

**Beard + Riser**  
ARCHITECTS PLLC  
201 MAIN STREET | GREENWOOD, MS 38930

**ADDENDUM #1**

**Project:** Greenwood Police Department and Municipal Court Renovation  
Greenwood, Mississippi

**Professional:** Beard + Riser Architects PLLC

**Date Issued:** May 5, 2016

**Pages:** 135 including this page



*This addendum form is part of the Construction Documents, modifying and superseding where it is inconsistent with them. All other conditions of the Contract Documents remain unchanged. Acknowledge receipt of this addendum by inserting its number in the appropriate place on the bid proposal form:*

1. **Item 1:** Prebid Conference Meeting Minutes and attendance list.
2. **Revision:** Document 001113 Advertisement for Bids and Document 00411 Bid Form (attached) revise to include the following:
  - 1.6 Successful bidder shall begin the Work on receipt of the Notice to Proceed and shall complete the Work within **270 calendar days**. Work is subject to liquidated damages of \$250 per calendar day beyond substantial completion.
3. **Clarification:** Insurance requirements are as follows:

*General Contractor shall maintain reasonable insurance to include liability, accidents on premises, builder's risk and workman's compensation. At a minimum, General Contractor shall hold insurance in the following amounts:*

- a. General Commercial.....\$1,000,000
- b. Owner's/Contractor's Protective Liability.....\$1,000,000
- c. Automobile Liability.....\$500,000
- d. Workman's Compensation.....Statutory
- e. Builder's Risk.....Equal to Amount of Work

4. **Revision/Addition:** Document 087100 Door Hardware revise to include the following:  
Add following to Hardware Set #1 Door 01:

1 Narrow Key Switch & Mortise Cylinder  
MKAN/1E-74 PATD C4 626 SE/BE

5. **Addition:** See attached Section 077200 Roof Accessories.
6. **Revision/Addition:** Add Division 08 Openings. See attached, revised Table of Contents.
7. **Addition:** See attached.

Division 08 Openings:

081113 HOLLOW METAL DOORS AND FRAMES  
082110 FLUSH WOOD DOORS

- |           |                                                                           |
|-----------|---------------------------------------------------------------------------|
| 083113    | ACCESS DOOR AND FRAMES                                                    |
| 083459    | VAULT DOORS AND DAY GATES                                                 |
| 084113    | ALUMINUM FRAMED ENTRANCES                                                 |
| 084113.10 | ALUMINUM STOREFRONTS                                                      |
| 084413    | GLAZED ALUMINUM CURTAIN WALL                                              |
| 084523    | 2 3/4" INSULATED TRANSLUCENT FIBERGLASS SANDWICH PANEL<br>SKYLIGHT SYSTEM |
| 085113    | ALUMINUM WINDOWS                                                          |
| 087100    | DOOR HARDWARE                                                             |
| 088000    | GLAZING                                                                   |
| 088300    | MIRRORS                                                                   |
8. **Addition:** See attached Section 099000 PAINTING AND COATINGS.
    - a. Note: Repair existing concrete exterior walls and fins. Patch and resurface/parge coat after rocks have been removed. Repair and resurface to level wall finish. Prep for application of coating system.
  9. **Revision:** See attached Structural Drawings.
 

|      |                                    |
|------|------------------------------------|
| S1.0 | NOTE SHEET                         |
| S2.0 | FOUNDATION PLAN                    |
| S3.0 | FOUNDATION DETAILS                 |
| S3.1 | FOUNDATION DETAILS                 |
| S4.0 | 2 <sup>ND</sup> FLOOR FRAMING PLAN |
| S4.1 | ROOF FRAMING PLAN                  |
| S5.0 | FRAMING DETAILS                    |
| S5.1 | FRAMING DETAILS                    |
| S5.2 | FRAMING DETAILS                    |
  10. **Revision/Addition:** See attached Architectural Drawings.
 

|      |                                                                                                                                                                          |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A4.1 | WINDOW TYPES & DETAILS:<br>Sheet A4.1- Window Schedule Glazing Type revised to coordinate with Section 088000 Glazing. Addition of Window Type T – One-way vision glass. |
| A4.2 | WINDOW TYPE DIAGRAMS<br>Sheet A4.2 – Window Type Diagrams added to coordinate with Sheet A4.1 Window Types & Window Schedule.                                            |
  11. **Revision:** See attached Electrical Drawings.
 

|      |                     |
|------|---------------------|
| E4.0 | MECH. CONN/AUX PLAN |
| E4.1 | MECH CONN/AUX PLAN  |
  12. **Addition:** Add barrier mesh for security to Room 128 Interview. Install 18 gauge per manufacturer's recommendations to onto stud framing with gypsum sheathing applied to the surface to conceal the barrier mesh.  
**Clarification:** (2) 2" fiber conduits stubbed to City Hall are currently shown on the Electrical drawings. Conduits will stub into existing City Hall server room on Northeast corner of building.

**END OF ADDENDUM #1**



## Pre-Bid Conference Minutes

Project: Greenwood Police Department and Municipal Court Renovations

Date: April 20, 2016

Time: 10:00 a.m.

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*Make introductions of all present:*

1. Bidding
  - a. Bid date
    - i. Until 2 p.m. on Thursday, May 12, 2016.
    - ii. Bids will be received at the Greenwood City Hall Upstairs Conference Room, 101 West Church Street.
    - iii. Drawings are available from Jackson Blueprint [www.jaxblue.com](http://www.jaxblue.com) online plan room - \$200 printed set and \$50 digital.
    - iv. Follow the "Instructions to Bidders" section in project manual.
    - v. Bid Bond is required (5% of the total amount of the base bid).
  - b. 240 calendar days from Notice to Proceed.
  - c. 5% Bid bond is required.
  - d. 100% Performance and Payment Bonds are required.
  - e. Addenda
    - i. Questions or clarifications will only be answered in writing via email or fax to the Professional.
    - ii. Last day to issue addenda is **May 10 at 2 pm** (48 business hours prior to bid). Please be sure to have all questions to us in writing at least 24 or more hours before this deadline so we have time to answer each question properly.
  - f. Allowances: \$3,500 for the purchase and installation of interior signage.
  - g. Liquidated Damages: \$250 per calendar day
  - h. Alternates:
    - i. Alternate #1 – Omit the Greenscreen @ front Entrance.

2. Examination of the site
  - a. It is critical that you become familiar with the site prior to submitting your bids.
3. General Scope of Work
4. **Open for Questions/Site Visit**
  - **All contractors agreed 240 is a tight schedule. All agreed extending the contract duration by 30 calendar days is adequate.**
  - **GC is responsible for asbestos inspection. Inspections are GC's responsibility.**
  - **The antenna towers to be removed by GC.**
  - **GC must provide notice to Fire Department and City Hall for any generator shut downs. It is the GC's responsibility to coordinate all shut downs.**
  - **Existing mechanical units are to be returned to the City (owner). The new Trane units are not to be destroyed.**
  - **Precast plank drill depth not to exceed 8".**

**End of Agenda**



DATE: April 20, 2016 – 10:00 a.m.

MEETING: Pre-bid Conference

PROJECT NAME: Greenwood Police Department & Municipal Court Renovations  
Greenwood, Mississippi

| NAME           | COMPANY                   | CELL PHONE     | EMAIL                        |
|----------------|---------------------------|----------------|------------------------------|
| Thomas Hann    | Cyber Technology Security | (662) 687-1305 | thann@ctspage.com            |
| Zeb O'Bryant   | RC                        | 662-392-4498   | Zobryant@rcconst.net         |
| Brian Plemons  | RC                        | 662-701-0920   | bplemons@rcconst.net         |
| Cindy Gibson   | Shackelford               | 601-397-2439   | cindy@shackelfordconst.com   |
| Jim Mcateer    | Kenneth Thompson          | 662-453-7765   | jim@krtbuilder.com           |
| Marty Barton   | Kenneth Thompson          | 662-299-6566   | Marty@krtbuilder.com         |
| Sammy Overley  | S/W ELEC.                 | 662-299-7964   | SOverley@bellsouth.net       |
| JOHN BLACK     | BEARD + RISER             | 662-897-5678   | JBLACK@BEARDRISER.COM        |
| Ligh Ann Black | BEARD + RISER             | 662-457-0431   | lblack@beardriser.com        |
| Thomas Gregory | City of Greenwood         |                | tgregory@cityofgreenwood.org |
| Dale Tackett   | TAELEC, LLC               | 662-299-7966   | tackettelectric@hotmail.com  |

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

DOCUMENT 00411 - BID FORM - STIPULATED SUM (SINGLE-PRIME CONTRACT)

1.1 BID INFORMATION

- A. Bidder: \_\_\_\_\_.
- B. Project Name: Greenwood Police Department and Municipal Court Renovation.
- C. Project Location: 406 Main Street, Greenwood, Mississippi.
- D. Owner: City of Greenwood, Mississippi.
- E. Architect: Beard + Riser Architects PLLC.

1.2 CERTIFICATIONS AND BASE BID

- A. Base Bid, Single-Prime (All Trades) Contract: The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and all subsequent Addenda, as prepared by Beard + Riser Architects PLLC and Architect's consultants, having visited the site, and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services, including all scheduled allowances, necessary to complete the construction of the above-named project, according to the requirements of the Procurement and Contracting Documents, for the stipulated sum of:
  - 1. \_\_\_\_\_ Dollars  
(\$\_\_\_\_\_).
  - 2. The above amount may be modified by amounts indicated by the Bidder on the attached Document 004323 "Alternates Form."

1.3 BID GUARANTEE

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 60 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting five percent (5%) of the Base Bid amount above:
  - 1. \_\_\_\_\_ Dollars  
(\$\_\_\_\_\_).
- B. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

1.4 SUBCONTRACTORS AND SUPPLIERS

- A. The following companies shall execute subcontracts for the portions of the Work indicated:

- |    |            |       |
|----|------------|-------|
| 1. | Concrete   | Work: |
| 2. | Masonry    | Work: |
| 3. | Roofing    | Work: |
| 4. | Plumbing   | Work: |
| 5. | HVAC       | Work: |
| 6. | Electrical | Work: |

1.5 TIME OF COMPLETION

- A. The undersigned Bidder proposes and agrees hereby to commence the Work of the Contract Documents on a date specified in a written Notice to Proceed to be issued by Architect, and shall fully complete the Work within 270 calendar days.

1.6 ACKNOWLEDGEMENT OF ADDENDA

- A. The undersigned Bidder acknowledges receipt of and use of the following Addenda in the preparation of this Bid:

1. Addendum No. 1, dated \_\_\_\_\_.
2. Addendum No. 2, dated \_\_\_\_\_.
3. Addendum No. 3, dated \_\_\_\_\_.
4. Addendum No. 4, dated \_\_\_\_\_.

1.7 BID SUPPLEMENTS

- A. The following supplements are a part of this Bid Form and are attached hereto.

1. Bid Form Supplement - Alternates.
2. Bid Form Supplement - Allowances.
3. Bid Form Supplement - Bid Bond Form (AIA Document A310).

1.8 CONTRACTOR'S LICENSE

- A. The undersigned further states that it is a duly licensed contractor, for the type of work proposed, in the State of Mississippi, and that all fees, permits, etc., pursuant to submitting this proposal have been paid in full.

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

1.9 SUBMISSION OF BID

- A. Respectfully submitted this \_\_\_\_ day of \_\_\_\_\_, 2015.
- B. Submitted By:\_\_\_\_\_.  
(Name of bidding firm or corporation).
- C. Authorized  
Signature:\_\_\_\_\_.  
(Handwritten signature).
- D. Signed By:\_\_\_\_\_.  
(Type or print name).
- E. Title:\_\_\_\_\_.  
(Owner/Partner/President/Vice President).
- F. Witness  
By:\_\_\_\_\_.  
(Handwritten signature).
- G. Attest:\_\_\_\_\_.  
(Handwritten signature).
- H. By:\_\_\_\_\_.  
(Type or print name).
- I. Title:\_\_\_\_\_.  
(Corporate Secretary or Assistant Secretary).
- J. Street  
Address:\_\_\_\_\_.
- K. City, State,  
Zip:\_\_\_\_\_.
- L. Phone:\_\_\_\_\_.
- M. License  
No.:\_\_\_\_\_.
- N. Federal ID No.:\_\_\_\_\_.  
(Affix Corporate Seal Here).

END OF DOCUMENT 004113



## **TABLE OF CONTENTS**

### **DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

|        |                                                   |
|--------|---------------------------------------------------|
| 001113 | ADVERTISEMENT FOR BIDS                            |
| 002113 | INSTRUCTIONS TO BIDDERS                           |
| 002213 | SUPPLEMENTARY INSTRUCTIONS                        |
| 003126 | EXISTING HAZARDOUS MATERIALS INFORMATION          |
| 004113 | BID FORM - STIPULATED SUM (SINGLE-PRIME CONTRACT) |
| 004313 | BID SECURITY FORMS                                |
| 004321 | ALLOWANCE FORM                                    |
| 004323 | ALTERNATES FORM                                   |
| 004393 | BID SUBMITTAL CHECKLIST                           |
| 006000 | PROJECT FORMS                                     |

### **DIVISION 01 – GENERAL REQUIREMENTS**

|        |                                     |
|--------|-------------------------------------|
| 011000 | SUMMARY                             |
| 012100 | ALLOWANCES                          |
| 012300 | ALTERNATES                          |
| 012500 | SUBSTITUTION PROCEDURES             |
| 012600 | CONTRACT MODIFICATION PROCEDURES    |
| 012900 | PAYMENT PROCEDURES                  |
| 013200 | CONSTRUCTION PROGRESS DOCUMENTATION |
| 013300 | SUBMITTAL PROCEDURES                |
| 014000 | QUALITY REQUIREMENTS                |
| 014200 | REFERENCES                          |
| 015000 | TEMPORARY FACILITIES AND CONTROLS   |
| 016000 | PRODUCT REQUIREMENTS                |
| 017300 | EXECUTION                           |
| 017700 | CLOSEOUT PROCEDURES                 |
| 017823 | OPERATION AND MAINTENANCE DATA      |
| 017839 | PROJECT RECORD DOCUMENTS            |
| 017900 | DEMONSTRATION AND TRAINING          |

### **DIVISION 02 – EXISTING CONDITIONS**

|        |                      |
|--------|----------------------|
| 020800 | ASBESTOS REMOVAL     |
| 024119 | SELECTIVE DEMOLITION |

### **DIVISION 03 – CONCRETE**

|        |                               |
|--------|-------------------------------|
| 033000 | CAST-IN-PLACE CONCRETE        |
| 035416 | HYDRAULIC CEMENT UNDERLAYMENT |

### **DIVISION 04 - MASONRY**

|        |                             |
|--------|-----------------------------|
| 040120 | MAINTENANCE OF UNIT MASONRY |
| 042000 | REINFORCED UNIT MASONRY     |

**DIVISION 05 – METALS**

|        |                           |
|--------|---------------------------|
| 051200 | STRUCTURAL STEEL FRAMING  |
| 054000 | COLD-FORMED METAL FRAMING |
| 055000 | METAL FABRICATIONS        |
| 055213 | PIPE AND TUBE RAILINGS    |

**DIVISION 06 – WOOD, PLASTICS AND COMPONENTS**

|        |                                               |
|--------|-----------------------------------------------|
| 061000 | ROUGH CARPENTRY                               |
| 061600 | SHEATHING                                     |
| 062023 | INTERIOR FINISH CARPENTRY                     |
| 064116 | PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS |

**DIVISION 07 – THERMAL AND MOISTURE PROTECTION**

|        |                                        |
|--------|----------------------------------------|
| 072100 | THERMAL INSULATION                     |
| 072500 | WEATHER BARRIERS                       |
| 074213 | METAL WALL PANELS                      |
| 074293 | SOFFIT PANELS                          |
| 075423 | THERMOPLASTIC POLYOLEFIN (TPO) ROOFING |
| 076200 | SHEET METAL FLASHING AND TRIM          |
| 077200 | ROOF ACCESSORIES                       |
| 079200 | JOINT SEALANTS                         |

**DIVISION 08 – OPENINGS**

|           |                                                                         |
|-----------|-------------------------------------------------------------------------|
| 081113    | HOLLOW METAL DOORS AND FRAMES                                           |
| 082110    | FLUSH WOOD DOORS                                                        |
| 083113    | ACCESS DOOR AND FRAMES                                                  |
| 083459    | VAULT DOORS AND DAY GATES                                               |
| 084113    | ALUMINUM FRAMED ENTRANCES                                               |
| 084113.10 | ALUMINUM FRAMED STOREFRONTS                                             |
| 084413    | GLAZED ALUMINUM CURTAIN WALL                                            |
| 084523    | 2 ¾" INSULATED TRANSLUCENT FIBERGLASS SANDWICH PANEL<br>SKYLIGHT SYSTEM |
| 085113    | ALUMINUM WINDOWS                                                        |
| 087100    | DOOR HARDWARE                                                           |
| 088000    | GLAZING                                                                 |
| 088300    | MIRRORS                                                                 |

**DIVISION 09 – FINISHES**

|           |                                |
|-----------|--------------------------------|
| 092900    | GYPSUM BOARD                   |
| 093013    | CERAMIC TILING                 |
| 095123    | ACOUSTICAL TILE CEILINGS       |
| 095470    | WOOD CEILING SYSTEMS           |
| 095470.10 | WOOD WALL SYSTEMS              |
| 096513    | RESILIENT BASE AND ACCESSORIES |
| 096519    | RESILIENT TILE FLOORING        |
| 096813    | TEXTILE COMPOSITE FLOORING     |
| 099000    | PAINTS AND COATINGS            |
| 099113    | EXTERIOR PAINTING              |
| 099123    | INTERIOR PAINTING              |

**DIVISION 10 – SPECIALTIES**

|           |                                       |
|-----------|---------------------------------------|
| 101423    | PANEL SIGNAGE                         |
| 102113.15 | STAINLESS STEEL TOILET PARTITIONS     |
| 102800    | TOILET, BATH, AND LAUNDRY ACCESSORIES |
| 104413    | FIRE PROTECTION CABINETS              |
| 104416    | FIRE EXTINGUISHERS                    |

**DIVISION 12 – FURNISHINGS**

|           |                                   |
|-----------|-----------------------------------|
| 123623.13 | PLASTIC-LAMINATE-CLAD COUNTERTOPS |
| 123661    | SIMULATED STONE COUNTERTOPS       |

**DIVISION 14 – CONVEYING EQUIPMENT**

|        |                     |
|--------|---------------------|
| 142400 | HYDRAULIC ELEVATORS |
|--------|---------------------|

**DIVISION 21 - FIRE PROTECTION**

|        |                                                          |
|--------|----------------------------------------------------------|
| 210553 | IDENTIFICATION FOR FIRE SUPPRESSION PIPING AND EQUIPMENT |
| 211100 | FACILITY FIRE SUPPRESSION WATER SERVICE PIPING           |
| 211313 | WET PIPE SPINKLER SYSTEM                                 |

**DIVISION 22 – PLUMBING**

|        |                                         |
|--------|-----------------------------------------|
| 220500 | COMMON WORK RESULTS FOR PLUMBING        |
| 220523 | GENERAL DUTY VALVES FOR PLUMBING PIPING |
| 221100 | FACILITY WATER DISTRIBUTION             |
| 221300 | FACILITY SANITARY SEWERAGE              |
| 224000 | PLUMBING FIXTURES AND TRIM              |

**DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITONING**

|        |                                               |
|--------|-----------------------------------------------|
| 230400 | GENERAL PROVISIONS                            |
| 230410 | CODES AND STANDARDS                           |
| 223050 | COMMON WORK RESULTS FOR HVAC                  |
| 230593 | TESTING, ADJUSTING, AND BALANCING OF HVAC     |
| 230711 | HVAC PLUMBING AND INSULATION                  |
| 233100 | HVAC DUCTS AND CASINGS                        |
| 233400 | VENTILATION SYSTEM                            |
| 233500 | AIR DISTRIBUTION SYSTEM                       |
| 233700 | AIR OUTLETS AND INLETS                        |
| 238100 | VARIABLE REFRIGERANT FLOW – MULTI INDOOR UNIT |
| 238140 | PACKAGED AIR UNITS – 3 TONS THROUGH 25 TONS   |
| 238200 | DIRECT DIGITAL CONTROL SYSTEM – SC BCU        |
| 238400 | AIR COOLED CONDENSING UNIT                    |
| 238500 | BUILDING CONTROL SYSTEM                       |

**DIVISION 26 – ELECTRICAL**

|        |                                                                  |
|--------|------------------------------------------------------------------|
| 260511 | ELECTRICAL GENERAL AND WORK IN EXISTING FACILITIES               |
| 260520 | LOW-VOLTAGE POWER CONDUCTORS AND CABLES                          |
| 260526 | GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS                     |
| 260533 | RACEWAYS, OUTLET BOXES AND JUNCTION BOXES FOR ELECTRICAL SYSTEMS |
| 260573 | ELECTRICAL STUDIES                                               |
| 260923 | SWITCHES AND RECEPTACLES                                         |
| 260925 | OCCUPANCY SENSORS                                                |
| 262400 | PANELBOARDS                                                      |
| 262800 | DISCONNECTS AND SEPARATELY-MOUNTED CIRCUIT BREAKERS              |
| 264300 | SURGE PROTECTIVE DEVICE (SPD)                                    |
| 265100 | LIGHTING                                                         |

**DIVISION 27 – COMMUNICATIONS**

|        |                            |
|--------|----------------------------|
| 273000 | TELEPHONE AND DATA SYSTEMS |
| 275113 | PAGING SYSTEM              |

**DIVISION 28 – ELECTRONIC SAFETY AND SECURITY**

|        |                                          |
|--------|------------------------------------------|
| 281300 | ACCESS CONTROL SYSTEM                    |
| 282302 | CLOSED CIRCUIT TELEVISION CONDUIT SYSTEM |
| 283100 | FIRE ALARM SYSTEM                        |

**DIVISION 32 – EXTERIOR IMPROVEMENTS**

|        |                                        |
|--------|----------------------------------------|
| 322303 | CRUSHED LIMESTONE COURSE               |
| 322618 | TRAFFIC CONTROL                        |
| 322625 | PAINTED TRAFFIC MARKINGS               |
| 329450 | WELDED WIRE PANEL PLANT SUPPORT SYSTEM |

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

**APPENDIX**

Geotechnical Report

Title: Additions and Renovations Greenwood Police Department

Engineer: Pritchard Engineering

Date: October 2015

Asbestos Survey

Title: Greenwood Police Department Building

Engineer: W.L. Burle Engineers, P.A.

Date: May 11, 2011

## SECTION 077200 - ROOF ACCESSORIES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Roof hatches.

#### 1.3 COORDINATION

- A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
- B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof accessories.
  - 1. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.
- C. Samples: For each exposed product and for each color and texture specified, prepared on Samples of size to adequately show color.
- D. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:
  - 1. Size and location of roof accessories specified in this Section.
  - 2. Method of attaching roof accessories to roof or building structure.

Greenwood Police Department and Municipal Court Renovations  
Beard + Riser Architects PLLC

3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
4. Required clearances.

E. Sample Warranties: For manufacturer's special warranties.

## 1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

## 1.6 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

- a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
- b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
- c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

### 2.2 ROOF HATCH

- A. Roof Hatches: Metal roof-hatch units with lids and insulated single-walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, straight sides, and integrally formed deck-mounting flange at perimeter bottom.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Greenwood Police Department and Municipal Court Renovations  
Beard + Riser Architects PLLC

- a. Acudor Products, Inc.
  - b. AES Industries, Inc.
  - c. Babcock-Davis.
  - d. Bilco Company (The).
  - e. Bristolite Daylighting Systems, Inc.
  - f. Custom Solution Roof and Metal Products.
  - g. Dur-Red Products.
  - h. Hi Pro International, Inc.
  - i. JL Industries, Inc.; a division of the Activar Construction Products Group.
  - j. KCC International Inc.
  - k. Lexcor; a division of Luxsoco corp.
  - l. Metallic Products Corp.
  - m. Milcor; Commercial Products Group of Hart & Cooley, Inc.
  - n. Natural Daylighting Systems.
  - o. O'Keeffe's Inc.
  - p. Pate Company (The).
  - q. Precision Ladders, LLC.
  - r. Williams Bros. Corporation of America (The).
- B. Type and Size: Single-leaf lid, 36 by 36 inches (900 by 900 mm).
- C. Loads: Minimum 40-lbf/sq. ft. (1.9-kPa) external live load and 20-lbf/sq. ft. (0.95-kPa) internal uplift load.
1. Dome Glazing: Minimum 40-lbf/sq. ft. (1.9-kPa) external live load and 20-lbf/sq. ft. (0.95-kPa) internal uplift load.
- D. Hatch Material: Zinc-coated (galvanized) steel sheet.
1. Thickness: Manufacturer's standard thickness for hatch size indicated.
  2. Finish: Baked enamel or powder coat.
  3. Color: As selected by Architect from manufacturer's full range.
- E. Construction:
1. Insulation: Cellulosic-fiber board.
    - a. R-Value: 12.0 according to ASTM C 1363.
  2. Nailer: Factory-installed wood nailer continuous around hatch perimeter.
  3. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
  4. Fabricate curbs to minimum height of 12 inches (305 mm) above roofing surface unless otherwise indicated.
- F. Hardware: Spring operators, hold-open arm, galvanized-steel spring latch with turn handles, galvanized-steel butt- or pintle-type hinge system, and padlock hasps inside and outside.
1. Provide two-point latch on lids larger than 84 inches (2130 mm).



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- G. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to roof-access ladder.
1. Operation: Post locks in place on full extension; release mechanism returns post to closed position.
  2. Height: 42 inches (1060 mm) above finished roof deck.
  3. Material: Steel tube.
  4. Post: 1-5/8-inch- (41-mm-) diameter pipe.
  5. Finish: Manufacturer's standard baked enamel or powder coat.
    - a. Color: As selected by Architect from manufacturer's full range.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. General: Install roof accessories according to manufacturer's written instructions.
  1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
  2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
  3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
  4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
  1. Coat concealed side of roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.

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2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.
3. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof accessories for waterproof performance.

C. Roof-Hatch Installation:

1. Verify that roof hatch operates properly. Clean, lubricate, and adjust operating mechanism and hardware.
2. Attach safety railing system to roof-hatch curb.
3. Attach ladder-assist post according to manufacturer's written instructions.

- D. Seal joints with elastomeric or butyl sealant as required by roof accessory manufacturer.

3.3 REPAIR AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780/A 780M.
- B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 099113 "Exterior Painting."
- C. Clean exposed surfaces according to manufacturer's written instructions.
- D. Clean off excess sealants.
- E. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077200

## SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes hollow-metal work.
- B. Related Requirements:
  - 1. Section 087100 "Door Hardware" for door hardware for hollow-metal doors.

#### 1.3 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

#### 1.4 COORDINATION

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

#### 1.5 PREINSTALLATION MEETINGS

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

#### 1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, temperature-rise ratings, and finishes.
- B. Shop Drawings: Include the following:
  - 1. Elevations of each door type.

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2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
  3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
  4. Locations of reinforcement and preparations for hardware.
  5. Details of each different wall opening condition.
  6. Details of anchorages, joints, field splices, and connections.
  7. Details of accessories.
  8. Details of moldings, removable stops, and glazing.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification:
1. For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches (75 by 127 mm).
  2. For "Doors" and "Frames" subparagraphs below, prepare Samples approximately 12 by 12 inches (305 by 305 mm) to demonstrate compliance with requirements for quality of materials and construction:
    - a. Doors: Show vertical-edge, top, and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.
    - b. Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow-metal panels and glazing if applicable.
- E. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

#### 1.7 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.
- B. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
  1. Provide additional protection to prevent damage to factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

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- C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch- (102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Amweld International, LLC.
2. Apex Industries, Inc.
3. Ceco Door Products; an Assa Abloy Group company.
4. Commercial Door & Hardware Inc.
5. Concept Frames, Inc.
6. Curries Company; an Assa Abloy Group company.
7. Custom Metal Products.
8. Daybar.
9. Deansteel.
10. de La Fontaine Industries.
11. DKS Steel Door & Frame Sys. Inc.
12. Door Components, Inc.
13. Fleming-Baron Door Products.
14. Gensteel Doors Inc.
15. Greensteel Industries, Ltd.
16. HMF Express.
17. Hollow Metal Inc.
18. Hollow Metal Xpress.
19. J/R Metal Frames Manufacturing, Inc.
20. Karpen Steel Custom Doors & Frames.
21. L.I.F. Industries, Inc.
22. LaForce, Inc.
23. Megamet Industries, Inc.
24. Mesker Door Inc.
25. Michbi Doors Inc.
26. MPI Group, LLC (The).
27. National Custom Hollow Metal.
28. North American Door Corp.
29. Philipp Manufacturing Co (The).
30. Pioneer Industries, Inc.
31. Premier Products, Inc.
32. Republic Doors and Frames.
33. Rocky Mountain Metals, Inc.
34. Security Metal Products Corp.
35. Shanahans Manufacturing Ltd.
36. Steelcraft; an Ingersoll-Rand company.
37. Steward Steel; Door Division.

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Beard + Riser Architects PLLC

- 38. Stiles Custom Metal, Inc.
- 39. Titan Metal Products, Inc.
- 40. Trillium Steel Doors Limited.
- 41. West Central Mfg. Inc.

- B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

## 2.2 REGULATORY REQUIREMENTS

- A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
  - 1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.
- B. Fire-Rated, Borrowed-Light Assemblies: Complying with NFPA 80 and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

## 2.3 INTERIOR DOORS AND FRAMES

- A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Standard-Duty Doors and Frames: SDI A250.8, Level 1. At locations indicated in the Door and Frame Schedule.
  - 1. Physical Performance: Level C according to SDI A250.4.
  - 2. Doors:
    - a. Type: As indicated in the Door and Frame Schedule.
    - b. Thickness: 1-3/4 inches (44.5 mm).
    - c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.032 inch (0.8 mm).
    - d. Edge Construction: Model 1, Full Flush.
    - e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.
    - f. Core: Kraft-paper honeycomb.
  - 3. Frames:

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- a. Materials: Uncoated, cold-rolled steel sheet, minimum thickness of 0.042 inch (1.0 mm).
  - b. Construction: Knocked down.
4. Exposed Finish: Prime.

## 2.4 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

- A. Construct exterior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Heavy-Duty Doors and Frames: SDI A250.8, Level 2.
- 1. Physical Performance: Level B according to SDI A250.4.
  - 2. Doors:
    - a. Type: As indicated in the Door and Frame Schedule.
    - b. Thickness: 1-3/4 inches (44.5 mm.)
    - c. Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch (1.0 mm), with minimum A40 (ZF120) coating.
    - d. Edge Construction: Model 1, Full Flush.
    - e. Core: Kraft-paper honeycomb.
    - 1) Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than 2.1 F x h x sq. ft./Btu (0.370 K x sq. m/W) when tested according to ASTM C 1363.
  - 3. Frames:
    - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
    - b. Construction: Knocked down.
  - 4. Exposed Finish: Prime.

## 2.5 FRAME ANCHORS

- A. Jamb Anchors:
- 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (51 mm) wide by 10 inches (254 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
  - 2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
  - 3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
  - 4. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe

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spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

- B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:
  - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
  - 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at finish floor surface.

## 2.6 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
  - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- G. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
- H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
- I. Glazing: Comply with requirements in Section 088000 "Glazing."
- J. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.



## 2.7 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
  - 1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch (0.66 mm), steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches (152 mm) apart. Spot weld to face sheets no more than 5 inches (127 mm) o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.
  - 2. Fire Door Cores: As required to provide fire-protection and temperature-rise ratings indicated.
  - 3. Vertical Edges for Single-Acting Doors: Bevel edges 1/8 inch in 2 inches (3.2 mm in 51 mm).
  - 4. Top Edge Closures: Close top edges of doors with inverted closures, except provide flush closures at exterior doors of same material as face sheets.
  - 5. Bottom Edge Closures: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets.
  - 6. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
  - 7. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch (19 mm) beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.
- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
  - 1. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
  - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
  - 3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
  - 4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
  - 5. Jamb Anchors: Provide number and spacing of anchors as follows:
    - a. Masonry Type: Locate anchors not more than 16 inches (406 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c., to match coursing, and as follows:

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- 1) Two anchors per jamb up to 60 inches (1524 mm) high.
    - 2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
    - 3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
    - 4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.
  - b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
    - 1) Three anchors per jamb up to 60 inches (1524 mm) high.
    - 2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
    - 3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
    - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
  - c. Compression Type: Not less than two anchors in each frame.
  - d. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
6. Head Anchors: Two anchors per head for frames more than 42 inches (1067 mm) wide and mounted in metal-stud partitions.
  7. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
    - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
    - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
  8. Terminated Stops: Terminate stops 6 inches (152 mm) above finish floor with a 45-degree angle cut, and close open end of stop with steel sheet closure. Cover opening in extension of frame with welded-steel filler plate, with welds ground smooth and flush with frame.
- D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.
- E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
  2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

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- F. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
  2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
  3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
  4. Provide loose stops and moldings on inside of hollow-metal work.
  5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

## 2.8 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

## 2.9 ACCESSORIES

- A. Louvers: Provide louvers for interior doors, where indicated, which comply with SDI 111C, with blades or baffles formed of 0.020-inch- (0.5-mm-) thick, cold-rolled steel sheet set into 0.032-inch- (0.8-mm-) thick steel frame.
1. Sightproof Louver: Stationary louvers constructed with inverted-V or inverted-Y blades.
- B. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- C. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

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- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

### 3.3 INSTALLATION

- A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.
- B. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
  - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
    - a. At fire-rated openings, install frames according to NFPA 80.
    - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    - c. Install frames with removable stops located on secure side of opening.
    - d. Install door silencers in frames before grouting.
    - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    - f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    - g. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
  - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
    - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

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3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
  4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
  5. Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.
  6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
  7. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
  8. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
    - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
    - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
    - a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
    - b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
    - c. At Bottom of Door: 5/8 inch (15.8 mm) plus or minus 1/32 inch (0.8 mm).
    - d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
  2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.
1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

### 3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

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- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
- E. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113

## SECTION 082110 - FLUSH WOOD DOORS

### PART 1 - General

#### 1.1 Related Documents

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 Summary

- A. This Section includes the following:
  - 1. Solid-core doors with High-Pressure Decorative Laminate (herein referred to as "HPDL") Thermal Fused faces.
  - 2. Factory fitting flush wood doors to frames and factory machining for hardware.
  - 3. Louvers and vision lite kits for flush wood doors.
- B. Related Sections include the following:
  - 1. Section 088000 "Glazing" for glass view panels in flush wood doors.

#### 1.3 Submittals

- A. Product Data: For each type of door. Include details of core and edge construction and trim for openings.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and other pertinent data.
  - 1. Indicate dimensions and locations of mortises and holes for hardware.
  - 2. Indicate dimensions and locations of cutouts.
  - 3. Indicate fire ratings for fire doors.
- C. Samples for Initial Selection: Color samples consisting of actual faces in small sections for the following:
  - 1. HPDL Thermal Fused Door Faces: Show the full range of colors and wood grains available.
- D. Samples for Verification:
  - 1. Hinge corner sections of HPDL Thermal Fused doors, approximately 5 by 11 inches (127 by 279 mm) for each color or wood grain specified.
  - 2. Louver blade and frame sections, 6 inches (150 mm) long, for each material and finish specified.
  - 3. Frames for light openings, 6 inches (150 mm) long, for each material, type, and finish required.

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- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified independent third party testing agency, for doors, showing compliance with specified performance requirements and physical properties.

#### 1.4 Quality Assurance

- A. Source Limitations: Obtain HPDL Thermal Fused Flush Wood Doors through one source from a single manufacturer.
- B. Quality Standard: Comply with WDMA I.S.1-A, 2004 edition "Industry Standard for Architectural Wood Flush Doors" and the following minimum values (for particle core doors):
  - 1. NWWDA TM-7 Cycle Slam Test: 1,000,000 cycles.
  - 2. NWWDA TM-8 Hinge Loading Test: 1,000 lbs.
  - 3. NWWDA TM-10 Edge Screw Holding Test: 700 lbs.
  - 4. NWWDA TM-10 Face Screw Holding Test: 650 lbs.
- C. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL 10C.
  - 1. Test Pressure: Test at atmospheric pressure. At 5 minutes into the test, the neutral pressure level in furnace shall be established at 40 inches (1000 mm) or less above the sill – positive pressure.
  - 2. Positive Pressure Fire-Rated Wood Doors: 20 minute doors to be Category B with frame-applied seals and 45, 60 & 90 minute doors to be Category A, with concealed intumescent.
  - 3. Oversize, Fire-Rated Wood Doors: For door assemblies exceeding sizes of tested assemblies, provide manufacturer's standard Construction Label, acceptable to authorities having jurisdiction, stating that doors comply with requirements of design, materials, and construction.
  - 4. Temperature-Rise Rating: At exit enclosures, provide doors that have a temperature-rise rating of 250 deg F (121 deg C) maximum after 30 minutes of fire exposure. Doors with this temperature-rise rating are limited to 100 sq. inches of clear view area of glazing.
  - 5. Blocking: When through-bolts are not to be used, indicate size and location of blocking in 45, 60 and 90 minute mineral core doors.
- D. Security Rating for Particle Core Doors:
  - 1. ASTM F 476, Grade 40.
- E. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

#### 1.5 Delivery, Storage, And Handling

- A. Comply with requirements of referenced standard and manufacturer's written instructions.



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Beard + Riser Architects PLLC

- B. Package doors to prevent damage in transit. Place doors on cardboard or wooden skids and wrap entire bundles of doors in plastic sheeting.
- C. Mark each door on top rail with opening number used on Shop Drawings.

1.6 Project Conditions

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity is between 25% and 55% during the remainder of the construction period.

1.7 Warranty

- A. Special Warranty: Manufacturer's standard form, signed by manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, have warped (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section, or show telegraphing of core construction in face exceeding 0.01 inch in a 3-inch (0.25 mm in a 75-mm) span.

PART 2 - Products

2.1 Manufacturers

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. HPDL Thermal Fused Flush Wood Doors:
    - a. Eggers Industries
    - b. Graham Wood Doors
    - c. Marshfield Door Systems
    - d. The Maiman Company
  - 2. Metal Lite Kits and Louvers for Doors:
    - a. Air Louvers, Inc.
    - b. Anemostat Door Products.
    - c. All Metal Stamping

2.2 Door Construction, General

- A. Adhesives: Do not use adhesives containing urea formaldehyde.
- B. HPDL Thermal Fused Wood Flush Doors:

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

1. WDMA I.S. 1A Performance Duty Level: Extra Heavy Duty
2. WDMA I.S. 1A Aesthetic Grade: Premium
3. HPDL Thermal-Fused Faces: Decorative faces thermally fused to cores under heat and pressure, complying with Laminating Materials Association's Product Standard and Typical Physical Properties of Decorative Overlays. LMA.2003.
4. Color or Woodgrain Pattern: As selected by Architect from manufacturer's full range of products.
5. Edgebanding: Impact-resistant polymer edging, minimum .040" thick, applied to all four edges after faces on all particle and mineral core doors. As selected by Architect from manufacturer's full range of products.
6. Provide doors with pilot holes factory-drilled for vertical edge hinges and lock sets.

2.3 Solid-Core Doors

A. Particleboard Cores: Comply with the following requirements:

1. Particleboard: ANSI A208.1, Grade M-2.
2. Wood Stiles and Rails: Not required.
3. Blocking: Not required.

B. Mineral Core Fire-Rated Doors:

1. Construction: Construction and core specified above for type of face indicated or manufacturer's standard mineral-core construction as needed to provide fire rating indicated.
2. Blocking: For mineral-core doors, provide composite blocking with improved screw-holding capability approved for use in doors of fire ratings indicated as needed to eliminate through-bolting hardware, as follows:
  - a. 5-inch (125-mm) top-rail blocking for closer attachment.
  - b. 5-inch (125-mm) bottom-rail blocking, in doors indicated to have protection plates or mortised automatic door bottoms.
  - c. 5-inch (125-mm) midrail blocking, in doors indicated to have armor plates.
  - d. 4-1/2-by-10-inch (114-by-250-mm) lock blocks, in doors indicated to have exit devices.
3. Edge Construction: At hinge stiles, provide manufacturer's standard laminated-edge construction with improved screw-holding capability and split resistance and with outer stile matching polymer edging.
4. Edge Construction Category A Mineral Core Doors: Provide edge construction with intumescent seals concealed by outer stile matching polymer edging, and laminated backing for improved screw-holding capability and split resistance.

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

5. Pairs: For 45, 60 & 90 minute fire doors, provide meeting stiles with concealed intumescent, to eliminate the need for metal meeting edges and/or overlapping astragal.

## 2.4 Louvers And Light Frames

### A. Metal Louvers:

1. Blade Type: Vision-proof, inverted V.
2. Metal and Finish: Galvanized steel, 0.0396 inch (1.0 mm) thick, hot-dip zinc coated and factory primed for paint finish.

### B. Fire Door Louvers: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire rating of one and one-half hours and less.

1. Metal and Finish: Galvanized steel, 0.0396 inch (1.0 mm) thick, hot-dip zinc coated and factory primed for paint finish.

### C. Wood Beads for Light Openings in Particle Core Wood Doors:

1. Wood Species: Factory finished to match door face
2. Profile: Manufacturer's standard lipped profile.
3. At 20-minute, fire-rated, wood-core doors, provide wood beads and intumescent glazing tape approved for such use.

### D. Metal Frames for Light Openings in Fire Doors: Manufacturer's standard frame formed of 0.0478-inch- (1.2-mm-) thick, cold-rolled steel sheet; factory primed and approved for use in doors of fire rating indicated.

## 2.5 Fabrication

### A. Fabricate doors in sizes indicated for Project-site fitting.

### B. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels, unless otherwise indicated:

1. Comply with clearance requirements of referenced quality standard for fitting. Comply with requirements in NFPA 80 for fire-rated doors.

### C. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.

1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.

### D. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required.

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

1. Light Openings: Trim openings with moldings of material and profile indicated.
2. Louvers: Factory install louvers in prepared openings.

PART 3 - Execution

3.1 Examination

- A. Examine doors and installed door frames before hanging doors.
  1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
  2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 Installation

- A. Hardware: For installation, see Division 8 Section "Door Hardware."
- B. Manufacturer's Written Instructions: Install doors, lite kits, and glazing to comply with manufacturer's written instructions, referenced quality standard, and as indicated.
  1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

3.3 Adjusting

- A. Operation: Rehang or replace doors that do not swing or operate freely.

END OF SECTION

## SECTION 083113 - ACCESS DOORS AND FRAMES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Access doors and frames for ceilings.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, fire ratings, materials, individual components and profiles, and finishes.
- B. Shop Drawings:
  - 1. Include plans, elevations, sections, details, and attachments to other work.
  - 2. Detail fabrication and installation of access doors and frames for each type of substrate.
- C. Samples: For each door face material, at least 3 by 5 inches (75 by 125 mm) in size, in specified finish.
- D. Product Schedule: Provide complete access door and frame schedule, including types, locations, sizes, latching or locking provisions, and other data pertinent to installation.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to access door and frame assemblies tested for fire-test-response characteristics according to the following test method and that are listed and labeled by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
  - 1. NFPA 288 for fire-rated access door assemblies installed horizontally.

Greenwood Police Department and Municipal Court Renovations  
Beard + Riser Architects PLLC

2.2 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product by one of the following:
  - 1. Access Panel Solutions.
  - 2. Acudor Products, Inc.
  - 3. Alfab, Inc.
  - 4. Babcock-Davis.
  - 5. Cendrex Inc.
  - 6. Elmdor/Stoneman Manufacturing Co.; Div. of Acorn Engineering Co.
  - 7. Jensen Industries; Div. of Broan-Nutone, LLC.
  - 8. J. L. Industries, Inc.; Div. of Activar Construction Products Group.
  - 9. Karp Associates, Inc.
  - 10. Larsen's Manufacturing Company.
  - 11. Maxam Metal Products Limited.
  - 12. Metropolitan Door Industries Corp.
  - 13. MIFAB, Inc.
  - 14. Milcor Inc.
  - 15. Nystrom, Inc.
  - 16. Williams Bros. Corporation of America (The).
- C. Source Limitations: Obtain each type of access door and frame from single source from single manufacturer.
- D. Fire-Rated, Flush Access Doors with Exposed Flanges:
  - 1. Assembly Description: Fabricate door to fit flush to frame, with a core of mineral-fiber insulation enclosed in sheet metal. Provide self-latching door with automatic closer and interior latch release. Provide manufacturer's standard-width exposed flange, proportional to door size.
  - 2. Locations: Ceiling, where indicated on Drawings.
  - 3. Size: As indicated on Drawings.
  - 4. Fire-Resistance Rating: Not less than that of adjacent construction.
  - 5. Temperature-Rise Rating: 450 deg F (250 deg C) at the end of 30 minutes.
  - 6. Uncoated Steel Sheet for Door: Nominal 0.036 inch (0.91 mm), 20 gage.
    - a. Finish: Factory finish.
  - 7. Frame Material: Same material, thickness, and finish as door.
  - 8. Hinges: Manufacturer's standard.
  - 9. Hardware: Lock.
- E. Hardware:
  - 1. Latch: Cam latch operated by knurled knob with interior release.
  - 2. Lock: Mortise cylinder.

## 2.3 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A 879/A 879M, with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.
- C. Frame Anchors: Same type as door face.
- D. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

## 2.4 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access doors to types of supports indicated.
  - 1. For concealed flanges with drywall bead, provide edge trim for gypsum board and gypsum base securely attached to perimeter of frames.
  - 2. For concealed flanges with plaster bead for full-bed plaster applications, provide zinc-coated expanded metal lath and exposed casing bead welded to perimeter of frames.
  - 3. Provide mounting holes in frames for attachment of units to metal or wood framing.
  - 4. Provide mounting holes in frame for attachment of masonry anchors.
- D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.
  - 1. For cylinder locks, furnish two keys per lock and key all locks alike.
  - 2. For recessed panel doors, provide access sleeves for each locking device. Furnish plastic grommets and install in holes cut through finish.

## 2.5 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Greenwood Police Department and Municipal Court Renovations  
Beard + Riser Architects PLLC

- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Steel and Metallic-Coated-Steel Finishes:
  - 1. Factory Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, with a minimum dry-film thickness of 1 mil (0.025 mm) for topcoat.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.
- B. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

#### 3.3 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.
- B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION 083113



## SECTION 083459 – VAULT DOORS AND DAY GATES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes:
  - 1. Show installation of anchorages for vault door frame.

#### 1.3 PREINSTALLATION MEETINGS

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

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, temperature-rise ratings, and finishes.
- B. Shop Drawings: For vault door assemblies.
  - 1. Include plans, elevations, sections and attachment details.
  - 2. Show operational clearances and coordination of frame with designed wall thicknesses.
  - 3. Show installation of anchorages for vault door frame.
- C. Setting Drawings: For anchorages, including sleeves, inserts, anchor bolts, and items with integral anchors that are to be embedded in supporting construction.
- D. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard sizes.
- E. Samples for Initial Selection: For each type of exposed finish.
  - 1. Include Samples of hardware and accessories involving color and finish selection.

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Beard + Riser Architects PLLC

- F. Samples for Verification: For each type of exposed finish, in manufacturer's standard sizes.

- 1. Include Samples of hardware and accessories to verify color and finish selection.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each vault door, for tests performed by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For vault door assemblies to include in emergency, operation and maintenance manuals.
  - 1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
    - a. Keying and combination information.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver vault door assemblies wrapped and crated to provide protection during transit and Project-site storage. Use vented plastic.
- B. Deliver keys to Owner by registered mail or overnight package service.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install vault door assemblies until spaces are enclosed and weathertight, and temporary HVAC system is operation and maintaining ambient temperature and humidity conditions at levels intended for building occupants during the remainder of the construction period.

