



March 8, 2019

## ADDENDUM NO. 1

TO THE CONTRACT DOCUMENTS

**FOR**

NORTH PARK ELEMENTARY SCHOOL ADMIN ADDITION AND MODERNIZATION

**FOR THE**

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

777 North F Street

San Bernardino, CA 92410

DSA No. 04-117672

File No. 36-55

RCA Job No. 1-78-22

### NOTICE TO BIDDERS

This Addendum forms a part of the Contract and modifies the original documents DSA Approved on December 4, 2018. It is intended that all work affected by the following modifications shall conform with related provisions and general conditions of the contract of the original drawings and specifications. Modify the following items wherever appearing in any drawing or sections of the specifications. Acknowledge receipt of Addendum No. 1 in the space provided on the Bid Form. Failure to do so may subject bidder to disqualification.

### GENERAL NOTES

- Item No. 1.1 General Items:
- 1.1.1 Asbestos report by EMLab P&K (Project: 210825002) is available for bidder reference through Crisp Imaging PlanWell Service online by clicking on 'PUBLIC PLANROOM' at [www.crispimg.com](http://www.crispimg.com).

### CHANGES TO THE SPECIFICATIONS

- Item No. 1.2 Reference Section 01 50 00 - Temporary Facilities and Controls:
- 1.2.1 Temporary laydown, parking and fencing clarified per attached Exhibit A:
- Provide gravel with Class 2 base parking area at rear of campus (NW corner) with striping, perimeter fencing, gates and designation signage as School Staff Parking. Restore irrigation and turf at end of construction (refer to green area on Exhibit A).
  - Provide Contractor laydown and parking area at front of campus (SE corner) with perimeter fencing, gates, signage, gravel/rock entry with gate and shaker plate. Restore irrigation and turf at end of construction (refer to blue area on Exhibit B).
  - Provide temporary fence line with privacy screen, gates and signage near new construction area. Restripe existing parking area damaged by construction activities and restore any damaged turf or planting in this area upon removal of temporary fencing at end of construction (refer to red area on Exhibit A).



- d. Contractor to phase work in order to maintain existing accessible parking and accessible path operational OR provide temporary accessible parking elsewhere in existing parking lot (must be in close proximity to existing accessible ramp). DSA approval is required if alternate temporary parking is provided, contractor shall be responsible for additional design and review fees for alternate temporary parking.
- e. Contractor to maintain entrance/access to existing trash bins and food service deliveries through the duration of construction

Item No. 1.3 1.3.1	Reference Section 03 30 00 - Cast-In-Place Concrete: Integral color concrete added per attached revised Section 03 30 00.
Item No. 1.4 1.4.1	Reference Section 05 50 00 - Miscellaneous Metal Fabrications: Add bollards per attached revised Section 05 50 00.
Item No. 1.5 1.5.1	Reference Section 05 52 13 - Pipe and Tube Railings: Paragraph 1.2.D, revise reference section for painting to be 09 96 00 - High-Performance Coatings.
Item No. 1.6 1.6.1	Reference New Section 08 87 33 - Architectural Decorative Window Films: Add attached new Section 08 87 33 in its entirety.
Item No. 1.7 1.7.1	Reference Section 09 51 00 - Suspended Acoustical Ceilings: Replace section per attached revised Section 09 51 00.
Item No. 1.8 1.8.1	Reference New Section 09 68 13 - Tile Carpeting: Add attached new Section 09 68 13 in its entirety.
Item No. 1.9 1.9.1	Reference New Section 09 72 00 - Wall Coverings: Add attached new Section 09 72 00 in its entirety.
Item No. 1.10 1.10.1	Reference Section 09 96 00 - High-Performance Coatings: Replace section per attached revised Section 09 96 00.
Item No. 1.11 1.11.1	Reference Section 10 21 23 - Cubicle Curtains and Track: Paragraph 2.04.C, add the following Basis of Design: Basis of Design Product: River #4684, Color 33 as manufactured by Carnegie Fabrics, or approved equal.
Item No. 1.12 1.12.1	Reference New Section 27 10 00.10 - Ethernet Cabling: Add attached new Section 27 10 00.10 in its entirety.
Item No. 1.13 1.13.1	Reference New Section 27 13 00 - Voice and Data Network System: Add attached new Section 27 13 00 in its entirety.
Item No. 1.14 1.14.1	Reference New Section 27 51 00 - Integrated Communications System: Replace Section 27 51 00 Educational Intercommunications in its entirety per attached new Section 27 51 00 Integrated Communications System.
Item No. 1.15 1.15.1	Reference New Section 28 13 53.11 - IP Network Compatible Intercom (IX System): Add attached new Section 28 13 53.11 in its entirety.
Item No. 1.16 1.16.1	Reference New Section 28 31 00 - Integrated Security System: Add attached new Section 28 31 00 in its entirety.
Item No. 1.17 1.17.1	Reference Section 28 31 10 - Fire Alarm System: Replace section in its entirety per attached Section 28 31 10.
Item No. 1.18 1.18.1	Reference Section 32 13 13 - Concrete Paving: Replace section per attached Section 32 13 13.



- Item No. 1.19 Reference Section 32 31 19 - Ornamental Metal Fences and Gates:  
1.19.1 Paragraph 2.02  
a. Item C.1, revise 2-1/2" to be 3" inches square.  
b. Item H, revise color to be "As indicated on Drawings, paint per Section 09 96 00 High-Performance Coatings."  
1.19.2 Paragraph 2.03.B, add Item 1 as follows:  
1. Finish: Match fence panel.  
1.19.3 Paragraph 2.04  
a. Item B, revise Meet the requirements of 1 to read "Meet the requirements of ASTM F900."  
b. Delete Item C in its entirety.
- Item No. 1.20 Reference New Section 32 33 00 - Site Furnishings:  
1.20.1 Add attached new Section 32 33 00 in its entirety.

## CHANGES TO THE DRAWINGS

- Item No. 1.21 Reference Sheet D-1.1:  
1.21.1 Revise per clouded areas of attached revised Sheet D-1.1.
- Item No. 1.22 Reference Sheet D-1.2:  
1.22.1 Replace Demo Plan per attached Sheet D-1.2.
- Item No. 1.23 Reference Sheet AS-1.0:  
1.23.1 Revise per clouded areas of attached revised Sheet AS-1.0.
- Item No. 1.24 Reference Sheet AS-2.0:  
1.24.1 Revise per clouded areas of attached revised Sheet AS-2.0.
- Item No. 1.25 Reference Sheet AS-2.1:  
1.25.1 Revise per clouded areas of attached revised Sheet AS-2.1.
- Item No. 1.26 Reference Sheet ASD-1.0:  
1.26.1 Detail 21, revise per attached ASK-1.1.  
1.26.2 Detail 24, add new detail per attached ASK-1.5.  
1.26.3 Detail 26, remove reference to "galv. finish" & add note "clean, prime & paint all exposed stl. members".  
1.26.4 Detail 28, remove reference to "galv. finish" & add note "clean, prime & paint all exposed stl. members".
- Item No. 1.27 Reference Sheet A1.1:  
1.27.1 Contractor to provide the following:  
a. Provide storage for all gym/fitness equipment currently in Room 150 for duration of construction; return and reinstall all equipment to Room 150 at end of construction.  
b. Relocate Computer Lab 114 to Fitness Room 150 for duration of construction; return and reinstall all equipment and furnishings to Room 114 at end of construction.  
c. Relocate Administration to Computer Lab 114
  - Provide temporary door with vision lite and hardware group 5 with panic hardware, closer, pull, security camera and security buzzer for Door 114A. (Include any applicable electrical work required for temporary door security camera, and security buzzer installed 48" A.F.F.)
  - Provide furniture and electrical/data outlets for a min. of (4) staff workstations.
  - Temporary Administration needs to remain fully operational through the end of construction; relocate to new area at the end of project.
  - Relocate or provide remote access to all systems: EST3 annunciator, security system, card reader system and PA system.
- 1.27.2 Revise Legend per attached Sketch ASK-1.10.
- Item No. 1.28 Reference Sheet A1.2:  
1.28.1 Revise Floor Plan per clouded areas of attached revised Sheet A1.2.



- Item No. 1.29      Reference Sheet A1.4:  
1.29.1      Revise Floor Plans per clouded areas of attached revised Sheet A1.4.
- Item No. 1.30      Reference Sheet A2.1:  
1.30.1      Omit Keynotes and revise hatch pattern of (E) Gyp Ceiling on Legend to remain to match RCP per attached Sketch ASK-1.9.
- Item No. 1.31      Reference Sheet A2.2:  
1.31.1      Revise Legend per attached Sketch ASK-1.8.
- Item No. 1.32      Reference Sheet A2.3:  
1.32.1      Revise Ceiling Plans per clouded areas of attached revised Sheet A2.3.
- Item No. 1.33      Reference Sheet A3.3:  
1.33.1      Revise Roof Plan per attached Sketch ASK-1.2.
- Item No. 1.34      Reference Sheet A4.1:  
1.34.1      Revise Building Elevations per clouded areas of attached revised Sheet A4.1.
- Item No. 1.35      Reference Sheet A5.1:  
1.35.1      Revise Wall Section 1 per attached Sketch ASK-1.7.
- Item No. 1.36      Reference Sheet A7.1:  
1.36.1      Revise per clouded areas of attached revised Sheet A7.1.
- Item No. 1.37      Reference Sheet A7.2:  
1.37.1      Revise per clouded areas of attached revised Sheet A7.2.
- Item No. 1.38      Reference Sheet A7.3:  
1.38.1      Revise per clouded areas of attached revised Sheet A7.3.
- Item No. 1.39      Reference Sheet A7.4:  
1.39.1      Revise Interior Elevations per clouded areas of attached revised Sheet A7.4.
- Item No. 1.40      Reference Sheet A7.5:  
1.40.1      Revise Interior Elevations and add Commons Room #135 per clouded areas of attached revised Sheet A7.5.
- Item No. 1.41      Reference Sheet A8.1:  
1.41.1      Revise Window Schedule per clouded areas of attached revised Sheet A8.1.
- Item No. 1.42      Reference Sheet A9.1:  
1.42.1      Revise per clouded areas of attached revised Sheet A9.1.
- Item No. 1.43      Reference Sheet AD-1.0:  
1.43.1      Revise notes on Details 6 and 30 per attached Sketch ASK-1.11.
- Item No. 1.44      Reference Sheet AD-1.1:  
1.44.1      Relocate Detail 9 on the sheet and add new Detail 10 per attached revised Sheet AD-1.1.
- Item No. 1.45      Reference Sheet AD-2.0:  
1.45.1      Replace sheet per attached revised Sheet AD-2.0.
- Item No. 1.46      Reference Sheet AD-2.1:  
1.46.1      Replace sheet per attached revised Sheet AD-2.1.
- Item No. 1.47      Reference Sheet AD-3.0:  
1.47.1      Replace Detail 22 per attached Sketch ASK-1.12.



- Item No. 1.48      Reference Sheet AD-4.0:  
                     1.48.1      Revised Details 21 and 22 per clouded areas of attached Sketch ASK-1.3.  
                     1.48.2      Detail 30, revise per clouded areas of attached Sketch ASK-1.4.
- Item No. 1.49      Reference Sheet AD-6.0:  
                     1.49.1      Revise per clouded areas of attached revised Sheet AD-6.0.
- Item No. 1.50      Reference Sheet AD-7.0:  
                     1.50.1      Omit Details 16, 17 and 26 in their entirety.  
                     1.50.2      Revise Detail 28 per attached Sketch ASK-1.6.
- Item No. 1.51      Reference Sheet AD-7.1:  
                     1.51.1      Details 19, 21 and 23 add following note regarding alum. break metal:  
                                     "color to match adjacent window system".
- Item No. 1.52      Reference Sheet S1-1.0:  
                     1.52.1      Added plan detail references per attached revised Sheet S1-1.0.
- Item No. 1.53      Reference Sheet S1-1.1:  
                     1.53.1      Foundation plan revised per clouded areas of attached revised Sheet S1-1.1.
- Item No. 1.54      Reference Sheet S1-3.1:  
                     1.54.1      Roof Framing plan revised per clouded areas of attached revised Sheet S1-3.1.
- Item No. 1.55      Reference Sheet SD-1.2:  
                     1.55.1      Detail 1, revised section to accommodate fire rated wall per attached Sketch SSK-1.1.  
                     1.55.2      Detail 3, revised section to accommodate fire rated wall per attached Sketch SSK-1.2.  
                     1.55.3      Detail 5, revised section to accommodate fire rated wall per attached Sketch SSK-1.3.
- Item No. 1.56      Reference Sheet SD-3.2:  
                     1.56.1      Detail 1, revised section to accommodate fire rated wall per attached Sketch SSK-1.4.  
                     1.56.2      Detail 2, revised section to accommodate fire rated wall per attached Sketch SSK-1.5.  
                     1.56.3      Add new Detail 16, per attached Sketch SSK-1.6.  
                     1.56.4      Add new Detail 17, per attached Sketch SSK-1.7.  
                     1.56.5      Add new Detail 18, per attached Sketch SSK-1.8.  
                     1.56.6      Add new Detail 19, per attached Sketch SSK-1.9.
- Item No. 1.57      Reference Sheet M-1.3:  
                     1.57.1      Detail 1, revise duct work per clouded areas of attached MSK-1.
- Item No. 1.58      Reference Sheet E0.11:  
                     1.58.1      Revise Panel Schedule per clouded areas of attached revised Sheet E0.11.
- Item No. 1.59      Reference Sheet E0.20:  
                     1.59.1      Revise Lighting Fixture Schedule as follows:  
                                     Remarks for Type G should read "Aircraft cable hung linear LED fixture with curves, pattern per plans.  
                                     \* Indicated contractor to provide appropriate options. 'C' indicates custom finish. Color is RAL-5012."
- Item No. 1.60      Reference Sheet E0.22:  
                     1.60.1      Revise sheet per clouded areas of attached revised Sheet E0.22.
- Item No. 1.61      Reference Sheet E0.30:  
                     1.61.1      Replace sheet in its entirety per attached revised Sheet E0.30.
- Item No. 1.62      Reference Sheet E1.11:  
                     1.62.1      Revise sheet per clouded areas of attached revised Sheet E1.11.
- Item No. 1.63      Reference Sheet E1.20:  
                     1.63.1      Revise sheet per clouded areas of attached revised Sheet E1.20.



- Item No. 1.64      Reference Sheet ED2.11:  
1.64.1      Revise demolition plan per clouded areas of attached revised Sheet ED2.11.
- Item No. 1.65      Reference Sheet E2.11:  
1.65.1      Revise Power/Signal Plan per clouded areas of attached revised Sheet E2.11.
- Item No. 1.66      Reference Sheet E2.12:  
1.66.1      Revise per clouded areas of attached revised Sheet E2.12.
- Item No. 1.67      Reference Sheet E2.13:  
1.67.1      Revise Power/Signal Plan per clouded areas of attached revised Sheet E2.13.
- Item No. 1.68      Reference Sheet E3.12:  
1.68.1      Revise lighting per clouded areas of attached revised Sheet E3.12.
- Item No. 1.69      Reference Sheet E3.13:  
1.69.1      Revise sheet per clouded areas of attached revised Sheet E3.13.
- Item No. 1.70      Reference Sheet E4.11:  
1.70.1      Add Roof General Notes per attached revised Sheet E4.11.

#### **ATTACHMENTS**

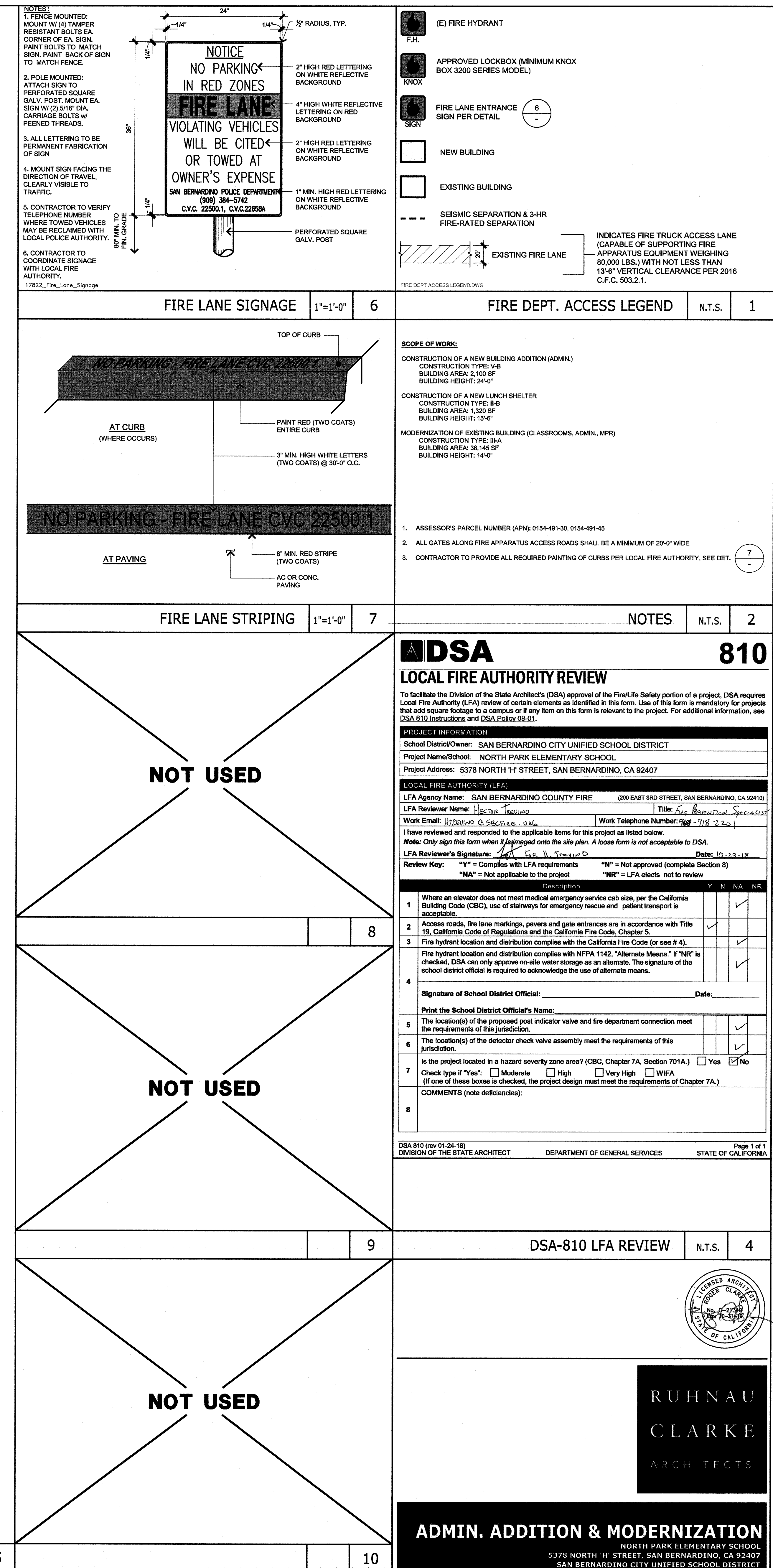
**Exhibits**      A  
**Specifications**      03 30 00, 05 50 00, 08 87 33, 09 51 00, 09 68 13, 09 72 00, 09 96 00, 27 10 00.10, 27 13 00, 27 51 00,  
28 13 53.11, 28 31 00, 28 31 10, 32 13 13, 32 33 00  
**Sketches**      ASK-1.1 thru ASK-1.12, SSK-1.1 thru SSK-1.9, MSK-1  
**Sheets**      D-1.1, D-1.2, AS-1.0, AS-2.0, AS-2.1, A1.2, A1.4, A2.3, A4.1, A7.1, A7.2, A7.3, A7.4, A7.5, A8.1, A9.1,  
AD-1.1, AD-2.0, AD-2.1, AD-6.0, S1-1.0, S1-1.1, S1-3.1, E0.11, E0.22, E0.30, E1.11, E1.20, ED2.11,  
E2.11, E2.12, E2.13, E3.12, E3.13, E4.11

#### **END OF ADDENDUM NO. 1**

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Roger Clarke, Principal  
#C-21340







**SECTION 03 30 00**  
**CAST-IN-PLACE CONCRETE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Floors and slabs on grade.
- B. Concrete foundations and anchor bolts.
- C. Joint devices associated with concrete work.
- D. Miscellaneous concrete elements, including equipment pads and thrust blocks.
- E. Concrete curing.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 10 00 - Concrete Forming and Accessories: Forms and accessories for formwork.
- B. Section 03 20 00 - Concrete Reinforcing.
- C. Section 03 35 11 - Concrete Floor Finishes: Densifiers, hardeners, applied coatings, and polishing.
- D. Section 07 92 00 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.
- E. Section 32 13 13 - Concrete Paving: Sidewalks, curbs and gutters.

**1.03 REFERENCE STANDARDS**

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).
- B. ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012).
  - 1. Section 6 Architectural Concrete.
- C. ACI 302.1R - Guide for Concrete Floor and Slab Construction; 2004 (Errata 2007).
- D. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000.
- E. ACI 305R - Hot Weather Concreting; 2010.
- F. ACI 306R - Cold Weather Concreting; 2010.
- G. ACI 308R - Guide to Curing Concrete; 2001 (Reapproved 2008).
- H. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2011.
  - 1. Use 2014 as indicated in 2016 CBC Ch 35 Referenced Standards.
- I. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2013.
  - 1. Use 2013 as indicated in 2016 CBC Ch 35 Referenced Standards.
- J. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2015a.
- K. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.
  - 1. Use 2014a as indicated in 2016 CBC Ch 35 Referenced Standards.



- L. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2013.
- M. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2012.
- N. ASTM C150/C150M - Standard Specification for Portland Cement; 2016.
  - 1. Use 2012 as indicated in 2016 CBC Ch 35 Referenced Standards.
- O. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2013.
- P. ASTM C579 - Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes; 2001 (Reapproved 2012).
- Q. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures; 2010.
- R. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2014.
- SS. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2010.**
- T. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2013.
- ±U.** ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2014.
- ∪V.** ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics; 2010.
- ∪W.** COE CRD-C 572 - Corps of Engineers Specifications for Polyvinylchloride Waterstop; 1974.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
  - 1. Including printed statement of VOC content and material safety data sheets.
- C. Mix Design: Submit proposed concrete mix design.
  - 1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
  - 2. Indicate proposed mix design complies with requirements of ACI 318, Chapters 4 and 5.
- D. Shop Drawings: Submit proposed layout of construction and control joints for approval.
- EE. Samples for Pigment Color Selection: Submit manufacturer's complete sample chip set, including pigment number and required dosage rate for each color.**
- F. Verification Samples: Submit sample chips of specified colors indicating pigment numbers and required dosage rates, for subsequent comparison to installed concrete.**
- G. Test Reports: Submit report for each test or series of tests specified.
- FH.** Mix Design: Submit mix designs prepared, stamped and signed by a Civil Engineer licensed in the State of California.
- GI.** Quality Control Submittals:



1. Field tests: Submit reports of all slump, strength and air content tests as required by authorities having jurisdiction and as indicated on the Drawings and specified herein.
  2. Delivery tickets: Have available copies of delivery tickets complying with ASTM C94/C94M for each load of concrete delivered to site. Include on the tickets the additional information specified in the ASTM document.
- HJ.** Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.
- IK.** Project Record Documents: Accurately record actual locations of embedded utilities and components that are concealed from view upon completion of concrete work.

#### **1.05 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
1. Maintain one copy of each document on site.
- B. Follow recommendations of ACI 305R when concreting during hot weather .
- C. When air temperature in the shade and away from artificial heat falls below 40 degrees F, or when concrete without special protection is likely to be subject to freezing temperatures before expiration of specified curing period, follow recommendations of ACI 306R when concreting during cold weather.
- D. Regulatory Requirements:
1. Conform to California Building Code (CBC) Chapter 19A requirement, as amended and adopted by authorities having jurisdiction.
  2. Chemical products field-applied to concrete shall comply with applicable air quality requirements of authorities having jurisdiction.
    - a. Comply with Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions, CALGreen Section 5.504.4 Finish material pollutant control; 5.504.4.1 Adhesives, sealants and caulks; 5.504.4.3 Paints and coatings.
- E. Testing Agency Services: District will engage an independent testing and inspection agency to conduct tests and perform other services specified for quality control during construction, as required by Sections 01 40 00 - Quality Requirements and Section 01 45 33 - Code-Required Special Inspections.
- F. Coordination: Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories. Coordinate concrete requirements with Work specified for underground utilities and mechanical and electrical equipment pads and bases.

#### **1.06 DELIVERY AND HANDLING**

- A. Protection During Concrete Placement: Provide protective coverings and runways, and use appropriate equipment and means of access to Work areas to avoid soiling or damage to existing conditions.
- B. Runoff: Prevent run off of water contaminated by construction agents and chemicals from soiling existing surfaces and from contaminating existing and future landscape areas.



## **PART 2 PRODUCTS**

### **2.01 FORMWORK**

- A. Comply with requirements of Section 03 10 00.

### **2.02 REINFORCEMENT MATERIALS**

- A. Comply with requirements of Section 03 20 00.

### **2.03 CONCRETE MATERIALS**

- A. Recycle Requirements: Concrete fly ash, rice hull ash or other pozzolanic materials total recycled content min 25%. Where total recycled content is equal to post consumer content plus half of secondary recycled content, but not to exceed recommended code guidelines.
- B. Cement: ASTM C150/C150M, Type I - Normal Portland type.
  - 1. Cement used in contact with soil shall be Type V - Sulfate Resistant.
  - 2. Acquire cement for entire project from same source.
- C. Fine and Coarse Aggregates: ASTM C33/C33M.
  - 1. Acquire aggregates for entire project from same source.
  - 2. Fine and coarse aggregates, CBC Title 24, Part 2, and as follows.
    - a. Structural Concrete: Maximum size not larger than 1/5 of narrowest dimension between forms, 1/3 depth of slab nor 3/4 of minimum clear spacing between individual reinforcing bars. Maximum aggregate size shall be 1 inch.
    - b. Other than Structural Concrete: Conform to requirements for structural concrete.
      - 1) Except maximum aggregate for concrete fill at stair tread and landings shall be 3/8 inch maximum.
- D. Color Additives: Pure, concentrated mineral pigments specifically intended for mixing into concrete and complying with ASTM C979/C979M.**
  - 1. **Concentration: Base dosage rates on weight of Portland cement, fly ash, silica fume, and other cementitious materials but not aggregate or sand.**
  - 2. **Packaging: If pigments are to be added to mix at site, furnish pigments in premeasured disintegrating bags to minimize job site waste.**
  - 3. **Color(s): As indicated on drawings.**
  - 4. **Manufacturers:**
    - a. **Butterfield Color: [www.butterfieldcolor.com/#sle](http://www.butterfieldcolor.com/#sle).**
    - b. **Davis Colors: [www.daviscolors.com/#sle](http://www.daviscolors.com/#sle).**
    - c. **Lambert Corporation: [www.lambertusa.com/#sle](http://www.lambertusa.com/#sle).**
    - d. **L.M. Scofield Company; CHROMIX® Admixtures for Color-Conditioned® Concrete: [www.scofield.com/#sle](http://www.scofield.com/#sle).**
    - e. **Substitutions: See Section 01 60 00 - Product Requirements.**
- E. Water: Clean fresh and potable, free of amounts of acids, alkalis and organic materials detrimental to concrete production.



## 2.04 ADMIXTURES

- A. General: Concrete Admixtures shall not affect concrete strength or color of colored concrete.
- B. Chemical Admixture:
  - 1. Use no admixtures not included in mix design. Products of the following manufacturers are specified and will be acceptable provided they comply with referenced standards all other requirements of the Contract Documents:
    - a. Manufacturers:
      - 1) BASF Building Systems: [www.buildingsystems.basf.com](http://www.buildingsystems.basf.com).
      - 2) Dayton Superior Corporation: [www.daytonsuperior.com](http://www.daytonsuperior.com).
      - 3) Euclid Chemical Co.: [www.euclidchemical.com](http://www.euclidchemical.com).
      - 4) L&M Construction Chemicals, Inc.: [www.lmcc.com](http://www.lmcc.com).
      - 5) Larsen Products Corp.: [www.larsenproducts.com](http://www.larsenproducts.com).
      - 6) MeadowBurke Co.: [meadowburke.com](http://meadowburke.com).
      - 7) W.R. Meadows, Inc.: [www.wrmeadows.com](http://www.wrmeadows.com).
      - 8) Sika Corporation; [www.us.sika.com](http://www.us.sika.com).
      - 9) Simpson Strong-Tie: [www.strongtie.com](http://www.strongtie.com)
      - 10) Specialty Products Group: [www.SPGoGreen.com](http://www.SPGoGreen.com).
      - 11) US Spec Division of US Mix Products Co.: [www.usspec.com](http://www.usspec.com).
      - 12) Substitutions: See Section 01 60 00 - Product Requirements.
- C. Do not use chemicals that result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- D. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.
  - 1. Manufacturers:
    - a. Euclid Chemical Company; ACCELGUARD 80: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - b. Accelguard 80 by Euclid Chemical Co.
    - c. Pozzutec 20 by Master Builders Technology, Inc.
    - d. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
  - 1. Manufacturers:
    - a. L.M. Scofield Company: [www.scofield.com](http://www.scofield.com).
    - b. Eucon Retarder 75 by Euclid Chemical Co.
    - c. Pozzolith R by Master Builders Technology, Inc.
    - d. Plastiment by Sika Corporation.
    - e. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Water Reducing Admixture: ASTM C494/C494M Type A.
  - 1. Manufacturers:
    - a. Euclid Chemical Company; EUCON NW: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - b. Eucon WR-75 by Euclid Chemical Co.
    - c. Pozzolith Normal or Polyheed by Master Builders Technology, Inc.
    - d. Plastocrete 161 by Sika Corporation.
    - e. Substitutions: See Section 01 60 00 - Product Requirements.



## 2.05 ACCESSORY MATERIALS

- A. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
1. Grout: Comply with ASTM C1107/C1107M.
  2. Height Change, Plastic State; when tested in accordance with ASTM C827/C827M:
    - a. Maximum: Plus 4 percent.
    - b. Minimum: Plus 1 percent.
  3. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
  4. Minimum Compressive Strength at 28 Days: 8,000 pounds per square inch.
  5. Flowable Products:
    - a. Dayton Superior Corporation; Sure-Grip High Performance Grout: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - b. Dayton Superior Corporation; Sure-Grip Precision Grout: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - c. Dayton Superior Corporation; 1107 Advantage Grout: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - d. L&M Construction Chemicals, Inc, a subsidiary of Laticrete International, Inc; DURAGROUT: [www.laticrete.com/our-products/concrete-construction-chemicals/#sle](http://www.laticrete.com/our-products/concrete-construction-chemicals/#sle).
    - e. Sika Corporation; SikaGrout 328: [www.us.sika.com](http://www.us.sika.com).
    - f. SpecChem, LLC; SC Precision Grout: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - g. US SPEC; MP Grout: [www.usspec.com](http://www.usspec.com).
    - h. W. R. Meadows, Inc; 588-10K: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
    - i. W. R. Meadows, Inc; 1428 HP: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
    - j. Substitutions: See Section 01 60 00 - Product Requirements.
  6. Low-Slump, Dry Pack Products:
    - a. Dayton Superior Corporation; Dri Pak Precast Grout: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - b. Dayton Superior Corporation; Turbo Grout HP 12: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - c. Euclid Chemical Co.; [www.euclidchemical.com](http://www.euclidchemical.com).
    - d. L&M Construction Chemicals, Inc, a subsidiary of Laticrete International, Inc; Duragrout: [www.lmcc.com/#sle](http://www.lmcc.com/#sle).
    - e. Sika Corporation; SikaGrout 212: [www.us.sika.com](http://www.us.sika.com).
    - f. US SPEC; GP Grout: [www.usspec.com](http://www.usspec.com).
    - g. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Non-Shrink Epoxy Grout: Moisture-insensitive, two-part; consisting of epoxy resin, non-metallic aggregate, and activator.
1. Composition: High solids content material exhibiting positive expansion when tested in accordance with ASTM C827/C827M.
    - a. Maximum Height Change: Plus 4 percent.
    - b. Minimum Height Change: Plus 1 percent.



2. Minimum Compressive Strength at 7 days, ASTM C579: 12,000 pounds per square inch.  
OR
3. Minimum Compressive Strength at 7 days, ASTM D695: 12,000 pounds per square inch.
4. Manufacturers:
  - a. Euclid Chemical Company; E3-DEEP POUR: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
  - b. Dayton Superior Corporation; Epoxy Grout J55: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
  - c. Dayton Superior Corporation; Pro-Poxy 2000 NS: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
  - d. Dayton Superior Corporation; Pro-Poxy 2000 DP: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
  - e. Euclid Chemical Co.; [www.euclidchemical.com](http://www.euclidchemical.com).
  - f. Five Star Products, Inc; Five Star DP Epoxy Grout: [www.fivestarproducts.com](http://www.fivestarproducts.com).
  - g. L&M Construction Chemicals, Inc.; [www.lmcc.com](http://www.lmcc.com).
  - h. Sika Corporation; Sika Grout Pak 42: [www.us.sika.com](http://www.us.sika.com).
  - i. SpecChem, LLC; SpecPoxxy Grout: [www.specchemllc.com](http://www.specchemllc.com).
  - j. US Mix Products Co.; [www.usspec.com](http://www.usspec.com).
  - k. W.R. Meadows, Inc.; REZI-WELD 3/2: [www.wrmeadows.com](http://www.wrmeadows.com).
  - l. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.06 BONDING AND JOINTING PRODUCTS**

- A. Bonding Compounds, General: Products of the following manufacturers are specified and will be acceptable provided they comply with requirements of the Contract Documents:
  1. BASF Building Systems: [www.buildingsystems.basf.com](http://www.buildingsystems.basf.com).
  2. Dayton Superior Corporation: [www.daytonsuperior.com](http://www.daytonsuperior.com).
  3. Euclid Chemical Co.: [www.euclidchemical.com](http://www.euclidchemical.com).
  4. L&M Construction Chemicals, Inc.: [www.lmcc.com](http://www.lmcc.com).
  5. Larsen Products Corp.: [www.larsenproducts.com](http://www.larsenproducts.com).
  6. MeadowBurke Co.: [meadowburke.com](http://meadowburke.com).
  7. W.R. Meadows, Inc.: [www.wrmeadows.com](http://www.wrmeadows.com).
  8. Sika Corporation; [www.us.sika.com](http://www.us.sika.com).
  9. Simpson Strong-Tie: [www.strongtie.com](http://www.strongtie.com)
  10. US Spec Division of US Mix Products Co.: [www.usspec.com](http://www.usspec.com).
  11. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Control Joints: Sawcut joints after concrete placement and finish. Preformed joint materials are not acceptable.
- C. Bonding Compounds: Polyvinyl acetate, acrylic or styrene butadiene base. Provide polyvinyl acetate compound at interior locations only.
  1. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
    - a. Acrylic or Styrene Butadiene:
    - b. Manufacturers:



- 1) BASF Building Systems; MasterEmaco A 400 or A 600: [www.buildingsystems.basf.com](http://www.buildingsystems.basf.com).
  - 2) Dayton Superior Corp.; Acrylic Bonding Agent J40: [www.daytonsuperior.com](http://www.daytonsuperior.com)
  - 3) Euclid Chemical Company; AKKRO-7T: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
  - 4) L&M Construction Chemicals, Inc.; Everbond: [www.lmcc.com](http://www.lmcc.com).
  - 5) MeadowBurke Co.; Arcylic Bond: [meadowburke.com](http://meadowburke.com).
  - 6) Sika Corporation; Sika Latex by Sika Corporation: [www.us.sika.com](http://www.us.sika.com).
  - 7) Simpson Strong-Tie; FX-Bondcrete: [www.strongtie.com](http://www.strongtie.com)
  - 8) SpecChem, LLC; Strong Bond Acrylic Bonder: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
  - 9) W. R. Meadows, Inc; ACRY-LOK-: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
  - 10) US Spec Division of US Mix Products Co.; Acrylcoat, Dura: [www.usspec.com](http://www.usspec.com).
  - 11) Substitutions: See Section 01 60 00 - Product Requirements.
2. Polyvinyl Acetate, PVA (Interior only except areas exposed to moisture):
- a. Products:
    - 1) Dayton Superior Corp.; PVA Bonding Agent J41: [www.daytonsuperior.com](http://www.daytonsuperior.com)
    - 2) Euclid Chemical Co.; Tammsweld: [www.euclidchemical.com](http://www.euclidchemical.com).
    - 3) L&M Construction Chemicals, Inc.; Everweld II: [www.lmcc.com](http://www.lmcc.com).
    - 4) Larsen Products Corp.; Weld-Crete: [www.larsenproducts.com](http://www.larsenproducts.com).
    - 5) W.R. Meadows, Inc.; Deck-O-Weld: [www.wrmeadows.com](http://www.wrmeadows.com).
    - 6) Substitutions: See Section 01 60 00 - Product Requirements.
3. Epoxy Bonding System:
- a. Complying with ASTM C881/C881M and of Type required for specific application.
  - b. Manufacturers:
    - 1) Adhesives Technology Corporation; Crackbond SLV-302, Crackbond LR-321, Crackbond LR-321 LPL, Ultrabond 2100 LPL, Ultrabond 2100, Ultrabond 1, Ultrabond 2, or Ultrabond HS200: [www.atcepoxy.com/#sle](http://www.atcepoxy.com/#sle).
    - 2) Euclid Chemical Company; DURAL FAST SET LV: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - 3) Euclid Chemical Company; DURALFLEX GEL: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - 4) Euclid Chemical Company; DURALFLEX LV: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - 5) Euclid Chemical Company; DURAL 452 GEL, DURAL 452 LV, or DURAL 452 MV: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - 6) Dayton Superior Corporation; Slow Set Bonding Agent: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - 7) Sika Corporation; Sikadur 31 Hi Mod Gel or Sikadur 32 Hi Mod Bonder: [www.us.sika.com](http://www.us.sika.com).
    - 8) Simpson Strong-Tie; FX-752 Epoxy Bonding Agent, FX-762 High-Modulus Epoxy Bonding Agent, FX-792LPL Long Pot Life Epoxy Bonding Agent: [www.strongtie.com](http://www.strongtie.com)
    - 9) SpecChem, LLC; SpecPoxy 1000, SpecPoxy 2000, SpecPoxy 3000, or SpecPoxy 3000FS: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - 10) W. R. Meadows, Inc; Rezi-Weld Gel Paste, Rezi-Weld Gel Paste State, Rezi-Weld 1000: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
    - 11) Substitutions: See Section 01 60 00 - Product Requirements.
- D. Waterstops: PVC, complying with COE CRD-C 572.



1. Configuration: Flatted Ribbed or Split Flange, as indicated on the drawings, or as recommended by manufacturer.
2. Size: 4 inch or as indicated on the drawings.
3. Manufacturers:
  - a. Greenstreak; Flat Ribbed number 781 and Split Flange 721: [www.greenstreak.com](http://www.greenstreak.com).
  - b. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
  1. Material: Closed-cell, non-absorbent, compressible polymer foam in sheet form.
  2. Manufacturers:
    - a. W. R. Meadows, Inc; Deck-O-Foam Joint Filler with pre-scored top strip: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Slab Contraction Joint Device: Preformed linear strip intended for pressing into wet concrete to provide straight route for shrinkage cracking.
  1. Manufacturers:
    - a. W. R. Meadows, Inc; Speed-E-Joint: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- G. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches on center; ribbed steel stakes for setting.
  1. Provide removable plastic cap strip that forms wedge-shaped joint for sealant installation.
  2. Height: To suit slab thickness.

## 2.07 CURING MATERIALS

- A. Evaporation Reducer: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.
  1. Manufacturers:
    - a. Atlas Tech Products Division of Atlas Construction Supply, Inc.; Atlas Finish-Film: [www.atlastechproducts.com](http://www.atlastechproducts.com).
    - b. Dayton Superior Corporation; AquaFilm Concentrate J74: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - c. Euclid Chemical Company ; EUCOBAR: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - d. Master Builder Solutions by BASF; MasterKure ER 50: [www.master-builders-solutions.basf.us](http://www.master-builders-solutions.basf.us).
    - e. Nox-Crete Products Group; Monofilm: [www.nox-crete.com](http://www.nox-crete.com)
    - f. Sika Corp.; SikaFilm: [usa.sika.com](http://usa.sika.com).
    - g. SpecChem, LLC; SpecFilm Concentrate or SpecFilm: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - h. W. R. Meadows, Inc; Evapre or Evapre-RTU: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
    - i. Substitutions: See Section 01 60 00 - Product Requirements.



- B. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.
  - 1. Application: Use at concrete slab on grade.
  - 2. Product dissipates within 4 to 6 weeks.
  - 3. Provide product containing fugitive red dye.
  - 4. Manufacturers:
    - a. Dayton Superior Corporation; Resin Cure with Dye J11WD: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - b. Dayton Superior Corporation; Clear Resin Cure J11W: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - c. Dayton Superior Corporation; Clear Cure VOC J7WB: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - d. Euclid Chemical Company; COLOR-CRETE CURE AND SEAL VOC: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - e. SpecChem, LLC; SpecRez: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - f. Paul M. Wolff Co.; SHUR-CURE: [www.paulwolffco.com](http://www.paulwolffco.com).
    - g. W. R. Meadows, Inc; 1100-Clear: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
    - h. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.08 CONCRETE MIX DESIGN**

- A. Mix Design: Contractor shall coordinate with the Testing Laboratory of Record, under supervision of Civil Engineer licensed in the State of California, to determine mix proportions to fulfill specified requirements for strength, aggregate, size and workability of concrete.
- B. Proportioning Normal Weight Concrete: Comply with ACI 211.1 and CBC (Chapter 19A) recommendations and requirements.
  - 1. Replace as much portland cement as allowable with fly ash or ground granulated blast furnace slag as is consistent with ACI and CBC recommendations.
- C. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
  - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- D. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
- E. Normal Weight Concrete:
  - 1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 3,000 pounds per square inch.
  - 2. Proportions: For normal weight concrete, in accordance with ACI 301, and as noted on the Drawings.
  - 3. Structural Concrete: Structural concrete strengths (including non-structural floor slabs on grade), aggregate sizes and slumps indicated on Structural Drawings.
  - 4. Water/Cement Ratio for Concrete in Contact with Soil: Not to exceed 0.45, unless otherwise indicated on Structural Drawings.



5. Water-Cement Ratio: As indicated on Structural Drawings.
6. Maximum Slump: As indicated on Structural Drawings.
7. Maximum Aggregate Size: As indicated on Structural Drawings.

## **2.09 MIXING**

- A. Transit Mixers: Comply with ASTM C94/C94M.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify lines, levels, and dimensions before proceeding with work of this section.
- B. Layout construction and control joints according to the drawing details and plans following these guidelines:
  1. Finished exposed concrete floors are critical for aesthetics.
  2. Layout joints on exposed concrete floors to allow for installation of utilities without sawcutting or concrete placement of different production batches subject to different colors. Staining and integral color concrete is not exempt from this requirement.
  3. Architect to review joint pattern submittal each floor.
  4. No lengthwise joints in corridors; place cross-corridor, if required.
  5. Place joint at 90 degree wall corners.
  6. Place joints at center line of columns.
  7. Equally space all joints.
- C. Verify that concrete cover requirements are met in formwork construction and reinforcement placement.
- D. Verify that base material (sand, gravel or natural as specified or indicated on Drawings) level, vapor barrier/retarder properly placed and that required clearances to reinforcing steel have been maintained.
- E. Verify that all embedded products and formed openings and recesses are correctly placed.
- F. At slabs on grade, verify that vapor retarder/barrier is properly placed and free of damage.

### **3.02 PREPARATION**

- A. Verify that forms are clean and free of rust before applying release agent.
- B. Prepare previously placed concrete by cleaning with hydro-blasting or wet sand blasting to provide suitable surface for bonding. Provide minimum aggregate exposure of 1/4 inch.
- C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
  1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.



2. Use latex bonding agent only for non-load-bearing applications.
- E. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
  1. See Section 07 26 16 - Under-Slab Vapor Retarder.
  2. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as shown on the drawings. Do not use sand.
    - a. Install total thickness indicated on Drawings. Provide crushed rock, 1/2 inch grading, clean washed, complying with ASTM C33/C33M.
    - b. Comply with CA Green Code Section 4.505.2.1 Capillary Break.

### **3.03 CONCRETE MIXING**

- A. Concrete Mixing, General: Comply with ACI 318 as adopted by CBC, Title 24, Part 2, Chapter 19A and ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete. Introduce and mix admixtures in compliance with manufacturer's instructions and recommendations.

### **3.04 PLACING CONCRETE**

- A. Notify District's Inspector and DSA at least 2 working days in advance of placing concrete.
- B. Place concrete in accordance with ACI 304R. General: Comply with ACI 318 as adopted by CBC, Title 24, Part 2, Chapter 19A and as follows:
  1. Schedule continuous placement of concrete to prevent the formation of cold joints.
  2. Ready mix concrete shall be delivered in accordance with ASTM C94/C94M. Concrete shall be placed within 90 minutes after start of mixing.
  3. Provide construction joints if concrete for a particular element or component cannot be placed in a continuous operation.
    - a. Submit for review, proposed locations of joints prior to pouring. See Structural Drawings for additional requirements.
  4. Deposit concrete as close as possible to its final location, to avoid segregation.
- C. Placement in Forms: Limit horizontal layers to depths which can be properly consolidated, but in no event greater than 24 inches.
  1. Consolidate concrete by means of mechanical vibrators, inserted vertically in freshly placed concrete in a systematic pattern at close intervals. Penetrate previously placed concrete to ensure that separate concrete layers are knitted together.
  2. Vibrate concrete sufficiently to achieve consistent consolidation without segregation of coarse aggregates.
  3. Do not use vibrators to move concrete laterally.
- D. Place concrete for floor slabs in accordance with ACI 302.1R. Schedule continuous placement and consolidation of concrete within planned construction joints.
  1. Place concrete in linear pattern, with control joints at slab on grade conditions only, with joints located as indicated on the Drawings.



2. Thoroughly consolidate concrete without displacing reinforcement or embedded items, using internal vibrators, vibrating screeds, roller pipe screeds or vibrating laser screed as described below.
  3. Screeding Procedures: Strike off and level concrete slab surfaces before bleed water can collect on surface. Do not work concrete further until finishing operations are commenced.
    - a. Typical Slabs: Strike off and level surface using highway straight edges, darbies or bull floats.
  4. Create control and construction joints true to line and profile. Do not radius the joints. Refer to the Drawings for structural requirements of joints.
  5. Locate joints as indicated on the Drawings. Submit for review, proposed locations of joints prior to pouring. See Structural Drawings for additional requirements. Locate joints on column centers and at re-entrant corners where possible.
  6. Sawcut control joints to one-quarter of slab depth, immediately after slab has achieved initial set and not longer than 8 hours. "Soff-Cut" method is preferred.
  7. Alternate control and construction joint products and procedures will be considered in accordance with substitution provision specified in Section 01 60 00 - Product Requirements.
- E. Notify Architect not less than 48 hours prior to commencement of placement operations.
  - F. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
  - G. Ensure reinforcement, inserts, and waterstops are not disturbed during concrete placement.
  - H. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.
  - I. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

### **3.05 SLAB JOINTING**

- A. Locate joints as indicated on the approved joint layout shop drawings.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
  1. Install where indicated and required on Structural Drawings, to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.
- D. Load Transfer Construction and Contraction Joints: Install load transfer devices as indicated; saw cut joint at surface as indicated for contraction joints.
- E. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.
- F. Construction Joints: Where not otherwise indicated, use metal combination screed and key form, with removable top section for joint sealant.



- G. Repair underslab vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- H. Separate slabs on grade from vertical surfaces with joint filler.
- I. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- J. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface. Conform to Section 07 92 00 for finish joint sealer requirements.
- K. Install joint devices in accordance with manufacturer's instructions.
- L. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- M. Apply sealants in joint devices in accordance with Section 07 92 00.
- N. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- O. Place concrete continuously between predetermined expansion, control, and construction joints.
- P. Do not interrupt successive placement; do not permit cold joints to occur.
- Q. Hot Weather Placement: Comply with recommendations of ACI 305R when ambient temperature before, during, or after concrete placement is expected to exceed 90 deg F or when combinations of high air temperature, low relative humidity, and wind speed are such that the rate of evaporation from freshly poured concrete would otherwise exceed 0.2 lbs./SF/Hr..
  - 1. Use evaporation reducer.
  - 2. Do not add water to approved concrete mixes under any conditions.
  - 3. Provide mixing water at lowest feasible temperature, and provide adequate protection of poured concrete to reduce rate of evaporation.
  - 4. Use fog nozzle to cool formwork and reinforcing steel immediately prior to placing concrete.
- R. Cold-Weather Placement: Comply with provisions of ACI 306R when air temperature has fallen to or is expected to fall below 40 deg F. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  - 1. Uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
  - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
- S. Protection: Ensure that reinforcement, embedded products, joint fillers and joint devices are not disturbed during concrete placement.

### 3.06 JOINTS

- A. Construction Joints: Locate and install construction joints so they do not impair strength or appearance of the structure, as acceptable to Architect.



1. Locate construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as indicated otherwise. Do not continue reinforcement through sides of strip placements.
    - a. Dowel Joints: As indicated on Drawings.
  2. Hydro wash joint to 1/4 inch aggregate exposure, followed by wet process sandblast or second hydrowash.
  3. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.
- B. Isolation Joints in Slabs-on-Grade: Construct isolation joints in slabs-on-grade at points of contact between slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, or as indicated.
1. Structural slab contact at foundation walls and grade beams shall be doweled as detailed.
- C. Contraction (Control) Joints in Slabs-on-Grade: Construct contraction joints in slabs-on-grade to form panels of patterns as shown.

### **3.07 FLOOR FLATNESS AND LEVELNESS TOLERANCES**

- A. An independent testing agency, as specified in Section 01 40 00, will inspect finished slabs for conformance to specified tolerances.
- B. Maximum Variation of Surface Flatness:
1. Exposed Concrete Floors: 1/4 inch in 10 feet.
  2. Under Seamless Resilient Flooring: 1/4 inch in 10 feet.
  3. Under Carpeting: 1/4 inch in 10 feet.
  4. For the following applications, depressions in slab floors between high spots shall be a maximum 1/8 inch in 10 ft., using a metal straight edge placed at any location on slab, and measured within 72 hours of pour.
    - a. Slabs receiving thin-set ceramic tile as specified in Section 09 30 00 - Tiling.
    - b. Slabs under movable or operable partitions as specified in Section 10 22 39 - Folding Panel Partitions.
    - c. Additional floor finishes may require similar tolerances that are not noted here. Refer to individual sections for their requirements.
  5. Curbs:
    - a. Top of Curb: 1/4 inch in 10 ft.
    - b. Side of Curb: 1/8 inch in 10 ft, non-cumulative, vertical and horizontal.
- C. Correct the slab surface if tolerances are less than specified.
- D. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

### **3.08 CONCRETE FINISHING**

- A. Repair surface defects, immediately after removing formwork.
1. Remove honeycombed areas and other defective concrete down to sound concrete, cutting perpendicular to surface or slightly undercutting without damaging reinforcement. Dampen patch location and area immediately surrounding it prior to applying bonding compound or patching mortar.



2. Before bonding compound has dried, apply patching mixture matching original concrete in materials and mix except for omission of coarse aggregate, and using a blend of white and normal portland cement as necessary to achieve color match. Consolidate thoroughly and strike off slightly higher than surrounding surface.
- B. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
  1. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.
- C. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.

### **3.09 CURING AND PROTECTION**

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
  1. Normal concrete: Not less than seven days.
- C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- D. Surfaces Not in Contact with Forms:
  1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
  2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water-fog spray or saturated burlap.
    - a. Spraying: Spray water over floor slab areas and maintain wet.
    - b. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.
  3. Final Curing: Begin after initial curing but before surface is dry.
    - a. Moisture-Retaining Sheet: Lap strips not less than 3 inches and seal with waterproof tape or adhesive; secure at edges.
    - b. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

### **3.10 MISCELLANEOUS CONCRETE ITEMS**

- A. Filling In: Fill in holes and openings left in concrete structures for passage of Work specified in other Sections, after such Work is in place. Mix, place, and cure concrete as specified to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete Work. Use non-shrink grout where required or indicated.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.



- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.

### **3.11 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
- B. Special Inspection: Employ a special inspector during taking of test specimens and placing of pneumatically placed concrete and all reinforced foundation concrete which is required to have a compressive strength in excess of 2,500 psi. Additional inspections, if required, indicated on Structural Drawings.
- C. Provide free access to concrete operations at project site and cooperate with appointed firm.
- D. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
- E. Field Certifications: For all concrete, provide signed copy of batch plant's certificate stating quantity of each material, amount of water, admixtures, departure time and date accompanying each load of materials or concrete.
- F. Field Tests of Concrete: Perform tests in accordance with applicable California Building Code requirements, ACI 301 and requirements of authorities having jurisdiction.
- G. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- H. Compressive Strength Tests: ASTM C39/C39M. For each test, mold and cure four concrete test cylinders. Obtain test samples for every 2,000 sq ft - 50 cu yd or less of slab and structural concrete of each class of concrete placed (CBC requirement).
  - 1. Test one cylinder at 7 days and two at 28 days after placement.
  - 2. Maintain fourth cylinder to be tested at 56 days only if 28-day test fails to meet strength requirement.
  - 3. Take one additional test cylinder during cold weather concreting and cure it at job site under same conditions as concrete it represents. Test cold weather cylinder at 28 days.
- I. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- J. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

### **3.12 DEFECTIVE CONCRETE**

- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.



1. Obtain repair details from Architect (Structural Engineer) and approved by DSA before proceeding.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

### **3.13 PROTECTION**

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.
- B. Protect concrete from marring and damage due to weather and construction activities.
  1. Protective measures shall include providing temporary coverings, and be in accordance with Section 01 50 00 - Temporary Facilities and Controls, and shall prohibit all non-essential construction activities, including cleaning and maintenance of construction equipment.
  2. In particular, protect concrete floor slabs from oil, paint and other products that might penetrate and degrade concrete surface.

**END OF SECTION**



## SECTION 05 50 00 METAL FABRICATIONS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Shop fabricated steel items.
- B. Steel framing and supports for applications where framing and supports are not specified in other sections.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 05 52 13 - Pipe and Tube Railings.
- C. Section 09 91 ~~13 - Exterior~~**23 - Interior** Painting: Paint finish.
- D. Section 09 ~~91-23 - Interior Painting~~**96 00 - High-Performance Coatings**: Paint finish on exterior fabricated metals.

#### 1.03 REFERENCE STANDARDS

- A. ASME B18.2.1 - Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series); 2010.
- B. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
  - 1. Use 2008 as indicated in 2016 CBC Referenced Standards.
- D. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- E. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.
  - 1. Use 2012a as indicated in 2016 CBC Referenced Standards.
- G. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014.
- H. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- I. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
  - 1. Use 2011 as indicated in 2016 CBC Referenced Standards.



- J. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.
- K. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2009 (Reapproved 2015).
- L. ASTM A924/A924M - Standard Specification for General Requirements for Sheet Steel, Metallic-Coated by the Hot-Dip Process; 2013.
- M. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2011 (Reapproved 2015).
- N. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.
- O. ASTM D1187/D1187M - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal; 1997 (Reapproved 2011).
- P. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
- Q. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.
  - 1. Use 2010 w/Errata as indicated in 2016 CBC Referenced Standards.
- R. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.
- S. SSPC-PA 1 - Shop, Field, and Maintenance Painting of Steel; 2004.
- T. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).
- U. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).
- V. SSPC-SP 10 - Near-White Blast Cleaning; 2007.
- W. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).
- X. SSPC-SP 3 - Power Tool Cleaning; 1982 (Ed. 2004).
- Y. SSPC-SP 5 - White Metal Blast Cleaning; 2007.
- Z. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

#### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
  - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.
- D. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited.



### **1.05 QUALITY ASSURANCE**

- A. Regulatory Requirements: Conform to applicable requirements of California Building Code (CBC), Title 24, Part 2, as amended and adopted by authorities having jurisdiction.
  - 1. Comply with Title 24, Part 9, California Fire Code Chapter 35 "Welding and Other Hot Work."
- B. Coordination: Provide templates and sleeves for incorporation of embedded items into the Work specified in other Sections.
- C. Field-Verified Dimensions: Prior to fabrication, field verify dimensions and details of construction. Immediately report variances in writing to Construction Manager and Architect.
- D. Fabricator's Qualifications: Fabricator of light structural steel framing members and other miscellaneous metal fabrications of structural character shall be approved by the authorities having jurisdiction in accordance with applicable Code provisions.
- E. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel or equal.
- F. Welder's Qualifications:
  - 1. Welding shall be performed by certified welders qualified in accordance with procedures specified in applicable referenced AWS standard, using materials, procedures and equipment of the type required for the Work.
  - 2. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.

### **1.06 PACKAGING, DELIVERY, STORAGE AND HANDLING**

- A. Storage, General: Store products in enclosed, well-ventilated spaces, not in contact with soil or vegetation and not subject to inclement weather.
- B. Delivery, Storage and Handling, Galvanized Products:
  - 1. Stack and bundle during transport and store to allow air flow between galvanized surfaces.
  - 2. Load for transport to permit continuous drainage should wetting occur.
  - 3. Do not rest galvanized products on cinders or clinkers.

### **1.07 PROJECT CONDITIONS**

- A. Field Inspection of Fabricated Products: Prior to installation, inspect products for damage and verify markings and dimensions against reviewed submittals.
- B. Environmental Conditions: Do not install products intended for interior locations when spaces are uncovered and unprotected from inclement weather.
- C. Coordination: Coordinate metal fabrications Work with Work specified in other Sections so that related Work shall be accurately and properly joined.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS - STEEL**

- A. Steel Sections: Steel plates, bars, angles, channels, and H-sections; ASTM A 36/A 36M.



1. Galvanized Steel: Structural shapes, plates and bars: From fully killed or semi-killed steel, ASTM A992/A992M, except silicon content in the range 0 to 0.4 percent or 0.15 to 0.25 percent, as applicable, only.
- B. Steel Tubing: ASTM A500/A500M, Grade B cold-formed structural tubing.
- C. Plates: ASTM A283/A283M.
- D. Steel Sheet:
  1. For structural uses: Hot-rolled, ASTM A1011/A1011M; cold-rolled, ASTM A1008/A1008M.
  2. For nonstructural uses: Cold-rolled, ASTM A1008/A1008M; hot-rolled, ASTM A1011/A1011M.
  3. Galvanized Sheet steel: ASTM A653/A653M, with ASTM A924/A924M, Coating Designation G90, for precoated sheet; ASTM A1011/A1011M for sheet used in fabrications.
- E. Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
- F. Slotted Channel Framing: ASTM A653/A653M, Grade 33.
- G. Slotted Channel Fittings: ASTM A1011/A1011M.
- H. Fasteners: See Article Anchors, Fasteners and Accessory Materials below.
- I. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.
- J. Galvanizing: See requirements specified below.
- K. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- L. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- M. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

## 2.02 ACCESSORIES

- A. Anchors and Fasteners, General: Same material, color and finish as the metal to which applied, unless otherwise indicated.
- B. Exterior Exposure: Provide stainless steel.
- C. Type, Size and Spacing: Unless otherwise indicated, provide fasteners of type, grade and class required for intended use and sized and spaced as required for loads and substrate.
- D. Screw Head, Typical: Unless otherwise noted, exposed screws shall be phillips oval or flat head, countersunk.
- E. Standard Bolts and Nuts, Steel: ASTM A307, Grade A, hexagonal head.
- F. Lag Screws and Bolts, Steel: ASME B18.2.1, type and grade best suited for the purpose, hexagonal or square head.
- G. Plain Steel Screws: FS FF-S-85, FS FF-S-92 and FS FF-S-111; type and grade best suited for the purpose.
- H. Self-Drilling Metal Screw Fasteners: TEKS by Buildex Division, Illinois Tool works, Inc.; ICC Report ESR-1976; [www.itwbuildex.com](http://www.itwbuildex.com).
- I. Plain Steel Washers: FS FF-W-92, round, carbon steel.



- J. Lock Washers: FS FF-W-84, helical spring, carbon steel.
- K. Fiber Plugs, Lead Expansion Shields and Screws: Not permitted.
- L. Anchors and/or Dowels Installed with Adhesives: See notes on Structural Drawings.
- M. Welding Rods and Bare Electrodes: Select according to AWS specifications for the metal alloy to be welded.
- N. Shop Primer Paint:
  - 1. Shop primer, general: Coordinate primer with finish paint and coating, as applicable, to provide sound foundation for field-applied topcoats despite prolonged exposure during construction.
  - 2. Shop primer for ferrous metal at exposed exterior locations: Fabricator's standard zinc-rich two-part catalyzed epoxy coating.
  - 3. Shop primer for ferrous metal at concealed exterior locations and for interior locations: Manufacturer's or fabricator's standard, fast-curing, lead-free, universal modified alkyd primer, complying with performance requirements of FS TT-P-645.
  - 4. Shop primer for galvanized steel, for exposed exterior locations: Fabricator's standard two-part catalyzed epoxy coating, compatible with specified finish paints.
- O. Field Primer and Finish Paints: As specified in Section 09 91 23 - Interior Painting.
- P. Bituminous Coating: High-build mineral-filled coal tar pitch coating, or a cold-applied asphalt mastic complying with ASTM D1187/D1187M, except containing no asbestos fibers.
  - 1. Basis of Design Product: H.B. Tnemecol Series 46-465 as manufactured by Tnemec, Inc., [www.tnemec.com](http://www.tnemec.com), or approved equal.
  - 2. Acceptable Manufacturers:
    - a. BASF (24 g/L).
    - b. Chemmasters.
    - c. Euclid Chemical.
    - d. Henry.
    - e. Polyguard.
    - f. W.R. Meadows, Inc.; Sealmatsic Type II (Brush-on/Spray Grade): [www.wrmeadows.com](http://www.wrmeadows.com)
    - g. Substitutions: See Section 01 60 00 - Product Requirements.
- Q. Bond Breaker Tape: Isolate dissimilar metals with Pecora 531 Bond Breaker Tape or equal.

## 2.03 FABRICATION

- A. Ferrous Metal Surfaces, General:
  - 1. For metal fabrications exposed to view upon completion of the Work: Provide ferrous metals materials selected for their surface flatness, smoothness, and freedom from surface blemishes.
  - 2. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, roughness, and, for steel sheet, variations in flatness exceeding those permitted by reference standards for stretcher-leveled sheet.
- B. Preparation Before Fabrication: Remove loose mill scale and rust and remove twists and bends in manners not injurious to materials and finishes.



- C. Fabrication: Fabricate and finish metal items in accordance with the Drawings and reviewed shop drawings.
  - 1. Contractor shall verify measurements before fabrication.
  - 2. Galvanize all exterior steel members to comply with ASTM A123/A123M. Provide minimum 1.7 oz/sq ft galvanized coating.
  - 3. Hot-dip galvanize fabricated ferrous items, indicated as remaining unpainted, after fabrication. Field connections shall be bolted or screwed where possible. Avoid field cutting and welding which damage galvanized coating.
  - 4. Fit and shop assemble items in largest practical sections, for delivery to site.
  - 5. Prepare and reinforce fabrications as required to receive applied items and transport to site.
- D. Cutting and Fitting: Fabricate with accurate angles and surfaces, true to the required lines and levels and as required to suit installation conditions.
  - 1. Fabricate items with joints tightly fitted and secured.
  - 2. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
  - 3. Punch, drill and reaming in manner to leave clean, true lines and surfaces.
    - a. Oversize hole 1/16 inch by punching, when material thickness is equal to or less than bolt diameter plus 1/8 inch.
    - b. Sub-punch 1/16 inch smaller than bolt and drill or ream to oversize by 1/16 inch, when material thickness is thicker than bolt diameter plus 1/8 inch.
  - 4. Gas cutting of non-structural steel items may be acceptable where stress is not transmitted through flame-cut surfaces.
    - a. Make cuts clean and to contour.
    - b. Deduct 1/8 inch from effective width of members cut by torch.
- E. Connections, General:
  - 1. Component parts of built-up members shall be well-pinned with closely-fitted contact.
  - 2. Conceal connections where possible.
  - 3. Otherwise, make countersinks for concealment after fabrication, except where noted.
- F. Bolted and Screwed Connections:
  - 1. Provide holes and connections for work specified in other Sections.
  - 2. Use bolts for field connections only.
  - 3. Provide washers under heads and nuts bearing on wood.
  - 4. Draw all nuts tight and nick threads of permanent connections.
  - 5. Use beveled washers where bearing is on sloped surfaces.
  - 6. Where screws must be used for permanent connections in ferrous metal, use flat head type, countersunk, with screw slots filled and finished smooth and flush.
- G. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.



- H. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- I. Welding: Conform to AWS D1.1/D1.1M recommendations.
  - 1. Do not field weld galvanized components to remain unfinished.
  - 2. Provide continuous welds at welded corners and seams.
  - 3. Grind exposed welds smooth and flush with base material.
  - 4. Re-weld to fill holes. Putties and fillers are not acceptable.
- J. Joints on Finished Surfaces: Provide welds ground smooth and filled.
- K. Joints Exposed to Weather or Water: Fabricate to keep water out, or provide adequate drainage of water that penetrates.
- L. Mechanical Finishes: Complete finishing prior to fabrication wherever possible.
  - 1. After fabrication, finish all joints, bends, abrasions, and other surface blemishes to match finish.
  - 2. Protect finish on exposed surfaces by using temporary protective covering.
- M. Coordination: Make provisions to connect metal fabrications with or to receive work specified in other Sections.

## 2.04 FABRICATED ITEMS

- A. Rough Hardware
  - 1. Provide bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as indicated on Drawings.
  - 2. Fabricate items to sizes, shapes, and dimensions required. Provide malleable-iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.
- B. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; galvanized finish.**
  - 1. **Material: Standard weight, galvanized steel pipe, size as indicated on Drawings.**
  - 2. **Cap: Formed steel, where indicated on Drawings.**
  - 3. **Grout: Where indicated, portland cement and sand mixture, dome shaped at top as indicated on Drawings.**
- C. Frames for Overhead Door Openings and Wall Openings: Channel and Angle sections; prime paint finish.
- D. Slotted Channel Framing:** Fabricate channels and fittings from structural steel complying with the referenced standards; factory-applied, rust-inhibiting thermoset acrylic enamel finish.
- E. Other Products and Fabrications**
  - 1. Other Products and Fabrications: Provide all materials not specifically described but required for a complete and proper installation, as selected by the Contractor, subject to review and acceptance by Construction Manager and Architect.



## 2.05 FINISHES - STEEL

- A. Prime paint all steel items. Conform to SSPC Painting Manual. Shop primer paint after fabrication all metal fabrications.
  - 1. Exceptions: Galvanize items to be embedded in concrete.
  - 2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
  - 3. Exceptions:
    - a. Do not prime stainless steel, plated steel, and anodized aluminum fabrications, unless specifically noted.
    - b. Do not shop prime galvanized fabrications, unless specifically noted.
    - c. Do not shop prime fabrications for which an entirely field-applied coating system is indicated.
- B. Prepare surfaces to be primed in accordance with minimum SSPC-SP2.
  - 1. Exterior fabrications: Clean in accordance with SSPC-SP 5, SSPC-SP 6, 8, or SSPC-SP 10.
  - 2. Interior fabrications: Clean in accordance with SSPC-SP 2, SSPC-SP 3, SSPC-SP 5, SSPC-SP 6, 8, or SSPC-SP 10.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat where finish painting is to be applied.
  - 1. Shop Priming: Comply with SSPC-PA 1. Coordinate with requirements specified in Section 09 91 23 - Interior Painting **and 09 96 00 - High-Performance Coatings**.
    - a. Coordinate primer with finish paint and coating, as applicable, to provide sound foundation for field-applied topcoats despite prolonged exposure during construction.
      - 1) Shop primer for ferrous metal at exposed exterior locations: Tnemec 90E-92, ethyl silicate zinc primer, or equal.
      - 2) Tnemec Series V10, or approved equal, modified alkyd rust-inhibitive primer, or manufacturer's or fabricator's standard, fast-curing, lead-free, universal modified alkyd primer, complying with performance requirements of FS TT-P-645.
    - b. Apply primer immediately following surface preparation.
    - c. Do not prime surfaces to be welded.
    - d. Do not prime surfaces in direct contact bond with concrete or mortar.
    - e. Spray apply shop prime without holidays, drips, runs.
    - f. Provide two coats where product is not to be finish painted or is to be concealed in completed work.
    - g. Apply an additional coat to corners, welds, edges, and fasteners.
    - h. Allow primer to dry and cure before handling.
- E. Shop Painting
  - 1. Shop Painting: Comply with SSPC-PA 1. Shop paint fabrications where feasible.
    - a. Apply thermosetting enamel paint, gloss or semi-gloss, of a type and color as selected and approved by Architect, if not otherwise specified.
    - b. Shop applied finish paint shall be baked to set and cure.



- c. Allow finish paint to thoroughly dry and cure before handling.
- 2. Steel Embedded in Concrete: Coat concealed faces with bituminous coating.
- 3. Galvanized Pre-Treatment: Where zinc-coated surfaces are specified to be shop primed, chemically treat surfaces to provide bond for paint before applying primer.
- F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

## **2.06 FABRICATION TOLERANCES**

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.

### **3.02 PREPARATION**

- A. Obtain Architect's review prior to site cutting or making adjustments not indicated on Drawings and reviewed shop drawings.
- B. Clean and strip primed steel items to bare metal where site welding is required.
- C. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.
- D. Make provision for erection loads with temporary bracing. Keep work in alignment.
- E. Clean and prime field welds. Touch up galvanized steel with cold galvanizing compound.

### **3.03 INSTALLATION**

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components as indicated on drawings.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

### **3.04 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.



- C. Maximum Out-of-Position: 1/4 inch.

### **3.05 CLEANING AND TOUCH-UP**

- A. Cleaning: Perform initial cleaning immediately after completion of installation. Prepare surfaces for finish painting.
- B. Galvanizing Touch-Up: Touch up galvanizing immediately after installation, including field welding.
  - 1. Prepare surface and apply cold galvanizing compound in compliance with ASTM A780/A780M and the manufacturer's instructions and recommendations.
- C. Primer Paint Touch-Up: Touch up shop paint immediately after erection. Use products compliant with Section(s) 09 91 13 - Exterior Painting and 09 91 23 - Interior Painting.
  - 1. Clean exposed areas of rust, field welds, bolted joints, and areas where primer is damaged by SSPC-SP 2 hand tool cleaning or SSPC-SP 3 power-tool cleaning.
  - 2. Paint with SSPC-Paint 15 (interior) or SSPC-Paint 20 (exterior) compliant material used for shop painting, minimum 3 mils dry film thickness.

**END OF SECTION**



**SECTION 08 87 33**  
**ARCHITECTURAL DECORATIVE WINDOW FILMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Interior Window Film.
- B. Decorative Window Film.
- C. Privacy Window Film.
- D. Window Film for existing windows.
- E. Graphic artwork cut pattern.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 11 13 - Hollow Metal Doors and Frames: Glazed doors and borrowed lites to receive architectural window film.
- B. Section 08 14 16 - Flush Wood Doors: Glazed doors to receive architectural window film.
- C. Section 08 43 13 - Aluminum-Framed Storefronts: Windows to receive architectural window film.
- D. Section 08 80 00 - Glazing: Glass to receive architectural window film.

**1.03 REFERENCE STANDARDS**

- A. ASTM E308 - Standard Practice for Computing the Colors of Objects by Using the CIE System; 2015.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- C. ASTM E903 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres; 2012.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data sheets on each product to be used.
- C. Shop Drawings:
  - 1. Submit shop drawings covering fabrication, installation and finish of specified systems.
  - 2. Include fully dimensioned plans and elevations with material coordination keys.
  - 3. Show artwork for each film item.
- D. Samples:



1. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
  2. Verification Samples: For each finish product specified, two samples representing actual product, color, and patterns.
- E. Manufacturer's Qualification Statement.
- F. Specimen Warranty.
- G. Installer's Qualification Statement.
- H. Manufacturer's Instructions:
1. Preparation instructions and recommendations.
  2. Storage and handling requirements and recommendations.
  3. Installation methods.
- I. Maintenance Data: Operation and maintenance data for installed products, including precautions against harmful cleaning materials and methods.
- J. Warranty: Submit manufacturer warranty and ensure that forms have been completed in District's name and registered with manufacturer.

#### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and approved by manufacturer.
1. Provide documentation that the installer is authorized by the Manufacturer to perform Work specified in this section.
  2. Provide a commercial building reference list of five (5) properties where the installer has applied window film. This list will include the following information:
    - a. Name of building.
    - b. The name and telephone number of a management contact.
    - c. Type of glass.
    - d. Type of film.
    - e. Amount of film installed.
    - f. Date of completion.
- C. Single-Source Responsibility: For each separate film graphic type required from one source of a single manufacturer.
- D. Graphic fabricator shall be responsible for the quality and materials and workmanship required for the execution of this contract including the materials and workmanship of any firms or individuals who act as his sub-contractors.
- E. Artwork for specific items as noted on Drawings shall be created to meet design intent. 1. Create artwork, including final artwork for fabrication (including reproducible film positives).
- F. The graphic design requirements shown by the details Drawings show design intent only and intended to establish basic dimensions colors, shapes, profiles, sight lines, and appearance.



Maintain visual design concept as shown, including sizes, shapes, colors, and placement as accurately as possible.

#### **1.07 MOCK-UP**

- A. Provide window film mock-up, one complete window, illustrating installation for evaluation of surface preparation techniques and application workmanship.
- B. Locate where directed.
- C. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
- D. Refinish mock-up area as required to produce acceptable work.
- E. Mock-up may remain as part of the Work.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products protected from weather, temperature, and other harmful conditions as recommended by supplier.
- C. Product must remain in original plastic bag and boxes and have storage conditions as follows:
  - 1. 40°F (5°C) - 90°F (32°C) storage temperature range
  - 2. Out of Sunlight
  - 3. Clean dry area
  - 4. Original container
  - 5. Do not stack boxes over six (6) units high. Excessive weight can damage the film
  - 6. Products are not recommended for interior applications where condensation consistently occurs.
  - 7. Handle products in accordance with manufacturer's instructions.
  - 8. Total pre-installation shelf life: 2 years. Up to 2 years unprocessed, OR process within 1 year and apply within 1 year of processing.

#### **1.09 FIELD CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
  - 1. Application temperature range is from 53 to 100 degrees F (12 to 38 degrees C).
- B. Environmental Limitations: Do not install until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Existing Conditions: Existing interior and exterior windows from the original building.

#### **1.10 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a one year period after Date of Substantial Completion.



- C. Provide five year manufacturer warranty for thermal shock fracture, appearance, adhesion, and solar reflective properties.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Basis of Design: 3M Window Film: [www.3m.com/windowfilm](http://www.3m.com/windowfilm).
  - 1. Local Representative: 3M Window Film Point of Contact – Michael Hassenauer (651) 737-1053. Email: [mjhassenauer@mmm.com](mailto:mjhassenauer@mmm.com).
- B. Other Acceptable Manufacturers:
  - 1. Flexvue Films: [www.flexvuefilms.com](http://www.flexvuefilms.com).
  - 2. Madico, Inc: [www.madico.com](http://www.madico.com).
  - 3. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.02 PERFORMANCE REQUIREMENTS**

- A. Fire Performance: Surface burning characteristics when tested in accordance ASTM E84:
  - 1. Flame Spread: 25, maximum.
  - 2. Smoke Developed: 450, maximum.

### **2.03 MATERIAL PROPERTIES**

- A. General: Glass and plastic finishes field-applied application to glass or plastic material as visually opaque or decorative film.
- B. Film (Fasara): Polyester.
- C. Film (Crystal): Vinyl.
- D. Decorative Pattern: Printed.
- E. Adhesive: Acrylic, Pressure Sensitive.
- F. Liner (Fasara): Transparent Polyester.
- G. Liner (Crystal): Silicone-coated Polyester.
- H. Average Overall Thickness (Film and Adhesive without Liner):
  - 1. Fasara: 3.2 mils (0.08 mm)
  - 2. Dusted - 3.2 mils (0.08 mm)
  - 3. Frosted - 4.7 mils (0.12 mm)
- I. Final film selection and graphics are to be determined after bid. Use the following as a basis of design.



## **2.04 COMBINATION PATTERNED FILM**

## **2.05 DOT PATTERNED FILM**

## **2.06 LINE PATTERNED FILM**

## **2.07 SINGLE PATTERNED FILM**

- A. Fasara - Lausanne Decorative / Privacy Glazing Film:
  - 1. Ultraviolet Rejected (ASTM E903): Not less than 99 percent.
  - 2. Visible Light Transmission (ASTM E903, ASTM E308): Not more than 84 percent.
  - 3. Visible Light Rejected (ASTM E903): Not less than 9 percent.
  - 4. Solar Heat Reduction: Not less than 8 percent.
  - 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E903): Not less than 0.94.
- B. Fasara - Mat Crystal I Decorative / Privacy Glazing Film:
  - 1. Ultraviolet Rejected (ASTM E903): Not less than 99 percent.
  - 2. Visible Light Transmission (ASTM E903, ASTM E308): Not more than 85 percent.
  - 3. Visible Light Rejected (ASTM E903): Not less than 9 percent.
  - 4. Solar Heat Reduction: Not less than 8 percent.
  - 5. Shading Coefficient at 90 Degrees (Normal Incidence) (ASTM E903): Not less than 0.94.

## **2.08 FABRICATION**

- A. Shop fabrication and tolerances for graphic artwork shall conform to the standards of the industry. All items shall be shop fabricated so far as practicable. Perform high-quality, professional workmanship. Fabricate work to proper proportions, with orientation that will be straight, plumb, level and square and to sizes, shapes and profiles indicated on the approved shop drawings.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify pattern prior to material acquisition.
- B. Confirm appropriate substrate is suitable for mounting of glass finish components prior to start of installation.
- C. Examine substrate(s) for compliance. Do not proceed with installation until unsatisfactory conditions have been corrected.
- D. Reference 3M Technical Data Sheet to determine compatibility of finish to substrate
- E. Responsibility for state of surfaces prior to installation to be pre-determined by installation specialist.
- F. Do not proceed with installation until unsatisfactory conditions have been corrected.
- G. Proceeding with installation implies installer's acceptance of substrate and conditions.



### **3.02 PREPARATION**

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- B. Thoroughly clean substrate of substances that could impair the overlay's bond, including mold, mildew, oil, grease.
- C. Re-clean surfaces with appropriate surface prep solvent and remove any haze or surface contamination.

### **3.03 INSTALLATION**

- A. Application must be performed by qualified installer.
- B. Do not proceed with installation until all finishing work has been completed in and around the work area.
- C. Install in accordance with manufacturer's instructions.
- D. Cut film edges neatly and square at a uniform distance of 1/8 inch (3 mm) to 1/16 inch (1.5 mm) of window sealant. Use new blade tips after 3 to 4 cuts.
- E. Spray the slip solution, composed of one capful of baby shampoo or dishwashing liquid to 1 gallon of water, on window glass and adhesive to facilitate proper positioning of film.
- F. Apply film to glass and lightly spray film with slip solution.
- G. Squeegee from top to bottom of window. Spray slip solution to film and squeegee a second time.
- H. Bump film edge with lint-free towel wrapped around edge of a 5-way tool.
- I. Upon completion of film application, allow 30 days for moisture from film installation to dry thoroughly, and to allow film to dry flat with no moisture dimples when viewed under normal viewing conditions.
- J. Refer to the applicable manufacturer's Installation Guide for additional details.

### **3.04 CLEANING**

- A. Remove left over material and debris from Work area. Use necessary means to protect film before, during, and after installation.
- B. Touch-up, repair or replace damaged products before Substantial Completion.
- C. After application of film, wash film using common window cleaning solutions, including ammonia solutions, 30 days after application.
  - 1. Do not use abrasive type cleaning agents and bristle brushes to avoid scratching film.
  - 2. Use synthetic sponges or soft cloths.

### **3.05 EXTRA MATERIALS**

- A. Furnish 2 percent extra material at time of installation. Deliver in protective packaging for storage and label contents appropriately.

**END OF SECTION**



**SECTION 09 51 00**  
**SUSPENDED ACOUSTICAL CEILINGS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Suspended metal grid ceiling system.
- B. Acoustical units.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 07 21 00 - Thermal Insulation: Acoustical insulation.
- C. Section 08 31 00 - Access Doors and Panels: Access panels.
- D. Division 23 - Heating, Ventilating, and Air-Conditioning (HVAC) - Air Outlets and Inlets: Air diffusion devices in ceiling.
- E. Division 26 - Electrical - Interior Lighting: Light fixtures in ceiling system.

**1.03 REFERENCE STANDARDS**

- A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.
- B. ASTM A568/A568M - Standard Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements For; 2014.
- C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2009a (Reapproved 2014).
- D. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.
  - 1. Use 2013a as indicated in 2016 CBC Referenced Standards.
- E. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.
- F. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2014.
- G. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.
- H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
  - 1. Use 2013a as indicated in 2016 CBC Referenced Standards.
- I. CHPS (HPPD) - High Performance Products Database; Current Edition at [www.chps.net/](http://www.chps.net/).
- J. DSA Interpretation of Regulations, issued by the Division of the State Architect (DSA).
- K. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- L. UL (FRD) - Fire Resistance Directory; current edition.
- M. UL (GGG) - GREENGUARD Gold Certified Products; current listings at <http://productguide.ulenvironment.com/QuickSearch.aspx>.



#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Do not install acoustical units until after interior wet work is dry.

#### **1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning.
  - 1. Shop drawings shall show:
    - a. Reflected ceiling plans;
    - b. Location of acoustical ceilings and suspension systems;
    - c. Location of light fixtures, diffusers, speakers and other exposed to view items;
    - d. List of materials;
    - e. Dimensions, jointing, method of hanger attachment, fastenings and other pertinent information.
    - f. Shop drawings may be in the form of revised copies of the Architect's reflected ceiling plan showing any proposed changes from the layout indicated.
- C. Product Data: Provide data on suspension system components.
  - 1. Submit manufacturer's catalog cuts, specifications, and other data for each component of the acoustical ceiling systems as necessary to demonstrate compliance with these specifications.
  - 2. Submit copies of the suspension system manufacturer's current ICC Evaluation Service Report.
- D. Samples: Submit two samples 12 by 12 inch in size illustrating material and finish of acoustical units.
- E. Samples: Submit six samples each, 12 inches long, of suspension system main runner.
- F. Manufacturer's Installation Instructions: Indicate special procedures.
- G. Maintenance Materials: Furnish the following for District's use in maintenance of project.
  - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
  - 2. Extra Acoustical Units: Five boxes of each type and size. Each box to have a minimum of 10 panels.

#### **1.06 QUALITY ASSURANCE**

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.



### **1.07 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials to the project in original unopened packages bearing the manufacturer's name, brand designation, and label verifying compliance with these specifications. Store materials in properly protected and dry storage area.
- B. Immediately before installation, store acoustical units for not less than 24 hours at the same temperature and relative humidity as the space where they are to be installed.

### **1.08 FIELD CONDITIONS**

- A. Maintain uniform temperature of minimum 60 degrees F, or as recommended by the manufacturer for products provided; and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

### **1.09 WARRANTY**

- A. Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels, sound diffusers, or veneer ceiling panels; that fail within the warranty period. Failures include, but are not limited to:
  - 1. Attachment devices: Rusting and manufacturing defects.
- B. Warranty Period:
  - 1. Attachment devices (for wall installation): One (1) year from date of substantial completion.
  - 2. Grid: Ten (10) years from date of substantial completion.

## **PART 2 PRODUCTS**

### **2.01 REGULATORY REQUIREMENTS**

- A. Flame Spread Rating: Provide acoustical ceiling units bearing the label of Underwriters' Laboratories, or other testing agency acceptable to the State Fire Marshal, indicating that the units provide the specified flame spread rating.
  - 1. Flame spread rating 0-15, smoke developed 0-15 per ASTM E84 for each acoustical tile type.
- B. Seismic Requirements: Furnish and install suspension systems in accordance with the suspension system manufacturer's current ICC Evaluation Service Report; the California Building Code (CBC), Title 24 Part 2, Table No. 1607A.1; CBC Title 24 Part 2, Chapter 25.
  - 1. Include the following Interpretation of Regulations, issued by the Division of the State Architect (DSA).
    - a. IR A-5: Acceptance of Products, Materials, and Evaluation Reports; Revised 1/27/17.
    - b. IR 16-9: Pendant Mounted Light Fixtures; Revised 11/3/10.
    - c. IR 25-2.13: Metal Suspension Systems for Lay-In Panel Ceilings; Revised 11/9/17.
    - d. IR 25-1: Maximum Allowable Load for 10 Gage and 12 Gage Wires; Revised 9/23/10.

### **2.02 MANUFACTURERS**

- A. Acoustic Tiles/Panels:
  - 1. Armstrong World Industries, Inc: [www.armstrong.com/#sle](http://www.armstrong.com/#sle).



- a. Local contacts Dai-Nee Tan 949-275-8169 or Tim Traber 760-473-1108
  2. CertainTeed Corporation: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
  3. USG: [www.usg.com/#sle](http://www.usg.com/#sle).
  4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Suspension Systems:
1. Same as for acoustical units.  
Rockfon, LLC: [www.rockfon.com](http://www.rockfon.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.03 ACOUSTICAL UNITS

- A. Acoustical Units - General: ASTM E1264, Class A.
1. VOC Content: As specified in Section 01 61 16.
  2. VOC Content: Certified as Low Emission by one of the following:
    - a. Product listing in UL (GGG).
    - b. Product listing in CHPS (HPPD).
- B. Acoustical Panels Type ~~ACT~~**ACP-01: Painted Dura-Brite** faced mineral fiber, ASTM ~~E 1264~~**E1264** Type ~~III~~**IV**, with the following characteristics:
1. Size: 24 ~~x 48~~**by 24** inches.
  2. Thickness: ~~5/8~~**3/4** inches.
  3. Composition: Wet felted.
  4. Density: ~~0.70~~**1.08** lb/sq.ft..
  5. Light Reflectance: ~~85~~**80** percent, determined ~~as specified~~ in **accordance with** ASTM E1264.
  6. ~~NRC Range: 0.55~~**Ceiling Attenuation Class (CAC): 40**, determined ~~as specified~~ in **accordance with** ASTM E1264.
  7. ~~Ceiling Attenuation Class (CAC): 35, determined as specified in ASTM E1264.~~
  8. ~~Fire Rating: Fire Guard, Class A.~~
    - a. Flame Spread and Smoke Developed Ratings: 0-25 flame spread and 0-50 smoke developed in accordance with ASTM E84.
  98. Edge: Square ~~Lay In 15/16 inch.~~
  109. Surface Color: White.
  1110. Surface Pattern: Non-directional fissured.
  1211. Suspension System: Exposed grid Type TBAR-1, **White**.
  1312. Basis of Design Product: ~~Fine Fissured~~**Ultima** No. ~~1729~~**1910** as manufactured by Armstrong World Industries, or approved equal.
- C. Acoustical Hanging Baffle Panels Type ACT-2 through ACT-6: Polyester faced with the following characteristics:
1. Size: As indicated on Drawings.
  2. Style: As selected by Architect from the manufacturer's full line.



- a. Square.
  - b. Canyon.
  - c. Bolt.
  - d. Ridge.
  - e. Swell.
3. Thickness: 1/2 inches.
4. NRC Range: 0.90, determined in accordance with ASTM E1264.
5. Fire Rating: Class A
  - a. Flame Spread and Smoke Developed Ratings: 0-25 flame spread and 0-50 smoke developed in accordance with ASTM E84.
6. Edge: Clear satin aluminum or powder-coated in black or white; as selected by Architect.
7. Surface Color: To be selected by Architect from manufacturer's standard line.
8. Suspension System: Exposed grid integrated with product. Provide bracing per DSA IR 25-2.13.
9. Basis of Design Product: Zintra Acoustic Baffles as manufactured by MDC, or approved equal.

#### **2.04 SUSPENSION SYSTEM(S)**

- A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.
  1. Main runners, cross runners, splices, expansion devices, intersection connectors shall be designed to carry a mean ultimate test load of not less than 180 lbs. in compression and tension per ASTM E580/E580M Section 5.1.2.
- B. Exposed Steel Suspension System Type TBAR-1: Formed steel, commercial quality cold rolled; heavy-duty per ASTM C635/C635M.
  1. Profile: Tee; 15/16 inch wide face.
  2. Construction: Double web.
  3. Finish: baked-on vinyl finish, matte white color, unless noted otherwise. Certain ceilings do have specific color requirements.
  4. Acceptable products:
    - a. Armstrong; Prelude XL 7301 main runners; FastSize; XL7341, XL7340, XL7342, and XL7328 cross runners - ICC ESR 1308.
    - b. Chicago Metallic CMC1200 Series; 200 main runners; 1226/1204 cross runners - ICC-ESR-2631.
    - c. Donn Corp.(USG); DXL26 main runners; DXL-216 cross runners - ICC ESR-1222.

#### **2.05 ACCESSORIES**

- A. Accesories are to be compliant with seismic requirements indicated in the ESR approval documents.
- B. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.



1. Suspension wires shall be #12 gage (0.106 inch diameter), soft annealed, and galvanized steel wires with Class 1 coating.
- C. Clips:
  1. SJCG (Armstrong) – Seismic Joint Clip, 5 inches x 1-1/2 inch, hot-dipped galvanized cold-rolled steel per ASTM A568/A568M. The two piece unit is designed to accommodate a seismic separation joint. The clip is compatible with 15/16 inch and 9/16 inch grid systems including Prelude, Suprafine, and Silhouette. The SJCG is not suitable for use with Vector panel installations.
- D. Acoustical Sealant For Perimeter Moldings: Non-hardening, non-skinning, for use in conjunction with suspended ceiling system.
- E. Gasket For Perimeter Moldings: Closed cell rubber sponge tape.
- F. Touch-up Paint: Type and color to match acoustical and grid units.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers does not interfere with other work.
- C. Wet operations such as plastering and concrete work shall be completed and dry before installation of acoustical ceilings.
  1. Mechanical, electrical and other work above the ceiling line shall be completed and approved before start of acoustical ceiling installation.
- D. Examine surfaces and conditions affecting proper installation of the materials, and report defects in materials or surfaces to which acoustical tile is applied.
  1. Do not start work until deficiencies have been corrected.
  2. Start of work of this section constitutes acceptance of the surfaces.

### **3.02 INSTALLATION - GENERAL**

- A. Place units as indicated on the shop drawings.
  1. Install with joints true and straight and junctures with ceilings, walls and openings neat and tight.
  2. Completed work shall present a smooth plane and level surface, free from unevenness, edge or corner offsets, cupping, scratches and other imperfections.
- B. ESR-1308, Section 4.4.3.1, Alternate Seismic Design Category D, E and F Installation: Under this installation, the runners must be rated heavy-duty and have a minimum simple span uniform load of 16.35 pounds per lineal foot (238 N/m); maximum ceiling weight permitted is 4 pounds per square foot (19.5 kg/m<sup>2</sup>).
- C. The SJCG Seismic Separation Joint Clip is to be installed per the manufacturer's instructions, CS-3815.
- D. Label/mark ceiling panels where valves, dampers, equipment, VAV boxes and similar, are located above.



1. Coordinate with above ceiling trades to provide a label, colored dot, or other demarcation located on the T-bar grid.

### **3.03 INSTALLATION - SUSPENSION SYSTEM**

- A. Install suspension system in accordance with ASTM C 636/C 636M, ASTM E 580/E 580M, and manufacturer's instructions and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
- D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- E. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.
- F. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- I. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- J. At exterior application of MetalWorks Vector Exterior, provide vertical compression posts of 20 ga. x 2-1/2 inch metal stud at each intersection of suspension grid main runner and cross-bar; 24 inches o.c. each way.
- K. Do not eccentrically load system or induce rotation of runners.
- L. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.

### **3.04 DSA IR-25-2.13 METAL SUSPENSION SYSTEMS FOR LAY-IN PANEL CEILINGS**

- A. General Requirements: CBC Section 1616A1.20 (1616.10.16\*) requires the design and installation to be in compliance with ASTM C635/C635M, ASTM C636/C636M, and ASTM E580/E580M, Section 5, with modifications.

Note: Amendments in CBC Section 1616A.1.20 (1616.10.16\*) replace and append ASCE 7, Section 13.5.6.

  1. The requirements in DSA IR 25-2.13 apply to flat and level ceiling systems whose total weight, including ceiling mounted air terminals, services and light fixtures, does not exceed four (4) psf. Heavier systems, systems that are not flat and level, those supporting lateral loads from partitions, and free floating ceilings supported by chains or cables, are beyond the scope of DSA IR 25-2.13 and will be as indicated on Drawings.
- B. Ceiling Design & Installation Requirements:
  1. Ceiling System Components:
    - a. Shall comply with ASTM C635/C635M and Section 5.1 of ASTM E580/E580M.



- b. The ceiling grid system must be rated heavy duty as defined by ASTM C635/C635M.
  - c. Main runners, cross runners, splices, expansion devices, and intersection connectors shall be designed to carry a mean ultimate test load of not less than 180 lbs. in compression and tension per ASTM E580/E580M Section 5.1.2.
  - d. Ceiling wire shall be Class 1 zinc coated (galvanized) carbon steel conforming to ASTM A641/A641M. Wire shall be #12 gage (0.106 inch diameter) with soft temper and minimum tensile strength = 70 ksi. The maximum allowable (ASD) tension load for wire meeting this specification is 350 pounds.
    - 1) Four (4) turns of the wire within 1.5 inches will develop the wire allowable load.
    - 2) Three (3) turns of the wire within 3 inches is assumed to develop no more than 50 percent of wire allowable load.
2. Suspension System Installation:
- a. Shall comply with ASTM C636/C636M and Section 5.2 of ASTM E580/E580M.
  - b. #12 gage hanger wires may be used for up to and including a 4 by 4 foot grid spacing and shall be attached to main runners. Splices in hanger wires shall develop 50 percent of the wire allowable load.
  - c. Provide #12 gage hanger wires at the ends of all main and cross runners within eight (8) inches of the support or within one-fourth (1/4) of the length of the end tee, whichever is least, for the perimeter of the ceiling area. Perimeter wires are not required when the length of the end tee is eight (8) inches or less.
  - d. Ceiling grid members shall be attached to two (2) adjacent walls per ASTM E580/E580M, Section 5.2.3. Ceiling grid members shall be at least 3/4 inch clear of other walls. If walls run diagonally to ceiling grid system runners, one end of main and cross runners should be free, and a minimum of 3/4 inch clear of wall.
  - e. The width of the perimeter supporting closure angle shall be not less than two (2) inches. Use of angles with smaller widths in conjunction with proprietary perimeter clips may be acceptable in accordance with Section 5 of DSA IR 25-2.13.
  - f. At the perimeter of the ceiling area, where main or cross runners are not connected to the adjacent wall, provide interconnection between the runners at the free end to prevent lateral spreading. A metal stabilizer or a #16 gage wire with a positive mechanical connection to the runner may be used and placed within eight (8) inches of the wall. Where the perpendicular distance from the wall to the first parallel runner is eight (8) inches or less, the stabilizer or #16 gage wire is not required.
3. Lateral Force Bracing Assembly Installation:
- a. Lateral force bracing assemblies consisting of a compression strut and four (4) #12 gage splayed bracing wires oriented 90 degrees from each other are required for all ceiling areas.
    - 1) Exception: Lateral force bracing may be omitted for suspended acoustical ceiling systems with a ceiling area not to exceed 144 square feet, for all values of SDS, when perimeter support is provided in accordance with subparagraph 3.04 B.2 of this section and perimeter walls are designed to carry the ceiling lateral forces.
  - b. Lateral force bracing assemblies shall be spaced per Table 1 for all values of the component importance factor (Ip) of the ceiling.



- c. There shall be a brace assembly a distance of not more than one half of the above spacing from each surrounding wall, expansion joint and at the edges of any ceiling vertical offset. For example, where the brace spacing is 8 x 12 feet, the edge distance shall be 4 feet in the direction of the 8 foot spacing and 6 feet in the direction of the 12 foot spacing.
- d. The slope of bracing wires shall not exceed 45 degrees from the horizontal plane and wires shall be taut. Splices in bracing wires shall develop the wire allowable load.
- e. Compression struts shall meet the following requirements:
  - 1) The strut shall be sized to adequately resist the vertical component force induced by the ceiling bracing wires and have a maximum kl/r not to exceed 300. The struts listed in Appendix A of DSA IR 25-2.13 meet this requirement for ceilings complying with the general requirements of this referenced IR.
  - 2) The strut shall not be more than one (horizontal) in six (vertical) out of plumb.

**TABLE 1: Lateral Force Brace Assembly Spacing**

Design Spectral Acceleration Parameter S(DS)	Brace Assembly Spacing (ft.)	
	z/h ≤ 0.5 *	z/h ≥ 0.5 * **
S(DS) Less than or equal to 1.15	12 x 12 feet	12 x 12 feet
S(DS) Greater than 1.15 and less than or equal to 1.73	12 x 12 feet	8 x 12 feet
S(DS) Greater than 1.73	8 x 12 feet	8 x 8 feet

\*Where, as defined in ASCE 7, Section 13.3.1:

z = height in structure of point of attachment of ceiling with respect to the base.

h = average roof height of the structure with respect to the base.

\*\*It shall be permitted to use the brace assembly spacing for “z/h > 0.5” for the full building height.

- 4. Attachment of Hanger and Bracing Wires:
  - a. Fasten hanger wires with not less than three (3) tight turns in three (3) inches. Hanger wire loops shall be tightly wrapped and sharply bent to prevent any vertical movement or rotation of the member within the loops (see ASTM E580/E580M, Section 5.2.7.2).
  - b. Fasten bracing wires with not less than four (4) tight turns in 1-1/2 inches.
  - c. Hanger and bracing wire anchorage to the structure shall be installed in such a manner that the direction of the anchorage aligns closely with the direction of the wire. (e.g. bracing wire ceiling clips must be bent as shown in the details and rotated as required to align closely with the direction of the wire, screw eyes in wood must be installed so they align closely with the direction of the wire, etc.).
  - d. Separate all ceiling hanger and bracing wires at least 6 inches from all unbraced ducts, pipes, conduit, etc.
  - e. Hanger and bracing wires shall not attach to or bend around obstructions including but not limited to: piping, ductwork, conduit and equipment. Provide trapeze or other supplementary support members at obstructions to allow typical hanger



- spacing. Brace assemblies must be configured and/or located in order to avoid obstructions in addition to maintaining the required brace assembly spacing.
- f. Provide additional hangers, struts and brace assemblies as required at all ceiling breaks, soffits, or discontinuous areas.
  - g. Hanger wires that are more than one (horizontal) in six (vertical) out of plumb shall have counter-sloping wires.
    - 1) Note: See ASTM C636/C636M, Figure 1, for counter-sloping methods.
  - h. Attachment of the bracing wires to the structure above and to the main runners shall be adequate for the load imposed. The weight (Wp) shall be taken as not less than 4 psf for calculating seismic forces (Fp).
  - i. Post-installed anchors (e.g. expansion anchors, screw anchors and power actuated fasteners) shall have a current Evaluation Report acceptable to DSA in accordance with IR A-5.
  - j. Power-actuated fasteners in concrete are not permitted for bracing wires.
5. Expansion Joints, Seismic Separation Joints:
- a. Expansion joints shall be provided in the ceiling at intersections of corridors and at junctions of corridors and lobbies or other similar areas.
  - b. For ceiling areas exceeding 2,500 sq. ft., a seismic separation joint shall be provided to divide the ceiling into areas not exceeding 2,500 sq. ft. in accordance with ASTM E580/E580M, Section 5.2.9.
6. Ceiling Fixtures, Terminals, and Devices:
- a. All fixtures, terminals, and other devices shall be mounted in a manner that will not compromise ceiling performance in accordance with Section 13.5.6.2.2 Item 5 of ASCE 7 as amended by CBC Section 1616A.1.20 (1616.10.16\*) and ASTM E580/E580M Sections 5.3 and 5.4.
  - b. Ceiling panels shall not support any light fixtures, air terminals or devices.
  - c. Penetrations through the ceiling for sprinkler heads and other similar devices that are not integrally tied to the ceiling system in the lateral direction shall have a 2 inch oversized ring, sleeve or adapter through the ceiling tile to allow free movement of 1 inch in all horizontal directions. Alternatively, per ASTM E580/E580M, Section 5.2.8.5, a flexible sprinkler hose fitting that can accommodate 1 inch of ceiling movement shall be permitted to be used in lieu of the oversized ring, sleeve, or adapter.
  - d. Slack safety wires shall be considered hanger wires for installation and testing requirements.
  - e. Light Fixtures:
    - 1) All light fixtures shall be positively attached to the ceiling suspension systems by mechanical means per CEC Article 410.36 to resist a horizontal force equal to the weight of the fixture. A minimum of two screws or approved fasteners are required at each light fixture, per ASTM E580/E580M, Section 5.3.1.
    - 2) Surface-mounted light fixtures shall be attached to the main runner with at least two positive clamping devices on each fixture. The clamping device shall completely surround the supporting ceiling runner and be made of steel with a minimum thickness of #14 gage. Rotational spring catches do not comply. A #12 gage slack safety wire shall be connected from each clamping device to the



structure above. Provide additional supports when light fixtures are 8 feet or longer or exceed 56 lbs. Maximum spacing between supports shall not exceed 8 feet.

- 3) Light fixtures weighing less than or equal to 10 lbs. shall have a minimum of one (1) #12 gage slack safety wire connected from the fixture housing to the structure above.
  - 4) Light fixtures weighing greater than 10 lbs. but less than or equal to 56 lbs may be supported directly on the ceiling runners, but they shall have a minimum of two (2) #12 gage slack safety wires connected from the fixture housing at diagonal corners to the structure above.
    - (a) Exception: All light fixtures greater than 2 by 4 feet weighing less than 56 lbs. shall have a #12 gage slack safety wire at each corner.
  - 5) All Light fixtures weighing greater than 56 lbs. shall be independently supported by not less than four (4) taut #12 gage hanger wires (one at each corner) attached from the fixture housing to the structure above or other approved hangers. The four (4) taut #12 gage wires or other approved hangers, including their attachment to the structure above, shall be capable of supporting four (4) times the weight of the fixture.
- f. Services within the Ceiling:
- 1) All flexible sprinkler hose fitting mounting brackets, ceiling-mounted air terminals or other services shall be positively attached to the ceiling suspension systems by mechanical means to resist a horizontal force equal to the weight of the component. Screws or approved fasteners are required. A minimum of two attachments are required at each component.
  - 2) Ceiling-mounted air terminals or other services weighing less than or equal to 20 lbs. shall have one (1) #12 gage slack safety wire attached from the terminal or service to the structure above.
  - 3) Flexible sprinkler hose fittings, ceiling-mounted air terminals or other services weighing more than 20 lbs. but less than or equal to 56 lbs. shall have two (2) #12 gage slack safety wires (at diagonal corners) connected from the terminal or service to the structure above.
  - 4) Flexible sprinkler hose fittings, ceiling-mounted air terminals or other services weighing more than 56 lbs. shall be supported directly from the structure above by not less than four (4) taut #12 gage hanger wires attached from the terminal or service to the structure above or other approved hangers. The four (4) taut #12 gage wires or other approved hangers, including their attachment to the structure above, must be capable of supporting four (4) times the weight of the unit.
- g. Other Devices within the Ceiling:
- 1) All lightweight miscellaneous devices, such as strobe lights, occupancy sensors, speakers, exit signs, etc., shall be attached to the ceiling grid per subparagraph 3.04 B.6.f.1 of this Section. In addition, devices weighing more than 10 lbs. shall have a #12 gage slack safety wire anchored to the structure above per subparagraph 3.04 B.6.f.2 of this Section. Devices weighing more than 20 lbs. shall be supported from the structure above using details provided by the registered design professional (RDP).

C. Additional Requirements:



1. Pendant Mounted Light Fixtures:
  - a. Where pendant mounted light fixtures are to be installed in areas with a suspended ceiling, the construction documents shall include complete support details complying with DSA IR 25-2.13 and DSA IR 16-9.
  - b. Support pendant-mounted light fixtures directly from the structure above with hanger wires or cables passing through each pendant hanger and capable of supporting two (2) times the weight of the fixture.
  - c. If a pendant mounted light fixture is directly and independently braced below the ceiling (i.e., aircraft cables to walls), then a brace assembly is not required above the ceiling.
  - d. If a pendant mounted light fixture is free to swing 45 degrees from vertical in all directions, and is not directly and independently braced below the ceiling, then a bracing assembly is only required where the pendant hanger penetrates the ceiling. Special details are required to attach the pendant hanger to the bracing assembly to transmit the horizontal and vertical forces. Exception: Where the weight of the fixture is less than 20 lbs., the vertical component of the brace force need not be considered so no compression strut/post is required.
  - e. Rigid conduit shall not be used for attachment of the fixtures.
2. Acoustical Ceiling Tile Panel Installation
  - a. For ceiling installations utilizing acoustical tile panels of mineral or glass fiber, it is not mandatory to provide 3/4 inch clearance between the acoustical tile panels and the wall on the sides of the ceiling which are free to slip.
3. Other Panel Types:
  - a. Panels weighing more than 1/2 psf, other than mineral fiber and glass fiber acoustical tile, and all metal and wood panels shall be positively attached to the ceiling suspension runners by mechanical means, such as bolts, screws, or rivets, and each attachment shall have the allowable design strength to support 100 percent of the weight of the panel acting in any direction. A minimum of two attachments are required for each panel. For ceiling installations utilizing panels other than mineral or glass fiber, 3/4 inch clearance shall be provided between the ceiling panel and the wall on the sides of the ceiling area which are free to slip, unless otherwise justified by seismic qualification indicated below.
  - b. The use of other types of attachment, such as clips, snap-in devices, perforated lips, clamping devices, or spring loaded devices or hooks, shall be listed per DSA IR A-5 and identified for use with the type of ceiling framing members and panels. The listing shall be seismically qualified in accordance with ASCE 7 Section 13.2.5 or 13.2.6.
  - c. An alternate means of compliance per CAC 4-304 may be proposed and reviewed on a project by project basis when using unlisted means of attachment. The alternate means of attachment shall have the allowable design strength to support 100 percent of the weight of the panel acting in any direction and shall be capable of maintaining that strength if the ceiling grid is distorted or out of level.
  - d. It is also alternately permitted to provide a secondary means of connecting the panel to the grid or structure to retain the panel in case of panel dropout, ceiling grid distortion, and ceiling grid becoming out-of-level. The secondary attachment



- shall have the allowable design strength to support two (2) times the weight of the panel acting in any direction, such as a slack wire or cable.
- e. Special attachment details complying with one of the methods outlined above, such as screws or cables, shall be provided at the perimeter of the ceiling, where panels are cut or altered, or where non-standard panel sizes or edge conditions occur.
- 4. Exitways:
    - a. Exitways of essential services buildings shall be installed in accordance with Section 13.5.6.2.2 Item 1 of ASCE 7 as amended by CBC Section 1616A.1.20 (1616.10.16\*). A main or cross runner shall be installed on all sides of each piece of tile, board or panel and each light fixture or grill. Splices or intersection of such runners shall be attached with through connectors such as pop rivets, screws, pins, plates with end tabs or other approved connectors.
  - 5. Free Floating Ceilings:
    - a. Free floating ceilings (ceilings not attached to any walls) supported by wires in accordance with DSA IR 25-2.13 shall be braced in accordance with this referenced IR, regardless of the ceiling area, unless it can be demonstrated the anticipated ceiling movement will not cause failure of the ceiling components or failure of mechanical, electrical, plumbing, and fire and life safety components/systems within the ceiling area and within the area of anticipated movement.
    - b. The perimeter of free floating ceilings shall be supported by a continuous runner which is spliced in accordance with ASTM E580/E580M Section 5.1.2.
- D. Ceiling System Alteration: The entire ceiling in the affected space shall be upgraded to meet the current requirements of the CBC and DSA IR 25-2.13, if any portion of the grid system is cut or altered.
- 1. Where the ceiling grid is not cut or altered, and the scope of work includes only the following:
    - a. Replacement of existing ceiling panels with like panels of equal or lesser weight.
    - b. Replacement of light fixtures and/or terminals with like units (units of equal size and of equal or lesser weight) placed in the same location.
    - c. No upgrade to the ceiling grid, suspension system or lateral force brace assemblies is required.
  - 2. Re-Use of Existing Ceiling Hanger Wires and Bracing Wires: Existing ceiling hanger and bracing wires may be reused provided they comply with the following:
    - a. The gage and spacing of the wires must comply with the current applicable codes and DSA IR 25-2.13.
    - b. If a new wire is to be spliced to an existing wire, the architect or structural engineer in general responsible charge must submit to the DSA for approval a detail and specification describing how the splice is to be made. Acceptable wire splice details are provided in Appendix A.
    - c. See Section 7 for testing requirements for the re-use of existing hanger and bracing wire assemblies.
- E. DSA Acceptance of Evaluation Reports:
- 1. Ceiling grid systems or components, with valid evaluation reports issued by qualified evaluation agencies, in accordance with DSA IR A-5, are accepted by the DSA, provided



the system or component meets the requirements of CBC Section 1616A.1.20 (1616.10.16\*), ASTM C635/C635M, ASTM C636/C636M and ASTM E580/E580M. Where a qualified evaluation report is utilized, the installation shall comply with all the requirements specified in the evaluation report, i.e., connections, member sizes, perimeter details, special clips to wall angles, etc.

2. In accordance with DSA IR A-5, DSA will accept OSHPD Preapproved Details (OPD) "2013 CBC Standard Suspended Ceiling Details for Acoustical Tile or Lay-in Panel Ceilings."

### **3.05 INSTALLATION - ACOUSTICAL UNITS**

- A. Install in coordination with suspension system.
- B. Install acoustical units in accordance with manufacturer's instructions.
- C. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- D. Fit border trim neatly against abutting surfaces.
- E. Install units after above-ceiling work is complete.
- F. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- G. Cutting Acoustical Units:
  1. Perform all cutting required for fixtures, pipes and other work passing through acoustical tile and panels.
    - a. Neatly and tightly fit units to such work and adjoining work.
    - b. Fit border units neatly and tightly against abutting surfaces.
  2. Scribe and cut panels to fit accurately at borders and at penetrations.
  3. Cut to fit irregular grid and perimeter edge trim.
  4. Make field cut edges of same profile as factory edges.
  5. Double cut and field paint exposed reveal edges.
  6. For reveal edge panels: Cut and reveal or rabbet edges of ceiling panels at border areas and vertical surfaces.
  7. Edges shall be concealed by support of suspension members.
- H. Install hold-down clips on panels within 20 ft of an exterior door.

### **3.06 FIELD QUALITY CONTROL**

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
- B. Coordination of Other Tests and Inspections: District will employ independent testing agency to test and/or inspect anchors; provide access and assistance as required to accommodate timely performance.
- C. Testing (per DSA IR 25-2.13): All field testing must be performed in the presence of the project inspector or a special inspector.
  1. New Installations:
    - a. Post-installed anchors in concrete used to support hanger wires shall be tested at a frequency of 10 percent.



