

PROJECT TEAM DIRECTORY

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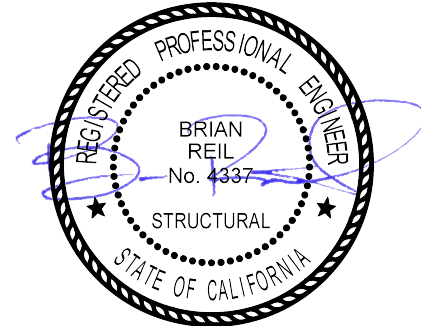
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Section 001110

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SECTION 01 11 00
SUMMARY OF THE WORK

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Description of the Work
- B. **Contractor** Warrants
- C. Contract Document Intent and Relationships
- D. University Furnished/**Contractor** Installed Products
- E. University Furnished/University Installed Products
- F. Concurrent Work Under Separate Contracts
- G. Site Condition Survey and Protection of Existing Improvements
- H. **Contractor** Use of Site and Premises
- I. University Beneficial Occupancy (if applicable)
- J. Project Phasing (if applicable)

1.02 DESCRIPTION OF THE WORK

- A. Project is titled: UC DAVIS HEALTH CANCER CENTER NET V2 UPGRADE 600A DISCONNECT INSTALLATION
- B. University Project No.: 9559410
- C. Project is located at 4501 X Street, UC Davis Health, Sacramento, California 95817, as shown on the vicinity map.
- D. Project is a 600A disconnect installation in the UC Davis comprehensive Cancer.
- E. A description of areas, types of construction and general nature of the Work are described in the construction documents.

F. Special Constraints and Criteria:

1. Refer to Section 011400 Work Restrictions for dates and hours when the building is occupied and operational, and work-shift hour requirements and restrictions.
2. Noise Mitigation shall be required when the building is occupied.
3. Egress shall not be restricted or impacted unless scheduled when the building is not occupied.

1.03 **Contractor WARRANTS**

- A. **Contractor** warrants that it is skilled and experienced in the use and interpretation of Contract Documents such as those included in the bid documents for this Contract. The **Contractor** further warrants that it has carefully reviewed the Contract Documents for this Work and has found them to be free of ambiguities and sufficient for bid purposes.
- B. **Contractor** warrants that it has inspected the Project Site and based on these observations, has satisfied itself as to the nature and location of the Work; and any special conditions likely to be encountered at the site which may affect the performance of the Work.
- C. **Contractor** warrants that its bid is based solely on the Contract Documents provided, its own observations, and written explanations and interpretations obtained from University's Representative and not on any explanation or interpretation, oral or written, from any other source.

1.04 **CONTRACT DOCUMENT INTENT AND RELATIONSHIPS**

- A. Contract Documents Intent: Provide all labor, material, equipment, tools, transportation, insurance, services, and all other requirements necessary to construct the project described in the Contract Documents.
- B. Relationship of Contract Documents: Drawings, Specifications and other Contract Documents in the Contract are intended to be complementary. What is required by one shall be as if required by all. What is shown or required, or may be reasonably inferred to be required, or which is usually and customarily provided for similar work, shall be included in the Work. For example, the drawings may not show every variation of an anchor clip that is required to support a curtain wall from its structural support; it can be reasonably inferred that variations of or additions to these clips are necessary to complete the installation of the working system and therefore all such clips are understood to be included in the Work.

- C. Discrepancies in Contract Documents: In the event of error, omission, ambiguity, or conflict in the Contract Documents, **Contractor** shall bring the matter to University's Representative's attention in a timely manner, for University's Consultant's determination and direction in accordance with provisions of the General Conditions of the Contract.
- D. Bidding and Contract requirements: Information for bidding, Conditions of the Contract and other Contract documents will be produced by University and may be included in the Contract Documents for convenience. Such documents are not Specifications. Specifications are found in Divisions 1 through 48 of the Contract, as listed in the Table of Contents of the Contract.
- E. Contract Drawings: The Drawings provided with and identified in the Contract are the Drawings referenced in the Agreement.
1. Drawings produced for this project may encompass Civil, Landscape, Architectural, Structural, HVAC, Plumbing, Piping, Fire Protection, and Electrical portions of the Work. Interior Design drawings may also be provided for product selection and installation information.
 2. The location, extent and configuration of the required construction and improvements are shown and noted on the Drawings. A list of Drawings is included in the Contract Documents.
 3. Drawings are arranged according to design discipline. Such organization and all references to trades, subcontractor, specialty contractor or supplier shall not control the **Contractor** in dividing the work among subcontractors or in establishing the extent of the work to be performed by any trade.
 4. Where the terms "as shown", "as indicated", "as noted", "as detailed", "as scheduled" or terms of like meaning, are used in the Drawings or Specifications, it shall be understood that reference is being made to the List of Drawings and the Specifications as bound in the Contract Documents.
 5. Where reference to the word "plans" is made anywhere in the Drawings, Specifications and related Contract Documents, it shall be understood to mean the Drawings listed in the List of Drawings.
- F. Contract Specifications: The Specifications provided as a part of the Contract Documents are the Specifications referenced in the Agreement.
1. The Specifications are organized by Division and Sections in accordance with recommended practice of the Construction Specifications Institute. Such organization shall not control the **Contractor** in dividing the work among

subcontractors or in establishing the extent of the work to be performed by any trade.

2. Specifications are included in the Contract, which also includes other Bidding and Contract Documents. Contents of the Contract are listed in the TABLE OF CONTENTS.
3. Information for bidding, Conditions of the Contract and other Contract documents will be produced by University. Such documents are not Specifications. Specifications are found in Division 1 through 48 of the Contract.

1.05 UNIVERSITY-FURNISHED, CONTRACTOR-INSTALLED (UFCI) PRODUCTS

- A. University-Furnished Products: University will furnish, for installation by **Contractor**, products which may be identified on the Drawing and in the Specifications as UFCI (University-Furnished/**Contractor**-Installed).
- B. Relationship to Work Under the Contract: Work under the Contract shall include all provisions necessary to fully incorporate such products into the Work, including, as necessary but not limited to: fasteners, backing, supports, piping, conduit, conductors, and other such provisions from point of service to point of connection, and field finishing, as shown on the Drawings and/or Specified herein. See Section 013100 - COORDINATION for additional requirements.

1.06 UNIVERSITY-FURNISHED, UNIVERSITY-INSTALLED (UFUI) PRODUCTS

- A. University-Furnished Products: University will furnish and install products which may be identified on the Drawing and in the Specifications as UFUI (University-Furnished/University-Installed).
- B. Relationship to Work Under the Contract: Work under the Contract shall include all provisions necessary to provide all rough-in requirements into the Work, including as necessary but not limited to fasteners, backing, supports, piping, conduit, conductors and other such provisions from point of service to point of connection, and field finishing, as shown on the Drawings and/or specified herein. See Section 013100 - COORDINATION for additional requirements.

1.07 CONCURRENT WORK UNDER SEPARATE CONTRACTS

- A. No Concurrent projects are anticipated.

- B. Relationship to Work Under the Contract: Work under the Contract shall include all provisions necessary to make such concurrent work under separate contracts complete in every respect and fully functional, including field finishing. Provide necessary backing, supports, piping, conduit, conductors, and other such provisions from point of service to point of connection for additional requirements.
- C. Related Contract Documents: University will make available, in a timely manner, Contract Documents of work under separate contracts for coordination and further description of that work. Such drawings and other data required for the coordination of the work of separate contracts with the Work of this Contract may be included with the Contract Documents. If so, they are provided for convenience only and are not to be considered Contract Documents.

1.08 SITE CONDITION SURVEY & PROTECTION OF EXISTING IMPROVEMENTS

- A. Site Condition Survey: Prior to commencing work, the **Contractor**, University's Representative and other University representatives shall tour the Project site together to examine and record the existing condition of site, adjacent buildings, and improvements. This record shall serve as a basis for determination of damage (if any) due to the construction process. The record shall be signed by all parties participating in the tour.
- B. Protection of Existing Improvements: Locate all known existing utilities prior to proceeding with construction. Existing utilities shall be kept in service where possible and protected by the **Contractor** from damage. If any structure or utility is damaged, take immediate action to ensure the safety of persons and University property and effect repair. If previously undiscovered structures or utilities are encountered, request University's Representative to provide direction on how to proceed with the work. Cracks, sags or damage to adjacent structures or improvements not noted in the original survey shall be reported to University's Representative.
- C. University does not normally charge for its shutdown support services. However, if poor planning or execution of a shutdown by **Contractor** causes excessive time and effort for University, University reserves the right to back charge **Contractor** for additional work.

1.09 CONTRACTOR USE OF SITE AND PREMISES

- A. Site Access: Limit access to site as indicated on the drawings. If routes and access points are not indicated, access shall be as directed or approved by University's Representative.
- B. Hours of Operation: Construction activities are limited to the hours of 7:00 a.m. to 5:00 p.m., Monday through Friday. Prior University approval is required for **Contractor** construction work at any other time or day.
- C. Construction Limit: Limit construction activities to areas indicated on Drawings as Project Area or, if not indicated, to areas immediately adjacent to buildings and as necessary for immediate construction or utility services and sitework, See Section 015100 - TEMPORARY UTILITIES for additional requirements.
- D. Utility Outages and Shutdowns: Schedule utility outages and shutdowns to times and dates acceptable to University's Representative. Duration of outages and shutdowns shall

not hinder University normal business operations. Provide fourteen (14) calendar days' notice of all utility outages and shutdowns.

PART II - PRODUCTS – Not Applicable to this Section

PART III - EXECUTION – Not applicable to this Section

END OF SECTION 01 11 00

SECTION 01 14 00
WORK RESTRICTIONS

PART I - GENERAL

1.01 WORK HOURS

- A. No Work shall be done outside of standard Monday through Friday 7:00 a.m. to 5:00 p.m. working hours, on holidays or weekends unless prior written approval has been retained from the University's Representative.

1.02 PROJECT PHASING - NOT USED

1.03 WORK SEQUENCE and WORK RESTRICTIONS

- A. Contractor will be required to work hours outside of the typical work hours when shutdowns occur. Coordination with University's Representative will be required to establish a work schedule that conforms to the University's needs. No systems worked can be left out of service at the end of a Contractor's shift.

1.04 **Contractor's** USE OF PROJECT SITE

- A. **Contractor's** use of the Project site for the Work and storage is restricted to the areas designated on the Drawings.

1.05 UNIVERSITY OCCUPANCY

- B. The entirety of the Cancer Center will be occupied during normal business hours of 7:00AM – 5:00PM, Monday through Friday. Contractor will be required to work hours outside of the typical work hours when shutdowns occur. Coordination with University's Representative will be required to establish a work schedule that conforms to the University's needs. No systems worked can be left out of service at the end of a Contractor's shift.

1.06 SUBSTANTIAL COMPLETION

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

1.07 PROTECTION OF PERSONNEL

- A. Patients, University of California Davis (UCD) personnel and Students, will be occupying parts of the adjacent buildings during the construction period. **Contractor** shall take proper precautions to ensure the safety of all persons during the construction period.

1.08 WORK SITE DECORUM

- A. 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, or any audio devices shall be strictly prohibited. Noise, that in the sole opinion of the University's Representative, is disturbing or disruptive to occupants of the building shall be scheduled for periods when the building is not occupied.
- B. **Contractor** shall control the conduct of its employees so as to prevent unwanted interaction initiated by **Contractor**'s employees with UCD staff, patients, students 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.

- C. **SMOKE AND TOBACCO-FREE ENVIRONMENT:** The University of California Davis is committed to a healthy campus and workplace culture and environment. Effective January 2, 2014, the University of California Davis is a Smoke and Tobacco-Free environment. Smoking and the use of smokeless tobacco products (e.g., e-cigarettes and other unregulated nicotine products) is strictly prohibited on all University of California Davis-controlled properties, owned or leased and regardless of location. This policy is intended to provide a healthier, safer, and productive work and learning environment for the entire University of California Davis community. For more information on the Smoke/Tobacco-Free Policy, please visit (<http://breathefree.ucdavis.edu>). For more information on the President's Mandate and other related resources, please visit <http://uctobaccofree.com/>.
- D. Alcoholic beverages are prohibited on the University's Project site.

1.09 INTERRUPTION OF BUILDING SERVICES

- 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 14 calendar 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. The **Contractor** shall program 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 workload, 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 **Contractor**'s 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.

1.10 SITE INGRESS AND EGRESS

- A. Access to Project site shall be as indicated on the Drawings. Access to Project site is limited to designated routing on existing access roads. The **Contractor** and their employees, sub **Contractor**s, suppliers or delivery personal must stay on the designated roads and may not drive, ride or walk to other locations unless prior permission is provided in writing by the University's Representative.
- B. **Contractor** shall take all necessary precaution to ensure the safety of the bicyclists and pedestrians that use the campus roads.

- C. **Contractor** shall clean the site access and roads affected by the Work and shall maintain such in a dust free and safe and usable condition for motorists, bicyclists and pedestrians. During inclement weather **Contractor** shall closely monitor conditions to prevent slickness of roads.
- D. **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.

1.11 MOTOR VEHICLE AND BICYCLE TRAFFIC CONTROL

- A. **Contractor** shall adopt all practical means to minimize interference to traffic. Access to other facilities in the area shall be maintained at all times. The **Contractor** shall 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 shall give a minimum of 14 business days notice before closing any street or access.
- B. **Contractor** shall furnish at **Contractor** 's expense all signage barricades, lights, and flaggers required to control traffic and shall 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. **Contractor** shall provide directional signs for use throughout the duration of the Project. The quantity shall be determined by the University's Representative and **Contractor** during a mandatory Pre-construction site meeting. **Contractor** shall 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 principals 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 II - PRODUCTS – Not applicable to this Section.

PART III - EXECUTION – Not applicable to this Section.

END OF SECTION 01 14 00

SECTION 01 25 00

CLARIFICATION/INFORMATION PROCEDURES

PART I - GENERAL

1.01 DESCRIPTION

- A. This Section contains the procedures to be followed by **Contractor** for submitting a Request for Information (RFI) upon discovery of any apparent conflicts, omissions, or errors in the Contract Documents or Drawings or upon having any question concerning interpretation.
- B. Section Includes
 - 1. RFI Administrative requirements
 - 2. RFI Procedures
 - 3. RFI Execution

1.02 RELATED DOCUMENT SECTIONS

- A. Conditions of the Contract: Governing requirements for changes in the Work, in Contract Sum and Contract Time.
- B. Section 016100 – PRODUCT REQUIREMENTS: Product options, substitutions, omissions, and improper descriptions.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Description: Section provides procedure for Contractors to obtain interpretation or clarification of the Contract Documents, or identify apparent conflicts, omissions, or errors in the Contract Documents.
- B. Responsible Person for **Contractor**: Submit name of the individual authorized to receive Requests for Information documents, and who is responsible for forwarding Request.
- C. RFI Format: Submit all Requests for Information on the form attached at the back of this Section, or electronic and/or web-based construction administration software provided or accepted by the University.

1.04 RFI PROCEDURES

A. RFI Format, Numbering and Subject:

1. RFI Format: Submit all requests for clarification or additional information in writing to University's Representative using the RFI Request for Information form provided at the back of this Section or obtained from University's Representative.
2. RFI Numbering: Number RFIs sequentially. Follow RFI number with sequential alphabetical suffix for resubmissions. For example, the first RFI is numbered "001". The second RFI is numbered "002" and so on. The first resubmittal of RFI "002" will be numbered "002a".
3. RFI Subject: Limit each RFI to one (1) subject only.

B. RFI Submittal conditions:

1. Discovery of unforeseen condition or circumstance not described in the Contract Documents.
2. Discovery of an apparent conflict, discrepancy, or inconsistency in or between portions of the Contract Documents.
3. Discovery of a situation, direction or apparent omission that cannot be reasonably inferred from the intent of the Contract Documents.

PART II - PRODUCTS – Not Applicable to this Section

PART III - EXECUTION

3.01 EXECUTION OF RFI's

- A. Email the University's Representative the RFIs. Emailed RFI requests received after normal business hours and/or received on non-normal workdays, as defined in

Specification Section 013100–COORDINATION, Item 1.07.F.4.A will begin notification time starting at 7:00 a.m. the following workday.

- B. Failure to provide proper information: 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 as a Contract Document discrepancy or omission without through review of the Documents (Capricious submission).
 4. **Contractor** submits the RFI assuming portions of the Contract Documents are excluded or by taking an isolated portion of the Contract Document in part rather than in whole.
 5. **Contractor** submits the RFI in an untimely manner without proper coordination and scheduling of Work of other Trades.
- C. Response Time: Request clarifications or information immediately upon discovery of need. Submit RFI's in a timely manner allowing full response time to avoid impacting Contract Schedule.
1. University's Representative, whose decision will be final, shall resolve issues and respond to questions of **Contractor**, in most cases, within fourteen (14) calendar days. Actual time may be lengthened for complex issues, or shortened for expedited situations, as mutually agreed in writing.
 2. After submission of an RFI by **Contractor** and prior to receipt of the RFI response from University, the **Contractor** proceeds with effected Work at own risk. Any portion of the Work not constructed in accordance with University interpretation, clarification, instruction or decision is subject to removal and replacement at **Contractor** expense.
- D. Failure to Agree: In the event of failure to agree to the scope of the Contract requirements, **Contractor** shall follow procedures set forth in Article 4 of the General Conditions of the Contract.

3.02 Refer to the following Attachment

- A. Request for Information

END OF SECTION 01 25 00

REQUEST FOR INFORMATION

Project #: _____ **Project Title:** _____
RFI #: _____ **Date:** _____ **HCAI #:** _____

UC Davis Health Facilities Design & Construction 4800 2 nd Avenue, Suite 3010, Sacramento, CA 95817 Attn.: Project Manager P: 916-734-#### C: ### ##-#### Email: #####@ucdavis.edu	From:	

SUBJECT: _____

SPEC SECTION/DRAWING #: _____ **PARA:** _____ **DETAIL:** _____
RM # _____ **GRID #** _____

TRANSMITTAL RECORD	Requestor to FD&C	FD&C to A/E	A/E to FD&C	FD&C to Requestor	Notes
Date Submitted					

INFORMATION NEEDED: _____

CONTRACTOR'S PROPOSED RESOLUTION: _____

REQUESTOR SIGNATURE: _____ REPLY REQUIRED BY: _____

ATTACHMENTS: _____

REPLY: _____

REPONDER SIGNATURE: _____ DATE: _____

UNLESS OTHERWISE INDICATED ABOVE, THE REPLY TO THIS RFI IS NOT INTENDED TO BE A CHANGE DIRECTIVE. SHOULD THE CONTRACTOR, SUBCONTRACTOR, OR SUPPLIERS FEEL THAT THE REPLY WILL IMPACT THE PROJECT COST OR SCHEDULE; IT SHOULD IMMEDIATELY BE CONVEYED TO THE UNIVERSITY'S FD&C PROJECT MANAGER, IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

COPIES: University CONSULTANTS _____ _____ _____ FILE

SECTION 012550

CONTRACT MODIFICATION PROCEDURES

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Change Order Administrative Requirements
- B. Documentation of Change in Contract Sum and Contract Time
- C. Change Procedures
- D. Field Orders
- E. Stipulated Sum Change Orders
- F. Unit Price Change Orders
- G. Time and Material Change Orders
- H. Cost Proposals and Supporting Documentation
- I. Execution of Change Orders
- J. Reconciliation of Change Orders

1.02 RELATED DOCUMENT SECTIONS

- A. General Conditions of the Contract: Governing requirements for changes in the Work, in Contract Sum and Contract Time.
- B. Section 012500 – CLARIFICATION/INFORMATION PROCEDURES
- C. Section 012900 – MEASUREMENT AND PAYMENT: Applications for Payment.
- D. Section 016100 – PRODUCT REQUIREMENTS: Product options, substitutions, omissions, and improper descriptions.
- E. Section 017700 – CLOSEOUT PROCEDURES: Project record documents.

1.03 DEFINITIONS

- A. Total Wage Rate: Base rate paid to the worker, including his/her fringe benefits, workman's compensation insurance and subsequent payroll taxes paid by the employer.
 - 1. Use Wage Rate Calculator issued with Division One.
 - 2. Projects in the University Controlled Insurance Program (UCIP) should not include workman's compensation in the wage rates.

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UC DAVIS HEALTH
CANCER CENTER NET V2 UPGRADE
600A DISCONNECT INSTALLATION

- B. Consumables: Material purchased in bulk and not expressly accounted for in the listed materials on a change order request. These include but are not limited to, rags, washers, screws, nuts, small bolts, lubricants, cleaning materials, pens, chalk, pencils, tie wire, caution tape, etc. Compensation for consumables shall be incorporated as a 3% percentage increase on direct material costs for trades where these items are routinely used.
- C. Non-working Supervision: Non-working supervision is not allowed to be included on a change order per GC article 7.3.3.

1.04 SUBMITTALS

- A. Submit the items listed below prior to submitting the 2nd Application for Payment.
 - 1. Total Wage Rates: Provide a wage rates for each key worker of the General Contractor and all Subcontractor tradespeople using the University's digital form for review and in compliance with the general conditions article 7 for approval by the University. Approved rates will be used in the Exhibit 7 Labor Rate Breakdown forms submitted with each Cost Proposal.

1.05 CHANGE ORDER ADMINISTRATIVE REQUIREMENTS

- A. Responsible Person for **Contractor**: Submit name of the individual authorized to receive construction change documents, and who is responsible for informing others in **Contractor's** employ of subcontractors of changes in the work.
- B. Exhibit 7 of the Contract includes the following Forms:
 - 1. COST PROPOSAL Form
 - 2. SUPPORTING DOCUMENTATION FOR THE COST PROPOSAL SUMMARY Form
 - 3. CHANGE ORDER Form
 - 4. REPORT OF SUBCONTRACTOR INFORMATION Form

1.06 DOCUMENTATION OF CHANGE IN CONTRACT SUM AND CONTRACT TIME

- A. Documentation of Changes in Contract Sum and Contract Time: Provide full information required for evaluation of proposal, of proposed changes and to substantiate costs of changes in the Work.
 - 1. Maintain detailed records of Work completed on time and material basis.
 - 2. Document each quotation for a change in Contract Sum and Contract Time with sufficient data to allow evaluation of the quotation.

- B. Additional Data: Upon request, provide additional data to support computations.
 - 1. Quantities of products, labor, and equipment.
 - 2. Taxes, insurance, and bonds.
 - 3. Overhead and profit.
 - 4. Justification for change in Contract Time, if claimed.
 - 5. Credit for deletions from Contract, similarly documented.

1.07 CHANGE PROCEDURES

- A. University's Supplemental Instructions: Minor changes in the Work, not involving adjustments to the Contract Sum or Contract time, as authorized by the General Conditions of the Contract, may be presented using Supplemental Instructions or correspondence containing similar information.
- B. University Initiated Changes: A Request for Proposal may be issued by University's Representative, which includes a detailed description of a proposed change with supplementary or revised Drawings and Specifications.
 - 1. The Request for Proposal may include an estimate of additions or deductions in the Contract Sum or Contract Time for executing the change and may include stipulations regarding overtime work and the period of time the requested response from the **Contractor** shall be considered valid.
 - 2. **Contractor** shall prepare and submit a response to the Request for Proposal within fourteen (14) calendar days.
- C. **Contractor** initiated Changes: **Contractor** may propose a change by submitting a request for change to University's Representative, describing proposed change and its full effect on the Work.
 - 1. Include statement describing reason for change, and full description of effects on Contract Sum, Contract Time, related Work and work being performed under separate contracts.
 - 2. Requests for substitutions shall be included under this category, with procedures as specified in Section 016100 – PRODUCT REQUIREMENTS.

1.08 FIELD ORDER

- A. Field Order: University's Representative may issue a Field Order, signed by University's Representative, instructing the **Contractor** to proceed immediately with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. The document will describe changes in the Work, and will designate the method of determining what, if any, change is due in the Contract Sum or the Contract Time.
 - 2. Promptly execute the change in the Work indicated in the Field Order prior to acceptance of a Cost Proposal for the Work by the University.
- B. Cost and Time Resolution: Costs and time adjustments for changes in the Work shall be per provisions of the General Conditions of the Contract, unless otherwise agreed to prior to issuance.

1.09 CHANGE ORDERS

- A. Stipulated Sum Change Orders: **Contractor's** response to Request for Proposal or Field Order will be considered and a mutually acceptable adjustment in Contract Sum and Contract Time will be determined. Change Order for this stipulated amount will be prepared by University's Representative for execution by University and **Contractor**.
- B. Unit Price Change Order: Change Order will be prepared by University's Representative for execution by University and **Contractor**, based on mutually acceptable quantities and pre-determined unit prices.
 - 1. For unit cost or quantities not pre-determined, the Work shall be accomplished under a Stipulated Sum Change Order, if there is no dispute over the estimated or stipulated maximum cost and time for the change.
 - 2. If the amounts are not defined or are disputed, a Field Order will be prepared and issued by University's Representative.
- C. Time and Material Change Orders: As directed for changes for where amounts are not defined or are disputed, **Contractor** shall execute the Work, keeping accurate records of time, both labor and calendar days, and cost of materials.
 - 1. **Contractor** shall prepare and submit an itemized account and supporting data after completion of the change, within the time limits indicated in the Conditions of the Contract.
 - 2. University's Representative will determine the change allowable in Contract Sum and Contract Time, as provided elsewhere in the Contract Documents, and make recommendation to University for acceptance of Change Order.
 - 3. **Contractor** shall provide full information as required and requested for evaluation of proposed changes, and to substantiate costs for changes in the Work.

PART II - PRODUCTS – Not Applicable to this Section

PART III - EXECUTION

3.01 CONTENT OF COST PROPOSALS

- A. Cost Proposals shall include the following:
1. Detailed description of the work involved including:
 - a. What work is being performed?
 - b. Where the work is performed?
 - c. When the work was performed if already completed?
 - d. When the work is scheduled to be performed if not yet completed?
 - e. Why this work is a change to the contract?
 2. Detailed description of any time impacts associated with the work; refer to General Conditions, paragraph 8.4.
 3. Materials
 - a. Material shall be submitted at the cost paid by the contractor.
 - 1) Invoices may be required to validate that meet the following criteria:
 - a) Invoices may be from different projects if the following conditions are met:
 - (1) The COR is before the contractor would reasonably have the material on site to accomplish the COR.
 - (2) Recent, within last 6 months.
 - (3) There must be at least enough of the material in question to accomplish the work in the proposed COR.
 - b) The invoice shall not be modified from the version provided by the vendor.
 4. Labor unit breakdown backed up by some sort of industry standard (NECA for electrical, MCAA for plumbing and mechanical, SMACNA for mechanical, Etc.) These standards shall be used at their base rate, with no added percentages nor

adjustments. This has been found to be a fair representation of the man-hours required to do these types of work.

- a. This project has been determined as NECA normal.
5. Wage rate back up matching the submitted back up as described in 1.03.A.
- B. Submittal of a Cost Proposal using the Cost of the Work plus Contractor Fee described in General Conditions paragraphs 7.3.5 and 7.3.6 shall include the following items in addition to those listed above:
1. Field Order instructing the change. Only a field order may instruct work to be completed using this basis.
 2. Material invoices shall be provided for any item used in Extra Work.
 3. Job site work tags identifying daily labor and material usage shall be submitted with:
 - a. Specific description of the work performed on that tag.
 - b. Identification of large equipment used
 - c. Identification of labor class for each individual
 - d. Location - room number, gridline or distinct location.
 - e. Signed by the Contractor and University's Representative.
- C. Any coordination required for implementation of a change into the work, documents, or model is and shall be considered part of the allowable markups provided in General Conditions paragraphs 7.3.3.1-18 and 7.3.4.

3.02 EXECUTION OF CHANGE ORDERS

- A. Execution of Change Orders: After the University's Representative has accepted the Change Order Proposal; the University's Representative shall prepare Change Order documents for signature by parties as provided in the Conditions of the Contract.

3.03 RECONCILIATION OF CHANGE ORDERS

- A. Schedule of Values: Promptly revise the Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjustment to the Contract Sum.
- B. Schedules: Upon completion of the Change Order, promptly revise progress schedules to reflect changes in Contract Time, revising sub-schedules to adjust time for other items of

Work as may be affected by the change. Submit revised schedules with next Application for Payment.

END OF SECTION 012550

SECTION 01 29 00

MEASUREMENT AND PAYMENT

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Procedures for preparation and presentation of Application for Payment.
- B. Procedures for preparation and presentation of Schedule of Values.

1.02 RELATED DOCUMENTS AND SECTIONS

- A. GENERAL CONDITIONS of the Contract: Progress Payments and Final Payment.
- B. Section 013200 – CONTRACT SCHEDULES
- C. Section 017700 – CLOSEOUT PROCEDURES
- D. Section 017800 – CLOSEOUT SUBMITTALS

1.03 PAYMENT APPLICATION FORM

- A. Payment Application Form: Prepare Applications for Payment using Exhibit 4 provided in the Contract.

1.04 SCHEDULE OF VALUES

- A. Coordination. Coordinate preparation of the Schedule of Values with preparation of the Contractor's Contract Schedule and as directed by the University's Representative.
 - 1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
 - a. Contractor's Contract Schedule.
 - b. Application for Payment form.
 - c. List of Subcontractors.
 - d. List of products (where/if appropriate).

- e. List of principal supplier and fabricators.
 - f. Submittal Schedule
 - g. Construction Cost Breakdown Sheet.
2. Submit the Schedule of Values to the University's Representative at the earliest feasible date, but in no case later than 7 calendar days before the date scheduled for Submittal of the Initial Application for Payment.
- B. Format and Content. Use the Specification Table of Contents as a guide to establish the format for the Schedule of Values.
- 1. Include the following Project identification on the Schedule of Values:
 - a. Project name and location.
 - b. Name of the University's Representative.
 - c. Project Number.
 - d. Contractor's name and address.
 - e. Date of Submittal.
 - 2. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:
 - a. Generic name.
 - b. Performance Specification or University Specification section.
 - c. Name of Subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier (if appropriate).
 - f. Change orders (number) that have affected value.
 - g. Dollar value. (Percentage of Contract Sum to the nearest one-hundredth percent, adjusted to total 100 percent.)

3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Break principal subcontract amounts down into several line items.
4. Round amounts off to the nearest whole dollar; the total shall equal the Contract Sum.
5. For each part of the Work where an Application for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed, provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
 - a. Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing, if required.

6. Provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. **Contractor's** General Conditions overhead and profit shall be a separate line item per month.
8. Allowances (if applicable). Show the line item value of allowances.

1.05 PREPARATION OF APPLICATIONS

- A. Preparation of Applications for Payment: The following requirements supplement the provisions of the General Conditions of the Contract. Refer to the GENERAL CONDITIONS OF THE CONTRACT.
 1. Present required information in PDF electronic file on the required forms. Media-driven forms are acceptable.
 2. Execute certification by verified electronic signature of authorized officer of the **Contractor**.
 3. Use data from the approved Schedule of Values. Provide dollar value in each column of application for each line item and portion of Work performed and for products stored, if permitted.
 - a. List value of each major item of Work and each subcontracted item of Work as a separate line item to serve as a basis for computing values for progress Payments. Round off values to nearest dollar. Listed items of work shall be identified by Specification Section number.
 - b. List products and operations of each major subcontract as separate line item.
 - c. Include Work Allowances (if any) within line item of Work.
 - d. Coordinate percentage complete with Progress Schedule.
 - e. Provide separate line items for each area of work such as but not limited to floors, zones, wings, or other areas that can be clearly identified.
 - f. The sum of values listed shall equal total Contract Sum.

4. List each authorized Change Order as an extension on the continuation sheet, listing the Change Order number and dollar value as for an original item of Work. Change Order shall be broken down same as Application for Payment.
 5. No Change Order shall be included with Application for Payment until approved in writing by University and University's Representative.
 6. Refer to 1.05 for other items required for the Application for Payment.
- B. Final Payment: Prepare Application for Final Payment as specified in Section 017700 – CLOSEOUT PROCEDURES.

1.06 SUBMISSION OF APPLICATIONS FOR PAYMENT

- A. Submission of Applications for Payment: The following requirements supplement provisions of the General Conditions of the Contract. Refer to the GENERAL CONDITIONS OF THE CONTRACT.
1. Submit one (1) PDF electronic file of each Application for Payment with verified electronic signature, such as DocuSign. Round values to nearest dollar or as specified for the Schedule of Values.
 2. Submit an updated Construction Progress Schedule with each Application for Payment and specified in Section 013200 – CONTRACT SCHEDULES.
 3. Submit one (1) PDF electronic file of Schedule of Values in accordance with the General Conditions of the Contract. Form and content shall be acceptable to the University. Transmit under PDF electronic transmittal letter. Identify University's Project Name and University's Project Number.
 - a. List installed value of each major item of Work and for each subcontracted item of Work as a separate line item to serve as a basis for computing values for Progress Payments. Round off values to nearest dollar. Listed items of Work shall be identified by Specification section number. Each value will be based on a percent complete of that line item.
 - b. For each major subcontract, list products and operations of that subcontract as separate line items.

- c. Coordinate listings with Progress schedule. **Contractor** project General Conditions plus overhead and profit shall be a separate line item in the Application for Payment; and be divided in an equal amount for each month part of the Contract Time period.
 - 1) At 50 percent completion of the work, or at other times the University's Representative deems appropriate, the University's Representative may request the monthly amount of overhead and profit be adjusted, if the contract schedule indicates going beyond the Contract End Date.
- d. For items on which payments will be requested for on-site stored products, list sub-values for cost of on-site stored products with taxes paid. If stored products are not on-site, they must be stored in a bonded warehouse or location approved by the University's Representative prior to including on the Application for Payment.
- e. Submit a sub-schedule for each separate Phase of Work specified in Section 011100. Include scheduling of sequences within each phase indicated on the drawings.
- f. The Sum of values listed shall equal total Contract Sum.

- g. When University's Representative requires substantiating information, submit data justifying line-item amounts in question.
 - h. Provide one (1) PDF electronic file of data with cover letter for each copy of Application. Show Application number and date, and line item by number and description.
4. Submit Applications for Payment, Continuation Sheets and Schedule of Values under PDF electronic transmittal letter. **Contractor** shall identify all payment application documents by University's Project Name and University's Project Number.

1.07 SUBSTANTIATING DATA

- A. University's Representative may request substantiating information. Submit data reconciling line-item amounts in question.
- B. Provide one (1) PDF electronic file of data with cover letter for each copy of submittal. Show Application number including date and line item by number with description.

PART II - PRODUCTS – Not Applicable to this Section

PART III - EXECUTION – Not Applicable to this Section

END OF SECTION 01 29 00

SECTION 01 31 00

COORDINATION

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Project Meetings
- B. Submittals Requirements
- C. General **Contractor** Coordination
- D. Coordination of Subcontractor and Separate Contracts
- E. University Criteria

1.02 RELATED REQUIREMENTS

- A. Section 011100 – SUMMARY OF THE WORK: Description of Contract Documents.
- B. Section 013200 – CONTRACT SCHEDULES
- C. Section 013300 – SHOP DRAWINGS, PRODUCT DATA AND SAMPLES
- D. Section 013500 – SPECIAL PROCEDURES: Interim Life Safety Measures (ILSM).
- E. Section 014500 – QUALITY CONTROL
- F. Section 014550 – INSPECTION AND TESTING OF WORK
- G. Section 015100 – TEMPORARY UTILITIES
- H. Section 015200 – CONSTRUCTION FACILITIES
- I. Section 015500 – VEHICULAR ACCESS AND PARKING: Traffic Regulation.
- J. Section 015600 – TEMPORARY BARRIERS, ENCLOSURES AND CONTROLS
- K. Section 015610 – AIRBORNE CONTAMINANTS CONTROL
- L. Section 016100 – PRODUCT REQUIREMENTS
- M. Section 017300 – CUTTING AND PATCHING
- N. Section 017700 – CLOSEOUT PROCEDURES: Coordination of completion reviews, inspections, and submission of documents.

- O. Section 017800 – CLOSEOUT SUBMITTALS: As-Built Documents.
- P. Division 21 - Fire Protection Systems.
- Q. Division 28 - Fire Alarm Systems

1.03 MEETINGS

- A. Pre-Construction/Site Mobilization Conference: University's Representative will administer site mobilization conference at Project site for clarification of responsibilities of University, University's Representation and **Contractor**, use of site and for review of administrative procedures. Site mobilization conference shall be held within fourteen (14) calendar days of Notice to Proceed, unless otherwise directed by University's Representative.
 - 1. Agenda: Pre-Construction/Site Mobilization Conference shall cover the following topics at a minimum:
 - a. Special Project Procedures: Implementation of requirements as specified in Section 013100 – COORDINATION.
 - b. Subcontractors List: Provide PDF electronic file. Distribute and discuss list of subcontractors and suppliers.
 - c. Construction Schedule: Provide per Section 013200. Distribute and discuss initial construction schedule and critical work sequencing of major elements of Work, including coordination of University furnished/**Contractor** installed (UFCI) products, University furnished/University installed (UFUI) products, and work under separate contracts, by utility agencies and companies and University.
 - d. Designation of Key personnel: Designate key personnel and update project directory for University, University's Consultants, **Contractor**, major subcontractors, major materials suppliers, serving utility agencies

and companies, other contractors performing work under separate contracts and governing authorities having jurisdiction.

- e. Project Communication Procedures: Review requirements and administrative requirements for written, electronic and oral communications.
 - f. Change Procedures: Review requirements and administrative procedures for Change Orders, Field Orders, University's Representative's Supplemental Instructions, and **Contractor's** Requests for Information.
 - g. Coordination: Review requirements for **Contractor's** coordination of Work; review sequence and schedule for work being performed for University under separate contracts.
 - h. Submittals Administration: Provide per Section 013300 and Section 016100. Review administrative procedures for shop drawings, project data and sample submittals and review of preliminary submittals schedule.
 - i. Project As-Built Documents: Provide per Section 017700 and Section 017800. Review requirements and procedures for project as-builts, specifications and other documents.
 - j. Construction Facilities and Temporary Utilities: Provide per Section 015100 and Section 015200. Designate storage and staging areas, construction office areas; review temporary utility provisions; review University requirements for use of premises.
 - k. Materials and Equipment: Review substitution requirements; review schedule for major equipment purchases and deliveries; review materials and equipment to be provided by University (UFCI and UFUI products).
 - l. Site Access by University's Representative and University's Consultants: Review requirements and administrative procedures **Contractor** may institute for identification and reporting purposes.
 - m. Testing and Inspection: Provide per Section 014550 and other sections of the Contract. Review tests and inspections by independent testing and inspection agencies, manufacturers, and governing authorities having jurisdiction.
 - n. Permits and Fees: Review Contract requirements; review schedule and process for obtaining permits and paying fees.
 - o. Hours of Work and Work Restrictions per Section 011400.
 - p. Hot Works Permit.
- B. Billing Meetings: A billing meeting will be conducted by the University's Representative each month prior to submittal of the Application for Payment. Agenda: review of the percent complete relating to the submitted Schedule of Values. Prior to the Billing Meeting the

Contractor will submit a draft of the Application for Payment for review by the IOR and University Representative.

- C. Progress Meetings: Progress meetings shall be periodically scheduled throughout progress of the Work. Frequency shall be as determined necessary for progress of Work. Generally, it is intended progress meetings be held once a week as designated by the University's Representative.
1. Administration: University's Representative shall make physical arrangements for meetings and prepare agenda with copies for participants, preside at meetings, record minutes and distribute an electronic file within four (4) workdays to **Contractor** University's Consultants, and other participants affected by decisions made at meetings.

2. Attendance: **Contractor's** Project Manager and jobsite Superintendent shall attend each meeting. **Contractor's** subcontractors and suppliers may attend as appropriate to subject under discussion. University will have a representative at each meeting. University's Consultants, as appropriate to agenda topics for each meeting and as provided in University/Consultant Agreement, will also attend.

a. Suggested Agenda for Progress Meetings:

- 1) Building Code/Fire Marshal Issues
- 2) Design Issues
- 3) Submittals and Long Lead Items
- 4) UFCI and UFUI products.
- 5) Request for Information
- 6) Safety Issues
- 7) Scheduling Status/1 Week Prior and 32 Week Look Ahead
- 8) Potential Schedule Delay Issues
- 9) Incomplete or Non-Conforming Work
- 10) Inspection Requests
- 11) Utility Shutdowns and Dig Notifications
- 12) Instructional Bulletins and Field Orders
- 13) Change Orders/Cost Proposals
- 14) Payment Applications and As-Built Documents
- 15) Miscellaneous Business
- 16) Other items affecting progress of the Work

D. Guarantees, Bonds, Service and Maintenance Contracts Review Meeting: Eleven months following the date of Substantial Completion, a meeting will be conducted by University's

Representative to review the guarantees, bonds and service and maintenance contracts for materials and equipment.

- E. In addition to meetings listed above, **Contractor** shall hold coordination meetings and pre-installation conferences to assure proper coordination of Work.
 - 1. Pre-installation Conferences: When required in individual Specification Sections, convene a pre-installation conference prior to commencing Work.
 - a. Require attendance by representatives of firms whose activities directly affect or are affected by the Work specified.
 - b. Review conditions of installation, preparation and installation procedures and coordination with related Work and Work under separate contracts.
- F. Location of all meetings will be as designated by University's Representative. Participants at all meetings shall be University's Representatives, Consultants and/or Vendors, **Contractor**, Superintendent, Subcontractors and others as appropriate.

1.04 SUBMITTALS

- A. Coordination of Submittals: Schedule and coordinate submittals as specified in Section 013300 – SHOP DRAWINGS, PRODUCT DATA AND SAMPLES, Section 017700 – CLOSEOUT PROCEDURES and Section 017800 – CLOSEOUT SUBMITTALS.
 - 1. Coordinate submittal effort of various trades, subcontractors and suppliers having interdependent responsibilities for installing, connecting, and placing into service such equipment, materials or installations as necessary for the Work.
 - 2. Coordinate requests for substitutions to assure compatibility of space, operating elements, and effect on work of others.
- B. Coordination/Engineering Drawings: Submit in accordance with Section 013300 – SHOP DRAWINGS, PRODUCT DATA AND SAMPLES and as specified herein.
- C. Work Plans: Submit as specified herein.

1.05 COORDINATION

- A. Coordination: **Contractor** shall coordinate the Work as stated in the General Conditions of the Contract. Work of the Contract includes coordination of the entire work of the Project, from beginning of construction activity through Project closeout and warranty periods. **Contractor** shall also coordinate Work under the Contract with work under separate contracts by University. **Contractor** shall cooperate with University and others as directed by University's Representative in scheduling and sequencing the incorporation into the

Work of University Furnished/**Contractor** Installed (UFCI) products identified in the Contract Documents.

1. Coordinate completion and cleanup of work of the separate trades, subcontractors, vendors, etc., in preparation for University occupancy
 2. After University occupancy, coordinate access to site by various trades, subcontractors, vendors, etc., for correction of defective work and/or work not in accordance with Contract Documents, to minimize University disruption.
 3. Assemble and coordinate closeout submittals specified in Section 017700 – CLOSEOUT PROCEDURES.
- B. Construction Interfacing and Coordination: Layout, scheduling and sequencing of Work shall be solely **Contractor's** responsibility. **Contractor** shall bring together the various parts, components, systems and assemblies as required for the correct interfacing and integration of all elements of Work. **Contractor** shall coordinate Work to correctly and accurately connect abutting, adjoining, overlapping and related elements, including work under separate contracts by University and utility agencies, if any.
- C. Installation of Systems into Project Space: Follow routings shown for pipes, ducts and conduits as closely as practicable, as shown on the Contract Documents with due allowance for available physical space; make runs parallel with line of building. Utilize space efficiently to maximize accessibility for other installations, future maintenance and repairs. In finished areas, except as otherwise shown, conceal pipes, ducts and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.
- D. Utility Work: Work occurring on or in the immediate vicinity of critical utilities must be directly supervised at all times by **Contractor's** qualified personnel. Requirements stated herein for notification, work plans, dig notification forms and marking locations of existing utilities shall apply. **Contractor** will be held fully liable for costs and damages due to unplanned interruption of critical utilities, including any personal injury to Hospital patients, visitors, or staff.
1. Provide supervision and coordination necessary to meet requirements of electrical power connection as set forth by the Sacramento Municipal Utility District (SMUD).
 2. Provide reasonable and convenient staging and access areas to permit SMUD, its vendors or subcontractors, to install, modify or remove electrical transformers or other components of the electrical power system furnished and installed by SMUD.

1.06 COORDINATION OF SUBCONTRACTORS AND SEPARATE CONTRACTS

- A. Conflicts: Conflicts shall be resolved by the **Contractor**. **Contractor** bears primary responsibility for conflict resolution regarding the coordination of all building trades, subcontractors and suppliers.
- B. Superintendence of Work: **Contractor** shall appoint a field superintendent who shall direct, supervise, and coordinate all Work in the Contract Documents.
- C. Subcontractors, Trades and Materials Suppliers: **Contractor** shall require all subcontractors, trades, crafts and suppliers to coordinate their portions of Work with the

Superintendent to prevent scheduling, sequencing, dimensional and other conflicts and omissions.

- D. Coordination with Work Under Separate Contracts: **Contractor** shall coordinate and schedule Work under Contract with work being performed for Project under separate contracts by University. **Contractor** shall make direct contacts with parties responsible for work of the Project under separate contracts, in order to provide timely notifications and to facilitate information exchanges.
- E. Service Connections: Except as otherwise indicated, final connection of mechanical services to general work is defined as being mechanical work; final connection of electrical services to general work is defined as electrical work.

1.07 UNIVERSITY CRITERIA

- A. During the Base Construction time, **Contractor** shall allow University **24 days** to move University equipment and/or provide furnishings in **Comprehensive Cancer Center Center**. **Contractor** shall notify University's Representative in writing a minimum of fourteen (14) calendar days prior to completion of area described above.
 - 1. **Contractor** shall show this time as a distinct activity on the detailed project schedule.
- B. Equipment Coordination: **Contractor** and University supplied equipment will require complete installation data be exchanged directly between **Contractor** and vendors and subcontractors involved as progress of Project requires. Individual requesting information shall advise when it is required. Incorrect, incomplete, delayed or improperly identified equipment causing delay or error in installation will require entity causing such action to be liable for modifications or replacements necessary to provide correct and proper installation, including relocations.
- C. **Contractor** shall provide large scale casework and equipment drawings for casework and equipment service rough-in locations (dimensioned from building features), service characteristics, and locations of studs or blocking where such locations are critical to mounting or otherwise installing equipment and casework. Furnish sizes and spacing required for mechanical and electrical cutouts, and a complete brochure of fittings, sinks, outlets, or other information to provide a complete assemblage of the items and accessories being furnished.
- D. Interruption of Services: Construction Work shall accommodate University's use of surrounding and adjacent premises during the construction period and shall provide continuous public access and use of surrounding and adjacent facilities. **Contractor** shall not deny access to public use facilities until an alternate means of public use has been provided. An interruption of service is defined as any event which in any way interrupts, disrupts or otherwise discontinues, even momentarily, the services provided by University to its patients and staff. Adequate notice, as described below, shall be given to University when any interruption of services or interference with the use of existing buildings and roads are anticipated. Any interruption of service will be made only by University upon such notice. Interruptions to University services will not be made without prior notification and

approval by University. **Contractor** shall never interrupt any University service without direct University participation.

1. Dig Notification: **Contractor** shall complete and submit for review to University's Representative, a Dig Notification Form, included at the end of this section, and obtain written authorization from University prior to the commencement of any digging activities. Digging activities include exploratory demolition, soils excavation, concrete core drilling, and saw cutting. **Contractor** shall include all pertinent information with the Dig Notification Form and submit with detailed work plan fourteen (14) calendar days prior to desired digging activity.
 2. The **Contractor** shall contact USA North 811 prior to starting underground Work to locate existing underground utilities.
 3. **Contractor** shall mark locations of all known utilities on ground of dig area with marker paint.
 4. Prior to commencement of digging activities, **Contractor** shall verify project inspector has inspected the dig site and confirmed the site marking as accurate, complete and in conformance with site utility plans.
 5. **Contractor** shall verify with University's Representative that all interested hospital departments have been notified of intent to begin digging operation.
 6. Record documents are required for dig activities. **Contractor** shall provide As-Built drawings.
- E. Shutdown Procedures: **Contractor** shall complete and submit for review and approval to University a Request for Shutdown form, included at the end of this section. **Contractor** shall include all pertinent information to assist University in coordination of shutdown activities. The Shutdown Request Form shall be submitted with a detailed work plan addressing the proposed shutdown not less than fourteen (14) calendar days prior to desired shutdown.
- F. The University does not normally charge for its shutdown support services. However, if poor planning and/or poor execution of a shutdown by the **Contractor** causes excessive time and effort for University personnel, the University reserves the right to back charge the **Contractor** for this effort required to support such shutdown.
1. **Contractor** shall verify with University's Fire Marshal that all appropriate Interim Life Safety Measures (ILSM) are in place.
 2. **Contractor** shall determine that proper and appropriate coordination and notification has been completed, including written authorization from University's Representative, prior to shut down.
 3. Service shutdowns shall require specific work plans to be submitted to and coordinated with University's Representative. Work Plan should reflect various

work trades, activities or entities requiring active participation with University teams to coordinating hospital functions with construction activities.

- a. **Contractor** shall request, schedule, and conduct a General Work Plan Meeting prior to any work activity occurrence. During this meeting **Contractor** and University shall produce and agree to a list of work activities, which will require digging and/or shutdown coordination and procedures.
 - b. University's Representative, upon receiving the agreed submission for coordination, shall schedule the actual digging and/or shutdown at the earliest possible date not later than fourteen (14) calendar days from receipt of the submission. Operation of valves, switches, etc. to affect shutdowns shall be operated by University personnel only.
 - c. A shutdown is defined as any interruption of services provided by University to its patients and staff.
4. Planned service shutdowns shall be accomplished during periods of minimum usage. **Contractor** shall plan work to restore service in minimum possible time and shall cooperate with the University to reduce number of shutdowns.
- a. Notwithstanding the provisions of Article 14.6 of the General Conditions of the Contract, **Contractor** may be required to perform certain types of work outside normal time periods.
 - 1) Non-normal times shall include, but not be limited to, periods of time before 7:00 a.m. and after 5:00 p.m. in the evening, weekend days, or legal holidays, or such periods of time which constitute split shifts or split working periods.
 - 2) **Contractor** shall include allocation of the cost of this work as part of the base bid and shall not be entitled to additional compensation as a result of such work during non-normal time periods.
 - 3) **Contractor** shall include the non-normal periods as distinct activities on the detailed project schedule.
 - 4) **Contractor** is advised and **Contractor** shall be prepared, at University written request, to perform certain shutdown and asbestos related work during non-normal time periods.
- G. Utility locations: Refer to Section 017600. General location of utility lines and services may be shown on the drawings or described elsewhere, University does not warrant the accuracy of the locations shown or described. Determination of the actual on-site locations of utility lines and services prior to the commencement of work shall be the responsibility of the **Contractor**. **Contractor** shall complete layout/research for Points of Connection (P.O.C.) and clean/prep piping at P.O.C. All capping, relocation or removal of such lines and services shall be performed by **Contractor** as a part of the Contract. New/continued piping and services installation shall be prefabricated and in place prior to the shutdown. All materials and tools required to complete the work must be at the shutdown location(s). **Contractor** shall not assume existing valves will hold 100%. **Contractor** is required to

have at least one (1) alternate method (including parts and equipment) to complete installation once shutdown has started. Note: only wheel type cutters shall be used on copper pipe to reduce contamination to existing systems/valves.