## PART 2 - PRODUCTS

### 2.1 FIRE-RESISTANCE RATED VAULT DOOR ASSEMBLIES

- A. Vault Door Assembly: Complying with NFPA 232, tested according to UL 155, and listed and labeled for fire-resistance ratings indicated by a qualified testing agency.
- B. Manufacturers: Available manufacturers offering products that may be incorporated into the work include, but are not limited to the following:
  - 1. Sentrysafe, Schwab Corp.
  - 2. Diebold Incorporated
- C. Door: Fabricated from all-welded, insulated steel sheet construction; with jambs and head shaped to interlock with frame.
  - 1. Clear Opening Size: 40 inches wide by 78 inches high.
- D. Frame: Fabricated from steel sheet and designed for nongrout installation; adjustable to accommodate wall thicknesses.
- E. Hardware and Accessories:
  - 1. Hinges: No fewer than three roller-thrust-bearing hinges of design, size, and weight required for smooth operation of door and to allow full, clear door opening; with hinge cover(s).
    - a. Hinge cover: Manufacturer's standard.
  - 2. Door Bolts: Permanently lubricated, not less than 11/16 inches in diameter, and fabricated from nickel-plated steel. On each vertical side of door, provide five door bolts that engage frame when extended. Bolts automatically retract when handle is operated and automatically extend when door closes.
  - 3. Handle: Manufacturer's standard.
  - 4. Combination Lock: UL 768, Group 2, three-wheel, mechanical type, capable of not less than one million possible combinations.
    - a. Provide key locking details.
  - 5. Escape Mechanism: Provide emergency operation of lock from vault side of door.
  - 6. Sill: Reinforced formed – or flat-steel plate.
  - 7. Trim: Stainless-steel, chromium plated, or other trim standard with door manufacturer.

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Beard + Riser Architects PLLC

- F. Painted Finish: Manufacturer's standard factory-applied, baked-on coating applied to vault door, frame, and wall flanges.
  - 1. Color: As selected by Architect from manufacturer's full range.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Coordinate size and location of vault door assemblies with supporting construction, and furnish anchoring devices with templates, diagrams, and instructions for their installation.
- B. Provide temporary shoring or bracing of floors while transporting vault door assemblies to final location as required to prevent surface damage to floors or deflection in excess of design loads.

#### 3.3 INSTALLATION

- A. Install vault door assemblies complete with doors, frames, and accessories and according to requirements of assemblies' UL listing.
- B. Set vault door frames accurately in position; plumb, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.

#### 3.4 ADJUSTING AND CLEANING

- A. Adjust vault door hardware and operating mechanism to function smoothly, and lubricate as recommended by manufacturer.
- B. Remove and replace work that cannot be cleaned and repaired to permanently eliminate evidence of damage, including dented and bent units.
- C. Touchup Painting: Immediately after erection, clean abraded areas of shop paint; paint exposed areas with same material used for shop painting.

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

END OF SECTION 083459

## SECTION 084113 ALUMINUM – FRAMED ENTRANCES

### PART 1 GENERAL

#### 1.01 Work Included

- A. Furnish and install aluminum entrance, entrance door frames complete with hardware, and related components as shown on the drawings and specified in this section.
- B. Basis of Design shall be EFCO Series D318 DuraStile Medium Stile Entrance Door and Frame or equal.
  - 1. A sample door (size and configuration) as per requirements of architect.
  - 2. Test reports documenting compliance with requirements of Section 1.05.
- C. Glass and Glazing
  - 1. All units shall be factory glazed.
- D. Single Source Requirement
  - 1. All products listed in Section 1.02 shall be by the same manufacturer.

#### 1.02 Related Work

- A.. Section 08 44 13 – Glazed Aluminum Curtain Walls
- B. Section 08 51 13 – Aluminum Windows

#### 1.03 Not used.

#### 1.04 Items Installed but Not Furnished

- A. Structural support of the framing, wood framing, structural steel, and final cleaning.

#### 1.05 Laboratory Testing and Performance Requirements

- A. Test Units
  - 1. Air test unit shall be minimum size of 36" (914 mm) x 84" (2134 mm).
- B. Test Procedures and Performances
  - 1. Entrance doors shall conform to all requirements for the door type referenced in 1.01.B. In addition, the following specific performance requirements shall be met.
  - 2. Air Infiltration Test
    - a. With door sash closed and locked, test unit in accordance with ASTM E 283 at a static air pressure difference of 1.57 psf (75 Pa).
    - b. Air infiltration shall not exceed .50 cfm/SF (2.54 l/s•m<sup>2</sup>) of unit, for single doors.
    - c. Air infiltration shall not exceed .10 cfm/SF (.50 l/s•m<sup>2</sup>) of unit for a pair of doors.
- C. Structural Loads:
  - 1. The system shall be designed to withstand the following loads normal to the plane of the wall:
    - a. Comply with requirements of ASCE7. Wind zone IV-250 mph winds per FEMA.

Greenwood Police Department and Municipal Court Renovations  
Beard + Riser Architects PLLC

1.06 Quality Assurance

- A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
- B. Test reports shall be accompanied by the entrance door manufacturer's letter of certification stating that the tested door meets or exceeds the referenced performance standard for the appropriate door type.

1.07 References

1.08 Submittals

- A. Contractor shall submit shop drawings, finish samples, test reports, and warranties.
  - 1. Samples of materials as may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, corner section, etc.

1.09 Warranties

- A. Total Entrance Door / Storefront Installation
  - 1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total entrance door installation which includes that of the doors, hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air and structural adequacy as called for in the specifications and approved shop drawings.
  - 2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at their expense during the warranty period.
- B. Window Material and Workmanship
  - 1. Provide written guarantee against defects in material and workmanship for 3 years from the date of final shipment.
- C. Glass
  - 1. Provide written warranty for insulated glass units that they will be free from obstruction of vision as a result of dust or film formation on the internal glass surfaces caused by failure of the hermetic seal due to defects in material and workmanship.
  - 2. Warranty period shall be for 10 (ten) years.
- D. Finish
  - 1. Warranty period shall be for 3 years from the date of final shipment.

PART 2 PRODUCTS

2.01 Material

- A. Aluminum
  - 1. Extruded aluminum shall be 6063-T6 alloy and temper.
- B. Hardware
  - 1. Refer to Section 087100 for Door Hardware.

Greenwood Police Department and Municipal Court Renovations  
Beard + Riser Architects PLLC

2. Hardware for entrance doors (check with entrance door manufacturer for compatibility with door) is specified under "Hardware Section" of the specifications and shall be sent to the door manufacturer for application. The finish hardware supplier shall be responsible for furnishing physical hardware and templates of all hardware to the entrance door manufacturer prior to fabrication, and for coordinating hardware delivery requirements with the hardware manufacturer, the general contractor and the entrance door manufacturer to ensure the building project is not delayed.

C. Glass

1. Insulated glass shall be 1" thick with a center of glass U-Factor of 0.3 maximum constructed as follows:
  - a. Exterior lite – 1/4" thick, clear color, tempered glass, with a surface coating of Pyrolytic on the number 2 surface.
  - b. Interspace content: argon filled.
  - c. Interior lite – 1/4" thick, clear color, tempered glass.

2.02 Fabrication

A. General

1. Major portions of the door sections shall have .188" (3 mm) wall thickness. Glazing stop sections shall have .050" (1.2 mm) wall thickness.

B. Entrance Doors

1. Door stiles shall be no less than 3 1/2" (88 mm) wide (not including glass stops).
2. Door stiles and rails shall have hairline joints at corners. Heavy concealed reinforcement brackets shall be secured with screws and shall be of deep penetration and fillet welded.
3. Weather stripping shall be wool pile and shall be installed in one stile of door pairs and in jamb stiles of center pivoted doors.

C. Door Frame

1. Depth of frame shall not be less than 4 1/2" (114 mm).
2. Face dimension shall not be less than 2" (50 mm).
3. Shear block construction shall be utilized throughout.
4. System design shall be such that raw edges will not be visible at joints.

D. Glazing

1. All units shall be dry glazed with extruded pressure fitting aluminum glazing stops, and EPDM gaskets.

F. Finish

1. Anodic
  - a. Finish all exposed areas of aluminum windows and components with electrolytically deposited color in accordance with Aluminum Association. Color shall be selected by architect from manufacturer's full range.

PART 3 EXECUTION

3.01 Inspection

A. Job Conditions



Greenwood Police Department and Municipal Court Renovations  
Beard + Riser Architects PLLC

1. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface and are in accordance with approved shop drawings.

3.02 Installation

- A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
- B. Plumb and align entrance door faces in a single plane for each wall plane and erect doors and materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.
- C. Adjust doors for proper operation after installation.
- D. Furnish and apply sealants to provide a weather tight installation at all joints and intersections and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.

3.03 Anchorage

- A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

3.04 Protection and Cleaning

- A. After completion of entrance installation, entrance doors shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be the responsibility of the general contractor.

END OF SECTION 084113

## SECTION 084113.10 ALUMINUM – STOREFRONTS

### PART 1 GENERAL

#### 1.01 Work Included

- A. Furnish and install aluminum architectural storefront system complete with hardware and related components as shown on drawings and specified in this section.
- B. Basis of Design storefront systems shall be EFCO System 403 Thermal Flush-Glazed Screw Spline Storefront.
  - 1. A sample storefront system as per requirements of architect.
  - 2. Test reports documenting compliance with requirements of Section 1.05.
- C. Glass
  - 1. Reference Section 08 81 00 for Glass and Glazing.
- D. Single Source Requirement
  - 1. All products listed in Section 1.02 shall be by the same manufacturer.

#### 1.02 Related Work

- B. Section 084413 – Glazed Aluminum Curtain Walls
- D. Section 085113 – Aluminum Windows

#### 1.03 Not used.

#### 1.04 Not used.

#### 1.05 Laboratory Testing and Performance Requirements

- A. Test Units
  - 1. Air, water, and structural test unit size shall be a minimum of two lites high and three lites wide.
  - 2. Thermal test unit sizes shall be 80" (2032 mm) wide x 80" (2032 mm) high with one intermediate vertical mullion and two lites of glass.
- B. Test Procedures and Performance
  - 1. Air Infiltration Test
    - a. Test unit in accordance with ASTM E 283 at a static air pressure difference of 6.24 psf (299 Pa).
    - b. Air infiltration shall not exceed .06 cfm/SF (.30 l/s•m<sup>2</sup>) of unit.
  - 2. Water Resistance Test
    - a. Test unit in accordance with ASTM E 331.
    - b. There shall be no uncontrolled water leakage at a static test pressure of 12.0 psf (575 Pa).
  - 3. Uniform Load Deflection Test

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Beard + Riser Architects PLLC

- a. Test in accordance with ASTM E 330.
- b. Deflection under design load shall not exceed  $L/175$  of the clear span.
4. Uniform Load Structural Test
  - a. Test in accordance with ASTM E 330 at a pressure 1.5 times the design wind pressure in 1.05.B.3.b.
  - b. At conclusion of the test, there shall be no glass breakage, permanent damage to fasteners, storefront parts, or any other damage that would cause the storefront to be defective.
5. Condensation Resistance Test (CRF)
  - a. Test unit in accordance with AAMA 1503.1.
  - b. Condensation Resistance Factor (CRF) shall not be less than 56 (frame) when glazed with 0.29 center of glass U-Factor. (See chart at end of section).
6. Condensation Resistance (CR)
  - a. With ventilators closed and locked, test unit in accordance with NFRC 500-2010.
  - b. Condensation Resistance (CR) shall not be less than 37 when glazed with 0.29 center of glass U-Factor. (See chart at end of section).
7. Thermal Transmittance Test (Conductive U-Factor)
  - a. With ventilators closed and locked, test unit in accordance with NFRC 100-2010.
  - b. Conductive thermal transmittance (U-Factor) shall not be more than 0.41 BTU/hr•ft<sup>2</sup>•°F (2.33 W/m<sup>2</sup>•K) when glazed with 0.29 center of glass U-Factor. (See chart at end of section).

| Glass Comparison Chart |                                 |                                                               |                           |                 |
|------------------------|---------------------------------|---------------------------------------------------------------|---------------------------|-----------------|
| Glass                  | C.O.G. <sup>2</sup><br>U-Factor | U-Factor <sup>1</sup>                                         | Frame<br>CRF <sup>3</sup> | CR <sup>1</sup> |
| 1" IG                  | 0.47                            | 0.56 BTU/hr•ft <sup>2</sup> •°F<br>(3.18 W/m <sup>2</sup> •K) | 56                        | 36              |
| 1" IG                  | 0.29                            | 0.41 BTU/hr•ft <sup>2</sup> •°F<br>(2.33 W/m <sup>2</sup> •K) | 56                        | 37              |
| 1" IG                  | 0.24                            | 0.37 BTU/hr•ft <sup>2</sup> •°F<br>(2.10 W/m <sup>2</sup> •K) | 56                        | 37              |

<sup>1</sup>U-Factor and Condensation Resistance (CR) are based on a nominal size of 47.25" (1200 mm) x 59" (1500 mm) with two lites of glass using NFRC-100, and 500 - 2010. <sup>2</sup>Intercept® Spacer. <sup>3</sup>Based on AAMA 1503.1

C. Structural Loads:

1. The system shall be designed to withstand the following loads normal to the plane of the wall:
  - a. Comply with requirements of ASCE7. Wind zone IV-250 mph winds per FEMA.

1.06 Field Testing and Performance Requirements

- A. Test in accordance with AAMA 501.2 for spray test only or AAMA 503.92 for pressurized test.

1.07 Quality Assurance

- A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
- B. Test reports shall be accompanied by the storefront manufacturer's letter of certification stating that the tested storefront meets or exceeds the referenced criteria for the appropriate storefront type.

1.08 References

1.09 Submittals

- A. Contractor shall submit shop drawings; finish samples, test reports, and warranties.
  - 1. Samples of materials as may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.
- B. An NFRC Component Modeling Approach (CMA) generated label certificate shall be provided by the manufacturer. The label certificate shall be project specific and will contain the thermal performance ratings of the manufacturer's framing combined with the specified glass, and the glass spacer used in the fabrication of the glass, at NFRC standard test size as defined in table 4-3 in NFRC 100-2010.

1.10 Warranties

- A. Total Storefront Installation
  - 1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total storefront installation. This includes the glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water and structural adequacy as called for in the specifications and approved shop drawings.
  - 2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at their expense during the warranty period.
- B. Window Material and Workmanship
  - 1. Provide written guarantee against defects in material and workmanship for 3 years from the date of final shipment.
- C. Glass
  - 1. Provide written warranty for insulated glass units that they will be free from obstruction of vision as a result of dust or film formation on the internal glass surfaces caused by failure of the hermetic seal due to defects in material and workmanship.
  - 2. Warranty period shall be for 10 (ten) years.
- D. Finish
  - 1. Warranty period shall be for 3 years from the date of final shipment.

## PART 2 PRODUCTS

### 2.01 Materials

#### A. Aluminum

1. Extruded aluminum shall be 6063-T6 alloy and temper.

#### B. Thermal Barrier

1. All exterior aluminum shall be separated from interior aluminum by a rigid, structural thermal barrier. For purposes of this specification, a structural thermal barrier is defined as a system that shall transfer shear during bending and, therefore, promote composite action between the exterior and interior extrusions.
2. Barrier material shall be poured-in-place, two-part polyurethane. A nonstructural thermal barrier is unacceptable.

### 2.02 Fabrication

#### A. General

1. All aluminum frame extrusions shall have a minimum wall thickness of .080" (2 mm).
2. All exposed work shall be carefully matched to produce continuity of line and design with all joints. System design shall be such that raw edges will not be visible at joints.

#### B. Frame

1. Depth of frame shall not be less than 4 1/2" (114 mm).
2. Face dimension shall not be less than 2" (50 mm).
3. Frame components shall be screw spline construction.

#### C. Glazing

1. All units shall be "dry glazed" with gaskets on both exterior and interior of the glass.

#### D. Finish

1. Anodic
  - a. Finish all exposed areas of aluminum windows and components with electrolytically deposited color in accordance with Aluminum Association Designation AA-M10-C22-A41 Color shall be selected by architect from manufacturer's full range.

## PART 3 EXECUTION

### 3.01 Inspection

#### A. Job Conditions

1. All openings shall be prepared by others to the proper size and shall be plumb, level and in the proper location and alignment as shown on the architect's drawings.

### 3.02 Installation

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- A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
- B. Storefront system shall be erected plumb and true, in proper alignment and relation to established lines and grades.
- C. Entrance doors shall be securely anchored in place to a straight, plumb and level condition, without distortion. Weather stripping contact and hardware movement shall be checked and final adjustments made for proper operation and performance of units.
- D. Furnish and apply sealing materials to provide a weather tight installation at all joints and intersections and at opening perimeters.
- E. Sealing materials specified shall be used in strict accordance with the manufacturer's printed instructions, and shall be applied only by mechanics specially trained or experienced in their use. All surfaces must be clean and free of foreign matter before applying sealing materials. Sealing compounds shall be tooled to fill the joint and provide a smooth finished surface.

3.03 Anchorage

- A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

3.04 Protection and Cleaning

- A. The general contractor shall protect the aluminum materials and finish against damage from construction activities and harmful substances. The general contractor shall remove any protective coatings as directed by the architect, and shall clean the aluminum surfaces as recommended for the type of finish applied.

END OF SECTION 084113.10

## SECTION 084413 - GLAZED ALUMINUM CURTAIN WALL

### PART 1 GENERAL

#### 1.01 Work Included

- A. Furnish and install architectural aluminum curtain wall complete with related components as shown on drawings and specified in this section.
- B. Glass
  - 1. Reference Section 088100 for Glass and Glazing.
- C. Single Source Requirement
  - 1. All products listed in Section 1.02 shall be by the same manufacturer.

#### 1.02 Related Work

- A. Section 084113 – Aluminum – Framed Entrances
- B. Section 084113.10 – Aluminum – Storefronts
- C. Section 085113 – Aluminum Windows

#### 1.03 Not used.

#### 1.04 Not used.

#### 1.05 Laboratory Testing and Performance Requirements

- A. Test Units
  - 1. Air, water, and structural test unit size shall be a minimum of two stories high and three lites wide.
  - 2. Thermal test unit sizes shall be 80" (2032 mm) wide x 80" (2032 mm) high with one intermediate vertical mullion and two lites of glass.
- B. Test Procedures and Performance
  - 1. Air Infiltration Test
    - a. Test unit in accordance with ASTM E 283 at a static air pressure difference of 6.24 psf (300 Pa).
    - b. Air infiltration shall not exceed .06 cfm/SF (.31 l/s•m<sup>2</sup>) of fixed wall area.
  - 2. Water Resistance Test
    - a. Test unit in accordance with ASTM E 331.
    - b. The test for static water penetration (ASTM E 331) shall be conducted at an air pressure difference of 15.0 psf (720 Pa). There shall be no water leakage as defined by AAMA 501.1, paragraph 5.5.
  - 3. Uniform Load Deflection Test
    - a. Test in accordance with ASTM E 330.
    - b. Deflection under design load shall not exceed L/175 for spans less than 162" (4114 mm).

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- c. Deflection under design load shall not exceed  $L/240 + 1/4"$  (6 mm) for spans greater than 162" (4114 mm).
- 4. Uniform Load Structural Test
  - a. Test in accordance with ASTM E 330 at a pressure 1.5 times the design wind pressure in 1.05.B.3.b.
  - b. At conclusion of the test there shall be no glass breakage, permanent damage to fasteners, curtain wall parts, or any other damage that would cause the curtain wall to be defective.
- 5. Condensation Resistance Test (CRF)
  - a. Test unit in accordance with AAMA 1503.1.
  - b. Condensation Resistance Factor (CRF) shall not be less than 67 (frame) when glazed with 0.29 center of glass U-Factor. (See chart at end of section).
- 6. Condensation Resistance (CR)
  - a. With ventilators closed and locked, test unit in accordance with NFRC 500-2010.
  - b. Condensation Resistance (CR) shall not be less than \_\_\_\_ when glazed with 0.29 center of glass U-Factor. (See chart at end of section).
- 7. Thermal Transmittance Test (Conductive U-Factor)
  - a. With ventilators closed and locked, test unit in accordance with NFRC 100-2010.
  - b. Conductive thermal transmittance (U-Factor) shall not be more than \_\_\_\_  $\text{BTU/hr}\cdot\text{ft}^2\cdot^\circ\text{F}$   
( $2.67\text{W/m}^2\cdot\text{K}$ ) when glazed with 0.29 center of glass U-Factor. (See chart at end of section).

| Glass Comparison Chart |                                 |                                                                                                |                           |                 |
|------------------------|---------------------------------|------------------------------------------------------------------------------------------------|---------------------------|-----------------|
| Glass                  | C.O.G. <sup>2</sup><br>U-Factor | U-Factor <sup>1</sup>                                                                          | Frame<br>CRF <sup>3</sup> | CR <sup>1</sup> |
| 1" IG                  | 0.47                            | 0.62 $\text{BTU/hr}\cdot\text{ft}^2\cdot^\circ\text{F}$<br>(3.52 $\text{W/m}^2\cdot\text{K}$ ) | 67                        | *               |
| 1" IG                  | 0.29                            | 0.47 $\text{BTU/hr}\cdot\text{ft}^2\cdot^\circ\text{F}$<br>(2.67 $\text{W/m}^2\cdot\text{K}$ ) | 67                        | *               |
| 1" IG                  | 0.24                            | 0.43 $\text{BTU/hr}\cdot\text{ft}^2\cdot^\circ\text{F}$<br>(2.44 $\text{W/m}^2\cdot\text{K}$ ) | 67                        | *               |

\*Please consult EFCO Product Tech Support department for values.

<sup>1</sup>U-Factor and Condensation Resistance (CR) are based on a nominal size of 47.25" (1200 mm) x 59" (1500 mm) with two lites of glass using NFRC-100, and 500 - 2010. <sup>2</sup>Intercept® Spacer. <sup>3</sup>Based on AAMA 1503.1

- 8. Seismic Performance
  - a. Test unit in accordance to AAMA 501.4 system to meet design displacement of 0.010 x the greater adjacent story height and ultimate displacement of 1.5 x the design displacement.
- 9. Sound Transmission Loss
  - a. Test unit in accordance with ASTM E 90-02.
  - b. Sound Transmission Class (STC) shall not be less than 30.

C. Structural Loads:



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Beard + Riser Architects PLLC

1. The system shall be designed to withstand the following loads normal to the plane of the wall:
  - a. Comply with requirements of ASCE7. Wind zone IV-250 mph winds per FEMA.

1.06 Field Testing and Performance Requirements

A. Test Units

1. Air, water, and structural test unit size shall be a representative sample of typical construction and shall have no outstanding punch list or other visible defects. If no test area and/or location have been identified, the persons doing the test shall select an area. This area shall be selected to provide representative performance data, usually a minimum of 100 ft<sup>2</sup>. The area to be tested shall include perimeter caulking, typical splices, frame intersections, and, if applicable, at least 2 entire vision lites and 2 entire spandrel lites containing an intermediate horizontal member. All operable components within the test area shall be isolated and exempt from the test procedure.

B. Test Procedures and Performance

1. Air Infiltration Test

- a. Test unit in accordance with AAMA 503-03 for field testing. The unit test shall be conducted at a minimum uniform static test pressure differential of at least 1.57 psf (75 Pa), but at a pressure differential not to exceed 6.24 psf (300 Pa).
- b. The maximum allowable rates of air leakage for field testing shall not exceed 1.5 times the project specification rate or .09 cfm/SF (.45 l/s•m<sup>2</sup>), whichever is greater.

2. Water Resistance Test

- a. Test unit in accordance with AAMA 503-03.
- b. The field water penetration resistance tests shall be conducted at a static test pressure of two-thirds of the specified project water penetration test pressure, but not less than 6.24 psf (300 Pa).

1.07 Quality Assurance

- A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
- B. Test reports shall be accompanied by the curtain wall manufacturer's letter of certification stating that the tested curtain wall meets or exceeds the referenced criteria for the appropriate curtain wall type.

1.08 References

1.09 Submittals

- A. Contractor shall submit shop drawings; finish samples, test reports, and warranties.
  1. Samples of materials as may be requested without cost to owner, i.e., metal, glass,

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Beard + Riser Architects PLLC

fasteners, anchors, frame sections, mullion section, corner section, etc.

1.10 Warranties

A. Total Curtain Wall Installation

1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total curtain wall installation. This includes the glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc. as it relates to air, water, and structural adequacy and the specifications and approved shop drawings.
2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at their expense during the warranty period.

B. Window Material and Workmanship

1. Provide written guarantee against defects in material and workmanship for 3 years from the date of final shipment.

C. Glass

1. Provide written warranty for insulated glass units, that they will be free from obstruction of vision as a result of dust or film formation on the internal glass surfaces caused by failure of the hermetic seal due to defects in material and workmanship.
2. Warranty period shall be for 10 (ten) years.

D. Finish

1. Warranty period shall be for 3 years from the date of final shipment.

PART 2 PRODUCTS

2.01 Materials

A. Aluminum

1. Extruded aluminum shall be 6063-T6 alloy and temper.

B. Anchors

1. Perimeter and floor line anchors shall be aluminum or steel. All steel anchors shall be properly insulated from the aluminum.

C. Thermal Barrier

1. The thermal barrier shall be extruded EPDM used as an applied thermal isolator.

2.02 Fabrication

A. General

1. All aluminum vertical and horizontal main frame extrusions shall have a minimum wall thickness of .125" (3 mm).

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B. Frame

1. Frame components shall be mechanically fastened by means of extruded aluminum shear blocks attached to vertical mullions.
2. Curtain wall system is able to accommodate separate interior and exterior finishes and colors.

C. Glazing

1. Outside glazed curtain wall system shall be dry glazed with an exterior aluminum pressure plate and snap cover with interior and exterior dense EPDM preset gasket.

D. Finish

1. Anodic
  - a. Finish all exposed areas of aluminum windows and components with electrolytically deposited color in accordance with Aluminum Association Designation AA-M10-C22-A41 Color shall be chosen by Architect from Manufacturer's full range.

PART 3 EXECUTION

3.01 Inspection

A. Job Conditions

1. All openings shall be prepared by others to the proper size and shall be plumb, level, and in the proper location and alignment as shown on the architect's drawings.

3.02 Installation

- A. Use only skilled tradesmen with work done in accordance with approved shop drawings and established specifications, and erect all curtain wall components to all building bench marks and column centerlines.
- B. Plumb and align curtain wall faces in a single plane for each wall plane, and erect curtain wall materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, building movement, and specified wind loads.
- C. Adjust windows in curtain wall for proper operation after installation.
- D. Furnish and apply sealants to provide a weather tight installation at all joints and intersections and at opening perimeters. Wipe off excess material, leave all exposed surfaces and joints clean and smooth.

3.03 Anchorage

- A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

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3.04 Protection and Cleaning

- A. The general contractor shall protect the aluminum materials and finish against damage from construction activities and harmful substances. The general contractor shall remove any protective coatings as directed by the architect, and shall clean the aluminum surfaces as recommended for the type of finish applied.

END OF SECTION 084413

SECTION 084523 - 2-3/4" INSULATED TRANSLUCENT FIBERGLASS SANDWICH PANEL  
SKYLIGHT SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes the insulated translucent sandwich panel skylight system and accessories as shown and specified. Work includes providing and installing:
  - 1. Factory prefabricated structural insulated translucent sandwich panels
  - 2. Aluminum installation system
  - 3. Aluminum flashing attached to skylights

1.2 SUBMITTALS

- A. Submit manufacturer's product data. Include construction details, material descriptions, profiles and finishes of skylight components.
- B. Submit shop drawings. Include elevations and details.
- C. Submit manufacturer's color charts showing the full range of colors available for factory-finished aluminum.
  - 1. Submit samples for each exposed finish required, in same thickness and material indicated for the work and in size indicated below. If finishes involve normal color variations, include sample sets consisting of two or more units showing the full range of variations expected.
    - a. Sandwich panels: 14" x 28" units
    - b. Factory finished aluminum: 5" long sections
- D. Submit Installer Certification signed by skylight manufacturer and by installer, certifying compliance with project qualification requirements.
- E. Submit product reports from a qualified independent testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products. Previously completed reports will be acceptable if for current manufacturer and indicative of products used on this project.
  - 1. Reports required are:
    - a. International Building Code Evaluation Report
    - b. Flame Spread and Smoke Developed (UL 723) – Submit UL Card
    - c. Burn Extent (ASTM D 635)
    - d. Color Difference (ASTM D 2244)
    - e. Impact Strength (UL 972)
    - f. Bond Tensile Strength (ASTM C 297 after aging by ASTM D 1037)
    - g. Bond Shear Strength (ASTM D 1002)
    - h. Beam Bending Strength (ASTM E 72)

- i. Fall Through Resistance (ASTM E 661)
- j. Insulation U-Factor (NFRC 100)
- k. NFRC System U-Factor Certification (NFRC 700)
- l. Solar Heat Gain Coefficient (NFRC or Calculations)
- m. Condensation Resistance Factor (AAMA 1503)
- n. Air Leakage (ASTM E 283)
- o. Structural Performance (ASTM E 330)
- p. Water Penetration (ASTM E 331)
- q. Class A Roof Covering Burning Brand (ASTM E 108)
- r. UL Listed Class A Roof System (UL 790) (Optional) – Submit UL Card
- s. LEED Credits
- t. Daylight Autonomy

### 1.3 QUALITY ASSURANCE

#### A. Manufacturer's Qualifications

- 1. Material and products shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least ten consecutive years and which can show evidence of those materials being satisfactorily used on at least six projects of similar size, scope and location. At least three of the projects shall have been in successful use for ten years or longer.
- 2. Panel system must be listed by an ANSI accredited Evaluation Service, which requires quality control inspections and fire, structural and water infiltration testing of sandwich panel systems by an accredited agency.
- 3. Quality control inspections shall be conducted at least once each year and shall include manufacturing facilities, sandwich panel components and production sandwich panels for conformance with AC177 "Translucent Fiberglass Reinforced Plastic (FRP) Faced Panel Wall, Roof and Skylight Systems" as issued by the ICC-ES.

- B. Installer's Qualifications: Installation shall be by a factory certified experienced installer, which has been in the business of installing specified skylight systems for at least ten consecutive years and can show evidence of satisfactory completion of projects of similar size, scope and type.

### 1.4 PERFORMANCE REQUIREMENTS

- A. The manufacturer shall be responsible for the configuration and fabrication of the complete skylight panel system.

- 1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- 2. Standard skylight system shall have less than 0.01 cfm/ft<sup>2</sup> air leakage by ASTM E 283 at 6.24 PSF (50 mph) and no water penetration by ASTM E 331 at 15 PSF; and structural testing by ASTM E 330.
- 3. Structural Loads; Provide skylight system capable of handling the following loads:
  - a. Live Load: 20.0 PSF
  - b. Snow Load: 10.0 PSF; Drift Load: 0.0 PSF
  - c. Wind Load: 23.7 PSF

## 1.5 DELIVERY STORAGE AND HANDLING

- A. Deliver panel system, components and materials in manufacturer's standard protective packaging.
- B. Store panels on the long edge; several inches above the ground, blocked and under cover in accordance with manufacturer's storage and handling instructions.

## 1.6 WARRANTY

- A. Submit manufacturer's and installer's written warranty agreeing to repair or replace panel system work, which fails in materials or workmanship within one year of the date of delivery. Failure of materials or workmanship shall include leakage, excessive deflection, deterioration of finish on metal in excess of normal weathering, defects in accessories, insulated translucent sandwich panels and other components of the work.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Basis-of-Design Product: The basis for this specification is for products manufactured by Kalwall Corporation.
- B. Kalwall Corporation, Tel: (800) 258-9777 – Fax: (603) 627-7905 – Email: [info@kalwall.com](mailto:info@kalwall.com)

### 2.2 PANEL COMPONENTS

#### A. Face Sheets

- 1. Translucent faces: Manufactured from glass fiber reinforced thermoset resins, formulated specifically for architectural use.
  - a. Thermoplastic (e.g. polycarbonate, acrylic) faces are not acceptable.
  - b. Face sheets shall not deform, deflect or drip when subjected to fire or flame.
- 2. Interior face sheets:
  - a. Flame spread: Underwriters Laboratories (UL) listed, which requires periodic unannounced retesting, with flame spread rating no greater than 50 and smoke developed no greater than 250 when tested in accordance with UL 723.
  - b. Burn extent by ASTM D 635 shall be no greater than 1".
- 3. Exterior face sheets:
  - a. Color stability: Full thickness of the exterior face sheet shall not change color more than 3 CIE Units DELTA E by ASTM D 2244 after 5 years outdoor South Florida weathering at 5° facing south, determined by the average of at least three white samples with and without a protective film or coating to ensure long-term color stability. Color stability shall be unaffected by abrasion or scratching.

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- b. Strength: Exterior face sheet shall be uniform in strength, impenetrable by hand held pencil and repel an impact minimum of 70 ft. lbs. without fracture or tear when impacted by a 3-1/4" diameter, 5 lb. free-falling ball per UL 972.

4. Appearance:

- a. Exterior face sheets: Smooth, .070 thick and Crystal in color.
- b. Interior face sheets: Smooth, .045 thick and White in color.
- c. Face sheets shall not vary more than  $\pm 10\%$  in thickness and be uniform in color.

B. Grid Core

- 1. I-beam Thermal break: Minimum 1", thermoset fiberglass composite.

C. Laminate Adhesive

- 1. Heat and pressure resin type adhesive engineered for structural sandwich panel use, with minimum 25-years field use. Adhesive shall pass testing requirements specified by the International Code Council "Acceptance Criteria for Sandwich Panel Adhesives".
- 2. Minimum tensile strength of 750 PSI when the panel assembly is tested by ASTM C 297 after two exposures to six cycles each of the aging conditions prescribed by ASTM D 1037.
- 3. Minimum shear strength of the panel adhesive by ASTM D 1002 after exposure to four separate conditions:
  - a. 50% Relative Humidity at 68° F: 540 PSI
  - b. 182° F: 100 PSI
  - c. Accelerated Aging by ASTM D 1037 at room temperature: 800 PSI
  - d. Accelerated Aging by ASTM D 1037 at 182° F: 250 PSI

2.3 PANEL CONSTRUCTION

- A. Provide sandwich panels of flat fiberglass reinforced translucent face sheets laminated to a grid core of mechanically interlocking I-beams. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat, sharp edge.
  - 1. Thickness: 2-3/4"
  - 2. Light transmission: 20%
  - 3. Solar heat gain coefficient .28.
  - 4. Panel U-factor by NFRC certified laboratory: 2-3/4" thermally broken grid .23. Complete insulated panel system shall have NFRC certified U-factor of .29.
  - 5. Grid pattern: Nominal size 12 x 24; pattern shoji.
- B. Standard panels shall deflect no more than 1.9" at 30 PSF in 10' 0" span without a supporting frame by ASTM E 72.
- C. Standard panels shall withstand 1200° F fire for minimum one hour without collapse or exterior flaming.
- D. Thermally broken panels: Minimum Condensation Resistance Factor of 80 by AAMA 1503 measured on the bond line.



E. Skylight System:

1. Skylight system shall pass Class A Roof Burning Brand Test By ASTM E 108.

F. Skylight System shall meet the fall through requirements of OSHA 1910.23 as demonstrated by testing in accordance with ASTM E661, thereby not requiring supplemental screens or railings.

## 2.4 BATTENS AND PERIMETER CLOSURE SYSTEM

A. Closure system:

1. Extruded aluminum 6063-T6 and 6063-T5 alloy and temper clamp-tite screw type closure system.
2. Curved closure system may be roll formed.
3. Skylight perimeter closures at curbs shall be factory sealed to panels.

B. Sealing tape: Manufacturer's standard, pre-applied to closure system at the factory under controlled conditions.

C. Fasteners: 300 series stainless steel screws for aluminum closures, excluding final fasteners to the building.

D. Finish:

1. Manufacturer's factory applied finish, which meets the performance requirements of AAMA 2604. Color to be \_chosen by architect\_ as selected from manufacturer's standards.
2. Mill (optional)

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Installer shall examine substrates, supporting structure and installation conditions.

B. Do not proceed with panel installation until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

A. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete, masonry or pressure treated wood, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by manufacturer.

### 3.3 INSTALLATION

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- A. Install the skylight system in accordance with the manufacturer's suggested installation recommendations and approved shop drawings.
  - 1. Anchor component parts securely in place by permanent mechanical attachment system.
  - 2. Accommodate thermal and mechanical movements.
  - 3. Set perimeter framing in a full bed of sealant compound, or with joint fillers or gaskets to provide weather-tight construction.
- B. Install joint sealants at perimeter joints and within the panel system in accordance with manufacturer's installation instructions.

3.4 FIELD QUALITY CONTROL

- A. Water Test: Installer to test skylights according to procedures in AAMA 501.2.
- B. Repair or replace work that does not pass testing or that is damaged by testing and retest work.

3.5 CLEANING

- A. Clean the skylight system interior and exterior, immediately after installation.
- B. Refer to manufacturer's written recommendations.

END OF SECTION 084523

## SECTION 085113 ALUMINUM WINDOWS

### PART 1 GENERAL

#### 1.01 Work Included

- A. Furnish and install aluminum architectural windows complete with hardware and related components as shown on drawings and specified in this section.
- B. Basis of Design windows shall be EFCO Series 510I Thermal AW-PG100-C Casement or equal.
  - 1. A sample window, 24" (610 mm) x 36" (919 mm) single unit, as per requirements of architect.
  - 2. Test reports documenting compliance with requirements of Section 1.05.
- C. Glass and Glazing
  - 1. Reference Section 088100 for Glass and Glazing.
- D. Single Source Requirement
  - 1. All products listed in Section 1.02 shall be by the same manufacturer.

#### 1.02 Related Work

- B. Section 084113 – Aluminum – Framed Entrances
- C. Section 084113.10 – Aluminum –Storefronts
- C. Section 08 44 13 – Glazed Aluminum Curtain Walls

#### 1.03 Not used.

#### 1.04 Not used.

#### 1.05 Laboratory Testing and Performance Requirements

- A. Test Units
  - 1. Air, water, and structural test unit shall conform to requirements set forth in AAMA/WDMA/CSA 101/I.S.2/A440 – 08 manufacturer's standard locking/operating hardware and insulated glazing configuration.
  - 2. Thermal test unit sizes shall be 48" (1219 mm) x 72" (1828 mm). Unit shall consist of a single inswing casement window.
- B. Test Procedures and Performances
  - 1. Windows shall conform to all AAMA/WDMA/CSA 101/I.S.2/A440 – 08 requirements for the window type referenced in 1.01.B. In addition, the following specific performance requirements shall be met.
  - 2. Life Cycle Testing
    - a. Test in accordance with AAMA 910. There shall be no damage to fasteners, hardware parts, support arms, activating mechanisms, or any other damage that

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would cause the window to be inoperable. Air infiltration and water resistance tests shall not exceed specified requirements.

3. Air Infiltration Test
  - a. With ventilators closed and locked, test unit in accordance with ASTM E 283 at a static air pressure difference of 6.24 psf (299 Pa).
  - b. Air infiltration shall not exceed .10 cfm/SF (.50 l/s•m<sup>2</sup>) of unit.
4. Water Resistance Test
  - a. With ventilators closed and locked, test unit in accordance with ASTM E 331/ASTM E 547 at a static air pressure difference of 12.0 psf (575 Pa).
  - b. There shall be no uncontrolled water leakage.
5. Uniform Load Deflection Test
  - a. With ventilators closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 100.0 psf (4788 Pa), positive and negative pressure.
  - b. No member shall deflect over L/175 of its span.
6. Uniform Load Structural Test
  - a. With ventilators closed and locked, test unit in accordance with ASTM E 330 at a static air pressure difference of 150.0 psf (7182 Pa), both positive and negative.
  - b. At conclusion of test there shall be no glass breakage, permanent damage to fasteners, hardware parts, support arms or actuating mechanisms, nor any other damage that would cause the window to be inoperable.
7. Forced Entry Resistance
  - a. Windows shall be tested in accordance to ASTM F 588 or AAMA 1302.5 and meet the requirements of performance level 40.
8. Condensation Resistance Test (CRF)
  - a. Test unit in accordance with AAMA 1503.1.
  - b. Condensation Resistance Factor (CRF) shall not be less than 53 (frame) when glazed with 0.29 center of glass U-Factor. (See chart at end of section).
9. Condensation Resistance (CR)
  - a. With ventilators closed and locked, test unit in accordance with NFRC 500-2010.
  - b. Condensation Resistance (CR) shall not be less than \_\_\_\_ when glazed with 0.29 center of glass U-Factor. (See chart at end of section).
10. Thermal Transmittance Test (Conductive U-Factor)
  - a. With ventilators closed and locked, test unit in accordance with NFRC 100-2010.
  - b. Conductive thermal transmittance (U-Factor) shall not be more than \_\_\_\_ BTU/hr•ft<sup>2</sup>•°F (3.07 W/m<sup>2</sup>•K) when glazed with 0.29 center of glass U-Factor. (See chart at end of section).

| Glass Comparison Chart |                                 |                                                               |                           |                 |
|------------------------|---------------------------------|---------------------------------------------------------------|---------------------------|-----------------|
| Glass                  | C.O.G. <sup>2</sup><br>U-Factor | U-Factor <sup>1</sup>                                         | Frame<br>CRF <sup>3</sup> | CR <sup>1</sup> |
| 1" IG                  | 0.47                            | 0.64 BTU/hr•ft <sup>2</sup> •°F<br>(3.63 W/m <sup>2</sup> •K) | 53                        | *               |
| 1" IG                  | 0.29                            | 0.54 BTU/hr•ft <sup>2</sup> •°F<br>(3.07 W/m <sup>2</sup> •K) | 53                        | *               |
| 1" IG                  | 0.24                            | 0.50 BTU/hr•ft <sup>2</sup> •°F                               | 53                        | *               |

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|  |  |                            |  |  |
|--|--|----------------------------|--|--|
|  |  | (2.84 W/m <sup>2</sup> •K) |  |  |
|--|--|----------------------------|--|--|

\*Please consult EFCO Product Tech Support department for values.

<sup>1</sup>U-Factor and Condensation Resistance (CR) are based on a nominal size of 24" (600 mm) x 59" (1500 mm) using NFRC-100, and 500 - 2010. <sup>2</sup>Intercept<sup>®</sup> Spacer. <sup>3</sup>Based on AAMA 1503.1

C. Structural Loads:

1. The system shall be designed to withstand the following loads normal to the plane of the wall:
  - a. Comply with requirements of ASCE7. Wind zone IV-250 mph winds per FEMA.

1.06 Not used.

1.07 Quality Assurance

- A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
- B. Test reports shall be accompanied by the window manufacturer's letter of certification, stating the tested window meets or exceeds the referenced criteria for the appropriate window type.

1.08 References

1.09 Submittals

- A. Contractor shall submit shop drawings; finish samples, test reports, and warranties.
  1. Samples of materials as may be requested without cost to owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.
- B. An NFRC Component Modeling Approach (CMA) generated label certificate shall be provided by the manufacturer. The label certificate shall be project specific and will contain the thermal performance ratings of the manufacturer's framing combined with the specified glass, and the glass spacer used in the fabrication of the glass, at NFRC standard test size as defined in table 4-3 in NFRC 100-2010.

1.10 Warranties

- A. Total Window Installation
  1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total window installation which includes that of the windows, hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air, water, and structural adequacy as called for in the specifications and approved shop drawings.
  2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor at their expense during the warranty period.

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B. Window Material and Workmanship

1. Provide written guarantee against defects in material and workmanship for 5 years from the date of final shipment.

C. Glass

1. Provide written warranty for insulated glass units that they will be free from obstruction of vision as a result of dust or film formation on the internal glass surfaces caused by failure of the hermetic seal due to defects in material and workmanship.
2. Warranty period shall be for 10 (ten) years.

D. Finish

1. Warranty period shall be for 5 years from the date of final shipment.

## PART 2 PRODUCTS

### 2.01 Materials

A. Aluminum

1. Extruded aluminum shall be 6063-T6 alloy and tempered.

B. Hardware

1. Locking handles shall be cam type and manufactured from a white bronze alloy with a US25D brushed finish.
2. Operating Hardware: to be selected by architect from manufacturer's options below:
  - a. Concealed 4-bar, stainless steel arms.OR
  - a. Precision machined aluminum 5 knuckle butt hinges with Teflon bushings and stainless steel pins.

C. Weather-Strip

1. All weather-strip shall be Santoprene® or equal.

D. Thermal Barrier

1. All exterior aluminum shall be separated from interior aluminum by a rigid, structural thermal barrier. For purposes of this specification, a structural thermal barrier is defined as a system that shall transfer shear during bending and, therefore, promote composite action between the exterior and interior extrusions.
2. The thermal barrier shall be thermal struts, consisting of glass reinforced polyamide nylon, mechanically crimped in raceways extruded in the exterior and interior extrusions.
3. Poured and debridged urethane thermal barriers shall not be permitted.

### 2.02 Fabrication

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A. General

1. All aluminum frame and vent extrusions shall have a minimum wall thickness of .125" (3 mm).
2. Mechanical fasteners, welded components, and hardware items shall not bridge thermal barriers. Thermal barriers shall align at all frame and vent corners.
3. Depth of frame and vent shall not be less than 2 7/16" (61 mm).
4. All frame and vent members shall be able to accommodate separate interior and exterior finishes and colors.

B. Frame

1. Frame components shall be mechanically fastened.

C. Ventilator

1. All vent extrusions shall be tubular.
2. Each corner shall be mitered, reinforced with an extruded corner key, hydraulically crimped, and "cold welded" with epoxy adhesive.
3. Each vent shall utilize two rows of weather stripping installed in specifically designed dovetail grooves in the extrusion. The exterior gasket will be omitted at the vent bottom rail for project-out vents and at the vent top rail for project-in vents, allowing air to pressure equalize the void between the vents and frame.

D. Glazing

1. All units shall be glazed with the manufacturer's standard sealant process provided the glass is held in place by a removable, extruded aluminum, glazing bead. The glazing bead must be isolated from the glazing material by a gasket.
2. All units shall be glazed with a minimum of 1/2" glass bit.

E. Finish

1. Anodic
  - a. Finish all exposed areas of aluminum windows and components with electrolytically deposited color in accordance with Aluminum Association Designation AA-M10-C22-a41. Color shall be chosen by Architect from Manufacturer's full range.

PART 3 EXECUTION

**3.01** Inspection

A. Job Conditions

1. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface, and are in accordance with approved shop drawings.

**3.02** Installation

- A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
- B. Plumb and align window faces in a single plane for each wall plane, and erect windows

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and materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

- C. Adjust windows for proper operation after installation.
- D. Furnish and apply sealants to provide a weather tight installation at all joints and intersections and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.

**3.03** Anchorage

- A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

**3.04** Protection and Cleaning

- A. After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be the responsibility of the general contractor.

END OF SECTION 085113



DOCUMENT 087100 – DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY:

- A. Section Includes: Finish Hardware for door openings, except as otherwise specified herein.
  - 1. Door hardware for steel (hollow metal) doors.
  - 2. Door hardware for aluminum doors.
  - 3. Door hardware for wood doors.
  - 4. Door hardware for other doors indicated.
  - 5. Keyed cylinders as indicated.
- B. Related Sections:
  - 1. Division 6: Rough Carpentry.
  - 2. Division 8: Aluminum Doors and Frames
  - 3. Division 8: Hollow Metal Doors and Frames.
  - 4. Division 8: Wood Doors.
  - 5. Division 26 Electrical
  - 6. Division 28: Electronic Security
- C. References: Comply with applicable requirements of the following standards. Where these standards conflict with other specific requirements, the most restrictive shall govern.
  - 1. Builders Hardware Manufacturing Association (BHMA)
  - 2. NFPA 101 Life Safety Code
  - 3. NFPA 80 -Fire Doors and Windows
  - 4. ANSI-A156.xx- Various Performance Standards for Finish Hardware
  - 5. UL10C – Positive Pressure Fire Test of Door Assemblies
  - 6. ANSI-A117.1 – Accessible and Usable Buildings and Facilities
  - 7. DHI /ANSI A115.IG – Installation Guide for Doors and Hardware
  - 8. ICC – International Building Code
- D. Intent of Hardware Groups
  - 1. Should items of hardware not definitely specified be required for completion of the Work, furnish such items of type and quality comparable to adjacent hardware and appropriate for service required.
  - 2. Where items of hardware aren't definitely or correctly specified, are required for completion of the Work, a written statement of such omission, error, or other discrepancy to be submitted to Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.
- E. Allowances

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1. Refer to Division 1 for allowance amount and procedures.