- 1) Power actuated fasteners in concrete shall be field tested for 200 lbs. in tension. All other post-installed anchors in concrete shall be tested in accordance with CBC Section 1910A.5.
  - b. Post-installed anchors in concrete used to attach bracing wires shall be tested at a frequency of 50 percent in accordance with CBC Section 1910A.5.
2. Re-Use of Existing Ceiling Hanger Wires and Bracing Wires:
  - a. All existing ceiling hanger wire/anchor assemblies must be tested to 200 lbs.
  - b. All existing bracing wire/anchor assemblies must be field tested to 440 lbs.
  - c. Where a new wire is spliced to an existing wire, each spliced wire/anchor assembly must be field tested to the loads given for existing assemblies above.

### **3.07 TOLERANCES**

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

### **3.08 ADJUSTING AND CLEANING**

- A. Replace loose and damaged tile and panels when directed.
- B. Touch-up all damaged finish.
- C. Leave all surfaces clean and free from markings and other disfigurements.
- D. Remove all debris resulting from the work of this section.

**END OF SECTION**







**SECTION 09 68 13**  
**TILE CARPETING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Carpet tile, fully adhered.
- B. Removal of existing carpet/tile.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 74 19 - Construction Waste Management and Disposal: Reclamation/Recycling of new carpet tile scrap and removed carpet tile.
- C. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.
- D. Section 09 05 61 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, removal of existing floor coverings, cleaning, and preparation.
- E. Section 09 6500 - Resilient Flooring: Topset Base.

**1.03 REFERENCE STANDARDS**

- A. AATCC Test Method 134 - Electrostatic Propensity of Carpets; 2011.
- B. AATCC Test Method 16 - Test Method for Colorfastness to Light; 2004.
- C. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2006 (Reapproved 2011).
- D. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2014c.
- E. CRI 104 - Standard for Installation of Commercial Carpet; 2015.
- F. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2015.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- C. Shop Drawings: Indicate layout of joints.
- D. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
- E. Submit two, 6 inch long samples of edge strip and base cap.
- F. Manufacturer's Installation Instructions: Indicate special procedures.
- G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.



- H. Maintenance Materials: Furnish the following for District's use in maintenance of project.
  - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
  - 2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

#### **1.06 FIELD CONDITIONS**

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.
  - 1. Store inside, in well ventilated area, protected from weather, moisture and soiling. Store rolls flat, not standing on end.
- B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.
- C. Deliver carpet materials in original mill protective wrapping with mill register numbers and tags attached.
- D. Ventilate installation area during installation and for 72 hours after installation.

#### **1.07 WARRANTY**

- A. Carpet Warranty: Provide 10-year Commercial Limited Warranty.
- B. Extended Warranty: Provide extended warranty covering edge raveling, delamination and wear exceeding 10 percent of face yarn weight for a period of 15 years after "Notice of Completion".

### **PART 2 PRODUCTS**

#### **2.01 REGULATORY REQUIREMENTS**

- A. All products used for flooring installation shall comply with flammability and smoke classifications for various locations of installation. Comply with applicable requirements of California Building Code (CBC) Chapter 8.
- B. Provide glue-down installation conforming to CBC Section 11B-302.2.
  - 1. Carpet shall be securely attached and shall have a firm cushion. pad, or backing or no cushion or pad.
    - a. Carpet shall have level loop, textured loop, level cut or level cut/uncut pile texture.
    - b. Pile height shall be 1/2 inch maximum.
  - 2. Exposed edges shall be fastened to floor surfaces and shall have trim on the entire length.
    - a. Carpet edges shall comply with CBC Section 11B-303.



- C. Comply with CalGreen Building Standards: All installed carpeting shall be low VOC emissions listed. Certified as Low Emission by one of the following:
1. Carpet and Rug Institute's Green Label Plus Program. CalGreen 5.504.4.4.1
  2. Compliant with the VOC emission limits and testing requirements specified in the California Department of Public Health's "Standard Method for the Testing and Evaluation Chambers", Version 1.1, February 2010 or Specification 01350. CalGreen 5.504.4.4.2.
  3. NSF/ANSI 140 at Gold level or higher. CalGreen 5.504.4.4.3
  4. SCS Floorscore; [www.scs-certified.com](http://www.scs-certified.com). CalGreen 5.504.4.4.4.
  5. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and EQ 7.1 (formerly EQ 2.2) dated July 2012 and listed in the CHPS High Performance Product Database; [www.chps.net/manual/lem\\_table.htm](http://www.chps.net/manual/lem_table.htm). CalGreen 5.504.4.4.5.

## **2.02 MANUFACTURERS**

- A. Tile Carpeting:
1. Basis of Design Product: Consequence II #03724 as manufactured by Tandus Centiva, or approved equal.
  2. Tandus: [www.tandus.com/#sle](http://www.tandus.com/#sle).
  3. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.03 MATERIALS**

- A. Tile Carpeting: Patterned Loop, manufactured in one color dye lot.
1. Tile Size: 18 by 36 inch, nominal.
  2. Thickness: 0.28 inch.
  3. Color: As indicated on Drawings.
  4. Pattern: Geometric.
  5. Critical Radiant Flux: Minimum of 0.45 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
  6. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
  7. VOC Content: Comply with Section 01 61 16.
  8. Indoor Air Quality—CRI Green Label Plus™
  9. Maximum Electrostatic Charge: 3.5 Kv. at 20 percent relative humidity, AATCC Test Method 134.
  10. Gage: 5/64 inch.
  11. Stitches: 10.0 per inch.
  12. Light Fastness:  $\geq 4.0$  at 80 Hours, AATCC Test Method 16.
  13. Primary Backing Material: Non-woven synthetic fiber.



## **2.04 ACCESSORIES**

- A. Sub-Floor Filler: White premix latex; type recommended by flooring material manufacturer.
- B. Edge Strips: Rubber, color as selected by Architect.
  - 1. Reducer, CRS-29-A manufactured by Johnsonite, a Tarkett Company; [www.johnsonite.com](http://www.johnsonite.com); or approved equivalent product.
- C. Adhesives:
  - 1. Compatible with materials being adhered; maximum VOC content as specified in Section 01 61 16.
- D. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that sub-floor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
  - 1. Maximum variation of 1/8-inch in 10 ft
- B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.
- C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.
  - 1. Test in accordance with Section 09 05 61.
  - 2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
- D. Carpet Verification: Verify carpet match before cutting or placement to ensure minimal variation between dye lots.
- E. Verify that required floor-mounted utilities are in correct location.

### **3.02 PREPARATION**

- A. Remove existing carpet tile.
- B. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61.

### **3.03 INSTALLATION**

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install carpet tile in accordance with manufacturer's instructions and CRI 104 (Commercial).
- C. Blend carpet from different cartons to ensure minimal variation in color match.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- E. Lay carpet tile in Vertical Ashlar pattern, with pile direction parallel to next unit, set parallel to building lines.
  - 1. Locate change of color or pattern between rooms under door centerline.
- F. Locate change of color or pattern between rooms under door centerline.



- G. Fully adhere carpet tile to substrate.
- H. Trim carpet tile neatly at walls and around interruptions.
  - 1. Edges: Run carpet under open bottom items and all cabinets and install tight to walls. Neatly trim and secure edge of carpet adjacent to door jambs where no base occurs.
- I. Complete installation of edge strips, concealing exposed edges.
- J. Carpet Finishing: Brush all seams and trim protruding pile tufts level. Remove excess adhesive on the carpet surface and thoroughly vacuum entire area. Leave room clean and ready for use.

### **3.04 PROTECTION**

- A. Cover carpet during construction period with reinforced kraft paper when construction traffic is required to cross carpeted areas.
- B. Remove and replace damaged or improperly installed carpet.

### **3.05 CLEANING**

- A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- B. Clean and vacuum carpet surfaces.
  - 1. Vacuum and remove all stains from carpet to satisfaction of Owner and in accordance with cleaning specified in Section 01 70 00 - Execution and Closeout Requirements.

### **END OF SECTION**







## **SECTION 09 72 00**

### **WALL COVERINGS**

#### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Surface preparation and prime painting.
- B. Wall covering.

##### **1.02 RELATED REQUIREMENTS**

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

##### **1.03 REFERENCE STANDARDS**

- A. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes; 2002 (Reapproved 2013).
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
  - 1. Use 2013a as indicated in 2016 CBC Referenced Standards.
- C. ASTM F793/F793M - Standard Classification of Wall Coverings by Use Characteristics; 2015.

##### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on wall covering and adhesive.
- C. Shop Drawings: Indicate wall elevations with seaming layout.
- D. Samples: Submit six samples of wall covering, 6 by 9 inch in size illustrating color, finish, and texture.
- E. Test Reports: Indicate verification of flame and smoke ratings, when tested by UL.
- F. Manufacturer's Installation Instructions: Indicate special procedures.
- G. Maintenance Data: Submit data on cleaning, touch-up, and repair of covered surfaces.
- H. Maintenance Materials: Furnish the following for District's use in maintenance of project.
  - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
  - 2. Extra Wall Covering Materials: 25 linear feet of each color and pattern of wall covering; store where directed.
  - 3. Package and label each roll by manufacturer, color and pattern, and destination room number.

##### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.



## **1.06 MOCK-UP**

- A. Provide panel, 3 panel drops wide, full height, illustrating installed wall covering and joint seaming technique.
- B. Locate where directed.
- C. Mock-up may not remain as part of the Work.

## **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Inspect roll materials at arrival on site, to verify acceptability.
- B. Protect packaged adhesive from temperature cycling and cold temperatures.
- C. Do not store roll goods on end.

## **1.08 FIELD CONDITIONS**

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or wall covering product manufacturer.
- B. Maintain these conditions 24 hours before, during, and after installation of adhesive and wall covering.
- C. Provide lighting level of 80 ft candles measured mid-height at substrate surfaces.

# **PART 2 PRODUCTS**

## **2.01 WALL COVERINGS**

- A. General Requirements:
  - 1. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
  - 2. Chemical and Stain Resistance: No visible staining or discoloration and no damage to surface texture when tested in accordance with ASTM D1308.
- B. Wall Covering - Type VWC-1: Fabric-backed vinyl roll stock.
  - 1. Comply with ASTM F793, Category V, Type II.
  - 2. Total Weight: 25 oz/sq yd.
  - 3. Roll Width: 54 inches.
  - 4. Backing: cotton scrim fabric.
  - 5. Color: as indicated on Drawings.
  - 6. Overcoating: Manufacturer's standard coating for stain resistance.
  - 7. Basis of Design Product: Lanark Vault Box Bentley as manufactured by Tri-Kes Lanark, or approved equal.
- C. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate.
- D. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.
- E. Substrate Primer and Sealer: Alkyd enamel type.



## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that substrate surfaces are prime painted and ready to receive work, and comply with requirements of wall covering manufacturer.
- B. Measure moisture content of surfaces using an electronic moisture meter. Do not apply wall coverings if moisture content of substrate exceeds level recommended by wall covering manufacturer.
- C. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.
- D. Inspect for any conditions detrimental to the proper and timely completion of the installation. Do not proceed with work until conditions have been corrected.

### **3.02 PREPARATION**

- A. Fill cracks in substrate and smooth irregularities with filler; sand smooth.
- B. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.
  - 1. Provide hanging surface that is smooth and free of all excess dust, oils or other foreign matter.
- C. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- D. Surfaces: Correct defects and clean surfaces that affect work of this section. Remove existing coatings that exhibit loose surface defects.
- E. Marks: Seal with shellac those that may bleed through surface finishes.
- F. Apply one coat of primer sealer to substrate surfaces. Allow to dry. Lightly sand smooth.
- G. Vacuum clean surfaces free of loose particles.

### **3.03 INSTALLATION**

- A. Apply adhesive and wall covering in accordance with manufacturer's instructions.
- B. Apply adhesive to wall surface immediately prior to application of wall covering.
- C. Use wall covering in roll number sequence.
- D. Razor trim edges on flat work table. Do not razor cut on gypsum board surfaces.
- E. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface.
- F. Butt edges tightly.
- G. Horizontal seams are not acceptable.
- H. Do not seam within 2 inches of internal corners or within 6 inches of external corners.
- I. Install wall covering before installation of bases and items attached to or spaced slightly from wall surface.
- J. Do not install wall covering more than 1/4 inch below top of resilient base.
- K. Cover spaces above and below windows, above doors, in pattern sequence from roll.



- L. Apply wall covering to electrical, telephone, and communications wall plates prior to replacing.
- M. Where wall covering tucks into reveals, or metal wallboard or plaster stops, apply with contact adhesive within 6 inches of wall covering termination. Ensure full contact bond.
- N. Install termination trim.
- O. Remove excess adhesive while wet from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

#### **3.04 FIELD QUALITY CONTROL**

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
- B. Provide manufacturer's field representative to observe continuing installation.
- C. After the application of three sheets of wood wallcovering, request inspection by Architect for material quality and proper installation.

#### **3.05 CLEANING**

- A. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.
- B. Reinstall wall plates and accessories removed prior to work of this section.

#### **3.06 PROTECTION**

- A. Do not permit construction activities at or near finished wall covering areas.

#### **3.07 MAINTENANCE**

- A. Submit a copy of maintenance instructions to District.

### **END OF SECTION**



**SECTION 09 96 00**  
**HIGH-PERFORMANCE COATINGS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. High performance coatings.
  - 1. Exterior Steel.
  - ~~2. Kitchen and toilet room walls.~~
  - ~~3. Epoxy on Concrete Floors.~~
- B. Surface preparation.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section ~~09 05 61 - Common Work Results for Flooring Preparation: Floor applications~~ **50 00 - Metal Fabrications: Exterior metal and bollards.**
- C. Section ~~09 91 05 52 13 - Pipe and Tube Railings.~~
- D. **Section 09 91 13 - Exterior Painting.**
- ~~E. Section 09 91 23 - Interior Painting: Requirements for mechanical~~ **32 31 19 - Ornamental Metal Fences and electrical equipment surfaces Gates.**

**1.03 REFERENCE STANDARDS**

- A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2014.
- B. ASTM D4587 - Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings; 2011.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
  - 1. Use 2013a as indicated in 2016 CBC Ch. 35 Referenced Standards.
- D. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition, [www.paintinfo.com](http://www.paintinfo.com).
- E. SSPC-SP 1 - Solvent Cleaning; 2015.
- F. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).
- G. SSPC-SP 6 - Commercial Blast Cleaning; 2007.
- H. SSPC-SP 7 - Brush-Off Blast Cleaning; 2007.
- ~~I. SSPC-SP 13 - Surface Preparation of Concrete; (Reaffirmed 2015); 2003.~~

**1.04 DEFINITIONS**

- A. Definitions of Painting Terms: ASTM D16, unless otherwise specified.



## 1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide complete list of all products to be used, with the following information for each:
  - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
  - 2. MPI product number (e.g. MPI #47).
  - 3. Cross-reference to specified coating system(s) product is to be used in; include description of each system.
  - 4. Manufacturer's installation instructions.
- C. Samples: Submit two samples 8 by 8 inch in size illustrating colors available for selection.
- D. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate.
  - 1. Provide stepped Samples defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
  - 2. List of material and application for each coat of each sample. Label each sample for location and application.
  - 3. Submit samples on the following substrates for Architect's review of color and texture:
    - a. Concrete: Provide 8 by 8 inch samples on rigid backing.
- ~~E. LEED certification product data as specified in Division 01, Section "Sustainable Design Requirements" for the following LEED credits:~~
  - ~~1. Credit EQ 4.1, Low-Emitting Materials, Adhesives & Sealants.~~
  - ~~2. Credit EQ 4.2, Low-Emitting Materials, Paints & Coatings~~
- ~~FE.~~ Manufacturer's Certificate: Certify that high-performance coatings comply with VOC limits specified.
- ~~GF.~~ Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- ~~HG.~~ Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- ~~IH.~~ Applicator's Quality Assurance: Submit list of a minimum of 10 completed projects of similar size and complexity to this Work. Include for each project:
  - 1. Project name and location.
  - 2. Name of owner.
  - 3. Name of contractor.
  - 4. Name of architect.
  - 5. Name of coating manufacturer.
  - 6. Approximate area of coatings applied.
  - 7. Date of completion.
- ~~JL.~~ Warranty: Submit manufacturer's standard warranty.



- KJ.** Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and coated surfaces, and color samples of each color and finish used.
- LK.** Maintenance Materials: Furnish the following for District's use in maintenance of project.
  - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
  - 2. Extra Coating Materials: 5 percent, not less than 1 gallon or 1 case of each type and color.
  - 3. Label each container with manufacturer's name, product number, color number, and room names and numbers where used.

#### **1.06 QUALITY ASSURANCE**

- A. Maintain one copy of each referenced document that applies to application on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- C. Applicator Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.
- D. Preapplication Meeting: Convene a preapplication meeting 2 weeks before start of application of coating systems. Require attendance of parties directly affecting work of this section, including Contractor, Architect, applicator, and manufacturer's representative. Review the following:
  - 1. Environmental requirements.
  - 2. Protection of surfaces not scheduled to be coated.
  - 3. Surface preparation.
  - 4. Application.
  - 5. Repair.
  - 6. Field quality control.
  - 7. Cleaning.
  - 8. Protection of coating systems.
  - 9. One-year inspection.
  - 10. Coordination with other work.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of coating, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Coating Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.



## **1.08 FIELD CONDITIONS**

- A. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- B. Do not install materials when temperature is below 55 degrees F or above 90 degrees F.
  - 1. Surface Temperature: Minimum of 5 degrees F above dew point.
- C. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of coating.
- D. Provide ventilation during coating evaporation stage in confined or enclosed areas in accordance with manufacturer's instructions.
- E. Restrict traffic from area where coating is being applied or is curing.

## **1.09 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Warranty: Include coverage for bond to substrate.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Materials specified are those that have been evaluated for the specific service. Request for material substitutions may be submitted in accordance with 01 25 00 - Substitution Procedures.
- B. Provide high performance coating products from the same manufacturer to the greatest extent possible.
  - 1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
  - 2. Substitution of other products by the same manufacturer is preferred over substitution of products by a different manufacturer.
- C. High-Performance Coatings:
  - 1. Basis of Design: Tnemec Company, Inc: [www.tnemec.com/#sle](http://www.tnemec.com/#sle).
    - a. Local Representative: Tony Hobbs, (310) 637-2363.
  - 2. Carboline: [www.carboline.com](http://www.carboline.com).
  - 3. PPG Paints: [www.ppgpaints.com/#sle](http://www.ppgpaints.com/#sle).
  - 4. Precision Coatings: [www.precisioncoatingsinc.com/#sle](http://www.precisioncoatingsinc.com/#sle).
  - 5. Sherwin-Williams Company: [www.protective.sherwin-williams.com/industries/#sle](http://www.protective.sherwin-williams.com/industries/#sle).
    - a. Local Representative: John Dumesnil, (619) 665-9341.
  - 6. Substitutions: Section 01 60 00 - Product Requirements.



## 2.02 HIGH-PERFORMANCE COATINGS

- A. Provide coating systems that meet the following minimum performance criteria, unless more stringent criteria are specified:
1. Material Compatibility: Provide primers, undercoats, and finish-coat materials that are compatible with one another and substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
  2. Interior products Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0, maximum, when tested in accordance with ASTM E84.
  3. Scrubbability: Excellent, when tested in accordance with ASTM D2486.
  4. Gloss and Color Retention: Excellent, when tested in accordance with ASTM D4587.

## 2.03 TOP COAT MATERIALS

- A. Coatings - General: Provide complete multi-coat systems formulated and recommended by manufacturer for the applications indicated, in the thicknesses indicated; number of coats specified does not include primer or filler coat.
1. Lead Content: Not greater than 0.06 percent by weight of total nonvolatile content.
  2. Chromium Content, as Hexavalent Chromium, Zinc Chromate, or Strontium Chromate: None.
  3. Volatile Organic Compound (VOC) Content: Comply with Section 01 61 16.
  4. Colors: As indicated.
- B. ~~Epoxy~~Latex Coating:
1. ~~Number of coats: Two.~~
  2. ~~Top Coat(s): Polyamide-EpoxyAcrylic, High Dispersion.~~
    - a. Sheen: **Semi-Gloss.**
    - b. ~~Coating Systems for Exterior SteelProducts:~~
      - 1) ~~Exterior Exposed: Moderate to severe weathering and exposure~~
      - 2) ~~Basis of Design Product: Zinc / Epoxy / Hybrid as manufactured by Tnemec Company, Inc., or approved equal.~~

Surface Preparation:			SSPC-SP 6
Shop Primer:	Aromatic Urethane, Zinc Rich	Series 90-97 Tneme Zinc	DFT 2.5 to 3.5 mils
Intermediate Coat:	Polyamidoamine Epoxy	Series L69 Hi-Build Epoxoline II	DFT 2.5 to 3.5 mils
Finish Coat:	Modified Polycarbamide	-Series 750 UVX	DFT 2.5 to 4.0 mils
Total DFT: 7.0 to 10.5 mils			

- 3) ~~Finish Color: As selected by Architect from manufacturer's custom colors and As indicated on the drawings.~~

3. ~~Coating Systems for Exterior Non-Passivated Galvanized Steel: Mild to Moderate, Overhead Deck, Ductwork, Conduit, Dry Utilities.~~



- a. ~~Basis of Design Product: Non-Passivated Galvanize/ Field touch-up zinc-rich primer/ Acrylic / Acrylic as manufactured by Tnemec Company, Inc., or approved equal.~~
- b. ~~Surface Preparation:~~
  - 1) ~~Prepare galvanized steel and nonferrous metal surfaces in accordance with ASTM D 6386 – Surface Preparation of Galvanized Surfaces and manufacturer’s instructions.~~
  - 2) ~~Ensure surfaces are dry.~~
  - 3) ~~Remove visible oil, grease, dirt, dust, protective mill coatings, and other soluble contaminants in accordance with SSPC SP 1 or manufacturer’s instructions as specified for coating system. Hand or Power tool clean to remove all insoluble contaminants. Follow initial cleaning with the following:~~
    - ~~(a) Chemically Treat with one of the following products to etch the galvanized surface to be coated:~~
      - ~~(1) Henkel Galvaprep 5.~~
      - ~~(2) Clean & Etch by Great Lakes Laboratory.~~
      - ~~(3) Reference ASTM D 6386-99 (2005) Section 5.4.2.~~
  - 4) ~~Touch-up Repairs: Mechanically clean damaged galvanized areas to bare metal in accordance with SSPC SP-11 Power Tool Clean to Bare Metal.~~
- c. ~~Spot Primer: Tneme Zinc Series 94 H2O @ 2.5-3.5 mils DFT~~
- d. ~~Primer: 115 Uni-Bond. DFT 2.0 to 3.0 mils.~~
- e. ~~Finish Coat: ; Series 1029 Enduratone DFT 2.0 to 3.0 mils.~~
- f. ~~Total DFT: 4.0 to 6.0 mils.~~
- g. ~~Finish Color: As selected by Architect from manufacturer’s standard colors and As indicated on the drawings.~~
- 4. ~~Top Coat(s): HDP, Water Based Coating.~~
  - a. ~~Sheen: Satin.~~
  - b.
- C. ~~Urethane Coating for Kitchen:~~
  - 1. ~~Coat(s): Polyurethane, Water Based, One or Two Component.~~
    - a. ~~Application: Kitchen and toilet room walls.~~
    - b. ~~Sheen: Gloss.~~
    - c. ~~Products:~~
      - 1) ~~Tnemec Company, Inc. Series 297 Enviro-Glaze: [www.tnemec.com/#sle](http://www.tnemec.com/#sle); with Enviro-Pox Series 287 concrete primer and Elasto-Grip Series 151 drywall primer.~~
- D. ~~Epoxy Floor Coating:~~
  - 1. ~~Number of Coats: Two, plus primer.~~
  - 2. ~~Top Coat(s): Polyamide-Epoxy Deck Coating, Slip Resistant, Two-Component; MPI #82.~~
    - a. ~~Sheen: Gloss.~~
    - b. ~~Basis of Design Product: MVT / Self Leveling Epoxy / CR Urethane System as manufactured by Tnemec, or approved equal.~~



Concrete Surface Preparation:	Shot blast or mechanically abrade		SSPC-SP 13 CSP-3-4
Prime Coat:	Modified Polyamine-Epoxy	Series-208 Epoxoprime MVT*	DFT 16 to 20-mils
Base Coat:	Aggregate-Filled Modified Polyamine-Epoxy	Series-210 Even-Flow SL	DFT 30.0 to 40.0 Mils
Semi-Gloss-Finish Coat:	Aliphatic Moisture-Cured Urethane	Series-248 Everthane	DFT 2.0 to 3.0 Mils
Gloss-Finish Coat:	Aliphatic Moisture-Cured Urethane	Series-247 Everthane	DFT 2.0 to 3.0 Mils

———— \*Tint as required based on finish color selection.

**32) Substitutions: Section 01 60 00 - Product Requirements.**

2. Primer: As recommended by coating manufacturer for specific substrate.

EC. Shellac: Pure, white type.

## 2.04 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of coated surfaces.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Do not begin application of coatings until substrates have been properly prepared.
- C. Verify that substrate surfaces are ready to receive work as instructed by the coating manufacturer. Obtain and follow manufacturer's instructions for examination and testing of substrates.
- D. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- E. Test shop-applied primer for compatibility with subsequent cover materials.
- F. Proceed with coating application only after unacceptable conditions have been corrected.
  1. Commencing coating application constitutes Contractor's acceptance of substrates and conditions.

### 3.02 PREPARATION

- A. Clean surfaces of loose foreign matter.
- B. Remove substances that would bleed through finished coatings. If unremovable, seal surface with shellac.
- C. Remove finish hardware, fixture covers, and accessories and store.



- D. Existing Painted and Sealed Surfaces:
  - 1. Strip existing paint and coatings from surface.
  - 2. Clean with mixture of trisodium phosphate and water to remove surface grease and foreign matter.
- E. Galvanized Surfaces:
  - 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
  - 2. Prepare surface according to SSPC-SP 2.
- F. Non-Passivated Galvanized Steel: Prepare galvanized steel and nonferrous metal surfaces in accordance with ASTM D 6386 - Surface Preparation of Galvanized Surfaces and manufacturer's instructions.
- G. Ferrous Metal:
  - 1. Solvent clean according to SSPC-SP 1.
  - 2. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning", and protect from corrosion until coated.
- H. Protect adjacent surfaces and materials not receiving coating from spatter and overspray; mask if necessary to provide adequate protection. Repair damage.

### **3.03 PRIMING**

- A. Apply primer to all surfaces, unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

### **3.04 COATING APPLICATION**

- A. Apply coatings in accordance with manufacturer's written instructions, to thicknesses specified and recommendations in "MPI Architectural Painting and Specification Manual".
- B. Apply in uniform thickness coats, without runs, drips, pinholes, brush marks, or variations in color, texture, or finish. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

### **3.05 FIELD QUALITY CONTROL**

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.
- B. District will provide field inspection.
- C. Dry Film Thickness Testing: District will engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.
  - 1. Touch up and restore coated surfaces damaged by testing.
  - 2. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, and specified thickness, Contractor shall pay for retesting and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations, and specified thickness.

### **3.06 INSPECTION**

- A. Request acceptance of each coat before applying succeeding coats.



- B. Touch-up and repair unacceptable work.

### **3.07 CLEANING**

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
- B. Clean surfaces immediately of overspray, splatter, and excess material.
- C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.
- D. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.

### **3.08 PROTECTION**

- A. Protect finished work from damage.

### **3.09 SCHEDULE**

- A. Colors: As indicated on Finish Schedule.
- B. Exterior Ferrous Metal Railings and Handrails, Fences, Exterior Metal, Gates, and Flashing: Epoxy, gloss, shop-applied after cleaning to bare metal, all surfaces coated including surfaces to be concealed or embedded in concrete.

**END OF SECTION**







## **SECTION 27 10 00.10**

### **ETHERNET CABLING**

#### **PART 1 - GENERAL**

##### **1.01 SUPPORTING CODES AND STANDARDS DOCUMENTS**

It is not possible to list all of the applicable Codes and Standards documents. A non-inclusive list of key documents is presented below as a minimum:

1. ANSI/EIA/TIA-568-B: Commercial Building Telecommunications Cabling Standard
2. ANSI/EIA/TIA-569-A: Commercial Building Standard for Telecom Pathways and Spaces
3. ANSI/EIA/TIA-606: Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
4. ANSI/EIA/TIA-607: Commercial Building Grounding/Bonding Requirements
5. California Electrical Code, based on NFPA 70: National Electrical Code
6. ISO/IEC 11801: Generic Cabling for Customer Premises
7. BICSI :Telecommunications Distribution Methods Manual (TDDM)
8. The latest revision of each document, and other related documents, is to be considered the one in force at the time of system construction and delivery to SBCUSD. The vendor is required to comply with the applicable documents in content and intent as well.
9. If any applicable documents are in conflict, then the more stringent requirement shall apply. The Contractor is required to advise the SBCUSD Information Technology (IT) Representative of any conflict that could result in work deficiencies.

##### **1.02 VENDOR REQUIREMENTS**

- A. Vendors bidding on SBCUSD work projects shall possess as a minimum the following qualifications:
  1. A manufacturer's Certified Installer/Contractor agreement in force at the time of bid submittal and throughout the entire construction process. A current support document shall be included in the Contractor's bid response.
  2. Authorization to facilitate the applicable Manufacturer's System Warranty.
  3. The contractor shall ensure that at least 50% of all technicians installing a copper system have received a manufacturer's training certificate for copper systems.
  4. The contractor shall ensure that 100% of the technicians installing a fiber optic system have received a manufacturer's training certificate for fiber optic systems.
  5. The contractor shall have copies of the technicians' certificates available for inspection by the SBCUSD IT Representative upon request.
  6. Vendor shall hold in good standing a California C-10 license. Note: a valid California C-7 license in addition is preferred by SBCUSD. Vendor must act as prime, but may utilize subcontractors. A copy of the license(s) is/are to be included in the vendor's bid response.



7. The Vendor must have completed a minimum of five projects of similar size and scope for public entities within the past three years.

## **PART 2 - PRODUCTS**

### **2.01 CABLING SYSTEM**

- A. All copper and fiber optic components of the cabling system are either to be of a single manufacturer, or of a manufacturer partnership under a system trade name offering a single point of contact for SBCUSD in the event of a warranty claim. The SBCUSD has chosen the Panduit TX6A 10 Gig UTP Copper Cabling solution as the baseline for all equivalents to be measured. Vendors submitting other manufacturer systems for considered must meet this system in physical and electronic performance as well as utility.

- B. **COPPER SYSTEM**

1. SBCUSD requires a high performing Category 6a system that meets the following system performance guaranteed headroom as a minimum based on worst pairs:

Electrical Value	TIA/EIA Category 6A	ISO Class EA
Insertion Loss	3%	3%
NEXT	3.5 dB	2.5 dB
PSNEXT	5 dB	4 dB
PSACR-F	10 dB	10 DB
Return Loss	3 dB	3 dB
PSACR-N	6.5 dB	6.5 dB
PSANEXT	2 dB	2 dB
PSAACR-F	10 dB	10 dB

- C. **Copper Cable Color Standards for Horizontal Cabling, Jack Inserts and Patch Cords**

1. The following colors are the District Standards for the specific network devices and services listed below:
  - a. Red: To be utilized when the project to install cabling has determined that the devices and services are in support of Alarms, Security, Energy Management Systems (EMS), and Environmental monitoring. The District has standardized on the color Red for horizontal cabling and jack inserts and patch cables on both ends of the horizontal cabling must also be Red in color.

- D. **Cable**

1. SBCUSD requires all cabling being installed within a building to be plenum rated in all environments. Even though quite desirable, SBCUSD is not aware of a Category 6A indoor/outdoor plenum-rated cable. As a result, SBCUSD is willing to accept an indoor/outdoor CM rated cable as long as the NEC termination and pathway requirements are met. Regardless of environment, the cabling shall be of the same electrical performance as Category 6A and be warranted by the same cabling system manufacturer, as Panduit or equivalent.
2. Installation of cabling shall be of continuous length from each termination point.



3. No length of cable shall exceed 285 feet (tested length).
4. The bend radius of any cable shall not exceed 4 times the diameter of the cable.
5. Should the cable become kinked while being installed, the contractor shall not attempt to repair the cable, but shall remove and replace the entire run. All cable runs are potential inspection items for the SBCUSD IT Representative.
6. The cable jacket shall be maintained as close to the point of termination as possible.
7. The cable pairs shall not be untwisted more than 1/2" from the termination point.
8. All cabling is to be installed in its own pathway and fully supported.
9. Cabling shall be installed with no more than a 4-foot space between supports.
10. Cabling can be installed in pathways such as cable tray and ladder racking, as long as the pathway is low-voltage cabling only, the pathway is appropriately bonded to the building grounding system, and the Data System cables are bundled separately from other low voltage cabling.
11. Underground cabling can be installed inside buildings to the ultimate termination point without transition as long as the cabling is rated for such applications.

E. Terminations

1. Jack modules shall be of insulation-displacement termination construction, and may offer mass termination of all four pairs simultaneously. In addition, a jack module must be available as part of the cabling system, and facilitate the same system performance and warranties, that can be utilized in existing workstation outlet faceplates from other manufacturers.
2. In an effort maximize space, SBCUSD has standardized on a discrete modular patch panel system. The system must allow the following:
  - a. Presentation of 48 individual module ports in a 1U (1.75") rack height.
  - b. Presentation of 24 individual module ports in a 1U (1.75") rack height.
  - c. Presentation of 12 individual module ports to be mounted in an 89B type wall bracket.
  - d. Offer Category 6a connectivity.
  - e. Offer Category 5e connectivity if required
3. Cabling shall be dressed cleanly and fully supported via Velcro straps and cabinet/rack supports. All cabling bundles are to be loosely secured with Velcro (hook & loop) straps only. Cable ties are not to be utilized. In addition, Velcro straps must not be spaced at regular intervals but must vary between 4-6 inches at random over the length of the secured cable section.
4. Cabling slack can be placed in the cabinet/rack area as well as the ceiling areas if fully supported by the proper pathway device. No more than 4 feet per horizontal run shall be stored.
5. No particular order is required between workstation cabling terminations or Access Point cabling terminations.
6. The ports are to be populated beginning with port one in sequence, leaving no open ports.



7. It is not a requirement to fill the unused ports with blanks.

#### F. Patch Cords

1. Small diameter Category 6A patch cords, as manufactured by Panduit (or approved equivalent) shall be provided by the contractor for the outlet or other device termination end as well as the patch panel termination end. The contractor may be asked to install the MDF/IDF/LDF patch cords in instances where the existing Edge switches are not being replaced, as part of the SBCUSD cabinet redressing requirement. These patch cords for the most part shall be either 8" in length or 12" in length as required with preference given to the 8" length where it can be used without strain.
2. Small diameter Category 6A patch cords, as manufactured by Panduit (or approved equivalent), utilized for all patching shall be of appropriate length and engaged into the associated terminated jack, then coiled and left to be engaged into the device at the appropriate time.
3. As a space saving effort, SBCUSD requires the diameter of the patch cable shall not exceed .150" as manufactured by Panduit (or approved equivalent).
4. The connector end of the patch cord shall provide a tangle-free latch design as manufactured by Panduit (or approved equivalent).
5. A Category 6A small diameter, tangle-free latch design patch cord for devices in lengths appropriate for the specific workstation shall be delivered to SBCUSD. The SBCUSD IT Representative will confirm the quantities and lengths required per site. At no time shall a patch cord exceeding 5 meters be required.

#### G. Cable Management

1. As part of SBCUSD's efforts to maximize cabinet/rack space utilization, no new horizontal cable management devices shall be installed. See Cabinets/Racks Redressing Requirements.
2. Rear cable management devices to support cables to the point of termination are to be utilized. A towel bar style bracket is acceptable as long as the cables are neatly and securely attached via Velcro straps.
3. Vertical wire management may be utilized when appropriate.

#### H. Labeling

1. All workstation outlets, Access Points, and patch panel termination ports are to be labeled with the SBCUSD standard labeling system.
2. The standard labeling system is as follows:
  - a. The patch panel termination location followed by the port number
    - 1) Example: IDF-A1 to port 07                      A1-07 (workstation cable)
    - 2) Example: IDF-A1 to port 07                      A1-W07 (Access Point cable)
3. A wrap around label shall be installed at each end of the cable no more than 4 inches from the point of termination presenting the same alphanumeric scheme.

#### I. Warranty

1. Installers must be Panduit/General certified and be able to provide the Certification Plus System Warranty for 25 years.
2. Installer Requirements



- a. Certification Plus System Warranties are only available when installed by a Panduit ONESM Partner accredited with the Deploy competency as of the date of installation. Such Partners must meet various criteria imposed by Panduit to achieve such status, including maintaining minimum levels of trained technicians and sales staff, and having a RCDD or Panduit-approved equivalent on staff.
- 3. Issuing the Warranty Certificate
  - a. Once the structured cabling system has been installed, registered, and validated by Panduit, a Certification Plus System Warranty Certificate will be issued to the end user, providing the confidence and security in the newly installed Panduit structured cabling system.

## **PART 3 - EXECUTION**

### **3.01 ACCEPTANCE OF INSTALLED CABLING**

- A. Cabling installer MUST provide Fluke (or equivalent) test results for each cable drop installed, showing the overall length of the horizontal cabling and the Pass/Fail status of the cable being tested. Fail results would require the installer to re-terminate both ends and re-test until it passes. Should re-termination fail to resolve the issue, then the installer must re-pull that run of cable.

### **END OF SECTION**







## SECTION 27 13 00

### VOICE AND DATA NETWORK SYSTEM

#### PART 1-GENERAL

##### 1.1 SCOPE

A. The Contractor shall furnish all labor, materials, appliances, tools, equipment, facilities transportation and services necessary for and incidental to performing all operations in connection with furnishing, delivery and installation of the work of this Section, complete as shown on the applicable Contract Drawings and/or specified herein.

1. This specification document provides the requirements for the installation, programming, and configuration of a voice and data network distribution system. This system shall include, but not be limited to:

- a) Main Distribution Frame (MDF)
- b) Intermediate Distribution Frames (IDF)
- c) Fiber optic cable
- d) Copper cable
- e) Cable terminations
- f) Workstation outlets
- g) Telephone outlets
- h) Acceptance testing
- i) Documentation and labeling
- j) Associated peripheral devices

B. Any material and/or equipment necessary for the proper operation of the system, which is not specified or described herein, shall be deemed part of this Specification.

1. Exception: Active electronics (i.e. Switches, routers etc.) shall be provided by the Owner/District.

C. The voice and data network system specified herein shall be interfaced with the site telephone system.



1. Contractor shall coordinate with the Owner/District or his representative to ascertain the requirements of the telephone interface.

## 1.2 QUALIFICATIONS

### A. Equipment

1. This specification is based on the equipment of manufacturer{s} who have been approved by the Owner/District. The Manufacturer{s} herein named shall be considered as meeting the requirements of this specification.

2. The equipment manufacturer shall be a United States manufacturer, who has been regularly engaged in the manufacture of data network systems for at least thirty (30) years.

3. Equipment provided for this project shall be the product of Panduit/General Cable. No substitutions shall be approved.

4. All equipment shall conform to applicable codes and ordinances.

5. All equipment shall bear the label of a Nationally Recognized Testing Laboratory (NRTL) such as Intertek Testing Services NA, Inc.(ITSNA - formerly ETL) or Underwriters Laboratories Inc.(UL) and be listed by their re-examination service.

### B. System Supplier/Installer

1. The system shall be provided and installed by the Manufacturer's Authorized Distributor who is trained and certified by the Manufacturer in the proper installation, programming, service and maintenance of the system.

2. The System Supplier/Installer shall hold a valid State of California Contractor's License, C-10.

3. The System Supplier/Installer shall show satisfactory evidence, upon request, that he maintains a fully equipped service organization capable of furnishing adequate inspection, service and maintenance of the system. The System Supplier/Installer shall maintain at his facility the necessary spare parts in the proper proportion as recommended by the manufacturer to maintain and service the equipment being supplied.

4. The System Supplier/Installer shall be prepared to offer a service contract for the maintenance of the system beyond the warranty period.

5. The System Supplier/Installer shall be an established data network, communications and electronics contractor that has and currently maintains a locally run and operated business for at least twenty (20) years.



a) The System Supplier/Installer shall have a Registered Communications Distribution Designer (RCDD) on staff at the time of the bid.

6. The System Supplier/Installer shall perform the entire installation consisting of: Wiring, Device Connection Terminations, Programming, In services and Warranty repair.

7. The System Supplier/Installer shall be a low voltage systems contractor, normally engaged in the business of data network systems installation.

8. The System Supplier/Installer shall designate one person to act as the project manager having total responsibility for communications and project technical integrity. This project manager shall have a minimum of three (3) years' experience as a supervisor and installer of the systems specified herein.

### 1.3 RELATED SPECIFICATIONS

A. The conditions of the General Contract (General, Supplementary, and other Conditions) and the Division 1- General Requirements specifications are hereby made a part of this Section.

1. Basic Electrical Materials and Methods
2. Wiring Methods
3. Building Wire and Cable
4. Raceways and Boxes
5. Cabinets and Enclosures
6. Telephone System

#### B. RELATED WORK BY OTHERS

1. Reference Part 3, sub-section 3.01 of this specification.

### 1.4 APPLICABLE CODES & STANDARDS

A. 2007 Building Standards Administrative Code, Part 1, Title 24, California Code of Regulations

B. 2007 California Building Code (CBC) Part 2, Title 24, California Code of Regulations (2006 Uniform Building Code, Volumes 1, 2 & 3 with 2007 California Amendments)

C. 2007 California Electrical Code (CEC) Part 3, Title 24, California Code of Regulations (2005 National Electrical Code with 2007 California Amendments)

D. 2007 California Fire Code (CFC) Part 9, Title 24, California Code of Regulations (2006 Uniform Fire Code with 2007 California Amendments)



E. ADA - Americans with Disabilities Act

F. CAC -California Administrative Code, Title 24

G. EIAITIA (Electronics Industries Alliance/Telecommunication Industry Association) 568  
Commercial Building Wiring Standard

## 1.5 SUBSTITUTIONS

A. The data network distribution system shall be Panduit/General Cable AS PER  
OWNER/DISTRICT STANDARDS. No substitutions shall be approved.

## 1.6 SUBMITTALS

A. Within thirty-five (35) calendar days after the date of the award of the contract. The Contractor shall submit to the Architect for review, eight (8) copies of a complete Submittal Package. The Submittal Package shall consist of the following sections, with each section separated with index tabs.

### 1. Title Page

- a) Project Title
- b) Project address
- c) Architect's name and address
- d) Contractor's name and address

### 2. Index of Submittal Contents

a) Each Section of the Submittal Package shall be numbered chronologically and shall be summarized in the Index.

### 3. Certifications

- a) Index of Certification Section Contents
- b) Valid State of California Contractors License
- c) Manufacturer's Certifications
  - 1) Authorized Distributor
  - 2) Factory Trained Technician



#### 4. Project List

a) A substantial list (minimum of 10) of completed projects equal in scope to that specified herein. Contact information shall be made available upon request.

#### 5. Product Data

- a) Index of Equipment Data Sheets
- b) Manufacturer's Data Sheets at a minimum for the following:
  - 1) Main Distribution Frame MDF
  - 2) Intermediate Data Frame IDF
  - 3) Fiber Optic enclosures and adapters
  - 4) Copper patch panels
  - 5) Fiber Optic cable
  - 6) Copper cable
  - 7) Fiber Optic cable terminations
  - 8) Voice and Data outlets and faceplates
  - 9) Applicable Listings and Approvals

## PART 2 - PRODUCTS

### 2.1 GENERAL REQUIREMENTS

A. All components of the computer data network system shall be products of a single manufacturer or manufacturer partnered system in order to provide one single product component and cabling system performance warranty direct from a single point of contact to the Owner/District. The factory warranties must include a product component warranty and a system performance warranty. The factory warranty period shall not be less than 20 years.

- 1. The equipment model numbers specified herein are that of the Panduit/General Cable.

#### B. Section Includes

1. Voice and Data Network System for school applications and shall at a minimum consist of the following:

- a) Main Distribution Frame (MDF)



- b) Intermediate Distribution Frame (IDF)
- c) Fiber Optic Cable Distribution
- d) Copper Cable Distribution
- e) Workstation outlets
- f) Telephone outlets

## 2.2 SYSTEM COMPONENTS

### A. Main Distribution Frame - MDF

1. Middle Atlantic - Model No. WRK-44-27
2. Floor standing, enclosed rack
3. UL Listed and EIA compliant 19" equipment rack
4. Dimensions-83-1/8" H.x 24-1/4"W.x 27-1/2" D.
  - a) Racking Height -77" (44 space)
  - b) Useable Depth - 25-3/4"
5. Accessory components that can be provided within the MDF rack are as follows:
  - a) Plexi Front Door
    - 1) Middle Atlantic -Model No. PFD-44
      - (a) Provide a quantity of (1) per cabinet
  - b) Vertical wire management
    - 1) Middle Atlantic -Model No.LACE-44LP
      - (a) Provide a quantity of (1) minimum
  - c) Horizontal wire management
    - 1) Middle Atlantic -Model No. WMPLSE
      - (a) Provide a quantity as required
  - d) Rack mount power strip
    - 1) Middle Atlantic -Model No. PD-915R
      - (a) Provide a quantity of (1) minimum



e) Rack mount fan

1) Middle Atlantic - Model No. QFAN

(a) Provide a quantity of two (2) minimum

f) Fiber Optic Enclosure

1) Panduit - Model No. FRME72EBL

(a) Accepts a maximum of 144 SC terminations

(b) Provide a quantity equal to the number of fiber optic cables multiplied by the number of strands per cable and a minimum of 20% spare capacity.

2) Panduit - Model No. FRME54EBL

(a) Accepts a maximum of 108 SC terminations

(b) Provide a quantity of (1)

3) Panduit - Model No. FRME36EBL

(a) Accepts a maximum of 72 SC terminations

(b) Provide a quantity of (1)

g) Fiber Optic Adapter Panels

1) Panduit - Model No. FAP3WDSC

(a) Pre-loaded with three (3) duplex SC adapters (total of 6 adapters)

(b) Provide a quantity of two (2) for each 12 strands fiber optic cable originating in the MDF as indicated on plans

2) Panduit - Model No. FAP6WDSC

(a) Pre-loaded with six (6) duplex SC adapters (total of 12 adapters)

(b) Provide a quantity of one (1) for each 12 strands fiber optic cable originating in the MDF as indicated on plans

h) Blank Fiber Optic Panel Adapter

1) Panduit - Model No. FAPB

(a) Provide a quantity as required to fill up fiber optic enclosures.

i) Copper Patch Panels



1) 96 port Category 6

(a) Panduit - Model No. DP96688WGP

2) 48 port Category 6

(a) Panduit - Model No. DP48688WGP

3) 24 port Category 6

(a) Panduit - Model No. OP24688WGP

4) Provide quantities of 96, 48 and 24 port patch panels as required to equal the number of local jacks served from the MDF as indicated on plans and a minimum of 20% spare capacity.

**B. Intermediate Distribution Frame - IDF**

1. Middle Atlantic - Model No. DWR-21-22PD

2. Wall mount, enclosed rack

3. UL Listed and EIA compliant 19" equipment rack

4. Complete with Plexi Front Door

5. Dimensions-43-13/16" H.x24-7/16"W.x 22" D.

a) Racking Height -36-1/4" (21 space)

b) Useable Depth - 20"

6. Accessory components that can be provided with the IDF rack are as follows:

a) Horizontal wire management

1) Middle Atlantic - Model No.WMPLSE

(a) Provide a quantity as required

b) Rack mount power strip

1) Middle Atlantic - Model No. PD-915R

(a) Provide a quantity of one (1) minimum

c) Rack mount fan

1) Middle Atlantic - Model No. QFAN

(a) Provide a quantity of one (1) minimum

d) Fiber Optic Enclosure

1) Panduit - Model No. FMTJW24



(a) Accepts a maximum of 48 SC terminations

(b) Provide a quantity of one (1)

2) Panduit - Model No. FAP3WDSC

(a) Pre-loaded with three (3) duplex SC adapters (total of 6 adapters)

(b) Provide a quantity of two (2) for each 12 strands fiber optic cable terminating in the IDF as indicated on plans

3) Panduit - Model No. FAP6WDSC

(a) Pre-loaded with six (6) duplex SC adapters (total of 12 adapters)

(b) Provide a quantity of one (1) for each 12 strands fiber optic cable terminating in the IDF as indicated on plans

e) Blank Fiber Optic Panel Adapter

1) Panduit Model No. - FAPB

(a) Provide a quantity as required to fill up fiber optic enclosure.

f) Copper Patch Panels

1) 96 port Category 6

(a) Panduit - Model No. DP96688WGP

2) 48 port Category 6

(a) Panduit - Model No. DP48688WGP

3) 24 port Category 6

(a) Panduit - Model No. DP24688WGP

4) Provide quantities of 96, 48 and 24 port patch panels in each IDF as required to equal the number of local jacks served from the IDF as indicated on plans and a minimum of 20% spare capacity.

C. Fiber Optic Cable

1) General Cable -Model No. CG0124M1A-DWB

a) Twelve (12) strand multi-mode outdoor loose tube

b) 62.5/125 - Core/Cladding Diameter

D. Fiber Optic Connectors

1) Leviton -Model No. 49884-MSC



- a) 62.5 Multi-mode SC type fiber connector
- b) Provide a quantity of two (2) per fiber strand

#### E. Copper Cable

##### 1) General Cable - Model No. 7133703

- a) Cable(s) serving workstation outlets
- b) One (1) - four (4) pair #24 AWG . UTP (Unshielded Twisted Pair) blue, per jack as indicated on plans
- c) EIA/TIA Category 6 compliant
- d) For use in above ground, non-plenum rated applications
  - 1) Cables shall not have a radius bend greater than 75%.
  - 2) Cables shall be laid at least 2 feet from any fluorescent ballast (in places where this is not possible, the architect shall be notified and the architect will provide the final disposition.
    - (a) Where cables are bundled, then they shall be tied at least every 2 feet.
    - (b) Cables from each classroom or administrative area will be pulled and punched down based upon the attached drawing.
    - (c) No cable will be run through exposed room areas without the direct approval of the architect.
    - (d) When laying cable above a ceiling area, it is to be suspended above the ceiling and tied for anchorage.

#### F. Voice and Data Outlets

- 1. All data jacks shall be Panduit "Minicom" Series
- 2. Category 6, RJ45, jack
  - a) Panduit -Model No. CJ688TGBU
    - 1) Snap-in type
    - 2) Finish blue
- 3. Coverplate
  - a) 2 snap-In ports with designation ID kit
    - 1) Panduit - Model No CFPL21W
      - (a) Finish - verify with Architect



b) 4 snap-in ports with designation ID kit

1) Panduit -Model No.CFPL41W

(a) Finish - verify with Architect

c) 6 snap-in ports with designation ID kit

1) Panduit - Model No. CFPL61W

(a) Finish - verify with Architect

d) Blank snap-ins

1) Panduit -Model No. CMBIW-X

(a) Finish - verify with Architect

### PART 3 - EXECUTION

#### 3.1 DIVISION OF WORK

A. While all work included under this specification is the complete responsibility of the contractor, the division of actual work listed following shall occur.

1. All conduits with pullcords, all electrical pullboxes, grounding rods, all outlet boxes, terminal cabinets, backboards, etc., which form part of the rough-in work shall be provided and installed completely by the Contractor. Coordinate as necessary for proper installation.

2. The balance of the system, including installation of initiating devices, notification appliances and equipment, making all connections, etc., shall be performed by the System Supplier/Installer.

3. All 120VAC power conductors and conduits associated with power circuits to all low voltage system equipment locations shall be provided and installed by the Contractor.

4. An insulated stranded copper ground wire shall be provided from each equipment rack to the building grounding system, in compliance with CEC Article 250, by the Contractor.

5. Labeling of pull boxes and terminal cabinets shall be provided and installed by the Contractor.

#### 3.2 INSTALLATION

A. All work shall be completed in strict accordance with all applicable cable codes and ordinances, by a qualified Manufacturer's Authorized Distributor.

B. Horizontal cable routing will be through the use of overhead hangers, raceways, conduits and/or cable trays, and/or wall conduits.



C. MDF/IDF Backboard terminations shall be terminated on AT&T 110 AA1-100 termination strips. The termination strips shall be installed on the 3/4" treated plywood backboard space provided in all telecommunication closets/rooms.

1. The number of pairs, equipment ports, and/or workstations to be terminated by the Contractor will be specified in the attached construction documents.

2. The MDF will provide cable to serve work areas located throughout the building(s) as follows:

a) Cabling consisting of active 4-pair" Category 6" UT cable(24AWGARMM) to be wired to each designated voice and data outlet identified in the documentation. The cable will be installed and terminated at each end by the Contractor.

b) Discrete and individually designated IDF/MDF AT&T 110 backboard fields for PBX, telephone company lines, and data system port fields.

c) Discrete and individually designated AT&T 110 backboard fields for end-user voice and data outlets.

3. Voice and/or Data Stations. Each four-pair 24 AWG voice and/or data cable will terminate on standard RJ-45 (8 position, 8 conductor) outlets at work locations and on the MDF/IDF AT&T 110 voice and data backboards as described above. Terminations will be allocated to the MDF/IDF termination areas and use colored designation strips. Designation strips will be marked with architectural area designation as indicated on the plans.

a) Workstation wiring. Standard wiring configuration for all work locations that includes the following:

1) Combination voice/data RJ-45 outlet sets, consisting of 1voice and 1data outlet. And dual data outlet sets, shall be located in a single 4-plex wall box location, for each workstation or equivalent.

2) Coordinate actual locations as furniture layouts are finalized by the site.

3) Surface mounted conduit systems shall provide voice, data, and/or video outlets as indicated on drawings.

4) Each voice or data outlet is to be wired from the IDF/MDF as indicated with individual pair Unshielded Twisted Pair (UTP) "Category 6" cable each voice/data outlet, two Individual or one dual 4-pair UTP "Category 6" cables.

5) The EIA/TIA 5688 wiring standard shall be adhered to for all data outlets unless otherwise directed (verify with school).

6) Whenever possible, wiring distribution will be designed but not located until such time as furniture locations have been finalized.



7) Fiber-optic Cabling. As directed by construction documentation, a fiber-optic cabling network shall be installed connecting all IDF LAN hub locations to the MDF. The fiber-optic network shall consist of:

(a) Twelve (12) multi-mode fibers, ISO (International Standards Organization) and FDDI (Fiber Distributed Data Interface) standard 62.5/125 micron core diameter; multi-mode fiber-optic cable.

(b) Connectors. AT&T ST-11 type ceramic connectors, or approved equivalent, shall be installed.

(c) Patch Panels. Appropriate manufacturer-approved patch panels.

#### 4. Wall Space:

a) All walls shall be equipped with 3/4" fire treated plywood backboards to ensure that sufficient space is available to mount termination hardware and related equipment.

b) A minimum of one 19" wall or floor-mounted rack or a lockable metal cabinet (as specified) shall be required for LAN and related equipment in each closet.

c) Power and grounding shall be provided to meet equipment manufacturer's specifications.

5. Horizontal wire and cable distribution. The District has implemented a variety of distribution methods for bringing wiring to the work location.

a) Conduit of indicated size and routing shall be installed.

6. Telephone closet terminations. Within each telephone closet all voice/data wiring and cabling will be terminated on AT&T 110AA1-100 Terminal Blocks.

a) Data terminations shall be cross-connected on AT&T 110 backboards per the 5688 telecommunications standards.

b) Data termination shall be patched via appropriate and certified Category 6 patch cords equipped with required RJ-45 and/or AT&T 110 connectors.

c) Voice terminations shall be terminated using EIA/TIA standards USOC.

D. Documentation and labeling. All cables, outlets and terminations shall be labeled and designated in accordance with District standard construction documents.

#### E. Cable/Wire

1. All cable/wire for the data network system shall be new.

2. System cable/wire and equipment installation shall be in accordance with good engineering practices as established by the Electronics Industries Alliance (EIA) and the California Electrical Code



(CEC). Wiring shall meet all applicable electrical codes. All cable/wire shall test free from all grounds and shorts.

3. All #22AWG and #24AWG connections throughout the system shall be made by spring tension clip "punch block", type 66 terminals or equal. Conductor's #20AWG and larger shall be terminated on barrier screw terminals.

4. All communication system cable/wire shall be labeled at all points of termination. All labeling shall be based on the room numbers as provided by the Owner or his representative.

5. Protection and dressing of cables:

a) Cables mounted on backboards and within equipment racks, etc., shall be grouped and securely attached to the backboard or enclosure in horizontal and vertical bundles in a neat workmanlike manner using Thomas & Betts "Ty-Rap", Panduit cable mounts and Allen-Tel cable management or equal. Edge protection material ("cat-track") shall be installed on edges of holes, lips of ducts or any other point where cables or harnesses cross metallic edge.

6. Shielding:

a) Cable shielding shall be connected to common ground at point of lowest audio level and shall be free from ground at any other point. Cable shields shall be terminated in same manner as conductors.

7. Underground cables

a) Any cable/wire pulled through manholes or pullboxes located below grade shall be continuous with no splices. The cable/wire shall be intact with no cuts in the protective outer jacket.

b) Provide 15% spare pair capacity for multi-pair cabling to each building.

F. Cable/Wire Terminations

1. All splices in above ground junction boxes shall be made on terminal strips.

### 3.3 SYSTEM START-UP

A. All start-up programming and system commissioning shall be performed by a manufacturer's trained and certified technician.

### 3.4 SYSTEM VERIFICATION

A. Subsequent to system start-up the system installer shall, at a minimum, verify that the following features are functioning property.

1. Two way talk-back

2. All call paging



3. Emergency call-in, if applicable
4. Call switches, if applicable
5. Verification of call station identifications with room numbers provided by the Owner or his representative.

### 3.5 ACCEPTANCE TESTING

1. The system installer shall, in the presence of the Inspector of Record (IOR), perform 100% testing as noted in System Verification above.

### 3.6 DOCUMENTATION

- A. Provide the following directly to the Supervisor of Technology Service.
  1. Provide a printed copy of all field programming for all components in system.
  2. Provide one copy of all diagnostic software with copy of field program for each unit.
  3. Provide one copy of all service manuals, parts list, and internal wiring diagrams of each component of system.
  4. Provide one copy of all field wiring runs, location and end designation of system.

### 3.7 MANUFACTURER 'S FIELD SERVICES

- A. The contractor shall, at the owner's request, make available a service contract offering continuing factory authorized service of this system after the initial warranty period.
- B. The system manufacturer shall maintain engineering and service departments capable of rendering advice regarding installation and final adjustment of the system.

### 3.8 IN SERVICE TRAINING

- A. Provide complete "in service" instructions of system operation to school personnel. Assist in programming of telephone system.
- B. The Contractor shall instruct personnel designated by the Owner in the proper use, basic care and maintenance of the system beyond the warranty period.
- C. The contractor shall provide a minimum of eight hours of in-service training with this system. These sessions shall be broken into segments, which will facilitate the training of individuals in the operation of this system. Operators Manuals and Users Guides Manual shall be provided at the time of this training.

### 3.9 GUARANTEE AND WARRANTY



A. Guarantee all parts, labor, and workmanship furnished under this contract for the minimum period of twelve months from the date of substantial completion, or first formal use by the Owner, whichever is last to occur. During the warranty period, report to the site and repair or replace any defective materials or workmanship without cost to the Owner. Non-emergency Warranty service shall be rendered within 24 hours after request by the Owner. Emergency service shall be provided within 8 hours of request by owner. Equivalent replacement equipment shall be temporarily provided when immediate on-site repairs cannot be made. Where warranties on

Individual pieces of equipment exceed twelve months. The guarantee period shall be extended to the warranty period of the particular items.

B. After completion of the work the Contractor shall submit a Certificate of Warranty, stating commence and expiration dates and conditions of the warranty, for signature of both participating parties. Incremental warranties for completed portions of the work may be negotiated at the discretion of the Owner, if delays occur beyond the control of the Contractor.

1. Panduit PAN-NET Performance Guarantee

a) All Panduit Pan-Net non-consumable products have a 20 year warranty.

3.10 EQUIPMENT MANUFACTURER'S REPRESENTATIVE

A. All work described hereinto be done by the manufacturer's authorized representative shall be provided by a documented factory authorized representative of the basic line of equipment to be utilized.

B. As further qualification for bidding and participating in the work under this specification the manufacturer's representative shall hold a valid C-10 Contractor's License issued by the Contractor's State License Board of California. The manufacturer's representative shall have completed at least ten (10) projects of equal scope, giving satisfactory performance and have been in the business of furnishing and installing Data systems of this type for at least five (5) years. The manufacturer's representative shall be capable of being bonded to assure the owner of performance and satisfactory service during the guarantee period.

C. The manufacturer's representative shall provide a letter with submittals from the manufacturer of all major equipment stating that the manufacturer's representative is an authorized distributor. This letter shall also state the manufacturer guarantees service performance for the life of the equipment, and that there will always be an authorized distributor assigned to service the area in which the system has been installed.

D. The contractor shall furnish a letter from the manufacturer of the equipment, which certifies that the equipment has been installed according to factory intended practices, that all the components used in the system are compatible and that all new portions of the systems are operating satisfactorily. Further, the contractor shall furnish a written unconditional guarantee, guaranteeing all parts and all labor for a period of one (1) year after final acceptance of the project by the owner.



END OF SECTION



## SECTION 27 51 00

### INTEGRATED COMMUNICATIONS SYSTEM

#### PART 1- GENERAL

##### 1.01 SCOPE

- A. Install new Bogen Quantum Multicom IP VoIP-Enabled Communications System. Upon completion of the work, the existing integrated communications system shall be complete with all the capabilities of the latest San Bernardino City Unified School District standards for integrated communications systems as noted in this specification. All provisions for a complete and operable system and tied in with the VoIP Telephone System, if being installed under a separate specification section shall be included under this scope of work. All Telephone Equipment including System Headend, Handsets and cabling are not part of this specification section.
- B. The Contractor shall furnish all labor, materials, appliances, tools, equipment, facilities transportation and services necessary for and incidental to performing all operations in connection with furnishing, delivery and installation of the work of this Section, complete as shown on the applicable Contract Drawings and/or specified herein.
- C. Any material and/or equipment necessary for the proper operation of the system, which is not specified or described herein, shall be deemed part of this Specification.
- D. The Integrated Communications System specified herein shall be interfaced with the site telephone system.
  - 1. Contractor shall coordinate with the Owner or his representative to ascertain the required number of telephone to intercom circuit interfaces (minimum of four).

##### 1.02 QUALIFICATIONS

- A. Equipment
  - 1. This specification is based on the equipment of manufacturer(s) who have been approved by the Owner and the Manufacturer(s) herein named shall be considered as meeting the requirements of this specification.
  - 2. The equipment manufacturer shall be a United States manufacturer, who has been regularly engaged in the manufacture of communication systems for at least thirty (35) years.
  - 3. **Equipment provided for this project shall be the product of Bogen Communications, Inc., Engineered Systems Division. No substitutions shall be approved.**



4. All equipment shall conform to applicable codes and ordinances.
5. All equipment shall bear the label of a Nationally Recognized Testing Laboratory (NRTL) such as Intertek Testing Services NA, Inc. (ITSNA - formerly ETL) or Underwriters Laboratories Inc. (UL) and be listed by their re-examination service.

B. System Supplier/Installer

1. The system shall be provided and installed by the Manufacturer's Authorized Distributor who is trained and certified by the Manufacturer in the proper installation, programming, service and maintenance of the system.
  - a) **Contact Bogen Communications, Inc., Engineered Systems Division (480) 892-7614 for the local authorized distributor.**
2. The System Supplier/Installer shall hold a valid State of California Contractor's License, C-10.
3. The System Supplier/Installer shall show satisfactory evidence, upon request, that he maintains a fully equipped service organization capable of furnishing adequate inspection, service and maintenance of the system. The System Supplier/Installer shall maintain at his facility the necessary spare parts in the proper proportion as recommended by the manufacturer to maintain and service the equipment being supplied.
4. The System Supplier/Installer shall be prepared to offer a service contract for the maintenance of the system beyond the warranty period.
5. The System Supplier/Installer shall be an established communications and electronics contractor that has and currently maintains a locally run and operated business for at least twenty (40) years.
6. The System Supplier/Installer shall perform the entire installation consisting of: wiring, device connection terminations, programming, inservices and warranty repair.
7. The System Supplier/Installer shall be a Low voltage systems Contractor, normally engaged in the business of sound reinforcement / intercom systems installation.
8. The System Supplier/Installer shall designate one person to act as the project manager having total responsibility for communications and project technical integrity. This project manager shall have a minimum of three (5) years experience as a supervisor and installer of the systems specified herein.

1.03 RELATED SPECIFICATIONS

- A. The conditions of the General Contract (General, Supplementary, and other Conditions) and the Division 1 - General Requirements specifications are hereby made a part of this Section.



1. Basic Electrical Materials and Methods
2. Wiring Methods
3. Building Wire and Cable
4. Raceways and Boxes
5. Cabinets and Enclosures
6. Master Clock
7. Telephone System

**B. RELATED WORK BY OTHERS**

1. All conduits with pull cords, all electrical pull boxes, grounding rods, terminal cabinets, backboards and all outlet boxes shall be provided and installed by the Division 16 Contractor. Coordinate as necessary for proper installation. Specialty boxes shall be provided by the system Supplier/Installer and shall be installed by the Division 16 Contractor.
2. All 120VAC power conductors and conduits associated with power circuits to all low voltage system equipment locations shall be provided and installed by the Division 16 Contractor.
3. An insulated stranded copper ground wire shall be provided from each equipment rack to the building grounding system, in compliance with CEC Article 250, by the Division 16 Contractor.
4. Labeling of pullboxes and terminal cabinets shall be provided and installed by the Division 16 Contractor.

**1.04 APPLICABLE CODES & STANDARDS**

- A. 2016 California Administrative Code, Part 1, Title 24, California Code of Regulations
- B. 2016 California Building Code (CBC), Part 2, Title 24, California Code of Regulations  
(2015 International Building Code, Volumes 1 & 2 with 2016 California Amendments)
- C. 2016 California Electrical Code (CEC) Part 3, Title 24, California Code of Regulations  
(2014 National Electrical Code with 2016 California Amendments)
- D. 2016 California Fire Code (CFC) Part 9, Title 24, California Code of Regulations  
(2015 International Fire Code with 2016 California Amendments)

**1.05 SUBSTITUTIONS**



**A. No substitutions shall be approved.**

**1.06 SUBMITTALS**

A. Within thirty-five (35) calendar days after the date of the award of the contract, the Contractor shall submit to the Architect for review, one (1) electronic and two (2) hard copies of a complete Submittal Package. The Submittal Package shall consist of the following sections, with each section separated with index tabs.

**1. Title Page**

- a) Project Title
- b) Project address
- c) Architect's name and address
- d) Contractor's name and address

**2. Index of Submittal Contents**

- a) Each Section of the Submittal Package shall be numbered chronologically and shall be summarized in the Index.

**3. Certifications**

- a) Index of Certification Section Contents
- b) Valid State of California Contractors License
- c) Manufacturer's Certifications
  - 1) Authorized Distributor
  - 2) Factory Trained Technician

**4. Project List**

- a) A substantial list (minimum of 20) of completed projects equal in scope to that specified herein.
  - 1) Contact information shall be made available upon request.

**5. Product Data**

- a) Index of Equipment Data Sheets
- b) Manufacturer's Data Sheets including cable types



1) Applicable Listings and Approvals

**PART 2- PRODUCTS**

2.01 GENERAL REQUIREMENTS

- A. The Integrated Communications System shall provide a comprehensive communication network between administrative and staff locations. The central processor and switching unit shall be of modular plug-in printed circuit board type, using HMOS microprocessor and TTL logic and HCMOS memory and sensing. HCMOS circuitry shall be protected with transient voltage surge suppression devices on all inputs and outputs. Non-volatile EPROM shall store permanent memory and non-volatile EEPROM shall store field-programmable memory. Systems, which use a battery to maintain system configuration information, shall not be acceptable.
- B. The system is to be designed and configured for maximum ease of service and repair. All major components of the system shall be designed as a standard component of one type of card cage. All internal connections of the system shall be with factory-keyed plugs designed for fault-free connection. The printed circuit card of the card cage shall be silk screened to indicate the location of each connection.
- C. Plug disconnect: All major equipment components shall be fully pluggable by means of multi-pin receptacles and matching plugs to provide for ease of maintenance and service.

2.02 ACCEPTABLE MANUFACTURERS

- A. The equipment model numbers specified herein are that of the **Bogen Communications, Inc., Ramsey, New Jersey**.
  - 1. The intent is to establish a standard of quality, function and features. It is the responsibility of the bidder to insure that the proposed product meets or exceeds every standard set forth in these specifications.
- B. The functions and features specified are vital to the operation of this facility; therefore, inclusion in the list of acceptable manufacturers does not release the contractor from strict compliance with the requirements of this specification.

2.03 SECTION INCLUDES

- A. Integrated Communications System for School Application
  - 1. Intercom System - Two way communication between any administrative phone and any classroom speaker.
    - a) Call initiation switches. (As required on drawings)
  - 2. Classroom telephones.



3. Public Address System
4. Master Clock functionality with bell schedules and timed events.
5. Public automated building exchange system (Passing Bells)
6. Voice over Internet Protocol (VoIP) communication modules.
7. Interface to Private Branch Exchange (PBX) or Voice over Internet Protocol (VoIP) system.
8. Telemedia control of VCR's, DVD's laser disk players.
9. Digital Video on Demand Server/ Encoder
10. Graphical Interface Emergency Response/Crisis Management

#### 2.04 SYSTEM SOFTWARE PARAMETERS

- A. The communication system shall be a Bogen Quantum Multicom IP, and shall provide a comprehensive communication network between administrative areas and staff locations throughout the facility. Nonvolatile memory shall store permanent memory and field-programmable memory. A system, which uses a battery to maintain system configuration information, shall not be acceptable. The system shall provide no less than the following features and functions:
  1. Telephonic communication (complete with DTMF signaling, dial tone, ringing and busy signals, and data display) on administrative stations shall use two wires. Systems that use more than two wires for communication, tones and data display shall not be acceptable.
  2. Amplified-voice communication with loudspeakers shall use a shielded audio pair (shield can be used as one of the two required conductors for administrative phone or call-in switch).
  3. The system shall be available in the following configurations:
    - a) QSW Wall-mounted in a custom enclosure. Station capacity shall be from 24 to 130 stations. All stations shall have the ability to support displays.
    - b) QSR Rack-mounted. Station capacity shall be from 24 to 250 stations. All telephone stations shall have the ability to support displays.
    - c) QRC24 & QRC48 Compact Quantum Rack System. Station capacity shall be from 24 to 48 stations. All stations shall have the ability to support displays, with an option to add up to 8 Central Office phone lines.



- d) 2223/2233 MC2KR Rack-mounted and integrated with Bogen Multi-Graphic Series 2223 or Series 2233 equipment. In this configuration, Quantum Multicom IP system station capacity shall be expandable up to 250 stations in increments of 24. All telephone stations shall have the ability to support displays. The Multi-Graphic system equipment provides the following: backup fail safe intercom and paging functions (Note: the systems operate independently; if one were to fail, the other provides intercom for student safety), plus two additional program channels, and additional Multi-Graphic functions. It shall be possible, by use of a separate call-in switch, to annunciate only to the Multi-Graphic portion of the system without using additional station ports within the Quantum Multicom IP system.
  - 1) The above system configurations represent a single processor in the Quantum Multicom IP. Each processor can be combined with up to 63 additional systems (nodes) for a total single facility capacity of up to 16,000 stations. Up to 99 additional facilities can communicate with each other to provide district-wide point-to-point calling and All-Call Paging with up to 1,600,000 stations.
- 4. The system shall consist of any combination of the following: Administrative Display Phones, Administrative VoIP Phones, and Administrative Phones.
  - a) Staff Classroom Stations shall consist of wall- or ceiling-mounted loudspeakers with call-in switches or handsets.
  - b) Administrative phone stations shall consist of VoIP phones, display phones, or DTMF dialing 2500 analog-style telephone sets.
  - c) Administrative Display Phones shall be DTMF-dialing digital telephone sets with a 4x16 character LCD display panel. They shall be equipped with a standard 12-key push-button dialing keypad. Phones requiring external LCD displays shall not be accepted as an equal. Optionally, a loudspeaker may be connected at each administrative station location.
    - 1) Up to 5 Administrative Wall Displays may be added to the Administrative Station for large office areas.
  - d) Administrative Display Phones and Administrative Phones shall have the option of including a loudspeaker.
  - e) All types of stations except administrative VoIP phones shall utilize the same type of field wiring. Future station alterations shall only require the station type to be changed and the proper software designation to be selected. Alterations shall not require field wiring or system head-end alterations. All field wiring and system head-end equipment shall support any type of station, at the time of installation. All contractor proposals shall reflect this capacity. Failure to submit and bid this



project in this manner will be deemed as being in direct conflict of these specifications and will be rejected.

- f) There shall be no limit to the number of administrative display stations within the total capacity of the system.
  - g) It shall be possible at any time to change the type of station at any location without equipment or wiring changes except for administrative VoIP phones that utilize existing LAN connections. Systems that limit the quantity of each station type or require future additional equipment and/or system expansion to provide additional administrative telephones shall not be accepted as an equal.
5. The system shall be a global switching system, providing up to 512 unrestricted simultaneous private telephone paths per facility. The system shall also be capable of providing up to 512 amplified intercom paths per facility. One amplified intercom path shall automatically be provided with each increment of 24 stations of system capacity. All hardware, etc., required to achieve the necessary number of amplified-voice intercom channels for this system shall be included in this submittal. Amplified-voice intercom channels shall provide voice-activated switching. Systems requiring the use of a push-to-talk switch on administrative telephones shall not be acceptable. There shall be an automatic level control for return speech during amplified-voice communications. The intercom amplifier shall also provide control over the switch sensitivity and delay times of the VOX circuitry.
6. It is of utmost importance that emergency calls from staff stations receive prompt attention. Therefore, it is important that there be an alternate destination in case the emergency call does not get answered at the primary location. To this end:
- a) The system shall provide 911 Dial-Through with specific outside line(s) dedicated only for this function to ensure that the line is available all the time for 911 calls. The 911 Dial-Through is available to any station that can dial.
  - b) The 911 CO lines will be pre-configured and reserved. If the 911 reserved lines are busy, the normal CO lines will be connected to route the 911 calls. If all the normal CO lines are busy, the ongoing call shall be disconnected and the 911 call shall be placed.
  - c) Staff-generated Emergency calls shall be treated as the second highest system priority. Therefore, all Emergency calls shall annunciate at the top of the call queue of their respective administrative telephone(s). Should that emergency call go unanswered for 15 seconds, the call shall be re-routed to an alternate speaker station then prompt the caller to make a verbal call for help. During the transfer, the original administrative telephone shall continue to ring the distinctive Emergency Ring. Should the Emergency Transfer to Station have an associated administrative telephone, it too shall ring the distinctive Emergency ring.
  - d) The Emergency Transfer to Station shall be field programmable.



- e) Should the original administrative telephone be engaged in a non-emergency conversation, its conversation shall be automatically terminated, indicated with an alert tone, and then reconnected to the station that generated the Emergency Call.
  - f) Should the administrative telephone be engaged in an emergency conversation, successive emergency calls shall log into the call queue as well as transfer to the Emergency Transfer Station for their verbal call for help. Upon termination of the initial emergency conversation, the next one shall immediately ring the administrative telephone.
  - g) Systems failing to transfer unanswered Emergency calls or failing to immediately connect to the administrative telephone shall not be deemed as equal.
7. There shall be a System-Wide Facility Emergency All-Call feature. The Emergency All-Call shall be accessed from designated administrative phones or by the activation of an external contact closure which shall give the third audio program input emergency status. The Emergency All-Call function shall have the highest system priority and shall override all other loudspeaker-related functions including Time Tone Distribution.
- a) Considering that emergencies calls are to be treated with the highest level of concern. Systems which do not regard Emergency-All-Call page from an administrative telephone with the highest priority shall not be deemed as equal.
  - b) Upon picking up the receiver and dialing "9", a menu shall appear on the display prompting the user to enter each subsequent digit. In this way, the user shall not be required to memorize complicated key sequences in order to access emergency functions.
  - c) The Emergency All-Call shall capture complete system priority, and shall be transmitted over all speakers in the facility. It shall also activate an external relay, which can be used to automatically override volume controls and other systems.
  - d) Systems without Emergency All-Call, or systems with All-Call that cannot be activated by external means, or which do not capture complete system priority or activate an external relay, shall not be acceptable.
8. There shall be at least four Dedicated Emergency Alarm Tones. Each may be accessed by dialing a three-digit number from designated administrative telephones. These emergency tones should be separate from the time tones. Systems using external alarm generators, or having less than four emergency alarm tones shall not be acceptable.
- a) Upon picking up the receiver and dialing "9", a menu shall appear on the display prompting the user to enter each subsequent digit. In this way, the user shall not be required to memorize complicated key sequences in order to access Emergency Alarm Tones.



9. There shall be four (4) External-Function Relay Driver Outputs, accessible from designated Quantum Commander Users or Administrative Display Telephones by dialing a four-digit number. These outputs remain set until accessed and reset at a later time. The user shall have the ability to review the status of each relay driver. A plain English menu, prompting the user through the fields without requiring the user to remember any dialing sequences shall support this feature. Systems that require the user to remember complicated dialing schemes or prompt the user via cryptic commands shall not be deemed equal.
  - a) The stations shall be capable of being programmed for security contact relays for use with magnetic locks, motion detectors, cameras or any low-voltage, dry contact creating device. System using security stations for control of external functions shall not be acceptable.
  - b) Upon picking up the receiver and dialing "9", a menu shall appear on the display prompting the user to enter each subsequent digit. In this way, the user shall not be required to memorize complicated key sequences in order to access external relay functions.
10. There shall be a program-material interface included with each node, which shall accept up to four (4) Bogen Power Vector Series program modules. Systems requiring an external program source interface shall not be acceptable.
11. There shall be an outside line feature. The circuitry shall interface with the station ports of an external telephone system, and shall provide facilities for up to 960 incoming lines per facility which shall be designated by the user to ring "day" and "night" administrative display stations or administrative stations. Where an administrative display station is designated to receive outside line calls, the phone shall ring with a unique tone and the outside line number shall appear on the display panel. The option shall also provide the ability to make outside line calls from Administrative Display Stations or Administrative Stations. This ability shall be programmable for each phone and there shall be thirty-two Classes of Service available to any station. This feature shall be capable of supporting DID, DISA, and a Security DISA function.
  - a) Cellular system access for Security is of the utmost concern. Wireless security page offers a password-protected Security DISA feature that shall be accessible only from authorized Police, Fire, Emergency personal or an off-premise security office, which monitors the facility's security system. It shall function as follows: upon confirmation of the password DISA number, the system shall allow security personnel to dial access any station and monitor the activity without pre-announce tone or the privacy tone. This will then allow the security office to determine exactly what the conditions are in the station and the actions need to be taken.
12. The system shall provide for field-programmable three-, four-, five-, or six-digit architectural station numbers.



13. There shall be an automatic level control for return speech during amplified-voice communications.
14. Each station loudspeaker shall be assignable to any one, any combination, or all of 64 Multi-purpose zones or any of the 16,000 hard-wired zones per facility.
  - a) Each station loudspeaker shall be assignable to any one, any combination, or all of 64 Multi-purpose zones. Systems with less than 64 Multi-purpose zones shall not be acceptable.
15. There shall be thirty-two (32) Flexible Time-Signaling Schedules with a total of 1024 user-programmed events per facility. Each event shall sound one of user-selected tones or external audio. It shall be possible to assign each schedule to a day of the week, or manually change schedules from an authorized Quantum Commander User via Web browser. Systems, which do not provide a minimum of thirty-two (32) flexible time-signaling schedules or a choice of eight (8) time tones plus external audio, shall not be acceptable.
16. An internal program clock (with battery backup) shall be included, allowing a total of 1024 user-programmed events per facility. It shall be possible to synchronize the internal program clock with an external master clock. Systems, which do not provide an internal program clock and/or can not synchronize with an external master clock to meet these specifications, are not equal.
  - a) There shall be thirty-two (32) flexible time-signaling schedules. It shall be possible to assign each schedule to a day of the week, or manually change schedules from an authorized Quantum Commander User via Web browser on the LAN/WAN.
  - b) The built-in Master Clock corrects time by accessing the LAN/WAN NTP time server.
  - c) The Quantum Processor is capable of adjusting the Daylight Savings Time automatically.
  - d) Each event shall be able to be directed to any one or more of the sixty-four (64) Multi-purpose time-signaling zones.
  - e) Each of the 64 Multi-purpose zones shall have a programmable "tone duration" unique unto itself. For example: the gymnasium shall receive a time tone for ten (10) seconds while the rest of the facility receives a tone for five (5) seconds.
  - f) Each event shall sound one of eight (8) user-selected tones or external audio. Each event may utilize a different custom tone. It shall be utilized to send the gymnasium, shop classes, and pool (if necessary), a separate time tone to indicate "clean up." Minutes later the entire facility can then receive the same time tone to indicate class change.



- g) Each of the eight (8) Distinct Time Tone Signals may be manually activated by selected Administrative Display Phones or from an authorized Quantum Commander User via web-browser. These tone signals shall remain active as long as the telephone remains off-hook, or until canceled from the keypad or Quantum Commander.
    - 1) Upon picking up the receiver and dialing "9", a menu shall appear on the display prompting the user to enter the next digit. In this way, the user shall not be required to memorize complicated key sequences in order to access manual time-tone functions.
    - 2) Systems that do not provide at least thirty-two (32) flexible time signaling schedules or do not provide automatic activation of schedules shall not be acceptable.
17. There shall be a zone-page/all-page feature that is accessible by selected administrative VoIP phones and administrative phones.
- a) There shall be automatic muting of the loudspeaker in the area where a page is originating.
  - b) There shall be a pre-announce tone signal at any loudspeaker selected for voice paging.
18. There shall be a voice-intercom feature that is accessible by selected administrative phones, administrative VoIP phones and all administrative display phones.
- a) There shall be a periodic privacy tone signal at any loudspeaker selected for amplified-voice communication.
  - b) There shall be a pre-announce tone signal at any loudspeaker selected for voice-intercom communication.
  - c) Privacy and pre-announce tone signals shall be capable of being disabled during system initialization.
  - d) There shall be an automatic switchover to private telephone communication should the person at the loudspeaker pick up his handset.
  - e) By picking up the receiver and dialing the first digit of the number of the station to be called, that number shall appear on the display along with a loudspeaker symbol, prompting the user to enter the next digits. There shall be no confusion as to the type of conversation that is to be established.
19. There shall be a telephonic communication feature, which is accessible by all Administrative VoIP Phones, Administrative Phones, and Administrative Display Phones.



- a) There shall be an audible ring signal announcing that a call has been placed to that station.
- b) Upon picking up the receiver and dialing \* (star), a telephone symbol shall appear on the display, prompting the user to enter the number of the station to be called. There shall be no confusion as to the type of conversation that is to be established.
- c) There shall be an automatic disconnect of Staff Handsets left off-hook to prevent them from tying up communications channels. The station shall receive a busy signal and shall automatically disconnect after 45 seconds. Systems shall also be capable of doing off hook emergency call-in.
- d) There shall be an automatic disconnect of Administrative Display Phones, Administrative VoIP Phones, and Administrative Phones to prevent them from tying up communications channels. When a phone goes off-hook and does not initiate a call within ten seconds, the station shall receive a busy signal and shall automatically disconnect after 45 more seconds.
- e) Staff and Administrative Phone Stations may be programmed to ring an Administrative Display Phone during day hours and another Administrative Phone during night hours. Day and Night Hours shall be user-programmable. Assignment of Staff Stations shall not be restricted to any particular Administrative Station. Systems that limit the number and assignment of staff call-in to particular Administrative Station of Administrative Stations shall not be acceptable.

20. Each staff call station shall be programmable for one of three call-in types, as follows:

- a) Normal / Emergency
- b) Urgent / Emergency
- c) Emergency
  - 1) Staff Call Stations programmed for access Normal / Emergency or Urgent / Emergency shall be able to initiate an emergency call by repeated flashing of the hook switch or repeated pressing of the call-in switch. Systems, which require additional switches and/or conductors to initiate an emergency call, shall not be acceptable.
  - 2) Emergency Calls from Administrative VoIP Phones, Administrative Phones or Staff Call Switch Stations shall interrupt a non-emergency call in progress at the designated Administrative Display Phone. The administrator shall receive a warning tone and be connected to the emergency caller. The disconnected party shall receive a busy signal. Systems which do not provide emergency call interrupt shall not be acceptable.



- 3) It shall be possible to connect a single push emergency call-in switch to any Administrative VoIP Phone or Administrative Phone, without effecting normal station operation.
  - 4) Normal and Urgent calls shall be logged into queue for the designated administrative display phones.
  - 5) Administrative Display Phones shall ring for a period of 45 seconds when they receive a call, and then stop ringing.
  - 6) Each queue shall first be sorted according to call priority (emergency calls, then urgent calls, and then normal calls). Calls are sorted within each priority level on a first-in, first-out basis. When a call is answered, it shall automatically be removed from the queue. Systems, which do not sort calls according to priority and order received, shall not be acceptable. 1) The display shall simultaneously show up to four (4) Staff Call Switch Station Calls pending. Additional calls, beyond four (4), shall be indicated by an arrow pointing down thus prompting the user that additional calls are waiting.
  - 7) It shall be possible to answer any incoming call simply by picking up the handset while it is ringing. It shall not be necessary to hit any buttons to answer a call unless the call has dropped into the queue.
21. Administrative VoIP Phones or Administrative Phones shall receive dial tone upon going off-hook. Outgoing calls are made by dialing the desired station. Incoming calls can be directed to the telephone or to the associated loudspeaker for a hands-free reply. There shall be an automatic switchover from loudspeaker to private telephone communication should the person pick up the handset.
- a) Administrative VoIP Phones or Administrative Phones shall be able to make a normal call to any Administrative Display Phone by dialing the number. They shall also be able to initiate an Emergency Call by flashing the hook switch. Emergency Calls shall ring the Designated Day/Night Administrative Display Phone and then their speaker will be connected to the emergency station if not answered within a predetermined time period. The system shall provide for selected administrators to have a PIN Numbers. By dialing the PIN at any system telephone, the administrator shall have access to emergency paging regardless of the restrictions on the particular phone being used.

## 22. Student Phone

- a) Student Phone shall be supported. The Student Phone can only make 10-digit (7 digit or less than or equal to 10 digit), 0 local and 911 calls. The call duration shall be set to 5 minutes. The dial tone shall be fed momentarily at 00:04:30, 00:04:40, 00:04:50, then at five minutes, calls are disconnected. The student phone can not receive any incoming calls.



- b) The Station is not allowed to dial the same number within 30 minutes and a busy signal shall be fed to the Station if the number is dialed.
23. Administrative Display Phones shall be equipped with a 4x16 character alphanumeric display panel.
- a) Administrative Display Phones shall receive dial tone upon going off-hook. Outgoing calls are made by dialing the desired stations. Incoming calls can be directed to the telephone or to the associated loudspeaker for a hands-free reply. There shall be an automatic switchover from loudspeaker to private telephone communication should the person pick up his handset.
  - b) The display shall normally show the time of day and day of week, the current time signaling schedule, and the numbers of up to four stations calling in along with the call-in status of each station (normal, urgent, emergency). When dialing from the Administrative Display Phone, the display shall indicate the station number and type of station (loudspeaker or handset) being dialed.
  - c) The display shall also provide user-friendly menu selections to assist the operator when paging and distributing program material. Displays shall be in English with internationally recognized symbols for maximum ease of use. Systems, which require the operator to memorize long lists of operating symbols or control codes, shall not be acceptable.
  - d) Administrative Display Phones shall be programmable for one of 3 station types for system access, as follows:
    - 1) Shall permit dialing any station in the system; turn program material on/off at their location; scroll, erase and auto-dial call-waiting queue; make conference calls and transfer calls; call forward to other administrative stations; make all-zone pages and emergency all-zone pages; have access to outside lines and be designated to receive outside line calls.
    - 2) Select and distribute or cancel program material to any combination of stations, paging zones, or all zones; set/reset alarm/external functions and zone paging.
    - 3) Bump or join a conversation in progress, manually initiate time tones.
  - e) Program selection, and its distribution or cancellation shall be accomplished from a designated administrative display telephone, with the assistance of the menu display system. Distribution and cancellation shall be to any one, or combination of speakers, or any zone(s), or all zones. It shall be possible to provide three program channels at the same time.
  - f) It shall be possible, via an Administrative Display telephone, to manually initiate any of eight (8) tones or any of the emergency tones. The tones shall be separate



and distinctly different from the emergency tones. The tone selected shall continue to sound until it is canceled, or until the administrative display phone is placed back on-hook.

- g) Each Administrative Phone shall maintain a unique queue of all stations calling that particular phone.

24. System programming shall be from an authorized Quantum Commander User via Web browser. All system programming data shall be stored in nonvolatile memory. A valid password shall be required to gain access to the following programmable functions:

- a) Station Initialization shall be accomplished from an authorized Quantum Commander User via web browser. All station initialization data shall be stored in nonvolatile memory. A password (separate from the password necessary for system programming) shall be required to gain access to the following station initialization parameters:
  - 1) Programming and diagnostics shall be built into the Quantum Commander Web server browser and be accessible only by authorized personnel. Diagnostics shall indicate passes and failures of system memory, system clock, all audio busses, tone generators, DTMF generators and decoders and the integrity of the field wiring.
  - 2) The diagnostics feature shall be the Quantum Commander. It shall be possible to individually select the test and card, or all to run diagnostics on. This shall be a standard feature of the system and supplied at the time of installation. It shall be accessible only by authorized stations and personnel.
  - 3) Systems not capable of supporting web-based diagnostics and any computer interface for programming and diagnostics, nor supportive of built-in diagnostics for the end user shall not be deemed as equal.

25. Rollover EOL (End-Of-Line Device)

- a) This feature shall be supported for all the Stations (Staff/Enhanced/Admin/SIP) configured with a loudspeaker. Based on the dialed sequence, (\*xxx, xxx) the call will be connected to the corresponding station/speaker. If the speaker/station is busy, the call is rolled over to the station/speaker corresponding to that station.
- b) If a handset station, configured with this feature, is busy when an Admin User calls the station, the call shall be rolled over to the associated speaker. If the speaker is also busy in this case, then the Admin call can bump the conversation.
- c) Rollover End-of-Line features not applicable with the Station with Call Switch or Station without the speaker.



- d) For calls initiated by a call switch or a non-dial handset, rollover to the admin speaker shall not happen.

26. Admin AAA Group (Always An Answer)

- a) This is an Administrative Phone feature. This feature shall be programmed from the Bogen Commander. A maximum of 10 Admin Phones will be supported in an Admin Group and there shall be a maximum of 32 Admin Groups per facility.
- b) Once the Admin Group is set:
  - 1) For normal calls, if the primary Day/Night Admin Phone is busy/no answer, all the phones in the Admin Group shall ring.
  - 2) For emergency calls, if the primary day/night phone does not answer, all the phones in the Admin Group shall ring.
  - 3) On no answer from any of the admin phones and if the emergency announce link is configured, the call shall be transferred to the emergency announce link as per the existing procedures.
  - 4) On answer from any of the Admin Phones, all the other phones shall stop ringing.

2.05 SYSTEM REQUIREMENTS

- A. The Integrated Communications System expansion shall be **Bogen Quantum Multicom IP** to match existing at site.
- B. The system shall provide no less than the following features and functions:
  - 1. Integration to public branch-exchange for a complete and integrated telephone intercommunication solution. All features and functionality's of the system shall be accessible from the Private Branch Exchange (PBX or phone switch) or Expansion Key Service Unit (EKSU), so as not to depend on the administrative phones for all functionality.
  - 2. The system shall be available in the following conguration:
    - a) Rack mount.
    - b) Single rack (node) capacity from 24 to 250 stations per node, 64 nodes per facility equaling a total of 16,000 stations per site, 100 site capacity.
    - c) All telephone stations shall have the ability to support displays.
  - 3. The system shall consist of any combination of Administrative, Staff and Enhanced Staff Stations.



- a) A minimum of one (1) Administrative Telephone required per system.
- b) The maximum number of Administrative Telephones with displays shall only be limited by the Station capacity of the system.
  - 1) Systems that limit the quantity of each type of Station or require rewiring or additional equipment and/or system expansion to provide additional Administrative Telephones shall not be accepted as equal.
- c) Administrative Stations
  - 1) DTMF dialing telephone sets with a four (4) line by 16-character LCD display panel.
  - 2) Standard 12 key pushbutton dialing keypad
  - 3) Loudspeaker may be connected at each location
  - 4) Optional loudspeaker may be included
  - 5) Membrane-type keypads shall not be accepted as equal
  - 6) Special function keys to perform common functions shall not be accepted as equal
- d) Staff Station
  - 1) Wall or ceiling mount loudspeaker with call-in switch
- e) Enhanced Staff Station
  - 1) DTMF dialing telephone sets connected to the PBX or EKSU
  - 2) Systems that require telephones to be connected to the intercom system shall not be acceptable
  - 3) Optional loudspeaker may be included
- f) All Station types shall utilize the same field wiring
  - 1) Future Station alterations shall require station type change only, not field wiring or head-end alterations. All field and system head-end equipment shall support any type of Station, at the time of installation. All proposed substitutions shall reflect this capacity. **Failure to submit or bid this project in compliance with this feature will be in direct conflict of this Specification and will be rejected.**



4. The system shall be capable of providing up to four (4) simultaneously amplified-voice intercom paths. One amplified intercom path shall automatically be provided with each increment of 24 stations of system capacity.
  - a) All hardware, etc. required to achieve the maximum number of amplified-voice intercom channels for this system shall be included in this submittal.

C. Remote Access

1. The system shall be capable of remote access via LAN/WAN network.
  - a) Remote access features and functions shall include the following:
    - 1) Perform programming of the main processor including all system features and functions noted elsewhere in this specification.
    - 2) The capability to perform system diagnostics and access integral system report software regarding the current system status for the following:
      - (a) Processors
      - (b) Station Cards
      - (c) Amplifiers
      - (d) Speaker Outputs
      - (e) Call Switch Outputs
    - 3) Activation of bell schedules and programming of specific events, zones and action taken.
    - 4) Activation of all time tones, all calls, zone pages and call forwarding.
    - 5) Monitoring of unlimited areas for security purposes.
  - b) External Device Server
    - 1) Shall support RS-232, RS-422 and RS-485 serial connections
    - 2) Shall configure via HTTP, DHCP, Telnet or serial
    - 3) Shall be capable of Flash ROM upgrades
    - 4) Network Interface – (10Base-T or 10Base-T/100Base-TX) Ethernet
    - 5) Serial Interface – DB25F, RS-232/RS-422/RS-485 serial port with DCE configuration.



- 6) Shall be capable of modem emulation and accept modem AT commands on the serial port to establish a network connection to the system.
  2. The contractor shall provide all active electronics, software and peripheral equipment for a complete and operable system.
  3. **Systems not capable of remote access requirements of this specification will not be considered acceptable.**
- D. Graphical Interface Emergency Response/Crisis Management
1. The intercom system shall be capable of interfacing with a web based emergency management system. The emergency management system shall offer two communications using the intercom speakers located throughout the campus.
    - a) Web based graphical interface
      - 1) System shall allow for graphical representations of the school site & floor plan showing locations of emergency exits, security cameras, emergency access points, hazardous material storage, utility connections and safe zones to be used by emergency personnel.
      - 2) System shall allow for web controlled password protected covert monitoring of any speaker location thru the intercom system in emergency situations by authorized emergency personnel.

## 2.06 SYSTEM COMPONENTS

### A. CONSOLE

1. Rack-mounted equipment shall be Bogen Model TCPER
  - a) Rack-TCPER61 / TCPER77 (size rack as required)
2. MCRMP
  - a) Rack-mounting panel. Includes the following components:
    - 1) MC512A-Power Supply (1 per system)
    - 2) MC2626B-Power Supply (1 for up to 120 stations, 2 for more than 120 stations)
    - 3) MCAPI-Audio Program Module Interface Assembly (1 per system)
3. MCRMF



- a) Rack mounting mainframe (1 per 120 stations). Includes built-in ventilation fans and the following circuit cards:

- 1) QSPC1-Processor card (1 per system)
- 2) MCACB-Analog card (1 per 24 stations)
- 3) MCSC-Station card (1 per 24 stations)
- 4) MCJCA-Ribbon cable assembly (interconnects 2 MCRMF)

#### 4. MCRM

- a) Relay module (1 per 24 stations). Mounts to:

- 1) MCRRP-Stand-alone configuration.

#### 5. Program Sources

- a) Bogen DST-1 Digital Stereo Tuner
- b) Denon DN-300z Multimedia Player with Bluetooth
- c) Provide AM/FM Antenna as needed

#### 6. Power Amplifiers

- a) HTA-125A-125 watt
- b) HTA-250A-250 watt

#### 7. Optional Equipment ( as required )

- a) MCTC-Telephone access card
- b) TMC4 – 4 channel IR interface
- c) DVS – Digital Video Server
- d) DVSES – Digital MPEG Encoding Station

### B. PERIPHERAL DEVICES

#### 1. ADMINISTRATIVE DISPLAY PHONE MCDS4

- a) Administrative display phones shall be Bogen Model MCDS4. The administrative telephone display panel shows the time of day and day of week, the current time signaling schedule, and the station numbers and call-in priority of staff stations



that have called that particular administrative station. A 2-key response is used to scroll the display, and answer or erase normal and urgent calls. Depending upon the system access level, an administrative station can use display menus to activate zone pages, alarm signals and external functions, as well as select program sources and distribute or cancel a program to any or all speakers or zones.

- 1) Administrative stations have the option of dialing either the loudspeaker or phone at each station location. An automatic switch from phone-to-intercom to phone-to-phone communication is made when the staff handset is lifted.
- 2) A built-in program clock, with battery back up, is included to automatically control class change or other signals. The clock may be synchronized with a master clock. 1024 events may be programmed into the system's eight time signaling schedules.

## 2. OFFICE AND CLASSROOM TELEPHONE STATIONS

- a) All Office and Classroom telephone station will be provided under a separate specification section and are not the responsibility of this specification section contractor.

## 3. SPEAKERS

- a) Interior speakers ceiling mounted shall be Bogen S86T725PG8W with Lowell P875X back box and SS24 tile support rails. Speaker grille shall be Lowell JG8X
- b) Interior speakers wall mount shall be Bogen MB8TSL
- c) Exterior speakers shall be Bogen FMH15T with Bogen SGHD8 Grille and FMHAR8 adapter kit. Speaker back box shall be Bogen BBFM6 for flush mount applications and Bogen BBSM6 for surface mount applications.
- d) All speaker cables shall be individually homerun back to the main intercom backboard. Speaker cable shall be West Penn 290 or equal by Belden.
- e) Wiring shall be done per manufacturer's recommendation
- f) All #22AWG connections throughout the system shall be made by spring tension clip "punch block", Siemons type 66 terminals or equal. Conductors #20AWG and larger shall be terminated on barrier screw terminals.
- g) All communication system cable/wire shall be labeled at all points of termination. All labeling shall be based on the room numbers as provided by the Owner or his representative.

### 2.07 AUXILIARY SYSTEMS

San Bernardino City Unified School District

**North Park Elementary School Admin. Addition & Modernization**

RCA Project No.: 1-78-22

INTEGRATED COMMUNICATIONS

SYSTEM SYSTEMS

27 51 00 - 22



#### A. CLOCK SYSTEM

1. Wireless Analog Classroom clocks shall be 14155 - 12" inch round, battery operation, surface mount type. All clocks shall be 14155 series exclusively manufactured by Primex Wireless to match existing standards throughout the school school district.
2. Wireless Analog Gymnasium, Multipurpose Rooms and Library clocks shall be 16" inch round, battery operation, surface mount. Clocks installed in the Gymnasium shall include wire guards. All clocks shall be Primex Wireless series exclusively manufactured by Primex Wireless to match existing standards throughout the school school district.
3. All wireless clocks will act as a repeater and a transmitter.
4. All wireless clocks will be interfaced with the Primex Wireless transmitter and utilize Network Time Server for synchronization of bell and clocks.

#### 2.08 WIRE AND CABLE

1. All wire and cables shall be new and unused. All wire and cable shall be enclosed in conduit unless otherwise noted. Wire not installed in equipment racks, not portable, or not installed in conduit shall meet all applicable codes.
2. Indoor dry location
  - a) **Westpenn Model No. 290 or approved equal**
    - 1) 22/2 conductor cable, CMR rated, non-plenum, complete with PVC jacket
3. Outdoor wet location (cable pairs to be sized as required for 15% spare capacity)
  - a) **Tappan Cable Model No. 2250BT15/CMR/WB or approved equal**
    - 1) 22/15 pair – Individual shielded pairs cable, CMR/WB rated, complete with black underground/direct burial, sunlight resistant rated PVC jacket
  - b) **Tappan Cable Model No. 2250BT8/CMR/WB or approved equal**
    - 1) 22/8 pair – Individual shielded pairs cable, CMR/WB rated, complete with black underground/direct burial, sunlight resistant rated PVC jacket
4. Protection
  - a) The contractor shall provide all necessary transient protection on the AC power feed and on all station lines leaving or entering the building.
  - b) The contractor shall note in his system drawings, the type and location of these protection devices as well as all wiring information. Such devices are not to be installed above the ceiling.



## 2.09 TERMINAL CABINETS & JUNCTION BOXES

1. All terminal cabinet and junction boxes are to be provided and installed by the Division 16 Prime Contractor. This contractor and the prime contractor shall coordinate mounting locations prior to install.

## PART 3– EXECUTION

### 3.01 DIVISION OF WORK

- A. While all work included under this specification is the complete responsibility of the contractor, the division of actual work listed following shall occur.
  1. All conduits with pull cords, all electrical pull boxes, grounding rods, all outlet boxes, terminal cabinets, backboards, etc., which form part of the rough-in work shall be provided and installed completely by the Division 16 Contractor. Coordinate as necessary for proper installation.
  2. The balance of the system, including installation of initiating devices, notification appliances and equipment, making all connections, etc., shall be performed by the System Supplier/Installer.
  3. All 120VAC power conductors and conduits associated with power circuits to all low voltage system equipment locations shall be provided and installed by the Division 16 Contractor.
  4. An insulated stranded copper ground wire shall be provided from each equipment rack to the building grounding system, in compliance with CEC Article 250, by the Division 16 Contractor.
  5. Labeling of pullboxes and terminal cabinets shall be provided and installed by the Division 16 Contractor.

### 3.02 INSTALLATION

- A. All work shall be completed in strict accordance with all applicable codes and ordinances, by a qualified Manufacturer's Authorized Distributor.
- B. Cable/Wire
  1. All cable/wire for the communications system shall be new.
  2. System cable/wire and equipment installation shall be in accordance with good engineering practices as established by the Electronics Industries Alliance (EIA) and the California Electrical Code (CEC). Wiring shall meet all applicable electrical codes. All cable/wire shall test free from all grounds and shorts.



3. All #22AWG and #24AWG connections throughout the system shall be made by spring tension clip "punch block", Siemon type 66 terminals or equal. Conductors #20AWG and larger shall be terminated on barrier screw terminals.
4. All communication system cable/wire shall be labeled at all points of termination. All labeling shall be based on the room numbers as provided by the Owner or his representative.
5. Protection and dressing of cables:
  - a) Cables mounted on backboards and within equipment racks, etc., shall be grouped and securely attached to the backboard or enclosure in horizontal and vertical bundles in a neat workmanlike manner using Thomas & Betts "Ty-Rap", Panduit cable mounts and Allen-Tel cable management or equal. Edge protection material ("cat-track") shall be installed on edges of holes, lips of ducts or any other point where cables or harnesses cross metallic edge.
6. Shielding:
  - a) Cable shielding shall be connected to common ground at point of lowest audio level and shall be free from ground at any other point. Cable shields shall be terminated in same manner as conductors.
7. Underground cables
  - a) Any cable/wire pulled through manholes or pullboxes located below grade shall be continuous with no splices. The cable/wire shall be intact with no cuts in the protective outer jacket.
  - b) Provide 15% spare pair capacity for multi-pair cabling to each building.

#### C. Cable/Wire Terminations

1. All splices in above ground junction boxes shall be made on terminal strips.

### 3.03 SYSTEM START-UP

- A. All start-up programming and system commissioning shall be performed by a manufacturer's trained and certified technician.

### 3.04 SYSTEM VERIFICATION

- A. Subsequent to system start-up the system installer shall, at a minimum, verify that the following features are functioning properly.
  1. Two way talk-back
  2. All call paging



3. Emergency call-in, if applicable
4. Call switches, if applicable
5. Verification of call station identifications with room numbers provided by the Owner or his representative.

#### 3.05 ACCEPTANCE TESTING

1. The system installer shall, in the presence of the Inspector of Record (IOR), perform 100% testing as noted in System Verification above.

#### 3.06 DOCUMENTATION

A. Provide the following directly to the Supervisor of Technology Service.

1. Provide a printed copy of all field programming for all components in system.
2. Provide one copy of all diagnostic software with copy of field program for each unit.
3. Provide one copy of all service manuals, parts list, and internal wiring diagrams of each component of system.
4. Provide one copy of all field wiring runs, location and end designation of system.

#### 3.07 MANUFACTURER'S FIELD SERVICES

- A. The contractor shall, at the owner's request, make available a service contract offering continuing factory authorized service of this system after the initial warranty period.
- B. The system manufacturer shall maintain engineering and service departments capable of rendering advice regarding installation and final adjustment of the system.

#### 3.08 IN SERVICE TRAINING

- A. Provide complete "in service" instructions of system operation to school personnel. Assist in programming of telephone system.
- B. The Contractor shall instruct personnel designated by the Owner in the proper use, basic care and maintenance of the system beyond the warranty period.
- C. The contractor shall provide a minimum of eight hours of in-service training with this system. These sessions shall be broken into segments, which will facilitate the training of individuals in the operation of this system. Operators Manuals and Users Guides shall be provided at the time of this training.

#### 3.09 FACTORY TRAINING & CERTIFICATION



- A. The manufacturer shall provide factory certified training to two (2) technicians employed by the school district. These technicians shall be trained and certified as manufacturers certified technicians capable of performing any work on the system after the installation of the system.
- B. All cost for training including travel, lodging, meals and per diem shall be included in the installing contractors base bid price for this section.

### 3.10 GUARANTEE AND WARRANTY

- A. Guarantee all parts, labor, and workmanship furnished under this contract for the minimum period of twelve months from the date of substantial completion, or first formal use by the Owner, whichever is last to occur. During the warranty period, report to the site and repair or replace any defective materials or workmanship without cost to the Owner. Non-emergency Warranty service shall be rendered within 24 hours after request by the Owner. Emergency service shall be provided within 8 hours of request by owner. Equivalent replacement equipment shall be temporarily provided when immediate on-site repairs cannot be made. Where warranties on individual pieces of equipment exceed twelve months, the guarantee period shall be extended to the warranty period of the particular items.
- B. After completion of the work the Contractor shall submit a Certificate of Warranty, stating start-up and expiration dates and conditions of the warranty, for signature of both participating parties. Incremental warranties for completed portions of the work may be negotiated at the discretion of the Owner, if delays occur beyond the control of the Contractor.

### 3.11 EQUIPMENT MANUFACTURER'S REPRESENTATIVE

- A. All work described herein to be done by the manufacturer's authorized representative shall be provided by a documented factory authorized representative of the basic line of equipment to be utilized.
- B. As further qualification for bidding and participating in the work under this specification the manufacturer's representative shall hold a valid C-10 Contractor's License issued by the Contractor's State License Board of California. The manufacturer's representative shall have completed at least ten (20) projects of equal scope, giving satisfactory performance and have been in the business of furnishing and installing sound systems of this type for at least five (35) years. The manufacturer's representative shall be capable of being bonded to assure the owner of performance and satisfactory service during the guarantee period.
- C. The manufacturer's representative shall provide a letter with submittals from the manufacturer of all major equipment stating that the manufacturer's representative is an authorized distributor. This letter shall also state the manufacturer guarantees service performance for the life of the equipment, and that there will always be an authorized distributor assigned to service the area in which the system has been installed.



- D. The contractor shall furnish a letter from the manufacturer of the equipment, which certifies that the equipment has been installed according to factory intended practices, that all the components used in the system are compatible and that all new portions of the systems are operating satisfactorily. Further, the contractor shall furnish a written unconditional guarantee, guaranteeing all parts and all labor for a period of one (1) year after final acceptance of the project by the owner.

END OF SECTION



**SECTION 28 13 53.11**  
**IP NETWORK COMPATIBLE INTERCOM (IX SYSTEM)**

**GENERAL**

**1.01 SECTION INCLUDES**

- A. IP Video Intercom. (Aiphone IX Series s system)

**1.02 RELATED SECTIONS**

- A. Section 27 10 00.10 - Ethernet Cabling.

**1.03 REFERENCES**

- A. Standards Institute (ANSI/TIA/EIA) 568 - Commercial Building Telecommunications Cabling Standard.
- B. International Organization for Standards (ISO) 9001:2000 - Quality Management Systems - Requirements.

**1.04 SYSTEM DESCRIPTION**

- A. IP Network Compatible Video Intercom System: A network-based communication and security system featuring video entry security, internal communication, emergency stations, and paging. All units and app in the systems shall be able to unlock doors remotely on a network, view and assist onsite visitors from an offsite location, broadcast emergency announcements, and communicate using a PoE network.
  - 1. Power Source: Power over Ethernet (802.3af).
  - 2. Network Interface: 10 BASE-T / 100 BASE-TX Ethernet CAT 6a (RJ-45).
  - 3. Network Protocols: IPv4, IPv6, TCP, UDP, SIP, HTTP, HTTPS, MJPEG, RTSP, RTP, RTCP, IGMP, MLD, SMTP, DHCP, NTP, DNS.
  - 4. Bandwidth Usage:
    - a. G.711: 64Kbps x 2 per video call.
    - b. 64Kbps per monitor.
    - c. H.264: 24Kbps ~ 2,048Kbps.
  - 5. Communication: Hands-free (VOX), push-to-talk (simplex), or handset (full-duplex).
  - 6. Video Display: 7 inches color LCD.
  - 7. Camera: Type:
    - a. 1/4 inch (6 mm) color CMOS.
    - b. View Area: 2 feet 2 inches (660 mm) vertical x 3 feet 1 inch (940 mm) horizontal at 20 inches (508 mm).
    - c. Resolution: VGA or higher
  - 8. Video Stream: ONVIF Profile S.
  - 9. Door Release: Programmable Form C dry contact, 24V AC/ DC, 500mA (which requires 24V DC power supply).
    - a. District standard electric strike: HES model 9600 Series 24 V DC.



10. Power Source for electric strike: Atop AD1048-24FS 48W/24DIN-Rail 24V DC.
11. Wire Type: CAT-6a. (District standard: Panduit)
12. Distance:
  - a. Base Bid to include up to 100 l. f. of cabling
  - b. Maximum allowable to any station to Network Node: not to exceed 330 feet (100 meters).

#### **1.05 SUBMITTALS**

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  1. Preparation instructions and recommendations.
  2. Storage and handling requirements and recommendations.
  3. Installation methods.
- C. Shop Drawings: Submit the following:
  1. Wiring Diagrams: Indicate wiring for each item of equipment and interconnections between items of equipment.
  2. Include manufacturer's names, model numbers, ratings, power requirements, equipment layout, device arrangement, complete wiring point-to-point diagrams, and conduit layouts.
- D. Installation and Operation Manuals:
  1. Submit manufacturer's installation and operation manual, including operation instructions and component wiring diagrams.
  2. Provide detailed information required for Owner to properly operate equipment.
- E. Warranty: Submit manufacturer's standard warranty.

#### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: ISO 9001:2008 certified company.
- B. Installer Qualifications: Factory trained and experienced with system installations of scope and size required for the Project.
- C. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- D. Storage: Store materials in clean, dry area indoors in accordance with manufacturer's instructions.
- E. Handling: Protect materials during handling and installation to prevent damage.

#### **1.07 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.



## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. IP Video Intercom System: IX Series Intercom System as manufactured by Aiphone Corporation. Web site: [www.aiphone.com](http://www.aiphone.com)
- B. Requests for substitutions will be considered in accordance with provisions of Document 00 43 25 - Substitution Request Form - During Procurement.

### **2.02 SYSTEM DESIGN**

- A. Master Station(s): Provide one master station at each campus.
  - 1. Aiphone Model IX-MV7-HW Provide one per campus at designated location.
- B. Audio Video Door Stations:
  - 1. Model IX-DA - Surface Mount: Provide one per campus at designated location.  
or
  - 2. Model IX-DF - Flush Mount: Provide one per campus at designated location.
  - 3. Option: Model IX-DV - Surface Mount.
- C. Signage:
  - 1. At each Door Station/Wall Box Contractor shall provide weatherproof signage Signage: "ASSISTANCE" (English) and "ASISTENCIA" (Spanish).
- D. Functional Components: As indicated on the drawings or as required to complete system.
  - 1. Video Master Station Model IX-MV7-HW:
    - a. An IP addressable video master station with a 7 inch color LCD monitor. It can be wall or desk mounted (desk stand included. This station requires a 802.3af compliant Power-over-Ethernet network.
  - 2. Audio/Video Door Station: Model IX-DA, IX-DF, or IX-DV
    - a. Station connects to a PoE network using CAT-6a cable.
  - 3. Optional Components (Unit price items to be used at District option):
    - a. RY-IP44 IP Programmable Relay Adaptor:
    - b. 45 Degree Mullion Mounting Bracket Model KMB-45:
    - c. Stainless Steel Security Lock Box Model LB-SDVF: for IX-DF, IX-DF-HID, & IX-DF-RP10.
    - d. Stainless Steel Enclosure Model SBX-ISDVF:
      - 1) 18-Guage stainless steel enclosure designed for surface mounting the IX-DF door stations.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine areas to receive integrated security and communication system.
- B. Notify District of conditions that would adversely affect installation or subsequent use.



- C. Do not begin installation until unacceptable conditions are corrected.

### **3.02 PREPARATION**

- A. Verify the following compliance before starting installation.
  - 1. The unit turns inoperative during power failure.
  - 2. Keep the intercom wires at least 1 foot (30 cm) away from strong electrical wiring (AC 100-240 V) including, in particular, wiring for inverter electrical appliances. Noise and malfunction could result.
  - 3. If a strong light shines on the main unit screen, the picture may turn white or only silhouettes will be visible.
  - 4. Other manufacturer's devices (such as sensor, detectors, door releases) used with this system, comply with the manufacturer's installation requirements.
  - 5. The LCD panel is manufactured with very high precision techniques, inevitably will have a very small portion of its picture elements always lit or not lit at all. This is not considered a unit malfunction. Please be aware of this in advance.

### **3.03 INSTALLATION**

- A. Install integrated security and communication system in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Mount equipment plumb, level, square, and secure. For video entrance stations and video door stations, comply with manufacturer's design requirements to provide optimum picture quality of station monitoring.

### **3.04 SET-UP AND ADJUSTING**

- A. Adjust integrated security and communication system for proper operation in accordance with manufacturer's instructions.

### **3.05 DEMONSTRATION AND TRAINING**

- A. Demonstration:
  - 1. Demonstrate that integrated security and communication system functions properly.
  - 2. Perform demonstration at final system inspection by qualified representative of manufacturer.
- B. Instruction and Training:
  - 1. Provide instruction and training of Owner's personnel as required for operation of integrated security and communication system.
  - 2. Provide hands-on demonstration of operation of system components and complete system, including user-level program changes and functions.
  - 3. Provide instruction and training by qualified representative of manufacturer.
  - 4. Provide DVD copy of video recorded training session(s)



### **3.06 PROTECTION**

- A. Protect installed integrated security and communication system from damage during construction.

**END OF SECTION**







## SECTION 28 31 00

### INTEGRATED SECURITY SYSTEM

#### PART 1.0 GENERAL

##### 1.01 SCOPE & RELATED DOCUMENTS

- A. The work covered by this section of the specifications include the furnishing of all labor, equipment, materials and performance of all operations associated with the installation of the Security Alarm System as outlined. All items required to complete the installation whether detailed here in the specification or on the drawings shall be included in this contract.
- B. The requirements of the conditions of the Contract, Supplementary Conditions, and General Requirements apply to the work specified in this section.
- C. Related work in other sections or divisions:
  - 1.) Electrical (Division 26).
- D. The entire installation, including materials and equipment shall meet or exceed the minimum standards and requirements of the following:
  - 1.) Underwriters Laboratory Inc.
  - 2.) 2016 Building Standards Administrative Code, Part 1, Title 24 C.C.R.
  - 3.) 2016 California Building Code (CBC), Part 2, Title 24 (1997 UBC Volumes 1-3 and 2016 California Amendments).
  - 4.) 2016 California Electrical Code (CEC), Part 3, Title 24 C.C.R. (2002 NEC and 2004 California Amendments).
  - 5.) 2016 California Fire Code (CFC), Part 9, Title 24 C.C.R. (2002 UFC and 2001 California Amendments).
  - 6.) 2016 California Mechanical Code (CMC), Part 3, Title 24 C.C.R. (2002 UMC and 2001 Amendments).
  - 7.) 2016 California Referenced Standards Code, Part 12, Title 24, C.C.R. Title 19, C.C.R. Public Safety, State Fire Marshall Regulations.
  - 8.) Manufacturers Specifications.

##### 1.02 SUBMITTALS (ADDITIONAL REQUIREMENTS)

- A. The plans and/or bid documents for this project have already been approved by SBCUSD. The Contractor shall prepare eight (8) sets of submittal booklets, for submittal to the District for approval.
- B. The following shall be included in the submittal book:
  - 1.) Cover Sheet: Project Name, Project Location, SBCUSD project Manager, System Supplier/System Installer with C-10 License Number, UL Listing Number with Expiration Dates.
  - 2.) Table of Contents: Page numbers of all specification sheets and CSFM Listing Numbers.
  - 3.) Specification Sheets for each piece of equipment.
  - 4.) CSFM Listing Sheets.
  - 5.) Letter or Certificate from the Security Manufacturer stating that the Security Alarm Contractor is an authorized distributor of specified Security Equipment at time of bid.

##### 1.03 EQUIPMENT QUALIFICATION

- A. The specification is based upon equipment as manufactured by Edwards Systems Technology – EST as approved by the District. The equipment specified is a District Standard (per Public Contract Code 3400), is established, in order to communicate with the **EXISTING Fireworks** Central Monitoring System located at the District School Police Headquarters (EST Fireworks was provided under



separate contract and is not part of this contract). The EDWARDS EST-3 control panel shall communicate with the **EXISTING Fireworks** via District's LAN network. Coordinate with District's IT department for configuring LAN network to communicate with Security Fireworks. The system supplied shall be a microprocessor-based direct wired, multi-priority peer-to-peer networked system. The system shall utilize independently addressed, microprocessor-based Security Systems Detectors, Devices and Modules as described in this specification. It shall be complete with all necessary hardware, software and memory specifically tailored for this installation.

- B. All equipment shall conform to all applicable codes and ordinances, and shall be listed by Underwriters Laboratories and the California State Fire Marshall.
- C. A pre-approved equipment suppliers, installation and service organizations for the equipment specified is Enko Systems 909-885-7771, TRL Systems 909-.390-8392, Building Electronic Controls 909-305-1600

#### 1.04 QUALIFICATION OF BIDDERS

- A. To qualify as an acceptable bidder, whether the bid is submitted to the Owner, his agent, a general contractor or a sub-contractor, the system bidder or contractor shall be a qualified U.L. Listed Security contractor (at time of bid) and shall hold a valid C-10 License issued by the Contractors State License Board of California. The system bidder or installing contractor shall herein be referred to as the Contractor. The Contractor shall also hold a State of California Consumer Affairs License - Bureau of Collection and Investigative Services. The Contractor shall also have on staff, a minimum of Three Nicet Certified Technologists (at time of bid). This is to insure that licensed installers familiar with this type of installation will be used on this project. The Contractor shall be the factory authorized distributor (at time of bid), for the brand of equipment being installed. The Contractor shall have been in the business of supplying, installing and servicing Addressable Security Systems for the past 15 years, in the State of California. The Contractor shall be able to refer to at least **25 projects with EST-3 Security Systems** of this nature rendering satisfactory service with contact persons, phone numbers and addresses. The Contractor shall maintain a fully equipped service organization capable of furnishing adequate repair service to the equipment. The Contractor shall maintain an inventory of all major components in stock at all times. The Contractor's Office shall be located within 30 miles of the job-site. This will insure an adequate service response, in a timely matter. The Contractor shall maintain on staff for the duration of the project a minimum of two EST-3 and Fire Works Certified Installers. Contractors not pre-approved in writing 21 days prior to bid hour and date will not be considered for this project. Contractors named in 1.03C above, are considered to be pre approved for this project, and will be able to satisfy warranties already in place, when adding onto the Fire Works Central Monitoring System Program.
- B. The responsibility of the installing Contractor is to provide all submittals, wire, devices, equipment, installation to conduit system furnished and installed under Division 26, programming, final test out and communications to existing Fireworks. All specialty Security System Back-boxes for the conduit system installation provided under Division 26, shall be provided under this section. Terminal cabinets, pull boxes, etc. shall be furnished and installed under Division 26.
  - 1. Authorization Letters: At Time of Bid, Letter from the fire alarm equipment manufacturer stating that the installing security alarm contractor is a Factory Authorized Distributor, and is trained and certified for the equipment proposed on this project and is licensed to purchase and install the software required to provide the specified functions.
  - 2. Certifications: **To Be Submitted at Bid Time**
    - a. At Time of Bid, Documentation that the **security** alarm contractor has on staff personnel that are EST Fireworks factory-trained and certified for the equipment proposed for this project and licensed by the state of California. ALL certifications submitted shall be in the company name of the installing contractor.



- b. At Time of Bid, Documentation that the **security** alarm contractor has **ALL** on staff personnel factory-trained and certified for the equipment proposed for this project and licensed by the state of California. **ALL** certifications submitted shall be in the company name of the installing contractor.
- c. Any contractor submitting a bid fails to provide the requested Letter and Certifications in installing Company Name as stated above will be deemed non-responsive and their bid will not be considered for this project.

## **PART 2 SYSTEM LAYOUT**

### **2.01 SYSTEM DESCRIPTION**

- A. The Security Alarm System as outlined on the drawings and/or project documents shall be a Security System as manufactured by Edwards. It shall be complete with all necessary hardware, software and memory specifically tailored for this project.
- B. Provide a new Network System, Remote Panels, Remote Keypads, Devices, etc. in accordance with specifications and drawings. Counts for devices to be in accordance with Districts Project Documents.
- C. All equipment needed for a complete operable system, (whether specifically indicated or not) shall be included in this section. It shall be the Installing Contractors responsibility for a COMPLETE AND OPERABLE SYSTEM upon completion of this project.

### **2.02 AUTOMATIC ALARM OPERATIONS**

- A. The security alarm system operation subsequent to the alarm initiation via motion detector, door contact, tamper switch, etc., shall be as follows:
  - 1.) Individual device in alarm shall display on partition keypad, in which zone device is located.
  - 2.) Display type and location of alarm per point on the Main Control Panel.
  - 3.) Display type and location of alarm per point on Remote LCD Keypad.
  - 4.) List on printer the time, date, type and user defined message for each event printed.
  - 5.) Graphically display on the Fire Works Station, school diagram showing whole school, with graphic scrolling thru system prompts, down to point of alarm activation.
  - 6.) Subsequent alarms are to report to the Keypad, Control Panel, and Fire Works and indicate to the operator that a subsequent alarm is present, and also indicate the number of subsequent alarms.

### **2.03 AUTOMATIC SUPERVISORY OPERATION**

- A. All data, initiating, indicating and supervisory lines shall be constantly monitored for integrity. Indicate opens, shorts, grounds, at Main Control Panel, Remote Keypad and Fire Works Station.

### **2.04 OPERATION**

- A. During the normal state, the NORMAL LED (green) shall flash. The first line of the LCD shall display the time in (HH:MM:SS) as well as the number of active points (AP) and the number of disabled points (DP) in the system.
- B. When the control panel goes into alarm condition, the NORMAL LED (green) extinguishes and the ALARM LED (red) shall light, the buzzer pulsates and the LCD indicates the time, the number of messages waiting, the type of alarm, the point ID number of device, and the time that the alarm occurred. The second line is dedicated to the user specified message.



- C. To silence the panel buzzer, the operator shall press the LOCAL SILENCE button and the buzzer will silence.
- D. To silence the audible devices, the operator shall press the ALARM SILENCE button. A new alarm shall cause the audibles to resound.
- E. During the TROUBLE condition, the amber TROUBLE LED shall light, the NORMAL LED shall go out, and the buzzer shall pulsate. The display shall indicate the point ID number of the device, the time the event occurred and up to a 40 character custom user description.
- F. During the MONITOR or SUPERVISORY condition, the appropriate LED shall light, the NORMAL LED shall go out, and the buzzer shall pulsate. The display shall indicate the point ID number of the device, the time the event occurred and up to a 40 character custom user description.

### **PART 3 MATERIALS**

#### **3.01 MAIN or REMOTE CONTROL PANEL EST-3 W/CAB7/CAB14/CAB21**

- A. Control Panel construction shall be modular with solid state, micro - processor based electronics. It shall display only those primary controls and displays essential to operation during an alarm condition.
- B. A local audible device shall sound during Alarm, Trouble, Monitor or Supervisory conditions. This audible device shall sound differently at each condition, to distinguish one condition from another without having to view the panel.
- C. Primary Keys, LED's, LCD Display
  - 1.) The following primary controls shall be visible through a front access panel:
    - 8 Line by 21 Character LCD display
    - Individual System ALARM LED and Switch
    - Individual SUPERVISORY LED and Switch
    - Individual TROUBLE LED and Switch
    - Individual MONITOR LED and Switch
    - Individual RESET LED and Switch
    - Individual ALARM SILENCE LED and Switch
    - Individual PANEL SILENCE LED and Switch
    - Individual DRILL LED and Switch
    - Individual LED'S For Power, Test, CPU Fail, Gnd Fault, Disable
    - NEXT/BACK Switch Per Condition
- D. The Master Controller shall be capable of supporting up to 64 supervised system nodes per single line network without any change in hardware. Each controller shall contain a RS-232 Printer /Programming Port for programming locally via an IBM PC.
- E. Each controller shall support up to 10 Intelligent Loop Cards (SDCs). Each card shall support (125) Intelligent Security Sensors and (125) Intelligent Modules. Systems which only monitor the presence of a conventional detector in an addressable base shall not be acceptable.
- F. The Master Controller shall have the following additional features without any changes in hardware or firmware:
  - 1.) Auto Programming and Electronic Addressing of Field Devices.
  - 2.) Logic Statements.
  - 3.) Time Controls.
  - 4.) Sequences.
  - 5.) Actions.
  - 6.) Analog Value Reporting of all analog sensors and traditional zones.
  - 7.) Maintenance Reporting by Intelligent Sensor.
  - 8.) Alarm Verification by point or zone. (0-60 Seconds).
  - 11.) Print a history of Sensors Activating the Verification Cycle.
  - 12.) On demand system condition printouts (status).
  - 13.) Enabling and Disabling of any system device or function.
  - 14.) Ground Fault Detection by Panel, by Signature Data Circuit, and by Device



- Module.
- 15.) Normal and Silent One Man Test.
- 16.) Windows Based Programming.
- 17.) Network Response Time Under 3 Seconds.
- 18.) Loop Response Time Under 750 Milliseconds.
- 19.) Device Mapping Feature for As-Builts.
- 20.) Up to 1750 History Events
- 21.) Remote Systems Diagnostic via Phone Line

### **3.02 KEYPADS – KPDISP**

- A. Provide one keypad in admin office, as indicated on drawings.
  - 1.) Keypads to be backlit 128 x 64 dot matrix LCD Display.
  - 2.) Units to support bilingual operation.
  - 3.) Keypad shall be provided for points status only. And have its own unique PIN number.

### **3.03 USER INTER-FACE ARM/DISARM DEVICE**

- A. Provide Viscount Arm/Disarm devices, equipment, wiring and programming as indicated on attached ESK-1. In order to achieve District Wide Uniformity the Viscount Arm/Disarm Security System is a District Standard. No Substitutions will be allowed.
- B. Provide EDWARDS Arm/Disarm devices as indicated on attached ESK-1. EDWARDS Security System is a District Standard. No Substitutions will be allowed.
- C. Viscount Arm/Disarm Devices shall have bilingual P-Touch label identification. English on top of device, Spanish on bottom of device, Arm/Brazo and Disarm/Desarmar.
- D. Devices shall have a separation of no less than 16". If separation of 16" cannot be achieved due to field conditions, it shall be brought to districts attention and an amiable solution agreed upon by all parties will be issued.

### **3.04 SIGNATURE SERIES DEVICES - GENERAL**

- 1. Each remote device shall have a microprocessor with non-volatile memory to support its function and serviceability. Each device shall store as required for its functionality the following data: device serial number, device address, device type, personality code, date of manufacture, hours in use, number of alarms and troubles, time and date of last alarm, amount of environmental left/used, last maintenance date, job/project number, current detector sensitivity values, diagnostic information (trouble codes) and algorithms required to process sensor data and perform communications with the loop controller.
- 2. Dependent on its functionality, each device shall be capable of monitoring up to 32 diagnostic codes. This data shall be stored at the device and available for system maintenance.
- 3. Each device shall be capable of performing its intended function dependent of the control panel, to lower loop data traffic. Each device shall immediately alert the loop controller of a status change to achieve a loop response time of less than 750ms.
- 4. Each device shall be capable of electronic addressing, either automatically or application program designed, to support physical/electrical mapping and supervision by location. Setting a device's address by physical means shall not be necessary. Each device shall be individually annunciated at the Main Control Panel and Remote Keypad.

### **3.05 SECURITY MODULE – SIGA-SEC2**

- A. Provide modules as indicated on the drawings and/or project documents.
- B. The Dual Input Module shall provide two (2) input circuits, each capable of a minimum of 6 personalities, each with a distinct operation.



### **3.06 SECURITY MOTION DETECTORS – SIGA-MDS**

- A. Provide motion detectors as indicated on the drawings and/or project documents.
- B. The passive infrared motion detector shall utilize adaptive signal processing with gliding focus mirror optics to analyze the size, speed and shape to determine the alarm threshold.
- C. The unit shall be configurable for up to seven different curtain patterns, have a range of up to 34 ft. and a 90 degree field of view.

## **PART 4 EXECUTION**

### **4.01 INSTALLATION**

- A. Wiring shall be installed in conduit as specified under the electrical section of the specification (Division 26).
- B. The sum of the cross-sectional areas of individual conductors shall not exceed 40% of the interior cross sectional area of the conduit. Minimum conduit size shall be 3/4 inch trade size.
- C. Wiring shall be identified at terminal and junction locations to prevent unintentional interference with the circuits during testing and servicing.
- D. Junction, pull and terminal boxes/cabinets shall be labeled. Labels shall be permanently affixed to covers/doors. Labeling to be Furnished and Installed under Division 26.
- E. Wiring color code shall be consistent throughout the system and shall allow for easy identification of initiating, indicating and auxiliary control circuits.
- F. Wiring at building terminal cabinets shall be terminated to screw barrier strips, with circuits identified.
- G. Wiring in control, terminal and junction cabinets shall be neatly arranged and bundled.
- H. Wiring shall test free of earth grounds or shorts between conductors.
- I. The contractor shall be responsible and assure the use of adequate numbers of skilled workmen, who are thoroughly trained and experienced, and completely familiar with the specified equipment and code requirements.
- J. The contractor shall be responsible for assuring that conduit size, wire type and color coding meets the specification, manufacturers and code requirements.

### **4.02 SYSTEM VERIFICATION**

- A. Upon completion of the installation, the security alarm contractor shall place into operation and test all operational features, functions and devices.
- B. Upon completion of testing, and after the system has been in operation for a minimum of 5 days without failure, the security alarm contractor shall schedule with the District a demonstration and field acceptance test.
- C. All testing shall be conducted in accordance with contract documents, manufacturer's instructions and per the requirements of the District's School Police.

### **4.03 GUARANTEE AND SERVICE**

- A. Security alarm system contractor shall provide written guarantees for all security alarm equipment and devices used on this project for a period of ONE (1) YEAR from the date of final acceptance.
- B. During the guarantee period the contractor shall repair or replace any defective material at no additional cost to the Owner.

### **4.04 IN SERVICE TRAINING**

- A. The security alarm contractor shall provide factory trained representatives to demonstrate the operation of the security alarm system to the Owner's personnel. The representative shall have a thorough knowledge of the equipment and operation of the system. The contractor shall provide one (1) 4 hour in-service training session.



- B. The security contractor shall provide to the District's School Police a demonstration of system operation. Session shall consist of one (1) 4 hour in-service training.

#### **4.05 OPERATION MAINTENANCE MANUALS**

- A. The security alarm contractor shall provide to the District, three (3) weeks after the field acceptance test, two (2) sets of operating/maintenance manuals and one (1) set of as-built drawings. Autocad .dwg files of each school site plan and/or floor plans to be provide by the SBCUSD.
- B. As-built drawings shall indicate the location of all devices, appliances, coding, zoning, wiring sequences, wiring methods, color coding, identification, labeling and connections of the components of the security alarm system as installed. The as-builts shall include a mapping sequence as generated by the Security Alarm Control Panel and connected computer. Systems not capable of this feature shall generate TRUE Device mapping sequences as-builts on Auto Cad 2014. These as-builts shall show the physical layout of all addressable devices as they were actually installed on the loop.

**END OF SECTION**



## SECTION 28 31 10

### FIRE ALARM SYSTEM

#### PART 1 GENERAL

##### 1.01 REQUIREMENTS

- A. This performance specification provides the minimum requirements for the Life Safety System. The work provided shall include, but not limited to furnishing all permits, equipment, materials, delivery, labor, documentation, testing and services necessary to design and furnish and install a complete, operational system Fire Alarm System.
- B. At the time of bid, all exceptions taken to these Specifications, all variances from these Specification and all substitutions of operating capabilities or equipment called for in these Specification shall be listed in writing and forwarded to the Engineer. Any such exception, variances or substitutions that were not listed at the time of bid and are identified in the submittal, shall be grounds for immediate disapproval without comment.
- C. The requirements of the conditions of the Contract, Supplementary Conditions, and General Requirements apply to the work specified in this section.
- D. The system shall be an active/interrogative type system where each transponder and/or addressable device is repetitively scanned, causing a signal to be transmitted to the main fire alarm control panel (FACP) indicating that the device and its associated circuit wiring is functional. Loss of this signal at the main FACP shall result in a trouble indication as specified hereinafter for the particular input.

##### 1.02 RELATED SECTIONS: NOT INCLUDED IN SCOPE OF WORK

- A. Water flow switches.
- B. Sprinkler valve supervisory switches.
- C. HVAC Systems Controls.
- D. Electrical (Division 26).

##### 1.03

- A. All work and materials shall conform to all applicable Federal, State and local codes and regulations governing the installation.
- B. Fire alarm system, equipment, installation, and wiring materials and methods used shall comply with the following codes and standards:
  - 1. System components proposed in this specification shall be UL listed for its intended use.
  - 2. California State Fire Marshall Listed Components
  - 3. 2016 California Building Code
  - 4. 2016 California Fire Code



5. 2016 California Mechanical Code
6. 2016 California Electrical Code
7. NFPA 72 – 2016  
National Fire Alarm Code®, As amended by CA code
8. NFPA 90 - Air-Conditioning and Ventilating Systems
9. NFPA 92A - 2012 Smoke Control Systems
10. UL listing for fire smoke control (UUKL)
11. Americans with Disabilities Act (ADA)

#### 1.04 EQUIPMENT QUALIFICATION

- A. The specification is based upon equipment as manufactured by Edwards System Technology EST-3.
- B. All equipment shall conform to all applicable codes and ordinances, and shall be listed by Underwriters Laboratories and the California State Fire Marshall.
- C. The EST-3 Fire Alarm Panel shall communicate with the existing Edwards EST Fireworks monitoring system by way of the District's LAN Network. The existing EST Fireworks was installed under separate contract and is under warranty.

#### 1.05 CONTRACTOR QUALIFICATIONS

- A. All work specified in this Section shall be performed (furnished, installed and connected) by a qualified fire alarm contractor. The fire alarm contractor or sub-contractor (regardless of tier) performing the work under this Section shall within 15 days, provide the following documentation to show compliance with the contractors qualifications in the bid package. Failure to provide all required documentation below shall render the bidder's bid non-responsive.
  1. Contractor's License: A copy of the contractor's valid State of California License. The contractor must be licensed in the state of project location and have been incorporated in the business in that state for a minimum of 5 years.
  2. Proof of Experience: Proof that the fire alarm contractor has successfully installed similar system fire detection, evacuation voice and visual signaling control components on a previous project of comparable size and complexity. Provide a statement summarizing any pending litigation involving an officer or principal of /or the company, the nature of the litigation and what effect the litigation may carry as it relates to this work in the worst case scenario. Non-disclosure of this item, if later discovered, may result, at the owner's discretion, in the contractor bearing all costs and any cost related to associate delays in the progress of the work.
  3. Industrial insurance certificates in conformance with the contract document.
  4. Insurance Certificates: Copy of fire alarm contractor's current liability insurance and state Service Capability: The fire alarm contractor shall have in-house engineering, installation and service personnel with a maintenance office within 30 miles of the project location
  5. Authorization Letters: At Time of Bid, Letters from the fire alarm equipment manufacturer stating that the fire alarm contractor is a Factory Authorized Distributor, and is trained and certified for the equipment proposed on this project



and is licensed to purchase and install the software required to provide the specified functions.

6. Certifications:

- a. At Time of Bid, Provide a copy of the National Institute for Certification in Technologies (NICET) Technician Level 4 Certificate for the employee actively involved in this project.
- b. At Time of Bid, Documentation that the fire alarm contractor has ALL on staff personnel factory-trained and certified for the equipment proposed for this project and licensed by the state of California.
- c. At Time of Bid, Provide a copy Fire-Life-Safety Technician (Fire Alarm) License by the state of California for ALL personnel providing work under this Section for this Project.

1.06 SCOPE OF WORK

1. The system supplied under this specification shall be a microprocessor-based direct wired, multi-priority peer-to-peer networked system. The system shall utilize independently addressed, microprocessor-based smoke detectors, heat detectors, and modules as described in this specification. It shall be complete with all necessary hardware, software and memory specifically tailored for this installation. It shall be possible to permanently modify the software on site by using a plug-in programmer.

B. The fire alarm scope of work shall consist of the following minimum requirements.

1. Fire Control Panels and Annunciators

- a. Provide New Fire alarm control panel as shown on plans. Additional related remote data gathering panels shall be provided as needed.
- b. A new remote recessed LCD annunciator shall be provided in the administration office. The annunciator shall report activity for all buildings.
- c. All FACP and remote data gathering panels shall complete the "network" between all areas of the campus and building(s) allowing for one common dialer to be installed for central station monitoring of the campus. Provide telephone lines using district issued phone numbers for Monitoring Services.
- d. Provide all programming for the EST-3 Fire Alarm Control Panel, 3-MODCOM dialer, and programming and complete graphics display at the existing District Edwards Fireworks monitoring system located at District's M & O Complex. Provide complete Point I.D. list to the District prior to programming.

2. Initiating Devices

- a. All initiating devices shall be new addressable devices as specified. Any conventional initiating devices utilized shall have individual addressable monitor modules provided for each conventional device for unique addressing and annunciation.



- b. Smoke detectors shall be added as follows.
  - 1) All Mechanical, Electrical, Telephone, Elevator, Transformer, Generator or similar room.
  - 2) At any elevator lobbies.
  - 3) Magnetically held open or automatic-closing doors.
  - 4) Roll doors and/or one-hour fire-resistive occupancy separations.
  - 5) Elevator Shafts if required per code.
  - 6) Storage areas.
  - 7) Smoke or Smoke/Fire Dampers (optional full area coverage by code in lieu of duct smoke detector at damper)
  - 8) All public and private areas and all rooms for 100% full area coverage.
  - 9) Beam pockets shall be covered as needed in order to meet current code requirements.
- c. Manual pull stations shall be added as follows.
  - 1) Next to the main remote Annunciator in admin office.
  - 2) All surface mount pull station shall be provided w/ manufacturers' listed back box.
- d. Heat Detectors shall be added as follows:
  - 1) Non-Residential Kitchens
  - 2) Trash Rooms
  - 3) Any room that has a source that will create steam or smoke
- e. Attic Heat Detectors (194 deg) shall be added as follows.
  - 1) Attic or above ceiling space as required by code.
- f. Sprinkler tamper and waterflow switches shall be individually monitored.
  - 1) Provide one (1) supervisory module circuit for each sprinkler valve supervisory and waterflow switch.
  - 2) Tamper switches in fire pump room only may be grouped together as allowed per code.

### 3. Notifications Devices

- a. Temporal Horns shall be added as follows.
  - 1) Shall be added throughout public and private spaces to achieve 15db above ambient as needed to meet current code requirements.

Strobes shall be added as follows.

- 2) Restrooms and Similar Uses: Public, Staff, locker rooms and dressing rooms.
- 3) Corridor System and Similar Uses: Public, Staff and Service Corridors, Vestibules and Passageways.
- 4) Gymnasiums and Similar Uses
- 5) Music Practice or Band Rooms
- 6) Multipurpose Rooms and Similar Uses: Auditoriums, Dining Rooms, Cafeterias, Outdoor Patios & Courts that require exiting through the building and are an occupied portion of the building.



- 7) Occupied Rooms where Ambient Noise Impairs Hearing of the Fire Alarm and Similar Uses: Kitchens, Laundry areas, Central Sterilization, Mechanical equipment rooms, Generator rooms, Boiler Rooms and Power Plants.
  - 8) Lobbies and Similar Uses
  - 9) Meeting Rooms
  - 10) Any other area for common use.
  - 11) Additional strobes shall be added in ADA rooms as needed.
  - 12) Sized Per ADA coverage and NFPA72
  - 13) Combination Audible/Visual appliances may be used as needed. Areas having more than 2 strobes in the field of view shall be synchronized Speakers shall be added as follows:
  - 14) Speakers shall be provided for Voice Evacuation to meet code and as shown on plans.
4. Booster Power Supplies shall be distributed throughout the facility to provide the power necessary for all indicating devices. Power Supplies shall be initiated by Synchronized Signal Modules. Synchronization by means of a common pair of wires chaining power supplies shall not an acceptable means of synchronization between units.
  5. Other device/controls shall be added as follows.
    - a. Interface and provide air-handling systems shutdown control. An addressable control relay shall be provided for each air handler unit.
    - b. Contractor shall install Remote Station Interface
      - 1) A digital alarm communicator transmitter, remote station transmitter, or municipal tie shall provide interface with a remote control station for monitoring alarm and trouble conditions. Communication to central station shall be by way of two supervised telephone lines.
      - 2) Install all required cross-connections to two Telephone lines.

#### 1.07 SEQUENCE OF OPERATIONS

- A. General Alarm Operation: Upon alarm activation of any area smoke detector, duct smoke detector, heat detector, manual pull station, sprinkler waterflow, the following functions shall automatically occur:
  1. The internal audible device shall sound at the control panel or command center.
  2. The LCD Display shall indicate all applicable information associated with the alarm condition including zone, device type, device location and time/date.
  3. All system activity/events shall be documented on the system printer.
  4. Any remote or local annunciator LCD/LED's associated with the alarm zone shall be illuminated.
  5. The following notification signals and actions shall occur simultaneously:
    - a. A signal shall be sounded on fire floors (zones). The signal shall be a Temporal 3 tone.



- b. Activate visual strobes on the fire floors (zones). The visual strobe shall stop operating when the "Alarm Silence" is pressed.
- 6. Transmit signal to the building automation system (if applicable) and/or shutdown all HVAC units serving the floor of alarm.
- 7. Transmit signal to the central station with point identification.
- 8. Activate automatic smoke control sequences (if applicable).
- 9. All stairwell/exit doors shall unlock throughout the building.
- 10. All self-closing fire/smoke doors held open shall be released.
- 11. All automatic events programmed to the alarm point shall be executed and the associated outputs activated.
- B. Supervisory Operation: Upon supervisory activation of any sprinkler valve supervisory switch, the following functions shall automatically occur:
  - 1. The internal audible device shall sound at the control panel or command center.
  - 2. The LCD display shall indicate all applicable information associated with the supervisory condition including; zone, device type, device location and time/date.
  - 3. All system activity/events shall be documented on the system printer.
  - 4. Any remote or local annunciator LCD/LED's associated with the supervisory zone shall be illuminated.
  - 5. Transmit signal to the central station with point identification.
- C. Trouble Operation: Upon activation of a trouble condition or signal from any device on the system, the following functions shall automatically occur:
  - 1. The internal audible device shall sound at the control panel or command center.
  - 2. The LCD keypad display shall indicate all applicable information associated with the trouble condition including; zone, device type, device location and time/date.
  - 3. All system activity/events shall be documented on the system printer.
  - 4. Any remote or local annunciator LCD/LED's associated with the trouble zone shall be illuminated.
  - 5. Transmit signal to the central station with point identification.
- D. Monitor Activation: Upon activation of any device connected to a monitor circuit, the following functions shall automatically occur:
  - 1. The LCD display shall indicate all applicable information associated with the status condition including; zone, device type, device location and time/date.
  - 2. All system activity/events shall be documented on the system printer.



3. Any remote or local annunciator LCD/LED's associated with the status zone shall be illuminated.

## 1.08 SYSTEM DESIGN PARAMETERS

### A. Standby power

1. The standby power supply shall be an electrical battery with capacity to operate the system under maximum supervisory load for twenty four (24) hours and capable of operating the system for fifteen (15) minutes of evacuation alarm on all devices, operating at maximum load. The system shall include a charging circuit to automatically maintain the electrical charge of the battery. The system shall automatically adjust the charging of the battery to compensate for temperature.

### B. Voltage Drop

1. The point-to-point or Ohm's Law voltage drop calculations of all alarm system circuits shall not exceed 10%.

### C. Spare Capacity

1. The system shall be engineered to accommodate 20% spare capacity on each individual loop, and 20% spare on system power supplies.

### D. Circuiting Guidelines

#### 1. Initiating Device Circuits

- a. Where necessary, conventional initiating device circuits (i.e. waterflow switches, valve supervisory switches, fire pump functions, etc.) shall be Class B (Style "A" or "B").

#### 2. Notification Appliance Circuits

- a. All notification appliance circuits shall be Class B (Style "Y"). The notification circuits shall be power limited. Non-power limited circuits are not acceptable.

#### 3. Signaling Line Circuits: Addressable Analog Devices

- a. The signaling line circuit connecting to addressable/analog devices including, detectors, monitor modules, control modules, isolation modules, intrusion detection modules and notification circuit modules shall be Class B (style 4).
- b. Each addressable analog loop shall be circuited so device loading is not to exceed 80% of loop capacity in order to leave for space for future devices.

#### 4. Signaling Line Circuits: Data & Audio for FACP & Annunciator Network

- a. The signaling line circuit connecting network panel/nodes, annunciators, command centers, shall be Class A (style 7). The media shall be copper except where fiber optic cable is specified on the drawings.



## 1.09 SUBMITTALS

### A. General

1. It is the responsibility of the contractor to meet the entire intent and functional performance detailed in these specifications.
2. The proposed equipment shall be subject to the approval of the Architect/Engineer/Owner.
3. Approved submittals shall only allow the contractor to proceed with the installation and shall not be construed to mean that the contractor has satisfied the requirements of these specifications.

### B. Equipment Submittal

1. Provide list of all types of equipment and components provided. This shall be incorporated as part of a Table of Contents, which will also indicate the manufacturer's part number, the description of the part, and the part number of the manufacturer's product datasheet on which the information can be found.
2. Provide manufacturer's ORIGINAL printed data sheets with the printed logo or trademark of the manufacturer for all equipment. Photocopied and/or illegible product data sheets shall not be acceptable.
3. Indicated in the documentation will be the type, size, rating, style, and catalog number for all items proposed to meet the system performance detailed in this specification.
4. CSFM listing sheet for each component.
5. Installer's NICET 4 Certification.
6. Letter or Certificate from the fire alarm manufacturer stating that the fire alarm contractor is an authorized distributor of the specified product.
7. Submit a copy of the system supplier's training certification for the specified product issued by the manufacturer of the integrated fire/life safety system.
8. Equipment submittals and other documentation shall be incorporated bound with the above information indexed and tabbed for quick reference.

### C. Shop Drawings

1. A complete set of shop drawings shall be supplied. The shop drawings shall be reproduced electronically in digital format. This package shall include but not be limited to:
  - a. All drawings and diagrams shall include the contractor's title block, complete with drawing title, contractor's name, address, date including revisions, and preparer's and reviewer's initials
  - b. Complete system bill of material with peripheral device backbox size information, part numbers, device mounting height information



- c. Detailed system operational description. Any Specification differences and deviations shall be clearly noted and marked.
- d. A riser diagram that individually depicts all control panels, annunciators, addressable devices and notification appliances. Field addressable devices and notification appliances may be grouped together by specific type per loop or circuit if allowed by AHJ.
- e. Complete 1/8" = 1'-0 scale floor plan drawing locating all system devices and elevation of all equipment at the Fire Command Station. Floor plans shall indicate accurate locations for all control and peripheral devices as well as raceway size and routing, junction boxes, and conductor size, and quantity in each raceway. All notification appliances shall be provided with a candela rating and circuit address that corresponds to that depicted on the Riser Diagram. If individual floors need to be segmented to accommodate the 1/8" scale requirements, KEY PLANS and BREAK-LINES shall be provided on the plans in an orderly and professional manner. End-of-line resistors (and values) shall be depicted.
- f. All drawings shall be reviewed and signed off by an individual having a minimum of a NICET 4 certification in fire protection engineering technology, subfield of fire alarm systems.
- g. Control panel wiring and interconnection schematics. The drawing(s) shall depict internal component placement and all internal and field termination points. Drawing shall provide a detail indicating where conduit penetrations shall be made, so as to avoid conflicts with internally mounted batteries. For each additional data-gathering panel, a separate control panel drawing shall be provided, which clearly indicated the designation, service and location of the control enclosure.
- h. Any additional requirements if required by AHJ for approval.
- i. Complete calculations shall clearly indicate the quantity of devices, the device part numbers, the supervisory current draw, the alarm current draw, totals for all categories, and the calculated battery requirements. Battery calculations shall also reflect all control panel component, remote annunciator, and auxiliary relay current draws.
- j. System (Load & Battery) calculations shall be provided for each system power supply, each notification appliance circuit and each auxiliary control circuit that draws power from any system power supply.

#### 1.10 OPERATING AND MAINTAINANCE MANUALS

- A. The manual shall contain a detailed narrative description of the system architecture, inputs, notification signaling, auxiliary functions, annunciation, and sequence of operations, expansion capability, application considerations and limitations.
- B. Manufacturer's data sheets and installation manuals/instructions for all equipment supplied.
- C. Minimum two (2) copies of the closeout documents shall be delivered to the building owner's representative at the time of system acceptance.
- D. Provide the name, address and telephone of the authorized factory representative.



#### 1.11 AS-BUILT PROJECT DRAWINGS AND DATA

- A. Drawings consisting of: a scaled plan of each building showing the placement of each individual item of the Integrated Life Safety System equipment as well as raceway size and routing, junction boxes, and conductor size, quantity, and color in each raceway.
- B. All drawings must reflect point to point wiring, device address and programmed characteristics as verified in the presence of the Engineer, Inspector of Record or District Representative.
- C. All drawings shall be provided in standard PDF and AutoCAD format.
- D. Refer to Div. 01 for additional requirements.

#### 1.12 WARRANTY

- A. The contractor shall warranty all materials for three (3) years, installation and workmanship for one (2) years from date of acceptance, unless otherwise specified.
- B. A copy of the manufacturer's warranty shall be provided with closeout documentation and included with the operation and installation manuals.
- C. The System Supplier shall maintain a service organization with adequate spare parts stock within 30 miles of the installation. Any defects that render the system inoperative shall be repaired within 24 hours of the owner notifying the contractor.

#### 1.13 EXTRA MATERIALS

- A. Provide 10% of each type of manual stations (minimum of one for each type).
- B. Provide six keys of each type.
- C. Provide 10% of each type of initiating or control device i.e. pull station, smoke detector, heat detector, monitor module, control relay; (minimum of one for each type).
- D. Provide 10% of each type of audible and visual indicating appliances (minimum of one for each type).

### **PART 2 PRODUCTS**

#### 2.01 MANUFACTURER

- A. Edwards System Technology: EST Fire & Life Safety – EST3

#### 2.02 GENERAL

- A. All equipment and components shall be the manufacturer's current model. The materials, appliances, equipment and devices shall be tested and listed by a nationally recognized approval agency for use as part of a protected premises (fire alarm) system.
- B. The contractor shall provide, from the acceptable manufacturer's current product lines, equipment and components, which comply, with the requirements of these specifications. Equipment or components, which do not provide the performance and features, required by these specifications are not acceptable, regardless of manufacturer.



- C. All System components shall be the cataloged products of a single supplier. All products shall be UL listed by the manufacturer for their intended purpose.
- D. All control panel assemblies and connected field appliances shall be both designed and manufactured by the same company, and shall be tested and cross-listed as to ensure that a fully functioning system is designed and installed.

## 2.03 FIRE ALARM CONTROL PANEL

### A. General, EDWARDS SYSTEMS TECHNOLOGY (EST) EST-3, CSFM 7170-1657:0186

1. The fire alarm control panel or panels and all system devices (Chime-strobes, strobes, pull stations, smoke and heat detectors, etc. shall be (EST) type EST-3 series . All under one label "UL/UOJZ listed and approved" for the use of fire alarm systems in this area of the United States of America.
2. The operating controls shall be located behind locked door with viewing window. All control modules shall be labeled, and all zone locations shall be identified.
3. The main controller 3-CPU shall be supervised, site programmable, and of modular design supporting up to 64 network nodes. The peer-to-peer network shall contain multiple nodes consisting of the command center, main controller, remote control panels, LCD/LED annunciation nodes, and workstations. Each node is an equal, active functional node of the network, which is capable of making all local decisions and generating network tasks to other nodes in the event of node failure or communications failure between nodes. When utilizing a network and multiple wiring faults occur, the network shall re-configure into many sub-networks and continue to respond to alarm events from every panel that can transmit and receive network messages.
4. The Main Controller Module shall control and monitor all local or remote peripherals. It shall support a large 168 character LCD, power supply, remote LCD and zone display annunciators, printers, and support communication interface standard protocol (CSI) devices such as color computer annunciators and color graphic displays.
5. Each controller shall contain a RS232 printer/programming port for programming locally via an IBM PC. When operational, each controller shall support a printer through the RS232 port and be capable of message routing.
6. The programmer shall be able to download all network and firmware applications from the configuration computer to all the network panels from a single location on the system.
7. The panels shall have the ability to add an operator interface control/display at each node that shall annunciate command and control system functions.
8. The system shall store all basic system functionality and job specific data in non-volatile memory. All site specific and operating data shall survive a complete power failure intact. Passwords shall protect any changes to system operations.
9. The control panel shall contain a standby power supply that automatically supplies electrical energy to the system upon primary power supply failure. The system shall include a charging circuit to automatically maintain the electrical charge of the battery.

### B. Signaling Line Circuits



1. The main controller 3-CPU shall be supervised, site programmable, and of modular design supporting up to 125 detectors and 125 remote modules per addressable Signaling line Circuit (SLC). The CPU shall support up to 10 SLC's per panel for a total system capacity of 2500 Intelligent Addressable points. The system shall be designed with peer-to-peer networking capability for enhanced survivability, with support for up to 64 nodes, each with up to 2500 points and an overall capacity of 160,000 points.
2. The system shall provide electronic addressing of analog/addressable devices.
3. The system shall have built-in automatic system programming to automatically address and map all system devices attached to the main controller.
4. The system shall use full digital communications to supervise all addressable loop devices for placement, correct location, and operation. It shall allow swapping of "same type" devices without the need of addressing and impose the "location" parameters on replacement device. It shall initiate and maintain a trouble if a device is added to a loop and clear the trouble when the new device is mapped and defined into the system.
5. The system shall have a UL Listed Detector Sensitivity test feature, which will be a function of the smoke detectors and performed automatically every 4 hours.

C. Voice Notification Circuits:

a. 3-ZA40B Zoned Audio Amplifier

- 1) Includes one (1) speaker circuit, wired as Style Y (Class B) or Style Z (Class A)
- 2) Produces 40 watts of digital power @ 70.7 V<sub>RMS</sub>
- 3) Operating Voltage 27.3 to 20.4 VDC
- 4) Alarm Current 2.48 amp max. at 40 Watts.

D. Audio Amplifier (3-ZA40B): Include as a minimum, the following features:

1. Selectable 70VRMS or 25VRMS speaker circuit output.
2. Power for the amplifier comes from the standard system power supply through the local rail.
3. Amplifier comes standard with one 24 VDC power limited Notification Appliance Circuit.
4. Back-up 1000HZ temporal generator.
5. Ability to deliver up to 8 different signals simultaneously.

E. Voice Notification Circuits:



- a. 3-ZA95 Zoned Audio Amplifier
  - 1) Includes one (1) speaker circuit, wired as Style Y (Class B) or Style Z (Class A)
  - 2) Produces 95 watts of digital power @ 70.7 V<sub>RMS</sub>
  - 3) Operating Voltage 27.3 to 20.4 VDC
  - 4) Alarm Current 5.54 amp max. at 95 Watts.
  
- F. Audio Amplifier (3-ZA40B): Include as a minimum, the following features:
  - 1. Selectable 70VRMS or 25VRMS speaker circuit output.
  - 2. Power for the amplifier comes from the standard system power supply through the local rail.
  - 3. Amplifier comes standard with one 24 VDC power limited Notification Appliance Circuit.
  - 4. Back-up 1000HZ temporal generator.

Ability to deliver up to 8 different signals simultaneously.
  
- G. Voice Options:
  - 1. Fire Fighter Telephone Handset (requires EST3 Lobby Enclosure): 3-ASU/FT
  
- H. DACT (Existing)
  - 1. The system shall provide off premise communications capability (DACT) for transmitting system events to multiple Central Monitoring Station (CMS) receivers.
  - 2. The system shall capable of providing the CMS(s) with point identification of system events using Contact ID or SIA DCS protocols.
  - 3. In the event of a panel CPU failure during a fire alarm condition, the DACT degrade mode shall transmit a general fire alarm signal to the CMS.
  
- I. User Interfere
  - 1. Main Control & Display
    - a. The main display shall be a large 168 character LCD with normal, alarm, trouble, supervisory, disabled point and ground fault indicators.
    - b. The interface shall show the first and most recent highest priority system events without any operator intervention. All system events shall be directed to one of four message queues. Messages of different types shall never intermix to eliminate operator confusion. A "Details" switch



shall provide additional information about any device highlighted by the operator.

- c. Receipt of alarm, trouble, and supervisory signals shall activate integral audible devices at the control panel(s) and at each remote annunciation device. The integral audible devices shall produce a sound output upon activation of not less than 85 dBA at 10 feet.
- d. The internal audible signal shall have different programmable patterns to distinguish between alarm, supervisory, trouble and monitor conditions.
- e. The annunciator shall contain the following controls:
  - 1) System Reset Switch with Indicator
  - 2) System Alarm Silence Switch with Indicator
  - 3) System Panel Silence Switch with Indicator
  - 4) Programmable Switch with Indicator
  - 5) Details Switch
  - 6) System Message Queue Scroll Switches.
  - 7) 10-Digit Keypad to Enable/Disable System and Functions.
- f. An authorized operator shall have the ability to operate or modify system functions like system time, date, passwords, holiday dates, restart the system and clear control panel event history file.
- g. An authorized operator shall be capable of performing test functions within the installed system.

2. Additional Annunciation & Control

- a. The system shall be capable to receive, monitor, and annunciate signals from individual devices and circuits installed throughout the building.
- b. Manufacturers' standard control switches shall be acceptable if they provide the required operation, including performance, supervision and position indication. If the manufacturers' standard switches do not comply with these requirements, fabrication of custom manual controls acceptable to the Owner is required.

J. Internal Modular Power Supply

- 1. System power supply(s) shall provide multiple power limited 24 VDC output circuits as required by the panel.
- 2. Upon failure of normal (AC) power, the affected portion(s) of the system shall automatically switch over to secondary power without losing any system functions.
- 3. Each system power supply shall be individually supervised. Power supply trouble signals shall identify the specific supply and the nature of the trouble condition.
- 4. All standby batteries shall be continuously monitored by the power supply. Low battery and disconnection of battery power supply conditions shall immediately annunciate as battery trouble and identify the specific power supply affected.



5. All system power supplies shall be capable of recharging their associated batteries, from a fully discharged condition to a capacity sufficient to allow the system to perform consistent with the requirements of this section, in 48 hours maximum.
6. All AC power connections shall be to the building's designated emergency electrical power circuit and shall meet the requirements of NFPA 72 - The AC power circuit shall be installed in conduit raceway. The power circuit disconnect means shall be clearly labeled FIRE ALARM CIRCUIT CONTROL and shall have a red marking. Disconnect shall be locked in the on position. The location of the circuit disconnect shall be labeled permanently inside the each control panel the disconnect serves.

K. Reports

1. The system shall provide the operator with system reports that give detailed description of the status of system parameters for corrective action, or for preventative maintenance programs. The system shall provide these reports via the main LCD, and shall be capable of being printed on any system printer.
2. The system shall provide a report that gives a sensitivity listing of all detectors that have less than 75% environmental compensation remaining. The system shall provide a report that provides a sensitivity (% Obscuration per foot) listing of any particular detector.
3. The system shall provide a report that gives a listing of the sensitivity of all of the detectors on any given panel in the system, or any given analog/addressable device loop within any given panel.
4. The system shall provide a report that gives a chronological listing of up to the last 1740 system events.
5. The system shall provide a listing of all of the firmware revision listings for all of the installed network components in the system.
6. The communications speed for RS-232 communications protocol shall be adjustable from 300 to 9600 Baud.

2.04 ANNUNCIATORS

A. General

1. The system shall have the capacity to support 64 network annunciators or EST-3 network panel nodes.

B. Remote LCD Annunciator, 3ANN, CSFM 7120-1657:0193

1. Remote LCD annunciators shall display each and every point in the system and be sized with the same number of characters as in the main FACP display. Any Annunciator that is not capable of displaying each point will not be considered equal. Grouping points to "zones" will not be acceptable.
2. Network alphanumeric annunciators shall be located throughout the facility as indicated on the plans and in the fire safety director's office. This annunciator shall be an Integral part of the Peer to Peer Network for survivability. Systems



that require a "host" Network Node to control remote annunciators shall not be considered acceptable.

3. Each annunciator shall contain a supervised; back lit, liquid crystal with a minimum of 8 lines with 21 characters per line. Where required, the annunciator shall include additional zonal annunciation and manual control without additional enclosures. The annunciator shall support full ability to serve as the operating interface to the system and shall include the following features;
  - a. Matched appearance with other system displays
  - b. Each LCD Display on each node (cabinet) in the system shall be configurable to show the status of any or all of the following functions anywhere in the system:
    - 1) Alarm
    - 2) Supervisory
    - 3) Trouble
    - 4) Monitor
4. Each annunciator must be capable of supporting custom messages as well as system event annunciation. It must be possible to filter unwanted annunciation of trouble, alarm or supervisory functions on a by point or by geographic area. The annunciators shall be mounted in stand-alone enclosures or integrated into the network panels as indicated on the plans.

## 2.05 INTELLIGENT ADDRESSABLE DETECTORS

### A. General

1. Each remote device shall have a microprocessor with non-volatile memory to support its functionality and serviceability. Each device shall store as required for its functionality the following data: device serial number, device address, device type, personality code, date of manufacture, hours in use, time and date of last alarm, amount of environmental compensation left/used, last maintenance date, job/project number, current detector sensitivity values, diagnostic information (trouble codes) and algorithms required to process sensor data and perform communications with the loop controller.
2. Each device shall be capable of electronic addressing, either automatically or application programmed assigned, to support physical/electrical mapping and supervision by location. Setting a device's address by physical means shall not be necessary.
3. The System Intelligent Detectors shall be capable of full digital communications using both broadcast and polling protocol. Each detector shall be capable of performing independent fire detection algorithms. The fire detection algorithm shall measure sensor signal dimensions, time patterns and combine different fire parameters to increase reliability and distinguish real fire conditions from unwanted deceptive nuisance alarms. Signal patterns that are not typical of fires shall be eliminated by digital filters. Devices not capable of combining different fire parameters or employing digital filters shall not be acceptable.
4. Each detector shall have an integral microprocessor capable of making alarm decisions based on fire parameter information stored in the detector head. Distributed intelligence shall improve response time by decreasing the data flow between detector and analog loop controller. Detectors that are not capable of



making independent alarm decisions shall not be acceptable. Maximum total analog loop response time for detectors changing state shall be 0.75 seconds.

5. Each detector shall have a separate means of displaying communication and alarm status. A green LED shall flash to confirm communication with the analog loop controller. A red LED shall flash to display alarm status.
6. The detector shall be capable of identifying up to 32 diagnostic codes. This information shall be available for system maintenance. The diagnostic code shall be stored at the detector.
7. Each smoke detector shall be capable of transmitting pre-alarm and alarm signals in addition to the normal, trouble and need cleaning information. It shall be possible to program control panel activity to each level. Each smoke detector may be individually programmed to operate at any one of five (5) sensitivity settings.
8. Each detector microprocessor shall contain an environmental compensation algorithm, which identifies and sets ambient "Environmental Thresholds" approximately six times an hour. The microprocessor shall continually monitor the environmental impact of temperature, humidity, other contaminants as well as detector aging. The process shall employ digital compensation to adapt the detector to both 24 hour long-term and 4 hour short-term environmental changes. The microprocessor shall monitor the environmental compensation value and alert the system operator when the detector approaches 80% and 100% of the allowable environmental compensation value. Differential sensing algorithms shall maintain a constant differential between selected detector sensitivity and the "learned" base line sensitivity. The base line sensitivity information shall be updated and permanently stored at the detector approximately once every hour.
9. The intelligent analog detectors shall be suitable for mounting on any Signature Series detector mounting base.
10. The Fire alarm system shall have the ability to set individual smoke detectors for alarm verification. Detector in the alarm verification mode shall indicate, by point in a text format at the main control and at the remote LCD annunciators.

**B. Photoelectric Smoke Detector, SIGA2-PHS, CSFM 7272-1657:0299**

1. Provide intelligent photoelectric smoke detectors SIGA2-PHS. The analog photoelectric detector shall utilize a light scattering type photoelectric smoke sensor to sense changes in air samples from its surroundings. The integral microprocessor shall dynamically examine values from the sensor and initiate an alarm based on the analysis of data. Systems using central intelligence for alarm decisions shall not be acceptable. The detector shall continually monitor any changes in sensitivity due to the environmental affects of dirt, smoke, temperature, aging and humidity. The information shall be stored in the integral processor and transferred to the analog loop controller for retrieval using a laptop PC or the SIGA-PRO Signature Program/Service Tool. The photo detector shall be rated for ceiling installation at a minimum of 30 ft (9.1m) centers and be suitable for wall mount applications. The photoelectric smoke detector shall be suitable for direct insertion into air ducts up to 3 ft (0.91m) high and 3 ft (0.91m) wide with air velocities up to 5,000 ft/min. (0-25.39 m/sec) without requiring specific duct detector housings or supply tubes. The heat detector provides a 135F (57C) Deg. fixed temperature sensor for heat due to fire. The heat sensor monitors the temperature of the air and determines whether an alarm should be initiated



2. The percent smoke obscuration per foot alarm set point shall be field selectable to any of five sensitivity settings ranging from 1.0% to 3.5%. The photo detector shall be suitable for operation in the following environment:
    - a. Temperature: 32°F to 120°F (0°C to 49°C)
    - b. Humidity: 0-93% RH, non-condensing
    - c. Elevation: no limit
- C. Fixed Temp/Rate of Rise Heat Detector, SIGA2-HRS, CSFM 7270-1657:0288
1. Provide intelligent combination fixed temperature/rate-of-rise heat detectors SIGA2-HRS. The heat detector shall have a low mass thermistor heat sensor and operate at a fixed temperature and at a temperature rate-of-rise. It shall continually monitor the temperature of the air in its surroundings to minimize thermal lag to the time required to process an alarm. The integral microprocessor shall determine if an alarm condition exists and initiate an alarm based on the analysis of the data. Systems using central intelligence for alarm decisions shall not be acceptable. The intelligent heat detector shall have a nominal fixed temperature alarm point rating of 135°F (57°C) and a rate-of-rise alarm point of 15°F (9°C) per minute. The heat detector shall be rated for ceiling installation at a minimum of 70 ft (21.3m) centers and be suitable for wall mount applications.
- D. Standard Detector Bases, SIGA-SB/SIGA-SB4, CSFM 7300-1657:0120
1. Provide standard detector mounting bases SIGA-SB suitable for mounting on North American 1-gang, 3½" or 4" octagon box and 4" square box. The base shall, contain no electronics, support all Signature Series detector types and have the following minimum requirements:
    - a. Removal of the respective detector shall not affect communications with other detectors.
    - b. Terminal connections shall be made on the room side of the base. Bases, which must be removed to gain access to the terminals, shall not be acceptable.
    - c. The base shall be capable of supporting one (1) Signature Series SIGA-LED Remote Alarm LED Indicator. Provide remote LED alarm indicators where shown on the plans.
- E. Relay Detector Bases, SIGA-RB / SIGA-RB4, CSFM 7300-1657:0120
1. Provide standard detector mounting bases SIGA-RB suitable for mounting on North American 1-gang, 3½" or 4" octagon box and 4" square box. The base shall support all Signature Series detector types and have the following minimum requirements:
    - a. Removal of the respective detector shall not affect communications with other detectors.
    - b. Terminal connections shall be made on the room side of the base. Bases, which must be removed to gain access to the terminals, shall not be acceptable.



- c. The relay shall be a bi-stable type and selectable for normally open or normally closed operation.
- d. The position of the contact shall be supervised.
- e. The relay shall automatically de-energize when a detector is removed.
- f. The operation of the relay base shall be controlled by its respective detector processor. Detectors operating standalone mode shall operate the relay upon changing to alarm state. Relay bases not controlled by the detector microprocessor shall not be acceptable.
- g. Form "C" Relay contacts shall have a minimum rating of 1 amp @ 30 Vdc and be listed for pilot duty.

## 2.06 CONVENTIONAL INITIATING DEVICES

### A. General

- 1. All initiating devices shall be UL Listed for Fire Protective Service.
- 2. All initiating devices shall be of the same manufacturer as the Fire Alarm Control Panel specified to assure absolute compatibility between the devices and the control panels, and to assure that the application of the initiating devices is done in accordance with the single manufacturer's instructions.

### B. Weatherproof Pull Stations, MPSR1-S45W-GE, CSFM 7150-1657:236 Provide single action, single stage MPSR series fire alarm stations with terminals for wire connections rated for outdoor use.

- 1. Key reset shall be provided with keys identical to those required for the specified fire alarm panels, booster power supplies and other locked fire alarm cabinets.
- 2. Finish the station in red plated surface to inhibit corrosion.
- 3. Compatible factory weatherproof box w/ gasket shall be provided in all locations.

### C. Fixed Temperature Low Profile Attic Heat Detectors, 282B-PL, CSFM 7270-1657:0109

- 1. Detectors shall be rated for a maximum smooth ceiling rating of 2,500 sq. ft. (232 m<sup>2</sup>).
- 2. The detector shall have a white finish and positive identification for the operation of the fixed temperature element.
- 3. The detectors shall be rated at 194°F (88°C) fixed temperature.
- 4. Detectors shall be suitable for mounting to 1-gang, 4" square, octagonal, BESA, or European single-gang.

## 2.07 INTELLIGENT ADDRESSABLE MODULES

### A. General

- 1. Each remote device shall have a microprocessor with non-volatile memory to support its functionality and serviceability. Each device shall store as required for



its functionality the following data: device serial number, device address, device type, personality code, date of manufacture, hours in use, time and date of last alarm, amount of environmental compensation left/used, last maintenance date, job/project number, current detector sensitivity values, diagnostic information (trouble codes) and algorithms required to process sensor data and perform communications with the loop controller.

2. Each device shall be capable of electronic addressing, either automatically or application programmed assigned, to support physical/electrical mapping and supervision by location. Setting a device's address by physical means shall not be necessary.
3. It shall be possible to address each Intelligent Signature Series module without the use of DIP or rotary switches. Devices using DIP switches for addressing shall not be acceptable. The personality of multifunction modules shall be programmable at site to suit conditions and may be changed at any time using a personality code downloaded from the Analog Loop Controller. Modules requiring EPROM, PROM, ROM changes or DIP switch and/or jumper changes shall not be acceptable. The modules shall have a minimum of 2 diagnostic LEDs mounted behind a finished cover plate. A green LED shall flash to confirm communication with the loop controller. A red LED shall flash to display alarm status. The module shall be capable of storing up to 24 diagnostic codes, which can be retrieved for troubleshooting assistance. Input and output circuit wiring shall be supervised for open and ground faults.
4. The module shall be suitable for operation in the following environment:
  - a. Temperature: 32°F to 120°F (0°C to 49°C)
  - b. Humidity: 0-93% RH, non condensing

**B. Single Input Module, SIGA-CT1, CSFM 7300-1657:0121**

1. Provide intelligent single input modules SIGA-CT1 for monitoring of PIV's, Fan Status, Tamper Switches, Flow Switches, Generator & Fire Pump Status, Preaction System Alarm or Trouble or any other dry contact required to be monitored.
2. The Single Input Module shall provide one (1) supervised Class B input circuit capable of a minimum of 4 personalities, each with a distinct operation.
3. The module shall be suitable for mounting on North American 2 ½" (64mm) deep 1-gang boxes and 1 ½" (38mm) deep 4" square box with 1-gang covers.
4. The single input module shall support the following circuit types:
  - a. Normally-Open Alarm Latching (Manual Stations, Heat Detectors, etc.)
  - b. Normally-Open Alarm Delayed Latching (Waterflow Switches)
  - c. Normally-Open Active Non-Latching (Monitor, Fans, Dampers, Doors, etc.)
  - d. Normally-Open Active Latching (Supervisory, Tamper Switches)

**C. Dual Input Module, SIGA-CT2, CSFM 7300-1657:0121**



1. Provide intelligent dual input modules SIGA-CT2 for monitoring of sets of PIV's, Fan/Damper Status, Tamper Switches, Flow Switches, Generator & Fire Pump Status, Pre-action System Alarm or Trouble or any other sets of dry contacts required to be monitored.
  2. The Dual Input Module shall provide two (2) supervised Class B input circuits each capable of a minimum of 4 personalities, each with a distinct operation.
  3. The module shall be suitable for mounting on North American 2 ½" (64mm) deep 1-gang boxes and 1 ½" (38mm) deep 4" square box with 1-gang covers.
  4. The dual input module shall support the following circuit types:
    - a. Normally-Open Alarm Latching (Manual Stations, Heat Detectors, etc.)
    - b. Normally-Open Alarm Delayed Latching (Waterflow Switches)
    - c. Normally-Open Active Non-Latching (Monitor, Fans, Dampers, Doors, etc.)
    - d. Normally-Open Active Latching (Supervisory, Tamper Switches)
- D. Signal Module, SIGA-CC1, CSFM 7300-1657:0121
1. Provide intelligent single input signal modules SIGA-CC1 for activation of booster power supplies, audible/visual circuits, speaker circuits or for monitoring and communication of phone jacks.
  2. The Single Input (Single Riser Select) Signal Module shall provide one (1) supervised Class B output circuit capable of a minimum of 2 personalities, each with a distinct operation.
  3. The module shall be suitable for mounting on North American 2 ½" (64mm) deep 2-gang boxes and 1 ½" (38mm) deep 4" square boxes with 2-gang covers, or European 100mm square boxes.
  4. The single input signal module shall support the following operations:
    - a. Audible/Visible Signal Power Selector (Polarized 24 Vdc @ 2A, 25Vrms @50w or 70 Vrms @ 35 Watts of Audio)
    - b. Telephone Power Selector with Ring Tone (Fire Fighter's Telephone)
  5. When selected as a telephone power selector, the module shall be capable of generating its own "ring tone".
- E. Synchronized Signal Module, SIGA-CC1S, CSFM 7300-1657:121
1. Provide intelligent single input signal modules SIGA-CC1S for activation of booster power supplies and/or audible/visual circuits that require synchronization.
  2. The Single Input (Single Riser Select) Signal Module shall provide one (1) supervised Class B output circuit capable of a minimum of 2 personalities, each with a distinct operation.



3. The module shall be suitable for mounting on North American 2 ½" (64mm) deep 2-gang boxes and 1 ½" (38mm) deep 4" square boxes with 2-gang covers, or European 100mm square boxes.
  4. The single input signal module shall support the following operations:
    - a. Audible/Visible Signal Power Selector (Polarized 24 Vdc @ 2A, 25Vrms @50w or 70 Vrms @ 35 Watts of Audio)
    - b. Telephone Power Selector with Ring Tone (Fire Fighter's Telephone)
  5. Provides UL1971 auto-sync output for synchronizing multiple notification appliance circuits
- F. Control Relay Module, SIGA-CR, CSFM 7300-1657:0121
1. Provide intelligent control relay modules SIGA-CR for activation and/or shutdown of fans, dampers, door holder circuits, door locks, shunt trip, elevator recall or any other fail safe system requiring control or activation.
  2. The Control Relay Module shall provide one form "R" dry relay contact rated at 2 amps @ 24 Vdc to control external appliances or equipment shutdown.
  3. The control relay shall be rated for pilot duty and releasing systems.
  4. The position of the relay contact shall be confirmed by the system firmware.
  5. The control relay module shall be suitable for mounting on North American 2 ½" (64mm) deep 1-gang boxes and 1 ½" (38mm) deep 4" square box with 1-gang covers.
- G. Manual Pull Station, SIGA-278, CSFM 7150-1657:0129
1. Provide intelligent double action, single stage fire alarm stations SIGA-278. The fire alarm station shall be of metal construction with an internal toggle switch. Provide a locked test feature. Finish the station in red with silver "PULL IN CASE OF FIRE" English lettering.
  2. The manual station shall be suitable for mounting on North American 2 ½" (64mm) deep 1-gang boxes and 1 ½" (38mm) deep 4" square box with 1-gang covers.
  3. Provide compatible surface mount red box, 276B-RSB, at all surface mount locations. Standard electrical boxes are not acceptable.
  4. Manual Pull Stations must comply with CBC Sections 11B-308 and 11B-309 and 907.3.

## 2.08 NOTIFICATION APPLIANCES

### A. General

1. All appliances shall be UL Listed for Fire Protective Service.



2. All strobe appliances or combination appliances with strobes shall be capable of providing the "Equivalent Facilitation" which is allowed under the Americans with Disabilities Act accessibility guidelines (ADA (AG)), and shall be UL 1971.
3. All appliances shall be of the same manufacturer as the Fire Alarm Control Panel specified to insure absolute compatibility between the appliances and the control panels, and to insure that the application of the appliances are done in accordance with the single manufacturers' instructions.
4. Any appliances, which do not meet the above requirements, and are submitted, for use must show written proof of their compatibility for the purposes intended. Such proof shall be in the form of documentation from all manufacturers which clearly states that their equipment (as submitted) are 100% compatible with each other for the purposes intended.

**B. Wall Strobes, Genesis G1 Series, CSFM 7125-1657:0218**

1. Strobes shall provide synchronized flash outputs. The light output shall be an even "FullLight" pattern with no hot spots. Strobes using specular reflectors are not acceptable.
2. It shall be possible to flash the strobe at a temporal flash rate to match the Chime and meet the intent of UL Private Mode signaling.
3. The strobe shall have selectable 15, 30, 75 or 110 cd settings.
4. It shall be possible to change the strobe setting without removing the device from the wall
5. The strobe shall be a low profile design, finished in neutral white and shall not protrude more than 1" off the wall. In-out screw terminals shall be provided for wiring.
6. The strobe shall be suitable for wall mounting and shall mount in a standard North American 1-gang box. All mounting hardware shall be captive and there shall be no mounting screws visible after the device is installed.

**C. Ceiling Strobes, Genesis GC Series, CSFM 7125-1657:0219**

1. Strobes shall provide synchronized flash outputs. The light output shall be an even "FullLight" pattern with no hot spots. Strobes using specular reflectors are not acceptable.
2. It shall be possible to flash the strobe at a temporal flash rate to match the Chime and meet the intent of UL Private Mode signaling.
3. The standard ceiling strobe shall have selectable 15, 30, 75 or 95 cd settings.
4. The high output ceiling strobe shall have selectable 95, 115, 150 or 177 cd settings.
5. It shall be possible to change the strobe setting without removing the device from the ceiling.



6. The strobe shall be a low profile design, finished in neutral white and shall not protrude more than 1.6" off the ceiling. In-out screw terminals shall be provided for wiring.
7. The strobe shall be suitable for ceiling mounting and shall mount in a standard 4" square 2 1/8" (54 mm) deep electrical box. All mounting hardware shall be captive and there shall be no mounting screws visible after the device is installed.

D. Wall Horns, Genesis G1 Series, CSFM 7135-1657:0202

1. The horn shall provide an 84 dBA sound output at 10 ft. when measured in reverberation room per UL-464.
2. The horn can also be set for low dB output with a jumper cut that reduces horn output by about 5 dB.
3. The horn shall have a selectable steady or synchronized temporal output.
4. It shall be a low profile design, finished in neutral white and shall not protrude more than 1" off the wall. In-out screw terminals shall be provided for wiring.
5. It shall be suitable for wall mounting and shall mount in a standard North American 1-gang box. All mounting hardware shall be captive and there shall be no mounting screws visible after the device is installed.

E. Wall Horn-Strobes, Genesis G1 Series, CSFM 7125-1657:0202

1. Strobes shall provide synchronized flash outputs. The light output shall be an even "Full Light" pattern with no hot spots. Strobes using specular reflectors are not acceptable.
2. It shall be possible to flash the strobe at a temporal flash rate to match the horn and meet the intent of UL Private Mode signaling.
3. The strobe shall have selectable 15, 30, 75 or 110 cd settings.
4. It shall be possible to change the strobe setting without removing the device from the wall
5. The horn shall provide an 84 DBA sound output at 10 ft. when measured in reverberation room per UL-464.
6. The horn can also be set for low dB output with a jumper cut that reduces horn output by about 5 dB.
7. The horn shall have a selectable steady or synchronized temporal output.
8. It shall be a low profile design, finished in neutral white and shall not protrude more than 1" off the wall. In-out screw terminals shall be provided for wiring.
9. It shall be suitable for wall mounting and shall mount in a standard North American 1-gang box. All mounting hardware shall be captive and there shall be no mounting screws visible after the device is installed.

F. Ceiling Horn-Strobes, Genesis GC Series, CSFM 7125-1657:0202



1. Strobes shall provide synchronized flash outputs. The light output shall be an even "Full Light" pattern with no hot spots. Strobes using specular reflectors are not acceptable.
2. It shall be possible to flash the strobe at a temporal flash rate to match the horn and meet the intent of UL Private Mode signaling.
3. The standard ceiling strobe shall have selectable 15, 30, 75 or 95 cd settings.
4. The high output ceiling strobe shall have selectable 95, 115, 150 or 177 cd settings.
5. It shall be possible to change the strobe setting without removing the device from the ceiling
6. The horn shall provide an 84 dBA sound output at 10 ft. when measured in reverberation room per UL-464.
7. The horn can also be set for low dB output with a jumper cut that reduces horn output by about 5 dB.
8. The horn shall have a selectable steady or synchronized temporal output.
9. The strobe shall be a low profile design, finished in neutral white and shall not protrude more than 1.6" off the ceiling. In-out screw terminals shall be provided for wiring.
10. The strobe shall be suitable for ceiling mounting and shall mount in a standard flush mounted 4" square 2 1/8" (54 mm) deep electrical box. All mounting hardware shall be captive and there shall be no mounting screws visible after the device is installed.

G. Weatherproof Horn, 757 Series, CSFM 7135-1657:0188

1. Horns shall be selectable for high or low dBA output and steady or temporal output.
2. At the high output setting, the horn shall provide an 85 dBA continuous sound output or a 82 dBA temporal sound output, when measured in reverberation room per UL-464.
3. In and out screw terminals shall be provided for wiring.
4. Weatherproof wall boxes (757A-WB) shall be provided for outdoor applications.

H. Speaker/Strobe, Genesis G4 Series G4RF-S7VM , CSFM 7320-1657:0211

1. The speaker shall include both 25 and 70 Volt VRMS models with field selectable power taps from 1/4 to 2 watt with listed sound output up to 90 dB.
2. The speaker audio inputs include a blocking capacitor for DC supervision.
3. The speaker has sealed back construction for extra protection and improved audibility.
4. The strobe shall have selectable 15, 30, 75 or 110 CD settings.



5. It shall be possible to change the strobe setting without removing the device from the wall.
6. It shall be a low profile design, finished in red. In-out screw terminals shall be provided for wiring.

It shall be suitable for wall mounting and shall mount semi flush in a standard North American 4"square electrical box, 2 1/8" deep. All mounting hardware shall be captive and there shall be no mounting screws visible after the device is installed.

I. Ceiling Speaker/Strobe, Genesis GC Series GCFR-S7VM , CSFM 7320-1657:0211

1. The speaker shall include both 25 and 70 Volt VRMS models with field selectable power taps from 1/4 to 2 watt with listed sound output up to 90 dB.
2. The speaker audio inputs include a 10uf blocking capacitor for DC supervision.
3. The speaker has sealed back construction for extra protection and improved audibility.
4. The strobe shall have selectable 15, 30, 75 or 95 cd settings.
5. It shall be possible to change the strobe setting without removing the device from the ceiling.
6. It shall be a low profile design, finished in red. In-out screw terminals shall be provided for wiring.

It shall be suitable for wall mounting and shall mount semi flush in a standard North American 4"square electrical box, 2 1/8" deep. All mounting hardware shall be captive and there shall be no mounting screws visible after the device is installed.

J. Weatherproof Speaker, Genesis WG4 Series WG4RN-S , CSFM 7320-1657:0289

1. The speaker shall include both 25 and 70 Volt VRMS models with field selectable power taps from 1/4 to 2 watt with listed sound output up to 90 dB.
2. The speaker audio inputs include a blocking capacitor for DC supervision.
3. The speaker has sealed back construction for extra protection and improved audibility.
4. It shall be a low profile design, finished in red. In-out screw terminals shall be provided for wiring.

It shall be suitable for wall mounting and shall mount semi flush in a standard North American 4"square electrical box, 2 1/8" deep. All mounting hardware shall be captive and there shall be no mounting screws visible after the device is installed.

K. Weatherproof Loud-Speaker, Re-Entrant Millennium Class #5552-15W-R,  
CSFM 7320-1657:0241

1. The speaker shall include both 25 and 70 Volt VRMS with power taps at 1, 2, 3, 8, 7.5 & 15 watt with listed sound output up to 120 dB.
2. The speaker audio inputs include a blocking capacitor for DC supervision.



3. The speaker has sealed back construction for extra protection and improved audibility.
4. It shall be a low profile design, finished in red. In-out screw terminals shall be provided for wiring.

It shall be suitable for exterior box mounting and shall mount with 1/2" conduit entrance..

## 2.09 ACCESSORY EQUIPMENT

### A. Multi-Voltage Control Relays, MR Series, CSFM 7300-1004:0101

#### 1. General

- a. Provide remote control relays connected to supervised ancillary circuits for control of fans, dampers, door releases, etc.
- b. Relay contact ratings shall be SPDT and rated for 10 amperes at 115 Vac.
- c. A single relay may be energized from a voltage source of 24 Vdc, 24 Vac, 115 Vac, or 230 Vac.
- d. A red LED shall indicate the relay is energized.
- e. A metal enclosure shall be provided.

#### 2. MR-100 Series

- a. Relay contact ratings shall be SPDT and rated for 10 amperes at 115 Vac.

#### 3. MR-200 Series

- a. Relay contact ratings shall be DPDT and rated for 10 amperes at 115 Vac.

### B. Remote Booster Power Supplies, BPS10A, CSFM 7300-1657:0229

1. Unit shall be a self contained with 24Vdc power supply and batteries housed in its own locked enclosure. Keys provided shall be identical to the keys provided for all other fire alarm equipment provided.
2. Power supply shall be available in 10 Amp models and 110 Vac.
3. On board LED indicators for each resident NAC, battery supervision, ground fault and AC power.
4. The power supply shall provide four (4) independent 3Amp NACs. Each circuit can be configurable as an auxiliary output.
5. Configurable for any one of three signaling rates: 120SPM; 3-3-3 temporal; or, continuous.
6. Two independent and configurable inputs switch selectable to allow correlation of the two (2) inputs and the four (4) outputs.



7. NACs shall be configurable for either four Class B or two Class A circuits.
8. The unit shall be compatible with SIGA-CC1S for synchronization of multiple power supplies without inter-connection wiring.
9. Brackets shall be provided inside the enclosure to allow mounting the signaling modules. All signaling modules shall be listed to be located inside the booster power supply enclosure.
10. A selectable dip switch shall enable built in synchronization for horns and strobes which may be used to synchronize downstream devices, as well as other boosters and their connected devices.

## 2.10 CONDUCTORS

- A. The requirement of this section apply to all system conductors, including all signaling line, initiating device, notification appliance, auxiliary function, remote signaling, AC and DC power and grounding/shield drain circuits, and any other wiring installed by the Contractor pursuant to the requirements of these Specifications.
- B. All circuits shall be rated power limited in accordance with NEC Article 760.
- C. All conductors shall be installed in conduit or enclosed raceway.
- D. All new system conductors shall be of the type(s) specified herein.
  1. All initiating circuit, signaling line circuit, AC power conductors, shield drain conductors and grounding conductors, shall be solid copper, stranded or bunch tinned (bonded) stranded copper.
  2. All signaling line circuits, including all addressable initiating device circuits shall be 16 AWG minimum multi-conductor jacketed twisted pair cable or as per manufacturer's requirements.
  3. All non-addressable initiating device circuits, 24 VDC auxiliary function circuits shall be 14 AWG minimum or per manufacturer's requirements.
  4. All notification appliance circuit conductors shall be solid copper or bunch tinned (bonded) stranded copper. Where stranded conductors are utilized, a maximum of 7 strands shall be permitted for No. 16 and No. 18 conductors, and a maximum of 19 strands shall be permitted for No. 14 and larger conductors.
  5. All audible notification appliance circuits shall be 12 AWG THHN minimum stranded or per manufacturer's requirements.
  6. All visual notification appliance circuits shall be 12 AWG minimum THHN stranded or per manufacturer's requirements.
  7. All wiring shall be color-coded throughout, to National Electrical Code standards.
  8. All underground cables shall be "Aqua-Seal" type and rated for the environment.

## 2.11 CONDUIT RACEWAY

- A. All systems and system components listed to UL864 Control Units for Fire Protective Signaling Systems maybe installed within a common conduit raceway system, in



accordance with the manufacture's recommendations. System(s) or system components not listed to the UL864 standard shall utilize a separate conduit raceway system for each of the sub-systems.

- B. The requirements of this section apply to all system conduits, raceways, electrical enclosures, junction boxes, pull boxes and device back boxes.
- C. All system conduits shall be of the sizes and types specified.
- D. All system conduits shall be EMT, 3/4 -inch minimum, except for flexible metallic conduit used for whips to devices only, maximum length 6 feet, 3/4-inch diameter, minimum.
- E. All system conduits, which are installed in areas, which may be subject to physical damage or weather, shall be IMC or rigid steel, 3/4 -inch minimum.
- F. Conduits shall be sized according to the conductors contained therein. Cross sectional area percentage fill for system conduits shall not exceed 40%.
- G. Existing conduit raceway system may be re-used where possible as directed by the Engineer.
- H. All fire alarm conduit systems shall be routed and installed to minimize the potential for physical, mechanical or by fire damage, and so as not to interfere with existing building systems, facilities or equipment, and to facilitate service and minimize maintenance.
- I. All conduits, except flexible conduit whips to devices, shall be solidly attached to building structural members, ceiling slabs or permanent walls. Conduits shall not be attached to existing conduit, duct work, cable trays, other ceiling equipment, drop ceiling hangers/grids or partition walls, except where necessary to connect to initiating, notification, or auxiliary function devices.
- J. All system conduits, junction boxes, pull boxes, terminal cabinets, electrical enclosures and device back boxes shall be readily accessible for inspection, testing, service and maintenance.
- K. All penetration of floor slabs and firewalls shall be sleeved (1" conduit minimum) fire stopped in accordance with all local fire codes.
- L. All interior conduit, junction boxes, and junction box covers shall be painted red.

### **PART 3 INSTALLATION**

#### **3.01 INSTALLATION CONDITIONS**

- A. All equipment and components shall be installed in strict compliance with each manufacturer's recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc. before beginning system installation.
- B. The entire system shall be installed in a workmanlike manner, in accordance with approved manufacturer's wiring diagram.



### 3.02 INSTALLATION REQUIREMENTS

- A. All pull stations shall be mounted 48 inches above the finished floor, as measured on handle.
- B. Pull stations currently mounted at the incorrect height shall be lowered accordingly when replaced.
- C. All new audio/visual devices shall be mounted so the lens is a minimum of 80 inches and no more than 96 inches above the finished floor, as measured on strobe lens edge. Devices shall be mounted no less than 6 inches from the ceiling.
- D. No area smoke detectors shall be mounted within 36 inches of any HVAC supply, return air register or lighting fixture.
- E. No area smoke or heat detector shall be mounted within 12 inches of any wall.
- F. All fire alarm devices shall be accessible for periodic maintenance. Should a device location indicated on the Contract Drawings not meet this requirement, it shall be the responsibility of the installing contractor to bring it, in writing, to the attention of the Project Engineer. Failure to bring such issues to the attention of the Project Engineer shall be the exclusive liability of the installing Electrical Contractor.
- G. End of Line Resistors shall be furnished as required for mounting as directed by the manufacturer. Devices containing end-of-line resistors shall be appropriately labeled. Devices should be labeled so removal of the device is not required to identify the EOL device.
- H. All addressable modules shall be mounted either in electrical/comm. rooms or in ceiling (10' max.) and be easily accessible. This shall include, but is not necessarily limited to, fan shutdown, elevator recall, shunt trip, sprinkler status points, or door release.
- I. Power-limited/Non-power-limited NEC wiring standards SHALL BE OBSERVED.
- J. Auxiliary relays shall be appropriately labeled to indicate "FIRE ALARM SYSTEM" and their specific function (i.e. FAN S-1 SHUTDOWN) and location.
- K. Contractor is to provide Fire Rated & Non Fire Rated Access Panels as shown on plans.

### 3.03 TEST & INSPECTION

- A. All fire alarm testing shall be in accordance with NFPA 72.
- B. The system shall be pre-tested and documented using NFPA 72 'RECORD OF COMPLETION' prior to the final inspection by the AHJ. The owner shall be notified of the pretest 48 hours in advance and shall witness this test if desired.
- C. The pre-test shall include the following:
  - 1. All intelligent analog addressable devices shall be tested for current address, sensitivity, and user defined message.
  - 2. All wiring shall be tested for continuity, shorts, and grounds before the system is activated.
  - 3. Proper operation and execution of all it's sequences.



4. All Notification Devices shall be tested for Visual and Audible compliance to code.
  5. Complete Fire Alarm System shall be tested including Fire alarm Control Panel, Dialer, Voice evacuation, Fire Works, all devices, power supplies, amplifiers and annunciators.
  6. Provide (Hard Copy) red-lined As-Built drawings on RFHC supplied drawings to include actual: addresses, conduit routing, device placement, J-Box placement, cable/conductor markings, wiring legend & Access Panels.
  7. Pre-Test is to be scheduled on completion of Fire alarm System installation.
  8. Contractor is to supply all materials, test equipment, tools, ladders, and sufficient manpower (minimum three men) to prepare areas for testing, testing and replacing furniture and ceiling tiles to original positions.
  9. Pre-test is to be witnessed by the Construction Manager.
- D. At the final test and inspection, a factory-trained representative of the system manufacturer shall demonstrate to the Owner, his representative, and the local fire inspector all its sequence of operations and any additional tests required by the AHJ. This shall include all tests required by NFPA72 and test results provided to Owner, Local AHJ, Engineer, Inspector of Record, and the District Of The State Architect. In the event the system does not operate properly, the test may be terminated. Corrections shall be made and the testing procedure shall be repeated until it is acceptable to the Owner, his representatives and the fire inspector. Provide the NFPA 72 certificate to the Owner, Local AHJ, Engineer, and the District of The State Architect. If the test fails in any part it will require a new test. It shall be the Contractor's responsibility to pay for all expenses incurred caused by any additional testing including Fire Watch, and Owner, Engineer, Inspector of Record time individually on an hour by hour basis at the rate of one hundred dollars per hour. Contractor is to provide all items in Section 16720 3.03C during final test.

#### 3.04 TRAINING

- A. The System Supplier shall schedule and present a minimum of (2) 8 hour segments of documented formalized instruction for the building owner, detailing the proper operation of the installed System. One training segment shall be available at the completion of the project. The second training segment may be required within the warranty period.
- B. The instruction shall be presented in an organized and professional manner by a person factory trained in the operation and maintenance of the equipment and who is also thoroughly familiar with the installation.
- C. The instruction shall cover the schedule of maintenance required by NFPA 72 and any additional maintenance recommended by the system manufacturer.
- D. Instruction shall be made available to the Local Municipal Fire Department if requested by the Local Authority Having Jurisdiction.

#### **END OF SECTION**



## **SECTION 32 13 13**

### **CONCRETE PAVING**

#### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Concrete sidewalks ~~and~~, **stair steps**, integral curbs, **and benches**.

##### **1.02 RELATED REQUIREMENTS**

- A. Section 03 10 00 - Concrete Forming and Accessories.
- B. Section 03 20 00 - Concrete Reinforcing.
- C. Section 03 30 00 - Cast-in-Place Concrete.
- D. Section 07 92 00 - Joint Sealants: Sealing joints.
- E. Section 31 22 00 - Grading: Preparation of site for paving and base and preparation of subsoil at pavement perimeter for planting.
- F. Section 32 11 23 - Aggregate Base Courses: Typical base course.
- G. Section 32 12 16 - Asphalt Paving: Asphalt wearing course.

##### **1.03 REFERENCE STANDARDS**

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).
- B. ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012).
- C. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000.
- D. ACI 305R - Hot Weather Concreting; 2010.
- E. ACI 306R - Cold Weather Concreting; 2010.
- F. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2011.
- G. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- H. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.
  - 1. Use 2012 as indicated in 2016 CBC Referenced Standards.
- I. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2013.
  - 1. Use 2013 as indicated in 2016 CBC Referenced Standards.
- J. ASTM D2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine; 2011.
- K. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2015a.
- L. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.
- M. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.
  - 1. Use 2014a as indicated in 2016 CBC Referenced Standards.
- N. ASTM C150/C150M - Standard Specification for Portland Cement; 2016.



1. Use 2012 as indicated in 2016 CBC Referenced Standards.
- O. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.
- P. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2013.
- Q. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2010.**
- R. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).
- S. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2004a (Reapproved 2013).**

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Mix Design: Design mixes for each concrete mix.
- C. Product Data: Provide data on joint filler, admixtures, and curing compound.
  1. Material Certificates signed by manufacturers for each of the following:
    - a. Cementitious materials and aggregates.
    - b. Steel reinforcement and reinforcement accessories.
    - c. Admixtures.
    - d. Curing compounds.
    - e. Joint fillers.
- D2. Colored concrete product data and color selections.**
- D. Samples: Submit 6 sample panels, 6 x 6 inch in size illustrating each finish.
  1. Samples can be of sufficient size for color selection and/or verification.
- E. Shop drawings: For pattern layout and verification.

#### 1.05 QUALITY ASSURANCE

- A. Industry Standard: Perform concrete paving Work in accordance with ACI 301.
- B. Regulatory Requirements: Where reference is made to Standard Specifications, the following shall apply.
  1. Where reference is made to Standard Specifications, the following shall apply:
    - a. Perform off-site Work in public rights-of-way as indicated on the Contract Drawings and in accordance with requirements of authorities having jurisdiction, including SSPWC.
      - 1) For conditions not indicated otherwise on Contract Drawings, conform to Standard Details adopted by authorities having jurisdiction, including SSPWC.
    - b. Perform on-site Work as indicated and referenced on the Contract Drawings and as specified herein.
  2. Conform to California Code of Regulations (CCR), Volume 2, Part 2, Chapters 18 and 19.



3. Conform to California Building Code (CBC), Chapter 11B and ADAAG for accessibility requirements.
  - a. Portland cement concrete paving shall be stable, firm, and slip resistant and shall comply with CBC Sections 11B-302 and 11B-403.
  - b. Concrete paving and concrete finishes along accessible routes of travel shall be at least as slip-resistant as that described as a medium salted finish for slopes of less than 6%, and slip resistant at slopes of 6% or greater; CBC 11B-403.2.
  - c. Continuous surfaces, including walks and sidewalks, shall have a continuous common surface, not interrupted by steps or by abrupt changes in level exceeding 1/4 inch vertical (CBC 11B-303.2), or beveled at 1:2 slope to a maximum height of 1/2 inch (CBC 11B-303.3) and shall have a minimum width of 48 inches; CBC 11B-403.5.1.
4. Comply with OSHA and Cal-OSHA requirements.
5. Surface cross slopes shall not exceed 2 percent on any accessible path of travel.
- C. Source Quality Control: Obtain like materials from one source throughout.
- D. Lines and Levels: Established by State of California licensed Surveyor or registered Civil Engineer. Costs of surveying services shall be included in the Contract Sum.
- E. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience.
  1. The Installer shall provide a qualified foreman or supervisor who has a minimum of three years experience with imprinted and textured concrete, and who has successfully completed at least five similar installations of high quality and similar in scope to that required.

#### **1.06 MOCK-UP**

- A. Install minimum 48 x 48 inch mock-up of concrete flatwork for each texture or color specified.
- B. Install mock-up one month prior to installation, located where directed by Architect.
- C. Use identical forming system, subgrade type, reinforcing, expansion joints, score joints, finishing and edge trim as specified for installation.
- D. Architect approval required prior to proceeding with finish installation. Acceptable sample shall serve as quality basis for evaluating subsequent work.
  1. Refinish mock-up area as required to produce acceptable work.
  2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.

#### **1.07 DELIVERY, STORAGE AND HANDLING**

- A. Delivery, Storage and Handling: Comply with requirements specified for regular concrete in Section 03 30 00 - Cast in Place Concrete.



## **PART 2 PRODUCTS**

### **2.01 PAVING ASSEMBLIES**

- A. Comply with applicable requirements of ACI 301.
- B. Concrete Sidewalks: 3,250 psi 28 day concrete, thickness as indicated on Drawings, minimum 4 inches, natural grey color Portland cement.
- C. Curbing, gutters, related drainage components: 2,500 psi, 28 day concrete.
- D. Parking Area Pavement: 3,000 psi 28 day concrete, thickness as indicated on Civil Drawings thick, reinforcing as indicated on Civil Drawings, finish as indicated on Drawings.

### **2.02 FORM MATERIALS**

- A. Wood form material, profiled to suit conditions.
- B. Joint Filler: Preformed; non-extruding bituminous type (ASTM D1751) or sponge rubber or cork (ASTM D1752).
  - 1. Thickness: 1/2 inch.

### **2.03 REINFORCEMENT**

- A. General: As indicated on Drawings and specified following. Reinforcement for portland cement concrete paving in public rights-of-way shall comply with all applicable requirements in the Standard Specifications for Public Works Construction (SSPWC) and Standard Details, as adopted by local authorities having jurisdiction.
- B. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) yield strength; deformed billet steel bars; unfinished.
  - 1. Unless detailed otherwise on Drawings, provide number 4 reinforcing bars at 24 inches on center, each way.
- C. Tie Wires: 18 gage minimum, black annealed steel.
- D. Construction Joint Reinforcing:
  - 1. Dowels: ASTM A615/A615M, Grade 60 - 60,000 psi yield strength; deformed billet steel bars; unfinished finish.

### **2.04 PERFORMANCE REQUIREMENTS**

- A. Albedo reflectance of finish concrete shall be minimum 0.30.

### **2.05 CONCRETE MATERIALS**

- A. Obtain cementitious materials from same source throughout.
- B. Cement: ASTM C150/C150M, Normal - Type I Portland cement, gray color.
- C. Fine and Coarse Mix Aggregates: ASTM C33/C33M Table 3 Class 4M, Non-reactive.
  - 1. Class C per SSPWC Section 201-1.3.2 // Section 73 and 90.
- D. Water: Clean, and not detrimental to concrete.
- EE. Color Additives: Pure, concentrated mineral pigments specifically intended for mixing into concrete and complying with ASTM C979/C979M.**



1. **Concentration:** Base dosage rates on weight of Portland cement, fly ash, silica fume, and other cementitious materials but not aggregate or sand.
  2. **Packaging:** If pigments are to be added to mix at site, furnish pigments in premeasured disintegrating bags to minimize job site waste.
  3. **Color(s):** As indicated on drawings.
  4. **Products:**
    - a. **BRICKFORM;** BRICKFORM Liquid Integral Color: [www.brickform.com](http://www.brickform.com).
    - b. **Butterfield Color:** [www.butterfieldcolor.com](http://www.butterfieldcolor.com).
    - c. **Davis Colors:** [www.daviscolors.com](http://www.daviscolors.com).
    - d. **Lambert Corporation:** [www.lambertusa.com](http://www.lambertusa.com).
    - e. **L.M. Scofield Company:** [www.scofield.com](http://www.scofield.com).
    - f. **Solomon Colors:** [www.solomoncolors.com](http://www.solomoncolors.com).
    - g. **Substitutions:** See Section 01 60 00 - Product Requirements.
- F. Chemical Admixtures: ASTM C494/C494M, Type A - Water Reducing, Type B - Retarding, Type D - Water Reducing and Retarding, Type F - Water Reducing, High Range, and Type G - Water Reducing, High Range and Retarding.
1. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

## 2.06 ACCESSORIES

- A. Liquid Curing Compound: ASTM C 309, Type 1, Class A.
  1. Comply with all applicable air pollution requirements.
- B. Surface Retarder: Spray applied, film forming, water based top surface retarder, calibrated for specific sized aggregate and finish requirements.
  1. **Color:** As selected by Architect from manufacturer's standard range.
  2. **Manufacturers:**
    - a. Fosroc, Inc.; Preco EAC-S, manufactured by , Georgetown, KY.
    - b. GCP Applied Technologies; Grace Top Cast: [www.graceconstruction.com](http://www.graceconstruction.com)
    - c. The Euclid Chemical Company; EZ Expose: [www.euclidchemical.com](http://www.euclidchemical.com).
    - d. **Substitutions:** See Section 01 60 00 - Product Requirements.
  3. Spray applied film forming protective coating for surfaces adjacent to retarded finish surfaces.
    - a. **Basis of Design Product:** Face Off as manufactured by GCP Applied Technologies, or equal.
    - b. **Acceptable Products:**
      - 1) Fosroc, Inc., manufactured by , Georgetown, KY.
      - 2) GCP Applied Technologies; Face Off: [www.graceconstruction.com](http://www.graceconstruction.com)
      - 3) **Substitutions:** See Section 01 60 00 - Product Requirements.
- C. Tactile Warning Surfaces: See Section 32 17 26.
- D. Concrete Paving Joint Sealant: Polyurethane, self-leveling; ASTM C920, Class 25, Uses T, I, M and A; single component.



1. Color: Gray.
2. Applications: Use for:
  - a. Joints in sidewalks and vehicular paving.
3. Products:
  - a. Pecora Corporation; NR-201 Self-Leveling Traffic and Loop Sealant: [www.pecora.com](http://www.pecora.com).
  - b. Sherwin-Williams Company; Stampede 1SL Polyurethane Sealant: [www.sherwin-williams.com](http://www.sherwin-williams.com).
  - c. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Soil Sterilant: As specified in Standard Specifications for Public Works Construction. Soil sterilant shall comply with all applicable environmental protection and hazardous materials laws and regulations.
  1. See Section 32 11 23 - Aggregate Base Course for product.
- F. Headers and Stakes: Pressure preservative treated douglas fir, 2 x 6 inch nominal size except at curves provide laminated 1 x 6 inch. Use hot dipped galvanized nails only.
- G. Expansion Joint Filler: ASTM D1751, premolded, compressible 1/2 inch thick non-extruding bituminous type resilient filler, compatible with joint backing and sealing products.

## 2.07 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Mix for Pedestrian (Sidewalk) Pavements, Natural Color, unless indicated otherwise: SSPWC, Section 201-1.1.2 - Class 520-B-3000, with minimum slump of 4 inches.
- C. Concrete Mix for Trash Enclosure and other Exterior Slabs on Grade: ASTM C94/C94M - Ready-Mixed Concrete, Alternative No. 2, minimum 28 day compressive strength as indicated on Drawings or, if not indicated; 3000 psi.
- D. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
  1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- E. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.
  1. Use accelerating admixtures in cold weather or set retarding admixtures in hot weather only when approved by Architect. Do not use calcium chloride.
- FF. Colored Concrete: Add pigments in strict accordance with manufacturer's instructions to achieve consistent color from batch to batch.**
- G. Concrete Properties:
  1. Compressive strength, when tested in accordance with ASTM C39/C39M at 28 days; As indicated on drawings.
  2. Water-Cement Ratio: Maximum 50-60 percent at point of placement, or according to indicated concrete strength.
  3. Maximum Slump: 4 inches.



## **2.08 MIXING**

- A. Transit Mixers: Comply with ASTM C94/C94M.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify compacted stabilized soil is acceptable and ready to support paving and imposed loads.
- B. Fine grading, checking, shaping, and compacting of subgrade shall be complete before start of concrete paving Work.
- C. Verify gradients and elevations of base are correct.

### **3.02 SUBBASE**

- A. Prepare subbase in accordance with local community adopted version of SSPWC standards.
- B. For pavement subject to vehicular traffic, provide sub-base and aggregate base material specified in Section 32 11 23 - Aggregate Base Courses and as indicated on the Drawings.
- C. Aggregate base is not required under Portland cement concrete paving subject only to pedestrian traffic in normal use.

### **3.03 PREPARATION**

- A. Project Conditions:
  - 1. Water and Dust Control: Maintain control of concrete dust and water at all times. Do not allow adjacent planting areas to be contaminated.
  - 2. Do not place pavement when base surface or ambient temperature is less than 40 degrees F or if base surface is wet or frozen.
  - 3. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Moisten base to minimize absorption of water from fresh concrete. Do not place concrete on standing water.
- C. Notify Architect minimum 24 hours prior to commencement of concreting operations.
- D. Curbs and Gutters: Schedule portland cement concrete curbs and gutters to be in place and cured prior to start of adjoining asphaltic concrete and portland cement concrete paving Work.

### **3.04 COORDINATION WITH EXISTING CONSTRUCTION**

- A. Connection to Existing Construction: Where new concrete is doweled to existing construction, drill holes in existing concrete, insert steel dowels and pack with non-shrinking grout.
- B. Preparation of Existing Concrete: Prepare previously placed concrete by cleaning with steel brush and apply bonding agent in accordance with manufacturer's instructions.

### **3.05 FORMING**

- A. Place and secure forms to correct location, dimension, profile, and gradient.



1. Surfaces and Edges: Except where special finishes and tooled edges are indicated, provide all exposed finish surfaces of dense concrete with sharp arises and outside corners.
2. Recesses and Openings: As indicated on Drawings or as directed.
- B. See Section 03 10 00 - Concrete Forming and Accessories.
- C. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
  1. Remove side forms for sidewalks, gutter depressions, island paving and driveways, not less than 12 hours after the finishing has been completed.
- D. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

### **3.06 REINFORCEMENT**

- A. Place reinforcement at midheight of slabs-on-grade.
- B. Reinforcement Placement, General: Locate reinforcement as indicated on Drawings or in Standard Specifications, whichever is more stringent.
  1. Locate reinforcement to provide required cover by concrete. If not otherwise indicated on Drawings or in Standard Specifications, provide concrete cover in compliance with ACI 318, Article 20.6.1.3.
  2. Place, support and secure reinforcement against displacement.
- C. Reinforcement Spacing: Space reinforcement as indicated on Drawings or in Standard Specifications, whichever is more stringent. If not indicated, maintain clear spacing of two times bar diameter but not less than 1-1/2 inch nor less than 1-1/3 times maximum size aggregate.
- D. Coordination: Locate reinforcement to accommodate embedded products and formed openings and recesses.
- E. Reinforcement Supports: Provide load bearing pads under supports or provide precast concrete block bar supports.
- F. Interrupt reinforcement at contraction and expansion joints.
- G. Place dowels to achieve pavement and curb alignment as detailed.
  1. Secure tie dowels in place before depositing concrete. Provide No. 3 bars, 18 inch long at 24 inches O.C. for securing dowels where no other reinforcement is provided.

### **3.07 COLD AND HOT WEATHER CONCRETING**

- A. Follow recommendations of ACI 305R when concreting during hot weather.
- B. Follow recommendations of ACI 306R when concreting during cold weather.
- C. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

### **3.08 PLACING CONCRETE**

- A. Mixing: If batch plant is within travel time not exceeding maximum limits, transit mix concrete in accordance with ASTM C94/C94M. If travel time exceeds limits, provide alternative means for mixing and submit for review and approval.



- BB. Colored Concrete: Add pigments in strict accordance with manufacturer's instructions to achieve consistent color from batch to batch.**
- C.** Place concrete in accordance with ACI 304R.
- CD.** Do not place concrete when base surface is wet.
- DE.** Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.
- EF.** Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.
- FG.** Use internal vibration to consolidate concrete around reinforcing per industry guidelines.
- GH.** Apply surface retarder only to surfaces indicated in accordance with manufacturer's instructions.

### 3.09 JOINTS

- A.** Align curb, gutter, and sidewalk joints.
- B.** Place 1/2 inch wide expansion joints as indicated on Drawings (if not indicated provide at 20 foot intervals) and to separate paving from vertical surfaces and other components and in pattern indicated.
  - 1. Place in all concrete walks, other exterior flatwork and concrete curbs and gutters.
  - 2. If expansion joints are not indicated, comply with standard details and specifications of authorities having jurisdiction, including Standard Details for Public Works Construction and Standard Specification for Public Works Construction, as applicable.
  - 3. Place expansion control filler to correct elevation and profile. Form joints with joint filler extending from bottom of pavement to within 1/2 inch of finished surface.
  - 4. Secure to resist movement by wet concrete.
  - 5. Coordinate locations to align expansion joints in adjoining concrete walks, curbs, gutters and other exterior flatwork.
  - 6. Provide expansion joints also at beginning and end of all curved segments.
  - 7. Provide expansion joints also at intersections of concrete curbs and gutters and building footing.
  - 8. Provide expansion joints also at intersections of concrete paving and building footing.
  - 9. Lay out expansion joint locations to occur where possible at penetrations such as handrail posts and columns.
  - 10. Place expansion control filler to correct elevation and profile.
- C.** Provide scored joints:
  - 1. As indicated on Drawings. If not indicated, locate joints in compliance with Standard Details and as indicated below.
  - 2. Evenly spaced at maximum 5 feet intervals for vehicular paving and 5 feet for pedestrian paving.
  - 3. Between sidewalks and curbs.
  - 4. Between curbs and pavement.



5. Lay out control joint locations to occur at penetrations such as handrail posts and columns and where shown on Drawings.
  6. Refer to Architectural, Landscape and Civil Drawings for additional information and joint locations.
- D. Provide keyed joints as indicated.
- E. Saw cut contraction joints 1/8 inch wide at an optimum time after finishing. Cut 1/3 into depth of slab.

### **3.10 EXPOSED AGGREGATE**

- A. Wash concrete surfaces to which surface retarder has been applied with clean water, and scrub with stiff bristle brush exposing aggregate to match sample panel.

### **3.11 FINISHING**

- A. Area Paving: Medium broom, texture perpendicular to pavement direction..
- B. Concrete Paving Finish: ACI 301, two-step trowel finish, followed after surface has achieved initial set by flooding of surface and light rubbing with bristle brush so that concrete fines are exposed slightly.
1. Finish surface less than 6 percent shall receive medium broom finish resembling medium grit sandpaper. CBC 11B-403 and 11B-302.1.
  2. Finish surface greater than 6 percent shall receive heavy broom finish. CBC 11B-403 and 11B-302.1.
  3. Surfaces shall have static coefficients of friction of 1.3 to 1.6 (dry) and 1.2 to 1.4 (wet) when field tested in accordance with ASTM D2047.
- C. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius.
1. Broomed: Pull broom across freshly floated concrete to produce medium texture in straight lines perpendicular to main line of traffic. Do not dampen brooms.
  2. Tooled Joints: 1-inch deep by 3/16-inch wide tooled joints with 1/8-inch radius corners.
- D. Curbs and Gutters: Comply with Standard Specifications.
- E. Specific Finishes:
- F. Curing and Sealing:
1. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.
  2. Integrally Colored Concrete: Apply curing compound for integrally colored concrete according to manufacturer's instructions using manufacturer's recommended application techniques. Apply curing and sealing compound at consistent time for each pour to maintain close color consistency.
    - a. Curing compound shall be same color as the colored concrete and supplied by same manufacturer of the colored admixture.
  3. Precautions shall be taken in hot weather to prevent plastic cracking resulting from excessively rapid drying at surface as described in CIP 5 Plastic Shrinkage Cracking published by the National Ready Mixed Concrete Association.



4. Do not cover concrete with plastic sheeting.

### **3.12 JOINT SEALING**

- A. See Section 3948 - 3948 for joint sealer requirements.

### **3.13 TOLERANCES**

- A. ACI 301, Class B, except paving in public rights-of-way shall comply with the Standard Specifications.
- B. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
- C. Maximum Variation From True Position: 1/4 inch.
- D. Control-joint grooves and other conspicuous lines:
  1. 1/4 inch maximum in any 20 feet.
  2. 1/2 inch maximum in any 40 feet.
- E. Variation in Cross-Sectional Thickness of Slabs:
  1. Minus 1/4 inch.
  2. Plus 1/2 inch.
- F. Variation in Radii
  1. In radii of less than 10 feet:
    - a. 1/8 inch in any 5 feet.
    - b. 1/4 inch in any 10 feet.
  2. In radii of 20 feet:
    - a. 1/4 inch in any 10 feet.
    - b. 3/8 inch in any 20 feet
  3. In radii of 30 feet or more:
    - a. 1/2 inch in any 20 feet.
    - b. 1 inch in any 30 feet.
- G. Coefficient of Friction for Finish Surface:
  1. Pedestrian Vehicular Finish Surface: Minimum 0.6 static coefficient of friction is required for all concrete paving finish surface. All concrete paving surfaces to be broom finish.
  2. Ramps: Minimum 0.8 static coefficient of friction is required for all concrete paving finish surfaces on ramps. All concrete paving surfaces on ramps to be broom finish.

### **3.14 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
  1. Provide free access to concrete operations at project site and cooperate with appointed firm.
  2. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
  3. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.



- B. Compressive Strength Tests: ASTM C39/C39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 75 cu yd or less of each class of concrete placed each day.
  - 1. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
  - 2. Perform one slump test for each set of test cylinders taken.
- C. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

### **3.15 PROTECTION**

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit pedestrian traffic over pavement until 75 percent design strength of concrete has been achieved.
- C. **Provide protection of colored concrete in accordance with colored concrete manufacturer's instructions and recommendations.**

**END OF SECTION**







**SECTION 32 33 00**  
**SITE FURNISHINGS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Benches.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 50 00 - Metal Fabrications: Anchors to attach site furnishings to mounting surfaces.

**1.03 REFERENCE STANDARDS**

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's specifications and descriptive literature, installation instructions, and maintenance information.

**1.05 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide manufacturer's Lifetime Warranty against defects in materials or workmanship for wood benches manufactured from solid teak.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

**2.02 WOOD BENCHES**

- A. Materials:
  - 1. Wood: Solid, Kiln-dried Ipe hardwood slats.
  - 2. Factory Finish: Natural.
- B. Frame: Black powder-coated steel.
  - 1. Formed 3/8 inch thick mild steel plate for wall-top mounting with with 7/8 inch diameter holes for anchors.
- C. Benches: Solid wood supports and seat section without back.
  - 1. Shape: Rectangle.
  - 2. Width: 14-3/8 inches.
- D. Basis of Design Product: Timberform 2047-6-01 Wall-top Seat as manufactured by Columbia Cascade Company ([www.site-furnishings.columbia-cascade.com](http://www.site-furnishings.columbia-cascade.com)), or approved equal.



