

PROJECT MANUAL

FOR

CALIFORNIA POLYTECHNIC UNIVERSITY, HUMBOLDT

1 Harpst St.
Arcata CA

LPAS Project No: 1485-0004



Construction Documents
03/26/2025



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CAL POLY HUMBOLDT
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SECTION 01 11 00

SUMMARY OF THE WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. The following subjects are included in this section:
 - 1. Project Description
 - 2. Project Phasing
 - 3. Contractor Use of Premises / Work Restrictions
 - 4. Superintendent / Supervisory Staff
 - 5. Special Project Requirements
 - 6. Protection of Work
 - 7. Owner Furnished / Contractor Installed
 - 8. Permits, Licenses, & Fees
 - 9. Partnering

1.3 PROJECT DESCRIPTION

- A. Work Included in the Contract: This project proposes to replace the roof at Harry Griffith Hall. The Work included shall consist of all construction and services involving work related to:
 - 1. Demolition of existing roofing, insulation and all roofing materials back to the concrete deck.
 - 2. Rooftop mechanical equipment shall be removed to allow for the installation of roof terminations and then re-installed, including all electrical connections and controls.
 - 3. Existing roof drains to be removed and replaced with tie-in of roof membrane.
 - 4. Installation of new tapered lightweight insulation and concrete system, roof membrane, various roof flashings and terminations for a complete, installed, waterproof installation.
 - 5. Roof guardrails.
- B. Contract Time: 92 Calendar days.
- C. Liquidated Damages: \$500.00 per day.

1.4 PROJECT PHASING

- A. Phasing Plan/Sequence of Work: Project is One Phase. Sequence of demolition and construction shall be such that the building interior is protected at all times.
- B. Owner Occupancy: Work will occur in an operating University environment.

C. Maintenance and Operation: Contractor to maintain access to service areas and not impact building utilities for duration of project.

D. Work Under Separate Contract:

1. The Trustees reserve the right to award separate contracts for performance of work within or adjacent to the project site. Work may be conducted simultaneously with work under this contract. Contractor shall cooperate fully with separate contractors and coordinate work so that work under separate contract may be carried out efficiently, without interfering or delaying Contractor's work.
2. Disagreements between Contractor and entities performing work under separate contract concerning concurrent use of work areas and access to site which are not resolved by the participants shall be referred to the University Representative. Contractor agrees to abide by the University Representative's determination as to concurrent use or priority of access, and to perform work in compliance with the University Representative's resolution at no additional cost.
3. Relationship to Work Under the Contract: Work under the Contract shall include all provisions necessary to make such concurrent work under separate contracts complete in every respect and fully functional, including field finishing. Provide necessary backing, supports, piping, conduit, conductors and other such provisions from point of service to point of connection, as shown on Drawings and specified herein. See Section 01 31 13 - Coordination for additional requirements.
4. Documents for Work Under Separate Contracts: University's Representative will make available, in a timely manner, drawings and specifications of work under separate contracts for coordination and further description of that work.
 - a. If available, such information will include drawings, specifications, product data, lists and construction schedules for such work.
 - b. Information concerning work under separate contracts or directly by University will be provided for convenience only and shall not to be considered Contract Documents.
5. Permits, Notices and Fees for Work under Separate Contracts: Notices required by and approvals required of, authorities having jurisdiction over work under separate contracts and related fees, will be solely the responsibility of University.

1.5 CONTRACTOR USE OF PREMISES / WORK RESTRICTIONS (Also refer to Contract General Conditions)

A. General

1. Contractor shall at all times conduct the work so as to impose no hardship on the Trustees or others engaged in the Trustees' work nor cause any unreasonable delay or hindrance thereto.
2. Construction activities will be scheduled to minimize disruption to the University and to Campus users.
3. The Contractor may not interrupt any Campus utilities without prior written permission from the Trustees. Requests for utility shutdowns shall be submitted a minimum of 14 calendar days in advance of the requested shutdown date.
4. Contractor shall contain all equipment and materials storage to the laydown area shown in the contract documents.
5. The Work of the Project is to be completed within an operating University, and that University operations and construction activities by others will be in progress at the Work Site during the course of this Contract. Refer to Section 01 14 00 – Work

Restrictions for additional requirements.

B. Surrounding Site Condition Survey (Refer to Sec. 01 11 11)

1. Prior to commencing the work, the Contractor and the University Representative shall tour the Project Site together to examine and record damage to existing buildings, landscape, hardscape and other improvements, both on and adjacent to the project site. The resulting record shall serve as a basis for determination of subsequent damage due to Contractor's operations and shall be signed by parties involved in the tour using Site Survey form 702.08 which is part of the contract documents. Any damage to existing improvements not noted in the original survey, but subsequently discovered, shall be reported to the University Representative immediately.

C. Protection of Existing Structures and Utilities (also refer to Contract General Conditions)

1. Locate all known existing utility installations before proceeding with construction operations which may cause damage to such installations. Existing record drawings are available for Contractor review at Cal Poly Humboldt's FacilitiesLink WebSite: <https://humboldt.metabim.com/login/Welcome.htm>. The existing utilities shall be protected and maintained in continual service at the Contractor's expense. Where existing utilities cross or are adjacent to the work of this contract, the Contractor shall notify the University Representative a minimum of 48 hours in advance of commencement of work and receive approval for the method of uncovering the utility. If ground activities are anticipated, then the Contractor shall locate the existing utility(s) by hand digging, pot holing, locator device, ground penetrating radar, X-ray, or other methods recommended by the Contractor and approved by the Construction Administrator. Repair of damage to existing utility(s) shall be at the Contractor's expense.
2. In the event that undocumented existing structures or utilities are encountered, the contractor shall immediately notify the University Representative and request direction concerning how to proceed with the work.
3. Should the Contractor damage any existing structure or utility, the Contractor shall take immediate action to ensure the safety of both persons and property.
4. Contractor shall visit existing building(s) and grounds and thoroughly familiarize itself with existing conditions. Existing record drawings are available for Contractor review at Cal Poly Humboldt's Facilities Link Web Site: <https://humboldt.metabim.com/login/Welcome.htm>
5. Contractor shall include all necessary pipe offsets, fittings, etc. as required to complete the work in the base bid. No additional costs due to the Contractor's failure to survey existing conditions and review available record drawings will be allowed.
6. Contractor shall note all utility items (utility meters, junction boxes, valve boxes, post indicator valves, utility covers, etc.) at or above grade in the vicinity of the project site These items indicate the presence of underground utilities in the area which shall be kept in continual service. This requirement shall apply regardless of inclusion of these utilities on existing record documents.
7. When cutting, removal or alteration of existing work is required to form connections with new work or otherwise to meet the requirements of the contract documents, perform such work so as not to damage the work that will remain in place. Refer to sections for cutting, patching and repair requirements.
8. Contractor shall provide all necessary materials, equipment, and labor to adequately protect existing structures, floors, architectural finishes, utilities,

landscape and hardscape which may be impacted by the work of this contract.

D. Allowable Work Schedule

1. Normal construction activities shall be performed Monday through Friday between the hours of 7:00 am and 6:00 pm, excluding holidays.
2. Shutdown of existing utilities or other activities which impact Campus operations shall be scheduled in advance with the University Representative in accordance with paragraph 1.05.A.3 above, and shall be scheduled during off-hours at the discretion of the University and at no additional cost to the University.
3. Contractor shall submit an "Off-hours work Schedule Request" a minimum of 72 hours prior to any anticipated weekend or holiday work. A request must also be submitted for work outside of normal working hours.
4. Sound allowance and noise control is covered in Special Procedures - 01 35 00 Section 1.6.

E. Site Decorum

1. Contractor is to control the conduct of labor forces and prevent unwanted interaction initiated by workers with the University staff, students or other individuals other than those associated with the project.
2. In the event that any worker initiates unwanted interaction, utilizes profanity, or (in the opinion of the University Representative) conducts him/herself in an offensive or unprofessional manner, the Contractor shall immediately remove the worker from the project and replace said worker with another of equivalent technical skill at no additional cost to the University.
3. No smoking is allowed on the University Campus. Reference the University Smoke and Tobacco Free Environment Systemwide Policy: <https://policy.humboldt.edu/eo-1108-policy-systemwide-smoke-and-tobacco-free-environment>
4. No radios, other than 2-way communication type, shall be allowed on the project site.
5. Contractor shall provide an ANSI Class II - Heavy Duty Safety Vest and Hard Hat for every employee, every subcontractor, every sub-tier subcontractor, and subcontractor employee working on-site. Vests are not optional. Failure to comply with this requirement may result in a \$500.00 credit per person per day to the University via credit change order. Contractor shall maintain an adequate supply of vests and hard hats on site at all times.
6. Photograph limitations for specific areas: No dormitory rooms or common areas occupied by students.

F. University Keys

1. Contractor shall provide a written request to the University for keys to existing facilities. Upon completion of work, contractor shall return all keys back to the University. If the Contractor fails to return a key, a lost key fine shall be charged for the actual cost of re-keying campus locks up to a maximum of \$5,000 per building.
2. Site fences shall be locked with the University standard lock in order to allow the University 24 hour access for maintenance and inspection, or response to an emergency condition. Should Contractor wish to use a different lock, it shall be double locked with the University standard lock at all times that the site is secured.

1.6 SUPERINTENDENT / SUPERVISORY STAFF

CAL POLY HUMBOLDT
SIEMENS HALL ROOF REPAIR – XPL311
LPAS Project No.: 1485-0004

SUMMARY OF WORK
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A. The following requirements are in addition to the requirements of the Contract General Conditions:

1. The Contractor shall employ a competent Superintendent able to read, write and communicate fluently in English. The Superintendent shall be on site at all times during which work occurs on the project site and shall be fully authorized to represent Contractor in all matters pertaining to the work of this contract. All communications and agreements with the Superintendent shall be binding upon Contractor. The Superintendent shall be acceptable to the University and shall continue in the capacity of Superintendent for the duration of the project unless the Superintendent ceases employment with Contractor or the University otherwise agrees. The Superintendent shall not be employed on any other project by the Contractor during the course of this project, unless approved by the University.
2. Work shall not occur on the site except under the direct supervision of the Superintendent. Failure to maintain a Superintendent on the Project site at all times that work is occurring will result in the issuance of a stop work notice by the University Representative. Any schedule impact resulting from said stop work order shall be the responsibility of the Contractor; no additional costs for delay will be due Contractor, nor will assessment of liquidated damages be suspended to account for the work stoppage.

1.7 SPECIAL PROJECT REQUIREMENTS

- A. No Special Project Requirements.

1.8 PROTECTION OF WORK

- A. Protect the Work from theft, vandalism, and unauthorized entry. The Contractor shall have the sole responsibility for job site security.
- B. During Off-Work Hours. During all hours that Work is not being prosecuted, furnish such watchman's services as Contractor may consider necessary to safeguard materials and equipment in storage on the Project site, including Work in place and in process of fabrication, against theft, acts of malicious mischief, vandalism, and other losses or damages.

1.9 OWNER-FURNISHED/CONTRACTOR-INSTALLED PRODUCTS

- A. Owner-Furnished/Contractor-Installed (OFICI) Products: University will furnish, for installation by Contractor, products which are identified on the Drawings and in the Specifications as "OFICI (Owner-Furnished/Contractor-Installed)", "installed by General Contractor," or similar terminology. See Drawings for identification of such products.
- B. Relationship to Work under the Contract: Work under the Contract shall include all provisions necessary to fully incorporate such products into the Work, including, as necessary, fasteners, backing, supports, piping, conduit, conductors and other such provisions from point of service to point of connection, and field finishing, as shown on Drawings and specified herein.

1.10 PERMITS, LICENSES AND FEES

- A. Permits, Licenses and Fees, General: Refer to Contract General Conditions.
- B. Licenses: Contractor shall obtain and pay all licenses associated with construction activities, such as business licenses, contractors' licenses and vehicle and equipment licenses. All costs for licenses shall be included in the Contract Amount.
- C. Parking Fees: Contractor shall obtain and pay for all parking permits and fees for vehicles parked off of the Construction Site. Refer to Section 01 55 00, Vehicular and Pedestrian Controls for additional parking requirements.

1.11 PARTNERING

- A. The Trustees intend to encourage the foundation of a cohesive partnership with the Contractor and its Subcontractors, the Architect and its consultants, and the Trustees. This partnership will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objectives are effective and efficient Contractor performance, intended to achieve completion within budget, on schedule, and in accordance with the Contract Drawings and Specifications.

END OF SECTION

DATE _____

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SECTION 01 14 00

WORK RESTRICTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. The following subjects are included in this section.

1. Submittals
2. Work Plans
3. Contractor's use of Premises
4. Contractor's Use of Project Area
5. Time Restrictions
6. Noise and Vibration Restrictions
7. University's use of Site and Premises

1.3 SUBMITTALS

- A. Submit each Work Plan for review and approval a minimum of 21 calendar days prior to the start of construction in areas affecting University operations. Participate in review of proposed Work Plan with the Construction Manager, Architect and University. Within 7 calendar days after joint review, submit revised Work Plan
- B. Format/Submittal Requirements
 1. Contractor's Work Plans shall be in the form of marked-up drawings, sketches and/or original drawings that clearly convey the nature and location of Contractor's planned activities. Drawings shall be supplemented by written descriptions of the work. Work Plans shall be submitted in written narrative form where deemed adequate by the Construction Administrator to fully describe construction activities, impacts and protectionary measures.
 2. Work Plans shall be submitted in accordance with the requirements of Section 01 33 00.

1.4 WORK PLANS

- A. Contractor shall submit comprehensive written work plans for all activities affecting University operations, including but not limited to, the following:
 1. Barricade and Fencing locations.
 2. Haul routes.
 3. Routing of vehicular and pedestrian traffic around specific construction area(s).
 4. Utility shutdowns/tie-in to existing utilities.
 5. Disabled access routes.

6. Fire Department access to University buildings.
 7. Vehicular traffic access to buildings.
 8. Parking spaces impacted.
 9. Construction site and contractor parking access.
 10. Large equipment access (cranes, loaders, backhoes, etc.)
 11. Work within pedestrian thoroughfares and campus roads.
 12. Work within the inner-Campus area.
- B. The Work Plans shall be used to communicate Project impacts to the campus community.
- C. Contractor shall cooperate with the University to minimize conflicts and facilitate University operations.
1. Off-hours and weekend work may be required for existing utility shutdowns and other work of major impact to the University. No additional costs shall be paid by the University due to this requirement.

1.5 CONTRACTOR'S USE OF PREMISES (Also refer to Contract General Conditions)

- A. General
1. Contractor shall at all times conduct the work so as to impose no hardship on the Trustees or others engaged in the Trustees' work nor cause any unreasonable delay or hindrance thereto.
 2. Construction activities will be scheduled to minimize disruption to the University and to Campus users.
 3. The Contractor may not interrupt any Campus utilities without prior written permission from the Trustees. Requests for utility shutdowns shall be submitted a minimum of 7 calendar days in advance of the requested shutdown date in writing to the Construction Administrator.
- B. Surrounding Site Condition Survey
1. Prior to commencing the work, the Contractor and the University Representative shall tour the Project Site together to examine and record damage to existing buildings, landscape, hardscape and other improvements, both on and adjacent to the project site. The documentation shall be turned over to the University within 21 days of receiving Notice to Proceed. The Site Survey and Acceptance Form (# 702.08) shall accompany this submittal.
 2. The resulting record shall serve as a basis for determination of subsequent damage due to Contractor's operations and shall be signed parties involved in the tour. Any damage to existing improvements not noted in the original survey, but subsequently discovered, shall be reported to the University Representative immediately.
- C. Protection of Existing Structures and Utilities (also refer to Contract General Conditions)
1. Locate all known existing utility installations before proceeding with construction operations that may cause damage to such installations. The existing utilities shall be protected and maintained in continual service at the Contractor's expense. Where existing utilities cross or are adjacent to the work of this contract, the Contractor shall notify the University Representative a minimum of 48 hours in advance of commencement of work. The Contractor shall locate the existing

- utility(s) by hand digging; repair of damage to existing utility(s) shall be at the Contractor's expense.
2. In the event that undocumented existing structures or utilities are encountered, the Contractor shall immediately notify the University Representative and request direction concerning how to proceed with the work.
 3. Should the Contractor damage any existing structure or utility, the Contractor shall take immediate action to ensure the safety of both persons and property.
 4. Contractor shall visit existing building(s) and grounds and thoroughly familiarize itself with existing conditions. Existing record drawings are available for Contractor review at Cal Poly Humboldt's FacilitiesLink WebSite:
<https://humboldt.metabim.com/login/Welcome.htm>
 5. Contractor shall include all necessary pipe offsets, fittings, etc. as required to complete the work in the base bid. No additional costs due to the Contractor's failure to survey existing conditions and review available record drawings will be allowed.
 6. Contractor shall note all utility items (utility meters, junction boxes, valve boxes, post indicator valves, manhole covers, etc.) at or above grade in the vicinity of the project site prior to commencing with trenching operations. These items indicate the presence of underground utilities in the area that shall be located and kept in continual service. This requirement shall apply regardless of inclusion of these utilities on existing record documents.
 7. When cutting, removal or alteration of existing work is required to form connections with new work or otherwise to meet the requirements of the contract documents, perform such work so as not to damage the work that will remain in place. Refer to Sections 01 35 00 and 01 73 29 for cutting, patching and repair requirements.
 8. Contractor shall provide all necessary materials, equipment, and labor to adequately protect existing structures, floors, architectural finishes, utilities, landscape, and hardscape that may be impacted by the work of this contract.
 - 9.

D. Allowable Work Schedule

1. Normal construction activities shall be performed Monday through Friday between the hours of 7:00 am and 6:00 pm, excluding holidays.
2. Shutdown of existing utilities or other activities which impact Campus operations shall be scheduled in advance with the University Representative in accordance with paragraph 1.4-A-3 above and shall be scheduled during off-hours at the discretion of the University and at no additional cost to the University.
3. Contractor shall submit an "Off-hours Work Schedule Request Form" (attached) a minimum of 72 hours prior to any anticipated weekend or holiday work. A form must also be submitted for work outside of normal working hours. The form to be utilized is included at the end of this section.

E. Site Decorum

1. Contractor is to control the conduct of labor forces and prevent unwanted interaction initiated by workers with the University staff, students or other individuals other than those associated with the project.
2. In the event that any worker initiates unwanted interaction, utilizes profanity, or (in the opinion of the University Representative) conducts him/herself in an offensive or unprofessional manner, the Contractor shall immediately remove the

worker from the project and replace said worker with another of equivalent technical skill at no additional cost to the University.

3. No smoking is allowed on the University Campus. Reference the University Smoke and Tobacco Free Environment Systemwide Policy: <https://policy.humboldt.edu/eo-1108-policy-systemwide-smoke-and-tobacco-free-environment>
4. No radios, other than 2-way communication type, shall be allowed on the project site.
5. Contractor shall provide an ANSI Class II - Heavy Duty Safety Vest and Hard Hat for every employee, every subcontractor, every sub-tier subcontractor, and subcontractor employee working on-site. Vests are not optional. Failure to comply with this requirement may result in a \$500.00 credit per person per day to the University via credit change order. Contractor shall maintain an adequate supply of vests and hard hats on site at all times.

F. University Keys

1. Contractor shall provide a written request to the University for keys to existing facilities. Upon completion of work, contractor shall return all keys back to the University. If the Contractor fails to return a key, a lost key fine shall be charged for the actual cost of re-keying campus locks up to a maximum of \$5,000 per building.
2. Site fences shall be locked with the University standard lock in order to allow the University 24-hour access for maintenance and inspection, or response to an emergency condition. Should Contractor wish to use a different lock, it shall be double locked with the University standard lock at all times that the site is secured.

1.3 CONTRACTOR'S USE OF PROJECT AREA

- A. Location of Work: The Work shall be accomplished within areas indicated on Drawings as Project Area or, if not indicated, to areas as directed by University's Representative. Use of other areas, including parking areas, shall be subject to approval by University's Representative. Refer to Section 01 55 29 - Construction Staging Areas and Section 01 55 00 - Vehicular and Pedestrian Controls for additional requirements.
1. Contractor shall not unreasonably encumber the site with materials or equipment.
 2. Contractor shall assume full responsibility for protection and safekeeping of products stored on the premises.
 3. Contractor shall move any stored products which interfere with operations of University or contractors performing work under separate contracts for University.
 4. Temporary closures or restrictions of use of public thoroughfares, necessary to accomplish the Work, shall be made only as approved in advance by public safety and parking authorities having jurisdiction, as directed in writing by the University's Representative.
- B. Unless otherwise specified or indicated on the Drawings, during the construction period the Contractor shall have full use of the designated Project Area for construction operations, including use of the site. Contractor's use of Project Area shall be limited only by University's right to perform construction operations with its own forces or to employ separate contractors on portions of the Project in accordance with the Contract General Conditions.
- C. Continued Use of Existing Building: Maintain existing building in a weather tight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.

D. Cooperation with Others:

1. The Contractor shall at all times cooperate with, coordinate the Work with and provide access to the University, University Contractors, and buildings operating in the vicinity of the Project Site to the extent necessary for the Work and ongoing operations at the University may progress in an orderly manner. The Contractor shall implement measures to minimize disruption to ensure the Contractor's actions and methods of operation will not result in interference with ongoing operations at the University. The Contractor shall have no claim against the University as result of these other activities. If Contractor's Work causes disruption to ongoing campus operations, Contractor shall work irregular hours and/or implement other measures, at the Contractor's expense, to avoid any disruption to ongoing University operations.
2. The Contractor agrees and acknowledges that the Work of the Project is to be completed within an operating University, and that University operations and construction activities by others will be in progress at the Work Site during the course of this Contract.
3. The Contractor shall coordinate construction activities with the Construction Manager to minimize interference with all parties concerned.

E. Protection of Existing Improvements and Facilities: Contractor shall protect property adjacent to the Project Area and all existing improvements and facilities within the Project Area, including paving and landscaping indicated to remain.

1. All existing improvements and facilities, except those specifically indicated for removal or reconstruction shall be protected with temporary barriers, enclosures, and passageways.
2. After completion of Work, existing improvements and facilities shall be restored to original condition and location. Project Area shall be cleaned and restored to presentable condition, equivalent to or better than the condition prior to start of Work.
3. Should existing improvements and facilities be damaged or soiled beyond renovation or repair, new products shall be provided by Contractor equivalent to existing products, as directed by University's Representative.

F. Project Area Access: Limit access to site to indicated routes and access points as identified. If routes and access points are not indicated, access shall be as approved and as directed by University's Representative. Do not restrict access to adjacent facilities and do not restrict access for those performing work under separate contracts for University.

1. Access to and egress from Project Area shall be in strict conformance to prearranged routes approved by University's Representative, with the understanding that curtailment of construction traffic or revision of access routes may be required on short notice if University's operations mandate such changes because of excessive noise or problems of safety, service, or supply.
2. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to service and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

G. Emergency Access: Provide pathways, drives, gates, directional signage, and other prov

isions as required by authorities having jurisdiction for emergency access to Project Area and adjoining campus facilities.

- H. Emergency Egress: Maintain all pathways, drives, gates, and other means of egress during construction as required by public safety authorities having jurisdiction.

1.4 TIME RESTRICTIONS

- A. Contractor's Work Hours: Work shall be limited to Monday through Friday, except University-observed holidays and periods when classes are not in session, during hours of 7:00am to 6:00pm.
 - 1. Work on other days and at other hours shall be only with written approval of University's Representative.
 - 2. Work during final exam periods at ends of class sessions shall be restricted to minimize noise, vibrations and other distracting and inhibiting activities.
 - 3. If it becomes necessary to perform Work on weekends and holidays, in order to meet milestone and final completion dates, Work shall be performed at no change in Contract Amount unless authorized by written Change Order or Field Instruction by the Construction Administrator.
- B. Utility Outages and Shutdown: Schedule utility outages and shutdowns to nights, weekends, school holidays or times and dates acceptable to and approved by University's Representative. University to approve shutdown of utility services during normal business hours
 - 1. Time and duration of outages and shutdowns shall not hinder normal campus activities except as authorized in writing by University's Representative.
 - 2. Provide seven 7 calendar days' notice in writing to University's Representative of all utility outages and shutdowns. Describe Work to be performed, which utilities will be interrupted and time and duration of interruption.
 - 3. Contractor shall provide temporary utilities to occupied facilities and adjacent properties when utilities must be interrupted for more than two hours, unless otherwise directed by University's Representative.
 - 4. Power interruptions beyond the authorized time shall be subject to liquidated damages in the amount of \$5,000 per day.
 - 5. Refer also to requirements for temporary utilities specified in Section 01 51 00, Temporary Utilities.

1.5 NOISE AND VIBRATION RESTRICTIONS

- A. Noise Restrictions: Minimize noise from construction activities. Limit loud construction activities to times when classes are not in session in adjacent spaces.
- B. Vibration Restrictions: Do not perform activities that cause vibrations in adjacent occupied spaces, including spaces above and below location where Work is performed. If vibrations transmit through structure, perform Work at times when University activities are not being conducted.

1.6 UNIVERSITY'S USE OF SITE AND PREMISES

- A. University's Use of Site and Premises: University reserves the right to occupy and to place and install equipment in completed or partially completed areas of buildings and site. Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.

1. Full University Occupancy: University will occupy site and existing buildings during entire construction period. Cooperate with University during construction operations to minimize conflicts and facilitate University usage. Perform the Work so as not to interfere with University's operations.
2. Partial University Occupancy: University reserves the right to occupy and to place and install equipment in completed areas of building provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.
3. Before University occupancy, mechanical, electrical, and fire safety systems shall be fully operational, and required tests and inspections shall be successfully completed. Any occupancy of a building is contingent upon a certificate of temporary or final occupancy provided by the Office of State Fire Marshal. Unless otherwise agreed, University will provide operation and maintenance of mechanical and electrical systems in portions of the building used by University. Unless otherwise agreed in writing by the University, warranty periods shall not begin until date established by Notice of Completion filed at Contract closeout.
4. Upon occupancy, University will assume responsibility for maintenance and custodial service for occupied portions of building.

END OF SECTION

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SECTION 01 22 00

UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Administrative and procedural requirements for unit prices when specified or indicated on the bid proposal form.

1.3 RELATED SECTIONS

- A. Section 01 45 00 - Quality Control: General testing and inspecting requirements, including those tests and inspections based on unit prices.

1.4 DEFINITIONS

- A. Unit Price: An amount proposed by Bidder and stated on the Bid Proposal as a price per unit of measurement for materials or services that will be added to or deducted from the Contract Sum by Change Order in the event the estimated quantities of Work required by the Contract Documents are increased or decreased.

1. Unit prices quoted in the Bid Proposal are for additions or deletions of approved items of Work.
2. All unit prices quoted shall be for the items completely installed, furnished, and operable in accordance with the Contract Documents, and shall include profit, overhead, taxes, cost of coordinating the unit price work with adjacent work, compensation for risk of loss or damage to the work regardless of cause, all expenses due to delays in performance, so they are the complete price to the University.
3. Unit prices shall not apply to work the Contractor elects to do for its own convenience or to correct errors committed by the Contractor.
4. All unit prices shall remain in effect for the full term of the Contract.
5. Quantities listed in the Contract Documents are approximate only. Contract Amount shall be adjusted by change order using unit prices listed for actual quantities of Work performed.

1.5 PROCEDURES

- A. Measurement and Payment Procedures: As stated in General Conditions of the Contract. Refer to individual product Specification Sections for Work that requires establishment of unit prices. Basis of each unit price is specified in those Sections.
 1. Measure: University reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this Work measured, at University's expense, by an independent surveyor.

2. Unit Prices are for various units of work to be added to or deducted from the quantities required for the Work as indicated and specified.
3. Unit Prices will be exercised as a right of the Trustees and shall remain in effect until Notice of Completion. Assume no change in time for performance of the Contract, unless provided in Change Order.
4. The Trustees retain the right to reject the quoted unit price. Changes in quantity and time will be made an item of a Change Order.
5. When accepted, coordinate related work, and modify surrounding work as required to accommodate the units listed below.
6. Contractor shall be responsible to determine the unit price quantities of material required, and to have it verified by the inspector prior to submitting a claim for a contract adjustment. Geotechnical Engineer to monitor and determine final length.
7. Unit prices shall not apply to work the Contractor elects to do for its own convenience or to correct errors committed by the Contractor.

B. The Trustees are not obligated to use the unit prices.

PART 2 - PRODUCTS

Not Applicable to this Section.

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

- A. Unit Price No. [*Number_*]: [*Title_*].
 2. Description: [*Unit_Price_Description_*], according to Section [*Number_*] - [*Title_*].
 3. Unit of Measurement: [*Description_*].

END OF SECTION

SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes Administrative and procedural requirements for Alternates.
 - 1. Acceptance or rejection of each Alternate is at discretion of the Trustees. None, any, or all Alternates may be accepted or rejected by the Trustees in order of precedence.
- B. Requirements and descriptions for products and scopes of Work identified as Alternates in the Drawings and Specifications and listed as "Bid Alternative "on the Bid Proposal Form.
- C. Included in this Section: non-technical descriptions of Alternates listed by number only on the Bid Proposal.
- D. Included in other Sections: technical specifications for work revising or adding/deducting from Base Bid work by Alternates.
- E. Unless otherwise specifically provided, the work described in Alternates shall be completed with no increase in Contract Time.
- F. The additional cost or credit for each Alternate shall represent the total adjustment to the contract sum associated with said Alternate.
- G. Refer to the Bid Proposal Form for information concerning order of acceptance of alternates.
- H. All labor, material, equipment, accessories, and incidental items required for a complete installation shall be included, whether or not specifically mentioned as part of the Alternate. Contractor shall perform necessary modifications or adjustments to affected adjacent work, whether new or existing, in order to fully and properly integrate the Alternate work into the Project. These necessary modifications and adjustments shall be included in the Alternate

1.3 QUALITY ASSURANCE

- A. The Base Bid specifications shall govern work of Alternates unless otherwise noted.

1.4 GENERAL REQUIREMENTS FOR ALTERNATES

- A. Coordination:
1. Determine the full effect on the Work of implementing each Alternate, including coordination, modification or adjustment of portions of the Work. Contract Amount included on the Bid Form for each Alternate includes the cost for all work required to incorporate the Alternate.
 2. To enable University to compare total costs where alternative materials and methods might be used or where scope of Work might be altered, Bid Alternate Work items have been established as described in this Section.
 3. Unless otherwise noted, Alternates will be accepted in the order listed until the Construction Budget is reached.
- A. Contract Amount included in Base Bid and as stated in executed Agreement shall include all costs for Work described in Contract Documents.
- C. Bid Proposal Form or other means prescribed for submission of proposed cost of Work shall include line items for each Alternate described in this Section. No Alternates other than as described in this Section shall be submitted, except in accordance with product options and substitutions provisions specified in Section 01 25 00, Substitution Procedures.
- D. Each Alternative is identified herein by number. This identification shall be used whenever referring to Work described in Alternate and when submitting cost proposals and payment requests.
- E. Alternative construction described in Alternates and revised scopes of Work shall be performed only when such Alternate is made a part of the Work by specific provision in the University-Contractor Agreement, if selected by University prior to execution of the Agreement, or by Change Order or Change Directive if selected subsequent to execution of the Agreement.

- F. Costs for Alternates shall be valid for no less than *[insert appropriate no. of days (30, 60, 90?)]* calendar days from date of Notice to Proceed and University may select any or all Alternates during that time. Once an Alternate is selected and the Contract modified for Work as described in the Alternate, changes to return to original scope of Work will be made only by Change Order or Change Directive in accordance with provisions of the Contract General Conditions for changes.

MAKE THIS PROJECT SPECIFIC

PART 2 - PRODUCTS AND EXECUTION

2.1

- A. If University elects to proceed on the basis of one or more of the described Alternates, Contractor shall make all modifications to Work as required to provide products complete, in place and fully functional, including all labor, equipment, services and incidental consumables necessary to apply, install and finish Work described in Alternate in accordance with requirements specified in related product Sections of these Specifications.

- B. Cost for Alternates shall be complete and include all net increases and decreases in Contract Amount for Work described in Alternate and for all changes in related Work. No claims for additional costs to University will be honored other than as stated in cost proposal for each Alternate.

2.2 SCHEDULE OF ALTERNATES [*THIS SECTION TO BE MODIFIED BY CAMPUS AS REQUIRED*]

- A. Additive Alternate Bid No. 1 - [*Title*].
 - 1. Base Bid condition: [*Brief Description*].
 - 2. Alternate Bid condition: [*Brief Description*].
 - 3. Location in contract documents [*Spec Section and / or Drawing Sheet No.*]
- B. Additive Alternate Bid No. 2 - [*Title*].
 - 1. Base Bid condition: [*Brief Description*].
 - 2. Alternate Bid condition: [*Brief Description*].
 - 3. Location in contract documents [*Spec Section and / or Drawing Sheet No.*]
- A. Deductive Alternate Bid No. 1 [*Title*].
 - 1. Base Bid condition: [*Brief Description*].
 - 2. Alternate Bid condition: [*Brief Description*].
 - 3. Location in contract documents [*Spec Section and / or Drawing Sheet No.*]

END OF SECTION

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SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. General requirements applicable to substitutions of materials, products, equipment and systems.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by Contractor after award of Contract are considered to be requests for substitutions. Following are not considered to be requests for substitutions:
 - 1. Substitutions requested during bidding period, and accepted by Addendum prior to award of Contract, are included in Contract Documents and are not subject to requirements specified in this Section for Substitutions.
 - 2. Revisions to Contract Documents requested by University Representative or Architect.
 - 3. Specified options of products and construction methods included in Contract Documents.
 - 4. Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.4 SUBSTITUTION OF MATERIALS AND EQUIPMENT

- A. Substitutions, General: Catalog numbers and specific brands or trade names are used in materials, products, equipment and systems required by the Specifications to establish the standards of quality, utility and appearance required. Alternative products which are of equal quality and of required characteristics for the purpose intended may be proposed for use provided the Contractor complies with provisions of Supplementary General Conditions and Contract General Conditions, subject to the following provisions.
 - 1. See Section 01 60 00 - Product Requirements for requirements regarding product options.
 - 2. Substitutions will only be authorized by properly executed Change Order or Field Instruction.
 - 3. Product and Material Substitution period will end 35 days after issuance of NTP. The University has no obligation to entertain substitutions.

1.5 SUBMITTALS

- A. Requests for substitutions will not be considered before selection of Contractor. Substitutions will not be considered when:
1. Indicated on shop drawings or product data submittals without separate formal "Substitution Request by the Contractor.
 2. Requested directly by subcontractor or supplier.
 3. Acceptance will require revision of Contract Documents.
 4. Proposed changes are not in compliance with general intent of Contract Documents.
- B. Requests for substitutions will be considered only as allowed in the Supplementary General Conditions and Contract General Conditions. Other requests will be considered after Notice to Proceed only when:
1. Specified product or method of construction cannot be provided within Contract Time. Architect or University Representative will not consider request if product or method cannot be provided as result of failure to pursue Work promptly or coordinate activities properly.
 2. Subsequent information or changes indicate specified product will not perform as intended.
 3. Requested substitution offers University substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities University must assume. University's additional responsibilities include compensation to Architect for redesign and evaluation services, compensation to University Representative for additional processing and evaluation services, increased cost of other construction by University, and similar considerations.
 - a. University Representative and Architect's time shall be compensated as specified for compensation of time in paragraph 01 25 00-H-3-a.
 4. Specified product or method of construction cannot receive necessary approval by governing authority, and requested substitution can be approved.
 5. Specified product or method of construction cannot be provided in manner that is compatible with other materials and where Contractor certifies that substitution will overcome incompatibility.
 6. Specified product or method of construction cannot be coordinated with other materials and where Contractor certifies that proposed substitution can be coordinated.
 7. Specified product or method of construction cannot provide warranty required by Contract Documents and where Contractor certifies that proposed substitution provides required warranty.
- C. Do not order or install substitute products without written acceptance from the University.
- D. Only 1 request for substitution for each product will be considered. When substitution is not accepted, provide specified product.
- E. Architect will determine acceptability of substitutions.
- F. Submit 2 copies of each request to Architect through University Representative on Substitution Request Form at end of Section. Submit separate form for each substitution.
1. Identify products by Specification Section and Article numbers.
 2. Provide manufacturer's name and address, trade name of products, and model or catalog number.
 3. List fabricators and suppliers as appropriate.
 4. Document each request with complete data substantiating compliance of proposed substitution with requirements of Contract Documents including independent laboratory

testing reports, approval numbers, listings, and approved assembly descriptions as requested by Campus Construction Manager or Architect, or as required by agencies having jurisdiction.

5. Attach product data as specified in Section 01 33 00.
6. Give itemized comparison of proposed substitution with specified product, listing variation, and reference to Specification Section and Article numbers.
7. Give quality and performance comparison between proposed substitution and specified product.
8. Submit written certification from manufacturer that proposed substitution is appropriate for this application.
9. List availability of maintenance services and replacement materials.
10. State effect of substitution on construction schedule, and changes required in other Work or products.

G. By making requests for substitutions, Contractor:

1. Represents that Contractor has personally investigated proposed substitute product and determined that it is equal to or superior in all respects to that specified.
2. Represents that Contractor will provide same warranty for substitution that Contractor would for the specified product.
3. Will coordinate installation of accepted substitute, making such changes as may be required for Work to be compatible with substrates and adjacent materials, and complete in all respects.
4. Waives claims for additional time related to substitution that may later become apparent.
5. Certifies that cost data presented is complete and includes related costs under this Contract, including redesign costs, and waives claims for additional costs related to substitution which may later become apparent.

H. Modification of Documents: Where substitution requires changes to design of Work as indicated on accepted Shop Drawings for proper installation; furnish drawings and specifications prepared by and bearing seal of licensed Architect and Architects as appropriate, revising Shop Drawings.

1. Submit revised Documents for acceptance in accordance with Section 01 33 00.
2. Revised Drawings shall be sufficiently complete for proper installation of substitution and related Work.
 - a. Include details of connection to and relationship with adjacent materials.
3. If, in Architect's sole judgment, proposed substitution is of such significance or deals with product or system affecting basic design or aesthetics, pay Architect for changes required to Contract Documents as follows:
 - a. Reimburse Owner for Architect's account for time spent in changing Contract Documents at rate of 3.2 times rate of Direct Personnel Expense (DPE). Direct Personnel Expense is defined as direct salaries of Architect's personnel engaged on Project and portion of costs of mandatory, and customary contributions and benefits related thereto, including employment taxes and other statutory employee benefits, insurance, sick leave, holidays, vacations, pensions, and similar contributions and benefits.
4. Contractor is responsible for cost of revised Documents, obtaining and paying for review and plan check by authorities having jurisdiction, and cost of revised construction.
5. Submit revised drawings with Record Documents in accordance with Section 01 78 39.

1.6 SUBMITTAL PROCEDURES

- A. Architect's and University Representative's Action: If necessary, Architect through University Representative will request additional information or documentation for evaluation within 1 week of receipt of request for substitution. Architect will notify Contractor of acceptance or

rejection of substitution within 2 weeks of receipt of request, or 1 week of receipt of additional information or documentation, whichever is later. Acceptance will be in form of Change Order, should a change in Contract cost or time be associated with the substitution.

1. Architect or University Representative will not make exhaustive attempt to determine products proposed for substitution are equivalent to, or can be modified in order to be equivalent to specified products.
 - a. Where extensive investigation is required by University Representative or Architect, as determined by University Representative or Architect, Contractor shall reimburse University for University Representative's or Architect's account for time spent in processing additional resubmittals at rate of 3.2 times rate of Direct Personnel Expense (DPE). Direct Personnel Expense is defined as direct salaries of Architect's or University Representative's personnel engaged on Project and portion of costs of mandatory, and customary contributions and benefits related thereto, including employment taxes and other statutory employee benefits, insurance, sick leave, holidays, vacations, pensions, and similar contributions and benefits.
 2. Use product specified if Architect and University Representative couldn't make decision on use of proposed substitute within time allocated.
 3. If accepted by Architect and University Representative, products proposed for substitution are accepted subject to modifications by manufacturer, if necessary, to meet detailed requirements of Drawings and Specifications.
- B. For Accepted Products: Submit shop drawings, product data, and samples in accordance with Section 01 33 00.
- C. Contractor's submittal, and Architect's and University Representative's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with Contract Documents do not constitute acceptable or valid request for substitution, nor do they constitute approval.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 26 13

REQUESTS FOR INTERPRETATION (RFI)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Procedures for submitting requests for interpretation (RFI).
- B. Limitations on use of RFI to obtain interpretation and clarification.

1.3 RELATED SECTIONS

- A. Section 01 31 13 - Coordination: Requirements for organizing and coordinating the Work.
- B. Section 01 31 26- Electronic Communications Protocol
- B. Section 013 33 00 - Submittal Procedures: Restriction on use of submittals for changes in materials, products, equipment and systems.
- C. Section 01 60 00 – Product Requirements: Procedures for requesting substitutions of materials, products, equipment and systems.

1.4 DEFINITIONS

- A. Request for Interpretation: A document submitted by the Contractor requesting clarification of a portion of the Contract Documents, hereinafter referred to as an RFI.

1.5 CONTRACTOR'S REQUESTS FOR INTERPRETATION (RFIs)

- A. Contractor's Requests for Interpretation (RFIs): Should Contractor be unable to determine from the Contract Documents the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of Work is described differently at more than one place in the Contract Documents; the Contractor shall request that the Architect make an interpretation of the requirements of the Contract Documents to resolve such matters. Contractor shall comply with procedures specified herein to make Requests for Interpretation (RFIs).
- B. Submission of RFIs: RFIs shall be prepared and submitted electronically on a form provided by the Contractor and approved by the University Representative.
 - 1. Forms shall be completely filled in and submitted via an Electronic Project Management (EPM) System agreed upon by the University Representative.
 - 2. Each RFI shall be given a discrete, consecutive number.
 - 3. Each page of the RFI and each attachment to the RFI shall bear the University's project name, project number, date, RFI number and a descriptive title.
 - 4. Contractor shall sign all RFIs attesting to good faith effort to determine from the Contract Doc

uments the information requested for interpretation. Electronic signatures are acceptable and subject to authentication. Frivolous RFIs shall be subject to reimbursement from Contractor to University for fees charged by Architect, Architect's consultants and other design professionals engaged by the University.

- C. Subcontractor-Initiated and Supplier-Initiated RFIs: RFIs from subcontractors and material suppliers shall be submitted through, be reviewed by and be attached to an RFI prepared, signed and submitted by Contractor. RFIs submitted directly by subcontractors or material suppliers will be returned unanswered to the Contractor.
 - 1. Contractor shall review all subcontractor- and supplier-initiated RFIs and take actions to resolve issues of coordination, sequencing and layout of the Work.
 - 2. RFIs submitted to request clarification of issues related to means, methods, techniques and sequences of construction or for establishing trade jurisdictions and scopes of subcontracts will be returned without interpretation. Such issues are solely the Contractor's responsibility.
 - 3. Contractor shall be responsible for delays resulting from the necessity to resubmit an RFI due to insufficient or incorrect information presented in the RFI.
- D. Requested Information: Contractor shall carefully study the Contract Documents, in particular, the Contract General Conditions, to ensure that information sufficient for interpretation of requirements of the Contract Documents is not included. RFIs that request interpretation of requirements clearly indicated in the Contract Documents will be returned without interpretation.
 - 1. In all cases in which RFIs are issued to request clarification of issues related to means, methods, techniques and sequences of construction, for example, pipe and duct routing, clearances, specific locations of Work shown diagrammatically, apparent interferences and similar items, the Contractor shall furnish all information required for the Architect or University's Representative to analyze and/or understand the circumstances causing the RFI and prepare a clarification or direction as to how the Contractor shall proceed.
 - 2. If information included with this type RFI by the Contractor is insufficient, the RFI will be returned unanswered.
- E. Unacceptable Uses for RFIs: RFIs shall not be used to request the following:
 - 1. Approval of submittals (use procedure specified in Section 01 33 00 - Submittals Procedures)
 - 2. Approval of substitutions (refer to Section 01 60 00 - Product Requirements)
 - 3. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Contract General Conditions)
 - 4. Different methods of performing Work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Contract General Conditions).
- F. Disputed Requirements: In the event the Contractor believes that a clarification by the University's Representative results in additional cost or time, Contractor shall comply with the Contract General Conditions.
- G. RFI Log: Contractor shall prepare and maintain a log of RFIs, and at any time requested by the University's Representative, the Contractor shall furnish copies of the log showing all outstanding RFIs.
- H. Review Time: Architect will return RFIs to Contractor and University's Representative within 14 calendar days of receipt. RFIs received after 5:00 pm shall be considered received on the next regular working day for the purpose of establishing the start of the 14 calendar day response period.

PART 2 - PRODUCTS

Not Applicable to this Section.

PART 3 - EXECUTION

Not Applicable to this Section.

END OF SECTION

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SECTION 01 31 13

PROJECT COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Requirements for Project Coordination and electrical and mechanical coordination or "tight" conditions involving Work under Contract.

1.3 RELATED SECTIONS

- A. Section 01 11 00 - Summary of the Work: Various types of Work to be coordinated, including Owner-Furnished/Contractor-Installed products and work under separate Contracts.
- B. Section 01 60 00 - Product Requirements: Coordination of products, especially general requirements for system completeness and product substitutions.

1.4 COORDINATION

- A. Coordination, General:
 - 1. Coordinate the Work according to provisions stated in Contract General Conditions. Do not delegate responsibility for coordination to any subcontractor.
 - a. Anticipate the interrelationship of all subcontractors and their relationship with the total work.
 - b. Resolve differences or disputes between subcontractors and materials suppliers concerning coordination, interference, or extent of work between sections. The Contractor's decisions, if consistent with the Contract Documents, shall be final. The Architect is not required to coordinate work between sections and will not do so.
 - c. Coordinate the work of subcontractors and material suppliers, so that their work is performed in a manner to minimize interference with, and to facilitate the progress of the work.
 - d. Provide detailing for a complete project.
 - 2. Coordinate Work under the Contract with work under separate contracts by University.
 - 3. Coordinate utility and building services shutdowns and closures of vehicular and pedestrian thoroughfares, including access to buildings and parking areas, to minimize disruption of University activities.
 - 4. Be responsible for providing anchorage, blocking, joining and other detailing as required to provide complete project.
 - 5. Do not obstruct spaces required by Code in front of electrical equipment, access doors, etc.
 - 6. Do not cover any Work (piping, wiring, ducts, etc.), until properly inspected and approved.
 - 7. Remove and replace any and all Work under any Section which is not in accordance with the Contract Documents with other materials and Work which is in conformance with the Con

tract Documents. Repair or replace all other Work damaged by these operations at no increase in contract price.

8. This work shall be coordinated with all associated Work in a manner that will ensure that all work will be accomplished as rapidly as the progress of the project will permit and so that no work will be delayed for want of associated work.
 - B. Coordination of OFCI Products: Contractor shall cooperate with University and others as directed by University's Representative in scheduling and sequencing the incorporation into the Work of Owner Furnished/Contractor Installed (OFCI) products identified in the Contract Drawings and Specifications.
 - C. Relationship of Contract Documents: Drawings, Specifications and other Contract Documents in the Project Manual are intended to be complementary. What is required by one shall be as if required by all. What is shown or required, or may be reasonably inferred to be required, or which is usually and customarily provided for similar work, shall be included in the Work.
 - D. Discrepancies in Contract Documents: In the event of error, omission, ambiguity or conflict in Drawings or Specifications, Contractor shall bring the matter to attention of the Architect in a timely manner during the bidding period, for determination and direction by the Architect in accordance with provisions of the Contract General Conditions.
 - E. Construction Interfacing and Coordination: Layout, scheduling and sequencing of Work shall be solely the Contractor's responsibility.
 1. Contractor shall verify, confirm and coordinate field measurements so that new construction correctly and accurately interfaces with conditions existing prior to construction.
 2. Contractor shall bring together the various parts, components, systems and assemblies as required for the correct interfacing and integration of all elements of Work. Contractor shall coordinate Work to correctly and accurately connect abutting, adjoining, overlapping and related elements, including work under separate contracts by University, utility agencies and companies.
- 1.5 COORDINATION OF SUBCONTRACTS AND SEPARATE CONTRACTS
- A. Superintendence of Work: Contractor shall appoint a field superintendent and a project manager, who shall directly, and full time supervise and coordinate all Work of the Contract.
 - B. Subcontractors, Trades and Materials Suppliers: Contractor shall require all subcontractors, trades, crafts and suppliers to coordinate their portions of Work with the Contractor's field superintendent to prevent scheduling, sequencing, dimensional and other conflicts and omissions.
 - C. Coordination with Work under Separate Contracts: Contractor shall coordinate and schedule Work under the Contract with work being performed for Project under separate contracts by University, serving utilities and public agencies. Contractor shall make direct contacts with parties responsible for work of the Project under separate contracts, in order to provide timely notifications and to facilitate information exchanges.
- 1.6 SUBMITTALS
- A. Coordination Documents: Coordinate shop drawings, diagrams and other specified in various product Sections of the Contract Specifications. Submit coordination drawings and schedules as specified below, prior to submitting shop drawings, product data, and samples.

PART 2 - PRODUCTS

Not Applicable to this Section.

PART 3 – EXECUTION

3.1 COORDINATION REQUIRED

- A. Coordinate progress schedules, including dates for submittals and for delivery of products.
- B. Conduct meetings with suppliers, installers and others concerned with the Work, to establish and maintain coordination of layout, sequencing and completion of various elements of Work.
- C. Conduct meetings with installers and others concerned with the Work, to properly integrate various mechanical and electrical systems, to facilitate construction and to provide proper access and work space for maintenance, renovation and improvement of system components. Include participation by representatives of University, including maintenance personnel.
- D. Assist in resolution of conflicts by providing technical advice, coordination drawings and three dimensional representations of integrated system components, including computer and physical models as necessary.
- E. At construction progress meetings, report on progress of Work to be adjusted under coordination requirements and any necessary changes in sequencing and scheduling of Work.
- F. Transmit minutes of coordination meetings and reports to University's Representative, Architect, Architect's consultants (as applicable) and to meeting participants.

3.2 COORDINATION OF SUBMITTALS

- A. Field Conditions: Contractor shall verify field dimensions and clearances and relationship to available space and anchoring provisions. Report conflicts in writing to the Architect and the University's Representative.
- B. Product Characteristics: Contractor shall:
 - 1. Review the effect of changes in one element of the Work of other elements of the Work. Identify conflicts and report conflicts in written and graphic form to the Architect and the University's Representative.
 - 2. Verify information provided in maintenance and operating instructions and coordinate preparation of maintenance and operation data. See Section 01 78 23 - Operation and Maintenance Data.

3.3 COORDINATION OF SUBSTITUTIONS AND MODIFICATIONS

- A. Review of Proposed Substitutions: See Section 01 25 00- Substitution Procedures. Product Substitution Contractor shall review Contractor's proposals and requests for substitution prior to submission to Architect.