F. Alternates

1. Refer to Division 1 for Alternates and procedures.

1.2 SUBSTITUTIONS:

- A. Comply with Division 1.

1.3 SUBMITTALS:

- A. Comply with Division 1.

- B. Special Submittal Requirements: Combine submittals of this Section with Sections listed below to ensure the "design intent" of the system/assembly is understood and can be reviewed together.

- C. Product Data: Manufacturer's specifications and technical data including the following:

1. Detailed specification of construction and fabrication.
2. Manufacturer's installation instructions.
3. Wiring diagrams for each electric product specified. Coordinate voltage with electrical before submitting.
4. Submit 6 copies of catalog cuts with hardware schedule.
5. Provide 9001-Quality Management and 14001-Environmental Management for products listed in Materials Section 2.2

- D. Shop Drawings - Hardware Schedule: Submit 6 complete reproducible copy of detailed hardware schedule in a vertical format.

1. List groups and suffixes in proper sequence.
2. Completely describe door and list architectural door number.
3. Manufacturer, product name, and catalog number.
4. Function, type, and style.
5. Size and finish of each item.
6. Mounting heights.
7. Explanation of abbreviations and symbols used within schedule.
8. Detailed wiring diagrams, specially developed for each opening, indicating all electric hardware, security equipment and access control equipment, and door and frame rough-ins required for specific opening.

- E. Templates: Submit templates and "reviewed Hardware Schedule" to door and frame supplier and others as applicable to enable proper and accurate sizing and locations of cutouts and reinforcing.

1. Templates, wiring diagrams and "reviewed Hardware Schedule" of electrical terms to electrical for coordination and verification of voltages and locations.

- F. Samples: (If requested by the Architect)

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1. 1 sample of Lever and Rose/Escutcheon design, (pair).
2. 3 samples of metal finishes

G. Contract Closeout Submittals: Comply with Division 1 including specific requirements indicated.

1. Operating and maintenance manuals: Submit 3 sets containing the following.
  - a. Complete information in care, maintenance, and adjustment, and data on repair and replacement parts, and information on preservation of finishes.
  - b. Catalog pages for each product.
  - c. Name, address, and phone number of local representative for each manufacturer.
  - d. Parts list for each product.
2. Copy of final hardware schedule, edited to reflect, "As installed".
3. Copy of final keying schedule
4. As installed "Wiring Diagrams" for each piece of hardware connected to power, both low voltage and 110 volts.
5. One set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

1.4 QUALITY ASSURANCE

A. Comply with Division 1.

1. Statement of qualification for distributor and installers.
2. Statement of compliance with regulatory requirements and single source responsibility.
3. Distributor's Qualifications: Firm with 3 years experience in the distribution of commercial hardware.
  - a. Distributor to employ full time Architectural Hardware Consultants (AHC) for the purpose of scheduling and coordinating hardware and establishing keying schedule.
  - b. Hardware Schedule shall be prepared and signed by an AHC.
4. Installer's Qualifications: Firm with 3 years experienced in installation of similar hardware to that required for this Project, including specific requirements indicated.
5. Regulatory Label Requirements: Provide testing agency label or stamp on hardware for labeled openings.
  - a. Provide UL listed hardware for labeled and 20 minute openings in conformance with requirements for class of opening scheduled.
  - b. Underwriters Laboratories requirements have precedence over this specification where conflict exists.
6. Single Source Responsibility: Except where specified in hardware schedule, furnish products of only one manufacturer for each type of hardware.

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- B. Review Project for extent of finish hardware required to complete the Work. Where there is a conflict between these Specifications and the existing hardware, notify the Architect in writing and furnish hardware in compliance with the Specification unless otherwise directed in writing by the Architect.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping: Comply with Division 1.
  - 1. Deliver products in original unopened packaging with legible manufacturer's identification.
  - 2. Package hardware to prevent damage during transit and storage.
  - 3. Mark hardware to correspond with "reviewed hardware schedule".
  - 4. Deliver hardware to door and frame manufacturer upon request.
- B. Storage and Protection: Comply with manufacturer's recommendations.

1.6 PROJECT CONDITIONS:

- A. Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for the proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.
- B. Review Shop Drawings for doors and entrances to confirm that adequate provisions will be made for the proper installation of hardware.

1.7 WARRANTY:

- A. Refer to Conditions of the Contract
- B. Manufacturer's Warranty:
  - 1. Closers: Ten years
  - 2. Exit Devices: Five Years
  - 3. Locksets & Cylinders: Three years
  - 4. All other Hardware: Two years.

1.8 OWNER'S INSTRUCTION:

- A. Instruct Owner's personnel in operation and maintenance of hardware units.

1.9 MAINTENANCE:

- A. Extra Service Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 1 Closeout Submittals Section.
  - 1. Special Tools: Provide special wrenches and tools applicable to each different or special hardware component.

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2. Maintenance Tools: Provide maintenance tools and accessories supplied by hardware component manufacturer.
3. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra service materials.

- B. Maintenance Service: Submit for Owner's consideration maintenance service agreement for electronic products installed.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS:

- A. The following manufacturers are approved subject to compliance with requirements of the Contract Documents. Approval of manufacturers other than those listed shall be in accordance with Division 1.

| <u>Item:</u>           | <u>Manufacturer:</u> | <u>Approved:</u>             |
|------------------------|----------------------|------------------------------|
| Hinges                 | Stanley              | Bommer, McKinney             |
| Continuous Hinges      | Stanley              | Select, ABH                  |
| Locksets               | Best                 | No Substitution              |
| Cylinders              | Best                 | No Substitution              |
| Exit Devices           | Precision 2000       | Von Duprin 98/99, Sargent 80 |
| Closers                | Stanley D-4550       | LCN 4040XP, Sargnet 351      |
| Access Control System  | S2 Security          | B.A.S.I.S. Lenel             |
| Automatic Operators    | Besam                | Horton, Stanley              |
| Security Cameras       | Arecont              | Acti, Panasonic              |
| Push/Pull Plates       | Trimco               | Burns, Rockwood              |
| Push/Pull Bars         | Trimco               | Burns, Rockwood              |
| Protection Plates      | Trimco               | Burns, Rockwood              |
| Door Stops             | Trimco               | Burns, Rockwood              |
| Flush Bolts            | Trimco               | ABH, Burns                   |
| Coordinator & Brackets | Trimco               | ABH, Burns                   |
| Threshold & Gasketing  | National Guard       | Reese, K.N. Crowder          |

### 2.2 MATERIALS:

- A. Hinges: Shall be Five Knuckle Ball concealed bearing hinges
1. Template screw hole locations
  2. Bearings are to be fully hardened.
  3. Bearing shell is to be consistent shape with barrel.
  4. Minimum of 2 permanently lubricated non-detachable bearings on standard weight hinge and 4 permanently lubricated bearing on heavy weight hinges.
  5. Equip with easily seated, non-rising pins.
  6. Non Removable Pin screws shall be slotted stainless steel screws.
  7. Hinges shall be full polished, front, back and barrel.
  8. Hinge pin is to be fully plated.
  9. Bearing assembly is to be installed after plating.
  10. Sufficient size to allow 180-degree swing of door
  11. Furnish five knuckles with flush ball bearings

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12. Provide hinge type as listed in schedule.
13. Furnish 3 hinges per leaf to 7 foot 6 inch height. Add one for each additional 30 inches in height or fraction thereof.
14. Tested and approved by BHMA for all applicable ANSI Standards for type, size, function and finish
15. UL10C listed for Fire rated doors.

B. Geared Continuous Hinges:

1. Tested and approved by BHMA for ANSI A156.26-1996 Grade 1
2. Anti-spinning through fastener
3. UL10C listed for 3 hour Fire rating
4. Non-handed
5. Lifetime warranty
6. Provide Fire Pins for 3-hour fire ratings
7. Sufficient size to permit door to swing 180 degrees

C. Mortise Type Locks and Latches:

1. Tested and approved by BHMA for ANSI A156.13, Series 1000, Operational Grade 1, Extra-Heavy Duty, Security Grade 2 and be UL10C.
2. Furnish UL or recognized independent laboratory certified mechanical operational testing to 4 million cycles minimum.
3. Provide 9001-Quality Management and 14001-Environmental Management.
4. Fit ANSI A115.1 door preparation
5. Functions and design as indicated in the hardware groups
6. Solid, one-piece, 3/4-inch (19mm) throw, anti-friction latchbolt made of self-lubricating stainless steel
7. Deadbolt functions shall have 1 inch (25mm) throw bolt made of hardened stainless steel
8. Latchbolt and Deadbolt are to extend into the case a minimum of 3/8 inch (9.5mm) when fully extended
9. Auxiliary deadlatch to be made of one piece stainless steel, permanently lubricated
10. Provide sufficient curved strike lip to protect door trim
11. Lever handles must be of forged or cast brass, bronze or stainless steel construction and conform to ANSI A117.1. Levers that contain a hollow cavity are not acceptable
12. Lock shall have self-aligning, thru-bolted trim
13. Levers to operate a roller bearing spindle hub mechanism
14. Mortise cylinders of lock shall have a concealed internal setscrew for securing the cylinder to the lockset. The internal setscrew will be accessible only by removing the core, with the control key, from the cylinder body.
15. Spindle to be designed to prevent forced entry from attacking of lever
16. Provide locksets with 7-pin removable and interchangeable core cylinders
17. Each lever to have independent spring mechanism controlling it
18. Core face must be the same finish as the lockset.

D. Exit Devices:

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1. Exit devices to meet or exceed BHMA for ANSI 156.3, Grade 1.
2. Exit devices to be tested and certified by UL or by a recognized independent laboratory for mechanical operational testing to 10 million cycles minimum with inspection confirming Grade 1 Loaded Forces have been maintained.
3. Exit devices chassis to be investment cast steel, zinc dichromate.
4. Exit devices to have stainless steel deadlocking  $\frac{3}{4}$ " through latch bolt.
5. Exit devices to be equipped with sound dampening on touchbar.
6. Non-fire rated exit devices to have cylinder dogging.
7. Non-fire rated exit devices to have  $\frac{1}{4}$ " minimum turn hex key dogging.
8. Touchpad to be "T" style constructed of architectural metal with matching metal end caps.
9. Touchbar assembly on wide style exit devices to have a  $\frac{1}{4}$ " clearance to allow for vision frames.
10. All exposed exit device components to be of architectural metals and "true" architectural finishes.
11. Provide strikes as required by application.
12. Fire exit hardware to conform to UL10C and UBC 7-2. UL tested for Accident Hazard.
13. Exit device to be heavy investment cast stainless steel. The strike is to be black powder coated finish.
14. Exit devices to have field reversible handing.
15. Provide heavy duty vandal resistant lever trim with heavy duty investment cast stainless steel components and extra strength shock absorbing overload springs. Lever shall not require resetting. Lever design to match locksets and latchsets.
16. Provide 9001-Quality Management and 14001-Environmental Management.
17. Vertical Latch Assemblies to have gravity operation, no springs.

E. Cylinders:

1. Provide the necessary cylinder housings, collars, rings & springs as recommended by the manufacturer for proper installation.
2. Provide the proper cylinder cams or tail piece as required to operate all locksets and other keyed hardware items listed in the hardware sets.
3. Coordinate and provide as required for related sections.

F. Door Closers shall:

1. Tested and approved by BHMA for ANSI 156.4, Grade 1
2. UL10C certified
3. Provide 9001-Quality Management and 14001-Environmental Management.
4. Closer shall have extra-duty arms and knuckles
5. Conform to ANSI 117.1
6. Maximum 2 7/16 inch case projection with non-ferrous cover
7. Separate adjusting valves for closing and latching speed, and backcheck
8. Provide adapter plates, shim spacers and blade stop spacers as required by frame and door conditions
9. Full rack and pinion type closer with 1½" minimum bore
10. Mount closers on non-public side of door, unless otherwise noted in specification
11. Closers shall be non-handed, non-sized and multi-sized.

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Beard + Riser Architects PLLC

- G. Push Plates: Provide with four beveled edges ANSI J301, .050 thickness, size as indicated in hardware set. Furnish oval-head countersunk screws to match finish.
- H. Pulls with plates: Provide with four beveled edges ANSI J301, .050 thickness Plate s with ANSI J401 Pull as listed in hardware set. Provide proper fasteners for door construction.
- I. Kickplates: Provide with four beveled edges ANSI J102, 10 inches high by width less 2 inches on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.
- J. Mop plates: Provide with four beveled edges ANSI J103, 4 inches high by width less 1 inch on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.
- K. Door Bolts: Flush bolts for wood or metal doors.
  - 1. Manual flush bolts, Certified ANSI/BHMA 156.16 at openings where allowed local authority.
  - 2. Provide Dust Proof Strike, Certified ANSI/BHMA 156.16 at doors with flush bolts without thresholds.
- L. Coordinator and Brackets: Provide a surface mounted coordinator when automatic bolts are used in the hardware set.
  - 1. Coordinator, Certified ANSI/BHMA A1156.3 Type 21A for full width of the opening.
  - 2. Provide mounting brackets for soffit applied hardware.
  - 3. Provide hardware preparation (cutouts) for latches as necessary.
- M. Power Supply: Provide power supply for (ELR) Electric Latch Retraction exit devices
  - 1. Motherboard will accept up to four plug-in Control Modules. Provide the appropriate necessary control module to operate the number of ELR exit devices used at each opening. The Control Module shall include a Time delay Feature, variable (0-4 minutes) latch retraction period in response to a momentary input.
  - 2. UL Listed for class II output
  - 3. Include circuit breakers for protection of motherboard
  - 4. 115 or 230 Volt user selectable switch, with AC input= 115 Volt at 1 Amp
  - 5. Control module shall include Fire alarm terminal and Auxiliary contacts for remote signaling.
  - 6. Optional card for Battery Backup (BT) power tap module to operate a Card reader or when ELR devices require battery backup (Lead Acid Batteries are not included and is to be furnished by others)
  - 7. Precision ELR150 Series with the required modules.
- N. Quick Connect Power Transfer: Power transfer device shall be a steel housing and flexible tube. Secure and inconspicuous channel is to bring power from the frame to the door.
  - 1. Precision EPT-12C



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Beard + Riser Architects PLLC

2. Tube shall contain 12 Wire bundle with Stanley Quick Connect Connectors one 4 wire connector consisting of two 18AWG wires and 2 24AWG wires and one 8 wire connector with 8 24AWG wires.
- O. Power Transfer: Power transfer device shall be a steel housing and flexible tube. Secure and inconspicuous channel is to bring power from the frame to the door.
1. Precision EPT-12C
  2. Tube shall accept up to 5/16" wire bundle and accommodate a door swing of 120 Deg.
  3. Wires as required by others
- P. Power Supply: UL Listed, Field Selectable 12VDC or 24VDC output. The power supply will specifically designed to support electric locks and access controls. The power supply uses 115 VAC at 800mA input. The power shall be able to be expanded to four station controls. The filtered and regulated output power is field selectable for 12 or 24 VDC.
1. Fire Alarm/Life Safety emergency release included in power supply.
  2. Available options for multiple door options four or more control stations, Adjustable Time delay relay, Battery charging, Battery Back up.
- Q. Electric Door Strike: Certified by ANSI/BHMA 156.31, Grade 1. and listed for Burglary Protection ANSI/ UL1034 Grade 1.
1. For General use provide fail-secure electric strike and with fire-rated device.
  2. Listed UL10C for Fire Door assemblies
  3. Latchbolt monitor switch option when specified in hardware sets.
  4. Provide the electric strike in the appropriate model that will accept a 5/8" or 3/4" latchbolt.
- R. Door Position Switch: Provide door position switch for door status monitoring as indicated in hardware sets.
1. At all fired rated doors the door and frames, position switch preparation will be provided by the door and frame manufacturer or by an authorized label service agent.
- S. Quick Connect plug-in connectors: Stanley quick connect plug-in must be used with a combination of the following components to work as a complete plug and play system.
1. Best locks series 45HW, 45HM, 8KW, 9KW, 9KM
  2. To include Quick connectors to Best lock products Suffix "C" Example (45HW-7DEL14H DS C)
  3. Precision Exit Devices 2000 Series, DE, DS, TS, TDS, LDS, ELR
  4. To include Quick connectors to Precision Electric Exit device products Prefix "C" Example (C ELR 2108 x V4908A TS)
  5. Precision 12 Conductor Electric Power Transfer EPT-12C
  6. Stanley 12 Hinges Conductor Hinge CECB179-12C
- T. Quick Connect Wire Harnesses: The Quick Connect wire harness shall have of one four wire connector and one eight wire connector. The four wire connector has two

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Beard + Riser Architects PLLC

18AWG and two 24AWG wires. The eight wire connector has eight 24AWG wires Stanley quick connect wire harnesses are available in various length's, 3" (76mm), 6" (152mm), 12" (304mm), 26" (660mm) 32" (812mm) 38" (965mm), 44" (1117mm), 50" (1270mm) and 192" (4876mm).

1. Wire Harness that is terminated at both ends is specified as WH-size (Example WH-3).
2. Wire Harness that is terminated at one end with exposed pin head at the other is specified as WH-size P (Example WH-3P).
3. Wire Harness 6" (152mm) terminated at one end with bray leads on the other is specified as WH-6E.

Notes The Wire harnesses with suffix "E" has brae wire ends, is used to connect the quick connect harness to a hardwired connection.

Wire harnesses of different lengths may be combined to form a desired length

The maximum size hole needed to pass through the quick connect plug is 1" (25MM).

- U. Electric Door Strike: ANSI/BHMA 156.31, Grade 1 and listed ANSI/ UL1034, Warnock Hersey.
  1. The electric strike will accept up to a 3/4" latch bolt and 1" deadbolt. Field reversible, failsafe/fail secure.
  2. Listed UL10C Fire Door assemblies for Single Door application.
  3. UL tested 1500 lb static strength
  4. ES5 Electrical Specifications Dual Voltage coil 600mA @12V DC, 300mA @24V AC
  5. Contacts: SPDT, Dry, 5 Amp @30V
  6. LBM Latch bolt Monitor
  7. LBM/LCM Signals door is closed and latched or unlatched and Open
  8. DBM Signals deadbolt projected or retracted.
- V. Seals: All seals shall be finished to match adjacent frame color. Seals shall be furnished as listed in schedule. Material shall be UL listed for labeled openings.
- W. Weatherstripping: Provide at head and jambs only those units where resilient or flexible seal strip is easily replaceable. Where bar-type weatherstrip is used with parallel arm mounted closers install weatherstrip first.
  1. Weatherstrip shall be resilient seal of (Neoprene, Polyurethane, Vinyl, Pile, Nylon Brush, Silicone)
  2. UL10C Positive Pressure rated seal set when required.
- X. Door Bottoms/Sweeps: Surface mounted or concealed door bottom where listed in the hardware sets.
  1. Door seal shall be resilient seal of (Neoprene, Polyurethane, Nylon Brush, Silicone)
  2. UL10C Positive Pressure rated seal set when required.

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

- Y. Thresholds: Thresholds shall be aluminum beveled type with maximum height of ½" for conformance with ADA requirements. Furnish as specified and per details. Provide fasteners and screws suitable for floor conditions.
- Z. Silencers: Furnish silencers on all interior frames, 3 for single doors, 2 for pairs. Omit where any type of seals occur.
- AA. Access Control & Video Management System to be Network Based Browser Connected Web user interfaced. Interfaced with access control and monitoring for Realtime surveillance from Home Page, Monitoring Desktop. Multi Camera Views. Owner to view and browse video from anywhere that has permitted access to the secure network.

2.3 FINISH:

- A. Designations used in Schedule of Finish Hardware - 3.05, and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 including coordination with traditional U.S. finishes shown by certain manufacturers for their products
- B. Powder coat door closers to match other hardware, unless otherwise noted.
- C. Aluminum items shall be finished to match predominant adjacent material. Seals to coordinate with frame color.

2.4 KEYS AND KEYING:

- A. Provide keyed brass construction cores and keys during the construction period. Construction control and operating keys and core shall not be part of the Owner's permanent keying system or furnished in the same keyway (or key section) as the Owner's permanent keying system. Permanent cores and keys (prepared according to the accepted keying schedule) will be furnished to the Owner.
- B. Cylinders, removable and interchangeable core system: Best CORMAX™ Patented 7-pin.
- C. Permanent keys and cores: Stamped with the applicable key mark for identification. These visual key control marks or codes will not include the actual key cuts. Permanent keys will also be stamped "Do Not Duplicate."
- D. Transmit Grand Masterkeys, Masterkeys and other Security keys to Owner by Registered Mail, return receipt requested.
- E. Furnish keys in the following quantities:
  - 1. 1 each Grand Masterkeys
  - 2. 4 each Masterkeys
  - 3. 2 each Change keys each keyed core
  - 4. 15 each Construction masterkeys
  - 5. 1 each Control keys

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

- F. The Owner, or the Owner's agent, will install permanent cores and return the construction cores to the Hardware Supplier. Construction cores and keys remain the property of the Hardware Supplier.
- G. Keying Schedule: Arrange for a keying meeting, and programming meeting with Architect Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying and programming complies with project requirements. Furnish 3 typed copies of keying and programming schedule to Architect.
- H. Installation of the Owner's Permanent Cores to be provided by Bidder in this Section.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Verification of conditions: Examine doors, frames, related items and conditions under which Work is to be performed and identify conditions detrimental to proper and or timely completion.
  - 1. Do not proceed until unsatisfactory conditions have been corrected.

#### 3.2 HARDWARE LOCATIONS:

- A. Mount hardware units at heights indicated in the following publications except as specifically indicated or required to comply with the governing regulations.
  - 1. Recommended Locations for Builder's Hardware for Standard Steel Doors and Frames, by the Door and Hardware Institute (DHI).
  - 2. Recommended locations for Architectural Hardware for flush wood doors (DHI).
  - 3. WDMA Industry Standard I.S.-1A-04, Industry Standard for Architectural wood flush doors.

#### 3.3 INSTALLATION:

- A. Install each hardware item per manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- B. Conform to local governing agency security ordinance.
- C. Install Conforming to ICC/ANSI A117.1 Accessible and Usable Building and Facilities.
  - 1. Adjust door closer sweep periods so that from the open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the landing side of the door.

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

- D. Installed hardware using the manufacturers fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use "Riv-Nuts" or similar products.
- E. Installation of the Owner's Permanent Cores to be provided by Bidder in this Section.

3.4 FIELD QUALITY CONTROL AND FINAL ADJUSTMENT

- A. Contractor/Installers, Field Services: After installation is complete, contractor shall inspect the completed door openings on site to verify installation of hardware is complete and properly adjusted, in accordance with both the Contract Documents and final shop drawings.
  - 1. Check and adjust closers to ensure proper operation.
  - 2. Check latchset, lockset, and exit devices are properly installed and adjusted to ensure proper operation.
    - a. Verify levers are free from binding.
    - b. Ensure latchbolts and dead bolts are engaged into strike and hardware is functioning.
  - 3. Report findings, in writing, to architect indicating that all hardware is installed and functioning properly. Include recommendations outlining corrective actions for improperly functioning hardware if required.

3.5 SCHEDULE OF FINISH HARDWARE:

Manufacturer List

| <u>Code</u> | <u>Name</u>          |
|-------------|----------------------|
| BE          | Best Access Systems  |
| BY          | By Others            |
| HS          | HES                  |
| NA          | National Guard       |
| PR          | Precision            |
| SD          | Stanley Door Closers |
| ST          | Stanley              |
| TR          | Trimco               |
| SE          | Securitron           |
| S2          | S2 Security          |

Finish List

| <u>Code</u> | <u>Description</u> |
|-------------|--------------------|
| AL          | Aluminum           |

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

|       |                       |
|-------|-----------------------|
| PC    | Prime Coat            |
| 626   | Satin Chromium Plated |
| 630   | Satin Stainless Steel |
| 689   | Aluminum Painted      |
| GREY  | Grey                  |
| US26D | Chromium Plated, Dull |
| US32D | Stainless Steel, Dull |

Option List

| <u>Code</u>  | <u>Description</u>                |
|--------------|-----------------------------------|
| C            | QUICK CONNECT WIRING OPTION       |
| C4           | CAM-STANDARD CAM                  |
| CD           | CYLINDER DOGGING                  |
| FL           | Fire Exit Hardware                |
| FS           | Fail Safe                         |
| HT           | Hospital Tip                      |
| 48"          | 48" Door Width                    |
| B4E          | BEVELED 4 EDGES - KICK PLATES     |
| ELR          | ELECTRIC LATCH RETRACTION         |
| LBR          | LESS BOTTOM ROD                   |
| TDS          | TOUCHBAR MONITORING DOUBLE SWITCH |
| VIN          | Visual Indicator                  |
| 2004M        | Electrolynx Adaptor               |
| EPT Prep     | EPT Prep (full mortise)           |
| C-SUNK HOLES | COUNTER SINKING OF KICK and MOP   |

PLATES

Hardware Sets

SET #1

Doors: 01

|   |                        |                               |     |    |
|---|------------------------|-------------------------------|-----|----|
| 1 | ADA Operator/Installed | 7100 series with push buttons | CL  | HO |
| 2 | FM Continuous Hinges   | 661-HD                        | AL  | ST |
| 2 | Exit Device            | 2203 CD (Wide Stile Door)     | 630 | PR |
| 2 | Rim Cylinder           | 12E-72 PATD                   | 626 | BE |
| 2 | Mortise Cylinder       | 1E-74 PATD C4                 | 626 | BE |
| 2 | Off Set Pull           | 1170 x 60"                    | 630 | TR |
| 1 | Door Closer            | CS-4550 EDA                   | 689 | SD |
| 1 | Gasketing              | 127 SA 1 x 36" 2 x 84"        |     | NA |
| 1 | Threshold              | 896 S 72"                     | AL  | NA |
| 2 | Door Sweep             | 101 VA 36"                    |     | NA |

DOOR HARDWARE

087100 -

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

SET #2

Doors: 02

|                    |                              |       |    |
|--------------------|------------------------------|-------|----|
| 8 Hinges           | CB179 4 1/2 X 4 1/2          | US26D | ST |
| 1 Exit Device      | 2203 CD LBR                  | 630   | PR |
| 1 Exit Device      | 2202 CD LBR                  | 630   | PR |
| 1 Rim Cylinder     | 12E-72 PATD                  | 626   | BE |
| 2 Mortise Cylinder | 1E-74 PATD C4                | 626   | BE |
| 2 Off Set Pull     | 1170 x 60"                   | 630   | TR |
| 2 Door Closer      | CLD-4550 S                   | 689   | SD |
| 2 Kick Plate       | KO050 10" X 1"LDW B4E C-SUNK | 630   | TR |
| 2 Floor Stop       | 1211                         | 626   | TR |
| 1 Smoke Seal       | 5020 C x LAR Head and Jambs  |       | NA |
| 1 Astragal         | 143 PA 94"                   |       | NA |

SET #3

Doors: 03, 18

|                        |                                                      |       |     |
|------------------------|------------------------------------------------------|-------|-----|
| 3 Hinges               | CB179 4 1/2 X 4 1/2                                  | US26D | ST  |
| 1 Lockset              | 45H-7D14J PATD                                       | 630   | BE  |
| 1 Electric Strike      | 1006CS-F 2004M                                       | 630   | HS  |
| 1 Door Closer          | CLD-4550 STD W/PA BRKT                               | 689   | SD  |
| 1 Kick Plate           | KO050 10" x 2" LDW B4E CSH                           | 630   | TR  |
| 1 Wall Bumper          | 1270CV                                               | 626   | TR  |
| 3 Door Silencers       | 1229A                                                | GREY  | TR  |
| 1 Request Exit         | 310                                                  | WH    | HO  |
| 1 Power Supply         | BPS-24                                               |       | SE  |
| 1 Door Position Switch | 1078                                                 | BLK   | GE  |
| 1 Card Reader          | I-Class Prox                                         | BLK   | HID |
| 1 Installation         | All Electronic Hardware, Access System, Provide/Pull |       |     |

Cable

NOTE: All access wiring to be supplied and installed by 08710 section

SET #3A

Doors: 54

|                   |                        |       |    |
|-------------------|------------------------|-------|----|
| 3 Hinges          | CB179 4 1/2 X 4 1/2    | US26D | ST |
| 1 Lockset         | 45H-7D14J PATD         | 630   | BE |
| 1 Electric Strike | 1006CS-F 2004M         | 630   | HS |
| 1 Door Closer     | CLD-4550 STD W/PA BRKT | 689   | SD |
| 1 Wall Bumper     | 1270CV                 | 626   | TR |

DOOR HARDWARE

087100 -

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

|                        |                                                      |      |     |
|------------------------|------------------------------------------------------|------|-----|
| 3 Door Silencers       | 1229A                                                | GREY | TR  |
| 1 Request Exit         | 310                                                  | WH   | HO  |
| 1 Power Supply         | BPS-24                                               |      | SE  |
| 1 Door Position Switch | 1078                                                 | BLK  | GE  |
| 1 Card Reader          | I-Class Prox                                         | BLK  | HID |
| 1 Installation         | All Electronic Hardware, Access System, Provide/Pull |      |     |
| Cable                  |                                                      |      |     |

NOTE: All access wiring to be supplied and installed by 08710 section

SET #4

Doors: 04, 05, 28, 35, 37

|                  |                            |       |    |
|------------------|----------------------------|-------|----|
| 3 Hinges         | CB191 4 1/2 X 4 1/2        | US32D | ST |
| 1 Push Plate     | 1001-3                     | 630   | TR |
| 1 Pull Plate     | 1013-3B                    | 630   | TR |
| 1 Door Closer    | CLD-4551 STD W/PA BRKT     | 689   | SD |
| 1 Mop Plate      | KM050 6" x 1" LDW B4E CSH  | 630   | TR |
| 1 Kick Plate     | KO050 10" x 2" LDW B4E CSH | 630   | TR |
| 1 Wall Bumper    | 1270CV                     | 626   | TR |
| 3 Door Silencers | 1229A                      | GREY  | TR |

SET #5

Doors: 17, 43

|                         |                            |       |    |
|-------------------------|----------------------------|-------|----|
| 3 Hinges                | CB191 4 1/2 X 4 1/2        | US32D | ST |
| 1 Privacy Indicator Set | 45H-0LT14J VIN             | 630   | BE |
| 1 Door Closer           | CLD-4551 STD W/PA BRKT     | 689   | SD |
| 1 Kick Plate            | KO050 10" x 2" LDW B4E CSH | 630   | TR |
| 1 Mop Plate             | KM050 6" x 1" LDW B4E CSH  | 630   | TR |
| 1 Wall Bumper           | 1270CV                     | 626   | TR |
| 1 Coat Hook             | 3071                       | 630   | TR |
| 3 Door Silencers        | 1229A                      | GREY  | TR |

SET #5A

Doors: 46



Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

|                         |                           |       |    |
|-------------------------|---------------------------|-------|----|
| 3 Hinges                | CB191 4 1/2 X 4 1/2       | US32D | ST |
| 1 Privacy Indicator Set | 45H-0LT14J VIN            | 630   | BE |
| 1 Mop Plate             | KM050 6" x 1" LDW B4E CSH | 630   | TR |
| 1 Wall Bumper           | 1270CV                    | 626   | TR |
| 1 Coat Hook             | 3071                      | 630   | TR |
| 3 Door Silencers        | 1229A                     | GREY  | TR |

SET #6

Doors: 13, 19, 22,

|                        |                                                      |       |     |
|------------------------|------------------------------------------------------|-------|-----|
| 3 Hinges               | CB179 4 1/2 X 4 1/2                                  | US26D | ST  |
| 1 Power Transfer       | CEPT-10                                              |       | SE  |
| 1 Exit Device          | C ELR TDS 2103                                       | 630   | PR  |
| 1 Offset Pull          | 1191-4-BP4                                           | 630   | TR  |
| 1 Rim Cylinder         | 12E-72 PATD                                          | 626   | BE  |
| 1 Door Closer          | CLD-4550 EDA                                         | 689   | SD  |
| 1 Wall Bumper          | 1270CV                                               | 626   | TR  |
| 1 Wire Harness         | WH-6E                                                |       | BE  |
| 1 Wire Harness         | WH-12P                                               |       | BE  |
| 1 Wire Harness         | WH-192P                                              |       | BE  |
| 3 Door Silencers       | 1229A                                                | GREY  | TR  |
| 1 Power Supply         | ELR151                                               |       | PR  |
| 1 Door Position Switch | 1078                                                 | BLK   | GE  |
| 1 Card Reader          | I-Class Prox                                         | BLK   | HID |
| 1 Installation         | All Electronic Hardware, Access System, Provide/Pull |       |     |

Cable

NOTE: All access wiring to be supplied and installed by 08710 section

SET #7

Doors: 06, 07, 08, 09, 12, 15, 16, 20, 21, 34, 36, 38, 39, 45, 48, 50, 51, 52, 57, 58, 59,

|                  |                     |       |    |
|------------------|---------------------|-------|----|
| 3 Hinges         | CB179 4 1/2 X 4 1/2 | US26D | ST |
| 1 Lockset        | 45H-7AT14J PATD     | 630   | BE |
| 1 Wall Bumper    | 1270CV              | 626   | TR |
| 3 Door Silencers | 1229A               | GREY  | TR |

SET #8

Doors: NOT USED

|               |                            |       |    |
|---------------|----------------------------|-------|----|
| 3 Hinges      | CB179 4 1/2 X 4 1/2        | US26D | ST |
| 1 Lockset     | 45H-7D14J PATD             | 630   | BE |
| 1 Door Closer | CLD-4550 STD W/PA BRKT     | 689   | SD |
| 1 Kick Plate  | KO050 10" x 2" LDW B4E CSH | 630   | TR |

DOOR HARDWARE

087100 -

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

|              |                             |  |    |
|--------------|-----------------------------|--|----|
| 1 Smoke Seal | 5020 C x LAR Head and Jambs |  | NA |
|--------------|-----------------------------|--|----|

SET #9

Doors: 14

|               |                             |       |    |
|---------------|-----------------------------|-------|----|
| 3 Hinges      | CB179 4 1/2 X 4 1/2         | US26D | ST |
| 1 Push        | 1000-4                      | US26D | TR |
| 1 Offset Pull | 1191-4-BP4                  |       |    |
| 1 Door Closer | CLD-4551 STD W/PA BRKT      | 689   | SD |
| 1 Kick Plate  | KO050 10" x 2" LDW B4E CSH  | 630   | TR |
| 1 Mop Plate   | KM050 6" x 1" LDW B4E CSH   | 630   | TR |
| 1 Wall Bumper | 1270CV                      | 626   | TR |
| 1 Floor Stop  | 1210                        | 626   | TR |
| 1 Smoke Seal  | 5020 C x LAR Head and Jambs |       | NA |

SET #10

Doors: 10, 23

|                        |                                                      |       |     |
|------------------------|------------------------------------------------------|-------|-----|
| 3 Hinges               | CB179 4 1/2 X 4 1/2                                  | US26D | ST  |
| 1 Lockset              | 45H-7D14J PATD                                       | 630   | BE  |
| 1 Electric Strike      | 1006CS-F 2004M-SMT PAK                               | 630   | HS  |
| 1 Door Closer          | CLD-4550 STD W/PA BRKT                               | 689   | SD  |
| 1 Kick Plate           | KO050 10" x 2" LDW B4E CSH                           | 630   | TR  |
| 1 Wall Bumper          | 1270CV                                               | 626   | TR  |
| 1 Smoke Seal           | 5020 C x LAR Head and Jambs                          |       | NA  |
| 1 Request Exit         | 310                                                  |       | HO  |
| 1 Door Position Switch | 1078                                                 | BLK   | GE  |
| 1 Card Reader          | I-Class Prox                                         | BLK   | HID |
| 1 Installation         | All Electronic Hardware, Access System, Provide/Pull |       |     |

Cable

NOTE: All access wiring to be supplied and installed by 08710 section

SET #11

Doors: 25, 29

|                    |                       |    |    |
|--------------------|-----------------------|----|----|
| 1 Continuous Hinge | 661HD UL 83" EPT Prep | AL | ST |
|--------------------|-----------------------|----|----|

DOOR HARDWARE

087100 -

Greenwood Police Department and Municipal Court Renovation  
Beard + Riser Architects PLLC

|       |                        |                                                      |     |     |
|-------|------------------------|------------------------------------------------------|-----|-----|
|       | 1 Power Transfer       | CEPT-10                                              |     | SE  |
|       | 1 Exit Delay Device    | C DE ELR TDS 2103                                    | 630 | PR  |
|       | 1 Offset Pull          | 1191-4-BP4                                           |     |     |
|       | 1 Door Closer          | CLD-4550 EDA                                         | 689 | SD  |
|       | 1 Rim Cylinder         | 12E-72 PATD                                          | 626 | BE  |
|       | 1 Mortise Cylinder     | 1E-74 PATD C4                                        | 626 | BE  |
|       | 1 Kick Plate           | KO050 10" x 2" LDW B4E CSH                           | 630 | TR  |
|       | 1 Gasketing            | 127 SA 1 x 48" 2 x 84"                               |     | NA  |
|       | 1 Threshold            | 896 S 48"                                            | AL  | NA  |
|       | 1 Door Sweep           | 101 VA 48"                                           |     | NA  |
|       | 1 Peep                 | 976-U                                                |     | TR  |
|       | 1 Wire Harness         | WH-6E                                                |     | BE  |
|       | 1 Wire Harness         | WH-12P                                               |     | BE  |
|       | 1 Wire Harness         | WH-192P                                              |     | BE  |
|       | 1 Power Supply         | ELR151-DE                                            |     | PR  |
|       | 1 Door Position Switch | 1078                                                 | BLK | GE  |
|       | 2 Card Reader          | I-Class Prox (Card-IN, Card-OUT)                     |     |     |
| BLK   | HID                    |                                                      |     |     |
|       | 1 Video/Audio Intercom | JP-Vandal Series to Dispatch Office                  | 132 | APH |
|       | 1 Installation         | All Electronic Hardware, Access System, Provide/Pull |     |     |
| Cable |                        |                                                      |     |     |

NOTE: All access wiring to be supplied and installed by 08710 section.  
NOTE: Connections to Fire Alarm Required for Miss Fire Code

SET #12

Doors: 11, 24,

|       |                        |                                                      |     |     |
|-------|------------------------|------------------------------------------------------|-----|-----|
|       | 1 Continuous Hinge     | 661HD UL 83" EPT Prep                                | AL  | ST  |
|       | 1 Power Transfer       | CEPT-10                                              |     | SE  |
|       | 1 Exit Device          | C ELR TDS 2103                                       | 630 | PR  |
|       | 1 Offset Pull          | 1191-4-BP4                                           | 630 | TR  |
|       | 1 Door Closer          | CLD-4550 EDA                                         | 689 | SD  |
|       | 1 Rim Cylinder         | 12E-72 PATD                                          | 626 | BE  |
|       | 1 Mortise Cylinder     | 1E-74 PATD C4                                        | 626 | BE  |
|       | 1 Kick Plate           | KO050 10" x 2" LDW B4E CSH                           | 630 | TR  |
|       | 1 Gasketing            | 127 SA 1 x 36" 2 x 84"                               |     | NA  |
|       | 1 Threshold            | 896 S 36"                                            | AL  | NA  |
|       | 1 Door Sweep           | 101 VA 36"                                           |     | NA  |
|       | 1 Wire Harness         | WH-6E                                                |     | BE  |
|       | 1 Wire Harness         | WH-12P                                               |     | BE  |
|       | 1 Wire Harness         | WH-192P                                              |     | BE  |
|       | 1 Power Supply         | ELR151                                               |     | PR  |
|       | 1 Door Position Switch | 1078                                                 | BLK | GE  |
|       | 1 Card Reader          | I-Class Prox                                         | BLK | HID |
|       | 1 Installation         | All Electronic Hardware, Access System, Provide/Pull |     |     |
| Cable |                        |                                                      |     |     |

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NOTE: All access wiring to be supplied and installed by 08710 section

SET #13

Doors: 26

|                    |                 |      |    |
|--------------------|-----------------|------|----|
| 1 Continuous Hinge | 661HD UL 83" HT | AL   | ST |
| 1 Deadlock         | 48H-7M PATD     | 626  | BE |
| 1 Set Flush Pulls  | 1115B           | 630  | TR |
| 3 Door Silencers   | 1229A           | GREY | TR |

VERIFY IF KEYED LOCKED BOTH SIDES

SET #14

Doors: NOT USED

|                    |                 |      |    |
|--------------------|-----------------|------|----|
| 1 Continuous Hinge | 661HD UL 83" HT | AL   | ST |
| 1 Lockset          | 45H-7W14J PATD  | 630  | BE |
| 1 Floor Stop       | 1211            | 626  | TR |
| 3 Door Silencers   | 1229A           | GREY | TR |

SET #15

Doors: 30

|                        |                            |      |     |
|------------------------|----------------------------|------|-----|
| 1 Continuous Hinge     | 661HD UL 83" EPT Prep      | AL   | ST  |
| 1 Power Transfer       | CEPT-10                    |      | SE  |
| 1 Exit Device          | C ELR TDS 2103             | 630  | PR  |
| 1 Offset Pull          | 1191-4-BP4                 | 630  | TR  |
| 1 Door Closer          | CLD-4550 CS                | 689  | SD  |
| 1 Kick Plate           | KO050 10" x 2" LDW B4E CSH | 630  | TR  |
| 1 Gasketing            | 127 SA 1 x 36" 2 x 84"     |      | NA  |
| 1 Door Sweep           | 101 VA 36"                 |      | NA  |
| 1 Drip Cap             | 16 A - 4" ODW              |      | NA  |
| 1 Threshold            | 896 S 36"                  | AL   | NA  |
| 3 Door Silencers       | 1229A                      | GREY | TR  |
| 1 Power Supply         | ELR-151                    |      | ST  |
| 1 Door Position Switch | 1078                       | BLK  | GE  |
| 1 Card Reader          | I-Class Prox               | BLK  | HID |

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Cable      1 Installation      All Electronic Hardware, Access System, Provide/Pull

NOTE: All access wiring to be supplied and installed by 08710 section

SET #16

Doors: 31, 44,

|                  |                             |       |    |
|------------------|-----------------------------|-------|----|
| 3 Hinges         | CB179 4 1/2 X 4 1/2         | US26D | ST |
| 1 Exit Device    | FL 2114 X 4914D             | 630   | PR |
| 1 Door Closer    | CLD-4550 STD W/PA BRKT      | 689   | SD |
| 1 Kick Plate     | KO050 10" x 2" LDW B4E CSH  | 630   | TR |
| 1 Wall Bumper    | 1270CV                      | 626   | TR |
| 1 Smoke Seal     | 5020 C x LAR Head and Jambs |       | NA |
| 3 Door Silencers | 1229A                       | GREY  | TR |

SET #17

Doors: 47, 53

|                  |                     |       |    |
|------------------|---------------------|-------|----|
| 3 Hinges         | CB179 4 1/2 X 4 1/2 | US26D | ST |
| 1 Lockset        | 45H-7R14J PATD      | 630   | BE |
| 1 Wall Bumper    | 1270CV              | 626   | TR |
| 3 Door Silencers | 1229A               | GREY  | TR |

SET #18

Doors: 32, 33, 40, 41, 42, 55, 56, 60, 61

|                  |                     |       |    |
|------------------|---------------------|-------|----|
| 3 Hinges         | CB179 4 1/2 X 4 1/2 | US26D | ST |
| 1 Lockset        | 45H-7D14J PATD      | 630   | BE |
| 1 Wall Bumper    | 1270CV              | 626   | TR |
| 3 Door Silencers | 1229A               | GREY  | TR |

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SET #19

Doors: NOT USED

|                    |                     |       |    |
|--------------------|---------------------|-------|----|
| 6 Hinges           | CB179 4 1/2 X 4 1/2 | US26D | ST |
| 2 Flush Bolt       | 3917-12             | 626   | TR |
| 1 Lockset          | 45H-7R14J PATD      | 630   | BE |
| 1 Coordinator      | 3094B2              | PC    | TR |
| 2 Wall Bumper      | 1270CV              | 626   | TR |
| 1 Dustproof Strike | 3910                | 630   | TR |
| 2 Door Silencers   | 1229A               | GREY  | TR |

SET #20

Doors: NOT USED

|                    |                            |       |    |
|--------------------|----------------------------|-------|----|
| 6 Hinges           | CB179 4 1/2 X 4 1/2        | US26D | ST |
| 1 Exit Device      | 2208 X 4908D CD LBR        | 630   | PR |
| 1 Exit Device      | 2202 X 4902D CD LBR        | 630   | PR |
| 1 Rim Cylinder     | 12E-72 PATD                | 626   | BE |
| 2 Mortise Cylinder | 1E-74 PATD C4              | 626   | BE |
| 2 Door Closer      | CLD-4550 CS                | 689   | SD |
| 2 Kick Plate       | KO050 10" x 2" LDW B4E CSH | 630   | TR |
| 2 Wall Bumper      | 1270CV                     | 626   | TR |
| 2 Door Silencers   | 1229A                      | GREY  | TR |

SET #21

Doors: 49

BALANCE OF HARDWARE BY DOOR SUPPLIER INCLUDING KEYED CYLINDER

NOTE: Verify that All devices to be prepped & installed to swing, lock, close and gasket this opening as supplied by Vault Door Supplier.

SET #22

Misc Access & CCTV System

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|      |                                                                                           |                      |     |
|------|-------------------------------------------------------------------------------------------|----------------------|-----|
| 1    | Access Control System                                                                     | EXT-16               |     |
| BLK  | S2                                                                                        |                      |     |
| 1    | Video Management System                                                                   | NetVR 100-16TB-IP32C | BLK |
| S2   |                                                                                           |                      |     |
| 250  | Prox Key Fob/Cards                                                                        | I-Class-ISO          | WH  |
| HID  |                                                                                           |                      |     |
| 14   | IP Camera, Dome                                                                           | M3005-V              | WHT |
| AXIS |                                                                                           |                      |     |
| 10   | IP Camera Dome                                                                            | M3026-VE             | WHT |
| AXIS |                                                                                           |                      |     |
| 1    | Key-Box                                                                                   | 180 Key Cab          |     |
|      | TELKey                                                                                    |                      |     |
| 1lot | Mounts, Cable, Wire & All Connections                                                     |                      |     |
| 1lot | Installation, Programming, Training                                                       |                      |     |
| 1lot | Installation of the Owner's Permanent Cores to insure Security at the end of the Project. |                      |     |
|      | Owner/Architect to verify time.                                                           |                      |     |

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Opening List

| <u>Opening</u> | <u>Hdw Set</u> |
|----------------|----------------|
| 01             | 1              |
| 02             | 2              |
| 03             | 3              |
| 04             | 4              |
| 05             | 4              |
| 06             | 7              |
| 07             | 7              |
| 08             | 7              |
| 09             | 7              |
| 10             | 10             |
| 11             | 12             |
| 12             | 7              |
| 13             | 6              |
| 14             | 9              |
| 15             | 7              |
| 16             | 7              |
| 17             | 5              |
| 18             | 3              |
| 19             | 6              |
| 20             | 7              |
| 21             | 7              |
| 22             | 6              |
| 23             | 10             |
| 24             | 12             |
| 25             | 11             |
| 26             | 13             |
| 27             | 5              |
| 28             | 4              |
| 29             | 11             |
| 30             | 15             |
| 31             | 16             |
| 32             | 18             |
| 33             | 18             |
| 34             | 7              |
| 35             | 4              |
| 36             | 7              |
| 37             | 4              |
| 38             | 7              |
| 39             | 7              |
| 40             | 18             |
| 41             | 18             |
| 42             | 18             |
| 43             | 5              |
| 43A            | 5              |
| 43B            | 17             |
| 44             | 16             |



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|     |    |
|-----|----|
| 45  | 7  |
| 46  | 5A |
| 47  | 17 |
| 47A | 17 |
| 48  | 7  |
| 49  | 21 |
| 50  | 7  |
| 51  | 7  |
| 52  | 7  |
| 53  | 17 |
| 54  | 3A |
| 54A | 19 |
| 54B | 19 |
| 55  | 18 |
| 56  | 18 |
| 57  | 7  |
| 58  | 7  |
| 59  | 7  |
| 60  | 18 |
| 61  | 18 |

END OF DOCUMENT 087100

## SECTION 088000 - GLAZING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes:
  - 1. Glass for windows, doors, interior borrowed lites, storefront framing, and glazed curtain walls.
  - 2. Glazing sealants and accessories.

