

Business Services Contracts Office

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ADDENDUM NO. 2

Date: January 14, 2025

Issued by: Sacramento City Unified School District

Project: Project #: 0822-401

0822-401 SCUSD Maintenance & Operations Facilities TI

This addenda shall supersede the original Information, attachments, and specifications regarding **Project No. 0822-401** where it adds to, deletes from, clarifies or otherwise modifies them. All other conditions and any previous addenda shall remain unchanged.

Part A - Project Manual

AD2.01 Refer to Project Manual, Table of Contents:

Revised to Read:

DIVISION 07 THERMAL AND MOISTURE PROTECTION

07 21 00 Thermal Insulation
07 26 00 Vapor Retarder
07 90 00 Joint Sealants

AD2.02 Refer to Project Manual, Table of Contents:

Revised to Read:

DIVISION 10 10 14 00 Signage

10 11 00 Visual Display Surfaces

AD2.03 Refer to Project Manual, Cover Page:

Revised to Read: 425 1st Avenue, Sacramento, CA 95818

AD2.04 Refer to Project Manual, Section 00 11 13 – NOTICE TO BIDDERS, ARTICLE 1. GENERAL, Section 1.01:

Revised to Read: Engineer's Estimate: \$1,500,000

Part B - Bidder Questions

QUESTION #1: The project manual spec table of contents as well as the finish floor plan call for various new floorings but no spec sections have been provided. Can you please provide the flooring specifications (09 65 00 Resilient Flooring – Tile, 09 65 16 Resilient Flooring – Sheet Vinyl, 09 67 23 Fluid-Applied Flooring – Epoxy, 09 67 24 Urethane Slurry Flooring System, 09 68 00 Carpet) and/or finish schedule?

RESPONSE: Specification section 09 65 16 is included in this addendum. Specification section 09 68 00 is included in this addendum. Specification section 09 67 23 and 09 67 24 not used on this project. Replace Sheet A9 in its entirety per attached Addendum Drawing **AD2.11**. Revised legend.

QUESTION #2: Please confirm whether the project is a PLA project or Prevailing wage project.

RESPONSE: Refer to Project Manual, 00 11 13 – NOTICE TO BIDDERS, ARTICLE 1. GENERAL, Sections 1.07 & 1.13.

QUESTION #3: Is there any work that need to be performed off hours? If yes, please provide trades that need to be performed off hours.

RESPONSE: Regular working hours.

QUESTION #4: Please confirm that contractors have parking during construction.

RESPONSE: Parking in front of the Facilities building typically used during normal operating hours will not be in use while staff is relocated. This parking will be available to the construction team.

QUESTION #5: Will be the working area occupied during construction?

RESPONSE: The working area will not be occupied.

QUESTION #6: REF SHEET A1. On sheet A1, keynote #2 reads "DEMO EXISTING PARTIAL HEIGHT WALL", however, this keynote appears to have been used at several door openings, as opposed to keynote #3 which reads "DEMO EXISTING DOOR AND FRAME". Please confirm that we are to demo the existing doors and frames that currently have keynote # 2 pointing to them.

RESPONSE: Replace Sheet A1 in it's entirety per attached Addendum Drawing **AD2.08**. Keynotes pointing to doors have been revised to Keynote No. 3.

QUESTION #7: REF SHEET S4.1, S2.1, A7, A6, A4. The Ceiling Framing Plan on sheet S2.1 provides information regarding the new partial height walls that make up the new office spaces. Per note 7 on the same page, these partial height partitions/walls should extend 7-1/2" above the ceiling. This dimensional requirement is noted again on detail D/S3.1. Detail 1/S4.1 shows what to do at wall connections, and includes a detail for conditions where the new partial height wall is intersecting at a beam or another wall. The detail for connecting the wall to a beam requires nailing a piece of 15/32"x5-1/2"x12" plywood across the top of the new wall and the top of the new beam, however, if constructed as detailed the top of the new wall will not be flush with the top of the new beam, thus leaving a small gap between the top of beam and bottom of plywood. Detail 4/A7 shows a 2" dimension between the bottom of new ceiling and bottom of gyp soffit/header. Per the opening schedule on A6, W1/W2/W3 are all 9'-0" tall. Per the reflective ceiling plan on A4, the ceiling elevations in these office spaces is 9'-2". If the new wall within these office spaces needs to be 7-1/2" above the ceiling, the top of these walls would therefore be 9'-9 1/2" (9'-2" + 7-1/2"). Considering a single layer of 5/8 gyp under the new beam to make up the header detail (4/A7), the bottom of the new beam would be at elevation 9'-0 5/8". Since these are 6x8 beams, the elevation at the top of beam would equal 9'-7 7/8" (9'-0 5/8" (elevation @ bottom of beam) + 7 1/4" (actual dimension of 6x8)). Comparing this elevation to the top of wall elevation of 9'-9 1/2", there is a 1-3/8" difference, thus creating the gap mentioned above.

RESPONSE: Top of wall should equal top of beam. For 6x8 actual depth of $7\frac{1}{2}$ ", top of beam would be 9'-8 1/8" (9'-0 5/8" + 7 $\frac{1}{2}$ ") with a dimension from top of beam to ceiling = 6 1/8" (9'-8 1/8" - 9'-2"). Drawings revised to show 6 1/8" dim from ceiling to top of wall. No detail changes required.

QUESTION #8: REF SHEET A2. The opening type label in room FAC106 - Planning Manager appears to have a typo and is unclear. We are assuming that this is a W1 type opening as the offices next door are all W1 along the same grid line. Please confirm this is a W1 type opening.

RESPONSE: Replace Sheet A2 in its entirety per attached Addendum Drawing **AD2.09**. Label revised to W1.

QUESTION #9: REF SHEET A9. On the Finish & Equipment Floor Plan (A9), there appear to be several items that may require additional backing, such as the new markerboards, new tack boards, new vinyl wrapped tackable panels. Please confirm that these all require new backing, and if so, please provide a detail for construction. Additionally, please confirm that the TVs and markerboards are not in the contractor's scope to furnish or install, as they are not included within the project specifications.

RESPONSE: Replace Sheet A9 in it's entirety per attached Addendum Drawing **AD2.11**. Added Detail No. 14 for blocking. Blocking is required for all accessories, markerboards, and TV's. Markerboards and TV/brackets are included in Contractor's scope of work. See added spec section 10 11 00 for information on markerboards and tackboards. Revise Specification TOC to reflect new spec section. Furthermore, per discussion with KMM: TVs are in contractor's scope per the Equipment Schedule on T000 and 27 41 00 Appendix A.

QUESTION #10: REF SHEET P001, P111, A1, E0.3. P111 calls for a new floor cleanout and a new vent-thru-roof pipe at the "FAC111 - Break Room". To install a new vent pipe this wall will need to be partially demolished, however, the demo plan (A1) does not call for any demo scope at this location. Please confirm the existing wall finish materials and please clarify the full extent of wall demolition scope in this room. Additionally, please advise if a new trap primer should be added to this room with the addition of a new floor clean out, and also advise if any backing is required for the new surface mounted instantaneous water heater. Lastly, there does not appear to be any information on the electrical panel schedules regarding the new instantaneous water heater. Please clarify where to land the conduit for this instantaneous water heater, and please clarify whether this conduit should be surface mounted or concealed within the wall/ceiling spaces.

RESPONSE: Confirmed. Contractor is required to demo and replace finishes behind new casework as required to plumb new sink, install blocking for casework, etc. Wall will need to be partially demolished for installation of new sink along with waste and water utilities. Vent can be offset as needed for ease of installation. A wall cleanout can be provided instead of a floor cleanout. No backing is required for mounting instantaneous water heater. Circuit the IWH to 'G-27/29', 50A/2P CB, 2 #6, #10G - 1"C, via 60A/NF/2P disconnect. Conceal conduit in wall.

QUESTION #11: REF SHEET E2.1, P111, P001. Sheet note #2 on the Power Enlarged Alteration Floor Plan (E2.1) reads "SAW CUT (E) SLAB AND PATCH TO MATCH EXISTING. COORDINATE POWER CONDUIT ROUTING WITH DATA/TELECOM CONDUIT ROUTING.", however, this note is not used on this page. Please confirm that the only locations where there will be any slab demolition per this note is at rooms FAC103 - Conference Room and FAC122 - Confidential Interview for the new floor receptacles.

RESPONSE: Slab is also being cut to extend utilities to the new sink in Room FAC111 – Break Room. Saw cutting and patching will be required for the installation of the new sink. Waste and

domestic water are under the slab, as shown on P111. Saw cutting will be required through FAC108, FAC111, & FAC112. Waste and water can share a trench to minimize removal and patching. Replace Sheet T200 in it's entirety per attached Addendum Drawing **AD2.18** to show under-slab low voltage pathway.

QUESTION #12: REF SHEET A9. Keynote #3 on sheet A9 appears to have a typo (reads "XXX") and is currently unused. Please confirm this note is just a typo and should be disregarded.

RESPONSE: Keynote has been revised to show scope. See attached Addendum Drawing **AD2.11**.

QUESTION #13: REF SHEET S2.1 Per sheet S2.1, the east wall in the new IDF room (between GL-9 &10) is shown as a partial height wall, though is not identified with a sheet note. On this same sheet, it is apparent that the relocated access ladder will be mounted to this partial height wall (key note #20). The key note also references the architectural drawings for the ladder mounting detail, however, this detail has not been provided. Please confirm that this wall should be a partial height wall (key note #7), and please provide the missing ladder mounting detail as referenced on sheet S2.1.

RESPONSE: Existing metal ladder will be removed as shown on Sheet A1 and reinstalled. The new wall top plate elevation should match the existing adjacent top plate elevation. Details 13-15/S4.1 have been added to clarify wall framing and connections. See attached Addendum Drawing **AD2.16**.

QUESTION #14: REF SHEET N/A. What is the required PSI and mix design info for the slab on grade patch back? It is not noted in the contract documents.

RESPONSE: See attached Addendum Drawing **AD2.12** revising concrete PSI.

QUESTION #15: REF SHEET A2, S2.1. On sheet A2 & S2.1, there appears to be a new framed partial height wall just east of gridline 9, which runs perpendicular into an existing window opening. Please confirm this is the design intent, and if so, please provide a detail or direction for how to terminate the wall at this window opening.

RESPONSE: Confirmed. The new wall does in fact intersect the window. Contractor shall extend wall material into window pocket to within 1/2" of glazing. Apply a solid black decal to inside face of glazing. Stuff cavity with batt insulation and acoustically seal between edge of gyp board and glazing. Furthermore, provide separate window shades on each side of wall.

QUESTION #16: Will the new low voltage MDF being relocated require the existing system to stay online while construction commences?

RESPONSE: Yes.

QUESTION #17: Will the new low voltage cabling require all to be in conduit?

RESPONSE: J-hooks are acceptable above T-bar and solid bottom cable tray is called out in FAC102. All other locations will require conduit.

QUESTION #18: Is there a timeline for construction start date? Finish date?

RESPONSE: Project anticipated to start early February and be complete, including closeout, by early July.

QUESTION #19: Is there any existing roof warranty we need to accommodate?

RESPONSE: There is an existing roof warranty with TREMCO.

List of Attachments

AD2.01 – Section 03 30 00 (14 Pages)

AD2.02 – Section 07 26 00 (7 Pages)

AD2.03 – Section 09 65 16 (5 Pages)

AD2.04 – Section 09 68 00 (9 Pages)

AD2.05 – Section 10 11 00 (5 Pages)

AD2.06 – Section 21 00 50 (17 Pages)

AD2.07 – Section 21 10 00 (11 Pages)

AD2.08 – Sheet A1 (1 Page)

AD2.09 – Sheet A2 (1 Page)

AD2.10 – Sheet A7 (1 Pag

AD2.11 – Sheet A9 (1 Page)

AD2.12 – Sheet S0.1 (1 Page)

AD2.13 – Sheet S0.2 (1 Page)

AD2.14 – Sheet S2.1 (1 Page)

AD2.15 – Sheet S3.1 (1 Page)

AD2.16 – Sheet S4.1 (1 Page)

AD2.17 – Sheet T000 (1 Page)

AD2.18 – Sheet T200 (1 Page)

AD2.19 – Sheet T201 (1 Page)

AD2.20 – Sheet T400 (1 Page)

AD2.21 – Sheet T401 (1 Page)

AD2.22 – Sheet T801 (1 Page)

AD2.23 – Sheet T802 (1 Page)

AD2.24 – Sheet FP001 (1 Page)

AD2.25 – Sheet FP111D (1 Page)

AD2.26 – Sheet FP111 (1 Page)

END OF ADDENDUM NO. 2

Acknowledgement of this Addendum will be required at time of bid.

AD02.01 01/14/2025

SECTION 03 30 00 CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Concrete Formwork.
- Reinforcement of Concrete.
- C. Concrete Placing and Finishing.

1.02 RELATED SECTIONS

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 05 12 00: Structural Steel.
- C. Section 06 10 00: Rough Carpentry.

1.03 REFERENCES

- A. Chapter 19, CBC 2022.
- B. ACI 211.1 Standard Practice for Selecting Proportions for Normal Weight, Heavy Weight and Mass Concrete.
- C. ACI 301 Specifications for Structural Concrete for Buildings.
- D. ACI 304R Guide for Measuring, Mixing, Transporting and Placing Concrete.
- E. ACI 305R Hot Weather Concreting.
- F. ACI 306R Cold Weather Concreting.
- G. ACI 308 Standard Practice for Curing Concrete.
- H. ACI 309R Guide for Consolidation of Concrete.
- I. ACI 318 Building Code Requirements for Structural Concrete.
- J. ASTM A615 / A615M 09b Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
- K. ASTM C33 / C33M-08 Concrete Aggregates.
- L. ASTM C94 / C94M-09a Ready-Mixed Concrete.
- M. ASTM C114- 09b Methods of Chemical Analysis of Hydraulic Cement.
- N. ASTM C150 / C150M-09 Portland Cement.

- O. ASTM C260-06 Air Entraining Admixtures.
- P. ASTM C494 / C49M-08a Water Reducing Admixtures.

1.04 QUALITY ASSURANCE

- A. All Concrete for the project shall be controlled concrete of specified strengths, of uniform color, and free from defects liable to adversely affect strength, durability or appearance of the structure or its components.
- B. Requirements of Regulatory Agencies: The quality and design of structural concrete shall comply with the requirements of the California Building Code, except where more stringent requirements are specified.
- C. Workmanship: Materials and methods used for the production and placement of concrete shall be such as to assure the specified quality and shall conform to applicable requirements of the Building Code for Reinforced Concrete (ACI 318) of the American Concrete Institute, except as otherwise specified in this Section.
 - All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.
 - 2. Proper installation of partitions and equipment requires the floor finish to be level and smooth throughout. Extreme care shall be exercised during all floating and troweling operations to check levels often.
 - 3. Any concrete work which does not comply with tolerances and elevations shown on drawings will be cause for rejection of all work affected, and, if so rejected, such work shall be removed and replaced at no increase in cost to the Owner.
- D. Repair of Defective Concrete Surfaces shall be done in the following manner when, in the opinion of the Architect, such defects may be repaired and at no additional cost to the Owner.
 - 1. Rock pockets, voids, spalls, cracks and exposed reinforcing shall be repaired with 1:2 cement mortar or cut out and patched. Prepare surfaces and bond cement mortar with concrete adhesive as hereinafter specified.
 - 2. Floor surfaces which exceed the allowable variation in plane or level (when an 8'-0" long straightedge is laid on the finished surface, the surface varies more than 3/16" in 8'-0") shall be ground and/or filled to obtain the level and plane required. Fill materials, where required, shall be of type approved by the Architect.
 - 3. Surfaces which are not plumb and square or which do not conform to the lines and levels indicated shall be chipped, ground, filled or trued as required to obtain the desired results.
- E. Uniformity of Concrete: All aggregates shall be measured by weight and the proportion of water to cement shall be accurately controlled by either automatic measuring devices or calibrated containers. All concrete placed shall be uniform strength and color appearance as well as surface texture.

- F. Screeds shall be provided all construction joints as required to ensure installation of concrete to lines and elevations noted.
- G. Concrete Preplacement Inspection: Concrete shall not be poured until the forms, reinforcement, and preparations are complete and have been reviewed by the Project Inspector.
- H. Ready-Mixed Concrete: ASTM C94 / C94M-09a except as otherwise specified herein. Mix and deliver in accordance with the requirements set forth in ASTM C94 and ACI 301. Continuous Batch Plant inspection is required per CBC Section 1705.3.3. Contractor may request waiver of batch plant inspection in accordance with CBC Section 1705.3.3.1 provided the following is met:
 - Approved Testing Laboratory shall check the first batching for each class of concrete and furnish mix proportions to the Licensed Weighmaster.
 - Licensed Weighmaster to positively identify materials as to quantity and to certify to each load by ticket.
 - Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt and will transmit two copies of record to Architect.
 - 4. Do not add water at the site to concrete mixes with a maximum specified WCR unless the water content at batch time provides for a WCR less than specified and this provision, including the quantity of water which may be added at the site, is specifically noted on the Mix Design and Certification by the mix preparer.
 - 5. At end of project, Weighmaster shall furnish affidavit to Architect on form satisfactory to Architect, certifying that all concrete furnished conforms in every particular and to proportions established by mix designs.
- I. Tests: For structural concrete, the Testing Lab shall take four (4) test cylinders of concrete not less than once each day, not less than once for every 50 cubic yards of concrete, or not less than 2,000 square feet of slab or wall surface area. Cylinders shall be made and stored as per instructions given by the testing laboratory and shall be in accordance with ASTM Specifications C-31 / C31M-09 and C-39 / C39M-09a. Cylinders shall be tested for ultimate compressive strength of concrete with one cylinder tested at the age of 7 days and two (from the same batch) to be tested at the age of 28 days, with one cylinder held as a spare for future testing if needed. Tests shall be made by a recognized test laboratory selected by the Owner and approved by the Architect.
 - Cylinders not meeting the required design stresses shall indicate defective
 concrete and such concrete shall be removed and replaced at no increase in cost
 to the Owner. Core tests requested by the Contractor to establish design stresses,
 when cylinder tests indicate defective concrete, shall be paid for by the Contractor.

1.05 SUBMITTALS

- A. Submit under provisions of Division 0, General Requirements.
- B. Manufacturer's Data: Submit manufacturer's product data with application and installation instructions for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, joint systems, chemical floor hardeners, and others as may be requested by the Architect.

C. Shop Drawings:

- 1. Shop drawings sheet size shall be 24" x 30" minimum and shall not be a reproduction of the construction documents.
- Reinforcing Steel: The correctness of the bending diagrams is the responsibility of the Contractor. Identify such shop drawings with a reference thereon to sheet and detail numbers from the contract drawings. No reinforcing steel shall be fabricated without approved shop drawings.
- 3. Proposed location of constructions and cold joints when different or in addition to those shown on the drawings.
- 4. Construction mount layout per paragraph 3.05.
- D. Concrete Mix Design: Submit proposed mix design prepared by concrete supplier. Mix design must submitted to Owner for review and acceptance by a recognized independent testing lab, for all structural concrete.

1.06 JOB CONDITIONS

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

PART 2 - PRODUCTS

2.01 FORM MATERIALS

- A. Plywood Forms shall be exterior plyform, in large sheets of adequate thickness to support the imposed loads, but in no case less than 5/8" thick.
- B. Lumber Forms may be used for concrete surfaces that are unexposed and require no further surface applied materials. Lumber, if used, shall be clean and sound 2 x 12 No. 2 grade or better Douglas fir.
- C. Form Coating: Form shall be coated with nongrain-raising and nonstaining types of form coating that will not leave a residual matter on the face of the concrete or adversely affect proper bonding of any subsequent paint or other surface applications.
 - 1. Form coating containing mineral oils or other nondrying materials will not be permitted for any concrete work.
- D. Form Ties: Snap off metal of fixed length: leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than one-inch diameter; manufactured by Burke, Dayton Superior, or accepted equal.
- E. Spreaders: Metal (no wood permitted).
- F. Form Release Agent: Colorless, non-staining, free from Lass; chemically active agent that shall not impair bonding of paint or other coatings intended for use.

2.02 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A615 / A615M -09b with Supplement S1, marked "S", Grade 60 for #4 bar and larger, Grade 40 for bars smaller than #4.
- Furnish 6x6 W1.4xW1.4 welded wire fabric in flat sheets; rolls will not be allowed.
- C. Wire Ties for tying reinforcing steel shall be #16 annealed wire.
- D. Bar Supports: Comply with CRSI "Recommended Practice for Placing Bar Supports, Specifications and Nomenclature, Latest Edition", except as otherwise specified. Wood is not permitted as supports for reinforcing.
- E. Spacers and Chairs: As manufactured by Kalman Steel Company, Concrete Engineering Company, or approved equal.

2.03 CONCRETE MATERIALS

- Portland Cement: ASTM C150 / C150M-09, Type II, low alkali. All cement used shall be of one manufacturer.
 - Use Type IIA cement if pumping of concrete is selected and permitted for placing of concrete.
 - All cement shall contain not more than 0.6 percent total alkali when calculated as sodium oxide as determined by "Methods of Chemical Analysis of Hydraulic Cement", ASTM C114-09b.
- B. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials (Class C is not permitted). Not more than 15% (by weight) may be substituted for portland cement.
- C. Water: Clean and free from deleterious amounts of acids, alkalis, salts and organic matter.
- D. Concrete Aggregates: ASTM C33 / C33M-08 except as otherwise specified hereinafter. All aggregates shall be nonreactive and nondegenerative, and shall consist of sound crushed rock, washed gravel, or a combination of both.
 - 1. Modify fine aggregates when air entrained concrete is used in accordance to Paragraph 4.2.4 of ASTM C33 / C33M-08.
 - Aggregate sources shall be approved by the Architect. Aggregate shall result in shrinkage of concrete not exceeding .048 percent at 28 days. Testing lab shall verify aggregate and concrete shrinkage.
 - 3. Do not use fine or course aggregates that contain substances that are known to cause spalling or adverse reactions in the concrete.
- E. Admixtures: Except for admixtures noted below, no other admixtures shall be used without written approval from the Architect. Where such agents are permitted, they shall be a type approved and used only as directed by the Architect and at no increase in cost to the

Owner. Agents including calcium chloride will <u>not</u> be permitted for use in concrete under any circumstances

- Air Entraining Agents: ASTM C260. Use where specified. The maximum entrained air content shall be no more than 4 percent + 1 percent by volume unless noted otherwise. Approved air entraining agents are Sika AER, Master Builders Micro Air, Darex AEA, and Protex AEA.
- 2. Water Reducing Admixtures: ASTM C494 and ACI 318, Section 3.6. Use where specified. Approved agent is Master Builders Pozzolith 322-N, used at the rate of 5+2 fluid ounces per 100 pounds of cement.

2.04 CRUSHED ROCK BASE

A. Under all new concrete ramps and paving, or as otherwise indicated on the Drawings, provide a minimum of 4 inches of crushed rock fill. Crushed rock fill shall be clean gravel of 1" max. size and have no material passing through a No. 4 sieve.

2.05 JOINT MATERIAL

- A. Provide 3/8" wide fiber expansion joint material, Model No. 320-F, as manufactured by W.R. Meadows or equal.
- B. Provide Snap-Cap as manufactured by W.R. Meadows or equal. Snap-Cap shall have a top plastic edge that can be used for leveling concrete. Once concrete has set up, top edge of Snap-Cap can be pulled free and discarded. Joint shall then be sealed.
- C. Joint sealing material shall be a two-component, self-leveling, polyurethane elastomeric sealant. Product shall be Sikaflex 2cSL as manufactured Sika Corporation, or equal. Color shall be shall be chosen from the full range of manufacturer's standard colors.

2.06 RELATED MATERIALS

- A. Concrete Adhesive and Bonding Agent: "Concresive #1001-LPL" (1-1/2 hour maximum pot life), an epoxy polysulfide type concrete adhesive as manufactured by Master Builders or equal.
- B. Liquid Curing Compound: W.R. Meadows, Product: "Vocomp-20" or equal.
- C. Bonding Adhesive: Burke, Bondcrete-S; use as a modifier for patching and overlays up to 1/2" thick or equal.
- D. Vapor Barrier: Stego Wrap, 15 mil. vapor barrier system, with a Class A rating, and perm rating not to exceed 0.01 perms; by Stego Industries of San Juan Capistrano, CA (877) 464-7834, VaporGuard by Reef Industries (713) 507-4250., Sundance 15 mil Vapor Barrier by Sundance Inc. (855) 300-7156, or 15 mil Husky, Yellow Guard, Vapor Barrier by Poly-America (800) 527-3322. No substitutions will be accepted. System to include Stego Mastic, Stego "Crete Claw Tape" and pipe boots, or accepted equal by the specified manufacturers. Conform to ASTM 1745.
- E. Drilled-in Concrete Anchors: Hilti "Kwik Bolt TZ2" (ICC-ES ESR-4266), Simpson Strong-Tie "Strong-Bolt 2" (ICC-ES ESR-3037) or accepted equal.

- Install per manufacturer's recommendation; use stainless steel for all exterior work.
- 2. Testing required as noted in the Structural Drawings.
- F. Patching Mortar: Meadow-Crete GPS, one-component, trowel applied, polymer enhanced, shrinkage-compensated, fiber reinforced, cementitious repair mortar for horizontal, vertical and overhead applications as manufactured by W.R. Meadows or accepted equalf

2.07 CONCRETE DESIGN



- A. Designed Strength and Classes of Concrete:
 - Class "A" concrete of 1" max. size aggregate shall have 3500 psi 28 day strength with a maximum water to cementitious materials ratio of 0.45. Use for all concrete.
- B. Slump of Concrete: The slump of concrete as determined by the Standard Test Method for Slump of Hydraulic Cement Concrete ASTM Designation C-143 / C143M-09 shall be as follows:
 - 1. Class "A": 4" plus or minus 1" (5" maximum).
- C. Laboratory Mix Design: Concrete designs shall be reviewed by the Testing Laboratory. The concrete mix designs reviewed by the Testing Laboratory and approved by the Project Architect or Structural Engineer shall be used by the Contractor. Contractor shall provide samples of aggregates as required by the laboratory to review the mix designs.
- Water Reducing Admixture: Unless noted otherwise, all concrete shall contain a water reducing admixture.

2.07 CONCRETE MIXING

- A. Ready-Mixed Concrete: ASTM C94 / C94M-09a except as otherwise specified herein.
 - Transit-mixed concrete shall be mixed for a period of not less than 10 minutes at a peripheral drum speed of approximately 200 feet per minute, and mixing shall be continued until discharge is complete. At least 3 minutes of the mixing period shall be at the job. Transit mixers shall be equipped with water measuring devices consisting of either accurately calibrated water tanks or water meters.
 - 2. When outside air temperature is between 85 degrees and 90 degrees, reduce mixing and delivery time from 90 minutes to 75 minutes. When outside air temperature is above 90 degrees, reduce mixing and delivery time to 60 minutes
- B. Job Mixing: Non-structural concrete only. The capacity of the mixer shall be such that it will handle one or more full sack batches. No split sack batches will be permitted except when all materials are weighed. The rated capacity of the mixer shall not be exceeded. The mixing drum shall be equipped with an automatic timing and locking device and with an accurate water gauge for measuring the amount of water used. Mixing time of each batch shall be at least 1-1/2 minutes after all ingredients are in the mixer.

PART 3 – EXECUTION

3.01 FORMS

- A. Build and Erect Forms to conform to the required shapes, patterns, lines, grades and dimensions indicated. Forms shall be substantial and tight to prevent any leakage of mortar, properly braced and tied together to maintain their position and shape. Forms shall not deflect under the dead load weight of the plastic concrete or construction loads. Joints in forming material shall be butted tightly and shall bear on solid construction. Provide tool edges where indicated. Completed form work to be checked for grade and alignment to tolerances not exceeding 1/8" in 10'-0" for top of forms and not more than 1/4" in 10'-0" for vertical face.
- B. Cast-in Items: Set in formwork all new sleeves, inserts, anchors, and similar items furnished and required under the work of other sections. Brace, anchor and support cast-in-items to prevent displacements and distortions.
- C. Clean forms after each use and coat with release agent as required.
- D. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.
- E. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.
- F. Build in securely braced temporary bulkheads, keyed as required, at approved locations of construction joints.
- G. Slope tie-wires downward to outside of wall.
- H. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.
- I. No metal or wood stakes are allowed in areas to be concreted.

3.02 REINFORCEMENT FABRICATION

- A. Steel reinforcement shall not be bent or straightened in a manner that will injure the material. Bars with kinks or bends not shown on the Drawings shall not be used. Heating of the bars for bending will not be permitted.
 - Spacers and chairs shall be as specified or detailed and spaced such that steel reinforcement will be carried without deflection.
 - 2. Concrete blocks may be used to support bottom layer of steel in floor slabs on grade.
 - 3. Bars shall be in long lengths with laps and splices as shown. Offset laps 5'-0" minimum in adjacent bars. Place steel with clearances and cover as shown. Bar laps shall be as indicated on the drawings. Tie all laps and all intersections with specified wire. Maintain clear space between parallel bars not less than 1-1/2 times

- nominal diameter for round bars, or twice side dimension for square bars, but in no case shall clear space be less than 1-1/2", nor less than 1-1/2 times maximum size concrete aggregate.
- 4. Reinforcing dowels for slabs shall be placed as detailed. Grease one penetration so that pour will not bond to dowel. Sleeves may be used if approved by the Architect before installation. Install dowels through all construction and expansion joints for all slabs on grade.
- Install welded wire fabric in lengths as long as possible. Lap adjoining pieces at least one full mesh and lace splices with wire ties. Offset laps of adjoining widths to prevent continuous laps in either direction.
- 6. Cut bars true to length with ends square and free of burrs.
- B. Drawing Notes: Refer to notes on Drawings for additional reinforcement requirements.
- C. Welding of reinforcing bar shall be performed only where indicated on plans and in compliance with AWS D1.4. All welding of reinforcement is to be inspected in accordance with CBC Table 1705A.2.1, Item 5(b).

3.03 CONCRETE PLACEMENT

- A. Surrounding Conditions: Before any concrete is placed, the following items of work shall have been completed in the area of placing.
 - 1. Forms shall have been erected, adequately braced, cleaned, sealed, lubricated if required, and bulkheaded where placing is to stop.
 - Any wood forms other than plywood shall be thoroughly water soaked before placing any concrete. The wetting of forms shall be started at least 12 hours before concreting.
 - 2. Reinforcing steel shall have been placed, tied, supported, and, at the time the concrete is placed around it, shall be cleaned of rust, scale, mill scale or other coatings that will destroy or reduce bond.
 - Embedded work of all trades shall be in place in the forms and adequately tied and braced.
 - 4. The entire place of deposit shall have been cleaned of dirt, chips, sawdust, rubbish, debris, hardened concrete and other foreign matter before concrete is deposited therein. No wooden ties nor blocking shall be left in concrete except where indicated for attachment of other work.
 - Concrete surfaces to which fresh concrete is to be bonded shall be saw cut and broken away as indicated. Surfaces shall be brush cleaned to remove all dust and foreign matter and to expose the aggregate, and then coated with the bonding adhesive herein specified.
- B. Conveying Concrete from mixer to forms shall be as rapid as possible.
- 1. Ready-mixed concrete shall be mixed and delivered in accordance with ASTM C94
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/ C94M-09a. A delivery ticket shall be furnished for each load of ready-mix or transit-mix concrete. A copy of each delivery ticket shall be handed to the job superintendent at the time of delivery and unloading. A record copy of the delivery tickets shall be forwarded to the Architect for his files.