### **2.03 WOOD PLANTERS, O.F.O.I.**

- A. Materials:
  - 1. Stainless steel fasteners, marine-anodized 6063-T5 aluminum, 3/4" solid tropical hardwood planking, and high-density plastics.
- B. Shape: Rectangular, Size as indicated on Drawings.
- C. Mounting: Freestanding.
- D. Basis of Design Product: Wood Garden Planter, "Tropical Hardwood RPL" as manufactured by DeepStream Designs ([www.deepstreamdesign.com](http://www.deepstreamdesign.com)), or approved equal.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

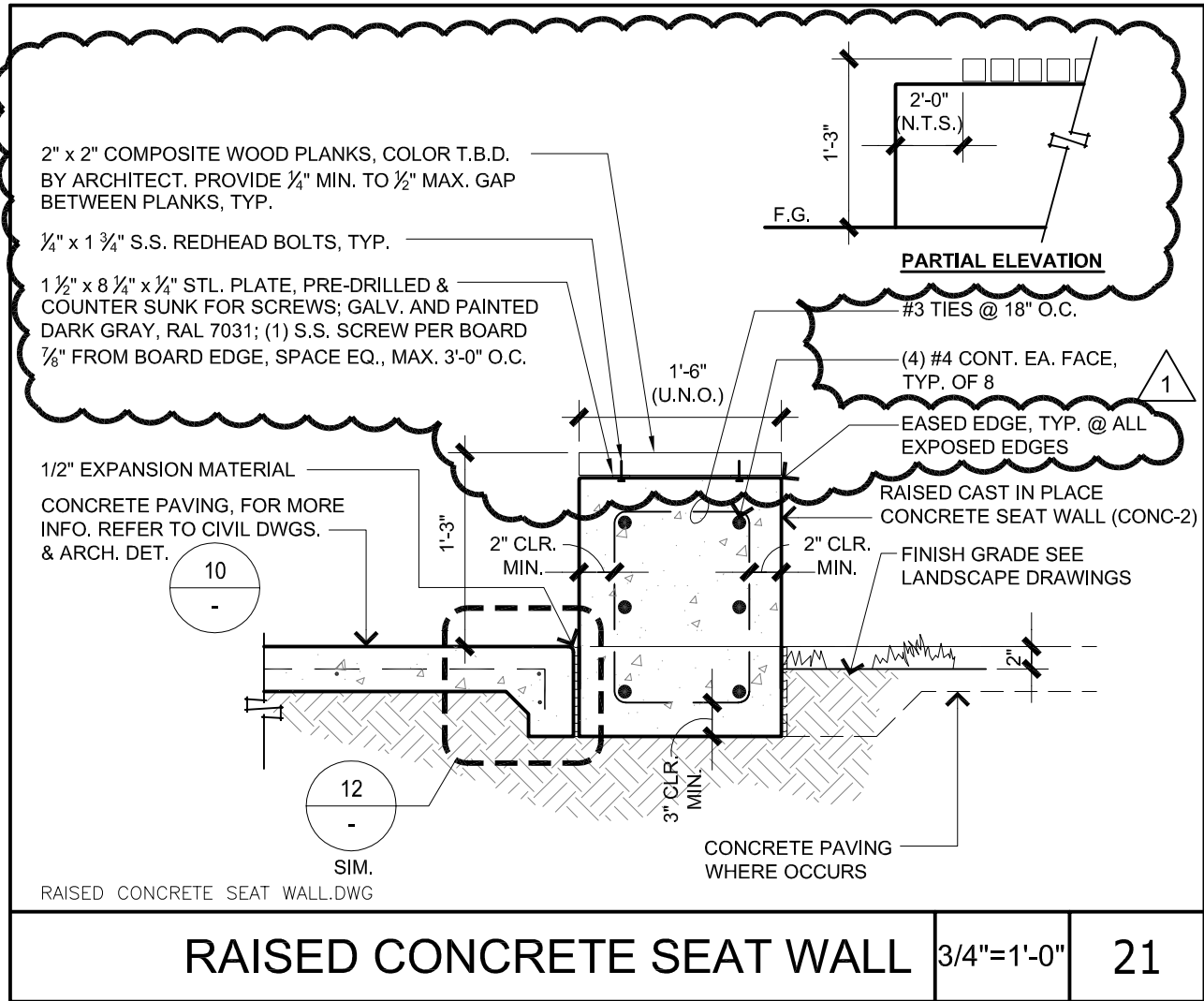
- A. Verify that mounting surfaces, preinstalled anchor bolts, or other mounting devices are properly installed; and ready to receive site furnishing items.
- B. See Section 05 50 00 for anchors to attach site furnishings to mounting surfaces.
- C. Do not begin installation until unacceptable conditions are corrected.

### **3.02 INSTALLATION**

- A. Install site furnishings in accordance with approved shop drawings, and manufacturer's installation instructions.
- B. Provide level mounting surfaces for site furnishing items.

**END OF SECTION**





REFERENCE SHEET ASD-1.0

**NORTH PARK ELEMENTARY SCHOOL**  
**ADMIN. ADDITION & MODERNIZATION**  
**5378 NORTH 'H' STREET, SAN BERNARDINO, CA 92407**  
**SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT**

RUHNAUCLARKE.COM  
 3775 TENTH STREET, RIVERSIDE CALIFORNIA 92501 (951) 684 4664  
 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92010 (760) 438 5899

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DSA File #: 36-55

Date: 2-1-2019

Project #: 1-78-22

Sheet #: **ASK-1.1**

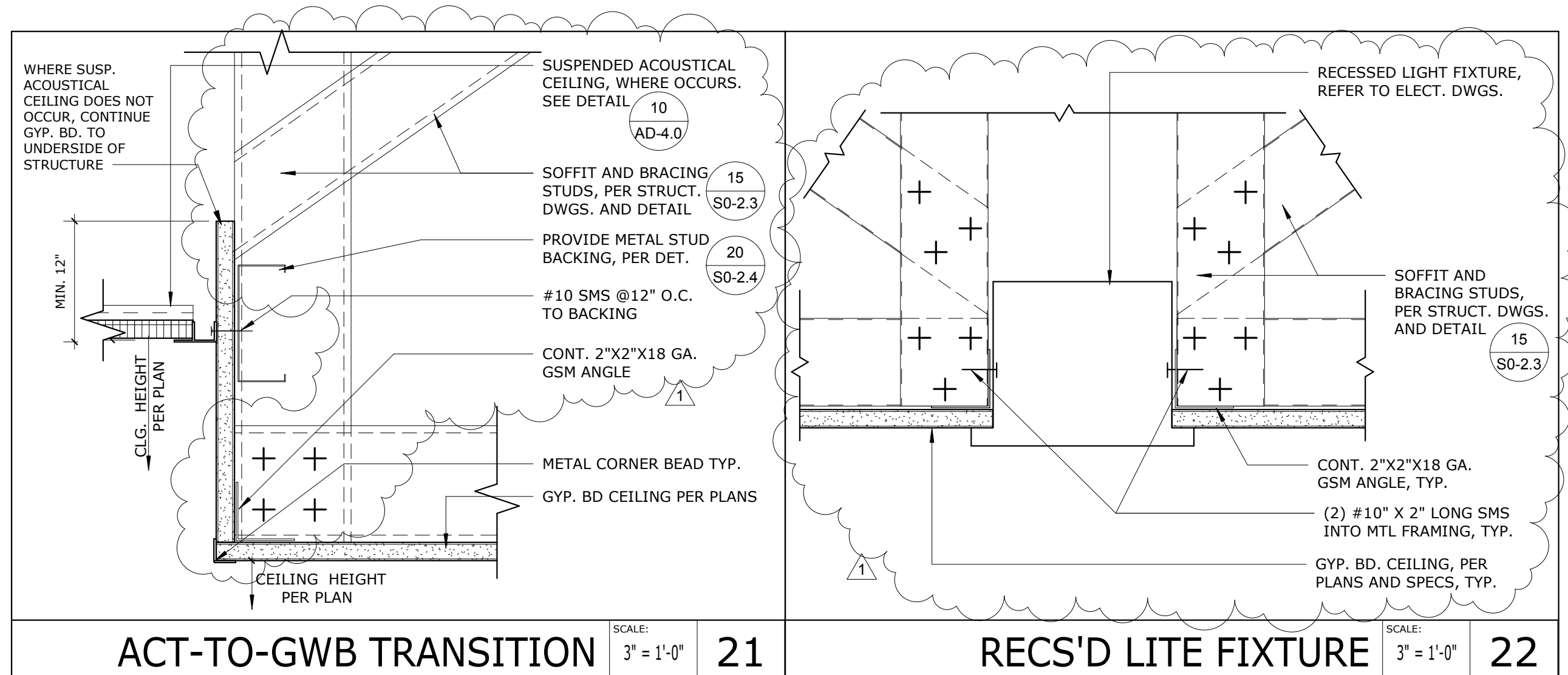
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REFERENCE SHEET AD-4.0

3" = 1'-0"

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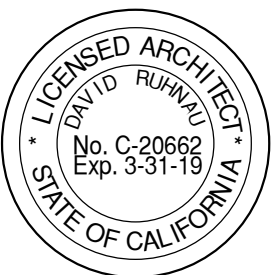
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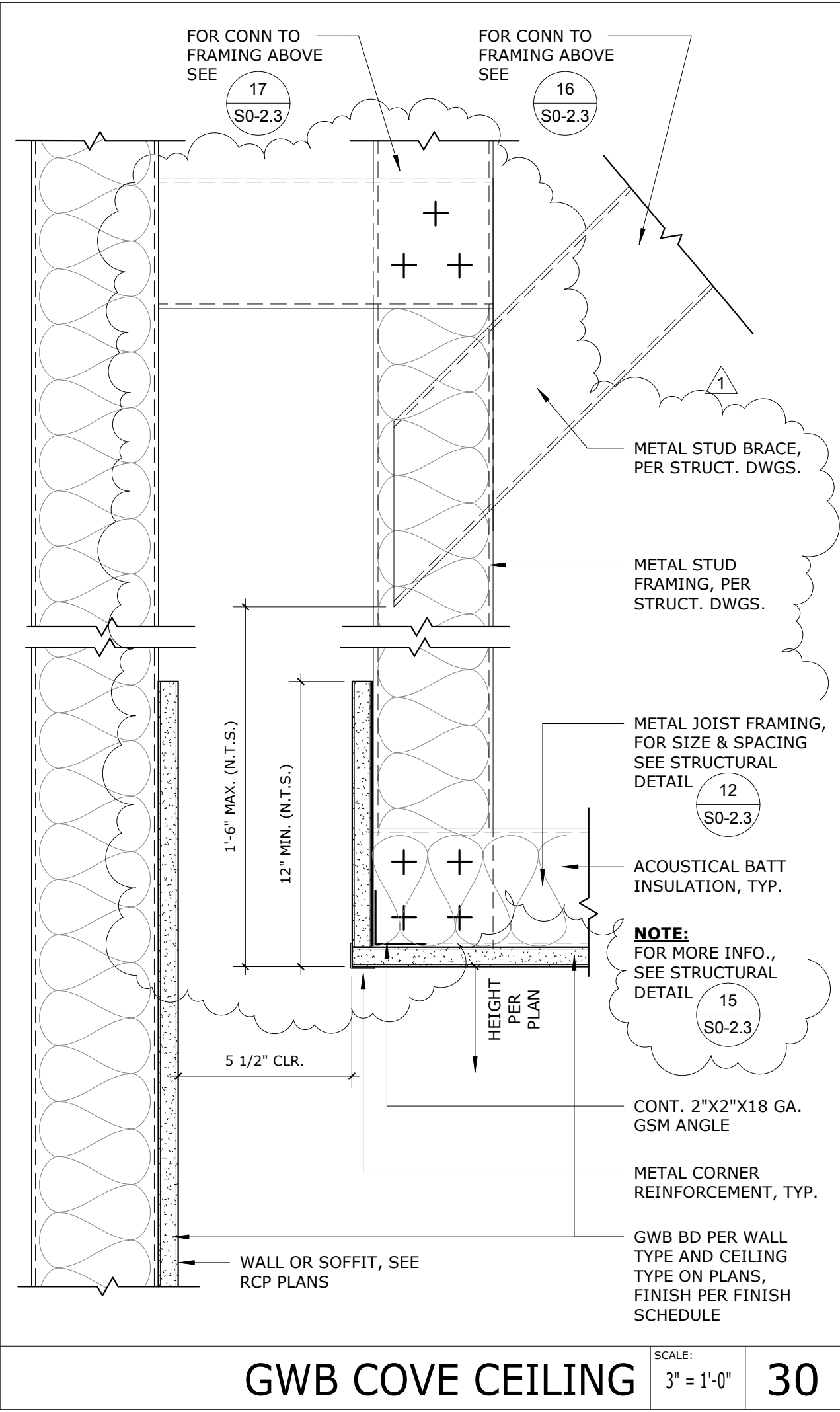
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ASK-1.3







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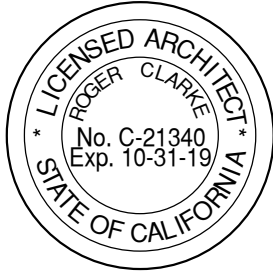
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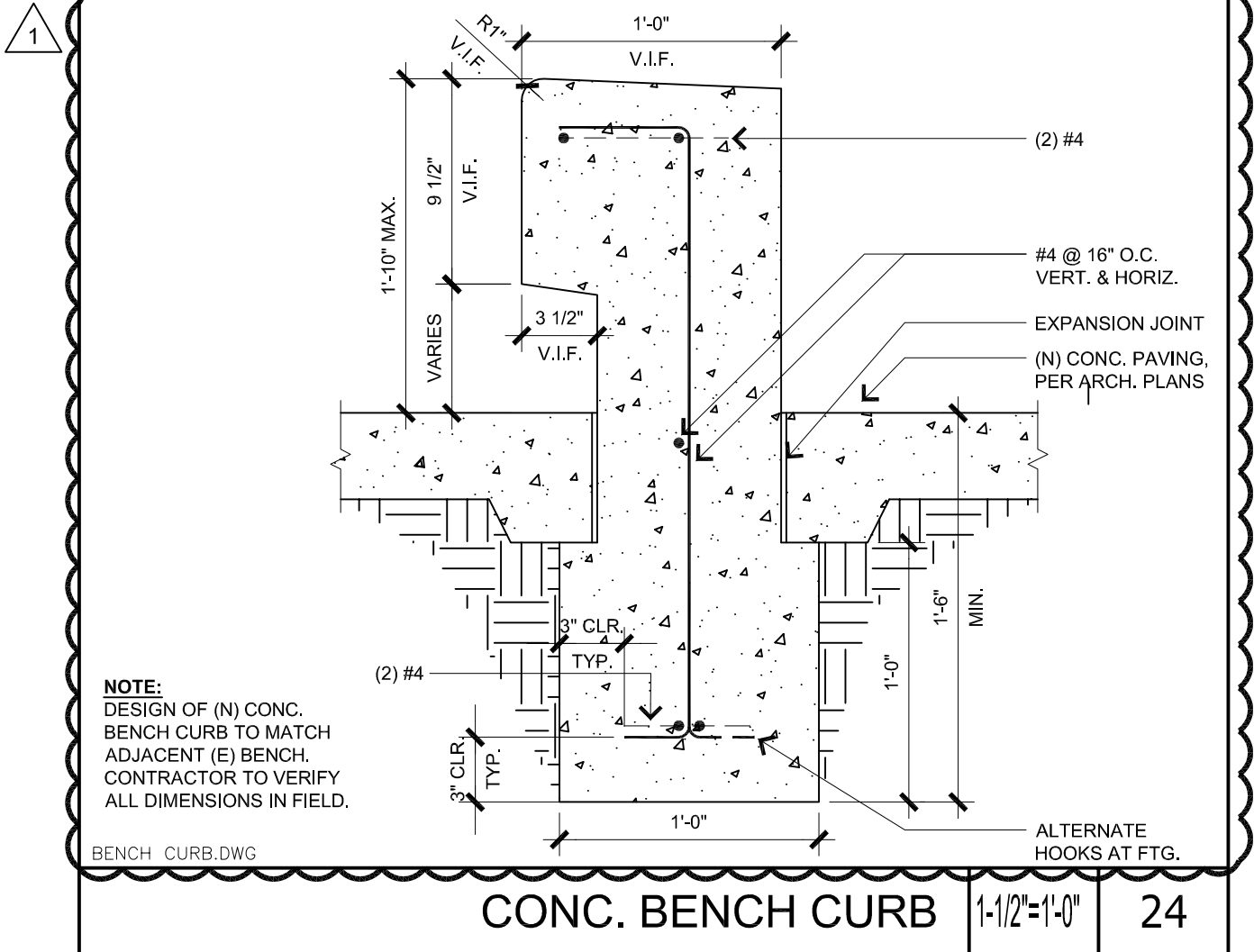
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DSA APN #: 04-117672  
DSA File #: 36-55  
Date: 2-1-2019  
Project #: 1-78-22  
Sheet #: **ASK-1.4**







REFERENCE SHEET ASD-1.0

SEE DETAIL

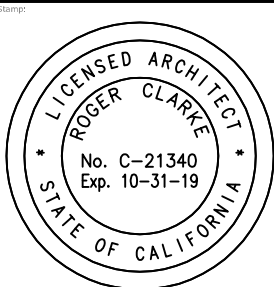
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**ADMIN. ADDITION & MODERNIZATION**  
 5378 NORTH 'H' STREET, SAN BERNARDINO, CA 92407  
 SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

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 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92010 (760) 438 5899

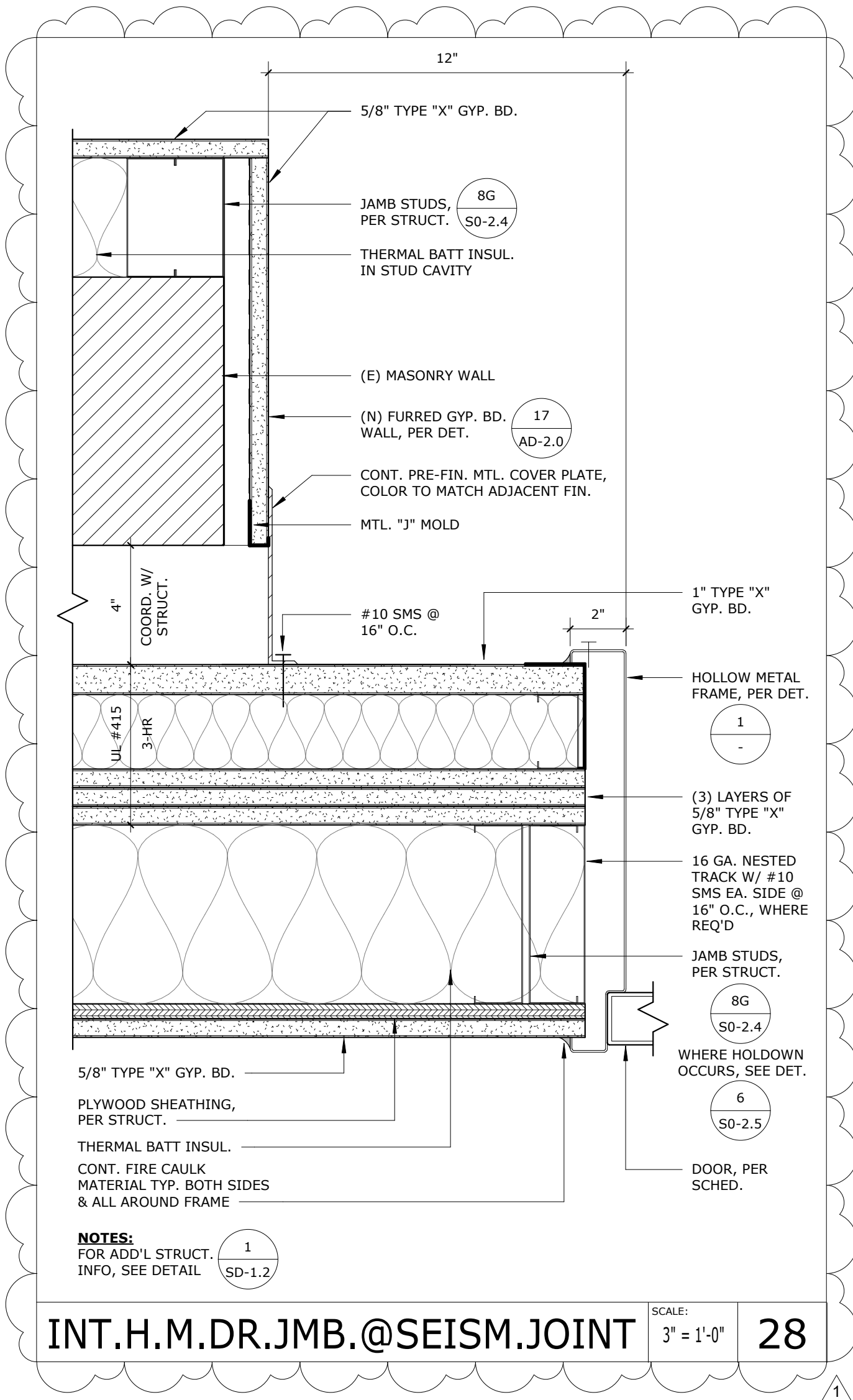
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 DSA File #: 36-55  
 Date: 2-27-2019  
 Project #: 1-78-22  
 Sheet #:

**ASK-1.5**







REFERENCE SHEET AD-7.0

3" = 1'-0"

# NORTH PARK ELEMENTARY SCHOOL

ADMIN. ADDITION & MODERNIZATION  
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

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5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92010 (760) 438 5899

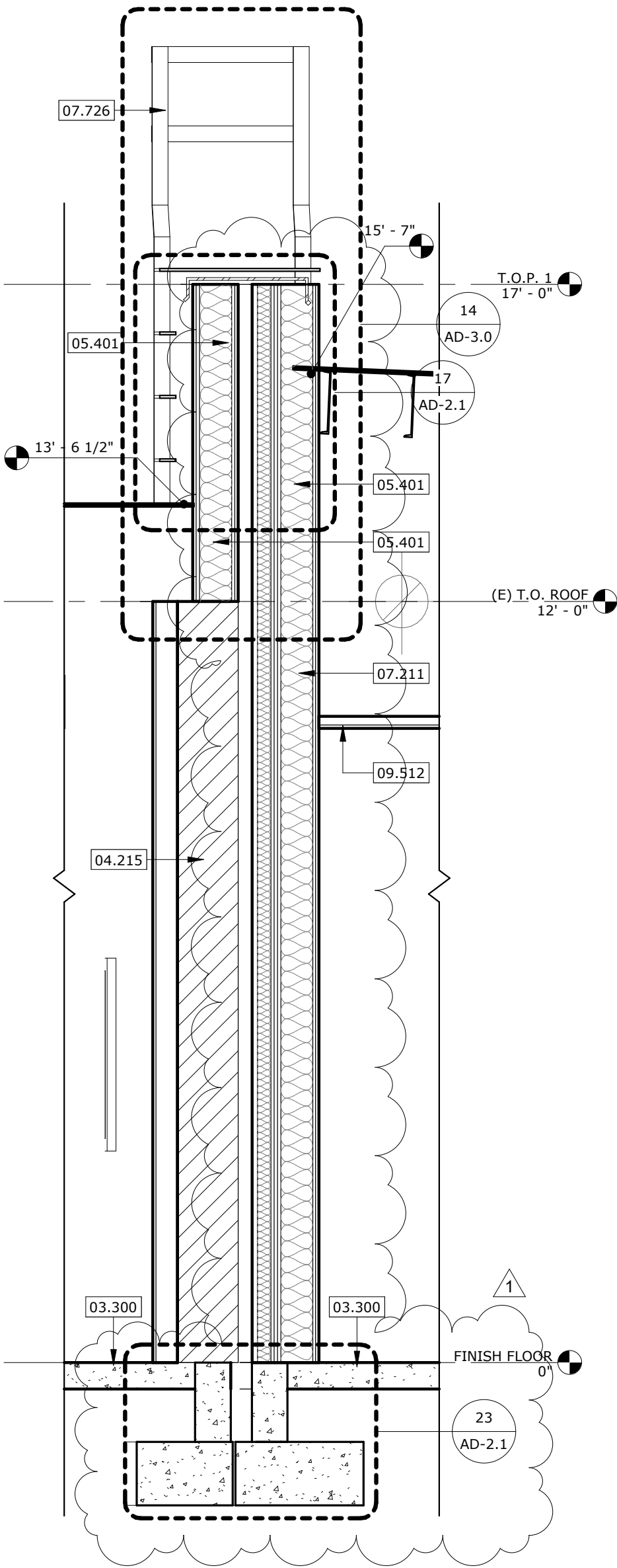
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DSA File #: 36-55  
Date: 3-6-19  
Project #: 1-78-22  
Sheet #:

ASK-1.6







WALL SECTION

SCALE:  
1/2" = 1'-0"

1

REFERENCE SHEET A5.1

1/2" = 1'-0"

NORTH PARK ELEMENTARY SCHOOL

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SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

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3775 TENTH STREET, RIVERSIDE CALIFORNIA 92501 (951) 684 4664  
5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92010 (760) 438 5899

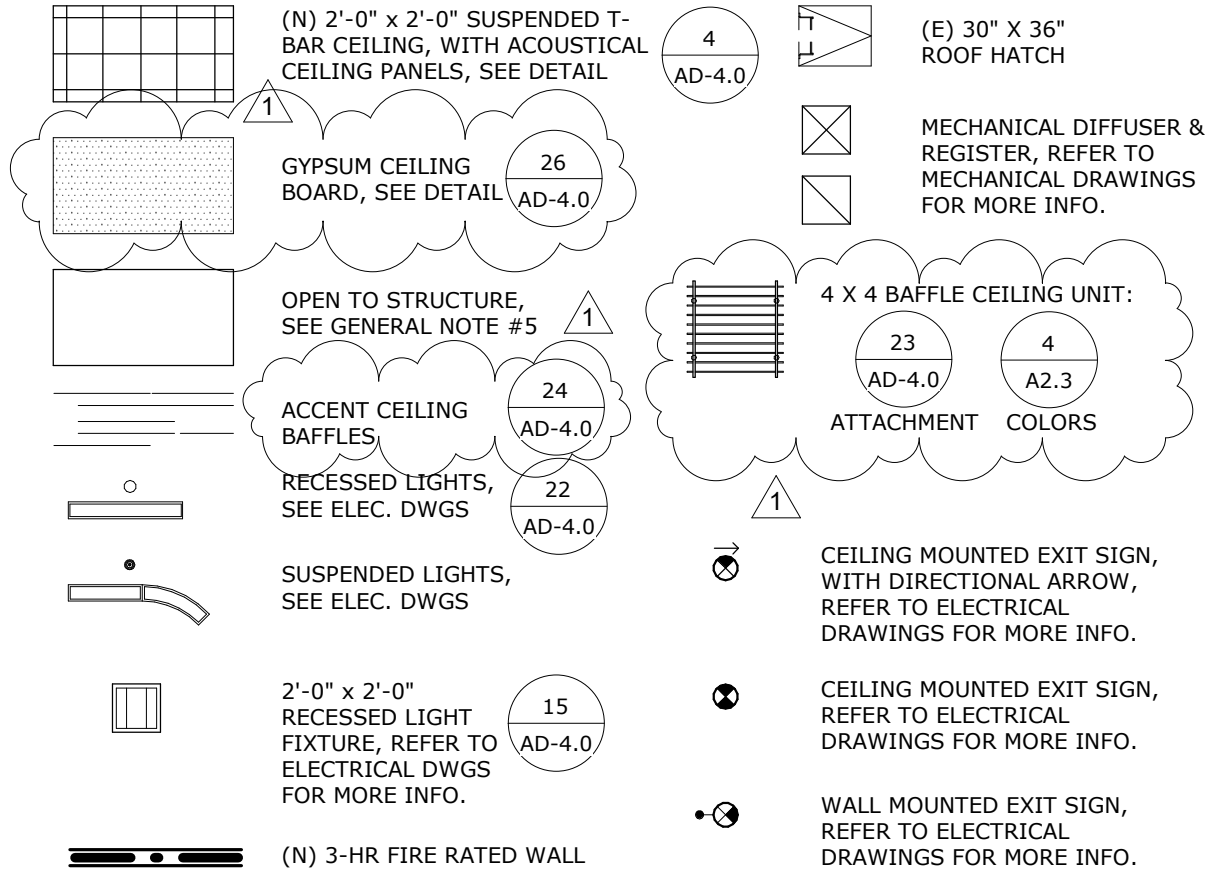
RUHNAU  
CLARKE  
ARCHITECTS

DSA APN #:	04-117672
DSA File #:	36-55
Date:	3-1-19
Project #:	1-78-22
Sheet #:	ASK-1.7





# MOD. R.C.P. LEGEND



Description :

## REFERENCE SHEET A2.2

Scale:

1/8" = 1'-0"

# NORTH PARK ELEMENTARY SCHOOL

ADMIN. ADDITION & MODERNIZATION  
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

3/1/2019 11:20:28 AM

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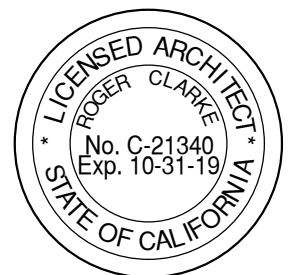
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Date:  
3-1-19

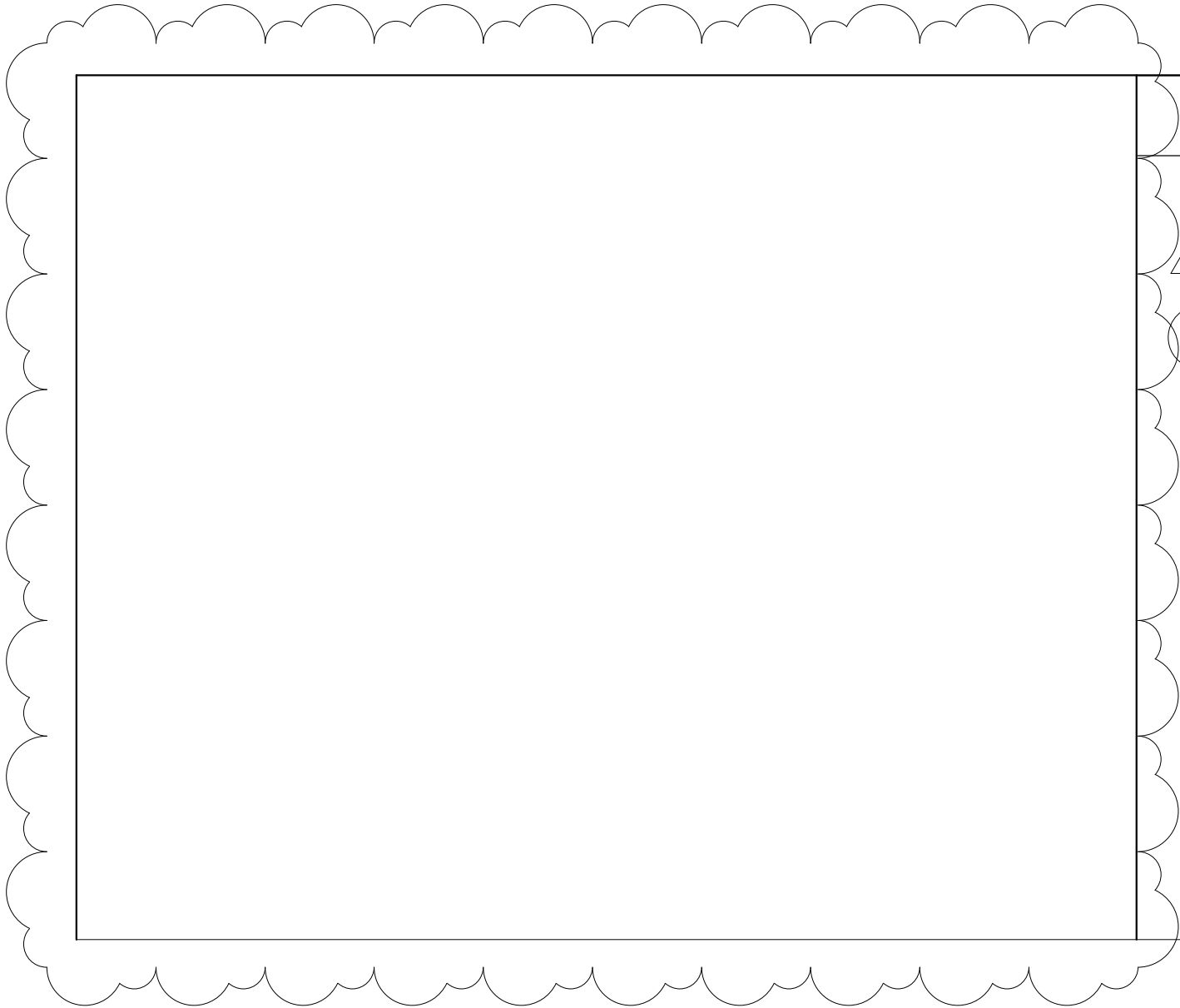
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1-78-22

Sheet #:  
**ASK-1.8**


Stamp:



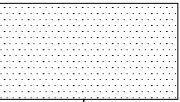


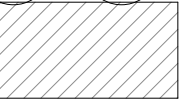


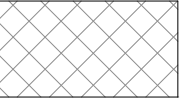
# DEMO R.C.P. LEGEND


- 

1

(E) 2X4 CEILING TILE PANELS  
AND (E) LIGHTS TO REMAIN,  
PROTECT IN PLACE, U.N.O.
- 

(E) GYP CEILING TO REMAIN  
AS IS, PROTECT IN PLACE
- 

(D) EXISTING GYP./ PLASTER  
CEILING AND (E) LIGHTS TO  
BE REMOVED
- 

(D) EXISTING CEILING TILE  
PANELS AND (E) LIGHTS TO  
BE REMOVED
- 

(E) 30" X 36" ROOF HATCH TO REMAIN, PROTECT IN PLACE

## NORTH PARK ELEMENTARY SCHOOL

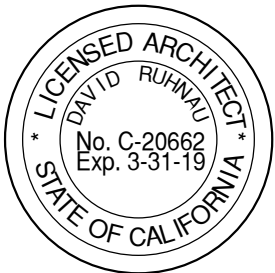
ADMIN. ADDITION & MODERNIZATION  
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DSA APN #:	04-117672
DSA File #:	36-55
Date:	3-1-19
Project #:	1-78-22
Sheet #:	

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ASK-1.9

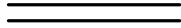




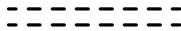
# DEMO FLOOR PLAN LEGEND



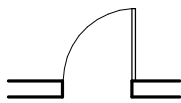
(E) BRICK WALLS



(E) METAL STUD WALLS



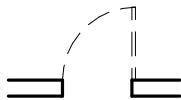
(E) WALLS TO BE DEMO, COORDINATE OPENINGS WITH MODERIZATION PLANS



(E) DOOR TO REMAIN

P.H.  
101  
45 MIN.

DOOR TAG, SEE SHEET T1 FOR MORE INFO.



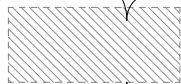
(E) DOOR TO BE REMOVED



(E) WINDOW TO BE REMOVED



(E) FLOOR SLAB TO BE REMOVED FOR FUTURE WORK. REFER TO MODERNIZATION PLANS & STRUCT. DWGS. FOR MORE INFO.



SAWCUT & TRENCH (E) CONCRETE SLAB AS REQUIRED TO INSTALL NEW PLUMBING, PER PLUMBING DRAWINGS



## NOTES:

- (E) WINDOWS ARE NOT CALLED OUT, (E) WINDOWS ARE TO BE REPLACED U.N.O.

Description :

**REFERENCE SHEET A1.1**

Scale:

**1/8" = 1'-0"**

**NORTH PARK ELEMENTARY  
SCHOOL**

ADMIN. ADDITION & MODERNIZATION

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

3/1/2019 3:03:05 PM

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DSA APN #:

04-117672

DSA File #:

36-55

Date:

3-1-19

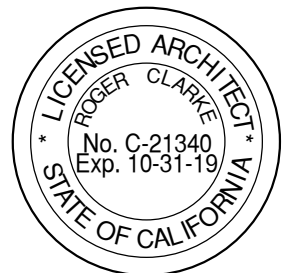
Project #:

1-78-22

Sheet #:

**ASK-1.10**

Stamp:









ALUM. COVER PLATE,  
CONSTR. SPECIALITIES  
SRJ-400

5/16-18x3 1/2" S/S CAP  
SCREW W/ SEALING  
WASHING & PVC SPACES  
@ 18" O.C.

2X SHAPED  
NAILER, TYP.

COUNTER FLASHING

MEMBRANE ROOFING SYSTEM  
UP AND OVER PARAPET

EXTERIOR GYPSUM  
SHEATHING

PLYWOOD SHEATHING PER  
STRUCT., WHERE OCCURS

N  
F.O.F.

CONTINUOUS  
MOISTURE SEAL

1/4"x2" S/S LAG  
SCREW W/ SEALING  
WASHING @ 18" O.C.

16" WIDE POLYETHYLENE  
VAPOR BARRIER

COUNTER FLASHING

MEMBRANE ROOFING  
SYSTEM AND OVER  
PARAPET

EXTERIOR GYPSUM  
SHEATHING

PLYWOOD SHEATHING,  
PER STRUCT.

5 3/8"

COORD. W/  
STRUCT.

UL #U415

3-HR

PARAPET @ SEISMIC JOINT

SCALE:  
3" = 1'-0"  
REF.: /

22

1

Description:

REFERENCE SHEET AD-3.0

Scale:

3" = 1'-0"

# NORTH PARK ELEMENTARY SCHOOL

ADMIN. ADDITION & MODERNIZATION  
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

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36-55

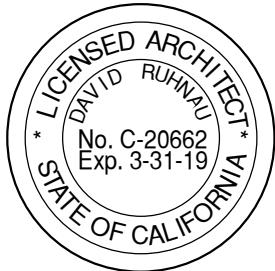
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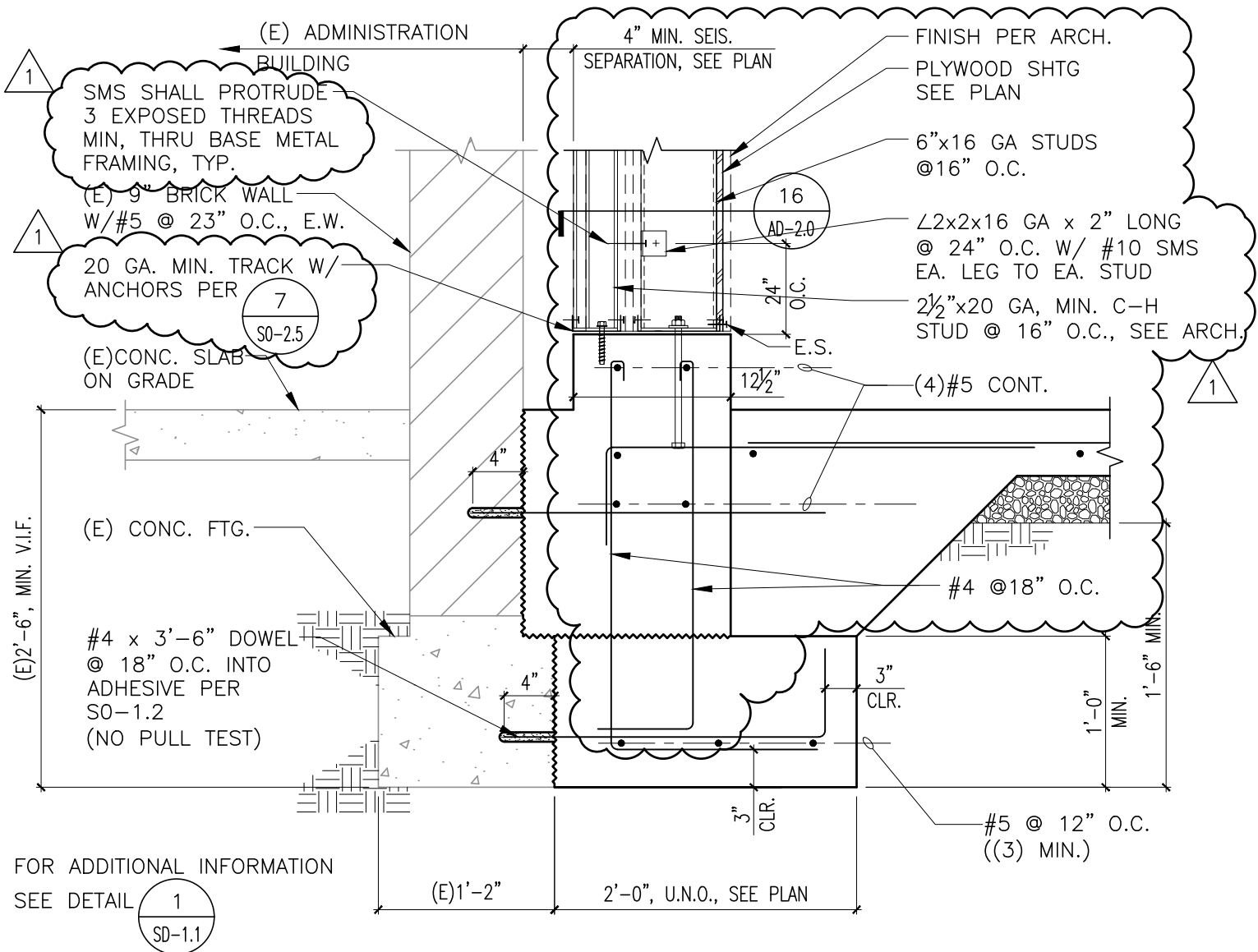
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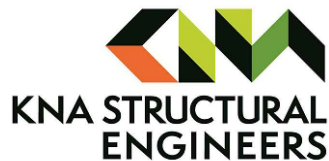
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ADDENDUM #1

REVISED DETAIL 1/SD-1.2

## ADMIN. ADDITIONAL & MODERNIZATION

NORTH PARK ELEMENTARY SCHOOL  
5378 NORTH 'H' STREET, SAN BERNARDINO, CA92407  
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

3/5/2019 9:43 AM

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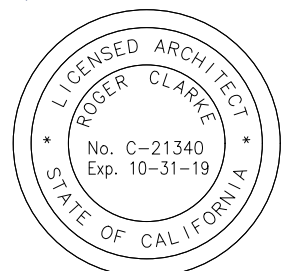
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Date:  
03/07/2019

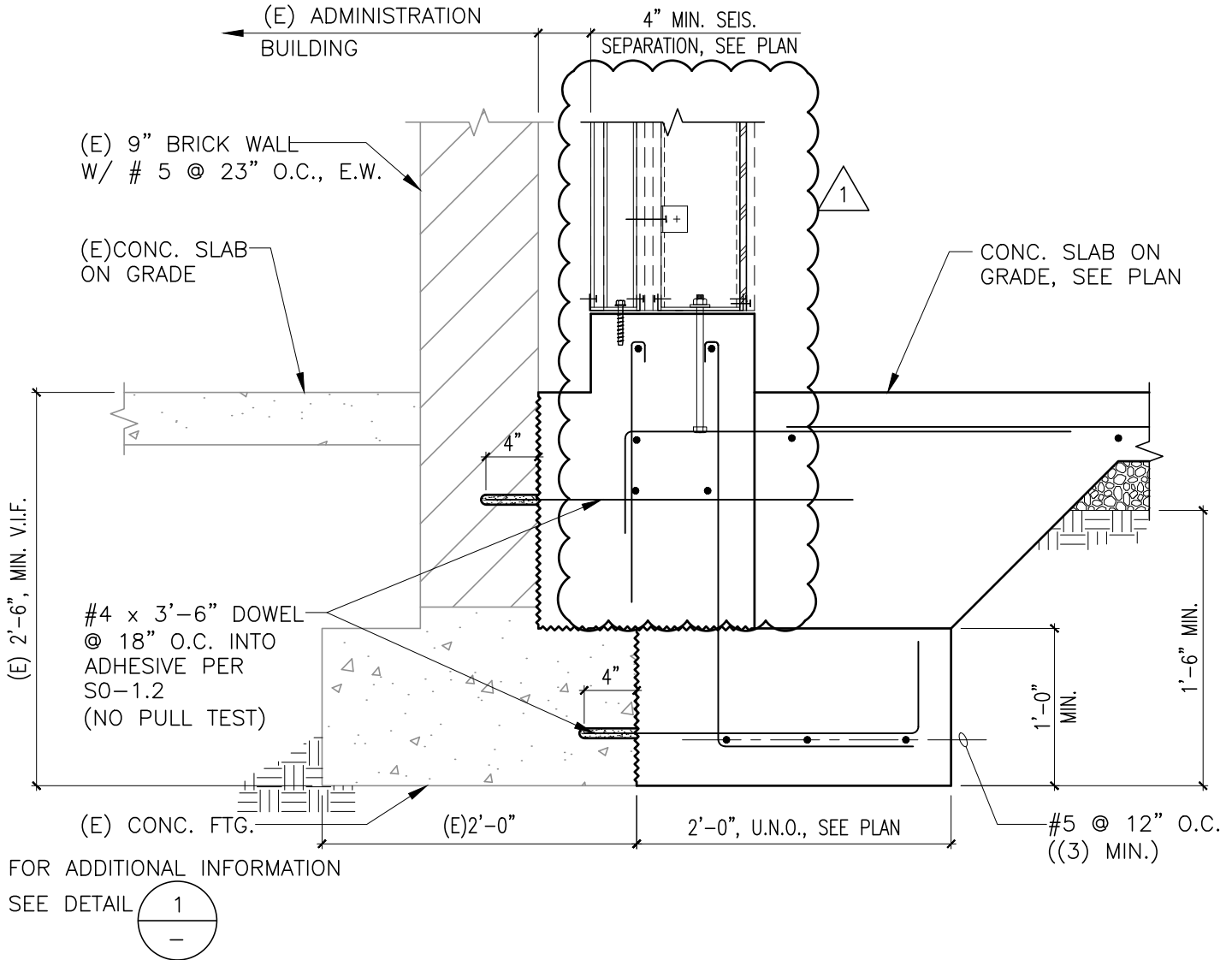
Project #:

Sheet #:  
**SSK-1.1**

Stamp:







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ADDENDUM #1

REVISED DETAIL 3/SD-1.2

## ADMIN. ADDITIONAL & MODERNIZATION

NORTH PARK ELEMENTARY SCHOOL  
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3/5/2019 9:43 AM

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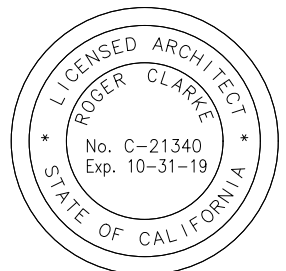
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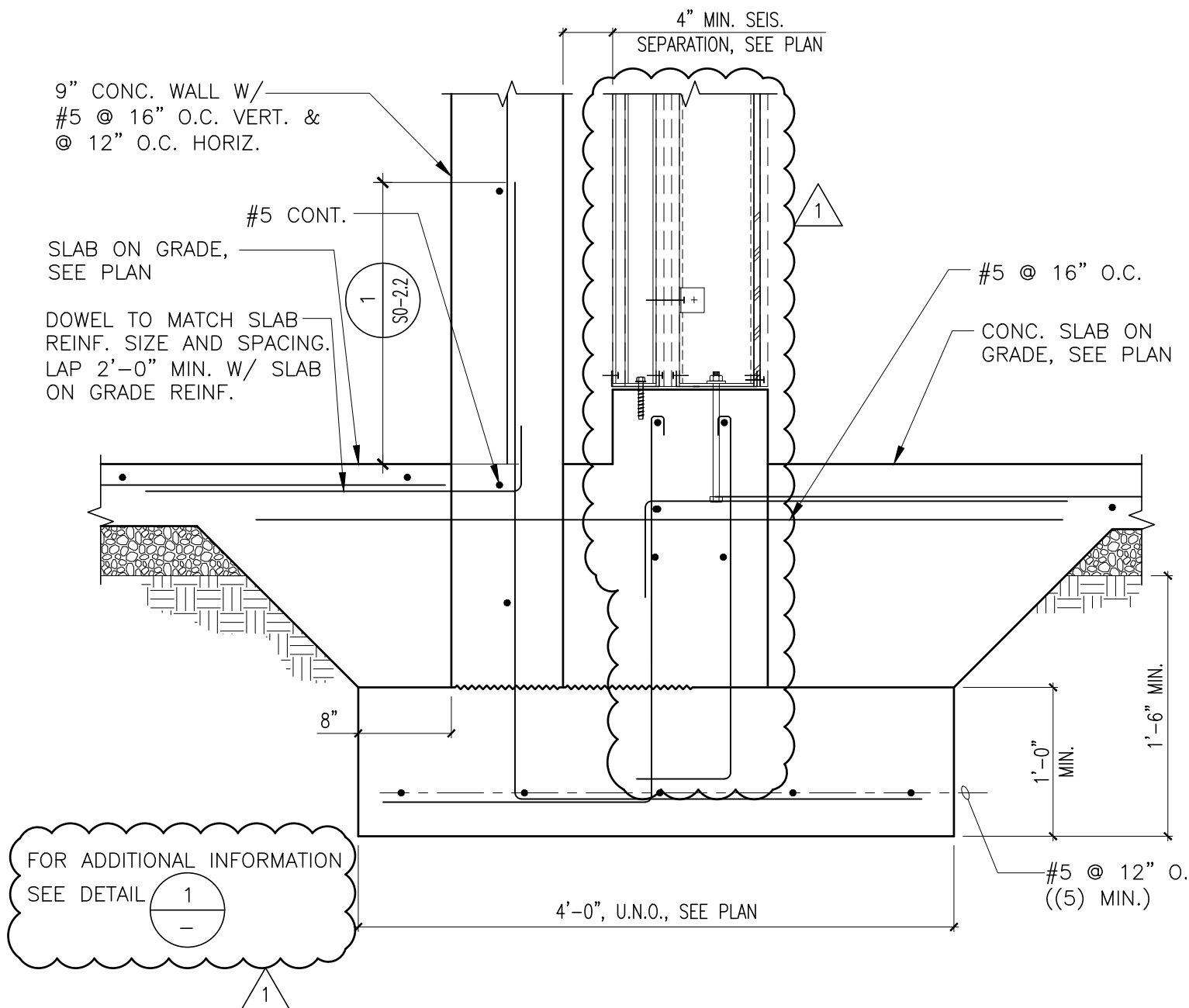
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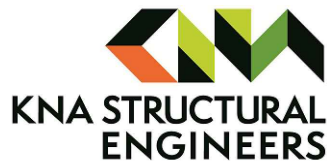
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ADDENDUM #1

REVISED DETAIL 5/SD-1.2

## ADMIN. ADDITIONAL & MODERNIZATION

NORTH PARK ELEMENTARY SCHOOL  
5378 NORTH 'H' STREET, SAN BERNARDINO, CA92407  
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

3/5/2019 9:43 AM

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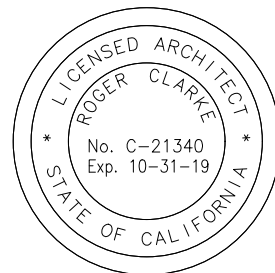
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03/07/2019

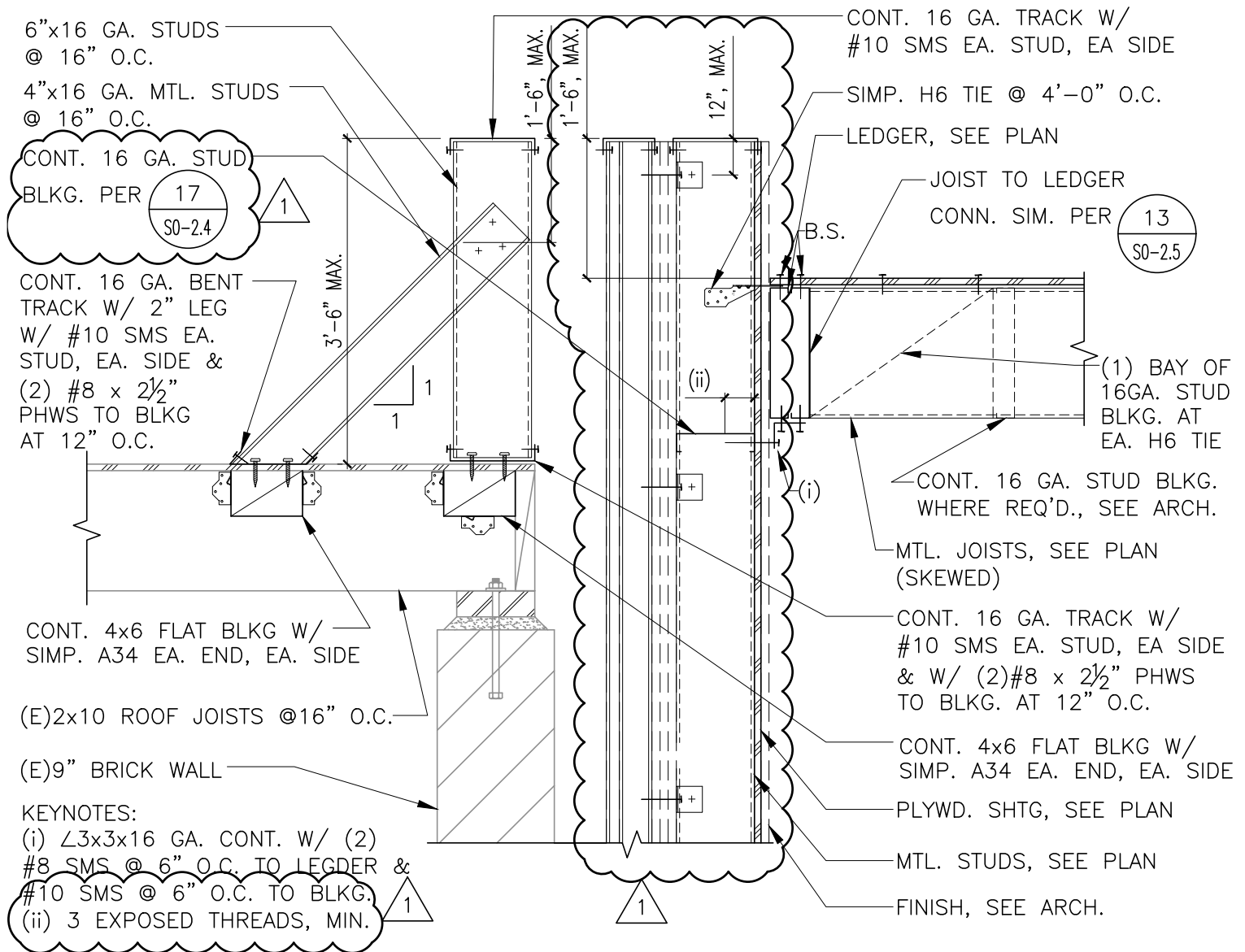
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Sheet #:  
**SSK-1.3**

Stamp:







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ADDENDUM #1

REVISED DETAIL 1/SD-3.2

## ADMIN. ADDITIONAL & MODERNIZATION

NORTH PARK ELEMENTARY SCHOOL  
5378 NORTH 'H' STREET, SAN BERNARDINO, CA92407  
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

3/5/2019 9:43 AM

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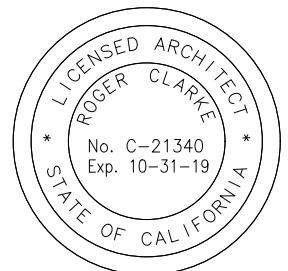
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03/07/2019

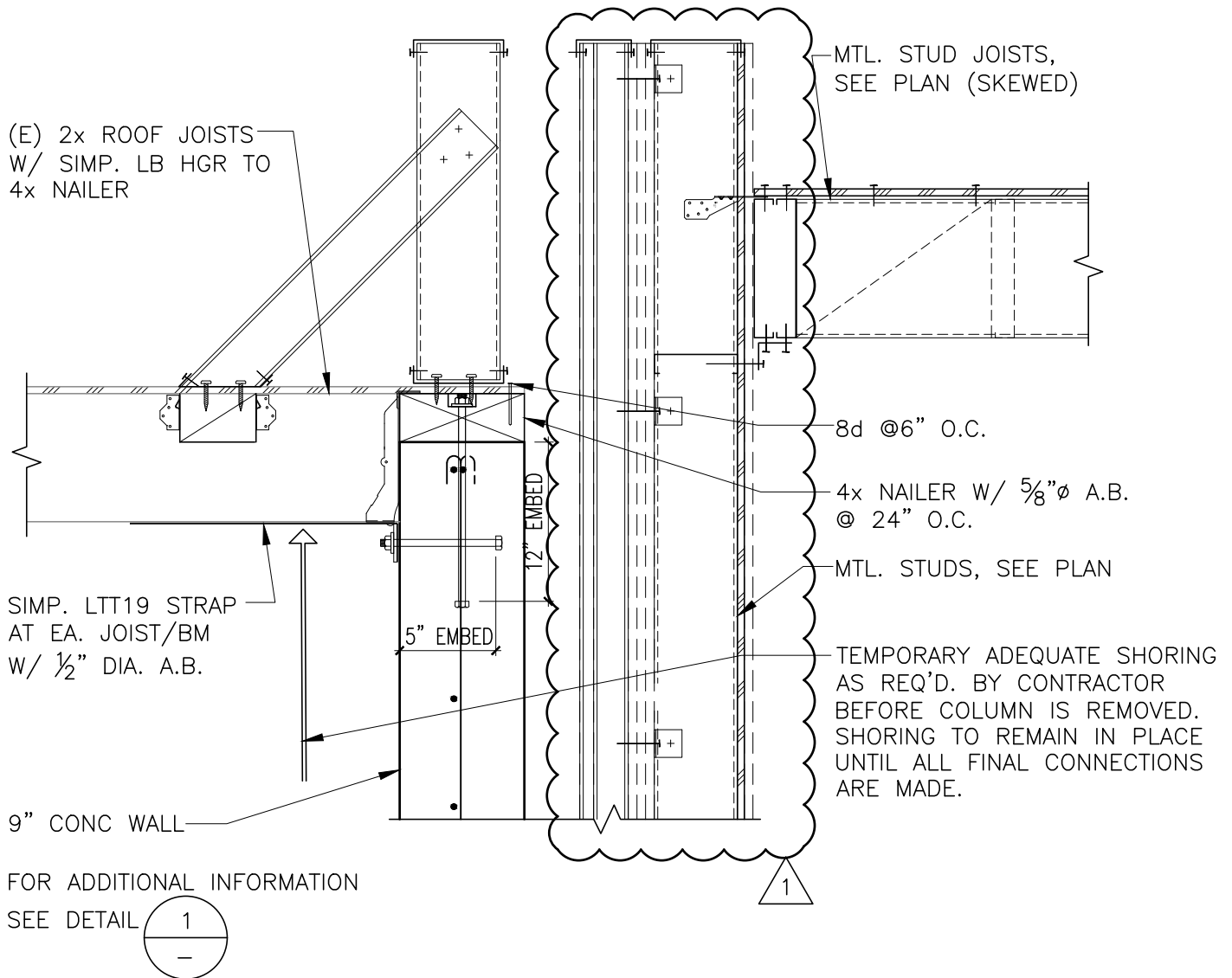
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**SSK-1.4**

Stamp:







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ADDENDUM #1

REVISED DETAIL 2/SD-3.2

## ADMIN. ADDITIONAL & MODERNIZATION

NORTH PARK ELEMENTARY SCHOOL  
5378 NORTH 'H' STREET, SAN BERNARDINO, CA92407  
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3/5/2019 9:43 AM

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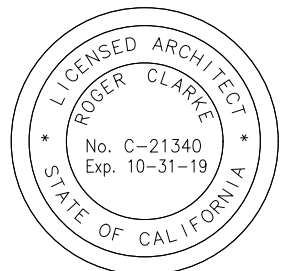
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03/07/2019

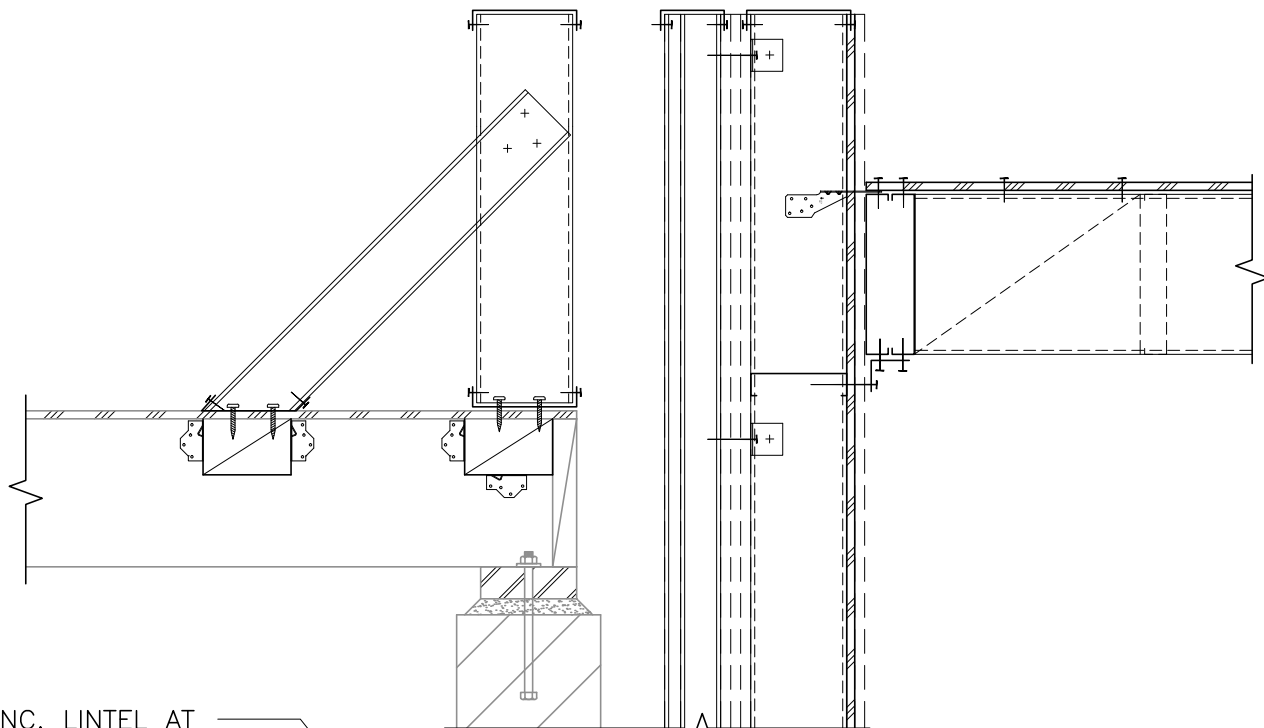
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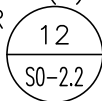
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CONC. LINTEL AT  
OPENING IN (E)BRICK  
WALL PER

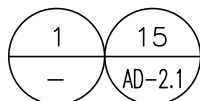


BUILT-UP LINTEL  
PER



SEE ARCH.

FOR ADDITIONAL INFO,  
SEE



10 GA. J-TRACK 2" x 6"  
CONT. W/ #10 SMS @ EA.  
C-H STUD & (2)#10 SMS  
@12" O.C. TO BUILT-UP LINTEL

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ADDENDUM #1

NEW DETAIL 16/SD-3.2

## ADMIN. ADDITIONAL & MODERNIZATION

NORTH PARK ELEMENTARY SCHOOL  
5378 NORTH 'H' STREET, SAN BERNARDINO, CA92407  
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

3/5/2019 9:43 AM

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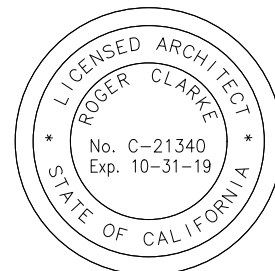
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03/07/2019

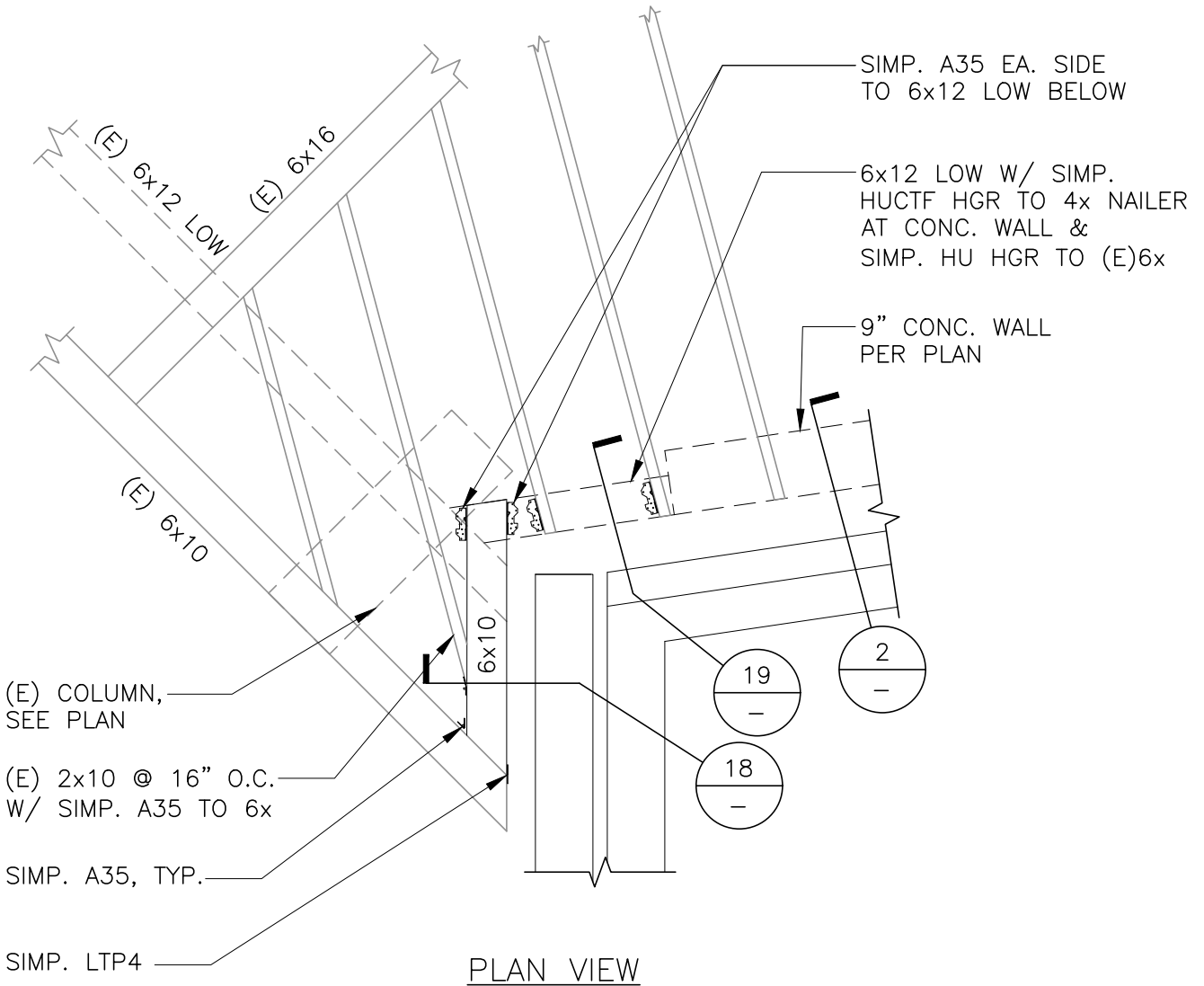
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Sheet #:  
**SSK-1.6**

Stamp:







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ADDENDUM #1

NEW DETAIL 17/SD-3.2

## ADMIN. ADDITIONAL & MODERNIZATION

NORTH PARK ELEMENTARY SCHOOL  
5378 NORTH 'H' STREET, SAN BERNARDINO, CA92407  
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

3/5/2019 9:44 AM

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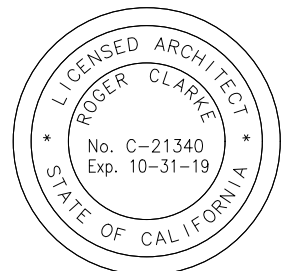
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Date: 03/07/2019

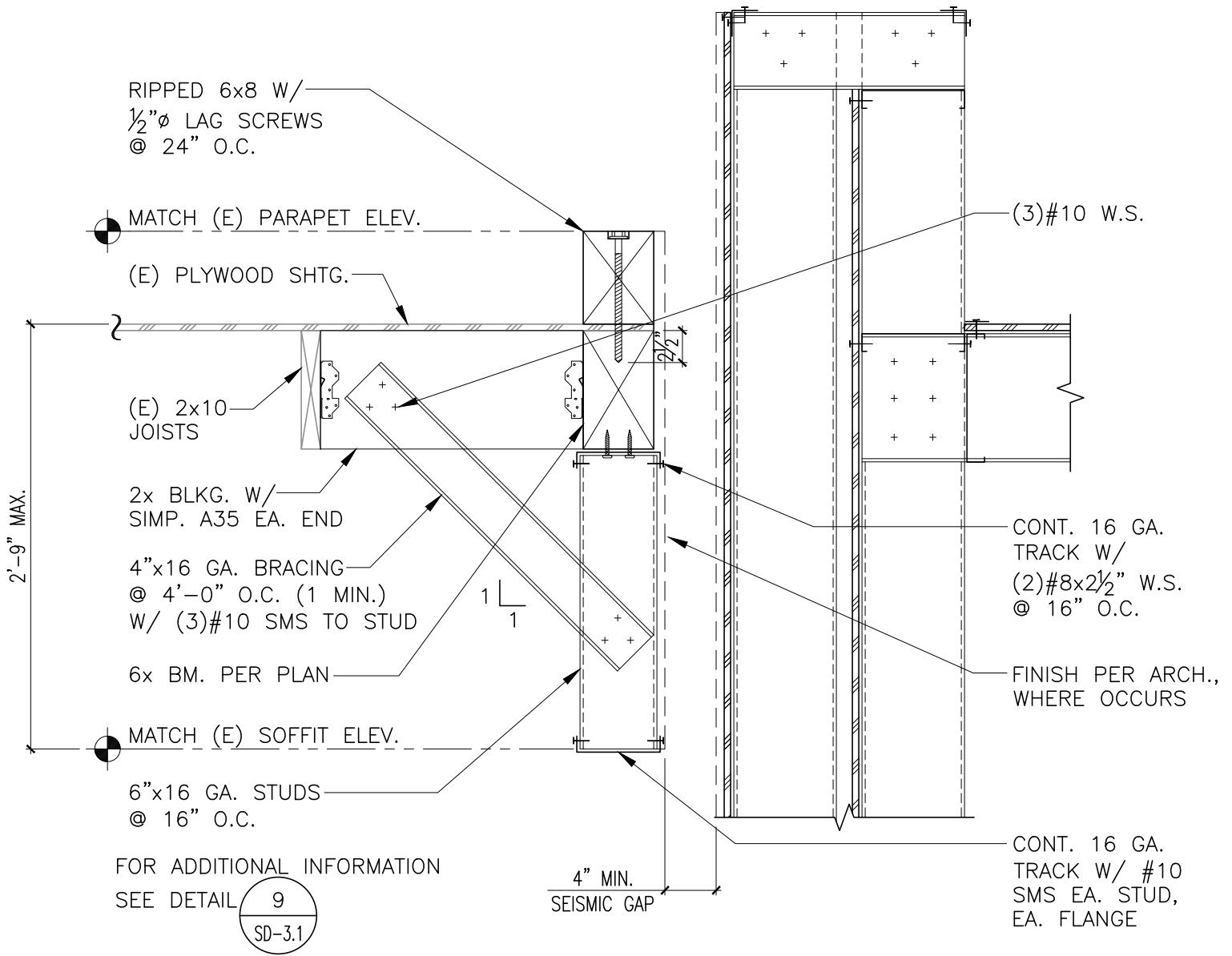
Project #:

Sheet #: **SSK-1.7**

Stamp:







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ADDENDUM #1

NEW DETAIL 18/SD-1.8

## ADMIN. ADDITIONAL & MODERNIZATION

NORTH PARK ELEMENTARY SCHOOL  
5378 NORTH 'H' STREET, SAN BERNARDINO, CA92407  
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3/5/2019 9:44 AM

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ARCHITECTS

DSA APN #:  
04-117672

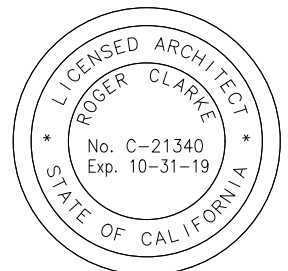
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03/07/2019

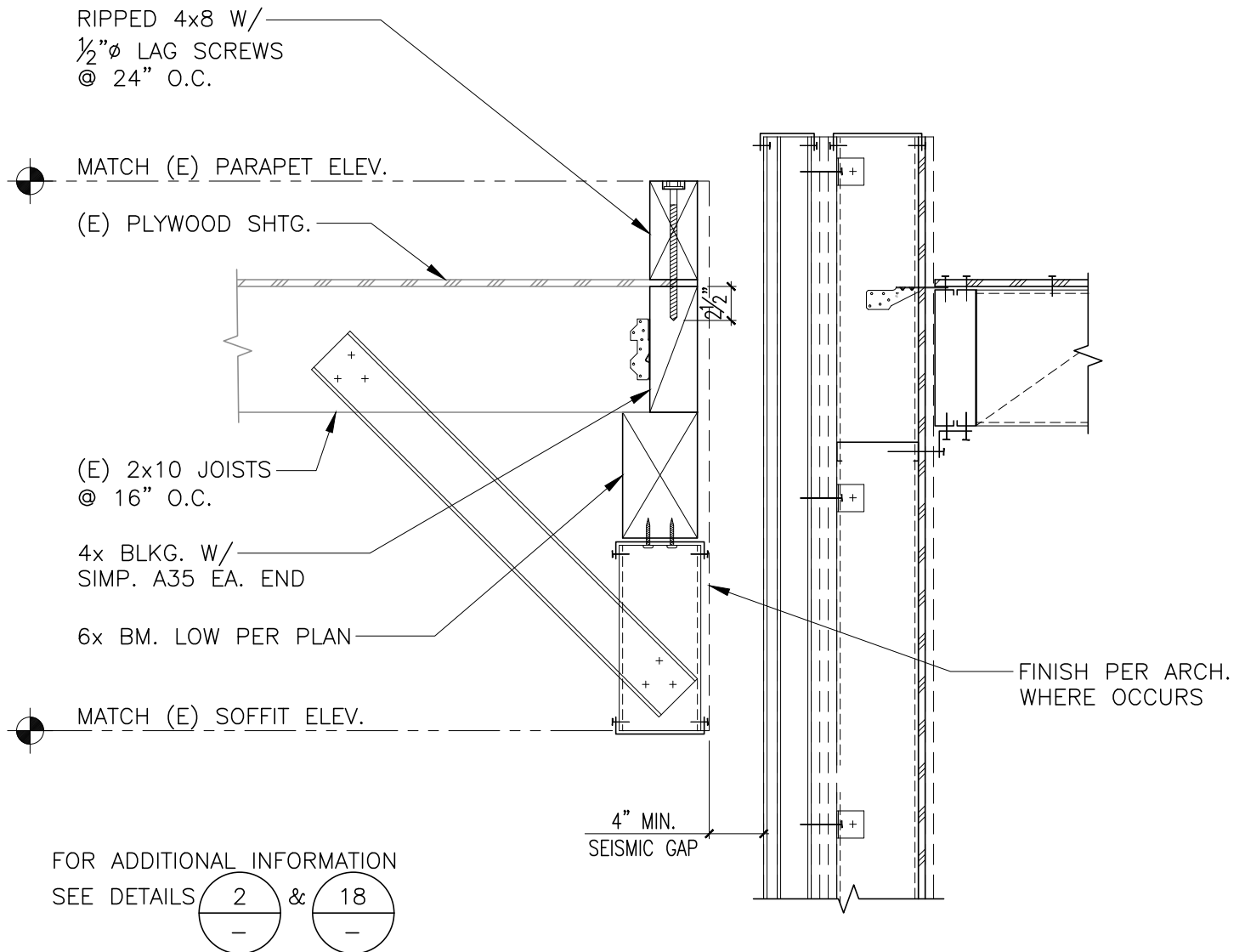
Project #:

Sheet #:  
**SSK-1.8**

Stamp:







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ADDENDUM #1

## NEW DETAIL 19/SD-3.2

# ADMIN. ADDITIONAL & MODERNIZATION

NORTH PARK ELEMENTARY SCHOOL  
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 SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

3/5/2019 9:44 AM

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 CLARKE  
 ARCHITECTS

DSA APN #:  
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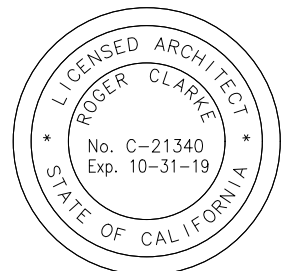
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 36-55

Date:  
 03/07/2019

Project #:

Sheet #:  
**SSK-1.9**

Stamp:



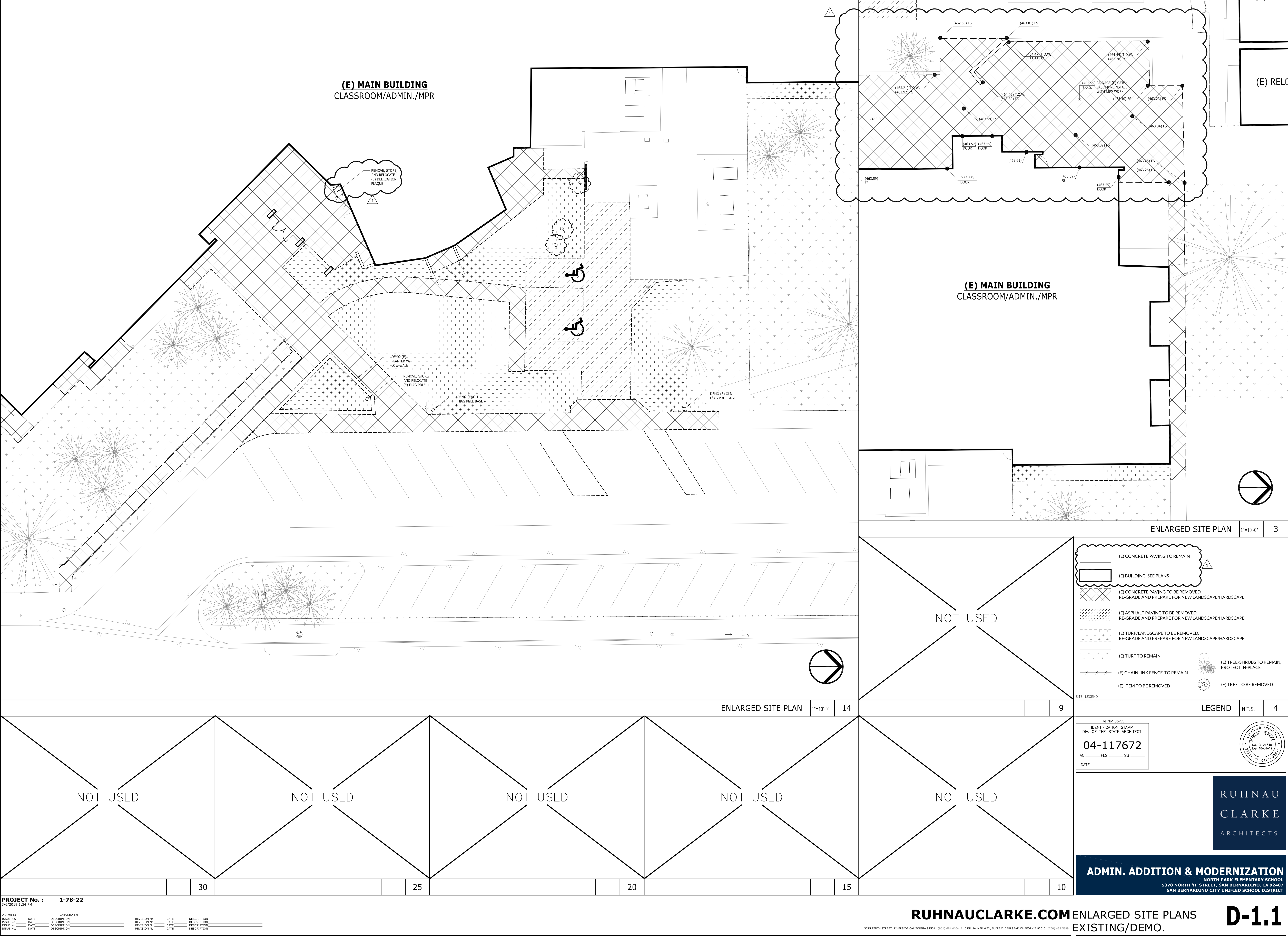




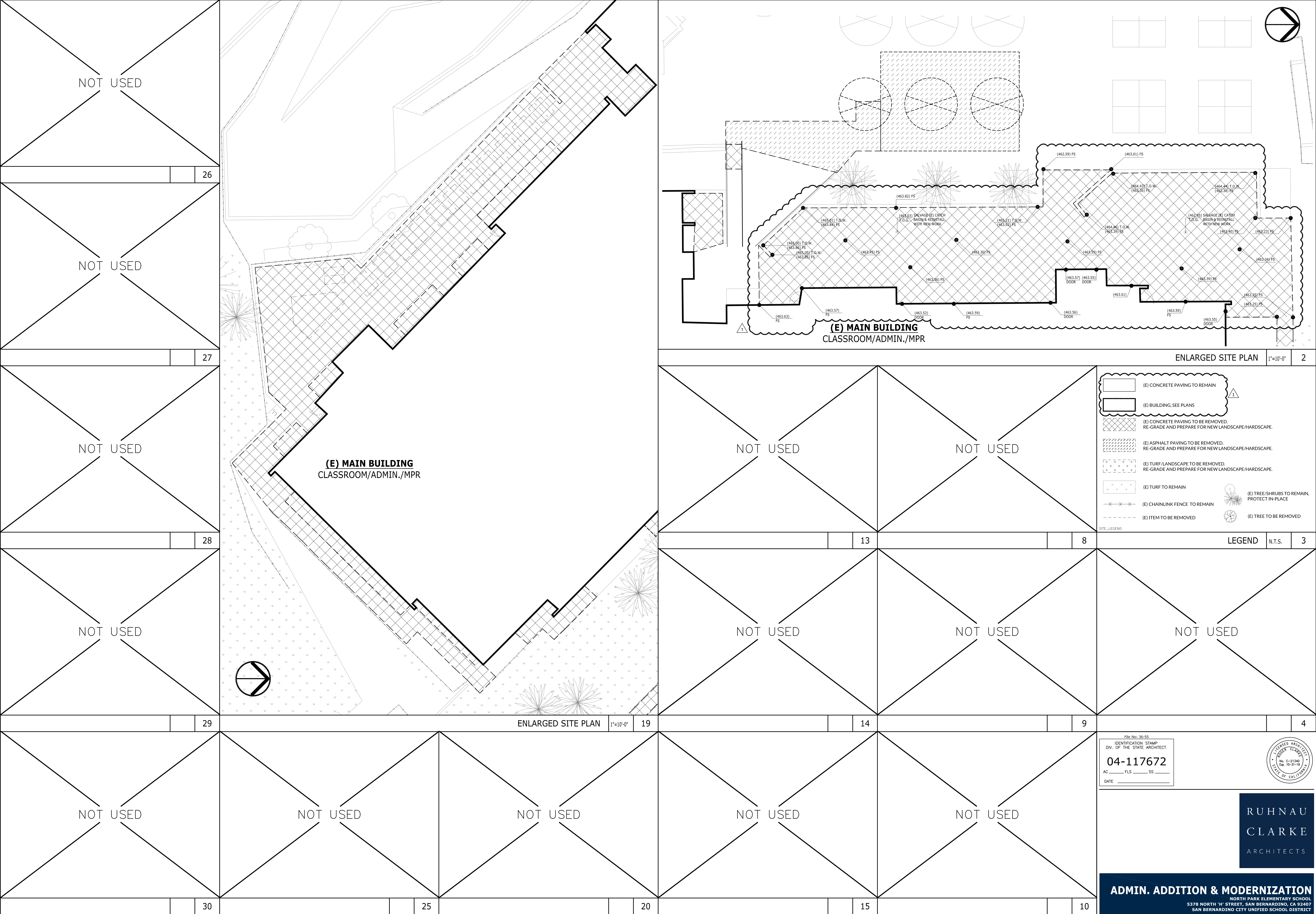
**1/8" = 1'-0"**

Stamp: The seal is circular with a double-line border. The outer ring contains the text "LICENSED ARCHITECT" at the top and "STATE OF CALIFORNIA" at the bottom, separated by two small stars. The inner circle contains the name "ROGER CLARKE" at the top, the license number "No. C-21340" in the center, and the expiration date "Exp. 10-31-19" at the bottom.

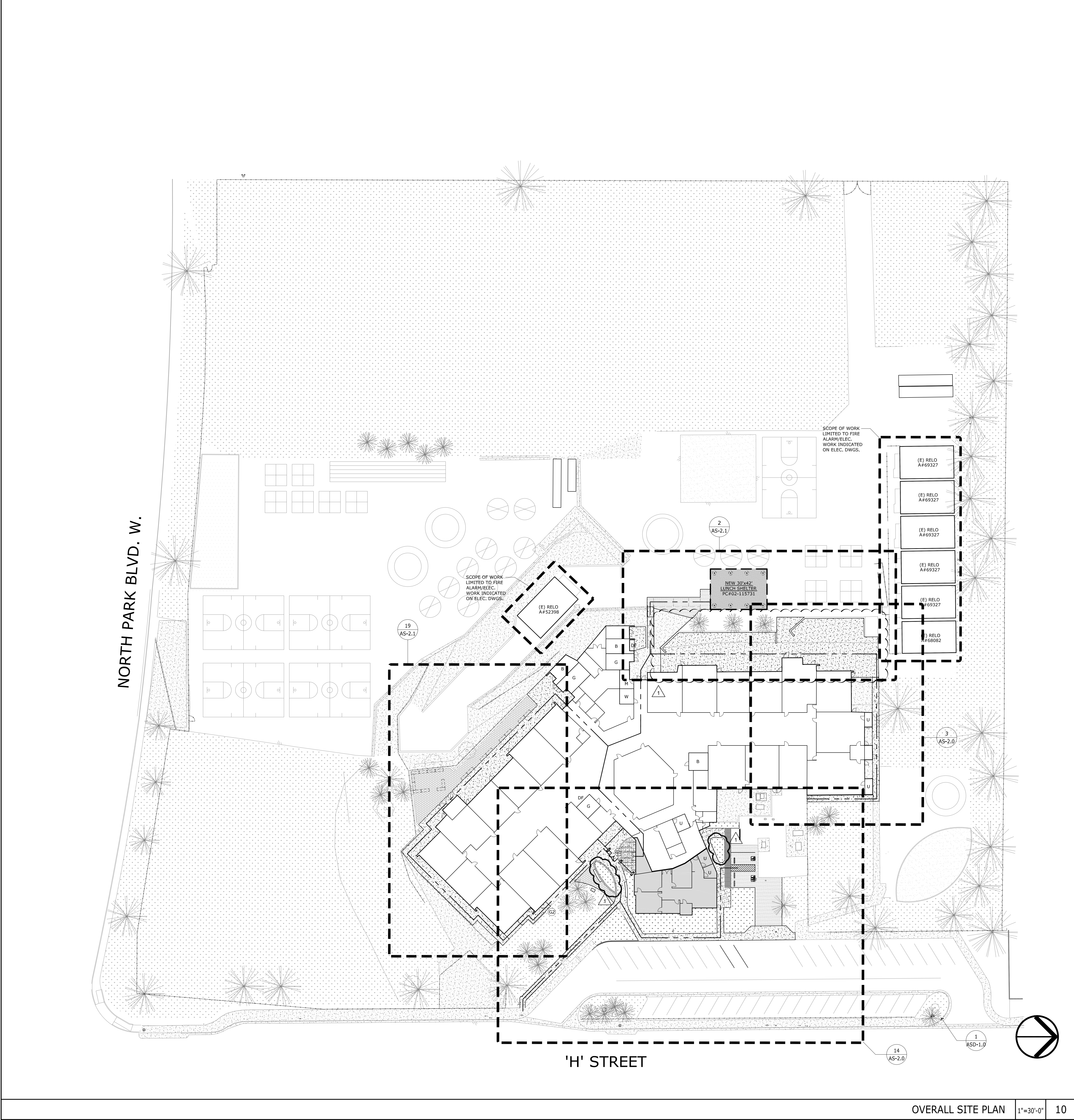












NO.	SIZE (WxH)	MATERIAL	FINISH	DETAILS	HDW GRP	PANIC	NOTES
G1	(N) PR 3'-0" X 6'-0"	STEEL	(P.2)	4/AS-2.1	-	YES	3
G2	(N) 3'-0" X 6'-0"	CL	GALV	8/AS-2.1	-	YES	3

NOTES:

1. PROVIDE HARDWARE PER FIRE DEPARTMENT REQUIREMENTS.

2. FOR GATEFINISH COLOR SELECTION, SEE C.M.F. LEGEND ON SHEET A-1.1.

3. PROVIDE KNOX BOX AS PART OF HARDWARE SET.

4. PROVIDE PADLOCK AS PART OF HARDWARE SET.

5. THIS GATE IS FOR SERVICE ACCESS ONLY.

ABBREVIATIONS:

CL CHARLINK

GALV GALVANIZED STEEL, TOUCH UP GALVANIZATION

PR

14143\_1.inch 2\_Gate Schedule.dwg

GATE SCHEDULE

N.T.S.

6

PATH OF TRAVEL (P.O.T.)

"DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE STATEMENT":

THE P.O.T. IDENTIFIED IN THESE CONSTRUCTION DOCUMENTS IS COMPLIANT WITH THE CURRENT APPLICABLE CALIFORNIA BUILDING CODE ACCESSIBILITY PROVISIONS FOR PATH OF TRAVEL REQUIREMENTS FOR ALTERATIONS, ADDITIONS AND STRUCTURAL REPAIRS. AS PART OF THE DESIGN OF THIS PROJECT, THE P.O.T. WAS EXAMINED AND ANY ELEMENTS, COMPONENTS OR PORTIONS OF THE P.O.T. THAT WERE DETERMINED TO BE NONCOMPLIANT 1.) HAVE BEEN IDENTIFIED AND 2.) THE CORRECTIVE WORK NECESSARY TO BRING THEM INTO COMPLIANCE HAS BEEN INCLUDED WITHIN THE SCOPE OF THIS PROJECT'S WORK THROUGH DETAILS, DRAWINGS AND SPECIFICATIONS INCORPORATED INTO THESE CONSTRUCTION DOCUMENTS. ANY NONCOMPLIANT ELEMENTS, COMPONENTS OR PORTIONS OF THE P.O.T. THAT WILL NOT BE CORRECTED BY THIS PROJECT BASED ON VALUATION THRESHOLD LIMITATIONS OR A FINDING OF UNREASONABLE HARSHIP ARE SO INDICATED IN THESE CONSTRUCTION DOCUMENTS. DURING CONSTRUCTION, IF P.O.T. ITEMS WITHIN THE SCOPE OF THE PROJECT REPRESENTED AS CODE COMPLIANT ARE FOUND TO BE NONCONFORMING BEYOND REASONABLE CONSTRUCTION TOLERANCES, THEY SHALL BE BROUGHT INTO COMPLIANCE WITH THE CBC AS A PART OF THIS PROJECT BY MEANS OF A CONSTRUCTION CHANGE DOCUMENT."

ABBREV.

RESTROOM DESIGNATION

B

BOY'S RESTROOM

G

GIRL'S RESTROOM

U

STUDENT UNISEX RESTROOM

S

STAFF UNISEX RESTROOM

DF

DRINKING FOUNTAIN

NOTES

N.T.S.

2

(N) CONCRETE PAVING (CONC-1), FOR ADDITIONAL INFO, SEE CIVIL DWGS.

(N) LANDSCAPE AREA, REFER TO LANDSCAPE DWGS.

(N) ACCENT CONCRETE PAVING (CONC-2), FOR ADDITIONAL INFO, SEE CIVIL DWGS.

(N) DECOMPOSED GRANITE, REFER TO LANDSCAPE DWGS.

(N) AC PAVING, FOR ADDITIONAL INFO, SEE CIVIL DWGS.

(E) LANDSCAPE AREA, TO REMAIN

(N) BUILDING, SEE PLANS

(E) BUILDING, SEE PLANS

LEGEND

N.T.S.

3

EXISTING PARKING LOT

TOTAL PARKING STALLS : 45

TOTAL ACCESSIBLE STALLS REQUIRED (PER CBC 2016 TABLE 11B-208.2) : 2

TOTAL REGULAR STALLS PROVIDED : 43

TOTAL REGULAR ACCESSIBLE STALLS PROVIDED : 1

TOTAL VAN ACCESSIBLE STALLS PROVIDED : 1

PARKING CALCULATIONS

--

4

File No: 36-55

IDENTIFICATION STAMP

DIV. OF THE STATE ARCHITECT

04-117672

AC \_\_\_\_\_ FLS \_\_\_\_\_ SS \_\_\_\_\_

DATE \_\_\_\_\_

REGISTERED ARCHITECT

No. C-21340

Exp. 10-31-19

STATE OF CALIFORNIA

RUHNAU

CLARKE

ARCHITECTS

ADMIN. ADDITION & MODERNIZATION

NORTH PARK ELEMENTARY SCHOOL

5378 NORTH 'H' STREET, SAN BERNARDINO, CA 92407

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

RUHNAUCLARKE.COM

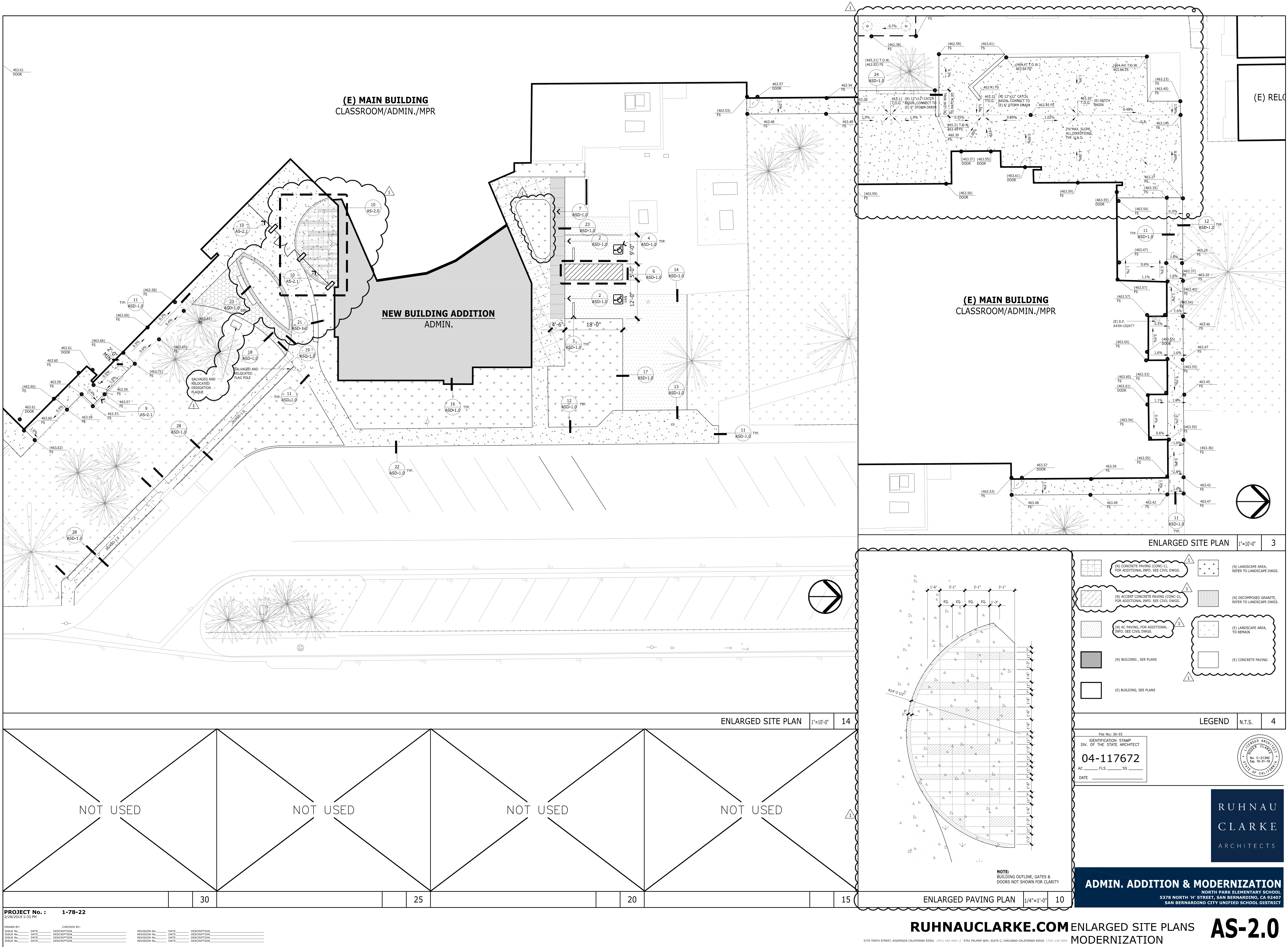
OVERALL SITE PLAN

MODERNIZATION

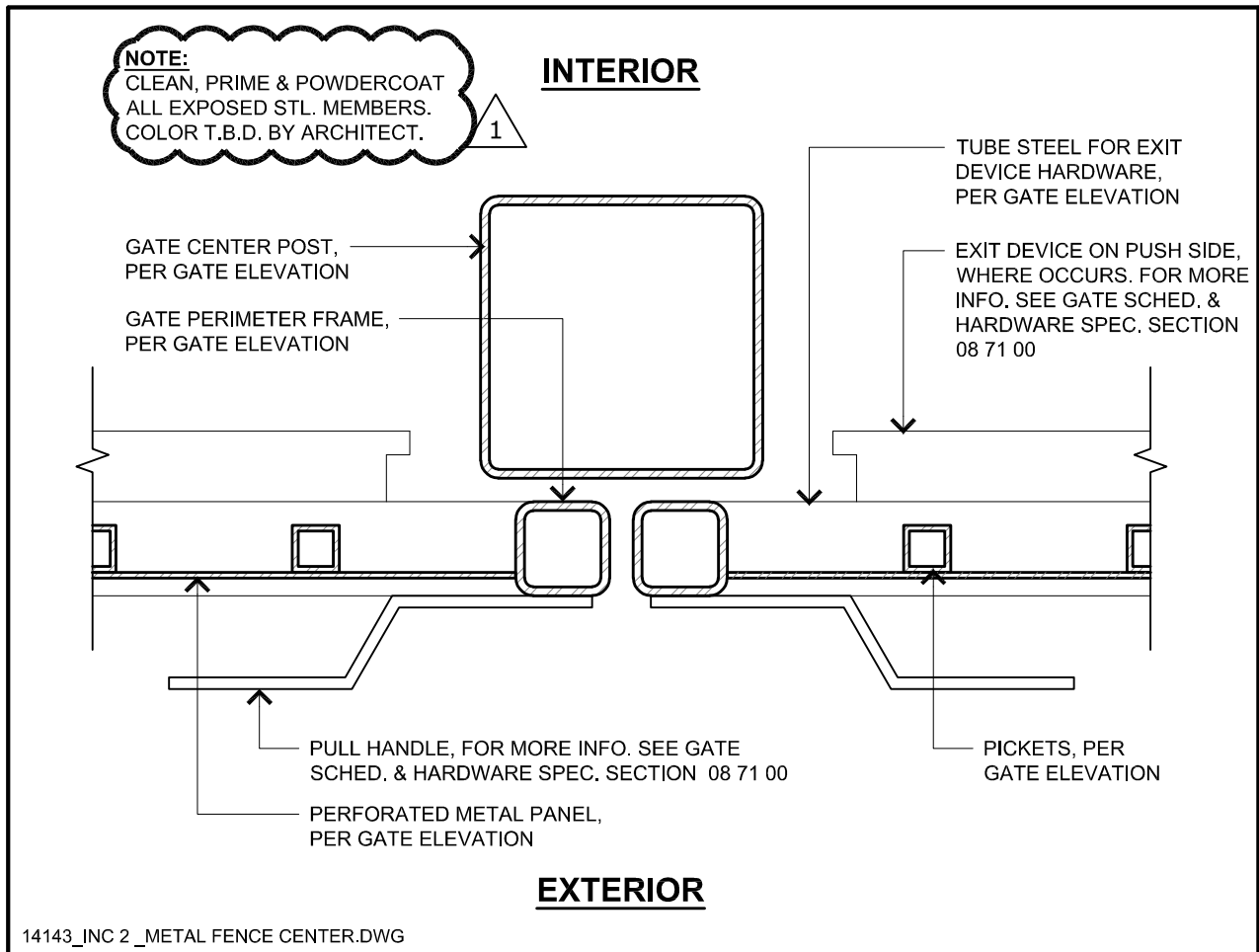
AS-1.0

1-78-22

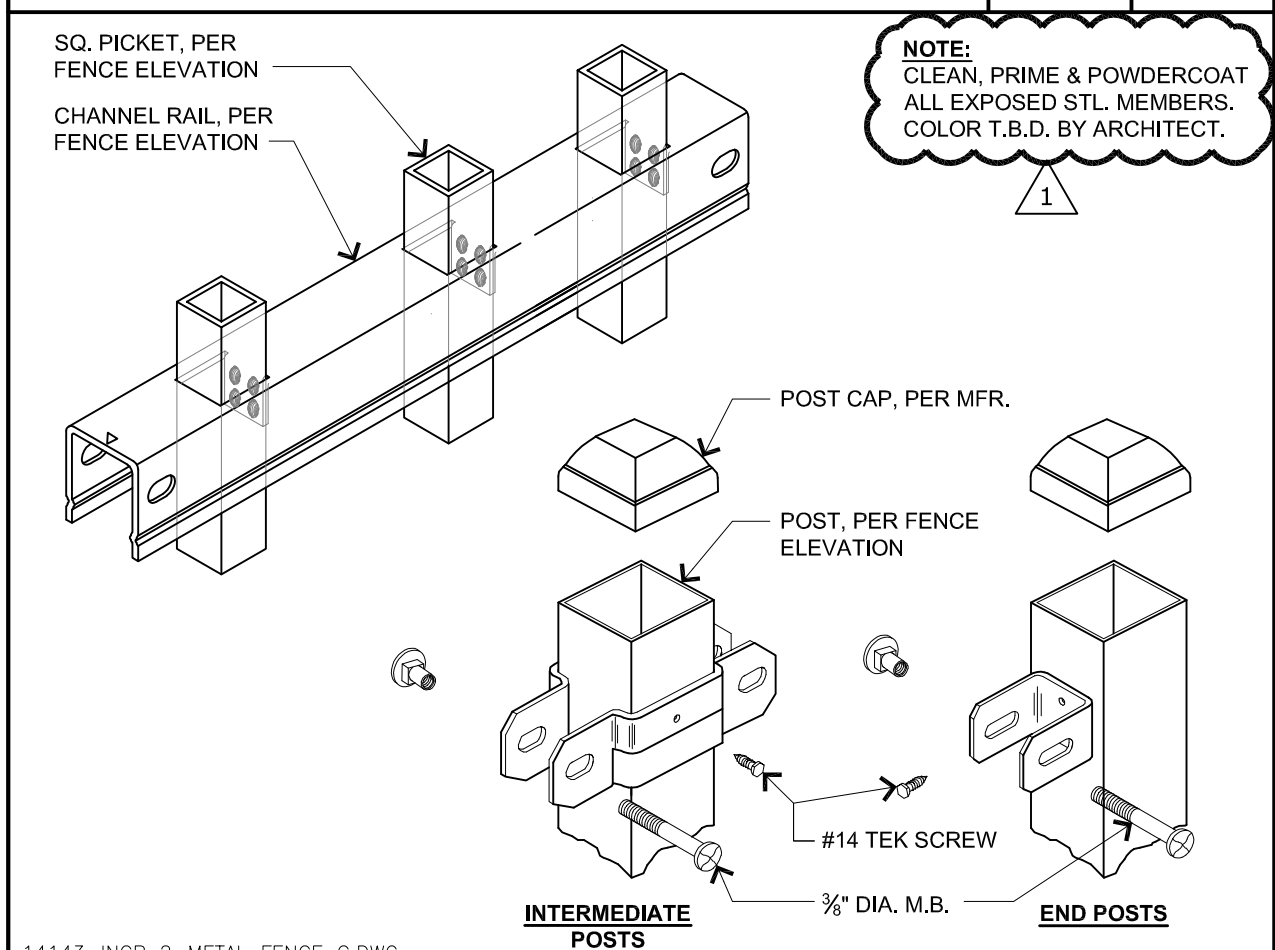




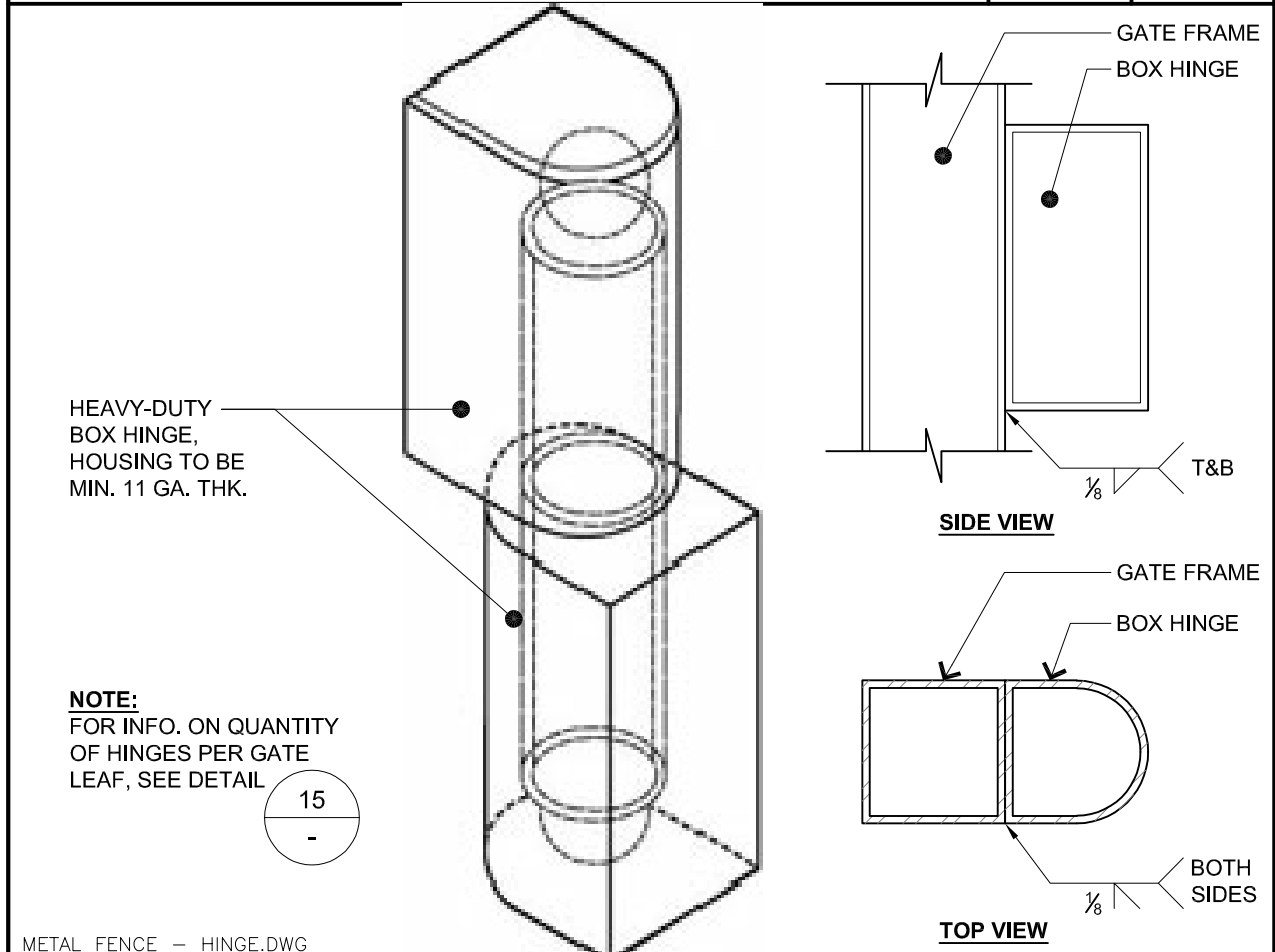




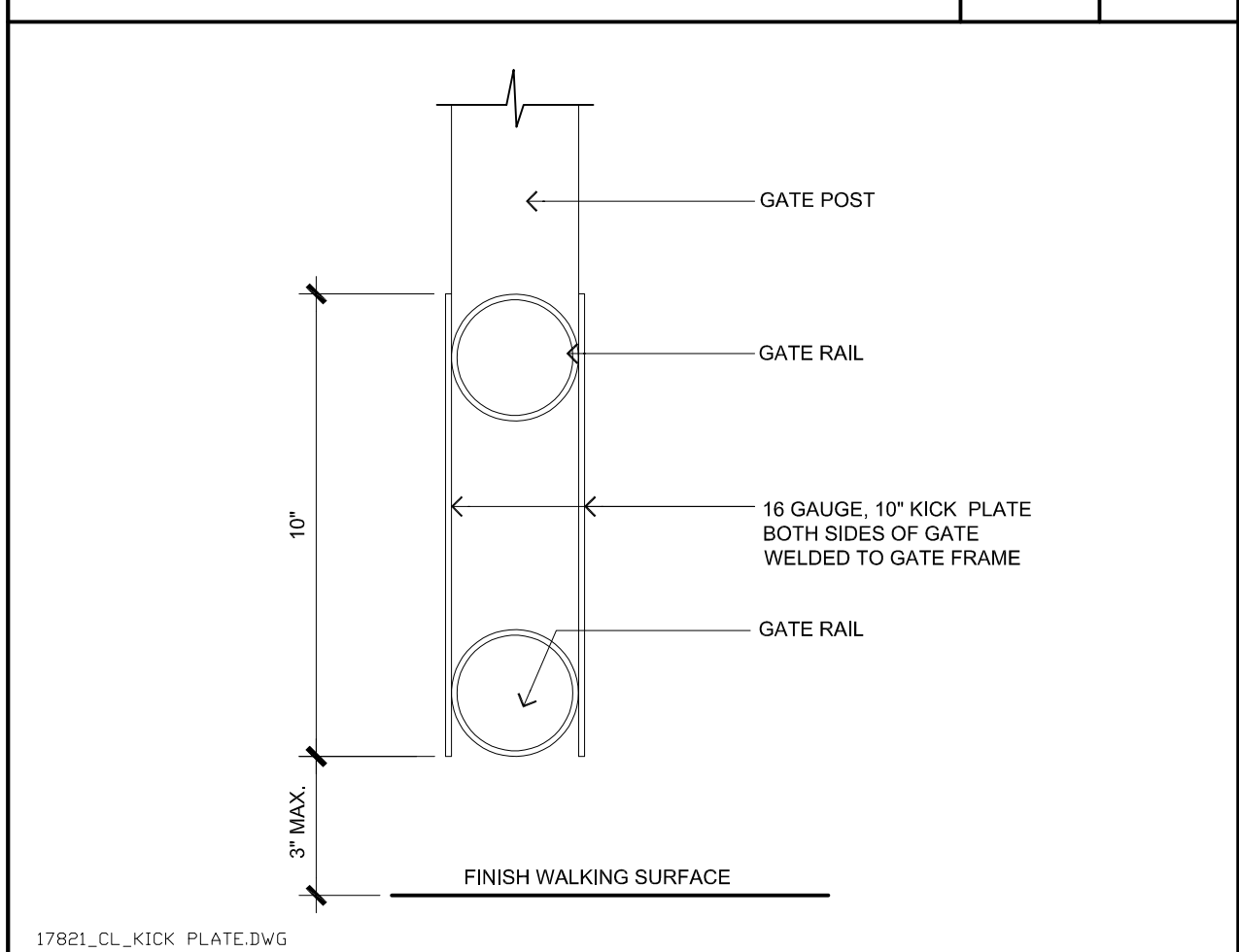
METAL PEDESTRIAN DOUBLE GATE - CENTER POST STOP 3'-1'-0" 26



