

## UC Davis Campus Division 1

### SOME GENERAL GUIDELINES FOR EDITING

1. The Project Manager should review these standard UC Davis Campus specifications and mark up a paper set with recommended changes to make the documents specific to the project requirements.
  - a. Strike out text and sections to be removed in red or other distinctive color. Please provide large blocks of text to be inserted in a Word file.
  - b. Read the Instruction Boxes to determine editing requirements. Blue instruction boxes are provided to assist with editing. Changes for Design/Build projects are color coded green. The contract staff will remove the instruction boxes when preparing the final documents.
  - c. Edit only shaded text. Areas shaded in gray [e.g. format] represent suggested text that may be modified by the Project Manager to meet the needs of the project.
2. Prior to editing any areas not shaded and before making major changes to standard sections the Project Manager should get approval from their Senior Project Manager.

Core Division 1 Specifications that should not be edited, although some sections may be not used (i.e. Marked as "NOT USED") depending on the particulars of the project:

  - Section 01 25 00 Substitution Procedures
  - Section 01 55 00 Vehicular Access and Parking
  - Section 01 56 39 Tree and Plant Protection
  - Section 01 57 23 Storm Water Pollution Prevention
  - Section 01 71 33 Protection of Adjacent Construction
  - Section 01 73 29 Cutting and Patching
  - Section 01 81 19 Indoor Air Quality Requirements
3. Standard documents streamline administration by all parties and UCOP GC. Changes required due to project requirements should be noted for use by field and office staff. Changes to improve standard documents should be submitted for review and implementation.
4. Please do not change the footer of the document as this is the only way for Contracts to verify the correct version is issued for bid.
5. If the PM requests the Design Professional review Division 1, a single annotated copy must be approved by the University's Representative before transmittal to Contracts.
6. If it is necessary to add a new Article, add it to the end of the "PART" do not change the outline sequence.
7. If a Paragraph/Article is not applicable, add "NOT USED" after the number/letter; do not change the outline sequence.
8. If an entire section is not to be used, mark it "NOT USED" and it will be deleted before the final printing and marked "NOT USED" in the Specifications Table of Contents.
9. Formatting problems such as widows (last line of a paragraph that appears alone at the top of a page) and orphans (first line of a paragraph that appears alone at the bottom of a page); that appear in this document and will be fixed by the Contracts before printing the final copy.
10. Verify that the Specification Table of Contents is reflective of the PM's intent; sections not used should be marked as "NOT USED". Validating the page count, however, is not necessary.

Project No: «Project»

Specifications  
for  
«ProjectTitle»  
«ContractTitle»

University of California  
Davis Campus  
Yolo County  
Davis, California

«PrepName\_1»  
«PrepAdd\_1»  
«PrepCityStateZip\_1»

or

Design and Construction Management  
255 Cousteau Place  
Davis, CA 95618

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**Do not change the footer of the document.**

**Word copies of sections available from DCM Contracts Unit at [DCMcontracts@UCDAVIS.edu](mailto:DCMcontracts@UCDAVIS.edu)**

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Areas shaded in gray [e.g. format] represent suggested text that may be modified by the project Manager to meet the needs of the project.

Instruction boxes are provided to assist with editing.

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**Do not change the footer of the document as Contracts uses the date to verify version.**

## SECTION 01 11 00 SUMMARY OF WORK

### PART 1 - GENERAL

Project description 1.1 A. should describe the base bid only and should include a general project scope of work, including all major trade work; and overall gross square footage if applicable. Portions of this information will be included in the Advertisement for Bids. Complete the first sentence of the description below.

#### 1.1 WORK REQUIRED BY CONTRACT DOCUMENTS

A. Provide all labor, materials, equipment, tools, transportation, insurance, and services to construct a [INSERT] gross square foot, [INSERT BUILDING TYPE, i.e., classroom residential office].  
[SAMPLE: A prior project has prepared the site for this new work. Construct 3 separate concrete-frame buildings and provide complete utilities, site development and landscaping to form a complete and habitable environment for research and teaching functions. Trade work includes, form work, concrete, steel (rebar and framing), cement plaster, wood and metal framing, casework, complete electrical, plumbing and mechanical systems, fire alarm and fire sprinklers, and paving.]

B. Assist the University to achieve certification for improved energy and environmental performance under the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) program. Many features have been included in the design of this project toward that end. Support this effort in several areas as outlined in these specifications including: Section 01 91 00 Commissioning, Section 01 74 00 Cleaning and Waste Management, Section 01 81 19 Indoor Air Quality Requirements and the use of recycled and locally manufactured materials Section 01 60 00 Product Requirements.

---OR---

C. Assist the University achieve specific energy and environmental performance goals on this project. Many features have been included in the design of this project toward that end. Support this effort in several areas as outlined in these specifications including: Section 01 91 00 Commissioning, Section 01 74 00 Cleaning and Waste Management, Section 01 81 19 Indoor Air Quality Requirements and the use of recycled and locally manufactured materials Section 01 60 00 Product Requirements.

**For Design-Build replace above with the following paragraphs A and B. Coordinate with Exhibit 45.**

A. Provide all labor, materials, equipment, tools, transportation, insurance, and services to construct a [INSERT] gross square foot, [INSERT BUILDING TYPE, i.e., classroom residential office] building to house [3] University departments. Refer to Exhibit 45 for a more comprehensive description of Work.

B. The Scope of the Construction Work includes, but is not necessarily limited to the following:

1. Demolition
2. Hazardous Materials Removal
3. General Construction
4. Infrastructure/Utilities
5. Landscaping
6. Fire Alarm and Fire Sprinkler Systems
7. Mechanical, Electrical, Plumbing

8. Telecommunications

- C. The Design Builder shall achieve a minimum of [Gold] [Silver] Certification for improved energy and environmental performance under the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) program.

Insert the following paragraphs for parking lot projects:

- A. Parking Lot Pavement Repairs: Remove the existing facilities, stockpile the material indicated on the Drawings, dispose of excess material legally off of University property, construct the parking lot surfacing of asphalt concrete on compacted sterilized subgrade or aggregate base as shown on the Drawings and marked in field, feather grind, overlay, overlay with fabric, provide slurry, and crack sealing as tabulated and indicated in the Contract Documents. Existing utility covers shall be adjusted as required. Restriping is not required as part of this Contract. Asphalt Grindings shall be delivered to the University within 5 road miles as directed by the University's Representative. [Verify acceptance of grinding before project goes out to bid.]
- B. Lot Closures: Submit a schedule for any lot closure to the University's Representative 5 days in advance for approval. Partial lot closures or blockages shall be submitted 3 days in advance. Provide an overall schedule at least 10 days prior to any work, showing planned sequence in all lots. Coordinate with the University's Representative to discuss the sequence of Work.
- C. Minor adjustments in the submitted schedule may be directed by the University due to scheduled use of the various lots.
- D. At Lot No. #, only one third of the lot shall be closed at any time. No two adjacent lots shall be closed at any time.
- E. Closures and blockages are to be signed by the University 2 days prior to, and barricaded by the Contractor the evening prior to the closure or blockage.
- F. Any Work occurring after [DATE] will be required to be done on weekends or off-hours, subject to the Project needs. The Contract Time will be extended to equivalent days as required by the schedule.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 11 00

Optional section if separate contractors will be on site. Delete section if not used

SECTION 01 12 00 MULTIPLE CONTRACT SUMMARY

PART 1 - GENERAL

1.1 CONSTRUCTION STAGING & MULTIPLE CONSTRUCTION CONTRACTS

- A. The following describes the scheduling of the Work and the coordination required for the Work done by separate contractors:
1. The University reserves the right to let other contracts such as, but not limited to [carpet installation, locker installation and landscape and irrigation installation].
  2. The following projects may be in progress throughout the duration of this project:
    - a. [INSERT TEXT AS APPROPRIATE]
  3. Disagreements between the Contractor and other contractors about concurrent use of Work areas or access to the Project site which are not resolved by the participants shall be referred to the University's Representative and the Contractor agrees to abide by the University's Representative's determination as to concurrent use or priority of access and to perform its Work in compliance with the University's Representative's resolution at no additional cost to the University.
- B. All material for construction operations shall be brought in and the Work so conducted as to avoid any interference with existing University facilities or their normal operations, and with concurrent construction Work by other contractors.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 12 00

SECTION 01 14 00 WORK RESTRICTIONS

PART 1 - GENERAL

1.1 WORK HOURS

- A. No Work shall be done outside of standard [Monday through Friday] [7:00 A.M. to 5:00 P.M.] [8:00 A.M. to 5:00 P.M.] [9:00 A.M. to 5:00 P.M.] working hours, on holidays or weekends unless prior written approval has been obtained from the University's Representative.

1. Coordinate with Supplementary Instructions to Bidders to establish liquidated damages for each phase and Section 01 32 00 Construction Progress Documentation.
2. Different phases can overlap or can be performed concurrently.
3. Don't use specific calendar dates unless site access is restricted to certain dates.
4. Always use calendar days from Notice to Proceed start date.
5. Include technical references for specification sections and drawing numbers.

1.2 PROJECT PHASING

- A. The Work of this Contract is divided into [#] Phases. Refer to Supplementary Instructions to Bidders for number of calendar days to complete work and number of calendar days separating each Phase
- B. The Work of Phase 1 consists of [description of phase].
1. This Phase must be completed before Phase # starts.
  2. This Phase runs concurrently with Phase #.
- C. The Work of Phase 2 consists of [description of phase].
1. This Phase must be completed before the next phase can start.
  2. This Phase must be completed before Phase # can start.
  3. This Phase runs concurrently with Phase #.

For Design Build Projects use the following in place of article 1.2 above.

1.3 PROJECT PHASING

- A. The Work of this Contract is divided into 3 Phases. Refer to the Request of Proposal and General Conditions.

1.4 WORK SEQUENCE

Sequence can be used to control the order of work but is not associated with liquidated damages.

- A. [INSERT TEXT AS APPROPRIATE]

1.5 CONTRACTOR'S USE OF PROJECT SITE

- A. Use of the Project site for the Work and storage is restricted to the areas designated on the Drawings.

Does on-site work need to be performed between specific dates? Edit text within [ ] as required, make project specific

- B. The Project site will be available for access [Date] to [Date].

1.6 UNIVERSITY OCCUPANCY

- A. The following portions of the Work are designated for occupancy by the University as indicated:

1. [INSERT TEXT AS APPROPRIATE]

Provide a complete list of portions of the work for which Substantial Completion applies. (Refer to General Conditions or Supplementary Conditions Article 9 Substantial Completion)

1.7 SUBSTANTIAL COMPLETION

A. Substantial Completion shall be applicable to the entire Work.

--or--

B. Substantial Completion shall only be applicable to the following portions of Work, if any, which are designated for separate delivery (reference General Conditions and Supplementary Conditions):

1. [INSERT TEXT AS APPROPRIATE]

Any other special requirements; e.g., no site work to be performed during final weeks, Regents meetings, holidays (national and university) sample only: Young Hall, which is located to the south of the project site, has a lecture hall and 3 classrooms, which will be used during these periods of time for testing edit text within [ ] adjust as specific to the project

1.8 COORDINATION WITH ACADEMIC CALENDAR AND FACILITY ACTIVITIES

A. Be advised that academic finals week takes place on the UC Davis campus during June, December and March of each year. During this period of time, students are involved in intensive testing relative to their academic course work. During these periods of time, noise level generated, as a result of construction activity must be kept to a minimum. Work with the University's requirements to achieve a level of noise that is acceptable to the University. Actual schedule for finals week during each year will be coordinated with following the issuance of the Notice to Proceed.

1.9 PROTECTION OF PERSONNEL

A. Students and University of California Davis (UCD) personnel will be occupying parts of the adjacent buildings during the construction period. Take proper precautions to ensure the safety of all persons during the construction period.

1.10 WORK SITE DECORUM

A. Loud conversation shall be avoided. The playing of audio devices shall be strictly prohibited. Noise, that in the sole opinion of the University's Representative is disturbing or disruptive to occupants adjacent to the area of work, shall be scheduled for periods when the adjacent area is not occupied.

Existing Building Option (if used, delete paragraph A above)

B. Extreme care to limit noise shall be taken at all times that the building is occupied. Loud or unnecessary conversation shall be avoided. The playing of radios, audio devices shall be strictly prohibited. Noise, that in the sole opinion of the University's Representative is disturbing or disruptive to occupants adjacent to the area of work, shall be scheduled for periods when the building is not occupied.

C. Classes and labs will be held in [Name of Building] in close proximity to project site during the progress of the work. Work that causes excessive noise or odors shall be performed off-hours or when classes are not in session. Coordinate this Work with University's Representative.

D. Control the conduct of its employees so as to prevent unwanted interaction initiated by Contractor's employees with UCD students, staff, or other individuals, adjacent to the Project site. Without limitation, unwanted interaction by Contractor's employees includes whistling at or initiating conversations with passersby. In the event that any Contractor's employee initiates such unwanted interaction, or utilizes profanity, Contractor shall, either upon request of University's Representative or on its own initiative, replace said employee with another of equivalent technical skill, at no additional cost to the University.

E. Smoking is not allowed in any University building. University policy prohibits smoking within 25 feet of building entrances or exits, and within 20 feet of any operable window.

F. Alcoholic beverages are prohibited on the University's Project site.

1.11 INTERRUPTION OF BUILDING SERVICES

Coordinate use of Exhibit 33 Utility Service Interruption/Shut Down Request with this section.

- A. Planned utility service shutdowns shall be accomplished during periods of minimum usage. In some cases this will require Work activities before 8:00 A.M. and after 5:00 P.M. and weekend Work, at no additional cost to the University. At least 7 business days advance notice shall be given to the University's Representative before interruptions to utility service (refer to Utility Service Interruption/Shut Down Request) and other interferences with use of existing buildings, surrounding hardscape and roads.
- B. Shutdowns critical to the completion of the project shall be listed as Milestones on the project schedule. Schedule the Work so that service will be restored in the minimum possible time, and shall cooperate with the University in reducing shutdowns of utility systems.
- C. The University reserves the right to deny shutdown requests based on scheduled work load, research projects, and usage of surrounding buildings or other activities planned on campus.
- D. University's costs for initial planned utility service shutdowns shall be borne by the University. If repeat utility service shutdowns are required due to work necessary to correct defective work, mistakes in new work layout such as misalignment or installation conflicts with other new work, University's costs for repeat shutdown(s) will be deducted from Contract Sum.

Special Project Procedures - Restricted Access

1.12 SITE INGRESS AND EGRESS

Select one of the next four paragraphs

- A. For access to the central campus, utilize the automatic gate controls access at First and A Streets. The gate allows automatic exit and allows entrance with use of a keypad. The keypad code will be issued to Contractor and will be changed periodically. No vehicle movement is allowed on central campus during hourly class breaks.

---OR---

Access to Project site may be limited to designated routing on existing access roads.

---OR---

Contractor shall be restricted to enter and exit from the Project site via \_\_\_\_\_. No other streets may be used.

---OR---

Access to Project site shall be as indicated on the Drawings.

- B. Take all necessary precaution to ensure the safety of the bicyclists and pedestrians that use the campus roads, especially during the hourly class breaks.
- C. Avoid use of motor vehicles on campus streets during the class breaks.
- D. Clean the site access and roads affected by the Work and maintain such in a dust free and safe and usable condition for motorists, bicyclists and pedestrians. During inclement weather closely monitor conditions to prevent slickness of roads.
- E. Contractor shall be permitted to block only 1/2 of a street at a time for momentary site access, unless specified otherwise. The street shall be operational and usable by the University at all times.

1.13 MOTOR VEHICLE AND BICYCLE TRAFFIC CONTROL

- A. Adopt all practical means to minimize interference to traffic. Access to other facilities in the area shall be maintained at all times. Provide a schedule of any activity that will impact traffic, or any planned lane or street closure, for approval by the University's Representative and give a minimum of 14 business days' notice before closing any street or access.
- B. Furnish at no additional cost to the University all signage barricades, lights, and flaggers required to control traffic and provide and maintain suitable temporary barricades, fences, directional signs, or

other structures as required for the protection of the public; and maintain, from the beginning of twilight through the whole of every night on or near the obstructions, sufficient lights and barricades to protect the public and Work.

- C. Provide directional signs for use throughout the duration of the Project. The quantity shall be determined by the University's Representative during a mandatory Pre-construction site meeting. Prepare a mock-up of the sign for approval by the University's Representative.
- D. It is the responsibility of the Contractor performing Work on or adjacent to, a roadway or highway to install and maintain such devices which are necessary to provide reasonably safe passage for the traveling public, including pedestrians and bicyclists, through the Work, as well as for the safeguard of workers. Before Work begins, a site meeting shall be held to discuss motor vehicle and bicycle traffic control plans for handling traffic through a construction or maintenance zone. Traffic control plans shall be submitted for review by the University's Representative and public agency or authority having jurisdiction over the roadway or highway. These traffic control plans shall be prepared by persons knowledgeable about the fundamental principles of temporary traffic controls and the work activities to be performed. The design, selection, and placement of traffic control devices for the traffic control plan shall be based on engineering judgment and in accordance with Part 6 of the California Manual on Uniform Traffic Control Devices for Streets and Highways.
- E. All metal plating and metal bridging shall be non-skid with waffle-patterns or right angle undulations or shall be coated with a non-skid product. Plating shall be installed with no protruding edges or corners sticking up and with no bouncing or shifting.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 14 00

Coordinate use of this section with the bid form (or proposal form for design build projects). When allowances are NOT USED, **DELETE** this Section.

SECTION 01 21 00 ALLOWANCES

PART 1 - GENERAL

1.1 ALLOWANCES REQUIREMENTS

- A. Included in the Contract Sum are all Allowances stated in the Contract Documents. Items covered by Allowances shall be supplied for such amounts and by such persons or firms as University's Representative may direct.
- B. The following shall apply, unless otherwise provided in the Contract Documents:
  - 1. Allowances shall cover the cost to Contractor of materials and equipment delivered at the Project site and all required taxes, less applicable trade discounts.
  - 2. Contractor's costs required for storage on and off the Project site, security, loading and unloading, handling at the Project site, labor, installation costs, overhead, profit, and other expenses contemplated for stated Allowance amounts shall be included in the Contract Sum and not in the Allowances.
  - 3. Unless otherwise provided herein, whenever costs are more than or less than Allowances, the Contract Sum shall be adjusted by Change Order based on (1) the difference between actual costs and the Allowances and (2) changes in Contractor's costs.

1.2 DESCRIPTION OF ALLOWANCES

- A. Allowance 1: [Description]
- B. Allowance 2: [Description]
- C. Allowance 3: [Description]

Optional material price escalation allowance; if NOT USED delete language

- A. Allowance 4 Material Price Escalation:
  - 1. The allowance(s) specified in these Allowances are the maximum amount(s) the Contractor will be entitled to by Change Order issued to define the adjustment below. If the computation results in an amount in excess of the allowance the Contractor agrees that it has included such amount in its bid and will not be entitled to any increase in excess of such maximum.
  - 2. The Contract Sum will be adjusted by Change Order based on the assigned dollar value and the allowance below for each material:
    - a. [Name of material]
      - 1) e.g. Steel with an assigned dollar value of \$1,000,000 and a allowance of \$100,000
      - 2) Repeat as necessary
  - 3. The Baseline Index Value for each material listed is the most recently published value for that material's component in the Engineering News Record Material Cost Index as of the Bid Deadline.
  - 4. Adjustments to the Contract Sum due to changes in the cost of each material listed will be made as follows:
    - a. Subtract the Baseline Index Value for the material from the corresponding number for the material from the Engineering News Record Material Cost Index for [month, year].
    - b. Divide the number resulting from the operation described by the Baseline Index Value for the material.
    - c. Multiply the number resulting from the operation described by the assigned dollar value for the material.
    - d. The University will issue a Unilateral Change Order adjusting the Contract Sum to reflect the number resulting from the operation described unless such number exceeds the Allowance in which event the University will issue a Unilateral Change Order to

confirm that the Contract Sum includes the entire amount of the Allowance and nothing more.

5. The University does not represent or warrant that the assigned dollar values set forth represent the actual cost of the listed materials; or that adjustments to the Contract Sum resulting from the methodology set forth in this Allowance will accurately reflect changes in the cost of any materials used in performing the Work.
6. If the Index for a material listed is unavailable from Engineering News Record, the University may utilize a substitute index that reasonably represents any changes in the cost of the material during the applicable time period.

Add the following for Design Build Projects

1.3 VERIFICATION OF EXPENDITURES

- B. Design Builder shall provide all necessary backup information regarding expenditures, quantities, etc. associated with the Allowance as University's Representative may require.

1.4 SELECTION AND PURCHASE

- C. At the earliest practical date after award of the Contract advise University's Representative of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- D. At University's Representative's request, obtain proposals for each Allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- E. Purchase products and systems selected by University's Representative from the designated supplier.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 21 00

Coordinate use of this section with the bid form (or proposal form for design build projects). When unit prices are NOT USED, **DELETE** this Section.

SECTION 01 22 00 UNIT PRICES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Unit Price quotations shall be inserted in the appropriate spaces in the Bid Form for each Unit Price item of Work described herein.
- B. Unit Prices stated in the Agreement shall be used to compute adjustments of the Contract Sum for approved Unit Price items of Work. Such adjustments shall be made by Change Order.
- C. Unit Prices shall include all labor, materials, tools, and equipment; all other direct and indirect costs necessary to complete the item of Work and to coordinate the Unit Price Work with adjacent Work; and shall include all overhead and profit. Contractor shall accept compensation computed in accordance with the Unit Prices for work installed in place as full compensation for furnishing such Work.
- D. Compensation will be paid for those items of Work described in below, Unit Prices.

1.2 SPECIFIED WORK

- A. Applicable Sections of the Specifications describe the materials and methods required under the various Unit Price items of Work.

The unit prices are also listed in the Bid Form. Attach a full and complete description of each unit price item including technical specification section or drawings where unit price appears.

1.3 UNIT PRICES

A. List of Unit Price Items and Descriptions

1. Description and Technical Section No.

SAMPLES BELOW APPLICABLE TO PARKING LOT PROJECTS

- 2. Clearing, Relocations and Removals & Adjust Ex. Utilities to Grade - Lump Sum. Unit Price (not applicable)
- 3. Three inch AC over 6 inch AB Paving - 12,341 SF
- 4. Six inch Storm Drain - 125 LF
- 5. Catch Basin - 8 EA

-or-

Use this option if base bid work includes an item or items, but you need a unit price to adjust actual installed quantities.

- B. List of Unit Price Items and Descriptions: Base bid quantities of {fire alarm devices} are shown on Drawings and are to be included in the Lump Sum Base Bid. Provide unit prices to add or delete {fire alarm devices} actually installed for a complete and functional system to the quantity of {fire alarm devices} shown on the Drawings. Adjustment to add or delete quantities will be made by Change Order to the Contract Sum.

- 1. Auxiliary Power Supply. Estimated Quantity - 4 EA
- 2. Manual Pull Station. Estimated Quantity - 10 EA

Confirm method and documentation of unit prices, and name of the person responsible for both taking measurements and determining the applicability of unit prices.

1.4 ADVANCED COORDINATION

- A. Immediately notify University's Representative when conditions require the use of Unit Price items of Work.

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- B. The applicability of, measurement methods for, documentation of, and the final adjustment of the Contract Sum for Unit Price items of Work shall be determined by the University's Representative.
- C. After performing Unit Price items of Work as directed by University's Representative, Contractor shall take necessary measurements in the presence of University's Representative and shall submit calculations of quantities to University's Representative for approval. Contractor shall notify University's Representative 1 day in advance of taking measurements.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 22 00

When Alternates are not used, delete this section. When Alternates are used, provide description of Alternates, following these instructions:

1. Identify and describe, in nontechnical terms, all Alternates to be included in the Bid Form.
2. Describe each Alternate in detail in technical specifications and/or drawings.
3. In each Alternate's description, include cross-references to all applicable Drawings and Specifications.
4. Identify all Alternates with a unique number so they can be identified accurately in other parts of the Construction Documents.
5. Clearly arrange the descriptions of the Alternates in the specifications sections so that the selection of any one of the Alternates, or any combination of them, will allow the facility to select the lowest responsible bidder without confusion and with minimum risk of bid protest.

## SECTION 01 23 00 ALTERNATES

### PART 1 - GENERAL

#### 1.1 ALTERNATES REQUIREMENTS

- A. This Section identifies each Alternate and describes basic changes to the Work only when that Alternate is made a part of the Work by specific provision in the Agreement.
- B. The Lump Sum Base Bid and Alternates shall include the costs of all supporting elements required, so that the combination of the Lump Sum Base Bid and any Alternates shall be complete. The scope of Work for all Alternates shall be in accordance with applicable Drawings and Specifications.
- C. Except as otherwise specifically provided by University, the Work described in Alternates shall be completed with no increase in Contract Time.
- D. This Section includes only the non-technical descriptions of the Alternates. Refer to the specific Sections of Divisions 2-33 of the Specifications for technical descriptions of the Alternates.
- E. Coordinate related Work and modify surrounding Work as required to properly and completely integrate the Alternates into the Work.

#### Facilities Manual Volume 4, Chapter 5, 5.4.2 Alternates

Ideally, the total bid price should cover the scope of a complete project without the need for alternate bids. However, if alternates are requested, they should be used with discretion, held to a minimum, carefully prepared to minimize bidder confusion, and coordinated with the specifications and the drawings.

Two reasons for requesting alternate bid prices are:

- to adjust the scope of the work so the contract sum will be within the budget.
- to allow a decision to be made between two materials or methods of different values.

#### 1.2 DESCRIPTION OF ALTERNATES

##### A. Alternate 1: Description and Technical Section No.

1. No extension of time will be granted if this Alternate is accepted.

---OR---

2. If this Alternate is accepted, the Contract Time will be extended [decreased] by [xx] days.

---AND/OR---

#### Facilities Manual Volume 4, Chapter 5, 5.4.2 Alternates

A post-award alternate may be accepted for a stipulated period from the date of the contract when the possibility of attaining additional funds after award probable. Not a basis for the award.

3. University reserves the right to accept this Alternate within [60] [90] [120] days after the date of the Agreement.

##### B. Alternate 2: Description and Technical Section No.

1. No extension of time will be granted if this Alternate is accepted.

---OR---

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2. If this Alternate is accepted, the Contract Time will be extended ~~increased~~ by ~~xx~~ days.

----AND/OR --

3. University reserves the right to accept this Alternate within ~~60~~ ~~90~~ ~~120~~ days after the date of the Agreement.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 23 00

Standard Specification

Coordinate use of Exhibit 30 Material Substitutions Proposal with this Section. Any changes to this section must be coordinated with the Office of the President.

SECTION 01 25 00 SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS REGARDING SPECIFICATION OF PRODUCTS, MATERIAL OR EQUIPMENT BY BRAND OR TRADE NAME

- A. Products, material or equipment specified by both brand or trade name and model number are approved for use, provided that Contractor complies with all Contract requirements. Specification of a product, material or equipment by brand or trade name and model number is not a representation or warranty that the product, material or equipment can be used without modification, to meet the requirements of the plans and specifications; Contractor shall, at its sole cost, modify such products, material, or equipment so that they comply with all requirements of the plans and specifications.
- B. The first-named product, material or equipment specified by brand or trade name and model number is the basis for the Project design and the use of any item other than the first-named one may require modifications of that design. If Contractor uses any product, material or equipment other than the first-named one, Contractor shall, at its sole cost:
  - 1. Make all revisions and modifications to the design and construction of the Work necessitated by the use of the product, material or equipment.
  - 2. Be responsible for all costs of any changes resulting from the use of the product, material or equipment including without limitation, costs or changes which affect other parts of the Work, the work of Separate Contractors, or any other property or operations of the University.
- C. When a product, material or equipment specified by brand or trade name is followed by the words "or equal," a substitution may be permitted if the substitution is equal to or superior to the first-named product, material or equipment in quality, utility and appearance and if the substitution complies with all other requirements of the plans and specifications.
- D. A product, material or equipment specified by brand or trade name followed by the words "or equal, no known equal," signifies that University does not have sufficient knowledge to specify a product, material or equipment, other than the one specified by brand or trade name, that is suitable for use on the Project. The use of the words "no known equal" is not intended to discourage substitution requests in accordance with the requirements specified herein.
- E. When catalog numbers and specific brands or trade names not followed by the designation "or equal" are used in conjunction with a product, material or equipment required by the specifications, substitutions will not be allowed and the named product, material or equipment must be used.
- F. Specification of a product, material or equipment by brand or trade name and model number is not a representation or warranty that the product, material or equipment is available; Contractor should confirm, prior to submitting its Bid, the availability of any product, material or equipment specified by brand or trade name and model number.

1.2 SPECIAL REQUIREMENTS FOR PRODUCTS, MATERIAL OR EQUIPMENT, OTHER THAN THE FIRST-NAMED PRODUCT, MATERIAL OR EQUIPMENT, SPECIFIED BY BOTH BRAND OR TRADE NAME AND MODEL NUMBER

- A. In addition to complying with all other submittal requirements of the Contract, submit within 70 days after the date of commencement specified in the Notice to Proceed, for review and approval by the University's Representative, Contractor prepared specifications and drawings, including design and engineering calculations, prepared by an appropriate licensed professional, depicting all revisions and modifications to the design and construction of the Work necessitated by the use of the

product, material or equipment. If no revisions or modifications are necessary, submit within 70 days after the date of commencement specified in the Notice to Proceed, a written representation that no revisions or modifications to the design or construction of the Work are necessitated by the use of the product, material or equipment. Contractor shall utilize the first-named product, material or equipment if Contractor fails to make the appropriate required submittal pursuant to this paragraph within the 70 day period.

- B. A product, material or equipment, other than the first-named product, material or equipment, specified by both brand or trade name and model number may be used if no revisions or modifications to the design or construction of the Work are necessitated by the use of the product, material or equipment. If such revisions or modifications are necessary, the product, material or equipment may be used only if the revisions or modifications are approved in writing by the University's Representative. Contractor has the burden of demonstrating, through the procedures specified herein, that any such revisions or modifications will not be detrimental to the quality, utility or appearance of the Project or any portion of the Project. The University's Representative may refuse to approve any such proposed revisions or modifications where, in the reasonable opinion of the University's Representative, Contractor has failed to demonstrate, through the procedures specified herein, that the revisions or modifications are not detrimental to the quality, utility or appearance of the Project or any portion of the Project.

### 1.3 SPECIAL REQUIREMENTS FOR SUBSTITUTIONS

- A. In addition to complying with all other submittal requirements of the Contract, submit written data demonstrating that the proposed substitution is equal to or superior to the first-named product, material or equipment in quality, utility, appearance, environmental performance criteria, and otherwise complies with all requirements of the plans and specifications, including:
1. Requests for substitutions will only be considered if Contractor completes and submits Material Substitutions Proposal Form and the following supporting data:
    - a. Complete technical data including drawings, performance specifications, samples, and test reports of the article proposed for substitution.
    - b. Statement by Contractor that the proposed substitution is in full compliance with the requirements of the Contract Documents and Applicable Code Requirements.
    - c. List of Subcontractors, if any, that may be affected by the substitution.
    - d. Contractor prepared specifications and drawings, including design and engineering calculations, prepared by an appropriately licensed professional, depicting all revisions and modifications to the design and construction of the Work necessitated by the use of the substitution. If no revisions or modifications are necessary, submit a written representation that no revisions or modifications to the design or construction of the Work are necessitated by the use of the product, material or equipment.
  - B. At the request of and within the timeframes specified by the University's Representative:
    1. Submit samples as deemed necessary by the University's Representative to evaluate the proposed substitution.
    2. Submit proposed substitution to tests deemed necessary by the University's Representative to evaluate the proposed substitution. Such tests shall be made by an independent Testing Laboratory and at the sole expense of Contractor, after review and approval of the test procedures by University's Representative. If re-testing is deemed necessary by the University's Representative to evaluate the proposed substitution, such re-testing shall be made by an independent Testing Laboratory at the sole expense of the Contractor.
    3. Provide any additional information deemed necessary by the University's Representative to evaluate the proposed substitution.
  - C. If University's Representative, in reviewing a proposed substitution, requires revisions or corrections to be made to previously accepted shop drawings and supplemental supporting data to be resubmitted, Contractor shall do so within the time period specified by the University's

Representative. A proposed substitution may be rejected if Contractor fails to submit such revisions, corrections, or supplemental supporting data within the specified time period.

