering

- Manufacturer: GE / Dresser
- Model: Roots Rotary Meter

All meters must include a provision for 15-minute interval trend export to the Energy Information System either directly or indirectly through an API export.

Air Balance

Design-BUILDER shall provide allowance for air and water systems balance by an independent air balance contractor. **Include all mechanically adjacent spaces impacted by new work. Examples: New DDC in BH, LA1 alongside or parallel to remaining pneumatic or pressure dependent systems.**

On renovation projects, the design engineer shall field verify existing airflow readings when existing values are being utilized in the design **prior to demolition or beginning new work.** This way the unforeseen issues with areas not meeting airflow expectations can be designed into the project.

Commissioning, Performance and Warranty

Comprehensive commissioning of all mechanical systems is required by a Campus selected third party commissioning agent.

The following campus standard specifications are to be used and will be provided to the Consultant by CSULB:

230179	Pipe Insulation
230800	Mechanical System Commissioning
230800A	Sample Pre-Functional Checklist (PFC) for AHU
230800B	Sample Functional Test Plan (FTP for AHU
230900	Building Automation Control System
232113	Hydronic Piping
232513	Water Treatment for Closed Loop Hydronic Systems

Division 26 – Electrical

General

1. Non-metallic sheathed cable is not acceptable for use.
2. All EMT used on the project shall have compression type fittings. Screw fittings are not acceptable.
3. All wire shall be copper and shall be stranded type wire. Solid wire not is allowed. Exterior underground conductors shall use “XHHW” insulation minimum or equal.
4. CSULB prefers ‘door-in-door’ electrical panels where applicable.
5. Label all switches and outlets with panel and circuit number. The face plate shall not be engraved but rather a label installed on the face plate.
6. Locations designated for equipment exceeding 1000W shall have a dedicated electrical circuit for each outlet (i.e. breakrooms and copy rooms).
7. Label all junction boxes and devices with circuit and panel numbers. Outdoor junction boxes shall be labeled with an embossed or engraved brass tag.
8. Bond the lid to pull boxes to the ground.
9. All pull boxes to be traffic rated regardless of area. They shall be galvanized lids stamped with “electrical”.
10. The splices in the outdoor pull boxes or other outdoor splices need to be waterproof. Use scotch guard or equal.
11. Use di-electric gasless 12KV switches (non SF-6).
12. Siemens panels are preferred and should be basis of design for branch panels.
13. No GFCI to be installed at the floor outlet, they should be using a GFCI breaker. Wax causes malfunction to the reset.

14. Kohler is preferred as basis of design for generators. Cummin-Onin is not acceptable.
15. Provide arc fault stickers per NFPA 70E on all new electrical gear.
16. All new outdoor equipment shall be enclosed by exterior gate meeting the clearance requirements of the equipment. A clear path for service shall be provided.
17. All medium and high voltage cabling shall be tested to meet current NETA standards.

Receptacles

Multi-wire (shared neutral) receptacle circuits are not acceptable. A dedicated neutral is required for each receptacle circuit.

All custodial rooms/closets shall have 2 duplex receptacles for charging their equipment.

Outdoor receptacles must have metal in-use covers such as Intermatic WP1010MXD.

Outdoor GFCI shall be Pass and Seymour.

Per Title 24, controlled and uncontrolled 120-volt receptacles are required in each private office, open office area, reception lobby, conference room, kitchenette in office spaces, and copy room. The two principal ways to comply include:

1. For each uncontrolled outlet, provide a controlled outlet within 6 feet; or
2. Use split wired duplex receptacles, with one uncontrolled and one controlled.

Transformers

All transformers shall be K rated type with the following specifications:

1. Copper winding conductor
2. Performance ratings:
 - Temperature rise (65 degC when operated at rated kVA output in a 40 degC ambient temperature)
 - Basic Impulse Level: 95kV
 - Voltage Taps: Four 2.5% taps, two above and two below rated high voltage.
 - High-Voltage Switch: 200A, oil immersed, minimum 10kA RMS, gang-operated.
3. Seismic qualifications – note whether actual testing or calculated.
4. Liquid filler: Non-toxic (edible) seed oil
5. Temporary heating provisions for moisture rejection during storage.

Clocks

Clocks are to be installed in all classrooms, open offices and other public spaces as deemed appropriate by CSULB. The standard is as follows:

Manufacturer: Primex; XR Series Traditional Series Analog Clocks
https://www.primexinc.com/en/catalogsearch/result/index/?clock_display_type=16&clock_series=51&q=XR+Series

Model: 14155 battery
Size: 12.5"
Signal: Wireless receiver
Specify with Black custom "The Beach" logo

Contact FM to have the technician come out to take readings to determine if there is a need for a new receiver at this location or not for the signal. This is usually done before the building is erected so that the specifications can be developed.

Small projects where there is one or two clocks required, FM can provide the clocks.

Conduit

All electrical conduits installed with a voltage greater than 480V shall be encased in a concrete duct encasement red in color. The concrete shall be 2,500 PSI minimum and cover all conduits a minimum of 2" on all sides.

Typical above ground exposed conduit shall be EMT or GRC. Allowed length of flex conduit or liquid-tight conduit shall be 6' and only located in ceilings. Flex conduit shall not be used in walls. MC/BX Cable, rigid non-metallic conduit, electrical non-metallic tubing and screw type fittings are not acceptable. Minimum above-ground conduit size is ¾". No push type supports for conduit allowed.

All below ground conduit shall be electrical PVC. Minimum below ground conduit size is 1". Use PVC-wrapped or PVC-coated steel elbows for conduit runs and elbows penetrating floor slabs. PVC shall use primer and glue that is manufactured for electrical PVC installations.

Underground Minimum Conduit Depth:

- 600V and less Conduit shall be buried 24" in depth minimum
- 600V and more Conduit shall be buried 36" in depth minimum

Rigid Steel Conduit (GRC)

- Used for circuits greater than 600volts. Provide "DANGER –HIGH VOLTAGE" labels on exposed conduits
- Installed above ground
 - o If installed below grade, the rigid conduit shall not be in direct contact with earth except where used as a riser where the conduit shall be wrapped with approved black pipe tape.

Electrical Metallic Tubing (EMT)

- May be installed indoors dry locations
- Do not use outdoors
- Do not install below grade
- Do not install in concrete
- Do not use in areas subject to severe physical damage(including but not limited to Mechanical and Electrical equipment rooms)

PVC Schedule 40 Conduit

- May be used underground within the building perimeter(below 600volts)
- Top of duct shall not be less than 24 inches below grade
- Risers shall be galvanized rigid steel where exposed.

Carlson or equal PVC conduit repair kit is to be used when repairing ALL broken conduit.

Minimum size for any telecommunication conduit is 1-1/4". It shall be noted that a standard 4S box does not have knock-outs to support this size conduit and a 5S box needs to be specified on the plans for this scenario.

Conduit shall not be used as an equipment ground. A separate grounding conductor shall be specified.

There shall be a note requiring a minimum of a 12" separation between telecommunication conduits and electrical conduits. All underground conduits shall have warning tape installed 12" below finish grade above the conduit.

Lighting

All lighting installed shall be LED type.

Interior Lights:

- Retrofit Type
 - ESPEN VEKT2x4/8T
(2x4 retrofit tbar with Enlighted controls)
 - ESPEN VEKT2x2
(2x2 retrofit tbar with Enlighted controls)
 - ESPEN VEKT1x4L
(1x4 hardlid door retrofit kit with Enlighted controls)
- New Construction Type
 - Eiko: VOL24/PS50/840/HD/EN1
(2x4 new construction TBAR with Enlighted sensor)
 - Eiko: VOL22/PS50/840/HD/EN1
(2x2 new construction TBAR with Enlighted sensor)
 - ESPEN VEFT1x4
(1x4 new construction Tbar w/ Enlighted sensor)
 - ESPEN VEFT2x4
(2x4 new construction Tbar w/ Enlighted sensor)
 - ESPEN VEFT2x2
(2x2 new construction Tbar w/ Enlighted sensor)
- Warehouse or mechanical rooms:
 - Sylvania

Color temperature for interior lighting must be 4000K. Light sources of 5000K have been used at the Fine Arts building, for visual clarity on art work.

Exterior Lights:

Parking lot/Street	Cree OSQ Series
Walkway/Pedestrian Areas	Cree Edge Series
Color	Cree Dark Bronze for all exterior lighting

1. Anchor bolts for light poles shall be galvanized.
2. Color temperature for exterior lighting must be 5700K.
3. All exterior lighting must be fused.
4. Use a minimum of 6in of 3/4in crushed rocks as a base for in-ground junction boxes to provide drainage.
5. Refer to Appendix J for Exterior Light Pole Grounding Detail.

Lighting Control:

Interior	Enlighted Digital Lighting Control System, Acuity Brands Floor plans with graphics showing lighting control zones and devices shall be provided Interior Wireless Enlighted for specific applications to be discussed with University
Exterior	Enlighted or LC&D relay panel type with Astro clock
Cable Color	Purple

All lighting control cables shall be purple/violet.

Lighting Battery Back-Up/Inverter:

Manufacturer:	Dual Light
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Electric Metering

Coordinate and provide power for HVAC control and BA system. Typically each mechanical equipment requires 120v power. Size shared circuits with input from control contractor to ensure VA requirements.

Main Electric Metering to tie into EMS:

Building Level Meters:

- Manufacturer: Electro Industries Gauge Tech (Local rep is Pacific Parts)
- Model: Shark 250
- Include Mersen Compact Fused (or equal) to allow for regular testing and calibration.

Sub Meters: (Anything downstream of building level meters)

- Manufacturer: Electro Industries Gauge Tech
- Model: MP 200 or Shark 250
 - The MP 200 can do multiple circuits (up to 24) and is a cost effective solution
 - Shark 250 is acceptable for this application too.

Exit Signs

Photo luminescent

Extension Cords and Power Taps

Extension cords are not a substitute for permanent wiring and are allowed to be used for no more than 90

days.

Relocatable power taps shall be of the polarized or grounded type, equipped with overcurrent protection, and shall be listed in accordance with UL 1363.

Emergency Responder Radio Coverage System (ERRC)

The Long Beach Fire Department requires the installation of an Emergency Responder Radio Coverage System (ERRC) in all buildings meeting any one of the following conditions:

1. There are more than 3 stories above grade plane (as defined by the California Building Code Section 202);
2. The total building area is 50,000 square feet or more;
3. The total basement area is 5,000 square feet or more;
4. The building is equipped with a solar photovoltaic system.

Please reference Appendix F “Emergency Responder Radio Coverage System (ERRC)” for specific guidelines on this system where required.

In addition to the frequencies required in Appendix F, ERRC, please add the frequencies below to the radio coverage system as it is vital to the radio coverage for the CSULB University Police.

CSULB University Police Frequencies:

- 470.7125 / 473.7125 ERP: 90W Location: ECS 33-47-0.7404N, 118-6-36.9936W
- 434.9250 / 469.9250 ERP: 90W Location: MHB 33-46-36.7032N, 118-6-47.4228W

Vendors that provide this service:

ComSerCo:	Adrian Harvey (714) 715-0131
Day Wireless:	Randon Flores (858) 537-0709

The following campus standard specifications are to be used and will be provided to the Consultant by CSULB:

260800	Commissioning of Electrical Systems
260800A	Sample Pre-Functional Checklist (PFC) for Occupancy Sensors
260800B	Sample Functional Test Plan (FTP) for Exterior Lighting Controls

Division 27 - Telecommunications

Definitions

Patch Panel – A termination point for data cables in a Telecom Room. Campus standard model is Commscope Systimax 360 GigaSPEED X10D 1100GS6 Category 6A 48-port panel. 24 port panels are not acceptable.

110 Block – A termination point for voice cables in a Telecom Room. Campus standard model is the LEVITON Category 6A series, MFR PART #41D6A-1F4 64 Pair or larger.

Horizontal Cable – The cable that runs from a Telecom Room to one or more Stations.

Horizontal Cable – The cable that runs from a Telecom Room to one or more Stations. Data cables have a white jacket, and Voice cables have a blue jacket. The Campus standard is Commscope Systimax Category 6A installed by Commscope certified installers that provide a warranty.

Faceplate – The plastic cover for an Outlet where jacks are snapped in and labels are affixed. The campus standard is the Systimax model M28L-246. In cases where a single-gang Outlet is used, the 6-port Systimax model M16L-246 is required.

Jack – The termination end of a Horizontal Cable. Green for Data, Gray for Voice, Yellow for Audio Visual. Commscope Systimax Category 6A jacks are required.

Outlet – The location where Telephone or Data cables are terminated. An outlet consists of a Faceplate and one or more Jacks. The campus standard for an Outlet is a dual gang electrical box recessed into a wall. A typical office has an outlet with 1 voice jack and 2 data jacks.

Telecom Room – A room that houses one or more distribution frames for Telephone/Data cable.

Distribution Frame – A rack or wall board that may house one or more Patch Panels or 110 Blocks for termination of Horizontal Cables that serve one or more Stations in a given portion of a building.

Station – An office, lab, cubicle, or other work area for staff, faculty, or students where one or more Outlets exist.

Wi-Fi

Wi-Fi is to be installed as the primary method for data for students in buildings. Each Wi-Fi outlet requires two Cat6A cables. Each ceiling Wi-Fi location shall be provided with a 5S dual gang electrical box with a support bracket. Pull and terminate all cables inside the box on a jack.

CSULB will create a coverage map for every project and provide to design team so that outlets can be specified at locations. CSULB will provide and connect Wi-Fi devices, but contractor needs to provide wiring and box.

Exterior Wi-Fi shall be considered in any project where exterior trenching is involved. Adaptors for the exterior light poles have been custom designed for the University Wi-Fi devices and shall be specified for the poles. Refer to detail for Wi-Fi poles in Appendix O.

The designer shall always depict the scope to have electric, gas and water meters tied into the campus EMS system in the contract documents. There shall also be data outlets shown for the control system, JACE controllers, and for the lighting control panels to connect into the campus data system.

The telecom standard is to utilize 1-1/4-inch conduit. It shall be noted that a standard 4S box does not have knock-outs to support this size conduit and a 5S box needs to be specified on the plans.

There shall be a note requiring a minimum of 12 inches of separation between telecommunication conduits and electrical conduits.

See Appendix J for Wifi pole Mounting

Minimum distance between telecommunication boxes should be 150 ft. between each but should be specified.

The designer shall plan for Wi-Fi devices to be unobstructed, and reachable by a 10ft ladder without significant moving of furniture or other items.

Pathway Quantity: No more than 40% fill ratio shall be exceeded for any pathway. Sufficient pathways must be designed and installed to meet this requirement.

Telecommunication Branch Outlet Cable Count

Office/Desk standard	3 Data / 1 Voice (wall)
AV rack for classroom	8 Data (wall)
Wi-Fi	2 Data
Misc.	2 Data minimum

Emergency Phones:

Manufacturer:	"Talk-a-Phone"
Model:	ETP-500E and ETP-110e for interior use

Tower mount is black
Exterior wall mount is stainless steel
Interior wall mount is red housing

Telecom Room Codes

Each room containing a Distribution Frame shall be assigned a Telecom Room Code. This code shall consist of the Building Number and an alpha character unique to that Telecom Room within the building.

Examples: Brotman Hall, BDF shall be "1A". MLSC 2nd floor IDF on South side shall be "94E".

The Telecom Room Code is an internal Division of IT (DoIT) standard, and the record shall be kept by DoIT personnel. A label will be affixed to the top-inside door frame of each Telecom Room denoting the room's specific code.

Patch Panels

Each Telecom or Data Patch Panel inside a given Telecom Room shall be designated with a unique numeral, prefixed with a "V" for voice and "D" for data.

Example: In Brotman Hall Room 1A, there are 3 distinct fields of voice 110 Blocks and 9 data Patch Panels. Both are unique numerical series. So the voice 110 Blocks would be labeled V1 through V3, and the data D1 through D9.

Patch Panels come with built-in designations for the position on the panel. For Patch Panels this is usually 1 through 48.

Voice 110 Blocks are based on the "field" of blocks. Cables are sequentially ordered from the top left to the

bottom right.

Outlets and Jacks

Each Jack shall be labeled based on the combination of:

- Telecom Room Code, minus the building number
- Patch Panel or 110 Block designation
- Patch Panel or 110 Block Position

There must exist a dash (“-”) between the Telecom room code and the Patch Panel or 110 Block designation. There must be a period (“.”) between the Patch Panel or 110 Block designation and the position on that panel or block.

Example: A data jack in room 188 of Brotman Hall could be designated “A-D9.32”. A voice jack in room 133 of Brotman Hall could be designated “B-V2.57”.

Faceplates no longer need specific designations. The entire jack label must be placed below the jack.

Contractor shall provide a list of final project room numbers and their associated outlet designations to the Division of IT for e911 location services.

Color Coding for Cable Jackets

Blue – Campus Phone system (Voice)

White – Campus Data network

Red – Fire Alarms

– Audio-Visual cabling

Gray – Building Control systems

Green – Security systems

Purple – Lighting Control systems

Jack

Where applicable, the following jack colors are specified. Many systems are direct-wire, and do not need jacks or patch cables.

Gray – Campus Phone System (Voice)

Green – Campus Data Network (previously Orange)

– Audio-Visual

Cables that terminate on a distribution frame in a Telecom Room will ONLY be Data or Voice cables, regardless of the purpose of the device at the other end (e.g. AV, lighting, or security). The following color coding is for any other low-voltage cabling that is point-to-point for the given device types.

Color Coding for Labels

All labels must be black ink on a white background.

Fiber Standards

Inter-building fiber is 48-strands of Single-mode (OS2) installed in ribbed or smooth wall innerduct, four 1-inch inside-diameter innerduct installed per 4-inch conduit, with minimum 1 open innerduct. Single innerducts are not permitted in conduits.

Intra-building fiber is 12-strands of Single-mode (OS2) and 12-strands of Multi-mode (OM3) riser fiber from BDF to each IDF in hub-and-spoke pattern, with no intermediate splicing, and installed in flexible corrugated 1.25-inch innerduct.

All fiber connector types are LC-UPC.

Fiber product standard is Corning.

The following campus standard specifications are to be used and will be provided to the Consultant by CSULB:

270500	Common Work Results for Communications
270526	Communications Grounding and Bonding
270528	Pathways for Communications Systems
270536	Cable Trays for Communications Systems
270543	Underground Ducts for Communications Systems
270544	Sleeves and Sleeve Seals for Communications Pathways and Cabling
271100	Communications Equipment Room Fittings
271300	Communications Backbone Cabling
271500	Communications Horizontal Cabling

Low voltage connections to Building Control Systems from Campus Network

1. Device enclosures must provide space for “biscuit” jacks on the end of Data cables.
2. Data cable count must be one more than the number of devices.
3. If enclosure is not in a Telecom Room, minimum 1” conduit from enclosure to nearest cable tray or other horizontal system.
4. If enclosure is in a Telecom Room, minimum 1” conduit from enclosure to Telecom ladder rack shall be supplied.
5. All Data cable shall be treated like normal horizontal structured cable as specified in Division 27, and terminated on back of patch panel in Telecom room.

Division 28 – Electronic Safety and Security

Fire Alarm System

Johnson Controls (formerly Simplex) Fire Alarm System for minor tenant improvements where Simplex currently resides or as defined by CSULB.

Notifier shall be used for new construction or major renovations or as defined by CSULB. CSULB to provide specification with project. Fiber connection to the FACP shall be either single mode or multimode and will depend on each application. This needs to be confirmed with University ITS department. Requirements for fiber card depending on media is identified in the Notifier specification provided by the University.

The requirement to update the campus graphics by Pyrocom for both Workstations at the University Police station and our Fire Alarm shop graphic command centers (Notifier ONYX or Simplex TSW) shall be included on every project that includes fire alarm or floor plan modifications.

Add program fire drill on Workstations (Notifier ONYX or Simplex TSW) for any new panel. Add programming of silence and reset from Workstations (Notifier ONYX or Simplex TSW). Requirement for 100% functionality pretest and final SFM test shall be added to all projects. Notifier or Johnson Controls (formerly Simplex) or applicable vendor is to provide manpower to cover, (Notifier ONYX or Simplex TSW), FACP, annunciator and field activation of devices for each test.

Four strand is the minimum wire amount allowed.

Fire alarm conduit shall be painted red.

The following campus standard specifications are to be used and will be provided to the Consultant by CSULB:

283111 Digital Addressable Fire Alarm System

Security System

Contacts:

1. Edgeworth Integrations – (805) 915-0211 Bob Kavanagh (if there are no panic buttons in design)
2. JMG Security Systems – (800) 900-4564

The CSU has a System Wide Video Security Camera Policy, refer to Appendix P. All requests for security cameras must be forwarded to the University Police for their involvement with regard to approval of the request as well as required technology. The End User and/or Customer is responsible for the costs of installation and maintenance. However, the University Policy will monitor and manage viewing rights. Infrastructure requirements shall meet campus standards provided in electrical standards, BiCSI, IEEE, CSU TIPS, and others that are mentioned in division 27. Please read the full policy at the link provided: <https://calstate.policystat.com/policy/8020972/latest>

Panic Buttons

Use and installation shall be coordinated with University DSC alarm system with wireless panic buttons.
<https://www.dsc.com/in.dex.php?n=Products&o=view&id=110>

All security cable shall be green.

Division 31 Earth Work

Typical Details for Base / Geogrid:

- Provide two options for reoccurring situation that takes place on campus.
- Any left over Geogrid should be turned over to Campus BBS.

Soils Report – Trenching Requirements:

- Bottom of footing or trench – need to be reviewed by Geotechnical Engineer.

- Inspector needs trenching requirements and bottom requirements included in Soils/Geotechnical Report.
- Potential Impacts can be mitigated.

Division 32 – Exterior Improvements

Irrigation Construction Standards

All irrigation on campus shall be designed as “reclaimed water” irrigation, regardless if the service is potable or reclaimed at the time of the improvements. The campus will convert the remaining areas to reclaimed water in the near future.

All systems shall have a backflow installed at the main line connection for the system.

Sprinklers:

- Rain Bird 1800-SAM pop-ups with check valve ONLY – NO pressure regulators built into the heads.
- Rain Bird 8000 series for larger applications.
- Hunter MP Rotator nozzles only to be paired with Rain Bird 1800-SAM sprinklers.

Drip:

Drip systems are not preferred and should be avoided if possible. But if approved for use, the following are the standards:

- Netafim laser cut Bioline AC (purple) drip tubing.
- To be installed above grade.
- Every individual station to include an indicator head (Rain Bird 1800 with a VAN 6 nozzle closed), flush valve, air relief.
- Drip system will need a fertilizer injector.

Valves & valve boxes

- Do not use slip can model valve boxes.
- There should be a 6in-wide mow strip around valve box.
- Electric irrigation applications:
 - 2 inch or smaller – Rain Bird EFB-CP series valve (brass).
 - 2 ½ inch or larger – Rain Bird BPE/BPES series valve (brass).
- Hydraulic irrigation applications:
 - Superior valve 100 series
- All newly installed station valves must include an isolation valve (Nibco brass ball valve) – to be installed inside the corresponding station valve box.

- All newly installed station valves need to include purple reclaimed water tags that indicate its station number and that it is reclaimed water. The valve box lid needs to be heat stamped with the station number.
- Non-locking option on newly installed valve boxes.
- Resilient Wedge gate valves for mainline applications underground with a 2 inch operating nut.

Quick coupler

- Rain Bird 33 or 44 series only (cap color will be Purple for reclaimed).
- Valve box for quick coupler shall be round with purple box and lid.

Primer & Glue

Christy's Red Hot Clear or Purple Primer and Christy's Red Hot Blue Low VOC to be used to connect PVC.

Pipe

- Piping over 2 inches – Manufacturer: JM Eagle, Blue Brute C900 DR14 (Class 305).
- All main lines piping and fittings shall be schedule 80 PVC.
- All lateral lines piping and fittings shall be schedule 40 PVC.

Miscellaneous

- 3M DBY – Dry type splices to connect wire.
- All wire splices need to be brought to grade and housed in a circular valve box and marked on irrigation as-builts.
- Controller charts are required to be supplied for all new systems or major renovations or existing systems. They are to be laminated.

Controller

- Rain Master Evolution DX3-48 (item number SA6-RM6-48) ONLY with radio communication board and wiring, GT DX3 UHF Radio and Low Profile Antenna (item number RXLP) and permanent mounted Promax Remote Cac Receiver (item number PMR-CAC) – RAC 003; access code must correspond to satellite address (consult university for satellite address). SiteOne Landscape Supply is the preferred vendor for these parts.
- Check with CSULB if a new remote controller is needed for the project.
- The radio frequency for the irrigation controller is #452.2375 with a power frequency of 4.00 W.
- Controller installation is to be verified by Rain Master or the warranty is voided.
- Directions on how to ground the unit must be followed.

Landscape

- Turf Replacement: Kikuyu First choice or TIFTUF Hybrid Bermuda sod 2nd choice. Check with University first
- It might be required that the sod be over-seeded with rye grass, depending on the time of year that the installation is to occur. Contractor shall consult with University prior to ordering sod.
- Seed Installation: to be discuss with university first
- Mulch: Agromin ES-2
- Rock Mulch: Southwest Boulder & Stone, California Gold. Confirm with the University
- Weed Barrier – Landscaper's Choice, GCI 500 Series

Design Requirements

The designer shall include irrigation and planting plans in the contract documents to restore areas outside of project limit that will be affected by the scope of work or staging areas that will need extensive restoration of landscaping.

When a project trenches through turf areas, the contract documents shall specify the restoration of the turf with sod not seed.

Warranty on newly installed trees and shrubs

Contractor shall warranty any newly installed tree for a period of one to two years (depending on project and circumstances); shrubs for 6 months and ground cover for 90 days. Contractor shall meet with the university arborist or a university-identified consulting arborist every 6 months during the warranty period to evaluate the trees. The purpose is to review and identify any changes in health or maintenance needs that need to be performed. The contractor shall be responsible for replacement of the tree with a similar size and variety if it is determined by the campus Arborist or consulting Arborist that the tree health is not to the university satisfaction. Warranty to start AFTER maintenance period is completed and accepted by CSULB.

Landscape maintenance period

All new landscapes shall be maintained by the contractor for a period of 90 days. During this period contractor is responsible for all maintenance of plant material, including trimming, spraying for insects, disease, weed control, irrigation programming, fertilizing and manual weed removal and cultivation. The contractor shall provide a maintenance schedule to the university project manager of the dates maintenance will be performed. The contractor's landscape maintenance contractor shall meet with a representative of the university Grounds department one day each month of the maintenance period to perform a site review of the landscape and note any plant condition or concerns of maintenance such as weed control, plant replacement or irrigation adjustments that need to be performed. Replacement of dead or dying plants shall be done as they are identified during the monthly site walks and prior to the next schedule site walk.

Irrigation programming

Contractor shall provide the university with an irrigation schedule prior to the start of the maintenance period. The schedule is required to be submitted to the construction manager. The programming of the irrigation controller will be performed by the university irrigation personnel and entered into our central system. A validated program copy will be given to the contractor. Any modifications to the program must be submitted in writing to the construction manager for changes to be made into the central system.

Tree Preservation Standards

Tree minimum size is 48-inch box.

Consultation with University Grounds must occur prior to the removal of any trees, otherwise full replacement value of tree shall be credited back to the University. The campus forest count cannot decrease due to a project. If the project site cannot support the amount of new trees needed to maintain the existing campus forest, the project shall provide monies for tree replacement to facilities management so new trees can be planted in other areas of the campus. Any tree removed from the campus will need to be replaced on a two for one ratio. For every tree removed, the size of the replacement tree shall be a 48-inch box tree or two 36-inch box trees. Tree planting site for replacement trees shall be determined by the University Grounds at no cost to the project.

All projects where trees are affected shall have tree protection details or specifications.

Decomposed Granite (DG)

If DG is specified for a project the DG shall include the organic binder “Pro Bond” and shall be stabilized. The color standard is “desert gold”.

Special Parking

New constructions must have two to four standard parking stalls for state vehicles.

Striping

Any paint at intersections, including crosswalks, shall be high quality asphalt striping paint (2 coats) in lieu to a Thermoplastic paint. Thermoplastic paints are not to be used. Any paint that is to be abandoned should be completely removed from asphalt and not covered over with tar or slurry.

Paint Manufacturer: Vista, ENNIS or All American Traffic paint
Two Coats of paint are required on all striping projects.

- Red:** No stopping, standing, or parking.
- Blue:** Parking is permitted only for a disabled person or a driver of a disabled person.
- Green:** Park for a limited time. Post the time with sign or striping.
- White:** Stop only long enough to pick up or drop off passengers.
- Yellow:** Stop no longer than the time posted to load or unload passengers or equipment.
Post time with sign or striping.

Parking lot asphalt slurry shall be specified to be as manufactured by “master seal” or equal, and shall always be specified to require 2 coats of slurry application.

Crosswalk Standards

Stop sign at cross walk shall be at or before stop bar. “Ladder” crosswalk shall be used on pedestrian crosswalks.



“Ladder” crosswalk

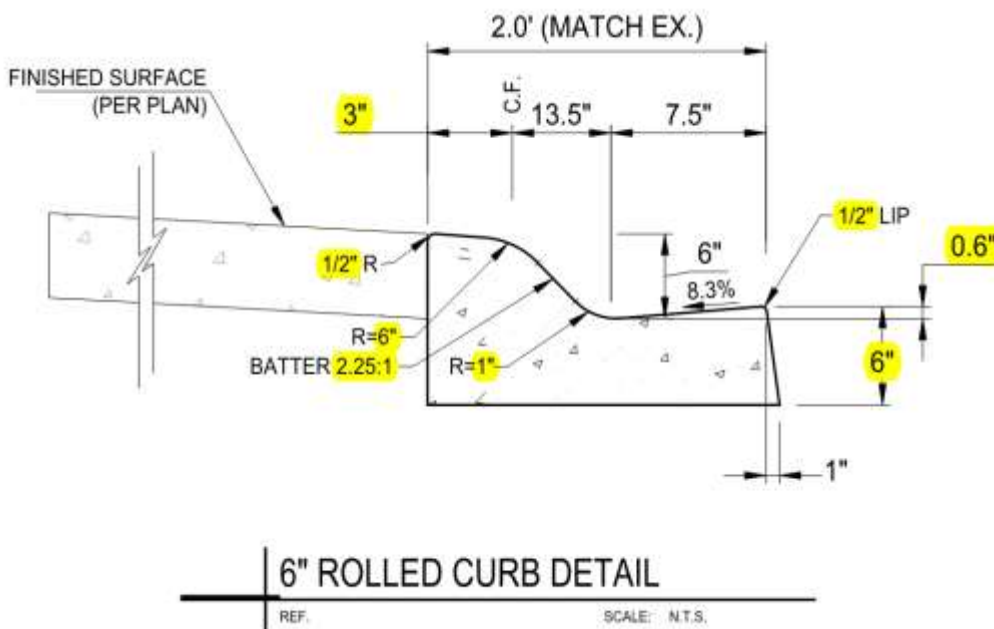
Stop sign at stop bar or before it

Truncated Domes

Color of truncated domes shall be federal yellow.

Fire Lane Rolled Curb

Fire lane transitions from street to off street shall be made by the use of a drive approach or by using the standards of a rolled curb required by LB Fire Department as follows:



Division 33 - Utilities

Campus Standard for Pressure Testing – Specify pressure and duration for each type of utility

- 150 psi for 2 hours or 4 hours
- Fire Line = 200 psi for 2 hours

Underground Piping – Sewer and Storm Drain shall be PVC rather than cast iron inside the building.

Backfill of trenched utilities

1. Minimum 12" of base with 4" asphalt in parking stalls and 12" base with 6" asphalt in travel lanes with no single lift exceeding 4".
2. Minimum 10" base with 5" concrete for sidewalks and 12" base with 6" concrete for ramps in sidewalks.
3. There is an option for the University to review subgrade and suggest geogrid upon the condition of subgrade prior to base placement for both asphalt and concrete.
4. Vehicle driveways and fire lanes will need to be engineered and coordinated with Geotechnical engineer.

Natural Gas Systems

1. MDPE Yellow Gas pipe. Manufactured by JM Eagle or equal.
2. Butt Fusion or Socket fusion joints.
3. Installers must be certified for type of fusion system.
4. Gas valves: Polyethylene with 2 inch operating nut.
5. Fittings: butt or socket fusion.

Storm Drains

1. Pipe: SDR 35 "Vinyl Tec" or "Diamond Plastic" HDPE black corrugated pipe.
2. For piping under roads check with design engineer to confirm this type of pipe can be used.
3. Fittings: "GPK" or equal.

Sewers

Pipe: No-hub cast iron pipe; Manufactured by Tyler or equal

- Bands: Fernco or equal no-hub bands.
- 4 band fittings minimum below grade.

Pipe: SDR 35 pipe

Fittings "GPK" or equal

Domestic Water

Mainlines:

Manufacturer: JM Eagle, Blue Brute C900 DR14 (Class 305)

Mechanical fittings: Mega lug, Tyler or Sigma.

- Fittings are to use stainless steel bolts.
- The fitting and bolt to be wrapped in 10 mil poly and taped to pipe to protect against corrosion.
- Bolts and nuts shall have no-oxide applied.

- Bell and spigot ends shall be restrained.

Copper pipe type “K” acceptable for small site lines for drinking fountains or hose bibs etc.

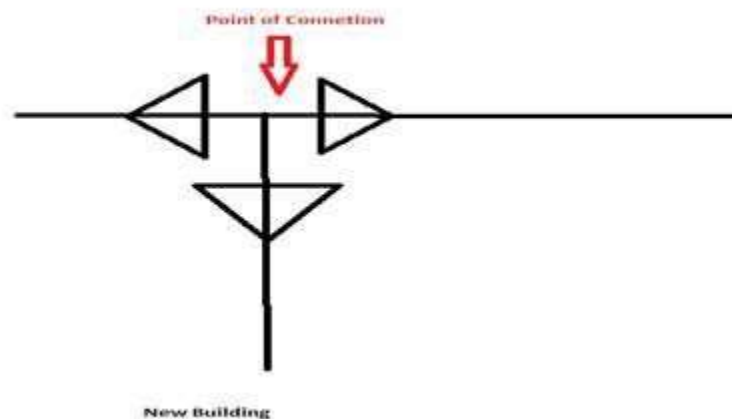
Thrust blocks are to be installed at all mainlines per SFM design requirements minimum. They are needed at all turns and tees.

SFM Plan Notes for “UNDERGROUND PIPING FOR PRIVATE FIRE SERVICE MAINS, HYDRANTS, FIRE SPRINKLERS AND FIRE STANDPIPES” are to be added to every project plan that has domestic water site piping.

The campus uses the domestic water loop to service fire service as well as domestic service.

Point of connections to main lines for new buildings, install a three way valve set-up per the below figure 33-1. This allows CSULB the ability to isolate the campus main on each side of the building, if problems arise, and maintain water service at all times.

Figure 33-1: Three Way Valve



All backflow preventer assemblies shall be specified in the contract documents to be tested and certified. This certification shall be turned over to CSULB for submission to Long Beach Water Department.

Fire Sprinkler

- Fire sprinkler drain hub in fire riser room shall be a minimum 6” diameter pipe, no matter the size of the building.
- Inspection and main drain valve should not be higher than 5’5”

Sewer and Storm Drain Manholes

1. Manufacturer: Jensen PRE-CAST or equal.
2. 48 inch diameter, shaft, cone and grade ring.

3. Appropriate lettering on lid “Sewer” or “SD” storm drain.

Fire Hydrants

1. Manufacturer: Clow-Valve Company wet barrel fire hydrants or equal.
2. Model 860 yellow with two 2-1/2 inch hose outlets and one 4 inch hose outlet.
3. 1-3/4 inch Pins required for LBFD Jones wrench.
4. CSULB follows the Long Beach Water department for Fire hydrant assembly WDS-102.
5. Use stainless steel breakaway bolts for attachment to the underground piping fitting.

Storm Water Management

The campus is required to comply with the non-traditional requirements in the Phase II MS4 permit. Fortunately, the Phase II permit non-traditional post-construction storm water management requirements include several options for compliance that allow the project's designers to integrate structural BMPs into the project at low cost and without sacrificing large areas of real estate. These options provide the campus much more flexibility than county requirements and are generally less prescriptive. *The campus is not required to follow LA County regulations.*

The project's designers should be directed to the full permit at the Water Board's website: (http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal_shtml).

They should be familiar with the permit and its requirements in general; and specifically with requirements that apply to their project.

Note that this permit became effective in 2013 and post-construction requirements became effective shortly thereafter. A “Guidance” document can be found in Appendix E and is a description of engineering that the designers can use to minimize impact of mitigation BMPs on the site. The Phase II non-traditional requirements allow the civil engineer significant leeway to design BMPs that are effective and meet the permit requirements but that are not intrusive and are very economical. The guidance document idea is for the civil engineer to design a system that meets the hydrologic and hydraulic requirements of the MS4 permit, but doesn't cost a fortune and doesn't take up a lot of land.

The MS4 permit post-construction requirements do not change if a project site is more than one acre; however, the project will require a SWPPP for Construction Activities because it is one acre or larger. It is recommended that the construction documents (drawings and specs) require the contractor to be solely responsible for the SWPPP; hiring the QSD and QSP; filing the Notice of Intent; prep and filing of annual reports; perform required inspections and sampling and file Notice of Termination.

We also want to point out that the water table is very high on lower campus and this may make infiltration and percolation options non-feasible as there is a minimum distance that needs to be maintained from the ground water levels and we are deficient. Design to verify.

CALIFORNIA STATE UNIVERSITY, LONG BEACH

CAMPUS STANDARD PEDESTRIAN RAILING DESIGN GUIDELINES



SHEET INDEX

SHEET #	SHEET TITLE
1	COVER
2	OVERVIEW
3	RAMPS
4	STAIRS
5	GUARDRAILS
6	WALLS
7	SECTIONS & DETAILS
8	SECTIONS & DETAILS
9	SECTIONS & DETAILS
10	SECTIONS & DETAILS
11	SECTIONS & DETAILS
12	GENERAL NOTES
13	GENERAL NOTES (CONT.)
14	SKATE DETERRENTS

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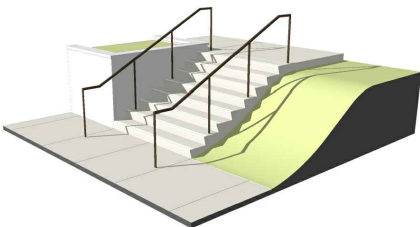
CSULB CAMPUS STANDARD PEDESTRIAN
RAILING DESIGN GUIDELINES

Scale: As Indicated
SHEET 01 OF 14

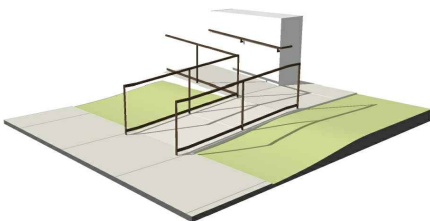
DESIGN INTENT:



HANDRAIL WITH GUARDRAIL

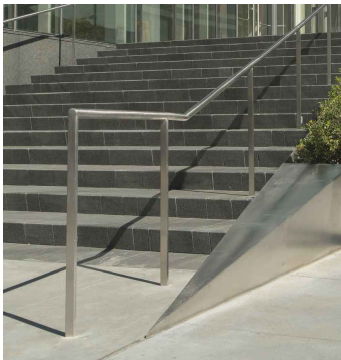
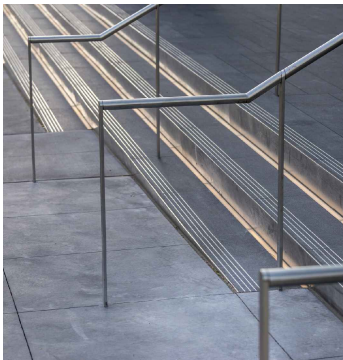


HANDRAIL ON STAIRS



HANDRAIL ON RAMP

REFERENCE IMAGERY:



MATERIAL FINISH

PAINTED STEEL

COLOR: CUSTOM BROWN
PRODUCT: EXTERIOR SEMI-GLOSS ENAMEL
MANUFACTURER: SHERMAN WILLIAMS

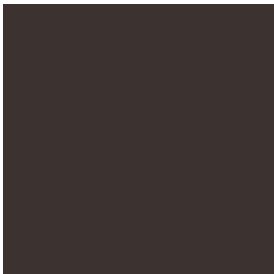
APPLICATION:

- RUST-INHIBITIVE METAL PRIMER
- PROTECTIVE ENAMEL, OIL-BASED PAINT (MIN. 2 COATS)

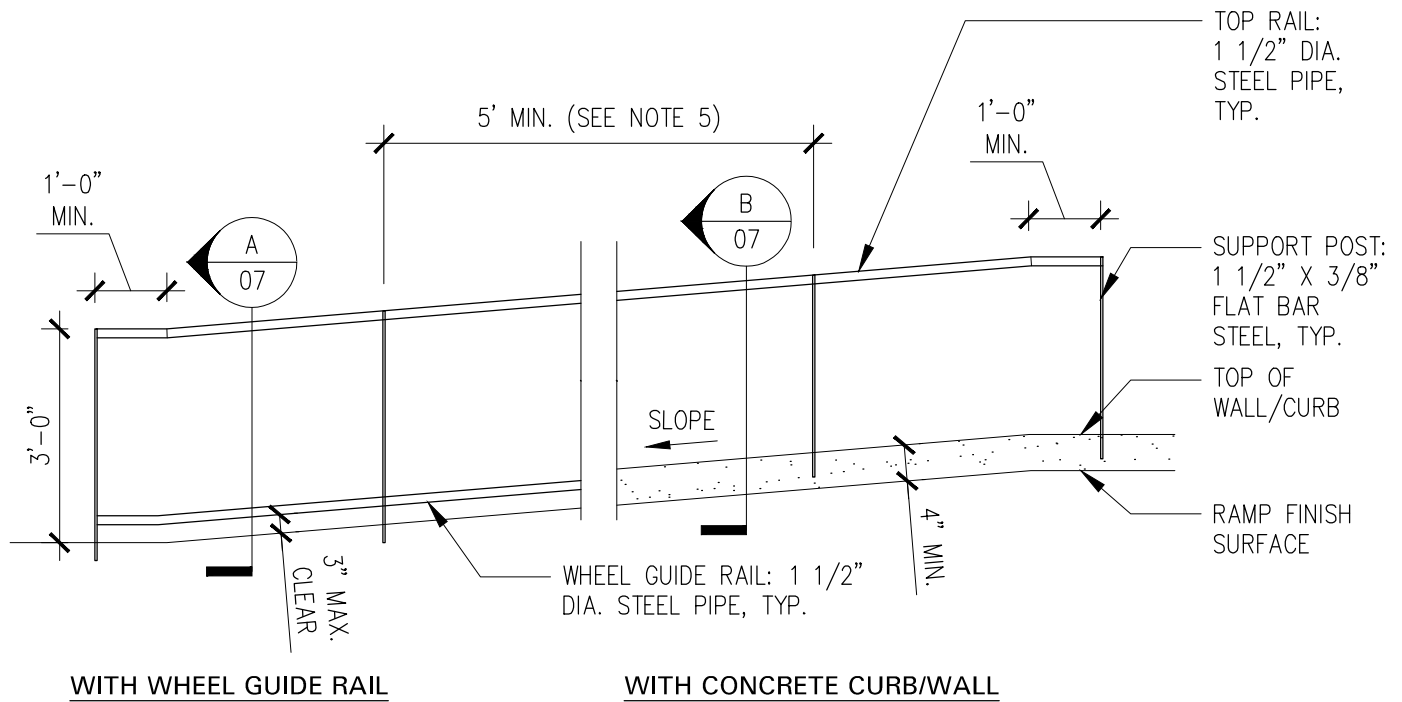
CUSTOM COLOR:

CCE*COLORANT	OZ	32	64	128
W1-WHITE	-	16	-	1
B1-BLACK	-	46	1	-
R2-MAROON	-	4	-	1
Y3-DEEP GOLD	-	6	1	-

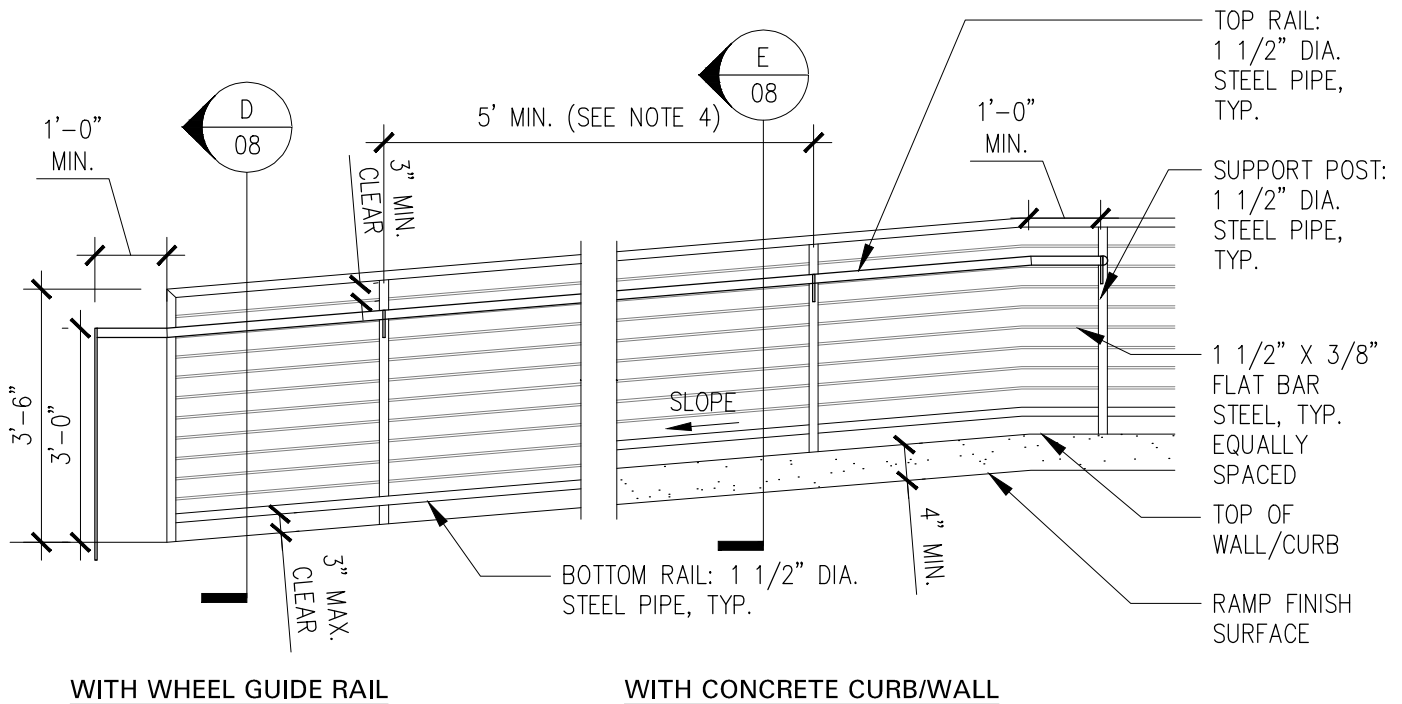
REFERENCE IMAGE:



CUSTOM BROWN TO MATCH



A1 HANDRAIL ON RAMPS LESS THAN 2'-6" ABOVE ADJACENT GRADE
3/8" = 1'-0"



A2 GUARDRAIL AND HANDRAIL ON RAMPS 2'-6" OR MORE ABOVE THE ADJACENT GRADE
3/8" = 1'-0"

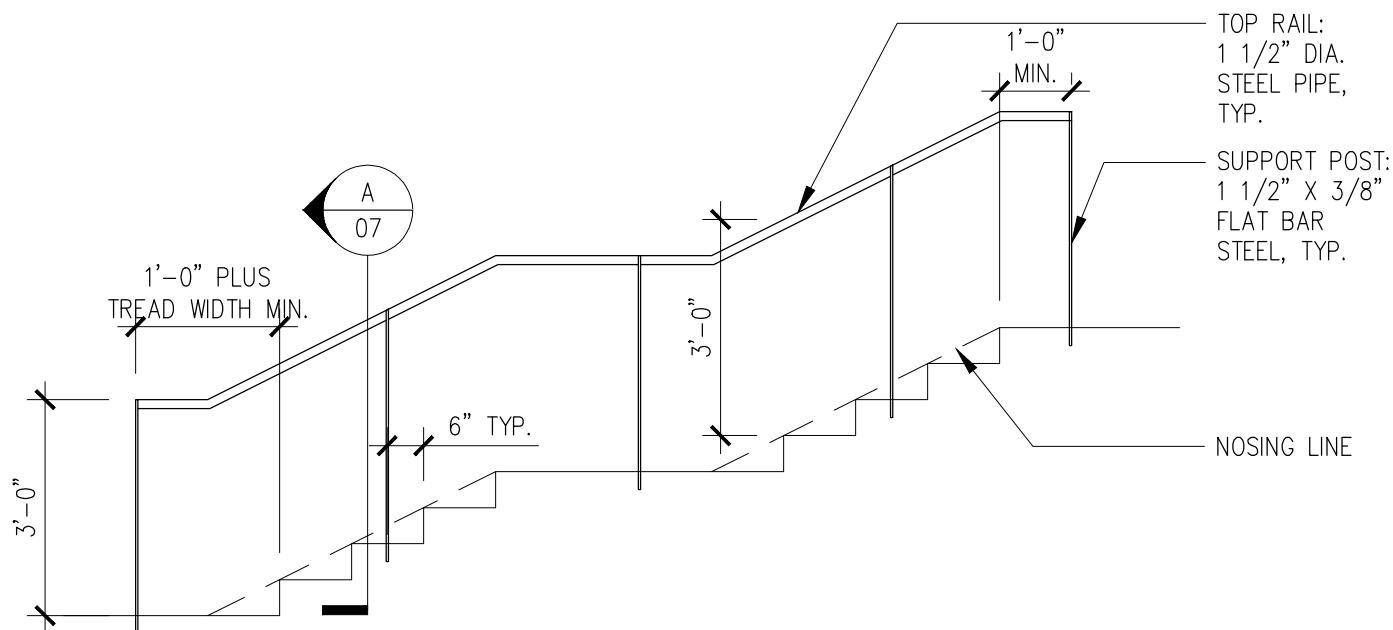
NOT FOR CONSTRUCTION

HANDRAIL AND GUARDRAIL ON RAMPS (WALKING SURFACE SLOPE > 5%)

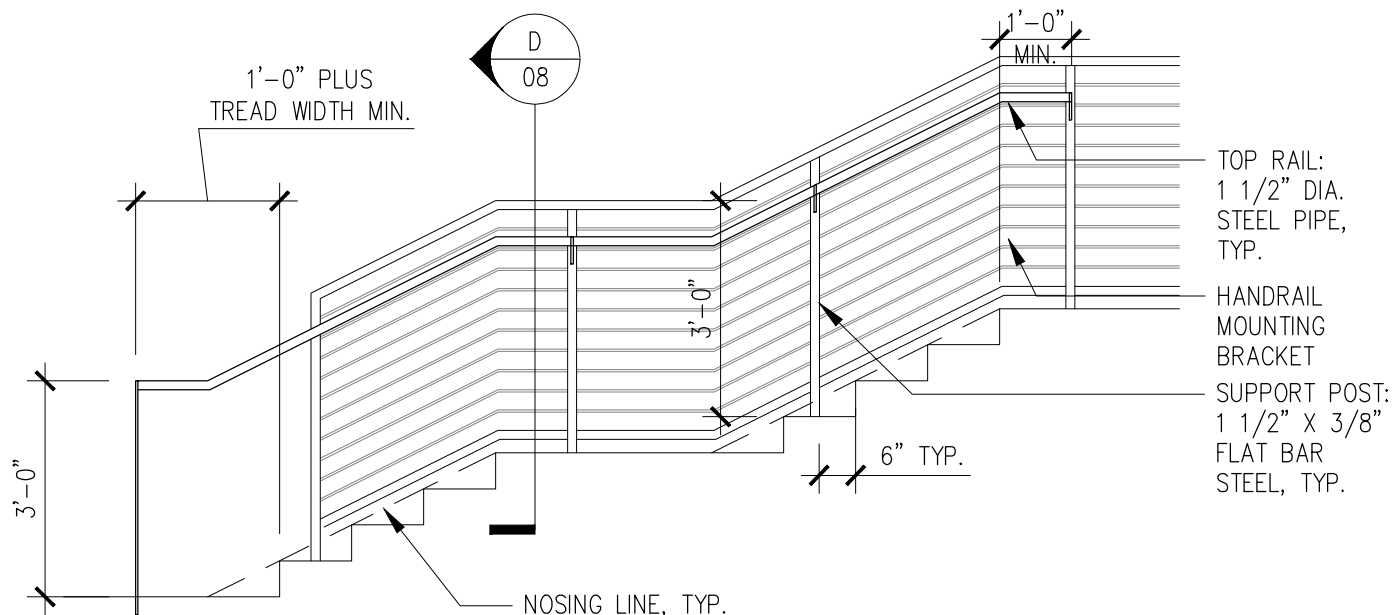
Date: 11/24/2021
Final

CSULB CAMPUS STANDARD PEDESTRIAN
RAILING DESIGN GUIDELINES

Scale: As Indicated
SHEET 03 OF 14



B1 HANDRAIL ON STAIRWAYS LESS THAN 2'-6" ABOVE THE ADJACENT GRADE
3/8" = 1'-0"



B2 GUARDRAIL AND HANDRAIL ON STAIRWAYS 2'-6" OR MORE ABOVE ADJACENT GRADE
3/8" = 1'-0"

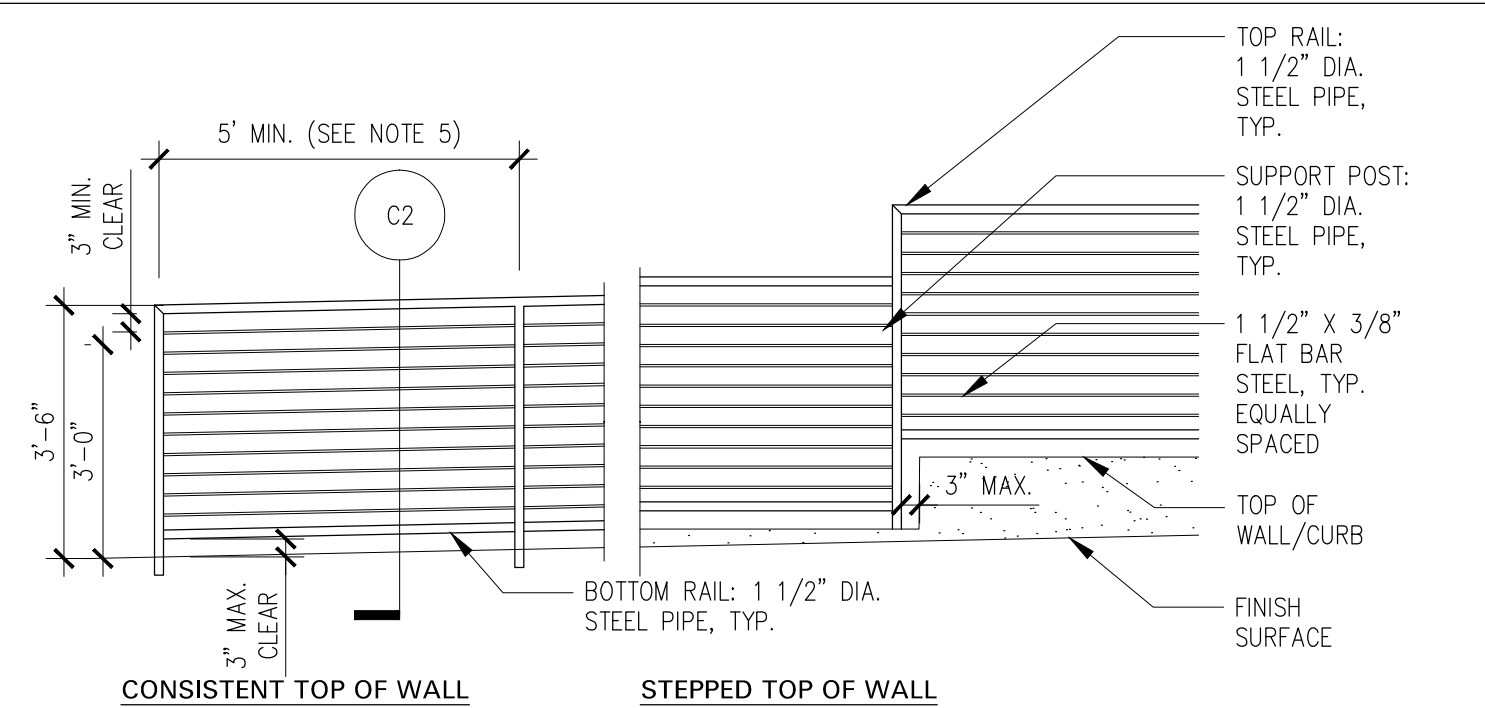
NOT FOR CONSTRUCTION

HANDRAIL AND GUARDRAIL ON STAIRWAYS

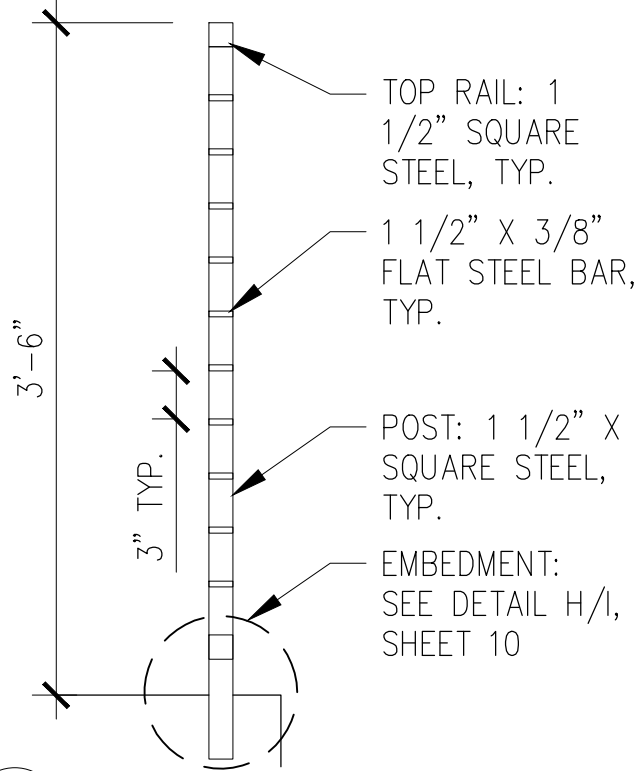
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CSULB CAMPUS STANDARD PEDESTRIAN
RAILING DESIGN GUIDELINES

Scale: As Indicated
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C1 GUARDRAIL ALONG WALKWAYS 2'-6" OR MORE ABOVE ADJACENT GRADE
3/8" = 1'-0"



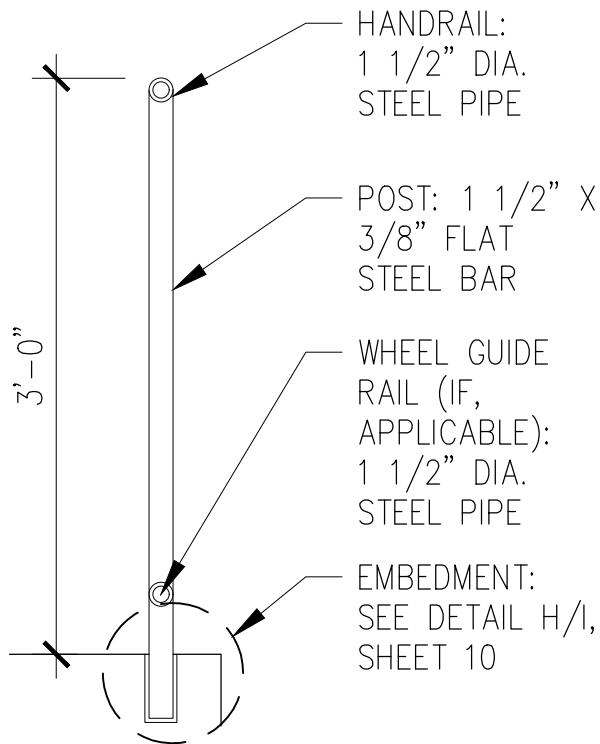
C2 GUARDRAIL SECTION
3/8" = 1'-0"

NOT FOR CONSTRUCTION

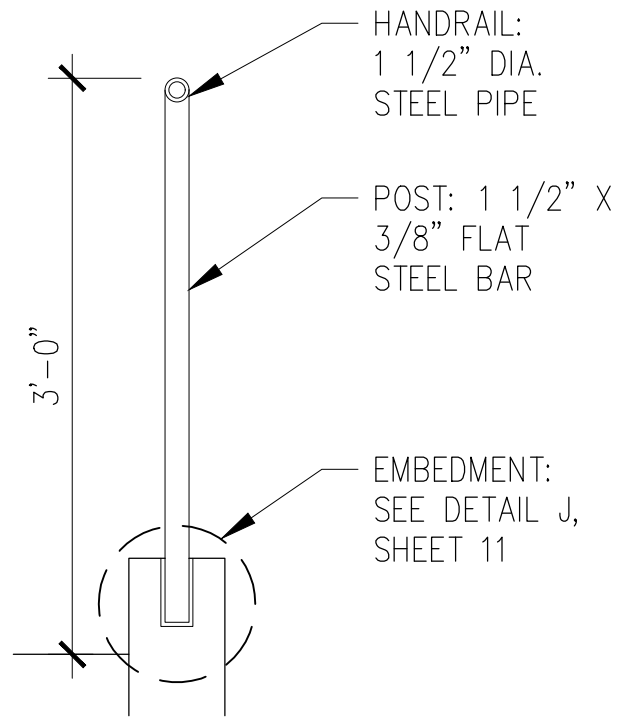
GUARDRAIL ON OPEN SIDE OF WALKWAYS
(WALKING SURFACE SLOPE < 5%)

HANDRAILS ATTACHED TO ADJACENT WALLS

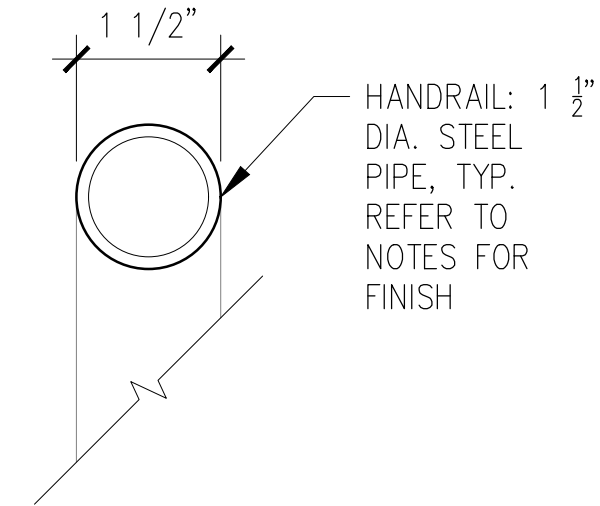
Appendix A - CSULB Design Standards



A HANDRAIL SECTION
1" = 1'-0"



B HANDRAIL SECTION ON CURB/WALL
1" = 1'-0"



C HANDRAIL PROFILE SECTION
6" = 1'-0"

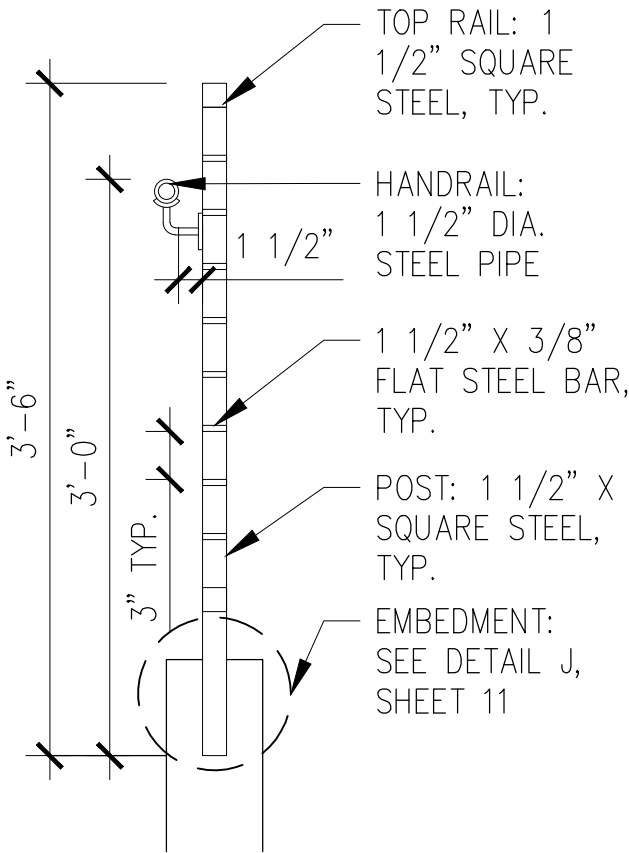
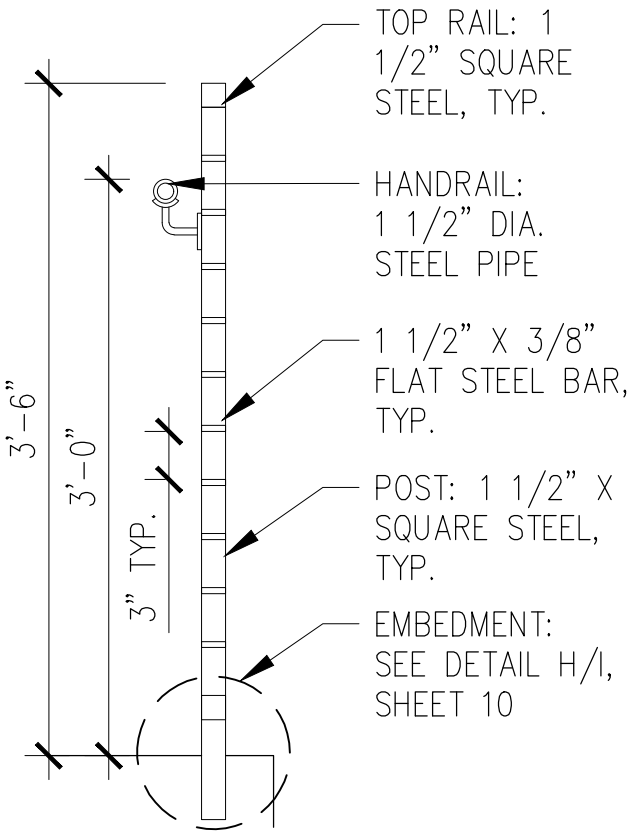
NOT FOR CONSTRUCTION

SECTIONS & DETAILS

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CSULB CAMPUS STANDARD PEDESTRIAN
RAILING DESIGN GUIDELINES

Scale: As Indicated
SHEET 07 OF 14



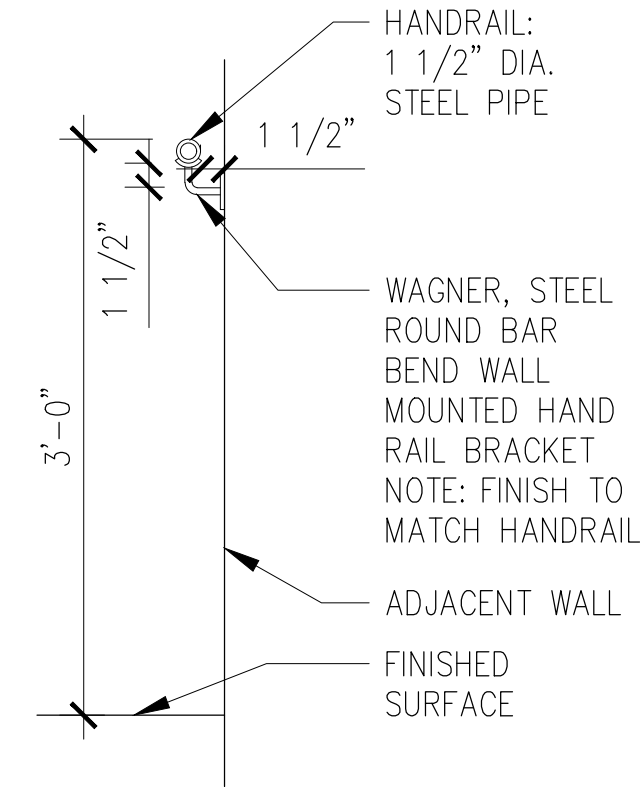
D GUARDRAIL WITH HANDRAIL SECTION
1" = 1'-0"

E GUARDRAIL WITH HANDRAIL SECTION ON CURB/WALL
1" = 1'-0"

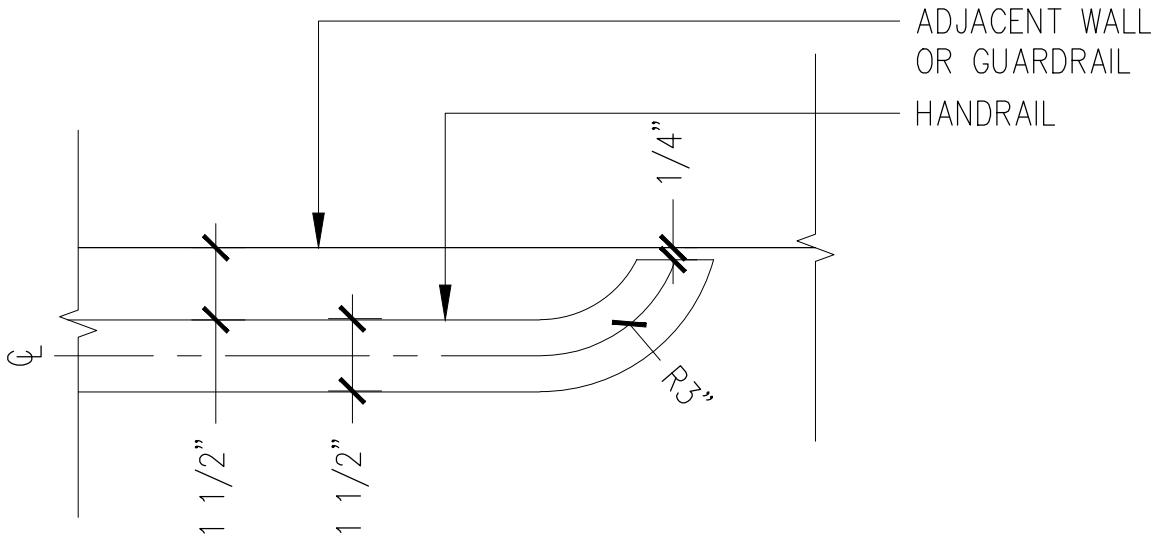
NOT FOR CONSTRUCTION

SECTION & DETAILS

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F HANDRAIL SECTION AT ADJACENT WALL
1" = 1'-0"

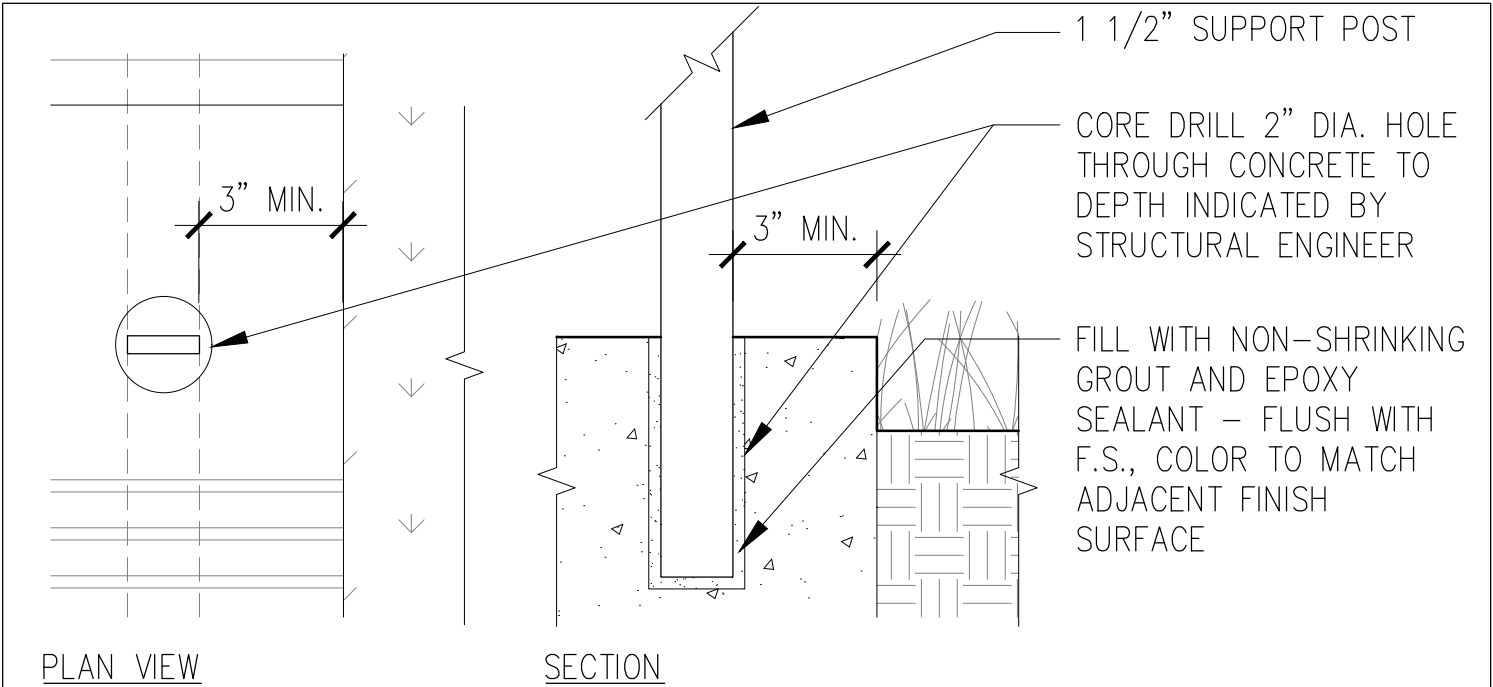


G HANDRAIL TERMINATION AT WALL
3" = 1'-0"

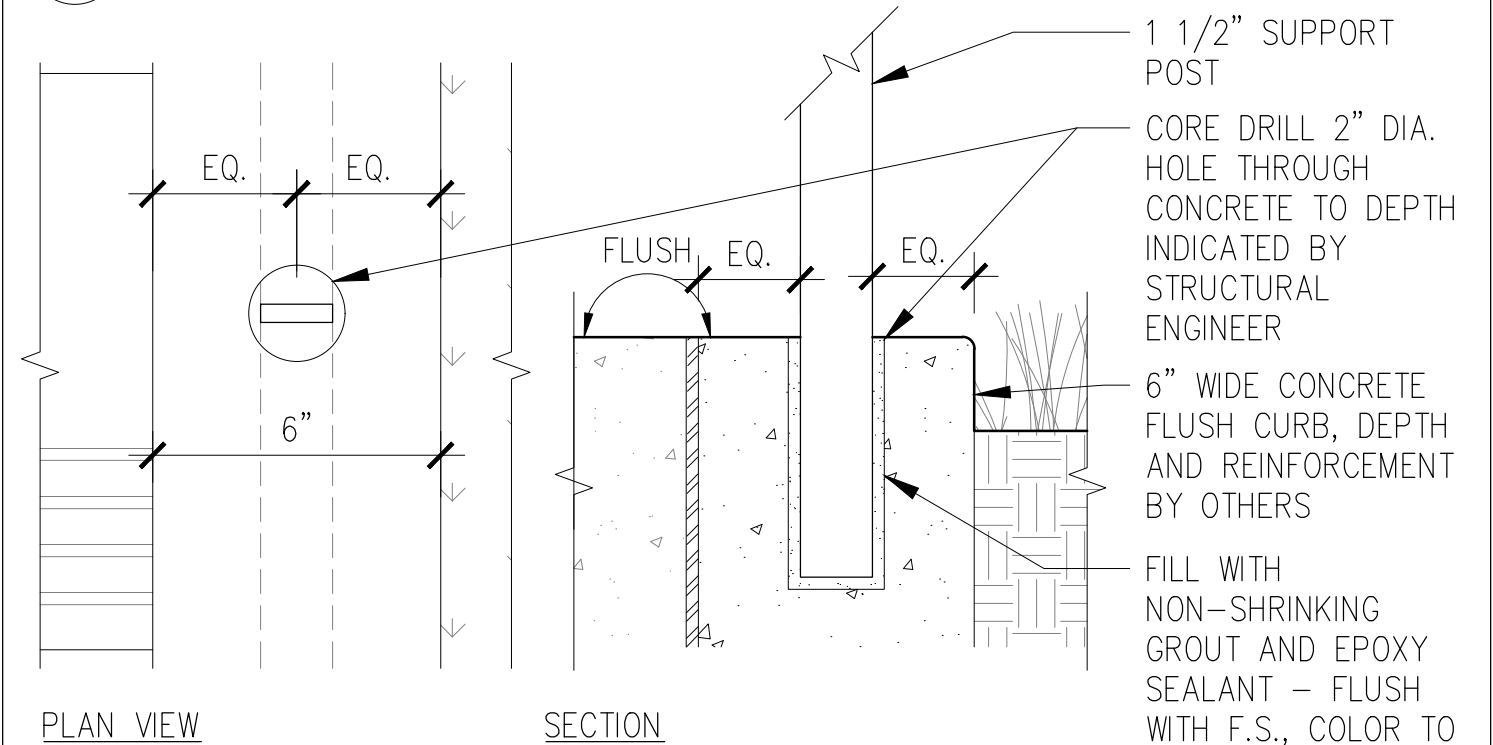
NOT FOR CONSTRUCTION

SECTION & DETAILS

Date: 11/24/2021	CSULB CAMPUS STANDARD PEDESTRIAN RAILING DESIGN GUIDELINES	Scale: As Indicated
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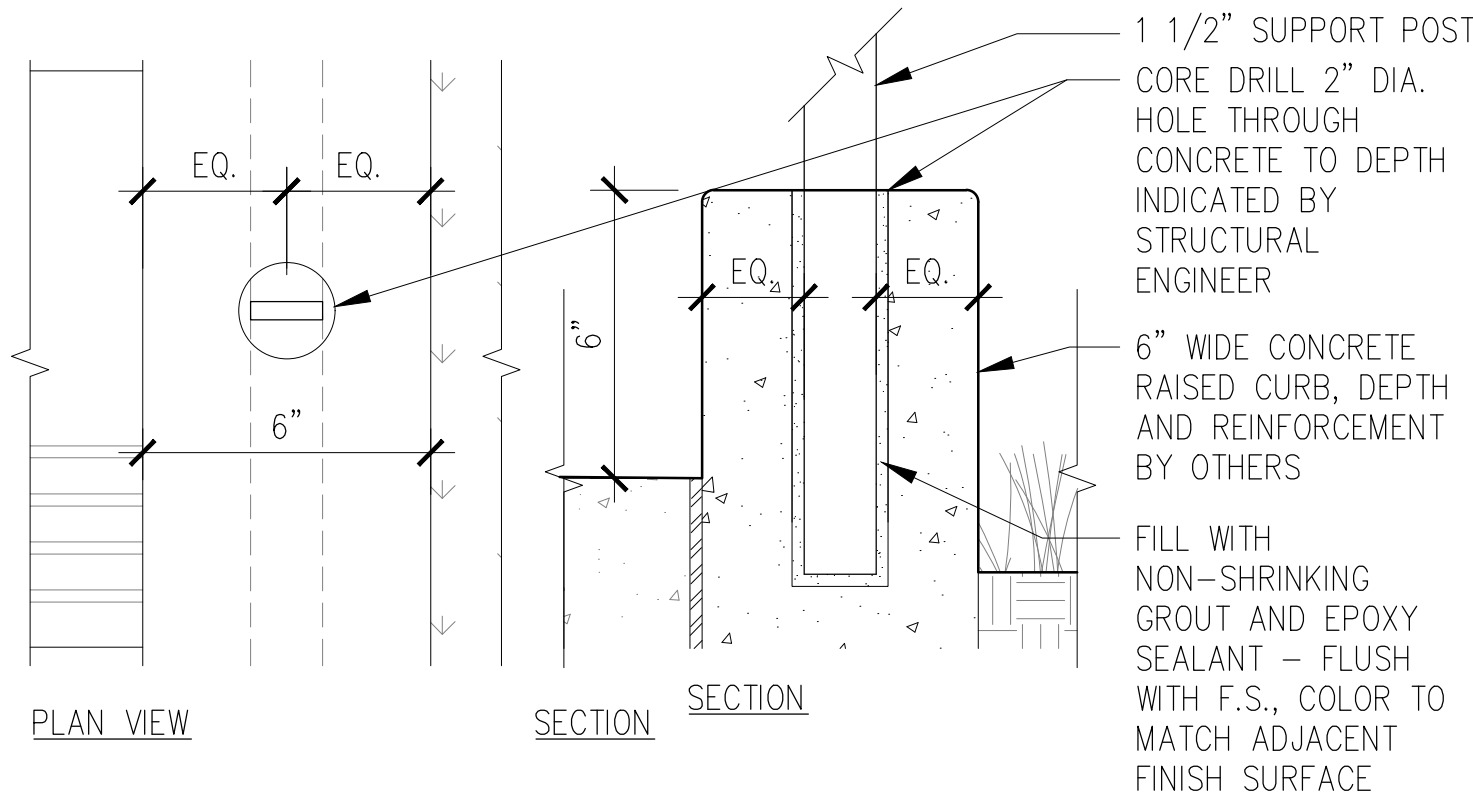
H POST EMBEDDED INTO FINISHED SURFACE
1" = 1'-0"



I POST EMBEDDED INTO FLUSH CURB
1" = 1'-0"

NOT FOR CONSTRUCTION

SECTION & DETAILS



H POST EMBEDDED INTO RAISED CURB/WALL
1" = 1'-0"

NOT FOR CONSTRUCTION

SECTION & DETAILS

Appendix A - CSULB Design Standards

NOTES (SHEET 1 OF 2):

1. DESIGN INTENT: THESE DRAWINGS REPRESENT THE GENERAL DESIGN INTENT TO BE IMPLEMENTED ON SITE. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING OWNER FOR ANY ADDITIONAL CLARIFICATION OR DETAILS NECESSARY TO ACCOMMODATE SITE CONDITIONS OR ARCHITECTURAL DETAILS.
2. STRUCTURAL PIPES, RAILING AND FASTENERS SHALL CONFORM TO ALL ASTM STANDARDS.
3. STEEL SHALL BE FABRICATED AND ERECTED IN CONFORMANCE WITH THE LATEST AISC SPECIFICATIONS AND CODE OF STANDARD PRACTICE BY A LICENSED FABRICATOR.
4. MAXIMUM SPACING OF POSTS SHALL BE 5 FEET ON STRAIGHT ALIGNMENTS AND 4 FEET ON CURVED ALIGNMENTS LESS THAN 30 FEET RADIUS. SPACING SHALL BE UNIFORM. REFER TO NOTE #10 FOR STRUCTURAL REQUIREMENTS TO BE REVIEWED BY PROJECT STRUCTURAL ENGINEER.
5. ALL RAILS AND ANY ADJACENT SURFACES TO BE FREE OF ANY SHARP OR ABRASIVE ELEMENTS. EDGES SHALL HAVE A MINIMUM RADIUS OF 1/8 IN.
6. ALL FIELD WELDS AS REQUIRED SHALL BE GROUND SMOOTH, AND FINISH SHALL BE REPAIRED AFTER FIELD WELDING.
7. 90 DEGREE BEND RADIUS TO THE CENTER OF PIPE SHALL BE WITH TWO (2) TO THREE (3) TIMES OF NOMINAL DIAMETER OF THE PIPE.
8. EMBEDMENT AND REINFORCEMENT OF CONCRETE AT SUPPORTS POST SHALL BE REVIEWED BY STRUCTURAL AND/OR CIVIL ENGINEER PRIOR TO FABRICATION AND INSTALLATION.
9. FINISH: ALL STEEL TO BE PROPERLY PRIMED AND FINISHED WITH A CONSISTENT PRODUCT PER MANUFACTURER LATEST RECOMMENDATIONS.
 - 9.1. PROVIDE TWO (2) FINISH COATS OVER A RUST-INHIBITIVE PRIMER.
 - 9.1.1. PRODUCT: HIGH PERFORMANCE EXTERIOR PAINT
 - 9.1.1.1. COLOR: CUSTOM BROWN COLOR

CCE*COLORANT	OZ	32	64	128
W1-WHITE	-	16	-	1
B1-BLACK	-	46	1	-
R2-MAROON	-	4	-	1
Y3-DEEP GOLD	-	6	1	-
 - 9.1.1.2. FINISH: SEMI-GLOSS
 - 9.1.1.3. MANUFACTURER: SHERMAN WILLIAMS

NOT FOR CONSTRUCTION

GENERAL NOTES

Date: 11/24/2021	CSULB CAMPUS STANDARD PEDESTRIAN RAILING DESIGN GUIDELINES	Scale: As Indicated
Final		SHEET 12 OF 14

NOTES (SHEET 2 OF 2):

10. STRUCTURAL REQUIREMENTS OF HANDRAILS AND RAILINGS: PROVIDE HANDRAILS AND RAILINGS COMPLYING WITH REQUIREMENTS OF ASTM E985 FOR STRUCTURAL PERFORMANCE, BASED ON TESTING PERFORMED ACCORDING TO ASTM E894 AND ASTM E935.
 - 10.1. HANDRAILS: CAPABLE OF WITHSTANDING FOLLOWING LOADS APPLIED AS INDICATED.
 - 10.1.1. CONCENTRATED LOAD OF 200 POUNDS APPLIED AT ANY POINT IN ANY DIRECTION.
 - 10.1.2. UNIFORM LOAD OF 50 POUNDS PER LINEAR FOOT APPLIED IN ANY DIRECTION.
 - 10.1.3. CONCENTRATED AND UNIFORM LOADS ABOVE NEED NOT BE APPLIED SIMULTANEOUSLY.
 - 10.2. GUARDRAIL SYSTEM: CAPABLE OF WITHSTANDING FOLLOWING LOADS APPLIED AS INDICATED.
 - 10.2.1. CONCENTRATED LOAD OF 200 POUNDS APPLIED AT ANY POINT AND IN ANY DIRECTION AT TOP OF GUARDRAIL SYSTEM.
 - 10.2.2. UNIFORM LOAD OF 50 POUNDS PER LINEAR FOOT APPLIED HORIZONTALLY AT THE TOP OF THE GUARDRAIL SYSTEM AND A SIMULTANEOUS LOAD OF 100 POUNDS PER LINEAR FOOT APPLIED VERTICALLY DOWNWARD AT THE TOP OF THE GUARDRAIL SYSTEM.
 - 10.2.3. CONCENTRATED AND UNIFORM LOADS ABOVE NEED NOT BE APPLIED SIMULTANEOUSLY.
 - 10.3. INFILL AREA OF GUARDRAIL SYSTEM: INTERMEDIATE RAILS, BALUSTERS, PICKETS AND PANEL FILLERS CAPABLE OF WITHSTANDING HORIZONTAL CONCENTRATED LOAD 200 POUNDS APPLIED ON 1 SQUARE FOOT AREA AT ANY POINT. ABOVE LOAD NEED NOT BE ASSUMED TO BE ACTING CONCURRENTLY WITH HORIZONTAL LOADS ON RAILING SYSTEM.
 - 10.4. INTERFACE WITH ADJACENT SYSTEMS:
 - 10.4.1. INTEGRATE DESIGN AND CONNECTIONS WITH ADJACENT CONSTRUCTION.
 - 10.4.2. ACCOMMODATE ALLOWABLE TOLERANCES AND DEFLECTIONS FOR STRUCTURAL MEMBERS IN INSTALLATION.
11. EXPANSION JOINTS: INSTALL EXPANSION JOINTS AT LOCATIONS INDICATED BUT NOT FARTHER APART THAN REQUIRED TO ACCOMMODATE THERMAL MOVEMENT. PROVIDE SLIP-JOINT INTERNAL SLEEVE EXTENDING TWO-INCHES (2") BEYOND JOINT ON EITHER SIDE, FASTEN INTERNAL SLEEVE SECURELY TO ONE SIDE, AND LOCATE JOINT WITHIN SIX INCHES (6") OF POST.

NOT FOR CONSTRUCTION

GENERAL NOTES CONTINUED

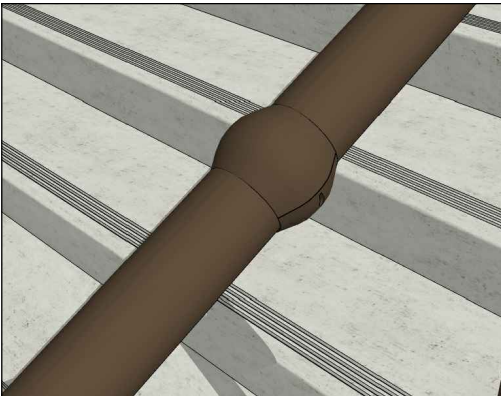
Date: 11/24/2021

Final

CSULB CAMPUS STANDARD PEDESTRIAN
RAILING DESIGN GUIDELINES

Scale: As Indicated

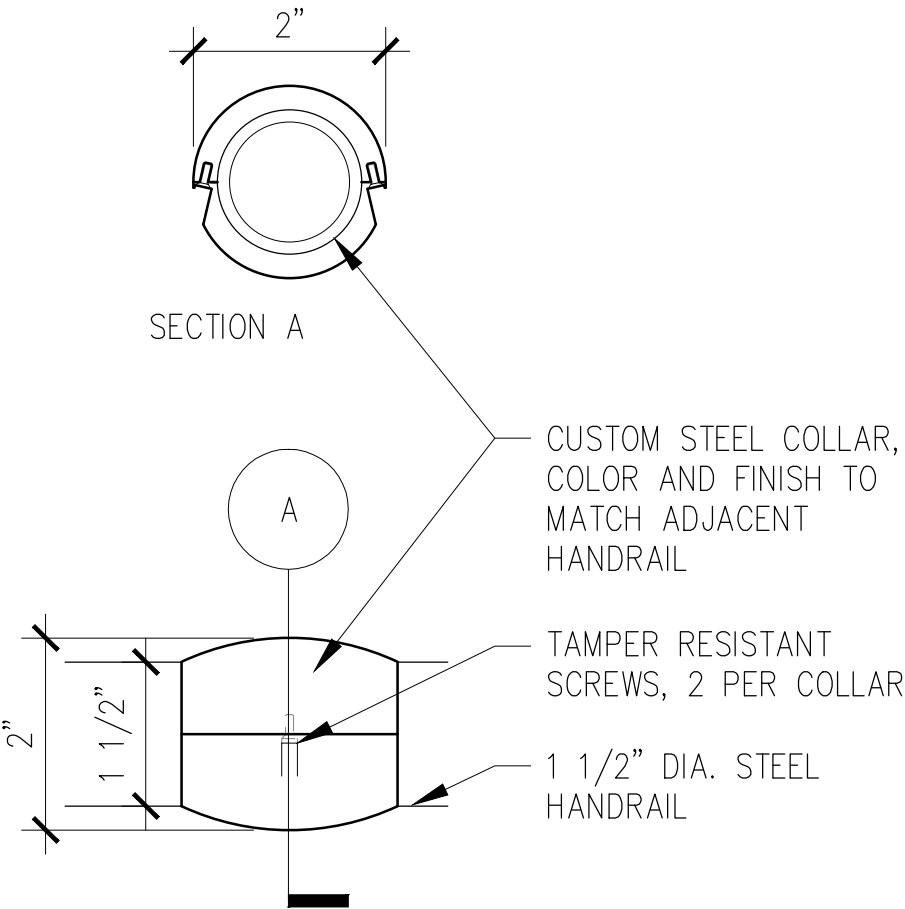
SHEET 13 OF 14



REFERENCE IMAGE

NOTES:

- 1. COLLAR TO MATCH COLOR AND FINISH OF ADJACENT HANDRAIL.
- 2. COLLAR TO BE INSTALLED 4' O.C. ON APPLICABLE RAILS SUSCEPTIBLE TO SKATING.