- H. Detailed Work Plans: **Contractor** shall develop and submit for review and approval to University's Representative detailed work plans for specific work activities, both inside and outside the work area, associated with impact to, or interruption of services and operation, and dig activities. Work Plans shall be submitted as a PDF electronic file with Table of Contents indexed. Work Plans shall include written description of work activity, detailed schedule with proposed sequence of operation and activity duration, type of equipment to be used, a copy of site plan highlighted to indicate sequencing and location of work and equipment, completed Request for Shutdown and/or Dig Notification forms as applicable, conformance to ILSM, and control methods for noise, vibration and airborne contaminants.
1. Work Plan submittal will not be accepted unless all required information is provided at time of submittal.
 2. Submit Work Plan at least fourteen (14) calendar days prior to the commencement of any associated work activities.
 3. Coordination/Engineering Drawings: **Contractor** shall provide a complete set of Coordination/ Engineering Drawings that indicates the architectural and structural building components; and combines all piping, conduits, fire sprinkler system, equipment, hangers, braces and other building components into one composite drawing for each floor, wing or area of work. Submit the Coordination/ Engineering Drawings as a bookmarked PDF electronic file. These drawings are for the **Contractor**'s and University's use during construction and shall not be construed as replacing any shop drawings, "As-Builts", or record drawings required elsewhere in the Contract Documents. University's review of these drawings is for design intent only and shall not relieve the **Contractor** of the responsibility for coordination of all work performed per the requirements of the Contract.
 - a. **Contractor** shall prepare and submit complete 1/4" = 1' - 0" coordination drawings, including plans, sections, details as are appropriate indicating the area layout, complete with debris removal area and materials access points, and all mechanical and electrical equipment in all areas and within above and below ceiling spaces for new and existing conditions, including bottom of all ducts, plenum, pipe and conduit elevations. Drawings shall show all structural and architectural components, restraints and other obstructions that may affect the work. Electronic or photo reproduction of University's Architectural Drawings is not acceptable.
 - b. **Contractor** and each Subcontractor shall ensure all relevant mechanical and electrical equipment, piping, conduit, fire sprinkler system, ceiling

hangers, braces etc., are shown and will fit, together with necessary items such as lights, ducts, fans, pumps, piping, conduit and the like.

- c. **Contractor** shall indicate all locations of expansion/ seismic joints and indicate how expansion for piping, conduit and other components is provided.
- d. **Contractor** shall indicate all locations for access doors or other means of access at conditions above and below for items requiring access or service including but not limited to valves, mechanical equipment, electrical equipment valves and other components. The **Contractor** is responsible that piping, conduit, braces and other obstructions do not block access to items indicated above.
- e. Submit completed and fully coordinated PDF electronic indexed file drawings with bookmarked Sheet Index together with **Contractor's** comments indicating possible areas of conflict for review to University's Representative prior to start of work.
- f. Penetrations: **Contractor** shall prepare a sleeving layout (1/4" scale) indicating size and locations of sleeves. Trades shall indicate to **Contractor** their requirements and locations. PDF electronic files to applicable trades and University's Representative.
- g. Completion of work: All coordination drawings shall be submitted together with record (as built) drawings of all trades involved in accordance with Section 013300 – SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

PART II - PRODUCTS – Not Applicable to this Section

PART III - EXECUTION

3.01 Refer to the following attachments

- A. Request for Shutdown (RFS) Info/Impact Report
- B. Dig Notification Form

END OF SECTION 01 31 00

REQUEST FOR SHUTDOWN (RFS) INFO/IMPACT REPORT

PROJECT NAME: _____

UNIVERSITY RFS# _____

PROJECT #: _____ HCAI #: _____ CONTRACTOR RFS #: _____

TODAY'S DATE: _____ SHUTDOWN DATE: _____ SUSPEND DATE: _____

TO: UC DAVIS HEALTH Facilities Design & Construction 4800 2 nd Avenue, Suite 3010 Sacramento, CA 95817 P: 916-734-7024	FROM: _____ _____ _____ _____ _____ _____
<u>Project Manager's email address:</u>	_____

Request Date: _____ Shutdown Target Date: _____

Requested By: _____ Requestor's Phone #: _____

Shutdown Work (Utility Specific): _____

Scope (Brief Description of Work): _____

Impact (Areas & Users): _____

Additional Comments:

DIG NOTIFICATION FORM

PROJECT #: _____ HCAI#: _____ DATE: _____

TO: UC DAVIS HEALTH Facilities Design & Construction 4800 2 nd Avenue, Suite 3010 Sacramento, CA 95817 P: 916-734-7024 Project Manager's email address: _____	FROM: _____ _____ _____ _____ _____
---	---

1. Has USA been notified? YES ___ NO ___
When? _____
2. Are all known utilities marked? YES ___ NO ___
3. Location of dig shown on attached site plan? YES ___ NO ___
Purpose _____
4. **Dates digging will take place** _____
Place _____

Signed: _____

<u>UNIVERSITY USE ONLY</u>		
Date received: _____		
1. Utilities verified by IOR?	YES ___	NO ___
2. Dig activities coordinated with all parties?	YES ___	NO ___
3. Comments: _____		
Date Authorized: _____	Signed: _____	
Date Returned: _____	Signed: _____	
Comments: (Utilities encountered, disruptions, successes, weather, etc.)		

Copies:	University _____	Consultants _____	File _____
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SECTION 01 32 00

CONTRACT SCHEDULES

PART I - GENERAL

1.01 SCOPE

- A. Preliminary Contract Schedule, Contract Schedule, updated Contract Schedules, Short Interval Schedules (SIS), Recovery Schedules and As Built Schedule.
- B. Sub-networks of activities (Fragnets) supporting Time Extension Requests.

1.02 DEFINITIONS

- A. Construction Schedule/CPM Schedule/Schedule: The most recent; Baseline Schedule, Updated Schedule or Revised Schedule.
- B. Final Baseline Schedule: A final and ongoing Schedule for the project that has been reviewed and accredited by the University's Representative
- C. 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.
- D. 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.
- E. Recovery Schedule: Schedule required when any Revised Schedule or Update Schedule shows the work to be more than 14 calendar days behind the latest University-accepted contract end date
- F. Short Interval Schedule (SIS): Schedule prepared on a weekly basis demonstrating the work accomplished the prior week and work planned for the upcoming three weeks.

1.03 SUBMITTALS

- A. Submit the following in accordance with Section 01 33 00 Shop Drawings, Product Data, Samples:
1. Proposed Scheduling Software and qualifications of individual preparing schedules.
 2. Preliminary Contract Schedule
 3. Contract Schedule including graphical and tabular reports.
 4. Monthly Updates to Contract Schedule, including Narrative Report.
 5. Short Interval Schedules
 6. Final As-Built Schedule
- B. Include an electronic version of all submittals required by this specification, including Narrative prepared in MS Word or .pdf format, CPM schedule in .xer file (P6 backup) or other schedule native file format if accepted under 1.3. A.1 above, .pdf of full schedule, and .pdf of critical path. The following fields shall be included:
1. Activity identification
 2. Activity description
 3. Duration, start, and finish dates.
 4. Percentage of completion
 5. Total float
 6. Responsible party
 7. Predecessors and successors

PART II - PRODUCTS

2.01 SOFTWARE

- A. The **Contractor** shall use Primavera P6 by Oracle Corporation, or equal to produce the schedule and all required graphical and tabular reports.

PART III - EXECUTION

3.01 PRELIMINARY CONTRACT SCHEDULE

- A. Within 10 calendar days after the Notice of Selection as the Apparent Lowest Responsible Bidder, **Contractor** shall submit the Preliminary Contract Schedule in both native and .pdf format to the University's Representative for acceptance. The Preliminary Contract Schedule shall represent the **Contractor's** 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 90 calendar days following the Notice to Proceed. This detailed work plan shall identify in detail the following activities for the first 90 calendar days:
1. Preparation of equipment and material submittals for review. List Project submittals within Schedule per each specification section including Division 1 requirements. Indicate dates for submission of required submittals. Note: schedule shall include 18 calendar days for the University's review of the Preliminary Contract Schedule.
 2. Make submissions within the following number of days after the Notice to Proceed:
 - a. Items needed in initial stages of Work or requiring long lead-time for ordering: 30 calendar days.
 - b. Deferred approval submittals, for review and approval by agencies such as University's when required: 60 calendar days.
 - c. Electrical, mechanical and equipment items other than those covered by item "a" above: 60 calendar days.
 - d. All other items: 90 calendar days.
 3. Procurement schedule.
 4. Critical Path for the first 90 calendar days.
- B. The Preliminary Contract Schedule shall acknowledge significant known constraints and include all anticipated activities prior to the Notice to Proceed.
- C. The Preliminary Contract Schedule shall not include any actual dates or progress measured against any activities.
- D. Acceptance of the Preliminary Contract Schedule is a condition for approval of the first progress payment application.
- E. The **Contractor's** progress shall be measured against the Preliminary Contract Schedule until such time as the University accepts the **Contractor's** first Contract Schedule. The Preliminary Contract Schedule shall be incorporated into the **Contractor's** proposed Contract Schedule.

- F. Unless approved by the University's Representative, there shall be no activities shown with durations greater than 14 calendar days (excluding submittals, submittal reviews, and procurement activities).

3.02 CONTRACT SCHEDULE (BASELINE)

- A. The Contract Schedule shall represent a practical plan to fully complete the Contract within the Contract Time. The Contract Schedule shall include a complete sequence of construction, in adequate detail for coordination of the Work and shall be coordinated with the preparation of the Schedule of Values per 01 29 00 Measurement and Payment.

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. The Contract Schedule shall be calculated using the Retained Logic method. Progress override calculations shall not be acceptable. The schedule shall not use negative float or constraints on work activities.
2. The Contract Schedule shall identify all holidays and non-working days.
3. Identity of the party responsible for the activity (i.e., University, General **Contractor**, specific subcontractor, etc.)
4. 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
 - e. Sequence – The following sequences shall be identified:
 - 1) Administrative
 - 2) Submittal and Review
 - 3) Fabrication
 - 4) Construction: including phasing and sequencing as identified in 011400 Work Restrictions
 - 5) Inspection, Commissioning, and Close-out

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, and scheduled activities requiring submittals or University's Representative's prior acceptance.
 - 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) The schedule shall allow submittal review time in accordance with Section 01 33 00 Shop Drawings, Product Data, Samples.
 - b. System test dates.
 - c. Scheduled overtime Work to the extent permitted by Contract Documents.
 - d. Dates **Contractor** requests designated workspaces, storage area, access, and other facilities to be provided by the University.
 - e. Dates **Contractor** requests orders and decisions from the University on designated items.
 - f. Dates **Contractor** requests University-furnished equipment.
 - g. Dates **Contractor** requests University-furnished utilities.
 - h. Planned dates for shutdown, connection and relocation of existing utilities.
 - i. Planned dates for connecting to or penetrating existing structures.
 - j. Planned dates for scheduled inspections as required by Codes, or as otherwise specified.
 - k. Commissioning Sequence and activities for all Building Systems.
2. Unless approved by the University's Representative, there shall be no activities shown with durations in excess of 7 calendar days (excluding submittals, submittal reviews, and procurement activities). Milestones should be listed for the completion of wings, floors, and other similar areas.
3. The allowable monthly rain days per the Supplemental Conditions shall be incorporated into the Schedule.

4. Identify types of calendars used and the logic of their application.

D. Submission

1. The first Contract Schedule shall be submitted to the University not later than 30 calendar days after Notice to Proceed. The period covered by Contract Schedule shall be the Contract Time as specified in the Notice to Proceed. The Contract Schedule shall incorporate the logic of the Preliminary Contract Schedule covering the first 90 calendar days following the Notice to Proceed. Items to be included with first submission:
 - a. Contract Schedule (Baseline)
 - b. Critical Path Schedule excluding all non-critical Work activities.
 - c. Narrative
2. Tabular Computer Reports
 - a. As requested by the University, the **Contractor** shall submit various computer-generated tabular reports.
 - b. As requested by the University's Representative, the **Contractor** will be required to submit additional Schedule Reports.

E. Acceptance

1. Upon receipt, the University's Representative shall review the proposed first Contract Schedule. Within **21** calendar 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.
2. If the proposed first Contract Schedule is accepted by the University's Representative, it shall become the Contract Schedule (or Baseline 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 need revision, the **Contractor** shall revise and resubmit the proposed first contract schedule to the University's Representative within 14 calendar days for acceptance. If accepted, 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. If not accepted the **Contractor** will resubmit within 10 calendar days for a new review period to start.

- a. 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 proposed Contract Schedule.

F. Schedule Logic

1. Activity schedule logic should normally be of Finish-to-Start relationship type and assembled to show order in which **Contractor** proposes to carry out the Work. The logic should indicate restrictions of access, availability of Work areas, and availability and use of manpower, materials, and equipment. Form basis for assembly of schedule logic on the following criteria:
 - a. Indicate which activities must be completed before subsequent activities can be started.
 - b. Indicate which activities can be performed concurrently.
 - c. Indicate which activities must be started immediately following completed activities.
 - d. Indicate resource sequencing due to availability or space restrictions.
 - e. Lags shall not be used if can be represented with additional schedule detail. Finish-to-start logic ties with positive lags are not permitted. All positive time consumption should be represented by a schedule activity. Start-to-start, or finish-to-finish logic ties with negative lags are not permitted.
 - f. Lags in Start-to-Start or Finish-to-Finish relationships must not exceed the duration of the predecessor or successor activity, respectively.

G. Non-Sequestering of Float

1. **Contractor** shall not sequester float through scheduling techniques, including, but not limited to, constrained dates, extending Work Activity duration estimates, using preferential logic, such as lag or negative lag (lead), unless specifically requested in writing and approved by University's Representative. It is acknowledged that University-caused or **Contractor**-caused time savings to Activities on, or near, the critical path will increase float, such increase in float shall not be for the exclusive use or benefit of either University or **Contractor**.

H. Out of Sequence Logic:

1. Resolution of conflict between actual work progress and schedule logic: When out of sequence activities develop in Schedule because of actual construction progress, **Contractor** shall submit revision to schedule logic to conform to current status and direction and include reasons in schedule update Narrative.

I. Preferential Logic:

1. The intended purpose of scheduling on a construction project is to help ensure that **Contractor**'s work on the project is adequately planned, tracked and managed. A construction schedule can be as simple as a list of activities, organized in a logical sequence, and time scaled. The concept of construction scheduling is to see that all activities necessary to complete the work, in accordance with the contract documents requirements, are properly planned, coordinated and managed. When **Contractor**'s schedule activities are not sequenced in the most logical manner, but rather, in a manner as to create the maximum possible opportunity for University interference to claim delay or interruption, the University will reject the schedule with a request of different sequence of activities.

3.03 EXPERIENCE REQUIREMENTS

- A. **Contractor** shall designate an individual from **Contractor**'s staff or a consultant who shall be responsible throughout the duration of the project for preparation of all schedules and reports as required by this specification. This individual shall also be required to attend all meetings with the University's Representative as required by this specification. The **Contractor** shall demonstrate to the satisfaction of the University that the individual or consultant has at least 3 years of experience preparing, maintaining, and administering detailed project schedules on projects of the same or similar size and complexity as this project. The **Contractor** shall also demonstrate to the satisfaction of the University that the individual or consultant is proficient in the use of the scheduling software proposed for use by the **Contractor** on this project.
- B. Within 14 calendar days after the Notice of Selection as the Apparent Lowest Responsible Bidder, **Contractor** shall provide the University with the identification, qualifications, and experience of and references for the proposed individual or consultant.

3.04 MONTHLY UPDATES

- A. After acceptance 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 acceptance with the draft payment application and 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. Actual dates shall be clearly distinguishable from projected dates.
 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 calendar 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** for input. Within 14 calendar days, 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. **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.
- G. With each monthly updated Contract Schedule, the **Contractor** shall provide an accompanying narrative describing the progress anticipated during the upcoming month, critical activities, delays encountered during the prior month, delays anticipated during the upcoming month, and an audit of the Contract Time. The audit shall show current days allowed by contract, days used through the end of the month, days remaining, percent of time used to date, and percent complete as measured by cost loaded schedule, and days ahead of or behind schedule. In the event that the **Contractor** was delayed by any occurrence during the prior month, the narrative report shall include a listing of all delays that affected the critical path and shall clearly explain the impact the claimed delay(s) had on the critical path and shall include an accounting of days lost or gained.
- H. In the event the monthly update shows the **Contractor** to be behind schedule (negative float), the narrative shall include a description of actions needed to bring the project back on schedule.

3.05 LOOK AHEAD SCHEDULES

- A. Look Ahead Schedule is 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 1 prior weeks, and all activities scheduled to occur during the next 3 weeks.

- B. Provide detailed Look Ahead Schedules every week.
- C. Submit in 11-inch by 17-inch Gantt chart format.
- D. Look Ahead Schedule shall be generated from the then current Preliminary Contract Schedule, Contract Schedule, or updated Contract Schedule. Activities listed in the Look Ahead Schedule shall reference the activity identification or other such coding for correlation to the activities listed in the Contract Schedule.

3.06 TIME EXTENSION REQUEST DOCUMENTATION

- A. In the event the **Contractor** shall request an extension of Contract Time, **Contractor** shall comply with the requirements of the General Conditions, including without limitation, General Conditions Article 8. In addition to the requirements of the General Conditions, as a condition to obtaining an extension of the Contract Time, **Contractor** shall timely submit a sub-network of the events of the delay that demonstrates the impact to the activities in the **Contractor**'s then current schedule, as well as the impact to the overall completion date of the project.
- B. If the University's Representative approves the extension of time, the next monthly updated Contract Schedule shall incorporate the subnetwork with the extension of time. In addition, the monthly updated Contract Schedule shall contain all changes mutually agreed upon by the **Contractor** and the University during preceding periodic reviews and all changes resulting from Change Orders and Field Orders.

3.07 AS BUILT SCHEDULE

- A. As a condition precedent to the release of retention, the last update of the Contract Schedule submitted shall be identified by the **Contractor** as the "As Built Schedule". The "As Built Schedule" shall be submitted when all activities are 100 percent complete. The "As Built Schedule" shall reflect the exact manner in which the project was actually constructed (including start and completion dates, activities, sequences, and logic) and shall include a statement signed by the **Contractor**'s scheduler that the "As Built Schedule" accurately reflects the actual sequence and timing of the construction of the project.

3.08 WEATHER DAYS ALLOWANCE

- A. Should inclement weather conditions, or the conditions resulting from weather, prevent the **Contractor** from proceeding with seventy-five (75) percent of the normal labor and equipment force engaged in the current critical activity item(s), (as shown on the latest CPM Progress Schedule accepted by the University's Representative), for a period of at least five (5) hours per day toward completion of such operation or operations, and the crew is dismissed as a result thereof, it shall be a weather delay day.

- B. The expected loss of days specified in the Supplementary Conditions, item 3 “Modification of General Conditions, Article 8 – Contract Time”, shall be included in a separate identifiable critical activity labeled "Weather Days Allowance" to be included as the last critical activity of the project schedule prior to substantial or final completion (whichever is contractual). The weather allowance activity shall be on, and remain on, the critical path of the project throughout the life of the project until it has been absorbed. Typically, all activity's leading to completion shall go through the weather allowance activity first. When weather days are experienced, and are approved as such by the University's Representative, the **Contractor** shall either:
1. Increase the duration of the current critical activity(ies) by the number of weather days experienced, or
 2. Add a critical activity to the schedule to reflect the occurrence of the weather day(s).
- C. The duration of the weather day allowance activity shall be reduced as weather days are experienced and included in the schedule. Any remaining weather days in the weather day allowance activity at the completion of the project shall be considered as float and shall not be for the exclusive use or benefit of either the University or **Contractor** .
- D. The **Contractor** shall not receive any additional compensation for unavoidable delays due to inclement or unsuitable weather. If all the weather allowance has been used, any additional weather delay experienced by the **Contractor** may result in a non-compensable time extension upon submission of acceptable supporting documentation to the University's Representative.

END OF SECTION 01 32 00

SECTION 01 32 20

CONSTRUCTION PROGRESS REPORTING

PART I - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Requirements and procedures for documentation of construction progress using still photographs.

B. Related sections include the following:

1. Division 01, Section "Closeout Procedures" for general closeout procedures.
2. Division 01, Section "Closeout Submittals."

1.02 PROGRESS PHOTOS/VIDEOS

A. Maintain a **daily** photographic record of the progress of the Work as outlined in Part III of this Section.

1. Photographs to accompany Superintendent Daily Reports will be done on a daily basis.

1.03 AS-BUILT DOCUMENTATION

A. The **Contractor** shall be responsible for the maintenance and completion of As-Built PDF Drawings and Models the following procedure shall be strictly adhered to:

1. **Contractor** shall download and save all of the construction documents. This set of Drawings along with the Specifications, shall be kept on file available to University's Representative's until the completion of the Project.
2. As the Work progresses, a complete and accurate notation of all documented changes or deviations from the Drawings and Specifications shall be recorded thereon and in the record model by the **Contractor**. Such indications shall be neatly made and kept current. Where exact locations are critical, such as in the case of buried piping or conduit, such locations - both horizontal and vertical - shall be dimensioned back to an above ground, permanent fixed point.
3. Properly note construction deviations or changes on the monthly As-Built, prior to proceeding with any Work in those locations. Do not complete Work or request inspections if such Work has been installed in locations contrary to the Drawings.

4. University's Representative may request to review the As-Builts, on a monthly basis and prior to each Application for Payment. If requested by University's Representative, provide access to the following:
 - a. Approval of Application for Payment is contingent upon timely review of monthly changes on As-Builts Drawings and Record Models.
 - b. PDF drawings and The Record Model must be available for review to the University's Representative of the sheets or areas on which changes have been noted during the preceding month.
5. All As-Built and Record indications shall be clear and legible.
6. At the completion of the Project, Refer to Section 017800 CLOSE OUT SUBMITTALS.

PART II - PRODUCTS – Not applicable to this section.

PART III - EXECUTION

- 3.01 Contractor is required to maintain a [**daily, weekly, monthly**] digital photographic record of the progress of the Work and is to submit the photographs and video coverage as required to the University Representative. Daily Photographs are required for Superintendent Daily Reports.

END OF SECTION 01 32 20

SECTION 01 33 00

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Administrative requirements for shop drawings, product data and samples submittals
- B. University's and University's Consultant's review of submittals
- C. **Contractor's** review of submittals
- D. Shop Drawing Submittals
- E. Product Data submittals
- F. Sample submittals
- G. Field Samples and mock-ups
- H. Submittal Schedule requirements

1.02 RELATED SECTIONS

- A. Section 011100 – SUMMARY OF THE WORK: Subcontractor and materials suppliers list.
- B. Section 013200 – CONTRACT SCHEDULES: Submission and review of schedules and submittals.
- C. Section 014500 – QUALITY CONTROL: Test and Inspection Reports.
- D. Section 016100 - PRODUCT REQUIREMENTS
- E. Section 017700 – CLOSEOUT PROCEDURES: Occupancy/Acceptance /Final Payment Submittals.
- F. Section 017800 – CLOSEOUT SUBMITTALS: Preparation of Maintenance and Operating Data.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. General Submittals Review: Submittals shall be made in accordance with requirements specified herein and in individual Sections.
 - 1. Submittals shall be a communication aid between **Contractor**, University's Representative, and University's Consultant(s) by which interpretation of Contract Documents requirements may be confirmed in advance of construction.

2. Submit on all products to be used on the Project. Make all submittals through the University unless otherwise directed.
 - a. The University's Representative shall provide timely review of submittals and re-submittals.
 - 1) University's Representative shall have twenty-one (21) days from receipt to review all submittals twenty-one (21) days from receipt to review re-submittals.
 - 2) The Fire Marshal shall have twenty-eight (28) days from receipt to review all submittals twenty-eight (28) days from receipt to review re-submittals.
 - 3) University's Representative will prepare and keep a log of review time of all submittals.
 3. Substitutions shall be submitted in accordance with Section 016100 – PRODUCT REQUIREMENTS.
 4. Make submittals sufficiently in advance of construction activities to allow shipping, handling and review by the University's Representative and their consultants.
- B. University's and University's Consultants Review: University's Consultant's review will be only for general conformance with the design intent of the Contract Documents. Review of submittals is not conducted for purpose of determining 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. Review actions of the University's Consultant or University shall not relieve **Contractor** from compliance with requirements of the Contract Documents. Changes shall only be authorized by separate written Change Order in accordance with the General Conditions of the Contract.
- C. Contractors Review: **Contractor** shall review, mark-up as appropriate and stamp Shop Drawings, Product Data, and Samples prior to submission. Submittal shall clearly show it has been reviewed by **Contractor** for conformance with the Contract Documents and for coordination with requirements of the Work. Notify University's Representative in writing, at time of submission, of any changes in the submittals from requirements of Contract Documents.

1.04 SUBMITTAL REQUIREMENTS

- A. Prompt Submission: Submittals shall be submitted promptly in accordance with Submittal Schedule and in such sequence as to cause no delay in the Work or in the work of any separate contractor. Present information in a clear and thorough manner to aid orderly review.

- B. Preparation: Title each submittal with the University's Project Name and the University's Project number, submittal date and dates of any previous submissions. Clearly mark each copy to identify product or model.
1. Identify each item on submittal by reference to Drawing sheet number, detail, schedule, room number, assembly or equipment number, Specification number Reference Standard (such as ASTM or Fed Spec Number) and other pertinent information to clearly correlate submittal with Contract Documents.
 2. Include the names of the **Contractor**, Subcontractor, Supplier and Manufacturer.
 3. Include field dimensions, clearly identified as such to establish relationship to adjacent or critical features of the Work or materials.
 4. Include pertinent information such as performance characteristics and capacities, wiring or piping diagrams and controls, catalog numbers and similar data.
 5. Modify manufacturer's standard schematic drawings and diagrams and other diagrams to delete information not applicable to the Work. Supplement standard information to provide information specifically applicable to the Work.
 6. Identify changes from requirements of the Contract Documents.
 7. Include 8" x 3" blank space on face of submittal for review stamps.
 8. Include **Contractor's** review stamp, initialed or signed, and dated, certifying to the review of the submittal, verification of materials, field measurements, conditions, and compliance of the information within the submittal with the requirements of the Work and of the Contract Documents.
- C. Number of submittals required:
1. Product Data Submittals: Submit PDF electronic file with booked marked table of contents and/or sheet index. Submittals for the Fire Department require an electronic file and two (2) hard copies.
 2. Initial/Re-submitted Shop Drawing Review(s): Submit PDF electronic file with booked marked table of contents and/or sheet index. Submittals for the Fire Department require an electronic file and two (2) hard copies.
 3. Final Shop Drawing Review and Approval: After obtaining University's Representative approval of initial/re-submitted shop drawing submittals, as described in Section 1.04.C.2 above, **Contractor** shall submit PDF electronic file with booked marked table of contents and/or sheet index. Submittals for the Fire Department require an electronic file and two (2) hard copies. **Contractor** is responsible for providing all approved shop drawings for its use and use by subcontractors and/or suppliers.
 4. Samples: Submit number specified. Samples shall be of sufficient size and quality to clearly illustrate the functional characteristics of the products, with integrally

related parts and attachment devices, including full range of colors, textures and patterns.

- D. Identifying Submittals: Identify each submittal by Specification section number followed by a number indicating sequential submittal for that Section. Re-submittals shall use the same number as the original submittal, followed by a letter indicating sequential re-submittal. Examples:
1. 092500 – 1 First submittal for Section 092500 – Gypsum Board
 2. 092500 – 2 Second submittal for Section 092500 – Gypsum Board
 3. 092500 – 2A Re-submittal of second submittal for Section 092500 – Gypsum Board
 4. 092500 – 2B Second re-submittal of second submittal for Section 092500 – Gypsum Board
- E. Resubmission Requirements: Revise and resubmit as specified for initial submittal. Identify any Changes other than those requested. Note any departures from Contract Documents or changes in previously reviewed submittals.
- F. Grouping of Submittals: Unless otherwise specifically permitted by University's Representative, make all submittals in groups containing all associated items as described

in each Specification Section. The University's Representative will reject partial submittals as incomplete.

G. Unsolicited Submittals: Unsolicited submittals will be returned NOT REVIEWED.

1.05 DISTRIBUTION

A. Reproduce and distribute finalized copies of Shop Drawings and Product Data, to the following:

1. **Contractor's** Project site file.
2. As-built Documents file maintained by **Contractor**.
3. Pertinent Separate Contractors.
4. Pertinent Subcontractors.
5. Pertinent Supplier or Manufacturer.

1.06 FIELD SAMPLES AND MOCK-UPS – NOT USED

1.07 SUBMITTAL SCHEDULE

A. Submittals Schedule: refer to Section 013200 – CONTRACT SCHEDULES.

1. The Submittal Schedule is a schedule for submission of Shop Drawings, Product Data and Samples by **Contractor**, and the processing and return of same by University.
2. **Contractor** shall prepare the Submittal Schedule as described herein and coordinate it with the Contract Schedule. No submittals will be processed before the Submittal Schedule has been submitted to and accepted by University.
3. Submittal Schedule shall be adjusted to meet needs of construction process and the Contract Schedule. Submit PDF electronic file with booked marked table of

contents and/or sheet index of the Submittal Schedule after it is completed and each time it is update by **Contractor**.

4. **Contractor** shall NOT begin fabrication or Work which requires submittals until the return of final reviewed and approved submittals have been received by the **Contractor**.

1.08 ENVIRONMENTAL PRODUCT DECLARATIONS

- A. Contractor must comply with Buy Clean California Act requirements per California Public Contract Code, Sections 3500-3505.
- B. Contractor shall submit to Project Manager/Construction Manager current facility-specific Environmental Product Declaration for each eligible material proposed to be used on the Project.
- C. Environmental Product Declaration (EPD): Type III environmental impact label, as defined by the International Organization for Standardization (ISO) standard 14025, or similarly robust life cycle assessment methods that have uniform standards in data collection consistent with ISO standard 14025, industry acceptance, and integrity.
- D. Eligible Materials: Any of the following:
 1. Carbon steel rebar.
 2. Flat glass.
 3. Mineral wool board insulation.
 4. Structural steel.
- E. Eligible Materials installed on the Project by Contractor must comply with any standards to the extent established in the BCCA or by University, whichever is more stringent. The facility-specific global warming potential for any Eligible Materials must not exceed any existing maximum acceptable global warming potential for that material pursuant to the BCCA or by University, whichever is more stringent ("EM Standards"). The standards are published on the Department of General Services (DGS) website and updated information can be found on this link: <https://www.dgs.ca.gov/PD/Resources/Page-Content/Procurement-Division-Resources-List-Folder/Buy-Clean-California-Act>
- F. Contractor shall not install any eligible materials on the project before submitting a facility-specific Environmental Product Declaration for that material.
- G. This section shall not apply to an eligible material for a particular contract if the University determines, upon written justification published on its Internet website, that requiring those eligible materials to comply would be technically infeasible, would result in a significant

increase in the project cost or a significant delay in completion, or would result in only one source or manufacturer being able to provide the type of material needed by the state.

PART II - PRODUCTS – Not Applicable to this Section

PART III - EXECUTION – Not Applicable to this Section

END OF SECTION 01 33 00

SECTION 01 34 00

CONTRACTOR(S) EMERGENCY PROCEDURES

PART I - GENERAL

- 1.01 The purpose of this specification is to outline, to the **Contractor**, the University's policy and procedures for effective project site management of an emergency situation during the construction of projects at UC Davis Health.
- 1.02 This procedure applies to all Contractors and their subcontractors who have contractual agreements with UC Davis Health.

PART II - DEFINITIONS

- 2.01 Disaster – any natural or human-made event that causes major disruption such as damage to the organization's buildings or grounds from severe weather conditions, earthquakes, other natural phenomena or loss of utilities (power, water and telephones), acts of civil disobedience, accidents or emergencies within the organization or in the surrounding community.
- 2.02 Code Green – a code notifying all employees that an emergency event has occurred, and University operations will be opening the Hospital Command Center and shifting to emergency operations.
- 2.03 Code Red – Fire
- 2.04 Code White – Hazardous Material / Chemical Spill
- 2.05 Control Facility – the County of Sacramento has designated UC Davis Health as the Control Facility for Sacramento County. The Control Facility coordinates medical control of patients and victim's dispersal to hospitals in the community/region.
- 2.06 Other emergency situations include the following systems failures as outlined in the UC Davis Emergency Response Plan.
- A. Water system failure
 - B. Telephone system failure
 - C. Fire
 - D. Electrical system failure
 - E. Security
 - F. Chemical spill
 - G. Evacuation

PART III - PROCEDURES

3.01 The **Contractor** will be issued a UC Davis Health Emergency Response Plan at the project

- A. Pre-construction meeting. This plan must be posted at the project site at all times in a visible location known to all project contractors.
- B. **Contractor** is directed to contact appropriate emergency personnel as outlined in the Emergency Response Plan information during an emergency.
- C. If the emergency involves an outside utility company, **Contractor** is to contact utility company directly. Known outside utilities located at the Sacramento campus are as follows.

1. Emergency Telephone Numbers

- a. Police Dispatch: 916-734-2555
- b. PO&M Dispatch (Electrical) 916-734-2763
- c. PG&E (Gas) 800-743-5000
- d. City of Sacramento Water 3-1-1
- e. HazMat Spill 916-734-2740

END OF SECTION 01 34 00

SECTION 01 35 00
SPECIAL PROCEDURES

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Interim Life Safety Measures (ILSM)
- B. Security Procedures
- C. Hazardous Materials Procedures

1.02 RELATED SECTIONS

- A. General Conditions of the Contract
- B. Section 011100 – SUMMARY OF THE WORK
- C. Section 013100 – COORDINATION
- D. Section 013200 – CONTRACT SCHEDULES
- E. Section 015600 – TEMPORARY BARRIERS, ENCLOSURES AND CONTROLS
- F. Section 015610 – AIRBORNE CONTAMINANTS CONTROL
- G. Section 017300 – CUTTING AND PATCHING
- H. Section 017400 – CLEANING

1.03 INTERIM LIFE SAFETY MEASURES (ILSM)

- A. ILSM Definition: Interim Life Safety Measures are those activities that are undertaken during construction, repair, and improvement operations that are established to temporarily compensate for the deficiencies caused in fire safety and protection that may be associated with such projects.
- B. Quality Assurance: Interim Life Safety Measures (ILSM) program shall comply with The Joint Commission Standards, Life Safety (LS) Section, LS.01.02.01.
 - 1. **Contractor** shall be responsible for setting up control procedures to adhere to ILSM Criteria Implementation Matrix and/or the ILSM Inclusion Criteria. Contractors shall notify University's Representative of anticipated and actual problems complying with ILSM.

2. **Contractor** shall submit proposed Fire and Life safety impairments (21) calendar days prior to implementation. Submittal of ILSM does not infer or guarantee acceptance by University. All submitted measures shall be reviewed and returned to **Contractor** indicating approval, approval as noted, or rejection, revision, or re-submittal requirement by University in writing no less than fourteen (15) calendar days prior to proposed implementation. If re-submittal is required, twenty-one (21) day review period from date of re-submittal will be required.
- C. Project ILSM Procedures: If a life safety code deficiency occurs, or is identified by any source, or the requirements of the current Life Safety Code are not being met; Interim Life Safety Measures must be implemented to the extent necessary to compensate for any deficient element(s) predicated on magnitude, severity, extent and duration before corrective actions are completed.

Any minor life safety code deficiency that could be corrected within 45 calendar days that is confined to a single smoke compartment or fire zone will not merit for declaring a hospital-wide ILSM(s) but would require reduction in flammable and combustible loads in the affected smoke compartment or zone as well as issuing a work order to complete the Plan For Improvement (PFI) within 45 calendar days of discovery.

The ILSM Criteria Implementation Matrix and/or the ILSM Inclusion Criteria forms completed by a University Representative are used to determine when and to what extent applicable ILSM measures as it pertains to each condition is required to be implemented. Based on the ILSM Inclusion Criteria assessment form, it may not be necessary to declare the need to implement ILSM measures under certain conditions as delineated in the form. When ILSMs are determined to be required, an ILSM Implementation Matrix shall be utilized by the contractor.

ILSMs must be implemented upon project development and must be continuously enforced through project completion. A comprehensive plan of correction is to be developed by the Project Representative, or designee using the ILSM Evaluation Form.

- D. Any impairment or shutdown of a passive or active fire and life safety device/system for a period of 4 hours or longer in a 24 hour period will require implementation of an ILSM. Some of the most common impairments are outlined below. The listing of these ILSM examples is not intended to limit or preclude preventative actions that may be required to temporarily compensate for other life safety deficiencies that may arise during construction activities due to unforeseen conditions, the contractor's changing work plan, or required continuing activities of University. Comments following each ILSM are known ILSM requirements at time of bid. These comments are made to assist **Contractor** in bid preparation and later preparation of ILSM plan for the Project. University makes no guarantee these comments address all conditions requiring action by **Contractor**.
1. ILSM example #1: Ensure exits provide free and unobstructed egress. Maintain free and unobstructed access and exits from all buildings to public ways. Maintain

escape facilities for construction workers at all times. Inspect means of egress in construction areas daily.

2. ILSM example #2: Maintain free and unobstructed access to emergency departments/services.
3. ILSM example #3: Ensure fire alarm, detection, and suppression systems are not impaired.
4. ILSM example #4: Ensure temporary construction partitions are smoke tight and built of noncombustible or limit combustible material that will not contribute to the
5. ILSM example #5: Provide additional firefighting equipment and use training for construction workers.
6. ILSM example #6: No smoking. **Contractor** shall follow the Universities smoking policy.
7. ILSM example #7: Develop and enforce storage, housekeeping, and debris removal practices that reduce the flammable and combustible fire load of the building to the lowest level necessary for daily operations.
8. ILSM example #8: Conduct a minimum of two (2) fire drills per shift per quarter.
9. ILSM example #9: Conduct regular hazard surveillance of buildings, grounds, and equipment with special attention to excavations, construction areas, construction storage, and field office.
10. ILSM example #10: Train personnel when structural or compartmentalization features compromise fire safety measures.
11. ILSM example #11: Conduct organization-wide safety education programs to ensure awareness of any LSC (Life Safety Control) deficiencies, construction hazards, and ILSM.

1.04 SECURITY PROCEDURES

- A. Security Program: Protect Work, existing premises, and University operations from theft, vandalism, and unauthorized entry.
 1. Security of the area shall be strictly maintained. **Contractor** shall control entrance of persons and vehicles related to University operations.
- B. Entry Control: Restrict entry of persons and vehicles into Project site and existing facilities. Allow entrance only to authorized persons with proper identification. Maintain log of workers and visitors, make available to University's Representative.
 1. **Contractor** shall control entrance of persons and vehicles related to University operations.
- C. Personnel Identification: Provide identification card to each person authorized to enter premises, showing: Personal photograph, name and assigned number, expiration date,

and employer. Maintain a list of accredited persons; submit copy to University's Representative on request.

- D. Miscellaneous Restrictions: Do not allow cameras on site; do not allow photographs except with written approval of University.

1.05 HAZARDOUS MATERIALS PROCEDURES

- A. Except as otherwise specified, should **Contractor** encounter site materials, reasonably believed to be asbestos, polychlorinated biphenyl (PCB), radioactive material, lead in paint, lead lining in walls or glass windows, lead in ceramic products, mold, water leaks or other hazardous materials or conditions, the **Contractor** shall immediately stop work in the affected area and report the condition to 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 identified as hazardous and has not been rendered harmless. The work in the affected area shall be resumed in the absence of hazardous materials, or when such materials have been rendered harmless.

- A. Spills, discharges, overruns, or similar occurrences involving hazardous materials on site shall be promptly reported in writing to University's Representative. If **Contractor** fails to notify University in a prompt and timely manner of an occurrence, University will contract with licensed hazardous materials abatement contractor to clean up the hazardous material. **Contractor** shall pay all costs of removal, including financial penalties incurred, the result of the **Contractor's** failure to act promptly in response to the product emergency.

- C. **Contractor** shall provide means and personnel to contain and control product emergencies or shall provide means and methods to render hazardous materials harmless.

PART II - PRODUCTS – Not Applicable to this Section

PART III - EXECUTION – Not Applicable to this Section

END OF SECTION 01 35 00



Fire Marshal's Office

4800 2nd Ave. #1200
 Phone: (916) 734-3036
 Fax: (916) 451-7754
 hs-fireprevention@ucdavis.edu

Interim Life Safety (ILSM)

Based upon documentation received (ILSM Impact worksheet) a risk analysis of this project has been made. The impairments to life safety systems have been identified and interim measure provided as set forth below.

PROJECT TITLE:	OSHPD #	A/C#
ILSM START DATE:	END DATE:	
FIRE LIFE SAFETY DEFICENCY(IES):		
INTERIM MEASURE(S):		

Unless otherwise noted below, these requirements apply to impairments of a duration extending beyond the current shift (greater than 8 hours)	ILSM1	ILSM2	ILSM3	ILSM4	ILSM5	ILSM6	ILSM7	ILSM8	ILSM9	ILSM10	ILSM11	ILSM12	ILSM13	ILSM14	ILSM15
Check all impairments that apply.															
Construction activity or repair															
Any impairment of a required egress															
Fire detection ALARM system impairment greater than 4 hours ***															
Fire SUPPRESSION system impairment greater than 10 hours															
Fire &/or smoke door hardware impaired															
Fire or smoke barriers with impairment															
Missing or incomplete fire or smoke barriers															
OTHER: <i>See below</i>															

**** Requires inspection by The Fire Marshal's Office prior to ILSM commencement.**

***** Fire Watch shall be documented and log provided to the Fire Marshal's Office at the end of each fire watch shift*****
 Daily Inspection Log shall be completed by construction team daily & Fire Prevention staff weekly

INTERIM LIFE SAFETY IMPLEMENTATION MEASURES	
ILSM 1	Life safety deficiencies have been evaluated per UCDH Policy 1635 based upon the submitted ILSM Impact Worksheet
ILSM 2	Policy for deficiencies is followed for a sprinkler system out of service more than 10 hours in a 24 hour period & fire alarm out of service for more than 4 hours in a 24 hour period.
ILSM 3	Post signage identifying the location of alternative exits to everyone affected
ILSM 4	Inspect exits in affected area on a daily basis
ILSM 5	Provide temporary but equivalent fire alarm & detection system for alarm impairment
ILSM 6	Provide additional fire fighting equipment (i.e. fire extinguishers)
ILSM 7	Temporary construction barrier smoke-tight, will not contribute to the development of fire & of solid construction (see UCDH Policy 1635 & OSHPD 9-3301)
ILSM 8	Increase surveillance of building, special attention to construction area & storage
ILSM 9	Enforce storage, housekeeping & debris removal practices to reduce fire load
ILSM 10	Provide additional training to those who work in the hospital on the use of firefighting equipment
ILSM 11	Conduct one additional fire drill per shift per quart.
ILSM 12	Inspect & test <i>temporary</i> systems monthly. -Document testing
ILSM 13	Conduct education to promote awareness of building deficiencies, hazards & temporary measures
ILSM 14	Train those who work in the hospital to compensate for impaired structural or compartmental fire safety features
ILSM 15	OTHER:

Responsible Individual Signature: _____
 Date: _____

Fire Marshal's Office Signature: _____
 Date: _____



UC Davis Health
 Fire Marshal's Office
 4800 2nd Ave., Suite 1200
 Sacramento, Ca 95817
 916-734-3036
 hs-fireprevention@ucdavis.edu
 www.ucdmc.ucdavis.edu/fire/



Interim Life Safety Measure (ILSM) Impact Worksheet

This form is completed by the Project Manager or Contractor or Contractor's Representative. Complete the form and submit to the Fire Marshal's Office for an evaluation of the need for an ILSM, Fire Watch, or other safety measure.

Project Title:			
Date of Project(s):		Time of Project(s):	
A/C#		OSHPD #	
Project Description:			

	Yes	No
Project alters or significantly compromises exit access, exiting, or exit discharge building elements? If yes, provide a floor plan showing how exiting is affected. Temporary exit and/or evacuation signs may be required.	<input type="checkbox"/>	<input type="checkbox"/>
Compromise of building compartmentation including fire or smoke walls, floor / ceiling assemblies, corridor walls, use area doors, or other defend in place elements? If yes, describe in information.	<input type="checkbox"/>	<input type="checkbox"/>
The issue impairs the building fire alarms or sprinkler systems?	<input type="checkbox"/>	<input type="checkbox"/>
The activity includes significant ignition sources such as cutting, welding, or other operations using flame or producing sparks?	<input type="checkbox"/>	<input type="checkbox"/>
The activity includes large quantities of combustible materials, flammable materials, or generation of large amounts of dust and debris?	<input type="checkbox"/>	<input type="checkbox"/>
Access to fire or life safety equipment affected? If yes, what systems or equipment? (i.e.: fire watch, Fire Inspector, extinguisher, etc.)	<input type="checkbox"/>	<input type="checkbox"/>
Are construction barriers present / required?	<input type="checkbox"/>	<input type="checkbox"/>



UC Davis Health
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4800 2nd Ave., Suite 1200
Sacramento, Ca 95817
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Documentation – When ILSMs are required, the following documentation must be maintained:

- a. Training rosters
- b. Fire drill reports
- c. Monthly inspection and testing of temporary fire alarm, detection, and suppression systems
- d. Daily inspection of construction area
- e. Weekly inspection of buildings, grounds, and equipment with special attention to excavations, construction areas, construction storage, and field offices
- f. Completed ILSM form at the job site

Note* Contractor activities that pose an immediate threat to the health and safety or patients, visitors, hospital employees or construction personnel shall be discontinued immediately until the hazards are abated and corrected and the appropriate ILSM(s) are developed.

Requestor's Signature

Date

UCDH Fire Marshal's Office Representative

Date

Information:

SECTION 01 39 00

GREEN BUILDING POLICY IMPLEMENTATION

PART I – GENERAL

1.01 SECTION INCLUDES

- A. Fundamental Building Systems Commissioning
- B. Construction Waste Management: Divert 80% from Landfill
- C. Construction Indoor Air Quality (IAQ) Management Plan: During Construction

1.02 RELATED DOCUMENTS AND SECTIONS

- A. Section 015600 – TEMPORARY BARRIERS, ENCLOSURES and CONTROLS
- B. Section 015610 – AIRBORNE CONTAMINANTS CONTROL
- C. Section 016100 – PRODUCT REQUIREMENTS
- D. Section 017400 – CLEANING
- E. Section 017500 – STARTING and ADJUSTING SYSTEMS
- F. Section 017600 – PROTECTING INSTALLED CONSTRUCTION
- G. Section 017700 – CLOSEOUT PROCEDURES
- H. Section 017800 – CLOSEOUT SUBMITTALS
- I. Section 018100 – PLUMBING/HVAC TESTING PROCEDURES
- J. Section 018200 – DEMONSTRATION and TRAINING
- K. Section 027250 – STORM DRAINAGE WATER QUALITY
- L. Section 142400 – HYDRAULIC ELEVATORS
- M. Section 145800 – PNEUMATIC TUBE SYSTEMS
- N. Division 21 – WET SPRINKLER SYSTEMS
- O. Division 22 – PLUMBING WORK
- P. Division 23 – MECHANICAL WORK (All)
- Q. Division 26 – ELECTRICAL WORK (All)

R. Division 33 – SITE UTILITIES

1.03 FUNDAMENTAL BUILDING SYSTEMS COMMISSIONING

- A. Commissioning is a systematic process of ensuring that all building systems and assemblies perform interactively according to University objectives and requirements and the design according to the contract documents. The commissioning process encompasses and coordinates the traditionally separate functions of system documentation, equipment start-up, control system calibration, systems testing, testing and balancing, and training. The commissioning process does not take away from or reduce the responsibility of the **Contractor** to provide a finished and fully functioning product. Commissioning during construction is intended to achieve the following specific objectives:
1. Ensure that applicable equipment, systems, and assemblies are installed according to the manufacturer's recommendations and to accepted industry standards, and that they receive adequate operational checkout by the **Contractor**.
 2. Ensure and document that equipment, systems, and assemblies' function and perform according to University objectives and requirements and the Contract Documents.
 3. Ensure that operations and maintenance (O&M) manuals are complete.
 4. Ensure that University operating and maintenance personnel for all systems are adequately trained.
- B. Commissioning will be performed under the authority and management of the University Plant Operations & Maintenance Department (PO&M), as an independent organization whose individuals are not directly responsible for project design or construction management.
- C. **Contractor** Commissioning Responsibilities
1. Designate a Commissioning Coordinator to organize, schedule, and coordinate the execution of **Contractor** and subcontractor commissioning responsibilities.
 2. Ensure that commissioning activities and durations including predecessors' activities completed prior to the start of commissioning activities, are represented in the contract schedule.
 3. Notify the University when system testing for mechanical and electrical items, installations, and equipment per mechanical and electrical specifications will be conducted.
 4. Provide all labor, materials, and subcontractor support required for system testing and commissioning to the University.
 5. Attend and participate in commissioning planning and other associated meetings to facilitate the commissioning process.

6. Provide additional documentation prior to normal O&M manual submittals to the University for development of installation, start-up, and testing procedures.
7. Assist in clarifying the operation and control of commissioned equipment or assemblies in areas where the specifications, control drawings, or equipment documentation is not sufficient preparing testing procedures.
8. Review test procedures developed by the University to ensure feasibility, safety, and equipment protection.
9. Verify that all equipment to be tested or commissioned is installed correctly, anchored correctly, electrical, wiring & breakers are the correct size for the equipment and all other utilities required are installed.
10. Execute testing for selected systems and assemblies under the direction of the University.
11. For work that did not pass testing or commissioning evaluate, identify, make repairs or corrections so not to delay the testing or commissioning process. Update the schedules with the revised commission activities.
12. Ensure that the local authorities having jurisdiction are present to witness any acceptance testing of systems that are a condition of building occupancy (fire alarm, fire damper, sprinkler system, etc.).
13. Train University personnel and prepare O&M manuals in accordance with the Contract Documents.

1.04 CONSTRUCTION WASTE MANAGEMENT: DIVERT 80% FROM LANDFILL

- A. Landfill Diversion Requirement: Divert 80% minimum of total project waste from landfill.
- B. Storage bins
- C. Submittals
 1. Waste Management Plan (WMP): Provide the following information:
 - a. Waste Material Estimating Sheet (Appendix A at the end of this Section): Project title, name of company which will implement the plan, and date.
 - b. Estimated job site waste to be generated, including types and quantities.
 - c. Proposed Alternatives to Landfilling: List each material planned to be salvaged or recycled, including quantities and proposed destination.

2. Waste Management Progress Reports: Submit the following information to the University's Sustainability Administrator on a monthly basis (for example: information for June is due by July 20):
 - a. Waste Management Log (Appendix B at the end of this Section):
 - b. Project title, name of company completing report and dates of period covered by the report.
 - c. Date, destination, and quantity of each type of material landfilled, salvaged or recycled.
 - d. Weighmaster tickets can be substituted for items a and c (except for salvaged items). In all instances, weighmaster tickets must be provided with this submittal.
 - e. Alternative report formats may be acceptable but must be reviewed and approved by the University's Sustainability Administrator before being used in lieu of the requirements above.
3. Legible copies of manifests, weight tickets, and receipts. Manifests shall be from recycling and/or disposal site operators that can legally accept the materials for the purpose of reuse, recycling or disposal.
4. Maintain at the Project site Waste Management Logs for each load of materials removed from site.

D. PROJECT MEETINGS

1. Discuss Waste management plans and implementation at the following meetings:
 - a. Pre-construction meeting.
 - b. Regular job-site meetings.

E. PROJECT CONDITIONS

1. Hazardous materials are excluded from the work of this Section. If hazardous materials are encountered or suspected, stop work in the suspect area. Refer to Section 013500 Special Procedures.

F. CONSTRUCTION WASTE RECYCLING SERVICES

1. Construction waste recycling services for materials shall be those proposed by the **Contractor** and approved by the University.

G. The following may be suitable for diversion from landfill, though the **Contractor** and **Contractor** recyclers are responsible for final determination of suitable materials.