#### 1.3 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. IBC: International Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

#### 1.4 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

#### 1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 2. Review temporary protection requirements for glazing during and after installation.

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1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.
  - 1. Insulating glass.
  - 2. Insulating glass, bullet resistant.
  - 3. Security glazing.
- C. Glazing Accessory Samples: For sealants and colored spacers, in 12-inch (300-mm) lengths. Install sealant Samples between two strips of material representative in color of the adjoining framing system.
- D. Glazing Schedule: List glass types and thicknesses for each size opening and location.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer manufacturers of insulating-glass units with sputter-coated, low-E coatings glass testing agency and sealant testing agency.
- B. Product Certificates: For glass.
- C. Product Test Reports: For coated glass insulating glass and glazing sealants, for tests performed by a qualified testing agency.
  - 1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.
- D. Preconstruction adhesion and compatibility test report.
- E. Sample Warranties: For special warranties.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved by coated-glass manufacturer.
- B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

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- E. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution.
  - 1. Install glazing in mockups specified in Section 084113 "Aluminum-Framed Entrances and Storefronts" and Section 084413 "Glazed Aluminum Curtain Walls" to match glazing systems required for Project, including glazing methods.
  - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
  - 1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
  - 2. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
  - 3. Test no fewer than eight Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
  - 4. Schedule enough time for testing and analyzing results to prevent delaying the Work.
  - 5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including the use of specially formulated primers.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.11 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
  - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F (4.4 deg C).

## 1.12 WARRANTY

- A. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
1. Warranty Period: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. AGC Glass Company North America, Inc.
  2. Berkowitz, JE, LP.
  3. Cardinal Glass Industries.
  4. Cristacurva Glass.
  5. Dlubak Corporation.
  6. Gardner Glass Products, Inc.
  7. General Glass International.
  8. Glasswerks LA, Inc.
  9. Glaz-Tech Industries.
  10. Guardian Industries Corp.
  11. Hartung Glass Industries.
  12. Northwestern Industries, Inc.
  13. Oldcastle BuildingEnvelope.
  14. Pilkington North America Inc.
  15. PPG Industries, Inc.
  16. Saint-Gobain Corporation.
  17. Schott North America, Inc.
  18. Tecnoglass S. A.
  19. Trulite Glass & Aluminum Solutions.
  20. Viracon, Inc.
- B. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.
1. Obtain products from single source from single manufacturer.
- C. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

## 2.2 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.
  - 1. Design Wind Pressures: Determine design wind pressures applicable to Project according to ASCE/SEI 7, based on heights above grade indicated on Drawings.
    - a. Basic Wind Speed: 125 mph (44 m/s).
    - b. Importance Factor: 1.0.
    - c. Exposure Category: B.
  - 2. Probability of Breakage for Sloped Glazing: For glass surfaces sloped more than 15 degrees from vertical, design glass for a probability of breakage not greater than 0.001.
  - 3. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch (25 mm), whichever is less.
  - 4. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- C. Windborne-Debris-Impact Resistance: Exterior glazing shall comply with basic-protection testing requirements in ASTM E 1996 for Wind Zone 4 when tested according to ASTM E 1886. Test specimens shall be no smaller in width and length than glazing indicated for use on Project and shall be installed in same manner as glazing indicated for use on Project.
  - 1. Large-Missile Test: For glazing located within 30 feet (9.1 m) of grade.
  - 2. Small-Missile Test: For glazing located more than 30 feet (9.1 m) above grade.
- D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
  - 1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
  - 2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
  - 3. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
  - 4. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
  - 5. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

## 2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
  - 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.
- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.
  - 1. Minimum Glass Thickness for Exterior Lites: 6 mm.
- E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

## 2.4 GLASS PRODUCTS

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
- B. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) as indicated, Quality-Q3.
  - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

## 2.5 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.

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1. Sealing System: Dual seal, with manufacturer's standard polyisobutylene and silicone primary and secondary sealants.
2. Spacer: Thermally broken aluminum.
3. Desiccant: Molecular sieve or silica gel, or a blend of both.

## 2.6 GLAZING SEALANTS

### A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Field-applied sealants shall have a VOC content of not more than 250 g/L.
4. Sealants shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
5. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

### B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Dow Corning Corporation; 790.
  - b. GE Advanced Materials - Silicones; SilPruf LM SCS2700.
  - c. May National Associates, Inc.; Bondaflex Sil 290.
  - d. Pecora Corporation; 890NST.
  - e. Sika Corporation U.S.; Sikasil WS-290.
  - f. Tremco Incorporated; Spectrem 1.

## 2.7 GLAZING TAPES

### A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.



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3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
  1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
  2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

## 2.8 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

## 2.9 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
  1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
    - a. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

- C. Grind smooth and polish exposed glass edges and corners.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
  - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
  - 2. Presence and functioning of weep systems.
  - 3. Minimum required face and edge clearances.
  - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

### 3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

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- F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
  - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
  - 2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

#### 3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against

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faces of removable stops. Start gasket applications at corners and work toward centers of openings.

- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

### 3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

### 3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

### 3.7 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other

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masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

### 3.8 MONOLITHIC GLASS SCHEDULE

- A. Glass Type GL-<1>: Clear fully tempered float glass; ASTM C 1048, Kind FT, Condition A, Type I, Class 1, tempered by the manufacturer's standard process (after cutting to final size).
  1. Minimum Thickness: 6 mm (1/4").
  2. Safety glazing required.
- B. Glass Type GL-<2>: Security Glazing.
  1. Basis-of-Design Product: SG4 by School Guard Glass as manufactured by Laminated Technologies Inc. (844) 744-5277 or equal.
  2. Minimum Thickness: 6 mm (1/4").
  3. Security glazing shall have the following characteristics:
    - a. No more than 4.1. lbs per square foot.
    - b. 5-aa1 rated for a minimum of 6 minutes.
    - c. Glass clad on interior and exterior surfaces.
    - d. F1233 rated.
    - e. Optical Haze of no more than 1.8%
- C. Glass Type GL-<3>: One-way vision glass.
  1. Basis-of-Design Product: Mirropane manufactured by Libby-Owens-Ford Co.; or equal.
  2. Minimum Thickness: 6 mm (1/4").
  3. Tempered clear glass with scratch-proof evaporated chromium alloy reflective coating one side, PPG Industries, Inc. or equal.

### 3.9 INSULATING GLASS SCHEDULE

- A. Glass Type GL-<4>: Low-E-coated, clear insulating glass.
  1. Overall Unit Thickness: 1 inch (25 mm).
  2. Minimum Thickness of Each Glass Lite: 6 mm.
  3. Outdoor Lite: Clear fully tempered float glass.
  4. Interspace Content: Argon.

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Beard + Riser Architects PLLC

5. Indoor Lite: Clear fully tempered float glass.
6. Low-E Coating: Pyrolytic on second surface.
7. Winter Nighttime U-Factor: 0.3 maximum.
8. Summer Daytime U-Factor: 0.3 maximum.
9. Visible Light Transmittance: 80 percent minimum.
10. Solar Heat Gain Coefficient: 0.45 maximum.
11. Safety glazing required.

B. Glass Type GL-<5>: Bullet resistant Low-E-coated, clear insulating glass.

1. Overall Unit Thickness: 1-1/4 inch (31 mm).
2. Minimum Thickness of Each Glass Lite: 6 mm.
3. Outdoor Lite: Clear fully tempered float glass.
4. Interspace Content: 3/8 inch Argon.
5. Indoor Lite: Clear fully tempered float glass.
6. Low-E Coating: Pyrolytic on second surface.
7. Winter Nighttime U-Factor: 0.3 maximum.
8. Summer Daytime U-Factor: 0.3 maximum.
9. Visible Light Transmittance: 80 percent minimum.
10. Solar Heat Gain Coefficient: 0.45 maximum.
11. Safety glazing required.
12. Blast rating shall be:
  - a. 4 psi/28 psi-msec for pieces up to 48"x96"
  - b. 10 psi/89 psi-msec for pieces up to 24"x48"

END OF SECTION 088000

## SECTION 088300 - MIRRORS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes the following types of silvered flat glass mirrors:
  - 1. Annealed monolithic glass mirrors.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Mirrors. Include description of materials and process used to produce each type of silvered flat glass mirror specified that indicates sources of glass, glass coating components, edge sealer, and quality-control provisions.
- B. Shop Drawings: Include mirror elevations, edge details, mirror hardware, and attachment details.
- C. Samples: For each type of the following:
  - 1. Mirrors: 12 inches (300 mm) square, including edge treatment on two adjoining edges.
  - 2. Mirror Clips: Full size.
  - 3. Mirror Trim: 12 inches (300 mm) long.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of mirror and mirror mastic.
- C. Preconstruction Test Reports: From mirror manufacturer indicating that mirror mastic was tested for compatibility and adhesion with mirror backing and substrates on which mirrors are installed.
- D. Sample Warranty: For special warranty.

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1.5 CLOSEOUT SUBMITTALS

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

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Mirror Mastic Compatibility Test: Submit mirror mastic products to mirror manufacturer for testing to determine compatibility of mastic with mirror backing.
  - 1. Testing is not required if data are submitted based on previous testing of mirror mastic products and mirror backing matching those submitted.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect mirrors according to mirror manufacturer's written instructions and as needed to prevent damage to mirrors from moisture, condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with mirror manufacturer's written instructions for shipping, storing, and handling mirrors as needed to prevent deterioration of silvering, damage to edges, and abrasion of glass surfaces and applied coatings. Store indoors.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not install mirrors until ambient temperature and humidity conditions are maintained at levels indicated for final occupancy.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to replace mirrors that deteriorate within specified warranty period. Deterioration of mirrors is defined as defects developed from normal use that are not attributed to mirror breakage or to maintaining and cleaning mirrors contrary to manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.
  - 1. Warranty Period: Five years from date of Substantial Completion.



## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Avalon Glass and Mirror Company.
  - 2. Binswanger Glass.
  - 3. Donisi Mirror Company.
  - 4. D & W Incorporated.
  - 5. Gardner Glass Products, Inc.
  - 6. Glasswerks LA, Inc.
  - 7. Guardian Industries Corp.
  - 8. Independent Mirror Industries, Inc.
  - 9. Lenoir Mirror Company.
  - 10. National Glass Industries.
  - 11. Trulite Glass & Aluminum Solutions.
  - 12. Virginia Mirror Company, Inc.
  - 13. Walker Glass Co., Ltd.
- B. Source Limitations for Mirrors: Obtain mirrors from single source from single manufacturer.
- C. Source Limitations for Mirror Accessories: Obtain mirror glazing accessories from single source.

### 2.2 SILVERED FLAT GLASS MIRRORS

- A. Mirrors, General: ASTM C 1503; manufactured using copper-free, low-lead mirror coating process.
- B. Tempered Glass Mirrors: Mirror Glazing Quality for blemish requirements and complying with ASTM C 1048 for Kind FT, Condition A, tempered float glass before silver coating is applied; tinted.
  - 1. Nominal Thickness: 6.0 mm.
  - 2. Tint Color: Bronze.

### 2.3 MISCELLANEOUS MATERIALS

- A. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- B. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.

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Beard + Riser Architects PLLC

- C. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors and certified by both mirror and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Franklin International.
    - b. Laurence, C. R. Co., Inc.
    - c. Liquid Nails Adhesive.
    - d. Palmer Products Corporation.
    - e. Royal Adhesives & Sealants, LLC.
  - 2. Adhesive shall have a VOC content of 70 g/L or less.
- D. Film Backing for Safety Mirrors: Film backing and pressure-sensitive adhesive; both compatible with mirror backing paint as certified by mirror manufacturer.

2.4 MIRROR HARDWARE

- A. Aluminum J-Channels: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover edges of mirrors in a single piece.
  - 1. Bottom and Side Trim: J-channels formed with front leg and back leg not less than 3/8 and 7/8 inch (9.5 and 22 mm) in height, respectively, and a thickness of not less than 0.04 inch (1.0 mm).
    - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      - 1) Andscot Company, Inc.
      - 2) Laurence, C. R. Co., Inc.
      - 3) Stylmark, Inc.
  - 2. Top Trim: J-channels formed with front leg and back leg not less than 5/8 and 1 inch (16 and 25 mm) in height, respectively, and a thickness of not less than 0.04 inch (1.0 mm).
    - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      - 1) Andscot Company, Inc.
      - 2) Laurence, C. R. Co., Inc.
      - 3) Stylmark, Inc.
  - 3. Finish: Clear bright anodized.

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Beard + Riser Architects PLLC

- B. Mirror Bottom Clips: Formed-steel shapes with plated finish indicated.
- C. Mirror Top Clips: Formed-steel shapes with plated finish indicated.
- D. Plated Steel Hardware: Formed-steel shapes with plated finish indicated.
- E. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.
- F. Anchors and Inserts: Provide devices as required for mirror hardware installation. Provide toothed or lead-shield, expansion-bolt devices for drilled-in-place anchors. Provide galvanized anchors and inserts for applications on inside face of exterior walls and where indicated.

## 2.5 FABRICATION

- A. Fabricate mirrors in the shop to greatest extent possible.
- B. Fabricate cutouts for notches and holes in mirrors without marring visible surfaces. Locate and size cutouts so they fit closely around penetrations in mirrors.
- C. Mirror Edge Treatment: Flat polished.
  - 1. Seal edges of mirrors with edge sealer after edge treatment to prevent chemical or atmospheric penetration of glass coating.
  - 2. Require mirror manufacturer to perform edge treatment and sealing in factory immediately after cutting to final sizes.
- D. Film-Backed Safety Mirrors: Apply film backing with adhesive coating over mirror backing paint, as recommended in writing by film-backing manufacturer, to produce a surface free of bubbles, blisters, and other imperfections.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, over which mirrors are to be mounted, with Installer present, for compliance with installation tolerances, substrate preparation, and other conditions affecting performance of the Work.
- B. Verify compatibility with and suitability of substrates, including compatibility of existing finishes or primers with mirror mastic.
- C. Proceed with installation only after unsatisfactory conditions have been corrected and surfaces are dry.

### 3.2 PREPARATION

- A. Comply with mastic manufacturer's written installation instructions for preparation of substrates, including coating substrates with mastic manufacturer's special bond coating where applicable.

### 3.3 INSTALLATION

- A. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.
  - 1. GANA Publications: "Glazing Manual" and "Mirrors, Handle with Extreme Care: Tips for the Professional on the Care and Handling of Mirrors."
- B. Provide a minimum airspace of 1/8 inch (3 mm) between back of mirrors and mounting surface for air circulation between back of mirrors and face of mounting surface.
- C. Install mirrors with mastic and mirror hardware. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors.
  - 1. Aluminum J-Channels: Provide setting blocks 1/8 inch (3 mm) thick by 4 inches (100 mm) long at quarter points. To prevent trapping water, provide, between setting blocks, two slotted weeps not less than 1/4 inch (6.4 mm) wide by 3/8 inch (9.5 mm) long at bottom channel.
  - 2. Aluminum J-Channels and Cleat: Fasten J-channel directly to wall and attach top trim to continuous cleat fastened directly to wall.
  - 3. Mirror Clips: Place a felt or plastic pad between mirror and each clip to prevent spalling of mirror edges. Locate clips so they are symmetrically placed and evenly spaced.
  - 4. Install mastic as follows:
    - a. Apply barrier coat to mirror backing where approved in writing by manufacturers of mirrors and backing material.
    - b. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.
    - c. After mastic is applied, align mirrors and press into place while maintaining a minimum airspace of 1/8 inch (3 mm) between back of mirrors and mounting surface.

### 3.4 CLEANING AND PROTECTION

- A. Protect mirrors from breakage and contaminating substances resulting from construction operations.
- B. Do not permit edges of mirrors to be exposed to standing water.

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- C. Maintain environmental conditions that prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.
- D. Clean exposed surface of mirrors not more than four days before date scheduled for inspections that establish date of Substantial Completion. Clean mirrors as recommended in writing by mirror manufacturer.

END OF SECTION 088300

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DOCUMENT 099000 - PAINTS AND COATINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation and field painting of exposed exterior items and surfaces.

1.2 RELATED SECTIONS

- A. Section 03 30 00 - Cast-in-Place Concrete.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM) D 16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.
- B. Steel Structures Painting Council (SSPC) SP6 - Commercial Blast Cleaning Procedures.
- C. Steel Structures Painting Council (SSPC) SP10 - Near White Blast Cleaning Procedure.

1.4 DEFINITIONS

- A. General: Standard coating terms defined in ASTM D 16.
  - 1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85 degree meter.
  - 2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60 degree meter.
  - 3. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60 degree meter.
  - 4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60 degree meter.
- B. Environments: The following terms distinguish between different corrosive exposures:
  - 1. "Severe environments" are highly corrosive industrial atmospheres with sustained exposure to high humidity and condensation and with frequent cleaning using strong chemicals. Environments with heavy concentrations of strong chemical fumes and frequent splashing and spilling of harsh chemical products are severe environments.
  - 2. "Moderate environments" are corrosive industrial atmospheres with intermittent exposure to high humidity and condensation, occasional mold and mildew development, and regular cleaning with strong chemicals. Environments with exposure to heavy concentrations of chemical fumes and occasional splashing and spilling of chemical products are moderate environments.
  - 3. "Mild environments" are industrial atmospheres with normal exposure to moderate humidity and condensation, occasional mold and mildew development, and infrequent cleaning with strong chemicals. Environments with low levels of mild chemical fumes and occasional splashing and spilling of chemical products are mild environments. Normal outdoor weathering is also considered a mild environment.

1.5 SUBMITTALS

- A. Submit under provisions of Section 013000.
- B. Product Data: For each paint system indicated, including:
  - 1. Material List: An inclusive list of required coating materials. Indicate each material

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and cross reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.

2. Preparation instructions and recommendations.
  3. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.
- C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.
- C. Paint exposed surfaces. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
- D. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
- E. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
1. Finish areas designated by Architect.
  2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
  3. Refinish mock-up area as required to produce acceptable work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label:
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain storage containers in a clean condition, free of foreign materials and residue.

1.8 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.
- B. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F (10 and 32 deg C).
- C. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F (7 and 35 deg C).
- D. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet

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surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

1.9 EXTRA MATERIALS

- A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.
- B. Quantity: Furnish Owner with an additional three percent, but not less than 1 gal (3.8 l) or 1 case, as appropriate, of each material and color applied.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Manufacturer: PPG Architectural Finishes, Inc.; One PPG Place; Pittsburgh, PA 15272. Toll Free Tel: 888-PPG-IDEA. Email: [request info](mailto:request info); Web: [www.ppgideascape.com](http://www.ppgideascape.com)

2.2 PAINT MATERIALS - GENERAL

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. VOC Classification: Provide high-performance coating materials, including primers, undercoats, and finish-coat materials, that meet the applicable local, state or federal VOC requirements.
- C. Color: To be selected by Architect from Manufacturer's full range.

2.3 EXTERIOR PAINT SYSTEMS

- A. Concrete (Other Than Concrete Unit Masonry): Provide the following finish systems over exterior concrete substrates:
  1. Acrylic Finish: Two finish coats over a primer.
    - a. Basis of Design Primer: PPG Paints; 4-603 Perma-Crete Interior/Exterior Alkali Resistant Primer. Applied at a dry film thickness of not less than 1.2 mils (0.030 mm).
    - b. Basis of Design Exterior Elastomeric Coating: PPG Paints; 4-110 Perma-Crete Pitt-Flex Elastomeric Coating: Applied at a dry film thickness of not less than 5.4 mils (0.136 mm).

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
  1. Notify Architect about anticipated problems when using the materials specified over



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substrates primed by others.

2. If a potential incompatibility of primers applied by others exists, obtain the following from the primer Applicator before proceeding:
  - a. Confirmation of primer's suitability for expected service conditions.
  - b. Confirmation of primer's ability to be top coated with materials specified.

### 3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
  1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
  1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
  1. Provide barrier coats over incompatible primers or remove and reprime.
  2. Provide barrier coats over incompatible primers or remove primers and reprime substrate.
  3. Cementitious Substrates: Prepare concrete and cement plaster surfaces to be coated. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods to prepare surfaces.
    - a. Use abrasive blast-cleaning methods if recommended by coating manufacturer.
    - b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not coat surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
- D. Material Preparation: Carefully mix and prepare coating materials according to manufacturer's written instructions.
  1. Maintain containers used in mixing and applying coatings in a clean condition, free of foreign materials and residue.
  2. Stir materials before applying to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into the material. Remove film and, if necessary, strain coating material before using.
  3. Use only the type of thinners approved by manufacturer and only within recommended limits.
  4. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

### 3.3 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. General: Apply high-performance coatings according to manufacturer's written instructions.
  1. Use applicators and techniques best suited for the material being applied.
  2. Do not apply high-performance coatings over dirt, rust, scale, grease, moisture,

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- 3. scuffed surfaces, or conditions detrimental to forming a durable coating film. Coating surface treatments, and finishes are indicated in the coating system descriptions.
  - 4. Provide finish coats compatible with primers used.
  - 5. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convactor covers, grilles, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
- C. Application Procedures: Apply coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
- 1. The number of coats and film thickness required is the same regardless of application method.
  - 2. Completed Work: Match approved Samples for color, texture, and coverage. Remove, refinish, or recoat work that does not comply with specified requirements.

3.4 FIELD QUALITY CONTROL

- A. Architect reserves the right to invoke the following test procedure at any time and as often as Architect deems necessary during the period when paint is being applied:
- 1. Architect may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from Project site, pay for testing, and repaint surfaces previously coated with the noncomplying paint. If necessary, Contractor may be required to remove noncomplying paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

- A. After completing painting, clean glass and paint spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.6 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
- C. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces.

END OF SECTION 099000



STRUCTURAL NOTES

GENERAL NOTES

- THE CONTRACTOR SHALL THOROUGHLY REVIEW ALL CONTRACT DOCUMENTS AND INFORM THE ARCHITECT OF CONFLICTS OR DISCREPANCIES PRIOR TO BIDDING, FABRICATION, AND CONSTRUCTION.
- IN CASES OF DISCREPANCIES IN DIMENSIONS AND ELEVATIONS BETWEEN STRUCTURAL AND ARCHITECTURAL DRAWINGS, CONTRACTOR SHALL COORDINATE WITH THE ARCHITECT PRIOR TO FABRICATION AND CONSTRUCTION.
- THE CONTRACTOR SHALL COORDINATE THE FIELD VERIFICATION OF ALL EXISTING SITE CONDITIONS SUCH AS EXISTING FLOOR ELEVATIONS, EXISTING FOOTING ELEVATIONS, EXISTING UTILITIES, ETC. WHETHER NOTED OR NOT IN THE CONTRACT DOCUMENTS AND SHALL NOTIFY THE ARCHITECT OF ANY CONFLICTS, DISCREPANCIES OR UNKNOWN CONDITIONS PRIOR TO FABRICATION AND CONSTRUCTION.
- REPRODUCTION OF CONTRACT DRAWINGS, IN ANY FORM, WILL NOT BE ACCEPTED AS SHOP DRAWINGS.
- REVIEW OF SUBMITTALS AND/OR SHOP DRAWINGS BY THE STRUCTURAL ENGINEER-OF-RECORD DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO REVIEW AND CHECK SHOP DRAWINGS FOR ERRORS AND OMISSIONS ASSOCIATED WITH THE PREPARATION OF SHOP DRAWINGS AS THEY PERTAIN TO MEMBER SIZES, DETAILS AND DIMENSIONS SPECIFIED IN THE CONTRACT DOCUMENTS. CONTRACTOR ALSO SHALL BE RESPONSIBLE FOR ALL MEANS, METHODS, TECHNIQUES, AND PROCEDURES OF CONSTRUCTION.
- CONTRACTOR SHALL PROVIDE TEMPORARY GUYS AND BRACING AS REQUIRED DURING CONSTRUCTION. STRUCTURE IS NOT STABLE UNTIL ALL STRUCTURAL MEMBERS, CONNECTIONS, AND DECKING ARE IN PLACE.
- IF CONTROL JOINT LOCATIONS ARE NOT SHOWN ON PLANS, PROVIDE SAWN CONTROL JOINTS @ 15'-0" ON CENTER MAXIMUM SPACING IN A PATTERN THAT WILL REDUCE SLAB CRACKS UNLESS NOTED OTHERWISE ON DRAWINGS. COORDINATE LOCATIONS WITH THE ARCHITECT AND ENGINEER.
- ACI, AISC, AITC AND AWS SPECIFICATIONS SHALL GOVERN ALL PHASES OF FABRICATION AND CONSTRUCTION.

SPREAD FOOTINGS

- ALL UNDERCUTTING, SITE PREPARATION, FILL SELECTION, BACKFILLING AND COMPACTION SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE SPECIFICATIONS AND SOILS ENGINEER'S RECOMMENDATIONS.
- ONLY AND ARE NOT NECESSARILY TO BE USED FOR CONSTRUCTION. THE SOILS ENGINEER OR HIS REPRESENTATIVE SHALL BE ENGAGED TO INSPECT ALL FOOTING EXCAVATIONS TO VERIFY THAT THE REQUIRED ALLOWABLE BEARING CAPACITY IS ATTAINABLE. BOTTOM OF FOOTING ELEVATIONS SHALL BE ADJUSTED PER THE ON-SITE RECOMMENDATIONS OF THE SOILS ENGINEER OR HIS REPRESENTATIVE.
- ALL SPREAD FOOTING EXCAVATIONS SHALL BE FOUNDED IN PROPERLY COMPACTED SELECT FILL OR IN THE NATURAL SOILS WITH ALL ALLOWABLE NET BEARING CAPACITY OF AT LEAST 3,000 PSF AND 3,500 PSF FOR CONTINUOUS AND SPREAD FOOTINGS RESPECTIVELY. (REF: GEOTECHNICAL INVESTIGATION, JOB TITLE: ADDITIONS & RENOVATIONS, GREENWOOD POLICE DEPARTMENT DATED OCTOBER 2015 BY PRITCHARD ENGINEERING.)
- MAINTAIN FINISHED GRADE (AND/OR BOTTOM OF FOOTING ELEVATIONS) TO PROVIDE AT LEAST 2'-0" COVER ABOVE THE BOTTOM OF ALL EXTERIOR FOOTINGS.

CONCRETE NOTES

CONCRETE REINFORCEMENT

- CONCRETE REINFORCEMENT SUPPLIER SHALL SUBMIT SHOP DRAWINGS TO THE ARCHITECT FOR REVIEW PRIOR TO CONSTRUCTION.
- ALL REINFORCING STEEL SHALL BE ASTM A615, GRADE 60, UNLESS NOTED OTHERWISE.
- PROVIDE THE FOLLOWING PROTECTIVE COVERING FOR ALL REINFORCING BARS UNLESS DETAILED OR NOTED OTHERWISE:

|                                  |          |
|----------------------------------|----------|
| SLAB-ON-GRADE BARS (BOTTOM)      | 3" CLEAR |
| BELOW GRADE (CAST AGAINST EARTH) | 3" CLEAR |
| BELOW GRADE (FORMED EDGE)        | 2" CLEAR |
| WALLS                            | 2" CLEAR |
| ELEVATED SLABS                   | 3" CLEAR |
- DO NOT CUT TIES OR CONTINUOUS BARS TO PROVIDE CLEARANCE FOR EMBEDDED ITEMS OR OTHER OBSTRUCTIONS. INDIVIDUAL BARS AND TIES MAY BE MOVED VERTICALLY UP TO 1.5" AS REQUIRED TO PROVIDE CLEARANCE FOR EMBEDS, HOOKS, ETC. DO NOT HEAT REINFORCING TO BEND IT.
- IF DOWELS OR VERTICAL REINFORCING ARE CUT OR SEVERELY BENT, CONTRACTOR MAY BE REQUIRED TO REMOVE THE CONCRETE BACK TO THE PREVIOUS POUR JOINT AND REPLACE THE DAMAGED BARS AND CONCRETE AT THE CONTRACTOR'S EXPENSE.
- REINFORCEMENT SHALL BE SPLICED ONLY AS SHOWN OR NOTED IN THE STRUCTURAL CONTRACT DOCUMENTS. SPLICES AT OTHER LOCATIONS SHALL BE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER-OF-RECORD PRIOR TO FABRICATION.
- REINFORCING BARS MARKED AS CONTINUOUS SHALL BE SPLICED WITH CLASS "B" TENSION LAP SPLICES ONLY.

| SIZE | 3000 PSI CLASS B |        | 4000 PSI CLASS B |       |
|------|------------------|--------|------------------|-------|
|      | TOP              | OTHER  | TOP              | OTHER |
| #3   | 2'-4"            | 1'-10" | 2'-0"            | 1'-7" |
| #4   | 3'-1"            | 2'-5"  | 2'-8"            | 2'-1" |
| #5   | 3'-11"           | 3'-0"  | 3'-4"            | 2'-7" |
| #6   | 4'-8"            | 3'-7"  | 4'-0"            | 3'-1" |
- ALL TENSION LAP SPLICES SHALL BE CLASS "B" UNLESS NOTED OTHERWISE.
- WELDED WIRE REINFORCEMENT SHALL CONFORM TO ASTM A185. LAP REINFORCEMENT 8 INCHES ON SIDES AND ENDS. MAINTAIN WIRE 1 TO 2 INCHES BELOW TOP SURFACE OF SLAB-ON-GRADE, UNLESS NOTED OTHERWISE. WELDED WIRE REINFORCEMENT MUST BE PLACED ON CHAIRS OR BOLSTERS AS REQUIRED TO MAINTAIN POSITION IN THE SLAB.
- ALL REINFORCEMENT SHALL BE PLACED ON CHAIRS, BOLSTERS, AND/OR CONCRETE MASONRY UNITS AS REQUIRED TO MAINTAIN POSITION. NO CLAY MASONRY UNITS WILL BE ACCEPTED FOR THIS APPLICATION.
- ONCE SHOP DRAWINGS HAVE BEEN REVIEWED, DO NOT ADD REINFORCING OR INFORMATION TO PREVIOUSLY SUBMITTED SHEETS FOR SUBSEQUENT SUBMITTALS UNLESS SHOP DRAWINGS ARE BEING RESUBMITTED AFTER BEING RETURNED "NOT REVIEWED".
- WHERE ANCHOR RODS ARE CAST INTO CONCRETE, PROVIDE SUPPLEMENTAL REINFORCING EACH WAY, TIED NEAR THE TOP AND BOTTOM OF ALL ANCHOR RODS TO THE ADJACENT REBAR TO SECURE RODS DURING CONCRETE PLACEMENT. (MINIMUM SIZE #4)
- IF IT IS NECESSARY FOR PLUMBING TO PASS THROUGH FOOTINGS, PLACE IN PIPE PENETRATION SLEEVE. DO NOT PLACE PLUMBING PARALLEL TO AND INSIDE OF FOOTING.
- IF IT IS NECESSARY FOR PLUMBING TO PASS THROUGH GRADE BEAMS HORIZONTALLY, LOCATE IN MIDDLE 1/3 OF BEAM AND PLACE IN PIPE PENETRATION SLEEVE. DO NOT PENETRATE BEAM VERTICALLY.

CAST-IN-PLACE CONCRETE

- CONCRETE SUPPLIER SHALL SUBMIT CONCRETE MIX DESIGN DATA TO THE ARCHITECT FOR REVIEW PRIOR TO CONSTRUCTION.
- CONCRETE SHALL HAVE AT LEAST THE FOLLOWING MINIMUM COMPRESSIVE STRENGTHS AT 28 DAYS:

|                                     |                     |
|-------------------------------------|---------------------|
| A. FOOTINGS                         | 3000PSI             |
| B. REINFORCED CMU & BOND BEAM FILL  | (SEE MASONRY NOTES) |
| C. SLABS-ON-GRADE, PEDESTALS, WALLS | 4000PSI             |
| D. ELEVATED SLABS                   | 4000PSI             |
| E. STAIR LANDINGS, STAIR TREADS     | 3000PSI             |
- MIX DESIGN SHALL INCLUDE AT LEAST THE FOLLOWING AMOUNTS OF PORTLAND CEMENT MEETING ASTM C150 OR D595 PER CUBIC YARD OF CONCRETE.

| NON-AIR ENTRAINED           |                                             |                               | AIR ENTRAINED                               |                               |       |                |
|-----------------------------|---------------------------------------------|-------------------------------|---------------------------------------------|-------------------------------|-------|----------------|
| 28 DAY COMPRESSIVE STRENGTH | MIN. CEMENT CONTENT (LBS./YD <sup>3</sup> ) | MAXIMUM PERMISSIBLE W/C RATIO | MIN. CEMENT CONTENT (LBS./YD <sup>3</sup> ) | MAXIMUM PERMISSIBLE W/C RATIO | SLUMP | AGGREGATE TYPE |
| 3000 PSI                    | 470                                         | 0.53                          | 517                                         | 0.46                          | 6"    | REGULAR ROCK   |
| 4000 PSI                    | 564                                         | 0.44                          | 611                                         | 0.40                          | 6"    | LIMESTONE      |
- PROPORTIONS OF CONCRETE MIX DESIGNS SHALL BE DETERMINED BY THE PROCEDURES ESTABLISHED IN SECTION 5.3 OF ACI 318-99.
- MIX DESIGN MAY INCLUDE (TYPE C) FLYASH AS A REPLACEMENT FOR PORTLAND CEMENT UP TO A MAXIMUM OF 20% OF THE TOTAL CEMENTITIOUS MATERIAL. DO NOT USE A FLYASH CONTAINING CONCRETE MIX WHEN THE TEMPERATURE DURING PLACEMENT OR CURING IS PROJECTED TO FALL BELOW 60 DEGREES FAHRENHEIT.
- MIX DESIGN MAY INCLUDE WATER REDUCING ADMIXTURES CONFORMING TO ASTM C494, TYPE A, TO PROVIDE WORKABILITY AND SPECIFIED SLUMP WITHOUT EXCEEDING SPECIFIED WATER/CEMENT RATIOS.
- ALL CONCRETE EXPOSED TO WEATHER SHALL CONTAIN 5.5% AIR ENTRAINMENT ( 1.5%). DO NOT EXCEED 3% AIR CONTENT IN CONCRETE RECEIVING A STEEL TROWEL FINISH.

ARCHITECTURAL PRECAST CONCRETE

- PRECAST MANUFACTURER SHALL SUBMIT CALCULATIONS AND SHOP DRAWINGS SEALED AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE IN WHICH THE PROJECT IS LOCATED TO THE ARCHITECT FOR REVIEW PRIOR TO FABRICATION.
- ARCHITECTURAL PRECAST CONCRETE SHALL BE DESIGNED AND MANUFACTURED BY A FIRM EXPERIENCED IN THE FIELD. MANUFACTURER SHALL ACCEPT FULL RESPONSIBILITY FOR THE DESIGN OF ALL PANELS AND CONNECTIONS TO THE STRUCTURE.
- PRECAST MANUFACTURER SHALL ADD REINFORCING REQUIRED FOR CONSTRUCTING, TRANSPORTING, LIFTING AND ERECTING ALL MEMBERS.
- SEE ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS (AND COORDINATE WITH THE VARIOUS CONTRACTORS) FOR THE EXACT SIZE AND LOCATION OF OPENINGS IN THE MEMBERS AND FOR ADDITIONAL EMBEDS REQUIRED BY ALL TRADES.
- COORDINATE THE LOCATION AND ELEVATION OF ALL MEMBER JOINTS WITH THE ARCHITECTURAL DRAWINGS.
- ALL STEEL CONNECTIONS, BOLTS, INSERTS, EMBEDS, ETC. USED TO CONNECT EXTERIOR PRECAST MEMBERS TO THE STRUCTURE SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION. ALL GALVANIZED COATINGS DAMAGED DURING SHIPPING, ERECTING, FIELD WELDING, ETC. SHALL BE REPAIRED WITH TWO (2) COATS OF COLD SPRAY GALVANIZING OR EQUAL REPAIR.
- ALL REBAR WITH ONE INCH (1") OR LESS CONCRETE COVER TO THE SURFACE OF THE PRECAST MEMBERS SHALL BE HOT DIPPED GALVANIZED OR OTHERWISE PROTECTED FROM CORROSION.
- CONCRETE FOR PRECAST MEMBERS SHALL HAVE A COMPRESSIVE STRENGTH OF AT LEAST 5000 PSI AT 28 DAYS.
- SEE ARCHITECT FOR ALL COLOR, AGGREGATE AND FINISH REQUIREMENTS ARE ARCHITECTURAL PRECAST.

MASONRY NOTES

- ALL CONCRETE MASONRY UNITS (CMU) SHALL COMPLY WITH ASTM C90, GRADE N, TYPE I. STANDARD WEIGHT UNITS SHALL BE USED BELOW FINISHED FLOOR OR BELOW FINISHED GRADE (OR BELOW FINISHED FLOOR FOR SITES WALLS WITH SLAB ABOVE) AND LIGHTWEIGHT UNITS SHALL BE USED ABOVE GRADE. SIZES SHALL BE AS INDICATED ON THE CONTRACT DRAWINGS.
- TYPE S MORTAR SHALL BE USED BELOW GRADE AND TYPE N MORTAR SHALL BE USED ABOVE GRADE WITH AN ALLOWABLE COMPRESSIVE STRENGTH OF AT LEAST 1800 PSI FOR TYPE S AND 750 PSI FOR TYPE N. MIX MORTAR WITH TYPE I PORTLAND CEMENT (TYPE III MAY BE USED FOR COLD WEATHER CONSTRUCTION), HYDRATED LIME MEETING ASTM C207 AND AGGREGATE MEETING ASTM C144 (VERIFY STANDARD MORTAR NOT WITH ARCHITECTS SPECIFICATIONS.)  
  
TYPE S MORTAR SHALL BE USED BELOW AND ABOVE GRADE WITH AN ALLOWABLE COMPRESSIVE STRENGTH OF AT LEAST 1800 PSI FOR TYPE S. MIX MORTAR WITH TYPE I PORTLAND CEMENT (TYPE III MAY BE USED FOR COLD WEATHER CONSTRUCTION), HYDRATED LIME MEETING ASTM C207 AND AGGREGATE MEETING ASTM C144. (USE THIS PARAGRAPH FOR NOTE #2 ON ALL WD&D PROJECTS.)  
  
TYPE M MORTAR SHALL BE USED BELOW GRADE AND TYPE S MORTAR SHALL BE USED ABOVE GRADE WITH AN ALLOWABLE COMPRESSIVE STRENGTH OF AT LEAST 2500 PSI FOR TYPE M AND 1800 PSI FOR TYPE S. MIX MORTAR WITH TYPE I PORTLAND CEMENT (TYPE III MAY BE USED FOR COLD WEATHER CONSTRUCTION), HYDRATED LIME MEETING ASTM C207 AND AGGREGATE MEETING ASTM C144. (USE THIS PARAGRAPH FOR NOTE #2 IF SEISMIC DESIGN CATEGORY IS D, E OR F.)
- FILL ALL BOND BEAMS, ALL CMU CELLS WITH VERTICAL REINFORCING OR EXPANSION BOLTS, AND ALL CELLS BELOW GRADE WITH 3000 PSI GROUT MEETING THE FOLLOWING REQUIREMENTS:

|                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A. USE A MINIMUM OF 5.5 BAGS OF PORTLAND CEMENT PER CUBIC YARD.                                                                                                                                                                              |
| B. MAXIMUM WATER/CEMENT RATIO BY WEIGHT SHALL BE 0.54.                                                                                                                                                                                       |
| C. WATER-REDUCING ADMIXTURE MEETING ASTM C494 SHALL BE USED TO PROVIDE SUFFICIENT FLOWABILITY TO READILY FILL CELLS WITH A REASONABLE AMOUNT OF RODDING. ADDITIONAL WATER WILL NOT BE ALLOWED AFTER INITIAL MIXING.                          |
| D. AGGREGATE SHALL BE WELL GRADED WITH A MAXIMUM SIZE OF 3/8"                                                                                                                                                                                |
| E. ALTERNATE MIX DESIGNS WILL BE CONSIDERED IF SUBMITTED TO THE ARCHITECT FOR APPROVAL AFTER CONTRACT IS AWARDED. ALTERNATE DESIGNS MUST SHOW SUFFICIENT FLOWABILITY CHARACTERISTICS AND A 28-DAY COMPRESSIVE STRENGTH OF AT LEAST 3000 PSI. |
- MAXIMUM HEIGHT OF ALL GROUT FILL SHALL NOT EXCEED 4'-0" UNLESS CLEANOUT AND INSPECTION HOLE IS PROVIDED AT THE BOTTOM OF THE POUR.
- ALL CMU SHALL BE REINFORCED WITH #5 VERTICAL AND DOWELS AT 4'-0" ON CENTER UNLESS SPECIFICALLY NOTED OTHERWISE OR NOTED AS UNREINFORCED MASONRY ON THE PLANS. WHERE SPLICES ARE REQUIRED, USE A LAP LENGTH OF AT LEAST 28 INCHES.
- ALL VERTICAL CORNERS, VERTICAL END CELLS AND ONE CELL EACH SIDE OF ALL OPENINGS SHALL BE GROUTED AND REINFORCED WITH (1) #5 UNLESS NOTED OTHERWISE.
- HORIZONTAL BOND BEAMS WITH (2) #5 CONTINUOUS SHALL BE PROVIDED AT THE TOP AND BOTTOM OF ALL OPENINGS, AT STRUCTURALLY CONNECTED ROOF AND FLOOR LEVELS, AT THE TOP OF ALL PARAPETS OR WALLS AND AS SPECIFICALLY SHOWN ON THE CONTRACT DRAWINGS. BOND BEAMS ABOVE AND BELOW OPENINGS SHALL EXTEND AT LEAST 2'-0" BEYOND THE OPENING UNLESS NOTED OTHERWISE.
- WHERE VERTICAL REINFORCING AND HORIZONTAL REINFORCING INTERSECT, ALL REINFORCING SHALL RUN CONTINUOUS.
- HORIZONTAL REINFORCING SHALL BE CONTINUOUS AT CORNERS WITH 90-DEGREE BENDS OR CORNER BARS WITH EACH LEG EQUAL TO THE REQUIRED LAP LENGTH. (SEE TYPICAL CORNER BAR DETAIL.)
- ALL CMU SHALL HAVE 9 GAUGE TRUSS TYPE JOINT REINFORCEMENT AT 16" ON CENTER VERTICALLY ABOVE GRADE AND 8" ON CENTER VERTICALLY BELOW GRADE UNLESS NOTED OTHERWISE.
- BOND BEAMS WITH (2) #4 CONTINUOUS HORIZONTAL BARS SHALL BE PLACED AT A MAXIMUM SPACING OF 4'-0" ON CENTER VERTICALLY.

METALS NOTES

STRUCTURAL STEEL FRAMING

- STRUCTURAL STEEL SUPPLIER SHALL SUBMIT SHOP DRAWINGS TO THE ARCHITECT FOR REVIEW PRIOR TO FABRICATION.
- ALL STRUCTURAL STEEL SHAPES SHALL BE AS FOLLOWS:

|                                                                                               |
|-----------------------------------------------------------------------------------------------|
| A. ALL WIDE FLANGE STRUCTURAL STEEL SHAPES SHALL BE ASTM A992.                                |
| B. SQUARE OR RECTANGULAR HOLLOW STRUCTURAL SECTIONS SHALL BE ASTM A500, GRADE B, Fy = 46 KSI. |
| C. ALL OTHER STRUCTURAL STEEL (CHANNELS, ANGLES, PLATES, ETC.) SHALL BE ASTM A36.             |
- ALL ANCHOR RODS SHALL BE ASTM F1554 GRADE 36 UNLESS NOTED OTHERWISE.
- STRUCTURAL BOLTS SHALL BE ASTM A325-N, UNLESS OTHERWISE NOTED.
- BOLTS THRU WOOD BLOCKING SHALL BE ASTM A307. ALL BOLTS IN CONTACT WITH TREATED WOOD SHALL BE STAINLESS STEEL (TYPE 316L), OR HOT DIPPED GALVANIZED WITH A MINIMUM COATING THICKNESS OF 0.2 OUNCES PER SQUARE FOOT (ASTM A153). USE STAINLESS BOLTS WITH STAINLESS STEEL CONNECTORS AND GALVANIZED BOLTS WITH GALVANIZED CONNECTORS IF ONLY ONE IS SPECIFIED.
- POST-INSTALLED ADHESIVE ANCHORS SHALL BE STANDARD HAS-E CARBON STEEL ANCHORS (OR APPROVED EQUAL) WITH A MINIMUM STEEL YIELD STRENGTH OF Fy=58 KSI OR ASTM F993 STAINLESS STEEL ANCHORS WITH A MINIMUM STEEL YIELD STRENGTH OF Fy=45 KSI, UNLESS SHOWN OTHERWISE ON THE DRAWINGS. ADHESIVE SHALL BE SIMPSON SET-XP EPOXY SYSTEM (OR APPROVED EQUAL) IN CONCRETE OR FILLED CMU CELLS AND SIMPSON SET-XP EPOXY SYSTEM (OR APPROVED EQUAL) IN HOLLOW CMU OR CLAY MASONRY.
- CONNECTIONS SHALL BE DESIGNED CONSIDERING BOLT THREADS INCLUDED IN THE SHEAR PLANE (A325-N). ALL BOLTING SHALL BE INSTALLED BY THE TURN-OF-THE-NUT METHOD, REMOVABLE LOAD INDICATOR BOLTS, OR CALIBRATED WRENCH. SNUG TIGHT BOLTING WILL NOT BE PERMITTED UNLESS SPECIFICALLY DETAILED ON CONTRACT DRAWINGS.
- ALL BOLTED CONNECTIONS (EXCEPT COMPOSITE FLOOR BEAM CONNECTIONS) SHALL BE BEARING TYPE SELECTED TO SUPPORT ONE-HALF (1/2) OF THE TOTAL UNIFORM LOAD CAPACITY OF THE BEAMS AS SHOWN IN THE TABLES OF UNIFORM LOAD CONSTANTS, PART 2 OF THE AISC MANUAL, 8TH EDITION, FOR THE GIVEN BEAM SIZE, SPAN AND GRADE OF STEEL SPECIFIED. THE EFFECTS OF ANY CONCENTRATED LOADS MUST BE TAKEN INTO ACCOUNT. CONNECTIONS SHALL BE DESIGNED CONSIDERING THREADS INCLUDED IN THE SHEAR PLANE (A325-N).
- ALL WELDS SHALL BE E70XX, MINIMUM AND SHALL BE PERFORMED BY A WELDER CERTIFIED BY AN AWS CERTIFIED INSPECTOR OR EDUCATOR WHILE WORKING FOR CURRENT EMPLOYER.
- DO NOT PRIME PAINT STEEL THAT RECEIVES SPRAYED FIREPROOFING.
- ALL STEEL LINTELS AND SHELF ANGLES SHALL BE COATED WITH A ZINC RICH PRIMER.
- ALL STRUCTURAL STEEL EXPOSED TO WEATHER (SUCH AS MECHANICAL FRAMES) SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.

