

ADDENDUM NO. 04

February 10, 2020

Murrieta Mesa High School New Classroom Building – DSA 04-118451 MURRIETA VALLEY UNIFIED SCHOOL DISTRICT

Project No - 02132020
DSA No. - 04-118451

The following changes, omissions, and/or additions to the Project Manual and/or Drawings shall apply to proposals made for and to the execution of the various parts of the work affected thereby, and all other conditions shall remain the same.

Careful note of the Addendum shall be taken by all parties of interest so that the proper allowances may be made in strict accordance with the Addenda, and that all trades shall be fully advised in the performance of the work which will be required of them.

Bidder shall acknowledge receipt of this Addenda in the space provided on the Bid Form. Failure to do so may subject Bidder to disqualification.

In case of conflict between Drawings, Project Manual, and this Addenda, this Addenda shall govern.

GENERAL NOTE

- 1) Bid date and time and submission location remain unchanged, as noted in the bid documents.

BID SCOPE CLARIFICATIONS

1) BNDS ADDENDUM NO. 04 – CHANGES TO SPECIFICATIONS

a. CHANGES TO PROJECT MANUAL TABLE OF CONTENTS

DIVISION 12 – FURNISHING

Add Section 123001 – Display Cases

Bid Package No. 10

b. SPECIFICATION SECTIONS ISSUED

Section 123001 – Display Cases

Bid Package No. 10

1. Add New Specification Section 123001 – Display Cases

c. SPECIFICATION SECTION NO. 053100 – STEEL DECKING

Bid Package No. 02 –

1. Substitution request granted as follows: Subparagraph 2.2-A: List of Manufacturers shall include Versa-Deck.

d. SPECIFICATION SECTION NO. 078123 – INTUMESCENT FIREPROOFING

Bid Package No. 02, Bid Package No. 06 –

1. Subparagraph 1.2-B: Related requirements lists 099726 – Cementitious Coatings as a reference. Other non-applicable references have been omitted.

e. SPECIFICATION SECTION NO. 093000 – TILING

Bid Package No. 07 –

1. Subparagraph 2.2-A & B: Glazed Wall Tile and Cove Base have been omitted.
2. Subparagraph 2.2-C & D: Tile Type CT-2 and CT-3 have been added/clarified.

f. SPECIFICATION SECTION NO. 101419 – DIMENSIONAL LETTER SIGNAGE

Bid Package No. 10 –

1. Subparagraph 2.1-A: Update to Dimensional Letter.
2. Subparagraph 2.3-4b: Projecting stud option omitted.
3. Subparagraph 3.2-B2: Projecting stud option omitted.

g. SPECIFICATION SECTION NO. 220719 – PLUMBING PIPING INSULATION

Bid Package No. 14 –

1. Subparagraph 3.12-A: Domestic Cold-Water requirement updated.
2. Subparagraph 3.12-C: Condensate requirements added.
3. Subparagraph 3.13-A: Domestic Water Piping requirements updated.
4. Subparagraph 3.13-C: Condensate requirements updated.

h. SPECIFICATION SECTION NO. 221316 – SANITARY WASTE AND VENT PIPING

Bid Package No. 14 –

1. Subparagraph 2.5-A through F: PVC Pipe and Fittings section added.
2. Subparagraph 3.10-D-3 Option added.

i. SPECIFICATION SECTION NO. 221413 – FACILITY STORM DRAIN PIPING

Bid Package No. 14 –

1. Subparagraph 2.4-A through F: PVC Pipe and Fittings section added.

2) BNDS ADDENDUM NO. 04 - ARCHITECTURAL DRAWINGS

a. SHEET NO. A7.7

Bid Package No. 03, Bid Package No. 06, Bid Package No. 07, Bid Package No. 08, Bid Package No. 10 –

1. Drawing 1B, 1C, & 1D/A7.7: Revise currently issued drawing per AD4-A11.

b. SHEET NO. A8.1

Bid Package No. 07 –

1. Drawing A8.1: Revise currently issued drawing per AD4-A12, Finish Schedule Notes, CT-2 and CT-3.

c. SHEET NO. A9.18

Bid Package No. 03, Bid Package No. 06, Bid Package No. 07, Bid Package No. 08, Bid Package No. 10 –

1. Drawing 8/A9.18: Revise currently issued drawing per AD4-A13.

d. SHEET NO. LI-1.01

Bid Package No. 01 –

1. Reference Note "E": See PB015 in Pre-Bid Requests For Information section below.

ADDITIONAL BID PACKAGE CLARIFICATIONS AND REVISIONS

1. Revision to Bid Package No. 12 –

- a. Remove Fire Alarm and Security Scope of Work from Bid Package 12.
- b. Remove underground low voltage conduit from this Bid Package.
- c. Clarification for this Bid Package to provide and install all low voltage cabling and wiring.
- d. Clarification for this Bid Package to provide and install all conduit beginning at 6" above finish floor.

2. Revision to Bid Package No. 13 –

- a. Bid Package No. 13 to furnish and install all underground site work, including conduit and boxes, etc. for all electrical, high voltage and low voltage systems.
- b. Revision for clarification to temporary power scope of work.
- c. Revision to remove provision of duct detectors from this Bid Package.

3. Addition of Bid Package No. 16 –

- a. Addition of new Bid Package No. 16 – Fire Alarm and Security.

4. Fire Truck Access Scope of Work

Bid Package No. 1 –

- a. Addition of Fire Truck Access Scope of Work, see attached 8.5 x 11. This Scope to be completed by March 23, 2020.

5. Project Manual Vol. 1 of 2, Section 2 Bid Forms To Be Submitted With Bid – All Bid Packages –

- a. Checklist of Mandatory Bid Forms

PRE-BID REQUESTS FOR INFORMATION

1. PB 011 - Indoor Piping Insulation Specification 220719

Bid Package No. 14 –

Question

Plumbing Piping Insulation specification section 220719, item 3.12-Indoor Piping Insulation Schedule calls for the domestic cold water piping to be insulated, as well as the domestic hot water piping. It is standard industry procedure to insulate the hot water piping, but not normally the domestic cold water. Please review and verify if the insulation of the domestic cold water is required or this can be deleted. Additionally, please confirm the requirements for insulation on condensate piping.

Response

Supporting documentation in Addendum 4 to follow.

2. PB 012 - Sanitary Waste and Vent Piping Clarification

Bid Package No. 14 –

Question

Sanitary Waste and Vent Piping specification section 221316, item 3.10-Piping Schedule calls for No-Hub Cast Iron with heavy duty bands for underground soil, waste and vent piping. Please confirm that the use of PVC DWV Schedule 40 pipe and fittings with solvent weld joints is also acceptable for underground soil, waste and vent piping. PVC DWV is superior product not susceptible to corrosion and has a cost saving to the owner. If acceptable, please confirm it would also be acceptable for use with underground storm drainage/roof drainage below grade within the building.

Response

Supporting documentation in Addendum 4 to follow.

3. PB 013 - 078123 - Intumescent Fireproofing Spec Clarification

Bid Package No. 02 and Bid Package No. 06 –

Question

Spec Section 078123-1.2-B.1 and B.2 indicate:

1.2 SUMMARY

A. Section includes mastic and intumescent fire-resistive coatings.

B. Related Requirements:

1. Section 078100 "Applied Fireproofing" for sprayed fire-resistive materials (SFRM).

2. Section 099646 "Intumescent Painting" for intumescent paints that are fire retarding, but not fire resistive.

However, neither 078100 nor 099646 exist within the project manual. Please clarify.

Response

This section has been updated in the spec. Subparagraph 1.2-B: Related requirements lists 099726 – Cementitious Coatings as a reference. Other non-applicable references have been omitted (See addendum 4).

4. PB 015 – Existing Irrigation Main Line and Irrigation Controller Wires Location

Bid Package No. 01 –

Question

Drawing Sheet LI-1.01 Reference Note "E".

A Site Survey/Tracing of the Existing Irrigation Main Line and Irrigation Control Wires Was Undertaken With the Murrieta Valley Unified School District (MVUSD) Irrigation Department. It Has Been Determined That The Existing Irrigation System Is Within The Proposed Footprint Limits Of The New Classroom Building. Please See The Attached Marked Up Photos Reflecting The Location Of The Existing Irrigation System As Traced Onsite.

Solution: Save And Or Relocate If Damage During The Demolition And Tree Removal, The Existing Irrigation Main Line, Irrigation Valves, Irrigation Valve Boxes, Irrigation Control Wires, And Irrigation Control Wire Boxes. Move As Close As Possible To The Existing Fire Lane Curb/Asphalt Paving. Remove The Existing Irrigation Main Line And Irrigation Control Wires That Are Presently Within The New Proposed Classroom Building Footprint, And Reconnect To The Irrigation 3" Main Line And Irrigation Control Wires Located At

The East Side Of The West Fire Lane. In Addition One Additional Lateral Line Runs From The Existing Volleyball Area To The Three Planters At The North Side Of The Kitchen/Cafeteria Building, These Planters Can Be Temporarily Feed From The Kitchen/Cafeteria Building Until They Can Be Tied Back Into The Newly Relocated Irrigation Main Line That Will Cross At The Base Of The Existing Classroom Stairway. The Valve, Valve Box And Controller Wires For These Three Planters Can Also Be Relocated To This Same Planter Area North Of The Kitchen/Cafeteria Building. Please review the attachments and advise.

Response

THE PROPOSED SOLUTION IS ACCEPTABLE, HOWEVER THE CONTRACTOR MUST ENSURE THE FOLLOWING ARE ADHERED TO:

- 1) CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXISTING IRRIGATION EQUIPMENT DAMAGED DURING CONSTRUCTION AND IF DAMAGED, SHALL REPLACE WITH SAME MANUFACTURER AND MODEL.
- 2) CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR/MODIFICATION/REROUTING OF ALL ADJACENT IRRIGATION SYSTEM EQUIPMENT THAT IS AFFECTED BY NEW CONSTRUCTION IMPROVEMENTS. CONTRACTOR SHALL REPAIR SAID SYSTEMS TO A LIKE NEW MANNER, PROVIDING NO LESS THAN 100% OF HEAD RADIUS COVERAGE IN ALL AREAS WITH SYSTEM LAYOUT AS APPROVED BY OWNER'S AUTHORIZED REPRESENTATIVE. CONTRACTOR SHALL CONFIRM ALL AREAS REQUIRING MODIFICATION WITH OWNER'S AUTHORIZED REPRESENTATIVE PRIOR TO BIDDING WORK AND PRIOR TO STARTING WORK.
- 3) CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE REMOVAL AND DISPOSAL OF ALL EXISTING IRRIGATION EQUIPMENT AFFECTED BY THE NEW CONSTRUCTION IMPROVEMENTS, IF NECESSARY. CONTRACTOR SHALL VERIFY ALL EQUIPMENT TO BE REMOVED AND DISPOSED OF IN FIELD PRIOR TO BIDDING WORK AND PRIOR TO STARTING WORK.

5. PB 016 – Panel Finish for Operable Wall

Bid Package No. 10 –

Question

Please verify type of panel finish required for the Operable Panel Partition, i.e., vinyl, fabric, etc.

Response

Per specification 102238, section 2.3-B, panel finish shall be fabric.

6. PB 017 – Mulch Clarification

Bid Package No. 01 –

Question

Subsequent 3.10 Mulching in Section 329300 indicated 2" depth layer, but Mulch legend on Sheet LM 1.01 indicated 3" depth layer. Please review and clarify.

Response

Provide 2" Depth Mulch layer per Section 329300.

7. PB 018 – Root Barrier Clarification

Bid Package No. 01 –

Question

Subsection 3.1 Tree Root Barrier installation in Section 329453 indicated to install root barrier where tree to be planted closer than 6' to paving, sidewalk or curb, but Root Barrier planting note #3 on Sheets LP-1.01 and LP-2.01 indicated 5' of Public Improvements. Please review and clarify.

Response

Install root barrier per Specification section 329453.

8. PB 020 -

Bid Package No. 07 –

Question

Sheets A8.1-Finish Schedule and A8.3-Finish Plans callout for CT-2 Floor Tile to be 24x48 and CT-3 Wall Tile to be 12x24; however, the Specification 093000-Tiling calls for Type CT-2 to be 8"x8" and Type CT-3 does not indicate a manufacture, series or color. The large format tile varies in price quite a bit and requires

a lot more labor, while the specified 8x8 is only available in Matte Finish and there's no option for a large format if selected. Please reference the attached product data and clarify the size of tiles for the floors and walls. Additionally, please provide relevant details for Type CT-3.

Response

See updated tile spec 093000, section 2.2 and updated finish schedule note on sheet A8.1 (provided in Addendum 4).

CT-2 - FLOOR TILE - 8"x8" - INT. FLOOR - 093000

CT-3 - WALL TILE - 8"x8" - INT. FLOOR - 093000

Manufacturer is Daltile, Porcelato Colorbody Porcelain.

**9. PB 021 - Low Voltage System Conduits Clarification
Bid Package No. 12, Bid Package No. 13, Bid Package No. 16 –
Question**

Please clarify who is responsible for low voltage system conduits for Division 27 and 28, Bid Package #12 or #13? It is mentioned in both scopes of work.

Original Response

Bid Package 12 is responsible for furnishing and installing all Low Voltage Conduits. See Bid Package 12, Page 4 of 6, Specific Scope of Work, Division 27 - Communications, Item No. 2 and Division 28 - Electronic Safety and Security, Item No. 13.

REVISED Response

See Revised Bid Package No.'s 12, 13, and 16.

**10. PB 022 - BP#12 Bonding Connections Clarification
Bid Package No. 12, Bid Package No. 13, Bid Package No. 16 –
Question**

Please clarify that Bid Package #12 is responsible for bonding connections of their own system components.

Response

Yes, Bid Package 12 is responsible for Bonding connections of their own work. See Bid Package 12, Page 4 of 6, Specific Scope of Work, Division 27 - Communications, Item No. 3 "...terminations...". SEE ALSO REVISED BID PACKAGE No. 12.

**11. PB 023 – Duct Detectors Clarification
Bid Package No. 12, Bid Package No. 13, Bid Package No. 16 –
Question**

Bid Package #13, Scope of Work 1.0-19 states to "Provide duct detectors to mechanical contractor for installation". Similar for Bid Package #12. Please clarify that the duct detectors are provided by BP#12.

Original Response

Bid Package 12 will provide all duct detectors. See Bid Package 12, Page 4 of 6, Specific Scope of Work, Division 28 - Electronic Safety and Security, Item No. 19.

REVISED Response

See Revised Bid Package No.'s 12, 13, and 16.

**12. PB 024 – Temporary Power Connections Clarification
Bid Package No. 13 –
Question**

Is Bid Package #13 responsible for temporary power connections of trailers for the CM & IOR? Is there a Logistics site plan available?

Original Response

Bid Package 13 will not be responsible for temporary power connections of the CM / IOR office Trailers. Bid Package 13 will be responsible for temporary power connections, hook-ups, etc. for jobsite temporary power, Per Division 01, General Requirements, Item No. 1.14 and Bid Package 13, Page 6 of 6, Specific Scope of Work, Item No. 27 and 28. A Staging/Logistics Plan is attached for the Office and Laydown Areas.

REVISED Response

See Revised Bid Package No. 13.

13. PB 025 - Furred Wall Type N4 Clarification

**Bid Package No. 02, Bid Package No. 06 –
Question**

The North wall at Entry Lobby is furred Type N4. This furred wall goes to bottom of low roof deck which at the point is 30'. The span chart for 4" stud on 15/S0.10 only shows max span for 4" stud to 22'-1". Please indicate size and spacing for stud capable of spanning this distance.

Response

See detail 8/S8.1 (referenced on S2.1.1 at grid line 7). The studs are clipped off to the HSS at the floor level. The studs span from the floor to the HSS, and then from the HSS to the roof. Each span should be less than 22'-1".

14. PB 027 – Tubular Skylights

**Bid Package No. 02, Bid Package No. 06, Bid Package No. 10 –
Question**

Please show the locations of skylights called out for in the Bid Package #10 scope. If none, please confirm that skylights are not required on Murrieta Mesa High School.

Response

There are no skylights on this project. This does not apply.

15. PB 028 – Wall/Beam Connection

**Bid Package No. 02, Bid Package No. 06 –
Question**

Will attachment of interior walls to beams in Details 7 & 8/A9.14 be similar to Detail 6/S0.11?

Response

Yes, that is correct.

16. PB 029 - Exterior Metal Stud Framing Design/Engineering Clarification

**Bid Package No. 06 –
Question**

The exterior metal stud framing is not listed as a Deferred Submittal; however, it is listed on Item #23 of Bid Package 6. Is Design and Engineering required for the exterior metal stud framing? Please review and verify.

Response

Addendum No. 4 will delete Item No. 23 of Bid Package 6.

17. PB 030 - Landscape Maintenance 90-Day Establishment Clarification

**Bid Package No. 01 –
Question**

Section 320190 states that Contractor will be responsible for 90 days Landscape maintenance; however, Maintenance note in Sheet LP-1.01 shows all required Landscape shall be maintained by Owner. Please clarify.

Response

Installing Contractor is responsible for 90-Day Landscape Maintenance as specified in Section 320190.

18. PB 031 – Duct Cleaning for New Ductwork

**Bid Package No. 15 –
Question**

Is Duct Cleaning going to be required for this project? This is all new ductwork and should be covered during construction per Cal-Green note below on M0.2: 5.504.3 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation, or during storage on the construction site and until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheet metal or other methods

acceptable to the enforcing agency to reduce the amount of dust, water and debris which may collect in the system. Please review and advise.

Response

No duct cleaning per specification section 233113, 3.8 & 3.9 will be required.

19. PB 033 – Fire Alarm Keynotes

**Bid Package No. 12, Bid Package No. 13, and Bid Package No. 16 –
Question**

Grid Line C3 between Grid Lines 6 and 7 on Sheet E5.2 (Level 2 Floor Plan – Fire Alarm) references Key Notes 1 and 2. Please see attached drawing and advise as to what these Key Notes should represent

Response

Key Notes were inadvertently omitted. Key Notes on this sheet should read:

KN #1 - Provide 120V circuit to panel. Connect to "lock on" breaker. Refer to E3 series sheets for circuit info.

KN #2 - Provide connection to existing FACP. Refer to site plan sheet E5.0 and fire alarm riser on E5.4.

20. PB 034 – Annunciator Zone Schedule

**Bid Package No. 12, Bid Package No. 13, and Bid Package No. 16 –
Question**

Reference Sheet E5.3, Section Block "Annunciator Zone Schedule Building 'A' Administration Room A144". Please review and verify that the Notes 2 and 3 are intended for new installation in Building "A" with the address reporting capabilities of Building "D4" New Classroom Building.

Response

There is an existing remote annunciator in room A144 in the Administration building. That annunciator should include all monitoring of the new system in building D4 as per keynote 1 E5.4.

21. PB 035 – Roofing Clarification

**Bid Package No. 04 –
Question**

Will Bid Package 4 carry the installation of 2" rigid insulation and 5/8" composite board shown on Detail 2/A9.1?

Response

Yes.

22. PB 036 – Drips at Exterior Windows and Doors

**Bid Package No. 04 –
Question**

Which Bid Package will supply and install drips at exterior windows and doors as seen in Details 10/A9.6 and 10/A9.7?

Response

Bid Package 4 - Roofing

23. PB 037 – MC Cable

**Bid Package No. 13 –
Question**

Specification 260533-4.8.1 states that MC armored cable can be utilized for all branch circuit wiring for lighting and power circuits, please confirm that MC Cable is acceptable to be used at for lighting and power circuits for this project.

Response

No concerns, MC cable is acceptable for use.

24. PB 038 – Interior Ceilings Clarification

**Bid Package No. 10 –
Question**

Will angle and gypsum be required at acoustic ceiling locations per Detail 1/A9.9 or does this only occur at gypsum ceilings with projection screens?

Response

Install per plan, reference Detail 1/A9.9.

25. PB 039 – Final Clean

All Bid Packages

Question

Will Section 017301-1.03 (H, I, X, Y) be completed by Category 10 re: cleaning and waxing of new sheet vinyl? Per Bid Package 10, 1.0 Division 01/3 "This bid package contractor will have primary responsibility for cost and providing of 017301-Final Clean".

Response

Reference Division 01 - General Requirements in Vol. 1 of 2 - Bidding Documents:

All Bid Package Contractors are responsible for all requirements in the Division 01 – General Requirements of the Specifications. Bid Package Contractor is responsible for all items included in the CM Supplemental Specifications and all other requirements as specified in Section 01000 General Requirements.

Bid Package #07-Flooring is responsible for Section 017301-H, I, X, Y reference Division 09-Finishes Items 1, 2, 3, 5, 6, 22, 23. Thoroughly clean floors and accessories as part of final acceptance, as well as the protection and clean-up of adjacent surfaces from own work.