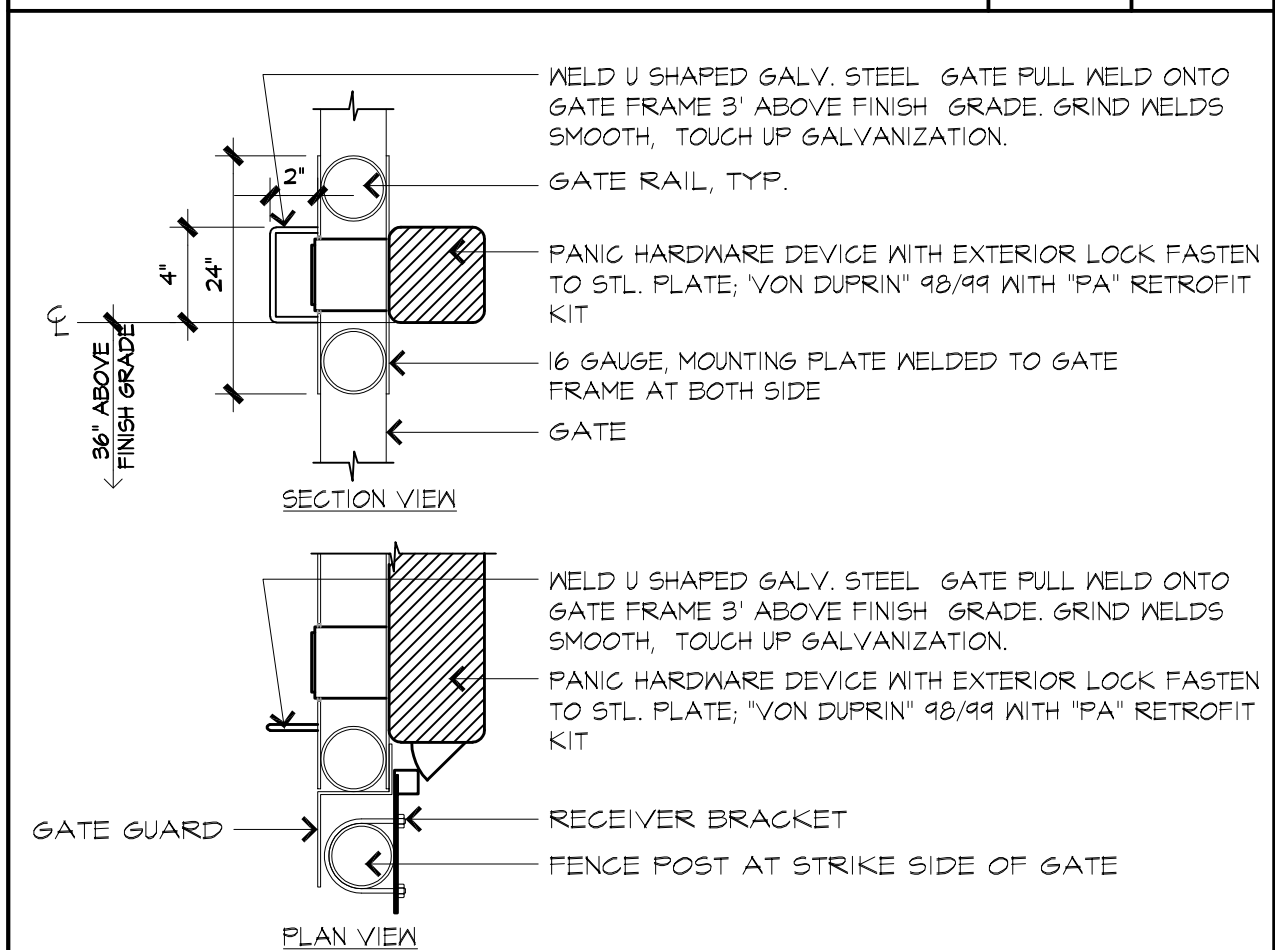
METAL FENCE - TYP. ATTACHMENT N.T.S. 27



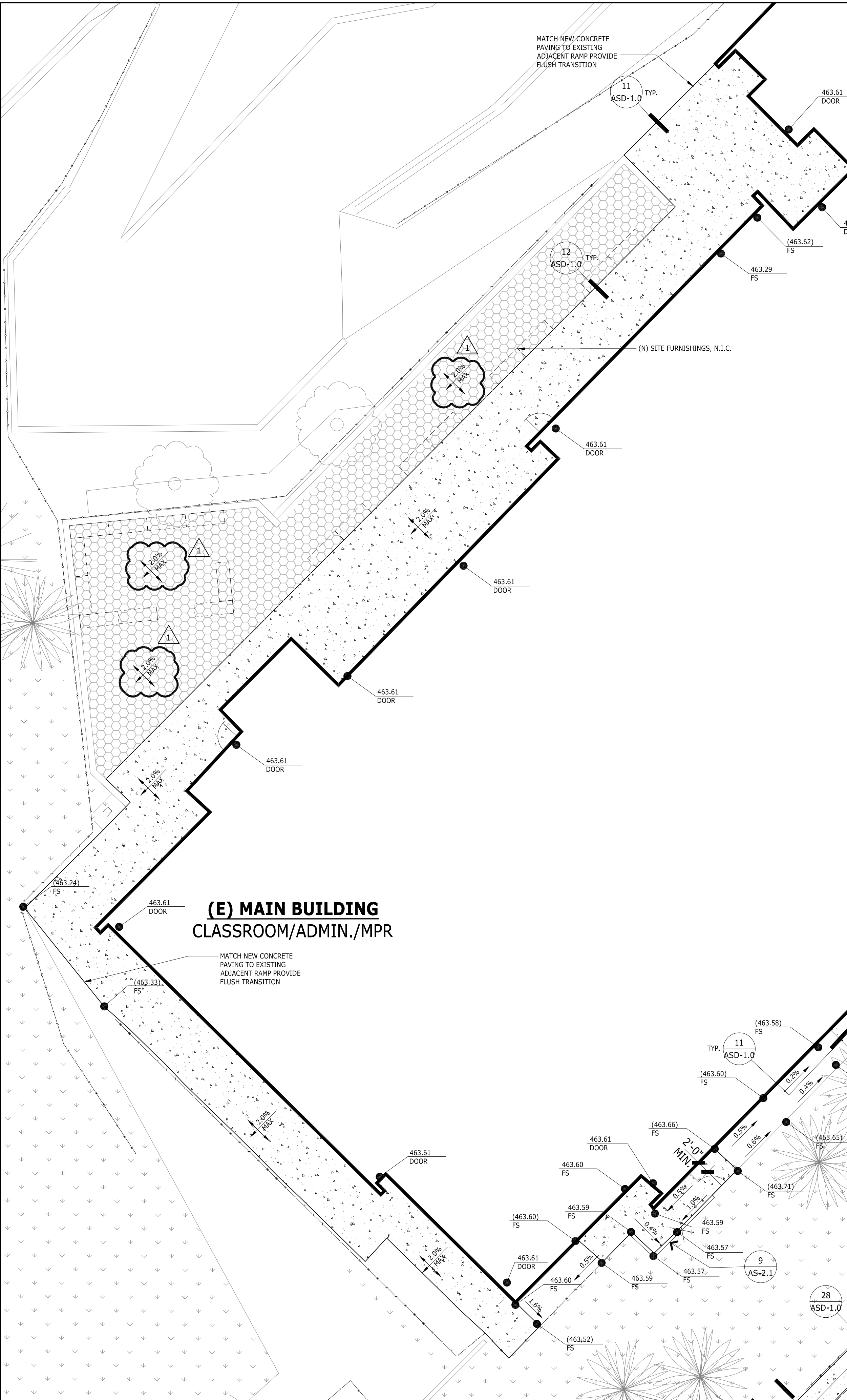
METAL FENCE - HINGE N.T.S. 28



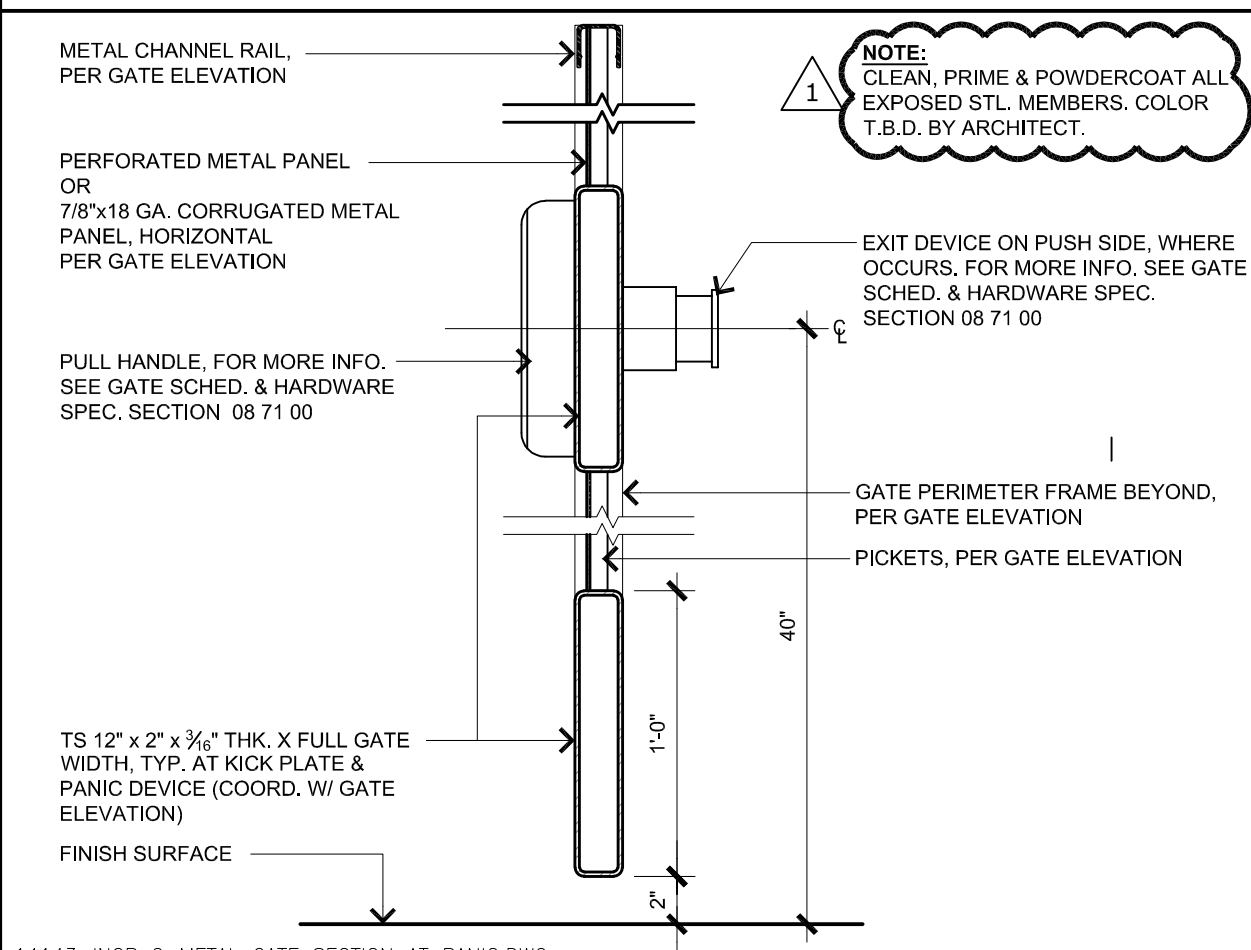
CHAINLINK PEDESTRIAN GATE - KICK PLATE 3" 29



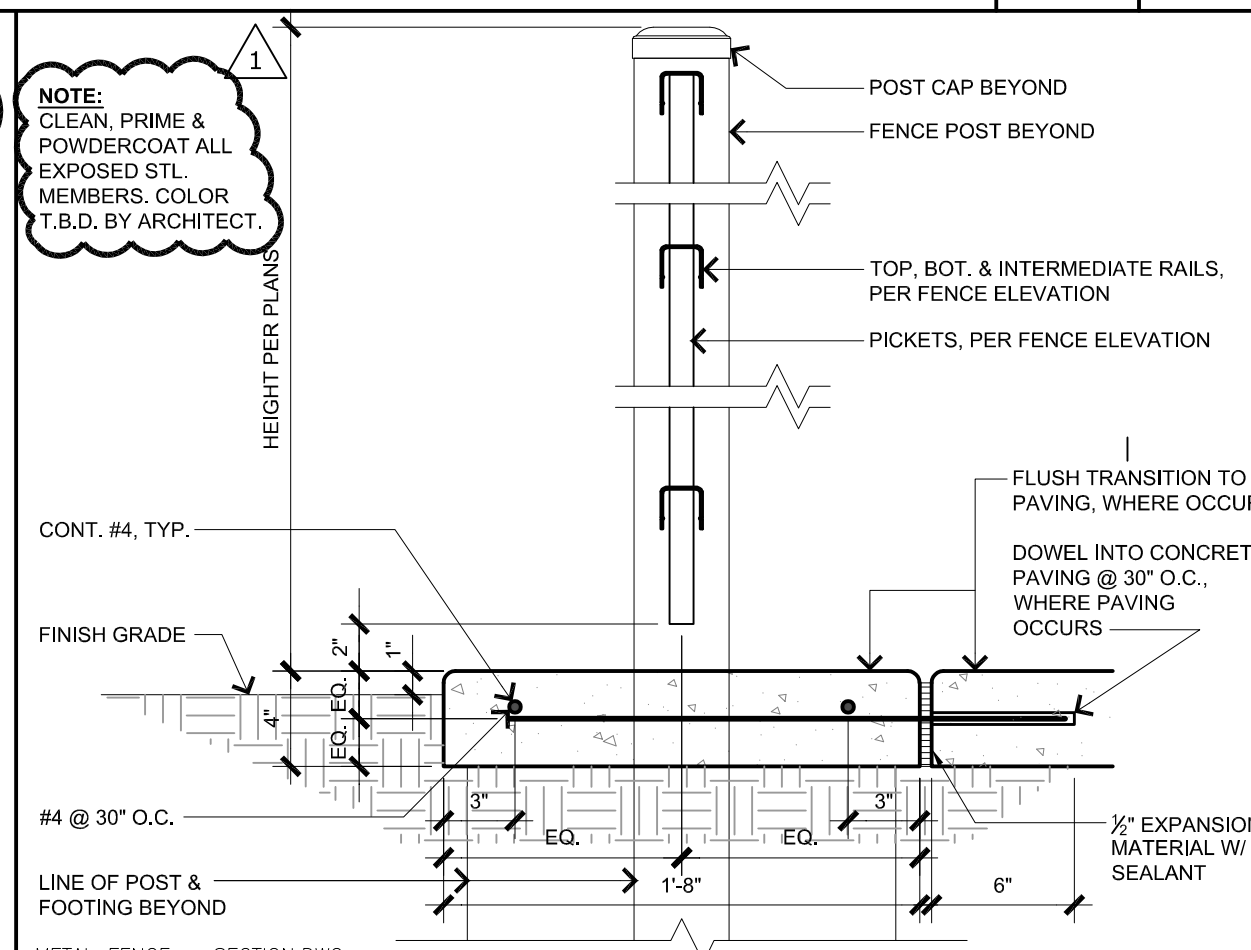
GATE PANIC HARDWARE 1 1/2" 30



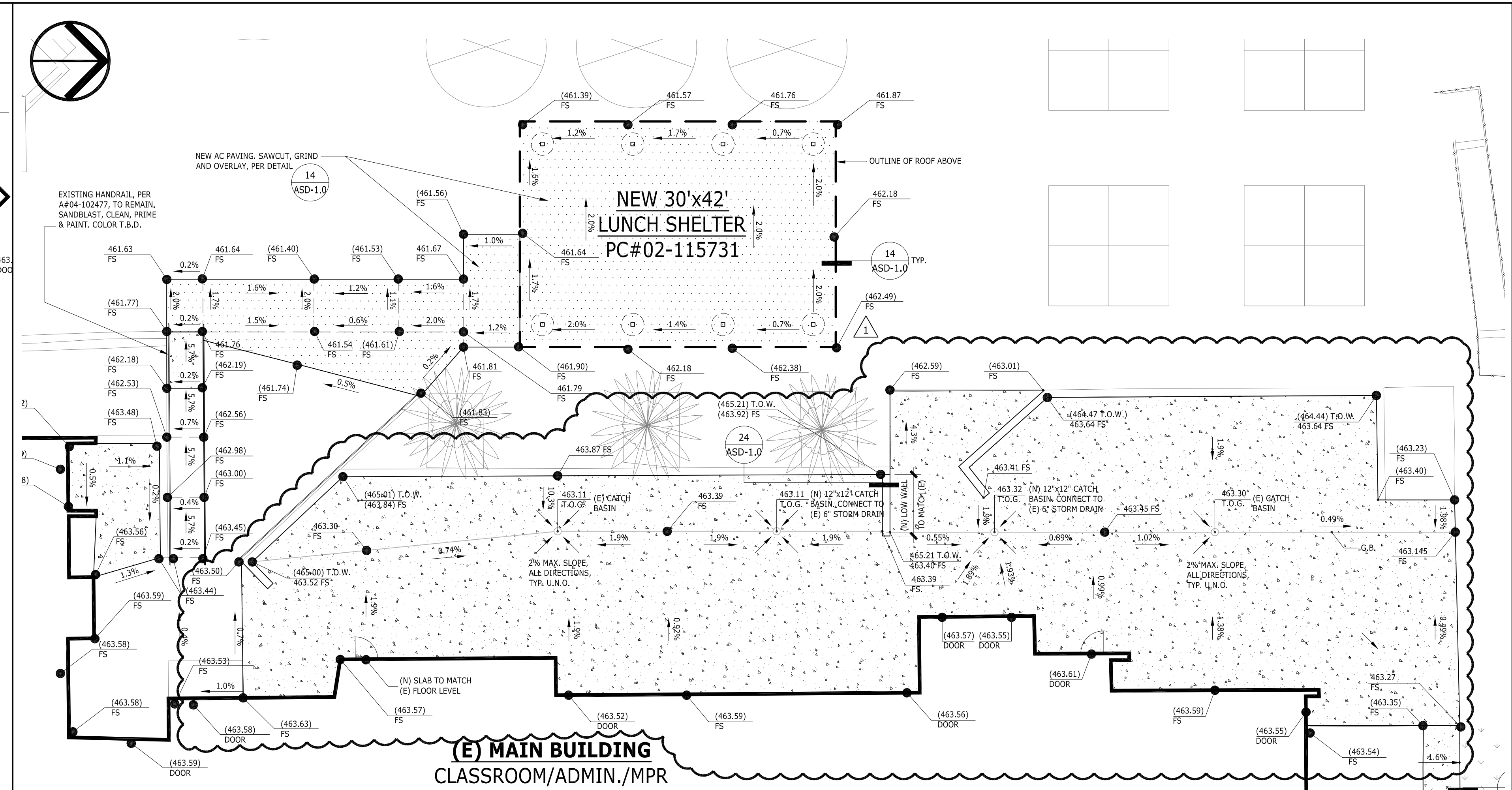
ENLARGED SITE PLAN 1'-10'-0" 19



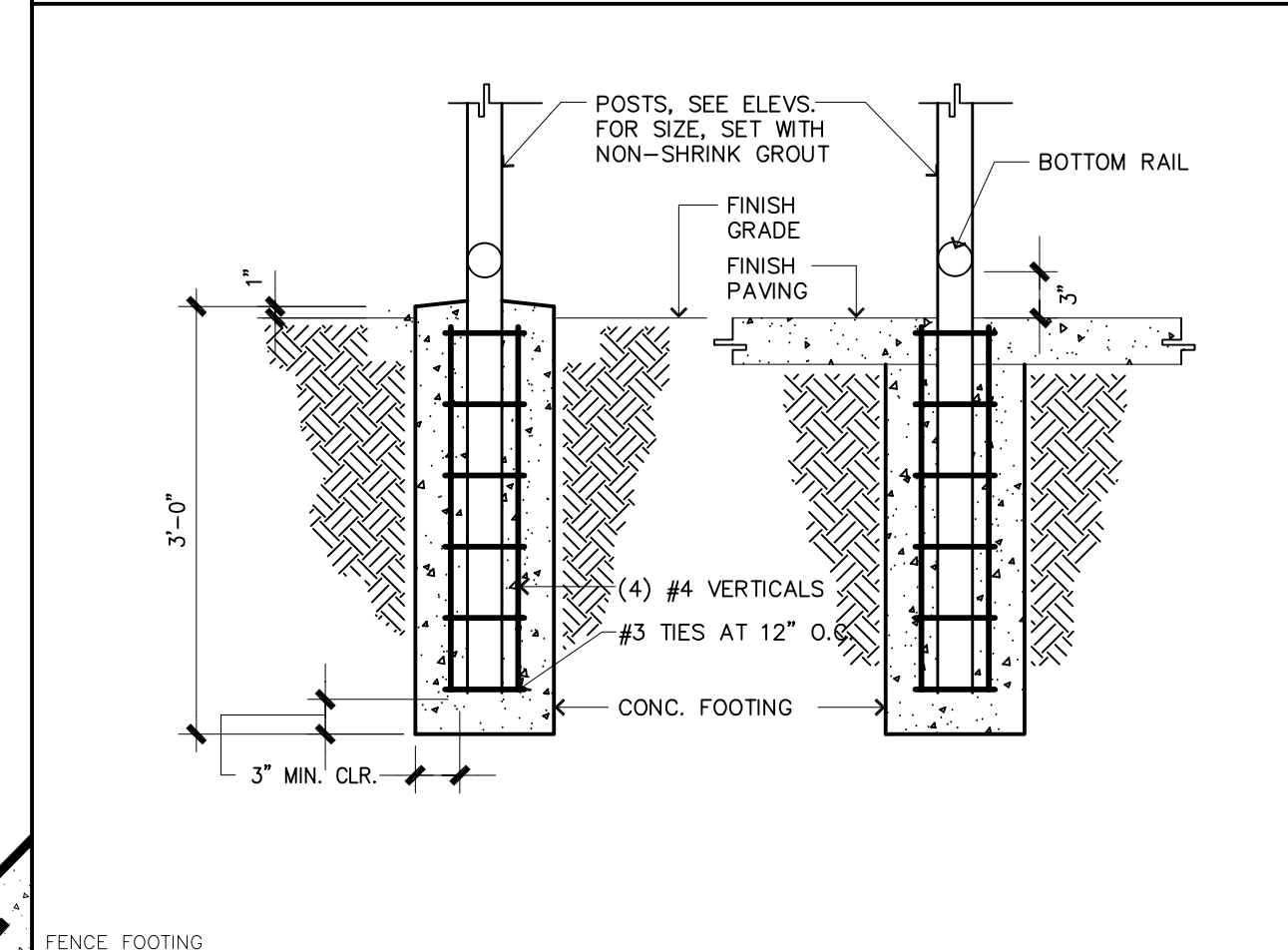
METAL PEDESTRIAN GATE - SECTION 1'-1/2'-1'-0" 25



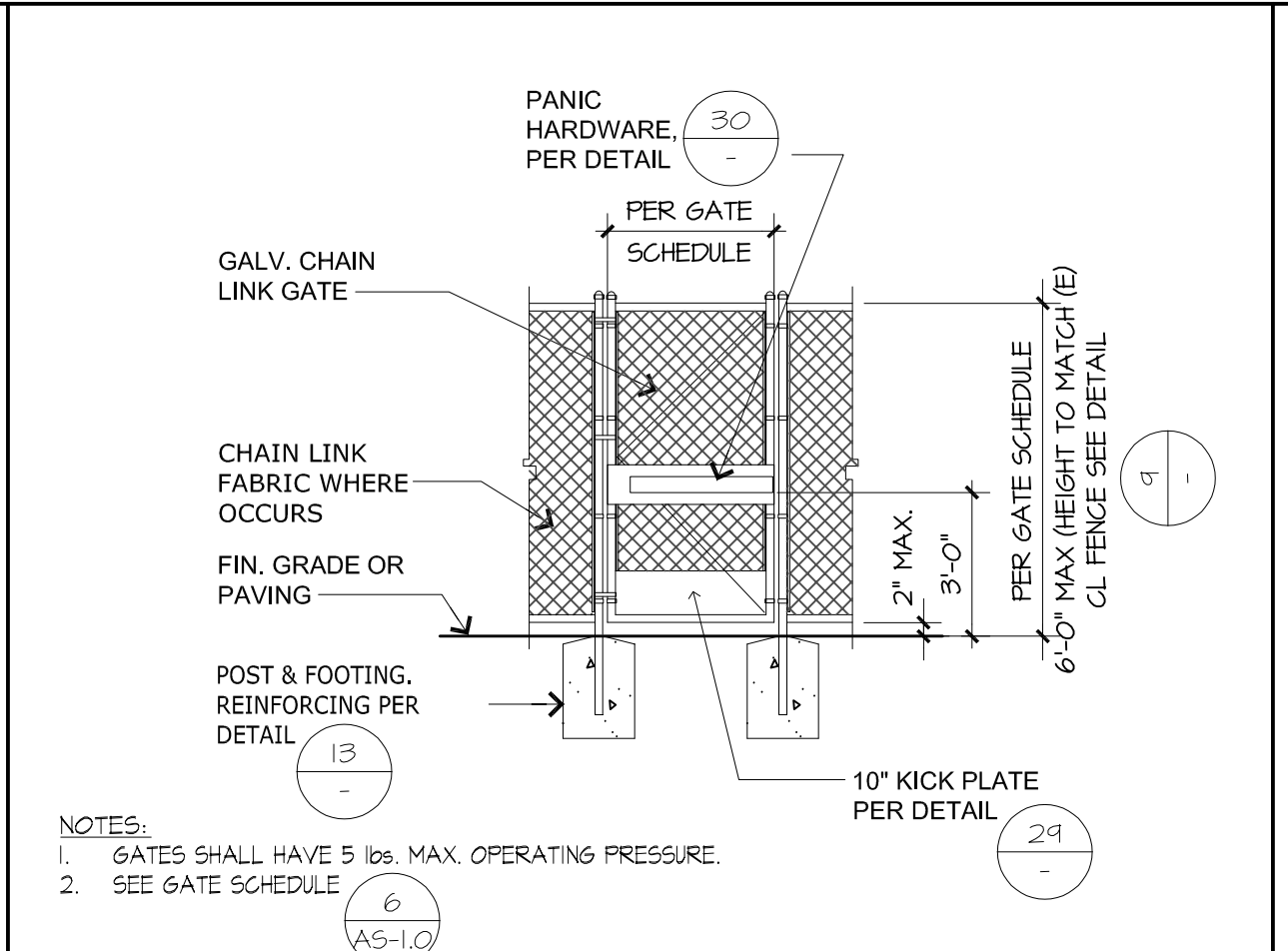
METAL FENCE - SECTION 1'-1/2'-1'-0" 20



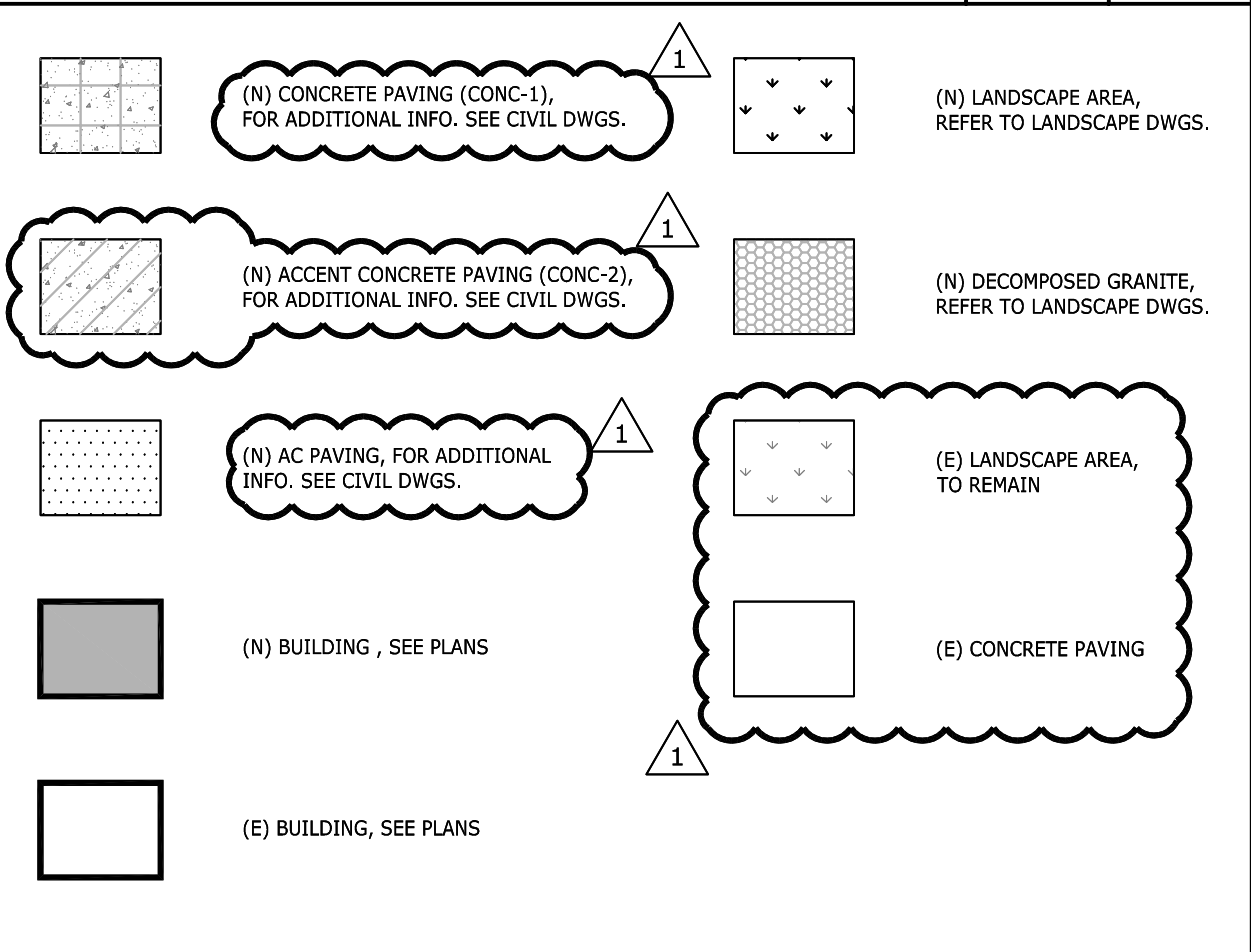
ENLARGED SITE PLAN 1'-10'-0" 2



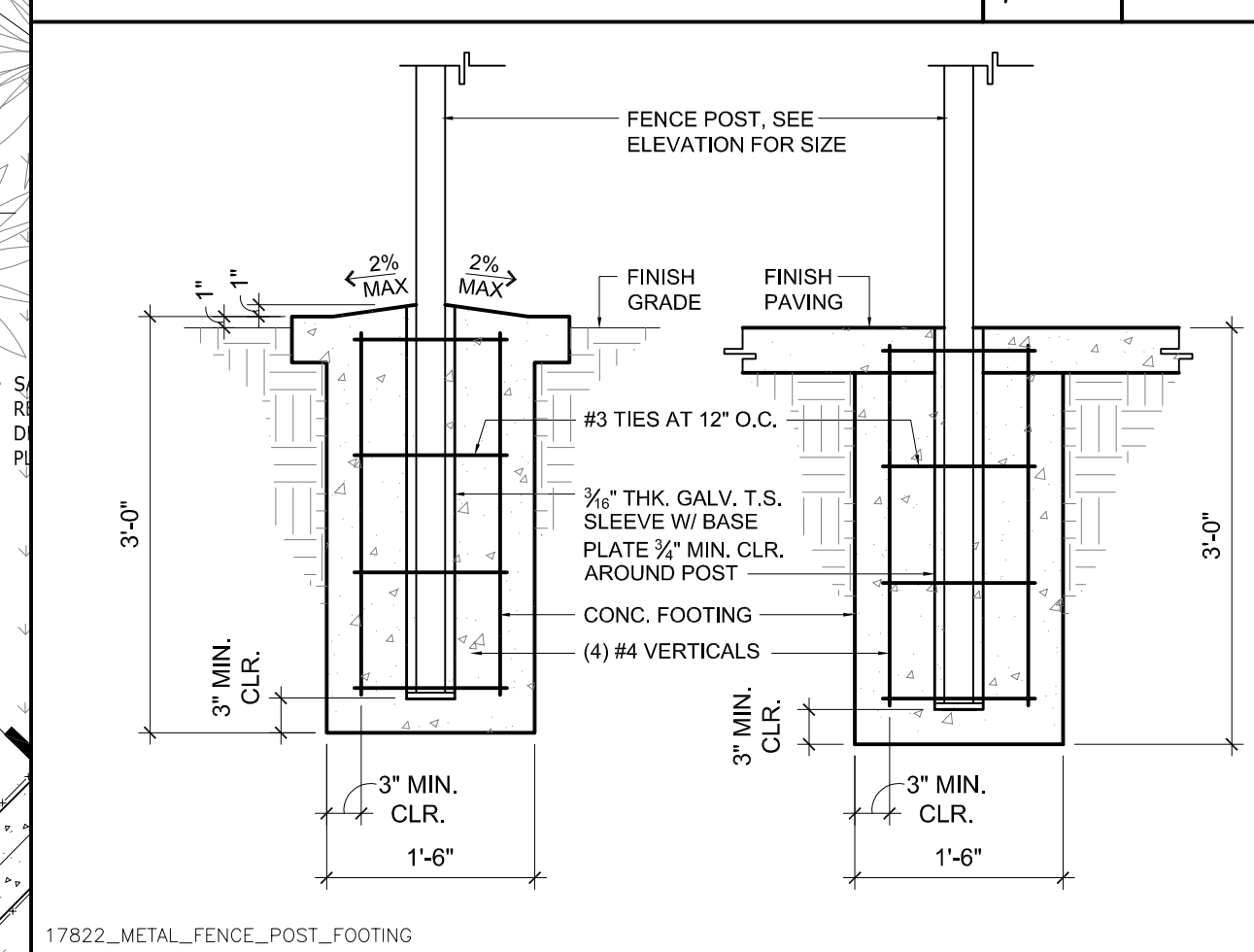
CL FENCE POST FOOTING 3/4"=1'-0" 13



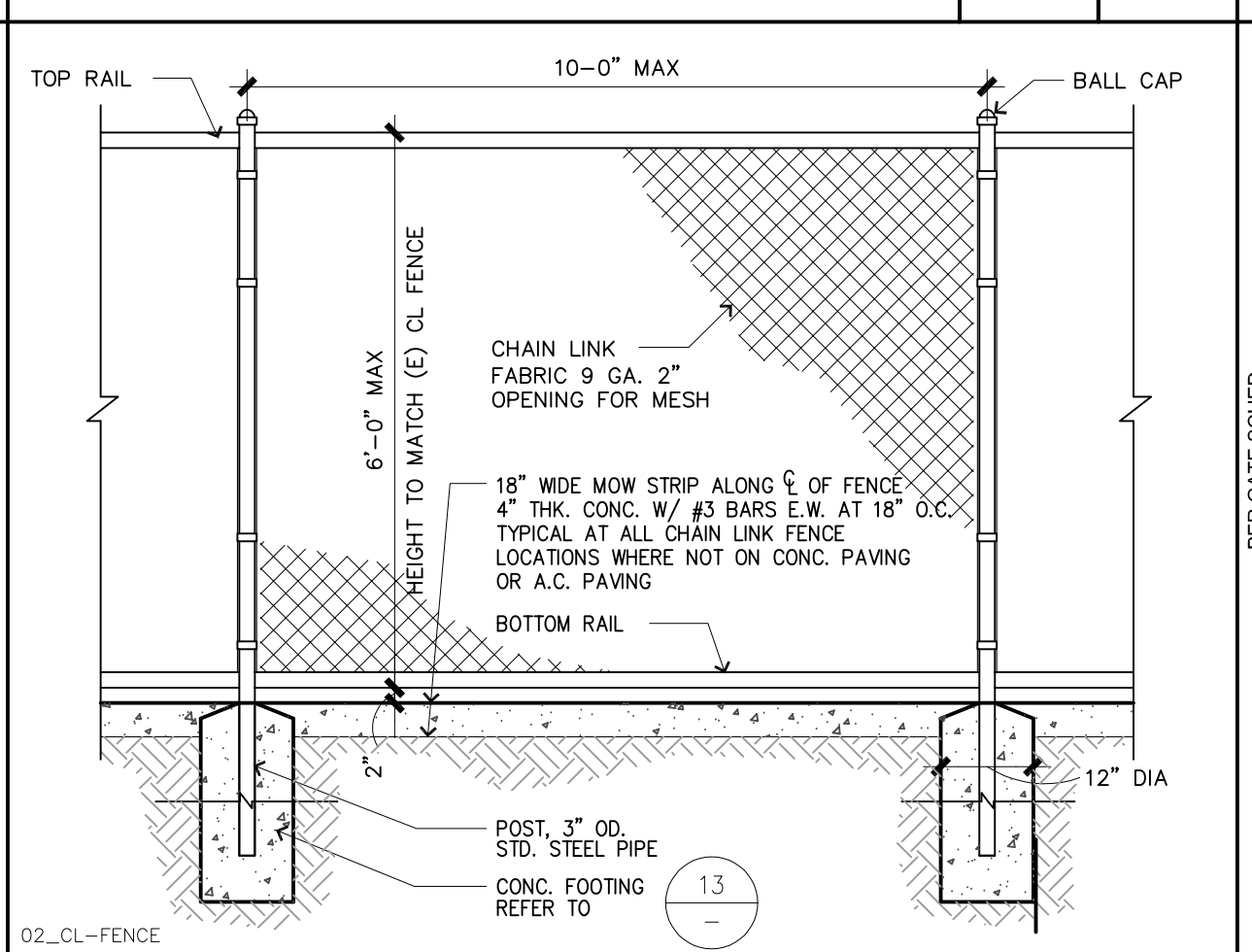
GATE ELEVATION 1/4" 8



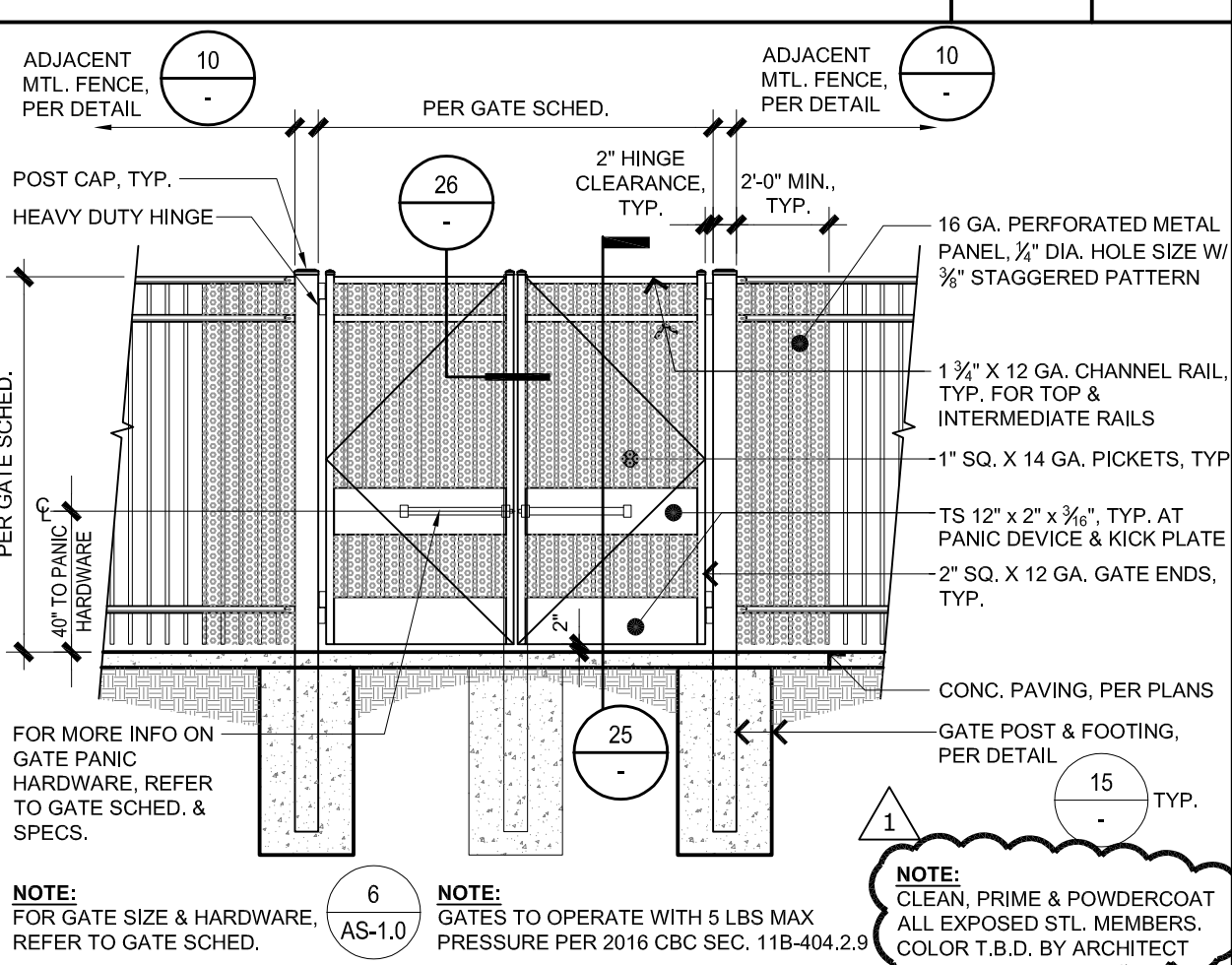
CHAIN LINK FENCE 1/2"=1'-0" 9



METAL FENCE - POST FOOTING 3/4"=1'-0" 14



METAL FENCE - GATE POST FOOTING 3/8"=1'-0" 15



METAL PEDESTRIAN DOUBLE GATE - ELEVATION 1/4"=1'-0" 4

PROJECT No. : 1-78-22		
2/28/2019 1:34 PM		
DRAWN BY:	CHECKED BY:	
ISSUE No. DATE DESCRIPTION	REVISION No. DATE DESCRIPTION	
ISSUE No. DATE DESCRIPTION	REVISION No. DATE DESCRIPTION	
ISSUE No. DATE DESCRIPTION	REVISION No. DATE DESCRIPTION	

GATE PANIC HARDWARE		
1 1/2"	30	

METAL PEDESTRIAN GATE - SECTION		
1'-1/2'-1'-0"	25	

METAL FENCE - SECTION		
1'-1/2'-1'-0"	20	

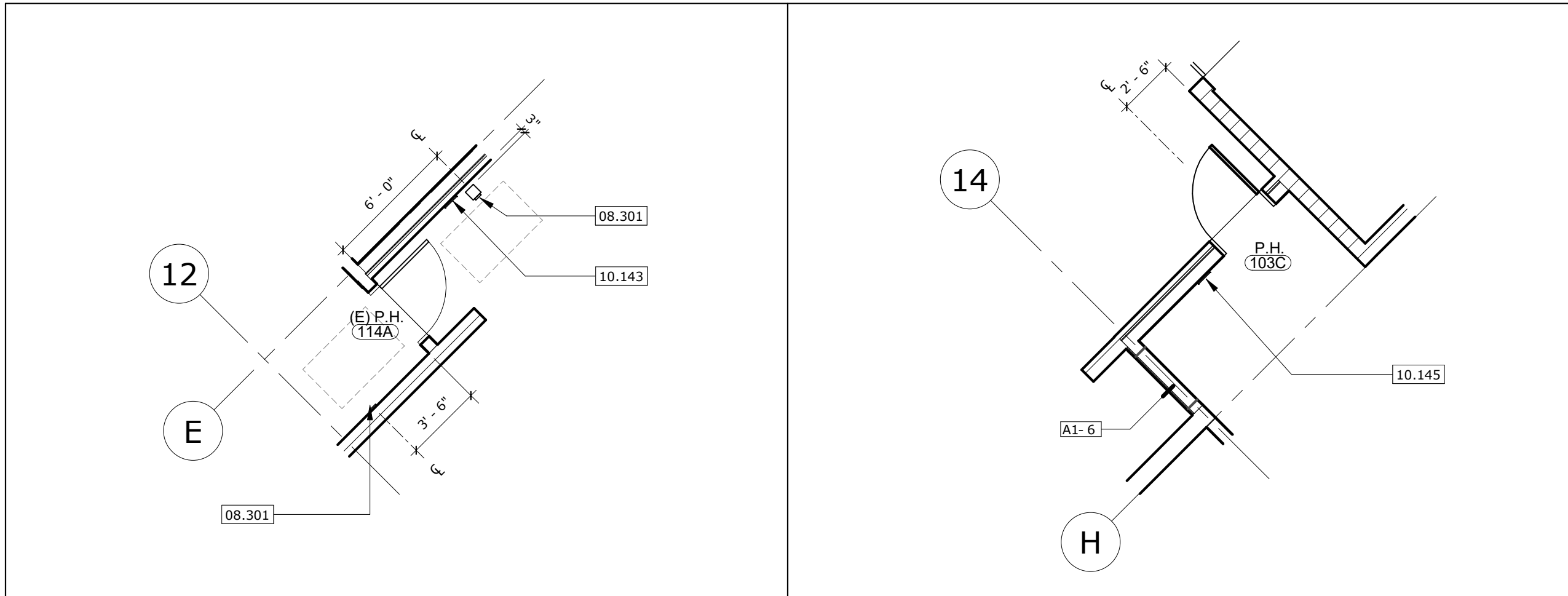
METAL FENCE - GATE POST FOOTING		
3/8"=1'-0"	15	

METAL FENCE - ELEVATION		
3/4"=1'-0"	10	





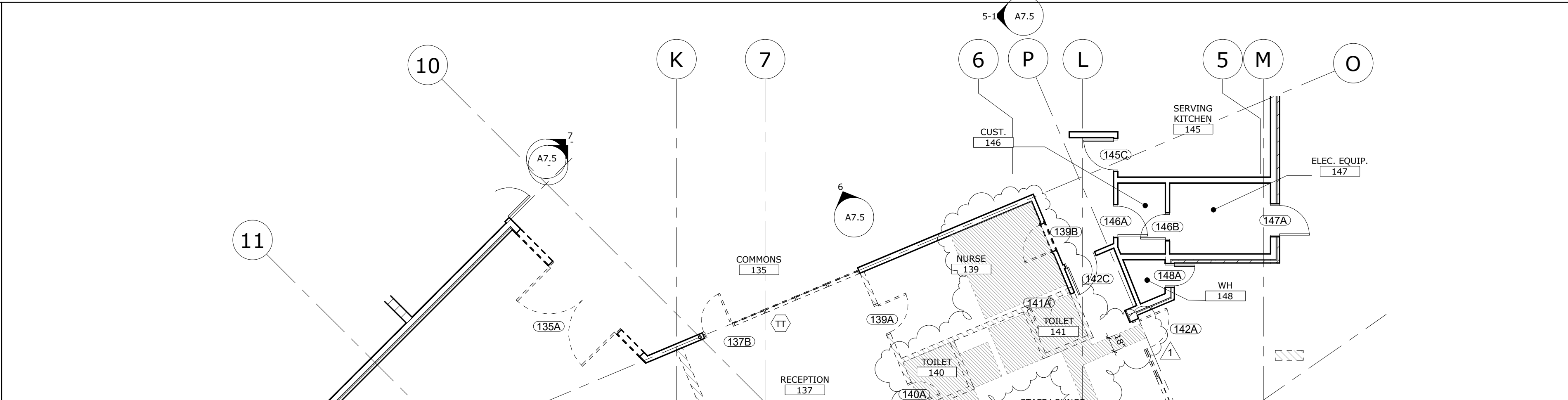




DOOR 114A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

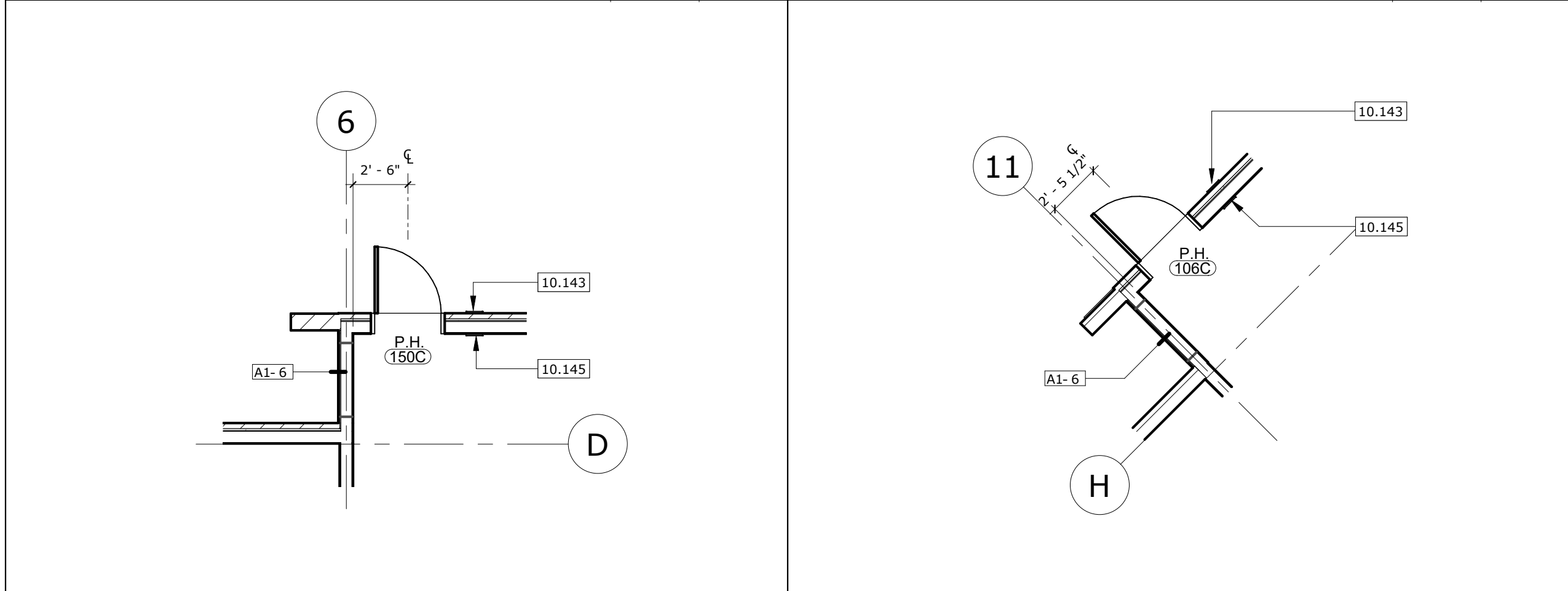
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DOOR 103C

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REF.: 1/A1.2

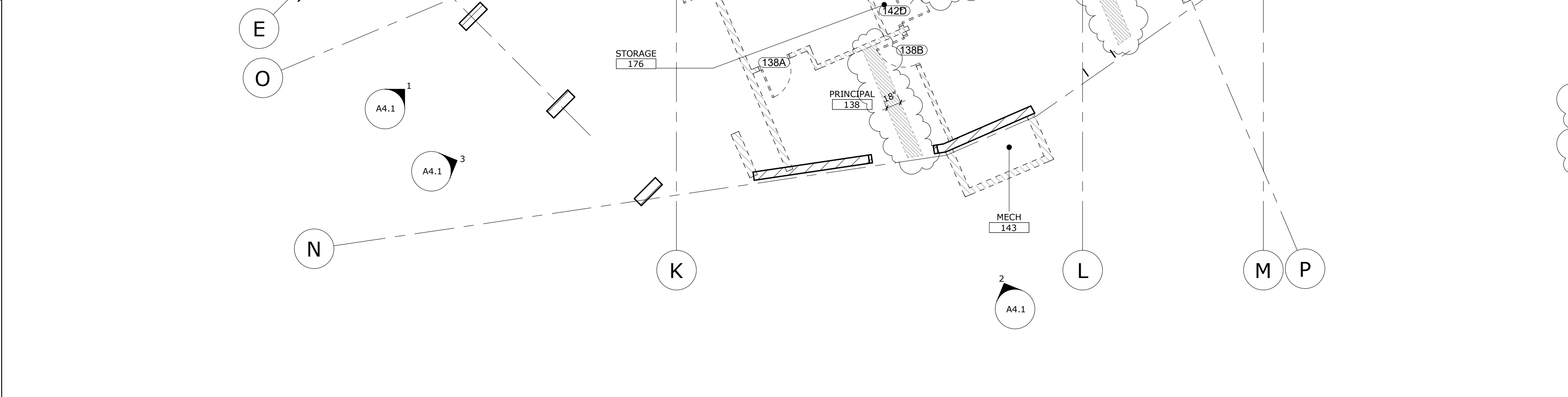
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DOOR 150C

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REF.: 1/A1.2

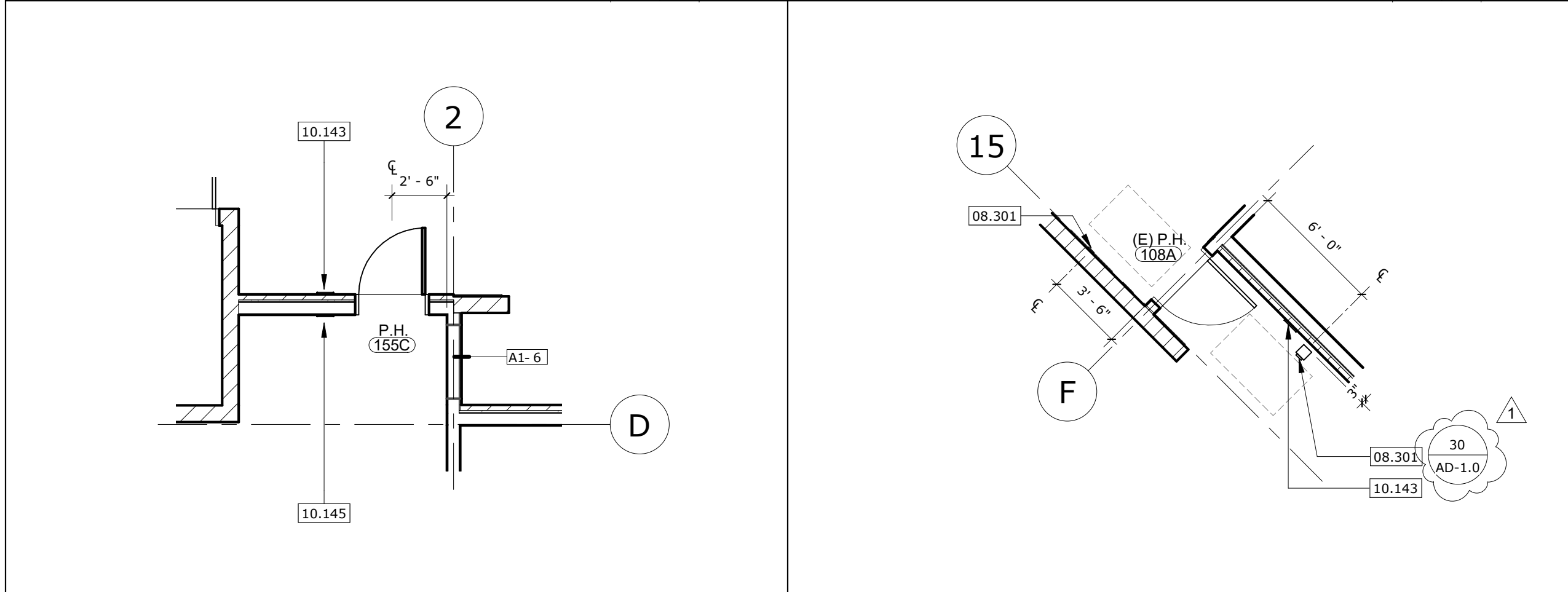
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DOOR 106C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

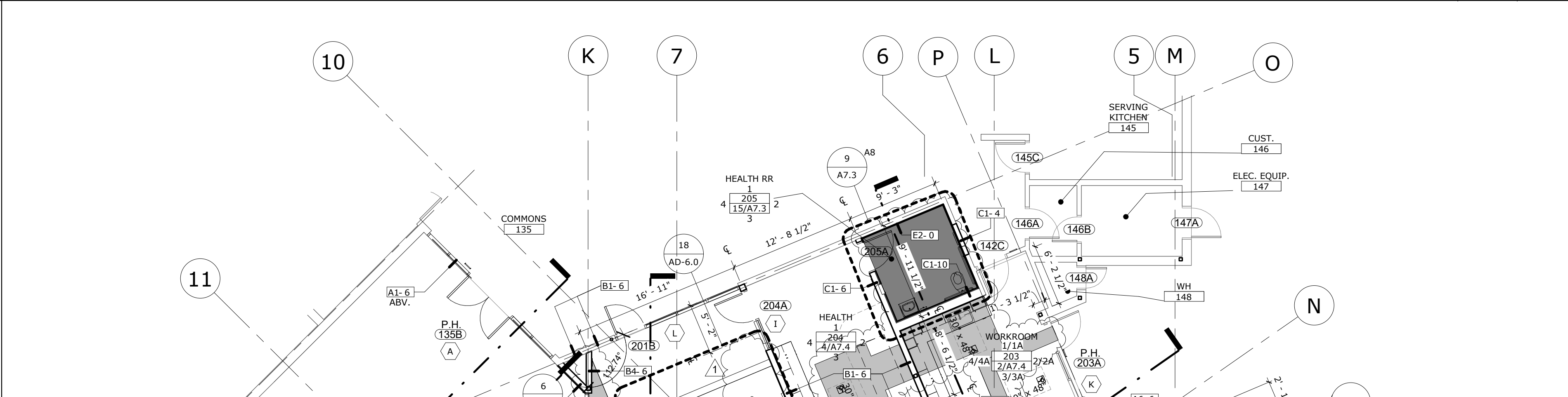
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DOOR 155C

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REF.: 1/A1.2

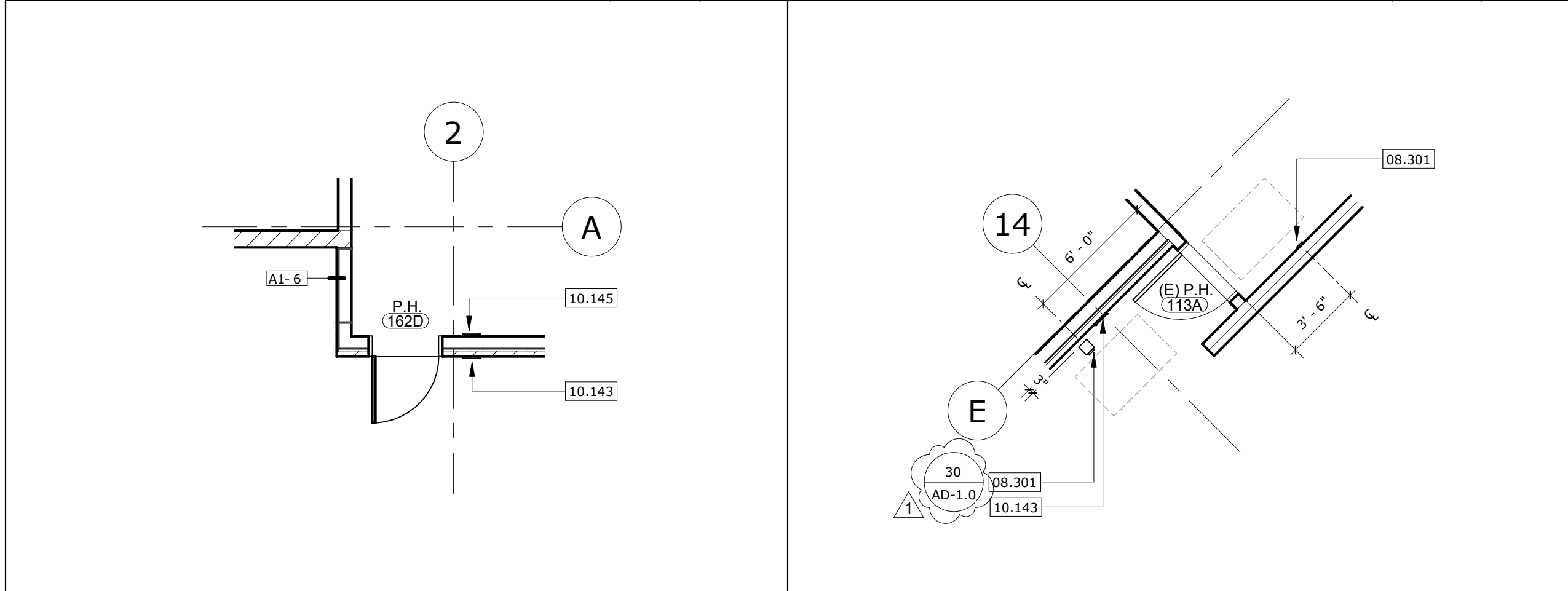
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DOOR 108A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

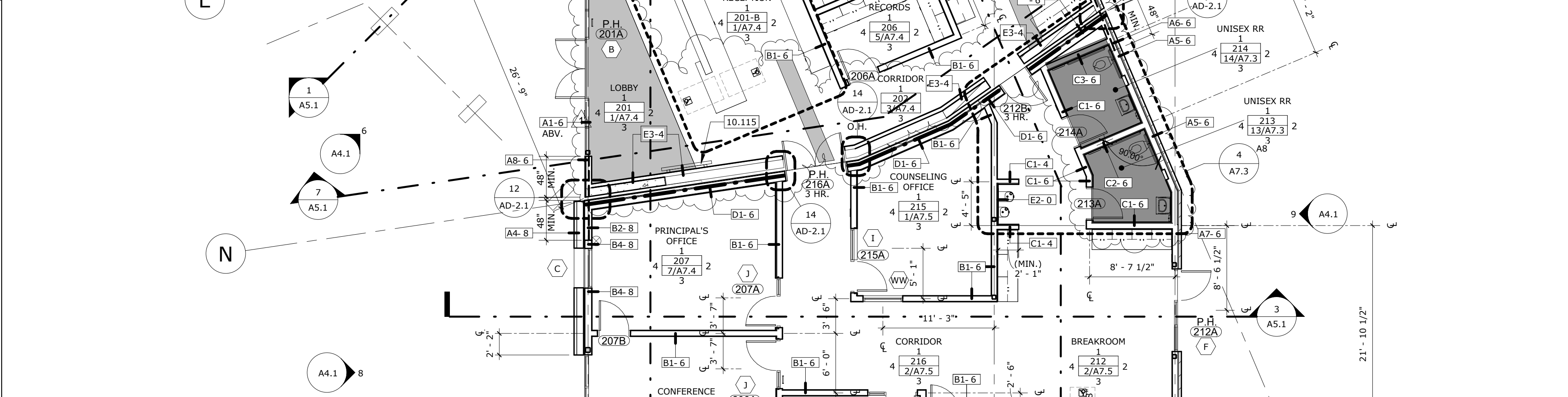
5



DOOR 162D

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

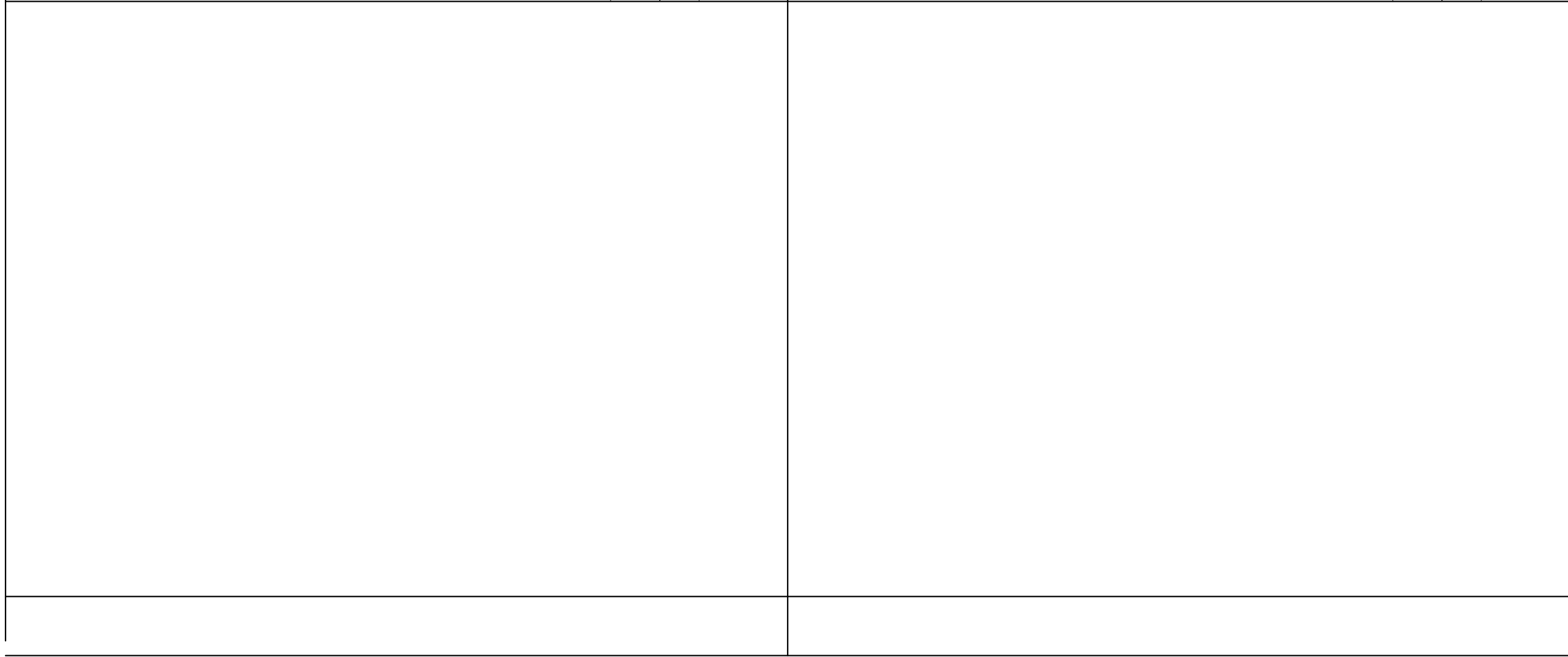
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DOOR 113A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

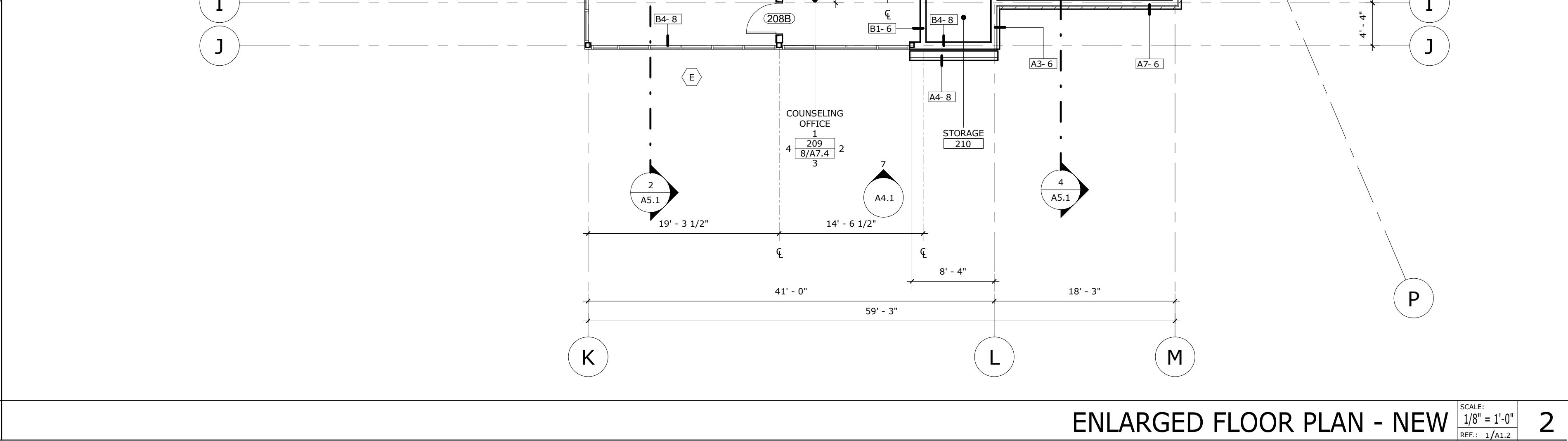
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DOOR 114A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

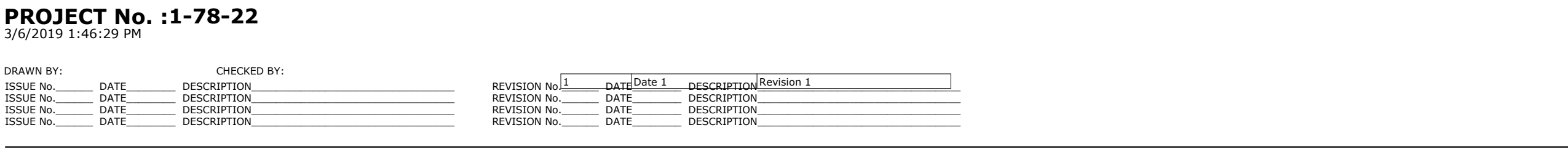
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DOOR 103C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

3



DOOR 150C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

8



DOOR 106C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

4



DOOR 155C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

9



DOOR 108A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

5



DOOR 162D

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

10



DOOR 113A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

6



DOOR 114A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

7



DOOR 103C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

3



DOOR 150C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

8



DOOR 106C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

4



DOOR 155C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

9



DOOR 108A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

5



DOOR 162D

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

10



DOOR 113A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

6



DOOR 114A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

7



DOOR 103C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

3



DOOR 150C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

8



DOOR 106C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

4



DOOR 155C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

9



DOOR 108A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

5



DOOR 162D

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

10



DOOR 113A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

6



DOOR 114A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

7



DOOR 103C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

3



DOOR 150C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

8



DOOR 106C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

4



DOOR 155C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

9



DOOR 108A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

5



DOOR 162D

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

10



DOOR 113A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

6



DOOR 114A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

7



DOOR 103C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

3



DOOR 150C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

8



DOOR 106C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

4



DOOR 155C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

9



DOOR 108A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

5



DOOR 162D

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

10



DOOR 113A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

6



DOOR 114A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

7



DOOR 103C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

3



DOOR 150C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

8



DOOR 106C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

4



DOOR 155C

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

9



DOOR 108A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

5



DOOR 162D

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

10



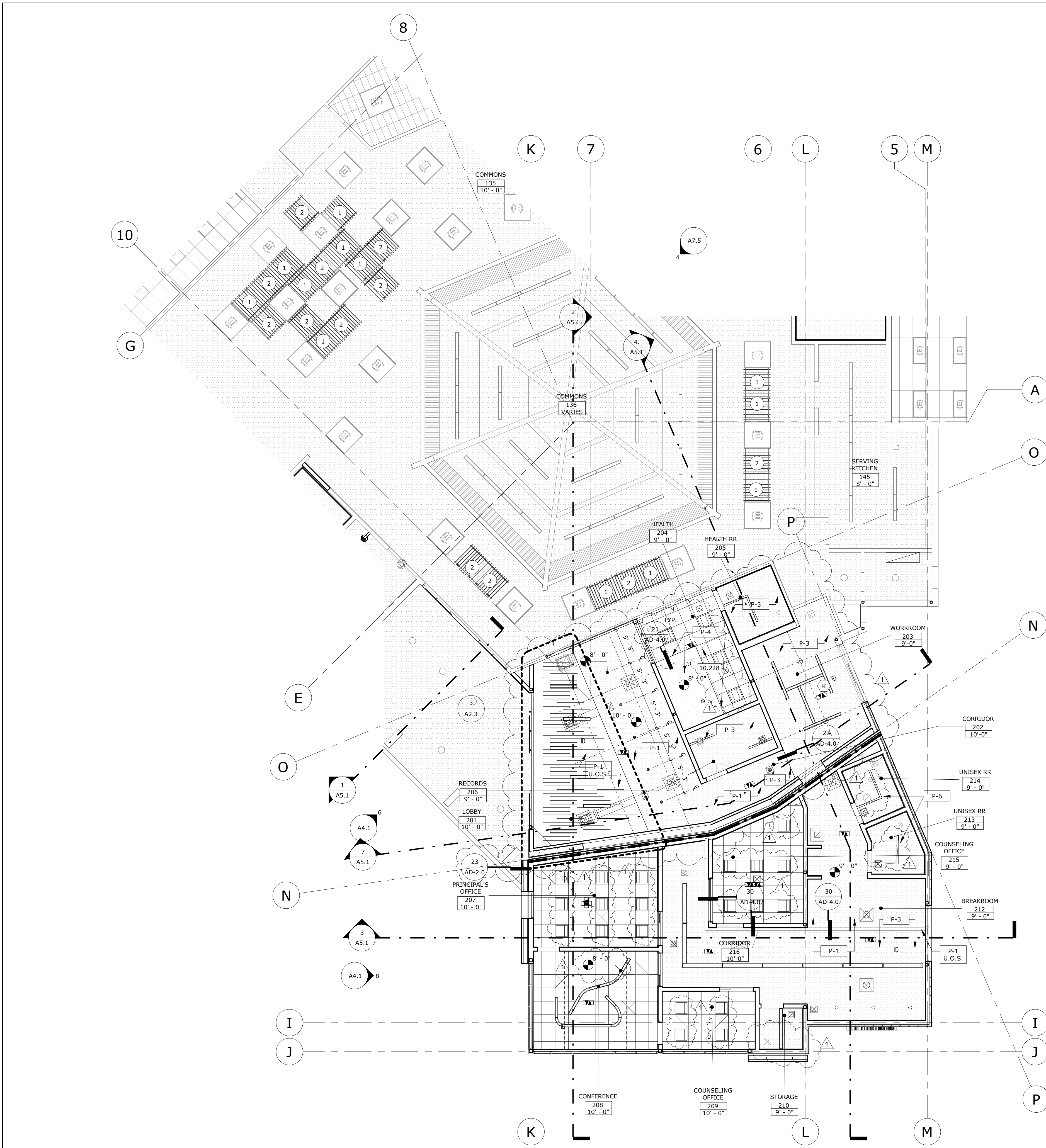
DOOR 113A

SCALE: 3/16" = 1'-0"  
REF.: 1/A1.2

6







### DEMO R.C.P. LEGEND

- (E) 2x4 CEILING TILE PANELS AND (E) LIGHTS TO REMAIN, PROTECT IN PLACE, U.N.O.
- (E) GYP CEILING TO REMAIN AS IS, PROTECT IN PLACE
- (D) EXISTING GYP. / PLASTER CEILING AND (E) LIGHTS TO BE REMOVED
- (D) EXISTING CEILING TILE PANELS AND (E) LIGHTS TO BE REMOVED
- (E) 30" X 36" ROOF HATCH TO REMAIN, PROTECT IN PLACE

### MOD. R.C.P. LEGEND

- (N) 2'-0" x 2'-0" SUSPENDED T-BAR CEILING, WITH ACOUSTICAL CEILING PANELS, SEE DETAIL
- GYPSUM CEILING BOARD, SEE DETAIL
- OPEN TO STRUCTURE, SEE GENERAL NOTE #5
- ACCENT CEILING BAFFLES, RECESSED LIGHTS, SEE ELEC. DWGS
- SUSPENDED LIGHTS, SEE ELEC. DWGS
- 2'-0" x 2'-0" RECESSED LIGHT FIXTURE, REFER TO ELECTRICAL DWGS FOR MORE INFO.
- (N) 3-HR FIRE RATED WALL
- 4 AD-4.0
- 26 AD-4.0
- 24 AD-4.0
- 22 AD-4.0
- 15 AD-4.0

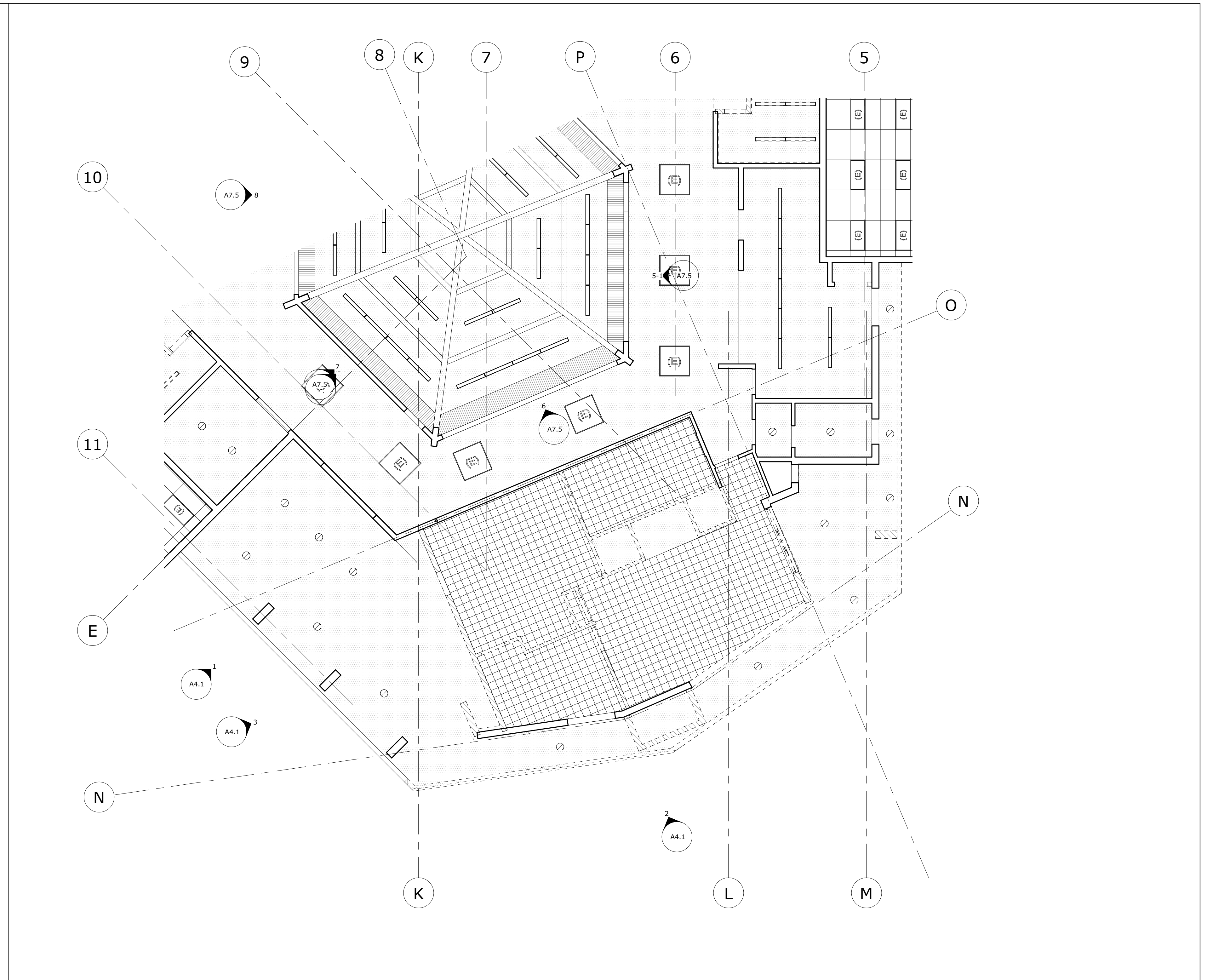
### KEYNOTES

- 10.228 PRIVACY CURTAIN & TRACK
- (E) 30" X 36" ROOF HATCH
- MECHANICAL DIFFUSER & REGISTER, REFER TO MECHANICAL DRAWINGS FOR MORE INFO.
- 4 X 4 BAFFLE CEILING UNIT: ATTACHMENT COLORS
- CEILING MOUNTED EXIT SIGN, WITH DIRECTIONAL ARROW, REFER TO ELECTRICAL DRAWINGS FOR MORE INFO.
- CEILING MOUNTED EXIT SIGN, REFER TO ELECTRICAL DRAWINGS FOR MORE INFO.
- WALL MOUNTED EXIT SIGN, REFER TO ELECTRICAL DRAWINGS FOR MORE INFO.

### ENLARGED CEILING PLAN - NEW

SCALE: 1/8" = 1'-0"  
REF.: 1/A2.1

4



### ENLARGED CEILING PLAN - EXISTING/DEMO

SCALE: 1/8" = 1'-0"  
REF.: 1/A2.1

1

### GENERAL NOTES: RCP

- ALL (N) LIGHT FIXTURES TO BE CENTERED IN SPACE, U.N.O.
- ALL CEILING HEIGHTS ARE RELATIVE TO THE FINISH FLOOR DIRECTLY BENEATH.
- ACOUSTICAL CEILING TILES AND GRID TO BE CENTERED IN ROOM.
- SEE DETAIL 1/AD-4.0 FOR METAL SUSPENSION SYSTEM LAY-IN NOTES AND REQUIREMENTS.
- ALL EXPOSED STRUCTURE, INCLUDING MECHANICAL & PLUMBING EQUIPMENT TO BE PAINTED. FOR MORE INFO SEE CMF SCHEDULE ON ID SHEETS
- ALL MECHANICAL, ELECTRICAL AND PLUMBING EQUIPMENT TO BE HELD AS TIGHT AS POSSIBLE TO CEILING STRUCTURE
- ALL CONDUIT IN EXPOSED AREAS WHERE CEILING STRUCTURE IS EXPOSED CAN ONLY PENETRATE WALLS AT ROOF / FLOOR DECK
- REFER TO ELECTRICAL & MECHANICAL DRAWINGS FOR CEILING COMPONENT CALLOUTS AND FIXTURE TYPES
- PAINT ALL SUPPLY & RETURNS OF ALL ACCENT PAINTED CEILING AREAS

### 4X4 BAFFLE UNIT-COLOR

SCALE: 3/4" = 1'-0"  
REF.: 7

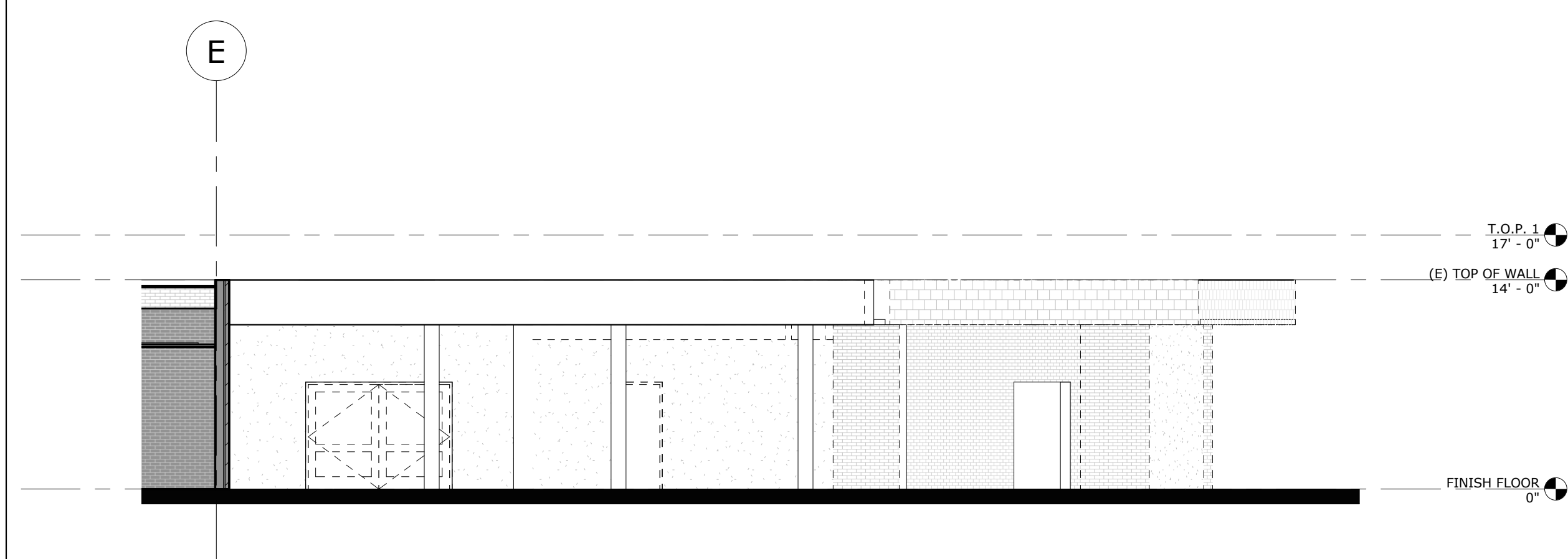
4

### ENLARGED CEILING PLAN - NEW

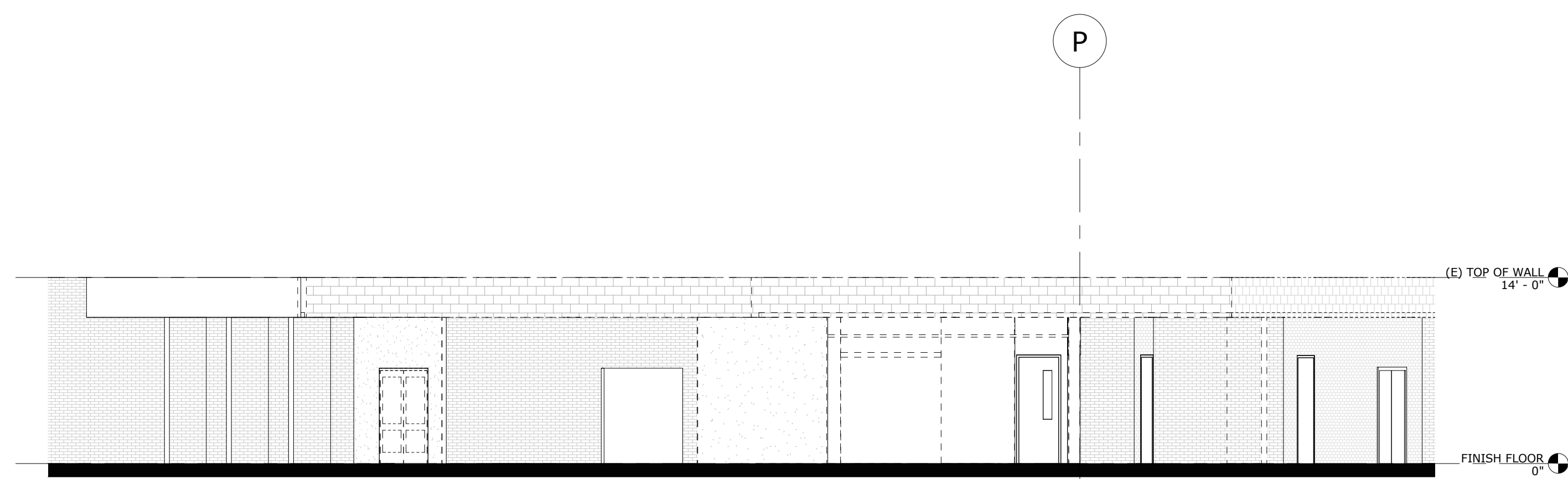
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REF.: 2/A2.3

3

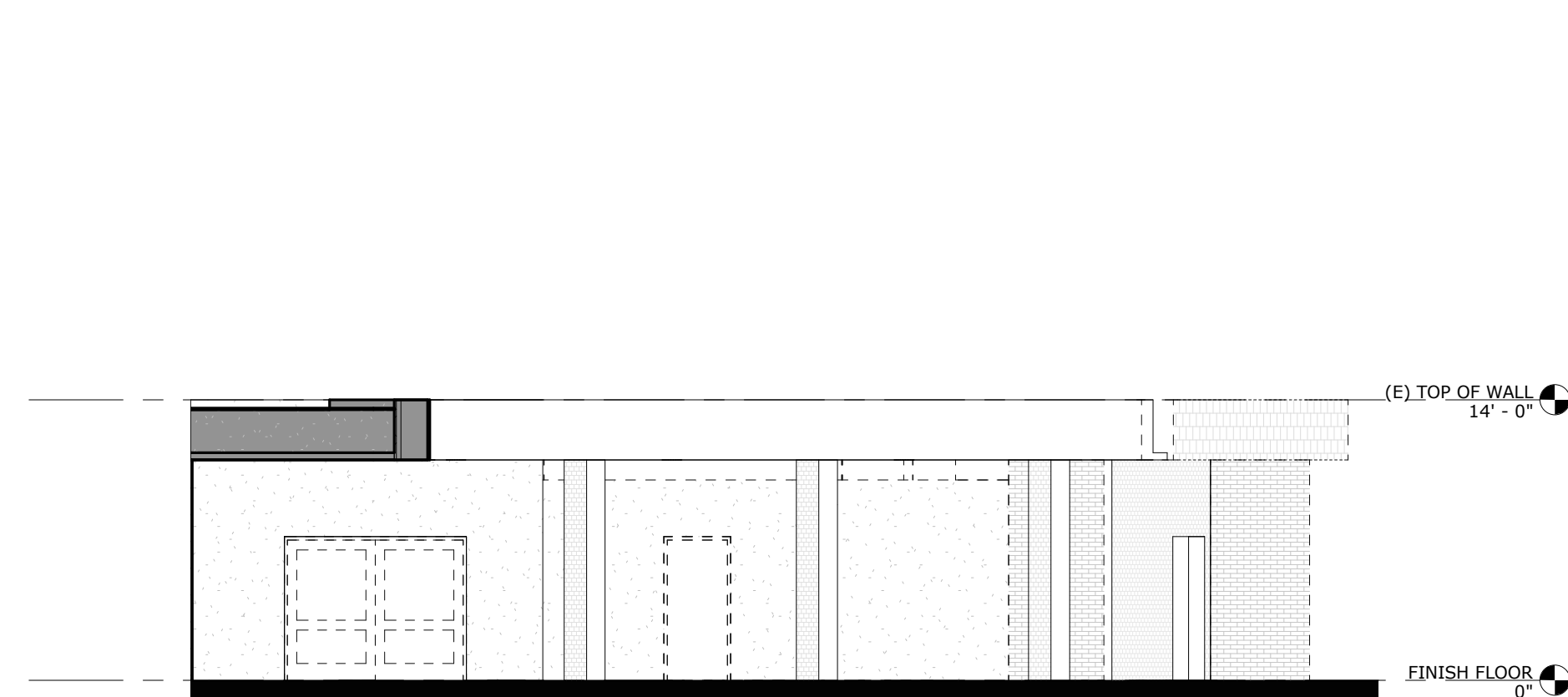




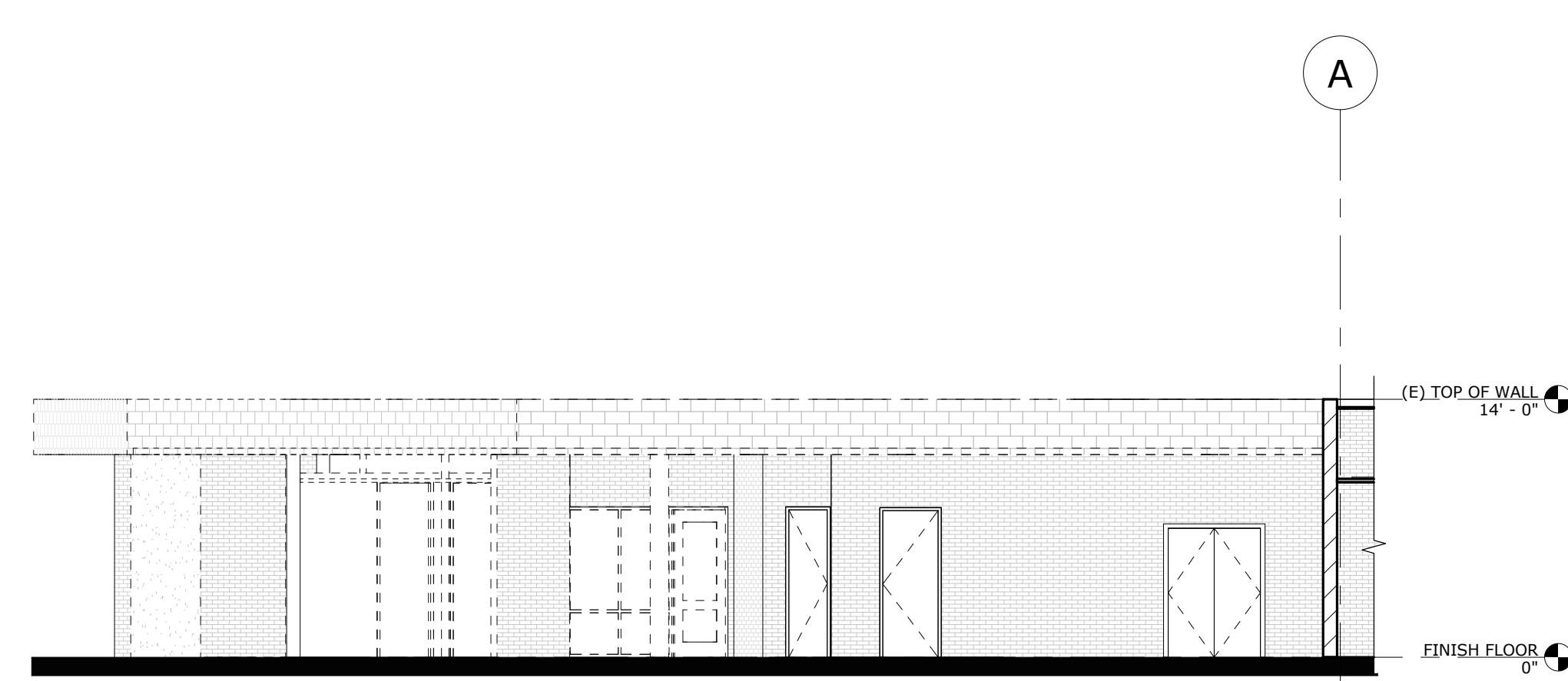
EXISTING/DEMO SOUTH-WEST ELEVATION



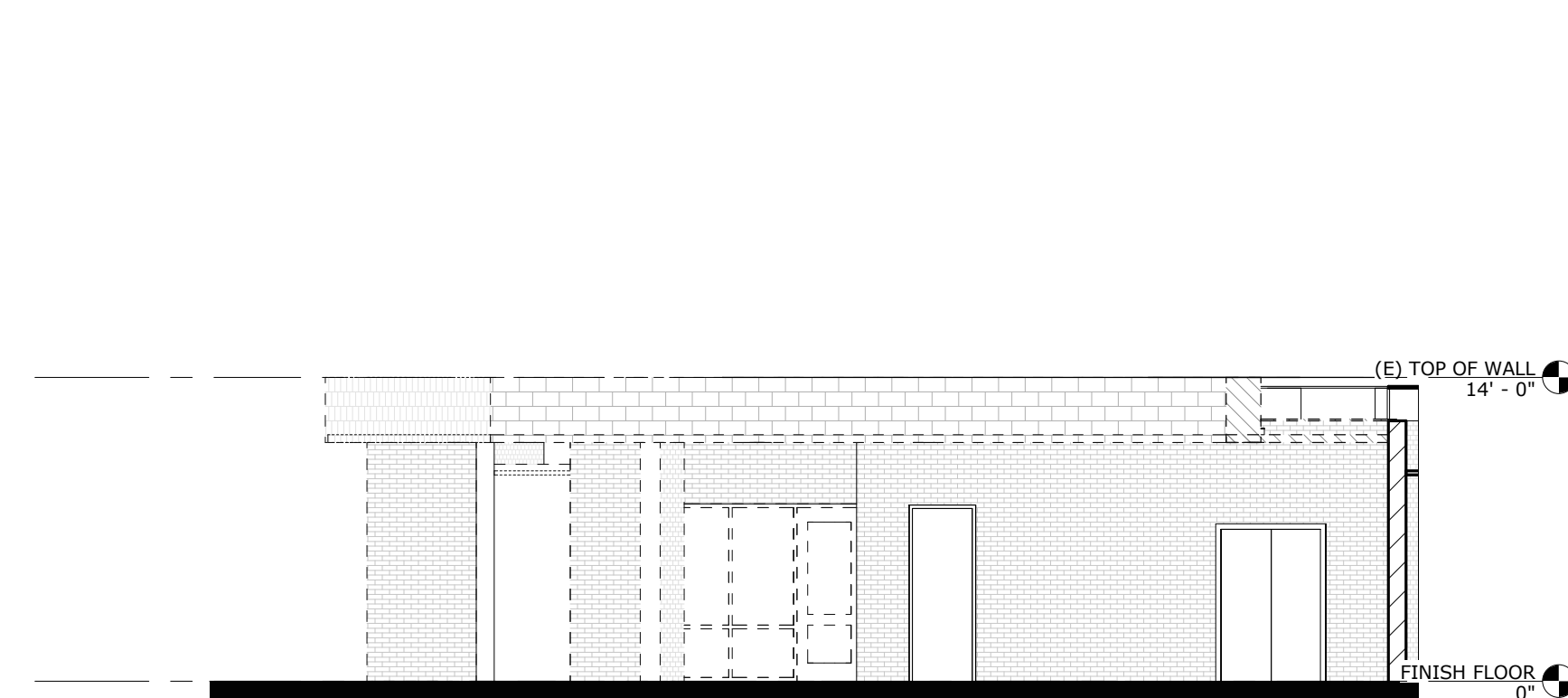
EXISTING/DEMO WEST ELEVATION



EXISTING/DEMO SOUTH ELEVATION



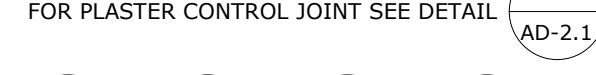
EXISTING/DEMO NORTH ELEVATION



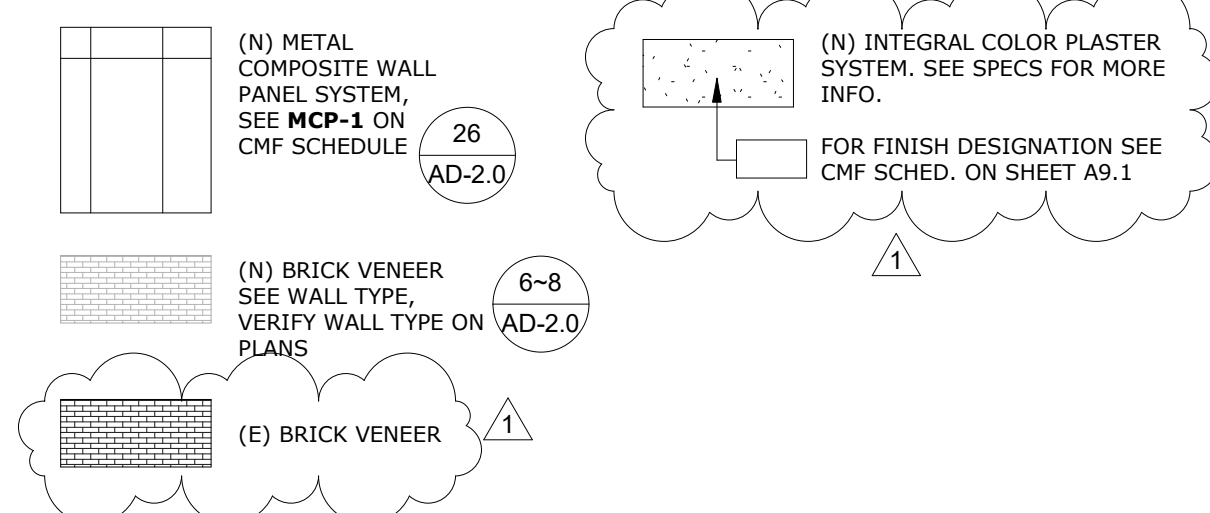
EXISTING/DEMO NORTH-EAST ELEVATION

1. FOR PLASTER CONTROL JOINT SEE DETAIL

10  
AD-2.1



### ELEVATION LEGEND



File No: 36-55

IDENTIFICATION STAMP

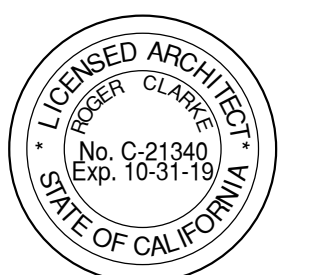
DIV OF THE STATE ARCHITECT

OFFICE OF REGULATION SERVICES

04-117672

AC \_\_\_\_\_ FLS \_\_\_\_\_ SS \_\_\_\_\_

DATE \_\_\_\_\_



RUHNAU  
CLARKE  
ARCHITECTS

**ADMIN. ADDITION & MODERNIZATION**  
NORTH PARK ELEMENTARY SCHOOL  
5378 NORTH 'H' STREET, SAN BERNARDINO, CA 92407  
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

## OVERALL BUILDING ELEVATIONS

## A4.1

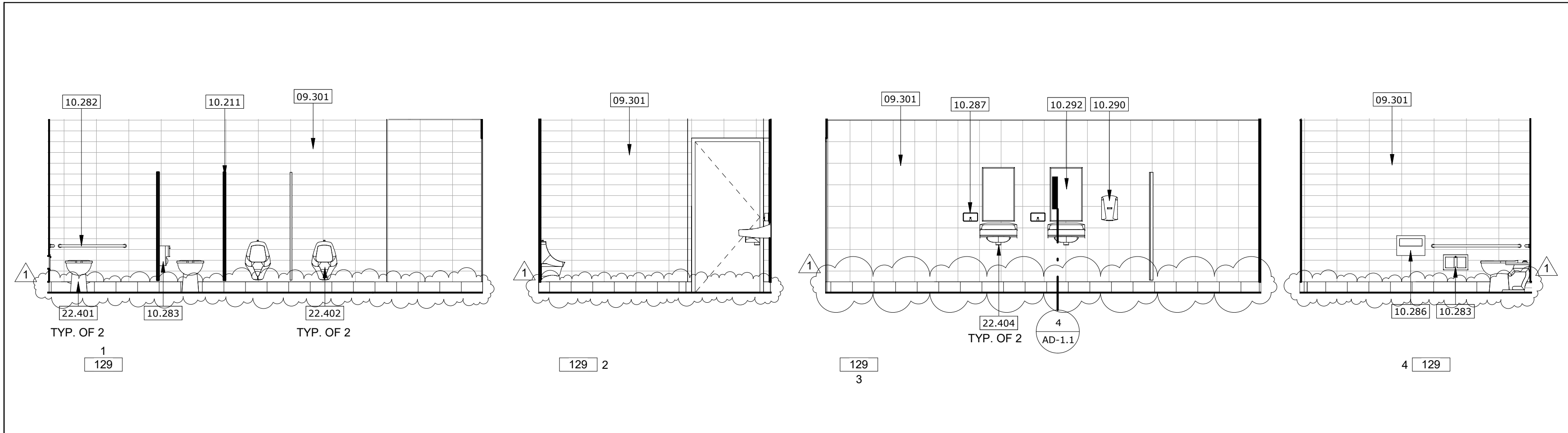
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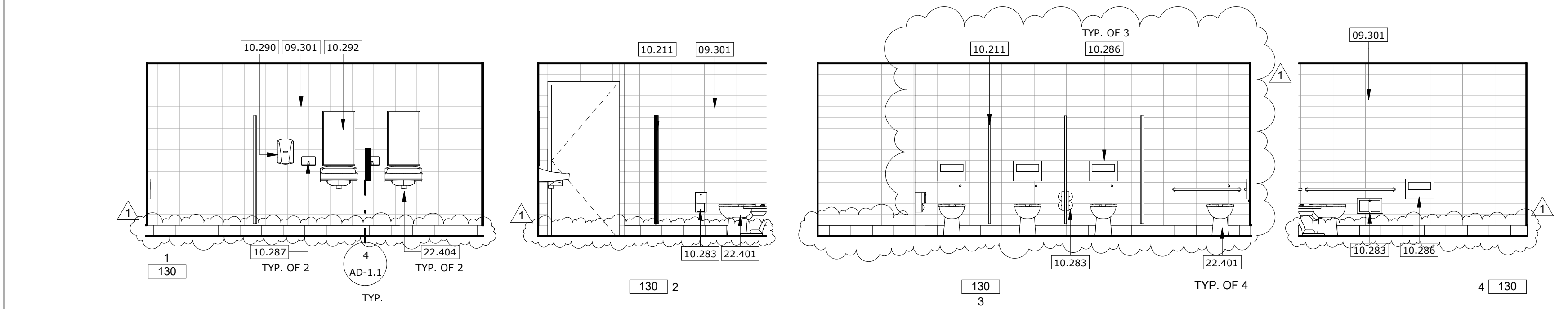
**RUHNAUCLARKE.COM**

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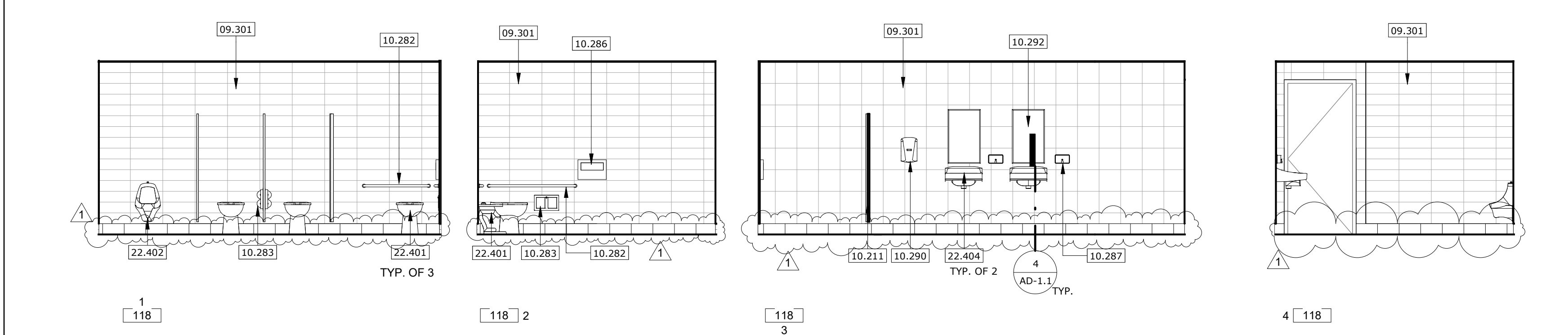




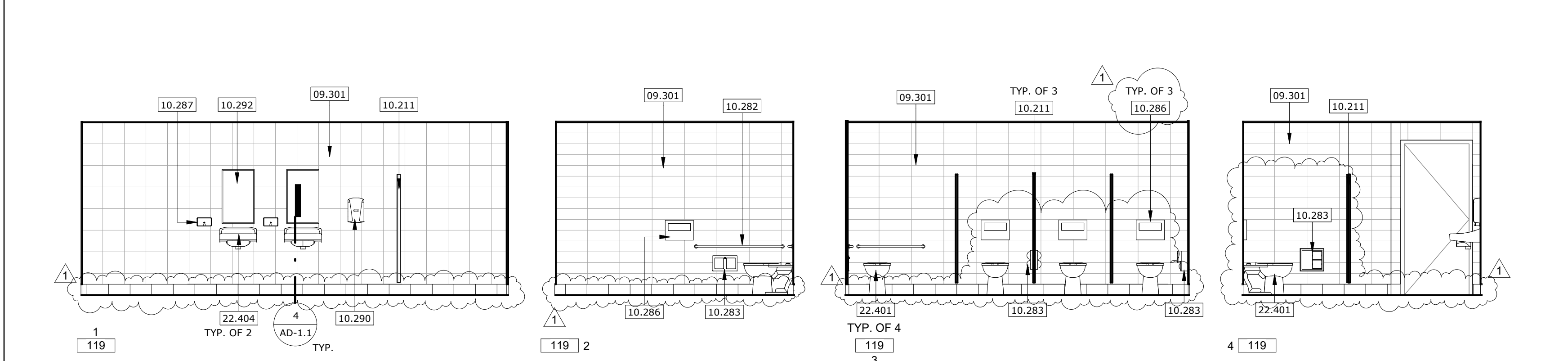
BOYS' R.R. #129 INTERIOR ELEVATION



GIRLS' R.R. #130 INTERIOR ELEVATIONS



BOYS' R.R. #118 INTERIOR ELEVATIONS

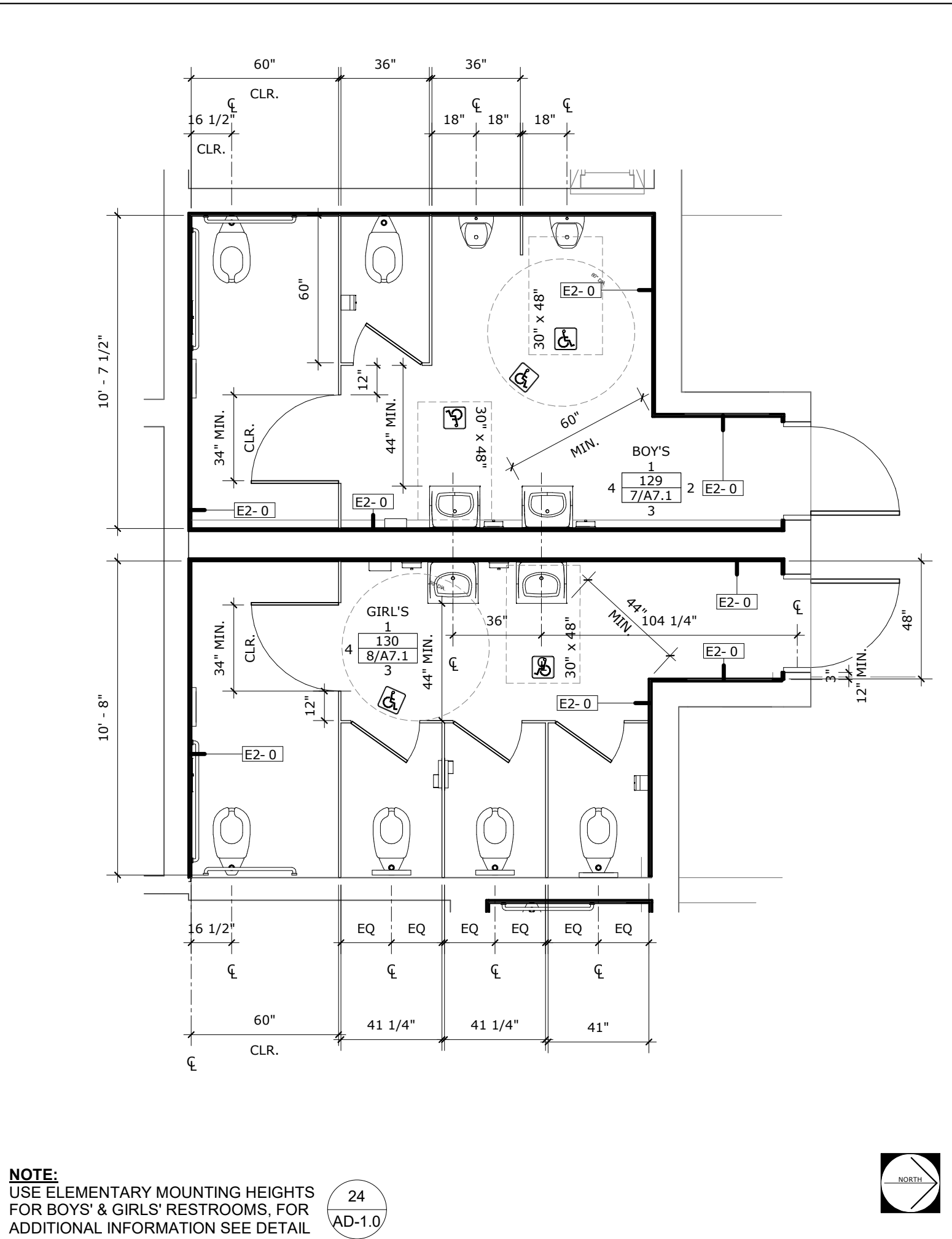


GIRLS' R.R. #119 INTERIOR ELEVATIONS

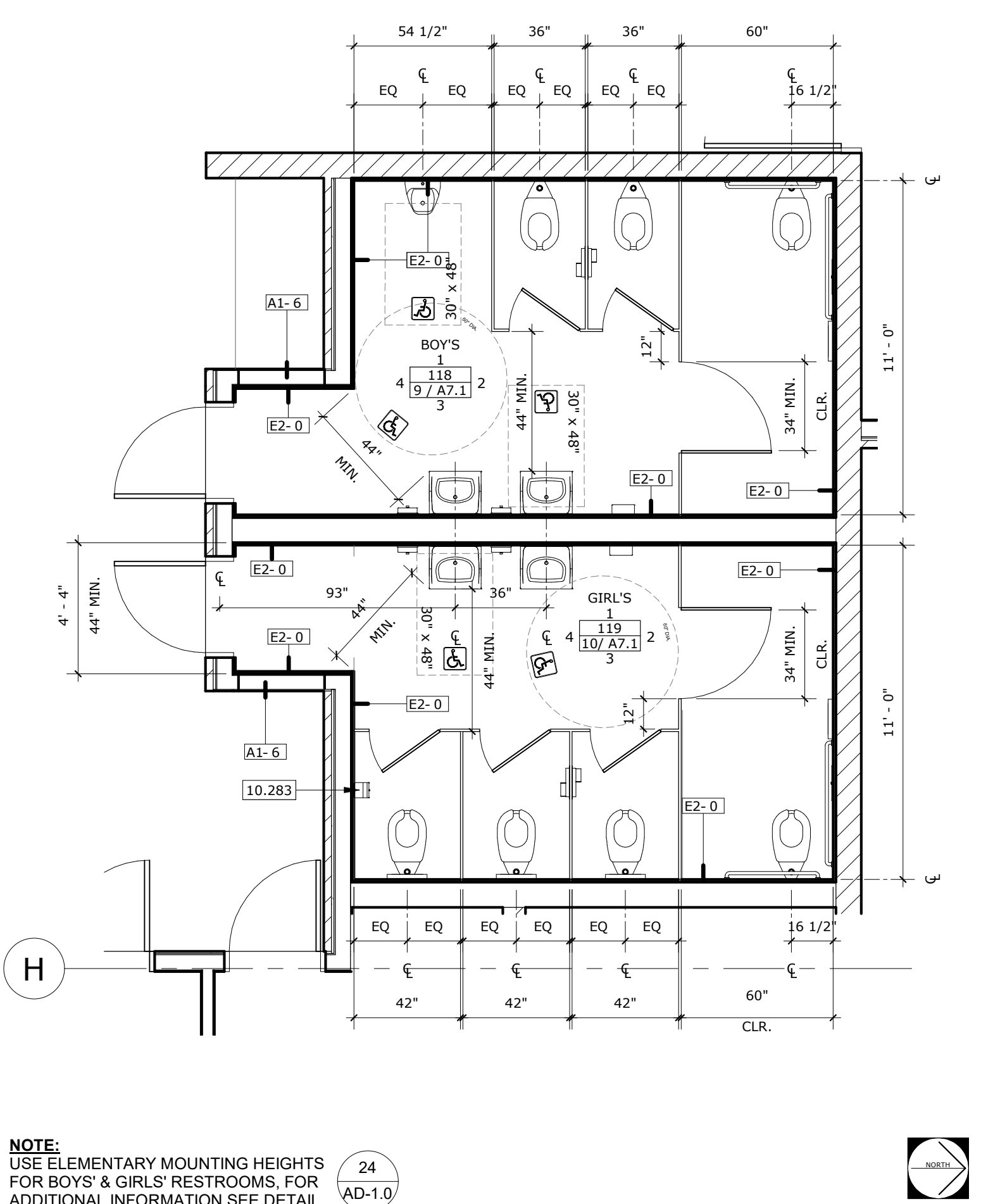


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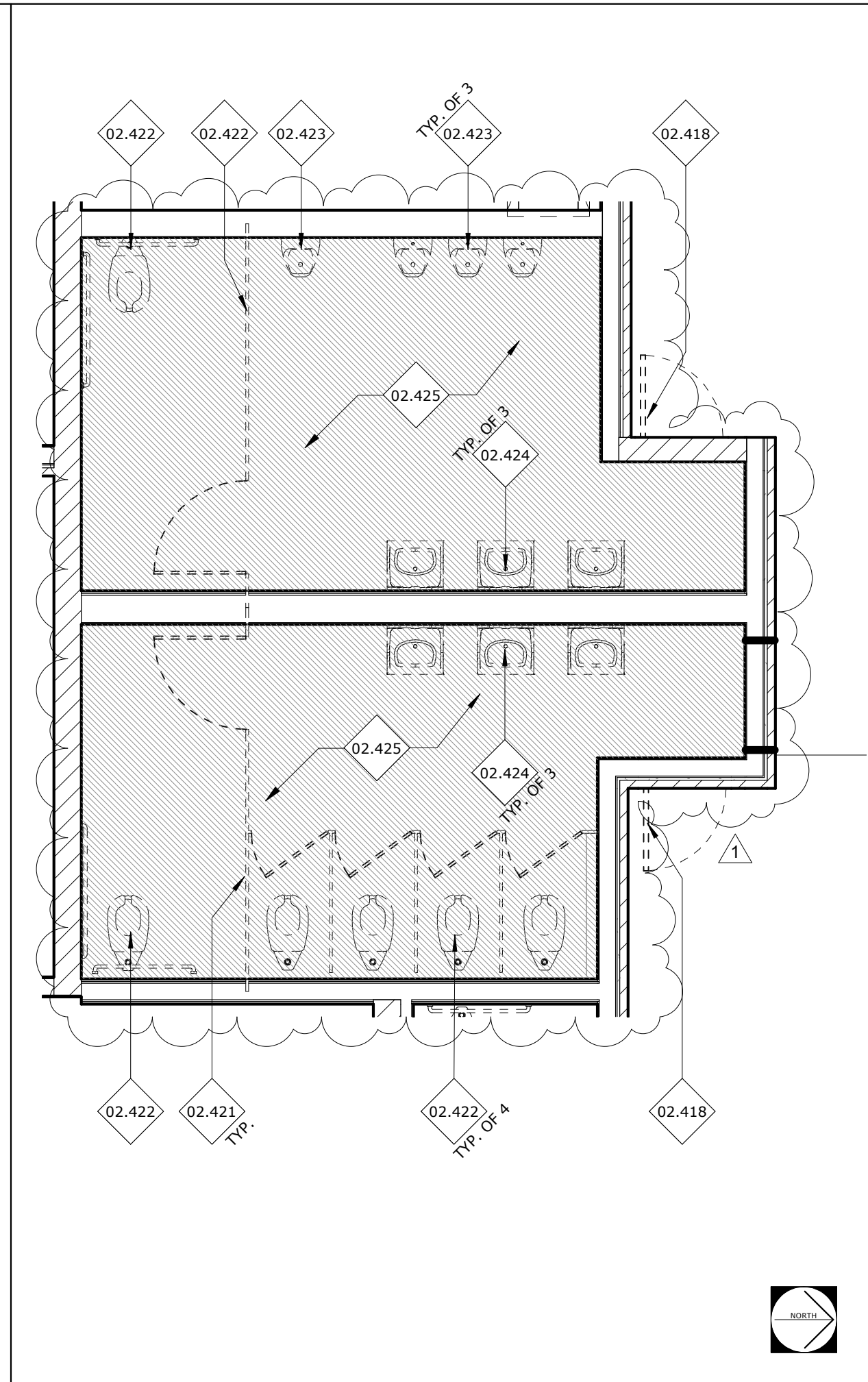
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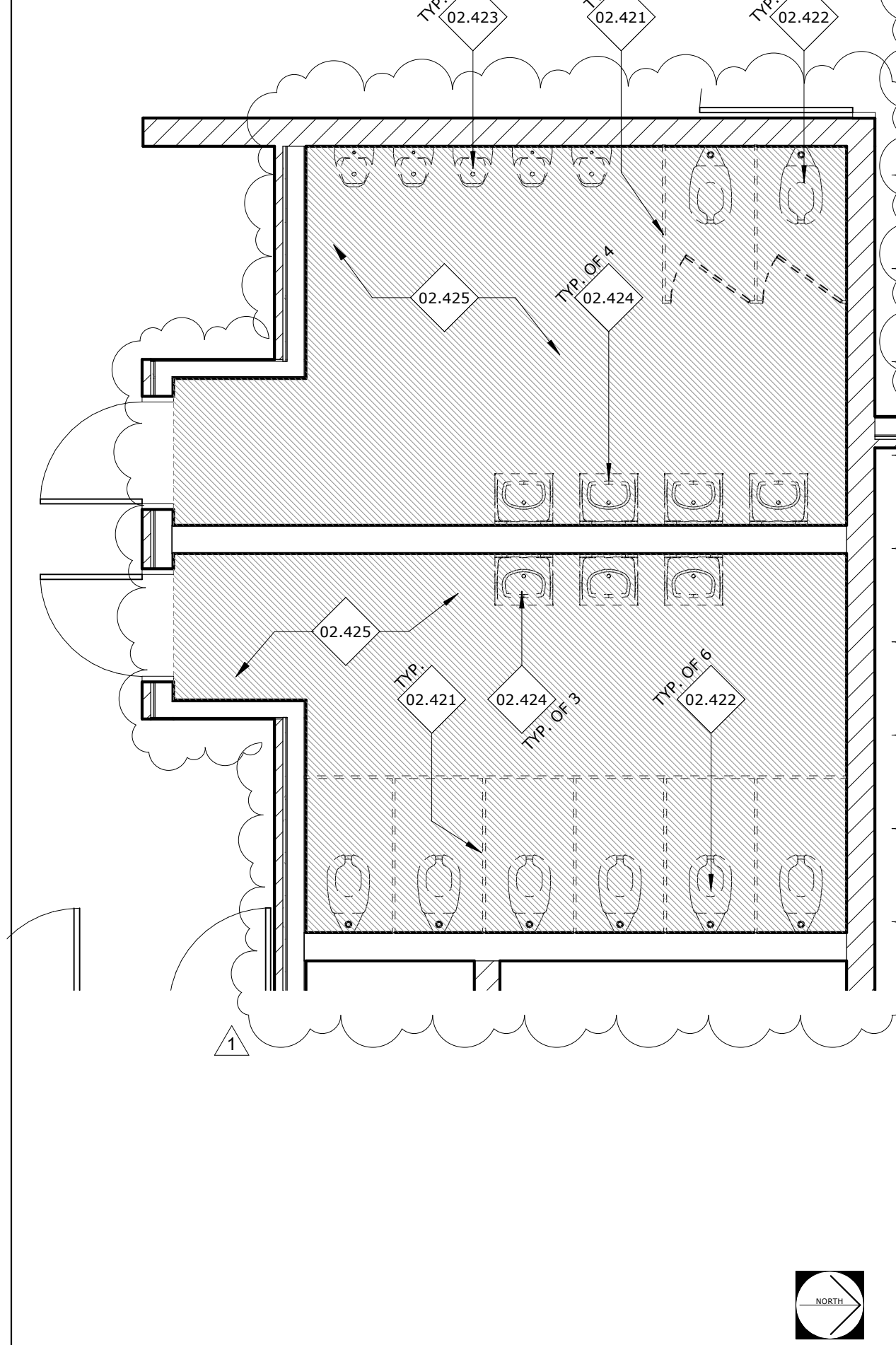
BOYS' #129 & GIRLS' R.R. #130 - NEW



BOYS' #118 & GIRLS' R.R. #119 - NEW



RR'S #129 & #130 - DEMO



RR #118 & #119 - DEMO

GEN. NOTES:INT.ELEV. & ENLG. PLN

1. VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
2. PROVIDE STUD BRACING AND SUPPORT FOR ALL WALL MOUNTED FIXTURES AND ACCESSORIES.
3. PER DETAIL 20 SO-2.4
4. PROVIDE GROMMETS AND RINGS IN COUNTER TOPS 60" O.C. FOR POWER AND DATA
4. FOR WALL TILE FINISH DETAILS SEE AD-2.1

KEYNOTES

02.418	DEMO (E) DOOR, FRAME AND HARDWARE & INFILL WITH NEW WALL ASSEMBLY.
02.421	DEMO (E) TOILET PARTITION/DOOR.
02.422	DEMO (E) WATER CLOSET.
02.423	DEMO (E) URINAL.
02.424	DEMO (E) LAVATORY.
02.425	EXISTING FLOOR/FINISH TO BE REMOVED.
09.301	WALL TILE SYSTEM
10.211	TOILET PARTITION
10.283	TOILET PAPER DISPENSER
10.286	TOILET SEAT COVER DISPENSER
10.287	SOAP DISPENSER
10.290	ELECTRIC HAND DRYER - 4" MAX. PROJECTION
10.292	GLASS MIRROR
22.401	WATER CLOSET
22.402	URINAL
22.404	LAVATORY

DEMO & FINISH LEGEND

	DEMO (E) FLOOR SLAB AND REPLACE PER STRUCTURAL MODERNIZATION DRAWINGS
	TYPICAL WALL TILE TRIM T-1
	TYPICAL WALL TILE T-2
	ACCENT WALL TILE R.R. #163 + #167 (KINDER) + #205 (HEALTH) = T-3 R.R. #118 + #129 + #144 (BOYS) + #131 (MEN) + #213 + #214 (STAFF) = T-4 R.R. #116 + #119 + #130 (GIRLS) + #133 (WOMEN) = T-5

File No: 36-55  
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SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

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ENL. RESTROOM PLANS  
/ INT. ELEV.