1. Concrete: Clean concrete, concrete with rebar, asphalt concrete.

2. Metals: Steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass or bronze, including banding, ductwork, framing, roofing and siding, flashing, piping and rebar.
3. Aggregate.
4. Wood: Clean dimensional wood, wood pallets, engineered wood products including plywood, particleboard, I joists.
5. Vegetation.
6. Cardboard, paper, packaging.
7. Masonry: Brick, ceramic tile, CMU.
8. Gypsum board.
9. Acoustic ceiling panels.
10. Carpet and pad.
11. Paint.
12. Insulation.
13. Plastics: ABS, PVC
14. Beverage containers

H. WASTE MANAGEMENT PLAN IMPLEMENTATION

1. Coordinate waste materials handling and separation for all trades.
2. Document results of the implementation of the Waste Management Plan.
3. Provide separation bins for temporary onsite storage, handling, transportation, recycling, salvage, and landfilling for all demolition and waste materials.
4. Keep recycling and waste bins areas neat, clean and clearly marked in order to avoid contamination or mixing materials.
5. Maintain logs onsite for each load of materials removed from site.

1.05 CONSTRUCTION INDOOR AIR QUALITY (IAQ) MANAGEMENT PLAN: DURING CONSTRUCTION

A. Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building including:

1. Meet or exceed the recommended design guidelines of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines, 1995, Chapter 3. Compliance with SMACNA Guidelines shall start no later than the

scheduled HVAC startup date. SMACNA Guidelines for HVAC protection and for protection of absorptive materials may need to start at an earlier stage, in accordance with the construction schedule.

2. Protect stored on-site or installed absorptive materials from moisture damage.
 3. Comply with requirements in Division 23 for Ductwork.
- B. Develop and implement an Indoor Air Quality Management Plan for the pre-occupancy phase.
1. Comply with requirements of in Division 23 for Ductwork.
- C. Submittals
1. Construction Indoor Air Quality Management Plan.
 - a. Submit documentation demonstrating that an Indoor Air Quality Management Plan was developed and implemented, including:
 2. SMACNA IAQ Guidelines Chapter 3 implementation.
 3. Stored on-site or installed abortive materials were successfully protected from moisture damage.
 4. Maintaining ductwork internal cleanliness.
 5. Documentation including product data, that if any air handling systems were used during construction, that any return and exhaust grilles were protected with filtration media with a Minimum Efficiency Reporting Value (MERV) of at least 13 (per ASHRAE 52.2) including filtration media manufacturer's name, model number, and MERV value.
 6. Documentation, including product data, that all filtration media was replaced prior to occupancy with filtration media with a Minimum Efficiency Reporting Value (MERV) of at least 13 (per ASHRAE 52.2) including filtration media manufacture's name, model number, and MERV Value.
 7. Provide photographs verifying plan compliance at different phases of construction.
 8. Submit documentation that a minimum two weeks building 100% outside air flush-out was completed, including dates when the flush-out was begun and completed and what steps were taken to guarantee 100% outside air usage.
 9. Submit documentation for the filtration media used during the flush-out period, including filtration media manufacturer's name, model number, and MERV value.
- D. Implementation
1. HVAC Protection
 - a. Comply with Section in Division 23 for Ductwork

PROJECT NO. 9559410
UC DAVIS HEALTH
CANCER CENTER NET V2 UPGRADE
600A DISCONNECT INSTALLATION

2. Source Control

- a. Prefabricated insulated ductwork and insulating materials should be protected against moisture. Ductwork materials shall be stored in a dry and clean environment pending installation.
- b. Containers of wet products shall be kept closed when not used. Waste materials that can release odor or dust shall be covered or sealed.

3. Housekeeping

- a. Minimize accumulation of dust fumes, vapors, or gases upon HVAC start up.
- b. Do not run the HVAC system until after dust generating finishes, such as spray applied fireproofing and gypsum board, have been installed.
- c. Suppress dust with wetting agents or sweeping compounds. Efficient and effective dust collecting methods such as damp cloths, wet mops, and vacuum with particulate filters, or wet scrubbers shall be used.
- d. Increase the cleaning frequency when dust build-up is noticed.
- e. Remove spills or excess applications of solvent-containing products as soon as possible.
- f. Also refer to Division 23 - Ductwork for requirements.
- g. Water accumulated inside the building shall be removed promptly. Porous materials such as insulation, ceiling tiles, gypsum wall board, carpet and fabric furnishings shall be protected from exposure to moisture.
- h. Store volatile liquids, including fuels and solvents in closed containers and outside of the building when not in use.

4. Scheduling

- a. When possible, install carpets, furnishings and highly absorbent materials after all VOC-emitting products have been installed and fully cured.
- b. Provide sufficient ventilation and air circulation after VOC-emitting materials are installed.
- c. New MERV 13 filters shall be installed immediately following the flush and prior to building occupation. Refer to Division 23 – Ductwork for additional requirements. Monitoring of IAQ Plan

- d. A minimum of 18 photographs, documenting the progress of the IAQ management Plan implementation, shall be taken at the following stages:
 - 1) Site delivery and storage processes
 - 2) Installation, protection, and housekeeping activities
 - 3) Commissioning, flushing, and re-filtering of HVAC systems

Enclose with each photograph a narrative identifying the date and location where the photograph was taken, and the SMACNA strategy applied.

- e. Subcontractor site coordination meetings shall be held monthly. The purpose of these meetings shall be to review the appropriate components of the IAQ Plan and to document the progress of the plan implementation. SMACNA IAQ Guidelines Appendix C shall be used as the Planning Checklist and Appendix D shall be used as the Inspection Checklist by the subcontractor.

5. Building Flush-Out

- a. Building flush-out and report: The subcontractor shall conduct a building flush-out and prepare a flush-out report. The flush-out report should include:
 - 1) Total days required, and actual days conducted.
 - 2) Hours per day required actual hours conducted.
 - 3) Outside air percentage recommended and actual used.

PART II – PRODUCTS – Not Applicable to this section

PART III – EXECUTION

3.01 Refer to the following attachments

- A. Appendix A: Waste Materials Estimating
- B. Appendix B: Waste Management Log"

END OF SECTION 01 39 00

APPENDIX A
WASTE MATERIALS ESTIMATING SHEET
(Use as many sheets as needed)

PROJECT TITLE: _____

COMPANY: _____

DATE: _____

		TOTAL AMOUNT GENERATED	AMOUNT RECYCLED	AMOUNT SALVAGED	AMOUNT LANDFILLED
MATERIAL	DESTINATION	TONS	TONS	TONS	TONS
TOTALS					

APPENDIX B
WASTE MANAGEMENT LOG
(Use as many sheets as needed)

PROJECT TITLE: _____

COMPANY: _____

LOG DATES: _____ through _____

Date	Material	Destination	Tons			
			Salvaged	Recycled	Landfilled	Total
Totals						

Note: provide weighmaster tickets with specific information on type of material recycled and weight.

PROJECT NO. 9559410
UC DAVIS HEALTH
CANCER CENTER NET V2 UPGRADE
600A DISCONNECT INSTALLATION

SECTION 01 41 00

REGULATORY REQUIREMENTS

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Relationship between Code, Ordinances, Standards and Contract Documents
- B. Applicable Codes, Laws and Ordinances
- C. Project Inspections
- D. California State Fire Marshal Requirements
- E. Department of Health Care Access and Information Projects

1.02 RELATED SECTIONS

- A. Section 013500 – SPECIAL PROCEDURES
- B. Section 014200 – REFERENCES
- C. Section 014500 – QUALITY CONTROL

1.03 RELATIONSHIP BETWEEN CODES, ORDINANCES, STANDARDS AND THE CONTRACT DOCUMENTS

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

1.04 APPLICABLE CODES, LAWS AND ORDINANCES

A. Building Codes, Laws, and Regulations:

1. Work shall meet or exceed the requirements of and be performed in accordance with applicable, adopted code requirements, laws and requirements of all other regulatory agencies, including, but not limited to the following:

a. California Code Series - 2022 Edition

- 1) California Administrative Code, California Code of Regulations – Title 24, Part 1
- 2) California Building Code, California Code of Regulations – Title 24, Part 2, Volume 1& 2
- 3) California Electrical Code, California Code of Regulations – Title 24, Part 3
- 4) California Mechanical Code, California Code of Regulations – Title 24, Part 4
- 5) California Plumbing Code, California Code of Regulations – Title 24, Part 5
- 6) California Energy Code, California Code of Regulations – Title 24, Part 6
- 7) Elevator Safety Construction Code, California Code of Regulations – Title 24, Part 7
- 8) California Historical Building Code, California Code of Regulations – Title 24, Part 8
- 9) California Fire Code, California Code of Regulations – Title 24, Part 9
- 10) California Existing Building Code, California Code of Regulations – Title 24, Part 10
- 11) California Referenced Standards Code, California Code of Regulations – Title 24, Part 12

b. NFPA Code Series. National Fire Protection Association (NFPA) (as adopted by State agencies)

- 1) NFPA 13 – Standard for the Installation of Sprinkler Systems.
- 2) NFPA 14 – Standard for the Installation of Standpipe and Hose System
- 3) NFPA 72 – National Fire Alarm and Signaling Code

- 4) NFPA 80 – Standard for Fire Doors and Other Opening Protectives
 - 5) NFPA 99 – Health Care Facilities Code
 - 6) NFPA 101 – Life Safety Code
 - 7) NFPA 252 – Standard Methods of Fire Tests of Door Assemblies
 - 8) NFPA 701 – Standard Methods of Fire Tests of Flame Propagation of Textiles and Films
- c. California Code of Regulation Series (embodied in California model codes as noted above)
- 1) Title 8, Industrial Relations
 - 2) Title 17, Public Health (Chapter 7)
 - 3) Title 19, Public Safety
 - 4) Title 21, Public Works
 - 5) Title 22, Social Security
 - 6) Title 24, Parts 1, 2, 3, 4, 5, 9 and 12
 - 7) Title 25, Energy Insulation Standards
- d. Americans with Disabilities Act (ADA) 2010 (Federal Law)
- e. Rules and regulations of private and public utilities
- f. American National Standards Institute (ANSI)
- g. American Society of Testing Materials (ASTM)
- h. Federal Specifications (Fed. Spec.)
- i. Underwriters Laboratories
- j. Traffic controls per California MUTCD requirements
2. All dates to comply with editions adopted and accepted by University and California State Fire Marshal (CSFM).
3. 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,
as applicable.

4. References on Drawings or in Specifications to "code" or "building code" not otherwise identified shall mean the codes specified above, together with all additions, amendments, changes, and interpretations adopted by code authorities of the jurisdiction having authority over the project.
- B. Other Applicable Laws, Ordinances and Regulations:
1. Work shall be accomplished in conformance with all applicable laws, ordinances, rules and regulations of Federal, State and local governmental agencies and jurisdictions having authority over the Project.
 2. Work shall be accomplished in conformance with all regulations of Public Utilities and utility districts.
 3. Where such laws, ordinances, rules and regulations require more care or greater time to accomplish Work, or require better quality, higher standards or greater size of products, Work shall be accomplished in conformance to such requirements with no change to Contract Time or Contract Sum, except where changes in laws, ordinances, rules and regulations occur subsequent to execution date of the Agreement.
 4. General **Contractor** shall not self-perform specialty contracting work defined in sections 7055 – 7059.1 of the California Business and Professions Code unless the General **Contractor** has the specialty contractor's license appropriate for the work performed. Otherwise, specialty contractors shall be retained by the **Contractor** contractor to perform specialty work identified in the project scope.

1.05 PROJECT INSPECTIONS

- A. Provision of inspectors by University, if any, or by Department of Health Care Access and Information pursuant to this Section and Section 1.04 above shall be subject to the following:
1. **Contractor** shall allow inspectors full access to Project at all times.
 2. **Contractor** shall not take any direction, approvals or disapprovals from inspectors.
 3. **Contractor** shall not rely on inspectors to ensure Work is completed in accordance with Contract Documents.
 4. Acts of omissions of any inspector (including without limitation inspector's failure to observe or report deficiencies in **Contractor's** Work) shall not relieve **Contractor** for responsibility to complete Work in accordance with Contract Documents.

1.06 DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION PROJECTS (If applicable or NOT USED)

- A. Department of Health Care Access and Information (HCAI) is the agency having jurisdiction over all acute care medical project design and construction unless a Memorandum of Understanding (MOU) has been established assigning University staff to perform regulatory duties.
- B. HCAI will approve an inspector for the Project who shall have full access to the Project at all times.
- C. HCAI will require Verified Report forms to be filed per testing, inspection and observation form during construction and a final verified report at completion of the project. Separate verified reports are required from Consultants, Project Inspector, and **Contractor**.
- D. HCAI will require a Building Permit for project submitted by University's Representative. No HCAI Building Permit fees are required to be paid by the **Contractor**.
- E. HCAI will require Change Order Approval submitted by University's Representative.
- F. HCAI will require a Licensed **Contractor's** Declaration from the **Contractor**.
- G. HCAI projects shall comply with the 2016 California Administration Code.

1.07 DEFERRED APPROVAL

- A. Where noted in the Contract Documents, certain items of materials and/or systems may require HCAI/CSFM deferred approval pending submittals of shop drawings. For these items, **Contractor** shall submit details and structural calculations for anchorage, to comply with State of California Code of Regulations Title 24, table T17-23-J. Calculations shall be made by a licensed Structural Engineer registered in the State of California.

PART II - PRODUCTS – Not Applicable to this Section

PART III - EXECUTION – Not Applicable to this Section

END OF SECTION 01 41 00

SECTION 01 42 00

REFERENCES

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Definitions and terms used in Contract Documents
- B. Reference Standards used in Contract Documents
- C. Common abbreviations and acronyms which may be used in Contract Documents

1.02 RELATED SECTIONS

- A. Section 014100 – Regulatory Requirements

1.03 DEFINITIONS OF TERMS

- A. Basic Contract Definitions: Words and terms governing the Work are defined in the General Conditions of the Contract, provided in the Contract Documents.
- B. Additional words and terms are used in the Drawings and Specifications and are defined as follows:
 - 1. Applicable: As appropriate for the particular condition, circumstance or situation.
 - 2. Approve (d): Used in conjunction with action on submittals, applications, and requests, is limited to duties and responsibilities stated in the General Conditions. Approvals shall only be valid if obtained in writing and shall not apply to matters regarding the means, methods, techniques, sequences and procedures of construction. Approval shall not release **Contractor** from responsibility to fulfill Contract requirements.
 - 3. And/or: If used, shall mean that either or both items so joined are required.
 - 4. By others: Work on the project that is outside the scope of Work to be performed under the Contract, but that will be performed by University, separate contractors or other means.
 - 5. **Contractor-Furnished/University-Installed (CFUI)**: Items, systems or equipment purchased by the **Contractor** as part of the project and handed over to the University for installation.
 - 6. Construction Site: Same as site.

7. Directed: As instructed by University or University's Representative, in writing, regarding matters other than the means, methods, techniques, sequences and procedures of construction. Terms such as "directed", "requested", "authorized", "selected", approved, "required", and "permitted" mean "directed by University's Representative", requested by University's Consultant" or University's Representative and similar phrases. No implied meaning shall be interpreted to extend the University's Representative responsibility into **Contractor's** supervision of construction.
8. Equal or Equivalent: As determined by the University's Consultant as being of the same quality, appearance, utility, durability, finish, function, suitability, and performance.
9. Furnish: Means "supply and deliver, ready for unloading, unpacking, assembly, installation, and similar operations".
10. Indicated: Refers to graphic representations, notes or schedules on Drawings, or Paragraphs or Schedules in Specifications, and similar requirements in Contract Documents. Where terms such as "shown", "noted", "scheduled", and "specified" are used, it is to help locate the reference.
11. Install: Describes operations at the site including unloading, unpacking, assembly, erection, anchoring, applying, working to dimension, protecting, cleaning, and similar operations.
12. Installer: "Installer" is the **Contractor** or an entity engaged by the **Contractor**, as an employee, subcontractor, or sub-subcontractor for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.
 - a. Experienced Installer: The term "experienced", when used with "installer" means having a minimum of five (5) previous Projects similar in size to this Project, and familiar with the precautions required, and with requirements of the authority having jurisdiction.
13. Jobsite: Same as site.
14. Necessary: as determined in the professional judgement of the University Representative through the University's Consultant as being necessary for the Work, in conformance with the requirements of the Contract Documents, and

excluding matters regarding the means, methods, techniques, sequences and procedures of construction.

15. Noted: Same as indicated.
16. Owner-Furnished/**Contractor**-Installed (UFCI): Item, system or equipment furnished by University at its cost and installed by the **Contractor** as part of the Work.
17. Per: In accordance with or in compliance with.
18. Products: Materials, systems or equipment.
19. Project site: Same as site.
20. Proper: As determined by the University's Representative as being proper for the Work, excluding matters regarding the means, methods, techniques, sequences and procedures of construction, which are solely the **Contractor's** responsibility to determine.
21. Provide: Means "furnish and install, complete and ready for use".
22. Regulation: Includes laws, ordinances, statutes and lawful orders issued by authorities having jurisdiction, and rules, conventions and agreements within the construction industry that control performance of the Work, whether lawfully imposed by authorities having jurisdiction or not.
23. Required:
 - a. As required by regulatory requirements of governing authorities.
 - b. As required by referenced standards.
 - c. As required by existing job conditions.
 - d. As generally provided by accepted construction practices of the locale.
 - e. As indicated on the Drawings and in the Specifications.
 - f. As otherwise required by the Contract Documents.
24. Scheduled: Same as indicated.
25. Selected: As selected by University's Representative or University's Consultant from the full national product selection of the manufacturer, unless otherwise specifically limited in the Contract Documents to a particular quality, color, texture or price range.
26. Shown: Same as indicated.
27. Site: Same as Site of the Work or Project Site; the area or areas or spaces occupied by the Project and including adjacent areas and other related areas

occupied or used by the **Contractor** for construction activities, either exclusively or with others performing other construction on the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land upon which the Project is to be built.

28. Testing Laboratories: Same as Testing and Inspection Agency.
29. Testing and Inspection Agency: An independent entity engaged to perform specific inspections or tests, at the Project Site or elsewhere, and to report on, and, if required, to interpret, results of those inspections or tests.
30. University-Furnished/**Contractor**-Installed (UFCI): Same as Owner-Furnished/**Contractor**-Installed.

1.04 REFERENCE STANDARDS

- A. References: The Drawings and Specifications contain references to various standards, standard specifications, codes, practices and requirements for products, execution, tests, and inspections. These reference standards are published and issued by the agencies, associations, organizations and societies listed in this Section or identified in individual Sections of the Specifications.
- B. Relationship to Drawings and Specifications: Such references are incorporated into and made a part of the Drawings and Specifications to the extent applicable.
- C. Referenced grades, Classes and Types: Where an alternative or optional grade, class or type of product or execution is included in a reference but is not identified in the Drawings or Specifications, provide the highest, best and greatest of the alternatives or options for the intended use and prevailing conditions.
- D. Copies of Reference Standards:
 - 1. Reference standards are not furnished with the Drawings and Specifications. It is the responsibility of the **Contractor**, subcontractors, manufacturers, suppliers, trades and crafts to be familiar with these generally recognized standards of the construction industry.
- E. Jobsite Copies:
 - 1. **Contractor** shall obtain and maintain at the Project site copies of reference standards identified on the Drawings and in the Specifications in order to properly execute the Work.
- F. Edition Date of References:
 - 1. When an edition or effective date of a reference is not given, it shall be understood to be the current edition or latest revision published as of the date of the Contract.
 - 2. All amendments, changes, errata, and supplements as of the effective date shall be included.
- G. ASTM and ANSI References: Specifications and Standards of the American Society for Testing and Materials (ASTM) and the American National Standards Institute (ANSI) are identified in the Drawings and Specifications by abbreviation and number only and may not be further identified by title, date, revision or amendment. It is the responsibility of the

Contractor to be familiar with and have access to these nationally, and industry recognized specifications and standards.

1.05 ABBREVIATIONS & ACRONYMS

- A. Abbreviations and Names: Where acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction or other entity applicable.
- B. Refer also to the "Encyclopedia of Associations", published by Gale Research Co., available in most libraries.
- C. The following are commonly used abbreviations which may be found on Contract Drawings and in Contract Specifications:

AA	Aluminum Association
AAA	American Arbitration Association
AAC	Architectural Anodizers Council
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
ACPA	American Concrete Pumping Association
ADA	Americans with Disabilities Act
ADC	Air Diffusion Council
AFSA	American Fire Sprinkler Association
AGA	American Galvanizers Association (formerly AHDGA)
AGA	American Gas Association
AGC	Associated General Contractors of American
AI	Asphalt Institute
AIA	American Institute of Architects
AIMA	Acoustical and Insulation Materials Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMCA	Air Movement and Control Association International
ANSI	American National Standards Institute
APA	Engineered Wood Association (formerly American Plywood Association)
APWA	American Public Works Association
ARMA	Asphalt Roofing Manufacturers Association
ASAC	American Subcontractors Association of America
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASLA	American Society of Landscape Architects
ASME	American Society of Mechanical Engineers
ASNT	American Society for Nondestructive Testing
ASPE	American Society of Plumbing Engineers
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Institute
AWPA	American Wood Preservers' Association
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BOC	Board of Corrections
CABO	Council of American Building Officials
CAC	California Administrative Code (see California Code of Regulations (CCR))
CAL/OSHA	State of California Construction Safety Orders
CBC	California Building Code
CCR	California Code of Regulations
CEC	California Electrical Code
CFC	California Fire Code
CFR	Code of Federal Regulations
CIMA	Construction Industry Manufacturers Association

CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers' Institute
CMC	California Mechanical Code
CPC	California Plumbing Code
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
CTIOA	Ceramic Tile Institute of America, Inc.
DHI	Door and Hardware Institute
DSA	Division of the State Architect
EJMA	Expansion Joint Manufacturers Association
FGMA	Flat Glass Marketing Association
FM	Factory Mutual Research Organization
FS	Federal Specification (from GSA)
GA	Gypsum Association
GSA	General Services Administration
HCAI	Department of Health Care Access and Information (State of California)
IAPMO	International Association of Plumbing and Mechanical Officials
IEEE	Institute of Electrical and Electronics Engineers, Inc.
ISO	International Organization for Standardization
MIA	Masonry Institute of America
ML/SFA	Metal Lath/Steel Framing Association
MM	State of California, Business and Transportation Agency, Department of Transportation, "Materials Manual"
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry
NAAMM	National Association of Architectural Metal Manufacturers
NEC	National Electrical Code
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NFC	National Fire Code
NFPA	National Fire Protection Association
NFSA	National Fire Sprinkler Association
NGA	National Glass Association
NIBS	National Institute of Building Sciences
NIST	National Institute of Standards and Technology
NPCA	National Precast Concrete Association
NRCA	National Roofing Contractors Association
NSC	National Safety Council
NSF	National Sanitation Foundation
NSPE	National Society of Professional Engineers
NTMA	National Terrazzo and Mosaic Association
NWMA	National Woodwork Manufacturers Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Precast/Prestressed Concrete Institute
PDCA	Painting and Decorating Contractors of America
PDI	Plumbing and Drainage Institute
PS	Product Standard (U.S. Department of Commerce)
RIS	Redwood Inspection Service
SDI	Steel Deck Institute
SFM	State Fire Marshal (California)
SFPE	Society of Fire Protection Engineers
SGCC	Safety Glazing Certification Council
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SSPC	Society for Protective Coatings (Steel Structure Painting Council)
SSPWC	Standard Specifications for Public Works Construction
SWRI	Sealant, Waterproofing and Restoration Institute
TCA	Tile Council of America
TJC	The Joint Commission
UBC	Uniform Building Code
UFC	Uniform Fire Code
UL	Underwriters Laboratories, Inc.
UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
USS	United States Standard

WCLIB	West Coast Lumber Inspection Bureau
WIC	Woodwork Institute of California
WWPA	Western Wood Products Association

- D. Words and terms not otherwise specifically defined in this Section or in the Contract Documents, shall be as customarily defined by trade or industry practice, by reference standard and by specialty dictionaries such as Dictionary of Architecture and Construction (Cyril M. Harris, McGraw-Hill Educational; 4th Edition, September 5, 2005).
- E. Additional abbreviations, used on the Drawings, are listed thereon.

PART II - PRODUCTS – Not Applicable to this Section

PART III - EXECUTION – Not Applicable to this Section

END OF SECTION 01 42 00

SECTION 01 45 00

QUALITY CONTROL

PART I - GENERAL

1.01 SECTION INCLUDES

- A. **Contractor's** Quality Control
- B. Quality of the Work
- C. Inspections and tests by governing authorities
- D. Inspections and tests by serving utilities
- E. Inspections and tests by manufacturer's representatives
- F. Inspections and Independent testing and Inspection Laboratories/Agencies
- G. **Contractor's** responsibilities in inspections and tests
- H. **Contractor's** responsibilities regarding the University's testing laboratory
- I. Test reports
- J. Geotechnical engineer

1.02 RELATED SECTIONS

- A. Section 013100 – COORDINATION
- B. Section 014100 – REGULATORY REQUIREMENTS: Compliance with applicable codes, ordinances and standards.
- C. Section 014550 – INSPECTION and TESTING of WORK
- D. Section 016100 – PRODUCT REQUIREMENTS: Product Options, substitutions, transportation and handling requirements, storage and protection requirements, and system completeness requirements.

1.03 [CONTRACTOR'S] [CM/CONTRACTOR'S] QUALITY CONTROL

- A. **Contractor's** Quality Control: **Contractor** shall ensure that products, services, workmanship and site conditions comply with requirements of the Contract Documents by coordinating, supervising, testing and inspecting the Work and by utilizing only suitably qualified personnel.
- B. Quality Requirements: Work shall be accomplished in accordance with quality requirements of the Contract Documents, including, by reference, all Codes, laws, regulations and standards. When no quality basis is prescribed, the quality shall be in

accordance with the best-accepted practices of the construction industry for the locale of the Project, for projects of this type.

- C. Quality Control Personnel: **Contractor** shall employ and assign knowledgeable and skilled personnel as required by contract or necessary if not prescribed to perform quality control functions to ensure the Work is provided as required.

1.04 QUALITY OF THE WORK

- A. Quality of Products: Unless otherwise indicated or specified, all products shall be new, free of defects and fit for the intended use.
- B. Quality of Installation: All Work shall be produced plumb, level, square and true, or true to indicated angle, and with proper alignment and relationship between the various elements and adjacent construction.
- C. Protection of Completed Work: Take all measures necessary to preserve completed Work free from damage, deterioration, soiling and staining, until Acceptance by University.
- D. Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Unless more stringent requirements are indicated or specified, comply with manufacturer's instructions and recommendations, reference standards and building code research report (ICC) requirements in preparing, fabricating, erecting, installing, applying, connecting and finishing Work.
- E. Deviations from Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Document and explain all deviations from reference standards and building code research report requirements and manufacturer's product installation instructions and recommendations, including acknowledgement by the manufacturer that such deviation is acceptable and appropriate for the Project.
- F. Verification of Quality: Work shall be subject to verification of quality by University's Representative and University's Consultant in accordance with provisions of the General Conditions of the Contract.
 - 1. **Contractor** shall cooperate by making Work available for inspection by University's Representative, University's Consultant or their designated representatives.
 - 2. Such verification may include mill, plant, shop, or field inspection as required.
 - 3. Provide access to all parts of the Work, including plants where materials or equipment are manufactured, fabricated or stored.
 - 4. Provide all information and assistance as required, including that by and from subcontractors, fabricators, materials suppliers and manufacturers, for verification of quality by University's Representative or University's Consultant.
 - 5. Contract modifications, if any, resulting from such verification activities shall be governed by applicable provisions in the General Conditions of the Contract.

- G. Observations by University's Consultants: Periodic and occasional observations of the Work in progress will be made by University's Consultant and their consultants as deemed necessary to review progress of Work and general conformance with design intent.

- H. Limitations on Inspections, Tests and Observations: Neither employment of independent testing and inspection agencies nor observations by University's Consultant and their consultants shall relieve **Contractor** of obligation to perform Work in full conformance to all requirements of Contract Documents.
- I. Acceptance and Rejection of Work: University's Representative reserves the right to reject all Work not in conformance to the requirements of the Contract Documents.
 - 1. If initial tests or inspections made by University's Testing Laboratory or Geotechnical Engineer reveal any portion of the Work fails to comply with Contract Documents, or if it is determined that any portion of Work requires additional testing or inspection, additional tests and inspections shall be made as directed by University's Representative.
 - 2. If such additional tests or inspections establish such portions of the Work comply with Contract Documents, all costs of such additional testing or inspection will be paid by University.
 - 3. If such additional tests or inspections establish such portions of the Work fail to comply with Contract Documents, all costs of such additional tests and inspection shall be deducted from the Contract sum.
- J. Correction of Non-conforming Work: Non-conforming Work shall be modified, replaced, repaired or redone by **Contractor** at no change in the Contract Sum or Contract time.
- K. Acceptance of Non-Conforming Work: Acceptance of non-conforming Work, without specific written acknowledgement and approval of University shall not relieve **Contractor** of the obligation to correct such Work.
- L. Contract Adjustment for Non-conforming Work: Should University or University's Consultants determine it is not feasible or in University's interest to require non-conforming Work to be repaired or replaced, an equitable reduction in Contract Sum shall be made by agreement between University and **Contractor**. If equitable reduction in Contract Sum cannot be agreed upon, a Directed Change Order will be issued and the amount in dispute resolved in accordance with applicable provisions of the General Conditions of the Contract.

1.05 INSPECTIONS AND TESTS BY GOVERNING AUTHORITIES

- A. Regulatory Requirements for Testing and Inspection: Comply with California Building Code (CBC) requirements and all other requirements of governing authorities having jurisdiction.
- B. Inspections and tests by governing Authorities: **Contractor** shall cause all tests and inspections required by governing authorities having jurisdiction to be made for Work under this Contract.
 - 1. Such authorities include University's Building Inspection (code compliance), University's Fire Marshal's office and similar agencies.

1.06 INSPECTIONS AND TESTS BY SERVING UTILITIES

- A. Inspections and Tests by Serving Utilities: **Contractor** shall cause all tests and inspections required by serving utilities to be made for Work under this Contract. Scheduling, conducting and paying for such inspections shall be solely the **Contractor's** responsibility.

1.07 INSPECTIONS AND TEST BY MANUFACTURER'S REPRESENTATIVES

- A. Inspections and Tests by Manufacturer's Representatives: **Contractor** shall cause all tests and inspections specified to be conducted by materials or systems manufacturers, to be made. Additionally, all tests and inspections required by materials or systems manufacturers as condition of warranty or certification of Work shall be made, the cost of which shall be included in the Contract Sum. Manufacturer's Representatives shall provide a PDF electronic report indicating but not limited to work or materials that are missing, not installed correctly, damaged or need correction. Manufacturer's Representatives shall issue a final PDF electronic report once all work and materials are installed correctly, functioning and in compliance with the Manufacturer's Warranty.

1.08 INSPECTION BY INDEPENDENT TESTING AND INSPECTION LABORATORIES

- 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, performing material and product testing and inspection, and other services as determined by University.
- B. University will select an independent testing and inspection laboratory or agency to conduct tests and inspections as called for in the Contract Documents and as required by governing authorities having jurisdiction.
1. Responsibility for payment for tests and inspection shall be as indicated in the schedule below. All time and costs for **Contractor's** services related to such tests and inspections shall be included in Contract Time and Contract Sum.
- C. **Contractor** shall notify University, and if directed by University's Representative testing and inspection laboratory, when Work is ready for specified tests and inspections.
- D. **Contractor** shall pay for all additional charges by testing and inspection agencies and governing authorities having jurisdiction due to the following:
1. **Contractor's** failure to properly schedule or notify testing and inspection agency or authority having jurisdiction.
 2. Changes in sources, lots or suppliers of products after original tests or inspections.
 3. Changes in means, methods, techniques, sequences and procedures of construction that necessitate additional testing, inspection and related services.

- E. Changes in mix designs for concrete and mortar after review and acceptance of submitted mix design. Test and inspections shall include, but not be limited to, the following:

List the applicable services required, for example:

Material Inspections and Tests		Paid by:
Concrete Reinforcement	Reinforcement Inspection	University
	Reinforcement Strength	University
Cast in Place	Slump Tests	University
	Compressive Strength Tests	University
Structural Steel	Welding Inspection	University
	High Strength Bolting Inspection	University

- F. Test and Inspection Reports: After each inspection and test, one (1) PDF electronic report shall be promptly submitted to University's Representative, **Contractor** and to agency having jurisdiction (if required by code).

1. Reports shall clearly identify the following:
 - a. Date issued
 - b. Project name and Project number
 - c. Identification of product and Specification Section in which Work is specified
 - d. Name of inspector
 - e. Date and time of sampling or inspection was conducted
 - f. Location in Project where sampling or inspection was conducted
 - g. Type of inspection or test
 - h. Date of tests
 - i. Results of tests
 - j. Comments concerning conformance with Contract Documents and other requirements
2. Test reports shall indicate specified or required values and shall include statement whether test results indicate satisfactory performance of products.
3. Samples taken but not tested shall be reported.
4. Test reports shall confirm that methods used for sampling and testing conform to specified test procedures.
5. When requested, testing and inspection agency shall provide interpretations of test results.

6. Verification reports shall be prepared and submitted, stating tests and inspections specified or otherwise required for Project, have been completed and material and workmanship comply with the Contract Documents. Verification reports shall be submitted at intervals not exceeding six (6) months, at Substantial Completion of the Project, and at all times when Work of Project is suspended.

1.09 CONTRACTOR RESPONSIBILITIES IN INSPECTIONS AND TESTS

- A. Tests, inspections and acceptances 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 notify University's Representative to make arrangements for such tests, inspections and acceptances. **Contractor** shall give University's Representative timely notice of all required inspections as outlined in Specification Section 014550 – INSPECTION and TESTING of WORK, Item 1.05, Scheduling Inspections – Notification Requirements.
- B. If such procedures for testing, inspection or acceptance reveal failure of any portion of the Work to comply with requirements of the Contract Documents, **Contractor** shall bear all costs made necessary by such failure including those of repeated procedures, including compensation for University's Consultant's services and expenses.
- C. If University and/or University's Consultants are to observe tests, inspections or make acceptances required by the Contract Documents, University and/or University's Consultant will do so promptly and, where practicable, at the normal place of testing.
- D. Cooperate with testing and inspection agency personnel, University, University's Consultant's and their consultants. Provide access to Work areas and off-site fabrication and assembly locations, including during weekends and after normal work hours.
- E. Provide incidental labor and facilities to provide safe access to Work to be tested and inspected, to obtain and handle samples at the Project site or at source of products to be tested, and to store and cure test samples.

1.10 CONTRACTOR RESPONSIBILITIES REGARDING UNIVERSITY TESTING LABORATORY

- A. Secure and deliver to University's Testing Laboratory adequate quantities of representative samples of materials proposed for use as specified.
- B. Submit to University's Representative the preliminary design mixes proposed for concrete and other materials, which require review, by University's Consultants and/or University's Testing Laboratory.
- C. Submit copies of product test reports as specified.

1.11 TEST REPORTS

- A. University's Testing Laboratory shall submit one (1) PDF electronic copy of all reports to the University's Representative, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

- 1.12 University will distribute one (1) PDF electronic copy of the reports to University's Consultants and **Contractor**.GEOTECHNICAL ENGINEER (If applicable or NOT USED)
- A. University will retain and pay the expense of a Geotechnical Engineer to perform inspection, testing and observation functions specified by University. Geotechnical Engineer will communicate only with University. University's Representative shall then give notice to **Contractor**, of any action required of **Contractor**.

PART II - PRODUCTS – Not Applicable to this Section

PART III - EXECUTION – Not Applicable to this Section

END OF SECTION 01 45 00

SECTION 01 45 20

SEISMIC CONTROL – NON-HCAI

PART I - GENERAL

1.01 DESCRIPTION

- A. Provide all required seismic restraints and calculations in order to ensure that the installation is in compliance with all applicable seismic codes, standards, and specific information listed herein.

1.02 QUALITY ASSURANCE

- A. ASTM standards
- B. 2022 California Building Code, Title 24 (CBC)

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data and installation instructions for each type of material listed in this Section, including shop drawings and other documentation to comply with the requirements of this Section.

PART II - PRODUCTS

2.01 SEISMIC RESTRAINT REQUIREMENTS

A. SUMMARY

1. This section covers the seismic restraint requirements for suspended vibration and non-vibration isolated items, systems and/or related suspended equipment.
2. The Design-Builder's, Design Professionals are the designers of record as referenced in this specification shall be the project architect, structural engineer and the appropriate system engineer (e.g., electrical etc.).
3. Department of Health Care Access and Information (HCAI) pre-approved designs may be submitted as an alternate provided they meet or exceed all the requirements contained within these specifications, and provided they meet or exceed all of the HCAI pre-approved service loads, installation applications, engineering services, etc. Furthermore, said other HCAI pre-approved designs must be submitted to the designers of record for review and acceptance, and to

the University as a deferred approval prior to installation, with all costs including but not limited to project delay costs, to be borne by the contractor.

4. Channel framing materials, fittings and related accessories shall be as indicated on the drawings. All channel members (trapezes and braces) shall be solid strut. Field drill bolt holes at 1/16" larger than bolt size as required for connections.

B. SEISMIC RESTRAINT DESIGN

1. The attachment, supports, and seismic restraints of suspended non-structural components and distribution systems listed below shall be designed to resist the total design seismic forces prescribed in the California Building Code (CBC).
 - a. All equipment/components including but not limited to: electrical, mechanical, plumbing, fire sprinklers and architectural.
 - b. Attachment, supports, and seismic restraints that are not shown on the approved construction document shall be engineered and built by the applicable system contractor. Engineering shall be performed (signed & sealed) by a licensed California Structural Engineer and submitted to the designers of record and the University for acceptance prior to installation. Cost to be borne by the contractor.
 - c. Design shall consider seismic relative displacement in accordance with ASCE 7-16 – 13.3.2.
2. Seismic restraint transverse and/or longitudinal spacing shall not exceed CBC requirements and the lesser of the following:
 - a. That which develops seismic design forces equal to or less than the capacity of the building structure.
 - b. That which develops seismic design forces that are equal to or less than the capacity of weakest part, component, anchorage, etc., contained within the seismic brace assembly.
 - c. 40 feet transversely and/or 80 feet longitudinally where pipes, conduits, and their connections are constructed of ductile materials (copper, ductile iron, steel or aluminum and brazed, welded or screwed connections).
 - d. 20 feet transversely and/or 40 feet longitudinally where pipes, conduits, and their connections are constructed of nonductile materials (e.g., cast iron, no-hub pipe and plastic).
 - e. 20 feet transversely and/or 40 feet longitudinally for bus ducts and cable trays, baskets, channels.
3. **Contractor** shall not adopt, use, or otherwise implement the omission of any seismic restraints without prior review and acceptance by the designers of record. Submittals for omission of seismic restraints shall be limited to piping, ducts, and conduits. All submittals for omission of seismic restraints must be signed and sealed by a licensed California Structural Engineer, approved by the University and include the following items:
 - a. Project-specific cover letter clearly indicating that said engineer has (with respect to the attached submittal for omission of seismic restraints) completely review the project documents including these specifications, the items/systems designs individually and in coordination with all other trades, and that all code and/or project specified requirements for omission

of restraints have been meet individually and in combination with each other, that (if the attached submittal for omission is approved) said engineer has been hired/retained by contractor to visit the project site without limit to review and inspect the installation of the items/systems which have been reviewed and approved for installation without seismic restraints.

- b. Engineered details and engineering for all vertical supports and their connections to the building structure to qualify, that top connections cannot develop moments, that lateral motion will not cause loss of item/system support, that lateral motion of the item/system will not cause damaging impact with other items/systems, that lateral motion of the item/system will not directly or indirectly impact any life safety, emergency services and/or hazardous items/systems or their supports.
4. Seismic hardware brackets shall provide a (Captive) 360° connection that completely encloses or encircles the rod, anchor, bolt, fastener, etc. Open hook and/or open slot seismic hardware brackets shall not be allowed.
5. Seismic restraint assembly connections shall not incorporate the use of break-off bolts or nuts and pneumatic fasteners.
6. Seismic restraint cables shall be looped through the seismic hardware bracket and turned back onto itself at the point of assembly/connection. Cables shall not be installed or attached to the seismic hardware bracket in a straight through (non-turn back) method of assembly/connection.
7. Seismic hardware brackets, connectors and related components shall be constructed entirely of malleable iron or steel. Seismic assemblies shall not include the use of cast components.
8. Ceiling and other types of single strand wire shall not be used as a seismic restraint, sway brace and/or safety restraint material.
9. The connection to the building structure of non-seismic sway bracing and/or safety restraints shall meet or exceed that required for the attachment of seismic restraints to the building structure.
10. Seismic restraints shall be installed to provide a minimum of (2) transverse and (1) longitudinal braces per run. A “run” shall be defined as a length of 5 feet or more.
11. The accumulated load of multiple items to any given support (with or without seismic restraints) shall be limited so as not to overload the building structure and the support assembly.
12. Trapeze systems installed in a multi-layer configuration shall have seismic restraints designed and installed for each individual trapeze layer.
13. Vertical supports shall be designed and installed to account for vertical tension and compression loads including accumulated seismic component increases.

14. Design of supports, seismic restraints and anchorage to the structure shall consider all conditions that involve thermal, structural separation, relative displacement, building expansion and contraction.
15. SMACNA details shall not be used without prior approval by Structural Engineer of Record (SEOR).

C. ACCEPTABLE MANUFACTURERS

1. HCAI pre-approved certified manufacturer (OPM)

D. ANCHORS, INSERTS AND FASTENERS

1. All anchors, inserts, fasteners or connections to the structure shall be submitted to the structural engineer of record for review and acceptance prior to installation.
2. Do not use any anchor or insert in concrete or metal decking with concrete fill, which does not have a signed structurally engineered design value based on its installed application and one of the following:
 - a. ICC evaluation report
 - b. HCAI pre-approved
3. Cast-in-place inserts used in concrete or metal decking with concrete fill, shall be constructed entirely of malleable iron or steel.
4. Cast-in-place inserts that contain internal threads shall include the installation of a jam or lock nut to secure the connection of the vertical support rod to the cast-in-place insert.
5. Cast-in-place inserts that allow for horizontal adjustment shall not be allowed unless an engineered solution is provided to assure positive captive positioning and securement of the attachment.
6. Do not use powder driven and power driven (Shoot-In) fasteners, expansion nails or internally threaded anchors in concrete or metal decking with concrete fill without prior scanning of the slab and wall for clearances, and to prevent damages to embedded electrical conduits and/or mechanical piping and reinforcing steel.
7. All beam clamps shall be constructed of malleable iron or steel. All single flange mounted beam clamps shall include a retaining strap or J-hook and must be submitted to the project structural engineer of record of review and acceptance prior to installation. Beam clamps shall not be used to resist seismic loads.

E. FIELD QUALITY CONTROL

1. Inspection of seismic restraints by the Inspector of Record (IOR), and/or (AHJ) Authority Having Jurisdiction.

PART III - EXECUTION

3.01 SEISMIC ANCHORING AND RESTRAINTS

A. Equipment anchors:

1. All equipment shall be anchored. Anchor equipment per details shown on the drawings where provided.
2. Anchor installation shall be in accordance with the current ICC report.
3. Anchor details provided are based on specific equipment information. Submit design for approval for anchoring of equipment which varies from design.

B. Conduit supports:

1. Conduits shall be supported and braced per CBC Title 24.

C. Lighting fixture supports:

1. Provide independent seismic support system for all lighting fixtures.

D. Minimum Clearance:

1. Diagonal braces and hanger supports shall maintain 6-inch minimum clearance from unbraced ducts and conduits, and 1-inch minimum clearance from braced ducts and conduits.
2. Except for sprinklers installed using flexible sprinkler hose, installed clearance shall be 3 inches between any sprinkler drop or sprig and permanently attached equipment and other distribution systems, including their structural supports and bracing.

3.02 INSTALLATION AND TESTING OF MECHANICAL ANCHORS:

- A. Where permitted in other Sections of this specification, post-installed concrete anchors may be used in hardened concrete.
- B. All post-installed concrete anchors shall be tested. Testing shall be performed in the presence of the Inspector of Record. Number of anchors to be tested shall be as shown on the drawings with a minimum of 50% of anchors installed and at each support. Testing shall be performed by torque or pull test, and to the values noted on the drawings. Test loads, frequency, procedure, and acceptance criteria of post-installed anchors in concrete shall be in accordance with CBC 1901.3.4.

END OF SECTION 01 45 20

SECTION 01 45 50

INSPECTION AND TESTING OF WORK

PART I - GENERAL SECTION INCLUDES

- A. Project Inspections and Procedures
- B. Scheduling Inspectors – Notification requirements

1.02 RELATED SECTIONS

- A. Section 013100 – COORDINATION
- B. Section 013200 – CONTRACT SCHEDULES
- C. Section 013500 – SPECIAL PROCEDURES
- D. Section 014100 – REGULATORY REQUIREMENTS
- E. Section 014500 – QUALITY CONTROL

1.03 DEFINITIONS

- A. IOR: Inspector-of-Record
- B. ACO: Area Compliance Officer for HCAI
- C. DSE: District Structural Engineer for HCAI
- D. FM: Fire Marshal (may include both HCAI FM and State FM)
- E. TL: Testing Laboratory

1.04 PROJECT INSPECTIONS AND TESTING PROCEDURES

- A. Inspections: This Project (is) (is not) under the jurisdiction of the Department of Health Care Access and Information. The following inspections will be requested on this project, as appropriate. Also see Part 3 for non-HCAI inspection items or Part 3, Item 3.11 for HCAI requirements.
 - 1. Inspections required by the California Building Code
 - 2. Inspections listed on the Testing, Inspection and Observation (TIO) form
 - 3. Final inspections

- B. Procedures: University's Representative shall be the **Contractor's** contact for all inspection requests. **Contractor** shall fill out Inspection Request Form for all inspections.
1. **Contractor** shall properly plan and coordinate inspection requests. Schedule delays caused by **Contractor's** failure to plan and/or coordinate inspection requests will not be considered for adjustments to Contract Time or Contract Sum.
 2. A complete set of HCAI/SFM stamped and approved Contract Drawings and Contract Specifications, including applicable shop drawings and building permit shall be available on site for review by the Inspector-of-Record. The **Contractor**, Subcontractors and other responsible parties shall be present during inspection walk-throughs. All areas of project scope shall be ready and accessible for inspection. **Contractor** shall provide access equipment as applicable for the inspector's needs.
 3. A complete set of codes referred to in the approved plans must be maintained on the job at all times.
 4. **Contractor** shall submit verified compliance reports as outlined in the California Administrative Code, Section 7-151.

1.05 SCHEDULING INSPECTIONS –NOTIFICATION REQUIREMENTS

- A. Advance Inspection Notification: University's Representative for this project requires the following advance notifications to schedule appropriate inspection agencies at the project site.
1. IOR Inspection Request Notification: Twenty-four (24) hours. Note: Inspection requests received by 2:00 PM will be scheduled for next day inspection. Inspection requests received after 2:00 PM will be scheduled for the following day; (example: Inspection request received at 2:01 PM on a Monday would be scheduled for inspection on Wednesday). Weekend and off-hours inspection requests will be scheduled on a case-by-case basis with a minimum of seventy-two (72) hour inspection request notification.
 2. HCAI Field Compliance Inspectors: Fourteen (14) calendar days.
 3. Testing Laboratory Inspections: Forty-eight (48) hours.
 - a. All testing laboratory and testing procedures must be scheduled by University's Representative. Inspections and/or testing directly scheduled by **Contractor** will not be accepted.
 - b. **Contractor** will bear all costs associated with unauthorized inspections and testing.
 4. State Fire Marshal Inspection Request Notification: Seventy-two (72) hours.

B. Methods of Inspection Notification:

1. All inspection notifications shall be in writing using inspection forms located at back of this Section. Incomplete forms will be returned as non-compliant, and no inspection will be scheduled until all required inspection information is provided.
2. Emailed inspection requests will be accepted. University's Representative email address is lfuka@ucdavis.edu Notification time begins from the date and stamp of the email, provided it is sent during normal business hours. Emailed inspection requests sent after normal business hours and/or received on non-normal workdays, as defined in Specification Section 013100 – COORDINATION, paragraph 1.07.F.4.A will begin notification time starting at 7:00 AM the following normal business day.

C. Off-hours Inspection Requests: **Contractor** shall provide time windows for all off-hour or other than normal work hour inspections. University's Representative shall have final authority in setting times of off-hour inspections.

D. Re-inspections:

1. More than two (2) re-inspections: The cost of re-inspections of the same work, more than twice, shall be deducted from Contract Sum. IOR's hourly rates are \$153.00 per hour during normal work hours and \$229.50 per hour for all off-hour inspections. University will provide itemized invoice for **Contractor's** records.
2. Work unprepared for inspection: Re-inspections of the same work scheduled by **Contractor**, but not ready for inspection will be identified as a re-inspection.

PART II - PRODUCTS – Not Applicable to this Section.

PART III - EXECUTION

Note: Part 3 describes typical inspection requirements for each individual inspector's jurisdiction for non-HCAI projects. Part 3 is provided as a reference source for **Contractor's** use and Scheduling, as applicable. Part 3 is not intended to be all-inclusive and **Contractor** shall verify actual inspection requirements needed for this project. See Item 3.11 for Testing, Inspection Observation for HCAI.

3.01 FIRE DAMPERS (Title 24, Part 2, Chapter 43)

Note: Manufacturer's installation instructions shall be used for inspections and testing.

- A. 1 Hour: IOR test 100%. State Fire Marshal tests 100% or as needed.
- B. 2 Hour: IOR tests 100%. State Fire Marshal tests 100%.
- C. Smoke: IOR tests 100%. State Fire Marshal tests 100%.

3.02 FIRE SPRINKLERS (Title 24, Part 2, Volume 1, Chapter 9; NFPA Bulletin 13)

- A. Approved drawings shall be on jobsite from start to completion of project.
- B. Underground pressure test @ 200 psi.
- C. State Fire Marshal to witness installation of underground lines.
- D. State Fire Marshal to witness underground flush prior to connection.
- E. Hydro-test above ground piping @ 200 psi for two (2) hours.
- F. Inspection of hangers, bracing, and seismic joint crossing(s).
- G. Flow alarm test, tamper switch test.
- H. Fire pump test.
- I. Certification by installer (Title 24, Part 9, Article 1006.3.4.2).
- J. Final inspection: signs in place, labeling, fire extinguishing system flow alarm test.

3.03 FIRE ALARM SYSTEM (Title 24; Part 9, Article 1006)

Note: Fire Sprinkler and Fire Alarm systems tests shall be performed in presence of State Fire Marshal.

- A. Approved drawings shall be on jobsite from start to completion of project.
- B. Verify Emergency Power source.
- C. Activate all initiating devices.
- D. Certification by installer (Title 24, Part 9, Article 1006.3.4.2).
- E. Complete test of system per Title 24, Part 9, CFC, Article 1003.3.4.1).

3.04 MEANS OF EGRESS (Title 24, Part 2, Volume 1, Chapters 10)

- A. Exit sign/light locations and connected to two (2) sources of power.
- B. Normal Power.
- C. Emergency Electrical System, Life Safety Branch.
- D. Construction - floors, walls, ceilings, penetrations per listings.
- E. Electrical boxes - no back to back, 24 inches horizontal separation (Section 709).
- F. Electrical boxes - 100+ square inches to be wrapped/protected.
- G. Flame Spread, Fuel Contribution and Smoke Density for finishes (Chapter 8).

3.05 EMERGENCY LIGHTING

- A. Generator Test (Title 24, Part 3, Section 700-4; Section 701-5).
- B. Emergency lights - locations (Title 24, Part 2, Volume 1, Chapter 10, Section 1003.2.8.5).

