

ADDENDUM NO. E

AUGUST 31, 2017

BIDDING AND CONTRACT DOCUMENTS

FOR

SCHOOL OF MEDICINE FIRST FLOOR FIT-OUT

PROJECT NO. 954041

CONTRACT NO. 954041-LF-2017-177



The following changes, additions, or deletions shall be made to the following documents as indicated for this Project; and all other terms and conditions shall remain the same. Each bidder is responsible for transmitting this information to all affected subcontractors and suppliers before the Bid Deadline.

1. **BID FORM**

Replace the Bid Form with the one issued in this Addendum.

2. **INFORMATION AVIALABLE TO BIDDERS**

Replace the Information Available to Bidders with the one issued in this Addendum.

3. **SPECIFICATIONS TABLE OF CONTENTS**

Replace the Specifications Table of Contents with the one issued in this Addendum.

4. **SPECIFICATIONS**

Add Specification 03 3543 Polish Concrete Finish

Add Specification 07 2100 Therma Insulation

Add Specification 079200 Joint Seleants

Replace Specification 09 2900 Gypsum Board with the one issue in this addendum.

5. **BID RFI'S**

BID RFI No.	QUESTIONS / ANSWERS
2-1	<p>Question: Spec. 12 2413. Please clarify the location of the (2) different types of roller shades</p> <p>Answer: Motor-operated roller shades are for upper clearstory windows that cannot be reached. They are located in the two labs (0130 and 0110, see Sheet A1-703) and in the office areas (101,105,109,113,177,121 see Sheet A1-700 detail 10) Manual shades for lower windows in offices if the rolling wood shutters are not accepted as alternate. Manual shades would be for the bottom lab windows as well if the alternate wood shutters are not accepted.</p>
2-2	<p>Question: Specification 11 53 63, 2.03.2.B calls for Biosafety Cabinet in Room 141 to be 60" wide and all others to be 72" wide.</p> <p>a. Basis of Design calls for Thermo Scientific Model 1300 Series Class II, Type A2 Cabinet, however, the cut sheet for this model only supplies two (2) sizes at 51.2" wide and 74.8" wide. Is the specified width incorrect?</p> <p>Answer: a - it has been confirmed from Thermo that model 1300 series 5' biosafety cabinets are available. Note that the 5' dimension is the inside dimension, not the outside dimension.</p>

BID RFI No.	QUESTIONS / ANSWERS
2-3	<p>Question: Specification 11 53 63. b. Room 141 does not appear in the room identification schedule or in plans; however, room 0122B has a Biosafety Cabinet that is smaller than the other cabinets shown in drawings. Does another drawing sheet include this room that is not in the original bid set, and/or is the room number provided in the specifications incorrect?</p> <p>Answer: b - Room 141 as noted in the specification section 115363 is in error. The correct room number is 0122B.</p>
2-4	<p>Question: Specification 11 53 63, 1.01.A E-18 Cylinder Restraint and LF1-002 calls for CFCI, however, Sheet Notes on LF1-101B, LF1-101C state OFOI. Detail 6/P1-502 parts list indicates the Cylinder Restraint as part number 9 and Note #3 states the number of Cylinders may vary, refer to plans, however, the plans do not have E-18 location markers. Please provide quantities and locations Cylinder Restraints are needed.</p> <p>Answer: Cylinder restraints are CFCI with locations as indicated on the LF drawings. Cylinders are OFOI as per sheet note on the LF plan sheets.</p>
2-5	<p>Question: Wall Tile, A1-101Af, Is there any wall tile required at the drinking fountains in the Alcove at the existing gang restrooms? If so, please clarify which walls receive the wall tile finish, height of wall tile, and tile type (TW1 or TW2).</p> <p>Answer: No. Wall finish is G1.C per finish plan and schedule</p>
2-6	<p>Question: Motorized Mechanical Shades, A1-101A, In Conference Room 0121, keynote 2 calls for Motorized Mechanical Shades on the west wall. This wall is not elevated. The corridor side of this wall is elevated on 7/A1-700, but there is not a reference to Motorized Mechanical Shades. Please clarify.</p> <p>Answer: This note is a drawing error. Please omit.</p>
2-7	<p>Question: Glazing, A1-701, detail 6, The keynote callouts for the glazing on this elevation are not consistent with other interior elevations for glazing. Please confirm keynote 1 should be called out for the lower panes of glass only, keynote 4 called out for all other panes of glass.</p> <p>Answer: Keynote 4 on the noted elevation calls out for clear glass for the entire panel. Keynote 1 calls out for the bottom portion of the glass panel to be translucent etched glass. See detail 4/A1-810 for extent of etching. The horizontal line on the elevation is meant to represent the line of the etching, not a joint of 2 pieces of glass. The full height panel is intended to be 1 piece of glass.</p>
2-8	<p>Question: Projection Screen, A1-101A, Please confirm specification and size of the Recessed Projection Screen in Conference Room 0121.</p> <p>Answer: Elite Screens model TE180XWH. 180" diagonal.</p>
2-9	<p>Question: Projector, A1-101Ar, Please confirm specification for the Projector in Conference Room 0121.</p> <p>Answer: Panasonic, model PT-RZ770BU</p>

BID RFI No.	QUESTIONS / ANSWERS					
2-10	<p>Question: Appliances, A1-702, Elevation 14, The appliances in Vestibule 0126 is keynoted as OFOI. Is the same true for the other appliances shown on the Floor Plans and Interior Elevations (Undercounter Refrigerator, Refrigerator, Coffee Makers)? If these other appliances are to be CFCI, please provide spec.</p> <p>Answer: All appliances are OFOI.</p>					
2-11	<p>Question: Floor & Base Finish, A1-101Df, What is the floor and base finish in Vestibule 0126? Demo plan calls to remove VCT flooring in this room.</p> <div data-bbox="576 646 764 877" style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <table border="1" style="width: 100%; text-align: center;"> <tr><td>0126</td></tr> <tr><td>C1</td></tr> <tr><td>G1.A</td></tr> <tr><td>RFB1.A</td></tr> <tr><td>RF1.A</td></tr> </table> </div> <p>Answer:</p>	0126	C1	G1.A	RFB1.A	RF1.A
0126						
C1						
G1.A						
RFB1.A						
RF1.A						
2-12	<p>Question: Insulation, A1-323-1, Note 2 on the Partition Modifier Schedule refers to spec section 07200 for in-wall sound insulation. This spec section is not found in the Specifications. Please advise.</p> <p>Answer: Specification section 072100 - Thermal Insulation, has been added to the specification package and 092900 has been modified and has been attached for reference.</p>					
2-13	<p>Question: Material laydown/Staging, Spec 01 5500, Staging Areas are noted in Spec 01 5500 "As specified by the University's Representative". Has a definitive location been identified?</p> <p>Answer: Staging/laydown area will be located at the loading dock on the East side of SOM Research building, as shown on sheet A1-100.</p>					
2-14	<p>Question: Exposed Polished and Sealed Concrete Flooring, A1-306, SC1 floor finish is to be Exposed Polished and Sealed Concrete floor. Does the Polished refer to grinding the existing concrete slab? If so, please provide grinding requirements.</p> <p>Answer: Specification Section 033543 – Polished Concrete Finishing, has been added to the specification package</p>					
2-15	<p>Question: Concrete Pad, A1-500, Enlargement 4, Activity 0126 is to receive a new concrete pad. Detail 4/A1-807 shows the pad 4" thick without reinforcements on top of existing slab. Is this correct? What is the finish?</p> <p>Answer: Provide #4 rebar @ 24" O.C. each way. ½" sealer joint and backer rod to existing construction at perimeter of new slab. Smooth trowel finish.</p>					
2-16	<p>Question: Doors/Frames/Hrdw, A-301-2, Should opening 161A be Aluminum Door & Frame identical to 162A?</p> <p>Answer: Door 161A changed to aluminum frame to match 162A. See detail 2/A1-810.</p>					