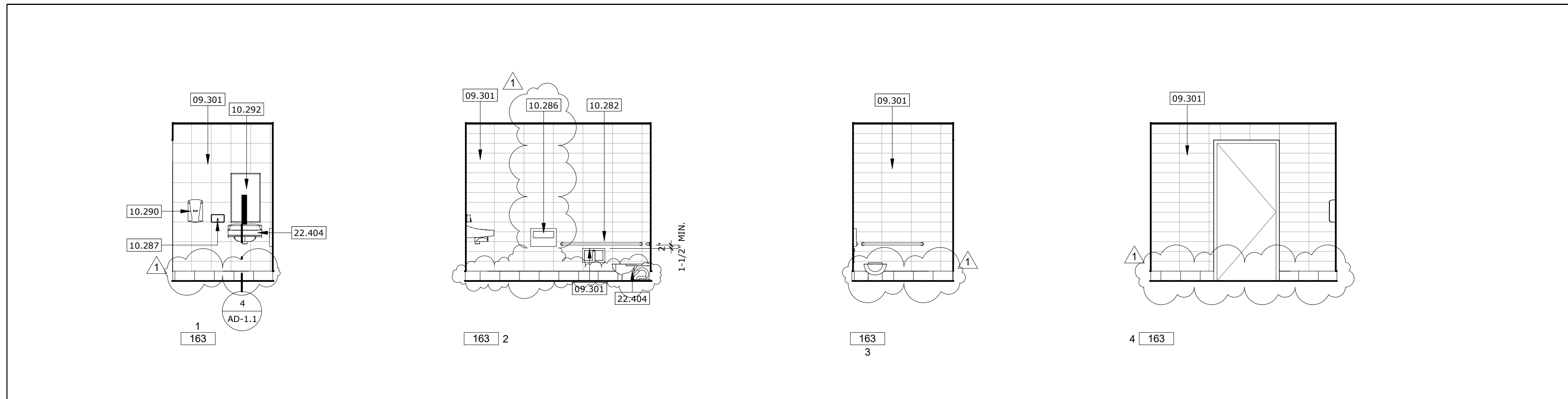
A7.1

3775 TENTH STREET, RIVERSIDE CALIFORNIA 92501 (951) 684-4664 / 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92009 (760) 438-5899

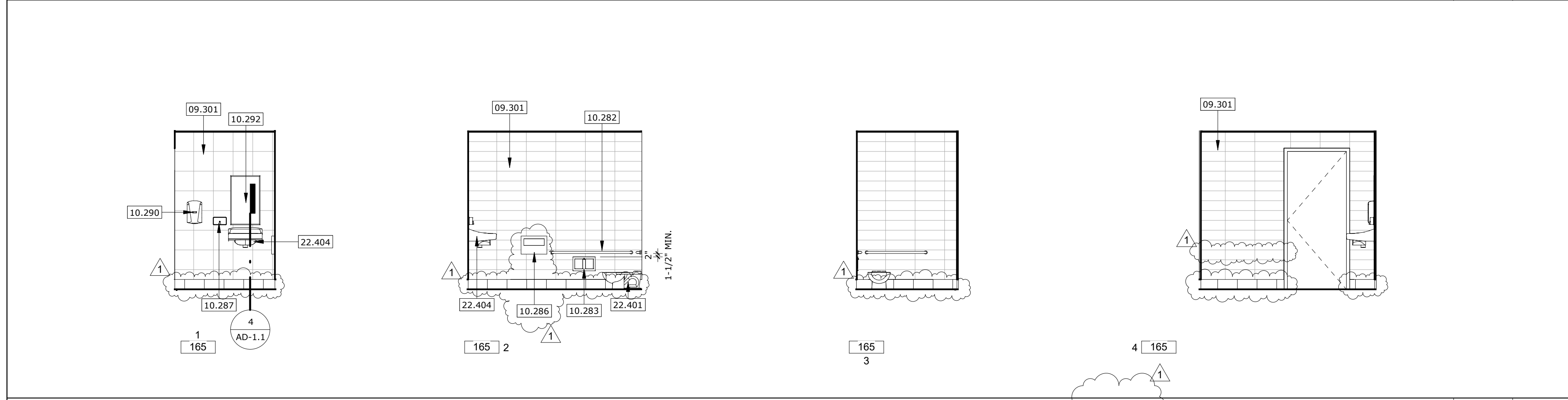




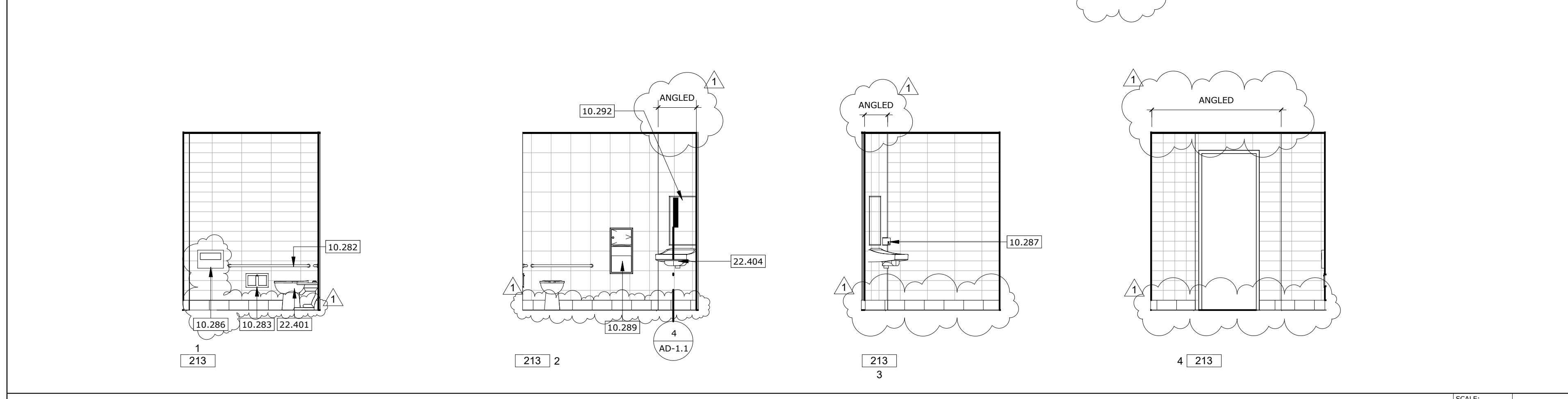




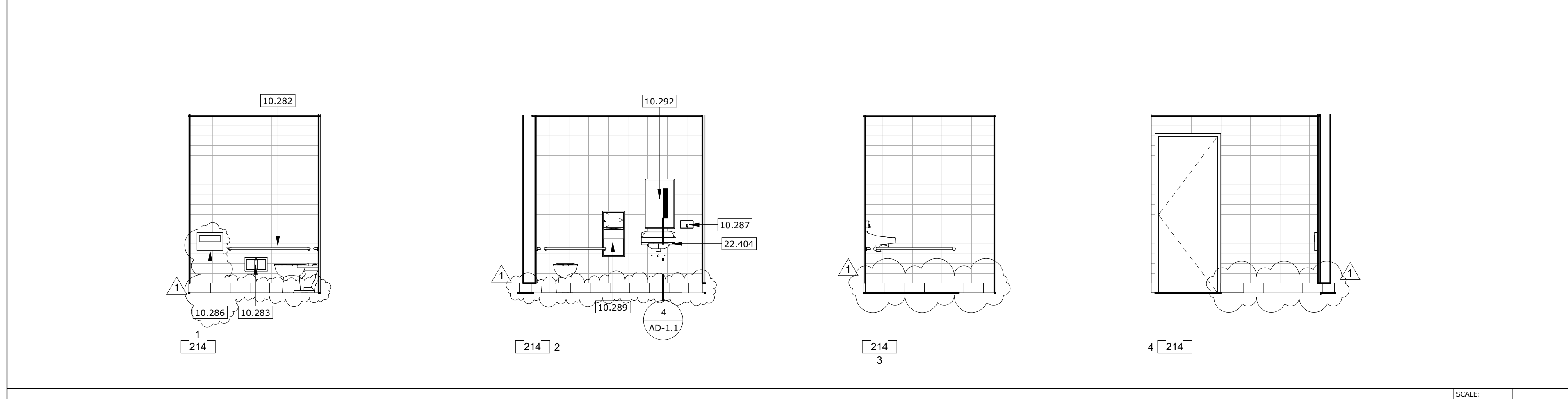
KINDER R.R. #163 INTERIOR ELEVATIONS 11



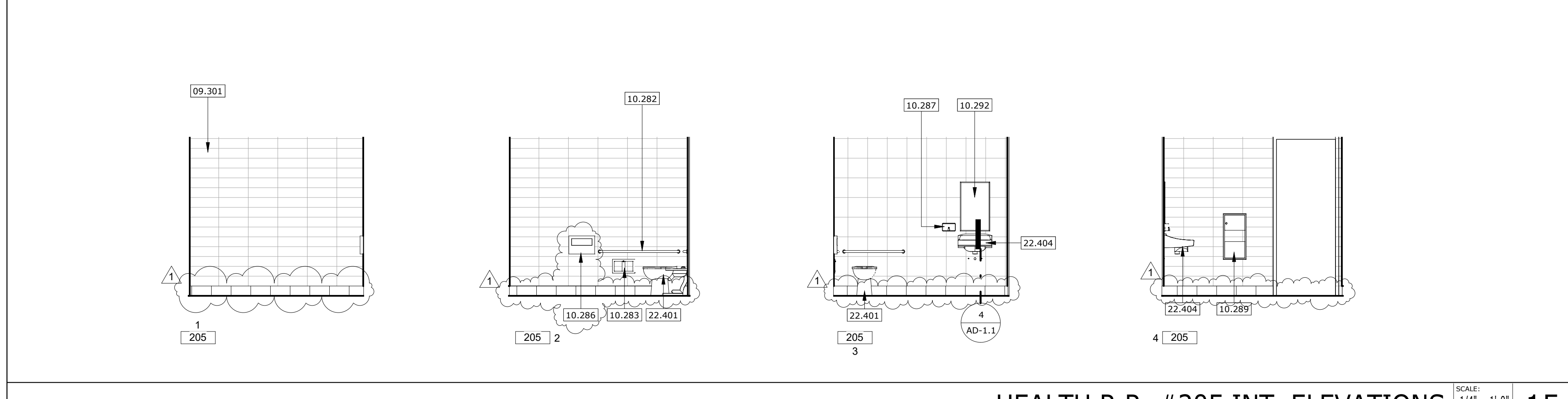
KINDER R.R. #167 INTERIOR ELEVATIONS 12



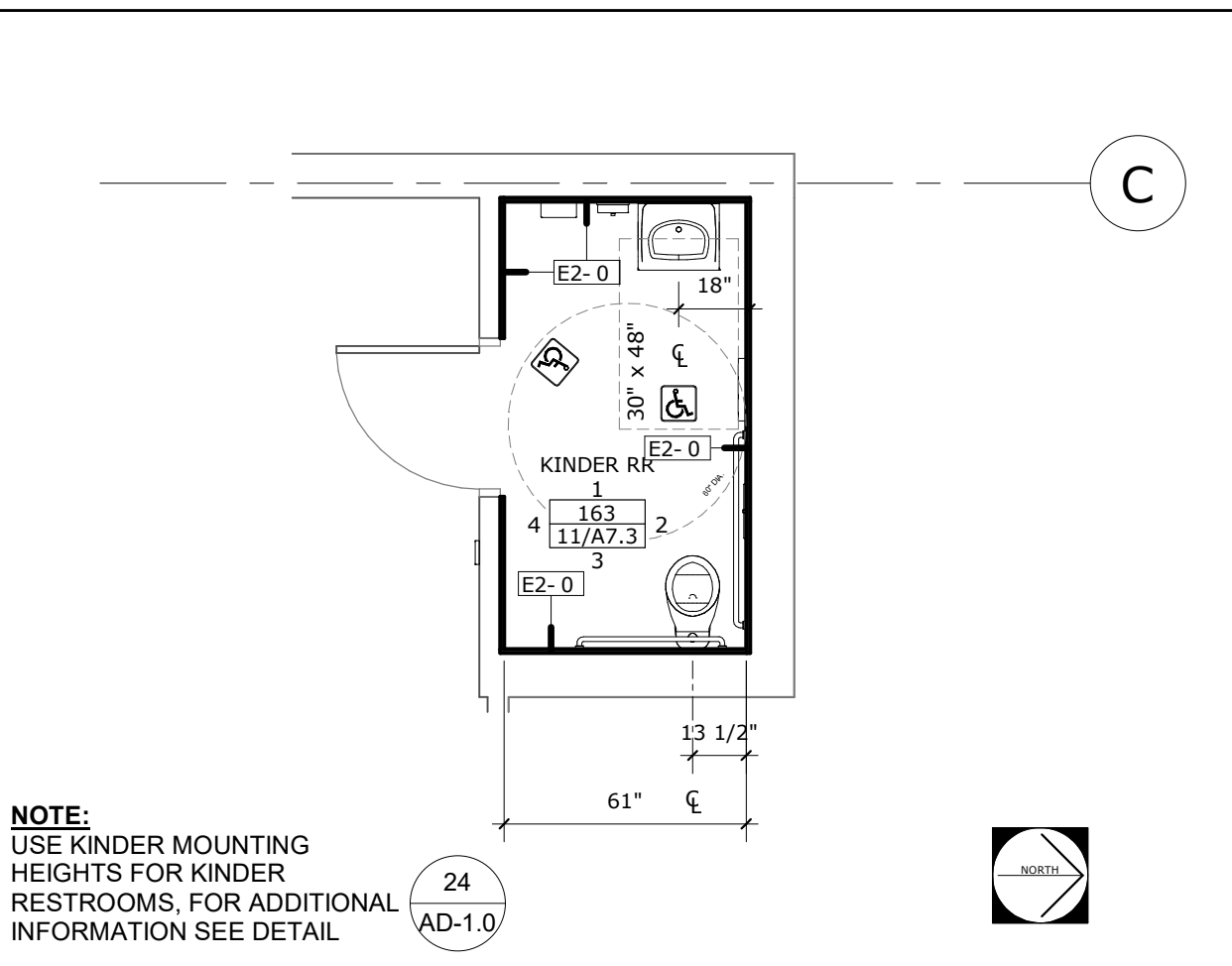
UNISEX R.R. #213 INT. ELEVATIONS 13



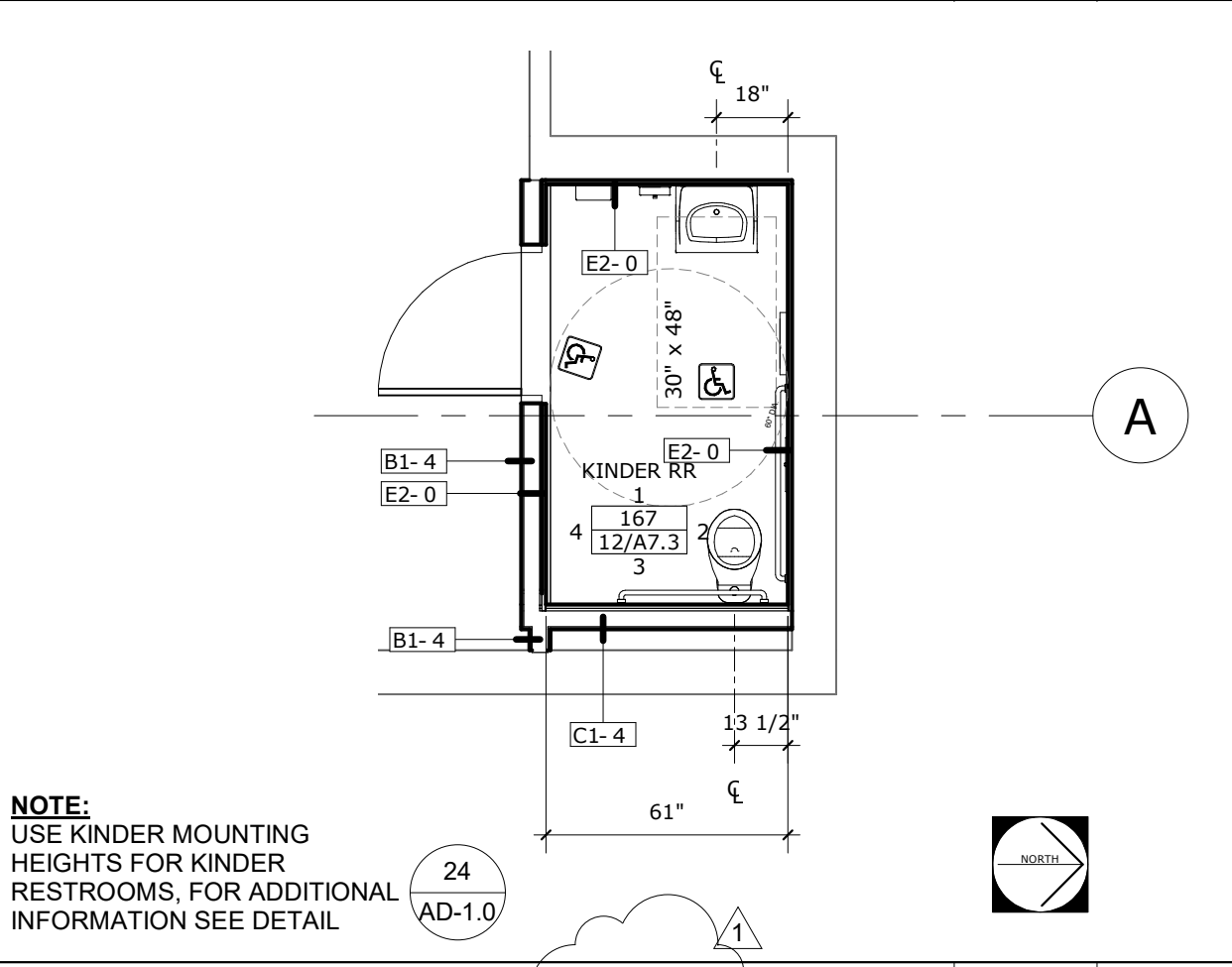
UNISEX R.R. #214 INTERIOR ELEVATIONS 14



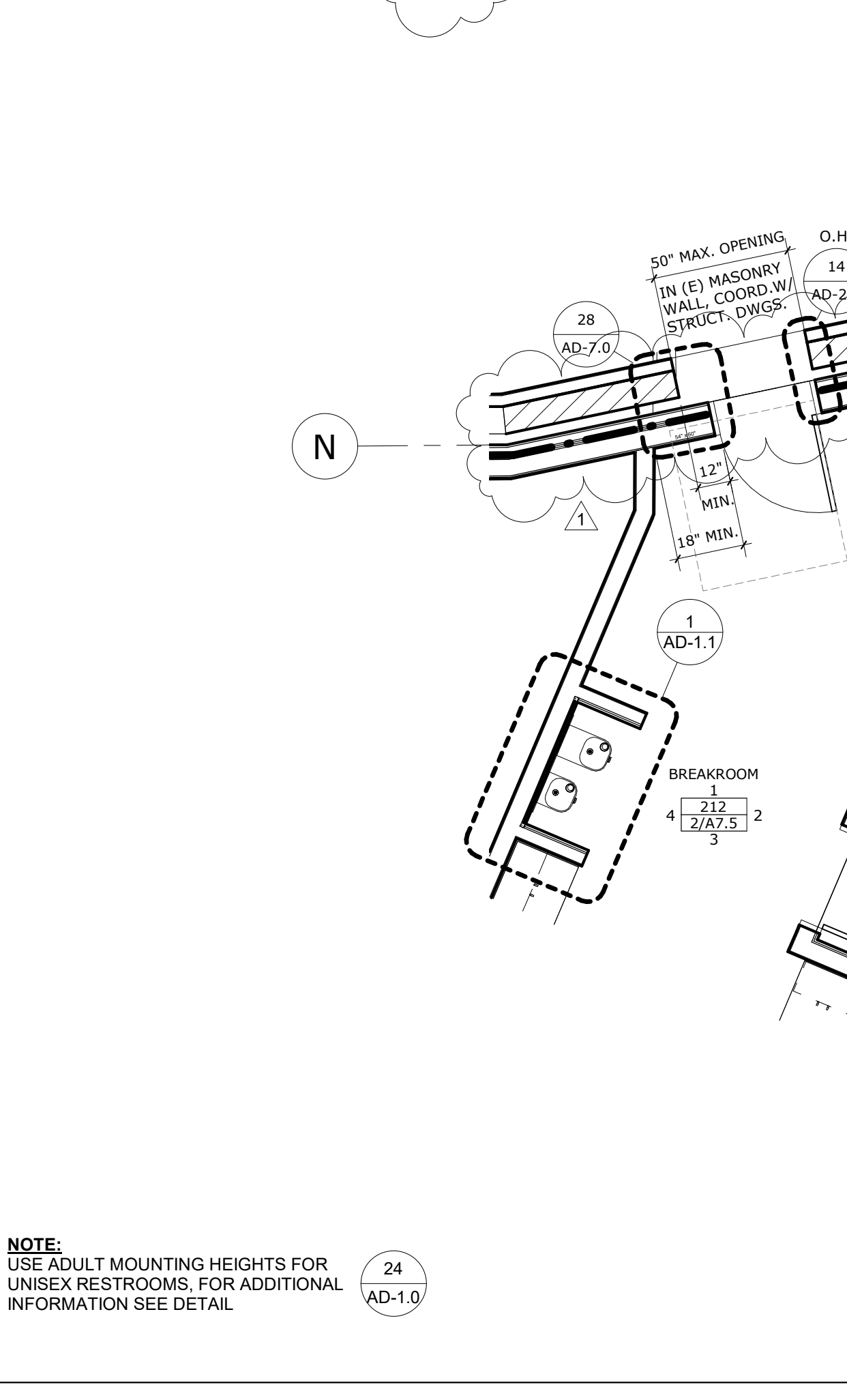
HEALTH R.R. #205 INT. ELEVATIONS 15



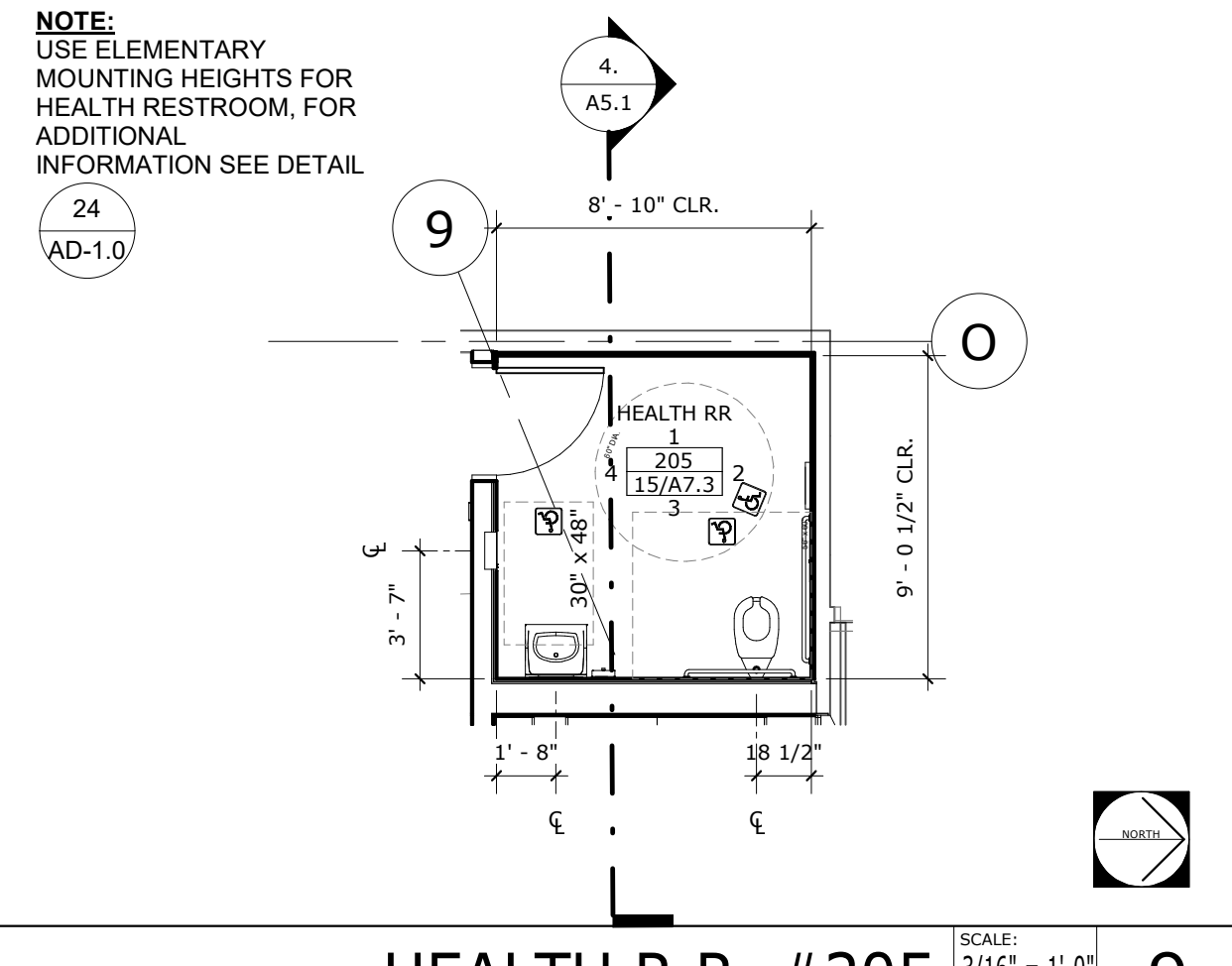
KINDER R.R. #163 - NEW 6



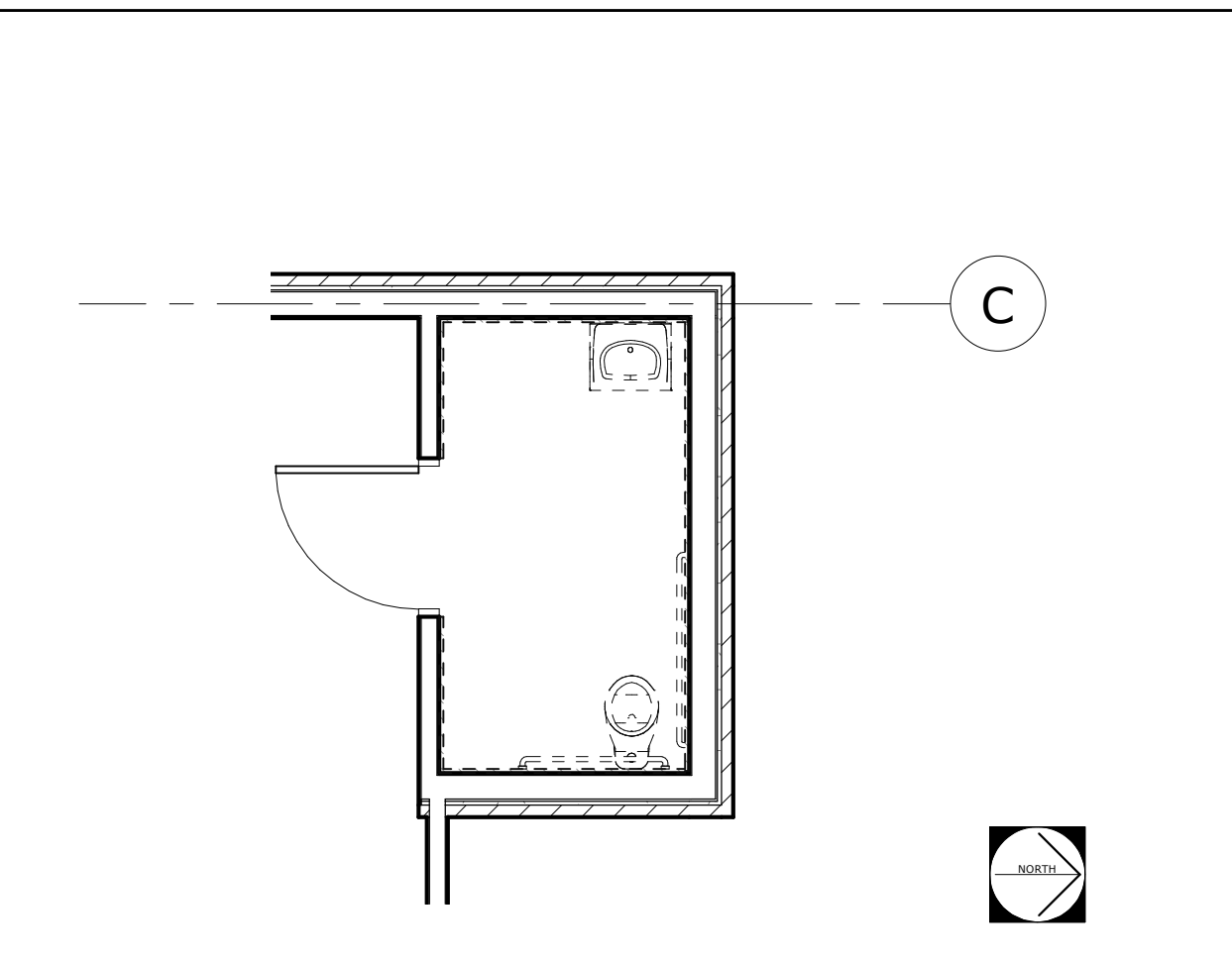
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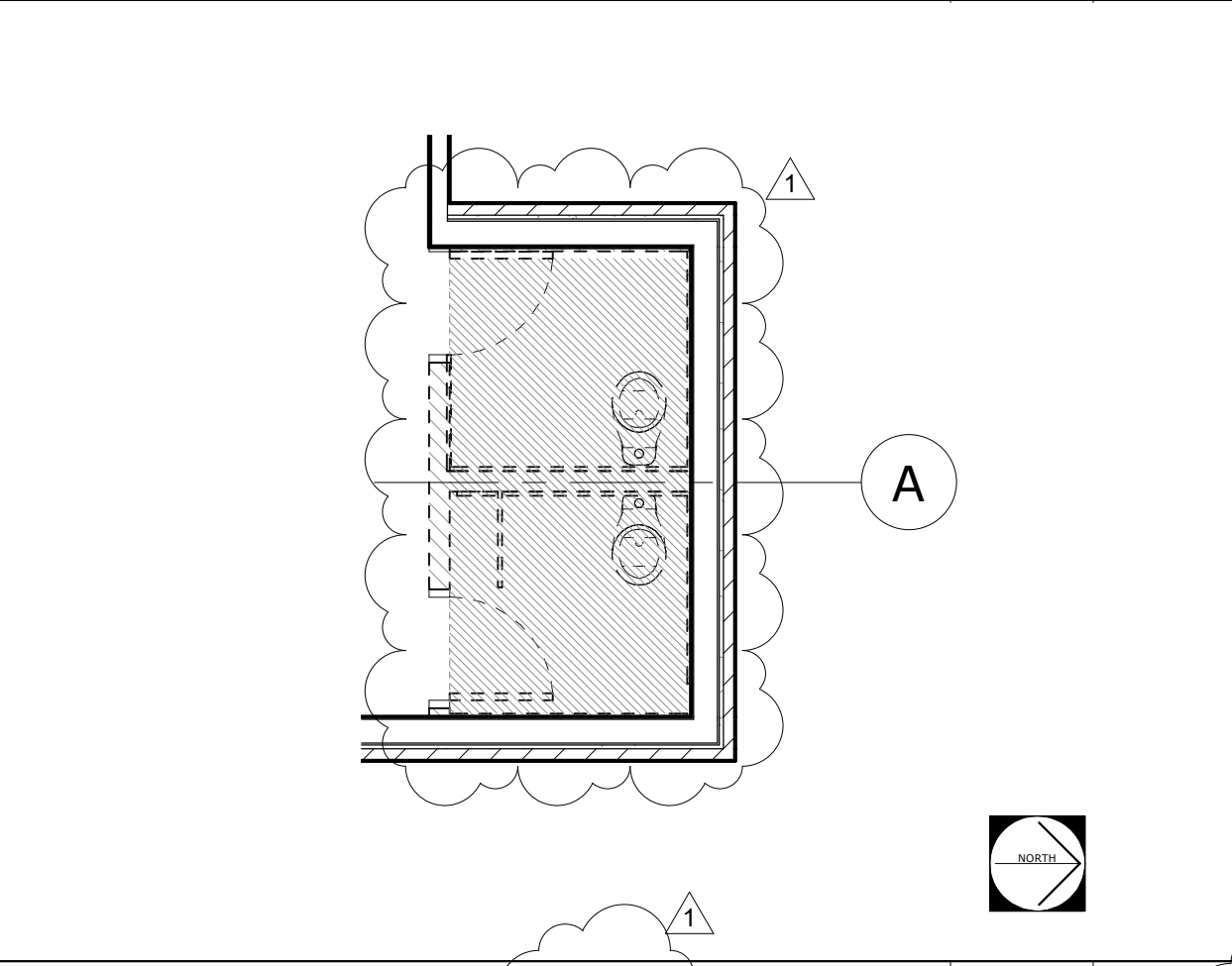
UNISEX R.R. #213 & #214 4



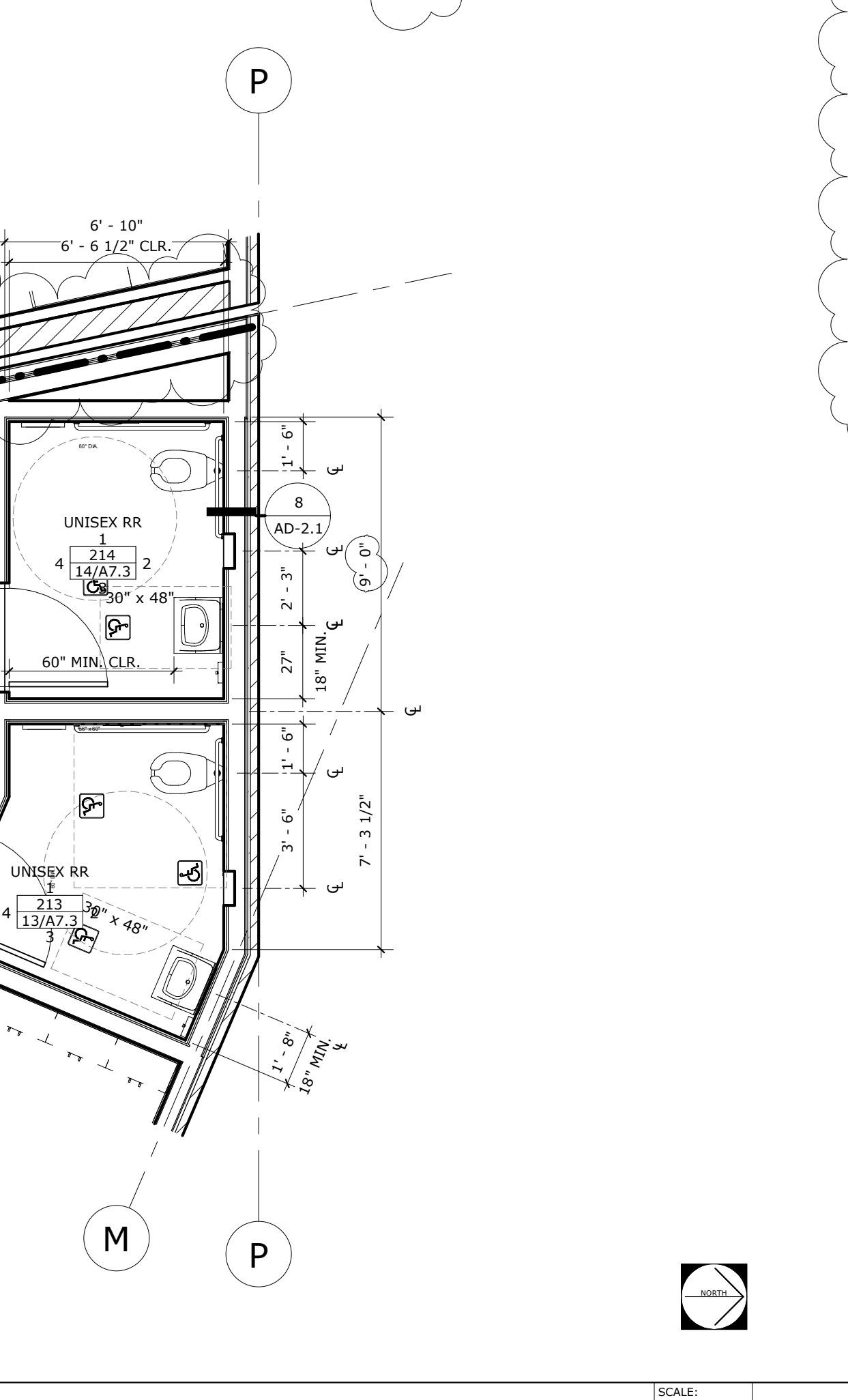
HEALTH R.R. #205 9



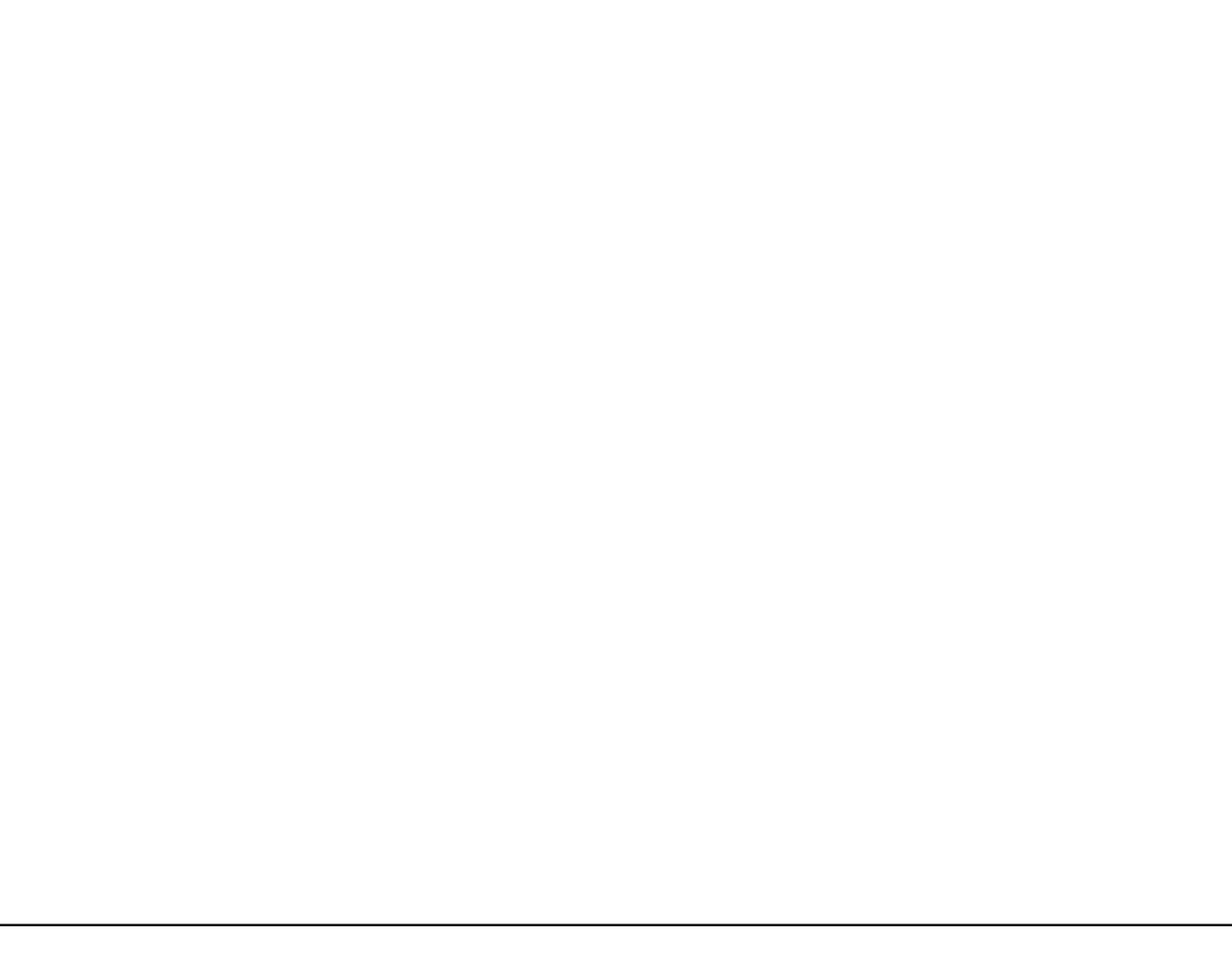
KINDER R.R. #163 - DEMO 1



KINDER R.R. #167 - DEMO 2



UNISEX R.R. #213 & #214 4



HEALTH R.R. #205 9

GEN. NOTES:INT.ELEV. & ENLG. PLN

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2. PROVIDE STUD BRACING AND SUPPORT FOR ALL WALL MOUNTED FIXTURES AND ACCESSORIES.
3. PER DETAIL 20 SO-2.4
4. PROVIDE GROMMETS AND RINGS IN COUNTER TOPS 60"O.C. FOR POWER AND DATA
4. FOR WALL TILE FINISH DETAILS SEE 4 AD-2.1

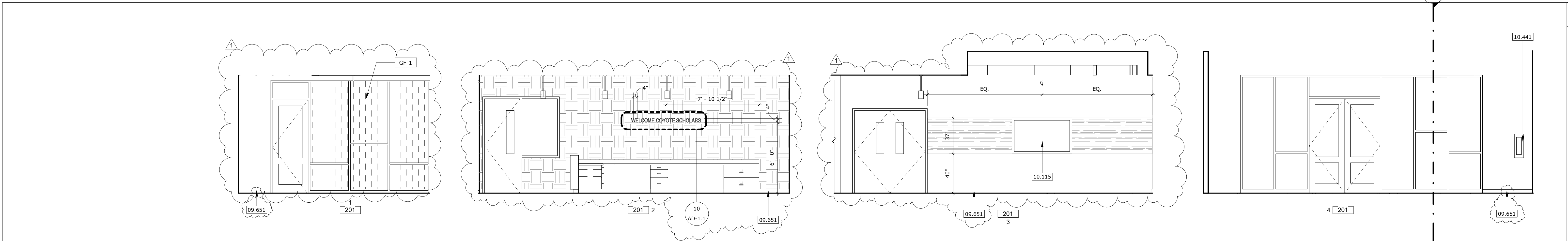
KEYNOTES

- 09.301 WALL TILE SYSTEM  
10.282 GRAB BAR  
10.283 TOILET PAPER DISPENSER  
10.286 TOILET SEAT COVER DISPENSER  
10.287 SOAP DISPENSER  
10.289 PAPER TOWEL DISPENSER / WASTE RECEPTACLE  
10.290 ELECTRIC HAND DRYER - 4" MAX. PROJECTION  
10.292 GLASS MIRROR  
22.401 WATER CLOSET  
22.404 LAVATORY

DEMO & FINISH LEGEND

- DEMO (E) FLOOR SLAB AND REPLACE PER STRUCTURAL MODERNIZATION DRAWINGS
- TILE
- TYPICAL WALL TILE TRIM T-1
- TYPICAL WALL TILE T-2
- ACCENT WALL TILE  
R.R. #163 + #167 (KINDER) + #205 (HEALTH) = T-3  
R.R. #118 + #120 + #144 (BOYS) + #131 (MEN) + #213 + #214 (STAFF) = T-4  
R.R. #116 + #119 + #130 (GIRLS) + #133 (WOMEN) = T-5





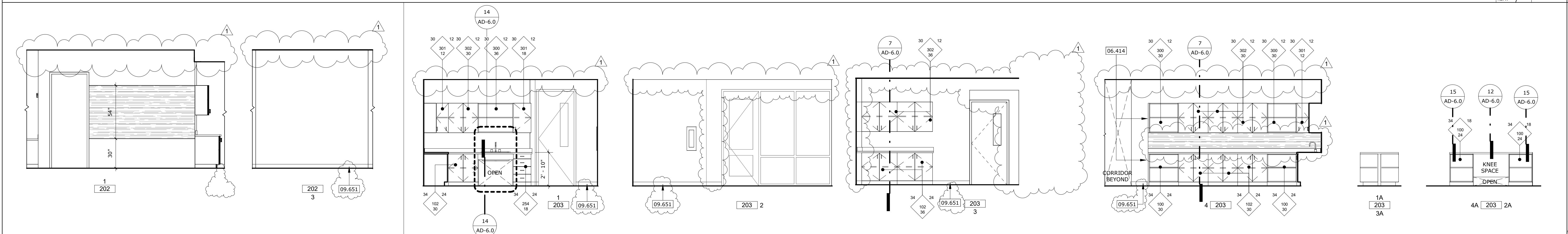
INTERIOR ELEVATIONS - LOBBY

GEN. NOTES:INT.ELEV. & ENLG. PLN

- 1. VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
- 2. PROVIDE STUD BRACING AND SUPPORT FOR ALL WALL MOUNTED FIXTURES AND ACCESSORIES.
- 3. PER DETAIL 20 SO-2.4
- 4. PROVIDE GROMMETS AND RINGS IN COUNTER TOPS 60"O.C. FOR POWER AND DATA
- FOR WALL TILE FINISH DETAILS SEE 4 AD-2.1

KEYNOTES

- 06.414 PLASTIC LAMINATE FILLER PANEL
- 09.651 RESILIENT BASE
- 10.115 WALL MOUNTED TELEVISION, 4" MAX. PROJECTION, O.F.C.I.
- 10.441 FIRE EXTINGUISHER CABINET



INTERIOR ELEVATIONS - CORRIDOR

INTERIOR ELEVATIONS - WORKROOM

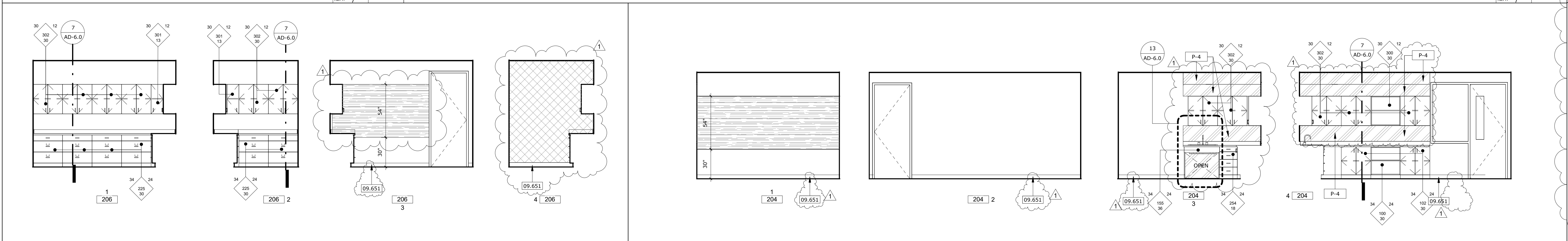
FINISH LEGEND

TACKABLE WALL PANEL TWP-1

GLAZING FILM GF-1

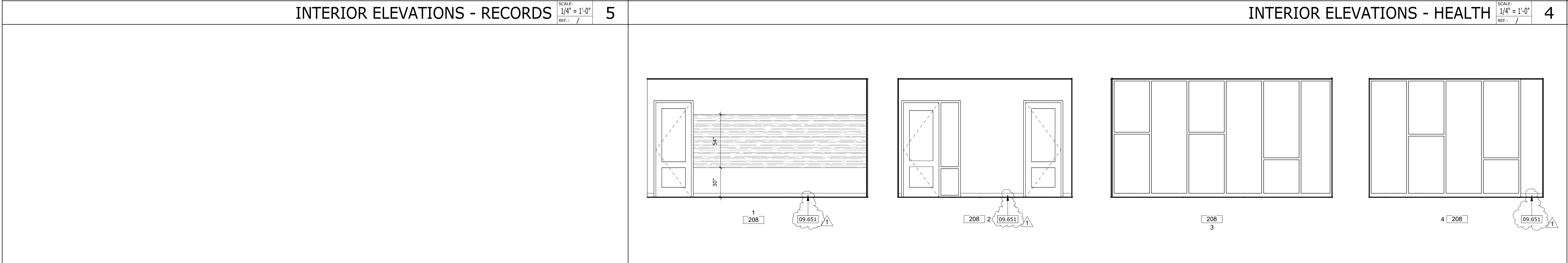
PAINT P-3, P-4

VINYL WALL COVERING VWC-1



INTERIOR ELEVATIONS - RECORDS

INTERIOR ELEVATIONS - HEALTH



INTERIOR ELEVATION - COUNSELING OFFICE

INTERIOR ELEVATIONS - PRINCIPAL'S OFFICE

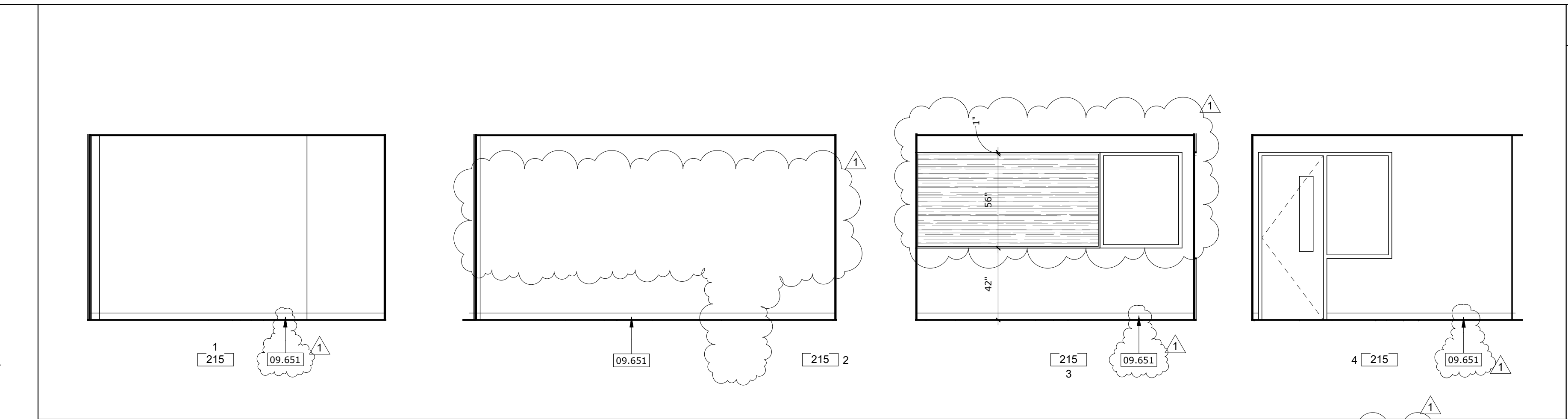
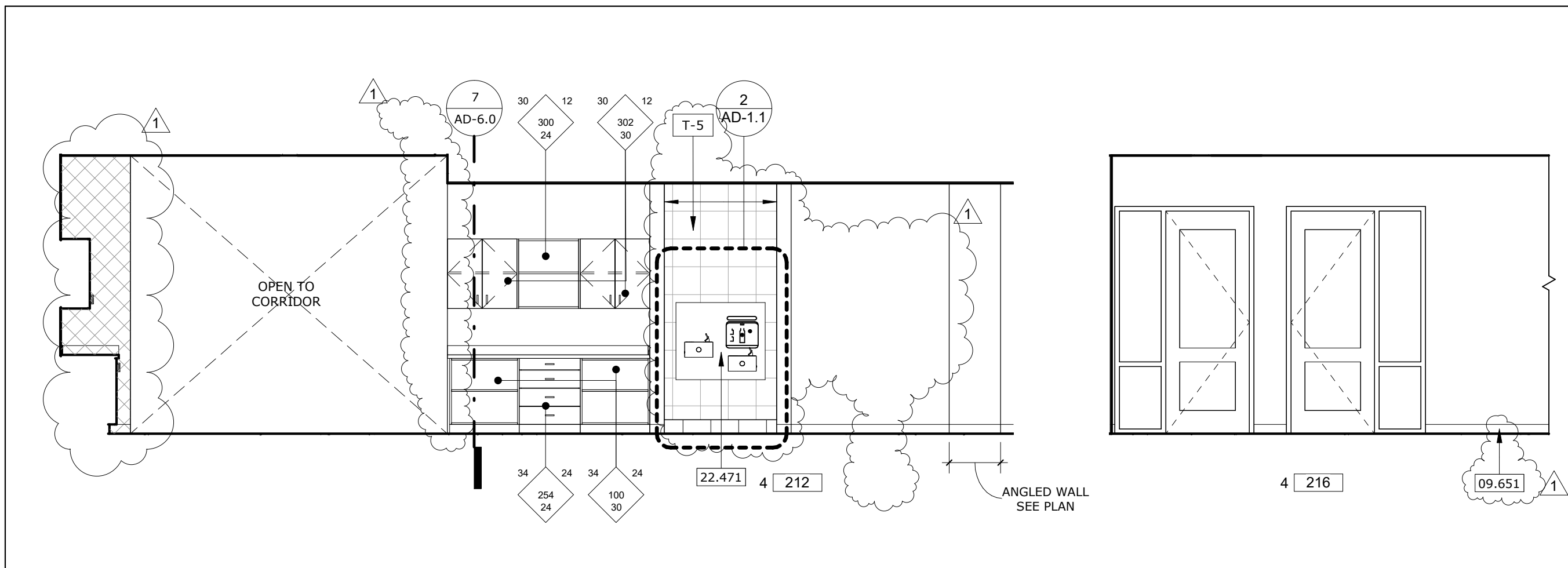
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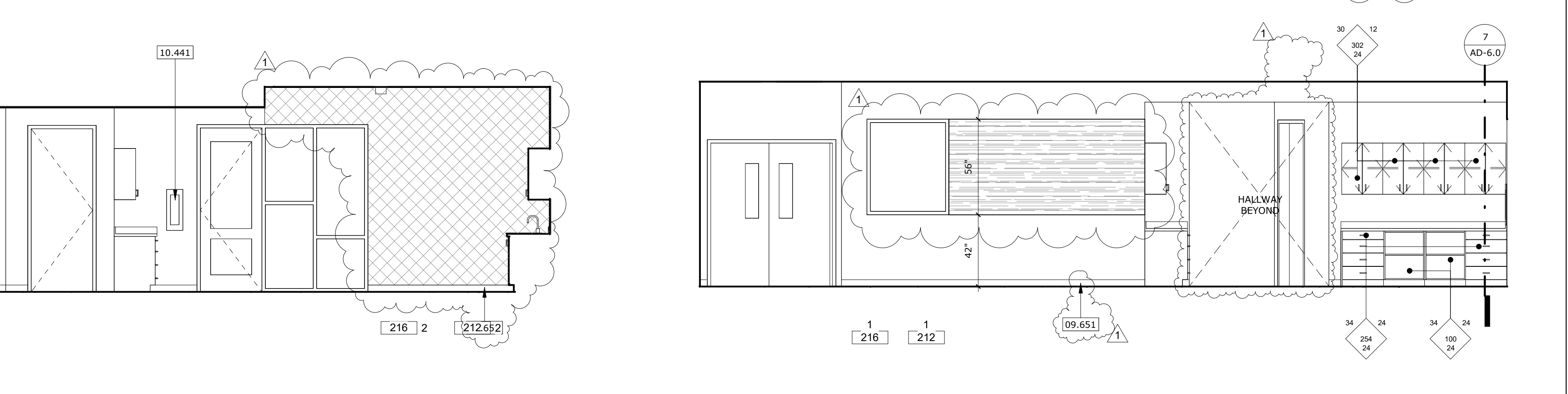
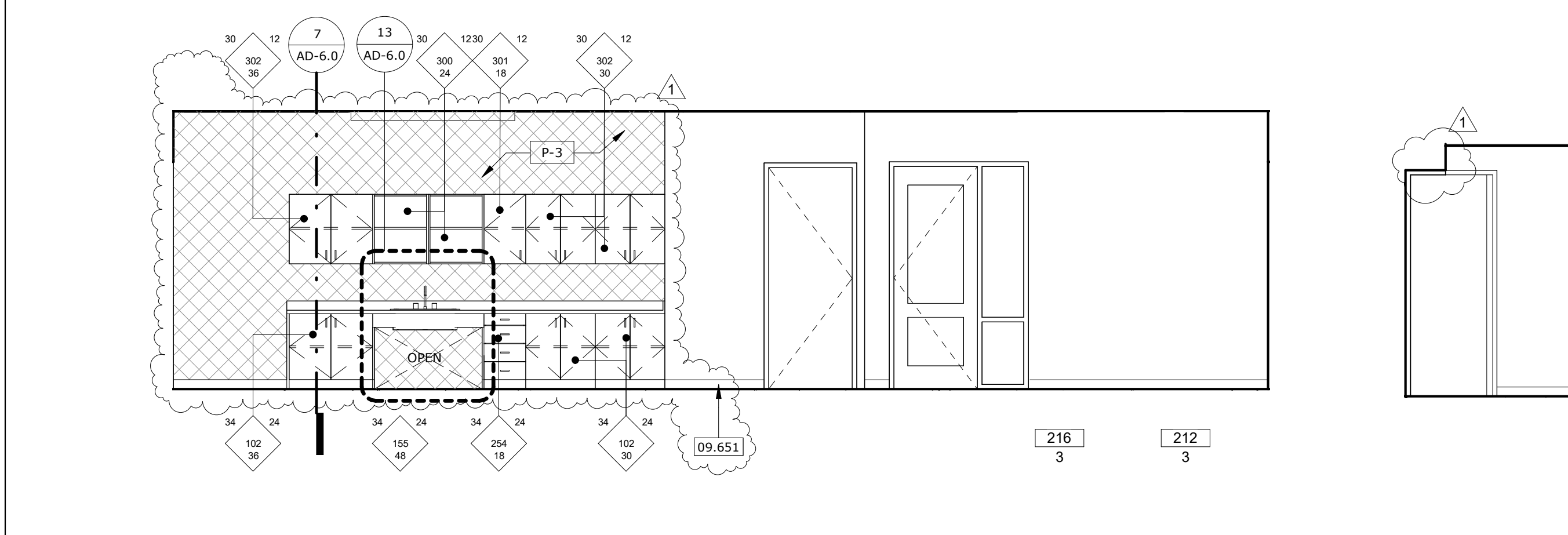
INTERIOR ELEVATIONS - COUNSELING OFFICE 1

GEN. NOTES:INT.ELEV. & ENLG. PLN

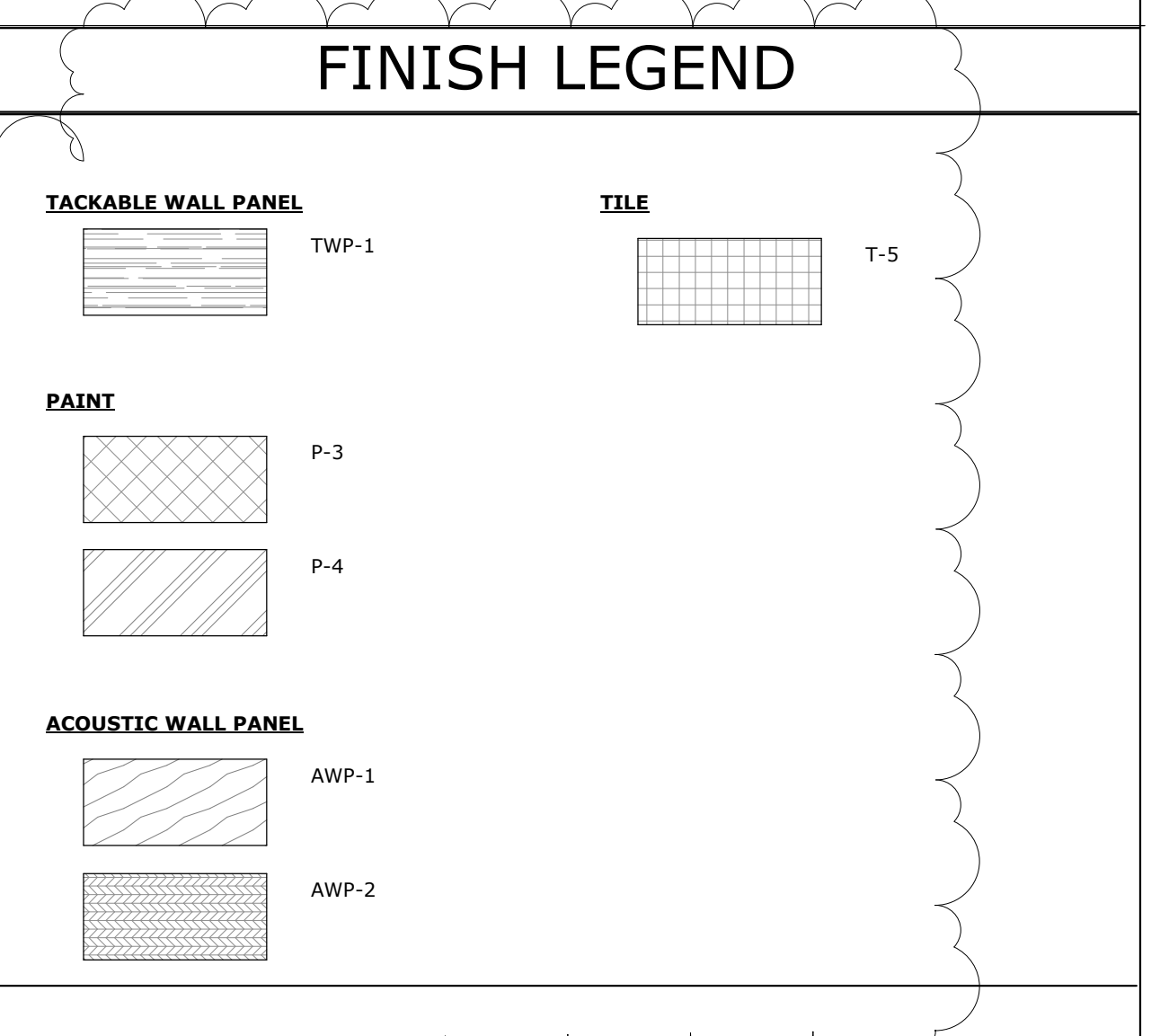
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4. FOR WALL TILE FINISH DETAILS SEE AD-2.1

KEYNOTES

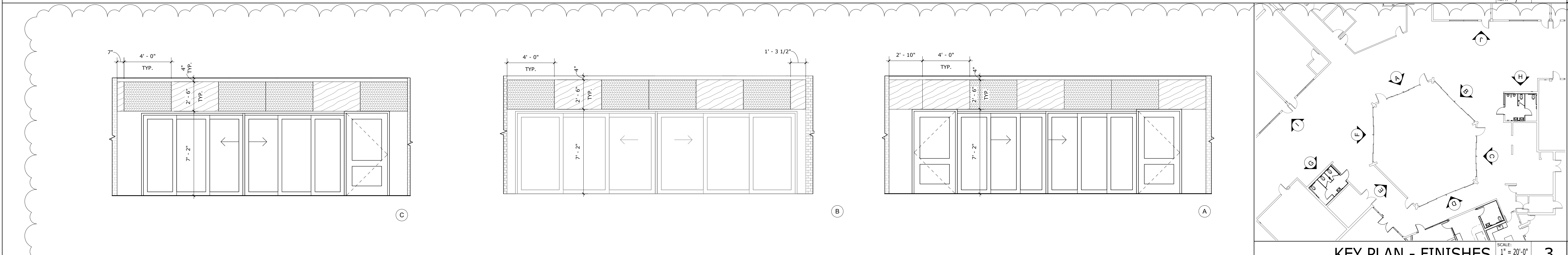
09.651 RESILIENT BASE  
10.441 FIRE EXTINGUISHER CABINET  
22.471 DRINKING FOUNTAIN



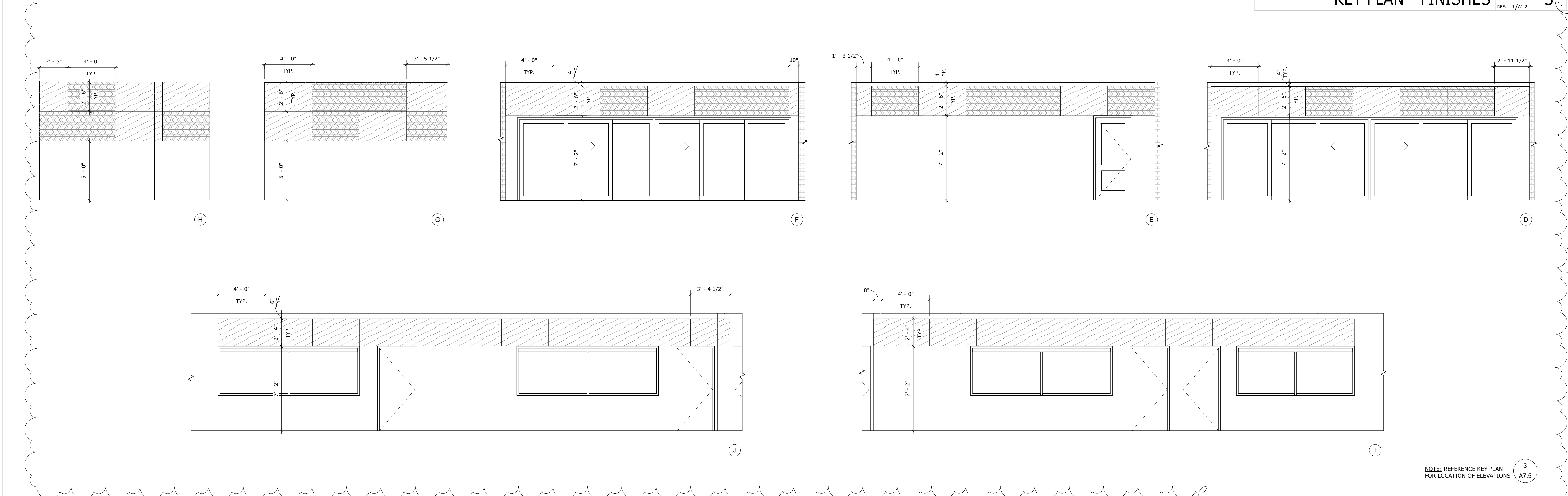
INTERIOR ELEVATIONS - CORRIDOR & BREAKROOM 2



FINISH LEGEND



KEY PLAN - FINISHES 3



INTERIOR ELEVATIONS - COMMONS 5

File No: 36-55

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DIV. OF THE STATE ARCHITECT  
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BRANDING

RUHNAU  
CLARKE  
ARCHITECTS

ADMIN. ADDITION & MODERNIZATION  
NORTH PARK ELEMENTARY SCHOOL  
5378 NORTH 'H' STREET, SAN BERNARDINO, CA 92407  
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

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ISSUE No. 98	DATE 3/6/2019
ISSUE No. 99	DATE 3/6/2019
ISSUE No. 100	DATE 3/6/2019



		DOOR SCHEDULE																					
DOOR NO.	ROOM NAME	DOOR TYPE	WIDTH	HEIGHT	THICKNESS	MATERIAL	DOOR PANEL FINISH	COLOR	MATERIAL	DOOR FRAME FINISH	COLOR	HEAD	DETAILS JAMB	SILL	GLAZING	CLOSER	HDWR GROUP	PANIC HDWR	SECURITY LOCK HDWR	FIRE RATING	REMARKS	DOOR NO.	
101A	CLASSROOM	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	1	NEW	01A	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	101A
101B	CLASSROOM	C	3'-0"	7'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	(E)	(E)	(E)	(E)	1	NEW	04	NEW PH	(E) P.H.	(E) DOOR TO BE REPLACED WITH (N) DOOR PANEL, KEEP (E) HARDWARE	101B	
103C	CLASSROOM	A	3'-0"	9'-6"	2"	HM	PSG	P-2	HM	PSG	P-2	21/AD-7.0	22/AD-7.0	7/AD-7.0	-	NEW	04	NEW PH	CDSI DOGGING	-	NEW EXTERIOR DOOR, NEW LOCATION DOOR	103C	
104A	CLASSROOM	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01B	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	104A	
105A	LIBRARY	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01B	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	105A	
106C	CLASSROOM	A	3'-0"	9'-6"	2"	HM	PSG	P-2	HM	PSG	P-2	21/AD-7.0	22/AD-7.0	7/AD-7.0	-	NEW	04	NEW PH	CDSI DOGGING	-	NEW EXTERIOR DOOR, NEW LOCATION DOOR	106C	
107A	CLASSROOM	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01B	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	107A	
108A	CLASSROOM	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	05	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE, THRESHOLD, AND PUSH PLATES	108A	
112A	CLASSROOM	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01B	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE, THRESHOLD, AND PUSH PLATES	112A	
112B	CLASSROOM	C	3'-0"	7'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	(E)	(E)	(E)	(E)	1	NEW	(E)	NEW PH	(E) DOOR TO BE REPLACED WITH (N) DOOR PANEL, KEEP (E) HARDWARE	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	112B	
113A	CLASSROOM	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	05	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE, THRESHOLD, AND PUSH PLATES	113A	
114A	COMPUTER LAB	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	05	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE, THRESHOLD, AND PUSH PLATES	114A	
116A	GIRL'S	A	3'-0"	7'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	14/AD-7.0	15/AD-7.0	11/AD-7.0	-	NEW	06	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	116A
118A	BOY'S	A	3'-0"	7'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	7/AD-7.0	-	-	-	07.5	-	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	118A
119A	GIRL'S	A	3'-0"	7'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	7/AD-7.0	-	-	-	07.5	-	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	119A
121A	CORRIDOR	(E)	6'-0"	7'-0"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01C	(E) P.H.	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	121A
129A	BOY'S	A	3'-0"	7'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	7/AD-7.0	-	-	-	07.5	-	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	129A
130A	GIRL'S	A	3'-0"	7'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	7/AD-7.0	-	-	-	07.5	-	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	130A
131A	MEN'S	(E)	3'-0"	8'-0"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	(E)	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE, PANEL TO BE (N) PAINTED, (E) HARDWARE SHALL NOT BE LOCKABLE FROM INSIDE	131A
133A	WOMEN'S	(E)	3'-0"	8'-0"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	(E)	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE, PANEL TO BE (N) PAINTED, (E) HARDWARE SHALL NOT BE LOCKABLE FROM INSIDE	133A
134A	CORRIDOR	(E)	6'-0"	7'-0"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01C	NEW PH	(E) TO REMAIN	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	(E) DOOR TO REMAIN, PROTECT IN PLACE, PANEL TO BE (N) PAINTED, (E) HARDWARE SHALL NOT BE LOCKABLE FROM INSIDE	134A	
135B	COMMONS	PR B	6'-0"	8'-0"	2"	ALUM/GLAZ	FF	ALUM-1	ALUM	FF	ALUM-1	18/AD-7.0	19/AD-7.0	4/AD-7.0	-	NEW	03	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	135B	
142C	COMMONS	C	3'-0"	8'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	12/AD-7.0	13/AD-7.0	10/AD-7.0	-	NEW	10	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	142C	
144A	BOY'S	B	3'-0"	7'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	14/AD-7.0	15/AD-7.0	11/AD-7.0	-	NEW	04	NEW PH	CDSI DOGGING	-	CLASSROOM SECURITY LOCK	144A	
145A	SERVING KITCHEN	(E)	5'-0"	7'-0"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	08	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	145A
149A	CLASSROOM	(E)	3'-0"	8'-0"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01B	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	149A	
150C	FITNESS	A	3'-0"	9'-6"	2"	HM	PSG	P-2	HM	PSG	P-2	21/AD-7.0	22/AD-7.0	7/AD-7.0	-	NEW	04	NEW PH	CDSI DOGGING	-	NEW EXTERIOR DOOR, NEW LOCATION DOOR	150C	
152A	CLASSROOM	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01B	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	152A	
153A	CLASSROOM	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01B	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	153A	
155C	CLASSROOM	A	3'-0"	9'-6"	2"	HM	PSG	P-2	HM	PSG	P-2	21/AD-7.0	22/AD-7.0	7/AD-7.0	-	NEW	04	NEW PH	CDSI DOGGING	-	NEW EXTERIOR DOOR, NEW LOCATION DOOR	155C	
156A	CLASSROOM	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01B	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	156A	
156B	CLASSROOM	C	3'-0"	7'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	(E)	(E)	(E)	(E)	1	NEW	(E) P.H.	(E) DOOR TO BE REPLACED WITH (N) DOOR PANEL, KEEP (E) HARDWARE	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	156B	
158A	KINDERGARTEN	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01B	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	158A	
158B	KINDERGARTEN	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01B	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	158B	
159A	CLASSROOM	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01B	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	159A	
160A	CLASSROOM	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01B	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	160A	
161A	KINDERGARTEN	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01B	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	161A	
162A	KINDERGARTEN	(E)	3'-0"	9'-6"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	01B	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	162A	
162B	KINDERGARTEN	(E)	3'-0"	7'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	(E)	(E)	(E)	(E)	1	NEW	(E) P.H.	(E) DOOR TO BE REPLACED WITH (N) DOOR PANEL, KEEP (E) HARDWARE	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	(E) DOOR TO BE REPLACED WITH (N) DOOR PANEL, KEEP (E) HARDWARE	162B	
162D	KINDERGARTEN	A	3'-0"	9'-6"	2"	HM	PSG	P-2	HM	PSG	P-2	21/AD-7.0	22/AD-7.0	7/AD-7.0	-	NEW	04	NEW PH	CDSI DOGGING	-	NEW EXTERIOR DOOR, NEW LOCATION DOOR	162D	
163A	KINDER RR	(E)	3'-0"	7'-0"	2"	(E)	PSG	(E)	(E)	PSG	(E)	(E)	(E)	(E)	(E)	(E)	(E)	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE, PANEL TO BE (N) PAINTED	163A
165A	WORKROOM	B	3'-0"	8'-0"	2"	ALUM	FF	ALUM-1	ALUM	FF	ALUM-1	23/AD-7.0	19824/AD-7.0	10/AD-7.0	-	NEW	01	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	165A
165B	WORKROOM	B	3'-0"	8'-0"	2"	ALUM	FF	ALUM-1	ALUM	FF	ALUM-1	23/AD-7.0	19824/AD-7.0	10/AD-7.0	-	NEW	01	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	165B
167A	KINDER RR	A	3'-0"	7'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	14/AD-7.0	15/AD-7.0	11/AD-7.0	-	NEW	09	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	167A
201A	LOBBY	PR B	6'-0"	8'-0"	2"	ALUM	FF	ALUM-1	ALUM	FF	ALUM-1	18/AD-7.0	19/AD-7.0	4/AD-7.0	-	NEW	03	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	201A	
201B	COMMONS	B	3'-0"	8'-0"	2"	ALUM	FF	ALUM-1	ALUM	FF	ALUM-1	18/AD-7.0	19/AD-7.0	4/AD-7.0	-	NEW	10	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	201B	
203A	WORKROOM	B	3'-0"	8'-0"	2"	ALUM	FF	ALUM-1	ALUM	FF	ALUM-1	18/AD-7.0	19/AD-7.0	4/AD-7.0	-	NEW	10	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	203A	
204A	HEALTH	B	3'-0"	8'-0"	2"	ALUM	FF	ALUM-1	ALUM	FF	ALUM-1	23/AD-7.0	19824/AD-7.0	10/AD-7.0	-	NEW	11	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	204A
205A	HEALTH RR	A	3'-0"	8'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	14/AD-7.0	15/AD-7.0	11/AD-7.0	-	NEW	09	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	205A
206A	RECORDS	A	3'-0"	8'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	12/AD-7.0	13/AD-7.0	10/AD-7.0	-	NEW	12	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	206A
207A	PRINCIPAL'S OFFICE	B	3'-0"	8'-0"	2"	ALUM	FF	ALUM-1	ALUM	FF	ALUM-1	23/AD-7.0	19824/AD-7.0	10/AD-7.0	-	NEW	13	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	207A
207B	PRINCIPAL'S OFFICE	B	3'-0"	8'-0"	2"	ALUM	FF	ALUM-1	ALUM	FF	ALUM-1	23/AD-7.0	24/AD-7.0	10/AD-7.0	-	NEW	13	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	207B
208A	CONFERENCE	B	3'-0"	8'-0"	2"	ALUM	FF	ALUM-1	ALUM	FF	ALUM-1	23/AD-7.0	19824/AD-7.0	10/AD-7.0	-	NEW	14	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	208A
208B	CONFERENCE	B	3'-0"	8'-0"	2"	ALUM	FF	ALUM-1	ALUM	FF	ALUM-1	23/AD-7.0	24/AD-7.0	10/AD-7.0	-	NEW	13	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	208B
209A	COUNSELING OFFICE	B	3'-0"	8'-0"	2"	ALUM	FF	ALUM-1	ALUM	FF	ALUM-1	23/AD-7.0	19824/AD-7.0	10/AD-7.0	-	NEW	13	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	209A
210A	STORAGE	A	3'-0"	8'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	12/AD-7.0	13/AD-7.0	10/AD-7.0	-	NEW	12	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	210A
212A	BREAKROOM	B	3'-0"	8'-0"	2"	ALUM	FF	ALUM-1	ALUM	FF	ALUM-1	20/AD-7.0	19824/AD-7.0	4/AD-7.0	-	NEW	02	NEW PH	CDSI DOGGING	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	212A	
212B	BREAKROOM	C	3'-0"	7'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	15/AD-2.1	14/AD-2.1 & 28/AD-7.0	10/AD-7.0	-	NEW	13	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	212B
213A	UNISEX RR	A	3'-0"	8'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	14/AD-7.0	15/AD-7.0	11/AD-7.0	-	NEW	15	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	213A
214A	UNISEX RR	A	3'-0"	8'-0"	2"	HM	PSG	P-2	HM	PSG	P-2	23/AD-7.0	15/AD-7.0	11/AD-7.0	-	NEW	15	-	-	-	-	(E) DOOR TO REMAIN, PROTECT IN PLACE. (N) HARDWARE AND THRESHOLDS	214A
215A	COUNSELING OFFICE	B	3'-0"	8'-0"	2"	ALUM	FF	ALUM-1	ALUM	FF	ALUM-1</												



FINISH SCHEDULE

ROOM NO.	ROOM NAME	FLOOR	MATERIAL	COLOR	BASE	COLOR	ELEVATION 1	COLOR	ELEVATION 2	COLOR	ELEVATION 3	COLOR	ELEVATION 4	COLOR	CEILING	COLOR	REMARKS	ROOM NO.
116	GIRL'S	T	T-1	T	T-1	T	FF	T-2	T	FF	T-2	T	FF	T-2	GWWB	PSG	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	116
118	BOYS	T	T-1	T	T-1	T	FF	T-2	T	FF	T-2	T	FF	T-2	GWWB	PSG	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	118
119	GIRL'S	T	T-1	T	T-1	T	FF	T-2	T	FF	T-2	T	FF	T-2	GWWB	PSG	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	119
129	BOYS	T	T-1	T	T-1	T	FF	T-2	T	FF	T-2	T	FF	T-2	GWWB	PSG	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	129
130	GIRL'S	T	T-1	T	T-1	T	FF	T-2	T	FF	T-2	T	FF	T-2	GWWB	PSG	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	130
131	MENS	T	T-1	T	T-1	T	FF	T-2	T	FF	T-2	T	FF	T-2	GWWB	PSG	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	131
133	WOMEN'S	T	T-1	T	T-1	T	FF	T-2	T	FF	T-2	T	FF	T-2	GWWB	PSG	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	133
144	BOYS	T	T-1	T	T-1	T	FF	T-2	T	FF	T-2	T	FF	T-2	GWWB	PSG	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	144
163	KINDER RR	T	T-1	T	T-1	T	FF	T-2	T	FF	T-2	T	FF	T-2	GWWB	PSG	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	163
167	KINDER RR	T	T-1	T	T-1	T	FF	T-2	T	FF	T-2	T	FF	T-2	GWWB	PSG	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	167
201	LOBBY	LVT	LVT-1	RB	RB-1	GWB	PES	P-1	GWB	PES	P-1	GWB	PES	P-1	GWBB/U.O.S./ACP	PES	REF 1/47.4 FOR GRAPHIC FILM LOCATION	201
202	CORRIDOR	LVT	LVT-2	RB	RB-1	GWB	PES	P-1	GWB	PES	P-1	GWB	PES	P-1	GWBB/U.O.S./ACP	PES	REF 1/47.4 FOR GRAPHIC FILM LOCATION	202
203	WORKROOM	LVT	LVT-2	RB	RB-1	GWB	PES	P-1	GWB	PES	P-1	GWB	PES	P-1	GWBB/U.O.S./ACP	PES	REF 1/47.4 FOR GRAPHIC FILM LOCATION	203
204	HEALTH RR	LVT	LVT-3	RB	RB-1	GWB	PES	P-1	GWB	PES	P-1	GWB	PES	P-1	GWBB/U.O.S./ACP	PES	REF 1/47.4 FOR GRAPHIC FILM LOCATION	204
205	HEALTH RR	T	T-1	T	T-1	T	FF	T-2	T	FF	T-2	T	FF	T-2	GWWB	PSG	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	205
206	RECORDS	LVT	LVT-2	RB	RB-1	GWB	PES	P-1	GWB	PES	P-1	GWB	PES	P-1	GWBB/U.O.S./ACP	PES	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	206
207	PRINCIPAL'S OFFICE	CPT	CPT-1,2,3	RB	RB-1	GWB	PES	P-1	GWB	PES	P-1	GWB	PES	P-1	GWBB/U.O.S./ACP	PES	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	207
208	CONFERENCE	CPT	CPT-1,2,4	RB	RB-1	GWB	PES	P-1	GWB	PES	P-1	GWB	PES	P-1	GWBB/U.O.S./ACP	PES	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	208
209	COUNSELING OFFICE	CPT	CPT-1,2,3	RB	RB-1	GWB	PES	P-1	GWB	PES	P-1	GWB	PES	P-1	GWBB/U.O.S./ACP	PES	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	209
210	STORAGE	LVT	LVT-3	RB	RB-1	GWB	PES	P-1	GWB	PES	P-1	GWB	PES	P-1	GWBB/U.O.S./ACP	PES	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	210
212	BREAKROOM	LVT	LVT-3	RB	RB-1	GWB	PES	P-1	GWB	PES	P-1	GWB	PES	P-1	GWBB/U.O.S./ACP	PES	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	212
213	UNISEX RR	T	T-1	T	T-1	T	FF	T-2	T	FF	T-2	T	FF	T-2	GWWB	PSG	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	213
214	UNISEX RR	T	T-1	T	T-1	T	FF	T-2	T	FF	T-2	T	FF	T-2	GWWB	PSG	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	214
215	COUNSELING OFFICE	CPT	CPT-1,2,4	RB	RB-1	GWB	PES	P-1	GWB	PES	P-1	GWB	PES	P-1	GWBB/U.O.S./ACP	PES	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	215
216	CORRIDOR	LVT	LVT-3	RB	RB-1	GWB	PES	P-1	GWB	PES	P-1	GWB	PES	P-1	GWBB/U.O.S./ACP	PES	REF INTERIOR ELEVATIONS FOR WALL TILE PATTERN	216

COLORS, MATERIALS & FINISHES LEGEND

MATERIAL	LOCATION
03 35 11 - CONCRETE FLOOR FINISHES	
CONC-1 NATURAL CONCRETE	TYPICAL @ HARDSCAPE
CONC-2 SCOFFED, CHEMIX ADMIXTURES, 'SUMMER BEIGE' #5234	ACCENT @ ENTRY/ BENCHES
06 20 00 - PLASTIC CABINETS	
PL-1 FORMICA, MATTE FINISH, 'WHITE DROPS' #8824-58	TYPICAL @ COUNTERTOP
PL-2 FORMICA, MATTE FINISH, 'DANISH MAPLE' #8906-58	TYPICAL @ CASEWORK
PL-3 FORMICA, MATTE FINISH, 'MAPLE WOODLINE' #8925-NT	TYPICAL @ RECEPTION DESK
PL-4 FORMICA, SQUARED FINISH, WHITE #898-SP	ACCENT @ RECEPTION DESK
PL-5 FORMICA, DECOMTAL, 'BRUSHED PEWTER ALUMINUM' #M2032	TYPICAL @ BASE
07 42 13 - METAL WALL PANELS	
MCP-1 ALUCOBOND, 'ALABASTER'	EXTERIOR
08 42 13 - ALUMINUM-FRAMED STOREFRONTS	EXTERIOR
ALUM-1 ARCADIA, ANODIZED ALUMINUM 'DARK BRONZE' #AB-6	
08 80 00 - GLAZING	
GL-1 PPG, SOLARBAN 90 (2) CLEAR + CLEAR	TYPICAL
GL-2 VANCEVA, #0045 INTERLAYER	ACCENT
GL-3 VANCEVA, #2243 INTERLAYER	ACCENT
08 87 33 - GLAZING SURFACE FILMS	
GF-1 3M, DECORATIVE FILM, CUSTOM GRAPHIC T.B.D.	ADMINISTRATION GLAZING @ ELEV. 1
09 30 00 - TILING	
T-1 DAL-TILE, VOLUME 1.0 GLAZED PORCELAIN, 'ELECTRIC MOSS' #VL79, 12"x24" w/ COORDINATING TRIM PIECES	FLOOR TILE @ RESTROOMS AND BASE
T-2 DAL-TILE, VOLUME 1.1 GLAZED PORCELAIN, 'CHEER YELLOW #VL87, 12"x12"	TYPICAL WALL TILE @ RESTROOMS
T-3 DAL-TILE, VOLUME 1.1 GLAZED PORCELAIN, 'TRADITION BLUE #VL89, 12"x12"	ACCENT WALL TILE @ RESTROOMS
T-4 DAL-TILE, VOLUME 1.1 GLAZED PORCELAIN, 'ACTION ORANGE #VL88, 12"x12" w/ COORDINATING TRIM AT D.F.	ACCENT WALL TILE @ RESTROOMS AND @ D.F. WALL TILE AND BASE
T-5 DAL-TILE, VOLUME 1.1 GLAZED PORCELAIN, 'ACTION ORANGE #VL88, 12"x12" w/ COORDINATING TRIM AT D.F.	ACCENT WALL TILE @ RESTROOMS AND @ D.F. WALL TILE AND BASE
09 30 00 - TILING (GROUT)	
G-1 CUSTOM BUILDING PRODUCTS, #19 'PEWTER'	FLOOR GROUT @ RESTROOMS
G-2 CUSTOM BUILDING PRODUCTS, #381 'BRIGHT WHITE'	WALL GROUT @ RESTROOMS/DRINKING FOUNTAIN
09 51 00 - ACOUSTICAL CEILINGS	
ACP-1 ARMSTRONG, ULTIMA 'WHITE' #1913, SQUARE LAY-IN 15/16" 24"x24"x3/8"	TYPICAL
ACP-2 MDC, ZINTRA ACOUSTIC BAFFLE 'MANDARIN' #ZTR4711, 10" SQUARE, GROMMET BAFFLE SYSTEM ASSEMBLY	LOBBY
ACP-3 MDC, ZINTRA ACOUSTIC BAFFLE 'SKY' #ZTR4714, 10" SQUARE, GROMMET BAFFLE SYSTEM ASSEMBLY	ACCENT @ COMMONS
ACP-4 MDC, ZINTRA ACOUSTIC BAFFLE 'MANDARIN' #ZTR4711, 10" SQUARE, 4"x4" GRID SUSPENSION	ACCENT @ COMMONS
ACP-5 MDC, ZINTRA ACOUSTIC BAFFLE 'SUNSHINE' #ZTR4710, 10" SQUARE, 4"x4" GRID SUSPENSION	ACCENT @ COMMONS
ACP-6 MDC, ZINTRA ACOUSTIC BAFFLE 'CHAMBRAY' #ZTR4703, 10" SQUARE, 4"x4" GRID SUSPENSION	ACCENT @ COMMONS
09 52 22 - ACOUSTIC WALL PANEL	
AWP-1 MBI COLORSONIX 2" M 6-74, GUILFORD OF MAINE, 'SILVER PAPER' #2100-538	TYPICAL @ COMMONS
AWP-2 MBI COLORSONIX 2" M 6-74, GUILFORD OF MAINE, 'BLUE PAPER' #2100-539	ACCENT @ COMMONS
09 65 00 - RESILIENT FLOORING (RUBBER BASE)	
RB-1 ROPPE, RUBBER BASE, 700 SERIES, 'SMOKE' #174, 4" H	TYPICAL
09 65 19 - RESILIENT TILE FLOORING	
LVT-1 ARMSTRONG, NATURAL CREATIONS MYSTIX NEVA #NA924, 'MORNING, BUTTERCUP', 6"x36"	LOBBY
LVT-2 ARMSTRONG, AIRBORNE ORCHARD ESTATE #NA135, 'OYSTER', 6"x48"	WORKROOM/RECORDS
LVT-3 ARMSTRONG, NATURAL CREATIONS MYSTIX ARIA #NA776, 'GREIGE', 18"x18"	BREAKROOM/CORRIDOR/HEALTH ROOM
09 67 00 - FLUID-APPLIED FLOORING	
EP-1 THEMIC, THERM-GLAZE SERIES #281, 'ALUMINUM' #57GR	HEALTH RESTROOM
09 68 00 - CARPET	
CPT-1 TANDUS CENTIVA, CONSEQUENCE II #03724, 'BLACK HOLE' #43516, NON-WOVEN SYNTHETIC FIBER, MODULAR, 18"x36" TILE, MONOLITHIC	TYPICAL @ OFFICE/COUNSELOR/CONFERENCE
CPT-2 TANDUS CENTIVA, CONSEQUENCE II #03724, 'OUTER SPACE' #43503, NON-WOVEN SYNTHETIC FIBER, MODULAR, 18"x36" TILE, MONOLITHIC	ACCENT @ OFFICES
CPT-3 TANDUS CENTIVA, CONSEQUENCE II #03724, 'SAFFRON' #43507, NON-WOVEN SYNTHETIC FIBER, MODULAR, 18"x36" TILE, MONOLITHIC	ACCENT @ OFFICES
CPT-4 TANDUS CENTIVA, CONSEQUENCE II #03724, 'AQUARIA' #43533, NON-WOVEN SYNTHETIC FIBER, MODULAR, 18"x36" TILE, MONOLITHIC	ACCENT @ OFFICES
09 72 0 - VINYL WALL COVERING	
VWC-1 TRUKES, JANARK VAULT BOX, BENTLEY 'HALOGEN' #LV-BE-02	RECEPTION
09 90 00 - PAINTING AND COATING	
P-1 DUNN EDWARDS, 'LIGHTHOUSE' #DEW385	TYPICAL @ UOS/ MECHANICAL/ PLUMBING
P-2 DUNN EDWARDS, 'SMOKEY MOUNTAIN' #DE598	DOORS/FRAMES
P-3 DUNN EDWARDS, 'ORANGE MARMALADE' #DE5222	ACCENT @ CORRIDORS/ RESTROOMS
P-4 DUNN EDWARDS, 'EXOTIC VIOLET' #DE5003	ACCENT @ HEALTH
P-5 DUNN EDWARDS, 'SUMMERTIME' #DE5381	ACCENT @ RESTROOMS
P-6 DUNN EDWARDS, 'MARINA' #DE5857	ACCENT @ RESTROOMS
P-7 DUNN EDWARDS, 'WHISPER GRAY' #DEC785	TYPICAL @ EXTERIOR BRICK VENEER
P-8 DUNN EDWARDS, 'ISLAND OASIS' #DE5729	ACCENT @ EXTERIOR BRICK VENEER
P-9 THEMIC, ENDURATONE SERIES #1029, COLOR TO MATCH P-7	TYPICAL @ ORNAMENTAL GATES/ FENCES
P-10 THEMIC, ENDURATONE SERIES #1029, COLOR TO MATCH P-8	TYPICAL @ HANDRAILS/ BOLLARD
P-11 RAL COLOR, LIGHT BLUE #5012	ACCENT @ CONFERENCE LIGHT FIXTURE
10 11 25.13 - FIXED TACKBOARDS	
TWP-1 CARNEGIE, META #8036-11	TYPICAL
10 21 13.17 - PHENOLIC TOILET COMPARTMENTS	
TP-1 SCRANTON, HINY HIDERS, BOLD COLLECTION, 'BLUEBERRY' WITH GRIP OF TEXTURE	TYPICAL
10 21 54 - PRIVACY CURTAIN	
PC-1 CANNIGIE FABRICS, RIVER #4684 COLOR 33	HEALTH
12 24 00 - WINDOW SHADES	
BS-1 MECHOSHADE, BUKOWILL REVERSIBLE WEAVE #6000 SERIES, 3% OPEN, SLATE #6016	INTERIOR TYPICAL @ EXTERIOR GLAZING
13 34 19.10 - LUNCH SHELTER	
LS-1 AMERICANA OUTDOORS, 'ALMOND' #845	ROOF PANEL @ LUNCH SHELTER
LS-2 AMERICANA OUTDOORS, 'ORANGE' #205	FRAME @ LUNCH SHELTER
13 33 00 - SITE FURNISHINGS	
SF-1 TIMBERFORM, GREENWAY WALL-TOP SEAT, WOOD SLATES #2047-6-01	ACCENT @ BENCHES
SF-2 DEEPTREEM DESIGNS, WOOD GARDEN PLANTERS, 'TROPICAL HARDWOOD RPL'	TYPICAL @ GARDEN, O.F.O.I.

FINISH PLAN - NEW ADDITION

SCALE: 1/8" = 1'-0"  
REF: 5/Jan.1

1

FINISHES PLAN - RESTROOMS

SCALE: 1/8" = 1'-0"  
REF: 5/Jan.1

2

FINISHES - KINDER.