3.06 KITCHEN HOOD FIRE SUPPRESSION SYSTEM (Title 24, Part 9, Article 10, Section 1005; Part 9, Section 10.513)

- A. Approved drawings shall be on jobsite from start to completion of project.
- B. State Fire Marshal to witness system test.

3.07 MECHANICAL CHECKLIST FOR CLOSE-OUT (Title 24, Part 4)

- A. Mechanical Equipment Requirements
 - 1. Access to Equipment (Section 305, 405, 606.5, 815, 2.2.8, 903, 910.8, 1106.3).
 - 2. Labeling of Equipment (Section 307).
 - 3. Identification of Equipment - Area or Space Served (Section 304.5).
- B. Mechanical Testing
 - 1. Air balance completed and reviewed by Mechanical Engineer-of-Record.
 - 2. Hospitals (Chapter 3, Section 314.1, Table 2110-A).
 - 3. Skilled Nursing (Chapter 3, Section 314.2) [test to include humidity controls in required areas - Section 2102(a)].
 - 4. Hydronic balance completed and reviewed by Mechanical Engineer-of-Record.
 - 5. Air and Hydronic reports forwarded to Mechanical Engineer of Record.
 - 6. Fuel Gas line inspection (Part 4, Section 1406 and Appendix B, Chapter 16).
 - 7. Atrium and/or Building Smoke Evacuation System (State Fire Marshal to witness).
- C. Boilers
 - 1. Boiler – Operating Adjustments and Instructions (Section 1022).
 - 2. Boiler – Inspections and Tests (Section 1023).
 - 3. Boiler – Clearances/Permits (Section 1005.0).
- D. Ducts
 - 1. Installation - Bracing (Part 4, Section 604.1.4)

2. Fire Damper test log from IOR (Part 4, Section 606.2).
3. Fire Damper test by State Fire Marshal (Part 4, Chapter 6, Section 606.2).
4. Smoke Damper and Detector test log from IOR (Including Duct Detector tests).
5. Smoke Damper and Detector by State Fire Marshal.

E. HVAC Unit Testing

1. Verify correct filter types and efficiencies.
2. Motor Rotation.
3. Condensate drain tests (Section 310).
4. Equipment shut down by smoke detectors (duct or space).

3.08 PLUMBING CHECKLIST FOR CLOSE-OUT (Title 24; Part 2, Chapter 29; Part 5)

A. Piping Systems (Title 24, Part 5)

1. Domestic Water Line Sterilization Test (Title 24, Part 2, Section 609.9; Title 22, Division 4, Chapter 16, Article 5).
2. Domestic Water System (hot, cold) Pressure test (Title 24, Part 5, 609.4).
3. Natural Gas Pressure Test (Title 24, part 5, Chapter 12, Section 1204).
4. Vent & Waste System Pressure test (Title 24, Part 5, 712.0).
5. Hydronic Water Pressure test (Title 24, Part 4 1201.2.8).

B. Water Heater Testing

1. Water Heater Temperature Test (Domestic/Patient) (105-120°F).
2. Water Heater Temperature Test (Kitchen) (180°F).
3. Water Heater Temperature Test (Laundry) (169°F).
4. Water Heater Temperature Alarm Test (Patient) (125°F).

C. Medical Gas System Testing (NFPA 99, Chapter 4) (Witnessed by SFM).

1. Pressure test - 150 psig - Oxygen, Medical Air & Nitrous Oxide (4-3.4.1.2).
2. Pressure test - 200 psig - Nitrogen (4-5.1.3.4).
3. 24-hour pressure test - 60 psig - Vacuum system (4-10).
4. 24-hour pressure test - 20% over operating pressure [A-4.3.4.1.2 (b)(e)].

5. Alarm test for system [4-3.4.1.3 (d)].
6. Area Valves, location, labeled, alarms tested (4-4.1 & 4-5.1.4).
7. Laboratory testing affidavits - welding/brazing (4-6.2.3.3).
8. Verified Medical Air Quality - Installation and 24 hour later.
9. Certification of system (Purity, Cross Connection, Alarms, Etc.) [4.5].
10. Certification of Bulk System [NFPA 50 (Oxygen) & CGA G-8.1 (Nitrous Oxide)].
11. Approved drawings and documents for submittal to University's Representative for permanent records).

3.09 ELECTRICAL CHECKLIST FOR CLOSE-OUT (Title 24, Part 3, and Part 1, Chapter 7, Section 7-141, 7-149)

A. Main Panel/Service

1. Identification and Labeling of Equipment (110-21, 110-22, 230-70).
2. Grounding test and Certification (250, 250-56).
3. Ground fault interrupt test adjustment and certification [230-95(c); 517-17(c)].
4. Emergency power transfer switch test (700-4).
5. Panel load balance.

B. Emergency Power and Standby Systems (Article 700 & 701) [Test Logs from IOR]

1. Emergency Generator testing and certification (701-5).
2. Identification and Labeling of equipment (110-21, 110-22, 517-22).
3. Lighting and Lighting Levels (517-22).
4. Receptacles (410L, 517-13, 517-18, 517-19).
5. Exiting signs and lights [517-32(b), 517-42(b)].
6. Nurse and Staff Call [517-33(a)].
7. Fire Alarm (760).

C. General Electrical Requirements

1. Working space/Headroom [Table 110-26(a); 110-33; 110-34].
2. Circuits and lights tested (410-45).

3. Receptacle polarity and grounding [200-10(b)].
4. Isolated ground monitor test [517-160(b)].
5. Motor load current adjustment.
6. Identification and Labeling of equipment (110-21; 110-22).
7. Identify circuits (Critical Care Areas) (517-19).

D. Miscellaneous Electrical Requirements

1. Test logs from **Contractor** and Inspector-of-Record.
2. Electrical Engineer-of-Record acceptance of system.
3. Owner In-Service training on Equipment.
4. Equipment Manuals and Instruction to Owner.
5. Warrantees and Equipment Certification.
6. As-Built documents to Owner.

3.10 FIRE MARSHAL INSPECTION REQUIREMENTS

A. Framing Inspections

1. Structural members in fire-resistive construction.
2. Check fireproofing per approved design tested assembly description.

B. Fire-Rated Partition Locations

1. Check for stud and nailing/screwing spacing per approved design tested assembly description.
2. Check for fire blocking in combustible construction.
3. Check for rated door/window frame installation (manufacturer's installation instructions shall be available for review).
4. Check for electrical installation, for example, number and size of electrical boxes, panels, cabinets, etc.
5. Check hangers, seismic bracing for sprinkler piping installation, if applicable (this would be checked during overload pressure test inspection phase of sprinkler system).

C. Close-In Inspections

1. Check fire-blocking and draft stops in combustible construction.

2. Check gypsum board installation in accordance with approved design assembly description for rated assembly.
3. Check integrity of firewall construction where recessed cabinets, panels, excessive electrical/plumbing are installed.

4. Check fire damper installation (manufacturer's installation instructions shall be available for review). Fire Marshal will witness actuation of minimum 10% fire dampers installed and 100% in 2 hour or greater fire rated wall assemblies.
5. Check for through-penetrations and fire-stop systems in all walls or floor/ceiling assemblies.
 - a. Check top of wall to structure fire stopping.
6. Check above ceiling areas and construction prior to installation of ceilings.
 - b. Check access and serviceability for above ceiling to included but not limited to valves, mechanical equipment, electrical equipment and other components that require adjustment, access or service.
 - c. [Contractor] [CM/ Contractor] [Design Builder] shall move any items including but not limited to conduit, piping, braces and other obstructions that block access to equipment and components needing adjustment, access or service.
 - d. Check bracing, anchorage, fasteners and installation.

D. Final Construction Inspections

1. Final project walk-through: Example, Emergency lighting will be tested to verify exit illumination of both interior and exterior, while generator (if applicable) is tested at same time.

3.11 HCAI – Testing, Inspection and Observation - NOT USED

3.12 Refer to the following attachment

- A. Inspection Request
- B. Non-conforming Work Notice

END OF SECTION 01 45 50

INSPECTION REQUEST

Project #: _____ HCAI #: _____ UCDH IR #: _____ [Contractor][CM/Contractor][Design-Builder] IR #: _____ Date: _____
 Project Name: _____ Spec Section (s): _____

To: UC Davis Health	From: _____
Facilities Design & Construction – Inspection Trailer	_____
4430 V Street, Building 35	_____
Sacramento, CA 95817	_____
P: 916-734-5060	P: _____
Email: lfuka@ucdavis.edu & Project IOR	E-mail: _____

Drawing Ref.: _____ Detail: _____ Shop Drawing: _____
 Project Schedule Activity ID No.: _____ Date of Inspection: _____ Time Requested: _____
 Type of Inspection: _____
 Location of Inspection (i.e., Floor, Column Line, etc.): _____

*Re-inspection Requested for Previous UCDH IR #: _____
 All work Requested for Inspection has been reviewed for compliance with the contract documents by [Contractor][CM/Contractor][Design-Builder]'s Superintendent prior to notification of Inspection Request.
 Signed: _____ Date: _____

UNIVERSITY USE ONLY

Date Received: _____ Time of Inspection: _____
 Date of Inspection: _____ Inspector: _____ Inspection Report Attached
 Inspector Arrival Time: _____ Inspector Departure Time: _____
 Comments: _____

Approved Approved as Noted Not Approved Cancelled

Inspection Request Notes or Description of Items of Deficiency if needed below (Part 1, Chapter 7, Section 7-145, item 6)

Project Field Record of Construction Progress Summary of Work in Progress (Part 1, Chapter 7, Section 7-145, item 6)
<i>Project Phase (Building Foundation, Structural, Wall Framing, Electrical Rough-In, Sprinkler Rough-In, etc.)</i>

Project Phase Percentage Complete (% of the phase completed):	Overall Project Percentage Complete:

NON-CONFORMING WORK NOTICE

PROJECT #: _____ HCAI #: _____ Notice #: _____ Date: _____

To: [PROJECT MANAGER NAME/EMAIL] _____ [DESIGN PROFESSIONAL NAME/EMAIL] _____ [IF HCAI PROJECT, AREA COMPLIANCE OFFICER/EMAIL] _____ _____ _____	From: UC Davis Health IOR Facilities Design & Construction – Inspection Trailer 4430 V Street, Building 35-A Sacramento, CA 95817 P: 916-734-5060
--	---

Spec Section Ref.: _____ Paragraph: _____ Drawing Ref.: _____

Detail: _____

In accordance with Article 12 of the General Conditions, the following defective condition(s) has/have become apparent:

Reported by: _____

CORRECTIVE ACTION SHOULD BE TAKEN AS SOON AS POSSIBLE AND COMMENCE NO LATER THAN TEN (10) CALENDAR DAYS AFTER THIS NOTICE. COORDINATE THE VERIFICATION OF THE CORRECTIVE ACTIONS WITH THE INSPECTOR OF RECORD. IF FURTHER INFORMATION IS NEEDED, ADVISE UNIVERSITY'S REPRESENTATIVE IN ACCORDANCE WITH THE GENERAL CONDITIONS.

Description of corrective action taken: _____

Accepted by: _____ Date: _____

CC:

SECTION 01 51 00
TEMPORARY UTILITIES

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Temporary Power and Lighting.
- B. Temporary Heating, Cooling & Ventilation.
- C. Temporary Water.
- D. Temporary Fire Protection.
- E. Temporary Telephone, Data, and WIFI.

1.02 RELATED SECTIONS

- A. Section 011100 – SUMMARY OF THE WORK
- B. Section 013500 – SPECIAL PROCEDURES: General requirements for temporary facilities and controls, to accommodate the University's occupancy and use of the areas and spaces adjacent to construction.
- C. Section 015610 – AIRBORNE CONTAMINANTS CONTROL
- D. Section 017400 – CLEANING
- E. Section 017700 – CLOSEOUT PROCEDURES

1.03 TEMPORARY UTILITIES

- A. Temporary Connections: Temporary power, water, sewer, gas and other utility services necessary for the Work may be made to existing building systems. Connections shall be subject to University's review and written approval. Coordinate with utility companies and University's Plant Operations & Maintenance Department for locations and methods of connections.
- B. **Contractor** shall provide and pay for installation, operation, maintenance, and removal of all utilities. The services will be provided at the current rates for each utility.

1.04 TEMPORARY POWER AND LIGHTING

A. Service Requirements:

1. Temporary Electrical Service: **Contractor** shall provide and pay for installation, operation, maintenance, and removal of temporary electrical service, lighting devices and restoration of existing and permanent equipment in accordance with applicable provisions of the Electrical Safety Orders of the State of California. Use of University's electrical power and lighting system is prohibited without University's written approval and will be considered only when an alternate electrical power source is unavailable.
 - a. Install initial services at time of site mobilization.
 - b. Modify and extend systems as Work requires.
 - c. Maintain electrical system to provide continuous service, including prompt restoration of interruptions to University systems when temporary service is connected.
 - d. Restore existing and permanent lighting used during construction to original condition. Replace defective fixtures, bulbs, and other component parts.
 - e. Clean existing and permanent lighting fixtures used during construction per Section 017400 – CLEANING.
2. Distribution: **Contractor** shall provide distribution network for temporary electrical power.
3. Power Source: Arrange for service with University's Plant Operations and Maintenance Department, or local utility company.
4. Conformance: All temporary wiring and electrical facilities shall be in accordance with applicable provisions of Electrical Safety Orders of the State of California.
5. Temporary Lighting: Construction lighting shall be supplied and maintained by **Contractor** at **Contractor**'s expense. Sufficient lighting levels shall be provided to allow construction to be properly and safely performed. **Contractor** shall give special attention to adequate lighting for stairs, ladders, floor openings, basements and similar spaces. Promptly replace burnt out, worn or defective parts.
6. Lighting fixtures: Locate fixtures in areas of Work: One (1) lamped fixture in rooms, except closets and utility chases; one (1) lamped fixture for every 750 square feet in large areas.
7. Security Lighting: **Contractor** shall provide security lighting during hours of low visibility.

B. Distribution requirements:

1. Weatherproof distribution boxes with one (1) - 240-volt, three (3) phase power outlet and four (4) – 120-volt outlets consisting of 100 amperes fused switches with equipment ground, spaced so a 100-foot extension cord will reach all areas of building.
2. Wiring, connections and protection for temporary lighting.
3. Wiring connections and protection for temporary and permanent equipment, for environmental control, for temporary use of electricity operated equipment, and for testing.

C. Use of University System: If alternate electrical power and lighting sources are unavailable, University may permit **Contractor** to use existing, in-place electrical system. University does not guarantee availability of electrical power or adequate lighting levels through use of existing system. If power and lighting is insufficient or not available **Contractor** shall provide secondary source (i.e., generator) as approved by University.

1. It is expressly understood and agreed by **Contractor** that University existing power and lighting system's primary obligation is servicing patient care. The University system is not designed for purposes of construction activities.
2. **Contractor** should expect power and lighting interruptions during course of Work. **Contractor** will be required to cease use of University electrical-power and lighting systems, as required by the needs of University.
3. When use of University electrical system is approved in writing, **Contractor** is required to adhere to University's electrical lockout procedures. See Division 26– Electrical or Campus Design Guidelines.
 - a. Provide and maintain warning labels on energized equipment.
 - b. Replace plates, electrical devices or similar existing items or components damaged as a result of temporary usage.

1.05 TEMPORARY HEATING, COOLING AND VENTILATING

A. Service Requirements:

1. **Contractor** shall provide temporary heat as necessary for proper installation of all work and to protect all work and materials against injury from dampness and cold and to dry out building. Fuel, equipment and method shall be approved in writing by University's Representative.

2. Install initial services at time of site mobilization. Modify and extend systems as Work requires.
3. Maintain systems to provide continuous service, including prompt restoration of interruptions to University systems when temporary service is connected.
4. Use of permanent heating system is preferred to any other system for maintaining temperature of building during installation of finish materials, but such use will not be permitted before clean-up after plastering and/or drywall work has been completed. **Contractor** shall make every effort to complete permanent heating system in time for such use. Permanent fans shall not be used before filters are installed. Filters shall be cleaned and serviced by **Contractor** just prior to final acceptance.
 - a. Vent portable units to building exterior, complete with automatic controls. Direct-fired units are not allowed. Locate units and outlets to provide uniform distribution of heating, cooling and ventilating.
 - b. Operate and maintain existing equipment being used; clean or replace filters and install filters in duct extensions as necessary to maintain occupied areas, work areas and finished areas, in specified condition.
 - c. Prior to operation of permanent equipment, verify controls and safety devices are complete, equipment has been tested, and inspection made and approved for operation.
 - d. Remove temporary materials and equipment when permanent system is operational. Restore existing and permanent systems used for temporary purposes to original condition.
 - e. Install temporary filters in air handling units and ducts, replace as necessary to prevent dust in equipment and ducts, to avoid contaminants in Work or finished areas. After completion, replace temporary filters with new, clean, reusable filters.
5. Maintain temperature, humidity, and ventilation in enclosed areas to provide ambient conditions for storage, preparation and Work; to cure installed materials, to prevent condensation, to dry floor surfaces and to prevent accumulations of dust, fumes and gases.
6. During non-working hours maintain temperature in enclosed areas occupied solely by **Contractor** at a minimum of 50°F., or higher as specified in individual Sections and by individual product suppliers and manufacturers. Areas occupied in whole or in part by University are to be maintained at normal temperatures.
7. Provide high efficiency particulate air (HEPA) filters as specified in SECTION 015610 – AIRBORNE CONTAMINANTS CONTROL, negative pressure ventilation, or special control of existing system as determined by University's Representative.

B. Utility Sources:

1. Electrical: As specified above in Item 1.04.
2. Existing mechanical systems may be used for temporary purposes. Coordinate use with University for conditions to be maintained in adjacent University occupied areas.
3. **Contractor** shall provide and pay for all installation, operation, maintenance and removal of equipment in accordance with applicable provisions of the Electrical Safety Orders of the State of California.

1.06 TEMPORARY WATER

A. Service Requirements:

1. Maintain systems to provide continuous service, including prompt restoration of interruptions to University's systems when temporary service is connected.
2. Water service, if necessary for construction, can be made available at no expense to the **Contractor** provided the water is not wasted. **Contractor** shall be responsible for distribution of water to points of use.
3. Certified reduced pressure type back-flow prevention device as submitted to and approved by University shall be installed before water is obtained from a University campus fire hydrant or interior building connection.

B. Plumbing: Maintain system to provide continuous service with adequate pressure to outlets, including University system when temporary service is connected. See also Division 1 Approvals and ILSM requirements.

1. Size piping to supply construction needs, temporary fire protection, and for University's needs when existing service is connected.
2. Disinfect piping used for drinking water. See Division 33 and 22 for requirements or Campus Design Guidelines
3. Source: University existing service, connect at locations as directed by University.
4. Provide valved outlets to control water pressure adequately for hoses.
5. Fire hydrants used for water supply for construction – **Contractor** must use only $\frac{7}{8}$ " square hydrant wrench on square operating nut and must use only pentagon wrench on pentagon operating nut. This is to prevent damage to the hydrant operating nut. Any damage caused by the use of an improper wrench or other misuse of the hydrant must be repaired at contractor expense. **Contractor** must inspect hydrant prior to use and make the University aware of any pre-existing damage.

- C. Use of Existing System: Existing system may be used for temporary water. Monitor usage to prevent interference with University's normal operational requirements.
- D. Use of Permanent System: **Contractor** shall obtain written agreement from University establishing start of warranty period and conditions of use.
- E. **Contractor** shall pay for installation, operation maintenance and removal of system and restoration of existing and permanent equipment. University will pay costs of water consumed for normal construction operations. **Contractor** shall take measures to conserve usage.

1.07 TEMPORARY FIRE PROTECTION

A. Requirements:

- 1. Maintain systems to provide continuous service, including prompt restoration of interruptions to University systems when temporary service is connected.
- 2. Provide and maintain fire protection equipment including extinguishers, fire hoses and other equipment as necessary for proper fire protection during course of the Work.
- 3. Use fire protection equipment only for fighting fires.
- 4. Locate fire extinguishers in field offices, storage sheds, tool houses, other temporary buildings and throughout construction site. In area under construction, provide at least one (1) fire extinguisher for each 5,000 square feet of building floor area. Locate fire extinguishers so that a person never has to walk more that seventy-five (75) feet to obtain one.
- 5. Assign qualified person with authority to maintain fire protection equipment, institute fire prevention measures, and direct prompt removal of combustible and waste material. Submit ILSM requirements per Specification SECTION 013500 – SPECIAL PROCEDURES.

1.08 TEMPORARY TELEPHONE, DATA, INTERNET, and WIFI

A. Service Requirements:

- 1. Maintain systems to provide continuous service, including prompt restoration of interruptions to University systems when temporary service is connected.
- 2. **Contractor** shall select from the following options:
 - a. University shall provide conduit, cabling and dial tone to **Contractor** 's location(s). **Contractor** shall pay University for cable, conduit installation and later removal of same and also pay University a monthly fee for use of University telephone, data internet, and WIFI system.

- b. University shall provide conduit and cabling to **Contractor** 's location(s). **Contractor** shall receive dial tone from local utility. **Contractor** shall pay University for cabling, conduit installation, maintenance of same and later removal of same. **Contractor** shall pay local utility for monthly telephone, data, internet and WIFI service.
 3. **Contractor** shall select number of lines, instruments and other features.
 4. **Contractor** shall prepare and submit to University an itemized request for telephone lines (according to option 2a or 2b above) and internet service. Project Manager will submit a service request to the IT department.
- B. Use of Existing System: Existing University telephone system shall not be used for temporary telephone service.
- C. **Contractor** Phone:
 1. **Contractor** shall have telephone emergency number or other facility available at **Contractor** 's business office for duration of contract where contractor and superintendent may be contacted within twenty-four (24) hours. Provide emergency numbers to University.
- D. Telephones:
 1. **Contractor** shall use, and only permit to be used, FCC approved communication devices on frequencies approved by FCC and University.
 2. **Contractor** shall not use, or permit to be used, communication devices which interfere with existing University communication systems, including, but not limited to:
 - a. Life Flight or CHP helicopters.
 - b. Emergency Service vehicle communications.
 - c. Plant Operations & Maintenance communication devices.
 - d. Microwave transmission stations.
 - e. UC Davis Health closed-circuit television or radio signals.
 - f. Cellular or other mobile phone systems in main hospital.
 - g. UC Davis Health voice or digital paging systems.

- E. Temporary Internet Service: Provide a high-speed internet connection (Min. 20 Mbps download, 10 Mbps upload) to **Contractor** 's field offices. The **Contractor** 's and University's field offices shall be capable of sending and receiving e-mail and be able access the Internet.
 - 1. **[WIFI coverage at the above internet speeds will be provided throughout the jobsite]**

PART II - PRODUCTS

2.01 MATERIALS

- A. May be new or used, adequate to the purpose.
- B. Devices and Equipment: Standard devices, meeting UL requirements.
- C. Telephones: may be product of local service company or specialty devices compatible with service company requirements.
- D. Modems compatible with internet service.

PART III - EXECUTION

3.01 INTERRUPTION OF EXISTING SERVICES

- A. No existing utility services shall be interrupted at any time without prior written approval from the University. Required shutdowns shall be scheduled a minimum of fourteen calendar days prior to actual shutdown. The operation of valves, switches, etc. will be performed and paid for by University.
 - 1. Prior to the outage, all possible Work shall have been completed which will minimize the length of the required outage. During the outage, the Work will be prosecuted with diligence by an adequate number of skilled personnel.
 - 2. Provide and pay for all personnel required by the University to maintain safe conditions during the outage including but not limited to fire watch, safety monitors and/or traffic control. Coordinate Work with University's Representative.

3.02 REMOVAL OF TEMPORARY CONSTRUCTION

- A. At the completion of the Work, the **Contractor** shall remove from the Project site all temporary utilities and services construction. Leave the Project site clean and free from debris, materials, or equipment.

END OF SECTION 01 51 00

SECTION 01 52 00
CONSTRUCTION FACILITIES

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Field Offices and Sheds
- B. Temporary Facilities
- C. Temporary Sanitary Facilities

1.02 RELATED SECTIONS

- A. Section 011100 – SUMMARY OF THE WORK
- B. Section 013500 – SPECIAL PROCEDURES: General requirements for temporary facilities and temporary controls to accommodate University continued occupancy and use of the areas and spaces adjacent to construction.
- C. Section 017400 – CLEANING
- D. Section 017700 – CLOSEOUT PROCEDURES

1.03 FIELD OFFICES AND SHEDS

- A. Field Office: **Contractor** shall provide a job office that will conform to the following minimum requirements:
 - 1. Suitable space for Work Stations, drawings, specifications, samples and other project records.
 - 2. Conference space for eight (8) persons, including layout tables.
 - 3. Heating and cooling to maintain a reasonable working environment.
 - 4. Telephone, Data and WIFI service as specified in Section 015100 – TEMPORARY UTILITIES
 - 5. Furnishings required: Conference table and chairs; racks and files for Contract Documents, submittals, and project record documents. Other furnishings are at **Contractor** 's option.
- B. Installation: Install office spaces for occupancy fifteen (15) calendar days after date of University/**Contractor** agreement.
- C. Preparation: Fill and grade sites for temporary structures to provide drainage away from buildings.

- D. Contract Documents: Complete set of Contract Drawings and Contract Specifications shall be kept continuously at the site. Copies of all Change Orders, letters, Shop Drawings, etc., shall be kept on the jobsite at all times and shall be available for inspector's use.
- E. Contact numbers: **Contractor** shall provide telephone numbers where **Contractor** may be reached at all times during normal working hours and after normal working hours, if emergency problems develop that require **Contractor**'s assistance.
- F. Storage Sheds and Containers for Materials, Tools and Equipment: If requested, University will provide space outside construction site where **Contractor** may provide and locate weather-tight sheds or containers for storage of construction materials, tools and equipment. **Contractor** shall be solely responsible for security of such sheds and containers. Size storage requirements to allow access, orderly provision of maintenance and inspection of products.
- G. Cleaning: Weekly janitorial services for offices; periodic cleaning and maintenance for office and storage areas. **Contractor** shall keep construction loading and parking areas clear of construction debris, especially debris that may cause slipping or tripping hazard that may injure vehicle tires, that may stain surfaces, and that may be tracked into existing buildings. Maintain approach walks free of mud and water.
- H. Removal: Upon completion of the work, and before the final payment, **Contractor** shall remove all temporary work and facilities and return site to condition required by the General Conditions of the Contract and at no change to the Contract Sum or the Contract Time.

1.04 TEMPORARY FACILITIES

- A. **Contractor** shall provide and maintain the following temporary facilities as required for execution of the Work:
 - 1. Scaffolding, staging, runways and similar equipment.
 - 2. Hoists or construction elevators, complete with operators, power and signals required.
 - 3. Temporary rigging, rubbish chutes, barricades around openings, ladders between floors, and similar equipment.
 - 4. Barricades, fencing, lights and similar safety precautions.
 - 5. Security cameras for remote video surveillance of the project site and 24/7 monitoring services that records and reports incidents and alarms. Security cameras to provide full coverage of the construction and storage site area.

- B. Maintenance: Use all means necessary to maintain temporary construction facilities and controls in proper and safe condition throughout progress of the Work.
- C. Replacement: In event of loss or damage, promptly restore temporary construction facilities and controls by repair or replacement at no change to the Contract Sum or the Contract Time.
- D. Conformance: All materials and equipment required to safely accomplish work under this Section shall be in conformance with requirements of CAL OSHA and other State and Federal Codes and regulations where applicable.
- E. Codes: All temporary work and facilities shall conform to the above requirements that pertain to operation, safety and fire hazard.
- F. Construction Site Security: Temporary barriers, doors and gates shall be keyed to University's master lock system. Security hardware to be provided by **Contractor** . Keying to University master lock system will be provided by University.

1.05 TEMPORARY SANITARY FACILITIES

- A. Use of existing facilities: Designated toilet facilities may be used by **Contractor** .
 - 1. Assigned facilities: Location of assigned toilet facilities and maintenance of same are responsibility of University. **Contractor** shall not have exclusive use to these facilities and shall abide by health and safety criteria regarding their use and sanitary upkeep.
 - 2. Unassigned facilities: Unassigned toilet facilities shall not be used without written authorization of University's Representative.
 - 3. **Contractor** may use existing toilet facilities that are within the limits of the Work.
- B. **Contractor** shall pay service charges for connection and use of sewage utilities.
- C. Portable units: Enclosed, portable, self-contained units or temporary water closets and urinals, secluded from public view may be used. Self-contained units shall be approved by University's Representative prior to use.
 - 1. **Contractor** shall pay costs of installation, maintenance and removal of temporary sanitary facilities.
 - 2. Provide facilities at time of site mobilization.
 - 3. Modify and extend services as work progress requires.
 - 4. When utility services are available, provide water, sewer service, and temporary water closets; remove portable facilities. Remove temporary fixtures when permanent facilities are operational.
 - 5. Clean areas of facilities daily, maintain in sanitary condition. Disinfect fixtures, repair or replace damaged fixtures, accessories and surfaces.

6. Provide toilet paper, paper towels, and soap in suitable dispensers.
7. Restore existing and permanent areas and facilities used to original condition. Remove all temporary construction facilities above and below grade. Leave the project site clean and free of debris, materials and equipment.

PART II - PRODUCTS

2.01 MATERIALS

- A. Serviceable, new or used, adequate for required purpose.

PART III - EXECUTION – Not Applicable to this Section

END OF SECTION 01 52 00

SECTION 01 55 00

VEHICULAR ACCESS AND PARKING

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Construction Parking and Access Roads
- B. Traffic Regulation
- C. Project Informational Signs

1.02 RELATED SECTIONS

- A. Section 011100 – SUMMARY OF THE WORK
- B. Section 013300 – SHOP DRAWINGS, PRODUCT DATA AND SAMPLES
- C. Section 013500 – SPECIAL PROCEDURES: General requirements for temporary facilities and temporary controls to accommodate University's continued occupancy and use of the areas and spaces adjacent to construction.
- D. Section 017400 – CLEANING
- E. Section 017700 – CLOSEOUT PROCEDURES: Project Closeout.

1.03 PARKING AREAS AND ACCESS ROADS

- A. Access Roads: Existing roads shall be used for construction access within limits defined herein. Temporary construction access roads shall not be permitted.
- B. Parking: Parking is controlled and limited by University.
 - 1. Parking of personal vehicles belonging to **Contractor** employees may be arranged with University's Parking Services, at 916-734-2687. Parking will be allowed in employee permit areas, at the current permit rates depending on space availability.
 - 2. Delivery of materials may be made to the job-site as required. **Contractor** shall coordinate with University's Representative.
 - 3. Dumpsters shall be located in approved location as arranged by University's Representative.
- C. Existing Pavements and Parking Areas: Designated existing on-site streets and driveways may be used for construction traffic. Vehicles with metal tracks will not be allowed.

1. Designated areas of existing parking facilities may be used by construction personnel. Do not allow heavy vehicles or construction equipment in parking areas.
2. Maintain traffic and parking areas in a sound condition, free of excavating material, construction equipment, products, mud, snow and ice.
3. Maintain existing and permanent paved areas used for construction. Repair existing facilities damaged by usage to original condition: promptly repair breaks, potholes, low areas, standing water and other deficiencies, to maintain paving and drainage in original or specified condition.
4. Remove temporary materials and construction when permanent paving is usable.

1.04 TRAFFIC REGULATION

- A. Schedule of Access Closing: **Contractor** shall adopt all practical means to minimize interference to traffic. Access to other facilities in the area shall be maintained at all times. **Contractor** shall provide schedule of planned closing of any street for approval by University and shall give minimum of fourteen (14) calendar days' notice before closing any street or access.
- B. Use of Fire Lanes: **Contractor** shall notify University of all major pickups and deliveries that require use of controlled access fire lanes. Keys to gates or other barriers will be provided, as needed, to allow use of fire lanes. Vehicles parked in fire lanes for delivery of materials shall be continuously manned for immediate removal if required by the University.
 1. Fire Lanes to remain open at all times and shall not be blocked without a Traffic Control Plan provided prior to work at the Fire Lane and approved by the University's Representative.
- C. All major pick-up and delivery operations shall occur in total before or after normal working hours.
 1. Drawings may indicate haul routes designated by University for use of construction traffic. Confine construction traffic to haul routes.
 2. Provide traffic control at critical areas of haul routes to regulate traffic and minimize interference with public traffic.
- D. Post-mounted and wall-mounted traffic control and informational signs as specified herein.
 1. Traffic Control Signs, Traffic Message Boards, Cones, Drums, Flares, Lights and Flag Control equipment: All as approved by California MUTCD requirements.
 2. **Contractor** shall furnish at all barricades: Lights and flag control required to control traffic, and shall also provide and maintain suitable temporary barricades, fences, directional signs, or other structures as required for protection of the public; and maintain from the beginning of twilight throughout the whole of every night on or near the obstructions, sufficient lights and barricades to protect the public and/or the Work.

- E. Construction Vehicle Parking: Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and University's operations. Prevent parking on or adjacent to roads or in non-designated areas.

- F. Flag Control: Provide properly trained and equipped flagmen to regulate vehicular traffic when construction operations or traffic encroach on public traffic ways.
 - 1. Provide properly trained and equipped personnel to regulate pedestrian traffic at all interior locations where construction traffic interfaces with University traffic.
 - 2. Flag control personnel shall wear appropriate identifying clothing such as bright colored vests, clearly visible and identifiable as having responsibility for traffic control.
- G. Lights: Use lights during hours of low visibility to delineate traffic lanes and to guide traffic.
- H. Traffic Signs and Signals: At approaches to site and on site, install traffic signs and signals at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
 - 1. Install and operate traffic control signals to direct and maintain orderly flow of traffic in areas under **Contractor** 's control, and areas affected by **Contractor** 's operations.
 - 2. Relocate traffic signs and signals as Work progresses, to maintain effective traffic control.
 - 3. Remove equipment and devices when no longer required. Repair damage caused by installation.

1.05 PROJECT INFORMATIONAL SIGNS - NOT USED

Applicable to this Section

PART III - EXECUTION – Not Applicable to this Section

END OF SECTION 01 55 00

PROJECT NO. 9559410
UC DAVIS HEALTH
CANCER CENTER NET V2 UPGRADE
600A DISCONNECT INSTALLATION

SECTION 01 56 00

TEMPORARY BARRIERS, ENCLOSURES and CONTROLS

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Barriers and Enclosures
- B. Protected Walkways and Weather Closures
- C. Tree and Plant Protection
- D. Temporary Controls

1.02 RELATED SECTIONS

- A. Section 011100 – SUMMARY OF THE WORK
- B. Section 013500 – SPECIAL PROCEDURES
- C. Section 013900 - GREEN BUILDING POLICY IMPLEMENTATION
- D. Section 015610 – AIRBORNE CONTAMINANTS CONTROL
- E. Section 017400 – CLEANING

1.03 BARRIERS AND ENCLOSURES

- A. Barricades: Provide to prevent public entry, to protect existing trees and plants, and to protect existing facilities and adjacent properties from damage during construction period. Relocate and extend as construction progress requires per California MUTCD requirements.
- B. Partitions and Ceiling Enclosures:
 - 1. Fire Enclosures-Rated-Corridors and Rated Assemblies: Provide non-combustible dust-proof barrier framed with 20-gauge metal studs spaced 24" o/c maximum and covered on both sides with 5/8" thick Type-X rated gypsum wallboard fire taped, braced so to be self-supporting without fastening to existing finishes.
 - a. Provide gaskets of closed cell neoprene, or strips of fiberglass insulation between barriers and existing finish.

- b. Finish exposed surfaces with two (2) coats of paint (color as selected by University), maintain in neat, orderly appearance and paint barrier on public side. Temporary emergency exit and or directional signage indicating Emergency Exits will be furnished and installed by **Contractor**.
 - c. Provide temporary doors in corridors with twenty (20) minute fire-rated assemblies and locksets to limit use.
 - d. Use of access doors and routes by workmen to be approved by University's Representative.
2. Fire Retardant Enclosures - Non-Rated Assemblies: Provide non-combustible dust-proof barriers framed with metal studs and covered on public side with Fire Retardant plastic laminate sheathing material. Flame spread 10 - smoke

development 45 - fuel contribution undeterminable, as manufactured by Reef Industries, Inc., P.O. Box 33248, Houston, TX77033 or equal.

- a. Joints shall be taped and sealed over framing studs.
 - b. Bracing shall be self-supporting without fastening to existing finishes.
 - c. Provide gaskets of closed cell neoprene, or strips of fiberglass insulation between barriers and existing finishes.
 - d. Provide non-staining taped seal to surrounding materials to insure seal.
 - e. Non-Rated Assemblies for Dust Control: Use ½" Type-X or equal gypsum wallboard applied on occupancy side on framing member. Joints over studs shall be taped and sealed. Other detail similar to 1.03-B.2 above.
- C. Removal: Remove temporary materials, equipment and construction at completion; repair damage caused by installation or use of barricades and enclosures. Restore existing facilities used during construction to specified or to original condition.

1.04 DIESEL VEHICLE/EQUIPMENT IDLING PROCEDURES

- A. When drivers of diesel powered on-road vehicles arrive at loading or unloading areas to drop-off or pick-up passengers, supplies, equipment, materials, etc., they shall turn off their vehicle's engine as soon as possible but no later than five minutes after arrival.
- B. Operators of off-road diesel-powered equipment shall turn off their engines when the equipment is not performing its primary function, but no later than five minutes after the equipment has come to a stop.
- C. Idling for "warm-up" prior to diesel vehicle or equipment operations on University property shall be limited to a maximum of five minutes.
- D. At end of work shift, or for the purpose of servicing, all diesel equipment shall be parked on site at furthest location away from Hospital air intake systems.
- E. All diesel-powered equipment shall be maintained in good operating condition. University representative will direct **Contractor** to remove any equipment producing high amount of diesel fumes resulting from diesel equipment being old or in poor operating condition.

1.05 PROTECTED WALKWAYS AND WEATHER CLOSURES

- A. Cover walkways to provide access to existing facilities for use by public and University personnel.
- B. Provide temporary roofing and weather-tight insulated closures of openings in exterior wall surfaces, to maintain specified working conditions, to protect products and finished work from inclement weather.
- C. Critical access and protected walkways shall comply with the CBC and CFC.

1.06 TREE AND PLANT PROTECTION

- A. Tree Protection: All trees not marked for removal shall be protected against damage from construction operations. Where necessary, in the opinion of University's Representative, trees surrounding building footprint or in close proximity to construction operation shall be protected with barricades. No trees shall be cut or felled without approval of University's Representative. Trees cut and/or removed without explicit instruction shall be replaced by **Contractor** at no cost to the University.
- B. Cutting and Pruning: Cutting and pruning of trees to accommodate construction shall be done only with approval and direction by University's Representative. Soil within the spread of tree branches (within drip line) shall not be disturbed except as directed by excavation or trenching drawings. Advance notice shall be given University if tree roots of 3" diameter or greater must be cut.
- C. Drip line Protection: Cars, trucks, or equipment shall NOT be parked or set within the drip line of any tree; nor shall there be any stockpiling or temporary building erected within the drip line.

1.07 TEMPORARY CONTROLS

- A. Dust Control: **Contractor** shall take appropriate steps throughout project to prohibit airborne dust due to work under this contract. Execute work by methods to minimize raising dust from construction operations. Water shall be applied wherever practical to settle and hold dust to minimum, particularly during demolition and moving of materials. No chemical dust prohibitor shall be used without written approval by University's Representative.
- B. Noise Control: Control noise as directed by University's Representative.
- C. Pollution Control: Use of noxious or toxic materials for all applications in alterations or work in buildings occupied by University personnel shall be done after proper notification and approval by University, this includes work performed on weekends or other unoccupied times.
 - 1. Provide methods, means and facilities to prevent contamination of soil, water and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.

- D. Waste Control: All waste materials resulting from process of clearing and construction shall be disposed of as follows:
1. General Refuse: All refuse and debris, combustible and incombustible, resulting from construction process, shall be removed from University property as described in the General Conditions of the Contract. **Contractor** shall not use any refuse container belonging to University.
 2. Hazardous Refuse: Solvents, oils and any other hazardous material shall be disposed of in containers and removed from site. At completion of work, any contaminated soil shall be removed and replaced with good soil by **Contractor** at no expense to University. Coordinate disposal with UC Davis Health EH&S department.
 3. Building materials containing asbestos that are part of the project shall not be disturbed or removed by the contractor during the construction of temporary barriers, enclosures and controls. The contractor shall request from the University's Representative materials that have been identified on the project to contain asbestos so that these materials are not disturbed. The contractor shall refer to Section 013500 Special Procedures, 1.05 Hazardous Materials Procedures regarding materials impacted by construction of temporary barriers, enclosures and controls.
 4. All material and equipment removed as part of the Project is property of University, unless specifically designated otherwise; such material and equipment shall be delivered to a location at the campus, as directed by University, to be selectively sorted by the University; remaining debris shall be disposed of by **Contractor** at no expense to University.
- E. Drainage Control: All portions of Work shall be kept free of standing water at all times during construction. Where required, temporary drainage ditches, berms, or pumping systems shall be constructed to divert drainage water from construction site, and resultant water shall be carried to nearest natural water course and disposed of without erosion to surrounding area. Care shall be taken to prevent silting of existing sinkholes and watercourses. Silt deposited as a result of the Work shall be removed and disposed of by **Contractor** at no cost to the University.
1. Rough grade site to prevent standing water and to direct surface drainage away from excavations, trenches, adjoining properties and public rights-of-way/s.
 2. Maintain excavations and trenches free of water. Provide and operate pumping equipment of a capacity to control water flow.
 3. Provide de-watering system and pumping to maintain excavations dry and free of water inflow on a twenty-four (24) hour basis.
 4. Provide piping to handle pumping outflow to discharge in manner to avoid erosion or deposit of silt. Provide settling basins to avoid silting; install erosion control at out-falls of system.
 5. Winterize and stabilize site with Geotextile Fabric and gravel so that the site drains and avoids it becoming a quagmire. Maintain access roads on the site with Geotextile Fabric and gravel and make repairs to avoid furrow, ruts, or potholes.

6. Remove equipment and installation when no longer needed.
- F. Sediment and Erosion Control: **Contractor** shall furnish, install and maintain means and methods to reduce excessive erosion, minimize sedimentation discharge, and prevent construction materials discharge from causing off-site and on-site contamination. **Contractor** shall coordinate with University.
1. **Contractor** shall pay for and maintain required permits.
 2. **Contractor** shall furnish:
 - a. National Pollutant Discharge Elimination (NPDE) permit.
 - b. **Contractor** shall file Notice of Intent to California State Water Resources Control Board (SWRCB) stating date construction will begin. Provide copy to University.
 - c. **Contractor** shall prepare, maintain and follow Storm Water prevention Plan. The Plan shall include **Contractor** 's Best Management Practices (BMP) describing means and methods to control sediment, erosion and other pollutants.
 - d. **Contractor** shall keep BMP Program at jobsite.

PART II - PRODUCTS

- 2.01 Polyethylene: Polyethylene used for critical barriers and for sealing walls, floors or ceiling systems shall be a minimum of 6 mil thickness and fire-retardant type listed by Fire Underwriters Laboratories, Griffolyn #T55R with Griffolyn fire retardant tape, or equal.

PART III - EXECUTION

- 3.01 Infection Control Risk Assessment ICRA Requirements:
- A. ****DELETE SECTION IF NON-PATIENT CARE SPACE*** NON-CLINICAL DUST CONTROL COVERED BY 1.03***
1. Refer to attached Infection Control Risk Assessment (ICRA) and UC Davis Health Construction Dust & Hazardous Materials Inspection Worksheet.
 - a. These documents dictate minimum requirements for Class I and II containments and minimum requirements that must be completed to control dust during construction.
 - 1) Mini containments (pop-up cubes) which are designed to have at most 1-2 people may be used in lieu of custom-built Class II Containments.
 2. The outside of the work containment shall have present: ICRA Permit, Interim Life Safety Measure (ILSM) Permit, Daily ICRA Inspection Forms, entry warning sign, Containment Entry Log (provided by the contractor) that lists all persons who enter

the containment regardless of affiliation, including all University employees, and an emergency telephone number of persons to call 24 hours.

3. Before any demolition or construction begins, all Protection Areas (infection control areas), control measures put in place and work plan by the **Contractor** will be inspected by a designated University representative. Work cannot begin until the work containment has been inspected and approved.

3.02 Refer to the following Attachments:

- A. Appendix A - Construction Dust & Hazardous Materials Inspection Worksheet
- B. Appendix B - Initial Information and Benchmark Containment Inspections
- C. Appendix C - Entry Warning Sign with Project Manager Contact Information

END OF SECTION 01 56 00

UC DAVIS HEALTH CONSTRUCTION DUST & HAZARDOUS MATERIALS INSPECTION WORKSHEET – APPENDIX A

ICRA Permit Number	ICRA Class
Job # and Name	Project Manager
Estimated Start	Estimated Completion

ACKNOWLEDGEMENT OF HAZARDOUS MATERIALS

Does the project contact hazardous materials (e.g., asbestos, lead, mold, PCBs, mercury)?	Yes / No
Verified How: (e.g., hazmat survey, personal knowledge)	
By Whom: (name & department)	

CONTAINMENT STRATEGIES

Enclosure Types [check all that apply]		
<input type="checkbox"/> Full Containment (poly over all surfaces not in SOW)	<input type="checkbox"/> Hard Barriers Required	
<input type="checkbox"/> Isolated Room – Critical Openings Only (seal doors, supply and return registers, etc)		
<input type="checkbox"/> Mini Containment Cube (only large enough for 1-2 people; aka pop up cube)		
<input type="checkbox"/> Shrouded Tool with HEPA filtered exhaust		
<input type="checkbox"/> Glove Box Containment with HEPA filtered exhaust		
Other:		
Negative Pressure Requirements [check all that apply]		
<input type="checkbox"/> -0.020" wc at all times (24/7) as displayed on mounted manometer		
<input type="checkbox"/> -0.020" wc at setup with some negative pressure throughout project as displayed on manometer		
<input type="checkbox"/> Visual Verification of some negative room pressure throughout project		
<input type="checkbox"/> No negative room pressure required		
<input type="checkbox"/> Negative pressure in localized HEPA exhausted work area (e.g. shrouded tool, glove box)		
Other:		
Negative Pressure Equipment [check all that apply]		
<input type="checkbox"/> Onsite Challenge Testing (DOP or particle counting) prior to setup		
<input type="checkbox"/> Challenge Tested within last 6 months; Equipment has remained onsite at University		
Single HEPA Unit; exhausted to: <input type="checkbox"/> Outdoors <input type="checkbox"/> Diffusion Box/Chamber		
Two HEPA Units in Parallel; exhausted to: <input type="checkbox"/> Outdoors <input type="checkbox"/> Diffusion Box/Chamber		
Other:		
Additional Containment Requirements [check all that apply]		
<input type="checkbox"/> Ante Room	<input type="checkbox"/> Masonite Floor Protection	<input type="checkbox"/> Protective Clothing
<input type="checkbox"/> Walk off mats	<input type="checkbox"/> Shoe Covers	<input type="checkbox"/> Air Scrubber
Other:		

VERIFICATION OF WORK

Type(s) of Inspection Required	Responsible Party
HEPA Equipment Verification	<input type="checkbox"/> EH&S <input type="checkbox"/> Consultant <input type="checkbox"/> Other:
Pre-Work Approval Inspection	<input type="checkbox"/> EH&S <input type="checkbox"/> Consultant <input type="checkbox"/> Other:
Daily Onsite Oversight	<input type="checkbox"/> PM <input type="checkbox"/> EH&S <input type="checkbox"/> Consultant <input type="checkbox"/> IOR <input type="checkbox"/> Other:
Air Sampling Type: _____ Frequency: _____	<input type="checkbox"/> EH&S <input type="checkbox"/> Consultant <input type="checkbox"/> Other:
Demolition Inspection	<input type="checkbox"/> PM <input type="checkbox"/> EH&S <input type="checkbox"/> Consultant <input type="checkbox"/> IOR <input type="checkbox"/> Other:
ICRA Downgrade	<input type="checkbox"/> PM <input type="checkbox"/> EH&S <input type="checkbox"/> Consultant <input type="checkbox"/> IOR <input type="checkbox"/> Other:
Final Visual Approval Inspection	<input type="checkbox"/> PM <input type="checkbox"/> EH&S <input type="checkbox"/> Consultant <input type="checkbox"/> IOR <input type="checkbox"/> Other:

PROJECT NO. 9559410
UC DAVIS HEALTH
CANCER CENTER NET V2 UPGRADE
600A DISCONNECT INSTALLATION

INITIAL INFORMATION AND BENCHMARK CONTAINMENT INSPECTIONS – APPENDIX B

ICRA #	Location	Set Up Date	Electrical Shop Inspection	Pre-Start Inspection (Name, Date, Time)	Post-Demo Inspection (Name, Date, Time)	Downgrade Inspection (Name, Date, Time)	Final Inspection (Name, Date, Time)	Take Down Date

DAILY INSPECTION LOG

(Sheet _____ of _____)

Date & Time	Performed By(Name)	Pressure Reading (+/-)	Acceptable Negative Pressure? (Y/N)	ILSM conditions still met? (Y/N/n/a)	Tack Mat useable? (Y/N)	Interior free of dust/debris? (Y/N)	Containment Integrity Intact (no holes or breaches)? (Y/N)	All ICRA permit conditions met? (Y/N)	Other Issues? (Explain)	Corrective Actions
Example 7/4/16 – 0800	B. Clean	-0.025	Y	Y	Y	Y	Y	Y	N	closed entry door

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ENTRY WARNING SIGN WITH PROJECT MANAGER CONTACT INFORMATION – APPENDIX C

CAUTION

CONSTRUCTION DUST PRECAUTIONS IN USE DO NOT ENTER

For More Information Contact the Project Manager

(Name)

Phone Number

(THIS SIGN MUST BE POSTED IN COLOR)

SECTION 01 56 10

AIRBORNE CONTAMINANTS CONTROL

PART I - GENERAL

1.01 SUMMARY

- A. Section Includes: University airborne contaminants control policy procedures and an Infection Control Risk Assessment (ICRA) and plan.

1.02 POLICY

- A. Airborne contaminants control is critical in all hospital areas, as well as non-hospital areas. **Contractor** shall limit dissemination of airborne contaminants produced by construction-related activities, including dust, chalk, powders, aerosols, fumes, fibers and other similar materials, in order to provide protection of immuno-compromised and other patients, staff, diagnostic operations, or sensitive procedures or equipment, from possible undesirable effects of exposure to such contaminants.
1. Construction activities causing disturbance of existing dust, or creating new dust, or other airborne contaminants, must be conducted in tight enclosures cutting off any flow of particles into patient areas.
 2. Ceilings, walls in Protection Areas and other areas in patient care areas as indicated on drawings must be secure at all times.
- B. An Infection Control Risk Assessment (ICRA) and plan to mitigate dust is required for each project. The risk assessment identifies patient groups at risk for infection due to construction dust. The dust mitigation plan is designed to contain dust within the construction zone.
- C. If visible mold is found during construction, renovation, or repairs, any ICRA in-hand is invalid and risk assessment shall be performed to reevaluate ICRA levels and the work plan prior to restart of the work. Upon discovering, seal any openings, stop work and notify the University's Representative immediately. This includes projects that are already considered and operating under a Class IV.
- D. Related Sections:
1. Section 017300 – CUTTING AND PATCHING: Removal of debris may be outside of normal work hours and shall be in tightly covered containers.
 2. Section 013500 – SPECIAL PROCEDURES: Perform work in accordance with requirements of this section.
 3. Section 013900 - GREEN BUILDING POLICY IMPLEMENTATION

4. Section 015100 – TEMPORARY UTILITIES: Provide high efficiency particulate air (HEPA) filters as specified in Section 015610, negative pressure ventilation, or special control of existing system as determined by University's Representative.
5. Section 015600 – TEMPORARY BARRIERS, ENCLOSURES AND CONTROLS: Extend barriers above ceilings as required to seal off and contain airborne contaminants.
6. Section 015600 – TEMPORARY CONTROLS: Contain waste materials during removal; bagging, wrapping, and transporting.
7. Section 017400 – CLEANING: Use wet cleaning methods and HEPA filtered vacuum cleaners as required to minimize release of airborne contaminants. Contain waste materials, debris and rubbish as noted above. Disinfect Containment and Protection Areas as directed by University's Representative

E. Dust Mitigation Requirements

1. An ICRA Daily Inspection Log ~~Compliance Survey~~ is attached at the end of this section under UC Davis Health Construction Dust Infection Prevention Best Practice Standard. The **Contractor** must complete this daily checklist and leave posted for the duration of the project at the outside of the containment. Any areas of non-compliance must be specifically listed and addressed for corrective measures when identified. A copy of the daily ICRA inspections shall be submitted to the University's Representative at an agreed upon time between the **Contractor** and the Project Manager.