STEEL SKATE DETERRENT COLLAR

6" = 1'-0"

NOT FOR CONSTRUCTION

SKATE DETERRENTS

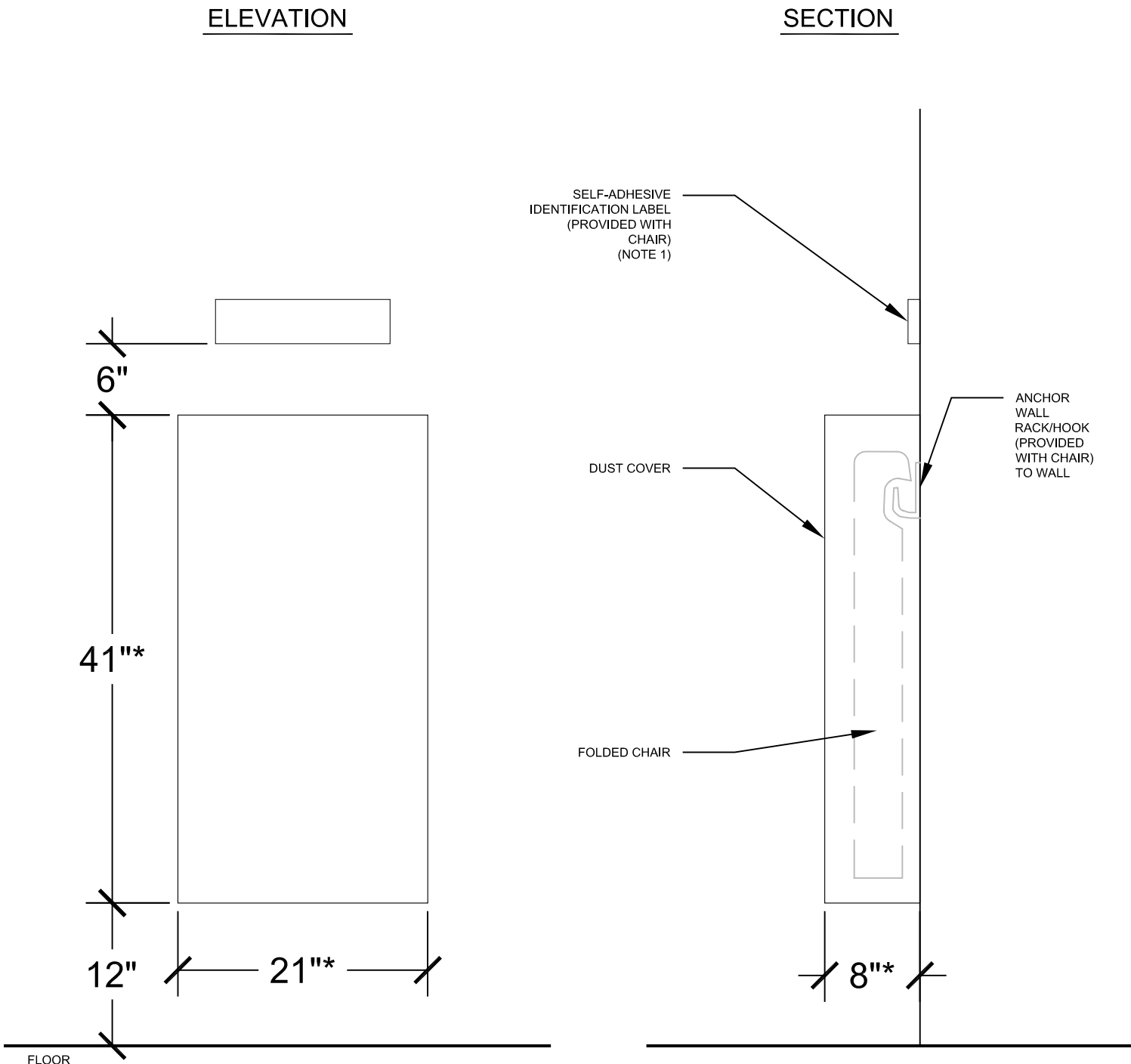
SKATE DETERRENTS



IN AREAS WHERE SKATE
DETERRENTS ARE
NEEDED, THE
GUARDRAIL OR HAND
RAIL POST MAY
PROJECT PAST THE
HANDRAIL AS A SKATE
DETERRENT. SEE
PHOTOS.



Appendix B - CSULB Design Standards



EVACUATION CHAIR
TYPICAL INSTALLATION DETAIL
*(BASED ON EVAC+ MODEL 300H)

NOTES:
(1) WHERE WALL IS NOT SUITABLE FOR ATTACHMENT OF SELF-ADHESIVE LABEL, PROVIDE AND ATTACH A SMOOTH PLATE TO THE WALL FOR THE SELF-ADHESIVE LABEL.

Evac+Chair® 300H Mk4

THE ONLY EVACUATION CHAIR ON THE MARKET WITH A DUAL POSITION SEAT

The Evac+Chair® 300H featuring 400lbs weight capacity and single person operation.



Features

1 Adjustable patient head restraint

Limits movement, securing the passenger in place

2 Friction tracks (Evac+Track technology)

The self braking reinforced tracks control speed of descent for easy single person operation

3 Ergonomic adjustable handle

For ease of deployment and compact storage

4 Reflective decals

For easy location in situations of poor visibility

5 Quick release safety belts (Head, Chest, Thigh)

For increased passenger safety

6 Heavy duty wheels

Ideal for operation over uneven terrain

7 Lockable rear wheels

Can be applied in situations where the chair needs to remain in a stationary position

8 Dual position seat

Dual position seat allows the user to decide each time which seating position they desire



Includes

- LIFETIME WARRANTY
- 3 Passenger Safety Belts (Head, Chest, Thigh)
- Photoluminescent Signage
- Wall Mounting Brackets
- Dust Cover
- User Guide
- Instructional DVD

Benefits

- Designed in the US
- FDA Registered
- Provides a quick, easy and safe emergency evacuation
- Easy to use
- One person operation
- Lightweight
- No heavy lifting required
- Enables small attendants to easily move passengers three times their size
- Easy to open, ready to use in seconds
- Folds for compact storage
- Exceeds fire safety requirements and emergency response guidelines established to support the Americans with Disabilities Act
- Wall mountable



Flat seat

with zipped side panels and over thigh quick release passenger restraint



Hammock seat

simply release zipped side panels, fasten together on underside, retaining use of over-thigh quick release passenger restraint



Dimensions	Height	Width	Depth	Weight	Weight Capacity
Folded	41"	20"	8"	19lbs	400lbs

VIDEO LINK: evac-chair.com/watch-video/

For over 35 years EVAC+CHAIR® is America's Original and World's Number One Selling Evacuation Chair. Don't Risk Lives, Beware of Poor Imitations and Inferior Substitutions. There is only one EVAC+CHAIR®. Unsurpassed Quality and Workmanship, Successful in Saving Lives in 9/11, EXCLUSIVE LIFETIME WARRANTY.

For further information please contact:

Evac+Chair North America LLC

3000 Marcus Ave, Suite #3E6, Lake Success, NY, 11042-1012

T 516-502-4240 W www.evac-chair.com E sales@evac-chair.com

EVAC+CHAIR®

THE WORLD'S NO.1 STAIRWAY EVACUATION CHAIR SINCE 1982

Evac+Chair® 600H

THE ONLY EVACUATION CHAIR ON THE MARKET WITH A DUAL POSITION SEAT

The Evac+Chair® 600 is a single operator chair which also incorporates 2 carrying handles that allow for 2 to 4 person upwards evacuation in locations with difficult access.

Features

- 1 Adjustable patient head restraint**
Limits movement, securing the passenger in place
- 2 Friction tracks (Evac+Track technology)**
The self braking reinforced tracks control of descent for easy single person operation
- 3 Ergonomic adjustable handle**
For ease of deployment and compact storage
- 4 Reflective decals**
For easy location in situations of poor visibility
- 5 Quick release safety belts (Head, Chest, Thigh)**
For increased passenger safety
- 6 Heavy duty wheels**
Ideal for operation over uneven terrain
- 7 Lockable rear wheels**
Can be applied in situations where the chair needs to remain in a stationary position
- 8 Fold away front and rear grab bars**
Single person operation with fold away grab bars allowing up to 4 people to assist with operation
- 9 Dual position seat**
Dual position seat allows the user to decide each time which seating position they desire



Flat seat

with zipped side panels and over thigh quick release passenger restraint



Hammock seat

simply release zipped side panels, fasten together on underside, retaining use of over-thigh quick release passenger restraint



Includes

LIFETIME WARRANTY

3 Passenger Safety Belts (Head, Chest, Thigh)
Photoluminescent Signage
Wall Mounting Brackets
Dust Cover
User Guide
Instructional DVD

Benefits

- Designed in the US
- FDA Registered
- Provides a quick, easy and safe emergency evacuation
- Easy to use
- One or two person operation
- Lightweight
- No heavy lifting required
- Enables small attendants to easily move passengers three times their size
- Easy to open, ready to use in seconds
- Folds for compact storage
- Exceeds fire safety requirements and emergency response guidelines established to support the Americans with Disabilities Act
- Wall mountable



Dimensions	Height	Width	Depth	Weight	Weight Capacity
Folded	47"	23"	12"	24lbs	400lbs

VIDEO LINK: evac-chair.com/watch-video/

For over 35 years EVAC+CHAIR® is America's Original and World's Number One Selling Evacuation Chair. Don't Risk Lives, Beware of Poor Imitations and Inferior Substitutions. There is only one EVAC+CHAIR®. Unsurpassed Quality and Workmanship, Successful in Saving Lives in 9/11, EXCLUSIVE LIFETIME WARRANTY.

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T 516-502-4240 W www.evac-chair.com E sales@evac-chair.com


EVAC+CHAIR®


THE WORLD'S NO.1 STAIRWAY EVACUATION CHAIR SINCE 1982

Appendix C- CSULB Design Standards CAL Fire Triage List as of January 2022

Office of the State Fire Marshal

Plan Submittal Checklist

 Please check all required items noted below, as well as any additional items, indicating that you have included them in your submitted Plans.

 *Indicates required field*

1. General

- ☐ Submit plans sufficient size (24in x 36in minimum, 30in x 42in maximum, 40 lbs. maximum per roll)
- ☐ Provide site address *
- ☐ Provide name of owner and occupant *
- ☐ Identify if new construction or T.I *
- ☐ Identify if new or existing tenant space *
- ☐ Identify if deferred submittal *
- ☐ Add CSFM file number to title sheet
- ☐ Slip sheets shall be bound to set
- ☐ Sheet Index Provided *
- ☐ Wet stamp and sign sheets *
- ☐ Electronic signature approval required *
- ☐ Scope of Work *
- ☐ Provide a Key Plan coordinated to each sheet
- ☐ Provide a North orientated Site Map
- ☐ List all Deferred Submittals
- ☐ Provide adopted code cycle listings and standards *
- ☐ Provide a legible scale. Typically 1/8" *
- ☐ Provide applicable reference plans
- ☐ Provide Local Fire Authority Approval Letter

2. ACCESS AND WATER SUPPLY

- ☐ Fire Department Access
- ☐ Fire Department Connection
- ☐ Fire Hydrants
- ☐ Fire Alarm Annunciator
- ☐ Fire Alarm Control Panel
- ☐ Knox Box/Key Switch
- ☐ Provide a complete fire access plan
- ☐ Provide 6 mo. current site fire flow information (Witnessed by SFM or certified by local water purveyor)
- ☐ Other:

3. NONSTRUCTURAL PROVISIONS

Building Analysis

This block of 20 items must appear on ALL plans and information must be provided. If any item(s) are not applicable to your project state "N/A".

- ☐ Occupancy groups and varied uses *
- ☐ Building construction type *
- ☐ Number of stories *
- ☐ Actual building height *
- ☐ Building area in square feet *
- ☐ Area of project in square feet *
- ☐ Separated, non-separated, accessory use *
- ☐ Allowable area *
- ☐ Area increase *
- ☐ Height increase *
- ☐ Fire Sprinklers (Type, Full, Partial) *
- ☐ Fire Alarm (Type) *
- ☐ Other Fire Protection System (Type) *
- ☐ Smoke Control System (Y/N) *
- ☐ Occupant load for entire building *
- ☐ Occupant load for each floor *

Appendix C- CSULB Design Standards CAL Fire Triage List as of January 2022

- ☐ Year building was constructed *
- ☐ High Fire Hazard Severity Zone (Y/N) *
- ☐ Seismic Joints and locations (Y/N) *
- ☐ Emergency Responder Radio Coverage (Y/N) *
- ☐ Identify occupancy groups/uses on floor plans
- ☐ Identify adjacent buildings on the site
- ☐ Identify fire separation distances
- ☐ Identify building allowable area increases
- ☐ Justify frontage allowances
- ☐ Classification of roof covering

Types and Materials of All Construction

- ☐ Provide wall legends
- ☐ Fire rated assemblies
- ☐ Provide listed assemblies to plans

Penetration protection

- ☐ Provide listed fire stopping systems to plans

Details for Opening Protection

- ☐ Door schedule
- ☐ Window schedule
- ☐ Louver schedule
- ☐ Listed smoke containment system

4. EXITING

- ☐ Paths of travel to a public way
- ☐ All occupancies/uses on floor plans
- ☐ Correct occupant load factors (gross, net)
- ☐ Cumulative loads (lobbies, corridors, stairs, etc.)
- ☐ Furniture plan
- ☐ Egress capacity (width and number)
- ☐ Door swing
- ☐ Door hardware
- ☐ Delayed egress design
- ☐ Emergency lighting and photometric

- ☐ Exit signs
- ☐ Exit enclosures (vertical and horizontal)
- ☐ Exit discharge
- ☐ Areas of refuge or safe dispersal areas

5. FIRE PROTECTION SYSTEMS

5. 1 FIRE ALARM

- ☐ Provide all OFSM Shop Drawing Notes
- ☐ Provide cut sheets and data sheets for all components
- ☐ Provide current CSFM listings
- ☐ Provide/correct equipment matrix
- ☐ Provide a sequence of operation
- ☐ Identify approved monitoring station
- ☐ Identify fire alarm and egress-control devices
- ☐ Demonstrate compliance for egress-control systems
- ☐ Provide ceiling configuration, surface, and height
- ☐ Provide/correct voltage drop calculations for devices
- ☐ Provide/correct riser diagram
- ☐ Provide/correct standby battery calculations
- ☐ Audible visual notification coverage insufficient
- ☐ Manual fire alarm box coverage insufficient

5.2 FIRE SPRINKLERS

- ☐ Provide all OSFM shop drawing notes
- ☐ Identify system type (wet, dry, pre-action, etc.)
- ☐ Provide ceiling configuration, surface, and height
- ☐ Provide hydraulic calculations
- ☐ Provide full height cross sections/ceiling construction
- ☐ Identify area protected by each system for each floor
- ☐ Identify area limitations for hazard classifications
- ☐ Correct notes/design to reflect CA amendments
- ☐ Identify miscellaneous storage conditions

5.3 SPRAY BOOTH

- ☐ Identify location of spray booth and building exits
- ☐ Identify room/area type of use.

- ☐ Identify square footage of booth
- ☐ Identify spray booth and floor construction (Provide specification sheet)
- ☐ Identify types and locations of fire extinguishers
- ☐ Identify ventilation design and rooftop terminus

5.4 CLEAN AGENT

- ☐ Provide highlighted product data and listing sheets
- ☐ Reflect interface with building fire alarm system
- ☐ Description of occupancy, hazard protected
- ☐ Provide cross section of floor/ceiling assemblies
- ☐ Provide Floor Plan
- ☐ Visual notification appliances shall be red
- ☐ Other:

5.5 HOOD AND DUCT EQUIPMENT/SYSTEMS

- ☐ Scaled Floor plan of area and equipment
- ☐ Dimensions of hoods, ducts, and appliances
- ☐ Equipment list for system, devices and materials
- ☐ Manufacturer's installation instructions
- ☐ Cut sheets and compliance with UL 300 Standard
- ☐ Isometric drawing of piping and components - Type, size and length of piping
- ☐ Isometric drawing of piping and components - Location and size of extinguishing agent
- ☐ Isometric drawing of piping and components - Location and identity of gas and electric shutoffs

6. EMERGENCY GENERATORS

- ☐ Proximity to structures & property lines
- ☐ Open or enclosed enclosure
- ☐ Class, level, type, & purpose
- ☐ Location/protection of automatic transfer switch
- ☐ Elevation/location of exhaust
- ☐ Fuel source type, contents & quantity
- ☐ Fuel tank location and set backs
- ☐ Generator load calculations
- ☐ Secondary containment
- ☐ Piping type, fittings and method of joining
- ☐ Vehicle impact protection

7. ELECTRIC VEHICLE CHARGING STATIONS

- ☐ Site Plan identifying location of charging stations
- ☐ Identify required signage, posts, wheel stops
- ☐ Identify transformer location, bonding & grounding
- ☐ Provide location of disconnect
- ☐ Charging equipment for vehicles requiring ventilation
- ☐ Identify means of indoor mechanical ventilation

8. PHOTOVOLTAIC SYSTEMS

Site Plan

- ☐ Location to property line(s)
- ☐ Separation distance to adjacent structures
- ☐ Location of disconnects
- ☐ Fire department access/fire lanes

Array Type

- ☐ Ground array
- ☐ Elevated/ rooftop array
- ☐ Array elevation
- ☐ Construction type
- ☐ Occupancy group
- ☐ Rooftop layout, access, ventilation, pathways

9. HAZARDOUS MATERIALS

9.1 CHEMICAL CLASSIFICATION

- ☐ Inventory summary with hazard class and totals
- ☐ Safety Data Sheets
- ☐ Floor plans
- ☐ Control areas
- ☐ Fume hoods and enclosures
- ☐ Spill control/secondary containment
- ☐ Standby/emergency power

9.2 ABOVEGROUND STORAGE TANKS

- ☐ Fuel tank location and set backs
- ☐ Fuel source type, contents & quantity
- ☐ Details of normal and emergency venting

- ☐ Secondary containment
- ☐ Piping type, fittings and method of joining
- ☐ Vehicle impact protection
- ☐ Details for fuel dispensing/filling

9.3 UNDERGROUND STORAGE TANKS

- ☐ Fuel tank location
- ☐ Tank type and design
- ☐ Supply and return piping runs
- ☐ Piping type and details
- ☐ Details for fuel dispensing/filling
- ☐ Vehicle impact protection
- ☐ Spill containers
- ☐ Leak detection and monitoring
- ☐ Emergency shutoff location
- ☐ Manufacturer equipment product sheets

10. HIGH PILE STORAGE

- ☐ Letter of intent signed by authorized department head
- ☐ HPS analysis prepared by a FPE
- ☐ Scaled site plan (fire lanes, hydrants, FDC's, risers)
- ☐ Scaled floor plan (HPS area, racks, access doors)
- ☐ Aisle dimensions
- ☐ Location and design of smoke vents

Footer Statement

- ☐ For more in-depth triage list and additional information on plan review submittal, visit the OSFM website at <http://osfm.fire.ca.gov/firelifesafety>
- ☐ I acknowledge that I have reviewed and certified that the above submittal is true and correct to the best of my knowledge. *

✓ Submit

Back

GENERAL ROOM NUMBERING GUIDELINE

ODD NUMBERS ON NORTH SIDE
EVEN NUMBERS ON SOUTH SIDE

BASEMENT: 010's
1st FLOOR: 100's
2nd FLOOR: 200's

ROOMS WITH ASF ARE GIVEN A 3 DIGIT NUMBERS. ROOMS WITHIN THAT SUITE ARE THEN GIVEN THAT SPACE'S NUMBER FOLLOWED BY AN ALPHA SUFFIX, GOING FROM A TO Z CLOCKWISE, STARTING IN THE NORTHESTER-N-MOST SPACE OF THAT SUITE.

CUBICLES ARE NOT GIVEN A SPACE NUMBER, UNLESS ENCLOSED WITH A SOLID, LOCKABLE DOOR.

NON-ASSIGNABLE SPACES ARE GIVEN A 2-LETTER PREFIX, FOLLOWED BY A 4-NUMBER IDENTIFICATION, SUCH AS TE0101.

NON-ASSIGNABLE SPACES AND THEIR ABBREVIATIONS ARE:

- MECHANICAL - ME
- TELEPHONE/TELECOM - TE
- CUSTODIAL - CU
- WOMEN'S RESTROOM - WR
- MEN'S RESTROOM - MR
- CORRIDOR - CO
- LOBBY - LO
- STAIRWAY - SW
- ELEVATOR - EV
- MISC NON ASSIGNABLE - MN
- Gender-Neutral Restroom - RR

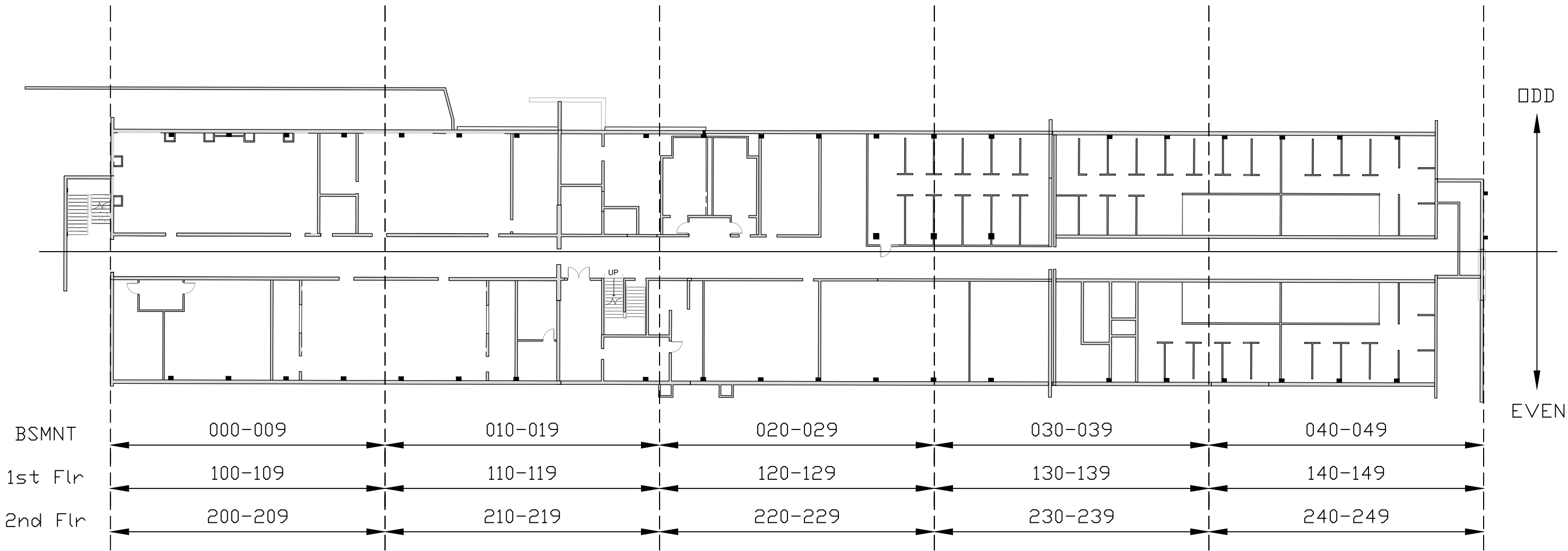
EXISTING STAIRWAYS ARE NUMBERED AS FOLLOW:

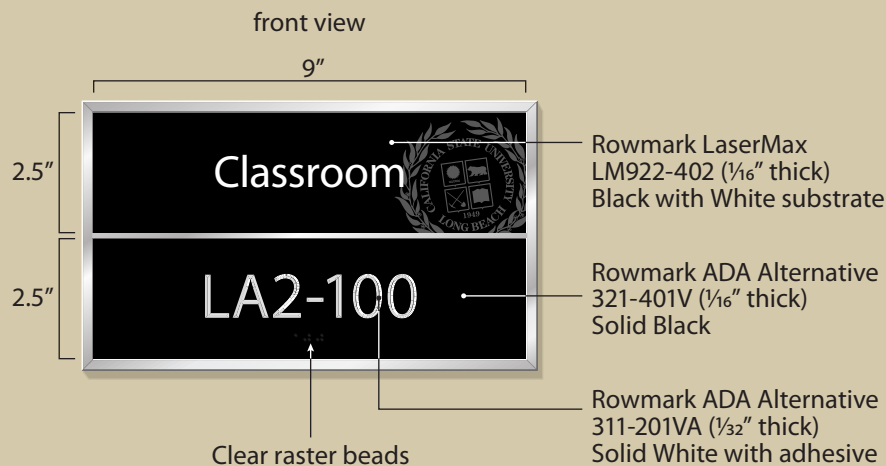
- SW0101 - WEST STAIRWAY
- SW0102 - CENTRAL STAIRWAY
- SW0103 - EAST STAIRWAY

EXAMPLE OF EXISTING ROOMS:

- 107
- 108
- 108A
- 108B
- 108C
- 108D
- CU0101
- EV0101
- MR0101

Space Management to review and approve all room numbering as early in the SD process as possible





cut-away side view



NAMEPLATES
font: Myriad Pro Regular (optical kerning)

when name alone is called for:

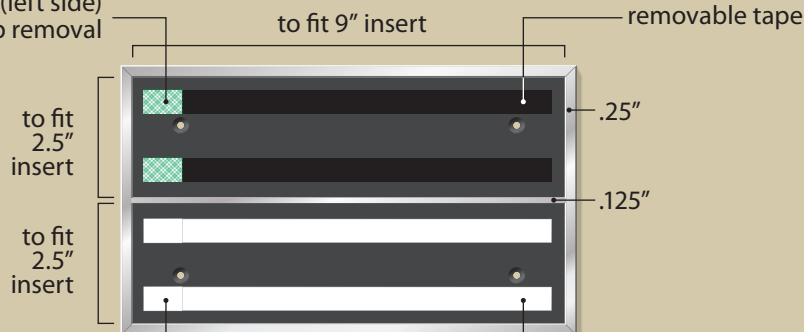


$\frac{1}{16}$ " thick

when name and title are called for:



leave 1" liner on tape (left side) for easier suction cup removal



$\frac{1}{2}$ " outer depth (aluminum)

$\frac{3}{16}$ " inner depth

$\frac{3}{16}$ " inner depth

leave 1" liner on tape (left side) for easier suction cup removal

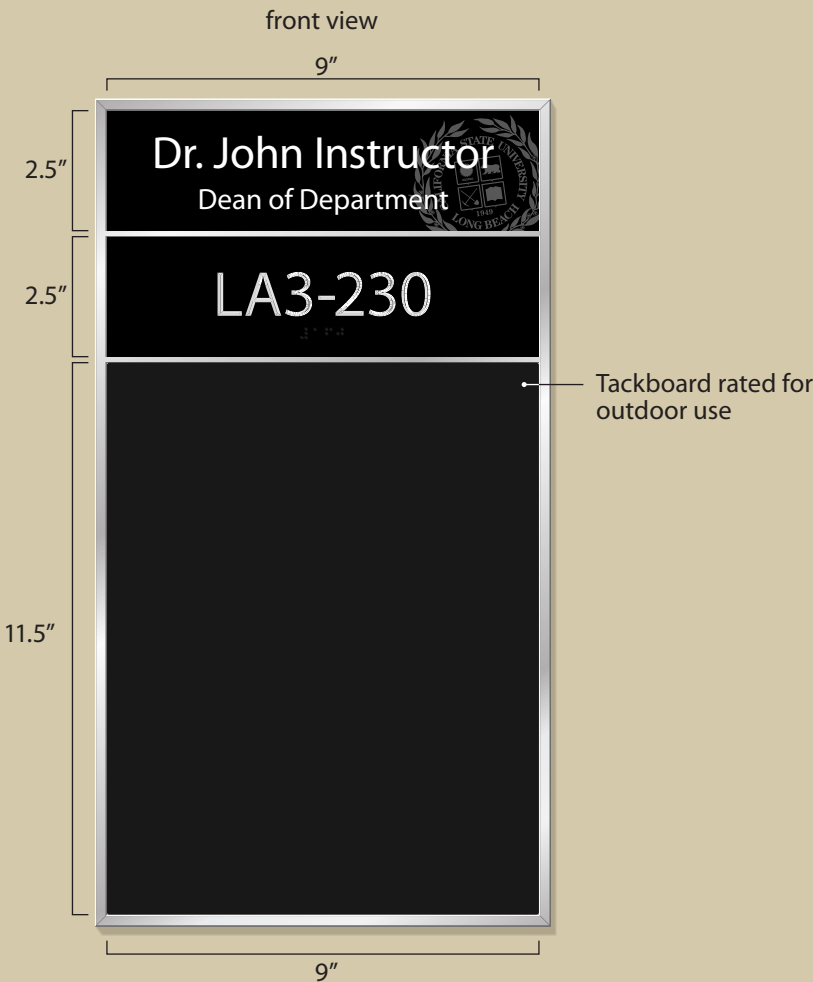
NUMBER PLATES
font: Myriad Pro Regular (optical kerning)



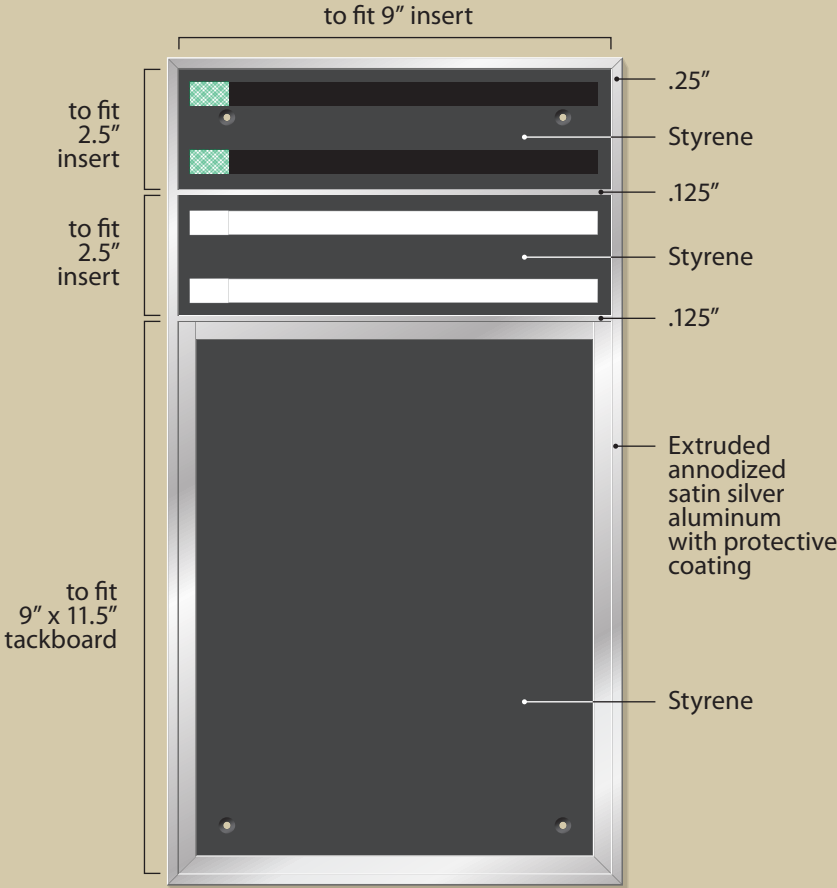
$\frac{1}{16}$ " thick with $\frac{1}{32}$ " applique

when letters are part of the room I.D.:





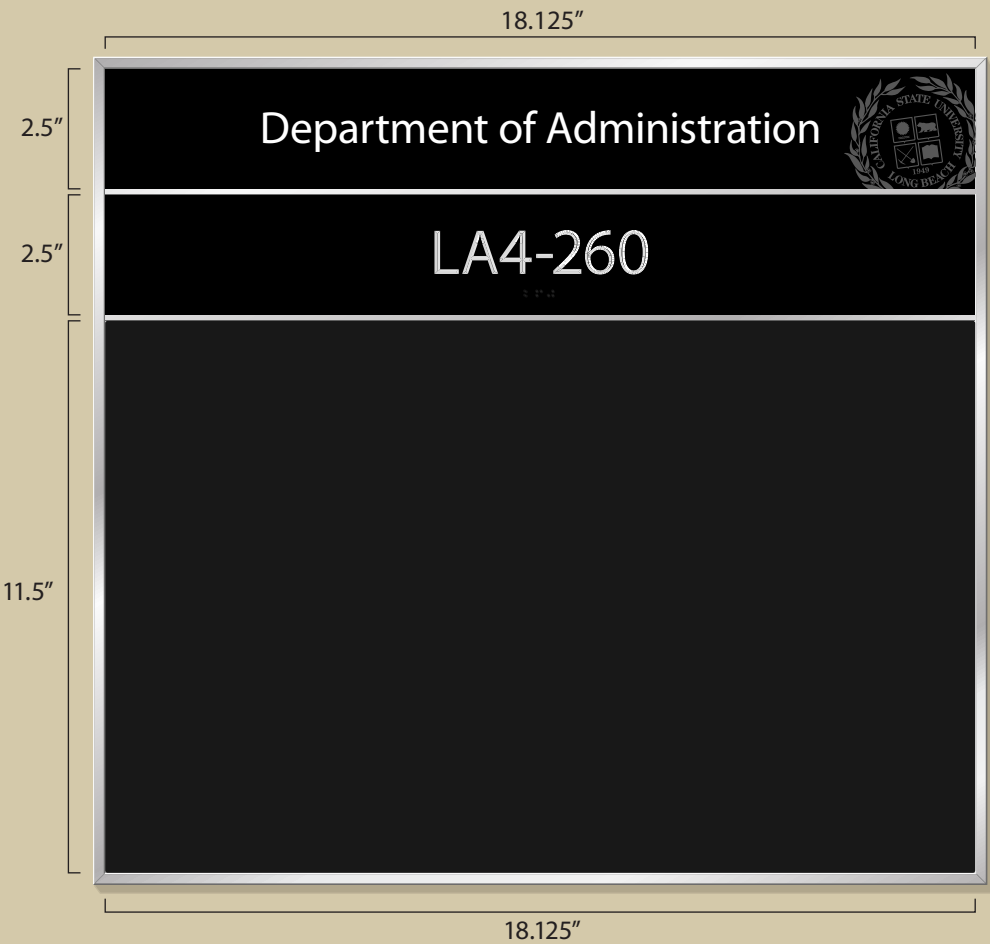
cut-away
side view



B1

front view

cut-away
side view



to fit 18.125" insert

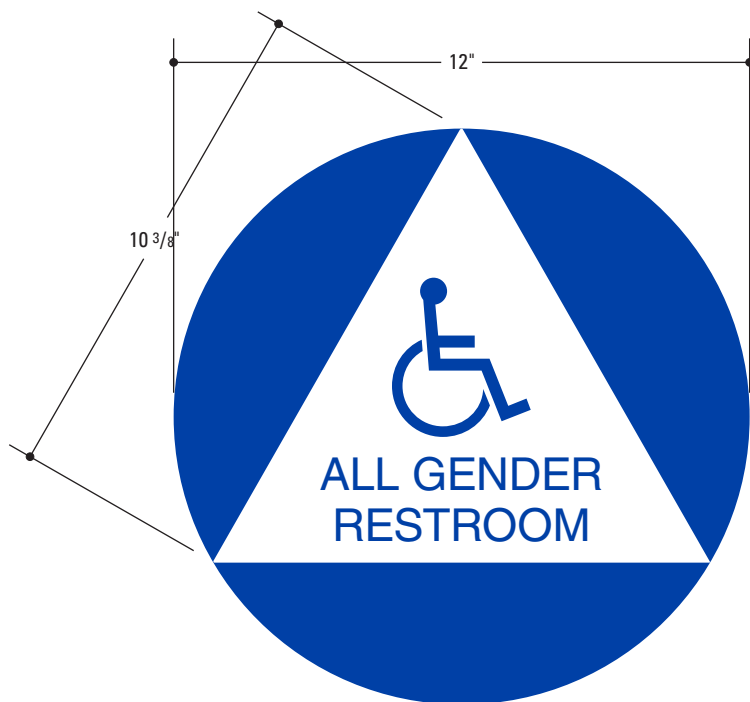


Appendix D3 - CSULB Design Standards



RESTROOM ADA

- **SUBSTRATE** – ¼" THICK NON GLARE ACRYLIC
- **GRAPHICS** – SUB SURFACE APPLIED DIGITAL PRINT
- **BACKGROUND** – TO MATCH PANTONE 293
- **HANDICAP SYMBOL & "ALL GENDER RESTROOM"**
– ROMARK 311-204/BRIGHT WHITE
- **BRILLE** – CALIFORNIA GRADE 2 - CLEAR
- **FONT** – HELVETICA



T24 RESTROOM SIGNS

- **SUBSTRATE** – ¼" THICK NON GLARE ACRYLIC CUT TO SHAPE
- **GRAPHICS** – SUB SURFACE APPLIED DIGITAL PRINT
- **BACKGROUND** – TO MATCH PANTONE 293
- **INSTALL** – FLUSH MOUNT TO DOOR W/DOUBLE SIDED TAPE



- | | |
|---|---|
| <input type="checkbox"/> Fresno
(559) 431-2502 | <input checked="" type="checkbox"/> San Diego
(619) 474-8246 |
| <input type="checkbox"/> Las Vegas
(702) 253-6470 | <input type="checkbox"/> Southern Ca.
(951) 328-2637 |
| <input type="checkbox"/> Livermore
(925) 449-1900 | |
| <input type="checkbox"/> Phoenix
(602) 484-8844 | |
| <input type="checkbox"/> Sacramento
(916) 635-0234 | |

PROJECT

CSULB PHYSICAL PLANNING

CLIENT

ANGELES CONTRACTOR, INC.

JDO#/JPO#

300 - 38394 - 092

MO#

197851

A.E.

ANDREW CABRERA

DESIGNER

BEN MOORE

ORIGINAL DATE

11 - 15 - 16

REVISIONS

11 - 16 - 16

SCALE

¼" = 1"

MAC FILE NAME (SD-010)

**CSULB RESTROOM
SIGNAGE**

CLIENT APPROVAL

☐ As is ☐ With revision(s)

Signature

Date

Your signature indicates final approval of this design, releasing MSI from responsibility of incorrect information.

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CALIFORNIA STATE UNIVERSITY

Guidance Document Post Construction BMPs

MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) Phase II MS4 Permit

NOVEMBER 14, 2014

GUIDANCE

For Design and Development of Phase II Small Municipal Separate Storm Sewer System (MS4) Post Construction Best Management Practices (BMP) Requirements for California State University Campuses

I. EXECUTIVE SUMMARY

- A. Adoption and Designations
- B. Requirements for Non-Traditional MS4s
- C. Structural Post Construction Best Management Practices
- D. Non-Structural Post Construction Best Management Practices
- E. Goals

II. PRINCIPLES FOR DESIGN OF STRUCTURAL BMPs

- A. Permit Requirements
- B. Alternatives
- C. Design Principles
- D. Examples

III. PRINCIPLES FOR DEVELOPMENT AND IMPLEMENTATION OF POST CONSTRUCTION NON-STRUCTURAL BMPS

- A. Permit Requirements
- B. Alternatives
- C. Development Principles
- D. Examples

IV. Resources and Links

I. EXECUTIVE SUMMARY

A. Adoption and Designations

In February, 2013 the State Water Resources Board adopted a renewed Phase II General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s). Phase II Small MS4s are not regulated under the municipal Phase I regulations. The permit became effective on July 1, 2013. The permit designates most California State University campuses as “Non-Traditional” MS4s. These designations can be found in Attachment B of the permit. Traditional MS4s are cities, counties and drainage and flood control districts that own and operate surface and sub-surface storm drain systems. Non-traditional MS4s are operators of substantial storm drain systems that are owned by state or federal government entities. Requirements specific to Non-traditional MS4s are contained in Sections A, B, C, D and F of the permit order.

For CSU campuses the permit is self-governing. It is the responsibility of the campus to report compliance efforts and certify compliance using the State Water Board’s Stormwater Multi-Application Reporting and Tracking System (SMARTS). Compliance can also be monitored by the public at large.

B. Requirements for Non-Traditional MS4s

Requirements in the permit order are phased in by year over the term of the permit, which is five years. During Year 2 of the permit Non-Traditional MS4s are required to implement a Post Construction Storm Water Management Program (SWMP). Post-Construction Storm Water Management Programming is a combination of structural and non-structural Best Management Practices (BMPs).

C. Structural Post Construction Best Management Practices

Structural BMPs function by storing or detaining runoff so that storm-water constituents settle out or are filtered and trapped by underlying soil or media. Basic mechanisms for removal of constituents are gravity settling, infiltration of soluble nutrients through the soil profile or filter media, or biological and chemical processes. Structural BMPs might use one or more of these mechanisms to achieve constituent removal from storm-water. Structural BMPs also retain runoff to reduce peak flows, which decreases hydro-modification downstream. Structural BMPs are permanent improvements and are designed integrally with a project, such as bio-swales, catch basin filters and permeable paving.

D. Non-Structural Post Construction Best Management Practices

Non-structural BMPs are typically "source control" measures, designed to reduce the level of contaminants and their concentrations in stormwater runoff. Non-structural BMPs are such measures as literature and signage that encourage facility users to eliminate non-stormwater discharges into the storm drain system and include maintenance programs, spill prevention plans and street sweeping.

E. Goals

This document is intended to provide California State University campuses with system-wide guidance for design, implementation, operation and maintenance of post-construction BMP elements. This document offers guidance to campus design and planning staff and maintenance staff to:

- Comply with the permit requirements,
- Develop campus design practices and principles that optimizes project costs and site impacts of

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structural BMPs,

- Develop principles for development of non-structural BMPs that use existing campus programs and materials to the maximum extent applicable.
- Establish consistency across the CSU system for MS4 permit compliance.

II. PRINCIPLES FOR DESIGN OF POST CONSTRUCTION STRUCTURAL BMPS

A. Permit Requirements

Section F.5.g of the permit divides requirements into four categories. They are:

- 1) Site Design Measures (Section F.5.g.1) for projects that create or replace between 2,500 square feet and 5,000 square feet of impervious surface,
- 2) Low Impact Development (LID) Design Standards (Section F.5.g.2) for projects that create or replace more than 5,000 square feet of impervious surface.
- 3) Alternative Post-Construction Storm Water Management Programs (Section F.5.g.3) for multi-benefit projects, which include water supply, flood control and drainage, habitat, open space preservation recreation and climate change.
- 4) Operation and Maintenance (O&M) of Post-Construction Storm Water Management Measures for new development projects, which requires a verification program to ensure BMPs are properly operated and maintained.

There are additional requirements, conditions and exclusions for road projects that create 5,000 square feet or more of new impervious surface. These are discussed in more detail in following paragraphs.

B. Compliance Options

Understanding the requirements of the permit is critical to designing economical structural BMPs that meet the requirements of the permit.

Projects 2,500 Square Feet to 5,000 Square Feet (F.5.g.1 - Site Design Measures)

The first level of projects that are required to include post construction BMPs are projects covering areas of at least 2,500 square feet and not more than 5,000 square feet. These projects are required to comply with the State Water Board SMARTS Post-Construction Calculator

(http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/wqo_2009_0009_app_21.xls), or equivalent, to quantify the runoff reduction resulting from implementation of site design measures.

The Post Construction Calculator is an Excel® spreadsheet that accepts input of project data and returns options for measures that will re-create the pre-project hydrologic site conditions. The goal is to achieve no increase in runoff from the project site. The options provided by the calculator can be extensive and costly and the calculator ignores specific site conditions, and off-site conditions, that may provide mitigation that satisfies the permit requirements. For these reasons the Calculator is not always the best tool for permit compliance for projects of this size.

The permit allows the use of an “equivalent” method to quantify runoff reduction. This equivalent can be a simple hydrologic calculation based on an 85th percentile storm (the storm frequency that includes 85% of all storm events) and using basic runoff coefficients. For physical plant and facilities managers and directors who are responsible for maintenance work, this calculation can be done once and then applied to future projects with adjustments for project size and other factors.

Projects 5,000 Square Feet & Larger (F.5.g.2 - Low Impact Development Design Standards)

For projects that create or replace 5,000 square feet or more of impervious surface the permit allows four specific numeric sizing criteria – two volume based and two flow based – from which to choose. They are as follows:

(1) Volumetric Criteria:

a) The maximized capture storm water volume for the tributary area, on the basis of historical rainfall records, determined using the formula and volume capture coefficients in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998) pages 175-178 (that is, approximately the 85th percentile 24-hour storm runoff event); or

b) The volume of annual runoff required to achieve 80 percent or more capture, determined in accordance with the methodology in Section 5 of CASQA's Stormwater Best Management Practice Handbook, New Development and Redevelopment (2003), using local rainfall data.

(2) Flow-based Criteria

a) The flow of runoff produced from a rain event equal to at least 0.2 inches per hour intensity; or

b) The flow of runoff produced from a rain event equal to at least 2 times the 85th percentile hourly rainfall intensity as determined from local rainfall records.

The most direct method above is Option a) under 2) Flow-based Criteria. This method requires no further research and no references. It is also unlikely any of the other options will produce significant cost savings because the numerical differences will be small and there will be no discernable size reductions in BMPs.

Volume based solutions require dedication of land for storage of storm water. Flow based solutions can be integrated into landscaped areas, parking surface with permeable material and other site elements.

Projects larger than 5,000 square feet are sub-divided into two categories. They are:

- 1) Projects that increase impervious surfaces by 50% or more of the project site.

For these projects, runoff and pollutant reduction is required for all impervious surfaces within the project site “to the extent feasible” from all impervious surfaces.*

- 2) Projects that increase impervious surfaces by less than 50% of the project site.

For these projects, runoff and pollutant reduction is required only from new and/or replaced impervious surfaces.

- * A pollutant is broadly defined as any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

“To the extent feasible” is not defined in the permit and it is difficult to find a definition on the State Water Board’s web site or the federal EPA’s web site. In most cases, the closest matches found are variations of the phrase, such as “maximum extent practicable,” “maximum extent feasible,” and “technically feasible.” In general, to the extent feasible should consider all factors, including technical feasibility, fiscal feasibility, public health risks, societal concerns, and social benefits. The criteria and factors used to determine this should be consistent and reasonable.