BID RFI No.	QUESTIONS / ANSWERS
2-17	<p>Question: Asbestos, General, Is there an Asbestos Survey complete on the building? Is there any asbestos present that will require abatement?</p> <p>Answer: UCR is not aware of any hazardous material at this building. If any material of concern will be discovered during the construction process, UCR will be responsible for testing through its 3rd party Consultant. Contractor will be responsible for the removal and disposal process. If necessary, scope will be adjusted via change order.</p>
2-18	<p>Question: Metal Stud Framing, Engineering, Are there any engineering requirements for the metal stud framing?</p> <p>Answer: This is not an essential services building. No special engineering requirements for metal stud framing.</p>
2-19	<p>Question: Interior Partitions, GA-216 and ASTM C840, GA-216 and ASTM C840 recommend utilization of control joints. If required, please provide locations on the architectural drawings.</p> <p>Answer: (1) location needed at eastern portion of corridor CR0100B. Provide a vertical control joint at center of long wall span. See sheetnote 4 on A1-101C.</p>
2-20	<p>Question: Soffits, A1-804, Please provide soffit drop detail.</p> <p>Answer: See 2/A1-805 for soffit detail.</p>
2-21	<p>Question: Interior Metal Framing, A1-304-1, Note 4 on 'Int Metal Framing - Framing Schedule' references detail 18, which is not provided on this sheet. Please provide referenced detail 18.</p> <p>Answer: Note should read "DETAILS 15 AND 16".</p>
2-22	<p>Question: Interior Metal Framing, A1-304-1, General Note #9, General note 9 references sheet A3-8020 for typical partition top track connection details, but this sheet is not included in the bid set. Please provide sheet A3-8020.</p> <p>Answer: Note should reference sheet A1-802.</p>
2-23	<p>Question: Interior Metal Framing, A1-304-1, Detail 15, Is it acceptable to screw notched track to studs in lieu of welding shown on detail 15 on sheet A1-304-1?</p> <p>Answer: Screws not acceptable. Provide welds as shown.</p>
2-24	<p>Question: Interior Metal Framing, A1-304-2, Detail 4, Are there any load-bearing partitions and ceilings on this project?</p> <p>Answer: There are no load bearing partitions or ceilings in the scope of this project.</p>
2-25	<p>Question: Interior Metal Framing, A1-304-2, Detail 5, For recessed items noted on detail 5 on sheet A1-304-2, details 5 and 6 on A3-8070 are referenced. This sheet is not provided in the bid set. Please provide details 5 and 6 on A3-8070.</p> <p>Answer: Note updated to reference 12/A1-803.</p>

BID RFI No.	QUESTIONS / ANSWERS
2-26	<p>Question: Interior Metal Framing, A1-304-2, Detail 5, Please provide detail #10 for Bottom Track referenced on detail 5 on sheet A1-304-2.</p> <p>Answer: Note updated to reference 12/A1-802.</p>
2-27	<p>Question: Drywall, A1-306, General Note #1, General note 1 on sheet A1-306 notes that Very High Impact Resistant gypsum board is to be applied to all new partitions. Is this correct? If so, is the VHI to go full height? Please clarify.</p> <p>Answer: This note is part of our standard nomenclature. VHI not used on this project.</p>
2-28	<p>Question: Framing/Drywall, A1-306, General Note #3, General note 3 on sheet A1-306 references detail XX/A-XXXX. Please clarify this detail.</p> <p>Answer: Note removed. Does not apply to this project.</p>
2-29	<p>Question: Framing/Drywall, A1-306, General Note #4, General note 4 on sheet A1-306 references details 1 & 2/A_-8001 and XX & XX/A_-XXXX. Please clarify these details.</p> <p>Answer: Note removed. Does not apply to this project.</p>
2-30	<p>Question: Backing, A1-803, Detail 1, Is there continuous metal stud backing required at all bases (all bottom of walls) as shown on detail 1/A1-803?</p> <p>Answer: Provide at all locations with coved base.</p>
2-31	<p>Question: Framing/Drywall, A1-803, Detail 1, Detail 4 on sheet A1-803 references detail 4/A4-3011 which is not included in the bid set. Please clarify this detail.</p> <p>Answer: Note updated to reference 4/A1-301-1.</p>
2-32	<p>Question: Framing/Drywall, A1-805, Detail 2, What is the 2" x 16 gauge strap at 8" oc required for?</p> <p>Answer: Not required</p>
2-33	<p>Question: Framing/Drywall, A1-808, Detail 3, Please confirm the base wall shown at the exterior wall on detail 3/A1-808 is an existing base wall.</p> <p>Answer: Confirmed</p>
2-34	<p>Question: Framing/Drywall, A1-809, details 1, 3, & 9, Please confirm the base walls shown at the exterior wall on details 1, 3, & 9/A1-809 are existing base walls.</p> <p>Answer: Confirmed</p>
2-35	<p>Question: General, Please confirm all items currently staged inside 1st floor work space will be moved out by UCR prior to commencement of construction.</p> <p>Answer: Confirmed.</p>