END OF ADDENDUM NUMBER 04

ADDENDUM 04 ATTACHMENTS:

SPECIFICATIONS:

PROJECT MANUAL VOL. 1 OF 2

Revised Checklist of Mandatory Bid Forms

Addition of Iran Contracting Act Certification

PROJECT MANUAL VOL. 2 OF 2 – TABLE OF CONTENTS

053100 – STEEL DECKING

078123 – INTUMESCENT FIREPROOFING

093000 – TILING

101419 – DIMENSIONAL LETTER SIGNAGE

123001 – DISPLAY CASES

220719 – PLUMBING PIPING INSULATION

221316 – SANITARY WASTE AND VENT PIPING

221413 – FACILITY STORM DRAIN PIPING

BID PACKAGES:

Revised Bid Package No. 12 – Low Voltage, AV, Communications

Revised Bid Package No. 13 – Electrical

New Bid Package No. 16 – Fire Alarm, Security

DRAWINGS:

Size 42 X 30

AD4-A11

AD4-A12

AD4-A13

8.5 x 11

Addendum No. 4 – Fire Truck Access – 1 page

102600 - WALL AND DOOR PROTECTION
 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES
 104413 - FIRE EXTINGUISHER CABINETS
 104416 - FIRE EXTINGUISHERS
 105113 - METAL LOCKERS

DIVISION 12 — FURNISHINGS

122116 - VERTICAL LOUVER BLINDS

123001 - DISPLAY CASES

DIVISION 21 — FIRE SUPPRESSION

211313 - WET-PIPE FIRE SPRINKLER SYSTEMS

DIVISION 22 — PLUMBING

220517 - SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING
 220518 - ESCUTCHEONS FOR PLUMBING PIPING
 220523.12 - BALL VALVES FOR PLUMBING PIPING
 220529 - HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT
 220553 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT
 220719 - PLUMBING PIPING INSULATION
 221116 - DOMESTIC WATER PIPING
 221119 - DOMESTIC WATER PIPING SPECIALTIES
 221316 - SANITARY WASTE AND VENT PIPING
 221319 - SANITARY WASTE PIPING SPECIALTIES
 221319.13 - SANITARY DRAINS
 221413 - FACILITY STORM DRAINAGE PIPING
 221423 - STORM DRAINAGE PIPING SPECIALTIES
 223300 - ELECTRIC, DOMESTIC-WATER HEATERS
 224213.13 - COMMERCIAL WATER CLOSETS
 224213.16 - COMMERCIAL URINALS
 224216.13 - COMMERCIAL LAVATORIES
 224216.16 - COMMERCIAL SINKS
 224700 - DRINKING FOUNTAINS AND WATER COOLERS

DIVISION 23 — HEATING VENTILATING AND AIR CONDITIONING

230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT
 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC
 230713 - DUCT INSULATION
 230719 - HVAC PIPING INSULATION
 230923 - DIRECT DIGITAL CONTROL (DDC) SYSTEM FOR HVAC
 231123 - FACILITY NATURAL-GAS PIPING
 232300 - REFRIGERANT PIPING
 233113 - METAL DUCTS
 233300 - AIR DUCT ACCESSORIES
 233346 - FLEXIBLE DUCTS
 233416 - CENTRIFUGAL HVAC FANS
 233713.13 - AIR DIFFUSERS
 233723 - HVAC GRAVITY VENTILATORS
 237416.11 - PACKAGED SMALL-CAPACITY ROOFTOP AIR-CONDITIONING UNITS
 238126 - SPLIT-SYSTEM AIR-CONDITIONERS

DIVISION 26 — ELECTRICAL



SECTION 078123 - INTUMESCENT FIREPROOFING

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 mastic and intumescent fire-resistive coatings.
- B. Related Requirements:

- 4
1. Section ~~078100 "Applied Fireproofing"~~ 099726 "Cementitious Coatings" for sprayed fire-resistive materials (SFRM).
 2. ~~Section 099646 "Intumescent Painting" for intumescent paints that are fire-retarding, but not fire resistive.~~

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 1. Review products, design ratings, restrained and unrestrained conditions, thicknesses, and other performance requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Framing plans or schedules, or both, indicating the following:
 1. Extent of fireproofing for each construction and fire-resistance rating.
 2. Applicable fire-resistance design designations of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
 3. Minimum fireproofing thicknesses needed to achieve required fire-resistance rating of each structural component and assembly.
 4. Treatment of fireproofing after application.
- C. Samples: For each exposed product and for each color and texture specified, 6in x 12in in size applied to 1/16 inch thick steel plate, showing intumescent finish, both with and without specified finish topcoat

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of fireproofing.
- C. Evaluation Reports: For fireproofing, from ICC-ES.
- D. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by fireproofing manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.

- B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for materials and execution.
 1. Build mockup of each type of fireproofing and different substrate and each required finish Insert description as shown on Drawings.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply fireproofing when ambient or substrate temperature is 50 deg F or lower unless Product Data Sheets allow for lower temperature application or if temporary protection and heat are provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after product application.
- B. Ventilation: Ventilate building spaces during and after application of fireproofing, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fireproofing dries thoroughly.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Assemblies: Provide fireproofing, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.
- B. Source Limitations: Obtain fireproofing for each fire-resistance design from single source.
- C. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E 119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Steel members are to be considered unrestrained unless specifically noted otherwise.
- D. Asbestos: Provide products containing no detectable asbestos.

2.2 MASTIC AND INTUMESCENT FIRE-RESISTIVE COATINGS

- A. Mastic and Intumescent Fire-Resistive Coating **UL-X367**: Manufacturer's standard,, and complying with indicated fire-resistance design.
 1. Products: Subject to compliance with requirements, provide the following provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Carbolite Company, a subsidiary of RPM International; AD Firefilm III AD Firefilm IV, Thermo-Sorb VOC, Thermo-Sorb 263, Thermo-Lag E100S or Thermo-Lag E100, (Exterior Application.)
 2. Application: Designated for "conditioned interior space purpose" use by a qualified testing agency acceptable to authorities having jurisdiction.

3. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design.
4. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: [25] <Insert number> or less.
 - b. Smoke-Developed Index: [50] [450] <Insert number> or less.
5. Hardness: Not less than [45] [65] [80] <Insert value>, Type D durometer, according to ASTM D 2240.
6. Finish: As selected by Architect from manufacturer's standard finishes.
 - a. Color and Gloss: As selected by Architect from manufacturer's full range.

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that are compatible with fireproofing and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.
- B. Substrate Primers: Primers approved by fireproofing manufacturer and complying with required fire-resistance design by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
- C. Reinforcing Fabric: Glass- or carbon-fiber fabric of type, weight, and form required to comply with fire-resistance designs indicated; approved and provided by fireproofing manufacturer.
- D. Reinforcing Mesh: Metallic mesh reinforcement of type, weight, and form required to comply with fire-resistance design indicated; approved and provided by fireproofing manufacturer. Include pins and attachment.
- E. Topcoat: Suitable for application over applied fireproofing; of type recommended in writing by fireproofing manufacturer for each fire-resistance design.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.
 1. Verify that substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, paints, and encapsulants, or other foreign substances capable of impairing bond of fireproofing with substrates under conditions of normal use or fire exposure.
 2. Verify that objects penetrating fireproofing, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
 3. Verify that substrates receiving fireproofing are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with fireproofing application.
- B. Conduct tests according to fireproofing manufacturer's written instructions to verify that substrates are free of substances capable of interfering with bond.

- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Cover other work subject to damage from fallout or overspray of fireproofing materials during application.
- B. Clean substrates of substances that could impair bond of fireproofing.
- C. Prime substrates where included in fire-resistance design and where recommended in writing by fireproofing manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fireproofing.
- D. For applications visible on completion of Project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fireproofing. Remove minor projections and fill voids that would telegraph through fire-resistive products after application.

3.3 APPLICATION

- A. Construct fireproofing assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, topcoats, finishing, and other materials and procedures affecting fireproofing work.
- B. Comply with fireproofing manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fireproofing; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.
- C. Coordinate application of fireproofing with other construction to minimize need to cut or remove fireproofing.
 - 1. Do not begin applying fireproofing until clips, hangers, supports, sleeves, and other items penetrating fireproofing are in place.
 - 2. Defer installing ducts, piping, and other items that would interfere with applying fireproofing until application of fireproofing is completed.
- D. Install auxiliary materials as required, as detailed, and according to fire-resistance design and fireproofing manufacturer's written instructions for conditions of exposure and intended use. For auxiliary materials, use attachment and anchorage devices of type recommended in writing by fireproofing manufacturer.
- E. Spray apply fireproofing to maximum extent possible. After the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by fireproofing manufacturer.
- F. Extend fireproofing in full thickness over entire area of each substrate to be protected.
- G. Install body of fireproofing in a single course unless otherwise recommended in writing by fireproofing manufacturer.
- H. Provide a uniform finish complying with description indicated for each type of fireproofing material and matching finish approved for required mockups.

- I. Cure fireproofing according to fireproofing manufacturer's written instructions.
 - J. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, and tested and corrections have been made to deficient applications.
 - K. Finishes: Where indicated, apply fireproofing to produce the following finishes:
 - 1. Manufacturer's Standard Finishes: Finish according to manufacturer's written instructions for each finish selected.
 - 2. Spray-Textured Finish: Finish left as spray applied with no further treatment.
 - 3. Rolled, Spray-Textured Finish: Even finish produced by rolling spray-applied finish with a damp paint roller to remove drippings and excessive roughness.
- 3.4 FIELD QUALITY CONTROL
- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 - 1. Test and inspect as required by the IBC, Subsection 1705.14, "Mastic and Intumescent Fire-Resistant Coatings."
 - B. Perform the tests and inspections of completed Work in successive stages. Do not proceed with application of fireproofing for the next area until test results for previously completed applications of fireproofing show compliance with requirements. Tested values must equal or exceed values as specified and as indicated and required for approved fire-resistance design.
 - C. Fireproofing will be considered defective if it does not pass tests and inspections.
 - 1. Remove and replace fireproofing that does not pass tests and inspections, and retest.
 - 2. Apply additional fireproofing, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.
 - D. Prepare test and inspection reports.
- 3.5 CLEANING, PROTECTING, AND REPAIRING
- A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.
 - B. Protect fireproofing, according to advice of manufacturer and Installer, from damage resulting from construction operations or other causes, so fireproofing is without damage or deterioration at time of Substantial Completion.
 - C. As installation of other construction proceeds, inspect fireproofing and repair damaged areas and fireproofing removed due to work of other trades.
 - D. Repair fireproofing damaged by other work before concealing it with other construction.
 - E. Repair fireproofing by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

Carboline Product Submitted

A. Primer: Carboline, Rustbond Epoxy Primer @ 1-2 mils DFT

B. Intumescent Fireproofing: Carboline AD Firefilm III @ required DFT mils.

C. Top Coat: Carboline Carbothane 133MC @ 2-3 mils DFT

Required Mils for Intumescent Fireproofing:

<i>Member Type</i>	<i>Member Size</i>	<i>A/P</i>	<i>Fire Rating</i>	<i>Firefilm III Thickness (mils)</i>	<i>Fire Test Design No.</i>
Column	HSS8X8X1/4	0.24	1 Hr	134	UL X673
Column	HSS18X6X1/4	0.25	1 Hr	134	UL X673

END OF SECTION 078123

SECTION 093000 - TILING

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. Ceramic tile.
 - 2. Glazed wall tile.
 - 3. Waterproof membrane.
 - 4. Crack isolation membrane.
 - 5. Metal edge strips.
- B. Tile installation
 - 1. Thin set tile at walls.
 - 2. Full mortar set at floors.

1.3 DEFINITIONS

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in "American National Standard Specifications for Installation of Ceramic Tile."
- C. Module Size: Actual tile size plus joint width indicated.
- D. Face Size: Actual tile size, excluding spacer lugs.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
- D. Samples for Verification:
 - 1. Full-size units of each type and composition of tile and for each color and finish required.
 - 2. Full-size units of each type of trim and accessory for each color and finish required.
 - 3. Stone thresholds in 6-inch lengths.
 - 4. Metal edge strips in 6-inch lengths.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.
- C. Product Certificates: For each type of product, signed by product manufacturer.
- D. Material Test Reports: For each tile-setting and -grouting product.
- E. Certification
 - 1. Prior to installation of tile in any one area, submit written certification to Architect certifying that surfaces are properly prepared for specified installation, and that all depressions and abutting edges are properly spaced and aligned to permit installation in pattern shown on drawings.
 - 2. Submit certification that selected detectable warning tile complies with requirements of the Americans with Disabilities Act of 1990.
 - 3. Submit certification that selected sealant specified in Section 079200 will achieve manufacturer's published adhesion values on specified tile.
 - 4. Slip Resistance Testing: Test six representative tile from each tile specified, selected at random from project stock per ASTM C1028 to verify compliance with slip resistance criteria.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Tile and Trim Units: Furnish one case of each tile type.

1.7 QUALITY ASSURANCE

- A. Source Limitations for Tile: Obtain tile of each type from one source or producer.
 - 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
 - 1. Stone thresholds.
 - 2. Waterproof membrane.
 - 3. Crack isolation membrane.
 - 4. Joint sealants.
 - 5. Cementitious backer units.
 - 6. Metal edge strips.
- D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Mock-up: Prior to beginning tile on typical toilet wall and floor surface, prepare in-place mock-up of portion of installation and obtain Architect's approval.

2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- 1.8 Retain paragraph below if Work of this Section is extensive or complex enough to justify a preinstallation conference. Qualifications
- A. Manufacturer:
 1. Manufacturer shall have produced tile products of similar type for a period of five (5) years prior to beginning work of this section and shall have the capability to produce the specified products to the delivery and quantity criteria of the project.
 - B. Staff:
 1. Use only personnel thoroughly trained and experienced in the skills required, have installed similar applications of the specified products within one year prior to beginning work of this section, and are completely familiar with the manufacturers' recommended methods of installation as well as the requirements of this work.
 2. Staff installing specified grout shall have attended manufacturer's training sessions and have installed specified grout within the past 12 months prior to beginning work.
- 1.9 DELIVERY, STORAGE, AND HANDLING
- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
 - B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
 - C. Store aggregates where grading and other required characteristics can be maintained, and contamination can be avoided.
 - D. Store liquid materials in unopened containers and protected from freezing.
 - E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.
- 1.10 PROJECT CONDITIONS
- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.
- 1.11 REGULATORY REQUIREMENTS
- A. Ceramic Tile Flooring demonstrating a coefficient of friction of at least 0.6 per ASTM C1028 shall be accepted as meeting the intent of slip resistance. CBC Section 11B-302.1.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
 - 1. Provide tile complying with Standard grade requirements unless otherwise indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCA installation methods specified in tile installation schedules, and other requirements specified.
- C. FloorScore Compliance: Tile for floors shall comply with requirements of FloorScore Standard.
- D. Low-Emitting Materials: Tile flooring systems shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- E. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- F. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.
- G. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

2.2 TILE PRODUCTS

~~A. Tile Type CT-1: Glazed wall tile.~~
~~1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal:~~
~~a. Daltile; Division of Dal-Tile International Inc., Method, Poreclato, Colorbody Porecelain.~~
~~2. Module Size: 8 by 8 inches.~~
~~3. Thickness: 5/16 inch.~~

~~B. Tile Type CTB-2: Cove Base~~
~~1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal:~~
~~a. Daltile; Division of Dal-Tile International Inc., Method, Poreclato, Colorbody Porecelain.~~
~~b. Module Size: 6 inches by 8 inches.~~



- C. Tile Type CT-2: Interior Floor Tile
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal:

- a. Daltile; Division of Dal-Tile International Inc., Porcelato Colorbody Porcelain.
- b. Module Size: 8 by 8 inches.
- c. Coefficient of Friction: Minimum 0.60, wet and dry per, ASTM C1028.
- d. Tile Color and Pattern: Grigio Granite CD40, Unpolished Field Tile.
- e. Grout Color: As selected by Architect from manufacturer's full range.

D. Tile Type CT-3: Interior Wall Tile

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

- a. **Daltile; Division of Dal-Tile International Inc., Porcelato Colorbody Porcelain.**
- b. **Module Size: 8 by 8 inches.**
- c. **Coefficient of Friction: Minimum 0.60, wet and dry per, ASTM C1028.**
- d. **Tile Color and Pattern: Grigio Granite CD40, Unpolished Field Tile.**
- e. **Grout Color: As selected by Architect from manufacturer's full range.**

4

E.

2.3 THRESHOLDS

- A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
 - 1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to 1/16 inch above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to 1/2 inch or less above adjacent floor surface.
- B. Marble Thresholds: ASTM C 503, with ASTM C 241 and with honed finish.
 - 1. Description: Color and profile as selected by Architect..

2.4 WATERPROOF MEMBRANE

- A. Mortar Bed Waterproofing Applications: NobleSeal Chloraloy 240, preformed sheet CPE membrane, 40 mil thickness. Provide preformed corners and all manufacturers recommended accessories.

2.5 CRACK ISOLATION MEMBRANE

- A. General: Manufacturer's standard product that complies with ANSI A118.12 for high performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

2.6 SETTING MATERIALS

- A. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.
 - 1. Cleavage Membrane: Asphalt felt, ASTM D 226, Type I; or polyethylene sheeting, ASTM D 4397, 4.0 mils thick.
- B. Cementitious Tile Adhesives Interior (Interior Glass Mosaic Tile):
 - 1. Tile adhesive requires a minimum "Shear Bond" strength after 28 days of 425 PSI for porcelain tile and 600 PSI for bisque tile.
 - 2. ANSI A118.4: Polymer-Enhanced Mortars:

- a. Custom Building Products ProLite Tile White Cement and Stone Thin-Set Mortar.
 - C. Cementitious Tile Adhesives Interior (Interior Colored Body Porcelain Tile):
 - 1. Tile adhesive requires a minimum “Shear Bond” strength after 28 days of 350 PSI for porcelain tile and 575 PSI for bisque tile.
 - 2. ANSI A118.4: Polymer-Enhanced Mortars:
 - a. Custom Building Products VersaBond Flex Fortified Thin-Set Mortar.
- 2.7 GROUT MATERIALS
- A. Grout (Interior Glass Mosaic Tile): Where indicated on the drawings, and elsewhere as required for filling the joints between tiles.
 - 1. Tile grout requires a minimum “Tinsel Strength” after 28 days of 525 PSI.
 - 2. Polymer-Modified Glass Aggregate Portland Cement Grout:
 - a. Custom Building Products Polyblend Non Sanded Tile Grout; ANSI A118.6, for joints 1/16” (1.5 mm) - 1/8 inch.
 - B. Grout (Interior Colored Body Porcelain Tile): Where indicated on the drawings, and elsewhere as required for filling the joints between tiles.
 - 1. Tile grout requires a minimum “Tinsel Strength” after 28 days of 500 PSI.
 - 2. Polymer-Modified Glass Aggregate Portland Cement Grout:
 - a. Custom Building Products Prism SureColor Tile Grout, ANSI A118.7 for joints 1/16 inch to 1/2 inch.
- 2.8 ELASTOMERIC SEALANTS
- A. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Section 079200 "Joint Sealants."
 - 1. Sealants shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
 - 3. Use primers, backer rods, and sealant accessories recommended by sealant manufacturer.
 - B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.
 - C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.
- 2.9 MISCELLANEOUS MATERIALS
- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

- B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; stainless-steel, ASTM A 666, 300 Series exposed-edge material.
 - 1. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
 - C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
 - D. Grout Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.
 - 1. Products: Subject to compliance with requirements, provide one of the following or equal:
 - a. Custom Building Products; Surfaceguard Sealer.
- 2.10 MIXING MORTARS AND GROUT
- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
 - B. Add materials, water, and additives in accurate proportions.
 - C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - 1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
 - 2. Verify that concrete substrates for tile floors installed with bonded mortar bed or thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
 - 3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
 - 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.
- C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
- D. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 MEMBRANE INSTALLATION

- A. Verify slab preparation complies with criteria specified in Section 033000.
 - 1. Remove all sealers, curing compounds and other materials affecting proper bond of membranes with bead blast abrasive equipment.
- B. Cleavage Membrane: Unless otherwise shown on drawings, where mortar bed is installed over concrete slab on grade at interior applications, provide specified cleavage membrane.
- C. Waterproofing Membrane Installation:
 - 1. Apply waterproofing membrane per manufacturers recommendations.
 - a. Apply thinset waterproofing membrane using approved latex modified mortar system.
 - 2. Provide preformed corners. Seal all penetrations with specified sealant.
 - 3. Detail all joints as required by manufacturer and approved submittal.
 - 4. Extend membrane up wall surface as shown on drawings. Coordinate with wall underlayment.
 - 5. At expansion joints, continue sheet material in looped fashion through joint to accommodate anticipated joint movement.
 - 6. Allow sufficient time for all seams, transitions and setting beds to cure before installing subsequent materials. Do not install tile over waterproofing until waterproofing has been tested to determine that it is watertight.

3.4 MORTAR BED INSTALLATION

- A. Unless noted otherwise, prepare floor substrate as required for complete bond. Remove all sealers, curing compounds and other materials affecting proper bond of membranes with bead blast abrasive equipment.
- B. Coordinate lath and mortar bed installation with concrete slab substrate joints. Align expansion joints in mortar bed and tile with substrate joints.
- C. Install mortar bed in accordance with specified method and referenced ANSI standard.

- D. Where waterproof membrane is provided, do not penetrate membrane. Provide accessory supports.

3.5 TILE INSTALLATION

- A. Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
 - 1. For the following installations, follow procedures in the ANSI A108 Series of tile installation standards for providing 95 percent mortar coverage:
 - a. Tile floors in wet areas.
 - b. Tile floors composed of tiles 8 by 8 inches or larger.
 - c. Tile floors composed of rib-backed tiles.
- B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- E. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
 - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
 - 2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 - 3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
- F. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
 - 1. Ceramic Mosaic Tile: 1/16 inch.
 - 2. Paver Tile: 1/4 inch.
 - 3. Glazed Wall Tile: 1/16 inch.
 - 4. Decorative Thin Wall Tile: 1/16 inch.
- G. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- H. Expansion Joints: Provide expansion joints complying with TCNA Detail EJ171 at the following specified locations and as located and shown on the drawings:
 - 1. At wall tile to paver/floor tile joints.
 - 2. At all expansion and control joints in substrate. Where tile joint does not occur directly over substrate joint, provide sealant joint on each side of joint.

3. At tile joint at inside vertical corners.
 4. At interior applications, at approximately 24 feet on center each way in floor and wall tile surfaces. Adjust to 12 feet at toilet tile conditions, and 8 feet for dark tile in sunlight areas.
 5. At exterior applications, at approximately 12 feet on center each way in floor and wall tile surfaces. Adjust to 8 feet as necessary for dark tile in sunlight areas.
 6. Where material transitions occur, comply with expansion/control joint criteria.
 7. At conditions where tile extends through doorways, extend wall cove/floor tile sealant joint across doorway.
 8. At floor drain/tile edge, column penetrations, tile terminations against frames and other restraining elements.
 9. At tile terminations against curbs, paving or other restraining elements.
- I. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
 - J. Stone Thresholds: Install stone thresholds in same type of setting bed as adjacent floor unless otherwise indicated.
 1. At locations where mortar bed (thickset) would otherwise be exposed above adjacent floor finishes, set thresholds in latex-portland cement mortar (thin set).
 - K. Metal Edge Strips: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated.
 - L. Grout Sealer: Apply grout sealer to grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.
- 3.6 WATERPROOFING INSTALLATION
- A. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.
 - B. Do not install tile or setting materials over waterproofing until waterproofing has cured and been tested to determine that it is watertight.
- 3.7 CRACK ISOLATION MEMBRANE INSTALLATION
- A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.
 - B. Do not install tile or setting materials over crack isolation membrane until membrane has cured.
- 3.8 FIELD QUALITY CONTROL
- A. Tolerances
 1. Grout joint alignment with adjacent edge: 1/8" in 10 feet.
 2. Row and column alignment: 1/8" in 10 feet deviation.
 3. Alignment with adjacent tile: 1/16" +/-.
 4. Level, plane and/or vertical: 1/8" in 10 feet deviation.

3.9 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove epoxy and latex-portland cement grout residue from tile as soon as possible.
 - 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
 - 3. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.
- B. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.10 INTERIOR TILE INSTALLATION SCHEDULE

- A. Interior Floor Installations, Concrete Subfloor:
 - 1. Tile Installation F111: Cement mortar bed (thickset) with cleavage membrane; TCA F111 and ANSI A108.1C.
- B. Interior Wall Installations, Metal Studs or Furring:
 - 1. Tile Installation W244: Thin-set mortar on cementitious backer units or fiber cement underlayment over cleavage membrane; TCA W244.

END OF SECTION 093000

This page intentionally left blank.