- D. Except for products, material or equipment designated in the Bidding Documents for evaluation of substitutions prior to award, requests for substitution, including the data required by Paragraph 1.3.A, must be submitted to the University's Representative not later than 35 days after the date of commencement specified in the Notice to Proceed. No requests for substitutions of products, material or equipment subject to the 35 day deadline shall be considered unless the request and supporting data is submitted on or before the deadline, except those deemed, in University's Representative's sole opinion, to be necessary because (i) previously specified or approved manufactured products, material or equipment are no longer manufactured, (ii) of University initiated change orders, or (iii) it is in the best interest of University to accept such substitution.
- E. If a product, material or equipment is designated in the Bidding Documents for evaluation of substitutions prior to award, then a request for substitution of the product, material or equipment, including the data required by Paragraph 1.3.A, must be submitted by the deadline specified in the Bidding Documents. Because of time constraints, only one submittal will be allowed for each such substitution request. Requests for substitutions of products, material or equipment designated for evaluation prior to award may not be made after the deadline specified in the Bidding Documents, and such requests shall not be considered unless the request and supporting data is submitted on or before the deadline specified in the Bidding Documents. Notwithstanding the forgoing, the University may consider, after award of the Contract, requests for substitution of a product, material or equipment designated for evaluation prior to award where, in University's Representative's sole opinion, a substitution is necessary because (i) previously specified or approved manufactured products, material or equipment are no longer manufactured, (ii) of University initiated change orders, or (iii) it is in the best interest of University to accept such substitution.
- F. In reviewing the supporting data submitted for substitutions, University's Representative will use, for purposes of comparison, all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Specifications. If more than 2 submissions of supporting data are required, the cost of reviewing the additional supporting data shall be at Contractor's expense.
- G. Contractor has the burden of demonstrating, through the procedures specified herein, that its proposed substitution is equal to or superior to the first-named product, material or equipment in quality, utility and appearance and complies with all other requirements of the plans and specifications. If revisions or modifications to the design or construction of the work are necessitated by the use of the substitution, Contractor also has the burden of demonstrating, through the procedures specified herein, that the use of the substitution will not be detrimental to the quality, utility or appearance of the Project or any portion of the Project.
- H. The University's Representative may refuse to approve any requested substitution where, in the reasonable opinion of the University's Representative, Contractor has failed to demonstrate, through the procedures specified herein, that the proposed substitution is equal to, or superior to, the first-named product, material or equipment, in quality, utility and appearance and that the proposed substitution complies with all other requirements of the plans and specifications.
- I. University's Representative may reject any substitution not proposed in the manner and within the time limits prescribed herein.
- J. Substitutions are not allowed unless approved in writing by the University's Representative. Any such approval shall not relieve Contractor from the requirements of the Contract Documents.
- K. The 35 day and 70 day submittal periods do not excuse Contractor from completing the Work within the Contract Time or excuse Contractor from paying liquidated damages if Final Completion is delayed.
- L. If revisions or modifications to the design or construction of the Work are necessitated by the use of a substitution, the substitution may be used only if the revisions and modifications are approved in

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writing by the University's Representative. The University's Representative may refuse to approve any such proposed revisions or modifications where, in the reasonable opinion of the University's Representative, Contractor has failed to demonstrate, through the procedures specified herein, that the revisions or modifications are not detrimental to the quality, utility and appearance of the Project or any portion of the Project.

- M. If a substitution request is finally rejected by the University Representative, Contractor shall furnish and install:
1. The first-named product, material, or equipment; or
  2. A product, material, or equipment, other than the first-named product, material or equipment, specified by both brand or trade name and model number, provided Contractor complies with the submittal requirements (including deadlines) of this section.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 25 00

Coordinate use of Exhibit 29 Request for Information or PRISM with this section.

SECTION 01 26 13 REQUESTS FOR INFORMATION PROCEDURES

PART 1 - GENERAL

1.1 REQUESTS FOR CLARIFICATION OR ADDITIONAL INFORMATION (RFIs)

- A. Submit a Request for Information (RFI) if one of the following conditions is discovered:
1. An unforeseen condition or circumstance that is not described in the Contract Documents.
  2. An apparent conflict or discrepancy between portions of the Contract Documents that appears to be inconsistent or is not reasonably inferred from the intent of the Contract Documents.
  3. An omission from the Contract Documents that cannot be reasonably inferred from the intent of the Contract Documents.

For Design Build add subparagraph 1.1.a.4.

4. To obtain University information, such as fire flows.
- B. Submit RFIs in a reasonable time frame so as not to affect the Contract Schedule and while allowing the full response time described below.
- C. Form of Submission

STANDARD PROCEDURE: Use this paragraph for PRISM based projects

1. Submit all requests for clarifications or additional information in writing to the University's Representative using the Design and Construction Management Request for Information (RFI) form on the Internet. Complete instructions for using RFIs on the Internet will be given at the Pre-Construction Meeting. Number RFIs sequentially. Submit a new RFI for each new question and limit each RFI to one subject.

---OR---

Use this paragraph for projects not using PRISM

2. Submit all requests for clarification or additional information in writing to the University's Representative using the Request for Information (RFI) form.
  3. Follow RFI number with sequential alphabetical suffix as necessary for each resubmission. For example, the first RFI would be "1." The resubmittal of RFI 1 with the same issue would be numbered "1.1". The second RFI would be "2."
  4. Indicate specification section impacted.
  5. Address impacts to schedule and cost.
- D. Suggest possible solutions to fit field conditions, if appropriate. RFIs will not be recognized or accepted if, in the opinion of University's Representative, one of the following conditions exist:
1. Contractor submits the RFI as a request for substitution.
  2. Contractor submits the RFI as a submittal.
  3. Contractor submits the RFI under the pretense of a Contract Documents discrepancy or omission without thorough review of the Documents.
  4. Contractor submits the RFI in a manner that suggests that specific portions of the Contract Documents are assumed to be excluded or by taking an isolated portion of the Contract Documents in part rather than whole.
  5. Contractor submits an RFI in an untimely manner without proper coordination and scheduling of Work of related trades.
- E. Response Time
1. University's Representative, or the delegate of the University's Representative, shall resolve such questions and issue instructions to Contractor within a reasonable time frame. In most cases, RFIs will receive a response within 7 days. In some cases, this time may need to be lengthened for complex issues, or shortened for emergency situations, as mutually agreed in writing.

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2. Should Contractor proceed with the Work affected before receipt of a response from University's Representative within the response time described above, any portion of the Work that is not done in accordance with the University's Representative's interpretations, clarifications, instructions, or decisions is subject to removal or replacement and the Contractor shall be responsible for all resultant losses.
3. Failure to Agree: In the event of failure to agree as to the scope of the Contract requirements, Contractor shall follow procedures set forth in the General Conditions.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 26 13

SECTION 01 31 13 PROJECT COORDINATION

PART 1 - GENERAL

1.1 COORDINATION REQUIREMENTS

- A. Coordinate the Work and do not delegate responsibility for coordination to any Subcontractor.
- B. Anticipate the interrelationship of all Subcontractors and their relationship with the Work.
- C. Resolve differences or disputes between Subcontractors concerning coordination, interference, or extent of the Work between Sections.
- D. Coordinate the Work of Subcontractors so that portions of the Work are performed in a manner that minimizes interference with the progress of the Work.
- E. Do not obstruct spaces and installations that are required to be clear by Applicable Code Requirements.
- F. Do not cover any piping, wiring, ducts, or other installations until they have been inspected and approved and required certificates of inspection have been issued.
- G. Remove and replace all Work that does not comply with the Contract Documents. Repair or replace any other Work or property damaged by these operations at no additional cost to the University.
- H. Coordinate all portions of the Work requiring careful coordination in order to fit in space available. Before commencing such portions of the Work, prepare supplementary Drawings for review by the University's Representative.
- I. Ensure that anchorage, blocking, joining, and other detailing are provided as required.
- J. Electrical and Mechanical Coordination
  - 1. Routing and Coordination of HVAC, Mechanical, Fire Sprinkler, Plumbing and Electrical Installations
    - a. Schedule and coordinate the Work of all Subcontractors having installation responsibilities [within the ceiling space] [of all the new and remodeled space], with respect to the sequence of Work and the allocation of space among the trades. Contractor's approved construction schedule shall clearly indicate the planned sequence of Work in such areas and any proposed departure from it affecting or potentially affecting coordination of the overall installation shall be brought promptly, in writing, to the attention of the University's Representative.
    - b. Prepare or have prepared detailed Shop Drawings in plan view, with cross-sections as necessary, indicating the proposed installation plan for all HVAC, mechanical, fire sprinkler, plumbing, and electrical installations within the area [of all the ceiling area] [of all the new and remodeled space]. These Drawings should depict actual elevations and linear dimensions, and all routing changes, transitions, and major offsets deemed necessary to accomplish the installation. Individual Shop Drawings may be prepared for each trade working within the designated space or area; however, the coordination of the consolidated installation shall remain the responsibility of the Contractor. These Shop Drawings shall be submitted to the University's Representative for review prior to commencement of installation, and shall be provided to each Subcontractor having Work in the area.
    - c. Should unavoidable conflicts be encountered during the preparation or review of the Shop Drawings, or during construction, they shall be promptly brought to the attention of the University's Representative, in writing, for resolution.
    - d. Where the Drawings are diagrammatic, showing only the general arrangement of the systems, Contractor shall have responsibility for the fitting of materials and equipment to other parts of the equipment and structure, and to make adjustments as necessary or required to resolve space problems, preserve service room, and avoid architectural and structural elements and the Work of other trades. Contractor may be required to identify

certain areas to relocate installations within the spaces depicted on the Drawings, e.g., ductwork may be shifted within the space shown to accommodate other systems. Such functional relocations shall not be deemed a change to the requirements of the Contract. In the event a major re-routing of a system appears necessary, Contractor shall prepare and submit for approval, Shop Drawings of the proposed rearrangement.

- e. Because of the diagrammatic nature and small scale of the Drawings, all necessary offsets, adjustments, and transitions required for the complete installation are not shown. Contractor shall carefully investigate the structural and finish conditions affecting all the Work and shall arrange such Work accordingly, furnishing such fittings, equipment, valves, accessories, etc., as may be required to meet such conditions, at no additional cost to the University.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

For Design Build insert the following

### PART 3 - EXECUTION

#### 3.1 PROJECT COORDINATION

- A. Coordination. Coordinate design activities and construction operations included in the various Sections of the University Specifications and Performance Specifications to ensure efficient and orderly installation of each part of the Work, including those portions of the construction that depend on each other for proper installation, connection and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components with Contractors on the project to ensure maximum accessibility for required maintenance, service and repair, and resolve differences or disputes between Subcontractors and their relationships with the Work.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. If necessary for the proper execution of the Work, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports and list of attendees at meetings.
  - 1. Prepare similar memoranda for University and Separate Contractors if coordination of their Work is required.
- C. Administrative Procedures. Coordinate scheduling and timing of required administrative procedures with other construction activities and the activities of other contractors to avoid conflicts and to ensure orderly progress of the Work

#### 3.2 DESIGN COORDINATION

- A. Review and approval by University's Representative of the following submittals must occur prior to fabrication and delivery of materials. Design, coordination of the design, and any required Shop Drawings must be completed and approved.
  - 1. Construction Documents must be completed and approved for the particular discipline prior to submissions of product data.
  - 2. Construction Documents must be completed for mechanical, electrical and plumbing systems.
  - 3. Shop Drawings of individual systems (if applicable) shall be made only after Construction Documents and construction coordination drawings have been reviewed and approved by University's Representative.
- B. Design Coordination. Coordinate design activities included under various sections of the Contract Documents to assure complete design and coordination with each part of the Work.

C. Administrative Procedures. Coordinate scheduling and timing of required administrative procedures with other design and construction activities to avoid delays and ensure orderly progress of the Work.

1. Such administrative activities include, but are not necessarily limited to:

- a. Preparation and submittal of workplan(s) and schedules to University's Representative for review and approval.
- b. Design progress and coordination meetings with the University.
- c. Design coordination meetings between design disciplines.
- d. Agency reviews and approvals.
- e. Progress meetings with installing contractors.
- f. Delivery and processing of submittals.
- g. Design Development and Construction Documents review and approval by University.

D. Design Process. Design Builder shall follow the design process as outlined in the Contract Documents.

E. Submittal Requirements. Submittals shall conform to the requirements as set forth in the Contract Documents.

END OF SECTION 01 31 13

Coordinate use of this section with Exhibit 4 application for payment.

SECTION 01 31 19 PROJECT MEETINGS

PART 1 - GENERAL

Use the following for Design Build:

1.1 PROJECT MEETINGS

- A. General. Schedule and conduct meetings and conferences at project site, unless otherwise indicated. Attendees at the meeting shall be designated representative(s) of both parties to the Contract, unless otherwise agreed.
- B. Design Progress Meetings. The University's Representative will schedule regular weekly Design Progress Meetings to determine the progress of the development of the Design portion of the Work prior to allowing construction to commence.
  - 1. Attendees shall be the University's Representative and University's Consultants (if any), Design Builder's senior staff assigned to this project, the Design Professionals, and others as directed by the University's Representative.
  - 2. Agenda shall include items of significance that could affect the completion of the construction drawings and specifications, and have a major impact on the quality, cost and overall schedule for the Work.
  - 3. Design Builder's Design Professional shall be responsible for developing the meeting agendas, and documenting and distributing the meeting reports. Meeting agendas shall be approved by the University's Representative prior to the meeting.
  - 4. Review progress subsequent to the previous meeting. Determine whether each activity is on time, ahead of or behind schedule in relation to the approved Contract Schedule. Determine how design behind schedule will be expedited. Discuss whether revisions are needed to ensure that current and subsequent design activities will be completed with the Contract Time.

1.2 PRECONSTRUCTION CONFERENCE

- A. Prior to commencement of Work, a preconstruction conference will be conducted by the University's Representative to discuss procedures that are to be followed during performance of the Work.
- B. Location: As designated by University's Representative.
- C. Attending shall be:
  - 1. University's Representative.
  - 2. University's Consultants and University's Representative's Consultants, as appropriate.
  - 3. Contractor, Contractor's Superintendent, Subcontractors, as appropriate.
  - 4. Others, as appropriate.

Required for all projects with underground work

1.3 PRE-DIG CONFERENCE

- A. Prior to commencement of each excavation activity, a pre-dig construction conference will be conducted by the University's Representative to discuss procedures that are to be followed during performance of the Work, coordinate excavation activities, review emergency response plans and any other contractual requirements.
- B. Location: As designated by University's Representative.
- C. Attending shall be:
  - 1. University's Representative, UCD Inspectors, UCD Utility Representatives.
  - 2. Contractor, Contractor's Superintendent, Subcontractors, as appropriate.
  - 3. USA locators.
  - 4. University's Consultants and University's Representative's Consultants, as appropriate.
  - 5. Others, as appropriate.

Optional, based on scope of work

1.4 PRE-INSTALLATION CONFERENCE

- A. Prior to commencement of particular Work, as determined by the University's Representative, a pre-installation conference will be conducted by the University's Representative to discuss procedures that are to be followed during performance of the Work, coordinate with other work activities, and to review any other contractual requirements.
- B. Location: As designated by University's Representative.
- C. Attending shall be:
  - 1. University's Representative, UCD Inspectors, as appropriate.
  - 2. University's Consultants and University's Representative's Consultants, as appropriate.
  - 3. Contractor, Contractor's Superintendent, Subcontractors, as appropriate..
  - 4. Others, as appropriate.

1.5 BILLING MEETINGS

- A. A billing meeting shall be conducted by University's Representative each month after receipt of the draft Application for Payment and prior to submittal of the Application for Payment. The purpose of the meeting shall be to review the Cost Breakdown (Schedule 1 in the Application for Payment) with the Project Schedule Monthly Update and the As-Built Drawings. This meeting may be combined with the regular construction meeting if approved by the University's Representative.
- B. Location: As designated by University's Representative.
- C. Attending shall be:
  - 1. University's Representative.
  - 2. Contractor's Superintendent, Subcontractors, as appropriate.
  - 3. Others, as appropriate.

1.6 PROGRESS MEETINGS

- A. During the course of construction, weekly progress meetings will be held to discuss and resolve field problems. The duration and number of meetings will be determined by the University's Representative.
- B. Location: A site designated by University's Representative that is convenient for all parties.
- C. Attending shall be:
  - 1. University's Representative.
  - 2. University's Consultants and University's Representative's Consultants, as appropriate.
  - 3. Contractor, Contractor's Superintendent, Subcontractors, as appropriate.
  - 4. Others, as appropriate.

1.7 COORDINATION MEETINGS

- A. Coordination Meetings shall be held as necessary to coordinate the Work.
- B. Location: As designated by University's Representative.
- C. Attending shall be:
  - 1. University's Representative, UCD Inspectors, as appropriate.
  - 2. University's Consultants and University's Representative's Consultants, as appropriate.
  - 3. Contractor, Contractor's Superintendent, Subcontractors, as appropriate.
  - 4. Others, as appropriate.

1.8 COMMISSIONING MEETINGS

PROJECT TITLE  
CONTRACT TITLE  
UNIVERSITY OF CALIFORNIA, DAVIS  
CITY, CALIFORNIA

PROJECT NO: 0000000

A. During the course of construction, commissioning meetings will be held to discuss, coordinate and resolve commissioning issues. The duration and number of meetings will be determined by the University's Representative. See Section 01 91 00 Commissioning.

B. Location: As designated by University's Representative.

C. Attending shall be:

1. University's Representative, UCD Inspectors, as appropriate.
2. Contractor, Contractor's Superintendent, Subcontractors, as appropriate..
3. Others, as appropriate.

1.9 GUARANTEES, BONDS, WARRANTIES, AND SERVICE/OPERATION AND MAINTENANCE CONTRACTS/DATA REVIEW MEETING

A. Eleven months following the date of [Substantial Completion] [Notice of Completion], a meeting shall be conducted by the University's Representative for the purpose of reviewing the guarantees, bonds, and service and maintenance contracts for materials and equipment. The Contractor shall take action as appropriate to implement repair or replacement of defective items, and to extend service and maintenance contracts as required.

B. Attending shall be:

1. University's Representative
2. University's Consultants and University's Representative's Consultants, as appropriate.
3. Contractor, Subcontractors, as appropriate.
4. Others, as appropriate.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 31 19

This section is used for projects under \$1,000,000 use other section if more than \$1M

SECTION 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SCOPE

- A. Preliminary Contract Schedule, Contract Schedule, and updated Contract Schedules.
- B. Graphical Reports
- C. Computer Software Requirements

1.2 DEFINITIONS

- A. Critical Work activities are defined as Work activities that, if delayed or extended, will cause a critical delay as defined in General Conditions Article 8. All other Work activities are defined as non-critical Work activities and are considered to have float.
- B. Float is defined as the time that a non-critical Work activity can be delayed or extended without causing a critical delay as defined in General Conditions Article 8. Neither the Contractor nor the University shall have an exclusive right to the use of float. Float is a shared resource available to each party to the contract. The Contractor shall document the effect of the use of float on the updated Contract Schedule.
- C. Preliminary Contract Schedule is defined as a practical schedule representing the Contractors plan for accomplishing the work within the Contract time showing all significant milestones for the Contract period as well as a detailed work plan for the first 60 days following the Notice to Proceed. The Preliminary Contract Schedule shall not include any actual dates or progress measured against any activities.

Edit between [ ], 60 days recommended for large projects

- D. Contract Schedule is defined as a graphical representation of a practical plan to complete the Work within the Contract Time. The first Contract Schedule that shall be submitted to the University not later than [30] [60] days after Notice to Proceed. The period covered by Contract Schedule shall be the Contract Time. The Contract Schedule shall incorporate the logic of the Preliminary Contract Schedule covering the first 60 days following the Notice to Proceed.
- E. Look Ahead Schedule is defined as a schedule derived from the Contract Schedule (or the most current monthly update of the Contract Schedule) which indicates in detail all activities scheduled or worked on for the 2 prior weeks, and all activities scheduled to occur during the next 4 weeks.

1.3 SUBMITTALS REQUIRED

- A. Submit the following in accordance with Section 01 33 23 Shop Drawings, Product Data, Samples
  - 1. Preliminary Contract Schedule
  - 2. Contract Schedule
  - 3. Monthly Updates to Contract Schedule
  - 4. Graphical Reports
  - 5. Electronic Schedule Files
  - 6. Look Ahead Schedules
- B. Submit all submittals required by this specification (except preliminary schedule and look-ahead schedules) to the University's Representative via electronic means. Submit 2 copies when transmitting via a diskette or CD-ROM.

PART 2 - PRODUCTS

2.1 SOFTWARE

- A. Software Requirements

1. The Contractor shall use SureTrak Project Manager by Primavera Systems, or equal to produce the schedule and all required graphical and tabular reports.

### PART 3 - EXECUTION

#### 3.1 PRELIMINARY CONTRACT SCHEDULE

- A. Within 10 days after the notice of selection as the apparent lowest responsible bidder, Contractor shall submit a Preliminary Contract Schedule to the University's Representative for approval. This schedule shall account for use of the Contract Time and identify significant known constraints and milestones within the Contract Time. The Preliminary Contract Schedule shall provide a detailed work plan of all activities planned by the Contractor for the first 60 days of the project subsequent to the Notice to Proceed as well as all anticipated activities prior to the Notice to Proceed. The Preliminary Contract Schedule, including the logic contained therein, shall be incorporated into the Contractor's proposed Contract Schedule. In addition to the detailed work plan, the Contractor shall identify in detail the following planned activities in the Preliminary Contract Schedule:
  1. Preparation of equipment and material submittals for review.
  2. Fabrication and delivery periods of long lead items.
  3. Major milestones.
  4. All holidays, UC Davis finals weeks and non-working days.
- B. Submission – The Contractor shall submit an electronic version (computer backup file) of the Preliminary Contract Schedule, as well as a Gantt chart of the Preliminary Contract Schedule to the University for approval as a condition precedent to being eligible for receipt of the first progress payment. The files shall be provided on CD-ROM prepared in MS Windows format.
- C. Form – The Preliminary Contract Schedule shall reflect the Contractor's actual plan of work for the first 60 days of the project. The Contractor's progress shall be measured against the preliminary contract schedule until such time as the University approves the Contractor's first Contract Schedule.

#### 3.2 CONTRACT SCHEDULE

- A. Within 30 days of the Notice to Proceed date, the Contractor shall submit its proposed Contract Schedule. The proposed Contract Schedule shall incorporate the Preliminary Contract Schedule, including the logic of the Preliminary Schedule, unless approval is granted by the University's Representative to deviate from this requirement.
- B. Form:
  1. The proposed first contract schedule shall be produced using CPM (Critical Path Method) techniques, in the PDM (Precedence Diagram Method) method of scheduling.
  2. When approved, the proposed first Contract Schedule shall become the Contract Schedule.
  3. The Contract Schedule shall represent a practical plan to fully complete the Contract within the Contract Time.
  4. The Contract Schedule shall identify all holidays, UC Davis finals weeks and non-working days.
  5. The Contract Schedule activities shall be coded with the following information applicable to each activity:
    - a. Area of the project
    - b. Identity of the party responsible for the activity (i.e., University, General Contractor, specific subcontractor...)
    - c. Specification section applicable to activity
    - d. Phase – The following phases shall be identified:
      - 1) Administrative
      - 2) Submittal and Review
      - 3) Fabrication
      - 4) Construction
      - 5) Inspection

C. Content:

1. The Contract Schedule shall identify all Work activities in correct sequence for the completion of the Work within the Contract Time. Work activities shall include the following:
  - a. Major Contractor-furnished equipment, materials, and building elements requiring submittals or University's Representative's prior approval.
    - 1) Show dates for the submission, review, and approval of each such submittal. Dates shall be shown for the procurement, fabrication, delivery, and installation of major equipment, materials, and building elements, and for scheduled activities designated by the University.
    - 2) A minimum of 18 days shall be allotted for University's Representative to review each submittal. The 18 days shall be measured starting with actual receipt by the University Representative of the submittal.
  - b. System test dates.
  - c. Dates Contractor requests designated workspaces, storage area, access, and other facilities to be provided by the University.
  - d. Dates Contractor requests orders and decisions from the University on designated items.
  - e. Dates Contractor requests University-furnished equipment.
  - f. Dates Contractor requests University-furnished utilities.
  - g. Planned dates for connection and relocation of existing utilities.
  - h. Planned dates for connecting to or penetrating existing structures.
  - i. Planned dates for scheduled inspections as required by Codes, or as otherwise specified.
  - j. Commissioning Sequence and activities for all Building Systems.
  - k. Punchlist and punchlist correction periods.
  - l. University Training periods.
2. The Contract Schedule shall include a complete sequence of construction, in adequate detail for the planning and coordination of the Work. Unless approved by the University's Representative, there shall be no activities shown with durations in excess of 20 business days.
3. The Contract Schedule shall be calculated using the Retained Logic method. Progress override calculations shall not be acceptable.

D. Submission

1. The Contractor shall submit an electronic version (computer backup file) of the Contract Schedule, as well as a Gantt chart of the Contract Schedule to the University. The files shall be provided on CD-ROM, prepared in MS Windows format.
2. Tabular Computer Reports
  - a. As requested by the University, the Contractor shall submit various computer-generated tabular reports.

E. Acceptance

1. Upon receipt, the University's Representative shall review the proposed first Contract Schedule. Within 5 business days of the University's receipt of the proposed first Contract Schedule, the University's Representative shall schedule a review meeting with the Contractor for the purpose of jointly reviewing the proposed first Contract Schedule. The meeting shall occur within 10 business days of the University's receipt of the proposed first contract schedule.
2. If the proposed first Contract Schedule is accepted by the University's Representative, it shall become the Contract Schedule. Such acceptance shall not relieve Contractor from its responsibility to fully complete the Contract within the Contract Time, nor shall it relieve Contractor from sole responsibility for any errors in the Contract Schedule.
3. If the Contractor or the University's Representative determines the proposed first Contract Schedule to be in need of revision, within 5 business days following the joint review meeting, the Contractor shall revise and resubmit the proposed first Contract Schedule to the University's Representative for acceptance, and, upon acceptance thereof, it shall become the Contract Schedule. Such acceptance shall not relieve Contractor from its responsibility to fully

complete the Contract within the Contract Time, nor shall it relieve Contractor from sole responsibility for any errors in the Contract Schedule. No progress payment beyond the second progress payment will be paid to the Contractor until such time as the University's Representative has approved the Contractor's first Contract Schedule.

### 3.3 MONTHLY UPDATES

- A. After approval of the first proposed Contract Schedule, Contractor shall update the Contract Schedule monthly. The update shall reflect progress as of the end of each month. Contractor shall submit monthly schedule update to the University's Representative for approval by no later than the tenth day of the following month. The updates shall be made as follows:
  - 1. The Monthly updates shall report progress based upon percent complete of each activity or remaining duration. Actual start dates shall be recorded for those activities that have started. Actual finish dates shall be recorded for those activities that are completed. Activities that are in progress shall reflect an actual start date and the percentage completion for the activity.
  - 2. The updated Contract Schedule shall reflect an up-to-date status of the contract work as completed, and materials furnished and in permanent place that qualify for payment.
  - 3. The updated Contract Schedule shall reflect Contract Time changes included in all processed change orders for the progress month and each preceding month
- B. Within 5 business days after receipt of the updated Contract Schedule in conjunction with the Application for Payment, the University's Representative shall review both and determine which work and material pay items qualify for payment; the approved data will then be returned to the Contractor with comments. The Contractor and the University's Representative shall meet to review the Construction CPM Schedule and discuss any changes required.
- C. The Contractor shall then revise and resubmit (if required) the Updated Contract Schedule and Application for Payment to the University's Representative for payment approval.
- D. The monthly update shall be calculated using retained logic with a required finish date specified as the current contract completion date. Progress Override calculations shall not be acceptable.
- E. No Applications for Payment will be processed nor shall any progress payments become due until updated Contract Schedules are accepted by University's Representative. The accepted, updated Contract Schedule shall be the Contract Schedule of record for the period it is current and shall be the basis for payment during that period. Acceptance of any updated Contract Schedules shall not relieve Contractor from its responsibility to fully complete the Contract within the Contract Time, nor shall it relieve Contractor from sole responsibility for any errors in the updated Contract Schedules.
- F. Submission
  - 1. The Contractor shall submit an electronic version (computer backup file) of the monthly update of the Contract Schedule, as well as a Gantt chart of the updated Contract Schedule to the University. The files shall be provided on CD-ROM produced in MS Windows format.
- G. Obligation
  - 1. Contractor shall perform the Work in accordance with the updated Contract Schedule. Contractor may change the Contract Schedule to modify the order or method of accomplishing the Work only with prior agreement by the University.

### 3.4 LOOKAHEAD SCHEDULES

- A. Provide detailed lookahead schedules every 2 weeks indicating all activities planned during the next 4 weeks.
- B. Submit in 11 inch by 17 inch Gantt chart format. Provide as many copies as requested by University's representative.

- C. Lookahead schedule shall correlate to the then current Preliminary Contract Schedule, Contract Schedule, or updated Contract Schedule. Lookahead schedules shall be legible but may be hand written and drawn.

### 3.5 GANTT CHART REQUIREMENTS

- A. Gantt Charts shall meet the following requirements
  - 1. Prepared on 11 inch by 17 inch paper
  - 2. Organized by Area and Phase
  - 3. Sorted by Early Start dates, then Total Float
  - 4. Bars shall be formatted in such a way that they are visually distinguishable through the use of graphical tools such as cross hatching (the use of color copies is encouraged)
  - 5. Columns shall include at a minimum
    - a. Activity ID
    - b. Activity Description
    - c. Original Durations
    - d. Remaining Durations
    - e. Early Start Dates
    - f. Early Finish Dates
    - g. Percent Complete
  - 6. The critical path of paths shall be clearly identifiable.

END OF SECTION 01 32 00

If project is not administered in PRISM, coordinate use of Exhibit 6 submittal schedule with this section.

SECTION 01 33 23 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

For Design Build include paragraphs A, B and C

- A. Schedule of Submittals. Design Builder shall submit to University's Representative a Submittal Schedule identifying all submittals requiring University review and approval for the current Phase within 30 days of Notice to Proceed for the applicable Phase.
- B. Specific Requirements. Refer to other sections of the University Specifications for specific requirements of the Submittal Schedule.
- C. Types of Submittals. Design Builder shall be required to submit to University's Representative for review and approval, as appropriate, the following types of submittals, including others not listed as may be required by the University's Representative or Scope of Work to properly review the Project.
  - 1. Design Builder's Workplan for the entire Work as required by the Agreement.
  - 2. Design Development Drawings.
  - 3. Construction Documents.
  - 4. Coordination Plan
  - 5. Shop Drawings including actual field measurements.
  - 6. Product Data. One Submittal per Specification section.
  - 7. Samples.
  - 8. Test Reports.
  - 9. Certifications.
  - 10. Quality Control Plan

- D. Shop Drawings, Product Data, and Samples shall be submitted to the University's Representative. Product Data and Samples for proposed substitutions shall be submitted to University's Representative in accordance with Section 01 25 00 Substitution Procedures. Contractor shall be responsible for obtaining copies of Shop Drawings, Product Data, and Samples as it may require for its own use.

Keep for PRISM administered projects:

- E. Procedures: Contractor shall use UCD Design and Construction Management submittal transmittal form on DCM PRISM website. Complete instructions and website access information will be provided at the Pre-Construction meeting.

1.2 RELATED REQUIREMENTS

A. Definitions

- 1. The terms "Shop Drawings" and "Product Data" as used herein also include, but are not limited to fabrication, erection, layout and setting drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. All other drawings and descriptive data pertaining to materials, equipment, piping, duct, conduit systems, and methods of construction as required to show that the materials, equipment, or systems and the positions thereof conform to the Contract Documents.
- 2. As used herein, the term "manufactured" applies to standard units usually mass-produced. The term "fabricated" means items specifically assembled or made out of selected materials to meet individual design requirements. Shop Drawings shall establish the actual detail of all manufactured or fabricated items, indicate proper relationship to adjoining Work, and amplify design details of mechanical and electrical equipment in proper relationship to physical spaces in the structure.

B. Manufacturer's Instructions

1. Where any item of Work is required by the Contract Documents to be furnished, installed, or performed in accordance with a specified product manufacturer's instructions, Contractor shall procure and distribute the necessary copies of such instructions to the University's Representative and the Contractor shall furnish, install, or perform the Work in strict accordance therewith.

C. Submittal Schedule

1.3 SUBMISSION AND REVIEW

- A. Submit the required submittals to University's Representative in a timely fashion to allow for adequate review and approval so that the Contract Schedule is not adversely impacted. [ADD FOR DESIGN BUILD: Design Professionals must review and stamp submittals prior to submitting to University's Representative.]

1.4 COORDINATION

- A. Coordinate Submittals with the proper sequencing of the Work so that the Contract Schedule can be maintained and University has reasonable time to review and comment.
  1. The Contractor shall submit a schedule for submission of Shop Drawings, Product Data, and Samples (the "Submittal Schedule"). The schedule shall include the Contractor's time to process the submittal(s), and the time required for review by the University's Representative and University's Design Professional. The schedule shall be agreed upon by the University's Representative, the University's Design Professional, and the Contractor in order that submittals will be available when needed by the construction process and so that each party can plan its workload in an orderly manner. All required submittals shall be initially submitted no later than [1 month] [2 months] [# months] after the Notice to Proceed.
  2. Contractor shall prepare the Submittal Schedule in the form contained in the Exhibits and coordinate it with the Contract Schedule. No submittals will be processed prior to the approval of the Submittal Schedule, unless an exception is made by the University's Representative.
  3. Submit 2 copies of the Submittal Schedule after it is completed and each time it is updated by the Contractor.
  4. In preparing the Submittal Schedule, the Contractor must first determine from the Contract Schedule the date the particular item is needed for the Work. Working backwards, the Contractor will add the required number of days for shipment, time for fabrication, and similar items to determine the date of the first submittal. Contractor shall be responsible for the impact to the schedule resulting from submittals that do not conform to contract requirements. Contractor shall provide time in the Submittal Schedule for the re-submittal of items that do not conform to contract requirements.
  5. The Submittal Schedule shall be adjusted to meet the needs of the construction process and the Contract Schedule.
  6. Review Time: The minimum time required by the University's Representative and the University's Design Professional to review and process Shop Drawings, Product Data and Samples shall be at least 18 days after receipt, except the time to review submittals requiring review by State Fire Marshal (SFM), shall be at least 28 days.
  7. Resubmittal: After receipt, resubmittals shall require the same time for review as the initial submittals.
  8. Submit items in a group or sequence which allows for review and coordination.
  9. Submit submittals promptly in accordance with the Submittal Schedule to avoid delay in the Work or in the Work of any Separate Contractor.

1.5 SHOP DRAWINGS

- A. Present information required on Shop Drawings in a clear and thorough manner. Identify details by reference to drawing and detail, schedule, room numbers shown and specified.