- 1. Contractor shall verify compliance with Contract Documents and shall certify compatibility with

h other elements of the Work, including proper integration with building structure, load limitations, operating and maintenance space and accessibility provisions, and suitability for available building services, including plumbing and electrical power and signal systems.

2. Contractor shall prepare and submit recommendation for action regarding proposals, including identification of related changes in other elements of the Work.

3.4 SYSTEM AND EQUIPMENT START UP

A. Observations of System and Equipment Activation and Start-Up: Contractor shall observe activation and start-up of systems and equipment, including all Work specified in with connections to utilities, building services and controls.

1. Contractor shall verify that utilities, building services and control systems are properly connected, complete and functional within criteria of manufacturer and criteria indicated in the Contract Documents.
2. Contractor shall verify that activated elements are properly anchored and that operating components operate properly according to the component's intended design.
3. Contractor shall verify that activated elements of the Work are in operable condition according to normal operating characteristics required by the manufacturer and the Contract Documents.
4. Should adjustments be necessary to activated elements, Contractor shall advise the Architect and University's Representative of necessary actions and shall observe that proper actions are performed to achieve required operating characteristics.

B. Observations of System and Equipment Demonstrations: Contractor shall observe performance demonstrations including equipment demonstrations to Architect and University's Representative. Record times and additional information required for operation and maintenance manuals.

C. Documentation of Observations of Activation, Start-Up, Adjustment and Demonstration: Contractor shall keep written record of activation, start-up, operational tests and inspections and necessary adjustments and re-tests and re-inspections.

1. Documentation shall include record of time and date of activation, start-up, operational tests and inspections and shall include measured results of tests and inspections.
2. Documentation shall be submitted to University's Representative and Architect.

3.5 INSPECTION AND ACCEPTANCE OF EQUIPMENT

A. Contract Completion Review:

1. Prior to Contract Completion review, Contractor shall verify that each component and system is ready for operation and use.

END OF SECTION

SECTION 01 31 19

PROJECT MEETINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 REQUIREMENTS INCLUDED

- A. Preconstruction meeting.
- B. Construction progress meetings.
- C. Pre-installation conferences.
- D. Change Order review meetings
- E. Monthly Progress Payment Meetings
- F. Contract Closeout Meeting

1.3 RELATED REQUIREMENTS

- A. Section 01 45 00 - Quality Control: General requirements for construction quality, to be reviewed at construction progress meetings.
- B. Section 01 32 00 - Construction Progress Documentation: General requirements for construction progress reports, to be reviewed at construction progress meetings.
- C. Section 01 33 00 - Submittal Procedures: Status of submittals to be reviewed at construction progress meetings.
- D. Section 01 77 00 - Contract Closeout Procedures: Contract Completion Review.

1.4 PRECONSTRUCTION MEETING

- A. Preconstruction Meeting: University's Representative will administer a preconstruction meeting immediately prior to Contractor mobilization onto the project site.
 - 1. Representatives of the Trustees, the Contractor, selected Subcontractors, Architect (attending virtually), and OTHER campus representatives, as appropriate, will attend.
- B. Schedule: Schedule preconstruction meeting within five days of construction start date established in the Notice to Proceed.
- C. Location: Preconstruction meeting will be held at a location as directed by the University's Representative.

D. Agenda: Preconstruction meeting shall cover the following topics as a minimum.

1. Special Project Procedures: Site access restrictions, if any, and requirements to avoid disruption of operations at adjoining facilities. Present University's requirements for use of premises.
2. Designation of Key Personnel: The Trustees, Architect, and Contractor shall designate key personnel and provide a name and address list that includes the following.
 - a. The Trustees: The University Representative, Inspector of Record, and others authorized to act in certain capacities for the University.
 - b. Architect: Principal and Project Administrator as appropriate.
 - c. Contractor: Project Manager and Superintendent.
 - d. Major subcontractors (as required): Principal/Project Manager and Superintendent.
 - e. Major materials suppliers (as required): Contact person.
3. Subcontractors List: Distribute and discuss list of subcontractors and suppliers.
4. Coordination: Review requirements for Contractor's coordination of Work. Review sequence and schedule for work being performed for University under separate contracts. Discuss coordination of construction to minimize impacts on continuing Campus operations.
5. Project Communication Procedures: Review administrative requirements for written and oral communications.
6. Construction Schedule: Distribute and discuss preliminary schedule, initial baseline construction schedule and critical work sequencing of major elements of Work, including coordination of Owner-Furnished/Contractor-Installed (OFICI) products and work under separate contracts by serving utility agencies and companies and University.
7. Campus and Site Security: Review requirements for Contractor to develop and implement site security.
8. Safety Program: Review requirements for Contractor to develop and implement safety program in compliance with Contract General Conditions, the Owner Controlled Insurance Program (OCIP), and OFS required site safety plan.
9. Site Access by University's Representative and Architect: Review requirements and administrative procedures Contractor may wish to institute for identification and reporting purposes.
10. Permits and Fees: Review Contract requirements and review schedule and process for obtaining permits and paying fees.
11. Project Layout: Review requirements for laying out of Work, including surveying requirements.
12. Construction Facilities: Designate storage and staging areas, construction office areas and parking areas and review site access requirements.
13. Temporary Utilities: Requirements for establishing and paying for temporary water, power, lighting and other utility services during construction, including metering and allowances. Refer to Section 01 51 00 - Temporary Utilities.
14. Construction Progress Schedules: Review requirements for preparation and submittal of updating of construction progress and submittals schedules.

15. Payment Procedures: Review requirements for preparation and submission of applications for progress payments and for final payment.
16. Change Procedures: Review requirements and administrative procedures for Change Orders, Field Instructions and Contractor's Requests for Interpretation (RFI).
17. Submittals Administration: Review administrative procedures for shop drawings, product data and samples submittals and review of preliminary Submittals Schedule.
18. Materials and Equipment: Review substitution or equal product requirements; review schedule for major equipment purchases and deliveries; review materials and equipment to be provided by University (OFCI products).
19. Testing and Inspection: Review tests and inspections to be performed by the following.
 - a. Independent testing and inspection agencies.
 - b. Manufacturers and installers.
 - c. Service utilities and public agencies.
 - d. Authorities having jurisdiction (i.e.: State Fire Marshal, Health Dept., etc.).
20. Operation and Maintenance Data: Format and content of operation and maintenance manuals. Refer to Section 01 78 23 - Operation and Maintenance Data.
21. Instruction of University's Personnel: Review requirements and scheduling of instruction of personnel specified for Demonstration and Training and in various Sections in Divisions 2 through 33 of the Specifications.
22. Starting and Adjusting Procedures: Review requirements of starting and adjusting operating components. Refer to Section 01 75 00 - Starting and Adjusting.
23. Project Record Documents: Review requirements and procedures for preparing, reviewing and submitting project record drawings and specifications.
24. Construction Cleaning: Review requirements for progress and final cleaning specified in Section 01 74 00 - Cleaning Requirements.
25. Contract Closeout: Review requirements specified in Section 01 77 00 - Contract Closeout Procedures, including procedures for filing of Notice of Completion, final payment and submittals.

1.5 CONSTRUCTION PROGRESS MEETINGS

- A. Construction Progress Meetings: Meetings will be held to review progress and quality of construction. The essence of the discussion of each meeting shall be entered into the written record (minutes) of the meeting by the University Representative designee.
- B. Schedule: Construction progress meetings shall be periodically scheduled throughout progress of the Work. Frequency shall be as determined necessary for progress of Work. Generally, it is intended that construction progress meetings be held at weekly intervals.
- C. Administration: The University's Representative shall make physical arrangements for meetings. The University's Representative shall prepare agenda with copies for participants, preside at meetings, record minutes and distribute copies within two working days to Architect, Contractor, participants and those affected by decisions made at meetings (these duties may be shared with the University's Representative or their designee and shall be determined at the preconstruction meeting). Each dis

cussion item at construction progress meetings shall be numerically identified and carried through subsequent meeting minutes until resolved.

D. Attendance: Contractor's project manager and jobsite superintendent shall attend each meeting. Contractor's subcontractors and suppliers may attend as appropriate to subject under discussion. University's Representative will attend each meeting. Architect shall attend virtually.

E. Suggested Agenda for Each Construction Progress Meeting:

1. Meeting Minutes: Review and correct, if necessary, minutes of previous meeting.
 - a. Unless published minutes are challenged in writing prior to the next regularly scheduled progress meeting, they will be accepted as properly stating the activities and decisions of the meeting.
 - b. Persons challenging published minutes shall reproduce and distribute copies of the challenge to all indicated recipients of the particular set of minutes.
 - c. Challenge to minutes shall be settled as priority portions of "old business" at the next regularly scheduled meeting.
2. Progress of the Work: Since last meeting and proposed progress.
 - a. Identify potential problems which might impede progress.
 - b. Develop corrective measures and procedures, including but not necessarily limited to additional manpower to regain planned schedule.
 - c. Review three-week "look ahead" construction schedule (current week plus two weeks ahead), including identification of conflicts and delays.
3. Ordering Status: Review status of long-lead time equipment and materials delivery affecting construction progress.
4. RFI Status: Review status of Requests for Interpretation (RFI) status.
5. Submittals Status: Review shop drawings, product data and samples submission and review status.
6. Contract Modifications: Pending Change Orders and Field Instructions. Review status of proposed substitutions.
7. Old Business: Active discussion topics carried over from previous meetings.
8. New Business: New topics of discussion affecting construction progress and quality.
9. Quality Control: Review maintenance of quality standards and identification of non-conforming Work, including proposed remedial measures to be taken by Contractor.
10. Project Record Documents: Status of project record drawings and specifications.
11. Environmental and Safety Issues.
12. Other items affecting progress and quality of the Work.

F. Meeting Time and Location: As mutually agreed by the Architect, the Contractor, and the University's Representative at on-site location.

G. Special Meetings: As necessary, the Architect, the Contractor, or the University's Representative may convene special meetings to discuss specific construction issues in detail and to plan specific activities.

1.6 PRE-INSTALLATION CONFERENCES

CAL POLY HUMBOLDT
SIEMENS HALL ROOF REPAIR – XPL311
LPAS Project No.: 1485-0004

PROJECT MEETINGS
01 31 19 - 4

- A. Pre-Installation Conferences: When specified in individual product specification Sections, convene a pre-installation conference prior to commencing Work specified in individual product Sections.
1. Require attendance by representatives of firms whose activities directly affect or are affected by Work specified in the Section.
 2. Review conditions of installation, preparation and installation procedures and coordination with related Work and work under separate contracts.
 3. Distribute written notice of agenda, meeting time, and location a minimum of 4 calendar days in advance.
 - a. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 2. Contract Documents.
 3. Options.
 4. Related Change Orders.
 5. Review of mockups.
 6. Possible conflicts.
 7. Compatibility problems.
 8. Time schedules.
 9. Weather limitations.
 10. Manufacturer's written recommendations.
 11. Installation procedures.
 12. Warranty requirements.
 13. Compatibility of materials.
 14. Acceptability of substrates.
 15. Testing and inspecting requirements.
 16. Required performance results.
 - b. Record significant conference discussions, agreements, and disagreements.
 - c. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

1.7 CHANGE ORDER REVIEW MEETING

- A. Subsequent to the weekly project meeting, a Change order review meeting shall be held to discuss in detail the status of all project change documents. The Contractor, University Representative and Architect (as necessary) shall be in attendance. The following items shall be reviewed at this meeting:
1. Cost Request Bulletins (both previously issued and necessary for progress of construction).
 2. Change Orders.
 3. Contractor Change Order Requests.
 4. Field Instructions (both previously issued and necessary for progress of construction).

1.8 MONTHLY PROGRESS PAYMENT MEETING

- A. A meeting shall be conducted by the University Representative each month prior to Contractor's submission of the Payment Application. This meeting shall be held subsequent to the regular project meeting which precedes the required date for submission of the Payment Application.
1. Each line item of the payment application shall be reviewed to confirm agreement with the

stated percentage complete for the specific item of work. The University Representative will advise Contractor of percentages which are not acceptable and will red-line a copy of the draft payment application indicating necessary revisions required in order for processing of the payment application.

2. The Contractor shall make necessary revisions in accordance with the red-line comments provided by the University Representative prior to official submission of the payment application.

1.9 CONTRACT CLOSEOUT MEETING

- A. Contract Closeout Meeting: As specified in Section 01 77 00 - Closeout Procedures.
- B. Approximately four (4) to six (6) weeks prior to the scheduled completion of the Project, for the convenience of the contractor, the University Representative will include in the standard meeting agenda a Project Close-out meeting.

The purpose of the close-out meeting is to produce an action list of major items required to be completed prior to the issuance of the Notice of Completion.

1. The action list shall assign an action responsibility and a projected action completion date to each item.
2. The contractor shall be solely responsible for the timely completion of all required close-out items.
3. Items to be considered include:
 - a. Punch list
 - b. O & M manuals
 - c. HVAC Balance Report
 - d. Spare Parts/Materials
 - e. Keys/Keying
 - f. Warrantees
 - g. As-built Drawings and Specifications
 - h. As-built Schedule
 - i. State Fire Marshal Inspection
 - j. Elevator Inspection
 - k. Other Required Regulatory Inspections
 - l. Removal of Temporary Facilities
 - m. Final Cleaning and Pest Control
 - n. Landscape Maintenance
 - o. Commissioning/Equipment Startup
 - p. Acceptance
 - q. Notice of Completion
 - r. Final Payment
 - s. Occupancy

PART 2 - PRODUCTS

Not applicable to this Section.

PART 3 - EXECUTION

Not applicable to this Section.

END OF SECTION

SECTION 01 31 26

ELECTRONIC COMMUNICATIONS PROTOCOL

PART 1- GENERAL

1.1 DESCRIPTION

- A. This Section is in addition to the Contract General Conditions.
- B. The Contractor shall be required to use an Electronic Project Management (EPM) system for electronic construction management document control and communications between the University, Architect of Record, other project-related consultants, and the Contractor (aka the Project team). Unless otherwise designated by the University, the system will be maintained and owned by the Contractor but operated collaboratively by the Project Team. The EPM that the Contractor chooses shall be approved by the University. The Contractor shall be responsible for training the members of the Project team on how to use the EPM at no additional costs to the contract.
- C. The Contractor shall be primarily responsible for the scanning, uploading, and logging of all electronic documents for the project as indicated below.
- D. The Contractor shall provide personnel and equipment as required by their employees to electronically submit all necessary documents.
- E. The EPM system shall contain the following information which shall be made available by the Contractor for the project team:
 - 1. Submittal Information (shop drawings, product data, etc.) and Logs
 - 2. Requests for Information and Logs
 - 3. Inspection Requests / Reports
 - 4. Non-Compliance Inspection Reports
 - 5. Project Photographs
 - 6. Project Meeting Minutes
 - 7. Project FTP Site
 - 8. Contract Documents (including specifications, drawings, reference materials, sketches, ASIs, etc.)
 - 9. Other Documentation as determined by the University's Representative and the Project team.
- F. All Request for Information (RFIs) and Inspection Requests shall be submitted by the Contractor to the University electronically through the EPM.
- G. The University will NOT accept faxed and/or handwritten documentation of RFIs, RFI Sketches, and/or Inspection Requests.
 - 1. The Contractor shall be solely responsible for data entry via the chosen EPM Website for the generation of RFIs.

2. The Contractor shall be solely responsible for the scanning of sketches / drawings as necessary for the electronic submittal and attachment of necessary information related to RFIs.
3. Contractor shall supply field personnel all necessary computer equipment necessary to enter RFIs and other documentation electronically.

H. Submittals shall be submitted via Section 01 33 00 Submittals.

1.2 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor shall have sufficient computer(s) with capabilities to access the EPM system at their on-site and off-site project offices. At the pre-construction meeting, the Contractor shall provide to the University's Representative the contact information (including email addresses) of all Contractor personnel that the Contractor chooses to provide coordination for the EPM system and information. At a minimum, this will include the Contractor's Project Engineer and/or other technical staff as required. These personnel shall have sufficient computer skills required to access the Internet and do basic trouble shooting of the EPM system. The Contractor shall provide training and technical support to the Project team personnel for use of the EPM system. The Contractor shall plan on an average of 4-hours training for each of the Project team personnel who will be using the system. Having the above capability in place onsite is a condition precedent to processing the Contractor's first payment request.

1.3 OFFICIAL RECORDS

- A. The documentation and records maintained on the EPM system will be the "Official Records" for the project (not including as-builts created by the Architect). At the conclusion of the project all records shall be made available via Adobe "pdf" and/or other electronic filing methods approved by the University Representative for import/export.

END OF SECTION

SECTION 01 32 00

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Section Includes:
 - 1. Requirements for CPM schedules and associated reports.
 - 2. Requirements for Contractor Work Plans.

1.3 CPM CONSTRUCTION SCHEDULES AND REPORTS

- A. General: Comply with the Contract General Conditions.
- B. Submittals:
 - 1. Initial Construction Schedule
 - 2. Submit a "Draft" 3-Week Look-ahead Schedule at the Pre-construction Meeting.
 - 3. Within 30 calendar days after issuance of Notice to Proceed, Contractor shall submit a detailed Initial Construction Schedule that includes all construction activities, from Notice to Proceed through Project completion.
 - 4. Within 15 calendar days, the Construction Administrator will review the Initial Construction Schedule and provide comments.
 - 5. Contractor shall revise the Initial Construction Schedule in accordance with University comments and resubmit within 15 calendar days. Upon approval by the University, the schedule shall be designated as the Contract Construction Schedule.
 - 6. No change to the content or CPM logic of the Contract Construction Schedule shall be made by Contractor without prior approval by the Construction Administrator.
- C. Schedule Updates
 - 1. The Contract Construction Schedule shall be updated and submitted monthly in accordance with the Contract General Conditions.
- D. The updated Contract Construction Schedule shall accurately represent the as-built condition of all completed and in-progress work activities as of the schedule data date.
 - 1. The Contract Construction Schedule shall use activity codes that allow for logical summarization of like activities. A Summary Schedule of not less than 20 activities shall be submitted monthly with the detailed Contract Construction Schedule.
 - 2. Prior to preparing the first update of the approved Contract Schedule, Contractor shall designate the approved Contract Schedule as the baseline, or "target schedule". All

schedule updates shall include the original (i.e. target) information, including start dates, finish dates, durations, successors, predecessors, etc. for each activity. The actual progress for each activity shall be shown directly below the target bar.

3. Monthly submittals shall include the following items.
 - a. Schedule electronic files
 - b. Detailed network diagram (D size)
 - c. Summary schedule (8-1/2" x 11")
 - d. Detailed bar chart graphics (8-1/2"x 11")
 - e. Tabular reports (8-1/2" x 11")
 - f. A 3-week look-ahead schedule (current week plus two weeks forward), derived directly from the Contract Construction Schedule, shall be updated and submitted for review during each weekly progress meeting. The 3-week look-ahead schedule shall be a sub-network of the Contract Construction Schedule; hand drawn schedules, marked-up versions of previous schedules, or schedules generated using alternate scheduling software will not be accepted.

E. Basic Requirements of Contractor's Scheduling System

1. The Contract Construction Schedule shall be prepared, updated and maintained using the latest version of Primavera Project Planner for Windows (or equal). Should Contractor request the use of an alternate scheduling software system, a formal Request for Substitution shall be submitted in accordance with section 01 25 00. Should the University approve use of an alternate system, Contractor shall be required to provide one legally licensed copy of the software to the Construction Administrator, as well as necessary training in the use of the system, at no additional cost.
2. The system shall be operated by on-site personnel at terminals located in Contractor's site office. On-site management shall be capable of using the system to address all project activities and resources on a real time interactive basis, and capable of rapidly evaluating alternative means and methods in response to job conditions and as required to optimize project management. Contractor's scheduling system shall be capable of providing the following minimum on-site reporting functions:
 - a. Precedence Diagram Method (PDM) schedules
 - b. Progress reports in tabular formats
 - c. Network comparisons
 - d. Super and sub-networks
 - e. Resource reporting
 - f. Report writer allowing flexible formatting and summarization
 - g. Graphic output to a laser jet printer or full size plotting device

F. C.P.M. Schedule Format

1. Activities shall be coded in a logical manner to allow for sorting and grouping of like characteristics, including but not limited to such items as: phase, work shift, project area, activity type (i.e. submittal, agency review, const. activity, etc.), trade, etc.
2. Include activities and milestones as requested for work completed by University under separate contract, University furnished materials, move in, etc.
3. The schedule duration shall be calculated using Critical Path Method for the Initial Construction Schedule, Contract Construction Schedule, and all schedule updates.
4. Work activities shall be divided so that no schedule activity shall be less than 1 nor more than 30 calendar days.
5. A minimum of 5% of the schedule activities shall be designated as milestone activities.
6. Identify work days and non-work days on the schedule.

7. Contractor shall work in conjunction with each subcontractor and supplier to ensure that all relevant submittal, procurement, delivery and installation dates for the various trades are accurately represented in the Initial Construction schedule and each subsequent schedule update.
8. Contractor's Superintendent shall be integrally involved in production of the Initial Construction Schedule and each subsequent update.
9. Include activities for all project submittals as required under Section 01 33 00 and the technical specifications (Divisions 2 through 33).
10. Failure by Contractor to include any element of the work required for performance of the Contract shall not relieve Contractor of the obligation to complete the entire Work of the Contract in accordance with the Contract Completion Date.

G. Construction Analysis

1. The Contractor shall provide the University the following minimum information in the Initial Construction Schedule and subsequent Monthly Updates:
 - a. Activity identification code keyed to Summary and Detailed Construction Schedules.
 - b. Activity description
 - c. Status date and remaining duration
 - d. Activity duration
 - e. Early start/early finish and late start/late finish
 - f. Total float
 - g. Free float
 - h. Predecessor and successor activity for each individual activity
 - i. A listing of all constraints for each individual activity
 - j. A comparison between the current update and the Initial Construction Schedule (baseline schedule).
 - k. No more than 20% of the total project activities shall be critical or near critical (less than 5 working days of total float).
2. The Initial Construction Schedule and subsequent Monthly Schedule Updates shall include, but not limited to, the following major milestones:
 - a. NTP Date, mobilization, coordination review and detailing activities.
 - b. Submittal preparation by Contractor and review and approval by the Architect and Construction Administrator, including shop drawings, technical manuals and all other submittals. Contractor shall allow at least 21 calendar days for review of submittals.
 - c. Order, manufacture, fabrication, delivery and checkout of all long lead and major construction material.
 - d. Off-site improvements
 - e. Demolition of existing structures
 - f. Earthwork – excavation, backfill and compaction
 - g. Foundation
 - h. Structural – columns and beams, deck, roof
 - i. Masonry
 - j. Waterproofing
 - k. Elevator superstructure, support
 - l. Rough-outs – mechanical, plumbing, electrical, telecommunications, HVAC, fire-alarm, sprinkler system
 - m. Exterior finishes – walls, roof
 - n. Building Dried-In
 - o. Miscellaneous metals and equipment installation

- p. M/E/P finishes - mechanical, plumbing, electrical, telecommunications, HVAC, fire-alarm, sprinkler system, elevator motors
 - q. Elevator cabs
 - r. Interior drywall/plaster
 - s. Interior finishes – painting, flooring, finish cabinetry, hardware
 - t. Sitework – curbs, gutters, hardscape, roads
 - u. All utility interfaces
 - v. Landscaping
 - w. Punch List
 - x. Performance and acceptance testing
 - y. Contractor close-out documentation and training
 - z. Contractor punch list corrective work
 - aa. Final cleanup
 - bb. Identification of all holidays and non-working days.
3. The Contractor shall show all tasks and milestones applicable for the project. The Construction Administrator shall be the final arbitrator on the tasks and milestones that should be included in the Initial Construction Schedule and subsequent updates.

H. Submittal Schedule

1. The University Representative will provide a schedule of all required submittals at the Pre-construction Meeting. Contractor shall input anticipated submission dates for each submittal item. Within 21 calendar days after award of Contract, and before submitting items for review, submit 2 copies of the completed submittal schedule. The submittal numbers designated by University Representative shall be used for identification of all submittals.

I. Responsibility for Completion

1. Should any monthly or weekly update of the Contract Construction Schedule indicate that the critical path has been extended, thus impacting the Contract Completion Date, Contractor shall submit a written action plan for bringing the schedule into compliance with the Contract Completion Date. Contractor shall initiate corrective actions, as approved by the Construction Administrator, at no additional cost. These actions shall include, but not be limited to, one or more of the following:
- a. Increase construction manpower in certain or all trades in order to bring the completion date into compliance with Contract requirements.
 - b. Increase the number of labor shifts, working hours per shift, or working days per week as required to bring the completion date into compliance with Contract requirements.
 - c. Reschedule activities in order to achieve the maximum number of concurrent work activities.
 - d. Arrange and pay for acceleration of fabrication schedules for long lead material items.
 - e. Arrange and pay for alternate shipping or delivery methods in order to expedite material procurement.
2. Comments provided by the Construction Administrator concerning the Initial Construction Schedule, Contract Construction Schedule, or any schedule update shall not relieve Contractor from the responsibility for compliance with the entire requirements of the Contract Documents.

0.1 CONSTRUCTION PROGRESS REPORTS

- A. Daily Log: Contractor shall maintain a written daily log at the job site with the following information as a minimum:
1. Date.
 2. Weather conditions.
 3. Subcontractors and trades performing Work under the Agreement on the Site, and number of workers each and number of hours worked by each worker.
 4. Others on the Site performing work for University under separate contracts.
 5. List of visitors to site, giving name, company or agency affiliation and telephone number.
 6. Descriptions of situations and circumstances which could delay normal progress of Work or which could be basis of claim for change in Contract Time or Contract Sum.
 7. Changes to Work and who authorized changes.
 8. Comments as Contractor determines are appropriate for Project record.
 9. Reports shall include photos and/ or videos as needed to illustrate a particular circumstance more accurately.
- B. Submission of Logs: Submit one copy of daily logs to University's Representative and Architect at weekly intervals, for review at Construction Progress Meetings.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Administrative requirements
- B. Construction Progress Schedule Submittal
- C. Contractor's review of submittals.
- D. Architect's review of submittals.
- E. Product data submittals.
- F. Shop drawing submittals.
- G. Sample submittals.
- H. Manufacturer's Instructions
- I. Reports of results of tests and inspections.
- J. Operations and Maintenance Data submittals
- K. Certificates

1.3 RELATED SECTIONS

- A. Section 01 31 13 – Project Coordination
- B. Section 01 31 26 – Electronic Communications Protocol
- C. Section 01 45 00 - Quality Control: Test and inspection reports.
- D. Section 01 77 00 - Closeout Procedures: Submittals for occupancy, Acceptance and Final Payment.
- E. Section 01 78 23 - Operation and Maintenance Data: Requirements for preparation and submission.

1.4 DEFINITIONS

- A. Shop Drawings, Product Data and Samples: Instruments prepared and submitted by Contractor, for Contractor's benefit, to communicate to Architect the Contractor's understanding of the design intent, for review and comment by Architect on the conformance of the submitted information to the general intent of the design. Shop drawings, product data and samples are not Contract Documents. Drawings, diagrams, schedules and illustrations, with related notes, are specially prepared for the Work.

k of the Contract, to illustrate a portion of the Work.

- B. Product Data: Standard published information ("catalog cuts") and specially prepared data for the Work of the Contract, including standard illustrations, schedules, brochures, diagrams, performance charts, instructions and other information to illustrate a portion of the Work.
- C. Samples: Physical examples that demonstrate the materials, finishes, features, workmanship and other characteristics of a portion of the Work. Accepted samples shall serve as quality basis for evaluating the Work.
- D. Other Submittals: Technical data, test reports, calculations, surveys, certifications, special warranties and guarantees, operation and maintenance data, extra stock and other submitted information and products shall also not be considered Contract Documents but shall be information from Contractor to Architect to illustrate a portion of the Work for confirmation of understanding of design intent.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Administrative Requirements for Submittals: Submittals shall be made in accordance with requirements specified herein and in other Divisions of the Specifications. See also the Contract General Conditions for additional requirements; especially those regarding requests for alternatives or equals and for substitutions.
 - 1. All required submittals, with the exception of O&M manuals, close-out submittals, and mock-ups required to be installed concurrent with specific construction activities, shall be submitted within 90 calendar days after Notice to Proceed.
- B. Contractor Coordination of Submittals: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - a. The Architect will return without action submittals requiring coordination with other submittals until related submittals are coordinated.
- C. Submittal Log: Prior to proceeding with affected work, Contractor shall prepare and submit a Submittal Log, which lists submittal items per the product specifications for review and approval by University's Representative and Architect. Contractor shall allow seven (7) calendar days for Trustees review. Submittal Log shall identify all specified submittals to be made and shall serve as checklist for submittals.
 - 1. Maintain accurate submittal log for duration of Contract. Indicate current status of all submittals at all times. Submit log at progress meeting and as otherwise requested by University Representative or Architect.
 - 2. Format shall be suitable for Project and shall be subject to acceptance by University's Representative and the Architect. Comply with directions by University's Representative and the Architect for scope and format of Submittals List.
 - 3. Submittals list shall include the following submittal types and headings:
 - SD = Shop Drawings are required
 - PD = Product Data required
 - SA = Samples required
 - CO = Color samples required

- SS = Site Sample installations are required
LM = List of Materials
RD = Record Drawings required
CE = Certificates are required
PR = Manufacturer's instructions or specifications required
OM = Operation and Maintenance manuals are required
EQ = Maintenance materials/equipment are required
WA = Warranties and/or guarantees are required
LR = Laboratory Reports are required
FT = Factory Test reports are required
ST = Site Test reports required
RP = Submittal to the Architect for record purposes only and not for review or approval
O = Other submittal requirements as specified in Section

4. Sample Table:

Section	<u>SD</u>	<u>PD</u>	<u>SA</u>	<u>CO</u>	<u>SS</u>	<u>LM</u>	<u>RD</u>	<u>CE</u>	<u>PR</u>	<u>OM</u>	<u>EQ</u>	<u>WA</u>	<u>LR</u>	<u>FT</u>	<u>ST</u>	<u>RP</u>	<u>O</u>
05120	x					x											
09250		x			x	x		x					x		x		
10810		x	x														

- D. Transmission of Submittals: Submittals shall be processed electronically (with exceptions such as product and material samples or otherwise designated or approved by the University Representative). Transmit all submittals from Contractor to Architect via Electronic Project Management (EPM) system, unless otherwise directed, using a transmittal form for each one. Submittals received from sources other than the Contractor will be returned without action. Include all information specified below for identification of submittal and for monitoring of review process.
1. Architect will provide example Letter of Transmittal, if requested.
 2. Submittals shall be concurrently made available via EPM to University's Representative for review.
- E. Timing of Submittals: Make submittals sufficiently in advance of construction activities to allow shipping, handling and review by the Architect and Architect's consultants. Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
1. The Architect will make desired corrections and consolidate relevant Trustees comments within fifteen (15) calendar days and return the submittal to the Contractor via EPM system. Submittals, which require coordination with other submittals, may require more than fifteen (15) calendar days review time. Submittals that require selection of colors will be reviewed. Color selection may not be provided until all submittals requiring color selection have been received and reviewed, and color selections have been approved by the Trustees.
 2. Make corrections required by the Architect and submit via EPM system for final review and distribution.
 3. If an intermediate submittal is necessary, process the same as the initial submittal.
 4. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.
- F. Submittals Identification:
1. Provide a space on all submittals electronically approximately four-inches by five-inches on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken. Include the following information on the label for processing and recording action taken:

- a. Project name and Trustees project number
 - b. Submission date
 - c. Name and address of Architect
 - d. Name and address of Contractor
 - e. Name and address of subcontractor
 - f. Name and address of supplier
 - g. Name of manufacturer
 - h. Number and title of appropriate Specification Section
 - i. Drawing number and detail references, as appropriate.
 2. Identify each element on submittal by reference to Drawing sheet number, detail, schedule, room number, assembly or equipment number, Specifications article and paragraph, and other pertinent information to clearly correlate submittal with Contract Drawings. On the submittal transmittal form or separate sheet record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information submitted complies with requirements of the Contract Document. The Architect's review of such submittals or shop drawings or product data shall not relieve the Contractor of responsibility for deviations from the drawings or specifications.
 3. Identify each submittal by Specification Section number followed by a number indicating sequential submittal for that Section. Resubmittals shall use same number as original submittal, followed by a letter indicating sequential resubmittal. For example:

09 26 13-01-01 First submittal for Section 09 26 13 - Gypsum Veneer Plastering.
09 26 13-02-01 Second submittal for Section 09 26 13 - Gypsum Veneer Plastering.
09 26 13-02-02 Resubmittal of second submittal for Section 09 26 13 - Gypsum Veneer Plastering.
09 26 13-02-03 Second resubmittal of second submittal for Section 09 26 13 - Gypsum Veneer Plastering.
 4. Place a permanent label or title block on each submittal electronically for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
- G. Grouping of Submittals: Unless otherwise specifically permitted by the Architect, make all submittals in groups containing all associated items. The Architect may reject partial submittals as incomplete or hold them until related submittals are made.
- H. Unsolicited Submittals: Unsolicited submittals may be returned without being reviewed.
- I. Record Submittals: When record submittals are specified, submit in accordance with the Electronic Project Management System requirements. Record submittals will not be reviewed but will be retained for historical and maintenance purposes.
- J. Revisions: Revisions to original submittal list and schedule will only be accepted by University Representative and Architect when revisions are required by circumstances not reasonably anticipated by Contractor during preparation of original schedule. Submit revisions not later than 20 calendar days following the date that the need for revision became necessary.
- 1.6 CONSTRUCTION PROGRESS SCHEDULE SUBMITTAL
- A. Submit as specified in the Contract General Conditions under Schedule and Section 01 32 00 for Construction Progress Documentation.
- 1.7 CONTRACTOR'S REVIEW OF SUBMITTALS
- A. Contractor's Review of Submittals: Prior to submission to Architect for review, Contractor shall review each submittal for completeness and conformance to specified requirements. Contractor shall stamp each submittal

with a review action stamp and sign each copy of submittal. Submittals without stamp and signature will not be reviewed and will be returned. Electronic signatures are acceptable but will need to be authenticated during the submittal process. Contractor's submittal action stamp shall certify the following actions by Contractor:

1. Field measurements have been determined and verified.
2. Conformance with requirements of Contract Drawings and Specifications is confirmed.
3. Catalog numbers and similar data are correct.
4. Work being performed by various subcontractors and trades is coordinated.
5. Field construction criteria have been verified, including confirmation that information submitted has been coordinated with the work being performed by others for University and actual site conditions.
6. All deviations from requirements of Drawings and Specifications have been identified and noted.
7. Contractor shall certify that submittals have been reviewed and approved:

Stamp Submittals utilizing the following language:

"The undersigned certifies this submittal has been reviewed and approved with respect to the means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incidental thereto; and also warrants that this submittal complies with the Contract Documents and comprises no variation thereto.

Signature: _____ Date: _____
Name Printed: _____ Title _____
Contractor Name: _____

8. Submittals not certified by being stamped and signed by Contractor electronically will be returned without action, as will submittals which, in University Representative's or Architect's opinion, have not been adequately reviewed and coordinated by Contractor.
- B. Changes in Work: Changes in the Work shall not be authorized by submittal review actions. No review action, implicit or explicit, shall be interpreted to authorize changes in the Work. Changes shall only be authorized by separate written direction from the University Representative, in accordance with the Contract General Conditions.
- C. Allow sufficient review time so that installation will not be delayed as result of time required to process submittals, including time for resubmittals.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Coordinate transmittal of different types of submittals for related elements of Work so processing will not be delayed by need to review submittals concurrently for coordination.
 - a. University Representative and Architect reserve right to withhold action on submittal requiring coordination with other submittals until related submittals are received.
 3. Allow additional time if processing must be delayed to permit coordination with subsequent submittals.
 4. If intermediate submittal is necessary, process same as initial submittal.

5. Allow same time for reprocessing each submittal as allowed for processing original submittal.
 6. No extension of Contract Time will be authorized because of failure to transmit submittals to University Representative sufficiently in advance of Work to permit processing.
- D. Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to University Representative using Submittal Transmittal form attached at the end of this section.
1. Submittals received from sources other than Contractor will be returned without action.
 2. Number each submittal and resubmittal as indicated in approved Submittal Schedule.
 3. Submittals forwarded without a completed Submittal Transmittal form will be returned without review.
 4. Submittals shall be submitted electronically unless they are related to materials and products.
- 1.8 REVIEW OF SUBMITTALS BY UNIVERSITY'S REPRESENTATIVE AND ARCHITECT
- A. Review of Submittals by University's Representative and Architect: Submittals shall be a communication aid between Contractor and Architect by which interpretation of Contract Documents requirements may be confirmed in advance of construction.
1. Reviews by University's Representative, Architect and Architect's consultants shall be only for general conformance with the design concept of the Project and general compliance with the information given in the Drawings and Specifications.
 2. The Architect's review shall not be construed as an "approval," or to relieve the Contractor(s) and material suppliers of responsibility for errors or omissions in the submitted documents.
 3. Acceptance of a specific item does not include acceptance of the assembly of which the item is a component.
 4. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return promptly via EPM system.
- B. Review Action: Architect will stamp each submittal with a uniform, self-explanatory action stamp.
1. Stamp will be appropriately marked as follows to indicate the action taken:
 - a. Action 1 (no exception taken): Means fabrication, manufacture, or construction may proceed providing submittal complies with Contract Documents.
 - b. Action 2 (make corrections noted; no resubmission required): Means fabrication, manufacture, or construction may proceed providing submittal complies with Architect's notations and Contract Documents. (Note: If Contractor cannot comply with notations, make revisions and resubmit.)
 - c. Action 3 (make corrections noted; submit corrected copy): Means fabrication, manufacture, or construction may proceed; however, submittal did not fully demonstrate full extent of all conditions, details and coordination with other surrounding work and therefore requires additional information and rework as noted. Resubmit shop drawings for final Action 1 or 2. Should Contractor proceed with fabrication, manufacturing or construction, it shall do so at its own risk.
 - d. Action 4 (rejected, revise and resubmit): Means submittal does not comply with design intent of Contract Documents. Do not use submittals stamped Action 3. Make revisions and resubmit.
 - e. Action 5 (rejected, submit specified item): Means submittal varies from specified item or system specified in Contract Documents and is not

acceptable for use on the project. Do not use submittals stamped Action 4. Make revisions and resubmit.

- f. Action 6 (resubmit with related assembly items): Means submittal of related assembly item(s) are required in conjunction with the submittal for proper review.
- g. Action 7 (rejected; incorrect transmittal): Means the Submittal Transmittal form specified for use on the Project was not included, incomplete, or incorrectly completed.
- h. Action 8 (No Action): Means documents have not been reviewed by Architect and submittal is returned to Contractor for several possible reasons: submittal not requested, submittal not complete, submittal not coordinated, or submittal bears no resemblance to design intent.
- i. Action 9 (submitted to consultant for review): This code is for the use of the Architect to indicate routing to various A/E consultants. Any submittals marked Action 6 by Architect will be returned to Contractor without review.
- j. Record Submittals: Specifications require certain information and calculations be submitted for record purposes only. Such submittals will not be acted upon, stamped or returned to Contractor.

- 2. Do not permit submittals marked "Rejected, Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress.
- 3. Note: Any work performed prior to receiving a fully approved submittal shall be done at the Contractor's risk and shall be subject to being replaced if Contract requirements are not met.

C. Contract Requirements:

- 1. Review actions by Architect and Architect's consultants shall not relieve the Contractor from compliance with requirements of the Contract Drawings and Specifications.
 - a. Acceptance of submittals with deviations shall not relieve Contractor from responsibility for additional costs of changes required to accommodate such deviations.
 - b. Deviations included in submittals without prior acceptance will be considered an exception from review of submittals whether noted or not on returned copy.
- 2. No review action, implicit or explicit, shall be interpreted to authorize changes in the Work. Changes shall only be authorized by separate written Change Order or Field Instruction, in accordance with the Contract General Conditions.
- 3. When professional certification of performance criteria of materials, systems or equipment is required by Contract Documents, University Representative and Architect shall be entitled to rely upon accuracy and completeness of such calculations and certifications.
- 4. Notations by University Representative or Architect which increase contract cost or time of completion shall be brought to University Representative's and Architect's attention before proceeding with Work.

D. Resubmittals:

- 1. Subject to same terms and conditions as original submittal.
- 2. University Representative and Architect will accept not more than one resubmittal.
 - a. Should additional resubmittals be required, Contractor shall reimburse Trustees for University Representative and Architect's accounts for time spent in processing additional resubmittals at rate of 3.2 times rate of Direct Personnel Expense (DPE). Direct Personnel Expense is defined as direct salaries of University Representative's and Architect's personnel engaged on Project and portion of costs of mandatory, and customary contributions and

benefits related thereto, including employment taxes and other statutory employee benefits, insurance, sick leave, holidays, vacations, pensions, and similar contributions and benefits.

1.9 PRODUCT DATA SUBMITTALS

- A. Product Data: Catalog cuts, photographs, illustrations, standard details, standard schedules, performance charts, material characteristics, color and pattern charts, test data, roughing-in diagrams and templates, standard wiring diagrams and performance curves and listings by Code authorities and nationally-recognized testing and inspection services. Where product data must be specially prepared because standard manufacturer data is not suitable for use, submit according to requirements for shop drawings specified below.
- B. Modifications to Standard Product Data: Modify manufacturer's standard catalog data to indicate precise conditions of the Project.
 1. Provide space for review action stamps and, if required by authorities having jurisdiction, license seal of Engineer and/or design consultant, if applicable.
 2. Mark each copy to show applicable choices and options. Where manufacturer's product data includes information on several products, some of which are not required, mark copies to highlight applicable information.
 3. Include the following information:
 - a. Manufacturer's literature with recommendations,
 - b. Compliance with recognized trade association standards,
 - c. Compliance with recognized testing agency standards,
 - d. Application of testing agency labels and seals,
 - e. Notation of dimensions verified by field measurement,
 - f. Notation of coordination requirements,
 - g. Environmental Product Declaration (EPD)'s information.

Environmental Product Declaration: Independently verified document created and verified in accordance with International Organization for Standardization (ISO) 14025 for Type III environmental declarations that identifies the global warming potential emissions of the facility- specific material or product through a product stage life cycle assessment.

The legislation was introduced as Assembly Bill (AB) 262. It targets the embedded carbon emissions of certain construction materials used in public works projects. AB 262 requires that these materials have a global warming potential that falls below a limit set by the Department of General Services.

The following materials or products are subject to the Buy Clean California Act, and shall have EPD's submitted for all products listed below:

Material or product	Material specifications: CSI Uniformat
Carbon steel rebar	Section 03 20 00, "Bar Reinforcement"
Structural steel	Section 05 12 00, "Structural Steel"
Flat glass	Section 08 80 00, "Glazing"
Mineral wool board insulation	Section 07 21 13.19 "Mineral Board Insulation"

4. Do not submit product data until compliance with requirements of the Contract Documents has been

n confirmed.

5. Proceed with installation only using reviewed copy of product data with appropriate action stamp as indicated in Section 1.8 B1 above. Do not permit use of unmarked copies of product data in connection with construction.
- C. Copies: Submit electronic copies of catalog pages with applicable data highlighted and cross-referenced to Drawings and Specifications requirements. Paper copies will not be acceptable unless specifically authorized by the University Representative. Distribution of approved submittals shall be electronic unless otherwise noted.

1.10 SHOP DRAWINGS SUBMITTALS

- A. Shop Drawings: Drawings, diagrams, schedules and other graphic depictions to illustrate fabrication and installation of a portion of the Work. Shop Drawings shall include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
1. Identification of products and materials included
 2. Compliance with referenced standards
 3. Notation of coordination requirements
 4. Dimensions
 5. Notation of dimensions established by field measurement.
- B. Coordination: Show all field dimensions and relationships to adjacent or critical features of Work.
- C. Preparation of Shop Drawings: Prepare and submit electronically newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.
1. Provide space for review action stamps and, if required by governing authorities having jurisdiction, license seal of Architect and Architect's design consultant, if applicable.
 2. Prepare shop drawings submitted in electronic format that shall be printable on minimum sheet size of 17-inches by 22-inches, or smaller if a multiple of 8-1/2 inches by 11-inches. Maximum size shall be 30-inches by 42-inches.
 3. Except as otherwise approved by the University Representative, submit all shop drawings electronically using the Contractor's Electronic Project Management system.
 4. Do not use Shop Drawings without an appropriate final review stamp indicating action taken in connection with construction.
- D. Distribution of Reviewed Shop Drawings: Electronic distribution of reviewed shop drawings will be by Contractor and must be stamped by the Architect.

1.11 SAMPLE SUBMITTALS

- A. Samples: Full-size, fully-fabricated samples cured and finished as specified and physically identical with the material or product proposed. Samples shall include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.
1. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to include the following:

- a. Project name and location
 - b. Manufacturer and supplier.
 - c. Name, finish, and composition of material.
 - d. Location where material is to be used.
 - e. Specification Section number.
 - f. Submittal number.
 - g. Contractor's review stamp.
 - h. Space for Architect's review stamp.
 - i. Compliance with recognized standards
 - j. Availability and delivery time.
 2. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
 3. Submit actual samples. Photographic or printed reproductions will not be accepted.
 4. Field samples specified in individual Sections are special types of samples. Field samples shall be full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be evaluated.
- B. Preliminary or Selection Submittals: Where samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit full set of choices for the specified material or product.
1. Preliminary submittals will be reviewed and returned with the Architect's mark indicating selection and other action.
- C. Quantity: Except for samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit three sets. One sample will be returned marked with the action taken.
1. Maintain sets of samples, as returned, at the Project site, for quality comparisons throughout the course of construction.
 2. Unless otherwise noted, full-size and complete samples will be returned and may be incorporated into field mock-ups. Samples may be incorporated into the Work (completed construction) only with written approval of the Architect and the University Representative in advance of sample preparation.
 3. Other samples shall be produced and mounted on cardstock in 8-1/2" by 11" format, three-hole punched and suitable for inclusion in product sample binders. Contractor shall provide binders as directed.
 4. Contractor shall prepare and distribute additional samples to subcontractors, manufacturers, fabricators, suppliers, installers, and others as necessary for performance of the Work.
 5. Accepted samples will form standard of comparison for finished Work. Defects and deviations in excess of those in accepted samples, are unacceptable and are subject to rejection of completed Work.
- D. Color Samples: Architect will review and select colors for Project only after all colors are received, so that colors may be properly coordinated.
- 1.12 MANUFACTURER'S INSTRUCTIONS
- A. Manufacturer's Instructions: Submit manufacturer's instructions for preparation, mixing, assembly, handling, application and installation of products, as applicable and as specified in product sections of the Specifications.

1. Include applicable ICBO ES Evaluation Reports. Evaluation Reports shall be current and shall be annotated for applicable products.
 2. Include applicable Safety Data Sheets (SDS), for Project record only.
 3. Include written recommendations, as applicable, from manufacturer for Project conditions.
 4. Identify conflicts between manufacturers' instructions and Contract Documents.
- B. Copies: Electronic distribution will be required. If requested and agreed to by the University Representative, copies may be distributed as necessary.
- C. Reviews by Architect and University's Representative: Manufacturer's instructions shall be for information and will not be reviewed by Architect or University's Representative.
- 1.13 REPORTS OF RESULTS OF INSPECTIONS AND TESTS
- A. Reports of Results of Inspections and Tests: Submit technical data, test reports, calculations, surveys, and certifications based on field tests and inspections by independent inspection and testing agency and by authorities having jurisdiction.
1. Reports of results of inspections and tests shall not be considered Contract Documents.
 2. Refer to Section 01 45 00 - Quality Control for additional requirements.
- 1.14 OPERATION AND MAINTENANCE DATA SUBMITTALS
- A. Operation and Maintenance Data Submittals: Refer to requirements specified in Section 01 78 23 - Operation and Maintenance Data. Include operation and maintenance data submittals in Construction Progress Schedule. Refer to Contract General Conditions.
- 1.15 CERTIFICATES
- A. When specified in individual specification Sections, submit manufacturers' certificates to Architect through Electronic Project Management system for review as specified.
- B. Certificates may be recent or previous test results on material or product, but must be acceptable to University Representative and Architect.

PART 2 - PRODUCTS

Not applicable to this Section.

PART 3 - EXECUTION

Not applicable to this Section.

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SECTION 01 35 00

SPECIAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- 1. Environmental protection procedures
- 2. Smoke/odor control procedures
- 3. Noise control procedures
- 4. Dust and air pollution control procedures
- 5. Hazardous materials procedures
- 6. Welding and burning mitigation procedures
- 7. Erosion and sediment control procedures (Storm Water Pollution Protection Plan)
- 8. Disposal operations procedures
- 9. Cultural resources procedures
- 10. Alteration project procedures.

1.3 RELATED SECTIONS

- A. Section 01 73 29 - Cutting and Patching: General requirements for procedures and limitations for cutting and patching the work.

1.4 ENVIRONMENTAL PROTECTION PROCEDURES

- A. Environmental Protection Procedures: General requirements specified in this Section are in addition to those of the Contract General Conditions.
 - 1. During the progress of the work, keep the premises occupied in a neat and clean condition and protect the environment both on site and off site, throughout and upon completion of the construction project.
 - 2. In coordination with the Campus, develop an Environmental Protection Plan in detail and submit to University's Representative for approval within 30 calendar days from the date of commencement specified in the Notice to Proceed. Distribute approved plan electronically to all employees and to all subcontractors and their employees. Environmental Protection Plan shall include, but not be limited to, the following items:
 - a. Required permits
 - b. Proposed sanitary landfill site
 - c. Other proposed disposal sites
 - d. Noise Control
 - e. Dust Control
 - f. Erosion and Sediment Control
 - g. Any agreements with public or private landowners regarding equipment, materials storage, borrow sites, fill sites, or disposal sites. Such agreements made by Contractor shall be invalid if their execution causes violation of local or regional grading or land use regulations.