SECTION 101419 - DIMENSIONAL LETTER SIGNAGE

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. Cast dimensional characters.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For dimensional letter signs.
 - 1. Include fabrication and installation details and attachments to other work.
 - 2. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
 - 3. Show message list, typestyles, graphic elements, and layout for each sign.
- C. Samples: For each type of sign assembly showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:
 - 1. Dimensional Characters: Full-size Sample of dimensional character.
- D. Sign Schedule: Use same designations specified or indicated on Drawings or in a sign schedule.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For signs to include in maintenance manuals.

1.5 FIELD CONDITIONS

- A. Field Measurements: Verify locations of electrical service embedded in permanent construction by other installers by field measurements before fabrication and indicate measurements on Shop Drawings.

1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of finishes beyond normal weathering.
 - b. Separation or delamination of sheet materials and components.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 DIMENSIONAL CHARACTERS

- A. Cast Dimensional Characters: Characters with uniform faces, sharp corners, and precisely formed lines and profiles, and as follows:

Murrieta Mesa HS New Classroom Bldg
Murrieta Valley Unified School District
BakerNowicki Design Studio #17028-00

DIMENSIONAL LETTER SIGNAGE
101419 – 1

1. Manufacturers: Subject to compliance with requirements, provide products by the following or equal:
 - a. A. R. K. Ramos Signage Systems.
 - b. Gemini, Inc.
 - c. Or equal.
2. Character Material: Cast aluminum.
3. Character Height: **9 inches.** △₄
4. Thickness: Manufacturer's standard for size of character.
5. Finishes:
 - a. Integral Aluminum Finish: Anodized color as selected by Architect from full range of industry colors and color densities.
- ~~6.~~ Mounting: ~~Concealed studs~~ **Projecting studs.** △₄
7. Typeface: ~~Kabel.~~ **Arial Bold** △₄

2.2 DIMENSIONAL CHARACTER MATERIALS

- A. Aluminum Castings: ASTM B 26/B 26M, alloy and temper recommended by sign manufacturer for casting process used and for type of use and finish indicated.
- B. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.3 ACCESSORIES

- A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signage, noncorrosive and compatible with each material joined, and complying with the following:
 1. Use concealed fasteners and anchors unless indicated to be exposed.
 2. For exterior exposure, furnish stainless-steel devices unless otherwise indicated.
 3. Exposed Metal-Fastener Components, General:
 - a. Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.
 4. Sign Mounting Fasteners:
 - a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material, screwed into back of sign assembly, or screwed into tapped lugs cast integrally into back of cast sign material, unless otherwise indicated.
 - ~~b. Projecting Studs: Threaded studs with sleeve spacer, welded or brazed to back of sign material, screwed into back of sign assembly, or screwed into tapped lugs cast integrally into back of cast sign material, unless otherwise indicated.~~** △₄
- B. Adhesives: As recommended by sign manufacturer and with a VOC content of 70 g/L or less for adhesives used inside the weatherproofing system and applied on-site when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Adhesives: As recommended by sign manufacturer and that comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

- D. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch thick, with adhesive on both sides.

2.4 FABRICATION

- A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
 - 1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
 - 2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
 - 3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
 - 4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
 - 5. Internally brace signs for stability and for securing fasteners.
 - 6. Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.
 - 7. Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

2.5 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

2.6 ALUMINUM FINISHES

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of signage work.
- B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.

- C. Verify that electrical service is correctly sized and located to accommodate signs.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
 - 1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
 - 3. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- B. Mounting Methods:
 - 1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
 - a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place sign in position and push until flush to surface, embedding studs in holes. Temporarily support sign in position until adhesive fully sets.
 - b. Thin or Hollow Surfaces: Place sign in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

~~2. Projecting Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.~~

~~a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place spacers on studs, place sign in position, and push until spacers are pinched between sign and substrate, embedding the stud ends in holes. Temporarily support sign in position until adhesive fully sets.~~

~~b. Thin or Hollow Surfaces: Place spacers on studs, place sign in position with spacers pinched between sign and substrate, and install washers and nuts on stud ends projecting through opposite side of surface, and tighten.~~

4

3.3 ADJUSTING AND CLEANING

- A. Remove and replace damaged or deformed characters and signs that do not comply with specified requirements. Replace characters with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Remove temporary protective coverings and strippable films as signs are installed.
- C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101419

This page intentionally left blank.

SECTION 123001 - DISPLAY CASES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Prefabricated display cases.**

1.2 REFERENCES

- A. NEMA LD -3 Standards**
- B. (ANSI) American National Standards Institute**
 - 1. ANSI H35.1 - Alloy and Temper Designation for Aluminum.**
- C. (ASTM) American Society for Testing and Materials**
 - 1. ASTM B 221 - Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.**
 - 2. ASTM E-84 – Standard Testing Method for Surface Burning Characteristics of Building Materials.**

1.3 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 013300.**
- B. Include materials, component profiles, fastening methods, assembly methods, joint details, accessory listings, and schedule of finishes. Include seaming plan of all countertop materials.**
- C. Samples & Color Chart:**
 - 1. Housing and Door Trim: Prior to fabricating, provide complete color chip/sample ring of prefinished frame for Architects color selection.**
 - 2. Interior Wall Materials:**
 - a. Forbo Linoleum Inc. 1/4-inch (6.35-mm) thick cork bulletin board color range.**
 - b. High Pressure Laminate: Manufacturer-standard color selection.**

1.3.1 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an authorized crew with installation and maintenance experience of the type of product as required for this project.**
- B. Fire-Test-Response Characteristics: For vinyl/fabric-faced tack surfaces, provide Class A (or Class 1) performance characteristics identical to those required in this Section per ASTM E 84.**
- C. Operation and Maintenance: Include data on regular cleaning, stain removal and general precautions.**

1.4 DELIVERY AND STORAGE

- A. Deliver factory-built units crated for protection and secured to the trailer whenever possible. Once delivered, inspect the unit for damage and return to**

crating for storage. Store crated units protected from temperature (above 55 degrees Fahrenheit) and humidity variations or possible jobsite traffic damage until the system is ready to be installed.

1.5 PROJECT CONDITIONS

- A. **Verify field measurements before fabrication to ensure proper fitting. Coordinate fabrication lead time with construction progress to avoid delaying the work. Notify Architect of any conflicts with other construction such as casework, electrical switches, outlets, clocks, fire detector devices, etc.**
1. **Established Dimensions:** Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with the fabricating without field measurements. Coordinate wall construction to ensure actual dimensions correspond to established dimensions.
 2. **Coordinate delivery with field conditions to provide proper temperature (above 55 degrees Fahrenheit) and humidity variations and protect from possible jobsite traffic damage until the system is ready to be installed.**

1.6 WARRANTY

- A. **Project Warranty:** Submit a written warranty executed by manufacturer agreeing to replace the unit provided the manufacturer's written instructions for proper handling, installation, protection, and maintenance have been followed.
1. **Manufacturer Warranty Coverage:** Pyramid Presentation Products Display Cases are warranted for One Year against defect in materials and workmanship. Warranty voided upon improper handling, installation, or vandalism. Warranty covers replacement of defective material but does not include the cost of removal or reinstallation.

PART 2 - PRODUCTS

2.1 PREFABRICATED EXHIBIT CASES

- A. **Basis of Design:** Characteristics of specific products manufactured by C.R. Laurence Co., Inc. are indicated to establish required level of quality, appearance, and performance. The Architect will consider requests for substitutions under the provisions of Section 012500.
- B. **Type 1:**
1. **Type 1: Stargazer Display Cases**
- C. **Characteristics: Type 1**
1. **Casefront:**
 - a. **Material:** Fabricated case front trim of not less than 1/8-inch thick aluminum alloy 6063-T5 extrusions meeting ASTM B221.
 - b. **Finish:** Clear Satin Anodized Aluminum (standard)
 - c. **Size:** As indicated on shop drawings.
 - d. **Case front to be fabricated with double-keyed miter connections for structural integrity, accurate square and plumb fit.**
 2. **Glass Doors: Sliding Glass Doors (standard) to be 1/4-inch thick tempered safety glass with polished edges, and inset finger pulls. Glass door shoe to be constructed with inset ball-bearing rollers traveling on a bottom guide track. Ratchet or plunger lock and two keys provided as required.**

3. **Shelving:**
 - a. Modular shelving systems at 6, 8, 10, or 12-inches deep as indicated on shop drawings.
 - b. Surface mounted single or double standards as indicated.
 - c. Indicate on drawings the number of rows.
 - d. ¼-inch thick tempered safety glass with polished edges.
4. **Case Housing:** Standard interior wall panels includes materials as indicated below laminated to Grade B (minimum) plywood using moisture-resistant, thermoplastic-type adhesive.
 - a. **Interior Wall Surface:** Plastic Laminate – Style as chosen by Architect.
5. **Back Panel:** Colored Cork – Forbo Linoleum resilient tackable surface, ¼-inch thick all natural materials with burlap binders, Uni-color shall extend throughout thickness of material contains no harmful byproducts or carcinogens, Class B rated in accordance to ASTM E-84, Class II rated in accordance to NFPA 255, Zero-effect chemical resistance to diluted acids and solvents with no resistance to high alkalis, Washable finish to retain original appearance and resist cracking, drying, and peeling, Self-healing from thumbtacks and pin punctures, Self-sanitizing quality in the form of bactericidal effect. Provide color as selected from manufacturer’s standard Forbo Bulletin Board color chart.
6. **Lighting:** Wiring locations as per architect drawings. Lighting installation performed by electrical contractor.

2.2 OTHER MATERIALS

- A. Provide all other materials, not specifically described but required for complete and proper installation of this work, as selected by the contractor and subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. **Inspection**
 1. Examine wall surfaces, with Installer present, for compliance with requirements and other conditions affecting installation. Prior to work of this section, carefully inspect previously installed work. Verify all such work is complete to the point where this installation may properly commence.
 2. Verify that work of this section may be installed in strict accordance with the original design, all pertinent codes and regulations, and all pertinent portions of the referenced standards.
 - a. Verify adequacy of backing and support framing.
 3. In the event of discrepancy, immediately notify the Architect.
 4. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 INSTALLATION

- A. Shall be made in accordance with manufacturer’s recommendations. Door framing and jambs shall be rigidly set square and plumb. Clearances between

the doors, sidelites, header and jamb shall be as recommended by door manufacturer. Top and bottom pivots shall be properly aligned using adjustment features shown on instruction sheets furnished by Stargazer Display Cases. The installation contractor shall be fully responsible for properly aligning and setting the doors all in accordance with the manufacturer's recommendation.

1. Deliver factory-built units completely assembled in accordance with manufacturer's shop drawings as approved by the architect. When overall dimensions require delivery in separate units, pre-fit components at the factory, disassemble for delivery, and make final joints at the site.
2. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim and accessories necessary for complete installation.
3. Install units in locations and at mounting heights indicated and according to manufacturer recommendations. Keep perimeter lines straight, plumb, and level
4. Do not install units over any mechanical or electrical openings or utilities. Should this condition occur, notify the Construction Manager for direction.

3.3 PROTECTION

- A. During and after installation, provide adequate protection against stains and damage during construction.

3.4 ADJUSTING AND CLEANING

- A. Adjust sliding doors, hardware, fixtures and other moving or operating parts to function smoothly and correctly.
- B. Clean casework, shelves, hardware, fittings and fixtures.

END OF SECTION 123001

SECTION 220719 - PLUMBING PIPING INSULATION

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 insulating the following plumbing piping services:
 - 1. Domestic cold-water piping.
 - 2. Domestic hot-water piping.
 - 3. Roof drains and rainwater leaders.
 - 4. Supplies and drains for handicap-accessible lavatories and sinks.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products in accordance with ASTM E84 by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less and smoke-developed index of 50 or less.
 - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less and smoke-developed index of 150 or less.
- C. Comply with the following applicable standards and other requirements specified for miscellaneous components:
 - 1. Supply and Drain Protective Shielding Guards: ICC A117.1.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.6 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

1.7 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come into contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested in accordance with ASTM C871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable in accordance with ASTM C795.
- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- F. Flexible Elastomeric: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C534/C534M, Type I for tubular materials.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. Armacell LLC.
 - b. K-Flex USA.
- G. Mineral-Fiber, Preformed Pipe: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C547.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Johns Manville; a Berkshire Hathaway company.
 - b. Knauf Insulation.
 - c. Owens Corning.
 - 2. Preformed Pipe Insulation: Type I, Grade A with factory-applied ASJ-SSL.
 - 3. 850 deg F.
 - 4. Factory fabricate shapes in accordance with ASTM C450 and ASTM C585.
 - 5. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
 - a. ITW Insulation Systems; Illinois Tool Works, Inc.
 - b. Resolco Inc.

2.2 INSULATING CEMENTS

- A. Mineral-Fiber Insulating Cement: Comply with ASTM C195.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Ramco Insulation, Inc.
 - b. Or Equal.

2.3 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
- B. Flexible Elastomeric and Polyolefin Adhesive: Solvent-based adhesive.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Armacell LLC.
 - b. Foster Brand; H. B. Fuller Construction Products.
 - c. K-Flex USA.

2. Adhesive: As recommended by flexible elastomeric and polyolefin manufacturer and with a VOC content of 80 g/L or less.
 3. Flame-spread index shall be 25 or less and smoke-developed index shall be 50 or less as tested in accordance with ASTM E84.
 4. Wet Flash Point: Below 0 deg F.
 5. Service Temperature Range: 40 to 200 deg F.
 6. Color: Black.
- C. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Foster Brand; H. B. Fuller Construction Products.
 2. Adhesive: As recommended by mineral fiber manufacturer and with a VOC content of 80 g/L or less.
- D. ASJ Adhesive and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A, for bonding insulation jacket lap seams and joints.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Foster Brand; H. B. Fuller Construction Products.
 2. Adhesives shall have a VOC content of 80 g/L or less.
- E. PVC Jacket Adhesive: Compatible with PVC jacket.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dow Consumer Solutions.
 - b. Johns Manville; a Berkshire Hathaway company.
 - c. Speedline Corporation.
 2. Adhesive: As recommended by Adhesive - PVC Jacket manufacturer and with a VOC content of 50 g/L or less.

2.4 MASTICS AND COATINGS

- A. Materials shall be compatible with insulation materials, jackets, and substrates.

1. Mastics: As recommended by insulation manufacturer and with a VOC content of 50 g/L or less.
- B. Vapor-Retarder Mastic, Water Based: Suitable for indoor use on below-ambient services.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Foster Brand; H. B. Fuller Construction Products.
 - c. Knauf Insulation.
 - d. Vimasco Corporation.
 2. Water-Vapor Permeance: Comply with ASTM E96/E96M or ASTM F1249.
 3. Service Temperature Range: 0 to plus 180 deg F.
 4. Comply with MIL-PRF-19565C, Type II, for permeance requirements.
 5. Color: White.
- C. Vapor-Retarder Mastic, Solvent Based, Indoor Use: Suitable for indoor use on below-ambient services.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Foster Brand; H. B. Fuller Construction Products.
 2. Water-Vapor Permeance: Comply with ASTM E96/E96M or ASTM F1249.
 3. Service Temperature Range: 0 to 180 deg F.
 4. Color: White.
- D. Vapor-Retarder Mastic, Solvent Based, Outdoor Use: Suitable for outdoor use on below-ambient services.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Foster Brand; H. B. Fuller Construction Products.
 2. Water-Vapor Permeance: Comply with ASTM E96/E96M or ASTM F1249.
 3. Service Temperature Range: Minus 50 to plus 220 deg F.
 4. Color: White.
- E. Breather Mastic: Water based; suitable for indoor and outdoor use on above-ambient services.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Foster Brand; H. B. Fuller Construction Products.
 - c. Knauf Insulation.
 - d. Vimasco Corporation.
2. Water-Vapor Permeance: ASTM E96/E96M, greater than 1.0 perm at manufacturer's recommended dry film thickness.
3. Service Temperature Range: 0 to plus 180 deg F.
4. Color: White.

2.5 LAGGING ADHESIVES

- A. Adhesives shall comply with MIL-A-3316C, Class I, Grade A, and shall be compatible with insulation materials, jackets, and substrates.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Foster Brand; H. B. Fuller Construction Products.
 - c. Vimasco Corporation.
 2. Adhesive shall be as recommended by insulation manufacturer and shall have a VOC content of 50 g/L or less.
 3. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over pipe insulation.
 4. Service Temperature Range: 20 to plus 180 deg F.
 5. Color: White.

2.6 SEALANTS

- A. Materials shall be as recommended by the insulation manufacturer and shall be compatible with insulation materials, jackets, and substrates.
- B. Joint Sealants:
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Foster Brand; H. B. Fuller Construction Products.
 - c. Pittsburgh Corning Corporation.

2. Permanently flexible, elastomeric sealant.
3. Service Temperature Range: Minus 58 to plus 176 deg F.
4. Color: White or gray.
5. Sealant shall have a VOC content of 420 g/L or less.

C. ASJ Flashing Sealants and PVC Jacket Flashing Sealants:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Or Equal.
2. Fire- and water-resistant, flexible, elastomeric sealant.
3. Service Temperature Range: Minus 40 to plus 250 deg F.
4. Color: White.
5. Sealant shall have a VOC content of 420 g/L or less.

2.7 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C1136, Type I.
 2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C1136, Type I.
 3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C1136, Type II.

2.8 FIELD-APPLIED JACKETS

- A. Field-applied jackets shall comply with ASTM C1136, Type I, unless otherwise indicated.
- B. Metal Jacket:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ITW Insulation Systems; Illinois Tool Works, Inc.
 - b. RPR Products, Inc.
 2. Aluminum Jacket: Comply with ASTM B209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.

- a. Sheet and roll stock ready for shop or field sizing.
- b. Finish and thickness are indicated in field-applied jacket schedules.
- c. Moisture Barrier for Indoor Applications: 1-mil- thick, heat-bonded polyethylene and kraft paper.
- d. Moisture Barrier for Outdoor Applications: 3-mil- thick, heat-bonded polyethylene and kraft paper.
- e. Factory-Fabricated Fitting Covers:
 - 1) Same material, finish, and thickness as jacket.
 - 2) Preformed two-piece or gore, 45- and 90-degree, short- and long-radius elbows.
 - 3) Tee covers.
 - 4) Flange and union covers.
 - 5) End caps.
 - 6) Beveled collars.
 - 7) Valve covers.
 - 8) Field fabricate fitting covers only if factory-fabricated fitting covers are not available.

C. Underground Direct-Buried Jacket: 125-mil- thick vapor barrier and waterproofing membrane, consisting of a rubberized bituminous resin reinforced with a woven-glass fiber or polyester scrim and laminated aluminum foil.

- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Pittsburgh Corning Corporation.
 - b. Polyguard Products, Inc.

D. Self-Adhesive Outdoor Jacket: 60-mil- thick, laminated vapor barrier and waterproofing membrane for installation over insulation located aboveground outdoors; consisting of a rubberized bituminous resin on a cross-laminated polyethylene film covered with white aluminum-foil facing.

- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Polyguard Products, Inc.
 - b. Or Equal.

2.9 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C1136.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. 3M Industrial Adhesives and Tapes Division.
 - b. Avery Dennison Corporation, Specialty Tapes Division.
 - c. Ideal Tape Co., Inc., an American Biltrite Company.
 - d. Knauf Insulation.
2. Width: 3 inches.
3. Thickness: 11.5 mils.
4. Adhesion: 90 ounces force/inch in width.
5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

2.10 SECUREMENTS

A. Bands:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ITW Insulation Systems; Illinois Tool Works, Inc.
 - b. RPR Products, Inc.
2. Stainless Steel: ASTM A240/A240M, Type 304; 0.015 inch thick, 3/4 inch wide with wing seal.
3. Aluminum: ASTM B209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 3/4 inch wide with wing seal.

B. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.

C. Wire: 0.062-inch soft-annealed, stainless steel.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. C & F Wire.
 - b. Or Equal.

2.11 PROTECTIVE SHIELDING GUARDS

A. Protective Shielding Pipe Covers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Just Manufacturing.
 - b. McGuire Manufacturing.
 - c. MVG Molded Products.
 - d. Truebro.
 - e. Zurn Industries, LLC.
 2. Description: Manufactured plastic wraps for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.
- B. Protective Shielding Piping Enclosures:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Truebro.
 - b. Zurn Industries, LLC.
 2. Description: Manufactured plastic enclosure for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with ADA requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
 1. Verify that systems to be insulated have been tested and are free of defects.
 2. Verify that surfaces to be insulated are clean and dry.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Coordinate insulation installation with the tradesman installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

- C. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping, including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and of thicknesses required for each item of pipe system, as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- G. Keep insulation materials dry during storage, application, and finishing. Replace insulation materials that get wet.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
 - 1. Install insulation continuously through hangers and around anchor attachments.
 - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends attached to structure with vapor-barrier mastic.
 - 3. Install insert materials and insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
 - 4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

- L. Install insulation with factory-applied jackets as follows:
 - 1. Draw jacket tight and smooth.
 - 2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward-clinching staples along both edges of strip, spaced 4 inches o.c.
 - 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward-clinching staples along edge at 4 inches o.c.
 - a. For below-ambient services, apply vapor-barrier mastic over staples.
 - 4. Cover joints and seams with tape, in accordance with insulation material manufacturer's written instructions, to maintain vapor seal.
 - 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- M. Cut insulation in a manner to avoid compressing insulation more than 25 percent of its nominal thickness.
- N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches in similar fashion to butt joints.
- P. For above-ambient services, do not install insulation to the following:
 - 1. Vibration-control devices.
 - 2. Testing agency labels and stamps.
 - 3. Nameplates and data plates.
 - 4. Cleanouts.

3.4 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
 - 1. Seal penetrations with flashing sealant.
 - 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 - 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
 - 4. Seal jacket to roof flashing with flashing sealant.

- B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.
- C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
 - 1. Seal penetrations with flashing sealant.
 - 2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 - 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
 - 4. Seal jacket to wall flashing with flashing sealant.
- D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
 - 1. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping and fire-resistive joint sealers.
- F. Insulation Installation at Floor Penetrations:
 - 1. Pipe: Install insulation continuously through floor penetrations.
 - 2. Seal penetrations through fire-rated assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.5 GENERAL PIPE INSULATION INSTALLATION

- A. Requirements in this article generally apply to all insulation materials, except where more specific requirements are specified in various pipe insulation material installation articles.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, Mechanical Couplings, and Unions:
 - 1. Install insulation over fittings, valves, strainers, flanges, mechanical couplings, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
 - 2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as that of adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.