- B. Direct copies of the Contract Documents are not acceptable as a submittal from the Contractor.

#### 1.6 PRODUCT DATA

##### A. Preparation

1. Clearly mark each copy to identify pertinent products or models.
2. Show performance characteristics and capacities.
3. Show dimensions and clearances required.
4. Show wiring or piping diagrams and controls.

##### B. Manufacturer's standard schematic drawings and diagrams

1. Modify the standard schematic drawings and other diagrams to delete information that is not applicable to the Work.
2. Supplement standard information to provide information specifically applicable to the Work.
3. Clearly indicate manufacturer's model or part number intended for Project.

##### C. Material Safety Data Sheets

1. Material Safety Data Sheets (MSDS) shall be submitted for all hazardous substances so defined by the State of California. MSDS shall also be provided for all substances furnished under this Contract that are not available to the general public from retail outlets, e.g., paints, coatings, lacquers, varnishes, sealers, removers, thinners, solvents, adhesives, cleaners, acids, putty, fillers, disinfectants, fungicides, pesticides, gases, oils, lubricants, treatments, liquid-applied flooring, etc.

- D. LEEDTM Product Data: Submit product data and information for documentation of credits for LEED certification. [ADD FOR DESIGN BUILD: Design Builder is responsible to submit for certification directly to USGBC.] Comply with ASTM E 2129 Standard Practice for Data Collection for Sustainability Assessment of Building Products, and Project requirements. Where information must be specially prepared for submittal because standard product documentation does not contain the information required, prepare written statements on manufacturer's letterhead certifying the required product attributes. Refer to Section 01 60 00 Product Requirements for additional information.

#### 1.6 SAMPLES

##### A. Samples shall be of sufficient size and quality to clearly illustrate the following:

1. Functional characteristics of the products with integrally related parts and attachment devices;
2. Full ranges of color, texture, and pattern;
3. Or as specified.

##### B. Field Samples and mock-ups (if required)

1. Erect at the Project site, at a location as directed by the University's Representative;
2. Size: As specified;
3. Fabricate each Sample and mock-up to be complete and fully finished;
4. Remove mock-ups at conclusion of the Work;
5. Or as specified.

##### C. Samples: Submit new samples in resubmittals as required for initial submittal.

#### 1.7 CONTRACTOR'S REVIEW OF SUBMITTALS

- A. Review, edit as appropriate, stamp and sign the Shop Drawings, Product Data, and Samples prior to submission. The Contractor's stamp shall include the language that the submittal has been reviewed by the Contractor per the requirements of Section 3.12 of the General Conditions. Submittals that do not comply with this paragraph will not be reviewed.

##### B. Determine and verify

1. Field measurements.
2. Field construction criteria.
3. Catalog numbers and similar data.
4. Conformance with Contract Documents.

C. Coordinate each submittal with requirements of the Work and of the Contract Documents.

D. Specifically identify in the GC Comment field of the transmittal form any deviations of the submitted item from the Contract Documents.

#### 1.8 SUBMITTAL REQUIREMENTS

A. A separate submittal is required for each specification section. The submittal items identified in a specification section shall be consolidated into a single submittal unless otherwise noted. Incomplete submittals shall be returned without review for re-submittal.

B. It is Contractor's responsibility to submit all submittals specified in each section of the specifications.

C. Submittals identified for record purposes will not be returned to the Contractor.

Use paragraphs D.1 through 3 if University's Design Professional is responsible for submittal review. This option used by DCM on Major Cap projects and is optional for DCM Minor Cap. Select only 1 of the following 3 options.

#### D. Number of Submittals Required

1. Shop Drawings:
  - a. Submit 3 copies of Shop Drawings to the University's Design Professional.
  - b. Submit 3 copies to the University's Representative.
  - c. The University's Design Professional shall return 1 copy with review comments to the Contractor.
2. Product Data and Non-Reproducible Submittals:
  - a. Submit 3 copies to the University's Design Professional and 3 copies to the University's Representative.
  - b. The University's Design Professional shall return 1 copy with review comments to the Contractor.
3. Samples and Non-reproducible Submittals:
  - a. Submit the number as specified in individual Specification Section(s) to the University's Design Professional.
  - b. Submit 1 copy to the University's Representative.

OR instead of the above, select the following for ELECTRONIC OPTION FOR SUBMITTALS

#### E. Number of Submittals Required

1. Shop Drawings, Product Data and other submittals that can be converted into electronic format:
  - a. Send electronic copies in .PDF format to the University's Representative and the University's Design Professional.
  - b. 2 hard copies to the University's Representative and 1 hard copy to the University's Design Professional.
  - c. The University's Representative shall return 1 electronic copy with the review comments to the Contractor.
2. Samples and Non-reproducible Submittals:
  - a. 3 hard copies to the University's Design Professional and 3 hard copies to the University's Representative.
  - b. The University's Representative shall return 1 hard copy with review comments to the Contractor.

OR instead of the above, use the following paragraphs 1 through 3 if University's Representative is responsible for submittal review. This option can be used by DCM Minor CAP. DCM Major Cap has elected not to use these paragraphs

E. Number of Submittals Required

1. Shop Drawings: Submit 1 reproducible transparency and 2 opaque reproductions of shop drawings to the University's Representative. The University's Representative shall return 1 reproducible transparency with review comments to the Contractor.
2. Project Data and Non-Reproducible Submittals: Submit 4 copies of the University's Representative. The University's Representative shall return 1 copy with review comments to the Contractor.
3. Samples and Non-Reproducible Submittals: Submit number as specified in individual Specification Section(s) to University's Design Professional. Submit 1 copy to the University's Representative.

F. Some specification sections may require submittals to be submitted electronically on CD-ROM in most current version of AutoCAD.

G. Submittals shall contain

1. Date of submission and dates of any previous submissions.
2. Project name and number.
3. Contract identification.
4. The names of
  - a. Contractor.
  - b. Subcontractor.
  - c. Supplier.
  - d. Manufacturer.
5. Identification of the product with the Specification Section number.
6. Field dimensions clearly identified as such.
7. Relation to adjacent or critical features of the Work or materials.
8. Reference standards such as American Society for Testing and Materials (ASTM) or Federal Specification (FS) numbers.
9. Identification of changes from requirements of the Contract Documents.
10. Identification of revisions on resubmittals. Note any departures from the Contract Documents or changes in previously reviewed submittals that were not commented upon.
11. An 8 by 3 inch blank space for review stamps.
12. Contractor's stamp, initialed or signed, certifying to the review of the submittal; verification of materials field measurements and conditions; and compliance of the information within the submittal with requirements of the Work and of the Contract Documents.

DCM Major Cap has elected not to use the paragraph regarding material submittal approval form. Using the next paragraph eliminates stamping and signing each submittal (used by the federal government). If this paragraph is used, you must make sure that Exhibit 16 is included in the exhibits.

13. Material Submittal Approval Form (MSAF): Contractor shall fill out and attach Material Submittal Approval Form (Refer to Exhibits) for shop drawings or products data to be reviewed by [University's Representative]. Submittals received without properly completed Material Submittal Approval Form will be returned without action to the Contractor.

---OR---

14. Contractor shall submit submittal(s) with transmittal provided by the University's Representative.

H. Resubmission Requirements

1. Shop Drawings and Product Data
  - a. Note any departures from the Contract Documents or changes in previously reviewed submittals that were not commented upon by the [University's Representative] [University's Design Professional].

- b. [University's Representative] [University's Design Professional] will review a total of 2 submittals for the same item at no cost to the Contractor. The cost for the review of more than 2 submittals of the same item shall be deducted from the Contract Sum.

I. Distribution

- 1. Reproduce and distribute copies of Shop Drawings and Product Data, that have been accepted by the University to the following locations:
  - a. Contractor's Project site file.
  - b. Record documents file maintained by the Contractor.
  - c. Subcontractors.
  - d. Supplier, manufacturer or fabricator.
- 2. Distribute Samples that have been accepted by the University to Subcontractors or suppliers that need samples for quality control and coordination.

- J. University's Representative [and University's Design Professional's Professional(s)] will review Contractor's submittals, such as Shop Drawings, Product Data and Samples, for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents.

For DCM Minor Cap projects only

- K. Contractor shall submit data, including but not necessarily limited to, the Sections identified in Table of Submittals. It is Contractor's responsibility to submit all submittals specified in each section of the specifications.

For DCM Minor Cap projects only. Add additional rows to table of submittals for technical sections and their requirements

TABLE OF SUBMITTALS										
Section	Shop Drawings	Data/List of Materials	MSDS	Color and/or Samples	Guarantee Over 1 Year	Mock-ups	Tests	Certifications	Other	
013200 Construction Progress Documentation		X	X							
013323 Shop Drawings, Product Data and Samples	X	X	X	X						
017329 Cutting and Patching	X			X						
017323 Bracing and Anchoring	X									
017400 Cleaning and Waste Management		X								
017800 Close-Out Submittals		X	X							

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

PROJECT TITLE  
CONTRACT TITLE  
UNIVERSITY OF CALIFORNIA, DAVIS  
CITY, CALIFORNIA

PROJECT NO: 0000000

END OF SECTION 01 33 23

SECTION 01 35 16 ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 SIGNAGE

- A. No signs or advertisements will be permitted on the Project site, including company name and logos on job site trailers, except with the express permission of University's Representative.
- B. For interior projects, install and maintain a project informational sign(s) provided by the University at a location(s) designated by the University's Representative.
- C. At every door and barricade separating the project work and staging areas from areas not included in the project work area, the Contractor shall provide, install and continuously maintain a construction warning sign. The 11 inch by 17 inch construction warning sign shall be reproduced from camera-ready text provided by the University's Representative, shall be plastic laminated on heavy cardstock and shall be securely affixed at eye level to the door or barricade.

1.2 NOTIFICATION

- A. Two weeks prior to entering occupied rooms, provide notice and schedule to each room occupant. The notice shall include work scope, date and hours of work. If schedule is changed, provide updates as soon as possible and obtain permission to enter prior to starting work.

1.3 OVERHEAD PROTECTION

- A. Where roof edge does not terminate in a parapet wall and where Work is in progress overhead and materials or objects could potentially fall, the Contractor is required to construct temporary covered pedestrian walkways over each building entrance. Walkway covers shall extend out 12 feet in length for the first floor and an additional 4 feet for each additional floor of the building. Walkway covers shall extend from face of building. Contractor shall be required to place and maintain yellow safety construction flagging or ropes with signage to prevent pedestrians from coming within 25 feet of Work in progress overhead and to route pedestrians in and out of building entrances.

1.4 POST-TENSIONING CABLES

- A. Post-tensioning cables are present in all beams and girders, and in the floor slab in strips in each direction adjacent to the mechanical shaft structures at the corners of the major structural bays in [Insert Name of Building]. The University will make as-built structural drawings available to Contractor for review. Contractor shall arrange for the services of an engineering testing lab to confirm locations of these cables wherever holes of any size are to be drilled for any reason, including holes for anchorage of suspended utility runs or where holes are to be core-drilled for mechanical, plumbing, or electrical piping penetrations in the floor slab. Testing for confirmation of cable locations shall be performed by the "Ferrosan" method; or other appropriate method, approved by the University's Representative.
- B. Contractor shall provide location and description of proposed work and obtain approval from University's Representative for testing for cable locations 7 days before procedure.
- C. Contractor shall immediately notify University's Representative if any cables are nicked, damaged or severed and shall replace any nicked, damaged or served cables at no additional cost to the University as soon as possible in a manner acceptable to the University's Representative.

1.5 INDOOR AIR QUALITY

- A. These requirements are in addition to the requirements of Section 01 81 19 Indoor Air Quality Requirements Contractor shall be responsible for protection of the cleanliness of the existing air handling system at all times.
  - 1. This protection shall include:
    - a. During site Work or building demolition, prefilters shall be provided and maintained on all building outside air intakes at all times throughout the construction duration.

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- b. Prior to starting any Work, the Contractor shall record and submit to the University's Representative, pressure readings across all existing air handler air filter banks before installation of new prefilters.
- c. During any interior Work that may create dust in the interior space and adjacent corridor/hallways, air filters shall be provided and maintained on all affected air return and exhaust grilles. Where air flow in or out of the space is not required, all air duct openings shall be temporarily blanked off with plywood or sheetmetal.
- d. Upon completion of all Work affecting existing air handling systems, the Contractor shall remove all temporary filters, covers and associated parts and restore the system to its original operating condition unless otherwise stated elsewhere in the Contract Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 35 16

1. University's Representative (Project Manager) will obtain from the Facility Environmental Planner a list of environmental mitigations, which apply to the construction phase of this specific project.
2. Mitigations will include both those required by the Long-Range Development Plan and project specific environmental documents.
3. Project Manager will draft clear, concise descriptions of measures with which the Contractor must comply. Enter the measures below.
4. Any changes to the Construction Contract, which impact the specified mitigation measures, should be discussed with the Facility Environmental Planner.
5. This information should be added to the Information Available To Bidders

## SECTION 01 35 43 ENVIRONMENTAL PROCEDURES

### PART 1 - GENERAL

#### 1.1 REQUIREMENTS

- A. The Environmental Mitigation requirements for this Project are recorded in this Specification Section. The mitigation measures may include, but are not limited to, procedures and standards to control:
  1. Dust Palliation
    - a. All unpaved construction areas shall be sprinkled with water or other acceptable Yolo-Solano Air Quality Management District (AQMD) [OR OTHER DISTRICT OTHER THAN Y/S] dust control agents during dust generating activities to reduce dust emissions. Additional watering or acceptable AQMD dust control agents shall be applied during dry weather or windy days until dust emissions are not visible.
    - b. Trucks hauling dirt and debris shall be covered to reduce wind-blown dust and spills.
    - c. On dry days, dirt or debris spilled onto paved surfaces shall be swept up immediately to reduce resuspension of particulate matter caused by vehicle movement. Approach routes to the Project site shall be cleaned daily of construction related dirt in dry weather.
    - d. On-site stockpiles of excavated material shall be covered. If stockpile is only needed for seven days or less, watering can be substituted for covering.
  2. Noise
    - a. Noise from job equipment and construction operations shall be kept to a minimum by use of adequate mufflers and other appropriate means.
    - b. Comply with all City of Davis [OR OTHER LOCATION] sound ordinances as required.
    - c. Do not exceed 86 db at Project Site property boundary.
  3. Odors: Work that causes excessive odors shall be performed only after coordination with the University's Representative. Contractor shall schedule work during off- hours or provide carbon-activated filtering of air intakes including those of adjacent building air handling units as may be needed to prevent odors and vapors from entering the buildings. Contractor shall provide 7 business days advance notice to the University's Representative in order for advance notices to be forwarded to building occupants. Work stoppage may occur if advance notification has not been coordinated or odors and vapors from the work are found to generate complaints from building occupants.
  4. **ADD ADDITIONAL MEASURES AS REQUIRED FOR PROJECT**

#### 1.2 ARCHAEOLOGICAL RESOURCES

- A. The project site is [not] known to be archaeologically sensitive. Archaeological resources are more likely to be present if the project site is within 1/2 mile of the historic Putah creek channel.
- B. If during the course of construction, evidence of deposits of historical or archaeological interest is found, cease Work affecting find and notify University's Representative. Do not disturb deposits until written notice is received from University's Representative to proceed.

Delete the following paragraphs if the project is not known to be archaeologically sensitive.

- C. Contractor will be compensated for lost time or changes in construction to avoid the find based upon normal change order procedures if Critical Path is affected.

D. Procedures

1. In order to assure that Work does not result in significant damage to archeological resources, the University shall be responsible for obtaining the service of a qualified archaeologist who will oversee all excavation done in connection with the Project. Oversight will begin before excavation is underway.
2. If archeological resources, or indicators thereof (such as darkened soil or "midden"), are encountered before or during excavation, Work occurring within 100 feet of the find will be temporarily halted. Secure Project site and notify the University's Representative immediately.
3. Any significant resources that are recovered shall be retained by University. Unauthorized collection of artifacts is prohibited. If human remains are encountered, Work will be halted.

1.3 HAZARDOUS MATERIALS

- A. [IF THERE ARE HAZ SECTIONS KEEP THIS PARAGRAPH.] Reference Sections 02 82 00 Asbestos Remediation; 02 83 00 Lead Remediation; and 02 85 00 Mold Clean-Up
- B. Except as otherwise specified, in the event Contractor encounters on the Project site material reasonably believed to be asbestos, polychlorinated biphenyl (PCB), lead, or other hazardous substances that have not been identified or rendered harmless, Contractor shall immediately stop work in the area affected and report the condition to the University's Representative in writing. The work in the affected area shall not thereafter be resumed except by written agreement of University and Contractor if in fact the material is asbestos, PCB, lead, or other hazardous substances and has not been rendered harmless. The work in the affected area shall be resumed in the absence of asbestos, PCB, lead, other hazardous substances, or when such materials have been rendered harmless.
- C. Disclose any unidentified hazardous substance or condition exposed during the work to the University's Representative for decision or remedy.
- D. In no event, shall the Contractor install materials that contain asbestos, PCB, lead or other known hazardous materials unless prior approval is obtained from the University.
- E. Disposal of lighting ballasts containing PCB's shall be accomplished by the University. Contractor shall be required to segregate waste ballasts that may contain PCBs. Ballasts labeled "NO PCBs" shall not be disposed of with PCB waste. The Contractor shall coordinate with the University's Representative regarding a date, location and time for delivery to a location on Campus to be designated.

DO NOT DELETE THE FOLLOWING TWO OFFICIAL NOTIFICATION ARTICLES

1.4 ASBESTOS IN BUILDINGS NOTIFICATION

- A. There are over 850 structures within UC Davis' authority that have or are presumed to have asbestos containing construction materials. California Health and Safety Code, Section 25915, Chapter 10.4, Division 20 requires UC Davis employees and contractors working for the campus to be notified of the presence of asbestos in buildings constructed prior to 1979.
- B. It is important to note that the presence of asbestos does not mean you have been exposed to asbestos. Exposure strictly refers to the inhalation or ingestion of friable asbestos particles. Asbestos becomes friable through drilling, sanding or similar destructive processes usually associated with remodeling or demolition work. Intact, bonded, sealed and undisturbed asbestos does not pose a hazard.
- C. For information about asbestos in specific buildings, contact the University's Representative.
- D. Contractors who disturb or potentially disturb hazardous or non-hazardous asbestos must comply with all Federal State and Local rules and regulations regarding asbestos materials.

1.5 LEAD BASED PAINT IN BUILDINGS

- A. There are over 850 structures within UC Davis authority that have or are presumed to have lead based paint. The California Department of Health Services (DHS) certifies workers and supervisors performing lead related construction activities, as defined in Title 17, California Code of Regulations, Division 1, Chapter 8. Lead related construction work is defined in Title 17 as any construction, alteration, painting, demolition, salvage, renovation, repair, or maintenance of any residential or public building, including preparation and cleanup, that, by using or disturbing lead containing material or soil, may result in significant exposure of adults or children to lead.
- B. Contractors shall utilize DHS certified workers and supervisors when performing activities that disturb painted/coated surfaces containing more than 600 ppm lead.
- C. It is important to note that the presence of lead does not mean you have been exposed to lead. Exposure strictly refers to the inhalation or ingestion of lead dust. Lead becomes dust through drilling, sanding or similar destructive processes usually associated with remodeling or demolition work. Intact, bonded, sealed and undisturbed lead does not pose a hazard.
- D. For information about lead in specific buildings, contact the University Representative.
- E. Contractors who disturb or potentially disturb lead must comply with all Federal, State and Local rules and regulations regarding hazardous materials.

#### 1.6 NOXIOUS OR TOXIC MATERIALS

- A. No noxious or toxic materials shall be used in or around occupied buildings without prior approval of the University.
- B. Store volatile wastes in covered metal containers and remove from premises daily.
- C. Prevent accumulations of wastes that create hazardous conditions.
- D. Provide adequate ventilation during use of volatile or noxious substances. Use such materials only after 48 hours previous notification to the University's Representative and preferably on weekends or "down" periods.
- E. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains.
- F. Do not allow or permit oil or fuel spillage during vehicle or equipment operations or maintenance. Any vehicle or equipment spills shall be cleaned up immediately and the soil disposed of properly. Provide secondary containment around any fuel or oil storage areas.
- G. Train Superintendent in prevention and correction of spills.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 35 43

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SECTION 01 35 53 SECURITY PROCEDURES

PART 1 - GENERAL

1.1 PROJECT SITE SECURITY

- A. Security of the Project site shall be strictly maintained. Contractor shall be responsible for keeping areas involved in this Work locked at all times when Work is not in progress.
- B. Provide security and facilities to protect the Work, existing facilities, and University's operations from unauthorized entry, vandalism, or theft.

1.2 KEYS

- A. Keys required for access to the Project will be issued by Design and Construction Management to the Contractor only. It shall be Contractor's responsibility to open areas for Subcontractors. Certain types of Projects may require more than 1 set of keys. Additional keys will be issued to the Contractor, if requested.
- B. At completion of the Project, all keys shall be returned to University's Representative. Failure to return keys will obligate Contractor for all costs incurred due to necessary rekeying.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 35 53

**OPTIONAL SECTION:** Mock-ups are part of Section 01 43 00 Quality Assurance; however this section should be used when more stringent building envelope requirements are desired.

SECTION 01 43 39 MOCK-UPS

PART 1 – GENERAL

1.1 MOCK-UPS

A. General mock-up requirements

1. Intent of mock-up is to permit review of appearance, quality of workmanship, coordination, compatibility, and relationships with adjacent materials, to test air and water infiltration performance, and to provide Contractor with opportunity to coordinate Subcontractor Work.
2. Maintain quality control over Work of various Sections of Specifications, manufacturers, products, services, workmanship, and site conditions to produce mock-ups in accordance with the Contract Documents.
3. Mock-ups include, but are not necessarily limited to, the following:
  - a. Exterior claddings, and finishes
  - b. Special Exterior Materials
  - c. Special Interior Finishes

B. Related Sections include the following:

Note to PM: Verify actual section numbers and titles with Design Professional  
Specify in each technical section when mock-ups are required from the Contractor and reference this Section 01 43 39 Mock-Ups.

1. Section 03 10 00 Concrete Formwork.
2. Section 03 20 00 Concrete Reinforcement.
3. Section 03 30 00 Cast-in-Place Concrete.
4. Section 04 20 00 Unit Masonry.
5. Section 04 72 00 Architectural Precast Concrete Fabrications.
6. Section 05 10 00 Structural Steel.
7. Section 05 30 00 Steel Decking.
8. Section 05 40 00 Cold-Formed Metal Framing.
9. Section 05 70 00 Decorative Metal.
10. Section 06 16 00 Sheathing.
11. Section 07 27 13 Modified Bituminous Sheet Air Barriers.
12. Section 07 42 43 Composite Wall Panels.
13. Section 07 54 19 Polyvinyl-Chloride (PVC) Roofing.
14. Section 07 62 00 Sheet Metal Flashing and Trim.
15. Section 07 92 00 Joint Sealants.
16. Section 08 41 13 Aluminum-Framed Entrances and Storefronts.
17. Section 08 44 13 Glazed Aluminum Curtain Walls.
18. Section 09 24 00 Portland Cement Plastering.

1.2 SUMMARY

- A. Location of the mock-up assembly at Project site must be approved by the University's Representative.

- B. Provide a freestanding exterior building mock-up to permit review of appearance, quality of workmanship, coordination, compatibility, and relationships with adjacent materials. The Contractor shall provide composite mock-up drawings prior to fabrication for approval by the University's Representative. Mock-up shall be constructed out of sequence and will not be incorporated into the final building. The mock-up will stand through the completion of the building exterior and serve as the standard for workmanship once it has been accepted in writing by the University's Representative. Provide the following exterior building mock-ups:
1. Exterior wall assembly systems and finishes, including all transitions and interfaces between different materials and walls to openings/curtain wall and storefronts. This is a single comprehensive mock-up.
    - a. Stucco: screeds, flashings, control and expansion joints, intersections with heads/jamb/sills of windows and doors and penetrations.
    - b. Precast to metal, with inside corner.
    - c. Metal panel to metal panel, with inside and outside corners.
    - d. Curtain wall to metal panel, with inside corner.
    - e. Curtain wall to curtain wall, with outside corner.
    - f. Curtain wall to precast, with inside corner.
  2. Exterior paving including all finishes specified.
- C. Provide full size room mock-ups within the building. The rooms to serve as the mock-ups shall be as indicated on the Drawings or as approved by University's Representative. Room mock-up shall include all required floor, wall, and ceilings finishes, casework, light fixtures, door(s) and frame(s), glazing, mechanical diffusers, and other required materials and finishes. Make necessary modifications until room mock-up is accepted by the University's Representative. Mock-up shall be constructed out of sequence. Upon acceptance, the room mock-up will be incorporated into the final completed Project. Provide the following room mock-ups:
1. Typical [Office/Conference] Room including all finishes
  2. Typical [Open Student Space (Academic Advising Center/Computer Center)] including all finishes and casework sections.
  3. Typical ornamental handrail/guardrail at 2 story volumes.
  4. Mock-ups will be used by the University's Representative to test color and material alternatives and to accept final colors, textures and workmanship. Multiple colors may be tested for each component as part of the mock-up until the University's Representative is satisfied.
- D. Special Finishes Mock-ups: Provide special finish mock-ups of the following materials in specified rooms. Mock-ups shall show materials and workmanship to be expected in the completed work. Make necessary revisions as required until each special finishes mock-up is accepted by the University's Representative. Accepted mock-ups will be allowed to remain in place. Provide special finishes mock-ups of the following:
1. Typical Interior Corridor including all finishes— at both the 2 story volume and single story volume conditions.
  2. Typical Corridor niche and alcove conditions.
- 1.3 SUBMITTALS
- A. Mock-ups shall not be fabricated until after acceptance of required submittals for all finish materials to be incorporated into the mock-ups. Project schedule shall take into account early submittal of these components to the University's Representative.
  - B. Submit shop drawings for the mock-up that integrate shop drawings of each finish material and footings and bracing. Clearly identify components and materials to be integrated into the assembly.

- C. Prior to construction of mock-ups, provide material samples as specified in the respective Specification Sections included as part of the mock-ups.
- D. Submit structural calculations as required to ensure the structural integrity of the mock-up. The calculations shall be signed by a licensed California structural or civil engineer and shall be submitted to the University's Representative for review.

#### 1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.
- B. Performance: Mock-ups shall be constructed for the University's Representative's review for compliance with the Contract Documents.
- C. Make necessary additions and modifications to mock-ups as required by the University's Representative.
- D. Modify mock-ups, or construct or install new components if requested by the University's Representative, until final acceptance is obtained.
- E. Provide as many modifications as required to achieve mock-ups that are acceptable to the University's Representative, meeting testing requirements, and of sufficient quality to serve as the standard for the complete Project.
- F. Following acceptance, mock-ups shall serve as a performance standard of quality and appearance of the Work it represents, including the interface with adjacent materials and components as applicable.
- G. Coordinate fabrication, delivery, assembly, and installation with related materials to be included in the mock-ups. Construction of the mock-up assemblies shall be under the supervision of the same personnel who will be employed for the subsequent work.
- H. Maintain mock-ups in neat, clean condition until removal or final acceptance. Repair damage as required to maintain in condition suitable for review and approval.
- I. Accepted building mock-up shall be removed from the Project site when indicated by the University's Representative. Accepted room mock-up may be incorporated into the work.
  - 1. Remove and clear area after approval of the exterior mock-up only as indicated by the University's Representative.
- J. Scheduling:
  - 1. Construct mock-ups in a timely manner to permit review and modifications such that the work is not delayed.
  - 2. Do not proceed with ordering of components or start construction until after mock-up acceptances have been obtained and University's Representative has approved.
  - 3. Provide the University's Representative not less than a 7 day notice of the time each component is ready for review.
  - 4. Include line item in the construction schedule for the exterior building mock-up, showing submittals, construction, review, and approval periods.
  - 5. Allow sufficient time in the schedule to accommodate failures of tests and necessity to modify and retest. The mock-up shall be erected in sufficient time to allow final approval of window frame color, glass selection, and sealant colors.

Note to PM: Coordinate testing of mock-ups with testing in each related technical specification section when the mock-ups are required from Contractor.

#### 1.5 PERFORMANCE TESTING

- A. Test Methods: The on-site exterior wall assembly mock-ups shall be tested in accordance with the following ASTM test procedures:
1. ASTM E 783: Field Measurement for Air Leakage through Installed Exterior Windows and Doors.
  2. ASTM E 1105: Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. As specified in the respective Sections of the Specifications.

### 2.2 EXTERIOR BUILDING MOCK-UPS

- A. Purpose: Establish standards for work indicated and specified to be included in mock-up to demonstrate quality of workmanship, materials, colors, and textures required by the Contract Documents. Include windows, sealants, siding, flashing, and other exterior materials.
1. Mock-up will be used by the University's Representative to test color and material alternatives and to review and accept final colors, textures and workmanship. A maximum of 5 different colors may be tested as the mock-up for each component.
  2. Interior finishes will not be required to be installed on the interior side of the exterior building mock-up.
- B. Design Concept: Engineer and construct mock-up, including required shoring, bracing, foundations, power, etc., making required additions and modifications to details as required.
1. Comply with performance requirements specified in the individual Specification Sections while maintaining basic design concept, member profiles, and alignment of components.
- C. Location: As indicated on the Drawings or as approved by University's Representative.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Pre-Engineering Conference for Exterior wall assembly: Prior to commencement of work, schedule meetings at mutually agreeable time to include University's Representative, University's Consultants (Design Professional, Structural Engineer, Waterproofing Consultant), Contractor, and Subcontractor involved in associated exterior work, manufacturer's representative and other interested parties to review methods and procedure to be used to achieve design and Performance Requirements.

### 3.2 INSTALLATION

- A. Installers proposed for use on the actual work shall install the mock-ups. Personnel representing manufacturers, fabricators, and installers of exterior wall components shall be present during mock-up construction and testing as appropriate for efficient evaluation and revision if required.

### 3.3 SEQUENCE OF INSPECTION

- A. Notify the University's Representative at the start of construction of mock-ups and transmit progress reports to allow the University's Representative to schedule reviews.
- B. Visual examination of mock-ups shall be made by the University's Representative.
- C. After approximately 50 percent of each mock-up has been built, request the University's Representative's preliminary review before completion. Incorporate visual and technical changes or variations requested by the University's Representative into mock-ups during their construction and prior to their completion.

- D. Obtain the University's Representative's acceptance of visual and technical qualities of mock-ups before commencing the corresponding work for the Project.
- E. Should the mock-ups fail to meet the requirements, it shall be taken down or dismantled, and reconstructed to the extent necessary, until acceptance has been obtained.
- F. Time the completion and reworking of mock-ups necessary to obtain acceptance to avoid delay in the construction schedule of the Project. Update the Construction Schedule to reflect required revisions to mock-ups.
- G. Maintain and protect mock-ups during construction to serve as a standard for judging work incorporated into the Project. Do not alter, remove, or destroy remote mock-ups until authorized by the University's Representative.

### 3.5 TESTING PROCEDURES

- A. Conduct tests of mock-ups in the presence of the University's Representative, the Contractor, the Installer and the University's Design Professional. Proceed with each test only after acceptance of the detailed outline of test procedure.
  - 1. Test protocol requires that air infiltration testing precede water tests. Should it be necessary for a water test to be performed in advance of the air test, the specimen must be allowed to completely dry before air test.
  - 2. The wind machine used for the dynamic water test shall generate wind speeds equivalent to 10 psf.
  - 3. Center deflection readings shall be taken for glass during testing.
- B. Tests: Make the following tests of the mock-ups in the order listed:
  - 1. Preliminary loading at 20 psf.
  - 2. Air Infiltration (Static Pressure): ASTM E783, except test pressure difference shall be 6.24 psf. Infiltration for entire assembly shall not exceed 0.1cfm/sf/min.
  - 3. Water Penetration (Cyclic Pressure): ASTM E 1105. Test to full design pressure without derating. No water intrusion is acceptable. The definition of water intrusion includes any water visible from the finished building interior, whether or not defined as controlled.
  - 4. Water penetration testing of exterior wall claddings. CBC Section 1403.2. Test all claddings, following this test procedure. Test to the code prescribed minimum pressure or building design pressure, whichever is greater.
- C. Preconstruction Test Report:
  - 1. Photographs:
    - a. Take a minimum of 20 photographs at locations and intervals required by the University's Representative.
    - b. Submit digital color images of mock-up before, during, and after testing. Include these images in the test report.
  - 2. Details of Test Results:
    - a. List test results in order of testing.
    - b. All tests required by the specifications are to be set forth in the test report stating each of the following:
      - 1) Test results achieved
      - 2) In the case where any revisions are made to the rest specimen to achieve the rest results reported. All such changes shall be noted in the test report and graphically described on the mock-up shop drawings.
      - 3) Testing dates.

- 4) A failure analysis sheet as an appendix to the test report indicting any corrective action taken to achieve compliance with the specification.

D. Corrective Measures:

1. Correct any deficiencies in the mock-up observed during testing and repeat tests as may be required to show compliance with the specified performance standards and the Contract Documents. Resubmit any submittals affected by these corrections. Resubmit Shop Drawings with changes made to assemblies to successfully complete preconstruction testing.
2. Deficiencies requiring repair or modification to the mock-up shall mandate a complete retesting of the mock-up beginning with the specified Preliminary Test unless otherwise requested by the University's Representative. If compliance with the performance standards is not achieved after 2 complete retests the Contractor shall replace mock-up completely with revised construction and start testing from the beginning.
3. Incorporate corrective measures indicated by the test report into the final exterior wall assemblies after review by the University's Representative.