BID RFI No.	QUESTIONS / ANSWERS
2-36	<p>Question: OSHPD, Spec 23 0241, Please reference specification section Vibration and Seismic Control, section 230241, Page 2 of 12, paragraph 1.3. This paragraph mentions OSHPD. Please clarify if this project has OSHPD requirements.</p> <p>Answer: No OSHPD requirements.</p>
2-37	<p>Question: MEP / Demo, General, Being that the other floors are occupied, will scheduled shutdowns be required or are there isolation valves available to keep the other floors up and running while work takes place on the 1st Floor?</p> <p>Answer: From existing drawings and what we could confirm during site visits, we know there are isolation valves located at the wall of the fire rated shaft located in the Linear Equipment Room 0112. These valves appeared to be for the following services: LCW, LHW, LHWR, & LA. Other lines service on that wall couldn't be easily identified. PW isolation valves are located at the corridor wall near grid lines 5 & F. CHW, HHW, VAC tie-in locations are on the main, therefore shutdown of the system will be required. UCR to confirm when shutdowns can be performed.</p>
2-38	<p>Question: Demolition, General, Is there a designated location available to stage the dumpster allowing for quick access from building and hauloff when full?</p> <p>Answer: Dumpster shall be located at the loading dock, on the East side of the SOM Research building, in the laydown/staging area. There is an existing access road to the loading dock. See sheet A1-100.</p>
2-39	<p>Question: Padded Vinyl Upholstery, A1-806, detail 6, Detail 6 on A1-806 calls for padded Vinyl Upholstery. The Finish Schedule on A1-306 defines (3) types of Vinyl Upholstery. Please clarify which type(s) and color(s) apply to detail 6 on A1-806.</p> <p>Answer: For the lunch room bench, use U1.A for the seat and back. For the corridor bench, use U2.B for the seat and U2.A for the back.</p>
2-40	<p>Question: Doors / Frames / HW, Spec 08 7100, part 3.7, The locations noted for each hardware set under 3.7 Door Hardware Schedule do not apply to this project. Please advise which Door Numbers from Door Schedule on A1-301-2 apply to each hardware set.</p> <p>Answer: Specification updated.</p>
2-41	<p>Question: Access Doors, A1-306, Access Door Schedule note 2, Note 2 on the Access Door Schedule calls for providing an allowance for (30) additional access panels including all required framing of openings and finishes. Is this to be carried by bidding GCs? If so, can the allowance be defined?</p> <p>Answer: This note removed. Access door schedule notes updated on A1-305 to clarify information. No allowance required.</p>

BID RFI No.	QUESTIONS / ANSWERS
2-42	<p>Question: Roll Up Shades / Wood Screens, Alternate #15; A1-703, elevations 6 & 7, Referencing elevations 6 & 7 on A1-703 and Alternate #15, please confirm the Base Bid shall include Motorized Roller Shades (color A) at transom high windows and Manual Roller Shades (color A) at sidelight low windows; the Sliding Wood Screens shown on the elevations are an ADD ALTERNATE which would require a deduct of the Manual Roller Shades at sidelights.</p> <p>Answer: Confirmed. Note that in labs, the wood panels shall cover the entire lower window assembly (2 panes of glass). In case of deduction of wood panels, (1) user controlled shade per lower window assembly (2 panes of glass). At Lab 0130, between gridlines E and F, provide (1) user controlled shade per lower window in case of deduction of wood panel.</p>
2-43	<p>Question: Laboratory Fixtures, LF1-002 & LF1-101B thru D, Please reference the lab Fixture Schedule on sheet LF1-002 and note the wall fixtures are LV-6, LA-7 & CO2-7. Please confirm if the LV-6 reference is a mistake and is to be the LV-7 fixture as the LV-7 is noted on the drawings and there are no other reference/model numbers listed for them.</p> <p>Answer: See Attachment #1 for updated schedule.</p>
2-44	<p>Question: Laboratory Fixtures, LF1-002 & LF1-101B thru D, Please reference the Lab Fixture Schedule on sheet LF1-002 and note the model numbers are not provided for the LA-6/LG-6/LV-6 fixtures, which are called out at the shared bench frames. Please advise if angled 90 degree fixtures are required here with lever handles.</p> <p>Answer: See Attachment #1 for updated schedule.</p>
2-45	<p>Question: Laboratory Fixtures, LF1-002 & LF1-101B thru D, Please confirm all plumbing services noted as LA/LG/LV are future services to be capped by the plumbing contractor with no fixture needed from the Lab Casework scope of work. This corresponds with the note on the drawings, however, not all call outs refer to the note.</p> <p>Answer: For rooms 0130H and 0110F, change LA and LV fixture designations to LA-7 and LV-7. For flex spaces 110B, 110C, 130C and 130D service designations without numbering is future as noted.</p>
2-46	<p>Question: Laboratory Equipment, LF1-800, detail 5, For the snorkel shown in this detail, both a wall bracket and attachment to the structure above is required. This is costly to provide both. Please confirm at locations over perimeter benches snorkels can be provided with wall brackets only.</p> <p>Answer: Snorkel detail 5/LF1-801 – structural support above the ceiling is not required. Snorkels are wall supported. Delete overhead structural support from project.</p>
2-47	<p>Question: Laboratory Equipment, LF1-800, detail 3, Please advise if double slotted standards are required at all drying racks as noted in this detail, or if they can be installed flat against the wall.</p> <p>Answer: Double slotted standards are not required for the wall mounted drying racks.</p>

BID RFI No.	QUESTIONS / ANSWERS
2-48	<p>Question: Electrical, Spec 26 0923, Spec section 260923 states lighting control manufacturer as Lutron. However, Sheet E1-602 shows lighting control diagrams as nLight. Please clarify lighting control manufacturer. If Lutron, please provide lighting control diagrams.</p> <p>Answer: The lighting control system will be Lutron so that it can tie into the existing Lutron system. The Lutron rep is working on the lighting control diagrams and they will be included in the IFC set</p>
2-49	<p>Question: Electrical, Please provide location of emergency lighting panel "2EHP1".</p> <p>Answer: It is noted on the Panelboard schedule, Electrical Room 0239 on 2nd Floor</p>
2-53	<p>Question: Electrical, E1-401, General Note 5, Sheet E1-401 General Note 5 states, "Extend existing cable tray system as shown. Provide pathway of j-hooks from cable tray to voice and data device locations. Final cable routing by others." Please confirm Tele/Data infrastructure is by EC and Tele/Data system and cabling will be provided by the Owner.</p> <p>Answer: No, this contractor is to provide all cable tray, j hooks, conduit, cable, devices, labeling, testing, etc for a complete installation. See specifications for final connections to devices</p>
2-54	<p>Question: Electrical, E1-000, General Note 11 Sheet E1-000 General Note 11 states to provide an Assistive Listening System. However, there are no drawings or specifications related to Assistive Listening. Please provide specifications and drawing locations of Assistive Listening.</p> <p>Answer: UCR to provide a portable assistive listening system. No scope for contractor for this item.</p>
2-49a	<p>Question: Electrical, Alternate #8, Please confirm Alternate #8 is to include conduit and wire for ceiling fans, while base bid does not include any scope related to ceiling fans.</p> <p>Answer: To confirm, all scope related to the ceiling fans, including conduit, wire, and controls are not to be included in the base bid and are included with the fans in the add-alternate.</p>
2-50	<p>Question: Electrical, Please provide detail for DMX controls of Fixture type "C".</p> <p>Answer: See details on Manufacturers cut sheet. IFC set will provide further details.</p>
2-51	<p>Question: Electrical, Please confirm ceiling fan switches, motorized shades raise/lower switches, and projection screen raise/lower switches are all wireless and do not require conduit or 120V power.</p> <p>Answer: This contractor is to provide the PICO wireless motorized shade controls. Assume ceiling fan controls and projection screen controls are hard wired.</p>