- 2. Conveying equipment shall be of a sufficient capacity to ensure a practically continuous flow of concrete to the placing point without separation or loss of materials. Carts and buggies shall be equipped with pneumatic tires. Runway supports shall not bear on reinforcing or fresh concrete. All conveying equipment shall be thoroughly cleaned before beginning and at frequent intervals during the placing of the concrete.
 - a. Chutes, if employed, shall slope not less than 4" or more than 6" per foot of horizontal run.
- Exercise care not to spill concrete on forms and reinforcing steel during the conveying operations. Where such spillage or splattering occurs, the surfaces shall be thoroughly cleaned before concrete hardens.
- C. Placing Concrete: Notify the Architect at least 48 hours in advance of beginning of pouring operations. Under no circumstances shall concrete that has partially hardened be deposited on the work. No concrete shall be placed during rainy weather without the Architect's approval.
 - The Project Inspector shall keep a record on the site of the time and date of placing the concrete in each portion of the structure in accordance with CBC Section 1705.3.6. The record shall be kept until the completion of the structure and a copy provided to the Architect.
 - Before starting new pour on or against concrete that has hardened, forms shall be retightened and the hardened concrete roughened and thoroughly cleaned of foreign matter and any laitance by sandblasting. Just ahead of the new pour, slush joints with a 2" layer of grout of the designated concrete mix minus 50 percent of the large aggregate.
 - 3. Reinforcing steel exposed to the sun shall be cooled by a water spray prior to the placing of concrete.
 - 4. No adjustment of steel reinforcement will be permitted during the placement of concrete.
 - 5. Concrete shall be scheduled so that the placing is a continuous operation for the completion of each section between predetermined construction joints. If a planned concreting operation cannot be carried on continuously, the concreting shall stop at temporary bulkheads. Locate where resulting construction joints shall be as shown on the Drawings or as approved by the Architect. Prior to placing of concrete for any concrete slabs, the moisture content of the subgrade below the slabs shall be adjusted to at least optimum moisture.
 - Deposit the concrete in forms as nearly as practicable in its final position to avoid flowing and maintain until completion of the unit an approximate horizontal plastic surface. Thoroughly compact all concrete during placing operations, thoroughly around reinforcement, embedded fixtures or accessories, and into the corners of

forms to eliminate air pockets and honeycombing. Compacting shall be done with mechanical vibrators. Vibrators shall not be used to cause concrete to flow horizontally. Thoroughly compact concrete to the forms to release the air and secure full contact of the concrete with the forms.

- 7. Hot Weather Concreting: Concrete placing and finishing operations during hot weather shall be done as quickly as possible. Ample personnel shall be available to handle and place the concrete immediately after its mixing or delivery to the site of the work. Concrete shall be placed in layers thin enough and over areas small enough to ensure complete bond and union of adjacent layers, and thus prevent "cold joints".
 - a. At air temperatures of 80 degrees Fahrenheit or above the following precautions should be taken:
 - In no case shall the temperature of the concrete exceed 90 degrees Fahrenheit when placed in the work.
 - 2) If necessary to produce and maintain concrete at an acceptable temperature, chopped or crushed ice shall be added directly into the mixer up to 50 percent by weight of the mixing water used, the weight of the ice being included in batch weight of the mixing water. The ice shall be added at such a rate and in such a manner that it will be completely melted by the time concrete is mixed.
 - 3) Stockpiled aggregates shall be saturated and kept surface moist by continuous fog spray or by intermittent sprinkling.
 - 4) Forms, reinforcements and subgrade surfaces shall be wet down immediately before concrete is placed in contact therewith. Remove all excess water before placing concrete. Wetting down of areas around the work to cool the surrounding air and increase the humidity is recommended.
- 8. Cold Weather Requirements: Do not place concrete when ambient temperature is below 40 degrees Fahrenheit and falling.

3.04 CONCRETE FINISHING

- A. All Concrete Work, except as otherwise specified, shall be of a quality that will present a finished appearance upon the stripping of the forms. Only a minimum of patching and finishing should be necessary as required to fill holes left by form ties and to remove any fins or minor irregularities left by the joints in the forms. Except as otherwise specified, all concrete surfaces shall be finished as follows:
- B. Final Tooling: Tool edges of paving, gutters, curbs and joints formed in fresh concrete with a jointing tool to a radius of 1/4". Repeat tooling of edges and joints after applying surface finishes. Eliminate tools marks on all concrete surfaces.
- C. Polish finish concrete areas where indicated on the Drawings and per Section 03 35 43, Concrete Polishing.

- A. Control joints shall be saw cut into concrete as soon as concrete slab can be walked on. Do not wait until the following day to saw cut concrete slab control joints.
- B. Construct contraction, construction, and isolation joints true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to the centerline unless otherwise indicated.
- C. Joints at Existing Concrete: All joints between existing concrete and new concrete are to include dowels at a minimum of #4 bars @ 4'-0" on center, 18" maximum from the ends, epoxy set into existing concrete a minimum of 6" in length at the centerline of existing concrete slab.
- D. Contraction Joints (Control Joints): Provide weakened-plane contraction joints, sectioning concrete into areas indicated. Construct contraction joints for a depth equal to at least 1/4 of the concrete thickness. Form in fresh concrete by grooving and finishing each edge of joint with a radiused jointer tool. Joints to be spaced at 10' on center maximum or as shown on the drawings.
- E. Construction Joints: Set construction joints at side and end terminations of concrete placement and at locations where placement operations are stopped for more than 1/2 hour, unless placement ends at isolation joints.
 - 1. Provide preformed galvanized steel or plastic keyway-section forms or bulkhead forms with keys. Use Burke "Keyed Kold Joint Header Form" or approved equal. Embed keys at least 1 1/2" into concrete.
 - 2. Continue reinforcement across construction joints.
 - 3. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.
- F. Isolation Joints (Expansion Joints): Form isolation joints of performed joint filler strips abutting concrete curbs, catch basin, manholes, inlets, structures, walks, other fixed objects, and where indicated.
 - 1. Extend joint fillers full width and depth of joint, not less than 1/2" or more than 1" below finished surface where a joint sealant is indicated. Place top of removable joint filler flush with finished concrete surface.
 - 2. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary, removable performed cap.
 - 3. After concrete has set up, remove cap exposing top edge of fiber joint filler, and apply joint sealant.
- 3.06 **PUMPING OF CONCRETE** (may be permitted for concrete, providing the following):
 - A. The Contractor engages a testing laboratory to design concrete mixes for pumping. Trial batches shall be made and tested as required hereinbefore for typical concrete.
- B. The quality and proportioning of aggregates for pumping conditions shall be determined in accordance with ACI, Recommended Practice 613. Aggregate proportioning must be SACRAMENTO CITY UNIFIED SCHOOL DISTRICT **FACILITIES OFFICE SPACE PLANNING**

- tailored to the particular pump intended for use.
- C. When starting a pump operation, actual pumping of concrete shall be preceded by a mortar mix (concrete without coarse aggregate) for the purpose of lubrication.
- D. All mortar and concrete leakage resulting from pumping operations shall be removed from formwork, reinforcing steel and any finished surface.

3.07 CURING

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperature. Comply with the recommendations of ACI 306R for cold weather protection and ACI 305R for hot weather protection during curing.
- B. Evaporation control is to be implemented in hot, dry and windy weather by protecting concrete from rapid moisture loss before and during finishing operations with an evaporation control material. Apply in accordance with manufacturer's instructions after screeding and bull floating, but not before floating.
- Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination.
 - For moisture-curing, keep surfaces continuously moist for not less than 7 days with water, a continuous water-fog spray, or absorptive cover kept wet continuously wet
 - 2. For moisture-retaining-cover, cover concrete with moisture retaining cover with side and end laps sealed.
 - 3. For curing compound, apply in accordance with manufacturer's instructions. Recoat areas subjected to rainfall within 3-hours after initial application.
- D. Forms shall remain in place for not less than the following periods of time. These periods represent minimum cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
 - 1. Vertical forms of foundations and walls: 5 days.
 - Slab edge screens or forms: 7 days.
 - Concrete columns and beam soffits: 28 days.

3.08 CLEANING AND PROTECTION

- Clean all surfaces and leave in satisfactory condition to receive final finish surface treatment.
- B. Protect concrete surfaces from damage by tools, equipment, material and workmen. No traffic, shoring or other loading will be permitted until concrete has hardened sufficiently to prevent injury to finish and strength, but at least 14 days.
 - 1. Remove surface stains and spillage of materials as they occur.

2. Sweep concrete and wash free of stains, discolorations, dirt, and other foreign material prior to final inspection.

END OF SECTION 03 30 00

AD02.02 01/14/2025

SECTION 07 26 00 VAPOR RETARDERS

PART 1 - GENERAL

1.01 SUMMARY

A. SECTION INCLUDES

- Concrete Vapor Emission Control System for remediation of excessive slab moisture and / or alkyd levels.
- 2. Repairs and preparation of concrete substrate and to install the concrete vapor emission control system.
- 3. Subfloor testing after concrete treatment.

B. RELATED SECTIONS

- 1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
- 2. Section 03 30 00: Cast-in-Place Concrete
- 3. Section 09 65 00: Resilient Flooring.
- 8. Section 09 68 00: Carpet.

C. REFERENCES

- 1. ASTM C920-14 Elastomeric Joint Sealants.
- 2. ASTM E96 / E96M-16 Test Method for Water Vapor Transmission of Materials.
- 3. ASTM F710-11-Practice for Prepping Concrete Floors to Receive Resilient Flooring.
- 4. ASTM F1869-16 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
- ASTM F2170-16 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

1.02 QUALITY ASSURANCE

A. Manufacturer Qualifications:

- 1. Ten-year experience in producing moisture vapor control emission products.
- 2. Minimum \$5-million product liability insurance policy from an A-rated carrier.
- 3. A warranty program covering coats associated with repair or replacement of concrete vapor emission control system and finish floor covering or coating, including repair or replacement labor.

B. Installer Qualifications:

- 1. Installer shall have experience in the installation of floor covering or floor coatings and shall have experience in the installation of concrete vapor emission control systems.
- 2. Floor covering installer must be factory trained and certified for the installation of the specific products being installed.
- 3. Installer to provide project inspector proof of certification prior to starting work.

4. Certified installer must be present on job site while work is in progress.

C. Testing Laboratory Qualifications:

1. Certified, bonded, qualified and experienced agency to perform pH and moisture vapor emission tests.

D. Pre-installation Meeting:

- 1. Contactor to notify Construction Manager with a minimum of 5-days' notice when anticipated to be ready for pre-installation meeting.
- 2. Contractor, installer and manufacturer representative are required to attend pre-installation meeting. Contractor is responsible for coordinating and scheduling their attendance.
- 3. Construction Manager will schedule meeting with Contractor team, Project Inspector, and Architect.
- 4. Purpose of Meeting: To review subfloor condition and test results; determination of appropriate treatment system(s) and location(s); and review installation requirements.

1.03 SUBMITTALS

- A. Provide a complete submittal package with all components required within this section. Submit per Section 00 72 00.
 - 1. Product Data: Provide product data describing physical and performance characteristics, material safety data sheets, certificates, warranty information and manufacture's installation instructions for proposed product.
 - 2. Submit product manufacturer's field reports and test reports with warranty certification.
 - 3. Submit anhydrous calcium chloride testing according to ASTM F1869 and RH Probe Tests results according to ASTM F2170. Submit substrate pH readings. Tests shall be performed by the Owner's Inspector and results provided to the Architect, Owner, General Contractor, flooring installer and Water Vapor Reduction System Manufacturer's Representative.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Store products in an approved ventilated dry area; protect from dampness, freezing, and direct sun light. Product should not be stored in areas with temperatures in excess of 90 °F or below 50 °F.

1.05 ENVIRONMENTAL REQUIREMENTS

- A. Areas to receive Vapor Emission Control System shall be clean, fully enclosed, weather tight with the permanent HVAC set at a uniform temperature per manufacturer's recommendation.
- B. Maintain ambient temperature required by manufacturer three days prior to, during, and 24 hours after installation of Vapor Emission Control System.
- C. Do not apply moisture vapor reduction system to unprotected surfaces or when water is accumulated on the surface of the concrete.

- D. Do not apply water vapor reduction system when temperature is lower than 50° F or expected to fall below this temperature within 24 hours from time of application.
- E. Protection: Protect water vapor reduction system to prevent damage from topical water for a minimum period of 24 hours from time of application.

1.06 WARRANTY

- A. Contractor shall file a pre-installation checklist with the manufacturer (as required) and receive written confirmation of the approval to proceed in order to obtain full warranty.
- B. Emission control system warranty must be from the manufacturer, in writing, and cover the cost of system materials, cementitious compounds and labor costs of application and preparation. In addition, the warranty must extend to the flooring material, adhesive and installation labor.
- C. Warranty period shall be no less than ten years or the life of the flooring covering whichever comes first.
- D. Warranty exclusion shall be limited to:
 - 1. Moisture failure due to topical intrusion of plumbing failure or other substances entering from the surfaces.
 - 2. Seismic damage occurring after installation.
 - 3. Replacement of flooring during warranty period as removal of flooring could damage emission control system.
 - 4. Aggregate found to be defective (expansive and reactive aggregate are examples).
- E. Warranty shall not exclude cracks visible at time of installation nor "improper installation".
- F. Manufacturer to provide evidence of a product liability insurance policy. Insurer shall have no less than an "A" rating from one of the four major rating services. A certificate of insurance shall be delivered to the Owner and shall name the Owner, Architect and General contractor as co-insured. Liability shall be in the amount of \$5 million per occurrence.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Vapor Emission Control System: The appropriate system(s) shall depend on the existing slab moisture and pH levels and the requirements of the specific floor covering product. The determination of which of the following systems would be most appropriate and the extent of treatment area(s) shall be made by the Owner's representative once the existing slab testing results are known.
- 1. Koester VAP1 2000 System. 100% solids epoxy.
- 2. Mapei Planiseal VS System. An alkali-resistant, two-component, 100%-solids epoxy coating that effectively stops moisture-related problems with floor coverings.

3. ARDEX MC™ RAPID.100% solids epoxy system.

2.02 MIX DESIGNS

A. VAP1 2000:

- 1. Use clean containers and mix thoroughly as per Manufacturer's requirements to obtain a homogeneous mixture. Use a low-speed motor less than 400 rpm and a two bladed Jiffy mixing blade only. DO NOT AERATE. Mix ratios are measured by volume.
- 2. VAP I® 2000 Mix Ratio: Mix Component A and B at a ratio of 2.4:1 by volume.

B. Mapai Planiseal VS:

- 1. Premix Part A to a homogenous consistency (2 to 3 minutes) using a low-speed mixer (at 300 to 450 rpm) and a "jiffy" (paint mixer) mixing paddle.
- 2. Pour Part B into Part A container and mix thoroughly to a smooth, homogenous consistency. Do not mix at high speeds, which can trap air within the mixed material.
- 3. Pour and spread the entire unit of any mixed Planiseal VS onto the substrate within 5 minutes of mixing.

C. ARDEX MC PLUS:

- 1. Each individual unit of ARDEX MC RAPID™ Red and ARDEX MC RAPID™ Green contains separate, pre-measured quantities of the hardener (Part A) and the resin (Part B). The hardening agent (Part A) is added to the resin (Part B).
- 2. ARDEX MRP and/or ARDEX K 301 are mixed in 2-bag batches at one time. Mix each bag of powder with the prescribed amount of water using an ARDEX Mixing Paddle and a 1/2" heavyduty drill (min. 650 rpm). Mix thoroughly for approximately 2-3 minutes to obtain a lump-free mixture. Follow written installation instructions for each material.
- 3. For mix designs related to the use of ARDEX underlayment's and toppings, refer to the standard mixing instructions for installation over concrete as shown in the manufacturer's installation instructions.
- 4. For instructions on the filling of dormant cracks and joints, follow the written instructions of the selected epoxy manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Calcium Chloride, RH Probe and pH test requirements:
 - 1. Anhydrous calcium chloride testing shall be performed by the Owner's Inspector.
 - 2. Provide anhydrous calcium chloride tests according to ASTM F1869 protocol.
 - 3. Provide RH Probe Tests according to ASTM F2170 protocol.
 - 4. Only conduct calcium chloride tests at the same temperature and humidity expected during normal use. If this is not possible then follow the F1869 method for non-acclimated spaces. Maintain these conditions 48 hours prior to and during tests. Water vapor transmission levels are directly affected by ambient room temperature and readings conducted without a sustained ambient temperature and humidity are NOT acceptable.
 - 5. Provide substrate surface pH readings.

6. Owner's Inspector shall provide test results with a marked-up floor finish plan showing test result. Inspector shall provide a written clarification on status of the ambient air temperature and humidity before and during the testing procedures.

B. Concrete Slab Inspection

- 1. Existing concrete slabs Testing for concrete deficiencies and contaminates such as un-reacted silicates, chlorides, A.S.R. (alkali-silica reaction), oil contamination, etc. is recommended by Koster to avoid bonding issues. These conditions can cause bonding concerns with all epoxy and finished floor coatings, including the Koster VAP 1 2000. This testing is not required by Koster. This testing should be performed by the owner's independent testing agency using utilizing standard coring methods and review of the history of the slab installation if available. Concrete should conform to ACI Committee 201 Report "Guide to Durable Concrete."
- 2. New concrete slabs Review Section 03 30 00 curing compounds. Silicate based curing compounds should be avoided.

3.02 PREPARATION

- A. Inspect all surfaces with regard to their suitability to receive moisture vapor reduction system with manufacturer's representative.
- B. Clean all surfaces to receive moisture vapor reduction system. Shot blast all floors to a CPS #3 or #4 and clean surfaces with vacuum and remove all residue off the concrete. Grinding is allowed only in areas not accessible by shot blasting. Do not acid etch. Remove ALL defective materials, and foreign matter such as dust, adhesives, gypsum based patching and leveling compounds, paint, dirt, unreacted sprayed on silicates, floor hardeners, bond breakers, oil, grease, curing agents, form release agents, efflorescence, laitance, shot blast bee bees, etc. Repair all cracks, expansion joint, control joints, and open surface honeycombs and fill in accordance with Manufacturers recommendations. Inform vapor reduction system manufacturer if concrete additives like silicates or chlorides or any other soluble compounds that have been used in the concrete mix or topically applied. Reinforcing fibers that are visible after shot blasting must be removed and vacuumed leaving no fibers left on the concrete surfaces. Provide uncontaminated, sound surface.
- C. Repair concrete prior to moisture vapor reduction system. Consult with vapor reduction manufacturer to determine suitable products for concrete repair.
- D. Shot blast a small test area and review surface profile with the finished flooring applicator. As the moisture vapor reduction system is not a leveling material make sure the flooring installer is aware that a feather finish or leveling material may be utilized to "flatten" the concrete after the application of the moisture vapor reduction system and prior to the flooring installation.
- E. Clean substrate surfaces to receive system treatment and treat surface irregularities with a 100% Portland Cement based patching compounded and cementitious fill compatible with prescribed system treatment as recommended by the manufacturer of the moisture control system.
- F. At all treated locations under finish goods i.e. carpet, VCT, etc., install self-leveling material to provide a smooth and uninterrupted concrete substrate for proper installation of floor finish.

3.03 JOINT AND CRACK PREPARATION

A. VAP1 2000:

- 1. Fill cracks, control joints, voids and deteriorated concrete with CTS Cements Rapid Set Cement All, Mortar Mix, Concrete Mix or Skim Coat prior to the VAP I 2000 application. Allow the products to cure according to Rapid Set's requirements before applying the VAP products over the repaired area. Do not use gypsum based cementitious patching, leveling and repair mortars under the VAP I 2000 systems. Cracks should be opened up to at least 1/4" x 1/4" to allow for a proper amount of Rapid Set materials to fill the voids. Any cracks/voids that may be contaminated by known or unknown substances should be routed out to remove any contaminants.
- 2. Expansion joints should be repaired per the detail on the VAP I 2000 data sheets. A fumed silica epoxy thickening agent (Aerosil or Cabosil) can be added to the VAP I 2000 products and used in place of cementitious materials for control joints and cracks if needed.
- 3. Consult with Koster America for crack general repair guidelines.

B. Mapai Planiseal VS:

- 1. Repair cracks before application of the Planiseal VS using an appropriate high-modulus epoxy (Planibond EBA or Planibond CR 50) mixed with sand if required (depending on the size of crack under repair). Cracks narrower than 1/8" (3mm) may typically be filled with Planiseal VS neat. Cracks wider than 1/8" (3mm) are to be repaired with suitable high-modulus epoxy such as Planibond EBA or Planibond CR 50 (consider an epoxy mortar if appropriate) filled to 1/8" to ½" (3 to 6mm) shy of the substrate surface (just below flush).
- 2. Avoid overfilling of cracks with high-modulus epoxies that will lead to epoxy spilling onto substrate. Any epoxy that spills onto the substrate surface must be removed, and any remaining residue must be fully seeded with sand. The subsequent application of the Planiseal VS must take place after all loose sand have been vacuumed up off the floor, and fully encapsulate the epoxy utilized for crack repair.
- 3. Contraction, control or saw-cut joint treatment Dormant control joints may typically be filled with Planiseal VS, or with Planibond EBA or Planibond CR 50 (consider an epoxy mortar if appropriate) filled to 1/8" to 1/8" (3 to 6mm) shy of the substrate surface (just below flush).

C. ARDEX MC:

- 1. Moving Joints honor all expansion and isolation joints up through the ARDEX Moisture Control System, and underlayment or topping.
- 2. Saw cuts, control joints and dormant cracks –To ensure that a continuous barrier to moisture emissions is created over the entire surface, ARDEX recommends the use of a two-part, low viscosity rigid epoxy crack and joint filler to fill small, non-moving cracks and saw-cut joints in existing concrete substrates. Cracks greater than a hairline in width [1/32" (0.79 mm)] and saw-cuts must be filled in strict accordance with the installation instructions provided by the ARDEX Technical Department. Once the dormant cracks and saw-cuts have been properly filled, allow these areas to cure thoroughly in accordance with the epoxy manufacturer's recommendations prior to proceeding with the ARDEX MC™ RAPID installation.
- 3. Saw Cuts, Control Joints and Dormant Cracks fill all non-moving joints and cracks greater than 1/32" with a rigid, low-viscosity, two-part epoxy joint sealant. Once the cracks and joints have been properly filled, broadcast a sand layer to refusal and allow these areas to cure as

recommended by the epoxy manufacturer prior to proceeding with the installation of the ARDEX MC™ RAPID.

3.04 INSTALLATION (per manufacturer's guidelines or as follows)

- A. The coverage rates vary by system. Follow manufacturer recommendations for the specific project application.
- B. Application of moisture reduction system shall be in strict accordance with manufacturer recommended methods and installation information.
- C. Cementitious underlayment with suitable primer is recommended if required by the Owner, floor covering installer, or the floor covering manufacturer to smooth and/or level surfaces after shot blasting and installation of the moisture reduction system. No underlayment or feather finish system is allowed under the moisture reduction system material. When water-based adhesives are utilized in the floor covering installation, use an approved cementitious underlayment system with primer prior to the installation of the flooring system. Contact the adhesive manufacturer for their minimum recommended thickness of cementitious underlayment to absorb excess moisture in the adhesive. Typically, a minimum of 1/8" is required. Note this is only for some water-based adhesives.

3.05 PROTECTION

- A. Prohibit any traffic or any activity that generates dust or debris from contaminating the treated slab until finished flooring is installed.
- B. Do not install finished flooring until the vapor control system has fully cured in accordance with manufacturer's recommendations.

END OF SECTION 07 26 00

AD02.03 01/14/2025

SECTION 09 65 16 RESILIENT FLOORING AND BASE

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Resilient Luxury Vinyl Tile Flooring.
 - 2. Rubber Flooring.
 - 3. Topset Resilient Base.
 - 4. Accessories.

B. Related Sections:

- 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.
- 2. Section 07 26 00: Vapor Retarders.
- 3. Section 09 68 00: Carpet.

1.02 SUBMITTALS

- A. Submit per the requirements the General Conditions for each product specified.
 - 1. Product Data: Provide product data describing physical and performance characteristics, sizes, patterns, colors, material safety data sheets and manufacturer's installation instructions for all proposed products.
 - 2. Submit samples for color selection illustrating color and pattern for floor material.

1.03 QUALITY ASSURANCE

- A. Flooring Contractor Installer Qualifications:
 - 1. Flooring Contractor to be an established firm experienced in the installation of the specified product and shall have access to all manufacturers required technical, maintenance, specifications and related documents.
 - 2. Floor covering installer must be factory trained and certified for the installation of the specific products being installed.
 - 3. Installer to provide project inspector proof of certification prior to starting work.
 - 4. Certified installer must be present on job site while work is in progress.

1.04 PROJECT CONDITIONS

- A. Install resilient products after other finishing operations, including painting, have been completed.
- B Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Storage and Protection: Store materials protected for exposure to harmful weather conditions and at a temperature and humidity conditions recommended by manufacturer. Materials should be stored in areas that are fully enclosed, weather tight with the permanent HVAC system set at a uniform temperature of at least 65 degrees F 48 hours prior to, during, and after installation.

Maintain ambient relative humidity between 40% and 60% during installation.

1.05 WARRANTY

- A. Installation Warranty: Two (2) year installation warranty commencing on recordation date of the Notice of Completion.
- B. Manufacturer's Warranty: Five (5) year manufacturer warranty commencing on recordation date of the Notice of Completion.

PART 2 - PRODUCTS

2.01 RESILIENT VINYL PLANK FLOORING (LVT) AND RUBBER FLOORING

- A. Manufacturer
 - 1. Interface
 - www.interface.com
 - 2. Approved equal meeting all specified requirements herein, including matching colors, textures and patterns.
- B. Performance Requirements
 - 1. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 2. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
 - 3. Flooring products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- C. Product Type, LVT2, Interface, "Studio Set Vol. 2" line.

1. Construction: High Performance Luxury Vinyl Tile

2. Class / ASTM F1700: Class III Printed Vinyl Plank

Wear Layer Thickness: 22 mil.
 Total Thickness: 4.5 mm

5. Backing Class: Commercial Grade

6. Finish: Ceramor

7. Nominal Dims. 25 cm x 1 m (9.85" x 39.4")

8. Slip Resistance (ASTM D2047) >0.55 wet/dry, ADA Compliant

9 Static Load Limit (ASTM F970) 1,500 psi 10. Flexibility (ASTM F137) Passes 11. Radiant Flux (ASTM E648) Class I 12. Residual Indentation (ASTM F1914) Passes 13. Chemical Resistance (ASTM F925) Passes

14. Color/Texture As selected by Architect at time of submittal
 15. Color Allowance See drawings for quantities and distribution

16. Install Pattern Ashlar

17. Installation Materials

- a. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation.
- b. Adhesives: XL Brands Adhesive 2000 Plus, XL Brands HM99 High Moisture Adhesive as recommended by Interface to meet site conditions.

D. Provide a minimum of one (1) unopened cartons of each type of LVT and rubber flooring used.

2.03 RUBBER BASE AND ACCESSORIES

- A. Manufacturer
 - 1. Roppe Rubber Corp. (Specified)
 - 2. Armstrong.
 - 3. Burke Industries.
 - 4.. Approved equal.
- B. Performance Requirements,
 - Topset Base
 - a. Conforming to ASTM F 1861 or FS-SS-W-40, Type 1 with matching end stops and manufactured performed outside corners. 6" high and 1/8 inch gauge.
 - b. Colors as selected by Architect from Manufacturer's full range of standard colors at time of submittal.

C. Accessories

- Resilient Edge Strips/Reducer Strips: Tapered or bullnose, minimum of 1 inch wide, as recommended by flooring manufacturer for specific application. Use at transition from wainscot wall finish to painted gypsum board and as otherwise required at flooring transitions.
- 2. Adhesive: Zero VOC, waterproof, high moisture rated, as recommended by flooring manufacturer for specific application.
- 3. Primer: Non-staining type as recommended by flooring manufacturer.
- 4. Leveling and Patching Compounds: Provide as recommended by flooring manufacturer for specific application.
- D. Provide a minimum of 10 lineal feet of base and transition pieces of each material and color specified.

2.05 ACCESSORIES

A. Manufacturer's standard accessories not specified but required for a complete installation.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Prepare substrates according to Tarkett written instructions to ensure proper adhesion of Resilient Flooring.
- B. Prepare concrete substrates in accordance with ASTM F 710.
 - Concrete floors must be free of dust, solvent, paint, wax, oil, grease, residual adhesive, adhesive removers, film-forming curing compounds, silicate penetrating curing compounds, sealing, hardening or parting compounds, alkaline salts, excessive carbonation or laitence, mold, mildew, and other foreign materials that may affect dissipation rate of moisture from the concrete, discoloration or adhesive bonding.
 - 2. Mechanically remove contamination on the substrate that may cause damage to the resilient flooring material. Permanent and non-permanent markers, pens, crayons, paint, etc., must not be used to write on the back of the flooring material or used to mark the substrate as they could bleed through and stain the flooring material.
- C. Fill cracks, holes, depressions and irregularities in the substrate with good quality Portland cement based underlayment leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- Do not install resilient products until they are same temperature as the space where they are to be installed. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.03 RESILIENT PLANK FLOORING INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient tile flooring.
- B. Luxury Vinyl Tile Flooring:
 - Install with Interface adhesive specified for the site conditions and follow adhesive label for proper use.
 - 2. Follow manufacturer's recommendation for tile orientation for Ashlar pattern.
 - 3. Open enough cartons of floor tiles to cover each area, and mix tile to ensure shade variations do not occur within any one area.
 - 4. Roll the flooring in both directions using a 100 pound three-section roller.

3.04 BASE MATERIAL INSTALLATION

A. Install resilient wall base on entire wall perimeter including toe spaces and open ends of cabinets and within accessible knee space of sink bases. Set all bases in adhesive as recommended by the manufacturer. All joints in bases, including those at any preformed comers, shall be plumb, flush, tight and inconspicuous. Seat top edge and back of base firmly against the wall. Interior corners shall be mitered and tightly fitted.

3.05 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- B. Perform the following operations immediately after completing resilient product installation.
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
 - 1. No traffic for 24 hours after installation.
 - 2. No heavy traffic, rolling loads, or furniture placement for 48 hours after installation.
- D. Wait 48 hours after installation before performing initial cleaning.

END OF SECTION 09 65 16

SECTION 09 68 00 CARPET

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

- 1. Broadloom carpet.
- 2. Integrated walk-off mats
- 3. Subfloor testing and preparation.
- 4. Installation of vapor retarder.

B. Related Sections:

- 1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
- 2. Section 03 30 00: Cast-in-Place Concrete.
- 3. Section 07 26 00: Vapor Retarders.
- 4. Section 09 29 00: Gypsum Board Systems (for all materials to receive base).
- 5. Section 09 65 16: Resilient Flooring and Base (and Accessories) (for resilient base to be provided for this Section).

1.02 REFERENCES

- A. ANSI/ASTM E648-15e1 Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- B. ASTM F1869-16 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

1.03 QUALITY ASSURANCE

- A. Manufacturer, Contractor, and Installer Qualifications:
 - 1. Manufacturer: Company specializing in contract flooring with ten years' minimum experience.
 - 2. Flooring Contractor: Company with five years' minimum documented experience, approved by manufacturer for the installation of the specified products and shall have access to all manufacturers required technical, maintenance, specifications and related documents.
 - 3. Installer:
 - a. Floor covering installer must be factory trained and certified for the installation of the specific products being installed.
 - b. Installer to provide project inspector proof of certification prior to starting work.
 - c. Certified installer must be present on job site while work is in progress.
 - 4. Testing Laboratory:
 - a. Certified, bonded, qualified and experienced agency to perform pH and Relative Humidity (RH) emission tests.

- B. Pre-Floor Covering Installation Meeting:
 - 1. Contactor to notify Construction Manager with a minimum of 5-days' notice when anticipated to be ready for pre-floor covering installation meeting. (After subfloor preparation is complete and ready for floor covering installation.)
 - 2. Contractor, installer, and manufacturer representative are required to attend pre-floor covering meeting. Contractor is responsible for coordinating and scheduling their attendance.
 - 3. Construction Manager will schedule meeting with Contractor team, Project Inspector, and Architect.
 - 4. Purpose of Meeting: To review subfloor preparation, verification of readiness for floor covering installation and use of correct products, verification of the acclamation of correct finish materials and review installation requirements.

C. Manufacturer's Field Services:

- 1. Manufacturer representative to attend the "Pre-Flooring" meeting.
- 2. Upon Owner or Architect's request, and with at least 72-hour notice, provide manufacturer's representative site visit(s) for inspection of product installation.
- 3. At the Owner's request, manufacturer representative to attend operation and maintenance training meeting for Owner's custodial staff prior to acceptance of floor covering installation.