- B. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result.
1. Avoid use of tools and equipment that produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.
 2. Comply with noise control requirements specified below.
- C. Construction Operations: All construction operations shall comply with all applicable Federal, State and local Codes, ordinances, statutes and regulations pertaining to water, air, solid waste and noise pollution. It shall be Contractor's responsibility to identify and determine necessary measures to be taken to comply with such Codes, ordinances, statutes and regulations.
- D. Definitions of Contaminants:
1. Sediment: Soil and other debris that have been eroded and transported by runoff water
 2. Solid waste: Rubbish, debris, garbage and other discarded solid materials resulting from construction activities, including a variety of combustible and non-combustible wastes, such as ashes, waste materials that result from construction or maintenance and repair work, leaves and tree trimmings
 3. Chemical waste: Includes petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, disinfectants, organic chemicals and inorganic wastes. Some of the above may be classified as "hazardous"
 4. Sanitary wastes:
 - a. Sewage: Domestic sanitary sewage
 - b. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing and consumption of food.
- E. Hazardous Materials: See also Section below titled "HAZARDOUS MATERIALS PROCEDURES."
1. Except as otherwise specified, in the event the Contractor encounters on the site material reasonably believed to be asbestos, lead, polychlorinated biphenyl (PCB), or other hazardous materials which have not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the Trustees in writing.
 2. Work in affected areas shall not thereafter be resumed except by written agreement of the Trustees and Contractor if in fact the material is asbestos, lead, PCB, or other hazardous materials and has not been rendered harmless.
 3. Work in affected areas shall be resumed in the absence of asbestos, lead, PCB, or other hazardous materials, or when such materials have been rendered harmless.
- F. Protection of Natural Resources: It is intended that the natural resources within the Project boundaries and outside the limits of permanent work performed under this Contract be preserved in their existing condition or be restored to an equivalent or improved condition upon completion of the work. Confine construction activities to areas defined by the public roads, easements, and work area limits shown on the drawings. Return construction areas to their pre-construction elevations except where surface elevations are otherwise noted to be changed. Maintain natural drainage patterns. Conduct construction activities such that ponding of stagnant water conducive to mosquito breeding habitat will not occur at any time.
1. Land resources protection: Do not remove, cut, deface, injure or destroy trees or shrubs outside the work area limits. Do not remove, deface, injure or destroy trees within the Project area wit

- hout permission from University's Representative. Such improvements shall be removed and replaced, if required, by the Contractor at no change in Contract Time and Contract Sum.
2. Landscaping protection: Protect trees that are located near the limits of Project area which may possibly be defaced, bruised or injured or otherwise damaged by the Contractor's operations. No ropes, cables or guys shall be fastened to or be attached to any existing nearby trees or shrubs for anchorages. Refer to additional requirements specified in Section 01 56 00 - Temporary Barriers and Controls.
 - a. Trimming: Refer to Section 01 56 39 - Tree and Plant Protection.
 - b. Excavations around trees: Refer to Section 01 56 39 - Tree and Plant Protection.
 - c. Repair and restoration: Repair or replace trees or other landscape feature scarred or damaged by equipment or construction operations as specified below. Repair and restoration plan shall be reviewed and approved by University's Representative prior to its initiation.
 3. Temporary construction:
 - a. Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other vestiges of construction as directed by the University's Representative.
 - b. Level all temporary roads, parking areas and any other areas that have become compacted or shaped.
 - c. Unpaved areas where vehicles have been operated shall receive suitable surface treatment or shall be periodically wetted down to prevent construction operations from producing dust damage and nuisance to persons and property, at no additional cost to the Trustees.
 - d. Keep haul roads clear at all times of any object that creates an unsafe condition. Promptly remove any contaminants or construction materials dropped from construction vehicles. Do not drop mud and debris from construction equipment on public streets. Sweep clean turning areas and pavement entrances as necessary.
 4. Water resources: Comply with all applicable Federal, State and local Codes, ordinances, statutes and regulations pertaining to discharge (directly or indirectly) of pollutants to underground and natural waters.
 - a. Perform all Work under the Contract in a manner that any adverse environmental impacts are reduced to a level that is acceptable to University's Representative and authorities having jurisdiction.
 - b. Refer to Division 2 - Site Construction, earthwork Sections, and Civil Drawings for specific requirements on control of storm water and disposal of water from dewatering activities.
 5. Oily Substances: At all times, special measures shall be taken to prevent oily or other hazardous substances from entering the ground, drainage areas or local bodies of water in such quantities as to affect normal use, aesthetics or produce a measurable impact upon the areas. All soil or water that is contaminated with oily substances due to Contractor's operations shall be disposed of in accordance with applicable regulations, at no change in Contract Time and Contract Sum.
- 1.5 SMOKE/ODOR CONTROL PROCEDURES
- A. Smoke/Odor Control: Protect primary fresh air intakes to existing buildings from exhaust from internal combustion engines, paint and solvent fumes and other noxious fumes and vapors.
 1. Implement control methods such as snorkels from engines exhausts to 50 feet away from air intakes. Provide carbon filters on air intakes as necessary, including periodic replacement of filters to ensure effectiveness.
 2. All other activities generating fumes shall be limited to minimum distance of 50 feet from air int

ake grilles.

3. If fume-generating procedures must occur within 50 feet of an air intake, Contractor shall do the following:
 - a. Notify University's Representative at least 14 calendar days in advance of such activities.
 - b. Perform Work when it least impacts the University (evenings, weekends or particularly windy days).
 - c. Provide carbon filter media, plastic barriers, or other control methods to ensure fresh air only enters into the building ventilation system.

1.6 NOISE CONTROL PROCEDURES

- A. Noise Control Procedures, General: Requirements of this Section are in addition to those of the Contract General Conditions. Maximum noise levels within 1,000 feet of classrooms, laboratories, residences, businesses, adjacent buildings and other populated areas:
 1. Noise levels for trenchers, pavers, graders and trucks: Not exceeding 90 dBA at 50 feet as measured under noisiest operating conditions.
 2. Noise levels for all other equipment: Not exceeding 85 dBA at 50 feet.
- B. Noise Control of Equipment:
 1. Equip jackhammers with exhaust mufflers and steel muffling sleeves.
 2. Use air compressors of a quiet type such as a "whisperized" compressor. Compressor hoods shall be closed while equipment is in operation.
 3. Use electrically-powered rather than gasoline or diesel powered fork-lifts.
 4. Provide portable noise barriers around jack hammering, with barriers constructed of 3/4 inch plywood lined with 1-inch thick duct-liner type fiberglass on Work side.
- C. Noise Control of Construction Operations:
 1. Keep noisy equipment as far as possible from noise-sensitive site boundaries.
 2. Machines shall not be left idling.
 3. Use electric power in lieu of internal combustion engine power whenever possible.
 4. Maintain equipment properly to reduce noise from excessive vibration, faulty mufflers, or other sources. All engines shall have properly functioning mufflers.
- D. Scheduling of Noisy Operations: Schedule construction activities to minimize time of noisy operations and disruption to occupants of adjoining facilities. Notify University's Representative in advance of performing Work creating unusual noise and schedule such Work at times mutually agreeable.
- E. Accessory Noise: Do not play radios, tape recorders, televisions, and other similar items at construction site.

1.7 DUST AND AIR POLLUTION CONTROL PROCEDURES

- A. Dust and Air Pollution Control Procedures, General: Requirements of this Section are in addition to those of Article 4.03 of the Contract General Conditions. Employ measures to prevent or minimize creation of dust and air pollution. Contractor shall appoint a dust control monitor to oversee and implement all measures specified in this Article.
 1. Unpaved areas shall be wetted down, to eliminate dust formation, a minimum of twice a day to reduce particulate matter. When wind velocity exceeds 15 mph, site shall be watered down more frequently.

- quently.
2. Store all volatile liquids, including fuels or solvents in closed containers.
3. No on-site burning of debris, lumber and other scrap shall be permitted.
4. Properly maintain equipment to reduce gaseous pollutant emissions.
5. Exposed areas, new driveways and sidewalks shall be seeded, treated with soil binders or paved, as appropriate, as soon as possible.
6. Cover stockpiles of soil, sand and other loose materials.
7. Cover trucks hauling soil, debris, sand or other loose materials.
8. Sweep project area streets at least once daily. Refer to Section 01 74 00 - Cleaning Requirements.

1.8 WELDING AND BURNING MITIGATION PROCEDURES

- A. Welding and Burning Mitigation Procedures: Eliminate welding and burning of steel as much as possible. Where unavoidable, perform welding and burning with all possible precaution to avoid fire hazard. Provide a fire watch for minimum of 30 minutes after burning stops. Provide protection for all adjacent surfaces.

1.9 EROSION AND SEDIMENT CONTROL PROCEDURES

- A. Erosion and Sediment Control Procedures: Refer to runoff control requirements specified in Section 01 57 00 - Temporary Controls. Obtain and comply with Storm Water Pollution Protection Plan (SWPPP) and project-specific requirements indicated on Civil Drawings.

1.10 DISPOSAL OPERATIONS PROCEDURES

- A. Solid Waste Management:
 1. Supply solid waste transfer containers. Daily remove all debris such as spent air filters, oil cartridges, cans, bottles, combustibles and litter. Take care to prevent trash and papers from blowing onto adjacent property. Encourage personnel to use refuse containers. Convey contents to a sanitary landfill.
 2. Washing of concrete containers where wastewater may reach adjacent property, storm drains or natural water courses will not be permitted. Remove any excess concrete to the sanitary landfill.
- B. Chemical Waste and Hazardous Materials Management: furnish containers for storage of spent chemicals used during construction operations. Dispose of chemicals and hazardous materials in accordance with applicable regulations.
- C. Garbage: Store garbage in covered containers, pick up daily and dispose of in a sanitary landfill.
- D. Grading Spoil and Landscape Debris: Dispose of vegetation, weeds, rubble, and other materials removed by the clearing, stripping and grubbing operations off site at a suitable disposal site in accordance with applicable Federal, State and local Codes, ordinances, statutes and regulations
- E. Excavated Materials:
 1. Native soil complying with the requirements of applicable Division 2 - Site Construction earthwork Section, may be used for backfill, fill and embankments as allowed in applicable by that section.
 2. Remove all material which is excavated in excess of that required for backfill. Dispose of unsuitable excavated material from the site and dispose of it legally.
 - a. Excess suitable backfill material shall be hauled off site. No additional compensation will be paid

- d to the Contractor for such off haul. Include all such costs in the Contract Sum.
- b. Unsuitable backfill material shall be disposed of off-site in accordance with applicable regulations, in a disposal site indicated in the Environmental Protection Plan.
- c. Remove rubbish and materials unsuitable for backfill immediately following excavation.
- d. Remove material in excess of that required for backfill immediately following backfill operations.

1.11 CULTURAL RESOURCES PROCEDURES

- A. Cultural Resources Procedures: Requirements specified in this Section are in addition to those required by Article 4.03 of the Contract General Conditions.
 - 1. Project does not pass through any known archaeological sites. However, it is conceivable that unrecorded archaeological sites could be discovered during construction.
 - 2. In the event that artifacts, human remains, or other cultural resources are discovered during subsurface excavations at locations of the Work, the Contractor shall protect the discovered items, cease work for a distance of 35 feet radius in the area, notify the Architect and University Representative and comply with applicable law.
 - 3. Trustees may retain an Archaeologist to monitor and recover data and artifacts during period that work has ceased.
 - 4. All items found which are considered to have archaeological significance are the property of the University.

1.12 ALTERATION PROJECT PROCEDURES

- A. Perform Alteration Procedures in accordance with Section 02 41 19 Selective Demolition.

PART 2 - PRODUCTS

2.1 PRODUCTS FOR PATCHING, EXTENDING AND MATCHING

- A. Provide same products or types of construction as that in existing structure, as needed to patch, extend or match existing.
- B. Generally the Contract Documents will not define products or standards of workmanship present in existing construction; determine products by inspection and necessary testing, and determine quality of workmanship by using existing as a sample for comparison.
- C. The presence of a product, finish, or type of construction requires that patching, extending or matching shall be performed as necessary to make work complete and consistent with identical standards of quality.

PART 3 - EXECUTION

3.1 CUTTING AND PATCHING

- A. Perform cutting and patching as specified in Section 01 73 29 - Cutting and Patching.

END OF SECTION

SECTION 01 35 43

ENVIRONMENTAL PROCEDURES HAZARDOUS MATERIAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Hazardous materials abatement.

1.3 IDENTIFIED HAZARDOUS MATERIALS

- A. Identified Hazardous Materials:
 - 1. Limited Hazardous Materials Investigations Survey and Report has been conducted for the University and will be provided via exhibit at the time of bid. This report is furnished as Information Available to Contractor.
 - 2. If hazardous materials will be disturbed by the Work, the Contractor shall perform hazardous materials abatement in compliance with requirements described in the document identified above. Costs and time associated with abatement of hazardous materials identified in this report shall be included in the Contract Sum and Contract Time.
 - a. Comply with California Code of Regulations, Title 8, Sections 1529, 1532.1 and 5208.
 - b. Comply with hazardous materials requirements in the University's Contractor Safety Manual, provided to Contractor under separate cover by University's Representative.
 - 3. Architect assumes no responsibility relating to existence of any hazardous materials, and Architect assumes no responsibility or liability for performance of Work described in the report identified above.

1.4 UNIDENTIFIED HAZARDOUS MATERIALS

- A. Unidentified Hazardous Materials:
 - 1. Information regarding known hazardous materials is available from University's office of Environmental Health & Safety.
 - 2. Except as otherwise specified, in the event that Contractor encounters on the project site material reasonably believed to be asbestos, lead, polychlorinated biphenyl (PCB), or other hazardous materials which have not been rendered harmless, the Contractor shall immediately stop work in the area affected and report the condition to University's Representative.
 - 3. Work in the affected area shall not be resumed except by written agreement between University and Contractor if in fact the material is asbestos, lead, PCB, or other hazardous materials and has not been rendered harmless.
 - 4. Work in the affected area shall be resumed in the absence of asbestos, lead, PCB or other hazardous materials, or when such materials have been rendered harmless.
- B. Notification and Disclosure: Refer to Contract General Conditions for Asbestos Notification and Disclosure requirements. Refer to Hazardous Materials Investigation Document for information available to Contractor.

1. In the event that hazardous materials are discovered on site during performance of the Work, Contractor shall notify the University's Representative and request directions for abatement of hazardous materials.
2. Comply with hazardous materials requirements in the University's Safety Manual, provided to Contractor under separate cover by University's Representative (if available).
3. University will ensure that the identified hazardous waste and/or hazardous materials are handled and disposed in the manner specified by the State of California Hazardous Substances Control Law (Health and Safety Code Division 20, Chapter 6.5).

PART 2 - PRODUCTS

Not applicable to this Section.

PART 3 - EXECUTION

Not applicable to this Section.

END OF SECTION

SECTION 01 35 50

SAFETY PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Procedures for health and safety protection, site safety requirements and requirements for reporting accidents.

1.3 RELATED SECTIONS

- A. Section 01 35 43 – Environmental Procedures - Hazardous Materials: Protection from asbestos containing materials (ACM), polychlorinated biphenyl (PCB), or other hazardous materials.
- B. Section 01 52 00 – Construction Facilities.
- C. Contract General Conditions – Article 4.08d.

1.4 SUBMITTALS

- A. Accident Reports: A copy of each accident report, which the Contractor or subcontractors submit to their insurance carriers, shall be forwarded to the Architect and to the University Representative as soon as possible, but in no event later than 5 calendar days after the day the accident occurred.
- B. Site Safety Plan: Submit a Site Safety plan per the requirements listed within this section.

1. Due within 21 Days of the Notice to Proceed. Make any required modifications and file the final approved submittal for the project records. During the course of construction, submit any proposed revisions for acceptance prior to implementing any changes.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Special facilities, devices, equipment, clothing, and similar items used by the Contractor in the execution of the Work shall comply with applicable regulations.

PART 3 - EXECUTION

3.1 STOP WORK ORDERS

- A. Stop Work Orders:
 - 1. When the Contractor or its subcontractors are notified by the University's Representative of an incident of noncompliance with the provisions of the Contract, and the action(s) to be taken, the Contractor shall immediately, if so directed, or within 48 hours after receipt of a notice of violation, correct the unsafe or unhealthy condition.

2. If the Contractor fails to comply promptly, all or any part of the work performed may be stopped by with a "Stop Work Order." When, in the opinion of the University's Representative, satisfactory corrective action has been taken to correct the unsafe and unhealthy condition, a written release of the stop work order will be issued as soon as possible.
3. The Contractor shall not be allowed any extension of time or compensation for damages by reason of or in connection with such work stoppage.

3.2 PROTECTION

- A. Protection: Contractor shall take all necessary precautions to prevent injury to the public, building occupants, or damage to property of others. Such measures shall not be prescribed by the University or Architect, but shall be the responsibility solely of the Contractor.
 1. For the purposes of the Contract, the public or building occupants shall include all persons not employed by the Contractor or a subcontractor working under the Contractor's direction.
 2. Work shall not be performed in any area occupied by the public or University's employees unless specifically permitted by the Contract or subsequent written agreements are made with adequate steps taken for the protection of the public and the University's employees.
 3. Whenever practicable, the work area shall be fenced, barricaded, or otherwise blocked off from the public or building occupants to prevent unauthorized entry into the work area.
- B. Alternate Precautions: When the nature of the Work prevents isolation of the work area, and the public or building occupants may be in or pass through, under or over the work area, alternate precautions such as the posting of signs, the use of signal persons, the erection of barricades or similar protection around any hazardous operations shall be used as appropriate.
- C. Public Thoroughfare: When Work is to be performed over a public thoroughfare such as a sidewalk, lobby, or corridor, the thoroughfare shall be closed, if possible, or other precautions taken such as the installation of screens or barricades. When the exposure to heavy falling objects exists, as during the erection of building walls or during demolition, special protection of the type detailed in 29 CFR 1910/1926 shall be provided.
- D. Hazardous Conditions: Storing, positioning or use of equipment, tools, materials, scraps, and trash in a manner likely to present a hazard to the public or building occupants by its accidental shifting, ignition, or other hazardous qualities is prohibited.
- E. Site Safety Plan and Office of Fire Safety Compliance:
 1. In compliance with the California Building Code (CBC) as enforced by the CSU Office of Fire Safety (OFS), a Site Safety Plan shall be produced for all construction projects covered under this agreement. The purpose of the Site Safety Plan is to mitigate fire hazards associated with the construction work and project site. The project-specific Site Safety Plan shall be based on the provisions for fire safety during building construction and demolition as set forth in Chapter 33 of the CBC, California Fire Code; and 2019 edition of NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.
 2. The project-specific Site Safety Plan will be produced by the University and provided to the Contractor at the time of bid. The Contractor shall be responsible for complying with and implementing all requirements of the Site Safety Plan that are not specifically assigned to the University (owner).
 3. Once the Site Safety Plan has been provided to the Contractor, the Contractor shall designate a Site Safety Director responsible to oversee general compliance with the Site Safety Plan. The Contractor's Site Safety Director, or their designee, will complete a daily Fire Safety Inspection at the project site during active construction. The Contractor shall work with the University to address any deficiencies identified during the Fire Safety Inspections in a timely manner.

END OF SECTION

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SECTION 01 35 53

SECURITY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Contractor Security requirements.

1.3 SECURITY (Also refer to Contract General Conditions)

- A. Protect the Work from theft, vandalism and unauthorized entry. Contractor shall have sole responsibility for job site security.
- B. Maintain security throughout construction until the University's occupancy or acceptance.
- C. Provide keying different from permanent keying of locks and include organized, locked and supervised storage for receiving and dispensing items of finish hardware throughout the construction.
- D. Provide the Project Inspector with keys necessary to gain access to locked areas of the Work. The Project Inspector will be responsible for such keys and will return them to the Contractor upon acceptance of the project or area as complete.

1.4 ENTRY CONTROL

- A. Restrict entrance of persons and vehicles into project site.
- B. Allow building entrance only to authorized persons with proper identification.

1.5 PERMANENT KEYS

- A. Immediately upon receipt of permanent keys for whatever purpose (finish hardware, mechanical equipment, casework, dispensers, lockers, switches, equipment items, etc.), tag or otherwise clearly identify keys according to one approved system and turn them over to the University prior to any opportunity of access to keys by parties other than the University.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 41 00
REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes: Certain Codes and Standards and relevant requirements applicable to the Work required under this Contract.

1.3 AUTHORITY AND PRECEDENCE OF CODES, ORDINANCES AND STANDARDS

- A. Authority: All codes, ordinances and standards referenced in the Drawings and Specifications shall have the full force and effect as though printed in their entirety in the Specifications.
- B. Precedence:
 - 1. Where specified requirements differ from the requirements of applicable codes, ordinances and standards, the more stringent requirements shall take precedence.
 - 2. Where the Drawings or Specifications require or describe products or execution of better quality, higher standard or greater size than required by applicable codes, ordinances and standards, the Drawings and Specifications shall take precedence so long as such increase is legal.
 - 3. Where no requirements are identified in the Drawings or Specifications, comply with all requirements of applicable codes, ordinances and standards of authorities having jurisdiction.

1.4 STATUTORY AND JURISDICTIONAL REGULATIONS

- A. Perform the Work in accordance with Applicable Code Requirements and applicable requirements of all other regulatory agencies including, but not limited to, the following:
 - 1. State of California Code of Regulations (CCR), Title 24 State Building Standards, 2022.
 - 2. California State Fire Marshall.
- B. Performance of the Work shall also comply with applicable requirements of California Code of Regulations (CCR) as follows:
 - 1. Title 19 - Public Safety.
 - 2. Title 22 - Social Security.

- C. Unless otherwise specified, specific references to codes, regulations, standards, manufacturers' instructions, or requirements of regulatory agencies, when used to specify requirements for materials or design elements, shall mean the edition of each in effect as identified in the Contract Documents.
- D. Contractor shall maintain copies of regulatory reference manuals and code books on the job site for reference during planning, submittal processing and field installation of specific work.
- E. Contractor and each subcontractor or supplier engaged in construction of the project shall be thoroughly familiar with the codes and regulations applicable to their specific construction activities. Contractor's responsibility for familiarity with applicable codes and regulations shall extend to the entire scope of work specified in the Contract Documents.

1.5 CONFLICTS

- 1.5.1 Unless otherwise directed by the Architect, if a conflict exists between referenced regulatory requirements, comply with the one establishing more stringent requirements.
- 1.5.2 Unless otherwise directed by the Architect, if a conflict exists between referenced regulatory requirements and the Contract Documents, comply with the more stringent requirements.

1.5.3 Submittals

- 1.5.3.1 Submit to the University Representative copies of all permits, licenses, certifications, inspection reports, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records and other documentation established and/or required in conjunction with compliance with specified standards and regulations. Maintain copies of the aforementioned documents at the project site at all times.

2 PRODUCTS (Not Used)

3 EXECUTION (Not Used)

END OF SECTION

SECTION 01 42 00

REFERENCE STANDARDS AND ABBREVIATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Use of references in Drawings and Specifications, including requirements for copies of reference standards at Project site.
- B. Definitions of terms used in Specifications and Drawings, including abbreviations, acronyms, names and terms which may be used in Specifications.

1.3 RELATED SECTIONS

- A. Section 01 41 00 - Regulatory Requirements: Identification of applicable building Code and other codes, ordinances and regulations applicable to performance of the Work.

1.4 USE OF REFERENCES

- A. References: The Drawings and Specifications contain references to various standards, standard specifications, codes, practices and requirements for products, execution, tests and inspections. These reference standards are published and issued by the agencies, associations, organizations and societies listed in this Section or identified in individual product specification Sections.
 - 1. Wherever term "Agency" occurs in Standard Specifications, it shall be understood to mean the term used for University for purposes of the Contract.
 - 2. Wherever term "Engineer" occurs in Standard Specifications, it shall be understood to mean Architect or other responsible design professional for purposes of the Contract.
 - 3. Where reference is made to Standard Details, such reference shall be to the Standard Details accompanying the Standard Specifications.
- B. Relationship to Drawings and Specifications: Such references are incorporated into and made a part of the Drawings and Specifications to the extent applicable.
- C. Referenced Grades Classes and Types: Where an alternative or optional grade, class or type of product or execution is included in a reference but is not identified on the Drawings or in the Specifications, provide the highest, best and greatest of the alternatives or options for the intended use and prevailing conditions.
- D. Copies of Reference Standards:
 - 1. Reference standards are not furnished with the Drawings and Specifications because it is presumed that the Contractor, subcontractors, manufacturers, suppliers, trades and crafts are familiar with these generally-recognized standards of the construction industry.

2. Copies of reference standards may be obtained from publishing sources.

E. Jobsite Copies:

1. Contractor shall obtain and maintain at the Project site copies of reference standards identified on the Drawings and in the Specifications in order to properly execute the Work.
2. At a minimum, the following shall be readily available at the site (electronically or in print), as applicable to the Work:
 - a. State Building Codes: As referenced in Section 01 41 00 - Regulatory Requirements.
 - b. Safety Codes: Occupational Safety and Health Act (OSHA) regulations and State of California, California Administrative Code, California Code of Regulations (CCR), Title 8 - Industrial Relations, Chapter 4, Subchapter 7, General Industry Safety Orders (Cal-OSHA), to extent applicable to the Work.
 - c. General Standards:
 - 1) CCR Title 24, Part 2, Volume 3: 2022 California Building Code (CBC) Material, Testing and Installation Standards.
 - 2) CCR Title 24, Part 12: 2022 California Referenced Standards Code.
 - 3) Underwriters Laboratories, Inc. (UL) Building Products Listing.
 - 4) Factory Mutual Research Organization (FM) Approval Guide.
 - 5) American Society for Testing and Materials (ASTM) Standards in Building Codes.
 - 6) American National Standards Institute (ANSI) standards.
 - d. Fire and Life Safety Standards: All referenced standards pertaining to fire rated construction and exiting.
 - e. Common Materials Standards: American Concrete Institute (ACI), American Institute of Steel Construction (AISC), American Welding Society (AWS), Gypsum Association (GA), National Fire Protection Association (NFPA), Tile Council of America (TCA) and Woodwork Institute of California (WIC) standards to the extent referenced within the Contract Specifications.
 - f. Research Reports: ICC Evaluation Service, Inc. (ICC-ES), formerly ICBO Evaluation Service, Inc. (ICBO ES) Research Reports and National Evaluation Service, Inc. Reports (NER), for products not in conformance to prescribed requirements stated in California Building Code (CBC).
 - g. Product Listings: Approval documentation, indicating approval of authorities having jurisdiction for use of product within the applicable jurisdiction.

F. Edition Date of References:

1. When an edition or effective date of a reference is not given, it shall be understood to be the current edition or latest revision published as of the date of the [Agreement] [Contract Drawings and Contract Specifications].
2. All amendments, changes, errata and supplements as of the effective date shall be included.

- G. ASTM and ANSI References: Specifications and Standards of the American Society for Testing and Materials (ASTM) and the American National Standards Institute (ANSI) are identified in the Drawings and Specifications by abbreviation and number only and may not be further identified by title, date, revision or amendment. It is presumed that the Contractor is familiar with and has access to these nationally- and industry-recognized specifications and standards.

1.5 DEFINITIONS OF TERMS

- A. Basic Contract Definitions: Words and terms governing the Work are defined in the Contract General and Supplementary Conditions, as referenced in the Agreement.

- B. Words and Terms Used on Drawings and in Specifications: Additional words and terms may be used in the Drawings and Specifications and are defined as follows:
1. "Applicable": As appropriate for the particular condition, circumstance or situation.
 2. "Approve(d)": Approval action shall be limited to the duties and responsibilities of the party giving approval, as stated in the Conditions of the Contract. Approvals shall be valid only if obtained in writing and shall not apply to matters regarding the means, methods, techniques, sequences and procedures of construction. Approval shall not relieve the Contractor from responsibility to fulfill Contract requirements.
 3. "And/or": If used, shall mean that either or both of the items so joined are required.
 4. "Directed": Limited to duties and responsibilities of the University's Representative or Architect as stated in the Contract General Conditions, meaning "as instructed by the University's Representative or Architect, in writing, regarding matters other than the means, methods, techniques, sequences and procedures of construction. Terms such as "directed", "requested", "authorized", "selected", "approved", "required", and "permitted" mean "directed by the University's Representative or Architect", "requested by the University's Representative or Architect", and similar phrases. No implied meaning shall be interpreted to extend the responsibility of the University's Representative, Architect or other responsible design professional into the Contractor's supervision of construction.
 5. "Equal" or "Equivalent": As determined by Architect or other responsible design professional as being equivalent, considering such attributes as durability, finish, function, suitability, quality, utility, performance and aesthetic features.
 6. "Furnish": Means supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations."
 7. "Indicated": The term indicated refers to graphic representations, notes, or schedules on the Drawings, or other Paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as "shown", "noted", "scheduled", and "specified" are used to help the reader locate the reference. There is no limitation on location.
 8. "Install": Describes operations at the Project site including the actual unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.
 9. "Installer"
 - a. "Installer": refers to the Contractor or an entity engaged by the Contractor, such as an employee, subcontractor, or sub-subcontractor for performance of a particular construction activity, including installation, erection, application and similar operations. Installers are required to be experienced in the operations they are engaged to perform.
 - b. "Experienced Installer": The term "experienced," when used with "installer" means having a minimum of 5 previous Projects similar in size to this Project, knowing the precautions necessary to perform the Work, and being familiar with requirements of authorities having jurisdiction over the Work.
 10. "Jobsite": Same as site.
 11. "Necessary": With due considerations of the conditions of the Project and as determined in the professional judgment of the Architect or other responsible design professional as being necessary for performance of the Work in conformance with the requirements of the Contract Documents, but excluding matters regarding the means, methods, techniques, sequences and

pro

cedures of construction.

12. "Noted": Same as "Indicated."
13. "Per": Same as "in accordance with," "according to" or "in compliance with."
14. "Products": Material, system or equipment.
15. "Project Site": Same as "Site."
16. "Proper": As determined by the Architect or other responsible design professional as being proper for the Work, excluding matters regarding the means, methods, techniques, sequences and procedures of construction, which are solely the Contractor's responsibility to determine.
17. "Provide": Means "furnish and install, complete and ready for the intended use."
18. "Regulation": Includes laws, ordinances, statutes and lawful orders issued by authorities having jurisdiction, as well as and rules, conventions and agreements within the construction industry that control performance of the Work.
19. "Required": Necessary for performance of the Work in conformance with the requirements of the Contract Documents, excluding matters regarding the means, methods, techniques, sequences and procedures of construction, such as:
 - a. Regulatory requirements of authorities having jurisdiction.
 - b. Requirements of referenced standards.
 - c. Requirements generally recognized as accepted construction practices of the locale.
 - d. Notes, schedules and graphic representations on the Drawings.
 - e. Requirements specified or referenced in the Specifications.
 - f. Duties and responsibilities stated in the Bidding and Contract Requirements.
20. "Scheduled": Same as "Indicated."
21. "Selected": As selected by the University's Representative, Architect or other responsible design professional from the full selection of the manufacturer's products, unless specifically limited in the Contract Documents to a particular quality, color, and texture or price range.
22. "Shown": Same as "Indicated."
23. "Site": Same as "Site of the Work" or "Project Site;" the area or areas or spaces occupied by the Project and including adjacent areas and other related areas occupied or used by the Contractor for construction activities, either exclusively or with others performing other construction on the Project. The extent of the Project Site is shown on the Drawings, and may or may not be identical with the description of the land upon which the Project is to be built.
24. "Supply": See "Furnish."
25. "Testing Laboratory" or "Testing Laboratories": An independent entity engaged to perform specific inspections or tests, at the Project Site or elsewhere, and to report on, and, if required, to interpret, results of those inspections or tests. Refer to Section 01458 - Testing Laboratory Services.
26. "Testing and Inspection Agency": Same as "Testing Laboratory."

1.6 ABBREVIATIONS, ACRONYMS, NAMES AND TERMS, GENERAL

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web site addresses are subject to change and are believed to be accurate and up-to-date.

AA	Aluminum Association, Inc. (The) www.aluminum.org	(202) 862-5100
AAADM	American Association of Automatic Door Manufacturers www.aaadm.com	(216) 241-7333
AABC	Associated Air Balance Council www.aabchq.com	(202) 737-0202
AAMA	American Architectural Manufacturers Association www.aamanet.org	(847) 303-5664
AASHTO	American Association of State Highway and Transportation Officials www.transportation.org	(202) 624-5800
AATCC	American Association of Textile Chemists and Colorists (The) www.aatcc.org	(919) 549-8141
ABMA	American Bearing Manufacturers Association www.abma-dc.org	(202) 367-1155
ACI	ACI International (American Concrete Institute) www.aci-int.org	(248) 848-3700
ACPA	American Concrete Pipe Association www.concrete-pipe.org	(972) 506-7216
AEIC	Association of Edison Illuminating Companies, Inc. (The) www.aeic.org	(205) 257-2530
AFPA	American Forest & Paper Association (See AF&PA)	
AF&PA	American Forest & Paper Association www.afandpa.org	(800) 878-8878 (202) 463-2700
AGA	American Gas Association www.aga.org	(202) 824-7000
AGC	Associated General Contractors of America (The) www.agc.org	(703) 548-3118
AHA	American Hardboard Association (Now part of CPA)	
AHAM	Association of Home Appliance Manufacturers www.aham.org	(202) 872-5955
AI	Asphalt Institute	(859) 288-4960

www.asphaltinstitute.org

AIA	American Institute of Architects (The) www.aia.org	(800) 242-3837 (202) 626-7300
AISC	American Institute of Steel Construction www.aisc.org	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
AITC	American Institute of Timber Construction www.aitc-glulam.org	(303) 792-9559
ALCA	Associated Landscape Contractors of America www.alca.org	(800) 395-2522 (703) 736-9666
ALSC	American Lumber Standard Committee, Incorporated www.alsc.org	(301) 972-1700
AMCA	Air Movement and Control Association International, Inc. www.amca.org	(847) 394-0150
ANSI	American National Standards Institute www.ansi.org	(202) 293-8020
AOSA	Association of Official Seed Analysts www.aosaseed.com	(505) 522-1437
APA	APA - The Engineered Wood Association www.apawood.org	(253) 565-6600
APA	Architectural Precast Association www.archprecast.org	(239) 454-6989
API	American Petroleum Institute www.api.org	(202) 682-8000
ARI	Air-Conditioning & Refrigeration Institute www.ari.org	(703) 524-8800
ARMA	Asphalt Roofing Manufacturers Association www.asphaltroofing.org	(202) 207-0917
ASCE	American Society of Civil Engineers www.asce.org	(800) 548-2723 (703) 295-6300
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers www.ashrae.org	(800) 527-4723 (404) 636-8400
ASME	ASME International (The American Society of Mechanical Engineers International) www.asme.org	(800) 843-2763 (212) 591-7722

ASSE	American Society of Sanitary Engineering www.asse-plumbing.org	(440) 835-3040
ASTM	ASTM International (American Society for Testing and Materials International) www.astm.org	(610) 832-9585
AWCI	AWCI International (Association of the Wall and Ceiling Industries International) www.awci.org	(703) 534-8300
AWCMA	American Window Covering Manufacturers Association (See WCSC)	
AWI	Architectural Woodwork Institute www.awinet.org	(800) 449-8811 (703) 733-0600
AWPA	American Wood-Preservers' Association www.awpa.com	(334) 874-9800
AWS	American Welding Society www.aws.org	(800) 443-9353 (305) 443-9353
AWWA	American Water Works Association www.awwa.org	(800) 926-7337 (303) 794-7711
BHMA	Builders Hardware Manufacturers Association www.buildershardware.com	(212) 297-2122
BIA	Brick Industry Association (The) www.bia.org	(703) 620-0010
BICSI	BICSI www.bicsi.org	(813) 979-1991
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International) www.bifma.com	(616) 285-3963
CCC	Carpet Cushion Council www.carpetcushion.org	(203) 637-1312
CCFSS	Center for Cold-Formed Steel Structures www.umn.edu/~ccfss	(573) 341-4471
CDA	Copper Development Association Inc. www.copper.org	(800) 232-3282 (212) 251-7200
CEA	Canadian Electricity Association www.canelect.ca	(613) 230-9263
CFFA	Chemical Fabrics & Film Association, Inc. www.chemicalfabricsandfilm.com	(216) 241-7333

CGA	Compressed Gas Association www.cganet.com	(703) 788-2700
CGSB	Canadian General Standards Board www.pwgsc.gc.ca/cgsb	(800) 665-2472 (819) 956-0425
CIMA	Cellulose Insulation Manufacturers Association www.cellulose.org	(888) 881-2462 (937) 222-2462
CISCA	Ceilings & Interior Systems Construction Association www.cisca.org	(630) 584-1919
CISPI	Cast Iron Soil Pipe Institute www.cispi.org	(423) 892-0137
CLFMI	Chain Link Fence Manufacturers Institute www.chainlinkinfo.org	(301) 596-2583
CPA	Composite Panel Association www.pbmdf.com	(301) 670-0604
CPPA	Corrugated Polyethylene Pipe Association www.cppa-info.org	(800) 510-2772 (202) 462-9607
CRI	Carpet & Rug Institute (The) www.carpet-rug.com	(800) 882-8846 (706) 278-3176
CRSI	Concrete Reinforcing Steel Institute www.crsi.org	(847) 517-1200
CSA	CSA International (Formerly: IAS - International Approval Services) www.csa-international.org	(800) 463-6727 (416) 747-4000
CSI	Cast Stone Institute 10 West Kimball St. Winder, GA 30680-2535	(770) 868-5909
CSI	Construction Specifications Institute (The) www.csinet.org	(800) 689-2900 (703) 684-0300
CSSB	Cedar Shake & Shingle Bureau www.cedarbureau.org	(604) 820-7700
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute) www.cti.org	(281) 583-4087
DHI	Door and Hardware Institute www.dhi.org	(703) 222-2010
EIA	Electronic Industries Alliance www.eia.org	(703) 907-7500

EIMA	EIFS Industry Members Association www.eima.com	(800) 294-3462 (770) 968-7945
EJCDC	Engineers Joint Contract Documents Committee www.asce.org	(800) 548-2723 (703) 295-6300
EJMA	Expansion Joint Manufacturers Association, Inc. www.ejma.org	(914) 332-0040
ESD	ESD Association	(315) 339-6937
FCI	Fluid Controls Institute www.fluidcontrolsintitute.org	(216) 241-7333
FIBA	Federation Internationale de Basketball Amateur (The International Basketball Federation) www.fiba.com	41 22 545 00 00
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation) www.fivb.ch	41 21 345 35 35
FM	Factory Mutual System (See FMG)	
FMG	FM Global (Formerly: FM - Factory Mutual System) www.fmglobal.com	(401) 275-3000
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc. www.floridarooft.com	(407) 671-3772
FSA	Fluid Sealing Association www.fluidsealing.com	(610) 971-4850
FSC	Forest Stewardship Council www.fscoax.org	52 951 5146905
GA	Gypsum Association www.gypsum.org	(202) 289-5440
GANA	Glass Association of North America www.glasswebsite.com	(785) 271-0208
GRI	Geosynthetic Research Institute (See GSI)	
GS	Green Seal www.greenseal.org	(202) 872-6400
GSI	Geosynthetic Institute www.geosynthetic-institute.org	(610) 522-8440

HI	Hydraulic Institute www.pumps.org	(888) 786-7744 (973) 267-9700
HI	Hydronics Institute www.gamanet.org	(908) 464-8200
HMMA	Hollow Metal Manufacturers Association (See NAAMM)	
HPVA	Hardwood Plywood & Veneer Association www.hpva.org	(703) 435-2900
HPW	H. P. White Laboratory, Inc. www.hpwhite.com	(410) 838-6550
IAS	International Approval Services (See CSA)	
IBF	International Badminton Federation www.intbadfed.org	(441-24) 223-4904
ICEA	Insulated Cable Engineers Association, Inc. www.icea.net	(770) 830-0369
ICRI	International Concrete Repair Institute, Inc. www.icri.org	(847) 827-0830
IEC	International Electrotechnical Commission www.iec.ch	41 22 919 02 11
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The) www.ieee.org	(212) 419-7900
IESNA	Illuminating Engineering Society of North America www.iesna.org	(212) 248-5000
IGCC	Insulating Glass Certification Council www.igcc.org	(315) 646-2234
IGMA	Insulating Glass Manufacturers Alliance (The) www.igmaonline.org	(613) 233-1510
ILI	Indiana Limestone Institute of America, Inc. www.iliai.com	(812) 275-4426
ISO	International Organization for Standardization www.iso.ch	41 22 749 01 11
ISSFA	International Solid Surface Fabricators Association www.issfa.net	(702) 567-8150
ITS	Intertek www.intertek.com	(800) 345-3851 (607) 753-6711

ITU	International Telecommunication Union www.itu.int/home	41 22 730 51 11
KCMA	Kitchen Cabinet Manufacturers Association www.kcma.org	(703) 264-1690
LMA	Laminating Materials Association www.lma.org	(201) 664-2700
LPI	Lightning Protection Institute www.lightning.org	(800) 488-6864 (847) 577-7200
MBMA	Metal Building Manufacturers Association www.mbma.com	(216) 241-7333
MFMA	Maple Flooring Manufacturers Association www.maplefloor.org	(847) 480-9138
MFMA	Metal Framing Manufacturers Association www.metalframingmfg.org	(312) 644-6610
MH	Material Handling Industry of America (See MHIA)	
MHIA	Material Handling Industry of America www.mhia.org	(800) 345-1815 (704) 676-1190
MIA	Marble Institute of America www.marble-institute.com	(440) 250-9222
MPI	Master Painters Institute www.paintinfo.com	(888) 674-8937
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc. www.mss-hq.com	(703) 281-6613
NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	(312) 332-0405
NACE	NACE International (National Association of Corrosion Engineers International) www.nace.org	(281) 228-6200
NADCA	National Air Duct Cleaners Association www.nadca.com	(202) 737-2926
NAGWS	National Association for Girls and Women in Sport www.aahperd.org/nagws/	(800)213-7193 x453
NAIMA	North American Insulation Manufacturers Association (The) www.naima.org	(703) 684-0084
NBGQA	National Building Granite Quarries Association, Inc.	(800) 557-2848

	www.nbgqa.com	
NCAA	National Collegiate Athletic Association (The) www.ncaa.org	(317) 917-6222
NCMA	National Concrete Masonry Association www.ncma.org	(703) 713-1900
NCPI	National Clay Pipe Institute www.ncpi.org	(262) 248-9094
NCTA	National Cable & Telecommunications Association www.ncta.com	(202) 775-3550
NEBB	National Environmental Balancing Bureau www.nebb.org	(301) 977-3698
NECA	National Electrical Contractors Association www.necanet.org	(301) 657-3110
NelMA	Northeastern Lumber Manufacturers' Association www.nelma.org	(207) 829-6901
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NETA	InterNational Electrical Testing Association www.netaworld.org	(303) 697-8441
NFHS	National Federation of State High School Associations www.nfhs.org	(317) 972-6900
NFPA	NFPA www.nfpa.org	(800) 344-3555 (617) 770-3000
NFRC	National Fenestration Rating Council www.nfrc.org	(301) 589-1776
NGA	National Glass Association www.glass.org	(703) 442-4890
NHLA	National Hardwood Lumber Association www.natlhardwood.org	(800) 933-0318 (901) 377-1818
NLGA	National Lumber Grades Authority www.nlga.org	(604) 524-2393
NOFMA	National Oak Flooring Manufacturers Association www.nofma.org	(901) 526-5016
NRCA	National Roofing Contractors Association www.nrca.net	(800) 323-9545 (847) 299-9070
NRMCA	National Ready Mixed Concrete Association	(888) 846-7622

	www.nrmca.org	(301) 587-1400
NSF	NSF International (National Sanitation Foundation International) www.nsf.org	(800) 673-6275 (734) 769-8010
NSSGA	National Stone, Sand & Gravel Association www.nssga.org	(800) 342-1415 (703) 525-8788
NTMA	National Terrazzo & Mosaic Association, Inc. www.ntma.com	(800) 323-9736 (540) 751-0930
NTRMA	National Tile Roofing Manufacturers Association (See RTI)	
NWWDA	National Wood Window and Door Association (See WDMA)	
OPL	Omega Point Laboratories, Inc. www.opl.com	(800) 966-5253 (210) 635-8100
PCI	Precast/ Prestressed Concrete Institute www.pci.org	(312) 786-0300
PDCA	Painting & Decorating Contractors of America www.pdca.com	(800) 332-7322 (314) 514-7322
PDI	Plumbing & Drainage Institute www.pdionline.org	(800) 589-8956 (978) 557-0720
PGI	PVC Geomembrane Institute www.pgi-tp.ce.uiuc.edu	(217) 333-3929
PTI	Post-Tensioning Institute www.post-tensioning.org	(602) 870-7540
RCSC	Research Council on Structural Connections www.boltcouncil.org	(800) 644-2400 (312) 670-2400
RFCI	Resilient Floor Covering Institute www.rfci.com	(301) 340-8580
RIS	Redwood Inspection Service www.calredwood.org	(888) 225-7339 (415) 382-0662
RTI	Roof Tile Institute (Formerly: NTRMA - National Tile Roofing Manufacturers Association) www.ntrma.org	(312) 670-4177
SAE	SAE International www.sae.org	(724) 776-4841
SDI	Steel Deck Institute www.sdi.org	(847) 462-1930

SDI	Steel Door Institute www.steeldoor.org	(440) 899-0010
SEFA	Scientific Equipment and Furniture Association www.sefalabs.com	(516) 294-5424
SGCC	Safety Glazing Certification Council www.sgcc.org	(315) 646-2234
SIA	Security Industry Association www.siaonline.org	(703) 683-2075
SIGMA	Sealed Insulating Glass Manufacturers Association (See IGMA)	
SJI	Steel Joist Institute www.steeljoist.org	(843) 626-1995
SMA	Screen Manufacturers Association www.smacentral.org	(561) 533-0991
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association www.smacna.org	(703) 803-2980
SMPTE	Society of Motion Picture and Television Engineers www.smpte.org	(914) 761-1100
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division) www.sprayfoam.org	(800) 523-6154
SPIB	Southern Pine Inspection Bureau (The) www.spib.org	(850) 434-2611
SPI/SPFD	Society of the Plastics Industry, Inc. (The) Spray Polyurethane Foam Division (See SPFA)	
SPRI	SPRI (Single Ply Roofing Institute) www.spri.org	(781) 647-7026
SSINA	Specialty Steel Industry of North America www.ssina.com	(800) 982-0355 (202) 342-8630
SSPC	SSPC: The Society for Protective Coatings www.sspc.org	(877) 281-7772 (412) 281-2331
STI	Steel Tank Institute www.steeltank.com	(847) 438-8265
SWI	Steel Window Institute www.steelwindows.com	(216) 241-7333

SWRI	Sealant, Waterproofing, & Restoration Institute www.swrionline.org	(816) 472-7974
TCA	Tile Council of America, Inc. www.tileusa.com	(864) 646-8453
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance www.tiaonline.org	(703) 907-7700
TMS	The Masonry Society www.masonrysociety.org	(303) 939-9700
TPI	Truss Plate Institute, Inc. www.tpinst.org	(608) 833-5900
TPI	Turfgrass Producers International www.turfgrasssod.org	(800) 405-8873 (847) 705-9898
UL	Underwriters Laboratories Inc. www.ul.com	(800) 285-4476 (847) 272-8800
UNI	Uni-Bell PVC Pipe Association www.uni-bell.org	(972) 243-3902
USAV	USA Volleyball www.usavolleyball.org	(888) 786-5539 (719) 228-6800
USGBC	U.S. Green Building Council www.usgbc.org	(202) 828-7422
USITT	United States Institute for Theatre Technology, Inc. www.usitt.org	(800) 938-7488 (315) 463-6463
WASTEC	Waste Equipment Technology Association www.wastec.org	(800) 424-2869 (202) 244-4700
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WCMA	Window Covering Manufacturers Association (See WCSC)	
WCSC	Window Covering Safety Council (Formerly: WCMA - Window Covering Manufacturers Association) www.windowcoverings.org	(800) 506-4636 (212) 661-4261
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association) www.wdma.com	(800) 223-2301 (847) 299-5200
WI	Woodwork Institute (Formerly: WIC – Woodwork Institute of California)	(916) 372-9943

www.wicnet.org

WIC	Woodwork Institute of California (See WI)	
WMMPA	Wood Moulding & Millwork Producers Association www.wmmpa.com	(800) 550-7889 (530) 661-9591
WSRCA	Western States Roofing Contractors Association www.wsrca.com	(800) 725-0333 (650) 548-0112
WWPA	Western Wood Products Association www.wwpa.org	(503) 224-3930

A. Abbreviations, General: The following are commonly-used abbreviations which may be found on the Drawings or in the Specifications:

AC or ac	Alternating current or air conditioning (depending upon context)
AMP or amp	Ampere
C	Celsius
CFM or cfm	Cubic feet per minute
CM or cm	Centimeter
CY or cy	Cubic yard
DC or dc	Direct current
DEG or deg	Degrees
F	Fahrenheit
FPM or fpm	Feet per minute
FPS or fps	Feet per second
FT or ft	Foot or feet
Gal or gal	Gallons
GPM or gpm	Gallons per minute
IN or in	Inch or inches
Kip or kip	Thousand pounds
KSI or ksi	Thousand pounds per square inch
KSF or ksf	Thousand pounds per square foot
KV or kv	Kilovolt
KVA or kva	Kilovolt amperes
KW or kw	Kilowatt
KWH or kwh	Kilowatt hour
LBF or lbf	Pounds force
LF or lf	Lineal foot
M or m	Meter
MPH or mph	Miles per hour
MM or mm	Millimeter
PCF or pcf	Pounds per cubic foot
PSF or psf	Pounds per square foot
PSI or psi	Pounds per square inch
PSY or psy	Per square yard
SF or sf	Square foot
SY or sy	Square yard
V or v	Volts

B. Abbreviations and Acronyms for Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities ind

icated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

ADAAG	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080
CFR	Code of Federal Regulations Available from Government Printing Office www.access.gpo.gov/nara/cfr	(888) 293-6498 (202) 512-1530
CRD	Handbook for Concrete and Cement Available from Army Corps of Engineers Waterways Experiment Station www.wes.army.mil	(601) 634-2355
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point www.dodssp.daps.mil	(215) 697-6257

C. Undefined Abbreviations, Acronyms, Names and Terms: Words and terms not otherwise specifically defined in this Section, in the Instructions to Bidders, in the Contract General Conditions, on the Drawings or elsewhere in the Specifications, shall be as customarily defined by trade or industry practice, by reference standard and by specialty dictionaries such as the following:

1. Dictionary of Architecture and Construction, Fourth Edition (Cyril M. Harris, McGraw-Hill Book Company, 2006).
2. The American Institute of Architects (AIA) Document M101, "Glossary of Construction Industry Terms."
3. Encyclopedia of Associations, published by Gale Research Co., commonly available in public libraries.

PART 2 - PRODUCTS

Not Applicable to this Section.

PART 3 - EXECUTION

Not Applicable to this Section.

END OF SECTION

SECTION 01 43 39

MOCK-UPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Full scale mock-ups for visual qualities.

1.3 DEFINITIONS

- A. Mock-Ups: Full-size, physical example assemblies to illustrate finishes and materials.
 - 1. Mock-ups are used to verify selections made under Sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples.
 - 2. Mock-ups establish the standard by which the Work will be judged.

1.4 SUBMITTALS

- A. Product Data and Shop Drawings: For each product or system that will be incorporated in the mock-ups, submit required submittals electronically as specified in submittal section and applicable product section of the Specifications.