BID RFI No.	QUESTIONS / ANSWERS
2-52	<p>Question: Electrical, Please identify who the existing switchgear manufacturer is on campus.</p> <p>Answer: For this building the distribution equipment provided under base build was Square D</p>
2-56	<p>Question: Based on Detail-2 on M1-801, the VAV damper actuator requires both an AO control signal, as well as an AI position feedback signal. Per the building standard, Alerton VAViH-SD controllers utilizing floating point (DO*2) control without direct actuator feedback have been used. The VAViH-SD controller is compliant with recent Title-24 clauses that require either hardwire damper actuator feedback at each zone or software monitoring of damper position. Proof of this compliancy, direct from the CEC, is attached. The VAViH-SD constantly monitors its actuators position via software and uses this information to adjust damper position. With this information, AHU fan VFDs are properly modulated per code. Please confirm the building standard VAViH-SD can be utilized on this project for all VAV zones (not including fast acting lab control zones). By using this controller it will reduce the amount of I/O needed and will reduce the amount of cost and installation time.</p> <p>Answer: CRB takes no exception to the RFI proposal.</p>
2-57	<p>Question: Based on Control Systems Section 230970 3.4 Wiring and Tubing Practices: All BAS equipment power shall be the responsibility of the Division 26 Electrical Contractor. It is the responsibility of the BAS Contractor to coordinate with the Division 26 Electrical Contractor on the final locations to which BAS equipment power is wired.</p> <p>Will each Air Terminal Box (ATB) be provided with 120V power by Division 26? Will ATB come with factory-mounted 120/24 low voltage transformers?</p> <p>Answer: Yes, 120V power for ATBs by Electrical contractor. No. BAS contractor to provide controller/transformer.</p>
2-58	<p>Question: Based on M1-501 Detail-1 "Chilled Beams Cooling Coil or Heating Piping" Note (6) CONTROL VALVE FAIL POSITION SHALL BE FAIL OPEN. Please confirm if the fail safe/open option is required for each valve, since the specification for control valves does not mention the requirement. If a fail open/close option is required, will the valve need to be driven by spring or electronically (battery back up)? Please confirm if floating point (DO X 2) valve actuators are acceptable for all chill beam vales. Floating point valve actuators are industry standard for zone ball valves ¾" and smaller. There are no control diagrams to indicate how to control the chill beams.</p> <p>Answer: Fail open control valves shall be spring controlled. CRB takes no exception to floating point valve actuators, contractor to comply with all the Title 24 and project specification requirements.</p>

BID RFI No.	QUESTIONS / ANSWERS
2-59	<p>Question: Based on detail 2 on M1-801, the VAV damper actuator requires both an AO control signal, as well as an AI position feedback signal. Per the building standard, Alerton VAViH-SD controllers utilizing floating point (DO*2) control without direct actuator feedback have been used. The VAViH-Sd controller is compliant with recent Title-24 clauses that require either hardwire damper actuator feedback at each zone or software monitoring of damper position. Proof of this compliancy, direct from the CEC, is attached. The VAViH-SD constantly monitors its actuators position via software and uses this information to adjust damper position. With this information, AHU fan VFDs are properly modulated per code. Please confirm the building standard VAViH-SD can be utilized on this project for all VAV zones (not including fast acting lab control zones). By using this controller it will reduce the amount of I/O needed and will reduce the amount of cost and installation time.</p> <p>Answer: CRB takes no exception to the RFI proposal.</p>
2-60	<p>Question: HVAC floor plans & Schedules. Terminal Boxes EV-0130H and EV-0130B appear to look like Phoenix Valves on the floor plans but are listed as Titus air terminal boxes on the schedule. Which is correct?</p> <p>Answer: Terminal box EV-0130H is a Titus VAV. Terminal box EV-0130B is a Phoenix valve.</p>
2-61	<p>Question: Terminal box CHE-0137 is listed as a Phoenix Valve on the schedule but indicated as a regular VAV box on the drawings. Which is correct?</p> <p>Answer: Terminal box CHE-0137 is a Titus VAV.</p>
2-62	<p>Question: Fire Alarm, Please confirm the existing fire alarm system in the building.</p> <p>Answer: The existing fire alarm system in the building is SimplexGrinnell.</p>
2-63	<p>Question: Acoustical Wall Panels, details 4, 5, 6/A1-809, Please confirm spec and thickness for acoustic wall panel behind fixed wood screen wall panels.</p> <p>Answer: Provide ¾" thick, black fabric wrapped acoustical wall panel. Armstrong Soundsoak 60-fr-701 as basis of design.</p>
2-64	<p>Question: Metal Plate Trim, detail 3/A1-809, Please clarify if the metal plate trim shown on detail 3/A1-809 should be included with ADD ALT #9 or Base Bid.</p> <p>Answer: Include in base bid.</p>

END OF ADDENDUM

BID FORM

FOR: SCHOOL OF MEDICINE FIRST FLOOR FIT-OUT
PROJECT NUMBER: 954041
CONTRACT NUMBER: 954041-lf-2017-177
UNIVERSITY OF CALIFORNIA, RIVERSIDE
RIVERSIDE, CALIFORNIA

~~August 2, 2017 August 15, 2017 August 18, 2017~~ **August 31, 2017**

BID TO:

Architects and Engineers
UNIVERSITY OF CALIFORNIA, RIVERSIDE
1223 University Avenue, Suite 240
Riverside, CA 92521

(951) 827-4204 **4590**

BID FROM:

(Name of Bidder)

(Contact Name)

(Address)

(City, State, Zip Code)

_____ (Telephone Number) _____ (Facsimile Number)

(E-mail)

(Date Bid Submitted)

Note: All portions of this Bid Form must be completed and the Bid Form must be signed before the Bid is submitted. Failure to do so will result in the Bid being rejected as non-responsive.

BIDDER'S NAME: _____

1.0 BIDDER'S REPRESENTATIONS

Bidder, represents that a) Bidder and all Subcontractors, regardless of tier, has the appropriate current and active Contractor's licenses required by the State of California and the Bidding Documents; b) it has carefully read and examined the Bidding Documents for the proposed Work on this Project; c) it has examined the site of the proposed Work and all Information Available to Bidders; d) it has become familiar with all the conditions related to the proposed Work, including the availability of labor, materials, and equipment; e) Bidder and all Subcontractors, regardless of tier, are currently registered with the California Department of Industrial Relations pursuant to California Labor Code Section 1725.5 and 1771.1. Bidder hereby offers to furnish all labor, materials, equipment, tools, transportation, and services necessary to complete the proposed Work on this Project in accordance with the Contract Documents for the sums quoted. Bidder further agrees that it will not withdraw its Bid within **60** days after the Bid Deadline, and that, if it is selected as the apparent lowest responsive and responsible Bidder, that it will, within 10 days after receipt of notice of selection, sign and deliver to University the Agreement in triplicate and furnish to University all items required by the Bidding Documents. If awarded the Contract, Bidder agrees to complete the proposed Work within ~~365~~ ~~350~~ **335** days after the date of commencement specified in the Notice to Proceed.