3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as that used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
 4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as that used for adjacent pipe. Overlap adjoining pipe insulation by not less than 2 times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
 5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than 2 times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers, so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
 6. Insulate flanges, mechanical couplings, and unions, using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than 2 times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Stencil or label the outside insulation jacket of each union with the word "union" matching size and color of pipe labels.
 7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
 8. For services not specified to receive a field-applied jacket, except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing, using PVC tape.
- C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

3.6 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

- A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- B. Insulation Installation on Pipe Fittings and Elbows:
 1. Install mitered sections of pipe insulation.
 2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

C. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed valve covers manufactured of same material as that of pipe insulation when available.
2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.
4. Secure insulation to valves and specialties, and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.7 INSTALLATION OF MINERAL-FIBER INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of preformed pipe insulation to pipe with wire or bands, and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward-clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive, as recommended by insulation material manufacturer, and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as that of straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

C. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of same material as that of straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

3.8 FIELD-APPLIED JACKET INSTALLATION

A. Where FSK jackets are indicated, install as follows:

1. Draw jacket material smooth and tight.
 2. Install lap or joint strips with same material as jacket.
 3. Secure jacket to insulation with manufacturer's recommended adhesive.
 4. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch- wide joint strips at end joints.
 5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.
- B. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless steel bands 12 inches o.c. and at end joints.

3.9 FINISHES

- A. Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below and as specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."
1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.
 - a. Finish Coat Material: Interior, flat, latex-emulsion size.
 - B. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.
 - C. Do not field paint aluminum or stainless steel jackets.

3.10 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections: Inspect pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of threaded fittings, three locations of welded fittings, two locations of threaded strainers, two locations of welded strainers, three locations of threaded valves, and three locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.
- C. All insulation applications will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

3.11 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
 - 1. Drainage piping located in crawl spaces.
 - 2. Underground piping.
 - 3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.



3.12 INDOOR PIPING INSULATION SCHEDULE

- A. Domestic Cold Water:
 - a. No insulation required.
- B. Domestic Hot:

- 1. NPS 1-1/4 and Smaller: Insulation shall be one of the following:



- a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1/2 inch thick.

- C. Condensate:
 - 1. NPS 1-1/4 and Smaller: Insulation shall be one of the following:
 - a. Flexible Elastomeric: 1/2 inch thick.



3.13 OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE

- A. Domestic Water Piping:
 - a. No insulation required.
- B. Domestic Hot Water:

- 1. All Pipe Sizes: Insulation shall be one of the following:



- a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 2 inches thick.

- C. Condensate:
 - 1. All Pipe Sizes: Insulation shall be one of the following:
 - a. Flexible Elastomeric: 1/2 inch thick.

END OF SECTION 220719

SECTION 221316 - SANITARY WASTE AND VENT PIPING

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. Hub-and-spigot, cast-iron soil pipe and fittings.
 - 2. Hubless, cast-iron soil pipe and fittings.
 - 3. Specialty pipe fittings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:
 - 1. Soil, Waste, and Vent Piping: 10-foot head of water.

2.2 PIPING MATERIALS

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.3 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

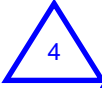
- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. AB & I Foundry; a part of the McWane family of companies.
 - 2. Charlotte Pipe and Foundry Company.
 - 3. NewAge Casting.

4. Tyler Pipe; a part of McWane family of companies.
- B. Pipe and Fittings: ASTM A 74, Service class(es).
- C. Gaskets: ASTM C 564, rubber.
- D. Caulking Materials: ASTM B 29, pure lead and oakum or hemp fiber.

2.4 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. AB & I Foundry; a part of the McWane family of companies.
 2. Charlotte Pipe and Foundry Company.
 3. NewAge Casting.
 4. Tyler Pipe; a part of McWane family of companies.
- B. Pipe and Fittings: ASTM A 888 or CISPI 301.
- C. Single-Stack Aerator Fittings: ASME B16.45, hubless, cast-iron aerator and deaerator drainage fittings.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Conine Manufacturing Co., Inc.
 - b. SE Sovent.
- D. CISPI, Hubless-Piping Couplings:
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ANACO-Husky.
 - b. Charlotte Pipe and Foundry Company.
 - c. Dallas Specialty & Mfg. Co.
 - d. Fernco Inc.
 - e. Josam Company.
 - f. Matco-Norca.
 - g. MIFAB, Inc.
 - h. Mission Rubber Company, LLC; a division of MCP Industries.
 - i. NewAge Casting.
 - j. Stant.
 - k. Tyler Pipe; a subsidiary of McWane Inc.

2. Standards: ASTM C 1277 and CISPI 310.
3. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.



1) A.Y. McDonald Mfg. Co.

2.5 PVC PIPE AND FITTINGS

- A. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping and "NSF-sewer" for plastic sewer piping.
- B. Solid-Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.
- C. Cellular-Core PVC Pipe: ASTM F 891, Schedule 40.
- D. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.
- E. Adhesive Primer: ASTM F 656.
- F. Solvent Cement: ASTM D 2564.

PART 3 - EXECUTION

3.1 EARTH MOVING

- A. Comply with requirements for excavating, trenching, and backfilling specified in Section 312000 "Earth Moving."

3.2 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems.
 1. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations.
 2. Install piping as indicated unless deviations to layout are approved on coordination drawings.
- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Install piping to allow application of insulation.
- J. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends.
 - 1. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical.
 - 2. Use long-turn, double Y-branch and 1/8-bend fittings if two fixtures are installed back to back or side by side with common drain pipe.
 - a. Straight tees, elbows, and crosses may be used on vent lines.
 - 3. Do not change direction of flow more than 90 degrees.
 - 4. Use proper size of standard increasers and reducers if pipes of different sizes are connected.
 - a. Reducing size of waste piping in direction of flow is prohibited.
- K. Lay buried building waste piping beginning at low point of each system.
 - 1. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream.
 - 2. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
 - 3. Maintain swab in piping and pull past each joint as completed.
- L. Install soil and waste and vent piping at the following minimum slopes unless otherwise indicated:
 - 1. Building Sanitary Waste: 2 percent downward in direction of flow for piping NPS 3 and smaller; 2 percent downward in direction of flow for piping NPS 4 and larger.
 - 2. Horizontal Sanitary Waste Piping: 2 percent downward in direction of flow.
 - 3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- M. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

1. Install encasement on underground piping according to ASTM A 674 or AWWA C105/A 21.5.
- N. Install aboveground copper tubing according to CDA's "Copper Tube Handbook."
- O. Plumbing Specialties:
1. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers in sanitary waste gravity-flow piping.
 - a. Install cleanout fitting with closure plug inside the building in sanitary drainage force-main piping.
 - b. Comply with requirements for cleanouts specified in Section 221319 "Sanitary Waste Piping Specialties."
 2. Install drains in sanitary waste gravity-flow piping.
 - a. Comply with requirements for drains specified in Section 221319 "Sanitary Waste Piping Specialties."
- P. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
- Q. Install sleeves for piping penetrations of walls, ceilings, and floors.
1. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- R. Install sleeve seals for piping penetrations of concrete walls and slabs.
1. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."

3.3 JOINT CONSTRUCTION

- A. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
- B. Join hub-and-spigot, cast-iron soil piping with calked joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead-and-oakum calked joints.
- C. Join hubless, cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.
- D. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1.
 1. Cut threads full and clean using sharp dies.
 2. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

- a. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
- b. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- c. Do not use pipe sections that have cracked or open welds.

3.4 SPECIALTY PIPE FITTING INSTALLATION

A. Transition Couplings:

- 1. Install transition couplings at joints of piping with small differences in ODs.
- 2. In Waste Drainage Piping: Unshielded, nonpressure transition couplings.

B. Dielectric Fittings:

- 1. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
- 2. Dielectric Fittings for NPS 2 and Smaller: Use dielectric nipples.
- 3. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric nipples.

3.5 INSTALLATION OF HANGERS AND SUPPORTS

A. Comply with requirements for pipe hanger and support devices and installation specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

- 1. Install carbon-steel pipe hangers for horizontal piping in noncorrosive environments.
- 2. Install carbon-steel pipe support clamps for vertical piping in noncorrosive environments.
- 3. Vertical Piping: MSS Type 8 or Type 42, clamps.
- 4. Install individual, straight, horizontal piping runs:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.
- 5. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
- 6. Base of Vertical Piping: MSS Type 52, spring hangers.

B. Install hangers for soil piping, with maximum horizontal spacing and minimum rod diameters, to comply with MSS-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

C. Support horizontal piping and tubing within 12 inches of each fitting and coupling.

- D. Support vertical runs of soil piping to comply with MSS-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

3.6 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect waste and vent piping to the following:
 - 1. Plumbing Fixtures: Connect waste piping in sizes indicated, but not smaller than required by plumbing code.
 - 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
 - 3. Plumbing Specialties: Connect waste and vent piping in sizes indicated, but not smaller than required by plumbing code.
 - 4. Install test tees (wall cleanouts) in conductors near floor and floor cleanouts with cover flush with floor.
 - 5. Equipment: Connect waste piping as indicated.
 - a. Provide shutoff valve if indicated and union for each connection.
 - b. Use flanges instead of unions for connections NPS 2-1/2 and larger.
- D. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.
- E. Make connections according to the following unless otherwise indicated:
 - 1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
 - 2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.

3.7 IDENTIFICATION

- A. Identify exposed sanitary waste and vent piping.
- B. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.8 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.

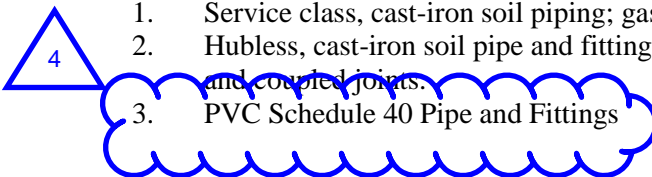
1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test sanitary waste and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired.
 - a. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 2. Leave uncovered and unconcealed new, altered, extended, or replaced waste and vent piping until it has been tested and approved.
 - a. Expose work that was covered or concealed before it was tested.
 3. Roughing-in Plumbing Test Procedure: Test waste and vent piping except outside leaders on completion of roughing-in.
 - a. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water.
 - b. From 15 minutes before inspection starts to completion of inspection, water level must not drop.
 - c. Inspect joints for leaks.
 4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight.
 - a. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg.
 - b. Use U-tube or manometer inserted in trap of water closet to measure this pressure.
 - c. Air pressure must remain constant without introducing additional air throughout period of inspection.
 - d. Inspect plumbing fixture connections for gas and water leaks.
 5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 6. Prepare reports for tests and required corrective action.

3.9 CLEANING AND PROTECTION

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect sanitary waste and vent piping during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.
- D. Exposed ABS Piping: Protect plumbing vents exposed to sunlight with two coats of water-based latex paint.
- E. Repair damage to adjacent materials caused by waste and vent piping installation.

3.10 PIPING SCHEDULE

- A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.
- B. Aboveground, soil and waste piping NPS 4 and smaller shall be any of the following:
 - 1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 - 2. Hubless, cast-iron soil pipe and fittings and hubless, single-stack aerator fittings; heavy-duty hubless-piping couplings; and coupled joints.
- C. Aboveground, vent piping NPS 4 and smaller shall be any of the following:
 - 1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 - 2. Hubless, cast-iron soil pipe and fittings; heavy-duty hubless-piping couplings; and coupled joints.
- D. Underground, soil, waste, and vent piping NPS 4 and smaller shall be any of the following:

- 1. Service class, cast-iron soil piping; gaskets; and gasketed joints.
 - 2. Hubless, cast-iron soil pipe and fittings; heavy-duty hubless-piping couplings; and coupled joints.
 - 3. PVC Schedule 40 Pipe and Fittings
- 

END OF SECTION 221316

SECTION 221413 - FACILITY STORM DRAINAGE PIPING

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. Hub-and-spigot, cast-iron soil pipe and fittings.
 - 2. Hubless, cast-iron soil pipe and fittings.
 - 3. Specialty pipe and fittings.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:
 - 1. Storm Drainage Piping: 10-foot head of water.

2.2 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. AB & I Foundry; a part of the McWane family of companies.
 - 2. Charlotte Pipe and Foundry Company.

3. NewAge Casting.
 4. Tyler Pipe; a part of McWane family of companies.
- B. Pipe and Fittings:
1. Marked with CISPI collective trademark and NSF certification mark.
 2. Class: ASTM A 74, Service class(es).
- C. Gaskets: ASTM C 564, rubber.
- D. Caulking Materials: ASTM B 29, pure lead and oakum or hemp fiber.

2.3 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. AB & I Foundry; a part of the McWane family of companies.
 2. Charlotte Pipe and Foundry Company.
 3. NewAge Casting.
 4. Tyler Pipe; a part of McWane family of companies.
- B. Pipe and Fittings:
1. Marked with CISPI collective trademark and NSF certification mark.
 2. Standard: ASTM A 888 or CISPI 301.
- C. CISPI, Hubless-Piping Couplings:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ANACO-Husky.
 - b. Charlotte Pipe and Foundry Company.
 - c. Dallas Specialty & Mfg. Co.
 - d. Fernco Inc.
 - e. Matco-Norca.
 - f. MIFAB, Inc.
 - g. Mission Rubber Company, LLC; a division of MCP Industries.
 - h. NewAge Casting.
 - i. .
 2. Couplings shall bear CISPI collective trademark.
 3. Standards: ASTM C 1277 and CISPI 310. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.
- D. Cast-Iron, Hubless-Piping Couplings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Charlotte Pipe and Foundry Company.
 - b. MG Piping Products Company.
2. Standard: ASTM C 1277.
3. Description: Two-piece ASTM A 48/A 48M, cast-iron housing; stainless-steel bolts and nuts; and ASTM C 564, rubber sleeve with integral, center pipe stop.
4. Mueller Industries, Inc.
5. National Pipe and Plastic, Inc.

4

2.4 PVC PIPE AND FITTINGS

- A. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping and "NSF-sewer" for plastic sewer piping.
- B. Solid-Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.
- C. Cellular-Core PVC Pipe: ASTM F 891, Schedule 40.
- D. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.
- E. Adhesive Primer: ASTM F 656.
- F. Solvent Cement: ASTM D 2564.

PART 3 - EXECUTION

3.1 EARTH MOVING

- A. Comply with requirements for excavating, trenching, and backfilling specified in Section 312000 "Earth Moving."

3.2 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems.
 1. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations.
 2. Install piping as indicated unless deviations from layout are approved on coordination drawings.

- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Install piping to allow application of insulation.
- J. Make changes in direction for piping using appropriate branches, bends, and long-sweep bends.
 - 1. Do not change direction of flow more than 90 degrees.
 - 2. Use proper size of standard increasers and reducers if pipes of different sizes are connected.
 - a. Reducing size of drainage piping in direction of flow is prohibited.
- K. Lay buried building piping beginning at low point of each system.
 - 1. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream.
 - 2. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
 - 3. Maintain swab in piping and pull past each joint as completed.
- L. Install piping at the following minimum slopes unless otherwise indicated:
 - 1. Building Storm Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 2 percent downward in direction of flow for piping NPS 4 and larger.
 - 2. Horizontal Storm Drainage Piping: 2 percent downward in direction of flow.
- M. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
 - 1. Install encasement on underground piping according to ASTM A 674 or AWWA C105/A 21.5.

- N. Install steel piping according to applicable plumbing code.
 - O. Install underground piping according to ASTM D 2321.
 - P. Install engineered siphonic drain specialties and storm drainage piping in locations indicated.
 - Q. Install underground, ductile-iron, force-main piping according to AWWA C600.
 - 1. Install buried piping inside building between wall and floor penetrations and connection to storm sewer piping outside building with restrained joints.
 - 2. Anchor pipe to wall or floor. Install thrust-block supports at vertical and horizontal offsets.
 - 3. Install encasement on piping according to ASTM A 674 or AWWA C105/A 21.5.
 - R. Plumbing Specialties:
 - 1. Install cleanouts at grade and extend to where building storm drains connect to building storm sewers in storm drainage gravity-flow piping.
 - a. Comply with requirements for cleanouts specified in Section 221423 "Storm Drainage Piping Specialties."
 - 2. Install drains in storm drainage gravity-flow piping.
 - a. Comply with requirements for drains specified in Section 221423 "Storm Drainage Piping Specialties."
 - S. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
 - T. Install sleeves for piping penetrations of walls, ceilings, and floors.
 - 1. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
 - U. Install sleeve seals for piping penetrations of concrete walls and slabs.
 - 1. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- 3.3 JOINT CONSTRUCTION
- A. Hub-and-Spigot, Cast-Iron Soil Piping Gasketed Joints: Join according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
 - B. Hub-and-Spigot, Cast-Iron Soil Piping Caulked Joints: Join according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead-and-oakum caulked joints.

- C. Hubless, Cast-Iron Soil Piping Coupled Joints:
 - 1. Join according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.
- D. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1.
 - 1. Cut threads full and clean using sharp dies.
 - 2. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - a. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - b. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
 - c. Do not use pipe sections that have cracked or open welds.

3.4 SPECIALTY PIPE FITTING INSTALLATION

- A. Transition Couplings:
 - 1. Install transition couplings at joints of piping with small differences in ODs.
 - 2. In Drainage Piping: Shielded, nonpressure transition couplings.
- B. Dielectric Fittings:
 - 1. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
 - 2. Dielectric Fittings for NPS 2 and Smaller: Use dielectric nipples.
 - 3. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric nipples.

3.5 INSTALLATION OF HANGERS AND SUPPORTS

- A. Comply with requirements for hangers, supports, and anchor devices specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
 - 1. Install carbon-steel pipe hangers for horizontal piping in noncorrosive environments.
 - 2. Install carbon-steel pipe support clamps for vertical piping in noncorrosive environments.
 - 3. Vertical Piping: MSS Type 8 or Type 42, clamps.
 - 4. Install individual, straight, horizontal piping runs:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.

5. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 6. Base of Vertical Piping: MSS Type 52, spring hangers.
- B. Install hangers for cast-iron piping, with maximum horizontal spacing and minimum rod diameters, to comply with MSS-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.
 - C. Support horizontal piping and tubing within 12 inches of each fitting and coupling.
 - D. Support vertical cast-iron to comply with MSS-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent, but as a minimum at base and at each floor.

3.6 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect interior storm drainage piping to exterior storm drainage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect storm drainage piping to roof drains and storm drainage specialties.
 1. Install test tees (wall cleanouts) in conductors near floor, and floor cleanouts with cover flush with floor.
- D. Where installing piping adjacent to equipment, allow space for service and maintenance.
- E. Make connections according to the following unless otherwise indicated:
 1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
 2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.

3.7 IDENTIFICATION

- A. Identify exposed storm drainage piping.
- B. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.8 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.

1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in.
 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Test storm drainage piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired.
 - a. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 2. Leave uncovered and unconcealed new, altered, extended, or replaced storm drainage piping until it has been tested and approved.
 - a. Expose work that was covered or concealed before it was tested.
 3. Test Procedure:
 - a. Test storm drainage piping on completion of roughing-in.
 - b. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts until completion of inspection, water level must not drop. Inspect joints for leaks.
 4. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 5. Prepare reports for tests and required corrective action.
- C. Piping will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.9 CLEANING AND PROTECTION

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.10 PIPING SCHEDULE

- A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.

- B. Aboveground storm drainage piping NPS 6 and smaller shall be any of the following:
 - 1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 - 2. Hubless, cast-iron soil pipe and fittings; CISPI, hubless-piping couplings; and coupled joints.

- C. Underground storm drainage piping NPS 6 and smaller shall be any of the following:
 - 1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 - 2. Hubless, cast-iron soil pipe and fittings; CISPI, hubless-piping couplings; and coupled joints.
 - 3. PVC Schedule 40 Pipe and Fittings