1.04 SUBMITTALS

- A. Provide a complete submittal package with all components required within this section. Submit per Section 01 33 00.
 - 1. Product Data: Provide product data describing physical and performance characteristics, sizes, patterns, colors, material safety data sheets, and method of seaming and manufacturer's installation instructions for all proposed products.
 - 2. Shop Drawings:
 - a. Provide a floor plan indicating all proposed seam locations and integrated walk-off mats. Indicate method of joining seams, and direction of carpet.
 - 3. Samples:
 - a. Submit samples for color selection illustrating color and pattern for floor material with samples of matching walk-off mats, rubber base and transition material proposed for installation.
 - b. Submit sample of solvent welded seam.
 - 4. Maintenance Data: Submit manufacturers recommend cleaning and maintenance data. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
 - 5. Recycled Content Percentage Submittals
 - 6. Submit a statement signed by the manufacturer's Executive Officer or independent certification third-party that the provided carpet materials have the specified recycled material percentage.
 - 7. Submit documentation of manufacturer's take-back program for carpet. Including:
 - a. Confirmation that the new carpet being installed will be accepted (at the point of future replacement) through a manufacturer's operating program for recycling or reuse.
 - b. Written description of such a process for the recycling and/or recovery of used/worn products.
 - c. Contact information for the take-back program.

- 8. Existing Carpet Recycling Plan and Recycling Certification. Submit documentation describing the reclamation plan for existing carpet. Include appropriate contact information, overview of procedures, and limitations and conditions applicable to the project Carpet recycling options consist of:
 - 1. Repurposing reusing the product in another application such as facilitating the donation of used carpeting to charities and other nonprofit organizations.
 - 2. Closed Loop Recycling turning waste materials into new materials of the same value, such as vinyl backing into vinyl backing and nylon yarn into nylon carpet yarn.
 - Open Loop Recycling creating other product types from reclaimed carpet. For example, turning nylon face fiber into automotive parts or carpet padding, including nylon face fiber in recycled backings
 - 4. Waste-to-Energy using carpet for waste-to-energy. In the case of waste-to-energy, manufacturer shall justify why carpet cannot be recycled as this method should be a last resort.
 - 5. Landfill or incineration are not approved disposal methods
 - 6. At the completion of the project, a certificate shall be furnished verifying the reclamation of the carpet and the pounds of material diverted from the landfill.

1.05 OPERATION AND MAINTENANCE DATA

- A. Submit cleaning and maintenance data under provisions of Section 01 33 00.
- B. Include maintenance procedures, recommended maintenance materials, and suggested schedule and products for cleaning.
- C. Provide in-service training with Owner's custodial staff prior to acceptance of flooring for proper care and maintenance of carpet. Also review and provide recommended type of furniture casters and glides.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Storage and Protection: Store materials protected for exposure to harmful weather conditions and at a temperature and humidity conditions recommended by manufacturer. Materials should be stored in areas that are fully enclosed, weather tight with the permanent HVAC system set at a uniform temperature of at least 68 degrees F (20 degrees C) for 72 hours prior to, during and after installation.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Store materials for three days prior to installation in area of installation to achieve temperature stability.
- B. Maintain ambient temperature between 65 and 85 F at floor level three days prior to, during, and 24 hours after installation of materials.

- C. Prior to testing for moisture vapor emission rate, space shall be enclosed, fully weather-tight, wetwork in space shall be completed and nominally dry, work above ceilings finished. The test site should be at the same temperature and humidity expected during normal use.
- D. Maintain lighting at a minimum uniform level of 50 or more-foot candles in areas where the floor system is being installed.
- E. Comply with CRI's "CRI Carpet Installation Standard" for temperature, humidity, and ventilation limitations.
- F. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weather tight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants.
- G. Floor temperature should be between 65 -85°F for proper adhesive curing and performance.
- H. If subfloor is contaminated with an oily residue either from removal of "cutback" during asbestos abatement or from a previous end use such as metal fabrication, this residue MUST be totally removed or covered prior to applying modular adhesive and carpet.

1.08 CONCRETE SUBFLOOR TESTING

- A. Testing for internal relative humidity of concrete slabs must be conducted in accordance with the current version of ASTM F2170, not to exceed manufacturer's requirements (ASTM F2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes).
- B. The Flooring Contractor shall verify in writing to the Owner, a minimum of thirty (30) days prior to scheduled carpet installation, the following substrate conditions:
 - 1. Moisture: Initial emission rate, as tested with in-situ probes, per ASTM F 2170.
 - 2. Alkalinity: pH level. Testing the pH at the surface of a concrete slab must be conducted in accordance with the current version of ASTM F710, not to exceed manufacturer's requirements (ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.)
- C. High Moisture and /or Alkalinity Readings:
 - 1. New Construction (New Concrete Slab)
 - a. If the Contractor's test results indicate that the slab relative humidity (RH) readings are below those of flooring manufacturer's requirement, then the Owner's representative will initiate independent testing to confirm results and will initiate additional testing using petrographic analysis to determine if the Water Cement Ratio and sufficient hydration has taken place.
 - 1) If it is determined that the Specifications were followed in their entirety, water/cement ratio (as specified), and or the concrete surface has been adequately hydrated; then the Contractor shall initiate a credit to the Owner for the cost of installation of the Vapor Retarders as specified in section 07 26 00 that were not installed.

- 2. Modernization Construction (Existing Concrete Slab)
 - a. If the Contractor's test results indicate that the slab relative humidity (RH) readings are below those of flooring manufacturer's requirement, then the Owner's representative will initiate independent testing to confirm results.
 - 1) If the independent test results do not substantiate the Contractor's findings, then the Contractor will be directed to proceed with the Vapor Retarder installation and the retesting cost will be back charged to the contractor.
 - 2) If the independent test results confirm the Contractor's findings, then the Contractor shall initiate a credit to the Owner for the cost of installation of the Vapor Retarders as specified in section 07 26 00 that were not installed.
- D. Comply with manufacturer's written requisites for field conditions including but not limited to testing for moisture, confirmation of vapor retarder, floor prep, bond test, photo documentation, etc.

1.09 EXTRA MATERIALS

- A. Provide a minimum of 4 square yards of each color installed. In addition, provide all usable scraps one sq. yd. or larger in size. Remnants shall be packaged, identified and delivered to the Owners' Representative, who will retain any he chooses for future repairs before they are removed from the job site.
- B. Provide a minimum of 10 lineal feet of base and transition pieces of each material and color specified or 2 % whichever is greater.

1.10 WARRANTY

- A. Manufacturer's Warranty: Lifetime Limited manufacturer warranty commencing on recordation date of the Notice of Completion.
 - Should carpet, show signs of excessive wear, static, delamination, edge ravel zippering, loss of backing resiliency or manufacturing defects- carpet shall be repaired or replaced with new carpeting at no cost to the Owner. Manufacturer to submit written warranty covering the following:
 - a. Lifetime limited non-prorated Guarantee shall also include:
 - 1) No resiliency loss of backing.
 - 2) No zippering.
 - 3) Static protection (will not lose static property—will not give static discharge above 3.5KV).
 - 4) No edge ravel or zippering.
 - 5) No Delamination.
 - 6) Surface wear (maintains at least 90% surface pile weight).
 - 7) No staining.
 - 8) Dimensional Stability.
 - 9) Moisture Resistance.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Carpet (Hybrid resilient sheet flooring) and integrated walk-off mats: Color as selected by Owner Representative from Manufacturer's standard range. No other substitutions will be allowed.
 - 1. **CPT2 Tarkett Commercial** Hybrid resilient sheet flooring
 - a. "Aftermath II" Series, 6'-0" roll, glue down. Powerbond cushion RS vinyl backing system and seam sealer.
 - b. Or Equal.
 - 2. WOM1 Tarkett Commercial Walk-off System to match carpet backing at specified locations
 - a. "Abrasive Action II" walk-off system Powerbond Cushion RS or 24"x24" Flex Aire cushion tile, at all exterior doors in carpeted rooms. Color to be coordinated with carpet color selection.
 - b. Or Equal.
- B Leveling and Patching Compounds:
 - 1. Portland cement-based patch recommended by carpet manufacturer. Install as recommended by manufacturer for specific application.
- C Primer: Low VOC, water-based, emulsion, and as recommended by product manufacturer.
 - 1. Tarkett Commercial: C-36E primer.
 - 2. Or manufacturer accepted equal.
- D. Adhesives: Low VOC, waterproof, and as recommended by product manufacturer.
 - 1. Tarkett "RS" pre applied microencapsulated tackifier.
 - 2. Tarkett Commercial: C-16E Powerbond Adhesive.
 - 3. Or Equal.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. New Construction (New Concrete Slab)
 - 1. Installer must examine areas and conditions under which resilient flooring and accessories are to be installed and must notify General Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Owner and Architect.
 - 2. Testing for internal relative humidity of concrete slabs must be conducted in accordance with the current version of ASTM F2170, not to exceed manufacturer's requirements (ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes)
 - 3. Verify that new surfaces are smooth and flat with maximum variation as specified in 03 31 00-Structural Concrete and are ready to receive work.

- 4. Beginning of installation on new substrates means acceptance of substrate. The existing substrates will require as much preparation as necessary to provide proper installation of new materials.
- B. Modernization Construction (Existing Concrete Slab)
 - 1. If existing flooring was determined to be asbestos containing and required abatement, verify that the abatement work has been accepted by the Owner's representative prior to commencing work.
 - Testing for internal relative humidity of concrete slabs must be conducted in accordance with the current version of ASTM F2170, not to exceed manufacturer's requirements (ASTM F2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes).

3.02 PREPARATION

- A. New Construction (New Concrete Slab)
 - 1. Install underlayment where flooring is being installed on a wooden subfloor per the manufacturer's instructions.
 - 2. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with manufacturer recommended subfloor filler.
 - 3. Apply, trowel, and float filler to leave a smooth, flat, hard surface.
 - 4. Prohibit traffic from area until filler is cured.
 - 5. Prepare floor substrate to be smooth, rigid, flat, level, permanently dry, clean and free of foreign materials such as dirt, paint, grease, oils, solvent, curing and hardening compounds, sealers, asphalt and old adhesive residue. Vacuum clean substrate.
 - 6. Apply primer to concrete surfaces.
- B. Modernization Construction (Existing Concrete Slab)
 - 1. Remove existing finishes, adhesives, and other materials as necessary to properly prepare existing substrates. (Refer to asbestos abatement procedures.)
 - 2. Install underlayment where flooring is being installed on a wooden subfloor per the manufacturer's instructions.
 - 3. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.
 - 4. Fill low spots, cracks, joints, holes and other defects with filler prior to flooring installation.
 - 5. Apply, trowel, and float filler to leave a smooth, flat, hard surface.
 - 6. Prohibit traffic from area until filler is cured.
 - 7. Prepare floor substrate to be smooth, rigid, flat, level, permanently dry, clean and free of foreign materials such as dirt, paint, grease, oils, solvent, curing and hardening compounds, sealers, asphalt and old adhesive residue. Vacuum clean substrate.
 - 8. Apply primer to concrete surfaces.

3.03 CARPET INSTALLATION

A. Install in accordance with manufacturers' instructions and recommendations with fully welded seams.

- B. Install flooring square with room axis and in accordance with approved shop drawing.
- C. Layout roll-goods in a manner to minimize seams and avoid seams in traffic areas. End butt joints shall be kept to a minimum, shall be staggered, and shall occur where approved on detail plan layout. Use the largest sections possible to minimize seams. Avoid cross seams, filler pieces and strips. Match edges for color shading and pattern at the seams in compliance with the manufacturer recommendations.
- D. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.
- E. Scribe, cut, fit flooring to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture, including pipes, outlets, edgings, thresholds, nosing and cabinets.
- F. Install edge strips at unprotected or exposed edges, and where flooring terminates.
- G. Install flooring on covers for telephone and electrical ducts, and similar items occurring within finish floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers.
- H. Adhere carpet to prepared substrate without producing open cracks, voids, raising and puckering at joints, telegraphing to adhesive spreader marks, or other surface imperfections in completed installation.
- I. Fully solvent weld all seams. Seams shall be unnoticeable in finished installation.
- J. Verify carpet match before cutting to ensure minimal variation between dye lots.
- K. Double cut carpet, to allow intended seam and pattern match. Make cuts straight, true, and unfrayed.
- L. Lay carpet on floors with run of pile in same direction as anticipated traffic.
- M. Do not change run of pile in any room where carpet is continuous through a wall opening into another room. Locate change of color or pattern between rooms under door centerline.
- N. Complete installation shall conform to the Carpet Installation Standard of Carpet and Rug Institute (CRI).

3.03 INTEGRATED WALK-OFF MAT INSTALLATION

- A. Install in accordance with manufacturers' instructions and recommendations.
- B. Install modular tile like any "dry-back" modular with a full-spread wet adhesive.
- C. Installation instructions for Tarkett Floorcoverings' Powerbond Non-RS (dry-back) Modules can be used as "reference only."

- D. Adhesive below is offered to install modular tile product based upon application and intended use:
 - 1. C-EX Pressure Sensitive Releasable Adhesive as required by manufacturer
- E. Modular tile should be securely attached to the sub-floor in compliance with ADA Accessibility Guidelines, latest edition, for Building & Facilities, Section 4.5.3.
- F. Provide integrated walk-off mats at all exterior door location where carpet is indicated to be installed. The walk-off mats shall extend a minimum of the door width plus six inches (6") and six feet (6'-0") in the direction of travel or as indicated on the drawings.

3.04 INSTALLATION - BASE MATERIAL

A. Install resilient wall base on entire wall perimeter including toe spaces and open ends of cabinets. Set all bases in adhesive as recommended by the manufacturer. All joints in bases shall be plumb, flush, tight and inconspicuous. Seat top edge and back of base firmly against the wall. Wrap base around all outside corners and no seams within 12" of corners. Interior corners shall be mitered and tightly fitted.

3.05 PROTECTION

- A. Prohibit traffic from carpet areas for 24 hours after installation.
- B. Protect flooring from damages by other trades prior to owner occupancy.

3.06 FINAL CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage. Remove and dispose of all small scraps, cartons, and rubbish upon completion of the work. Remove all loose threads with sharp scissors.
- B. Clean carpet of all spots with proper spot remover, and vacuum carpet surfaces.

END OF SECTION 09 68 00

SECTION 10 11 00

VISUAL DISPLAY SURFACES

AD02.05 01/14/2025

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Section Includes:
 - 1. Porcelain Enamel Steel Markerboards Fixed and Horizontal Sliding Units.
 - 2. Aluminum Framed Fixed Tackboards.

1.02 RELATED SECTIONS

A. Section 06 10 00: Rough Carpentry.

1.03 REFERENCED STANDARDS

- A. American Society for Testing Materials
 - ASTM E84 Standard Test Method for Surface Burning Characteristics for Building Materials.
 - 2. ASTM B221 Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wires, Profiles and Tubes.
- B. Porcelain Enamel Institute
 - 1. PEI-1002 Manual and Performance Specifications for Porcelain Enamel Writing Surfaces.
- C. GREENGUARD Environmental Institute
 - 1. GREENGUARD Indoor Air Quality Certified.
 - 2. GREENGUARD Children and Schools Indoor Air Quality Certified.

1.04 SUBMITTALS

- A. Shop Drawings: Provide shop drawings for each type of visual display board required.
- B. Product Data: Provide technical data for materials specified. Include Material Safety Data Sheets, when applicable.
- C. Samples and color charts: Provide Manufacturer's color charts and composition samples of face, core, cork, backing and trim to illustrate finish, color, and texture, where required.
- D. Manufacturer's Instructions: Provide Manufacturer's installation instructions.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications:

- Manufacturer shall be a firm engaged in the manufacture of visual display boards in the United States.
- 2. Manufacturer shall have a minimum of 5 years experience in the manufacture of visual display boards.
- B. Regulatory Requirements: Conforms to applicable code for flame/smoke rating in tackboards in accordance with ASTM E84.
- C. Product Certifications: Provide GREENGUARD Indoor Air Quality Certified and GREENGUARD Children and Schools certificates for markerboards, as applicable.
- D. Operation and Maintenance: Include data on regular cleaning, stain removal, and precautions.

1.06 PROJECT CONDITIONS

- A. Field measure prior to preparation of shop drawings and fabrication to ensure proper fit.
- B. Comply with manufacturer's recommendations for acclimating area for interior moisture and temperature to approximate normal occupied conditions.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Schedule delivery of visual display boards with spaces sufficiently complete so that visual display boards can be installed upon delivery.
- B. Store products in manufacturer's unopened packaging until ready for installation.
- C. Store materials protected from exposure to harmful weather conditions and at temperatures and humidity conditions recommended by manufacturer.

1.08 WARRANTY

- A. Submit a "Life of the Building" warranty, stating that under normal usage and maintenance, and when installed in accordance with manufacturer's instructions and recommendations, Claridge porcelain enamel steel markerboard surfaces are guaranteed for the Life of the Building.

 Guarantee covers replacement of defective boards but does not include cost of removal or reinstallation.
- B. Submit a standard warranty, stating that when installed in accordance with manufacturer's instructions and recommendations. Guarantee does not cover normal wear and tear, improper handling, any misuse, or any defects caused by vandalism or subsequent abuse. Guarantee covers replacement of defective material but does not include cost of removal or reinstallation.
- C. Writing Surface Warranty Period: (Lifetime) commencing on Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Visual Display Board Manufacturer: Claridge Products and Equipment, 1nc., Harrison, Arkansas 72601; Toll Free: 800-434-4610; Telephone: 870-743-2200; Fax: 870-743-1908; E-mail: claridge@claridgeproducts.com; website: www.claridgeproducts.com.

B. Or approved equal.

2.02 MATERIALS FOR MARKERBOARD PANELS.

- A. Writing Surface Face Sheet Manufactured in accordance with Porcelain Enamel Institute's specification.
 - 1. Shall be enameling grade cold rolled steel manufactured from a minimum of 30 percent post-consumer and post-industrial waste.
 - 2. Enameling grade steel shall be coated with LCS3 Porcelain Enamel by Claridge Products and Equipment.
 - a. 3-Coat process shall include:
 - i. Bottom Ground Coat 1.5 to 2.2 mils
 - ii. Top Ground Coat 2.0 to 2.8 mils
 - iii. Top Cover (Color) Coat 3.0 to 4.0 mils
 - 3. Firing Temperature: Enamel shall be fired at lowest possible temperatures to reduce steel and porcelain stresses and achieve superior enamel and hardness.
 - 4. Color: As selected by Architect from manufacturer's standards. Color charts furnished on request.
 - 5. Surface shall allow for use of magnets for display.
- B. Writing Surface Core:
 - 7/16" Medium Density Fiberboard composed of approximately 90% post-industrial waste.
- C. Writing Surface Backing.
 - 1. Foil Back at fixed wall-mounted locations.
 - 2. Aluminum Sheet Back at sliding casework-mounted locations.
- D. Factory Framed Markerboards.
 - 1. Face Sheet: LCS3 porcelain enamel steel Markerboard.
 - 2. Core Material: 7/16" MDF
 - 3. Backing: Foil Back at fixed wall-mounted locations; Aluminum Sheet Back at casework-mounted sliding locations.
 - 4. Series: 4.
 - 5. Typical Arrangement: A.
 - 6. Panel Size:
 - Fixed locations 4 feet tall by 6 foot long.
 4 feet tall by 8 foot long.

7. Color: 100 White.

2.03 ALUMINUM TRIM

- A. Trim shall be 6063 alloy grade aluminum with T5 tempering in accordance with ASTM B221 and shall have 201-R1 satin anodize finish. (Color Anodize and Powder Coat finishes optional).
 - 1. Factory Built Trim
 - a. Series: 4.
- B. Accessories:
 - 1. Marker Tray:
 - At fixed locations: Optional continuous, hollow aluminum tray with cast aluminum end closures at bottom of each markerboard.
 - 2. Map Rail:
 - a. Optional continuous 2" map rail with cork insert and end stops at the top of each markerboard and chalkboard

2.04 FIXED TACKBOARDS

- A. Provide where located on the Drawings, wall mounted clear anodized aluminum framed vinyl-wrapped cork board equal to Claridge Fabricork series. Provide from manufacturer's full range of colors. Fabricork consist of vinyl fabric over cork underlay with ¼" hardboard backing. Aluminum trim shall be 6063 alloy grade aluminum with T5 tempering in accordance with ASTM B221-14 and shall have 201-R1 satin anodize finish. Provide anchoring points in aluminum for screw attachment to walls.
- B. Sizes: 4'-0" high x 4'-0" wide, 4'-0" high x 6'-0" wide, or as otherwise indicated on Drawings.

2.05 TACKBOARD FABRICATION

A. Shop assembly: factory assembled.

PART 3 - EXECUTION

3.01 PROJECT CONDITIONS

- A. Verify before installation that interior moisture and temperature approximate normal occupied conditions.
- B. Verify that wall surfaces are true and plumb and are prepared and ready to receive boards.

3.02 INSTALLATION

- A. Deliver factory-built units completely assembled and of dimensions shown in details and in accordance with manufacturer's Shop Drawings as approved by the Architect.
- B. Follow manufacturer's instructions for storage and handling of units before installation.
- C. Do not install boards on damp walls or in damp and humid weather without heat in the building.

- D. Install level and plumb, keeping perimeter trim straight in accordance with manufacturer's recommendations.
- E. At fixed wall-mounted marker boards, install angle clips at bottom edge of unit at 24" o.c. Set unit on clips and secure top edge of unit to wall through top map rail with minimum #8 wood screws with minimum 2 inch embed into wall studs or wood blocking. If wood blocking option is used, provide 2x flat with Simpson A35 clips at each end.

3.03 ADJUST AND CLEAN

- A. Verify that all accessories are installed as required for each unit.
- B. At completion of work, clean surfaces, and trim in accordance with manufacturer's recommendations, leaving all materials ready for use.

[END OF SECTION 10 11 00]

SECTION 21 00 50

AD02.06 01/14/2025

BASIC FIRE SPRINKLER MATERIALS AND METHODS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

- 1. Access doors.
- 2. Pipe Identification.

1.02 RELATED REQUIREMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. This Section is part of each Division 21 Section.

1.03 ADDITIONAL REQUIREMENTS

- A. Furnish and install incidental work not shown or specified necessary to provide a complete and workable system.
- B. Make temporary connections required to maintain services during the course of the Contract without additional cost to Owner. Notify Owner seven days in advance before interrupting services.

1.04 REFERENCES AND STANDARDS

- A. Where material or equipment is specified to conform to referenced standards, it shall be assumed that the most recent edition of the standard in effect at time of bid shall be used.
 - 1. ANSI American National Standards Institute.
 - 2. ASTM American Society for Testing and Materials.
 - 3. CCR California Code of Regulations.
 - a. Title 8 Division of Industrial Safety, Subchapter 7; General Industry Safety Orders, Articles 31 through 36.
 - 4. NCPWB National Certified Pipe Welding Bureau.
 - 5. CEC California Electrical Code.
 - 6. NEMA National Electrical Manufacturers' Association.
 - 7. NFPA National Fire Protection Association, as amended by the CBC.
 - 8. OSHA Occupational Safety and Health Act.
 - 9. UL Underwriters' Laboratories, Inc.

B. Requirements of Regulatory Agencies:

1. The publications listed below form part of this Specification. Comply with provisions of these publications except as otherwise shown or specified.

- a. California Building Code, 2022.
- b. California Electrical Code, 2022.
- c. California Energy Code, 2022.
- d. California Fire Code, 2022.
- e. California Green Building Standards Code, 2022.
- f. California Mechanical Code. 2022.
- g. California Plumbing Code, 2022.
- h. California Code of Regulations, Title 24.
- i. California Health and Safety Code.
- j. CAL-OSHA.
- k. California State Fire Marshal, Title 19 CCR.
- I. DSA Division of the State Architect. Interpretive Regulations (IR's).
- m. National Fire Protection Association, as amended by the CBC.
- n. Occupational Safety and Health Administration.
- o. Other applicable state laws.
- 2. Nothing in Drawings or Specifications shall be construed to permit work not conforming to these codes, or to requirements of authorities having jurisdiction. It is not the intent of Drawings or Specifications to repeat requirements of codes except where necessary for clarity.

1.05 DRAWINGS

- A. Examine Contract Documents prior to bidding of Work and report discrepancies in writing to Architect.
- B. Drawings showing location of equipment and materials are diagrammatic and job conditions will not always permit installation in location shown. The fire protection Drawings show general arrangement of equipment and materials, etc., and shall be followed as closely as existing conditions, actual building construction, and work of other trades permit.
 - 1. Architectural and structural Drawings are part of the Work. These Drawings furnish Contractor with information relating to design and construction of the Project. Architectural Drawings take precedence over fire protection Drawings.
 - 2. Because of the small scale of fire protection Drawings, not all offsets, fittings, and accessories required are shown. Investigate structural and finish conditions affecting the Work and arrange Work accordingly. Provide offsets, fittings, and accessories required to meet conditions. Inform Architect immediately when job conditions do not permit installation of equipment and materials in locations shown. Obtain Architects' approval prior to relocation of equipment and materials.
 - 3. Relocate equipment and materials installed without prior approval of Architect. Remove and relocate equipment and materials at Contactors' expense upon Architects' direction.
 - 4. Minor changes in locations of equipment, piping, ducts, etc., from locations shown shall be made when directed by the Architect at no additional cost to the Owner providing such change is ordered before such items of work, or work directly connected to same are installed and providing no additional material is required.
- C. Execute work mentioned in Specifications and not shown on Drawings, or vice versa, the same as if specifically mentioned or shown in both.

1.06 FEES AND PERMITS

- A. Obtain and pay for permits and service required in installation of the Work. Arrange for required inspections and secure approvals from authorities having jurisdiction. Comply with the requirements of Division 1.
- B. Arrange for utility connections and pay charges incurred, including excess service charges.
 - 1. Bear the cost of construction related to utility services, from point of connection to utility services shown on Contract Documents. This includes piping, excavation, backfill, meters, boxes, check valves, backflow prevention devices, general service valves, concrete work, and the like, whether or not Work is performed by Contractor, local water/sanitation district, public utility, other governmental agencies or agencies' assigns.

1.07 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. General:

a. Coordinate Work in this Section with trades covered in other Specification Sections to provide a complete and operable installation of highest quality workmanship.

2. Electrical Coordination:

- a. Refer to the Electrical Drawings and Specifications, Division 26, for service voltage and power feed wiring for equipment specified in this Section. Contractor has full responsibility for the following items of work:
 - 1) Review the Electrical Drawings and Division 26 Specifications to verify that electrical services provided are adequate and compatible with equipment requirements.
 - 2) If additional electrical services are required above that indicated on Electrical Drawings and in Division 26, such as more control interlock conductors, larger feeder, or separate 120 volt control power source, include cost to furnish and install additional electrical services as part of bid.
 - 3) Prior to proceeding with installation of additional electrical work, submit detailed drawings indicating exact scope of additional electrical work.

3. Mechanical Coordination:

- a. Arrange for pipe spaces, chases, slots and openings in building structure during progress of construction, to accommodate mechanical system installation.
- b. Coordinate installation of supporting devices. Set sleeves in poured-in-place concrete and other structural components during progress of construction.
- c. Coordinate requirements for access panels and doors for mechanical items requiring access where concealed behind finished surfaces. Access panels and doors are specified in Division 08 Section "Access Doors and Frames."

1.08 SUBMITTALS

A. Refer to Division 01 Submittals Section(s) for additional requirements.

- B. Provide submittal of materials proposed for use as part of this Project. Product names in Specifications and on Drawings are used as standards of quality. Furnish standard items on specified equipment at no extra cost to the Contract regardless of disposition of submittal data. Other materials or methods shall not be used unless approved in writing by Architect. Architect's review will be required even though "or equal" or synonymous terms are used.
 - 1. Partial or incomplete submittals will not be reviewed.
 - 2. Quantities are Contractor's responsibility and will not be reviewed.
 - 3. Provide materials of same brand or manufacturer for each class of equipment or material.
 - 4. Identify each item by manufacturer, brand, trade name, number, size, rating, or other data necessary to properly identify and review materials and equipment. Words "as specified" are not sufficient identification.
 - 5. Identify each submittal item by reference to items' Specification Section number and paragraph, by Drawing and detail number, and by unit tag number.
 - 6. Organize submittals in same sequence as in Specification Sections.
 - 7. Show physical arrangement, construction details, finishes, materials used in fabrications, provisions for piping entrance, access requirements for installation and maintenance, physical size, mechanical characteristics, foundation and support details, and weight.
 - a. Submit shop drawings, performance curves, and other pertinent data, showing size and capacity of proposed materials.
 - b. Specifically indicate, by drawn detail or note, that equipment complies with each specifically stated requirement of Contract Documents.
 - c. Drawings shall be drawn to scale and dimensioned (except schematic diagrams). Drawings may be prepared by vendor but must be submitted as instruments of Contractor, thoroughly checked and signed by Contractor before submission to Architect for review.
 - d. Catalog cuts and published material may be included with supplemental scaled drawings.
- C. Review of submittals will be only for general conformance with design concept and general compliance with information given in Contract Documents. Review will not include quantities, dimensions, weights or gauges, fabrication processes, construction methods, coordination with work of other trades, or construction safety precautions, which are sole responsibility of Contractor. Review of a component of an assembly does not indicate acceptance of an assembly. Deviations from Contract Documents not clearly identified by Contractor are Contractor's responsibility and will not be reviewed by Architect.
- D. Within reasonable time after award of contract and in ample time to avoid delay of construction, submit to Architect shop drawings or submittals on all items of equipment and materials provided. Provide submittal in at least seven copies and in complete package.
 - 1. Shop drawings and submittals shall include Specification Section, Paragraph number, and Contract Drawing unit symbol or detail number for reference. Organize submittals into booklets for each Specification section and submit in loose-leaf binders with index. Deviations from Contract Documents shall be clearly identified and appear at the beginning of submittal package, and shall be referenced to applicable Contract Documents requirements.
- E. Provide layouts for fire protection systems, for inclusion in coordinated layout specified in Section 23 80 00. Comply with requirements for layouts specified in Section 23 80 00.
- 1.09 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data and installation instructions for fire protection systems materials and products.
- B. Shop Drawings.
- C. Provide product data for insulation products, including insulation, insulation facings, jackets, adhesives, sealants, and coatings, indicating compliance with requirement that these products contain less than 0.1 percent (by mass) polybrominated diphenyl ethers (PBDEs) in penta, octa, or deca formulations.
- D. Product Data for California Green Building Standards Code Compliance: For adhesives and sealants, including primers, documentation of compliance including printed statement of VOC content and chemical components.
- E. Delegated-Design Submittal: For seismic supports, anchorages, and restraints indicated to comply with performance requirements and design criteria.
 - 1. Calculations performed for use in selection of seismic supports, anchorages, and seismic restraints shall utilize criteria indicated in Structural Contract Documents.
 - 2. Supports, anchorage and restraints for piping and equipment shall be an OSHPD pre-approved system such as Tolco, ISAT, Mason, or equal. Pipes and equipment shall be seismically restrained in accordance with requirements of current edition of California Building Code and NFPA 13. System shall have current OPA number and shall meet additional requirements of authority having jurisdiction. Provide supporting documentation required by the reviewing authority and the Architect and Engineer. Provide layout drawings showing piping, ductwork and restraint locations.
 - a. Bracing of Piping and Equipment: Specifically state how bracing attachment to structure is accomplished. Provide shop drawings indicating seismic restraints, including details of anchorage to building. In-line equipment must be braced independently of piping, and in conformance with applicable building codes. Provide calculations to show that pre-approval numbers have been correctly applied in accordance with general information notes of pre-approval documentation.
 - 3. In lieu of the above or for non-standard installations not covered in the above pre-approved systems, Contractor shall provide layout drawings showing piping, equipment, and restraint locations, and detailing supports, attachments and restraints, and furnish supporting calculations and legible details sealed by a California registered structural engineer, in accordance with California Building Code and NFPA 13.
 - 4. Additional Requirements: In addition to the above, conform to State and local requirements.