2.0 ADDENDA

Bidder acknowledges that it is Bidder's responsibility to ascertain whether any Addenda have been issued and if so, to obtain copies of such Addenda from University's Facility at the appropriate address stated on Page 1 of this Bid Form. Bidder therefore agrees to be bound by all Addenda that have been issued for this Bid.

3.0 NOT USED

4.0 LUMP SUM BASE BID

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(Place figures in appropriate boxes.)

5.0 SELECTION OF APPARENT LOW BIDDER

Refer to the Instructions to Bidders for selection of apparent low bidder.

6.0 UNIT PRICES

The quantities set forth in the Unit Prices are estimates. University does not represent that the actual quantity of any Unit Price item will equal the Estimated Quantity stated below. University will perform the extension of the Unit Price times the respective Estimated Quantity.

BIDDER'S NAME: _____

Unit Price No. 1: Animal Racks, as specified on plans.

Estimated Quantity of units: 2

\$, . per each

(Place Unit Price figures in appropriate boxes.)

Unit Price No. 2: Snorkels, as specified on plans.

Estimated Quantity of units: 6

\$, . per each

(Place Unit Price figures in appropriate boxes.)

Unit Price No. 3: ~~Movable Lab Benches, as specified on plans.~~

~~Estimated Quantity of units: 34~~

Unit Price No. 3a: MTA 48a Movable Lab Benches, as specified on plans.

\$, . per each

(Place Unit Price figures in appropriate boxes.)

Unit Price No. 3b: MT 60a Movable Lab Benches, as specified on plans.

\$, . per each

(Place Unit Price figures in appropriate boxes.)

Unit Price No. 3c: MT 60d Movable Lab Benches, as specified on plans.

\$, . per each

(Place Unit Price figures in appropriate boxes.)

BIDDER'S NAME: _____

Unit Price No. 4a: Biosafety Cabinets 60", as specified on plans.

Estimated Quantity of units: 7

\$, . per each

(Place Unit Price figures in appropriate boxes.)

Unit Price No. 4b: Biosafety Cabinets 72", as specified on plans.

Estimated Quantity of units: 7

\$, . per each

(Place Unit Price figures in appropriate boxes.)

7.0 DAILY RATE OF COMPENSATION FOR COMPENSABLE DELAYS WITH TWO OPTIONS

Bidder shall determine and provide below the daily rate of compensation for any Compensable Delay caused by University at any time during the performance of the Work. A Facility may choose a minimum compensable delay in the best interests of the Project. If so, use the language in parentheses { } and in grey highlight:

\$, . X 10 multiplier
 (Place figures in appropriate boxes.)

Failure to fill in a dollar figure for the daily rate for Compensable Delay shall render the bid non-responsive. University will perform the extension of the daily rate times the multiplier.

The daily rate shown above will be the total amount of Contractor entitlement for each day of Compensable Delay caused by University at any time during the performance of the Work and shall constitute payment in full for all delay costs, direct or indirect (including, without limitation, compensation for all extended home office overhead and extended general conditions), of the Contractor and all subcontractors, suppliers, persons, and entities under or claiming through Contractor on the Project. The number of days of Compensable Delay shown as a "multiplier" above is not intended as an estimate of the number of days of Compensable Delay anticipated by the University. The University will pay the daily rate of compensation only for the actual number of days of Compensable Delay, as defined in the General Conditions; the actual number of days of Compensable Delay may be greater or lesser than the "multiplier" shown above.

BIDDER'S NAME: _____

8.0 ALTERNATES

In order for a Bid to be responsive, Bidder must submit an additive bid, a deductive bid, or a "no change" bid, for each Alternate listed below. The failure to do so shall result in the Bid being rejected as non-responsive. The failure to quote an amount, unless the bidder marks the "no change" box, will result in the bid being rejected as non-responsive.

The Contract Time will change by the number of days, if any, specified for each accepted Alternate.

If "Add" or "Deduct" is intended, indicate by placing figures in the corresponding boxes. If "No Change" is intended, indicate by marking the "No Change" box

Alternate No. 1: Add, Glass Marker Boards

5 GLASS MARKER BOARDS AT ENDS OF LAB BENCHES - BASIS AS NO MARKER BOARDS.

Add \$

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

University reserves the right to accept this Alternate within 30 calendar days after the date University signs the Agreement:

Alternate No. 2: Add, First Floor Autoclave

FIRST FLOOR AUTOCLAVE - BASIS NO AUTOCLAVE AND SUPPORT EQUIPMENT.

Add \$

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

University reserves the right to accept this Alternate within 30 calendar days after the date University signs the Agreement:

Alternate No. 3: Add, Epoxy Flooring

EPOXY FLOORING AT AUTOCLAVE - BASIS AS WELDED SEAM VINYL.

Add \$

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No extension of the Contract Time will be granted if this Alternate is accepted.

University reserves the right to accept this Alternate within 30 calendar days after the date University signs the Agreement:

BIDDER'S NAME: _____

Alternate No. 4: Not Used.

Alternate No. 5: Not Used.

Alternate No. 6: Not Used.

Alternate No. 7: Add, Casework and Fume Hood

CASEWORK AND FUME HOOD IN SPECIALTY LAB 143 - BASIS AS EMPTY SPACE.

Add \$

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No extension of the Contract Time will be granted if this Alternate is accepted.

University reserves the right to accept this Alternate within 30 calendar days after the date University signs the Agreement:

Alternate No. 8: Add, Office Ceiling Fans

OFFICE CEILING FANS - BASIS AS NO FANS OR ELECTRICAL.

Add \$

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No extension of the Contract Time will be granted if this Alternate is accepted.

University reserves the right to accept this Alternate within 30 calendar days after the date University signs the Agreement:

Alternate No. 9: Add, Decorative Wood Wall Grilles

DECORATIVE WOOD WALL GRILLES AT OFFICE DOORS - BASIS AS PAINTED GYPSUM BOARD WALLS.

Add \$

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No extension of the Contract Time will be granted if this Alternate is accepted.

University reserves the right to accept this Alternate within 30 calendar days after the date University signs the Agreement:

BIDDER'S NAME: _____

Alternate No. 10: Add, Banquette In Lab Corridor

BANQUETTE IN LAB CORRIDOR - BASIS AS EMPTY SPACE

Add \$

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No extension of the Contract Time will be granted if this Alternate is accepted.

University reserves the right to accept this Alternate within 30 calendar days after the date University signs the Agreement:

Alternate No. 11 Add, 2 Light-Tight Curtains

2 LIGHT-TIGHT CURTAINS IN SUPPORT LABS - BASIS AS NO CURTAINS.

Add \$

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No extension of the Contract Time will be granted if this Alternate is accepted.

University reserves the right to accept this Alternate within 30 calendar days after the date University signs the Agreement:

Alternate No. 12: Add, Metal Shelving Units

METAL SHELVING UNITS IN LINEAR EQUIPMENT ROOMS - BASIS AS NO SHELVING.