1.5 QUALITY ASSURANCE

- A. Mock-Ups: Before installing portions of the Work requiring mock-ups, build mock-ups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mock-ups in location and of size indicated or, if not indicated, as directed by University's Representative.
 - 2. Notify University's Representative and Architect minimum of seven days in advance of dates and times when mock-ups will be constructed.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Obtain review and acceptance of mock-ups by Architect and University's Representative before starting Work, including fabrication and installation construction.
 - 5. Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 6. Demolish and remove mock-ups when directed, unless otherwise indicated.

PART 2 - PRODUCTS

2.1 MOCK-UPS FOR VISUAL QUALITIES

- A. Mock-Ups for Visual Qualities: Before installing portions of the Work requiring a mock-up, build the mock-ups with each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Construct field mock-ups as indicated on the Drawings, indicating assemblies and interfaces of materials.
 2. Construct mock-ups at location where directed by University's Representative.
 3. Demonstrate the proposed range of visual effects, qualities and workmanship.
 4. Provide structural substrate for mock-ups as suitable. Mock-ups shall be free standing and self-supporting.
 5. Maintain mock-ups during construction in an undisturbed condition as a standard for judging completed Work.
 6. Demolish and legally dispose of mock-ups when directed, unless otherwise indicated.

PART 3 - EXECUTION

3.1 CONSTRUCTION OF MOCK-UPS FOR VISUAL QUALITIES

- A. Mock-Ups for Visual Qualities, General: Construct mock-ups as noted on the Drawings and specified in individual product Sections of the Specifications, including the following:
1. Construct mock-up where indicated on the Drawings or, if not indicated, where designated by University's Representative.
 2. Construct wall and ceiling framing for gypsum board finish, paint, door frames and doors (with hardware), floor fill at Corridor door, floor coverings and base, wallcoverings, dummy lighting fixtures, dummy electrical and signal outlets, dummy plumbing fixtures, casework and trim.
 3. Remove, reconstruct and refinish products as necessary to achieve fit, finish and tolerances acceptable to University's Representative and Architect.

END OF SECTION

SECTION 01 45 00

QUALITY CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Definitions
- B. Responsibilities
- C. Inspections
- D. Submittals
- E. Regulatory requirements for testing and inspection.
- F. Contractor's quality control.
- G. Quality of the Work.
- H. Inspections and tests by authorities having jurisdiction.
- I. Inspections and tests by serving utilities.
- J. Inspections and tests by manufacturer's representatives.

1.3 RELATED SECTIONS

- A. Section 01 31 13 - Coordination: Coordination of Work under Contract.
- B. Section 01 41 00 - Regulatory Requirements: Compliance with applicable codes, ordinances and standards.
- C. Section 01 45 29 - Testing Laboratory Services: Selection of independent testing and inspection laboratory; tests and inspections conducted by testing laboratory.
- D. Section 01 60 00 - Product Requirements: Product options, substitutions, transportation and handling requirements, storage and protection requirements, and system completeness requirements.

1.4 DEFINITIONS

- A. Quality control services include inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by University Representative or Architect.
- B. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract

Document requirements.

1. Specific quality control requirements for individual activities are specified in Sections relative to those activities.
2. Specified inspections, tests, and related actions do not limit Contractor's quality control procedures that facilitate compliance with Contract Document Requirements.
3. Requirements for Contractor to provide quality control services required by University Representative, Architect, or authorities having jurisdiction are not limited by provisions of this Section.

0.5 RESPONSIBILITIES

- A. General: Comply with requirements of Contract General Conditions.
- B. Unless otherwise indicated as the responsibility of another identified entity, Trustees will employ and pay for services of independent testing laboratory to perform inspections, tests, and other quality control services specified elsewhere in Contract Documents and required by authorities having jurisdiction.
 0. Where individual Sections specifically indicate that certain inspections, tests, and other quality control services are Contractor's responsibility, Contractor shall employ and pay qualified independent testing agency to perform quality control services. Costs for these services are included in Contract Sum.
 - a. Where Trustees have engaged testing agency for testing and inspecting part of Work, and Contractor is also required to engage entity for same or related element, Contractor shall not employ entity engaged by Trustees, unless agreed to in writing by Trustees.
- C. Retesting: Contractor is responsible for retesting where results of inspections, tests, or other quality control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether original test was Contractor's responsibility.
 0. Cost of retesting Work, revised or replaced by Contractor, is Contractor's responsibility where required tests performed on original Work indicated noncompliance with Contract Document requirements.
- D. Associated Services: Cooperate with agencies performing required inspections, tests, and similar services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:
 0. Provide access to Work.
 1. Furnish incidental labor and facilities necessary to facilitate inspections and tests.
 2. Assist Trustees as requested in taking quantities of representative samples of materials that require testing or assist testing agency in taking samples.
 3. Provide facilities for storage and curing of test samples.
 4. Provide security and protection of samples and test equipment at Project Site.

- E. Duties of Testing Agency: Independent agency engaged to perform inspections, sampling, and testing of materials and construction specified in individual Sections shall cooperate with University Representative, Architect, and Contractor in performance of agency's duties. Testing agency shall provide qualified personnel to perform required inspections and tests.
 - 1. Agency shall notify University Representative, Architect, and Contractor promptly of irregularities or deficiencies observed in Work during performance of its services.
 - 2. Agency is not authorized to release, revoke, modify, alter, interpret, or expand requirements of Contract Documents or approve or accept any portion of Work.
 - 3. Agency shall not perform any duties of Contractor.

1.6 INSPECTIONS

- A. General: All construction work shall be subject to inspection by the Trustees (hereinafter referred to as Owner) and the Architect, and all such construction or work shall remain accessible and exposed for inspection purposes until approved by the Owner.
 - 1. The Owner will provide project personnel, including inspectors, to be available at the project site.
 - 2. Approval as a result of an inspection shall not be construed to be an approval of any violation of the provisions of the building code or of other ordinances of the California State Building Code or other regulations of Agencies having jurisdiction over this project, including plans and specifications. Inspections presuming to give authority to violate or cancel the provisions of code or contract documents shall not be valid.
 - 3. It shall be the duty of the contractor to cause the work to remain accessible and exposed for inspection purposes. Neither the Inspector, Trustees, nor Architect shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.
- B. Inspection Requests: It shall be the duty of Contractor to notify the Inspector that specific work is ready for inspection. The Owner requires that every request for inspection be filed at least two working days (48 hours) before such inspection is desired. Such requests shall be submitted in writing, using the inspection request form included in the form template package.
- C. Approval Required: Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the Inspector. The Inspector, upon notification, shall make the requested inspections and shall either indicate in writing that a specific portion of the construction is satisfactory as completed, or shall notify the Contractor that same fails to comply with plans and specifications. Any portions which do not comply shall be corrected by the Contractor prior to the end of the workday, or a Deficiency Notice will be issued by the Inspector placing the Contractor on notice that the work does not conform to the requirements of the Contract Documents. Such portion of Work shall not be covered or concealed until authorized by the Inspector.
 - 1. There shall be a final inspection and approval of all buildings and structures when completed and ready for occupancy and use.
- D. Inspection Coordination: Contractor shall provide, on a weekly basis, an anticipated Inspection Requirements Schedule, coordinated with the three-week look ahead schedule. The Inspection Requirements Schedule shall show the anticipated inspection needs for the following three

weeks to facilitate appropriate campus coordination, as well as mobilization of required inspection staffing.

0.7 SUBMITTALS

A. Reports:

1. Where Trustees are responsible for service, independent testing agency shall submit certified reports electronically (or in writing if necessary), of each inspection, test, or similar service to University Representative and Architect.
2. If Contractor is responsible for service, independent testing agency shall submit certified report electronically (or in writing if necessary) of each inspection, test, or similar service through Contractor for distribution as noted above.
3. Submit additional copies of each written report directly to governing authority when authority so directs.

B. Report Data: Provide reports electronically of each inspection, test, or similar service including, but not limited to the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making inspection or test.
6. Designation of Work and test method.
7. Identification of Specification Section.
8. Complete inspection or test data.
9. Test results and interpretation of test results.
10. Ambient conditions at time of sample taking and testing.
11. Comments or professional opinion on whether inspected or tested Work complies with Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting.

1.8 REGULATORY REQUIREMENTS FOR TESTING AND INSPECTION

- ### A. Building Code Requirements:
- Comply with requirements for testing and inspections in the California Building Code (CBC), as interpreted by authorities having jurisdiction. Additional requirements for testing and inspection, as adopted by authorities having jurisdiction, shall be included in the Contract Sum

and Contract Time.

- B. Requirements of Fire Regulations: Comply with testing and inspection requirements of the Fire Marshal having jurisdiction. All tests and inspections shall be included in Contract Sum and Contract Time.

1.9 CONTRACTOR'S QUALITY CONTROL

- A. Contractor's Quality Control: Contractor shall ensure that products, services, workmanship and site conditions comply with requirements of the Drawings and Specifications by coordinating, supervising, testing and inspecting the Work and by utilizing only suitably qualified personnel.
- B. Quality Requirements: Work shall be accomplished in accordance with quality requirements of the Drawings and Specifications, including, by reference, all Codes, laws, rules, regulations and standards. When no quality basis is prescribed, the quality shall be in accordance with the best accepted practices of the construction industry for the locale of the Project, for projects of this type.
- C. Quality Control Personnel: Contractor shall employ and assign knowledgeable and skilled personnel as necessary to perform quality control functions to ensure that the Work is provided as required.
- D. Coordination of Field Quality Control: Contractor shall coordinate and schedule field quality control activities of University's independent testing and inspection agency and inspectors from authorities having jurisdiction.

1.10 QUALITY OF THE WORK

- A. Quality of Products: Unless otherwise indicated or specified, all products shall be new, free of defects and fit for the intended use.
- B. Quality of Installation: All Work shall be produced plumb, level, square and true, or true to indicated angle, and with proper alignment and relationship between the various elements.
- C. Protection of Existing and Completed Work: Take all measures necessary to preserve and protect existing and completed Work free from damage, deterioration, soiling and staining, until Acceptance by the University.
- D. Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Unless more stringent requirements are indicated or specified, comply with manufacturer's instructions and recommendations, reference standards and building code research report requirements in preparing, fabricating, erecting, installing, applying, connecting and finishing Work.
- E. Deviations from Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Document and explain all deviations from reference standards and building code research report requirements and manufacturer's product installation instructions and recommendations, including acknowledgement by the manufacturer that such deviations are acceptable and appropriate for the Project.
- F. Verification of Quality: Work shall be subject to verification of quality by University or Architect in accordance with provisions of the Contract General Conditions.
 - 1. Contractor shall cooperate by making Work available for inspections and observations by University's Representative, Architect and their consultants.
 - 2. Such verification may include mill, plant, shop, or field inspection, as required.

3. Provide access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated.
 4. Provide all information and assistance as necessary, including that from subcontractors, fabricators, materials suppliers and manufacturers, for verification of quality by University's Representative or Architect.
 5. Contract modifications, if any, resulting from such verification activities shall be governed by applicable provisions in the Contract General Conditions.
- G. Observations by Architect and Architect's Consultants: Periodic and occasional observations of Work in progress will be made by Architect and Architect's consultants as deemed necessary to review progress of Work and general conformance with the design intent.
- H. Limitations on Inspection, Test and Observations: Employment of an independent testing and inspection agency and observations by Architect and Architect's consultants shall not relieve Contractor of the obligation to perform Work in full conformance to all requirements of Contract Documents and applicable Building Code and other regulatory requirements.
- I. Rejection of Work: The University reserves the right to reject any and all Work not in conformance to the requirements of the Contract Documents.
- J. Correction of Non-Conforming Work: Non-conforming Work shall be modified, replaced, repaired or redone by the Contractor at no change in Contract Sum or Contract Time.
- K. Acceptance of Non-Conforming Work: Acceptance of non-conforming Work, without specific written acknowledgement and approval of the University's Representative, shall not relieve the Contractor of the obligation to correct such Work.
- L. Contract Adjustment for Non-conforming Work: Should University's Representative determine that it is not feasible or not in University's interest to require non-conforming Work to be repaired or replaced, an equitable reduction in Contract Sum shall be made by agreement between University's Representative and Contractor. If an equitable amount cannot be agreed upon, a Field Instruction will be issued and the amount in dispute resolved in accordance with applicable provisions of the Contract General Conditions.
- M. Non-Responsibility for Non-Conforming Work: Architect and Architect's consultants disclaim any and all responsibility for Work produced that is not in conformance with the Contract Drawings and Contract Specifications.
- 1.11 INSPECTIONS AND TESTS BY AUTHORITIES HAVING JURISDICTION
- A. Inspections and Tests by Authorities Having Jurisdiction: Contractor shall cause all tests and inspections required by authorities having jurisdiction to be made for Work under this Contract.
1. Except as specifically noted, scheduling, coordinating and conducting such inspections and tests shall be solely the Contractor's responsibility.
 2. All time required for inspections and tests by authorities having jurisdiction shall be included in the Contract Time.
 3. Costs for inspections and tests by authorities having jurisdiction will be paid by University.

1.12 INSPECTIONS AND TESTS BY SERVING UTILITIES

- A. Inspections and Tests by Serving Utilities: Contractor shall cause all tests and inspections required by

serving utilities to be made for Work under the Contract.

1. Except as specifically noted, scheduling, coordinating and conducting such inspections and tests shall be solely the Contractor's responsibility. All time required for inspections and tests by serving utilities shall be included in the Contract Time.
2. Except as specifically noted, all costs for inspections and tests by serving utilities shall be included in the Contract Sum.

1.13 INSPECTIONS AND TESTS BY MANUFACTURER'S REPRESENTATIVES

- A. Inspections and Tests by Manufacturer's Representatives: Contractor shall cause all specified tests and inspections to be conducted by materials or systems manufacturers. Additionally, all tests and inspections required by materials or systems manufacturers as conditions of warranty or certification of Work shall be made, the cost of which shall be included in the Contract Sum.
 1. Scheduling, coordinating and conducting such inspections and tests shall be solely the Contractor's responsibility. All time required for inspections and tests by manufacturer's representatives shall be included in the Contract Time.
 2. All costs for inspections and tests by manufacturer's representatives shall be included in the Contract Sum.

1.14 INSPECTIONS BY INDEPENDENT TESTING AND INSPECTION AGENCY

- A. Inspections by independent Testing Laboratory: Refer to Section 01 45 29 - Testing Lab Services.

PART 2 - PRODUCTS

Not applicable to this Section.

PART 3 - EXECUTION

Not applicable to this Section.

END OF SECTION

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SECTION 01 45 29

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Administrative and procedural requirements for quality control services.
 - 1. Quality control services include inspections and tests and related actions including reports, performed by independent agencies, and governing authorities. They do not include Contract enforcement activities performed by the Trustees or Architect.
 - 2. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.

1.3 RELATED SECTIONS

- A. Section 01 45 00 - Quality Control: General requirements for inspections and tests.
- B. Individual Product Specifications Sections: Specific requirements for inspections and tests.

1.4 RESPONSIBILITIES

- A. Testing Laboratory: Trustees will engage and pay for the services of an independent agency to perform inspections and tests specified as the Trustees' responsibility.
 - 1. Where the Trustees have engaged a testing agency or other entity for testing and inspection of a part of the Work, and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the Trustees, unless otherwise agreed in writing with the Trustees.
- B. Retesting: The Contractor is responsible for the cost of retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.
 - 1. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.
- C. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested.

- D. Coordination: The Contractor, the Trustees, Inspector, and each agency engaged to perform inspections, testing and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition the Contractor shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
1. The Contractor is responsible for communicating to the Inspector the scheduling times for inspections, tests, taking samples and similar activities.
- E. Payment for Testing Laboratory Services:
1. Unless otherwise specified, Trustees will pay for tests and inspections performed by Testing Laboratory, as specified in individual product Sections of the Specifications. Overtime costs due to scheduling for the convenience of the Contractor or to make up for Work behind schedule shall be deducted by Change Order from Contract Sum.
 2. When tests and inspections are required on an overtime basis, initial payment will be made by the Trustees. All costs for overtime testing and inspections shall be paid for by the Contractor and deducted by Change Order from the Contract Sum.
 3. Unless otherwise specified, Contractor shall be back-charged for mileage and travel time for inspection services requiring more than fifty (50) miles from Project site to test products purchased by Contractor.
 - a. Testing laboratory shall forward all billings and records of such costs to University's Representative for approval.
 - b. Such costs, if determined by University's Representative to be attributable to the Contractor under this provision, shall be deducted by Change Order from Contract Sum.
 4. Contractor shall pay all costs for repeated observations, reinspection or retesting by Testing Laboratory due to non-conforming Work. Costs shall be deducted by Change Order from Contract Sum.
 5. Additional Tests, Inspections and Related Services: Contractor shall be charged costs for additional tests, inspections and related services, due to the following. Such costs shall be deducted by Change Order from Contract Sum.
 - a. Work is not ready to inspect when inspectors arrive.
 - b. Failure to properly schedule or notify testing and inspection agency or authorities having jurisdiction.
 - c. Changes in sources, lots or suppliers of products after original tests or inspections.
 - d. Changes in means methods, techniques, sequences and procedures of construction that necessitate additional testing, inspection and related services.
 - e. Changes in mix designs for concrete and mortar after review and acceptance of submitted mix design.
 - f. Multiple off-site fabrication sites.
 - g. Fabrication and installation errors.
 - h. Inefficient, sporadic, or poorly organized manufacturing that causes additional testing costs to be incurred.
- F. Segregation in Billing of Overtime Services: Billings for overtime services shall have straight time and overtime costs segregated and shall have substantiation by detailed explanations justifying necessity of services on overtime basis.
- G. Obligation to Perform Work According to Contract Documents: Employment of Testing Laboratory sha

It in no way relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents and applicable Codes.

H. Limits on Testing Laboratory's Authority:

1. Testing Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Testing Laboratory may not approve or accept any portion of the Work.
3. Testing Laboratory may not assume any duties of Contractor.
4. Testing Laboratory shall have no authority to stop Work.

I. Contractor's Responsibilities to Testing Laboratory: Contractor shall make the Work in all stages of progress available for personal and continuous observation by the Testing Laboratory.

1. Testing Laboratory shall have free access to any and all parts of the Work at all times.
2. Contractor shall provide the Testing Laboratory with reasonable facilities for Testing Laboratory to obtain such information as Testing Laboratory determines is necessary for Testing Laboratory to be kept fully informed of the progress and manner of performance of the Work and character of products, according to Testing Laboratory's duties and responsibilities.
3. Observation and inspection of the Work by Testing Laboratory shall not relieve Contractor from any obligation to fulfill the requirements of the Contract.

J. Retesting: When materials tested fail to meet requirements herein specified, they shall be promptly corrected or removed and replaced and retested in a manner required by University's Representative. Costs involved in retesting shall be deducted by Change Order from Contract Sum.

1.5 TESTS AND INSPECTIONS

A. Tests and Inspections, General: All construction work shall be subject to inspection by the Trustees and the Architect and all such construction or work shall remain accessible and exposed for inspection purposes until approved by the Trustees.

1. The Trustees will provide project personnel, including inspectors, to be available at the project site.
2. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of the building code or of other ordinances of the jurisdiction, including plans and specifications. Inspections presuming to give authority to violate or cancel the provisions of code, or of plans and specifications shall not be valid.
3. It shall be the duty of the contractor to cause the work to remain accessible and exposed for inspection purposes. Neither the Inspector nor the Trustees or Architect shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

B. Inspection Requests: It shall be the duty of the Contractor doing the work to notify the Inspector that such work is ready for inspection. The Trustees require that such work is ready for inspection. The Trustees require that every request for inspection be filed at least two working days before such inspection is desired. Such requests shall be in writing.

- C. Approval Required: Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the Inspector. The Inspector, upon notification, shall make the requested inspections and shall either indicate in writing that portion of the construction is satisfactory as completed, or shall notify the Contractor that same fails to comply with plans and specifications. Any portions of Work that do not comply shall be corrected by the Contractor, and such portion shall not be covered or concealed until authorized by the Inspector.
1. There shall be a final inspection and approval of all buildings and structures when completed and ready for occupancy and use.
- D. Inspection Coordination: Contractor shall provide, on a weekly basis, an anticipated Inspection Requirements Schedule, coordinated with the three-week look ahead schedule, showing the anticipated inspection needs for the following three weeks to facilitate appropriate campus coordination and interface as well as mobilization of required inspection staffing.
- E. Required Inspections: Reinforcing steel, structural framework, or interior wall and/or ceiling support framing of any part of any building or structure shall not be covered or concealed without first obtaining the approval of the Inspector.
1. Listed below are the minimum inspection requirements:
- a. Post-installed concrete anchors.
 - b. Roofing.
 - c. Final Inspection: To be made when the building is completed and ready for occupancy.
 - d. Other Inspections: In addition to the called inspections specified above, the inspector may make or require other inspections of any construction work to ascertain compliance with the provisions of the plans and specifications.
 - e. Re-inspections: A re-inspection fee may be assessed for each inspection or re-inspection when such portion of work for which inspection is called for but is not complete or when corrections called for are not made.
2. The Contractor shall be responsible for reviewing all of the Contract Documents for any additional inspection requirements.

1.6 SUBMITTALS

- A. Reports: Trustees' independent testing agency shall submit a certified electronic report of each inspection, test or similar service, to the Architect, the Trustees, the Contractor, and the Inspector.
- B. Report Data: Electronically distributed reports of each inspection test or similar service shall include, but not be limited to:

Date of issue
Project title and number
Name, address and telephone number of testing agency
Dates and locations of samples and tests or inspections
Names of individuals making the inspection or test
Designation of the Work and test method
Identification of product and Specification Section
Complete inspection or test data
Test results and an interpretation of test results
Ambient conditions at the time of sample-taking and testing
Comments or professional opinion as to whether inspected or tested
Work complies with Contract Document requirements

Name and signature of laboratory inspector
Recommendations on retesting.

1.7 SCHEDULES FOR TESTING

- A. Testing and Inspection Schedule: After discussion with University's Representative and Testing Laboratory in advance of performance of testing and inspection services, Contractor shall determine dates and times necessary for Testing Laboratory to schedule performance of required tests and inspections and determine due dates for issuance of reports.
 - 1. Integrate Testing and Inspection Schedule with Construction Schedule requirements specified in the Contract general Conditions.
 - 2. Determine and indicate in Testing and Inspection Schedule necessary time for preparation and submission of reports of tests and inspections.
- B. Revising Testing and Inspection Schedule: When changes of the construction schedule are necessary during construction, coordinate all such changes of schedule with the testing laboratory as required.
- C. Adherence to Testing and Inspection Schedule: When the Testing Laboratory is ready to test according to the determined schedule but is prevented from testing or taking specimens due to incompleteness of the work, all extra costs for testing attributed to the delay may be back-charged to the Contractor and shall not be borne by the University.

1.8 CONTRACTOR'S RESPONSIBILITIES

- A. Contractor's Responsibilities for Inspections and Tests:
 - 1. Notify Project Inspector and Testing Laboratory two working days in advance of expected time for operations requiring inspection and testing services.
 - 2. Deliver to Testing Laboratory or designated location, adequate samples of materials proposed to be used which require advance testing, together with proposed mix designs.
 - 3. Cooperate with University's Representative, Testing Laboratory, Project Inspector, Architect, Architect's consultants and other responsible design professionals. Provide access to Work areas and off-site fabrication and assembly locations, including during weekends and after normal work hours.
 - 4. Provide incidental labor and facilities to provide safe access to Work to be inspected and tested, to obtain and handle samples at the Work site or at source of products to be tested, and to store and cure test samples.
 - 5. Provide at least 15 days in advance of first inspection or test of each type, a schedule of tests or inspections indicating types of tests or inspections and their scheduled dates.
 - 6. Provide two working days notice to University's Representative, Architect and, as applicable, responsible design consultant, of each test and inspection.

1.9 INSPECTIONS TESTS BY OTHERS

- A. Inspections by Others: Refer to Section 01 45 00 - Quality Control for requirements regarding observations and inspections by University's Representative, Architect and Project Inspector.

- B. Tests by Others: Refer to Section 01 45 00 - Quality Control and individual product Specifications Sections for requirements regarding tests and inspections by product manufacturers and others, including serving utilities.

PART 2 - PRODUCTS

Not Applicable to this Section.

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. Repair and Protection: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract Document 01 73 29 requirements for "Cutting and Patching."
 - 1. Protect construction exposed by or for quality control service activities, and protect repaired construction.
 - 2. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION

SECTION 01 51 00

TEMPORARY UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Temporary utilities and services, including:
 - 1. Temporary water service
 - 2. Temporary sanitary facilities
 - 3. Temporary power and lighting
 - 4. Construction telephone service.

- B. Removal of temporary utilities.

1.3 RELATED SECTIONS

- A. Section 01 11 00 - Summary of the Work: Contractor's use of site and premises.

1.4 SUBMITTALS

- A. Temporary Utilities: Submit reports of tests, inspections, applicable meter readings and similar procedures performed on temporary utilities.

1.5 TEMPORARY UTILITIES AND SERVICES

- A. Temporary Utilities and Services, General: All utilities and other services necessary for proper performance of the Work shall be provided by Contractor, unless specifically noted otherwise. Refer to Contract General Conditions. Temporary utilities and services shall conform to all applicable requirements of authorities having jurisdiction and serving utility companies and agencies, including the following:
 - 1. Requirements of authorities having jurisdiction, including:
 - a. Cal OSHA
 - b. California Building Code (CBC) requirements
 - c. Health and safety regulations
 - d. Utility agency and company regulations
 - e. Police, Fire Department and Rescue Squad rules
 - f. Environmental protection regulations
 - 2. Standards:
 - a. NFPA Document 241 - Building Construction and Demolition Activities.
 - b. ANSI A10 Series - Safety Requirements for Construction and Demolition.
 - c. NECA Electrical Design Library - Temporary Electrical Facilities.

- d. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with California Electrical Code (CEC).
- B. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.
- C. Temporary Connections and Fees: Contractor shall arrange for services and pay all fees and service charges for temporary power, water, sewer, gas and other utility services necessary for the Work.
 - 1. Contractor shall apply for and obtain permits for temporary utilities, including permits for temporary generators, from authorities having jurisdiction.
 - 2. All costs for temporary connections, including fees charged by serving utilities, shall be included in Contract Sum.
- D. Use of Temporary Utilities: Enforce strict discipline in use of temporary utilities to conserve on consumption. Limit use of temporary utilities to essential and intended uses to minimize waste and abuse.

1.6 PROJECT CONDITIONS

- A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities or permit them to interfere with progress. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on the site.
- B. Contractor shall be responsible for building and individual room security to all areas of work where Contractor or its subcontractors enter and perform work.

1.7 TEMPORARY WATER SERVICE

- A. Temporary Water Service: Contractor shall locate and connect to existing water source for temporary construction water service. Contractor shall comply with the following:
 - 1. Locate and connect to existing water source for temporary construction water service, as acceptable to University's Representative.
 - 2. Extend branch piping with outlets located, so that water is available by use of hoses.
 - 3. Temporary water service piping, valves, fittings and meters shall comply with requirements of the serving water utility and California Plumbing Code (CPC).
 - 4. All costs to establish temporary construction water system shall be included in the Contract Sum, or if so specified, costs shall be paid from Contractor's General Conditions, Allowances, or Contingency.

1.8 TEMPORARY SANITARY FACILITIES

- A. Temporary Sanitary Facilities: Provide and maintain adequate temporary sanitary facilities and enclosures for use by construction personnel.
 - 5. Number of temporary toilets shall be suitable for number of workers.
 - 6. Provide wash-up sink with soap, towels and waste disposal.

- B. Use of Existing Sanitary Facilities: Not allowed.

1.9 TEMPORARY POWER AND LIGHTING

- A. Temporary Power and Lighting, General: Comply with NECA Electrical Design Library - Temporary Electrical Facilities.
 - B. Temporary Power: Provide electric service as required for construction operations, with branch wiring and distribution boxes located to provide electrical service for performance of the Work.
 - 1. Provide temporary electric feeder connected to electric utility service at location determined by Contractor and as approved by serving electric utility.
 - 2. Temporary power conduit, raceways, fittings, conductors, panels, connections, disconnects, overcurrent protection, outlets and meters shall comply with requirements of the serving electric utility, California Electrical Code (CEC) and requirements of authorities having jurisdiction.
 - 3. Contractor shall pay all costs to establish temporary electric service, or if so specified, costs of temporary power shall be paid from Contractor's General Conditions, Allowances, or Contingency.
 - 4. As necessary in order to maintain construction progress, Contractor shall provide and pay all costs associated with generators used for temporary power.
 - C. Temporary Lighting: Provide temporary lighting as necessary for proper performance of construction activities and for inspection of the Work.
 - 1. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
 - 2. Maintain lighting and provide routine repairs.
 - D. Protection: Provide weatherproof enclosures for power and lighting components as necessary. Provide overcurrent and ground-fault circuit protection, branch wiring and distribution boxes located to allow convenient and safe service about site of the Work. Provide flexible power cords as required.
 - E. Service Disruptions: When necessary for energizing and de-energizing temporary electric power systems, minimize disruption of service to those served by public mains. Schedule transfers at times convenient to University and to occupants.
- #### 1.10 CONSTRUCTION TELEPHONE SERVICE
- A. Construction Telephone Service: Provide telephone service to Contractor's field staff by means of cellular telephone or other methods to enable communications between University's Representative, Project Inspector and Contractor.
 - 1. Include voice message services.
 - 2. All costs of construction telephones shall be included in Contract Sum.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Materials: Contractor shall provide new materials. If acceptable to the University Representative, and

amaged previously used materials in serviceable condition may be used. Provide materials that are suitable for the use intended. Their use and methods of installation shall not create unsafe conditions or violate requirements of applicable codes and standards.

- B. Equipment: Contractor shall provide new equipment; or, if acceptable to the Trustees, Contractor may provide undamaged, previously used equipment in serviceable condition. Provide equipment that is suitable for use intended.

PART 3 - EXECUTION

3.1 TEMPORARY UTILITIES INSTALLATION

- A. Temporary Utilities Installation, General: Contractor shall engage the appropriate local utility company or personnel to install temporary service or connect to existing service.
 - 1. Use Charges: Cost or use charges for temporary facilities are the Contractor's responsibility.
 - 2. Allowance for Utilities Charges: When Contract includes an allowance for metering of utility services, whether through temporary or permanent facilities, unused amount shall be returned to the Trustees by deductive change order.
- B. Water Service: Contractor may take water from the University's systems in such quantities and at such times as they are available. If this is done, Contractor shall provide all temporary materials necessary to extending the utility to where they will be used. Contractor shall install a meter and reimburse the University for any water used. Where sub-metering is not possible or practical, a flat fee may be established and paid to the University.
- C. Temporary Electric Power Service: Contractor may take electricity from the University's system if available. If this is done, Contractor shall provide all equipment, including connections, and other materials necessary for extending the utility lines to where they will be used. Contractor shall coordinate the installation with the University's Representative. Contractor shall install a meter and reimburse the University for any power used. Where sub-metering is not possible or practical, a flat fee may be established and paid to the University.
 - 1. When not available from the University, the Contractor must arrange and pay for electric service through the local utility or furnish his own portable power.
 - 2. All permanent power used by the Contractor prior to Occupancy by the Trustees shall be metered and paid for by the Contractor.
- D. Temporary Telephones: Contractor shall have telephone service available at its business office for the duration of contract where the Contractor and its superintendent may be contacted.
- E. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities, Contractor shall install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Contractor shall comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations." Contractor shall:
 - 1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
 - 2. Store combustible materials in containers in fire-safe locations.
 - 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection fac

ilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.

4. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.
- F. Maintenance of Temporary Utilities and Services: Contractor shall maintain temporary utilities and services in good operating condition until removal. Contractor shall protect from utilities and services from environmental and physical damage.

3.2 TERMINATION AND REMOVAL OF TEMPORARY UTILITIES AND SERVICES

- A. Termination and Removal of Temporary Utilities and Services: Unless the Trustees require that it be maintained longer, Contractor shall remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Completion. Contractor shall complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. At Completion, Contractor shall clean and renovate permanent facilities that have been used during the construction period.
- B. Removal of Temporary Underground Utilities and Restoration: Remove temporary underground utility installations to a minimum depth of two-feet below utility services. Contractor shall:
 1. Backfill, compact and re-grade site as necessary to restore areas or to prepare for indicated paving and landscaping.
 2. Restore paving damaged by temporary utilities. Refer to requirements specified in Section 01 73 29 - Cutting and Patching Requirements.
- C. Cleaning and Repairs: Contractor shall clean exposed surfaces and repair damage caused by installation and use of temporary utilities and services. Where determined by University's Representative that repair of damage is unsatisfactory-Work, Contractor shall replace construction with matching finishes. Refer to requirements specified in Section 01 73 29 - Cutting and Patching Requirements.

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SECTION 01 52 00

CONSTRUCTION FACILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. This Section specifies requirements for temporary services and facilities, including utilities, temporary construction fencing, construction and support facilities, security and protection.
- B. Temporary utilities that are required include but are not limited to:
 - 1. Water service and distribution.
 - 2. Temporary electric power and light.
 - 3. Telephone service.
 - 4. Data services.
- C. Temporary construction and support facilities that are required include but are not limited to:
 - 1. Field offices and storage sheds
 - 2. Temporary enclosures
 - 3. Waste disposal services
 - 4. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities that are required include but are not limited to:
 - 1. Temporary fire protection
 - 2. Barricades, warning signs, lights
 - 3. Environmental protection.
 - 4. Site security for theft.

1.3 ACTION SUBMITTALS

- A. Layout of Field Offices and Sheds: Within five working days of the Notice-to-Proceed, Contractor shall submit to University's Representative a proposed layout for field offices, sheds and storage areas. University's Representative will review and respond within five working days with comments and directions. Contractor shall comply with directions of University's Representative.
- B. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.4 PROJECT CONDITIONS

- A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on the site.
- B. Contractor shall be responsible for security to all areas of work where Contractor or its subcontractors enter and perform work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials; if acceptable to the University Representative, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended. Their use and methods of installation shall not create unsafe conditions or violate requirements of applicable codes and standards.
- B. Temporary Construction Perimeter Fence - Provide 11-gauge, galvanized 2-inch, chain link fabric fencing 8-feet high with galvanized steel pipe posts, 1-1/2" I.D. for line posts, top posts and bottom posts, and 2-1/2" I.D. for corner posts. All fencing shall be covered with green fabric shade cloth, secured to top and bottom rails through integral metal eyelets. Contractor is responsible to maintain the fence and green shade through the entire duration of the contract. Contractor it is the contractor's responsibility to coordinate and relocate the fence as required for construction.
- C. All work areas within the campus and public spaces shall be fenced with minimum 6 feet chain link portable fence sections, with 1-1/2" top, bottom and side rails. All fencing shall be covered with blue fabric shade cloth material, secured to top, bottom and side rails with integral metal eyelets. Shade cloth shall not be left unsecured. Fencing materials shall be maintained in good, damage free condition at all times.
 - 1. Fencing shall extend around and enclose entire work area, as well as stored materials and equipment.
 - 2. Fencing shall be secured in a closed condition when not required to be open to allow completion of the work. Fencing shall be secured each day at the close of work.
 - 3. The use of alternate materials such as barricades, delineators and caution tape to enclose or delineate work areas will not be accepted.
 - 4. 3 sand bags shall be placed on every stand. Contractor shall replace sand bags whenever a sand bag ruptures.
 - 5. Contractor can tie-back fencing to fixed stakes as required in lieu of sand bags. Tie backs shall not be trip hazards.
 - 6. Plastic water filled K-rail can be used in lieu of fencing when approved in advance by the University.

2.2 EQUIPMENT

- A. General: Provide new equipment; or, if acceptable to the University, Contractor may provide undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.

- B. First Aid Supplies: Comply with governing regulations.
- C. Fire Extinguishers: Provide 2 hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL- rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.
- D. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.
- E. Temporary lighting: Provide adequate illumination to all areas of the project as required for ingress, egress, and prosecution of the Work. Provide cages where fixtures are exposed to potential breakage.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage the appropriate local utility company or personnel to install temporary service or connect to existing service.
 - 1. Use Charges: Connection and cost or use charges for temporary facilities are the Contractor's responsibility.
 - 2. Allowance for Utilities Charges: When Contract includes an allowance for metering of utility services, whether through temporary or permanent facilities, unused amount shall be returned to the Trustees by deductive change order.
- B. Water Service: Water may be taken from the University's systems in such quantities and at such times as they are available. If this is done, provide all temporary materials necessary to extending the utility to where they will be used. Contractor shall install a meter of type acceptable to the University and reimburse the University for the cost of any water used.
- C. Temporary Electric Power Service: Electricity may be taken from the University's system if available. If this is done, provide all equipment, including connections, and other materials necessary for extending the utility lines to where they will be used. Coordinate the installation with the University Representative. Contractor shall install a meter of type satisfactory to University and reimburse the University for any power used. Where sub-metering is not possible or practical, a flat fee may be established and paid to the University.
 - 1. When not available from the University, the Contractor must arrange and pay for electric service through the local utility or furnish his own portable power.
 - 2. All permanent power used by the Contractor prior to Occupancy by the University shall be metered and paid for by the Contractor.
- D. Temporary Fire Protection: Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations".

1. Locate fire extinguishers where convenient and effective for their intended purpose.
 2. Store combustible materials in containers in fire-safe locations.
 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires.
 4. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.
- E. Work outside defined construction site: Comply with Section 01 55 00, Vehicular and Pedestrian Controls for requirements for all work that impacts areas outside of the Construction site perimeter as defined in the contract documents. This includes ingress and egress to the site by construction personnel and vehicles.
- F. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.
- G. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- H. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
- I. Termination and Removal: Unless the University require that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired. At Completion, clean and renovate permanent facilities that have been used during the construction period.

3.3 SANITARY FACILITIES

- A. Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with regulations and health codes for type, number, location, operation and maintenance of fixtures and facilities. Install where facilities will best serve projects needs.
1. Provide toilet tissue, paper towels, paper cups and similar disposable materials for each facility. Provide covered waste containers for used materials.
 2. Contractor shall not use existing campus sanitary facilities at any time.

3.4 SUPPORT FACILITIES

- A. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not store materials more than seven days during normal weather or 3 days when temperature is expected to rise above 80 degrees F. Handle hazardous, dangerous or unsanitary waste by containerizing properly. Dispose of material lawfully.
1. Furnish equipment necessary for refuse removal. Do not use University disposal bins or trash carts at any time.

3.5 SECURITY

- A. Prior to commencement of the work, initiate a security program and install enclosure fence with lockable entrance gates. Location shall be sufficient to encompass the entire area of construction operation.
 - 1. Install and maintain substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.
 - 2. University will not be liable for damage or loss to the Work due to trespass or theft. In addition, the University or University shall not be liable for loss or damage to Contractor's materials, tools, or equipment. The contractor is solely responsible for the security the contractor's work area.
- B. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.
 - 1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

3.6 REMOVAL OF CONSTRUCTION FACILITIES

- A. Removal of Construction Facilities: Unless otherwise mutually agreed by University's Representative and Contractor, remove temporary materials, equipment, services, and construction prior to Contract Completion review.
 - 1. Coordinate removal with requirements specified in Section 01 51 00 - Temporary Utilities, Section 01 55 00 - Vehicular and Pedestrian Controls and Section 01 57 00 - Temporary Controls.
 - 2. Completely remove in-ground construction facilities to minimum depth of two feet. Backfill, compact and regrade site as necessary to restore areas or to prepare for indicated paving and landscaping.
- B. Cleaning and Repairs: Clean and repair damage caused by installation or use of temporary construction facilities on public and private rights-of-way.

END OF SECTION

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SECTION 01 55 00

VEHICLE AND PEDESTRIAN CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Section specifies requirements for construction activities impacting the Campus Community outside the designated construction site, as well as requirements for Contractor ingress to and egress from the project site. Section includes, but is not limited to the following:
 - 1. Construction activities within or adjacent to pedestrian walkways and thoroughfares.
 - 2. Construction within landscape and hardscape areas outside the designated Project site area.
 - 3. Procedures for work within city streets and campus roads.
 - 4. Haul routes and temporary traffic Control.
 - 5. Contractor parking.

1.3 WORK WITHIN AREAS OF PEDESTRIAN ACCESS

- A. General: These requirements apply to all work required on the Campus outside the designated Project Site. Requirements also apply to activities occurring on the Project Site, which impact adjacent areas of the Campus.
- B. Fencing of Work Areas
 - 1. All work areas within the campus and public spaces shall be fenced with minimum 6-foot chain link portable fence sections, with 1-1/2" top, bottom and side rails. All fencing shall be covered with blue fabric shade cloth material, secured to top, bottom and side rails with integral metal eyelets. Shade cloth shall not be left unsecured. Fencing materials shall be maintained in good, damage free condition at all times.
 - a. Fencing shall extend around and enclose entire work area, as well as stored materials and equipment.
 - b. Fencing shall be secured in a closed condition when not required to be open to allow completion of the work. Fencing shall be secured each day at the close of work.
 - c. The use of alternate materials such as barricades, delineators and caution tape to enclose or delineate work areas will not be accepted.
 - d. 3 sand bags shall be placed on every stand. Contractor shall replace sand bags whenever a sand bag ruptures.
 - e. Contractor can tie-back fencing to fixed stakes as required in lieu of sand bags. Tie backs shall not be trip hazards.
 - f. Plastic water filled K-rail can be used in lieu of fencing when approved in advance by the University.

C. Sidewalk Closures and Restrictions

1. Use Cal-Trans Standard reflectorized signage where required to indicate closure of sidewalks, temporary revisions to crosswalks and other impacts to normal pedestrian walk routes.
2. Where sidewalks are partially restricted due to construction activities, a minimum width of 48" shall be maintained.
3. Bases for temporary fencing shall not extend into the required walk area.
4. Where portions of a sidewalk are temporarily closed, temporary fencing shall be placed at the nearest intersection to prevent the site impaired from traveling in a direction that will require them to eventually stop and return to said intersection. Pedestrian detour signs and "sidewalk closed" signs shall also be provided at the point of closure.

D. Access for construction equipment and material deliveries

1. All haul routes and delivery routes shall conform to the routes designated in Contractor's approved Work Plans. Refer to Section 01 14 00 for requirements.
2. Times for delivery of materials and hauling shall comply with the requirements of the Contract Documents and approved Contractor Work Plans.
3. No staging or parking of vehicles or construction equipment will be allowed outside the Project Site, except within the work areas designated in the approved Contractor Work Plans.
4. Flagman Requirements
 - a. All major vehicles and equipment using approved haul routes that travel over intercampus pedestrian thoroughfares shall be escorted by at least one flagman until the vehicle or equipment is within the confines of the project site. Contractor is advised that the Campus Community includes a large volume of students and staff with disabilities, including but not limited to wheel chair users, persons with hearing impairments, and persons with sight impairments; for this reason, escorting of equipment and vehicle traffic will be strictly enforced.
 - 1) Flagman shall be trained and shall direct pedestrians and traffic in accordance with the requirements set forth in Article 1.4 below.
 - b. Entry exit gates to the project site shall be left in a closed position at all times, unless a flagman is stationed at the gate to control unauthorized entry into the project site.
5. Maintenance of Thoroughfares
 - a. Pedestrian thoroughfares and crossings shall be maintained in a safe, clean condition, free of dirt, gravel and other debris resulting from construction operations at all times.
 - b. Where work occurs on or adjacent to pedestrian thoroughfares, Contractor shall employ adequate measures (such as sandbagging, earthen barriers, etc.) to ensure that walks are protected from overflow of construction materials or runoff into the pedestrian area.
 - c. Where work occurs on or adjacent to pedestrian thoroughfares, Contractor shall employ adequate measures to ensure that walks are protected from overhead hazards, such as falling debris. Provide covered walkway structures and other measures as required to comply with O.S.H.A. standards.
 - d. Contractor shall confirm local Fire Dept. requirements for access to the construction site and other Campus facilities impacted by the Work throughout the course of construction. Where Fire Dept. access must be maintained at specific areas, Contractor shall tailor the Work Plan and provide necessary temporary measures to accommodate requirement.
6. Trenching Operations
 - a. Where trenching occurs through, across or adjacent to pedestrian thoroughfares, the work shall comply with the approved Work Plan for the area in question.
 - b. Temporary pedestrian crossings required due to trenching operations:

- 1) Steel plating shall be placed across trenches and trench bracing shall be installed in accordance with W.A.T.C.H. standards as referenced in section 1.04 below.
- 2) Minimum 6 feet high chain link fencing sections (per paragraph 1.2-B above) shall be installed inside the edge of the plating on each side to clearly delineate the path of travel and prevent pedestrians from stepping into trench area.
- 3) All steel plating shall have beveled edges and shall comply with A.D.A. requirements for path of travel. Edges of plates at each approach shall be painted with a 1" safety yellow contrasting band. Plating shall be anchored in accordance with W.A.T.C.H. standards and carry appropriate traffic ratings where it is required to carry emergency response vehicle traffic.
- 4) The use of barricades, delineators and or caution tape in lieu of the required temporary fencing sections is unacceptable.

1.4 WORK WITHIN ROADWAYS AND PARKING AREAS

A. General Requirements

1. All construction activities which occur within campus roadways and parking areas shall comply with the 2012 version of the City of Los Angeles Work Area Traffic Control Handbook (W.A.T.C.H.) for traffic control, signage and barricading, as supplemented by these specifications. Where conflicts exist between specific requirements, the more stringent requirement shall apply. W.A.T.C.H. standards are available from Building News Inc., 3055 Overland Ave., Los Angeles, Ca., 90034 - Phone: 310/202-7775.
2. Flagman requirements and operations shall comply with W.A.T.C.H. standards and the State of California, Dept. of Transportation "Instructions to Flaggers" - 2012 Edition.
3. Signage: All temporary traffic control signage shall comply with California Vehicle Code Section 21400 and California Dept. of Transportation (Cal-Trans) standards. All signage shall be reflectorized.
4. Where trenches, excavations or other work is required within streets, the Work shall be scheduled so as to maintain a minimum of one open traffic lane at all times. A minimum of two lanes as required allowing safe 2-way traffic shall be restored prior to completion of Contractor's operations each day.
5. All work within University roadways and parking areas requires approval of Contractor's Work Plan prior to commencement. Refer to Section 01 14 00 for Work Restrictions.

B. Fencing, Barricades and Traffic Plating

1. All work areas shall be fenced in compliance with paragraph 1.3-B above. Modifications to this requirement due to specific access requirements for completion of the work shall be requested by Contractor in the Work Plan Submittal for a designated area.
2. Type I Barricades as referenced in the W.A.T.C.H. standards are not acceptable for use on the Project. Contractor shall use type II or type III barricades where required.
3. Where temporary traffic controls must remain in place overnight or at other times when Contractor is not continuously present in the work area, cones, plastic delineators and other lightweight traffic control devices subject to displacement shall not be used for traffic control.
4. Where temporary fencing and/or barricades remain in place overnight, Type II barricades with flashing amber lights shall be used to delineate the protruding corners of the of the work area enclosure at the approach from each direction.
5. Where trenches or excavations of a depth of 3'-0" or deeper and a width of 2'-0" or greater are directly adjacent to a drive lane, the trench shall be plated in accordance with W.A.T.C.H. standards, or concrete barricades (k-rail) shall be installed to protect vehicle

traffic from entering the excavation during times when the work area is not manned by Contractor.

6. Where trenches or excavations of a depth of 4'-0" or greater are directly adjacent to a drive lane or pedestrian walk, the protective fencing shall be a minimum horizontal distance of 4'-0" from the edge of the excavation.
7. All traffic plates shall be beveled in the direction of vehicle traffic and secured in place. Where work occurs at pedestrian crossings, comply with Article 1.3 above.
8. Comply with W.A.T.C.H. standards for sizing of traffic plates and shoring of trenches up to 4' in width. For trenches exceeding 4' in width, Contractor shall engage a Civil Engineer registered in the State of California to design plating and shoring system.

C. Flagman Requirements

1. Whenever existing traffic lanes are altered, contractor shall provide properly equipped and trained flagmen to direct traffic. Comply with W.A.T.C.H. standards and Cal-Trans "Instructions to Flaggers".
2. Whenever a section of two-way traffic is temporarily reduced to one lane, a minimum of two flagmen shall be provided to ensure proper traffic control in each direction. 2-way radio devices shall be used for communication between the flagmen where both direct line of site and audible communication cannot be maintained.
3. Flagmen shall be dedicated solely to traffic and pedestrian control and shall not perform additional duties while assigned as flagmen.

D. Signage

1. Traffic control signage shall be provided as required for safe and proper direction of vehicles and in accordance with the requirements listed in paragraph 1.4-A-3 above.
2. All signage shall be reflectorized.
3. Temporary traffic control signs shall be California Dept. of Transportation standard type as listed in the following schedule.

Sign Type	Designation	Size
Stop	R1R	30 x 30
Speed limit	R2R	24 x 30
Keep right/left	R7R	18 x 24
Do not enter	R11R	24 x 24
No right turn	R16R	24 x 24
No left turn	R17R	24 x 24
No parking	R26DR	12 x 12
No parking/fire lane	R26RFL	12 x 18
No parking anytime	R28R	12 x 18
Yield	R39R	30" triangle
Disabled parking	R99R	12 x 18
Exit only	R108R	18 x 24
Enter only	R109R	18 x 24
No pedestrians	R96R	18 x 18
Use crosswalk	R96BR	18 x 12
Two-way traffic ahead	R40R	24 x 30
Merge	WLR (L) or (R)	24 x 24

E. Haul Routes

1. Haul Routes for Construction activities and delivery of materials shall strictly adhere to routes designated in the contract documents. All vehicles and equipment are required to use designated routes only. Deviations from designated haul routes shall only be permitted where previously authorized in Contractor's approved Work Plans.

2. Continuous or major hauling on campus roads shall be restricted to the hours of 7:00 am through 6:00 p.m. unless otherwise authorized by the University Representative.
3. Contractor shall comply with hauling and truck traffic requirements on all City roads and shall obtain all required permits and authorizations. Weight loads carried by vehicles shall be within capacity recommended by manufacturer and shall comply with applicable laws and regulations relating to allowable capacities for specific roads.
4. Roads shall be maintained in a clean condition at all times. Sweeping of roads shall occur at minimum on a daily basis, or more often as required by continual hauling operations or construction traffic.
5. All loads shall be covered with secured tarpaulins when gravel, asphalt, debris, or other loose materials are removed from or hauled into the Campus.
6. Truck staging shall not occur on any campus road, or City road within the Campus, unless prior authorization is received through approval of the Contractor's Work Plan.
7. Provide protection against damage to existing sidewalks, curbs and gutters and other improvements at locations where construction vehicles enter. Contractor shall be responsible for repair of all damage resulting from its operations. Damage to concrete shall be repaired by replacement of full sections to the nearest existing construction joint in each direction.