1.10 INFORMATIONAL SUBMITTALS

- A. Provide coordination drawings for fire protection systems in accordance with the requirements of Specification Section 21 10 00.
- B. Furnish to Project Inspector complete installation instructions on material and equipment before starting installation.

1.11 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:

- 1. Refer to Division 01 for complete instructions.
- 2. Furnish three complete sets of Operating and Maintenance Manual bound in hardboard binder, and one compact disc containing complete Operating and Maintenance Manual in searchable PDF format. Provide Table of Contents. Provide index tabs for each piece of equipment in binder and disc. Start compiling data upon approval of submittals.
 - a. Sets shall incorporate the following:
 - 1) Product Data.
 - 2) Shop Drawings.
 - 3) Record Drawings.
 - 4) Service telephone number, address and contact person for each category of equipment or system.
 - 5) Complete operating instructions for each item of fire sprinkler system.
 - a) Original manual of NFPA-25 for fire sprinkler system.
 - 6) Copies of guarantees/warrantees for each item of equipment or systems.
 - 7) Test data as specified.
 - 8) Typewritten maintenance instructions for each item of equipment listing lubricants to be used, frequency of lubrication, inspections required, adjustment, etc.
 - 9) Manufacturers' bulletins with parts numbers, instructions, etc., for each item of equipment.
 - 10) A complete list or schedule of scheduled valves giving the number of the valve, location and the rooms or area controlled by the valve. Identify each valve with a permanently attached metal tag stamped with number to match schedule. Post list in frame under plastic on wall in mechanical room or where directed by Architect.
 - 11) Check test and start reports for each piece of fire protection equipment provided as part of the Work.
 - 12) Commissioning and Preliminary Operation Tests required as part of the Work.
 - b. Post service telephone numbers and addresses in an appropriate place designated by Architect.

B. Record Drawings:

- 1. Refer to Division 01, Record Documents, for requirements governing Work specified herein.
- 2. Upon completion of the work, deliver to Architect the following:
 - a. Originals of drawings showing the Work exactly as installed.
 - b. One complete set of reproducible drawings showing the Work exactly as installed.
 - c. One compact disc with complete set of drawings in PDF format showing the Work exactly as installed.
 - d. Provide Contractor's signature, verifying accuracy of record drawings.
 - e. Obtain the signature of the Project Inspector for all record drawings.

1.12 SUBSTITUTIONS

- A. Refer to Division 01 for complete instructions. Requirements given below are in addition to or are intended to amplify Division 01 requirements. In case of conflict between requirements given in this Section and those of Division 01, Division 01 requirements shall apply.
- B. It is the responsibility of Contractor to assume costs incurred because of additional work and or changes required to incorporate proposed substitute into the Project. Refer to Division 01 for complete instructions.
- C. Substitutions will be interpreted to be manufacturers other than those specifically listed in Contract Documents by brand name, model, or catalog number.
- D. Only one request for substitution will be considered for each item of equipment or material.
- E. Substitution requests shall include the following:
 - 1. Reason for substitution request.
 - 2. Complete submittal information as described herein; see "Submittals."
 - 3. Coordinated scale layout drawings depicting position of substituted equipment in relation to other work, with required clearances for operation, maintenance and replacement.
 - 4. List optional features required for substituted equipment to meet functional requirements of the system as indicated in Contract Documents.
 - 5. Explanation of impact on connected utilities.
 - 6. Explanation of impact on structural supports.
- F. Installation of reviewed substitution is Contractors' responsibility. Any mechanical, electrical, structural, or other changes required for installation of substituted equipment or material must be made by Contractor without additional cost to Owner. Review by Architect of substituted equipment or material will not waive these requirements.
- G. Contractor may be required to compensate Architect for costs related to substituted equipment or material.

1.13 DELIVERY, STORAGE AND HANDLING

A. Protect equipment and materials delivered to Project site from weather, humidity and temperature variations, dirt, dust and other contaminants.

1.14 FIELD CONDITIONS

- A. Contractor shall visit Project site and examine existing conditions in order to become familiar with Project scope. Verify dimensions shown on Drawings at Project site. Bring discrepancies to the attention of Architect. Failure to examine Project site shall not constitute basis for claims for additional work because of lack of knowledge or location of hidden conditions that affect Project scope.
- B. Information on Drawings relative to existing conditions is approximate. Deviations from Drawings necessary during progress of construction to conform to actual conditions shall be approved by Architect and shall be made without additional cost to Owner. The Contractor shall be held responsible for damage caused to existing services. Promptly notify Architect if services are found which are not shown on Drawings.

1.15 WARRANTY

- A. Refer to Division 01 for warranty requirements, and duration and effective date of Contractor's Standard Guarantee.
- B. Repair or replace defective work, material, or part that appears within warranty period, including damage caused by leaks.
- C. On failure to comply with warranty requirements within a reasonable length of time after notification is given, Architect/Owner shall have repairs made at Contractor's expense.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Materials or equipment of the same type shall be of the same brand wherever possible. All materials shall be new and in first class condition.
- B. All sizes, capacities, and efficiency ratings shown are minimum.
- C. Refer to Section 21 10 00 for specific system piping materials.

2.02 MATERIALS

- A. No material installed as part of this Work shall contain asbestos.
- B. California Green Building Code Compliance:
 - 1. Fire protection equipment shall not contain CFCs.
 - 2. Fire protection equipment shall not contain Halons.

2.03 ACCESS DOORS

- A. Where floors, walls, or ceilings must be penetrated for access to fire protection equipment or devices, provide access doors, 14 inch by 14 inch minimum size in usable opening. Where entrance of a serviceman may be required, provide 20 inch by 30 inch minimum usable opening. Locate access doors/panels for non-obstructed and easy reach.
 - 1. Access doors less than 7'-0" above floors and exposed to public access shall have keyed locks.
- B. Access doors shall match those supplied in Division 08, except as noted in this Section.
- C. Provide stainless steel access doors for use in toilet rooms, shower rooms, kitchens and other damp areas. Provide steel access doors with prime coat of baked-on paint for other areas.
- D. Do not locate access doors in highly visible public areas such as lobbies, waiting areas, and primary entrance areas. Coordinate with Architect when access is required in these areas.
- E. Where specific information or details relating to access panels different from the above is shown or given on Drawings or other Divisions of work, that information shall supersede this specification.

F. Manufacturers: Subject to compliance with requirements, available manufacturers offering products which may be incorporated into the Work include Milcor, Karp, Nystrom, or Cesco, equal to the following:

1. Milcor:

- a. Style K (plaster).
- b. Style DW (gypsum board).
- c. Style M (masonry).
- d. Style "Fire Rated" where required.

2.04 PIPE IDENTIFICATION

- A. Identify each piping system and indicate the direction of flow by means of Seton, Inc., Marking Services Inc., Reef Industries, Inc., or equal, pre-tensioned, coiled semi-rigid plastic pipe labels formed to circumference of pipe, requiring no fasteners or adhesive for attachment to pipe.
- B. The legends and flow arrows shall conform to ASME A13.1.

PART 3 - EXECUTION

3.01 EXISTING MATERIALS

- A. Remove existing equipment, piping, wiring, construction, etc., which interferes with Work of this Contract. Promptly return to service upon completion of work in the area. Replace items damaged by Contractor with new material to match existing.
- B. Removed materials which will not be reinstalled, and which are not claimed by Owner shall become property of Contractor and shall be removed from Project site. Consult Owner before removing any material from Project site. Carefully remove materials claimed by Owner to prevent damage and deliver to Owner-designated storage location.
- C. Existing piping and wiring not reused and are concealed in building construction may be abandoned in place and all ends shall be capped or plugged. Remove unused piping and wiring exposed in Equipment Rooms or occupied spaces. Material shall be removed from Project premises. Disconnect power, water, gas, pump or any other active energy source from piping or electrical service prior to abandoning in place.
- D. Existing piping and equipment modified or altered as part of this Work shall comply with the most recent applicable code requirements.

3.02 FRAMING, CUTTING AND PATCHING

- A. Special framing, recesses, chases and backing for Work of this Section, unless otherwise specified, are covered under other Specification Sections.
- B. Contractor is responsible for placement of pipe sleeves, hangers, inserts, supports, and location of openings for the Work.

- C. Cutting, patching, and repairing of existing construction to permit installation of equipment, and materials is responsibility of Contractor. Repair or replace damage to existing work with skilled mechanics for each trade.
- D. Cut existing concrete construction with a concrete saw. Do not utilize pneumatic devices.
- E. Core openings through existing construction for passage of new piping and conduits. Cut holes of minimum diameter to suit size of pipe and associated insulation installed. Coordinate with building structure, and obtain Structural Engineer's approval prior to coring through existing construction.

3.03 DEMOLITION

- A. Refer to Division 01 Sections "Cutting and Patching" and/or "Selective Demolition" for general demolition requirements and procedures.
- B. Disconnect, dismantle and remove fire protection systems, equipment, and components indicated to be removed. Coordinate with all other trades.
 - 1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - 2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping to remain with same or compatible piping material.
 - 3. Equipment to Be Removed: Drain down and cap remaining services and remove equipment.
 - 4. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - 5. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
- C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.04 ELECTRICAL REQUIREMENTS

- A. Provide adequate working space around electrical equipment in compliance with the California Electrical Code. Coordinate the fire protection Work with the electrical Work to comply.
- B. Furnish necessary control diagrams and instructions for controls. Before permitting operation of equipment which is furnished, installed, or modified under this Section, Contractor shall review associated electrical work, including overload protection devices, and assume complete responsibility for correctness of electrical connections and protective devices. Motors and control equipment shall conform to the Standards of the National Electrical Manufacturers' Association. Equipment and connections exposed to weather shall be installed in NEMA IIIR enclosures with factory wired strip heaters in each starter enclosure and temperature control panel where required to inhibit condensation.
- C. All line voltage and low voltage wiring and conduit associated with fire protection system are included in this Section. Wiring and conduit shall comply with Division 26.

3.05 PIPING SYSTEM REQUIREMENTS

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

3.06 PRIMING AND PAINTING

- A. Perform priming and painting on the equipment and materials as specified herein.
- B. See Division 09 Painting Section(s) for detailed requirements.
- C. Priming and Painting:
 - 1. Exposed ferrous metals, including piping, which are not galvanized or factory-finished shall be primed and painted.
 - a. Black Steel Piping:
 - 1) Primer: One coat gray Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, comparable products by Rust-Oleum, Kelly Moore, or equal.
 - 2) Topcoat: Two coats gray Sherwin-Williams Pro Industrial Waterbased Alkyd Urethane Enamel, comparable products by Rust-Oleum, Kelly Moore, or equal.
 - 2. Metal surfaces of items to be jacketed or insulated except piping shall be given two coats of primer unless furnished with equivalent factory finish. Items to be primed shall be properly cleaned by effective means free of rust, dirt, scale, grease and other deleterious matter and then primed with the highest grade zinc rich primer. After erection or installation, primed surfaces shall be properly cleaned of foreign or deleterious matter that might impair proper bonding of subsequent paint coatings. Abrasion or other damage to shop or field prime coat shall be properly repaired and touched up with same material used for original priming.
 - 3. Where equipment is provided with nameplate data, the nameplate shall be masked off prior to painting. When painting is completed, remove masking material.

3.07 PIPING SYSTEMS INSTALLATION

A. At time of final connection, and prior to opening valve to allow pressurization of water piping from existing systems, on site or off site, perform a pressure test to indicate static pressure of existing systems. If pressure on fire protection piping is greater than 175 psi, inform Architect immediately. Do not allow piping systems to be pressurized without written consent of the Architect.

B. General:

- 1. Piping shall be concealed unless shown or otherwise directed. Allow sufficient space for ceiling panel removal.
- 2. Installation of piping shall be made with appropriate fittings. Bending of piping will not be accepted.
- 3. Install piping to permit application of insulation where required and to allow valve servicing.
- 4. Where piping or conduit is left exposed within a room, the piping or conduit shall be run true to vertical, horizontal, or intended planes. Where possible, uniform margins are to be maintained between parallel lines and/or adjacent wall, floor, or ceiling surfaces.

- 5. Horizontal runs of pipes and/or electrical conduit suspended from ceilings shall provide for maximum headroom clearance. The clearance shall not be less than 6'-6" without written approval from Architect.
- 6. Close ends of pipe immediately after installation. Leave closure in place until removal is necessary for completion of installation.
- 7. Each piping system shall be thoroughly flushed and proved clean before connection to equipment.
- 8. Install exposed polished or enameled connections with special care showing no tool marks or threads at fittings.
- 9. Install horizontal valves with valve stem above horizontal.
- 10. Use reducing fittings; bushings shall not be allowed. Use eccentric reducing fittings wherever necessary to provide free drainage of lines and passage of air.
- 11. Verify final equipment locations for roughing-in.
- 12. Where piping is installed in walls within one inch of face of stud, provide 16 gauge sheet metal shield plate on face of stud. The shield plate shall extend minimum 1-1/2 inches beyond outside diameter of pipe.

C. Sleeves:

- 1. Install Adjus-to-Crete, Pipeline Seal and Insulator, or equal, pipe sleeves of sufficient size to allow for free motion of pipe, 24 gauge galvanized steel. The space between pipe and sleeves through floor slabs on ground, through outside walls above or below grade, through roof, and other locations, as directed, shall be caulked with oakum and mastic and made watertight. The space between pipe and sleeve and between sleeve and slab or wall shall be sealed watertight.
- 2. At Contractor's option, Link-Seal, Metraflex Metraseal, or equal, casing seals may be used in lieu of caulking. Wrap pipes through slabs on grade with 1 inch thick fiberglass insulation to completely isolate pipe from concrete.

D. Floor, Wall, and Ceiling Plates:

1. Fit pipes, with or without insulation, passing through walls, floors, or ceilings, and hanger rods penetrating finished ceilings with chrome-plated or stainless escutcheon plates.

E. Firestopping:

- 1. Pack annular space between pipe sleeves and pipe through floors and walls with UL listed fire stop, and seal at ends. Pipe penetrations shall be UL listed, Hilti, 3M Pro-Set, or equal.
 - a. Install fire caulking behind fire protection services installed within fire rated walls, to maintain continuous rating of wall construction.
- 2. Provide SpecSeal Systems UL fire rated sleeve/coupling penetrators, or equal, for each pipe penetration or fixture opening passing through floors, walls, partitions or floor/ceiling assemblies. Penetrators shall comply with UL Fire Resistance Directory (Latest Edition), and with Chapter 7, CBC requirements.
- 3. Sleeve penetrators shall have built in anchor ring for waterproofing and anchoring into concrete pours or use special fit cored hole penetrator for cored holes.
- 4. Copper and steel piping shall have SpecSeal plugs, or equal on both sides of penetrator to reduce noise and to provide waterproofing.
- 5. All above systems to be installed in strict accordance with manufacturer's instructions.

6. Alternate firestopping systems are acceptable if approved as equal. Contractor is responsible for determining suitability of alternate products for their intended use, and shall assume all risks and liabilities in connection with the use of alternate products.

F. Hangers and Supports:

- 1. General: Support equipment and piping so that it is firmly held in place by approved iron hangers and supports and special hangers as required. Hangers and supports shall be UL listed for fire protection service. Components shall support weight of equipment, pipe, fluid, and pipe insulation based on spacing between supports with minimum factor of safety of five based on ultimate strength of material used. Do not exceed manufacturer's load rating. Pipe attachments or hangers, shall be of same size as pipe or tubing on which used, or nearest size available. Architect shall approve hanger material before installation. Do not support piping with plumbers' tape, wire rope, wood, or other makeshift devices. Where building structural members do not match piping support spacing, provide "trapeze" (bridging) support members attached to building structural members by methods approved by structural Engineer.
 - a. Materials, design, and type numbers per Manufacturers' Standardization Society (MSS), Standard Practice (SP)-58.
- 2. Hanger components shall be provided by one manufacturer. B-Line, Grinnell, Tolco, Afcon, Loos & Co., Uni-Strut, or equal.
- 3. Hanger and Supports:
 - a. Vertical Piping: Tolco Fig. 6, or equal, clamps attached to pipe above each floor to rest on floor. Provide intermediate support for vertical piping greater than 25 feet in length.
 - b. Individually Suspended Piping: Tolco Fig. 200 or Fig. 1 Clevis, complete with threaded rod, or equal.

<u>Pipe Size</u>	<u>Rod Size</u>
4" and Smaller	3/8"
5" to 6"	5/8"

- c. Trapeze Suspension: Sch-10 or Sch-40 steel pipe trapeze member in accordance with NFPA 13- published load ratings.
- d. Pipe Clamps and Straps: B-Line B2000 or B2400, Tolco, Fig. 200 or Fig. 1, or equal. Where used for seismic support systems, provide B-line B2400, Tolco fig. 69 series retainer pipe straps, or equal.
- e. Deck Connectors: Afcon Fig. 610 steel ceiling plate, or equal, where approved by structural Engineer.
- 4. Support to Structure:

- a. Wood Structure: Provide and install wood blocking as required to suit structure. Provide lag screws or through bolts with length to suit requirements, and with size (diameter) to match the size of hanger rods required.
 - 1) Do not install Lag screws in tension without written review and acceptance by Structural Engineer.

Side Beam Angle Clip	B-Line B3062MSS Type 34
Side Beam Angle Clip	B-Line B3060
Ceiling Flange	B-Line B3199

- 2) Blocking for support of piping shall be not less than 2 inch thick for piping up to 2 inch size. Provide 3 inch blocking for piping up through 5 inch size, and 4 inch blocking for larger piping. Provide support for blocking in accordance with Structural Engineers requirements.
- 3) Where lag screws are used, length of screw shall be 1/2 inch less than the wood blocking. Pre-drill starter holes for each lag screw.
- 5. Pipe hanger and support spacing: Locate hangers and supports at each change of direction, within one foot of elbow, and spaced per NFPA 13, and per pipe manufacturer's listing, except as noted below.
- 6. Provide rigid insulation and a 12 inch long, 18 gauge galvanized sheet iron shield between the covering and the hanger whenever hangers are installed on the outside of the pipe covering.
- 7. Insulate copper piping from ferrous materials and hangers with two layers of 3 inch wide, 10 mil polyvinyl tape wrapped around pipe.
- 8. Provide a support or hanger close to each change of direction of pipe either horizontal or vertical and as near as possible to concentrated loads.
- 9. Suspend rods from concrete inserts with removable nuts where suspended from concrete decks. Power actuated inserts will not be allowed.

3.08 UNIONS AND FLANGE INSTALLATION

- A. Install Watts, Epco, Nibco, or equal, dielectric unions or flanges at points of connection between copper or brass piping or material and steel pipe or material. Bushings or couplings shall not be used.
- B. Install unions in piping NPS 2" and smaller and flanges in piping NPS 2-1/2" and larger whether shown or not at each connection to equipment and tanks, and at connections to automatic valves.
- C. Locate unions for easy removal of equipment, tanks, or valves.

3.09 ACCESS DOOR INSTALLATION

A. Furnish and install access doors wherever required whether shown or not for easy maintenance of fire protection systems. Access doors shall provide for complete removal and replacement of equipment.

3.10 PIPE IDENTIFICATION

- A. Provide temporary identification of each pipe installed, at time of installation. Temporary identification shall be removed and replaced with permanent identification as part of the Work.
- B. Apply legend and flow arrow at valve locations; at points where piping enters or leaves a wall, partition, cluster of piping or similar obstruction, at each change of direction, and at approximately 20'-0" intervals on pipe runs. Variations or changes in locations and spacing may be made with approval of Architect. There shall be at least one marking in each room. Markings shall be located for maximum visibility from expected personnel approach.
- C. Wherever two or more pipes run parallel, markings shall be supplied in the same relative location on each.
- D. Apply markings after painting and cleaning of piping and insulation is completed.

3.11 TESTS AND ADJUSTMENTS

- A. Test installations in accordance with the following requirements and all applicable codes:
 - 1. Project Inspector should witness tests of piping systems.
 - 2. Notify Architect at least seven days in advance of tests.
 - 3. Notify local fire department of time and date of fire systems testing.
 - 4. Piping shall be tested at completion of roughing-in, or at other times as directed by Architect.
 - 5. Furnish necessary materials, test pumps, gases, instruments and labor required for testing.
 - 6. Isolate from system equipment that may be damaged by test pressure.
 - 7. Make connections to existing systems with flanged connection. During testing of new work, provide a slip-in plate to restrict test pressure to new systems only. Remove plate and complete connection to existing system at completion of testing.
 - a. Project Inspector shall witness final connection to system.
- B. Test Schedule: No loss in pressure or visible leaks shall show after four hours at pressures indicated:

System Tested	Test Pressure PSI	<u>Test With</u>
Fire Sprinkler Piping	200	Water

- Piping, including underground piping, connected to fire sprinkler system shall be tested and certified in accordance with NFPA requirements, except where requirements listed in this Section exceed requirements of NFPA.
- C. Should material or work fail in any of these tests, it shall be immediately removed and replaced with new material, and portion of work replaced shall again be tested by Contractor at his own expense.
- D. Lubricate each item of equipment, including motors, before operation.
- 3.12 CHECK, TEST AND START REQUIREMENTS

- A. An authorized representative of the equipment manufacturer shall perform check, test and start of each piece of fire protection equipment. The representative may be an employee of the equipment manufacturer, or a manufacturer-certified contractor. Submit written certification from the manufacturer stating that the representative is qualified to perform the check test and start of the equipment.
 - 1. As part of the submittal process, provide a copy of each manufacturer's printed startup form to be used.
 - 2. Some items of specified equipment may require that check, test and start of equipment must be performed by the manufacturer, using manufacturer's employees. See specific equipment Articles in these Specifications for this requirement.
 - 3. Provide all personnel, test instruments, and equipment to properly perform the check, test and start work.
 - 4. When work has been completed, provide copies of reports for review, prior to final observation of work.
- B. Provide copies of the completed check, test and start report of each item of equipment, bound with the Operation and Maintenance Manual.
- C. Upon completion of the work, provide a schedule of planned maintenance for each piece of equipment. Indicate frequency of service, recommended spare parts and methods for adjustment and alignment of all equipment components. Provide a copy of the schedule with each operating and maintenance manual. Provide a copy of certification from the Owner's representative indicating that they have been properly instructed in maintenance requirements for the equipment installed.

3.13 COMMISSIONING AND PRELIMINARY OPERATIONAL TESTS

- A. Prior to observation to determine final acceptance, put fire protection systems into service and check that work required has been done, including but not limited to the following condensed check list. Provide indexed report to tabulating the results of tests.
 - 1. Equipment has been started, checked, lubricated and adjusted in accordance with manufacturer's recommendations.
 - 2. Correct rotation of motors and ratings of overload heaters are verified.
 - 3. All manufacturers' certificates of start-up specified have been delivered to Owner.
 - 4. All equipment has been cleaned, and damaged painted finishes touched up.
 - 5. Missing or damaged parts have been replaced.
 - 6. Flushing of piping systems has been completed and water treatment equipment, where specified, is completed.
 - 7. Equipment labels, pipe marker labels, ceiling markers and valve tags are installed.
 - 8. Valve tag schedules, corrected control diagrams, sequence of operation lists and start-stop instructions have been posted.
 - 9. Maintenance manuals have been delivered and Owner training has been completed.

B. Review of Contractor's Tests:

1. Tests made by Contractor or manufacturers' representatives are subject to observation and review by Owner. Provide timely notice prior to start of each test, in order to allow for observation of testing. Upon completion of tests, provide letter to confirm that testing has been successful.

C. Test Logs:

1. Maintain test logs listing the tests on mechanical systems showing dates, items tested, inspectors' names, remarks on success or failure of tests.

END OF SECTION

SECTION 21 10 00

AD02.07 01/14/2025

FIRE SPRINKLER SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Sprinkler heads.
 - 2. Pipe and Fittings.
 - Valves.

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 21 00 50 Basic Fire Sprinkler Materials and Methods.

1.03 REFERENCES

- A. It is the intent of these Specifications to provide for complete and operating fire protection automatic sprinkler system in full compliance with the following standards:
 - 1. National Fire Protection Association (NFPA) Standard No. 13, 2016, as amended by the CBC.
 - 2. CBC Chapter 9.
 - 3. NFPA No. 24, 2016 (as amended).
 - 4. NFPA No. 25, 2013 (California Edition).
- B. The work shall also be in accordance with all local or state requirements that apply.

1.04 DESCRIPTION OF WORK

- A. Work of this section includes, but is not limited to, the following:
- B. An existing fire sprinkler system is in place, consisting of a fire sprinkler riser for each zone with the main supply line and zone control valve for each floor, branch lines, and tees to each sprinkler head. Extend and modify the existing system as required to properly protect the building in accordance with NFPA 13 criteria.
- C. Furnish all coordination, labor, design drawings, calculations, materials, tools, and equipment to install the wet pipe automatic fire sprinkler system as described in this Specification Section. System shall be hydraulically calculated and designed for the building occupancy classification as determined by NFPA 13.
 - 1. The Work includes, but is not limited to the following:
 - a. Complete automatic fire risers, including valves, fire department connections, flow switches, pressure switch and service mains as indicated.

- b. Complete interior wet type automatic fire protection spray type sprinkler distribution system, including overhead service and branch mains, lateral supply piping, supports, hangers, seismic bracing, and heads
- c. Required tests and inspections.
- d. Provide electrical work required to complete the system. Contractor shall be responsible for providing complete and operable systems, including electrical wiring. Install wiring in conduit, in accordance with Division 26.
- e. Protected areas shall include areas above and below the finished ceilings, exterior exposure, canopies, stairways, rooms, areaways, entry, etc, and other areas requiring sprinklers. Thoroughly examine architectural and other drawings as required to satisfy this requirement.
- f. Tags, identification labels and instruction manuals for proper operation and maintenance.
- D. Provide fire sprinklers to protect combustible building overhangs greater than 4 feet wide, as required by local authority.
- E. Determine the static and residual pressure for the site as required for accurate determination of system requirements. Base system calculations on the lowest expected static and residual pressure for the area.
 - 1. Test data for static and residual pressure shall be obtained from water district or local fire department; test shall be made within the last six months prior to start of work.
 - 2. Provide calculations based on 10 percent minimum safety factor. For hydraulically calculated fire sprinkler systems the maximum velocity in the building and the fire main piping shall not exceed 15 feet per second.

1.05 DRAWINGS

- A. Contractor shall thoroughly examine architectural, structural, mechanical, plumbing, electrical, and other Drawings provided as part of this Contract.
- B. Coordinate suitable head locations and spacing with Architect.

1.06 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of fire protection products, of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Installer Qualifications: A firm with at least five years of successful installation experience on projects with fire sprinkler piping systems similar to that required for this Project.
 - 1. A State of California Fire Protection Contractor's license (C-16) is required.
- C. Fire Sprinkler Fitter Certification:
 - 1. Automatic fire extinguishing systems sprinkler pipefitters shall be certified by Office of the State Fire Marshall (OSFM).
- D. Design Criteria: Provide complete fire protection systems as indicated and as required by authority having jurisdiction.

- 1. When there is conflict between requirements of authority having jurisdiction or requirements of other agencies and these Drawings and Specifications, requirements of authority having jurisdiction and recommendations of standards agencies shall govern.
- 2. Design and install entire system in accord with applicable codes, standards, and regulations.
- 3. The automatic sprinkler system shall conform to requirements of the National Fire Protection Association, Standard No. 13, as amended by the CBC. Contractor shall hydraulically calculate sprinkler system in accordance with NFPA 13.
- 4. Drawings are diagrammatic only to indicate rooms/areas of sprinkler protection and piping clearances when appropriate. Rerouting of pipe and addition, deletion or relocation of heads may be necessary. Submit proposed layout for approval prior to start of installation.
- 5. FM Compliance: Comply with Factory Mutual "Approval Guide."
- 6. Supply equipment and accessories in accordance with requirements of all applicable national, state and local codes.
- 7. Items of a given type shall be the products of the same manufacturer.
- 8. Scheduled equipment performance is minimum capacity required.
- 9. Scheduled electrical capacity shall be considered as maximum available.

1.07 COORDINATION

- A. Coordinate Work in this Section with trades covered in other Sections of Specifications to provide a complete and operable installation of highest quality workmanship.
- B. Coordinate location of fire protection piping, mains and branches, to avoid interference with work by other trades. Plumbing drainage piping and ductwork shall have right-of-way over fire protection piping. Wherever conflicts exist, fire protection piping shall be offset or rerouted at no additional cost to Owner. Provide locations of piping for use in Coordinated Layout called for in Specification Section 23 80 00.
- C. Piping shall be concealed, except where so indicated or where absolutely necessary to be exposed. Exposed piping shall be placed as approved by Architect prior to installation. Heads shall be fully coordinated with architectural reflected ceiling plan and placed in center of ceiling tiles.
- D. On-site measurement of pipe will be required. Offsets, pipe, fittings, drains, etc., required to meet job conditions shall be furnished and installed at no extra cost to Owner.
- E. Additional heads required by NFPA 13 regulations shall be provided at no extra cost, if required as a result of Contractors' coordination. Location of heads and mains shall not be changed unless approved by Architect.
- F. Coordinate layout and installation of sprinklers with other construction penetrating ceilings, including light fixtures, HVAC equipment, and partition assemblies.
- G. The Architect shall decide any differences or disputes concerning coordination, interference or extent of work, and his decision shall be final.

1.08 SUBMITTALS

- A. Samples: Provide one sample of each sprinkler head type.
- B. Shop Drawings: Submit in accordance with Division 01, and as follows:

- 1. Prepare Drawings, calculations, and product data of fire protection systems indicating pipe sized, pipe locations, fittings, shutoffs, equipment, etc. Note, in bold type, any piping which will project beyond finished surfaces of normally occupied rooms, exterior of the building or other locations which will expose the system to view.
- 2. Layout drawings and flow calculations approved by agencies having jurisdiction.
- 3. Drawings and calculations shall be stamped and signed by a State of California licensed professional engineer prior to submission to the Architect. Engineer shall be qualified for this work.
- C. Manufacturer's data for each item of material or equipment used.
- D. Welding operator qualification certificates.
- E. Office of the State Fire Marshall (OSFM) certification cards for automatic fire extinguishing systems sprinkler pipefitters.
- F. Test Reports: As indicated in paragraph "Tests".
 - 1. Sprinkler pressure test.
 - 2. Alarm system test.
- G. Operation and Maintenance Manual:
 - 1. Operation and Maintenance Manual in accordance with Section 21 00 50. Include an original copy of NFPA 25, California edition, in Operation and Maintenance Manual for fire sprinkler system.
 - 2. Guarantees in accordance with Division 01.
- H. Deferred Approval Documents: Do not proceed with fabrication or installation of fire sprinkler system until deferred approval documents have been approved by regulatory agencies.
 - 1. General: Provide detailed drawings, specifications, and calculations prepared by a State of California licensed professional engineer.
 - a. Documents produced by the Contractor shall be stamped and signed by the licensed mechanical engineer responsible for their preparation.
 - 2. Architect Review: Make additions, changes and corrections as directed by Architect and resubmit.
 - 3. Agency Review: Architect will submit documents to Agency or Authority Having Jurisdiction. Make additions, changes and corrections required by Agency / Authority at no cost to Owner and resubmit to Architect.
 - 4. Agency Approval: Architect will submit documents to Agency / Authority for final approval.

1.09 APPLICABLE PUBLICATIONS

- A. The following publications form a part of this specification:
 - 1. ANSI American National Standards Institute.
 - 2. ASME American Society of Mechanical Engineers.
 - 3. UL Underwriters' Laboratories, Inc. Fire Resistance Directory.
 - 4. CBC California Building Code.
 - 5. NFPA National Fire Protection Standards as amended by the CBC.

- 6. CFC California Fire Code.
- 7. CPC California Plumbing Code.

1.10 SUPERVISION

A. Keep a competent superintendent on the job that shall coordinate the activities of the crafts and maintain the progress of the work to the satisfaction of the Architect.

1.11 SITE CONDITIONS

A. Verify all dimensions at the building site and check existing conditions before beginning work. Make changes that are necessary to coordinate the work with other trades, after review by the Architect.