E. Final Acceptance

1. Final Acceptance of the mock-up shall be done in writing. Successful testing results and the completed test report are required for this acceptance.

3.7 DISPOSAL

- A. When authorized by University's Representative, demolish and remove all components of composite mockups from project site.

END OF SECTION 01 43 39

Coordinate use of the following exhibits:  
Exhibit 27 Automatic Sprinkler Systems-Contractor's Material and Test Certificate for Aboveground Piping, Exhibit 28 Automatic Sprinkler Systems-Contractor's Material and Test Certificate for Underground Piping, Exhibit 38 Refrigerant Recovery/Use Notification Form, and Exhibit 39 New Refrigerant Containing Equipment input form with this section

SECTION 01 41 00 REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 CODES, AGENCIES, AND REFERENCES

- A. The Work shall be performed in accordance with Applicable Code Requirements and applicable requirements of all other regulatory agencies, including, but not limited to, the following:
1. Americans with Disabilities Act - Title II.
  2. California Environmental Quality Act.
  3. California Health and Safety Code.
  4. National Fire Protection Association (NFPA).
  5. Federal Occupational Safety and Health Administration.
  6. Federal Environmental Protection Agency – Clean Air Act.

Coordinate item 7 with Section 01 57 01 Storm Water Pollution Prevention

7. Storm Water Pollution Prevention Act.
8. Local Air Quality Management District.

1.2 STANDARDS AND CODES

- A. Applicable laws, codes, rules, regulations, ordinances and standards
1. California Code of Regulations (CCR)
    - a. Title 8, Industrial Relations
    - b. Title 17, Public Health
    - c. Title 19, Public Safety
    - d. Title 20, Public Utilities and Energy
    - e. Title 21, Public Works
    - f. Title 22, Environmental Health
    - g. Title 24
      - 1) Part 2, California Building Code (2007)
      - 2) Part 3, California Electric Code (2001)
      - 3) Part 4, California Mechanical Code (2007)
      - 4) Part 5, California Plumbing Code (2007)
      - 5) Part 6, California Energy Code (2005)
      - 6) Part 7, California Elevator Safety Construction Code
      - 7) Part 9, California Fire Code (2007)
      - 8) Part 12, California State Reference Standards

1.3 REFERENCES

- A. 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 latest edition of each in effect at the date of submission of bids, or the date of the Change Order or Field Order, as applicable.

1.4 CONFLICTS

- A. Unless otherwise directed by the University's Representative, if a conflict exists between referenced regulatory requirements and the Contract Documents, comply with the one establishing the more stringent requirements.
- B. Nothing stated in this Section of the Specifications or other Sections of the Specifications, the other Contract Documents or the Bidding Documents or shown on the Drawings shall be construed as

allowing Work that is not in strict compliance with all applicable Federal, State, regional, and local statutes, laws, regulations, rules, ordinances, codes and standards.

#### 1.5 TRENCHING AND SHORING

- A. All Work shall be in full accordance, but not necessarily limited to the following codes and regulations: Titles 8, 19, 21, 22, & 24, State of California, California Code of Regulations (CCR), California Occupational Safety and Health Administration (OSHA).
1. Pursuant to Labor Code 6707, the Contractor shall include in the bid all costs incident to the provisions of adequate sheeting, shoring, bracing or equivalent method for the protection of life or limb that shall conform to applicable Federal and State safety orders.
  2. Before beginning any excavation 5 feet or more in depth, the Contractor shall submit to the University's Representative a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation. The proposed plan shall comply with the standards established by the State of California Construction Safety Orders, Title 8 and Title 24 of the California Code of Regulations (CCR). If the detailed plan varies from such shoring system standards, it shall be prepared by a registered civil or structural engineer whose name and registration number shall be indicated on the Drawing. If a dispute arises as to whether the plan must be prepared by a registered civil or structural engineer, the University's Representative's determination of the matter shall be final and conclusive on the Contractor. The cost of required engineering services shall be borne by the Contractor and shall be deemed to have been included in the Contract Sum for the Work as stated in the Agreement.
  3. Neither the review nor approval of any plan showing the design of shoring, bracing, sloping, or other provisions for worker protection, shall relieve the Contractor from the obligation to comply with construction State of California Construction Safety Order and Title 24 of the California Code of Regulations (CCR) for the design and construction of such protective Work, and the Contractor shall indemnify the University and the University's Representative from any and all claims, liability, costs, actions and causes of action arising out of or related to the failure of such protective systems. The Contractor shall defend the University, its officers, employees and agents and the University's Representative in any litigation or proceeding brought with respect to the failure of such protective systems.
  4. All Work including any temporary construction shall be in full compliance with the latest orders of the Division of Industrial Safety of the State of California and all codes and regulations as called for hereinafter in these specifications.

#### 1.6 REGULATORY NOTIFICATIONS

- A. Submit all required notifications to Federal, State of California, State in which disposal facility is located if not in California, regional, and local agencies with regulatory responsibilities associated with the Work activities that are included in the Contract. All notifications shall be served in writing, in the form required by the agency requiring notification, and in a timely manner so as not to negatively impact the Project schedule. Serve notifications at least 10 business days in advance (or earlier if required by agency) of activity requiring notice. The Contractor shall serve all required notifications in writing to all governmental and quasi-government agencies having notification requirements pertaining to any portion of the Work included in the Project.
- B. Contractor shall file a Notice of Intent for coverage under State General Construction Activity Storm water Permit National Pollutant Discharge Eliminate System (NPDES). Contractor shall comply with applicable permit requirements including the project Storm Water Pollution Prevention Plan (prepared by the Contractor). Reference Section 01 57 01 Storm Water Pollution Prevention
- C. The University owns many buildings throughout the state of California. The Contractor is responsible for contacting the local jurisdictional authority for AQMD in the area of work. Submit a written plan of intention for demolition of any building, removal of a load-bearing structure or removal of large stationary equipment and pay associated fees to the local Air Quality Management District (AQMD) in which the Work is to be performed. Comply with notification requirements

established by the local AQMD. Notification shall be filed a minimum of 10 business days in advance of starting site work. Provide the University's Representative with a copy of all notifications a minimum of 7 business days in advance of starting site work.

1.7 PERMITS, NOTIFICATIONS, CERTIFICATES AND UNIFORM HAZARDOUS WASTE MANIFEST

A. Permits

1. Contractor will [not] be required to obtain a [City of Davis] [specify other locations as necessary] building permit.

B. Fire Department

1. Contractor shall be responsible for coordinating the following notifications and obtaining the following permit(s) and posting of permit(s) on Project site prior to starting the Work. Permits are to be obtained through the University's Representative. Contractor shall allow for a minimum turnaround time of 4 business days. For permits involving fire alarm shutdowns allow a minimum of 7 business days. Contractor must follow the rules and regulations as written on or attached to the permit.
    - a. Hazardous Condition Permit - Hot Work: must be coordinated before starting any hot work (welding, burning, or cutting, etc.) involving use of gas or electric welding equipment. The permit may be applicable to more than 1 building. Contractor is responsible for reporting to the UC Dispatch Center by telephone (530) 752-6317, at the beginning and 30 minutes prior to the end of each shift that such "hot" work takes place.
    - b. Hazardous Conditions Permit-Asbestos / Lead: must be obtained before starting removal of asbestos containing materials, polychlorinated biphenyl (PCB), lead base paint or other hazardous materials found on Project site.
    - c. Hazardous Condition Permit-Special Conditions: Coordinate in advance with the University Fire Department before restricting access to or blocking of any building exit or Work that will require the shutdown of building fire protection or alarm systems. In addition, Contractor must obtain a permit for the storage or use of any flammable liquid in excess of 10 gallons or in any confined area where vapors can be ignited. The Contractor is responsible for reporting to the UC Davis Fire Dispatch Center by telephone at (530) 752-6317 at the beginning and 30 minutes prior to the end of each shift that such work takes place.
    - d. The Contractor must submit at the end of the Work Automatic Sprinkler Systems-Contractor's Material and Test Certificate for Aboveground Piping and Automatic Sprinkler Systems-Contractor's Material and Test Certificate for Underground Piping for approval by the UCDFD. The Automatic Sprinkler underground and aboveground will not be accepted until these certificates have been completed and submitted.
  2. Project Permit Sign-Off Card -UCDFD: Prior to commencing Work, the University's Representative will provide Contractor with a Project Permit Sign-Off Card issued by the UCDFD. The Project Permit Sign-Off Card shall be kept at the project site at all times. Required inspections as noted on the Project Permit Sign-Off Card shall be coordinated a minimum of 7 business days in advance through the University's Representative. Project will not be accepted nor occupied until fire clearance is granted by UCDFD.
- C. Underground Service Alert (USA) Notifications: Prior to commencing clearing, excavation and trenching, coordinate with Underground Service Alert (USA North/1-800-227-2600 or 811), in accordance with Section 01 71 33 Protection of Adjacent Construction.
- D. Uniform Hazardous Waste Manifest: Contractor shall be responsible for coordination with the University's Representative for obtaining a Uniform Hazardous Waste Manifest prior to removal of asbestos containing materials, polychlorinated biphenyl (PCB), or other hazardous materials from the Project site. Manifest will be provided by a Representative from University of California Environmental Health & Safety (UCDEH&S). Only the UCDEH&S Duty Officer will be allowed to sign individual manifests on behalf of the Contractor/University.

Coordinate with Exhibit 38 Refrigerant Recovery/Use Notification Form and Exhibit 39 New Refrigerant Containing Equipment Input Form

- E. Refrigerant Recovery/Use Notification and New Refrigerant Containing Equipment Input Form:  
Prior to University's release of final payment, Contractor shall submit necessary UC-Davis Refrigerant Recovery/Use Notification Form(s) and UC Davis Refrigerant Containing Equipment Input Form(s) located in the Exhibits to the University's Representative. The following work practices and information is required:
1. All Work has been performed in compliance with Federal Environment Protection Agency, Clean Air Act.
  2. Only EPA certified technicians have added or recovered refrigerants while working on refrigerant containing equipment (EPA Section 608 – Refrigerant Recycling Rule, Technician Certification).
  3. All work performed on refrigerant containing equipment (RCE) shall be documented and submitted using the UC-Davis Refrigerant Recovery/Use Notification Form. A separate form shall be submitted for each (RCE) unit per Section 608, Clean Air Act, Refrigerant Recycling Rule. Contractor shall submit notification forms with project As-Built Documents.
  4. Storage, labeling and disposal of refrigerants shall comply with EPA.
  5. Decommissioned refrigerant containing equipment shall display a weather resistant label clearly noting the removal of all hazardous materials, e.g. refrigerant, coolant, used oil, or any other hazardous material removed from unit.
  6. Disposal of decommissioned refrigerant containing equipment shall comply with all Federal, State and local regulations.
  7. All new refrigerant containing equipment shall be registered using the UC Davis New Refrigerant Containing Equipment Input Form.
- F. In no event, shall the Contractor install materials that contain asbestos, PCB, lead or other known hazardous materials unless prior approval is obtained from the University.
- G. Regulated Carcinogens by Title 8 California Code of Regulations (CCR), Subchapter 7, Group 16 (Control of Hazardous Substances), Article 110 (Regulated Carcinogens).
1. Products containing chemicals regulated as carcinogens by the State of California are not allowed for use on University projects.
  2. Case-by-case exceptions may be considered for products containing the following Cal/OSHA recognized carcinogens:
    - a. Methylene Chloride, 5202
    - b. Cadmium, 1532, 5207
    - c. Inorganic Arsenic, 5214
    - d. Formaldehyde, 5217
    - e. Benzene, 5218
  3. Case-by-case exceptions may only be made when suitable alternative products are not available. Such exceptions are subject to written approval by the University's Representative.
  4. Exceptions require that the Contractor shall have an established carcinogen program as required by Cal/OSHA (§5203. Carcinogen Report of Use Requirements) and shall submit to University's Representative, a copy of the Cal/OSHA Confirmation of Report for Cal/OSHA carcinogens.
  5. When exceptions are granted, the Contractor is responsible for providing to the University's Representative a copy of the semi-annual Confirmation of Report received from Cal/OSHA or, in lieu of that, a copy of the Contractor's semi-annual report as submitted to Cal/OSHA at periods not to exceed 6 months, or at project closeout, whichever occurs first.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 41 00

SECTION 01 42 00 REFERENCES

PART 1 - GENERAL

Edit to add any additional standards required by technical specifications that are not listed below. To avoid confusion with California Electrical Code **DO NOT** abbreviate California Energy Commission it must be spelled out.

1.1 ABBREVIATIONS

- A. Abbreviations and Acronyms: Where abbreviations and acronyms are used in Specifications, they shall mean the recognized name of the entities in the following list:

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	Architectural Aluminum Manufacturers' Association
AAN	American Association of Nurserymen, Inc.
AASHTO	American Association of State Highway and Transportation Officials
ABAG	Association of Bay Area Governments
ABPA	Acoustical and Board Products Association
ABPTA	American Bearing Power Transmission Association
ACI	American Concrete Institute
ACIL	American Council of Independent Laboratories
ACPA	American Concrete Pipe Association
ADA	Americans with Disabilities Act of 1990
ADAAG	American with Disabilities Act Accessibility Guidelines
ADC	Air Diffusion Council
AFBMA	Anti-Friction Bearing Manufacturers Association
AFI	Air Filter Institute
AGA	American Gas Association
AF&PA	American Forest and Paper Association
AGC	Associated General Contractors of America
AHA	American Hardboard Association
AI	The Asphalt Institute
AIA	American Institute of Architects
AIEE	American Institute of Electrical Engineers
AIMA	Acoustical and Insulation Materials Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALSC	American Lumber Standards Committee
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
AOAC	Association of Official Analytical Chemists
APA	American Plywood Association
API	American Petroleum Institute
AQMD	Air Quality Management District
ARI	Air-Conditioning and Refrigeration Institute
ASA	American Standards Association
ASAHC	American Society of Architectural Hardware Consultants
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers Association
ASTM	American Society for Testing and Materials
AWCI	Association of Wall and Ceiling Industries

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AWG	American Wire Gauge
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWPB	American Wood Preservers Bureau
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers' Association
BICSI	Building Industry Consulting Service International
BOCA	Building Officials and Code Administrators
CAC	California Administrative Code
Cal/OSHA	California Division of Occupational Safety and Health
CARB	California Air Resources Board
CBC	California Building Code
CBSC	California Building Standards Commission
CCR	California Code of Regulations
CDA	Copper Development Association, Inc.
CE	Corps of Engineers (U.S. Dept. of the Army)
CEC	California Electrical Code
CESO	California Elevator Safety Order
CGA	Compressed Gas Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturer's Institute
CLPA	California Lathing and Plastering Association
CMC	California Mechanical Code
CMM	State of California, Business and Transportation Agency, Division of Highways "Materials Manual"
CPC	California Plumbing Code
CPSC	Consumer Product Safety Commission
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standards of NBS (U.S. Dept. of Commerce)
CSS	State of California, Business and Transportation Agency, Department of Public Works, Division of Highways' "Standard Specifications"
CTI	Cooling Tower Institute
DCM	Design and Construction Management (UCD)
DHI	Door & Hardware Institute
DHS	California Department of Health Services
DSA	Division of State Architect
DSA/AC	Division of State Architect, Access Compliance Section
EIA	Electronic Industrial Alliance
EPA	Environmental Protection Agency
ESO	Electrical Safety Orders of Division of Industrial Safety, Title 8, CAC
ETL	Electrical Testing Laboratories
FCC	Federal Communications Commission
FFDA	Federal Food and Drug Administration
FGMA	Flat Glass Marketing Association
FIA	Factory Insurance Association
FM	Factory Mutual System, Factory Mutual Engineering Corporation
FS	Federal Specifications
GA	Gypsum Association
GFI	Ground Fault Interrupter
HEPA	High Efficiency Particulate Air

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HI	Hydronics Institute
HMI	Hoists Manufacturers Institute
HMMA	Hollow Metal Manufacturers Association
HPMA	Hardwood Plywood Manufacturers Association
IAPMO	International Association of Plumbing and Mechanical Officials
IBEW	International Brotherhood of Electrical Workers
IBR	Institute of Boiler and Radiator Manufacturers
ICBO	International Conference of Building Officials
ICEA	Insulated Cable Engineering Association
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society of North America
IGCC	Insulating Glass Certification Council
IPCEA	Insulated Power Cable Engineers' Association
ISA	Instrument Society of America
ISO	International Standards Organization
ITU	International Telecommunications Union
LIA	Lead Industries Association
LEED	Leadership in Energy and Environmental Design
MBMA	Metal Building Manufacturer's Association
MIA	Marble Institute of America
MIL	U.S. Government, Military Specification
MLSFA	Metal Lath/Steel Framing Association
MM	State of California, Business and Transportation Agency, Department of Public Works, Division of Highways' "Materials Manual"
MSS	Manufacturers Standardization Society of Valves and Fittings Industry
NAAB	National Association of Air Balance
NAAMM	The National Association of Architectural Metal Manufacturers
NACE	National Association of Corrosion Engineers
NBFU	National Board of Fire Underwriters
NBGQA	National Building Granite Quarries Association, Inc.
NBHA	National Builders' Hardware Association
NBS	National Bureau of Standards
NCMA	National Concrete Masonry Association
NCPWB	National Certified Pipe Welding Bureau
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NETA	InterNational Electrical Testing Association
NFPA	National Fire Protection Association
NHLA	National Hardwood Lumber Association
NIOSH	National Institute of Occupational Safety and Health
NPA	National Particleboard Association
NPDES	National Pollutant Discharge Eliminate System
NRC	Noise Reduction Coefficient
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association
NSF	National Sanitation Foundation
NWMA	National Woodwork Manufacturers Association, Inc.
NWWDA	National Wood Window and Door Association
OSHA	Office of Safety and Health Act
OSHPD	Office of Statewide Health Planning and Development

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PCA	Portland Cement Association
PCB	Polychlorinated Biphenyl
PCI	Precast/Prestressed Concrete Institute
PDI	Plumbing and Drainage Institute
PI	Perlite Institute
PS	Product Standard of United States Department of Commerce
RCSC	Research Council on Structural Connection
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service
RUS	U.S. Department of Agriculture, Rural Utilities Service
RWQCB	Regional Water Quality Control Board's
SAE	Society of Automotive Engineers
SBC	State Building Code
SBS	State Building Standards Electrical Code, Title 24, Part 3
SCAQMD	South Coast Air Quality Management District
SDI	Steel Door Institute
SFM	State of California, Office of State Fire Marshal
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal & Air Conditioning Contractors' National Association, Inc.
SPIB	Southern Pine Inspection Bureau (Grading Rules)
SPR	Simplified Practice Recommendation
SSPC	Society for Protective Coatings
STC	Sound Transmission Coefficient
SWI	Sealant and Waterproofers Institute
SWPPP	Storm Water Pollution Prevention Plan
TCA	Tile Council of America, Inc.
TIA	Telecommunications Industry Association
UBC	Uniform Building Code
UCD	University of California Davis
UCDDCM	University of California Davis Design and Construction Management
UCDEH&S	University of California Davis Environmental Health & Safety
UCDFD	University of California Davis Fire Department
UCDFPB	University of California Davis Fire Prevention Bureau
UCDFM	University of California Davis Facilities Management
UCDTAPS	University of California Davis Transportation and Parking Services
UFAS	Uniform Federal Accessibility Standards
UHMW	Ultra-High Molecular Weight
UL	Underwriters' Laboratories, Inc.
USA	Underground Service Alert
USDA	United States Department of Agriculture
USGBC	United States Green Building Council's
USS	United States Standards
USSG	United States Steel Gauge
WAPA	Western Area Power Authority
WCLIB	West Coast Lumber Inspection Bureau
WH	Warnock Hersey
WI	Woodwork Institute In 2003
WLPDIA	Western Lath/Plaster/Drywall Industries Association
WRSI	Western Concrete Reinforcing Steel Institute
WWPA	Western Wood Products Association
WWPOA	Western Wood Preserving Operators Association

WWTP	Waste Water Treatment Plant
YSAQMB	Yolo/Solano Air Quality Management Board

B. Additional abbreviations, used on the Drawings, are listed thereon.

## 1.2 SYMBOLS

A. Symbols, used only on the Drawings, are shown thereon.

## 1.3 DEFINITIONS

A. The following terms, when used on the Drawings or in the Specifications, shall have the following meanings:

1. AS DIRECTED - "As directed by the University's Representative."
2. AS REQUIRED - "As required by Applicable Code Requirements; by good building practice; by the condition prevailing; by the Contract."
3. AS SELECTED - "As selected by the University's Representative."
4. BY OTHERS - Work on this Project that is outside the scope of Work to be performed by the Contractor under this Contract, but that will be performed by the University, Separate Contractors, or other means.
5. EQUAL - Of same quality, appearance, and utility to that specified, as determined by the University's Representative. The Contractor bears the burden of proof of quality.
6. EXPOSED - Exposed to view, both interior and exterior; exposed to elements.
7. FABRICATED - Items specifically assembled or made out of selected materials to meet individual design requirements.
8. FURNISH - "Supply only, not install (unless required to be provided or installed elsewhere in the Contract Documents)."
9. INSTALL - "Install or apply only, not furnish."
10. MANUFACTURED - Applies to standard units usually mass produced.
11. OFF SITE - Outside the Work area as shown on the Drawings or the property lines.
12. PROJECT SITE - Geographical location of the Project.
13. PROVIDE - "Furnish and install."
14. SHOWN - "As indicated on the Drawings."
15. SPECIFIED - "As written in the Contract Documents."
16. SUBMIT - "Submit to University's Representative."
17. UNIVERSITY-FURNISHED, CONTRACTOR INSTALLED - "To be furnished by University at its cost and installed by Contractor as part of the Work."

For Design Build add the following terms:

18. DESIGN BUILDER: The term "Design Builder" means the person or firm identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. As used in the Documents, the term Contractor means Design Builder.
19. SPECIFICATIONS - Shall mean University Specification, Performance Specification, Design Builder's detailed specification, or standard specification. When any of these specifications shall conflict, the specification offering the highest performance or design standard to the University shall govern.
20. LETTER OF INSTRUCTION - Clarification/Supplemental Instructions.
21. PERFORMANCE SPECIFICATIONS - The printed documents in the Exhibits defining the criteria of materials and workmanship required as a minimum under this contract.
22. SUBMITTALS - Detailed fabrication and setting drawings, deliverable as called for in the Contract Documents, samples, material lists, and manufacturer's equipment brochures setting forth in detail the Work as it is proposed by Design Builder.
23. UNIVERSITY SPECIFICATIONS - General Requirements in the exhibits to the Contract Documents.

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PART 1 - PRODUCTS (NOT USED)

PART 2 - EXECUTION (NOT USED)

END OF SECTION 01 42 00

SECTION 01 43 00 QUALITY ASSURANCE

PART 1 - GENERAL

1.1 MOCKUPS

OPTIONAL ARTICLE: Mock-ups are part of this section; however Section 01 43 39 Mock-Ups should be used when more stringent building envelope requirements are desired, especially for stucco and new buildings. In that case use the "Refer to" paragraph and delete the remainder of this article.

A. Refer to Section 01 43 39 Mock-Ups

OR

B. General mock-up requirements

1. Intent of mock-up is to ascertain element's designed fit into space provided and to provide Contractor with opportunity to coordinate Subcontractor Work.
2. Maintain quality control over Work of various Sections of Specifications, manufacturers, products, services, workmanship, and site conditions to produce mock-ups in accordance with the Contract Documents.
3. Mock-ups include, but are not necessarily limited to, the following:

Project Manager should specify in each technical section when the mock-ups are required from the Contractor.

- a. Portland Cement Concrete Paving.
- b. Concrete Work.
- c. OTHERS

C. Submittals: Complete required submittals prior to construction of mock-ups including but not limited to product data, samples and shop drawings as required.

D. Construction Schedule: Include mock-up activities including administrative and procedural submittals and materials ordering and assembly on Schedule per the requirements of 013200 Construction Progress Documentation. Identify every element required for each mock-up. Allow ample advance time for preparation and approval of mock-ups prior to placement of final orders for work without delay to progress or completion of the work.

E. Workmanship

1. Comply with standards specified. Provide qualified personnel to produce mock-up of specified quality.
2. Assemble and erect complete, with specified attachment and anchorage devices, flashings, seals and finishes. Secure mock-ups in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.
3. Provide finish to match approved samples. When required in individual Specification Sections, install full-scale mock-up of assembly at Project site at location acceptable to the University's Representative.

F. Approval

1. Maintain approved mock-ups as standard for evaluating Work until Work is completed and removal is approved by the University's Representative.
2. Acceptable mock-ups shall not be retained in completed Work unless noted otherwise.
3. Remove unacceptable mock-ups. Mock-ups not incorporated into finished Work shall be removed from the site immediately as approved by the University's Representative.
4. Mock-ups shall be approved by the University's Representative in writing, as a condition precedent to approval of shop drawings for work represented by the mock-up.

1.2 TESTING AND INSPECTION

A. Definitions

1. The term "University's Testing Laboratory" means a testing laboratory retained and paid for by University for the purpose of reviewing material and product reports and performing other services as determined by the University.
2. The term "Contractor's Testing Laboratory" means a testing laboratory retained and paid for by Contractor to perform the testing services required by the Contract Documents. Contractor's Testing Laboratory shall be an organization other than University's Testing Laboratory and shall be acceptable to the University's Representative. It may be a commercial testing organization, the testing laboratory of a trade association, the certified laboratory of a supplier or manufacturer, Contractor's own forces, or other organization. Contractor's Testing Laboratory shall have performed testing of the type specified for at least 5 years.
3. The term "Geotechnical Engineer" means an engineer retained and paid for by the University for the purpose of performing inspection, testing, and observation functions specified by the University.

B. Contractor's Responsibilities Regarding University's Testing Laboratory

1. Secure and deliver to University's Testing Laboratory adequate quantities of representative samples of materials proposed for use as specified.
2. Submit to University's Testing Laboratory the preliminary design mixes proposed to be used for concrete and other materials that require review by University's Testing Laboratory.
3. Submit copies of product test reports as specified.
4. Furnish incidental equipment, labor and facilities:
  - a. To provide University's Testing Laboratory access to the Work to be tested.
  - b. To obtain and handle samples at the Project site or at the source of the product to be tested.
  - c. To facilitate inspections and tests.
  - d. For storage and curing of test samples.
5. Provide notice to University's Representative sufficiently in advance of operations to allow for University's Testing Laboratory assignment of personnel and scheduling of tests.
6. When tests or inspections are cancelled after such notice due to work not being ready for testing, Contractor shall reimburse University for University's Testing Laboratory personnel and travel expenses incurred.

C. Tests and Inspections

1. Tests, inspections, and acceptance of portions of the Work required by the Contract Documents or by Applicable Code Requirements shall be made at the appropriate times. Except as otherwise provided, Contractor shall make arrangements for such tests, inspections, and acceptances with Contractor's Testing Laboratory. Contractor shall give the University's Representative timely notice of when and where tests and inspections are to be made using the Inspection Request Exhibit.
2. If such procedures for testing, inspection, or acceptance reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, Contractor shall bear all costs made necessary by such failure including those of repeated procedures and compensation for the University's Representative's services and expenses.
3. If the University's Representative is to observe tests, inspections, or make acceptances required by the Contract Documents, University's Representative will do so promptly and, where practicable, at the normal place of testing.
4. Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.
5. Certain portions of the Work will be tested and inspected at various stages. Nothing in any prior acceptance or satisfactory test result shall govern, if at any subsequent time the Work, or portion thereof, is found not to conform to the requirements of the Contract Documents.
6. If testing and inspection is required by the University's Representative outside of a [50] mile radius from the project site, any additional costs above the University's Testing Laboratory

local standard rates shall be borne by the Contractor, including but not limited to per diem costs, travel time and premium time.

7. Inspection related to steel

a. For testing and inspection work related to steel, refer to Sections [00 00 00 Title], [00 00 00 Title] and [00 00 00 Title].

1) Allocated Time: Costs of welding and fabrication inspection up to a total of [ ] man days of inspection (at 8 hours per man day) on all hot rolled and cold formed steel framing, including miscellaneous metal assemblies, not differentiated between field and shop welding, will be borne by the University; and the cost of any such inspection required above this amount will be borne by Contractor.

b. The University may at its option recognize the steel fabricator as an "Approved Fabricator" per 2001 CBC Section 1701.7.

1) Submit the following for the approved fabricator:

a) Fabricator's quality control inspection reports of all weldments.

b) A certificate of compliance that the Work was performed in accordance with the approved drawings and Specifications.

D. Additional Testing and Inspection

1. If initial tests or inspections made by University's Testing Laboratory or Geotechnical Engineer reveal that any portion of the Work does not comply with the Contract Documents, or if the University's Representative determines that any portion of the Work requires additional testing or inspection, additional tests and inspections shall be made as directed.

a. If such additional tests or inspections establish that such portion of the Work complies with the Contract Documents, all costs of such additional tests or inspections shall be paid by the University.

b. If such additional tests or inspections establish that such portion of the Work fails to comply with the Contract Documents, all costs of such additional tests and inspections, and all other costs resulting from such failure, including compensation for the University's Representative and the University's consultants, shall be deducted from the Contract Sum.

E. Test Reports

1. University's Testing Laboratory and Contractor's Testing Laboratory shall submit [1 copy] [# copies] of all reports to University's Representative, indicating observations and results of tests and indicating compliance or non-compliance with the Contract Documents.

2. University's Representative will distribute 1 copy of the reports to the University, University's consultants, and Contractor.

3. The number of copies for the Contractor and supplier being tested will be determined upon commencement of the Contract.

F. Closing in Uninspected Work

1. Do not allow or cause Work to be covered or enclosed before it has been inspected and approved by the University's Representative. Should any Work be enclosed or covered before it has been approved, it shall be uncovered, inspected, approved or repaired, and covered. Make all repairs necessary to restore Work of others to the condition in which it was found at time of cutting, at no additional cost to the University.

G. Geotechnical Engineer

1. All excavation, filling, and compaction shall be subject to inspection, observation, and testing by Geotechnical Engineer. When required, University will retain and pay the expenses of a Geotechnical Engineer to perform inspection, testing, and observation functions specified by the University. The Geotechnical Engineer shall communicate only with the University's

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Representative. The University's Representative shall then give notice to the Contractor of any action required of the Contractor.

---OR---

2. All excavation, filling, and compaction shall be subject to inspection, observation, and testing by Geotechnical Engineer. The University will retain and pay expenses of the Geotechnical Engineer to perform the inspection, testing, and observation functions described in this Section, except that the costs of any additional testing or inspection made necessary by inadequate compaction, replacement of unacceptable material or other Work not complying with the Contract Documents shall be borne by the Contractor and may be deducted from the Contract Sum. The Geotechnical Engineer shall communicate with the University's Representative who will relay any appropriate instructions to the Contractor.
3. Source Quality Control: Geotechnical Engineer will sample and test fill material from the source designated by the Contractor. Contractor shall pay for the Geotechnical Engineer's transportation expenses, if the source is more than 50 miles from the Project site.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 43 00

SECTION 01 45 00 QUALITY CONTROL

PART 1 - GENERAL

**OPTIONAL – The General Conditions specify a project superintendent for all projects**  
PM should use this section to add more contractor staff such as Project Manager or Quality Assurance Manager for commissioning.

If the project does not require extra Contractor staff delete the section.

When Contractor staff has been part of a prequalification process coordinate with PQ requirements.

For Design Build use Section 01 44 00 Quality Control

**NOTE: THIS IS TEXT FROM THE GENERAL CONDITIONS**

1.1.31: The term "Superintendent" means the person designated by Contractor to represent Contractor at the Project site in accordance with Article 3.

**3.8 SUPERINTENDENT**

3.8.1 Contractor shall employ a competent Superintendent satisfactory to University who shall be in attendance at the Project site at all times during the performance of the Work. Superintendent shall represent Contractor and communications given to and received from Superintendent shall be binding on Contractor.

3.8.2 Failure to maintain a Superintendent on the Project site at all times Work is in progress shall be considered a material breach of this Contract, entitling University to terminate the Contract or alternatively, issue a stop Work order until the Superintendent is on the Project site. If, by virtue of issuance of said stop Work order, Contractor fails to complete the Contract on time, Contractor will be assessed Liquidated Damages in accordance with the Agreement.

3.8.3 The Superintendent approved for the Project must be able to read, write and verbally communicate in English.

3.8.4 The Superintendent may not perform the Work of any trade, pick-up materials, or perform any Work not directly related to the supervision and coordination of the Work at the Project site when Work is in progress.

**1.1 CONTRACTOR'S PROJECT MANAGER**

- A. Contractor shall employ a competent Project Manager satisfactory to University who shall be in attendance at the Project site **[at all times] [as needed]** during the performance of the Work. Project Manager shall represent Contractor and communications given to and received from Project Manager shall be binding on Contractor.
- B. The Contractor shall submit to the University the qualifications of the Project Manager prior to commencement of the Work. The University shall approve the Project Manager based on his/her experience with projects similar in type, scope and size.
- C. The Project Manager approved for the Project must be able to proficiently read, write and verbally communicate in English. The Project Manager may not perform the Work of any trade, pick up materials, or perform any Work not directly related to the supervision and coordination of the Work at the Project site while Work is in progress.
- D. Failure to maintain a Project Manager on the Project site at all times Work is in progress shall be considered a material breach of this Contract, entitling University to terminate the Contract or alternatively, issue a stop Work order until the Project Manager is on the Project site. If, by virtue of issuance of said stop Work order, Contractor fails to complete the Contract on time, Contractor will be assessed Liquidated Damages in accordance with the Agreement.
- E. If the Contractor elects a replacement of the Project Manager, such replacement shall be approved by the University's Representative prior to actual replacement. The same criteria employed by the

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University to evaluate the initial Project Manager shall also apply to the University's approval of any subsequent Project Manager.