F. Emergency Response Access

1. Contractor shall maintain adequate provisions for passage of emergency response vehicles (ambulances, fire trucks etc.) over campus roads and inner-campus thoroughfares at all times.
2. At all times that work is occurring which requires trenching, excavations, or other blockages of any fire lane or emergency access location, Contractor shall have traffic plating and other materials and equipment on hand as required to permit immediate passage of response vehicles in the case of an emergency. At no time shall said blockages be left unmanned.

1.5 PARKING CONTROL

- A. Contractor and all subcontractors, suppliers, etc. are required to purchase University parking passes. Contractor Parking Passes are required for all vehicles parking on campus regardless of location.
- B. Contractor, subcontractors and suppliers shall park within the Construction site and other authorized areas as identified in the Contract Documents.
- C. Any parking in University lots or stalls outside the authorized areas identified in the Contract Documents requires payment of the current University parking fees as evidenced by display of a valid Cal Poly Humboldt parking permit. Permits may be obtained by purchasing them through the University Dept. of Public Safety.
- D. Contractor, subcontractors and suppliers shall at no time park any vehicle on the inner-campus, outside the confines of the construction site as designated in the Contract Documents. Vehicles in non-compliance will be cited and towed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 MAINTENANCE OF PARKING AND ACCESS ROADS

- A. Maintenance: Contractor shall maintain traffic and parking areas in a sound condition. Contractor shall repair breaks, potholes, low areas, standing water and other deficiencies, to maintain paving and drainage in original or specified condition.
- B. Cleaning of Sidewalks, Roadways, and Parking Areas: Contractor shall keep public and private rights-of-way and parking areas clear of construction-caused soiling, dust and debris, especially debris hazardous to vehicle tires.
 - 1. Contractor shall inspect and perform cleaning hourly to ensure entire public commons areas, sidewalks, crosswalks, roadways, haul routes, and parking lots are free of all debris. Contractor shall provide dedicated laborers and equipment as required to ensure areas are kept neat and clean during each day of the contract.
 - 2. Contractor shall coordinate with requirements specified in Section 01 57 00 - Temporary Controls and Section 01 74 00 - Cleaning Requirements.

END OF SECTION

SECTION 01 55 29

CONSTRUCTION STAGING AREAS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Contractor Staging Area requirements.

1.3 RELATED SECTIONS

- A. Section 01 11 00 - Summary of the Work: Contractor's use of site and premises.
- B. Section 01 52 00 - Construction Facilities: Field offices and sheds.
- C. Section 01 35 53 - Security
- D. Section 01 55 00 - Vehicular & Pedestrian Controls
- E. Section 01 57 00 - Temporary Controls
- G. Section 01 74 00 - Cleaning Requirements: Periodic cleaning and cleaning for Final Completion review.

1.4 SUBMITTALS

- A. Shop Drawings: Prior to site mobilization, Contractor shall prepare and submit for review by University's Representative a site plan indicating detailed layout of Contractor Staging Area, including:
 - 1. Temporary utilities
 - 2. Temporary fencing and gates
 - 3. Temporary offices and sheds
 - 4. Construction aids
 - 5. Vehicular access ways and on-site parking
 - 6. Temporary barriers and enclosures
 - 7. Storm water pollution prevention measures

PART 2 - PRODUCTS

Not applicable to this Section.

PART 3 - EXECUTION

CAL POLY HUMBOLDT
SIEMENS HALL ROOF REPAIR – XPL311
LPAS Project No.: 1485-0004

CONSTRUCTION STAGING AREAS
01 55 29 - 1

3.1 CONTRACTOR STAGING AREA REQUIREMENTS

- A. Contractor Staging Areas: Refer to reference drawings included in the set of Contract Drawings for location of Contractor Staging Areas.
 - 1. Contractor shall use only site areas designated specifically by University as Contractor Staging Area for the Project.
 - 2. Contractor Staging Area for the Project shall be clearly indicated on site plan. Contractor shall remove equipment placed or located outside of areas designated for Contractor Staging Area to within Contractor Staging Area at no change in Contract Time and Contract Sum.
 - 3. Contractor shall keep access to Contractor Staging Areas and other construction access ways and thoroughfares clear at all times. Contractor shall provide traffic and parking control signage acceptable to University's Representative.
- B. Cleanliness: Contractor shall keep Staging Area clear of trash and debris and in neat order. Contractor shall be responsible for cleanliness and order of assigned Staging Areas, as acceptable to University's Representative.

3.2 REMOVAL OF CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

- A. Removal of Construction Facilities and Temporary Controls: Unless otherwise mutually agreed by University's Representative and Contractor, Contractor shall remove temporary materials, equipment, services, and construction prior to Contract Completion review. Contractor shall coordinate removal with requirements specified in Section 01 51 00 - Temporary Utilities, Section 01 52 00 - Construction Facilities, Section 01 55 00 - Vehicular & Pedestrian Controls and Section 01 57 00 - Temporary Controls.
- B. Cleaning and Repairs: Contractor shall clean and repair damage caused by installation or use of temporary facilities on public and private rights-of-way.
- C. Removal of Temporary Utilities and Restoration: Contractor shall remove temporary underground utility installations to a depth of two feet. Backfill, compact and regrade site as necessary to restore areas or to prepare for indicated paving and landscaping.

END OF SECTION

SECTION 01 56 39

TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Requirements to preserve and protect, as necessary existing trees and shrubs, and other existing vegetation.
- B. All trees and plant materials to remain on site shall be protected from all trades working on the job, and it shall be the Contractor's responsibility to ensure that all subcontractors are aware of and held responsible for any damage to existing trees and plant material. In addition, Contractor shall be held responsible to insure that following protective measures are carried out throughout the entire construction period.
- C. Maintenance: Throughout the life of the construction project, the Contractor shall be responsible for overseeing measures necessary to protect all existing trees, lawns, shrubs, groundcover and other plants.

1.3 RELATED REQUIREMENTS

- A. Section 01 57 00 – Temporary Controls

PART 2 - PRODUCTS

2.1 BARRIERS

- A. Barriers: As specified in Section 01 57 10 – Existing Finish Protection.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect all existing trees, shrubs and ground covers from stockpiling, material storage including soil, vehicle parking and driving within the tree drip line. Restrict foot traffic to prevent excessive compacting of soil over root systems.

- B. Protect root systems of existing trees, shrubs, and ground covers from damage due to chemically injurious materials in solution caused by runoff and spillage during mixing, placement of construction materials, and drainage from stored materials.
- C. Protect root system from flooding, erosion, excessive wetting and drying resulting from de-watering and other operations.
- D. Protect existing plant materials from unnecessary cutting, breaking and skinning of roots and branches, skinning and bruising of bark.
- E. Do not allow fires under and adjacent to existing trees or plants.

3.2 REPAIR AND REPLACEMENT OF SHRUBS AND GROUND COVER

- A. Repairs and Replacements of Shrubs and Ground Cover: Repair shrubs and other vegetation damaged by construction operation in manner acceptable to University's Representative.
 - 1. Make repairs promptly after damage occurs to prevent progressive deterioration of damaged plant. Remove and replace all dead and damaged plants up to six-inch diameter, which are determined by University's Representative as being incapable of restoration to normal growth pattern.
 - 2. Provide new shrubs of same size and species as those replaced or as acceptable to the University's Representative.

3.3 COMPENSATION TO UNIVERSITY FOR LOST AND DAMAGED TREES

- A. The Contractor shall be liable for the loss in value to damaged trees and for all repair or replacement costs resulting from construction operations as determined by the University Representative. Because of the irreplaceable nature of many of the existing trees, the amount of assessment shall be determined by the University Representative, depending upon tree species, condition before damage, and location value.
- B. Designated sums shall be governed by applicable provisions of the Contract General Conditions

END OF SECTION

SECTION 01 57 00

TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. The requirements for the following subjects are included in this Section:
 - 1. Environmental Protection Plan
 - 2. Smoke/Odor Control
 - 3. Noise Control
 - 4. Dust and Air Pollution Control
 - 5. Welding and Burning
 - 6. Erosion and Sediment Control
 - 7. Disposal Operations
 - 8. Cultural Resources

1.3 PROTECTION OF EXISTING CONDITIONS

- A. Protection of Adjacent Facilities: Contractor shall restrict Work to limits indicated on the Drawings and as specified in Section 01 11 00 - Summary of the Work. Protect existing, adjacent facilities from damage, including soiling and debris accumulation.
- B. Video and Photo Record of Existing Conditions: Contractor shall produce video record and photo records of all existing conditions within and adjacent to Project area.
 - 1. Video record shall be made with sound to record comments to identify locations and describe conditions. Photo records shall be made available on a USB drive
 - 2. University's Representative will accompany Contractor during recording of existing conditions but will not direct recording process.
 - 3. Video and photo record shall capture the state of existing features, including but not limited to:
 - a. Paving
 - b. Landscaping
 - c. Building surfaces
 - d. Utilities
 - e. Lighting standards, fencing, signage and other site appurtenances
 - 4. Contractor shall retain one copy and deliver one copy of video and photo record to University's Representative within seven calendar days after they have been produced.
 - 5. Video and photo record shall be used to verify restoration of existing conditions after completion of construction activities.

6. Existing features not recorded shall be restored as directed by University's Representative, including reconstruction and refinishing as determined necessary by University's Representative.
- C. Existing Utilities - Should the Contractor break any utility the contractor should immediately act to repair the utility. Contractor shall continuously work to repair broken utilities to minimize impact to the University.
- D. Contractor shall maintain spare parts and materials to repair all utilities, water lines, sewer lines, etc.

1.4 ENVIRONMENTAL PROTECTION PLAN

- A. The requirements of the Article are in addition to those of the Contract General Conditions.
- B. During the progress of the work, keep the premises occupied in a neat and clean condition and protect the environment both on site and off site, throughout and upon completion of the construction project.
- C. In coordination with the Campus, develop an Environmental Protection Plan in detail and submit to the University Representative within 30 calendar days from the date of commencement specified in the Notice to Proceed. Distribute the approved plan to all employees and to all subcontractors and their employees. The Environmental Protection Plan shall include, but not be limited to, the following items:
 1. Copies of required permits.
 2. Proposed sanitary landfill site.
 3. Other proposed disposal sites.
 4. Noise Control.
 5. Dust Control.
 6. Erosion and Sediment Control.
 7. Copies of any agreements with public or private landowners regarding equipment, materials storage, borrow sites, fill sites, or disposal sites. Any such agreement made by the Contractor shall be invalid if its execution causes violation of local or regional grading or land use regulations.
 8. Hazardous waste disposal procedures.
- D. Requirements: All operations shall comply with all federal, state and local regulations pertaining to water, air, solid waste and noise pollution.
- E. Definitions of Contaminants:
 1. Sediment: Soil and other debris that have been eroded and transported by runoff water.
 2. Solid waste: rubbish, debris, garbage and other discarded solid materials resulting from construction activities, including a variety of combustible and non-combustible wastes, such as ashes, waste materials that result from construction or maintenance and repair work, leaves and tree trimmings.
 3. Chemical Waste: Includes petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, disinfectants, organic chemicals and inorganic wastes. Some of the above may be classified as "hazardous."
 4. Sanitary Wastes:
 - a. Sewage: domestic sanitary sewage.
 - b. Garbage: refuse and scraps resulting from preparation, cooking, dispensing and consumption of food.

5. Hazardous Materials: Except as otherwise specified, in the event the Contractor encounters on the site material reasonably believed to be hazardous, including asbestos, polychlorinated biphenyl (PCB), or other materials which have not been rendered harmless, the Contractor shall immediately stop work in the area affected and report the condition to the University in writing. The Work in the affected area shall not thereafter be resumed except by written agreement of the University and Contractor if in fact the material is asbestos, PCB, or other hazardous materials and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of asbestos, PCB, or other hazardous materials, or when such materials have been rendered harmless.

F. Protection of Natural Resources:

1. General: It is intended that the natural resources within the project boundaries and outside the limits of permanent work performed under this Contract be preserved in their existing condition or be restored to an equivalent or improved condition upon completion of the work. Confine construction activities to areas defined by the public roads, easements, and work area limits shown on the drawings. Except where otherwise noted, return construction areas to their pre-construction elevations. Maintain natural drainage patterns. Conduct construction activities such that ponding of stagnant water conducive to mosquito breeding habitat will not occur at anytime.
2. Land Resources: Do not remove, cut, deface, injure or destroy trees or shrubs outside the work area limits. Do not remove, deface, injure or destroy trees within the work area without permission from the Architect. Such improvements shall be removed and replaced, if required, by the Contractor at his own expense.
 - a. Protection: Protect trees that are located near the limits of the Contractor's work areas which may possibly be defaced, bruised or injured or otherwise damaged by the Contractor's operations. No ropes, cables or guys shall be fastened to or be attached to any existing nearby trees or shrubs for anchorages. No vehicles or equipment shall be parked within the extents of the canopy of any tree.
 - b. Trimming: Refer to Tree and Plant Protection Section 01 56 39.
 - c. Excavation Around Trees: Refer to Tree and Plant Protection 01 56 39.
 - d. Repair or Restoration: Repair or replace any trees or other landscape feature scarred or damaged by equipment or construction operations as specified below. The repair and/or restoration plan shall be reviewed and approved by the University and Architect prior to its initiation.
 - e. Temporary Construction: Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other vestiges of construction as directed by the Architect. Level all temporary roads, parking areas and any other areas that have become compacted or shaped. Any unpaved areas where vehicles are operated shall receive a suitable surface treatment or shall be periodically wetted down to prevent construction operations from producing dust damage and nuisance to persons and property, at no additional cost to the University. Keep haul roads clear at all times of any object which creates an unsafe condition. Promptly remove any contaminants or construction materials dropped from construction vehicles. Do not drop mud and debris from construction equipment on public streets. Sweep clean turning areas and pavement entrances as necessary.
3. Water Resources: Investigate and comply with all applicable federal, state and local regulations concerning the discharge (directly or indirectly) of pollutants to the underground and natural waters. Perform all work under this Contract in such a manner that any adverse environmental impacts are reduced to a level that is acceptable to the Architect and regulatory agencies. Refer to Earthwork Section, paragraph on control of water for "dewatering" water disposal requirements.
 - a. Oily Substances: At all times, special measures shall be taken to prevent oily or other hazardous substances from entering the ground, drainage areas or local

bodies of water in such quantities as to affect normal use, aesthetics or produce a measurable impact upon the areas. Any soil or water which is contaminated with oily substances due to the Contractor's operations shall be disposed of in accordance with applicable regulations.

1.5 SMOKE/ODOR CONTROL

- A. Primary fresh air intakes to existing buildings must be protected from exhaust from internal combustion engines, paint and solvent fumes and other noxious fumes and vapors.
- B. The Contractor must implement control methods such as snorkels from engines exhausts to 50 feet away from air intakes.
- C. All other activities generating fumes must be limited to a distance of at least 50 feet from the air intake grille.
- D. If fume generating procedures must occur within 50 feet of an air intake the Contractor is responsible for the following:
 - 1. Notify the University Representative at least 14 days in advance.
 - 2. Complete the work when it least impacts the University (evenings, weekends, or particularly windy days).
 - 3. Provide carbon filter media, plastic barriers, or other control methods to assure fresh air only enters into the building ventilation system.

1.6 NOISE CONTROL

- A. The requirements of this section are in addition to those of the Project Contract General Conditions.
- B. Maximum noise levels within 1,000 feet of any classroom, laboratory, residence, business, adjacent buildings, or other populated area: noise levels for trenchers, pavers, graders and trucks shall not exceed 90 dBA at 50 feet as measured under the noisiest operating conditions. For all other equipment, noise levels shall not exceed 85 dBA at 50 feet.
- C. Equipment: Equip jackhammers with exhaust mufflers and steel muffling sleeves. Air compressors should be of a quiet type such as a "whisperized" compressor. Compressor hoods shall be closed while equipment is in operation. Use electrically powered rather than gasoline or diesel-powered forklifts. Provide portable noise barriers around jack hammering, barriers constructed of ¾-inch plywood lined with 1-inch-thick fiberglass on work side.
- D. Operations: keep noisy equipment as far as possible from noise-sensitive site boundaries. Machines should not be left idling. Use electric power in lieu of internal combustion engine power wherever possible. Maintain equipment properly to reduce noise from excessive vibration, faulty mufflers, or other sources. All engines shall have properly functioning mufflers.
- E. Scheduling: schedule noisy or potentially disruptive operations so as to minimize their duration at any given location, and to minimize disruption to the adjoining users. Notify the University Representative in advance of performing work creating unusual noise and schedule such work at times mutually agreeable. The University reserves the right to require performance of any noisy and/or potentially disruptive work during off-hours in order to accommodate the Universities operations.

- F. Do not play radios, tape recorders, televisions, and other similar items at construction site.

1.7 DUST AND AIR POLLUTION CONTROL

- A. The requirements of this Article are in addition to those of the Contract General Conditions.
- B. Employ measures to avoid the creation of dust and air pollution.
 - 1. Unpaved areas shall be wetted down, to eliminate dust formation, a minimum of twice a day to reduce particulate matter. When wind velocity exceeds 15 mph, site shall be watered down more frequently.
 - 2. Store all volatile liquids, including fuels or solvents in closed containers.
 - 3. No open burning of debris, lumber or other scrap will be permitted.
 - 4. Properly maintain equipment to reduce gaseous pollutant emissions.
- C. Exposed areas, new driveways and sidewalks shall be seeded, treated with soil binders, or paved as soon as possible.
- D. Cover stockpiles of soil, sand and other loose materials.
- E. Cover trucks hauling soil, debris, sand or other loose materials.
- F. Sweep project area streets at least once daily, or more often as required to maintain streets in a clean condition.
- G. Appoint a dust control monitor to oversee and implement all measures listed in this Article.

1.8 WELDING AND BURNING

- A. Eliminate welding and burning of steel as much as possible. Where unavoidable, perform welding and burning with all possible precaution to avoid fire hazard. Provide a fire watch for minimum of 30 minutes after burning stops. Provide protection for all adjacent surfaces.

1.9 EROSION AND SEDIMENT CONTROL

- A. Discharge construction runoff into small drainages at frequent intervals to avoid build-up of large potentially erosive flows.
- B. Prevent runoff from flowing over unprotected slopes.
- C. Keep disturbed areas to the minimum necessary for construction.
- D. Keep runoff away from disturbed areas during construction.
- E. Direct flows over vegetated areas prior to discharge into public storm drainage systems.
- F. Trap sediment before it leaves the site, using such techniques as check dams, sediment ponds, or siltation fences.
- G. Remove and dispose of all project construction-generated siltation that occurs in offsite retention ponds.

- H. Stabilize disturbed areas as quickly as possible.
- I. Remove mud from tires of earth moving trucks and equipment before traversing project area streets.
- J. Contractor shall commission a Civil Engineer licensed in the State of California to produce a Water Quality Management and Storm Water Pollution Prevention Plan per Section 01 57 23. The plan shall comply with all applicable Code and Agency requirements and shall govern the protectionary measures to be implemented and maintained by Contractor throughout the construction period. The plan shall be subject to approval by the University, and Contractor shall make reasonable revisions as directed by the University at no additional cost.

1.10 DISPOSAL OPERATIONS

- A. Solid Waste Management: supply solid waste transfer containers. Daily remove all debris such as spent air filters, oil cartridges, cans, bottles, combustibles and litter. Take care to prevent trash and papers from blowing onto adjacent property. Encourage personnel to use refuse containers. Convey contents to a sanitary landfill.
- B. Washing of concrete containers where wastewater may reach adjacent property, storm drains or natural watercourses will not be permitted. Remove any excess concrete to the sanitary landfill.
- C. Chemical Waste and Hazardous Materials Management: furnish containers for storage of spent chemicals used during construction operations. Dispose of chemicals and hazardous materials in accordance with applicable regulations.
- D. Garbage: store garbage in covered containers; pick up daily and dispose of in a sanitary landfill.
- E. Dispose of vegetation, weeds, rubble, and other materials removed by the clearing, stripping and grubbing operations off site at a suitable disposal site in accordance with applicable regulations.
- F. Excavated Materials:
 - 1. Native soil complying with the requirements of Earthwork Section, may be used for backfill, fill and embankments as allowed by that section.
 - 2. Spoil Material: remove all material that is excavated in excess of that required for backfill, and such excavated material that is unsuitable for backfill, from the site.
 - a. Excess suitable backfill material shall be hauled off site. No additional compensation will be paid to the Contractor for such off haul. Include all such costs in the lump sum prices bid for the project.
 - b. Unsuitable backfill material will be disposed of off site in accordance with applicable regulations, in a disposal site indicated in the Environmental Protection Plan. Remove rubbish and materials unsuitable for backfill immediately following excavation. Remove material in excess of that required for backfill immediately following backfill operations.
- G. Rubbish shall consist of all materials not classified as suitable materials or rubble and shall include shrubbery, trees, timber, trash and garbage.

1.11 CULTURAL RESOURCES

- A. The requirements of this article are in addition to those of the Contract General Conditions.
- B. The project does not pass through any known archaeological sites. However, it is conceivable that unrecorded archaeological sites could be discovered during construction.
- C. In the event that artifacts, human remains, or other cultural resources are discovered during subsurface excavations at locations of the Work, the Contractor shall protect the discovered items, cease work for a distance of 35 feet radius in the area, notify the Architect and comply with applicable law.
- D. The University may retain an Archaeologist to monitor and recover data and artifacts during period when work has ceased.
- E. All items found which are considered to have archaeological significance are the property of the University.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

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SECTION 01 57 10

EXISTING FINISH PROTECTION

GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Section specifies the requirements for construction activities impacting the interior and exterior improvements within and adjacent to the construction site. The protection requirements herein are minimum requirements and is/are the contractor's responsibility to ensure all aspects of work are protected regardless of the listing within this specification or not. Protection of work is an on-going process whereby the contractor shall adjust, add, change, and replace protection as needed throughout the project to ensure all aspects of work are protected to the greatest possible extent. Section includes but is not limited to the following:
 - 1. Protection of existing finishes within and adjacent to the work area(s).
 - 2. Protection of existing equipment within and adjacent to the work area(s).
 - 3. Protection of completed work.
 - 4. Protection of Building systems, i.e. mechanical, electrical, plumbing utilities and data systems.
 - 5. Protection of ingress and egress pathways.
 - 6. Erection and maintenance of temporary barriers and enclosures.

1.3 CODES AND REGULATIONS

- A. California Building Code (CBC): Comply with California Building Code (CBC) Chapter 33, Section 3303, Protection of Pedestrians During Construction or Demolition
- B. Fire Regulations: Comply with requirements of fire authorities having jurisdiction, including California Fire Code (CFC) Article 87 during performance of the Work.
- C. Safety Regulations: Comply with requirements of all applicable Federal, State and local safety rules and regulations. Contractor shall be solely responsible for jobsite safety.

- D. Barricades and Barriers: As required by governing authorities having jurisdiction, provide substantial barriers, guardrails and enclosures around Work areas and adjacent to embankments and excavations for protection of workers and the public.

1.4 PRODUCTS

A. INTERIOR AND EXTERIOR PROTECTION OF EXISTING IMPROVEMENTS

- A. Walking surface protection: Provide non-destructive compatible walking surface protection over all finishes remaining in-place during the period of construction.
- B. Safe Exiting: All protective measures shall be designed, installed and maintained so they do not interfere with the safe exiting of the area's occupants in an emergency. If lighting systems have been disabled, the Contractor shall install temporary construction lighting sufficient to safely perform the work.

1.5 MAINTENANCE OF CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

- A. Maintenance: Use all means necessary to maintain temporary barriers and enclosures in proper and safe condition throughout progress of the Work.
- B. Replacement: In the event of loss or damage, promptly restore temporary barriers and enclosures by repair or replacement at no change in the Contract Sum or Contract Time.

1.6 TEMPORARY BARRIERS, ENCLOSURES AND PASSAGEWAYS

- A. Temporary Barriers, General: Provide temporary fencing, barriers and guardrails as necessary to provide for public safety, to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
 - 1. Note requirements for continued occupancy and use of existing buildings and site areas during construction
 - 2. Comply with applicable requirements of California Building Code (CBC) and authorities having jurisdiction, including industrial safety regulations. Review requirements with University's Representative
 - 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for firefighting
 - 4. Paint temporary barriers and enclosures with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard
 - 5. Where appropriate and necessary, provide warning lighting, including flashing red or amber lights.
- B. Temporary Closures: Provide temporary closures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
- C. Security Closures and Lockup: Provide substantial temporary closures of openings in exterior surfaces and interior areas as appropriate to prevent unauthorized entrance, vandalism, theft and similar violations of security. Provide doors with self-closing hardware and locks.
- D. Temporary measures shall suit and connect to existing building systems, and shall be approved by University's Representative and authorities having jurisdiction.

1.7 PROTECTION OF INSTALLED WORK

- A. Protection of Installed Work, General: Provide temporary protection for installed products. Control traffic in immediate area to minimize damage.
- C. Protective Coverings: Provide protective coverings at walls, projections, jambs, sills, and soffits of openings as necessary to prevent damage from construction activities, such as coatings applications, and as necessary to prevent other than normal atmospheric soiling.

1.8 REMOVAL OF TEMPORARY BARRIERS AND ENCLOSURES

- A. Removal of Temporary Barriers and Enclosures: Unless otherwise mutually agreed by University's Representative and Contractor, remove temporary materials, equipment, services, and construction prior to Contract Completion review.
- B. Cleaning and Repairs: Clean and repair damage, soiling and marring caused by installation or use of temporary barriers and enclosures.

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SECTION 01 57 23

STORM WATER POLLUTION PREVENTION

PART 1 - GENERAL

1.1 DESCRIPTION.

The work includes, but is not limited to, the development, implementation, maintenance, reporting, inspection procedures and execution of the project Storm Water Pollution Prevention Plan (SWPPP), in compliance with the State of California Construction General Permit.

- A. Contractor shall provide all material, labor, and equipment for the development, installation, implementation, and maintenance of all storm water pollution prevention measures. Including conveyance, detention, filtration, and treatment facilities. Scope of work to include:
 - 1. Contract the development of a SWPPP by a California Certified Qualified SWPPP Developer (QSD). Contractor shall pay all costs associated with development, engineering, and implementation of the SWPPP.
 - 2. Contractor shall be responsible for hiring or contracting for the services of a California certified Qualified SWPPP Practitioner (QSP).
 - 3. Prior to start of construction the Contractor shall submit 3 complete sets of the SWPPP as follows; one hard copy set and 2 electronic sets; one in MS Word and one in Portable Document Format (pdf), to the University and Architect of Record for review and approval.
 - 4. The University Department of Environmental Health and Safety will be responsible for submitting the approved SWPPP and all associated permit fees to the State Water Resources Control Board.
 - 5. Contractor's QSP shall be responsible for providing and implementing all measures of the Approved SWPPP, including continuous maintenance throughout the life of the project, especially before, during, and after rain events.
 - 6. Contractor shall be responsible for all water samples testing required by the SWPPP.
 - 7. Contractor shall modify and amend the SWPPP as necessary based on project conditions, durations, weather and seasonal changes.
 - 8. The minimum compliance basis shall be that of the California General Permit (NPDES) 2009-009-DWQ as modified by 2010-0014-DWQ.
- B. Contractor shall have storm drain pollution prevention measures in place and functioning at all times. The Construction General Permit (CGP) does NOT recognize a rainy season.
- C. Contractor shall not allow any non-storm water discharges, including ground water, to enter the storm drain system. Examples of non-storm water discharges include, but are not limited to: domestic supply water used to wash streets, construction materials, tools, equipment and vehicles.

- D. Discharges not covered by the Construction General Permit shall be discharged as required per appropriate city, county, or state standard.

1.2 RELATED WORK

- A. Section 01 41 00: Regulatory Requirements
- B. Section 01 57 00: Temporary Controls
- C. Section 01 57 23a: Storm Water Management Monthly Report
- D. Section 01 52 00: Construction Facilities
- E. Section 01 77 00: Contract Closeout Procedures

1.3 REFERENCE STANDARDS

- A. California Stormwater Quality Association – Construction BMP Handbook Portal / SWPPP Template
- <http://www.casqa.org>
- B. California Environmental Protection Agency – State Water Resources Control Board
<http://www.swrcb.ca.gov>
- C. National Oceanic and Atmospheric Administration United States Department of Commerce
<http://www.noaa.gov>
- D. Clean Water Act, United States Environmental Protection Agency, and Porter-Cologne Clean Water Act, State of California
- E. Los Angeles Regional Water Quality Control Board's current Water Quality Control Plan (Basin Plan)
- F. State Water Resources Control Board Order No. 2009-0009-DWQ, as amended by Order No. 2010-014-DWQ, NPDES No. CAS000002 – General Construction Permit
http://www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits.shtml
- G. American Public Works Association – Standard Specifications for Public Works Construction, latest edition. Building News Inc. www.bnibooks.com

1.4 SUBMITTALS

- A. Product Data: Manufacturer's literature and data including; location, applicable size, material, source, rated capacity, effective opening size, listing/approvals, or other labeling for the following:
 - 1. Draft SWPPP Plan developed by a qualified QSD in hard copy, editable electronic copy, and pdf. Approved final copy to be submitted electronically to the University for upload

to SWRCB website. Hard copy drawings for submittal shall be on full size sheets. SWPPP document shall include the following:

- a. Names and California certificate numbers of project QSD and QSP
- b. Water Sampling Procedures
- c. List of Laboratories certified in the "Environmental Laboratories Accreditation Program (ELAP)" that may be used on the project.
- d. Erosion Control Products (ECPs)
- e. Silt fencing
- f. Inlet protection
- g. Soil Binders
- h. Any other manufactured products used to implement Best Management Practices (BMP) including filters, tanks, pumps, and other devices.
- i. Monthly BMP Inspection Reports – due monthly at the end of each month. Complete and submit, including detailed list of corrective actions taken for non compliances.
- j. Annual Report – Complete all documentation necessary for Project's Annual Report as required by the SWRCB for all construction activities, ending June 30th of each year, and submit to the University by August 1st of the same year.
- k. Notice of Termination
 - 1) Photographs of the completed project
 - 2) Annual Report documents covering the time period from the last annual report to the completion of the project
 - 3) Complete the Notice of Termination information for the project in SMARTS for approval by the University.

- B. Shop Drawings and Calculations: Contractor shall provide shop drawings for review and approval that shall depict the location, site, and size, type, and function of all BMP components. Supporting calculations shall be included as necessary to validate sizing and effectiveness of components for the following systems if used:

1. Active treatment systems
2. Pumping systems
3. Filter system

1.5 DEFINITIONS

- A. Active Areas of Construction: All areas undergoing land surface disturbance activities related to the project including, but not limited to, project staging areas, immediate access areas and storage areas. All previously active areas are still considered active until final stabilization is complete.
- B. Active Treatment System (ATS): A treatment control BMP that reduces turbidity of the construction site runoff by adding chemicals or using electrical current to enhance flocculation, coagulation and settling of suspended sediment. The two major types of systems are flow through treatment and batch treatment.
- C. Best Management Practices (BMPs): Includes schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent, eliminate, or reduce the pollution of water leaving a site. BMPs also include treatment requirements, operating

procedures, and practices to control site runoff spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

- D. Construction Activity: Includes clearing, grading, excavation, and all Contractor activities that could result in soil disturbance or contribute to water pollution.
- E. Dewatering Operations: Practices that manage the discharge of pollutants when water must be removed from a work location to proceed with construction work or to provide vector control.
- F. Discharge: A release of flow of storm or non-storm water or other substance from a conveyance system or storage container off-site to a storm drain, flood control channel, etc.
- G. Effluent Limitations: Limitations on amounts of pollutants that may be contained in a discharge.
- H. Erosion Control: Erosion control is any source control practice that prevents water pollution by protecting the soil surface and preventing soil particles from being detached by rainfall, flowing water, or wind.
- I. Construction General Permit (CGP): The National Pollutant Discharge Elimination System (NPDES) permit issued by the California State Water Resources Control Board for the discharge of storm water associated with construction activities from soil disturbance of one acre or more.
- J. Gross Pollutants: Visible pollutants such as trash, debris and floatables, which may create an aesthetic "eye sore" in waterways, and heavy metals, pesticides, or bacteria in storm water. Gross pollutants also include plant debris (such as leaves and lawn clippings), animal excrement, street litter, and other organic matter.
- K. Hazardous Waste: A waste or combination of wastes that, because of its quantity, concentration, or physical, chemical or infectious characteristic, may either cause or significantly contribute to an increase in mortality or an increase in serious irreversible illness: or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed. Or possess at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity) or appears on EPA or state lists as hazardous. Hazardous Waste is regulated under the Federal Resource Conservation and Recovery Act and the California Health and Safety Code.
- L. High Risk of High pH Discharge: A "high risk of high pH discharge" can occur during utility construction, vertical construction, and during any portion of any construction phase where significant amounts of materials are placed directly on the land at the site in a manner that could result in significant alterations to the background pH of any discharge.
- M. Illicit Discharge: Any discharge to a receiving water that is not in compliance with applicable laws and regulations, e.g. is not discharged pursuant to the applicable NPDES permit.
- N. Inactive Areas of Construction: Areas of construction activity that have been disturbed but which are not currently being worked and are not scheduled to be re-disturbed for at least 14 days.
- O. Legally Responsible Person (LRP): The person possessing the title of the land on which the construction activities will occur. When ownership is by a corporation or public agency, the LRP is the appropriate corporate officer of public official as defined in the General Permit.

- P. Municipal Separate Storm Sewer System (MS4): A conveyance or system of conveyances; including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, channels or storm drains: (i) designed or used for collecting or conveying storm water;(ii) which is not a combined sewer; and (iii) which is not part of a Publicly Owned Treatment Works (POTW) as defined at Title 40 of the Code of Federal Regulations (CFR) 122.2.
- Q. Non-Storm water Discharge: Any discharge to a MS4 or receiving water that is not composed entirely of storm water.
- R. Non-Point Sources Pollution: Pollution that originates from diffuse contamination that does not originate from a single discrete source and specifically does not come from a point source as defined by the Clean Water Act. Non-point surface pollution can originate from aerial diffuse sources, agriculture, forests, and irrigation runoff.
- S. Notice of Intent (NOI): Part of the required Permit Registration Documents, which provides information on the owner, location, type of project, and verifies that the owner will comply with the conditions of the Construction General Permit.
- T. Notice of Termination (NOT): Formal notice to SWRCB submitted by owner/developer that a construction project is complete and the project has met the conditions to terminate the permit.
- U. NPDES Permit: NPDES is an acronym for National Pollutant Discharge Elimination System. NPDES is the national program for administering and regulating Sections 307,318, 402, and 405 of the CWA. In California, the State Water resources Control Board (SWRCB) has issued a General Permit for storm water discharges associated with construction activities.
- V. Numeric Action Level (NAL): An allowable range or threshold for a particular water quality measurement to gauge the performance of the measures or practices used at a site to minimize the discharge of pollutants. The NAL is used to determine if it is necessary to take corrective action. The general Permit includes NALs for pH and turbidity; however these action levels are not directly enforceable.
- W. Numeric Effluent Limitation (NEL): *The Numeric Effluent Limitations (NELs) for pH and turbidity contained in Order 2009-0009-DWQ are no longer in effect as of December 27, 2011. In addition, because receiving water monitoring is required only if the NELs are triggered, all receiving water monitoring requirements are also suspended.*
- X. Permit Registration Documents (PRD): A set of documents that serve as the formal notice to SWRCB, submitted by the owner of a construction site, that says said owner seeks coverage under the Construction General Permit for discharges associated with construction activities.
- Y. Point Source: Any discernible, confined, and discrete conveyance from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agriculture storm water runoff.
- Z. Precipitation: Any form of rain or snow.
- AA. Qualified SWPPP Developer (QSD): Individual who is authorized to develop and revise SWPPPs.

- BB. Qualified SWPPP Practitioner (QSP): Individual assigned responsibility for the implementation of all elements of the SWPPP, including non-storm water and storm water visual observations, sampling and analysis, and preparation of Rain Event Action Plans.
- CC. Qualifying Storm or Rain Event: Any event that produces 0.5 inches or more precipitation within a 48 hour or greater period between rain events.
- DD. Rain Event Action Plan (REAP): Written document, specific for each rain event, that when implemented is designated to protect all exposed portions of the site within 48 hours of any likely precipitation event. REAPs are prepared by the QSP based on the predicted rain event and construction activities.
- EE. Receiving water: A storm drainage system, channel, river, lake, stream, estuary, bay, or ocean into which runoff is discharged.
- FF. Rolled Erosion Control Products (RECPs): Prefabricated product such as mulch-control nets, open-weave geotextiles, and erosion-control blankets. Typically manufactured from wood excelsior, straw, jute, coir, polyolefins, PVC and nylon. Designed to control erosion and assist in establishment of vegetation.
- GG. Runoff: Water originating from rainfall, melted snow, and other sources (e.g., sprinkler irrigation) that flows over the land surface to drainage facilities, rivers, streams, lakes, and wetlands.
- HH. Run-on: Off-site storm water or other surface flow that flows onto a project site.
- II. Significant Materials: Includes materials such as; fuels; solvents, detergents, and plastic pellets; finished materials such as metallic products; materials used in food processing or production; hazardous substances designed under Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm and non-storm water discharges.
- JJ. Significant Quantities: The volume, concentrations, or mass of a pollutant in storm water discharge that can cause or threaten to cause pollution, contamination, or a nuisance that adversely impact human health or the environment and causes or contributes to a violation of the EPA Clean Water Act.
- KK. Storm Water: Defined as runoff and snowmelt runoff consisting only of those discharges, which originate from precipitation events. Storm water is that portion of precipitation that flows across a surface to the storm drain system or receiving waters.
- LL. Storm Water Multiple Application and Report Tracking System (SMARTS) - SMARTS has been developed by the SWRCB to provide an online tool to assist dischargers in submitting their Permit Registration Documents (PRD), No Exposure Certification (NEC) if applicable, NOTs and Annual Reports, as well as viewing and printing receipts of fee payments, monitoring the status of submitted documents, and viewing application and renewal fee statements.
- MM. Storm Water Pollution Prevention Plan (SWPPP): A written plan that documents the series of phases and activities that characterizes the project site and describes the necessary actions to implement to prevent the pollution of storm and non-storm water discharges during construction.

- NN. Storm Drainage System – In this document, the term “storm drainage system” shall include storm water conduits, storm drain inlets and other storm drain structures, gutters, channels, water courses, creeks and lakes.
- OO. Traditional Construction Project: Most construction projects, including but not limited to commercial, residential, industrial, educational, and roadway construction projects. Does not included those projects defined as Linear Underground Projects (LUPs) in the CGP.
- PP. Waste Management: Source control management practices that prevent pollution by limiting or reducing potential waste pollutants at their source, before they come into contact with storm or non-storm water. Practices under this category are “good housekeeping” and include procedural and structural BMPs for handling, storing, and disposing of waste generated by the construction project.
- QQ. Wind Erosion Control: Methods used to minimize wind erosion. Controls consist of covering or applying water or other dust palliatives to prevent and alleviate dust nuisance.
- RR. Construction Site Stormwater Manager (CSSM): Contractor’s designated staff person or sub Contractor with the responsibility of managing the implementation of the SWPPP on the project site. The CSSM shall have the authority to direct work on the job site as necessary to maintain compliance with the SWPPP program. CSSM shall be a Qualified SWPPP Practitioner (QSP).

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Materials, Equipment and Procedures suitable for SWPPP implementation.
1. Contractor to provide an engineered SWPPP signed by a California Certified QSD for electronic submittal by the University to the State Water Resources Control Board. Contractor shall provide a descriptive project site drawing depicting all BMPs for: run-on and run-off controls and good housekeeping measures, as well as storm and non-storm water control measures that will be used on the site. All erosion and sediment control BMP measures shall be listed in the project SWPPP and indicated on the water pollution control plan. SWPPP shall include water sampling criteria as required.
 2. Rolled Erosion Control Products (RECPs): Use degradable erosion control blanket appropriate for required protection duration.
 - a. Mulch Control netting: A planar woven natural fiber or extruded geosynthetic mesh used as a temporary degradable rolled erosion control product to anchor loose fiber mulches.
 - b. Open weave textile: A temporary degradable rolled erosion control product composed of processed natural or polymer yarns woven into a matrix, used to provide erosion control and facilitate vegetation establishment.
 - c. Erosion control blanket: a temporary degradable rolled erosion control product composed of processed natural or polymer fibers mechanically, structurally or chemically bound together to form a continuous matrix to provide erosion control and facilitate vegetation establishment

- B. Straw Wattle/Fiber Rolls: A pre-manufactured roll of rice or wheat straw, wood excelsior, or coconut fiber encapsulated within photodegradable plastic or biodegradable jute, sisal, or coir fiber netting.
1. Netting: shall have a minimum durability of one year after installation. The netting shall be secured tightly at each end of the roll. Rolls shall be between 8 inches and 12 inches in diameter. Rolls between 8 inches and 10 inches in diameter shall have a minimum weight of 1 pound per linear foot and a minimum length of 20 feet. Rolls between 10 inches and 12 inches in diameter shall have a minimum weight of 3 pounds per linear foot and a minimum length of 10 feet.
 2. Stakes: Wood stakes shall be a minimum of 1" x 2" x 24". Wood stakes shall be untreated fir, redwood, cedar, or pine and cut from sound timber. They shall be straight and free of loose or unsound knots and other defects, which would render them, unfit for the purpose intended. Metal stakes shall not be used.
 3. Rope: Rope shall be biodegradable, such as sisal or manila, with a minimum diameter of 1/4 inch.
- C. Flocculent: Chemical added to a fluid to promote the coagulation and sedimentation of suspended material in the Automatic Treatment System (ATS) if required.
1. Must be Chitosan or approved equivalent.
 2. Jar tests shall be conducted using water samples selected to represent typical site conditions and in accordance with ASTM D2035-08 (2003)
 3. The discharger shall conduct, at minimum, six site-specific jar tests for each project to determine the proper polymer and dosage levels for the ATS.
- D. Filter Fabric: Shall comply with SSPWC Section 213 - Engineering Fabric, of Standard Specifications.
- E. Hydroseed Mix: Shall consist of seed, tackifier, and mulch. Mix shall comply with SSPWC Section 308-4.9 Erosion Control Planting.
1. Seed: The species and application rates of grass, legume, and cover-crop seed furnished shall be as stipulated herein.
 - a. Seed shall be furnished separately or in mixtures in standard containers with the seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked for each kind of seed.
 - b. The Contractor shall furnish the Architect (1) one signed copy and the University (1) signed copy of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within 6 months of date of delivery. This statement shall include: name and address of laboratory, date of test, lot number for each kind of seed, and the results of tests as to name, percentages of purity and of germination, and percentage of weed content for each kind of seed furnished, and, in case of a mixture, the proportions of each kind of seed.
 - c. Seeds shall be applied as follows:

<u>LBS/AC</u>	<u>SPECIES/COMMON NAME</u>
7	Vulpia microstachys, Small Fescue
2	Vulpia octoflora, Six weeks fescue
 2. Fertilizer: Must be a pelleted or granular form and must be one of the following:

Organic Fertilizer Products	Guaranteed Chemical Analysis (N-P-K) (%)	Company
Biosol Mix® - Granular	7-2-3	Rocky Mountains Bioproducts Edwards, CO
Fertil-Fibers™	6-4-1	Quattro Environmental Coronado, CA
Sustane®	5-2-4	Natural Fertilizer of America Cannon Falls, MN
Approved Equal ¹	(N) 5 to 7 (P) 1 to 5 (K) 2 to 10	

¹Approved equal must be within the ranges shown for N-P-K. The cumulative (N) release rate must be no more than 70 percent the first 70 days after incubation (86° F) with 100 percent at 350 days or more.

3. Straw: Shall comply with CSS Section 20-2.06 of Standard Specifications
4. Tackifier: Tackifier shall be plant based and applied at an appropriate rate and ratio as indicated by the manufacturer.
 - a. Guar (Plant based)
 - b. Psyllium (Plant based)
 - c. Starch (Plant based)
5. Fiber: Fiber shall be free from lead paint, printing ink, varnish, petroleum products, seed germination inhibitors, chlorine bleach, and synthetic or plastic materials. Fiber shall be, at most, 7 percent ash. Fiber shall be one of the following products:
 - a. Wood: wood shall comply with the following:
 - 1) Long strand, whole wood fibers, thermo-mechanically processed from clean, whole wood chips
 - 2) Not made from sawdust, cardboard, paper, or paper byproducts
 - 3) At least 25 percent of fibers 3/8 inch long
 - 4) At least 40 percent held on a No.25 sieve
 - b. Cellulose: Cellulose Fiber shall be made from natural or recycled pulp fiber, such as wood chips, sawdust, newsprint, chipboard, corrugated cardboard, or a combination of these materials
 - c. Alternate: Alternate fiber shall comply with the following:
 - 1) Long strand, whole natural fibers made from clean straw, cotton, corn, or other natural feed stock.
 - 2) At least 25 percent of fibers 3/8 inch long
 - 3) At least 40 percent held on a No. 25 sieve
 - d. A combination of wood, cellulose, or alternate
6. Coloring Agent: Use a biodegradable, nontoxic coloring agent free from copper, mercury, and arsenic.

- F. Mulch: Mulch shall comply with SSPWC Section 212-1.2.5 Mulch and shall be, tree bark, wood chips, shredded bark, or a combination of thereof at the Contractor's option.

G. Silt Fencing Fabric: Geosynthetic fabric for temporary silt fence shall consist of one of the following:

1. Polyester, Polypropylene, Combined polyester and polypropylene fabric:

Property	ASTM Designation	Specification	
		Woven	Non-woven
Grab breaking load 1-inch grip, lb, min. in each direction	D 4632	120	120
Apparent elongation percent, min., in each direction	D 4632	15	50
Water Flow Rate max. average roll value, gallons per minute/square foot	D 4491	10-50	100-150
Permittivity 1/sec., min.	D 4491	0.05	0.05
Apparent opening size max. average roll value, U.S. Standard sieve size	D 4751	30	30
Ultraviolet Degradation percent of original unexposed grab breaking load 500 hr, minimum	D 4595	70	

- a. Sample under ASTM D 4354, Procedure C.
- b. Test under ASTM D 4759. All properties shall be based on Minimum Average Roll Value (MARV).
- c. Identify, store, and handle under ASTM D 4873.
2. Protect geosynthetics from moisture, sunlight, and damage during shipping and storage. Label each unit with the manufacturer's name, identifying information, and product identification.
3. Posts: Posts must be wood or steel
 - a. Wood posts must:
 - 1) Untreated fir, redwood, cedar, or pine and cut from sound timber
 - 2) Straight and free of loose or unsound knots and other defects that would render the stakes unfit for use
 - 3) Pointed on the end to be driven into the ground
 - 4) At least 2" x 2" in size, and 4 feet long
 - b. Steel posts must:
 - 1) Have a "U," "T," "L," or other cross-sectional shape that can resist failure from lateral loads.
 - 2) Be pointed on the end to be driven into the ground.
 - 3) Weigh at least 0.75-pound per foot.
 - 4) Be at least 4 feet long.
 - 5) Have a safety cap attached to the exposed end. The safety cap must be orange or red plastic and fit snugly to the metal post.

H. Inlet protection:

1. Sediment filter bag:
 - a. Must be made of fabric

- b. Must be sized to fit the catch basin or drainage inlet
 - c. Must include a high-flow bypass
 - d. May include a metal frame, sediment bags that do not have a metal frame and are deeper than 18 inches must:
 - 1) Include lifting loops and dump straps
 - 2) Include a restraint cord to keep the sides of the bag away from the walls of the catch basin
 - 2. Gravel-filled bag fabric must:
 - a. Be made from fabric
 - b. Have inside dimensions from 24 to 32 inches in length, and from 16 to 20 inches in width
 - c. Have the opening bound to retain the gravel. The opening must be sewn with yarn, bound with wire, or secured with a closure device
 - d. Weigh from 30 to 50 pounds when filled with gravel
 - 3. Gravel for gravel filled bags must be:
 - a. From $\frac{3}{8}$ inch to $\frac{3}{4}$ inch in diameter
 - b. Clean and free from clay balls, organic matter, and other deleterious material
- I. Soil Binders:
- 1. The soil binder must be:
 - a. Nonflammable
 - b. Nontoxic to aquatic organisms
 - c. Free from growth or germination inhibiting factors
 - d. A plant-based product
 - 2. Soil binder classified as a plant-based product must be:
 - a. A natural high molecular weight polysaccharide
 - b. A high viscosity hydrocolloid that is miscible in water
 - c. Functional for at least 180 days
 - d. Labeled as either guar, psyllium, or starch
 - 3. Guar must be:
 - a. A guar gum based product derived from the ground endosperm of the guar plant, *Cyamopsis tetragonolobus*
 - b. Treated with dispersant agents for easy mixing
 - c. Able to be diluted at the rate of 1 to 5 pounds per 100 gallons of water
 - 4. Psyllium must be:
 - a. Made of finely ground myceloid coating of *Plantago ovata* or *Plantago ispaghula* seeds
 - b. Able to dry and form a firm but re-wettable membrane
 - 5. Starch must be a non-ionic, water-soluble granular material derived from corn, potato, or other plant-based source.
 - 6. Coloring agent: Use a biodegradable, nontoxic coloring agent free from copper, mercury and arsenic to ensure the hydraulic mulch contrasts with the application area.

PART 3 - EXECUTION

3.1 ROLES AND RESPONSIBILITIES

- A. General: During the Construction and Closeout phases of the project the Contractor is responsible for all of the duties identified in the project SWPPP, including overall compliance with the SWPPP and GCP, and the physical implementation and maintenance of all site BMPs.
- B. Contractor shall provide an engineered SWPPP Plan signed by QSD for electronic submittal by the University Department of Environmental Health and Safety to the State Water Resources Control Board.
- C. Pre-Construction
 - 1. General: The Contractor shall participate in meetings, training sessions, and coordination efforts with the owner to refine the project SWPPP and define communication protocols.
 - 2. Construction Site Stormwater Manager: The Contractor shall designate a single qualified person to be the project Construction Site Stormwater Manager (CSSM). This person shall be on-site during work hours and shall be available to address construction stormwater concerns. A backup CSSM shall be designated to perform the duties of the CSSM in the event they are unable to do so or not reachable during an emergency.
 - 3. Training: Both the CSSM and their designated back-up shall be a QSP prior to the start of construction, and maintain certification for the project duration.
 - 4. Coordination of project SWPPP: The Contractor is responsible for participating in the coordination of the SWPPP. This shall include but is not limited to the following.
 - a. Attend a pre-construction meeting with the owner to present the site logistics plan for all phases of the project and discuss how BMPs will be integrated to the plan. Prime Contractor is responsible to provide SWPPP amendments as required. Amendments must be prepared by a Qualified SWPPP Developer (QSD).
- D. Construction Phase
 - 1. Daily Tasks: The CSSM shall be responsible for performing the following daily tasks.
 - a. Check daily weather forecast on NOAA site for greater than 50 percent likely hood of rainfall.
 - b. Maintain the sub-Contractor log.
 - c. Provide copies of BMP information to sub-Contractors regarding implementation around their areas of work.
 - d. Perform visual inspection of the site and all installed BMPs.
 - e. Make corrections to faulty or poorly performing BMPs within 24 hours.
 - f. Contractor shall post and maintain a copy of the BMPs in their project office.
 - g. A hard copy of the SWPPP document must be kept on-site at all times. In the event there is not an onsite field office, the binder shall be kept in the CSSM's vehicle and be onsite during work hours.
 - 2. Event Specific Tasks: The CSSM shall be responsible for performing the following tasks based on a specific event. For each event the CSSM shall report and implement the necessary measures within 24 hours unless noted otherwise.