1.12 REGULATIONS

A. All work shall be installed in strict conformity with California Building Code (CBC), California Plumbing Code (CPC), and California Electric Codes (CEC), Industrial Safety Orders, California Mechanical Code (CMC), California Fire Code (CFC), and other laws and regulations of authorities having jurisdiction.

1.13 FEES AND PERMITS

A. Take out permits and pay fees and charges required in connection with the Work.

1.14 TEMPORARY CONNECTIONS

A. Temporary connections required to maintain services during the course of the Contract shall be made without additional cost to Owner. The normal function of the building must not be interrupted; notify Owner minimum seven days in advance before interrupting any service.

1.15 EXISTING MATERIALS

- A. Existing equipment, piping, construction, etc., which interferes with work of the Contract shall be removed and promptly returned to service. Damaged items shall be replaced with new material to match existing.
- B. Removed materials which will not be reused and which are not claimed by the Owner shall become the property of the Contractor and shall be removed from the premises. Consult Owner before removing any material from premises. Materials claimed by Owner shall be removed carefully to prevent damage and delivered on the site where directed.
- C. Existing piping not to be reused and which is concealed in the building construction may be capped and abandoned in place but such piping and wiring which is exposed in equipment rooms or occupied spaces shall become property of Contractor and shall be removed from the premises.

PART 2 - PRODUCTS

2.01 GENERAL

A. The equipment to be furnished under this Specification shall be standard product of manufacturer. Where two or more units of the same class of equipment are required, these units shall be products of

a single manufacturer; however, component parts of system need not be products of the same manufacturer.

2.02 MATERIALS AND EQUIPMENT

A. Unless otherwise shown on Drawings, specified, or directed by Architect, materials and equipment used in installation of sprinkler systems shall be listed as approved by FM or UL for fire protection systems, and shall be the latest design of the manufacturer.

2.03 SPRINKLER HEADS

- A. Provide spray pattern type sprinkler heads, of ordinary degree temperature rating, except that sprinkler heads for installation in vicinity of heating equipment, and in other areas noted on Drawings, shall have temperature ratings required for such locations by NFPA 13.
- B. Sprinkler heads shall be upright, pendent, or sidewall, as required.
 - 1. Heads in ceilings of occupied spaces with recessed lights shall be chrome plated, semi-recessed pendent type, with white escutcheon.
 - 2. Sprinkler heads in rooms with surface mounted lights shall be chrome plated pendant style, with two-piece white escutcheon.
 - 3. Provide head guards in equipment rooms and storage rooms and all other locations where subject to damage.
 - 4. Upright heads in areas with no ceilings shall be rough bronze finish.
 - 5. Provide quick response type heads in light and ordinary hazard occupancies.
 - 6. Side wall heads may be used (except in extended coverage type) to cover special areas where overhead piping and heads are impractical or a considered visual problem by the Architect or Owner. Side wall heads shall be chrome finish.
 - 7. Outdoor heads, if required shall be dry or freeze resistant.
 - 8. Adjustable drop nipples are not acceptable.
- C. Recessed sprinkler heads shall have chrome finish and adjustable chrome finish escutcheons; exposed pendent heads in finished ceilings shall have chrome finish and white ceiling escutcheons. Concealed (flush) heads shall be all brass, with white cover plate.
 - 1. Provide oversized escutcheons where required to meet the requirements of ASCE 7.
- D. Spare Heads: Furnish spare heads equal to one percent of total number of heads installed under Contract, but not less than twelve. Spare head types furnished shall be representative of types and temperature ratings of heads installed, and in proportion to number of each type and temperature rating of heads installed. Furnish not less than two sprinkler head wrenches, with at least one wrench for each type of sprinkler head installed. Place spare heads and wrenches in wall mounted box manufactured for this purpose.

2.04 PIPE AND FITTINGS

A. For Installation Aboveground: 150 PSI, Schedule 40 black steel pipe, ASTM A-53 with ductile or cast iron screwed fittings.

- 1. Schedule 10 black steel pipe, ASTM A 135 or ASTM A 795, with grooved fittings and associated couplings may be used for pipe sizes 2 inches through 5 inches. Provide NFPA 13-specified wall thickness for pipe sizes 6 inches through 10 inches. Threading of piping will not be accepted.
- B. Mechanical tees, saddle fittings, bushings and mechanical sprinkler head fittings shall not be used.

2.05 VALVES

- A. Angle, Check, and Globe Valves: Fed. Spec WW-V-51; Class A, type as suitable for application.
 - 1. Select check valves for installation in vertical lines recommended by manufacturer as suitable for vertical installation. Install in vertical lines only where flow is upward.

B. Gate Valves:

- 1. Sizes 1-1/2 inches or less: Fed. Spec WW-V-54, Class A.
- 2. Sizes above 1-1/2 inches: Fed. Spec WW-V-58, Class A, designation OS or OF, as required. Provide OS&Y type, 175 pound rated working pressure.
- 3. Furnish and deliver to Owner one wrench of each size required for operating underground valves.
- C. Drain Valves: angle, or globe. Fed. Spec WW-V-51; Class A, type as suitable for application.
 - 1. UL listed and FM approved combination test and drain fittings may be used.
- D. Zone Control Valves: UL listed, outside screw and yoke or butterfly. Valves shall be sealed open with approved seal. Provide weatherproof actuator housing, with two single pole, double throw switches.
 - 1. Supervisory Switch: Fit the control valves on the fire sprinkler risers with supervisory switch, with single pole double throw switch actuator installed to change switch position when valve is being closed.
- E. Sprinkler Inspector's Test Fittings:
 - 1. Standard: UL's "Fire Protection Equipment Directory" or FM Global's "Approval Guide."
 - 2. Pressure Rating: 175-psig minimum.
 - 3. Body Material: Cast- or ductile-iron housing with sight glass.
 - 4. Integral factory or field-installed pressure relief valve.
 - 5. Size: Same as connected piping.
 - 6. Inlet and Outlet: Threaded.

2.06 UNION AND FLANGES

A. Size and Type:

- 1. Steel 2 inches and smaller: 150 pound screwed black or galvanized malleable iron, match pipe, ground joint, brass to iron seat.
- 2. Steel 2-1/ inches and larger: 150 pound black flange union, flat faced, full gasket.
- B. Gaskets: 1/16 inch thick rubber Garlock #122, Johns-Manville, or equal.

C. Flange Bolts: Open hearth bolt steel, square heads, with cold pressed hexagonal nuts, cadmium plated when installed below ground. Provide copper plated steel bolts and nuts or brass bolts and nuts for brass flanges.

2.07 GAUGES

A. Marsh "Quality Gage", U.S. Gage, Danton 800, or equal, U.L. listed, with bronze bushed movement and front recalibration. Dials shall be white with black numerals, 3-1/2 inch dial face. Normal reading shall be at midscale. Provide a three-way valve on each gauge connection.

PART 3 - EXECUTION

3.01 GENERAL

- A. Installation of the sprinkler system shall not be started until complete plans and specifications (including water supply information and type of existing sprinkler system, if any) have been approved by the State Fire Marshal.
 - 1. Piping shall be concealed unless shown or otherwise directed.
 - 2. Where piping is left exposed within a room, it shall be run true to vertical, horizontal or intended planes. Where possible, uniform margins shall be maintained between parallel lines and/or adjacent wall, floor or ceiling surfaces.
 - 3. Horizontal runs of pipes and/or electrical conduit suspended from ceilings shall provide for maximum headroom clearance. This clearance shall not be less than 6'-6" without written approval from Architect.
 - 4. Minor changes in locations of equipment, piping, etc., from locations shown shall be made when directed by Architect at no additional cost to Owner, providing such change is ordered before such items of work, or work directly connected to same, are installed and providing no additional material is required.
 - 5. Grade all piping as required by NFPA 13.
 - 6. Close ends of pipe immediately after installation; leave closure in place until removal is necessary for completion of installation.
 - 7. Piping systems shall be thoroughly flushed and proved clean before connection to equipment.
 - 8. Pipe discharge of each drain valve to floor sink or drain.

3.02 HANGER AND SUPPORT INSTALLATION

- A. General: Support piping so that it is firmly held in place by approved iron hangers and supports and by special hangers as required in accordance with NFPA 13. Hangers shall support loads specified in NFPA 13, and, in addition, shall support weight of pipe, fluid and pipe insulation, based on spacing between supports with minimum factor of safety of five based on ultimate strength of material used. Do not exceed manufacturer's load rating. Pipe attachments, or hangers, shall be of same size as pipe or tubing on which used, or nearest larger size available. Materials, design, and type numbers per Manufacturers' Standardization Society (MSS) Standard Practice SP-58, provide branch line restraints where hangers exceed 6 inches long, in accordance with NFPA 13. Install concrete anchors required. Hanger material shall be approved by Architect before installation. Do not support piping by plumbers' tape, wire, rope, wood or other makeshift devices.
- B. Suspend rods from angle clips, in accordance with Section 21 00 50.

3.03 SEISMIC REQUIREMENTS

- A. Comply with CBC, Volume 2, Chapter 16A and CBC Chapter 9 and NFPA 13.
- B. Seismic bracing system shall be a complete pre-engineered bracing system. Pre-engineered bracing system shall include plan layout, brace selection, specification, and calculations. Complete system shall be submitted to Architect for review. See Delegated Design Submittal paragraph in article, Submittals, in Section 21 00 50.
- C. Anchorage for various manufactured and fabricated items is detailed and scheduled on the drawings or specified.
 - 1. For proposed changes to anchorage shown, or specified, submit proposed methods of anchorage with calculations prepared by a California Registered Structural Engineer. Design of anchorage shall comply with the above regulations using minimum coefficients, CP, listed CBC Chapter 16A.
- D. It is not intended that prototype or non-standard equipment or equipment frames be provided. However, items of equipment shown or specified to be anchored shall maintain integrity at point of anchor after being subjected to accelerations equivalent to those established herein.
- E. Anchors: Piping shall be provided with anchors for protection of piping against damage due to earthquakes, as required by CBC Chapter 16A, NFPA 13, and other sections of this Specification.

3.04 TESTS

- A. At various stages and upon completion, the system must be tested in the presence of the enforcing agency.
- B. Upon completion and prior to acceptance of the installation, subject entire new system to tests required in NFPA 13, and furnish Owner with certificates as appropriate.

3.05 IDENTIFICATION

- A. Coordinate requirements with the authority having jurisdiction.
- B. Provide brass valve tags at each system valve, indicating valve service.
- C. Provide signage at each sprinkler valve, with sign indicating specific portion of system controlled by
- D. Provide signage at each outdoor alarm device, with sign indicating which authority to call if device is activated.
- E. Prior to final acceptance, Contractor shall provide accurate color-coded Building Plan at riser location, clearly depicting fire protection system area of coverage, location of inspectors' test/drain connection and auxiliary drain connections. Provide this information at each system or building at riser location for building. Plan(s) shall be one-half size and plastic laminated.
- F. Provide hydraulic data signage permanently attached to risers, indicating location, basis of design, water supply and pressure requirements of system.

3.06 ELECTRICAL WIRING

- A. Coordination of wiring systems is part of this work. Contractor shall ensure that the following is completed.
 - 1. Work provided in other Specification Sections:
 - a. Supervised wiring to fire alarm control panel.
 - b. Supervised wiring from main waterflow indicator to fire alarm panel.
 - c. Supervised wiring from sprinkler flow switches to fire alarm panel.
 - d. Supervised wiring from valve water flow alarm switches to fire alarm panel.
 - 2. Work provided in this Specification Section:
 - a. Wiring diagrams for devices.
 - b. Other wiring not specified to provide an operating system.

3.07 SPRINKLER HEAD INSTALLATION

- A. Heads shall be placed upright where on exposed piping, unless otherwise noted, and in pendant position on concealed piping, unless noted otherwise, with deflectors parallel to the ceiling or roof slope. Clearance between deflectors and ceilings, electric, or heating equipment, or other obstruction shall be in accordance with the requirements of NFPA 13. Provide sprinkler head guards where heads are subject to mechanical damage, for example, at mechanical rooms, and storage rooms and gymnasiums.
- B. Mount box containing spare sprinkler heads and wrenches on wall in location selected by Owner.
- C. Do not install pendent sprinkler heads until flushing of piping has been completed.
- D. Provide return bend as illustrated in NFPA 13 (NFPA exceptions do not apply) for each sprinkler head installed in finished ceiling.

3.08 PIPING INSTALLATION

- A. Pipe shall be assembled in accordance with the applicable requirements of NFPA 13 and NFPA 24.
- B. Provide concrete thrust blocks for underground and underslab piping in accordance with NFPA 24 and CBC.

3.09 VALVE IDENTIFICATION

A. All valves shall be identified by permanent metal tags or other approved means.

3.10 DRAIN INSTALLATION

- A. Auxiliary drains shall be installed on low points in each system.
 - 1. Five or fewer trapped gallons will not require a drain valve but may be drained through a plugged fitting. Drain valves shall be in accordance with the requirements of NFPA 13.
- B. Install one inspector's test drain on sprinkler system. Extend drain to outside in location approved by Architect. Water discharge shall be positioned such that landscaping will not be damaged.

- C. Drain valves shall be piped to a safe place of discharge and discharge shall be visible either by open-end drainpipe or sight drain fitting.
- D. Provide flushing connections at ends of cross-mains.

3.11 SLEEVE INSTALLATION

- A. Install AMI Products, Adjus-to-Crete, or equal, pipe sleeves of sufficient size to allow for free motion of pipe, 24 gauge galvanized steel. The space between pipe and sleeves through floor slabs on ground, through outside walls above or below grade, through roof, and other locations as directed shall be caulked with oakum and mastic and made watertight. The space between pipe and sleeve and between sleeve and slab or wall shall be sealed watertight.
- B. Holes through existing concrete walls or floors shall be core drilled. The space between pipe and hole through floor slabs on ground, through outside walls above or below grade, through roof and other locations as directed shall be made watertight.
- C. At walls below grade Link-Seal casing seals, or equal, may be used in lieu of caulking. Pipes penetrating walls below grade shall be anchored at wall.

3.12 FLOOR, WALL, AND CEILING PLATE INSTALLATION

A. Fit pipes with or without insulation passing through walls, floors, or ceilings and hanger rods penetrating finished ceilings with chrome plated or stainless steel plates.

3.13 FIRESTOPPING

- A. The annular space between pipe sleeves and pipe passing through all floors and walls shall be packed with incombustible mastic or other suitable material, in accordance with U.L. Fire Resistance Directory.
- B. Penetrations in fire rated assemblies shall also be protected in accordance with CBC Chapter 7, Section 712, and UL Fire Resistance Directory.

3.14 UNION AND FLANGE INSTALLATION

- A. Install unions whether shown or not at each connection to equipment and at one connection to each valve or cock.
- B. Locate the unions for easy removal of the equipment or valve.

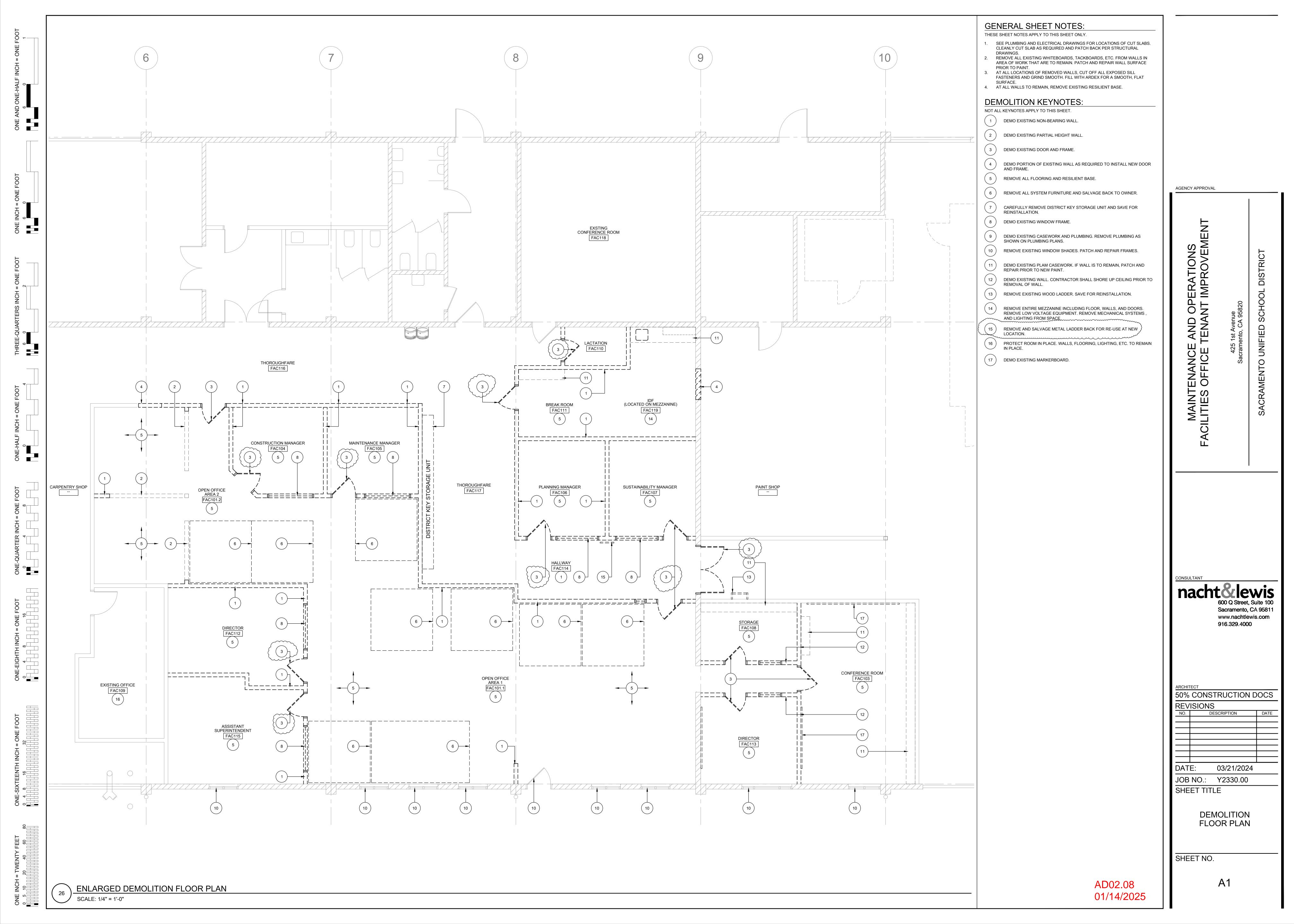
3.15 CLEANING

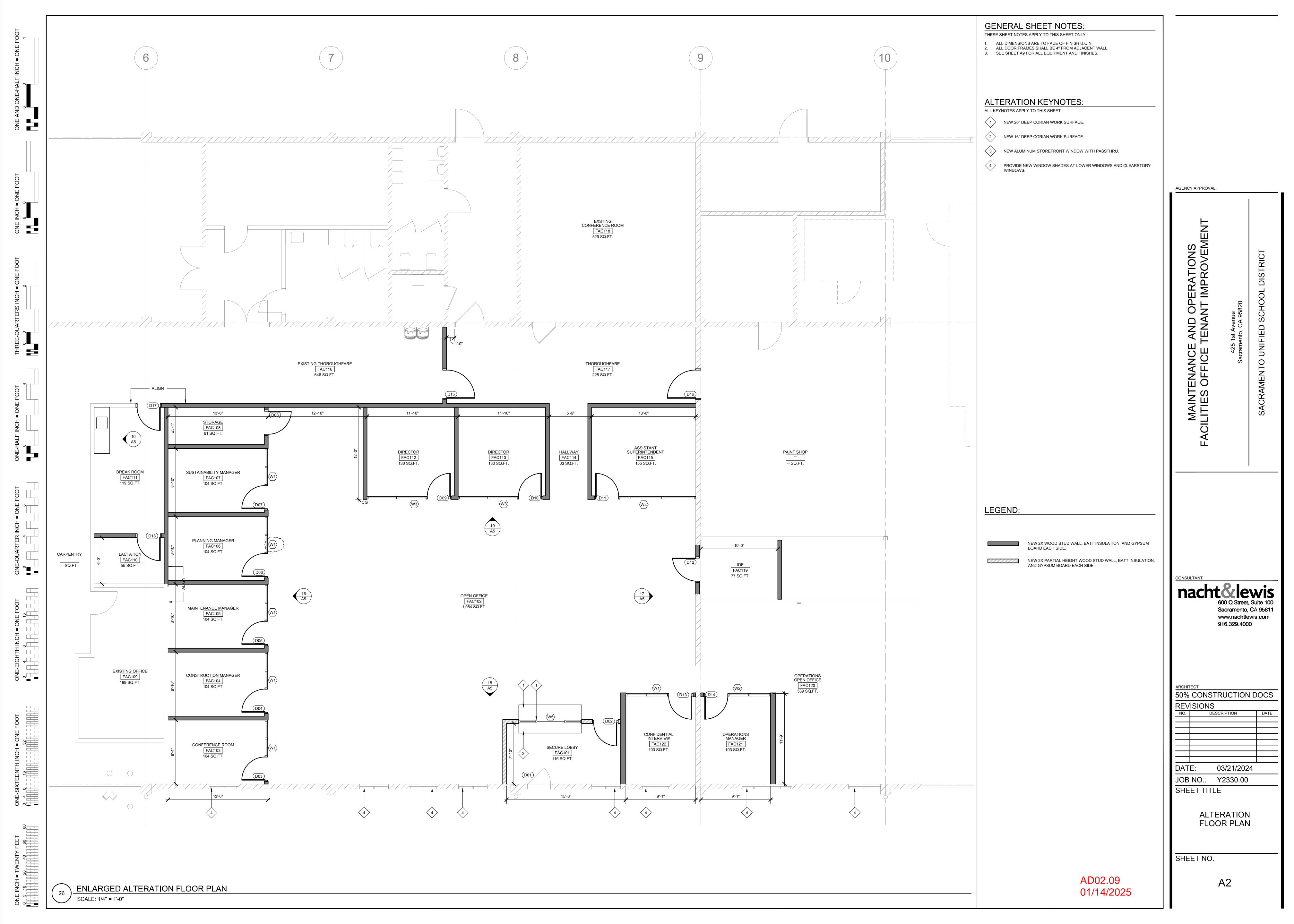
A. Upon completion of tests, clean equipment, piping, etc., installed under this Section of the Specifications.

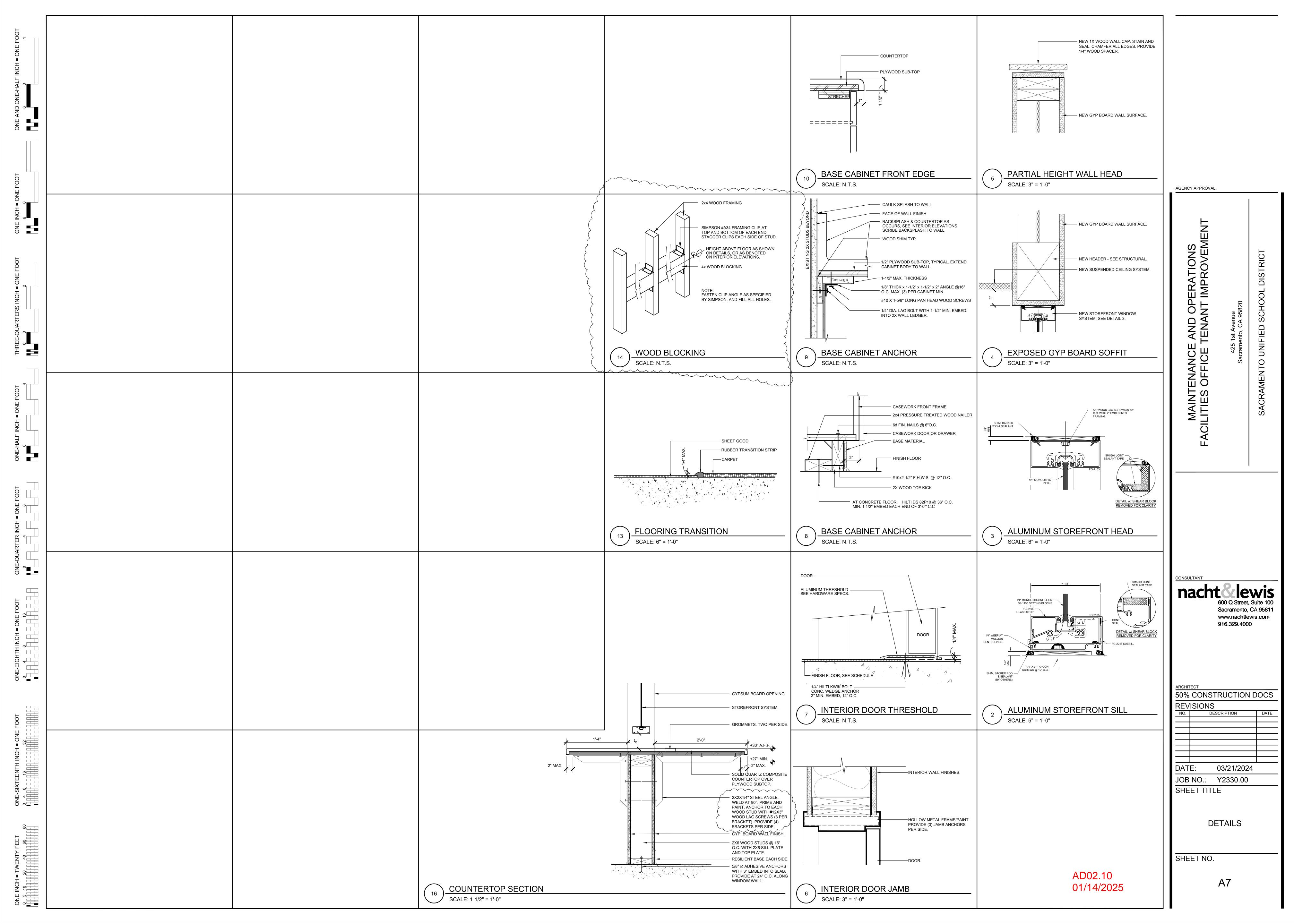
3.16 PIPING SYSTEM FLUSHING

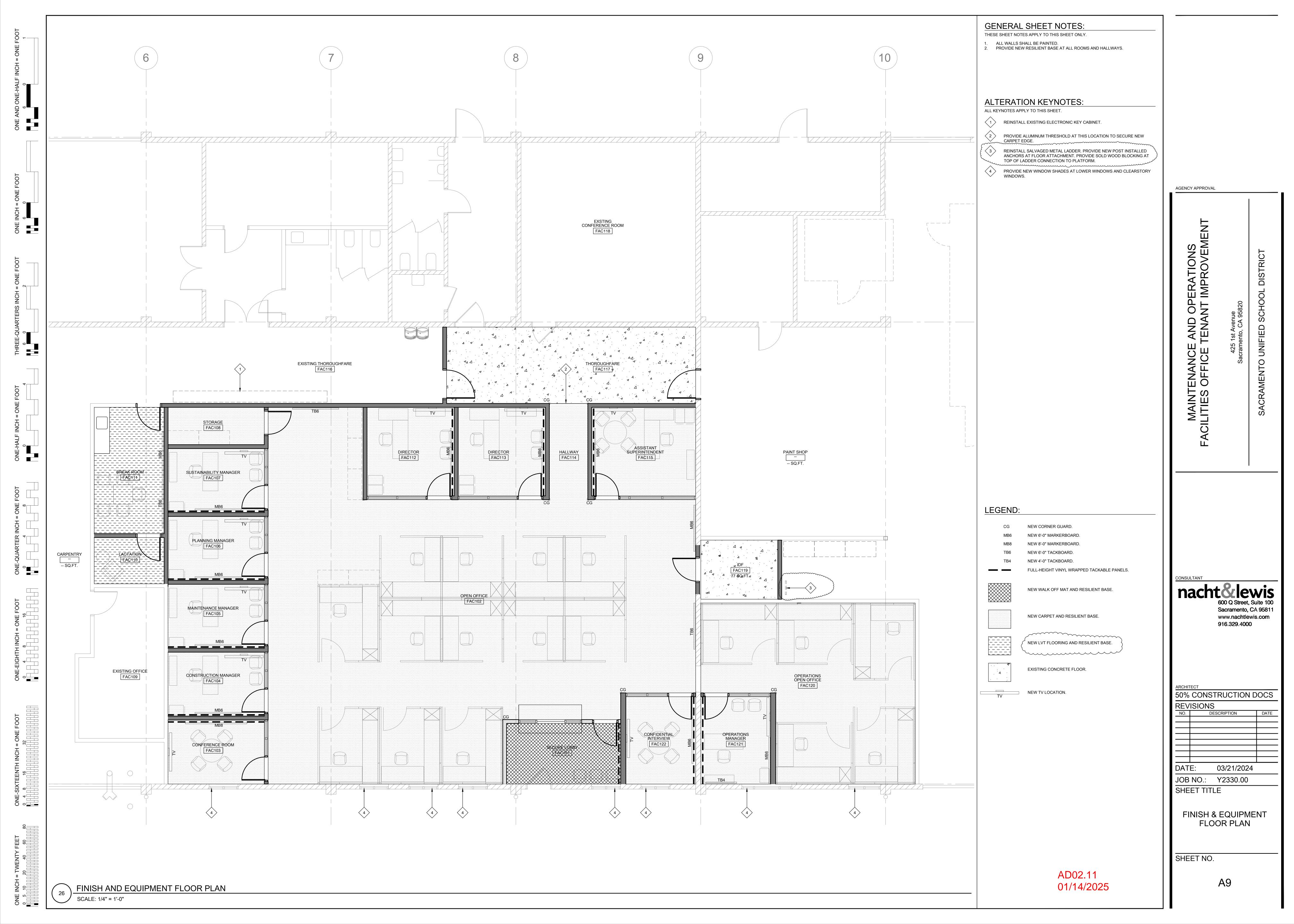
A. Entire system shall be flushed out and cleaned after completion of piping, and prior to installation of sprinkler heads. Flush shall be continued until water runs clear at drain connections.

END OF SECTION









CONCRETE:

1. ALL CONCRETE SHALL BE NORMAL WEIGHT PER ACI 301 AND HAVE PROPORTIONS OF CEMENT, COARSE AND FINE AGGREGATE, WATER AND ADMIXTURES TO PRODUCE THE PROPERTIES SPECIFIED FOR EACH CONCRETE MIX TYPE PER ACI 301 ON THE BASIS OF PREVIOUS FIELD EXPERIENCE OR TRIAL BATCHES.

2. CONCRETE SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES. REFER TO PROJECT SPECIFICATIONS (WHERE

	APPLICABLE) FOR ADDITIONAL REQUIREMENTS:					
	CLASS	APPLICATION	STRENGTH	MAX V		
ا کر			f'c (psi)	RATI		
\	CLASS A	FOOTINGS & SLABS	3500	.45		
		CONCRETE TESTING NOT RE	QUIRED			
		~				

A. THE APPROVED PROPORTIONS SHALL BE CAREFULLY MAINTAINED. NO DEVIATION FROM THE APPROVED PROPORTIONS SHALL BE MADE WITHOUT WRITTEN APPROVAL BY ENGINEER.

B. USE ADMIXTURES IN ACCORDANCE W/MANUFACTURER'S SPECIFICATIONS. USE WATER-REDUCING ADMIXTURE THAT WILL NOT RESULT IN SEGREGATION, HONEYCOMBING, OR ROCK POCKETS.

C. ANY OF THE ABOVE MIXES CAN BE USED FLOWABLE (8" MAX SLUMP) IF THE PROPER ADDITION OF ADMIXTURES IS INCLUDED AND THE W/C RATIO IS NOT INCREASED.

D. CEMENT PER ASTM C-150 TYPE I OR TYPE II FLY ASH PER ASTM C-618 CLASS N OR CLASS F UP TO 20% OF PORTLAND CEMENT MAY BE SUBSTITUTED WITH FLY ASH

E. COARSE AND FINE AGGREGATES PER ASTMC-33 F. ADMIXTURES AND DOSAGES WILL VARY W/CLIMATE AND JOB SITE REQUIREMENTS. CONTRACTOR IS RESPONSIBLE FOR PROVIDING MIX DESIGN SUITABLE FOR JOB SITE CONDITIONS. ADMIXTURES CONTAINING CHLORIDES ARE NOT PERMITTED.