For smaller projects, this Article may be deleted or the requirements modified as appropriate after consultation with Peter Shahrokh and Ardie Dehghani.

#### 1.2 QUALITY ASSURANCE MANAGER

- A. Contractor shall employ a competent Quality Assurance Manager satisfactory to University who shall be in attendance at the Project site. The Quality Assurance Manager shall manage, coordinate and supervise the Contractor's quality assurance program and the construction phase commissioning process. The Quality Assurance Manager shall be a representative of the Contractor [and shall be a different individual than the Superintendent and the Project Manager]. All communication between the Quality Assurance Manager and the University shall be binding to the Contractor.
- B. The qualifications and detailed responsibilities of the Quality Assurance Manager are specified in section 01 91 00 Commissioning.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 45 00

Coordinate with Exhibit 43 - Utility Service Initiation And Termination Form

Revisions to this section should complement the following general conditions paragraph; 3.3 labor and materials - 3.3.1 unless otherwise provided in the contract, contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and final completion of the work, whether temporary or permanent and whether or not incorporated or to be incorporated in the work.

SECTION 01 51 00 TEMPORARY UTILITIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes provision of temporary utilities and includes administrative and procedural requirements.

1.2 REQUIREMENTS

- A. Refer to applicable requirements specified in Division 22 Plumbing, and in Division 26 Electrical, Division 27 Telecommunications and Division 33 Utilities.

For Mini or Brief Form Contracts, select option "B".

For Long Form Contracts with work in existing buildings, option "B" may be selected.

For Long Form Contracts requiring siting of temporary trailers or major construction, option "C" shall be selected.

- B. University will furnish, at no cost to Contractor, utilities used during the course of construction and commissioning; including gas, water, electricity, chilled water, **[and] steam[, and data service]** until that portion of the work is accepted by the University through Beneficial Occupancy or Substantial Completion. Contractor shall install and maintain services during the Work. Contractor shall provide and pay for the monthly usage for telephone **[and data]** service. If the University's Representative determines, that the Contractor is not making reasonable efforts to conserve energy and water, it may terminate its permission for free access and impose partial or full charges for such services it provides to the Contractor effective from the date such determination is provided to the Contractor in writing.

-- OR --

- C. Contractor shall provide, maintain and pay the University for the monthly usage of all utilities used during the course of construction and commissioning; including gas, water, electricity, chilled water, steam, and telephone and data service until that portion of the work is accepted by the University through Beneficial Occupancy or Substantial Completion. Payment in full for all temporary utilities shall be a condition precedent to issuance of the Notice of Substantial Completion.
- D. University does not guarantee amounts of utilities available from existing University's sources, nor will the University be responsible for interruptions in service.
- E. Contractor shall coordinate with the University's Representative prior to making any temporary utility connections.
- F. Contractor shall submit to University's Representative for approval a small scale drawing detailing proposed points of connections, materials proposed for use and routes for temporary utilities. Contractor shall not proceed with connections, modifications or extension of utilities without written approval by the University's Representative.
- G. Maintain and operate systems in conformance with industry standard, applicable codes and manufacturer guidelines to provide continuous service.
- H. Contractor shall be responsible for costs for connection, modification or extension and disconnection of all temporary utilities; e.g. gas, water, power and telephone.

- I. Temporary materials may be new or used, but shall be adequate for the required purposes. Their use and methods of installation shall not create unsafe conditions or violate requirements of Applicable Codes and Standards.
- J. Submit Utility Service Initiation and Termination Form located in the Exhibits to initiate request for temporary or final utilities service. Submit a dedicated form for each utility and for each request to University's Representative. Submit the form 14 days prior to the requested utility service start date.
- K. Utility charges that are delinquent for more than 60 days shall be deducted from the Contractor's Application for Payment.

### 1.3 REQUIREMENTS OF REGULATORY AGENCIES

- A. Install and use temporary utilities in accordance with the following:
  - 1. California Electrical Code.
  - 2. Federal, State, and local codes and regulations.
  - 3. University Utility provider requirements.

### 1.4 SUBMITTALS

- A. Contractor shall make all submittals in accordance with Section 01 33 23 Shop Drawings, Product Data and Samples.
- B. Small scale drawing detailing points of connections, materials proposed for use and routes for temporary utilities.
- C. Utility Service Initiation and Termination Form located in the Exhibits, one for each utility service, to request temporary or final utility service. Submit the form 14 days prior to the requested utility service start date.

### 1.5 PROJECT PERMANENT UTILITIES USED DURING CONSTRUCTION

- A. Coordinate with University's Representative for inspection of work prior to requesting permanent utilities. Contractor shall correct all deficiencies before the related utility is energized.
- B. Provide proof of calibration for permanent meters prior to activating permanent utility services. The calibration date shall not exceed 6 months prior to installation.
- C. Pay University for monthly usage of all permanent utilities used during construction and commissioning including gas, water, electricity, chilled water, steam, telephone and data.

### 1.6 ACTIVATING UTILITIES

- A. For all utilities except telephone and data, request activation using Utility Service Initiation and Termination Form located in the Exhibits.
- B. Refer to the temporary telephone and data services in this specification for the related requirements.

### 1.7 REMOVAL AND RECONDITIONING

- A. Request University to disconnect services and develop final billing using Utility Service Initiation and Termination Form located in the Exhibits. University requires a 5-day written notice prior to the date of the referenced utility disconnect request. Verbal requests for disconnects will not be accepted.
- B. At the conclusion of the work, remove all temporary services installed as a requirement of these Contract Documents and return the temporary meters to University. Restore temporary utilities to their original condition at the completion of Work.
- C. Legally and properly dispose of all debris resulting from removal and reconditioning operations.

If metering and recharge for utilities during the contract was not selected as listed in Paragraph 1.C, delete requirements listed below in paragraphs 1.8 & 1.9. Retain title and insert (NOT USED)

1.8 TEMPORARY ELECTRICITY AND WATER METERING

- A. University will provide temporary water and electricity metering for temporary services. Contractor shall coordinate exact meter location with University's Representative prior to proceeding with work and provide adequate accessible location for University to install these meters.
- B. The electrical meter will be housed in an approved NEMA 3 enclosure. Contractor shall provide an accessible location for this meter adjacent to the Contractor's main breaker. Contractor shall complete the necessary related work including conduit and provide two one-inch knockouts in their main breaker panel to allow University to extend and connect the meter to the breaker.
- C. The water meter will be located adjacent to the Contractor's approved reduced pressure backflow preventer. Contractor shall complete the necessary related work including piping and disinfection.

1.9 UTILITY RATES

- A. Electricity, natural gas, water, steam and chilled water may be taken from University's systems in such quantities and at such times as they are available. If this is done, provide all equipment, including, connections, transformers, and other materials necessary for extending the utility lines to where they will be used. Coordinate the installation with the University's Representative.
- B. If construction power, natural gas, water, chilled water, steam, or other related utilities are not available, Contractor shall be required to provide supplemental equipment such as generators to accommodate the construction needs.

Project Manager to contact Brenda Scalzi with FO&M Utility Group at (530) 754-5224 for current rates

- C. Pay for electricity and natural gas used at the current PG&E rate. Utilities Rate charges for fiscal year 2012 are:
  - 1. Electricity \$0.0835/kwh
  - 2. Gas \$1.0141/therm
- D. Pay for the following utilities at the current University rate. Utilities Rate charges for fiscal year 2012 are:
  - 1. Chilled Water \$.0870/ton
  - 2. Steam \$13.9644/klb
  - 3. Water \$1.1000/ccf
  - 4. Sewer \$2.5704/ccf
- E. Utility rates are subject to change at any time through the campus rate setting process.
- F. Contractor will be billed on a monthly basis via the University accounting system. Payments shall be made monthly and account paid in full before final University payment to Contractor is made.

1.10 TEMPORARY FIRE PROTECTION

- A. Contractor shall conform to all applicable codes, standards, regulations and the following rules, and instructions of the University of California Davis Fire Department (UCDFD).
- B. Assign a qualified person with authority to maintain fire protection equipment, institute fire prevention measures, be a liaison with the University of California Davis Fire Prevention Bureau (UCDFPB) and direct the prompt removal of combustible and waste materials from the Project site. Prior to start of Work, the Project Superintendent and the Contractor's Safety Officer shall meet with the University's Representative and UCDFD Assistant Fire Marshal assigned to the Project for a mandatory safety meeting.
- C. No burning shall be done on Project site.
- D. Provide and maintain fire protection equipment including extinguishers, fire hoses, and other equipment as necessary for proper fire protection during the course of the Work

Use fire protection equipment only for extinguishing fires.

- E. Locate fire extinguishers in field offices, storage sheds, tool houses, other temporary buildings, and throughout the Project site. In the area under construction [demolition] [and abatement] provide at least 1 multi-purpose dry chemical fire extinguisher for each 5,000-square feet of building floor area. Locate fire extinguishers so that a person never has to walk more than 75 feet to obtain one.]
- F. Fire extinguisher minimum size shall be 4A:20BC (10 pound ABC).
- G. Call 9-1-1 and pull fire alarm box when applicable, for any emergency. Report the exact location (building name and street intersection) and nature of the emergency. If using a cellular phone dial (530) 752-1234 for an emergency located on University property. Contractor is responsible for and will be billed for fire response charges (actual cost of personnel and equipment) for any false alarm.
- H. Refer to Section 01 41 00 Regulatory Requirements for permits required.
- I. Vehicles and materials stored on Project site must not obstruct, block, damage or render useless any fire hydrants, fire department connection, fire alarm box or fire access roadway. Any necessary road closures or disruption to utilities shall be requested through the University's Representative.
- J. Once accepted by the Fire Marshal, do not tamper with or work on any fire alarm or fire protection system without first gaining authorization from the UCDFD. System shutdown requests shall require a minimum of 72-hours advance notice. Call (530) 752-1236 for any such requests.

#### 1.11 TEMPORARY HEAT AND VENTILATION

- A. Provide temporary heat and ventilation as required to maintain adequate environmental conditions to meet specified minimum conditions for installation of materials; and to protect equipment, materials, and finishes from damage due to temperature or humidity. The use of temporary heating appliances will require a Hazardous Conditions Permit as specified in Section 01 41 00 Regulatory Requirements.
- B. Provide adequate forced ventilation of enclosed areas to cure installed materials, to prevent excessive humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases.
- C. Permanent HVAC System: If University authorizes use of permanent HVAC system for temporary use during construction, provide filter with Minimum Efficiency Rating Value (MERV) 13 at each exhaust or return air grille in system and remove at end of construction.

#### 1.12 TEMPORARY SANITARY FACILITIES

- A. Contractor shall provide at the Project site, portable chemical toilets. Type, location and maintenance of temporary toilets are subject to inspection and approval of the University's Representative.
- B. Permanent toilet facilities within an existing building shall not be used without written authorization of the University.

--- OR ---

- C. Existing sanitary facilities may be used during construction. Maintain daily in clean and sanitary condition.

#### 1.13 TEMPORARY TELEPHONE AND DATA SERVICE

Edit make project specific. the next 2 paragraphs are for small projects that don't require a site trailer and phone service on campus

- A. Contractor shall have telephone facilities available at Contractor's business office for the duration of the Contract where Contractor and Contractor's Superintendent may be contacted.
- B. Contractor shall provide a cellular telephone at all times for effective University's Representative's communication with the Contractor.

--OR--

C. Provide direct line telephone service at the Project site for the use of personnel and employees.  
Minimum service required:

1. One direct-line telephone in Contractor's field office.
2. One direct-line telephone in the field office of University's Representative.
3. Other telephones as required

D. Procedures for Requesting Telephone and Data Service on Campus

1. The University owns and operates a telephone system and a high speed Campus Wide Area Network (WAN). All telephone, FAX lines and connections to the WAN are provided through the University Communications Resources Department (CR). All lines permit long-distance and local dialing access. Telephone lines include the following features:
  - a. Three-way conference calling, code-activated hold, and last number redial. Fax and modem lines include data protection features.
  - b. Contractor may choose and supply any single line or key system telephone equipment to utilize the lines. Contractor is responsible for activation of key systems. Communications Resources can bring lines to a demarcation point for the Contractor to facilitate access to their key system.
2. Communications Resources' personnel may be available to install any necessary internal wiring. All costs shall be paid by Contractor.
3. University requires a written request for service at least 30 days prior to the desired activation date. Contractor's written request shall include the billing address, the location of the Project trailer, on site contact names and phone numbers, any need for internal wiring, and the number and type of lines to have installed.
4. Disconnection of Services at project completion
  - a. Communications Resources requires a 5-day written notice prior to the date of disconnect of telephone service.
  - b. At the conclusion of the Work, any external wiring installed by the Contractor shall be removed by the Contractor.
  - c. Verbal requests for disconnects will not be accepted by Communications Resources' personnel. Service will continue and Contractor shall be responsible for all costs until written notice to disconnect has been received by Communications Resources.
5. Direct questions about these procedures or request for an estimate of costs, to Communications Resources' Customer Services Representative at (530) 752-4603.

Coordinate use of 1.14 Temporary Water with Section 03 31 30 Disinfection of Domestic Water Piping

1.14 TEMPORARY WATER

- A. Comply with Section 33 13 00 Disinfection of Domestic Water Piping requirements prior to activation.
- B. If water is obtained from a campus fire hydrant, the hydrant valve shall not be used as a control valve. Use hydrant wrench; do not use pipe wrench. Contractor shall provide all valving necessary to control the flow of water.
- C. A reduced pressure backflow preventer shall be used at any connection to University's system, including fire hydrant.
- D. Install according to California Administrative Code, Title 17, Section 7603(c), and test immediately after installation by a certified tester in accordance with Title 17, CAC, Section 7605(d).
- E. Install piping with taps located so that water is available throughout the Project site by the use of hoses. Protect piping and fittings against freezing.
- F. Provide water for human consumption in accordance with the regulatory requirements for potable water.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

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END OF SECTION 01 51 00

SECTION 01 52 00 CONSTRUCTION FACILITIES

PART 1 - GENERAL

Review Project Manager workspace requirements. Coordinate inspector workspace requirements with the inspection staff supervisor.

1.1 JOB OFFICE

- A. Contractor shall provide and maintain a temporary office of exclusive use of the University's Representative.
- B. The office for the University's Representative shall not be less than [10 feet by 16 feet by 8 feet] [10 feet by 60 feet by 8 feet] [12 feet by 60 feet by 8 feet] and shall be wind and weatherproof with adequate natural and artificial light to read drawings and specifications. It shall contain the following: a toilet with hand sink, a drawing table 42 by 72 inches (minimum), plan racks, provisions for supplies and clothing, a desk with lockable file drawer, a chair, its own temporary heating and air conditioning facilities, and shall have a telephone for the purpose of conducting all business pertinent to the Project. University's Representative's telephone may be an extension of Contractor's phone, providing there are at least [INSERT TEXT AS APPROPRIATE] incoming trunk lines and 5 Network Access Module (NAMS). The office shall be secure and lockable.
- C. Contractor shall be responsible for providing all necessary temporary utility hook-ups including but not limited to: sanitary sewer, electricity, telephone, data and water. Coordination and installation of temporary utilities will be accomplished in accordance with Section 01 51 00 Temporary Utilities.
- D. Temporary Utilities: Refer to Section 01 51 00 Temporary Utilities
- E. Contractor shall provide space with table and chairs for meetings for at least [20] [#] people.
- F. Contractor shall maintain a similar office for its use and that of its superintendent.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 52 00

SECTION 01 54 00 CONSTRUCTION AIDS

PART 1 - GENERAL

1.1 CRANE OPERATION, STAGING AND STORAGE

- A. Operator Training and Crane Certification: Prior to starting crane operations, Contractor shall provide copies of operator's training and crane certification to the University's Representative.
- B. Crane Staging Area: Crane staging areas are shown on Drawings. Contractor will be required to coordinate with the University's Representative a minimum of 5 business days in advance of loading and removal of materials from the roof.
- C. Storage: Contractor will not be allowed on-site crane storage.

1.2 TEMPORARY SCAFFOLDING

- A. Contractor shall provide and maintain the following temporary facilities as required to complete the Contract:
  - 1. Scaffolding, staging, runways, and similar equipment.
  - 2. Hoists or construction elevators, complete with operators, power and signals required.
  - 3. Temporary rigging and similar equipment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 54 00

Standard Specification

Project Manager to coordinate the Contractor Parking and Staging areas and identify on the Drawings.

SECTION 01 55 00 VEHICULAR ACCESS AND PARKING

PART 1 - GENERAL

1.1 ROADS

- A. Existing roads shall be used for construction access within the limits defined herein. Temporary construction access roads shall not be permitted.

1.2 PARKING

- A. Contractor parking shall be in areas designated on the Drawings. Requests for parking outside of designated areas shall be submitted for consideration and approval to the University's Representative. All parking arrangements must be coordinated and approved prior to commencement of work, obtain approval for all parking arrangements and purchase permits from UC Davis Parking & Transportation Services (TAPS) at (530) 752-7657.
- B. Permit and identifier rates provided below are for fiscal year 11-12. Rates are subject to change after June 30, 2012 and without prior notice. Contractor shall pay rates in effect at the time permits are required, with no change to the Contract Sum.
- C. Parking permits required inside fenced Limits of the Work or in designated Contractor parking areas:
1. A valid parking identifier issued by TAPS must be displayed on every vehicle except delivery vehicles actively engaged in loading or unloading. The identifier will be valid for the term of the project, up to 12 months from the date of issuance.
  2. The current cost for a parking identifier is \$2.70, plus \$1.50 per month.
  3. Lost, stolen, illegible or expired parking identifiers must be replaced immediately for the cost of a new identifier (the new permit will have the same expiration date).
- D. Parking permits required outside fenced Limits of the Work:
1. A valid Contractor parking permit must be displayed on every vehicle.
  2. Parking is permitted only in lots specifically designated by TAPS.
  3. The current cost for a Contractor parking permit is \$9.00 per day or \$63.00 per month.
  4. If the permit is lost/stolen, fades or becomes otherwise illegible it must be replaced for an additional \$10.00 fee.
- E. Temporary use of parking spaces outside Limits of the Work:
1. Contractor shall obtain approval of the University's Representative and TAPS if any existing parking spaces outside the Limits of the Work must be temporarily blocked or used for access, storage, loading, protection against damage from construction operations (paint overspray, etc.) or any other activity associated with the Work other than parking vehicles.
  2. Contractor shall request approval at least 3 business days in advance of the requested commencement of the use of the parking spaces. Each request will be reviewed and consideration will be based on the expected impact to the area specified. University reserves the right to refuse approval, with no change to the Contract Sum. The appropriate daily or monthly permit rate will be charged for each parking space used, along with any applicable setup charges.
  3. If approved for up to 12 months, Contractor shall pay the short-term monthly "V" permit rate, currently \$63.00 per month, except for metered spaces which shall be charged a rate equivalent to the meter income, at no additional cost to the University.
  4. If approved for longer than 12 months, Contractor shall pay the cost to employ temporary measures as deemed necessary by the University to provide alternative parking capacity equal to the lost capacity, including attendant parking or the construction of temporary parking, at no additional cost to the University.

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PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 55 00

SECTION 01 56 00 TEMPORARY BARRIERS AND ENCLOSURES

PART 1 - GENERAL

1.1 TEMPORARY FACILITIES

- A. Contractor shall provide and maintain the following temporary facilities as required to complete the Contract:
1. Rubbish chutes, barricades around openings, ladders between floors and similar equipment.
  2. Barricades, lights and similar safety precautions.
  3. All materials and equipment required to safely accomplish Work under this Section shall be in conformance with requirements of California Occupational Safety and Health act (Cal/OSHA), Chapter 5 of CalTrans Traffic Manual and other State and Federal Codes and regulations where applicable.
- B. Removal: Upon completion of the Work, and before the final payment, Contractor shall remove all temporary Work and facilities to put the Project site in the condition required by the General Conditions with no additional cost to the University.

1.2 TEMPORARY PROJECT CONSTRUCTION FENCE

- A. Provide [6 foot high chain link fence type Project barricades] [4 feet by 8 feet plywood fence] [with privacy screening] [without privacy screening] around construction site as required. All construction fencing materials shall be new.
- B. The Contractor is responsible for removal of the fence at the end of construction.
- OR---
- C. The fence will become the property of the University at additional no charge at the end of construction.
- D. Provide gates complete with locking devices.
- E. Use material with smooth surfaces for Work exposed to the public.
- F. Provide fence layout to the University's Representative for approval.
- G. Maintain fence in secure and safe condition to the satisfaction of the University's Representative at all times.
- H. Contractor shall not place any signs, advertisements, notices, or graphic materials on construction fencing that have not been approved in advance by University's Representative.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 56 00

Standard Specification

SECTION 01 56 39 TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Perform all Work necessary and required to protect and maintain all trees, shrubs, groundcover and turf, not identified for removal, within the limits of the Work in healthy growing condition at all times during the Project. If during the course of construction, any adjacent trees or shrubs are damaged, penalties will be assigned for tree injury, which results in the decline or death of trees. The preservation of existing trees to remain is a critical project requirement.
- B. Contractor shall be directly responsible for protection and welfare of all existing trees within the limits of the Work and directly adjacent to the limits of the Work. This responsibility shall continue until the entire Project is completed and accepted by the University and through the maintenance period.
- C. Limits of Work: Refer to Drawings for limits of Work.
- D. Definitions
  - 1. "Injury" is defined, without limitation, as any bruising, scarring, tearing, or breaking of roots, branches, or trunk.
  - 2. "Tree protection zone" is defined for each species. Species tolerance to construction impacts and the tree's age determine the radius of the tree protection zone. The tree protection zone shall be 1.5 feet per inch trunk diameter unless otherwise noted by the University's Representative.
  - 3. "Existing tree" is defined as any or all of the existing trees to be preserved, as designated on the Drawings.
  - 4. "Consulting Arborist" is a certified arborist registered by the International Society of Arboriculture (ISA). Contractor shall submit Arborist credentials for review by University's Representative. Consulting Arborist shall be supplied at the expense of the Contractor.

1.2 Standards

- A. Published specifications, standards, tests, or recommended methods of trades, industry, or governmental organizations apply to the Work of this Section.
  - 1. Cabling, Bracing and Guying Standards for Shade Trees, latest revision, as published by the National Arborist Association (NAA), 174 RT 101, Bedford, New Hampshire 03102.

1.3 SITE CONDITIONS

- A. Field verify all dimensions, grades, and coordinates, which affect existing trees and plants. Indicate elevations at the base of all trees within the limits of the Work on the grading plan. Report discrepancies to the University's Representative in writing, and obtain the University's Representative instructions prior to proceeding with the Work affected.
- B. Should utilities, grade changes, or other conditions not shown on the Drawings be found within the tree protection zone during the course of the Work, report to the University's Representative in writing, and obtain instruction prior to proceeding with the Work affected.

1.4 PRECONSTRUCTION CONFERENCE

- A. It shall be the responsibility of the Contractor to call for a meeting at the Project site with the University's Representative. Meeting attendees shall include the Contractor, University's Representative, Consulting Arborist, Engineers, and Architects. This meeting shall occur prior to start of construction of any nature within the protection zone of the trees.

- B. The purpose of the meeting shall be to establish the conditions of all existing trees upon receipt of the Project site by the Contractor. Failure to call for said meeting implies acceptance by the Contractor of existing trees in their existing condition.
- C. The University's Representative shall document the condition of the trees prior to this meeting. The purpose of the meeting shall be to confirm what work is to occur near the trees and to discuss mitigation of the potential impacts on trees to be preserved if necessary.

#### 1.5 TREE PROTECTION

- A. No trees shall be cut or felled without specific permission from the University's Representative. Trees cut or damaged without written permission of the University's Representative shall be subject to provisions of Repair and Compensation.
- B. During the course of construction, take all necessary precautions to protect the existing trees from injury or death. Protection shall be given to the roots, trunk, limbs and foliage of all existing trees.
- C. Fencing:
  - 1. Contractor shall install tree protection fencing around trees to be preserved at a distance required from the base of the trunk to the protection zone. All fencing shall remain until Project completion, and it shall then be removed only as directed by the University's Representative.
  - 2. Tree protection fencing shall be chain-link fencing (minimum 6-feet) on concrete anchor blocks unless otherwise noted.
  - 3. During the course of construction, Contractor shall relocate the fence if required to facilitate construction only after notifying University's Representative, to avoid compaction or other injury of tree roots.
  - 4. The Contractor shall protect the fencing and shall be responsible for any damage incurred to the fences requiring replacement or reinstallation.
- D. Approval by the University's Representative for Work within the tree protection zone shall not waive the Contractor's responsibility for complying with the requirements of this Section.
- E. During the course of construction of approved Work within the tree protection zone, no roots larger than 2 inches in diameter shall be cut without prior written approval by the University's Representative.
- F. Do not permit the following within the tree protection zone of an existing tree, except as specified in this Section:
  - 1. Storage or parking automobiles or other vehicles.
  - 2. Stockpiling of building material, refuse, or excavated materials.
  - 3. Skinning or bruising of bark.
  - 4. Use of trees as support posts, power poles, or signposts; anchorage for ropes, guy wires, or power lines; or other similar functions.
  - 5. Dumping of poisonous materials on or around trees and roots. Such materials include but are not limited to paint, petroleum products, contaminated water, or other deleterious materials.
  - 6. Cutting of tree roots by utility trenching, foundation digging, placement of curbs and trenches, and other miscellaneous excavation without prior written approval by the University's Representative.
  - 7. Damage to trunk, limbs, or foliage caused by maneuvering vehicles or stacking material or equipment too close to the tree.
  - 8. Compaction of the root area by movement of trucks or grading machines, storage of equipment, gravel, earth fill, or construction supplies, etc.

9. Excessive water or heat from equipment, utility line construction, under or near shrubs or trees.
10. Damage to root system from flooding, erosion, and excessive wetting and drying resulting from dewatering and other operations.
11. Do not use herbicide within the area of the tree protection zone without prior written approval from the University's Representative. The application of herbicides anywhere on the Project site to which can be attributed the decline or death of existing trees shall constitute negligence on the part of the Contractor. Contractor shall be liable for damages.
12. During construction the existing site surface drainage patterns shall not be altered within the area of the tree protection zone, except as shown on the Drawings.
13. Contractor shall not alter the existing water table within the area of the tree protection zone.
14. Grading is to be avoided within the tree protection zone unless absolutely necessary. Grading techniques and mitigation procedures are to be specified by the University's Representative.

G. Excavation Around Trees:

1. Excavation within tree protection zone of trees shall be done only where absolutely necessary and by, or at the direction and with approval from the University's Representative.
2. Where utilities are to be installed within tree protection zones, boring shall be used. Contractor also has the option of tunneling under and around roots by hand digging or vacuuming. Main lateral roots, and taproots shall not be cut. Smaller roots that interfere with installation of new Work may be cut.
3. Where excavation for new construction is required within tree protection zone of trees, hand excavation, vacuuming and tunneling shall be employed to minimize damage to root systems. If large, main lateral roots are encountered, they shall be exposed beyond excavation limits. If encountered immediately adjacent to location of new construction and relocation is not practical, roots shall be cut approximately 6 inches back from new construction. Obtain approval from the University's Representative before cutting.
4. Tree roots shall be cut with a mechanical root-cutter rather than typical trenching to minimize root wrenching.
5. Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be packed with wet peat moss or 4 layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill. The cover over the roots shall be wetted to the point of runoff so roots stay moist. This should be done at least daily during most seasons, but may be required more frequent watering during the summer months. Excavations shall be closed within 24 hours; and, where this is not possible, the side of the excavation adjacent to the tree shall be kept shaded with burlap or canvas. No excavation shall occur within 10 feet of the trunk of any tree. Excavations within 20 feet of any tree shall be limited to that which is absolutely necessary for building construction under the supervision of the University's Representative.

H. Backfilling in tree protection zone:

1. Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Jet backfill when trench has been backfilled to half its depth and again when fully backfilled, making certain no air pockets exist around roots.
2. Do not use mechanical equipment to compact backfill. There shall be no air tamping used to avoid compaction of tree root systems. Tamp carefully using hand tools, refilling and retamping until Final Acceptance as necessary to offset settlement.

1.6 TRIMMING OF TREES

- A. In company with the University's Representative ascertain the limbs and roots, which are to be trimmed, and clearly mark them to designate the approved point of cutting.
- B. Cutting and pruning of trees as required to accommodate construction shall be done only with the specific permission and direction of the University's Representative.
- C. A Consulting Arborist, certified by the International Society of Arboriculture (ISA), may be engaged to direct removal of branches from trees and large shrubs that are to remain if required to clear for new construction.
- D. Dead and damaged trees that are determined by the University's Representative to be incapable of restoration to normal growth pattern shall be removed at no additional cost to the University.
- E. Pruning operations shall be extended to restore the natural shape of entire tree where directed by the University's Representative and as noted on the Drawings.
- F. Cut evenly, using proper tools and skilled workers, to achieve neat severance with the least possible damage to the tree. Follow ISA Pruning Guidelines.
- G. Branching structure shall be thinned in accordance with NAA "Pruning Standards and Practices" to balance structural or weight balance problems in the crown of the tree that might lead to further damage. Thinning shall not exceed 30 percent of existing branching structure.

1.7 MAINTENANCE DURING CONSTRUCTION

- A. Maintenance includes, but is not limited to mitigation of damage due to storm drainage, or any condition, which requires immediate attention, and proper placement & maintenance of Tree Protection Fencing. Unauthorized moving of fencing may subject the Contractor to charges.
- B. Contractor shall perform periodic inspections of existing trees to be preserved and submit written reports to the University's Representative outlining additional maintenance Work as may be required to ensure the health and general well being of the plant material. The Contractor shall retain, at the direction of the University's Representative, additional specialists as may be required to perform this Work.
- C. Irrigation: During construction, the existing trees to be preserved shall be given water to saturate the top 3 to 4 feet of the soil within the tree protection zone and 2 to 3 feet extending from the tree protection zone, as demonstrated by the soil probe, by the Contractor after coordination with the University's Representative. Quantities and lengths of watering time are variable and shall depend upon seasonal rainfall. Irrigation recommendations from the University's Representative shall be followed.
- D. All necessary measures shall be taken to maintain healthy living conditions for existing trees to be preserved. Such measures shall include but not be limited to periodic washing of leaves for the removal of dust, irrigation, etc.

1.8 REPAIR AND COMPENSATION

- A. Any injury to existing tree trunks, limbs or roots over 2 inches in diameter shall be immediately reported in writing to the University's Representative and, at the direction of the University's Representative, repaired immediately at the Contractor's expense and approved by the University's Representative.
- B. The University's Representative shall direct repair of trees injured by construction operations. Repairs shall be made promptly after injury occurs to prevent progressive deterioration of damaged trees.
- C. Any tree to remain which is injured or destroyed owing to the Contractor's failure to provide adequate protection shall be compensated for in accordance with the following schedule of values using "tree caliper" method (greatest trunk diameter, measured 30 inches above ground):

1. For trees and shrubs with diameters up to and including 4 inches, compensation shall be the actual cost of replacement with item similar in species, size, and shape, including:
  - a. Actual cost of item boxed out of ground.
  - b. Transportation and delivery of boxed item to Project site.
  - c. Planting and staking.
  - d. Maintenance, including watering, fertilizing, pruning, pest control, and other care for a period of 90 days.
2. For trunks up to:
  - a. Twelve inches - \$7,200
  - b. Thirteen inches - \$8,200
  - c. Fourteen inches - \$9,200
  - d. Fifteen inches - \$10,000
  - e. Sixteen inches - \$11,500
  - f. Seventeen inches - \$12,000
  - g. Eighteen inches and over, add for each caliper inch - \$1,200
  - h. For each mature (5 years or older) Tree - \$30,000
3. A penalty will be assessed for limb injury of \$200 per inch of limb diameter for any limb greater than 2 inches in diameter, measured where the limb should be pruned in order to make a proper thinning cut.
4. A penalty will be assessed of \$20 per square inch of tree trunk area injured. This penalty shall be assessed when it is determined that the Contractor is responsible for damage to a tree trunk, but the tree is still healthy enough to remain at the site. An example of this kind of damage would be the collision of a tractor with the trunk of a mature tree where the bark is peeled back, and the injured area will require repair and healing.

D. Damaged tree limbs or trees that have died as a result of injury during construction shall remain the property of the University and shall remain or be removed by the Contractor as directed by the University.

#### 1.9 SHRUB, GROUNDCOVER AND TURF PROTECTION

A. Keep damage to shrubs, groundcover, turf and other plant materials to a minimum and restore to original condition. Turf shall be restored with sod lawn unless otherwise approved by the University's Representative.

#### 1.10 WARRANTY OF REPLACEMENT PLANT MATERIAL

A. Contractor shall warrant that all plants covered by the provisions of this Section will be healthy and in flourishing condition of active growth 1 year from the date of Final Acceptance.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 56 39

Standard Specification

This section is required for any project that has exterior work that would disturb soil, i.e., grading, excavation, trenching, etc.

Required forms follow this section - Exhibits 34 and 34A are no longer used.