Alternative Post Construction Storm Water Management Program

The permit allows provides for compliance using projects having multiple benefits (see Permit Section F.5.g.3). This general option allows the campus to mitigate storm water quality effects on another part of campus and to combine mitigation requirements from multiple projects into one or more mitigation efforts.

In practice, this means that multiple small projects on a campus can be mitigated with a project on another part of the campus. For example, a recreation field or garden created in one part of a campus can be used to mitigate a project in another part of the campus. New building projects that include landscaping and that exceed their own mitigation requirements can be used for mitigation for other projects.

This will require advanced planning by the campus, but this work can be integrated into project planning and master planning. Non-traditional Phase II MS4 permittees are not required to create a campus-wide water quality management plan; however, mitigation must be tracked and recorded to show compliance and effectiveness.

Taken as a whole, the above narrative describes and the tool box provided in the permit for compliance for large and small projects. To take advantage of this tool box some basics during planning and design to be considered are:

- Begin site planning early. Site planning participants should include the architect/ designer, landscape architect and the designer of the site storm-water BMPs, which is usually a civil engineer. Ideally, the BMP designer should have experience in hydrology and hydraulics. This will facilitate comparison of the options, alternatives, adjustments and exceptions to the requirements.
- Identify common site elements that can be developed as BMPs for storm water treatment or retention system. These may include landscape buffers, seating areas, tree wells, pedestrian plazas and other elements.
- Use landscaping as structural BMPs. In most cases, projects will already include landscaping as site features.
- Keep runoff on the surface to the maximum extent possible. Surface drainage is slower and will increase time of concentration, which will decrease peak flows.

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- Combine storm site drains with water quality management BMPs.
- Use small footprint BMPs when possible. Examples of this are:
 - Catch basin filters
 - Permeable pavers arranged in strips, such as walkways that are perpendicular to surface flow
 - Individual tree wells with functioning filter and infiltration systems.
- Use small changes in building/improvement locations to create spaces to increase BMP effectiveness. Examples of this are:
 - Shifting a building a few feet in one direction to create a flow path into which roof drainage can be conducted to allow surface flow
 - Raising a finish floor by small increments (inches) to create flow paths
- Avoid increasing site improvements footprint solely for BMP components.
- Use self-treating and self-retaining areas.
- Consult with campus maintenance as part of planning and design process.
- The permit does not require that every drop of rainfall be treated and/or retained and it does not require treatment of the entire site if the increase in impervious area is less than 50%.
- Control runoff at the source when possible. Drainage system and control or treatment structure costs increase with distance from the source.
- Avoid underground treatment and storage systems. These usually have large footprints, have high construction costs and are expensive and inconvenient to maintain.
- Avoid one-size-fits-all design concepts, such as retaining the first three-quarters inch of runoff.
- Avoid “standard” or “typical” structural BMP details. Many of these have been developed by cities and counties and are included in their SUSMP criteria, but are not necessary to develop effective BMPs under the Phase II MS4 permit.

III. PRINCIPLES FOR DEVELOPMENT OF POST CONSTRUCTION NON-STRUCTURAL BMPS

Non-structural BMPs consist of processes, prohibitions, procedures, schedules of activities, etc., that prevent pollutants from contacting storm water discharges and authorized non-storm water discharges. They are generally considered low technology, but cost-effective measures.

Post Construction Non-structural BMPs fall into broad general categories. These include:

- Good Housekeeping
- Preventive Maintenance
- Spill Response (for any pollutant)
- Material Handling and Storage Procedures
- Employee Training
- Waste Handling and Recycling Procedures

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- Record Keeping and Reporting
- Erosion Control and Site Stabilization Requirements
- Inspections
- Quality Assurance
- Public Outreach and Education

These categories apply across campuses for all facilities.

For many of the categories listed above, BMPs are already in place on California State University campuses. These include:

- Street Sweeping Schedules
- Storm Drain Maintenance Programs
- Sanitary Sewer Maintenance Programs
- Spill Prevention, Control and Counter-Measure (SPCC) Plans
- Equipment Maintenance Manuals and Programs
- Public Education and Outreach Efforts

These documents and plans can be adapted to the Post Construction Storm Water Management Program, which, in some case, can be as simple as changing the title of documents. In some cases, the only effort necessary is reporting or uploading plans and procedures to the State's SMARTS web site during prior to reporting deadlines.

The most efficient effort for producing non-structural BMPs is to use existing items as described above. Using BMP material common to other campuses leverages efforts across the CSU system. This can be new material produced by collaboration among campuses, or existing material that one or more campuses may already be using. For new projects, maintenance and operation manuals and materials may be produced by product suppliers or contractors. This effort can be added to construction contract document packages in either specifications or drawings.

The following are some general guidelines for developing post-construction BMPs that apply across all types of projects:

- Use Existing Campus-Created Content
- Adapt Content from other Recently Completed Projects
- Use Existing BMP Literature and Materials Created by Other Campuses
- Use Public Domain Material
- Use Materials Created by Phase I and other Phase II MS4s
- Adapt Content/Text from Equipment Operating and Maintenance Manuals

Using the guidelines each campus can minimize efforts to produce structural and post-construction BMPs and fully comply with the requirements of the MS4 permit.

IV. Resources and Links

More information, as well as some content, can be found at the following:

www.casqa.org

www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml



Long Beach Fire Department Bureau of Fire Prevention

FIRE PREVENTION REQUIREMENT
NO. 1.043 01/17

EMERGENCY RESPONDER RADIO COVERAGE SYSTEM

2016 CALIFORNIA FIRE CODE, SECTION 510

This policy shall apply to all buildings in the City of Long Beach, excepted as those noted below. The California Fire Code (CFC), Section 510 requires that all buildings be provided with radio enhancement systems designed to provide radio coverage in all areas of buildings where signal strength does not meet the minimum criteria due to building construction and/or location. The intent of this guideline is to provide the Long Beach Fire Department (LBFD) interpretation of the minimum standards necessary to meet the requirements for emergency responder radio coverage (ERRC) in accordance with state code.

BUILDINGS REQUIRED TO HAVE AN EMERGENCY RESPONDER RADIO COVERAGE SYSTEM.

Approved radio coverage for emergency responders shall be provided within all buildings meeting any one of the following conditions:

1. There are more than 3 stories above grade plane (as defined by the California Building Code Section 202);
2. The total building area is 50,000 square feet or more;
3. The total basement area is 5,000 square feet or more;
4. The building is equipped with a solar photovoltaic system.

PERMITS

A construction permit is required for installation of or modification to ERRC systems and related equipment. To acquire an installation permit for ERRC systems, submit the following to the Long Beach Fire Department for high rise buildings or to Development Services for all other buildings at City of Long Beach located at 333 W. Ocean Blvd., 4th floor.

1. A completed Permit Application – provide all required information.
(<http://www.lbds.info/civica/filebank/blobdload.asp?BlobID=4336>)
The permit applicant shall be the installing contractor. See CFC 510.5.2 for ERRC personnel qualifications.
2. All installing contractors shall have a California Electrical (C-10 or C-7) Contractor's License; a valid worker's compensation certificate; and a Long Beach Business license. When the design and plans are produced by a party other than the licensed contractor, the plans shall be stamped by a Professional Engineer.
3. A minimum of three sets of shop quality plans and one submittal packet for the proposed ERRC system – one set of plans will be retained by the City of Long Beach.

4. Installation, alteration, or demolition of a system shall not commence prior to the approval of plans and issuance of a permit. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.
5. The job card and approved Long Beach Fire Department/Development Services plans shall be kept at the project site at all times. Once the ERRC system has been given final approval, a set of plans shall remain with the owner.
6. Equipment shall have FCC certification prior to installation.
7. **Operating Permit** - An emergency responder radio coverage operating permit is required annually.

PLANS

A. General Requirements for all ERRC projects.

1. Plans and attachments shall be clearly labeled and legible.
2. Plans shall include a title sheet, an equipment list (manufacture name and model numbers), a written standard operating procedure, a floor plan, a system riser diagram, and secondary power calculations.
3. Attachments shall include highlighted manufacture's specification sheets for all equipment and devices such as; cables, amplifiers, ups, batteries and antennae; indicating the FCC certification.

B. Title Sheet

1. The title (front) sheet shall contain the following information:
 - Project name and address of the project.
 - The designers full name, FCC General Radiotelephone Operator License (GROL) number and signature. The designer of record shall be responsible for the entire system being worked on.
 - Business name, address, and California Contractor's License number and FCC GROL of the installing contractor. If the designer of the ERRC system is not the installing contractor, the following shall be clearly indicated/printed on the plans:
 - **DESIGNED BY**
 - **INSTALLING CONTRACTOR**
 - Type of supervising station service as per NFPA 72. NFPA 1221 9.6.13
 - Number of basements, number of stories above basement, building height, total building area, and building construction type.
 - A note stating that the design and installation complies with NFPA 72 (2016 edition), NFPA 1221 (2016 edition) the California Electrical Code (2016 edition), the California Fire Code (2016 edition), the California Building Code (2016 edition), and the Long Beach Fire Department ordinances, policies and standards.

C. Equipment List

1. Provide the model number, manufacturer's name, description, quantity, and symbols to be used (legend) for each device, equipment, and conductors proposed to be installed.

D. Floor Plan

1. The following shall be clearly indicated:
 - Scale used and a graphical representation of the scale. The minimum scale for ERRC plans is $1/8" = 1' - 0"$. Metric scale shall not be accepted.
 - Room and room names.
 - The locations of partitions, non-rated walls, and rated walls.
 - The location of all Emergency Responder equipment.
 - Power and panel locations.
 - Raceway routing.
 - Conduit and conductor size.
 - Roof plan showing locations(s) of antennae.
 - Location(s) of in building antennae

E. Riser Diagram

1. Provide the following:
 - Single-line wiring diagram (riser diagram) that shows the interconnection of equipment of the whole system.
 - Type and size of wire or conductor to be used.
 - Schematic drawing of electrical system and backup power.
 - Show supervisory points from repeater.

F. Calculations

- Secondary power supply. Emergency responder radio coverage systems shall be provided with an approved secondary source of power per CFC 510.4.2.3. When primary power is lost, the power supply to the emergency responder radio coverage system shall automatically transfer to the secondary power supply. The design capacity shall be based on 100 percent load for 24 hours. UPS systems shall be enclosed in a NEMA Type 4 or NEMA 4X-type waterproof enclosure. Provide battery ventilation in accordance with code.
- Signal propagation map – Provide a color map indicating the signal strengths as designed and then as installed by As-Built.
- Attachments. Manufacturer's specification sheets for all devices, equipment, and materials to be used shall be submitted, including the cables, amplifiers, UPS, batteries, antennae and transponder to the supervising station. Highlight on the cut sheet which device or equipment is being used, the listing information, and the application per listing.

DESIGN AND INSTALLATION

1. ERRC systems shall be designed and installed in accordance with NFPA 72 (2016 edition), NFPA 1221 (2016 edition), the California Electrical Code (2016 edition), the California Fire Code (2016 edition), the California Building Code (2016 edition), and the Long Beach Fire Department ordinances, requirements, and standards.
2. Design the ERRC to provide signal amplification on every floor of the building. Components used in the installation of the ERRC system, such as repeaters,

- transmitters, receivers, signal boosters, cabling, and fiber-distributed antennae systems, shall be tested for compatibility with the public safety radio system.
3. ERRC shall permit the simultaneous use of interoperability of analog and digital modulation radios. ERRC shall be neutral host and nonproprietary.
 4. ERRC shall not infringe on or be overrun by adjacent building communication systems or cellular telephone service provider systems. Permanent external filters and attachments shall not be permitted.
 5. Describe if a Class A (A is channelized) 24 channels; or Class B (requires special registration with FCC and notice to the City of Long Beach Emergency Operations Center) is being proposed.
 6. **Critical Areas.** Critical areas, including fire command centers, fire pump rooms, exit stairs, exit passageways, elevators, elevator lobbies, standpipe cabinets, sprinkler sectional valve locations, and other areas deemed critical by the AHJ, shall be provided with 99 percent floor area radio coverage. NFPA 1221, 9.6.7.4.
 7. **General Building Areas.** General building areas shall be provided with 95 percent floor area radio coverage.
 8. Documentation required is presented in 2016 NFPA 72, Chapter 7.
 9. The fire and building codes determine when these systems are required in a building. NFPA 72 and NFPA 1221 tells you how these systems shall be installed when required by the fire and building codes, in addition to Section 510 of the Fire Code.
 10. **Frequencies.** See Attachment A in this document for a list of frequencies used in the City of Long Beach.
 11. **Location.** The ERRC headend including all common equipment shall be located in a room on the main floor or one floor below grade. Rooms housing ERRC equipment shall be separated from the remainder of the building by 2 hour rated fire barriers. A sign or map identifying location of room and master power switch shall be provided as needed to assure the location is readily identifiable to emergency responders. For buildings without a fire command center, the ERRC and/Emergency Power Off switch shall be located inside the fire alarm panel room.
 12. Verify with the ERRC headend equipment manufacture as to whether or not the room housing the equipment shall be provided with continuous air conditioning to alleviate heat build-up.
 13. Provide pathway (circuit) survivability in accordance with NFPA 72, 24.3.13.8.
 14. Location of the main RF and donor site (site closest to the jobsite) and their power – Identify on the plans the Lat/Long coordinates. At no time will the contractor be allowed access to City radio sites. **Additional frequencies.** Provide ERRC expandability to permit future additions and changes to emergency responder radio frequencies. “The building owner shall modify or expand the emergency responder radio coverage system at his or her expense in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC.” Place this sentence as a note on the cover sheet.
 15. For emergency responder radio coverage systems that are combined with other non-emergency radio systems such as: cellular telephone signal enhancement, Wi-Fi systems, pager systems, and/or medical telemetry systems, repairs or modifications to any emergency or non-emergency system will require a construction permit from the City. Acceptance testing shall be conducted as part of the construction permit to verify there has been no negative impact to the emergency responder radio coverage system.
 16. All repeater, transmitter, receiver, signal booster components, external filters and battery system components shall be contained in National Electrical Manufacturer’s

Association (NEMA) 4-type waterproof cabinet(s) or other *approved* enclosures. NFPA 1221, 9.6.11.2

17. **Emergency Power Off (EPO).** A disconnect relay connection that will disengage the power shall be provided and be the only method of turning off a UPS system. DC systems shall have a Battery Disconnect Switch. To turn the entire ERRC off, two actions must be completed. 1) Turn off the secondary power supply using the EPO switch and 2) Turn off the circuit breaker to cut the normal AC. The switch(es) shall be readily identifiable. The location of such power switches and signage identifying their location, shall be made during plan review.
18. **Supervision.** See 2016 ed. of NFPA 1221, section 9.6.13 for monitoring requirements of ERRC systems. As a minimum, provide supervision of the ERRC antennas, signal boosters, power supplies and UPS. Trouble signals shall be generated for power supplies. The system shall include automatic supervisory and trouble signals for: antennae malfunction, signal booster failure, low battery capacity, sending a supervisory signal at 70% of battery capacity, loss of normal AC power and failure of battery charger. Program the fire alarm system to relay ERRC supervisory and trouble signals to the appropriate supervising station. If the building does not have a fire alarm or sprinkler monitoring panel, a dedicated function fire alarm control unit, as defined in NFPA 72, shall be provided. Should a fire alarm system not be provided at the premise, a dedicated monitoring panel shall be provided in accordance with NFPA 1221, section 9.6.13.2. Monitoring the integrity of power supplies shall be in accordance with section 9.1.2.2 of NFPA 1221, 2016 edition.
19. **Wiring.** The wiring shall be in metal raceways for any interconnecting conductors, cables or other physical pathways for systems employing a Level 1 survivability. See 2016 NFPA 72, section 12.4.2. The conduit is not required to be dedicated to radio system cable. Radio system cable may be commingled in the conduit with fiber-optic and other cable that will not impede signal transmission and complies with the California Electrical Code.
20. The feeder and riser coaxial cables shall be rated as plenum cables. The feeder coaxial cables shall be connected to the riser coaxial cable using hybrid coupler devices of a value determined by the overall design.
21. Riser coaxial cables shall be rated as riser cables and routed through a 2-hour-rated enclosure. The connection between the riser and feeder coaxial cables shall be made within the 2-hour-rated enclosure, and passage of the feeder cable in and out of the 2-hour-rated enclosure shall be fire-stopped to 2-hour ratings.
22. Systems shall have lightning protection that complies with NFPA 780.
23. **Signage.** Signage shall be provided in accordance with section 509 of the California Fire Code. Show the location and the verbiage on the plans of what the sign will look like. Example: A sign shall be located above or near the building Knox box stating "THIS BUILDING IS EQUIPPED WITH AN EMERGENCY RESPONDER RADIO COVERAGE SYSTEM".

TESTING

1. "Prior to conducting acceptance testing, an electrical inspection shall be conducted and witnessed by the Building Department Electrical Inspector. Proof of Final Electrical signoff shall be made available at the time of Final Fire Inspection." .Place these sentences on the plans.

2. "Inspection is required to demonstrate compliance with the provisions of CFC 510. The owner or an authorized agent of the owner is responsible to obtain and fund special inspection services by contract with a contractor approved by the Authority Having Jurisdiction (AHJ). The owner is responsible to provide acceptable radio coverage within the facility, access to documentation and to request inspection after a system is first installed, annually and when modifications are made to the facility. Inspection requests will identify the testing service who will propose a schedule and provide supporting records. The contractor will provide as-built documentation, commissioning test data and observations of the physical installation and performance of the signal booster system as verification of proper system operation prior to placing the system on-the-air and to document indoor radio coverage of the system." . Place this paragraph on the plans.
3. **Field testing.** Radio protocols will need to be coordinated with PD/Fire dispatch operations, as they will be testing on the City's main dispatch channels, use clear regular voice communications and avoid any code or call signs.
4. Typically LBFD/LBPD allow testing on its frequencies only during slow times between 0500 and 0700 hours.
5. Contractors will call radio dispatch at 562-570-9500 two days prior to starting their testing and one hour prior to the day of testing.
6. Two-way radios for testing shall be provided by the installation contractor and the technician shall be trained in the proper use of emergency radios.
7. LBFD/LBPD frequencies may not be used for anything other than short test counts. Conversation between employees at the site shall not take place on the frequencies.
8. **Acceptance testing.** Upon completion of installation, the building owner shall have the radio system tested to ensure that ERRC on each floor of the building is functional. **Amplifiers shall not be placed on air before they are verified.** The two primary considerations for Acceptance Tests are 1) Equipment Validation (before it is placed on the air) and 2) Coverage Validation (to document the improved coverage).
9. Maximum Output Power Testing(Uplink)
 - Class A Amplifier:
 1. Perform and document two measurements: a) Determine the maximum level into the amplifier by transmitting from a portable radio directly below a DAS antenna. b) Determine the minimum input into the amplifier by transmitting from the furthest point into a DAS antenna. This establishes the range of inputs. The range should not exceed the AGC range of the amplifier or the output level will be affected.
 2. Perform and document a link calculation for the radio path between the building and the Donor Site.
 3. Adjust the gain of the amplifier to ensure the uplink signal level received at the radio site is above -95 dBm
 - Class B Amplifier
 1. Document all transmissions within the pass band filter. Calculate the composite power output based on full channel loading, including unwanted signals.
 2. Minimum/Maximum readings: a) Document the maximum level into the amplifier by transmitting from a portable radio directly below a DAS antenna. b) Document the minimum input into the amplifier by transmitting from the furthest point into a DAS antenna. This establishes the range of inputs. The range should not exceed the AGC range of the amplifier or the output level will be affected.
 3. Record the measured noise floor out of the amplifier.

4. Provide a link calculation for the radio path between the building and the Donor Site.
5. Document the gain of the amplifier is adjusted to ensure the uplink signal level at the radio site is above -95 dBm and the amplified noise received at the radio site is below -130 dBm.
10. **Dummy load:** When conducting a test, or loading up procedure, a dummy load on the "Donor" antenna connection of the amplifier shall be used or the array shall be disconnected from the donor antenna until the Equipment/System operation has been demonstrated to the Inspector. A dummy load is a large resistor capable of dissipating the radio energy from your transmitter as heat into the air. This capability is necessary during the testing and repair of radio gear. When repairing the transmitter of a radio is often required to transmit for a short time in order to diagnose the problem. But instead of transmitting an unnecessary test signal live on the air, technicians connect a dummy load to the antenna jack. This allows them to transmit a test radio signal that is absorbed in the dummy load. This forces the amplifier to be off the air until power levels, gain and antenna isolation are checked. The installer can perform all of his checks and adjustments by using a signal generator and keeping all transmissions inside the building.
11. After completion of the Signal Level Measurements and evaluation of Audio Quality, LBFD will be asked by the contractor to schedule a Fire Department representative to survey the building to verify Fire Command and Dispatch radio operation. Failure of the operational check will require that the owner correct deficiencies and re-schedule Acceptance Testing.

ANNUAL TESTING AND PROOF OF COMPLIANCE

1. The emergency responder radio coverage system shall be inspected and tested by qualified personnel annually, or, whenever structural changes occur in or around the complex including additions or remodels that could materially change the original field performance tests. A final test report provided by the Owners Testing Agency shall be provided to LBFD.
2. **Dummy load.** When conducting a test, or loading up procedure, a dummy load on the "Donor" antenna connection of the amplifier shall be used or the array shall be disconnected from the donor antenna until the Equipment/System operation has been demonstrated to the Inspector. A dummy load is a large resistor capable of dissipating the radio energy from your transmitter as heat into the air. This capability is necessary during the testing and repair of radio gear. When repairing the transmitter of a radio is often required to transmit for a short time in order to diagnose the problem. But instead of transmitting an unnecessary test signal live on the air, technicians connect a dummy load to the antenna jack. This allows them to transmit a test radio signal that is absorbed in the dummy load. This forces the amplifier to be off the air until power levels, gain and antenna isolation are checked. The installer can perform all of his checks and adjustments by using a signal generator and keeping all transmissions inside the building.
3. Testing shall also be in compliance with CFC 510.6.1.

4. The City of Long Beach Radio Communications and Fire Department personnel shall have the right to enter onto the property at any reasonable time to conduct field-testing to verify the required level of radio coverage.
5. **Minimum qualifications of personnel.** Only certification of in-building training is considered demonstration of adequate skills and experience. The minimum qualifications of the system designer, lead installation personnel and personnel conducting radio system tests shall include possession of:
 1. **A valid FCC-issued general radio operators license; and**
 2. **Certification of in-building system training issued by –**
 - a) **Association of Public Safety Communications Officials (APCO)**
 - b) **National Association of Business Education Radio (NABER)**
 - c) **Personal Communications Industry Association (PCIA) or,**
 - d) **The manufacturer of the equipment being installed.**
 - e) Other nationally recognized organizations or schools.

Note: All design documents and all tests shall be recorded and the data signed by a person meeting the minimum qualifications required by CFC 510.5.2 and herein.

INSPECTIONS

1. Field inspections shall be scheduled only after a permit has been issued.
2. Inspections shall be scheduled by the installing contractor only. When scheduling for inspection, request for sufficient time to complete a thorough inspection of the work performed. Travel time is included in your inspection time.
3. Inspections may be scheduled by calling the phone number on the permit card. The following information is required: Permit Number. The amount of time required for inspection (including travel time) name, and number of contact person. An inspector will call to schedule the time and date of the inspection.
4. Missed inspections or inspections canceled within 48 hours shall be counted against inspection time. The installing contractor shall conduct a complete test of the system and shall complete all parts of the "Record of Completion" (Section 7.7 of NFPA 72, 2016 edition) **prior** to the Long Beach Fire Department (LBFD) inspection date.
5. Necessary coordination shall be made such that representatives of other contractors whose equipment are involved in the testing are present.
6. There shall be sufficient personnel and equipment to demonstrate the installation.
7. The contractor shall schedule a Fire Department representative to survey the building and verify Fire Command and Dispatch radio operation through the Fire Prevention Bureau.
8. At the time of inspection, the contractor shall hand the following documentation (see 2016 NFPA 72 section 7.5) to the inspector upon his/her arrival, which includes:
 - a) Approved and stamped plans and complete permit (white, pink, hard card).
 - b) A copy of the completed "Emergency Communications Systems Supplementary Record of Completion". The Emergency Communications Systems Supplementary Record of Completion shall include the Names and contact information of personnel to be contacted at any time (24/7/365) if access to the equipment is needed.
 - c) As-built plans if installation has deviations from the approved plan.

Appendix F - CSULB Design Standards

- d) All previous records of inspections.
- 9. After the successful completion of the tests/inspections, provide the following to the LBFD inspector:
 - a) For central station service systems, a copy of the listing organization's certification that the installation complies with NFPA 72 or a copy of the placard from the listed central station certifying that the installation complies with NFPA 72. Permit shall not be "finaled" without this certificate or placard.
 - b) The permit card (for inspector's signature).
 - c) Documents specified in 2016 NFPA 72 sections 7.5.
- 10. After final completion and acceptance of the project, the contractor shall provide the following to the owner:
 - a) Documents specified in 2013 NFPA 72 section 24.8.
 - b) All literature and instructions provided by the manufacturers describing proper operation and maintenance of all devices and equipment,
 - c) A copy of the approved plan and as-built plan, if applicable,
 - d) A copy of the Certificate of Completion, and
 - e) The signed and finaled permit card.
- 11. Code requires one set of ERRC technical information and documentation to be filed in the Fire Command Center (if one exists) or in the ERRC headend room. After final completion and acceptance of the project, the Owner shall maintain the following on site:
 - a) Documents specified in 2016 NFPA 72 section 24.15.1.
 - b) All literature and instructions provided by the manufacturers describing proper operation and maintenance of all devices and equipment,
 - c) A copy of the as-built plan,
 - d) Summary drawing showing locations of ERRC headend and node equipment, and antenna sites,
 - e) Summary of ERRC frequencies utilized,
 - f) Table of effective radiated power at antenna sites,
 - g) Keys to radio equipment room in key box
 - h) Label indicating ERRC system on premises at lock box
 - i) A copy of the Certificate of Completion, and
 - j) The Names and contact information of personnel to be contacted at any time (24/7/365) if access to the equipment is needed.

ATTACHMENT A:

Technical Specifications for Emergency Responder Radio Communications System Operated by the City of Long Beach October 5, 2015

The Emergency Responder radio system operated by the City of Long Beach includes:

Multi-site VHF and UHF Analog Conventional Systems
Single Site 700 MHz P25 Digital Trunked System

Radio Frequencies used by City of Long Beach First Responders Include:

Downlink	Uplink	Type	ERP (W)
460.1250	465.1250	Conventional	200
460.2250	465.2250	Conventional	200
460.3500	465.3500	Conventional	200
460.2000	465.2000	Conventional	200
453.1000	458.1000	Conventional	400
453.3500	458.3500	Conventional	400
460.5000	465.5000	Conventional	200
462.9750	467.9750	Conventional	73
463.1500	468.1500	Conventional	73
153.9500	156.1950	Conventional	208
153.9200	158.9400	Conventional	150
151.1600	159.3750	Conventional	150
771.45625	801.45625	Trunking	400
771.46875	801.46875	Trunking	400
771.83125	801.83125	Trunking	400
771.84375	801.84375	Trunking	400
772.08125	802.08125	Trunking	400
772.09375	802.09375	Trunking	400
Location	Latitude	Longitude	AMSL
Signal Hill	33-47-58.0N	118-9-47.2W	108.0 M

For additional information please contact
John Black
Wireless Communications Manger
5580 Cherry Ave
Long Beach CA 90805
(562) 570-4801
john.black@longbeach.gov



California State University, Long Beach
ZERO WASTE PROGRAM BIN SPECIFICATIONS

INTERIOR
Breakroom/Central Office Areas
(non-fire rated areas)



Model: [FlexE](#)

Approximate Cost: \$275 plus shipping

Vendor: CleanRiver

Contact: Tom Lembo - 888-646-4246 (ext. 227)

Streams: 2 stream (landfill/waste, mixed recycling)

Dimensions: 24"W x 21"D x 42-1/2"H (including backboard)

Weight: 20 lbs (including backboard)

Capacity: 50 gallon (25 gallon per stream)

Colors: Black (body), black (landfill/trash opening plate), blue (mixed recycling opening plate)

Features: 2-stream, backboard, non-hinged lid, rectangular opening

Graphics (included): Waste Not branding w/website (front), Waste Not stream icons (mixed recycling, landfill/trash), backboard signage (mixed recycling, landfill/trash)



California State University, Long Beach
ZERO WASTE PROGRAM BIN SPECIFICATIONS

INTERIOR

Breakroom/Central Office Areas
Space constrained spaces only



Model: [TMP36](#)
Approximate Cost: \$225 plus shipping
Vendor: CleanRiver
Contact: Tom Lembo - 888-646-4246 (ext. 227)
Streams: 2 stream (landfill/waste, mixed recycling)
Dimensions: 22"W x 17.5"D x 33.75"H. Note: allot space for two 11"W by 17"h signs above bin.
Weight: 23 lbs
Capacity: 36 gallon (18 gallon per stream)
Colors: Black (body), black (landfill/trash opening plate), blue (mixed recycling opening plate)
Features: 2-stream, rectangular opening
Graphics (included): Waste Not branding w/website (front), Waste Not stream icons on front & back (mixed recycling, landfill/trash).
Note: Vendor does not fabricate signage. Signage for these bins will need to be provided by Contractor (see page 9 of this document)



California State University, Long Beach
ZERO WASTE PROGRAM BIN SPECIFICATIONS

INTERIOR

Fire-rated Corridors



Model: Kaleidoscope (Item RC-KDSQ-2S) + Custom 11" x 17" signage panel
Approximate Cost: \$460 per pair of bins plus shipping \$75 for 2 custom signage panel
Vendor: Waxie (manufactured by Ex-Cell)
Contact: Steve Woodson - 714-724-6831
Streams: 2 (Mixed Recycling, Landfill/Trash)
Dimensions: 31.5"W x 15.75"D x 30"H total (15.75"W x 15.75"D x 30"H per bin)
Weight: 71lb total (35.5 per bin)
Capacity: 48 gallon total (24 gallon per in)
Colors: Black texture finish (bn 1), Blue texture finish (bin2), Silver star top (both)
Features: Rectangular openings, 4 pre-drilled holes for mounting 11"x17" signage panels, plastic liner, extra cam lock (2 per door - Recycle)
Graphics: White LANDFILL/TRASH decal on 2 sides (bin 1); White RECYCLABLES decal on 2 sides (bin2)
Note: Vendor does not fabricate signage. Signage for these bins will need to be purchased by Contractor from a different vendor (see page 7 of this document). SFM requires bins placed in corridors to be mounted to the wall.



California State University, Long Beach
ZERO WASTE PROGRAM BIN SPECIFICATIONS

INTERIOR
Offices/Workstations (Deskside)



Model: Office Recycle Bin
Approximate Cost: \$7.50 + shipping
Vendor: Staples, Uline, other office supply vendor
Contact: N/A
Streams: one
Dimensions: 4”L x 10”W x 15” H
Weight: 2 lbs
Capacity: 7 gallons
Colors: Blue (body)
Features: N/A
Graphics: White recycle icon. Waste Not decal (not shown) [See page 10 of this document](#)

Model: Hanging Waste Basket with lid
Approximate Cost: \$5.10 + shipping
Vendor: Busch Systems
Contact: Lisa Doucette - 800=565-9931 x 1540
Streams: one
Dimensions: “L x 7”W x 8”H
Weight: 1 lb
Capacity: 1 gallon
Colors: Black (body + lid)
Features: N/A
Graphics (included): White “Landfill/Trash Only” stamped lid



California State University, Long Beach
ZERO WASTE PROGRAM BIN SPECIFICATIONS

EXTERIOR

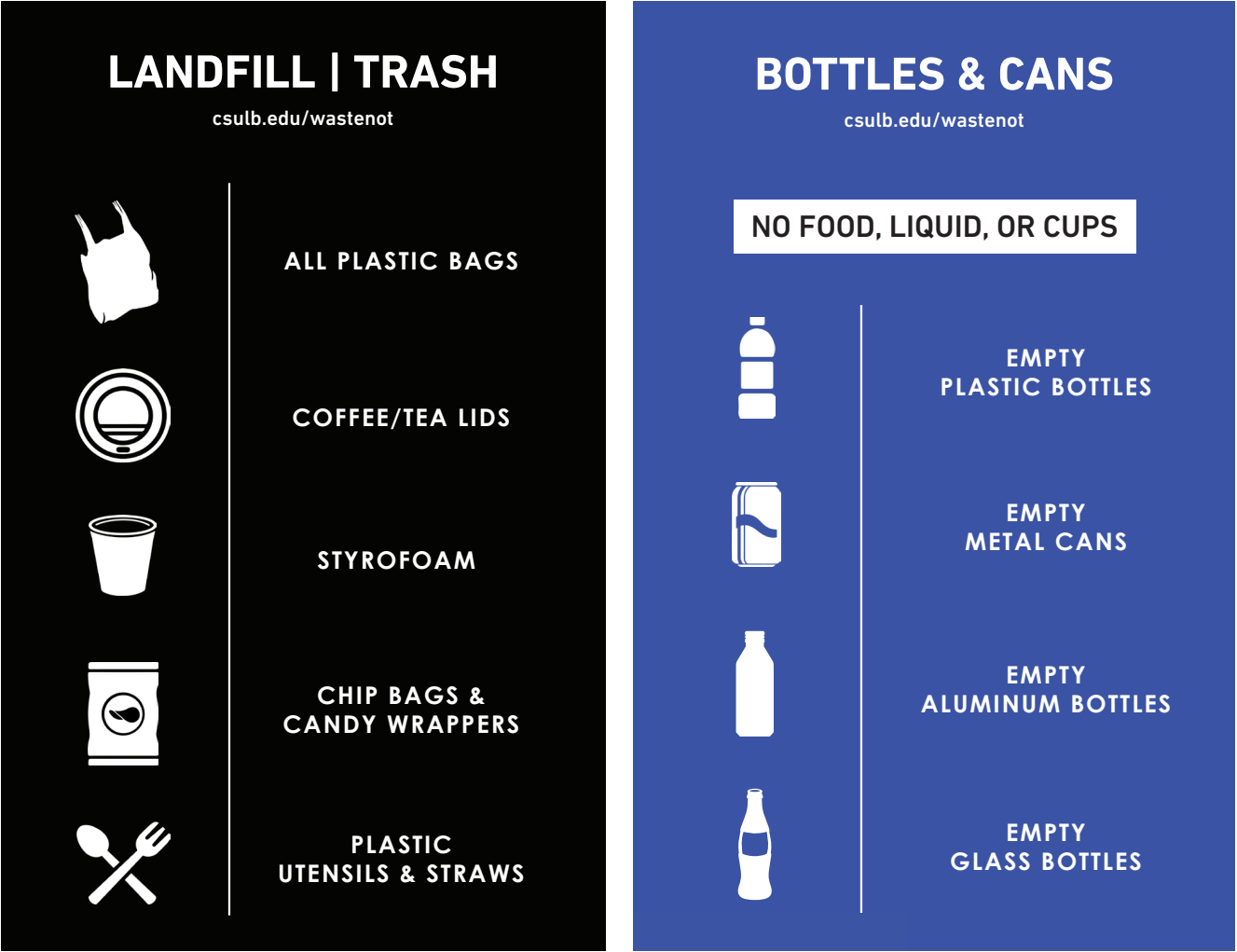


Model: XD50-2 (open on 2 sides)
Approximate Cost: \$1380 + shipping
Vendor: Clean River
Contact: Tom Lembo 888-646-4246 (ext.227)
Streams: 2 streams
Dimensions: 8”W x 22”D x 49.5”H
Weight: 177 lbs
Capacity: 100 gallon (50 gallon per bin)
Colors: Black (Front panels, side panels, dome top), Weathered Wood (trim), LB logo (Gold Pantone 124C, CMYK: C7, M36, Y100, K0)
Features: Dome top, side opening, plastic liners included, extra long Cam locks (2 per door Mixed Recycle), engraved resin LB logo, full opening (both sides Landfill/Trash), saturn shaped opening with custom circular insert (both sides Bottles/Can Recycle), kick plates to protect posters
Graphics (included): Large graphic posters and opening labels (front & back); LB logo and “Made from recycled milk jugs” logo (side)



California State University, Long Beach
ZERO WASTE PROGRAM BIN SPECIFICATIONS

EXTERIOR BIN GRAPHICS
FRONT PANELS



OPENING LABELS



Signage and opening labels will be included with orders of XD50-2 bins.



California State University, Long Beach
ZERO WASTE PROGRAM BIN SPECIFICATIONS

INTERIOR BIN GRAPHICS
KALEIDOSCOPE BINS



Approximate Cost: \$12.50 per sign (\$25 for set) plus one time set-up fee (\$60)
Vendor: ARC Document Solutions, LLC
Contact: Craig Callas 949-660-1150
Dimensions: Custom signage holders accommodate signage size of 15.875" W x 11" H.
Features: Color digital print on permanent adhesive vinyl with matt overlamine, kiss cut for rounded corners
NOTE: Contractor must contact Owner for graphics file (holli.fajack@csulb.edu)



California State University, Long Beach
ZERO WASTE PROGRAM BIN SPECIFICATIONS

INTERIOR BIN GRAPHICS
FLEX-E BINS

MIXED RECYCLING

EMPTY GLASS & PLASTIC BOTTLES

EMPTY METAL CANS

CARDBOARD

EMPTY PLASTIC FOOD CONTAINERS

CLEAN PAPER

LANDFILL | TRASH

CHIPS & CANDY WRAPPERS

ALL PLASTIC BAGS

COFFEE/TEA LIDS

ALL CONDIMENT WRAPPERS

POLYSTYRENE

PLASTIC STRAWS & UTENSILS

Signage will be included with orders of FlexE Bins



California State University, Long Beach
ZERO WASTE PROGRAM BIN SPECIFICATIONS

INTERIOR BIN GRAPHICS
TPM36 BINS

MIXED RECYCLING

PLASTIC CUPS

CARDBOARD

METAL CANS

CLEAN FOIL

GLASS & PLASTIC BOTTLES

PLASTIC CONTAINERS

CLEAN PAPER

NO
FOOD
OR
LIQUID

LANDFILL | TRASH

ALL PLASTIC BAGS

ALL CONDIMENT WRAPPERS

BEVERAGE LIDS

CANDY WRAPPERS & CHIP BAGS

PLASTIC UTENSILS & STRAWS

STYROFOAM

TPM36 bins do not come with a signage holder or panel. Signage will need to be mounted on the wall by contractor. Graphic files are available from Owner (holli.fajack@csulb.edu).

Signage size is 11"W x 17"H. Should be printed full color and full bleed on durable, waterproof material or be laminated for easy clean up. Contractor may work with any printer capable of producing signs meeting these specifications.



California State University, Long Beach
ZERO WASTE PROGRAM BIN SPECIFICATIONS

INTERIOR BIN GRAPHICS
OFFICE DESKSIDE RECYCLE BIN DECAL



Vendor of Deskside Recycle bins does not fabricate decal.
Decals will be provided by Owner (holli.fajack@csulb.edu).

Appendix H - CSULB Design Standards

CUSTOMER APPROVAL SHEET (NSDS)

Please Email/Fax Approval back to Sales Rep

Product Type: **Configured**

Quote#: **Q000195504**

Item #: **55357-20072**

Phantom Product

Ref Item #: **55357-20044**

Description: Freedom One eLift Lectern, OB, Oval Grommet, CC500, CWCWVM

Variable	Outcomes
Laminate	Colombian Walnut 7943K-07 T3
Edgeband	Colombian Walnut 3MM
Metal Finish	Champagne Metallic
Lectern Style/OB Cutouts:	OB-Wksurface w/CUSTOM Cutout See Below
Base	Glides
Rack Options	Std Wksurface (No Cutout)
Door Options	Acrylic Door (Factory Install)
Shelf	Flip Up Shelf (Not Factory Install)
Keyboard	Keyboard Tray (Factory Install)
Logo Panel	NONE
CoveColor/Additional Cutouts:	No Cove/Color was Selected



Conceptual Drawing

Cut Out Details(1):	Oval Grommet
Cut Out Details(2):	CC500
Cut Out Details(3):	1.75" Dia Shock Mt
Cut Out Details(4):	Hole Pattern for Tlp Pro 1022T



Logo	n/a

Electronics



Other Notes:

1) Add Oval Grommet Hole through Instrument Panel for a Ergontron #45-241-026

2)

3)

**** Internal Use Only ****

[Spectrum Industries | Office and Educational Furniture](#)



925 First Ave P.O. Box 400 Chippewa Falls, WI 54729 Ph. 1-800-235-1262 Fax 1-800-335-0473

E-mail: spectrum@spectrumfurniture.com Web site: www.spectrumfurniture.com

Appendix H - CSULB Design Standards

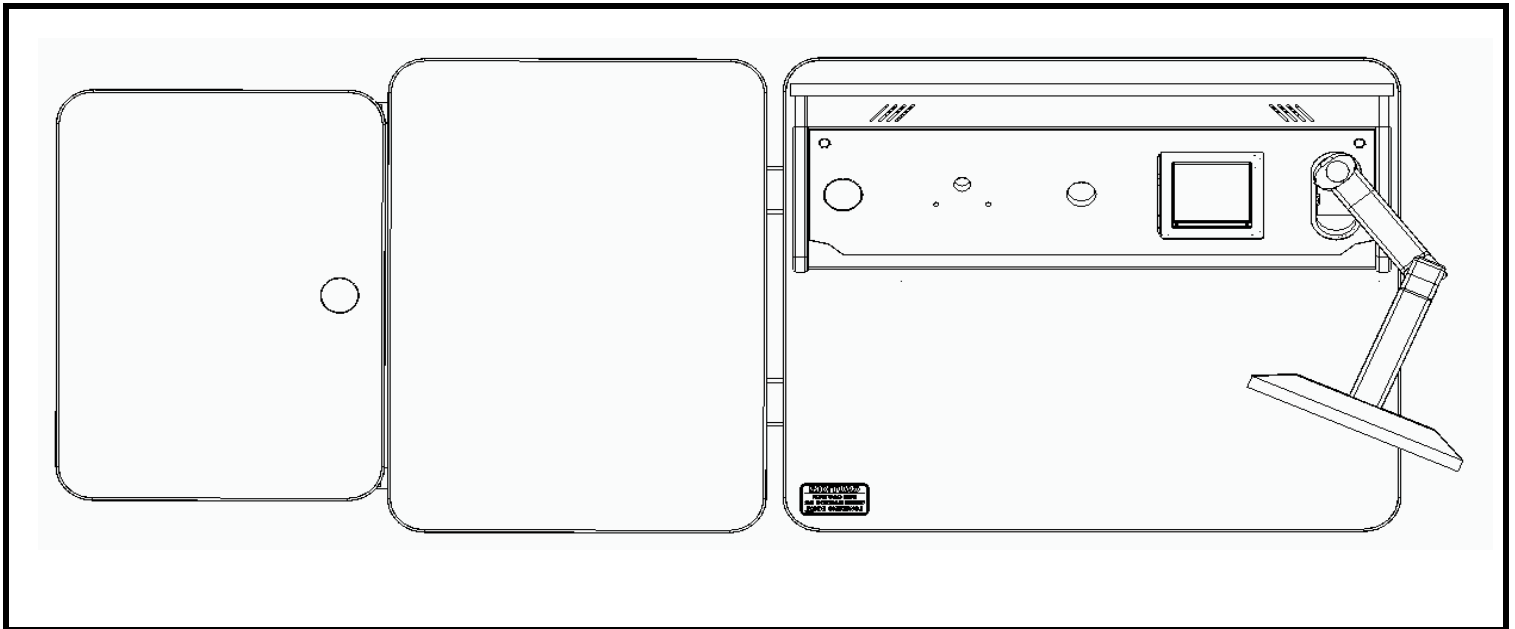
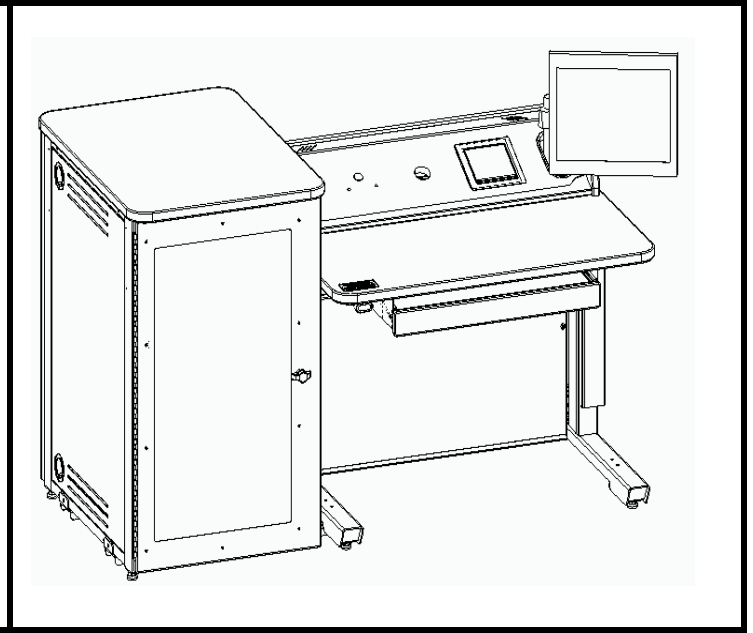
Fax approval back to: 1-800-335-0473

IMAGE DETAIL PAGE

Quote#: Q000195504

Item# 55357-20072

Description Freedom One eLift Lectern, OB, Oval Grommet, CC500, CWCWVM



By signing the Customer Approval Sheet the customer agrees that all changes listed above are correct.

No orders for non-standard products will be accepted without a signed Customer Approval Sheet.

Please submit both pages of this approval sheet when returning to Spectrum.