3. ALL DEBRIS SHALL BE REMOVED FROM FORMS AND FOOTING EXCAVATIONS PRIOR TO POURING CONCRETE. NO WOOD STAKES OR FORM SPREADERS SHALL BE PERMITTED IN

4. ALL REINFORCEMENT, ANCHOR BOLTS, AND OTHER EMBEDDED ITEMS SHALL BE SECURED IN POSITION SHOWN ON DRAWINGS PRIOR TO PLACING CONCRETE.

VIBRATION PER ACI 309 BY MEANS SUITABLE FOR ON SITE CONDITIONS. USE HAND RODDING OR TAMPING AS REQUIRED. 6. CONSTRUCTION JOINTS SHALL HAVE ALL LOOSE MATERIAL REMOVED AND SHALL BE INTENTIONALLY ROUGHENED TO $\frac{1}{4}$ " AMPLITUDE PRIOR TO POURING CONCRETE. CONTRACTOR SHALL SUBMIT CONSTRUCTION JOINT LOCATIONS TO ENGINEER

FOR APPROVAL PRIOR TO CONSTRUCTION.

5. CONCRETE SHALL BE CONSOLIDATED BY MECHANICAL

CONCRETE REINFORCEMENT:

1. DETAIL, FABRICATE, AND PLACE REINFORCING PER ACI 315 AND ACI 318. SUPPORT REINFORCEMENT W/APPROVED CHAIRS,

SPACERS, OR TIES. REINFORCEMENT SHALL BE DEFORMED BILLET STEEL PER ASTM A-615, GRADE 60. ALL REINFORCEMENT AT BOUNDARY ELEMENTS AND REINFORCEMENT TO BE WELDED SHALL BE

3. ALL BENDING OF REINFORCEMENT PER ACI. FIELD BENDING OF REINFORCEMENT SHALL NOT BE PERMITTED. 4. REINFORCING SHALL BE TIED IN PLACE. TACK WELDING OF REINFORCING IS NOT PERMITTED.

ASTM A-706, GRADE 60.

5. CONTRACTOR TO TAKE NECESSARY PRECAUTIONS TO INSURE CONCRETE IS PROPERLY CONSOLIDATED AROUND ALL BOLTS, ANCHORAGES, ETC.

6. WHERE REINFORCING IS NOT SPECIFIED, REFER TO ACI 318 FOR MINIMUM REINFORCEMENT.

7. DEFORMED BAR ANCHORS PER ASTM A-496

• •		
8.	PROVIDE MINIMUM COVER FOR ALL REINFORCING A	S FOLLO
	APPLICATION	COVER
	CONCRETE CAST AGAINST EARTH	3"
	CONCRETE EXPOSED TO EARTH OR WEATHER: #5 AND SMALLER	1½"
	#6 AND LARGER	2"
	CONCRETE NOT EXPOSED TO EARTH OR WEATHER: SLABS AND WALLS BEAMS AND COLUMNS	3" 1 ¹ / ₂ "

POST INSTALLED ANCHOR NOTES:

1. ALL POST INSTALLED ANCHORS ARE TO BE INSTALLED PER MANUFACTURER FOR EACH ANCHOR AND PER THE ICC REPORTS LISTED BELOW.

2. ALL POST-INSTALLED ANCHORS ARE TO BE CAREFULLY INSTALLED SO AS TO NOT DISTURB OR DAMAGE THE STEEL REINFORCING IN ANY WAY. ANCHORS MAY NOT BE INSTALLED UNTIL CONCRETE OR GROUT HAS REACHED A MINIMUM AGE OF 28 DAYS.

3. ALL HOLES FOR DRILLED-IN ANCHORS SHALL BE COMPLETELY DRY AND WELL CLEANED WITH A BOTTLE BRUSH AND COMPRESSED AIR PRIOR TO INSTALLING THE ANCHORS.

4. ALL DRILLED-IN ANCHORS SHALL BE TESTED AND INSPECTED PER CHAPTER 17 OF THE 2022 CBC. INSPECTION DURING INSTALLATION AND TESTING UPON COMPLETION OF INSTALLATION SHALL BE DONE BY A CERTIFIED TESTING LABORATORY.

HILTI KB TZ2 PER ICC-ES ESR-4266

5. POST-INSTALLED ANCHORS ARE TO BE AS FOLLOWS:

5.1 EXPANSION ANCHORS IN CONCRETE

6. POST-INSTALLED ANCHORS ARE TO BE INSTALLED ONLY WHERE SPECIFICALLY DETAILED, WITH EMBEDMENTS AS SPECIFICALLY IDENTIFIED IN EACH APPLICABLE DETAIL. FOR ADDITIONAL INFORMATION, UNO, FOR EXPANSION ANCHORS, SEE TABLES BELOW.

POST-INSTALLED ANCHORS MAY NOT BE USED AT LOCATIONS OTHER THAN THOSE SPECIFICALLY DETAILED IN THE PROJECT DRAWINGS WITHOUT PRIOR WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD.

WINTER/WITHOUTE OF THE STREET OF THE GRADE.				
CONCRETE: HILTI KWIK BOLT TZ2	EXPANSION AND	HORS - SEE ICC E	SR-4266 TABLE	
ANCHOR DIAMETER	<u>3</u> "Ø	<u>1</u> ''Ø	<u>5</u> "Ø	
BIT DIAMETER	<u>3</u> "Ø	<u>1</u> "Ø	<u>5</u> "Ø	
NOMINAL EMBEDMENT	2 ¹ / ₂ "	2½"	4 <u>1</u> "	
HOLE DEPTH	2 ³ "	2 ³ / ₄ "	43"	
TORQUE (STAINLESS STEEL)	30 FT-LB	40 FT-LB	60 FT-LB	
TORQUE (CARBON STEEL)	30 FT-LB	50 FT-LB	40 FT-LB	

ROUGH CARPENTRY-HARDWARE:

A. ALL STEEL CONNECTORS, STRAPS, HANGERS, HARDWARE, ETC SHALL BE BY SIMPSON STRONG-TIE OR APPROVED EQUAL UNO. ATTACH W/FASTENERS PER MFR TO ACHIEVE THE MAXIMUM

TABULATED VALUE. B. HARDWARE COMPONENTS AND FASTENERS INSTALLED AGAINST OR INTO TREATED LUMBER SHALL HAVE CORROSION PROTECTION APPROPRIATE FOR THE TYPE OF CHEMICALS USED IN THE TREATMENT PROCESS. AS A MINIMUM, ALL HARDWARE AND FASTENERS INTO/AGAINST TREATED LUMBER OR IN EXTERIOR APPLICATIONS SHALL BE HOT-DIPPED GALVANIZED (G185 MIN FOR HARDWARE) OR STAINLESS STEEL.

C. INSTALL ALL SPECIFIED FASTENERS BEFORE LOADING THE CONNECTION. D. NAILS FOR HARDWARE SHALL NOT BE OVERDRIVEN OR DEFORM THE PART. THE CONTRACTOR SHALL VERIFY WITH THE

HARDWARE MFR THAT THE PART PUBLISHED CAPACITIES ARE NOT REDUCED AS A RESULT OF THE INSTALLED CONDITION. E. FASTENER SUBSTITUTIONS FOR HARDWARE ARE NOT ALLOWED UNLESS APPROVED FOR USE BY THE MFR AND THE HARDWARE CAPACITY IS NOT REDUCED. F. WASHERS AT WOOD CONNECTIONS SHALL BE SQUARE PLATE

STEEL OR MALLEABLE IRON W/THE FOLLOWING MIN

FASTENER DIAM.	MIN DIMENSIONS	MIN THICKNESS
<u>1</u> "	2" x 2"	<u>3</u> " 16
<u>5</u> " 8	2½" x 2½"	<u>1</u> "
<u>3</u> 11 4	2 ³ / ₄ " x 2 ³ / ₄ "	<u>5</u> " 16
7 ₁₁	3" x 3"	5 " 16
1"	3½" x 3½"	3"

ROUGH CARPENTRY-FASTENERS:

A. ALL SPECIFIED NAILS SHALL CONFORM TO ASTM F1667 OR ICC ESR-1539. ALTERNATE FASTENERS MUST HAVE AN ICC EVALUATION REPORT AND MAY NOT BE USED UNLESS APPROVED IN WRITING BY RW CONSULTING ENGINEERS. ALL NAILS SHALL BE FULL ROUND HEAD WITH MINIMUM PROPERTIES AS FOLLOWS:

SPECIFIED	MINIM	UM NAIL P	ROPERTIES	
FASTENER	DIAMETER	LENGTH	PENETRATION	APPLICATIO
8D	.131"Ø	2 <u>1</u> "	1 ³ "	SHEATHING
10D	.148"Ø	$2\frac{1}{2}$ "	1 ¹ / ₂ "	SHEATHING
10D	.131"Ø	3"	1 ³ / ₈ "	FRAMING
16D	.131"Ø	3 <u>1</u> "	1 <u>3</u> "	FRAMING

B. NAILS SHALL BE LOCATED AND SPACED TO PREVENT SPLITTING OF WOOD. PREDRILL ALL FASTENERS 75% MAX OF FASTENER DIAMETER WHERE WOOD TENDS TO SPLIT.

TOENAILS SHALL BE DRIVEN AT AN ANGLE OF APPROX 30° WITH THE MEMBER AND STARTED APPROX $\frac{1}{3}$ THE LENGTH OF THE NAIL FROM THE MEMBER END.

NAILS USED IN HARDWARE SHALL BE AS SPECIFIED BY HARDWARE MFR. NAILS INSTALLED IN TREATED LUMBER SHALL HAVE CORROSION PROTECTION APPROPRIATE FOR THE TYPE OF CHEMICALS USED IN THE TREATMENT PROCESS. AS A MINIMUM, NAILS INTO TREATED LUMBER OR IN EXTERIOR APPLICATIONS SHALL BE HOT-DIPPED GALVANIZED PER ASTM A153 CLASS D OR TYPE 316 STAINLESS STEEL.

SHEATHING NAILS SHALL BE DRIVEN SO THAT THEIR HEAD OR CROWN ARE FLUSH WITH THE SURFACE OF THE SHEATHING.

A. ALL SPECIFIED BOLTS IN WOOD FRAMING SHALL CONFORM TO ANSI/ASME STANDARD B18.2.1.

B. HOLES SHALL BE A MIN OF $\frac{1}{32}$ " TO A MAX OF $\frac{1}{16}$ " GREATER THAN THE BOLT DIAMETER. HOLES SHALL BE ACCURATELY ALIGNED AND NOT FORCIBLY DRIVEN.

BOLTS INSTALLED IN TREATED LUMBER SHALL HAVE CORROSION PROTECTION APPROPRIATE FOR THE TYPE OF CHEMICALS USED IN THE TREATMENT PROCESS. AS A MINIMUM, BOLTS INTO TREATED LUMBER OR IN EXTERIOR APPLICATIONS SHALL BE HOT-DIPPED GALVANIZED PER ASTM A153 CLASS C OR TYPE 316 STAINLESS STEEL.

D. BOLTS SHALL BE INSTALLED WITH A STANDARD CUT WASHER OR PLATE WASHER AT HEAD AND NUT W/CORROSION PROTECTION TO MATCH

THE BOLT. E. ALL BOLTS & NUTS TO BE TIGHTENED DURING INSTALLATION & RE-TIGHTENED JUST PRIOR TO CLOSING IN.

ROUGH CARPENTRY-MATERIALS:

1. ALL SAWN LUMBER SHALL BE DOUG FIR UNO AND HAVE MOISTURE CONTENT NOT TO EXCEED 19% AT TIME OF INSTALLATION. EACH PIECE SHALL BEAR THE STAMP OF WCLIB OR WWPA SHOWING GRADE MARK. 2. ALL SAWN LUMBER TO BE #2DF FOR 4x & SMALLER. #1DF FOR

6x & LARGER UNO. MATERIAL IN CONTACT W/CONCRETE SHALL BE PRESSURE TREATED. 3. PRESERVATIVE TREATED & PRESSURE TREATED LUMBER A. SAWN LUMBER TO BE PROTECTED FROM EARTH, WEATHER,

EARTH, & CONCRETE/CMU OR WOOD SHALL BE TREATED B. PRESERVATIVE TREATMENT & CLEARANCES TO SOIL OR CONCRETE SHALL BE PER CBC 2303.1.9 & 2304.12.1.2 C. FIELD CUTS & HOLES IN TREATED LUMBER SHALL BE PROTECTED

IN ACCORDANCE W/AWPA STANDARD M4 D. CONTRACTOR TO COORDINATE WITH TREATED WOOD SUPPLIER TO DETERMINE THE APPROPRIATE LEVEL OF CORROSION PROTECTION FOR HARDWARE & FASTENERS IN CONTACT WITH WOOD TREATED WITH CORROSIVE CHEMICALS.

4. ALL WOOD PANEL STRUCTURAL SHEATHING SHALL BE STAMPED W/APA TRADEMARK AND CONFORM TO MOST CURRENT EDITION OF PS-1 OR PS-2. USE THICKNESS AND NAILING AS SHOWN ON DRAWINGS. SHEATHING SHALL HAVE EXPOSURE RATING AS APPROPRIATE FOR ON-SITE EXPOSURE CONDITIONS DURING CONSTRUCTION AND IN FINAL CONDITION. EQUIVALENT OSB SHALL BE USED IN LIEU OF PLYWOOD. PROVIDE PLYWOOD AT ALL EXPOSED EAVE CONDITIONS.

DESIGN CRITERIA:

1. PROJECT ADDRESS: 424 1ST AVE SACRAMENTO, CA 95820

2. BUILDING CODE: 2022 CALIFORNIA BUILDING CODE

GRAVITY LOADS:

CEILING LIVE LOAD = 20 PSF CEILING DEAD LOAD = 10 PSF

WOOD STUD = 10 PSF

4. LATERAL LOADS: RISK CATEGORY II

SEISMIC LOADS (ASCE 7-16) SITE CLASS D (ASSUMED) SEISMIC DESIGN CATEGORY IMPORTANCE FACTOR 1.0 $S_{c} = 0.582$ $S_{a} = 0.257$

 $F_3 = 1.334$ $\vec{F_y} = NULL$ $S_{MS} = 0.777$ $S_{M1} = NULL$ $S_{DS} = 0.518$ $S_{D1} = NULL$

NON-STRUCTURAL COMPONENTS: (ASCE7-16 13.3.1.1) $a_p = 1.0$ $R_p = 2.5$ $F_p = \frac{.4 a_p S_{DS} W_p}{(D_p / L_p)} [1 + 2(z/h)]$

 $F_p = .249 W_p \text{ (USD)}$

1. ALL NEW WORK SHALL CONFORM TO TITLE 24 2022 EDITIONS WITH AMENDMENTS AND ALL OTHER APPLICABLE CODES AND REGULATIONS.

2. THIS SET OF STRUCTURAL DRAWINGS IS APPLICABLE ONLY TO THE LISTED PROJECT AND SITE LOCATION.

3. NOTES ON THIS SHEET ARE TYPICAL AND SHALL APPLY UNLESS OTHERWISE NOTED OR SHOWN. TYPICAL DETAILS SHALL APPLY FOR ALL LIKE CONDITIONS UNLESS OTHERWISE NOTED OR DETAILED.

4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS, ELEVATIONS, EXISTING CONDITIONS, AND OTHER RELATED ITEMS. THE CONTRACTOR SHALL REVIEW THE CONTRACT DOCUMENTS PRIOR TO CONSTRUCTION AND SHALL NOTIFY THE ENGINEER OF RECORD IF ANY CONFLICTS ARE SHOWN OR NOTED.

5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFORM TO RELEVANT SECTIONS OF THE CALIFORNIA "CONSTRUCTION SAFETY ORDERS" AND ALL OSHA REQUIREMENTS. THE ENGINEER OF RECORD ACCEPTS NO RESPONSIBILITY FOR THE CONTRACTOR'S FAILURE TO COMPLY W/ THESE REQUIREMENTS.

6. STRUCTURAL DRAWINGS REPRESENT THE FINISHED STRUCTURE, AND DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. DESIGN AND CONSTRUCTION OF ALL TEMPORARY BRACING, SHORING, FORMING, ETC REQUIRED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

INSPECTION NOTES:

1. ALL TESTS AND INSPECTIONS ARE TO BE PROVIDED BY A QUALIFIED TESTING LAB OF RECORD, HIRED BY THE DISTRICT.

2. ALL TESTS AND INSPECTIONS SHALL CONFORM TO CHAPTER 17 OF THE 2022

FOUNDATION NOTES:

FOUNDATIONS ARE DESIGNED BASED ON PRESCRIPTIVE REQUIREMENTS OF CBC TABLE 1806.2 AS FOLLOWS:

PROPERTY VALUE SOIL BEARING 1500 PSF LATERAL BEARING 200 PCF

2. FOOTINGS SHALL BEAR ON FIRM, DRY, UNDISTURBED SOIL OR COMPACTED FILL PER SOILS REPORT. FOOTING DEPTHS INDICATED ON THE PLANS ARE MINIMUM. AREAS OVER-EXCAVATED SHALL BE BACKFILLED W/COMPACTED STRUCTURAL FILL PER SOILS REPORT OR LEAN CONCRETE (F'C=1000 PSI) AT CONTRACTOR'S EXPENSE.

AND DURING THE PLACEMENT OF CONCRETE.

3. CONTRACTOR TO NOTIFY ENGINEER OF RECORD IMMEDIATELY WHERE JOB SITE CONDITIONS ARE DIFFERENT THAN SHOWN ON CONTRACT DOCUMENTS. 4. ALL FOOTINGS NOT FORMED SHALL BE POURED INTO NEAT

EXCAVATIONS. PRECAUTIONS SHALL BE TAKEN TO PREVENT

SLOUGHING OF SOIL INTO THE FOOTING EXCAVATION PRIOR TO

S3.1 WALL SECTIONS & ELEVATION S4.1 DETAILS **ABBREVIATIONS:** AMERICAN IRON AND STEEL INSTITUTE AISI

CEILING FRAMING PLAN

STRUCTURAL SHEET INDEX: **GENERAL NOTES**

S0.2

S2.1

TYPICAL DETAILS

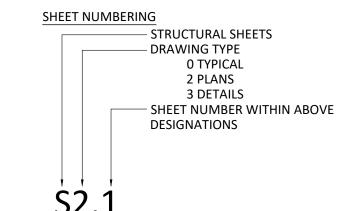
AMERICAN INSTITUTE OF STEEL CONSTRUCTION ARCHITECT/ARCHITECTURAL AMERICAN SOCIETY OF TESTING AND MATERIALS

AMERICAN WELDING SOCIETY BOTTOM OF CALIFORNIA BUILDING CODE CFS COLD-FORMED STEEL DIAMETER **DRAWINGS** F.O. FACE OF STEEL ANGLE MAX MAXIMUM MINIMUM NOT TO SCALE NUMBER OR POUNDS

CENTER TO CENTER SEOR STRUCTURAL ENGINEER OF RECORD SHEET METAL SCREW T & B TOP AND BOTTOM THRU THROUGH

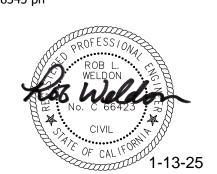
T.O. TOP OF UNLESS NOTED OTHERWISE VERIFY IN FIELD

DRAWING STANDARDS:



STANDARD DETAIL DETAIL & ELEVATION LOCATION & LOCATION AGENCY APPROVAL





Sacramento, CA 95811 www.nachtlewis.com 916.329.4000

FINAL SPACE PLAN REVISIONS

DESCRIPTION PRE-BID QUESTIONS

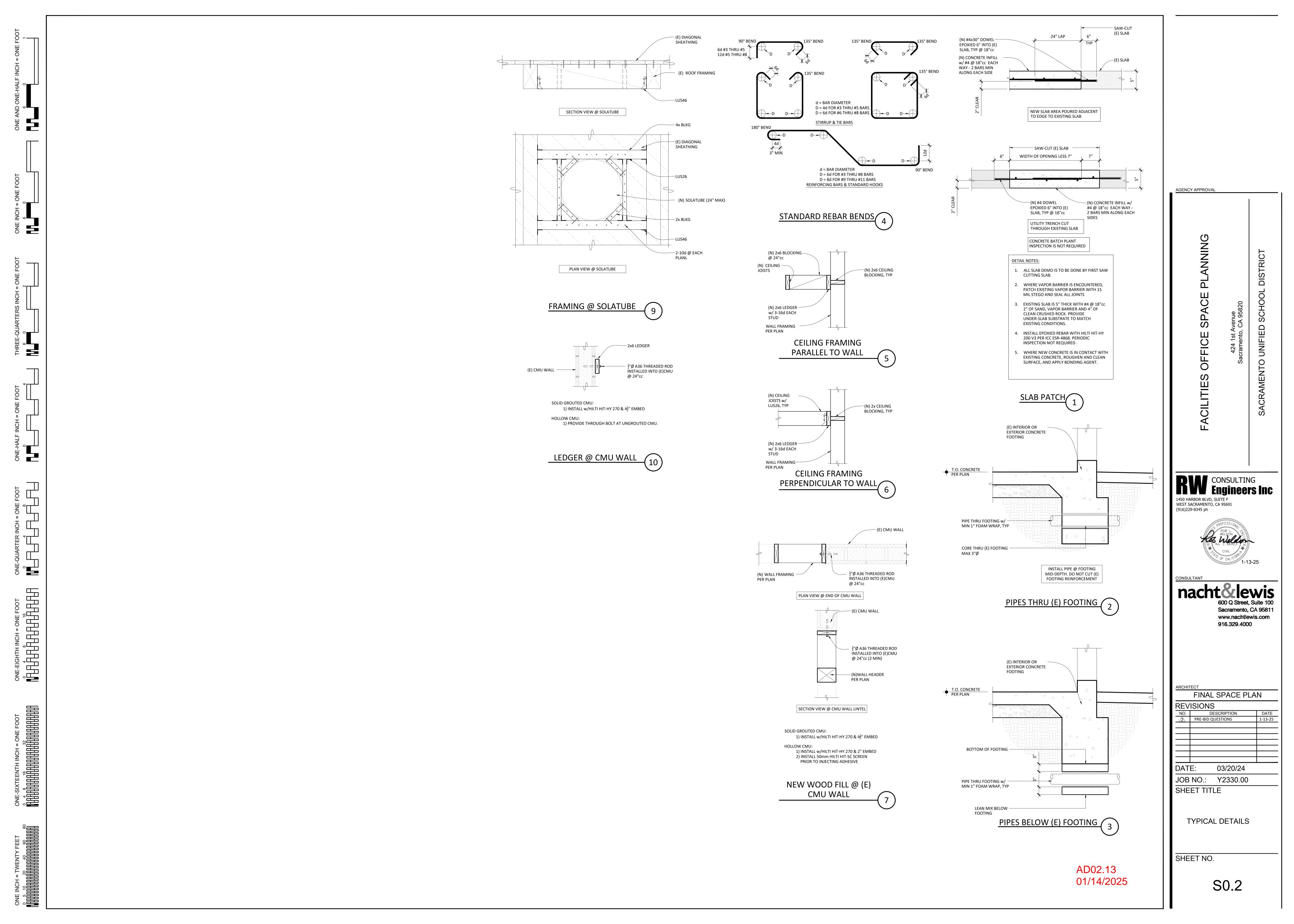
03/20/24 JOB NO.: Y2330.00 SHEET TITLE

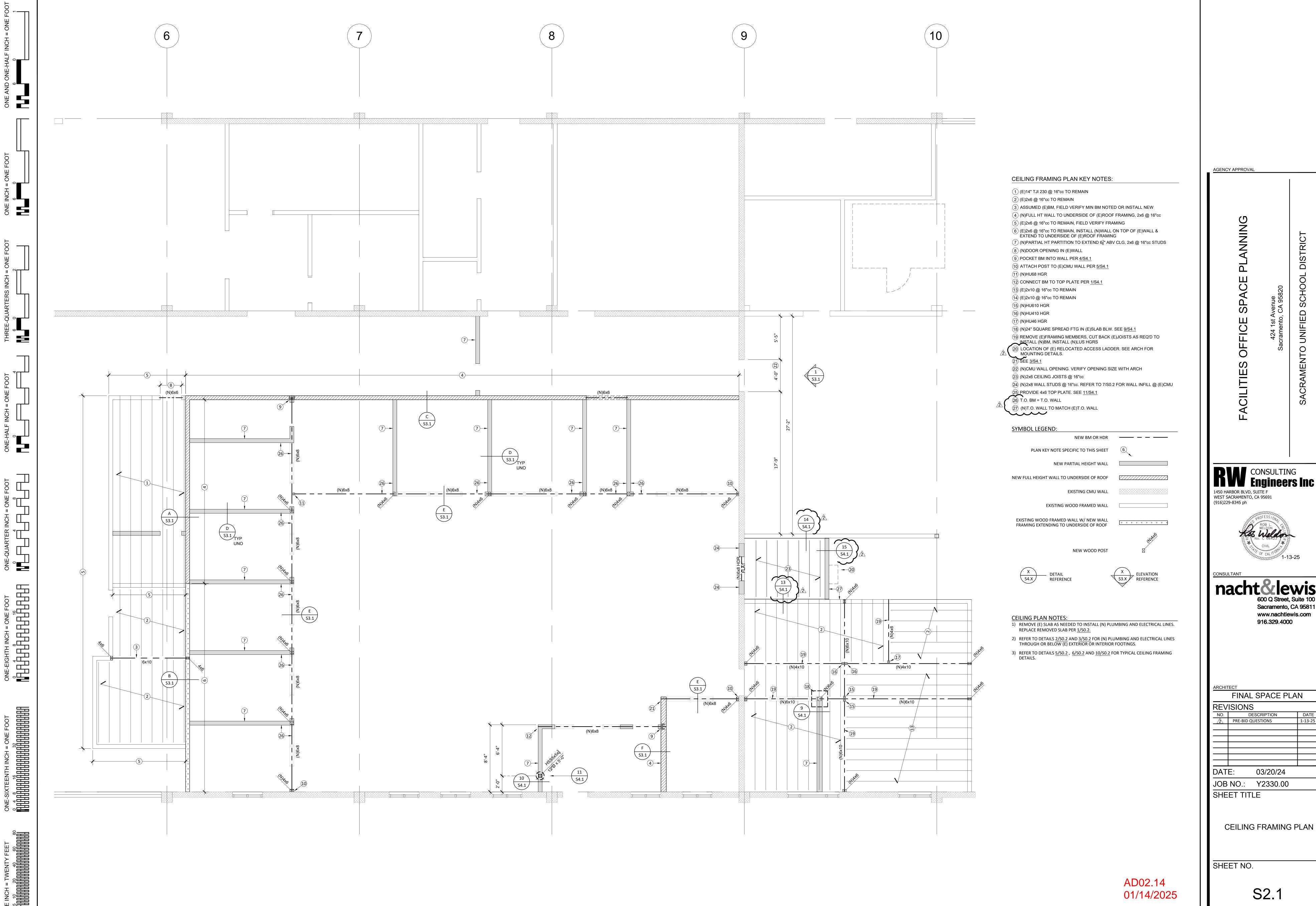
GENERAL NOTES & TYPICAL DETAILS

SHEET NO.

S0.1

AD02.12 01/14/2025





RW CONSULTING Engineers Inc



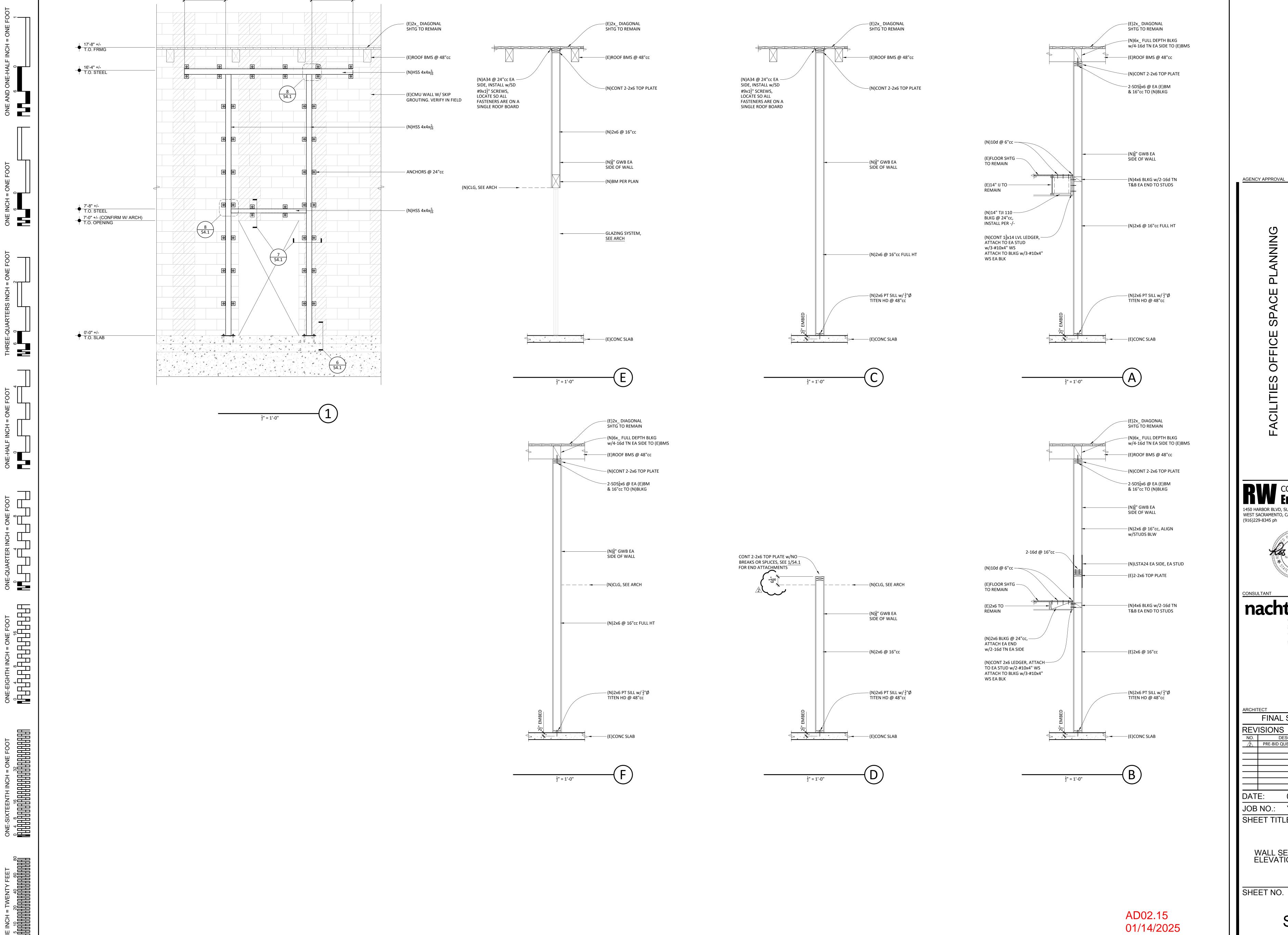
nacht&lewis 600 Q Street, Suite 100 Sacramento, CA 95811 www.nachtlewis.com

FINAL SPACE PLAN

DESCRIPTION PRE-BID QUESTIONS

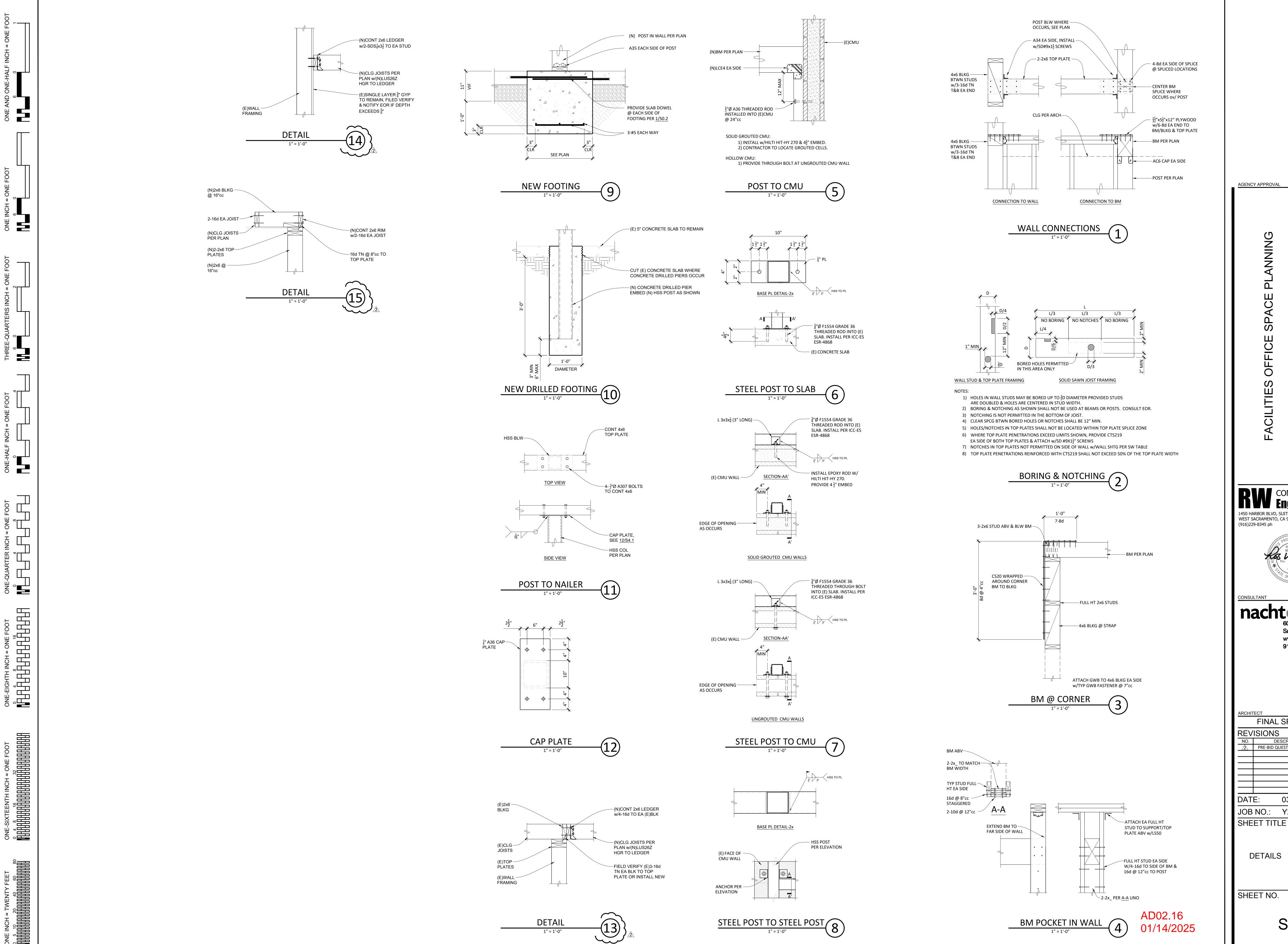
03/20/24

JOB NO.: Y2330.00



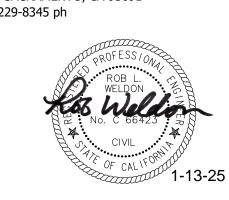
RW CONSULTING Engineers Inc 1450 HARBOR BLVD, SUITE F WEST SACRAMENTO, CA 95691 (916)229-8345 ph 600 Q Street, Suite 100 Sacramento, CA 95811 www.nachtlewis.com 916.329.4000 FINAL SPACE PLAN REVISIONS DATE 1-13-25 DESCRIPTION PRE-BID QUESTIONS 03/20/24 JOB NO.: Y2330.00 SHEET TITLE WALL SECTIONS & ELEVATION SHEET NO.