F. UC Davis Health Construction Dust Infection Prevention Best Practice Standard

- a. The UC Davis Health Construction Dust Infection Prevention Best Practice Standard is attached at the end of this Section and augments information & requirements of Section 015610.
- b. Refer to the UC Davis Health Construction Dust Infection Prevention Best Practice Standard per requirements for.
 - 1) Responsibilities
 - 2) Procedures
 - 3) Training And Certifications
 - 4) Containment Design & Construction
 - 5) Materials And Equipment
 - 6) Cleaning Procedures
 - 7) Documentation
 - 8) Containment Verification

- 9) Inspection Criteria
- 10) And other Dust Infection Prevention Measures

1.03 SUBMITTALS

- A. Submit to Project Inspector or Post at Anteroom Daily ICRA Inspection Log.
- B. Schedules: Submit work areas and procedure schedules for containment of airborne contaminants. Include this work in the Project Schedule per 013200.
- C. Detailed Work Plan: Drawings including but not limited to Work Area/ Floor Plan, Path of Travel, Egress and Exiting, Rated Construction and details of construction of necessary temporary barriers, and description of procedures to be used to achieve and maintain control of construction-related airborne contaminants.
 - 1. As applicable, the drawing should include the following: location of ante room(s), location of manometer, location of negative air units exhausting outside the building including number of negative air units and sizes (cfm), and location of sealed blocked off areas of corridors. Any impacts to corridors will need to be approved via ILSM (see specification section 013500 for details).
 - 2. Identify the areas surrounding the project area, assessing potential impact of construction on the patient care area. Identify the specific uses (e.g., patient rooms, medication room, operating room, etc.)
 - 3. Identify the potential impacts including but not limited to.
 - a. HVAC, Ventilation (outages, air flow directions, clean to dirty, air intakes/exhausts, air balance, disruptions, etc.).
 - b. Plumbing (outages, hand-washing access, work area, flushing/draining systems, charging systems, disinfecting systems, etc.).
 - c. Electricity (outages for critical equipment, special ventilation areas, monitoring).
 - d. Identify Airborne infection isolation rooms and patient rooms with immunocompromised conditions that will require High-efficiency Particulate Air (HEPA) filters.
 - 4. Identify containment measures including but not limited to types of barriers to be used. HEPA filtration to be used. Renovation/construction areas should be isolated from occupied areas during construction and provide clean-to-dirty airflow with respect to surrounding areas.
 - 5. Assess preventive maintenance requirements. Will the service/maintenance frequency and level of service of systems need to be modified during construction (e.g., ventilation filters, air intake system, potable water, plumbing, doors). Work Hours: Can or will the work be done during non-patient care hours?

6. Include provisions for but not limited to traffic flow, entrance, egress, control, debris removal and housekeeping.
 7. Work Hours: Identify areas of work that will be done during non-patient care hours. Refer to Sections 011100 Summary of Work and Section 011400 Work Restrictions
 8. The Detailed Work Plan shall be reviewed and approved by the University's Representative prior to the start of Construction.
- D. Project Experience and Training: In order to be considered qualified to work with negative pressure containments; **Contractor** 's must demonstrate experience by providing either of the following:
1. Previously completed, documented negative pressure containment work in a healthcare facility along with an owner reference. Minimum documentation shall include project descriptions and photographs or containment schematics.
 2. Documentation that the contactors' proposed foreman has successfully obtained one of the following from the American Society for Healthcare Engineering (ASHE):
 - a. Certified Healthcare Constructor (CHC) Certification
 - b. Health Care Construction (HCC) Certificate
 - c. Managing Infection Prevention During the Construction & Operation of Health Care Facilities Course Completion

1.04 QUALITY CONTROL

- A. Pre-construction Meeting: Before any construction on site begins, **Contractor** 's Superintendent is required to attend a mandatory pre-construction orientation session held by University's Representative for a review on precautions to be taken.
- B. Review by PO&M HVAC staff for possibility to disconnect air supply and return into the project area. Negative air machines shall be connected to separate electrical circuits.
- C. Notification: A minimum of fourteen (14) calendar days written notification to University's Representative of possible construction activity causing airborne contaminants in Protection Areas.

1.05 DEFINITIONS

- A. Containment Areas: As determined by University's Representative and if shown. Includes all areas of construction activities, adjacent staging and storage areas, and passage areas for workers, supplies and waste. The containment area includes ceiling spaces above and adjacent to construction activities.
- B. Critical Openings – Include all potential paths for air and contaminants to move from the project area to outside of the project area and include: supply registers, return registers, exhaust registers, doors, windows, and other openings within the area where contaminants

can escape. Sealing the critical openings can be accomplished with tape, plastic, hard barriers and a combination of these materials to seal airtight the critical opening.

- C. HEPA System DOP Testing – An ANSI / ASTM recognized method to test the integrity of a High Efficiency Particulate filter which filters out 99.97% of particles 0.3 micrometers or larger. DOP testing is performed by specialty **Contractor** 's. The Health System requires that HEPA systems be tested to the ANSI / ASTM standard as delivered prior to their use onsite as further described in this Standard.
- D. ICRA (ICRA) Infection Control Risk Assessment - An evaluation of patient risk based on a matrix of the patient population health in the work area and the invasiveness of the project. This assessment ultimately generates a permit (ICRA permit) issued by Infection Prevention requiring compliance with one of four precaution levels. The ICRA program is documented in Hospital P&P 2120. ICRA's apply to patient care areas and their adjoining contiguous areas. All ICRA evaluations are the sole responsibility of the Health System Infection Prevention Department based on an application by the Project Manager. ICRA Permits expire and can be extended subject to approval by the Infection Prevention Department.

1.06 PERFORMANCE REQUIREMENTS

A. University's Representative's Responsibilities:

- 1. Determination of the Containment and Protection Areas, as well as, the standard of limitations of the **Contractor** 's responsibilities, required for the project.
- 2. Statement of Requirements: Description in graphic and written form as required to communicate the above based on evaluation of the construction area and the impact of the project on patient care.
- 3. Coordinate any testing and monitoring as necessary with EH&S or a third party.

B. **Contractor** Responsibilities:

- 1. Provide specific means and methods of achieving and maintaining control of airborne contaminants during construction.
- 2. Implement all mitigation measures as listed in the UC Davis Health Construction Dust & Hazardous Materials Inspection Worksheet, which have been reviewed and approved by Infection Prevention and EH&S. The work shall be performed in accordance with the specific ICRA/Dust Mitigation Plan, Class (I, II, III or IV) and approved ICRA Permit. **Contractor** shall ensure that all workers are trained and adhere to the mitigation requirements including provisions indicated per UC Davis Health Construction Dust Infection Prevention Best Practice Standard attached at the end of this Section.
- 3. **Contractor** shall notify University's Representative in writing, a minimum of fourteen (14) calendar days prior to starting construction activity, which might be expected to produce excess levels of airborne contaminants in containment area so that additional precautions may be taken.

4. If project construction activities will occur beyond the expiration date identified in the ICRA Permit, **Contractor** shall coordinate with University's Representative to request extension of the ICRA Permit utilizing the ICRA Permit Extension Form attached provided at the end of in this section.

PART II - PRODUCTS

2.01 MATERIALS

- A. Polyethylene: Polyethylene used for critical barriers and for sealing walls, floors or ceiling systems shall be a minimum of 6 mil thickness and fire retardant type listed by Fire Underwriters Laboratories, Griffolyn #T55R with Griffolyn fire retardant tape, or equal.

PART III - EXECUTION

- 3.01 PROJECT SPECIFIC REQUIREMENTS: The below criteria shall be applied on a case by case basis as outlined in the project specific requirements, ICRA Permit(s), and EH&S Worksheet(s)

- A. PM TO MODIFY THIS SECTION. ATTACH ICRA PERMITS, EH&S WORKSHEETS, OR ANY OTHER APPLICABLE DOCUMENTATION
- B. THE BELOW LISTED CRITERIA ARE POSSIBLE STRATEGIES FOR CLASS 3 AND 4 CONTAINMENTS. NOT ALL OF THE STRATEGIES WILL BE ALLOWED OR REQUIRED. THE ICRA PERMIT AND EH&S WORKSHEET DEFINE WHAT IS ALLOWABLE. THINK OF THE ICRA PERMIT AND EH&S WORKSHEET AS A MENU. THE BELOW IS A DETAILED DESCRIPTION OF EACH ITEM ON THAT MENU.

3.02 CONTAINMENT CRITERIA

- A. The outside of the work containment shall have present: ICRA Permit, Interim Life Safety Measure (ILSM) Permit, Daily ICRA Inspection Forms, manometer, entry warning sign, Containment Entry Log (provided by the **Contractor**) that lists all persons who enter the containment regardless of affiliation, including all University employees, an emergency telephone number of person to call 24 hours a day in the event of a negative pressure alarm or other issue, and that an Environment of Care Incident Report under the category of "Construction Dust" must be filed by area nursing management in case of constant or annoying alarms.
- B. The interior of the containment area shall be cleaned on a continual basis daily. Hard surface floors in work area, adjacent hallways and passage areas require vacuuming with HEPA-filtered vacuum cleaners and frequent wet-mopping during demolition and construction; protect adjacent carpeted areas with plastic and plywood and vacuum with HEPA-filtered vacuum cleaners. Only an EPA Listed Germicide approved by the UC Davis Health Infection Prevention shall be used on the project site.
- C. Regardless of containment strategies, execute work by methods to minimize raising dust from construction operations. Water may be used to assist in controlling airborne dust.
- D. Full containment

1. All surfaces in the containment area except surface where work is to occur must be covered in plastic unless they are non-porous, smooth, and accessible for cleaning.
 2. Sealing of Openings: Use tape or other impenetrable sealant to seal barrier wall seams, cracks around window and door frames, exhaust system ductwork, pipes, joints and ducts. Use of spray glue is not acceptable to be used inside of the building.
 3. **Contractor** must block off existing ventilation supply registers, return registers and exhaust registers in the construction area.
 4. All polyethylene and other materials used for temporary enclosures shall be at least 6 mil thickness and fire-retardant type. Zip poles or other easily removable supports shall be used for projects extending beyond one work shift. Temporary walls with metal stud framing may be required for long term projects and must be approved by the Project Manager. All doors leading into the containment area shall utilize zippered doors for control of the air flow and closing the plastic doors.
- E. Critical seal of areas
1. Use tape or other impenetrable sealant to seal barrier wall seams, cracks around window and door frames, exhaust system ductwork, pipes, joints and ducts. Use of spray glue is not acceptable to be used inside of the building.
- F. Cubes
1. Mini-containments (pop-up cubes) which are designed to have at most 1-2 people are means of control to access attic spaces, wall spaces and subfloor spaces usually at defined entry points such as access hatches or above a drop-in ceiling system. Cubes are reviewed and approved by the University's Representative on a case by case basis.
- G. Glove Boxes
1. A glove box can be used for some work where a HEPA filtered vacuum is attached to the glove box when a small area of work is to be performed. A glove bag is attached to the box enclosure to allow the worker to make small openings by drilling or cutting within the negative pressure glove box. Glove boxes are reviewed and approved by the University's Representative on a case by case basis.
- H. Shrouded tools
1. Shrouded tools can be used for some work. A HEPA (DOP Tested) filtered vacuum is attached to the shroud. Shrouded tools are reviewed and approved by the University's Representative on a case by case basis.
- 3.03 NEGATIVE AIR CRITERIA
- A. Under no circumstances shall the HEPA filtered air be discharged into existing HVAC returns, exhaust ducting or building plenum spaces.

- B. When the air from the HEPA filtered negative air unit exhaust cannot be directed outside of the building due to no windows in the vicinity of the work or if impractical, all HEPA filtered negative air units shall be exhausted to a location agreeable to the PM. Each HEPA unit shall be plugged into a separate electrical circuit to provide temporary redundancy should one unit fail or due loss of electrical power. The PO&M Electrical shop shall inspect and test each circuit connected to the HEPA negative air unit prior to use.
- C. When the air from the negative air units is exhausted inside of the building, the exhaust air from negative air unit shall be directed into a "diffusion cube" constructed of pleated filters to disperse the air in a manner that does not raise dust or blow air directly onto patients, staff or visitors. The **Contractor** shall consider and install charcoal filters in the negative air units to control smells/odors associated with the construction.
- D. Negative air units shall be positioned as far from the entry ante room containment as possible for distribution of air flow throughout the project area. The number of negative air units shall be to provide sufficient negative pressure and for a minimum of at least four (4) air changes per hour of the volume of the entire work containment.
- E. Dual HEPA Units operating in parallel may be required for redundancy in high-risk areas.
- F. DOP testing of HEPA equipment
 - 1. Negative air units and HEPA filtered vacuums are to be challenge tested onsite by the DOP test method by a third party prior to being placed in service, after a HEPA filter change, when dropped or damaged or moved from the project site. Only HEPA systems that pass the challenge DOP testing can be used on the project. All HEPA equipment shall be tested per ANSI/ASME N510 Section 10 to ensure 99.97% efficiency at 0.3 micrometer mean aerodynamic diameter.
 - 2. The entire piece of HEPA equipment shall be challenge tested, not just the filter media. The University's Consultant or EH&S shall witness the HEPA challenge testing procedure in entirety. Once the HEPA system passes the challenge testing and passes, the HEPA equipment may be used at the location tested for a period not to exceed one year. The testing label shall remain on the HEPA equipment and remain legible. Re-testing of the HEPA equipment is required annually, if the piece of equipment is transported out of the building to another building location on the campus, if dropped, or otherwise subjected to forces that might unseat the HEPA filter, damaged by water or laceration of the filter or if HEPA filter maintenance or adjustments are performed.
 - 3. When utilizing HEPA Filtered Vacuums for glove boxes or shrouded tools these HEPA Vacuums must be DOP tested.

3.04 NEGATIVE AIR MONITORING CRITERIA

- A. Fully Monitored Negative Air Maintaining -0.020" Water Column (in-WC)
 - 1. Build containment with negative air machines capable of maintaining a pressure differential of -0.020 in-WC across all critical barriers
 - 2. Demonstrate negative pressure is achieved continuously (24/7) by means of an electronic manometer sensitive to measure down to -0.020" wp. An Omniguard IV recording manometer is recommended as the standard instrument for containment

pressure monitoring, but other electronic manufactured models with similar sensitivities at low pressures and recording capabilities are acceptable.

B. Hybrid Monitoring and Visual Verification

1. Build containment with negative air machines capable of maintaining a pressure differential of -0.020 in-WC across all critical barriers.
2. During the course of construction, the scope of work may dictate removal of work (e.g. Ceilings or drywall) that would make it difficult to maintain -0.02 in-WC of negative pressure. During working hours Visual Verification of negative pressure may be used in lieu of the -0.02 in-WC requirement with electronic monitoring.
3. At the end of shift all openings must be sealed to bring the containment back to the -0.020 in-WC requirement.

C. Visual Verification

1. The containment shall be visually inspected to verify the plastic is bowed inward to the project area. Tell tail ribbon may also be used to confirm negative pressurization. Visual Verification of negative pressure without the use of a manometer shall be performed upon first entry to the work area, during the course of the work, especially if there are any changes to the work space that may change the negative pressure, prior to taking any breaks and at the end of the work period.

3.05 ADDITIONAL CONTAINMENT CRITERIA

A. Ante Room

1. An ante room is a separate chamber attached to the containment area with zippered doors to allow entry and exit into the containment area. Entry into the containment area shall be only via the ante room. The ante room is commonly constructed of zip poles or equivalent, plastic and tape. The ante room is sized for each project to allow workers and equipment to be moved into and out of the containment area. A sticky mat is required in the ante room for workers and carts on wheels to use when exiting the ante room from the containment area. The zippered doors are to remain closed or adjusted slightly open as necessary to allow negative pressure to be maintained at least -0.020 in-WC.
2. The ante room shall have a sticky mat present which is intended to remove any debris from the bottom of work shoes before leaving the ante room into the public area. The sticky mat is not intended to clean debris from the bottom of disposable coveralls or from booties. The sticky mat layers shall be replaced many times during a work shift when work involves movement of many workers and supplies out of the containment area. The **Contractor** is responsible for removing a dirty sticky mat and replacing it with a clean one when it is necessary.
3. Workers entering into the containment area will put on a full body disposable coverall with booties inside of the ante room before entering the containment area. Entry into the ante room requires one of the two zippered doors to be opened at one time to maintain the required negative pressure. After entering the ante room, the zipper shall be closed before leaving the ante room into the containment area.

B. Air Scrubbing

1. The **Contractor** shall place additional HEPA filtered fan units (negative air unit) inside of the project work area and operate them in recirculation mode or "scrub mode" near the final cleaning phase of the project to aide in additional particulate cleaning of the space. These units will circulate air internal to the containment area and scrub the air to reduce the total airborne particle concentrations inside of the containment area.

C. Disposable Coveralls and Booties

1. Disposable coveralls are required in all Class IV containment areas and selected to provide protection of street clothes from particulates generated inside of the

containment area. Disposable coveralls shall be changed if they become ripped and are no longer serviceable.

2. Proper use of the disposable coveralls, booties and use of the sticky mat shall be followed at all times for all workers and UC Davis Health employees, when it is required by the ICRA Permit. At no time shall workers leave the containment area wearing disposable coveralls and booties. They are to be removed in the ante room or immediately in front of the ante room within the containment area if it is free and clean of debris. The workers shall remove all disposable coveralls and booties and place them in the plastic garbage bag and leave the ante room after walking on the sticky mat.

3.06 CONTAINMENT SET UP

- A. Notify University's Representative forty-eight (48) hours prior to containment set up.
- B. Build containment in compliance with ICRA, drawings and plans.
- C. Notify University's Representative and EH&S for inspection prior to start of work. Before any demolition or construction begins, all Protection Areas (infection control areas), control measures put in place and work plan by the **Contractor** will be inspected by the University's Environmental Health & Safety Personnel, or by a designated representative of the University. Work cannot begin until the containment area has been inspected and approved, meeting all of the provisions of the ICRA Permit.

3.07 REMOVAL OF CONTAINMENT

- A. Provide thorough cleaning of existing surfaces, which become exposed to dust, before leaving the containment area and before allowing staff and the public access to the project area.
- B. Final cleaning of the containment area requires diligent HEPA vacuuming of all horizontal surfaces and wet wiping all surfaces. Clean towels, sponges, cloth rags or other means shall be used with clean water to effectively clean all surfaces within the containment area. Use of a measured solution of an EPA Listed Germicide is required as part of the final detail cleaning.
- C. Additional HEPA filtered negative air units may be installed for scrubbing of particles (see 3.05 B).
- D. Coordinate with the University's Representative to call for a final visual inspection of the containment area. The final visual inspection will be made after the **Contractor** has thoroughly cleaned the entire containment area. The **Contractor** will be allowed to remove the containment barriers after the interior has passed the visual inspection for cleanliness.
- E. Particle count assessment may be made inside of the containment area by the University's Representative as part of the final visual inspection process in addition to the final visual inspection. Particle testing will include testing the airborne concentration of various particle sizes compared to the concentration outside of the containment area. If particle counts inside of the containment area are significantly greater than outside of the containment area, the **Contractor** shall continue to scrub the air inside of the project area with HEPA filtered negative air units and conduct additional surface cleaning until subsequent particle testing has demonstrated particle concentrations inside of the containment area are not

significantly greater than particle concentrations immediately outside of the containment area.

3.08 ENTRY/EGRESS

- A. Entry into the project containment area shall be through the ante room. Entry into the ante room requires one of the two zippered doors to be opened at one time to maintain the required negative pressure. After entering the ante room, the zipper shall be closed before leaving the ante room into the containment area. Equipment and supplies brought into the containment area shall be in sealed leak tight containers inside of rolling covered carts. Equipment, tools and supplies brought into the building shall be clean and free of dust, debris, mold and other contaminants. Cardboard products shall not be brought into the containment area if they are water damaged or have suspect mold growth.
- B. All HEPA equipment when transported into and out of the containment area shall be cleaned of all debris on the surfaces and shall have the intake openings sealed with plastic and duct tape.
- C. All workers leaving the containment area shall leave in clean clothes. At no time shall disposable coveralls or booties be worn when leaving the containment area through the anteroom into the public area. The workers shall clean all gross particulate debris from the coveralls using a HEPA filtered vacuum. Disposable coveralls can be taken off after gross debris has been removed from the disposable coveralls. The worker shall remove the disposable coverall inside of the ante room by rolling the disposable coverall inside out and then place it into a garbage container (plastic bag) located inside of the ante room or just inside of the project work area.
- D. All equipment and supplies leaving the containment area shall be cleaned of all dust and debris before leaving the containment area. Removal of supplies, materials and waste debris from the containment area shall be using tightly covered containers/carts that contain the waste material. The wheels of carts shall be cleaned on a frequent schedule to minimize track-out of debris as they are removed from the containment area. All waste material shall be in sealed leak tight containers. If plastic bags are used, they shall be 6 mil thick at a minimum.

3.09 ENFORCEMENT

- A. Failure to maintain required containment will result in issuance of written warning; if situation is not corrected within eight (8) hours of receipt of warning, University will have cause to stop the work as provided in Article 2.1 (if Brief Form) or 2.3 (if Long Form) of the General Conditions. Any egregious violation of safety requirements shall be grounds for Immediate Work Stoppage.

3.10 Refer to the following Attachments

- A. Infection Control Risk Assessment (ICRA) with Matrix of Precautions for Construction & Renovation: 3 Pages.
- B. Infection Control Construction Permit: 1 Page.
- C. UCDH Construction Dust & Hazardous Materials Inspection Worksheet: 1 Page.
- D. ICRA Permit Extension Request and Instructions: 2 Pages.

- E. UC Davis Health Construction Dust Infection Prevention Best Practice Standard: 23 Pages including.
1. Appendix A: Inspection Documentation Form and Daily Inspection Log.
 2. Appendix B: Entry Warning Sign with Project Manager Contact.
 3. Appendix C: Staff Education Poster.

END OF SECTION 01 56 10

BASIC PROJECT INFORMATION

Project Name:	Project Number:	Today's Date	
Impacted Department(s):	Building Number and Name:	Floor:	Suite/Room:
Estimated Construction Start Date:		Estimated Completion Date:	
UCDH Project Manager:	UCDH PM Mobile Phone #:	UCDH PM Email:	
Construction Manager:	CM Mobile Phone:	CM Mobile Email:	

GENERAL PROJECT SCOPE

(This area is intentionally left blank for project scope details.)

ATTACH DESCRIPTIVE PROJECT SCHEMATIC OR IMAGE TO PACKET

MULTIDISCIPLINARY TEAM

Identify the multidisciplinary team that was included in the review of this packet and agree with the requirements identified within the packet.

Department	Name	Email
UCDH Project Manager		
Fire Marshal's Office		
Infection Prevention		
Environmental Health & Safety		
Contractor Representative		
Other Multidisciplinary Team Members		

INFECTION CONTROL RISK ASSESSMENT

Step One: Using the table, identify the Construction Project Activity Type (A-E).

Type A <input type="checkbox"/>	<p>Inspection and non-invasive activities. Includes but is not limited to:</p> <ul style="list-style-type: none"> • Removal of ceiling tile for visual inspection-limited to 1 tile per 50 square feet with limited exposure time. • Limited building system maintenance (e.g., pneumatic tube station, HVAC system, fire suppression system, electrical and carpentry work to include painting without sanding) that does not create dust or debris. • Clean plumbing activity limited in nature.
Type B <input type="checkbox"/>	<p>Small-scale, short duration activities that create minimal dust and debris. Includes but is not limited to:</p> <ul style="list-style-type: none"> • Work conducted above the ceiling (e.g., prolonged inspection or repair of firewalls and barriers, installation of conduit and/or cabling, and access to mechanical and/or electrical chase spaces). • Fan shutdown/startup. • Installation of electrical devices or new flooring that produces minimal dust and debris. • The removal of drywall where minimal dust and debris is created. • Controlled sanding activities (e.g., wet or dry sanding) that produce minimal dust and debris.
Type C <input type="checkbox"/>	<p>Large-scale, longer duration activities that create a moderate amount of dust and debris. Includes but is not limited to:</p> <ul style="list-style-type: none"> • Removal of preexisting floor covering, walls, casework or other building components. • New drywall placement. • Renovation work in a single room. • Nonexistent cable pathway or invasive electrical work above ceilings. • The removal of drywall where a moderate amount of dust and debris is created. • Dry sanding where a moderate amount of dust and debris is created. • Work creating significant vibration and/or noise. • Any activity that cannot be completed in a single work shift.
Type D <input type="checkbox"/>	<p>Major demolition and construction activities. Includes but is not limited to:</p> <ul style="list-style-type: none"> • Removal or replacement of building system component(s). • Removal/installation of drywall partitions. • Invasive large-scale new building construction. • Renovation work in two or more rooms.
Type E <input type="checkbox"/>	<p>Exterior Construction typical activities. include, but are not limited to:</p> <ul style="list-style-type: none"> • Excavation, Trenching, Grading, Boring, Pile Driving, Demolition • Asphalt, Concrete, Stucco, Scaffolding • Roofing • Window washing, Caulking, Tuckpointing, Cleaning, Painting • Landscaping, Planting

Explain this Reasoning for this Assessment:

Step Two: Using the table below, identify the Patient Risk Group(s) that will be affected. If more than one risk group will be affected, select the higher risk group.

Low Risk Non-patient care areas such as:	Medium Risk Patient care support areas such as:	High Risk Patient care areas such as:	Highest Risk Procedural, invasive, sterile support and highly compromised patient care areas such as:
<input type="checkbox"/> Office areas not on clinical units <input type="checkbox"/> Breakrooms not on clinical units <input type="checkbox"/> Bathrooms or locker rooms not on clinical units <input type="checkbox"/> Mechanical rooms not on clinical units <input type="checkbox"/> EVS closets not on clinical units <input type="checkbox"/> Corridors and gathering areas not near clinical units	<input type="checkbox"/> Waiting / Lobby areas <input type="checkbox"/> Clinical engineering <input type="checkbox"/> Materials management <input type="checkbox"/> Sterile processing department - dirty side <input type="checkbox"/> Cafeteria, gift shop, coffee shop, and food kiosks <input type="checkbox"/> Public hallways and gathering areas near clinical units	<input type="checkbox"/> Patient care rooms and areas <input type="checkbox"/> All acute care units <input type="checkbox"/> Emergency department <input type="checkbox"/> Employee health <input type="checkbox"/> Pharmacy: General Work Zone <input type="checkbox"/> Medication rooms and clean utility rooms <input type="checkbox"/> Imaging suites: diagnostic imaging <input type="checkbox"/> Laboratory <input type="checkbox"/> Kitchen	<input type="checkbox"/> All transplant and intensive care units <input type="checkbox"/> All oncology units and other areas with severely immunocompromised patients <input type="checkbox"/> OR theaters and restricted areas <input type="checkbox"/> Procedural suites <input type="checkbox"/> Pharmacy compounding <input type="checkbox"/> Sterile processing department: Clean side <input type="checkbox"/> Transfusion services <input type="checkbox"/> Dedicated isolation units and isolation rooms <input type="checkbox"/> Imaging suites: invasive imaging <input type="checkbox"/> Dialysis unit

Describe key patient risks:

Step Three: Match the Patient Risk Group (Low, Medium, High, Highest) from Step Two with the planned Construction Activity Project Type (A, B, C, D, E) from Step One using the table below to find the Class of Precautions (I, II, III, IV or V) or level of infection control activities required. The activities are listed in the table below – Minimum Required Infection Control Precautions by Class.

Patient Risk Group	Construction Project Activity Type				
	TYPE A	TYPE B	TYPE C	TYPE D	TYPE E
LOW Risk	<input type="checkbox"/> I	<input type="checkbox"/> II	<input type="checkbox"/> II	<input type="checkbox"/> III*	<input type="checkbox"/> Exterior
MEDIUM Risk	<input type="checkbox"/> I	<input type="checkbox"/> II	<input type="checkbox"/> III*	<input type="checkbox"/> IV	
HIGH Risk	<input type="checkbox"/> I	<input type="checkbox"/> III	<input type="checkbox"/> IV	<input type="checkbox"/> V	
HIGHEST Risk	<input type="checkbox"/> III	<input type="checkbox"/> IV	<input type="checkbox"/> V	<input type="checkbox"/> V	

All construction and maintenance activities as defined in Step 1 require a permit and approval unless the work does not expose patients or employees and the ICRA Committee determines there is no appreciable risk to patients for acquired infection due to the project. Such decisions must be documented.

Environmental conditions that could affect human health, such as sewage, Mold, asbestos, gray water, and black water will require Class of Precautions IV for LOW and MEDIUM Risk Groups and Class of Precautions V for HIGH and HIGHEST Risk Groups.

Class III* Precautions - Type C [Medium Risk groups] and Type D [Low Risk Groups] work areas that cannot be sealed and completely isolated from occupied patient care spaces should be elevated to include negative air exhaust requirements as listed in Class IV Precautions.

Surrounding Area Assessment

Step Four: Assess potential risk to areas surrounding the project. Using the table below, identify the surrounding areas that will be affected and the type of impact that will occur. If more than one risk group is impacted, select the higher risk group using Step 2 - Patient Risk Group.

Unit Location:	Below	Above	Lateral	Behind	Front
Unit Name:					
Risk Group:					
Unit Contact:					
Phone:					
Email:					
Additional Controls:	<input type="checkbox"/> Noise <input type="checkbox"/> Vibration <input type="checkbox"/> Dust control <input type="checkbox"/> Ventilation <input type="checkbox"/> Pressurization	<input type="checkbox"/> Noise <input type="checkbox"/> Vibration <input type="checkbox"/> Dust control <input type="checkbox"/> Ventilation <input type="checkbox"/> Pressurization	<input type="checkbox"/> Noise <input type="checkbox"/> Vibration <input type="checkbox"/> Dust control <input type="checkbox"/> Ventilation <input type="checkbox"/> Pressurization	<input type="checkbox"/> Noise <input type="checkbox"/> Vibration <input type="checkbox"/> Dust control <input type="checkbox"/> Ventilation <input type="checkbox"/> Pressurization	<input type="checkbox"/> Noise <input type="checkbox"/> Vibration <input type="checkbox"/> Dust control <input type="checkbox"/> Ventilation <input type="checkbox"/> Pressurization
Impact on other systems, such as:	<input type="checkbox"/> Data <input type="checkbox"/> Mechanical <input type="checkbox"/> Med Gases <input type="checkbox"/> Water Systems	<input type="checkbox"/> Data <input type="checkbox"/> Mechanical <input type="checkbox"/> Med Gases <input type="checkbox"/> Water Systems	<input type="checkbox"/> Data <input type="checkbox"/> Mechanical <input type="checkbox"/> Med Gases <input type="checkbox"/> Water Systems	<input type="checkbox"/> Data <input type="checkbox"/> Mechanical <input type="checkbox"/> Med Gases <input type="checkbox"/> Water Systems	<input type="checkbox"/> Data <input type="checkbox"/> Mechanical <input type="checkbox"/> Med Gases <input type="checkbox"/> Water Systems
Notes:					

Were there discoveries in surrounding areas that would serve as cause to increase the class of precautions and necessitate additional controls? If so, please summarize.

NOISE AND VIBRATION ASSESSMENT

Type	Suggested Control Measures
<input type="checkbox"/> Drilling <input type="checkbox"/> Heavy Equipment <input type="checkbox"/> Motors <input type="checkbox"/> Pounding <input type="checkbox"/> Grinding <input type="checkbox"/> Other: Click or tap here to enter text.	<input type="checkbox"/> Required for high-impact activities – Notify PO&M, Building Coordinator and EH&S <input type="checkbox"/> Always consider using Engineering solutions before using Personal Protective Equipment. <input type="checkbox"/> Coordinate disruption plan with PO&M and other stakeholders as necessary <input type="checkbox"/> Deploy noise dampening blankets or other similar equipment <input type="checkbox"/> Use tools or alternative methods designed to minimize noise and vibrations <ul style="list-style-type: none"> <input type="checkbox"/> Use diamond drills instead of powder-actuated fasteners <input type="checkbox"/> Use beam clamps instead of shot <input type="checkbox"/> Prefab where possible <input type="checkbox"/> Use tin snips to cut metal studs instead of using a chop saw <input type="checkbox"/> Install metal decking with vent tabs, then use cellular floor deck hangers <input type="checkbox"/> Consider pro-press instead of soldering, brazing, or welding <input type="checkbox"/> Wet core drill instead of dry core or percussion <input type="checkbox"/> Instead of jackhammering concrete, use wet diamond saws <input type="checkbox"/> Use HEPA vacuums instead of standard wet/dry vacuums <input type="checkbox"/> Use mechanical joining system sprinkler fittings instead of threaded <input type="checkbox"/> Where fumes are tolerated, use chemical adhesive remover instead of mechanical <input type="checkbox"/> To remove flooring, shot blast instead of using a floor scraper <input type="checkbox"/> Use electric sheers instead of reciprocating saw for ductwork cutting. <input type="checkbox"/> Install exterior man/material lifts. <input type="checkbox"/> Provide staff and/or patients with noise-reducing protective equipment (e.g., ear plugs) <input type="checkbox"/> Relocate members/staff to another area of the facility for the duration of the activity <input type="checkbox"/> Notify affected areas before noise or vibration-producing activity <input type="checkbox"/> Schedule activities during hours that minimize patient, visitor, and staff impact. Hours: Click or tap here to enter text. <input type="checkbox"/> Other: Click or tap here to enter text.

AIR QUALITY IMPACT

Type	Suggested Control Measures
<input type="checkbox"/> Dust <input type="checkbox"/> Chemical (VOC) <input type="checkbox"/> Fugitive Emissions (Fumes) <input type="checkbox"/> Potential Mold <small>Note: If Mold is encountered, follow work practices outlined in the General Requirements Division 1 Section 01561 Document.</small> <input type="checkbox"/> Asbestos <input type="checkbox"/> Paint Solvent/Cleaner <input type="checkbox"/> Roofing Tar <input type="checkbox"/> Other: Click or tap here to enter text.	<input type="checkbox"/> Restrict/shut down air handlers for the duration of activity <input type="checkbox"/> Install temporary partitions <input type="checkbox"/> Install charcoal filters in HVAC or portable units <input type="checkbox"/> Install temporary ductwork and portable units <input type="checkbox"/> Prohibit idling of heavy equipment engines <input type="checkbox"/> Provide local exhaust ventilation <input type="checkbox"/> Substitute material with low VOC product <input type="checkbox"/> Notify area staff and EH&S before construction activity that may impact air quality <input type="checkbox"/> Provide negative pressure/HEPA filtration <input type="checkbox"/> Exhaust HEPA–99.97% to exterior <input type="checkbox"/> Relocate members/staff to another area of the facility for the duration of the activity <input type="checkbox"/> Schedule activities during hours that minimize patient, visitor, and staff impact. Hours: Click or tap here to enter text. <input type="checkbox"/> Provide Safety Data Sheets to EH&S for other recommended actions <input type="checkbox"/> Other: Click or tap here to enter text.

HAZARDOUS MATERIALS

A determination regarding the presence of hazardous materials in all UCDH buildings must be made before a project starts. This can be accomplished by existing surveys that identify the presence of hazardous materials or by hiring a consultant to perform a hazardous materials assessment of the areas that the project will impact. All impacted Hazardous Materials must be handled per the appropriate control measures.

Note: A Certified Asbestos Consultant must have conducted an asbestos survey before any demolition or renovation activity. There are no exceptions based on the date of construction or the facility's age.

ACKNOWLEDGEMENT OF HAZARDOUS MATERIALS

Does the project contact hazardous materials (e.g., asbestos, lead, mold, PCBs, mercury)?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
How was this verified?	<input type="checkbox"/> Hazmat Survey	<input type="checkbox"/> Personal Knowledge	
	<input type="checkbox"/> Other:		
Who verified this information?	<input type="checkbox"/> Company:		
	<input type="checkbox"/> Person and Department:		
	<input type="checkbox"/> Other:		
Hazardous Materials Present in Project Work Area	Required Control Measures		
<input type="checkbox"/> Asbestos <input type="checkbox"/> Lead <input type="checkbox"/> PCBs <input type="checkbox"/> Universal Waste <input type="checkbox"/> Other: Click or tap here to enter text.	Follow work practices outlined in the General Requirements Division 1 Document.		

CONTAINMENT REQUIREMENTS WORKSHEET

Containment Barrier	Where construction will impact fire-rated assemblies, the contractor is responsible for constructing interim assemblies and barriers that maintain the integrity of the structure's fire-rated system. Note: Interim Life Safety Measures may be required.		
	<input type="checkbox"/> Full Containment (poly over all surfaces within containment)		
	<input type="checkbox"/> The ceiling plenum within the work area shall be isolated and sealed by fire-rated six mil. poly		
	<input type="checkbox"/> Hard Barriers are recommended for work lasting greater than 30 days and in high-traffic areas.		
	<input type="checkbox"/> Fire retardant plastic barriers are recommended for work lasting less than 30 days. Plastic Barriers cannot be used where hot work will be performed.		
	<input type="checkbox"/> Isolated Room – Critical Openings Only (seal doors, supply and return registers, etc.)		
	<input type="checkbox"/> Prefabricated Containment Cube (only large enough for 1-2 people; aka pop-up cube or Mini Cube)		
	<input type="checkbox"/> Shrouded Tool with HEPA filtered exhaust		
<input type="checkbox"/> Glove Box Containment with HEPA filtered exhaust			
<input type="checkbox"/> Other:			
Negative Pressure	The contractor is required to maintain and document negative air pressure. DOP Tested HEPA-filtered negative air machines (with a minimum of 99.97% efficiency) and a rating of 200 to 2000 cubic feet per minute (CFM) is required for construction activities.		
	<input type="checkbox"/> -0.020" WC always displayed on a mounted digital manometer		
	<input type="checkbox"/> -0.020" WC at setup with negative pressure throughout the project as displayed on the manometer		
	<input type="checkbox"/> Visual Verification of some negative room pressure throughout the project		
	<input type="checkbox"/> No negative room pressure required		
	<input type="checkbox"/> Negative pressure in localized HEPA exhausted work area (e.g., shrouded tool, glove box)		
	<input type="checkbox"/> Additional Ante room under negative pressure		
<input type="checkbox"/> Other:			
Air Exhaust	<input type="checkbox"/> Air exhausted directly outside - Avoid exhausting air near air intakes or operable windows doors, and avoid exhausting air near walkways		
	<input type="checkbox"/> For air exhausted inside, check any of the following conditions that are required:		
	<input type="checkbox"/> Additional Filtration (ex. Charcoal, Diffuser system)		
	<input type="checkbox"/> Exhaust into Ducts/HVAC system – Mechanical engineer must confirm that exhausted air will not negatively impact the air balance of the existing system		
	<input type="checkbox"/> Onsite Challenge Testing (DOP or particle counting) before containment setup		
<input type="checkbox"/> Challenge Tested within last six months; Equipment has remained onsite at UCDH			
Additional Containment Requirements	<input type="checkbox"/> Ante Room	<input type="checkbox"/> Masonite Floor Protection	<input type="checkbox"/> Protective Clothing
	<input type="checkbox"/> Walk Off Mats	<input type="checkbox"/> Shoe Covers	<input type="checkbox"/> Collect Samples During Work
	<input type="checkbox"/> Other:		
Verification of Work	<input type="checkbox"/> HEPA Equipment Verification	<input type="checkbox"/> EH&S <input type="checkbox"/> Consultant <input type="checkbox"/> Other:	
	<input type="checkbox"/> Pre-Work Approval Inspection	<input type="checkbox"/> PM <input type="checkbox"/> EH&S <input type="checkbox"/> Consultant <input type="checkbox"/> IOR <input type="checkbox"/> Other:	
	<input type="checkbox"/> Daily Onsite Oversight	<input type="checkbox"/> PM <input type="checkbox"/> EH&S <input type="checkbox"/> Consultant <input type="checkbox"/> IOR <input type="checkbox"/> Other:	
	<input type="checkbox"/> Post Demolition/Abatement Inspection	<input type="checkbox"/> PM <input type="checkbox"/> EH&S <input type="checkbox"/> Consultant <input type="checkbox"/> IOR <input type="checkbox"/> Other:	
	<input type="checkbox"/> ICRA Downgrade	<input type="checkbox"/> PM <input type="checkbox"/> EH&S <input type="checkbox"/> Consultant <input type="checkbox"/> IOR <input type="checkbox"/> Other:	
	<input type="checkbox"/> Final Visual Containment Inspection	<input type="checkbox"/> PM <input type="checkbox"/> EH&S <input type="checkbox"/> Consultant <input type="checkbox"/> IOR <input type="checkbox"/> Other:	
	<input type="checkbox"/> Air Sampling	<input type="checkbox"/> EH&S <input type="checkbox"/> Consultant <input type="checkbox"/> Other:	
Air Sampling	<input type="checkbox"/> Particle Counting <input type="checkbox"/> Mold <input type="checkbox"/> Asbestos <input type="checkbox"/> Other:		Frequency:
Air Balance in Adjacent Areas:	The contractor is responsible for maintaining air balance in adjacent <u>high</u> and <u>highest-risk areas</u> per design/ASHRAE guidelines. Contact PO&M to verify the air balance requirements of surrounding areas.		
	Adjacent High/Highest Risk Areas		Air Balance Requirements
			Positive/negative pulldown

		Positive/negative pulldown
ICRA Permit Number		ICRA Class
23-00001		Choose an item.

Project Number:		Project Name:	
Impacted Department:	Building Number and Name:	Floor:	Suite/Room:
UCDH Project Manager:	UCDH PM Mobile Phone #:	UCDH PM Email:	
Construction Manager:	CM Mobile Phone:	CM Mobile Email:	
General Contractor:	General Contractor Mobile Phone:	General Contractor Mobile Email:	
Containment will be set up and maintained by:		Third-Party Containment Consultant:	

ICRA Class Choose an item.		Project Start Date	Completion Date
Additional Requirements			
Signatures	Project Manager	General Contractor	Infection Control and Prevention
Downgrade Request – ICRA Class Choose an item.		Project Start Date	Completion Date
Additional Requirements			
Signatures	Project Manager	General Contractor	Infection Control and Prevention
Extension Request – ICRA Class Choose an item.		Project Start Date	Completion Date
Additional Requirements			
Signatures	Project Manager	General Contractor	Infection Control and Prevention

INFECTION PREVENTION REQUIREMENTS - CLASS I

Prior to and During Construction:	<ul style="list-style-type: none"> • Perform noninvasive work activity as to not block or interrupt patient care. • Perform noninvasive work activities in areas that are not directly occupied with patients. • Perform noninvasive work activity in a manner that does not create dust. • Immediately replace any displaced ceiling tile before leaving the area and/or at end of noninvasive work activity.
Upon Completion of Work:	<p>Cleaning</p> <ul style="list-style-type: none"> • Clean work areas including all environmental surfaces, high horizontal surfaces and flooring materials. • Check all supply and return air registers for dust accumulation on upper surfaces as well as air diffuser surfaces. <p>HVAC Systems</p> <ul style="list-style-type: none"> • Remove isolation of HVAC system in areas where work is being performed. Verify that HVAC systems are clean and operational. • Verify the HVAC systems meet original airflow and air exchange design specifications.
	<p>Additional Infection Prevention Requirements:</p>

INFECTION PREVENTION REQUIREMENTS - CLASS II

Prior to and During Construction:	<ul style="list-style-type: none"> • Perform only limited dust work and/or activities designed for basic facilities and engineering work. • Perform limited dust and invasive work following standing precautions procedures approved by the organization. • This Class of Precautions must never be used for construction or renovation activities.
Upon Completion of Work:	<p>Cleaning:</p> <ul style="list-style-type: none"> • Clean work areas including all environmental surfaces, high horizontal surfaces, and flooring materials. • Check all supply and return air registers for dust accumulation on upper surfaces as well as air diffuser surfaces. <p>HVAC Systems:</p> <ul style="list-style-type: none"> • Remove isolation of the HVAC system in areas where work is being performed. Verify that HVAC systems are clean and operational. • Verify the HVAC systems meet original airflow and air exchange design specifications.
	<p>Additional Infection Prevention Requirements:</p>

INFECTION PREVENTION REQUIREMENTS - CLASS III

Prior to and During Construction:	<ul style="list-style-type: none"> • Provide active means to prevent airborne dust dispersion into the occupied areas. • Means for controlling minimal dust dispersion may include hand-held HEPA vacuum devices, polyethylene plastic containment, or isolation of work area by closing room door. • Remove or isolate return air diffusers to avoid dust from entering the HVAC system. • Remove or isolate the supply air diffusers to avoid positive pressurization of the space, • If work area is contained, then it must be neutrally to negatively pressurized at all times. *If negative pressure is required, see additional requirements below. • Seal all doors with tape that will not leave residue • Contain all trash and debris in the work area. • Nonporous/smooth and cleanable containers (with a hard lid) must be used to transport trash and debris from the construction areas. These containers must be damp-wiped cleaned and free of visible dust/debris before leaving the contained work area. • Install a sticky (dust collection) mat at entrance of contained work area based on facility policy. Sticky mats must be changed routinely and when visibly soiled. • Maintain clean surroundings when area is not contained by damp mopping or HEPA vacuuming surfaces. <p>Additional requirements for Class III containments that require negative pressure:</p> <ul style="list-style-type: none"> • Maintain negative pressurization of the entire workspace by use of HEPA exhaust air systems directed outdoors. Exhaust discharged directly to the outdoors that is 25 feet or greater from entrances, air intakes and windows requires the highest degree of filtration feasible. • If exhaust is directed indoors, then the system must be HEPA filtered. Prior to start of work, HEPA filtration must be verified by particulate measurement as no less than 99.97% efficiency and must not alter or change airflow/pressure relationships in other areas. • Exhaust into shared or recirculating HVAC systems, or other shared exhaust systems (e.g., bathroom exhaust) is not acceptable. • Install digital monitoring manometer with one thousandth of inch of water pressure (eg. - 0.024) exterior of work containment to continually monitor negative pressurization. The non-digital manometer monitors are not acceptable.
Upon Completion of Work:	<p>Cleaning:</p> <ul style="list-style-type: none"> • Clean work areas including all environmental surfaces, high horizontal surfaces, and flooring materials. • Check all supply and return air registers for dust accumulation on upper surfaces as well as air diffuser surfaces. <p>HVAC Systems:</p> <ul style="list-style-type: none"> • Remove isolation of the HVAC system in areas where work is being performed. Verify that HVAC systems are clean and operational. • Verify the HVAC systems meet original airflow and air exchange design specifications. <p>Class III precautions require inspection and documentation for downgraded ICRA precautions.</p> <p>Construction areas must be inspected by the designee on the containment requirements worksheet for discontinuation or downgrading of ICRA precautions.</p> <p>Work Area Cleaning:</p>

- Clean work areas including all environmental surfaces, high horizontal surfaces and flooring materials.
- Check all supply and return air registers for dust accumulation on upper surfaces as well as air diffuser surfaces.

Removal of Critical Barriers:

- Critical barriers must remain in place during all work involving drywall removal, creation of dust and activities beyond simple touch-up work. The barrier may NOT be removed until a work area cleaning has been performed.
- All (plastic or hard) barrier removal activities must be completed in a manner that prevents dust release. Use the following precautions when removing hard barriers:
 - Carefully remove screws and painter tape.
 - If dust will be generated during screw removal, use hand-held HEPA vacuum.
 - Drywall cutting is prohibited during removal process.
 - Clean all stud tracks with HEPA vacuum before removing outer hard barrier.
 - Use a plastic barrier to enclose area if dust could be generated.

Negative Air Requirements:

- The use of negative air must be designed to remove contaminants from the work area.
- Negative air devices must remain operational at all times and in place for a period after completion of dust creating activities to remove contaminants from the work area and before removal of critical barriers.

HVAC systems:

- Upon removal of critical barriers, remove isolation of HVAC system in areas where work is being performed.
- Verify that HVAC systems are clean and operational.
- Verify the HVAC systems meets original airflow and air exchange design specifications.

Additional Infection Prevention Requirements:

INFECTION PREVENTION REQUIREMENTS - CLASS IV

Prior to and During Construction:

- Construct and complete critical barriers meeting NFPA 241 requirements. Barriers must extend to the ceiling or if ceiling tile is removed, to the deck above.
- All (plastic or hard) barrier construction activities must be completed in a manner that prevents dust release. Plastic barriers must be effectively affixed to ground and ceiling and secure from movement or damage. Apply tape that will not leave a residue to seal gaps between barriers, ceiling or floor.
- Seal all penetrations in containment barriers, including floors and ceiling, using approved materials (UL schedule firestop if applicable for barrier type).
- Containment units or environmental containment units (ECUs) approved for Class IV precautions in small areas totally contained by the unit and that has HEPA-filtered exhaust air (MiniCube Mobile Containments).
- Remove or isolate return air diffusers to avoid dust entering the HVAC system.
- Remove or isolate the supply air diffusers to avoid positive pressurization of the space.
- Negative airflow pattern must be maintained from the entry point to the anteroom and into the construction area. The airflow must cascade from outside to inside the construction area. The entire construction area must remain negatively pressurized.
- Maintain negative pressurization of the entire workspace by use of HEPA exhaust air systems directed outdoors. Exhaust discharged directly to the outdoors that is 25 feet or greater from entrances, air intakes and windows requires the highest degree of filtration feasible.
- If exhaust is directed indoors, then the system must be HEPA filtered. Prior to start of work, HEPA filtration must be verified by particulate measurement as no less than 99.97% efficiency and must not alter or change airflow/pressure relationships in other areas.
- Exhaust into shared or recirculating HVAC systems, or other shared exhaust systems (e.g., bathroom exhaust) is not acceptable.
- Install digital monitoring manometer with one thousandth of inch of water pressure (eg. - 0.024) exterior of work containment to continually monitor negative pressurization. The non-digital manometer monitors are not acceptable.
- Contain all trash and debris in the work area.
- Nonporous/smooth and cleanable containers (with a hard lid) must be used to transport trash and debris from the construction areas. These containers must be damp-wiped cleaned and free of visible dust/debris before leaving the contained work area.
- Worker clothing must be clean and free of visible dust before leaving the work area. HEPA vacuuming of clothing or use of cover suites is acceptable.
- Workers must wear shoe covers prior to entry into the work area. Shoe covers must be changed prior to exiting the anteroom to the occupied space (non-work area). Damaged shoe covers must be immediately changed.
- Install a sticky (dust collection) mat at entrance of contained work area based on facility policy. Sticky mats must be changed routinely and when visibly soiled.
- Collection of particulate data during work may be collected to assure that contaminants do not enter the occupied spaces. Routine collection of particulate samples may be used to verify HEPA filtration efficiencies. Collection of particulate data may be collected by Environmental Health and Safety or approved third party consultant.