****Non-standard products are non-returnable, non-refundable and can require a lead time of up to 6-12 weeks depending on the complexity of the changes and the time of year.****

Approved By: Dennis LuPresto
(signature)

Date: 05/14/2018

Dennis LuPresto
(print name)

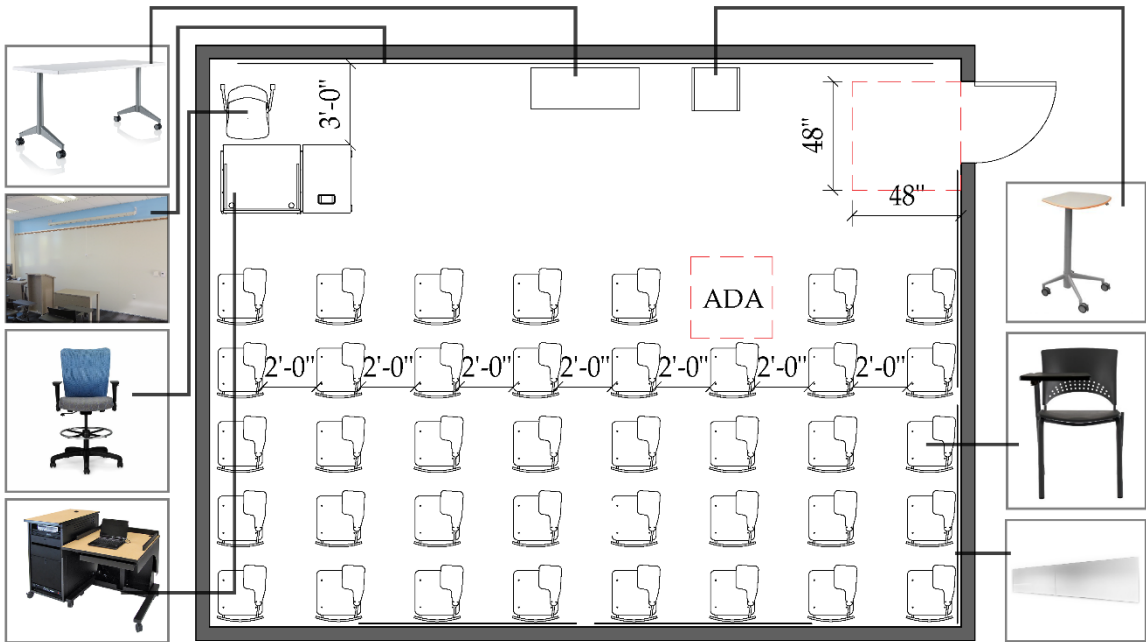
SPECTRUM
INDUSTRIES INC.

925 First Ave P.O. Box 400 Chippewa Falls, WI 54729 Ph. 1-800-235-1262 Fax 1-800-335-0473

E-mail: spectrum@spectrumfurniture.com Web site: www.spectrumfurniture.com

Classroom Standards

Rev 9/2/20



TABLET ARM CHAIR CLASSROOM

UPDATED 7.10.20

ASF: 20

Tablet Arm Chair Classroom

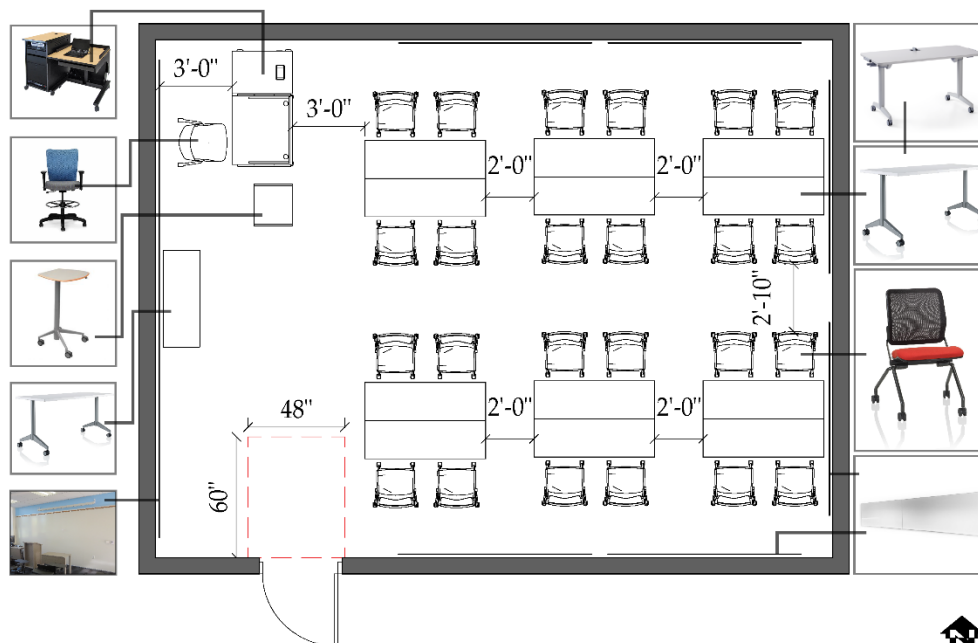
Note: all rooms to have 10" stainless steel chair rail centered at chair back height

List of Furniture Types:

Item:	Brand:	Overall Dimensions:
Tablet Arm Chairs	AllSeating – Multistack Tablet	33"H, 24.75"W, 29.5"D
Teacher Station	Freedom One Lectern	36.25"W x 30"D x 28.5" to 42"H (with casters)
Teacher Chair	CSI Fullmer Inertia Stool	28"W x 28"D x 38.5" - 45.5"H
Podium	Smith System – Sit Stand Lectern, Asian Night Trim	30-45"H, 23.5", 20"D
Teacher Table	KI Pirouette Table	18"W x 48"L x 30"H
Whiteboard – Wall Mounted	Steelcase Markerboards - TANGRAM	144"W x 48"H, +36" AFF
Whiteboard – Teaching Wall	Sans Series Ceramic board wall-to-wall application	8' tall, 4" off floor, provide marker tray
Projector Screen	Da-Lite Model C With CSR Manual Wall and Ceiling	Diagonal Projection Screen - 54" x 96" Matte White - 110"

Classroom Standards

Rev 9/2/20



ACTIVE LEARNING CLASSROOM

UPDATED 7.10.20

ASF: 25

Active Learning Classroom

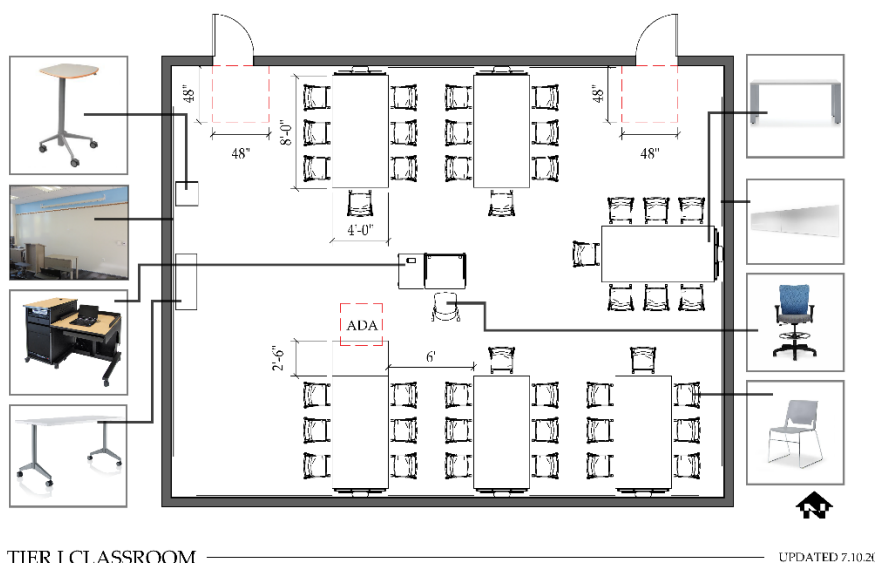
Note: all rooms to have 10" stainless steel chair rail centered at chair back height

List of Furniture Types:

Item:	Brand:	Overall Dimensions:
Student Chairs	-KI Torsion Air Nesting Armless Chair, Upholstered Seat/Mesh -Movi Nesting Chair	-23.8"W x 23.9"D x 33.3"H -26"W x 26"D x 34.5"H
Student Tables	-KI Pirouette Table -Steelcase Verb Nesting Table	19"W x 60"L x 30"H
Teacher Station	Freedom One Lectern	36.25"W x 30"D x 28.5" to 42"H (with casters)
Teacher Chair	CSI Fullmer Inertia Stool	28"W x 28"D x 38.5" - 45.5"H
Podium	Smith System – Sit Stand Lectern, Asian Night Trim	30-45"H, 23.5", 20"D
Teaching Table	KI Pirouette Table	18"W x 48"L x 30"H
Whiteboard – Wall Mounted	Steelcase Markerboards - TANGRAM	144"W x 48"H, 36" AFF
Whiteboard – Teaching Wall	Sans Series Ceramic board wall-to-wall	8' tall, 4" off floor, provide marker tray

Classroom Standards

Rev 9/2/20



ASF: 20-25

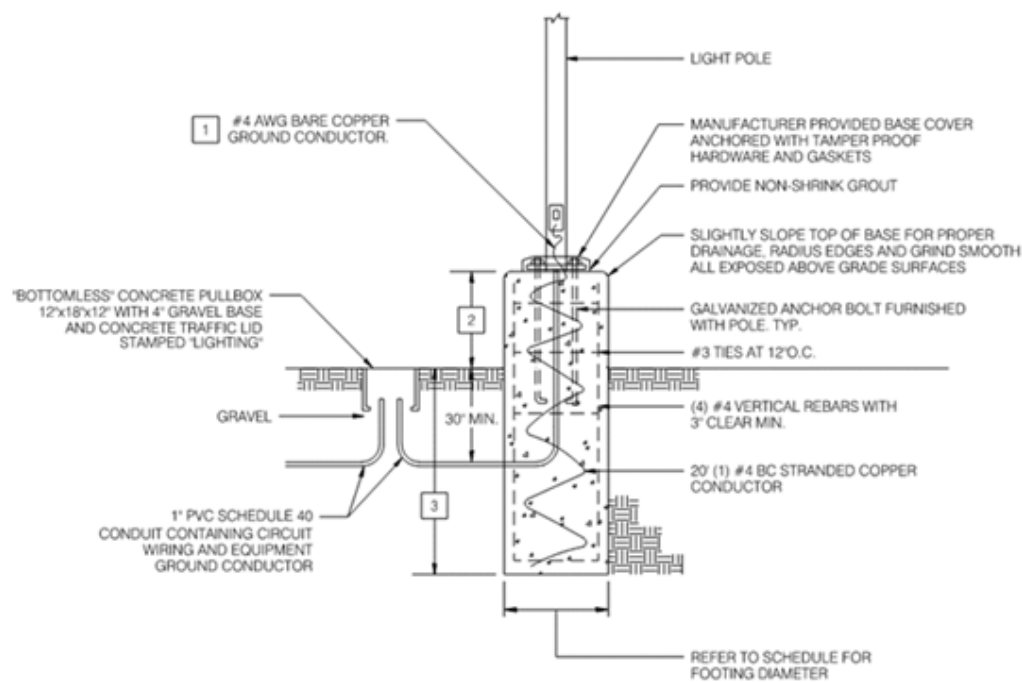
Tier 1 Classroom

Note: all rooms to have 10" stainless steel chair rail centered at chair back height

List of Furniture Types:

Item:	Brand:	Overall Dimensions:
Student Chairs	<i>Haworth Very Side Chair – polymer shell</i>	23"W x 23.3"D x 30.6"H
Learning Tables	<i>Haworth Planes- Markerboard Top Table</i>	48" W x 96"L x 30"H
ADA Table (option to reduce 2 seats main table instead of using ADA table)	<i>Haworth Planes- Markerboard Top Table</i>	48" W x 36"L x 30"H
Teacher Station	<i>Freedom One Lectern</i>	36.25"W x 30"D x 28.5" to 42"H (with casters)
Teacher Chair	<i>CSI Fullmer Inertia Stool</i>	28"W x 28"D x 38.5" - 45.5"H
Podium	<i>Smith System – Sit Stand Lectern, Asian Night Trim</i>	30-45"H, 23.5", 20"D
Teacher Table	<i>KI Pirouette Table</i>	18"W x 48"L x 30"H
Whiteboard – Wall Mounted	<i>Steelcase Markerboards - TANGRAM</i>	144"W x 48"H, +36" AFF
Whiteboard – Teaching Wall	<i>Sans Series Ceramic board wall-to-wall application</i>	8' tall, 4" off floor, provide marker tray
Projector Screen	<i>Da-Lite Model C With CSR Manual Wall and Ceiling</i>	Projection Screen 54" x 96" / Matte White - 110"

OL-10 FOOTING DETAIL AS PROVIDED BY OTHERS.



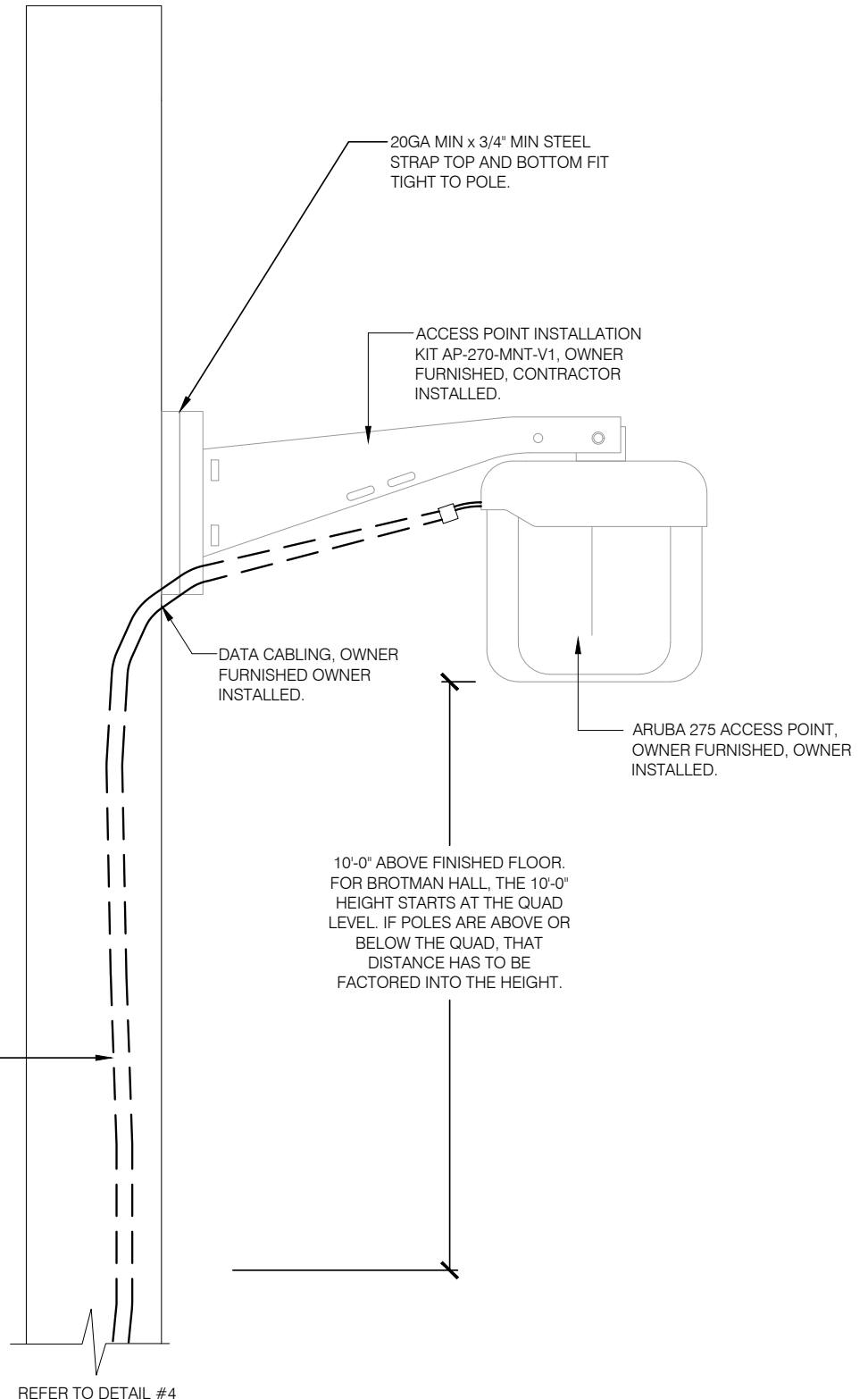
LIGHT POLE FOOTING SCHEDULE			
POLE HEIGHT	FOOTING HEIGHT BELOW GRADE	FOOTING DIAMETER	FOOTING HEIGHT ABOVE GRADE
0'-0" UP TO 15'-0"	4'-0"	2'-0"	6"
15'-1" UP TO 30'-0"	6'-0"	2'-6"	6"

NOTES

- 1 GROUND POLE TO GROUND CONDUCTORS IN CONDUITS.
- 2 REFER TO SCHEDULE FOR ABOVE GRADE HEIGHT.
- 3 REFER TO SCHEDULE FOR FOOTING LENGTH BELOW GRADE.

GENERAL NOTES




- 1. CONTRACTOR SHALL COORDINATE WITH STRUCTURAL FOR EXACT LOCATION PRIOR TO INSTALLATION OF POLE.



NOTE











1. WIRELESS ACCESS POINT WEIGHS 5.3 LBS.
2. ACCESS POINT MOUNTING KIT WEIGHS 3 LBS.
3. CONTRACTOR SHALL COORDINATE WITH CSULB ITS IF THE WIRELESS ACCESS POINT COMPONENTS SHALL BE PAINTED WHITE WITH LATEX BASED PAINT.

Appendix K - CSULB Design Standards

INDOOR CORRIDOR - IN ORDER OF PREFERENCE					
IMAGE	NAME	MANUFACTURER	LOCATION	COST	NOTE
	MLB720BCL Series	MAGLIN	TBD	\$1130 (2017)	PROPOSED BENCH IPE wood finish, silver frame for interior & exterior
	GRAZIE TANDEM SEATING	KI	TBD	\$1600 (2017)	3-seat with table. Better option than American Seating -- easier to procure Finishes to vary depending on application.
	HUB	KI	AS 3rd Floor Corridor, Hauth Center	\$2558 (2017)	Options to include charging outlets along back and sides. Finishes to vary depending on application.

interior only

Appendix K - CSULB Design Standards

OUTDOOR - IN ORDER OF PREFERENCE					
IMAGE	NAME	MANUFACTURER	LOCATION	COST	NOTE
	PARC VUE BENCH	LANDSCAPE FORMS	EED Courtyard	\$1082 (2017)	Existing is without arms
	CATENA TABLE AND PARC CENTER CHAIRS	LANDSCAPE FORMS	EED Courtyard	Table: \$845 Chair: \$212 5-PC Set: \$1693 (2019)	36" table - Catena Option for umbrella hole Freestanding or ground mount
	CUSTOM	Quickcrete	West Campus Drive drop-off		Custom bench
	LBT TABLE	QUICK CRETE	PPFM, EN3	\$1382 (2019)	Umbrella hole option, variety of colors - French Grey used so far. Also comes in ADA size
	Food Court Table	QUICK CRETE	EED North	\$1467 (2019)	Umbrella hole option, variety of colors - French Grey used so far. Also comes in ADA size
	WALDEN BENCH (Standard <u>Donor</u> Bench)	THOMAS STEELE	HSCI Donor Benches	\$1085 (2017)	Bench is 8'. Finishes include recycled plastic. Vendor is Recreation Republic, Inc.
	MLPT 400 SERIES CLUSTER SEATING	MAGLIN	Throughout	\$1910 (2019)	Wood grain recycled plastic in Brown finish with silver frame. Fixed seating.
	MLPT210 SERIES	MAGLIN	TBD	\$2780 (2019)	Wood grain recycled plastic in Brown finish with silver frame. Fixed seating.
	MLB720CL Series	MAGLIN	DONOR BENCH ALTERNATIVE		Wall Mount Sandstone HDPC finish for outdoors.
	MLB720BCL Series	MAGLIN	TBD	\$1130 (2017)	PROPOSED BENCH IPE wood finish, silver frame for interior & exterior



CALIFORNIA STATE UNIVERSITY, LONG BEACH

PHYSICAL PLANING AND FACILITIES MANAGEMENT

**Green Cleaning Policy
and
High Performance Cleaning Program**

for

**California State University – Long Beach
1250 Bellflower Boulevard
Long Beach, CA**

Table of Contents

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Policy Overview

This Green Cleaning Policy and High Performance Cleaning Program is intended to assist the management of CSULB in pursuit of their goal to maintain a clean, healthy, and safe building environment while simultaneously minimizing the impacts of cleaning processes, procedures and products on the natural environment.

1) Scope

a) Management Scope

This Green Cleaning policy applies to all cleaning conducted at CSULB. This policy is overseen by the CSULB Manager and shall not be revised, changed or updated without management consent.

b) Physical Scope

This Green Cleaning Policy applies to the following buildings on the CSULB campus:

- Hall of Science
- _____
- _____
- _____

This policy includes the all grounds associated with the listed buildings, extending to the property line and including cleaning of hardscape, parking, and the building exterior. Maintenance of grounds, hardscape and building exteriors is directed by the Building Exterior and Site Management Plan for the CSULB campus.

2) Performance Metric

Analysis of the ongoing performance of the overall Green Cleaning Policy and High Performance Cleaning Program at CSULB will be assessed by a three-part process:

1. Annual meetings with the CSULB Custodial Manager and staff to review cleaning performance,
2. An annual review of all relevant purchasing and/or performance data to determine compliance with key program goals, and
3. An annual building walk through and tenant contact meetings intended to elicit feedback

3) Goals

a) Program Goal

As noted above, the goal of this program is to minimize exposure of building occupants and maintenance personnel to potentially hazardous chemical, biological and particle contaminants which may adversely impact air quality, health, building finishes and systems, and the environment, and to balance these needs with the cost and quality of the managed systems to provide a sustainable approach to cleaning and janitorial maintenance.

b) Performance Goals

CSULB has established the following goals for the implementation and ongoing operation of the campus green cleaning policy:

1. Seek to ensure that 100% of cleaning, hard floor and carpet care products meet program sustainability criteria.
2. Seek to achieve 100% of cleaning equipment purchases consistent with program sustainability criteria.
3. Maintain appropriate standard operating procedures, strategies, and guidelines for critical tasks.
4. Ensure appropriate staff training on an ongoing basis.
5. Collect occupant feedback to ensure continuous improvement and occupant satisfaction.

4) Responsible Parties

The Custodial Manager is responsible for developing and managing the implementation of the Green Cleaning Policy & Program.

Personnel involved with various elements of the green cleaning program shall carry out their tasks according to this policy, and report all relevant activities to the aforementioned parties. To ensure an effective and coordinated effort, the building staff responsible for overseeing the Green Cleaning Policy & Program shall review all proposed cleaning activities before implementation.

Green cleaning strategies for the property shall include actions performed by the following contractor:

Function	Company Name	Primary Contact	Phone
Custodial Services	GCA	Jonathan Romines	214-355-7000 Ext.213

5) Time Period

This policy was formally adopted on February 15, 2009 and will remain in place, with amendments and revisions, during the length of the cleaning contract ending on February 15, 2013. It will then be renewed.

Green Cleaning Policy

1) Products

a) Green Cleaning Product Use

Wherever feasible, cleaning products and materials, including hard floor and carpet care products, used on the CSULB campus shall meet the requirements of LEED-EB:O&M 2009 EQc3.3: Green Cleaning, Purchase of Sustainable Cleaning Products and Materials.

Product types subject to these requirements include, but are not limited to, bio-enzymatic cleaners, hard floor cleaners, carpet cleaners, general purpose cleaners, specialty cleaners, odor control, disinfectants, disposable janitorial paper products and trash bags, and hand soaps.

b) General Sustainability Criteria

- Cleaning products must meet one or more of the following standards for the appropriate category:
 - Green Seal GS-37, for general-purpose, bathroom, glass and carpet cleaners use for industrial and institutional purposes
 - Environmental Choice CCD-110, for cleaning and degreasing compounds
 - Environmental Choice CCD-146, for hard surface cleaners
 - Environmental Choice CCD-148, for carpet and upholstery care
- Disinfectants, metal polish, floor finishes, strippers or other products not addressed by GS-37 or Environmental Choice CCD-110, 146, or 148 shall meet at least one of the following standards for the appropriate category:
 - Green Seal GS-40, for industrial and institutional floor care products
 - Environmental Choice CCD-112, for digestion additives for cleaning and odor control
 - Environmental Choice CCD-113, for drain or grease traps additives
 - Environmental Choice CCD-115, for odor control additives
 - Environmental Choice CCD-147, for hard floor care
 - California Code of Regulations maximum allowable VOC levels for the specific product category
- Disposable janitorial paper products and trash bags meet the minimum requirements of one or more of the following programs for the applicable product category:
 - U.S. EPA Comprehensive Procurement Guidelines for Janitorial Paper and Plastic Trash Can Liners
 - Green Seal GS-09, for paper towels and napkins
 - Green Seal GS- 01, for tissue paper
 - Environmental Choice CCD-082, for toilet tissue

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- Environmental Choice CCD-086, for hand towels
 - Janitorial paper products derived from rapidly renewable resources or made from tree-free fibers
- Hand soaps meet one or more of the following standards:
 - No antimicrobial agents (other than as a preservative) except where required by health codes and other regulations (i.e., food service and health care requirements)
 - Green Seal GS-41, for industrial and institutional hand cleaners
 - Environmental Choice CCD-104, for hand cleaners and hand soaps

c) Product-Specific Criteria

Detailed information on product-specific selection criteria for all major categories of cleaning chemical use at CSULB can be found in Appendix B – Product-Specific Performance Criteria

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d) Approved Product List

The products listed below are approved for use. Products beyond those listed here must be submittal for approval prior to use.

Product Type	Product Name	Manufacturer	Vendor	Sustainability Criteria
Cleaning Chemicals				
Neutral Floor & Hard Surface Cleaner	Green Concepts #40	Eco Concepts	BRH Supply	Green Seal GS-37
Neutral Disinfectant Cleaner	Green Concepts #2	Eco Concepts	BRH Supply	N/A
Glass and Window Cleaner	Green Concepts #27	Eco Concepts	BRH Supply	Green Seal GS-37
All Purpose Cleaner	Green Concepts #1	Eco Concepts	BRH Supply	Green Seal GS-37
Restroom Tile & Grout Cleaner	Green Concepts #25	Eco Concepts	BRH Supply	Green Seal GS-37
Air Freshener	Green Concepts #50	Eco Concepts	BRH Supply	N/A
Foaming Hand Soap	Clea Blue Foaming Hand Wash	Unisan	Unisan	GS-41A
Gum Remover	Gum Remover #060080	Cleansource	Cleansource	none
Graffiti Remover	Claire Graffiti Remover	Claire	Cleansource	EPA DFE
Floor Stripper	Freedom Floor Stripper	Johnson Diversity	Waxie	GS-37
Floor Sealer	Hillyard 341	Hillyard	Hillyard	none
Carpet Defoamer	Defoamer II	Hillyard	Hillyard	none
Carpet Extraction	Carpet Extraction & Pre Spray	Hillyard 965	Hillyard	GS-37
Carpet Pre Spray	Green Concepts #5	Eco Concepts	BRH Supply	GS-37
Floor Finisher	Super Shine All	Hillyard	Hillyard	none

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Product Type	Product Name	Manufacturer	Vendor	Sustainability Criteria
Paper Products				
Double Roll Toilet Tissue	Unisource Private Brand	Solaris Paper	AF&S Product and Services	Rapidly Renewable Fibers
Roll Towels	Unisource Private Brand	Solaris Paper	AF&S Product and Services	Rapidly Renewable Fibers
1/2 –Fold Seat Covers	SG203 Seat Covers	Empire	Empire	30% Post-Consumer Recycled Material (EPA CPG)
Product Type	Product Name	Manufacturer	Vendor	Sustainability Criteria
Trash Can Liners & Bags				
Large Can Liners	22X20X48 black liner	E*Polystar	E*Polystar	30% postconsumer material/30% secondary material/40% virgin material
Small Can Liners	12X8X21	Solaris	E*Polystar	10% postconsumer material/90% virgin material (EPA CPG)
Recycle Liners		E*Polystar	E*Polystar	20% postconsumer material/40% secondary material/40% virgin material
Sanitary Napkin Bags	Wax Paper Liners		Waxie	No postconsumer material

In addition, wherever possible, microfiber cloths, dusting tools and flat mop systems are preferred. By virtue of its design, microfiber gathers dust and dirt more effectively and with its high absorbency rate allows for both cleaning and polishing to occur. In order for this to occur the microfiber, when soiled, must be exchanged for a clean microfiber. Proper training and reinforcement is required to ensure associates fold and re-fold cloths to efficiently use 8 cleaning sides and exchange flat mops and dust sleeves in a timely manner.

e) Performance Metric

The practices listed above shall be implemented to the extent practicable, with a target goal of 90 percent of products (as measured by cost) complying with the

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appropriate sustainability criteria. The custodial service provider and paper products provider will track purchase rates on a monthly basis and report to the Custodial Manager quarterly as to performance.

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2) Equipment

a) Green Cleaning Equipment Use

All new equipment acquisitions for use at CSULB shall comply with the requirements of IEQc3.4: Green Cleaning, Sustainable Cleaning Equipment.

b) Sustainability Criteria

- Vacuuming is to be performed utilizing a vacuum that meets the CRI “Green Label” testing program. They shall be capable of capturing 96% of particulates 0.3 microns in size and operate with sound level less than 70dBA.
- Hot water extraction equipment for deep cleaning carpets is capable of removing sufficient moisture such that carpet can dry in less than 24 hours.
- Powered maintenance equipment including floor buffers, burnishers and automatic scrubbers is equipped with vacuums, guards, and/or other devices for capturing fine particulates, and shall operate with a sound level less than 70dBA.
- Propane-powered floor equipment has high efficiency, low emissions engines.
- Automated scrubbing machines are equipped with variable-speed feed pumps to optimize the use of cleaning fluids.
- Battery powered equipment is equipped with gel batteries.
- As appropriate all products are to be recycled appropriately.

c) Approved Product List

The equipment listed below is approved in the event of new equipment acquisition. Equipment beyond that listed here must be submittal for approval prior to acquisition.

Equipment Type	Equipment Name	Manufacturer	Vendor	Sustainability Criteria
Vacuum	Quarter Vac Vacuum backpack	Pro-Team	Maintex	68 dBA
Vacuum	Chariot iVac Stand up ride	Windsor	Hillyard	68 dBA
Vacuum	Versamatic	Windsor	Hillyard	66.4 dBA
Carpet Spotter	Tennant R3	Tennant	Maintex	69 dBA

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Extractor	Tennant R14	Tennant	Maintex	73 dBA
Extractor	CFR PRO 500	CFR	Waxie	
Buffer	Tennant FM 20SS	Tennant	Maintex	<70 dBA

d) Performance Metric

All newly acquired cleaning equipment shall comply with the criteria listed above. The custodial service provider shall track the percent of equipment utilized in the building that meets the criteria, based on cost or number of pieces of equipment, with a target of no less than 20% of equipment achieving compliance.

In addition, the custodial service provider will be required to maintain a log of all powered cleaning equipment operated in the building, including purchase date and all repair and maintenance activities. Vendor cut sheets for all equipment used on site will be made available on-demand. When cleaning equipment replacement is necessary, acquisition dates and supporting documentation shall be retained to demonstrate that all newly acquired equipment shall comply with the specifications.

3) Cleaning Procedures

The procedures, strategies and metrics below have been adopted at CSULB to ensure the effective implementation of the Green Cleaning Policy. This section outlines general cleaning strategies and addresses common surfaces and materials; Appendix A addresses cleaning procedures by specific room and space types.

a) General Strategies for Sustainable Cleaning

- Assess the areas to be maintained, and the usage patterns.
- Determine how to meet the overall goals of the cleaning program.
- Develop a comprehensive approach to the maintenance of the building/property and determine the product specification to be used.
- Ensure that in-house maintenance staff is educated on the policies.
- Ensure that safety, health and environmental practices are compliant with applicable local regulatory requirements.
- Ensure with building management the proper disposal for all cleaning wastes.
- Development of cleaning strategies should focus on the following:
 - efficient use of chemicals
 - efficient use of supplies
 - meet the hygiene and appearance goals of the building/property
 - protect the building's occupants, systems and finishes from contaminants that adversely affect them
 - address the frequency of cleaning in all areas (see specifications)

i) Hard Floor Care

It is the intent of CSULB to implement a floor care system that can be maintained without frequently in order to reduce the amount of coatings and other materials that are harmful to the environment and people.

- Hard floor surfaces are to be scrubbed/re-finished not more than once per year with an electric low speed buffing machine.
- The electric low speed buffing machine is to be stored on-site, therefore reducing the impact of transportation on the environment.
- Contractor to maintain floor cleaning procedures and make available to building management upon request.
- ...

To the degree feasible, entryways and entrances into CSULB are equipped with walk-off mats and/or grates:

- Walk-off mats are cleaned (Monthly) and vacuumed (Daily).
- All walk-off mats at all building entries are intended to measure no less than 10 feet in the direction of egress.

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Floor care maintenance shall consistently be performed according to written protocols without exceptions. QC checks will be used to ensure 100% adoption.

ii) Carpet Care

- Staff will only use vacuums with less than 70 dBA
- Staff will ensure that vacuum bags are changed regularly to prevent dust buildup

iii) Exterior Care

Care of the building exterior is guided by the Building Exterior and Site Maintenance Plan.

b) Cleaning Procedures and Protocols by Room Type/Space Use

Specific cleaning procedures, protocols and practices designated for all major room types and space uses on the CSULB campus have been identified below and articulated in Appendix A. and metrics below have been adopted at CSULB to ensure the effective implementation of the Green Cleaning Policy.

c) Chemical Safety Procedures

The following protocols have been established to mitigate spills, leaks and mismanagement. All practices below are communicated to custodians working on the property in a formal training setting on a yearly basis.

i) Labels and Material Safety Data Sheets (MSDS)

- Follow all chemical labels and MSDS warnings and use products only as directed.
- Never use an unlabeled container or any chemical product if you are not certain what it is.
- Report to Supervisor all missing or unreadable labels

ii) Personal Protective Equipment (PPE) and Engineering Controls

Compliance with relevant OSHA regulations is a key component of CSULB Green Cleaning Program. According to OSHA regulations, workers must use personal protective equipment (PPE) for the eyes, face, head, and extremities; protective clothing; respiratory devices; and protective shields and barriers, when they are using hazardous chemical materials. PPE used by janitors could include goggles or other types of face guards; gloves (made of a material appropriate for the

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task); long-sleeved shirts and long pants; hats; and respirators, among other equipment.

CSULB trains each employee how to use PPE. Each employee must learn when and what PPE is necessary for a particular job; how to properly wear PPE; the limitations of the PPE they are using; and the proper care and maintenance for the PPE.

CSULB PPE guidelines are as follows:

- Wear protective gloves and/or safety glasses as directed on the product label or MSDS.
- Inform your Supervisor if PPE is needed.
- Always spray chemicals away from your body, especially your eyes and mouth. Whenever possible, spray chemical into micro fiber clothe.
- Do not eat or drink near any cleaning chemicals and always wash hands after using chemicals.
- Never smell, inhale or taste the contents of a chemical container to determine its contents.

iii) Cleaning with Chemicals

- Use only products provided by CSULB.
- Use only products that you have been trained to use.
- Report all chemical spills to your Supervisor immediately and refer to instructions on MSDS for proper spill cleanup and disposal.
- Please inform your foreperson or supervisor if you are unable to get something clean with the chemicals provided.
- If product comes into contact with any body part, flush immediately with water. Remove any contaminated clothing. Follow first-aid instruction on the label or MSDS.
- All chemical containers are to be securely covered and stored away from flames or intense heat.
- Properly remove all cleaning chemical residue so customers and tenants will not be overexposed to chemicals.
- Wash hands after using chemicals.
- Do NOT bring products from home.
- Never puncture or collapse an aerosol can. Use only in accordance with label instructions.

iv) Mixing Chemicals

- Never mix two different chemical products together: this may cause a dangerous and poisonous gas.
- Only fill each secondary container bottle with the exact same product each time you refill.
- Dilute with water only where required.

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- Make sure water is turned off and that no chemicals remain in mop buckets, unlocked dispensers or machine tanks over night.
 - Make sure all caps are secure when returning chemicals to rack or closet.
- v) Chemical Storage
- Do not store chemicals above eye level.
 - Do not store food or drinks around chemicals (No food or water may be kept on janitor cart).
- vi) Chemical Safety and Emergency Procedures
- Report all chemical product spills to your Supervisor immediately and refer to instructions on the MSDS for proper spill cleanup and disposal.
 - If any product comes into contact with any body part, flush immediately with lots of water. Follow first-aid instruction on the label or MSDS and call 911 if necessary.
 - All chemical containers are to be securely covered and stored away from flames, heat and the sun.
 - Properly remove all cleaning chemical residue so customers and tenants will not be unknowingly exposed to chemicals.

vii) Chemical Concentrates and Dilution Systems

It is the intent of building management to have chemical concentrates used whenever possible in order to lower transportation costs between manufacturer and end-user, lower use of packaging materials, lower real chemical use to obtain same performance, and to lower exposure of maintenance personnel to hazardous chemicals.

- A portion controlled, closed dilution system is to be utilized in order to further reduce environmental impacts.
- Pre-labeled containers are to be utilized.

Dilution systems and chemical concentrates shall be wholly utilized for the following product types:

- Product 1 Green Concepts #1
- Product 2 Green Concepts #2.
- Product 3 Green Concepts #5
- Product 4 Green Concepts #25
- Product 5 Green Concepts #27
- Product 6 Green Concepts #40
- Product 7 Green Concepts #50

viii) Performance Metric

Protocols governing safe handling and storage of cleaning chemicals shall be wholly adopted. QC checks will be used to ensure 100% adoption.

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d) Cleaning Strategies for Vulnerable Building Occupants

Vulnerable building populations at CSULB have been identified to ensure that adequate precautionary measures are taken in relation to the Green Cleaning Program. Product selection and use is accordingly varied on a case-by-case basis as needed for each vulnerable population. In addition, CSULB makes detailed cleaning practice and product information available to vulnerable building occupants via the campus sustainability website.

e) Hand Hygiene

Signage shall be posted to remind all building occupants and guests to maintain proper hand hygiene.

All restroom facilities, including those in guest rooms, public areas, and back-of-house spaces shall include appropriate hand soaps as specified in section 1 of this policy.

Protocols promoting hand hygiene shall be wholly adopted. QC checks will be used to ensure 100% adoption.

4) Occupant Feedback

CSULB places the highest priority on ensuring that building occupants have multiple means of providing feedback to management as to the custodial services provided and specific complaints, concerns or occupant needs. Two modes of occupant feedback have been established on the CSULB campus:

1. Custodial supervisors and the Custodial Manager visit each building annually to visually inspect the building. Occupant representatives are contacted preceding the annual 'floor walk' by the custodial services representative and invited to meet with the floor walk team to discuss any issues or concerns. Each tenant representative is contacted during this process to ensure that concerns are communicated to the management staff.
2. The Physical Planning and Facilities Management Office maintains an immediate response customer service help line (562-985-4357) that allows for occupants to provide direct, immediate calls about urgent custodial issues. The Custodial Manager is tasked with ensuring immediate response to those issues.

5) Staffing Plan

To meet cleaning objectives within the building, minimum staffing requirements must be met. Factors such as occupancy rates, seasonal variations, and other considerations are taken into account when adjusting the staffing plan. The campus custodial staffing plan is included as Appendix C.

6) Staff Training

All custodians are properly trained in the use, maintenance and disposal of cleaning products, dispensing equipment and packaging.

All janitors receive annual chemical safety training.

All janitors are educated on the use of products upon their hire and once per year thereafter, as well as annual HAZCOM training. Or, as necessary, to ensure proper use and disposal of products.

Training records of all staff are to be maintained by the custodial service provider and be made available to building management for review upon request.

Performance Metric - All workers shall receive 24 hours of training annually.

7) Policy Review

a) Quality Control

Assessment of the ongoing performance of the Green Cleaning program at CSULB will be conducted by a three-part process:

1. On an annual basis, the Custodial Manager and a representative from the custodial service provider will conduct custodial floor 'walks' to assess custodial performance, discuss any issues or challenges, and to address any new developments relating to custodial practices.
2. Purchasing-related performance will be tracked via compliance with LEED credit requirements as per individual product categories.

b) Annual Review

The Green Cleaning Policy at CSULB will be reviewed annually and approved by the Custodial Manager.

[APPENDIX A – CLEANING PROCEDURES BY ROOM TYPE / SPACE USE](#)

Common Areas

1. Dust-sweep and wash hard surfaced flooring. Remove gum, tar, and other foreign matter from flooring **nightly**.
2. If floor mats have been used during the day, they shall be thoroughly vacuumed and cleaned **nightly**.
3. Dust baseboards, trim, louvers, moldings, furnishings, ledges and all other fixtures **nightly**.
4. Clean any building directory, mail depository and all other decorative metal as needed, using a micro fiber cloth dampened with water only **nightly**.
5. Completely clean all entrance and revolving door glass and entryway glass sidelights; clean all glass in building directory **nightly using micro fiber cloth**.
6. Empty and clean all waste receptacles and remove waste material to designated areas in the building. Dispose of waste and replace plastic liners in accordance with building's recycling program **nightly**.
7. Remove dirt, finger marks, smudges, etc. from doors, doorframes, walls up to six feet, switch plates, glass, push plates, handles, railings, moldings, trim, etc. Damp wipe metal trim as necessary using water or acceptable green product only **nightly**.
8. Dust/ sweep stonework flooring (If in the Building) with micro fiber mop to insure dust-free floors **nightly**.
9. Spot mop with micro fiber wet mop stonework flooring **nightly**.
10. Complete high dusting (as specified under office areas) **once per month (provide annual schedule)**.
11. Thoroughly vacuum **nightly** and remove spots and stains from carpeting, including edges and corners **weekly (provide annual schedule for carpet spotting)**.

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12. Submit a Hard Surface floor care system that minimizes the need to strip and refinish surfaces. A written schedule should be developed on an annual basis. All strippers, cleaners and finishes should be certified green.

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Offices and Administrative Areas

Per Weekly Schedule

1. Dust or vacuum hard surfaced flooring to insure dust free floors **nightly**.
2. Vacuum all carpeted areas and rugs **nightly** moving light furniture.
3. Empty all waste containers and replace plastic liners in accordance with building's recycling program **nightly**. Damp wipe waste containers when liquid or food residue is showing.
4. Remove waste paper and waste materials to the collection area of the building using janitor carts/carriages. Contractor personnel to place waste material in trash receptacles in accordance with building's recycling program **nightly**.
5. Dust with a micro fiber cloth or mitt all horizontal surfaces that can be reached without a ladder, i.e., desks, file cabinets, binder bins, cubicles, window sills, book cases, ledges, trim, etc. **nightly (A daily rotated schedule is acceptable)**.
6. Spot clean to remove dirty, finger marks, smudges, etc. from all doors, doorframes, switch plates, walls, glass areas adjacent to doors, floor to ceiling partition glass, push plates, handles, railings, etc. **nightly**.
7. Clean polish and sanitize all drinking fountains and water coolers using a green solution **nightly**.
8. Wet wipe counters and tabletops in coffee/kitchen areas **nightly**.
9. Spot clean all glass entrance doors and side panels to remove finger marks, smudges, etc. with a micro fiber cloth **nightly**.
10. Turn off lights and secure space when work assignments are complete **nightly**.
11. Spot clean all carpet as needed throughout building **weekly (Annual schedule)**.

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12. Dust baseboards, chair rails, trim, louvers, moldings and other “low-dust” areas ***nightly***.
13. Damp mop, with micro fiber wet mop, uncarpeted areas ***nightly***.
14. Damp wipe clean interior building metal including doors, knobs, hinges, lock face plates, door saddles, push plates, kick plates, etc. using a micro fiber cloth dampened with green cleaner ***nightly***.
15. Do high dusting, which includes the following ***quarterly*** (*submit schedule*):
 - Dust clean all lighting fixtures, exposed pipes and ducts, ceiling vents, etc.
 - Dust clean all vertical surfaces such as partition, ventilating louvers and vents, walls, trim, etc. not reached in nightly cleaning.
 - Dust tops of cabinets, files, partitions, vending equipment, refrigerators, etc. not reached in nightly cleaning.
 - Dust window frames.
16. Submit a Hard Surface floor care system that minimizes the need to strip and refinish surfaces. A written schedule should be developed on an annual basis. All strippers, cleaners and finishes should be certified green.

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Restrooms

1. Sweep and mop flooring with approved disinfectant cleaner ***nightly***.
2. Wash and polish mirrors, and all chrome and other bright work including shelves, flushometers, exposed piping, toilet seat and partition hinges, dispensers, and all other washroom fixtures using appropriate Green *Restroom Cleaning Systems* ***nightly***.
3. Wash all surfaces of toilets and urinals with approved green cleaning solution ***nightly***.
4. Wash clean all washbasins and counter tops with approved green solution ***nightly***.
5. Spot clean partitions, tile walls, and doors with special attention to areas behind sinks, around urinals and around entrance. Remove graffiti ***nightly***.
6. Empty and clean towel and sanitary disposal receptacles and waste material and refuse to designated area in the building using janitor carts/carriages.
7. Replace liners in all receptacles with clear liners.
8. Wash clean receptacles ***nightly***.
9. Clean and flush floor and other drains using organic products designed for sanitary sewers once ***per week***.
10. Refill toilet paper, paper towels, hand soap and sanitary products ***nightly***.
11. Wash partition, tile walls and enamel painted surfaces with appropriate cleaners ***once per week***.
12. Machine scrub flooring with approved green cleaner solution ***once per month (submit schedule)***.
13. Remove hard water stains from all fixtures by using appropriate cleaner after normal cleaning ***weekly***.

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14. Do high dusting and damp wipe ceiling vents ***once per month.***

Restroom Two-step Cleaning System

Regular Daily Cleaning:

Trash removal, surface cleaning, disinfection, and restocking supplies should occur daily in most commercial or office restrooms.

Routine cleaning involves removing trash and replacing can liners; refilling dispensers; dusting high surfaces; cleaning toilets and urinals with a non-acid bowl cleaner; cleaning showers with a non-acid soap remover; cleaning mirrors and other glass surfaces; cleaning walls, ceiling, partitions, doors, and light switches; disinfecting all surfaces and fixtures; and vacuuming and wet mopping with a cleaner/disinfectant.