SECTION 01 57 23 STORM WATER POLLUTION PREVENTION

PART 1 - GENERAL

1.1 APPLICABILITY

- A. Construction projects resulting in land disturbance of one acre or more: Contractor shall apply for coverage under the Construction General Permit, Waste Discharge Requirements Order No. 2009-0009 DWQ (National Pollutant Discharge Elimination System (NPDES) Permit No.CAS000002 prior to commencement of construction activities. The document is available from the State Water Resources Control Board website at [http://www.swrcb.ca.gov/water\\_issues/programs/stormwater/constpermits.shtml](http://www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits.shtml)

OR

- B. Construction projects resulting in land disturbance of less than one acre: Contractor shall comply with the Campus Storm Water Management Plan (SWMP). The document is available at the UC Davis Safety Services website: [http://safetyservices.ucdavis.edu/programs-and-services/environmental-compliance/water-1/ucd\\_swmp\\_2010.pdf](http://safetyservices.ucdavis.edu/programs-and-services/environmental-compliance/water-1/ucd_swmp_2010.pdf)

1.2 SCOPE

- A. Discharge of pollutants (any substance, material, or waste other than clear, uncontaminated storm water) from the project into the storm drain system is strictly prohibited by the Central Valley Regional Water Quality Control Board's (RWQCB) Water Quality Control Plan (Basin Plan).
- B. Provide all material, labor, equipment for installation, implementation, and maintenance of all surface-water pollution prevention measures. This work includes the following:
1. Provide, place, and install effective measures for preventing runoff of soil, silts, gravel, hazardous chemicals or other materials prohibited by the Central Valley RWQCB from entering the storm water drainage system.
  2. Management of on-site construction materials in such a manner as to prevent said materials from contacting storm water or wash water and running off into the storm drain system.
  3. Complying with applicable standards and regulations specified herein.
  4. Maintain the most current revised Storm Water Pollution Prevention Plan (SWPPP) at the Contractor's work site. Three hard copies and an electronic copy of the original and each revision shall be forwarded to the University's Representative.
  5. Review any changes in the SWPPP plan each week at the weekly meetings with University's Representative and others. At each weekly meeting, the Contractor shall submit a numbered checklist of the current status of each prevention measure on the job site
- C. In this section, the term "storm drain system" shall include storm water conduits, storm drain inlets and other storm drain structures, street gutters, channels, ditches, and the Arboretum waterway.
- D. Sanitary sewer discharge regulations are intended to provide protection of the sanitary sewer system and the campus Waste Water Treatment Plant (WWTP). In this section, "sanitary sewer" shall include any sanitary sewer manhole, clean out, sewer laterals or other connection to the WWTP.
- E. Contractor shall have storm water pollution prevention measures in place and conduct inspections year-round. It is the responsibility of the Contractor to be prepared for a rain event in the non-rainy

season, and to be aware of weather predictions. The University is not responsible for informing the Contractor of rain predictions.

- F. Sanitary sewer blockages can result in a back-up and discharge to the storm drain system. Contractor shall immediately notify the University's Representative if they become aware of a clogged sanitary sewer associated with the project.
- G. Contractor shall not allow any non-storm water from the project to enter the storm drain system. Examples of non-storm water include water used for dust suppression, pipe flushing and testing, and domestic supply water used to wash streets, painting and drywall equipment, vehicles, or other uses.
- H. Water resulting from de-watering an excavation may be discharged to a storm drain only if it is free of pollutants, including sediment. Contractor shall use methods such as a settling basin or filter to ensure that dewatering discharges are free of pollutants.

### 1.3 REGULATIONS AND STANDARDS

- A. Contractor shall comply with the following applicable regulations:
  - 1. Clean Water Act, United States Environmental Protection Agency, and Porter-Cologne Clean Water Act, State of California.
  - 2. Central Valley Basin (Region 5) Water Quality Control Plan (Basin Plan), California Regional Water Quality Control Board, 1998 Edition including revisions.
  - 3. Construction General Permit, Waste Discharge Requirements Order No. 2009-0009 DWQ (National Pollutant Discharge Elimination System (NPDES) Permit No. CAS000002). This Order is referred to as the Construction General Permit (CGP).
  - 4. Small Municipal Separate Storm Sewer System (MS4) General Permit, Waste Discharge Requirements Order No. 2003-0005 DWQ NPDES Permit No. CAS 000004. This Order refers to the Campus Storm Water Management Plan (SWMP).WDID # 5A57NP00014
- B. Contractor shall comply with the following standards and guidelines on storm water pollution prevention:
  - 1. California Stormwater Quality Association (CASQA) - Construction BMP Handbook Portal. This document is available for a fee from the CASQA website at <http://www.casqa.org/>

### 1.4 QUALITY ASSURANCE

- A. Storm Water Pollution Prevention Plan (SWPPP) shall be prepared and certified by a Qualified SWPPP Developer (QSD). A Construction Site Monitoring Program (CSMP) shall be part of the SWPPP and included as an appendix or separate SWPPP chapter.
- B. Qualified SWPPP Practitioner (QSP) shall oversee the implementation of all BMPs, monitoring, inspections and reports required by the Construction General Permit. Effective September 1, 2011, a QSP shall be either a QSD or have one of the following certifications:
  - 1. A certified erosion, sediment and storm water inspector (CESSWI) registered through Enviro Cert International, Inc.; or,
  - 2. A certified inspector of sediment and erosion control (CISEC) registered through Certified Inspector of Sediment and Erosion Control, Inc.
  - 3. Effective September 1, 2011, both QSDs and QSPs shall have attended a State Water Board sponsored or approved QSD/QSP training course and pass the State proctored exam. A current list of certified QSD/QSPs is available from the CASQA website at: <http://www.casqa.org/>

### 1.5 SUBMITTALS

- A. Submittals shall comply with requirements specified in Section 01 33 23 Shop Drawings, Product Data and Samples. All submittals listed below shall be submitted to the University's Representative 21 days prior to groundbreaking to allow for review and acceptance by the University of California Davis Office of Environmental Health & Safety (EH&S). No sitework may occur prior to review and certification of the submittals
- B. The contractor shall comply with additional requirements for Linear Underground/ Overhead Projects (LUPs) as outlined in Attachment A of the Construction General Permit.
- C. The contractor shall comply with additional requirements for Active Treatment Systems (ATS) as outlined in Attachment F of the Construction General Permit.

Construction projects resulting in land disturbance of less than one acre use the following paragraphs and the forms at the end of this section. These construction projects are not required to register in the State's SMARTS on-line reporting system, submit Permit Registration Documents (PDRs) in SMARTS or pay an annual permit fee.

- D. Construction projects resulting in land disturbances of less than one acre shall comply with the Campus Storm Water Management Plan (SWMP)
- E. Submit a New Construction Project Form (following section) to the University's Representative 21 days prior to ground breaking. This form is required for documentation of compliance with the campus Storm Water Management Plan (SWMP).
- F. Submit a Storm Water Pollution Prevention Plan (SWPPP) using the SWPPP Template in Appendix B of the California Stormwater Quality Association (CASQA) - Construction BMP Handbook Portal. This template can be downloaded from the California Stormwater Quality Association website at <http://www.casqa.org/>. Three hard copies and an electronic copy of the SWPPP must be submitted to the University's Representative 21 days prior to ground breaking. The SWPPP must contain all required elements specified in the General Permit. The SWPPP shall be developed and revised by a Qualified SWPPP Developer (QSD) as necessary to meet the following objectives:
  - 1. To identify pollutant sources that may affect the quality of storm water discharges associated with construction activity from the construction site.
  - 2. To identify non-storm water discharges.
  - 3. To identify, construct, and implement storm water pollution prevention measures (Best Management Practices, or BMPs) to reduce or eliminate pollutants in storm water discharges from the construction site, both during construction and after construction is completed.
  - 4. Develop a maintenance schedule for BMPs installed during construction designed to reduce or eliminate pollutants after construction is completed (post-construction BMPs).
  - 5. Contractor shall amend the SWPPP whenever there is a change in construction or operations that may affect the discharge of pollutants to surface waters. All amendments shall be done by a QSD and attach a copy to the SWPPP at the construction site.
  - 6. The plan shall include a site map and site-specific written plan that describes pollution sources for the construction activity and the methods that will be used for erosion and sediment control, hazardous materials management, and any other construction activity that are sources of storm drain system pollution. The lists of topics to be covered in the plan are included in Part 3 Execution of this Section.
- G. Comply with UC Davis Construction Stormwater Minimum Best Management Practices (BMPs) Requirements outlined in **Exhibit C**.
- H. Submit a Project Completion Form (following section) to the University's Representative when final stabilization has been reached. Final stabilization is obtained at 70% final cover, and when there is no potential for construction-related storm water pollutants to be discharged into site runoff.

Construction projects resulting in land disturbance of one acre or more use the following paragraphs. These projects are required to apply for coverage under the CA Construction General Permit in the State's SMARTS on-line reporting system, submit Permit Registration Documents (PRDs) and pay an annual permit fee. Delete the forms at the end of this section.

I. Construction projects resulting in land disturbance of one acre or more shall submit Permit Registration Documents (PRDs). PRDs shall be electronically submitted [21] days prior to commencement of construction activity using the State Water Resources Control Board's Storm Water Multi-Application Report Tracking System (SMARTS) at <http://smarts.waterboards.ca.gov/smarts/faces/SwSmartsLogin>. Contractor must register as a Data Submitter in SMARTS and provide their user ID# to the University's Representative prior to uploading PRDs. The following information shall be submitted and must be deemed complete by SMARTS, before a WDID number will be issued confirming coverage under the General Construction Permit.

J. Initial Permit Registration Documents (PRDs):

1. Notice of Intent (NOI)

2. Risk Assessment (Construction Site Sediment and Receiving Water Risk Determination) The Contractor shall comply with additional permit requirements which are based on the outcome of the construction project risk determination. These requirements are outlined in the Construction General Permit (CGP).

- a. Risk Level 1 Requirements - CGP (Attachment C)
- b. Risk Level 2 Requirements - CGP (Attachment D)
- c. Risk Level 3 Requirements - CGP (Attachment E)

3. Site Map-

- a. The project's surrounding area (vicinity)
- b. Site layout
- c. Construction site boundaries
- d. Drainage areas
- e. Discharge locations
- f. Sampling locations
- g. Areas of soil disturbances (temporary or permanent)
- h. Active areas of soil disturbances (cut and fill)
- i. Locations of all runoff Best Management Practices (BMPs)
- j. Locations of all erosion control BMPs
- k. Locations of all sediment control BMPs
- l. Active Treatment System (ATS) location (if applicable)
- m. Locations of sensitive habitats, watercourses, or other features which are not to be disturbed
- n. Locations of all post-construction BMPs
- o. Locations of storage areas for waste, vehicles, service, loading/unloading of materials, access (entrances/exits) points to construction site, fueling, and water storage, water transfer for dust control and compaction practices

4. Storm Water Pollution Prevention Plan (SWPPP) including a Construction Site Monitoring Program (CSMP) shall be certified by a Qualified SWPPP Developer (QSD) and shall meet the minimum criteria using the SWPPP template in Section 2, Appendix B of the CASQA - Construction BMP Handbook Portal. This template is available from the CASQA website for a fee at <http://www.casqa.org/>. The SWPPP must contain all required elements specified in the Construction General Permit. The SWPPP shall be designed, developed and revised as necessary, and signed by the QSD to meet the following objectives:

- a. All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled
- b. All non-storm water discharges must be identified and either eliminated, controlled or treated.
- c. Site Best Management Practices (BMPs) are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from construction activity using Best Available Technologies Economically Achievable (BAT) and Best Conventional Pollutant Control Technologies (BCT).
- d. Design details as well as BMP controls for site run-on must be complete and correct
- e. Stabilization BMPs installed to reduce or eliminate pollutants after construction is complete.
- f. The Qualified SWPPP Developer (QSD) shall include information in the SWPPP that supports the conclusions, selections, use and maintenance of BMPs.
- g. The SWPPP shall be available at the construction site during working hours while construction is occurring and shall be made available upon request by a State Inspector.

5. University's Representative will secure the Annual Permit Fee which is payable to the SWRCB.

**K. Additional PRD Requirements:**

1. The Annual Report is due by August 15th of each year, or prior to submittal of a Notice of Termination (NOT). The reporting period is July 1<sup>st</sup> to June 30<sup>th</sup>.

a. Submittal of the report is completed by filling out the Annual Report form in the SMARTS on-line reporting system.

2. Notice of Termination (NOT) required within 90 days of when construction is complete and shall include electronic photo(s) representative of the site showing final stabilization. The NOT must demonstrate that final stabilization is attained by one of the following methods as outline in the Construction General Permit.

- a. 70% final cover method
- b. RUSLE or RUSLE 2 method
- c. Custom method

3. Site work shall not commence until the initial Permit Registration Documents (PRDs) have been electronically submitted to the State Water Resources Control Board's Storm Water Multi-Application Report Tracking System (SMARTS) and a WDID number has been issued to confirm coverage under the Construction General Permit. PRDs will be reviewed and certified by the University of California Davis, Office of Environmental Health & Safety (EH&S).

**1.6 TRAINING REQUIREMENTS**

A. Qualified SWPPP Developer (QSD) shall write, amend and certify SWPPPs. A QSD shall have one of the following registrations or certifications, and appropriate experience, as required for:

1. A California registered professional civil engineer
2. A California registered professional geologist or engineering geologist
3. A California registered landscape architect
4. A professional hydrologist registered through the American Institute of Hydrology
5. A Certified Professional in Erosion and Sediment Control (CPESC) registered through Enviro-Cert International, Inc.
6. A Certified Professional in Storm Water Quality (CPSWQ) registered through Enviro Cert International, Inc.

7. A professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET)
- B. Qualified SWPPP Practitioner (QSP) shall implement all BMPs required by the General Construction Permit. Effective September 1, 2011, a QSP shall be either a QSD or have one of the following certifications:
  1. A certified erosion, sediment and storm water inspector (CESSWI) registered through Enviro Cert International, Inc.; or,
  2. A certified inspector of sediment and erosion control (CISEC) registered through Certified Inspector of Sediment and Erosion Control, Inc.
- C. Effective September 1, 2011, both QSDs and QSPs shall have attended a State Water Board sponsored or approved QSD/QSP training course and pass the State proctored exam.

PART 2 - PRODUCTS

2.1 MATERIAL

- A. General: Provide materials as required for execution of the work.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall ensure a Qualified SWPPP Developer (QSD) will write and amend the SWPPP that includes a site map and written description of pollution prevention methods. The intent of this requirement is to ensure Contractor compliance with applicable regulations for the discharge of storm water from the project. The Contractor will choose the best available performance-based technology and methods to prevent storm water pollution for construction site activity. The method(s) chosen shall be appropriate for each specific site condition.

3.2 SWPPP TOPICS

- A. Following are topics the Contractor shall address in the SWPPP:

SWPPP Certification By Qualified SWPPP Developer (QSD)	
Section 1 SWPPP Requirements	
1.1	Introduction
1.2	Permit Registration Documents (PDRs)
1.3	SWPPP Availability and Implementation
1.4	SWPPP Amendments
1.5	Retention of Records
1.6	Required Non-Compliance Reporting
1.7	Annual Report
1.8	Changes to Permit Coverage
1.9	Notice of Termination
Section 2 Project Information	
1.10	Project and Site Description
1.11	Stormwater Run-On From Offsite Areas
1.12	Findings of the Construction Site Sediment and Receiving Water Risk Determination
1.13	Construction Schedule
1.14	Potential Construction Site Pollutant Sources
1.15	Identification of Non-Stormwater Discharges
Section 3 Best Management Practices (BMPs)	
3.1	Schedule for BMP Implementation
3.2	Erosion Control and Sediment Control
3.3	Non-Stormwater and Material Management
3.4	Post-Construction Stormwater Management Measures

Section 4 BMP Inspection, Maintenance, and Rain Event Action Plans
4.1 BMP Inspection and Maintenance
4.2 Rain Event Action Plans
Section 5 Training
Section 6 Responsible parties and Operators
6.1 Responsible Parties
6.2 Contractor List
Section 7 Construction Site Monitoring Program
7.1 Purpose
7.2 Applicability of Permit Requirements
7.3 Monitoring Locations
7.4 Safety
7.5 Visual Monitoring (Inspections)
7.6 Water Quality Sampling and Analysis
7.7 Watershed Monitoring Option
7.8 Quality Assurance and Quality Control
7.9 Reporting Requirements and Records Retention

B. The Contractor shall insure a Qualified SWPPP Practitioner (QSP) will oversee the implementation of the SWPPP, Construction Site Monitoring Program (CSMP), BMPs, monitoring, inspections and reporting. Inspections shall be performed weekly, pre-storm, post-storm and at least once each 24-hour period during qualifying storm events. Non-storm water discharge observations shall be performed quarterly. A qualifying storm event has a 50% or greater probability of precipitation. The CGP requires that dischargers only use the National Oceanographic and Atmospheric Administration (NOAA) weather forecasts to predict qualifying storm events. The NOAA website is located at: <http://www.srh.noaa.gov/>. Repairs and design changes to BMPs shall be implemented within 72 hours of identification. For each inspection required complete the Inspection Checklist using the template in Appendix D -Field Monitoring and Analysis Guidance of the CASQA - Construction BMP Handbook Portal. The template is available from the CASQA website for a fee at <http://www.casqa.org>

1. Inspection Checklist - The checklist at a minimum shall include:

- a. Inspection date and date inspection report was written
- b. Weather information, including duration of rain event, time elapsed since last storm, approximate amount of rainfall
- c. Site information , including state of construction, activities completed, and approximate area of the site exposed
- d. A description of any BMPs evaluated and any deficiencies noted
- e. If construction site is safely accessible during inclement weather, list the observations of all BMPs, or list the results of visual inspections of all relevant outfalls, discharge points, downstream locations and any projected maintenance activities
- f. Report presence of noticeable odors, or visible sheen on the surface of any discharges
- g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates
- h. Photographs taken during the inspection, if any
- i. Inspector's name, title and signature

C. Retention of Records - All required storm water records must be maintained by the discharger for 3 years from the date the Notice of Termination (NOT) was approved by the RWQCCB. Contractor shall provide copies of stormwater documents, inspections and reports to the University's representative at project completion.

For projects with Risk Level 2 and Risk Level 3 Requirements add the following article, describe the risks:
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3.3 RISK LEVEL 2 AND RISK LEVEL 3 REQUIREMENTS

- A. The project has Risk level [2] [3] due to \_\_\_\_\_.
- B. Additional requirements for Risk Level 2 and Risk Level 3 sites are outlined in Attachment D and Attachment E of the General Construction Permit. This information is available from the State Water Resources Control Board website at [http://www.swrcb.ca.gov/water\\_issues/programs/stormwater/](http://www.swrcb.ca.gov/water_issues/programs/stormwater/)

3.3 ENVIRONMENTAL ENFORCEMENT

- A. The Central Valley RWQCB has authority to enforce, through codified regulations, any portions of this Section that may violate applicable regulations. Agency enforcement may include but is not limited to: citations, orders to abate, bills for cleanup costs and administration, civil suits, and criminal charges. Contract compliance action by the University shall not be construed to void or suspend any enforcement actions by these or other regulatory agencies.
- B. Contractor shall notify the University's Representative within 24 hours after issuance of any citation(s) issued by any regulatory agency and shall be responsible for all fines and costs necessary to correct the conditions listed in the citation(s) to include all legal fees and University expenses.

END OF SECTION 01 57 23

Following are two added forms for projects less than 1 acre. Delete if project is 1 acre or more.

**NEW CONSTRUCTION PROJECT FORM**

To Comply with the terms of the Campus Storm Water Management Plan (SWMP)		
(Construction activity that disturbs less than one acre of land surface)		
<b>CONTRACTOR INFORMATION</b>		
Contractor:		Contact Person:
Mailing Address:		Title:
City:		Phone:
State:		Zip:
Emergency Phone:		Email:
<b>PROJECT INFORMATION</b>		
DCM PM:		Phone:
Physical Address:		Site Phone:
Total size of construction site: (Acres)		Total area to be disturbed: (% of total)
Percent of site imperviousness: (%)	Pre-Construction: (%)	Post-Construction: (%)
Construction commencement date:		Construction completion date:
<b>STORM WATER POLLUTION PREVENTION PLAN (SWPPP)</b>		
<input type="checkbox"/>	A SWPPP has been prepared for this project and is available for review:	
	Date prepared:	Date Amended:
<input type="checkbox"/>	A SWPPP will be prepared and ready for review by:	
<input type="checkbox"/>	SWPPP was developed by a Qualified SWPPP Developer (QSD)	
	Name:	Certification #:
<input type="checkbox"/>	SWPPP will be implemented by a Qualified SWPPP Practitioner (QSP)	
	Name:	Certification #:
<b>CONSTRUCTION SITE MONITORING PROGRAM (CSMP)</b>		
<input type="checkbox"/>	A CSMP has been prepared for this project and is available for review:	
	Date prepared:	Date Amended:
<input type="checkbox"/>	CSMP complies with Risk Level 1 Requirements of the Construction General Permit:	
<b>CONTRACTOR CERTIFICATION:</b>		
<i>"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations. In addition, I certify that the provisions of the permit, including the development and implementation of a Storm Water Pollution Prevention Plan and a Monitoring Program Plan will be complied with."</i>		
Name:		Title:
Signature:		Date:
<b>UNIVERSITY'S REPRESENTATIVE:</b>		
Name:		Title:
Signature:		Date:

PROJECT TITLE  
 CONTRACT TITLE  
 UNIVERSITY OF CALIFORNIA, DAVIS  
 CITY, CALIFORNIA

PROJECT NO: 0000000

**NOTICE OF CONSTRUCTION PROJECT COMPLETION FORM**

To comply with the terms of the Campus Storm Water Management Plan (SWMP) (Construction activity that disturbs less than one acre of land surface)	
<b>PROJECT INFORMATION:</b>	
<b>CONTRACTOR INFORMATION:</b>	
Contractor:	Contact Person:
DCM Project Manager:	Phone:
Phone:	Email:
<b>BASIS OF COMPLETION: (choose one)</b>	
<input type="checkbox"/>	1. The construction project is complete based on one of the following conditions. There is no potential for construction-related storm water pollutants to be discharged into site runoff and all construction materials/wastes have been disposed of properly
<input type="checkbox"/>	A. 70 % Final Cover Method - no computation proof required
<input type="checkbox"/>	B. Revised Universal Soil Loss Equation (RUSLE or RULSE2) Method - computational proof required
<input type="checkbox"/>	C. Custom Method - Site will not pose any additional sediment risk than it did prior to construction activity, other than option A or B above
Date of Project Completion:	
<input type="checkbox"/>	2. Construction activities have been suspended, either temporarily or indefinitely
<input type="checkbox"/>	A. Erosion and sediment controls have been implemented prior to suspension of construction activity
Date of Project Suspension:	Expected Startup Date:
<b>EXPLANATION OF BASIS OF COMPLETION: (attach site photos)</b>	
<b>RETENTION OF RECORDS: (3 years after completion of project)</b>	
<input type="checkbox"/>	Construction storm water documents such as the SWPPP, CSMP, Monitoring Reports and Inspection/Observation Reports were submitted to University's Representative at project completion
Date Submitted:	
<b>CONTRACTOR'S REPRESENTATIVE:</b>	
<i>Submission of this Notice of Construction Project Completion Form constitutes notice to the University's Representative that the construction site identified on this form is no longer authorized to discharge storm water associated with construction activity by the NPDES Small Municipal Separate Storm Sewer System (MS4) General Permit No. CAS000004 and the Campus Storm Water Management Plan (SWMP)</i>	
Name:	Title:
Signature:	Date:
<b>UNIVERSITY'S REPRESENTATIVE:</b>	
Name:	Title:
Signature:	Date:

SECTION 01 58 00 PROJECT IDENTIFICATION

PART 1 - GENERAL

1.1 TEMPORARY PROJECT SIGNAGE

- A. Contractor shall install and maintain a project informational sign(s) provided by the University at a location(s) designated by the University's Representative.

The following paragraph is for projects in existing buildings.

- B. At every door and barricade separating the project work and staging areas from areas not included in the project work area, the Contractor shall provide, install and continuously maintain a construction warning sign. The 11 inch by 17 inch construction warning sign shall be reproduced from camera-ready text provided by the University's Representative, shall be plastic laminated on heavy cardstock and shall be securely affixed at eye level to the door or barricade.

The following paragraphs are for major new projects only. Delete paragraphs that are not applicable.

- C. No signs or advertisements will be permitted on the Project site, including company names and logos on job site trailers, except with express permission of University's Representative.
- D. Provide one 4 feet by 8 feet Project sign to be located at the Project site mounted on two 6 by 6 inch posts set in concrete in the location identified by the University Representative.
- E. Format, colors and content for production of the sign shall be provided by the University's Representative.
- F. Contractor must coordinate the fabrication and installation. The sign may be produced by the University's Sign Shop (for a fee), or a third party sign fabricator.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 58 00

SECTION 01 60 00 PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 REQUIREMENTS

- A. All material and equipment incorporated in the Work shall be:
  - 1. New, unless specifically noted otherwise in the Contract Documents.
  - 2. In condition acceptable to the University's Representative.
  - 3. Suitable for intended use.

1.2 UNIVERSITY FURNISHED ITEMS

- A. [INSERT TEXT AS APPROPRIATE]

1.3 TRANSPORTATION AND HANDLING

- A. Arrange for delivery of materials and equipment to minimize length of on-site storage prior to installation.
- B. All common carrier deliveries shall be marked for the Contractor. Identify location of Project site by Project name, street address, etc.
- C. University will not receive deliveries on behalf of the Contractor.
- D. Deliver manufactured products and materials in their original unbroken containers or bundles, clearly labeled with manufacturer's name, brand, and grade seal or model number and labels intact until time of use.
- E. Handle materials and equipment in a manner to avoid damage to products and their finishes.
- F. Promptly remove damaged or defective products from the Project site and replace at no additional cost to the University.

1.4 STORAGE AND PROTECTION

- A. Other than Project site, storage space may not be available.
- B. Store manufactured products in accordance with manufacturers' instructions and with seals and labels intact and legible.
  - 1. Keep materials clean, dry, and undamaged.
  - 2. Store products subject to damage by the elements in weathertight enclosures.
  - 3. Maintain temperature and humidity in accordance with manufacturers' recommendations.
- C. Exterior Storage
  - 1. Store materials and equipment above ground on blocking or skids to prevent soiling, staining, and damage.
  - 2. Cover products that are subject to damage by the elements with impervious protective sheet coverings. Provide adequate ventilation to prevent condensation.
  - 3. Store sand, rock, or aggregate material in a well-drained area on solid surfaces to prevent mixing with foreign matter.
- D. Arrange storage to allow adequate inspection.
- E. Periodically inspect stored products to assure that products are maintained under specified conditions and are free from damage and deterioration.
- F. Protection After Installation
  - 1. Use protective materials and any methods necessary to prevent damage to installed materials and equipment from traffic, construction operations, weather, etc. Remove protection when no longer required.

2. Maintain temperature and humidity conditions in interior spaces for the Work in accordance with manufacturers' instructions for the materials and equipment being protected.

1.5 UNDERWRITERS' LABORATORIES LABEL

- A. Materials and equipment, for which Underwriters' Laboratories, Inc. (UL) standards have been established and their label service is available, shall bear the appropriate UL Label.

1.6 MANUFACTURERS' TRADE MARKS AND NAMES

- A. University's Representative reserves the right to review and request the removal or redesign of manufacturers' trade marks and names on items of materials and equipment which will be exposed to view in the completed Work. Such removal or redesign shall be at no additional cost to the University.

1.7 LEED AND ENVIRONMENTAL PERFORMANCE REQUIREMENTS

- A. Provide documentation described below for inclusion in the application for LEED Certification for environmental performance.
- B. Materials and Resources: Provide documentation of the environmental performance attributes listed below for products or materials specified with these attributes. Include documentation for the cost of the product or materials exclusive of labor.
  1. Recycled Content:
    - a. Products and materials required to have recycled content may include post- industrial and post-consumer recycled content. Recycled content shall be defined in accordance with ISO 14021 – Environmental labels and declarations - Self-declared environmental claims (Type II environmental labeling).
    - b. Provide product data on post-consumer recycled content and post-industrial recycled content as a percentage of the full product composite (based on weight).
    - c. Minimum recycled content values listed in the specifications shall mean the sum of post-consumer recycled content and one-half the post-industrial recycled content.
    - d. For salvaged and refurbished materials, provide product data or letter stating that material is salvaged or refurbished.
  2. Regional Materials:
    - a. Regional materials or products are extracted, harvested or recovered as well as manufactured at a facility within 500 miles of the Project.
    - b. If only a fraction of a material or product is extracted, harvested or recovered as well as manufactured regionally, document that percentage (by weight).
    - c. Document location of raw material extraction, harvest, or recovery (mine, quarry, plantation, forest, recycling center, etc.) as well as product manufacturing facility.
  3. Rapidly renewable materials:
    - a. These materials or products are made from plants that are typically harvested within a 10 year cycled or shorter.
    - b. Provide documentation identifying the percentage of rapidly renewable content in the material or product (based on weight).
  4. Certified wood:
    - a. These materials and products are certified in accordance with the Forest Stewardship Council (FSC) Principles and Criteria, for wood building components.
    - b. Provide wood certification documentation, including chain-of-custody documentation, from the manufacturer.
- C. Indoor Air Quality: For all materials listed below used in the interior of the building (within the exterior weatherproofing system) and applied on site, provide product data and Material Safety Data Sheets highlighting VOC and other applicable chemical emission test results and limits and include statements that prohibited chemical components were not used as ingredients in the manufacture of the products.

1. Adhesives and Sealants:

<b>Adhesives</b>	<b>VOC Limit g/L)</b>
Carpet Adhesive	50
Carpet Pad Adhesive	50
Wood Flooring Adhesive	100
Rubber Floor Adhesive	60
Subfloor Adhesive	50
Ceramic tile Adhesive	65
VCT and asphalt tile Adhesive	50
Dry wall and panel Adhesive	50
Cove Base Adhesive	50
Multipurpose Construction Adhesive	70
Structural Glazing Adhesive	100
Single Ply Roofing Membrane Adhesive	250
PVC welding	285
CPVC welding	270
ABS welding	400
Plastic cement welding	250
Adhesive primer for plastic	250
Contact Adhesive	80
Special Purpose Contact Adhesive	250
Structural Wood Member Adhesive	140
All others	250
<b>Aerosol Adhesives</b>	
General Purpose Mist	65% VOC by weight
General Purpose Web	55% VOC by weight
Special Purpose	70% VOC by weight
<b>Substrates</b>	
Metal to metal	30
Plastic foams	50
Porous material except wood	50
Wood	30
Fiberglass	80
<b>Sealants</b>	
Architectural	250
Nonmembrane Roof	300
Single Ply Roof Membrane	450
Other	420
<b>Sealant Primers</b>	
Architectural – nonporous	250
Architectural – porous	775
Modified Bituminous	500
Other	750

Requirements are from South Coast Air Quality District Rule 1168 (1/7/05) except for aerosol adhesive requirements which come from Green Seal Standard GS 36 (10/19/00) Applicable definitions apply.

- a. Prohibited Chemicals: the manufacturer shall demonstrate that the following chemical compounds are not used as ingredients in the manufacture of the product.
- (1) chloroform
  - (2) ethylene dichloride
  - (3) methylene chloride

- (4) perchloroethylene
- (5) trichloroethylene

2. Paints and Coatings:

<b>Interior Coatings</b>	<b>VOC Limit g/L)</b>
Non-flat	150
Flat	50

<b>Exterior Coatings</b>	
Non-flat	200
Flat	100

**Anti-corrosive Coatings (ferrous)**  
 Gloss, Semi-gloss and Flat 250  
 Requirements from Green Seal Standard GS 11 (10/19/00) and GC 03  
 (1/7/97). Applicable definitions apply.

<b>Clear Wood Finishes</b>	<b>VOC Limit g/L)</b>
Varnish	350
Lacquer	550
Shellac (clear)	730
Shellac (pigmented)	550
Stains	250

<b>Sealers</b>	
Waterproofing sealers	250
Sanding Sealers	275
Other Sealers	200
Floor coatings	100

Requirements are from South Coast Air Quality District Rule 1113 (1/1/04).  
 Applicable definitions apply.

3. Carpet Systems:

<b>Carpet*</b>	<b>24 hr Emission Factor Limit (mg/m<sup>2</sup>/hr)</b>
Acetaldehyde	0.02
Benzene	0.055
Caprolactam	0.12
2-Ethylhexanoic Acid	0.046
Formaldehyde	0.05
1-Methyl-2-Pyrrolidinone	0.3
Naphthalene	0.02
Nonanal	0.024
Octanal	0.024
4-Phenylcyclohexene	0.05
Styrene	0.41
Toluene	0.28
Vinyl Acetate	0.4
Total VOCs	0.5
Formaldehyde	0.05

**Cushion\*\***

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	Emission factor limit (mg/m <sup>2</sup> /hr)
Total VOCs	1.00
4 – Phenylcyclohexane	0.30
Formaldehyde	0.05
Styrene	0.05

**Adhesives**

See requirements for adhesives and sealants (above) for VOC limits.  
\*Partial requirements (24 hour emission limits only). See Carpet and Rug Institute – Green Label Plus program for applicable definitions and additional testing requirements.  
\*\* See Carpet and Rug Institute – Green Label program for applicable definitions.

4. Composite wood and agrifiber products:

No added urea-formaldehyde resins. This requirement applies to laminating resins and binders used in fabrication as well as the base material.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 60 00

SECTION 01 71 23 FIELD ENGINEERING

PART 1 - GENERAL

1.1 PREPARATION

- A. Lay out and install all Work to lines and grades in accordance with Contract Documents.

1.2 LAYOUTS AND MEASUREMENTS

- A. Provide all survey Work required for horizontal and vertical location of all Work in this Project.
- B. The location shall be staked from lines shown on the Drawings. Mark the limits of the Project site and obtain Underground Service Alert (USA North/1-800-227-2600 or 811) clearance prior to starting clearing or excavation Work. Provide USA permit number to University's Representative prior to starting site Work.
- C. Contractor shall be responsible for replacement and reestablishment of control stakes, monuments, and lines furnished by the University that are destroyed or disturbed by Contractor's operation.
- D. Furnish to the University's Representative, prior to Project acceptance, 2 complete sets of the field notes for the survey Work and cut sheets in addition to 1 set of Drawings marked showing all deviations from Project alignment and grades.
- E. Generally, grades shall match adjacent surfaces, and existing flow lines shall be maintained.