- a. Rain Event Action Plan (REAP): For Risk Levels 1, 2 or 3 projects, when the CSSM determines there is a greater than 50 percent likelihood of rainfall per the NOAA forecast, the CSSM shall prepare and implement a REAP.
 - b. BMP Maintenance: When a visual inspection or deficiency notice identifies that a site BMP is damaged, improperly installed, or otherwise in need of repair the Contractor shall be responsible for ensuring the BMP is repaired within 24 hours.
 - c. Non-Storm Water Run-Off Reporting: In the event of a spill or release of material that may cause non-storm water runoff, all Contractors and sub-Contractors employees are responsible for immediately notifying the CSSM and containing the spill for clean up, removal, and required analysis.
 - d. The Contractor shall provide, operate and maintain any and all storm water conveyance, detention, and or treatment facilities required to meet the CGP Risk Level Requirements appropriate for the project.
3. Periodic Tasks: The CSSM shall be responsible for performing the following tasks as necessary during the course of construction.
 - a. BMP Maintenance: As needed for the project duration.
 - b. Annual Report: Assist and coordinate with owner to fulfill annual reporting requirements. Submit all records and documentation requested by the SMARTS system and the CGP.
 4. At all qualifying Rain Events the QSP shall take samples in accordance with the SWPPP and the GCP.

E. SWPPP Closeout Phase

1. The Contractor shall ensure that all temporary BMPs, equipment, and construction materials have been removed from the project site
2. The Contractor shall ensure that all permanent planting and landscaping has been installed and established and prepare documentation to demonstrate the minimum 70-percent coverage has been established.
3. The Contractor shall ensure that all permanent post-construction BMPs have been installed.
4. The Contractor shall stencil with Thermoplastic paint, "Do Not Dump, Drains to Ocean" on every drain inlet, catch basin, exterior drain contained within the project site AND within 100' of the boundary of the perimeter of the project on all sides.
5. The design of the stencil shall be approved by the University Department of Environmental Health and Safety prior to placement.

F. Contractor Transition: Where the project site will continue under the current approved SWPPP, however responsibility will transition to a different Contractor:

1. The Contractor shall leave the site in a condition acceptable to both the owner and the incoming Contractor.
2. The CSSM shall walk the site with the incoming Contractor no less than two weeks prior to the planned transition of job site responsibility. At that time the condition of all BMPs will be reviewed and those requiring repair and/or replacement identified. The Contractor shall perform all identified repair and/or replacement prior to the transition of site responsibility.

3.2 BEST MANAGEMENT PRACTICES (BMPS) INSTALLATION AND IMPLEMENTATION:

For each applicable section below, the Contractor shall delineate the items on the site map.

- A. Areas of Disturbed Soil - Contractor shall clearly identify on the site map all areas of soil disturbance. These areas shall include soil removal or augmentation, such as holes, pits, excavations, trenches, berms, slopes, fill, and imported top soil.
- B. Areas of Existing Vegetation - Contractor shall protect existing vegetation that is to be preserved on the site from mechanical or other injury during the project. Areas of existing vegetation shall be clearly delineated on the site map.
- C. Dust Suppression-Water Management - Contractor shall use best available dust suppression equipment and methods to control dust so that the dust does not cause discomfort or nuisance to occupants of the project site neighboring property. Contractor shall control dust suppression water so that it is effective in controlling dust, but does not enter the storm drain system.
- D. De-Watering and Sediment Management - Ground water encountered in excavations is not covered under the CGP. Removal and discharge of ground water must be handled with separate permit. If groundwater is encountered on the project site the Contractor shall stop all construction activities in the immediate area and notify the University Representative and Project Architect before proceeding. The Contractor is required to contact the local sanitary sewer and/or storm water agency for discharge requirements and prohibitions. Storm water in excavations that has not mixed with ground water is covered by the CGP. Water quality must comply with discharge regulations.
- E. Site Ingress and Egress Tracking Prevention - The Contractor shall ensure that soil is not tracked off the project site or onto public or campus rights of way.
- F. Storm Drain Inlet Protection - The Contractor shall protect storm drain inlets from receiving sediment, hazardous chemicals, gasoline, diesel, oil or grease, trash, debris or other pollutants from the construction site.
- G. Construction Materials Storage - The Contractor shall cover and berm around materials that could contribute storm water pollution.
- H. Concrete, Mortar, Saw cutting - Concrete, Mortar, and Saw cutting: Proper procedures for concrete, mortar, and saw cutting activities are designed to prevent these materials from coming into contact with storm water flows and raising or lowering pH to levels outside the acceptable range. Concrete, mortar, and saw cutting also create potential problems for air pollution, and deliver and storage. Refer to 2010 CASQA Handbook, WM-1 "Concrete Waste Management", WM-3 "Stockpile Management", and WM-8 "Concrete Waste Management" for proper procedures and practices.
- I. Vehicle and Equipment cleaning, fueling, and maintenance
 - 1. Vehicle and Equipment Cleaning: Proper vehicle and equipment cleaning procedures and practices eliminate or reduce the discharge of pollutants to storm water from vehicle and

- equipment cleaning operations. Procedures and practices include but are not limited to: using offsite facilities; washing in designated, contained areas only; eliminating discharges to the storm drain by infiltrating the wash water; and training employees and subcontractors in proper cleaning procedures. Refer to 2010 CASQA Handbook, NS-8 "Vehicle and Equipment Cleaning" for proper procedures and practices.
2. Vehicle and Equipment fueling: Vehicle Equipment fueling procedures and practices are designated to prevent fuel spills and leaks, and reduce or eliminate contamination of storm water. This can be done by using offsite facilities, fueling in designated areas only, enclosed or covering stored fuel, implementing spill controls, and training employees and subcontractors in proper fueling procedures. Refer to 2010 CASQA Handbook, NS-9 "Vehicle and Equipment Fueling" for proper procedures and practices
 3. Vehicle and Equipment Maintenance: Proper vehicle and Equipment Maintenance procedures and practices are designed to prevent or reduce the contamination of storm water resulting from vehicle and equipment maintenance by running a "dry and clean site" The best option would be to perform maintenance activities at an offsite facility. If this option is not available then work should be performed in designated areas only, while providing cover for materials stored outside, checking for leaks and spills, and containing and cleaning up spills immediately. Employees and subcontractors must be trained in proper procedures. Refer to 2010 CASQA Handbook, NS-10 "Vehicle and Equipment Maintenance" for proper procedures and practices
- J. Spill Prevention and Control: Proper spill Prevention and Control procedures and practices are designed to prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees Refer to 2010 CASQA Handbook, WM-10 "Spill Prevention and Control" for proper procedures and practices. WM-1 "Materials Delivery and Storage", and WM-2 "Material Use", also contain useful information on spill prevention.
- K. Rolled Erosion Control Products (RECPs)
1. General procedure: prepare a stable and firm soil surface free of rocks and other obstructions. Apply soil amendments as necessary to prepare seedbed. Place fertilizer, water, and seed in accordance with manufacturer, local/state regulations, or engineer/specifiers requirements. Typically, RECPs are unrolled parallel to the primary direction of flow. Ensure the product maintains intimate contact with the soil surface over the entirety of the installation. Do not stretch or allow material to bridge over surface inconsistencies. Staple/stake RECPs to the soil such that each staple/stake is flush with the underlying soil. Install anchor trenches, seams and terminal ends as specified. Install RECPs after application of seed, fertilizer, mulches (if necessary) and other necessary soil amendments.
 2. Installation: Anchor Trenches, Seams and Terminal Ends: Utilize one of the methods below for initial anchoring of Upslope Anchor RECPs
 - a. Staples: Install the RECPs 3 ft (900 mm) beyond the shoulder of the slopes onto flat final grade. Secure roll ends with a single row of stakes/staples on 1ft (300 mm) centers
 - b. Anchor trench: Excavate a 6 in. by 6 in. (150 mm by 150 mm) anchor trench. Extend the upslope terminal end of the RECPs 3 ft. (900 mm) past the anchor trench. Use stakes or staples to fasten the produce into the bottom of the anchor

- trench on the 1 ft. (300 mm) centers. Backfill the trench and compact the soil into the anchor trench. Apply seed and any necessary soil amendments to the compacted soil and cover with remaining 1 ft. (300 mm) terminal end of the RECPs. Fold product over compacted soil in anchor trench to overlap downslope material. Secure terminal ends of RECPs with a single row of stakes or staples on 1 ft. (300 mm) centers
- c. Staple Check: Construct a stake/staple check slot along the top edge of the RECPs by installing two rows of staggered stakes/staples 4 in. (100 mm) apart on 4 in. (100 mm) centers
 - d. Single net product anchor trench: Excavate a 6 in. by 6 in. (150 mm by 150 mm) anchor trench. Position roll such that the leading end of the roll is downslope and upside down. Apply seed and necessary soil amendments. Extend product 1 ft. downslope of anchor trench and place material in anchor trench (upside down). Secure terminal end and material in anchor trench with staples at 1 ft. intervals. Fill anchor trench with soil and compact. Apply seed and necessary soil amendments to fill placed in anchor trench. Move remaining roll over and downslope of anchor trench and proceed unrolling RECP downslope (since roll was initially reversed, folding material over anchor trench will result in the net side up, and rolling correctly downslope over the anchor trench).
3. Seams – Utilize one of the methods below for seaming of RECPs
- a. Adjacent seams: Overlap edges of adjacent RECPs by 2 to 4 in. (50 to 100 mm) or by abutting products as defined by manufacturer. Use a sufficient number of stakes or staples to prevent seam or abutted rolls from separating.
 - b. Consecutive rolls: Shingle and overlap consecutive rolls 2 to 6 in. (50 to 150 mm) in the direction of flow. Secure staples through seam at 1 ft. (300 mm) intervals
 - c. Check seam: Construct a stake/staple check seam along the top edge of RECPs for slope application and at specified intervals in a channel by installing two staggered rows of stakes/staples 4 in. (100 mm) apart on 4 in. (100 mm) centers.
 - d. Slope interruption check slot: excavate a trench measuring 6 in. wide by 6 in. deep (150 mm by 150 mm). Secure produce to the bottom of the trench. Fold product over upslope material and fill and compact the trench on the downslope side of check slot and seed fill. Continue rolling material downslope over trench.
4. Terminal Ends – Utilize one of the methods below for all terminal ends of RECPs
- a. Staples: Install the RECPs 3 ft. (900 mm) beyond the end of the channel and secure end with a single row of stakes/staples on 1 ft. (300 mm) centers. Stakes/staples for securing RECPs to the soil are typically 6 in (150 mm) long.
 - b. Anchor trench: Excavate a 6 in. by 6 in. (150 mm by 150 mm) anchor trench. Extend the terminal end of the RECPs 3 ft. (900 mm) past the anchor trench. Use stakes or staples to fasten the product into the bottom of the anchor trench. Apply seed and any necessary soil amendments to the compacted soil and cover with remaining 1 ft. (300 mm) terminal end of the RECPs. Secure terminal end of RECPs with a single row of stakes or staples on 1 ft. (300 mm) centers.
 - c. Check slot: Construct a stake/staple check slot along the terminal end of the RECPs by installing two rows of staggered stakes/staples 4 in. (100 mm) apart on 4 in. (100 mm) centers.
 - 1) Slope installations: At the top of slope, anchor the RECPs according to one of the methods detailed above. Securely fasten all RECPs to the soil by installing stakes/staples at a minimum rate of 1.3/yd² (1.5/m²) within the body of the blanket. For the most effective RECP installation use

stake/staple patterns and densities as recommended by manufacturer. For adjacent and consecutive rolls of RECPs follow seaming instructions detailed above. The terminal end of the RECPs installation must be anchored using one of the methods detailed above.

- d. Recommended maximum gradient for RECPs slope applications
 - 1) Mulch Control Nets: 5:1(H:V)
 - 2) Netless Rolled Erosion Control Blankets: 4:1 (H:V)
 - 3) Single-net Erosion Control Blankets & Open Weave Textiles: 3:1 (H:V)
 - 4) Double-net Erosion Control Blankets: 2:1 (H:V)
- 5. Straw Wattle/Fiber Rolls Installation:
 - a. Fiber rolls: Rope and notched stakes shall be used to restrain the fiber rolls against the slope. Stakes shall be driven into the slope until the notch is even with the top of the fiber roll. Rope shall be knotted at each stake and laced between stakes. After installation of the rope, stakes shall be driven into the slope such that the rope will hold the fiber roll tightly to the slope. Furrows will not be required.
 - b. Fiber rolls shall be placed 10 feet apart along the slope for slope inclination (horizontal: vertical) of 2:1 and steeper, 15 feet apart along the slope for slope inclination between 2:1 and 4:1, 20 feet apart along the slope for slope inclination between 4:1 and 10:1, and a maximum of 50 feet apart along the slope for slope inclination of 10:1 and flatter.
 - c. The bedding area for the fiber rolls shall be cleared of obstructions including rocks, clods, and debris greater than one inch in diameter before installation.
 - d. If cross slope drainage is desired, replace the following with "The installed angle of the fiber roll to the slope contour shall create a 2 percent to 5 percent grade from the center of the slope to the slope conform at the limit of disturbance." The limit of disturbance refers to the edge of a disturbed soil area (DSA) created by grading, vegetation removal, etc. Edit as needed.
 - e. Fiber rolls shall be installed approximately parallel to the slope contour.
 - f. If the intended function of the fiber rolls to disperse concentrated water runoff and to reduce runoff velocities is impaired, the Contractor shall take action to repair or replace the fiber rolls. Split, torn, or unraveling rolls shall be repaired or replaced. Broken or split stakes shall be replaced. Sagging or slumping fiber rolls shall be repaired with additional stakes or replaced. Locations where rills and other evidence of concentrated runoff have occurred beneath the rolls shall be corrected. Fiber rolls shall be repaired or replaced within 24 hours of identifying the deficiency.
- L. Filter Fabric: Shall comply with SSPWC Section 213 – Engineering Fabric", of Standard Specifications.
- M. Silt Fence Installation: Silt fence must be:
 - 1. Constructed with silt fence fabric, posts, and fasteners
 - 2. Prefabricated or assembled at the job site
 - 3. Attached to posts using these methods:
 - a. If prefabricated silt fence is used, posts must be inserted into sewn pockets
 - b. If assembled on the job site:
 - 1) If wood posts are used, fasteners must be staples or nails
 - 2) If steel posts are used, fasteners must be tie wires or locking plastic fasteners

- 3) Spacing of the fasteners must be no more than 8 inches apart
4. Installation:
 - a. Placing the bottom of the fabric in a trench that is at least 6 inches deep
 - b. Securing with posts placed on the downhill side of fabric
 - c. Backfilling the trench with soil and hand or mechanically tamping to secure the fabric in the trench
 - d. Silt fence sections connected by:
 - 1) Joining separate sections of silt fence to form reaches that are no more than 500 feet long
 - 2) b. Securing the end posts of each section by wrapping the tops of the posts with at least two wraps of 16-gage diameter tie wire
 - 3) c. Ensuring that each reach is a continuous run of silt fence from an end to an opening, including joined panels
 - 4) Place silt fence approximately parallel to the slope contour. For any 50 foot section of silt fence, do not allow the elevation at the base of the fence to vary more than 1/3 of the fence height.
 - 5) If you mechanically push the silt fence fabric vertically through the soil, you must demonstrate that the silt fence fabric will not be damaged and will not slip out of the soil, resulting in sediment passing under the silt fence fabric.
 - 6) If you reinforce the silt fence fabric with wire or plastic mesh, you may increase the post spacing to a maximum of 10 feet. The field-assembled reinforced silt fence must be able to retain saturated sediment without collapsing.
5. Maintenance: Maintain temporary silt fence to provide sediment holding capacity and to reduce runoff velocities by:
 - a. Removing sediment from behind the silt fence when sediment is 1/3 the height of the silt fence above ground
 - b. Repairing or adjusting the silt fence when rills and other evidence of concentrated runoff occur beneath the silt fence fabric
 - c. Repairing or replacing the silt fence fabric when it become split, torn, or unraveled within 24 hours of discovering damage unless engineer approves a longer period
 - d. Removing sediment deposits, trash, and debris from temporary silt fence as needed or when directed by the Architect. If removed sediment is deposited within project limits, it must be stabilized and not subject to erosion by wind or water. Trash and debris must be removed and disposed of properly.

N. Hydroseed:

1. The quantity of tackifier in the mixture shall be as recommended by the manufacturer.
2. The ratio of water to fiber and tackifier in the mixture shall be as recommended by the manufacturer. The proportions of various erosion control materials may be changed by the Architect to meet field conditions. Use hydroseeding equipment to apply hydroseed.
3. Apply hydroseed:
 - a. At application rate recommended by manufacturer. Successive applications or passes may be needed to achieve the recommended rate:
 - 1) To form a continuous mat with no gaps between the mat and the soil surface
 - 2) From 2 or more directions to achieve a continuous mat
 - 3) In layers to avoid slumping and to aid drying

- b. During dry weather or at least 24 hours before predicted rain
 - c. The ratio of total water to total tackifier in the mixture shall be as recommended by the manufacturer.
 - d. Seed may be dry applied at the rate recommended by the manufacturer for small areas not accessible by the hydroseeding equipment, when approved in writing by the Architect. Dry applied seed shall be incorporated into the soil a maximum depth of 1/4 inch by raking or dragging.
 - e. Hydraulic application of erosion control (Hydroseed) materials for rolled erosion control product (Netting) areas shall be applied by hose, from the ground. Erosion control (Hydroseed) materials must be applied onto the slope face such that the materials are well integrated into the rolled erosion control product (Netting) and in contact with ground surface. Application must be perpendicular to the slope face such that rolled erosion control product (Netting) materials are not damaged or displaced. Complete tackifier application on the same day as straw work began for that area.
 - f. The CSSM may change the application rates of erosion control (Hydroseed) materials to meet field conditions.
 - g. For any area where erosion control (Hydroseed) materials are to be applied, the application of all erosion control (Hydroseed) materials to be applied to that area must be completed within 72 hours from when the first materials were applied.
 - h. Immediately after the application of the hydroseed, sprinklers shall be operated just long enough to wash excess material from previously planted materials and site features. Care shall be taken to avoid washing or eroding materials from area.
 - i. Follow-up applications shall be made as needed to cover weak spots and to maintain adequate soil protection.
 - j. Contractor shall provide regular irrigation as required until hydroseeding is well established. Contractor shall review in the field with the SWMR to determine when irrigation can cease.
- O. Mulch: Spread mulch to a uniform thickness. Extend mulch to the edge of retaining walls, dikes, paving and to within 4 feet from the flow line of paved and unpaved drainage ditches.
- P. Inlet Protection: Install per manufacturers recommendations and maintain as required based on field conditions and inspections.
- Q. Soil Binders:
- 1. Apply soil binder:
 - a. Per the manufacturer's recommendations for the job site soil conditions. Pre-wet the area if recommended by the manufacturer.
 - b. From 2 or more directions to achieve a continuous cover.
 - c. During dry weather at least 24 hours before predicted rain.
 - 2. Do not apply soil binder if:
 - a. Water is standing on or moving across the soil surface
 - b. Soil is frozen
 - c. Air temperature is below 40 °F during the tackifier-curing period unless allowed by the manufacturer and approved by the engineer. Note: Do not over-spray soil binder onto the traveled way, sidewalks, lined drainage channels, or existing vegetation.
 - 3. Maintenance:

- a. Reapply soil binder within 24 hours of discovering visible erosion, unless the Architect approves a longer period
- b. Temporary soil binder disturbed or displaced by the Contractor's vehicles, equipment, or operations must be reapplied at the Contractor's expense.

END OF SECTION

Insert Campus Name	Storm Water Management Monthly Report		Form EF XXXX.00
	Revision 1.0	Revision Date Xx/xx/xx	Effective Date Xx/xx/xx

_____ Storm Water Management Report for: _____ to _____

YYYYY) Month Year (MM / DD /

(MM / DD / YYYYY)

Inspection and Monitoring Requirements <i>Refer to the projects SWPPP for details, such as:</i> <ul style="list-style-type: none"> • Inspection frequencies, • Testing parameters, etc. 	Risk Level	Visual Inspections					Sample Collection		Were all required inspections and sampling conducted? Yes ¹ <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> ¹ Attach copies of inspections and sampling reports as applicable					
		Quarterly Non-storm Water Discharge	Pre-storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water						
			Baseline	REAP										
			1	X						X	X	X		
			2	X						X	X	X	X	
3	X	X	X	X	X	X								

Were there any Storm Water or authorized non-storm water discharges? List the dates of the events: _____	Yes <input type="checkbox"/> No <input type="checkbox"/>
Are there loose stockpiled construction materials that are currently not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.) covered and bermed?	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Are the site management (i.e., "housekeeping") measures for <u>construction materials</u> that could potentially be a threat to water quality if discharged implemented and effective?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Are the site management (i.e., "housekeeping") measures for <u>waste management</u> , implemented and effective?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Are good housekeeping measures for <u>vehicle storage and maintenance implemented and effective?</u>	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Are good housekeeping for <u>landscape materials implemented and effective?</u>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Are good housekeeping measures in place on the construction site to control the air disposition of site materials and from site operations?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Are there any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Are measures in place to control all non- storm water discharges during construction and were they effective?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Were any vehicles washed done in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems?	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Are effective wind erosion control measures in place?	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Are effective soil covers in place for inactive areas and all finished slopes, open space, utility backfill, and completed lots?	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Are effective perimeter controls in place that stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site?	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>

Effective Date
Xx/xx/xx

¹ Attach copies of inspections and sampling reports as applicable

project description

Certify the project is in compliance with the Storm Water Pollution Prevention Plan (SWPPP) for this project and the current General Permit For Storm Water Discharges Associated With Construction And Land Disturbance Activities (NPDES NO. CAS000002).

date

SECTION 01 58 00

TEMPORARY PROJECT SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Temporary project signage including informational signs.

1.3 RELATED SECTIONS

- A. Section 01 35 43 – Environmental Protection: Coordination of signage for environmental protection.
- B. Section 01 52 00 – Construction Facilities: Coordination of signage locations.
- C. Section 01 55 00 – Vehicle and Pedestrian Controls: Coordination of signage w/ parking & traffic control
- D. Section 01 74 19 – Construction Waste Management: Coordination of signage associated with the Waste Management and Recycling Plan.

1.4 SUBMITTALS

- A. Temporary Project Signage Submittal: In coordination with the Construction Area Plan submittal, which identifies the locations and types of signs for the purposes of construction, the Temporary Project Signage submittal shall include the graphic design and signage material information to demonstrate compliance with project requirements.
 - 1. Due within 21 Days of the Notice to Proceed. Make any required modifications and file the final approved submittal for the project records. During the course of construction, submit any proposed revisions for acceptance prior to implementing any changes.
 - 2. The Temporary Project Signage submittal shall include a copy of the signage graphics for all temporary signs to be used as part of the construction process, including, but not limited to the Project Identification Sign(s), traffic control signs, informational, and directional signs.

PART 2 - PRODUCTS

2.1 SIGN MATERIALS

- A. Sign Structure and Framing: Contractor shall provide new materials, wood or metal, structurally adequate to support sign panel and suitable for specified finish.
- B. Sign Surfaces: Sign surfaces shall be minimum 5/8-inch thick, exterior grade, softwood plywood with medium or high-density phenolic sheet overlay, standard large sizes to eliminate joints. Contractor shall provide sheet thickness as required to span across framing members and provide even, smooth surface without waves or buckles.
- C. Hardware: Hardware shall be hot-dip galvanized steel.

2.2 PROJECT IDENTIFICATION SIGN

- A. In addition to signage otherwise required, contractor shall provide not less than one project sign per General Conditions 4.23. The sign may be 3 feet by 5 feet securely mounted in an approved location. Submit sign graphics and proposed location for approval. The sign shall be of durable

construction and quality graphics with no advertising.

- i. Name of the Project;
- ii. Description of the work;
- iii. Name and/or logo the University;
- iv. Name and/or logo the Contractor;
- v. Name and/or logo of the Architect and their primary consultants;
- vi. Contractor's field office phone number;
- vii. University emergency phone number.

2.3 PROJECT INFORMATIONAL SIGNS

- A. Restrictions: Contractor shall not display signs other than Project Identification Sign specified above and Project Informational Signs specified below without written approval of University's Representative.
- B. Project Informational Signs: Informational signs, necessary for conduct of construction activities or required by governmental authorities having jurisdiction, may be displayed when in conformance to sign construction and graphic requirements specified in this Section.
 1. Adequacy of signage for safety and conformance to requirements of authorities having jurisdiction and trade practices shall be solely Contractor's responsibility.
 2. The University reserves the right to reject signage that does not meet the University's standards.
- C. Sign Design: Informational signage shall be produced by professional sign painters or graphics designers and be of size and lettering style consistent with use. Colors shall be as required by authorities having jurisdiction and, if not otherwise required, of colors consistent with Project graphics. Where sign is related to vehicular access, comply with Caltrans standard details.

PART 3 – EXECUTION

3.1 TEMPORARY PROJECT SIGNAGE INSTALLATION

- A. Project Identification Sign Construction: Construct sign support structure and install panels in durable manner, to resist high winds.
- B. Project Identification Sign Installation: Erect Project Identification Sign on site at a lighted location of public visibility, adjacent to the main entrance to site, as approved by University.
 1. Contractor shall install sign at height for optimum visibility, on ground-mounted poles or attached to portable structure on skids.
 2. Portable structures shall resist overturning force of wind.
- C. Field Painting: Paint all surfaces and edges of sign face and support for finished appearance.

3.3 SIGNS MAINTENANCE

- A. Signs Maintenance: Contractor shall maintain signs and supports in a neat, clean condition. Contractor shall repair all damage and weathering to structure, framing and signage.
- B. Sign Relocation: Contractor shall relocate signs as required by progress of the work.

3.4 REMOVAL

- A. Project Signage Removal: Contractor shall remove Temporary Project Signage when directed, but no later than at the Final Completion. Contractor shall coordinate removal with requirements specified in Section 01 52 00 – Construction Facilities.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. General requirements for products used for the Work, including:
 - 1. General characteristics of products
 - 2. Product options
 - 3. System completeness
 - 4. Transportation and handling requirements
 - 5. Storage and protection of products
 - 6. Installation of products.

1.3 RELATED REQUIREMENTS

- A. Section 01 25 00 - Substitution Procedures: Requirements for product substitutions.
- B. Section 01 33 00 - Submittal Procedures: Requirements applicable to submittals for "or equal" and substitute products.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle products according to manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
 - 1. Schedule delivery to minimize long-term storage at site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to site in undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products upon delivery to ensure compliance with Contract Documents and to ensure that products are undamaged and properly protected.
 - 5. Store products at site in manner that will facilitate inspection and measurement of quantity or counting of units.
 - 6. Store products subject to damage by elements above ground, under cover in weather-tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

1.5 PRODUCT SELECTION

- A. General: Comply with requirements of the Contract General Conditions.
- B. Product Selection Procedures: Contract Documents and governing regulations govern product selection. Procedures governing product selection include following:
 - 1. General: Comply with requirements of the Contract General Conditions.
 - 2. Products Specified by Reference Standards or Description Only: Any product meeting those standards or description.
 - 3. Products Specified by Indicating Basis for Design: Design and approval is based on systems, products, and assemblies of manufacturer indicated. Equivalent systems, products, and assemblies of other named manufacturers may be used, however, Contractor is responsible for additional approvals required, for coordination with remainder of Contract Documents, and for costs of redesign or recalculation required. Comply with Section 01 25 00 to obtain approval for use of unnamed product.
 - 4. Products Specified by Naming One or More Manufacturers: Products of named manufacturers meeting Specifications. Submit request for substitution for manufacturer not specifically named.
 - a. Products of acceptable manufacturers are subject to requirements of Specifications for specified product.
 - 5. Products Specified by Naming One or More Manufacturers with No Known Equals: Products of named manufacturers meeting Specifications: no options, no substitutions.
 - a. Products of acceptable manufacturers are subject to requirements of Specifications for specified product.
 - 6. Descriptive Specification Requirements: Where Specifications describe product or assembly, listing exact characteristics required, with or without use of brand or trade name, provide product or assembly that provides characteristics and otherwise complies with Contract requirements.
 - 7. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by manufacturer for application indicated.
 - a. Manufacturer's recommendations may be contained in published product literature or by manufacturer's certification of performance.
 - 8. Compliance with Standards, Codes, and regulations: Where Specifications only require compliance with imposed code, standard, or regulation, select product that complies with standards, codes, or regulations specified.
 - 9. Visual Matching: Where Specifications require matching established Sample, Architect's decision will be final on whether proposed product matches satisfactorily.
 - a. Where no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of Section 01 25 00 for selection of matching product in another product category.
 - 10. Visual Selection: Where specified product requirements include phrase "... as selected from manufacturer's standard colors, patterns, textures..." or similar phrase, select product and manufacturer that complies with other specified requirements. Architect will select color, pattern, and texture from product line selected.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS

A. Installation of Products:

1. Contractor shall comply with manufacturer's instructions and recommendations for installation of products, except where more stringent requirements are specified and necessary due to Project conditions or are required by authorities having jurisdiction.
2. Contractor shall anchor each product securely in place, accurately located and aligned with other Work.
3. Contractor shall clean exposed surfaces and provide protection to ensure freedom from damage and deterioration at time of Contract Completion review. Contractor shall refer to additional requirements specified in Section 01 74 00 - Cleaning Requirements.

END OF SECTION

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SECTION 01 71 00

EXAMINATION AND PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Requirements for preparation prior to installing, applying and placing products to determine acceptable conditions for the Work.
- B. Layout of the Work and other engineering services necessary to accomplish the Work.

1.3 RELATED REQUIREMENTS

- A. Section 01 78 10 - Survey and Layout Data: Requirements for survey and layout data submittals.
- B. Individual Division 2 through 33 Product Specification Sections: Specific requirements for preparation prior to performance of the Work.

1.4 LAYOUT OF WORK

- A. Surveyor: Contractor shall select and pay for services of a land surveyor, registered in the State of California, for proper performance of the Work.
 - 1. Services of surveyor shall be suitable for layout and verification of location of utilities and site elements.
 - 2. For the Project record, Contractor shall submit the name, address and telephone number of land surveyor before starting survey Work.

PART 2 - PRODUCTS

Not Applicable to this Section.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Manufacturer's Requirements: Contractor shall determine product manufacturer's requirements and recommendations prior to commencing Work.

- B. Preparations: Contractor shall perform preparation actions according to manufacturer's instructions and recommendations and according to specified procedures.
 - 1. Contractor shall perform surface preparation as necessary to create suitable substrates for application, installation and placement of products.
 - 2. Contractor shall notify University's Representative in writing of unsuitable conditions preventing proper performance of the Work.
- C. Existing Utility Information: Contractor shall furnish information to serving utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Contractor shall coordinate with University's Representative and with authorities having jurisdiction.
- D. Existing Utility Interruptions: Contractor shall not interrupt utilities serving facilities occupied by University or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Contractor shall notify University's Representative not less than two working days in advance of proposed utility interruptions.
 - 2. Contractor shall not proceed with utility interruptions without written permission from University's Representative.
- E. Field Measurements: Contractor shall take field measurements as required to fit the Work properly. Contractor shall recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, Contractor shall verify dimensions of other construction by field measurements before fabrication. Contractor shall coordinate fabrication schedule with construction progress to avoid delaying the Work.
- F. Space Requirements: Contractor shall verify space requirements and dimensions of items shown diagrammatically on Drawings.
- G. Review of Contract Documents and Field Conditions: Immediately upon discovery of the need for clarification of the Contract Documents, Contractor shall submit a Request for Interpretation (RFI) to Architect. Contractor shall include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Contractor shall submit requests in accordance with requirements specified in Section 01 26 13 - Requests for Interpretation (RFI), using form as directed by University's Representative.
- H. Verification of Construction Layout: Before proceeding to layout the Work, Contractor shall verify layout information shown on Drawings, in relation to the property survey and existing benchmarks, and locate survey reference points. If discrepancies are discovered, Contractor shall promptly notify University's Representative, Architect and Project Inspector.

3.2 FIELD ENGINEERING

- A. Examination: Contractor shall verify locations of survey control and reference points prior to starting Work. If discrepancies are discovered, Contractor shall promptly notify University's Representative, Architect and Project Inspector.
- B. Survey Control and Reference Points: Refer to Article 1.5 in Section 01 78 10 - Survey and Layout Data.

3.3 SURVEYING AND FIELD ENGINEERING SERVICES

- A. Surveying and Field Engineering Services: Contractor shall provide surveying and field engineering services as necessary for performance of the Work. Refer to Section 01 78 10 - Survey and Layout Data.
1. Contractor shall be responsible for the accuracy and adequacy of surveying and field engineering services.
 2. Contractor shall utilize recognized engineering practices.
 3. Contractor shall check the location, level and plumb, of every major element as the Work progresses.
 4. Contractor shall preserve construction survey stakes and marks for the duration of their usefulness.
 5. If construction survey stakes are lost or disturbed, and require replacement, Contractor shall perform replacement at no change in Contract Sum and Contract Time.
 6. Contractor shall excavate all holes necessary for line and grade stakes.
- B. Surveying for Layout and Control of the Work: Contractor shall establish elevations, lines and levels for all Work under the Contract. Contractor shall locate and lay out by instrumentation and similar appropriate means:
1. Site improvements, including pavements, curbs, headers, sewers, storm drains, structures, and paving. Note on Project Record Drawings utility locations, slopes and invert elevations.
 2. Stakes for cutting, filling, grading and topsoil placement, to establish finished grade or flow line indicated on Contract Drawings.
 - a. Contractor shall preserve construction survey stakes and marks for the duration of their usefulness.
 - b. If construction survey stakes are lost or disturbed, and require replacement, Contractor shall perform replacement at no change in Contract Sum and Contract Time.
 - c. Contractor shall excavate all holes necessary for line and grade stakes.
 3. Grid or axis for structures, building foundation, column locations and ground floor elevations.
 4. Contractor shall establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 5. Contractor shall establish dimensions within tolerances indicated. Contractor shall not scale Drawings to obtain required dimensions.
 6. Contractor shall inform installers of lines and levels to which they must comply.
 7. When deviations from required lines and levels exceed allowable tolerances, Contractor shall notify University's Representative, Architect and Project Inspector.
 8. Contractor shall close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Monuments: Contractor shall establish a minimum of two permanent monuments on site, referenced to established control points. Contractor shall record locations, with horizontal and vertical data, on Project Record Drawings.
1. In accordance with Business and Professions Code section 8772, any monument set by a licensed land surveyor or registered civil engineer to mark or reference a point on a property or land line shall be permanently and visibly marked or tagged with the certificate number of the surveyor or civil engineer setting it, each number preceded by the letters "L.S." or "R.C.E." respectively, as the case may be, or, if the monument is set by a public agency, it shall be marked with the name of the agency and the political subdivision it serves.

2. Nothing in this Section shall prevent the inclusion of other information on the tag, which will assist in the tracing, or location of survey records, which relate to the tagged monument.
 3. Contractor shall ensure that centerline ties filed with the County Surveyor will be checked for compliance with this law.
- D. Site Grading Verification: Upon completion of grading, Contractor shall survey graded areas and establish that elevations are correct and within acceptable tolerances for paving and finish grading.
- E. Verification of Work: Contractor shall periodically verify layout and completed conditions of the Work by same means.

END OF SECTION

SECTION 01 73 00
EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. General requirements for installing, applying and placing products.
- B. General requirements for correction of defective Work.

1.3 RELATED REQUIREMENTS

- A. Individual Division 2 through 33 Product Specification Sections: Specific requirements for installing, applying and placing products.

1.4 EXECUTION

- A. Manufacturer's Requirements: Contractor shall determine product manufacturer's requirements and recommendations prior to commencing Work.
- B. Execution: Contractor shall perform installation, application and placement actions according to manufacturer's instructions and recommendations and according to specified procedures.
 - 1. Contractor shall perform surface preparation as necessary to create suitable substrates for application, installation and placement of products.
 - 2. Contractor shall notify University's Representative in writing of unsuitable conditions preventing proper performance of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 INSTALLATION, APPLICATION AND PLACEMENT OF PRODUCTS

- A. Manufacturer's Instructions: Contractor shall comply with manufacturer's written instructions and recommendations for installing, applying, placing and finishing products.

- B. Installation, Application and Placement, General: Contractor shall locate the Work and components of the Work accurately, in correct alignment, orientation and elevation, as indicated.
 - 1. Contractor shall make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, Contractor shall install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Contractor shall install products at the time and under conditions that will ensure the best possible results. Contractor shall maintain conditions required for product performance until acceptance of the Work.
 - 4. Contractor shall conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
 - C. Tools and Equipment: Contractor shall not use tools or equipment that produce harmful noise levels.
 - D. Anchors and Fasteners: Contractor shall provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 1. Mounting Heights: Where mounting heights are not indicated, Contractor shall mount components at heights directed by Architect.
 - 2. Contractor shall allow for building movement, including thermal expansion and contraction.
 - E. Joints: Contractor shall make joints of uniform width. Where joint locations in exposed work are not indicated, Contractor shall arrange joints for the best visual effect. Contractor shall fit exposed connections together to form hairline joints.
 - F. Hazardous Materials: Contractor shall use products, cleaners, and installation materials that are not considered hazardous.
 - G. Cleaning: Contractor shall comply with requirements specified in Section 01 74 00 - Cleaning Requirements. See individual product Specifications Sections for specific cleaning procedures to be performed.
 - H. Protection: Contractor shall provide barriers, covers and other protective devices as recommended by manufacturer and complying with general.
 - 1. Contractor shall comply with manufacturer's written instructions for temperature and relative humidity.
 - 2. See individual product Specifications Sections for specific protective measures to be provided.
 - I. Limiting Exposures: Contractor shall supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.
- 3.2 UNIVERSITY-INSTALLED PRODUCTS
- A. Not used.

3.3 CORRECTION OF THE WORK

- A. Correction of the Work, General: Contractor shall repair or remove and replace defective construction. Contractor shall restore damaged substrates and finishes to match original and new surrounding construction.
 - 1. Contractor shall comply with requirements in Section 01 73 29 - Cutting and Patching Requirements.
 - 2. Repairing shall include replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
 - 3. Contractor shall remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
 - 4. Contractor shall repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
 - 5. Contractor shall remove and replace chipped, scratched, and broken glass.
- B. Restoration of Existing Conditions: Contractor shall restore permanent facilities used during construction to their original condition or to match new construction.

END OF SECTION

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SECTION 01 73 29

CUTTING AND PATCHING REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. This section specifies administrative and procedural requirements for cutting and patching.
- B. Work included in this Section:
 - 1. Cutting and patching not required to be performed as part of the Work specified in other Sections.
 - 2. Cutting and patching existing construction altered or disturbed to accommodate new construction.
 - 3. Cutting and patching existing construction damaged or defaced during new construction as required to restore to existing or better condition at the time of award of Contract.
 - 4. Cutting and patching required to:
 - a. Install or correct non-coordinated Work.
 - b. Remove and replace defective and non-conforming Work.
 - c. Remove samples of installed Work for testing.
- C. Refer to other Sections and drawings for specific requirements of the extent and limitations applicable to cutting and patching, demolishing, or altering existing construction of individual parts of the Work.

1.3 SUBMITTALS

- A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposed work plan describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed from the University. Include the following information, as applicable, in the proposal:
 - 1. Describe the extent of cutting and patching required and how it is to be performed.
 - 2. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
 - 3. List products to be used and firms or entities that will perform work.
 - 4. Indicate dates when cutting and patching is to be performed.
 - 5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
 - 6. Where cutting and patching involves addition of reinforcement to structural elements, submit details to show how reinforcement is integrated with the original structure.

7. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.
8. Effects on University operations and on concurrent operations construction by other contractors.

1.4 QUALITY ASSURANCE

- A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
 1. Obtain approval from the Architect of the cutting and patching proposal before cutting and patching the following structural elements:
 - Bearing and retaining walls
 - Structural concrete
 - Structural steel
 - Lintels
 - Timber and primary wood framing
 - Structural decking
 - Stair systems
 - Miscellaneous structural metals
 - Equipment supports
 - Piping, ductwork, vessels and equipment
- B. Operational and Safety Limitations: Do not cut and patch operating elements or safety-related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.
 1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety-related systems:
 - Primary operational systems and equipment
 - Air or smoke barriers
 - Water, moisture, or vapor barriers
 - Membranes and flashings
 - Fire protection systems
 - Noise and vibration control elements and systems
 - Control systems
 - Communication systems
 - Electrical wiring systems
- C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace work cut and patched in a visually unsatisfactory manner.
- D. If possible retain the original installer or fabricator throughout construction phases to cut and patch the following categories of exposed work, or if it is not possible to engage the original installer or fabricator, Contractor shall engage another recognized experienced and specialized firm:
 - Concrete finishes
 - Painting

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Use materials that are identical to existing materials unless not available. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. BEFORE PROCEEDING CONTRACTOR SHALL OBTAIN APPROVAL OF THE ARCHITECT.
- B. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered. Inspect existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.
 - 1. Before proceeding, meet at the site with parties involved in cutting and patching, including asbestos abatement, mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
 - 2. Beginning of cutting or patching shall be interpreted to mean that existing conditions were found by Contractor to be acceptable.
 - 3. After uncovering existing Work, Contractor shall inspect conditions affecting proper accomplishment of Work.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut where required.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 PERFORMANCE

- A. General
 - 1. Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

2. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. Cutting

1. Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.
2. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
3. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
4. Cut through concrete and masonry using a cutting machine such as carborundum saw or diamond core drill.
5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
6. Provide fire-safe seals to maintain fire rating at all penetrations.

C. Patching

1. Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
2. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
3. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

3.4 CLEANING

- A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION

SECTION 01 74 00

CLEANING REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Cleaning during construction.
- B. Cleaning for Contract Completion review and final acceptance of the Work.

1.3 RELATED REQUIREMENTS

- A. Additional Requirements: Cleaning for specific products or elements of Work are described in individual product Specification Sections in Divisions 2 through 33. Contractor shall comply also with University's Contractor Safety Handbook.

1.4 SUBMITTALS

- A. Product List: Contractor shall submit complete list of all cleaning agents and materials for University's Representative's review and approval.
- B. Cleaning Procedures: Contractor shall submit description of cleaning processes, agents and materials to be used for final cleaning of the Work. Processes and degree of cleanliness shall be as directed by University's Representative. All cleaning processes, agents and materials shall be subject to University's Representative's review and approval.

1.5 QUALITY ASSURANCE

- A. Cleaning and Disposal Requirements, General: Contractor shall conduct cleaning and disposal operations in compliance with all applicable codes, ordinances and regulations, including environmental protection laws, rules and practices.
- B. Cleaning Workers: Contractor shall employ experienced workers or professional cleaners for final cleaning. Contractor shall clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Contractor shall comply with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents and Materials: Contractor shall use only those cleaning agents and materials which will not create hazards to health or property and which will not damage or degrade surfaces. Contractor shall:
 - 1. Use only those cleaning agents, materials and methods recommended by manufacturer of the material to be cleaned.
 - 2. Use cleaning materials only on surfaces recommended by cleaning agent manufacturer.

PART 3 - EXECUTION

3.1 CLEANING DURING CONSTRUCTION

- A. Garbage Control: Contractor shall control accumulation of debris, waste materials and rubbish. Periodically, Contractor shall dispose of debris, waste and rubbish off-site in a legal manner.
- B. Cleaning, General: Contractor shall clean sidewalks, driveways and streets frequently to maintain public thoroughfares free of dust, debris and other contaminants.
- C. Cleaning of Existing Facilities: Contractor shall clean surfaces in existing structures where alteration and renovation Work is being performed or where other construction activities have caused soiling and accumulation of dust and debris. Contractor shall:
 - 1. Clean dust and soiling from floor surfaces.
 - 2. Clean dust from horizontal and vertical surfaces.
- D. Parking Area Cleaning: Contractor shall keep parking areas clear of construction debris, especially debris hazardous to vehicle tires.
- E. Thoroughfare Clearing and Cleaning: Contractor shall keep site accessways, parking areas and building access and exit facilities clear of mud, soiling and debris. Contractor shall:
 - 1. Remove mud, soil and debris and dispose in a manner which will not be injurious to persons, property, plant materials and site.
 - 2. Comply with runoff control requirements stated above and as required by governing authorities having jurisdiction.
- F. Cleaning Frequency: At a minimum, Contractor shall clean Work areas daily.
- G. Failure to Clean: Should cleaning by Contractor not be sufficient or acceptable to University's Representative, especially regarding paths of travel, University may engage cleaning service to perform cleaning and deduct costs for such cleaning from sums owed to Contractor.

3.2 CONTRACT COMPLETION REVIEW CLEANING, GENERAL

- A. Contract Completion Review Cleaning, General: Contractor shall execute a thorough cleaning prior to Contract Completion review by University's Representative and Architect. Contractor shall complete final cleaning before submitting final Application for Payment. Contractor shall:

1. Conduct cleaning in compliance with regulations of authorities having jurisdiction and industrial safety standards for cleaning.
2. Employ professional building cleaners to thoroughly clean building.
3. Complete cleaning operations specified below before requesting inspection for Certification of Completion. Contractor shall:
 - a. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Leave concrete floors broom clean.
 - b. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
 - c. Clean the site, including landscape development areas, of rubbish, litter and foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits.

B. Waste Disposal, Contractor shall:

1. Remove waste materials from the site and conduct disposal in a lawful manner.
2. Do not burn waste materials.
3. Do not bury debris or excess materials on the University property.
4. Do not discharge volatile, harmful or hazardous materials into drainage systems.
5. Where extra materials of value remaining after completion of associated work have become the University's property, arrange for disposition of these materials as directed.

3.3 EXTERIOR CLEANING

- A. Building Exterior Cleaning: Contractor shall clean exterior of adjacent facilities where construction activities have caused soiling and accumulation of dust and debris. Contractor shall:
1. Remove labels that are not permanent labels.
- B. Site Cleaning: Contractor shall broom clean exterior paved surfaces. Contractor shall rake clean other surfaces of the grounds. Contractor shall:
1. Wash down and scrub where necessary all paving soiled as a result of construction activities. Thoroughly remove adhered soil.
 2. Remove from the site all construction waste, unused materials, excess soil and other debris resulting from the Work. Legally dispose of waste.

3.4 CLEANING INSPECTION

- A. Cleaning Inspection: Prior to Final Payment or acceptance by University for partial occupancy or beneficial use of the premises, Contractor and University's Representative shall jointly conduct an inspection of interior and exterior surfaces to verify that entire Work is acceptably clean.
- B. Inadequate Cleaning: Should final cleaning be inadequate, as determined by University's Representative, and Contractor fails to correct conditions, University may engage cleaning service under separate contract and deduct cost from Contract Sum.

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SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

Section includes requirements and procedures for ensuring optimal diversion of construction and demolition (C&D) waste materials generated by the Work from landfill disposal within the limits of the Construction Schedule and Contract Sum.

- A. California State law (Public Resources Code sections 40000 *et seq.*) requires the California State University to develop source reduction, re-use, recycling, and composting programs to divert 65% of all solid waste from landfill disposal by 2020. Construction waste materials generated by the Work are targeted to achieve and maintain these diversion rates.
- B. The Work of this Contract requires that a minimum of 65% by weight of the construction and demolition materials generated in the Work is diverted from landfill disposal through a combination of re-use and recycling activities (Current California Green Building Standards Code).
- C. Requirements for submittal of Contractor's Construction Waste and Recycling Plan prior to the commencement of the Work.
- D. Contractor's quantitative reports for construction waste materials as a condition of approval of the third progress payment.

1.3 DEFINITIONS

- A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations. A Class III landfill must have a solid waste facilities permit from CalRecycle and is regulated by the Enforcement Agency (EA).
- B. Construction and Demolition Debris: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous as defined in California Code of Regulations, Title 22, and Section 66261.3 *et seq.* This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel. The debris may be commingled with rock, soil, tree stumps, and other

vegetative matter resulting from land clearing and landscaping for construction or land development projects.

- C. C&D Recycling Center. A facility that receives only C&D material that has been separated for reuse prior to receipt, in which the residual (disposed) amount of waste in the material is less than 10% of the amount separated for reuse by weight.
- D. Disposal. Final deposition of construction and demolition or inert debris into land, including stockpiling onto land of construction and demolition debris that has not been sorted for further processing or resale, if such stockpiling is for a period of time greater than 30 days; and construction and demolition debris that has been sorted for further processing or resale, if such stockpiling is for a period of time greater than one year, or stockpiling onto land of inert debris that is for a period of time greater than one year.
- E. Enforcement Agency. Enforcement agency as defined [i.e. in Public Resources Code 40130].
- F. Inert Disposal Facility or Inert Waste Landfill: A disposal facility that accepts only inert waste such as soil and rock, fully cured asphalt paving, uncontaminated concrete (including fiberglass or steel reinforcing rods embedded in the concrete), brick, glass, and ceramics, for land disposal.
- G. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.
- H. Mixed Debris Recycling Facility: A processing facility that accepts loads of commingled construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing the non-recyclable residual materials.
- I. Recycling: The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
- J. Reuse. The use, in the same or similar form as it was produced, of a material which might otherwise be discarded.
- K. Separated for Reuse. Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream for the purpose of additional sorting or processing those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace, and includes materials that have been "source separated."
- L. Solid Waste: All putrescible and non-putrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by State law.

- M. Source-Separated: Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream at the point of generation for the purpose of additional sorting or processing of those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw materials for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.
- N. Waste Hauler: A company that possesses a valid permit from the local waste management authority to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal in the locality.