S3.1



AGENCY APPROVAL

RW CONSULTING Engineers Inc 1450 HARBOR BLVD, SUITE F WEST SACRAMENTO, CA 95691



Sacramento, CA 95811 www.nachtlewis.com 916.329.4000

FINAL SPACE PLAN REVISIONS DATE 1-13-25 DESCRIPTION PRE-BID QUESTIONS

03/20/24 JOB NO.: Y2330.00

DETAILS

S4.1

ABBREVIATIONS: REVISED: 09/20/2023 AMPERE ABOVE FINISHED FLOOR ABOVE FINISHED GRADE **ANNUNCIATOR** ACCESS POINT BFF BELOW FINISHED FLOOR BFG BELOW FINISHED GRADE BICSI BUILDING INDUSTRY CONSTRUCTION SERVICE INTERNATIONAL BLDG CONDUIT CABINET CATEGORY CABLE TELEVISION CANDELA CFCI CONTRACTOR FURNISHED/CONTRACTOR INSTALLED CENTER LINE CO CARBON MONOXIDE EXISTING EMT ELECTRICAL METALLIC TUBING EOL END OF LINE FIRE ALARM FIRE ALARM CONTROL PANEL FTC FIRE TERMINAL CABINET GALVANIZED RIGID CONDUIT G OR GB GROUND BOX INTRUSION ALARM CONTROL PANEL INTERMEDIATE DISTRIBUTION FRAME INTERMEDIATE METAL CONDUIT J OR JB JUNCTION BOX MECHANICAL / ELECTRICAL / PLUMBING MAIN DISTRIBUTION FRAME MINIMUM PONT OF ENTRY MPOE NEW NFPA NATIONAL FIRE PROTECTION ASSOCIATION NTS NOT TO SCALE **NOT APPLICABLE** OWNER FURNISHED EQUIPMENT OWNER FURNISHED/CONTRACTOR INSTALLED OFOI OWNER FURNISHED/OWNER INSTALLED OUTSIDE PLANT PVC POLYVINYL CHLORIDE RCDD REGISTERED COMMUNICATION DISTRIBUTION DESIGNER RCWY RACEWAY ROOM SR SURFACE RACEWAY TYPICAL UG UNDERGROUND UNDERWRIGHTERS LABORATORIES UNO UNLESS NOTED OTHERWISE VOLTS WEATHERPROOF

SYMBOL	DESCRIPTION	MANUFACTURER	MODEL / PART NUMBER	NOTES / DETAIL REFERENCES
	INTRUSION ALARM CONTROL PANEL	BOSCH	B9512G	N/A
	CONTROL PANEL ENCLOSURE	BOSCH		N/A
[MCD]	CONTROL PANEL ENCLOSURE LOCK/KEY	BOSCH		N/A
IACP	DUAL BATTERY HARNESS	BOSCH		N/A
	POWER SUPPLY / ENCLOSURE	BOSCH	D1640/D8109	N/A
	POPEX LOOP MODULE	BOSCH	B299	N/A
	BATTERY 12VDC, 8 AH	POWERSONIC	PS-1280	N/A
KP	ALPHANUMERIC KEYPAD	воѕсн	B930	N/A
	MOTION DETECTOR, WALL MOUNT	воѕсн	ZX935Z	N/A 5 6
	WALL MOUNT GIMBLE	DSC	DM-W	
DC	DOOR CONTACT	GEORGE RISK INDUSTRIES	195-12WG	N/A
DC	POPIT MODULE	BOSCH	D9127U	
RDC	ROLL-UP DOOR SURFACE MOUNT DOOR CONTACT	GEORGE RISK INDUSTRIES	4532	N/A
[NDO]	POPIT MODULE	BOSCH	D9127U	
	CABLE 18AWG/2-CONDUCTOR - INTERIOR	WEST PENN	224	COLOR = WHITE
	CABLE 18AWG/2-CONDUCTOR - OSP	WEST PENN	AQ-224 	N/A
	CABLE 18AWG/4-CONDUCTOR - INTERIOR	WEST PENN	244	COLOR = GRAY
	CABLE 18AWG/4-CONDUCTOR - OSP	WEST PENN	— — — — — — — AQ-244	N/A

	ELECTRONIC ACCE ALL EQUIPMENT AND MATERIALS ARE CON			FIGURED (UNO)
SYMBOL	DESCRIPTION	MANUFACTURER	MODEL / PART NUMBER	NOTES / DETAIL REFERENCES
CON	ACCESS CONTROL MANAGEMENT EMBEDDED CONTROLLER	AVIGILON	AC-MER-CONT- LP1501	N/A
MDC	DOOR/DATA LOCATION, CAT6A JACK/CABLE	ORTRONICS / SUPERIOR ESSEX	SEE 27 10 00	BLACK JACK / BLUE CABLE
MRC◀	ACCESS CONTROL MANAGEMENT REMOTE CONTROLLER (POE)	AVIGILON	AC-MER-CONT- MR62E	N/A 7 8 9 7 800 7800 7800 7800 7800 7800 78
PSU	ACCESS CONTROL POWER SUPPLY UNIT W/ BATTERY BACKUP	AVIGILON	AC-LSP-2DR- MER-LCK	INSTALL AT MDF LOCATION
CRA	CARD READER	SCHLAGE	MT11-485	N/A
CRA	ELECTRIFIED LOCKSET	SEE DIV 8	SEE DIV 8	PROVIDED BY DIV 8
QEL	ELECTRIFIED PANIC HARDWARE	COORDINATE W/ DIV 8	SEE DIV 8	PROVIDED BY DIV 8
	RFID CARDS	SCHLAGE	8520	QUANTITY 100. SERIALIZED PER DIST. REQUIREMENTS.

	DESCRIPTION	MANUFACTURER	MODEL / PART NUMBER	NOTES / DETAIL REFERENCES
2300	MEDIUM CAPACITY SURFACE MOUNTED CABLE RACEWAY	WIREMOLD	WM2300	N/A (1)
5400	HIGH CAPACITY SURFACE MOUNTED CABLE RACEWAY	WIREMOLD	WM5400	N/A 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	SURFACE CONDUIT	COMMERCIAL GENERIC	N/A	N/A 11 12 13 T800 T800 T800
	UNDERGROUND CONDUIT	COMMERCIAL GENERIC	N/A	N/A 2 3 4 T800 T800 T800
JJ	J-HOOK (SINGLE/STACKED)	NVENT/CADDY		N/A (8) (780°
]]_]	SOLID CABLE TRAY (DOUBLE)	SNAKETRAY		N/A (8)
E	CONDUIT STUB	COMMERCIAL GENERIC	N/A	N/A (12)
•	CONDUIT RISER	COMMERCIAL GENERIC	N/A	N/A (2) (780)
J	SURFACE MOUNTED JUNCTION BOX	COMMERCIAL GENERIC	N/A	N/A
MDF / IDF	DATA RACK	SEE SHEET T400	SEE SHEET T400	N/A (10)
шш	LADDER RACK	CHATSWORTH PRODUCTS		4 15 16 17 18 19 600 T800 T800 T800 T800 T80
TGB	TELECOM GROUND BUS BAR, WALL MOUNT	CHATSWORTH PRODUCTS	10622-010	N/A (12)
#	DATA PERMANENT LINK, CAT6A JACK/CABLE # = QTY., NO # = 1	ORTRONICS / SUPERIOR ESSEX	SEE 27 10 00	WHITE JACK / 2 WHITE CABLE T80
M	MODULAR PLUG DATA PERMANENT LINK, CAT6A JACK / CABLE / MOD PLUG	ORTRONICS / SUPERIOR ESSEX	SEE 27 10 00	MOD PLUG / WHITE CABLE
B	FUTURE DATA LOCATION. PATHWAY ONLY WITH BLANK COVER	N/A		N/A
A D.	WIRELESS ACCESS POINT / DATA LOCATION, CAT6A JACK/CABLE, WALL, QTY 2	ORTRONICS / SUPERIOR ESSEX	SEE 27 10 00	GREEN JACK / WHITE CABLE
AP▼	WIRELESS ACCESS POINT, WALL MOUNT	CISCO	SEE 27 21 00	N/A 3
<u></u>	WIRELESS ACCESS POINT/ DATA LOCATION, CAT6A JACK/CABLE, CEILING, QTY 2	ORTRONICS / SUPERIOR ESSEX	SEE 27 10 00	GREEN JACK / WHITE CABLE
- (A)- AP	WIRELESS ACCESS POINT, CEILING MOUNT	CISCO	SEE 27 21 00	N/A (6)
	WIRELESS ACCESS POINT / DATA LOCATION, CAT6A JACK/CABLE, EXTERIOR WALL, QTY 2	ORTRONICS / SUPERIOR ESSEX	SEE 27 10 00	GREEN JACK / WHITE CABLE
AP	WIRELESS ACCESS POINT, EXTERIOR WALL MOUNT W/ ENCLOSURE	CISCO / OBERON	SEE 27 21 00	N/A (5)
	CLOCK/DATA LOCATION, CAT6A JACK/CABLE	ORTRONICS / SUPERIOR ESSEX	SEE 27 10 00	YELLOW JACK / WHITE CABL
12:00	CLOCK/SMALL MESSAGE BOARD, SPEAKER COMBO	RAULAND TELECENTER U	SEE 27 51 23.50	N/A 3 10 T801 T80
DC ■	CAT6A DATA DROP LOCATION - DROP CEILING INTERCOM SPKR/IP MOD	RAULAND	SEE 27 51 23.50	N/A \$\int_{002} \overline{5}{\tag{780}}
	CAT6A DATA DROP LOCATION - CEILING MOUNTED SPEAKER/IP MODULE	RAULAND	SEE 27 51 23.50	N/A
	CAT6A DATA DROP LOCATION - WALL MOUNTED SPEAKER/IP MODULE	RAULAND	SEE 27 51 23.50	N/A 4 13 T801 T80
S S S S S S S S S S S S S S S S S S S	CAT6A DATA DROP LOCATION - EXTERIOR INTERCOM SPEAKER/IP MODULE	LOWELL AND RAULAND	SEE 27 51 23.50	MOUNT IP MODULE 9 INSIDE BUILDING T80
	CAMERA/DATA LOCATION, MOD PLUG DATA PERM LINK, CAT6A JACK/CABLE/MOD PLUG	ORTRONICS / SUPERIOR ESSEX	SEE 27 10 00	BLUE JACK / BLUE CABLE
	NETWORK INTERIOR DOME CAMERA		WV-S22500-V3L	N/A
•	CAMERA/DATA LOCATION, MOD PLUG DATA PERM LINK, CAT6A JACK/CABLE/MOD PLUG	ORTRONICS / SUPERIOR ESSEX	SEE 27 10 00	BLUE JACK / BLUE CABLE
EXT	NETWORK EXTERIOR DOME CAMERA		WV-S25500-V3LG	N/A (14)
	CAMERA/DATA LOCATION, MOD PLUG DATA PERM LINK, CAT6A JACK/CABLE/MOD PLUG	ORTRONICS / SUPERIOR ESSEX	SEE 27 10 00	BLUE JACK / BLUE CABLE
	NETWORK EXTERIOR MULTI-SENSOR (3X4MP) CAMERA		WV-S8543LG	N/A (14)
	CAMERA/DATA LOCATION, MOD PLUG DATA PERM LINK, CAT6A JACK/CABLE/MOD PLUG	ORTRONICS / SUPERIOR ESSEX	SEE 27 10 00	BLUE JACK / BLUE CABLE
	NETWORK EXTERIOR MULTI-SENSOR (4X4MP) CAMERA	I-PRO	WV-S8544LG	N/A 14 T80
	NETWORK VIDEO RECORDER	I-PRO	NVR-RL-2-96TB-V4	N/A
NVR	<u>'</u>		•	i .
NVR (LARGE MONITOR WALL BRACKET W/ TV	PEERLESS / SEE 27 41 00 FOR TV MFG.	PA762 / SEE 27 41 00 FOR TV P/N.	N/A (1)

CONTRACTOR FURNISHED DOCUMENTS:

- (SHOP DRAWINGS / PRODUCT SUBMITTALS / QUALIFICATIONS)
- ORDERING AND INSTALLATION OF THE SYSTEMS SHALL NOT BE STARTED UNTIL THE FOLLOWING:
- 1.1. CONTRACTOR FURNISHED SHOP DRAWINGS ARE RECEIVED AND APPROVED BY THE DESIGNER.
- 1.2. PRODUCT SUBMITTAL DOCUMENTS ARE RECEIVED AND APPROVED BY THE DESIGNER. 1.3. APPLICABLE QUALIFICATION DOCUMENTATION ARE RECEIVED
- AND APPROVED BY THE DESIGNER. ANY DESIGN AND/OR INSTALLATION DISCREPANCIES/CHANGE ORDER REQUESTS ARE TO BE ADDRESSED AT TIME OF SHOP DRAWING
- CREATION. CHANGE ORDERS AFTER APPROVED SHOP DRAWINGS ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. ALTERNATIVE PRODUCTS ARE TO SUBMITTED WITH A FORMAL
- SUBSTITUTION REQUEST AND THE CONTRACTOR IS RESPONSIBLE FOR DEMONSTRATING PRODUCT FULL EQUIVALENCY. . IT SHALL BE UNDERSTOOD THAT THE DRAWINGS, DETAILS, AND
- ONE-LINES PROVIDED WITH THE DESIGN PACKAGE ARE DIAGRAMMATIC. INFORMATION PRESENTED IN DESIGN DRAWINGS ARE AS ACCURATE AS POSSIBLE, BUT ACCURACY IS NOT GUARANTEED AND FIELD VERIFICATION, OF ALL DIMENSIONS, ROUTING, ETC., BY THE CONTRACTOR IS REQUIRED.
- DRAWINGS AND SPECIFICATIONS ARE PROVIDED TO SHOW THE INTENT OF THE DESIGN TO ASSIST THE CONTRACTOR IN SUBMITTING AN ACCURATE BID. CONTRACTOR IS DIRECTED TO MAKE FIELD SURVEYS AS PART OF THEIR WORK PRIOR TO SUBMITTING SYSTEM LAYOUT DRAWINGS (SHOP DRAWINGS). THE CONTRACTOR SHALL MAKE ALLOWANCE IN THE PROPOSAL TO COMPLY WITH THE INTENT OF THE DESIGN.
- IN CASE OF DOUBT OF WORK INTENDED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REQUEST INSTRUCTIONS FROM THE DESIGNER OR OWNER PRIOR TO BID.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE, OPERABLE, AND FULLY FUNCTIONING SYSTEM.

TECHNOLOGY GENERAL PROJECT NOTES:

- UPON COMPLETION OF THE INSTALLATION OF THE SYSTEMS, THE CONTRACTOR SHALL PROVIDE A SATISFACTORY TEST OF THE ENTIRE SYSTEMS IN THE PRESENCE OF THE ARCHITECT/DESIGNER, INSPECTOR, AND THE OWNER.
- A STAMPED SET OF APPROVED SYSTEM DESIGN DOCUMENTS, AND CONTRACTOR FURNISHED SHOP DRAWINGS SHALL BE ON THE JOB SITE AND USED FOR INSTALLATION. THE CONTRACTOR SHALL INCORPORATE ANY AND ALL REDLINES TO DRAWINGS SETS AS REQUIRED. ANY DEVIATION FROM APPROVED DESIGN DOCUMENTS, INCLUDING THE SUBSTITUTION OF DEVICES. SHALL BE APPROVED BY THE ARCHITECT/DESIGNER AND THE OWNER PRIOR TO INSTALLATION.
- ANY DISCREPANCIES BETWEEN THE DRAWINGS AND THE CODE OR RECOGNIZED STANDARDS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/DESIGNER PRIOR TO INSTALLATION.
- . ALL PENETRATIONS THROUGH RATED ASSEMBLIES REQUIRING OPENING PROTECTION SHALL BE PROVIDED WITH THROUGH PENETRATION FIRST STOP SYSTEMS WITH A "T" RATING EQUAL TO THE ASSEMBLY PENETRATED, SEE DETAILS ON SHEET T801 FOR MORE INFORMATION.
- PER CEC STANDARDS, ALL WIRING IS TO BE PULLED THROUGH EACH JUNCTION BOX AND CONNECTED DIRECTLY TO EACH DEVICE. DO NOT SPLICE THE WIRE. THERE MUST BE AT LEAST 6" OF LEAD WIRE FROM THE BOX TO THE DEVICE.
- . ALL LOW VOLTAGE CIRCUITS SHALL BE IN CONDUIT. SURFACE RACEWAY, OR OPEN RUN ABOVE CEILINGS, UNDER FLOORS AND IN WALLS IN A NEAT AND PROTECTED MANNER AS INDICATED ON DESIGN DOCUMENTS. EXPOSED CABLES ARE ONLY PERMITTED IF INDICATED ON DESIGN DOCUMENTS AS "EXPOSED".
- LOW VOLTAGE PANELS. REMOTES. AND COMPONENTS SHALL BE SECURED TO MOUNTING SURFACES PER MANUFACTURER'S SPECIFICATIONS. NO SINGLE DEVICE SHALL EXCEED THE WEIGHT FOR 20 lbs., WITHOUT SPECIAL MOUNTING DETAILS.
- THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/DESIGNER AT A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO FINAL INSPECTION FOR FINAL PUNCH ALL ITEMS ON PUNCH LIST MUST BE COMPLETE FOR JOB TO FINAL.
- PRIOR TO FINAL INSPECTION, THE CONTRACTOR SHALL PROVIDE ALL PROJECT AS-BUILT DRAWINGS AND MANUALS PER SPECIFICATIONS.
- 10. THE CONTRACTOR SHALL ALSO PROVIDE A TYPED RECORD OF COMPLETION. A FINAL WILL NOT BE GRANTED UNTIL THE ABOVE IS
- THE TERM "PROVIDE" SHALL MEAN TO FURNISH, INSTALL AND MAKE FULLY OPERATIONAL.

APPROVED BY THE OWNER.

SCOPE OF WORK:

- FURNISH, INSTALL, AND MAKE OPERATIONAL ALL COMPONENTS FOR A NEW DATA NETWORK SYSTEM, INCLUDING CONSTRUCTION OF A NEW MDF; NEW PATHWAY, FIBER, AND COPPER FEEDERS TO SERVE EXISTING IDF LOCATIONS; RELOCATION OF THE FIBER MPOE; AND TRANSFER OF SERVICES FROM THE EXISTING MDF.
- . FURNISH AND INSTALL NEW CAT6A DATA CABLING TO NEW AND EXISTING DATA LOCATIONS AS NOTED.
- THE NEW MDF SHALL BE CONSTRUCTED AND MADE OPERATIONAL PRIOR TO DEMO OF THE EXISTING MDF. CAREFULLY COORDINATE CUTOVER REQUIREMENTS WITH THE DISTRICT REPRESENTATIVE SO

THAT SYSTEM DOWNTIME IS MINIMIZED.

- . FURNISH, INSTALL, AND MAKE OPERATIONAL ALL COMPONENTS FOR A NEW INTRUSION ALARM SYSTEM INCLUDING A NEW IACP, NEW KEYPADS, NEW SENSORS, AND OTHER COMPONENTS AS NOTED.
- . FURNISH. INSTALL, AND MAKE OPERATIONAL ALL COMPONENTS FOR A NEW ELECTRONIC ACCESS CONTROL SYSTEM, INCLUDING A NEW SYSTEM CONTROLLER, POWER SUPPLY, DOOR CONTROLLERS, AND OTHER COMPONENTS AS NOTED.
- FURNISH, INSTALL, AND MAKE OPERATIONAL ALL COMPONENTS FOR A NEW CLOCK/BELL/INTERCOM SYSTEM. INCLUDING A NEW SYSTEM CONTROLLER, SPEAKERS, MESSAGE BOARDS, AND OTHER COMPONENTS AS NOTED.
- 7. FURNISH, INSTALL, AND MAKE OPERATIONAL NEW WALL MOUNTED
- B. DEMO ALL OLD OR ABANDONED DEVICES, PATHWAY, AND CABLING PERTAINING TO THE ABOVE SYSTEMS.

PROJECT CODES AND STANDARDS

- PARTIAL LIST OF APPLICABLE CODES AND STANDARDS EFFECTIVE JANUARY 1, 2022:
- 2022 CALIFORNIA ADMINISTRATIVE CODE (CAC), CCR, TITLE 24, PART 1 2022 CALIFORNIA BUILDING CODE (CBC), CCR, TITLE 24, PART 2
- (2021 INTERNATIONAL BUILDING CODE WITH CALIFORNIA AMENDMENTS) 2022 CALIFORNIA ELECTRICAL CODE (CEC), CCR, TITLE 24, PART 3 (2020 NATIONAL ELECTRICAL CODE WITH CALIFORNIA AMENDMENTS) 2022 CALIFORNIA MECHANICAL CODE (CMC), CCR, TITLE 24, PART 4 (2021 UNIFORM MECHANICAL CODE, WITH CALIFORNIA AMENDMENTS) 2022 CALIFORNIA PLUMBING CODE (CPC), CCR, TITLE 24, PART 5
- (2021 UNIFORM PLUMBING CODE, WITH CALIFORNIA AMENDMENTS) 2022 CALIFORNIA ENERGY CODE, CCR, TITLE 24, PART 6 2022 CALIFORNIA FIRE CODE (CFC), CCR, TITLE 24, PART 9 (2021 INTERNATIONAL FIRE CODE WITH CALIFORNIA AMENDMENTS)
- 2022 CALIFORNIA GREEN BUILDING STANDARDS CODE, CCR, TITLE 24, 2022 CALIFORNIA REFERENCED STANDARDS CODE, CCR, TITLE 24, PART
- 2022 NFPA 72: NATIONAL FIRE ALARM AND SIGNALING CODE, NATIONAL FIRE PROTECTION ASSOCIATION

ANCHORAGE AND BRACING NOTES: APPLICABLE CODE: 2022 CBC REVISED: 01/11/2024

MEP COMPONENT ANCHORAGE NOTE:

ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE DSA-APPROVED CONSTRUCTION DOCUMENTS. THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2022 CBC SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7-16 CHAPTERS 13, 26, AND 30:

- 1. ALL PERMANENT EQUIPMENT AND COMPONENTS. 2. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G., HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER. "PERMANENTLY ATTACHED" SHALL INCLUDE ALL ELECTRICAL CONNECTIONS EXCEPT PLUGS FOR 110/220 VOLT RECEPTACLES
- HAVING A FLEXIBLE CABLE. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT WHICH IS HEAVIER THAN 400 POUNDS OR HAS A CENTER OF MASS LOCATED 4 FEET OR MORE ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT IS REQUIRED TO BE RESTRAINED IN A MANNER APPROVED BY DSA.

THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE BUT NEED NOT DEMONSTRATE DESIGN COMPLIANCE WITH THE REFERENCES NOTED ABOVE. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT. FLEXIBLE CONNECTIONS MUST ALLOW MOVEMENT IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTIONS:

- A. COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVING A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE
- COMPONENT. B. COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM

THE ANCHORAGE OF ALL MECHANICAL, ELECTRICAL AND PLUMBING COMPONENTS SHALL BE SUBJECT TO THE APPROVAL OF THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND ACCEPTANCE BY DSA. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH THE ABOVE REQUIREMENTS.

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION **SYSTEM BRACING NOTE:**

PIPING. DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-16 SECTION 13.3 AS DEFINED IN ASCE 7-16 SECTIONS 13.6.5, 13.6.6, 13.6.7, 13.6.8; AND 2022 CBC, SECTIONS 1617A.1.24, 1617A.1.25 AND 1617A.1.26.

THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM ARE AS NOTED BELOW. WHEN BRACING AND ATTACHMENTS ARE BASED ON A PREAPPROVED INSTALLATION GUIDE (E.G., HCAI OPM FOR 2013 CBC OR LATER), COPIES OF THE BRACING SYSTEM INSTALLATION GUIDE OR MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF AND DURING THE HANGING AND BRACING OF THE DISTRIBUTION SYSTEMS. THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE

MECHANICAL PIPING (MP), MECHANICAL DUCTS (MD), PLUMBING PIPING (PP), ELECTRICAL DISTRIBUTION SYSTEMS (E):

 $\mathsf{MP} \square \mathsf{MD} \square \mathsf{PP} \square \mathsf{E} X$ OPTION 1: DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS.

MP | MD | PP | E | OPTION 2: SHALL COMPLY WITH HCAI (OSHPD) PREAPPROVAL (OPM #) _, AS INCLUDED IN THESE DRAWINGS WITH PROJECT-SPECIFIC NOTES AND DETAILS.