METAL DECKING

- METAL DECKING SUPPLIER SHALL SUBMIT SHOP DRAWINGS PREPARED UNDER THE DIRECT SUPERVISION OF A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF MISSISSIPPI TO THE ARCHITECT FOR REVIEW PRIOR TO FABRICATION.
- FLOOR DECKING SHALL BE 1.0C24 GALVANIZED CENTERING ATTACHED TO THE STRUCTURE WITH 5/8" DIAMETER PUDDLE WELDS IN A 33/4 PATTERN AT ALL SUPPORTS AND (4) #10 TEK SCREW SIDELAP FASTENERS BETWEEN SUPPORTS.
- ROOF DECKING SHALL BE 1.5B22 PAINTED ROOF DECK ATTACHED TO THE STRUCTURE WITH SIMPSON 'XLQ114T1224' STRONG-DRIVE XL LARGE-HEAD METAL SCREWS IN A 36/4 PATTERN AT ALL SUPPORTS AND (7)SIMPSON 'XU34X1016' SELF-DRILLING X METAL SIDELAP FASTENERS BETTWEEN SUPPORTS.

COLD-FORMED METAL FRAMING

- COLD-FORMED METAL FRAMING SUPPLIER SHALL SUBMIT SHOP DRAWINGS TO THE ARCHITECT FOR REVIEW PRIOR TO FABRICATION.
- SHOP DRAWINGS SHALL DETAIL A COMPLETE SYSTEM SHOWING MEMBER SIZES, SPACING AND CONNECTIONS TO THE STRUCTURE.
- ALL STRUCTURAL STUDS, TRACK, BRIDGING, END CLOSURES AND ACCESSORIES SHALL BE FORMED FROM STEEL CONFORMING TO THE REQUIREMENTS OF ASTM A653/A653M.
- ALL COLD-FORMED STEEL STUD SECTIONS ARE IDENTIFIED ACCORDING TO THE DESIGNATIONS GIVEN IN THE "STEEL STUD MANUFACTURERS ASSOCIATION" (SSMA) PRODUCT TECHNICAL INFORMATION MANUAL. SEE SSMA FOR MINIMUM SECTION PROPERTIES.  
  
EXAMPLE: 600S162-43

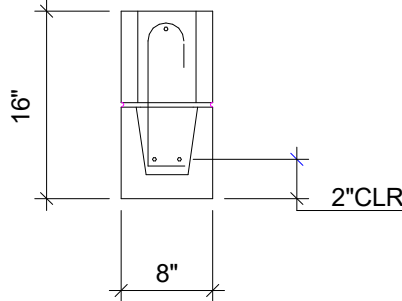
|                                                           | MILS | GAUGE NO. |
|-----------------------------------------------------------|------|-----------|
| 600 = MEMBER DEPTH (600 x 1/100 INCHES = 6")              | 33   | 20        |
| S = STYLE (S=STUD, T=TRACK, U= CHANNEL)                   | 43   | 18        |
|                                                           | 54   | 16        |
| 162 = FLANGE WIDTH (162 x 1/100 INCHES = 1.625" = 1-5/8") | 68   | 14        |
|                                                           | 97   | 12        |

  
YIELD STRENGTH SHALL BE 33 KSI UNLESS NOTED ON PLANS AS FOLLOWS:  
600S1162-43 (50 KSI) - FOR 50KSI YIELD STRENGTH

- SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- PROVIDE COLUMNS BUILT-UP OF MULTIPLE STUDS (2 STUDS MIN.) FOR HEADER AND BEAM BEARING.
- ALL STUDS AT LOAD BEARING WALLS SHALL BE CUT FULL LENGTH WITH TRACKS (TOP AND BOTTOM) INSTALLED TIGHT AGAINST ENDS OF STUD. NO GAPS BETWEEN END OF STUDS AND TRACK WILL BE ALLOWED IN LOAD BEARING STUDS.
- ALL COLD-FORMED STEEL FRAMING SHAPES (SUCH AS Z-PURLINS, C-PURLINS, HAT CHANNELS AND EAVE STRUTS) ARE IDENTIFIED ACCORDING TO THE DESIGNATIONS GIVEN IN THE LIGHT GAGE STEEL INSTITUTE (LGS) "LIGHT GAGE STRUCTURAL STEEL FRAMING SYSTEM DESIGN HANDBOOK". SEE LGS! FOR MINIMUM SECTION PROPERTIES.

| LINTEL SCHEDULE |                           |                                      |                                     |                                     |
|-----------------|---------------------------|--------------------------------------|-------------------------------------|-------------------------------------|
| WALL TYPE       | UP TO 4'-0" OPENING       | 4'-1" TO 6'-4" OPENING               | 6'-5" TO 8'-4" OPENING              | 8'-9" TO 9'-4" OPENING              |
| 4" VENEER       | $\angle$ 3-1/2x3-1/2x1/4  | $\angle$ 5x3-1/2x5/16 (LLV)          | $\angle$ 6x3-1/2x5/16 (LLV)         | $\angle$ 7x4x3/8(LLV)               |
| 8" BLOCK        | 8"x8" LINTEL BLK. W/(2)#5 | 8"x16" LINTEL BLK. W/(2)#5 (NOTE #6) | 8x16 LINTEL BLK. w/ (2)#6 (NOTE #6) | 8x16 LINTEL BLK. w/ (2)#6 (NOTE #6) |

- LINTEL SCHEDULE APPLIES UNLESS NOTED OR DETAILED OTHERWISE
- 8" BEARING @ EA. END, MINIMUM.
- USE 3,000 PSI CONCRETE IN LINTEL BLOCKS.
- FILL CELLS BELOW LINTEL BEARING w/ CONCRETE FULL HEIGHT. (PROVIDE (1)#4 VERTICAL BAR IN EACH CELL).
- FOR OPENINGS LARGER THAN SHOWN ON LINTEL SCHEDULE ABOVE PROVIDE 50 LBS/FT. STRUCTURAL STEEL. VERIFY EXACT SIZE WITH STRUCTURAL ENGINEER.
- AT 16" HIGH BOND BEAMS USE THE FOLLOWING ADDITIONAL BARS

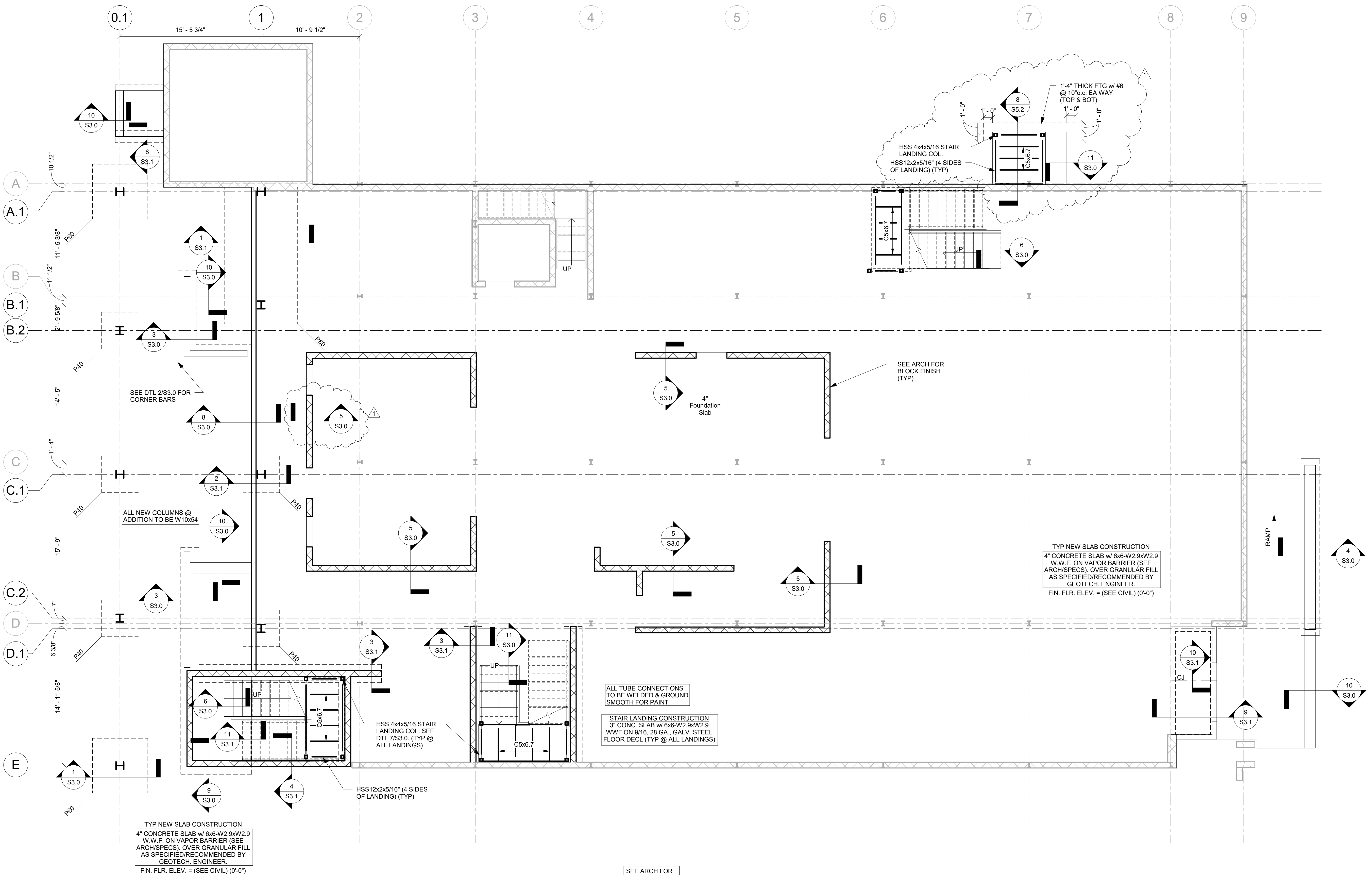


STRUCTURAL PANELS

- WALL SHEATHING SHALL BE 1/2", 5-PLY, C-D INT-APA RATED PLYWOOD WITH EXTERIOR GLUE (SPAN INDEX 24/16). ATTACHMENT SHALL BE WITH #8x1" FLAT HEAD, SHARP POINT, SELF-DRILLING SCREWS AT 6" ON CENTER AT SUPPORTED EDGES AND AT 12" ON CENTER ALONG ALL INTERMEDIATE SUPPORTS.
- DESIGN LOADS:
- |                                        |                                                                                                                                                                        |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DEAD LOADS:                            | WEIGHT OF THE STRUCTURE                                                                                                                                                |
| ROOF LIVE LOAD:                        | 20 PSF                                                                                                                                                                 |
| FLOOR LIVE LOADS:                      | OFFICES 50 PSF<br>CORRIDORS 80 PSF<br>LOBBIES 100 PSF<br>STAIRS AND EXITS 100 PSF                                                                                      |
| GROUND SNOW LOAD:                      | 10 PSF                                                                                                                                                                 |
| BASIC WIND SPEED:                      | Vult: 120 MPH<br>Vasd: 93 MPH                                                                                                                                          |
| WIND RISK CATEGORY:                    | I                                                                                                                                                                      |
| WIND EXPOSURE:                         | C                                                                                                                                                                      |
| INTERNAL PRESSURE COEFFICIENT:         | 0.18                                                                                                                                                                   |
| COMP. & CLADDING WIND PRESSURE:        | SEE ASCE 7, FIGURE 6-3                                                                                                                                                 |
| SEISMIC IMPORTANCE FACTOR              | I: 1.00                                                                                                                                                                |
| SEISMIC RISK CATEGORY:                 | II                                                                                                                                                                     |
| MAPPED SPECTRAL RESPONSE ACCELERATIONS | Ss: 0.29<br>S1: 0.13<br>Sds: 0.30<br>Sd1: 0.20                                                                                                                         |
| SPECTRAL RESPONSE COEFFICIENTS         | D                                                                                                                                                                      |
| SITE CLASS:                            | D                                                                                                                                                                      |
| SEISMIC DESIGN CATEGORY                | D                                                                                                                                                                      |
| BASIC SEISMIC-FORCE-RESISTING SYSTEM:  | MAIN: MOMENT RESISTING FRAME SYSTEMS<br>FRAME: SPECIAL STEEL MOMENT FRAMES<br>ADDITION: BEARING WALL SYSTEM<br>LIGHT-FRAMED WALLS SHEATHED WITH WOOD STRUCTURAL PANELS |
| DESIGN BASE SHEAR:                     | MAIN FRAME: 0.04W<br>ADDITION: 0.05W                                                                                                                                   |
| SEISMIC RESPONSE COEFFICIENT           | MAIN FRAME Cs: 0.04<br>ADDITION Cs: 0.05                                                                                                                               |
| RESPONSE MODIFICATION FACTOR           | MAIN FRAME R: 8<br>ADDITION R: 6.5                                                                                                                                     |
| ANALYSIS PROCEDURE:                    | EQUIV. LATERAL FORCE (1617.4)                                                                                                                                          |
| CODES                                  | 2012 INTERNATIONAL BUILDING CODE                                                                                                                                       |







| Pad Footing Schedule |       |        |       |                     |           |
|----------------------|-------|--------|-------|---------------------|-----------|
| MARK                 | "W"   | "L"    | "t"   | REINFORCING         | REMARKS   |
| P40                  | 4'-0" | 4'-0"  | 1'-0" | (5) #5 EA WAY       | TOP & BOT |
| P60                  | 6'-0" | 6'-0"  | 1'-0" | (7) #5 EA WAY       | TOP & BOT |
| P80                  | 8'-0" | 15'-0" | 1'-0" | #5 @ 10"o.c. EA WAY | TOP & BOT |

① FOUNDATION PLAN  
3/16" = 1'-0"

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GREENWOOD, MS

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1989 Oak Tree Cove, Suite A  
HERNANDO, MS 38632  
662.469.9571



DATE: 03-30-2016  
REVISIONS: 05-04-2016  
DRAWN BY: JC  
CHECKED BY: LCF

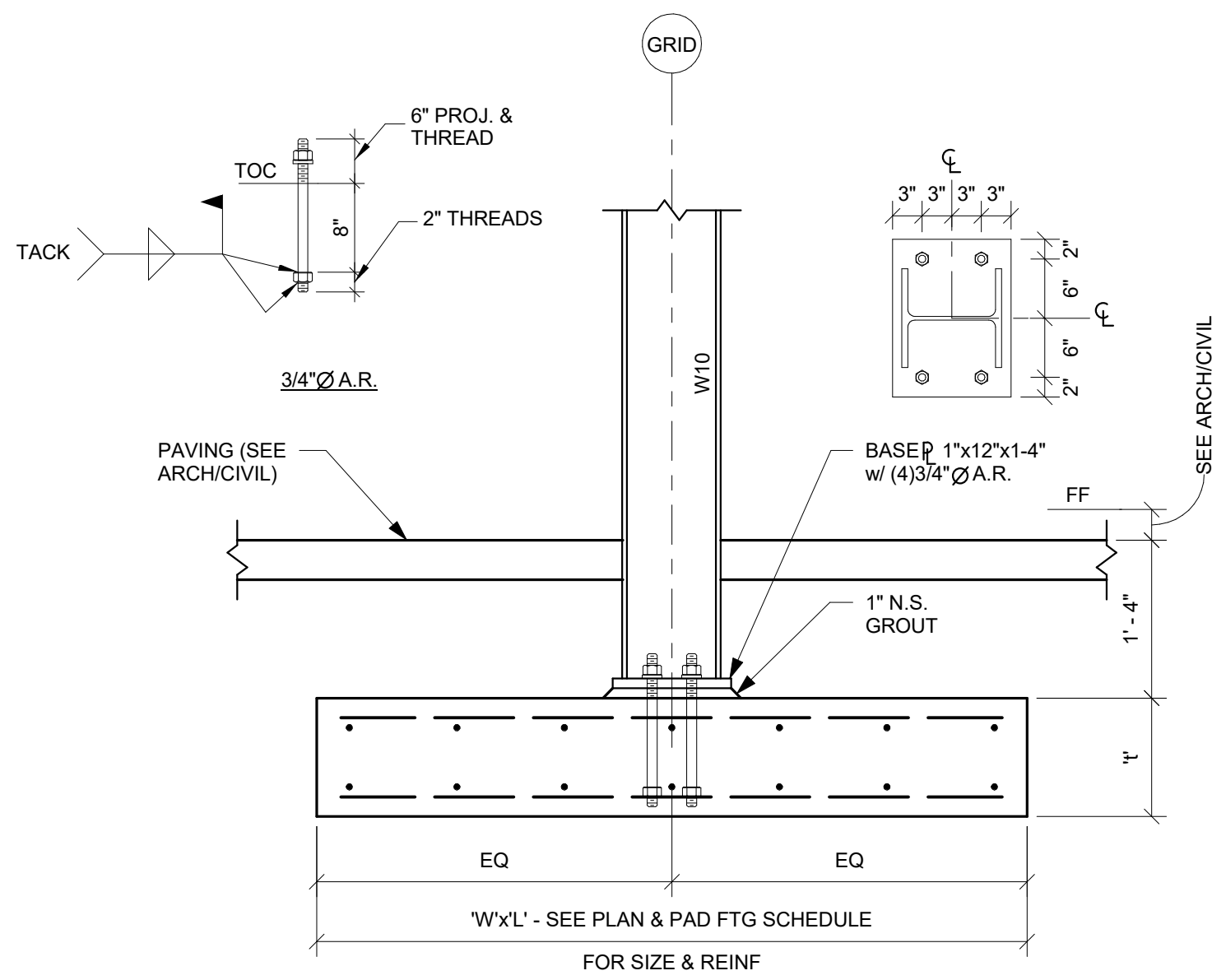
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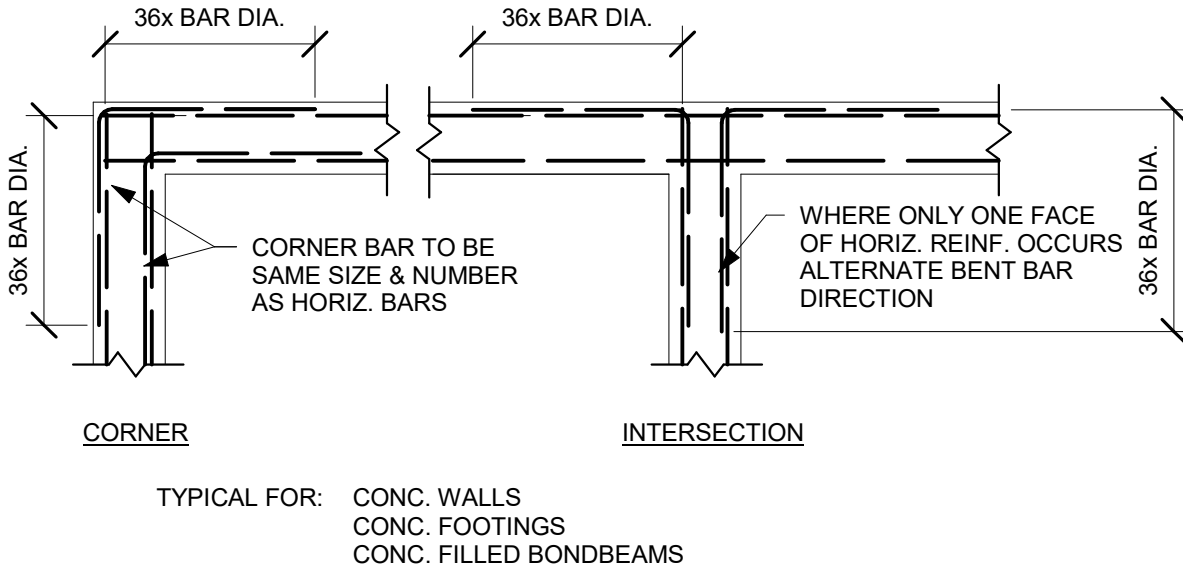
FOUNDATION  
PLAN

SHEET #:  
**S2.0**

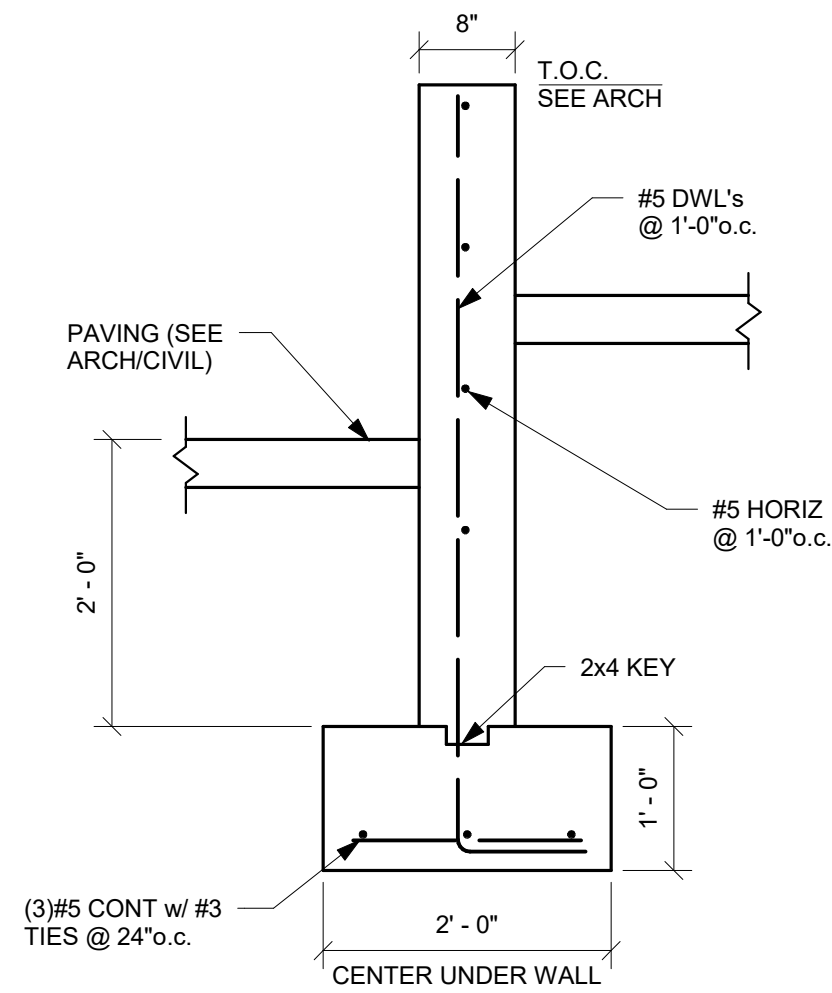




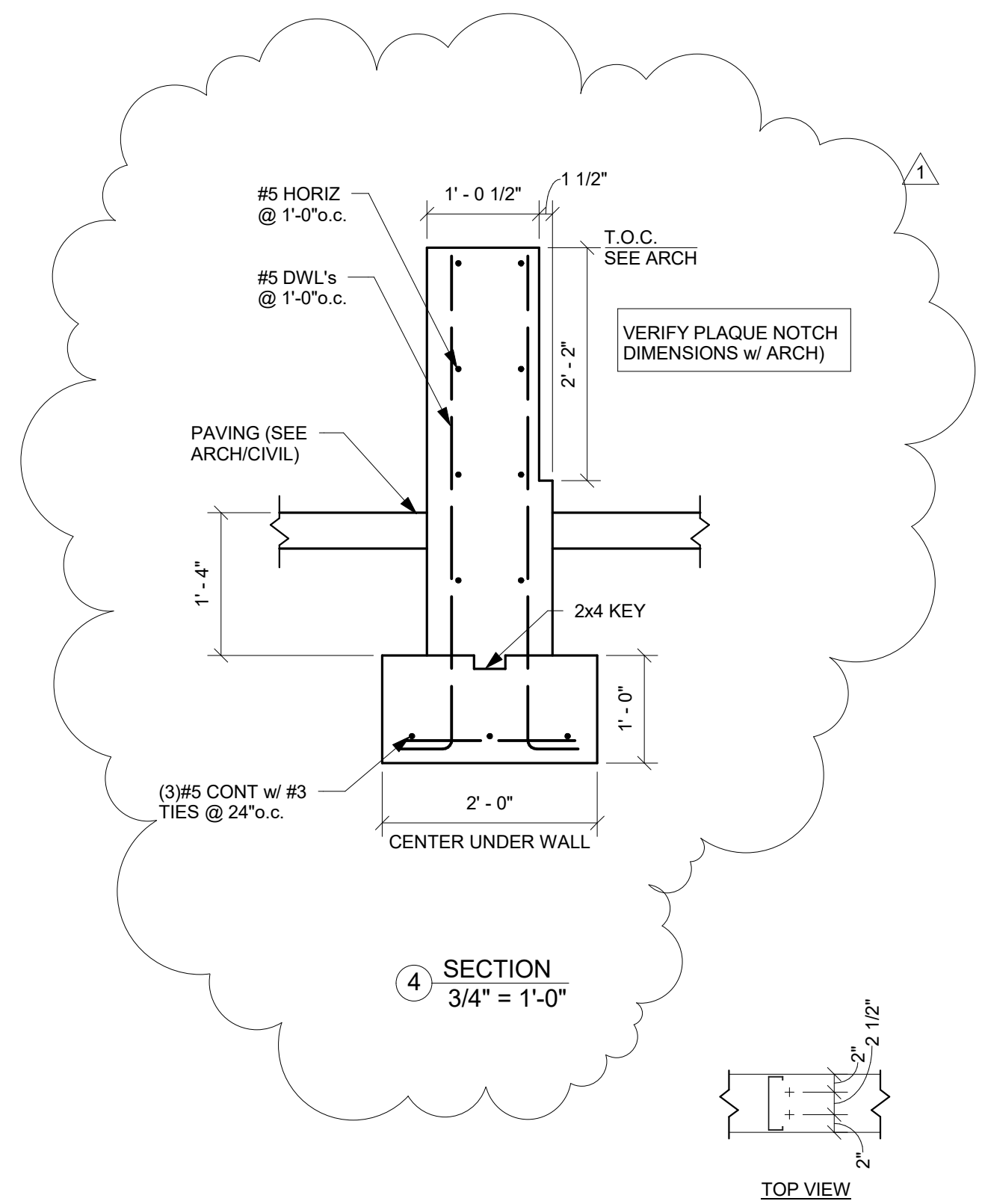
① SECTION  
3/4" = 1'-0"



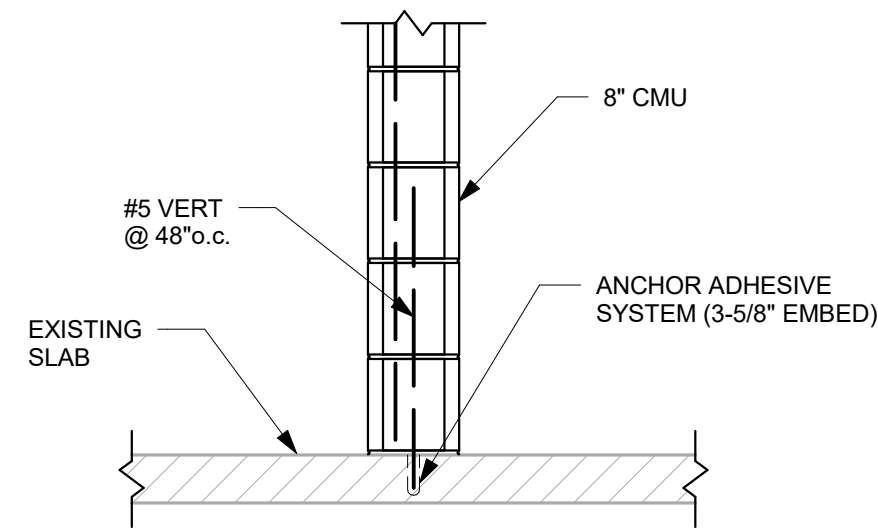
② TYPICAL CORNER BAR PLAN DETAIL  
NTS



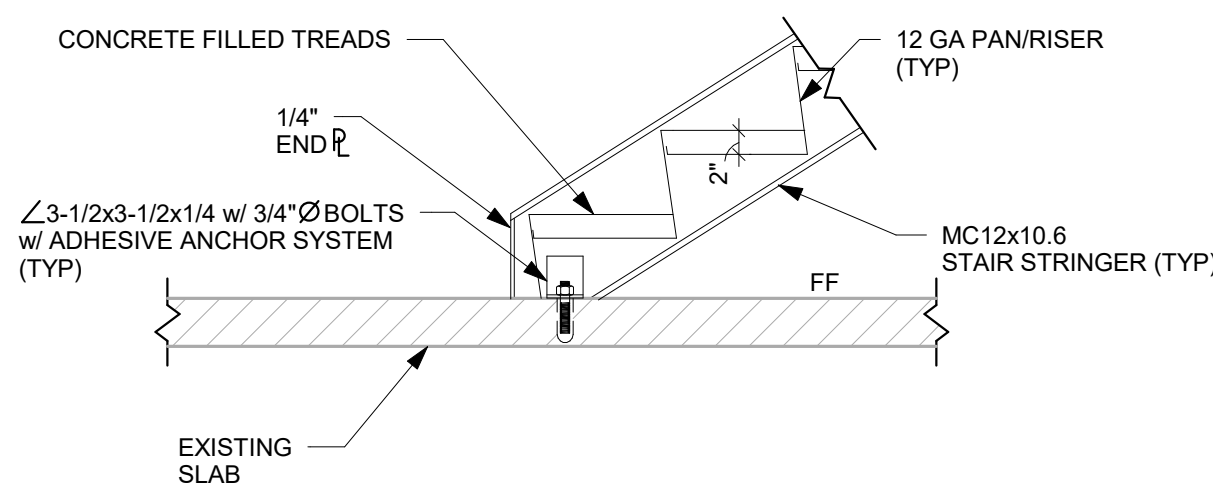
③ SECTION  
3/4" = 1'-0"



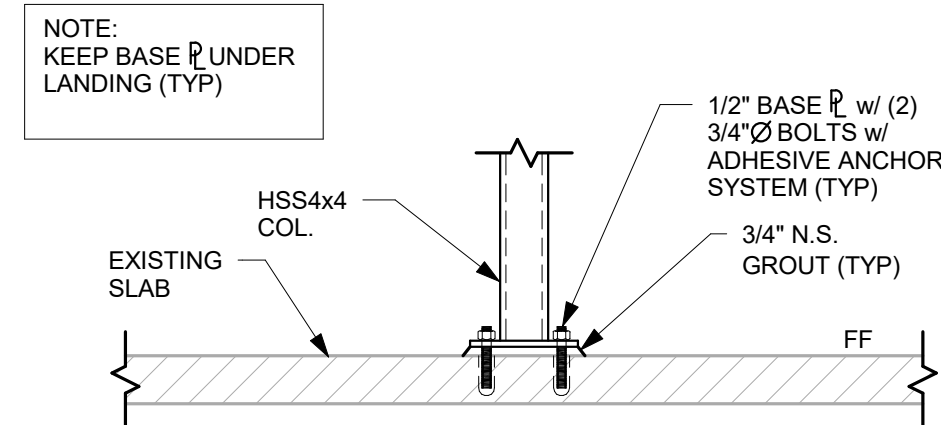
④ SECTION  
3/4" = 1'-0"



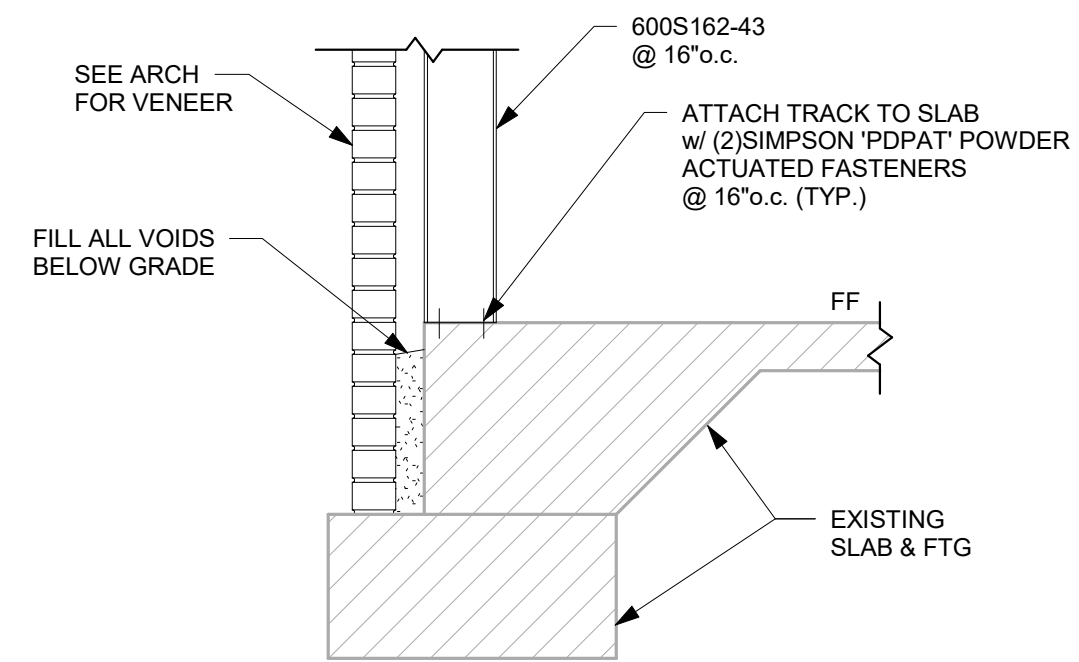
⑤ SECTION  
3/4" = 1'-0"



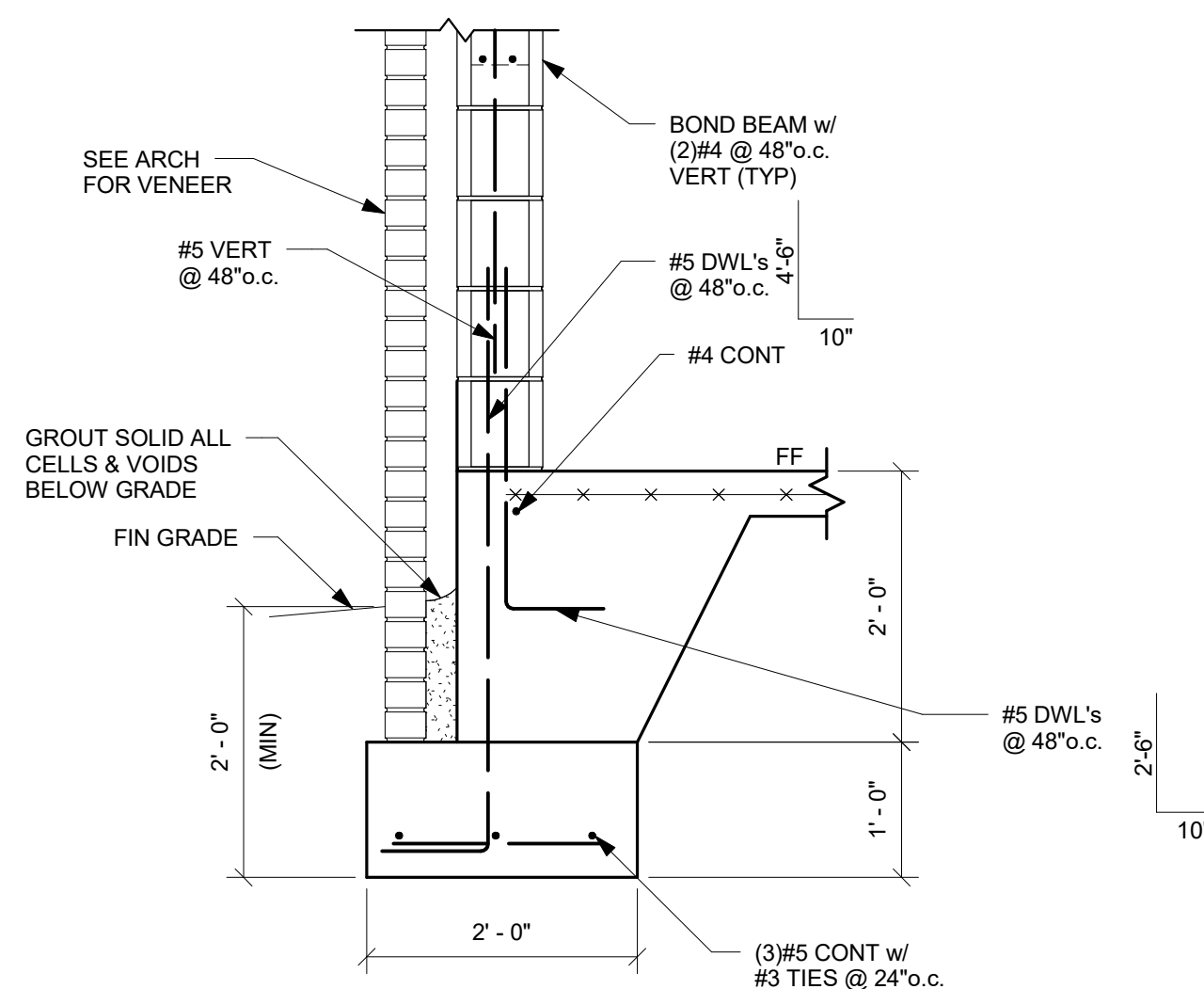
⑥ SECTION  
3/4" = 1'-0"



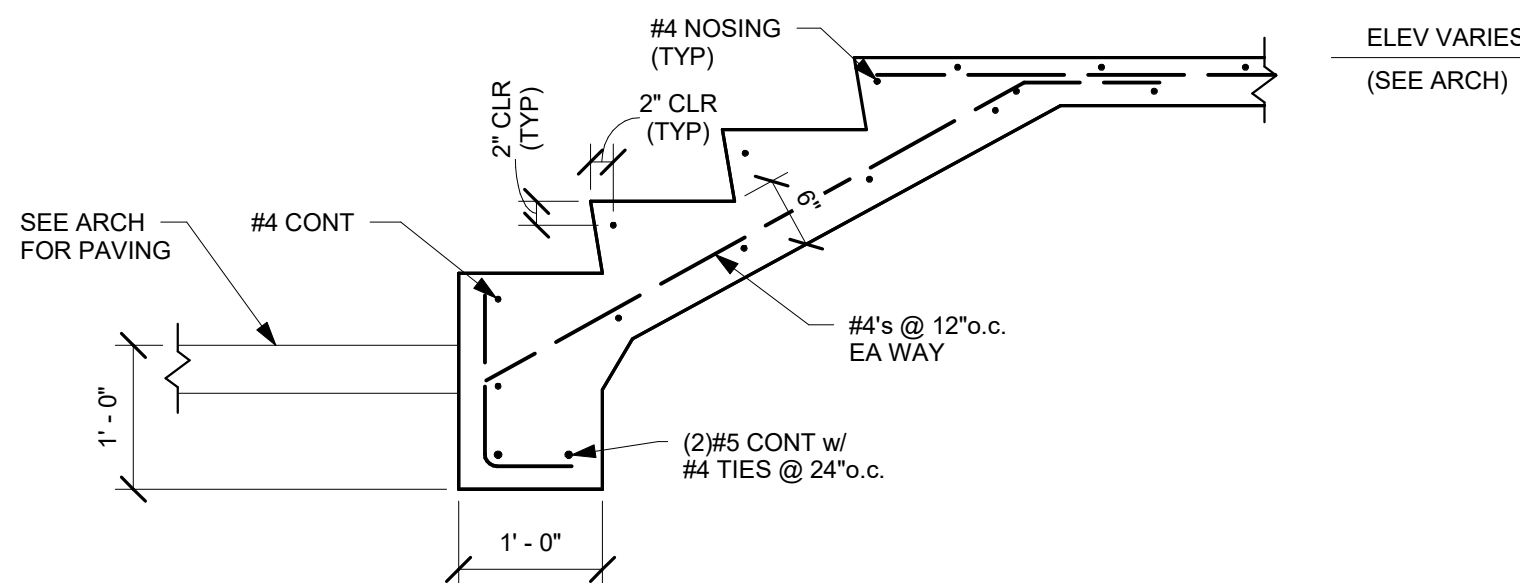
⑦ SECTION  
3/4" = 1'-0"



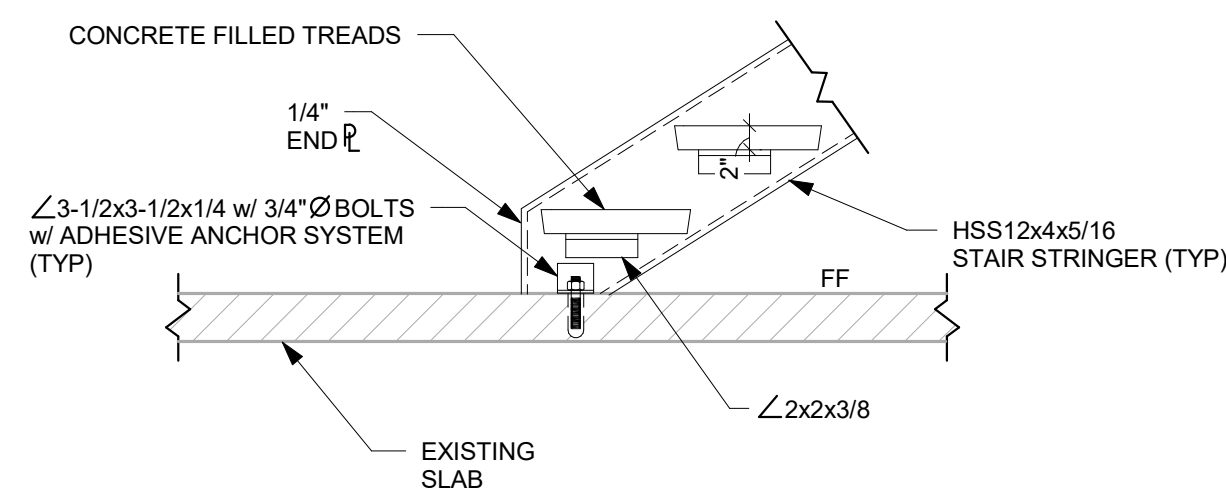
⑧ SECTION  
3/4" = 1'-0"



⑨ SECTION  
3/4" = 1'-0"

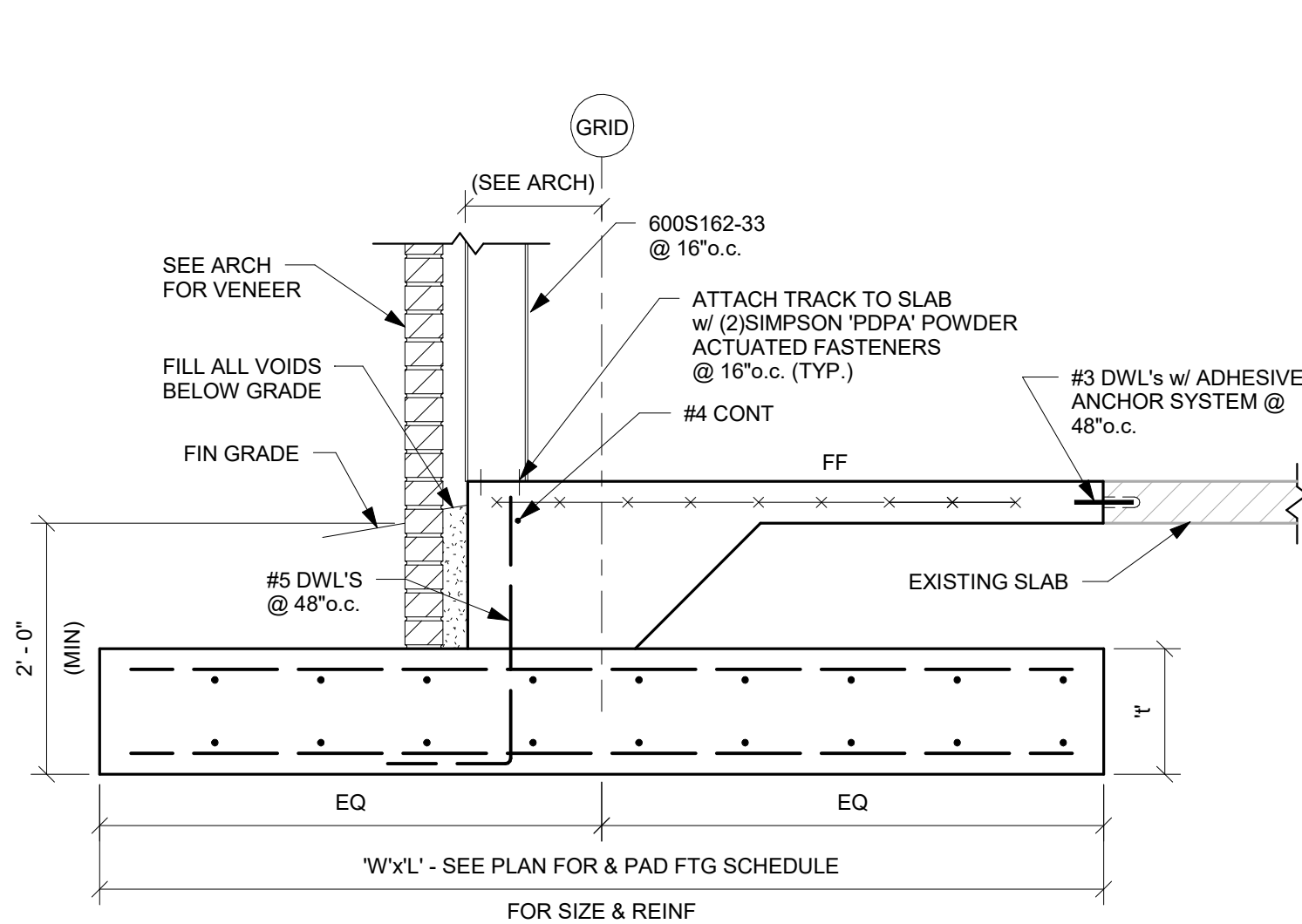


⑩ SECTION  
3/4" = 1'-0"