1.4 SUBMITTALS

- A. Contractor's Construction Waste and Recycling Plan
 - A. Review Contract Documents and estimate the types and quantities of materials under the Work that are anticipated to be feasible for on-site processing, source separation for re-use or recycling. Indicate the procedures that will be implemented in this program to effect jobsite source separation, such as, identifying a convenient location where dumpsters would be located, putting signage to identify materials to be placed in dumpsters, etc.
 - B. Prior to commencing the Work, submit Contractor's Construction Waste and Recycling Plan. Submit in format provided (Section 01 74 19A). The Plan must include, but is not limited to the following:
 - a. Contractor's name and project identification information;
 - b. Procedures to be used;
 - c. Materials to be re-used and recycled;
 - d. Estimated quantities of materials;
 - e. Names and locations of re-use and recycling facilities/sites;
 - f. Tonnage calculations that demonstrate that Contractor will re-use and recycle a minimum 65% by weight of the construction waste materials generated in the Work.
 - C. Contractor's Construction Waste and Recycling Plan must be approved by the Construction Administrator prior to the start of Work.
 - D. Contractor's Construction Waste and Recycling Plan will not otherwise relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures.
- B. Contractor's Reuse, Recycling, and Disposal Report
 - A. Submit Contractor's Reuse, Recycling, and Disposal Report on the form provided (Section 01 74 19B) with each application for progress payment. Failure to submit the form and its supporting documentation will render the application for progress payment incomplete and delay progress payments. If applicable, include manifests, weight tickets, receipts, and invoices specifically identifying the Project for re-used and recycled materials:
 - a. Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick).
 - b. Salvaging building materials or salvage items at an off-site salvage or reuse center (i.e. lighting, fixtures).
 - c. Recycling source separated materials on site (i.e. crushing asphalt/ concrete for base course, or grinding for mulch).

- d. Recycling source separated material at an offsite recycling center (i.e. scrap metal or green materials).
- e. Use of material as Alternative Daily Cover (ADC) at landfills.
- f. Delivery of soils or mixed inert material to an inert landfill for disposal (inert fill).
- g. Disposal at a landfill or transfer station (where no recycling takes place).
- h. Other (describe).
- B. Contractor's Reuse, Recycling, and Disposal Report must quantify all materials generated in the Work, disposed in [Class III] landfills, or diverted from disposal through recycling. Indicate zero (0) if there is no quantity to report for a type of material.
- C. As indicated on the form:
 - a. Report disposal or recycling either in tons or in cubic yards: if scales are available at disposal or recycling facility, report in tons; otherwise, report in cubic yards. Report in units for salvage items when no tonnage or cubic yard measurement is feasible.
 - b. Indicate locations to which materials are delivered for reuse, salvage, recycling, accepted as daily cover, inert backfill, or disposal in landfills or transfer stations.
 - c. Provide legible copies of weigh tickets, receipts, or invoices that specifically identify the project generating the material. Said documents must be from recyclers and/or disposal site operators that can legally accept the materials for the purpose of reuse, recycling, or disposal.
- D. Indicate project title, project number, progress payment number, name of the company completing the Contractor's Report and compiling backup documentation, the printed name, signature, and daytime phone number of the person completing the form, the beginning and ending dates of the period covered on the Contractor's Report, and the date that the Contractor's Report is completed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SALVAGE, RE-USE, RECYCLING AND PROCEDURES

- A. Identify re-use, salvage, and recycling facilities.
- B. Develop and implement procedures to re-use, salvage, and recycle new construction and excavation materials, based on the Contract Documents, the Contractor's Construction Waste and Recycling Plan, estimated quantities of available materials, and availability of recycling facilities. Procedures may include on-site recycling, source separated recycling, and/or mixed debris recycling efforts.
 - A. Identify materials that are feasible for salvage, determine requirements for site storage, and transportation of materials to a salvage facility.
 - B. Source separate new construction, excavation and demolition .
 - C. Miscellaneous Construction Debris: Develop and implement a program to transport loads of mixed (commingled) new construction materials that cannot be feasibly source separated to a mixed materials recycling facility.

3.2 DISPOSAL OPERATIONS AND WASTE HAULING

- A. Legally transport and dispose of materials that cannot be delivered to a source separated or mixed recycling facility to a transfer station or disposal facility that can legally accept the materials for the purpose of disposal.
- B. Use a permitted waste hauler or Contractor's trucking services and personnel. To confirm valid permitted status of waste haulers, contact the local solid waste authority.
- C. Become familiar with the conditions for acceptance of new construction, excavation and demolition materials at recycling facilities, and prior to delivering materials.
- D. Deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, composting, or disposal.
- E. Do not burn, bury or otherwise dispose of solid waste on the project job-site.

3.3 RE-USE AND DONATION OPTIONS

Implement a re-use program to the greatest extent feasible. Options may include:

California Materials Exchange (CAL-MAX) is a free program sponsored by CalRecycle and is designed to help connect businesses, organizations, manufacturers, schools, and individuals with the most effective online resources for exchanging materials. Go to <http://www.calrecycle.ca.gov/CalMAX/>. Public Surplus is a government agency surplus auction system used by many universities. Go to <https://www.publicsurplus.com> for more information.

3.4 REVENUE

Revenues or other savings obtained from recycled, re-used, or salvaged materials shall accrue to Contractor unless otherwise noted in the Contract Documents.

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SECTION 01 75 00

STARTING AND ADJUSTING PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Starting systems.
- B. Demonstration and instructions.
- C. Testing, adjusting, and balancing.

1.3 RELATED REQUIREMENTS

- A. Section 01 45 00 - Quality Control
- B. Section 01 78 23 - Operation and Maintenance Data
- C. Commissioning Guideline for CSU Capital Projects

1.4 STARTING SYSTEMS

- A. Contractor shall coordinate schedule for start-up of various equipment and systems.
- B. Contractor shall notify University's Representative, Architect, Commissioning Provider and Project Inspector in writing at least seven calendar days prior to start-up of each item.
- C. Contractor shall verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions, which may cause damage.
- D. Contractor shall verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Contractor shall verify that wiring and support components for equipment are complete and tested.
- F. Contractor shall execute start-up under supervision of applicable manufacturer's representative and/or Contractor's personnel in accordance with manufacturer's instructions.

- G. When specified in individual specification Sections, Contractor shall require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Contractor shall submit a written report in accordance with Section 01 33 00 - Submittal Procedures that equipment or system has been properly installed and is functioning correctly.

1.5 DEMONSTRATION AND INSTRUCTIONS

- A. Contractor shall demonstrate operation and maintenance of Products to University's personnel at least two weeks prior to date of Contract Completion review.
- B. Contractor shall demonstrate Project equipment and instruct in a classroom environment located at the University. The instruction shall be done by a qualified manufacturers' representative who is knowledgeable about the Project.
- C. Contractor shall utilize operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with University's personnel in detail to explain all aspects of operation and maintenance.
- D. Contractor shall demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled agreed time and at equipment/designated location.
- E. Contractor shall prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- F. The amount of time required for instruction on each item of equipment and system is that specified in individual sections. If no time is specified in individual sections, Contractor shall include in his/her bid sum a reasonable sum to perform instruction to the satisfaction of the University.

1.6 TESTING, ADJUSTING, AND BALANCING

- A. Testing Agency: Contractor shall appoint, employ, and pay for services of an independent firm to perform testing, adjusting and balancing.
- B. Reports will be submitted by the independent firm to University's Representative, Architect and Project Inspector indicating observations and results of tests and indicating compliance or non-compliance with the requirements of the Contract Documents.
- C. University reserves the right to hire its own independent testing and balancing company to check the work and the report submitted by the Contractor's testing and balancing firm.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

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SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
 - 1. Final inspection procedures.
 - 2. Operating and maintenance manual submittal.
 - 3. HVAC balance report.
 - 4. Submittal of warranties.
 - 5. As-built drawings.
 - 6. Removal of temporary facilities.
 - 7. Final cleaning.

1.3 PUNCH LIST INSPECTION

- A. When each building/phase is, in the opinion of the Contractor, complete in all respects, the Contractor shall call for a punch-list inspection.
- B. Inspection Procedures: On receipt of a request for inspection, the University Representative will schedule the Inspection. If, in the judgment of the University Representative and the Architect, the project is not sufficiently complete in all respects, the University Representative will so advise the Contractor and discontinue the inspection.
 - 1. Results of the completed inspection will form the basis of requirements for final acceptance punch-list.

1.4 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents set as a working drawing set for construction purposes. Protect from deterioration and loss in a secure, fire-resistive location. Provide access to record documents for The University' and the Architect's reference during normal working hours throughout the course of the Project.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line prints of Contract Drawings and Shop Drawings. If using a digital copy of Contract Drawings, they must be available on job site for review at anytime. Mark the set to show the actual installation where the installation varies from the Work as originally shown or specified. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record

a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the work. Digital record set must be marked with red text.
2. Mark new information that is important to the University, but was not shown on Contract Drawings or Shop Drawings. Show all utilities, obstructions, etc. not previously noted in the Contract Documents, but discovered through completion of the work.
3. Note related Change Order, Field Instruction and RFI numbers where applicable.
4. Update Record Drawings at a minimum of once per week throughout the course of the Project.
5. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
6. Upon completion of the work, submit Record Drawings to the University Representative for further processing per section 01 78 39 Project Record Documents.

C. Record Specifications: Maintain one complete copy of the Project Specifications, including addenda, and one copy of other written construction documents such as Change Orders, Field Instructions, RFI's and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.

1. Upon completion of the work, submit record Specifications to the Architect for the University's records.

D. Operating and Maintenance Manuals: Submit one (1) set to the Architect for review and approval. Once approved send one hard copy set and one electronic set to the University with a transmittal to be signed and accepted by the Construction Administrator.

1.5 CLOSEOUT PROCEDURES: CLOSEOUT MEETING

A. The University Representative will call for a Project closeout meeting approximately four to six weeks prior to the anticipated completion date.

1. At this meeting, a completion Action List will be prepared listing all major items to be completed prior to the issuance of the Notice of Completion.
2. The Action List shall assign a responsibility and a projected completion date to each item.
3. The Contractor shall be solely responsible for the timely completion of all required closeout items.

1.6 FINAL CLEANING

A. General Cleaning: General cleaning during the construction period is required by the General Conditions and included in Section 01 52 00, Construction Facilities.

B. Cleaning Standards: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for Certification of Completion.

- a. Remove labels that are not permanent labels.
 - b. Clean exposed exterior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances.
 - c. Clean the site, including landscape development areas, of rubbish, litter and foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits.
- C. Removal of Protection: Remove temporary protection and facilities installed for protection of the work during construction and repair site to previous conditions.
- D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner. Where extra materials of value remaining after completion of associated work have become the University's property, arrange for disposition of these materials as directed.

1.7 FINAL ACCEPTANCE

- A. Preliminary Procedures: Before requesting final inspection for certification of University and Architect's final acceptance, complete the following:
 - 1. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect and the University Representative.
- B. Re-inspection Procedure: The University and Architect will re-inspect the work upon receipt of notice that the work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the University.
 - 1. Upon completion of re-inspection, the Architect will prepare and submit to the University, a certificate of final acceptance, or advise the Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 - 2. Upon final acceptance by the University and the Architect, the University Representative will then prepare a letter to the University stating that the project has been constructed in accordance with the contract documents and is complete in all respects.
- C. Completion Schedule: All punch list corrections shall be completed by Contractor within 30 days after Substantial Completion or the contract completion date, whichever is earlier. The University reserve the right to complete any outstanding punch list work remaining after the thirty-day period at Contractor's expense.
- D. Additional Inspections: Should additional re-inspections be required, Contractor shall reimburse University for University Representative's and Architect's account for time spent in conducting additional re-inspections at a rate of 3.2 times rate of Direct Personnel Expense (DPE). Direct Personnel Expense is defined as direct salaries of University Representative's and Architect's personnel engaged on Project and portion of costs of mandatory and customary contributions and benefits related thereto, including employment taxes and other statutory benefits, insurance, sick leave, holidays, vacations, pensions, and similar contributions and benefits.

1.8 FINAL PAYMENT

- A. Final Payment: After completion of all items listed for completion and correction and after submission of all documents and products and after final cleaning, Contractor shall submit final Application for Payment, identifying total adjusted Contract Sum, previous payments and sum remaining due. Payment will not be made until the following are accomplished:
1. All Project Record Documents have been received and accepted by the Architect.
 2. All extra materials and maintenance stock have been transferred and accepted by University.
 3. All warranty documents and operation, maintenance data, service agreements, maintenance contracts and salvage materials have been received and accepted by University's Representative.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 78 10

SURVEY AND LAYOUT DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Administrative requirements for survey and layout data submittals.

1.3 RELATED REQUIREMENTS

- A. Section 01 71 00 – Examination & Preparation Requirements: Layout of the Work and other engineering services required for accomplishing the Work.
- B. Section 01 77 00 - Contract Closeout Procedures: Submittals for occupancy, Acceptance and Final Payment.

1.4 LAYOUT OF THE WORK

- A. Responsibility for Layout of the Work: Contractor shall be solely responsible for complete, timely and accurate layout of the Work including, but not necessarily limited to, horizontal and vertical control and dimensional coordination as necessary to construct the Work in accordance with the Contract Documents. Contractor shall:
 - 1. Employ a Land Surveyor or a Civil Engineer, registered in the State of California, to perform survey work.
 - 2. Employ a Professional Engineer, of the discipline required for the specific service on the Project, and licensed in the State of California where required in the specifications in Divisions 2 through 33.

1.5 PROJECT SURVEY CONTROL POINTS

- A. Survey Reference Points: Existing basic horizontal and vertical control points are shown on the Contract Documents, or location of control points will be furnished by the University Representative. Contractor shall use the University Survey, provided by the University Representative, as the Basis of Bearings for survey horizontal control, and shall tie at least one Project site control point to a point on the University Survey. NAVD 29 and NAD 83 shall be used for vertical and horizontal control. Contractor shall:
 - 1. Locate and protect control points prior to starting site work, and preserve all permanent reference points during construction.
 - 2. Make no changes or relocations without prior written notice to Architect.

3. Report to University Representative and Architect when any reference point is lost or destroyed. Lost or destroyed reference control points
 4. Require a surveyor to replace project control points, which may be lost or destroyed. Establish replacements based on original survey control.
- B. Contractor shall establish a minimum of two permanent benchmarks on the project site that are referenced to control points identified in the Contract Documents. Document horizontal and vertical location of benchmarks on the project record documents.

1.6 SUBMITTALS

- A. Submit, name, address, and telephone number of Surveyor before starting survey work.
- B. On request of Architect, submit documentation to verify accuracy of field engineering work.
- C. Submit certificate signed by the Land Surveyor, licensed to practice in the State of California, certifying that elevations and locations of improvements are in conformance with the requirements of the Contract Documents.

1.7 SURVEY RECORD DOCUMENTS

- A. Survey Record Documents: Contractor shall maintain a complete and accurate log of control and survey work as Work progresses. Upon completion of foundation walls, infrastructure, and major site improvements, Contractor shall prepare a certified survey illustrating dimensions (horizontal NAD 83 and vertical NAVD 29), locations, angles and elevations of new construction and site work. The certified survey shall also document existing infrastructure encountered during construction. Contractor shall submit survey record documents as specified in Section 01 77 00 - Contract Closeout Procedures.
- B. Locations provided on the certified survey shall be provided by a licensed land surveyor and coordinated with the control points tied to the University Record of Survey as per paragraph 1.4-A above.
- C. For each new Project utility or improvement which is not to be owned and maintained by the University, Contractor shall provide a legal description and plot, stamped and signed by a properly licensed surveyor or Civil Engineer, and which will use the University Record of Survey as the Basis of Bearings and will provide a Point of Commencement shown on said Record of Survey.

1.8 CONTRACTOR'S REVIEW

- A. Scope of Contractor's Review: Contractor shall review Survey and layout data prior to submission for University's review or filing. Contractor shall sign each submittal copy certifying that:
 1. Field measurements have been determined and verified.
 2. Field construction criteria have been verified.
 3. Conformance with Drawings and Specifications requirements is confirmed.
- B. Contractor's Review Action: Contractor shall indicate clearly on survey and layout data whether the dimensions and coordinates are in compliance with Contract requirements. Contractor shall

note clearly and sign each submittal certifying that reported data "Conforms" or "Does Not Conform".

- C. Changes and Deviations: Contractor shall identify all deviations from requirements of Drawings and Specifications. Changes in the Work shall not be authorized by submittals review actions. No review action, implicit or explicit, shall be interpreted to authorized changes in the Work. Changes shall only be authorized by separate written Change Order or Field Instruction, in accordance with the Contract General Conditions.

1.9 REVIEWS BY UNIVERSITY'S REPRESENTATIVE AND ARCHITECT

- A. Reviews by University's Representative and Architect, General: Reviews of survey and layout data by University's Representative and Architect, or other responsible design professional, shall be only for general conformance with the design concept and requirements based on the information presented. Neither Architect nor other responsible design professional shall verify submitted survey and layout data.
- B. Contract Requirements: Reviews by University's Representative, Architect or other responsible design professional shall not relieve the Contractor from compliance with requirements of the Drawings and Specifications. Changes shall only be authorized by separate written Change Order or Field Instruction, in accordance with the Contract General Conditions.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Format and content of operation and maintenance manuals.
 - 1. Data requirements for materials and finishes.
- B. Instruction of University's personnel.
- C. Submission of operation and maintenance manuals.

1.3 RELATED REQUIREMENTS

- A. Product Specifications Sections in Divisions 2 through 33: Specific requirements for operation and maintenance data.

1.4 QUALITY ASSURANCE

- A. Preparation of data shall be done by personnel:
 - 1. Trained and experienced in maintenance and operation of described products.
 - 2. Familiar with requirements of this Section.
 - 3. Skilled as technical writer to the extent required to communicate essential data.
 - 4. Skilled as draftsman competent to prepare required drawings.

1.5 SUBMITTALS

- A. Submittal for Review: Contractor shall submit one electronic bookmarked PDF copy to Engineer for review and approval.
- B. Final Submittal: Contractor shall submit one electronic PDF copy prior to submission of final Application for Payment.

1.6 SUBMITTAL FORMAT

- A. Format for Operation and Maintenance Data Manuals: Contractor shall prepare data in the form of an instructional manual. Contractor shall comply with the general requirements specified below and comply with specific requirements for types of products used in the project.
- B. Electronic File: Contractor shall also provide all operation and maintenance data into a single PDF bookmarked file with a table of contents. The table of contents shall be linked to the various sections in the PDF file.

1.7 CONTENT OF MANUAL

- A. Table of contents arranged in systematic order.
 - 1. Include name of Contractor, name of responsible principal, address and telephone number.
 - 2. Include a list of each product required to be included, indexed to content of the volume.
 - 3. List, with each product, the name, address and telephone number of:
 - a. Subcontractor or installer.
 - b. Maintenance contractor, as appropriate.
 - c. Local source of supply for replacement parts.
 - 4. Identify each product-by-product name and other identifying symbols as set forth in Contract Documents.
- B. Product Data:
 - 1. Include only those sheets that are pertinent to the specific product.
 - 2. Annotate each sheet to:
 - a. Clearly identify specific product or part installed.
 - b. Clearly identify data applicable to installation.
 - c. Delete references to inapplicable information.
- C. Drawings:
 - 1. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
 - a. Do not use Project Record Documents as maintenance drawings.
- D. Provide written text as required to supplement product data for the particular installation:
 - 1. Organize in a consistent format under separate headings for different procedures.
 - 2. Provide logical sequence of instructions for each procedure.
- E. Provide a copy of each warranty, bond and service contract issued.
 - 1. Provide information sheet for Owner's personnel, including:
 - a. Proper procedures in event of failure.
 - b. Instances that might affect validity of warranties or bonds.
- F. Provide a copy of each Material Safety Data Sheet (MSDS) received with products or materials delivered to the site for incorporation into the Project, for Owner's future reference.

1.8 MANUAL FOR MATERIALS AND FINISHES

- A. Content, for architectural products, applied materials and finishes:

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1. Manufacturer's data, giving full information on products.
 - a. Catalog number, size, and composition.
 - b. Color and texture designations.
 - c. Information required for re-ordering special manufactured products.
 2. Instructions for care and maintenance.
 - a. Manufacturer's recommendation for types of cleaning agents and methods.
 - b. Cautions against cleaning agents and methods that are detrimental to the product.
 - c. Recommended schedule for cleaning and maintenance.
- B. Content, for moisture-protection and weather-exposed products:
1. Manufacturer's data, giving full information on products.
 - a. Applicable standards.
 - b. Chemical composition.
 - c. Details of installation.
 2. Instructions for inspection, maintenance, and repair.
- C. Additional requirements for maintenance data: Refer to other sections of Specifications.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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SECTION 01 78 36

WARRANTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers' standard guaranties, warranties on products and special warranties.
- B. Refer to the General conditions for terms of the Contractor's special warranty of workmanship and materials.
- C. Specific requirements for warranties for the work and products and installations that are specified to be guaranteed or warranted are included in the individual Sections of Divisions 2 through 16.
- D. Certifications and other commitments and agreements for continuing services to the University are specified elsewhere in the Contract Documents.
- E. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.3 RELATED REQUIREMENTS

- A. Section 01 77 00 - Closeout Procedures: General requirements for closeout of the Contract.
- B. Section 01 78 23 - Operation and Maintenance Data: Operating and maintenance data binders, to include copies of warranties and bonds.
- C. Product Specification Sections in Divisions 2 through 33: Special Project warranty requirements for specific products or elements of the Work; commitments and agreements for continuing services to University.

1.4 DEFINITIONS

- A. The terms product guarantee or warranty are synonymous for this Project and shall be taken to mean the required guaranty or warranty required by the Contract General Conditions or by the Contract Drawings or Specifications.

- B. Standard Product Warranties are pre-printed written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the University.
- C. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the University. Special Warranties shall be in writing.

1.5 WARRANTY REQUIREMENTS

- A. Related Damages and Losses: When correcting warranted work that has failed, remove and replace other work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted work.
- B. Reinstatement of Warranty: When work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that work covered by a warranty has failed, replace or rebuild the work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective work regardless of whether the University has benefited from use of the work through a portion of its anticipated useful service life.
- D. University's Recourse: Written warranties made to the University are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the University can enforce such other duties, obligations, rights, or remedies.
 - 1. Rejection of Warranties: The University reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- E. The University reserves the right to refuse to accept work for the Project where a special warranty, certification, or similar commitment is required on such work or part of the work, until evidence is presented that entities required to countersign such commitments are willing to do so.

1.6 SUBMITTALS

- A. Submit a copy of the Standard or Special written warranties to the University for each Specification Section as part of the complete submittal package for review and approval by the University.
- B. Submit written warranties to the University prior to the date of acceptance by the University. Submittal of the project Guarantees and Warranties is a requirement precedent to the filing of the Notice of Completion by the University.
 - 1. When a designated portion of the work is completed and occupied or used by the University, by separate agreement with the Contractor during the construction period but prior to acceptance of the entire project, Contractor shall submit properly executed warranties to the University within fifteen days of occupancy or use of that designated portion of the work.

- C. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the University for approval prior to final execution.
- D. Form of Submittal: At Final Completion, compile each required warranty and bond properly executed by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual. Use guarantee form at the end of this Section. Document to be submitted as a bookmarked PDF for University review and approval.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)



PROJECT _____ PROJECT No. _____
CONTRACTOR _____ CONTRACT No. _____
ARCHITECT _____ DATE _____

GUARANTEE QUALITY AND PERFORMANCE

We the undersigned hereby guarantee that the:

which we have installed on the subject campus has been done in accordance with the plans and specifications and that all the work as installed will fulfill the requirements of the guarantees included in the specifications. We further agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced in so doing, that may prove to be defective in its materials, workmanship or installation within a period of _____ year(s) from the date of official acceptance of the project as complete, by the Trustees of the California State University or any Officer or Employee authorized to act on its behalf. The repairs or replacement shall be done without any expense whatsoever to the Trustees of the California State University, ordinary wear and tear and unusual abuse or neglect excepted. Within _____ days after being notified in writing by the Trustees of any defects in the work, we agree to commence and prosecute the work necessary with due diligence in order to fulfill the terms of this guarantee, and to complete the work within a reasonable period of time, and in the even of our failure to so comply, we, separately and collectively, do hereby authorize the Trustees of the California State University to proceed to have such work done at our expense and will honor and pay the costs thereof upon demand.

By: _____ Subcontractor or Supplier	Date: _____
By: _____ General Contractor	Date: _____

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END OF SECTION

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SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Requirements for Project Record Documents to be submitted for Contract closeout.

1.3 PROJECT RECORD DOCUMENTS

- A. General:
 - 1. Contractor shall not use Record Documents for construction purposes.
 - 2. Contractor shall protect from deterioration and loss in a secure, fire-resistive location; provide access to Record Documents for the University's and the Architect's reference during normal working hours.
 - 3. Contractor shall keep Project Record Documents current, as they will be reviewed for completeness by Architect, Inspector, and University's Representative as condition for certification of each Progress Payment Application.
- B. Record Drawings: Contractor shall record information continuously as Work progresses. Contractor shall not conceal Work permanently until all required information is recorded. Contractor shall:
 - 1. Maintain a clean, undamaged set of blue or black line white prints of Contract Drawings and Shop Drawings. If using a digital copy of Contract Drawings, they must be available on job site for review at anytime. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately.
 - 2. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
 - 3. Legibly and to scale, mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the work. Digital record set must be marked with red text.
 - 4. Mark new information that is important to the University but was not shown on Contract Drawings or Shop Drawings. Record actual construction, including:
 - a. GPS X, Y and Z coordinate of manholes interior corner and each utilidor where it leaves the steam manhole.
 - b. The following for underground utilities and valves installed and encountered:
 - 1) 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.

- 2) Service type.
 - 3) Pipe/utility size.
 - 4) Pipe/utility material.
 - c. Field changes of dimension and detail.
 - d. Details not on original Contract Drawings. Application of copies of details produced and provided by Architect during construction will be accepted.
 5. Note related Change Order numbers where applicable.
 6. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
 7. Store Record Documents separate from documents used for construction.
- C. Record Specifications: Contractor shall record changes made by Addenda and Change Orders. Contractor shall legibly mark and record in red ink actual Products installed or used, including:
1. Manufacturer's name and product model or catalog number.
 2. Product substitutions or alternates utilized.
- D. Record Photos: Contractor shall photograph all work before covering up, including:
1. All open trenches and manholes shall be photographed.
 2. All exposed utilities should be identified in the photos.
 3. Show photographs locations on Record Drawings.
- E. Initial Submission:
1. Prior to the date of the Notice of Completion, Contractor shall submit color PDF scanned record prints and one paper-copy set of marked Record Documents to University Representative for Architect's review and approval.
 1. Prior to the date of the Notice of Completion, Contractor shall submit annotated PDF electronic file and one paper-copy set of marked Record Specifications to University Representative for Architect's review and approval.
 2. Architect will indicate whether general scope of changes, additional information recorded, and quality of mark-ups are acceptable.
- F. Final Submission:
1. Submit color PDF record prints of marked Record Documents.
 2. Print each drawing, whether or not changes and additional information were recorded.
 3. Submit annotated PDF electronic file of marked Record Specifications.
 4. Submit annotated PDF electronic file of Record Photographs.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 02 41 19
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Demolition and removal of selected portions of building or structure.
- 2. Salvage of existing items to be reused or recycled.

B. Related Requirements:

- 1. Division 01 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
- 2. Division 01 "Cutting and Patching" for cutting and patching procedures.
- 3. Division 01 "Alteration Project Procedures" for general protection and work procedures for alteration projects.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and store.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

- 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 INFORMATIONAL SUBMITTALS

- A. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.6 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.7 FIELD CONDITIONS

- A. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- B. Storage or sale of removed items or materials on-site is not permitted.
- C. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following:
- B. Notify warrantor on completion of selective demolition and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

- B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- B. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
 - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- C. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.
- D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- E. Survey of Existing Conditions: Record existing conditions by use of measured drawings, and preconstruction photographs.
 - 1. Comply with requirements specified in Division 01 "Photographic Documentation."
 - 2. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
 - 3. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 2. Arrange to shut off utilities with utility companies.
 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 5. Maintain adequate ventilation when using cutting torches.
 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 9. Dispose of demolished items and materials promptly. Comply with requirements in Division 01 "Construction Waste Management and Disposal".
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area on-site or as otherwise designated by Owner.
 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.
- 3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS
- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.

- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
- D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings."

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and recycle or dispose of them according to Division 01 "Construction Waste Management and Disposal".
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.

3.7 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

SECTION 03 52 16

LIGHTWEIGHT INSULATING CONCRETE ROOF DECKS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide an insulating concrete (cellular or hybrid) roof deck system as shown on the Drawings and as needed for a complete and proper installation.

1.2 APPLICATOR QUALIFICATION

- A. The Applicator shall be approved by the Manufacturer – Elastizell Corporation of America.

1.3 CERTIFICATION

- A. When required upon completion, a certificate from the Manufacturer and Applicator states that the materials and installation methods follow current practices.

1.4 PRODUCT DATA

- A. Prior to start of the work, provide installation procedures, fire ratings, and wind uplift data for this application.

PART 2 - PRODUCTS

2.1 LIGHTWEIGHT INSULATING CONCRETE

- A. Insulating concrete is a slurry of cement, water, and Elastizell preformed foam to produce an insulating concrete of a specific density range. Foam concentrate shall comply with ASTM C869 when tested in accordance with ASTM C796.

2.2 CEMENT

- A. Portland cement shall comply with ASTM C150 or C595.

2.3 WATER

- A. Use potable water.

2.4 AGGREGATE

- A. For hybrid mixtures, the expanded mineral aggregate shall comply with ASTM C332, Group I.

2.5 ADMIXTURES

- A. Use Manufacturer approved admixtures for water reducing and set acceleration.

2.6 PROPERTIES

- A. Physical properties shall meet the following criteria:

	Range II	Range III*
Cast Density	34-42 pcf	42-48 pcf
Minimum Compressive Strength	160 psi	250 psi
Roofing Membrane Type	nailed base sheet	fully adhered system

** Hybrid mixtures may be used with Range III by the addition of 1 to 2 bags of expanded aggregates.*

2.7 INSULATION BOARD

- A. When included, nominal 1.0 pcf EPS insulation board shall conform to ASTM C578 Type I, in thickness shown on the Drawings. EPS board shall have bond holes equal to approximately 3% of the board area. The board is placed in a bond coat and topped with a minimum 2" of insulating concrete. The EPS board may be stair-stepped or of constant thickness.

2.8 EXPANSION JOINTS

- A. Provide Expansion joints if they are in the structural system and per NRCA recommendations. Control joint filler is not necessary at vertical protrusions.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Prior to starting work, any unsatisfactory conditions of related trades shall be corrected by others.

3.2 PREPERATION

- A. General Contractor shall clear deck of all standing water, dirt, debris, ice, etc. Prepare the roof grades prior to placing the insulating concrete roof deck system.

3.3 INSTALLATION

- A. Install the insulating concrete roof deck system in accordance with current practices to insure proper drainage, the required insulation value, and fire and uplift ratings.
 - 1. Mixing and placing: Insulating concrete is mixed in approved equipment and pumped into place. EPS bond coats, double casting, and two-density casting are acceptable methods of installation.

2. Finishing: Screed the insulating concrete to the proper thickness and slope. The surface shall be free of ridges and sharp projections prior to installation of the roofing membrane.
3. Weather:
 - a. Insulating concrete may be place when temperatures are 32°F and rising. If colder temperatures are anticipated, the Applicator shall take suitable precautions (heated water, etc.) for the installation of an acceptable deck. Coordinate the roofing membrane application with the insulating concrete installation to avoid prolonged exposure of the deck.
4. Testing:
 - a. Check the cast density at the point of placement and adjust the mix to obtain the required cast density. A minimum 4 test specimens (3"x6" cylinders) shall be sampled at the point of placement daily or for each 100 cubic yards of material placed. Protect samples from damage, temperature extremes and test per ASTM C495. Compressive test samples shall not be oven-dried prior to testing. Manufacturer shall conduct and report test results.
5. Completion:
 - a. For nailed base sheet applications, roofing membrane installation may begin after a nail pull test is conducted with an acceptable withdrawal resistance (Minimum 40lbs pull). This facilitates deck curing and reduces drying shrinkage. For fully adhered systems, a peel test of the membrane attachment should be conducted per the roofing manufacturer's requirement. This is dependent on the type of adhesive that the roofing manufacturer recommends.

3.4 POST INSTALLATION:

- A. Protect the insulating concrete roof deck from construction traffic. The roof deck should not be left exposed for longer than 7 days. The Applicator cannot be responsible for rain (moisture) entering the roof deck after the deck is cast and finished. The general contractor and roofing contractor are responsible for removing excess water in the system. Consult the roofing membrane manufacturer for their recommended nailing pattern or adhesive for securing the roofing membrane to the roof deck system.

END OF SECTION 03 52 16

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SECTION 05 05 25

POST INSTALLED CONCRETE ANCHORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Post-installed mechanical anchors in concrete, including:
 - a. Wedge-type expansion anchors approved for use for seismic applications in cracked and uncracked concrete.
 - b. Screw-type drilled-in anchors approved for use for seismic applications in cracked and uncracked concrete.
2. Post-installed adhesive anchors in concrete, approved for use for seismic applications in cracked and uncracked concrete.

1.2 REFERENCES

- ###### A.
- ICC-ES or IAPMO-ES Evaluation Report: Evaluation Report issued by the ICC or IAPMO Evaluation Service demonstrating compliance with provisions of the 2018 International Building Code.

1.3 DEFINITIONS

- ###### A.
- Nominal Embedment Depth: Minimum length from concrete surface to end of anchor following completion of anchor installation. For wedge-type anchors, nominal embedment depth shall be measured following application of installation torque.

1.4 SUBMITTALS

- ###### A. General:
- Submit the following in accordance with Division 01, "Submittal Procedures".
1. Manufacturer's product data.
 2. Manufacturer's installation instructions.
 3. ICC-ES or IAPMO-ES Evaluation Reports.

1.5 QUALITY ASSURANCE

- ###### A. Certifications:
- Anchors shall have an active ICC-ES or IAMPPO-ES Evaluation Report in accordance with the following ICC-ES Acceptance Criteria:
1. Mechanical Anchors in Concrete: Acceptance Criteria for Mechanical Anchors in Concrete Elements (AC 193).

2. Adhesive Anchors in Concrete: Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements (AC 308).

PART 2 - PRODUCTS

2.1 MECHANICAL ANCHORS

- A. General: Anchors shall be tested and approved for use in cracked and uncracked concrete in accordance with ICC-ES AC 193.
 1. Anchors installed through underside of steel deck shall be tested and approved for installation through the soffit of concrete-filled metal deck assemblies in accordance with ICC-ES AC 193.
- B. Acceptable Products: Where anchor manufacturer and product are indicated on Drawings, provide designated product.
 1. Contractor shall be allowed to substitute products of other manufacturer's, subject to demonstrating equivalent tension and shear strength to specified anchor, under project installation conditions.
 2. Where anchor design is prepared by Trade Subcontractor's Engineer, use product designated by Trade Subcontractor's Engineer, subject to meeting requirements of this Section.
 3. Wedge Anchors: Wedge type, torque-controlled expansion anchors. Size and nominal embedment depth as indicated on Drawings.
 4. Material: Unless otherwise indicated on the Drawings, provide carbon steel anchors with zinc plating in accordance with ASTM B633, SC1, Type III. As indicated on the Drawings, provide AISI Type 304 or Type 316 stainless steel anchors with manufacturers matching nut and washer.
 5. Acceptable Products: Where anchor product and manufacturer are not indicated on Drawings or designated by Trade Subcontractor's Engineer, provide one of the following:
 - a. Kwik Bolt TZ, by Hilti, Inc.
 - b. Strong-bolt 2, by Simpson Strong-Tie Co. Inc.
 - c. Power-Stud+ SD2, by Powers Fasteners, Inc.
 - d. Trubolt+ Wedge Anchor, by ITW Red Head.
- C. Screw Anchors: Hardened steel, screw-type anchors or rod hangers approved for use in cracked and uncracked concrete. Diameter and nominal embedment depth as indicated on Drawings.
 1. Limitations: Anchors shall be used in dry interior environments only.
 2. Material: Case hardened low carbon steel, with zinc plating in accordance with ASTM B633, SC1, Type III.

3. Acceptable Products: Where anchor product and manufacturer are not indicated on Drawings or designated by Trade Subcontractor's Engineer, provide one of the following:
 - a. Kwik HUS-EZ screw anchor and HUS-EZ1 rod hanger, by Hilti.
 - b. Titen HD Screw Anchor and Titen HD Rod Hanger, by Simpson Strong-Tie Co. Inc.
 - c. Wedge-Bolt+ and Vertigo+ Rod Hanger, by Powers Fasteners.

2.2 ADHESIVE ANCHORS

- A. Adhesive Anchors: Threaded steel rod or inserts complete with nuts and washers, epoxy adhesive injection system, and manufacturer's installation instructions.
- B. General: Anchors shall be tested and approved for use to resist seismic forces (IBC Seismic Design Categories A to F) in cracked and uncracked concrete in accordance with ICC-ES AC 308.
- C. Epoxy Adhesive: Two-component, 100% solids, structural epoxy conforming to ASTM C881, Type IV; Grade 3; prepackaged in cartridges for manually or pneumatically operated caulk gun and automatically mixed at nozzle.
 1. Where anchor manufacturer and product are indicated on Drawings, provide designated product.
 2. Contractor shall be allowed to substitute products of other manufacturer's, subject to demonstrating equivalent tension and shear strength to specified anchor, under project installation conditions.
 3. Where anchor design is prepared by Trade Subcontractor's Engineer, use product designated by Trade Subcontractor's Engineer, subject to meeting requirements of this Section.
 4. Acceptable Products: Where anchor product and manufacturer are not indicated on Drawings or designated by Trade Subcontractor's Engineer, provide one of the following:
 - a. HIT RE500 V3 Epoxy Adhesive Anchoring System, by Hilti, Inc.
 - b. Set-XP Epoxy Adhesive, by Simpson Strong-Tie Co. Inc.
 - c. PE 1000+, by Powers Fasteners, Inc.
 - d. Epcon G5 adhesive, by ITW Red Head.
- D. Threaded Rod:
 1. Material: Unless otherwise indicated on the Drawings, furnish carbon steel threaded rods conforming to ASTM A36 or ASTM A193 Type B7. As indicated on the Drawings, provide Type 304 or Type 316 stainless steel anchors with manufacturers matching nut and washer.

2. Finish: Furnish carbon steel rods with zinc plating in accordance with ASTM B633, SC1, Type III at dry interior locations. Furnish carbon steel rods with hot-dipped galvanized coating complying with ASTM A153 at exterior and damp interior locations.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install anchors in conformance with manufacturer's written instructions.
- B. Examination:
 1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Notify University's Representative for clarification where reinforcing steel or other embedded items require relocation of anchors or cutting of reinforcement.
 2. Notify University's Representative for clarification where anchors appear to be located too close to edge of concrete, in particular where edge is not shown on Drawing detail.
 3. Notify University's Representative for clarification where concrete thickness is inadequate to achieve specified anchor embedment. Minimum concrete thickness shall allow for specified embedment, plus one anchor diameter allowance for overdrilling, plus 3/4 inch minimum cover from end of hole to concrete surface.
- C. Drilling:
 1. Do not drill holes in concrete mix has achieved full design strength.
 2. Drill holes with rotary impact hammer drills using carbide-tipped bits with diameter as recommended by anchor manufacturer. Reduce impact as hole approaches concrete surface as necessary to prevent cracking and spalling. Use core bits only with approval of University's Representative and only for mechanical anchors.
 3. Holes shall be drilled perpendicular to the concrete surface, unless otherwise shown on Drawings. Anchors shall be drilled to within 5 percent of specified alignment.
 4. Exercise care in drilling to avoid damaging existing reinforcing, conduits and other embedded items.
- D. Wedge Anchors:
 1. Drill holes designated nominal embedment depth plus one anchor diameter minimum. End of hole shall be 3/4 inch minimum clear from concrete surface.
 2. Remove dust and debris with pressurized air, in accordance with manufacturer's instructions.

3. Set anchors to designated nominal embedment depth, plus an allowance for withdrawal during torque tightening.
4. Tighten using a torque wrench to manufacturer's recommended installation torque. Following attainment of 10% of recommended torque, achieve 100% of designated torque within 5 or fewer turns of the nut. If torque is not achieved, the anchor shall be removed and replaced unless otherwise directed by the University's Representative.

E. Screw Anchors:

1. Take particular care to achieve proper hole diameter. Use only sharp bits with diameter recommended by manufacturer. Use drilling equipment and methods to prevent enlargement of holes by wobble.
2. Remove dust and debris with pressurized air, in accordance with manufacturer's instructions.
3. Install the anchor in accordance with manufacturer's instructions with an impact wrench. Take care not to overtighten anchor; note that manufacturer's maximum installation torque is not the torque intended to be achieved during proper installation.

F. Adhesive Anchors:

1. Drill holes to diameter recommended by manufacturer with rotary impact hammer drills using carbide-tipped bits; core bits shall not be permitted.
2. Thoroughly clean holes by brushing and blowing with compressed air in accordance with manufacturer's instructions. Clean immediately prior to anchor installation under observation of Special Inspector.
3. Inject adhesive into holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive. Follow manufacturer recommendations to ensure proper mixing of adhesive components. Sufficient adhesive shall be injected in the hole to ensure that the annular gap is filled to the surface. Remove excess adhesive from the surface. Shim anchors with suitable device to center the anchor in the hole.
4. Do not disturb or load anchors before manufacturer specified cure time has elapsed.

3.2 REPAIR OF DEFECTIVE WORK

- A. Remove and replace misplaced or malfunctioning anchors. Fill empty anchor holes and patch failed anchor locations with high-strength non-shrink, nonmetallic grout. Anchors that fail to meet proof load or installation torque requirements shall be regarded as malfunctioning.

3.3 FIELD QUALITY CONTROL

- A. Testing Laboratory will:

1. Review manufacturer's recommended installation and inspection procedures, as contained in Evaluation Service Report.
2. Special Inspect installation for conformance with Contract Documents, manufacturer's recommendations, and requirements of the applicable ES report. Verify that anchors are being installed by trained installers.
 - a. Periodically inspect installation of mechanical anchors.
 - b. Continuously inspect installation of adhesive anchors during hole cleaning and anchor installation.
3. Proof test a random sample of dowels in accordance with the following requirements, except where Drawings designate that no proof testing is required.
 - a. Wedge Anchors: Torque test 25% of anchors to recommended installation torque using a calibrated wrench. Anchor should not rotate more than 1/2 turn.
 - b. Screw anchors: Torque test 25% of anchors to 10% of manufacturer's recommended installation torque using a calibrated wrench. Anchor should not rotate more than 1/4 turn.
 - c. Adhesive Anchors: Tension test a minimum of two anchors of each type for each installer for each day's placement. Use hydraulic ram testing for bond, confined configuration. There shall be no discernible movement of anchor from hole after 15 seconds of loading. Test to loads shown on Drawings or as indicated by University's Representative.

END OF SECTION

SECTION 05 50 00

METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Railing post.
- 2. Gates.

- B. Products furnished, but not installed, under this Section include the following:

- 1. Loose steel lintels.
- 2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
- 3. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

1.3 COORDINATION

- A. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.4 ACTION SUBMITTALS

- A. Shop Drawings: Show fabrication and installation details. Provide Shop Drawings for the following:
 - 1. Railing Post
 - 2. Gates

1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

- 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- C. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

- D. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- E. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.
- F. Aluminum Plate and Sheet: ASTM B209, Alloy 6061-T6.
- G. Aluminum Extrusions: ASTM B221, Alloy 6063-T6.
- H. Aluminum-Alloy Rolled Tread Plate: ASTM B632/B632M, Alloy 6061-T6.

2.3 MISCELLANEOUS MATERIALS

- A. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- B. Shrinkage-Resistant Grout: Factory-packaged, nonmetallic, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- C. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained concrete with a minimum 28-day compressive strength of 3000 psi.

2.4 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing [and contour of welded surface matches that of adjacent surface].
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.5 SHELF ANGLES

- A. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.
- B. Galvanize and prime shelf angles located in exterior walls.
- C. Prime shelf angles located in exterior walls with zinc-rich primer.
- D. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.6 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
 - 1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.
- C. Galvanize and prime exterior miscellaneous steel trim.
- D. Prime exterior miscellaneous steel trim with zinc-rich primer.

2.7 GENERAL FINISH REQUIREMENTS

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
 - 1. Cast Aluminum: Heavy coat of bituminous paint.
 - 2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLATION OF BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with shrinkage-resistant grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.3 REPAIRS

- A. Touchup Painting:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
 - 2. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099113 "Exterior Painting."

END OF SECTION

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SECTION 05 52 13

PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Shop-fabricated steel pipe and tube railings.

1.3 REFERENCES

- A. See Division 01 "References".

- B. Codes:

- 1. California Building Code (CBC): Title 24 Part 2.
 - 2. California Green Building Standards Code (CALGreen): Title 24 Part 11.

- C. Reference Standards:

- 1. ASTM A36: Standard Specification for Carbon Structural Steel.
 - 2. ASTM A53: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 3. ASTM A500: Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - 4. ASTM A513: Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.

1.4 SUBMITTALS, GENERAL

- A. See Division 01 "Submittal Procedures".
- B. See Division 01 "Material Contaminant Restrictions" for additional submittals.

1.5 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Grout, anchoring cement, and paint products.

- B. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- D. Samples: For each type of exposed finish required.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Welding certificates.
- C. Mill Certificates: For Type 316 stainless steel, signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.
- D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.
- E. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E894 and ASTM E935.
- F. Evaluation Reports: For post-installed anchors, from ICC-ES.

1.7 QUALITY ASSURANCE

- A. Qualifications: See Division 01 "Quality Assurance".
 - 1. Fabricator.
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 - 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."
- C. Coordination:
 - 1. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
 - 2. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

3. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. See Division 01 "Product Requirements".
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Packaging Waste Management: See Division 01 "Construction Waste Management and Disposal".

1.9 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. See Division 01 "Regulatory Requirements".
- B. See Division 01 "Product Accessibility Requirements" for features required of handrails to meet accessibility requirements.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Division 01 "Quality Assurance", to design railings, including attachment to building construction.
- B. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 1. Handrails and Top Rails of Guards:
 - a. Uniform load of 50 lbf/ ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 2. Infill of Guards:
 - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
 - b. Infill load and other loads need not be assumed to act concurrently.

- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

- 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.3 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.
 - 1. Provide type of bracket with predrilled hole for exposed bolt anchorage and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.
- C. Hot-dip galvanize railings for exterior installations and where indicated.

2.4 PIPE AND TUBE RAILINGS

- A. Pipe: ASTM A53, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
- B. Tubing: ASTM A500 (cold formed) or ASTM A513.
- C. Plates, Shapes, and Bars: ASTM A36.
- D. Fittings:
 - 1. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.
 - 2. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves; however, galvanize anchors to be embedded in exterior concrete or masonry.

2.5 FASTENERS

- A. General: Provide the following:
 - 1. Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A153 or ASTM F2329 for zinc coating.
 - 2. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

- C. Fasteners for Interconnecting Railing Components:
 - 1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
 - 2. Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.
- D. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E488, conducted by a qualified independent testing agency.
 - 1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.
 - 2. Material for Exterior Locations and Where Stainless Steel Is Indicated:
 - a. Alloy Group 1 stainless-steel bolts, ASTM F593, and nuts, ASTM F594.
 - b. Corrosive Environments: Use Alloy Group 2.

2.6 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187.
- D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- E. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.
 - 1. Water-Resistant Product: At exterior locations and where indicated, provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.7 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.
- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G. Connections: Fabricate railings with either welded or nonwelded connections unless otherwise indicated.
- H. Welded Connections for Steel [and Stainless Steel]: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove flux immediately.
 - 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- I. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
 - 1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.
- J. Form Changes in Direction as Follows:
 - 1. By radius bends of radius indicated or by inserting prefabricated elbow fittings of radius indicated.

- K. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- L. Close exposed ends of railing members with prefabricated end fittings.
- M. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- N. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
 - 1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.
- O. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.
- P. For railing posts set in concrete, provide stainless-steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.
- Q. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. See Division 01 "Execution".
- B. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

- A. See Division 01 "Execution".
- B. Install pipe and tube railings according to approved shop drawings.
- C. Fit exposed connections together to form tight, hairline joints.

- D. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 - 1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 - 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 - 3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- E. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
 - 1. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.
- F. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- G. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

- A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.
- B. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.
- C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.4 ANCHORING POSTS

- A. Use metal sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

- B. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
- C. Leave anchorage joint exposed with 1/8-inch buildup, sloped away from post.

3.5 ATTACHING RAILINGS

- A. Anchor railing ends at walls with round flanges anchored to wall construction and welded to railing ends or connected to railing ends using nonwelded connections.
- B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and welded to railing ends or connected to railing ends using nonwelded connections.
- C. Secure wall brackets and railing end flanges to building construction as follows:
 - 1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
 - 2. For hollow masonry anchorage, use toggle bolts.
 - 3. For wood stud partitions, use hanger or lag bolts set into studs or wood backing between studs. Coordinate with carpentry work to locate backing members.
 - 4. For steel-framed partitions, use self-tapping screws fastened to steel framing or to concealed steel reinforcements.

3.6 CLEANING

- A. See Division 01 "Progress Cleaning and Final Cleaning".
- B. Clean by washing thoroughly with clean water and soap, and rinsing with clean water.
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A780.

3.7 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION

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SECTION 06 05 73

WOOD TREATMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Wood preservative treatment.
- B. Related Requirements:
 - 1. Division 01 "Material Contaminant Restrictions".

1.3 REFERENCES

- A. See Division 01 "References".
- B. Codes:
 - 1. California Building Code (CBC): Title 24 Part 2.
 - 2. California Green Building Standards Code (CALGreen), Title 24 Part 11.
- C. Reference Standards:
 - 1. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 2. AWPA M4: Standard for the Care of Preservative-Treated Wood Products.
 - 3. AWPA N1: All Millwork Products - Preservative Treatment by Non-pressure Process.
 - 4. AWPA U1: Use Category System - User Specification for Treated Wood.

1.4 SUBMITTALS, GENERAL

- A. See Division 01 "Submittal Procedures".
- B. See Division 01 "Material Contaminant Restrictions" for additional submittals.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Wood-Preservative Treatment:
 - a. Include data and warranty information from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
 - b. Indicate type of preservative used and net amount of preservative retained.
 - c. Include chemical-treatment manufacturer's written instructions for finishing treated material and manufacturer's written warranty.
- B. Evaluation Reports: For preservative-treated and fire-retardant-treated wood materials, from ICC-ES or similar.

1.6 DELIVERY, STORAGE, & HANDLING

- A. See Division 01 "Product Requirements".
- B. Packaging Waste Management: See Division 01 "Construction Waste Management and Disposal".

PART 2 - PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. See Division 01 "Regulatory Requirements".
- B. See Division 01 "Material Contaminant Restrictions", for allowable VOC content.