Class IV precautions require inspection and documentation for downgraded ICRA precautions.

Construction areas must be inspected by the designee on the containment requirements worksheet for discontinuation or downgrading of ICRA precautions.

Work Area Cleaning:

- Clean work areas including all environmental surfaces, high horizontal surfaces and flooring materials.
- Check all supply and return air registers for dust accumulation on upper surfaces as well as air diffuser surfaces.

Removal of Critical Barriers:

- Critical barriers must remain in place during all work involving drywall removal, creation of dust and activities beyond simple touch-up work. The barrier may NOT be removed until a work area cleaning has been performed.
- All (plastic or hard) barrier removal activities must be completed in a manner that prevents dust release. Use the following precautions when removing hard barriers:
 - Carefully remove screws and painter tape.
 - If dust will be generated during screw removal, use hand-held HEPA vacuum.
 - Drywall cutting is prohibited during removal process.
 - Clean all stud tracks with HEPA vacuum before removing outer hard barrier.
 - Use a plastic barrier to enclose area if dust could be generated.

Negative Air Requirements:

- The use of negative air must be designed to remove contaminants from the work area.
- Negative air devices must remain operational at all times and in place for a period after completion of dust creating activities to remove contaminants from the work area and before removal of critical barriers.

HVAC systems:

- Upon removal of critical barriers, remove isolation of HVAC system in areas where work is being performed.
- Verify that HVAC systems are clean and operational.
- Verify the HVAC systems meets original airflow and air exchange design specifications.

Additional Infection Prevention Requirements:

INFECTION PREVENTION REQUIREMENTS - CLASS V

Prior to and During Construction:

- Construct and complete critical barriers meeting NFPA 241 requirements. Barriers must extend to the ceiling or if ceiling tile is removed, to the deck above.
- All (plastic or hard) barrier construction activities must be completed in a manner that prevents dust release. Plastic barriers must be effectively affixed to ground and ceiling and secure from movement or damage. Apply tape that will not leave a residue to seal gaps between barriers, ceiling or floor.
- Seal all penetrations in containment barriers, anteroom barriers, including floors and ceiling using approved materials (UL schedule firestop if applicable for barrier type).
- Construct anteroom large enough for equipment staging, cart cleaning, workers. The anteroom must be constructed adjacent to entrance of construction work area.
- Personnel will be required to wear coveralls at all times during Class V work activities. Coveralls must be removed before leaving the anteroom.
- Remove or isolate return air diffusers to avoid dust entering the HVAC system.
- Remove or isolate the supply air diffusers to avoid positive pressurization of the space.
- Negative airflow pattern must be maintained from the entry point to the anteroom and into the construction area. The airflow must cascade from outside to inside the construction area. The entire construction area must remain negatively pressurized.
- Maintain negative pressurization of the entire workspace by use of HEPA exhaust air systems directed outdoors. Exhaust discharged directly to the outdoors that is 25 feet or greater from entrances, air intakes and windows requires the highest degree of filtration feasible
- If exhaust is directed indoors, then the system must be HEPA filtered. Prior to start of work, HEPA filtration must be verified by particulate measurement as no less than 99.97% efficiency and must not alter or change airflow/pressure relationships in other areas.
- Exhaust into shared or recirculating HVAC systems, or other shared exhaust systems (bathroom exhaust) is not acceptable.
- Install digital monitoring manometer with one thousandth of inch of water pressure (eg. -0.024) exterior of work containment to continually monitor negative pressurization. The non-digital manometer monitors are not acceptable.
- Contain all trash and debris in the work area.
- Nonporous/smooth and cleanable containers (with a hard lid) must be used to transport trash and debris from the construction areas. These containers must be damp-wiped cleaned and free of visible dust/debris before leaving the contained work area.
- Worker clothing must be clean and free of visible dust before leaving the work area anteroom.
- Workers must wear shoe covers prior to entry into the work area. Shoe covers must be changed prior to exiting the anteroom to the occupied space (non-work area). Damaged shoe covers must be immediately changed.
- Install a sticky (dust collection) mat at entrance of contained work area based on facility policy. Sticky mats must be changed routinely and when visibly soiled.
- Collection of particulate data during work may be collected to assure that contaminants do not enter the occupied spaces. Routine collection of particulate samples may be used to verify HEPA filtration efficiencies. Collection of particulate data may be collected by Environmental Health and Safety or approved third party consultant.

Class IV precautions require inspection and documentation for downgraded ICRA precautions.

Construction areas must be inspected by the designee on the containment requirements worksheet for discontinuation or downgrading of ICRA precautions.

Work Area Cleaning:

- Clean work areas including all environmental surfaces, high horizontal surfaces and flooring materials.
- Check all supply and return air registers for dust accumulation on upper surfaces as well as air diffuser surfaces.

Removal of Critical Barriers:

- Critical barriers must remain in place during all work involving drywall removal, creation of dust and activities beyond simple touch-up work. The barrier may NOT be removed until a work area cleaning has been performed.
- All (plastic or hard) barrier removal activities must be completed in a manner that prevents dust release. Use the following precautions when removing hard barriers:
 - Carefully remove screws and painter tape.
 - If dust will be generated during screw removal, use hand-held HEPA vacuum.
 - Drywall cutting is prohibited during removal process.
 - Clean all stud tracks with HEPA vacuum before removing outer hard barrier.
 - Use a plastic barrier to enclose area if dust could be generated.

Negative Air Requirements:

- The use of negative air must be designed to remove contaminants from the work area.
- Negative air devices must remain operational at all times and in place for a period after completion of dust creating activities to remove contaminants from the work area and before removal of critical barriers.

HVAC systems:

- Upon removal of critical barriers, remove isolation of HVAC system in areas where work is being performed.
- Verify that HVAC systems are clean and operational.
- Verify the HVAC systems meets original airflow and air exchange design specifications.

Additional Infection Prevention Requirements:

INFECTION PREVENTION REQUIREMENTS – EXTERIOR

Prior to and During Construction:	<ul style="list-style-type: none"> • Identify and confirm fugitive fume and dust control measures are in place prior to work starting i.e., charcoal filters at air intakes, scrubbers on equipment etc. • Contractor must submit an excavation and trenching plan for review and implementation. • Install fencing, physical barriers and interior/exterior signage to re-direct pedestrian and vehicular traffic as necessary. • If locally required, validate soil survey was performed to identify potential contaminants (e.g., valley fever, radon, legionellosis, etc.). • Ensure that fugitive dust control measures are adhered to (e.g., work area is kept wet). • Validate those fumes created by equipment and material is controlled. <ul style="list-style-type: none"> o If required, install charcoal filters on air intake to building. o Maintain equipment exhaust scrubbers if working near sensitive areas or near air-intake o Minimize equipment idling • Validate barriers restricting access and signage into construction work areas are maintained.
Upon Completion of Work:	<ul style="list-style-type: none"> • Ensure all control measures are removed at completion of project.
	Additional Infection Prevention Requirements:

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PURPOSE

This document represents the minimum best practice standards to prevent the acquisition of nosocomial infection in patients due to exposure to potentially infectious or harmful dust created by construction, renovation, or maintenance activities.

Aspergillus fungal spores carried on dust particles are the most common cause of construction-related infection in healthcare settings. Overall mortality from a healthcare construction and renovation-related fungal infection is 50%. Infection due to construction in healthcare facilities is estimated to cause 5,000 deaths each year in the United States.

The Project Manager, Infection Prevention, and Environmental Health & Safety will audit performance to this standard, as amended by the needs of specific projects. All users of this standard are authorized to contact EH&S directly with questions or for consultation.

SETTING

All work has been evaluated by IP and EH&S and received an Infection Control Risk Assessment (ICRA) permit for construction, remodeling, maintenance, or repair activities at the University of California, Davis Health (UCDH) facilities. This includes external construction and work at leased facilities where owner-provided contractors are used. Work in non-patient care areas such as the School of Medicine and medical research facilities may be excluded.

This standard does not apply to projects contacting hazardous materials, such as asbestos, lead, chemical, or radioactive materials. Projects involving hazardous materials must undergo additional assessment and approval processes. If hazardous materials are discovered during work, immediately contact UCDH Environmental Health & Safety (EH&S) and Infection Prevention (IP) for additional risk assessment.

DEFINITIONS

Anteroom – a small room connected to the entrance of the negative pressure containment, used for donning/doffing protective clothing and adding a layer of insulation between the containment and hospital environment; required on Class IV and V containments.

Containment – a system of barriers and/or negative pressure equipment that isolates the construction zone air space from the adjacent hospital environment.

Critical Barrier – barrier sealed over critical openings into the work area such as HVAC vents, doorways, electrical outlets, gaps in a drop in ceilings, or other openings.

DOP test – filter challenge test; a standard recognized method to test the integrity of a HEPA filter using dispersed oil particulate (DOP) and particle counting techniques which a specialty contractor performs.

HEPA filter – High-Efficiency Particulate Air (HEPA) filter removes 99.97% of particles 0.3 micrometers and is even more efficient for particles of other sizes.

Immunocompromised – having a weakened immune response due to an infection, disease, or immunosuppressive agents such as medication or irradiation.

Infection Control Risk Assessment (ICRA) – process which evaluates patient risk due to construction activities focused on reducing the risk of infection; based on a matrix of the affected patient population and the invasiveness of the work. This assessment generates a permit issued by Infection Prevention requiring compliance with one of five precaution levels (classes). See UCDH Hospital Policy and Procedure 2004.

In writing – written, hard copy, or electronic communications. Electronic communications must be retained in the same manner as hard-copy documents.

Manometer – electronic pressure measuring instrument sensitive to measuring one-thousandth of an inch of water pressure (e.g., -0.024" wp).

Negative pressure – pressure within a system that is less than the environment that surrounds that system; having atmospheric pressure that is less than the ambient atmospheric pressure—examples: vacuum flask (thermos) interstitial space, airborne infectious agent isolation room.

Nonporous – free from minute spaces or holes (pores) where contamination may be trapped; smooth.

Nosocomial Infection – hospital-acquired infection; infection contracted from the environment, staff, or operations of a healthcare facility.

Particle Counting – method of determining ambient particulate concentrations of various sized airborne particles using a laser diode and photodetector; not specific to the nature of the sampled particle.

Poly – polyethylene sheeting; plastic film sheeting used to contain contamination.

Positive pressure – pressure within a system that is greater than the environment that surrounds that system; having atmospheric pressure that is greater than the ambient atmospheric pressure. Example: inside of an inflated balloon or tire.

Patient Care Area – a location where patient care is provided, not limited to direct treatment, and can include waiting rooms, lobbies, food service areas, and other places throughout the facility where patients may be present. Infection risks are elevated in these locations as immunocompromised patients are concentrated.

RESPONSIBILITIES

All parties to this standard must primarily act in the best interests of patients and patient care, regardless of the impact on project timelines or other constraints.

PROJECT MANAGER

The Project Manager (PM) is the Facilities Planning and Development (FP&D) or Plant Operations and Maintenance (PO&M) representative overseeing project execution. The PM oversees the Contractor or in-house personnel performing the work. A third-party construction manager may supplement the PM's duties, but the UCDH PM retains all responsibility under this best practice standard.

The project manager shall ensure the following:

- All work is performed under an approved ICRA
- An Interim Life Safety Measure (ILSM) plan is created, if necessary
- Coordination with work area stakeholders regarding the potential impacts on patient care, including the containment location, project duration, and any changes during construction
- This best practice document is followed throughout the duration of the project
- A qualified consultant is hired for projects (as determined by agreement between FP&D and EH&S) and projects which take place after hours or on weekends
- Plans and specifications (bidding documents) are developed per this best practice standard
- Containment inspectors and consultants perform to this best practice standard
- Contractor expectations are communicated in writing before the start of work
- The Contractor must comply with plan specifications and approved ICRA permit precautions.
- Routine containment inspections are performed and documented by a trained, qualified containment inspector
- Project documentation is maintained
- Containment failures or severe breaches of practice are communicated to EH&S and IP in writing as soon as possible
- Root causes of failures are determined, and corrective action is taken to prevent future episodes
- Work is stopped for excessive noise/vibration, breach of containment, non-compliance with this best practice standard, or other patient care is compromised by the work
- Environmental Services (EVS) is contacted for a terminal clean of the project area after a successful final inspection and containment dismantlement

CONTRACTOR

The Contractor is responsible for complying with all provisions of plans, specifications, and approved ICRA permit precautions to control construction dust at the project site. These provisions include witnessed DOP testing of all HEPA-filtered equipment.

The Contractor shall ensure that all site workers, including subcontractors, are knowledgeable of the requirements of plans, specifications, and approved ICRA permit precautions and the reasons for controlling construction dust. The Contractor is required to stop work at times of excessive noise or vibration when containment is breached, when this standard is not being complied with, and when directed by the PM, EH&S, or IP.

CONTAINMENT INSPECTORS

Containment inspectors may perform any of the inspections listed in the “Inspection Criteria” section except for the initial containment inspection (aka “Pre-start”). Containment inspectors must be trained by EH&S (or a qualified consultant) and report to the PM and EH&S.

ENVIRONMENTAL HEALTH AND SAFETY

Environmental Health and Safety (EH&S) is responsible for providing consulting services related to this best practice standard, auditing containment inspector and consultant performance, and updating these best practices document.

EH&S is responsible for ensuring either EH&S or the consultant performs the following:

- Witness DOP testing of HEPA-filtered equipment or perform particle count challenge testing in rare cases

- Complete site inspections according to this best practice standard (must perform the pre-start inspection and approve of the containment design)
- Audits of contractor performance, including particle counting
- Training of containment inspectors
- Environmental sampling, as needed
- Investigation of containment failures
- Stop work for excessive noise/vibration, breach of containment, non-compliance with this best practice standard, or other patient care is compromised
- Along with IP, approve any deviations to this best practice standard

INFECTION PREVENTION

The Department of Hospital Epidemiology and Infection Prevention (IP) is involved in many facets of the control and prevention of nosocomial infections at UC Davis Health System, including infections from construction dust. The IP Department reviews and approves Infection Control Risk Assessments (ICRAs) of construction projects; along with EH&S, approves temporary deviations to this best practice standard to support unique scenarios; and approves this best practice standard document. IP may audit compliance with this Standard and has the authority to stop work for: excessive noise/vibration, breach of containment, non-compliance with this standard, or other project issues compromising patient care.

ENVIRONMENTAL SERVICES

Environmental services (EVS) personnel perform terminal cleaning of project areas once containments have been removed (per UCDH Hospital Policy and Procedure). The PM must provide a 24-hour notification to EVS that terminal cleaning will be needed, in addition to notification when the containment is being removed. Note that containment removal cannot occur until the Contractor has completed a full cleaning of the containment, and the final visual inspection has passed. EVS personnel also occasionally perform final clean inspections for some work.

CONSULTANTS

Consultants retained by FP&D or PO&M provide project scoping, planning, specification, and work plan development, project monitoring for compliance with this standard, and inspection services. EH&S shall approve consultants based on education, training, and experience before beginning billable work. Consultants may only use qualified employees trained and experienced with infection prevention and construction dust control in a hospital setting. Consultants shall be directed by the PM and shall communicate with EH&S and the PM.

POLICY

All work that has received an ICRA Class III*, IV, or V permit must be completed using a negative pressure containment system to separate the construction air space from the hospital environment. This system comprises an enclosed work area and HEPA-equipped filtration units providing negative pressure to the work area. The following policies shall apply to all personnel working with negative pressure containments at UCDH facilities.

TRAINING

All personnel working with negative pressure containments shall be trained and knowledgeable in the following:

- ICRA Permit contents and requirements
- Site-Specific Containment plan
- Provisions of this best practice standard
- Requirements in Section 01561 Airborne Contaminant Control Specifications
- Infection risks associated with construction
- Methods to control the dissemination of dust and fungal spores
- Proper use of protective clothing
- Proper entry and exit procedures
- Manufacturer's requirements, where manufactured containment systems are used (e.g., cubes)
- How to respond to a loss of negative pressure or too much negative pressure
- Breach in Practice response and required notifications
- Contractors shall be additionally trained in the following:
 - Proper containment design, construction, and maintenance techniques
 - Proper load-out techniques for equipment/wastes
 - Containment cleaning regime: daily, final, and terminal cleaning
 - Containment Failure Emergencies caused by the Contractor may require retraining at the discretion of the PM, IP, or EH&S. Training is to be provided by EH&S, or an EH&S-approved training provider, such as a consultant.

EXPERIENCE

Contractors, consultants, and containment inspectors shall demonstrate the following experience requirements before performing duties under this standard.

CONTRACTORS

To be considered qualified to work with negative pressure containments, contractors must demonstrate experience by providing either of the following:

- Previously completed, documented negative pressure containment work in a healthcare facility along with an owner reference. Minimum documentation shall include project descriptions and photographs or containment schematics.
- Documentation that the contractors' proposed onsite Foreman and onsite Supervisor has successfully obtained one of the following from the American Society for Healthcare Engineering (ASHE):
 - Certified Healthcare Constructor (CHC) Certification;
 - Health Care Construction (HCC) Certificate; or
 - Managing Infection Prevention During the Construction & Operation of Health Care Facilities Course Completion

CONSULTANTS

To be considered qualified to work with negative pressure containments, consultants must demonstrate all the following:

- Hands-on oversight by a Certified Industrial Hygienist (CIH) in good standing with the American Board of Industrial Hygiene (ABIH)
- Field personnel shall be experienced in Healthcare Construction Infection Prevention and shall possess certification in good standing by Cal/OSHA as a California Certified Asbestos Consultant (CAC) or Certified Site Surveillance Technician (CSST)

- Owner references for previously completed, documented negative pressure containment oversight work in healthcare facilities

CONTAINMENT INSPECTORS

Containment inspectors may be trained in-house UCDH personnel or outside, third-party consultants. EH&S shall approve all containment inspectors before commencing inspection tasks. Approval shall include ensuring familiarity with the following:

- The operation, maintenance, and inspection of HEPA-filtered equipment
- Methods to achieve and maintain negative pressure in containments
- Methods to monitor negative pressure
- Inspection elements and documentation requirements

EQUIPMENT

Equipment used for construction containments must arrive free and clean of any debris or significant dust. Equipment that cannot be thoroughly decontaminated must arrive wrapped in 6 mil (0.006 inches) polyethylene sheeting, be used only within negative pressure containment, be wrapped before transport out of the containment, and be transported offsite in a covered cart.

All polyethylene sheeting shall be flame retardant and at least six mils thick. Waste bags shall be six mils thick.

All HEPA-filtered equipment must be tested before being utilized to ensure the integrity of the filter and housing. The equipment will be tested onsite by standard dispersed oil particulate (DOP) challenge testing using a certified independent testing contractor. In rare cases or emergencies, EH&S or an approved consultant may perform onsite particle challenge testing of HEPA-filtered equipment. A legible label indicating the date tested, testing party, and expiration date must be affixed to the equipment for it to be considered compliant with this best practice standard.

Both DOP and particle tests shall be valid for six months from the date of initial testing, provided the Contractor certifies and can verify that the machines have remained at the same building with the same filters in place since initial testing and have not been moved, modified, inverted, or roughly handled in that time. Previously tested equipment removed from the building shall be tested before being reutilized onsite.

PROCEDURE

Best practice procedures must be used wherever possible when working with negative pressure containment systems.

WORK PRACTICES

To minimize the creation of airborne dust, capture and control dust as close to the source of generation as possible. Use water mist, HEPA vacuums, vacuum tool attachments, and/or other methods to prevent the spread of dust within the containment.

Clean as you go and clean up promptly. Vacuum up dust as it is generated. Vacuum out exposed cavities as soon as they are made accessible. The Contractor shall perform daily cleaning of the containment interior by HEPA, vacuuming any noticeable dust, and bagging up debris. Do not leave debris in an unoccupied containment.

The Contractor shall inspect the containment before starting work and immediately repair any breaches, holes, or other issues.

Stop work and notify the PM immediately if unforeseen hazardous materials (including mold) are discovered during construction. This condition will warrant a reassessment of the project by IP and EH&S.

Use only tested, HEPA filter-equipped vacuums. Do not use standard shop vacuums; all vacuums without HEPA filters are dust distributors.

Avoid dry sweeping, dry shoveling, or other dry debris cleanups. Use a water mist or sweeping compound before sweeping or shoveling debris. Do not use compressed air on dust or debris.

In occupied areas, provide an effective means of diffusing the air exhausted from HEPA-filtered negative air machines.

PROTECTIVE CLOTHING

Class IV and V containments require protective clothing, including shoe covers. The purpose of this clothing is to protect street clothing from becoming contaminated during work and prevent the track out of dust.

Shoe covers may be attached to protective suits or may be worn separately. Head coverings are not required unless dust creation is expected to be extensive, as in the case of abrasive blasting or concrete coring, or head exposure is likely, as in the case of attic crawling. Protective clothing may be disposable (e.g., Tyvek suits) or reusable and regularly laundered.

Note that disposable suits are not typically fire-resistant and, therefore, not intended for hot work environments. If fire-resistive clothing is necessary, it must be brought onsite in a sealed bag, used only within containment, and re-bagged and sealed before offsite transport.

DECONTAMINATION

To avoid tracking construction dust in the hospital environment, workers and equipment must be carefully decontaminated before exiting the containment.

PERSONNEL

For exceptionally dusty work, before removing protective clothing, clean the outside surface using a HEPA equipped vacuum or damp towel/sponge frequently rinsed in clean water. Do not use disinfectants to wipe skin or protective clothing to avoid chemical hazards.

If respiratory protection is used, remove protective clothing before removing the respirator.

When removing protective clothing, roll the suit outwards and down the body such that the exterior side is rolled into itself and only the clean side of the suit is exposed. Only touch the inside (clean side) of the suit. Step out of the suit and discard it into a waste bag for disposal or a plastic bag for laundering. If shoe covers are not attached to the suit, remove them by rolling the dirty side onto itself.

Step onto the tack mat several times to remove fugitive dust before stepping onto the flooring outside the work area. Note: The sticky mat is not intended to clean the bottom of the booties. They are designed to clean the bottom of the work boots/shoes after removing booties or full-body coveralls.

When working in semi-restricted or restricted areas, put on clean protective clothing before entering the semi-restricted or restricted area located outside the negative pressure containment.

Wash face, hands, and any exposed skin surfaces as soon as possible upon exiting containment. A wash station near the work area may be required for dusty work.

EQUIPMENT & WASTES

Decontaminate the exterior surface of all bagged waste, tools, or construction materials before the exit of the containment by wet wiping. Tools or materials that cannot be exposed to water may be thoroughly HEPA vacuumed before removal.

Contaminated construction materials, tools, or other reusable items contaminated with dirt or debris must be wrapped in 6 mil plastic sheeting or bags any time they are outside the containment and before covered cart transport. Insides of transport carts shall be maintained free and clean of dust and debris.

Nonporous/smooth and cleanable containers with a hard lids must be used to transport trash and debris from the construction areas. Before leaving the contained work area, these containers must be damp-wiped, cleaned, and free of visible dust/debris. Open carts or plastic-covered carts are unacceptable.

CONTAINMENT DESIGN & CONSTRUCTION

Containment is the primary engineering control to prevent patient exposure to contamination. Proper containment design and construction are necessary for proper function. The following sections are related to whole, negative pressure containments; alternative containment strategies are presented in the next section.

LOCATION

Nurse management must approve the containment location and configuration in patient care areas. Containment location concerning emergency egress must be reported to UCDH Fire Marshal's Office. An Interim Life Safety Measure (ILSM) plan may be required.

MATERIALS

Temporary containments in non-fire-rated locations lasting less than 30 days may be constructed of fire-rated polyethylene sheeting (at least six mil in thickness) that meets the standards specified by the UCDH Fire Marshal's Office. The polyethylene used for critical barriers and sealing walls, floors, or ceiling systems shall be a minimum of 6 mil thickness and fire-retardant type listed by Fire Underwriters Laboratories, Griffolyn #T55R with Griffolyn fire retardant tape, or equal, (no known equal).

Only approved one-hour fire-rated temporary containment systems that meet ASTM E84, Class A requirements for smoke and fire for fire-rated assemblies/enclosures shall be used. Only approved fire damper systems used to control smoke/fire in a fire-rated containment assembly shall be used.

Containments to remain in place for more than 30 days, those requiring additional security or those designed to control highly dusty environments, as in the case of abrasive blasting or concrete coring, shall be constructed of rigid, airtight materials, such as drywall and metal wall framing. A hard-sided containment with a lockable door shall be used when there are concerns about security or safety from unauthorized entry, especially if the containment will be left unattended for extended amounts of time.

Avoid creating tape damage on existing finish materials.

CONSTRUCTION

Locate the HEPA-filtered negative pressure unit as far away from the containment entrance (or other location of makeup air) as possible and duct the exhaust outdoors whenever feasible. Distancing the negative pressure unit from the source of makeup air helps to ensure complete and effective scrubbing of the contained airspace. Locating the unit too near the entrance can allow pockets of contamination to exist within the contained zone. At least four air changes per hour must be provided within the negative pressure containment at all times, which can be determined by the number of HEPA-filtered negative air unit scrubbers operating cubic feet per minute and the volume of the containment. All sources of air infiltration into the work zone must be sealed off before erecting containment barriers. These critical barriers include those over HVAC supply and return registers, electrical outlets, gaps in the drop-in ceilings, doorways not being used, etc.

All existing surfaces within the containment which are not to be disturbed during construction must be covered with polyethylene sheeting unless they are nonporous, smooth, and accessible for cleaning. Where floors are likely to be damaged by the construction activities, durable flooring (e.g., plywood, Masonite) shall be installed over two layers of plastic sheeting.

Locate tack mats outside of the containment exit when possible. Otherwise, locate tack mats on the floor, just inside the containment exit. An additional tack mat may be useful for incredibly dusty projects. Expose a new tack sheet when tack mats are no longer sticky and again at the end of each shift. The use of wetted carpet mats is not acceptable.

When required, a manometer displaying the current containment pressure must be installed in an accessible location near the containment entrance.

NEGATIVE PRESSURE REQUIREMENTS

Negative pressure containments shall be a minimum of -0.020 inches of water column or less (-0.021, -0.022, -0.023....) relative to the adjacent, uncontained space. Exceptions to this requirement may be allowed by IP and will be listed on the ICRA permit. Demonstrate negative pressure is achieved continuously (24/7) through an electronic manometer sensitive to measure down to -0.020” wp. The manometer shall be capable of measuring the water pressure down to at least -0.001” in-WC. Inclined manometers using a liquid water solution and non-digital air pressure gauges are unacceptable since they do not meet the sensitivity of measuring -0.001” WC.

Zero pressure or positive pressure is unacceptable and must be responded to immediately. Locate and repair holes or breaches in the exterior containment system with tape. Secure zip poles if they have fallen. Close the entry door by zipping lower or closing the flaps and securing it. A pressure too negative (-0.060 inches of water column or less) can cause the containment to collapse inwards. To relieve too negative pressure, turn down the negative air machines, if possible, and increase the size of the containment door openings.

Manometer Reading	Why it’s a problem	Response Options
Positive Pressure (+0.001 and greater)	Active contaminant ejection	This is an emergency. Call Project Manager ASAP!
No pressure (0.000)	Possible contaminant migration	Close zipper doors, Check and repair breaches, Ensure correct operation of negative air machines, and Call Project Manager.
Too Negative (-0.060 and less)	Could collapse containment	Lift the zipper on the containment and anteroom door

ALTERNATIVE CONTAINMENT STRATEGIES

A full negative pressure enclosure is not always possible or warranted. Work may be completed using alternative containment strategies such as those listed below. IP may approve other alternative containment strategies on a case-by-case basis.

MOBILE CONTAINMENTS, AKA "CUBES"

Cubes are manufactured containment systems that are erected on a mobile platform. Examples are pictured on the following page. They are most often used for Class III or IV work and must conform to all Class III or IV ICRA permit requirements, including negative pressure, cleaning, inspection, required postings, etc.

Cubes are not typically inspected at the same frequency as fixed containments as the work is often of short duration and may occur in several locations throughout a single day.

The containment inspector shall conduct periodic, unannounced audits of cube work to ensure compliance with the ICRA and this best practice standard. Inspect cube operations two times or more for each ICRA permit issued. Projects longer than two weeks shall be audited at least twice per month. Where failures are located, corrective action must be taken immediately.

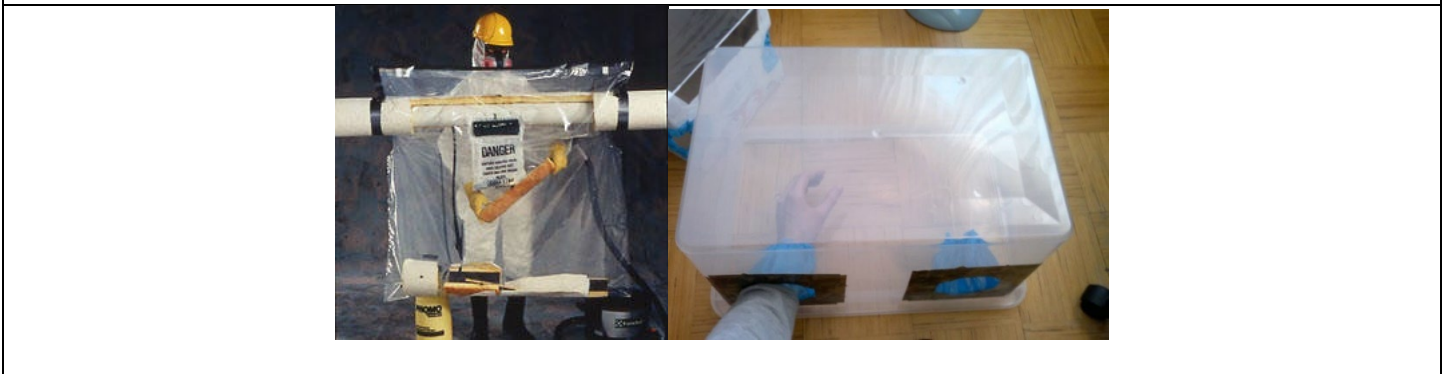
EXAMPLES OF MOBILE CONTAINMENTS OR "CUBES"



"GLOVE" BAGS OR BOXES & HEPA SHROUDS

Small projects may be accomplished by containing the work only - and not the workers. Glove bags, boxes, and HEPA shrouds can be used to complete work that disturbs small areas. Some examples of these systems are pictured on the following page.

EXAMPLES OF GLOVE BAGS OR BOXES



EXAMPLES HEPA SHROUDED SYSTEMS



Projects commonly completed using these systems include drilling small penetrations, cutting in for wire receptacles, and placing backing plates for hanging objects from the wall. Because the containment cannot be posted, display the required postings (including the ICRA permit) in the work area.

Before first use, the design and construction of these types of containments shall be approved by IP and EH&S.

The glove bag or box should be composed of a sturdy frame enclosed in polyethylene or a transparent, sturdy material (e.g., plastic panel). Do not use corrugated materials, as they tend to collect and retain dust. A tested HEPA vacuum is used to maintain negative pressure within the glove bag/box. The bag/box must be cleaned before detachment. The negative pressure may be verified by observing the bowing of the bag/box sides, using visible smoke, tissue paper, or other means approved by EH&S.

Work utilizing these types of containments is typically very short in duration; therefore, inspections differ from those performed in fixed containments. Further, because these types of systems heavily rely on the work practices used, contractors must be strictly monitored, especially at the beginning of a project.

The containment inspector shall conduct periodic, unannounced audits of the work to ensure compliance with the ICRA permit and this best practice standard. Where failures are located, corrective action must be taken immediately, and EH&S must be notified immediately.

DEHUMIDIFICATION

Dry-out efforts using dehumidifiers are allowed if completed within 72 hours of initial wetting and are approved by EH&S and/or IP. If the duration of the wetting is unknown, additional measures must be performed to ensure no mold growth has occurred – consult with EH&S.

Dehumidification may only be used in clean water or steam condensate intrusion cases. Materials wetted by contaminated, black, or grey water require measures beyond dehumidification, ideally removal and replacement.

Dehumidification of voids such as wall or ceiling cavities must be done as a closed loop such that the space does not become positively pressured relative to patient care areas.

POSTINGS

All the following postings must be maintained in the work area at all times a Class I-V permitted project is in progress:

- Copy of ICRA Permit
- Copy of Interim Life Safety Measure (ILSM) Permit
- Containment Inspection Log (See Appendix A)
- Entry Warning Sign with Project Manager Contact (See Appendix B)

CLEANING PROCEDURES

Once all work has been completed within containment, use the following procedures to perform a final cleaning. Final cleaning must be verified and signed off by the containment inspector before removing the containment.

- Change into a clean disposable suit or clean clothing.
- Carefully HEPA Vacuum all surfaces. Use an appropriate attachment to ensure all large dust is removed. Vacuum slowly and pay special attention to cracks and crevices where dust may have accumulated.
- Prepare a measured solution of a UCDH-approved EPA-listed disinfectant (see UCDH Hospital Policy and Procedure 2111) and use it according to the instructions on the label.
- Using clean towels or sponges, wipe all surfaces with disinfectant. If visible dust accumulates on the applicator, wipe again until no residue is detected. Frequently change to clean applicators.
- Leave the surface wet and allow it to air dry. Do not wipe dry.
- Remove the top floor layer, if present, and HEPA vacuum and wipe down the bottom floor layer.
- Call for a final visual inspection. The inspection will not be performed until the containment is dry.
- If the containment does not pass inspection, the entire containment must be re-cleaned using the steps outlined above before re-inspection.
- When containment passes inspection, remove the components, retain the documents for the project manager, and contact EVS for terminal cleaning of the project area.

DOCUMENTATION

The project manager shall retain all the following documents related to the containment:

- Copy of ICRA permit
- Containment Inspection Log (see Appendix A) and any Manometer Logs
- Copies of HEPA equipment certification
- Records of sampling conducted, if any
- Findings from project audits
- Documents should be retained until the project is completed and occupancy has been granted.

CONTAINMENT VERIFICATION

Periodic particle counting is recommended and may be required to ensure exhausted air meets the HEPA rating and ambient air near the project is not excessively loaded with particles, compared to baseline measurements collected before construction or measurements collected in areas deemed currently acceptable. Particle counters should be set to log the collected data, and all sampling records must be provided to the project manager and EH&S.

INSPECTION CRITERIA

Inspections are required: at the initial containment setup to verify proper construction each day to ensure a proper operation once all demolition has been completed, whenever an ICRA reclassification is requested, and when all work has been completed, and the containment has been cleaned. The requirements of each of these types of inspections follow.

INITIAL CONTAINMENT INSPECTION (AKA "PRE-START") – EH&S OR CONSULTANT ONLY

To ensure the containment is sufficient before the start of work, EH&S or the consultant shall check for the following and sign off on the posted "inspection documentation form" with their name and the date and time the pre-start inspection passed.

- ILSM permit conditions are met (if applicable)
- All equipment is free and clear of dust/debris or arrives wrapped in poly
- A hard lid-covered cart is available for waste transport
- HEPA-filtered equipment has passed inspection and is not expired
- Protective clothing is available
- HVAC is sealed off in the work area, and other critical barriers are in place
- Containment is complete (no holes/gaps) and structurally sound
- Negative pressure exhaust is located as far from containment entry as possible
- Nonporous, non-cleanable surfaces not in the scope are covered in poly
- Fixtures outside of the scope of work are covered or removed
- Where floor damage may occur, durable floor protection is in place
- Installed manometer displays sufficient negative pressure
- Negative pressure exhaust is diffused/not directing high-velocity air onto occupants
- All required postings are in place

INSPECTIONS WHILE WORKING

Containment inspections shall be performed at least once per workday. For projects of extended length when work activity is not being performed, including on weekends or holidays, and if the work area had a comprehensive surface cleaning and received a passing visual inspection by a third-party environmental consultant, the daily inspections are not required. At a minimum, ICRA inspections shall be made weekly for containments on projects of extended non-work activity. Containment checks shall include the following. The containment inspector shall note observations on the "Containment Inspection Form" (see Appendix A) attached to the containment.

- ILSM permit conditions are met (if applicable)
- Containment remains complete (no holes/gaps/tears) and structurally sound
- No unauthorized personnel are inside
- All required postings are in place
- No changes to the location of the HEPA exhaust
- The Tack mat is present and usable
- No signs of track out are observed
- Installed manometer displays sufficient negative pressure
- Containment is generally clean
- Covered carts with hard lids are being used to transport equipment and wastes
- All ICRA permit conditions are met

IN-PROGRESS INSPECTIONS (AKA “POST-DEMO”)

To ensure completion of the demolition phase of projects, the containment inspector shall verify the following conditions and sign off on the containment documentation form with their name and the date and time the inspection was completed.

- All wetted or hazardous materials have been removed entirely (May require using infrared cameras and/or moisture meters to verify remaining materials are dry).
- The demolition scope is complete
- No hazardous materials have been discovered
- Containment is clean, and waste has been removed

ICRA CLASS CHANGE (AKA “ICRA DOWNGRADE”)

At times, with the approval of IP, construction work may begin under ICRA Permit Class III, IV, or V and become reclassified to a lower ICRA Class once significant dust-producing activities have ceased. An inspection must take place before the downgrade to ensure that the dust-producing work is complete, the Class III or IV containment is clean, and the IP requirements of the ICRA permit downgrade are met. The containment must meet the criteria for a “final visual inspection” (see next section), except for all construction efforts being complete.

FINAL INSPECTION BEFORE DISMANTLEMENT (AKA “FINAL VISUAL”)

Once the construction is complete, a containment inspector shall verify the following and document a passing final inspection by signing the inspection log form attached to the containment, including the date and time the inspection passed. Before dismantling the containment, the Contractor shall collect all posted paperwork, including any manometer tapes, and deliver it to the Project Manager, who is responsible for contacting EVS for the terminal cleaning.

- All construction efforts are completed
- No tools, equipment, or personal belongings are present (clean ladder excepted)
- No debris or wastes are present
- The Tack mat is clean
- Containment is “white glove” clean – no visible dust can be wiped from any surface

REFERENCES

The following sources were used to gather information for this policy.

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Vogel R, et. al. (2015). Infection prevention manual for construction and renovation. Association for Professionals in Infection Control and Epidemiology.

Caution

Construction Dust Precautions In Use
Do Not Enter

For More Information Contact the UCDH Project
Manager

(Name)

Phone Number

This sign must be posted in color

SECTION 01 61 00
PRODUCT REQUIREMENTS

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Product Options
- B. Product Substitutions
- C. Product Transportation and Handling Requirements
- D. Product Storage and Protection
- E. Product System Completeness

1.02 RELATED SECTIONS

- A. Section 013300 – SHOP DRAWINGS, PRODUCT DATA AND SAMPLES
- B. Section 013900 - GREEN BUILDING POLICY IMPLEMENTATION
- C. Section 014100 – REGULATORY REQUIREMENTS
- D. Section 014500 – QUALITY CONTROL

1.03 PRODUCTS

- A. Product Selection: Provide products that comply with Contract Documents, are undamaged and unused at installation.
- B. Product Completeness: Provide products complete with all accessories, trim, finish, safety guards and other devices needed for complete installation and for intended use and effect.
- C. Products: Items purchased for incorporation in Work, whether purchased for project or taken from previously purchased stock; this includes materials, equipment, assemblies, fabrications and systems.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model designation indicated in the manufacturer's published product data.
 - 2. Materials: Products that are shaped, cut, worked, mixed, finished, refined, or otherwise fabricated, processed or installed to form part of the Work.
 - 3. Equipment: A product with operating parts, whether motorized or manually operated, requiring connections such as wiring or piping.

- D. Specific Product requirements: Refer to requirements of Section 014500 – QUALITY CONTROL and other Sections in Division 2 through 49 for specific requirements for products.
- E. Code Compliance: All products, other than commodity products prescribed by Code, shall have current listing service report or research report. Minimum Requirements: Specified requirements are minimum requirements.
- F. Interchangeability: To fullest extent possible, provide products of the same kind from single source. Products supplied in quantity shall be same product and interchangeable throughout the Work. When options are specified for selection of any of two (2) or more products, product selected shall be compatible with products previously selected.
- G. Nameplates: Except for required labels and operating data, do not attach manufacturer's name plates or trademarks on surfaces exposed to view in occupied spaces or on the exterior of building.
- H. Equipment Nameplates: Provide permanent nameplate on each item or service-connected or power-operated equipment. Locate on inconspicuous accessible surface. Nameplate shall contain the following information and essential operating data:
 - 1. Name of product and manufacturer
 - 2. Model and serial number
 - 3. Capacity and Speed
 - 4. Ratings and other pertinent information
- I. Listing Service: Products, for which listing service standards have been established and for which their service label is available, shall bear the appropriate listing service label.

1.04 PRODUCT OPTIONS

- A. Products Specified Only by Description: Where the Contract Specifications describe a product, listing characteristics required, with or without use of a brand name, provide a product that provides the appropriate characteristics and otherwise complies with the requirements.
- B. Performance Specification: Where Contract Specifications require compliance with performance requirements, provide products that comply and are recommended for application. Manufacturer's recommendations may be contained in Product literature, or by certification of performance.
- C. Compliance with Standards: Where Contract Specifications require compliance with a standard, select a product that complies with the standard specified.
 - 1. Wherever catalog numbers and specific brands or trade names followed by the designation "to match existing" are used in conjunction with product(s) required by the Contract Specification, no substitution will be considered.

- D. Products Specified by Naming One (1) or More Manufacturers:
1. Specified manufacturer(s): Provide specified product(s) of the specified manufacturer. Wherever more than one (1) manufacturer's product is specified, the first-named product is the basis for the design used in the Work and the use of alternative-named products or substitutes may require modifications in that design. If such alternatives are proposed by **Contractor** and are approved by University, **Contractor** shall assume all costs required to make necessary revisions and modifications to the design, including additional costs to University for evaluation of revisions and modifications of the design resulting from the substitutions submitted by **Contractor** .
 - a. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or equal" supporting data for second manufacturer's product, if proposed by **Contractor** , shall be submitted in accordance with the requirements for substitution.
 2. Quality Standard: Products(s) of the specified manufacturer shall serve as standard by which the product(s) of other named manufacturers are evaluated.
- E. "Or Equal" Provision: Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by Contract Specification to establish standard of quality, utility, and appearance required.
1. "Or Equal" Products: Equivalent products of manufacturers other than the specified manufacturer may be provided if determined by University's Representative to be acceptable in accordance with substitution provisions following:
 - a. **Contractor** shall submit to University's Representative, within thirty-five (35) calendar days after the date of commencement of the Work specified in the Notice to Proceed, a list in excel format containing Specification Section number with extension i.e. 088000 2.B.1.a. with descriptions of each product proposed for substitution.
 - b. **Contractor** shall provide supporting data as required herein.
 - c. University will evaluate **Contractor** 's proposal. The decision of University shall be final.
 - d. University will accept, in writing, proposed substitutions that are in University's opinion equal in quality, utility and appearance to the product specified. Such acceptance does not relieve **Contractor** from complying with requirement of the Contract Documents.

- e. **Contractor** shall be responsible for all costs of any changes resulting from **Contractor**'s proposed substitutions that affect other work, or the Work of Separate **Contractor**.
 - f. Failure to place orders for specified products sufficiently in advance of required date for incorporation into the Work will not be considered justification for **Contractor** to request a substitution or deviation from requirements of the Contract Documents. The sixty (60) calendar day submittal period does not excuse **Contractor** from completing the Work within the Contract Time.
- 2. **Contractor**'s Determination: Prior to submitting "or equal" product(s) for consideration, **Contractor** shall review and determine product(s) meet or exceed the quality and warranty provisions of the specified product.
 - 3. Late Substitution Requests: If a request for substitution occurs after the sixty (60) calendar day period, the substitution may be reviewed at the discretion of University and the costs of such review, as approved by University, shall be deducted from the Contract Sum.
 - a. Product Availability Waiver: Substitutions will be considered after the sixty (60) calendar day period only when a product becomes unavailable due to no fault of the **Contractor**.
- F. Visual Matching: Where Contract Specifications require matching a sample, University's decision on proposed product match is final. If no product matches and complies with other requirements, comply with provisions for "substitutions" for selection of a matching product in another category.
 - G. Visual Selection: Where requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product that complies with other requirements. University's Representative will select color, pattern and texture from the product line selected.

1.05 SUBSTITUTIONS

- A. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the **Contractor** after award of the Contract shall be considered "substitutions". The following are not considered substitutions:
 - 1. Revisions to Contract Documents requested by University's Representative or University's Consultant.
 - 2. Specified options of products and construction methods included in Contract Documents.
 - 3. Compliance with governing regulations and orders issued by governing authorities.

- B. Substitution Provisions: Requests for Substitutions will only be considered if **Contractor** submits the following data:
1. Furnish complete technical data including drawings, performance specifications, samples, test reports and any additional information required by University's Representative, for each product proposed for substitution.
 - a. Submit ONE (1) PDF file with bookmarks.
 - b. In reviewing supporting data for substitution, University will use, for purpose of comparison, all characteristics of Basis of Design specified product as it appears in manufacturer's published data even though all characteristics may not have been particularly mentioned in the Contract Specifications. If more than two (2) substitutions of supporting data are required, University's costs of reviewing additional supporting data will be deducted from the Contract Sum.
 - c. Submit statement indicating substitution's effect on the Construction Schedule, if any.
 - d. Submit cost information, including proposal of net deduction, if any, from Contract Sum.
 2. Furnish statement by **Contractor** that proposed substitution is in full compliance with requirements of Contract Documents and Applicable Codes.
 3. Provide a Comparison Table as part of the substitution request listing the design and performance criteria of the Basis of Design specified product with the proposed substitution product side by side. The design and performance criteria shall include but not limited to; size, thickness, gauge, strength, function, ASTM rating, test report data, manufacturing association standards & data, technical properties & performance data, traffic or weather resistance, quality assurance data, warranty and other design and performance criteria list in Basis of Design manufactures specification and written material.
 4. Furnish list of Subcontractors, if any, that may be affected by the substitution.
 5. If proposed substitution requires portions of the Work to be redesigned or removed in order to accommodate substituted product, submit design and engineering calculations prepared by the licensed design professional of record.
 6. Contract Document Revisions: Should **Contractor** -proposed or alternate sequence or method of construction require revision of Contract Documents, including revisions for purpose of determining feasibility, scope or cost, or revisions for the purpose of obtaining approval by governing authorities having jurisdiction, revisions will be made by University's Consultant who is the design professional of record.
 - a. Services of University's Consultants, including time spent in researching and reporting on proposed substitutions or alternate sequences and methods of construction, shall be paid by **Contractor** when such activities are considered additional services to the design services contracts of University.

- b. Cost of services by University's Consultants shall be paid on a time and material basis, based on current hourly fee schedules, with reproduction, long distance telephone and shipping costs reimbursable. Such fees shall be paid whether or not the proposed substitution or alternate sequence or method of construction is ultimately accepted by University and Change Order executed. Such fees owed shall be deducted from the Contract sum on the next Application for Payment.
- 7. Submit all proposed substitutions in writing to University using the Request for Substitution form provided at the back of this Section.
- C. University may reject any substitution not proposed as described above and presented within the time prescribed.
- D. Revisions to submittals: If University's Representative, in reviewing list of substitutions, requires revisions or corrections to previously accepted Shop Drawings and supplemental supporting data, **Contractor** shall promptly do so. If any proposed substitution is judged by University's Representative to be unacceptable, the specified product shall be provided at no cost to the University.
- E. Samples: Samples may be required. Tests required by University's Representative for determination of quality and utility shall be made by **Contractor**'s independent testing Laboratory, at expense of **Contractor**, with prior University acceptance of test procedure.

1.06 TRANSPORTATION, DELIVERY AND HANDLING

- A. Transport products by methods to avoid product damage.
- B. Schedule delivery to minimize long-term storage and prevent overcrowding construction spaces. Coordinate with installation to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
- C. Deliver products in undamaged condition in manufacturer's original sealed container or packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- D. Provide equipment and personnel to handle products by methods to prevent soiling, marring or other damage.
- E. Promptly inspect products on delivery to ensure products comply with Contract Documents, quantities are correct, and to ensure products are undamaged and properly protected. Promptly remove damaged or defective products from site and replace at no adjustment to the Contract Sum and/or Contract Time.

1.07 STORAGE AND PROTECTION

- A. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible.
- B. Store products to facilitate inspection and measurement of quantity or counting of units.

- C. Store heavy materials away from structures in a manner that will not endanger supporting construction.
- D. Store sensitive products in weather-tight enclosures. Store products subject to damage by the elements above ground, under cover in a weather-tight enclosure, with ventilation adequate to prevent condensation.
 - 1. Maintain temperature and humidity within range required by manufacturer's instructions.
 - 2. Exterior Storage:
 - a. Store products above ground on blocking or skids to prevent soiling, staining and damage.
 - b. Cover products that are subject to damage by the elements with impervious protective sheet coverings. Provide adequate ventilation to prevent condensation.
 - c. Store sand, rock, aggregate or other loose granular material in well-drained area on solid surfaces. Prevent mixing with foreign matter.
 - 3. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged and maintained under required conditions, free from damage and deterioration.
- E. Protection After Installation: Provide barriers, substantial coverings, notices and other materials or methods as necessary to protect installed work from traffic, subsequent construction operations and weather.
 - 1. Maintain temperature and humidity conditions in interior spaces for Work in accordance with manufacturers' instructions for materials and equipment being protected.
 - 2. Remove protective measures when no longer required and prior to Acceptance of the Work.

1.08 SYSTEM COMPLETENESS

- A. The Contract Drawings and Contract Specification are not intended to be comprehensive directions on how to produce the Work. Rather, the Drawings and Specifications are instruments of service prepared to describe the design intent for the completed Work.
- B. It is intended that equipment, systems and assemblies be complete and fully functional even though not fully described. Provide all products and operations necessary to achieve the design intent described in the Contract Documents.
- C. **Contractor** is urged to report to University's Representative immediately when elements essential to proper execution of the Work are discovered to be missing or misdescribed in the Contract Documents or if the design intent is unclear.

- D. Should an essential element be discovered as missing or misdescribed prior to receipt of bids or establishing a negotiated Contract Sum, an Addendum or Clarification will be issued so that all cost may be accounted in the Contract Sum.
- E. Should an obvious omission or misdescription of a necessary element be discovered and reported after execution of the Agreement, **Contractor** shall provide the element as though fully and correctly described.

PART II - PRODUCTS – Not Applicable to this Section

PART III - EXECUTION

3.01 INSTALLATION OF PRODUCTS

- A. Comply with manufacturer's instructions and recommendations for installation of products.
- B. Anchor each product securely in place, accurately located and aligned with other Work. Clean exposed surfaces and protect to ensure freedom from damage and deterioration at time of Substantial Completion.

3.02 Refer to the following Attachment:

- A. Request for Substitution Form.

END OF SECTION 01 61 00

REQUEST FOR SUBSTITUTION

Substitution #: _____ Submittal #: _____ Date: _____

Project#: _____ HCAI#: _____

PROJECT NAME: _____

TO: UC DAVIS HEALTH Facilities Design & Construction 4800 2 ND Avenue, Suite 3010 Sacramento, CA95817 P: 916-734-7024 Attn.: (Project Manager's Email Address)	FROM: _____ _____ _____ _____ _____
--	--

Name of Party Submitting Request for Substitution: _____

Reason for Submitting Request for Submission: _____

Specification Section and Paragraph #: _____

Substitution Manufacturer name and address: _____

Proposed substitution (trade name of product, model or catalog #): _____

Fabricators and Suppliers (as appropriate): _____

PRODUCT DATA: ATTACH PRODUCT DATA AS SPECIFIED IN SPECIFICATION SECTION 013300 – SHOP DRAWINGS, PRODUCT DATA AND SAMPLES Similar projects using product (list dates of installation and names/phone numbers of Owners): _____ _____ _____ Similar comparison of proposed substitution with specified product (indicate variation(s), and reference each variation to appropriate Specification Section paragraphs): -ATTACH COMPARISON SUMMARY-
--

(SUBSTITUTION REQUEST CONTINUES)

Quality and performance comparison between proposed substitution and specified product:

Availability of maintenance services and replacement materials: _____

Effect of proposed substitution on Construction Schedule: _____

Effect of proposed substitution on other work or products: _____

SECTION 01 73 00
CUTTING AND PATCHING

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Requirements and limitations for cutting and patching Work.
- B. Hazardous Conditions Permit requirements for brazing, welding and other hot work.