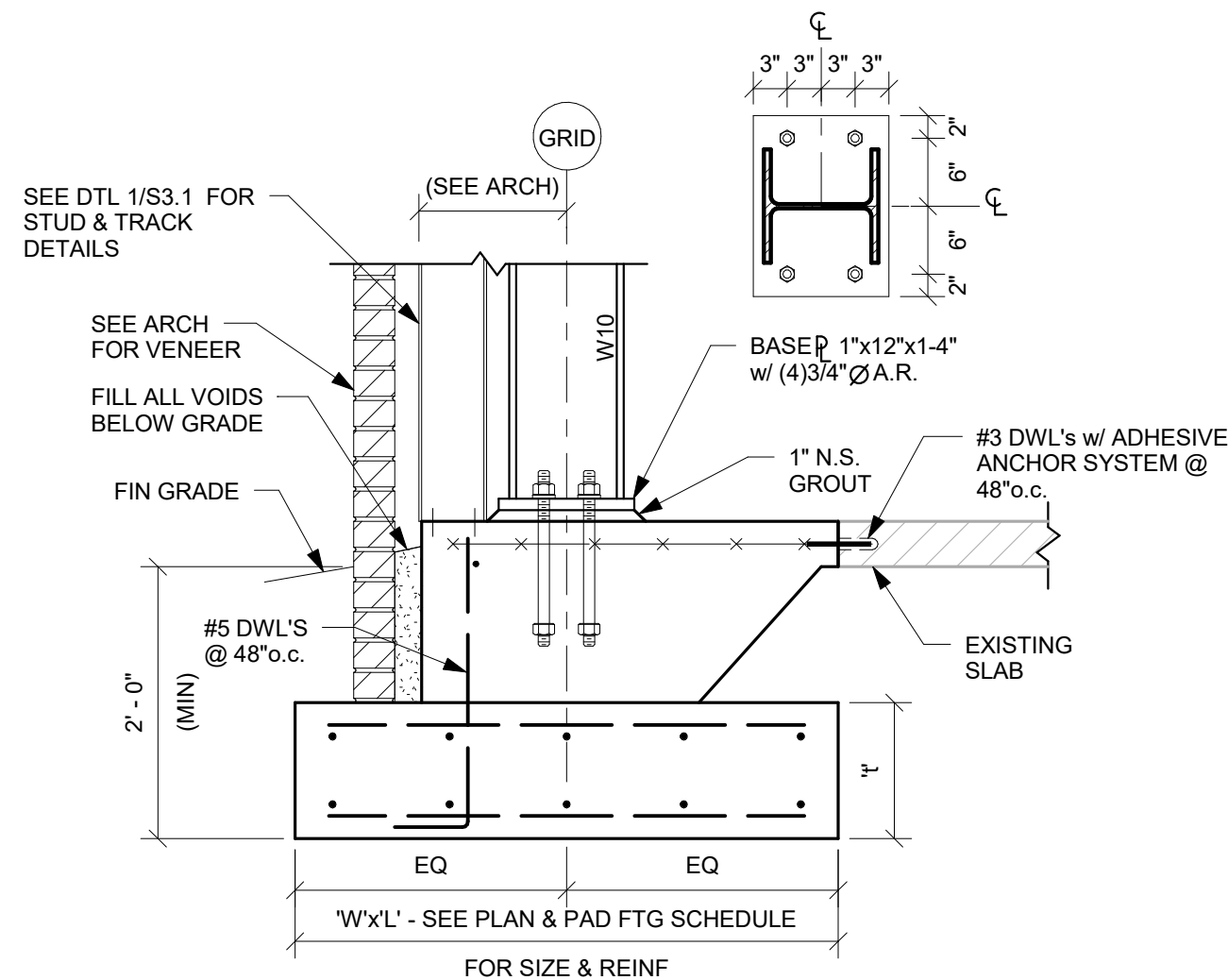


⑪ SECTION  
3/4" = 1'-0"

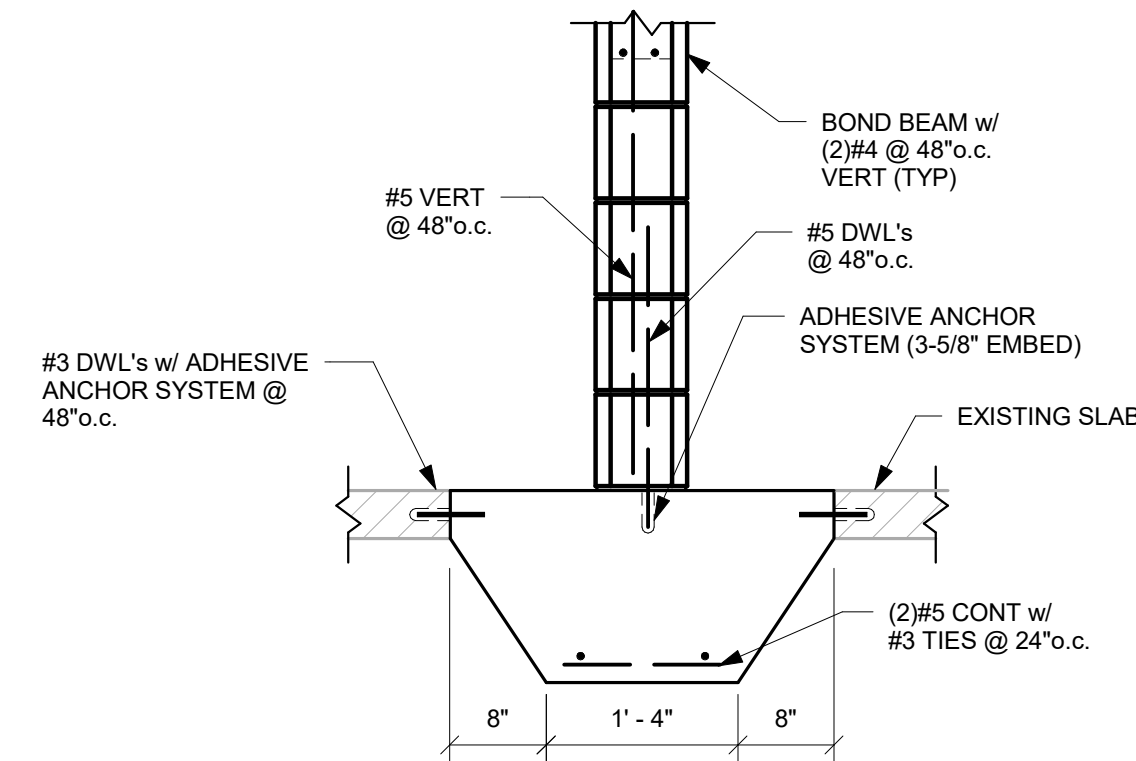




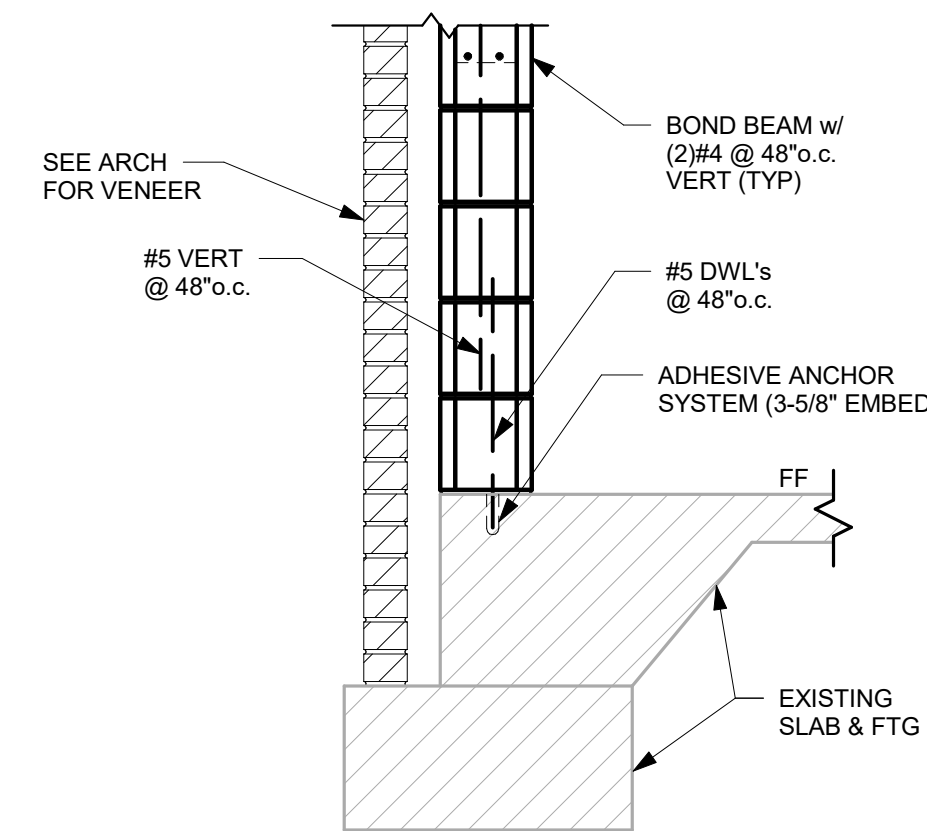
1 SECTION  
3/4" = 1'-0"



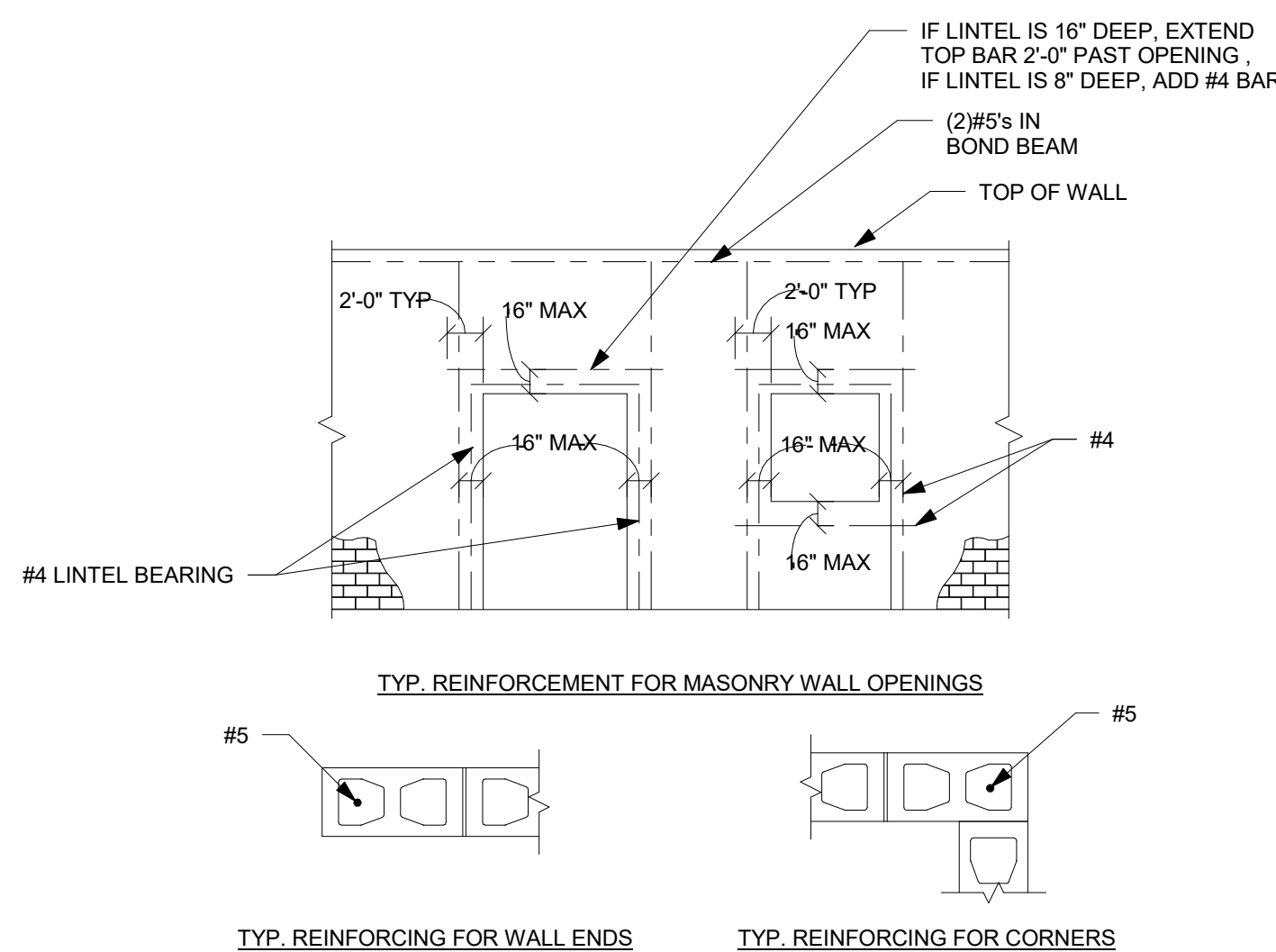
2 SECTION  
3/4" = 1'-0"



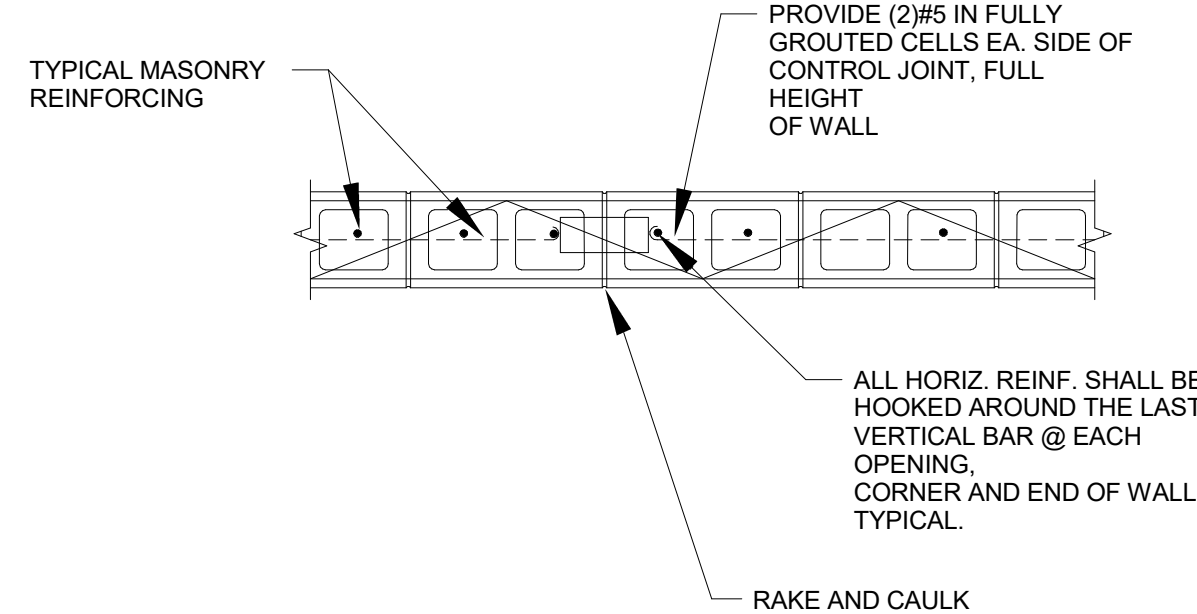
3 SECTION  
3/4" = 1'-0"



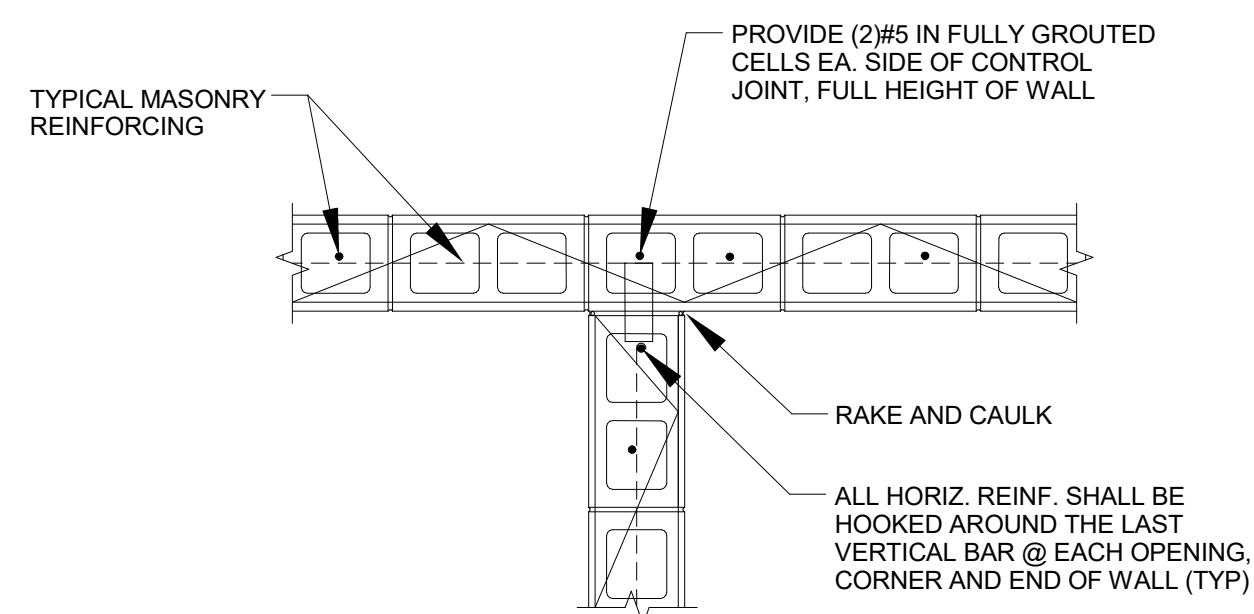
4 SECTION  
3/4" = 1'-0"



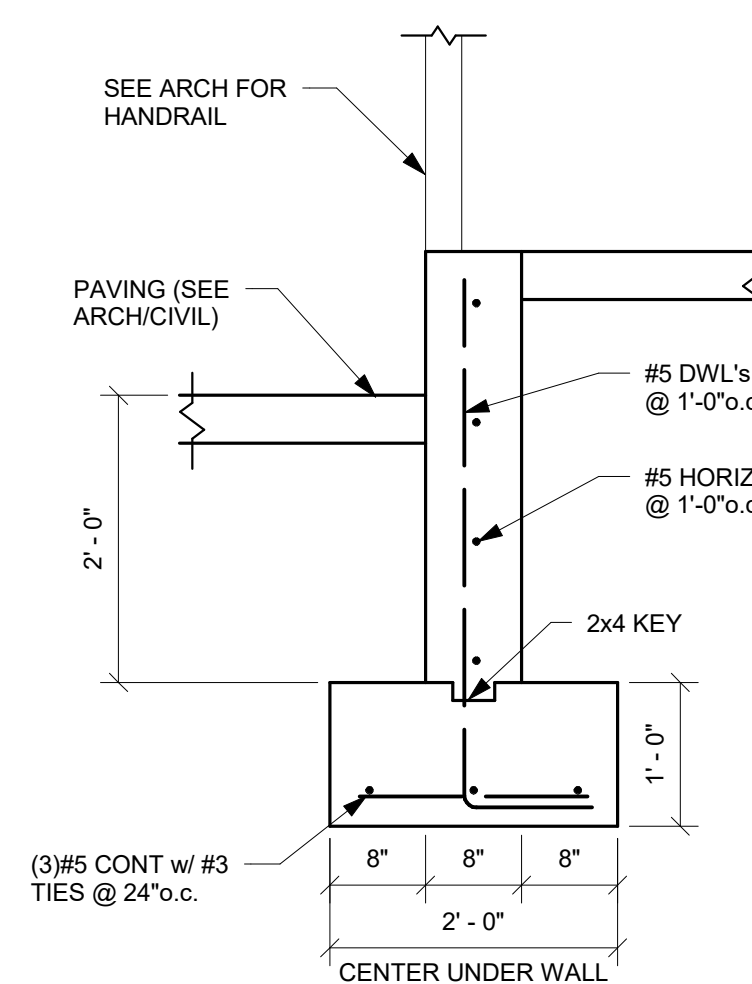
5 SECTION  
1/4" = 1'-0"



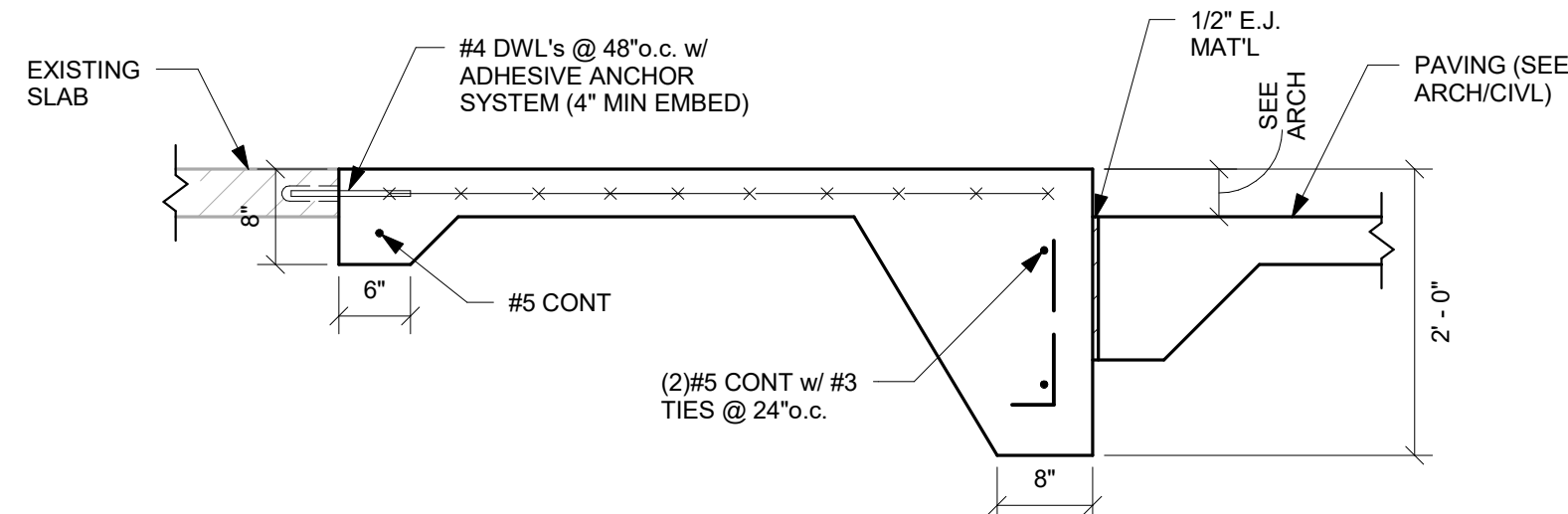
6 TYP CONTROL JOINT IN MASONRY WALL  
3/4" = 1'-0"



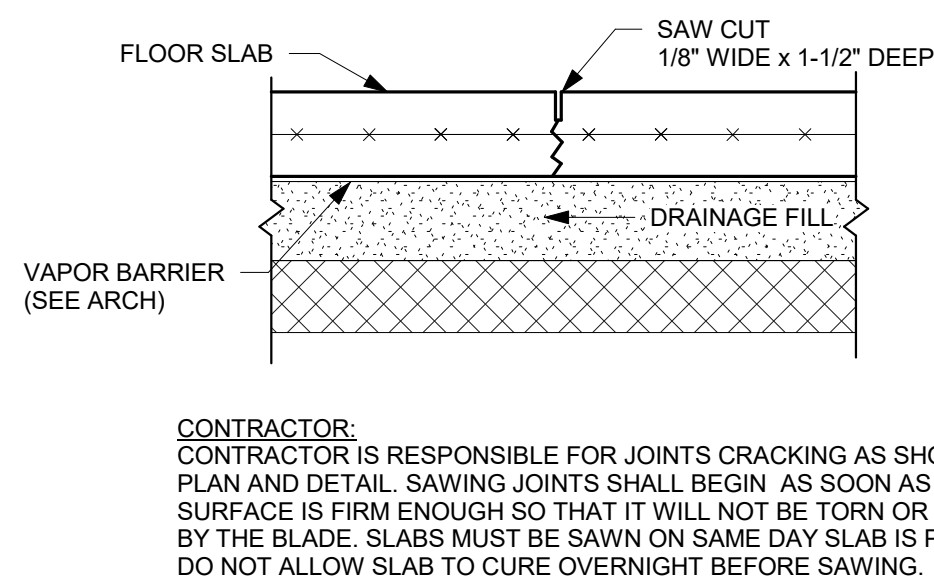
7 TYP CONTROL JOINT IN MASONRY WALL INTERSECTION  
3/4" = 1'-0"



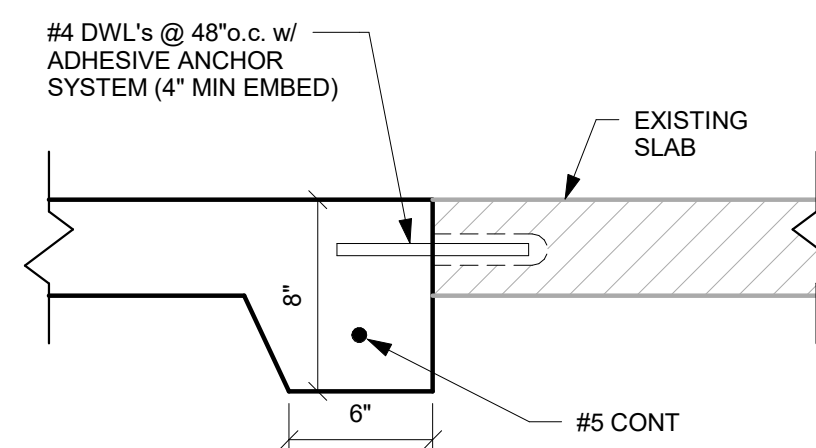
8 SECTION  
3/4" = 1'-0"



9 SECTION  
3/4" = 1'-0"

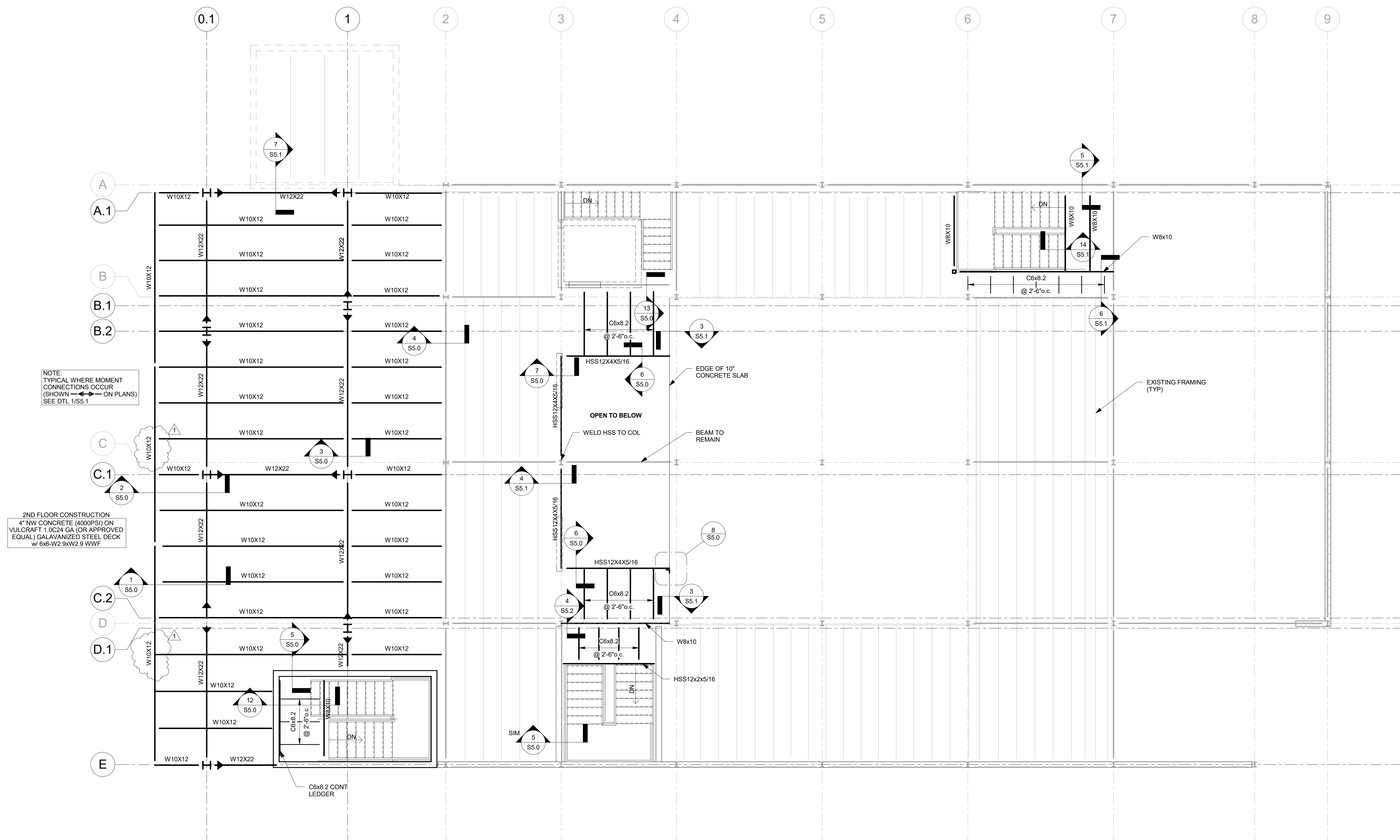


10 TYPICAL CONTROL JOINT DETAIL  
NTS



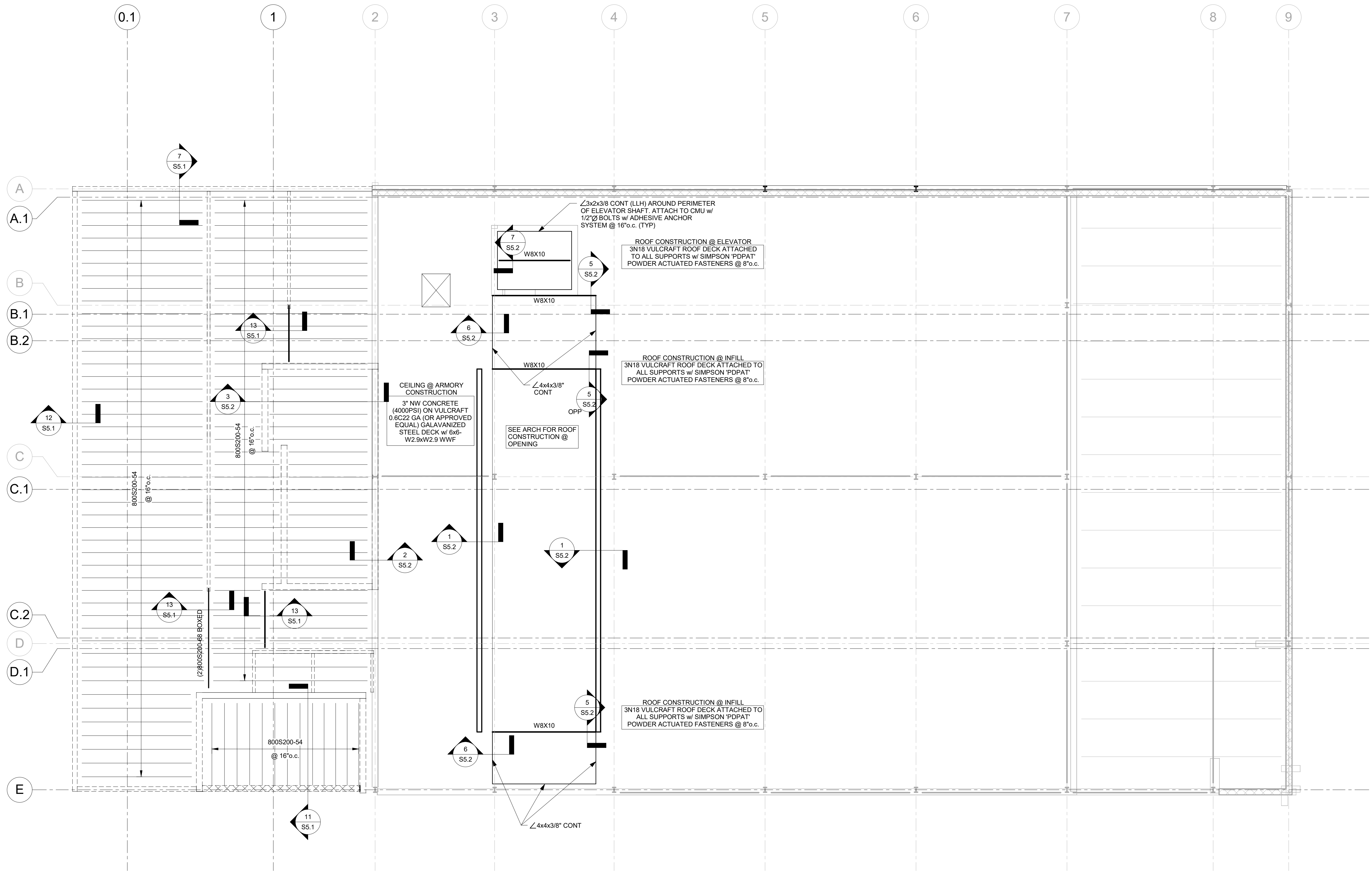
11 SECTION  
1 1/2" = 1'-0"





2nd FLOOR FRAMING  
3/16" = 1'-0"





- NOTES:
- ROOF DECKING SHALL BE 1.5B22 ROOF DECK ATTACHED TO THE STRUCTURE WITH #12 TEK SCREWS IN A 36/4 PATTERN AT ALL SUPPORTS AND (4)#10 TEK SCREW SIDELAP FASTENERS BETWEEN SUPPORTS
  - ALL HEADERS SHALL BE (2)#800S200-54 BOXED (U.N.O) (REF DTL 8/S5.1)

ROOF FRAMING PLAN  
3/16" = 1'-0"

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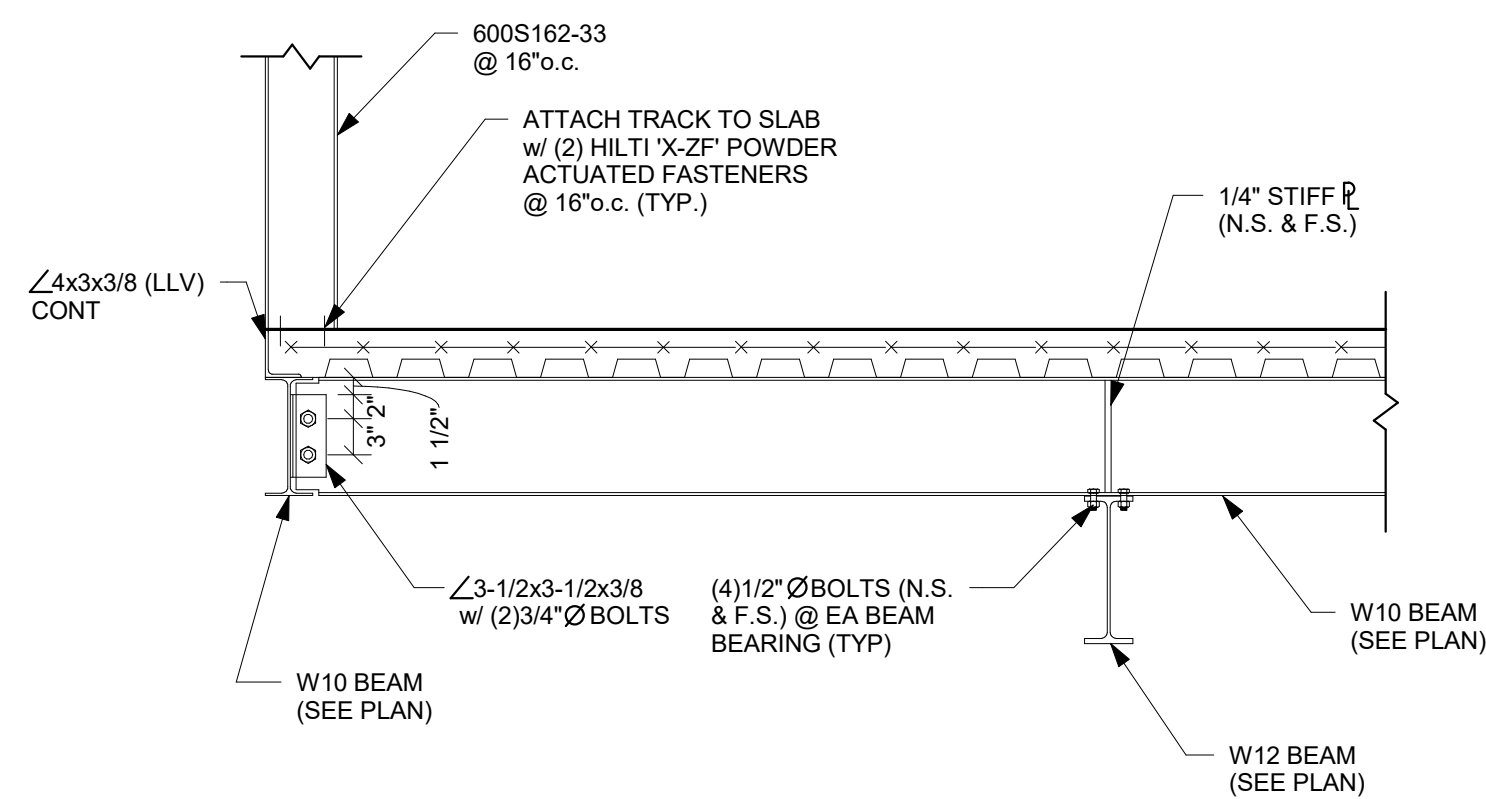
|             |            |    |     |
|-------------|------------|----|-----|
| DATE:       | 03-30-2016 | JC | LCF |
| REVISIONS:  |            |    |     |
| DRAWN BY:   |            |    |     |
| CHECKED BY: |            |    |     |

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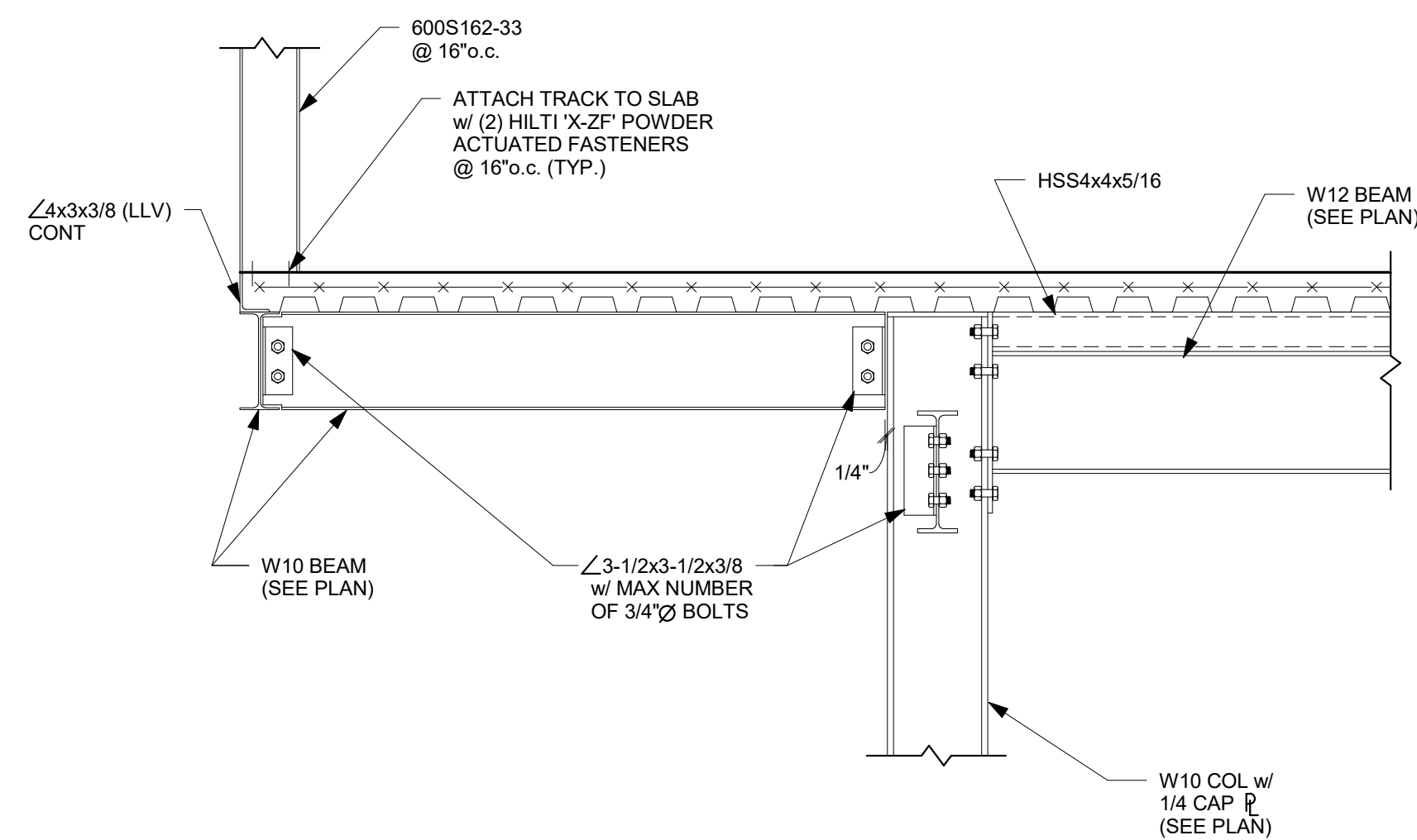
ROOF FRAMING  
PLAN

SHEET #:  
**S4.1**

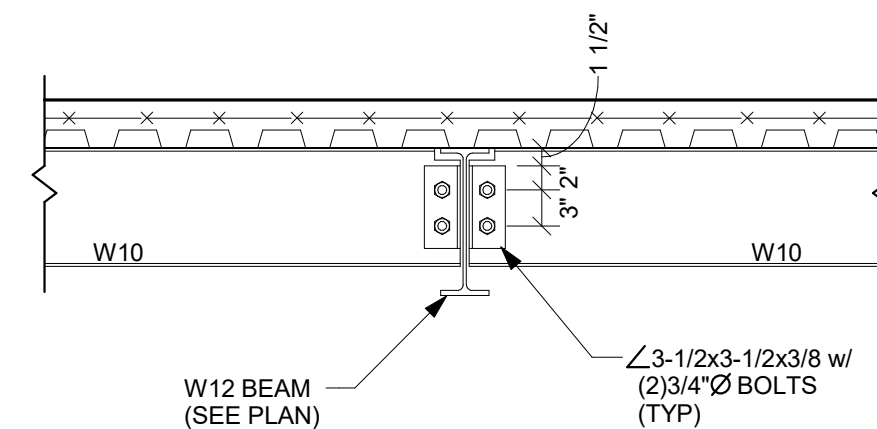




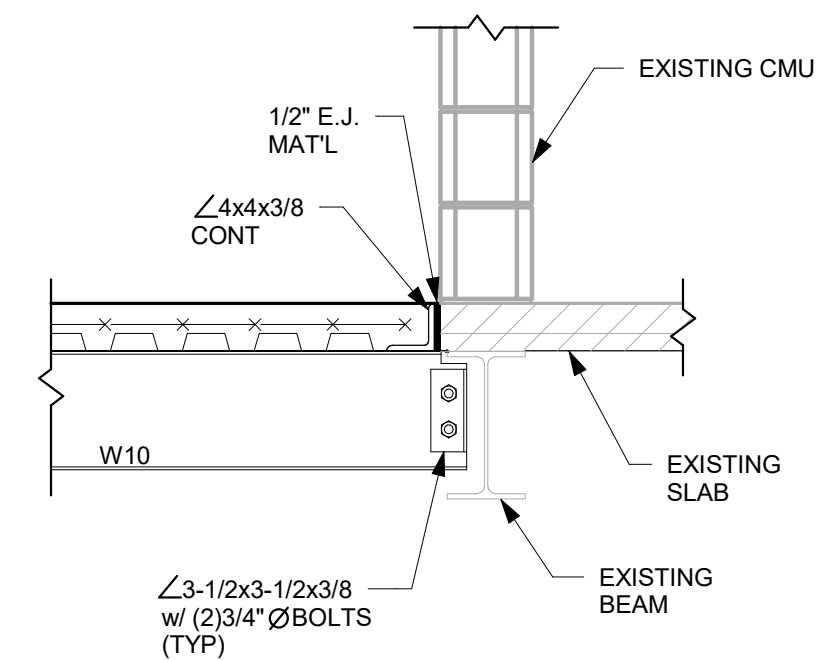
1 SECTION  
3/4" = 1'-0"



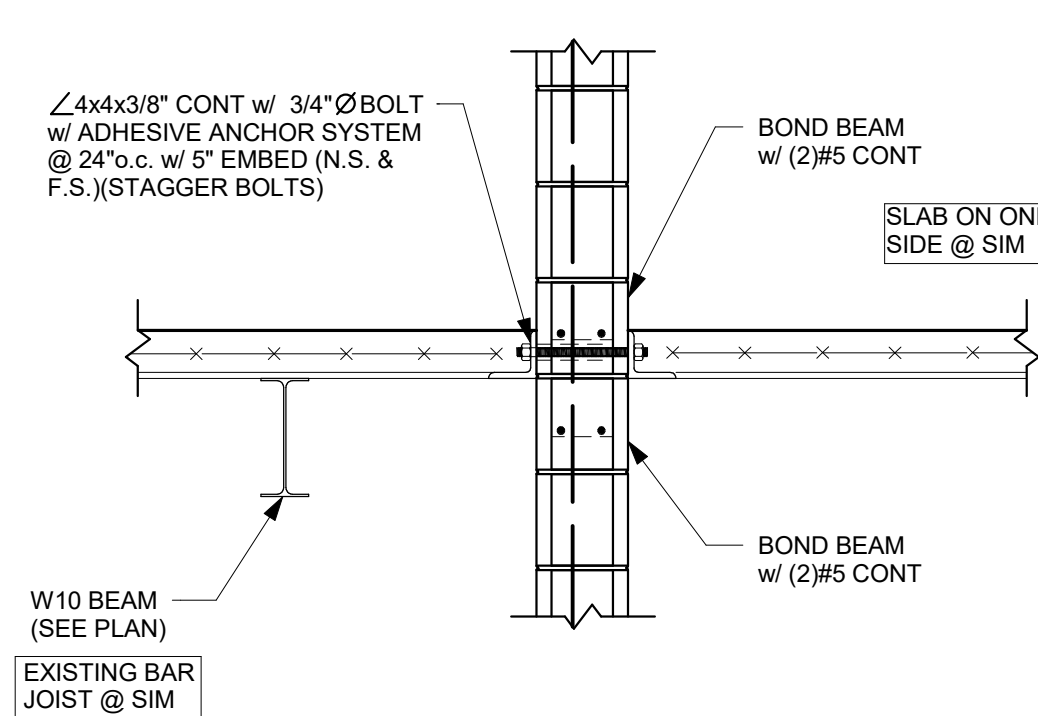
2 SECTION  
3/4" = 1'-0"



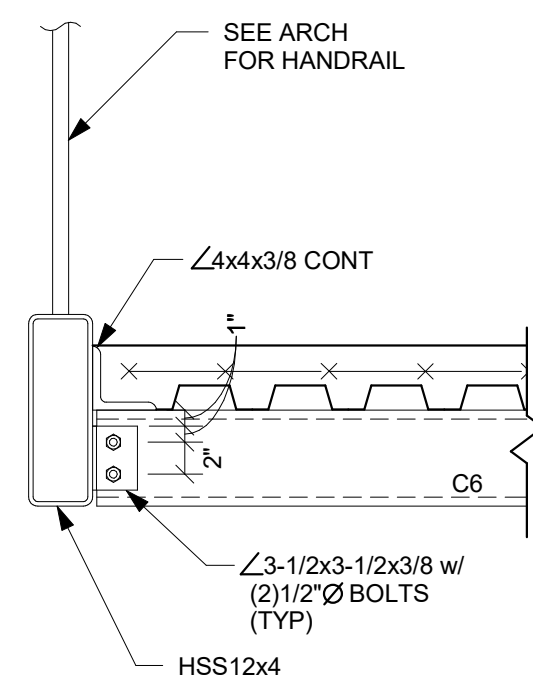
3 SECTION  
3/4" = 1'-0"