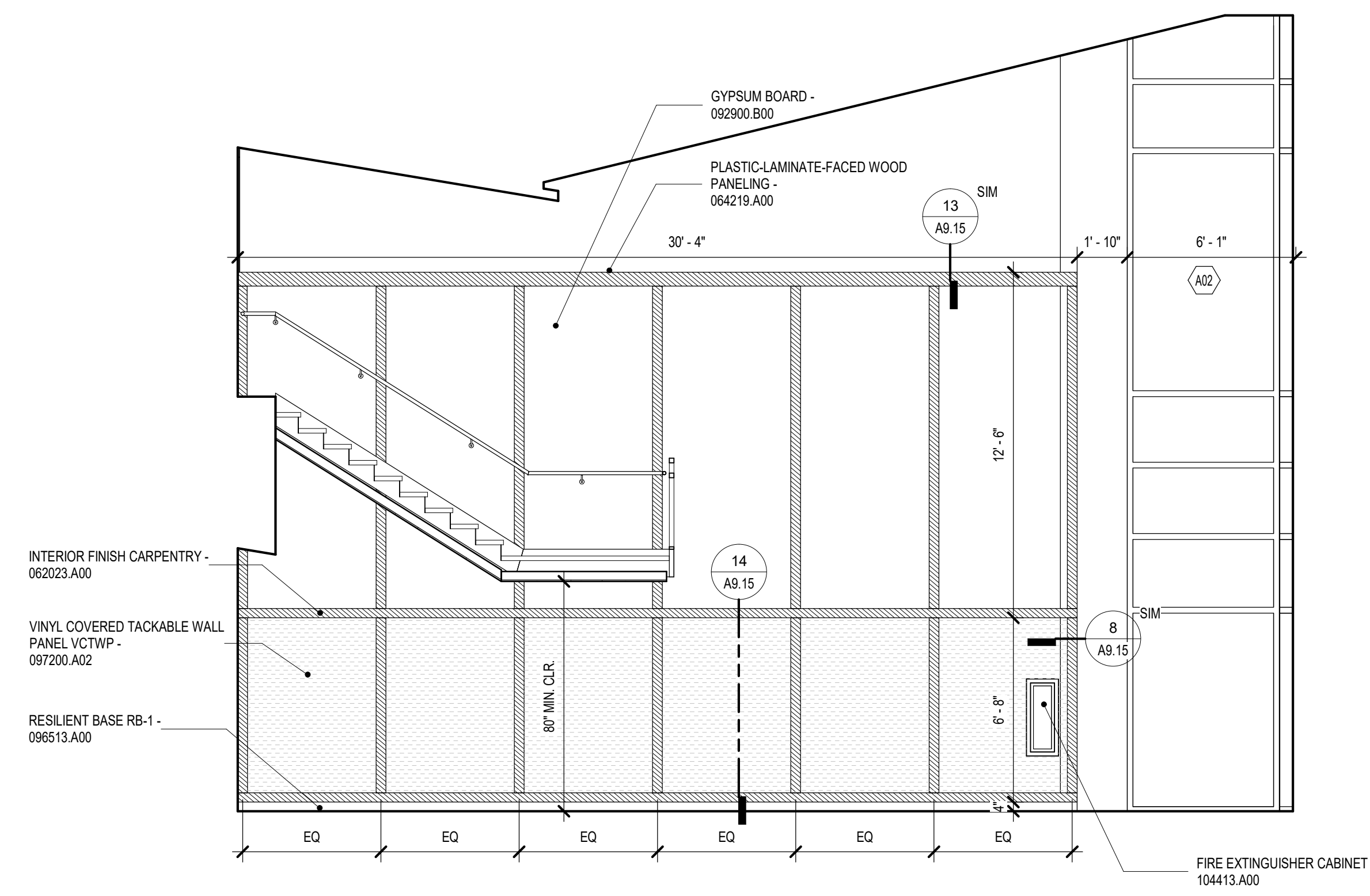
END OF SECTION 221413



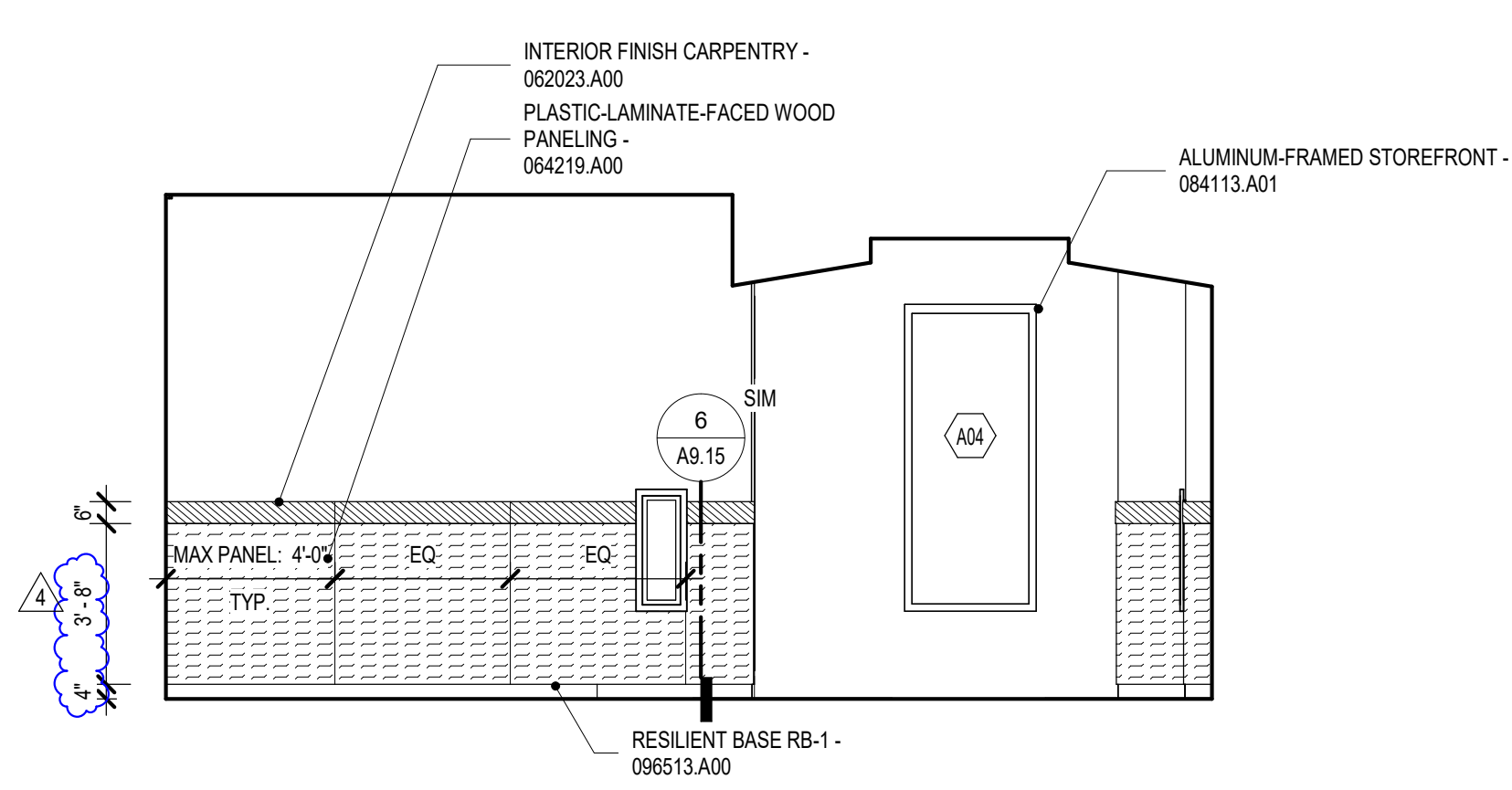
MURRIETA VALLEY USD
MURRIETA MESA HIGH SCHOOL
NEW CLASSROOM BUILDING

KEYNOTES

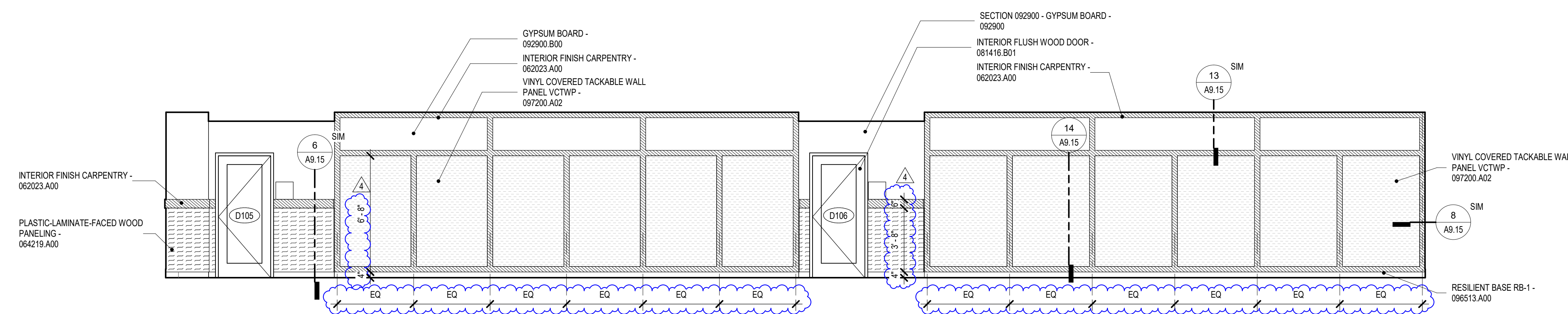
062023.A00	INTERIOR FINISH CARPENTRY
064116.A03	ADJUSTABLE SHELVES
064219.A00	PLASTIC-LAMINATE-FACED WOOD PANELING
081416.B01	INTERIOR FLUSH WOOD DOOR
084113.A01	ALUMINUM-FRAMED STOREFRONT
092900	SECTION 092900 - GYPSUM BOARD
092900.B00	GYPSUM BOARD
096513.A00	RESILIENT BASE RB-1
097200.A02	VINYL COVERED TACKABLE WALL PANEL VCTWP
101419.A01	CAST DIMENSIONAL CHARACTER
104413.A00	FIRE EXTINGUISHER CABINET
123001.A00	DISPLAY CASE



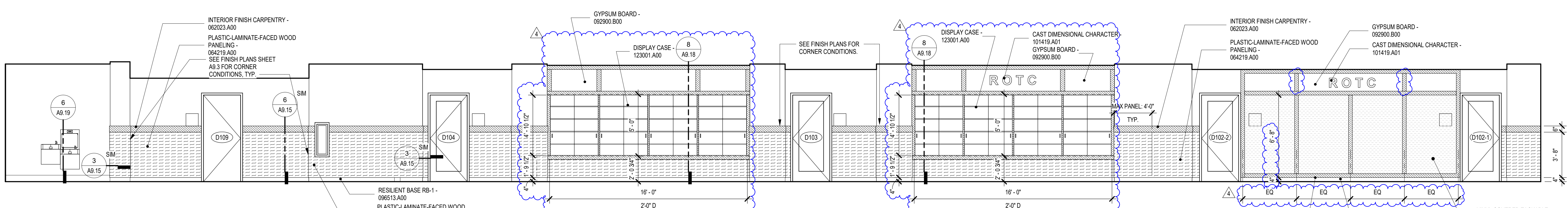
1A CORRIDOR (D100), MAIN ENTRY - INTERIOR ELEVATION 1A
A2.1 1/4" = 1'-0"



1C CORRIDOR (D100) - INTERIOR ELEVATION 1C
A2.1 1/4" = 1'-0"



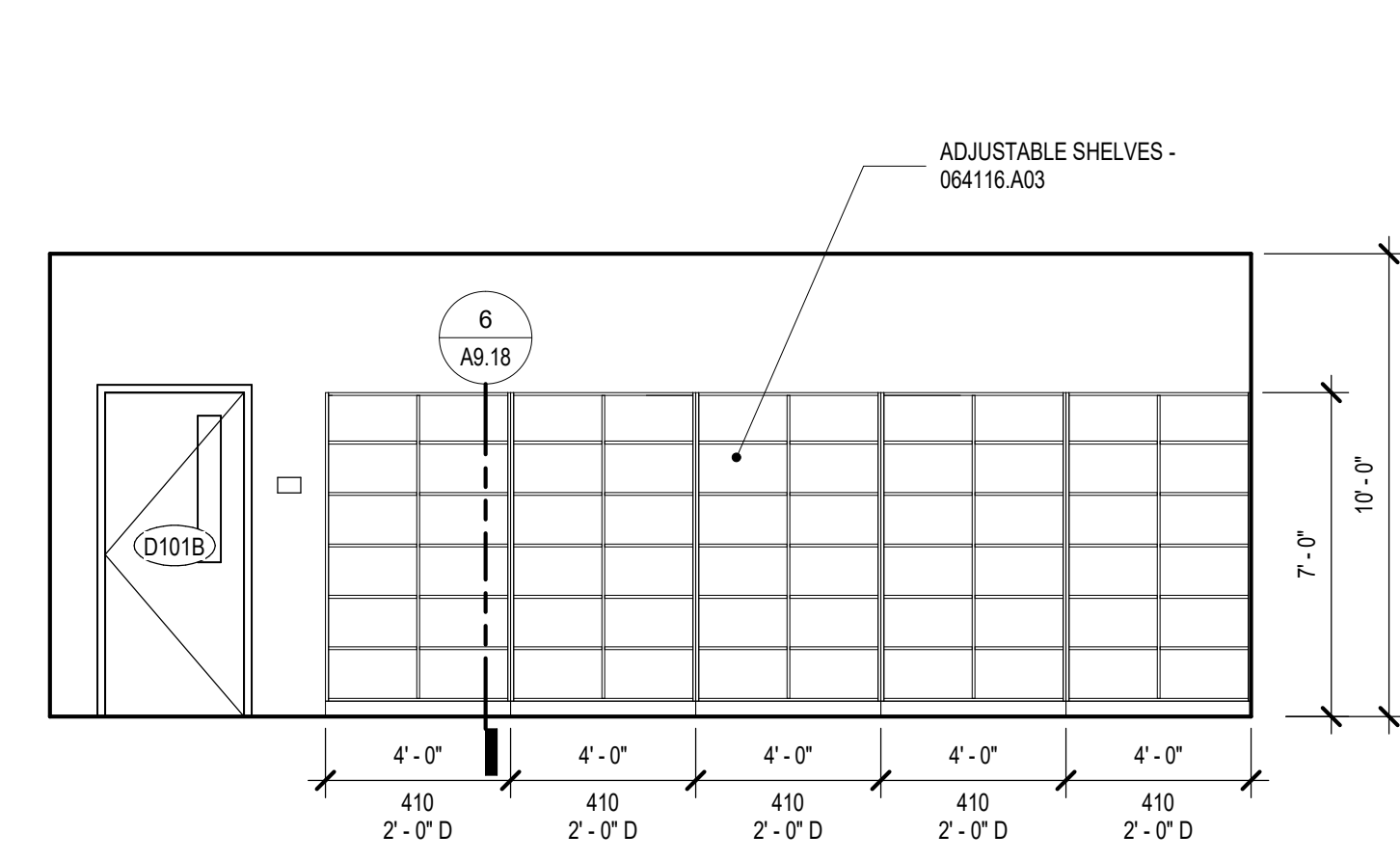
1B CORRIDOR (D100) - INTERIOR ELEVATION 1B
A2.1 1/4" = 1'-0"



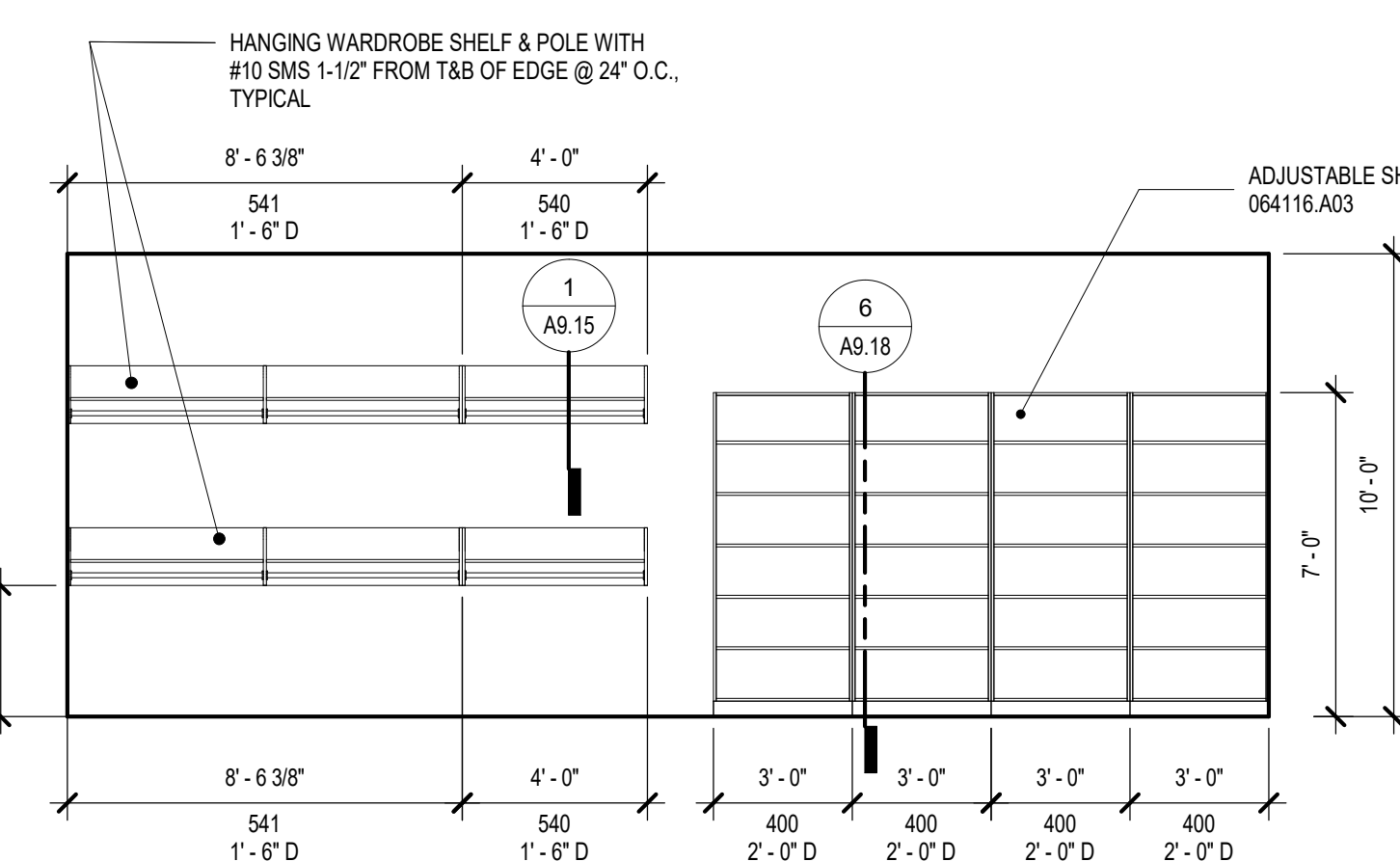
1D CORRIDOR (D100) - INTERIOR ELEVATION 1D
A2.1 1/4" = 1'-0"

LEGEND

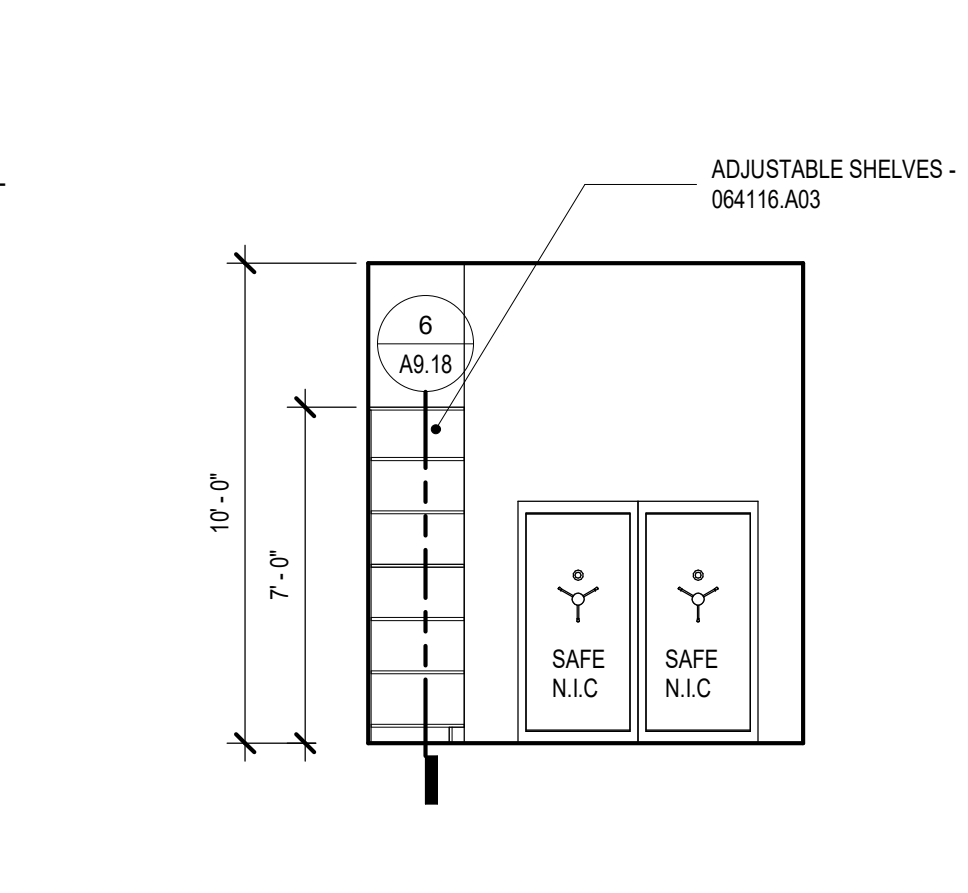
	VINYL COVERED TACKABLE WALL PANEL - 097200
	WOOD TRIM 3/4" THICK x 6" WIDE - 062023
	PLASTIC LAMINATE WALL PANELING - 064219



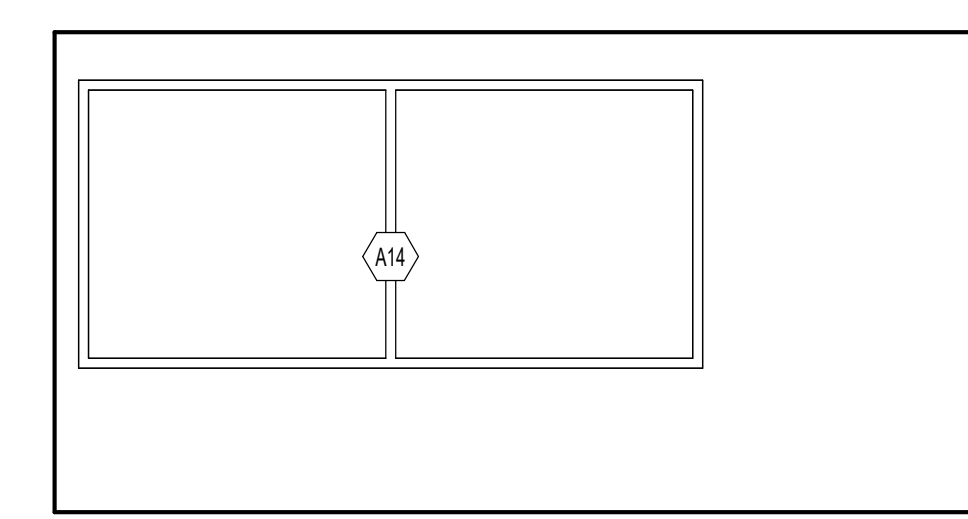
3C ROOM D101B - STORAGE - INT. ELE. 3C
A2.1 1/4" = 1'-0"



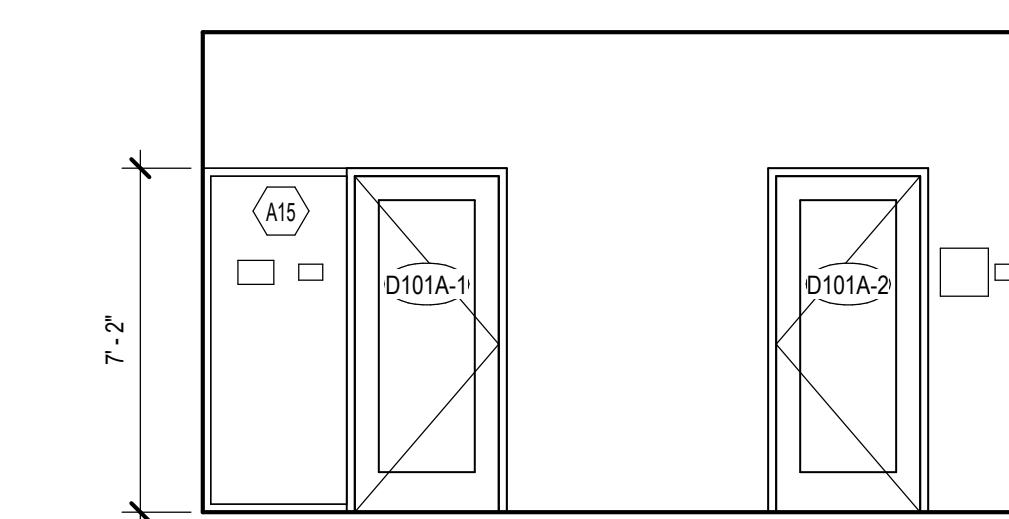
3B ROOM D101B - STORAGE - INT. ELE. 3B
A2.1 1/4" = 1'-0"



3A ROOM D101B - STORAGE - INT. ELE. 3A
A2.1 1/4" = 1'-0"



2B ROOM D101A - OFFICES - INT. ELE. 2B
A2.1 1/4" = 1'-0"



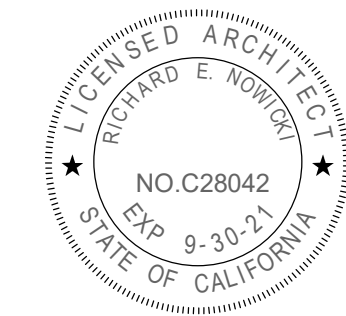
2A ROOM D101A - OFFICES - INT. ELE. 2A
A2.1 1/4" = 1'-0"