Add \$

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No extension of the Contract Time will be granted if this Alternate is accepted.

University reserves the right to accept this Alternate within 30 calendar days after the date University signs the Agreement:

Alternate No. 13: Not Used.

Alternate No. 14: Add, Natural Gas

LAB NATURAL GAS IN RESEARCH LABS - BASIS AS NO DISTRIBUTED NATURAL GAS IN RESEARCH LABS.

Add \$

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No extension of the Contract Time will be granted if this Alternate is accepted.

BIDDER'S NAME: _____

University reserves the right to accept this Alternate within 30 calendar days after the date University signs the Agreement:

Alternate No. 15: Deduct, Wood Sliding Screens

WOOD SLIDING SCREENS AT EXTERIOR GLASS – BASIS AS USER-CONTROLLED PULL DOWN SHADES.

Deduct \$

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No extension of the Contract Time will be granted if this Alternate is accepted.

University reserves the right to accept this Alternate within 30 calendar days after the date University signs the Agreement:

BIDDER'S NAME: _____

11.0 BIDDER INFORMATION

TYPE OF ORGANIZATION

(Corporation, Partnership, Individual, Joint Venture, etc.)

IF A CORPORATION, THE CORPORATION IS ORGANIZED UNDER THE LAWS OF:

THE STATE OF _____
(State)

NAME OF PRESIDENT OF THE CORPORATION:

(Insert Name)

NAME OF SECRETARY OF THE CORPORATION:

(Insert Name)

IF A PARTNERSHIP, NAMES OF ALL GENERAL PARTNERS:

(Insert Name(s))

CALIFORNIA CONTRACTORS LICENSE(S):

(Classification(s)) (License Number) (Expiration Date)

(For Joint Venture, list Joint Venture's license and licenses for all Joint Venture partners.)

BIDDER'S NAME: _____

12.0 REQUIRED COMPLETED ATTACHMENTS

The following documents are submitted with and made a condition of this Bid:

1. Bid Security in the form of _____
(Bid Bond or Certified Check)

13.0 DECLARATION

I, _____, hereby declare that I am the
(Printed Name)
_____ of _____
(Title) (Name of Bidder)

submitting this Bid Form; that I am duly authorized to execute this Bid Form on behalf of Bidder; and that all information set forth in this Bid Form and all attachments hereto are, to the best of my knowledge, true, accurate, and complete as of its submission date.

I further declare that this bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

I declare, under penalty of perjury, that the foregoing is true and correct and that this Declaration was executed at:

_____, in the State of _____,
(Name of City if within a City, otherwise Name of County) (State)

on _____,
(Date)

(Signature)

INFORMATION AVAILABLE TO BIDDERS

The following information is made available for the convenience of bidders and is not a part of the Contract. The information is provided subject to the provisions of Article 3 of the General Conditions.

1. The University of California has contracts for materials, equipment and/or services with the suppliers listed on the Office of the President Procurement Services website at:
<http://www.ucop.edu/procurement-services/for-suppliers/ucop-designated-construction-agreements.html>

General Contractors or others submitting bids for University construction projects may enter into agreements with these suppliers that utilize the pricing and terms contained in the University-supplier agreements. The university does not represent or warrant that materials/equipment/services of these suppliers meet the requirements of the University’s construction contracts.

Use of such suppliers shall not relieve Contractor from its obligation to meet all contractual requirements in any contracts with the University. The university will not be a party to any agreements with such suppliers and accepts no performance obligations or liability with respect to such agreements.

2. Fire Sprinkler Plans:

Sheet FS-1 of 5	Tunnel Fire Sprinkler Piping Plan	6-29-2009
Sheet FS-2 of 5	1 st Floor Fire Sprinkler Piping Plan	6-29-2009
Sheet FS-3 of 5	2 nd Floor Fire Sprinkler Piping Plan	6-29-2009
Sheet FS-4 of 5	3 rd Floor Fire Sprinkler Piping Plan	6-29-2009
Sheet FS-5 of 5	Penthouse Fire Sprinkler Piping Plan	6-29-2009

3. **Bid RFI's Attachment #1- Laboratory Fixture Schedule**

END OF INFORMATION AVAILABLE TO BIDDERS

ATTACHMENT #1

LABORATORY FIXTURE SCHEDULE

SERVICES	MOUNTED	MODEL NUMBER	NOTES
ICW/IHW-1	DECK	WATERSAVER CTA141-9VB	
EW-2	DECK	WATERSAVER CTEW1022BP	
PW-3	DECK	WATERSAVER CT7833	
LV-4, LA-4, LG-4	FUME HOOD	WATERSAVER CT740N-CR	
ICW-5	FUME HOOD	WATERSAVER CT739W-151WSA	
LV-7, LA-7, CO2-7	WALL	WATERSAVER CT4880FT-325	
ICW/IHW-8	PANEL	WATERSAVER CTA1714-9VB-WSA	SCULLERY SINK
ICW/IHW-9	PANEL	WATERSAVER CTPR1711-110WSA	SCULLERY SINK
PW-10	PANEL	WATERSAVER CT7840	SCULLERY SINK
EW-11	PANEL	WATERSAVER CTEW1041BP	SCULLERY SINK
ICW-12	WALL	WATERSAVER CT2800FT-325	ICE FLAKER
ICW/IHW-13	SINK	WATERSAVER CT4534-VB-58	SINK MOUNTED. INFRARED
EW-14	DECK	GUARDIAN GBF1849LH-L	BARRIER FREE SWING DOWN.
LA-6, LV-6, LG-6	BENCH	WATERSAVER CT4880-225WSA	

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SPECIFICATIONS

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		01 1400	Work Restrictions
		01 2200	Unit Prices
		01 2300	Alternates
		01 2500	Product Options, Requirements & Substitution Procedures
		01 2613	Requests for Information & Instructions (RFI) Procedures
		01 3113	Coordination
		01 3119	Project Meetings
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		06 2023	Interior Finish Carpentry
		06 4116	Plastic-Laminate-Faced Architectural Cabinets
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<u>Initial Issue</u>	<u>Revision</u>	<u>Section #</u>	<u>Title</u>
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		23 0250 (DS)	F4 (Fiberglass w/ASJ and PVC Fitting Covers)
		23 0250 (DS)	F7 (Fiberglass Blanket Ductwork Insulation w/ASJ [Kraft Paper])
		23 0250 (DS)	F8 Fiberglass Rigid Board Ductwork Insulation with ASJ (Kraft Paper) Data Sheet
		23 0250	Piping Insulation Thickness Chart
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		23 0500 (DS)	PP31 (Polypropylene Fire Resistant Waste System)
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		23 0510	Hydronic System Specialties
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		23 0891	Metal Ductwork

<u>Initial Issue</u>	<u>Revision</u>	<u>Section #</u>	<u>Title</u>
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<u>Initial Issue</u>	<u>Revision</u>	<u>Section #</u>	<u>Title</u>
		28 0513.13	CCTV Communications Conductors and Cables
		28 1300	Access Control
		28 3100	Fire Detection and Alarm System

NOTES:

(DS) represents data sheet documents that supplement the written specification.
Discipline column indicates the responsible Professional of Record as noted on the Seal Sheet.