SCALE: 1/8" = 1'-0"  
REF: 5/Jan.1

3

GENERAL NOTES: FINISH PLAN

- ALL FINISHES SHALL COMPLY WITH CBC CHAPTERS 3, 8 & 10, CFC AND CCR TITLE 19
- WALL AND CEILING MATERIALS SHALL NOT EXCEED THE FLAME SPREAD CLASSIFICATIONS IN CBC TABLE 803.1.1
- FOR TYPICAL FLOOR FINISH TRANSITIONS, REFER TO DETAIL 10
- ALL ADJACENT DISSIMILAR FINISH MATERIALS TO RECEIVE BEAD OF CAULK, U.N.O.
- SEE INTERIOR ELEVATION SHEETS FOR ACCENT PAINT LOCATIONS
- ALL EXPOSED STEEL, HOLLOW METAL DOORS AND FRAMES, AND LOUVERS TO BE PAINTED
- TOILET ROOM, TOILET ROOM VESTIBULES, AND FOOD SERVICE AREA WALLS AND CEILINGS NOT COVERED BY EITHER TILE OR F.R.P. TO HAVE MOISTURE RESISTANT GYP. BD., U.N.O.
- COORDINATE FINISHES WITH MECHANICAL FOR PLUMBING FIXTURES
- FOR EXTENT AND PATTERN OF CEILING FINISH, SEE REFLECTED CEILING PLAN
- AT COVE BASE, PROVIDE CONT. 3/8" RADIUS
- FOR TYPICAL CERAMIC TILE DETAILS, REFER TO DETAIL 4

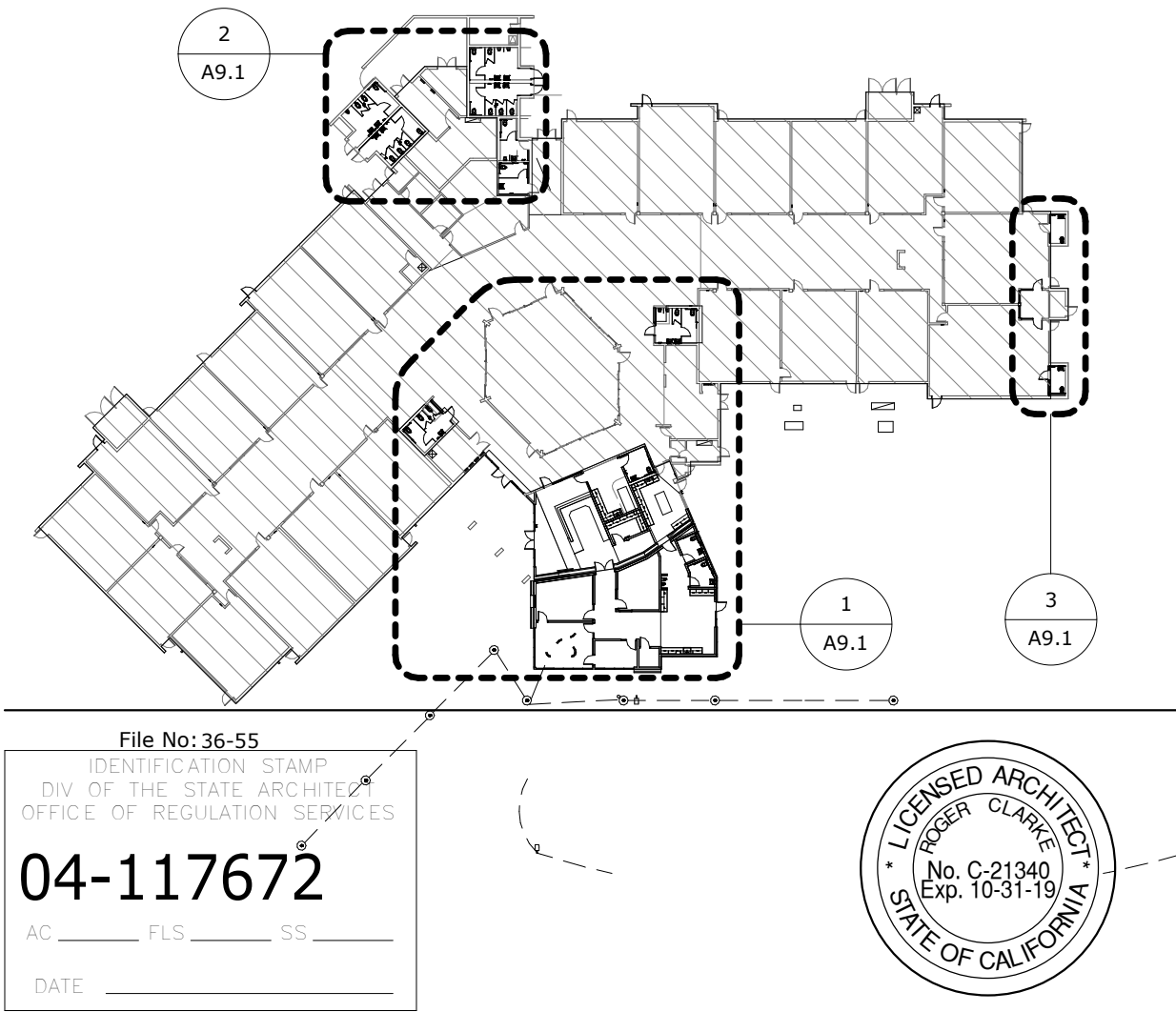
FINISH ABBREVIATIONS

ACP	ACOUSTIC CEILING PANEL	PT	PORCELAIN TILE
AWP	ACOUSTIC WALL PANEL	RES	RESINOUS FLOORING
CMU	CONCRETE MASONRY UNIT	RS	ROLLER SHADE
CONC	CONCRETE	RB	RUBBER BASE
CPT	CARPET	SAF	SYNTHETIC ATHLETIC FLOORING
EP	EPOXY	SC	SEALED CONCRETE
FF	FACTORY FINISH	SSM	SYNTHETIC SURFACE MATERIAL
FRP	FIBERGLASS REINFORCED PANEL	ST	STAIN
GF	GRAPHIC FILM	T	TILE
GL	GLAZING	TSP	TOILET PARTITION
GWB	GYP/SUM WALL BOARD	TWP	TOP SET BASE
GWBB	WATER RESISTANT GWB	UOS	UNDERSIDE OF STRUCTURE
ICB	LOCKER	VCB	VENTED COVED BASE
L	LUXURY VINYL TILE	VCT	VINYL COMPOSITION TILE
MP	METAL PANEL	WVC	WOOD COMPOSITE PANEL
OP	OPERABLE PARTITION	WACP	WASHABLE ACOUSTIC CEILING PANEL
PL	PAINT	WAF	WOOD ATHLETIC FLOORING
PES	PAINT: EGGSHELL	WDM	WOOD MASSIVE FLOORING
PF	PAINT: FLAT	WP	WALL PROTECTION
PG	PAINT: GLOSS	WVFB	WOOD VENEER FACE BLADE
PC	POWDER COAT		
QT	QUARRY TILE		

FINISH LEGEND

CARPET	RESILIENT TILE FLOORING (LUXURY VINYL TILE)
CPT-1	LVT-1
CPT-2	LVT-2
CPT-3	LVT-3
CPT-4	T-1

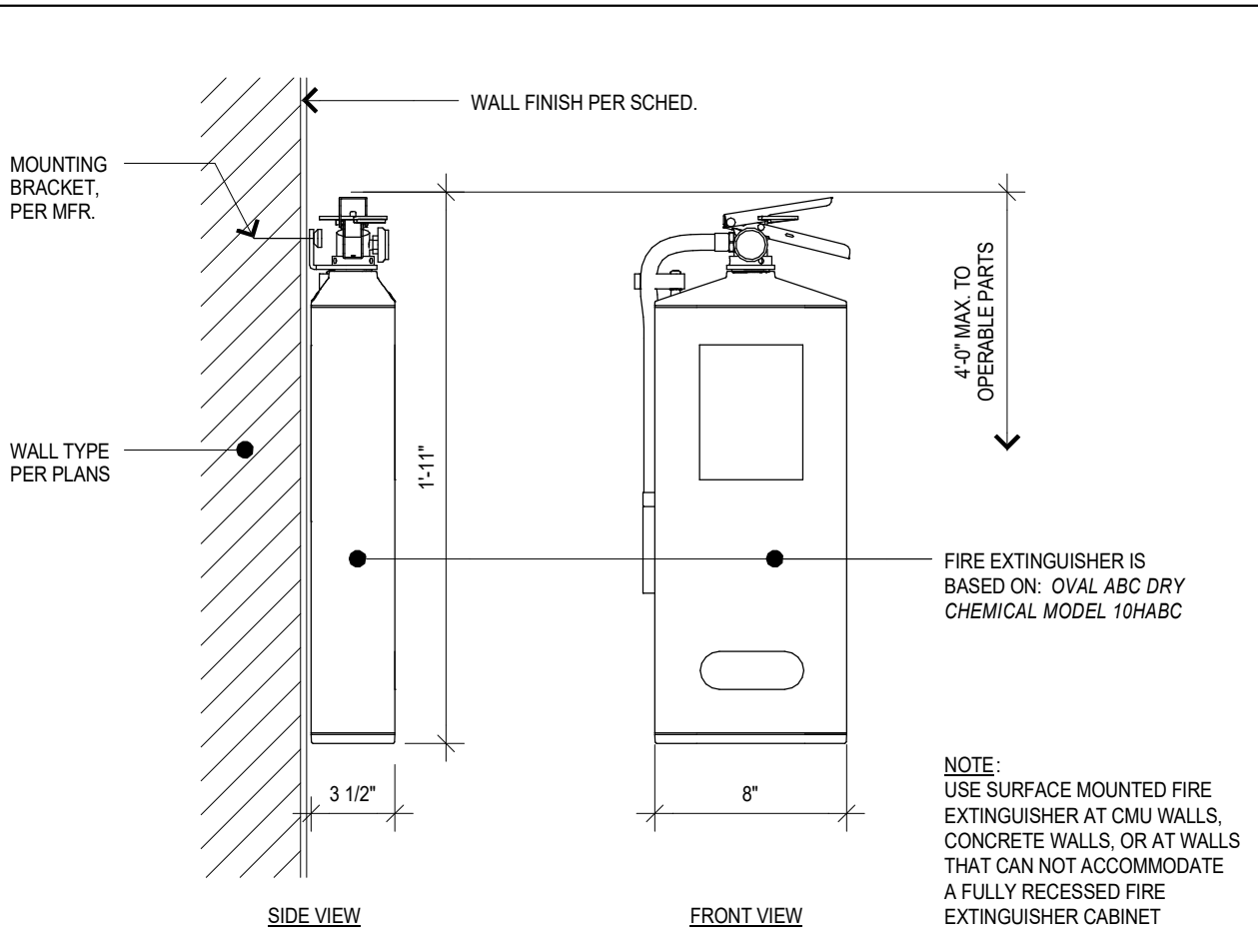
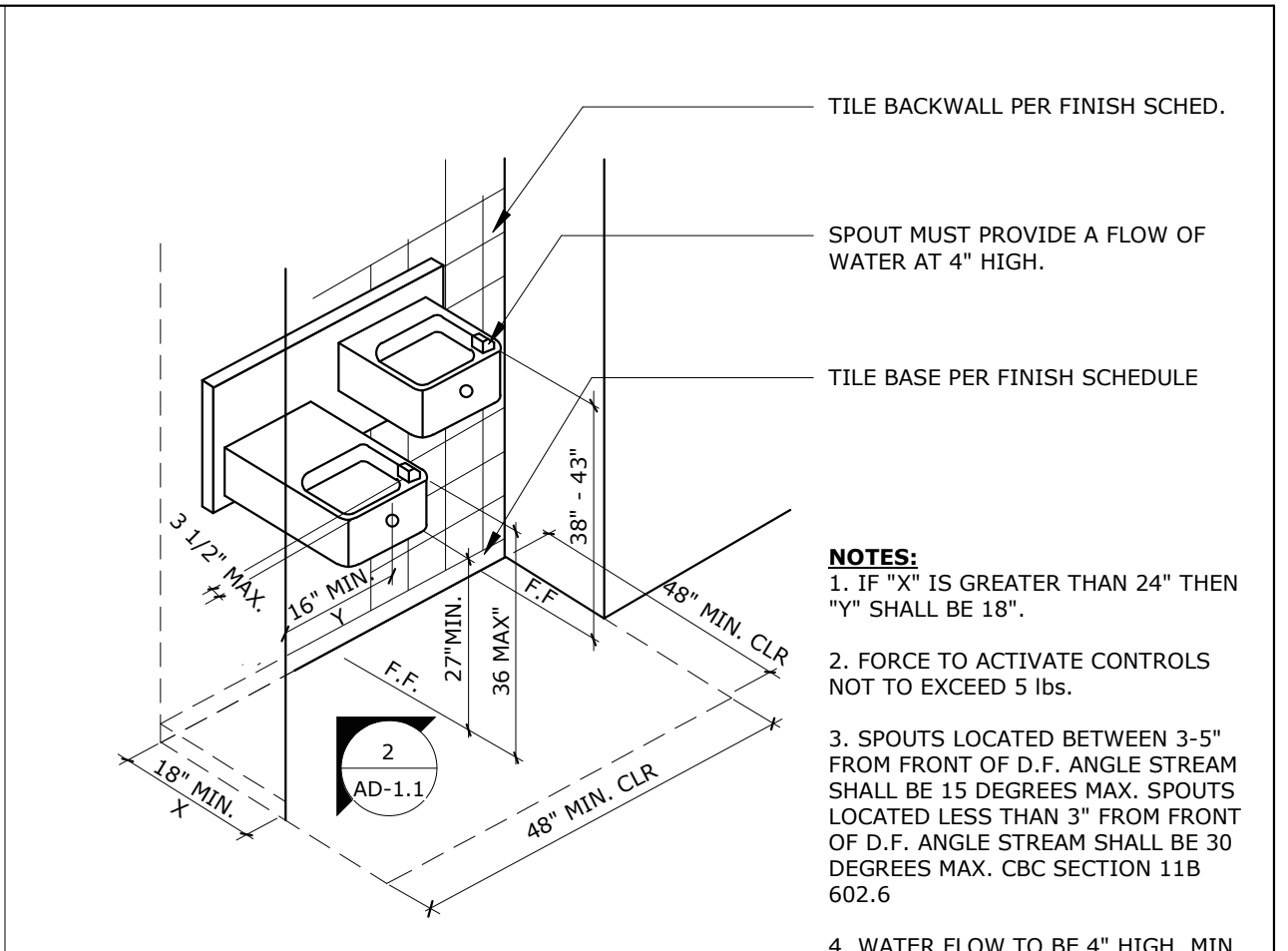
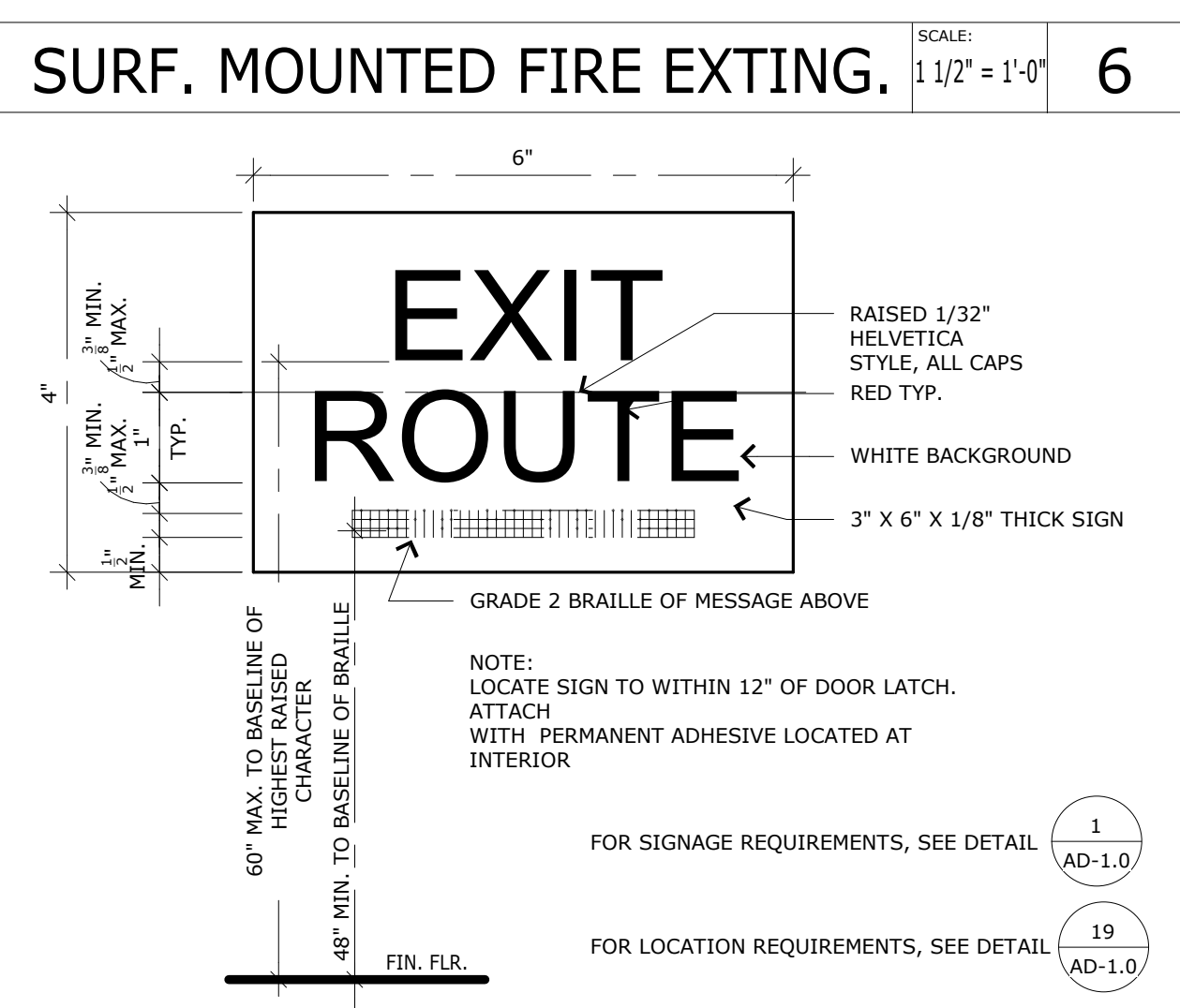
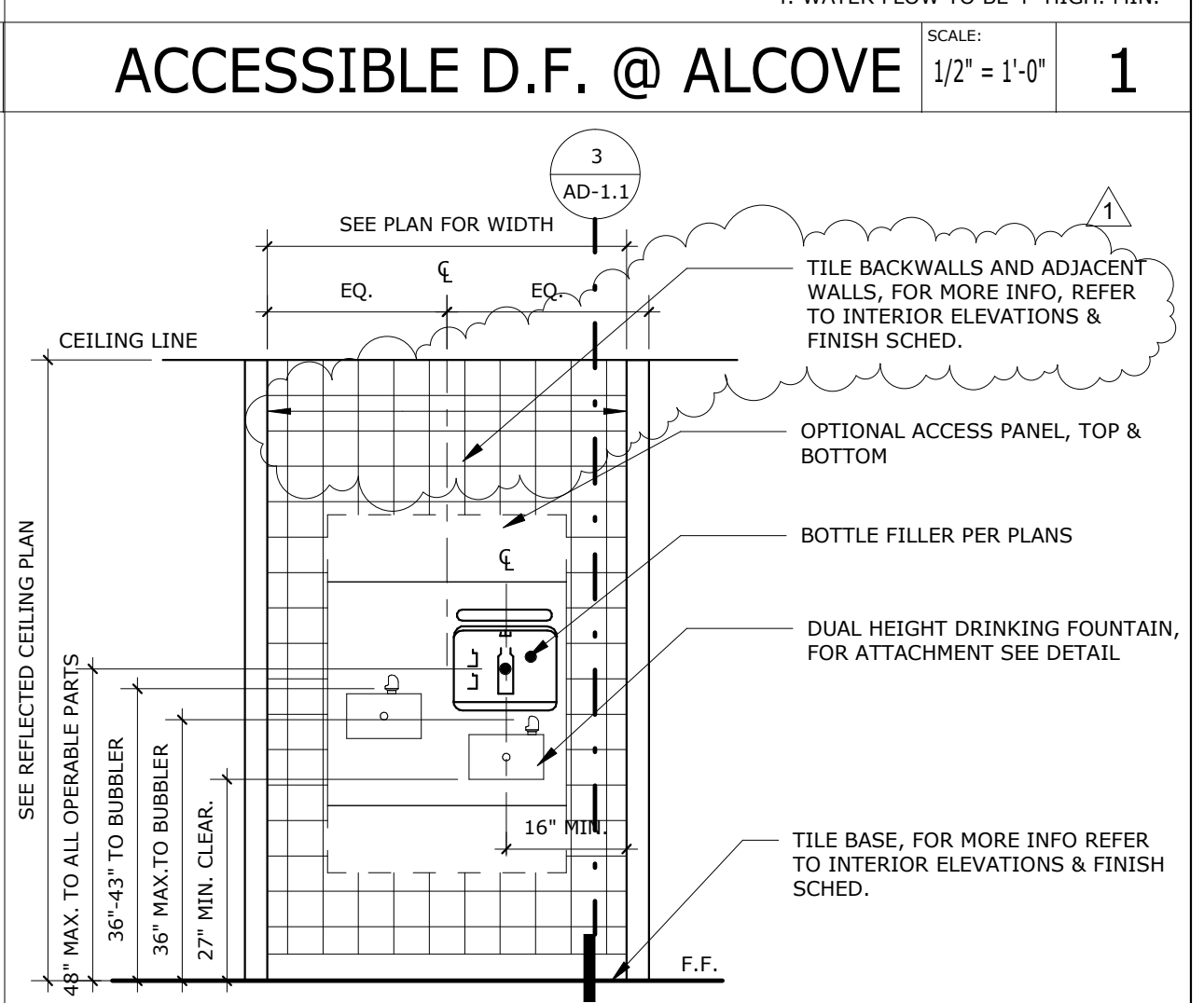
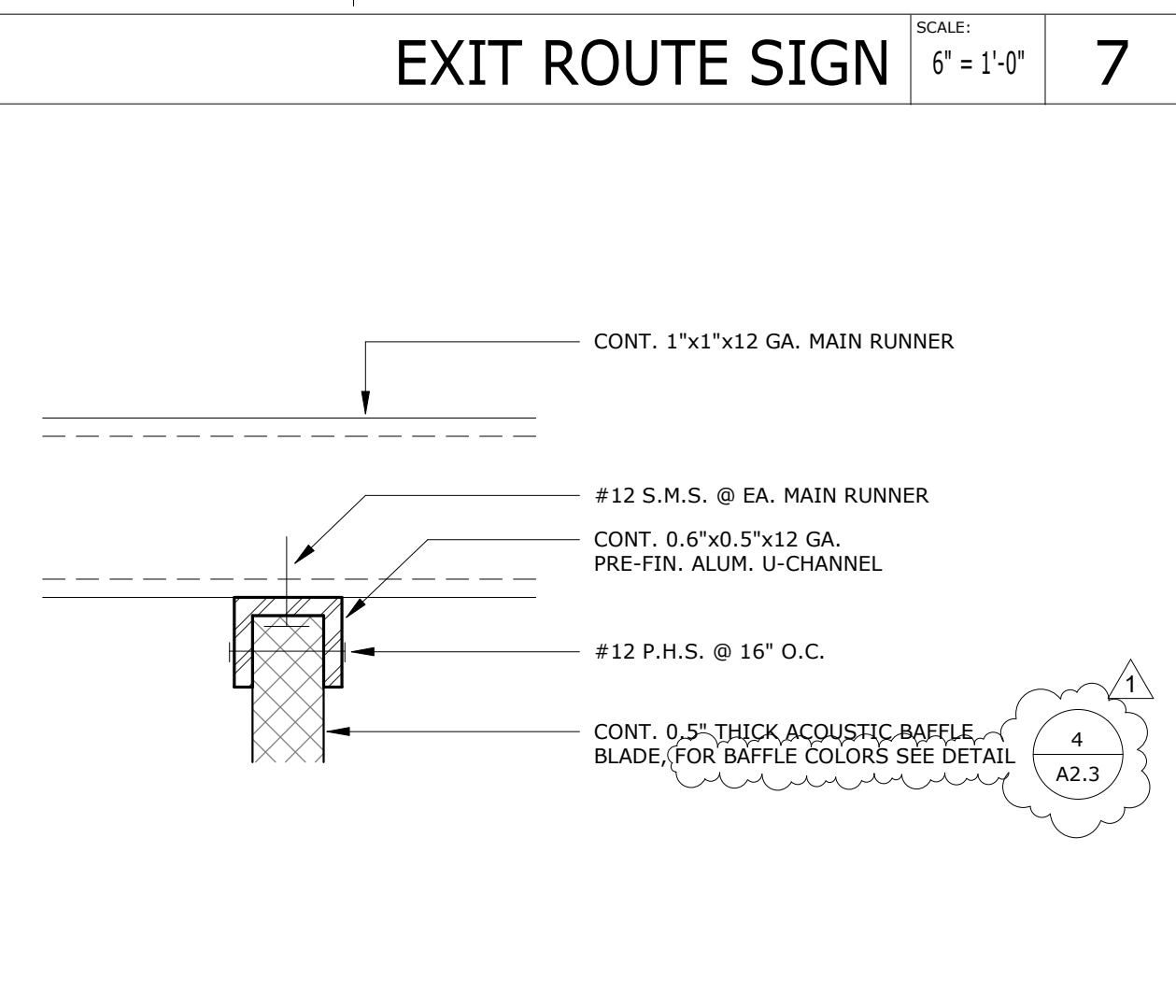
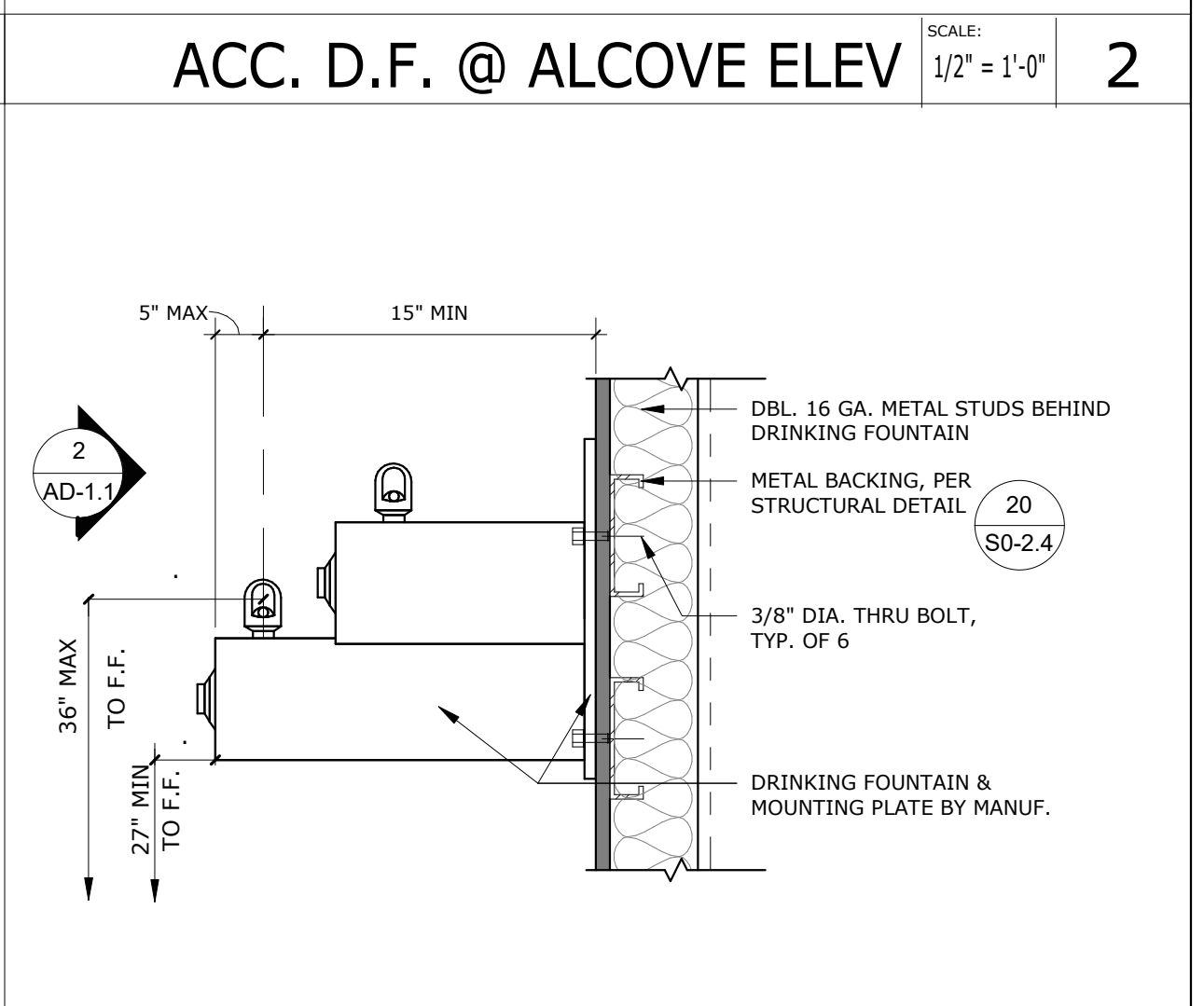
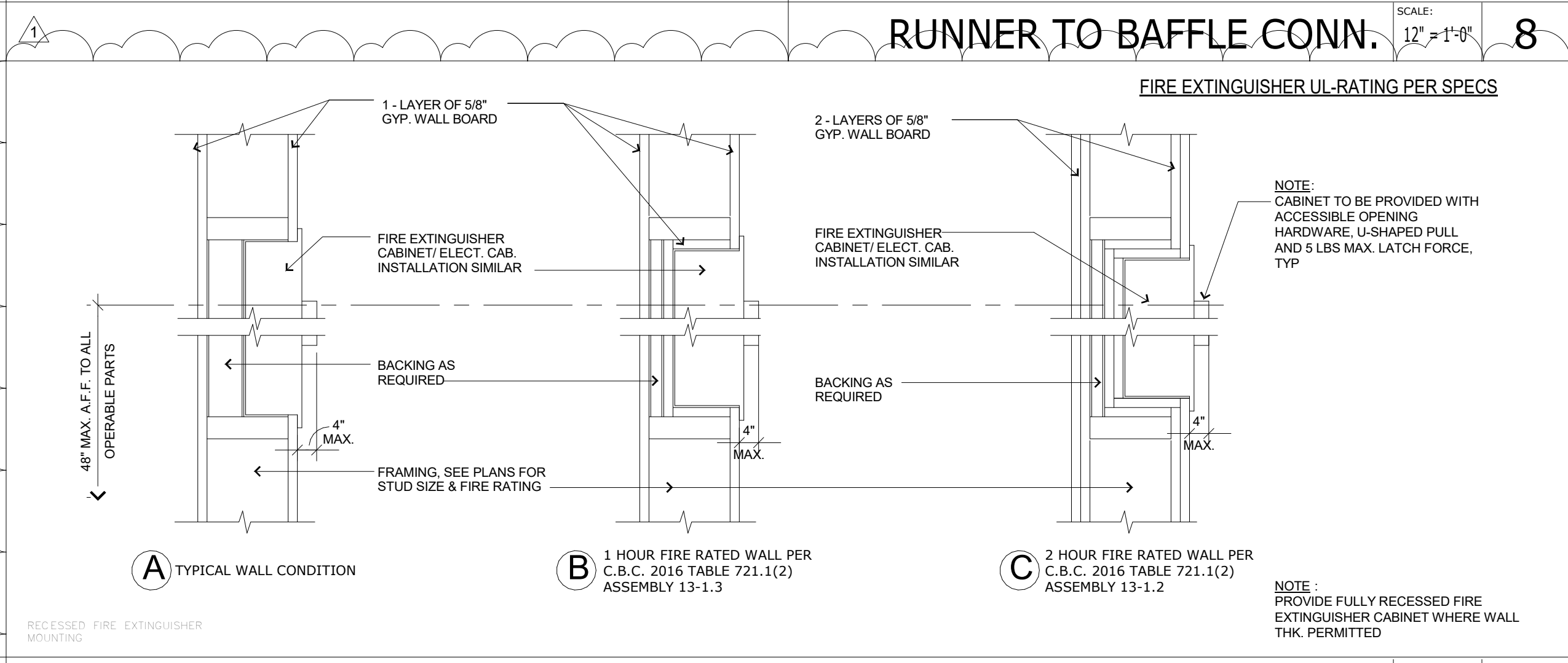
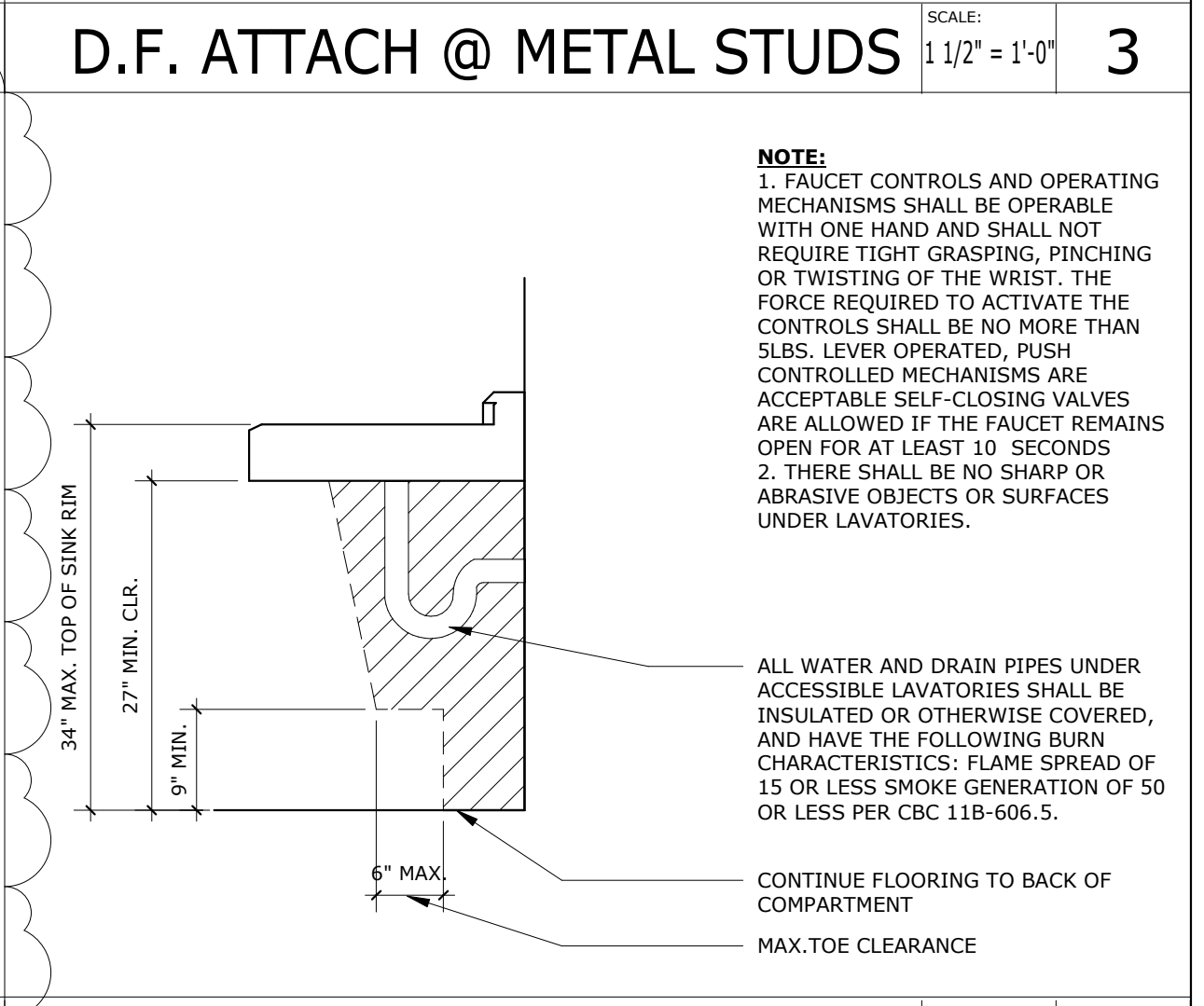
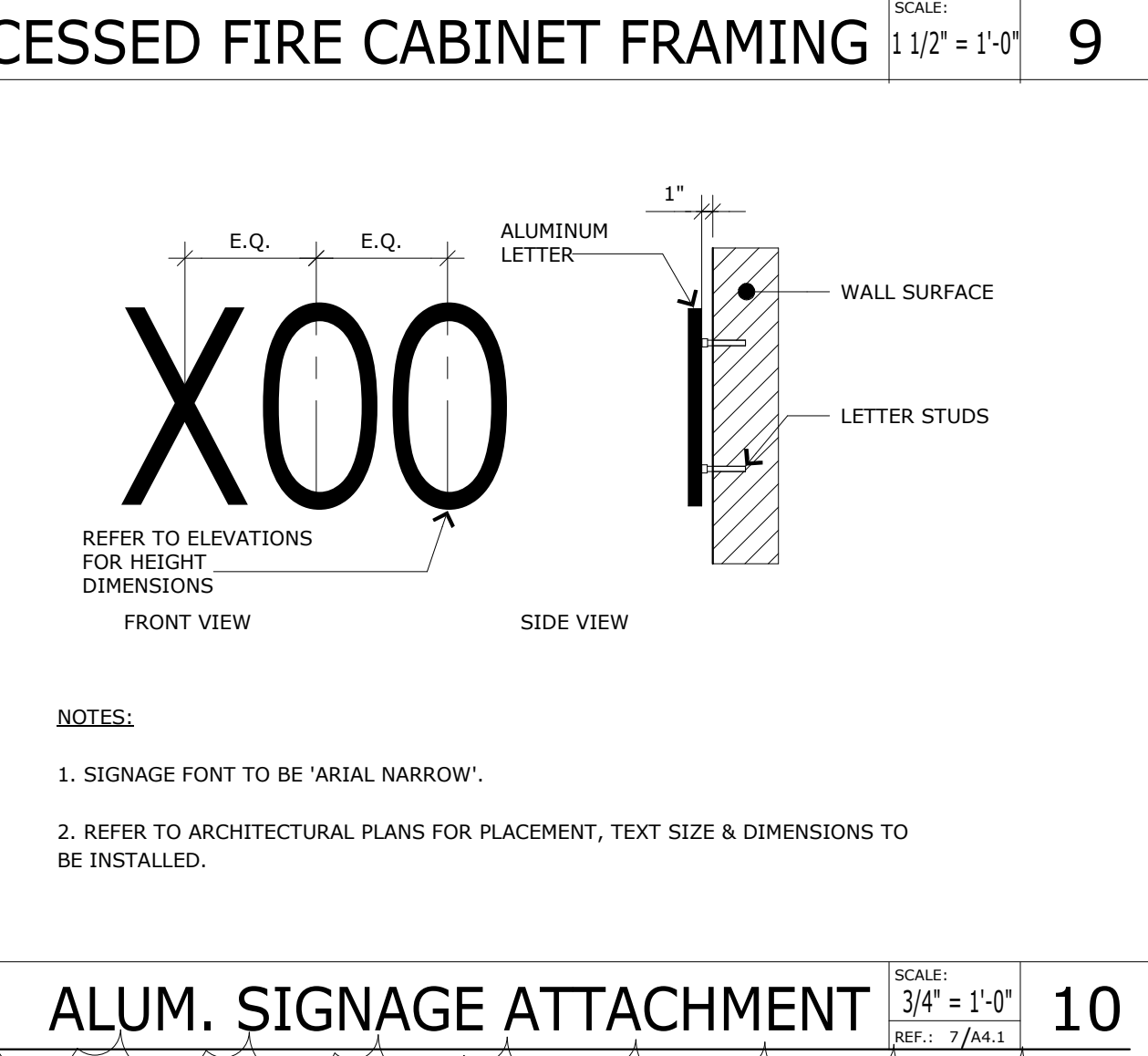
KEY PLAN



ADMIN. ADDITION & MODERNIZATION

NORTH PARK ELEMENTARY SCHOOL  
5378 NORTH 'H' STREET, SAN BERNARDINO, CA 92407  
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT



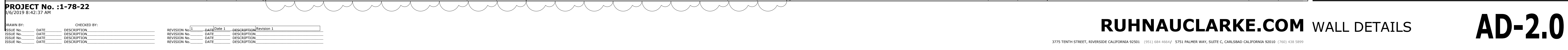
						
					<b>SURF. MOUNTED FIRE EXTING.</b> <div> <div>SCALE: 1 1/2" = 1'-0"</div> <div>6</div> </div>	<b>ACCESSIBLE D.F. @ ALCOVE</b> <div> <div>SCALE: 1/2" = 1'-0"</div> <div>1</div> </div>
						
					<b>EXIT ROUTE SIGN</b> <div> <div>SCALE: 6" = 1'-0"</div> <div>7</div> </div>	<b>ACC. D.F. @ ALCOVE ELEV</b> <div> <div>SCALE: 1/2" = 1'-0"</div> <div>2</div> </div>
						
					<b>RUNNER TO BAFFLE CONN.</b> <div> <div>SCALE: 12" = 1'-0"</div> <div>8</div> </div>	<b>D.F. ATTACH @ METAL STUDS</b> <div> <div>SCALE: 1/2" = 1'-0"</div> <div>3</div> </div>
						
					<b>RECESSED FIRE CABINET FRAMING</b> <div> <div>SCALE: 1 1/2" = 1'-0"</div> <div>9</div> </div>	<b>LAVATORY CLEARANCE</b> <div> <div>SCALE: 3/4" = 1'-0"</div> <div>4</div> </div>
						<div> <div>File No: 36-55</div> <div>IDENTIFICATION STAMP</div> <div>DIV. OF THE STATE ARCHITECT</div> <div>OFFICE OF REGULATION SERVICES</div> <div>04-117672</div> <div>AC _____ FLS _____ SS _____</div> <div>DATE _____</div> </div> <div> <div> <div> <div>REGISTERED ARCHITECT</div> <div>CLAUDE CLARKE</div> <div>STATE OF CALIFORNIA</div> <div>No. C-21340</div> <div>Exp. 10-31-19</div> </div> <div>STAMPS</div> </div> <div> <div> <div>RUHNAU</div> <div>CLARKE</div> <div>ARCHITECTS</div> </div> <div>BRANDING</div> </div> <div> <div>ADMIN. ADDITION &amp; MODERNIZATION</div> <div>NORTH PARK ELEMENTARY SCHOOL</div> <div>5378 NORTH 'H' STREET, SAN BERNARDINO, CA 92407</div> <div>SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT</div> </div> </div>

PROJECT No. :1-78-22

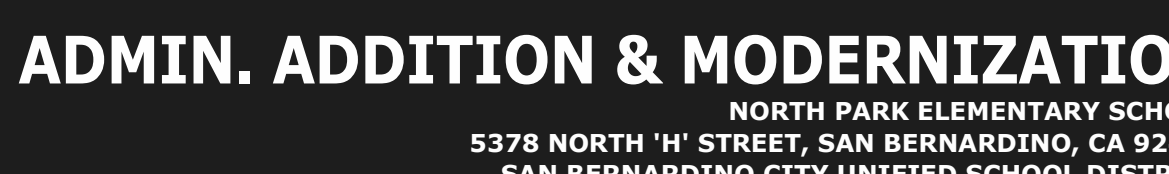
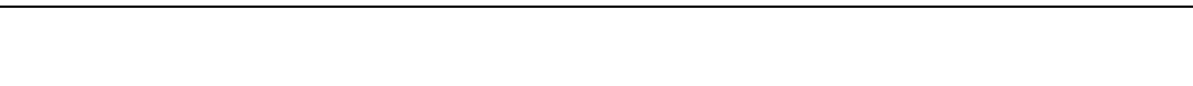
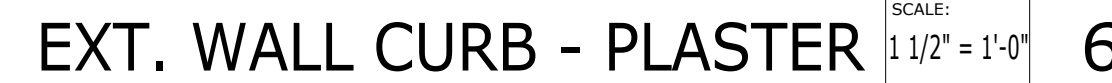
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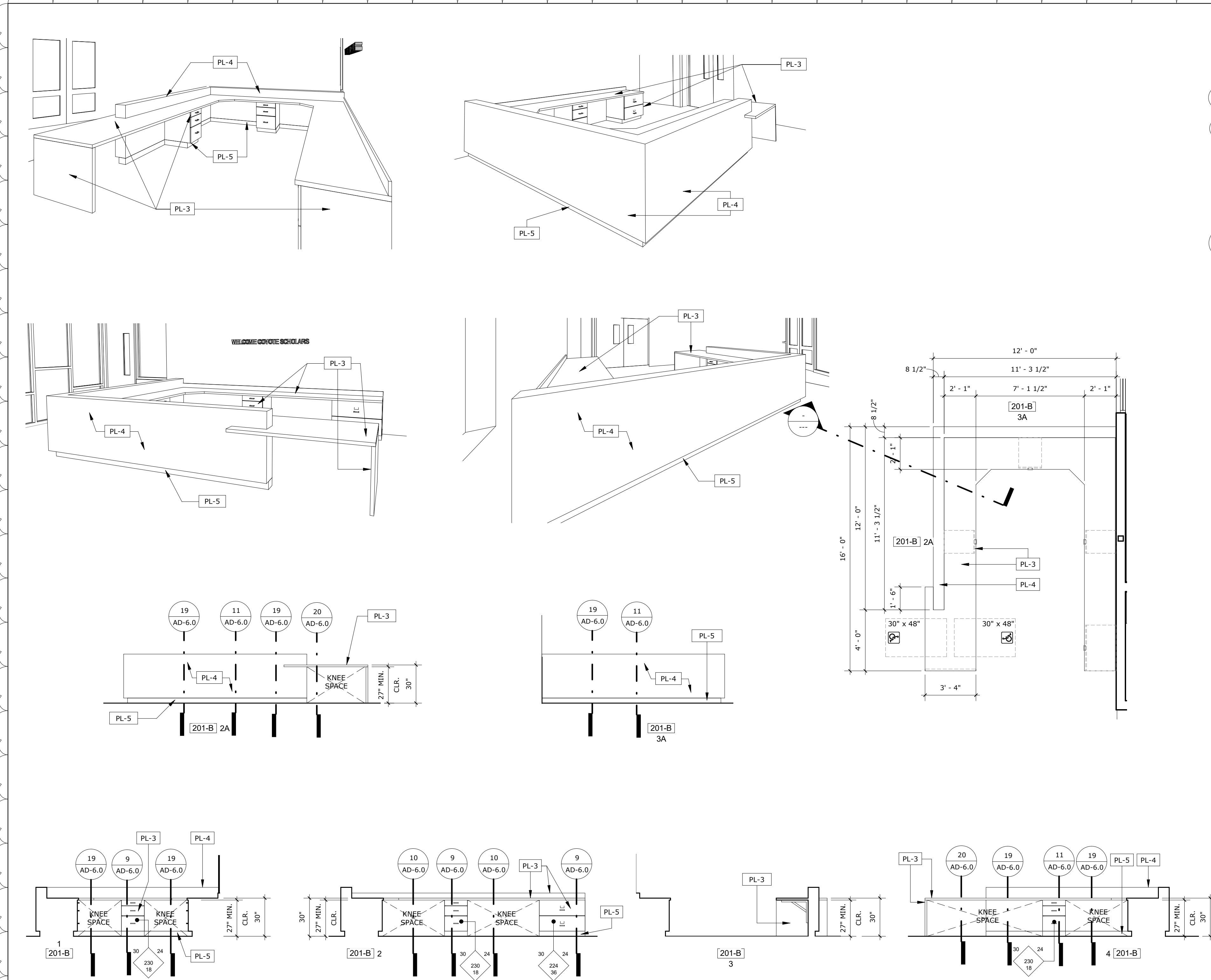




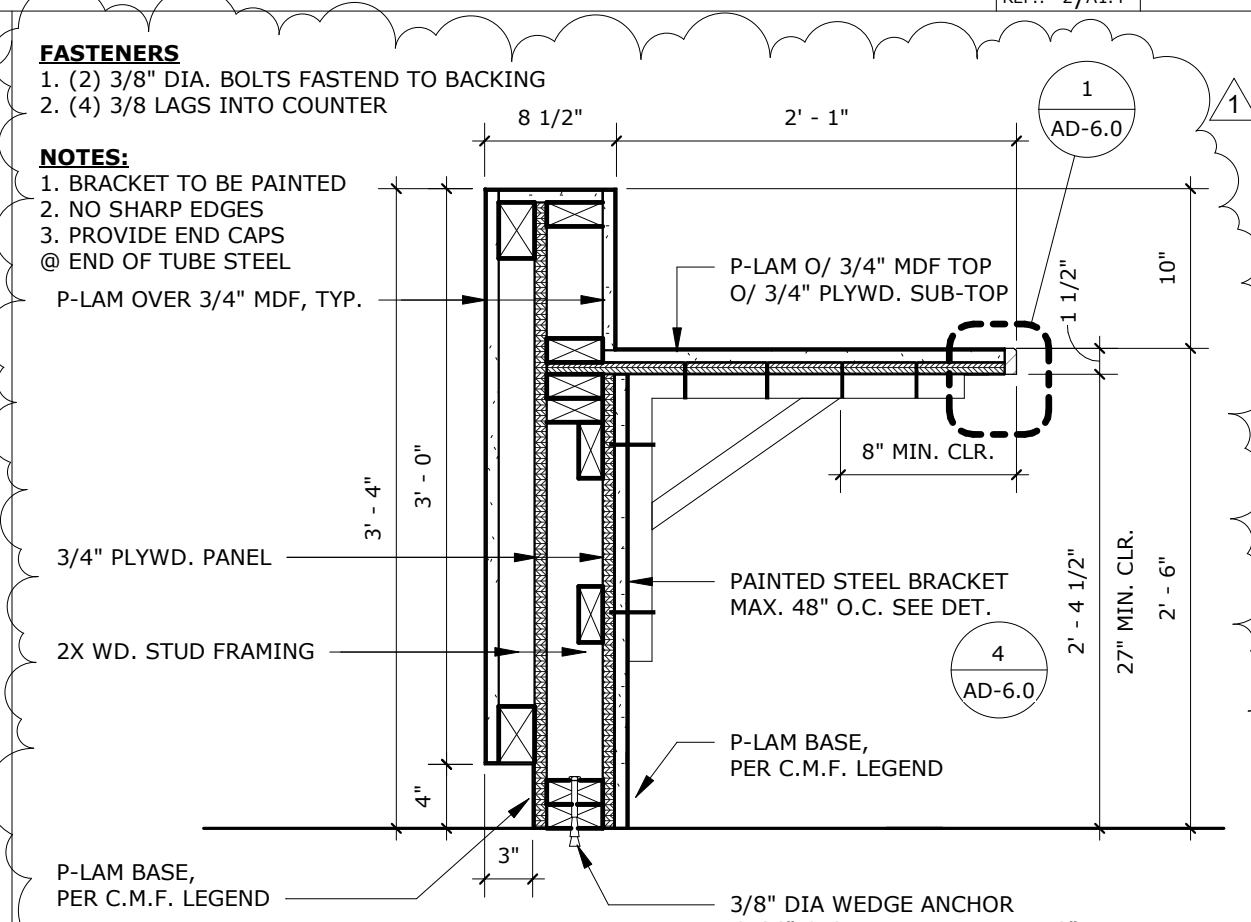




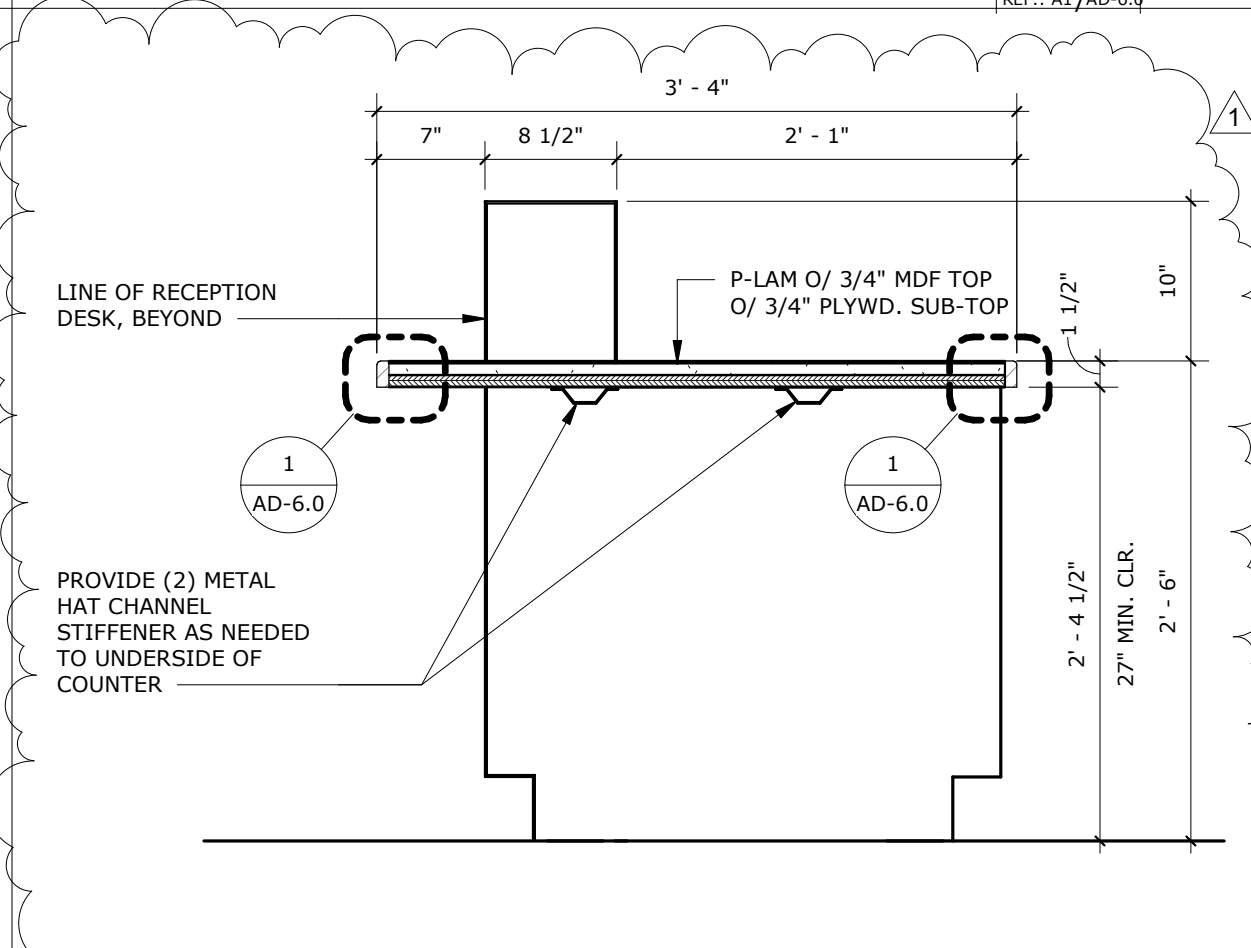




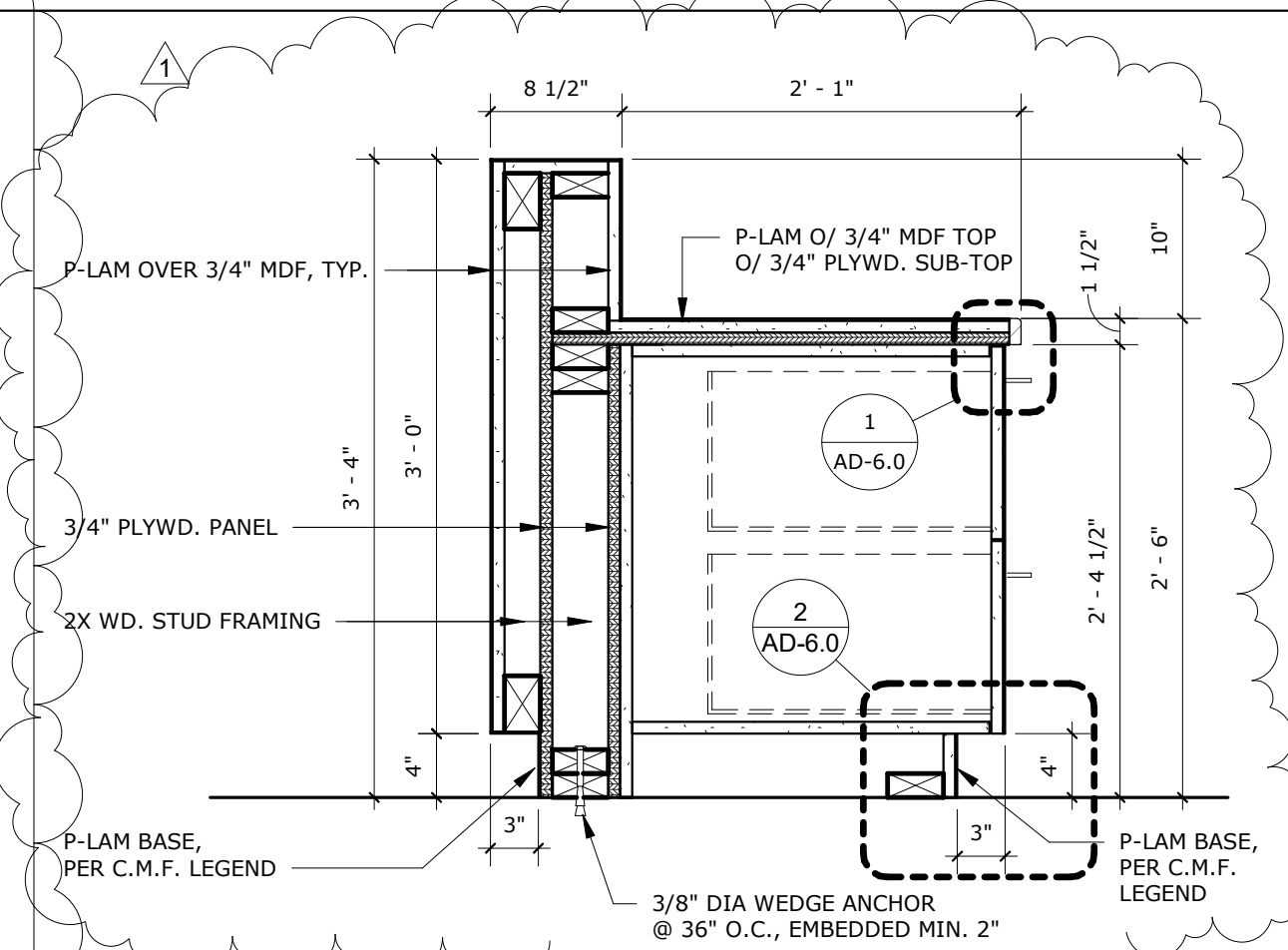
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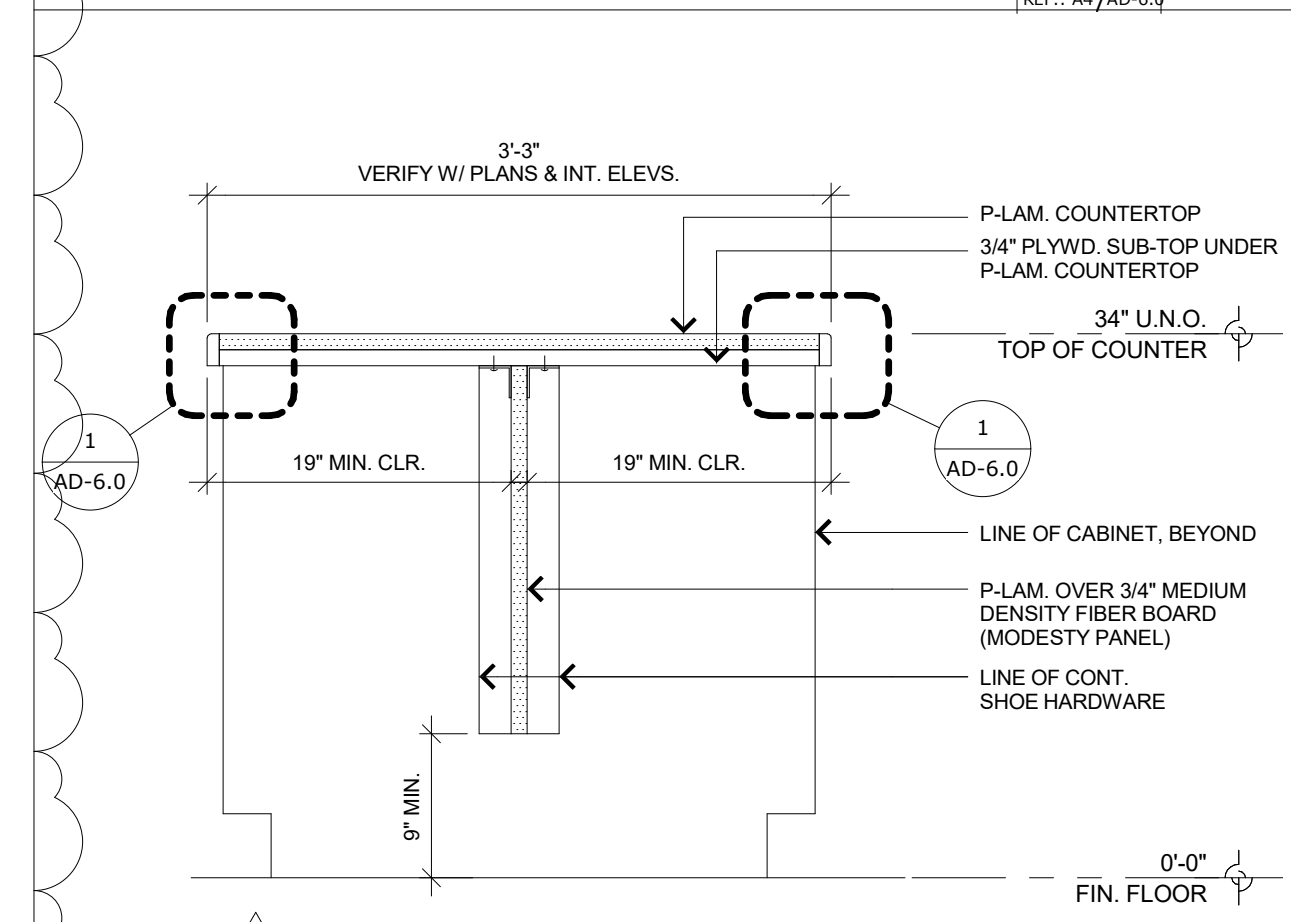
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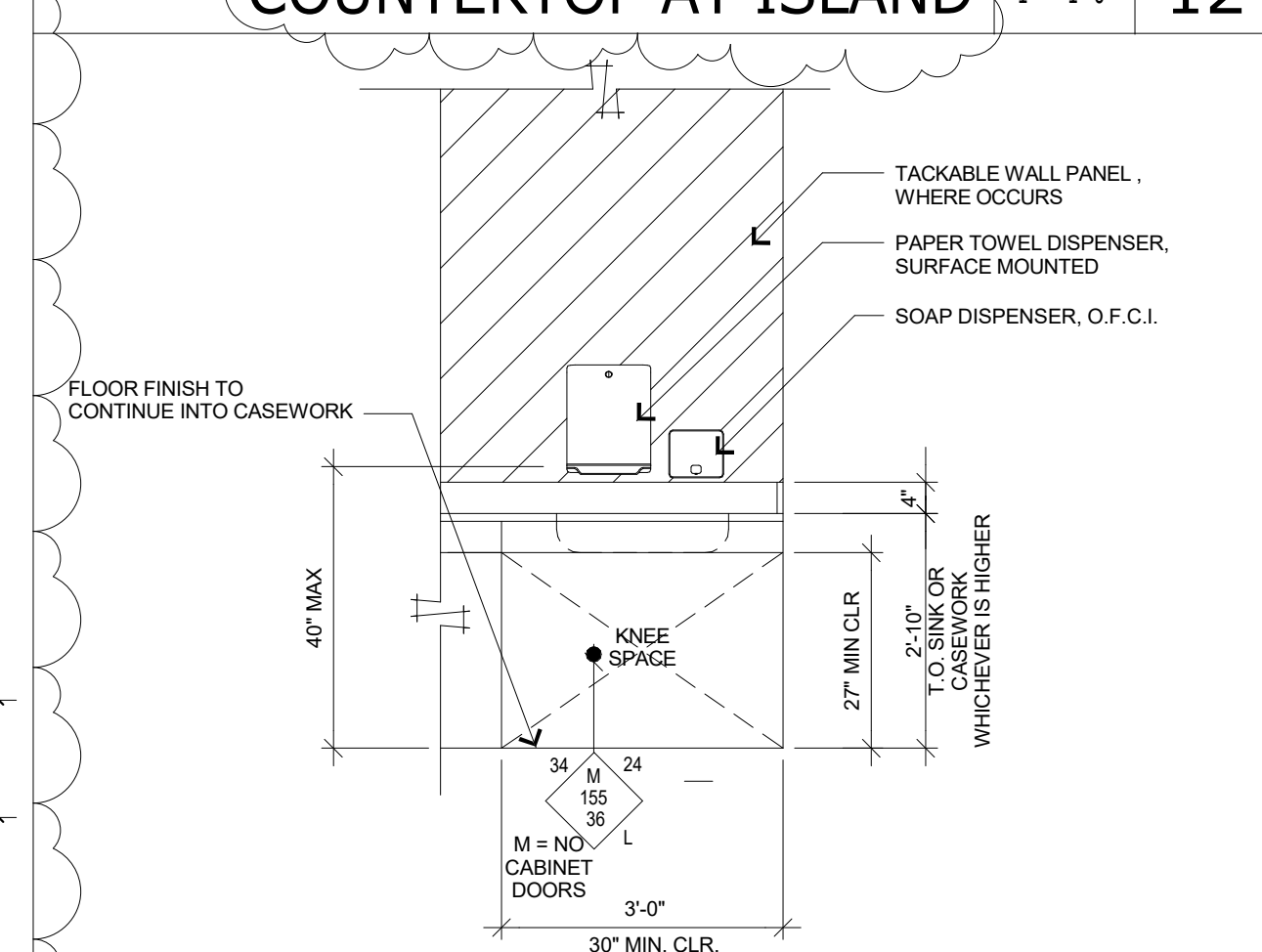
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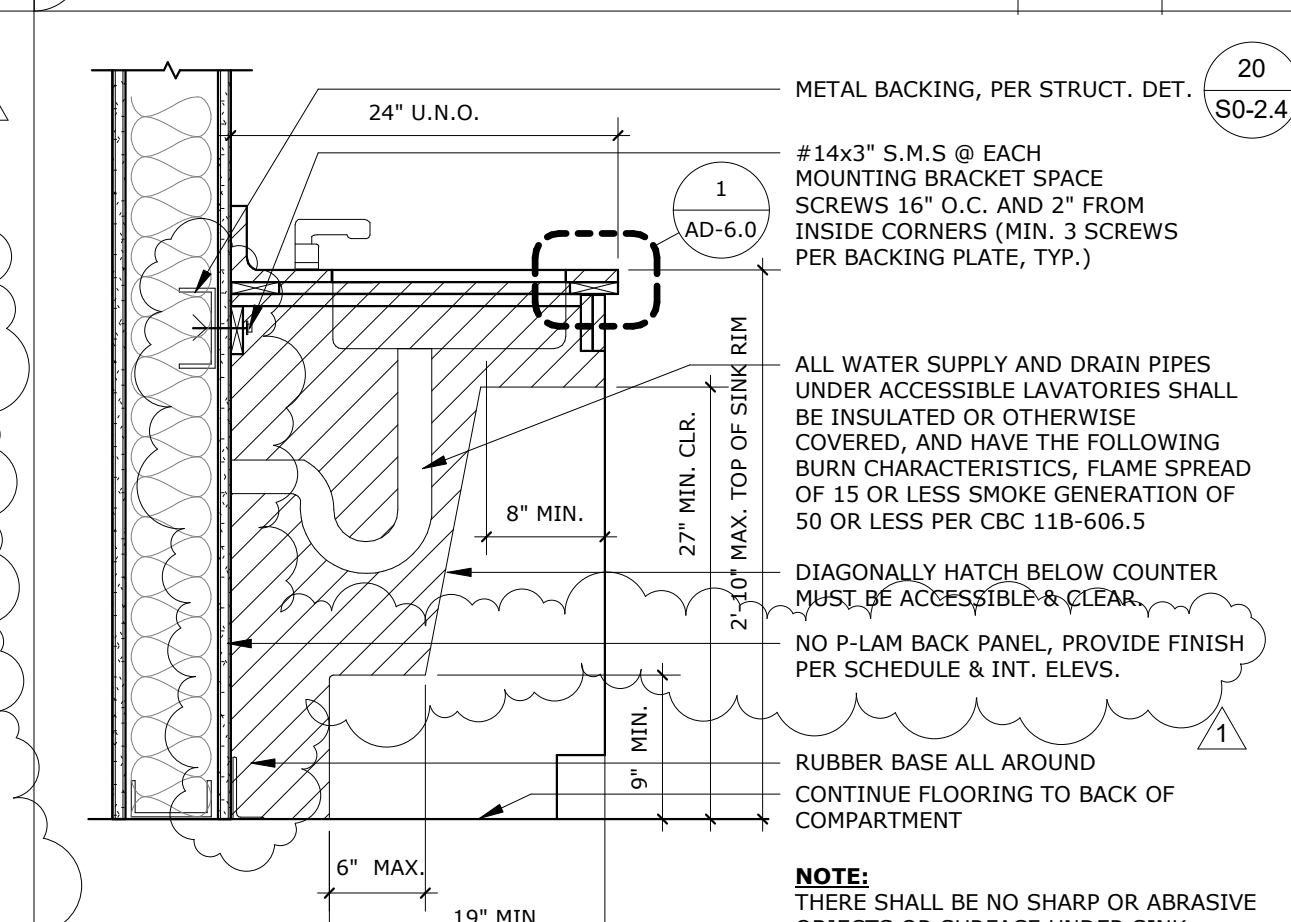
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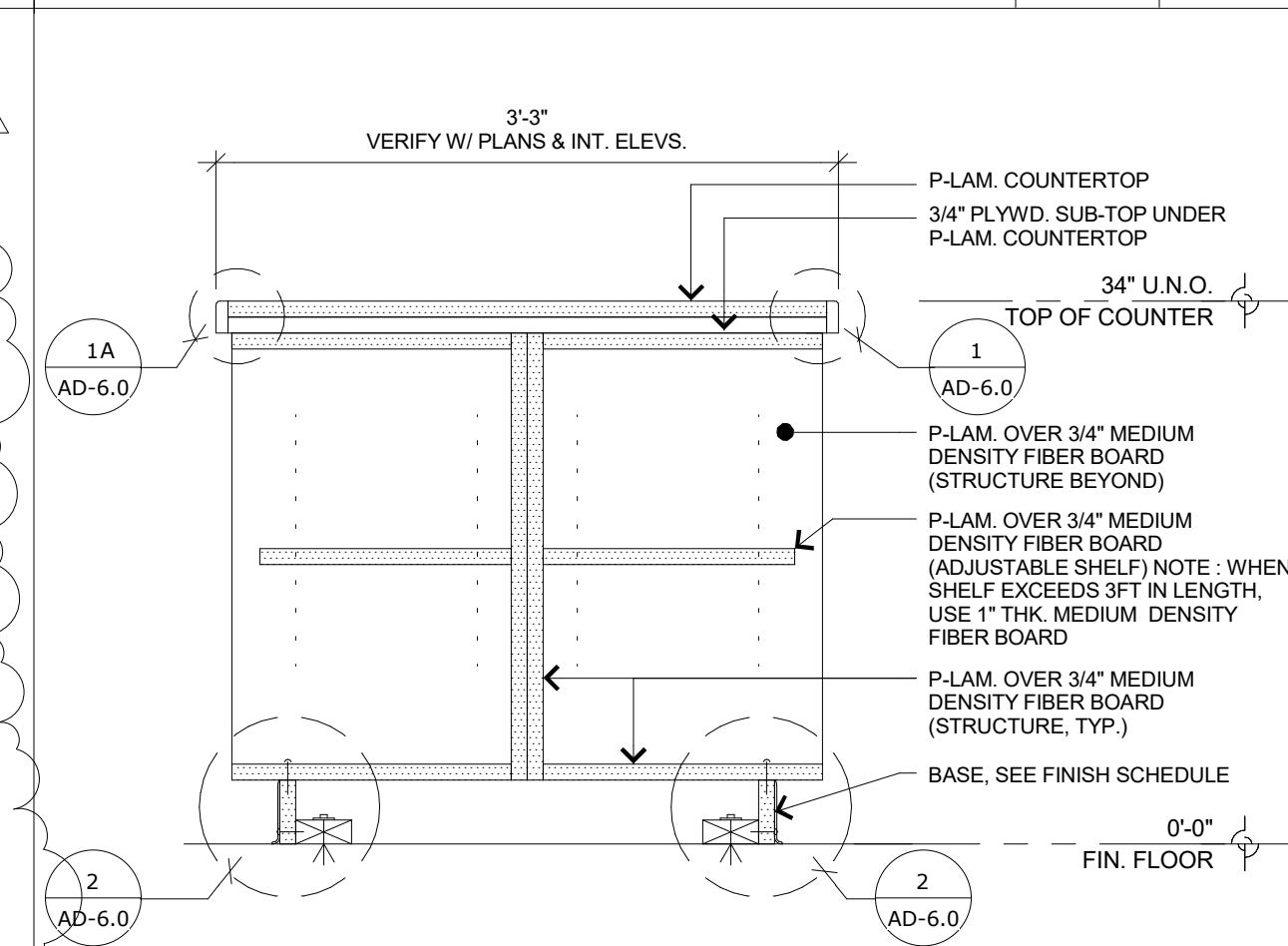
COUNTERTOP AT ISLAND 12



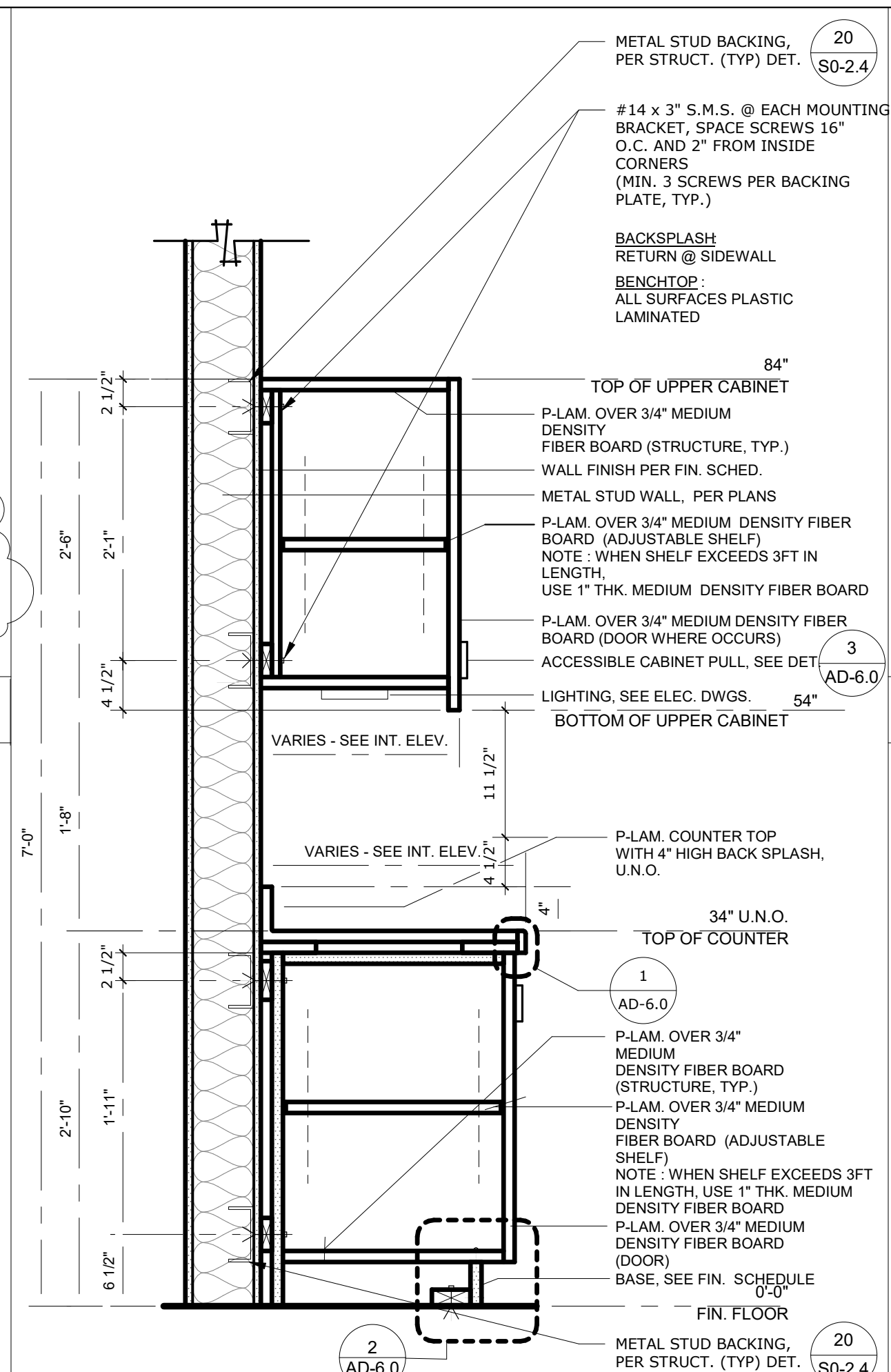
ACCESS. SINK & BASE CABINET 13



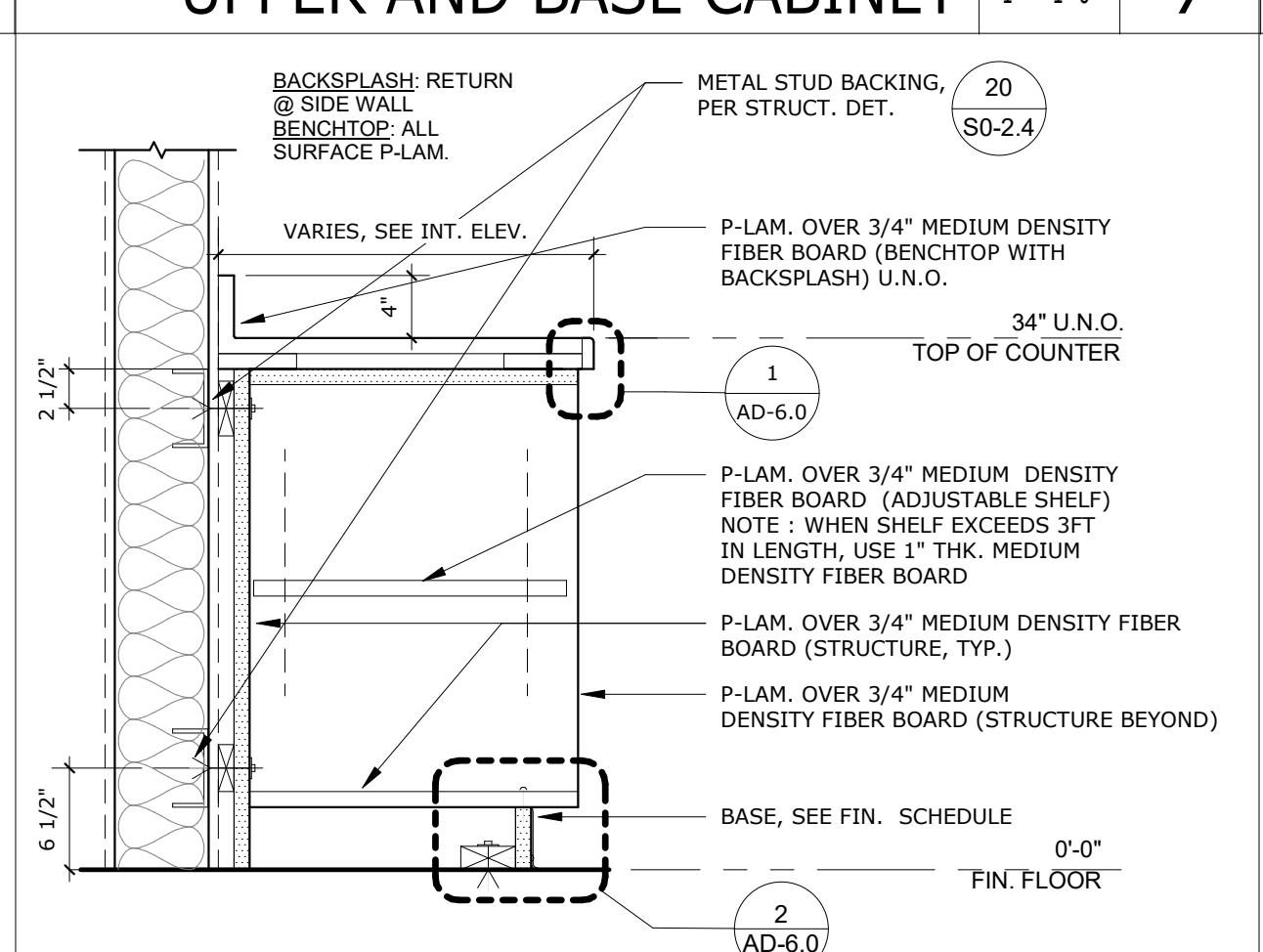
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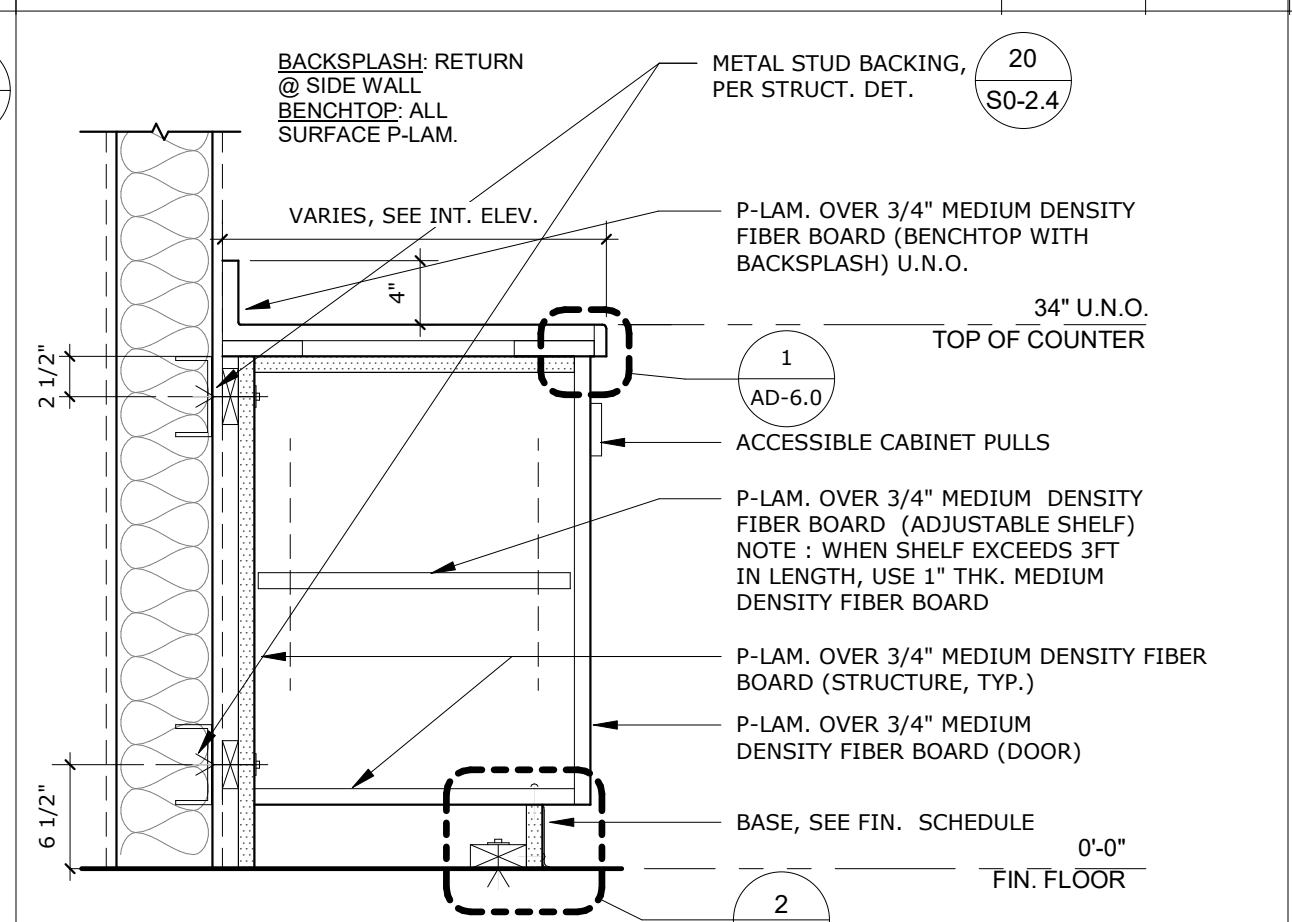
OPEN BASE CABINET AT ISLAND 15



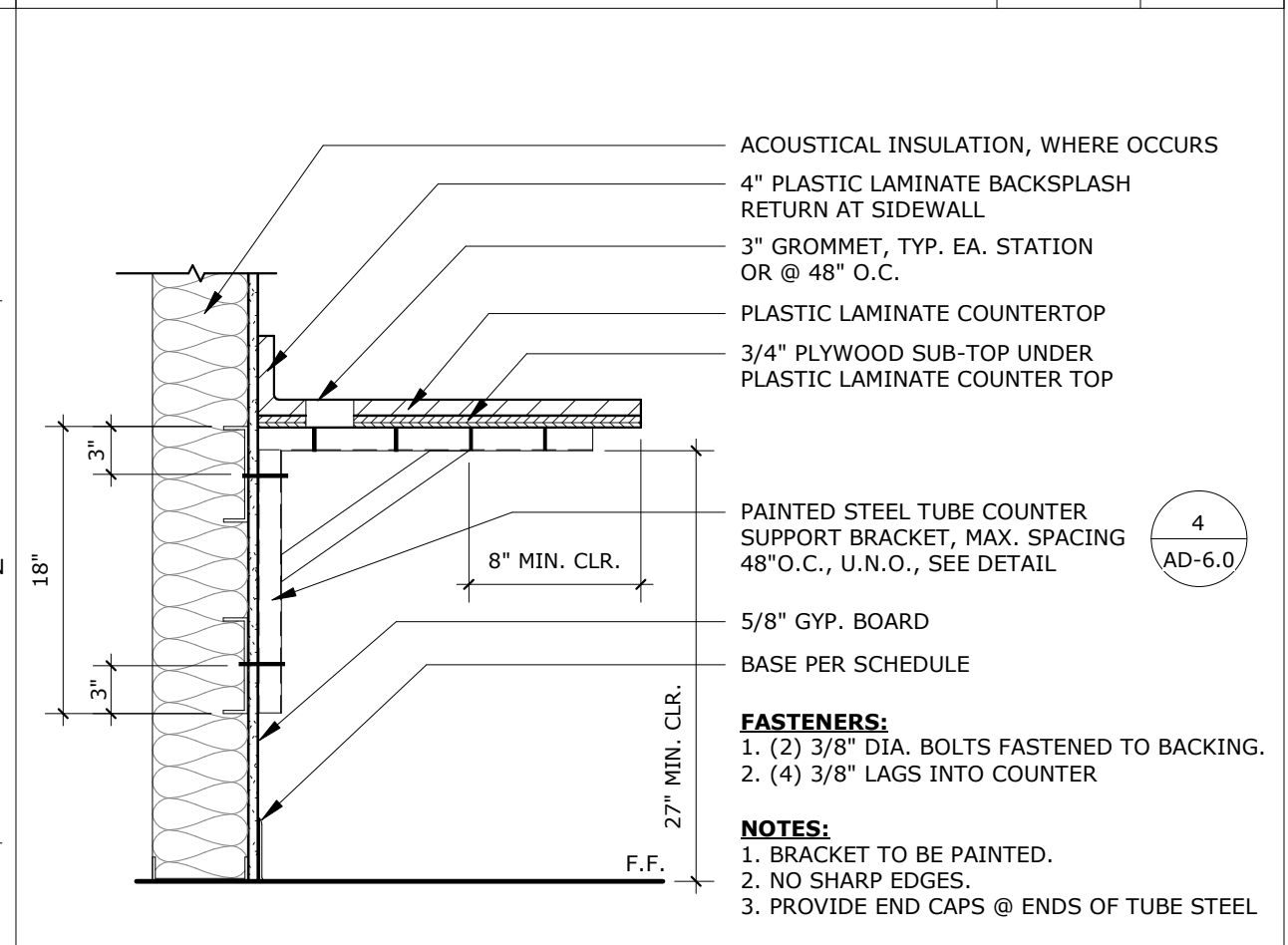
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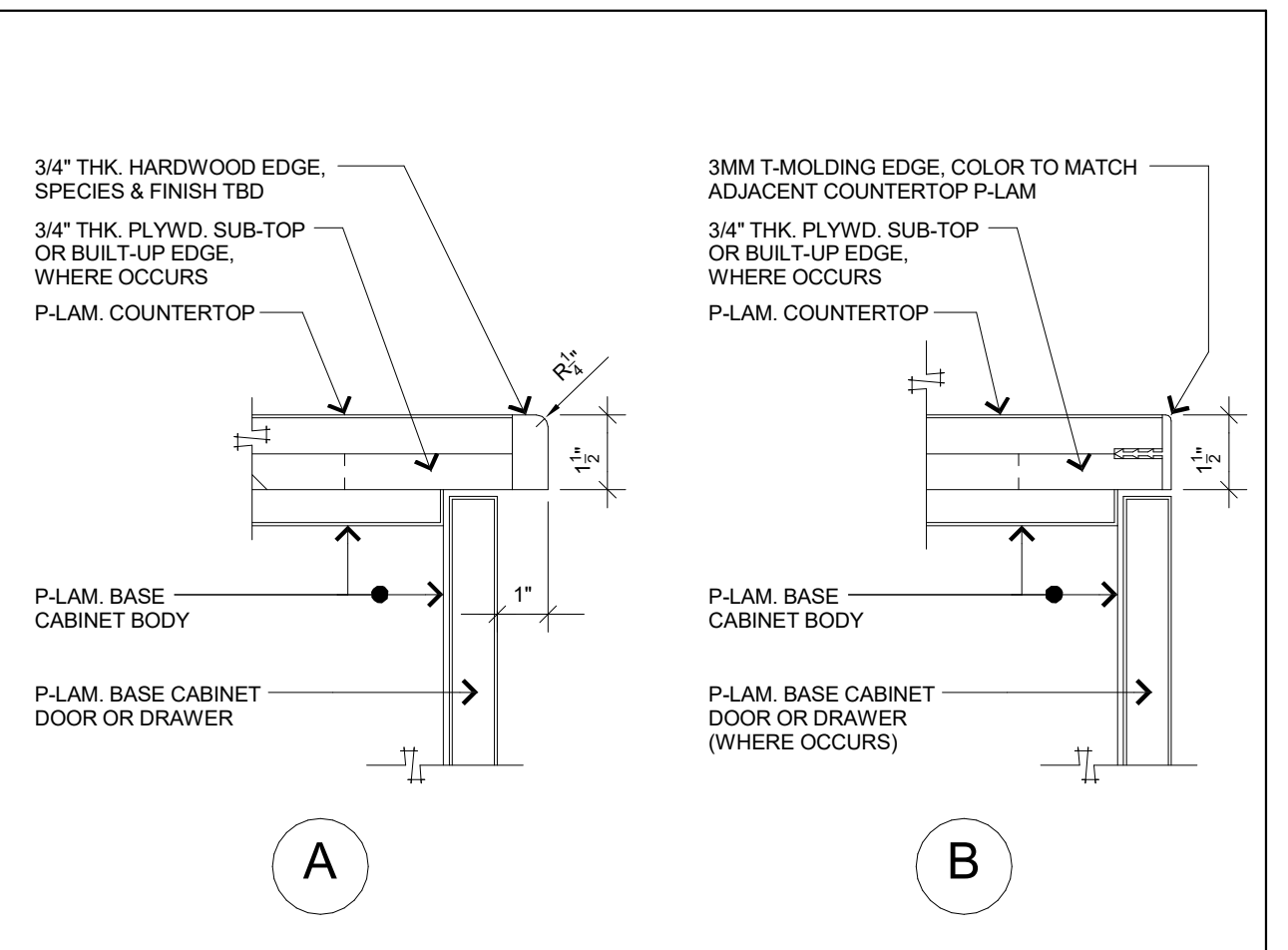
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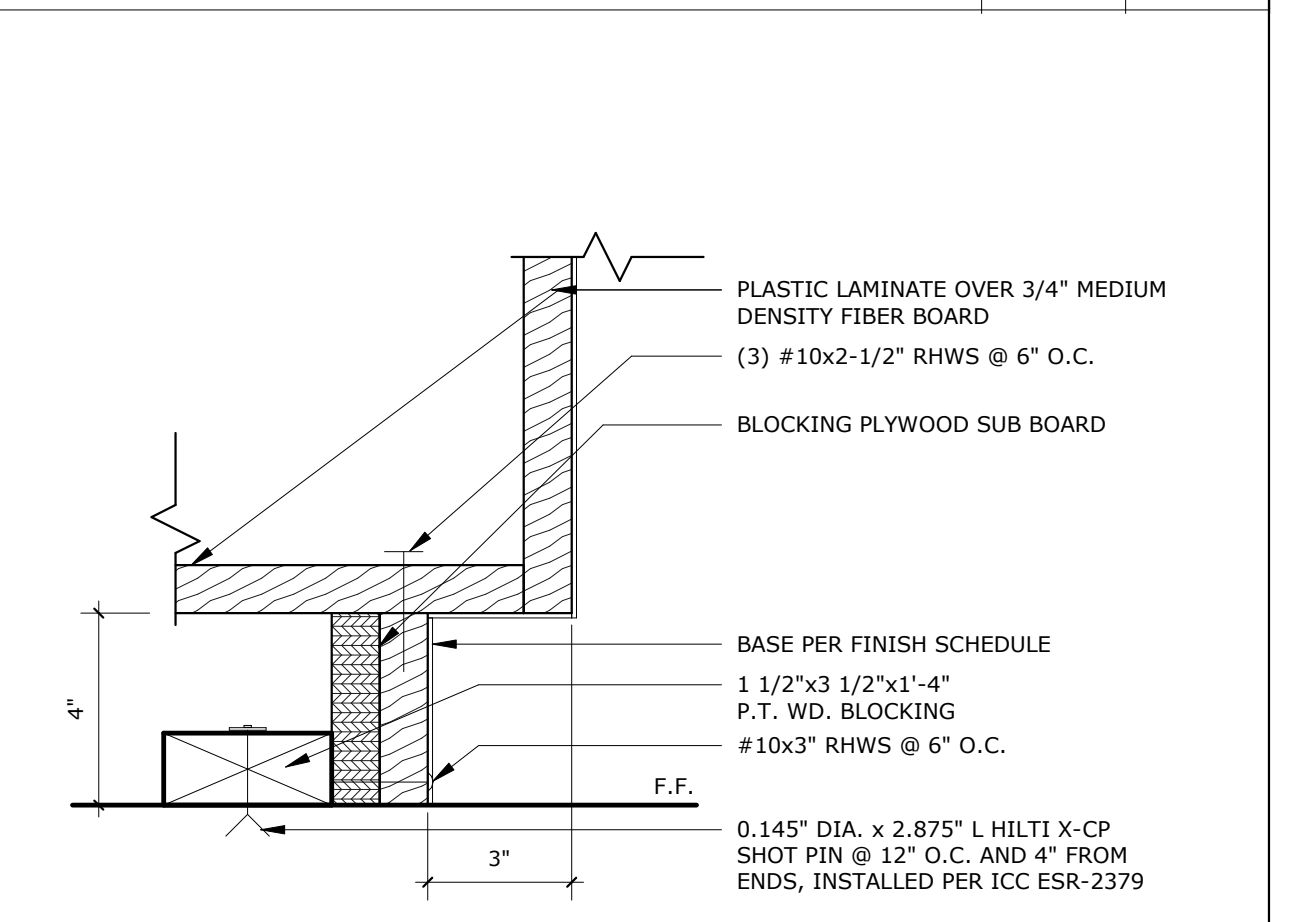
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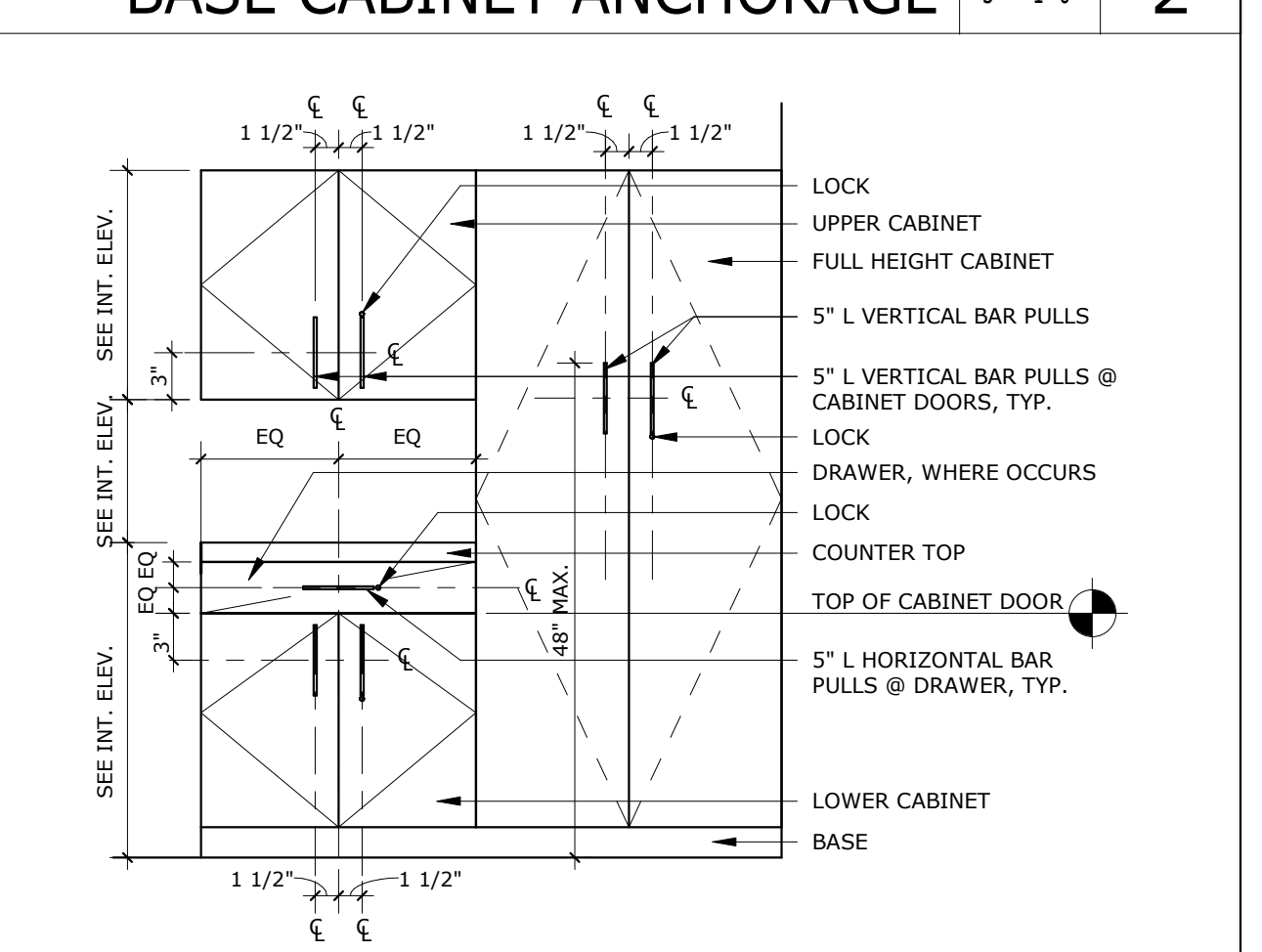
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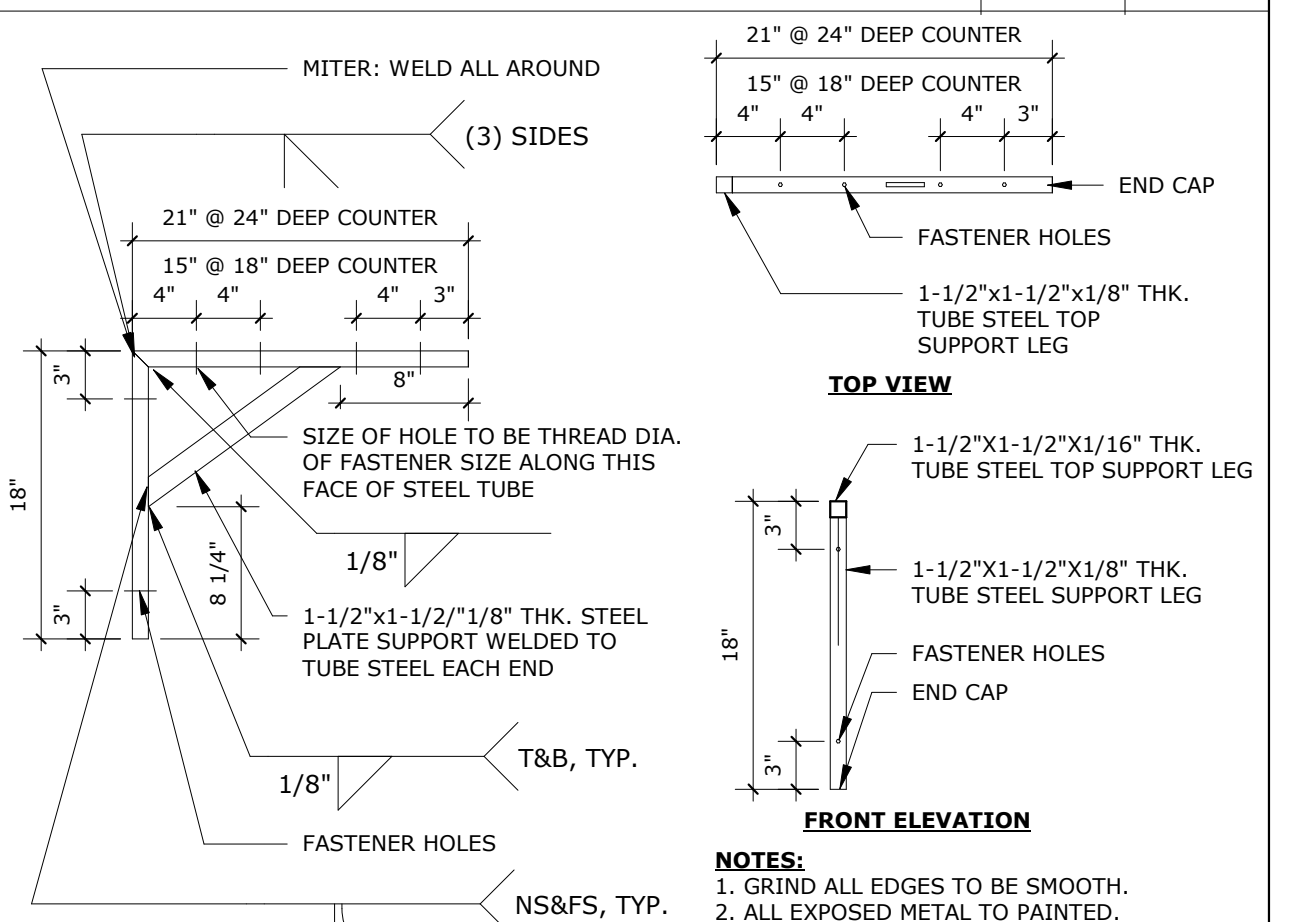
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BASE CABINET ANCHORAGE 2



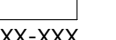
TYP. CABINET PULLS 3



COUNTER SUPPORT BRACKET 4

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ISSUE No. 3	DATE 3	DESCRIPTION	REVISION 3











1. SEE SHEETS S0-1.1 THROUGH S0-2.6 FOR GENERAL NOTES AND TYPICAL DETAILS.
2. FOR ANY DIMENSIONAL INFORMATION NOT SHOWN, SEE ARCHITECTURAL DRAWINGS.
3. SEE ARCHITECTURAL, PLUMBING, MECHANICAL, AND ELECTRICAL DRAWINGS FOR SIZE AND LOCATION OF ROOF OPENINGS AND FLASHING ON ROOF FRAMING PLANS. SEE DETAILS S0-2.3 FOR TYPICAL OPENINGS, UNLESS NOTED OTHERWISE.
4. ALL BEAMS SHALL BE EQUALLY SPACED BETWEEN COLUMNS, UNLESS NOTED OTHERWISE.
5. "MJ" DENOTES MECHANICAL UNIT. MAXIMUM ALLOWABLE WEIGHT IS SHOWN. SEE MECHANICAL AND ARCHITECTURAL DRAWINGS FOR EXACT SIZE AND WEIGHT OF MECHANICAL UNITS. FOR TYPICAL FRAMING AT MECHANICAL UNITS, SEE DETAILS S0-2.3 & S0-2.1.
6. THE CONTRACTOR SHALL COORDINATE LOCATION OF ALL FRAMING BEAMS AT MECHANICAL UNITS WITH MECHANICAL DRAWINGS. THE LOCATION OF FRAMING SHALL MATCH CURB LAYOUT AND ROOF PENETRATIONS FOR THE SUPPLIED UNITS.
7. PROVIDE 18" GA. FULL DEPTH SOLID BLOCKING AT 8'-0" MAXIMUM OR MID-SPAN, WHICHEVER IS LESS, FOR ROOF JOISTS PER S0-2.6.
8. FOR DOUBLE JOIST FRAMING, SEE 750-2.6.
9. FOR TOP TRACK SPICE, SEE DETAIL 150-2.6, UNLESS NOTED OTHERWISE. WHERE TOP TRACK BREAK/TERMINATE AT HSS COLUMNS, PROVIDE SPICE PER S0-2.6.

[= 15'-0"] : INDICATES TOP OF STEEL ELEVATION.

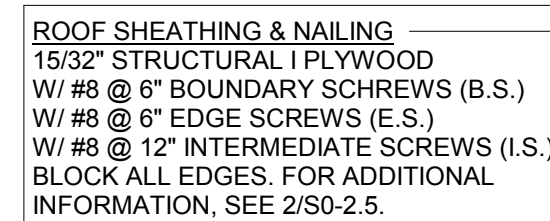
↔ : INDICATES SPAN OF OF METAL STUD JOISTS.

—○— : INDICATES EXTENT OF JOISTS.

⌋ — 15'-0" — ⌋ : INDICATES METAL STUD HEADER OVER OPENING BELOW.  
SEE DETAIL 8B/SO-2.4 FOR SIZE AND FRAMING UNLESS NOTED OTHERWISE ON PLAN.

▬ : INDICATES EXTENT OF PARAPET BRACING. SEE PLAN FOR DETAIL REFERENCES.

B1 : INDICATES A BUILT-UP MTL STUD BM PER DETAIL 3/SO-2.3.



SCALE: 3/16" = 1'-0"

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## S1-3.1



[illegible]

- WHERE PANEL, IS INDICATED TO INCLUDE FEED THRU LUGS, PROVIDE FEED THRU LUGS AT THE OPPOSITE END OF THE PANELBOARD FROM THE PANELBOARD MAIN LUGS.
- WHERE PANEL, IS INDICATED TO INCLUDE DOUBLE LUGS, PROVIDE A DOUBLE LUG KIT AT THE SAME END OF THE PANELBOARD AS THE PANELBOARD MAIN LUGS.
- WHERE PANEL CIRCUIT BREAKER RATING IS SHOWN AS SERIES RATED, PROVIDE CIRCUIT BREAKERS IN PANELBOARD WHICH ARE SERIES RATED WITH THE UPSTREAM SYSTEM FOR THE COMPLETE FAULT CURRENT OF THE PANELBOARD SHALL BE MARKED WITH THE SERIES CONNECTED RATINGS, AS WELL AS ALL MARKING AS REQUIRED BY THE NEC, OR CEC WHERE ADAPTED, 240-83(C).
- WHERE PANEL, IS INDICATED AS RECESSED OR FLUSH MOUNTED, PROVIDE SPARE CONDUITS SUBBED IN TO THE ACCESSIBLE CEILING SPACE, PROVIDE ONE (1) 3/4" CONDUIT ONLY FOR EACH OF THE THREE (3) PIPES OR SPES, THE PANELBOARD SHALL BE MARKED WITH THE SERIES CONNECTED RATINGS, AS WELL AS ALL MARKING AS REQUIRED BY THE NEC, OR CEC WHERE ADAPTED, 240-83(C).
- WHERE PANEL, IS INDICATED AS RECESSED OR FLUSH MOUNTED, PROVIDE SPARE CONDUITS SUBBED IN TO THE ACCESSIBLE CEILING SPACE, PROVIDE ONE (1) 3/4" CONDUIT ONLY FOR EACH OF THE THREE (3) PIPES OR SPES, THE PANELBOARD SHALL BE MARKED WITH THE SERIES CONNECTED RATINGS, AS WELL AS ALL MARKING AS REQUIRED BY THE NEC, OR CEC WHERE ADAPTED, 240-83(C).
- PROVIDE BREAKER INTERLOCK WITH ADJACENT BREAKER(S) FOR ANY MULTI-WIRE BRANCH CIRCUIT. BREAKER INTERLOCK GROUPING SHALL BE BY BRANCH CIRCUIT GROUP (i.e. ALL BRANCH CIRCUITS WITHIN A COMMON NEUTRAL SEC. OR SEC WHERE ADAPTED, 210.4 (B)) COMMON Yoke (NEC, OR CEC WHERE ADAPTED, 210.7(B)).
- PROVIDE BREAKER LOCK OFF DEVICE ON ANY CIRCUIT BREAKER FEEDING A TRANSFORMER AS REQUIRED, PER NEC, OR CEC WHERE ADAPTED, 450.14, WHEN AN EXISTING PANEL IS BEING ALTERED OR MODIFIED IN ANY WAY, CONTRACTOR SHALL INCLUDE ALL COSTS IN BIDDING FOR THE BREAKER LOCK OFF DEVICE AND THE TRANSFORMER CIRCUIT BREAKERS BASED ON CONTRACTOR'S INVESTIGATION OF EXISTING CONDITIONS.
- ALL CIRCUIT BREAKERS SHALL BE BOLT-ON PANEL AND SHALL BE SUITABLE FOR 75 DEGREE AMPACITY CONDUCTORS.
- ELECTRICAL PANELS SHALL BE DEAD FRONT SAFETY TYPE. PANELS SHALL BE MINIMUM 20" WIDE AND 5-3/4" DEEP UNLESS OTHERWISE NOTED.
- ALL ELECTRICAL PANEL BUSSING SHALL BE TIN PLATED ALUMINUM.
- CONDUCTORS OF A MULTI-WIRE BRANCH CIRCUIT SHALL ORIGINATE FROM THE SAME PANELBOARD. THE BRANCH CIRCUIT SHALL BE PROVIDED WITH A MEANS THAT WILL PERMIT THE EASY DISCONNECT OF THE UNGROUNDED CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES.

- "1" PROVIDE LOCK-ON DEVICE.
- "2" PROVIDE LOCK-OFF DEVICE.
- "3" PROVIDE SHUNT TRIP DEVICE.
- "4" PROVIDE GFCI TYPE DEVICE.
- "5" PROVIDE A RED CIRCUIT BREAKER.
- "6" PROVIDE AFCI TYPE DEVICE COMPLYING WITH NEC, OR CEC WHERE ADOPTED, 210.12(A) &(8)
- "7" ROUTE CIRCUIT THRU LIGHTING CONTROL PANEL.
- "8" NEW LOAD IN EXISTING CIRCUIT BREAKER.

**PROJECT No. :1-78-22**  
 3/6/2019 11:47:55 AM

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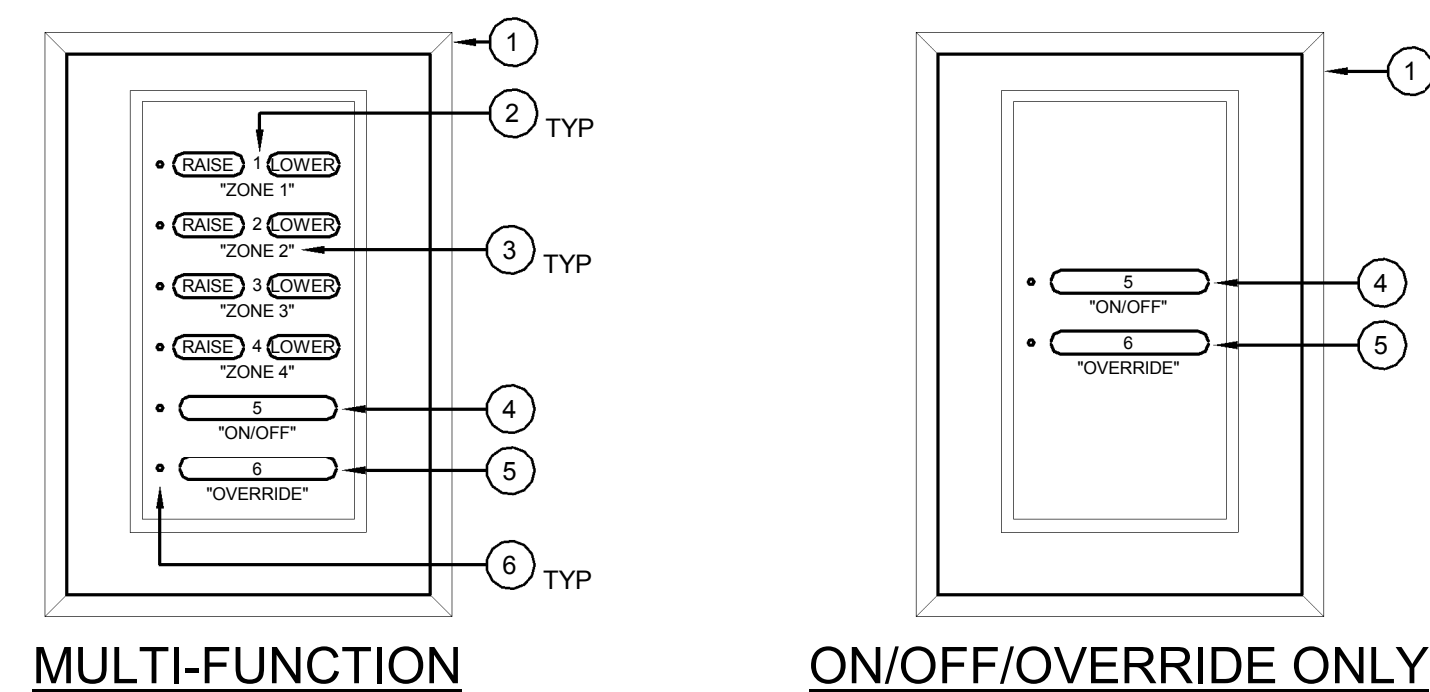


DIAGRAM NOTES:

- 1 TYPICAL PUSHBUTTON STATION SHALL OF SAME MANUFACTURER AS, AND COMPATIBLE WITH, SELECTED OVERALL LIGHTING CONTROL SYSTEM MANUFACTURER. WHERE PUSHBUTTON STATION IS IN ADDITION TO STAND-ALONE DIMMER STATION, IT SHALL FUNCTION ONLY AS 2-HR OVERRIDE AND CONTAIN ONE BUTTON. WHERE PUSHBUTTON STATION IS TO FUNCTION AS 2-HR OVERRIDE AND LOCAL CONTROL, IT SHALL CONSIST OF TWO-BUTTONS PER "ZONE" FOR "RAISE" AND "LOWER" FUNCTIONS PER ZONE. SEE PLANS FOR ACTUAL LOCATIONS AND QUANTITIES. ELECTRICAL CONTRACTOR TO INCLUDE PUSHBUTTON CONTROL WIRE ROUTING IN AS-BUILT DOCUMENTATION.  
"NUMBER OF BUTTONS PER SCHEDULE."  
"BUTTON AND PLATE COVER COLORS BY ARCHITECT OR INTERIOR DESIGNER."
- 2 PUSHBUTTON POSITION IDENTIFICATION, SHOWN FOR REFERENCE ONLY. REFER TO PUSHBUTTON SCHEDULE FOR ASSIGNED CONTROL DESIGNATION.
- 3 ENGRAVING TO BE INCLUDED WITH PUSHBUTTON, WITH LABELING SPECIFIC TO THE ZONE CONTROLLED AS INDICATED IN PUSHBUTTON SCHEDULE, UNLESS OTHERWISE NOTED.
- 4 MASTER ON/OFF BUTTON TO CONTROL ON/OFF OPERATION OF ALL BUTTONS WITHIN THIS PUSHBUTTON STATION ONLY.
- 5 CEC TITLE 24 REQUIRED 2-HOUR OVERRIDE BYPASS BUTTON. REFER TO PUSHBUTTON SCHEDULE FOR ZONES TO BE OPERATED BY THIS BYPASS BUTTON. LIGHTS CONTROLLED BY THIS PUSHBUTTON TO "FLASH" OR PROVIDE OTHER MEANS OF NOTIFICATION PRIOR TO TURNING OFF.
- 6 LED INDICATOR LIGHT.