TECHNOLOGY SHEET INDEX:

SHEET DESCRIPTION

- TECHNOLOGY COVER SHEET
- TECHNOLOGY FLOOR PLAN DEMO MDF 1.00 TECHNOLOGY FLOOR PLAN DEMO - IDF 1.01 AND 1.02
- TECHNOLOGY FLOOR PLAN NEW MDF 1.00 T201 TECHNOLOGY FLOOR PLAN NEW - IDF 1.01 AND 1.02
- TECHNOLOGY REFLECTED CEILING PLAN NEW MDF 1.00
- TECHNOLOGY REFLECTED CEILING PLAN NEW IDF 1.01
- TECHNOLOGY SINGLE LINE DIAGRAMS TECHNOLOGY SINGLE LINE DIAGRAMS
- TECHNOLOGY DETAILS TECHNOLOGY DETAILS TECHNOLOGY DETAILS TECHNOLOGY DETAILS

AGENCY APPROVAL

ERATIONS

Carmichael, CA 95608

Office: (916) 359-4000 www.kmmservices.com BICZI NNY KAGSTROM EXPIRES 12/31/2027

Sacramento, CA 95811

916.329.4000

www.nachtlewis.com

Regis No 163629

ONSULTANT

FINAL SPACE PLAN REVISIONS DESCRIPTION ADDENDUM 002

09/20/2023

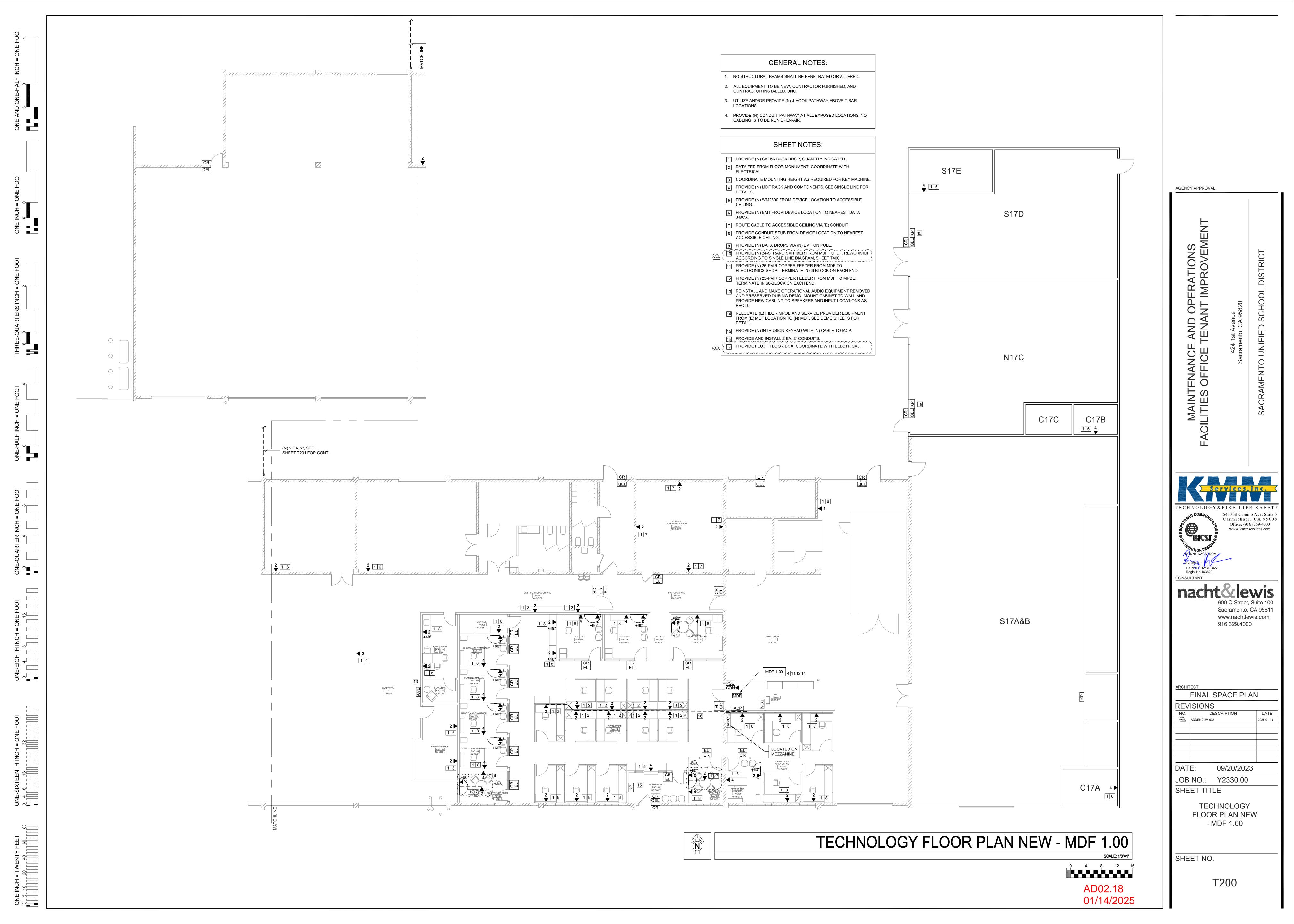
JOB NO.: Y2330.00 SHEET TITLE

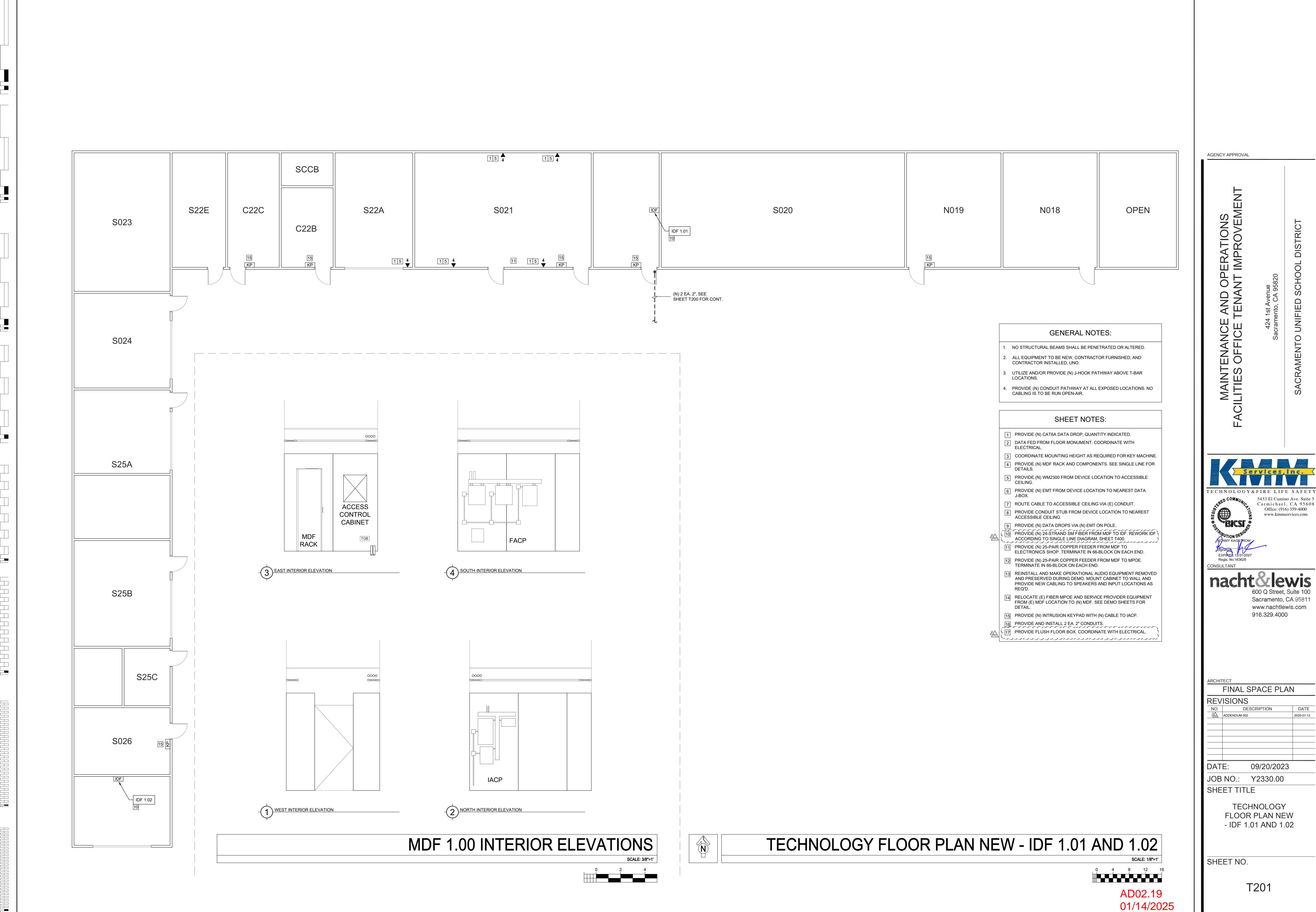
> **TECHNOLOGY COVER SHEET**

SHEET NO.

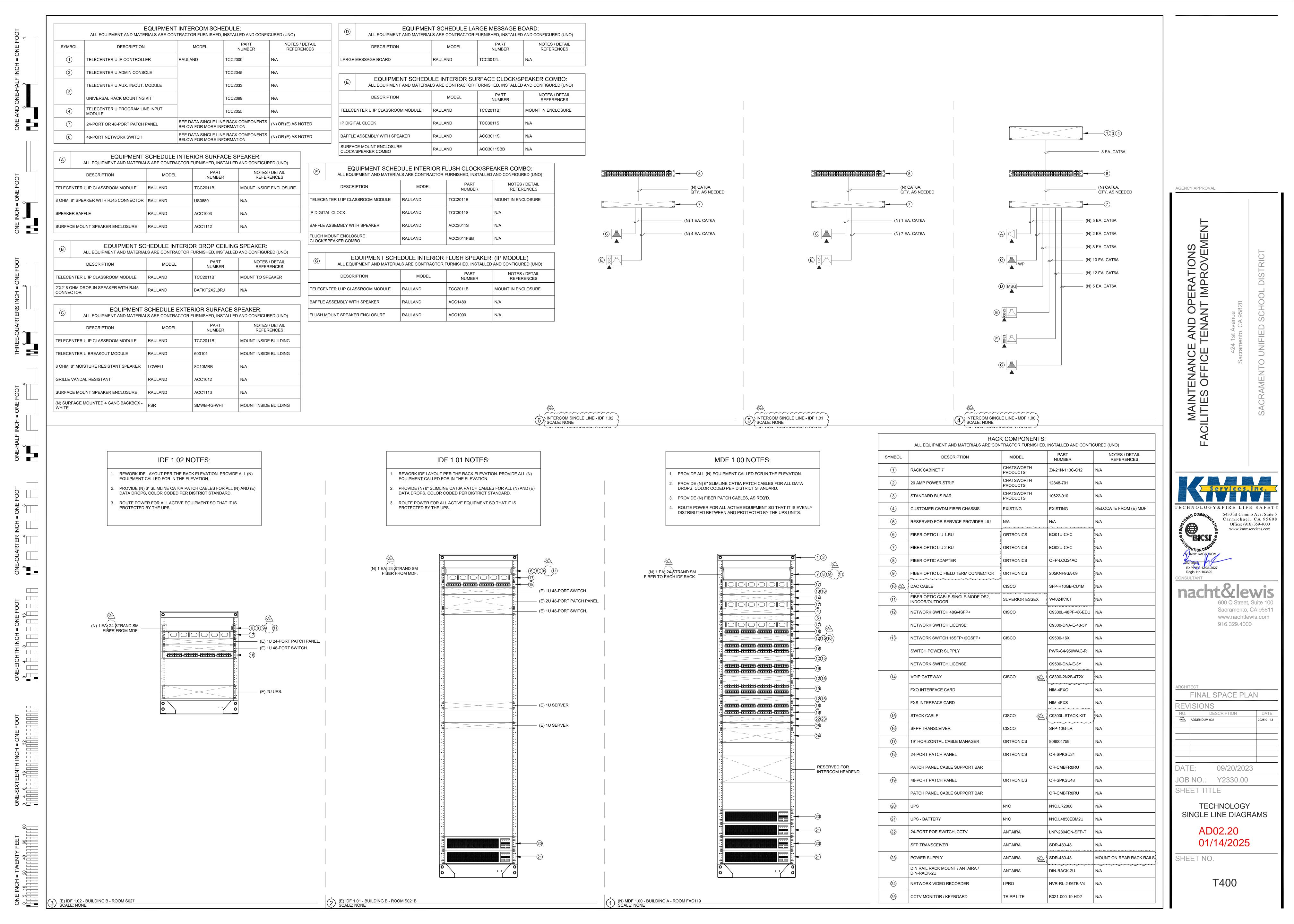
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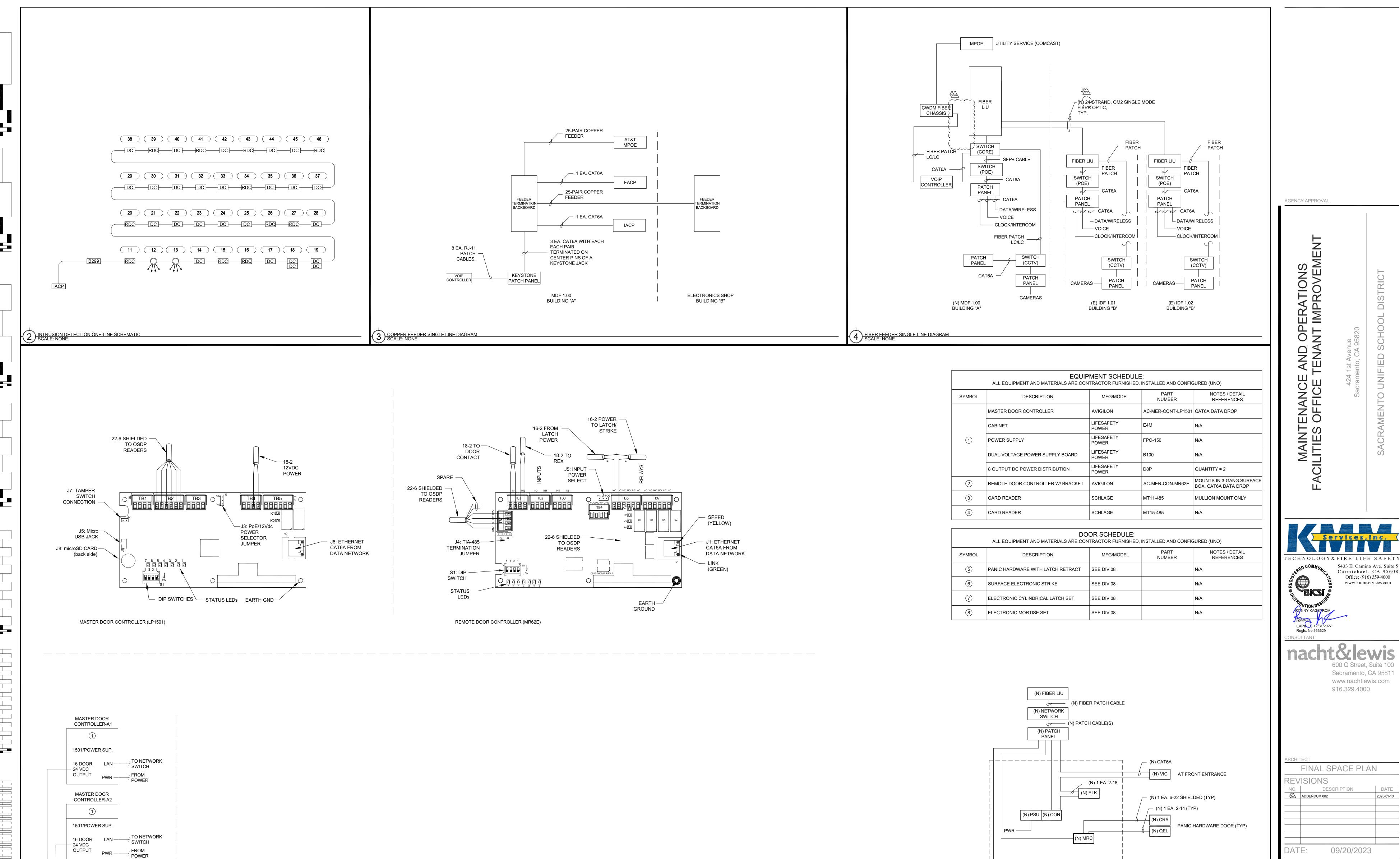
AD02.17 01/14/2025





Sacramento, CA 95811





EACH

CONTROLLED

DOOR (TYP)

2 3 OR 4

ELECT. DOOR

HARDWARE

(1 TYPE/DOOR)

5678

TO NETWORK 2 SWITCH

FINAL SPACE PLAN JOB NO.: Y2330.00 SHEET TITLE TECHNOLOGY SINGLE LINE DIAGRAMS AD02.21 01/14/2025

T401

SHEET NO.

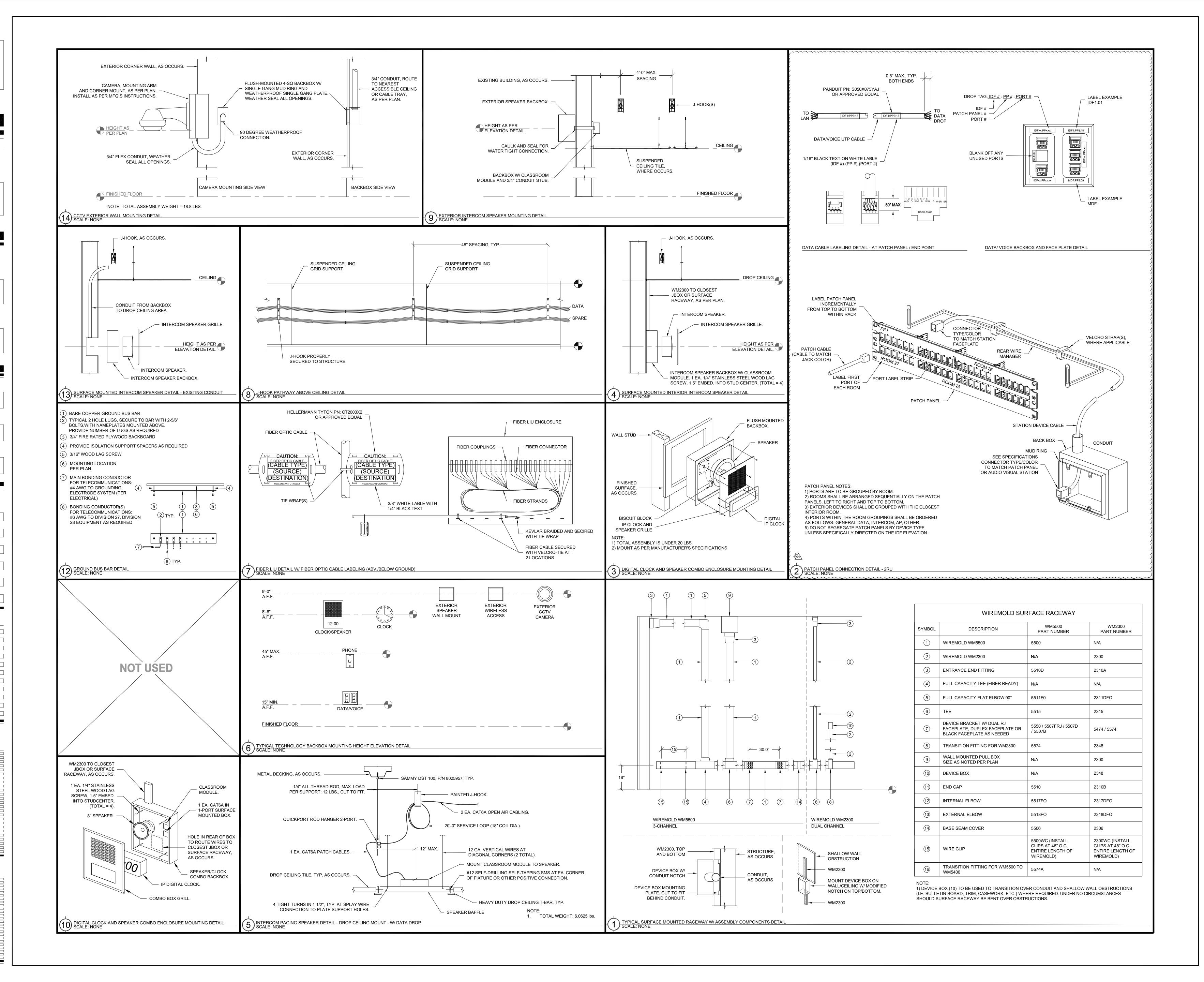
(N) CRA
(N) CRA

(N) ELS

(N) MRC

ELECTRONIC ACCESS WIRING SCHAMATIC
SCALE: NONE

LATCH SET DOOR (TYP)



AGENCY APPROVAL

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TECHNOLOGY&FIRE LIFE SAFETY

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EXPIRES 12/31/2027
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CONSULTANT

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FINAL SPACE PLAN

REVISIONS

NO. DESCRIPTION DATE

ADDENDUM 002 2025-01-13

DATE: 09/20/2023

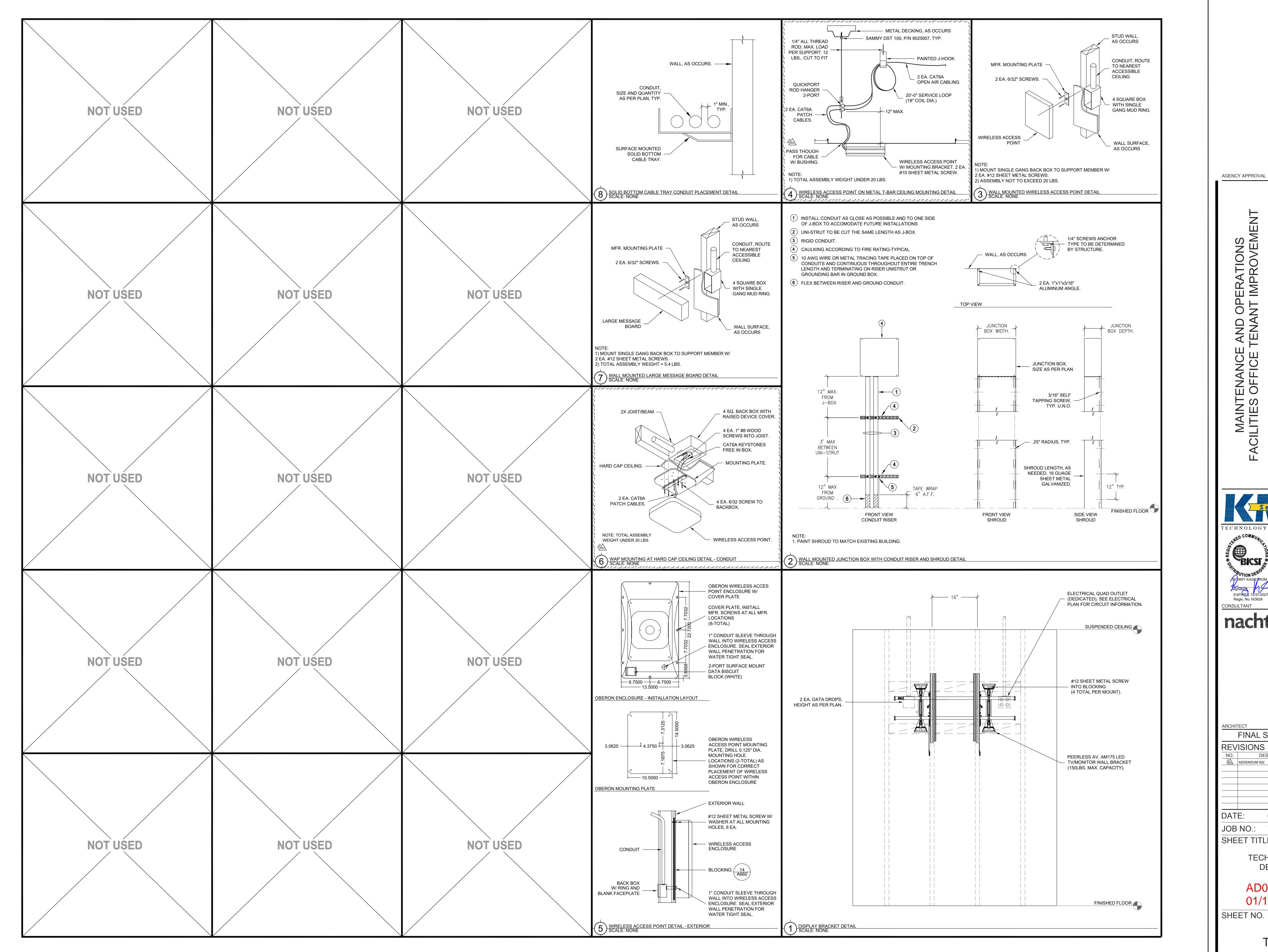
JOB NO.: Y2330.00
SHEET TITLE

TECHNOLOGY DETAILS

AD02.22

01/14/2025 SHEET NO.

T801



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BICSI

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Sacramento, CA 95811 www.nachtlewis.com 916.329.4000

FINAL SPACE PLAN

DESCRIPTION

09/20/2023 JOB NO.: Y2330.00

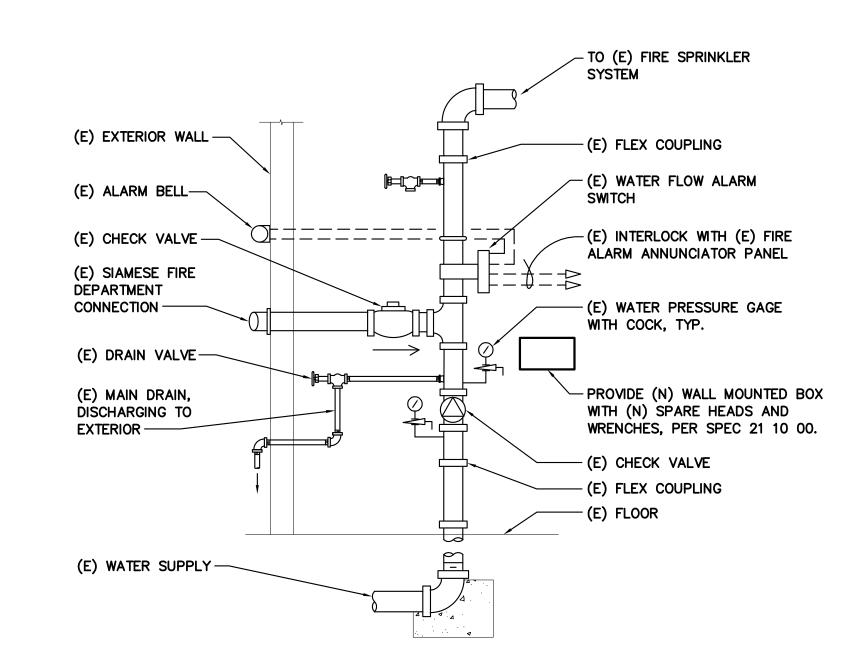
SHEET TITLE

TECHNOLOGY DETAILS

AD02.23 01/14/2025

SHEET NO.

FIRE SPRINKLER LEGEND				
SYMBOL	ABBREVIATION	DESCRIPTION		
—— ATF——	ATF	AUTOMATIC FIRE SPRINKLER PIPING		
————	BFP/WM	BACKFLOW PREVENTOR/WATER METER		
—— DSP——	DSP	DRY STAND PIPE		
	(E)	EXISTING		
₫.	FDC	FIRE DEPARTMENT CONNECTION		
<u>-</u> ⊗	FH	FIRE HYDRANT		
—— F ——	F	FIRE WATER PIPING		
D	D	FIRE SPRINKLER PIPING DRAIN		
\circ	FSR	FIRE SPRINKLER RISER		
	(N)	NEW		
—— ♦ ——	0S & Y	OUTSIDE STEM & YOKE VALVE		
→	PIV	POST INDICATOR VALVE		
WSP	WSP	WET STAND PIPE		
		UPRIGHT FIRE SPRINKLER HEAD		
——		PENDANT FIRE SPRINKLER HEAD		
		SIDEWALL FIRE SPRINKLER HEAD		



(E) FIRE SPRINKLER RISER

SCALE : NONE

FIRE SPRINKLER GENERAL NOTES

- 1. DRAWINGS SHALL BE CONSIDERED DIAGRAMMATIC ONLY. CONTRACTOR SHALL FIELD VERIFY WHERE POSSIBLE EXACT LOCATIONS, SIZES AND ELEVATIONS OF ALL (NEW & EXISTING) DUCTWORK, PIPING CONNECTIONS, OTHER WORK, ETC... PRIOR TO THE INSTALLATION OF ANY NEW WORK.
- 2. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REVISIONS, TRANSITIONS, OFFESTS, ETC., TO AVOID (NEW & EXISTING) DUCTWORK, PIPING, EQUIPMENT OR STRUCTURE AND TO MAKE A COMPLETE AND FUNCTIONING
- 3. PIPING SHALL BE SUPPORTED AND BRACED PER THE SMACNA "GUIDELINES FOR SEISMIC RESTRAINTS OF MECHANICAL AND PLUMBING PIPING SYSTEMS".
- 4. INSTALL ALL WORK TO CLEAR ARCHITECTURAL, STRUCTURAL MEMBERS AND MECHANICAL SYSTEMS. ADJUST PIPING AS NECESSARY. NO ITEM SUCH AS PIPE, ETC., SHALL BE IN CONTACT WITH ANY EQUIPMENT. INSTALL ALL PIPING AS HIGH AS POSSIBLE OR AS SPECIFIED ON DRAWINGS TO MAINTAIN MAXIMUM ACCESSIBILITY.
- 5. THE ENTIRE SYSTEM IS TO BE DESIGNED IN ACCORDANCE WITH THE UNIFROM BUILDING CODE, CALIFORNIA BUILDING CODE, LOCAL AND STATE FIRE MARSHAL REQUIREMENTS, THE LATEST EDITIONS OF THE NFPA CODES, AND ALL OTHER REGULATIONS THAT MAY APPLY.
- 6. INSTALLATION OF THE SPRINKLER SYSTEM SHALL NOT BE STARTED UNTIL COMPLETE PLANS AND SPECIFICATIONS, INCLUDING WATER SUPPLY INFORMATION HAVE BEEN APPROVED BY THE LOCAL FIRE MARSHAL AND ENGINEER OF RECORD. AT VARIOUS STAGES AND UPON COMPLETION, THE SYSTEM MUST BE TESTED IN THE PRESENCE OF THE INSPECTOR OF RECORD.
- . ALL AREAS OUTLINED ON PLANS SHALL BE FIRE SPRINKLERED. SEE PLANS FOR LOCATIONS. REFER TO DIVISION 21, SPECIFICATION SECTIONS 21 00 50 AND 21 10 00 FOR A COMPLETE DESCRIPTION OF FIRE PROTECTION REQUIREMENTS.
- 8. THE LOCATIONS OF RISERS, FEED MAINS, CROSS MAINS AND BRANCH PIPING WHERE SHOWN ON THE DRAWINGS ARE APPROXIMATE. FINAL LOCATION IS THE CONTRACTOR'S RESPONSIBILITY AND SHALL BE IN COMPLIANCE WITH THE SPECIFICATIONS AND ALL APPLICABLE CODES OR REGULATIONS.
- 9. ALL PIPING, HEADS, AND SPRINKLER WORK SHALL BE COORDINATED TO THE ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND ELECTRICAL WORK. PIPING SHALL BE CONCEALED, EXCEPT WHERE SO INDICATED OR WHERE WHERE ABSOLUTELY NECESSARY TO BE EXPOSED. EXPOSED PIPING SHALL BE PLACED AS APPROVED BY THE LOCAL FIRE MARSHAL PRIOR TO INSTALLATION. HEADS SHALL BE FULLY COORDINATED WITH ARCHITECTURAL REFLECTED CEILING PLAN.
- 10. IN GENERAL, HEADS SHALL BE SYMMETRICALLY LOCATED IN CENTER OF CEILING PANELS AND FULLY COORDINATED WITH CEILING OR SOFFIT LIGHT FIXTURES AND AIR CONDITIONING INLETS AND OUTLETS.
- 11. THE LOCATION OF FIRE SPRINKLER HEADS SHALL BE COORDINATED WITH CEILING LAYOUT AND ALL OTHER TRADES FOR COMPLETE FIRE PROTECTION COVERAGE OF ALL AREAS. PROVIDE DETAILED PLANS FOR APPROVAL BY THE LOCAL FIRE MARSHAL PRIOR TO INSTALLATION.
- INSTALL FIRE SPRINKLER HEADS IN AREAS WITH NO CEILING ABOVE DUCTS, ALSO BELOW DUCTS WHEN DUCTS INTERFERE WITH PROPER FLOOR COVERAGE. HEADS THAT ARE SUBJECT TO MECHANICAL DAMAGE AND/OR BELOW 7'-0" MUST HAVE HEAD GUARDS.
- PROVIDE SPRINKLER HEADS AS REQUIRED ON TOP OF SHAFTS, AT ELEVATORS, ENCLOSED STAIRWAYS, ETC.
- PROVIDE PENDENT AND/OR UPRIGHT TYPE SPRINKLER HEADS WHERE REQUIRED BY CALIFORNIA BUILDING CODE.

 12. COORDINATE THE LOCATION OF FIRE SPRINKLER HEADS WITH CEILING LAYOUT AND ALL OTHER TRADES FOR
- COMPLETE FIRE PROTECTION COVERAGE OF ALL AREAS. PROVIDE DETAILED PLANS FOR APPROVAL PRIOR TO INSTALLATION.
- 12. PROVIDE CEILING ESCUTCHEON AS REQUIRED.
- 13. PROVIDE FLEXIBLE CONNECTION EACH SIDE OF JOINT AT PIPE PENETRATIONS THRU BUILDING SEISMIC WALLS AND THRU BUILDING EXPANSION JOINTS.
- 14. DUE TO THE LIMITED SPACE AVAILABLE, ON—THE—JOB MEASUREMENT OF PIPE WILL BE REQUIRED. OFFSETS, PIPE, ADDITIONAL HEADS, FITTINGS, DRAINS, ETC., REQUIRED TO MEET JOB CONDITIONS SHALL BE FURNISHED AND INSTALLED AT NO EXTRA COST TO THE OWNER.
- 15. FIRE SPRINKLER HYDRAULIC DESIGN DENSITY SHALL BE PER NFPA 13.

ARCHITECT, LOCAL AUTHORITY AND ENGINEER FOR THEIR REVIEW.

- 16. FOR EXPOSED AREAS PIPING SHALL RUN PARALLEL TO STRUCTURE AND BEAMS, AS HIGH AS POSSIBLE, CONCEAL ADJACENT TO BEAMS AND STRUCTURE WHEREVER POSSIBLE. PIPING SHALL BE EXPOSED, PAINTED. HEADS SHALL BE UPRIGHT AND/OR SIDEWALL, STANDARD BRONZE FINISH.
- 17. PROTECT PENETRATIONS OF RATED FIRE ASSEMBLIES SHALL BE IN ACCORDANCE WITH THE CALIFORNIA BUILDING CODE.
- 18. FIRE PROTECTION SYSTEM DESIGN IS DEFERRED APPROVAL. PLANS SHALL BE SUBMITTED TO THE PROJECT
- 19. PROVIDE SPRINKLER SYSTEM CERTIFICATION STATEMENT.
- 20. CONTRACTOR SHALL VERIFY AVAILABLE STATIC AND RESIDUAL WATER PRESSURES WITH UTILITY COMPANIES AND LOCAL FIRE DEPARTMENT PRIOR TO BEGINNING CALCULATIONS AND DESIGN.

AGENCY APPROVAL

D OPERATIONS IANT IMPROVEMEN

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