INTERIOR ELEVATIONS

NO. 4	DATE 1/31/2020	ISSUE Revision 4	PROJECT NO. 17028-00	DATE: 11/12/2019
-------	----------------	------------------	----------------------	------------------

BIM 360://17028-00 MMHS Classroom Bldg.ARCH-BNDS-MMHS-NCB.rvt 2/4/2020 3:06:22 PM



MURRIETA VALLEY USD
MURRIETA MESA HIGH SCHOOL
NEW CLASSROOM BUILDING

FINISH SCHEDULE

NO.	ROOM NAME	SCHEDULE-FINISHES											REMARKS
		FLOOR		WALLS				WAINSCOT		CEILING	BLINDS		
		FIN.	BASE	NORTH FIN.	EAST FIN.	SOUTH FIN.	WEST FIN.	FIN.	HEIGHT	MATERIAL/ FINISH	BLINDS INT WIN	BLINDS WIN EXT	
D100A	ENTRANCE LOBBY	RF-2	N/A	PF-3	PF-3	PF-3	PF-3	N/A	N/A	GB/PF-3		No	13
D100B	CORRIDOR	RF-2, RF-3	RB-1	PLWP/PF-3	PLWP/PF-3	PLWP/PF-3	PLWP/PF-3	N/A	5'-0"	GB/PF-3, ACP-1			2
D101A	OFFICE	CPT-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1		Yes	
D101B	STORAGE	RF-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1	No	No	
D101C	SECURE STORAGE	RF-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1	No	No	
D101E	CORRIDOR FOYER	RF-2, RF-3	RB-1	PLWP/PF-3	PLWP/PF-3	PLWP/PF-3	PLWP/PF-3	PLWP	5'-0"	ACP-1			13
D102	ROTC CLASSROOM	CPT-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1		Yes	
D102A	GIRLS DRESSING	RF-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1	No	No	
D102B	BOYS DRESSING	RF-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1	No	No	
D103	CLASSROOM	CPT-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1	No	Yes	
D104	CLASSROOM	CPT-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1	No	Yes	
D105	CLASSROOM	CPT-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1	No	Yes	
D106	CLASSROOM	CPT-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1	No	Yes	
D107	JANITOR	CS-1	RB-1	PF-4	PF-4	PF-4	PF-4	N/A	N/A	EXP	No	No	4
D108	WOMEN	CT-2	CTB-2	CT-3/PF-4	CT-3/PF-4	CT-3/PF-4	CT-3	6'-6"	6'-6"	GB/PF-4			
D109	ELECTRICAL	CS-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	EXP			
D110	MEN	CT-2	CTB-2	CT-3/PF-4	CT-3/PF-4	CT-3/PF-4	CT-3	6'-6"	6'-6"	GB/PF-4			
D111	STAFF RR	CT-2	CTB-2	CT-3/PF-4	CT-3/PF-4	CT-3/PF-4	CT-3	6'-6"	6'-6"	GB/PF-4			
D112	FIRE RISER	CS-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXP			
D200	CORRIDOR	RF-2, RF-3	RB-1	PLWP/PF-3	PLWP/PF-3	PLWP/PF-3	PLWP	5'-0"	5'-0"	GB/PF-3, ACP-1			2,13
D200A	BRIDGE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
D201	CLASSROOM	CPT-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1	No	Yes	
D202	CLASSROOM	CPT-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1	No	Yes	
D203	CLASSROOM	CPT-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1	No	Yes	
D204	CLASSROOM	CPT-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1	No	Yes	
D205	CLASSROOM	CPT-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1	No	Yes	
D206	CLASSROOM	CPT-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	ACP-1	No	Yes	
D207	JANITOR	CS-1	RB-1	PF-4	PF-4	PF-4	PF-4	N/A	N/A	EXP	No	No	
D208	WOMEN	CT-2	CTB-2	CT-3/PF-4	CT-3/PF-4	CT-3/PF-4	CT-3	6'-0"	6'-0"	GB/PF-4			
D209	IDF	RF-1	RB-1	PF-3	PF-3	PF-3	PF-3	N/A	N/A	EXP			
D210	MEN	CT-2	CTB-2	CT-3/PF-4	CT-3/PF-4	CT-3/PF-4	CT-3	6'-0"	6'-0"	GB/PF-4			
D211	STAFF RR	CT-2	CTB-2	CT-3/PF-4	CT-3/PF-4	CT-3/PF-4	CT-3	6'-0"	6'-0"	GB/PF-4		No	

NO.	SCHEDULE-DOOR											REMARKS			
	DOOR				FRAME			OPENING		DETAILS			PANIC HDW	Hardware Group	
	WIDTH	HEIGHT	TYPE	MAT.	FIN.	GLASS	TYPE	MAT.	FIN.	HEAD	JAMB				THRESH
D100A	6'-0"	7'-0"	L	ALUM	FF	GL-1	3	ALUM	FF		9/A9.6	9/A9.6	12/A9.6	Yes	1
D100B	6'-0"	7'-0"	L	ALUM	FF	GL-1	3	ALUM	FF		9/A9.6	9/A9.6	12/A9.6	Yes	1
D101A.1	3'-0"	7'-0"	F	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	3
D101A.2	3'-0"	7'-0"	F	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	3
D101B	3'-0"	7'-0"	C	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	6
D102-1	3'-0"	7'-0"	F	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	Yes	9 14
D102-2	3'-0"	7'-0"	F	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	Yes	9 14
D102A	3'-0"	7'-0"	A	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	4
D102B	3'-0"	7'-0"	A	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	4
D103	3'-0"	7'-0"	F	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	9 14
D104	3'-0"	7'-0"	F	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	9 14
D105	3'-0"	7'-0"	F	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	9 14
D106	3'-0"	7'-0"	F	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	9 14
D107	3'-0"	7'-0"	A	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	8 3
D108	3'-0"	7'-0"	A	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	11
D109	3'-0"	7'-0"	A	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	7
D110	3'-0"	7'-0"	A	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	11 3
D111	3'-0"	7'-0"	A	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	10
D112	3'-0"	7'-0"	A	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	2
D200	6'-0"	7'-0"	L	ALUM	FF	GL-1	3	ALUM	FF		9/A9.6	9/A9.6	12/A9.6	Yes	1
D201	3'-0"	7'-0"	F	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	9 14.8
D202	3'-0"	7'-0"	F	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	9 14
D203	3'-0"	7'-0"	F	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	9 14
D204	3'-0"	7'-0"	F	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	9 14
D205	3'-0"	7'-0"	F	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	9 14
D206	3'-0"	7'-0"	F	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	9 14
D207	3'-0"	7'-0"	A	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	8 3
D208	3'-0"	7'-0"	A	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	11 3
D209	3'-0"	7'-0"	B	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	7
D210	3'-0"	7'-0"	A	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	11 3
D211	3'-0"	7'-0"	A	WD	FF	GL-4	1	HM	PF-1		1/A9.6	2/A9.6	3/A9.6	No	10

FINISH SCHEDULE NOTES

ACP-1 2X2 ACOUSTICAL CEILING PANEL - 095113

CPT-1 CARPET - 066816 (FIELD)

CS-1 SEALED CONCRETE (CLEAR) - 033000

CT-2 FLOOR TILE - 6"X6" - INT. FLOOR - 080000

CT-3 WALL TILE - 6"X6" - INT. WALL - 093000

EXP EXPOSED STRUCTURE

GB GYP BOARD, 5/8" - 092900

PC-1 POLISHED CONCRETE - 033510 (COLOR 1-NATURAL GREY)

PF-1 PAINT, SEMI-GLOSS, PRIMED STEEL INTERIOR - 099123

PF-3 PAINT, EGGSHELL, GYP/PLUM BOARD SURFACES - 099123

PF-4 PAINT, SEMI-GLOSS, GYP/PLUM BOARD SURFACES - 099123

PFX-1 PAINT, ACRYLIC, SEMI-GLOSS, STEEL DOOR, FRAMES- EXTERIOR - 099113

PLWFP PLASTIC LAMINATE FACED WOOD PANELING - 064219

INTR INTERIOR TRIM - 062023

PRFN PREFINISHED

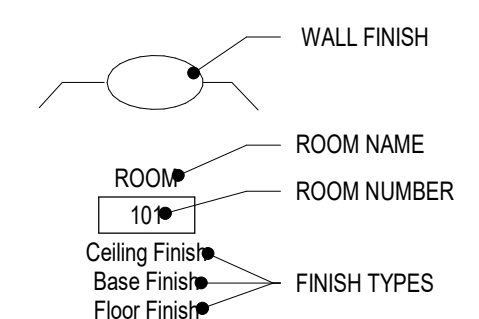
RB-1 4" RESILIENT BASE - COVERED - 095513

RF-1 RESILIENT FLOORING - 095516

RF-2 RESILIENT FLOORING

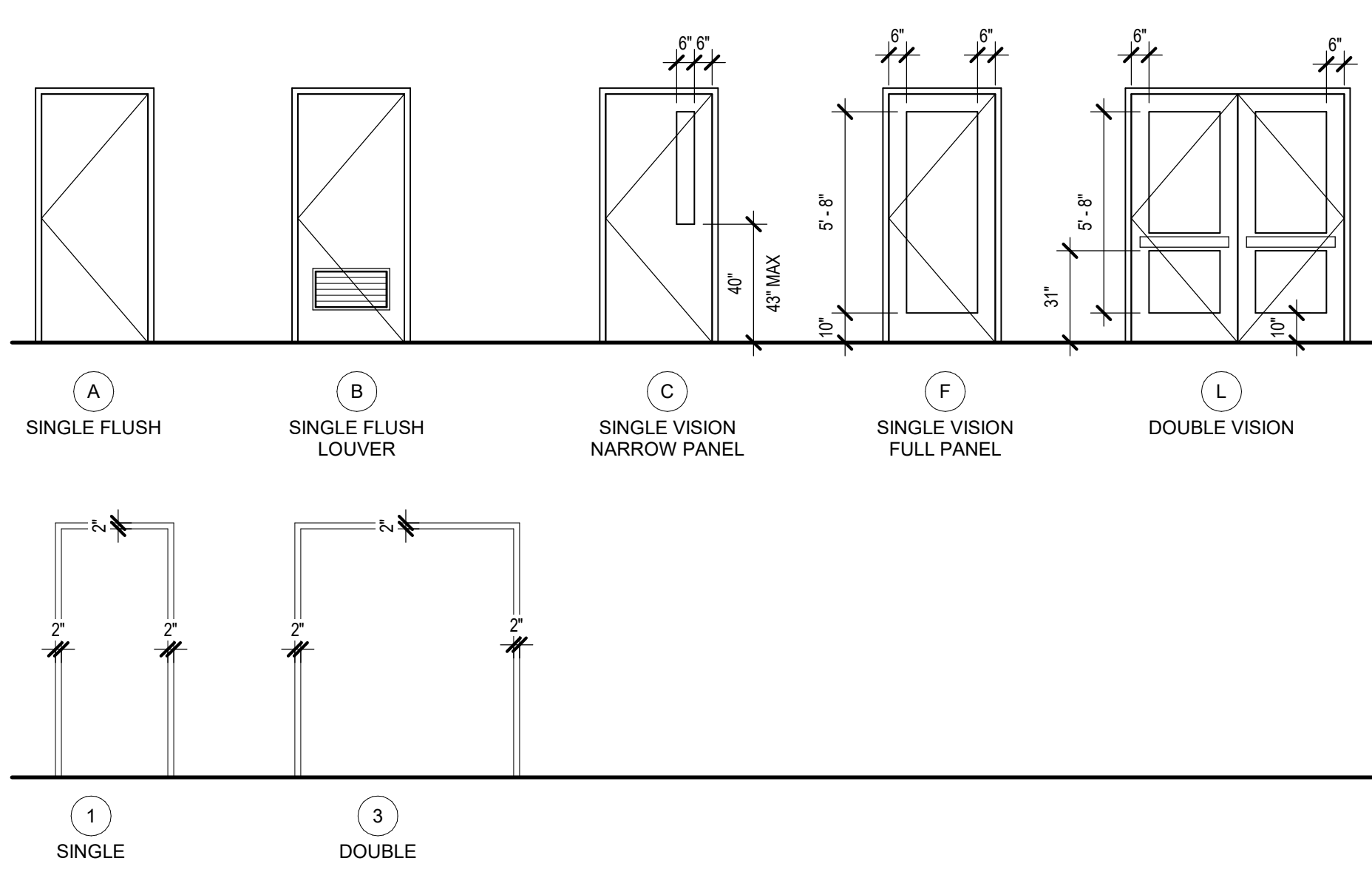
RF-3 RESILIENT FLOORING

VCTWP VINYL COVERED TACKABLE WALL PANEL - 097200



- FINISH REMARKS
- SEE INTERIOR ELEVATION FOR ADDITIONAL INFORMATION.
 - SEE FLOOR PLAN FOR PATTERN, LAYOUT AND LOCATION OF FLOOR FINISHES.
 - PAINT ALL EXPOSED STRUCTURAL STEEL, METAL DECK, DUCTWORK & ELECTRICAL COMPONENTS.
 - CERAMIC TILE WAINSCOT (CT-1) AT MOP SINK ONLY, 4" HEIGHT x WIDTH & LENGTH OF SINK.
 - PAINT FLAT BLACK ABOVE CLOUDS
 - SLOPE SLAB TO DRAIN PER PLAN
 - 2" SLAB DEPRESSION, REFER TO 12 FOR CERAMIC TILE ASSEMBLY & UNCOUPLING MEMBRANE 093000 A8.15
 - 2 1/2" SLAB DEPRESSION
 - 7 1/2" SLAB DEPRESSION
 - STAIRS CARPETED
 - EXTERIOR STAIR FINISH PER ENLARGED SITE PLAN
 - MOTORIZED BLINDS
 - APPLY INTUMESCENT COATING TO EXPOSED STRUCTURE

- GENERAL NOTES
- ALL FINISHES SHALL COMPLY WITH C.B.C. CHAPTER 8, AND WITH TITLE 19 C.C.R. & 2010 C.F.C. CHAPTER 8
 - PAINT ALL EXPOSED STRUCTURAL STEEL, METAL DECK, DUCTWORK & ELECTRICAL COMPONENTS AT INTERIOR
 - WHERE WALL CERAMIC TILE OCCURS- USE 1/2" BACKER BOARD
 - SEE DETAIL A8.6 FOR TRANSITION BETWEEN FLOOR MATERIALS
 - ALL BLINDS MANUAL U.N.O
 - SEE I.D. SHEETS FOR FLOOR FINISH PLANS
 - ALL FLOORING SHALL HAVE A COEFFICIENT OF FRICTION GREATER THAN 0.6, PER ASTM C1028.



SCHEDULE NOTES

GLASS TYPES

GL-1 INSULATED UNIT, TINTED, TEMPERED - 088000

GL-4 1/4" SINGLE VISION, CLEAR, TEMPERED - 088000

GL-5 SPANDREL, TEMPERED - 088000

MATERIALS

ALUM ALUMINUM

HM HOLLOW METAL

WD WOOD

STL STEEL

FF FACTORY FINISH

WINDOW FRAME TYPES

SF-1 ALUMINUM STOREFRONT - CENTER GLAZING - 084113

CW-1 ALUMINUM CURTAIN WALL - 6" DEEP - 084113

- DOOR SCHEDULE REMARKS
- NOT USED
 - 90 DEGREE INHIBITOR/ DOOR STOP
 - 3/4" UNDERCUT
 - MAGNETIC HOLD OPEN
 - DOOR BY FOLDING PARTITION MANUFACTURER
 - STC - 40 SOUND CONTROL DOOR - 083473
 - STC - 35 SOUND CONTROL DOOR - 083473
 - DOORS TO BE LOCKABLE FROM THE INSIDER PER CBC 1010.1.11

- WINDOW GENERAL NOTES
- WINDOWS AND INTEGRATED ALUMINUM-FRAMED SUNSHADES ARE SUBJECT TO DEFERRED APPROVAL.
 - DIMENSIONS TO EDGE MULLIONS ARE TO FACE OF FRAME.
 - FOR TYPICAL EXTERIOR WINDOW FLASHING DETAIL, SEE 1/A07
 - REFERENCE WINDOW TYPES FOR DOOR / WINDOW FRAME COMBINATIONS
 - WHEN WINDOW TYPES ARE IMMEDIATELY ADJACENT ONLY ONE VERTICAL MULLION OCCURS, REFERENCE PLANS AND ELEVATIONS, AND WINDOW DETAILS.
 - REFERENCE FINISH SCHEDULES FOR WINDOW SHADE LOCATIONS
 - INSTALL WINDOW SHADES PER TYPICAL DETAILS
 - PROVIDE DRIP EDGE AT EXTERIOR ALUMINUM DOOR HEADS, BY DOOR MANUFACTURER, FINISH TO MATCH.
 - ALL CLASSROOM DOORS STC - 31 - 081416
 - FOR DOOR HARDWARE TYPES, REFER TO SPEC SECTION 087100.
 - PROVIDE BACKING PER 1/A8.15 AT ALL WALL MOUNTED DOOR STOPS.