1.3 SURVEY REFERENCE POINTS

- A. Basic horizontal and vertical control points for the Project will be established from existing structure.
- B. Locate and protect control points prior to beginning the Work, and preserve all permanent reference points throughout construction operations.
  - 1. Do not change reference points without prior approval of the University's Representative.
  - 2. Report to the University's Representative when any reference point is lost, destroyed, or requires relocation due to necessary changes in grades or locations.
  - 3. Replace, at no additional cost to University, control points that may be lost or destroyed; base replacements on original survey control.

1.4 PROJECT SURVEY REQUIREMENTS

- A. Establish lines and levels, locate, and lay out:
  - 1. Site improvements.
    - a. Stakes for grading and fill placement.
    - b. Utility slopes and invert elevations.
  - 2. Batter boards for structures.
  - 3. Building foundations, column locations, and floor levels.
  - 4. Controlling lines and levels required for mechanical and electrical Work.
- B. Verify layouts as Work proceeds to assure compliance with required lines, levels, and tolerances.

1.5 RECORDS

- A. Maintain a complete and accurate log of all control and survey Work as it progresses.
- B. On completion of foundation walls and major site improvements, prepare a certified survey showing all dimensions, locations, angles, and elevations of construction.

1.6 SUBMITTALS

- A. Upon request, submit documentation to verify accuracy of field engineering Work.
- B. For all seismic bracing systems, submit structural calculations and details prepared and signed by the Contractor's licensed engineer that include all resultant forces applied to the building structure.

Do not over stress building structure. Calculations will be reviewed for compliance with design criteria, not for arithmetic.

#### 1.7 SUPPORT AND BRACING

##### A. General

1. Design all support and bracing systems. Provide for attachment to portions of the building structure capable of bearing the loads imposed. Design systems to not over stress the building structure.

##### B. Seismic Bracing

1. Design and install all support systems to comply with the seismic requirements of the 2007 California Building Code (CBC) and ASCE7, Chapter 13 for nonstructural components.
2. Design and install seismic bracing so as not to defeat the operation on any required vibration isolation or sound isolation devices.
3. Seismic design data shall be presented on construction documents in accordance with Section 1603.1.5 of the California Building Code (CBC).
4. Seismic bracing shall be designed by a structural engineer licensed in California.
5. For seismic bracing for mechanical, electrical and plumbing systems, refer to the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA), "Guidelines for Seismic Restraints of Mechanical Systems and Plumbing Piping Systems" for guidelines.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 71 23

Standard Specification

SECTION 01 71 33 PROTECTION OF ADJACENT CONSTRUCTION

PART 1 - GENERAL

1.1 SURROUNDING SITE CONDITION SURVEY

- A. Prior to commencing the Work, tour the Project site with University's Representative to examine and record damage to existing adjacent buildings, campus streets and city streets, bicycle paths, sidewalks, and all other improvements. This record shall serve as a basis for determination of subsequent damage due to Contractor's operations and shall be signed by all parties making the tour. Any cracks, sags, or damage to the adjacent buildings and improvements not noted in the original survey, but subsequently discovered, shall be reported to the University's Representative.

1.2 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings show, if applicable, existing above and below grade structures, drainage lines, storm drains, sewers, water, gas, electrical, hot water, steam and steam condensate return lines, chilled water, landscape irrigation, site lighting and other utilities that are known to the University in their approximate location. Exercise care in avoiding damage to these facilities. The Contractor will be held responsible for the repair if damaged. The University or University's Representative does not guarantee that all utilities or obstructions are shown or that the locations indicated are accurate.
- B. Locate and surface mark (various colors specified by USA) all known existing underground structures and utilities before proceeding with construction operations that may damage them. Stake and flag utility valve boxes and other surface structures. Prior to commencing excavation and trenching, coordinate with Underground Service Alert (USA North/1-800-227-2600 or 811) for field verification and marking of utilities within limits of Project site. Provide USA notification permit number to University's Representative prior to starting site Work. Coordinate with University's Representative well in advance to schedule the Pre-Dig Conference for each excavation activity, in accordance with Section 01 31 19 Project Meetings. Existing underground structures and utilities shall be kept in service unless approval to interrupt or shutdown service is obtained from University's Representative. If damaged, the utility shall be repaired at no additional cost to the University.
- C. Uncover, prior to any earthwork for new construction, all existing piping where crossings, interferences, close proximity (5 feet or less) or connections are shown on the Drawings, from 1 foot below proposed construction limit to the existing ground surface. Any variation in the actual elevations and the indicated elevations shall be brought to the University's Representative's attention. If the Contractor does not expose all existing utilities, Contractor shall not be entitled to additional compensation for Work necessary to avoid interferences.
- D. If interferences occur at locations other than the general locations shown on the Drawings, and such utilities are damaged before their locations have been established, or create an interference, notify the University's Representative and a method for repairing the damage or correcting the interference shall be supplied by the University's Representative. Payment for additional Work due to interferences not shown on the Drawings shall be in accordance with the General Conditions.
- E. Care shall be exercised to prevent damage to adjacent facilities including walks, streets, curbs, and gutters from settlement, lateral movement, undermining, and washout and other hazards; where equipment will pass over these obstructions suitable planking shall be placed. Damaged facilities, due to the Contractor operations, shall be removed and replaced at no additional cost to the University.
- F. If any other structures or utilities are encountered, request University's Representative to provide direction on how to proceed with the Work.
- G. If any structure or utility is damaged, take immediate action to ensure the safety of persons and property. Correct damage immediately. Contractor shall bear all costs of correction, replacement, repair, restoration, including related damages additional testing, inspection, and compensation for

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University's Representatives services and expenses. Compensation to the University shall be made by deductive Change Order.

- H. No Work is to be performed on energized electrical equipment unless scheduled with the University's Representative. The University reserves the right to specify specific conditions for all Work involving energized high-voltage electrical equipment.

### 1.3 ADJACENT BUILDING AIR INTAKES

- A. For existing building air intakes located within 100 feet of the construction site boundary, provide and maintain prefilters on the exterior of the louvers.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 71 33

## SECTION 01 73 23 BRACING AND ANCHORING

### PART 1 - GENERAL

#### 1.1 DESCRIPTION

- A. This Section provides guidelines and limitations for supporting all mechanical, electrical, plumbing or architectural items from the building structure. Refer to Section 01 73 23 Field Engineering for engineering and design provided by the Contractor.
- B. Install all support and bracing systems to comply with the requirements of the 2007 California Building Code (CBC) and ASCE 7, Chapter 13 for nonstructural components. Provide for attachment to portions of the building structure capable of bearing the loads imposed.
- C. Contractor is not required to design support and bracing for items which the Contract Documents provide specific attachment, support, and bracing.

#### 1.2 SUBMITTALS

- A. Submit Shop Drawings for all substructures and attachment methods in accordance with Section 01 33 23 Shop Drawings, Product Data and Samples.
- B. Submit proposed alternative methods of attachment for review and approval by the University's Representative prior to deviating from the requirements given below.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Furnish all substructures and fasteners required to comply with the limitations given below. Use materials as specified in the various Sections and as appropriate to the use.
- B. Channel framing systems: as required to meet Project design.
- C. All exterior materials: hot-dipped galvanized or stainless steel.

### PART 3 - EXECUTION

Review with Consultants and revise as applicable to the project design.

#### 3.1 GUIDELINES & LIMITATIONS

- A. Contractor shall coordinate the load requirements from all Subcontractors so that no combination of loads exceeds the limitations given below.
- B. Steel Structure
  - 1. At both the floor and the roof, attachments may be at the upper or the lower truss chord (horizontal members at top and bottom of truss). Hang no loads from web members (the diagonal and vertical members between chords), including the end diagonal member where the lower chord is discontinuous.
  - 2. Make the point of attachment at a panel point of the truss girders or joints. (The panel points are the intersections of the horizontal chords with the diagonal or vertical web members.)
  - 3. Make no attachments to metal decking without written approval from the University's Representative. If requested, inserts shall be provided where concrete fill occurs or stiffeners welded where roof insulation occurs. Submit supported weights and details as required for such approval.
  - 4. Do not weld on any trusses. Use bolted or clamped type connections.
  - 5. Hang no more than 20 lbs. per metal deck rib in any span.
  - 6. At floor and roof joists, hang only concentric loads, not one-sided loaded. At all other members (W beams and truss girders) hang all loads greater than 40 lbs. concentric.
  - 7. Attach no loads greater than the following without specific approval of University's Representative:
    - a. Floor joists and girders: 500 lbs. point load. 1000 lbs. total for a single span.

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b. Roof joists and girders: 300 lbs. point load. 600 lbs. total for a single span.

C. Wood Structure

1. Support no loads from plywood deck.
2. At 2 x 4 stiffeners of roof panels, hang no loads.
3. At Glue Lam Beam (GLB) girders, hang no loads greater than 200 lbs. without consultation. For multiple loading (on girder or from incoming purlin) submit Drawings for University's Representative's review.
4. Place all fasteners for hanger support within the middle 1/3 of the beam depth.
5. Total loads suspended from the roof structure shall not exceed the design loading of 4.5 pounds per square foot.

END OF SECTION 01 73 23

Standard Specification

SECTION 01 73 29 CUTTING AND PATCHING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included

1. Patching and matching existing Work altered or disturbed to accommodate new construction.
2. Patching and matching existing Work damaged or defaced during new construction as required to restore to condition at time of award of Contract.
3. Matching of new Work in existing construction to adjacent existing Work unless otherwise noted.
4. Execute cutting, patching and matching in a manner to prevent damage to other Work and to provide proper surfaces for the installation of repairs, penetrations through surfaces, equipment, or other items.

1.2 SUBMITTALS

- A. Submit in accordance with Section 01 33 23 Shop Drawings, Product Data and Samples.
- B. Product Literature and Shop Drawings: Submit for review materials, methods, or systems different from existing Work to be matched.
- C. Samples as requested by the University's Representative.

1.3 QUALITY ASSURANCE

A. Design Criteria

1. Patching shall achieve security and protection where exposed to weather, and shall preserve the continuity of existing fire ratings.
2. Cutting, patching and matching shall successfully duplicate the undisturbed adjacent finishes, colors, textures, and profiles. Where there is dispute over whether the duplication is successful or has been achieved to a reasonable degree, the judgment of the University's Representative shall be final.
3. Notify University Representative in writing if non-complying existing construction or field conditions are encountered.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in the original packages, containers or bundles with seals unbroken and labels intact until time of use.

1.5 PROJECT CONDITIONS

- A. Environmental Requirements: Follow the manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials shall be as required to match the appearance, quality and performance of the existing finishes to be duplicated and materials to be replaced.
- B. Where the existing finish to be duplicated was achieved with materials now out of production or otherwise unavailable, obtain review and acceptance by the University's Representative of substitutions.
- C. Provide primers, sealers, underlayments, backing, blocking, furring, suspension systems, and related items required for any purpose in patching existing Work.
- D. Materials shall be subject to the review of and acceptance by the University's Representative.

### PART 3 - EXECUTION

#### 3.1 GENERAL REQUIREMENTS

- A. Perform Work in accordance with the manufacturer's recommendations, deviating only as directed by the University's Representative to achieve a good match.
- B. For the following items, employ the installer or fabricator to perform any cutting, patching or matching of such items:
  - 1. Weather-exposed or moisture-resistance elements.
  - 2. Fireproofing.
  - 3. Finishes surfaces exposed to view.
- C. Adjust and fit products to provide a neat installation.
- D. Inform the University's Representative of locations where Work will be noisy, and obtain the University's Representative approval of the times during which such Work will be done; otherwise keep noise to a minimum.
- E. Finish or refinish surfaces as required to match adjacent finishes. Refinish to nearest intersection or refinish entire assembly.
- F. Patching of old ceramic tile surfaces:
  - 1. Match tile if practical.
  - 2. If matching tile is unavailable, provide stock tile of color acceptable to University's Representative. Install replacement tile in a uniform, rectilinear pattern that is symmetrical to the repair area e.g., not a zigzag or checkerboard. Pattern shall be acceptable to University's Representative.
  - 3. Minor small screw holes may be filled with a rubberized grout of a color close to the tile color.

#### 3.2 PAINTING

- A. Extent of Painting
  - 1. Paint over the entire surface plane, unless otherwise noted.
  - 2. Over patched wall, soffit, or ceiling surfaces, paint to the nearest cut off line for the entire surface, such as the intersection with the adjacent wall or ceiling, a beam, a pilaster, or to nearest opening frame where a total cut off does not occur within 10 feet of the patch, unless otherwise noted.
- B. Ensure painted surfaces do not present a spotty, touched-up appearance.
- C. Provide a smooth continuous surface in texture, coverage, and color.

#### 3.3 PAVEMENT

- A. Asphaltic and Portland Cement concrete shall be patched to match adjacent surfaces and thickness, with similar material, e.g., exposed aggregate concrete, colored concrete, etc.
- B. Remove and replace all damaged concrete and all concrete to be demolished to the nearest full depth joint. Surface scribed and partial depth sawn joints shall not be acceptable in lieu of full depth joints unless specifically approved by the University Representative.
- C. Restore pavement markings.
- D. Other paving materials and systems such as decomposed granite; stone pavers, etc. shall be replaced or restored in kind. Replace or restore an entire panel or area to present a uniform appearance to the satisfaction of the University's Representative.
- E. All new surfaces shall be within 1/4 inch elevation of adjacent surfaces. All slopes to adjacent surfaces shall be less than 1 in 20, unless approved by University's Representative.

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3.4 LANDSCAPING AND IRRIGATION

- A. Restore to pre-existing condition, using similar materials.

3.5 MECHANICAL AND ELECTRICAL SYSTEMS

- A. Matching non-compliant materials currently in place will not be acceptable.
- B. Where equipment or devices have been removed, and where the active side of the pipe remains, cap or plug all abandoned piping using either threaded or soldered fittings. Do not rely on the existing valves for a positive shutoff.

END OF SECTION 01 73 29

Coordinate use of Exhibit 32 Waste Management Progress Report – Construction Recycling Report with this section.

## SECTION 01 74 00 CLEANING AND WASTE MANAGEMENT

### PART 1 - GENERAL

#### 1.1 REQUIREMENTS

- A. During the progress of the Work, keep the Project site in a neat and clean condition that is free of debris to the satisfaction of the University's Representative. All materials and debris accumulated in conjunction with completing this Work shall be legally recycled or disposed of by Contractor off campus. Refer to Section 01 77 00 Closeout Procedures for final cleaning requirements.
- B. Furnish labor, containers, transportation and payment of fees associated with recycling, reuse, salvage and disposal of demolition and construction materials. Do not use University refuse or recycling containers except as specifically permitted below.

#### 1.2 RECYCLING

- A. Recover for reuse and recycling debris and waste materials from the Work to achieve a minimum goal of diverting 75 percent of total Project waste (by weight) from landfill. Materials that can not be reused nor recovered and recycled shall be disposed of as waste and debris in a legal and conscientious manner. Contractor may keep all revenues and other incentives for recycling materials from the project.
- B. Recycle, re-use or salvage all of the following materials removed during demolition or transported to the project site and not incorporated into the Project. Provide separate containers with identifying signage for source separation of the following resources. Do not transport these materials to a landfill site:
  - 1. Household recyclables including office paper, plastic bottles, plastic wrapping, etc.
  - 2. Clean dimensional wood, pallet wood
  - 3. Concrete
  - 4. Concrete Block, Brick
  - 5. Cardboard and paper board
  - 6. Glass
  - 7. Gypsum Boards
  - 8. Paint (Non-Lead Base Paint)
  - 9. Metal/Copper/ Steel/Aluminum
  - 10. Organic material suitable for composting or other recycling
  - 11. Carpet and carpet padding
- C. Asphalt grindings shall be delivered from the Project to a location on University property, within 5 road miles from the Project site as designated by the University's Representative. Transportation cost shall be borne by the Contractor.

#### 1.3 HAZARDOUS MATERIALS

- A. The University has determined that there are no known hazardous substances on this project. Should any suspicious substances be found notify University's Representative and refer to Section 01 35 43 Environmental Procedures.

OR

- B. The University has identified all known hazardous substances on this project. Comply with requirements listed in the following Sections:
  - 1. Section 02 82 00 Asbestos Remediation
  - 2. Section 02 83 00 Lead Remediation.
  - 3. Section 02 85 00 Mold Clean-Up

#### 1.4 DISPOSAL

- A. All excess soil shall be disposed of by the Contractor off the University property, at no additional cost to the University.
- B. Solvents, oils and any other material that may be harmful to plant life shall be disposed of in containers. At completion of Work, any contaminated soil shall be removed from the University's property and replaced with good soil by Contractor at no additional cost to the University.
- C. Do not burn or bury rubbish or waste materials on the University's property.

#### 1.5 SUBMITTALS

- A. Waste Management Plan (Non-Hazardous Materials) as shown in the exhibits:

1. The Waste Management Plan shall include a list of anticipated types and quantities of waste materials generated from the Project site and proposed siting locations (including map) for waste/recycling containers. The plan shall identify materials to be recycled, re-used or salvaged. It shall include efforts at source reduction, material handling procedures and collection of weight and hauling destination information.
2. Source Reduction: List processes that minimize waste such as working with suppliers to take back or buy back substandard, rejected or unused items and to deliver supplies using returnable pallets and containers. Also include procedures to minimize breakage, mishandling, contamination, and other factors that reduce job site waste.
3. Material Handling Procedures: List means by which source separated waste materials will be protected from contamination, and the means for recycling them consistent with requirements for acceptance by designated facilities.
4. Submit the initial Waste Management Progress Report – Construction Recycling Report to the University Representative within 10 days after the Notice to Proceed and prior to any waste removal. Update and resubmit the plan prior to final inspection. The final update shall include:
  - a. Total amount of waste in tons landfilled from the Project and the identity of the transfer station/landfill.
  - b. Total amount (in tons) of each material recycled, reused, or salvaged from the Project and the receiving party.
  - c. Total amount of all materials recycled in tons.
  - d. Total percentage of material recycled in tons.

- B. Waste Management Progress Report – Construction Recycling Report as shown in the exhibits:

1. The Progress Report shall include a summary of waste materials (recycled, salvaged, reused, disposed, etc.) by the Project. The Progress Report shall contain the amount of material (in tons) and the destination (landfill facility, material recovery facility, transfer station, used building materials yard, etc.). Attach weigh bills, disposal fees paid and other documentation confirming amount and disposal location of waste/recycled materials.
2. Update monthly and submit on the first business day of each calendar month.

#### PART 2 - PRODUCTS (NOT USED)

#### PART 3 - EXECUTION

##### 3.1 WASTE MANAGEMENT IMPLEMENTATION

- A. Designate an on-site person responsible for instructing workers and overseeing sorting and recording of waste/recyclable materials.
- B. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the Project.
- C. Meetings: The Construction Waste Management meetings shall include subcontractors affected by the Waste Management Plan as well as the University's Representative.
- D. Limit recycling and waste bin areas to areas approved on the Waste Management Plan. Keep recycling and waste bins neat and clearly marked in order to avoid contamination of materials.

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Recycled, re-used and salvaged materials shall be sorted on site unless the Contractor can demonstrate that there is insufficient space to accommodate it.

- E. Do not stockpile resources or waste on-site beyond the period necessary for sorting and accumulation of practical quantities for transport off-site. Do not sell resources on the University's property. Provide for periodic collection of resources or waste and transportation off-site.
- F. The University will accept small, sorted loads of cardboard and metals that are less than 2 cubic yards (approximately a pick up truck load). This material can be delivered to the R4 Recycle Center located off of LaRue Road near Putah Creek Lodge Drive. Please call the R4 Recycling Program at (530) 752-6970 for more information or visit the web site at <http://r4.ucdavis.edu>.

END OF SECTION 01 74 00

SECTION 01 77 00 CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 FINAL COMPLETION

- A. When Work is complete, submit written certification to University's Representative that:
1. Work has been inspected for compliance with the Contract Documents.
  2. Work has been completed in accordance with the Contract Documents.
  3. Equipment and systems have been tested in presence of the University's Representative and are operational.
  4. Work is complete and ready for final inspection.

1.2 PREPARATION FOR FINAL INSPECTION

- A. Perform final cleaning as specified below.
- B. In accordance with Section 01 78 00 Close-Out Submittals, assemble guarantees/warranties with service and maintenance contracts, operating and maintenance instructions, and other items as specified, and submit to the University's Representative.

1.3 FINAL CLEANING

- A. Upon completion of the Work, promptly remove from the vicinity:
1. All of Contractor's equipment.
  2. All temporary structures.
  3. All surplus material, including construction debris, lumber, etc.
  4. Mock-ups, field samples, and similar submittals unless directed otherwise by the University's Representative.
  5. Remove waste, surplus materials and rubbish from Project site, including roof areas.
- B. The entire Project site shall be left in a neat and clean condition to the satisfaction of the University's Representative.
- C. Execute final cleaning prior to final inspection. Cleaning shall be by experienced professional cleaners.
1. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances, polish glass and glossy surfaces, glazing vacuum all floors.
  2. Clean equipment and fixtures to a sanitary condition, clean permanent filters and replace disposable filters of mechanical equipment operated during construction. See Section 01 81 19 Indoor Air Quality Requirements.
  3. Vacuum and wipe sides of electrical panels and cabinetwork.
  4. Comply with manufacturer's instructions for cleaning.
  5. Clean each surface or unit to condition expected from normal, commercial building cleaning and maintenance program.
- OR---
6. Clean each surface or unit to condition acceptable for a teaching and research laboratory building. This condition shall exceed the cleanliness expected from a conventional commercial building cleaning and maintenance program.
  7. Clean Project site, sweep paved areas, rake clean ground surfaces.
  8. Remove stains, dirt, finger marks, etc., from wall and ceiling surfaces and trim.
  9. Disinfect, clean and polish all plumbing fixtures.
  10. Use cleaning materials and methods that will not create hazards to health or property or cause damage to products or Work.
  11. Remove temporary tapes, wrapping, coatings, paper labels, and similar items. Dust, mop, wash or wipe exposed and semi-exposed surfaces as necessary to leave Work in new, clean condition.

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12. Cleaning products shall meet the Green Seal Environmental Standard for Industrial and Institutional Cleaners (GS-37).
13. Floor sealers or strippers shall meet the Green Seal Environmental Standard for Industrial & Institutional Floor-Care Products (GS-40).

1.4 RESTORATION OF DAMAGED WORK

- A. Restore or replace, as specified or directed by the University's Representative, materials and finishes damaged from movement of equipment or other operations at no additional cost to the University.
- B. Restoration shall be equal to original Work, and finishes shall match appearance of existing adjacent Work.

1.5 REMEDIAL WORK

- A. Remedial Work necessary owing to faulty workmanship or materials shall be at no additional cost to the University.
- B. Work shall be coordinated with University's Representative and performed at such time and in such manner to cause minimal interruption and inconvenience to University's operations.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 77 00

SECTION 01 78 00 CLOSE-OUT SUBMITTALS

PART 1 - GENERAL

1.1 GUARANTEES

- A. Compile and submit guarantees, bonds, and service and maintenance contracts specified in the individual Specification Sections.
- B. Guarantees from Subcontractors shall not limit Contractor's warranties and guarantees to the University. Whenever possible, Contractor shall cause warranties of Subcontractors to be made directly to the University. If such warranties are made to the Contractor, Contractor shall assign such warranties to the University prior to final payment.
- C. Submittal Requirements
  1. Submit written guarantees, in the form of Guarantee/Warranty Form as shown in the exhibits in accordance with Section 01 33 23 Shop Drawings, Product Data and Samples. Submit the original forms on sheets 8-1/2 by 11 inches punched for 3-ring binder. Fold larger sheets to fit into binders.
  2. Submit an electronic copy in .PDF format with the warranties in sequence by specification number. Where one warranty form covers multiple specifications, provide additional copies to place in subsequent specification locations.
  3. Assemble required guarantees, bonds, and service and maintenance contracts.
  4. Number: 1 commercial quality, 3-ring binder, with durable and cleanable plastic covers.
  5. Identify each binder on the cover with typed or printed title, "Guarantees and Bonds", and the following:
    - a. Project No.
    - b. Title of Project.
    - c. Name of Contractor.
  6. Table of Contents: Neatly typed and in orderly sequence. Provide complete information for each item as follows:
    - a. Product or Work item.
    - b. Firm name, address, telephone number and name of principal.
    - c. Scope.
    - d. Provide information for University's personnel.
      - 1) Proper procedure in case of failure.
      - 2) Circumstances that might affect the validity of guarantee or bond.
  7. Binder Format:
    - a. Place warranties in sequence by specification number. Where one warranty form covers multiple specifications, provide additional copies to place in subsequent specification locations.
    - b. Provide tabs for each CSI division.
  8. Submit an electronic copy in .PDF format with the warranties in sequence by specification number. Where one warranty form covers multiple specifications, provide additional copies to place in subsequent specification locations.
  9. Time of Submittals
    - a. Within 10 days after date of Substantial Completion, prior to request for final payment.
    - b. For Work activities, where Final Completion is delayed beyond the date of Substantial Completion, provide updated submittal within 10 days after Final Completion, listing the date of Final Completion as the start of the Guarantee to Repair Period.

## 1.2 PROJECT RECORD DOCUMENTS

- A. Submit the record documents in accordance with Section 01 78 39 Project Record Documents.

## 1.3 SPARE PARTS AND MAINTENANCE MATERIAL

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual Specification Sections.
- B. Deliver to locations as directed by University's Representative.
- C. When the University Representative requests that materials be delivered to locations other than the Project site, provide receipt signed by the receiver stating the nature of the material, the quantity, and the place and date. Deliver such receipts to the University's Representative upon completion of the Work.
- D. In addition to required parts listed in other Sections of the Specification, provide any special programming software and database tools necessary to operate the system.

## 1.4 OPERATION AND MAINTENANCE MANUALS

### A. Work Included

1. Compile Product Data and related information appropriate for University's maintenance and operation of products provided under this Contract.
2. Prepare operating and maintenance data as specified herein and as specified in individual Specification Sections.

### B. Form of Submittal

1. Prepare data in the form of an instructional manual for use by University's personnel.
  - a. Format
    - 1) Size: 8-1/2 by 11 inches.
    - 2) Paper: 20 lb. minimum, white, for typed pages.
    - 3) Text: Manufacturers' printed or neatly typewritten data.
    - 4) Drawings
      - (a) Provide reinforced punched binder tab that is bound with the text.
      - (b) Fold larger Drawings to the size of the text pages.
    - 5) Provide fly-leaf for each separate product or each piece of operating equipment.
      - (a) Provide typed description of products and major component parts of equipment.
      - (b) Provide indexed tabs.
    - 6) Cover: Identify each volume with typed or printed title "Operating and Maintenance Instructions". List the following:
      - (a) Project No.
      - (b) Title of Project.
      - (c) Identify general subject matter covered in the volume.

### b. Binders

- 1) Commercial quality three-ring binders with durable and cleanable plastic covers.
- 2) When multiple binders are used, correlate the data into related groups.

- c. Submit an electronic copy of all material in .PDF format organized identically to the manual. The electronic copy shall be broken into individual files by equipment and system.

### C. Content of Manual

1. Table of Contents: Include in each volume, neatly typewritten.
  - a. Identify Contractor, name of responsible principal, address, and phone number.
  - b. List each product included, indexed to the content of the volume.
  - c. List, with each product, the name, address, and telephone number of:

- 1) Subcontractor or installer.
  - 2) Maintenance contractor, as appropriate.
  - 3) Identify area of responsibility of each of the previously mentioned parties.
  - 4) Nearest source of supply for parts and replacement.
  - d. Identify each product-by-product name and other identifying symbols as set forth in the Contract Documents.
2. Product Data
    - a. Include only those sheets that are pertinent to the specific product.
    - b. Annotate each sheet to:
      - 1) Clearly identify the specific product or part installed. Include part nomenclature as indicated in the Design, model number, serial number, operating data and options provided.
      - 2) Clearly identify the data applicable to the installation.
      - 3) Delete references to inapplicable information.
3. Drawings
    - a. Supplement Product Data with Drawings as necessary to clearly illustrate:
      - 1) Relations of component parts of equipment and systems.
      - 2) Control and flow diagrams.
    - b. Coordinate Drawings with information in Project record documents to assure correct illustration of completed installation.
    - c. Do not use Project record documents as maintenance Drawings.
  4. Written text: As required to supplement Product Data for the particular installation.
    - a. Organize in a consistent format under separate headings for different procedures.
    - b. Provide a logical sequence of instructions for each procedure.
  5. Copy of each warranty, bond, and service contract issued.
    - a. Provide information sheet to the University's personnel.
      - 1) Proper procedures in the event of failure.
      - 2) Circumstances that might affect the validity of warranties or bonds.

D. Manual for Equipment and Systems

1. For each unit of mechanical equipment and each mechanical system include the following:
  - a. Description of unit or system, and component parts
    - 1) Function, normal operating characteristics, and limiting conditions.
    - 2) Performance curves, engineering data, and tests.
    - 3) Complete nomenclature and commercial numbers of replaceable parts.
    - 4) Include with the Manual the Submittal for the equipment. Update to reflect actual installed equipment.
  - b. Operating procedures
    - 1) Start-up, break-in, and normal operating instructions.
    - 2) Regulation, control, stopping, shutdown, and emergency instructions.
    - 3) Summer and winter operating instructions.
    - 4) Special operating instructions.
  - c. Systems Demonstration
    - 1) Prior to final inspection, demonstrate operation of each system to University's Representative and University personnel. All work, required for each system to be fully functional, shall be complete and the system shall be fully operational prior to the demonstration.
    - 2) Instruct designated personnel in operation, adjustment, and maintenance of equipment and systems, using operation and maintenance data as basis of instruction.
  - d. Maintenance procedures
    - 1) Routine operations.

- 2) Guide to "trouble-shooting".
- 3) Disassembly, repair, and reassembly.
- 4) Aligning, adjusting, and checking.

Include if project requires preventative maintenance schedule

- e. Preventative Maintenance (PM) Schedule
    - 1) A tabular listing of all systems and equipment within the facility which require preventative maintenance, to include:
      - (a) System or equipment name.
      - (b) System or equipment number.
      - (c) PM activity to be performed on that system or piece of equipment.
      - (d) Consumable materials required for performance of the PM activity, such as lubricants, including the specification and quantity needed.
      - (e) Frequency of performance of PM activity.
      - (f) Date of performance of first round of each PM activity relative to facility commissioning and acceptance by the University.
    - 2) The requirements of this section cannot be met merely by the supply of O&M manuals from equipment vendors. The extraction of recommended preventative maintenance activities from vendor manuals for all equipment and incorporation onto a summary table as described above is required.
  - f. Servicing and lubricating schedule, with list of lubricants required.
  - g. Manufacturer's printed operating and maintenance instructions.
  - h. Description of sequence of operation by control manufacturer.
  - i. Original manufacturer's parts list, illustrations, current prices, recommended quantities to be maintained in storage, assembly drawings, and diagrams required for maintenance.
    - 1) Predicted life of parts subject to wear.
    - 2) Items recommended to be stocked as spare parts.
  - j. As-installed control diagrams by controls manufacturer.
  - k. Contractor's and Subcontractors' coordination drawings and as-built color-coded piping diagrams.
  - l. Charts of valve tag numbers, with the location and function of each valve.
  - m. Other data as required in the various Specification Sections.
2. For each electrical and electronic system, include the following:
- a. Description of system and component parts.
    - 1) Function, normal operating characteristics, and limiting conditions.
    - 2) Performance curves, engineering data, and tests.
    - 3) Complete nomenclature and commercial numbers of replaceable parts.
  - b. Circuit directories of panelboards.
    - 1) Electrical service.
    - 2) Controls.
    - 3) Communications.
  - c. As-built color-coded wiring diagrams.
  - d. Operating procedures
    - 1) Routine and normal operating instructions.
    - 2) Sequences required.
    - 3) Special operating instructions.
  - e. Maintenance procedures
    - 1) Routine operations.
    - 2) Guide to "trouble-shooting".
    - 3) Disassembly, repair, and reassembly.
    - 4) Adjustment and checking.
  - f. Manufacturer's printed operating and maintenance instructions.
  - g. Original manufacturer's parts list, illustrations, current prices, recommended quantities to be maintained in storage, assembly drawings, and diagrams required for maintenance.
    - 1) Predicted life of parts subject to wear.

- 2) Items recommended to be stocked as spare parts.
- h. Other data as required in the individual Specification Sections.
3. Prepare and include additional data as may be required for instruction of the University's personnel.
4. Additional requirements for operating and maintenance data as specified in the individual Specification Sections.
5. Provide complete information for products specified in the individual Specification Sections.

E. Submittal Requirements

1. Submit 2 copies of the draft of the proposed format and table of contents prior to preparation of the data and a minimum of 45 days prior to the date of Substantial Completion or the scheduled training (whichever occurs first).
2. Submit 1 copy of the complete data in final draft form on or before 75 percent progress payment submittal.
3. Submit 4 copies of the approved data in final form a minimum of 7 days prior to the scheduled training or the inspections scheduled to establish Substantial Completion (whichever occurs first).
4. Submittal and acceptance of the operations and maintenance data is a prerequisite for issuance of the Certificate of Substantial Completion.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 78 00

SECTION 01 78 39 PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Record Documents consist of As-Built Project Drawings, Shop Drawings, Coordination Drawings (layout drawings), Specifications, and Addenda with all as-built information recorded on them, and Record Drawings that incorporate all as-built information.
- B. Store Project record documents and samples in the Contractor's office separate from documents used for construction.