2.2 PRESERVATIVE-TREATED-WOOD MATERIALS

- A. Preservative-Treated-Wood Materials: Provide with water-repellent preservative treatment complying with AWPA N1 (dip, spray, flood, or vacuum-pressure treatment).
 - 1. Preservative Chemicals: 3-iodo-2-propynyl butyl carbamate (IPBC).
 - 2. Use chemical formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants in solution to distinguish treated material from untreated material.
- B. Blocking, Shims, and Nailers: Provide with water-repellent preservative treatment by pressure process, AWPA U1; Use Category UC3b.
 - 1. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.
 - 2. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

3. Mark lumber with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee's (ALSC) Board of Review.
- C. Extent of Preservative-Treated Wood Materials:
1. Exterior woodwork.
 2. Interior architectural woodwork in contact with concrete or masonry.
 3. Items indicated to be fire-retardant treated do not receive preservative treatment.
- D. Items fabricated from the following wood species need not be treated:
1. Redwood.
 2. Western red cedar.
 3. White oak.
 4. African mahogany.
 5. Honduras mahogany.
 6. Ipe.
 7. Dark red meranti.
 8. Teak.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Preservative-Treated Wood Materials: Where field cut or drilled, treat cut ends and drilled holes according to AWP M4.

3.2 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

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SECTION 06 10 53

MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Framing with dimension lumber.
 - 2. Rooftop equipment bases and support curbs.
 - 3. Wood blocking, cants, and nailers.
 - 4. Wood furring.

1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater size but less than 5 inches nominal (114 mm actual) size in least dimension.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
 - 3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency in accordance with ASTM D5664.

4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.5 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:

1. Preservative-treated wood.
2. Power-driven fasteners.
3. Post-installed anchors.
4. Metal framing anchors.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPAC U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
 2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

2.2 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Rooftop equipment bases and support curbs.
4. Cants.
5. Furring.

B. Dimension Lumber Items: Construction or No. 2 grade lumber of any of the following species:

1. Hem-fir (north); NLGA.
2. Spruce-pine-fir; NLGA.
3. Hem-fir; WCLIB or WWPA.
4. Western woods; WCLIB or WWPA.
5. Northern species; NLGA.

C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

D. For nailers used for attachment to wood nailers, metal deck or masonry wall construction, use FM Approvals FM 1-49 compliant extruded-aluminum nailers.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Metal-Era, Inc.; Eliminailer-T or comparable product.
2. Wind Design for Edge Systems Used with Low-Slope Roofing Systems (ANSI/SPRI/FM 4435/ES-1): 600 psi (4.14 MPa).
3. Material: 0.080-inch (2.02-mm) thick, extruded aluminum.

4. Extruded Length: 12 ft. (3.65 m).
 5. Height: 1-1/2 inches (38 mm).
 6. Horizontal Roof Flange onto Substrate: 2-1/2 inches (64 mm).
 7. Holes: 9/32-by-3/8-inch (7-by10-mm) slotted holes, staggered at 6 inches (152 mm) o.c.
- E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.3 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

2.4 METAL FRAMING ANCHORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cleveland Steel Specialty Co.
 2. KC Metals Products, Inc.
 3. Phoenix Metal Products, Inc.
 4. Simpson Strong-Tie Co., Inc.
 5. USP Structural Connectors.
- B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 (Z180) coating designation.
1. Use for interior locations unless otherwise indicated.
- C. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653/A653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
1. Use for wood-preservative-treated lumber and where indicated.
- D. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304.

1. Use for exterior locations and where indicated.

2.5 MISCELLANEOUS MATERIALS

- A. Adhesives for Gluing Furring to Concrete or Masonry: Formulation complying with ASTM D3498 that is approved for use indicated by adhesive manufacturer.
 1. Adhesives shall have a VOC content of 70 g/L or less.
 2. Adhesive shall comply with testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." The building concentration of formaldehyde shall not exceed half of the indoor recommended exposure limit, or 33 mcg/cu. m, and that of acetaldehyde shall not exceed 9 mcg/cu. m.
- B. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
- D. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- E. Do not splice structural members between supports unless otherwise indicated.
- F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.

- G. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches (2438 mm) o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
 2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches (2438 mm) o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal (38-mm actual) thickness.
 3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. (9.3 sq. m) and to solidly fill space below partitions.
 4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 ft. (6 m) o.c.
- H. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- I. Comply with AWP A M4 for applying field treatment to cut surfaces of preservative-treated lumber.
1. Use inorganic boron for items that are continuously protected from liquid water.
 2. Use copper naphthenate for items not continuously protected from liquid water.
- J. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
 3. ICC-ES evaluation report for fastener.
- K. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- 3.2 INSTALLATION OF WOOD BLOCKING AND NAILER
- A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

3.3 INSTALLATION OF WOOD FURRING

- A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- (19-by-63-mm actual-) size furring horizontally at 24 inches (610 mm) o.c.
- C. Furring to Receive Gypsum Board: Install 1-by-2-inch nominal- size furring vertically at 16 inches o.c.

3.4 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

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SECTION 07 54 19

POLYVINYL-CHLORIDE (PVC) ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Polyvinyl chloride (PVC) roofing system.

- B. Related Requirements:

- 1. Section 03 52 16 "Lightweight Insulating Concrete Roof Decks". For insulation that is part of roof assembly.

1.3 REFERENCES

- A. See Division 01 "References".

- B. Codes:

- 1. California Building Code (CBC): Title 24 Part 2.
 - 2. California Energy Code, Title 24 Part 6.
 - 3. California Green Building Standards Code (CALGreen): Title 24 Part 11.

- C. Reference Standards:

- 1. ASTM D4434: Standard Specification for Poly(Vinyl Chloride) Sheet Roofing.

- D. Definitions:

- 1. Roofing Terminology: Definitions in ASTM D1079 and glossary in NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.

1.4 SUBMITTALS, GENERAL

- A. See Division 01 "Submittal Procedures".

- B. See Division 01 "Material Contaminant Restrictions" for additional submittals.

1.5 ACTION SUBMITTALS

- A. Product Data: For each item to be installed.
 - 1. For insulation and roof system component fasteners, include copy of FM Approvals' RoofNav listing.
- B. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:
 - 1. Layout and thickness of insulation.
 - 2. Base flashings and membrane terminations.
 - 3. Flashing details at penetrations.
 - 4. Tapered insulation thickness and slopes.
 - 5. Roof plan showing orientation of steel roof deck and orientation of roof membrane, fastening spacings, and patterns for mechanically fastened roofing system.
 - 6. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
 - 7. Tie-in with air barrier.
- C. Samples for Verification: Roof membrane and flashing, of color required.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.
- B. Certified statement from existing roof membrane manufacturer stating that existing roof warranty has not been affected by Work performed under this Section.

1.7 QUALITY ASSURANCE

- A. Qualifications: See Division 01 "Quality Assurance".
 - 1. Manufacturer Qualifications: A qualified manufacturer that is UL listed or listed in FM Approvals' RoofNav for roofing system identical to that used for this Project.

2. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.
- B. Preinstallation Meeting: See Division 01 "Project Meetings".
1. Convene minimum two weeks before starting work of this Section.
 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 5. Review structural loading limitations of roof deck during and after roofing.
 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
 7. Review governing regulations and requirements for insurance and certificates if applicable.
 8. Review temporary protection requirements for roofing system during and after installation.
 9. Review roof observation and repair procedures after roofing installation.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- A. See Division 01 "Product Requirements".
- B. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- C. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- D. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- E. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

- F. Packaging Waste Management: See Division 01 "Construction Waste Management and Disposal".

1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.10 WARRANTY

- A. Special (NDL) Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Special warranty includes all components of roofing system.
 - 2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. See Division 01 "Regulatory Requirements".
- B. Roof assemblies and components to meet requirements of CBC Chapter 15 "Roof Assemblies and Rooftop Structures".
 - 1. PVC Material: ASTM D4434 (CBC 1507.13.2).
 - 2. Glass-faced Gypsum Board: ASTM C1177 (CBC Table 1508.2).
 - 3. Polyisocyanurate Board: ASTM C1289, Type I or II (CBC Table 1508.2).
- C. See Division 01 "Material Contaminant Restrictions", for allowable VOC content.
- D. See Division 01 "Exterior Enclosure Performance Requirements" for minimum performance requirements for exterior insulation and roof products.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roof system and flashings shall remain watertight.
 - 1. Accelerated Weathering: Roof membrane shall withstand 2,000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
 - 2. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D3746, ASTM D4272, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.

- B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.
- C. ENERGY STAR Listing: Roofing system shall be listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.
- D. Energy Performance: See Division 01 "Exterior Enclosure Performance Requirements".
- E. Exterior Fire-Test Exposure: ASTM E108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

2.3 SUSTAINABILITY REQUIREMENTS

- A. See Division 01 "Sustainable Design Requirements".
- B. Solar Reflectance Index (SRI): Three-year-aged SRI not less than 64, or initial SRI not less than 82, when calculated according to ASTM E1980, based on testing identical products by a qualified testing agency.

2.4 POLYVINYL CHLORIDE (PVC) ROOF ASSEMBLY

- A. Source Limitations: Obtain components for roofing system from roof membrane manufacturer or manufacturers approved by roof membrane manufacturer.
- B. Assembly, excluding auxiliary components:
 - 1. Substrate.
 - a. Refer to architectural drawings and specifications.
 - 2. Vapor barrier.
 - 3. Rigid insulation.

- a. Section 03 52 16 "Lightweight Insulating Concrete Roof Decks".
- 4. PVC membrane.
 - a. Application: Fully-adhered.
- 5. Walkway pads.

2.5 VAPOR BARRIER

- A. Self-Adhering-Sheet Vapor Barrier: ASTM D1970/D1970M, polyethylene film laminated to layer of rubberized asphalt adhesive, minimum 40-mil-total thickness; maximum permeance rating of 0.1 perm; cold applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor barrier manufacturer.
 - 1. Acceptable Manufacturers and Products:
 - a. Johns Manville, JM Vapor Barrier SA.
- B. Self-Adhering-Sheet Vapor Barrier: Polyethylene film laminated to layer of butyl rubber adhesive, minimum 30-mil-total thickness; maximum permeance rating of 0.1 perm; cold applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor barrier manufacturer.

2.6 POLYVINYL CHLORIDE (PVC) ROOFING

- A. PVC Sheet: ASTM D4434, Type III, fabric-reinforced and fleece-backed.
 - 1. Basis of Design Manufacturer and Product:
 - a. Sika, PVC Fleece-Back Membrane.
 - 2. Subject to compliance with requirements, acceptable manufacturers include:
 - a. Carlisle.
 - b. GAF.
 - c. Johns Manville.
 - d. Sika Sarnafil.
 - e. Soprema.
 - f. Substitutions: See Division 01 "Substitution Procedures".

3. Physical Properties:

- a. Membrane Thickness: 80 mils.
- b. Exposed Face Color: Gray.
- c. Breaking Strength (ASTM D751): 500 lbf/in minimum.
- d. Elongation at Break (ASTM D751): 30 percent, minimum.
- e. Seam Strength (ASTM D751): Pass, minimum 75 percent of breaking point.
- f. Low Temperature Bend (ASTM D2136): Pass.
- g. Linear Dimensional Change (ASTM D1204): 0.1 percent maximum.
- h. Static Puncture Resistance (ASTM D5602): Pass, at 33 lbf minimum.
- i. Dynamic Puncture Resistance (ASTM D5635): Pass, at 10 J minimum.

2.7 WALKWAY PADS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads or rolls, approximately 3/16 inch thick and acceptable to roofing system manufacturer.
 1. Width: Approximately 36 inches or as noted on plans
 2. Color: Contrasting with roof membrane.

2.8 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with other roofing components, for a complete roof system.
- B. Adhesives and Sealants: See Division 01 "Material Contaminant Restrictions", for maximum allowable VOC content.
 1. Bonding Adhesive: Manufacturer's standard, for horizontal and vertical applications.
- C. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as PVC sheet.
- D. PVC-Coated Metal: Manufacturer's standard sheet metal with PVC membrane laminated to one side.
- E. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.
- F. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
- G. Metal Battens: Manufacturer's standard, aluminum-zinc-alloy-coated or zinc-coated steel sheet, approximately 1 inch wide by 0.05 inch thick, prepunched.

- H. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing components to substrate, and acceptable to roofing system manufacturer.
- I. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.9 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with other roofing system components.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.
- C. Adhesives and Sealants: See Division 01 "Material Contaminant Restrictions", for maximum allowable VOC content.
 - 1. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- D. Protection Mat: Woven or nonwoven polypropylene, polyolefin, or polyester fabric, water permeable and resistant to UV degradation, type and weight as recommended by roofing system manufacturer for application.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. See Division 01 "Execution".
- B. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

C. Concrete Roof Decks:

1. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
2. Verify that concrete substrate is visibly dry and free of moisture, and that minimum concrete internal relative humidity is not more than as recommended by roofing system manufacturer, when tested according to ASTM F2170.
 - a. See Division 01 "Quality Control" for additional information.
3. Verify that concrete-curing compounds that will impair adhesion of roofing components to roof deck have been removed.
4. Verify that joints in precast concrete roof decks have been grouted flush with top of concrete.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing system installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 INSTALLATION OF ROOFING, GENERAL

- A. See Division 01 "Execution".
- B. Install roofing system according to roofing system manufacturer's written instructions, approved shop drawings, FM Approvals' RoofNav assembly requirements, and FM Global Property Loss Prevention Data Sheet 1-29.
- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
- D. Install roof membrane and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition[and to not void warranty for existing roofing system].

- E. Coordinate installation and transition of roofing system component serving as an air barrier with other air barrier components.

3.4 INSTALLATION OF MECHANICALLY-FASTENED ROOFING

- A. Mechanically fasten roof membrane over area to receive roofing according to roofing system manufacturer's written instructions.
- B. Unroll roof membrane and allow to relax before installing.
- C. Start installation of roofing in presence of roofing system manufacturer's technical personnel.
- D. Accurately align roof membrane, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- E. Mechanically fasten or adhere roof membrane securely at terminations, penetrations, and perimeter of roofing.
- F. Apply roof membrane with side laps shingled with slope of roof deck where possible.

- G. In-Seam Attachment: Secure one edge of PVC sheet using fastening plates or metal battens centered within seam, and mechanically fasten PVC sheet to roof deck.
- H. Seams: Clean seam areas, overlap roof membrane, and hot-air weld side and end laps of roof membrane and sheet flashings to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roof membrane and sheet flashings.
 - 2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
 - 3. Repair tears, voids, and lapped seams in roof membrane that do not comply with requirements.
- I. Spread sealant bed over deck-drain flange at roof drains, and securely seal roof membrane in place with clamping ring.

3.5 INSTALLATION OF BASE FLASHING

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.6 CLEANING

- A. See Division 01 "Progress Cleaning and Final Cleaning".
- B. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.7 PROTECTING AND CLEANING

- A. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

- B. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

END OF SECTION

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SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawing and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Fabricated sheet metal items, including flashings and other items noted on the drawings.

B. Reference Standards:

- 1. AAMA 611: Voluntary Specification for Anodized Architectural Aluminum.
- 2. AAMA 620: Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Aluminum Substrates.
- 3. AAMA 621: Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) and Zinc-Aluminum
- 4. ASTM A653: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- 5. ASTM A666: Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- 6. ASTM B32: Standard Specification for Solder Metal.
- 7. ASTM B209: Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- 8. ASTM D4586: Standard Specification for Asphalt Roof Cement, Asbestos-Free.
- 9. SMACNA (ASMM): Architectural Sheet Metal Manual.

C. Definitions:

- 1. Bonderized (Phosphatized) Steel: Galvanized G90 steel that is put through a phosphate bath and then receives a layer of Chromate. The resulting dull finish provides excellent adhesion for other materials.

1.3 SUBMITTALS, GENERAL

- A. See Division 01 "Submittal Procedures".
- B. See Division 01 "Material Contaminant Restrictions" for additional submittals.

1.4 ACTION SUBMITTALS

- A. Product Data: For manufactured products.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.5 INFORMATIONAL SUBMITTAL

- A. Fabricator and Installer Qualifications.

1.6 QUALITY ASSURANCE

- A. Qualifications: See Division 01 "Quality Requirements".
 - 1. Fabricator.
 - 2. Installer.
- B. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.
 - 1. Maintain one copy of each document on site.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. See Division 01 "Product Requirements".
- B. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials that could cause discoloration or staining.
- D. Packaging Waste Management: See Division 01 "Construction Waste Management and Disposal".

PART 2 - PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. See Division 01 "Regulatory Requirements".
- B. See Division 01 Material Contaminant Restrictions, for allowable VOC content.

2.2 SHEET MATERIALS

- A. Galvanized Steel: ASTM A653, with G90/Z275 zinc coating; minimum 24 gage, (0.0239 inch) thick base metal.

- B. Pre-Finished Galvanized Steel: ASTM A653, with G90/Z275 zinc coating; minimum 24 gage, (0.0239) inch thick base metal, with factory-applied PVDF coil coating.
 - 1. 70 Percent PVDF Fluoropolymer, Two-Coat: Fluoropolymer finish containing not less than 70 percent polyvinylidene difluoride (PVDF) resin by weight in color coat, AAMA 621.
 - 2. Color: As selected by Architect from manufacturer's standard colors.

2.3 ACCESSORIES

- A. Fasteners: Galvanized steel, with soft neoprene washers.
- B. Primer: Zinc chromate type.
- C. Protective Backing Paint: Zinc molybdate alkyd.
- D. Sealant: As specified in Section 07 9200 "Joint Sealants".
 - 1. See Division 01 "Material Contaminant Restrictions", for maximum allowable VOC content.
- E. Plastic Cement: ASTM D4586, Type I.
- F. Solder: ASTM B32; Sn50 type.

2.4 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- F. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake hemmed edges.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.3 INSTALLATION

- A. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.
- B. Apply plastic cement compound between metal flashings and felt flashings.
- C. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- D. Solder metal joints for full metal surface contact, and after soldering wash metal clean with neutralizing solution and rinse with water.
- E. Secure downspouts in place with concealed fasteners.

END OF SECTION

SECTION 07 71 00

ROOF SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Copings.
 - 2. Roof-edge specialties.
 - 3. Roof-edge drainage systems.
 - 4. Reglets and counterflashings.

- B. Related Requirements:

- 1. Section 077123 "Manufactured Gutters and Downspouts".
 - 2. Section 077200 "Roof Accessories" for set-on-type curbs, equipment supports, vents, and other manufactured roof accessory units.

1.3 REFERENCES

- A. See Division 01 "References".

- B. Codes:

- 1. California Building Code (CBC): Title 24 Part 2.
 - 2. California Green Building Standards Code (CALGreen): Title 24 Part 11.

- C. Reference Standards:

- 1. ANSI / SPRI / FM 4435 / ES-1: Test Standard for Edge Systems Used with Low Slope Roofing Systems.
 - 2. ASTM A153: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 3. ASTM C920: Standard Specification for Elastomeric Joint Sealants.
 - 4. ASTM C1311: Standard Specification for Solvent Release Sealants.
 - 5. ASTM D2244: Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
 - 6. ASTM D4214: Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.

7. ASTM F2329: Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.

1.4 SUBMITTALS, GENERAL

- A. See Division 01 "Submittal Procedures".
- B. See Division 01 "Material Contaminant Restrictions" for additional submittals.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof specialties.
 1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.
 2. Include details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
 3. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.
 4. Detail termination points and assemblies, including fixed points.
 5. Include details of special conditions.
- C. Samples for Verification:
 1. Include Samples of each type of roof specialty to verify finish and color selection, in manufacturer's standard sizes.
 2. Provide 12-inch lengths of full-size components in specified material and finish, and including fasteners, cover joints, accessories, and attachments.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Product Certificates: For each type of roof specialty.
- C. Product Test Reports: For copings and roof-edge flashings, for tests performed by a qualified testing agency.
- D. Sample Warranty: For manufacturer's special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. See Division 01 "Operation and Maintenance Data" and Division 01 "Project Record Documentation".
- B. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.8 COORDINATION

- A. Coordinate roof specialties with flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are SPRI ES-1 tested to specified design pressure.
- B. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.
- B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.11 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. See Division 01 "Regulatory Requirements".
- B. Roof coping and edges to comply with CBC 1504.5 "Edge securement for low-slope roofs".
 - 1. Metal edge securement to be designed and installed for wind loads in accordance with CBC Chapter 16 "Structural Design".
 - 2. Metal edge securement to be tested for resistance in accordance with Test Methods RE-1, RE-2, and RE-3 of ANSI/SPRI ES-1, except Vult wind speed to be determined from Figure 1609(1), 1609(2), or 1609(3), as applicable.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. SPRI Wind Design Standard: Manufacture and install copings and roof-edge specialties tested according to SPRI ES-1 and capable of resisting the following design pressures:
 - 1. Design Pressure: As indicated on Drawings.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.3 MANUFACTURERS, GENERAL

- A. Source Limitations: Obtain roof specialties approved by manufacturer providing roofing-system warranty.

2.4 COPINGS

- A. Metal Copings: Manufactured coping system consisting of metal coping cap in section lengths not exceeding 12 feet, concealed anchorage; with corner units, end cap units, and concealed splice plates with finish matching coping caps.
- B. Subject to compliance with requirements, acceptable manufacturers include:

1. ATAS International.
2. Berridge Manufacturing.
3. OMG Roofing Products (formerly Hickman).
4. Pac-Clad.
5. SAF Perimeter Systems.
6. Substitutions: See Division 01 "Substitution Procedures".

C. Physical Properties:

1. Metallic-Coated Sheet Steel Coping Caps: Thickness as required to meet performance requirements.
2. Surface: Smooth, flat finish.
3. Coping-Cap Attachment Method: Face and back legs hooked to continuous cleats, with spring clip below coping.

D. Shop-Fabricated Copings: Fabricated copings which have been tested and approved to ANSI/SPRI ES-1, RE-3, may be used in this Project.

1. Refer to Regulatory Requirements article above.
2. See Section 076200 "Sheet Metal Flashing and Trim" for additional information.

2.5 ROOF-EDGE SPECIALTIES

A. Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet and a continuous metal receiver with integral drip-edge cleat to engage fascia cover and secure single-ply roof membrane. Provide matching corner units.

B. Subject to compliance with requirements, acceptable manufacturers include:

1. ATAS International.
2. Berridge Manufacturing.
3. OMG Roofing Products (formerly Hickman).
4. Pac-Clad.
5. SAF Perimeter Systems.
6. Substitutions: See Division 01 "Substitution Procedures".

C. Physical Properties:

1. Metallic-Coated Steel Sheet Fascia Covers: Thickness as required to meet performance requirements.
2. Surface: Smooth, flat finish.
3. Corners: Factory mitered and continuously welded.
4. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.
5. Receiver: Manufacturer's standard material and thickness.

- D. Shop-Fabricated Roof Edges: Fabricated roof edges which have been tested and approved to ANSI / SPRI ES-1, RE-2, may be used in this Project.
 - 1. Refer to Regulatory Requirements article above.
 - 2. See Section 076200 "Sheet Metal Flashing and Trim" for additional information.

2.6 ROOF-EDGE DRAINAGE SYSTEMS

- A. See Section 077123 "Manufactured Gutters and Downspouts" for additional information.
- B. Parapet Scuppers: Manufactured with closure flange trim to exterior, 4-inch- wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof.

2.7 REGLETS AND COUNTERFLASHINGS

- A. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:
 - 1. Stainless Steel: Type 304, nominal 0.020-inch thickness minimum.
 - 2. Corners: Factory mitered and soldered or continuously welded.
- B. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches and in lengths not exceeding 12 feet designed to snap into reglets or through-wall-flashing receiver and compress against base flashings with joints lapped, from the following exposed metal:
 - 1. Zinc coated (galvanized) steel, thickness as required to meet performance requirements..
- C. Subject to compliance with requirements, acceptable manufacturers include:
 - 1. Berridge Manufacturing.
 - 2. Fry Reglet.
 - 3. OMG Roofing Products (formerly Hickman).
 - 4. Substitutions: See Division 01 "Substitution Procedures".
- D. Accessories:
 - 1. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where reglet is provided separate from metal counterflashing.
 - 2. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

2.8 MISCELLANEOUS MATERIALS

- A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:
 - 1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
 - 2. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
 - 3. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A153 or ASTM F2329.
- B. Elastomeric Sealant: ASTM C920, elastomeric polyurethane or silicone polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.
- C. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.

2.9 FINISH

- A. Coping and Edge Metal:
 - 1. 70 percent PVDF Fluoropolymer, Two-Coat: Fluoropolymer finish containing not less than 70 percent polyvinylidene difluoride (PVDF) resin by weight in color coat (AAMA 621).
 - 2. Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. See Division 01 "Execution".
- B. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- C. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.
- D. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. See Division 01 "Execution".

- B. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.
 - 1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Provide uniform, neat seams with minimum exposure of solder and sealant.
 - 3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
 - 4. Torch cutting of roof specialties is not permitted.
 - 5. Do not use graphite pencils to mark metal surfaces.
- C. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Coat concealed side of uncoated aluminum roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
- D. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
 - 1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise indicated on Drawings.
 - 2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.
- E. Fastener Sizes: Use fasteners of sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- F. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.
- G. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.
- H. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work. Tin edges of uncoated copper sheets using solder for copper. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.3 COPING INSTALLATION

- A. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.

- B. Anchor copings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.
 - 1. Interlock face and back leg drip edges into continuous cleats anchored to substrate manufacturer's required spacing that meets performance requirements.

3.4 ROOF-EDGE SPECIALTIES INSTALLATION

- A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.5 ROOF-EDGE DRAINAGE-SYSTEM INSTALLATION

- A. General: Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.
- B. Parapet Scuppers: Install scuppers through parapet where indicated. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
 - 1. Anchor scupper closure trim flange to exterior wall and seal or solder to scupper.
 - 2. Loosely lock front edge of scupper with conductor head.
 - 3. Seal or solder exterior wall scupper flanges into back of conductor head.
- C. Refer to Section 077123 "Manufactured Gutters and Downspouts" for additional information.

3.6 REGLET AND COUNTERFLASHING INSTALLATION

- A. General: Coordinate installation of reglets and counterflashings with installation of base flashings.
- B. Surface-Mounted Reglets: Install reglets to receive flashings where flashing without embedded reglets is indicated on Drawings. Install at height so that inserted counterflashings overlap 4 inches over top edge of base flashings.
- C. Counterflashings: Insert counterflashings into reglets or other indicated receivers; ensure that counterflashings overlap 4 inches over top edge of base flashings. Lap counterflashing joints a minimum of 4 inches and bed with butyl sealant. Fit counterflashings tightly to base flashings.

3.7 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.
- D. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07 71 23

MANUFACTURED GUTTERS AND DOWNSPOUTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawing and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Gutters.
- 2. Conductor heads.
- 3. Downspouts.

- B. Related Requirements:

- 1. Section 076200 "Sheet Metal Flashing and Trim".
- 2. Section 077100 "Roof Specialties".

1.3 REFERENCES

- A. Codes:

- 1. California Building Code (CBC): Title 24 Part 2.
- 2. California Green Building Standards Code (CALGreen): Title 24 Part 11.

- B. Reference Standards:

- 1. ASTM A653: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- 2. ASTM B209: Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- 3. SMACNA: Architectural Sheet Metal Manual (ASMM).

1.4 SUBMITTALS, GENERAL

- A. See Division 01 "Submittal Procedures".
- B. See Division 01 "Material Contaminant Restrictions" for additional submittals.

1.5 ACTION SUBMITTALS

- A. Product Data: Provide data on prefabricated components.
- B. Samples: Submit two samples, 8 inch long illustrating component design, finish, color, and configuration.

1.6 ADMINISTRATIVE REQUIREMENTS

- A. Conform to ASMM for sizing components for rainfall intensity determined by a storm occurrence of 1 in 5 years.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. See Division 01 "Product Requirements".
- B. Stack material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope to drain.
- C. Do not store in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.

PART 2 - PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. Conform to applicable code for size and method of rain water discharge.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.3 COMPONENTS

- A. Gutters: Manufactured in uniform section lengths not exceeding 12 feet, with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least 1 inch above front edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal as gutters.
 - 1. Profile: As shown on Architectural drawings.
 - 2. Galvanized Steel: Nominal 0.034-inch thickness.
- B. Conductor Heads: Manufactured conductor heads, each with flanged back and stiffened top edge, and of dimensions and shape indicated, complete with outlet tube that nests into upper end of downspout, exterior flange trim, and built-in overflow.
 - 1. Formed Aluminum: 0.032 inch thick.
 - 2. Galvanized Steel: Nominal 0.028-inch thickness.
- C. Downspouts: Plain rectangular complete with mitered elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors.
 - 1. Galvanized Steel: Nominal 0.034-inch thickness.
- D. Anchors and Supports: Profiled to suit gutters and downspouts.
 - 1. Anchoring Devices: Type recommended by fabricator.
 - 2. Gutter Supports: Brackets.
 - 3. Downspout Supports: Brackets.
- E. Fasteners: Same material and finish as gutters and downspouts, with soft neoprene washers.

2.4 FABRICATION

- A. Form gutters and downspouts of profiles and size indicated.
- B. Fabricate with required connection pieces.
- C. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.
- D. Hem exposed edges of metal.
- E. Fabricate gutter and downspout accessories; seal watertight.

2.5 MATERIALS

- A. Aluminum Sheet: ASTM B209, alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.
- B. Galvanized Steel Sheet: ASTM A653, G90 coating.

2.6 ACCESSORIES

- A. Splash Blocks: Precast concrete units to channel drained water from downspout away from the building foundation.
 - 1. Basis of Design Manufacturer and Product:
 - a. Basalite, Splash Block.
 - b. Substitutions: See Division 01 "Substitution Procedures".

2.7 FINISHES

- A. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- B. Galvanized Steel Finish:
 - 1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.
- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil.

3.3 INSTALLATION, GENERAL

- A. Install components in accordance with manufacturer's instructions. Anchor securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.
 - 1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Provide uniform, neat seams with minimum exposure of solder and sealant.
 - 3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
 - 4. Torch cutting of roof specialties is not permitted.
 - 5. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

3.4 ROOF-EDGE DRAINAGE-SYSTEM INSTALLATION

- A. General: Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.
- B. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 24 inches apart. Attach ends with rivets and solder to make watertight. Slope to downspouts.
 - 1. Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion-joint caps.
 - 2. Install continuous leaf guards on gutters with noncorrosive fasteners, removable for cleaning gutters.
- C. Conductor Heads: Anchor securely to wall with elevation of conductor top edge 1 inch below scupper discharge.

- D. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches on center.
 - 1. Provide elbows at base of downspouts at grade to direct water away from building.
 - 2. Connect downspouts to underground drainage system indicated.
 - E. Connect downspouts to storm sewer system. Seal connection watertight.
 - F. Do not install sealants at temperatures below 40 degrees F.
- 3.5 CLEANING AND PROTECTION
- A. See Division 01 "Execution".
 - B. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
 - C. Clean and neutralize flux materials. Clean off excess solder and sealants.
 - D. Remove temporary protective coverings and strippable films as components are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.
 - E. Replace components that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior joint sealants.
 - 2. Backing materials.

1.3 REFERENCES

- A. See Division 01 "References".
- B. Codes:
 - 1. California Building Code (CBC): Title 24 Part 2.
 - 2. California Energy Code, Title 24 Part 6.
 - 3. California Green Building Standards Code (CALGreen): Title 24 Part 11.
- C. Reference Standards:
 - 1. ASTM C834: Standard Specification for Latex Sealants.
 - 2. ASTM C910: Standard Test Method for Bond and Cohesion of One-Part Elastomeric Solvent Release-Type Sealants.
 - 3. ASTM C1193: Standard Guide for Use of Joint Sealants.
 - 4. ASTM C1311: Standard Specification for Solvent Release Sealants.
 - 5. ASTM C1330: Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.
 - 6. ASTM C1472: Standard Guide for Calculating Movement and Other Effects When Establishing Sealant Joint Width.
- D. Definitions:
 - 1. Movement Joint:

1.4 SUBMITTALS, GENERAL

- A. See Division 01 "Submittal Procedures".

- B. See Division 01 "Material Contaminant Restrictions" for additional submittals.

1.5 ACTION SUBMITTALS

- A. Product Data: For each item to be installed.
- B. Samples: For each kind and color of joint sealant required.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer and witnessed by a qualified testing agency or a qualified testing agency.
- C. Preconstruction Laboratory Test Reports: From sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.
- D. Field-Adhesion-Test Reports: For each sealant application tested.
- E. Sample Warranties: For special warranties.

1.7 DELIVERY, STORAGE, & HANDLING

- A. See Division 01 "Product Requirements".
- B. Store joint sealants and backing materials to prevent freezing.
- C. Packaging Waste Management: See Division 01 "Construction Waste Management and Disposal".

1.8 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.9 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. See Division 01 "Regulatory Requirements".
- B. See Division 01 "Material Contaminant Restrictions", for maximum allowable VOC content for sealant primers and sealants.

2.2 PERFORMANCE REQUIREMENTS

- A. Movement Joints: Joint sealant assemblies, including materials and installation, to withstand movement. Refer to "Movement Joints" article below for additional information.

2.3 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.4 MANUFACTURERS

A. Basis of Design Manufacturer:

1. Sika.

B. Subject to compliance with requirements, acceptable manufacturers include:

1. BASF Construction Chemicals.
2. Dowsil (formerly Dow Corning).
3. Pecora Corporation.
4. Sika.
5. Tremco
6. Substitutions: See Division 01 "Substitution Procedures".

2.5 EXTERIOR JOINT SEALANTS

A. Vertical surfaces and horizontal non-traffic surfaces.

1. Joint Locations:
 - a. Joints between different materials listed above.
 - b. Perimeter joints between materials listed above and frames of doors, windows and louvers.
2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT. Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.
3. Basis of Design Manufacturer and Product:
 - a. Tremco, Spectrum 1.
 - b. Substitutions: See Division 01 "Substitution Procedures".

2.6 INTERIOR JOINT SEALANTS

A. Vertical surfaces and horizontal non-traffic surfaces.

1. Joint Locations:
 - a. Exterior wall, exposed interior surfaces, control and expansion joints.
 - b. Tile control and expansion joints.
 - c. Unit masonry, concrete walls, and partitions, exposed surfaces, vertical joints.
 - d. Precast structural concrete beams and planks, joints on underside.

2. Joint Sealant: Urethane, S, NS, 25, NT. Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
 3. Basis of Design Manufacturer and Product:
 - a. Tremco, Dymonic 100.
 - b. Substitutions: See Division 01 "Substitution Procedures".
- B. Vertical surfaces and horizontal non-traffic surfaces not subject to significant movement.
1. Joint Locations:
 - a. Exterior wall, exposed interior surfaces, control joints.
 - b. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
 2. Joint Sealant: Acrylic latex. ASTM C834, Type OP, Grade NF.
 3. Basis of Design Manufacturer and Product:
 - a. Tremco, Tremflex 834.
 - b. Substitutions: See Division 01 "Substitution Procedures".
- 2.7 JOINT-SEALANT BACKING
- A. Sealant Backing Materials, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C1330, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
1. Acceptable Manufacturers:
 - a. Adfast.
 - b. Alcot Plastics.
 - c. Nomaco.
 - d. W. R. Meadows.
 - e. Substitutions: See Division 01 "Substitution Procedures".
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.
1. Acceptable Manufacturers:
 - a. 3M.

- b. Berry Plastics Corporation.
- c. C.R. Laurence.
- d. Scapa Tapes North America.
- e. Valley Industrial Products.
- f. Substitutions: See Division 01 "Substitution Procedures".

2.8 MISCELLANEOUS MATERIALS

- A. Sealant Primers: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
 - 1. See Division 01 "Material Contaminant Restrictions" for allowable VOC content.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

2.9 SOURCE QUALITY CONTROL

- A. Preconstruction Testing: See Division 01 "Quality Control" for additional information.
 - 1. Provide samples of project-specific materials to sealant manufacturer for adhesion, compatibility, and stain testing prior to mockup construction.
 - 2. Confirm suitability of sealant material for intended use, including but not limited to:
 - a. Freeze / thaw.
 - b. High temperatures.
 - c. Liquid immersion.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. See Division 01 "Execution".
- B. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - d. Exterior insulation and finish systems.
 3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

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- B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
 - 1. Refer to "Movement Joints" article below for additional information.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C1193 unless otherwise indicated.

3.4 MOVEMENT JOINTS

- A. Provide movement joints to alleviate pressure from building movement, compliant with ASTM C1193. Movement joints to be designed for compression, extension, longitudinal extension, and transverse extension. Width and depth of movement joints to meet requirements of ASTM C1472.

3.5 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: See Division 01 "Quality Requirements".

3.6 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.7 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

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SECTION 09 24 00

CEMENT PLASTERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Cement plaster base assembly, for stucco finish in this Section and finish materials in other Sections.
2. Lath.
3. Accessories.

1.3 REFERENCES

- A. See Division 01 "References".

- B. Codes:

1. California Building Code (CBC): Title 24 Part 2.
2. California Energy Code, Title 24 Part 6.
3. California Green Building Standards Code (CALGreen): Title 24 Part 11.

- C. Reference Standards:

1. ASTM A653: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM C35: Standard Specification for Inorganic Aggregates for Use in Gypsum Plaster.
3. ASTM C150: Standard Specification for Portland Cement.
4. ASTM C206: Standard Specification for Finishing Hydrated Lime.
5. ASTM C207: Standard Specification for Hydrated Lime for Masonry Purposes.
6. ASTM C578: Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
7. ASTM C595: Standard Specification for Blended Hydraulic Cements.
8. ASTM C847: Standard Specification for Metal Lath.
9. ASTM C897: Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters.
10. ASTM C926: Standard Specification for Application of Portland Cement-Based Plaster.

11. ASTM C932: Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering.
12. ASTM C933: Standard Specification for Welded Wire Lath.
13. ASTM C954: Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
14. ASTM C1002: Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
15. ASTM C1032: Standard Specification for Woven Wire Plaster Base.
16. ASTM C1047: Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
17. ASTM C1063: Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster.
18. ASTM C1328: Standard Specification for Plastic (Stucco) Cement.

D. Definitions:

1. Moist Cure: The process of continuously wetting the surface of curing cement plaster. This properly hydrates the cement particles, which strengthens the cement plaster and reduces cracking.

1.4 INFORMATIONAL SUBMITTALS

- A. Field reports.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. See Division 01 "Product Requirements".
- B. Deliver materials in their original packages showing manufacturer and product identification.
- C. Store materials inside under cover, off the ground, and keep them dry and protected against damage from weather, moisture, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.
- D. Packaging Waste Management: See Division 01 "Construction Waste Management and Disposal".

1.6 FIELD CONDITIONS

- A. Comply with ASTM C926 requirements.
- B. Exterior Plasterwork:

1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
2. Apply plaster when ambient temperature is greater than 40 deg F.
3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.

1.7 WARRANTY

A. Provide manufacturer's standard warranty for products selected:

1. Base Coat with Cementitious Finish Coat: 5 years.

PART 2 - PRODUCTS

2.1 REGULATORY REQUIREMENTS

A. See Division 01 "Regulatory Requirements".

B. Exterior and interior installations to comply with CBC 2510 "Lathing and Furring for Cement Plaster (Stucco).

1. CBC 2510.1 and Chapter 35 - Appropriate materials to be used, per Table 2507.2:
 - a. Accessories: ASTM C1047.
 - b. Blended cement: ASTM C595.
 - c. Metal lath: ASTM C847.
 - d. Sand: ASTM C35, ASTM C897.
 - e. Plastic cement: ASTM C1328.
 - f. Portland cement: ASTM C150.
 - g. Steel screws: ASTM C1002, ASTM C954.
 - h. Welded wire lath: ASTM C933.
 - i. Woven wire plaster base: ASTM C1032.
2. Materials to be protected from the weather (CBC 2510.2).
3. Installation of materials per ASTM C926 and ASTM C1063 (CBC 2510.3).
4. Metal lath and lath attachments to be of corrosion-resistant materials (CBC 2510.4).
5. Gypsum sheathing is acceptable backing when covered with a water-resistive barrier (CBC 2510.5.2.2).
6. Water-resistive barrier: Vapor-permeable, with performance equivalent to 2 layers ASTM E2556, Type 1 barrier. Flashing to be installed to drain water between the 2 layers (CBC 2510.6).
 - a. Exception: Water-resistive barrier with performance equal to or greater than ASTM E2556, Type 2, and separated with a substantially nonwater-absorbing layer or drainage space.

C. Exterior installations to comply with CBC 2512 "Exterior Plaster".

1. Minimum three coat system over metal lath or gypsum board backing (CBC 2512.1).
2. Minimum two coat system over concrete or masonry (CBC 2512.1).
3. At base of wall, weep screed to be minimum 26 gauge corrosion-resistant, with minimum 3-1/2 inch vertical attachment flange, located at or below the foundation plate line on exterior stud walls, per ASTM C926 (CBC 2512.1.2).
4. Installation of lath, weather barrier, flashing, and drip screed per ASTM C1063 (CBC 2512.1.1).
5. Plaster coats to be protected from freezing for not less than 24 hours after set has occurred. Installation to occur when ambient temperature is higher than 40 degrees F. (CBC 2512.4).
6. Brown coat surface variation shall not exceed 1/4 inch in any direction under a 5 foot straight edge (CBC 2512.5).
7. CBC 2512.6 and Table 2512.6 - First and second coats to be applied and moist cured per ASTM C926 and the following:
 - a. First coat moist curing period: 48 hours, minimum.
 - b. Interval between first and second coat: 48 hours, minimum.
 - c. Second coat moist curing period: 48 hours, minimum.
 - d. Interval between second and finish coats: 7 days.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: Where indicated, provide cement plaster assemblies identical to those of assemblies tested for fire resistance according to ASTM E119 by a qualified testing agency.

2.3 CEMENT PLASTERING SYSTEMS, GENERAL

- A. Comply with ASTM C926 for applications indicated.
- B. Refer to Architectural drawings for locations of different finish systems, including finish materials specified in other Sections installed over cement plaster base in this Section.
- C. All fasteners and attachments penetrating underlayment and water-resistive barriers are to be sealed at all penetrations.
1. Refer to:
 - a. Section 079200 "Joint Sealants".

2.4 EXTERIOR VERTICAL CEMENT PLASTERING SYSTEMS

- A. Substrate: Sheathing on Wood or Metal Studs.

1. System: Three Coat.
 - a. Substrate:
 - b. Lath and accessories.
 - c. Cement plaster scratch and brown base coats.
 - d. Finish:
 - 1) Textured cementitious finish coat.
 - 2) Paint.

2.5 METAL LATH

- A. Welded Wire Lath: ASTM C933, Class 1, self-furring, with galvanized coating complying with ASTM A641. Acceptable alternative to ASTM C847 3.4 lb/yd² diamond mesh metal lath, and ASTM C1032 1.4 lb/yd² woven wire lath.

1. Basis of Design Manufacturer and Product:
 - a. Structa Wire, Mega Lath.
 - b. Substitutions: See Division 01 "Substitution Procedures".
2. Physical Properties:
 - a. Thickness: 17 gauge.
 - b. Openings: 0.7 inch by 1-1/2 inches.
 - c. Furring Depth: 1/4 inch.
 - d. Maximum Span: 24 inches on center.

- B. Open Soffit and Similar Horizontal Applications Welded Wire Lath: ASTM C933, Class 1, self-furring, with galvanized coating complying with ASTM A641, and with heavy perforated kraft paper within wire assembly. Acceptable alternative to ASTM C847 lath.

1. Basis of Design Manufacturer and Product:
 - a. Structa Wire, V-Truss Walls and Ceilings.
 - b. Substitutions: See Division 01 "Substitution Procedures".

2. Physical Properties:

- a. Thickness:
- b. Furring Depth: 3/8 inch.
- c. Maximum Span: 24 inches on center.

2.6 ACCESSORIES, GENERAL

- A. General: Comply with ASTM C1047 and ASTM C1063, and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.

2.7 METAL ACCESSORIES

- A. Material: Hot-dip galvanized steel sheet, ASTM A653, G60 (Z180) zinc coating.
- B. Basis of Design Manufacturer:
 - 1. ClarkDietrich.
- C. Acceptable Manufacturers:
 - 1. Amico.
 - 2. Substitutions: See Division 01 "Substitution Procedures".
- D. Metal Accessories:
 - 1. Foundation Weep Screed: #36 Sill Screed.
 - 2. Foundation Weep Screed over Continuous Insulation: FHA-7 Weep (Sill) Screed.
 - 3. Control Joint: #15 (double-v) Control Joint.
 - 4. Inside Corner Control Joint: #30 Inside Corner Control Joint.
 - 5. Casing Bead: #66 SF Casing Bead.
 - 6. External- (Outside-) Corner Reinforcement: Cornerite.
 - 7. Cornerbeads: #1A Expanded Corner Bead.
 - 8. Soffit Vents: Aluminum units with perforated flange.
 - a. Match depth of finish system.

2.8 CEMENT PLASTER MATERIALS

- A. Source Limitations: Obtain cement plaster system products from single manufacturer.
- B. Basis of Design Manufacturer:
 - 1. Omega Products International.

- C. Subject to compliance with requirements, acceptable manufacturers include:
 - 1. BASF.
 - 2. BMI (Sika).
 - 3. Dryvit.
 - 4. LaHabra (Parex).
 - 5. Sto.
 - 6. Substitutions: See Division 01 "Substitution Procedures".
- D. Cementitious Base Coat, General: Factory-prepared blend of ASTM C150 portland cement, sand, chopped fibers, and proprietary ingredients.
 - 1. Sand added to base coat at Project site is not acceptable.
- E. Three Coat System Scratch and Brown Base Coats:
 - 1. Basis of Design Manufacturer and Product:
 - a. Omega Products International, Super Cement Sanded Scratch and Brown.
 - b. Substitutions: See Division 01 "Substitution Procedures".

2.9 MISCELLANEOUS MATERIALS

- A. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories, including:
 - 1. Water containing salt, alum, or plaster residue accelerates plaster set and may cause efflorescence.
 - 2. Water containing organic or vegetable matter may retard plaster set, cause staining, and interfere with plaster bond.
- B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch long, free of contaminants, manufactured for use in cement plaster.
- C. Lime: ASTM C206, Type S; or ASTM C207, Type S.
- D. Admixtures: By or as recommended by base coat manufacturer, and compatible with all materials.
- E. Sand Aggregate: ASTM C897.
- F. Perlite Aggregate: ASTM C35.

- G. Bonding Compound: ASTM C932.
- H. Fasteners for Attaching Metal Lath to Substrates: ASTM C1063 and acceptable to lath manufacturer.
- I. Washers: To fasten metal lath over substrate.
 - 1. Without Continuous Insulation:
 - a. Acceptable Manufacturers and Products:
 - 1) Rodenhouse, Grip-Plate Lath and Plaster Washer.
 - 2) Wind-Lock, Lath Plate - Legless.
 - 3) Substitutions: See Div. 1 "Substitution Procedures".
 - 2. With Continuous Insulation:
 - a. Acceptable Manufacturers and Products:
 - 1) Rodenhouse, Grip-Plate Tab Washer.
 - 2) Wind-Lock, Lath-Lock with Legs.
 - 3) Substitutions: See Division 01 "Substitution Procedures".
- J. Wire: ASTM A641, Class 1 zinc coating, soft temper, not less than 0.0475-inch diameter unless otherwise indicated.

2.10 FINISHES

- A. Textured Cementitious Finish Coat: Factory-mixed portland cement, aggregates, and proprietary ingredients.
 - 1. Basis of Design Manufacturer and Product:
 - a. Omega Products International, ColorTek Paint Grade (PG) Exterior Stucco.
 - b. Substitutions: See Division 01 "Substitution Procedures".
 - 2. Physical Properties:
 - a. Texture: Refer to Architectural drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. See Division 01 "Execution".
- B. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. Verify water resistive barrier is installed correctly and completely.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.
- B. Prepare smooth, solid substrates for plaster according to ASTM C926.

3.3 INSTALLATION, GENERAL

- A. See Division 01 "Execution".
- B. Install all components per manufacturer's instructions and approved shop drawings.
- C. Install lath, accessories, furring, and furring accessories to that the finished cement plaster surfaces are true to line, level, plumb, and square, to receive the specified cement plaster thickness.
- D. Fire-Resistance-Rated Assemblies: Install components according to requirements for design designations from listing organization and publication indicated on Drawings.

3.4 INSTALLING METAL LATH

- A. Metal Lath: Install according to ASTM C1063.
- B. Cut metal lath at all control joint locations.

- C. Cut metal lath at all expansion joint locations, leaving a gap wide enough to accommodate movement of the expansion joint accessory.

3.5 PLASTER APPLICATION

- A. General: Comply with ASTM C926.
 - 1. Mix materials per manufacturer's directions. Do not exceed the amount of water indicated.
 - 2. Do not exceed pot life of material as documented by manufacturer. Verify pot life of each material prior to application.
 - 3. Do not deviate more than plus or minus 1/4 inch in 10 feet from a true plane in finished plaster surfaces when measured by a 10-foot straightedge placed on surface.
 - 4. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
 - 5. Provide plaster surfaces that are ready to receive field-applied finishes indicated.
 - a. Where plaster application is used as a base for adhered finishes, omit finish coat.
- B. Moist Cure: Moist cure all coats of cement plaster installation, per duration required in manufacturer's installation instructions, but no shorter than required in Regulatory Requirements article above.
 - 1. Surface-mist up to 4 times daily.
 - 2. Do not allow uneven or excessive evaporation. Ensure appearance color is consistent during moist cure period.
 - 3. Do not oversaturate cement plaster.
- C. Bonding Compound: Apply on [unit masonry] [and] [concrete] substrates for direct application of plaster.
- D. Scratch Coat:
 - 1. Apply scratch coat with sufficient material and pressure to form full keys through, to fully embed the metal lath, and with sufficient thickness past the metal lath to allow surface scoring.
 - 2. Once the scratch coat starts to firm, score the entire surface in one direction only. Vertical surfaces to be scored horizontally.

3. Provide sufficient moist curing time, to allow the scratch coat to reach rigidity necessary to support the installation of the brown coat without damaging the scratch coat or its key.

E. Brown Coat:

1. Apply brown coat with sufficient material and pressure to ensure tight contact with the scratch coat, and to provide a minimum total base coat thickness as required by the manufacturer and ASTM C926.
2. Bring the surface to a true, even plane with a rod or straight edge. Fill surface defects in plane with cement plaster.
3. Float the surface uniformly to allow proper bonding of the following material coat.

3.6 FINISH INSTALLATION

A. General:

1. Immediately before application, moisten the base coat to control finish coat moisture absorption.

3.7 PLASTER REPAIRS

- A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

3.8 CLEANING

- A. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

3.9 PROTECTION

- A. See Division 01 "Execution".
- B. Remove temporary protection and enclosure of other work after plastering is complete.

END OF SECTION

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