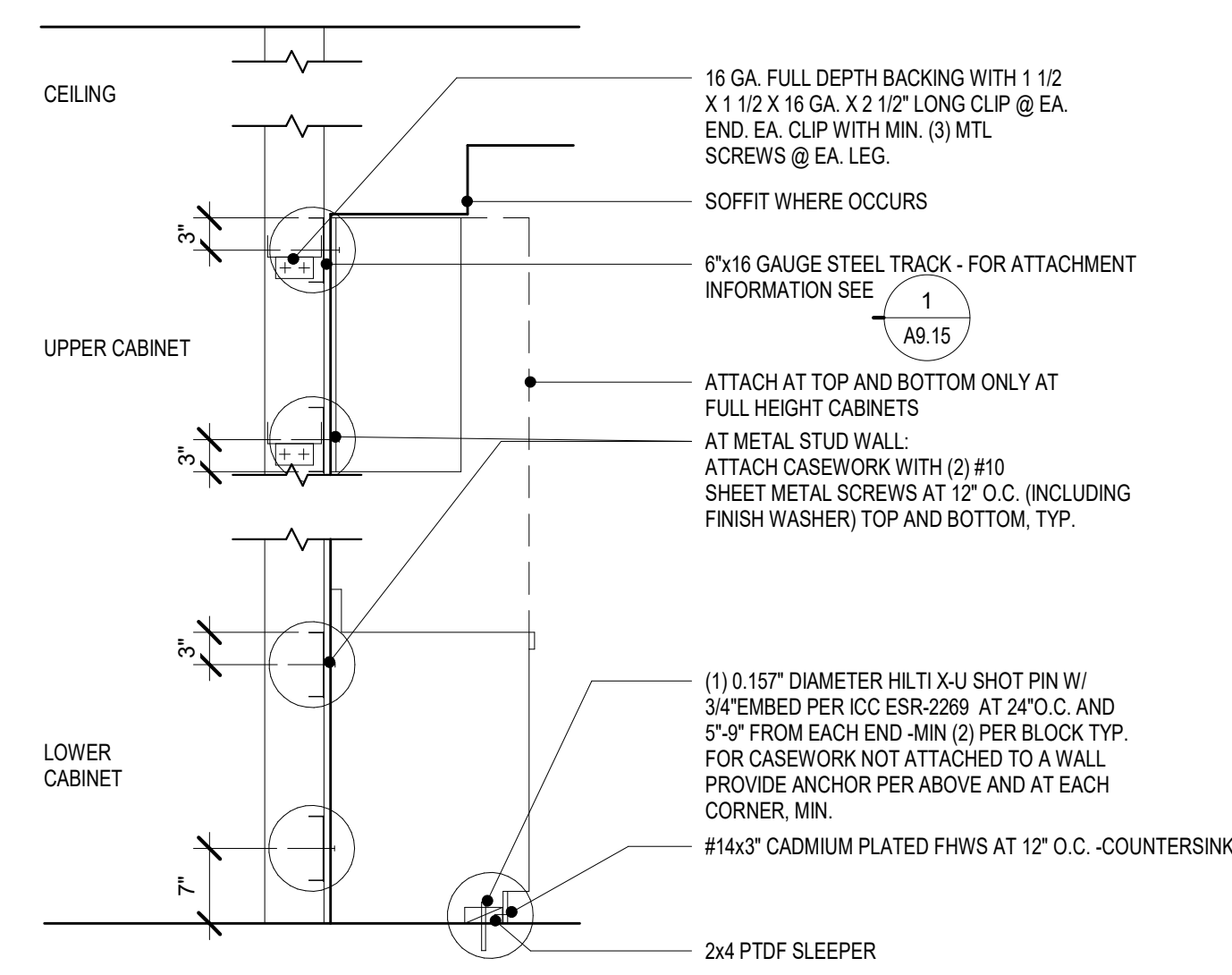
DOOR AND FINISH SCHEDULE

NO. DATE ISSUE PROJECT NO: 17028-00 DATE: 11/12/2019

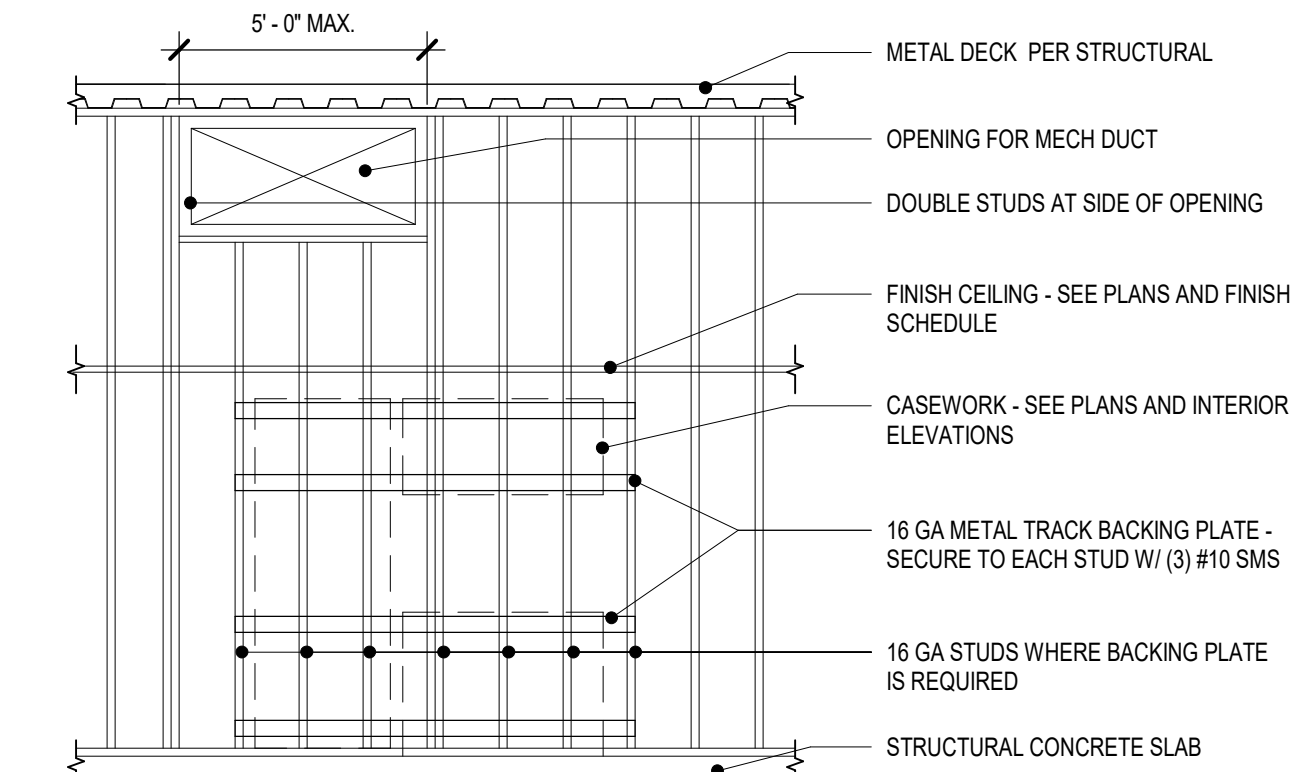
DRAWING A8.1 AD4-A12



MURRIETA VALLEY USD
MURRIETA MESA HIGH SCHOOL
NEW CLASSROOM BUILDING

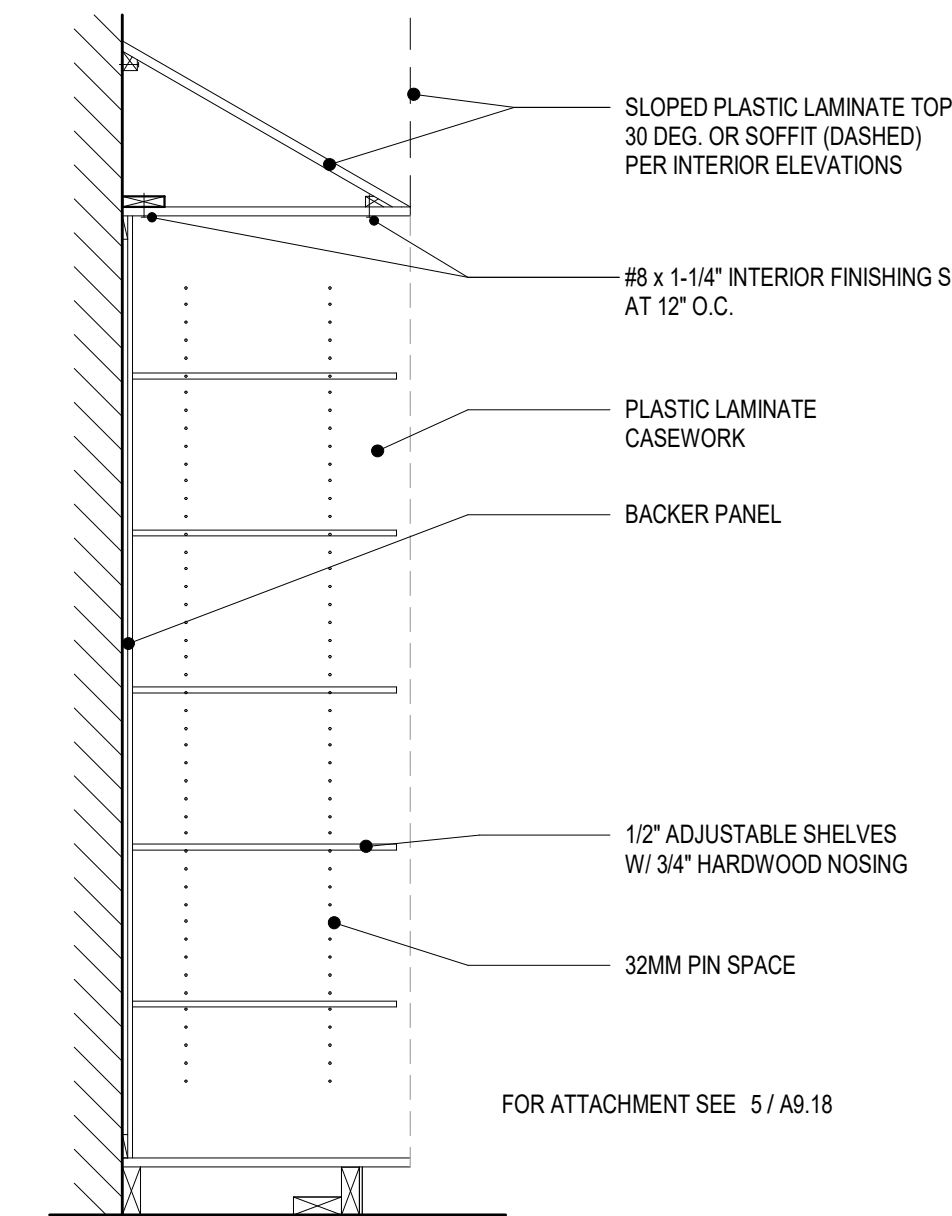


5 MILL - ANCHORAGE
3/4" = 1'-0"

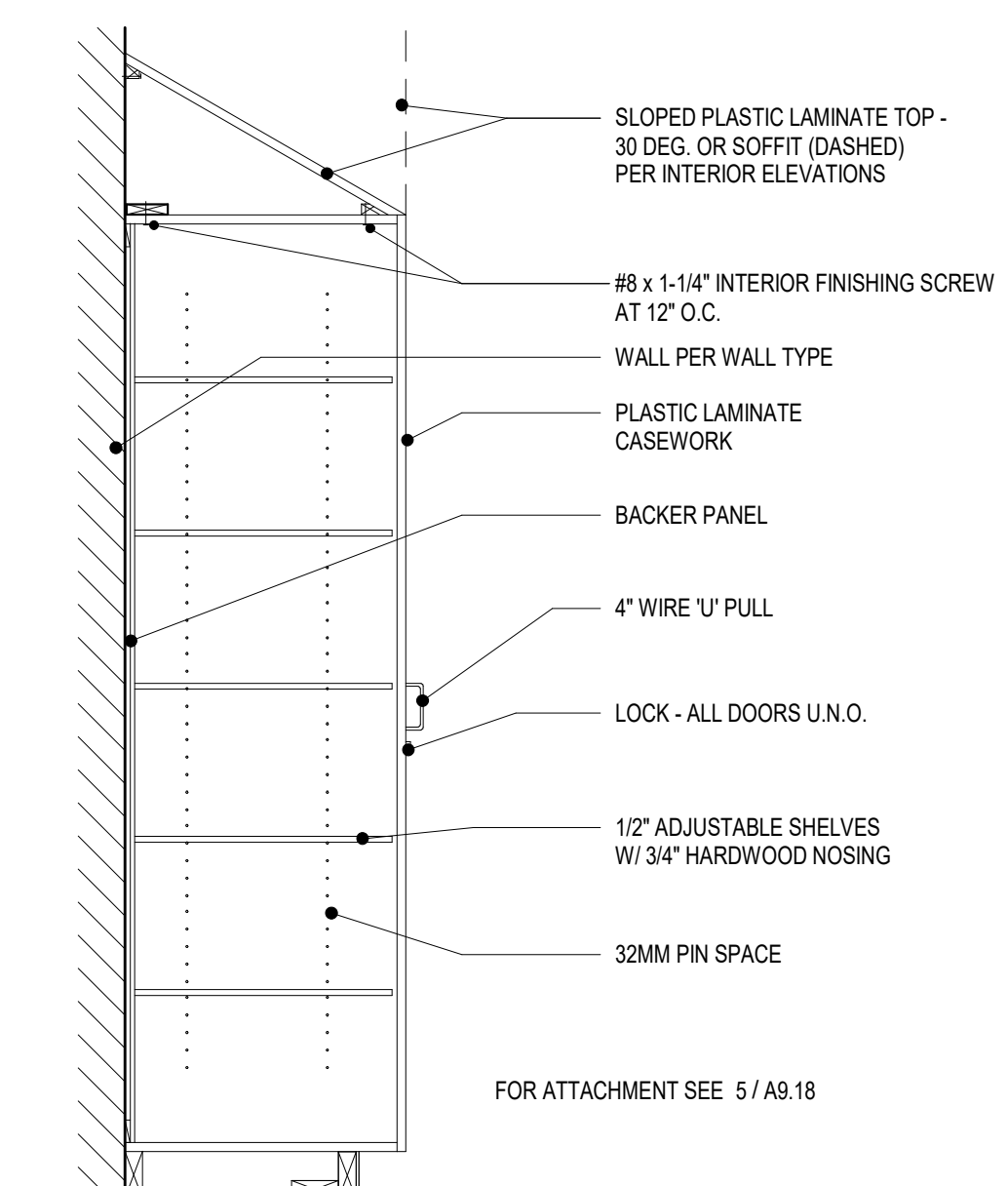


1 TYP. WALL FRAMING / BACKING
1/4" = 1'-0"

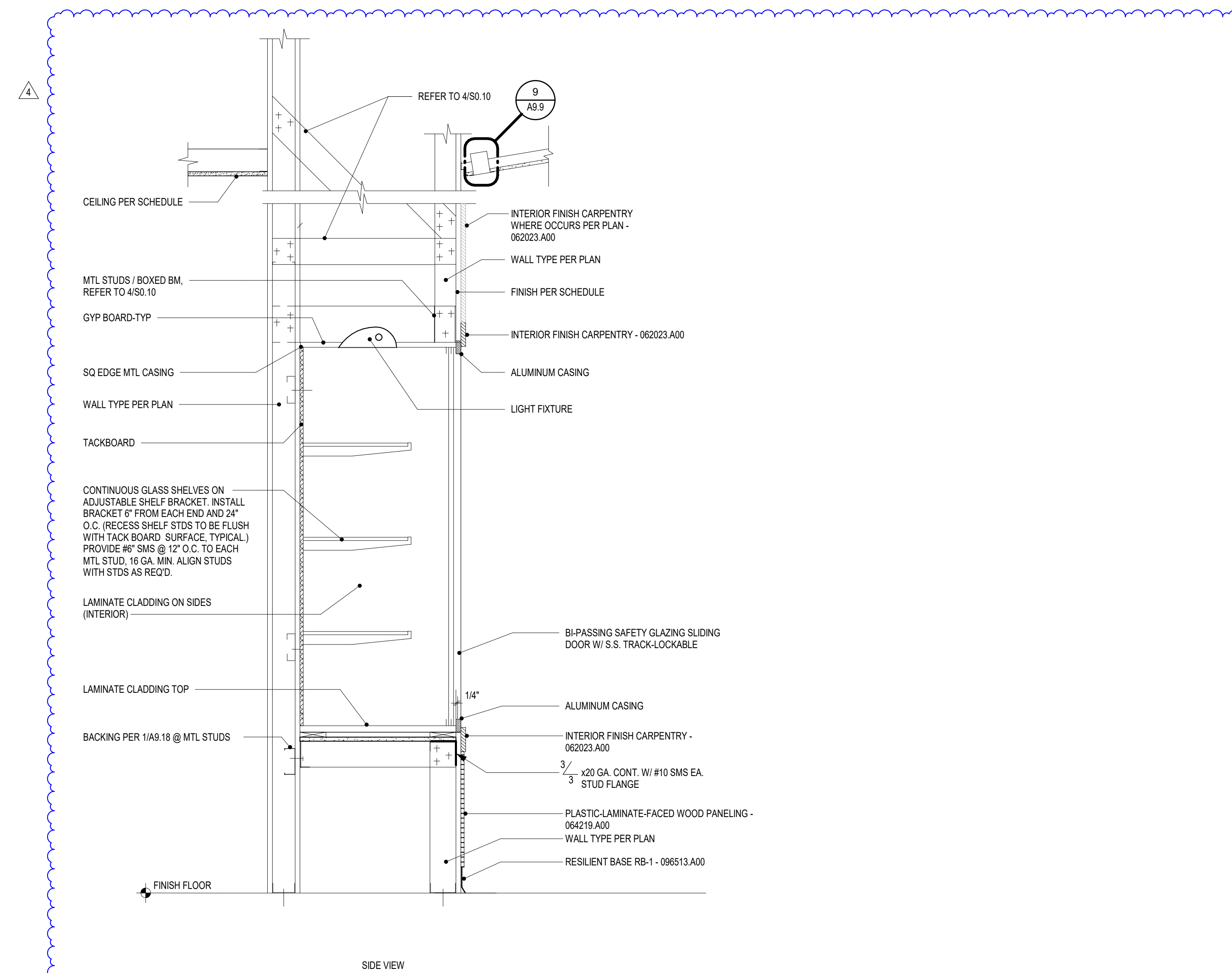
- CASEWORK WALL ELEVATION & FOR TYPICAL WALL FRAMING INFORMATION
1. SEE DETAILS
 2. USE BACKING PLATE FOR WALL-HUNG CABINETS (UP TO 2 SHELVES), BASE CABINETS, FULL HEIGHT CABINETS, AND LOCKERS.
 3. USE #10 SELF-TAPPING SHEET METAL SCREWS TO ATTACH ITEMS TO BACKING PLATES.
 4. WALL STUD FLANGES MUST BE CONTINUOUS.
 5. ANCHOR BACKING PLATES TO (3) STUDS MINIMUM AND TO (1) STUD BEYOND ITEM. SEE DETAIL 1 / A8.15



6 MILL - FULL HEIGHT CABINET W/ NO DOOR
A7.1 3/4" = 1'-0"



2 MILL - FULL HEIGHT CABINET
A7.2 3/4" = 1'-0"



8 MILL - DISPLAY CASE (WITH LIGHTING)
A7.1 1" = 1'-0"

MILLWORK DETAILS

Murrieta Mesa High School New Classroom Building

BID PACKAGE: 12

Low Voltage, Communications

SCOPE OF WORK SUMMARY:

The scope of work includes, but is not necessarily limited to, furnishing all labor, materials, accessories, appliances, tools, equipment, facilities, transportation, applicable taxes and services necessary for, and incidental to, performing all operations in connection with the specification sections listed below, complete as indicated on the drawings and specifications or incidental to the requirements of this Bid Package Contractor and/or specified herein, unless specifically excluded.

The Following are the Project Contract Documents and are primary to this Bid Package:

- Bid Packages (All Bid packages on project)
 - Bid Package #01 – Concrete, Site General
 - Bid Package #02 – Steel
 - Bid Package #03 – Casework, Finish Carpentry
 - Bid Package #04 – Roofing, Sheetmetal
 - Bid Package #05 – Doors, Frames, Hardware
 - Bid Package #06 – Lath, Plaster, Drywall
 - Bid Package #07 – Flooring, Ceramic Tile
 - Bid Package #08 – Paint, Wall Covering
 - Bid Package #09 – Windows and Storefront
 - Bid Package #10 – Specialties, Building General
 - Bid Package #11 – Fire Sprinkler
 - Bid Package #12 – Low Voltage, Communications
 - Bid Package #13 – Electrical
 - Bid Package #14 – Plumbing
 - Bid Package #15 – HVAC
 - Bid Package #16 – Fire Alarm, Security
- Plans – Murrieta Mesa High School New Classroom Building – November 12, 2019
- Project Manual - Murrieta Mesa High School New Classroom Building – January 6, 2020
- Site Logistics and Fencing Map (Created by EHCC)
- Subsurface Survey – (as included in the Special Conditions)
- Preliminary Project Schedule (as included in the Special Conditions)
- DSA – TI 103 – Testing and Inspection Requirements (if applicable)
- Construction Manager Supplemental Specifications
 - 001000 General Requirements (for All Bid Packages)
 - 004600 Post Bid Interview (for All Bid Packages)
 - 012100 Allowances
 - 017301 Final Clean

- Specifications – Murrieta Mesa High School New Classroom Building – November 12, 2019

Division 01 – General Requirements

011100	Summary
012500	Substitution Procedures
012600	Contract Modification Procedures
012900	Payment Procedures
013100	Project Management and Coordination
013233	Photographic Documentation
013300	Submittal Procedures
014000	Quality Requirements
014200	References
014529	Testing Lab Services
015000	Temporary Facilities and Controls
016000	Product Requirements
017300	Execution
017419	Construction Waste Management and Disposal
017700	Closeout Procedures
017823	Operation and Maintenance Data
017839	Project Record Documents
017900	Demonstration and Training

Division 07 – Thermal and Moisture Protection

079000 – Joint Sealants (As Applies to Own Work)

Division 26 – Electrical

260100 – General Provisions

Division 27 - Communications

271000 – Voice-Data Infrastructure

272000 – Integrated Audio Visual System

275116 – Wireless Clock System

1.0 INCLUSIONS:
SPECIFIC INCLUSIONS FOR THE SCOPE OF WORK (including, but not limited to)

The Bid Package Contractor will be responsible for completing all work included in the contract documents including, but not limited to, the following summary.

Division 01 – General Requirements

The Bid Package Contractor is responsible for all requirements in the Division 01 – General Requirements of the Specifications.

The Bid Package Contractor is responsible for all items included in the CM Supplemental Specifications and all other requirements as specified in Section 001000 General Requirements.

Division 07 – Thermal and Moisture Protection

079200 – Joint Sealants (As Applies to Own Work)

1. Furnish and install caulking and sealants required or specified for own Work.

Division 26 - Electrical

260100 – General Provisions

Division 27 - Communications

271000 – Voice-Data Infrastructure

272000 – Integrated Audio Visual System

275116 – Wireless Clock System

2. Furnish and install all labor, materials and equipment necessary to install all low voltage systems per Plans, Specifications and Addenda, including but not limited to; low voltage systems, voice and data systems, paging systems, computer networking systems, communication systems, communication cabling, sound systems, video systems, telephone systems, clock systems, CATV systems, telephone backboards, connections to existing systems, conduit, wiring, fixtures, flashings, rods, supports, brackets, seismic restraints, wiring devices, fire sealants, identification, hardware, trim and accessories for a complete operational system and installation.
3. Provide all labor, materials and equipment necessary to install all audio visual equipment per Plans, Specifications and Addenda, including but not limited to; all specified equipment for a fully functional audio/video system, local controls, local inputs, monitoring video systems, audio routing, mixing and display systems, control systems, intercom systems, sound systems, sound distribution systems, sound reinforcement systems hearing assistance systems, production communication systems, video projectors, projector mounts, projector screens, flat panel TV's, speakers, mounting brackets, conduit, boxes, wiring, terminations, software, rigging, hardware, acoustical analysis, testing and any other services or incidental equipment needed in order to meet the functional requirements of the specified components for a complete operational system and installation.
4. Coordination with utility companies as required to complete all work involving the relocating of transformers, vaults, conduits, conductors and other equipment or required items.

Murrieta Mesa High School New Classroom Building

BID PACKAGE: 12 (Continued)

Low Voltage, AV, Communications

5. Coordination of all rough and finish opening requirements with affected trades to ensure proper installation of all fixtures, openings and other equipment for own work. Provide openings for own work if required due to lack of coordination by this Prime Trade Contractor.
6. Coordinate required blocking and backing with affected trades. Provide blocking and backing for own work if required due to lack of coordination by this Prime Trade Contractor.
7. Seismic requirements for own work.
8. Labeling and identification as specified or required for own work.
10. Start-up, testing, adjustments and commissioning as specified for own work. Submit all closeout documents, O&M manuals, spare parts and tools, warranties, and other specified items per Plans and Specifications. Update as-built drawings as required.
11. Owner training, demonstrations, videos or instructional sessions for maintenance and operations staff as specified or required. Schedule and coordinate with Owner through Construction Manager.
12. Provide extra stock, turnover and replacement materials as specified.
13. This Prime Trade Contractor will provide all cabling and low voltage wiring for own work; all conduit for own work beginning at 6" above finish floor. Bid Package 13 – Electrical will furnish and install all underground site work, including conduits, boxes, etc.

2.0 SPECIAL NOTES FOR THIS BID PACKAGE

Contractor for this scope of work shall include an allowance equal to 5% of total construction cost for Bid Package 12 – Low Voltage, Communications as an **Owner Unspecified Allowance** to be used for unforeseen conditions and at the discretion of the District. See Construction Manager Supplemental Specification Section 012100.

In addition to this allowance, it is noted that the specifications may include dollar amount allowances for scope not confirmed at time of ultimate design, contractor is to include said dollar amounts in addition to item above and note full allowance amount on bid form.

NOTE:

All of the work in the above sections **MUST** be included in the **BID PACKAGE No. 12 – LOW VOLTAGE, AUDIO VISUAL, COMMUNICATIONS** unless specifically excluded herein. **CONTRACTOR MUST EXAMINE ALL OTHER SPECIFICATION SECTIONS, DRAWINGS, AND CONTRACT DOCUMENTS** for related work that may be specified or shown on drawings and required to be included as work under this Bid Package.

Murrieta Mesa High School New Classroom Building

BID PACKAGE: 12 (Continued)

Low Voltage, AV, Communications

This Bid Package summary supplements and complements the Plans, Specifications, and the balance of the project documents, hereafter referred to as Contract Documents and in no way supersedes any information contained in the Contract Documents unless specifically stated.

It is the responsibility of each bidder to fully familiarize themselves with the entire Summary of Work for all Bid Packages, as the individual Specifications' Sections interface throughout the project and thus impact all Bid Package Contractors.

END OF THIS SECTION

Murrieta Mesa High School New Classroom Building

BID PACKAGE: 13

Electrical

SCOPE OF WORK SUMMARY:

The scope of work includes, but is not necessarily limited to, furnishing all labor, materials, accessories, appliances, tools, equipment, facilities, transportation, applicable taxes and services necessary for, and incidental to, performing all operations in connection with the specification sections listed below, complete as indicated on the drawings and specifications or incidental to the requirements of this Bid Package Contractor and/or specified herein, unless specifically excluded.