END OF SPECIFICATIONS
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SECTION 033543

POLISHED CONCRETE FINISHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes polished concrete finishing, including staining and scoring.
 - 1. Concrete for polished concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, initial finishing, and curing is specified in Section 033000 "Cast-in-Place Concrete."
- B. Related Requirements:
 - 1. Section 033000 "Cast-in-Place Concrete" for concrete not designated as polished concrete.

1.3 DEFINITIONS

- A. Design Reference Sample: Sample designated by Architect in the Contract Documents that reflects acceptable surface quality and appearance of polished concrete.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Sustainable Design Submittals:
 - 1. [Laboratory Test Reports](#): For stains and liquid floor treatments, indicating compliance with requirements for low-emitting materials.
- C. Samples for Initial Selection: For each type of product requiring color selection.
- D. Samples for Verification: For each type of exposed color.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Repair materials.
2. Stain materials.
3. Liquid floor treatments.

1.6 QUALITY ASSURANCE

A. Field Sample Panels: After approval of verification sample and before casting concrete, produce field sample panels to demonstrate the approved range of selections made under Sample submittals. Produce a minimum of three sets of full-scale panels, approximately **48 by 48 inches (1200 by 1200 mm)** minimum, to demonstrate the expected range of finish, color, and appearance variations.

1. Locate panels as indicated or, if not indicated, as directed by Architect.
2. Maintain field sample panels during construction in an undisturbed condition as a standard for judging the completed Work.
3. Demolish and remove field sample panels when directed.

1.7 FIELD CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatments for Polished Concrete Finish: Clear, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and is suitable for polished concrete surfaces.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
 - a. Euclid Chemical Company (The); an RPM company; Euco Diamond Hard.
 - b. L&M Construction Chemicals, Inc; FGS Hardener Plus.
 - c. Moxie International; Moxie Shield 1500 Penetrating Sealer.
2. Products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

PART 3 - EXECUTION

3.1 POLISHING

- A. Polish: Level 2: Low sheen, 400 grit.
- B. Apply polished concrete finish system to interior exposed concrete flooring.
 - 1. Machine grind floor surfaces to receive polished finishes level and smooth.
 - 2. Apply penetrating liquid floor treatment for polished concrete in polishing sequence and according to manufacturer's written instructions, allowing recommended drying time between successive coats.
 - 3. Continue polishing with progressively finer-grit diamond polishing pads to gloss level.
 - 4. Control and dispose of waste products produced by grinding and polishing operations.
 - 5. Neutralize and clean polished floor surfaces.

END OF SECTION 033543

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SECTION 072100 THERMAL INSULATION

072100 THERMAL INSULATION

THERMAL INSULATION

THERMAL INSULATION

THERMAL INSULATION

THERMAL INSULATION

Revise this Section by deleting and inserting text to meet Project-specific requirements.
 Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

GENERAL

RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.
 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

SUMMARY

Section Includes:

Glass-fiber blanket.

Glass-fiber board.

Related Requirements:

Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 092900 "Gypsum Board" for sound attenuation blanket used as acoustic insulation.

ACTION SUBMITTALS

Product Data: For each type of product.

INFORMATIONAL SUBMITTALS

Product Test Reports: For each product, for tests performed by a qualified testing agency.

Evaluation Reports: For foam-plastic insulation, from ICC-ES.

1.1 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.1 GLASS-FIBER BLANKET

- A. Insulation shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

- C. Glass-Fiber Blanket, Unfaced: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
- D. Glass-Fiber Blanket, Polypropylene-Scrim-Kraft Faced: ASTM C 665, Type II (nonreflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier).

2.2 GLASS-FIBER BOARD

- A. Insulation shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- C. Glass-Fiber Board, Unfaced: ASTM C 612, Type IA; unfaced, with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84, passing ASTM E 136 for combustion characteristics. Nominal density of 2.25 lb/cu. ft, thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F.
- D. Glass-Fiber Board, Faced: ASTM C 612, Type IA; faced on one side with foil-scrim-kraft or foil-scrim-polyethylene vapor retarder, with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84. Nominal density of 2.25 lb/cu. ft., thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F.

2.3 INSULATION FASTENERS

- A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place.

Revise "Plate" and "Spindle" subparagraphs below if stainless steel or another metal is required.

Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.

Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.

0.030 inch thick by 2 inches square.

Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.

thick by 2 inches square.

Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.

2 inches square.

Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.

square.

Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.

0.105 inch in diameter; length to suit depth of insulation.

in diameter; length to suit depth of insulation.

Anchors in "Adhesively Attached, Angle-Shaped, Spindle-Type Anchors" Paragraph below are intended for attaching insulation to mullions while preventing it from touching spandrel glass.

Adhesively Attached, Angle-Shaped, Spindle-Type Anchors: Angle welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place.
 Revise "Angle" and "Spindle" subparagraphs below if stainless steel or another metal is required.
 Angle: Formed from 0.030-inch-thick, perforated, galvanized carbon-steel sheet with each leg 2 inches square.
 Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.
 0.030-inch-thick, perforated, galvanized carbon-steel sheet with each leg 2 inches square.
 Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.
 thick, perforated, galvanized carbon-steel sheet with each leg 2 inches square.
 Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.
 2 inches square.
 Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.
 square.
 Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.
 0.105 inch in diameter; length to suit depth of insulation.
 in diameter; length to suit depth of insulation.
 Revise size in "Insulation-Retaining Washers" Paragraph below if required.
 Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick galvanized-steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches square or in diameter.
 0.016-inch-thick galvanized-steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches square or in diameter.
 thick galvanized-steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches square or in diameter.
 1-1/2 inches square or in diameter.
 square or in diameter.
 Retain subparagraph below if anchors are used in crawl spaces, ceiling plenums, attic spaces, and so forth, where sharp ends of spindles would be exposed to human contact.
 Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in the following locations:
 Crawl spaces.
 Ceiling plenums.
 Attic spaces.
 Insulation Standoff: Spacer fabricated from galvanized mild-steel sheet for fitting over spindle of insulation anchor to maintain air space of 1 inch between face of insulation and substrate to which anchor is attached.
 Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates without damaging insulation, fasteners, or substrates.
 1 inch between face of insulation and substrate to which anchor is attached.
 Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates without damaging insulation, fasteners, or substrates.
 between face of insulation and substrate to which anchor is attached.
 Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates without damaging insulation, fasteners, or substrates.

ACCESSORIES

Retain "Insulation for Miscellaneous Voids" Paragraph below for miscellaneous voids if needed for thermal protection or air-infiltration reduction.

Insulation for Miscellaneous Voids:

Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.

Spray Polyurethane Foam Insulation: ASTM C 1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.