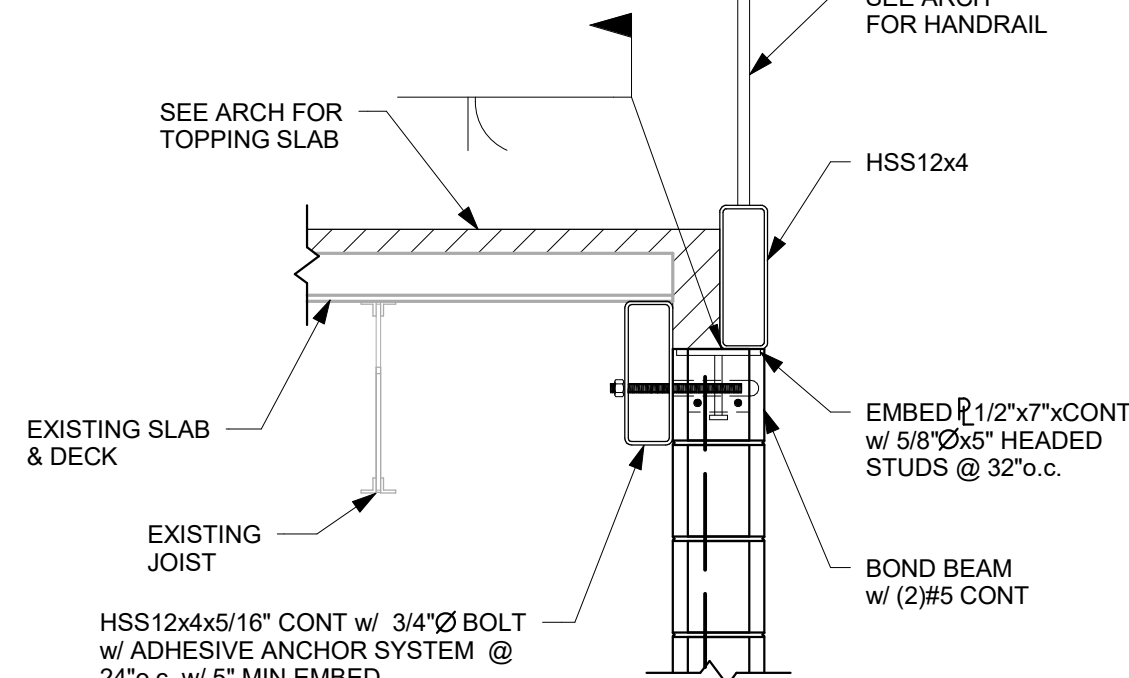
4 SECTION  
3/4" = 1'-0"



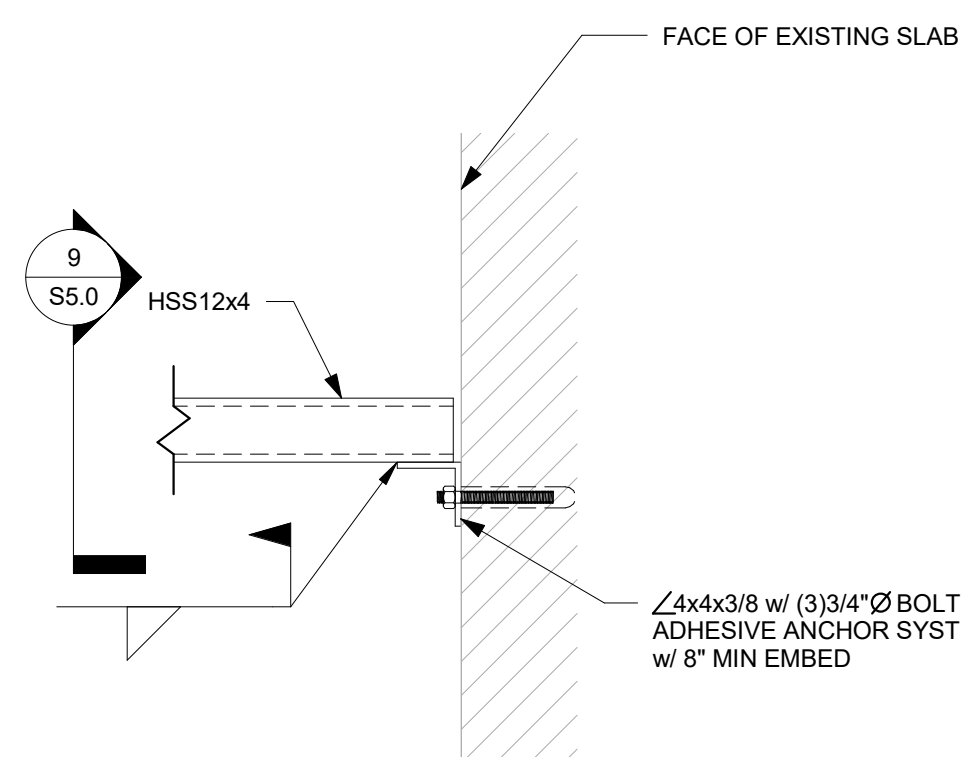
5 SECTION  
3/4" = 1'-0"



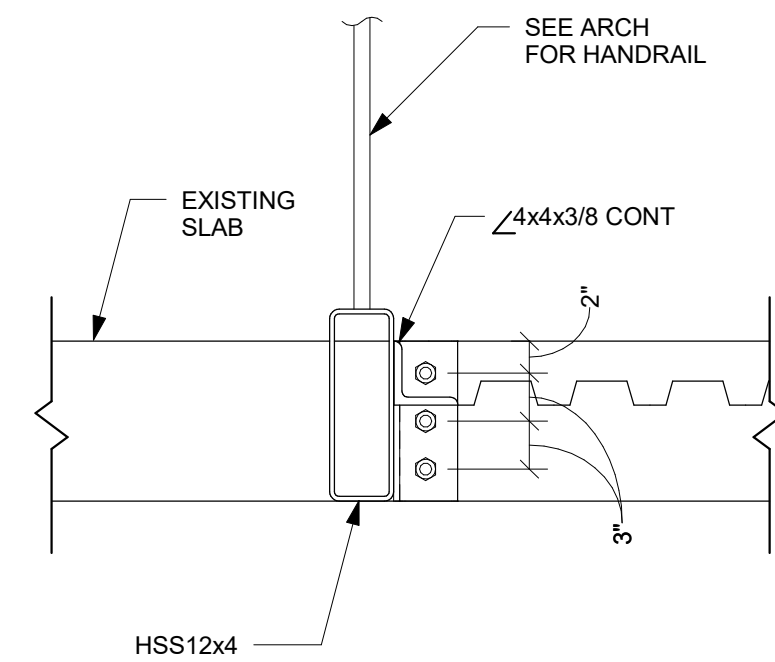
6 SECTION  
1" = 1'-0"



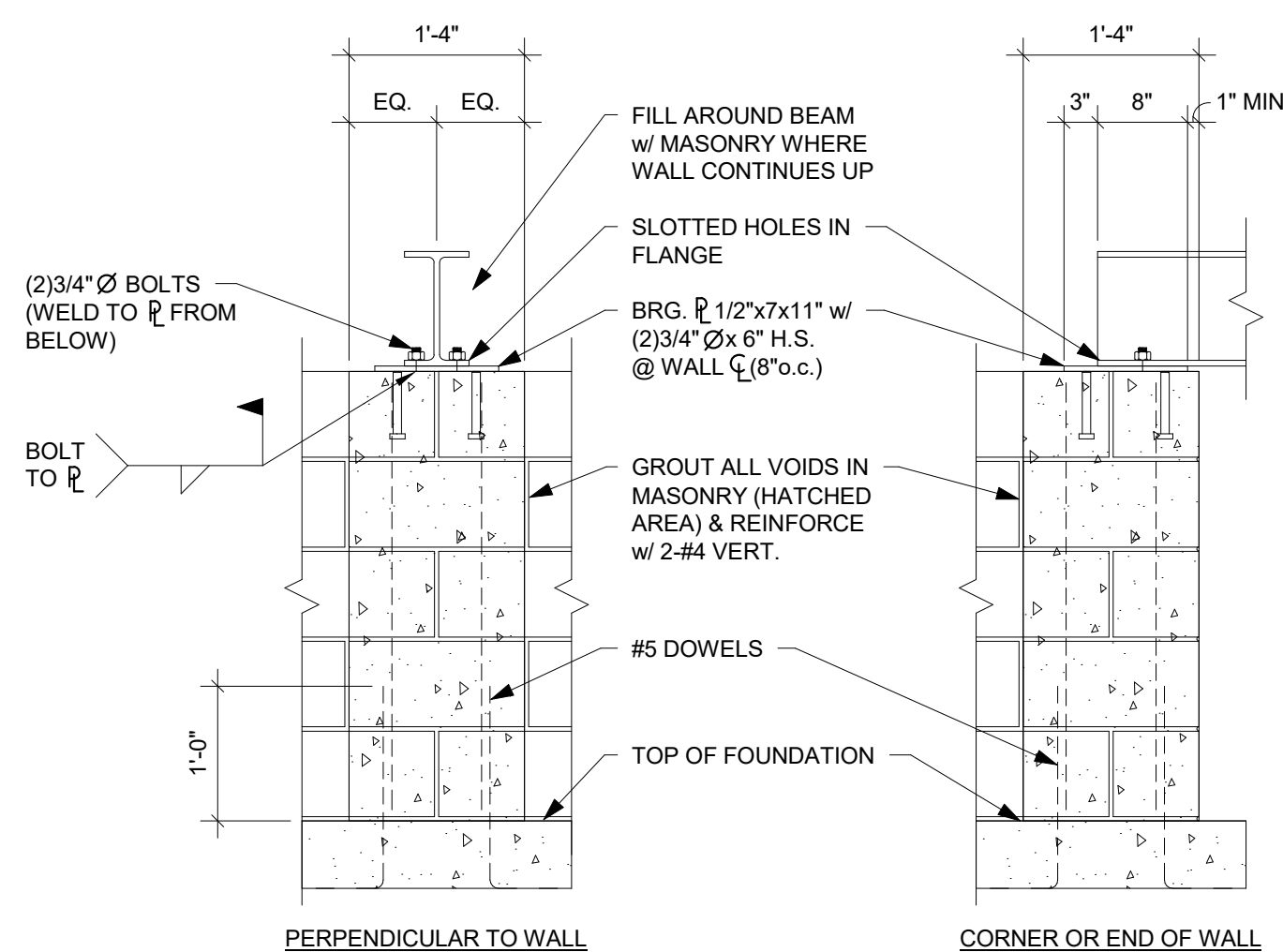
7 SECTION  
3/4" = 1'-0"



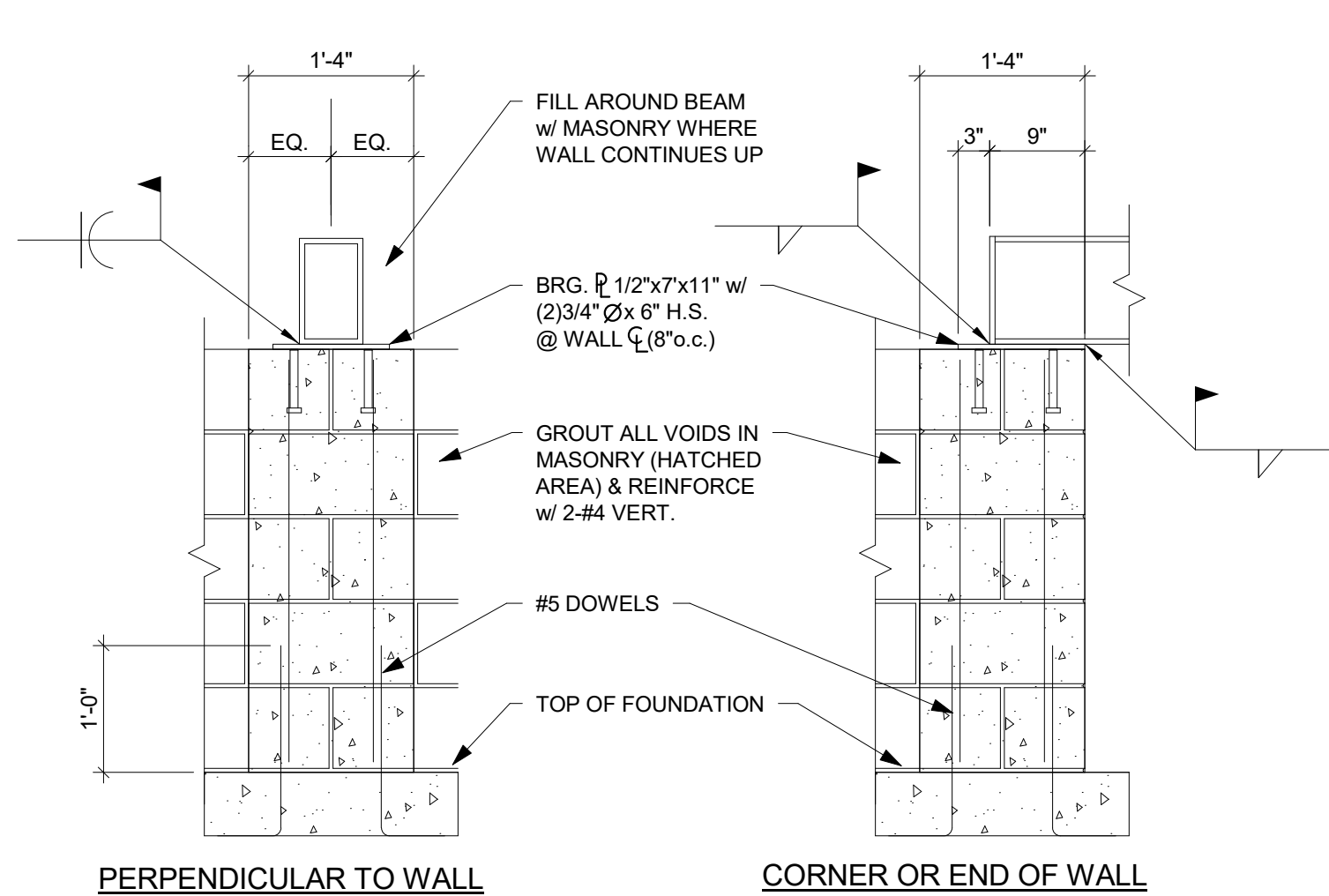
8 SECTION  
1" = 1'-0"



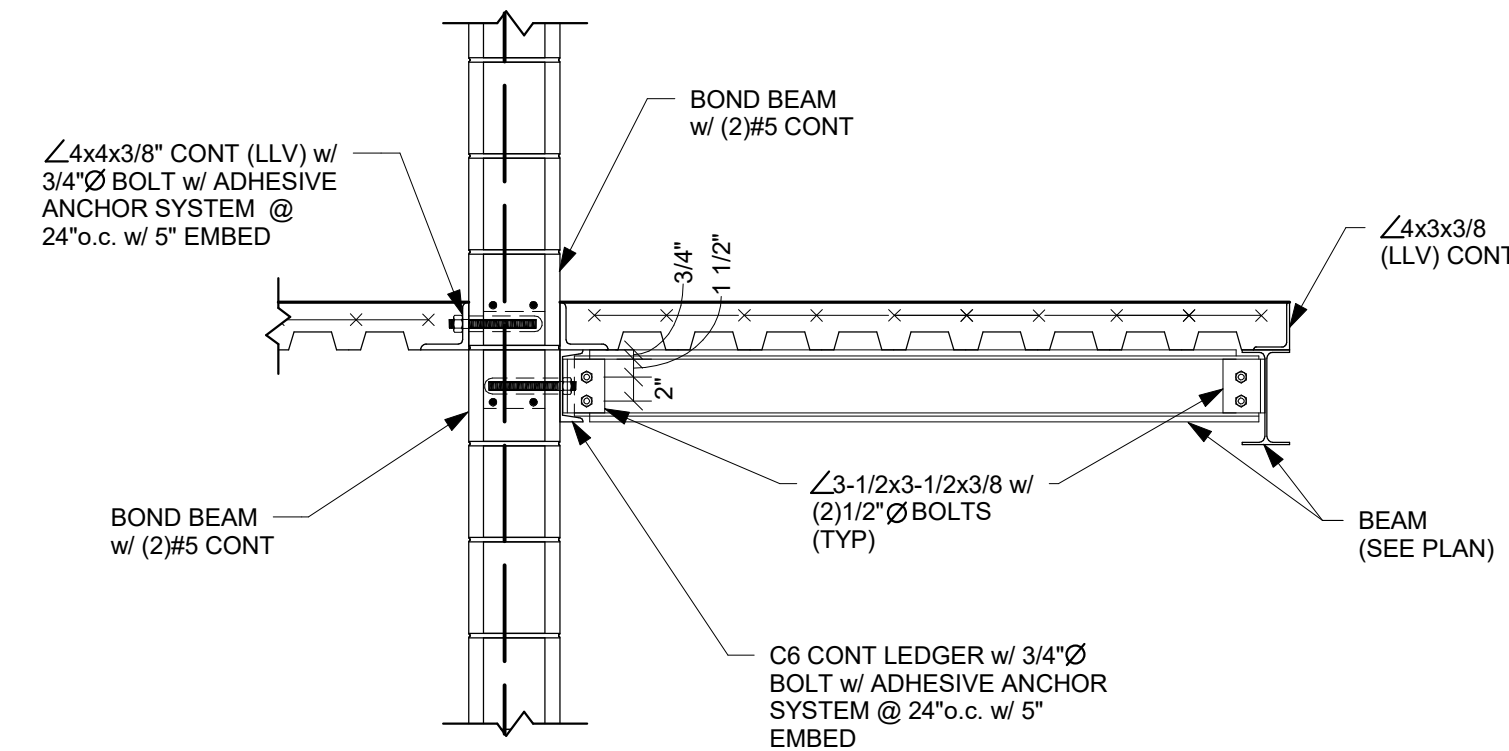
9 SECTION  
1" = 1'-0"



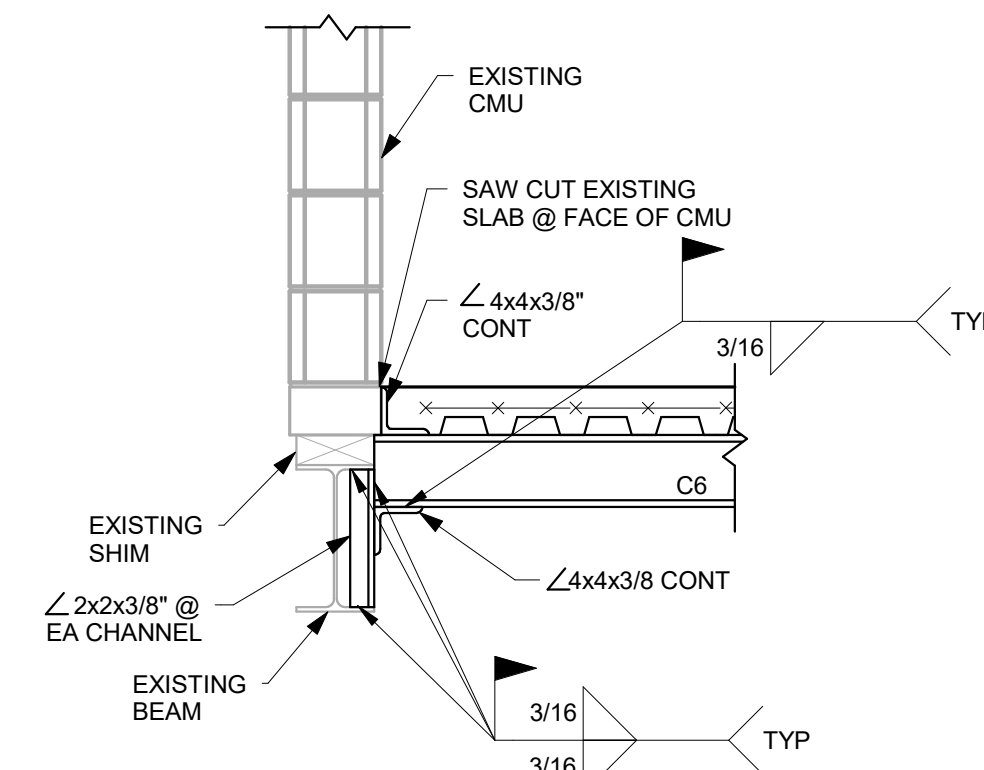
10 WIDE FLANGE BEARING ON CMU  
3/4" = 1'-0"



11 HSS BEARING ON CMU  
3/4" = 1'-0"

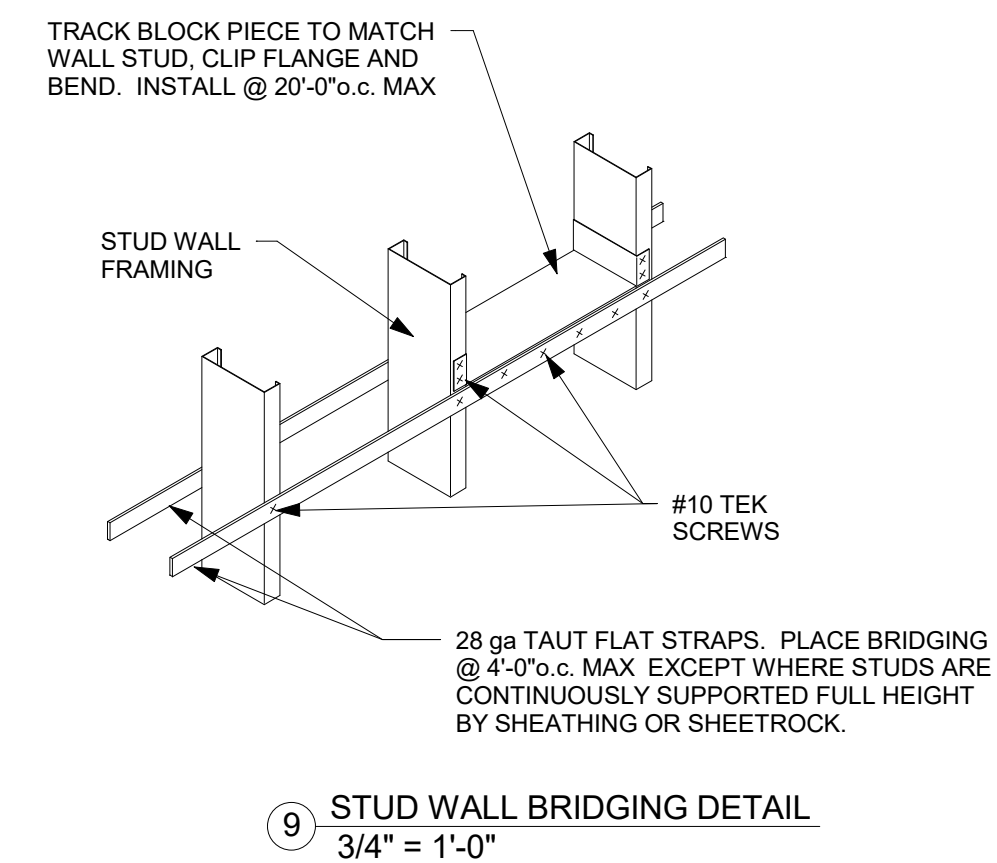
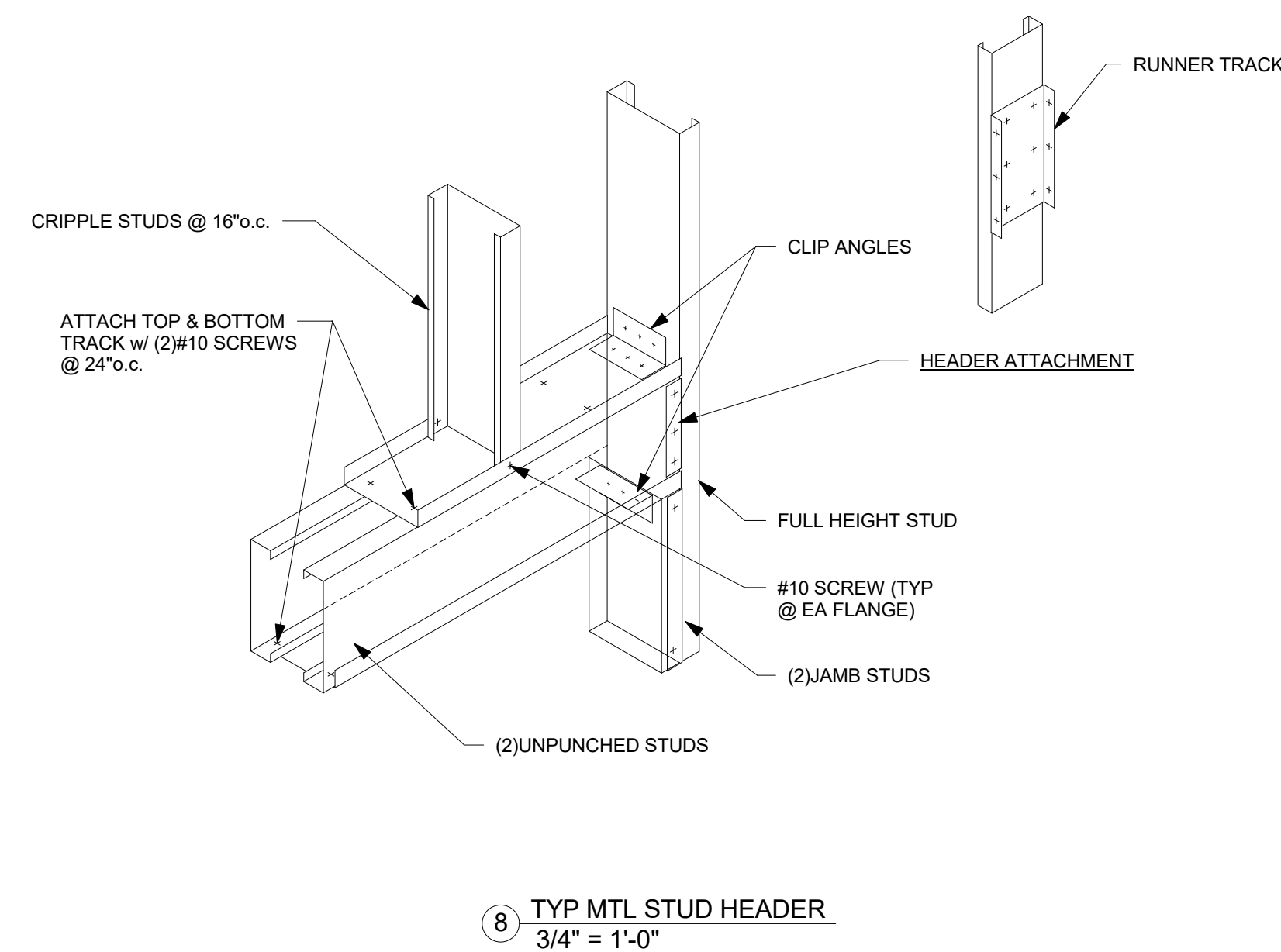
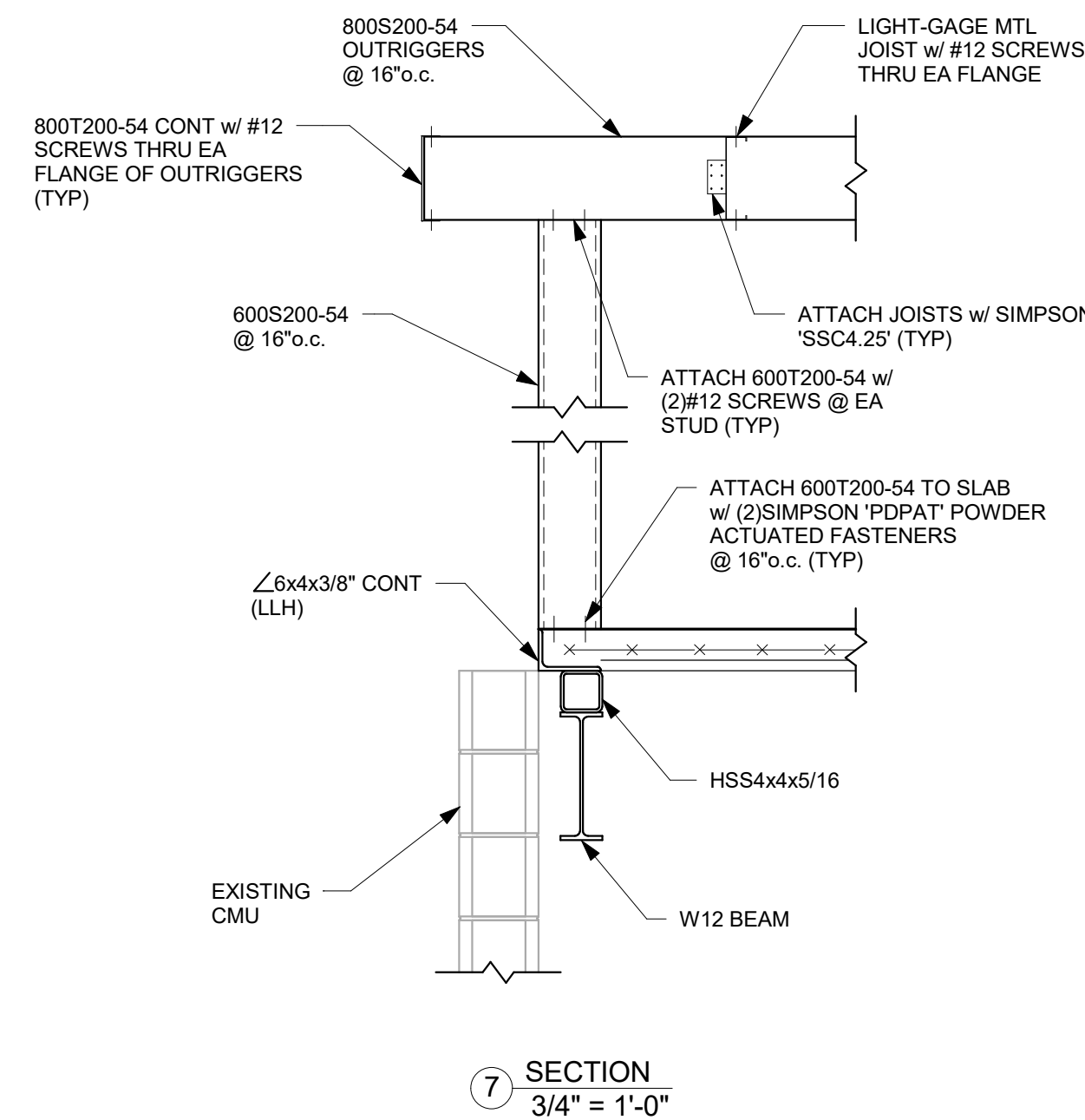
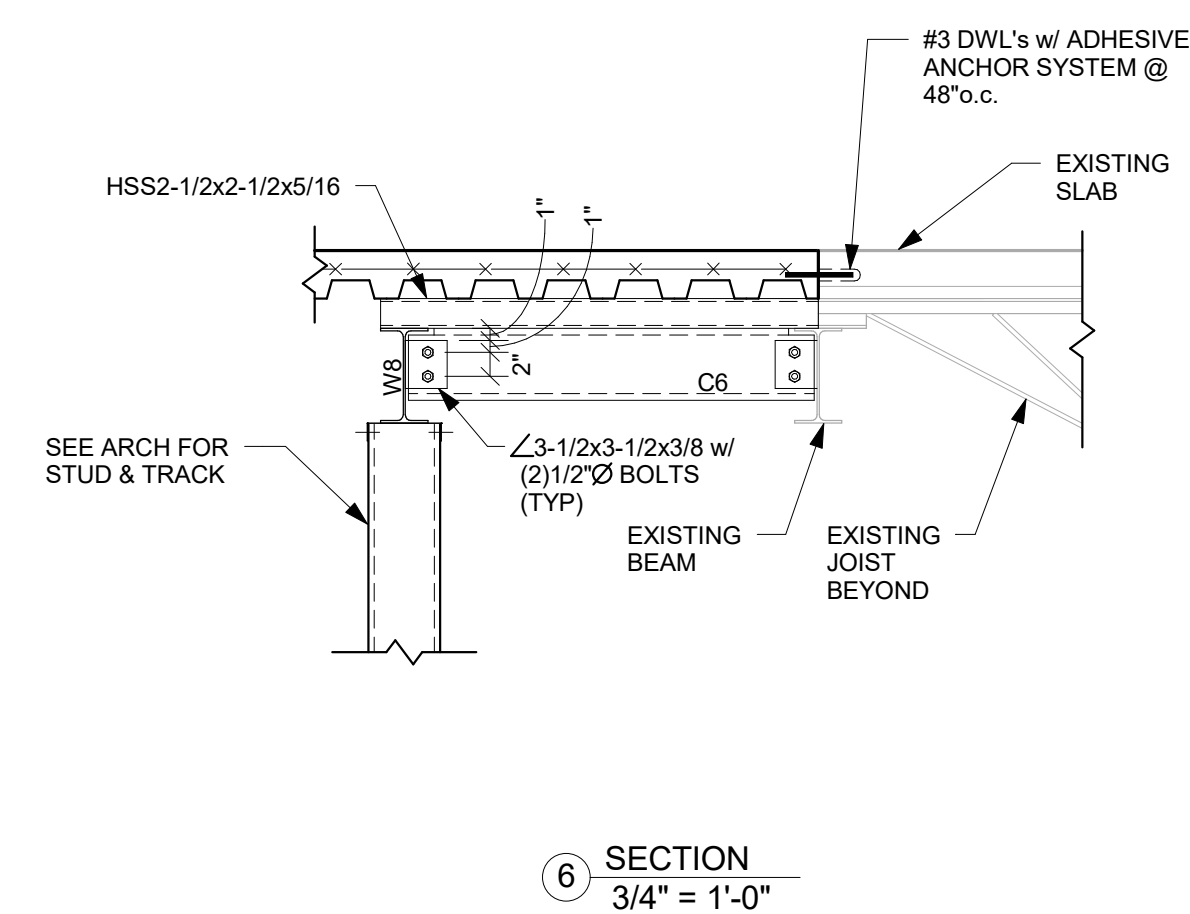
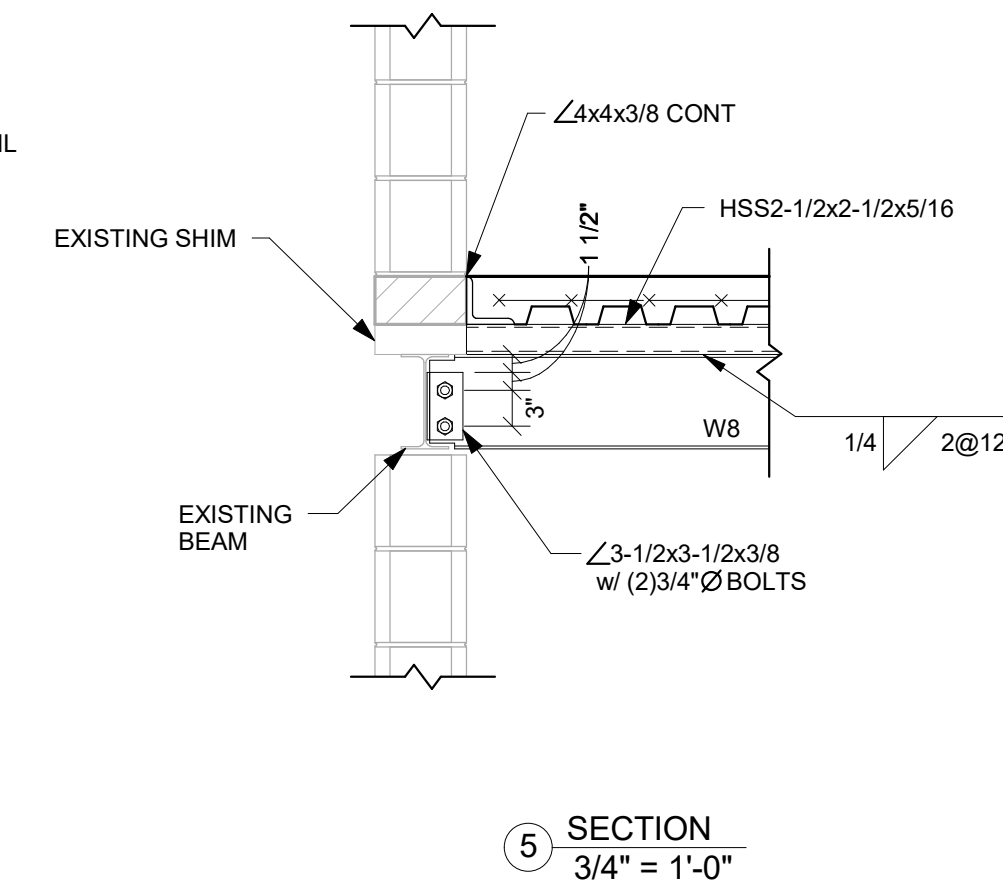
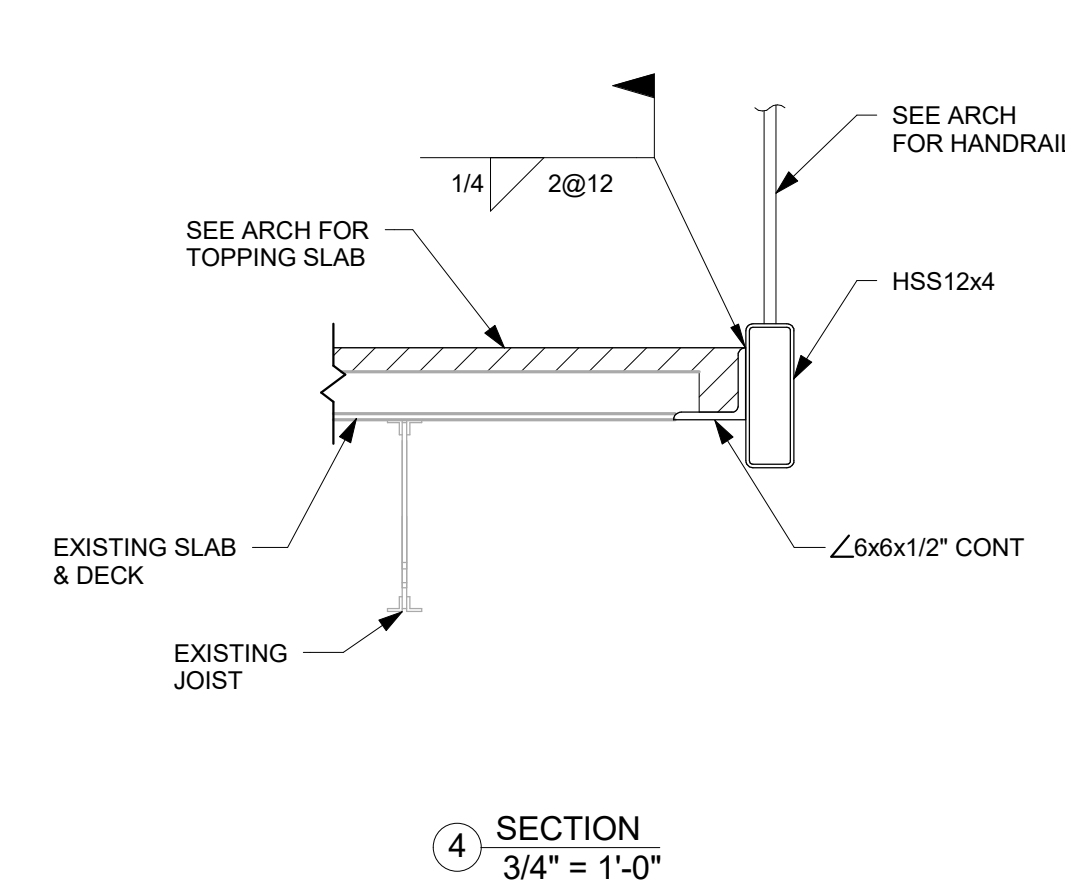
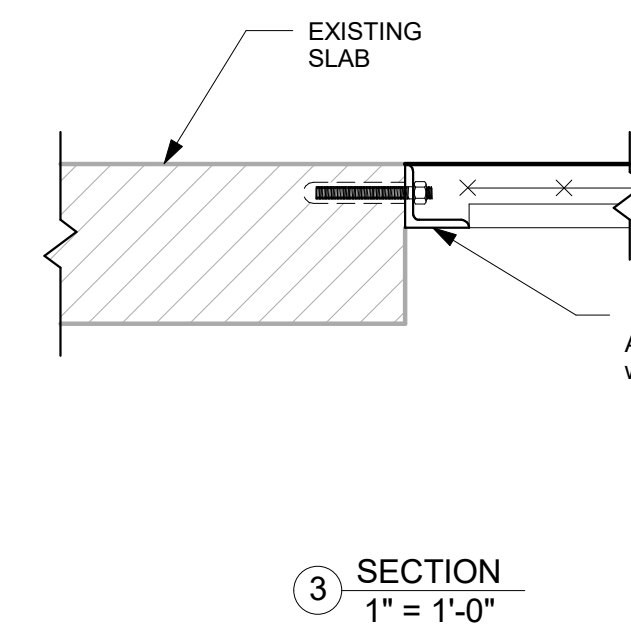
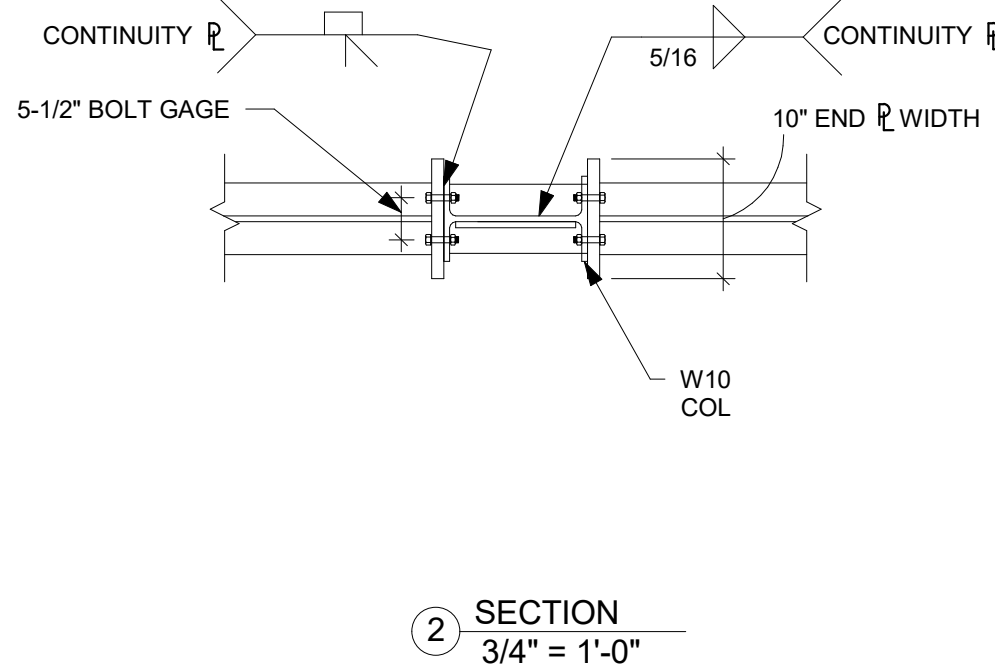
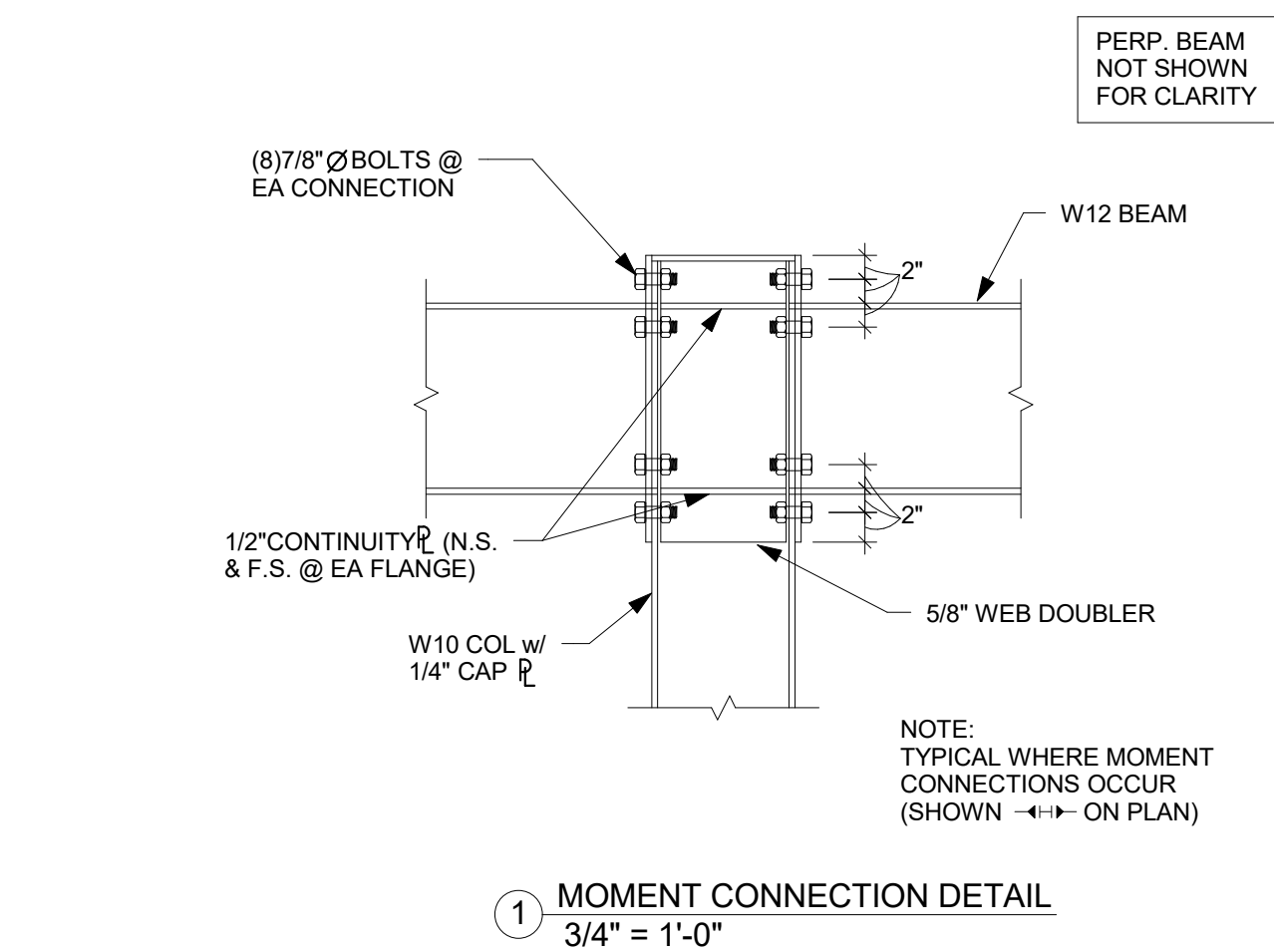