The Following are the Project Contract Documents and are primary to this Bid Package:

- Bid Packages (All Bid packages on project)
 - Bid Package #01 – Concrete, Site General
 - Bid Package #02 – Steel
 - Bid Package #03 – Casework, Finish Carpentry
 - Bid Package #04 – Roofing, Sheetmetal
 - Bid Package #05 – Doors, Frames, Hardware
 - Bid Package #06 – Lath, Plaster, Drywall
 - Bid Package #07 – Flooring, Ceramic Tile
 - Bid Package #08 – Paint, Wall Covering
 - Bid Package #09 – Windows and Storefront
 - Bid Package #10 – Specialties, Building General
 - Bid Package #11 – Fire Sprinkler
 - Bid Package #12 – Low Voltage, Communications
 - Bid Package #13 – Electrical
 - Bid Package #14 – Plumbing
 - Bid Package #15 – HVAC
 - Bid Package #16 – Fire Alarm, Security
- Plans – Murrieta Mesa High School New Classroom Building – November 12, 2019
- Project Manual - Murrieta Mesa High School New Classroom Building – January 6, 2020
- Site Logistics and Fencing Map (Created by EHCC)
- Subsurface Survey – (as included in the Special Conditions)
- Preliminary Project Schedule (as included in the Special Conditions)
- DSA – TI 103 – Testing and Inspection Requirements (if applicable)
- Construction Manager Supplemental Specifications
 - 001000 General Requirements (for All Bid Packages)
 - 004600 Post Bid Interview (for All Bid Packages)
 - 012100 Allowances
 - 017301 Final Clean

Murrieta Mesa High School New Classroom Building

BID PACKAGE: 13 (Continued)

Electrical

- Specifications – Murrieta Mesa High School New Classroom Building – November 12, 2019

Division 01 – General Requirements

- 011100 Summary
- 012500 Substitution Procedures
- 012600 Contract Modification Procedures
- 012900 Payment Procedures
- 013100 Project Management and Coordination
- 013233 Photographic Documentation
- 013300 Submittal Procedures
- 014000 Quality Requirements
- 014200 References
- 014529 Testing Lab Services
- 015000 Temporary Facilities and Controls
- 016000 Product Requirements
- 017300 Execution
- 017419 Construction Waste Management and Disposal
- 017700 Closeout Procedures
- 017823 Operation and Maintenance Data
- 017839 Project Record Documents
- 017900 Demonstration and Training

Division 07 – Thermal and Moisture Protection

- 079000 – Joint Sealants (As Applies to Own Work)

Division 13 – Electrical

- 260100 – General Provisions
- 260519 – Power Conductors
- 260526 – Grounding
- 260533 – Conduit and Fittings
- 260534 – Outlet and Junction Boxes
- 260543 – Underground Pull Boxes and Manholes
- 260923 – Digital Lighting Control System
- 262213 – Dry Type Transformer
- 262413 – Switchboard
- 262416 – Panelboards
- 262726 – Switches and Receptacles
- 262816 – Disconnects
- 265114 – LED Lighting Fixtures and Lamps
- 269090 – Testing

1.0 INCLUSIONS:

SPECIFIC INCLUSIONS FOR THE SCOPE OF WORK (including, but not limited to)

The Bid Package Contractor will be responsible for completing all work included in the contract documents including, but not limited to, the following summary.

Division 01 – General Requirements

The Bid Package Contractor is responsible for all requirements in the Division 01 – General Requirement of the Specifications.

The Bid Package Contractor is responsible for all items included in the CM Supplemental Specifications and all other requirements as specified in Section 001000 General Requirements.

Division 07 – Thermal and Moisture Protection
079200 – Joint Sealants (As Applies to Own Work)

1. Furnish and install caulking and sealants required or specified for own Work.

Division 13 – Electrical

260100 – General Provisions
260519 – Power Conductors
260526 – Grounding
260533 – Conduit and Fittings
260534 – Outlet and Junction Boxes
260543 – Underground Pull Boxes and Manholes
260923 – Digital Lighting Control System
262213 – Dry Type Transformer
262413 – Switchboard
262416 – Panelboards
262726 – Switches and Receptacles
262816 – Disconnects
265114 – LED Lighting Fixtures and Lamps
269090 – Testing

2. Furnish and install all labor, materials and equipment necessary to install all electrical systems per Plans, Specifications and Addenda, including but not limited to; all high voltage systems, electrical cabling and wiring, conduit, underground conduit for low voltage systems, building lighting, lighting control devices, interior lighting, exterior lighting, underground cable, underground ducts, cabling boxes, infrastructure conduits, end vaults, precast boxes, pull boxes, switchboards, panel boards, transformers, disconnects, circuit breakers, electrical grounding, electrical bonding, motor starters, switches, raceways, boxes, conduit, wire, conductors, cables, cable trays, transfer switches, barrier posts, connections to existing systems, fixtures, flashings, hanger rods, supports, brackets, seismic restraints, wiring devices, vaults, pads, dry utilities, fire sealants, electrical identification, hardware, trim and accessories for a complete operational system and installation.

Murrieta Mesa High School New Classroom Building

BID PACKAGE: 13 (Continued)

Electrical

3. Coordination with utility companies as required to complete all work involving the relocating of transformers, vaults, conduits, conductors and other equipment or required items.
4. Submit all closeout documents, O&M manuals, spare parts and tools, warranties, and other specified items per Plans and Specifications. Update as-built drawings as required.
5. Owner training, demonstrations, videos or instructional sessions for maintenance and operations staff as specified or required. Schedule and coordinate with Owner through Construction Manager.
6. Coordinate with Concrete Contractor for proper placement, projection and orientation of light standards. Provide anchor bolts and anchor bolt templates completely assembled and set with the correct anchor bolt projection.
7. Coordination of all rough and finish opening requirements with affected trades to ensure proper installation of all fixtures, openings and other equipment for own work.
8. Coordinate required blocking and backing with affected trades. Provide blocking and backing for own work if required due to lack of coordination by this Prime Trade Contractor.
9. Coordinate removal and relocation of erosion control devices with jobsite Superintendent. Repair or replace damaged devices caused by this Prime Trade Contractor.
10. Trenching, backfill, compaction and unformed concrete for own work. Spoils to be removed to a legal offsite location by this PTC.
11. Provide final hook up of high and low voltage systems installed by others. Circuitry and hook up of all electrical equipment and components supplied by others. Any and all reference to electrical trades will be to this Prime Trade Contractor. This bid package will complete the hook up of all electrical related fixtures and connections for a complete and proper installation.
12. Start-up, testing, adjustments and commissioning as specified for own work.
13. Provide extra stock, turnover and replacement materials as specified.
14. Seismic requirements for own work.
15. Labeling and identification as specified or required for own work.
16. Saw cutting, demolition, removal, disposal and patching for own work.
17. Attachment of light fixture wires to fixtures in suspended grid ceilings, wires supplied by others.

Murrieta Mesa High School New Classroom Building

BID PACKAGE: 13 (Continued)

Electrical

18. Provide, install, maintain and remove (as the work progresses) all temporary electrical power and lighting for the project.
20. Relocation of existing electrical utilities. All abandoned conduit and wires to be “made safe” by this Prime Trade Contractor.
21. Provide “safe off” of all existing electrical work, as applies to demolition (demolition by others).

ALSO INCLUDES:

22. Comply with Detail 4/E1.2, underground conduit and installation at building footings and under concrete slabs, for a complete installation.
23. All electrical demolition and removals needed to remove conflicting electrical services, safe off, and allow all subsequent trades to perform work. All work associated with electrical demolition is critical and all normal premium times hours shall be included in bid until work is ready for subsequent trade. This shall include removal of all conductor material inside existing conduit in the areas to be removed, such that demolition contractor can remove conduits without concern for contents.
24. All Braces, brackets, sleepers and support systems complete (including their attachment to the building structure) as required for this PTC’s work, including structural & miscellaneous steel items when detailed only on the Electrical Drawings, or not specifically detailed but required.
25. All access doors required by Plumbing, HVAC, Fire Sprinkler and Electrical PTC’s shall be located, supplied and installed by those PTC’s.
26. This PTC is to review the Bid Documents for potential conflicts between intended routing of own work (indicated diagrammatically only on the bid documents, such as gas, water, waste and vent, fire sprinkle, etc.) and that of all other building and site components. Failures to do so will result in this PTC’s rerouting of own work and all incidental costs resulting from such.
27. Temporary Power is to be provided by this PTC. Reference General Bid Category – Section 4.3 for specifics. Temporary power boxes and cords are to be in place – ready for use, from 6:30 am to 5:00 pm daily. Once Concrete foundation work proceeds all temp power boxes/ cords are to be left out ready for use 24 hours a day (excluding weekends and holidays) secured to deter theft. In the event of theft this PTC shall replace equipment immediately to mitigate loss of production. Cost for replacement of cords/ boxes shall be borne by this PTC.
28. Temporary Power is to be checked and certified per OSHA requirements but no less than every month at beginning of month. Provide CM with documentation of certification.

29. This Prime Trade Contractor will furnish and install all underground site work, including conduits, boxes, etc. for all low voltage work. Bid Packages 12 and 16 will provide all low voltage wiring, and all low voltage conduit beginning at flange 6" above finish floor.

2.0 SPECIAL NOTES FOR THIS BID PACKAGE

Contractor for this scope of work shall include an allowance equal to 5% of total construction cost for Bid Package 13 – Electrical, as an **Owner Unspecified Allowance** to be used for unforeseen conditions and at the discretion of the District. See Construction Manager Supplemental Specification Section 012100.

NOTE:

All of the work in the above sections **MUST** be included in the **BID PACKAGE No. 13 - ELECTRICAL** unless specifically excluded herein. **CONTRACTOR MUST EXAMINE ALL OTHER SPECIFICATION SECTIONS, DRAWINGS, AND CONTRACT DOCUMENTS** for related work that may be specified or shown on drawings and required to be included as work under this Bid Package.

This Bid Package summary supplements and complements the Plans, Specifications, and the balance of the project documents, hereafter referred to as Contract Documents and in no way supersedes any information contained in the Contract Documents unless specifically stated.

It is the responsibility of each bidder to fully familiarize themselves with the entire Summary of Work for all Bid Packages, as the individual Specifications' Sections interface throughout the project and thus impact all Bid Package Contractors.

END OF THIS SECTION

Murrieta Mesa High School New Classroom Building

BID PACKAGE: 16

Fire Alarm, Security

SCOPE OF WORK SUMMARY:

The scope of work includes, but is not necessarily limited to, furnishing all labor, materials, accessories, appliances, tools, equipment, facilities, transportation, applicable taxes and services necessary for, and incidental to, performing all operations in connection with the specification sections listed below, complete as indicated on the drawings and specifications or incidental to the requirements of this Bid Package Contractor and/or specified herein, unless specifically excluded.

The Following are the Project Contract Documents and are primary to this Bid Package:

- Bid Packages (All Bid packages on project)
 - Bid Package #01 – Concrete, Site General
 - Bid Package #02 – Steel
 - Bid Package #03 – Casework, Finish Carpentry
 - Bid Package #04 – Roofing, Sheetmetal
 - Bid Package #05 – Doors, Frames, Hardware
 - Bid Package #06 – Lath, Plaster, Drywall
 - Bid Package #07 – Flooring, Ceramic Tile
 - Bid Package #08 – Paint, Wall Covering
 - Bid Package #09 – Windows and Storefront
 - Bid Package #10 – Specialties, Building General
 - Bid Package #11 – Fire Sprinkler
 - Bid Package #12 – Low Voltage, Communications
 - Bid Package #13 – Electrical
 - Bid Package #14 – Plumbing
 - Bid Package #15 – HVAC
 - Bid Package #16 – Fire Alarm, Security
- Plans – Murrieta Mesa High School New Classroom Building – November 12, 2019
- Project Manual - Murrieta Mesa High School New Classroom Building – January 6, 2020
- Site Logistics and Fencing Map (Created by EHCC)
- Subsurface Survey – (as included in the Special Conditions)
- Preliminary Project Schedule (as included in the Special Conditions)
- DSA – TI 103 – Testing and Inspection Requirements (if applicable)
- Construction Manager Supplemental Specifications
 - 001000 General Requirements (for All Bid Packages)
 - 004600 Post Bid Interview (for All Bid Packages)
 - 012100 Allowances
 - 017301 Final Clean

- Specifications – Murrieta Mesa High School New Classroom Building – November 12, 2019

Division 01 – General Requirements

011100	Summary
012500	Substitution Procedures
012600	Contract Modification Procedures
012900	Payment Procedures
013100	Project Management and Coordination
013233	Photographic Documentation
013300	Submittal Procedures
014000	Quality Requirements
014200	References
014529	Testing Lab Services
015000	Temporary Facilities and Controls
016000	Product Requirements
017300	Execution
017419	Construction Waste Management and Disposal
017700	Closeout Procedures
017823	Operation and Maintenance Data
017839	Project Record Documents
017900	Demonstration and Training

Division 07 – Thermal and Moisture Protection

079000 – Joint Sealants (As Applies to Own Work)

Division 26 – Electrical

260100 – General Provisions

Division 28 – Electronic Safety and Security

280100 – General Provisions
281300 – Security System
282300 – Video Surveillance System
283001 – Fire Alarm System Voice EVAC

1.0 INCLUSIONS:

SPECIFIC INCLUSIONS FOR THE SCOPE OF WORK (including, but not limited to)

The Bid Package Contractor will be responsible for completing all work included in the contract documents including, but not limited to, the following summary.

Division 01 – General Requirements

The Bid Package Contractor is responsible for all requirements in the Division 01 – General Requirements of the Specifications.

The Bid Package Contractor is responsible for all items included in the CM Supplemental Specifications and all other requirements as specified in Section 001000 General Requirements.

Division 07 – Thermal and Moisture Protection

079200 – Joint Sealants (As Applies to Own Work)

1. Furnish and install caulking and sealants required or specified for own Work.

Division 26 - Electrical

260100 – General Provisions

Division 28 – Electronic Safety and Security

280100 – General Provisions

281300 – Security System

282300 – Video Surveillance System

283001 – Fire Alarm System Voice EVAC

13. Furnish and install all labor, materials and equipment necessary to install all low voltage systems per Plans, Specifications and Addenda, including but not limited to: fire alarm systems, security systems, connections to existing systems, conduit, wiring, fixtures, flashings, rods, supports, brackets, seismic restraints, wiring, devices, fire sealants, identification, hardware, trim and accessories for a complete operational system and installation.
14. Coordination with utility companies as required to complete all work involving the relocating of transformers, vaults, conduits, conductors and other equipment or required items.
15. Coordination of all rough and finish opening requirements with affected trades to ensure proper installation of all fixtures, openings and other equipment for own work. Provide openings for own work if required due to lack of coordination by this Prime Trade Contractor.
16. Coordinate required blocking and backing with affected trades. Provide blocking and backing for own work if required due to lack of coordination by this Prime Trade Contractor.
17. Seismic requirements for own work.
18. Labeling and identification as specified or required for own work.
19. Provide duct detectors to Mechanical Contractor for installation. This Prime Trade Contractor will provide final connection and integration into full low voltage system.
20. Perform pre-construction survey and provide written documentation, reports, etc. of existing to remain fire alarm systems, throughout campus as applicable. Survey must be completed and Reports must be submitted to Construction Manager within forty-five (45) days from receipt of Prime Contract.
21. This Prime Trade Contractor will provide all cabling and low voltage wiring for own work and all conduit for own work beginning at 6" above finish floor. Bid Package 13 – Electrical will furnish and install all underground site work, including conduits, boxes, etc.

22. Start-up, testing, adjustments and commissioning as specified for own work. Submit all closeout documents, O&M manuals, spare parts and tools, warranties, and other specified items per Plans and Specifications. Update as-built drawings as required.
23. Owner training, demonstrations, videos or instructional sessions for maintenance and operations staff as specified or required. Schedule and coordinate with Owner through Construction Manager.
24. Provide extra stock, turnover and replacement materials as specified.

2.0 SPECIAL NOTES FOR THIS BID PACKAGE

Contractor for this scope of work shall include an allowance equal to 5% of total construction cost for Bid Package 16 – Fire Alarm, Security as an **Owner Unspecified Allowance** to be used for unforeseen conditions and at the discretion of the District. See Construction Manager Supplemental Specification Section 012100.

In addition to this allowance, it is noted that the specifications may include dollar amount allowances for scope not confirmed at time of ultimate design, contractor is to include said dollar amounts in addition to item above and note full allowance amount on bid form.

NOTE:

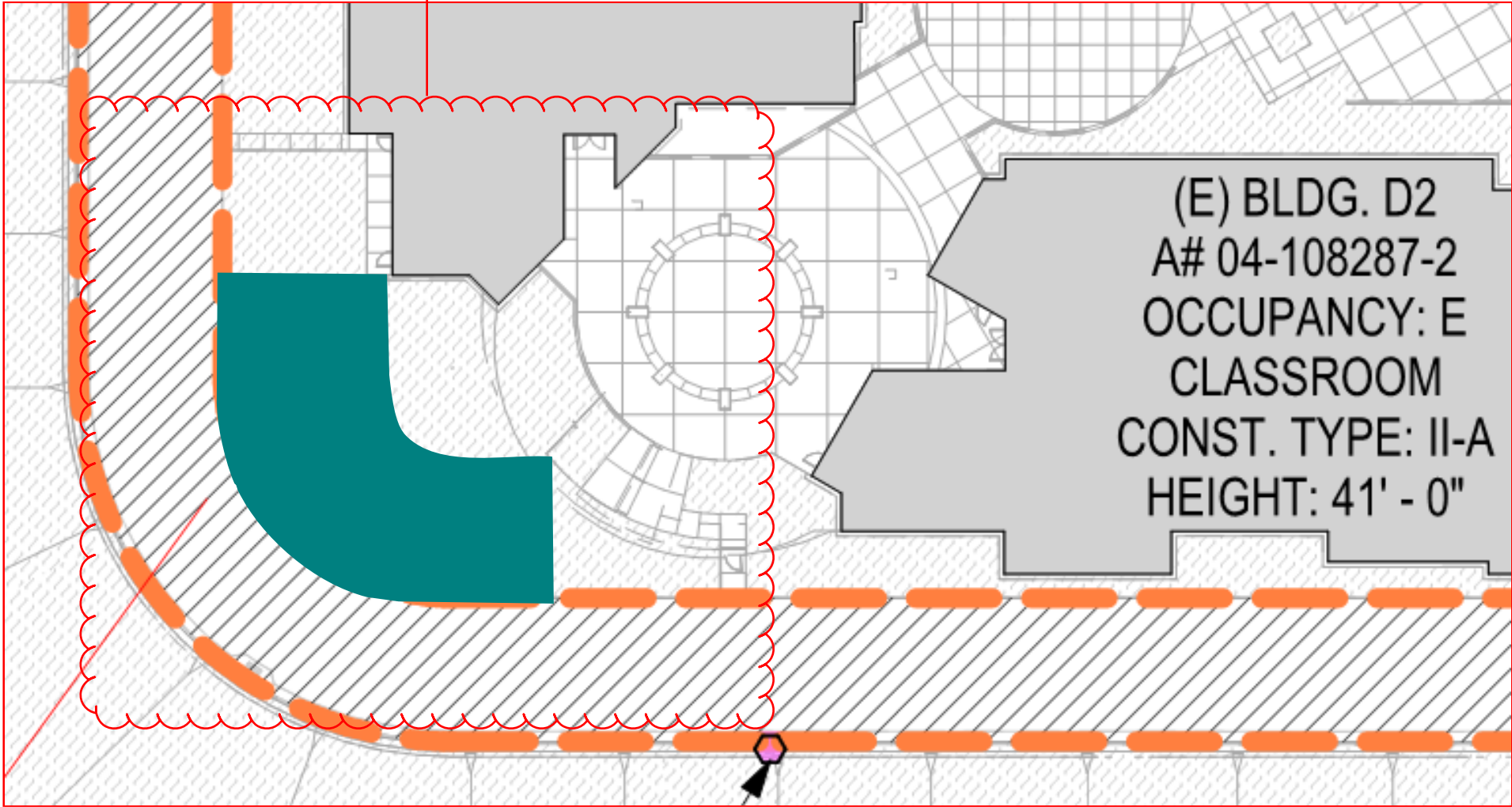
All of the work in the above sections **MUST** be included in the **BID PACKAGE No. 16 – FIRE ALARM, SECURITY** unless specifically excluded herein. **CONTRACTOR MUST EXAMINE ALL OTHER SPECIFICATION SECTIONS, DRAWINGS, AND CONTRACT DOCUMENTS** for related work that may be specified or shown on drawings and required to be included as work under this Bid Package.

This Bid Package summary supplements and complements the Plans, Specifications, and the balance of the project documents, hereafter referred to as Contract Documents and in no way supersedes any information contained in the Contract Documents unless specifically stated.

It is the responsibility of each bidder to fully familiarize themselves with the entire Summary of Work for all Bid Packages, as the individual Specifications' Sections interface throughout the project and thus impact all Bid Package Contractors.

END OF THIS SECTION

Demolition Scope:
Ensure no sprinkler heads within scope area prior to grubbing and DG work; Remove and grub all landscaping, weeds, plants including all roots; in-fill existing fire pit, remove 1" of existing DG, install 3" DG with compaction to flush transition with existing curb, maintaining equivalent grade.



CHECKLIST OF MANDATORY BID FORMS

(For Contractor's use and reference only. Additional documents may be required so bidders should carefully review all Contract Documents and Bid Documents)

- Designation of Subcontractors
- Bid Form
- Contractor's Certificate Regarding Workers Compensation
- Non-Collusion Declaration
- Bid Bond (or Bid Guarantee form if Security is other than Bid Bond)
- Substitution Request Form (If Substitution Request Form is not submitted then NO Substitutions will be allowed after the bids are opened)
- Acknowledgment of Bidding Practices Regarding Indemnity
- DVBE Participation Statement
- Contractor's Certificate Regarding Drug-Free Work Place
- Contractor's Certificate Regarding Alcoholic Beverage and Tobacco-Free Campus Policy
- IRAN CONTRACTING ACT CERTIFICATION DOCUMENT 00 45 19.01-1

IRAN CONTRACTING ACT CERTIFICATION
(Public Contract Code Sections 2202-2208)

PROJECT/CONTRACT NO.: _____ between the Murrieta Valley Unified School District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

Prior to bidding on or submitting a proposal for a contract for goods or services of \$1,000,000 or more, the bidder/proposer must submit this certification pursuant to Public Contract Code section 2204.

The bidder/proposer must complete **ONLY ONE** of the following two options. To complete OPTION 1, check the corresponding box **and** complete the certification below. To complete OPTION 2, check the corresponding box, complete the certification below, and attach documentation demonstrating the exemption approval.

- OPTION 1.** Bidder/Proposer is not on the current list of persons engaged in investment activities in Iran created by the California Department of General Services ("DGS") pursuant to Public Contract Code section 2203(b), and we are not a financial institution extending twenty million dollars (\$20,000,000) or more in credit to another person, for 45 days or more, if that other person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.
- OPTION 2.** Bidder/Proposer has received a written exemption from the certification requirement pursuant to Public Contract Code sections 2203(c) and (d). *A copy of the written documentation demonstrating the exemption approval is included with our bid/proposal.*

CERTIFICATION:

I, the official named below, CERTIFY UNDER PENALTY OF PERJURY, that I am duly authorized to legally bind the bidder/proposer to the OPTION selected above. This certification is made under the laws of the State of California.

<i>Vendor Name/Financial Institution (Printed)</i>	<i>Federal ID Number (or n/a)</i>
<i>By (Authorized Signature)</i>	
<i>Printed Name and Title of Person Signing</i>	<i>Date Executed</i>

END OF DOCUMENT