Deep Cleaning:

Deep cleaning in public restrooms usually needs to be done weekly. Deep cleaning also may be required when custodians are cleaning a restroom for the first time or when the restroom is particularly dirty. High-traffic restrooms may need deep cleaning once a day, even if routine cleaning is done more frequently.

Some deep cleaning tasks require stronger chemical products to remove stubborn deposits or stains. Examples include removing graffiti, cleaning stained toilet bowls, and removing shower tile deposits. In addition, custodians may need to spend more time removing soil with brushes and scrub pads.

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Lecture or Classrooms

1. Dust hard surfaced flooring with micro fiber dry mops to insure dust free floors **nightly**.
2. Vacuum all carpeted areas and rugs **nightly** moving light furniture and making sure to vacuum between desks.
3. Clean and remove all loose trash and debris from between seats **nightly**
4. Empty all waste containers and replace plastic liners in accordance with building's recycling program **nightly**. Damp wipe waste containers when liquid or food residue is showing.
5. Remove waste paper and waste materials to the collection area of the building using janitor carts/carriages. **nightly**.
6. Spot clean to remove dirty, finger marks, smudges, etc. from all doors, doorframes, switch plates, walls, glass areas adjacent to doors, floor to ceiling partition glass, push plates, handles, railings, etc. **nightly**.
7. Clean polish and sanitize all drinking fountains and water coolers using a green solution **nightly**.
8. Wet wipe counters and tabletops in coffee/kitchen areas **nightly**.
9. Spot clean all glass entrance doors and side panels to remove finger marks, smudges, etc. with a micro fiber cloth **nightly**.
10. Turn off lights and secure space when work assignments are complete **nightly**.
11. Spot clean all carpet as needed throughout building **weekly** (**Rotated schedule is acceptable**).
12. Dust baseboards, chair rails, trim, louvers, moldings and other "low-dust" areas **weekly**.
13. Damp mop, with micro fiber wet mop, uncarpeted areas **nightly**.

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14. Damp wipe clean interior building metal including doors, knobs, hinges, lock face plates, door saddles, push plates, kick plates, etc. using a micro fiber cloth dampened with green cleaner ***once per week***.

15. Do high dusting, which includes the following ***quarterly***:

Dust clean all lighting fixtures, exposed pipes and ducts, ceiling vents, etc.

Dust clean all vertical surfaces such as partition, ventilating louvers and vents, walls, trim, etc. not reached in nightly cleaning.

Dust tops of cabinets, files, partitions, vending equipment, refrigerators, etc. not reached in nightly cleaning.

Dust window frames.

16. Submit a Hard Surface floor care system that minimizes the need to strip and refinish surfaces. A written schedule should be developed on an annual basis. All strippers, cleaners and finishes should be certified green.

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Kitchenettes/Pantries/Lounges

1. Empty waste receptacles and replace liners **nightly**
2. Clean table tops with green solution **nightly**
3. Disinfect drinking fountain, sink, counter tops and fronts, exterior surface of refrigerator and microwave **nightly**
4. Spot clean chairs **nightly**
5. Vacuum carpeted floors with Hepa or triple filtration vacuum; remove gum and soil spots **nightly**
6. Dust mop and damp mop with micro fiber tiled areas **nightly**
7. Clean glass partitions, display cases and interior door glass **nightly**
8. Spot clean walls, including behind, around waste receptacles **nightly**
9. Spot clean furniture (chairs, tabletops, counter surfaces)
10. High dust vents, lights, pipes (12 feet and below) and connecting vertical and horizontal wall surfaces

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Conference and Meeting Rooms

1. Empty waste receptacles and recycling, replace liners, damp clean **nightly**
2. Clean glass in doors and partitions **nightly**
3. Clean white boards and trays **nightly** (unless marked SAVE)
4. Vacuum carpeted floors; remove gum and soil spots **nightly**
5. Dust mop and damp mop traffic patterns on non-carpeted floors **nightly**
6. Dust furniture surfaces and damp clean table tops **nightly**
7. Spot clean door surfaces **Weekly**
8. Dust mop and damp mop non-carpeted floors thoroughly **nightly**
9. Maintain finish on non-carpeted floors
10. High dust vents, lights, pipes, (12 feet and below) and connecting vertical and horizontal wall surfaces **quarterly**

LABORATORIES

Per Bi – Weekly Schedule

NOTE: Waste receptacles containing glass, needles or other hazardous materials mixed with the regular trash will not be removed by the custodians.

1. Empty regular waste receptacles and replace liners **nightly**
2. Seek permission before ever cleaning chalk or white boards in a laboratory
3. Microfiber mop and damp mop floors with green cleaning solution **nightly**
4. Clean doors and glass, damp wipe switch plates and fire extinguishers **nightly**
5. Maintain finish on non-carpeted floors
6. Dust vertical surfaces and vents, ONLY AFTER checking with laboratory personnel to ensure dusting **quarterly** will not harm research

Shops and Locker Rooms

Shop Areas

1. Empty waste receptacles and replace liners **nightly**
2. Dust Furniture **nightly**
3. Clean and disinfect sinks **nightly**
4. Sweep, dust mop and damp mop floors **nightly**
5. Maintain finish or seal to non carpeted floors **Monthly**

Four (4) times per year:

- Dust vents, lights, pipes, (12 feet and below) and connecting vertical and horizontal wall surfaces, spot clean walls **quarterly**

Locker Rooms

1. Empty waste receptacles and change liners **nightly**
2. Restock dispensers: soap, paper towel, toilet tissue **nightly**
3. Clean and disinfect toilets and urinals **nightly**
4. Disinfect basin **nightly**
5. Spot wash walls, partitions and lockers (with disinfectant) **nightly**
6. Clean mirrors and polish stainless steel and chrome surfaces **nightly**
7. Sweep floors, damp mop floors with disinfectant solution **nightly**
8. Damp clean and polish partitions thoroughly **weekly**
9. Clean doors and wall tiles **weekly**
10. Pour at least one gallon of water down floor drain **weekly**
11. De-scale fixtures as needed **minimum of once per month**
12. Interim restroom maintenance (power washing, top scrub floors)
13. High dust vents, lights, pipes (12 feet and below) and connecting vertical and horizontal wall surfaces **quarterly**
14. Maintain floor finish/seal where applicable **monthly**

[APPENDIX B – Product-Specific Selection Criteria](#)

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1. ALL PURPOSE CLEANERS

All Purpose Cleaners consist of a broad array of possible formulations. The following are some of the specific issues to compare for this product category:

- Products with GS-37 certification are preferred
- pH: Prefer those with a neutral pH (closer to 7) as compared to those with extreme pH (closer to 1 or 14)
- Biodegradability: Prefer those that are readily biodegradable as compared to those that are slower to degrade. Unfortunately, many older formulations use excellent performing ingredients that have been found to have serious environmental and health concerns (see ingredients to avoid).
- Dyes & Fragrances: Prefer those with no or low levels of dyes and fragrances compared to those products that are heavily dyed or fragranced. If dyes are necessary use those that are approved for foods and cosmetics (F&C).
- VOCs: Prefer those that have no or low VOC as compared to alternatives with higher levels. Consider detergent based products compared to those containing solvents.
- More Preferable Ingredients: surfactants containing terms such as lauryl, amides, and glycosides.
- Less Preferable Ingredients: Alkyl Phenol Ethoxylates, NTA, EDTA, glycol ethers, sodium hydroxide, potassium hydroxide, sodium metasilicate, phosphates.

2. BATHROOM CLEANERS

Bathroom Cleaners are often acids because of the need to remove mineral deposits from sinks, bowls and urinals. Frequently they are heavily dyed, contain chlorine bleach (sodium hypochlorite) which is a respiratory irritant and can burn eyes and skin and strongly fragranced. The following are some of the specific issues to compare for this product category:

- Products with GS-37 certification are preferred
- pH: Prefer those with a more neutral pH as compared to those with extreme pH (closer to 1).
- Bathroom cleaners may fall more in the range of pH 4 as compared to traditional products that may have a pH below 1.
- Dyes & Fragrances: Prefer those with no or low levels of dyes and fragrances compared to those products that are heavily

dyed or fragranced. If dyes are necessary use those that are approved for foods and cosmetics (F&C).

- Biodegradability: Prefer those that are readily biodegradable as compared to those that are slower to degrade. Unfortunately, many older formulations use excellent performing ingredients that have been found to have serious environmental and health concerns (see ingredients to avoid).
- More Preferable Ingredients: surfactants containing terms such as lauryl, amides, glycosides, hydrogen peroxide, citric or acetic acid.
- Less Preferable Ingredients: Alkyl Phenol Ethoxylates, NTA, EDTA, sodium hypochlorite (chlorine bleach), hydrochloric acid, phosphoric acid.

3. BATHROOM DISINFECTANTS

Bathroom Disinfectants are similar to general disinfectants, but typically may have an acidic pH (closer to 1) to remove hard water deposits in sinks, bowls and urinals, and contain chlorine bleach (sodium hypochlorite) which is a respiratory irritant and can burn eyes and skin. The selection issues include both those under general disinfectants and bathroom cleaners. Care in selection and use is important. The following are some of the specific issues to compare for this product category:

- See Bathroom Cleaners for similar attributes.
- Products with GS-40 certification are preferred
- For bathroom floors, products with Environmental Choice CCD-147 are preferred
- Antimicrobial Ingredients: Prefer antimicrobial ingredients that have a lower potential for persistence in the environment and to accumulate in living tissue compared to those with a greater potential.
- More Preferable Active Ingredients: hydrogen peroxide.
- Less Preferable Active Ingredients: sodium hypochlorite (chlorine bleach), quaternary ammonium compounds, alcohols, phenolic compounds.

4. CARPET CLEANER

Products with Environmental Choice CCD-148 certification are preferred. Also see All Purpose Cleaners. In addition, select carpet

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cleaners that when dry are not sticky or tacky. This minimizes resoiling and extends the time between cleaning.

5. CHROME CLEANER/POLISH

Chrome Cleaner/Polish frequently use petroleum distillates, which are poisonous and derived from a non-renewable resource. The following are some of the specific issues to compare for this product category:

- Products with GS-40 certification are preferred
-
- VOC: Prefer those that have no or low VOC as compared to alternatives with higher levels.
- Bio-Based / Renewable Resources: Prefer products that use oils derived from renewable resources as compared to oils from non-renewable resources.
- More Preferable Ingredients: emulsified vegetable oils
- Less Preferable Ingredients: petroleum distillates, ammonia.

6. FLOOR FINISHES

Floor Finishes must be durable and appropriate for the prescribed maintenance method, but they typically contain heavy metals. Importantly, floor finishes must be compatible with the stripping solution. The following are some of the specific issues to compare for this product category:

- Products with GS-40 certification are preferred
- Durability: Prefer finishes that are more durable (require less maintenance such as buffing, restoring and recoating) than less durable finishes that require more frequent maintenance.
- Heavy Metals: Prefer non-metal cross-linked polymers as compared to those containing heavy metals. Another significant benefit of non-metal polymer formulas is that frequently they can be removed with less hazardous floor strippers.
- More Preferable Ingredients: metal-free polymers.
- Less Preferable Ingredients: metal-crosslinked polymers.

7. FLOOR STRIPPERS

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Floor Strippers typically have extreme pH, solvents and ammoniated compounds necessary to remove metal cross-linked floor finishes. Floor strippers must be compatible with the floor finish. The following are some of the specific issues to compare for this product category:

- Products with GS-40 certification are preferred
- pH: Prefer those with a pH closer to neutral (in the range of 10 to 12) as compared to those with extreme pH (closer to 14).
- VOC: Prefer those that have no or low VOC as compared to alternatives with higher levels.
- Bio-Based / Renewable Resources: Prefer those that containing naturally derived solvents as compared to those containing non renewable derived solvents.
- More Preferable Ingredients: d-Limonene (citrus solvent) and methyl esters (derived from soy).
- Less Preferable Ingredients: ethylene glycol mono butyl ether (butyl cellusolve), 2-butoxyethanol, ammonia, and sodium hydroxide.

8. FURNITURE POLISH

Furniture Polishes frequently use petroleum distillates, which are poisonous and derived from a nonrenewable resource. The following are some of the specific issues to compare for this product category:

- Products with Environmental Choice CCD-148 certification are preferred.
- VOC: Prefer those that have no or low VOC as compared to alternatives with higher levels.
- Bio-Based / Renewable Resources: Prefer products that use oils derived from renewable resources as compared to oils from non-renewable resources.
- More Preferable Ingredients: citrus (lemon and orange) oils, emulsified vegetable oils.
- Less Preferable Ingredients: petroleum distillates.

9. GENERAL DEGREASER

General Degreasers are typically heavy-duty cleaners that include solvents for removing oil-based soils. Traditional solvents are typically derived from a non-renewable sources (e.g., petroleum), can be flammable, have a high degree of VOCs which can cause respiratory

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irritation and contribute to environmental pollution and some have severe health impacts. The following are some of the specific issues to compare for this product category:

- Products with Environmental Choice CCD-110 certification are preferred
- See All-Purpose Cleaners
- VOC: Prefer those that have no or low VOC as compared to alternatives with higher levels.
- Bio-Based / Renewable Prefer products that use oils derived from renewable resources as compared to oils from non-renewable resources.
- Flashpoint: Prefer products that have a high flashpoint compared to those with a low flashpoint.
- More Preferable Ingredients: d-Limonene (derived from citrus fruits) and methyl esters from soy and corn.
- Less Preferable Ingredients: glycol ethers in general, ethylene glycol mono butyl ether (butyl cellusolve), and sodium hydroxide.

10. GENERAL DISINFECTANTS

General Disinfectants are similar to cleaners (see all-purpose cleaners) with additional ingredients added to kill bacteria and other unwanted organisms, and bathroom disinfectants. Because disinfectants kill organisms they are toxic by definition. Some are persistent in the environment and accumulate in living tissue. Care in selection and use is important. The following are some of the specific issues to compare for this product category:

- Products with Environmental Choice CCD-110 certification are preferred
- See Bathroom Disinfectants for similar attributes.
- Antimicrobial Ingredients: Prefer antimicrobial ingredients that have a lower potential for persistence in the environment and to accumulate in living tissue compared to those with a greater potential.
- More Preferable Active Ingredients: hydrogen peroxide and quaternary ammonium compounds.
- Less Preferable Active Ingredients: sodium hypochlorite (chlorine bleach), phenol compounds.

11. GLASS CLEANERS

Glass Cleaners are cleaners that have ingredients added to reduce streaking and to evaporate quickly. Traditional glass cleaners can contain alcohol and other solvents (typically glycol ethers) or ammonia. The following are some of the specific issues to compare for this product category:

- Products with GS-37 certification are preferred
- VOCs: Prefer those that have no or low VOC as compared to alternatives with higher levels. Consider detergent based products compared to those containing solvents.
- Flashpoint: Prefer products that have a high flashpoint compared to those with a low flashpoint.
- pH: Prefer those with a neutral pH (closer to 7) as compared to those with extreme pH (closer to 1 or 14)
- Biodegradability: Prefer those that are readily biodegradable as compared to those that are slower to degrade. Unfortunately, many older formulations use excellent performing ingredients that have been found to have serious environmental and health concerns (see ingredients to avoid).
- Dyes & Fragrances: Prefer those with no or low levels of dyes and fragrances compared to those products that are heavily dyed or fragranced. If dyes are necessary use those that are approved for foods and cosmetics (F&C).
- More Preferable Ingredients: surfactants containing terms such as lauryl, amides, and glycosides.
- Less Preferable Ingredients: ammonia, alcohols, propylene glycol, 2-butoxyethanol and other glycol ethers.

12. GRAFFITI REMOVER

Graffiti Remover used to be formulated with chlorinated solvents (e.g., methylene chloride) before they were banned due to their environmental impact. Many graffiti removers are packaged in aerosol cans which often contain hydrocarbon propellants (e.g., propane, butane), which are highly flammable and can contribute to indoor air quality problems.

- Products with GS-37, GS-40, Environmental Choice CCD-110, or Environmental Choice CCD-146 certification are preferred

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- VOCs: Prefer those that have no or low VOC as compared to alternatives with higher levels. Consider detergent based products compared to those containing solvents.
- Flashpoint: Prefer products that have a high flashpoint compared to those with a low flashpoint.
- pH: Prefer those with a neutral pH (closer to 7) as compared to those with extreme pH (closer to 1 or 14)
- More Preferable Ingredients: n-Methyl-2-Pyrrolidone, d-Limonene, methyl esters (derived from soy).
- Less Preferable Ingredients: methylene chloride, petroleum distillates, propane, butane, isobutene, and sodium hydroxide.

13. GUM REMOVER

Gum Removers used to be formulated with chlorinated solvents (e.g., freon) before they were banned due to their environmental impact. Dry ice and carbon dioxide are preferable replacements. Degreasers can be used in some situations (see section on General Degreasers).

- Products with GS-37, GS-40, Environmental Choice CCD-110, or Environmental Choice CCD-146 certification are preferred
- VOCs: Prefer those that have no or low VOC as compared to alternatives with higher levels. Consider detergent based products compared to those containing solvents.
- Flashpoint: Prefer products that have a high flashpoint compared to those with a low flashpoint.
- pH: Prefer those with a neutral pH (closer to 7) as compared to those with extreme pH
- (closer to 1 or 14)
- More Preferable Ingredients: dry ice, carbon dioxide.
- Less Preferable Ingredients: freon, dichloro-difluoromethane, trichloro-fluoromethane.

14. LIME & SCALE REMOVER

Lime & Scale Removers are acids because of the need to remove mineral deposits from sinks, bowls and urinals.

- pH: Prefer those with a more neutral pH as compared to those with extreme pH (closer to 1). Environmentally preferable lime and scale removers may fall more in the range of pH 4 as compared to traditional products that may have a pH below 1.

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- More Preferable Ingredients: citric or acetic acid.
- Less Preferable Ingredients: hydrochloric or phosphoric acid.

15. SOLVENT SPOT REMOVERS

Solvent Spot Removers are necessary for spot removal particularly on carpets. Use detergent based spotters if possible (must be followed with extraction or other method to remove/absorb the detergent).

- See All-Purpose Cleaners
- VOCs: Prefer products that have no or low VOC compared to those with higher VOC content.
- Flashpoint: Prefer products that have a high flashpoint compared to those with a low flashpoint.
- More Preferable Ingredients: d-Limonene (derived from citrus fruits) and methyl esters (derived from soy).
- Less Preferable Ingredients: mineral spirits, 2-butoxyethanol

16. URINAL DEODORIZERS

Urinal Deodorizers are traditionally blocks placed in urinals to reduce odors. Preferably these deodorizers should be eliminated altogether through more frequent cleaning and other methods of deodorizing. However, if urinal deodorizers are still required preference should be given to those with the safest ingredients.

- Products with Environmental Choice CCD-115 certification are preferred
- Biodegradability: Prefer detergents that are readily biodegradable as compared to those that are slower to degrade. Unfortunately, many older formulations use excellent performing ingredients that have been found to have serious environmental and health concerns (see ingredients to avoid).
- More Preferable Ingredients: surfactants containing terms such as lauryl, amides, glycosides,
- Less Preferable Ingredients: Alkyl phenol ethoxylates, paradichlorobenzene

17. WOOD & STONE FLOOR COATINGS

Wood & stone floor coatings have traditionally been solvent-based products. While extremely durable to protect flooring materials that

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are very expensive to replace, these coatings can be quite hazardous during the drying and curing period. The two primary issues to consider during product selection is the use of zero or low-VOC containing materials which will reduce indoor air quality concerns and the products durability which is important to protect the flooring and due to the product and applications cost. One final note, many organizations lack specific expertise in application for these types of finishes. Thus, supplier support (e.g., training) is very important.

- Durability: Prefer durable finishes that require less maintenance (e.g., recoating) then less durable finishes that require more frequent recoating.
- Flashpoint: Prefer products that have a high flashpoint compared to those with a low flashpoint.
- More Preferable Ingredients: water- or epoxy-based finishes.
- Less Preferable Ingredients: xylene, stoddard solvent

APPENDIX C – CAMPUS CUSTODIAL STAFFING PLAN

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Custodial Staffing Plan

Building	GSF	WeeklyCleaning Hours Required	Staff & Hours
Hall of Science	164,500	80	Rosalva Guzman- 40 Contract Employee- 40

**INTERIOR AND EXTERIOR
INTEGRATED PEST MANAGEMENT PLAN**

**Hillside Dining
California State University Long Beach**

Implemented: July 1, 2012

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Statement of Purpose

The purpose of this Integrated Pest Management (IPM) plan is to guide the use of environmentally sensitive pest management strategies and least-toxic control methods to enhance the health and safety of building users and the natural environment.

Integrated Pest Management (IPM) is defined as managing outdoor pests (plants, fungi, insects and/or animals) in a way that protects human health and the surrounding environment and that improves economic returns through the most effective, least-risk option. Core elements of IPM include:

- Use of least-toxic chemical pesticides
- Minimum use of chemicals
- Use of chemicals and pesticides only in targeted locations and for targeted species
- Routine inspection and monitoring
- Proactive communication

To ensure building users are informed and empowered to care for their own health with regard to pest management activities, the plan includes procedures for notifying occupants and visitors in advance of any pesticide application other than a least-toxic pesticide.

Goals

The goals of the IPM program at Hillside Dining are:

1. Protect human health and the surrounding environment by employing a range of preventative strategies and using least-toxic products for pest control and eradication.
2. Inspect and monitor pest populations and locations to enhance control strategies.
3. Minimize the quantity and toxicity of chemicals used for pest management.
4. Minimize environmental impacts by using species-specific pesticides and targeting application areas carefully.
5. Establish clear criteria for acceptable circumstances in which using a pesticide other than a least-toxic pesticide is necessary; toxic pesticides shall only be used when there is a threat to public health and safety, or to prevent economic or environmental damage, and only after other alternatives have been implemented and are shown to be ineffective.
6. Provide building occupants and visitors with advanced notice of IPM activities involving use of a pesticide other than a least-toxic pesticide.
7. Employ only pesticide products and materials that fall under Tier 3 of the City of San Francisco's hazard criteria
8. Adhere to the requirements of this plan at all times and under all circumstances

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Strategy

IPM promotes the use of a range of preventative and non-chemical approaches to control pest populations and stave off infestation. If an infestation with unacceptable impacts occurs, thereby warranting additional treatment, IPM then favors the use of least-toxic pesticides. The targeted application of a toxic pesticide is allowed only after all other reasonable non-toxic options are exhausted. This plan outlines preventative best practices and eradication strategies approved for use at the building. Provisions for the use of least-toxic pesticides, and toxic chemicals when necessary, are outlined should a pest infestation occur.

Scope

This IPM plan applies to the building interior and grounds for Hillside Dining. The plan includes approved IPM strategies for managing and eradicating pests that are common to the site, and provides resources to facilitate learning about new and emerging IPM strategies. This plan is applicable at all times at Hillside Dining.

Definitions

Emergency – A pest outbreak that poses an immediate threat to public health or will cause significant economic or environmental damage.

Least-toxic pesticide – Any pesticide product that meets San Francisco's Tier 3 hazard criteria is low hazard, and considered a least-toxic pesticide. Tier 3 products are the next line of defense against pests after preventative measures are exhausted.

Pesticide – Any substance, or mixture of substances, used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may be detrimental to vegetation, humans, or animals.

Tiered Materials – The City of San Francisco's pesticide classification system based on hazard potential. Products are evaluated against comprehensive list of hazard criteria including carcinogenicity, reproductive toxicity, endocrine disruption, acute toxicity, hazard to birds/fish/bees/wildlife, persistence, and soil mobility, and are placed within the Tier structure based on the evaluation results.

Tier 1: Highest concern

Tier 2: Moderate concern

Tier 3: Lowest concern

Tier 4: Insufficient information available to assign to above tiers

Record Keeping

Monitoring the effectiveness of the IPM plan over time requires diligent tracking of several items: pest populations and locations; management strategies employed; quantities and types of chemicals and products used; and the outcome of pest

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management activities. The Manager of Grounds and Services shall maintain records that include the information below. See the appendix for the Record Keeping form that shall be used at Hillside Dining to standardize all record keeping activities.

1. Target pest
2. Prevention and other non-chemical methods of control used
3. Type and quantity of pesticide used
4. Location of the pesticide application
5. Date of pesticide application
6. Name of the pesticide applicator
7. Application equipment used
8. Summary of results

Performance Measurements and QA/QC

The environmental performance of the IPM program shall be compiled from IPM records and analyzed on a semi-annual basis. An IPM report identifying the types of pest problems encountered at the building and the types and quantities of all pesticides used shall be generated by CSU-LB Grounds staff and reviewed by the Manager of Grounds and Services. The following metrics shall be tracked throughout the year and documented in the report to evaluate the IPM plan at Hillside Dining over time:

1. The severity and location of all major pest infestations
2. The amount of each pesticide product used by volume
3. *Number and list of work orders for service of pest issues reports can be generated from our work order system for tracking purposes.*
4. *Tracking work orders for chemical used and labor for pest related services.*

Responsible Parties

The Manager of Grounds and Services is responsible for the implementing the IPM plan and providing guidance and resources to the organization.

The Manager of Grounds and Services is responsible for record keeping and performance measurement. This position shall measure and track performance over time, and is responsible for compiling and synthesizing the annual IPM report on metrics.

The Manager of Grounds and Services is responsible for quality assurance/quality control processes. This position shall verify that the plan is being implemented consistently and correctly, that performance persists over time, and that performance measurement methods truly reflect actual outcomes.

Contact Information:

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Building User Notification

Notifying building users of pesticide applications other than a least-toxic pesticide is a critical component of the IPM plan. Providing occupants and visitors with the appropriate information at the appropriate time enables individuals to take precautions as they see necessary to protect their personal health. At Hillside Dining, a 72 hour advance notice to building occupants is required for the application of any pesticide other than a least-toxic pesticide. Advance notice procedures shall take the following form:

1. Post signs at least 3 business days before application of the pesticide product, and leave signs in place for at least 3 business days after application.
2. Post signs at every entry point to where the pesticide is applied, if applied in an enclosed area. In highly visible, open area locations, post signs around the perimeter of the area where the pesticide is applied.
3. Signs must be standardized and easily recognizable. See the appendix for the approved notification sign template.
4. Email all regular building occupants at least 3 business days before application of the pesticide product *Prefer not to implement this portion of the program. The following reasons: financial impact to department, delay in response time.*
5. Each sign/email must contain the following information:
 - a. The name and active ingredient of the pesticide product
 - b. The targeted pest
 - c. The application date
 - d. The signal word indicating the toxicity category of the pesticide product
 - e. The name and contact information of an individual that is responsible for fielding questions regarding the application.
6. Each sign/email must be in both English and Spanish.
7. Copies of posted signs and emails shall be retained for record keeping purposes for one year.

Emergencies

A pest outbreak is considered an emergency when it poses an immediate threat to public health or will cause significant economic or environmental damage. Emergency pesticide applications require notification to building users within 24 hours of the application in accordance with procedures numbered 2 through 7 under the “Building User Notification” section of this plan.

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General Preventative Practices

General preventative practices are simple housekeeping and landscaping procedures that eliminate sources of food, water and shelter that attract pests to the building grounds and interior. Hillside Dining shall use the following methods to control pests and prevent outbreaks:

Landscaping and Site

1. Use mulch and other landscaping best practices to promote soil and plant health.
2. Use weed-free soil amendments.
3. Maintain and plan landscape features to eliminate safe havens for pests and rodents.
4. Keep vegetation trimmed 18 inches from the building and fill area with stones or similar material to prevent nesting.
5. Clean up plant debris, especially from fruit-bearing trees.
6. Remove invasive plants that are known to harbor or provide food for pests.

Building Infrastructure

1. Maintain the building envelope by weather-stripping around windows and doors, installing door sweeps, screens or other barriers, and sealing cracks and crevices to prevent pests from entering the building.
2. Remove hiding places by cleaning up clutter such as cardboard boxes, crates, used tires, wood piles.
3. Manage trash receptacles and dumpster areas for clutter and cleanliness to minimize food sources and hiding places. Garbage containers should be clean, free of odors and covered, where feasible. Collection of trash or debris surrounding containers or collection areas is unacceptable.
4. Eliminate water sources by fixing leaky pipes, cleaning out drains and rain gutters, and preventing water from pooling on concrete or soil after irrigating landscape.
5. Rinse all food and beverage containers before placing in recycling bins.

Inspections

Visual inspections shall be performed at least 2 times per month and will include an assessment of all pest control measures in place at the building.

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Approved Pesticides

Chemical pesticides are considered a last resort under the tenets of integrated pest management. This control strategy is to be used at Hillside Dining after non-chemical options are exhausted. Pesticides that meet the requirements of Tier 3 are considered least-toxic and may be applied without building user notification when chemical product use is required. To qualify as a Tier 3 material, all of the following statements must be true:

1. Product contains no known, likely, or probable carcinogens
2. Product contains no reproductive toxicants (CA Prop 65 list)
3. Product contains no ingredients listed by Illinois EPA as known, probable, or suspect endocrine disrupters
4. Active ingredients has soil half-life of thirty days or less
5. Product is labeled as not toxic to fish, birds, bees, wildlife, or domestic animals

Tier 3 pest management products approved for use at Hillside Dining are:

Target Pest	Product Name	Active Ingredient
Wasps, Hornets	EcoExempt Jet Wasp and Hornet Killer	2-phenthyl proprionate
Mosquitos	Dipel Pro DF Biological Insecticide Dry Flowable	Bacilius thuringlenairs, Bubsp. Kurslaki
Ants/Cockroaches	EcoExempt G	Eugenol, thyme oils, plant oils
Various invasive worms, Fire Ants	Conserve SC Turf and Ornamental	Spinosad

Under emergency conditions (as defined above) and/or assuming that both preventative methods and least-toxic pesticides prove ineffective at suppressing a pest infestation, a toxic pesticide that meets the requirements of Tier 2 may be applied.

Tier 2 pest management products approved for use under the conditions outlined above at Hillside Dining are:

Target Pest	Product Name	Active Ingredient
Ants	Terro Ant Killer II, Terro-PCO Liquid Ant Bait, Terro Ant Killer II Liquid And Bait	Sodium tetraborate decahydrate
Mosquitos	Zoecon Altosid XR-G, Zoecon Altoside Pro-G Insect Growth Regulator	S-Methoprene
Mosquitos	Zoecon Altosid XR Extended Residual Briquets	S-Methoprene
Cockroaches	Maxforce FC Professional Control Roach Bait Stations	Fipronil

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Common Pests & Treatment

The following methods and procedures have been determined to be effective at Hillside Dining and have been implemented at the current time. These methods are environmentally sound and intended to achieve the goals of IPM as it relates to this site.

In the instance that a pest or situation not anticipated by this document arises, it is the responsibility of the pest control service provider and building management staff to collaborate on a management strategy that is both effective and consistent with the goals of this IPM program.

Ants

- In areas where ants are present, wipe the areas down with soapy water in order to prevent the formation of major scent trails. If there already is an established trail, wipe backwards from the food source to the entrance of the trail.
- Block all entry points to the building – ants will give up trying to find a way through after 1-2 days. Temporary blockades can be made using sticky substances such as petroleum jelly, chili powder, or cinnamon.
- Always keep opened foodstuffs in sealed containers or store them in the refrigerator or freezer. Clean out kitchen cabinets, drawers and shelves to remove crumbs and stains. Keep sinks and worktops clean and dry.
- Baits are best put in the path of an ant trail and then removed after the ant activity stops, before they lure ants from another colony to the area.
- Prune branches close to the building and removed fences or anything that might create a bridge for the ants to cross.
- Low toxicity compounds to control ants include diatomaceous earth (DE), a chalk-like powder consisting of the fossilized remains of diatoms, a type of hard-shelled algae.
- <Include site-specific ant controls>Ants often enter buildings seeking food, water, or refuge from hot weather or flooding. Long trails of ants leading from nests to food sources can cause considerable concern among building occupants. Successfully managing ants requires diligence and a combination of integrated pest management strategies.

Exclusion

Ant infestations often follow a seasonal cycle. Prepare for the annual influx of ants by caulking and sealing the building envelope before ants are likely to invade. Ants prefer to make trails along structural elements, such as wires and pipes, and frequently use them to enter and travel within a building. Focus exclusion efforts in these areas.

Sanitation

Ants eat sugars, fruits, nuts, fats, dead or live insects, and meat. Store attractive food items in closed containers and wash the container exterior to remove food residue. Rinse out empty beverage containers or remove them from the building. Thoroughly

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clean up grease, spills and crumbs from kitchens, food service areas, and office desks. Remove garbage from the building daily and change liners frequently. Look for indoor nesting sites, such as potted plants, and remove if there ants have settled there.

Landscape Management

Ants like to make nests near plants that support large populations of honeydew-producing insects such as aphids, soft scales, mealybugs or whiteflies. Avoid planting these trees and shrubs next the building, or use IPM methods to manage honeydew-producing insects. Keep plants, grass, and mulch several inches away from the foundation of buildings because this can be an ideal nesting site for ants. Ants may also be attracted up into trees or shrubs by ripening or rotten fruit or floral nectar. Trim branches and limbs of trees and shrubs that touch the building to keep ants from gaining access via these routes. Keep ants out of trees by banding the trunks with a sticky substance. Check bands regularly for debris buildup that will allow ants to cross.

Least-Toxic Treatments

Detergent and water – A Green Seal certified cleaning product mixed with water is an effective non-toxic treatment method. This solution, when sprayed on ants, will immobilize them, allowing them to be wiped up with a sponge or mop. This method should be followed by exclusion and sanitation methods to prevent more ants from invading the same location.

Desiccant dusts – Desiccant dusts, such as diatomaceous earth, are low in toxicity to people and do not lose their effectiveness over time, as long as they do not get wet. Desiccant dusts are inert dusts combined with absorptive powders that destroy insects by absorbing their protective outer body cover, causing them to dry out, or desiccate. Diatomaceous earth is readily available in retail stores. Place desiccant dusts within cracks and crevices where ants enter the structure.

Baits – Baits should be used in combination with the strategies outlined above to be fully effective. Baits greatly reduce the amount of pesticide that must be used to kill ants. Foraging ants take the bait back to the nest to feed to other members of the colony, resulting in colony death. There are many types of baits that differ in their formulation (paste, liquid, gel, etc.), their attractant (protein, oil, sugar, etc.), and in the toxicant (active ingredient) they utilize. Different species of ants respond differently to bait toxicants, attractants, and formulations. Proper identification of ant species and proper bait selection is an important aspect of any ant IPM program. Place bait stations along foraging trails, but do not disturb ant trails between the nest and the bait. Killing the ants or disturbing the trails prevents the ants from taking the bait back to the colony to kill nest mates. Ant colonies may switch their bait preferences as their nutritional requirements change. A colony may prefer a protein bait one week and an oil bait the next. If ants stop taking an existing bait, it may need to be changed.

Appendix M - CSULB Design Standards

Cockroaches

- Cockroaches contaminate food with their excrement and secrete and unpleasant odor that can permeate the indoor environment.
- There are five main species of cockroaches and effective control depends on identifying them correctly.
- Integrated pest management measures for controlling cockroaches include effective hygiene and exclusion practices, sticky traps lined with pheromones, and insect growth regulators.
- All food handling areas should be cleaned frequently.
- Cockroach control is best done by a professional on a contract basis, through the application of least-toxic pesticides.
- Control is necessary on a regular basis because of the mobility, reproduction, longevity, and behavior of cockroaches.
- Ensure that you know what pesticides are being used by the professional contractor and do not assume they are using an environmentally appropriate chemical.

Rodents

- Rodent control should start with a survey to determine the source of the problem and the conditions that encourage the infestation. Following the survey, implement a program to kill the rodents, removing their sources of food and water, eliminating their place of refuge and making it rodent-proof, and educating and obtaining the cooperation of employees. If the food supply is removed before you eradicate them, the rodents will migrate to other areas, making elimination more difficult.
- Openings in building foundations and walls should be closed or screened with wire mesh that has holes not more than 1.25 cm (0.5 in) wide. Where pipes enter masonry, force heavy hardware cloth or steel wool into the opening, then fill it with concrete.
- Continuous surveillance is necessary, and places where rodents have been gnawing to gain entry to a building should be sealed with metal flashing.
- Doors are particularly vulnerable to rodent entry so ensure that external doors and windows close tightly with no gaps at the bottom.
- Materials stored in the open, in sheds or in building should be stacked at least 30 cm (1 ft.) above the ground.
- Stringent waste disposal practices should be observed – secure all waste in closed containers and not just plastic bags.
- Wash dustbin areas regularly. Make sure composting bins are designed to prevent rodents from entering.
- Traditional mouse and rat traps, or snap traps, kill instantly. If trapping efforts fail, it is usually due to too few traps being used.
- Bait should be sticky to ensure that the mouse triggers the trap mechanism even if it only lightly touches the bait. Mice prefer peanut butter or chocolate to cheese. Bacon, oatmeal or apples can also be used as bait.

Appendix M - CSULB Design Standards

- An alternative to snap traps is a battery-operated trap that generates a high-voltage once the rat or mouse is inside. The design is relative safe and can be used in areas where children, pets or wildlife may be present.

Due to its high toxicity, rodent bait is not considered least-toxic under any circumstance.

Mosquitos

- The best control method for mosquitoes is to eradicate their habitat.
- Because they like moisture and lay their eggs in standing water, it is important not to leave flower pots, buckets, plastic sheeting or other open containers outside collecting water. Ensure that any rainwater collectors are fitted with lids.
- Clear debris from gutters and drains to ensure there is no standing water after rain and drain unused pools or fountains so that the water cannot become stagnant.
- Drain or fill depressions, mud flats, and other areas that might hold water.
- Repair leaking taps and air-conditioning units so that puddles cannot form and ensure that septic tanks and sewage systems are properly maintained and in good working order.
- Avoid over-irrigating lawns and gardens, and keep weeds and grass (where the insects rest) well-clipped.
- If you have a pond or lake on the building grounds, fill it with mosquito-eating fish such as top-feeding minnows or goldfish – they will eat the mosquito larvae before they mature into adults.
- Some buildings have successfully reduced the number of mosquitoes and other insects by attracting bats to their property. A simply-built bat house will usually accommodate up to 100 bats.
- To prevent mosquitoes from coming indoors, fit fine-mesh screens to porches, doors and windows.
- If these measures are insufficient, area repellents such as citronella candles, coils or sprays will repel mosquitoes from porches, patios and other unscreened outdoor areas, although they only work well when the air is still.

Training

All staff undergo training each year in the safe handling and application of chemicals for landscape. Training of the grounds staff in the area of Hillside Dining will be instructed in best management practices for the implementation of an IPM program.

Resources

1. The City of San Francisco has an award-winning Integrated Pest Management program.
www.sfenvironment.org/our_programs/topics.html?ti=1
2. The Integrated Pest Management Institute of North America, Inc. provides news, standards, and information about upcoming IPM conferences and webinars.







Appendix M - CSULB Design Standards

www.ipminstitute.org

3. Beyond Pesticides is a non-profit organization committed to pesticide safety.
www.beyondpesticides.org

Appendix

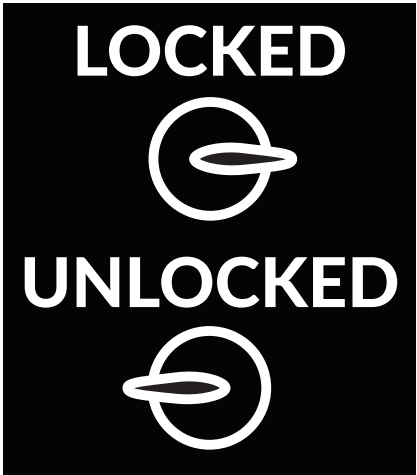
1. Notification sign template for toxic pesticide applications
2. IPM Record Keeping form

<h1>SIP DOOR SIGN TYPES</h1> <p>For Offices and Doors Which Do Not Have Positive Lock Indication</p> <p>All signs to be installed on door with top of sign located at 5" below door handle</p>		 <div><div>1</div><div>TURN LOCK</div></div>		<div><div><div>LOCKED</div><div>⊖</div><div>UNLOCKED</div><div>ⓘ</div></div><div>Option 1H</div></div> <div><div><div>LOCKED</div><div>ⓘ</div><div>UNLOCKED</div><div>⊖</div></div><div>Option 1V</div></div>
 <div><div>2</div><div>PUSH BOTTOM LOCK</div></div>	<div><div><div>LOCKED</div><div>🚪</div><div>UNLOCKED</div><div>🚪</div></div><div>3-1/2"</div><div>4"</div></div>	 <div><div>3</div><div>CLASSROOM/ KEYPAD LOCK FOR SECURED ROOMS</div></div> <p>NOTE: Classroom doors which can be unlocked will have a locked/unlocked indicator and can be locked without a key from the inside.</p>	<div><div><div>Door is Always Locked When Closed</div><div>3"</div><div>4"</div></div></div>	
<div><div>Outside View</div><div>Inside View</div></div> <div><div>4</div><div>OFFICE LOCK</div></div>	<div><div><div>Lock Door From Hallway Side</div><div>4A</div></div><div><div><div>Lock Door From External Side</div><div>4B</div></div><div>3"</div><div>4"</div></div></div>	 <div><div>5</div><div>STORE-ROOM LOCK</div></div>	<div><div><div>Door is Always Locked When Closed</div><div>3"</div><div>4"</div></div></div>	

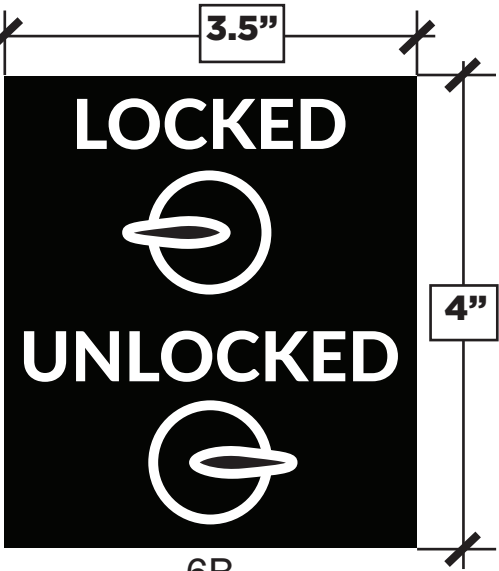
Appendix N- CSULB Design Standards



6 THUMB-TURN LOCK



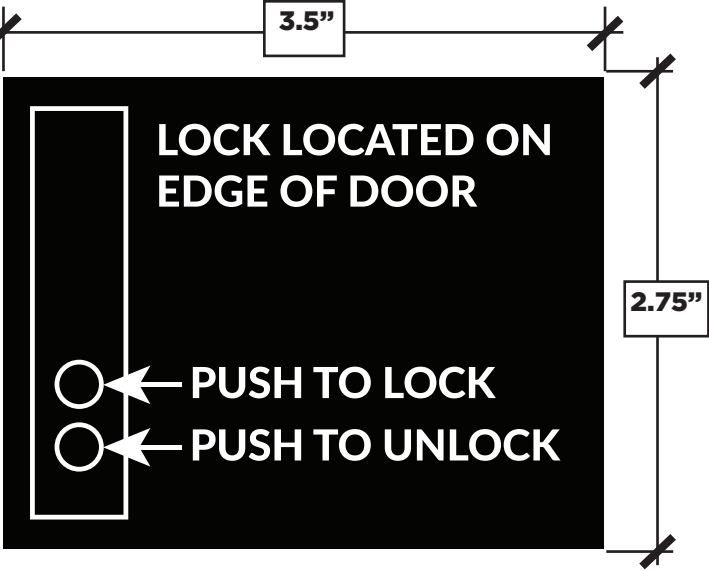
6A



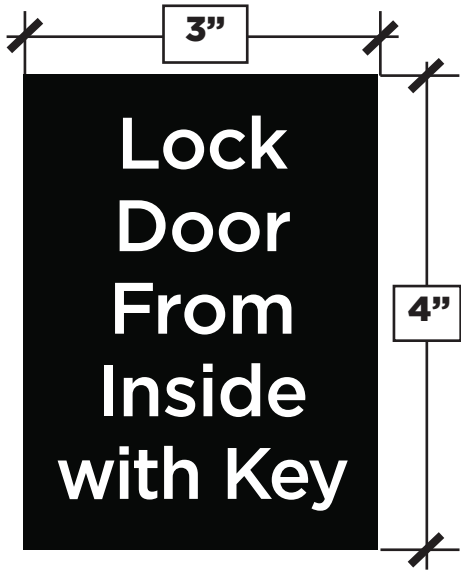
6B



7 PUSH-BUTTON LOCK



8 INTERIOR KEYED DEADBOLT



Appendix N- CSULB Design Standards

Shelter in Place Locks - Standards

Updated 9/21/20

It is desired that buildings, classrooms and office spaces on campus provide protection for occupants in the event that sheltering in place is required. This program should be fully implemented in 2021. Funding from multiple sources has been identified.

All new or renovated doors in listed room types should include the following features

- The ability for someone to lock the doors from the inside without a key
- Provide positive identification to occupants in multi-user spaces that the door is locked
- All code-required exiting features (such as panic hardware) must remain functional when locked
- Allow police to override the lock from the outside with their key
- Signage/stickers should be placed on doors to note the use of the lock. Signs required vary by location.

Listed Space Types

- Lecture Rooms (see note 1)
- Teaching Labs
- Computer Labs
- Office Suite/Research Area Entrances
- Conference Rooms (if not in an Office Suite)
- Single person offices (see notes 2, 3)

Note1: Rooms with electronic locks, such as active learning rooms and LA2,3,4 spaces shall be converted to function as SIP, including positive identification/signage

Note2: it shall be considered sufficient in existing buildings, in a single person office, if the door hardware can be left in the “locked” position when open and the door simply pulled closed in the event of a shelter in place event. This will make the room secure but will not have the positive identification feature. Signage to denote the locking process shall be installed at office doors that do not have a positive identification that the door is locked.