12 SECTION  
3/4" = 1'-0"

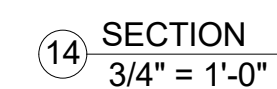
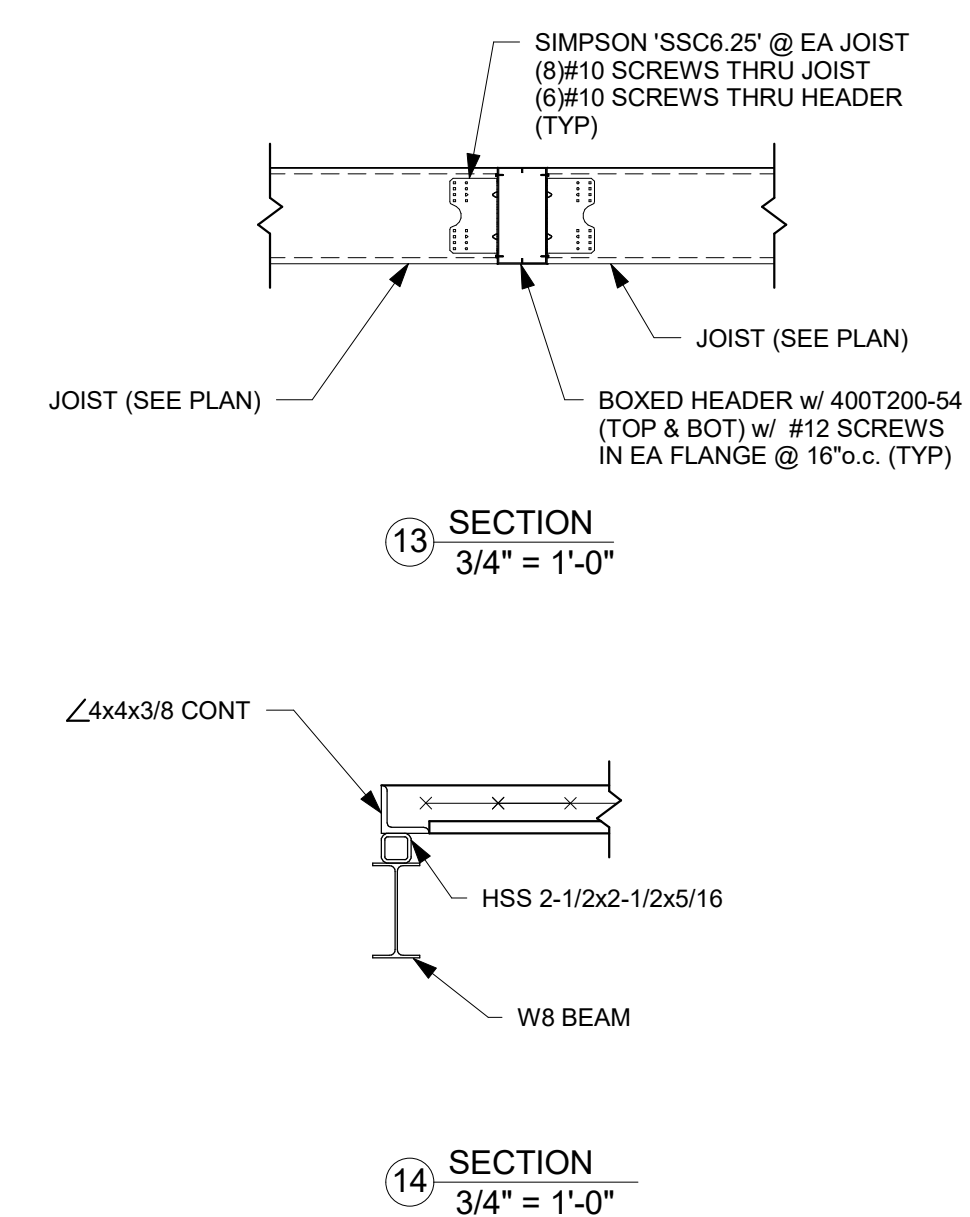
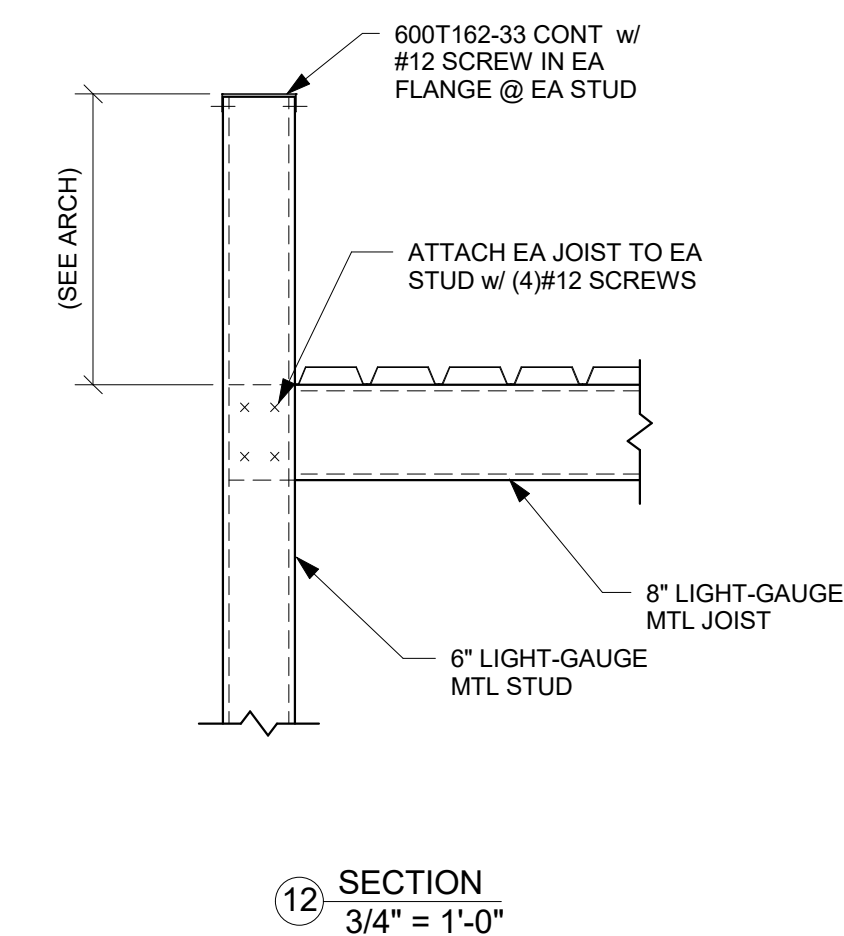
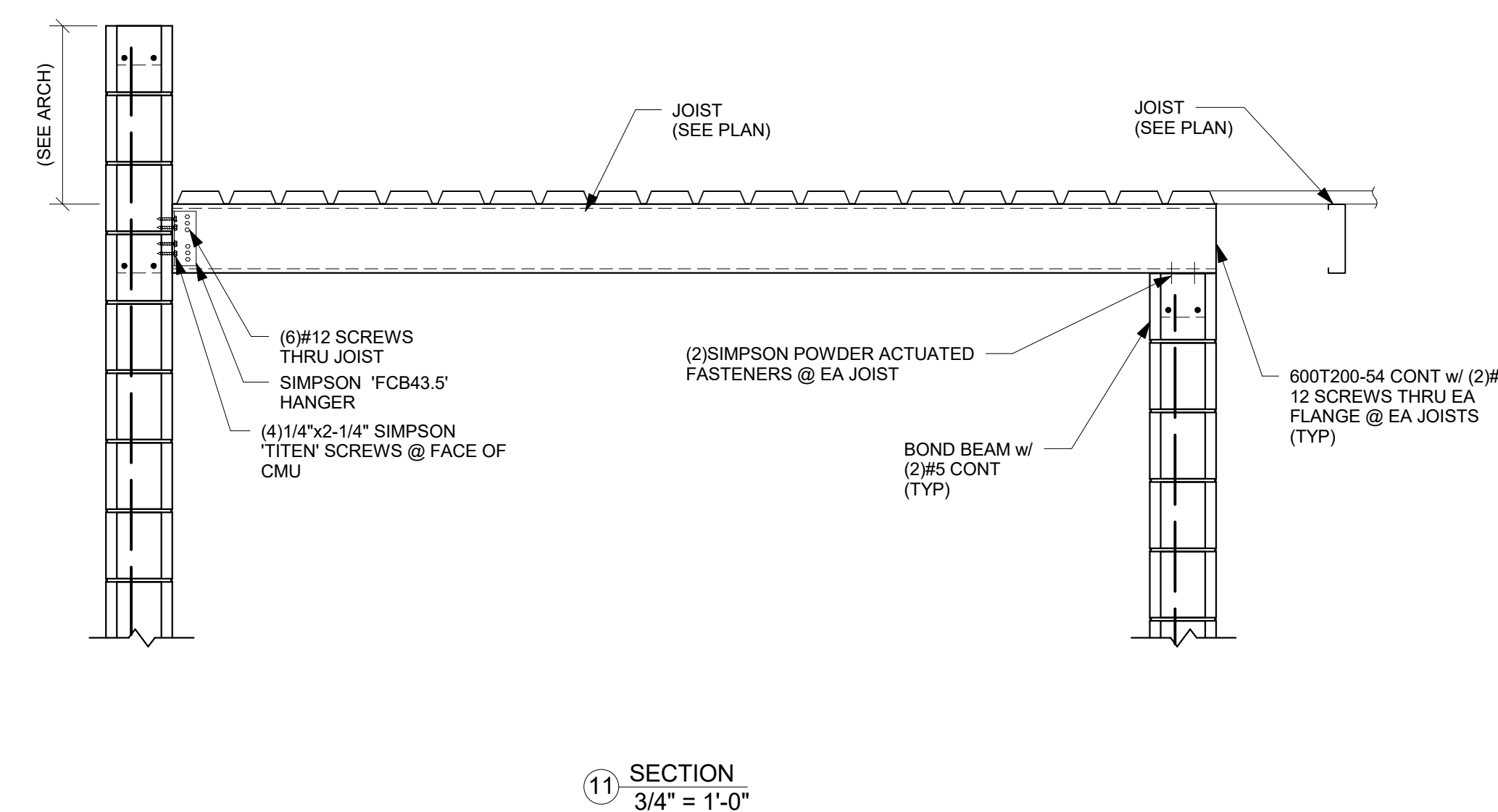
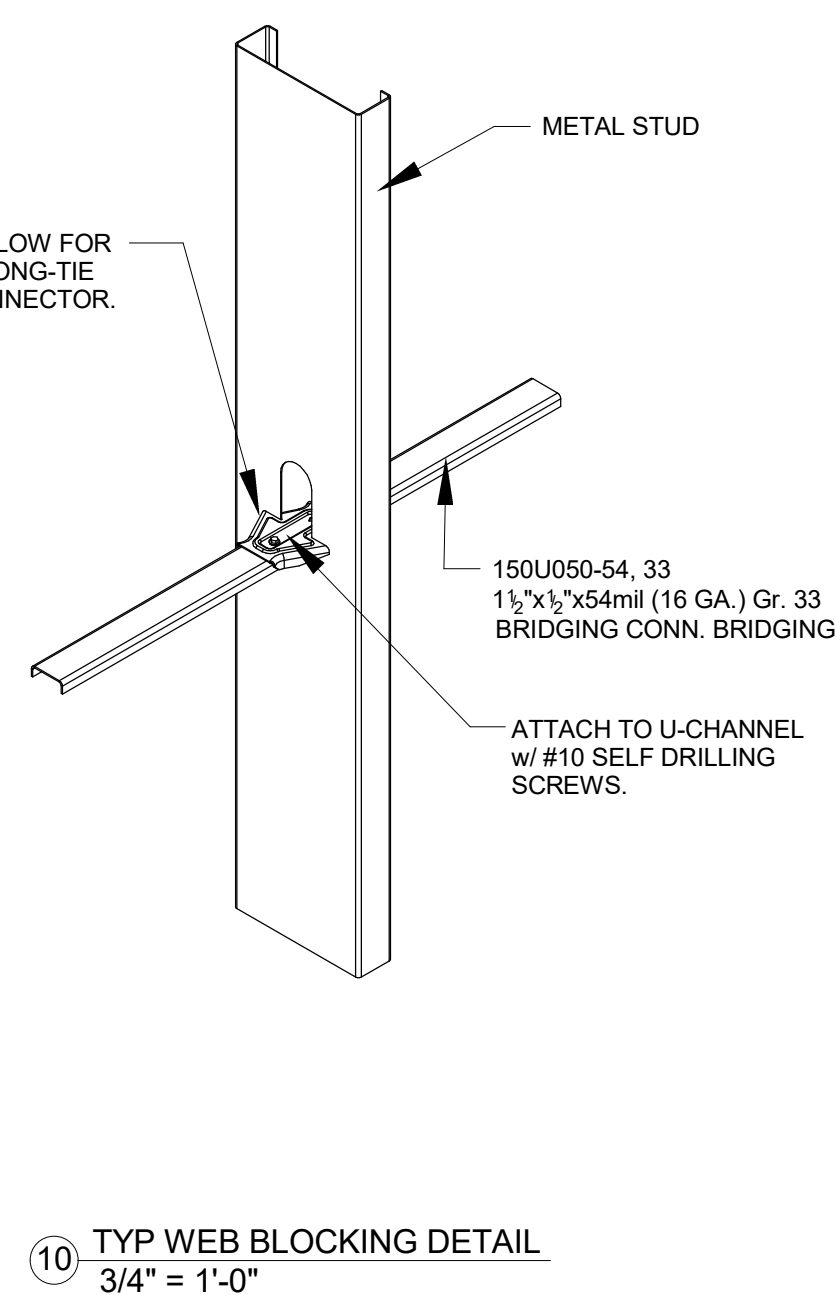


13 SECTION  
3/4" = 1'-0"

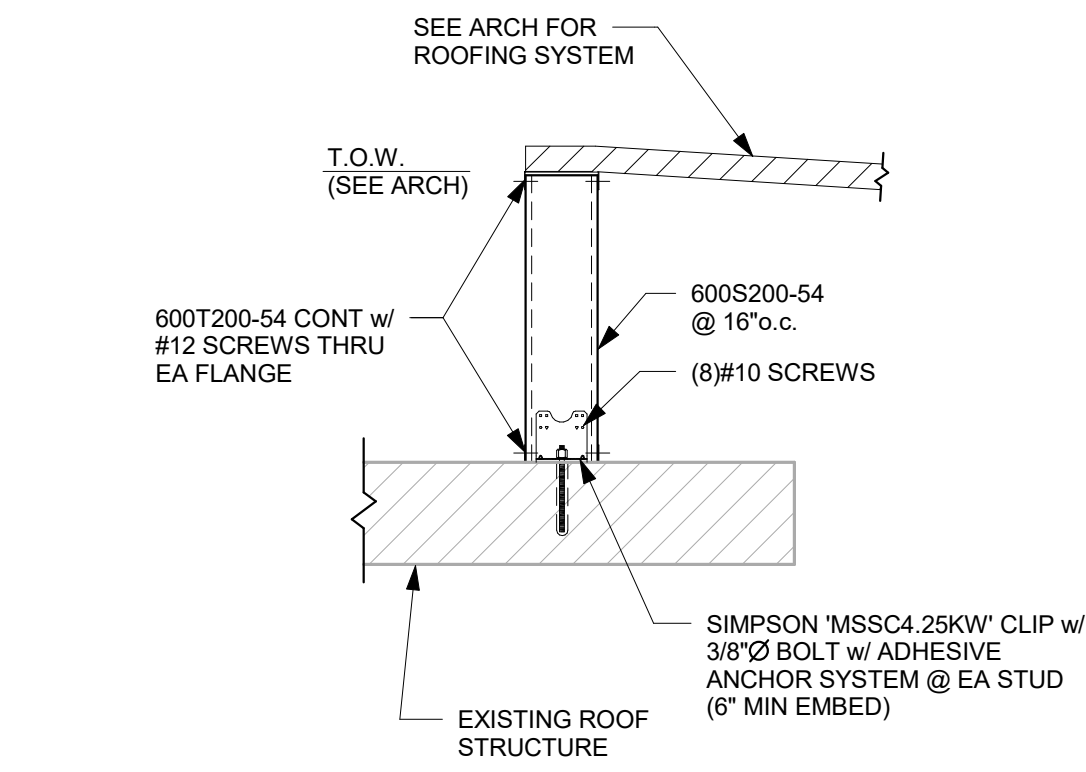




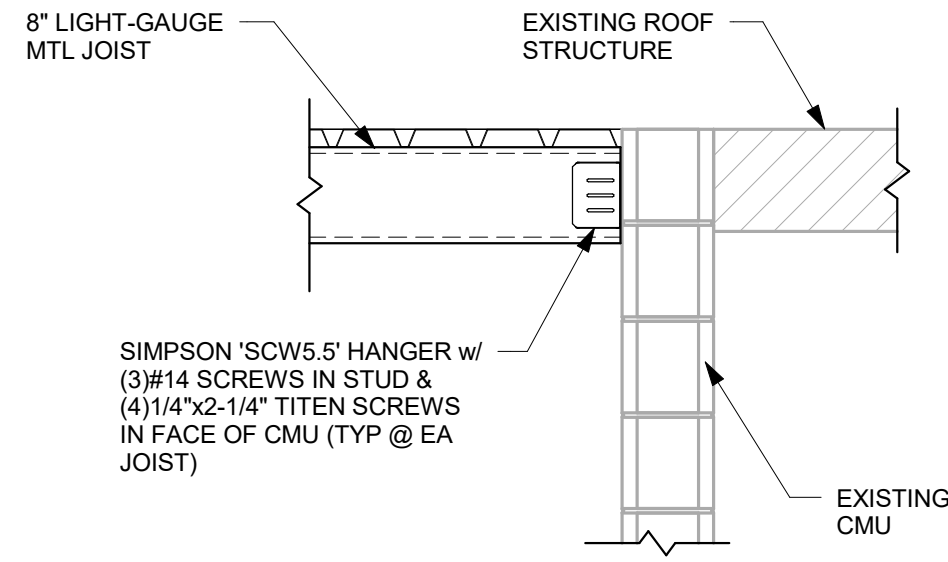
| SIMPSON<br>MODEL<br>NO. | STUD<br>DEPTH<br>(IN.) | STUD THICKNESS<br>ML (GA.)           |
|-------------------------|------------------------|--------------------------------------|
| SUBH3.25                | 3½"                    | 33(20)<br>43(18)                     |
| MSUBH3.25               | 3½"                    | 54(16)<br>68(14)<br>97(12)           |
| SUBH3.25                | 6"                     | 33(20)<br>43(18)                     |
| MSUBH3.25               | 6"                     | 54(16)<br>68(14)<br>97(12)           |
| SUBH3.25                | 8"                     | 43(18)<br>54(16)<br>68(14)<br>97(12) |



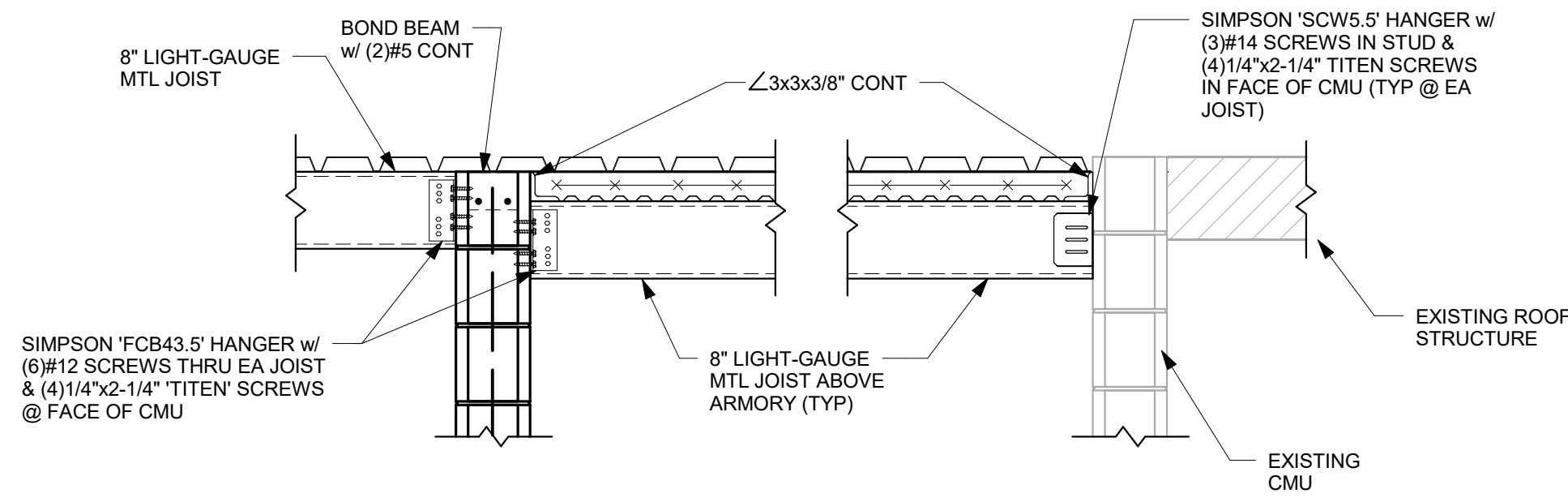




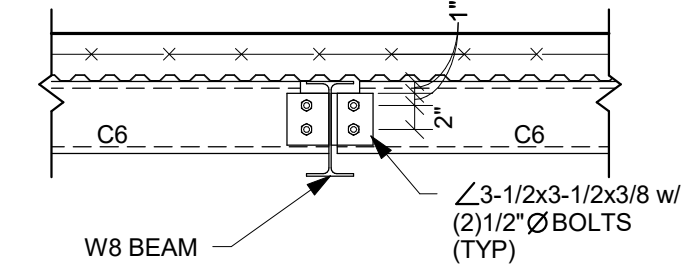
① SECTION  
3/4" = 1'-0"



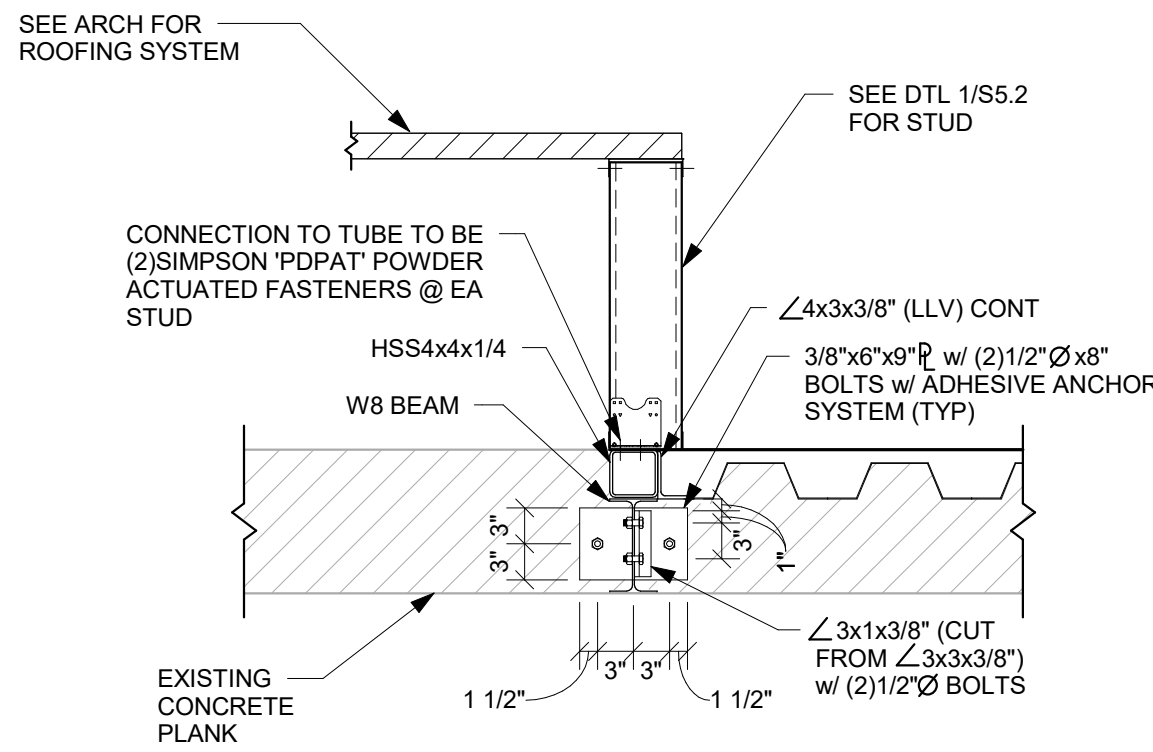
② SECTION  
3/4" = 1'-0"



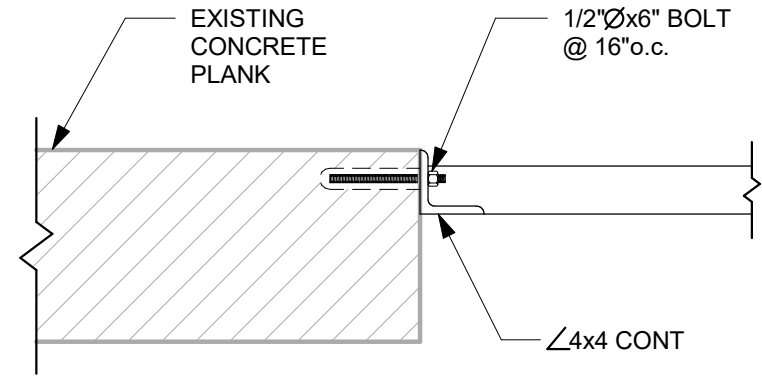
③ SECTION  
3/4" = 1'-0"



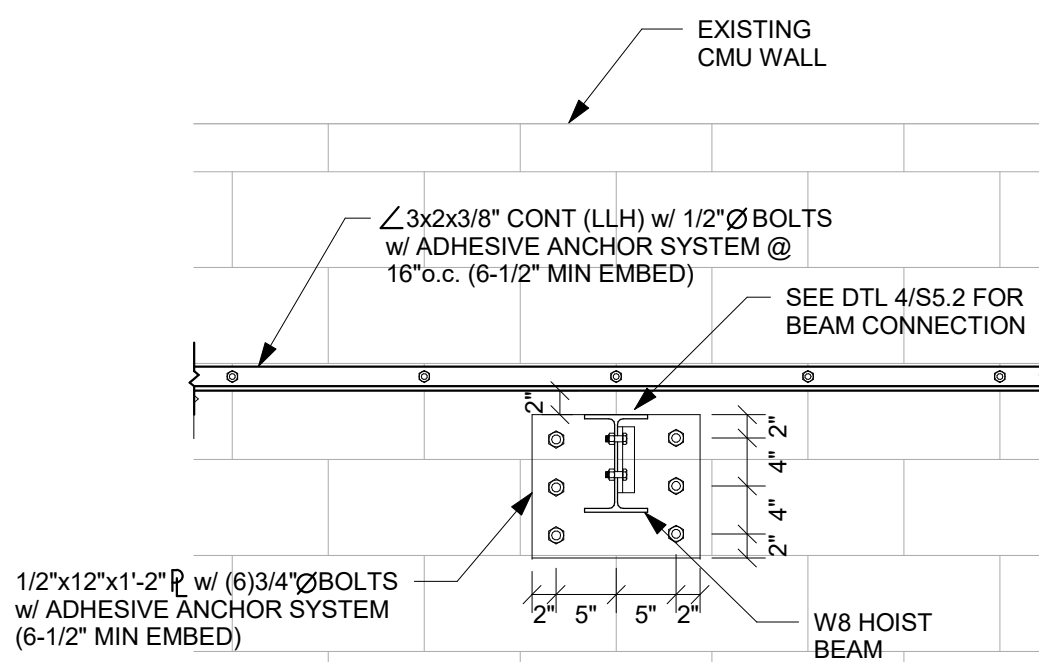
④ SECTION  
3/4" = 1'-0"



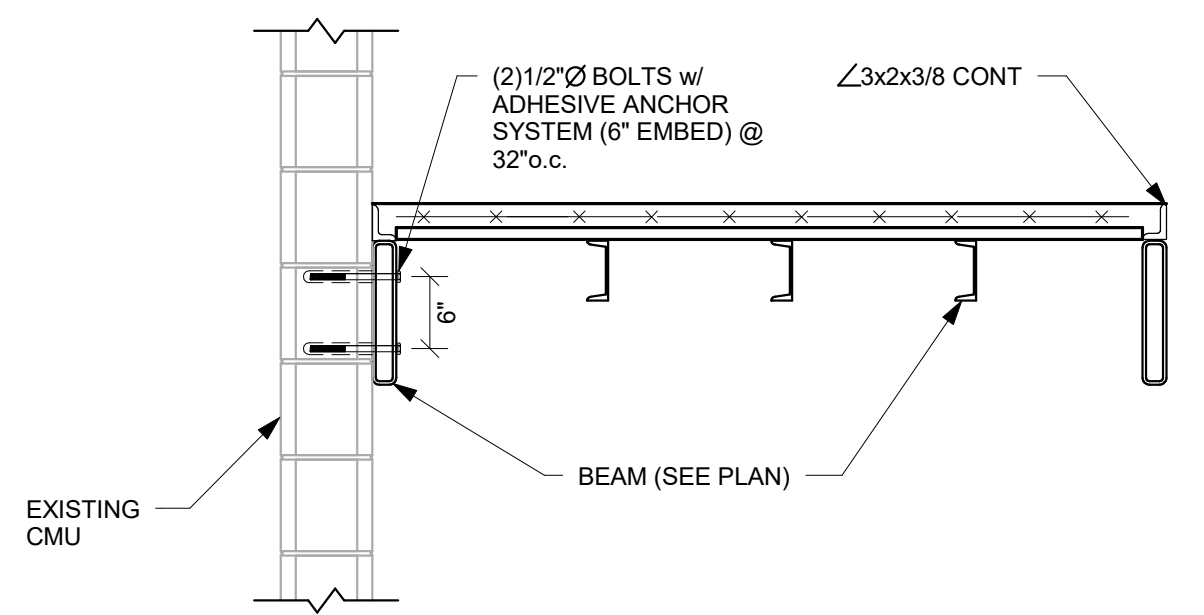
⑤ SECTION  
3/4" = 1'-0"



⑥ SECTION  
1" = 1'-0"

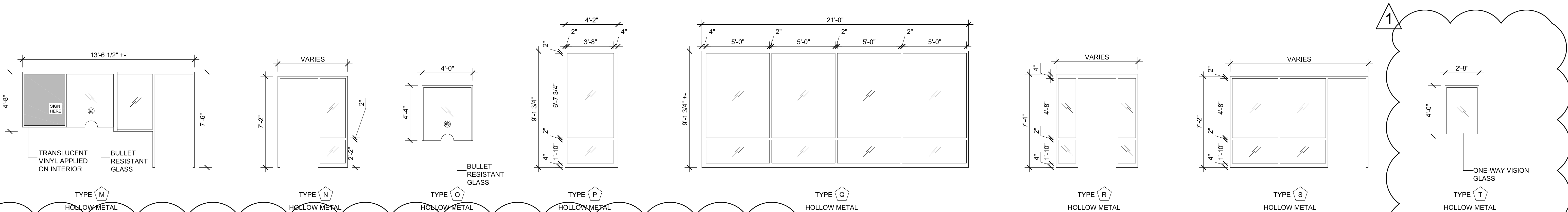
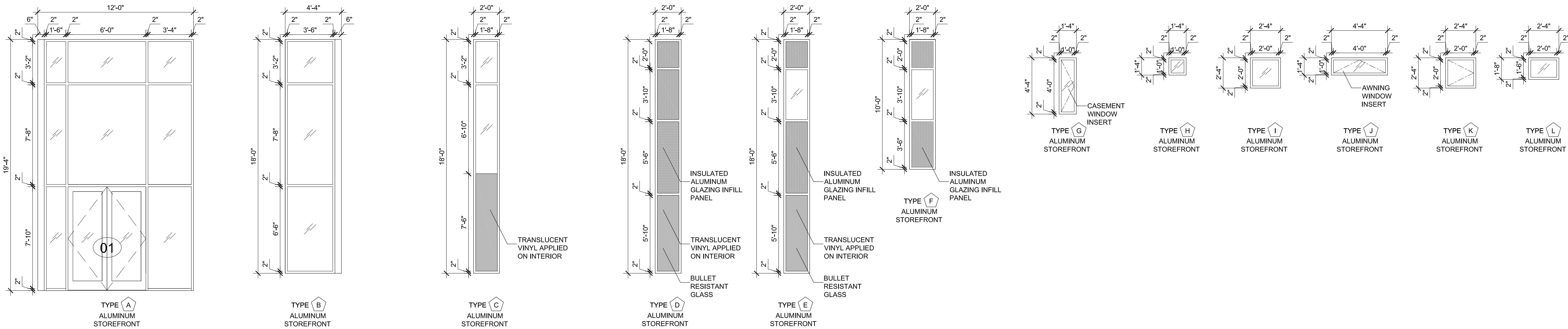


⑦ SECTION  
3/4" = 1'-0"



⑧ SECTION  
3/4" = 1'-0"





WINDOW SCHEDULE

GLAZING TYPE  
TYPE 1 - PLATE GLASS  
TYPE 2 - PLATE GLASS/SECURITY GLAZING  
TYPE 3 - ONE-WAY VISION GLASS  
TYPE 4 - 1" INSULATED GLASS  
TYPE 5 - BULLET RESISTANT 1-1/4" INSULATED GLASS  
TYPE 6 - 1" INSULATED ALUMINUM GLAZING INFILL PANEL

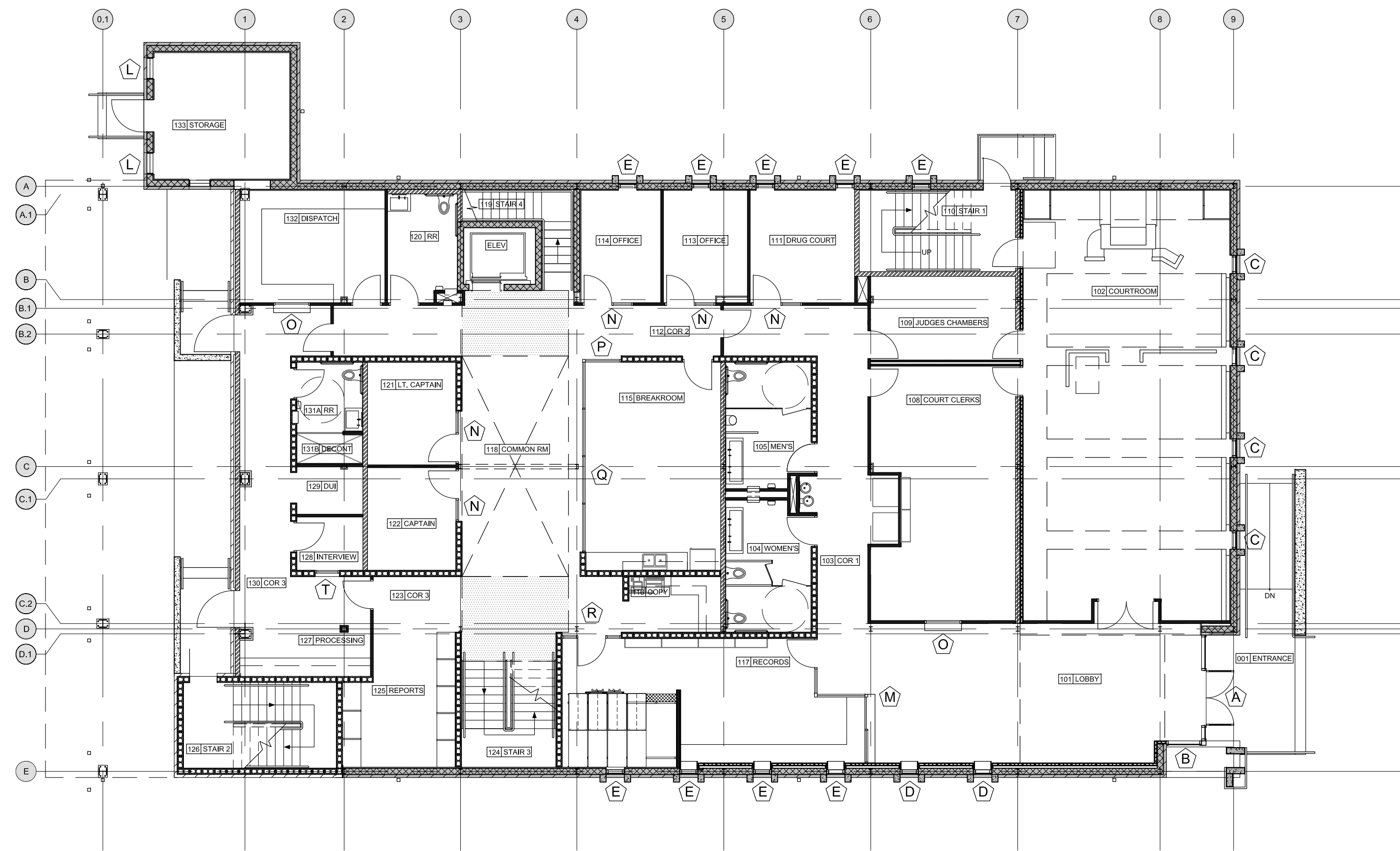
| WINDOW TYPE | MTL.  | WINDOW SIZE     |               | MANUFACTURER/FINISH | REMARKS                                                                            | GLAZ. TYPE |
|-------------|-------|-----------------|---------------|---------------------|------------------------------------------------------------------------------------|------------|
|             |       | W               | H             |                     |                                                                                    |            |
| A           | ALUM. | 12'-0"          | 19'-4"        | EF                  | INSERT DOOR 01                                                                     | 1          |
| B           | ALUM. | 4'-4"           | 18'-0"        | EF                  |                                                                                    | 1          |
| C           | ALUM. | 2'-0"           | 18'-0"        | EF                  | TRANSLUCENT VINYL APPLIED ON INTERIOR                                              | 1          |
| D           | ALUM. | 2'-0"           | 18'-0"        | EF                  | TRANSLUCENT VINYL APPLIED ON INTERIOR.<br>BULLET RESISTANT GLASS FIRST FLOOR ONLY. | 5 & 6      |
| E           | ALUM. | 2'-0"           | 18'-0"        | EF                  | TRANSLUCENT VINYL APPLIED ON INTERIOR.<br>BULLET RESISTANT GLASS FIRST FLOOR ONLY. | 4, 5 & 6   |
| F           | ALUM. | 2'-0"           | 10'-0"        | EF                  |                                                                                    | 4 & 6      |
| G           | ALUM. | 1'-4"           | 4'-4"         | EF                  | CASEMENT WINDOW INSERT                                                             | 1          |
| H           | ALUM. | 1'-4"           | 1'-4"         | EF                  |                                                                                    | 1          |
| I           | ALUM. | 2'-4"           | 2'-4"         | EF                  |                                                                                    | 1          |
| J           | ALUM. | 4'-4"           | 1'-4"         | EF                  | AWNING WINDOW INSERT                                                               | 1          |
| K           | ALUM. | 2'-4"           | 2'-4"         | EF                  | CASEMENT WINDOW INSERT                                                             | 1          |
| L           | ALUM. | 2'-4"           | 1'-8"         | EF                  |                                                                                    | 1          |
| M           | HM    | 13'-6 1/2" +/-  | VARIES        | HM, PTD.            | TRANSLUCENT VINYL APPLIED ON INTERIOR                                              | 2          |
| N           | HM    | VARIES          | 7'-2"         | HM, PTD.            |                                                                                    | 1          |
| O           | HM    | 4'-0"           | 4'-4"         | HM, PTD.            | 4" DIAMETER TALK THRU                                                              | 2          |
| P           | HM    | 4'-2"           | 9'-1 3/4" +/- | HM, PTD.            |                                                                                    | 1          |
| Q           | HM    | 21'-0"          | 9'-1 3/4" +/- | HM, PTD.            |                                                                                    | 1          |
| R           | HM    | 6'-5 5/16" +/-  | 7'-4"         | HM, PTD.            |                                                                                    | 1          |
| S           | HM    | 10'-10 3/8" +/- | 7'-2"         | HM, PTD.            |                                                                                    | 1          |
| T           | HM    | 2'-8"           | 4'-0"         | HM, PTD.            | ONE-WAY VISION GLASS. MIRROR COATING ON INTERIOR RM 128 INTERVIEW.                 | 3          |



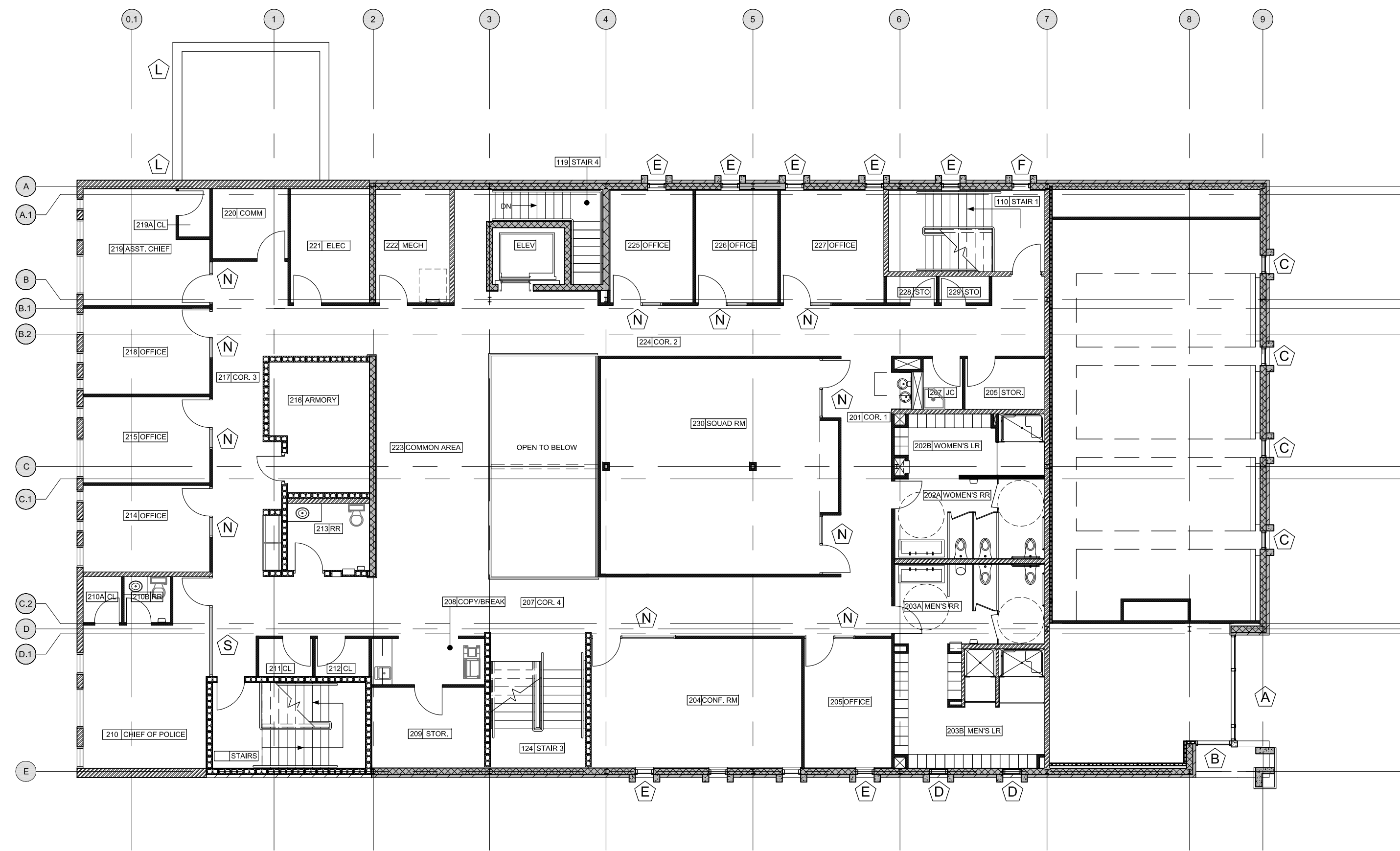
| REVISIONS |  | DATE       | DESCRIPTION |
|-----------|--|------------|-------------|
| NO.       |  |            | ADDENDUM #  |
| 1         |  | 05.05.2016 |             |

|                     |     |    |
|---------------------|-----|----|
| DATE: 03.30.2016    | LAB | JB |
| REVISIONS: 05.05.16 |     |    |
| DRAWN BY:           |     |    |
| CHECKED BY:         |     |    |

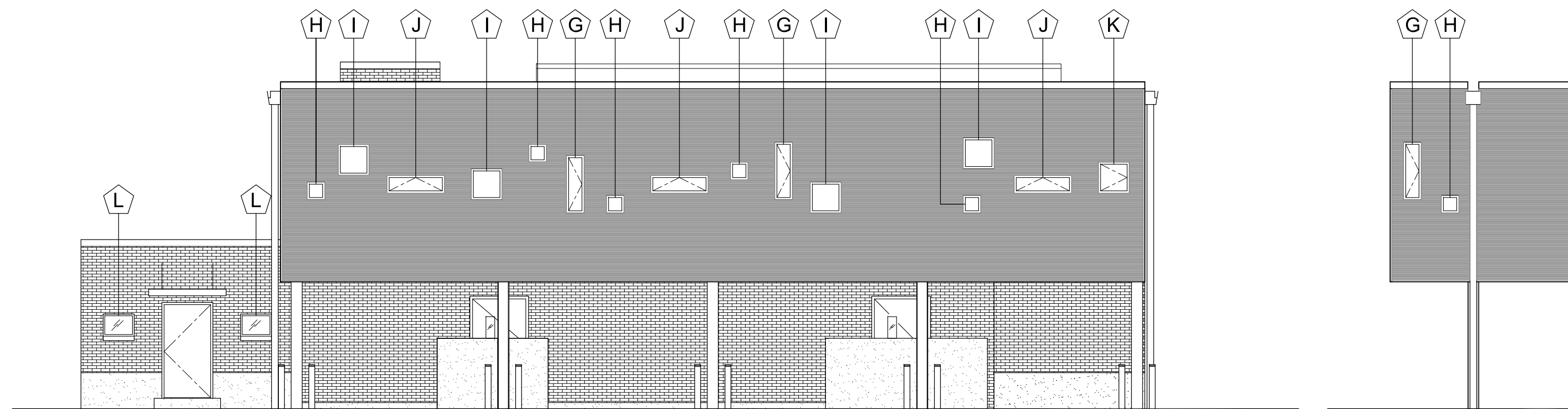




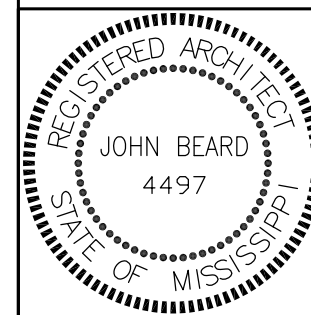
1 FIRST FLOOR - WINDOW TYPES  
scale: 3/32"= 1' - 0"



2 SECOND FLOOR - WINDOW TYPES  
scale: 3/32"= 1' - 0"



3 ELEVATION @ REAR ADDITION - WINDOW TYPES  
scale: 1/8"= 1' - 0"



| REVISIONS |  | DATE       | DESCRIPTION |
|-----------|--|------------|-------------|
| NO.       |  |            |             |
| 1         |  | 05.05.2016 | ADDENDUM #1 |

|                  |                     |
|------------------|---------------------|
| DATE: 03.30.2016 | REVISIONS: 05.05.16 |
| DRAWN BY: LAB    | CHECKED BY: JB      |

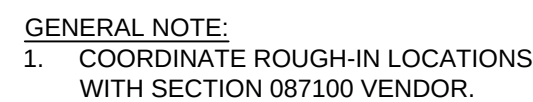
201 MAIN STREET  
GREENWOOD, MS 38930  
[P] 662.455.2581  
www.beardriser.com

**B+R**  
BEARD + RISER  
ARCHITECTS PLLC  
WINDOW TYPE  
DIAGRAMS





Scale: NONE



E4.0 Scale: NONE

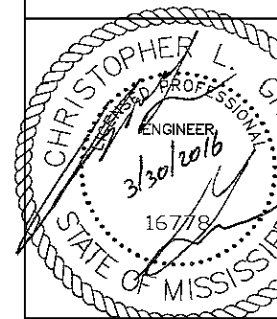
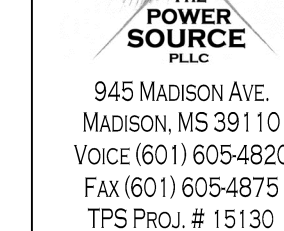


1. R1 IS A FIRE ALARM SYSTEM RELAY. THE COIL VOLTAGE IS BASED ON THE OUTPUT OF THE FIRE ALARM CONTROL PANEL. IT SHALL HAVE NORMALLY OPEN CONTACTS THAT ARE CLOSED BY THE FACP AFTER AN ALARM SIGNAL FROM ONE OF THE THERMAL DETECTORS HAS BEEN RECEIVED AND THE TIME DELAY REQUIRED BY NFPA 72, PARAGRAPH 21.4.3 HAS EXPIRED.
2. R2 SHALL HAVE A 120V COIL. IT SHALL HAVE NORMALLY-CLOSED CONTACTS; HOWEVER, UNDER NORMAL OPERATING CONDITIONS, THE CONTACTS ARE HELD-OPEN WHEN CONTROL VOLTAGE IS PRESENT.

E4.0 Scale: NONE



**GREENWOOD POLICE DEPARTMENT  
AND MUNICIPAL COURT RENOVATIONS**  
CITY OF GREENWOOD  
GREENWOOD, MS



DATE: 3.30.2016  
REVISIONS: 1 4.18.16  
DRAWN BY: SCW  
CHECKED BY: CLG

MECH. CONN  
AUX PLAN

SHEET #:

## E4.C