1.2 RECORD DOCUMENTS

A. As-Built Project Drawings

- 1. Maintain on Project site at all times in an approved location and in a clean, dry legible condition, 1 set of Project Drawings and 1 set of all Shop Drawings. These documents shall be used to record as-built conditions on a day-to-day basis, and shall be kept current, and shall be available for inspection by the University's Representative during normal working hours.
- 2. Track changes to the Documents in blue ink.
- 3. Record the following types of information on record drawings:
  - a. Location of Work buried under or outside the building, such as plumbing and electrical lines and conduits. Provide horizontal and vertical dimensions from fixed points. Record all locations of underground Work, points of connection, valves, manholes, catch basins, capped stubouts, invert elevations, etc.
  - b. Locations of all significant Work concealed inside the building, the locations of which were changed from those shown on the Drawings.
  - c. Locations of all items, not necessarily concealed but varying from the locations shown on the Drawings.
  - d. All changes in size, location, and other features of installation not shown on Drawings.
  - e. Sufficient information such that Work concealed in the building may be located with reasonable ease and accuracy. This may be accomplished by dimension or by stating the relationship to the spaces in the building near which the Work was installed. The University's Representative's decision on what constitutes sufficient information shall be final.
  - f. All electrical and control installations to indicate terminal points, wire numbers/circuit numbers, panel designations, device identification, and sequence of operations.
  - g. Record existing below-grade utilities if they are exposed by the project or are located within the Project boundary on the record drawings.
  - h. All changes shall be sketched or referenced directly on the record documents. If changes to the documents are issued via Addenda, RFI, Field Order, Letter of Instruction, or Change Order and include a detailed sketch, attach the sketch directly to the record documents.
- 4. Additional Drawings shall be provided as required to properly describe changes.

B. Specifications and Addenda

- 1. Record the following:
  - a. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
  - b. Changes made by Addenda, Change Order or Field Order, and clarifications and interpretations made by Letter of Instruction.

C. Coordination Drawings

- 1. Maintain the Coordination Drawings required by [Division 21-Fire Suppression, Division 22-Plumbing, Division 23-Heating, Ventilating, and Air-Conditioning (HVAC), Division 26-Electrical and Division 27-Communications and Division 28-Electronic Safety and Security of] the

Specifications similar to the requirements for the Project drawings noted above. These layout drawings are not shop drawings as defined by the General Conditions, but, together with shop drawings or layout drawings of all other affected Sections, are used to check, coordinate, and integrate the Work of the various Sections.

For Design Build projects insert the following:

D. Record Drawings

1. Record drawings shall be made from the As-Built Drawings, incorporating all revisions and changes made via Addenda, Change Order and information and other data, in accordance with Exhibit 45. All changes must be transferred to the original CAD digital files of the Drawings, to reflect a true "As-Built" condition. The digital files and plots shall be labeled "RECORD DRAWING" with the appropriate date. Design Builder shall provide one set of Bond prints, and electronic sets on compact disk formatted in Adobe Acrobat (.pdf), and AutoCad (.dwg) with drawings in Plot File (.plt) format with file titles to match the sheet numbers; "bind" all plot sheets.

1.3 SUBMITTAL OF PRELIMINARY RECORD DOCUMENTS.

- A. Upon completion of the site underground work the submit on compact disk a digital color scanned copy of the Civil Drawings in pdf format to the University's Representative. Submit in accordance with Section 01 33 23 Shop Drawings, Product Data and Samples

1.4 SUBMITTAL OF FINAL PROJECT RECORD DOCUMENTS

- A. Upon completion of the Work, the record documents shall be certified by the Contractor to represent the true, as-built conditions and submitted to the University's Representative.
- B. Submittal and acceptance of complete and final Project Record Documents is a prerequisite for issuance of the Certificate of Substantial Completion.
  1. For Work included in the Certificate of Substantial Completion, submit complete and final Project Record Documents a minimum of 14 days prior to the date of Substantial Completion.
  2. For Work excluded from the Certificate of Substantial Completion, submit a minimum of 14 days prior to the date of acceptance of the Work.
- C. Submit the final Record Documents in accordance with Section 01 33 23 Shop Drawings, Product Data, and Samples.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 78 39

Verify that all sections and divisions listed throughout this section are included in the specifications.

SECTION 01 79 00 DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section contains requirements for training the University's personnel, by persons retained by the Contractor specifically for the purpose, in the proper operation and maintenance of the equipment and systems installed.

1.2 RELATED WORK AND DOCUMENTS

- A. Section 01 33 23 Shop Drawings, Product Data and Samples.
- B. Section 01 78 00 Close-Out Submittals.
- C. Section 01 91 00 Commissioning.
- D. Division 11 Equipment.
- E. Division 13 Special Construction.
- F. Division 14 Conveying Systems Sections: Individual sections stipulate specific installation and start-up requirements for Elevators (if used).
- G. Division 21 Fire Suppression.
- H. Division 22 Plumbing.
- I. Division 23 Heating, Ventilating, and Air Conditioning.
- J. Division 25 Integrated Automation.
- K. Division 26 Electrical.
- L. Division 28 Electronic Safety and Security.

1.3 QUALITY ASSURANCE

- A. Where required by the Contract Documents, the Contractor shall provide on-the-job training of the University's personnel. The training sessions shall be conducted by qualified, experienced, factory-trained representatives of the equipment manufacturers. Training shall include instruction in both operation and maintenance of the subject equipment.

1.4 SUBMITTALS

- A. The following information shall be submitted to the University's Representative in accordance with the provisions of Section 01 33 23 Shop Drawings, Product Data and Samples. The material shall be reviewed and accepted by the University's Representative not less than 21 days prior to the provision of training.
  - 1. Lesson plans for each training session to be conducted by the manufacturer's representatives. In addition, training manuals, handouts, visual aids, and other reference materials shall be included.
  - 2. Subject of each training session, identity and qualifications of individuals to be conducting the training, and tentative date and time of each training session.
  - 3. Electronic copies in the form of CD/DVD of all training sessions and field instructions shall be submitted to the University at conclusion of training.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Where specified, the Contractor shall conduct training sessions for the University's personnel to instruct the staff on the proper operation, care, and maintenance of the equipment and systems installed.

Training shall take place at the Project Site and under the conditions specified in the following paragraphs. Approved operation and maintenance manuals shall be available at least 30 days prior to the date scheduled for the individual training session.

## 2.2 LESSON PLANS

- A. Formal written lesson plans shall be prepared for each training session. Lesson plans shall contain an outline of the material to be presented along with a description of visual aids to be utilized during the session. Each plan shall contain a time allocation for each subject.
- B. One complete set of originals of the lesson plans, training manuals, handouts, visual aids, and reference material shall be the property of the University and shall be suitably bound for proper organization and easy reproduction. The Contractor shall furnish 10 copies of necessary training manuals, handouts, visual aids and reference materials at least 7 days prior to each training session.

## 2.3 FORMAT AND CONTENT

- A. Each training session shall be comprised of time spent both in the classroom and at the specific location of the subject equipment or system. As a minimum, training session shall cover the following subjects for each item of equipment or system:
  - 1. Familiarization:
    - a. Review catalog, parts lists, drawings, etc., which have been previously provided for the plant files and operation and maintenance manuals.
    - b. Check out the installation of the specific equipment items.
    - c. Demonstrate the unit and indicate how all parts of the specifications are met.
    - d. Answer questions.
  - 2. Safety:
    - a. Using material previously provided, review safety references.
    - b. Discuss proper precautions around equipment.
  - 3. Operation:
    - a. Using material previously provided, review reference literature.
    - b. Explain all modes of operation (including emergency).
    - c. Check out University's personnel on proper use of the equipment.
  - 4. Preventive Maintenance:
    - a. Using material previously provided, review preventive maintenance (PM) lists including:
      - 1) Reference material.
      - 2) Daily, weekly, monthly, quarterly, semiannual, and annual jobs.
        - (a) Show how to perform PM jobs.
        - (b) Show University's personnel what to look for as indicators of equipment problems.
      - 3) Corrective Maintenance.
        - (a) List possible problems.
        - (b) Discuss repairs-point out special problems.
        - (c) Open up equipment and demonstrate procedures, where practical.
      - 4) Parts.
        - (a) Show how to use previously provided parts list and order parts.
        - (b) Check over spare parts on hand. Make recommendations regarding additional parts that should be available.
      - 5) Local Representatives.
        - (a) Where to order parts: Name, address, telephone.
        - (b) Service problems.
        - (c) Who to call.
        - (d) How to get emergency help.
  - 5. Operation and Maintenance Manuals:
    - a. Review any other material submitted.

- b. Update material, as required.

### PART 3 - EXECUTION

#### 3.1 TRAINING

- A. Training shall be conducted in conjunction with the operational testing and commissioning periods. Classes shall be scheduled such that classroom sessions are interspersed with field instruction in logical sequence. The Contractor shall arrange to have the training conducted on consecutive days, with no more than 6 hours of classes scheduled for any 1 day. Concurrent classes shall not be allowed. Training shall be certified by listing attendees and subjects covered.
- B. Acceptable operation and maintenance manuals for the specific equipment shall be provided to the University prior to the start of any training. Video taping shall take place concurrently with all training sessions. All training sessions and field instruction shall be videotaped by the Contractor and tapes of all classes submitted to the University.
- C. The following services shall be provided for each item of equipment or system as required in individual Specification Sections. Additional services shall be provided, where specifically required in individual Specification Sections.
  - 1. As a minimum classroom equipment training for University's personnel will include:
    - a. Using slides and drawings, discuss the equipment's specific location in the facility and an operational overview.
    - b. Purpose and facility function of the equipment.
    - c. A working knowledge of the operating theory of the equipment.
    - d. Startup, shutdown, normal operation, and emergency operating procedures, including a discussion on system integration and electrical interlocks, if any.
    - e. Identify and discuss safety items and procedures.
    - f. Routine preventative maintenance, including specific details on lubrication and maintenance of corrosion protection of the equipment and ancillary components.
    - g. Operator detection, without test instruments, of specific equipment trouble symptoms.
    - h. Required equipment exercise procedures and intervals.
    - i. Routine disassembly and assembly of equipment if applicable (as judged by the University on a case-by-case basis) for purposes such as operator inspection of equipment.
  - 2. As a minimum, hands-on equipment training for University's personnel shall include:
    - a. Identify location of equipment and review the purpose.
    - b. Identifying piping and flow options.
    - c. Identifying valves and their purpose.
    - d. Identifying instrumentation.
    - e. Location of primary element.
    - f. Location of instrument readout.
    - g. Discuss purpose, basic operation, and information interpretation.
    - h. Discuss, demonstrate, and perform standard operating procedures and round checks.
    - i. Discuss and perform the preventative maintenance activities.
    - j. Discuss and perform startup and shutdown procedures.
    - k. Perform the required equipment exercise procedures.
    - l. Perform routine disassembly and assembly of equipment if applicable.
    - m. Identify and review safety items and perform safety procedures, if feasible.
  - 3. Classroom equipment training for the maintenance and repair personnel will include:
    - a. Theory of operation.
    - b. Description and function of equipment.
    - c. Startup and shutdown procedures.
    - d. Normal and major repair procedures.
    - e. Equipment inspection and troubleshooting procedures including the use of applicable test instruments and the "pass" and "no pass" test instrument readings.

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- f. Routine and long-term calibration procedures.
  - g. Safety procedures.
  - h. Preventative maintenance such as lubrication; normal maintenance such as belt, seal, and bearing replacement; and up to major repairs such as replacement of major equipment part(s) with the use of special tools, bridge cranes, welding jigs, etc.
4. Hands-on equipment training for maintenance and repair personnel shall include:
- a. Locate and identify equipment components.
  - b. Review the equipment function and theory of operation.
  - c. Review normal repair procedures.
  - d. Perform startup and shutdown procedures.
  - e. Review and perform the safety procedures.
  - f. Perform University approved practice maintenance and repair job(s), including mechanical and electrical adjustments and calibration and troubleshooting equipment problems.

END OF SECTION 01 79 00

Standard Specification

This section applies to all new projects requiring Regental approval and is recommended for all major remodels (verify actual policy requirements).

For small or limited scope projects or exterior projects, project manager shall modify as appropriate for the project.

SECTION 01 81 19 INDOOR AIR QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes construction Indoor Air Quality (IAQ) goals and includes administrative and procedural requirements for the development and execution of a construction air quality management plan to maintain high indoor air quality during the Work and following completion of it.

1.2 PERFORMANCE REQUIREMENTS

- A. Anticipate and prevent conditions that could compromise indoor air quality due to construction means, methods, process, and materials with particular attention to the following:
1. Eliminating the use of materials containing Volatile Organic Compounds (VOC), formaldehyde and certain chemical compounds for which limitations are specified in Section 01 60 00 Product Requirements, and select construction materials and processes that will eliminate potential IAQ pollutants and contaminants from the Work.
  2. Protect the ventilation system components during construction and clean contaminated components after construction is complete.
- B. Conform to recommendations of Sheet Metal and Air Conditioning National Contractors Association (SMACNA) Guidelines for Occupied Buildings under Construction, Chapter 3 Control Measures for the following.
1. HVAC protection.
  2. Source control.
  3. Pathway interruption.
  4. Housekeeping.
  5. Scheduling.

1.3 SUBMITTALS

- A. Prepare an IAQ Management Plan for the construction and commissioning phases of the project conforming to these specifications and the recommendations of Sheet Metal and Air Conditioning National Contractors Association (SMACNA) Guidelines for Occupied Buildings under Construction, Chapter 3 Control Measures.
1. Draft IAQ Management Plan Review Meeting: Once the University's Representative has reviewed the Draft IAQ Management Plan and prior to construction at the site, schedule and conduct a meeting to review the Draft IAQ Management Plan and discuss procedures, schedules and specific requirements for IAQ during the construction and pre-construction phases of the building. Discuss coordination and interface between the Contractor and other construction activities.
    - a. Attendees: The Contractor and related Contractor personnel associated with the work of this Section, including personnel to be in charge of the IAQ management program, the University's Representative and such additional personnel as the University's Representative deems appropriate.
  2. Final IAQ Management Plan: Make any revisions to the Draft IAQ Management Plan agreed upon during the draft IAQ plan meeting and incorporate resolutions agreed to be made subsequent to the meeting. No work in the building interior may be initiated until this final plan has been submitted and approved.

- B. Construction Photographs: Digital, color images, 640 by 480 pixels on CD-ROM documenting construction IAQ management measures implemented during the Work such as duct protection measures and measures to protect on-site stored or installed absorptive materials from moisture. Provide annotation for images including, date, time and subject. Provide photographs of examples of each measure at 3 different times during construction.
- C. Product Data: Filtration media used during construction and installed immediately prior to occupancy with Minimum Efficiency Reporting Value (MERV) values highlighted.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.1 APPLICATION

- A. For the construction and commissioning phases of the Project provide the following:
  - 1. HVAC Protection: Shut down the return side of the HVAC system whenever possible during heavy construction. If the system must remain operational during construction include the following strategies that apply:
    - a. Fit the return side of the HVAC system with temporary filters.
    - b. Isolate the return side of the HVAC system from the surrounding environment as much as possible (e.g., place all tiles for the ceiling plenum, repair all ducts and air handler leaks).
    - c. Damper off the return system in the heaviest work areas and seal the return system openings with plastic.
    - d. Upgrade the filter efficiency where major loading is expected to affect operating HVAC system.
    - e. Clean permanent return air ductwork per National Air Duct Cleaning Association standards upon completion of all construction and finish installation work.
  - 2. Source Control: Provide non-toxic formulations of materials and products and comply with chemical compound limitations throughout the work including but not limited to adhesives, coatings, substrate products, sealants, and cleaning products.
  - 3. Pathway Interruption: Prevent contamination of clean spaces. Include the following strategies that apply:
    - a. Use 100 percent outside air ventilation (when outside temperatures are between 55 degrees F and 85 degrees F and humidity is between 30 percent and 60 percent) with air exhausted directly to the outside during installation of finishes and other VOC emitting materials.
    - b. Erect air infiltration barriers between work areas or between the inside and outside of the building to prevent unwanted airflow from dirty to clean areas.
  - 4. Housekeeping: Reduce construction contamination in the building prior to occupancy through HVAC and regular space cleaning activities.
    - a. Store building materials in a weather tight, clean area prior to unpacking for installation.
    - b. Check for possible damage to building materials from high humidity.
    - c. Clean all coils, air filters, and fans before testing and balancing procedures are performed.
  - 5. Scheduling: Specify construction sequencing to reduce absorption of VOC's by materials that act as sinks or contaminant sources. Complete application of wet and odor-emitting materials such as paints, sealants, and coatings before installing sink materials such as ceiling tiles, carpets, insulation, gypsum products, and fabric-covered furnishings are installed.
  - 6. Material Protection: Protect stored and installed absorptive materials from exposure to moisture through precipitation, plumbing leaks, or condensation from the HVAC system to prevent microbial contamination. Where practical provide conditioning period in controlled

environment to reduce moisture content of materials where protection failed or was otherwise ineffective.

For small projects, this period may be reduced or eliminated

7. Flush-out: Conduct a minimum two-week building flush-out with new filtration media at 100 percent outside air following the end of construction activities and prior to Final Acceptance. No work shall occur during the flush-out period. Filtration media shall have a Minimum Efficiency Reporting Value of 13 as determined by ASHRAE Standard 52.2-1999. (Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size)

8. Final Filters: Replace filtration media used during flush-out prior to occupancy.

### 3.2 IMPLEMENTATION

- A. Manager: The Contractor's Quality Assurance Manager shall be responsible for instructing workers and overseeing and the IAQ Management Plan for the Project.
- B. Progress Meetings: Construction related IAQ procedures shall be included in the pre-construction and construction progress meeting agendas.
- C. Distribution: The Contractor shall distribute copies of the IAQ Management Plan to the Job Site Foreman, each Subcontractor and the University's Representative
- D. Instruction: Provide on-site instruction regarding the IAQ procedures for all of the participants in the construction.
- E. Documentation: Document IAQ measures with photographs.

END OF SECTION 01 81 19

## SECTION 01 91 00 COMMISSIONING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Perform and document commissioning. This Section supplements but does not supersede specific testing requirements found elsewhere in the Contract Documents. The equipment and systems included in the commissioning work scope are described in detail in tables included in the following specification sections:

1. Section XX XX XX Commissioning of Building Envelope
2. Section XX XX XX Commissioning of Equipment
3. Section 22 08 00 Commissioning of Plumbing
4. Section 23 08 00 Commissioning of HVAC
5. Section 25 08 00 Commissioning of DDC/EMS System
6. Section 26 08 00 Commissioning of Electrical Systems
7. Section 28 08 00 Commissioning of Electronic Safety and Security
8. Section 33 08 00 Commissioning of Utilities

B. General Responsibilities

1. Provide all materials, labor and documentation to execute the commissioning activities as described in the Contract Documents.
2. Provide a Quality Assurance Manager.
3. Coordinate the commissioning work and ensure that commissioning responsibilities of all trades are executed according to the Contract Documents.
4. Include commissioning activities in the contract schedule.
5. Attend commissioning meetings.

#### 1.2 RELATED WORK AND DOCUMENTS

- A. Section 01 33 23 - Shop Drawings, Product Data and Samples
- B. Section 01 79 00 - Demonstration and Training
- C. Division XX Title
- D. Division XX Title
- E. Division 22 Plumbing
- F. Division 23 Heating, Ventilating, and Air Conditioning (HVAC)
- G. Division 25 Integrated Automation
- H. Division 26 Electrical
- I. Division 28 Electronic Safety and Security
- J. Division 33 Utilities

#### 1.3 ABBREVIATIONS & DEFINITIONS

- A. ASHRAE: American Society of Heating, Refrigerating, and Air Conditioning Engineers.
- B. Commissioning (Cx): The process of verifying and documenting that all equipment and systems are correctly installed and perform interactively according to the requirements of the Contract Documents.
- C. Commissioning Team: The group of individuals who collaborate to ensure the facility is commissioned including Contractor and University's Representative.
- D. Commissioning Plan: The plan that outlines the process, procedures, deliverables, and specific goals of commissioning. It also defines the roles of the parties participating in commissioning the project during construction.
- E. Cx Action Item: An issue identified during the verification process that must be resolved prior to acceptance of completed Installation/Start-up Verification (ISV) and Functional Performance Test (FPT) checklists.

- F. Deficiency: A condition in installation, operation or performance of equipment and systems that is not in conformance with the Contract Documents.
  - G. Equipment Functional Performance Tests (EFPT): Tests designed to demonstrate that the operation of equipment and system components meet design intent and project requirements under operating conditions. These tests are documented on the FPT Checklist. These tests may be performed by testing agencies described in the Contract Documents.
  - H. Functional Performance Test (FPT) Checklist: The checklist used to document the successful operation and performance of equipment and systems. This checklist includes the Equipment Functional Performance Tests, the Operational Tests and the System Functional Performance Tests.
  - I. Installation/Start-up Verification (ISV) Checklist: The checklist used to document the successful installation and start-up of equipment. This checklist includes requirements for verifying the proper installation and start-up of equipment and systems and preparations required for continuous operation.
  - J. Operational Test (OT): Tests designed to validate satisfactory system performance over a period of time under normal operating conditions, satisfactory recovery of systems from failure conditions (such as a power outage), and the correct response of systems to emergency conditions (such as encountered during Fire Alarm conditions). In general, the operational tests consist largely of trend data collected prior to the System Functional Performance Tests (SFPT). This data is an historical record of the system operational performance. These tests are documented on the FPT Checklist.
  - K. Quality Assurance Manager (QAM): Person employed by the Contractor to manage, coordinate, and supervise the installation, start-up and testing of systems and equipment, the Contractor's quality assurance program, and the commissioning process of the project. The QAM qualifications and responsibilities are described in this section.
  - L. Sequence of Operations (SOO): Narrative describing the modes of operation and control sequences for equipment and systems.
  - M. Start-up Test: The process whereby the Contractor executes the equipment manufacturer recommended start-up and check out procedures, completes the start-up checklists, energizes the device or equipment, and documents it is in proper working order.
  - N. System: A system includes all items of equipment, devices and appurtenances connected in such a manner that their operation or function complements, protects or controls the operation or function of the others.
  - O. System Functional Performance Tests (SFPT): Tests designed to demonstrate the satisfactory operation of equipment as a complete system under operating conditions. This shall include a detailed verification of the Sequence of Operations. Testing of some systems may require the proper functioning of other systems (i.e., the testing of proper performance of air handlers shall require the proper operation of chilled water and hot water systems, and thus these water systems must be tested before the air handlers, and they must be in satisfactory operation during the air handler testing. These tests are documented on the FPT Checklist.
  - P. TAB: Testing, Adjusting, and Balancing.
  - Q. Trending: Monitoring and recording the history of performance and parameters using the Emergency Management System (EMS) or devices like data loggers. Trending is used to prove successful operation of systems over a period of time, and is a prerequisite for a system's Functional Performance Test.
- 1.4 COORDINATION
- A. Commissioning Meetings
    - 1. Cx Kickoff Meeting

- a. The QAM shall schedule, plan and conduct a commissioning kickoff meeting with the entire commissioning team in attendance within [60] days of the commencement of construction.
  - b. The objectives of the meeting are to review the commissioning work scope, to clarify team member roles and responsibilities, and to plan the commissioning activities for the entire duration of the project.
  - c. The QAM shall prepare and distribute meeting minutes to all participants.
2. Scheduled Cx Coordination Meetings
- a. The QAM shall plan and conduct regular Cx coordination meetings as construction progresses.
  - b. These meetings shall be included in the project schedule and shall occur at the following intervals:
    - 1) [Every 60 days] between the initial kickoff meeting and the beginning of the ISV portion of the work;
    - 2) [Every 14 days] during the ISV portion of the work;
    - 3) [Every 7 days] during the FPT portion of the work.
  - c. The objective of these meetings is to facilitate coordination of the work of all trades and resolve deficiencies.

## 1.5 SUBMITTALS

- A. Documentation supporting QAM qualifications as required in the Quality Assurance article.
- B. Installation/Start-up Verification (ISV) Checklists
  1. Specific ISV checklists have been included in the sections listed in the Summary article.
  2. Customize and submit ISV checklists for review and acceptance prior to beginning of installation verification and start-up. Manufacturer's installation and start-up instructions shall be included with each ISV checklist. Customized ISV Checklists that incorporate all University review comments shall be submitted by Contractor [60] days prior to the beginning of equipment startup.
  3. If the project includes equipment for which checklists have not been included in the Specifications, Contractor shall develop these checklists using the supplied checklists as models of scope and detail. The sections listed in the Summary article indicate which checklists shall be developed by the Contractor.
- C. Functional Performance Test Checklists
  1. Specific FPT checklists have been included in the sections listed in the Summary article.
  2. Functional Performance Test (FPT) Checklists include Equipment Functional Performance Tests (EFPT), Operational Tests (OT) and System Functional Performance Tests (SFPT).
  3. The Contractor shall customize and submit FPT checklists for review and acceptance prior to beginning of tests. The customizing work shall address characteristics and requirements of equipment actually provided. Contractor shall require all subcontractors and vendors to review FPT procedures to ensure feasibility, safety and equipment protection. Provide necessary alarm limits to be used during the tests. Damage caused to equipment during tests performed in accordance with the approved procedures shall be the responsibility of the Contractor. Customized FPT Checklists that incorporate all University review comments shall be submitted by the Contractor [60] days prior to the beginning of equipment startup.
  4. If the project includes equipment for which checklists have not been included in the specifications, Contractor shall develop these checklists using the supplied checklists as models of scope and detail.
- D. Commissioning Schedule
  1. Submit a schedule for commissioning activities and provide specific information on the date and duration of individual tests. Any temporary systems or installations that are required to allow start-up and testing shall also be included in the schedule.

E. Final Commissioning Binders and CD

1. Submit the Final Commissioning Binders in paper format (1 original with wet signatures) and in electronic PDF format scanned from signed originals (1 CD). These binders shall contain completed and signed-off ISV and FPT checklists documenting the successful installation, start-up, and functional performance of all systems and equipment.
2. Completed and signed off ISV and FPT checklists for all systems and equipment shall be accepted by the University's Representative as a condition for Substantial Completion.

1.6 QUALITY ASSURANCE

A. Quality Assurance Manager (QAM)

1. Employ a competent QAM satisfactory to the University who shall be in attendance at the Project site for all commissioning activities.
2. The QAM shall be a representative of the Contractor and shall be a different individual than the Superintendent [or the Project Manager]. All communication between the QAM and the University shall be binding to the Contractor.
3. The QAM shall have at least 5 years experience, or experience on at least 5 separate similar projects, in performing the roles described in this section. The Contractor shall submit to the University the QAM qualifications for review and approval prior to commencement of the Work.
4. The QAM shall manage, coordinate and supervise the Contractor's Quality Assurance Program and the Commissioning activities including the following:
  - a. Coordinate construction activities.
  - b. Coordinate submittals, Requests for Information, Coordination Drawings and O&M documentation to the University.
  - c. Coordinate and supervise the installation, start-up and testing of equipment and systems.
  - d. Coordinate inspections and testing activities with University's Representative.
  - e. Supervise the commissioning process and coordinate commissioning activities of all trades and the University's Representative. Require each trade to assign a Cx Coordinator authorized as a representative of that trade in commissioning activities. The Cx Coordinators shall have expertise and experience in systems commissioning and shall participate in and perform commissioning team activities. Manage the Cx Coordinators and their Cx activities.
  - f. Assemble the Commissioning Binders.
  - g. Signoff commissioning checklists.
  - h. Develop the orientation and training plan.
  - i. Coordinate orientation and training of University's operating personnel.
  - j. Attend and conduct Cx coordination meetings and coordinate attendance of trade Cx Coordinators as applicable.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 QUALITY CONTROL

- A. All ISV and FPT testing shall be witnessed by the University's Representative. Notify the University's Representative of testing schedule 48 hours in advance.
- B. All testing procedures for electrical systems shall comply with the requirements of the latest version of Acceptance Testing Specification by the National Electrical Testing Association, Inc. (NETA). Include NETA requirements in the checklist.
- C. Independent Testing Agencies: For systems where testing by independent agencies is specified, the Contractor shall notify the University's Representative when the testing activities are scheduled. Aspects of EFPT and SFPT accomplished during the independent agency testing may be accepted if they meet the intent of the EFPT and SFPT as determined by the University's Representative. The Contractor shall submit the independent testing agency reports prior to the commencement of EFPT and SFPT for acceptance.

### 3.2 COMMISSIONING BINDERS

- A. The commissioning documents shall be organized in three volumes (binders) which shall be maintained on the project site at all times.
  - 1. The first volume shall contain the Commissioning Plan which shall consist of:
    - a. Commissioning Report (provided by the Commissioning Agent when commissioning is completed)
    - b. Commissioning Issues Log (provided by the University and updated by the Contractor)
    - c. Installation/Start-up Verification Checklist and Functional Performance Checklist Summary (provided by the University and customized by the Contractor)
    - d. Commissioning Meeting Minutes
    - e. Commissioning Schedule (provided by the Contractor)
    - f. Construction Commissioning Plan Narrative (provided by the University)
    - g. Training Plan Summary (provided by the Contractor)
    - h. Reference Information (provided by the University)
      - 1) University's Project Requirements
      - 2) Basis of design Narratives for systems to be commissioned
      - 3) Commissioning Specifications
  - 2. The second volume shall contain project specific ISV checklists.
  - 3. The third volume shall contain project specific FPT checklists.
  - 4. The second and third volumes shall contain all wet-signature certifications completed as part of the commissioning process.

### 3.3 SYSTEM INSTALLATION

- A. Document the successful installation of systems and equipment using the ISV Checklists. Completion and sign-off of ISV Checklists are a prerequisite to beginning the FPTs.

### 3.4 SYSTEM START UP

- A. Document the successful start-up of systems and equipment using the ISV checklists.
- B. Factory Start Ups: Contractor shall notify the University's Representative 48 hours in advance of scheduled factory start-ups. Aspects of EFPT and SFPT accomplished during the factory start-up may be accomplished and accepted if they meet the intent of the EFPT and SFPT as determined by the University's Representative.
- C. Start-up, Testing, Adjusting and Balancing
  - 1. Provide the services of a qualified Factory authorized Service Representative to perform equipment/device start-up. Start-up procedures shall be in accordance with the Contract Documents, manufacturer's requirements, and reference or industry standards.
  - 2. Provide the services of a qualified Factory authorized Service Representative or, where required, a certified Independent Testing Agency to perform system testing and adjustment.

### 3.5 FUNCTIONAL PERFORMANCE TESTING

- A. Equipment Functional Performance Tests (EFPT)
  - 1. Perform all equipment functional performance testing described in the FPT checklists.
  - 2. Document the successful operation and performance of equipment using the FPT checklists.
- B. Operational Tests (OT)
  - 1. Once EFPTs are completed, each system shall be set up to perform per contract requirements. A preliminary TAB report shall be submitted and approved prior to executing the OTs.
  - 2. Final sequences of operation and testing procedures shall be developed and submitted as attachments to the FPT Checklists.
  - 3. OT data shall be generated prior to the System Functional Performance Tests (SFPT). As part of the Operational Testing, all dynamic systems powered by electricity shall be tested to

simulate a power outage. Those systems on emergency power shall be tested on all sources. Recovery from power outage conditions shall also be observed for proper return to regular system operation.

4. All adjusted, balanced, and controlled systems shall be assessed to determine the optimal setting for the system as applicable. The optimal settings shall be determined to establish reliable, efficient, safe and stable operation. Electrical settings shall conform to Power System Study Mechanical systems shall be balanced by the TAB to meet Contract Document requirements.

C. System Functional Performance Tests (SFPT)

1. Perform all system functional performance testing described in the FPT checklists.
2. Document the successful operation and performance of systems using the FPT checklists.

D. Test Equipment

1. Have on site the following equipment in support of commissioning activities:
  - a. Standard testing equipment required to perform startup and initial checkout and functional performance testing.
  - b. Data logging equipment to trend the operation of standalone equipment which is not connected to an Energy Management and Control System.
  - c. Two-way radios for the duration of the FPT testing.
2. Calibration
  - a. All testing equipment shall be of sufficient quality and accuracy to test and measure system performance within the tolerances specified. All equipment used for testing and calibration shall be National Institute of Standards and Technology/National Bureau of Standards (NIST/NBS) traceable and calibrated within the current 12 month period. Calibration tags shall be affixed or certificates readily available. If not otherwise noted, the following minimum requirements apply:
    - 1) Temperature sensors and digital thermometers shall be calibrated in accordance with ANSI/ASME B40.1, shall have a certified calibration to an accuracy of 0.5 degree Fahrenheit and a resolution of + or - 0.1 degrees Fahrenheit.
    - 2) Pressure sensors shall be calibrated in accordance with ANSI/ASME B40.1, and shall have an accuracy of + or - 2.0 percent of the value range being measured (not full range of meter).

E. Calibration of Installed Sensing Equipment

1. All meters, thermometers, and sensing instruments provided as part of the Project shall have documented calibration using appropriate test equipment or factory calibration certificates. The factory calibration sheet shall identify the device serial number on the certification.
2. Certificates of calibration shall be included with the FPT Checklists.

3.6 SEASONAL / DEFERRED TESTING

- A. Provide an allowance for 16 hours of QAM's time [and 16 hours of Control Technician's time] to assist the University's Representative with seasonal or deferred functional performance testing during the warranty period.

END OF SECTION 01 91 00