Note3: New single person workstations with doors shall be lockable from the inside but do not require positive identification

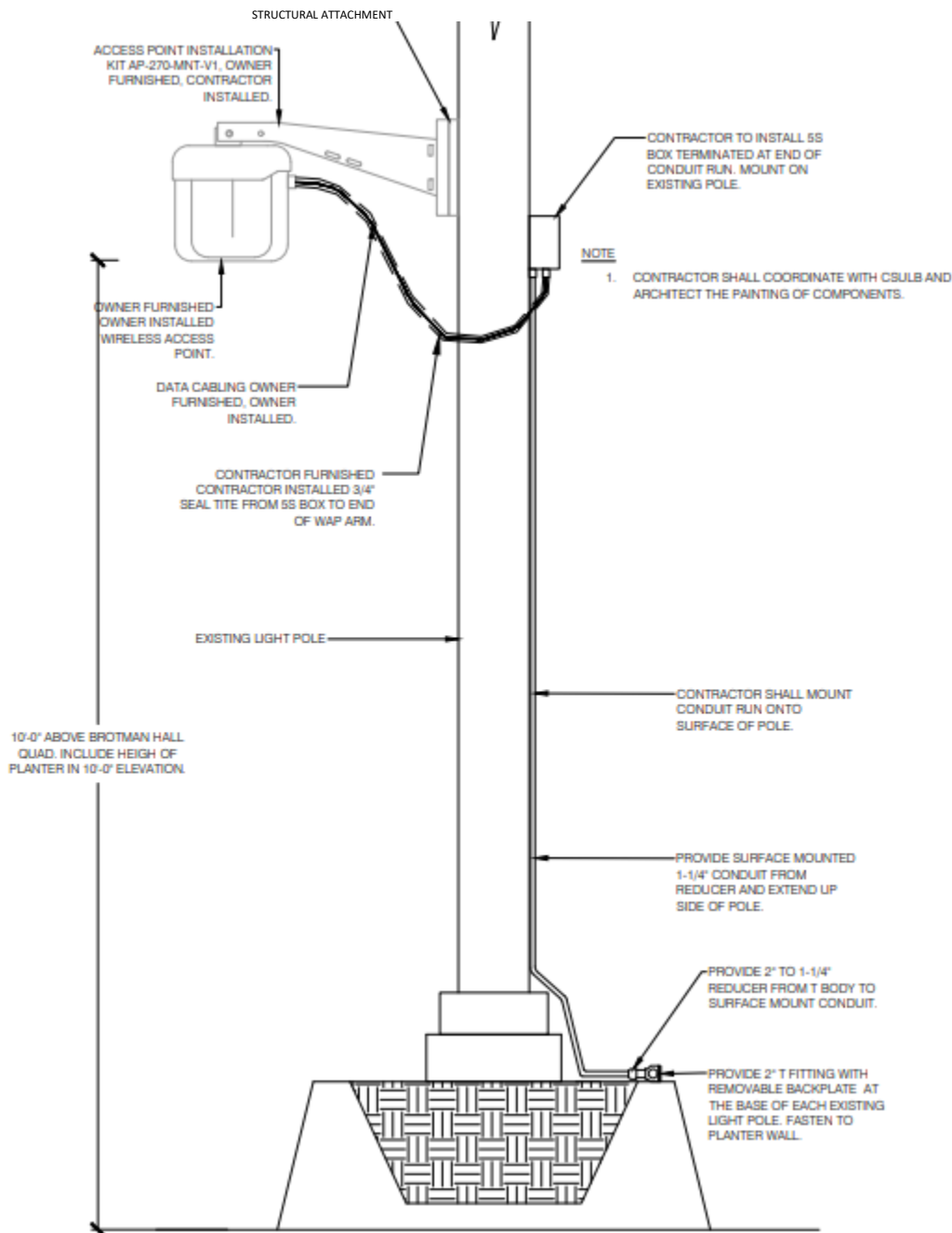
Other Space Types

- Building Entrances are excluded
 - It was determined that these will not have SIP locks as no one would be clearly responsible to go and lock them, potentially locking others out. Go into a room to shelter.
 - It was determined that one central button at UPD to lock all exterior doors is not desired
 - Could still be locked by a key holder (un-dogging the panic bar)
 - The staff at the events can lock the doors with keys if necessary
- UPD is contracting with a consultant to establish a campus policy for the following space types, based on industry best practices:

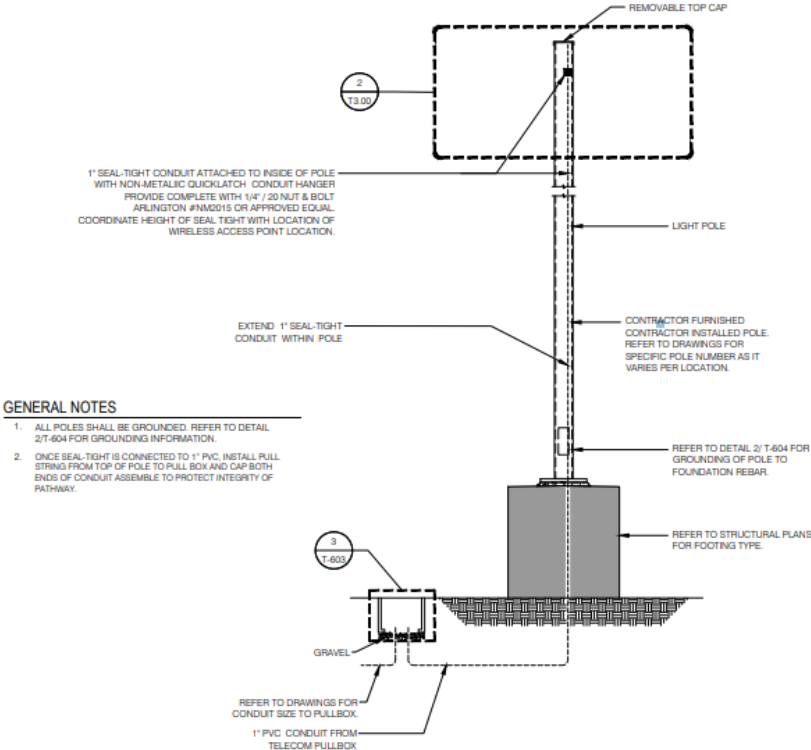
Appendix N- CSULB Design Standards

- “Venue” entrances which are staffed during public access such as the Pyramid and UMC
 - Large Spaces currently locked by staff with key: Library Entrance, UDP, BKS, SRWC, USU
- Restrooms are excluded
- Housing spaces are considered to be sufficiently securable in their current state

EXISTING LIGHTING POLE WIFI INSTALLATION
EXAMPLE



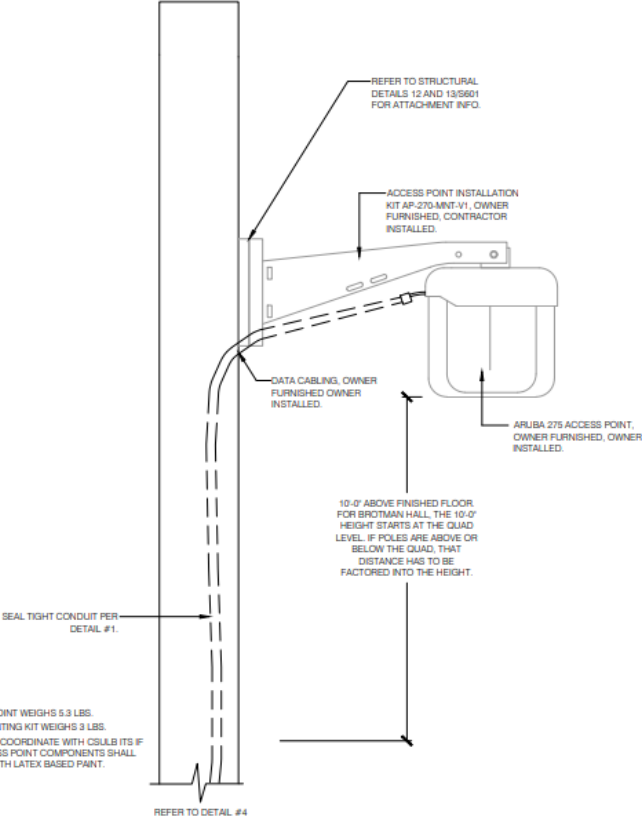
NEW LIGHTING POLE WIFI INSTALLATION
EXAMPLE



GENERAL NOTES

1. ALL POLES SHALL BE GROUNDING. REFER TO DETAIL 2/T-604 FOR GROUNDING INFORMATION.
2. ONCE SEAL TIGHT IS CONNECTED TO 1" PVC. INSTALL PULL STRING FROM TOP OF POLE TO PULL BOX AND CAP BOTH ENDS OF CONDUIT ASSEMBLY TO PROTECT INTEGRITY OF PATHWAY.

1 NEW WAP POLE INFRASTRUCTURE DETAIL
NO SCALE



- NOTE
1. WIRELESS ACCESS POINT WEIGHS 5.3 LBS.
 2. ACCESS POINT MOUNTING KIT WEIGHS 3 LBS.
 3. CONTRACTOR SHALL COORDINATE WITH CSULB ITS IF THE WIRELESS ACCESS POINT COMPONENTS SHALL BE PAINTED WHITE WITH LATEX BASED PAINT.

2 NEW POLE MOUNTED WIRELESS ACCESS POINT
NO SCALE

Appendix P - CSULB Design Standards



Systemwide Human Resources/Labor Relations
401 Golden Shore, 4th Floor, Long Beach, CA 90802-4210

www.calstate.edu

Neha R. Shah
Manager of Systemwide Labor Relations

Tel.: 562-951-4538
Fax: 562-951-4890
E-mail: nshah@calstate.edu

VIA E-MAIL

June 8, 2020

Neil Jacklin
President
California State University Employees Union
120 K Street, 2nd Floor
Sacramento, CA 95814
njacklin@csueu.org

RE: Systemwide Video Security Camera Policy

Dear Mr. Jacklin:

The University has concluded negotiations regarding the Systemwide Video Security Camera Policy. Please find the final version of the Policy enclosed here for your records. The Policy will go into effect immediately.

Sincerely,

Neha Shah
Manager, Systemwide Labor Relations

cc: Labor and Employee Relations Department, California State University, Office of the Chancellor
Office of General Counsel, California State University, Office of the Chancellor
Mike Redmond, Assistant Vice Chancellor Operations Support, California State University, Office of the Chancellor

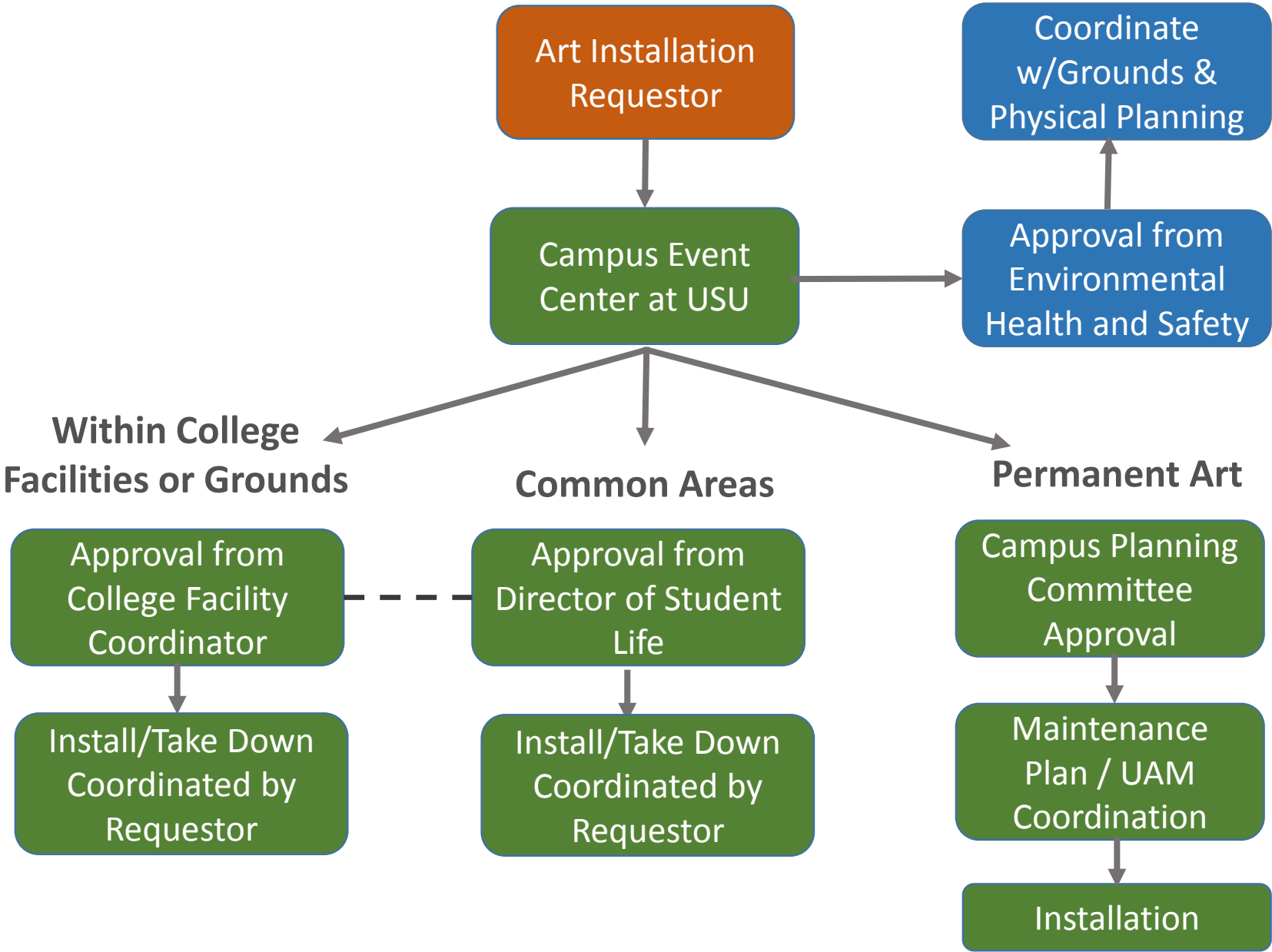
CSU Campuses
Bakersfield
Channel Islands
Chico
Dominguez Hills
East Bay

Fresno
Fullerton
Humboldt
Long Beach
Los Angeles
Maritime Academy

Monterey Bay
Northridge
Pomona
Sacramento
San Bernardino
San Diego

San Francisco
San José
San Luis Obispo
San Marcos
Sonoma
Stanislaus

PUBLIC ART
INSTALLATIONS
ON CAMPUS



Appendix R - CSULB Design Standards

Building Name Signage Standard

Updated 9-11-20

The campus standard building lettering shall be Futura Medium font, fabricated in aluminum or stainless steel with a clear-coat finish. Note that the letter “O” or the number “0” will need to be installed with the grain vertical.

Letters should have a vertical brush grain and fully backed to prevent debris and insect nesting. Letter height varies from 8” – 12”, depth aprx 1.5”, standoff from building aprx 1/8”.

Final size, depth and spacing of each letter should be determined on a case by case basis as building heights vary. As part of the design process Campus Planning should specify the wording, letter size, and location. Prior to letter fabrication, a paper template shall be put in place by vendor and approved by Campus Planning to ensure size and location are appropriate.



CALIFORNIA STATE UNIVERSITY, LONG BEACH

COLOR SCHEMES FOR BUILDINGS AROUND QUAD

OCTOBER 2015

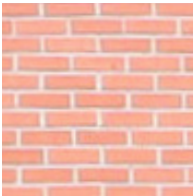
Steinberg Architects



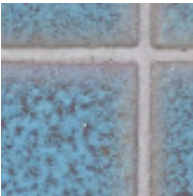
Color Schemes for Buildings Around Quad

- F03 - Faculty Offices
- F02 - Faculty Offices
- LH - Lecture Halls
- KKJZ - KKJZ
- FA4 - Fine Arts 4
- PH1 - Peterson Hall 1
- ~~PH2 - Peterson Hall 2~~





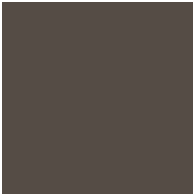
REFERENCE BRICK
EXISTING BRICK ON EXISTING CAMPUS BUILDINGS



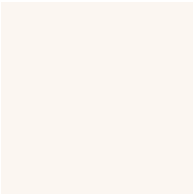
REFERENCE TILE
EXISTING TILE ON FA4: FINE ARTS BUILDING



Is this the correct tile photo?
Did you meant to reference
the solid blue tile on FO3?



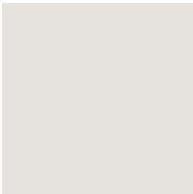
P1
MANUFACTURER: DUNN EDWARDS
COLOR: WEATHERED BROWN
DEC 756



P4
MANUFACTURER: DUNN EDWARDS
COLOR: MILK GLASS
DEW 358



P7 OPTION 2
MANUFACTURER: DUNN EDWARDS
COLOR: PACIFIC PALISADE
DE 5787



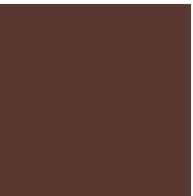
P2
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765



P6
MANUFACTURER: DUNN EDWARDS
COLOR: TRAIL DUST
DE 6123



P7 OPTION 3
MANUFACTURER: DUNN EDWARDS
COLOR: DEEP CORAL
DE 5713



M1
MANUFACTURER: CITADEL ARCHITECTURAL PRODUCTS
COLOR: DARK BRONZE ANODIZED
KYNAR 500 METALLIC

The sample we received was Medium
Bronze Anodized. Which one is
correct?

Proposed Colors



P7 OPTION 1
MANUFACTURER: DUNN EDWARDS
COLOR: IVY ENCHANTMENT
DE 5571



F03 East Existing

F03 Faculty Offices

- P1**

MANUFACTURER: DUNN EDWARDS

COLOR: WEATHERED BROWN

DEC 756
- P2**

MANUFACTURER: DUNN EDWARDS

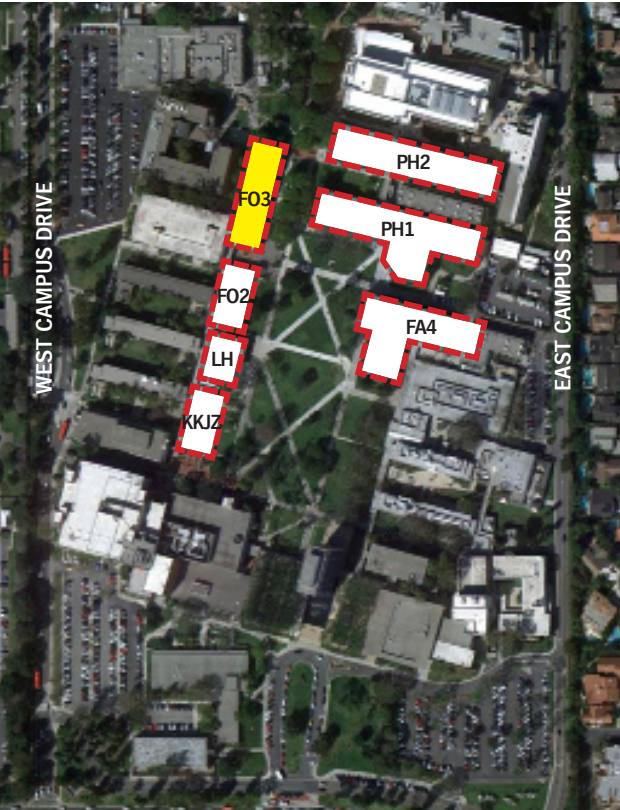
COLOR: BONE

DEC 765



F03 East Proposed

Make the columns
P2 - Bone





F03 East

Existing

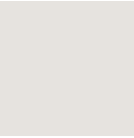


Proposed

F03 Faculty Offices



P1
MANUFACTURER: DUNN EDWARDS
COLOR: WEATHERED BROWN
DEC 756



P2
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765



P4
MANUFACTURER: DUNN EDWARDS
COLOR: MILK GLASS
DEW 358



M1
MANUFACTURER: CITADEL ARCHITECTURAL PRODUCTS
COLOR: DARK BRONZE ANODIZED
KYNAR 500 METALLIC

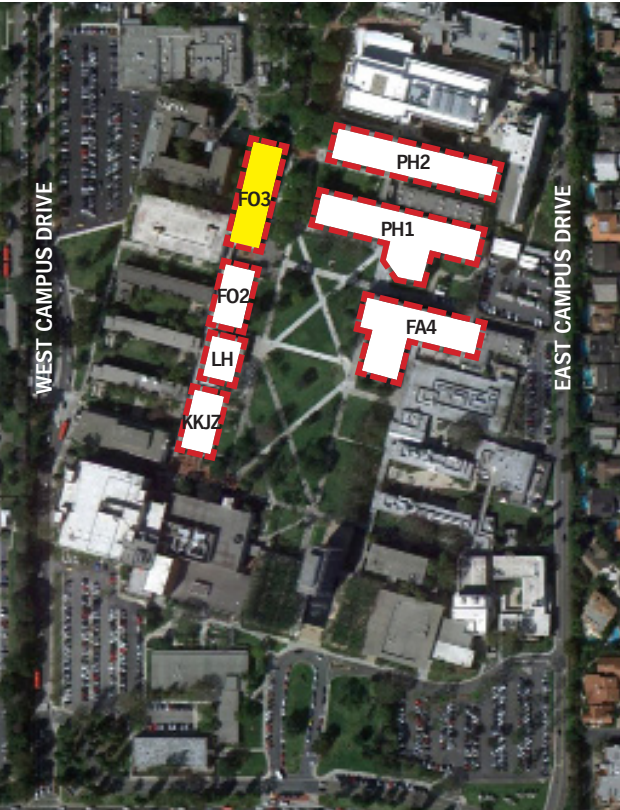


F03 West

Existing



Proposed





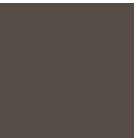
F02 East

Existing

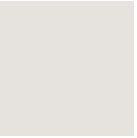


Proposed

F02 Faculty Offices



P1
MANUFACTURER: DUNN EDWARDS
COLOR: WEATHERED BROWN
DEC 756



P2
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765



M1
MANUFACTURER: CITADEL ARCHITECTURAL PRODUCTS
COLOR: DARK BRONZE ANODIZED
KYNAR 500 METALLIC

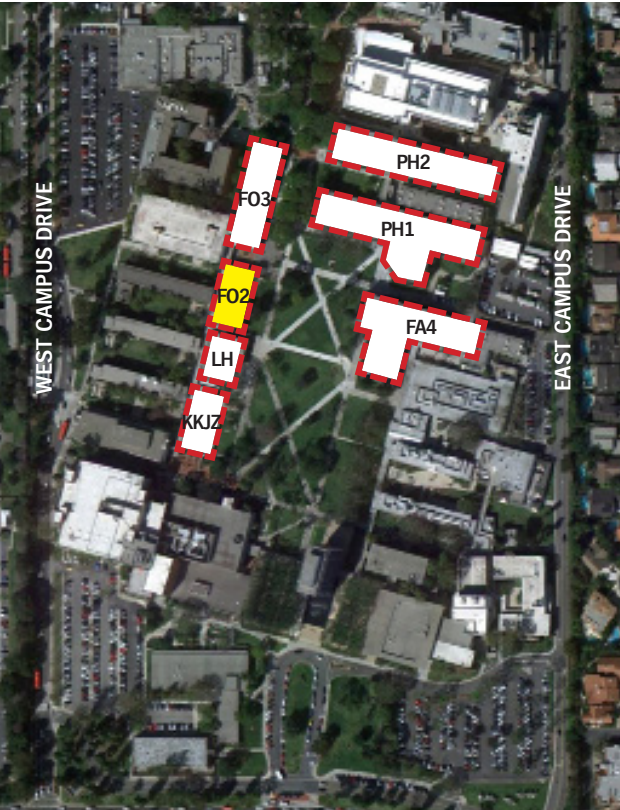


F02 West

Existing



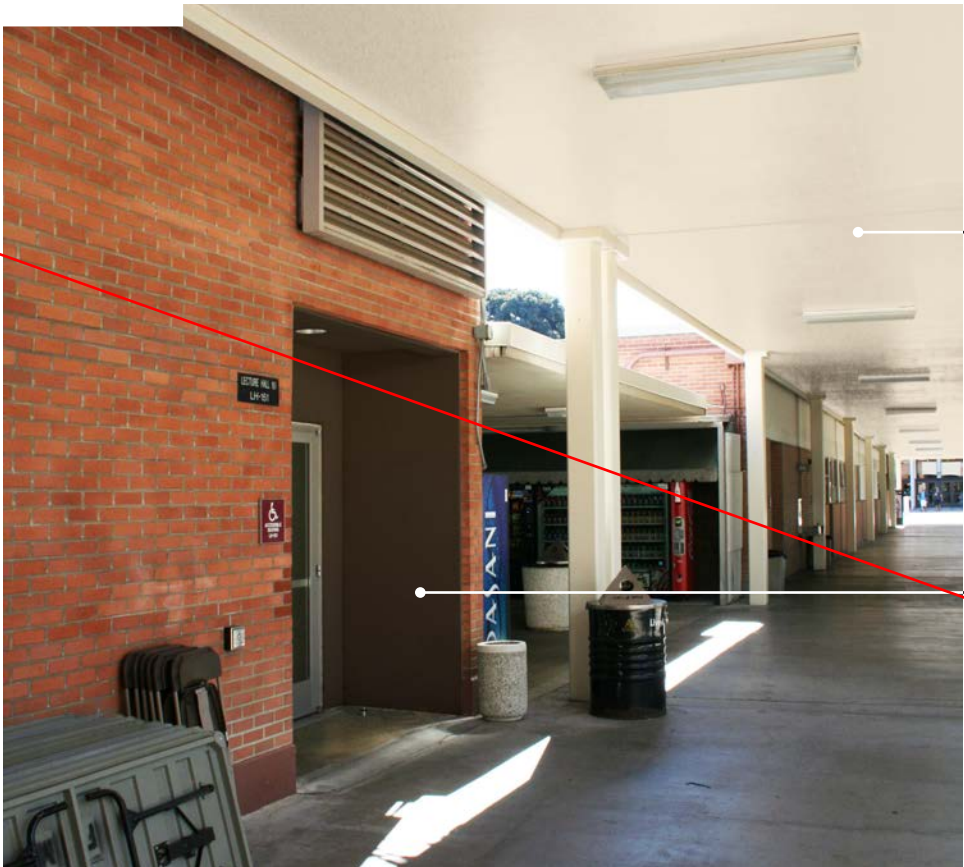
Proposed



LH Lecture Halls



LH West Existing Proposed

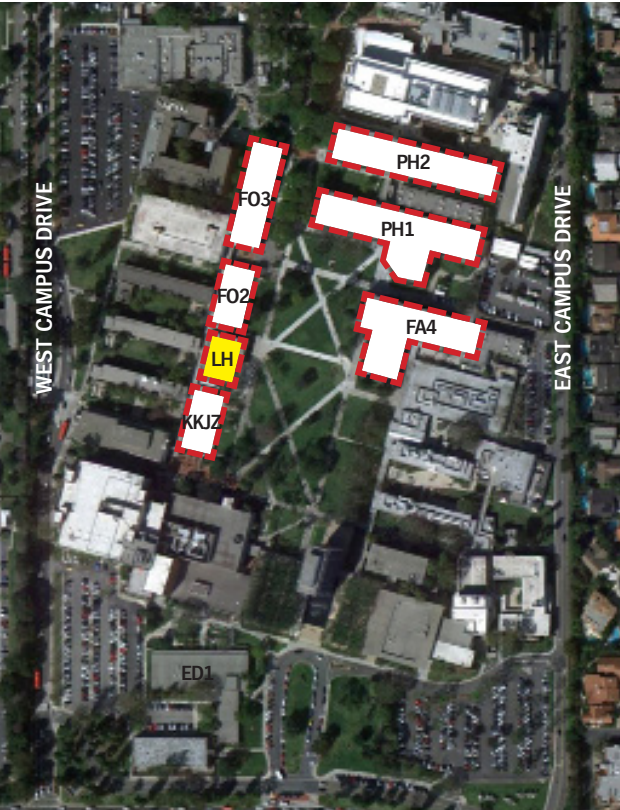


- P1**
MANUFACTURER: DUNN EDWARDS
COLOR: WEATHERED BROWN
DEC 756
- P2**
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765

This was painted in the past 2 years. Don't think we'll repaint.



LH South Existing Proposed





KKJZ East

Existing

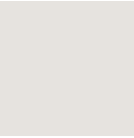


Proposed

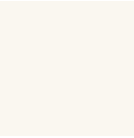
KKJZ KKJZ



P1
MANUFACTURER: DUNN EDWARDS
COLOR: WEATHERED BROWN
DEC 756



P2
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765



P4
MANUFACTURER: DUNN EDWARDS
COLOR: MILK GLASS
DEW 358



M1
MANUFACTURER: CITADEL ARCHITECTURAL PRODUCTS
COLOR: DARK BRONZE ANODIZED
KYNAR 500 METALLIC

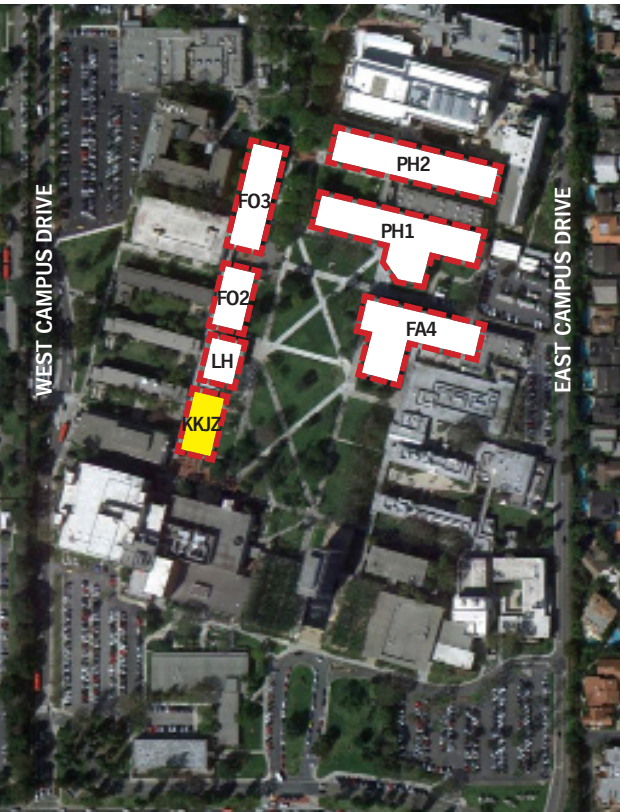


KKJZ North

Existing



Proposed





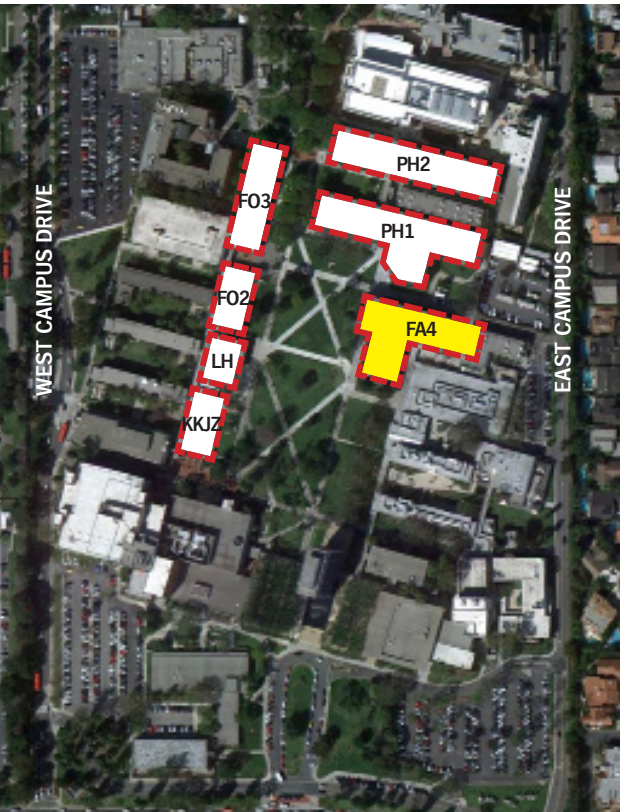
FA4 South

Original



FA4 South

Existing





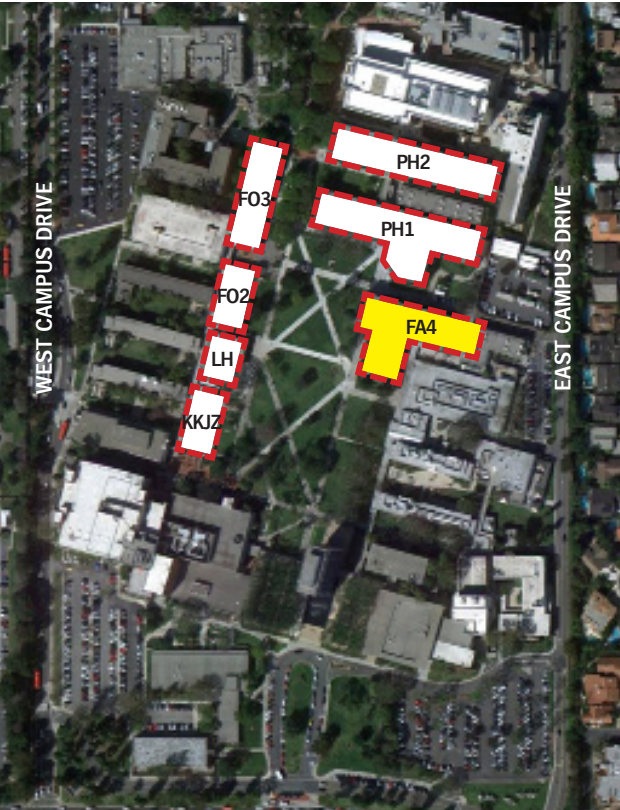
FA4 South Existing



FA4 South Proposed

FA4 Fine Arts 4 (Option 1)

- P1**
MANUFACTURER: DUNN EDWARDS
COLOR: WEATHERED BROWN
DEC 756
- P2**
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765
- P6**
MANUFACTURER: DUNN EDWARDS
COLOR: TRAIL DUST
DE 6123
- P7 OPTION 1**
MANUFACTURER: DUNN EDWARDS
COLOR: IVY ENCHANTMENT
DE 5571





FA4 South

Existing



Proposed

FA4 Fine Arts 4 (Option 1)

- P1**
MANUFACTURER: DUNN EDWARDS
COLOR: WEATHERED BROWN
DEC 756
- P2**
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765
- P6**
MANUFACTURER: DUNN EDWARDS
COLOR: TRAIL DUST
DE 6123
- P7 OPTION 1**
MANUFACTURER: DUNN EDWARDS
COLOR: IVY ENCHANTMENT
DE 5571

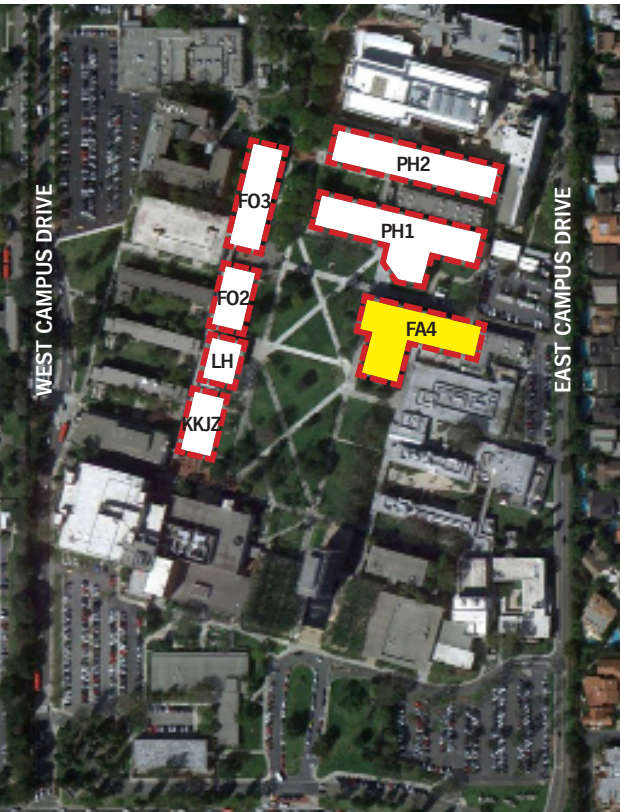


FA4 North

Existing



Proposed





FA4 East

Existing

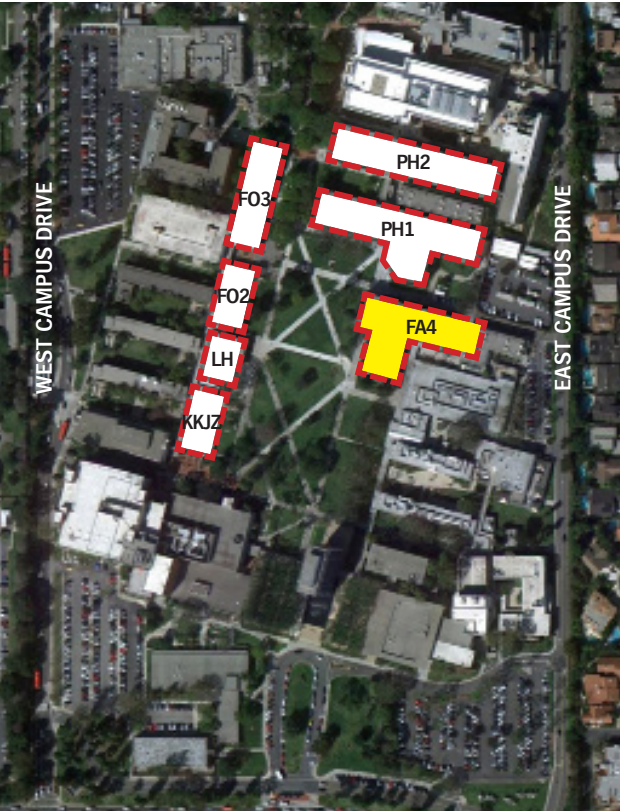
FA4 Fine Arts 4 (Option 1)

- P2**
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765
- P7 OPTION 1**
MANUFACTURER: DUNN EDWARDS
COLOR: IVY ENCHANTMENT
DE 5571



FA4 East

Proposed



FA4 Fine Arts 4 (Option 2)

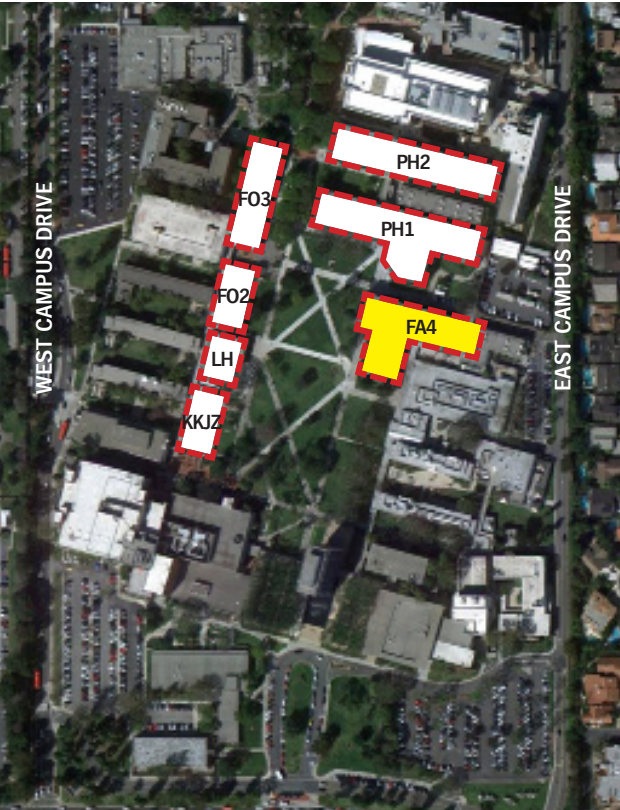


FA4 South Existing

- P1**
MANUFACTURER: DUNN EDWARDS
COLOR: WEATHERED BROWN
DEC 756
- P2**
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765
- P6**
MANUFACTURER: DUNN EDWARDS
COLOR: TRAIL DUST
DE 6123
- P7 OPTION 2**
MANUFACTURER: DUNN EDWARDS
COLOR: PACIFIC PALISADE
DE 5787



FA4 South Proposed



FA4 Fine Arts 4 (Option 2)



FA4 South

Existing



Proposed

- P1**
MANUFACTURER: DUNN EDWARDS
COLOR: WEATHERED BROWN
DEC 756
- P2**
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765
- P6**
MANUFACTURER: DUNN EDWARDS
COLOR: TRAIL DUST
DE 6123
- P7**
- P7 OPTION 2**
MANUFACTURER: DUNN EDWARDS
COLOR: PACIFIC PALISADE
DE 5717

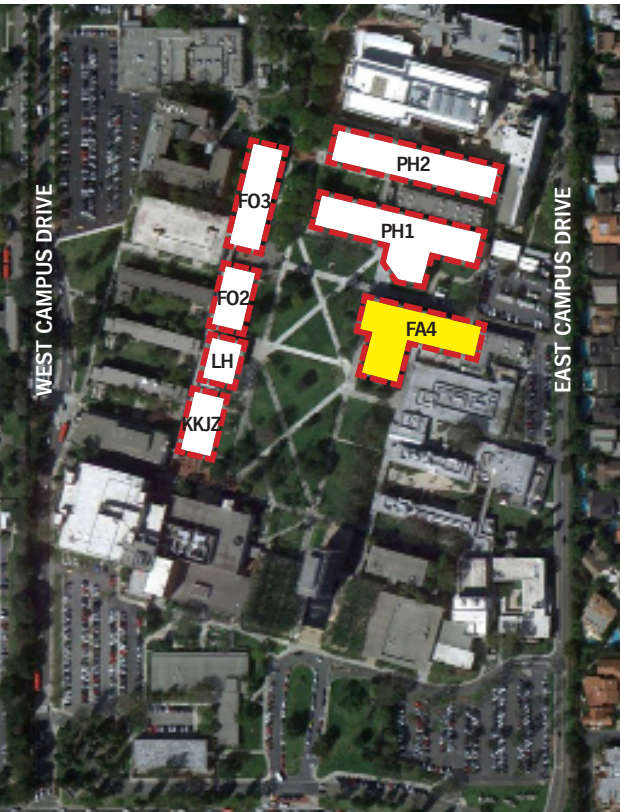


FA4 North

Existing



Proposed





FA4 East

Existing

FA4 Fine Arts 4 (Option 2)

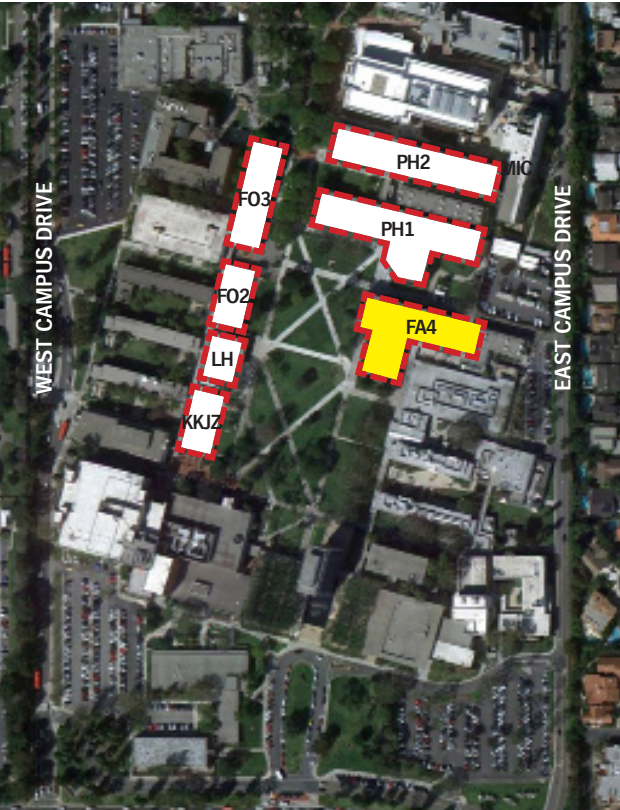
P2
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765

P7 OPTION 2
MANUFACTURER: DUNN EDWARDS
COLOR: PACIFIC PALISADE
DE 5787



FA4 East

Proposed





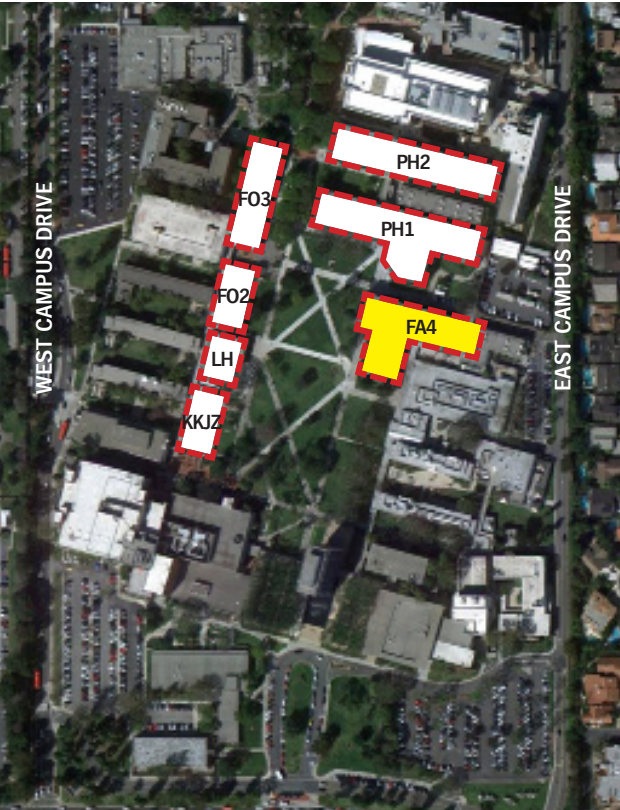
FA4 South Existing



FA4 South Proposed

FA4 Fine Arts 4 (Option 3)

- P1**
MANUFACTURER: DUNN EDWARDS
COLOR: WEATHERED BROWN
DEC 756
- P2**
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765
- P6**
MANUFACTURER: DUNN EDWARDS
COLOR: TRAIL DUST
DE 6123
- P7 OPTION 3**
MANUFACTURER: DUNN EDWARDS
COLOR: DEEP CORAL
DE 5173