1.02 RELATED SECTIONS

- A. Section 011100 – SUMMARY OF THE WORK
- B. Section 013100 – COORDINATION
- C. Section 013300 – SHOP DRAWINGS, PRODUCT DATA AND SAMPLES
- D. Section 015610 – AIRBORNE CONTAMINANTS CONTROL
- E. Section 016100 – PRODUCT REQUIREMENTS
- F. Individual Specifications Sections.
 - 1. Cutting and patching incidental to Work specified in this Section.
 - 2. Coordination with work in other Sections for openings required to accommodate Work specified in those other Sections.

1.03 SUBMITTALS

- A. **Contractor]** shall complete and submit for review to University's Representative, a Coring/Sawcutting Form, included at the end of this Section, and obtain written authorization for University prior to the commencement of any dig activities. **Contractor]**

shall include all pertinent information with the Coring/Sawcutting Form and submit with detailed work plan fourteen (14) calendar days prior to desired coring/cutting activity.

1. Structural integrity of any element of Project.
 2. Integrity of weather-exposed or moisture-resistant element.
 3. Efficiency, maintenance, or safety of any operational element.
 4. Visual qualities of sight-exposed elements.
 5. Work of University.
 6. Utility supply, drains, fire alarm, communication.
- B. Include in request:
1. Identification of Project, including University's Project Name and Project Number.
 2. Location and description of affected Work.
 3. Necessity for cutting and patching.
 4. Description of proposed work, and products to be used.
 5. Alternatives to cutting and patching.
 6. Effect on work of University.
 7. Written permission of University.
 8. Date and time work will be executed.

1.04 NOTIFICATIONS

- A. Before starting welding or cutting work involving the use of gas or electric welding equipment, or any brazing work involving gas or electric brazing equipment **Contractor** shall complete the online Hazardous Conditions Permit form at <https://health.ucdavis.edu/fire/>. **Contractor** shall allow seventy-two (72) Hours for Fire Marshal's approval and issuance of Hazardous Conditions Permit. This permit will be issued without cost to **Contractor** and may be applicable to more than one (1) building. **Contractor** shall be responsible for reporting to Fire Department either by telephone or in person at beginning and end of each day's work. Provide minimum written notice of fourteen (14) calendar days prior to such activities.
1. Welding and brazing personnel must be certified by a University or HCAI approved laboratory and must maintain this certification during the work of this Contract.
 2. **Contractor** is responsible for notifying University of all apparent locations where suspect asbestos containing materials may be present or discovered during the course of the project such as cement pipes or other insulated material, which may be a result of newly excavated materials below grade or after building systems are opened such as within wall, ceiling or subfloor spaces. When any such location is

discovered by **Contractor**], information relating thereto shall be immediately communicated to University's Representative.

3. Where welding and cutting activity is required and suspect painted surfaces are present that will be impacted by the welding or cutting activity, the contractor shall request from the University's Representative information regarding laboratory analysis for lead or other hazardous metals in the painted metal components before any cutting or welding is performed. The contractor shall refer to Section 013500 Special Procedures, 1.05 Hazardous Materials Procedures regarding materials impacted by welding and cutting activity.
4. **Contractor**] shall then follow any and all instructions as indicated by University's Representative.

PART II - PRODUCTS

2.01 MATERIALS

- A. Product substitution: For any proposed change in materials, submit request for substitution under provision of SECTION 016100 – PRODUCT REQUIREMENTS. Use only materials for cutting, fitting, and patching which comply with the applicable

Specification Sections, and which match adjacent materials. Use materials whose installed performance will equal or surpass that of existing materials.

PART III - EXECUTION

3.01 EXAMINATION

- A. General: Execute cutting, fitting and patching including excavation and fill, to complete Work and:
 - 1. Fit the several parts together, to integrate with other work.
 - 2. Uncover work to install ill-timed work.
 - 3. Remove and replace defective and non-conforming work.
 - 4. Remove samples of installed work for testing.
 - 5. Provide openings in elements of Work for penetrations of mechanical and electrical work.
- B. Examination, General: Inspect existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.
 - 1. After uncovering existing Work, inspect conditions affecting proper accomplishment of Work.
 - 2. Beginning of cutting or patching shall be interpreted to mean that existing conditions were found acceptable by **Contractor**].
- C. Ground Penetrating Radar: Determine by Ground Penetrating Radar all existing reinforcing, conduit and piping located in concrete walls and slabs prior to demolition. Clearly mark all locations and review with University Representative prior to demolition.

3.02 PREPARATION

- A. Temporary Supports: Provide supports to assure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.
- B. Weather Protection: Provide protection from elements in all areas that may be exposed by uncovering work. Maintain excavations free of water.
- C. Protection. Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
- D. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas. Do not block required exit ways or stairs.
- E. Protect rated floor, wall and ceiling assemblies. Prior to cutting opening in a rated assemblies review with University's Representative and get written approval form the Fire Marshal.

3.03 CUTTING AND PATCHING

- A. Execute cutting, fitting, and patching to properly complete Work.
- B. Coordinate installation or application of products for integrated Work.
- C. Uncover completed Work as necessary to install or apply products out of sequence.
- D. Remove and replace defective or non-conforming Work.
- E. Provide openings in the Work for penetrations of mechanical and electrical Work.
- F. Provide cutting and patching to accommodate all demolition work as part of this contract. Provide level and plumb cuts at locations that will be exposed or to provide smooth and even surface for patching to existing work or surfaces.
- G. Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.

3.04 PERFORMANCE

- A. Execute cutting and patching by methods to avoid damage to adjoining Work, and that will provide appropriate surfaces to receive final finishing.
- B. Execute cutting and patching of weather-exposed, moisture-resistant and sight-exposed surfaces by methods to preserve weather, moisture and visual integrity.
- C. Restore work with new Products as specified in individual Sections of Contract Documents.
- D. Cut rigid materials using masonry saw or core drill. Pneumatic tools are not allowed without prior approval from University. Coordinate timing of all sawing and cutting work with the University's Representative. Do not over saw cut corners and intersection unless written authorization is provided from the University Representative and the Structural Engineer of Record.
- E. Fit work neat and tight allowing for expansion and contraction. Butt new finishes to existing exposed structure, pipes, ducts, conduit, and other penetrations through surfaces.
- F. At penetrations of firewalls, partitions, ceiling, or floor construction, completely seal voids with UL approved fire-rated assembly. Provide temporary closures at the end of each workday. Closures shall be approved by the University Fire Marshal.
- G. Refinish surface to match adjacent finish. For continuous surfaces, refinish to nearest intersection, corner or natural break and from floor to ceiling. For an assembly, refinish unit. All patched surfaces from new to existing shall provide a smooth and even transitions aligning with the adjacent surface with no visible marks, joints, seams, sheen, texture or color difference.
- H. Where new construction is to join with or match existing work, it shall be finished exactly to that work so as to form a complete unified and finished element.
- I. Visual Requirements: Do not cut and patch operating elements or related components in a manner that would, in the University's Representative's opinion, reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in

visual evidence of cutting and patching. Remove and replace construction cut and patched in a visually unsatisfactory manner, including by not limited to.

1. Repair and patch in areas where finishes have been visually disturbed by cutting and patching to the nearest intersections.
2. Processed concrete finishes
3. Firestopping
4. Acoustical ceilings
5. Flooring
6. Carpeting

3.05 Refer to the Following Attachment

- A. Coring/Sawcutting Notification

END OF SECTION 01 73 00

CORING/SAWCUTTING NOTIFICATION

LOCATION: _____ PROJECT#: _____
TITLE: _____

TRACKING NUMBER: _____
(Provided by PO&M)

HCAI #: _____ DATE: _____

TO: Facilities Design & Construction UC Davis Health 4800 2nd Avenue, Suite 3010 Sacramento, CA 95817 P: 916-734-7024 (Project Manager's email address)	FROM: _____
---	--------------------

SCOPE: _____

HAS USA BEEN NOTIFIED? YES NO *When?* _____

ARE ALL KNOWN UTILITIES MARKED? YES NO *By Whom?* _____

LOCATION OF WORK SHOWN ON ATTACHED SITE PLANS? YES NO *Purpose:* _____

DATE(S) CORING OR SAWCUTTING WILL TAKE PLACE: _____ Signed: _____

<u>UC DAVIS HEALTH USE ONLY</u>	
DATE RECEIVED: _____	
WHO FROM UNIVERSITY WILL AUTHORIZE, SUPERVISE AND VERIFY? PHONE: _____	
Utilities Verified by IOR? <input type="checkbox"/> YES <input type="checkbox"/> NO	
Activities coordinated with: <input type="checkbox"/> PO&M <input type="checkbox"/> Fire <input type="checkbox"/> Telecom <input type="checkbox"/> Occ. Safety <input type="checkbox"/> Other (Itemize): _____	
COMMENTS: Signed: _____ DATE AUTHORIZED: _____ University Representative PO&M: _____	
COMPLETION DATE: _____	
COMMENTS: (Unknown Utilities Encountered, Disruptions, Successes, Weather, etc.)	
SIGNED: _____	
Copies to: University Consultants, PO&M, Fire, Telecom, File, Others:	

SECTION 01 74 00

CLEANING

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Construction Cleaning.
- B. Requirements for cleaning during progress of Work, at Substantial Completion of Work and at Acceptance of Work.
- C. Disposal of waste materials, debris and rubbish during construction.

1.02 RELATED SECTIONS

- A. General Conditions of the Contract: Cleanup.
- B. Additional Requirements: Cleaning for specific products or elements of Work are described in Specification Sections describing that Work.
- C. Section 015610 Airborne Contaminants Control have procedures and practices that shall be implemented and followed by the Contractor for this project.
- D. Section 013900 Green Building Policy Implementation: Waste Management Program

PART II - PRODUCTS

2.01 MATERIALS

- A. Use only those cleaning agents and materials that will not create hazards to health or property and that will not damage surfaces.
- B. Use only those cleaning agents, materials and methods recommended by manufacturer of the material to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning agent manufacturer.

2.02 EQUIPMENT

- A. Provide covered containers for deposit of waste materials, debris, and rubbish.
- B. Provide at each entry point to the Work, and at other areas as directed by University's Representative, a clean room sticky mat. Replace mats daily or as requested by University Representative.

PART III - EXECUTION

3.01 CLEANING

- A. Construction Cleaning: During Construction, maintain buildings, premises and property free from waste materials and rubbish. Dispose of such waste and debris at reasonable intervals off of University property.
1. Maintain areas under Contractor's control free of waste materials, debris and rubbish. Maintain site in a clean and orderly condition.
 2. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to closing such spaces.
 - a. All horizontal surfaces above ceilings shall be cleaned prior to ceiling closer.
 3. After every concrete placement clean all wet concrete from all surfaces.
 - a. Interior and exterior
 4. Clean interior areas daily to provide suitable conditions for Work. Remove debris from areas of work on a daily basis at a minimum, or more often as required to provide suitable conditions for work.
 5. Broom clean with sweeping compound or HEPA Vacuum interior areas prior to start of surface finishing, and continue cleaning on an as needed basis.
 6. Control cleaning operations so that dust and other particles will not adhere to wet or newly coated surfaces.
 7. Provide a mat, as specified above, for project entrances and exits. Item to be of sufficient size to allow personnel exiting project site to clean debris and dust from shoes. Tracking dust and debris through working areas of hospital and/or related buildings is not acceptable.
 8. Any dust or debris tracked out of the construction site, either by foot traffic or by debris hauling vehicles shall be cleaned by the contractor. If the dirt or other debris is determined by the University's Representative to be from the contractor's activities at the jobsite it shall be cleaned in a timely manner regardless of how far from the site it is.
- B. Conduct cleaning and disposal operations in compliance with Waste Management Program per 013900 and all applicable codes, ordinances, regulations, including anti-pollution laws.

3.02 SUBSTANTIAL COMPLETION CLEANING

- A. Execute a thorough cleaning prior to Substantial Completion review by University's Representative.

- B. At roof areas remove all unused materials and construction waste including but not limited to screws, nails, fasteners, sheet metal cuttings, scrapes, oil, grease and adhesive. Wash down roof horizontal and vertical surfaces. Clean out all debris at roof drains.
- C. Clean walkways, driveways and streets by thorough brooming and wash-down.
- D. Clear debris from storm drainage lines and ways, leaving site ready for stormy weather.
- E. Rake landscaped areas clean.
- F. Remove waste and surplus materials, rubbish and temporary construction facilities, utilities and controls.
- G. Disinfect containment and protection areas as directed by University Representative.
- H. For Airborne Contamination areas: Construction cleaning use wet cleaning methods and HEPA-filtered vacuum cleaners are required to minimize release of airborne contaminants. Contain waste materials, debris and rubbish.

3.03 FINAL COMPLETION CLEANING

- A. Complete final cleaning before submitting final Application for Payment.
- B. Employ professional building cleaners to thoroughly clean building immediately prior to final inspection.
- C. Remove the following but not limited to concrete splatters, paint splatters, pencil marks, pen marks, chalkline marks, tape, protective films & coatings, grease, mastic, adhesives,

dust, dirt, stains, fingerprints, labels, and other foreign materials from all sight-exposed interior and exterior surfaces.

- D. Restore damaged or marred surfaces.
- E. Remove dust from all horizontal surfaces not exposed to view, including light fixtures, ledges and fixture lenses.
- F. Clean and polish all glass, mirrors, and bright metal work. Clean and disinfect all plumbing fixtures.
- G. Damp wash all resilient flooring. Waxing of resilient flooring shall be done by the University.
- H. Thoroughly sweep all floors and vacuum all carpets.
- I. Cleaning of Work provided by University under separate contracts, will not be required except if soiled by construction activities under this Contract.
- J. Thoroughly clean and polish all resilient flooring, metal and plastic surfaces; remove labels and protective coatings.
- K. Replace filters and clean heating and ventilating equipment used for temporary heat and ventilation.
- L. Remove waste material or equipment that has been damaged, touch up and /or repair exposed areas; such repairs to be approved by University's Representative.
- M. Should final cleaning be inadequate, as determined by University's Representative, and Contractor fails to correct conditions, University's Representative may order thorough cleaning and deduct the cost from Final Payment.

3.04 FINAL COMPLETION SITE CLEANING

- A. Broom clean exterior paved surfaces. Rake clean other surfaces of the grounds.
- B. Power Wash, Hose down and scrub where necessary all concrete and walks dirtied as a result of the construction work. Thoroughly remove mortar droppings from all walks and pavements.
- C. Remove from the site all tools, equipment, construction waste, unused materials, excess earth, and all debris resulting from the Work.

3.05 DISPOSAL

- A. Conduct cleaning and disposal operations in compliance with all applicable codes, ordinances, regulations, including anti-pollution laws.
- B. Do not bury or burn rubbish or waste material on University premises.
- C. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains.

D. Remove waste materials, debris, and rubbish from site and dispose of off-site.

3.06 INSPECTION

A. Prior to Beneficial Occupancy, Substantial Completion or Final Completion; Contractor and University's Representative shall jointly conduct an inspection of sight-exposed interior and exterior surfaces to verify that entire Work is clean.

END OF SECTION 01 74 00

SECTION 01 75 00
STARTING AND ADJUSTING SYSTEMS

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Procedures for Starting Systems

1.02 RELATED SECTIONS

- A. Section 018100 – PLUMBING/HVAC TESTING PROCEDURES
- B. Section 018200 – DEMONSTRATION AND TRAINING
- C. Section 019100 - COMMISSIONING
- D. Division 22
- E. Division 23
- F. Division 25
- G. Division 26
- H. Division 27

1.03 SUBMITTAL REQUIREMENTS

- A. Submit preliminary schedule listing times and dates for start-up of each item of equipment in sequence in writing, minimum of ninety (90) calendar days prior to any start-up.
 - 1. Start up, testing and Commissioning of equipment shall be integrated and coordinated with the contract schedule.
 - a. Adjustments will be made as project progresses, but the sequencing will be maintained.
- B. Submit manufacturer's representative reports within one (1) week after start-up, listing satisfactory start-up dates.
- C. Provide information, manufacturer and model number of all testing equipment to be used and current certification that the testing equipment has been calibrated within the last 6 months.
- D. Maintain log with dates and results of Starting and Adjustments, and provide electronic copy to University's Representative.

1.04 PROJECT CONDITIONS

- A. Building enclosure shall be complete and weather-tight.
- B. Excess packing and shipping bolts shall be removed.
- C. Interdependent systems shall have been checked and made operational.
- D. Permanent Power is connected and operational to the building.

PART II - PRODUCTS – Not Applicable to this Section

PART III - EXECUTION

3.01 INSPECTION

- A. Verify Project conditions comply with requirements for start-up.
- B. Verify status of Work meets requirements for starting equipment and systems.

3.02 PREPARATION

- A. Coordination: Coordinate sequence for start-up of various item of equipment.
- B. Notification: Notify University in writing, minimum of fourteen (14) calendar days prior to start-up of each item of equipment.
- C. **Contractor** Quality Assurance Manager shall take the lead role for Starting and Adjusting the equipment; coordinate and work with the University's Representative and Inspectors throughout the entire process.
 - 1. Coordinate all start-up with the Commissioning Agent for the project.
- D. Information on hand: Have Contract Documents, shop drawings, product data, and operation and maintenance data at hand during entire start-up process.
- E. Verify each piece of equipment is anchored correctly per the manufacturer's requirements and the Contract Documents prior to energizing or starting.
- F. Verify each piece of equipment is connected to the correct power source, the breaker and conductors are the correct size. Overcurrent protection in place and required shut offs adjacent to the equipment are in place.
- G. Verify each piece of equipment has been checked for proper lubrication, drive rotation, belt tension, control sequence, and other conditions that may cause damage prior to energizing or starting.
- H. Verify control systems are fully operational in automatic mode.

- I. Manufacturer's Criteria: Verify tests, meter readings and specific electrical characteristics agree with electrical equipment manufacturers' criteria.
- J. Bearings: Inspect for cleanliness: clean and remove foreign matter, verify alignment. Take corrective action as required.
- K. Drives: Inspect for tension on belt drives, adjustment of vari-pitch sheaves and drives, alignment, proper equipment speed, and cleanliness. Take corrective action as required. Verify shaft grounding protection is in place.
- L. Motors: Verify motor amperage agrees with nameplate value. Inspect for conditions that produce excessive current flow and that exist due to equipment malfunction. Take corrective action as required. Verify shaft grounding protection is in place.

3.03 STARTING SYSTEMS

- A. Execute start-up under supervision of responsible **Contractor** personnel.
- B. Place equipment in operation in proper sequence in accordance with sequencing schedule and the contract schedule.
- C. Follow manufacturer's requirements and recommendations for Starting and Adjusting, including any University requirements that may be listed in the Contract and Construction Documents.
- D. Equipment manufacturers representatives shall be on site for Starting and Adjusting that equipment.
- E. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- F. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- G. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

END OF SECTION 01 75 00

SECTION 01 76 00

PROTECTION of EXISTING and INSTALLED CONSTRUCTION

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Protection for Products Including University Provided Products, After Installation.
- B. Protection of Existing Utilities, Interference and Underground Structures.
- C. Protection of Existing Structures and Work adjacent to new construction and demolition.

1.02 RELATED SECTIONS

- A. Section 013100 – COORDINATION
- B. Section 013900 – GREEN BUILDING POLICY IMPLEMENTATION
- C. Section 015100 – TEMPORARY UTILITIES

1.03 EXISTING UTILITIES

- A. Known Utilities: Known existing utilities are shown on Contract Drawings in approximate locations. **Contractor** shall exercise care in avoiding damage to existing facilities. **Contractor** shall be responsible for repair of same if damaged through **Contractor** 's action. Hand excavation shall be utilized when digging in close proximity to existing utilities. University does not guarantee that all utilities or obstructions are shown, or that locations indicated are accurate.
- B. As part of the Contract Work the investigation and excavation to locate existing utilities and underground structures shall be as follows, Contractor shall assume the existing known utility is within a 5 feet zone on either side of the location indicated on the Contract Documents. If the existing known utility is not located within a 5 feet zone on either side of the location indicated on the Contract Documents, the Contractor shall immediately notify the Universities Representative. The Contractor shall continue excavating until the existing utility is located. The Contractor shall be compensated for any additional excavation beyond the 5 feet zone on either side of the existing utility per 1.03D.
- C. Electrical Equipment: No work shall be performed on energized electrical equipment unless scheduled with University's Representative. University reserves right to specify specific conditions for all work involving energized high voltage electrical equipment and its scheduled modification proposal.

- D. Uncovering Facilities: Prior to any earthwork for new construction, **Contractor** shall uncover all existing piping where crossings, interferences or connections are shown on Contract Drawings, from one (1) foot below proposed construction limit to the existing ground surface. Any variation in actual elevations and indicated elevations shall be brought to University's Representative attention. If **Contractor** does not expose all existing utilities, **Contractor** shall not be entitled to additional compensation for work necessary to avoid unknown interferences.
- E. Interferences: If interferences occur at locations other than general locations shown on Contract Drawings, and such utilities are damaged before such locations have been established, or create an interference, **Contractor** shall immediately notify University's Representative and a method for correcting said interference shall be supplied by University. Payment for additional work due to interferences not shown on Contract Drawings shall be in accordance with the General Conditions of the Contract. Cost of repair to damaged utilities shall be deducted from the Contract Sum.
- F. Accuracy of Drawings: Drawings showing location of equipment, piping, etc. are diagrammatic and job conditions will not always permit installations in locations shown. When a conflict situation occurs, immediately bring to attention of University's Representative for determination of relocation.
- G. Deviations from Drawings: Information shown relative to existing power and signal service is based upon available records and data but shall be regarded as approximate only. Minor deviations found necessary to conform with actual locations and conditions shall be made at no change to the Contract Sum.

PART II - PRODUCTS – Not Applicable to this Section

PART III - EXECUTION

3.01 PROTECTION AFTER INSTALLATION

- A. Installed Equipment and Materials: Adequately protect all installed equipment and materials until completion and acceptance by University's Representative.
- B. Existing Facilities: All existing areas, improvements and facilities shall be protected from damage of any type resulting from operations, equipment or workers of **Contractor** during the construction process.
- C. Subsequent Operations: Protect installed products and control traffic in immediate area to prevent damage from subsequent operations.
- D. Traffic Areas: Provide protective coverings at walls, projections, corners, and jambs, sills, and soffits of openings in and adjacent to traffic areas.
- E. Elevators: Cover walls and floors of elevator cabs, and jambs of cab doors, when elevators are used by construction personnel. Protect the elevator call buttons, switches, communication devices, lights, thresholds and other components.
- F. Moisture and Humidity Protection: Protect all new installed work and existing work per the manufacturer's requirements from moisture or humidity damage including but not limited

to stored materials, finishes, gypsum board, insulation, doors, casework, millwork, equipment and all other building components.

- G. Finished Floors: Protect finished floors and stairs from dirt, wear, and damage:
1. Secure heavy sheet goods or similar protective materials in place, in areas subject to foot traffic.
 2. At all transitions to adjacent areas not under construction.
 3. Lay rigid materials in place in areas subject to movement of heavy objects and where storage of products will occur.
- H. Waterproofed and Roofed Surfaces:
1. Restrict use of surfaces for traffic of any kind, and for storage of products.
 2. When an activity is mandatory, obtain recommendations for protection of surfaces from manufacturer. Install protection and remove on completion of activity. Restrict use of adjacent unprotected areas.
 3. No Construction work shall be conducted on any unprotected roof weather new or existing.
 4. All pathways to work on the roof shall be protected.
- I. Lawns and Landscaping: Restrict traffic of any kind across planted lawn and landscaped areas.
- J. Adjacent Facilities: Care shall be exercised to prevent damage to adjacent facilities including walks, curbs, and gutters. Adequate protection shall be placed where equipment will pass over such obstructions, and facilities damaged by construction operations shall be removed and replaced at **Contractor** 's expense.

3.02 Protection of Existing Structure and Work adjacent to new construction and demolition.

- A. The **Contractor** shall protect existing in place work at the exterior and interior, including but not limited to finishes, materials, products, utilities, fixtures, and equipment adjacent to new construction and demolition. Any existing in place work at the exterior and interior that is damaged by the **Contractor** shall be repaired or replaced at no extra cost to the University.
- B. Overloading: **Contractor** shall be responsible for overloading any part or parts of structures beyond the calculated capacities of the design. Placing materials, equipment, tools,

machinery, or any other item shall be done with care to avoid overloading. No loads shall be placed on floors or roofs before they have attained their permanent and safe strength.

- C. Damaged Work: All damaged work shall be replaced, repaired, and restored to its original condition without change to the Contract Sum. Repair or replace all damaged work promptly as directed by University's Representative.
- D. Damaged Utilities: Where existing utilities are damaged or disrupted on account of any act, omission, neglect, or misconduct of the **Contractor** in the manner or method of executing the Work, or due to non-execution of work, such damage shall be immediately repaired to maintain operation regardless of the time of occurrence.
- E. Temporary Construction: Provide temporary construction necessary for protection of building and its parts. Close in buildings as soon as possible to protect from weather and vandalism. Protect existing buildings and controlled temperature areas from damage.
- F. Doors and Casework: Protect doors, millwork and mill counters and cases and hardware from damage, including abrading and scratching of finishes. Protect doors and frames and hardware from mechanical damage and damage to anodic coatings.
- G. Protective Coatings: Remove protective coatings, etc., as required to leave work in condition for painting and finishing, final cleaning, etc.
- H. Exterior Work: Protect all exterior work, including existing asphalt paving and landscaping and buildings.

END OF SECTION 01 76 00

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Project Closeout Procedures
- B. Contract Closeout Procedures
- C. Punch List of Incomplete Work or Corrections

1.02 RELATED SECTIONS

- A. Section 013100 – COORDINATION
- B. Section 013300 – SHOP DRAWINGS, PRODUCT DATA AND SAMPLES: Administrative general requirements for submittals.
- C. Section 013900 – GREEN BUILDING POLICY IMPLEMENTATION
- D. Section 015600 – TEMPORARY BARRIERS, ENCLOSURES AND CONTROLS: Removal of Controls.
- E. Section 017400 – CLEANING: Final Cleaning.
- F. Section 017800 – CLOSEOUT SUBMITTALS

1.03 FINAL COMPLETION ACTIONS

- A. On Application for Payment that coincides with date Substantial Completion is claimed, show 100% completion for portion of Work claimed substantially complete.
- B. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
- C. Notify the University's Representative fourteen (14) calendar days prior to the Project being ready for permanent cores and keying.
- D. Complete start-up testing and Commissioning of systems, and instruction of University personnel. Remove temporary facilities from site, along with construction tools, mock-ups, and similar elements.

1.04 SUBSTANTIAL COMPLETION REVIEW

A. Preliminary Punch List Review:

1. **Contractor** shall provide an electronic file as indicated in Item 1.04, C., (Preliminary Punch List) of items not installed, to be completed, not functioning correctly or to be corrected. The list shall include the anticipated dates of when the work is to be installed, completed or corrected.
2. Organize the List per Item 1.04, C.
3. List shall identify items by location (e.g., room number and name) and consecutive number (e.g., 307-5 might identify item 5 in room 307, Roof-4 would identify item 4 on Roof).
4. Segregate architectural, plumbing, HVAC and electrical Work on separate lists.
5. University's Representative and **Contractor** shall conduct a brief walk-through of Project to review scope and adequacy of list.

B. **Contractor** 's Certification: When determined by **Contractor** that Work is substantially complete, **Contractor** shall notify University's Consultant and University's Representative.

1. Submit to University's Representative written certification that:
 - a. Contract Documents have been reviewed.
 - b. All portions of Work have been carefully inspected.
 - c. Work is complete in accordance with Contract Documents.
 - d. Equipment and systems have been commissioned, tested, adjusted and balanced and are fully operational.
 - e. Indicate Operation of systems that have been demonstrated to University personnel and which systems have not been demonstrated to University personal.
 - f. Work is ready for University's Consultant's Substantial Completion review.
2. Provide minimum fourteen (14) calendar days' notice to University's Representative prior to desired date for Punch List review.

C. Organization of List (Punch List):

1. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by **Contractor** that are outside the limits of construction.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Format Requirements: Provide the following:
 - a. Organized electronic file that is able to be filtered or queried by the following categories:
 - 1) Contractor or Subcontractor
 - 2) Building Area/Floor if applicable
 - 3) Room Number or specific interior or exterior area.
 - 4) Photo Number if applicable
 - 5) Open or Closed
 - 6) Columns for use by University's Representative
 - a) Responsible Design Consultant
 - 7) Comments
 - b. Other Punchlist Software may be used if approved by the University's Representative.
 - c. Include the following information at the top of each page:
 - 1) Project name and Number.
 - 2) Date.
 - 3) Name of University's Representative.
 - 4) Name of **Contractor** .
 - 5) Page number.

D. Punch List Review: University's Representative and University's Consultants as may be required, will attend a Contract closeout review and conduct a walk-through of Project to review **Contractor**'s list of items to be completed and corrected (Punch List). **Contractor** and University's Consultant shall note deficiencies, if any.

1. **Contractor** shall prepare list and record additional items as University's Representative may determine require completion and correction from walk-through.

- a. If deficiencies are noted University's Representative and University's Consultant shall promptly notify **Contractor** in writing, listing observed deficiencies.
 - b. If no deficiencies are noted, or when noted deficiencies are removed from the Punch List, University's Representative shall promptly notify **Contractor**.
2. **Contractor** shall edit the electronic file and distribute list with University's Representative and University's Consultant's additions.
 3. **Contractor** shall remedy deficiencies.
 4. Costs of additional visits to site by University's Consultants to review completion and correction of Work shall be deducted from the Contract Sum.
- E. Uncorrected Work: Refer to requirements specified in SECTION 014500 – QUALITY CONTROL regarding Contract adjustments for non-conforming work.
- F. Cleaning and Clearing: Prior to Substantial Completion review, execute cleaning and clearing site of temporary facilities and controls, as specified in SECTION 015600 – TEMPORARY BARRIERS, ENCLOSURES AND CONTROLS and SECTION 017400 CLEANING
- G. Testing and Inspection: Prior to Substantial Completion review, complete all tests and inspections and submit applicable reports and approvals. Provide commissioning of building systems per Section 013900 GREEN BUILDING POLICY IMPLEMENTATION.
1. Complete materials tests and inspections.
 2. Complete commissioning, testing, inspection, balancing, sterilization and cleaning of plumbing and HVAC systems.
 3. Complete commissioning, testing and inspection of electrical system.
 4. Complete commissioning and operational tests of equipment.
 5. IF HCAI PROJECT: Submit electronic file of **Contractor** 's Final HCAI Verified Reports to University's Representative certifying completion of the Work in conformance with the Contract Documents. Report forms will be supplied by University's Representative.
- H. Acceptance of the Work shall not relieve **Contractor** of any responsibility for defects that develop during the guarantee period and are caused by **Contractor** 's failure to perform work in accordance with requirements of Contract Documents.

1.05 FINAL COMPLETION SUBMITALS (See 017800 CLOSEOUT SUBMITTALS)

1.06 STATEMENT OF ADJUSTMENT OF ACCOUNTS

- A. Submit final statement reflecting adjustments to Contract Sum indicating:
1. Original Contract Sum
 2. Previous Change Orders
 3. Changes under allowances (Mark as NOT USED if not project applicable.)
 4. Changes under unit prices (Mark as NOT USED if not project applicable.)
 5. Deductions for uncorrected work
 6. Penalties
 7. Deductions for liquidated damages
 8. Deductions for re-inspection fees
 9. Other adjustments to Contract Sum
 10. Total Contract Sum as adjusted
 11. Previous payments
 12. Sum remaining due
- B. University will issue a final Change Order reflecting approved adjustments to Contract Sum not previously made by Change Order.

1.07 APPLICATION FOR FINAL PAYMENT

- A. Final Payment: After completion of all items listed for completion and correction, after submission of all documents and products, and after final cleaning, submit final Application for Payment, identifying total adjusted Contract Sum, previous payments and sum remaining due. Refer to SECTION 012900 – MEASUREMENT AND PAYMENT and the General Conditions of the Contract.
- B. Submit As-Built Documents to University's Representative with final Application for Payment.

PART II - PRODUCTS – Not Applicable to this Section

PART III - PART III - EXECUTION

3.01 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use.

3.02 REPAIR PERIOD (GUARANTEE OR WARRANTY PERIOD)

- A. Upon acceptance of the project or a portion thereof from the **Contractor**, the "Guarantee to Repair Period" of one year or more will begin as described in Article 9 of the General Conditions. The University Representative will become responsible for receiving notices of Defective Work from building occupants and securing **Contractor** compliance where applicable. The University Representative shall have prime responsibility for follow-up & monitoring of **Contractor** activities. (Refer to Article 12 of General Conditions).
1. If the **Contractor** must "Shut-down" the fire and security alarms in an occupied building, then the **Contractor** shall be responsible to provide a fire and security watch until the system, at no additional cost to the University.

END OF SECTION 01 77 00

SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Equipment Data
- B. Operation and Maintenance Instructions
- C. Instruction of University personnel
- D. Schedule of Submittals
- E. Spare Parts and Maintenance Materials
- F. Guarantees, Warranties, Bonds, Service and Maintenance Contracts
- G. Project Record Documents

1.02 RELATED SECTIONS

- A. Section 013100 – COORDINATION
- B. Section 013300 – SHOP DRAWINGS, PRODUCT DATA AND SAMPLES
- C. Administrative general requirements for submittals.
- D. Section 013900 – GREEN BUILDING POLICY IMPLEMENTATION
- E. Section 014500 – QUALITY CONTROL: Manufacturer's tests and inspections as a condition of warranty.
- F. Section 016100 – PRODUCT REQUIREMENTS
- G. Section 017700 – CLOSEOUT PROCEDURES

1.03 FILE FORMATS

- A. All printed documents submitted per this section shall be in PDF format
 - 1. The PDF files will be unlocked and searchable.
 - 2. All PDF documents will be bookmarked.
 - 3. The exception to electronic format for As-Built drawings will be noted in the specific specification section where they are required.
- B. Digital Photography

1. All files will be submitted in JPEG

1.04 EQUIPMENT DATA AND OPERATION AND MAINTENANCE (O&M) INSTRUCTIONS

- A. Preparation of data shall be done by persons:
1. Trained and experienced in maintenance and operation of described products.
 2. Familiar with requirements of this Section.
 3. Skilled in technical writing to extent required for communication of essential data.
 4. Skilled as drafters competent to prepare required drawings
- B. O&M Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at time of Section Submittals. Submit reviewed manual content formatted and organized as required by this Section. Prepare in the form of a data and instructional manual.
- C. Submit PDF electronic files of operation and maintenance manuals. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to the University. The exception to electronic format will be indicated in the specific specification section requiring hard copies of the manual.
1. Name each indexed document file in composite electronic index with applicable item name. Include a completed electronically linked operation and maintenance directory.
 - a. List Project title and Project number and particular building as applicable.
 - b. Enable inserted reviewer comments on draft submittals.
 2. Organization: Arrange content by systems under Section numbers and sequence in accordance with the Project Specifications Table of Contents.
- D. Table of Contents, Each Volume: Provide title of Project, Project number, with names, addresses, and telephone numbers of University's Representative, as applicable, and **Contractor**, including name of contact person. Provide schedule of products and systems, indexed to content of the volume.
1. For each Product or System: List names addresses and telephone numbers of subcontractor, original supplier and manufacturer, as applicable, including name of contact person. Include name and address of local source of supplies and replacement parts.
 2. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete information not applicable.
 3. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project As-Builts Documents as maintenance drawings.
 4. Additional Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in SECTION 014500 – QUALITY CONTROL.
 5. Warranties and Bonds: Include in each applicable section.

E. Manual for Materials and Finishes:

1. Building Products, applied Materials, and Finishes: Provide PDF composite electronically indexed file. Include product data, with catalog number, size, composition, and color and texture designations. Provide information for re-ordering custom manufactured Products.
2. Instruction for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
3. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
4. Additional Requirements: As specified in individual Specification Sections.
5. Table of Contents: Provide PDF electronic file with links to individual sections.

F. Manual for Equipment and Systems

1. Record Instructions: Forward to University's Representative, upon completion of work, and before work will be considered for acceptance, complete PDF composite electronically indexed file of instructions of entire plant and component parts, including manufacturer's certificates, warranty slips, parts lists, descriptive brochures, and maintenance and operating instructions, in quantities set forth in various Divisions. Submit drafts for review before preparing final PDF electronic file.
2. O & M Instructions: Provide and install, where directed, printed sheet under clear plastic cover, giving concise operating and maintenance instruction for equipment.
3. Each Item of Equipment and Each System: Inclusive description of unit or system, Model Number, Serial Number, and component parts. Identify function, normal characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts. Best to include all information provided in final approved equipment submittal. Design drawing shall be updated to reflect what was actually provided.
4. Panelboard Circuit Directories: Provide electrical service characteristics, controls and communications.
5. Wiring Diagrams: Include color-coded wiring diagrams as installed.
6. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown, and emergency instructions. Include summer, winter, and any special operating instructions.
7. Maintenance Requirements: Include routine procedures and guide for troubleshooting; disassembly, repair, and re-assembly instructions; and alignment, adjusting, balancing, and checking instructions. Provide servicing and lubrication schedules, and list of lubricants required.
8. Instructions: Include manufacturer's printed operation and maintenance instructions. Include sequence of operation by controls manufacturer.

9. Parts Data: Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
 10. Control Data: Provide as installed control diagrams by controls manufacturer.
 11. Piping Data: Provide **Contractor's** coordination drawings, with color piping diagrams as installed. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
 12. Design Data: Provide a listing in table of Contents for design data, with tabbed binder divider page and space for insertion of data.
 13. Reports: Include test and balancing reports as specified.
 14. Additional Requirements: As specified in individual Specification Sections.
- G. Instruction of University's Personnel: Instruct University designated personnel to their full and complete understanding, procedures necessary to operate and maintain equipment and systems on continuing basis. Provide training of staff.
1. Schedule: Before final inspection, instruct University designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times. For equipment requiring seasonal operation, perform instructions for other seasons within six (6) months of completion.
 2. Basis of Information: Use operation and maintenance manuals as basis for instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
 3. Instructional Material: Prepare and insert additional data in the manual when need for such data becomes apparent during instruction.
- H. Equipment Data and Operation and Maintenance Instructions Submittals:
1. Submittals: Comply with administrative requirements specified in SECTION 013300 – SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
 2. Preliminary Draft O&M Submittal: Submit electronic files of each manual at least **[180]** calendar days before commencing demonstration and training. University's Representative will review draft and return with comments.
 - a. The comments or corrections shall be incorporated into the Final O&M submittal.
 - b. Correct or revise each manual to comply with the University's Representatives comments. Submit electronic copies of each corrected manual within **[15]** calendar days of receipt of University's Representative's comments.
 - c. University's Representative will notify the **Contractor** when the edits have been accepted for incorporation into the final O&M submittal.

3. Advance Submittals: For equipment, or component parts of equipment to be put into service during construction and operated by University, submit documents within ten (10) calendar days after equipment approval.
4. Final O&M Submittal: After completion of instruction of University operation and maintenance personnel and final inspection, revise content of documents to include additional information deemed necessary from instruction experience of University's personnel and any changes made during construction. Submit each manual in the final form prior to requesting inspection for Substantial Completion. The University's Representative will return comments electronically.
 - a. Submit electronic copies of each manual prior to requesting training.

1.05 SPARE PARTS, EXTRA STOCK AND MAINTENANCE MATERIALS

- A. Products Required: Where called for in Contract Specifications, deliver to University's Representative, materials, etc., for use in maintenance work. Provide list of materials delivered to University's Representative, indicating date and acceptance by University's Representative.
 1. Provide quantities of products, spare parts, maintenance tools, and maintenance materials specified in individual Sections to be provided to University's Representative, in addition to that required for completion of the Work.
 2. Products supplied shall be identical to those installed in the Work. Include quantities in original purchase from supplier to avoid variations in manufacture.
 3. Provide itemized list of all spare parts, materials and transmittal to the University's Representative for acceptance.
- B. Storage, maintenance: Store products with products to be installed in the Work, as specified in SECTION 016100 – PRODUCT REQUIREMENTS: Product Storage and Protection.
- C. Delivery to site: Prior to final payment, deliver and unload spare products to project site. Coordinate with University's Representative and obtain receipt. University will handle and store products.

1.06 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
 1. List of Documents: Include a table of contents for each O&M and emergency, operations listed per CSI Specification number.
 2. List of Systems and Subsystems: Include references to operation and maintenance manuals that contain information about each system.
 3. List of Equipment: List equipment for each system, organized by system. For pieces of equipment not part of system, list separately.

4. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."
5. This Directory shall be submitted to the University's Representative for review and acceptance.

1.07 MAINTENANCE AGREEMENTS

- A. Prior to Closeout all Maintenance Agreements required by the Contract Documents shall be assembled and submitted electronically with the Closeout Submittal Requirements.
 1. Provide all Maintenance Agreements in PDF form.
 - a. Submit individual files for each Maintenance Agreement with a directory assembled by CSI division.
 - 1) Combine all project Maintenance Agreements including the directory into one PDF for record.
 - 2) Files will be formatted for printing with a footer identifying the CSI number and UC Davis Health project number.
 - 3) There will be a front cover to the file that contains all project information including the **Contractor** contact information.

1.08 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
 1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 1. Fire.
 2. Flood.
 3. Gas leak.
 4. Water leak.
 5. Power failure.
 6. Water outage.
 7. System, subsystem, or equipment failure.
 8. Chemical release or spill.

- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of University's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
 - 1. Instructions on stopping.
 - 2. Shutdown instructions for each type of emergency.
 - 3. Operating instructions for conditions outside normal operating limits.
 - 4. Required sequences for electric or electronic systems.
 - 5. Special operating instructions and procedures.

1.09 WARRANTIES AND GUARANTEES

- A. Warranties and Guarantees, general: Guarantees from subcontractors shall not limit **Contractor's** warranties and guarantees. Whenever possible, **Contractor** shall cause warranties of subcontractors to be made directly to University. If such warranties are made to **Contractor**, **Contractor** shall assign such warranties to University prior to final payment. When equipment and products, or components thereof, bear a manufacturer's warranty or guarantee that extends the time period of **Contractor's** warranty or guarantee, so state in the warranty or guarantee.
 - 1. Standard Product Warranties: Preprinted written warranties published by individual manufacturers for particular products and specifically endorsed by manufacturer to University.
 - 2. Special Warranties: Written warranties required by or incorporated in Contract Documents, to extend time limits provided by standard warranties or to provide greater rights for University.
 - 3. Provisions for Special Warranties: Refer to General Conditions of the Contract for terms of **Contractor's** special warranty of workmanship and materials.
 - 4. Specific Warranty Requirements: requirements are included in the individual Sections of Division 2 through 49 of the Contract Specifications, including content and limitations.
 - 5. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve **Contractor** of warranty on work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractor's requirement to countersign special warranties with **Contractor**.
 - 6. Related Damages and Losses: When correcting warranted work that has failed, remove and replace other work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted work.
 - 7. Reinstatement of Warranty: When work covered by a warranty has failed and been corrected, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to original warranty with an equitable adjustment for depreciation.

8. Replacement Cost: On determination that work covered by a warranty has failed, replace or rebuild the work to an acceptable condition complying with requirements of Contract Documents. **Contractor** shall be responsible for cost of replacing or rebuilding defective work regardless of whether University has benefited from use of the work through part of its useful service life.
 9. University Recourse: Written warranties made to the University are in addition to implied warranties, and shall not limit duties, obligations, right and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which University can enforce such other duties, obligations, rights, or remedies.
 10. Rejection of Warranties: University reserves right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
 11. University reserves right to refuse to accept work where a special warranty, or similar commitment is required, until evidence is presented that entities required to countersign commitments are willing to do so.
 12. When designated portion of Work is completed and occupied or used by separate agreement with **Contractor** during the construction period, submit properly executed warranties to University's Representative within fourteen (14) calendar days of completion of that designated portion of the Work.
 13. Submit written guarantees, in the form contained at end of this Section.
- B. Form of Warranty or Guarantee: All written warranties and guarantees, excepting manufacturers' standard printed warranties and guarantees, shall be submitted on **Contractor's**, subcontractor's, material supplier's, or manufacturer's own letterhead, addressed to University. Warranties and guarantees shall be submitted in duplicate and complying with the form letter following. Warranty and guarantee letters shall be signed by all responsible parties and by **Contractor** in every case, with modifications only as approved by University to suit the conditions pertaining to the warranty or guarantee.
- C. Submission requirements:
1. **Contractor** shall collect and assemble required warranties, guarantees, bonds, and service and maintenance contracts. Provide PDF electronically signed or signed and scanned copies of each. Organize documents into an orderly sequence based on the table of contents of the Project Manual CSI divisions.
 2. Table of Contents: Provide PDF electric file with links to individual warranty sections. Include the following information.
 - a. Product or Work item.
 - b. Product or work suppliers firm name, address, telephone number and name of principal.
 - c. Scope of guarantee, bond, service or maintenance agreement.
 - d. Date of beginning of guarantee, bond, service or maintenance contract.
 - e. Duration of guarantee, bond, service or maintenance contract.

- f. **Contractor's** name, address, telephone number and name of principal.
- g. Provide information for University personnel:
 - 1) Proper procedure in case of failure.
 - 2) Circumstances that might affect validity of guarantee or bond.

D. Warranty Submittal

- 1. Provide all warranties in PDF composite electronically indexed files.
 - a. Submit individual files for each warranty with a directory assembled by CSI division.
 - 1) Combine all project warranties including the directory into one PDF for record
 - 2) Files will be formatted for printing with a footer identifying the CSI Number and UC Davis Health Project Number.
 - 3) There will be a front cover to the file that contains the title "WARRANTY, GUARANTEE AND BOND" as well as all project information including the **Contractor** contact information. Title of Project and UC Davis Health Project Name and Number.
 - 4) Coordinate copies of each warranty to be included in operation and maintenance manuals.
 - 5) Final Submittal shall be incorporated into one PDF, bookmarked and searchable document.

- F. Time of Submittals: Submit **[60]** calendar days prior to request for final payment. When work activity is delayed materially beyond date of Substantial Completion, provide updated submittal within ten (10) calendar days after Final Completion, listing date of Final Completion as the start of the Guarantee period.

1.10 PROJECT AS-BUILT RECORD DOCUMENTS

A. Maintenance of As-Built Documents and Samples:

- 1. Provide complete set of As-Built Drawings and Specifications, showing every change from original Contract set, including all Addenda, Change Order, job decisions, etc. PDFs for this purpose may be obtained from University's Representative.
- 2. Refer to Section 017700 CLOSEOUT PROCEDURES for additional requirements for As-Built Documents.
- 3. When work is complete and prior to final payment, submit one (1) complete set of all As-Built documents, marked to show any deviation from the original Contract set. These documents are to be an accurate description of all work as constructed.
- 4. As-Built Schedule: **Contractor** shall provide As-Built Schedule of construction activities. Schedule shall be in same format as specified in SECTION 013200 – CONTRACT SCHEDULES.

- B. As-Built Drawings: Comply with the following:
1. Number of Copies: Submit one PDF file bookmarked and searchable of marked-up As-Builts.
 - a. Initial Submittal:
 - 1) Submit PDF As-Built digital data files.
 - 2) Submit digital data files per UC Davis Health Campus Design Guidelines.
 - 3) University's Representative will indicate whether general scope of changes, additional information recorded, and quality of document are acceptable.
 - b. Final Submittal:
 - 1) Submit PDF electronic files of digital As-Built.
 - 2) Submit digital data files per UC Davis Health Campus Design Guidelines.
 - 3) Final submittals of all formats will include all documents whether changes were made or not.
- C. As-Built Specifications: Submit one annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- D. As-Built Product Data: Submit annotated PDF electronic files and directories of each submittal.
1. When As-Built Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- E. Miscellaneous As-Built Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.
- F. Submittals: At Contract closeout, deliver Record Documents and samples as required by SECTION 017700 – CLOSEOUT PROCEDURES.
1. Transmit with cover letter listing:
 - a. Date.
 - b. Project title and Project number.
 - c. **Contractor's** name, address and telephone number.
 - d. Number and title of each Record Document.
 - e. Signature of **Contractor** or authorized representative.

1.11 AS-BUILT SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. Note related Change Orders, As-Built Product Data, and As-Built Drawings where applicable.
 5. Format: Submit As-Built Specifications as annotated PDF electronic file.

1.12 AS-BUILT PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, As-Built Specifications, and As-Built Drawings where applicable.
 4. Format: Submit As-Built Product Data as annotated PDF electronic file Include As-Built Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

1.13 AS-BUILT SAMPLES

- A. Preparation: Mark Samples to identify the material and location or use on project; indicate finish designations of materials and products, where designations are indicated on Drawings. Cross-reference Samples with corresponding Product Data submitted.
1. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 2. Note related Change Orders, As-Built Specifications, and As-Built Drawings where applicable.
 3. Format: Submit As-Built Samples in same size and format as indicated for each sample in the specification's sections. Pack samples securely, with protective wrapping. Include As-Built Samples directory organized by Specification Section number and title.
 4. Each Sample will be labeled with Manufacturer, Model, Product Number, CSI Section and UC Davis Health Project Name and Number.

1.14 MISCELLANEOUS AS-BUILT SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work.
 - 1. Format: Submit miscellaneous As-Built submittals as PDF electronic file Include miscellaneous As-Built submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous As-Built submittals.

1.15 PHOTOGRAPHS

- A. General: Prior to Closeout all photographic documentation required per 013220 Construction Progress Reporting shall be assembled and submitted with the Closeout Submittal Requirements.

1.16 CONSENT OF SURETY AND FINAL CERTIFICATES

- A. General: Prior to closeout Consent of Surety and Final Certificates required by the Contract Documents shall be assembled and submitted with the Closeout Submittal Requirements.

PART II - PRODUCTS – Not Applicable to this Section

PART III - EXECUTION

3.01 Refer to the following attachments

- A. Guarantee
- B. Report of Work Required by Warranty

END OF SECTION 017800

GUARANTEE

Project Title: _____

Project Location: _____

Project Number: _____ DATE: _____

GUARANTEE FOR _____ (the "Contract"),
(Specification SECTION and Contract No.)

between The Regents of the University of California ("University") and

_____ ("Contractor").

(Name of **Contractor** or Subcontractor)

hereby guarantees to University that the portion of the Work described as follows:

which it has provided for the above referenced Project, is of good quality; free from defects; free from any liens, claims, and security interests; and has been completed in accordance with Specification SECTION _____ and the other requirements of the Contract.

The undersigned further agrees that, if at any time within _____ months after the date of the guarantee the undersigned receives notice from University that the aforesaid portion of the Work is unsatisfactory, faulty, deficient, incomplete, or not in conformance with the requirements of the Contract, the undersigned will, within 10 days after receipt of such notice, correct, repair, or replace such portion of the Work, together with any other parts of the Work and any other property which is damaged or destroyed as a result of such defective portion of the Work or the correction, repair, or replacement thereof; and that it shall diligently and continuously prosecute such correction, repair, or replacement to completion.

In the event the undersigned fails to commence such correction, repair, or replacement within 10 days after such notice, or to diligently and continuously prosecute the same to completion, the undersigned, collectively and separately, do hereby authorize University to undertake such correction, repair, or replacement at the expense of the undersigned; and **Contractor** will pay to University promptly upon demand all costs and expenses incurred by University in connection therewith.