NOTES:

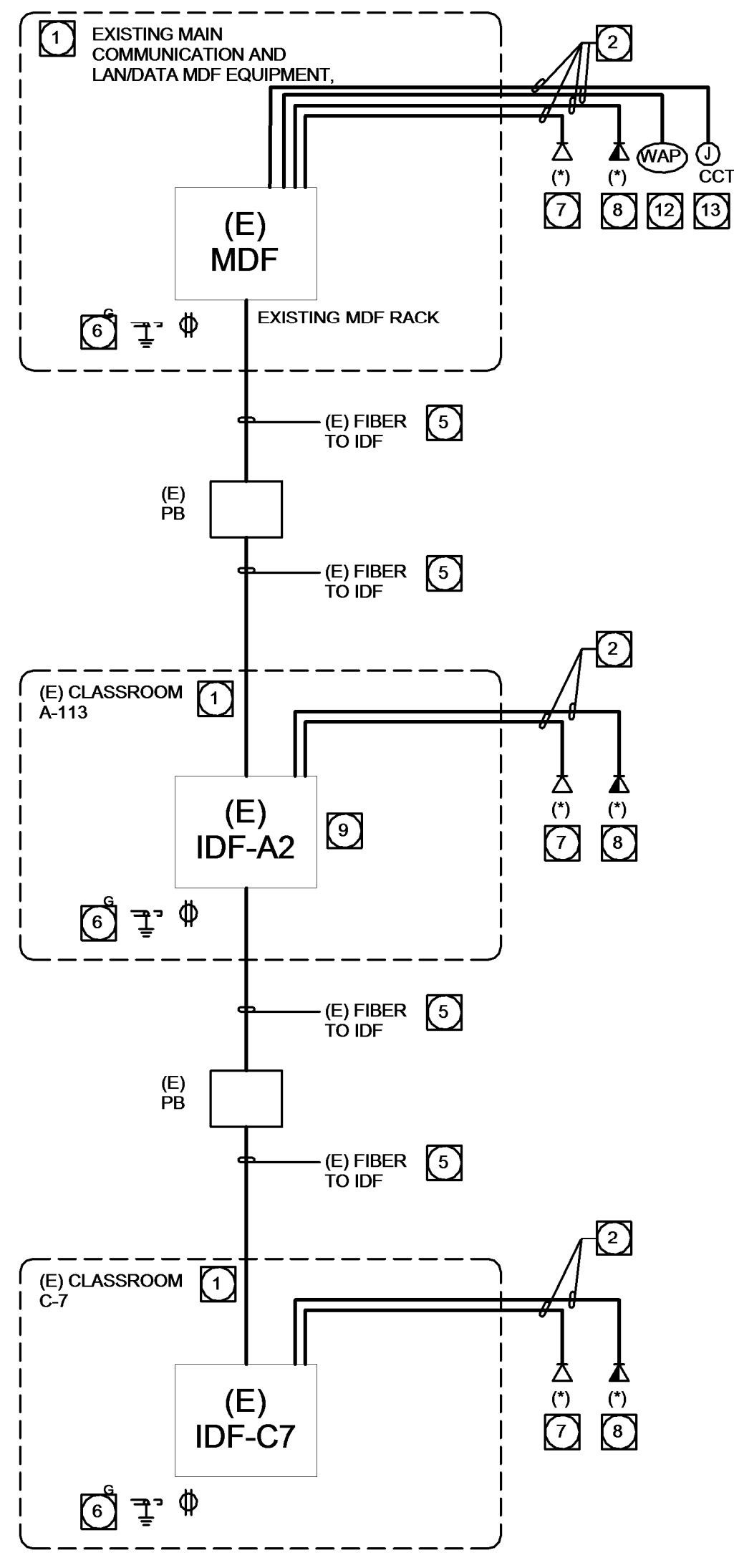
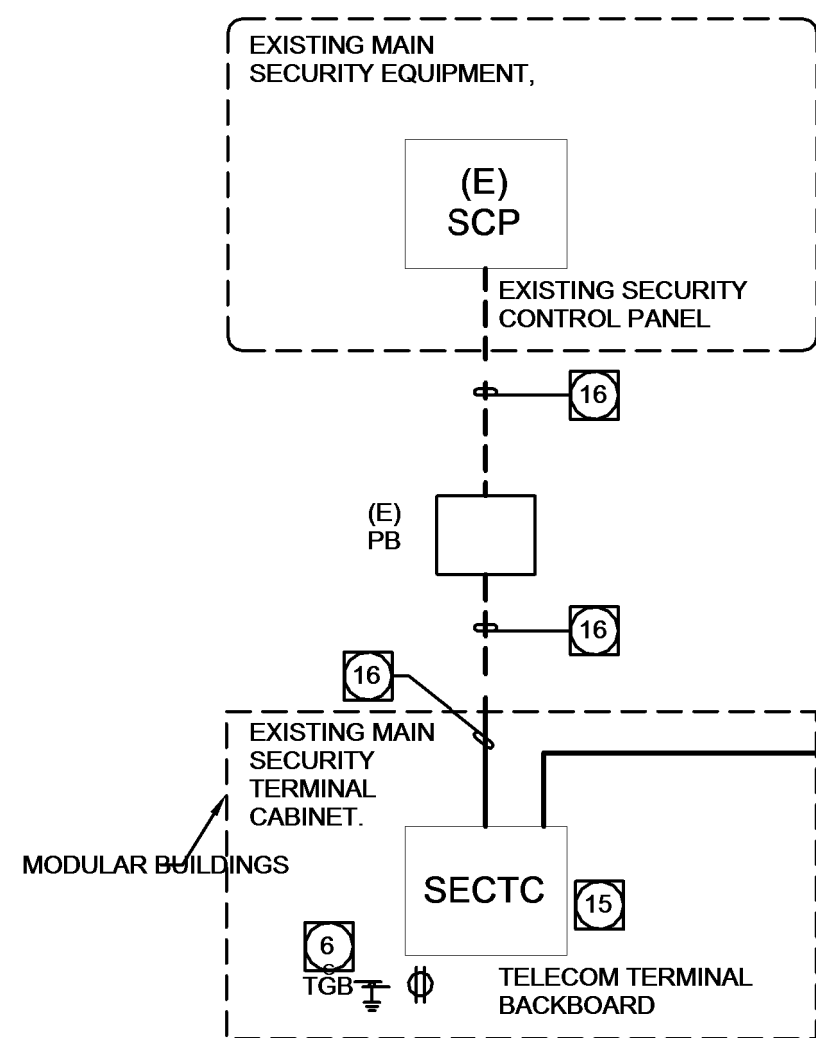
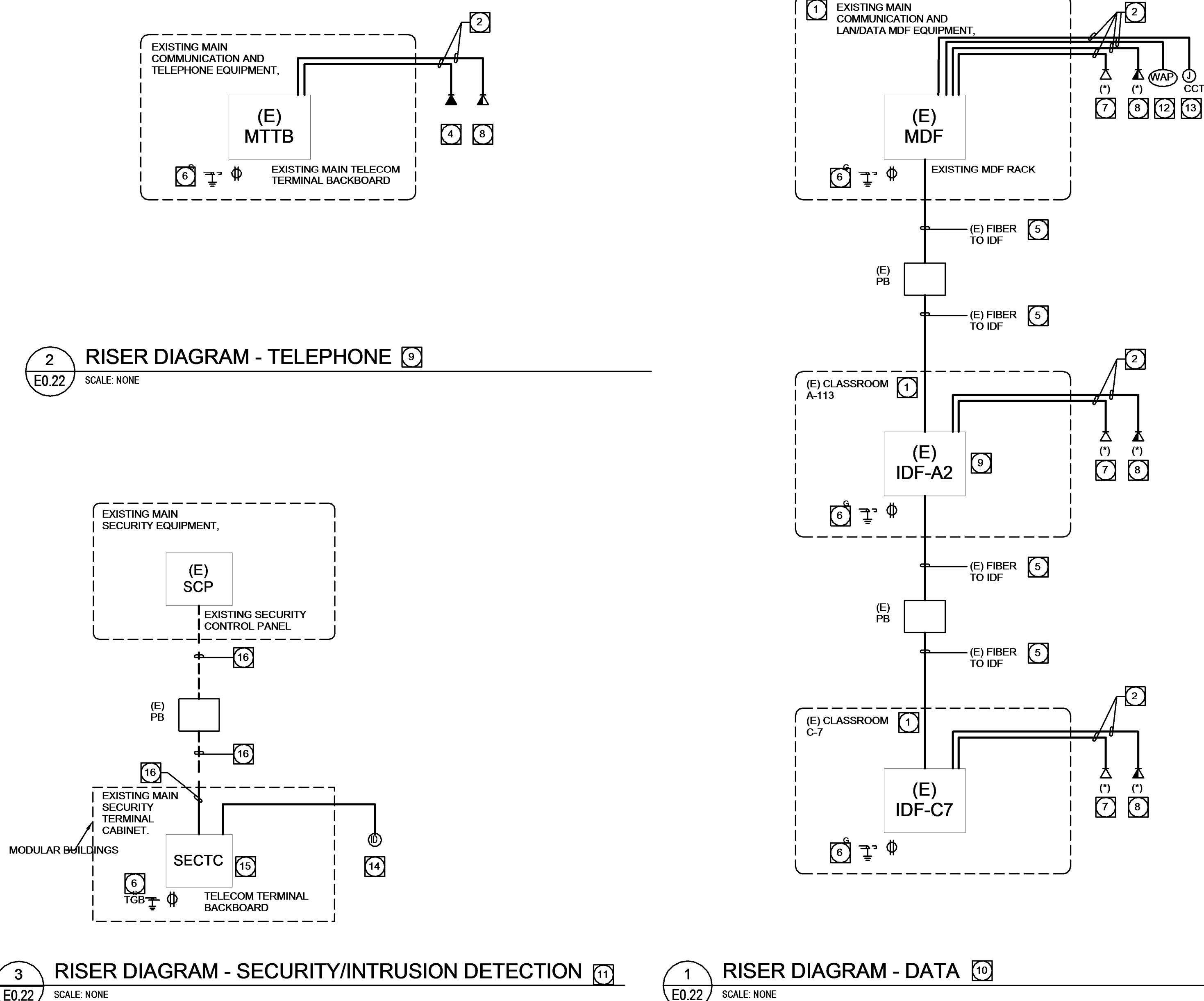
- PROVIDE PUSHBUTTON STATIONS AS REQUIRED TO ACCOMMODATE NUMBER OF BUTTONS / ZONES SHOWN. WHEN MULTIPLE STATIONS ARE REQUIRED DUE TO MANUFACTURER SELECTED AND AVAILABLE BUTTON CONFIGURATIONS, LOCATE STATIONS IN MULTI-GANG JUNCTION BOX AND NECESSARY MULTI-GANG FACEPLATE.
- DO NOT PROVIDE EXCESS OR INOPERABLE "DUMMY" BUTTONS WHICH ARE NOT NECESSARY WITHIN EACH STATION. STATIONS. PROVIDE ONLY THE NUMBER OF BUTTONS REQUIRED FOR THE ZONES SHOWN AT EACH STATION.

RELAY SCHEDULE			
LCP NAME: LCP-A1			
RELAY #	PANEL NAME	CIRCUIT	CONTROL METHOD
1	-	#	PC-ON, TC-OFF
2			LOAD DESCRIPTION
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

PUSHBUTTON SCHEDULE			
SWITCH/BUTTON CONTROL ID	POSITION	ZONE	RELAY(s) CONTROLLED
PB1	1	ON/OFF	PANEL - CIRCUITS
	2	VERRIDE	PANEL - CIRCUITS

## PLAN NOTES

1




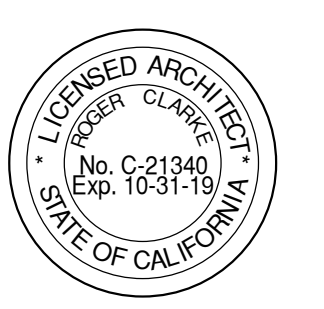
## GENERAL NOTES

1. FOR CLARITY, ONLY ELECTRICAL FACILITIES SPECIFICALLY-RELEVANT TO THE SCOPE OF WORK ARE SHOWN.

## KEY NOTES

- 1 EXISTING MDF/IDF RACK/CABINET TO REMAIN PROTECT IN PLACE. CONTRACTOR SHALL PROVIDE NECESSARY EQUIPMENT. (PATCH PANELS, CABLEING, PATCH CORDS, WIRE MANAGEMENT, ETC.) FOR ADDITION OF NEW DATA DROPS.
- 2 ROUTE NEW CABLEING THRU ACCESSIBLE CECILING, WHERE NO ACCESSIBLE CECILING FOUND/CONDUIT.
- 3 NOT USED.
- 4 EXISTING TELEPHONE FIELD DEVICE LOCATION. REPLACE EXISTING FIELD RJ11 JACK WITH NEW RJ45 JACK TERMINATED ON EXISTING CAT6A CABLE. DISCONNECT EXISTING CAT6A CABLE FROM TERMINAL BLOCKS AND INSTALL RJ45 JACK AND EXTEND EXISTING CABLE UTILIZING EXISTING INSTALLED SERVICE LOOPS WITH PATCH PANELS WITH EXTENDING CECILING. TYPICAL. \*\*\* INDICATES QUANTITY OF DATA CABLES AS INDICATED ON PLANS. PROVIDE OUTLET, COLOR AND COLORS AND PATCH PANEL LABELING IN ACCORDANCE WITH DISTRICT STANDARDS.
- 5 EXISTING DATA/LAN FIBER CABLE BACKBONE TO REMAIN. PROTECT IN PLACE.
- 6 EXISTING 120V/20A POWER RECEPTACLES AT IDF DATA EQUIPMENT RACK AND EXISTING GROUND/BOND CONDUCTOR CONNECTION TO THE TELECOM GROUNDING BUSBAR SHOWN TO REMAIN PROTECT IN PLACE.
- 7 PROVIDE (1) (COLOR) RJ-45 CAT 6A DATA CONNECTOR/OUTLETS AT ALL LOCATIONS SHOWN IN THE SITE AND BUILDING PLANS, INCLUDING HOMERUN (COLOR)-JACKETED CAT 6A CABLEING TO PATCH PANELS IN THE DATA EQUIPMENT RACK. THE SITE AND BUILDING PLANS, INCLUDING HOMERUN (2) CAT 6A CABLEING TO PATCH PANELS IN THE IDF DATA EQUIPMENT RACK INDICATED, TYPICAL. PROVIDE 10' CABLE SERVICE LOOP ABOVE CECILING FOR EACH CABLE. ALL CABLEING AND COLOR PER DISTRICT STANDARDS.
- 8 PROVIDE (2) CAT6A CABLES. (1) SHALL BE PER PLAN NOTE 4 AND (1) SHALL BE PER PLAN NOTE 7.
- 9 TELEPHONE SYSTEM EQUIPMENT/DEVICES AND CABLEING (INCLUDING VENDOR/INSTALLER QUALIFICATIONS) FOR NEW SYSTEM EXPANSION SHALL BE PER DISTRICT/CAMPUS-STANDARD.
- 10 DATA SYSTEM EQUIPMENT/DEVICES AND CABLEING (INCLUDING VENDOR/INSTALLER QUALIFICATIONS) FOR EXISTING SYSTEM EXPANSION SHALL BE DISTRICT STANDARDS.
- 11 SECURITY/INTRUSION SYSTEM EQUIPMENT/DEVICES AND CABLEING (INCLUDING VENDOR/INSTALLER QUALIFICATIONS) FOR EXISTING SYSTEM EXPANSION SHALL BE DISTRICT STANDARD.
- 12 PROVIDE A DEDICATED WIRELESS ACCESS POINT ("WAP") CAT 6A DATA CONNECTOR/OUTLET AT EACH LOCATION SHOWN IN THE SITE AND BUILDING PLANS, INCLUDING HOMERUN (2) CAT 6A CABLEING TO PATCH PANELS IN THE IDF DATA EQUIPMENT RACK INDICATED, TYPICAL. PROVIDE 10' CABLE SERVICE LOOP ABOVE CECILING FOR EACH CABLE. ALL CABLEING AND COLOR PER DISTRICT STANDARDS.
- 13 PROVIDE 3/4" C. W/ PULL STRING FROM CCTV JUNCTION BOX TO MDF/IDF, FOR FUTURE CCTV CAMERA.
- 14 PROVIDE DUAL-TECHNOLOGY (ULTRASONIC/INFRARED) MOTION SENSORS AT ALL INDOOR LOCATIONS SHOWN IN THE SITE AND BUILDING PLANS, INCLUDING HOMERUN 48-16 CABLEING TO THE TERMINAL CABINETS INDICATED, TYPICAL. DEVICE AND CABLE PER CAMPUS STANDARD FOR EXTENSION OF EXISTING SYSTEM.
- 15 SECURITY SYSTEM TERMINAL CABINET COMPLETE WITH BACKPANEL, TERMINATION FIELDS, SYSTEM MODULES AND CONNECTIONS FOR EXISTING SYSTEM EXPANSION.
- 16 PROVIDE SECURITY NETWORK/TRUNK CABLE TO SECURITY TERMINAL CABINET: 12C/18R SHIELDED, UNIDIRECTIONAL, 100MHZ OF LOCATION, WESTPENN ACC3283 OR APPROVED EQUAL. ALL CABLE TO BE PER DISTRICT STANDARDS.

File No: 36-55  
IDENTIFICATION STAMP  
DIV OF THE STATE ARCHITECT  
OFFICE OF REGULATION SERVICES  
**04-117672**  
AC \_\_\_\_\_ FLS \_\_\_\_\_ SS \_\_\_\_\_  
DATE \_\_\_\_\_



**OMB ELECTRICAL ENGINEERS, INC.**  
 8825 Research Drive  
 Irvine, CA 92618  
 (949) 753-1553 Fax (949) 753-1992  
 E-Mail: [mail@ombengrs.com](mailto:mail@ombengrs.com)

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## ADMIN. ADDITION & MODERNIZATION

**NORTH PARK ELEMENTARY SCHOOL**  
**5378 NORTH 'H' STREET, SAN BERNARDINO, CA 92407**  
**SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT**

**PROJECT No. :1-78-22**  
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ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION
ISSUE No.	DATE	DESCRIPTION	1	02/08/2018	Addendum #1
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## LIGHTING CONTROL RELAY SCHEDULES

# E0.22

1-78-2



<b>STATE OF CALIFORNIA</b> <b>INDOOR LIGHTING</b> <small>REGULATORY DIVISION</small>		 <b>CALIFORNIA ENERGY COMMISSION</b>
<b>CERTIFICATE OF COMPLIANCE</b> Indoor Lighting		<b>NRCC 101-01</b> (Page 1 of 1)
Project Name: <b>North Park Elementary School Modernization</b>		Date Prepared: <b>1/12/2019</b>

<b>A. General Information</b>			
Climate Zone:	Conditioned Floor Area: <b>4,508</b>		
	Unconditioned Floor Area: <b>0</b>		
Building Type:	<input type="checkbox"/> <b>1</b> Residential <input type="checkbox"/> <b>2</b> Nonresidential Public Schools <input type="checkbox"/> <b>3</b> High-Rise Residential	<input type="checkbox"/> <b>4</b> Hotels/Motels <input type="checkbox"/> <b>5</b> Unconditioned Spaces	
<input type="checkbox"/> <b>6</b> Schools <input type="checkbox"/> <b>7</b> New Construction <input type="checkbox"/> <b>8</b> Complete Building	<input type="checkbox"/> <b>9</b> Conditioned Spaces <input type="checkbox"/> <b>10</b> Addition <input type="checkbox"/> <b>11</b> Tailored		
Method of Construction:			
Project Address: <b>5378 North 11<sup>th</sup> Street</b>			


  

<b>B. Lighting Compliance Documents</b> (select yes for each document included)			
<i>For detailed instructions on the use of this and the Energy Efficiency Standards compliance documents, refer to the Nonresidential Manual published by the California Energy Commission.</i>			
YES	NO	COMP. DOC.	TITLE
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRCC-11A-05	Certificate of Compliance - All Pages required on plans for all buildings.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRCC-11A-06	Lighting Controls, Certificate of Compliance, and FPL Calculations. All Pages required on plans for all buildings.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	NRCC-11A-07	Indoor Lighting Power Allowance
<input type="checkbox"/>	<input type="checkbox"/>	NRCC-11A-08	Tailored Method Workbooks
<input type="checkbox"/>	<input type="checkbox"/>	NRCC-11A-09	Line Voltage Track Lighting Workbooks
<input type="checkbox"/>	<input type="checkbox"/>	NRCC-11A-10	Indoor Lighting Existing Conditions

**STATE OF CALIFORNIA**  
**INDOOR LIGHTING**  
ENERGY EFFICIENCY ACT (Title 20, Chapter 4.2, California Public Resources Code)

**CERTIFICATE OF COMPLIANCE**  
 Indoor Lighting

Project Name: **North Park Elementary School Modernization**



CALIFORNIA ENERGY COMMISSION

**NRCC-LTH-01-01**  
(page 2 of 2)

**A Separate Lighting Schedule Must Be Filled Out for Conditioned and Unconditioned Spaces. Installed Lighting Power listed on this Lighting Schedule is only for:**

**□ UNCONDITIONED SPACE**      **□ UNCONDITIONED SPACE**

Date prepared: **1/21/2019**

**H. Indoor Lighting Schedule and Field Inspection Energy Checklist**

Uninsulated Space		Insulated Watts						Location		Field Inspector <sup>1</sup>	
G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	Pass	Fail
<small>Name tag</small>	<small>Complete Narrative Description (i.e., 4' x 4' Fluorescent troffer, T32FL, one dimmable electronic ballast)</small>	<small>Watts per foot</small>	<small>How wattage was determined</small>	<small>Watts per foot</small>	<small>Watts per foot</small>	<small>Watts per foot</small>	<small>Watts per foot</small>	<small>Watts per foot</small>	<small>Primary Function Area in which these luminaires are installed</small>		
		<small>Watts per foot (W/ft)</small>	<small>Watts per foot (W/ft)</small>	<small>Watts per foot (W/ft)</small>	<small>Watts per foot (W/ft)</small>	<small>Watts per foot (W/ft)</small>	<small>Watts per foot (W/ft)</small>	<small>Watts per foot (W/ft)</small>	<small>Watts per foot (W/ft)</small>		
A	A-2"x2" Receased Led Direct/Indirect Fixture	28.0	□	□	2	116	Office <= 250 sqft	□	□		
A	A-2"x2" Receased Led Direct/Indirect Fixture	28.0	□	□	9	261	Office <= 250 sqft	□	□		
A	A-2"x2" Receased Led Direct/Indirect Fixture	28.0	□	□	7	203	Convention/Conference/Meeting	□	□		
B	B-4'x4' LED Direct/Indirect Fixture	29.0	□	□	4	116	Medical and Office	□	□		
B	B-4'x4' LED Direct/Indirect Fixture	30.0	□	□	32	960	Conductor/Restroom/Janitor	□	□		
C	C-4'x4' Under Cabinet Light	22.0	□	□	6	132	Office <= 250 sqft	□	□		
D	D-4'x4' RECESSED LED FIXTURE	28.0	□	□	3	84	Office <= 250 sqft	□	□		
D	D-6' RECESSED LED FIXTURE	28.0	□	□	6	140	Conductor/Restroom/Janitor	□	□		
E	E-6" LED Downlight	21.0	□	□	2	42	Medical and Clinical Care	□	□		

INSTALLED WATTS PAGE 2

2,054

Enter sum total of all pages into NRCC-LTH-01-01 Page 2

CA Building Energy Efficiency Standards – 2016 Nonresidential Compliance

April 2016

STATE OF CALIFORNIA <b>INDOOR LIGHTING – LIGHTING CONTROLS</b> CERTIFICATE OF COMPLIANCE DECLARATION OF COMPLIANCE Indoor Lighting - Lighting Controls		CALIFORNIA ENERGY COMMISSION  NRCC-LTH-14-01 (Page 2 of 3)
Project Name: <b>North Park Elementary School Modernization</b>	Date Reported: <b>1/21/2019</b>	

A separate document must be filled out for Conditioned and Unconditioned Spaces. This page is used only for the following:

- ☒ CONDITIONED SPACES      ☐ UNCONDITIONED SPACES

**B. Mandatory and Prescriptive Indoor Lighting Control Schedule, PAF Calculation, and Field Inspection Checklist**

Lighting Control Schedule		Standards Complying With: <sup>1</sup> (✓ if all that apply, or enter "E" if Exempted)										PAF Credit Calculation <sup>4</sup>		Field Inspector
												Wired or Controlled by lighting	PAF Credit Calculation (See L1)	
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Location in Building	Type/Description of occupancy control (i.e.: occupancy sensor, automatic time switch, timer, electronic dimming, etc.)	# of Units	(130.10)(a)	(130.10)(b)	(130.10)(c)	(130.10)(d)	(130.10)(e)	(130.10)(f)	(130.10)(g)	(130.10)(h)	(130.10)(i)	✓ / Acceptance or True Rejected		
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			Pas
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			Fai
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			D
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			D
<b>Control Credits PAGE TOTAL (Sum of Column 13):</b>												<b>0</b>		
<b>IF MULTIPLE PAGES ARE USED, ENTER SUM TOTAL OF Control Credits for all pages HERE! (Sum of Column 13):</b>														

1. § 130.10(a) = Manual area controls; § 130.10(b) = Multi-Level; § 30.10(c) = Auto Shut-Off; § 130.10(d) = Mandatory Daylight; § 130.10(e) = Demand Response; § 140.6(f) = Additional lighting controls installed to earn a PAF; § 140.6(g) = Prescriptive Secondary Safety Daylight Controls.

2. Check Table 140.6-A for percent Factor. PAFs shall not be traded between conditioned and unconditioned spaces. As a condition to earn a PAF, an installation Certificate is also required to be filed, not signed and submitted.


Enter Control Credits total into NRCC-LTH-01-01, Page 1

[illegible]

<div style="display: flex; justify-content: space-between;"> <div> <b>STATE OF CALIFORNIA</b>  <b>NIGHT LIGHTING</b>  <small>(NIGHT-TITLE-REVISION-001)</small> </div> <div> <small>CELESTRA ENERGY CORPORATION</small>  <b>NRC-11-03-05</b>  <small>(Page 1 of 2)</small> </div> </div>	
<b>CERTIFICATE OF COMPLIANCE</b> <small>Original Lighting</small>	
<b>Project Name:</b> North Park Elementary School Modernization	
<b>Date Entered:</b> 1/27/2019	
<b>C. Summary of Allocated Lighting Power</b> Conditioned and Unconditioned space lighting must not be combined for compliance	
<b>Indoor Lighting Power for Conditioned Spaces</b>	
	<div style="display: flex; justify-content: space-between;"> <span>Installed Lighting NRC-11-03-05, Table B, Office 2</span> <span>Watts</span> </div>
01	<div style="display: flex; justify-content: space-between;"> <span>Portable Only, for Office 2</span> <span>+ 4,651</span> </div>
02	<div style="display: flex; justify-content: space-between;"> <span>Minus Lighting Control Credits NRC-11-03-05, Table 4, page 2</span> <span>+ 0</span> </div>
<b>03</b> <b>Minus Lighting Control Credits</b> <b>NRC-11-03-05, Table 4, page 2</b>	
04	<div style="display: flex; justify-content: space-between;"> <span>Adjusted Installed Lighting Power (from 1 minus row 2 minus row 3)</span> <span>= 4,651</span> </div>
<b>Complex 001 of Installed / Allowed (Box 04 = Box 05)</b>	
<b>Allowed Lighting Power</b> Conditioned NRC-11-03-05, page 1	
05	<div style="display: flex; justify-content: space-between;"> <span>4,660</span> </div>
Alterations with replacement luminaires that have at least 50/55% lower power compared to the original existing luminaires, may verify from the allocated watts to the allowed watts per NRC-11-05, page 2.	
<b>Indoor Lighting Power for Unconditioned Spaces</b>	
	<div style="display: flex; justify-content: space-between;"> <span>Installed Lighting NRC-11-03-05, Table B, Office 2</span> <span>Watts</span> </div>
<b>06</b> <b>Minus Lighting Control Credits</b> <b>NRC-11-03-05, Table 4, page 2</b>	
<b>Adjusted Installed Lighting Power</b> <b>(from 1 minus row 2)</b>	
<b>Complex 001 of Installed / Allowed (Box 04 = Box 05)</b>	
<b>Allowed Lighting Power</b> Unconditioned NRC-11-03-05, page 1	
Alterations with replacement luminaires that have at least 50/55% lower power compared to the original existing luminaires, may verify from the allocated watts to the allowed watts per NRC-11-05, page 2.	

<b>STATE OF CALIFORNIA</b> <b>INCOR Lighting</b> <small>INCOR Lighting is a registered company</small>			<b>CALIFORNIA ENERGY COMMISSION</b> <b>NRC 111-01-01</b> <small>Page 1 of 1</small>						
<b>CERTIFICATE OF COMPLIANCE</b> Indoor Lighting									
Project Name: <b>North Park Elementary School Modernization</b>		Date Received: <b>1/21/2019</b>							
A Separate Lighting Schedule Must Be Filled Out For Conditioned and Unconditioned Spaces. Installed Lighting Power listed on this Lighting Schedule is only for: <input checked="" type="checkbox"/> <b>CONDITIONED SPACE</b> <input type="checkbox"/> <b>UNCONDITIONED SPACE</b>									
<b>A. Indoor Lighting Schedule and Field Inspection Energy Checklist</b>									
Luminaire Schedule		Installed Watts				Location	Field Inspector <sup>1</sup>		
01	02	03	04	05	06	07	08	09	
Name or Type of	Complete Luminaire Description (e.g., 4' x 8' Troffer fluorescent fixture, T321L, one dimmable electronic ballast)	Watts per luminaire	Watts per luminaire (if different from 03)	Watts per luminaire (if different from 03)	Watts per luminaire (if different from 03)	Watts per luminaire (if different from 03)	Primary Function Area in which these luminaires are installed	Pass	Fail
			How wattage was determined						
E	E- 6" LED Downlight	21.0	<input type="checkbox"/>	<input checked="" type="checkbox"/> 5	105	Corridor/Recessed/Support	<input type="checkbox"/>	<input type="checkbox"/>	
E	E- 6" LED Downlight	21.0	<input type="checkbox"/>	<input checked="" type="checkbox"/> 12	252	Office > 250 sq ft	<input type="checkbox"/>	<input type="checkbox"/>	
G-2	G- 2" CABLE HUNG LED FIXTURE	29.0	<input type="checkbox"/>	<input checked="" type="checkbox"/> 6	156	Convention/Conference/Meeting	<input type="checkbox"/>	<input type="checkbox"/>	
G-3	G- 3" CABLE HUNG LED FIXTURE	39.0	<input type="checkbox"/>	<input checked="" type="checkbox"/> 5	195	Convention/Conference/Meeting	<input type="checkbox"/>	<input type="checkbox"/>	
G-4	G- 4" CABLE HUNG LED FIXTURE	52.0	<input type="checkbox"/>	<input checked="" type="checkbox"/> 1	52	Convention/Conference/Meeting	<input type="checkbox"/>	<input type="checkbox"/>	
H-3	H- 3" CABLE HUNG LED FIXTURE	17.0	<input type="checkbox"/>	<input checked="" type="checkbox"/> 6	102	Office > 250 sq ft	<input type="checkbox"/>	<input type="checkbox"/>	
H-4	H- 4" CABLE HUNG LED FIXTURE	19.0	<input type="checkbox"/>	<input checked="" type="checkbox"/> 6	114	Lobby	<input type="checkbox"/>	<input type="checkbox"/>	
H-5	H- 6" CABLE HUNG LED FIXTURE	28.0	<input type="checkbox"/>	<input checked="" type="checkbox"/> 2	28	Corridor/Recessed/Support	<input type="checkbox"/>	<input type="checkbox"/>	
INSTALLED WATTS PAGE TOTAL					1,397	Enter sum total of all pages into NRC111-01-01 Page 2			

California Energy Efficiency Standards - 2016 Nonresidential Compliance		April 2018
<p><b>STATE OF CALIFORNIA</b></p> <p><b>INDOOR LIGHTING – LIGHTING CONTROLS</b></p> <p>CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance          Indoor Lighting – Lighting Controls          MS-C-12-01-02  <b>(Page 3 of 2)</b></p>		
<p><b>North Park Elementary School Modernization</b></p> <p style="text-align: right;">Last Modified: 1/21/2018</p>		
<p><b>CERTIFICATION AUTHORITY'S DECLARATION STATEMENT</b></p> <p>I hereby declare that this Certificate of compliance documentation is accurate and complete.</p> <p style="text-align: right;">I am the:</p> <p>Signature: _____          Name: Benjamin Benitez          Title: CM          Company: BMC Electrical Engineers, Inc.          Address: 6555 Research Dr.          City: Irvine, CA 92618          Phone: 949-753-1553</p>		
<p><b>RESPONSIBLE PERSON'S DECLARATION STATEMENT</b></p> <p>I affirm the following under penalty of perjury, under the laws of the State of California:</p> <ul style="list-style-type: none"> <li>a) The information provided on this Certificate of Compliance is true and correct;</li> <li>b) I have taken all reasonable steps to ensure the accuracy or correct representation of the building design or system identified on this Certificate of Compliance;</li> <li>c) The energy efficiency and performance specifications, materials, components, and manufactured devices for the building design or system designed on this Certificate of Compliance conforms to the requirements of Title 24, Part 6 and Part 6 of the California Code of Regulations;</li> <li>d) The energy efficiency features and design features identified on this Certificate of Compliance are consistent with the information provided on and other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.</li> </ul> <p>I understand that if the project does not comply with the California Code of Regulations as made available with the building permit(s) issued for the building, and may be subject to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building official at occupancy.</p> <p style="text-align: right;">Responsible Person Signature: _____          Date Signed: 1/21/2018</p> <p>Signature: _____          Name: Ryan Lopez          Title: Project Manager          Company: BMC Electrical Engineers, Inc.          Address: 4140 Tanager Canyon Rd, Suite 308          City: Corona, CA 92623          Phone: 949-753-1553</p>		

<b>Building Energy Efficiency Standards - 2014 Nonresidential Compliance</b>		January 2018
<b>STATE OF CALIFORNIA</b> <b>INDOOR LIGHTING POWER ALLOWANCE</b> (CALIFORNIA ENERGY COMMISSION)		
<b>CERTIFICATE OF COMPLIANCE</b> Certificate of Compliance - Indoor Lighting Power Allowance (California Energy Commission)		<b>CALIFORNIA ENERGY COMMISSION</b>  NCCCLT-13-01-0 (Page 4 of 4)
Project Name: North Park Elementary School Modernization		Month/Year: 1/21/2019
<b>DOCUMENTATION AUTHOR'S DECLARATION STATEMENT</b> I, _____, certify that this Certificate of Compliance documentation is accurate and complete.		
Documentation Author Name: _____		
Address: 8525 Benjamin Blvd. City: OAKLAND (Electrical Engineering, Inc.)		
Phone: 949-725-8934		Documentation Author Signature:  Signature Date: 1/21/2019
Address: 8525 Benjamin Blvd. City: OAKLAND (Electrical Engineering, Inc.)		(UA Certificate Identification or equivalent)
Phone: 949-725-8934		(UA Certificate Identification or equivalent)
<b>RESPONSIBLE PERSON'S DECLARATION STATEMENT</b> I certify the following under penalty of perjury, under the laws of the State of California:		
1. The information provided on this Certificate of Compliance is true and correct. 2. I am a legal resident of the State of California and I am the owner or authorized agent of the building design or system design identified on this Certificate of Compliance. 3. The energy efficiency and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 2 and Part 6 of the California Code of Regulations. 4. The energy efficiency and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance are consistent with the information provided on this applicable compliance certificate. 5. I ask my contractor to complete the project in accordance with the information provided for approval with this building permit application. 6. I ask my contractor to complete the project in accordance with the information provided for approval with this building permit application. 7. I ask my contractor to complete the project in accordance with the information provided for approval with this building permit application.		
I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the building owner provides to the building owner or architect.		
Signature: _____ Title: _____		
Date: _____		
Signature: _____ Title: _____		
Date: _____		
Address: 4150 North Canyon Rd., Suite 308 City: Corona, CA 92683		
Phone: 949-725-8934		1/21/2019 13442
Address: 4150 North Canyon Rd., Suite 308 City: Corona, CA 92683		Phone: 949-725-8934

STATE OF CALIFORNIA <b>INDOOR LIGHTING</b> <small>(CALIFORNIA E-ENERGYSTAR)</small> <hr/> <b>CERTIFICATE OF COMPLIANCE</b> <hr/> Indoor Lighting Project Name:   North Park Elementary School Modernization	<div style="text-align: right;"><small>CALIFORNIA ENERGY COMMISSION</small></div> <div style="text-align: right;"><b>NREL-LT-01-01</b></div> <div style="text-align: right;">(Page 3 of 3)</div> <hr/> Date Prepared:   1/21/2019
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<b>I. Declaration of Required Certificates of Acceptance</b> Declare by electing yes or no if all the Certificates that will be submitted. (Retain copies and verify forms are completed and signed.)			
YES	NO	Compliance Document/Title	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRLCA-LTH-02-A - Must be submitted for occupancy sensors and automatic time switch controls.	<input type="checkbox"/> Field Inspector
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRLCA-LTH-03-B - Must be submitted for automatic daylight controls.	<input type="checkbox"/> Field Inspector
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRLCA-LTH-04-A - Must be submitted for demand responsive lighting controls.	<input type="checkbox"/> Field Inspector
<input type="checkbox"/>	<input checked="" type="checkbox"/>	NRLCA-LTH-05-A - Must be submitted for institutional tunnel power adjustment factor (IAU).	<input type="checkbox"/> Field Inspector

A Separate Lighting Schedule Must Be Filled Out for Conditioned and Unconditioned Spaces. Installed Lighting Power listed on this Lighting Schedule is only for:

☐ CONDITIONED SPACE      ☐ UNCONDITIONED SPACE

<b>F. Indoor Lighting Schedule and Field Inspection Energy Checklist</b>  1) The actual indoor lighting power listed on the next 2 pages includes all installed permanent and planned portable lighting systems. 2) When Complete Building Methods is used for compliance, all such different type of luminaires on separate lines. 3) When California Electrical Mechanical Institute is used for compliance, list each different type of luminaire by its complete function name and lamp specification. 4) Also include lighting fixture in schedule, and submit the track lighting compliance document (NREL-LT-05-15) when line-voltage track lighting is installed.
--

STATE OF CALIFORNIA <b>INDOOR LIGHTING</b> (PUBLIC UTILITIES CODE, SECTION 85500)		CALIFORNIA ENERGY COMMISSION 
<b>CERTIFICATE OF COMPLIANCE</b> Indoor Lighting		NRC 12-01-01 (Page 6 of 6)
Project Name: North Park Elementary School Modernization		Date Prepared: 12/21/2019
<b>DOCUMENTATION AUTHORITY'S DECLARATION STATEMENT</b> I, hereby, that this certificate of Compliance documentation is accurate and complete. Declaration Authority Name: Benjamin Berleze Company: OMB Electrical Engineers, Inc. Address: 8255 Research drive City/State/Zip: Irvine, CA 92618 Date: 12/21/2019 Signature: CA Declaration Statement ID (if applicable): 946-753-1553		
<b>RESPONSOR'S DECLARATION STATEMENT</b> I, hereby the following under penalty of perjury, under the laws of the State of California: 1. The information provided on this Certificate of Compliance is true and correct. 2. The information provided on this Certificate of Compliance and Provisions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance is complete. 3. The energy modeling and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1, and Part 6 of the California Code of Regulations. 4. The energy modeling and system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculated plans, and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permits issued for the building, and made available to the enforcement agency at applicable requests. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the building permit provider to the building agency at occupancy.		
Company: OMB Electrical Engineers, Inc. Address: 1406 Temescal Canyon Rd. Suite 308 City/State/Zip: Corona, CA 92883		Responsible Declaration Signature: Date Signed: 12/21/2019 Location: 13442 Phone: 946-753-1553

Bulding Energy Efficiency Standards - 2016 Nonresidential Compliance
April 2016

STATE OF CALIFORNIA  
**INDOOR LIGHTING POWER ALLOWANCE**  
 (CALIFORNIA TITLE 24, PART 6.02.05)

**CERTIFICATE OF COMPLIANCE**  
 Certificate of Compliance - Indoor Lighting Power Allowance

Project Name: North Park Elementary School Modernization

CALIFORNIA ENERGY COMMISSION

NRCC-171-03-6  
 (Page 1 of 4)

A separate page must be filled out for Conditioned and Unconditioned Spaces. This page is only for:

☒ CONDITIONED spaces      ☐ UNCONDITIONED spaces

Date Received: 1/21/2019

**A. SUMMARY TOTALS OF LIGHTING POWER ALLOWANCES**

☐ If using Complete Method for compliance, use only the total in column (a) as total allowed building watts.

☐ If using Area Category Method, Tailored Method, or a combination of Area Category and Tailored Method for compliance, use only the total in column (b) as the total allowed building watts.

	(a)	(b)
01. Complete Method Allowed Watts. Documented in section 8 of NRCC171-03-6 (below on this page)		
02. Area Category Method Allowed Watts. Documented in section 3.1 of NRCC171-03-6 (below on this page)	3,460	
03. Tailored Method Allowed Watts. Documented in section 4 of NRCC171-04-6	0	
<b>TOTAL ALLOWED BUILDING WATS. Enter number into correct cell on NRCC171-01, Page 2, Row 1</b>	<b>3,460</b>	

☐ Check here if building contains both conditioned and unconditioned areas.

**B. COMPLETE BUILDING METHOD TOTAL LIGHTING POWER ALLOWANCE**

	01	02	03	04
TYPE OF BUILDING (From I440-6 Table I440-6.B)	WATS PER FT <sup>2</sup>	X	COMPLETE BUILDING AREA	= ALLOWED WATTS
			Total Area	
Total Watts. Enter Total Watts into section A, row 1 (Above on this page)				

**C. 1-A AREA CATEGORY METHOD TOTAL LIGHTING POWER ALLOWANCES**

	Watts
Total from section C-2	3,460
Total from section C-3, 0	
<b>Total Watts. Enter Total Watts into section A, row 2 (Above on this page)</b>	<b>3,460</b>

**For Alterations only - Reduced lighting power option (Total Allowed Watts < 0.65). Enter this value into section A, row 2 (Above on this page).**

[illegible]

DATE OF FORMAL <b>INDOOR LIGHTING – LIGHTING CONTROLS</b> (MANDATORY) (SEE FORM 1001)	<div style="text-align: right;"> </div> <div style="text-align: right; font-weight: bold; font-size: small;">         CALIFORNIA ENERGY COMMISSION       </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CERTIFICATE OF COMPLIANCE</b>          Indoor Lighting – Lighting Controls       </div> <div style="display: flex; justify-content: space-between; align-items: center; margin-top: 10px;"> <div>         Project Name: <b>North Park Elementary School Modernization</b> </div> <div>         Job Number: <b>7-21-2019</b> </div> </div> <div style="text-align: right; margin-top: 10px;">         NRCC 11-51-02          (Page 1 of 2)       </div>	
<b>A. Mandatory Lighting Control Declaration Statements (indicate if the measure applies by checking yes or no below.)</b>		
YES	NO	<b>Control Requirements</b> Lighting that is controlled by self-contained lighting control devices which are certified to the Energy Commission according to the Title 20 Appliance Efficiency Regulations is accordance with Section 110.9. <input type="checkbox"/>
YES	NO	Lighting shall be controlled by a lighting control system or energy management control system in accordance with §110.5. An installation Certificate shall be submitted to the accordance with Section 130.140. <input type="checkbox"/>
YES	NO	One or more Track Lighting Immersed Control Units shall be installed which have been certified to the Energy Commission with §110.9 and §130.0. Additionally, an installation Certificate shall be submitted in accordance with Section 130.140. <input type="checkbox"/>
YES	NO	A Track Lighting Supplementary Occupancy Protection Panel shall be installed in accordance with Section §110.9 and Section 130.0. Additionally, an installation Certificate shall be submitted in accordance with Section 130.140. <input type="checkbox"/>
YES	NO	All lighting controls and equipment shall comply with the applicable requirements in §110.9 and shall be installed in accordance with the manufacturer's instructions in accordance with Section 130.1. <input type="checkbox"/>
YES	NO	All luminaires shall be functionally controlled with manually switched On and Off lighting controls in accordance with Section 130.14a. <input type="checkbox"/>
YES	NO	General lighting shall be separately controlled from all other lighting systems in an area. Floor and wall display, window display, case display, ornamental, and other effects lighting shall be separately controlled on circuits that are 20 amps or less. When track lighting is used, general, display, ornamental, and special effects lighting shall be separately controlled; in accordance with Section 130.14a. <input type="checkbox"/>
YES	NO	The general lighting of any enclosed area 100 square feet or larger, with a connected lighting load that exceeds 0.5 watts per square foot shall meet the installation Certificate control requirements in accordance with Section 130.140. <input type="checkbox"/>
YES	NO	All installed indoor lighting shall be equipped with controls that meet the applicable <b>Track On/Off</b> requirements in Section 130.14c. <input type="checkbox"/>
YES	NO	Lighting in all Daylit Zones shall be controlled in accordance with the requirements in Section 130.16f and daylit zones are shown on the plans. <input type="checkbox"/>
YES	NO	Lighting power in buildings larger than 15,000 square feet shall be capable of being automatically reduced in response to a Demand Responsive Signal in accordance with Section 130.14e. <input type="checkbox"/>
Before an occupancy permit is granted for a newly constructed building or area, or a new lighting system serving a building, area, or site is started for normal use, indoor lighting (including the building, area, or site) shall be certified as meeting the Acceptance Requirements for Automatic Dimming in accordance with Section 130.3.4a. The controls required to meet the Acceptance Requirements include: Automatic daylight controls, code compliant On/Off and Demand Responsive controls.		

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance

January 2018

STATE OF CALIFORNIA  
**INDOOR LIGHTING POWER ALLOWANCE**  
CAL EBC-2016-LTL-E (REVISED 01/18)  
CERTIFICATE OF COMPLIANCE  
Certificate of Compliance: Indoor Lighting Power Allowance

CALIFORNIA ENERGY COMMISSION  
NRCC-LTH-03-A  
[PART 2 OF 2]

Project Name: North Park Elementary School Modernization

Date Received: 1/21/2019

A separate page must be filled out for Conditioned and Unconditioned Spaces. This page is only for:

☒ CONDITIONED spaces      ☐ UNCONDITIONED spaces

**C-2 AREA CATEGORY METHOD GENERAL LIGHTING POWER ALLOWANCE**

☒ Does not include lighting for offices, Portable lighting shall be documented only in Section G of NRCC-LTH-01-E.  
☐ Separately list lighting for each primary function area as defined in §100.1 of the Standards.

AREA CATEGORY (From §100.6 & Table 140.6-C)		G1	G2	G3	G4
Location in Building	Primary Function Area per Table 140.6-C	WATTS PER ft <sup>2</sup>	X	AREA (ft <sup>2</sup> )	= ALLOWED WATTS
Corridor/Restroom/Support	Corridor/Restroom/Support	0.60		2,004	1,202
Office <= 250 sqft	Office <= 250 sqft	1.00		120	120
Lobby	Lobby	0.80		650	520
Office > 250 sqft	Office > 250 sqft	0.75		1,029	772
Convention/Conference/Meeting	Convention/Conference/Meeting	1.20		489	587
HEALTH	Medical and Clinical Care	1.20		216	259
		<b>TOTALS</b>			<b>4,508</b>

Enter sum total Area Category allowed watts into section C-1 of NRCC-LTH-03-A (this compliance document)

**3,460**

Building Energy Efficiency Standards - 2015 Nonresidential Compliance

File No: 36-55

IDENTIFICATION STAMP  
DIV. OF THE STATE ARCHITECT  
OFFICE OF REGULATION SERVICES

04-117672

AC \_\_\_\_\_ FLS \_\_\_\_\_ SS \_\_\_\_\_

DATE \_\_\_\_\_

REGISTERED PROFESSIONAL ENGINEER  
ROY L. LOPEZ  
No. 13442  
Exp. 09/30/18  
ELECTRICAL  
STATE OF CALIFORNIA

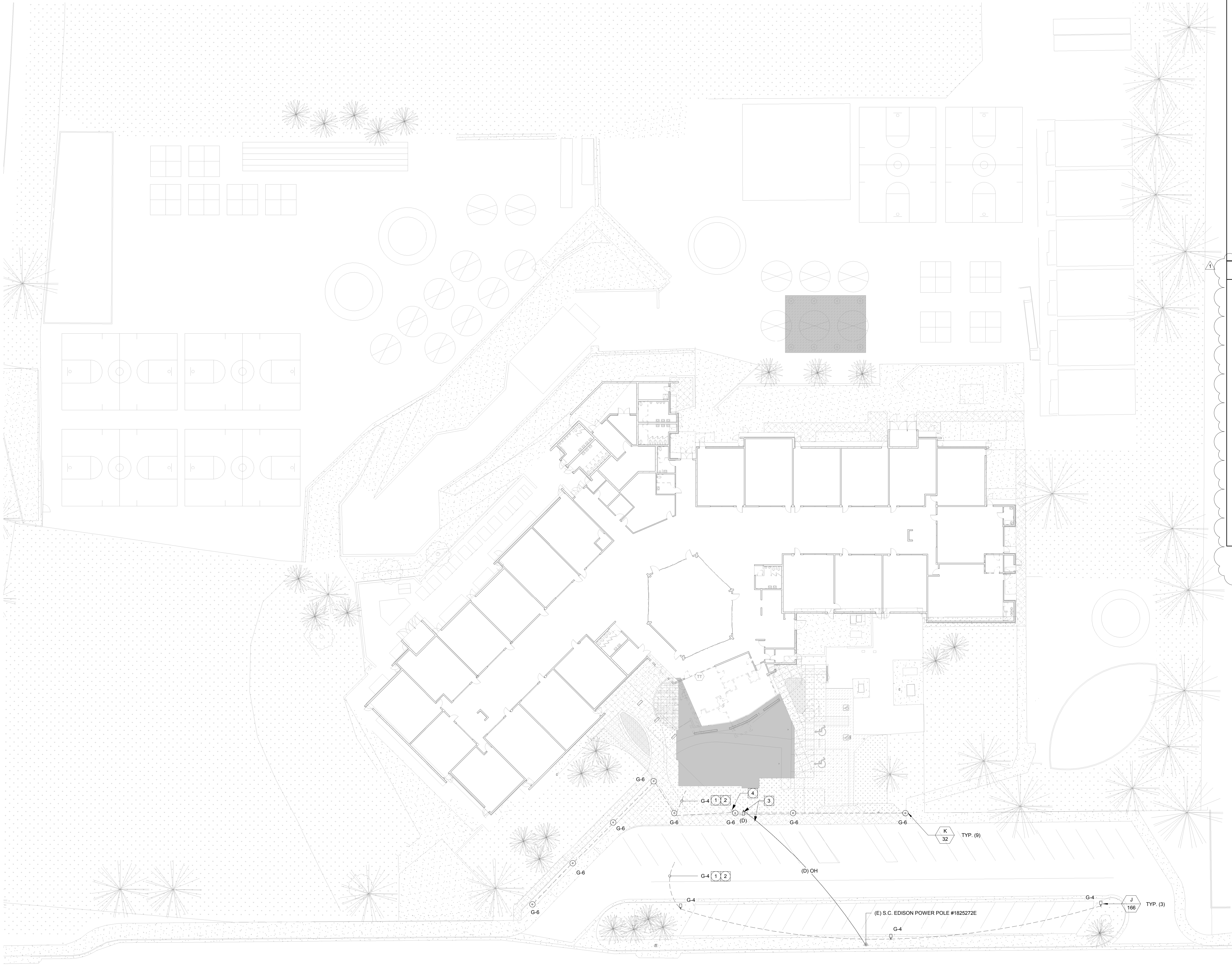
REGISTERED ARCHITECT  
ROBERT CLAYTON  
No. C-21340  
Exp. 10-31-19  
STATE OF CALIFORNIA

**PROJECT No. :11-78-22**  
 3/6/2019 11:48:06 AM

DRAWN BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_

ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION
ISSUE No.	DATE	DESCRIPTION	REVISION No.	1	02/08/2018 Addendum #1
ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION
ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION
ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION





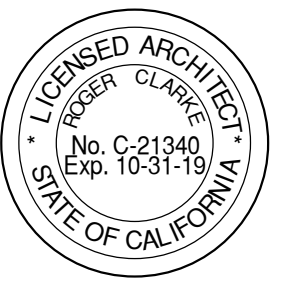
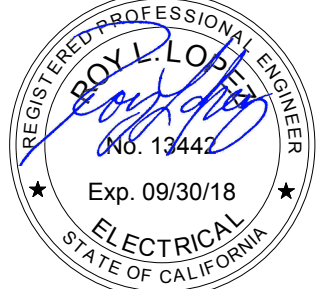
PLAN NOTES

1. EXTEND AND CONNECT CIRCUITING FROM JUNCTION BOX(ES) TO LIGHT FIXTURES/DEVICES IN AREA WITH SAME CIRCUIT NUMBERS. ROUTE #10 CONDUCTORS (MINIMUM) THROUGHOUT, UNLESS OTHERWISE NOTED. PROVIDE PULL BOXES AS REQUIRED.
2. ROUTE CIRCUIT VIA LIGHTING CONTROL PANEL.
3. EXISTING PARKING POLE LIGHT FED OVERHEAD BY S.C.EDISON TO BE DISCONNECTED AND REMOVED COMPLETE. CONTRACTOR TO WORK COORDINATE WITH S.C.EDISON FOR DISCONNECTION AND REMOVAL OF POLE.
4. EXISTING FLAG POLE TO BE DEMOLISHED.

LIGHTING GENERAL NOTES

1. ALL LIGHTING FIXTURES SHALL BE PROVIDED WITH ALL NECESSARY MOUNTING HARDWARE TO BE MOUNTED IN CEILING TYPES SPECIFIED AND COORDINATED WITH ARCHITECTURAL DRAWINGS.
2. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS FOR ALL LIGHTING FIXTURES AND DEVICES. WALL MOUNTED FIXTURE HEIGHTS SHALL BE VERIFIED WITH ARCHITECT AND CONFIRMED PRIOR TO ROUGH IN.
3. RECESSED LIGHTING FIXTURES:  
A. SHALL BE PROVIDED WITH ALL REQUIRED STRUCTURAL SUPPORTS AS REQUIRED BY THE AHJ AND CBC.  
B. LOCATED IN FIRE RATED CEILINGS SHALL BE PROVIDED WITH RATED ENCLOSURES SIZED TO CONFORM WITH MANUFACTURER REQUIRED CLEARANCES BETWEEN FIXTURE AND ENCLOSURE.
4. COVE MOUNTED FIXTURES SHAL BE PROVIDED IN QUANTITIES TO COVER THE ENTIRE LENGTH OF THE COVE. VERIFY COVE DIMENSIONS ON PLAN PRIOR TO FIXTURE ORDER.
5. ALL FLUORESCENT AND LED DIMMING ZONES SHALL BE PROVIDED WITH A DEDICATED NEUTRAL CONDUCTOR, AND VOLTAGE AND CONTROL CONDUCTORS TO MATCH THE CONTROL TYPE (2-WIRE OR 3-WIRE LINE OR LOW VOLTAGE.) CONFIRM WITH BALL-STD/DRIVER TYPE AND CONTROLS.
6. LIGHTING FIXTURES PROVIDED WITH EMERGENCY BATTERY PACKS SHALL BE PROVIDED WITH A CONSTANT HOT CONNECTION TO THE CHARGING LEAD FROM THE SAME CIRCUIT PROVIDING POWER TO THE LUMINAIRE. WHERE NOT INSTALLED WITHIN THE FIXTURE, LOCATIONS OF REMOTE LED CHARGING INDICATORS SHALL BE VERIFIED AND APPROVED PRIOR TO ROUGH IN.
7. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXIT SIGNS, NUMBER OF FACES AND CHEVRON REQUIREMENTS. DISCREPANCIES BETWEEN ELECTRICAL AND ARCHITECTURAL PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO FIXTURE ORDER.

File No: 36-55  
IDENTIFICATION STAMP  
DIV. OF THE STATE ARCHITECT  
OFFICE OF REGULATION SERVICES  
**04-117672**  
AC \_\_\_\_\_ FLS \_\_\_\_\_ SS \_\_\_\_\_  
DATE \_\_\_\_\_



**OMB**  
OMB ELECTRICAL ENGINEERS, INC.

8825 Research Drive  
Irvine, CA 92618  
(949) 753-1553 Fax (949) 753-1992  
E-Mail: omb@ombengr.com

**RUHNAU  
CLARKE**  
ARCHITECTS

**1 ELECTRICAL SITE PLAN**  
Scale: 1" = 20'-0"

PROJECT No. :1-78-22  
3/6/2019 11:48:12 AM

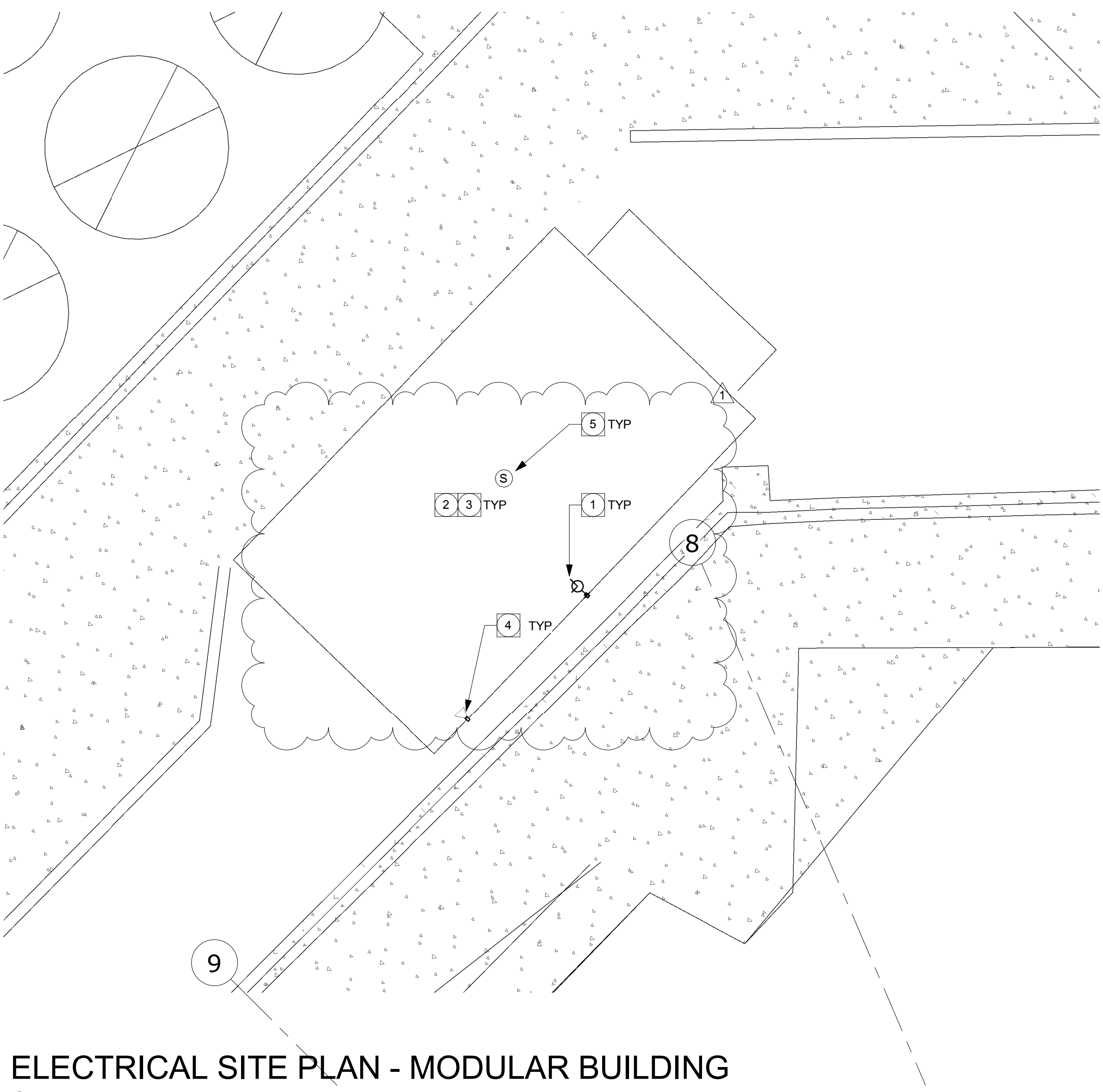
DRAWN BY:			CHECKED BY:					
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ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION			
ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION			

**RUHNAUCLARKE.COM** ELECTRICAL SITE PLAN

**E1.11**

3775 TENTH STREET, RIVERSIDE CALIFORNIA 92501 (951) 684-4664 / 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92009 (760) 438-8899



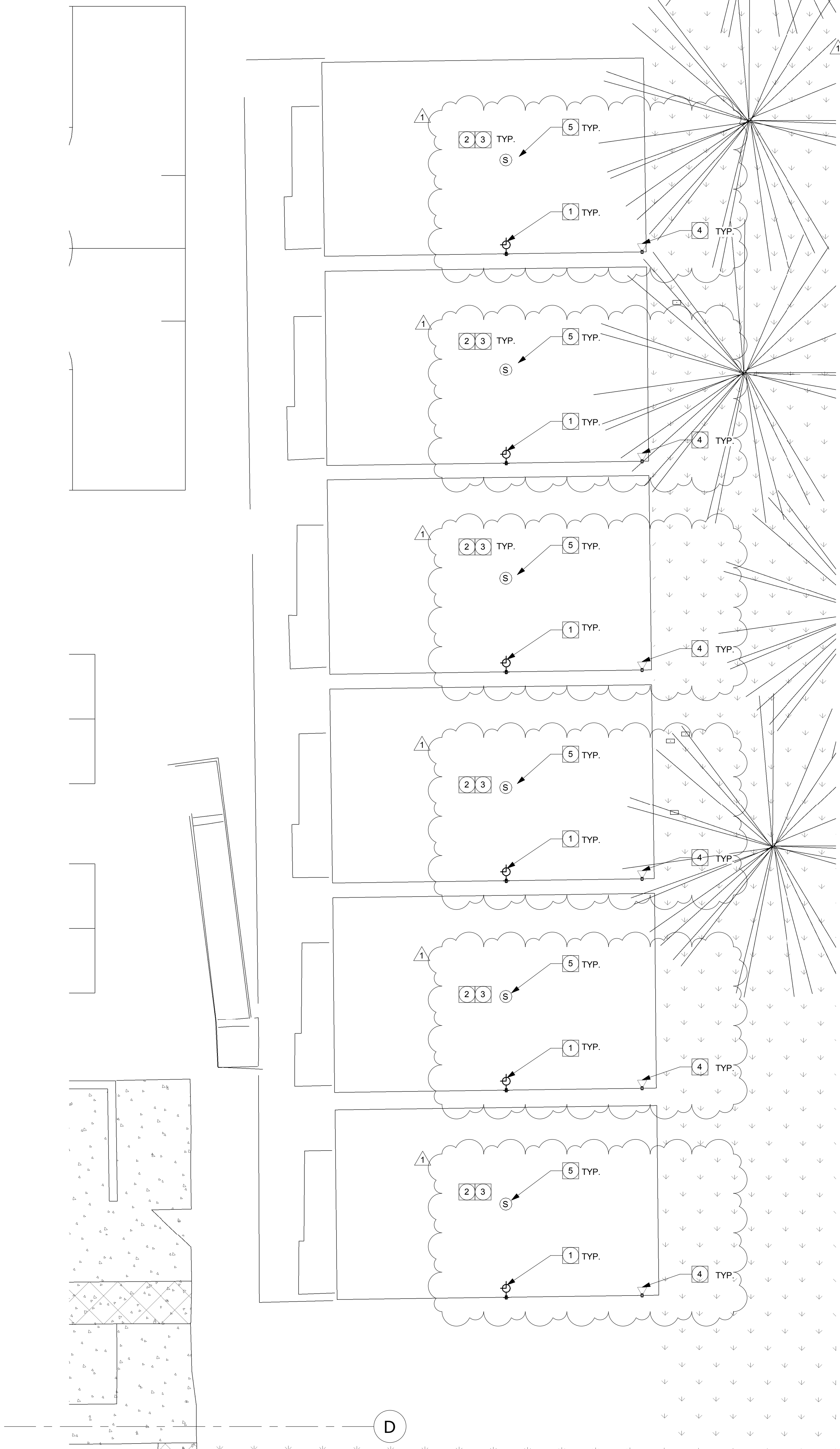


ELECTRICAL SITE PLAN - MODULAR BUILDING

2  
Scale : 1/8" = 1'-0"

PROJECT No. :1-78-22  
3/6/2019 11:53:57 AM

DRAWN BY:			CHECKED BY:		
ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION
1	02/08/2019	Revised	1	02/08/2019	Revised
2	02/08/2019	Revised	2	02/08/2019	Revised
3	02/08/2019	Revised	3	02/08/2019	Revised
4	02/08/2019	Revised	4	02/08/2019	Revised
5	02/08/2019	Revised	5	02/08/2019	Revised



ELECTRICAL SITE PLAN - MODULAR BUILDINGS

1  
Scale : 1/8" = 1'-0"

## PLAN NOTES

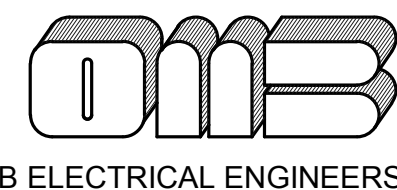
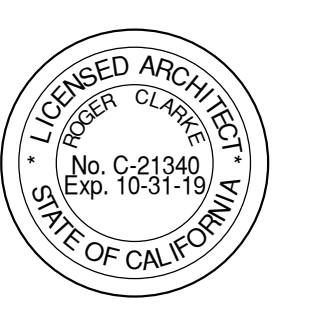
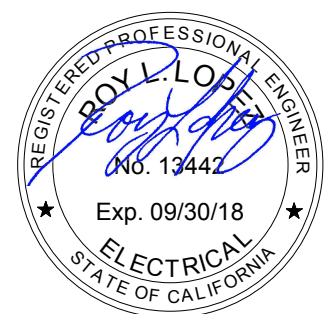
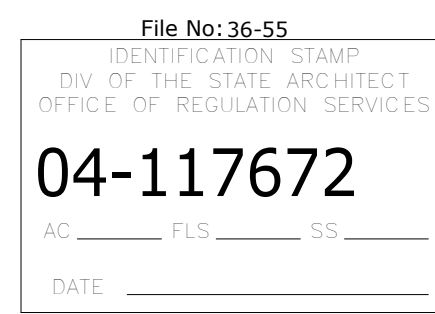
1. PROVIDE NEW CLOCK. PER SPECIFICATIONS PROVIDE 3/4"C UP TO ACCESSIBLE CEILING AND CAT6 TO IDF CABINET.
2. ALL EXISTING POWER TO REMAIN AND PROTECT IN PLACE.
3. ALL EXISTING LIGHTING TO REMAIN AND PROTECT IN PLACE.
4. NEW CAT6 CABLE FOR VOIP PHONE.
5. NEW INTERCOMPA SPEAKER WITH CABLING BACK TO INTERCOMPA SYSTEM.

## POWER GENERAL NOTES

1. ALL WALL MOUNTED DEVICE HEIGHTS SHALL BE VERIFIED WITH ARCHITECTURAL ROOM ELEVATIONS PRIOR TO ROUGH-IN.
2. PENETRATIONS THRU FIRE RATED WALLS SHALL BE PROTECTED WITH AN APPROVED FIRE STOP SYSTEM EQUAL TO OR GREATER THAN THE RATING OF THE WALL BEING PENETRATED.
3. ALL DEVICES MOUNTED BACK TO BACK ON COMMON WALLS SHALL BE INSTALLED IN SEPARATE BOXES AND OFFSET 24" MINIMUM OR PROVIDED WITH PUTTY OR ANOTHER APPROVED SOUND PROOF BACKING.
4. WHEN EXPOSED CEILING OR OPEN GRID CONDITIONS EXIST, CONTRACTOR SHALL PROVIDE:  
ALL BRANCH CIRCUITS TO BE INSTALLED IN EMT.  
ALL BRANCH CIRCUITS SHALL BE ROUTED PARALLEL TO BUILDING STRUCTURES AND RACKED NEATLY IN GROUPS OF MULTIPLE PATHWAYS.  
ALL LOW VOLTAGE CABLES SHALL BE:  
a. INSTALLED IN EMT CONDUIT PATHWAYS OR  
b. INSTALLED NEATLY IN CABLE MANAGEMENT OPEN BASKET OR LADDER TYPE WIREWAY SUPPORTED INDEPENDENTLY FROM STRUCTURE ABOVE.  
EXPOSED LOW VOLTAGE CABLING IN OPEN TYPE CEILING APPLICATIONS INSTALLED ON D-RINGS, J-HOOKS OR SIMILAR APPARATUS WILL NOT BE ACCEPTED UNLESS APPROVED IN WRITING BY ARCHITECT/ENGINEER PRIOR TO ANY ROUGH IN OR INSTALLATION. CONTRACTOR SHALL INCLUDE AN ALLOWANCE IN HIS BASE BID FOR THE INSTALLATION OF LOW VOLTAGE CABLES IN OPEN CEILINGS AS DESCRIBED.
5. EXPOSED CABLE/CONDUCTORS INSTALLED IN A PLENUM SPACE SHALL BE LISTED FOR SUCH ENVIRONMENT AND INSTALLATION SHALL CONFORM TO NEC, OR CEC WHERE ADOPTED, ARTICLE 300.22 (C).
6. TAMPER RESISTANT TYPE RECEPTACLES SHALL BE PROVIDED IN ALL AREAS OF A BUILDING OR STRUCTURE (FOR EDUCATIONAL, SUPERVISORY OR PERSONAL CARE) OR PORTION THEREOF WHERE FOUR (4) OR MORE CHILDREN OF AGES SEVEN (7) YEARS OR LESS, ARE PRESENT (CEC 406.2, 406.4(D) (5), 406.11 THROUGH 406.14.)

## SIGNAL GENERAL NOTES

1. PROVIDE CONDUITS WITH PULL TAPELINE WITH FIVE (5) FEET OF ADDITIONAL PULL TAPE COILED AT EACH END.
2. CONDUIT BEND RADII SHALL BE A MINIMUM OF SIX (6) TIMES THE INTERNAL DIAMETER FOR CONDUITS AND UNDER AND TEN (10) TIMES THE INTERNAL DIAMETER FOR CONDUITS GREATER THAN 2".
3. CONDUITS AND SLEEVES PROTRUDING THROUGH FLOOR SHALL TERMINATE MINIMUM 3" BEYOND FLOOR SURFACE. REFERENCE ELECTRICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.
4. ALL CONDUIT PENETRATIONS SHALL BE SEALED WITH MECHANICAL SEALS OR PLUGS TO PREVENT THE INFILTRATION OF GAS AND/OR WATER.
5. PROVIDE LABEL IDENTIFICATION FOR EACH CONDUIT AND PULL BOX PER IDENTIFICATION SPECIFICATION REQUIREMENTS. CONDUITS SHALL BE TAGGED WITH THE LOCATION OF THE OTHER END AND DISTANCE OF CONDUIT RUN.
6. ALL BELOW GRADE OR IN-SLAB MOUNTED CONDUITS SHALL BE CLEAN AND FREE OF ALL WATER AND DEBRIS PRIOR TO THE INSTALLATION OF SYSTEM CABLING.
7. PENETRATIONS THROUGH FIRE RATED WALLS SHALL BE PROTECTED WITH AN APPROVED FIRE STOP SYSTEM EQUAL TO OR GREATER THAN THE RATING OF THE WALL BEING PENETRATED.
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## ADMIN. ADDITION & MODERNIZATION

NORTH PARK ELEMENTARY SCHOOL  
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SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

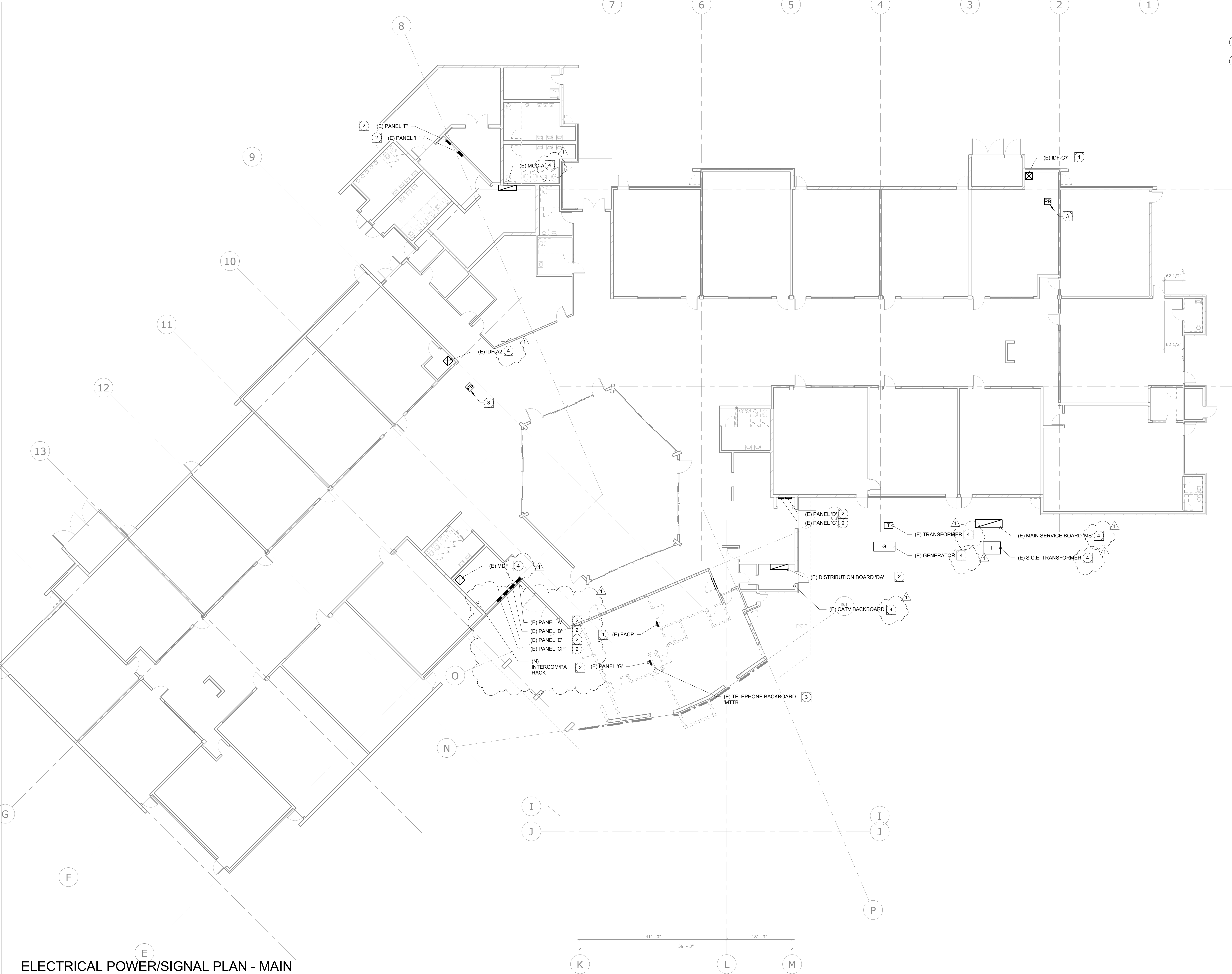
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ELECTRICAL SITE PLAN  
- MODULAR BUILDINGS

E1.20

3775 TENTH STREET, RIVERSIDE CALIFORNIA 92501 (951) 684-4664 / 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92009 (760) 438-5899





### PLAN NOTES

- 1. EXISTING FIRE ALARM CONTROL PANEL TO BE REMOVED AND REPLACED WITH NEW
- 2. EXISTING PANEL TO REMAIN. PROTECT IN PLACE.
- 3. EXISTING SIGNAL PULL BOX IN ATTIC SPACE TO REMAIN. PROTECT IN PLACE.
- 4. EXISTING TO REMAIN. PROTECT IN PLACE.

### GENERAL NOTES

- SEE ARCHITECTURAL DEMOLITION DRAWINGS FOR PLANNED DEMOLITION WALLS AND CEILINGS, AS WELL AS EXISTING-TO-REMAIN CEILINGS.
- SEE MECHANICAL/PLUMBING DEMOLITION DRAWINGS FOR PLANNED MECHANICAL/PLUMBING EQUIPMENT DEMOLITION AND EXISTING-TO-REMAIN MECHANICAL/PLUMBING EQUIPMENT.
- CHANGE ALL OVER CURRENT PROTECTIVE DEVICES TO "OFF" POSITION WHICH SERVE LIGHTING, RECEPTACLES, EQUIPMENT, ETC. BEING DEMOLISHED TO POINT OF ORIGINATION. ENSURE NO LOADS WILL REMAIN BEING SERVED BY SAID OVER CURRENT PROTECTIVE DEVICE AFTER DEMOLITION. PRIOR TO CHANGING "ON/OFF" POSITION.

### DEMOLITION NOTES

- ALL EQUIPMENT, DEVICES, ETC. IDENTIFIED AS (X) TO BE DEMOLISHED BACK TO POINT OF ORIGIN. MAINTAIN CIRCUIT CONTINUITY TO ALL DEVICES IN ADJACENT AREAS SERVICE BY SAME CIRCUIT.
- ALL EXISTING FIXTURES INDICATED AS "ER" ARE EXISTING TO BE RELOCATED. SEE NEW LIGHTING PLANS FOR NEW LOCATIONS. MAINTAIN CIRCUIT AND SWITCHING CONTINUITY TO LIGHT FIXTURES ADJACENT AREAS.
- FIELD VERIFY ALL EXISTING WALL SWITCH AND OCCUPANCY SENSOR LOCATIONS AND RELOCATE AS NECESSARY TO ACCOMMODATE NEW CONSTRUCTION.
- ALL EQUIPMENT, DEVICES, ETC. NOT IDENTIFIED AS BEING DEMOLISHED ARE EXISTING TO REMAIN UNDISTURBED, UNLESS NOTED OTHERWISE ON NEW POWER AND SIGNAL PLANS. REFERENCE BUILDING POWER PLANS FOR EXISTING DEVICES TO BE RELOCATED, RECIRCUITED, ETC.
- ALL EXISTING WORK SHOWN LIGHT, NEW WORK SHOWN DARK.
- THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC ONLY. DO NOT SCALE THE ELECTRICAL DRAWINGS TO DETERMINE THE LOCATION OF EQUIPMENT OR OUTLETS.
- THE EXISTING CONDITIONS SHOWN ARE FROM AVAILABLE RECORD DRAWINGS AND SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL VERIFY ACTUAL EXISTING CONDITIONS AT SITE PRIOR TO SUBMITTING BID. ALL DEMOLITION, ALTERATION, EXTENSION, RELOCATION, REHABILITATION WORK SHALL BE INCLUDED IN CONTRACT. NO ADDITIONAL ALLOWANCE OR CHANGE ORDERS WILL BE ACCEPTED.
- CONTRACTOR IS RESPONSIBLE TO RELOCATE OR REMOVE FROM WALLS, CEILINGS, FLOOR SPACES, ETC. ANY EXISTING CONDUITS, WIRES, BOXES, FITTINGS, FIXTURES OR OTHER ELECTRICAL EQUIPMENT WHICH INTERFERES WITH PLANNED REMODEL WORK. PROVIDE CIRCUIT CONTINUATION REQUIRED FOR ALL EXISTING OUTLETS, FIXTURES, EQUIPMENT, ETC. SCHEDULED TO REMAIN.
- NOTIFY THE ENGINEER IMMEDIATELY WHEREVER EXISTING EQUIPMENT IS ENCOUNTERED WHICH MUST BE RELOCATED DUE TO THE NEW CONSTRUCTION, OR NOT INDICATED ON "AS-BUILT" DRAWINGS OR WAS BURIED UNDERGROUND OR EMBEDDED IN STRUCTURE WALLS.
- CAREFULLY PROTECT ALL WALLS, TRIM, FLOORS, EQUIPMENT, UTILITY LINES AND MATERIALS. WHEN WORKING ON FINISHED SURFACES, LIMIT DAMAGE TO THE SMALLER AREA IF POSSIBLE AND RESTORE TO THE ORIGINAL CONDITION ALL SURFACES WHICH ARE DAMAGED BECAUSE OF THE INSTALLATION OF THIS WORK.
- EQUIPMENT, MATERIALS AND SUPPLIES TEMPORARILY REMOVED FOR PROTECTION SHALL BE REPLACED IN ORIGINAL LOCATIONS. ANY MATERIALS DAMAGED SHALL BE REPLACED WITH NEW MATERIALS OF LIKE KIND AND QUALITY.
- DEMOLITION WORK SHALL BE DONE IN A MANNER WHICH WILL NOT CAUSE UNNECESSARY INCONVENIENCE OR DANGER TO USERS OF THE PREMISES AND ADJACENT SITE, AND NOT INTERFERE WITH ITS OPERATION. ANY DEMOLITION WORK TO BE PERFORMED MUST BE PLANNED IN ADVANCE.
- DO ALL DRILLING, CUTTING, ETC. REQUIRED TO DEMOLISH ELECTRICAL WORK AS INDICATED. PROVIDE BLANK COVER PLATES ON ALL OUTLES EXPOSED BY REMOVAL OF FIXTURE OR DEVICES.
- RESEAL ALL PENETRATIONS OR OPENING THROUGH WALLS, CEILING, FLOORS, ETC., TO MAINTAIN THE RATING OF STRUCTURE.
- ALL REMOVED MATERIALS AND EQUIPMENT WHICH IS SALVAGED MATERIALS SHALL REMAIN IN THE PROPERTY OF THE OWNER. DELIVER SUCH SALVAGED MATERIALS AND EQUIPMENT ON THE PREMISES AS DIRECTED BY OWNER AND NEATLY PILE OR STORE THEM AND PROTECT FROM DAMAGED. DISPOSE OF ALL HAZARDOUS MATERIAL PER GUIDELINE OF THE STATE OF CALIFORNIA, DEPARTMENT OF HEALTH SERVICES AND OTHER AGENCIES HAVING JURISDICTION.
- CONTRACTOR SHALL FIELD VERIFY EXISTING CONDUIT/WIRING RUNS, REUSE AS REQUIRED AND REMOVED ALL UNUSED CONDUIT/WIRING. UNUSED CONDUIT IN INACCESSIBLE LOCATIONS (WALLS TO REMAIN) CAN BE ABANDONED IN PLACE. REMOVE UNUSED WIRING.

**ELECTRICAL POWER/SIGNAL PLAN - MAIN BUILDING DEMO**

Scale : 3/32" = 1'-0"

PROJECT No. :1-78-22  
3/6/2019 11:49:02 AM

DRAWN BY:		CHECKED BY:		REVISION No.:		DATE:		DESCRIPTION:	
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3				3					
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NORTH PARK ELEMENTARY SCHOOL  
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SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

**ELECTRICAL DEMOLITION - MAIN BUILDING**

**ED2.11**

File No: 36-55  
IDENTIFICATION STAMP  
DIV. OF THE STATE ARCHITECT  
OFFICE OF REGULATION SERVICES  
**04-117672**  
AC \_\_\_\_\_ FL \_\_\_\_\_ SS \_\_\_\_\_  
DATE \_\_\_\_\_

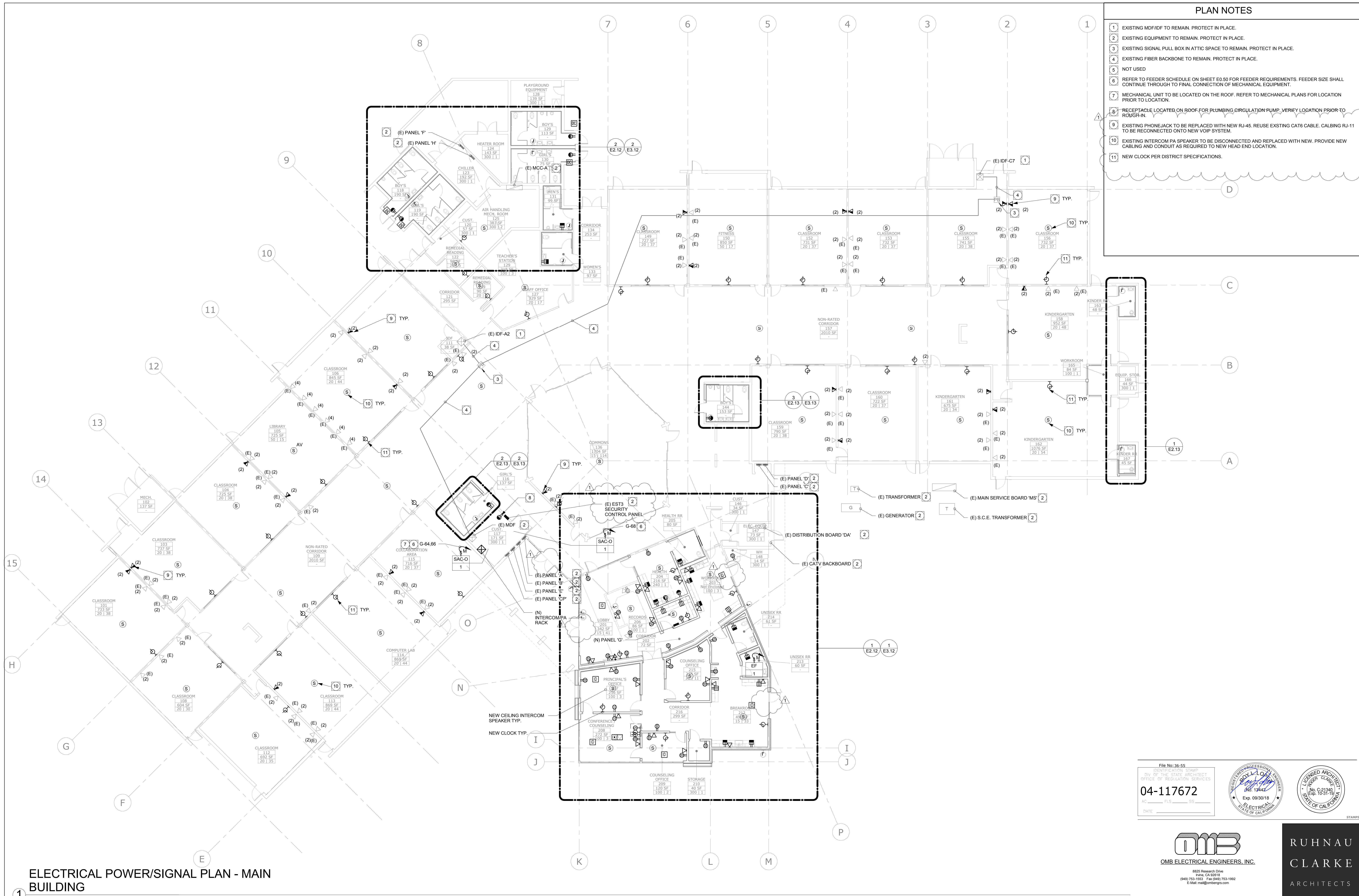
REGISTERED PROFESSIONAL ENGINEER  
**BOYD L. LOPEZ**  
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Exp. 09/30/18  
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REGISTERED ARCHITECT  
**RUHNAU CLARKE**  
No. C-21340  
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**RUHNAU CLARKE ARCHITECTS**





- PLAN NOTES**
- EXISTING MDF/IDF TO REMAIN. PROTECT IN PLACE.
  - EXISTING EQUIPMENT TO REMAIN. PROTECT IN PLACE.
  - EXISTING SIGNAL PULL BOX IN ATTIC SPACE TO REMAIN. PROTECT IN PLACE.
  - EXISTING FIBER BACKBONE TO REMAIN. PROTECT IN PLACE.
  - NOT USED
  - REFER TO FEEDER SCHEDULE ON SHEET E0.50 FOR FEEDER REQUIREMENTS. FEEDER SIZE SHALL CONTINUE THROUGH TO FINAL CONNECTION OF MECHANICAL EQUIPMENT.
  - MECHANICAL UNIT TO BE LOCATED ON THE ROOF. REFER TO MECHANICAL PLANS FOR LOCATION PRIOR TO LOCATION.
  - RECEPTACLE LOCATED ON ROOF FOR PLUMBING CIRCULATION PUMP. VERIFY LOCATION PRIOR TO ROUGH-IN.
  - EXISTING PHONEJACK TO BE REPLACED WITH NEW RJ-45. REUSE EXISTING CAT6 CABLE. CALIBING RJ-11 TO BE RECONNECTED ONTO NEW VOIP SYSTEM.
  - EXISTING INTERCOM PA SPEAKER TO BE DISCONNECTED AND REPLACED WITH NEW. PROVIDE NEW CABLING AND CONDUIT AS REQUIRED TO NEW HEAD END LOCATION.
  - NEW CLOCK PER DISTRICT SPECIFICATIONS.

**ELECTRICAL POWER/SIGNAL PLAN - MAIN BUILDING**

1 Scale : 3/32" = 1'-0"

PROJECT No. :1-78-22	
3/6/2019 11:48:24 AM	
DRAWN BY:	CHECKED BY:
ISSUE No.:	REVISION No.:
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SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

**ELECTRICAL POWER/SIGNAL PLAN - MAIN BUILDING**

**E2.11**

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**04-117672**  
AC \_\_\_\_\_ FLS \_\_\_\_\_ SS \_\_\_\_\_  
DATE \_\_\_\_\_

**PROFESSIONAL ENGINEER**  
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Exp. 09/30/18  
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STATE OF CALIFORNIA

**REGISTERED ARCHITECT**  
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Exp. 10-31-19  
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**RUHNAU CLARKE ARCHITECTS**



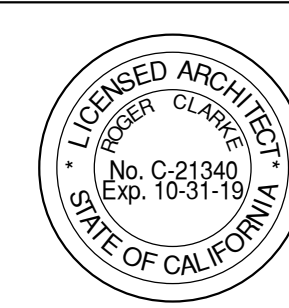


ENLARGED POWER/SIGNAL PLAN - ADMINISTRATION

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PLAN NOTES

- 1 EXTEND AND CONNECT CIRCUITING FROM JUNCTION BOX(ES) TO DEVICES IN AREA WITH SAME CIRCUIT NUMBER, ROUTE #12 CONDUCTORS (MINIMUM) THROUGHOUT, UNLESS OTHER WIRE NOTED. PROVIDE JUNCTION BOXES AS REQUIRED.
- 2 REFER TO FEEDER SCHEDULE ON SHEET E0.50 FOR FEEDER REQUIREMENTS. FEEDER SIZE SHALL CONTINUE THROUGHOUT TO FINAL CONNECTION OF MECHANICAL EQUIPMENT.
- 3 INTERCEPT EXISTING ROOM RECEPTACLE CIRCUIT AND EXTEND TO NEW RECEPTACLE.
- 4 PROVIDE ASSITED LISTENING SYSTEM PER DETAIL 7/E5.21
- 5 CONNECT TO HAND DRYER AS REQUIRED, VERIFY LOCATION PRIOR TO ROUGH-IN.
- 6 DOOR ENTRY CAMERA PROVIDE 3/4" WITH (1) CAT6A CABLE TO DOOR ENTRY CONTROL STATION LOCATED AT ADMIN. DESK.
- 7 DOOR ENTRY SYSTEM POWER. CONNECT AS REQUIRED PER MANUFACTURER'S REQUEST. VERIFY LOCATION PRIOR TO ROUGH-IN.
- 8 DOOR ENTRY CONTROL STATION AT ADMIN DESK. VERIFY LOCATION PRIOR TO ROUGH-IN. CONNECT AS REQUIRED FOR A FULLY OPERATIONAL SYSTEM. PROVIDE 3/4" WITH CAT 6A TO IDF.
- 9 CONCEAL CONDUIT IN CASEWORK. COORDINATE AS REQUIRED.
- 10 PROVIDE 120V, 20A CIRCUIT AND VIDEO OUTLET FOR TV-MONITOR. VERIFY MOUNTING HEIGHT PRIOR TO ROUGH-IN.
- 11 INTRUSION DETECTION MOTION SENSOR. PROVIDE ALL CONDUIT, CABLING, ACCESSORIES, POPPITS AND PROGRAMMING REQUIRED FOR A FULLY OPERATIONAL SYSTEM. VERIFY MOUNTING HEIGHT PRIOR TO ROUGH-IN.
- 12 FUTURE CCTV CAMERA PROVIDE WEATHER-PROOF JUNCTION BOX WITH BLANK FACE PLATE AND 1" CONDUIT WITH PULL STRING TO IDF CABINET.
- 13 PROVIDE NEW INTERCOM PA CEILING SPEAKER WITH CABLING BACK TO INTERCOM RACK PER SPECIFICATIONS WITH DISTRICT.
- 14 PROVIDE NEW CLOCK PER DISTRICT SPECIFICATIONS.

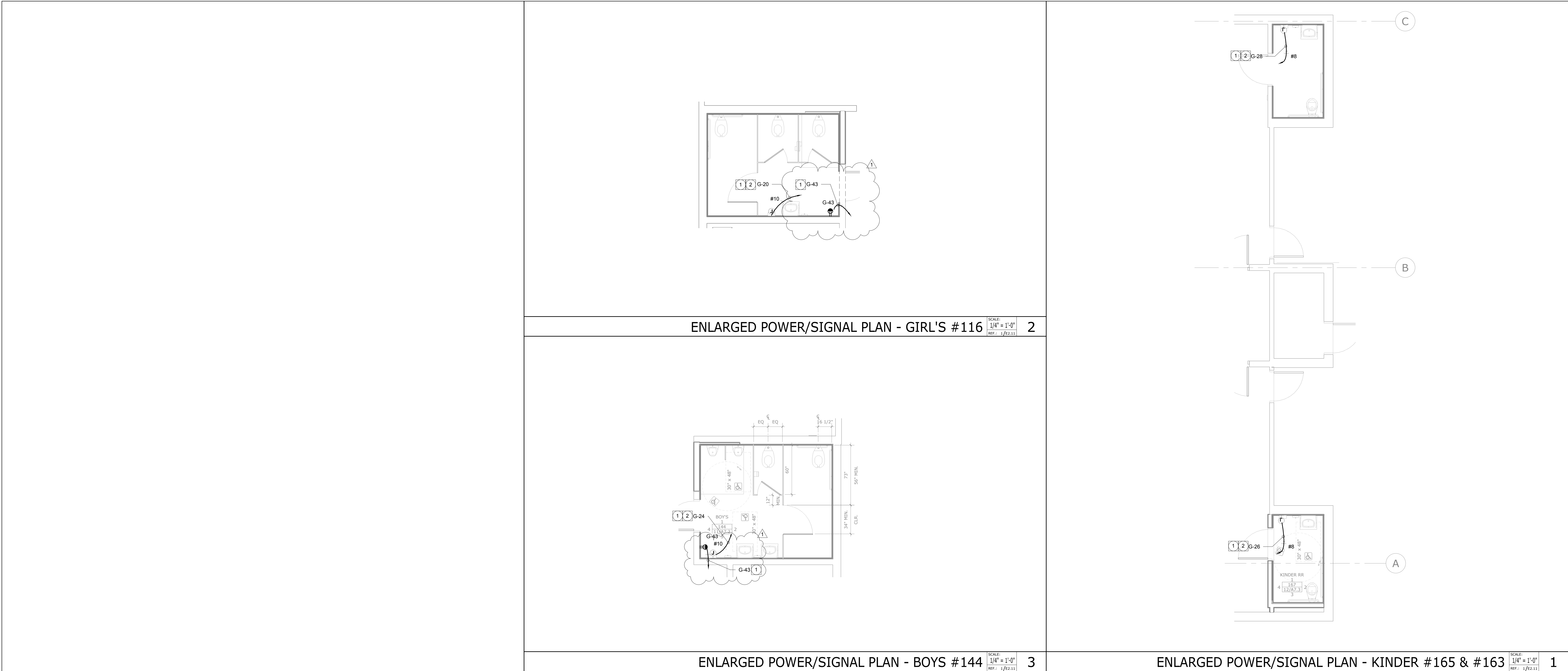


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ELECTRICAL  
POWER/SIGNAL PLAN -  
ENLARGED PLAN

3725 TENTH STREET, RIVERSIDE CALIFORNIA 92501 (951) 684-4664 / 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92010 (760) 438-5899





### SIGNAL GENERAL NOTES

1. PROVIDE CONDUITS WITH PULL TAPE/LINE WITH FIVE (5) FEET OF ADDITIONAL PULL TAPE COILED AT EACH END.
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2. CONNECT TO HAND DRYER AS REQUIRED. VERIFY LOCATION PRIOR TO ROUGH-IN.

File No: 36-55

IDENTIFICATION STAMP  
DIV OF THE STATE ARCHITECT  
OFFICE OF REGULATION SERVICES

04-117672

AC \_\_\_\_\_ FLS \_\_\_\_\_ SS \_\_\_\_\_

DATE \_\_\_\_\_

REGISTERED PROFESSIONAL ENGINEER  
BOY L LOY  
No. 12442  
Exp. 09/30/18  
ELECTRICAL  
STATE OF CALIFORNIA

REGISTERED ARCHITECT  
CLARKE  
No. C-21340  
Exp. 10-31-19  
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ADMIN. ADDITION & MODERNIZATION

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SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

ELECTRICAL  
POWER/SIGNAL PLAN -  
ENLARGED PLAN

E2.13

PROJECT No. :1-78-22

3/6/2019 11:48:31 AM

DRAWN BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_

ISSUE No. _____	DATE _____	DESCRIPTION _____	REVISION No. _____	DATE _____	DESCRIPTION _____
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1-78-22







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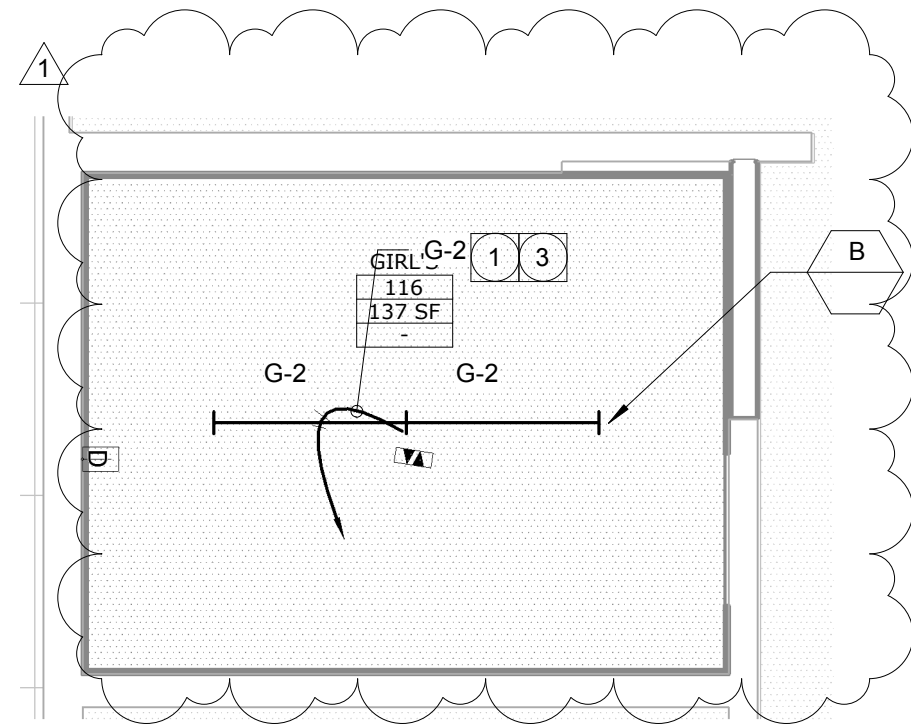
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**ADMIN. ADDITION & MODERNIZATION**  
NORTH PARK ELEMENTARY SCHOOL  
5378 NORTH 'H' STREET, SAN BERNARDINO, CA 92407  
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

**ELECTRICAL LIGHTING**  
**PLAN - ENLARGED**  
**PLAN**

**E3.12**

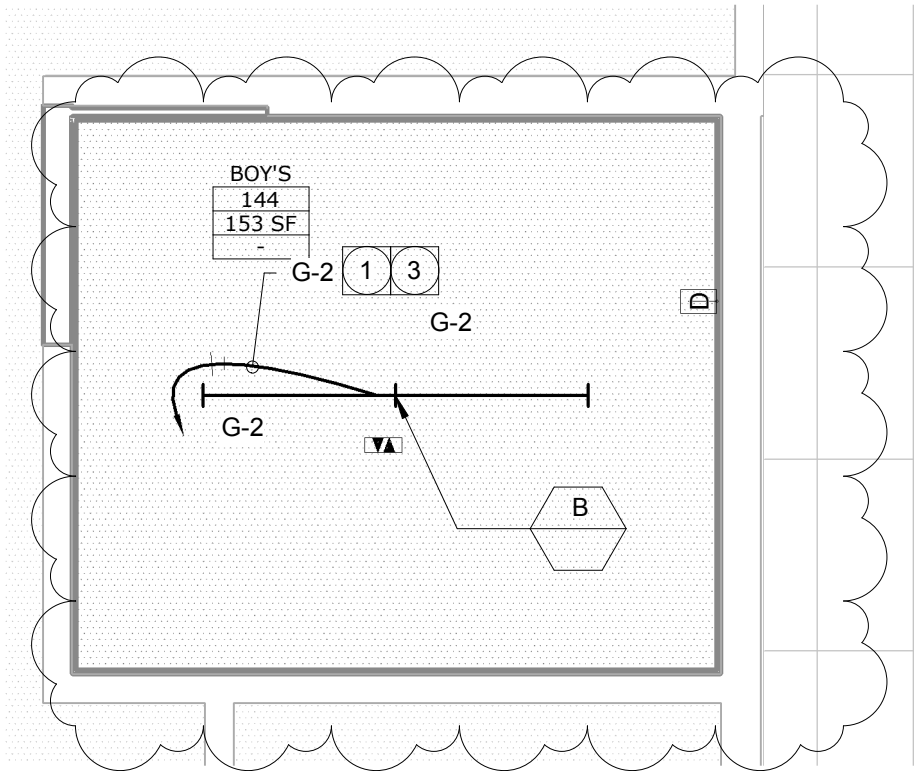




ENLARGED LIGHTING PLAN - GIRL'S #116

SCALE: 1/4\"/>

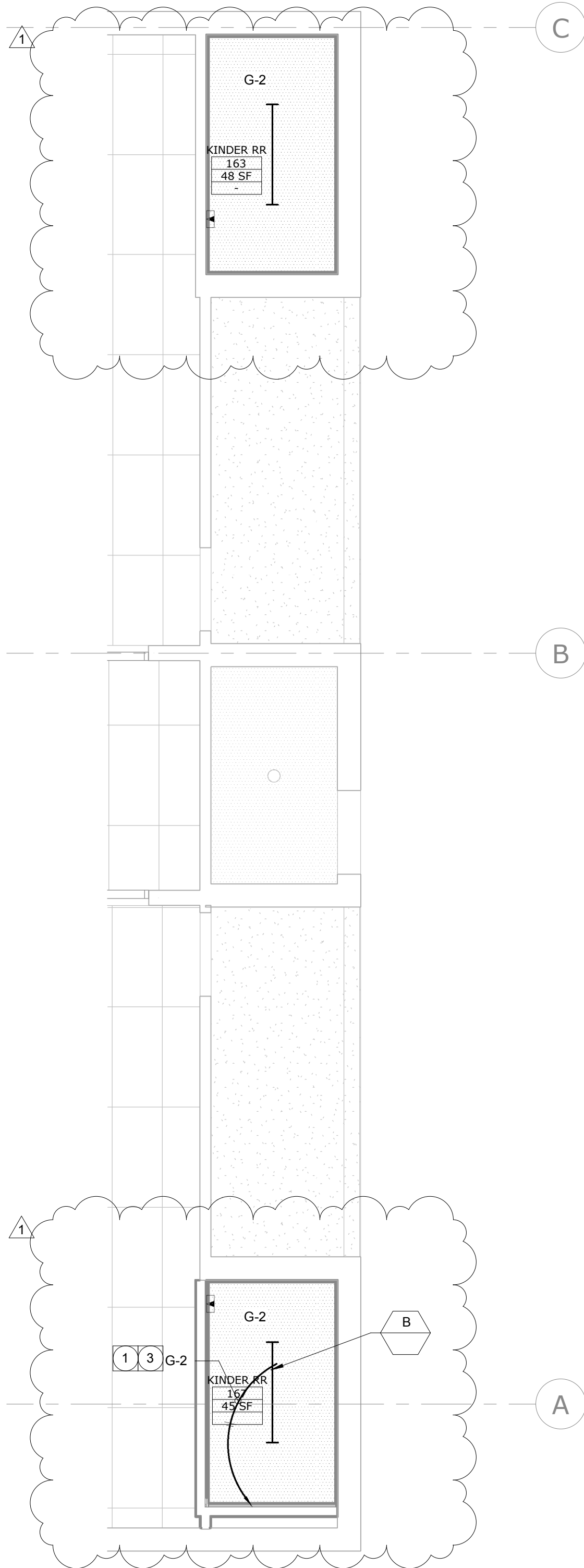
2



ENLARGED LIGHTING PLAN - BOY'S #144

SCALE: 1/4\"/>

1



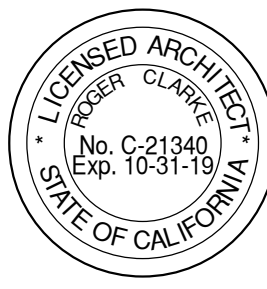
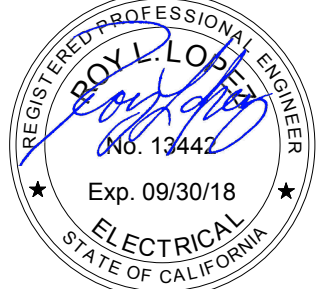
ENLARGED LIGHTING PLAN - KINDER #165 & #163

SCALE: 1/4\"/>

4

PLAN NOTES	LIGHTING GENERAL NOTES
<div><div>1</div><div>EXTEND AND CONNECT CIRCUITING FROM JUNCTION BOX(ES) TO LIGHT FIXTURES/DEVICES IN AREA WITH SAME CIRCUIT NUMBERS. ROUTE #12 CONDUCTORS (MINIMUM) THROUGHOUT, UNLESS OTHERWISE NOTED. PROVIDE JUNCTION BOXES AS REQUIRED.</div></div> <div><div>2</div><div>ROUTE CIRCUIT VIA LIGHTING CONTROL PANEL.</div></div> <div><div>3</div><div>INTERCEPT EXISTING ROOM LIGHT. CIRCUIT AND EXTEND TO NEW LIGHTING.</div></div>	<div><div>1.</div><div>ALL LIGHTING FIXTURES SHALL BE PROVIDED WITH ALL NECESSARY MOUNTING HARDWARE TO BE MOUNTED IN CEILING TYPES SPECIFIED AND COORDINATED WITH ARCHITECTURAL DRAWINGS.</div></div> <div><div>2.</div><div>REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS FOR ALL LIGHTING FIXTURES AND DEVICES. WALL MOUNTED FIXTURE HEIGHTS SHALL BE VERIFIED WITH ARCHITECT AND CONFIRMED PRIOR TO ROUGH IN.</div></div> <div><div>3.</div><div>RECESSED LIGHTING FIXTURES:<div><div>A.</div><div>SHALL BE PROVIDED WITH ALL REQUIRED STRUCTURAL SUPPORTS AS REQUIRED BY THE AHJ AND CBC.</div></div><div><div>B.</div><div>LOCATED IN FIRE RATED CEILINGS SHALL BE PROVIDED WITH RATED ENCLOSURES SIZED TO CONFORM WITH MANUFACTURER REQUIRED CLEARANCES BETWEEN FIXTURE AND ENCLOSURE.</div></div></div></div> <div><div>4.</div><div>COVE MOUNTED FIXTURES SHAL BE PROVIDED IN QUANTITIES TO COVER THE ENTIRE LENGTH OF THE COVE. VERIFY COVE DIMENSIONS ON PLAN PRIOR TO FIXTURE ORDER.</div></div> <div><div>5.</div><div>ALL FLUORESCENT AND LED DIMMING ZONES SHALL BE PROVIDED WITH A DEDICATED NEUTRAL CONDUCTOR, AND VOLTAGE AND CONTROL CONDUCTORS TO MATCH THE CONTROL TYPE (2-WIRE OR 3-WIRE LINE OR LOW VOLTAGE.) CONFORM WITH BALLST/DRIVER TYPE AND CONTROLS.</div></div> <div><div>6.</div><div>LIGHTING FIXTURES PROVIDED WITH EMERGENCY BATTERY PACKS SHALL BE PROVIDED WITH A CONSTANT HOT CONNECTION TO THE CHARGING LEAD FROM THE SAME CIRCUIT PROVIDING POWER TO THE LUMINAIRE. WHERE NOT INSTALLED WITHIN THE FIXTURE, LOCATIONS OF REMOTE LED CHARGING INDICATORS SHALL BE VERIFIED AND APPROVED PRIOR TO ROUGH IN.</div></div> <div><div>7.</div><div>REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXIT SIGNS. NUMBER OF FACES AND CHEVRON REQUIREMENTS. DISCREPANCIES BETWEEN ELECTRICAL AND ARCHITECTURAL PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO FIXTURE ORDER.</div></div>

File No: 36-55  
IDENTIFICATION STAMP  
DIV. OF THE STATE ARCHITECT  
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**04-117672**  
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**ELECTRICAL LIGHTING  
PLAN - ENLARGED  
PLAN**

**E3.13**

PROJECT No. :1-78-22  
3/6/2019 11:48:42 AM

DRAWN BY:			CHECKED BY:					
ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION	Addendum #1		
ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION			
ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION			
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