FA4 Fine Arts 4 (Option 3)



FA4 South

Existing



Proposed

- P1**
MANUFACTURER: DUNN EDWARDS
COLOR: WEATHERED BROWN
DEC 756
- P2**
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765
- P6**
MANUFACTURER: DUNN EDWARDS
COLOR: TRAIL DUST
DE 6123
- P7 OPTION 3**
MANUFACTURER: DUNN EDWARDS
COLOR: DEEP CORAL
DE 5173

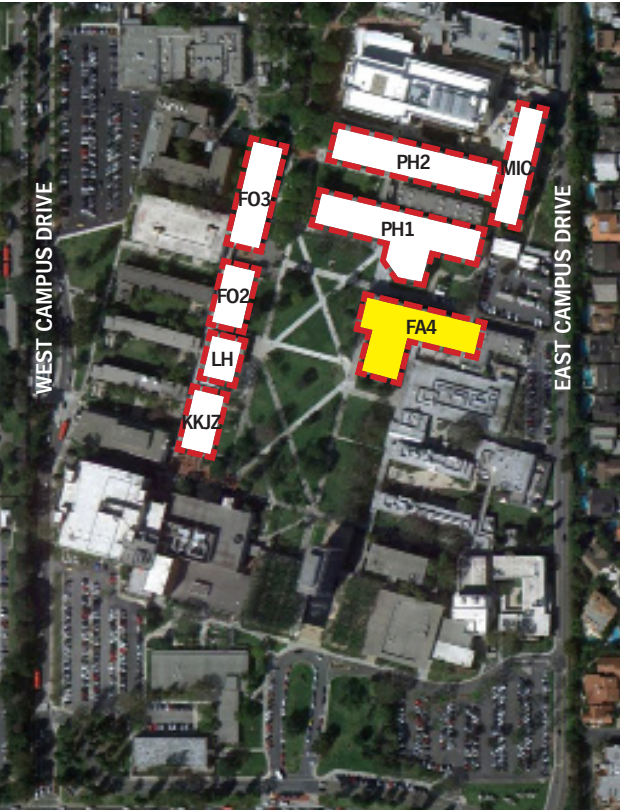


FA4 North

Existing



Proposed





FA4 East

Existing

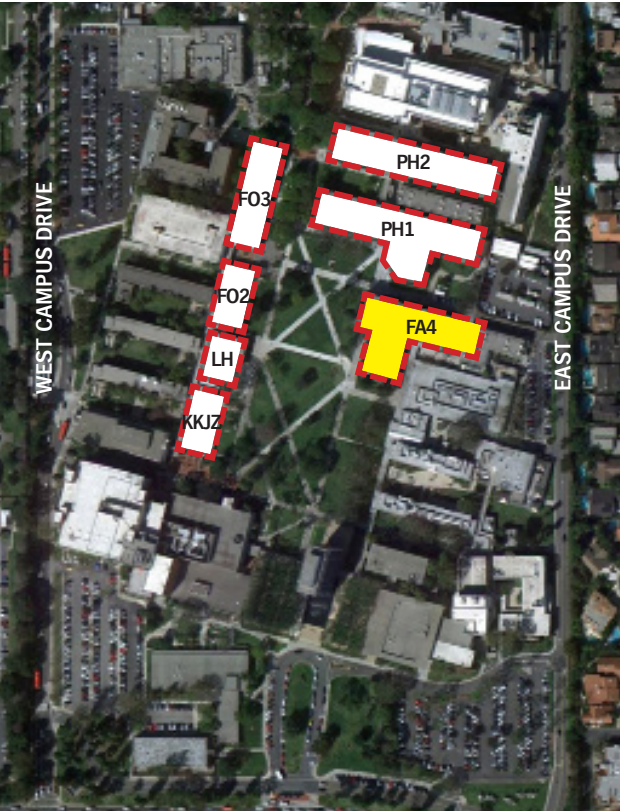
FA4 Fine Arts 4 (Option 3)

- P2**
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765
- P7 OPTION 3**
MANUFACTURER: DUNN EDWARDS
COLOR: DEEP CORAL
DE 5173



FA4 East

Proposed





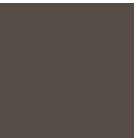
PH1 South

Existing

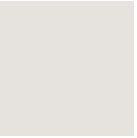


Proposed

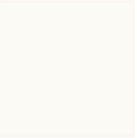
PH1 Peterson Hall 1



P1
MANUFACTURER: DUNN EDWARDS
COLOR: WEATHERED BROWN
DEC 756



P2
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765



P4
MANUFACTURER: DUNN EDWARDS
COLOR: MILK GLASS
DEW 358



M1
MANUFACTURER: CITADEL ARCHITECTURAL PRODUCTS
COLOR: DARK BRONZE ANODIZED
KYNAR 500 METALLIC



PH1 North

Existing



Proposed





PH2 West Existing



Proposed

PH1 Peterson Hall 1

P1
MANUFACTURER: DUNN EDWARDS
COLOR: WEATHERED BROWN
DEC 756

P2
MANUFACTURER: DUNN EDWARDS
COLOR: BONE
DEC 765

P4
MANUFACTURER: DUNN EDWARDS
COLOR: MILK GLASS
DEW 358

P6
MANUFACTURER: DUNN EDWARDS
COLOR: TRAIL DUST
DE 6123

M1
MANUFACTURER: CITADEL ARCHITECTURAL PRODUCTS
COLOR: DARK BRONZE ANODIZED
KYNAR 500 METALLIC

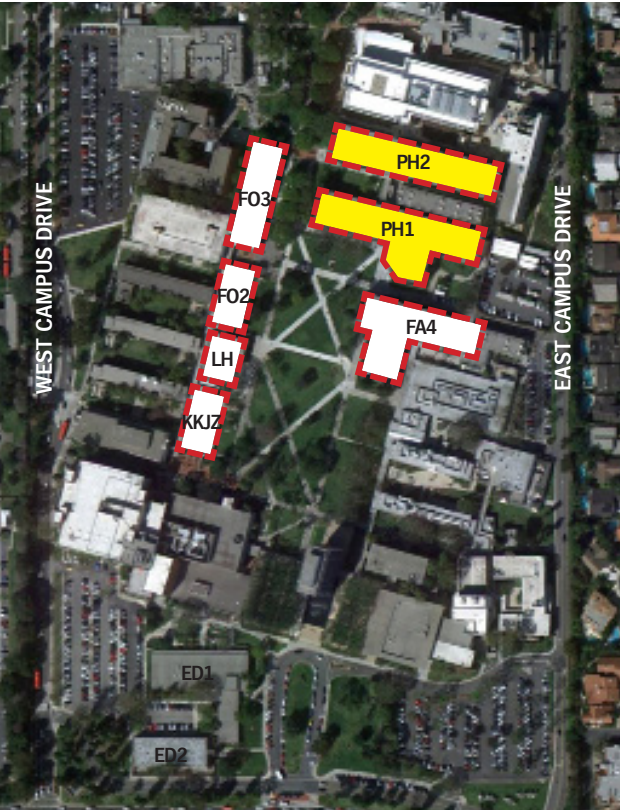
This does not match P6 - Trail Dust. Please correct.



PH2 North Existing



Proposed



Appendix T - CSULB Design Standards

Tree Preservation/Replacement Policy Standards

as of 9/30/20

General Considerations

- **Specimen trees** – Special conditions may apply to historical or large specimen trees. These types of trees may require bonding to ensure asset preservation. Qualifying factors of a specimen tree include the variety of tree, its training or the location. Specimen trees need to be identified at the beginning of a construction project.
- **3rd Party Arborist Review** – A Certified 3rd Party Arborist should be used to review construction documents and provide written guidelines for the contractor to insure proper tree protection, preservation and pre-construction inspection. It is the contractor's responsibility to make the necessary adjustments recommended by the consulting Arborist in a timely manner to preserve tree health. Failure to make recommended corrections may result in tree damage or removal if tree health is compromised.
- **Tree Protection Zone (TPZ)**. CSULB utilizes the drip line method which uses the tree canopy drip line to define the boundary where the entire area within the drip line is considered the TPZ.
- **Project Impact Assessment** – Factors to consider impact to affected trees before & during construction include:
 - **Irrigation system** - Disruption to irrigation often affects trees and plant materials inside and outside of project scope. It is the contractor's responsibility to provide water to affected areas. Acceptable temporary water systems include portable systems, hand watering or having a third party contracted to water. The university can provide resources at a charge back rate to the project for labor and materials.
 - **Grade changes, utility installation, trenching, and vehicle traffic** - Discussion has to occur at the beginning of a project to insure acceptable measures are taken to limit the impact of construction on affected and surrounding trees. A Certified 3rd Party Arborist should be involved during the design phase to review and provide guidance as to whether trees should be removed or protected in place. Evaluation to remove or protect a tree should include its age, variety of tree, and current tree health.
- **Campus GIS Tree Software (Arbor Pro)** – CSULB uses a software data base to track all tree data campus wide. Each tree has an ID number and a record of health. This tool is used as a base line for monitoring the trees during construction. Any damages or work done such as pruning to trees or removal will be noted in the tree details for the individual tree. The contractor shall keep a log on modifications done to trees and provide that information to the Grounds department so data can be up dated.
- **IPM (Integrated Pest Management)** - It is the contractor's responsibility to maintain tree/plant health of affected plants through the duration of construction. If a tree has been identified and needs to be treated for insects or disease, adherence to CSULB's IPM is required. The contractor is to submit a means and methods for treatment to the project manager - this will be reviewed by Safety and Risk and the Grounds department prior to use and approval. Contractor needs to include safety data sheet (SDS) and label at the time of request.
- **Support from BBS Grounds** the Grounds department can offer support services for a project if requested. Service can include irrigation repair, tree trimming, tree removal, maintenance of landscape, chemical application services. Service availability is dependent on staff availability and current project load and schedules. BBS grounds can provide an estimate for services.

Preservation & Protection

- **Tree protection plan should include:**
 - Barrier requirements TPZ (Tree Protection Zone) Drip Line
 - Hard fencing is required around trees in work areas
 - Soft orange fencing is needed around drip line of trees near job sit trailers
 - No dumping or storage of materials with protective fencing areas
 - No parking of equipment or vehicles under the dripline of trees
 - No chaining and or securing of equipment, tools or gang boxes to trees
 - No excess spoils or storage of materials with in dripline of tree
 - Soil and root protection with the TPZ. If foot or vehicular traffic or construction activities cannot be kept outside of the TPZ for the entire duration of construction, actions must be taken to disperse the load, minimizing soil compaction and mechanical root damage. The following methods are approved: 6 to 12 inches of wood chip to the area. Layering method ¾" Plywood or drivable matting over 4inches of thick layer of wood chip. Or applying a geotextile fabric that is staked and taut and overlaid with 4 to 6" of gravel. All materials must be removed after construction and the areas restored.
 - Irrigation setup and scheduling
 - Contractor shall keep an irrigation log to document irrigation for the duration of the project. The following shall be noted in the log: Date of watering, Location of watering noting tree ID number, duration of watering
 - Fertility & preventative measures
 - With the use of 3rd party Arborist Assessment and plan
 - Root & canopy pruning procedures during construction
 - Must be completed by certified ISA & FM Arborist
 - The Arborist will provide root pruning standards to the contractor on acceptable means and methods for the pruning of roots. No roots over 2" in diameter shall be removed without consultation of Campus Arborist or the

Appendix T - CSULB Design Standards

project consulting Arborist. Failure to follow Arborist recommendations may result in the removal and replacement of the tree at the contractors' expense.

- Hand excavate around roots. If necessary. Utilize an air spade to minimize damage during the excavation process.
- Photo document all excavated areas that contain roots that are in proximity of trees involved in the project.
- Properly prune all exposed roots on the tree in question. Follow guidelines instructed by a certified arborist. Utilize a sharp hand saw - Fanno 13" curved hand saw tri-edge blades or similar. Do NOT use a reciprocating saw (saw-zall). No roots shall be pruned over 1" in diameter without a Certified Arborist present.
- Prune small roots with a sharp set of hand loppers or hand pruners. Corona brand or similar. Roots 1" diameter or smaller.
- Large roots, over 2" in diameter can be pruned utilizing a Pulaski axe and sharpening the edges when necessary in the presence of a certified arborist. Clean up Pulaski axe cuts with Fanno hand saw. These tools can be purchased at Bishop Company 562 421-1833 or similar.
- Photo document all root pruning areas prior. During and upon completion of root areas in question. Submit to arborist for review PRIOR to root pruning.
 - All roots should have a clean finish pruning cut to promote proper healing following root pruning.
 - Root pruning should be kept to a minimum whenever possible. The long-term effects may not be revealed for 3-7 years following the root pruning. Adherence to these job-site specifications is paramount. This ensures that all possible avenues are explored in a professional and positive manner within reason so that large and beautiful specimen trees are not removed and destroyed without merit

Replacement Policy

- Replacement variety has to be considered to align with Campus Master Plan and Species diversity (pest resistant & growth ability in climate zone)
- Replacement variety is approved by Campus Grounds Manager
- Location is approved by Campus Grounds Manager & Planning
- Variety has to be considered based on growth rate and age/variety of tree i.e. JG tree collection; Campus palm collection
- **Replacement guidelines:**
 - Specimen tree species may be more expensive or if the tree is of historical significance or is an artifact tree in which case value will need to be assessed and a plan for replacement established at the time of the project
 - General tree species i.e. skyline trees
 - For every 25' feet of tree height removed (1) 48" box tree will be replaced or credited to campus tree fund
 - Market value cost of a 48" box size tree replacement includes material and install. 2020 cost \$1,400
 - Replacement of total lost trees during construction will be tracked through the fiscal year
 - A project will be created to repopulate campus forest at the beginning of new fiscal year

Tree Typology - Shade Trees

Updated
Spring 2024

The primary role of Shade Trees on the CSULB campus is to provide shade to it's surrounding environment. This is due to its spreading canopy and crown. Evergreen trees provide shelter from wind in the winter and sunlight in the summer. Deciduous trees may be more desirable in situations where a gain in solar heat in the winter is needed. Shade trees are desirable around seating-meeting-outdoor study areas where faculty, staff and students may gather.



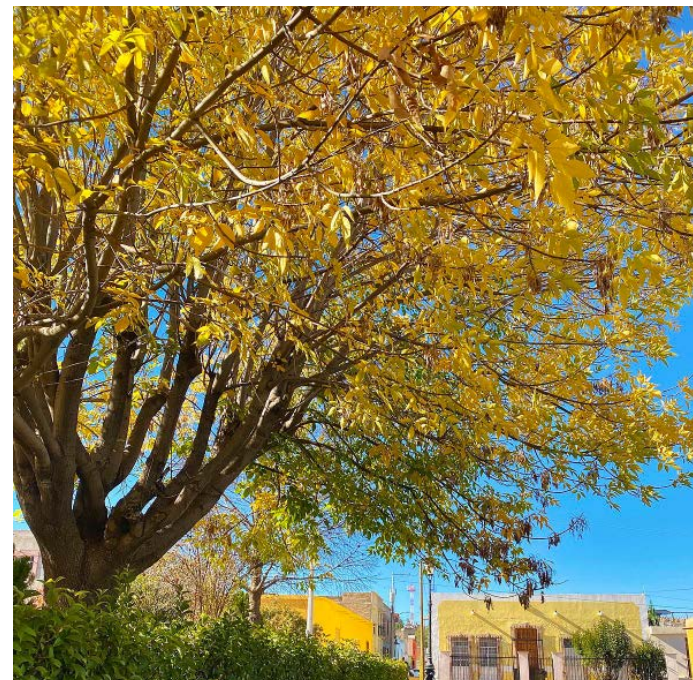
Afrocarpus gracilior
African Fern Pine
40-60'H x 20-40'W



Arbutus 'Marina'
Marina Strawberry Tree
40-50'H x 25-40'W



Cassia leptophylla
Gold Medallion Tree
25'H x 30'W



Fraxinus velutina
Velvet Ash
50'H x 30-40'W



Koelreuteria bipinnata
Chinese Flame Tree
40'H x 15-30'W



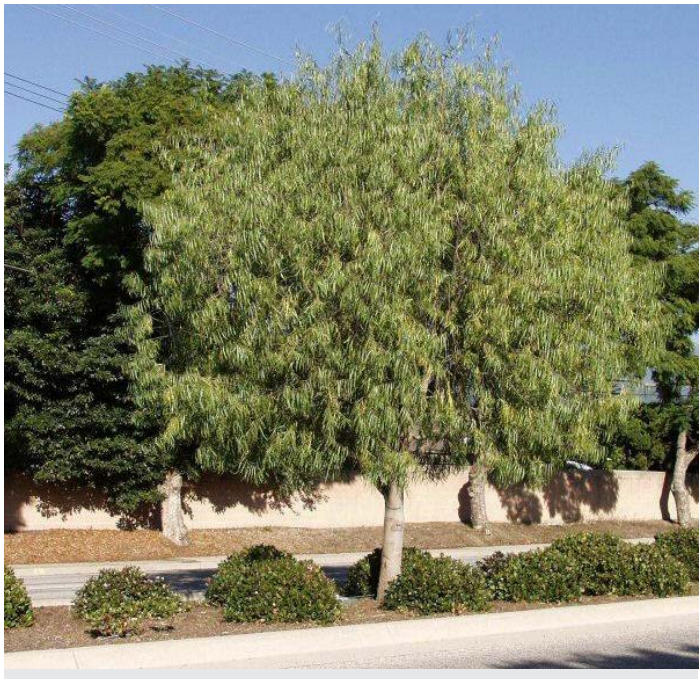
Quercus agrifolia
Coast Live Oak
70'H x 30-70'W

Tree Typology - Street-Pedestrian Trees

The Pedestrian Tree’s primary role on the CSULB campus is to provide shade and low-canopy for walkways. This key characteristics of a Pedestrian Tree are its low-spreading canopy and crown. Evergreen trees provide year-round shade. Deciduous trees may be more desirable in situations where a gain in solar heat in the winter is needed, or the visual of a seasonal change is wanted. Pedestrian Trees serve a multitude of functions such as a psychological directional element to pathways, an experience of safety, and building edges. The use of flowering Pedestrian Trees provide seasonal ambiance and



Agonis flexuosa
Peppermint Tree
35'H x 15-30'W



Geijera parviflora
Australian Willow
45'H x 20'W



Cercis canadensis 'Forest Pansy'
Purple Leaf Eastern Redbud
30'H x 20-25'W



Lagerstroemia ssp
Myrtle
15-30'H x 20-30'W



Ginkgo biloba
Maidenhair Tree
70'H x 25'W



Pistacia chinensis 'Red Push'
Red Push Chinese Pistache
25-40'H x 25-35'W

Tree Typology - Skyline Trees

Skyline Trees are important to the campus because they help to identify the areas of campus.

The Skyline Trees allows for an interesting layering of the tree canopies on campus and maintains the main identifier of a rich campus palette. Skyline Trees help to reduce the scale of large buildings and ground them in the campus landscape fabric. Trees, such as the Palm tree helps to identify the important entry points to the campus or student gathering areas. The Eucalyptus tree helps to maintain the original campus design intent at its origin and replace the existing Eucalyptus palette.



Pinus canariensis
Canary Island Pine
80'H x 20-35'W



Phoenix canariensis
Canary Island Date Palm
60'H x 40'W



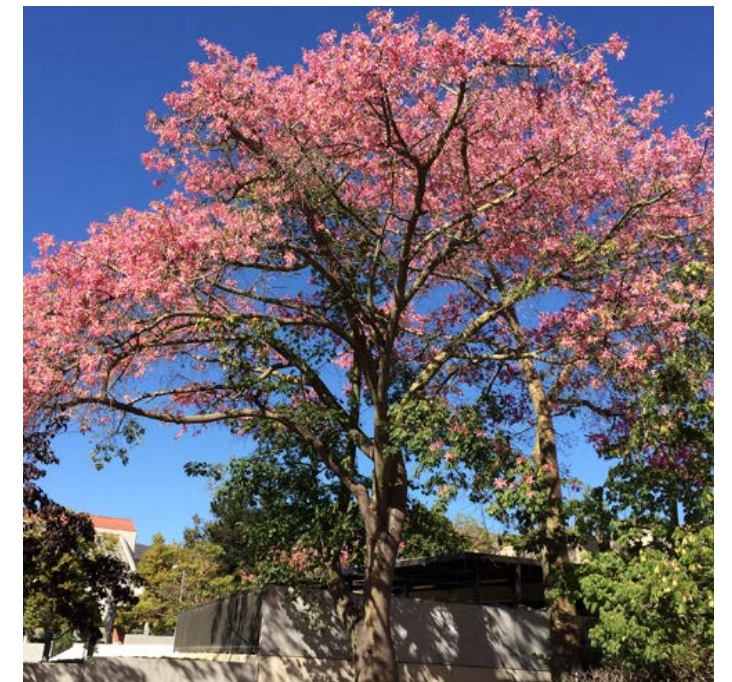
Brachychiton acerifolius
Flame Bottle Tree
60'H x 30-40'W



Eucalyptus deglupta
Rainbow Eucalyptus
100'H x 60-80'W



Spathodea campanulata
African Tulip Tree
80'H x 30-60'W



Ceiba speciosa
Floss Silk Tree
60'H x 40-50'W

Tree Typology - Signature Campus Tree Replacement

The current campus has a signature tree which was part of the original design intent by Killingsworth and Lovell:

Prunus 'Helen Borchers'

Helen Borchers Flowering Peach

Climate change and current soil conditions has made the use of the tree not sustainable for the campus as it no longer reaches its full potential on the campus. As such a new campus tree is desired. A small scale blooming tree is imagined for the campus, both of which can be seen to the right.



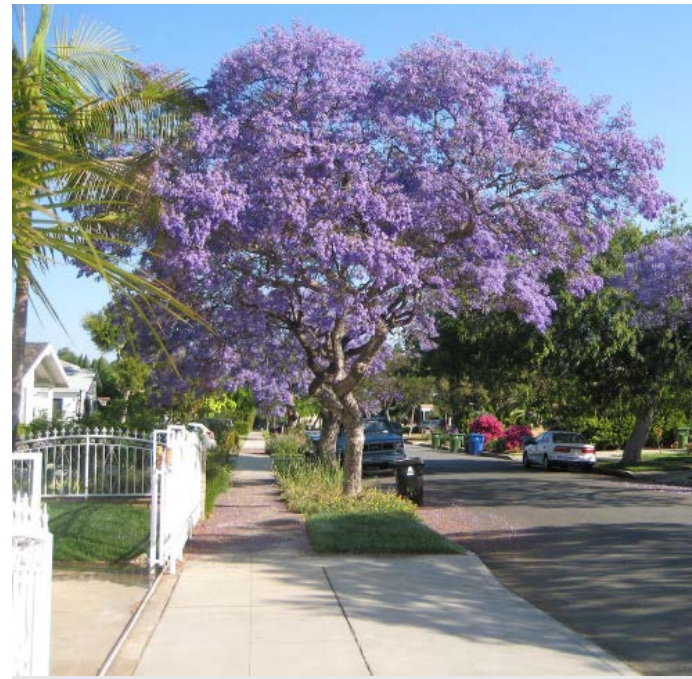
Cercis canadensis 'Flame Thrower'
Eastern Redbud 'Flame Thrower'



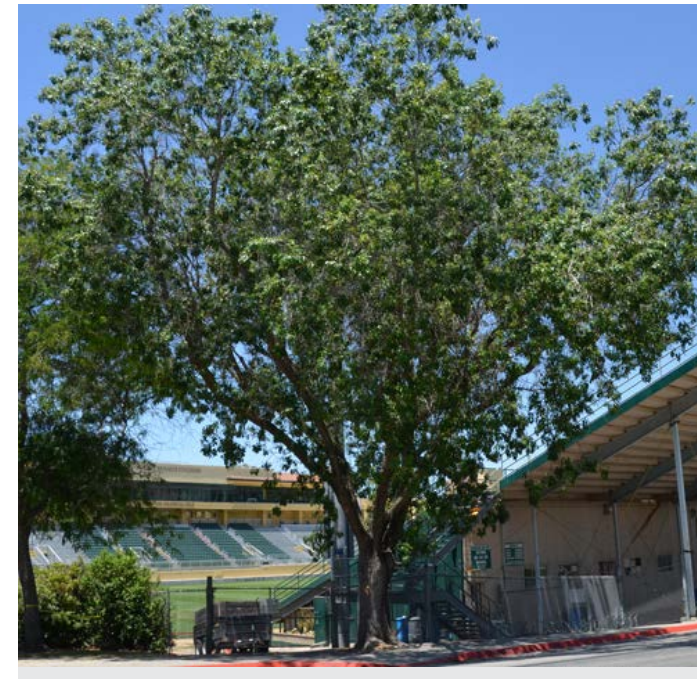
Prunus serrulata 'Pink Cloud'
Flowering Cherry

Tree Typology - Fire Lane Trees

The previous diagram exhibits the network of fire lanes on the campus. The fire lanes on campus represent part of the functional aspect of the campus emergency system. It is important that trees planted adjacent to fire lanes allow for access, they also provide a shaded pathway for users. Offsets from the hardscape will help with branching structures hanging in pathways of emergency vehicles. It is important that the chosen trees are able to maintain a minimum height of 13'-6" from hardscape surfaces for unobstructed access.



Jacaranda mimosifolia
Jacaranda Tree
50'H x 30-40'W



Fraxinus velutina
Velvet Ash
50'H x 30-40'W



Phoenix canariensis
Canary Island Date Palm
60'H x 40'W



Quercus lobata
Valley Oak
70'H x 30-40'W



Ulmus parvifolia 'Tree Green'
True Green Evergreen Elm
60'H x 30-40'W



Podocarpus gracilior
Fern Pine
50'H x 30-50'W



SAN JOAQUIN CHEMICALS, INC.

. . . "water is our profession"

SINCE 1955

WATER CONSULTANTS • SYSTEMS ENGINEERING • MANUFACTURING CHEMISTS

February 16, 2018

Jeff Manis, Supervisor Of Trades
California State University of Long Beach
1331 Palos Verdes Blvd
Long Beach, CA 90084

Subject: CSU, Long Beach HHW Pipe Cleaning & Passivation Process Procedure

Dear Mr. Manis,

San Joaquin Chemicals, Inc., recommends passivating all new loops a minimum of forty-eight hours. This process must begin immediately with the introduction of water to the system. The contractor will add SANACOR® 2109CP with the fill water via a properly sized chemical pump actuated by a water meter or paddle wheel device portioning chemical feed to system makeup. This method will also verify system water volume. This process will introduce SANACOR® 2109CP non-hazardous passivator, compatible with the cleaning solution. The passivation product will remain in the system during the hydro testing and be removed with the cleaning compound during the flushing process. It is important that the passivator be of potable water quality in the case that leaks occur during the hydro testing.

SANASOLV® 6103 cleaning compound is introduced at the rate of 10 gallons per 1000 gallons of system contained water. The cleaner shall be recirculated a minimum of 48 hours before flushing begins. Forty-eight hours of flushing is defined as 48 hours of continuous operation of recirculating pumps once SANASOLV® 6103 has been added to the system. If the pumps are turned off for more than four hours of the 8 hours recirculation process recommences over.

The recirculating pumps must remain operating for the entire cleaning and flushing process. The completion of the flushing process is determined by testing water from each section of pipe. In addition, during the flushing process maintain circulation and continuous makeup to expedite the process.

Recirculating system water conductivity within 5% of makeup.
pH within 0.25 units of makeup water pH
M alkalinity within 20 ppm of makeup water M alkalinity.
Chlorides within 10% of makeup water chlorides.
Iron <0.15 ppm above makeup water background iron levels
Copper <0.05 ppm above makeup water background copper levels.
The recirculation water shall have no color or visible suspended solids.

Immediately after the completion of system flushing and test verifications, SANACOR® L2301A (HHW LOOP) must be added to the system.

The treatment parameters must be > 1.5 times operating parameters and be recirculated 8 hours prior to connecting to the main loop.

Add sufficient isothiazoline biocide (maximum EPA label requirements) to the isolated loop within 24 hours of the passivator chemicals. Addition levels shall be the maximum as specified on the biocide EPA label.


Concord • Fresno • Bakersfield • Irwindale • Las Vegas • Phoenix
PHONE: (800) 647-9577 • e-mail: wearewater@sjc-inc.com • FAX: (888) 808-9514
California Contractor License 461677

Appendix U - CSULB Design Standards

The recirculation will be provided by the contractor's portable recirculation pumps. The Mechanical Contractor shall provide a method of cross tying the supply and return loops. If auxiliary pumps are required they must be supplied by the Mechanical Contractor. The recirculation rate must be equal to 25% of the pipe volume. The system should be cross connected less than 10 feet from main loop connection points. This will allow us to replicate recirculation dynamics similar to system design. The only exception to this replication of flow dynamics will be temperature.

If there are any additional questions, you may contact SAN JOAQUIN CHEMICALS, INC. at (818) 612-9269.

Sincerely,



James Alewine
Southern Area Manager

Cc: Jim Scott, Technical Department
Bob Domm, Technical Department



SAN JOAQUIN CHEMICALS, INC.

Concord • Fresno • Bakersfield • Irwindale • Las Vegas • Phoenix

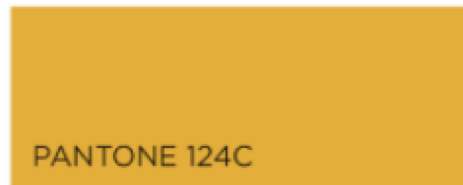
PHONE: (800) 647-9577 • e-mail: wearewater@sjc-inc.com • FAX: (888) 808-9514

California Contractor License 461677

Color Palette

White should be the most-used color in our color palette. It grounds the other colors and helps them shine with the greatest intensity. Your design should begin with white. Then add color to the mix. Layouts that lack prominent white space – or that are flooded with yellow, gray, or black – lose their energy.

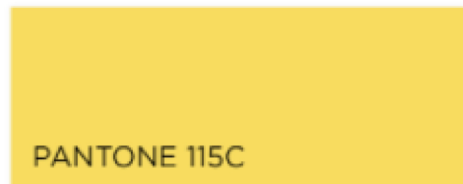
The primary university colors are white, yellow, and black. Gray (70% black) can be used for body copy.



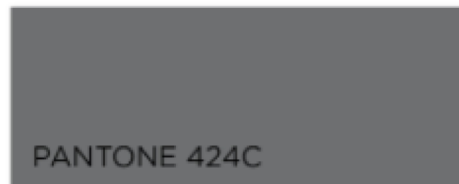
R:236 G:170 B:0
C:7 M:35 Y:100 K:0
#ecaa00



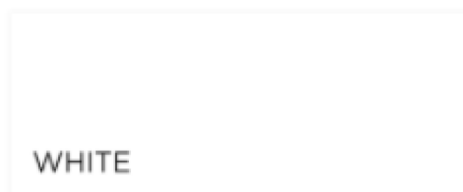
100% Black
#000000
For richer black, please check with your printer's optimal specifications.



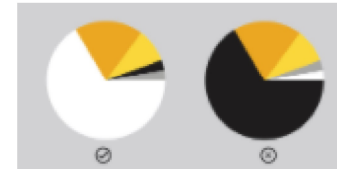
R:255 G:218 B:39
C:1 M:11 Y:93 K:0
#ffda27



R:112 G:114 B:113
C:57 M:47 Y:48 K:14
#707271



#ffffff



Color Distribution

These pie charts illustrate the difference between recommended color proportions for layouts and proportions that are not preferred. These do not represent hard percentages, but serve as a guidelines while you're designing a piece.

Consistency may seem boring, but it's necessary for your brand to gain any visual equity over time. And remember, you'll get bored long before your audience will.

Contrast

When designing your content, it is important that the contrast between the font color and the background color is sufficient. The minimum contrast between the font and background is 4.5:1.

To test the color contrast, download the [Color Contrast Analyzer](#) tool, by The Paciello Group.

CSULB CONTROLS

CAMPUS STANDARD

PURPOSE

Improve the accessibility and resiliency of all campus HVAC Control systems by utilizing and extending the Building Automation System (BAS). Encourage technology adoption to access and share information between diverse data customers: Beach Building Services (BBS) Customer Service, BBS Energy, BBS Engineering, DCS, EHS, and ITS.

CONTROLS OVERVIEW

Control systems and BAS act as energy data infrastructure, utilizing multiple Niagara servers, 2 Phoenix servers, 80+ Jaces (building controllers), and approximately 3,500 equipment controllers to operate and monitor equipment and spaces. Existing installed devices range from the 1980's to present, including electronic-pneumatic interfaces, Smart 2, Modbus, LonWorks, BACnet, Phoenix lab controls, and Niagara (Jaces and servers). An Energy Information System (EIS), and multiple lighting controls servers interact with the Niagara system. Most controllers are configurable, and some operate subordinate to building controllers. Some controllers are factory application specific.

Only freely programmable, and fully open Distech ECY BACnet/IP may be installed in new control systems.

Jaces may be installed as gateways to proprietary systems but must openly route all BACnet traffic. Freely programmable Distech Eclipse BACnet/IP is the only acceptable new controller. OEM installed and supported; application-specific, configurable unitary (non-programmable) controls may be allowed. These may communicate BACnet IP, BACnet RS485, or Modbus. System architecture will be actively managed and maintained by CSULB.

Lighting control and space management systems integrate on-campus to save energy while maintaining comfort.

PERFORMANCE-BASED GOALS

1. Provide web access to all controlled systems (or notes explaining stand-alone systems) for every building.
2. Control all occupied spaces between 68°F and 74°F. Alarm deviations that persist 1 h (adj.).
3. Control all occupied spaces within $\pm 20\%$ of airflow setpoint. Alarm deviations that persist 4 h (adj.).
4. Control all equipment occupancy based on feedback via Energy team coordinated integrations. Use any reliable data source available: lighting control, space management software, local hardware, etc.
5. Maintain floor plan-based navigation to all controlled equipment.
6. Maintain mechanically accurate diagrams and equipment/space association tables for all equipment.
7. Maintain hyperlinked energy flow path from generation at CP to end use at all zone equipment.
8. Maintain campus-wide control system riser with dynamic outage indication.
9. Maintain searchable navigation of all data by building name or number, equipment, and space served.
10. Maintain definable user access to real-time and history data of any building within 5 min.
11. Maintain local control regardless of remote programming status. If a building controller or server is offline, revert to local control and pre-defined local setpoints within 30 min. Test failures at every layer.
12. Maintain override control by allowing Energy team the ability to remotely relax all space temperature and airflow setpoints. These overrides shall be tuned to recover occupied setpoints within 30 min (adj.).
13. Maintain centralized outside air damper control to allow single-point override per building and entire campus to latch outside air dampers open, closed, or to minimum ventilation mode.
14. Maintain up-to-date Sequence of Operation for all HVAC equipment and related systems.
15. Maintain control sequences as finite state machines. Display and allow override of all operational modes.
16. Retain history values at 5-min intervals for ALL inputs, outputs, control variables, and setpoints.
17. Retain minimum 2+ years of history data for ALL inputs, outputs, control variables, and setpoints.

CSULB CONTROLS

CAMPUS STANDARD

BAS SERVER REQUIREMENTS

The servers shall provide reliable BAS integration, GUI access for control, scheduling, alarms, and historical data.

TYPICAL WEB VIEW CHARACTERISTICS

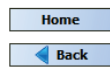
1. Utilize base aspect ratio of 1,500px wide, 1,000px tall, scrollable. Mobile and responsive layouts TBD.
2. Web safe fonts only. Sanserif 12pt preferred. Other sizes and formatting acceptable for clarity.
3. All graphical equipment and system diagrams to match point naming guideline.
4. No “pop-up” graphics that open separate windows except as requested or approved per project.
5. Include Sequence of Operation text and EOR-approved drawing reference with each system and unit

NAVIGATION BAR

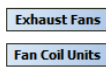
Header allowing direct navigation to all logically associated groups of equipment or data. Organize links by unit, floor, area, etc. Include links to all schedules, alarms, and history.



CCPE



VAV Overview



Floor 1



Radiant 1



Roof



History



Schedules



CAMPUS HOME VIEWS

Map, tabular, and CP loop views provide links to building home pages

System architectural view: Jaces, control networks, controllers including counts and device outage/status indication

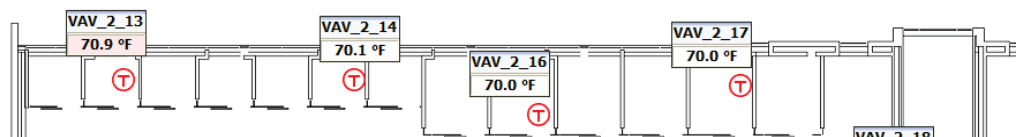
BUILDING HOME SCREEN

Landing page accurately describing HVAC systems and unit counts. Include reference to, or text directly pulled from either the BOD, or Cx building summary section to provide perspective of system types and dependencies.

FLOOR OVERVIEWS

Images shall include up-to-date floor layout including walls, doors, HVAC zone boundaries. Use DCS-provided plan data including accurate compass rose per floor view.

BAS overlay data shall include equipment data hyperlinks, temperature-driven background colors, and thermostat locations



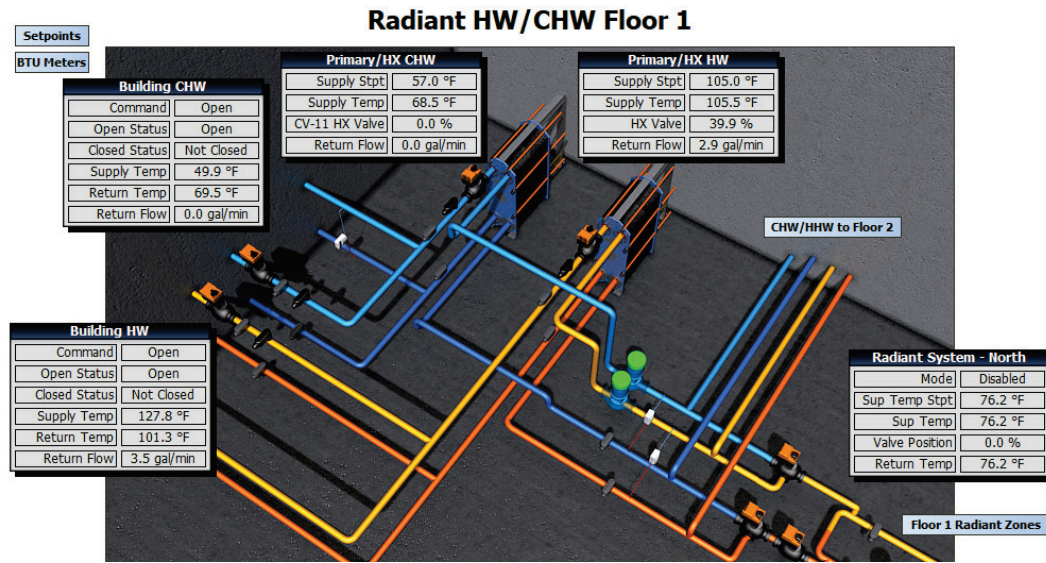
CSULB CONTROLS

CAMPUS STANDARD

CP DISTRIBUTION AND SYSTEM OVERVIEWS

Provide a single-line diagram showing CP tie-in, water and air distribution, and terminal zones, with hyperlinks to each system or zone.

Existing example from CPIE



HVAC EQUIPMENT OVERVIEWS

1. Display typical equipment grouped by system in table format: AHUs, FCUs, VAVs, etc.
2. Hyperlink to each equipment shown.
3. Include at minimum: occupancy, command, status, setpoint, temperature feedback.
4. Include links to all parent and child systems, and relevant Sequence of Operation for each.
5. Include individual "rogue zone" exception from system resets (shown on right, below).

Existing example from SSSC

DOAS-1	Unit	Occupancy Status	Active Setpoint	Zone Temp	Slab Setpoint	Slab Temp	Radiant Mode	Radiant Command	Airflow Setpoint	Airflow	Damper Position	Reset	
												Press	Temp
	VAV101 (Room 100 C)	Standby	84.5 °F	71.5 °F	73.0 °F	73.0 °F	Heat	0.0 %	0.0 cfm	0.0 cfm	0.0 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	VAV102 (Room 100 C)	Standby							0.0 cfm	0.0 cfm	0.0 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	VAV103 (Room 100 B)	Standby	78.0 °F	72.1 °F	73.1 °F	73.1 °F	Heat	0.0 %	0.0 cfm	0.0 cfm	0.0 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	VAV104 (Room 100 B)	Standby							0.0 cfm	0.0 cfm	0.0 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	VAV105 (Room 100 A)	Standby	78.0 °F	74.6 °F	75.6 °F	75.6 °F	Heat	0.0 %	0.0 cfm	0.0 cfm	0.0 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	VAV106 (Room 100 A)	Standby							0.0 cfm	0.0 cfm	0.0 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	VAV107 (Pantry)	Standby	78.0 °F	74.5 °F					125.0 cfm	0.0 cfm	100.0 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	VAV108 (Lobby)	Standby							200.0 cfm	26.0 cfm	100.0 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CSULB CONTROLS

CAMPUS STANDARD

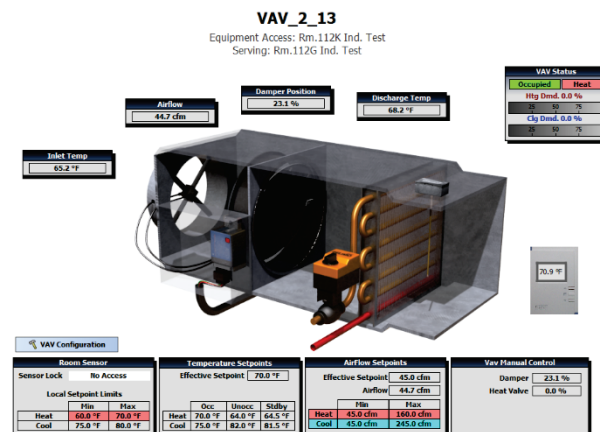
HVAC EQUIPMENT VIEWS

Mechanically accurate schematic displaying all I/O name, data, setpoints, and configuration data required to operate the equipment. Hyperlink to any upstream or downstream equipment. For example, an AHU with CP hydronic connection shall hyperlink up to any local CP data or CP loop connection, and down to all terminal zones. Include system Sequence of Operation text and source notes e.g., 1967 Drawing Name sheet M-123

Clearly display tabular setback values, and occupancy controls (none, local, EIS/Ad-Astra, EIS/EMS)

Display separate, adjustable values detailing: all rooms served with thermostat location noted, equipment access, and controller access. Show controlled values adjacent to setpoint. Use styles and colors documented in point naming guideline.

Existing example from SSSC

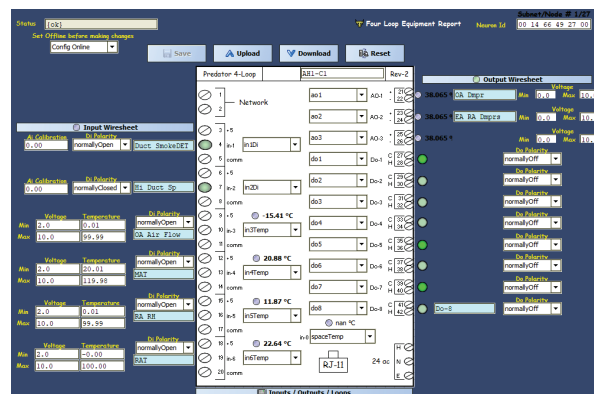


HVAC TECHNICIAN VIEWS

Technically accurate schematic or photo displaying I/O names, values, and configuration data as available to troubleshoot the equipment controller.

Display separate, adjustable values detailing: all rooms served with thermostat location noted, equipment access, and controller access.

Existing example from LIB



CSULB CONTROLS

CAMPUS STANDARD

BAS JACE / BUILDING CONTROLLER REQUIREMENTS

Where a Jace or other hardware running a Tridium product is provided, it shall display equivalent graphical access as provided at the server, if possible. If the installed systems can't support that level of access, provide the following:

TYPICAL VIEW CHARACTERISTICS

1. Utilize base aspect ratio of 1,500px wide, 1,000px tall, scrollable. Mobile and responsive layouts TBD.
2. Web safe fonts only. Sanserif 12pt preferred. Other sizes and formatting acceptable for clarity.
3. All graphical equipment and system diagrams to match point naming guideline.
4. No "pop-up" graphics that open separate windows except as requested or approved per project.
5. Include Sequence of Operation text and EOR-approved drawing reference with each system and unit

NAVIGATION BAR

Header allowing direct navigation to all logically associated groups of equipment or data. Organize links by unit, floor, area, etc. Include links to all schedules, alarms, and local history.



CCPE

Home

Back

VAV Overview

Exhaust Fans

Fan Coil Units

Floor 1

Floor 2

Floor 3

Radiant 1

Radiant 2

Radiant 3

Roof

DOAS-1

DOAS-2

History

BTU Meters

Electric Meters

Schedules

Alarms

BUILDING HOME SCREEN

Landing page accurately describing HVAC systems and unit counts. Include reference to, or text directly pulled from either the BOD, or Cx building summary section to provide perspective of system types and dependencies.

HVAC EQUIPMENT OVERVIEWS

1. Display typical equipment grouped by system in table format: AHUs, FCUs, VAVs, etc.
2. Hyperlink to each equipment shown.
3. Include at minimum: occupancy, command, status, setpoint, temperature feedback.
4. Include links to all parent and child systems, and relevant Sequence of Operation
5. Include individual "rogue zone" exception from system reset sequence (shown on right, below).

DOAS-1	Unit	Occupancy Status	Active Setpoint	Zone Temp	Slab Setpoint	Slab Temp	Radiant Mode	Radiant Command	Airflow Setpoint	Airflow	Damper Position	Reset	
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	VAV105 (Room 100 A)	Standby	78.0 °F	74.6 °F	75.6 °F	75.6 °F	Heat	0.0 %	0.0 cfm	0.0 cfm	0.0 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	VAV106 (Room 100 A)	Standby							0.0 cfm	0.0 cfm	0.0 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	VAV107 (Pantry)	Standby	78.0 °F	74.5 °F					125.0 cfm	0.0 cfm	100.0 %	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	VAV108 (Lobby)	Standby							200.0 cfm	26.0 cfm	100.0 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>