SUBCONTRACTOR

Signed: _____ Title: _____

Typed Name: _____

Name of Firm: _____

Contractor License Classification & Number: _____

Address: _____

Telephone Number: _____

CONTRACTOR

Signed: _____ Title: _____

Typed Name: _____

Name of Firm: _____

Contractor License Classification & Number: _____

Address: _____

Telephone Number: _____

**SECTION 05500
MISCELLANEOUS METAL FABRICATIONS**

PART I - GENERAL

1.01 DESCRIPTION:

- A. Scope: Work under this Section shall include all material and installation necessary to provide Miscellaneous Metal Fabrications, as shown and detailed on the drawing and specified herein.
- B. Related Work Specified Elsewhere:
 - 1. Division 5 – STRUCTURAL STEEL

1.02 QUALITY ASSURANCE

- A. References:
 - 1. 2022 California Building Code (CBC)
 - 2. American Institute for Steel Construction (AISC): Steel Construction Manual, 16th Edition.
 - 3. American Welding Society (AWS): D1.1 Structural Welding Code
 - 4. National Association of Architectural Metal Manufacturers (NAAMM): Standards
 - 5. Steel Structures Painting Council (SSPC): Painting Manual
- B. QUALIFICATIONS:
 - 1. General: Fabricator and installer specializing in the work of this Section with minimum three (3) years documented experience.
 - 2. Welding: Performed by certified welders per AWS

1.03 SUBMITTALS

- A. General: Refer to Section 01330 – SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
- B. Shop Drawings: Submit manufacture and installation details, including fastenings.
- C. Product Data: None required for specified products; required for alternate products.
- D. VOC compliance certificate signed by manufacturers certifying compliance of their products with regulations of authorities having jurisdiction over volatile organic compounds (VOCs).

1.04 PRODUCT HANDLING

- A. General: Refer to Section 01310 – COORDINATION

- B. Items Requiring Anchorage in Concrete: Deliver with complete setting diagrams, measurements, ICC evaluation reports, and manufacturer's written instructions.

1.05 GUARANTEE

- A. Period: Provide in required form for a period of one (1) year from the date of final acceptance by the University's Representative.

PART II - PRODUCTS

2.01 MATERIALS

A. Steel Shapes:

1. General: ASTM A36 except ASTM A992 for wide-flange shapes
2. Steel Tubing: ASTM A500, Grade B
3. Steel Pipe: ASTM A53, Grade B
4. Strut: Galvanized, 1 5/8" 12 GA, solid unpunched strut

B. Fastenings:

1. General: Bolts, nuts, screws, washers, and other various fastenings necessary for proper erection of work. Galvanized steel fastenings or other non-rusting types for exterior steel work.
2. Exposed in Finished Surfaces: Tamperproof countersunk Phillips flat head screws, unless otherwise shown; finish to match adjacent surfaces.
3. Plastic Screw Anchors:
 - a. Type HUD, manufactured by Hilti, Inc.
 - b. Star Anchors and Specialty Fasteners, Inc., or equal.

C. Post-installed Anchors:

1. Except where indicated on the drawings, post-installed anchors shall consist of the following anchor types as provided by Hilti, Inc. or approved equal.
 - a. Anchorage to concrete
 - i) Adhesive anchors for cracked/uncracked concrete use:
 - 1) Hilti HIT-HY 200 Safe Set System with HILTI HIT-Z rod per ICC ESR-3187
 - 2) Hilti HIT-HY 200 Safe Set System with HILTI Hollow Drill Bit System with threaded rod per ICC ESR-3187.
 - 3) Hilti HIT-RE 500-SD Epoxy Adhesive Anchoring System with threaded rod per ICC ESR-2322 for slow cure applications
 - 4) ITW Red Head EPCON G5 per ICC-ESR 1137
 - 5) Powers PE 1000 per ICC-ESR 2583

- ii) Medium duty mechanical anchors for cracked/uncracked concrete
 - 1) ITW Red Head PER ICC-ESR 2427
 - 2) Powers Power-Stud SD2 per ICC-ESR 2502
 - 3) Hilti KB-TZ2 expansion anchors per ICC ESR-4266

- b) Rebar doweling into concrete
 - i) Adhesive anchors for cracked concrete use
 - 1) Hilti HIT-HY 200 Safe Set System with Hilti Hollow Drill Bit System with continuously deformed rebar per ICC ESR-3187.
 - 2) Hilti HIT-RE 500-SD Epoxy Adhesive Anchoring System with continuously deformed rebar per ICC ESR-2322.
 - 3) ITW Red Head EPCON G5 per ICC-ESR 1137
 - 4) Powers PE 1000 per ICC-ESR 2583

- 2) Anchor capacity used in design shall be based on the technical data published by the manufacturer or such other method as approved by the Structural Engineer of Record. Substitution requests for alternate products must be approved in writing by the Structural Engineer of Record prior to use. Contractor shall provide calculations demonstrating that the substituted product is capable of achieving the performance values of the specified product. Substitutions will be evaluated by their having an ICC ESR showing compliance with the relevant building code for seismic uses, load resistance, installation category, and availability of comprehensive installation instructions. Adhesive anchor evaluation will also consider creep, in-service temperature and installation temperature.

- 3) Install anchors per the manufacturer instructions, as included in the anchor packaging.

- 4) Overhead adhesive anchors must follow manufacturer's printed installation procedures.

- 5) The contractor shall arrange an anchor manufacturer's representative to provide onsite installation training for all of their anchoring products specified. The Structural Engineer of Record must receive documented confirmation that all of the contractor's personnel who install anchors are trained prior to the commencement of installing anchors.

- 6) Anchor capacity is dependent upon spacing between adjacent anchors and proximity of anchors to edge of concrete. Install anchors in accordance with spacing and edge clearances indicated on the drawings.

- 7) Existing reinforcing bars in the concrete structure may conflict with specific anchor locations. Unless noted on the drawings that the bars can be cut, the contractor shall review the existing structural drawings and shall undertake to locate the position of the reinforcing bars at the locations of the concrete anchors, by Hilti Ferrosan, GPR, X-Ray, chipping or other means.

- D. Non-Shrink Grout:
 - 1. "Embco" manufactured by BASF Corporation
 - 2. W.R. Meadows, Inc, or equal.
- E. Primer: Per Section 09900 – PAINTING

2.02 FABRICATION

- A. Workmanship:
 - 1. General: Shop assemble work in largest practical sections; minimize field connections. Grind smooth parts exposed to view; remove weld marks and leave free of fabrication marks. Miter corners and edges unless otherwise shown. Make members true to length so assembling may be done without fillers. Bends, twists, open joints in finished members, or projecting edges or corners at connections will not be permitted. Miter, cope, and block carefully to produce tight hairline joints. Provide lugs, clips, connections, bolts, and fastenings necessary to complete fabrication.
 - 2. Galvanizing: Treat all areas burned off or damaged during fabrication with specified repair compound.
 - 3. Reinforcement: Provide proper reinforcement for hardware, and other fabricated metal work, as required.
 - 4. Welding: Use sequence welding to minimize distortion and heat stresses. Weld by shielded electric arc process per AWS. Use continuous welding along entire area of contact, except where spot welding is permitted. Grind all welds smooth on exposed surfaces. Spot welding not permitted on exposed surfaces.
 - 5. Shop Painting: Per SSPC standards.

PART III - EXECUTION

3.01 PREPARATION

- A. General: Refer to Section 01310 – COORDINATION
- B. Conditions of Work in Place: Carefully examine before beginning work; report defects.
- C. Job Measurements: Take field measurements; report discrepancies between plan and field dimensions.

3.02 INSTALLATION

A. Performance:

1. General: Install with workmen skilled in the particular type of work required and in accordance with the written instructions of the manufacturers.
2. Coordination: Deliver miscellaneous metal items to be installed in concrete or masonry, complete with all clips, anchors or bolts necessary to secure them in place.
3. Workmanship: Set work plumb and true; properly assemble and erect in a rigid and workmanlike manner. Do cutting, punching, drilling and tapping for attachment of other work coming into contact with fabricated metal work where indicated or as directed. Do necessary cutting, drilling, and fitting for installation of fabricated metal work. Execute drilling, cutting, and fitting carefully; when required, fit work at job before finishing. No burning in field permitted. Replace, or repair parts damaged or injured during erection in an acceptable manner. Drill holes for fasteners to exact diameter as recommended by fastener manufacturer. Oversized holes or holes not properly located that produce misalignment of fastener will be rejected.
4. Inspection: Provide Special Inspection for installation of structural anchors as required by the construction documents, manufacturer requirements and testing and inspection reports.
5. Testing: Provide tension testing of structural anchors as required by the construction documents and testing and inspection reports.
6. Field Touch-up: Touch-up damaged surfaces and field welds of steel, scheduled to be painted, per SSPC standards.
7. Protection: After erection, provide proper protection for fabricated metal items from other construction operations.

B. Non-shrink grout:

1. Convene pre-application meeting two (2) weeks before start of application of non-shrink grout.
2. Require attendance of parties directly affecting work of this section, including contractor, architect, engineer, applicator, and manufacturer's representative.
3. Review materials, surface preparation, forming, mixing, placing, curing, protection, and coordination with other work.

END OF SECTION 05500

SECTION 260500
ELECTRICAL WORK – GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 CONDITIONS:

- A. The Requirements of General Conditions and Special Conditions apply to Work of this Section as if fully repeated herein.
- B. Drawings and specifications take precedence when they call for materials or construction methods of better quality or larger size than required by codes laws, rules, or regulations.
- C. The Requirements of this Section apply to all Work of Division 26.

1.02 WORK INCLUDED:

- A. Provide a complete working installation with all material and equipment as shown and specified. The Contract Documents do not undertake to show or specify every item to be provided. When an item not shown or specified is necessary for proper operation of equipment shown or specified, provide the item, which will allow the system to function properly, at no increase in Contract Price.
- B. Make electrical connections for equipment furnished as part of Work of other Sections.
- C. Perform necessary equipment seismic anchorage in compliance with the California Building Code Title 24.
- D. The drawings indicate the arrangements of electrical equipment. Review architectural drawings and details for door swings, cabinets, counters, and built-in equipment; conditions indicated on architectural plans shall govern. Coordinate installation of electrical equipment with structural system and mechanical equipment and access thereto. Coordinate installation of recessed electrical equipment with concealed ductwork and piping, and wall thickness.
- E. Equipment layout is based on one manufacturer's product or from composite dimensions from multiple manufacturers. Where equipment selected for use on the job differs from layout, coordinate space requirements and connection arrangements with Engineer. Equipment which exceeds specified maximum dimensions, or which reduces required clearances shall not be accepted.

1.03 QUALITY ASSURANCE:

- A. Requirements of Regulatory Agencies:
 - 1. As specified in Division 1 - General Requirements.
 - 2. Nothing in the Contract Documents shall be construed to permit Work not conforming to applicable laws, ordinances, rules, or regulations.
 - 3. When the Contract Documents exceed requirements of applicable laws, ordinances, rules or regulations, Contract Documents shall take precedence.

4. It is not the intent of the Contract Documents to repeat requirements of Codes except where necessary for completeness or clarity.
5. All installed or connected equipment shall be labeled or certified for its use by a nationally recognized testing laboratory. Where equipment is not furnished with a factory installed label or certification, it shall be the responsibility of the contractor to obtain and pay for the necessary tests and approvals.

1.04 SUBMITTALS:

A. General:

1. Submit Shop Drawings and supplemental data for all materials and equipment specified in all Sections of this Division, in accordance with the Requirements of Division 1, and as specified hereinafter.
2. Submittals shall have materials proposed for the project identified. Catalog cuts containing unidentified materials or superfluous information will not be accepted.
3. All submittals shall be reviewed by the Contractor and stamped with his approval prior to submitting to the Architect. Contractor shall indicate in writing any deviation in submittals from requirement of Contract Documents.
4. Forward all submittals to the Architect, together, at one (1) time. Individual or incomplete submittals will not be acceptable. Only one (1) request for substitution will be considered on each item of materials or equipment.
5. Wherever catalog numbers and specific brands or trade names, not preceded by the designation "equal to", or followed by the designations "or equal", "or accepted equal", or "or approved equal", are mentioned in these Specifications or Drawings, no substitutions will be accepted.
6. Identify each item by manufacturer, brand, trade name, number, size, rating, or whatever other data is necessary to properly identify and check materials and equipment. The words "as specified" will not be sufficient identification.
7. Identify each submittal item by reference to Specification Section paragraph in which the item is specified or Drawing and Detail number.
8. Organize submittals in binders, in the same sequence as they appear in Specification Sections, article or paragraphs.
9. Internal wiring diagrams of equipment shall show wiring as actually furnished for this project, with all optional items clearly identified as included or excluded. Clearly identify external wiring connections. Identify and obliterate superfluous material.
10. Acceptance of a substitute is not to be considered a release from the Specifications. Correct any deficiencies in an item, even though approved, at Contractor's expense.
11. Be responsible for installation of approved substitution. Make any changes required for installation of approved substituted equipment at no increase in Contract Sum.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING:

- A. Identify materials and equipment delivered to site to permit check against materials list and Shop Drawings.

- B. Protect from loss or damage. Replace lost or damaged materials and equipment with new at no increase in Contract Sum.

1.06 PROJECT EXAMINATION AND CONDITIONS:

- A. Examine project; verify dimensions and locations against Drawings and become informed of all conditions under which Work is to be done before submitting proposals.
- B. Information shown relative to services is based upon available records and data but shall be regarded as approximate only. Make deviations found necessary to conform with actual locations and conditions with no increase in Contract Sum. Verify locations and elevation of utilities prior to commencement of excavation for new underground installations.

1.07 DRAWINGS AND COORDINATION WITH OTHER WORK:

- A. Drawings:
 - 1. For purposes of clarity and legibility, Drawings are essentially diagrammatic to the extent that many offsets, bends, special fittings, and the exact locations of items are not shown, unless specifically dimensioned.
 - 2. Exact routing of wiring and locations of outlets, panels, and other items, shall be governed by structural conditions, and materials and equipment already in place. Use data in the Contract Documents. In addition, the Architect reserves the right, at no increase in Contract Sum, to make any reasonable change in locations of exposed electrical items, to group them into orderly relationships and/or increase their utility. Verify the Architect's requirements in this regard prior to roughing-in.
 - 3. Dimensions, locations of doors, partitions and similar physical features shall be taken from Architectural Drawings and verified at the site as part of the Work of this Division. Consult the Architectural Drawings for exact location of outlets to center with architectural features, panels, and similar items, at the approximate locations shown on the Electrical Drawings.
 - 4. Drawings indicate, generally, routes of all branch circuits. All runs to panels are indicated as starting from nearest outlet, pointing to direction of panel. Continue all such circuits, conduits to panel as though routes were indicated in their entirety.
- B. Coordination:
 - 1. Work out all "tight" conditions involving Work of this Division and Work of other Divisions in advance of installation. Provide additional Work necessary to overcome "tight" conditions, at no increase in Contract Sum.
 - 2. Differences of disputes concerning coordination, interference or extent of Work between Divisions shall be decided by General Contractor. His decision, if consistent with Contract Document requirements, shall be final.
 - 3. Make every effort to keep existing electrical circuits, including telephone, public address, fire alarm, power, and other electrical services, in operation. Where power outages are unavoidable, schedule such outages with the Owner to occur at such times as to cause the least disruption of normal facility functions.
- C. Equipment Rough-In:

1. Rough-in locations shown on Electrical Drawings for equipment furnished by the Owner and for equipment furnished under other Divisions are approximate only. Obtain exact rough-in locations from the following sources:
 - a. From the Architect for Owner-furnished, Contractor-installed equipment.
 - b. From the Architect for existing equipment where such equipment is relocated as part of the Work of this Contract.
2. Verify electrical characteristics of equipment before starting rough-in.
3. Unless otherwise shown or specified, equipment which requires electrical connection shall be installed as part of the Work of the Division in which specified. Internal components shall be wired to a single point with wiring in raceway direct connection (hardwired) to building electrical system or internal wiring and connections with cord and plug for receptacle connection to building wiring.
4. Unless otherwise shown or specified, provide direct raceway and conductor connections from building wiring system to equipment terminals for direct connected equipment which is Contractor-furnished and Contractor-installed, Owner-furnished and Contractor-installed, and for existing equipment relocated by the Contractor.
5. Insert plug in receptacle for cord-connected equipment which is Contractor-furnished and Contractor-installed, Owner-furnished and Contractor-installed and for existing equipment relocated by the Contractor. Provide new cord and plug if required on Owner-furnished and Contractor-installed equipment.
6. Disconnect existing equipment from building electrical system, including internal wiring required for relocation and reconnection at new location.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Identify materials and equipment by manufacturer's name and nameplate data. Remove unidentified materials and equipment from site.
- B. Equipment specified by manufacturer's number shall include all accessories, controls, and other components, listed in catalog as standard with equipment. Furnish optional or additional accessories as specified. All materials shall be UL labeled and in accordance with NEMA Standards.
- C. Where no specific make of material or equipment is mentioned, any high-quality product of a reputable manufacturer may be used, provided it conforms to requirements of system and meets with Architect's acceptance.
- D. Conflicts between Plans and Specifications, exclusive of the General Conditions of the Contract, the most stringent and higher quality requirement shall govern.
- E. If the Contract Documents are not complete as to any detail such as accessories or hardware, of a required construction system or with regard to manner of installing of parts, materials, or equipment, but there exists an accepted trade standard for good and

workmanlike construction, such detail or accessories shall be deemed to have been implicitly required by the Contract Documents in accordance with such standard.

- F. Equipment and material damaged during transportation, installation, or operation will be considered as totally damaged. Replace with new. Variance from this will be permitted only with written acceptance.
- G. Provide an authorized representative to constantly supervise the Work of this Division and to check all materials prior to installation for conformance with the Contract Documents.
- H. Do not use equipment exceeding dimensions indicated for equipment, or arrangements that reduce required clearances, or exceed specified maximum dimensions.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. **Manufacturer's Directions:** Follow manufacturer's directions where manufacturers of articles used furnish directions covering points not specified or shown.
- B. All Work shall be done in orderly, workmanlike manner in accordance with NECA Standard of Installation and present neat appearing installation when completed.

3.02 NORMAL CONTINGENCIES:

- A. **Protection:** In performance of Work, protect existing facility and protect Work of other Sections as well as Work of this Section from damage.
 - 1. Existing conduits which are required to be extended, altered, or reconnected shall be accomplished as shown or as directed. Existence of any wires, conduits, or other facilities are shown in a general way only. Determine existence, location, and condition on site.
 - 2. Where existing conduits which are shown to be revised or which will be essential to functioning of particular system are cut or exposed due to construction changes, new connections shall be made in most expeditious manner as directed or shown. Where wiring is involved, new wires shall be "pulled-in" between nearest available accessible reused outlets. In all cases where new wires are required, shown, or specified to be installed in existing conduits, if same cannot be installed, new conduits shall be provided therefore as directed.
 - 3. Attention is called to the fact that all new conduit, wiring, and apparatus shown or specified shall be connected to existing systems so as to function as complete units.
 - 4. All conduits, electrical apparatus, and similar items, in place and not shown or specified to be reused or which will not be essential to functioning of various systems when Work is completed, shall be removed. No existing material shall be reinstalled or reused, unless shown or specified. Concealed conduits which are not shown or specified to be reused and become exposed due to

construction changes shall be removed to nearest available accessible reused outlets.

3.03 PERFORMANCE:

- A. Sleeves, Chases, and Concrete Inserts:
 - 1. This Division shall provide, to cause no delay, all required sleeves, chases, concrete inserts, anchor bolts, and similar items before concrete is placed, and be responsible for correct location and installation of same.
 - 2. Sleeves and chases are prohibited in structural members, except were shown or as otherwise approved in writing.
- B. Cutting and Patching:
 - 1. Do all cutting and patching, including structural reinforcing, necessary for the Work of this Division.
 - 2. No reinforcing steel or pre-stressed tendons may be cut within concrete floors without prior approval. All new cores or drilled holes shall be a minimum of 1 ½" clear of existing reinforcing. Concrete slabs must be scanned to determine the location of all reinforcing steel prior to coring, anchorage, drilling, or any other modifications.
 - 3. Do no cutting or patching without prior approval. Repair damage done by cutting and patching equal to original condition, in Architect's opinion.
- C. Provide metal backing plates, anchor plates, and similar items that are required for anchorage for the Work of this Section; securely weld or bolt to metal framing. Wood blocking or backing will not be permitted in combination with metal framing.

3.04 TESTING AND ADJUSTING:

- A. Furnish all labor and test equipment required for the Work of this Division. Testing work is defined as that work necessary to establish that equipment has been properly assembled, connected, and checked to verify that intent and purpose of the drawings, specifications, manufacturer's instruction manuals, and directions of Architect have been accomplished in satisfactory manner.
- B. Provide field tests to verify component compliance with Specifications, including but not limited to adjusting, calibrating, and setting circuit breakers, relays, timers, etc.
- C. After completion of testing and adjustment, operate the different systems and equipment under normal working conditions and show specified performance. If, in the opinion of the Architect, performance of equipment or systems is not in accordance with Contract Document or submitted data, alter, or replace equipment at no increase in Contract Sum.
- D. Do not allow or cause any Work installed hereunder to be covered up or enclosed before it has been inspected and accepted. Should any Work be enclosed or covered up before it has been approved, uncover such Work, and after it has been inspected and approved, make all repairs necessary to restore Work of Others to condition in which it was found at time of cutting, all at no increase in Contract Sum.

3.05 CLEANING AND PAINTING:

- A. Properly prepare Work of this Division to be finish painted as part of the Work of Painting Section.
- B. Refinish Work supplied with final finish as part of the Work of this Division if damaged as part of the Work of this Division to satisfaction of Architect.
- C. Thoroughly clean interiors of switchboards and motor control centers. After other Work is accomplished, clean exposed conduit, panels (interiors and exteriors), fixtures, and equipment, and leave in condition satisfactory to Architect.
- D. Clean out and remove from site all surplus materials and debris resulting from this Work, including surplus excavated materials.

3.06 SALVAGE MATERIAL AND EQUIPMENT:

- A. Where remodel or demolition work is to be accomplished under this Contract, all removed materials and equipment which in the opinion of the Owner are salvable shall remain the property of the Owner. Such salvaged materials and equipment shall be delivered to the Owner on the premises as directed and shall be neatly piled or stored and protected from damage.
- B. All materials considered to be scrap and not salvable shall be removed from the premises and disposed of by the Contractor.

END OF SECTION

SECTION 260519
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

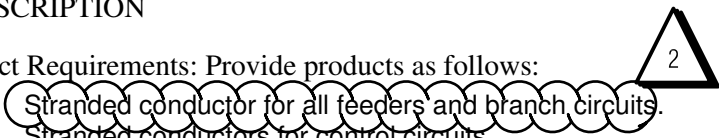
1.01 SUMMARY

- A. Section includes building wire and SO cable with insulation rated 600 volts and less; and wiring connectors and connections.
- B. Related Sections:
 - 1. Section 260553 - Identification for Electrical Systems: Product requirements for wire identification.

1.02 REFERENCES

- A. NECA (National Electrical Contractors Association) - Standard of Installation.
- B. ANSI/NFPA 70 – National Electrical Code (NEC).
- C. Part 3, Title 24, - California Electrical Code (CEC).
- D. Underwriters Laboratories, Inc. (UL).
 - 1. UL-83, UL-44 – Thermoplastic-Insulated Wire and Cables.

1.03 SYSTEM DESCRIPTION

- A. Product Requirements: Provide products as follows:
 - 1.  Stranded conductor for all feeders and branch circuits.
 - 2. Stranded conductors for control circuits.
 - 3. Conductor not smaller than 12 AWG for power and lighting circuits. The minimum size of emergency system conductors shall be 10 AWG.
 - 4. Conductor not smaller than 16 AWG for control circuits.
 - 5. 10 AWG conductors for 20 amperes, 120-volt branch circuit home runs longer than 75 feet.
 - 6. 10 AWG conductors for 20 amperes, 277-volt branch circuit home runs longer than 200 feet.
 - 7. Cables shall be jacketed 600 volts SO type.
- B. Wiring Methods: Provide the following wiring methods:
 - 1. Concealed Dry Interior Locations: Use only building wire, Type THHN/THWN-2 or XHHW-2 insulation, in raceway.
 - 2. Exposed Dry Interior Locations: Use only building wire Type THHN/THWN-2 or XHHW-2 insulation, in raceway.

1.04 SUBMITTALS

- A. Product Data: Submit for building wire and each cable type.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.06 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on Drawings.

1.07 COORDINATION

- A. Where wire and cable destination are indicated and routing is not shown, determine routing and lengths required.
- B. Determine required separation between wire, cable, and other work. Determine cable routing to avoid interference with other work.
- C. Wire and cable routing indicated is approximate unless dimensioned.

PART 2 PRODUCTS

2.01 BUILDING WIRE

- A. Manufacturers:
 - 1. Diamond Wire & Cable Co.
 - 2. Essex Group Inc.
 - 3. General Cable Co.
 - 4. Approved equal.
- B. Product Description: Single conductor 600 volt insulated wire.
- C. Conductor: Copper.

2.02 ELECTRICAL INSULATING TAPE:

- A. Electrical insulating tape shall be 600-volt, flame retardant, cold and weather resistant, minimally .85 mil thick plastic vinyl material: Scotch No. 88, Tomic No. 85, Permacel No. 295, or equal.

2.03 WIRING CONNECTORS

- A. Insulated spring wire connectors: multi-part construction incorporating a steel spring enclosed with a color coded outer thermoplastic shell.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify raceway installation is complete and supported.

3.02 PREPARATION

- A. Completely and thoroughly swab raceway before installing wire.

3.03 EXISTING WORK

- A. Remove exposed abandoned wire and cable, including abandoned wire and cable above accessible ceiling finishes. Patch surfaces where removed cables pass through building finishes.
- B. Disconnect abandoned circuits and remove circuit wire and cable. Remove abandoned boxes when wire and cable servicing boxes is abandoned and removed. Install blank cover for abandoned boxes not removed.
- C. Provide access to existing wiring connections remaining active and requiring access. Modify installation or install access panel.
- D. Extend existing circuits using materials and methods as specified.
- E. Clean and repair existing wire and cable remaining or wire and cable to be reinstalled.

3.04 INSTALLATION

- A. Route wire and cable to meet Project conditions.
- B. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- C. Splices in homerun conductors to panelboards, switchboards, switchgear, motor control centers, motor control enclosures, and other panels shall be kept to the minimum practicable and shall only be made as necessary to support pulling of the conductors. Make splices in conductors only within junction boxes, wiring troughs and other enclosures as permitted by the California Electrical Code.
- D. Do not splice conductors in pull boxes, panelboards, switchboards, switchgear, motor control centers or motor control enclosures.
- E. Identify and color code wire and cable under provisions of Section 26 05 60. Identify each conductor with its circuit number or other designation indicated.
- F. Special Techniques--Building Wire in Raceway:
 - 1. Pull conductors into raceway at same time.
 - 2. Install building wire 4 AWG and larger with pulling equipment.
 - 3. A maximum of three branch circuits are to be installed on any one conduit on 3 phase 4 wire system.
 - 4. Install a minimum of twelve inches of slack conductor at each outlet.
- G. Special Techniques - Wiring Connections:
 - 1. Clean conductor surfaces before installing lugs and connectors.
 - 2. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
 - 3. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

3.05 WIRE COLOR

- A. General
 - 1. For wire sizes 10 AWG and smaller, install wire colors in accordance with the following:
 - a. Black and red for single phase circuits at 120/240 volts.
 - b. Black, red, and blue for circuits at 120/208 volts single or three phase.
 - c. Violet, brown, and yellow for circuits at 277/480 volts single or three phase.
 - 2. For wire sizes 8 AWG and larger, identify wire with colored tape at terminals, splices, and boxes. Colors are as follows:
 - a. Black and red for single phase circuits at 120/240 volts.
 - b. Black, red, and blue for circuits at 120/208 volts single or three phase.
 - c. Violet, brown, and yellow for circuits at 277/480 volts single or three phase.
- B. Branch Circuits: Shared neutral conductors for multiple circuits are not permitted. Provide a separate neutral conductor for each phase conductor.
- C. Neutral Conductors: White. When two or more neutrals are located in one conduit, individually identify each with proper circuit number.
- D. Branch Circuit Conductors: Install three or four wire home runs with each phase uniquely color coded.
- E. Ground Conductors:
 - 1. For 6 AWG and smaller: Green.
 - 2. For 4 AWG and larger: Identify with green tape at both ends and visible points including junction boxes.

3.06 CONTROL, COMMUNICATION AND SIGNAL CONDUCTORS

- A. Install in separate raceway systems from electrical line voltage wiring.

END OF SECTION

SECTION 260526
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Wire.
 - 2. Mechanical connectors.

1.02 REFERENCES

- A. Institute of Electrical and Electronics Engineers:
 - 1. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
- B. Part 3, Title 24, - California Electrical Code (CEC).

1.03 SYSTEM DESCRIPTION

- A. All panelboards, junction boxes, pull boxes, wire ways, device boxes, and equipment enclosures shall be bonded to the separate green equipment grounding conductor.

1.04 QUALITY ASSURANCE

- A. Provide grounding materials conforming to requirements of NEC, IEEE 142, and UL labeled.

PART 2 PRODUCTS

2.01 WIRE

- A. Bonding Conductor: Stranded copper with dual rated THHN/THWN insulation, color identified green.

PART 3 EXECUTION

3.01 PREPARATION

- A. Remove paint, rust, mill oils and surface contaminants at connection points.

3.02 EQUIPMENT GROUNDING

- A. Equipment Grounding Conductor: Provide a CEC sized insulated copper ground conductor in all 120VAC through 600 VAC feeder and branch circuit distribution conduits and cables.

- B. Conduit terminating in concentric, eccentric, or oversized knockouts at panelboards, cabinets, gutters, etc. shall have grounding bushings and bonding jumpers installed interconnecting all such conduits.
- C. Provide bonding jumpers across expansion and deflection couplings in conduit runs, pipe connections to water meters, dielectric couplings in metallic cold water piping system.
- D. Provide internal ground wire in flexible conduit connected at each end via grounding bushing.
- E. Permanently ground entire light and power system in accordance with CEC, including service equipment, distribution panels, lighting panelboards, switch and starter enclosures, motor frames, grounding type receptacles, and other exposed non-current carrying metal parts of electrical equipment.
- F. Accomplish grounding of electrical system by using insulated grounding conductor installed with feeders and branch circuit conductors in conduits. Size grounding conductors in accordance with CEC or as indicated on drawings. Install from grounding bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes or metal enclosures of service equipment. Ground conduits as necessary by means of grounding bushings on terminations at panelboards and switchboards to grounding bus.
- G. Permanently attach equipment and grounding conductors prior to energizing equipment.

3.03 FIELD QUALITY CONTROL

- A. Provide visual and mechanical inspection in accordance with NETA ATS, 7.13.1.

END OF SECTION

SECTION 260529
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Conduit supports.
 2. Formed steel channel.
 3. Spring steel clips.
 4. Sleeves.
 5. Firestopping relating to electrical work.

1.2 REFERENCES

- A. ASTM International
1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
 3. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
- B. Part 3, Title 24, - California Electrical Code (CEC).
- C. Underwriters Laboratories Inc.:
1. UL 1479 - Fire Tests of Through-Penetration Firestops.
 2. UL - Fire Resistance Directory.

1.3 DEFINITIONS

- A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

1.4 SYSTEM DESCRIPTION

- A. Firestopping Materials: UL 1479, to achieve fire ratings in accordance with UL Design Numbers noted on Drawings.

1.5 PERFORMANCE REQUIREMENTS

- A. Penetrations: Provide through-penetration firestop systems that are installed to resist the spread of fire, passage of smoke and other hot gases according to requirements indicated, to restore the original fire-resistance rating of assembly penetrated.
1. Install complete through penetration firestop systems that have been tested and are listed by recognized testing agencies per ASTM E 814 or UL 1479 fire tests in a configuration that is representative of site conditions.

2. F-Rated Systems: Install through-penetration firestop systems with F-ratings indicated, as determined per ASTM E 814 or UL 1479, but not less than the fire resistance rating of the assembly being penetrated.
3. T-Rated Systems: Install through-penetration firestop systems with T-ratings indicated, as well as F-ratings, as determined per ASTM E 814 or UL 1479, where required by the Building Code.

1.6 SUBMITTALS

- A. Product Data:
 1. Hangers and Supports: Submit manufacturers catalog data including load capacity.
 2. Firestopping: Submit data on product characteristics, performance, and limitation criteria.
- B. Engineering Judgements: For conditions not covered by UL or WH listed designs, submit judgements by licensed professional engineer suitable for presentation to authority having jurisdiction for acceptance as meeting code fire protection requirements.

1.7 SEISMIC DETAILS AND CALCULATIONS

- A. Submit details and calculations for support and anchors that are not specifically detailed on the Drawings where required by California Building Standards Code, California Code of Regulations, Title 24. Pre-approved systems may be used as noted below only if the pre-approval is current and accepted by the local agency having jurisdiction.
- B. Where pre-approved bracing systems will be employed, submit:
 1. System component brochure describing components used and detailed installation instructions.
 2. Loads to be transmitted to the structure at anchor points.

1.8 QUALITY ASSURANCE

- A. Through Penetration Firestopping of Fire Rated Assemblies: UL 1479 with 0.10-inch water gage minimum positive pressure differential to achieve fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
 1. Wall Penetrations: Fire F-Ratings as indicated on Drawings, but not less than 1-hour.
 2. Floor Penetrations: Fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
 - a. Floor Penetrations within Wall Cavities: T-Rating is not required.

1.9 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years' experience.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

PART 2 - PRODUCTS

2.1 CONDUIT SUPPORTS

- A. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.
- B. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.
- C. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.
- D. Conduit clamps - general purpose: One-hole malleable iron for surface mounted conduits.
- E. Cable Ties: High strength nylon temperature rated to 185 degrees F. Self-locking.

2.2 FORMED STEEL CHANNEL

- A. Product Description: 1 5/8 inches solid P1000 square Galvanized 12 gage thick steel.

2.3 SPRING STEEL CLIPS

- A. Spring steel conduit hanger to threaded rod or wire.

2.4 SLEEVES

- A. Sleeves for Through Non-fire Rated Floors: 18 gage thick galvanized steel.
- B. Sleeves for Through Fire Rated and Fire Resistive Floors and Walls, and Fire Proofing: Prefabricated fire rated sleeves including seals, UL listed.

2.5 FIRESTOPPING

- A. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.
 - 1. Silicone Firestopping Elastomeric Firestopping: Single component silicone elastomeric compound and compatible silicone sealant meeting the requirements of Div. 07 "Penetration Firestopping" or "Joint Firestopping" as applicable.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify openings are ready to receive sleeves.
- B. Verify openings are ready to receive firestopping

3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.
- B. Remove incompatible materials affecting bond.
- C. Install damming materials to arrest liquid material leakage.
- D. Obtain permission from Architect/Engineer before using powder-actuated anchors.
- E. Do not drill or cut structural members.

3.3 INSTALLATION - HANGERS AND SUPPORTS

- A. Anchors and Fasteners:
 - 1. Concrete Structural Elements: Provide expansion anchors or powder actuated anchors.
 - 2. Steel Structural Elements: Provide beam clamps, spring steel clips.
 - 3. Concrete Surfaces: Provide expansion anchors.
 - 4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Provide structural backing plate.
 - 5. Solid Masonry Walls: Provide expansion anchors.
 - 6. Sheet Metal: Provide sheet metal screws.
 - 7. Wood Elements: Provide wood screws.
- B. Inserts:
 - 1. Install inserts for placement in concrete forms.
 - 2. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
 - 3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
 - 4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- C. Install conduit and raceway support and spacing in accordance with the California Electrical Code.
- D. Install all support devices according to manufacturer's guidelines and recommendations.
- E. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
- F. Do not drill through structural framing members.
- G. Do not support equipment or fixtures from the roof deck. Provide necessary framing and joist hangers to span between structural members to locate hangers properly.
- H. Install multiple conduits runs on common hangers.
- I. Supports:
 - 1. Fabricate supports from structural steel or formed steel channel. Install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
 - 2. Install surface mounted cabinets and panelboards with minimum of four anchors.
 - 3. In wet and damp locations install steel channel supports to stand cabinets and panelboards 1 inch off wall.

3.4 INSTALLATION - FIRESTOPPING

- A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit, and other items, requiring firestopping.

3.5 INSTALLATION - SLEEVES

- A. Set sleeves in position in forms. Provide reinforcing around sleeves.
- B. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- C. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.
- D. Where conduit or raceway penetrates floor, ceiling, or wall, close off space between conduit or raceway and adjacent work with fire stopping insulation and caulk.
- E. Install chrome plated steel escutcheons at finished surfaces where penetrations occur below finished ceilings.

3.6 FIELD QUALITY CONTROL

- A. Inspect installed firestopping for compliance with specifications.

3.7 CLEANING

- A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 260533
RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes conduit and tubing, surface raceways, wire ways, outlet boxes, pull and junction boxes.
- B. Related Sections:
 - 1. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
 - 2. Section 26 05 53 - Identification for Electrical Systems.
 - 3. Section 26 05 19 - low voltage electrical power conductors and cables.

1.02 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.
- B. National Electrical Manufacturers Association:
 - 1. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
 - 2. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- C. Part 3, Title 24, - California Electrical Code (CEC).

1.03 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.

1.04 DESIGN REQUIREMENTS

- A. Minimum Raceway Size:
 - 1. 3/4 inch.

1.05 SUBMITTALS

- A. Product Data: Submit for the following:
 - 1. Electrical metallic tubing.

2. Flexible metal conduit.
 3. Raceway fittings.
 4. Conduit bodies.
- B. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.06 COORDINATION

- A. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.
- B. Coordinate Work of this Division and Work of other Divisions in advance of installation. Provide additional Work to overcome tight conditions at no increase in Contract Sum.
- C. Coordinate installation of outlet boxes for equipment specified in other divisions.

PART 2 PRODUCTS

2.01 FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction.
- B. Fittings: NEMA FB 1; Fittings shall be steel insulated throat type rated as suitable for system ground continuity.

2.02 ELECTRICAL METALLIC TUBING (EMT)

- A. Product Description: ANSI C80.3; galvanized tubing.
- B. Fittings: NEMA FB 1; steel compression concrete tight couplings and connectors. Fittings shall meet same requirements for finish and material as EMT conduit. Box connectors shall have nylon insulated throat. Set screw type couplings are not permitted.
- C. Fittings shall be assembled with anti-corrosion, conductive anti-seize compound at joints made absolutely tight to exclude water.
- D. Conduit Bodies: Provide types of shapes, and sizes to suit individual applications. Bodies shall be malleable iron.

2.03 OUTLET BOXES

- A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2-inch male fixture studs where required.
 2. Boxes for shall be 1-1/2 inch deep by 4-inch square minimum.
 3. Boxes for telecommunications outlets shall be 2-1/2 inch deep by 4 11/16-inch square minimum. Provide 1-gang device ring.

- 4. Concrete Ceiling Boxes: Concrete type.
- B. Cast Boxes: NEMA FB 1, Type FD, cast ferroalloy. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.
- C. Wall Plates for Finished Areas: As specified in Section 26 27 26.
- D. Wall Plates for Unfinished Areas: Furnish gasketed cover.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.02 EXISTING WORK

- A. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces.
- B. Remove concealed abandoned raceway to its source.
- C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.
- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installations using materials and methods as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.

3.03 INSTALLATION

- A. Ground and bond raceway and boxes in accordance with Section 26 05 26.
- B. Fasten raceway and box supports to structure and finishes in accordance with Section 26 05 29.
- C. Identify raceway and boxes in accordance with Section 26 05 53.
- D. Arrange raceway and boxes to maintain headroom and present neat appearance.
- E. Maintain minimum 12" clearance from top of suspended ceiling to bottom of conduits where possible.
- F. Electrical wiring, conduits and boxes may not be installed within 1 1/2" of metal deck roofs.

3.04 INSTALLATION - RACEWAY

- A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.
- B. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- C. Group related raceway; support using conduit rack. Construct rack using steel channel specified in Section 26 05 29; provide space on each for 25 percent additional raceways.
- D. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports
- E. Do not attach raceway to ceiling support wires or other piping systems.
- F. Route exposed raceway parallel and perpendicular to walls.
- G. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
- H. Maintain clearance between raceway and piping for maintenance purposes.
- I. Maintain 2-inch clearance between raceway running perpendicular to piping with temperatures exceeding 104 degrees F.
- J. Maintain 12-inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
- K. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- L. Install fittings to accommodate expansion and deflection where raceway crosses seismic, control or expansion joints.
- M. Install suitable pull string or cord in each empty raceway except sleeves and nipples.
- N. Install suitable caps to protect installed conduit against entrance of dirt and moisture.

3.05 USES PERMITTED

- A. Electrical metallic tubing (EMT) shall be used as follows:
 - 1. Concealed in stud partitions and hollow masonry walls.
 - 2. For connections from junction box to lighting fixtures except in accessible ceilings.
 - 3. In suspended or accessible ceilings above 8 feet.
 - 4. Exposed in dry locations above 8 feet where not subjected to mechanical damage.
 - 5. In furred ceiling spaces.
- B. Flexible steel conduit shall be used as follows:
 - 1. Recessed lighting fixtures. (6ft max)
 - 2. Motor connections.
 - 3. Connection between fan plenum and structure.

4. At expansion joints.
 5. At transformers and other equipment which produces vibration.
 6. At damp and wet locations or where exposed to weather, flexible steel conduit shall be liquid tight type.
 7. Up to 20 feet of length is permitted between receptacles and light fixtures within the same single room.
 8. Tite-bite type connectors shall be used.
 9. All flexible steel conduit shall be used with code sized ground wire installed.
 10. All homeruns shall be in conduit, do not use flexible conduits for any homeruns routed to panels.
- C. All other conduit, unless excluded herein, not permitted in accordance with the California Electrical Code, or otherwise indicated on the drawings, shall be electrical metallic tubing (EMT).
- D. Conduit types shall not be mixed indiscriminately with other types in the same run, unless specified herein or required by the CEC.
- E. Use flexible conduit for connections to motors, dry type transformers, electrical duct heaters, unit heaters, and flush mounted lighting fixtures. Conduit must be secured.
1. Flexible conduit from outlet box to flush mounted lighting fixture shall not exceed 6 feet in length.
 2. Maintain ground continuity through flexible conduit with green equipment grounding conductor; do not use flexible conduit for ground continuity.

3.06 INSTALLATION - BOXES

- A. Boxes for Concealed Conduits:
1. Flush mounted.
 2. Provide raised covers for boxes to suit the wall or ceiling, construction, and finish.
- B. Install wall mounted boxes at elevations to accommodate mounting heights as indicated on Drawings.
- C. Adjust box location up to 10 feet prior to rough-in to accommodate intended purpose.
- D. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- E. In Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 24 inches from ceiling access panel or from removable recessed luminaire.
- F. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- G. Do not install flush mounting box back-to-back in walls; install with minimum 6 inches separation.
- H. Provide acoustical rated moldable putty pads for all boxes located in acoustic rated walls.
- I. Provide fire rated moldable putty pads for all boxes located in fire rated walls.

- J. Secure flush mounting box to interior wall and partition studs with screws, not nails. Use box support bracket with far side support leg. Accurately position to allow for surface finish thickness.
- K. Install stamped steel bridges to fasten flush mounting outlet box between studs.
- L. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- M. Install adjustable steel channel fasteners for hung ceiling outlet box.
- N. Do not fasten boxes to ceiling support wires or other piping systems.
- O. Support boxes independently of conduit.
- P. Install gang box where more than one device is mounted together. Do not use sectional box.
- Q. Install gang box with plaster ring for single device outlets.

3.07 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements.
- B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation specified in other Sections.
- C. Locate outlet boxes to allow luminaires positioned as indicated on Drawings.
- D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.08 ADJUSTING

- A. Adjust flush-mounting outlets to make front flush with finished wall material.
- B. Install knockout closures in unused openings in boxes.

3.09 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Clean exposed surfaces and restore finish.

END OF SECTION

**SECTION 260553
IDENTIFICATION FOR ELECTRICAL SYSTEMS**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Wire markers.

PART 2 PRODUCTS

2.01 WIRE MARKERS

- A. Description: Self-adhering, pre-printed or machine printable, self-laminating vinyl wrap around strips. Inscribe blank markers using the printer recommended by the manufacturer for this purpose.
- B. All conductors shall be marked and identified. Include voltage, phase, and feeder number, on each cable/conductor in each box/enclosure/cabinet where wires of more than one circuit or communication/signal system are present.
- C. Legend:
 - 1. Power and Lighting Circuits: Branch circuit or feeder number as indicated on Drawings.
 - 2. Control Circuits: Control wire number as indicated on shop drawings.

PART 3 EXECUTION

3.01 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.

3.02 EXISTING WORK

- A. Provide updated, type written, panelboard schedules for all branch circuit work completed as part of renovation and/or new construction projects. Schedules shall include the load description and the room number or area installed.
- B. Wire Marker Installation:
 - 1. Install wire marker for each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.
 - 2. Provide colored plastic phase tape in half-lapped turns for a distance of 3 inches from terminal points and in boxes where splices or taps are made.
- C. Box Identification:
 - 1. After completion, using an indelible wide tip marker, indicate on the cover of each junction and pull box the designation of the circuits contained therein, i.e., A-1, 3,

5.

- D. After box installation and wire termination completion all junction box and pull box covers shall be field marked/painted as follows:
1. Normal branch power circuits "Green"
 2. Critical branch power circuits "Yellow"
 3. Life Safety branch power circuits "Red"
 4. Equipment branch power circuits "Blue"
- E. Conduit and Raceway Identification:
1. Where electrical conduit is exposed in spaces with exposed mechanical piping which is identified by color-coded method, apply color-coded identification on electrical conduit in manner similar to piping identification. Except as otherwise indicated, use white as coded color for conduit.

3.03 FIRESTOPPING

- A. Firestopping shall be labeled at each location where installed, on each side of the penetrated fire barrier, and within 12 in. of the firestopping material.

END OF SECTION

SECTION 26 28 19

ENCLOSED SWITCHES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes non-fusible switches.

1.2 REFERENCES

- A. National Electrical Manufacturers Association:
 - 1. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
- B. International Electrical Testing Association:
 - 1. ANSI/NETA ATS - 2017 Acceptance Testing Specifications for Electrical Power Equipment and Systems.

1.3 SUBMITTALS

- A. Product Data: Submit switch ratings and enclosure dimensions.

1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of enclosed switches and ratings of installed fuses.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

PART 2 PRODUCTS

2.1 NONFUSIBLE SWITCH ASSEMBLIES

- A. Manufacturers:
 - 1. Square D.
 - 2. Or approved equal.
- B. Product Description: NEMA KS 1, Type HD enclosed load interrupter knife switch. Handle lockable in OFF position.
- C. Enclosure: NEMA KS 1, to meet conditions. Fabricate enclosure from steel finished with

manufacturer's standard gray enamel.

1. Exterior Locations: Type 3R.

D. Furnish switches with entirely copper current carrying parts.

2.2 SWITCH RATINGS

A. Switch Rating: Horsepower rated for AC as indicated on Drawings.

B. Short Circuit Current Rating:

1. Non-Fused Switches: UL listed for 10,000 rms symmetrical amperes.

PART 3 EXECUTION

3.1 EXISTING WORK

A. Disconnect and remove abandoned enclosed switches.

B. Maintain access to existing enclosed switches and other installations remaining active and requiring access. Modify installation or provide access panel.

C. Clean and repair existing enclosed switches to remain or to be reinstalled.

3.2 INSTALLATION

A. Install enclosed switches plumb. Provide supports in accordance with Section 26 05 29.

B. Install engraved plastic nameplates in accordance with Section 26 05 53.

3.3 FIELD QUALITY CONTROL

A. Provide visual and mechanical inspections per NETA ATS 7.5.1.1.A.

B. Perform tests per NETA ATS 7.5.1.1.B.

3.4 INDEPENDENT TESTING ORGANIZATION AND PERSONNEL

A. Obtain the services of an independent third party testing organization to perform electrical tests.

B. Independent testing organization and personnel shall meet the requirements of NETA ATS 3.1 and 3.2.

C. Provide written test results and a final report of electrical tests per NETA ATS 5.4 to Architect.

END OF SECTION

SECTION 26 28 23

ENCLOSED CIRCUIT BREAKERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes molded-case circuit breakers in individual enclosures.

1.2 REFERENCES

- A. National Electrical Manufacturers Association:
 - 1. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.
- B. International Electrical Testing Association:
 - 1. ANSI/NETA ATS – 2017 Acceptance Testing Specifications for Electrical Power Equipment and Systems.

1.3 SUBMITTALS

- A. Product Data: Submit catalog sheets showing ratings, trip units, time current curves, dimensions, and enclosure details.

1.4 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations and continuous current ratings of enclosed circuit breakers.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

PART 2 PRODUCTS

2.1 MOLDED CASE CIRCUIT BREAKER

- A. Manufacturers:
 - 1. Squared D.
 - 2. Or approved equal.
- B. Product Description: Enclosed, molded-case circuit breaker conforming to NEMA AB 1. Circuit breakers with frame sizes 250 amperes and larger shall have a field adjustable variable magnetic trip element.

- C. Minimum fully rated Short Circuit Rating:
 - 1. 65,000-amperes RMS at 480V, or as shown on Drawings.
- D. Panelboard breakers shall match the kAIC rating and manufacturer of the enclosure.
- E. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, Class A ground fault interrupter circuit breakers as indicated on Drawings.
 - 1. Circuit breaker handle locks shall be provided for all circuits that supply emergency egress lights, energy management and control system (EMCS) panels and fire alarm panels.
 - 2. Circuit breakers shall be molded case, thermal magnetic trip type with common trip handle for all poles.
- F. Include adjustable trip breakers where required to achieve selective coordination or limit fault current as coordinated with the results of the contractor prepared power system study.
- G. Accessories: As indicated on Drawings. Conform to NEMA AB 1.
- H. Enclosure: NEMA AB 1, to meet conditions. Fabricate enclosure from [steel finished with manufacturer's standard gray enamel].
 - 1. Exterior Locations: Type 3R.

PART 3 EXECUTION

3.1 EXISTING WORK

- A. Disconnect and remove abandoned enclosed circuit breakers.
- B. Maintain access to existing enclosed circuit breakers and other installations remaining active and requiring access. Modify installation or provide access panel.
- C. Clean and repair existing enclosed circuit breakers to remain or to be reinstalled.

3.2 INSTALLATION

- A. Install enclosed circuit breakers plumb. Provide supports in accordance with Section 26 05 29.
- B. Height: 5 feet to operating handle.
- C. Locate and install engraved plastic nameplates in accordance with Section 26 05 53.

3.3 FIELD QUALITY CONTROL

- A. Provide circuit breaker visual and mechanical inspection in accordance with NETA ATS, 7.6.1.1.A.
- B. Perform circuit breaker electrical tests on all circuit breakers 150 amperes and above in accordance with NETA ATS, 7.6.1.1.B.

3.4 INDEPENDENT TESTING ORGANIZATION AND PERSONNEL

- A. Obtain the services of an independent third party testing organization to perform electrical tests.
- B. Independent testing organization and personnel shall meet the requirements of NETA ATS 3.1 and 3.2.
- C. Provide written test results and a final report of electrical tests per NETA ATS 5.4 to Architect.

3.5 ADJUSTING

- A. Adjust trip settings to coordinate circuit breakers with other overcurrent protective devices in circuit. Time Current Curves performed by the Electrical Engineer of Record.
- B. Adjust trip settings to provide adequate protection from overcurrent and fault currents.

END OF SECTION