Retain "Adhesive for Bonding Insulation" Paragraph below for insulation adhesively bonded to substrates.

- B. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.
 - 1. Adhesives shall have a VOC content of 70 g/L or less.
 - 2. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.

4. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
 5. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.
 - a. Exterior Walls: Set units with facing placed toward as indicated on Drawings.
 - b. Interior Walls: Set units with facing placed as indicated on Drawings.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.
 2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.
- 3.4 PROTECTION
- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

SECTION 079200

JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. It is absolutely critical that all penetrations into the Vivarium perimeter as depicted on the construction drawings are completely sealed. This includes all partition penetrations as covered by this specification section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Silicone joint sealants.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. Samples for Verification: For each kind and color of joint sealant required, provide Samples.
- C. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Product Test Reports: For each kind of joint sealant, for tests performed by a qualified testing agency.
- C. Preconstruction Laboratory Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.
- D. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.
- E. Field-Adhesion-Test Reports: For each sealant application tested.
- F. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency.
1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 2. Conduct field tests for each kind of sealant and joint substrate.
 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 4. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
 5. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.8 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.9 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 - 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 - 2. Disintegration of joint substrates from causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS "JS-1"

- A. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. GE Construction Sealants; Momentive Performance Materials Inc.; Contractors-N SCS1800.
 - b. Approved equal products by other manufacturers.

2.3 MILDEW-RESISTANT JOINT SEALANTS "JS-2"

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.

- 1. Products: Subject to compliance with requirements, provide one of the following:

- a. Dow Corning Corporation; DOW CORNING® 786 SILICONE SEALANT -.
- b. GE Construction Sealants; Momentive Performance Materials Inc.; SCS1700 Sanitary.
- c. Tremco Incorporated; Tremsil 200.

2.4 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Alcot Plastics Ltd.
- b. BASF Corporation; Construction Systems.
- c. Construction Foam Products; a division of Nomaco, Inc.

- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
 - 4. Provide flush joint profile at where indicated according to Figure 8B in ASTM C 1193.
 - 5. Provide recessed joint configuration of recess depth and at locations indicated according to Figure 8C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
 - 1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform 1 test for the first 100 feet of joint length for each kind of sealant and joint substrate.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 3. Inspect tested joints and report on the following:
 - a. Whether sealants filled joint cavities and are free of voids.
 - b. Whether sealant dimensions and configurations comply with specified requirements.
 - c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
 4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
 5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement "JS-1".

1. Joint Locations:
 - a. Control joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints between interior wall surfaces and hollow metal frames of interior doors.
 - c. Perimeter joints between interior wall surfaces and frames of stainless steel interior doors where in contact with glass.
 - d. Other joints as indicated on Drawings.
 - e. Perimeter joints between interior wall surfaces and ceiling surfaces.
2. Joint Sealant: Silicone, neutral curing, S, NS, 50, NT.
3. Joint-Sealant Color:
 - a. Glass Contact: Translucent.
 - b. All other locations: White.

B. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces "JS-2".

1. Joint Locations:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Perimeter joints between interior wall surfaces and frames of stainless steel interior doors (except where in contact with glass).
 - c. Around devices within in bio-containment room perimeter unless otherwise noted.
 - d. General sealing use for all interior joints unless otherwise indicated on Drawings or in this Joint-Sealant Schedule.
2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
3. Joint-Sealant Color: White.

END OF SECTION

SECTION 092900

GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
 - 2. Backing panels.
- B. Related Requirements:
 - 1. Section 092216 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. LEED Submittals:
 - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
 - 2. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regionally manufactured and regionally extracted and manufactured materials. Include statement indicating cost for each regionally manufactured material.
 - a. Include statement indicating location of manufacturer and distance to Project for each regionally manufactured material.
 - b. Include statement indicating location of manufacturer and point of extraction, harvest, or recovery for each raw material used in regionally extracted and manufactured materials. Indicate distance to Project and fraction by weight of each regionally manufactured material that is regionally extracted.
 - 3. Product Data for Credit IEQ 4.1: For adhesives used to laminate gypsum board panels to substrates, documentation including printed statement of VOC content.
- C. Samples: For the following products:
 - 1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.
- D. Samples for Verification: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.
 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 GYPSUM BOARD, GENERAL

- A. Recycled Content of Gypsum Panel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Regional Materials: Gypsum panel products shall be manufactured within 500 miles of Project site.
- C. Regional Materials: Gypsum panel products shall be manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
- D. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

- A. Gypsum Wallboard: ASTM C 1396/C 1396M.
 1. Thickness: As indicated on drawings.
 2. Long Edges: Tapered.
- B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
 1. Thickness: As indicated on drawings.
 2. Long Edges: Tapered..

- C. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
 - 1. Thickness: As indicated on drawings.
 - 2. Long Edges: Tapered.
- D. Abuse-Resistant Gypsum Board: ASTM C 1629/C 1629M.
 - 1. Core/Size: As indicated on Drawings.
 - 2. Long Edges: Tapered.
 - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
- E. Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
 - 1. Core/Size: As indicated on Drawings.
 - 2. Long Edges: Tapered.
 - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.3 BACKING PANELS

- A. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or ASTM C 1325, with manufacturer's standard edges.
 - 1. Core: As indicated on Drawings.
 - 2. Thickness: As indicated.
 - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
 - 2. Exterior Gypsum Soffit Board: Paper.
 - 3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
 - 4. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use setting-type, sandable topping compound.
 - 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
 - 5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.

D. Joint Compound for Exterior Applications:

1. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.
2. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.

E. Joint Compound for Tile Backing Panels:

1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
2. Cementitious Backer Units: As recommended by backer unit manufacturer.
3. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2.5 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

1. Laminating adhesive shall have a VOC content of 50 g/L or less).

C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

D. Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

E. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Franklin International.
 - b. Hilti, Inc.
 - c. United States Gypsum Company.
2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

- a. USG Corporation.
 - 3. Acoustical joint sealant shall have a VOC content of 250 g/L or less.
 - 4. Acoustical joint sealant shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- F. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 1. Wallboard Type: As indicated on Drawings.
 2. Type X: As indicated on Drawings.
 3. Ceiling Type: As indicated on Drawings.
 4. Abuse-Resistant Type: As indicated on Drawings.
 5. Mold-Resistant Type: As indicated on Drawings.
- B. Single-Layer Application:
 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
 3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- C. Multilayer Application:
 1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
 2. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

- D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written instructions and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.4 APPLYING TILE BACKING PANELS

- A. Cementitious Backer Units: ANSI A108.11, at locations indicated on drawings.

3.5 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints at locations indicated on Drawings, according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners unless otherwise indicated.
 - 2. LC-Bead: Use at exposed panel edges.
 - 3. L-Bead: Use where indicated.
 - 4. U-Bead: Use where indicated.
- D. Aluminum Trim: Install in locations indicated on Drawings.

3.6 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: As indicated on drawings.
- E. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.7 APPLYING TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.

3.8 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION