NewAtlantic
CONTRACTING, INC.

Building Addendum #3

University of North Carolina at Charlotte
Facilities Operations and Parking Services Complex
Building Phase

Date: 09/20/17

The following items are hereby incorporated into the above referenced Project:

BIDDERS MANUAL

1. **Part 4 – Bidder Package Descriptions:**
    a. BP 2B – Site Fencing
        i. Add "323100 ENCLOSED TRACK INDUSTRIAL ALUMINUM CANTILEVER GATE SYSTEM" dated 09.19.17 to Applicable Specifications
    b. BP 16A – Electrical
        i. Item 8.b. – add bullet "Provide complete working access control system per Access Control General Notes on Sheet E-008. The slide gate operators will be tied into Open Options and will use a contactless reader for entry and will be free-exit. There will also be a contactless card reader on the man-gate. Intercoms will be at both locations as well. Rough-in provisions for possible License Plate Reader are to be included for future installation by owner."
        ii. Add "101723 ACCESS CONTROL SPECIALTIES" dated 09.19.17 to Applicable Specifications

QUESTIONS AND ANSWERS

1	Are Card Readers Owner Furnished and Installed?	Refer to LS3P Addendum No. 6; Item - 5, Item - 38, and Item - 40. BP16A is to furnish and install Access Control System as defined in LS3P Addendum no. 6 (i.e. Access Control General Notes on Sheet E008).
2	SUBSTITUTION REQUEST: I'm hoping to substitute a CTS Tru PC topping for the Ardex PC-T. The product meets requirements and color(grey) and it's more price competitive.	Substitution Request per specification section 012500 required for consideration of alternate products.

3	BP 15B Plumbing- Scope of Work item number 7 lists rainwater collection system. No roof drains are shown on the plumbing drawings. Will any rainwater collection system be required of the Plumbing contractor?	There are no roof drains. Downspouts will be installed by the trade contractor installing the roof. The sitework contractor will connect the downspouts to the yard drainage system.
4	Specification section 083323 subsection 1.8B states that the special finish warranty is for 10 years. 10 year finish warranties are not available on standard overhead coiling doors due to that the slats contact each other during operation as the door coils and uncoils. Please confirm if this requirement can be deleted considering bidders will not be able to comply.	Refer to Specification Section 083323 Article 1.8.B.
5	Specification section 083323 subsection 2.2J, 2.3J, and 2.11-A all list two different finish types with an either or statement on their requirement, “Baked-Enamel or powder-coat finish”. Each of these finishes represents a vastly different price point, with baked enamel providing 3 color options and powder coat between 180 and 200 options. Please confirm if we are to provide baked enamel finish or powder coat finish.	Refer to LS3P Addendum No. 6, Item - 4
6	Specification section 083323 subsection 2.2H and 2.6A list two contradictory types of locking devices. 2.2H requires slide bolt locks whereas 2.6A requires cylinder locks. Please confirm which of the two options we are to provide	Refer to LS3P Addendum No. 6, Item - 4
7	083323 1.8B Finish warranty. Manufacture offer different warranties on powder coating. Maximum warranty is 4 years. Is that acceptable?	Refer to Specification Section 083323 Article 1.8.B
8	083323 2.2H slide bolts locks 2.6A keyed locks. Are either of these required as all the doors are motor operated? If so, which is required? If locks required, how about the use of interlocks?	Refer to LS3P Addendum No. 6, Item - 4
9	Specs 230593 Part 1.2 items A.7 & A.8 indicates Sound & IAQ testing. However, nowhere else in the specs mentioned about this tests.	Refer to LS3P Addendum No. 6, Item - 9
10	Is a trap primer required on the mechanical room floor drains? Schedule says all floor drains but none shown in that area for drains.	Refer to LS3P Addendum No. 6, Item - 32
11	Is a trap primer required for the ice maker floor drains?	All "public access" floor drains designated as "FD1" shall have trap primers, refer to Plumbing Fixture and Equipment Schedule on P-002.
12	To eliminate the above questions can trap guards be used in lieu of the trap primers.	Refer to LS3P Addendum No. 6, Item - 32 . Hose bibbs are also provided at "back of house" areas for trap seal maintenance and general use. Trap guard inserts are not approved for "public" locations designated as "FD1".
13	Can PVC be used for the underground sanitary?	No. Refer to Plumbing Materials and Notes on P-001 and specification section 220503.

14	Can CPVC be used for the underground domestic water at the wash racks	No. Refer to Plumbing Materials and Notes on P-001 and specification section 220503.
15	Can PVC be used for the underground sanitary at the wash racks.	No. Refer to Plumbing Materials and Notes on P-001 and specification section 220503.
16	Please provide information on window treatment location. No window schedule or horizontal blind schedule provided. Please advise.	Refer to LS3P Addendum No. 6, Item - 29
17	133419 - is a 24 ga 24" trapezoidal panel acceptable?	Refer to Specification Section 133419, Article 2.6.
18	133419 - is grey the only acceptable color? This is not a standard color.	Refer to LS3P Addendum No. 4, Item - 8
19	133419 - is a 26 ga thru-fastened wall panel acceptable?	Refer to Specification Section 133419, Article 2.6.
20	133419 - is a 26 ga thru-fastened soffit panel acceptable?	Refer to Specification Section 133419, Article 2.7.
21	Wall section W4 on sheet A-003 indicates “ribbed metal panel” which is a thru-fastened panel. Please clarify.	Refer to LS3P Addendum No. 6, Item - 16
22	At Warehouse building plans call for aluminum downspouts, specs call for steel. Please clarify.	Refer to LS3P Addendum No. 6 and Specification Section 133419 Article 2.9.F.
23	Plans call for aluminum covers at each projecting beam. Is this required?	Refer to LS3P Addendum No. 6, Item - 24 and Item - 27
24	Based on the various "window types" is one blind expected for multiple windows or is a blind a required per window? For example in Type E, should window treatments include transom in each of the five units? Please provide details.	Refer to LS3P Addendum No. 6, Item - 26 and Item - 29
25	The drawings indicate that the floor drains receive trap primers. Would trap guards be acceptable in lieu of trap primers?	Trap guards specified for "back of house" floor drains designated as "FD2", refer to Plumbing Fixture and Equipment Schedule on P-002. Hose bibbs are also provided at "back of house" areas for trap seal maintenance and general use. Trap guard inserts are not approved for "public" locations designated as "FD1".
26	Can you provide details on the equipment for the slide gates and fence scope?	Refer to C403, specification section 323119, and LS3P Addendum No. 6, Item - 12
27	Dye for Polished Concrete- The dye makers are specified and a grey is specified on the finish legend, however the particular grey desired is not listed. There are a few different grays that are available; soft grey, medium, dark, charcoal, and many more. Is there a particular grey that is desired? Also, the dye is specified to be waterbased, throughout our experience water based colors are not as	Refer to LS3P Addendum No. 6, Item - 3

	vibrant as acetone based dyes. Will acetone based dye be accepted or must it be waterbased.	
28	The specs cal for ArdeX PC-T and Ardex primer. Would Tru PC and the primer TXP both made by Rapidset be an accepted alternative to the Ardex products?	Substitution Request per specification section 012500 required for consideration of alternate products.
29	Machinery- The spec does not say if propane powered machinery is allowed. Will they be acceptable?	No, unless proper ventilation is provided per OSHA requirements.
30	Polished Concrete - mockups and field samples are typically done on the same poured slab that is to receive polishing. If there are multiple sections/pours that require polishing mockups and field samples are typically required at each location to get true expectation of finished product. Will this be a requirement for the polished concrete on this project?	Refer to Specification Section 033553 Article 1.7 and finish floor plans.
31	Please provide details for the exterior trash receptacle.	Exterior trash receptablces are Owner provided.
32	Please provide schedule/details for residential appliances	Refer to drawings and specification section 113100.
33	BP 16A - #4.h states that the generator is owner furnished, but then says to "Include Fuel Tank." Please clarify who is to furnish what generator related items and provide specifications for any items to be furnished by EC.	Owner furnished generator will have a belly tank.
35	Please provide signage schedule	Not available. Please base bid on speifications, drawings (i.e. A-765), and UNCC Design Guidelines - Annex D - Campus Sign Standards (http://facilities.uncc.edu/our-services/business-related-services/facilities-planning/design-and-construction-manual).

SPECIFICATIONS & DRAWINGS:

See attached **LS3P ADDENDUM NUMBER SIX** dated September 19, 2017**.**

END OF ADDENDUM

ADDENDUM VI

Date of Addendum: 19 September 2017

Project Name: Facilities Operations / Parking Services Complex

Building Package

SCO ID# 16-15656-02B

PROJECT INFORMATION

A. Owner: University of North Carolina at Charlotte.

B. SCO ID Number: 16-15656-02B.

C. Architect: LS3P.

D. Architect Project Number: 9202-164730.

NOTICE TO BIDDERS

A. This Addendum is issued **to all Pre-Qualified Subcontractors** pursuant to the **Instructions to Bidders and Conditions of the Contract**. This Addendum serves to clarify, revise, and supersede information in the Project Manual, Drawings, and previously issued Addenda. Portions of the Addendum affecting the Contract Documents will be incorporated into the Contract by enumeration of the Addendum in the Owner/Contractor Agreement.

B. The Bidder shall acknowledge receipt of this Addendum in the appropriate space on the Bid Form.

C. The date for receipt of bids is **unchanged by this Addendum.**

D. **ADDENDUM I, II, AND III HAVE BEEN ISSUED IN THE EARLY SITE/STRUCTURAL PACKAGE.**

ATTACHMENTS

A. This Addendum includes the following attached Documents and Specification Sections:
1. Document 000010 – Table of Contents, dated September 19, 2017, (reissued).
2. Notice to Bidders, dated September 19, 2017, (reissued).
3. Section 033543 – Polished Concrete Finishing, dated September 19, 2017, (reissued).
4. Section 083323 – Overhead Coiling Doors, dated September 19, 2017, (reissued).
5. Section 087100 – Door Hardware, dated September 19, 2017, (reissued).
6. Section 099113 – Exterior Painting, dated September 19, 2017, (reissued).
7. Section 101723 – Access Control Specialties, dated September 19, 2017, (new).
8. Section 105113 – Metal Lockers, dated September 19, 2017, (reissued).
9. Section 232114 – Underground Pre-Insulated Hydronic Piping, dated September 19, 2017, (reissued).
10. Section 323100 – Enclosed Track Industrial Aluminum Cantilever Gate System, dated September 19, 2017, (new).

B. This Addendum includes the following attached Sheets:
1. General Sheet G-000 – Cover Sheet/Sheet Index, dated 09/19/2017, (reissued).
2. General Sheet G-005 – Life Safety Site Plan, dated 09/19/2017, (reissued).

3. General Sheet G-006 – Office/Shops Life Safety Plan, dated 09/19/2017, (reissued).
4. Architectural Sheet A-101B – Office/Shops Partial Floor Plan – FO, dated 09/19/17, (reissued).
5. Architectural Sheet A-102B – Warehouse Partial Floor Plan - East, dated 09/19/2017, (reissued).
6. Architectural Sheet A-121A – Office/Shops Building RCP - PATS, dated 09/19/2017, (reissued).
7. Architectural Sheet A-121B – Office/Shops Building RCP - FO, dated 09/19/2017, (reissued).
8. Architectural Sheet A-354 – Wall Sectional Elevations & Details – Office / Shops, dated 09/19/2017, (reissued).
9. Architectural Sheet A-420 – Enlarged RCP's and Details, dated 09/19/2017, (reissued).
10. Architectural Sheet A-511 – Section Details (Exterior), dated 09/19/2017, (reissued).
11. Architectural Sheet A-512 – Section Details (Exterior), dated 09/19/2017, (reissued).
12. Architectural Sheet A-551 – Roof Details, dated 09/19/2017, (reissued).
13. Architectural Sheet A-603 – Frame, Louver, and Storefront Elevations, dated 09/19/2017, (reissued).
14. Architectural Sheet A-721A – Office/Shops Partial Finish Floor Plan – PaTS, dated 09/19/2017, (reissued).
15. Architectural Sheet A-721B – Office/Shops Partial Finish Floor Plan – FO, dated 09/19/17, (reissued).
16. Plumbing Sheet P-002 – Plumbing Schedules, dated 09/19/17, (reissued).
17. Plumbing Sheet P-101A – Floor Plan - PATs/FO – Waste and Vent, dated 09/19/17, (reissued).
18. Plumbing Sheet P-201A – Floor Plan - PATs/FO - Water and Gas, dated 09/19/17, (reissued).
19. Mechanical Sheet M-001 – Mechanical Legend, Notes and Schedules, dated 09/19/17, (reissued).
20. Mechanical Sheet M-005 – Mechanical Sequence of Operations, dated 09/19/17, (reissued).
21. Mechanical Sheet M-403 – Enlarged Mechanical Room Details, dated 09/19/17, (reissued).
22. Electrical Sheet E-008 – Electrical Details, dated 09/19/17, (reissued).
23. Electrical Sheet E-009 – Electrical Site Plan – Overall, dated 09/19/17, (reissued).
24. Electrical Sheet E-010 – Electrical Site Plan – Electrical, dated 09/19/17, (reissued).
25. Electrical Sheet E-201A – Reflected Ceiling Plan - PATs/FO - Lighting, dated 09/19/17, (reissued).
26. Electrical Sheet E-501 – Power Riser, dated 09/19/17, (reissued).
27. Electrical Sheet E-602 – Panel Schedules, dated 09/19/17, (reissued).

REVISIONS TO DIVISION 00 PROCUREMENT AND CONTRACTING REQUIREMENTS

Item VI-1. Replace DOCUMENT 000010 – TABLE OF CONTENTS with revised Document, included in the Attachments.

Item VI-2. Replace DOCUMENT - NOTICE TO BIDDERS with revised Document, included in the Attachments.

REVISIONS TO DIVISIONS 02 - 49 SPECIFICATION SECTIONS

Item VI-3. Replace SECTION 033543 – POLISHED CONCRETE FINISHING, with revised Document, included in the Attachments.

Item VI-4. Replace SECTION 083323 – OVERHEAD COILING DOORS, with revised Document, included in the Attachments.

Item VI-5. Replace SECTION 087100 – DOOR HARDWARE, with revised Document, included in the Attachments.

Item VI-6. Replace SECTION 099113 – EXTERIOR PAINTING, with revised Document, included in the Attachments.

Item VI-7. Add SECTION 101723 – ACCESS CONTROL SPECIALTIES, included in the Attachments.

Item VI-8. Replace SECTION 105113 – METAL LOCKERS, with revised Document, included in the Attachments.

Item VI-9. SECTION 230593 – TESTING, ADJUSTING, AND BALANCING FOR HVAC, Article: Make the following revisions:

A. Delete Article 1.2.A.7 in its entirety.
B. Delete Article 1.2.A.8 in its entirety.

Item VI-10. Replace SECTION 232114 – UNDERGROUND PRE-INSULATED HYDRONIC PIPING with revised Document, included in the Attachments

Item VI-11. SECTION 260533 – RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS, Article: Make the following revisions:

A. Article 1.2.H: Revise “Where installing conduit on exterior surface of exterior walls, mount conduit minimum ¼ -inch from wall with clamp-backs or strut.” to read “Where installing conduit on interior surface of exterior walls, mount conduit minimum ¼ -inch from wall with clamp-backs or strut.”

Item VI-12. Add SECTION 323100 – ENCLOSED TRACK INDUSTRIAL ALUMINUM CANTILEVER GATE SYSTEM, included in the Attachments.

REVISIONS TO DRAWING SHEETS

Item VI-13. Replace SHEET G-000 – COVER SHEET/SHEET INDEX with revised Sheet G-000, included in the Attachments.

Item VI-14. Replace SHEET G-005 – LIFE SAFETY SITE PLAN with revised Sheet G-005, included in the Attachments.

Item VI-15. Replace SHEET G-006 – OFFICE/SHOPS LIFE SAFETY PLAN with revised Sheet G-006, included in the Attachments.

Item VI-16. SHEET A-003 – CONSTRUCTION SUBSYSTEMS: Make the following revisions:

A. Exterior Wall Systems, System W4: Revise “RIBBED METAL PANEL / Z-GIRT WALL CONSTRUCTION” to read “METAL PANEL / Z-GIRT WALL CONSTRUCTION”.
B. Exterior Wall Systems, System W4: Revise “12" WIDE VERTICAL ORIENTED RIBBED, NON-INSULATED METAL PANEL” to read “12" WIDE VERTICAL ORIENTED, NON-INSULATED METAL PANEL”

Item VI-17. Replace SHEET A-101B - OFFICE/SHOPS PARTIAL FLOOR PLAN - FO, with revised Sheet A-101B, included in the Attachments.

Item VI-18. Replace SHEET A-102B – WAREHOUSE PARTIAL FLOOR PLAN – EAST with revised Sheet A-102B, included in the Attachments.

Item VI-19. Replace SHEET A-121A – OFFICE/SHOPS BUILDING RCP – PATS with revised Sheet A-121A, included in the Attachments.

Item VI-20. Replace SHEET A-121B – OFFICE/SHOPS BUILDING RCP – FO with revised Sheet A-121B, included in the Attachments.

Item VI-21. SHEET A-201 – EXTERIOR ELEVATIONS - OFFICE/SHOPS BUILDING: Make the following revisions:

A. Elevation Keyed Notes, Note 11: Revise “6 1/2" W x 5" H ALUMINUM GUTTER, PREFINISHED” to read “6 1/2" W x 5" H METAL GUTTER, PREFINISHED”.
B. Elevation Keyed Notes, Note 12: Revise “2 3/4" x 4 1/4" ALUMINUM DOWNSPOUT, PREFINISHED” to read “2 3/4" x 4 1/4" METAL DOWNSPOUT, PREFINISHED”.
C. Elevation Keyed Notes, Note 21: Revise “PREFINISHED ALUMINUM FASCIA AND, VENTED SOFFIT” to read “PREFINISHED METAL FASCIA AND VENTED SOFFIT”.

Item VI-22. SHEET A-202 – EXTERIOR ELEVATIONS - WAREHOUSE AND GAS STORAGE BUILDING: Make the following revisions:

A. Elevation Keyed Notes, Note 11: Revise “6 1/2" W x 5" H ALUMINUM GUTTER, PREFINISHED” to read “6 1/2" W x 5" H METAL GUTTER, PREFINISHED”.
B. Elevation Keyed Notes, Note 12: Revise “2 3/4" x 4 1/4" ALUMINUM DOWNSPOUT, PREFINISHED” to read “2 3/4" x 4 1/4" METAL DOWNSPOUT, PREFINISHED”.
C. Elevation Keyed Notes, Note 21: Revise “PREFINISHED ALUMINUM FASCIA AND, VENTED SOFFIT” to read “PREFINISHED METAL FASCIA AND VENTED SOFFIT”.

Item VI-23. SHEET A-353 – EXTERIOR ELEVATIONS - WAREHOUSE AND GAS STORAGE BUILDING: Make the following revisions:

A. Detail A4, revise “ALUM SOFFIT BY PEMB MANUF, COLOR TO MATCH GUTTER” to read “METAL SOFFIT BY PEMB MANUF, COLOR TO MATCH GUTTER”.
B. Detail A4, revise “6 1/2" W X 5" H PREFINISHED ALUM GUTTER BY PEMB MANF.” to read “6 1/2" W X 5" H PREFINISHED METAL GUTTER BY PEMB MANF.”.
C. Detail A5, revise “6 1/2" W X 5" H PREFINISHED ALUM GUTTER BY PEMB MANF.” to read “6 1/2" W X 5" H PREFINISHED METAL GUTTER BY PEMB MANF.”.

Item VI-24. Replace SHEET A-354 – WALL SECTIONAL ELEVATIONS & DETAILS - OFFICE / SHOPS with revised Sheet A-354, included in the Attachments.

Item VI-25. Replace SHEET A-420 – ENLARGED RCP'S AND DETAILS with revised Sheet A-420, included in the Attachments.

Item VI-26. Replace SHEET A-511 – SECTION DETAILS (EXTERIOR) with revised Sheet A-511, included in the Attachments.

Item VI-27. Replace SHEET A-512 – SECTION DETAILS (EXTERIOR) with revised Sheet A-512, included in the Attachments.

Item VI-28. Replace SHEET A-551 – ROOF DETAILS with revised Sheet A-551, included in the Attachments.

Item VI-29. Replace SHEET A-603 – FRAME, LOUVER, AND STOREFRONT ELEVATIONS with revised Sheet A-603, included in the Attachments.

Item VI-30. Replace SHEET A-721A – OFFICE/SHOPS PARTIAL FINISH FLOOR PLAN – PATS with revised Sheet A-721A, included in the Attachments.

Item VI-31. Replace SHEET A-721B – OFFICE/SHOPS PARTIAL FINISH FLOOR PLAN - FO with revised Sheet A-721B, included in the Attachments.

Item VI-32. Replace SHEET P-002 – PLUMBING SCHEDULES with revised Sheet P-002, included in the Attachments.

Item VI-33. Replace SHEET P-101A – FLOOR PLAN - PATS/FO – WASTE AND VENT with revised Sheet P-101A, included in the Attachments.

Item VI-34. Replace SHEET P-201A – FLOOR PLAN - PATS/FO - WATER AND GAS with revised Sheet P-201A, included in the Attachments.

Item VI-35. Replace SHEET M-001 – MECHANICAL LEGEND, NOTES AND SCHEDULES with revised Sheet M-001, included in the Attachments.

Item VI-36. Replace SHEET M-005 – MECHANICAL SEQUENCE OF OPERATIONS with revised Sheet M-005, included in the Attachments.

Item VI-37. Replace SHEET M-403 – ENLARGED MECHANICAL ROOM DETAILS with revised Sheet M-403, included in the Attachments.

Item VI-38. Replace SHEET E-008 – ELECTRICAL DETAILS with revised Sheet E-008, included in the Attachments.

Item VI-39. Replace SHEET E-009 – ELECTRICAL SITE PLAN - OVERALL with revised Sheet E-009, included in the Attachments.

Item VI-40. Replace SHEET E-010 – ELECTRICAL SITE PLAN - ELECTRICAL with revised Sheet E-010, included in the Attachments.

Item VI-41. Replace SHEET E-201A – REFLECTED CEILING PLAN - PATS/FO - LIGHTING with revised Sheet E-201A, included in the Attachments.

Item VI-42. Replace SHEET E-501 – POWER RISER with revised Sheet E-501, included in the Attachments.

Item VI-43. Replace SHEET E-602 – PANEL SCHEDULES with revised Sheet E-602, included in the Attachments.

END OF ADDENDUM VI

TABLE OF CONTENTS
FOR

FACILITIES OPERATIONS / PARKING SERVICES COMPLEX

UNC CHARLOTTE

CHARLOTTE, NORTH CAROLINA

(*Sections listed in *ITALICS* are included for Reference Only)

VOLUME ONE

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

DIVISION 01 – GENERAL REQUIREMENTS

VOLUME TWO

END OF TABLE OF CONTENTS

N O T I C E TO B I D D E R S

New Atlantic Contracting, Construction Manager, will accept sealed bids for UNC Charlotte, Facilities Operations and Parking Services (FOPS) Complex project from Pre-Qualified 1st Tier Trade Contractors.

Sealed proposals will be received at the ~~Cone University Center Building, Lucas Room 341, (#5 on the campus map~~ **Student Union Building, Room 200 (#69 on the campus map)** - http://facilities.uncc.edu/maps - (visitor parking available in **Union Deck &** Cone Deck 1 & 2) on the University of North Carolina at Charlotte Campus, Charlotte, North Carolina on ~~Tuesday, September 19, 2017 at 2:00pm and 3:00pm~~ **Wednesday, September 27, 2017 at 2:00pm**, and immediately thereafter publicly opened and read for the furnishing of labor, material and equipment entering into the construction of:

University of North Carolina at Charlotte
Facilities Operations and Parking Services (FOPS) Complex
Building Phase

Bids will be received from Prequalified 1st Tier Trade Contractors for the following bid packages. All proposals shall be lump sum.

2B	SITE FENCING
3B	POLISHED CONCRETE
4A	MASONRY
6A	ARCHITECTURAL CASEWORK & COUNTERTOPS
7A	WATERPROOFING / AIR BARRIER / JOINT SEALANTS
7B	ROOFING & GUTTERS
8A	DOORS, FRAMES, & HARDWARE
8B	OVERHEAD DOORS & LOADING DOCK EQUIPMENT
8C	STOREFRONT / GLASS & GLAZING
9A	GYPSUM BOARD ASSEMBLIES
9B	ACOUSTICAL CEILINGS
9C	TILE
9D	FLOORING (CARPET & RESILIENT)
9E	PAINTING
10A	SPECIALTIES (TOILET ACCESSORIES & PARTITIONS, FEC, APPLIANCES)
10B	SIGNAGE
10C	METAL LOCKERS
12A	WINDOW TREATMENTS
13A	PRE-ENGINEERED BUILDINGS
15A	FIRE PROTECTION
15B	PLUMBING
15C	HVAC
16A	ELECTRICAL

Pre-Bid Meeting

An open pre-bid meeting will be held for all interested bidders on Tuesday, August 29, 2017 at 10:30am. The meeting will address project specific questions, issues, bidding procedures and bid forms. The meeting will be held at the Cone Center, Room 111, on the University of North Carolina at Charlotte Campus. The Pre-Bid Meeting is not mandatory but bidders are encouraged to attend.

The meeting is also to identify preferred brand alternates and their performance standards that the owner will consider for approval on this project.

Per G.S. 133-3, on Tuesday, August 29, 2017 at 10:30am UNC Charlotte would like to hereby serve public notice of formal notification of preferred brand alternates. Any and all persons shall use this time to state concerns or reservation of any preferred alternates.

- **Door Hardware** - Provide Schlage Locksets, (no substitutions) as described in Specification Section 087100.
- **Fire Alarm** – Provide Simplex Fire Detection Systems, (no substitutions) as described in Specification Section 283111.
- **Access Control** – Provide Open Option Systems, (no substitutions) as described in Specification Section 281300
- **Unit Masonry** – Provide Hanson Brick, "Morrocroft Special" brick (no substitutions), as described in Specification Section 042000
- **Unit Pavers** – Provide Pine Hall, English Edge Pavers, (no substitutions) as described in Specification Section 321400.

Justification of any approvals will be made available to the public in writing no later than seven (7) days prior to bid date.

Complete plans, specifications and contract documents will be open for inspection at:

1. Construction Manager - New Atlantic Contracting, Inc., 2635 Reynolda Rd, Winston-Salem, NC 27106, Phone: (336) 759-7440.
2. Designer – LS3P, 227 W Trade Street, Suite 700, Charlotte, NC 28208, Phone: (704) 371-7845
3. Owner – UNC Charlotte, Facilities Management/Police Building, 2nd floor – Capital Projects, 9151 Cameron Blvd, Charlotte, NC 28223, Phone: (704) 687-0615

Digital copies of the plans, specifications and contract documents are available at the following;

1. New Atlantic Contracting website – www.new-atlantic.net
   a. Click "Subcontractor Portal" – open the "Estimating" folder
2. Construct Connect at content@constructconnect.com, (800) 364-2059
3. North Carolina Offices of Dodge Data & Analytics – (800) 393-6343 – http://dodgeprojects.construction.com/
4. Metrolina Minority Contractors Association (MMCA) – mmca@mmcaofcharlotte.org, (877) 526-6205

Please contact Grady Dwiggins with New Atlantic Contracting if you need any assistance accessing New Atlantic's on-line plan room.

NOTE: The bidder shall include with the bid proposal the form *Identification of Minority Business Participation* identifying the minority business participation it will use on the project and shall include either *Affidavit **A*** or *Affidavit **B*** as applicable. Forms and instructions are included within the Proposal Form in the bid documents. Failure to complete these forms is grounds for rejection of the bid. (GS143-128.2c Effective 1/1/2002.)

All contractors are hereby notified that they must have proper license as required under the state laws governing their respective trades.

~~General contractors are notified that Chapter 87, Article 1, General Statutes of North Carolina, will be observed in receiving and awarding general contracts. General contractors submitting bids on this project must have license classification for Buildings.~~

> ~~NOTE--SINGLE PRIME CONTRACTS: Under GS 87-1, a contractor that superintends or manages construction of any building, highway, public utility, grading, structure or improvement shall be deemed a "general contractor" and shall be so licensed. Therefore a single prime project that involves other trades will require the single prime contractor to hold a proper General Contractors license.~~

Unless otherwise noted, each proposal shall be accompanied by a cash deposit or a certified check drawn on some bank or trust company, insured by the Federal Deposit Insurance Corporation, of an amount equal to not less than five percent (5%) of the proposal, or in lieu thereof a bidder may offer a bid bond of five percent (5%) of the bid executed by a surety company licensed under the laws of North Carolina to execute the contract in accordance with the bid bond. Said deposit shall be retained by the owner as liquidated damages in event of failure of the successful bidder to execute the contract within ten days after the award or to give satisfactory surety as required by law.

~~Bid, Payment and Performance bonds are waived for trade packages under $500,000 with the exception of the building envelope Trade Packages. If submitting on multiple trade packages and the aggregate of the packages meets or exceeds $500,000, a Bid, Payment and Performance bond will be required for each trade package.~~

Payment will be made based on ninety-five percent (95%) of monthly estimates and final payment made upon completion and acceptance of work.

No bid may be withdrawn after the scheduled closing time for the receipt of bids for a period of 30 days.

The owner reserves the right to reject any or all bids and to waive informalities.

Please direct all bid questions to New Atlantic Contracting for further collaboration with the Design Team.

New Atlantic Contracting
2635 Reynolda Road, Winston-Salem, NC 27106.
Bid Questions shall be directed to Grady Dwiggins
Email: gdwiggins@new-atlantic.net

Bidders who will not attend the Bid Opening need to ensure their sealed bids are delivered no later than **1:00 p.m.** ~~September 19, 2017~~ **September 27, 2017** to the following:

Mailed Bids:
Attn: Ms. Joyce Clay
The University of North Carolina at Charlotte
Facilities Management – Capital Project
9201 University City Boulevard
Charlotte, NC 28223-0001

Or

Hand Delivered:
Attn: Ms. Joyce Clay – 2nd Floor Capital Projects
Facilities Management/Campus Police Building (#55 on the campus map)
9151 Cameron Boulevard

Charlotte, NC 28223
(704) 687-0615

Designer:	Owner:
LS3P	University of North Carolina at Charlotte
227 W Trade Street, Suite 700	9201 University City Boulevard
Charlotte, NC 28202	Charlotte, NC 28223
704-371-7845	704-687-8622

SECTION 033543 - POLISHED CONCRETE FINISHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes polished concrete system, including primer, polished concrete topping, ~~staining~~ and polishing requirements.

1. Concrete for polished concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, initial finishing, and curing is specified in Section 033000 "Cast-in-Place Concrete" and Section 033500 “Concrete Finishes.”
2. Section includes furnishing of all labor, material, equipment, and services necessary for the ~~stain,~~ dry diamond grinding, and polishing of concrete.

1.3 DEFINITIONS

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

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with polished concrete to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.
d. Cast-in-place concrete subcontractor.
e. Polished concrete finishing Subcontractor.

2. Review cold- and hot-weather concreting procedures, curing procedures, concrete finishing, and protection of polished concrete.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include product data for each grinding machine, including all types of grinding heads, dust extraction system, joint fillers, concrete densifying impregnators, penetrating sealer, and any other chemicals used in the process.

B. Polishing Schedule: Submit plan showing polished concrete surfaces and schedule of polishing operations for each area of polished concrete before start of polishing operations. Include locations of all joints, including construction joints.

C. Samples for Verification: For each type of exposed color.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

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

1. Polished concrete topping.
~~2. Stain materials.~~
3. Epoxy primer.
4. Repair materials.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Installer shall have experience in the ~~staining,~~ grinding, and polishing of concrete flooring similar to the scope of work in the Project and for at least 3 years and written documentation of successful installations.

B. Coefficient of Friction: Achieve following coefficient of friction by field quality control testing in accordance to the following standards:

1. ANSI B101.1 Static Coefficient of Friction - Achieve a minimum of .42 for level floor surfaces.

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

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

D. Mockups: Before casting concrete, build mockups to verify selections made under Sample submittals and to demonstrate typical joints, surface finish, tolerances, and standard of workmanship. Build mockups to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
2. Demonstrate curing, finishing, and protecting of polished concrete.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Final Acceptance.

1.8 FIELD CONDITIONS

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

PART 2 - PRODUCTS

2.1 CONCRETE DENSIFIER

A. Liquid Densifier: An aqueous solution of silicon dioxide dissolved in lithium silicate that penetrates into the concrete surface and reacts with the calcium hydroxide to provide a permanent chemical reaction that hardens and densifies the wear surface of the cementitious portion of the concrete.

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

a. ARDEX Americas (Basis-of-Design).
1) Product: ARDEX PC 10.
b. Ameripolish
c. Increte Systems, Inc.
d. Laticrete International, Inc.
e. PROSOCO, Inc.
f. QC Construction Products.
g. Scofield, L.M. Company.

2.2 POLISHED CONCRETE TOPPING

A. Polished Concrete Topping: Portland-cement-based, self-leveling topping suitable to receive mechanical polishing.

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

a. ARDEX Engineered Cements (Basis-of-Design).

1) Product: ARDEX PC-T Polished Concrete Topping.
b. Ameripolish.
c. Increte Systems Inc.
d. Laticrete International, Inc.
e. PROSOCO, Inc.
f. QC Construction Products.
g. Scofield, L. M. Company.

B. Primer: Two-component, 100% solids epoxy resin primer for use with polished concrete topping.
a. ARDEX Engineered Cements (Basis-of-Design).
1) Product: ARDEX EP 2000.
b. Ameripolish.
c. Increte Systems Inc.
d. Laticrete International, Inc.
e. PROSOCO, Inc.
f. QC Construction Products.
g. Scofield, L. M. Company.

~~2.3 STAIN MATERIALS~~

~~A. Penetrating Stain: Water-based, acrylic latex, penetrating stain with colorfast pigments.~~

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

~~a. Ameripolish.~~
~~b. Bomanite Co.~~
~~c. Butterfield Color.~~
~~d. Increte Systems Inc.~~
~~e. PROSOCO, Inc.~~
~~f. QC Construction Products.~~
~~g. Scofield, L.M. Company.~~

~~B. Color: As indicated in Room Finish Legend on Drawings.~~

2.4 LIQUID FLOOR TREATMENTS

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

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

a. ARDEX Americas (Basis-of-Design).
1) Product: ARDEX PC Finish Stain & Wear Protection.
b. Ameripolish

c. Increte Systems, Inc.
d. Laticrete International, Inc.
e. PROSOCO, Inc.
f. QC Construction Products.
g. Scofield, L.M. Company.

2.5 CONCRETE POLISHING EQUIPMENT AND TOOLS

A. Equipment and Tooling: For use as part of multi-step dry mechanical process and accessories.

1. Planetary Grinder and Polisher: Large platform, 32-inch wide planetary floor polisher with head pressure of 600 lbs.
2. Grinding Heads:

    a. Metal Bonded Diamonds: 60-80 grit of medium bonded metal.
    b. Transitional Diamonds: Ceramic, flat block resin bonded: 100 grit.
    c. Resin Bonded Diamonds: 200, 400 and higher grit, as required.

3. Micro Polisher (Burnishing Equipment): High speed walk-behind, or ride-on machines capable of generating 1000 to 2000 revolutions per minute and with sufficient head pressure of not less than 20 lbs. to raise floor temperature by 20 degrees F.

    a. Specific weight and RPM are required to reach temperature of 100 deg F for application of polish finish.
    b. Required Tooling: Diamond impregnated; 400, 800, 1500, 3000 grit as required.
4. Edge Grinding and Polishing Equipment: Hand-held or walk-behind machines which produces same results, without noticeable differences, as large planetary grinder and polisher.
5. Dust Extraction System: All grinding and polishing completed with grinder and polisher equipment shall be connected to a dust collector.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Acceptance of Surfaces and Conditions:

1. Examine substrates to be polished for compliance with requirements and other conditions affecting performance.
2. Concrete Finished Floor Flatness according to applicable Division 03 Concrete sections.
3. Concrete curing methods according to applicable Division 03 Concrete sections.
4. Concrete Compression strength per according to applicable Division 03 Concrete sections.

A. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents.

B. Starting work within a particular area will be construed as acceptance of surface conditions.

3.2 PREPARATION

A. Cleaning New Concrete Surfaces:

1. Prepare and clean concrete surfaces.
2. Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, paint splatter, and other contaminants incompatible with liquid applied products and polishing.

~~3.3 STAINING~~

~~A. Newly placed concrete shall be at least 30 days old before staining.~~

~~B. Prepare surfaces to receive staining according to manufacturer's written instructions and as follows:~~

~~1. Clean concrete thoroughly by scraping, applying solvents or stripping agents, sweeping and pressure washing, or scrubbing with a rotary floor machine and detergents recommended by stain manufacturer. Rinse until water is clear and allow surface to dry.~~

~~a. Do not use acidic solutions to clean surfaces.~~

~~2. Test surfaces with droplets of water. If water beads and does not penetrate surface, or penetrates only in some areas, profile surfaces by grinding, sanding, or abrasive blasting. Retest and continue profiling surface until water droplets immediately darken and uniformly penetrate concrete surfaces.~~
~~3. Apply acidic solution to dampened concrete surfaces, scrubbing with uncolored, acid-resistant nylon bristle brushes until bubbling stops and concrete surface has texture of 120 grit sandpaper. Do not allow solution to dry on concrete surfaces. Rinse until water is clear. Control, collect, and legally dispose of runoff.~~
~~4. Neutralize concrete surfaces and rinse until water is clear. Test surface for residue with clean white cloth. Test surface according to ASTM F 710 to ensure pH is between 7 and 8.~~

~~C. Allow concrete surface to dry before applying stain. Verify readiness of concrete to receive stain according to ASTM D 4263 by tightly taping 18 by 18 inch, 4 mil thick polyethylene sheet to a representative area of concrete surface. Apply stain only if no evidence of moisture has accumulated under sheet after 16 hours.~~

~~D. Penetrating Stain: Apply penetrating stain to concrete surfaces according to manufacturer's written instructions and as follows:~~

~~1. Apply first coat of stain to dry, clean surfaces by airless sprayer or by high volume, low-pressure sprayer.~~
~~2. Allow to dry four hours and repeat application of stain in sufficient quantity to obtain color consistent with approved mockup.~~

~~3. Rinse until water is clear. Control, collect, and legally dispose of runoff.~~

3.4 POLISHING

A. Polish: Level 2 Satin/Matte; Low sheen, 400 grit.

B. Aggregate Exposure: Class B Fine Aggregate (salt and pepper).

C. Apply polished concrete finish system to cured and prepared slabs to match accepted mockup.

1. Machine grind floor surfaces to receive polished finishes level and smooth and to depth required to reveal aggregate to match approved mockup.
~~2. Apply reactive stain for polished concrete in polishing sequence and according to manufacturer's written instructions.~~
3. Apply penetrating liquid floor treatment for polished concrete in polishing sequence and according to manufacturer's written instructions, allowing recommended drying time between successive coats.
~~4. Apply penetrating stain for polished concrete in polishing sequence and according to manufacturer's written instructions.~~
5. Continue polishing with progressively finer-grit diamond polishing pads to gloss level, to match approved mockup.
6. Control and dispose of waste products produced by grinding and polishing operations.
7. Neutralize and clean polished floor surfaces.

END OF SECTION 033543

SECTION 083323 - OVERHEAD COILING DOORS

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. Insulated Service doors.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for miscellaneous steel supports.

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design overhead coiling doors, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance, Exterior Doors: Capable of withstanding the design wind loads.

1. Design Wind Load: As indicated on Drawings.
2. Deflection Limits: Design overhead coiling doors to withstand design wind load without evidencing permanent deformation or disengagement of door components.

C. Operation Cycles: Provide overhead coiling door components and operators capable of operating for not less than number of cycles indicated for each door. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

1.4 ACTION SUBMITTALS

A. Product Data: For each type and size of overhead coiling door and accessory.

1. Include construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

1. Include plans, elevations, sections, and mounting details.
2. Include details of equipment assemblies, and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
4. For exterior components, include details of provisions for assembly expansion and contraction and for excluding and draining moisture to the exterior.
5. Show locations of controls, locking devices, and other accessories.

C. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.

1. Include similar Samples of accessories involving color selection.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For overhead coiling doors to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum of ten (10) years experience in producing rolling doors of the type specified.

B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

1. Installer shall provide evidence of at least five (5) years experience with a minimum of three (3) projects of equivalent size and scope within the last two (2) years, and have the manufacturer’s approval.
2. Manufacturers’ or installers’ logos, decals, or signs shall not be allowed to be applied to automatic door operators.

C. Source Limitations: Obtain overhead coiling doors from single source from single manufacturer.

D. Regulatory Requirements: Comply with applicable provisions in ICC/ANSI A117.1.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of coiling doors that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures including, but not limited to, excessive deflection.
      b. Faulty operation of hardware.
      c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use, rust through.
      d. Delamination of exterior or interior facing materials.
   2. Warranty Period: Five years from date of Final Acceptance.

B. Special Finish Warranty: Manufacturer's standard from in which manufacturer agrees to repair or replace components that show evidence of deterioration of factory applied finishes within specified warranty period.
   1. Warranty Period: 10 years from date of Final Acceptance.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. General: Manufacturers' or installers' logos, decals, or signs shall not be allowed to be applied to automatic door operators.

B. Manufacturers: Subject to compliance with requirements, provide products approved by Architect by one of the following:
   1. Cornell Iron Works, Inc.
   2. Cookson Company (The).
   3. McKeon Door Company.
   4. Overhead Door Corporation.

2.2 DOOR ASSEMBLY

A. Insulated Service Door: Overhead coiling door formed with curtain of interlocking metal slats.

B. Operation Cycles: Door components and operators capable of operating for not less than 20,000. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.
   1. Include tamperproof cycle counter.

C. Door Curtain Material: Galvanized steel; 22 ga thick.

D. Door Curtain Slats: Flat profile slats of 1-7/8- to 3-1/4- inch center-to-center height.

1. Insulated-Slat Interior Facing: Metal.
2. Gasket Seal: Manufacturer's standard continuous gaskets between slats.

E. Bottom Bar: Two angles, each not less than 2 inch by 2 inch by 1/8 inch; fabricated from hot-dip galvanized and finished to match door.

F. Curtain Jamb Guides: Galvanized steel with exposed finish matching curtain slats. Provide removable post(s) and jamb guides where shown on Drawings.

G. Hood: Match curtain material and finish.

1. Shape: As shown on Drawings.
2. Mounting: As shown on Drawings.

H. Locking Devices: Equip door with slide bolt for padlock.

I. Electric Door Operator:

1. Usage Classification: Heavy duty, 25 or more cycles per hour and more than 90 cycles per day.
2. Operator Location: As indicated on Drawings.
3. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use; moving parts of operator enclosed or guarded if exposed and mounted at 8 feet or lower.
4. Motor Exposure: Exterior, wet, and humid.
5. Motor Electrical Characteristics: As recommended by manufacturer.

    a. Voltage: 120-V ac, single phase, 60 Hz.

6. Emergency Manual Operation: Push-up type.

7. Control Station(s): Where indicated on Drawings.
8. Other Equipment: Audible and visual signals.

J. Door Finish:

1. ~~Baked Enamel or~~ Powder-Coated Finish: Color as selected by Architect from manufacturer's full range.

    a. Galvanized steel curtain slats to be phosphate treated and finished with a baked-on prime coat of paint. Galvanized steel hood and all other exposed ferrous surfaces shall be primed

2.3 DOOR CURTAIN MATERIALS AND CONSTRUCTION

A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices.

Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:

1. Steel Door Curtain Slats: Zinc-coated (galvanized), cold-rolled structural steel sheet; complying with ASTM A 653/A 653M, with G90 zinc coating; nominal sheet thickness (coated) of 0.028 inch; and as required.
2. Insulation: Fill slats for insulated doors with manufacturer's standard thermal insulation complying with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84 or UL 723. Enclose insulation completely within slat faces.
3. Metal Interior Curtain-Slat Facing: Match metal of exterior curtain-slat face, with minimum steel thickness of 0.010 inch and minimum aluminum thickness of 0.032 inch.

B. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain, and a continuous bar for holding windlocks.

2.4 HOODS

A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.

1. Galvanized Steel: Nominal 24 gauge thick, hot-dip galvanized steel sheet with G90 zinc coating, complying with ASTM A 653/A 653M.
2. Exterior-Mounted Doors: Fabricate hood to act as weather protection and with a perimeter sealant-joint-bead profile for applying joint sealant.

B. Intermediate supports shall be provided as required to prevent excessive sag. The hood shall be equipped with a thermally controlled, internal, galvanized steel flame baffle, when required.

2.5 LOCKING DEVICES

A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.

~~B. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.~~

2.6 CURTAIN ACCESSORIES

A. Weatherseals for Exterior Doors: Equip each exterior door with weather-stripping gaskets fitted to entire exterior perimeter of door for a weather-resistant installation unless otherwise indicated.
   1. Provide perimeter gasketing on guides and bottom bars and field installed at the head of the opening. It shall be installed to effectively close the perimeter gaps, but not so tight as to affect the automatic closing of the door under alarm or test conditions.

   2. At door head, use 1/8-inch- thick, replaceable, continuous-sheet baffle secured to inside of hood or field- installed on the header.
   3. At door jambs, use replaceable, adjustable, continuous, flexible, 1/8-inch- thick seals of flexible vinyl, rubber, or neoprene.
   4. Astragals: For exterior doors, equip each door bottom bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper and weathersealing.

B. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.

2.7 COUNTERBALANCING MECHANISM

A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

B. Counterbalance Barrel:. Counterbalance shaft assembly shall consist of steel pipe capable of supporting curtain load with maximum deflection of 0.03" per foot of width and helical torsion spring assembly designed for proper balance of door to insure that effort to operate door will not exceed 15 pounds. Provide wheel for applying spring torque and for future adjustment located outside end bracket.

C. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.8 ELECTRIC DOOR OPERATORS

A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and operation-cycles requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.

   1. Comply with NFPA 70.
   2. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc.

B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.

C. Door Operator Location(s): Operator location indicated for each door.

1. Front-of-Hood Mounted: Operator is mounted to the right or left door head plate with the operator on coil side of the door-hood assembly and connected to the door drive shaft with drive chain and sprockets. Front clearance is required for this type of mounting.

D. Motors: Reversible-type motor for motor exposure indicated for each door assembly.

1. Electrical Characteristics: Minimum as indicated for each door assembly. If not indicated, large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. and not more than 12 in./sec., without exceeding nameplate ratings or service factor.
2. Operating Controls, Controllers, Disconnect Switches, Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
3. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.

E. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled "Open" and "Stop" and sustained- or constant-pressure push-button control labeled "Close."

1. Interior-Mounted Units: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
2. Exterior-Mounted Units: Full-guarded, standard-duty, surface-mounted, weatherproof type, NEMA ICS 6, Type 4 enclosure, key operated.

F. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf.

G. Audible and Visual Signals: Audible alarm and visual indicator lights in compliance with the accessibility standard.

2.9 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM/NOMMA's "Metal Finishes Manual for Architectural and Metal Products (AMP 500-06)" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.10 STEEL AND GALVANIZED-STEEL FINISHES

A. ~~Baked-Enamel or~~ Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.
   1. Galvanized steel curtain slats to be phosphate treated and finished with a baked-on prime coat of paint. Galvanized steel hood and all other exposed ferrous surfaces shall be primed.

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

B. Install overhead coiling doors, hoods, controls, and operators at the mounting locations indicated for each door.

C. Accessibility: Install overhead coiling doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.

D. Power-Operated Doors: Install according to UL 325.

3.3 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

   1. Perform installation and startup checks according to manufacturer's written instructions.
   2. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.
   3. Test door closing when activated by detector or alarm-connected fire-release system. Reset door-closing mechanism after successful test.

3.4 ADJUSTING

A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.

1. Adjust exterior doors and components to be weather-resistant.

B. Lubricate bearings and sliding parts as recommended by manufacturer.

C. Adjust seals to provide tight fit around entire perimeter.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION 083323

SECTION 087100 – DOOR HARDWARE

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 commercial door hardware for the following:

1. Swinging doors.
2. Other doors to the extent indicated.
3. Commercial door hardware.
4. Cylinders for doors specified in other Sections.
5. Electrified door hardware.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware, power supplies, back-ups and surge protection.
3. Automatic operators.
4. Cylinders specified for doors in other sections.

C. Related Sections:

1. Section 081113 “Hollow Metal Doors and Frames.”
2. Section 084113 “Aluminum-Framed Entrances and Storefronts.”

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ASTM E1886 - Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials.
3. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure difference.
4. ASTM E1996 - Standard specification for performance of exterior windows, curtain walls, doors and storm shutters impacted by Windborne Debris in Hurricanes.
5. ICC/IBC - International Building Code.
6. NFPA 80 - Fire Doors and Windows.
7. NFPA 101 - Life Safety Code.
8. NFPA 105 - Installation of Smoke Door Assemblies.
9. TAS-201-94 - Impact Test Procedures.

10. TAS-202-94 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components using Uniform Static Air Pressure.
11. TAS-203-94 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.
12. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards:

1. ANSI/BHMA Certified Product Standards - A156 Series
2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 ACTION SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware. Organized into door hardware sets indicating type, style, function, size, label, hand, manufacturer, fasteners, location, degree of opening, and finish of each door hardware item. Include description of each electrified door hardware function, wiring diagrams and sequence of operation.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

   a. Type, style, function, size, label, hand, and finish of each door hardware item.
   b. Manufacturer of each item.
   c. Fastenings and other pertinent information.
   d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
   e. Explanation of abbreviations, symbols, and codes contained in schedule.
   f. Mounting locations for door hardware.
   g. Door and frame sizes and materials.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

   a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
   b. Complete (risers, point-to-point) access control system block wiring diagrams.

2. Electrical Coordination: Coordinate with related Division 26 Electrical Sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: Contact UNC Charlotte's housing lock shop to obtain bittings.

1.4 CLOSEOUT SUBMITTALS

A. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

B. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.

1.5 QUALITY ASSURANCE

A. Supplier Qualifications:

1. Person who is or employs a qualified DHI Architectural Hardware Consultant.

2. Shall have supplied jobs of similar size and value.

3. Shall have been in the business of supplying finish hardware for a minimum of five years.

B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing both standard and electrified builders hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that

indicated for this Project. Supplier recognized as a factory direct distributor in good standing by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

1. Scheduling Responsibility: Preparation of door hardware and keying schedules.

D. Automatic Operator Supplier Qualifications: Power operator products and accessories are required to be supplied and installed through current members of the manufacturer's "Power Operator Preferred Installer" program. Suppliers are to be factory trained, certified, and a direct purchaser of the specified power operators and be responsible for the installation and maintenance of the units and accessories indicated for the Project.

E. Source Limitations: Obtain electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that are listed to perform electrical modifications, by a testing and inspecting agency acceptable to authorities having jurisdiction, are acceptable.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

F. Regulatory Requirements: Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following:

1. NFPA 70 "National Electrical Code", including electrical components, devices, and accessories listed and labeled as defined in Article 100 by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

2. Where indicated to comply with accessibility requirements, comply with DOJ’s 2010 ADA Standards for Accessible Design and ANSI A117.1 as follows:

   a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist. Handles wrap to door completely.
   b. Door Closers: Comply with the following maximum opening-force requirements indicated:

      1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
      2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

   c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.

3. NFPA 101: Comply with the following for means of egress doors:

a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.

b. Thresholds: Not more than 1/2 inch high.

4. Fire-Rated Door Assemblies: Provide door hardware for assemblies 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 NFPA 252 (neutral pressure at 40" above sill) or UL-10C.

a. Test Pressure: Positive pressure labeling.

G. Hurricane Resistant Exterior Openings: Provide exterior door hardware as complete and tested assemblies, or component assemblies, including approved doors and frames specified under Final Acceptance1113 "Hollow Metal Doors and Frames", to meet the wind loads, design pressures, debris impact resistance, and glass and glazing requirements applicable to the Project.

1. Test units according to ASTM E330, ASTM E1886, ASTM E1996 standards, certified by a qualified independent third party testing agency acceptable to authority having jurisdiction, and bearing a third party certification agency permanent label indicting windstorm approved product.

H. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

I. Keying Conference: Conduct conference at Project site. Incorporate keying conference decisions into final keying schedule. Submit schematic to manufacturer at time of order. The keying meeting will establish everything pertaining to the owners keying requirements for the pertaining project. If a keying meeting is not conducted, then the key/cylinder order is null and void.

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

J. Keys: All keys shall be labeled and copy of finalized schematic drop shipped to owner by registered mail.

K. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, arrange for manufacturers' representatives to hold a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.

2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

L. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

M. Templates: Obtain and distribute templates for doors, frames, finish hardware and other work specified to be factory prepared for installing door hardware.

N. Standards: Comply with BHMA A156 series standards, Grade 1.

O. Certified Products: Provide door hardware that is listed in BHMA directory of certified products.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within warranty period.

1. Warranty Period for Locks: A minimum of 10 years from date of Final Acceptance.
2. Warranty Period for Manual Closers: A minimum of 25 years from date of Final Acceptance.

B. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

C. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

D. Special Warranty Periods:

1. Minimum of ten years for mortise locks and latches.
2. Minimum of five years for exit hardware.
3. Minimum of twenty five years for manual door closers.
4. Minimum of two years for electromechanical door hardware

1.7 EXTRA MATERIALS/ATTIC STOCK

A. Furnish full-size units described below that match products installed and that are packaged with protective covering and identified with labels describing contents.

1. Doors/Door Hardware:
   a. Exit Devices – Non-Electrified Rim/Vertical Rod – 2 each
   b. Exit Devices – Electrified Rim/Vertical Rod – 2 each
   c. Mortise/Cylindrical Non-Electrified Locks: 4 of each function for Mortise and Cylindrical.
   d. Mortise/Cylindrical Electrified Locks: 4 of each function for Mortise and Cylindrical.
   e. Continuous Hinges: 4 of each function.
   f. Butt Hinges: 12
   g. Logic Cylinders (Mortise & KIK): 12 each
   h. Logic Cylinders (Rim): 4
   i. Logic Keys: 50
   j. Mechanical (Non-Logic) Bedroom Cylinders: 50 additional change sets
   k. Auxilary locks: 4 of each function

2. Electrical Parts:
   a. Electric strikes: 2 of each function.
   b. Power supplies: 2 of each manufacturer.
   c. Prop Alarms: 2
   d. Magnetic hold opens: 4 complete (magnet and arm)

1.8 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.9 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to

source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Related Division 08 Sections (Steel, Aluminum and Wood) doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications..

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

1. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

a. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

B. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the owner.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity, unless otherwise indicated:

a. Two Hinges: For doors with heights up to 60 inches.
b. Three Hinges: For doors with heights 61 to 90 inches.
c. Four Hinges: For doors with heights 91 to 120 inches.
d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

   a. Exterior & Interior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.

4. Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:

   a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:

      1) Out-swinging exterior doors.
      2) Out-swinging access controlled doors.
      3) Out-swinging lockable doors.

5. Acceptable Manufacturers:

   1) Hager Companies (HAG).
   2) McKinney Products Company (MCK).
   3) Stanley Commercial Hardware; Div. of The Stanley Works (STH).

B. Continuous Geared Hinges: ANSI/BHMA A156.26 certified continuous geared hinge with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Provide concealed flush mount (with or without inset), full surface, or half surface, in standard and heavy duty models, as specified in the Hardware Sets. Concealed continuous hinges to be U.L. listed for use on up to and including 90 minute rated door installations and U.L. listed for windstorm components where applicable. Factory cut hinges for door size and provide with removable service power transfer panel where indicated at electrified openings.

1. Acceptable Manufacturers:

   1) Select Products Limited (SPL).
   2) McKinney Products Company. (MCK).
   3) Pemko Manufacturing Co., Inc. (PEM).

2.3 ELECTRIFIED DOOR HARDWARE

A. Boxed Power Supplies: Modular unit in NEMA ICS 6, Type 4 enclosure; filtered and regulated; and listed and labeled for use with fire alarm systems.

B. Power Transfer: Where required to get power to the door provide an auxiliary power transfer. This transfer shall be concealed when the door is closed. The CEPT by Securitron is the basis of design.

   Manufacturers:

   a. Securitron (SU) – EL-CEPT
   b. Von Duprin (VD) – EPT-10

C. ELECTRIFIED EXIT DEVICES: Allows the latchbolt to be retracted electrically for momentary or maintained periods of time from a remote location. Device bolts remain retracted for as long as the device is energized. Removal of power returns the device to the life safety, self-latching mechanical mode. Electrified exit devices will not interface with central or local fire alarm systems. Electrified exit device will be interfaced with automatic door operators, and access controls systems. Will allow free egress at all times.

Manufacturers:

a. Yale (YA) 7150P Series
b. Corbin Ruswin ED5200S A Series

D. ELECTRIC STRIKES:

1. Standard Electric Strikes: Heavy duty, cylindrical and mortise lock electric strikes conforming to ANSI/BHMA A156.31, Grade 1, UL listed for both Burglary Resistance and for use on fire rated door assemblies. Stainless steel construction with dual interlocking plunger design tested to exceed 3000 lbs. of static strength and 350 ft-lbs. of dynamic strength. Strikes tested for a minimum 1 million operating cycles. Provide strikes with 12 or 24 VDC capability and supplied standard as fail-secure unless otherwise specified. Option available for latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike.

2. Acceptable Manufacturers:

a. TRINE (TRN) 4100 Series
b. HES (HS).
c. DORMA (DM)

3. Surface Mounted Rim Electric Strikes: Surface mounted rim exit device electric strikes conforming to ANSI/BHMA A156.31, Grade 1, and UL Listed for both Burglary Resistance and for use on fire rated door assemblies. Construction includes internally mounted solenoid with two heavy-duty, stainless steel locking mechanisms operating independently to provide tamper resistance. Strikes tested for a minimum of 1,500,000 operating cycles. Provide strikes with 12 or 24 VDC capability supplied standard as fail-secure unless otherwise specified. Option available for latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike. Strike requires no cutting to the jamb prior to installation. Surface mounted Rim Electric strikes are to work with conjunction with ANSI A156.3, Type 28 Grade 1, square bolt type exit devices only.

4. Acceptable Manufacturers:

a. TRINE 4800 SERIES (TRN)
b. Others upon approval

5. Provide electric strikes with in-line power controller and surge suppressor by the same manufacturer as the strike with combined products having unlimited lifetime warranty.

E. Door prop alarms: Where indicated provide 3000 Series door prop alarm system by Security Products, Inc. Coordinate power supply to power maximum number of units. Prop alarm power

supply shall be secured with EBOX type key secured enclosed type box. See attachments for details.

F. Hurricane and Tornado Resistance Compliance: Power transfer devices to be U.L. listed for windstorm components where applicable.

G. Door prop alarms: Where indicated provide MONITOR 3000 Series door prop alarm system by Security Products, Inc. Coordinate power supply to power maximum number of units. Prop alarm power supply shall be secured with EBOX type keyed alike secured enclosed type box. See attachments for details.

H. Electric Door Hardware Cords: Provide electric transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Acceptable Manufacturers:

a. McKinney Products (MK) – QC-C Series.

Provide one each of the following tools as part of the base bid contract:

a. McKinney Products (MK) - Electrical Connecting Kit: QC-R001.
b. McKinney Products (MK) - Connector Hand Tool: QC-R003.

2.4 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified automatic, self-latching, and manual flush bolts and surface bolts. Manual flush bolts to be furnished with top rod of sufficient length to allow bolt location approximately six feet from the floor. Furnish dust proof strikes for bottom bolts. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.

1. Acceptable Manufacturers:

a. Door Controls International (DC).
b. Rockwood Manufacturing (RO).
c. Trimco (TC).

B. Coordinators: ANSI/BHMA A156.3 certified door coordinators consisting of active-leaf, hold-open lever and inactive-leaf release trigger. Coordinators fabricated from steel with nylon-coated strike plates and built-in adjustable safety release.

1. Acceptable Manufacturers:

a. Door Controls International (DC).
b. Rockwood Manufacturing (RO).
c. Trimco (TC).

C. Door Push Plates and Pulls: ANS/BHMA A156.6 certified door pushes and pulls of type and design specified below or in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, 4-inches wide by 16-inches high, with square corners and beveled edges, secured with exposed screws unless otherwise indicated.
2. Straight Pull Design: Minimum 1-inch round diameter stainless steel bar or tube stock pulls with 2 1/2-inch projection from face of door unless otherwise indicated.
3. Offset Pull Design: Minimum 1-inch round diameter stainless steel bar or tube stock pulls with 2 1/2-inch projection and offset of 90 degrees unless otherwise indicated.
4. Push Bars: Minimum 1-inch round diameter horizontal push bars with minimum clearance of 2 1/2-inch projection from face of door unless otherwise indicated.
5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

a. Acceptable Manufacturers:

1) Hiawatha, Inc. (HI).
2) Rockwood Manufacturing (RO).
3) Trimco (TC).

2.5 CYLINDERS, KEYING, AND STRIKES

A. Mechanical Room (HVAC, Telecom/Data & Electrical) Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
1. Number of Pins: Six.
2. Cylinders to have a “F’ keyway.
3. All cylinders and keys to be drop shipped to University HRL Locksmith:
a. UNC Charlotte
Nathan Delcamp
9201 University City Blvd
Scott Hall Lock Shop
Charlotte, NC 28223
4. Bittings by the owner.
5. Installation of cylinders shall be installed by the owner, with coordination through the contractor.
6. Keying System: Factory-registered keying system; building master only/non-existing key system.
a. Keys: Do not provide any cut mechanical master F keys.

B. Student Bedroom door locks: Tumbler type, constructed from brass or bronze, stainless steel or nickel silver.
1. Number of Pins: 7
2. Cylinders to have a Dorma D400 keyway.
3. All cylinders and keys to be drop shipped to University HRL Locksmith:
a. UNC Charlotte

Nathan Delcamp
9201 University City Blvd
Scott Hall Lock Shop
Charlotte, NC 28223

4. Bittings to be provided by the factory.
5. Installation of cylinders shall be installed by the owner, with coordination through the contractor.
6. Keying System: Factory-registered keying system; building master only/non-existing key system.
7. Keys:
   a. Each keyset (keyset serial number to be determined by the UNCC HRL Locksmith) to have cut keys. Quantity shall be the number of students per bedroom plus an additional 2 cut keys per each keyset, i.e. 2 student bedroom = 4 cut keys.

C. Electro/Mechanical Cylinders: Provide electronic cylinders by Medeco to match and extend the owners existing key system.
1. Cylinders to be Logic Classic type.
2. Keys and cylinders to be drop shipped to the owner.
3. Key quantities to match occupancy of each entire unit plus one, (i.e. 4 person unit = 5 keys). Provide an additional 50 keys for other use.
4. Cylinders and keys shall be programmed, installed and maintained by the University HRL Lockshop, with coordination of the contractor.
5. Locations:
   1) Suite entries
   2) Bedroom doors
   3) Keyed Removable mullions
   4) Exterior doors
   5) Lounges/study rooms
   6) Other public areas as indicated.

D. Cylinder guard rings are to be used on each Mortise and Rim Cylinder where applicable.

A. Manufacturer:
1. KEEDEX – K-24L-26D
2. Others upon approval.

2.6 MECHANICAL LOCKS AND LATCHES

A. Mortise Locks: Provide this type lock at unit entry doors.
1. Manufacturers:
   a. Yale Commercial. (YAL).
   b. Dorma (DMA).
   c. Marks (MX).
2. Lockset shall meet ANSI A156.13, Grade 1.
3. Lockset Design: 8000 Series lock with Augusta (AUSL) by Yale (Basis of Design).

B. Cylindrical Locks and Lever Sets: Provide this type lock at all doors where mortise locks or exit devices are not required.

1. Manufacturers:
   a. Yale Commercial (Yal).
   b. Dorma (DMA).
   c. Marks (MX).
2. Listed and certified ANSI A-156.2, Grade 1.
3. Lockset Design: 5400LN Series with Augusta (AU) by Yale (Basis of Design).

C. Dummy Trim: Lever, trim and finish shall match lockset design.

D. Lock Throw: Comply with labeled fire door requirements.

E. Backset: 2-3/4 inches, unless otherwise indicated.

F. Functions:
1. Public Areas: Classroom
2. Data, Storage, Utility, Entry suite: Storeroom
3. Offices: office function.

G. Functions at living units:
1. Unit Doors: Storeroom function.
2. Bedroom Door: Office function (no deadbolt) with interior thumb turn.
3. Single toilets: Privacy function.
4. All other room doors: Passage

2.7 AUXILIARY LOCKS

A. Mortise Deadlocks, Small Case: ANSI/BHMA A156.5, Grade 1, certified small case mortise type deadlocks constructed of heavy gauge wrought corrosion resistant steel. Steel or stainless steel bolts with a 1" throw and hardened steel roller pins. Deadlocks to be products of the same source manufacturer and keyway as other specified locksets.

1. Acceptable Manufacturers:

   a. Yale Locks and Hardware (YA) - 350 Series.
   b. Sargent Manufacturing (SA) - 4870 Series.
   c. Corbin Russwin Hardware (RU) - DL410

2.8 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Auxiliary Deadlocks: BHMA A156.5.
3. Dustproof Strikes: BHMA A156.16.

2.9 EXIT DEVICES

A. Manufacturers:

1. Yale Security Inc. (YAL). 7150
2. Corbin Russwin Architectural Hardware Inc. (CR). ED-5200S
3. Securitech Group (SH) 936 Series

B. Panic Exit Devices: Shall be listed and labeled for panic protection, based on testing according to UL 305.

C. Fire Exit Devices: Shall complying with NFPA 80, listed and labeled for fire and panic protection, based on testing according to UL 305 and NFPA 252.

D. Only rim type exit devices are to be used. Where pairs of doors are required provide a keyed removable mullion.

E. All latch bolts shall be deadlocking.

F. Rim exit devices shall have slide action deadbolt with positive deadlocking in lieu of pullman type latchbolt.

1. Shall comply with ANSI A156.3, Type 28 Grade 1.

G. Exit devices to be provided with flush end caps.

H. All exposed metal shall be in BHMA 630. Aluminum anodized finish will not be accepted.

I. Outside operating trim shall be through-bolted with concealed fasteners.

J. Operating trim shall be freewheeling with clutch mechanism allowing lever to rotate 60 degrees when locked to prevent vandalism.

K. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

L. End cap bracket shall be drilled and tapped into metal doors and through bolted into wood doors.

M. Tube Steel Removable Mullions: ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish. Provide keyed removable feature, stabilizers, and mounting brackets as specified in the Hardware Sets. At openings designed for severe wind load conditions due to hurricanes or tornadoes, provide manufacturers approved mullion and accessories to meet applicable state and local windstorm codes.

1. Acceptable Manufacturers:

a. Corbin Russwin 907KBM
b. Yale Locks and Hardware (YA) - M200 Series.
c. Von Duprin (VD) - 9954 Series.

2.10 ELECTROMECHANICAL CONVENTIONAL EXIT DEVICES

A. Electrified Conventional Push Rail Devices (Heavy Duty): Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified below.

1. Acceptable Manufacturers:

a. Yale Locks and Hardware (YA) - 7150 Series.
b. Von Duprin (VD) – HS-98 Series.
c. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
d. No Substitution/Alternate – Facility Standard.

B. Acceptable Electrified Options: Electric latch retraction, electric dogging.

C. Non-Acceptable Electrified Options: Outside door trim control, exit alarm, delayed egress, latchbolt monitoring, lock/unlock status monitoring, touchbar monitoring and request-to-exit signaling.

D. Unless otherwise indicated, provide electrified exit devices standard as fail secure.

2.11 DOOR CLOSERS

A. Shall be certified ANSI A156.4 Grade 1.

B. Surface-Mounted Closers:

1. Shall have multi sized spring power adjustment for sizes 2 thru 6 or 1thru 4 for barrier free applications.
2. Shall have full covers.
3. Provide soffit plate for parallel arm applications using aluminum frames with blade stops or snap on stops.
4. Manufacturers:

a. Yale (YA) 5800 Series.
b. Dorma (DMA) 8900 Series.
c. Stanley D4550 Series. Stanley Commercial Hardware; Div. of The Stanley Works (STH).

C. Size of Units: Multi-sized, adjustable to meet field conditions and requirements for opening force.

D. Installation of door closers should be non-viewable throughout the corridors. Parallel, Heavy Duty arms are preferred (Push Side). If a Parallel arm closer will be viewed throughout a

corridor, then a non parallel door closer arm is acceptable to remove the door closer body and arm from a viewable corridor side (Pull Side).

E. POWER ASSIST CLOSERS/ADA DOOR OPENERS:
1. Provide surface operator that complies with ANSI A156.19
2. Manufacturers:
   a. Norton (NOR) 5700 Series
   b. Dorma (DMA) ED800 Series
   c. Stanley (STN) D-4990 Series
3. Units to be provided with radio frequency receiver and 2 fobs per operator location.

F. Closer bodies can be installed with self tapping/drilling screws into metal doors. Closer bodies are to be through bolted into wood doors.

2.12 STOPS AND HOLDERS

A. Stops and Holders:

1. All doors shall have a doorstop that effectively protects any and all doors, walls and finish hardware that comes into contact with the operation of the function of the door. Wall stops are the preferred method.

2. Provide sufficient blocking and reinforcement for secure installation and operation of all stops and holders.

3. Pre-hung door units to receive hinge pin stops where wall stops are not able to effectively stop and protect the door.

4. Overhead stops shall be provided where required if wall stop can not stop and protect the doors, walls or finish hardware from damage.

5. Oversized floor stops are only permitted for exterior doors.

6. Closer stop arms are only permitted if specified in hardware set.

7. Manufacturers:
   a. McKinney (MK)
   b. Rockwood Manufacturing (RM)
   c. Pemko Manufacturing Co., Inc. (PEM)

B. Silencers for Door Frames: Neoprene or rubber; fabricated for drilled-in application to frame.

2.13 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Metal Protection Plates: ANSI/BHMA A156.6 certified metal protection plates (kick, armor, or mop), beveled on four edges (B4E), fabricated from the following.

   a. Stainless Steel: 050-inch thick, with countersunk screw holes (CSK).

4. Fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets.

5. Acceptable Manufacturers:

   a. Hiawatha, Inc. (HI).
   b. Rockwood Manufacturing (RO).
   c. Trimco (TC).

2.14 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

   1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: :Assemblies 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. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and UBC 7-2, Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Hurricane Resistance Compliance: Architectural seals to be U.L. listed for windstorm components where applicable. Provide the appropriate hurricane or tornado resistant products that have been independent third party tested, certified, and labeled to meet state and local windstorm building codes applicable to project.

G. Acceptable Manufacturers:

1. Pemko Manufacturing (PE).
2. Reese Enterprises, Inc. (RS).
3. Zero International (ZE).

2.15 ELECTRONIC ACCESSORIES

A. Power Supplies: Provide Nationally Recognized Testing Laboratory Listed 12VDC or 24VDC (field selectable) filtered and regulated power supplies. Include battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.

1. Acceptable Manufacturers:

a. Altronix AL Series (FOR USE WITH ELECTRIC STRIKES ONLY)
b. Securitron Door Controls (SU) – AQD Series. (FOR USE WITH ELECTRIC STRIKES ONLY).
c. Yale Locks and Hardware (YA) 782N. (FOR USE WITH ELECTRIFIED EXIT DEVICES ONLY).

2.16 KEY CONTROL SYSTEM

A. Key Lock Boxes: Designed for storage of two keys, with tamper switches to connect to intrusion detection system.

1. Basis of Design: Knox Box Rapid Entry Key System, 1300 Series, Knox Company, Irvine, CA. (866) 625-4563. Single unit. Locate as directed by authorities having jurisdiction.

2. Manufacturers:
a. ABLOY Security, Inc.; an ASSA ABLOY Group company (ABL).
b. Knox Company (KNX).
c. Supra Products (SUP).
d. or approved/supplied by AHJ.

B. Keying Requirements: Key Lock Box must be dual keyed and second key shall be keyed to the UNCC Campus Police Department standard.

2.17 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.18 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series

3.3 INSTALLATION

A. Examine doors and frames for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

B. Electronic Hardware: Installer of electric hardware to be tested prior to interface with the access control system.

C. Steel Door and Frame Preparation: Comply with DHI A115 series. Drill and tap doors and frames for surface-applied hardware according to SDI 107.

D. Wood Door Preparation: Comply with DHI A115-W series.

E. Hardware Installation: Shall be in accordance to manufactures instructions.

F. Mounting Heights: Comply with the following requirements, unless otherwise indicated:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

G. Miscellaneous Accessories: Shall be provided as necessary for the proper and secure attachment of all hardware to doors and frames.

H. Adjust and reinforce attachment substrates as necessary for proper installation and operation. Drill and tap units that are not factory prepared for fasteners. Space fasteners and anchors according to industry standards.

1. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with Architect.

a. Configuration: Provide one power supply for each door. It is acceptable to provide the number of power supplies required to adequately supply doors with electrified door hardware.

2. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

I. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with accessibility requirements.

1. Door Closers Adjustments:

a. Adjust sweep period so that from an open position of 70 degrees, the door will take at least three seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

b. Adjust back-check to slow the door opening at about 75 degrees, when door is forcibly opened beyond its pre-adjusted.

J. Key Lock Box: The key lock box shall be tied to the Campus' security system which is monitored by the Campus police department.

1. The key lock box shall have a 2 taper switches to which will be tied to the door if it is opened and the wall if the key lock box is removed.
2. The key lock box will b through-bolted and securely attached to an external wall. See manufacturer's written instructions for mounting.
3. The key lock box shall contain 2 sets of keys to fire pumps, elevators, and rooms.

3.4 FIELD QUALITY CONTROL

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. and provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SCHEDULE

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

HW SET # 1.0

~~1 Continuous Hinge~~	~~CFM_HD1~~		~~PE~~
1 Continuous Hinge	**CFM_HD1 PT**		**PE**
~~1 Electrified Deadlatch~~	~~4300 M 2~~	~~313~~	~~AD~~
~~1 Paddle Operator~~	~~4591~~	~~US26D~~	~~AD~~
1 Access Control Mortise Lock	**AD300 RHO (HARDWIRED)**	**626**	**SC**

~~1~~	~~Cylinder~~	~~AS REQUIRED~~	~~626~~	~~SC~~
~~1~~	~~Offset Pull~~	~~RM201 x MTG 12XHD~~	~~US32D~~	~~RO~~
1	Door Closer	4040XP MC SCUSH BRKTS REQ SNB	AL	LC
1	Threshold	171A		PE
1	Weatherstrip	BY DOOR MANUFACTURER		00
1	**Electric Power Transfer**	**EPT10**	**SP28**	**VD**
~~1~~	~~Card Reader~~	~~FURNISHED IN OTHER SECTION~~		~~00~~
~~1~~	~~Power Supply~~	~~PS902~~		~~VD~~
1	**Power Supply**	**AS REQUIRED**		**SC**
1	Wiring Diagram	AS REQUIRED		00
1	Door Position Switch	DPS-M/W AS REQUIRED		SU

~~OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD RELEASE ELECTRIFIED DEADLATCH ALLOWING INGRESS. EGRESS AT ALL TIMES BY PADDLE OPERATOR.~~

OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD UNLOCKS OUTSIDE LEVER ALLOWING INGRESS. EGRESS AT ALL TIMES BY INSIDE LEVER.

HW SET # 2.0

1	Continuous Hinge	CFM_HD1 PT		PE
~~1~~	~~Rim Exit Device~~	~~EL 98NL-OP 110MD-NL SNB~~	~~US26D~~	~~VD~~
1	**Rim Exit Device**	**98EO**	**US26D**	**VD**
1	**Access Control Trim**	**AD300 993R (HARDWIRED)**	**626**	**SC**
1	Cylinder	AS REQUIRED	626	SC
~~1~~	~~Offset Pull~~	~~RM201 x MTG 12XHD~~	~~US32D~~	~~RO~~
1	Door Closer	4040XP MC SCUSH BRKTS REQ SNB	AL	LC
1	Threshold	171A		PE
1	Weatherstrip	BY DOOR MANUFACTURER		00
1	Electric Power Transfer	EPT10	SP28	VD
~~1~~	~~Card Reader~~	~~FURNISHED IN OTHER SECTION~~		~~00~~
~~1~~	~~Power Supply~~	~~PS914 900-2RS 900-BB~~		~~VD~~
1	**Power Supply**	**AS REQUIRED**		**SC**
1	Wiring Diagram	AS REQUIRED		00
1	Door Position Switch	DPS-M/W AS REQUIRED		SU

~~OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD SIGNALS ELECTRIC LATCH RETRACTION ALLOWING INGRESS. EGRESS AT ALL TIMES BY EXIT DEVICE PUSH BAR.~~

OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD UNLOCKS OUTSIDE LEVER ALLOWING INGRESS. EGRESS AT ALL TIMES BY EXIT DEVICE PUSH BAR.

HW SET # 3.0

2	Continuous Hinge	CFM_HD1 PT		PE
1	Keyed Removable Mullion	KR4954	SP28	VD
1	Elect Rim Exit Device	EL 98NL-OP x 110MD-NL SNB	US26D	VD

1	Elect Rim Exit Device	EL 98EO SNB	US26D	VD
2	Cylinder	AS REQUIRED	626	SC
2	Offset Pull	RM201 x MTG 12XHD	US32D	RO
2	Door Operator	4640	AL	LC
1	Threshold	171A		PE
1	Weatherstrip	BY DOOR MANUFACTURER		00
2	Electric Power Transfer	EPT10	SP28	VD
~~1~~	~~Card Reader~~	~~FURNISHED IN OTHER SECTION~~		~~00~~
1	**Wall Reader**	**FURNISHED IN OTHER SECTION**		**OT**
2	Door Actuator	8310-856T		LC
1	Power Supply	PS914 900-2RS 900-BB		VD
1	Wiring Diagram	AS REQUIRED		00
2	Door Position Switch	DPS-M/W AS REQUIRED		SU

OPERATION: DOORS TO BE CLOSED AND LOCKED AT ALL TIMES UNLESS EXIT DEVICE PUSH BARS ARE IN THE DOGGING POSITION BY THE ACCESS CONTROL SYSTEM. WHEN DOGGED, DOOR ACTUATORS FROM EITHER SIDE OF OPENING ACTIVATE DOOR OPERATORS ALLOWING INGRESS AND EGRESS. WHEN LOCKED, PRESENTATION OF A VALID CARD SIGNAL ELECTRIC LATCH RETRACTION ALLOWING INGRESS. EGRESS AT ALL TIMES BY EXIT DEVICE PUSH BARS.

NOTE: LOCKING AND UNLOCKING OF EXTERIOR VESTIBULE DOORS ARE TO BE CONTROLLED BY THE ACCESS CONTROL SYSTEM.

HW SET # 3.1

2	Continuous Hinge	CFM_HD1 PT		PE
1	Keyed Removable Mullion	KR4954	SP28	VD
1	Elect Rim Exit Device	EL 98NL-OP x 110MD-NL SNB	US26D	VD
1	Elect Rim Exit Device	EL 98EO SNB	US26D	VD
1	Cylinder	AS REQUIRED	626	SC
2	Offset Pull	RM201 x MTG 12XHD	US32D	RO
2	Door Operator	4640 (VESTIBULE FUNCTION)	AL	LC
1	Threshold	171A		PE
1	Weatherstrip	BY DOOR MANUFACTURER		00
2	Electric Power Transfer	EPT10	SP28	VD
~~1~~	~~Card Reader~~	~~FURNISHED IN OTHER SECTION~~		~~00~~
1	**Wall Reader**	**FURNISHED IN OTHER SECTION**		**SC**
1	Door Actuator	8310-856T		LC
1	Power Supply	PS914 900-2RS 900-BB		VD
1	Wiring Diagram	AS REQUIRED		00
2	Door Position Switch	DPS-M/W AS REQUIRED		SU

OPERATION: DOORS TO BE CLOSED AND LOCKED AT ALL TIMES UNLESS EXIT DEVICE PUSH BARS ARE IN THE DOGGING POSITION BY THE ACCESS CONTROL SYSTEM. WHEN DOGGED, DOOR ACTUATORS FROM EITHER SIDE OF OPENING ACTIVATE DOOR OPERATORS ALLOWING INGRESS AND EGRESS. WHEN LOCKED, PRESENTATION OF A VALID CARD SIGNAL ELECTRIC LATCH RETRACTION ALLOWING INGRESS. EGRESS AT ALL TIMES BY EXIT DEVICE PUSH BARS. EXTERIOR DOOR ACTUATOR TO ACTIVATE EXTERIOR AND INTERIOR DOOR OPERATORS SIMULTANEOUSLY.

HW SET # 4.0

	Hinge	T4A3386 x NRP	US32D	MK
~~1~~	~~Elect Rim Exit Device~~	~~EL 98NL x 990NL SNB~~	~~US26D~~	~~VD~~**1**
	Rim Exit Device	**98EO**	**US26D**	**VD**
1	**Access Control Trim**	**AD300 993R (HARDWIRED)**	**626**	**SC**
1	Cylinder	AS REQUIRED	626	SC
1	Door Closer	4040XP MC CUSH SNB	AL	LC
1	Kick Plate	K1050 8" CSK 3BE	US32D	RO
1	Threshold	2005AT		PE
1	Set Weatherstrip	303AS		PE
1	Rain Guard	346C		PE
1	Door Bottom Sweep	3452CNB		PE
1	Electric Power Transfer	EPT10	SP28	VD
~~1~~	~~Card Reader~~	~~FURNISHED IN OTHER SECTION~~		~~00~~
~~1~~	~~Power Supply~~	~~PS914 900-2RS 900-BB~~		~~VD~~
1	**Power Supply**	**AS REQUIRED**		**VD**
1	Wiring Diagram	AS REQUIRED		00
1	Door Position Switch	DPS-M/W AS REQUIRED		SU

~~OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD SIGNALS ELECTRIC LATCH RETRACTION ALLOWING INGRESS. EGRESS AT ALL TIMES BY EXIT DEVICE PUSH BAR.~~

OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD UNLOCKS OUTSIDE LEVER ALLOWING INGRESS. EGRESS AT ALL TIMES BY EXIT DEVICE PUSH BAR.

HW SET # 5.0

	Hinge	T4A3386 x NRP	US32D	MK
1	Entrance Lock	LV9453 L 06A	626	SC
1	Cylinder	AS REQUIRED	626	SC
1	Door Closer	4040XP MC CUSH SNB	AL	LC
1	Kick Plate	K1050 8" CSK 3BE	US32D	RO
1	Threshold	2005AT		PE
1	Set Weatherstrip	303AS		PE
1	Rain Guard	346C		PE
1	Door Bottom Sweep	3452CNB		PE
1	Door Position Switch	DPS-M/W AS REQUIRED		SU

HW SET # 6.0

	Hinge	T4A3386 x NRP	US32D	MK
1	Storeroom Lock	LV9080 L 06A	626	SC
1	Cylinder	AS REQUIRED	626	SC
1	Door Closer	4040XP MC CUSH SNB	AL	LC
1	Kick Plate	K1050 8" CSK 3BE	US32D	RO
1	Threshold	2005AT		PE
1	Set Weatherstrip	303AS		PE
1	Rain Guard	346C		PE

1	Door Bottom Sweep	3452CNB		PE
1	Door Position Switch	DPS-M/W AS REQUIRED		SU

HW SET # 7.0

	Hinge	T4A3386 x NRP	US32D	MK
1	Storeroom Security Lock	LV9480 L 06A	626	SC
1	Cylinder	AS REQUIRED	626	SC
1	Door Closer	4040XP MC CUSH SNB	AL	LC
1	Kick Plate	K1050 8" CSK 3BE	US32D	RO
1	Threshold	2005AT		PE
1	Set Weatherstrip	303AS		PE
1	Rain Guard	346C		PE
1	Door Bottom Sweep	3452CNB		PE
1	Door Position Switch	DPS-M/W AS REQUIRED		SU

HW SET # 7.1

	Hinge	T4A3386 x NRP	US32D	MK
1	Electric Hinge	T4A3386 x CC	US32D	MK
~~1~~	~~Electrified Lock~~	~~L9092EU L 06A~~	~~626~~	~~SC~~
1	**Access Control Mortise Lock**	**AD300 RHO (HARDWIRED)**	**626**	**SC**
1	Cylinder	AS REQUIRED	626	SC
1	Door Closer	4040XP MC CUSH SNB	AL	LC
1	Kick Plate	K1050 8" CSK 3BE	US32D	RO
1	Threshold	2005AT		PE
1	Set Weatherstrip	303AS		PE
1	Rain Guard	346C		PE
1	Door Bottom Sweep	3452CNB		PE
~~1~~	~~Card Reader~~	~~FURNISHED IN OTHER SECTION~~		~~00~~
~~1~~	~~Power Supply~~	~~PS902~~		~~VD~~
1	**Power Supply**	**AS REQUIRED**		**SC**
1	Wiring Diagram	AS REQUIRED		00
1	Door Position Switch	DPS-M/W AS REQUIRED		SU

OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD UNLOCKS OUTSIDE LEVER ALLOWING INGRESS. EGRESS AT ALL TIMES BY INSIDE LEVER.

HW SET # 8.0

	Hinge	T4A3386 x NRP	US32D	MK
1	Set Combo Flush Bolts	2845/2945	US26D	RO
1	Dust Proof Strike	570	US26D	RO
1	Storeroom Lock	LV9080 L 06A	626	SC
1	Cylinder	AS REQUIRED	626	SC
2	Door Closer	4040XP MC CUSH SNB	AL	LC
2	Kick Plate	K1050 8" CSK 3BE	US32D	RO
1	Threshold	2005AT		PE
1	Set Weatherstrip	303AS		PE
1	Rain Guard	346C		PE

2	Door Bottom Sweep	3452CNB		PE
2	Astragal	18041CNB		PE
2	Door Position Switch	DPS-M/W AS REQUIRED		SU

HW SET # 8.1

	Hinge	T4A3386 x NRP	US32D	MK
1	Electric Hinge	T4A3386 x CC	US32D	MK
1	Set Combo Flush Bolts	2845/2945	US26D	RO
1	Dust Proof Strike	570	US26D	RO
~~1~~	~~Electrified Lock~~	~~L9092EU L 06A~~	~~626~~	~~SC~~
1	**Access Control Mortise Lock**	**AD300 RHO (HARDWIRED)**	**626**	**SC**
1	Cylinder	AS REQUIRED	626	SC
2	Door Closer	4040XP MC CUSH SNB	AL	LC
2	Kick Plate	K1050 8" CSK 3BE	US32D	RO
1	Threshold	2005AT		PE
1	Set Weatherstrip	303AS		PE
1	Rain Guard	346C		PE
2	Door Bottom Sweep	3452CNB		PE
2	Astragal	18041CNB		PE
~~1~~	~~Card Reader~~	~~FURNISHED IN OTHER SECTION~~		~~00~~
~~1~~	~~Power Supply~~	~~PS902~~		~~VD~~
1	**Power Supply**	**AS REQUIRED**		**SC**
1	Wiring Diagram	AS REQUIRED		00
2	Door Position Switch	DPS-M/W AS REQUIRED		SU

OPERATION: DOORS TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD UNLOCKS OUTSIDE LEVER ALLOWING INGRESS. EGRESS AT ALL TIMES BY INSIDE LEVER.

HW SET # 9.0

2	Continuous Hinge	CFM_HD1 PT		PE
1	Keyed Removable Mullion	KR4954	SP28	VD
1	Elect Rim Exit Device	EL 98NL-OP x 110MD-NL SNB	US26D	VD
1	Elect Rim Exit Device	EL 98EO SNB	US26D	VD
2	Cylinder	AS REQUIRED	626	SC
2	Offset Pull	RM201 x MTG 12XHD	US32D	RO
2	Door Operator	4640	AL	LC
1	Door Seals	BY DOOR MANUFACTURER		00
2	Electric Power Transfer	EPT10	SP28	VD
~~1~~	~~Card Reader~~	~~FURNISHED IN OTHER SECTION~~		~~00~~
1	**Wall Reader**	**FURNISHED IN OTHER SECTION**		**SC**
2	Door Actuator	8310-856T		LC
1	Power Supply	PS914 900-2RS 900-BB		VD
1	Wiring Diagram	AS REQUIRED		00

OPERATION: DOORS TO BE CLOSED AND LOCKED AT ALL TIMES UNLESS EXIT DEVICE PUSH BARS ARE IN THE DOGGING POSITION BY THE ACCESS CONTROL SYSTEM. WHEN DOGGED, DOOR ACTUATORS FROM EITHER SIDE OF OPENING ACTIVATE DOOR OPERATORS ALLOWING INGRESS AND EGRESS. WHEN LOCKED, PRESENTATION OF A

VALID CARD SIGNAL ELECTRIC LATCH RETRACTION ALLOWING INGRESS. EGRESS AT ALL TIMES BY EXIT DEVICE PUSH BARS.

NOTE: LOCKING AND UNLOCKING OF INTERIOR VESTIBULE DOORS ARE TO BE CONTROLLED BY THE ACCESS CONTROL SYSTEM.

HW SET # 9.1

2	Continuous Hinge	CFM_HD1		PE
2	Set Push Pull Bar	RM251 x MTG T1HD	US32D	RO
2	Door Operator	4640 (VESTIBULE FUNCTION)	AL	LC
1	Door Seals	BY DOOR MANUFACTURER		00
1	Door Actuator	8310-856T		LC
1	Wiring Diagram	AS REQUIRED		00

OPERATION: INTERIOR DOOR ACTUATOR ACTIVATES INTERIOR AND EXTERIOR DOOR OPERATORS SIMULTANEOUSLY.

HW SET # 9.2

1	Continuous Hinge	CFM_HD1		PE
1	Set Push Pull Bar	RM251 x MTG T1HD	US32D	RO
1	Door Closer	4040XP MC SCUSH BRKTS REQ SNB	AL	LC
1	Door Seals	BY DOOR MANUFACTURER		00

HW SET # 10.0

	Hinge	TA2714	US26D	MK
~~1~~	~~Elect Rim Exit Device~~	~~EL 98L NL x 996L NL SNB~~	~~US26D~~	~~VD~~
1	**Rim Exit Device**	**98EO**	**US26D**	**VD**
1	**Access Control Trim**	**AD300 993R (HARDWIRED)**	**626**	**SC**
1	Cylinder	AS REQUIRED	626	SC
1	Door Closer	4040XP MC CUSH SNB	AL	LC
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE
1	Electric Power Transfer	EPT10	SP28	VD
~~1~~	~~Card Reader~~	~~FURNISHED IN OTHER SECTION~~		~~00~~
~~1~~	~~Power Supply~~	~~PS914 900 2RS 900 BB~~		~~VD~~
1	**Power Supply**	**AS REQUIRED**		**VD**
1	Wiring Diagram	AS REQUIRED		00

~~OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD SIGNALS ELECTRIC LATCH RETRACTION ALLOWING INGRESS. EGRESS AT ALL TIMES BY EXIT DEVICE PUSH BAR.~~

OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD UNLOCKS OUTSIDE LEVER. EGRESS AT ALL TIMES BY EXIT DEVICE PUSH BAR.

HW SET # 10.1

	Hinge	TA2714	US26D	MK
~~1~~	~~Elect Rim Fire Exit Device~~	~~EL 98L-NL-F x 996L-NL SNB~~	~~US26D~~	~~VD~~
1	**Rim Fire Exit Device**	**98EO-F**	**US26D**	**VD**
1	**Access Control Trim**	**AD300 993R (HARDWIRED)**	**626**	**SC**
1	Cylinder	AS REQUIRED	626	SC
1	Door Closer	4040XP MC CUSH SNB	AL	LC
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE
1	Electric Power Transfer	EPT10	SP28	VD
~~1~~	~~Card Reader~~	~~FURNISHED IN OTHER SECTION~~		~~00~~
~~1~~	~~Power Supply~~	~~PS914 900-2RS 900-BB~~		~~VD~~
1	**Power Supply**	**AS REQUIRED**		**SC**
1	Wiring Diagram	AS REQUIRED		00

~~OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD SIGNALS ELECTRIC LATCH RETRACTION ALLOWING INGRESS. EGRESS AT ALL TIMES BY EXIT DEVICE PUSH BAR.~~

OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD UNLOCKS OUTSIDE LEVER ALLOWING INGRESS. EGRESS AT ALL TIMES BY EXIT DEVICE PUSH BAR.

HW SET # 11.0

	Hinge	TA2714	US26D	MK
1	SVR Exit Device	9827L-NL x 996L-NL LBR SNB	US26D	VD
1	SVR Exit Device	9827EO LBR	US26D	VD
1	Cylinder	AS REQUIRED	626	SC
2	Door Closer	4040XP MC EDA SNB	AL	LC
2	Kick Plate	K1050 8" CSK 3BE	US32D	RO
2	Wall Stop	409	US32D	RO
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

HW SET # 11.1

	Hinge	TA2714	US26D	MK
1	Rim Fire Exit Device	98L-NL x 996L-NL SNB	US26D	VD
1	Cylinder	AS REQUIRED	626	SC
1	Door Closer	4040XP MC EDA SNB	AL	LC
1	Kick Plate	K1050 8" CSK 3BE	US32D	RO
1	Wall Stop	409	US32D	RO
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

HW SET # 12.0

	Hinge	TA2314	US32D	MK
1	Privacy Set	ND40S RHO	626	SC
1	Door Stop	409/441CU	32D/26D	RO
3	Silencer	608		RO

HW SET # 13.0

	Hinge	TA2714	US26D	MK
1	Privacy Set	ND40S RHO	626	SC
1	Door Closer	4040XP MC REG SNB	AL	LC
1	Door Stop	409/441CU	32D/26D	RO
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

HW SET # 14.0

	Hinge	TA2314	US32D	MK
1	Privacy Set	ND40S RHO	626	SC
1	Door Closer	4040XP MC REG SNB	AL	LC
1	Door Stop	409/441CU	32D/26D	RO
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

HW SET # 15.0

	Hinge	TA2714	US26D	MK
1	Office Lock	ND92 H D RHO	626	SC
1	Permanent Core	AS REQUIRED	626	SC
1	Door Stop	409/441CU	32D/26D	RO
3	Silencer	608		RO

HW SET # 16.0

	Hinge	TA2714	US26D	MK
1	Classroom Lock	ND94 H D RHO	626	SC
1	Permanent Core	AS REQUIRED	626	SC
1	Door Stop	409/441CU	32D/26D	RO
3	Silencer	608		RO

HW SET # 16.1

	Hinge	TA2714	US26D	MK
1	Double Cylinder Lock	ND66 H D RHO	626	SC
2	Permanent Core	AS REQUIRED	626	SC
1	Door Stop	409/441CU	32D/26D	RO
3	Silencer	608		RO

HW SET # 17.0

	Hinge	TA2714	US26D	MK
1	Classroom Lock	ND94 H D RHO	626	SC
1	Permanent Core	AS REQUIRED	626	SC
1	Door Closer	4040XP MC REG SNB	AL	LC
1	Kick Plate	K1050 8" CSK 3BE	US32D	RO
1	Door Stop	409/441CU	32D/26D	RO
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

HW SET # 17.1

	Hinge	TA2714	US26D	MK
1	Classroom Lock	ND94 H D RHO	626	SC
1	Permanent Core	AS REQUIRED	626	SC
1	Door Closer	4040XP MC REG SNB	AL	LC
1	Door Stop	409/441CU	32D/26D	RO
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

HW SET # 18.0

	Hinge	TA2714	US26D	MK
1	Classroom Lock	ND94 H D RHO	626	SC
1	Permanent Core	AS REQUIRED	626	SC
1	Overhead Stop	6ADJ-X36	630	RF
1	Door Closer	4040XP MC REG SNB	AL	LC
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

HW SET # 19.0

NOT USED

HW SET # 20.0

	Hinge	T4A3786	US26D	MK
1	Electric Hinge	T4A3786 x CC	US26D	MK
1	Set Combo Flush Bolts	2845/2945	US26D	RO
1	Dust Proof Strike	570	US26D	RO
~~1~~	~~Electrified Lock~~	~~ND96EL H D RHO~~	~~626~~	~~SC~~
1	**Access Control Cylindrical Lock**	**AD300 RHO (HARDWIRED)**	**626**	**SC**
1	Permanent Core	AS REQUIRED	626	SC
1	Door Closer	4040XP MC CUSH SNB	AL	LC
2	Kick Plate	K1050 8" CSK 3BE	US32D	RO
1	Wall Stop	409	US32D	RO
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE
~~1~~	~~Card Reader~~	~~FURNISHED IN OTHER SECTION~~		~~00~~
~~1~~	~~Power Supply~~	~~PS902~~		~~VD~~
1	**Power Supply**	**AS REQUIRED**		**SC**
1	Wiring Diagram	AS REQUIRED		00

OPERATION: DOORS TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD UNLOCKS OUTSIDE LEVER ALLOWING INGRESS. EGRESS AT ALL TIMES BY INSIDE LEVER. ELECTRIFIED LOCK TO BE TIED INTO FIRE ALARM SYSTEM.

HW SET # 21.0

	Hinge	TA2714	US26D	MK
1	Storeroom Lock	ND96 H D RHO	626	SC
1	Permanent Core	AS REQUIRED	626	SC
1	Door Closer	4040XP MC REG SNB	AL	LC
1	Kick Plate	K1050 8" CSK 3BE	US32D	RO

1	Door Stop	409/441CU	32D/26D	RO
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

HW SET # 21.1

	Hinge	TA2714	US26D	MK
1	Flush Bolt	555/557	US26D	RO
1	Dust Proof Strike	570	US26D	RO
1	Storeroom Lock	ND96 H D RHO	626	SC
1	Permanent Core	AS REQUIRED	626	SC
1	Door Closer	4040XP MC EDA SNB	AL	LC
2	Kick Plate	K1050 8" CSK 3BE	US32D	RO
2	Door Stop	409/441CU	32D/26D	RO
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

HW SET # 21.2

	Hinge	TA2714	US26D	MK
1	Storeroom Lock	ND96 H D RHO	626	SC
1	Permanent Core	AS REQUIRED	626	SC
1	Door Closer	4040XP MC REG SNB	AL	LC
1	Door Stop	409/441CU	32D/26D	RO
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

HW SET # 22.0

	Hinge	TA2714	US26D	MK
1	Storeroom Lock	ND96 H D RHO	626	SC
1	Permanent Core	AS REQUIRED	626	SC
1	Door Closer	4040XP MC EDA SNB	AL	LC
1	Kick Plate	K1050 8" CSK 3BE	US32D	RO
1	Wall Stop	409	US32D	RO
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE

HW SET # 23.0

	Hinge	TA2714	US26D	MK
1	Storeroom Lock	ND96 H D RHO	626	SC
1	Permanent Core	AS REQUIRED	626	SC
1	Door Stop	409/441CU	32D/26D	RO
3	Silencer	608		RO

HW SET # 23.1

	Hinge	TA2714	US26D	MK
1	Electric Hinge	TA2714 x CC	US26D	MK
~~1~~	~~Electrified Lock~~	~~ND96EL H D RHO~~	~~626~~	~~SC~~**1**
	Access Control Cylindrical Lock	**AD300 RHO (HARDWIRED)**	**626**	**SC**
1	Permanent Core	AS REQUIRED	626	SC
1	Door Closer	4040XP MC REG SNB	AL	LC

1	Kick Plate	K1050 8" CSK 3BE	US32D	RO
1	Door Stop	409/441CU	32D/26D	RO
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE
~~1~~	~~Card Reader~~	~~FURNISHED IN OTHER SECTION~~		~~00~~
~~1~~	~~Power Supply~~	~~PS902~~		~~VD~~
1	**Power Supply**	**AS REQUIRED**		**SC**
1	Wiring Diagram	AS REQUIRED		00

OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD UNLOCKS OUTSIDE LEVER ALLOWING INGRESS. EGRESS AT ALL TIMES BY INSIDE LEVER.

HW SET # 23.2

	Hinge	TA2714	US26D	MK
1	Electric Hinge	TA2714 x CC	US26D	MK
~~1~~	~~Electrified Lock~~	~~ND96EL H D RHO~~	~~626~~	~~SC~~
1	**Access Control Cylindrical Lock**	**AD300 RHO (HARDWIRED)**	**626**	**SC**
1	Permanent Core	AS REQUIRED	626	SC
1	Door Closer	4040XP MC EDA SNB	AL	LC
1	Kick Plate	K1050 8" CSK 3BE	US32D	RO
1	Wall Stop	409	US32D	RO
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE
~~1~~	~~Card Reader~~	~~FURNISHED IN OTHER SECTION~~		~~00~~
~~1~~	~~Power Supply~~	~~PS902~~		~~VD~~
1	**Power Supply**	**AS REQUIRED**		**SC**
1	Wiring Diagram	AS REQUIRED		00

OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD UNLOCKS OUTSIDE LEVER ALLOWING INGRESS. EGRESS AT ALL TIMES BY INSIDE LEVER.

HW SET # 23.3

	Hinge	TA2714	US26D	MK
1	Electric Hinge	TA2714 x CC	US26D	MK
~~1~~	~~Electrified Lock~~	~~ND96EL H D RHO~~	~~626~~	~~SC~~
1	**Access Control Cylindrical Lock**	**AD300 RHO (HARDWIRED)**	**626**	**SC**
1	Permanent Core	AS REQUIRED	626	SC
1	Door Closer	4040XP MC REG SNB	AL	LC
1	Door Stop	409/441CU	32D/26D	RO
1	Set Door Seals/Silencers	S88D/608 AS REQUIRED		PE
~~1~~	~~Card Reader~~	~~FURNISHED IN OTHER SECTION~~		~~00~~
~~1~~	~~Power Supply~~	~~PS902~~		~~VD~~
1	**Power Supply**	**AS REQUIRED**		**SC**
1	Wiring Diagram	AS REQUIRED		00

OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD UNLOCKS OUTSIDE LEVER ALLOWING INGRESS. EGRESS AT ALL TIMES BY INSIDE LEVER.

HW SET # 24.0

	Hinge	TA2714	US26D	MK
1	Push Plate	70F	US32D	RO
1	Pull Plate	111x70C	US32D	RO
1	Door Closer	4040XP MC REG SNB	AL	LC
3	Silencer	608		RO

HW SET # 25.0

	Hinge	T4A3786	US26D	MK
1	Push Pull Set	111x73C/73CL	US32D	RO
1	Door Closer	4040XP MC CUSH SNB	AL	LC
1	Kick Plate	K1050 8" CSK 3BE	US32D	RO
3	Silencer	608		RO

HW SET # 26.0

NOT USED

HW SET # 27.0

NOTE: OVERHEAD DOOR - ALL HARDWARE FURNISHED IN OTHER SECTION BY DOOR MANUFACTURER.

MANUFACTURERS ABBREVIATIONS:
1. MK - McKinney
2. PE - Pemko
3. RO - Rockwood
4. VD - Von Duprin
5. SC - Schlage
6. AD - Adams Rite
7. RF - Rixson
8. LC - LCN Closers
9. SU - Securitron

SECTION 099113 - EXTERIOR PAINTING

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 surface preparation and the application of paint systems on the following exterior substrates:

1. Steel.
2. **Galvanized metal.**

B. Related Requirements:

1. Division 05 Sections for shop priming of metal substrates with primers specified in this Section.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Verification: For each type of paint system and each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches square.
2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

C. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
3. VOC content.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 1 gal. of each material and color applied.

1.5 QUALITY ASSURANCE

A. Single-Source Responsibility: For each painting system, use a single manufacturer for primer and topcoats.

B. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of total systems for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

C. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Final Acceptance.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles for the paint category indicated.

B. Colors: As selected by Architect from manufacturer's full range.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.

2.3 METAL PRIMERS

A. Primer, Alkyd, Anti-Corrosive for Metal:

1. Benjamin Moore; Super Spec HP Alkyd Metal Primer P06/KP06.
2. PPG Paints; Speedhide Int/Ext Rust Inhibitive Steel Primers.
3. Sherwin-Williams; Protective & Marine Kem Kromik Universal Primer.
4. Tnemec; Series V10 Tnemec Primers.

B. Galvanized-Metal Primer:

1. Benjamin Moore; Acrylic Metal Primer, M04
2. PPG Paints; Pitt-Tech Plus Int/Ext DTM Primer, 90-712.
3. Sherwin-Williams; Industrial & Marine DTM Acrylic Primer/Finish B66W1.
4. Sherwin-Williams; Pro Indusrtial Pro-Cryl Universal Metal Primer, B66-310

2.4 SOLVENT-BASED PAINTS

A. Alkyd, Exterior Gloss (Gloss Level 6):

1. Benjamin Moore; Impervo Alkyd High Gloss Enamel 133/C133/N133/K133.
2. PPG Architectural; Devoe Coatings Devguard 4308 Alkyd Gloss Industrial Enamel.
3. Sherwin-Williams; Protective & Marine Seaguard 1000 Marine N41W00620.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

C. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:

1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."
3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."

E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

A. Steel Substrates:

1. Alkyd System:

a. Prime Coat: Primer, alkyd, anticorrosive for metal.
b. Prime Coat: Shop primer specified in Section where substrate is specified.
c. Intermediate Coat: Exterior alkyd enamel matching topcoat.
d. Topcoat: Alkyd, exterior, gloss (Gloss Level 6).

B. Galvanized-Metal Substrates:

1. Alkyd System:

a. Prime Coat: Primer, acrylic, galvanized metal primer.
b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
c. Topcoat: Alkyd, exterior, gloss (Gloss Level 5).

END OF SECTION 099113

SECTION 101723 – ACCESS CONTROL SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Access control pedestal enclosures.

B. Related Requirements:

1. Section 087113 “Automatic Door Operators” for additional requirements.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each access control specialty.

1. Include plans, elevations, sections, and mounting details.
2. Include diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Product certificates.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the USDJ's "2010 ADA Standards for Accessible Design" and ICC A117.1 for access control specialties.

2.2 ACCESS CONTROL PEDESTAL ENCLOSURES

A. ADA-Compliant Access Control Pedestal Enclosures: Individual housing enclosure, constructed for outdoor exposure.

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

   a. Chase Security Systems, Inc.
   b. Gooseneck Stands.
   c. Pedestal CEO LLC.

2. Construction: One-piece, bollard-style pedestal enclosure, with concealed internal reinforcement and slanted tops.

   a. Material: Aluminum.
   b. Dimensions: 48 inches high by 6 inches wide by 4 inches deep.
   c. Aluminum Finish: Powder-coat finish.

3. Pedestal: Aluminum pedestal for in-ground mounting with concealed mounting bolts and base plate. Include backside access panel with tamper-resistant fasteners for access to service components.
4. Access Control Mounting: Provide steel mounting plate with threaded inserts located to receive surface-mounted access control; plate is concealed when access control is installed.
5. Access Control Adaptor: Provide adaptor if required for installation of access control.

2.3 MATERIALS

A. Fasteners: Screws, bolts, inserts, anchorages, and other fastening devices of same material as items being fastened, and of same finish where exposed, except provide stainless-steel fasteners for exterior exposures. Use tamperproof fasteners where exposed to view.

2.4 ALUMINUM FINISHES

A. Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer’s written instructions for cleaning, conversion coating, and applying and baking finish.

1. Color and Gloss: Color to match Devoe Malaga Green (1UM40A), PMS56-5, or equal such as Tiger Drylac “RAL 6012”.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install access control specialties according to manufacturer's written instructions. Install units level and plumb, with tight joints and uniform appearance, and free of deformation and surface and finish irregularities.

B. Install access control specialties after other finishing operations, including painting, have been completed.

END OF SECTION 101723

SECTION 105113 - METAL LOCKERS

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. Welded athletic lockers.
2. Locker benches.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of metal locker.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal locker and bench.

B. Shop Drawings: For metal lockers.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Show locker trim and accessories.
3. Include locker identification system and numbering sequence.

C. Samples for Verification: For the following products, in manufacturer's standard size:

1. Lockers and equipment.
2. Locker benches.

D. Product Schedule: For lockers. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Full-size units of the following metal locker hardware items equal to 10 units for each type and finish installed.

a. Locks.
b. Identification plates.
c. Hooks.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for their installation.

B. Deliver combination control charts to Owner by registered mail or overnight package service.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.

1.9 COORDINATION

A. Coordinate sizes and locations of wood bases for metal lockers.

B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures.
b. Faulty operation of latches and other door hardware.

2. Damage from deliberate destruction and vandalism is excluded.
3. Warranty Period for Knocked-Down Metal Lockers: Two years from date of Final Acceptance.
4. Warranty Period for Welded Metal Lockers: 10 years from date of Final Acceptance.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain metal lockers and accessories from single source from single locker manufacturer.

1. Obtain locks from single lock manufacturer.

B. Basis-of-Design: Subject to compliance with requirements, provide lockers by Penco Products, Inc. or a comparable product by one of the following:

1. List Industries, Inc.
2. Lyon, LLC.
3. Penco Products, Inc. (Basis-of-Design).
4. Republic Storage Systems, LLC.

2.2 PERFORMANCE REQUIREMENTS

A. Accessibility Requirements: For lockers indicated to be accessible, comply with applicable provisions in the U.S. Department of Justice 2010 ADA Standards for Accessible Design and ICC A117.1.

2.3 WELDED ATHLETIC LOCKERS

A. Doors: One piece; fabricated from 0.060-inch nominal-thickness steel sheet; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges.

1. Doors less than 12 inches wide may be fabricated from 0.048-inch nominal-thickness steel sheet.
2. Doors for box lockers less than 15 inches wide may be fabricated from 0.048-inch nominal-thickness steel sheet.
3. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches wide; welded to inner face of doors.
4. Stiffeners: Manufacturer's standard full-height stiffener fabricated from 0.048-inch nominal-thickness steel sheet; welded to inner face of doors.
5. Door Style: Vented panel as follows:

a. Louvered Vents: No fewer than six louver openings at top and bottom for single-tier and three louver openings at top and bottom for double-tier lockers.

~~b. Perforated Vents: Manufacturer's standard shape and configuration.~~

B. Body: Assembled by welding body components together. Fabricate from unperforated steel sheet with thicknesses as follows:

1. Tops and Bottoms: 0.060-inch nominal thickness, with single bend at edges.
2. Backs: 0.048-inch nominal thickness.
3. Shelves: 0.060-inch nominal thickness, with double bend at front and single bend at sides and back.

~~C. Perforated Sides: Fabricated from 0.060-inch nominal-thickness steel sheet with manufacturer's standard diamond perforations.~~

D. Frames: Channel formed; fabricated from 0.060-inch nominal-thickness steel sheet or 0.097-inch nominal-thickness steel angles; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral, full-height door strikes on vertical main frames.

1. Cross Frames for Double-Tier Lockers: Channel formed and fabricated from same material as main frames; welded to vertical main frames.

E. Hinges: Welded to door and attached to door frame with no fewer than two factory-installed rivets per hinge that are completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees.

1. Hinges: Manufacturer's standard, steel.

F. Door Handle and Latch for Box Lockers: Stainless-steel strike plate with integral pull; with steel padlock loop that projects through metal locker door.

G. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch high.

H. Label Holders: Clear plastic, designed to accommodate changeable card name holders; minimum 1 inch high by 4 inches wide.

I. Hooks: Manufacturer's standard ball-pointed type, aluminum or steel; zinc plated.

J. Filler Panels: Fabricated from 0.048-inch nominal-thickness steel sheet.

K. Materials:

1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.

L. Finish: Baked enamel or powder coat.

1. Color: As indicated on Interior Finish Legend on Drawings.

2.4 PEDESTAL BENCHES

A. Provide bench units with overall assembly height of 17-1/2 inches nominal.

B. Bench Tops: Manufacturer's standard one-piece units, with rounded corners and edges.

1. Size: Minimum 9-1/2 inches wide by 1-1/2 inches thick in lengths indicated on Drawings, but not exceeding 96 inches, except provide 20- inch-wide tops where accessible benches are indicated.
2. Material: Laminated clear hardwood with one coat of clear sealer on all surfaces and one coat of clear lacquer on top and sides.

C. Fixed Pedestals: Manufacturer's standard supports, with predrilled fastener holes for attaching bench top and anchoring to floor, complete with fasteners and anchors, and as follows:

1. Tubular Steel: 1-1/2-inch- diameter steel tubing secured to bench tops with stainless steel, tamper resistant torx head screws and secured to the floor using lead expansion shields with 2-inch stainless steel Phillip's head machine bolts.

a. Color: As selected by Architect from manufacturer's full range.

2.5 FABRICATION

A. Fabricate metal lockers square, rigid, without warp, and with metal faces flat and free of dents or distortion. Make exposed metal edges safe to touch and free of sharp edges and burrs.

1. Form body panels, doors, shelves, and accessories from one-piece steel sheet unless otherwise indicated.
2. Provide fasteners, filler plates, supports, clips, and closures as required for complete installation.

B. Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments. Factory weld frame members of each metal locker together to form a rigid, one-piece assembly.

1. Configuration: As indicated on Drawings.

C. Equipment: Provide each locker with an identification plate and the following equipment:

1. Single-Tier Units: Two shelves, one double-prong ceiling hook, and one single-prong wall hooks.
2. Double-Tier Units: One double-prong ceiling hook and two single-prong wall hooks.

D. Welded Construction: Factory preassemble metal lockers by welding all joints, seams, and connections; with no bolts, nuts, screws, or rivets used in assembly of main locker groups. Factory weld main locker groups into one-piece structures. Grind exposed welds flush.

E. Continuous Zee Base: Fabricated in lengths as long as practical to enclose base and base ends; finished to match lockers.

F. Continuous Sloping Tops: Fabricated in lengths as long as practical, without visible fasteners at splice locations; finished to match lockers.

1. Sloping-top corner fillers, mitered.

G. Filler Panels: Fabricated in an unequal leg angle shape; finished to match lockers. Provide slip-joint filler angle formed to receive filler panel.

2.6 ACCESSORIES

A. Fasteners: Zinc- or nickel-plated steel, slotless-type, exposed bolt heads; with self-locking nuts or lock washers for nuts on moving parts.

B. Anchors: Material, type, and size required for secure anchorage to each substrate.

1. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls for corrosion resistance.
2. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls, floors, and support bases, 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 INSTALLATION

A. General: Install lockers level, plumb, and true; shim as required, using concealed shims.

B. Welded Lockers: Connect groups together with standard fasteners, with no exposed fasteners on face frames.

C. Trim: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.

1. Attach recess trim to recessed metal lockers with concealed clips.
2. Attach filler panels with concealed fasteners. Locate filler panels where indicated on Drawings.
3. Attach sloping-top units to metal lockers, with closures at exposed ends.
4. Attach boxed end panels using concealed fasteners to conceal exposed ends of nonrecessed metal lockers.
5. Attach finished end panels using fasteners only at perimeter to conceal exposed ends of nonrecessed metal lockers.

D. Fixed Benches: Provide no fewer than two pedestals for each bench, uniformly spaced not more than 72 inches apart. Securely fasten tops of pedestals to undersides of bench tops, and anchor bases to floor.

3.3 ADJUSTING

A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding. Verify that integral locking devices operate properly.

3.4 PROTECTION

A. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction.

B. Touch up marred finishes, or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION 105113

SECTION 23 21 14 – UNDERGROUND PRE-INSULATED HYDRONIC PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

B. Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them.

1.02 SUMMARY

A. This section provides for furnishing, installing, and testing pre-insulated carbon steel direct buried water piping system including valves, fittings and appurtenances for chilled water service in conformance with ASME B 31.1 – 31.9, latest edition.

B. All preinsulated piping systems shall be completely sealed and waterproof, and they shall be capable of allowing sufficient movement for thermal expansion and contraction. Each assembly shall be factory-designed for the specific service medium, temperature, and pressure. Expansion loops, expansion joints, anchors, and guides shall be furnished and installed to provide a trouble-free system and avoid stress on any equipment.

1.03 REFERENCE STANDARDS

A. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.

B. All reference amendments adopted prior to the effective date of this Contract shall be applicable to this Project.

C. All materials, installation and workmanship shall comply with the applicable requirements and standards addressed within the following references:

1. ASME B31.9 Building Services Piping.

2. ASTM C518 Insulation thermal conductivity, "k factor".

3. ASTM D 638 Tensile strength and elongation of plastic materials.

4. ASTM D 1621 Compressive strength of insulating foam.

5. ASTM D 1622 Density of insulating foam.

6. ASTM D 2856 Closed cell content of insulating foam.

7. ASTM D 2240 Shore hardness of materials.

8. PPI TR-4 – Recommended Hydrostatic Strengths and Design Stresses for Thermoplastic Pipe and Fittings Compounds.

9. ASTM F 714 – Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.

10. ASTM D 3035 - Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.

11. ASTM D 3261 – Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.

1.04 QUALITY ASSURANCE

A. The manufacturer is required to provide a field representative (paid for by the Contractor) to be present during the initial installation period to train the contractor on unloading and handling and installation of the insulated piping. Training shall address bedding preparation, insulation of joints and backfilling of piping. The manufacturer's representative shall make a minimum of five observations during the installation and shall submit a written report through the Contractor to the Engineer describing his observations including that he has inspected the piping at the job site for damage to the insulation and jacket, recommendations for correction to any improperly installed piping and the progress of the installation.

B. On completion of the installation, the Contractor shall deliver to the Owner a certificate from the manufacturer that the installation is in compliance with all installation recommendations and warranty requirements of the manufacturer.

C. Welders employed by the Contractor shall have passed a qualification test in accordance with the current edition of ANSI B31.1 Section IX, ASME Boiler and pressure vessel code. Welders shall be certified for the type of pipe material specified and position of welds required during fabrication of the piping. Submit the welding certificates and pictorial identification of each welder to the Engineer for review prior to commencing piping fabrication.

D. All welds shall be identified by the welder's mark and a sequence number. The Contractor shall coordinate with the owner's Certified Welding Inspector (CWI), certified as Level 2 minimum in the NDE methods utilized, to visually examine all welds in accordance with inspection and examination requirements of ANSI B 31.9. Any welds failing the visual inspection shall be ground out, re-welded and ultra-sonically tested at the expense of the Contractor. The CWI shall submit a written report of his examination of each weld to the Engineer.

E. 100% of all fitting, flange and joint welds, shop or field shall be ultrasonically tested by the owner's certified welding inspector and the CWI shall examine the results and provide a written report to the Owner/CM/Engineer. All welds not meeting the requirements of ANSI B 31.1 latest edition will be ground out, re-welded and re-tested at the expense of the Contractor.

1.05 SUBMITTALS

A. Product Data:

1. Submit shop drawings, to scale, of the piping layout of the pre-insulated direct buried piping system.

2. Drawings shall indicate all offsets, elevation changes and existing utility crossings.

3. Product data on materials.

4. Welders Certifications and proposed weld procedures shop and field.

5. End seal certification.

B. Record Documents:

1. The data submitted with the shop drawings shall certify that all materials used are meeting the indicated standards and conductivity (k)-factors, and that the proposed sealing method will assure a watertight system

2. Field reports.

3. Record as-built drawings of all buried and concealed piping, indicating exact locations, sizes, pipe materials, and service media. These documents exclude commodities by others except at locations where the specified piping procured and installed under the scope of this specification crosses under or over other pipes or types of utility commodities.

1.06 DELIVERY, STORAGE AND HANDLING

A. Products shall be delivered in original, unbroken packages, containers, or bundles bearing the name of the manufacture.

B. Products shall be carefully stored in a manner that will prevent damage and in an area that is protected from the elements.

C. End caps weather supplied by the piping manufacturer or fabricated by the contractor are to be placed at the ends of the piping sections to keep debris and reptiles from entering inside the pipe while it is placed in storage.

D. Prefabricated sections of the preinsulated pipe are to be handled per the manufacturer’s recommendations or instructions.

1.07 WARRANTY

A. Manufacturer's warranty form in which manufacturer agrees to repair or replace components that fail in materials or workmanship within specified warranty period.

PART 2 - PRODUCTS

2.01 GENERAL

A. All materials shall meet or exceed all applicable referenced standards, federal, state and local requirements, and conform to codes and ordinances of authorities having jurisdiction.

B. Pre-insulated Piping:

1. All straight sections of steel pipe shall be factory insulated. Field weld joints shall be provided with field insulation kits to be compatible with the pre-insulated pipe.

2. The carrier pipe shall be concentrically located within the jacket.

3. Carrier pipe shall be standard weight, carbon steel, seamless, ASTM A-53, Grade A or B. All joints shall be butt-welded. Pipe fittings shall be standard weight seamless steel welding fittings satisfying ASTM A284, Grade WPA or WPB, ANSI B16.9e, long radius bends, having a wall thickness equal to the pipe. Piping fittings shall be factory welded to sections of straight pipe and factory insulated and jacketed. All piping shall be shipped from the factory to the job with ends capped.

4. Provide polyurethane insulated underground carbon steel core piping system with HDPE outer shell. The pre-insulated pipe shall be in unitized factory prefabricated sections. Pipe shall be listed suitable for use with 38°F chilled water.

5. Insulation. The insulation shall be formed-in-place closed-cell polyurethane foam providing intimate contact with both the core pipe and casing pipe. It shall be 90-95 percent closed cell with a 2 lb/cu.ft. density. Provide a thermal conductivity coefficient of 0.16 BTU/hr (sq. ft.) (F/In.) at 73°F.

MINIMUM INSULATION THICKNESS

Pipe Size (in.)	Insulation Thickness (in.)	
	Chilled Water	Hot Water
1 – 8	1.5	1.5
10 – 12	1.5	1.5

6. After hydrostatic testing of the carrier pipe, field joints shall be insulated, with kits provided by the pre-insulated pipe manufacturer. Field joint insulation shall be applied in straight sections by pour foaming in-situ, using molds furnished by the system manufacturer. Field joint insulation surface shall be sealed with a heat shrinkable sleeve. Insulation and jacket on all fittings shall be factory applied after pipe spool fabrication, extending continuously onto adjoining straight section(s) of pipe.

C. Casing:

1. The casing shall be seamless high-density polyethylene with a minimum thickness of 120 mils.

2. Joints and Fittings. Field joints shall be made only on straight pipe sections. Fitting insulation and casing shall be factory applied.

3. End Seals. The end of each pipe casing joint shall be sealed to the carrier pipe with a preformed flexible polyethylene end seal or by turning down the jacket to seal against the service pipe. End seals shall be factory applied and bonded to the jacket and carrier pipe. End seals/jacket combinations are to be certified by an independent testing laboratory at 20-foot head pressure for 48-hour test period to maintain a watertight seal. End seal certification shall be submitted for approval. Mastic end seals are not acceptable. O-Ring seals are not acceptable. Provide a preformed heat shrink end seal at all field cuts.

4. Underground piping shall be bedded in compacted granular material ASTM C33 gradation 67, with pea gravel 8" under, around and 6" over laid pipe. Cover with densely compacted backfill. Piping trench for a distance of 8'-0" out from building shall not have pea gravel or sand but shall be select backfill densely compacted as specified for building floor slab backfill.

5. Prepare shop drawings to scale indicating the entire site plan with all underground piping thereon. Elevations of all piping shall be indicated. Details of piping and bedding shall be drawn indicating size materials and arrangement. All shop drawings shall be submitted to the pipe manufacturer for their review and shall bear their stamp of approval prior to A/E review. Excavation for and laying of pipe shall not be started until these shop drawings are approved.

6. Prior to fabrication, the Contractor shall review drawings of all disciplines, visit the site and make on-site measurements to ascertain that no interferences will be encountered upon installation. If there are any significant deviations from the Contract Drawings, produce "Interference Drawings." Before fabricating the piping and installing related equipment, the Contractor shall send a letter to the Owner stating that no interferences exist in the proposed installation. By submitting this letter, the Contractor certifies that he has performed the above requirements and no interferences will result during installation. There will be no additional compensation for minor deviations.

7. Piping has a design pressure of 150 psig and shall be tested at a pressure of 225 psi. Test only one line at a time. Isolate piping from building and existing system during tests. Do not insulate field weld joints until after hydro-static test.

8. Factory technical assistance shall be provided by an authorized representative of the manufacturer. The representative shall be thoroughly qualified in knowledge and experience in the proper installation methods of this type of piping system. Refer to paragraphs 1.04 A & B for additional requirements

2.02 MANUFACTURERS

A. Products of the following manufacturers which comply with all requirements are acceptable:

1. Perma Pipe

2. Thermal Pipe Systems, Inc.

3. Thermacor

4. Insul-Tek

PART 3 - EXECUTION

3.01 INSTALLATION

A. Installation shall meet or exceed all applicable federal, state and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.

B. Install piping in accordance with the specifications, pipe manufacturer's published installation instructions and as shown on the drawings.

C. Field Supervision. Factory trained field supervision shall be provided for all critical periods of pre-insulated pipe installation including but not limited to: unloading, field joint construction, field insulation of joints and fittings, and testing.

D. Field Joints and Valves. All field joints and valves shall be insulated and sealed after successful hydrostatic test. Joint areas shall be backfilled after installation of insulation and jacket in accordance with manufacturer's recommendation.

E. Install pre-formed heat shrink seals on all field cuts of pre-insulated piping shall be in accordance with manufacturer’s published recommendations:

F. Backfill. Refer to typical piping trench detail on design drawings. Evenly fill trench width with 8 inch layers of backfill material compacting each layer to a minimum compaction of 95% of Standard Density as indicated in Division 2.

G. The Contractor shall contact the Owner’s water treatment company and purchase and install recommended chemicals for flushing and treatment of the piping system. Initial charges of chemicals for cleaning and treatment of the piping system shall be at the expense of the Contractor.

H. Clean piping prior to filling system by using a pressurized water jet system that is drawn thru the piping system. The Contractor shall provide all temporary connections, piping, valves, air vents, portable pumps, shot feeders, etc. as required for cleaning, filling and draining the piping system. Submit a complete cleaning plan to the Engineer for review, include a drawing showing all temporary connections. Provide a written plan for filling the system, method of adding chemicals, description of chemicals to be used, and method of the disposal of cleaning water. Disposal of chemically treated water is to be in accordance with City of Charlotte requirements. After cleaning is complete introduce the approved chemicals into the system and provide a chemical analysis report of the treated water in the piping. A report shall be provided for all applicable systems chilled and hot water. After the report is approved by the Owner and/or Engineer, contractor shall proceed with opening the extension of the underground piping system to the new building piping systems. Final turnover of the extended underground piping system and new building piping system to the existing campus underground piping systems shall occur after all flushing and chemical treatment reports have been reviewed and approved.

3.02 TESTING

A. Test each line separately, apply a hydraulic pressure of 225 psig and carefully check for leaks over the 4-hour test period. New distribution system shall be completely isolated from existing distribution system during testing by means of a weld end cap or flat plate. Repair all leaks and retest the system until proved leak tight. Pressure testing to be witnessed by engineer and owner’s commissioning agent. Note: Backfill piping as required, leaving joints exposed prior to subjecting piping to pressure test. After test, Contractor shall connect new piping to existing piping as prescribed in the documents.

~~B. Ten percent (10%) of all welds shall be radiographed; ten welds minimum. If 2 welds fail, all welds will be radiographed and repaired as required at the Contractor's expense. Refer to paragraphs 1.04 C, D & E.~~

END OF SECTION 23 21 14

SECTION 32 31 00 ENCLOSED TRACK INDUSTRIAL ALUMINUM CANTILEVER GATE SYSTEM

PART 1 - GENERAL

1.1 WORK INCLUDED

The contractor shall provide all labor, materials, and appurtenances necessary for installation of the industrial cantilever gate system defined herein.

1.2 RELATED WORK

Section 31 00 00 - Earthwork
Section 32 13 13 - Concrete

1.3 SYSTEM DESCRIPTION

The manufacturer shall supply a total industrial ornamental aluminum cantilever gate system. The system shall include all components (i.e. tracks, uprights, bracing, pickets, hardware, fittings and fasteners) required.

1.4 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.5 REFERENCES

- ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus.
- ASTM B221 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
- ASTM D523 - Test Method for Specular Gloss.
- ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.
- ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
- ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
- ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.
- ASTM F1184 – Industrial & Commercial Horizontal Slide Gates

1.6 SUBMITTAL

The manufacturer’s submittal package consisting of gate elevations, hardware details, and installation details, shall be submitted prior to installation.

1.7 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism, and theft.

PART 2 - MATERIALS

2.1 MATERIAL

A. The materials used for cantilever gate framing (i.e., uprights, diagonal braces and pickets or pales) shall be manufactured from ASTM B221 aluminum (designation 6063-T-6) with a yield strength of 25,000 PSI, a tensile strength of 30,000 PSI and a standard mill finish. The rails shall be manufactured from ASTM B221 aluminum (designation 6063-T-6) with minimum yield strength of 25,000 PSI, a tensile strength of 30,000 PSI and a standard mill finish.

B. Material for diagonal bracing and uprights shall be 2" sq. x ¼" aluminum. Material for pickets shall be 1" x 1/8" wall aluminum.

C. Internal roller truck assembly shall be self-aligning swivel ball-and-socket type running on four bearing wheels. Internal roller truck assembly shall be affixed to the hanger bracket by means of a 5/8" diameter industrial-grade rod end/center bolt, with a minimum static load rating of 10,000 pounds. Attachment of the center bolt to the truck body shall be by means of a swivel joint to ensure equivalent and consistent loading on all bearing wheels and internal track surfaces throughout the travel of the gate.

2.2 FABRICATION

A. Pickets, enclosed track, uprights and diagonal bracing shall be pre-drilled and labeled for easy assembly. All components shall be precut to specified lengths.

B. Top and bottom rail extrusions shall be mechanically fastened to vertical uprights and reinforced with diagonal braces, as required by drawing.

C. The manufactured components shall be subjected to the thermal stratification coating process (high-temperature, in-line, multi-stage, and multi-layer) including, as a minimum, a six-stage pretreatment/wash and an electrostatic spray application of a polyester finish. The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be black. The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 1.

Table 1 – Coating Performance Requirements

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 3,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).

Weathering Resistance	D822 D2244, D523 (60˚ Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

PART 3 - EXECUTION

3.1 PREPARATION

A. All new gate installations shall be laid out by the contractor in accordance with the construction plans.

B. All hardware shall be installed in accordance with the installation instructions. Cantilever gates shall be installed so they comply with current ASTM F2200 & UL325 standards.

C. Gate stops shall be installed on each track in a way that conforms to current ASTM F2200 standards.

3.2 GATE INSTALLATION

Gate post shall be spaced according to specified gate elevation. Posts shall be set in concrete footers having a minimum depth of 48" with a minimum diameter of 12" (Note: In some cases, local restrictions of freezing weather conditions may require a greater depth). The "Earthwork" and "Concrete" sections of this specification shall govern material requirements for the concrete footer. Posts setting by other methods such as plated posts or grouted core-drilled footers are permissible only if shown by engineering analysis to be sufficient in strength for the intended application.

3.3 CLEANING

3.4 The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

END OF SECTION 32 31 00

UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE
FACILITIES OPERATIONS / PARKING SERVICES COMPLEX

9201 UNIVERSITY CITY BLVD, CHARLOTTE, NC, 28223

BUILDING BID DOCUMENTS
AUGUST 21, 2017 **9202-164730**
SCO ID#: 16-15656-02B

LIST OF SHEETS

GENERAL

LS3P ASSOCIATES LTD.
227 WEST TRADE STREET
SUITE 700
CHARLOTTE, NC 28202
tel: 704.333.6686
fax: 704.371.7906

G-000	COVER SHEET/SHEET INDEX
G-001	NC BUILDING CODE SUMMARY OFFICE/SHOPS & WAREHOUSE
G-002	NC BUILDING CODE SUMMARY GAS STORAGE BUILDING AND CANOPIES
G-003	PROJECT LEGENDS AND ABBREVIATIONS
G-004	U.L. DETAILS
G-005	LIFE SAFETY SITE PLAN
G-006	OFFICE/SHOPS LIFE SAFETY PLAN
G-007	WAREHOUSE/GAS STORAGE LIFE SAFETY PLAN

CIVIL

LandDesign
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
tel: 704.333.0325
fax: 704.332.3246

C101	EXISTING CONDITIONS
C202	EROSION CONTROL PLAN - PHASE 2
C203	EROSION CONTROL DETAILS
C204	EROSION CONTROL DETAILS
C300	LAYOUT PLAN - BASE BID
C300A	LAYOUT PLAN - ALTERNATES
C401	SITE DETAILS
C402	SITE DETAILS
C403	SITE DETAILS
C404	SITE DETAILS
C600	UTILITY PLAN
C603	UTILITY DETAILS
C700	STORMWATER MANAGEMENT PLAN
C701	STORMWATER MANAGEMENT PLAN - BUILDING
C704	STORMWATER DETAILS
C705	STORMWATER BMP DETAIL

ROAD IMPROVEMENTS

Kimley Horn and Associates, INC.
200 S Tryon St. #200
CHARLOTTE, NC 28202
tel: 704.333.5131

R-001	SIGNAL DESIGN FOR CAMERON BOULEVARD AT POPLAR LANE
R-002	ELECTRICAL DETAILS FOR CAMERON BOULEVARD AT POPLAR LANE
R-003	APS OPERATION FOR CAMERON BOULEVARD AT POPLAR LANE
R-004	MAST ARM LOADING (1/2) FOR CAMERON BOULEVARD AT POPLAR LANE
R-005	MAST ARM LOADING (2/2) FOR CAMERON BOULEVARD AT POPLAR LANE
R-006	PUSH BUTTON DETAILS FOR CAMERON BOULEVARD AT POPLAR LANE

STRUCTURAL

SKA CONSULTING ENGINEERS, INC.
4651 CHARLOTTE PARK DRIVE
SUITE 150
CHARLOTTE, NC 28217
tel: 704.424.9663
fax: 704.424.9665

S-101	GENERAL NOTES, ABBREVIATIONS AND DRAWING LEGENDS
S-201	OFFICE/SHOPS BUILDING FOUNDATION PLAN - FOR REFERENCE ONLY
S-202	WAREHOUSE AND GAS STORAGE FOUNDATION PLAN - FOR REFERENCE ONLY
S-203	ROOF FRAMING PLAN - OFFICE AND SHOPS, GAS STORAGE AND WASH RACK
S-204	ROOF FRAMING OVER-BUILD
S-501	BRACED FRAME ELEVATIONS
S-502	BRACED FRAME ELEVATIONS - FOR REFERENCE ONLY
S-601	SECTIONS AND DETAILS
S-801	TYPICAL DETAILS - FOR REFERENCE ONLY
S-802	TYPICAL DETAILS

ARCHITECTURAL

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A-001	ARCHITECTURAL SITE PLAN
A-002	ARCHITECTURAL SITE PLAN - ALTERNATES
A-003	CONSTRUCTION SUBSYSTEMS
A-004	PARTITION TYPES
A-011	OFFICE/SHOPS BUILDING OVERALL FLOOR PLAN
A-012	WAREHOUSE BUILDING OVERALL FLOOR PLAN
A-101A	OFFICE/SHOPS PARTIAL FLOOR PLAN - PATS
A-101B	OFFICE/SHOPS PARTIAL FLOOR PLAN - FO
A-101C	OFFICE/SHOPS PARTIAL FLOOR PLAN - FO SHOPS
A-102A	WAREHOUSE PARTIAL FLOOR PLAN - WEST & GAS STORAGE
A-102B	WAREHOUSE PARTIAL FLOOR PLAN - EAST
A-103	WASH RACK AND COVERED STORAGE CANOPIES (ALTERNATE NO. 2 & 12)
A-121A	OFFICE/SHOPS BUILDING RCP - PATS
A-121B	OFFICE/SHOPS BUILDING RCP - FO
A-121C	OFFICE/SHOPS PARTIAL RCP - FO SHOPS
A-122A	WAREHOUSE PARTIAL RCP - WEST
A-122B	WAREHOUSE PARTIAL RCP - EAST
A-151	ROOF PLAN - OFFICE/SHOPS, WAREHOUSE AND GAS STORAGE BUILDING
A-201	EXTERIOR ELEVATIONS - OFFICE/SHOPS BUILDING
A-202	EXTERIOR ELEVATIONS - WAREHOUSE AND GAS STORAGE BUILDING
A-203	EXTERIOR ENLARGED ELEVATIONS - BRICK PROJECTIONS
A-204	EXTERIOR ENLARGED ELEVATIONS - BRICK PROJECTIONS
A-251	INTERIOR ELEVATIONS
A-252	INTERIOR ELEVATIONS
A-301	BUILDING SECTIONS - OFFICE/SHOPS BUILDING
A-302	BUILDING SECTIONS - WAREHOUSE BUILDING
A-351	WALL SECTIONS - OFFICE / SHOPS BUILDING
A-352	WALL SECTIONS - OFFICE / SHOPS BUILDING
A-353	WALL SECTIONS - OFFICE / SHOPS, WAREHOUSE AND MISC. BUILDINGS
A-354	WALL SECTIONAL ELEVATIONS & DETAILS - OFFICE / SHOPS
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A-410	TOILET ROOM PLANS AND SCHEDULE
A-411	RESTROOM INTERIOR ELEVATIONS
A-420	ENLARGED RCP'S AND DETAILS
A-501	PLAN DETAILS
A-510	SECTION DETAILS
A-511	SECTION DETAILS (EXTERIOR)
A-512	SECTION DETAILS (EXTERIOR)
A-551	ROOF DETAILS
A-601	DOOR SCHEDULE & DOOR TYPES
A-602	HEAD, JAMB, AND SILL DETAILS
A-603	FRAME, LOUVER, AND STOREFRONT ELEVATIONS
A-720	ROOM FINISH LEGEND AND FINISH SCHEDULES
A-721A	OFFICE/SHOPS PARTIAL FINISH FLOOR PLAN - PATS
A-721B	OFFICE/SHOPS PARTIAL FINISH FLOOR PLAN - FO
A-721C	OFFICE/SHOPS PARTIAL FINISH FLOOR PLAN - SHOPS
A-722A	WAREHOUSE PARTIAL FINISH FLOOR PLAN - WEST
A-722B	WAREHOUSE PARTIAL FINISH FLOOR PLAN - EAST
A-761	CASEWORK / MILLWORK DETAILS
A-765	SIGNAGE
A-766	MOCK-UP PANEL

FIRE PROTECTION

OPTIMA ENGINEERING
1927 SOUTH TRYON STREET
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fax: 704.338.9974

FP-001	FIRE PROTECTION - SPECIFCATIONS, NOTES AND SCHEDULES
FP-002	FIRE PROTECTION - DETAILS
FP-011	FLOOR PLAN - OFFICE/SHOPS - FIRE PROTECTION
FP-012	FLOOR PLAN - WAREHOUSE - FIRE PROTECTION

PLUMBING

OPTIMA ENGINEERING
1927 SOUTH TRYON STREET
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CHARLOTTE, NC 28203
tel: 704.228.1292
fax: 704.338.9974

P-001	PLUMBING SCHEDULES AND NOTES
P-002	PLUMBING SCHEDULES
P-003	PLUMBING DETAILS
P-004	PLUMBING DETAILS
P-101A	FLOOR PLAN - PATS/FO - WASTE AND VENT
P-101C	FLOOR PLAN - FO SHOPS - WASTE AND VENT
P-102A	FLOOR PLAN - WAREHOUSE - WASTE AND VENT - WEST
P-102B	FLOOR PLAN - WAREHOUSE - WASTE AND VENT - EAST
P-201A	FLOOR PLAN - PATS/FO - WATER AND GAS
P-201C	FLOOR PLAN - FO SHOPS - WATER AND GAS
P-202A	FLOOR PLAN - WAREHOUSE - WATER & GAS - WEST
P-202B	FLOOR PLAN - WAREHOUSE - WATER & GAS - EAST

MECHANICAL

OPTIMA ENGINEERING
1927 SOUTH TRYON STREET
SUITE 300
CHARLOTTE, NC 28203
tel: 704.228.1292
fax: 704.338.9974

M-001	MECHANICAL LENDEND, NOTES AND SCHEDULES
M-002	MECHANICAL SCHEDULES
M-003	MECHANICAL UTILITY MONITORING DETAILS
M-004	MECHANICAL VENTILATION CALCULATIONS
M-005	MECHANICAL SEQUENCE OF OPERATIONS
M-006	MECHANICAL POINTS LIST
M-010	MECHANICAL SITE PLAN
M-101A	FLOOR PLAN PATS/FO - MECHANICAL DUCT
M-101AP	FLOOR PLAN PATS/FO - MECHANICAL PIPING
M-101C	FLOOR PLAN - FO SHOPS - MECHANICAL DUCT
M-101CP	FLOOR PLAN - FO SHOPS - MECHANICAL PIPING
M-102A	FLOOR PLAN - WAREHOUSE - MECHANICAL DUCT - WEST
M-102AP	FLOOR PLAN - WAREHOUSE - MECHANICAL PIPING - WEST
M-102B	FLOOR PLAN - WAREHOUSE - MECHANICAL DUCT - EAST
M-102BP	FLOOR PLAN - WAREHOUSE - MECHANICAL PIPING - EAST
M-201A	ROOF PLAN PATS/FO - MECHANICAL
M-201C	ROOF PLAN - FO SHOPS - MECHANICAL
M-202B	ROOF PLAN - WAREHOUSE - MECHANICAL - EAST
M-401	ENLARGED MECHANICAL ROOM - OFFICE SHOPS
M-402	ENLARGED MECHANICAL ROOM - WAREHOUSE
M-403	ENLARGED MECHANICAL ROOM DETAILS
M-501	MECHANICAL DETAILS
M-502	MECHANICAL DETAILS

ELECTRICAL

OPTIMA ENGINEERING
1927 SOUTH TRYON STREET
SUITE 300
CHARLOTTE, NC 28203
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fax: 704.338.9974

E-001	ELECTRICAL NOTES
E-002	ELECTRICAL DETAILS
E-003	ELECTRICAL DETAILS
E-004	ELECTRICAL DETAILS
E-005	ELECTRICAL DETAILS
E-006	ELECTRICAL DETAILS
E-007	ELECTRICAL DETAILS
E-008	ELECTRICAL DETAILS
E-009	ELECTRICAL SITE PLAN - OVERALL
E-010	ELECTRICAL SITE PLAN - ELECTRICAL
E-011	ELECTRICAL SITE PLAN - LIGHTING
E-101A	FLOOR PLAN - PATS/FO - POWER
E-101C	FLOOR PLAN - FO SHOPS - POWER
E-102A	FLOOR PLAN - WAREHOUSE - POWER - WEST
E-102B	FLOOR PLAN - WAREHOUSE - POWER - EAST
E-201A	REFLECTED CEILING PLAN - PATS/FO - LIGHTING
E-201C	REFLECTED CEILING PLAN - FO SHOPS - LIGHTING
E-202A	REFLECTED CEILING PLAN - WAREHOUSE - WEST - LIGHTING
E-202B	REFLECTED CEILING PLAN - WAREHOUSE - EAST - LIGHTING
E-301A	REFLECTED CEILING PLAN - PATS/FO - SPECIAL SYSTEMS
E-301C	REFLECTED CEILING PLAN - FO SHOPS - SPECIAL SYSTEMS
E-303A	REFLECTED CEILING PLAN - WAREHOUSE - SPECIAL SYSTEMS - WEST
E-303B	REFLECTED CEILING PLAN - WAREHOUSE - SPECIAL SYSTEMS - EAST
E-401A	FLOOR PLAN - PATS/FO - POWER/HVAC
E-401C	FLOOR PLAN - FO SHOPS - POWER/HVAC
E-402A	FLOOR PLAN - WAREHOUSE - POWER/HVAC - WEST
E-402B	FLOOR PLAN - WAREHOUSE - POWER/HVAC - EAST
E-501	POWER RISER
E-502	MEDIUM VOLTAGE POWER RISER
E-601	LIGHTING SCHEDULE
E-602	PANEL SCHEDULES
E-603	PANEL SCHEDULES
E-604	PANEL SCHEDULES
E-605	PANEL SCHEDULES

TELECOMM

OPTIMA ENGINEERING
1927 SOUTH TRYON STREET
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TC-001	TELECOM NOTES
TC-002	TELECOM DETAILS
TC-100	PARTIAL FLOOR PLANS - TELECOM ROOMS

LandDesign

CIVIL/ LANDSCAPE

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STRUCTURAL

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optima engineering

MECHANICAL/ELECTRICAL/ PLUMBING/FIRE PROTECTION

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ROAD IMPROVEMENT

Kimley Horn and Associates, INC.
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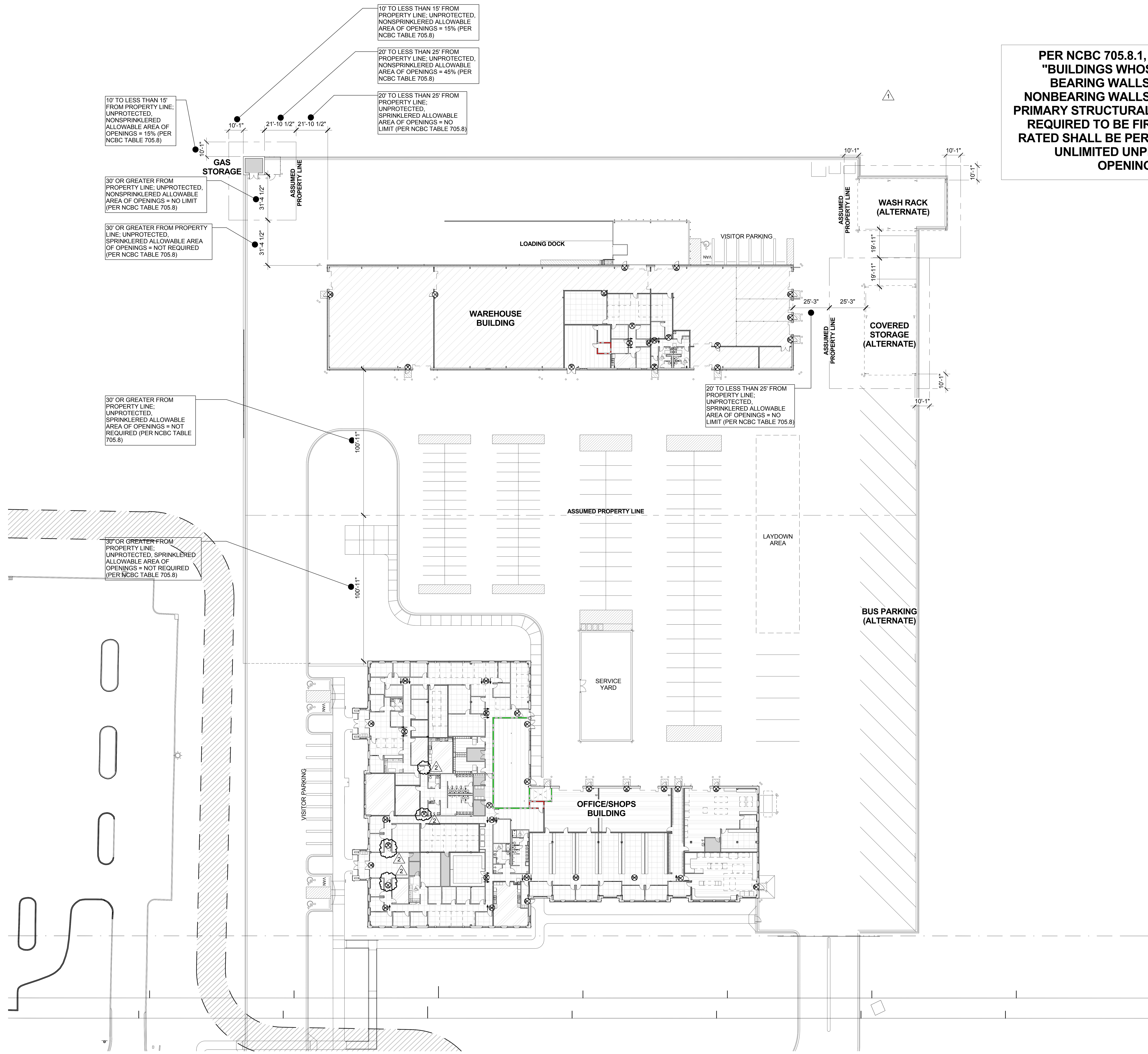
email: tom.hartmann@kimley-horn.com

PER NCBC 705.8.1, EXCEPTION 2 "BUILDINGS WHOSE EXTERIOR BEARING WALLS, EXTERIOR NONBEARING WALLS AND EXTERIOR PRIMARY STRUCTURAL FRAME ARE NOT REQUIRED TO BE FIRE-RESISTANCE RATED SHALL BE PERMITTED TO HAVE UNLIMITED UNPROTECTED OPENINGS."



A2 LIFE SAFETY PLAN - SITE PLAN

1/32" = 1'-0"

PROJECT NORTH TRUE NORTH

UNC CHARLOTTE

FACILITIES OPERATIONS / PARKING SERVICES COMPLEX

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LS3P ASSOCIATES LTD. CERT. NO. 50417 CHARLOTTE, NORTH CAROLINA

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REVISIONS:

No.	Description	Date
1	Addendum No. 4	08/28/207
2	Addendum No. 6	09/19/2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: KF
CHECKED BY: SH

LIFE SAFETY SITE PLAN

G-005

BUILDING BID DOCUMENTS

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LIFE SAFETY AREA OCCUPANCY SCHEDULE - OFFICE/SHOPS			
NAME	AREA	AREA PER OCCUPANT	OCCUPANT LOAD
Assembly - Unconcentrated			
FO TRAINING RM	568 SF	15 SF	38
FO BREAKRM	621 SF	15 SF	42
FO CONF	198 SF	15 SF	14
PaTS MULTI-PURP ROOM	340 SF	15 SF	23
PaTS CONF	220 SF	15 SF	15
PaTS BREAKRM	400 SF	15 SF	27
Business			
BUSINESS	3876 SF	100 SF	39
BUSINESS	2845 SF	100 SF	29
BUSINESS	524 SF	100 SF	6
BUSINESS	2647 SF	100 SF	27
BUSINESS	5138 SF	100 SF	52
BUSINESS	3297 SF	100 SF	33
BUSINESS	2211 SF	100 SF	23
BUSINESS	167 SF	100 SF	2
Industrial Areas			
WORKSHOPS	1609 SF	100 SF	17
ZONES WORKSHOPS	1553 SF	100 SF	16
ZONES WORKSHOPS	1116 SF	100 SF	12
WORKSHOPS	1574 SF	100 SF	16
Locker Rooms			
PaTS LOCKERS	455 SF	50 SF	10
Mechanical Room			
MECHANICAL	1552 SF	300 SF	6
MECH	141 SF	300 SF	1
MECHANICAL	680 SF	300 SF	3
Storage Areas			
STOR.	111 SF	300 SF	1
STOR.	118 SF	300 SF	1
STOR.	127 SF	300 SF	1
STOR.	239 SF	300 SF	1
STOR.	152 SF	300 SF	1
	32479 SF		456

LIFE SAFETY LEGEND

ROOM NAME / 1 OCC — OCCUPANCY LOAD
150 SF — ROOM AREA
OCC Type/SF per OCC — OCCUPANCY LOAD FACTOR; OCCUPANCY GROUP

EGRESS TRAVEL PATH: DISTANCE NOTED IS ACTUAL*

ACTUAL LOAD ON EGRESS COMPONENT
MAXIMUM CAPACITY OF EGRESS COMPONENT(1005.1) (DOOR EGRESS WIDTH/ .20) (STAIR EGRESS WIDTH / .30)

FEC — FIRE EXTINGUISHER CABINET
FEB — FIRE EXTINGUISHER BRACKET
EXIT SIGN

ASSEMBLY - UNCONCENTRATED (15 NET - 1004.1.1)
BUSINESS - (100 GROSS - 1004.1.1)
INDUSTRIAL AREAS (100 GROSS - 1004.1.1)
LOCKER ROOMS (50 GROSS - 1004.1.1)
MECHANICAL / ELECTRICAL ROOMS (300 GROSS - 1004.1.1)
STORAGE / SUPPORT AREAS (300 GROSS - 1004.1.1)
WAREHOUSES (500 GROSS - 1004.1.1)

DEAD END CORRIDOR 50'-0" MAX. TRAVEL DISCANCE (1018.4)

B: 300'-0" Exit Access Travel Distance (1016.1); 100'-0" Common Path of Egress Travel (1014.3)
S-1: 250'-0" Exit Access Travel Distance (1016.1); 100'-0" Common Path of Egress Travel (1014.3)
F-1: 250'-0" Exit Access Travel Distance (1016.1); 100'-0" Common Path of Egress Travel (1014.3)

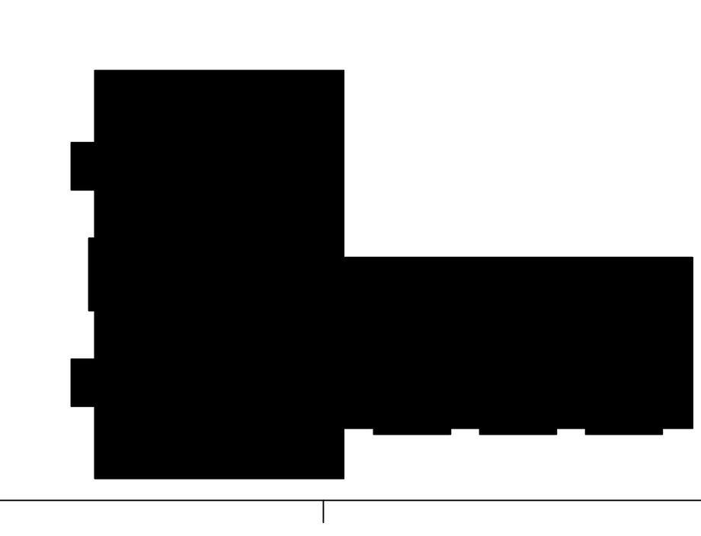
PARTITION LEGEND

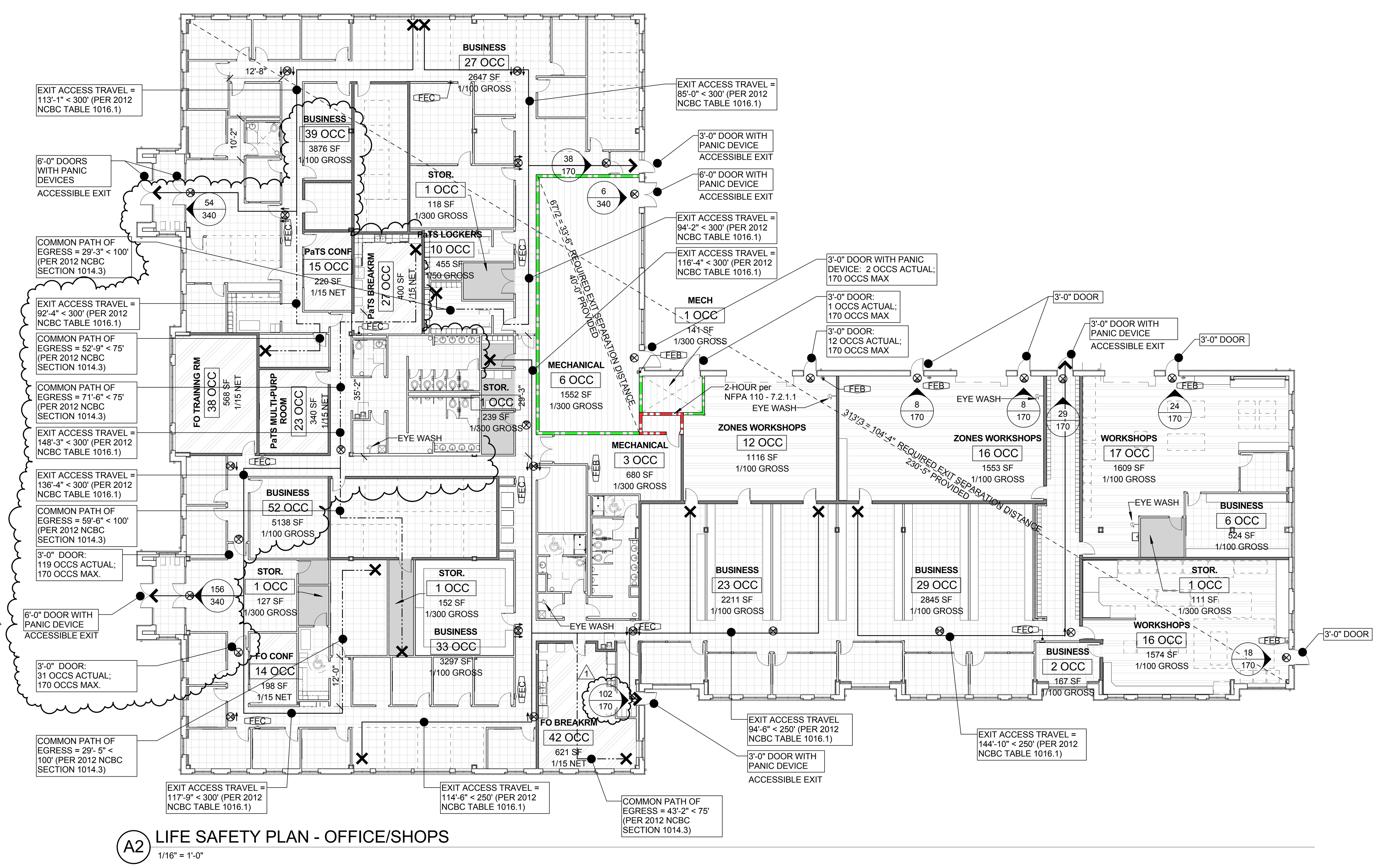
1. ALL EXTERIOR WALLS TO BE TYPE W1 U.N.O. SEE A-003 FOR CONSTRUCTION OF SUBSYSTEMS
2. SEE SHEET A-004 FOR CONSTRUCTION OF PARTITION TYPES
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE G32 U.N.O.

NON-RATED WALL. EXTEND GYP. BD. AND FRAMING TO STRUCTURE ABOVE.
NON-RATED WALL. EXTEND GYP. BD. TO MIN. 4" ABOVE FINISHED CEILING AND FRAMING TO STRUCTURE ABOVE.
1 HR-RATED BARRIER; EXTEND TO THE UNDERSIDE OF THE DECK ABOVE.
2 HR-RATED BARRIER; EXTEND TO THE UNDERSIDE OF THE DECK ABOVE.

FEC — FIRE EXTINGUISHER CABINET
FEB — FIRE EXTINGUISHER BRACKET
CG — CORNER GUARD

KEYPLAN





A2 LIFE SAFETY PLAN - OFFICE/SHOPS
1/16" = 1'-0"

PROJECT NORTH   TRUE NORTH

UNC CHARLOTTE

FACILITIES OPERATIONS / PARKING SERVICES COMPLEX

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REVISIONS:

No.	Description	Date
1	Addendum No. 6	09/19/2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: KF
CHECKED BY: SH

OFFICE/SHOPS LIFE SAFETY PLAN

G-006

BUILDING BID DOCUMENTS

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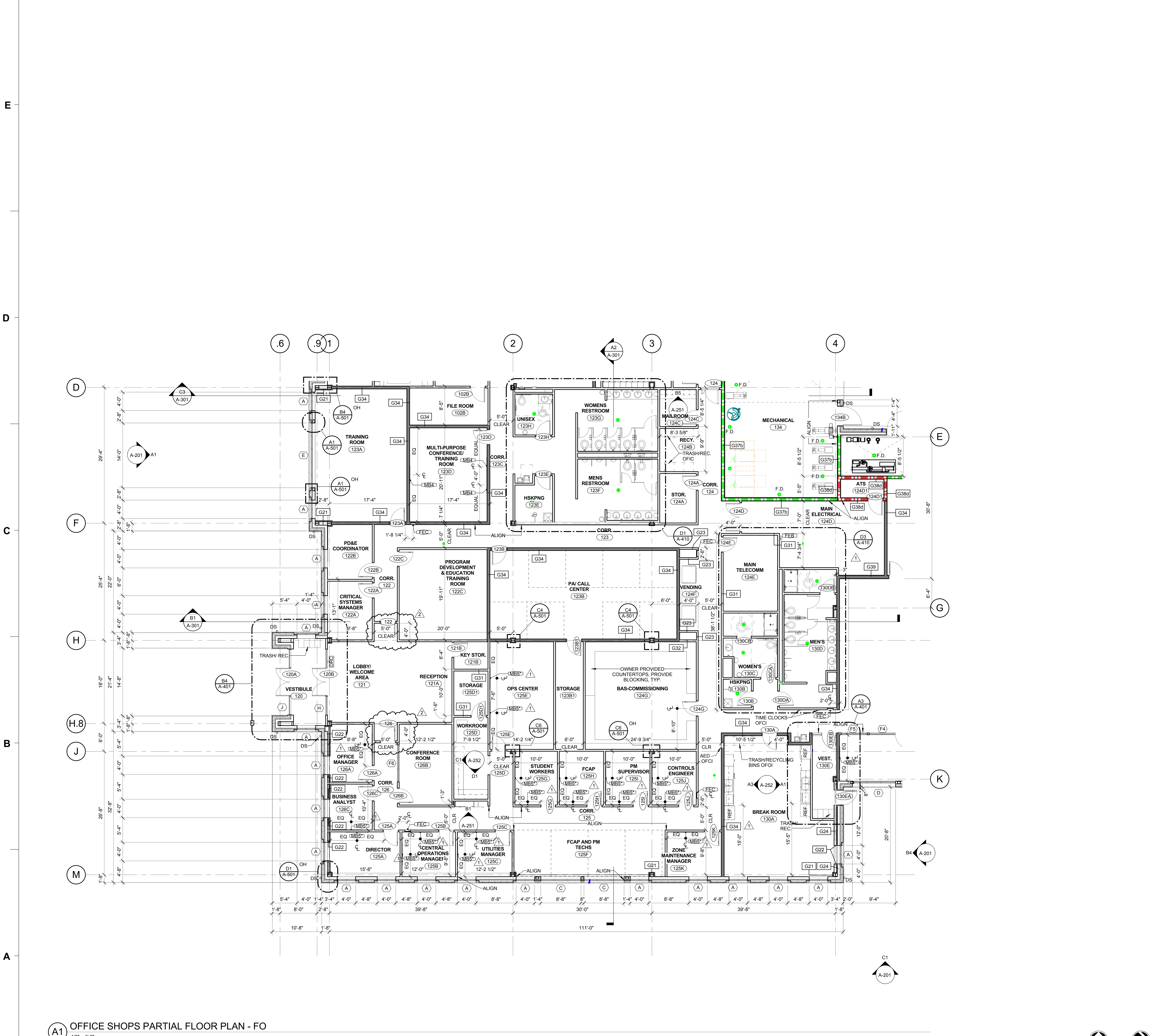

A1 OFFICE SHOPS PARTIAL FLOOR PLAN - FO

1/8" = 1'-0"

FLOOR PLAN SHEET NOTES

1. EXTERIOR DIMENSIONS AT MASONRY VENEER ARE TO FACE OF MASONRY.
2. INTERIOR DIMENSIONS INDICATED ARE TO FACE OF FINISH WALLS AND CENTERLINES OF COLUMNS, UNO.
3. LOCATE DOOR OPENINGS 4" FROM NEAREST PERPENDICULAR WALL, UNO.
4. FIRE AND SOUND RATED WALLS/PARTITIONS TO BE CONSTRUCTED TIGHT TO STRUCTURE, PIPING, DUCTWORK AND OTHER PENETRATIONS. ALL WORK IS TO BE BRACED TO STRUCTURE ABOVE.
5. WHERE PARTITIONS OF DIFFERENT FIRE RATINGS INTERSECT, THE HIGHEST RATED PARTITION SHALL CONTINUE THROUGH. MAINTAIN PARTITION FIRE RATING BEHIND RECESSED FIRE EXTINGUISHER CABINETS.
6. INSTALL BLOCKING IN PARTITIONS FOR CASEWORK, WALL MOUNTED EQUIPMENT, TRIM AND RELATED CONSTRUCTION AS INDICATED IN THE SPECIFICATIONS.
7. SEE LIFE SAFETY PLANS FOR REQUIRED FIRE SEPARATION WALLS.
8. SEE SHEET A-601 & A-603 FOR DOOR WINDOW & GLAZING TYPES
9. SEE SHEET A-603 FOR LOUVER TYPES
10. SEE SHEET A-003 FOR CONSTRUCTION SUBSYSTEMS.
11. SEE SHEET A-251, A-252, A-410, A-411 AND A-761 FOR CASEWORK ELEVATIONS & DETAILS.
12. SEE SHEETS A-251 AND A-252 FOR INTERIOR ELEVATIONS, ACCESSORY DESCRIPTIONS & MOUNTING HEIGHTS.
13. SEE SHEETS A-721 THROUGH A-722 FOR FINISH FLOORING, TRANSITIONS, PATTERNS AND WALL PROTECTION.
14. SEE SHEET A-720 FOR FINISH SCHEDULE.
15. SEE SHEETS A-401 FOR ENLARGED PLANS INDICATING ADDITIONAL DIMENSIONS AND PARTITION TYPES.
16. SEE SHEET A-765 FOR SIGN SCHEDULE & ELEVATIONS AND DETAILS.
17. SEE STRUCTURAL DRAWINGS FOR SLAB DEPRESSIONS AND CUTOUTS.
18. SEE BUILDING ELEVATION DRAWINGS FOR LOCATION OF EXTERIOR MASONRY CONTROL JOINTS.
19. EXTERIOR DIMENSIONS TAKEN FROM MASONRY FACE, NOT METAL PANEL
20. ACCESSIBLE AND COMMON FEATURES, E.G., AUTOMATIC DOOR ACTIVATOR, CARD SWIPE, SHALL BE PLACED 34"-36" AFF. DO NOT PLACE ACCESSIBLE OR COMMON USE BUILDING FEATURES WITHIN 24" OF AN INTERIOR CORNER.

PARTITION NOTES

1. ALL NON-DESIGNATED PARTITIONS SHALL BE TYPE G32.
2. ALL PIPE AND CONDUIT PENETRATIONS THRU 1 HR RATED OR MORE PARTITIONS, FLOORS, ROOF, ETC. SHALL BE SEALED WITH A RESPECTIVELY RATED FIRE BARRIER PENETRATION SEALING SYSTEM BY 3M OR U.L. APPROVED EQUAL
3. TILE BACKER BOARD SHALL BE USED IN ALL LOCATIONS TO RECEIVE TILE FINISHES. REFER TO FINISH SCHEDULE AND INTERIOR ELEVATIONS FOR LOCATIONS..
4. CONTRACTOR SHALL COORDINATE WITH MECHANICAL DUCTWORK PRIOR TO FABRICATION OF PARTITION WALLS.
5. SHOULD CONDITIONS OCCUR WHERE A WALL IS UNABLE TO GO STRAIGHT UP TO STRUCTURE DUE TO PIPING, DUCTWORK, ETC., THE PARTITION (GYPSUM BOARD AND FRAMING) MAY JOG HORIZONTALLY ABOVE THE CEILING TO AVOID THE PROBLEM. RATED WALL INTEGRITY SHALL BE MAINTAINED.
6. WHERE STUDS EXTEND TO STRUCTURE AND GYPSUM WALLBOARD AND SOUND ATTENUATION BLANKETS EXTEND JUST ABOVE THE FINISH CEILING, CAP OFF PARTITION FINISHES WITH A RUNNER CHANNEL WHEN CEILING PLENUM IS USED AS A RETURN AIR PLENUM.
7. DIMENSIONAL CONFLICTS BETWEEN PARTITION TYPES AND THE ARCHITECTURAL FLOOR PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.
8. SEE LIFE SAFETY PLANS FOR THE LOCATIONS OF SMOKE BARRIERS, SMOKE PARTITIONS AND FIRE-RATED PARTITIONS.
9. REFER TO UNDERWRITERS LABORATORIES, INC. FIRE RESISTANCE VOLUMES - CURRENT EDITION FOR SPECIFIC CONSTRUCTION REQUIREMENTS OF U.L. LISTED ASSEMBLIES.
10. REFER TO MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR TYPICAL U.L. LISTED PENETRATIONS THROUGH FIRE-RATED ASSEMBLIES. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING APPROPRIATE PROJECT-SPECIFIC U.L. LISTED ASSEMBLIES FOR PENETRATIONS.
11. AT ALL EXISTING AND CONSTRUCTED PARTITIONS THE CONTRACTOR IS TO MAINTAIN THE FIRE-RESISTIVE INTEGRITY
12. PROVIDE ACOUSTICAL SEALANT AT PERIMETER OF ALL SOUND RATED PARTITIONS AND AT ALL PARTITION PENETRATIONS. IF PARTITION IS FIRE RATED, PROVIDE UL LABELED FIRESTOPPING IN PLACE ACOUSTICAL SEALANT AT PARTITIONS THAT ARE SOUND AND FIRE RATED, PROVIDE ACOUSTICAL SEALANT AT PARTITION PENETRATIONS THAT DO NOT REQUIRE FIRESTOPPING (EXAMPLE: DUCT PENETRATIONS WITH FIRE DAMPERS).

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE TYPE W1 U.N.O. SEE A-003 FOR CONSTRUCTION OF SUBSYSTEMS
2. SEE SHEET A-004 FOR CONSTRUCTION OF PARTITION TYPES
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE G32 U.N.O.

NON-RATED WALL. EXTEND GYP. BD. AND FRAMING TO STRUCTURE ABOVE.

NON-RATED WALL. EXTEND GYP. BD. TO MIN. 4" ABOVE FINISHED CEILING AND FRAMING TO STRUCTURE ABOVE.

1 HR-RATED BARRIER; EXTEND TO THE UNDERSIDE OF THE DECK ABOVE.

2 HR-RATED BARRIER; EXTEND TO THE UNDERSIDE OF THE DECK ABOVE.

FEC FIRE EXTINGUISHER CABINET

FEB FIRE EXTINGUISHER BRACKET

CG CORNER GUARD

KEYPLAN

UNC CHARLOTTE

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WILLIAM SCOTT BAKER REGISTERED ARCHITECT 8326 NORTH CAROLINA CHARLOTTE, N.C. 9/19/2017

LS3P ASSOCIATES LTD. REGISTERED ARCHITECTURAL COMPANY CERT. NO. 50417 CHARLOTTE, NORTH CAROLINA

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REVISIONS:

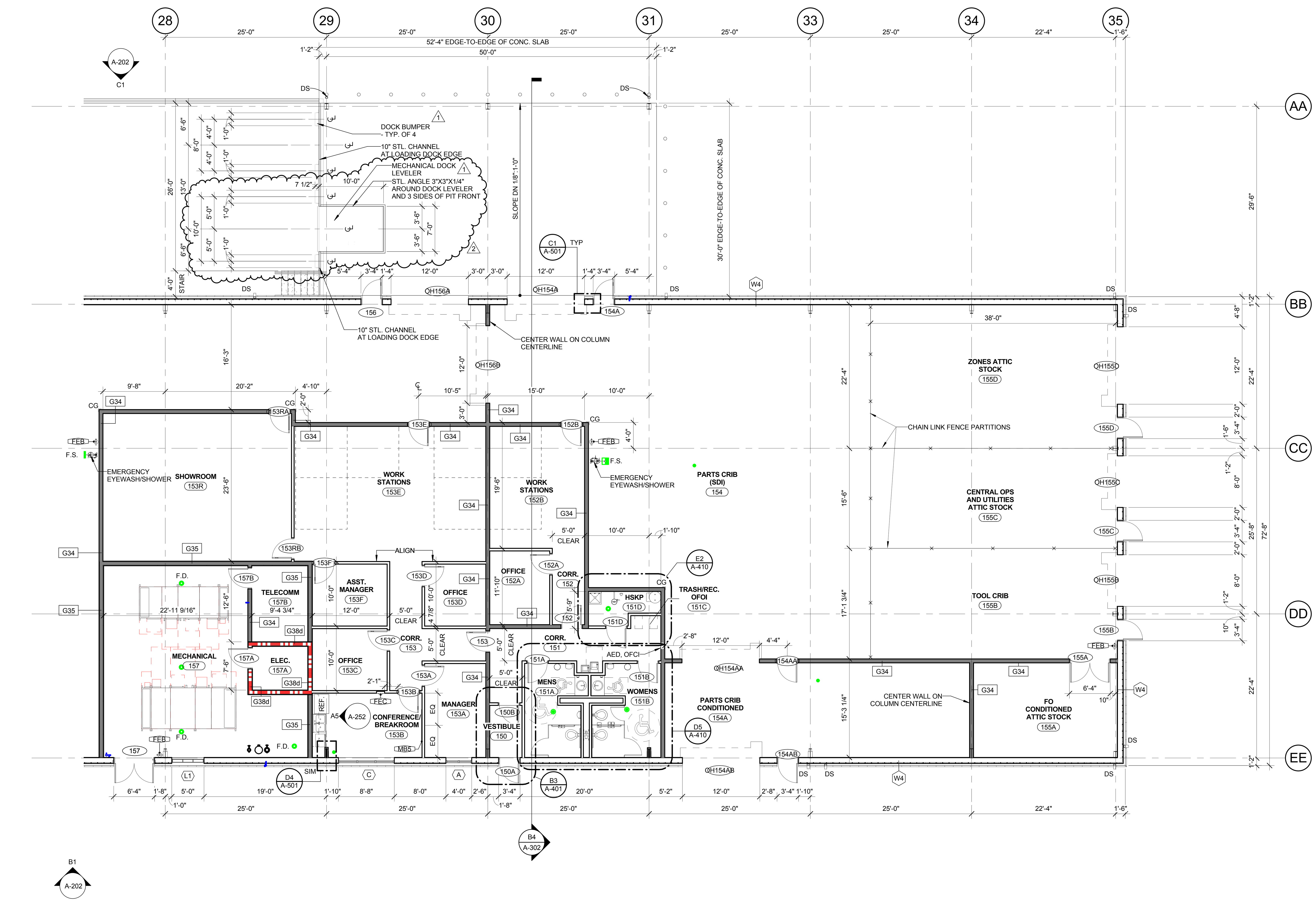
No.	Description	Date
1	Addendum No. 5	09/11/2017
2	Addendum No. 6	09/19/2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: KF
CHECKED BY: SH

OFFICE/SHOPS PARTIAL FLOOR PLAN - FO

A-101B

BUILDING BID DOCUMENTS



A1 WAREHOUSE PARTIAL FLOOR PLAN - EAST

1/8" = 1'-0"

PROJECT NORTH

TRUE NORTH

FLOOR PLAN SHEET NOTES

1. EXTERIOR DIMENSIONS AT MASONRY VENEER ARE TO FACE OF MASONRY.
2. INTERIOR DIMENSIONS INDICATED ARE TO FACE OF FINISH WALLS AND CENTERLINES OF COLUMNS, UNO.
3. LOCATE DOOR OPENINGS 4" FROM NEAREST PERPENDICULAR WALL, UNO.
4. FIRE AND SOUND RATED WALLS/PARTITIONS TO BE CONSTRUCTED TIGHT TO STRUCTURE, PIPING, DUCTWORK AND OTHER PENETRATIONS. ALL WORK IS TO BE BRACED TO STRUCTURE ABOVE.
5. WHERE PARTITIONS OF DIFFERENT FIRE RATINGS INTERSECT, THE HIGHEST RATED PARTITION SHALL CONTINUE THROUGH. MAINTAIN PARTITION FIRE RATING BEHIND RECESSED FIRE EXTINGUISHER CABINETS.
6. INSTALL BLOCKING IN PARTITIONS FOR CASEWORK, WALL MOUNTED EQUIPMENT, TRIM AND RELATED CONSTRUCTION AS INDICATED IN THE SPECIFICATIONS.
7. SEE LIFE SAFETY PLANS FOR REQUIRED FIRE SEPARATION WALLS.
8. SEE SHEET A-601 & A-603 FOR DOOR WINDOW & GLAZING TYPES
9. SEE SHEET A-603 FOR LOUVER TYPES
10. SEE SHEET A-003 FOR CONSTRUCTION SUBSYSTEMS.
11. SEE SHEET A-251, A-252, A-410, A-411 AND A-761 FOR CASEWORK ELEVATIONS & DETAILS.
12. SEE SHEETS A-251 AND A-252 FOR INTERIOR ELEVATIONS, ACCESSORY DESCRIPTIONS & MOUNTING HEIGHTS.
13. SEE SHEETS A-721 THROUGH A-722 FOR FINISH FLOORING, TRANSITIONS, PATTERNS AND WALL PROTECTION.
14. SEE SHEET A-720 FOR FINISH SCHEDULE.
15. SEE SHEETS A-401 FOR ENLARGED PLANS INDICATING ADDITIONAL DIMENSIONS AND PARTITION TYPES.
16. SEE SHEET A-765 FOR SIGN SCHEDULE & ELEVATIONS AND DETAILS.
17. SEE STRUCTURAL DRAWINGS FOR SLAB DEPRESSIONS AND CUTOUTS.
18. SEE BUILDING ELEVATION DRAWINGS FOR LOCATION OF EXTERIOR MASONRY CONTROL JOINTS.
19. EXTERIOR DIMENSIONS TAKEN FROM MASONRY FACE, NOT METAL PANEL
20. ACCESSIBLE AND COMMON FEATURES, E.G., AUTOMATIC DOOR ACTIVATOR, CARD SWIPE, SHALL BE PLACED 34"-36" AFF. DO NOT PLACE ACCESSIBLE OR COMMON USE BUILDING FEATURES WITHIN 24" OF AN INTERIOR CORNER.

PARTITION NOTES

1. ALL NON-DESIGNATED PARTITIONS SHALL BE TYPE G32.
2. ALL PIPE AND CONDUIT PENETRATIONS THRU 1 HR RATED OR MORE PARTITIONS, FLOORS, ROOF, ETC. SHALL BE SEALED WITH A RESPECTIVELY RATED FIRE BARRIER PENETRATION SEALING SYSTEM BY 3M OR U.L. APPROVED EQUAL
3. TILE BACKER BOARD SHALL BE USED IN ALL LOCATIONS TO RECEIVE TILE FINISHES. REFER TO FINISH SCHEDULE AND INTERIOR ELEVATIONS FOR LOCATIONS..
4. CONTRACTOR SHALL COORDINATE WITH MECHANICAL DUCTWORK PRIOR TO FABRICATION OF PARTITION WALLS.
5. SHOULD CONDITIONS OCCUR WHERE A WALL IS UNABLE TO GO STRAIGHT UP TO STRUCTURE DUE TO PIPING, DUCTWORK, ETC., THE PARTITION (GYPSUM BOARD AND FRAMING) MAY JOG HORIZONTALLY ABOVE THE CEILING TO AVOID THE PROBLEM. RATED WALL INTEGRITY SHALL BE MAINTAINED.
6. WHERE STUDS EXTEND TO STRUCTURE AND GYPSUM WALLBOARD AND SOUND ATTENUATION BLANKETS EXTEND JUST ABOVE THE FINISH CEILING, CAP OFF PARTITION FINISHES WITH A RUNNER CHANNEL WHEN CEILING PLENUM IS USED AS A RETURN AIR PLENUM.
7. DIMENSIONAL CONFLICTS BETWEEN PARTITION TYPES AND THE ARCHITECTURAL FLOOR PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.
8. SEE LIFE SAFETY PLANS FOR THE LOCATIONS OF SMOKE BARRIERS, SMOKE PARTITIONS AND FIRE-RATED PARTITIONS.
9. REFER TO UNDERWRITERS LABORATORIES, INC. FIRE RESISTANCE VOLUMES - CURRENT EDITION FOR SPECIFIC CONSTRUCTION REQUIREMENTS OF U.L. LISTED ASSEMBLIES.
10. REFER TO MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR TYPICAL U.L. LISTED PENETRATIONS THROUGH FIRE-RATED ASSEMBLIES. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING APPROPRIATE PROJECT-SPECIFIC U.L. LISTED ASSEMBLIES FOR PENETRATIONS.
11. AT ALL EXISTING AND CONSTRUCTED PARTITIONS THE CONTRACTOR IS TO MAINTAIN THE FIRE-RESISTIVE INTEGRITY
12. PROVIDE ACOUSTICAL SEALANT AT PERIMETER OF ALL SOUND RATED PARTITIONS AND AT ALL PARTITION PENETRATIONS. IF PARTITION IS FIRE RATED, PROVIDE UL LABELED FIRESTOPPING IN PLACE ACOUSTICAL SEALANT AT PARTITIONS THAT ARE SOUND AND FIRE RATED, PROVIDE ACOUSTICAL SEALANT AT PARTITION PENETRATIONS THAT DO NOT REQUIRE FIRESTOPPING (EXAMPLE: DUCT PENETRATIONS WITH FIRE DAMPERS).

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE TYPE W1 U.N.O. SEE A-003 FOR CONSTRUCTION OF SUBSYSTEMS
2. SEE SHEET A-004 FOR CONSTRUCTION OF PARTITION TYPES
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE G32 U.N.O.

NON-RATED WALL. EXTEND GYP. BD. AND FRAMING TO STRUCTURE ABOVE.

NON-RATED WALL. EXTEND GYP. BD. TO MIN. 4" ABOVE FINISHED CEILING AND FRAMING TO STRUCTURE ABOVE.

1 HR-RATED BARRIER; EXTEND TO THE UNDERSIDE OF THE DECK ABOVE.

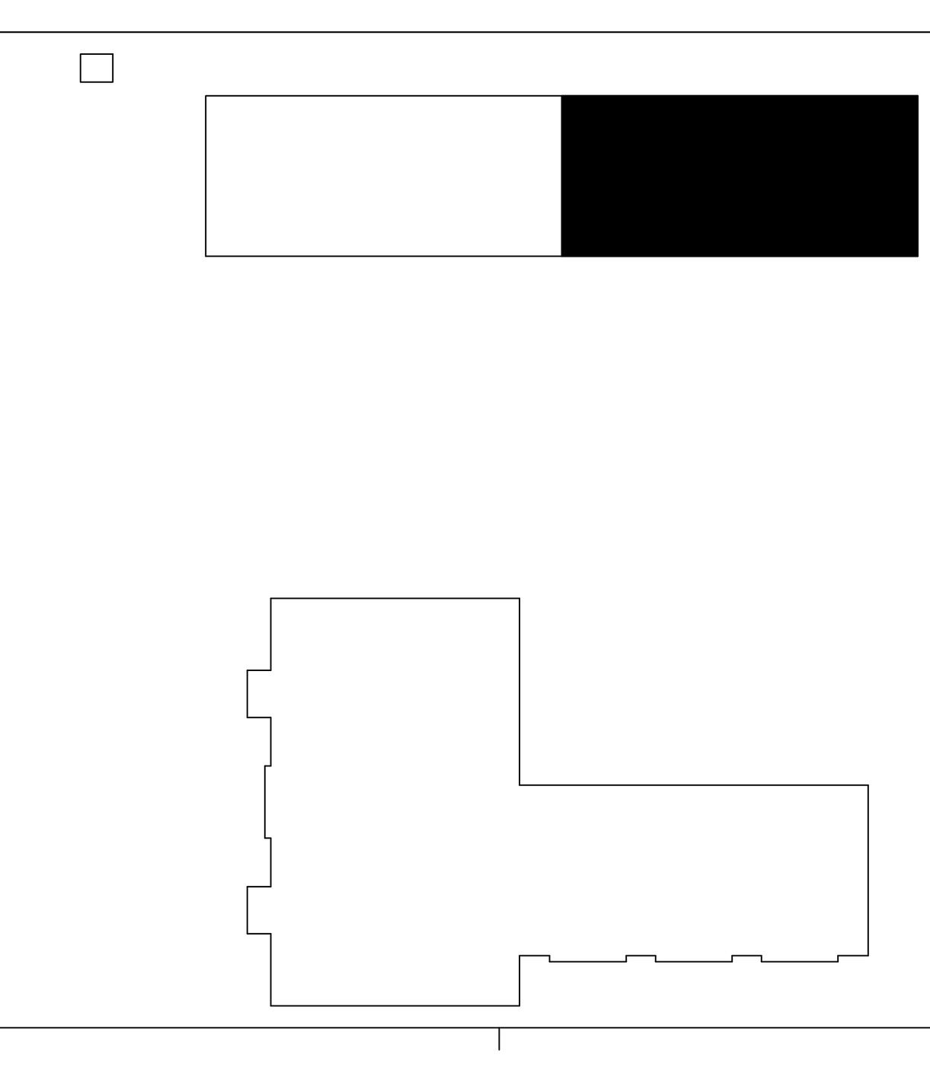
2 HR-RATED BARRIER; EXTEND TO THE UNDERSIDE OF THE DECK ABOVE.

FEC FIRE EXTINGUISHER CABINET

FEB FIRE EXTINGUISHER BRACKET

CG CORNER GUARD

KEYPLAN



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REVISIONS:

No.	Description	Date
1	Addendum No. 5	09/11/2017
2	Addendum No. 6	09/19/2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: KF
CHECKED BY: SH

WAREHOUSE PARTIAL FLOOR PLAN - EAST

A-102B

BUILDING BID DOCUMENTS

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9/20/2017 10:01:09 AM

REFLECTED CEILING PLAN SHEET NOTES

1. SEE SHEET A001 FOR WALL TYPES AND HEIGHT OF WALLS ABOVE CEILING.
2. SEE FINISH SCHEDULE FOR CEILING TYPES & MATERIALS IN EACH ROOM / AREA.
3. INTERIOR DIMENSIONS INDICATED ARE TO FACE OF FINISH AND CENTERLINES OF COLUMNS, UNO.
4. CEILING GRIDS/TILES TO BE CENTERED IN ALL ROOMS UNLESS NOTED OTHERWISE. PARTIAL TILES AT ROOM PERIMETERS SHALL NOT BE LESS THAN 6" IN EITHER DIMENSION.
5. ALL CEILINGS TO BE 10'-0" AFF, UNO. CEILING HEIGHTS SHOWN ON THE REFLECTED CEILING PLANS ARE NON-TYPICAL AND SPECIFIC TO THE AREA INDICATED. REFER TO INTERIOR ELEVATIONS FOR THE HEIGHTS OF SOFFITS ABOVE CASEWORK.
6. SEE ELECTRICAL, FIRE ALARM AND FIRE PROTECTION DRAWINGS FOR SPECIAL SYSTEMS, SMOKE DETECTORS, LIGHTING AND WALL MOUNTED FIXTURES NOT SHOWN ON THIS SHEET. COORDINATE LOCATIONS OF ALL FIXTURES NOT INDICATED WITH LAYOUT INDICATED ON THIS SHEET.
7. LIGHT FIXTURES AND MECHANICAL DIFFUSERS ARE SHOWN FOR POSITIONING IN FINISH CEILING SYSTEM. COORDINATE WITH MECHANICAL AND ELECTRICAL DRAWINGS FOR FIXTURE TYPES, MECHANICAL DIFFUSERS, WALL MOUNTED FIXTURES AND INSTALLATION OF FIXTURES IN SPACES WITHOUT CEILINGS. (LIGHTING AND HVAC DIFFUSERS ARE SHOWN FOR COORDINATION ONLY - SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR SPECIFIC INFORMATION).
8. SEE MECHANICAL FLOOR PLANS FOR EXTENT OF EXPOSED DUCTWORK IN EXPOSED STRUCTURE AREAS WITHOUT CEILINGS.
9. EXTEND PERIMETER WALLS AND FINISH TO STRUCTURE ABOVE AT EXPOSED STRUCTURE AREAS. PAINT ALL EXPOSED DUCTWORK, PIPING, HANGERS, ETC…
10. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR MOUNTING LOCATIONS OF ITEMS WHERE NO CEILING IS INDICATED.
11. CENTER LIGHTS, DIFFUSERS, EXIT SIGNS SMOKE DETECTORS, SPEAKERS, GENERAL ALARM SPEAKERS/STROBES & MISC DEVICES IN CEILING TILES WHERE THEY ARE LOCATED. ALIGN MULTIPLE ITEM CENTER OR EDGES.
12. LOCATE MECHANICAL GRILLES AND DIFFUSERS SHOWN IN CORNERS OR NEAR WALL TO 12" OFF WALLS, UNO.
13. INSTALL ACCESS PANELS IN GYPSUM BOARD CEILINGS AT DUCT DAMPER CONTROLS, DUCT MOUNTED SMOKE DETECTORS, MANUAL DUCT CONTROLS, ETC.
14. ALL SINGLE LIGHT FIXTURES SHALL BE CENTERED IN THE CEILING WITHIN THEY OCCUR.
15. LOCATE SPRINKLER HEADS IN THE CENTER ZONE OF THE CEILING TILE. ALIGN CORRIDOR SPRINKLER HEADS IN THE SAME LINE PARALLEL TO THE WALL WITHIN EACH SPECIFIC CEILING CONSTRUCTION.
16. SPRINKLER HEADS, OTHER THAN CONCEALED, SHALL BE FULLY RECESSED (CENTER IN CEILING TILE).
17. ALL GWB CEILINGS TO RECEIVE CONCEALED SPRINKLER HEADS.

A1 FIRST FLOOR REFLECTED CEILING PLAN

1/8" = 1'-0"

RCP LEGEND

- 2X2 CEILING PANEL
- STUCCO
- GYPSUM BOARD
- EXPOSED STRUCTURE - PAINTED
- ALUMINUM SOFFIT
- OC OCCUPANCY SENSOR
- SD SMOKE DETECTOR
- HD HEAT DETECTOR
- MD MULTI DETECTOR (SMOKE, CO, HEAT)
- WAP WIRELESS ACCESS PORT
- 10'-0" HEIGHT (FEET, INCHES) ABOVE FINISHED FLOOR, 10'-0" U.N.O.
- HIGH BAY LED FIXTURE
- 1 X 4 LED FIXTURE
- 2 X 4 LED FIXTURE
- 2 X 2 LED FIXTURE
- RECESSED LED FIXTURE
- 4' STRIP LED FIXTURE
- SUPPLY AIR DIFFUSER
- RETURN AIR DIFFUSER
- EXHAUST FAN
- CAMERAS
- S FIRE STROBE
- SP FIRE ARLM SPEAKER WITH STROBE

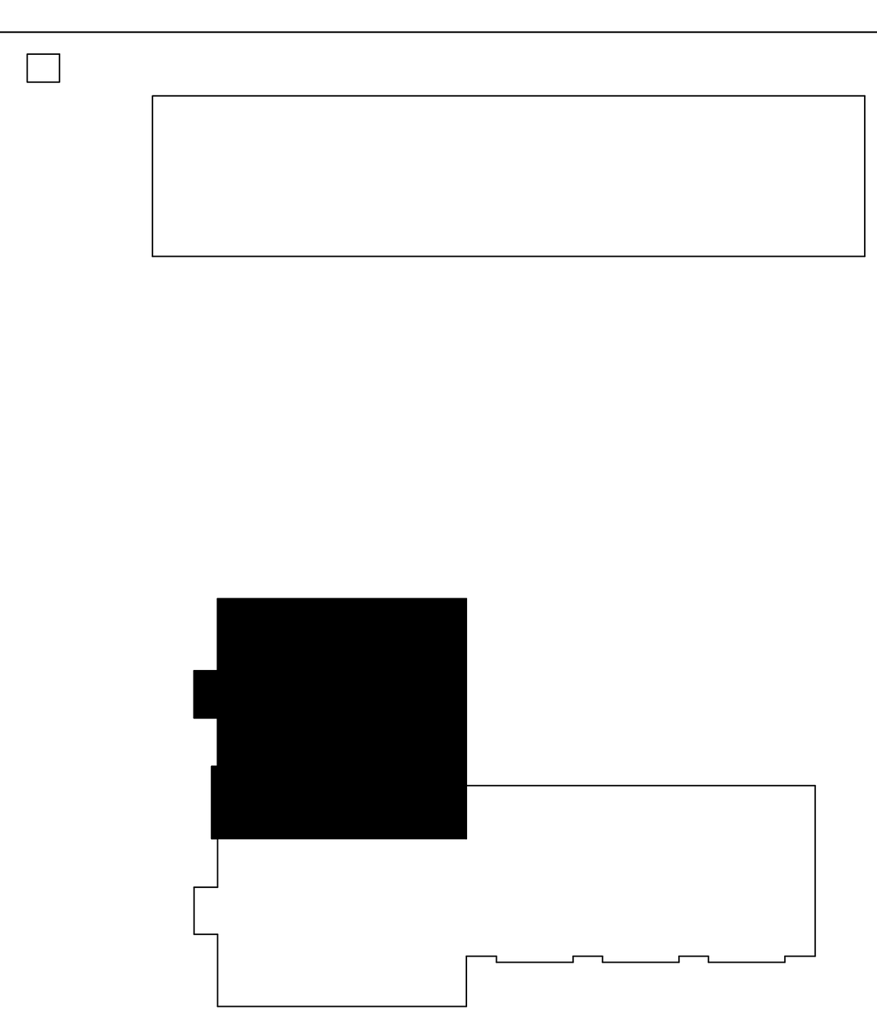
PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE TYPE W1 U.N.O. SEE A-003 FOR CONSTRUCTION OF SUBSYSTEMS
2. SEE SHEET A-004 FOR CONSTRUCTION OF PARTITION TYPES
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE G32 U.N.O.

- NON-RATED WALL. EXTEND GYP. BD. AND FRAMING TO STRUCTURE ABOVE.
- NON-RATED WALL. EXTEND GYP. BD. TO MIN. 4" ABOVE FINISHED CEILING AND FRAMING TO STRUCTURE ABOVE.
- 1 HR-RATED BARRIER; EXTEND TO THE UNDERSIDE OF THE DECK ABOVE.
- 2 HR-RATED BARRIER; EXTEND TO THE UNDERSIDE OF THE DECK ABOVE.

- FEC FIRE EXTINGUISHER CABINET
- FEB FIRE EXTINGUISHER BRACKET
- CG CORNER GUARD

KEYPLAN



PROJECT NORTH TRUE NORTH

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REVISIONS:

No.	Description	Date
1	Addendum No. 6	09/19/2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: ZS
CHECKED BY: SH

OFFICE/SHOPS BUILDING RCP - PATS

A-121A

BUILDING BID DOCUMENTS

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A1 FIRST FLOOR REFLECTED CEILING PLAN
1/8" = 1'-0"

PROJECT NORTH TRUE NORTH

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9/20/2017 10:10:53 AM

REFLECTED CEILING PLAN SHEET NOTES

1. SEE SHEET A001 FOR WALL TYPES AND HEIGHT OF WALLS ABOVE CEILING.
2. SEE FINISH SCHEDULE FOR CEILING TYPES & MATERIALS IN EACH ROOM / AREA.
3. INTERIOR DIMENSIONS INDICATED ARE TO FACE OF FINISH AND CENTERLINES OF COLUMNS, UNO.
4. CEILING GRIDS/TILES TO BE CENTERED IN ALL ROOMS UNLESS NOTED OTHERWISE. PARTIAL TILES AT ROOM PERIMETERS SHALL NOT BE LESS THAN 6" IN EITHER DIMENSION.
5. ALL CEILINGS TO BE 10'-0" AFF, UNO. CEILING HEIGHTS SHOWN ON THE REFLECTED CEILING PLANS ARE NON-TYPICAL AND SPECIFIC TO THE AREA INDICATED. REFER TO INTERIOR ELEVATIONS FOR THE HEIGHTS OF SOFFITS ABOVE CASEWORK.
6. SEE ELECTRICAL, FIRE ALARM AND FIRE PROTECTION DRAWINGS FOR SPECIAL SYSTEMS, SMOKE DETECTORS, LIGHTING AND WALL MOUNTED FIXTURES NOT SHOWN ON THIS SHEET. COORDINATE LOCATIONS OF ALL FIXTURES NOT INDICATED WITH LAYOUT INDICATED ON THIS SHEET.
7. LIGHT FIXTURES AND MECHANICAL DIFFUSERS ARE SHOWN FOR POSITIONING IN FINISH CEILING SYSTEM. COORDINATE WITH MECHANICAL AND ELECTRICAL DRAWINGS FOR FIXTURE TYPES, MECHANICAL DIFFUSERS, WALL MOUNTED FIXTURES AND INSTALLATION OF FIXTURES IN SPACES WITHOUT CEILINGS. (LIGHTING AND HVAC DIFFUSERS ARE SHOWN FOR COORDINATION ONLY - SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR SPECIFIC INFORMATION).
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16. SPRINKLER HEADS, OTHER THAN CONCEALED, SHALL BE FULLY RECESSED (CENTER IN CEILING TILE).
17. ALL GWB CEILINGS TO RECEIVE CONCEALED SPRINKLER HEADS.

RCP LEGEND

- 2X2 CEILING PANEL
- STUCCO
- GYPSUM BOARD
- EXPOSED STRUCTURE - PAINTED
- ALUMINUM SOFFIT
- OCCUPANCY SENSOR
- SMOKE DETECTOR
- HEAT DETECTOR
- MULTI DETECTOR (SMOKE, CO, HEAT)
- WIRELESS ACCESS PORT
- 10'-0" HEIGHT (FEET, INCHES) ABOVE FINISHED FLOOR, 10'-0" U.N.O.
- HIGH BAY LED FIXTURE
- 1 X 4 LED FIXTURE
- 2 X 4 LED FIXTURE
- 2 X 2 LED FIXTURE
- RECESSED LED FIXTURE
- 4' STRIP LED FIXTURE
- SUPPLY AIR DIFFUSER
- RETURN AIR DIFFUSER
- EXHAUST FAN
- CAMERAS
- FIRE STROBE
- FIRE ARLM SPEAKER WITH STROBE

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE TYPE W1 U.N.O. SEE A-003 FOR CONSTRUCTION OF SUBSYSTEMS
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3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE G32 U.N.O.

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- NON-RATED WALL. EXTEND GYP. BD. TO MIN. 4" ABOVE FINISHED CEILING AND FRAMING TO STRUCTURE ABOVE.
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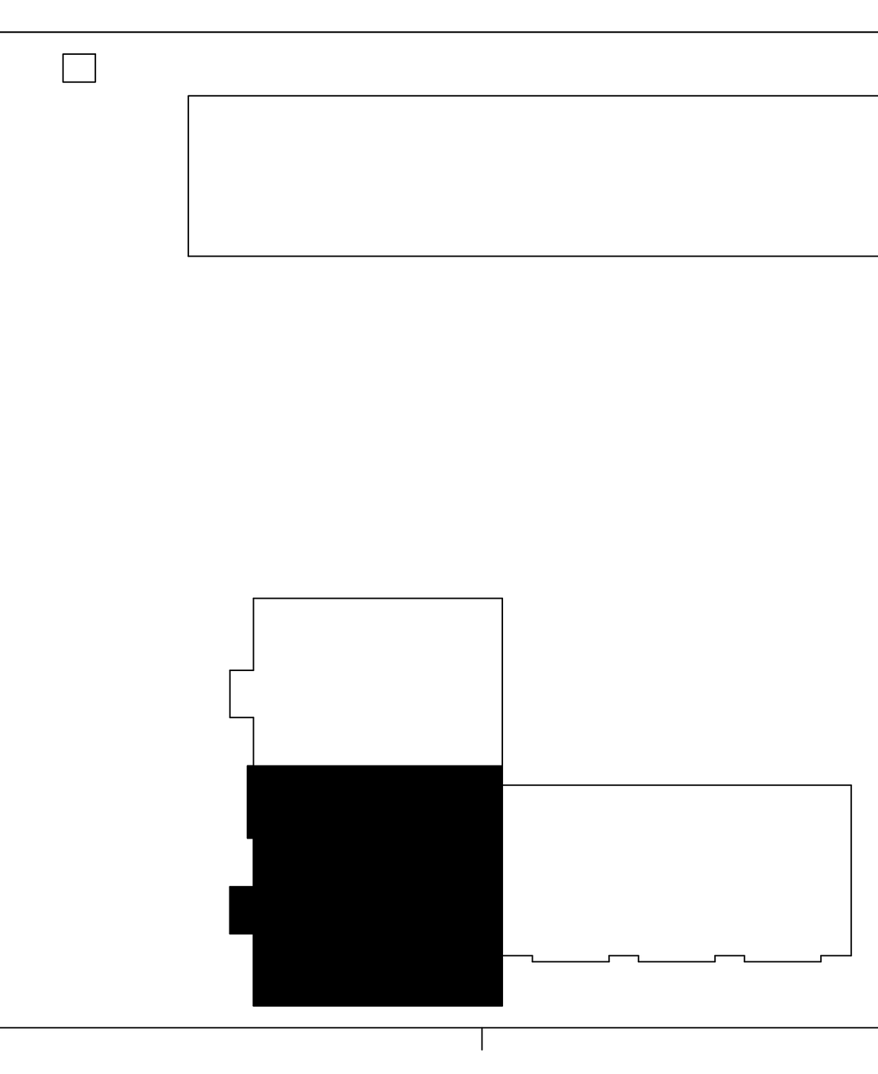
- 2 HR-RATED BARRIER; EXTEND TO THE UNDERSIDE OF THE DECK ABOVE.

- FEC FIRE EXTINGUISHER CABINET
- FEB FIRE EXTINGUISHER BRACKET
- CG CORNER GUARD

KEYPLAN



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REVISIONS:

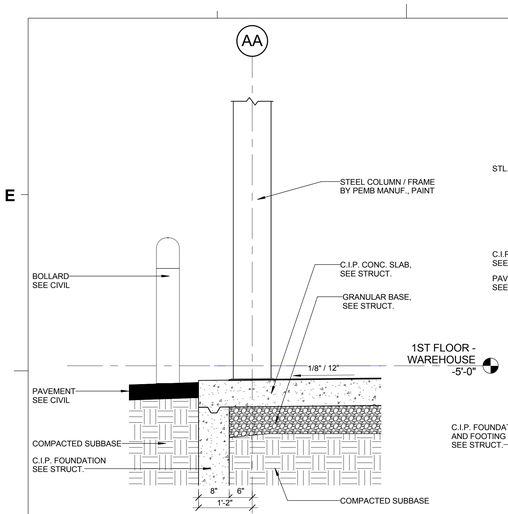
No.	Description	Date
1	Addendum No. 6	09/19/2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: ZS
CHECKED BY: SH

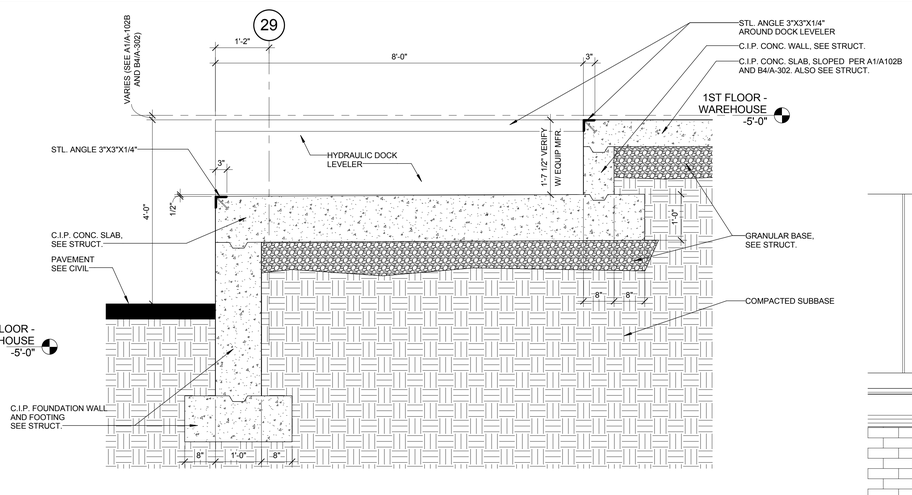
OFFICE/SHOPS BUILDING RCP - FO

A-121B

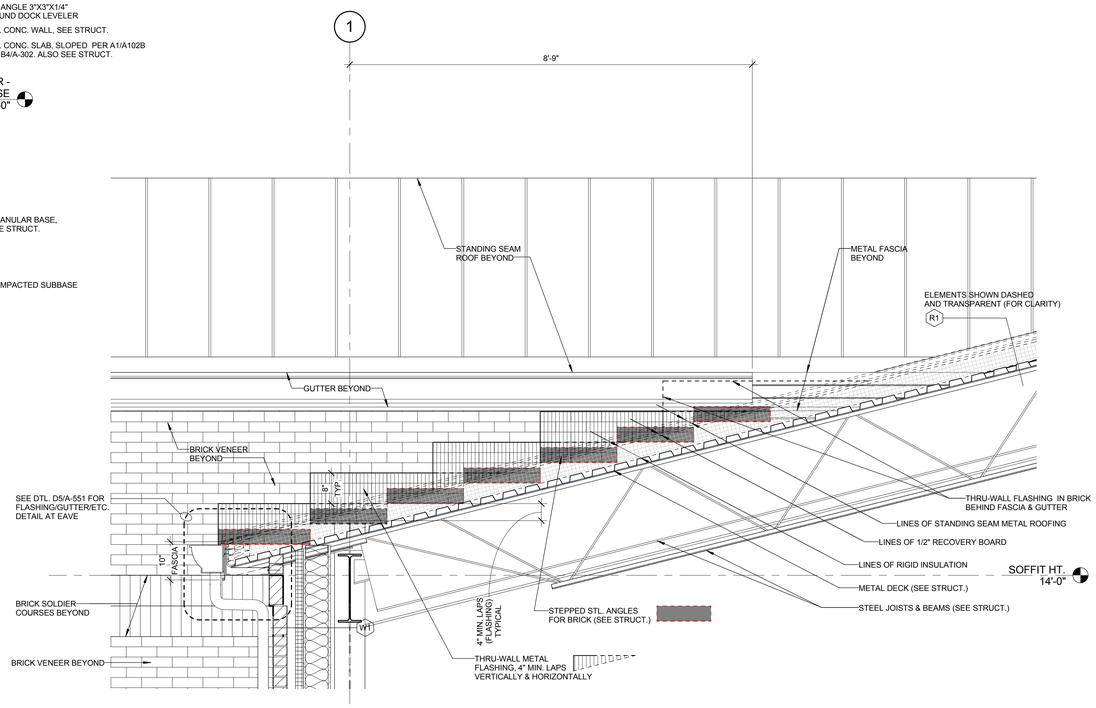
BUILDING BID DOCUMENTS



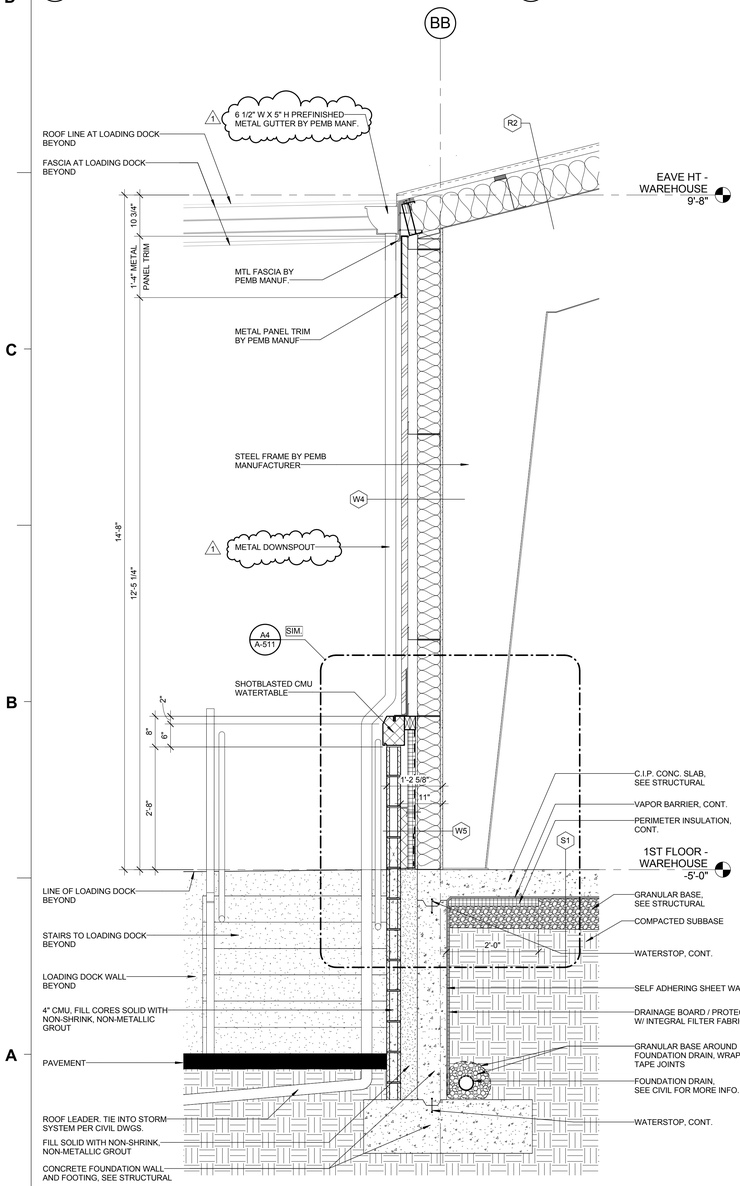
D1 SECTION - WALL AT LOADING DOCK
3/4" = 1'-0"



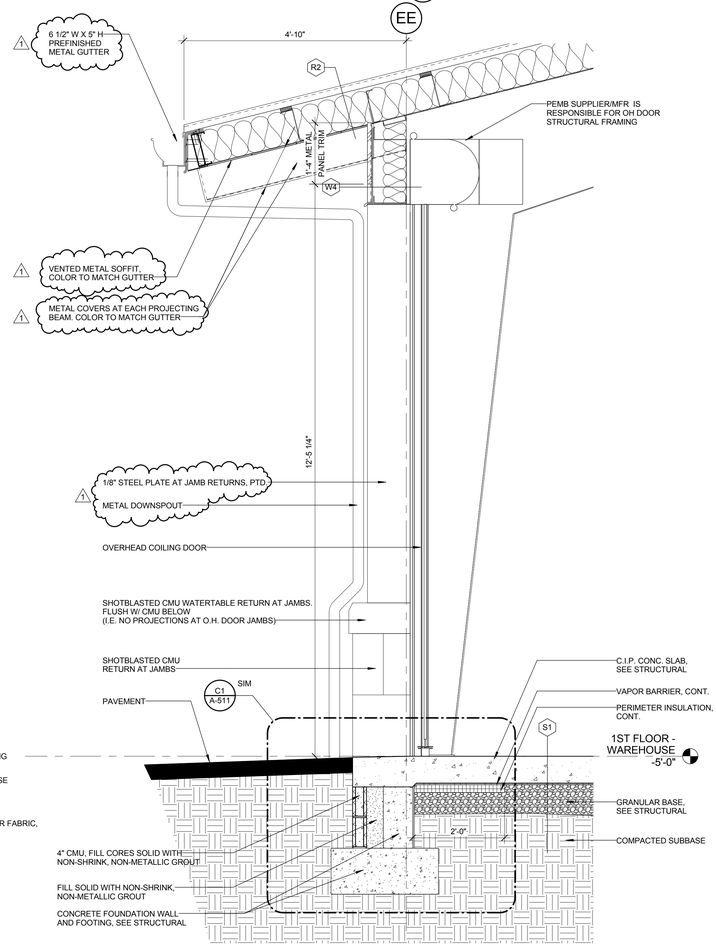
D2 SECTION - LOADING DOCK AT DOCK LEVELER
3/4" = 1'-0"



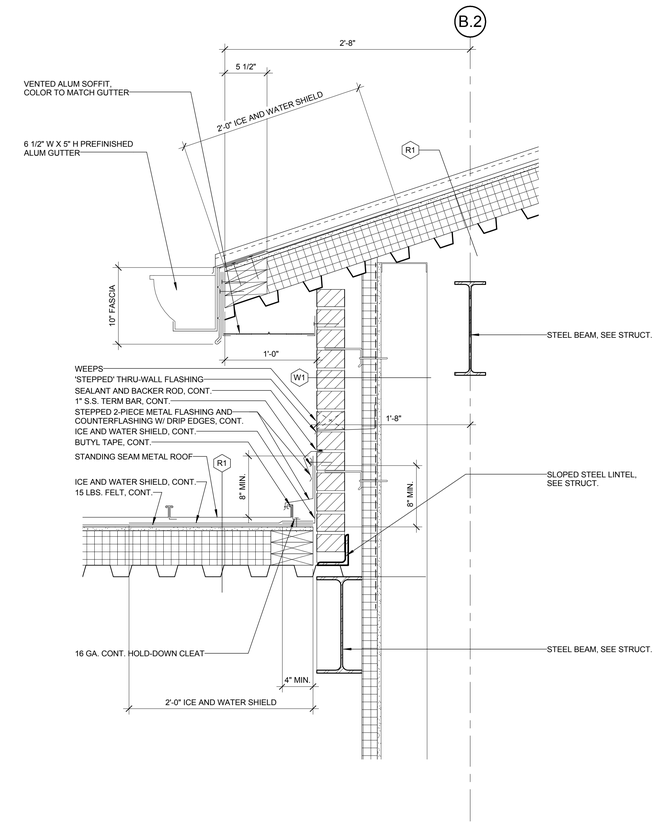
D4 SECTONAL ELEVATION - TYPICAL SIDE OF ENTRY NODES
3/4" = 1'-0"



A1 WALL SECTION - WAREHOUSE AT LOADING DOCK
3/4" = 1'-0"



A3 WALL SECTION - WAREHOUSE AT OVERHEAD DOOR
3/4" = 1'-0"



A5 SECTION - BRICK WALL ADJACENT TO ROOF AT ENTRY NODES
1 1/2" = 1'-0"

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REVISIONS:

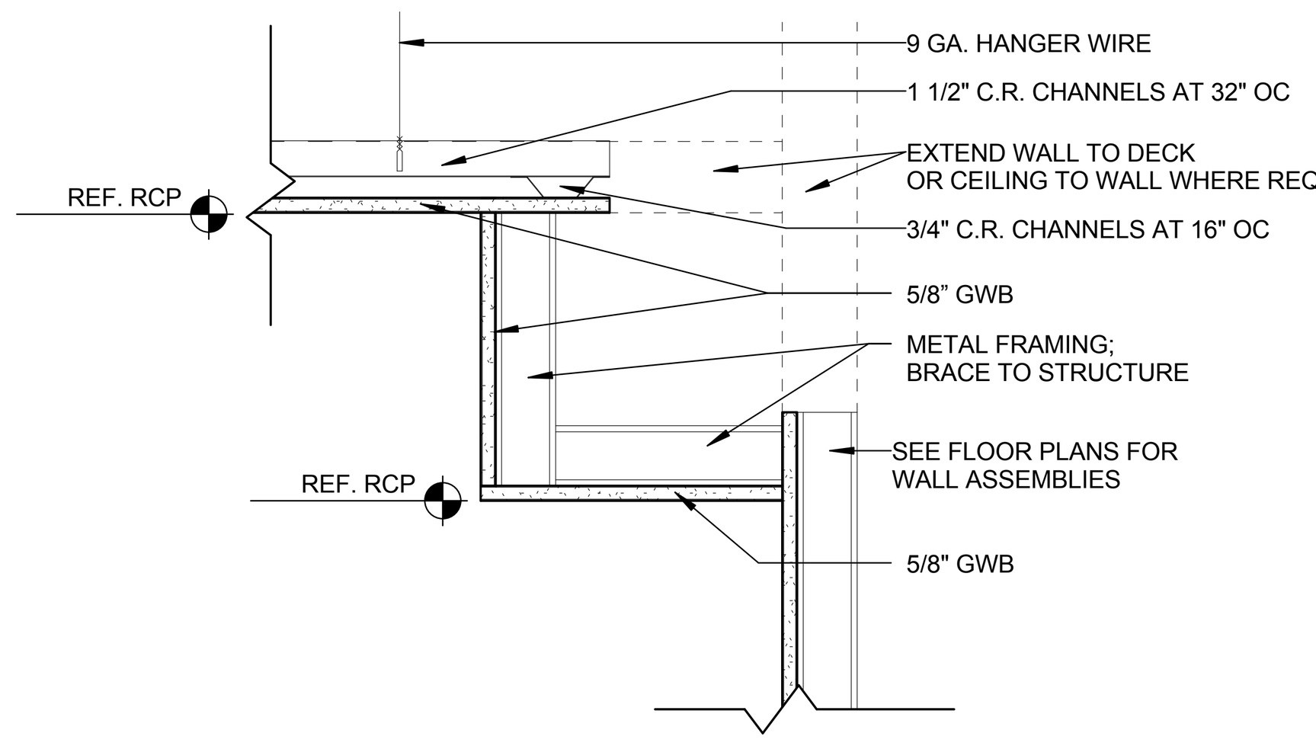
No.	Description	Date
1	Addendum No. 6	09/19/2017

PROJECT:	9202-164730
SCO ID:	16-15656-02B
ITEM: 315	CODE: 41526
DATE:	AUGUST 21, 2017
DRAWN BY:	RD
CHECKED BY:	SH

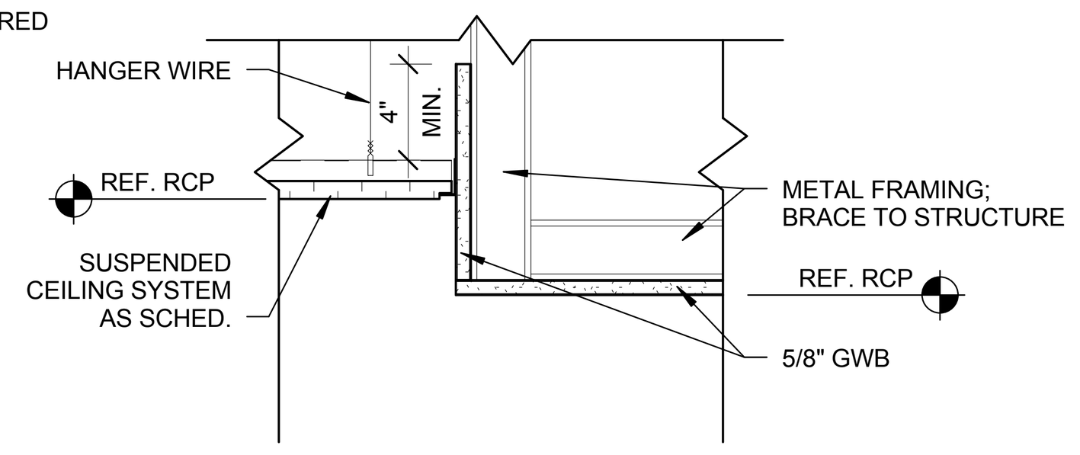
WALL SECTIONAL ELEVATIONS & DETAILS - OFFICE / SHOPS

A-354

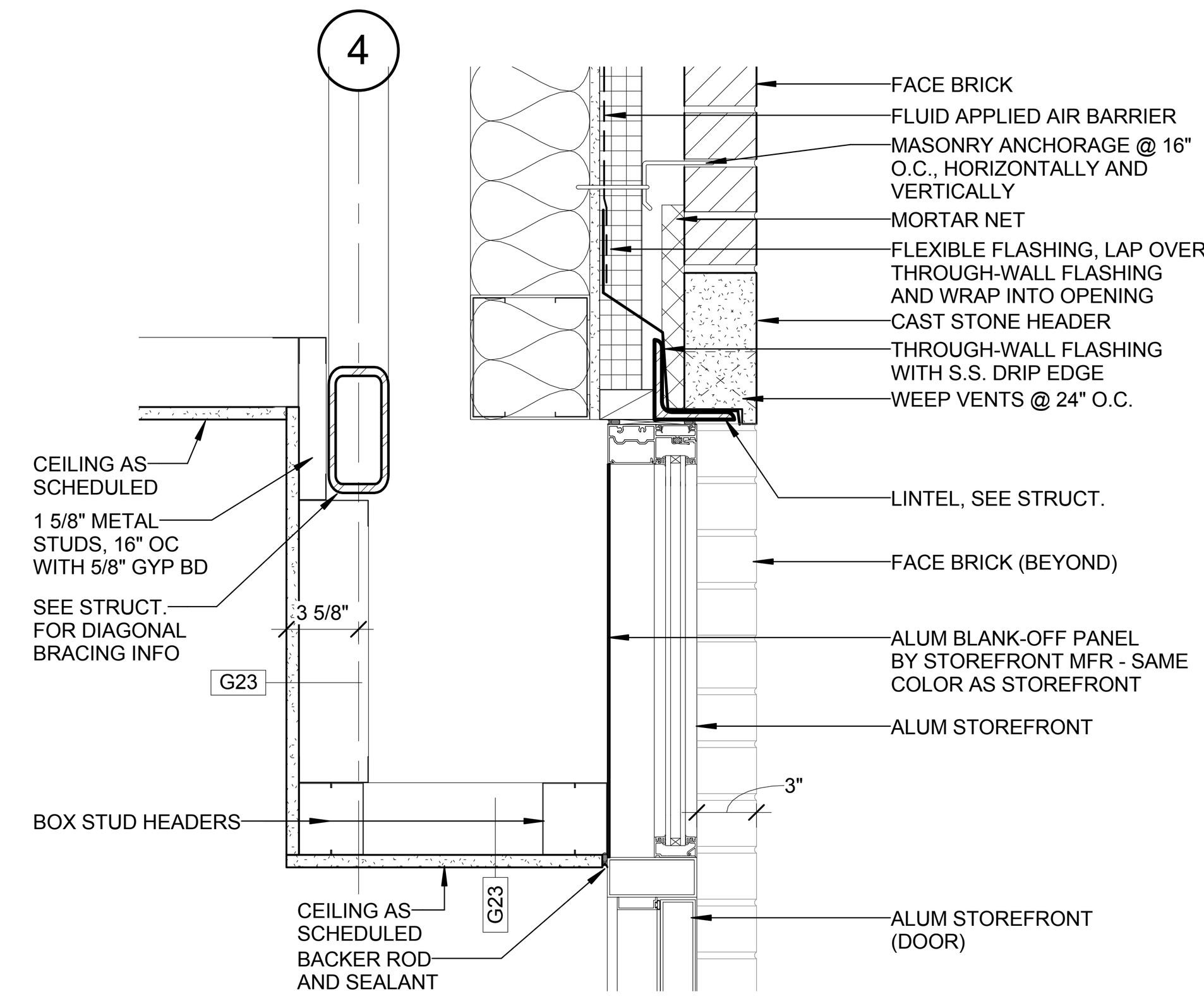
BUILDING BID DOCUMENTS



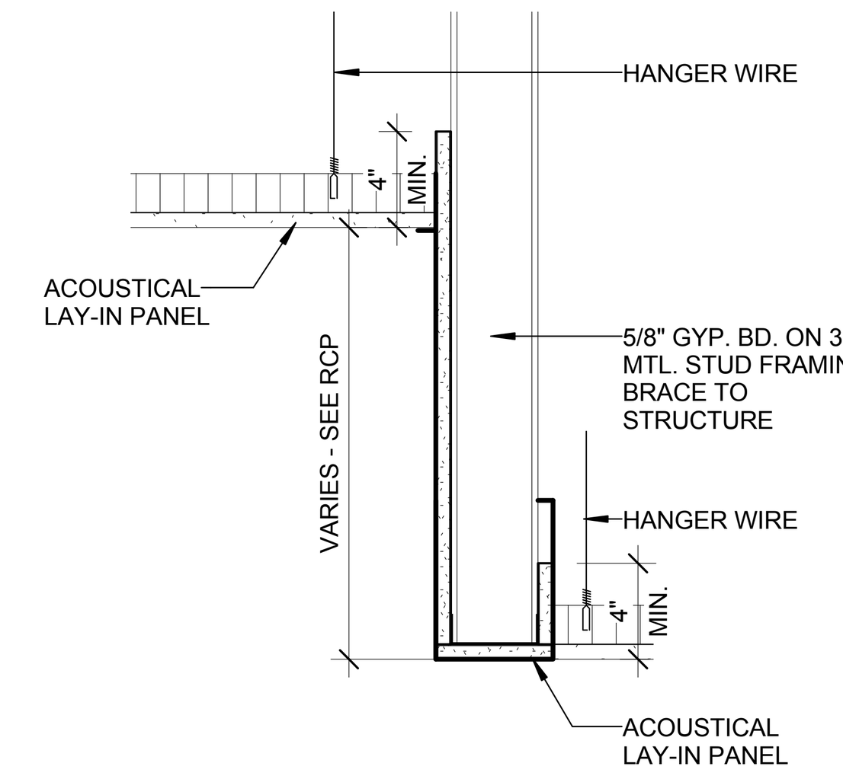
E1 DETAIL @ GWB BULKHEAD
1 1/2" = 1'-0"



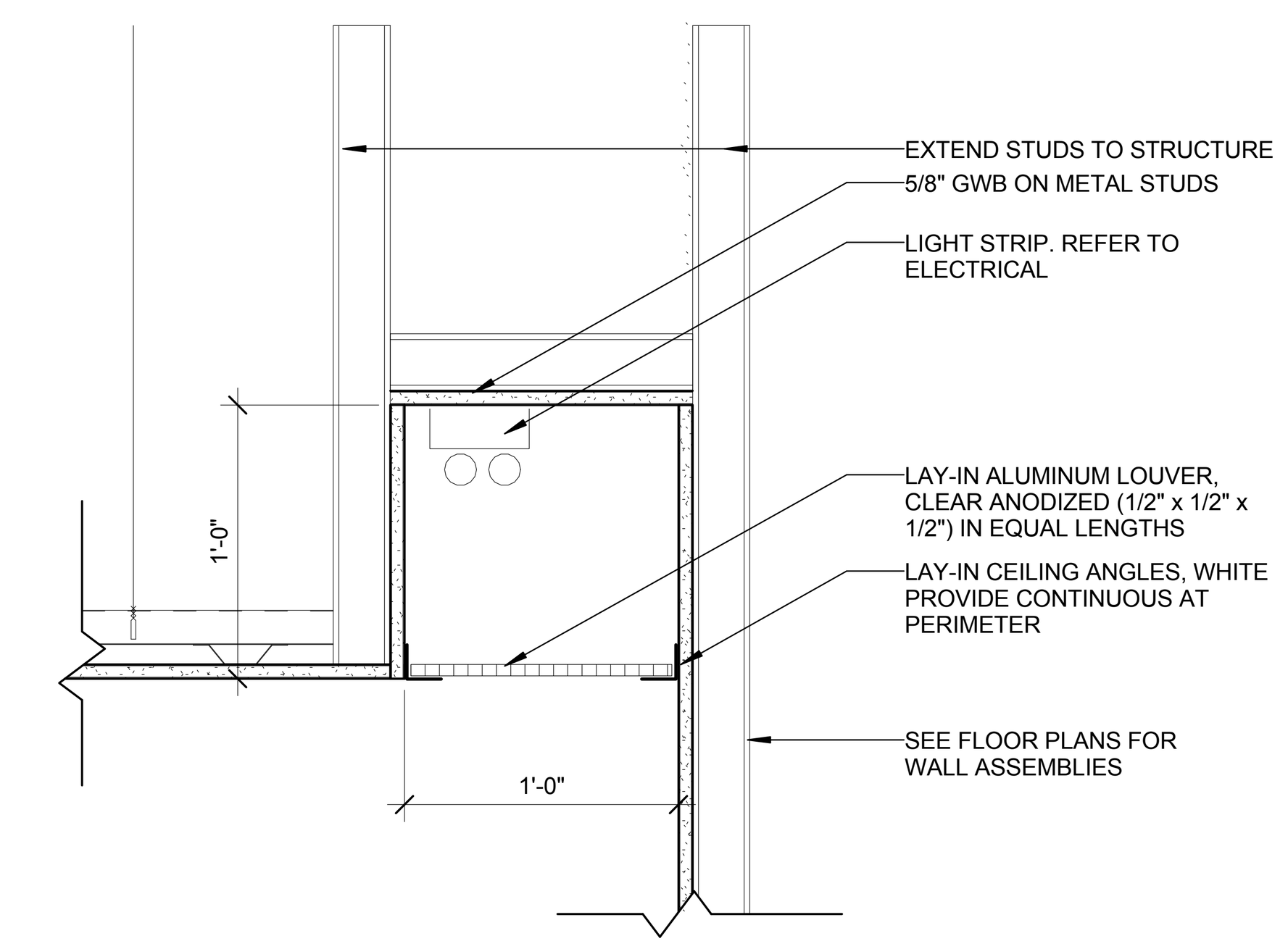
E2 DETAIL @ CEILING TRANSITION - GWB/ACT
1 1/2" = 1'-0"



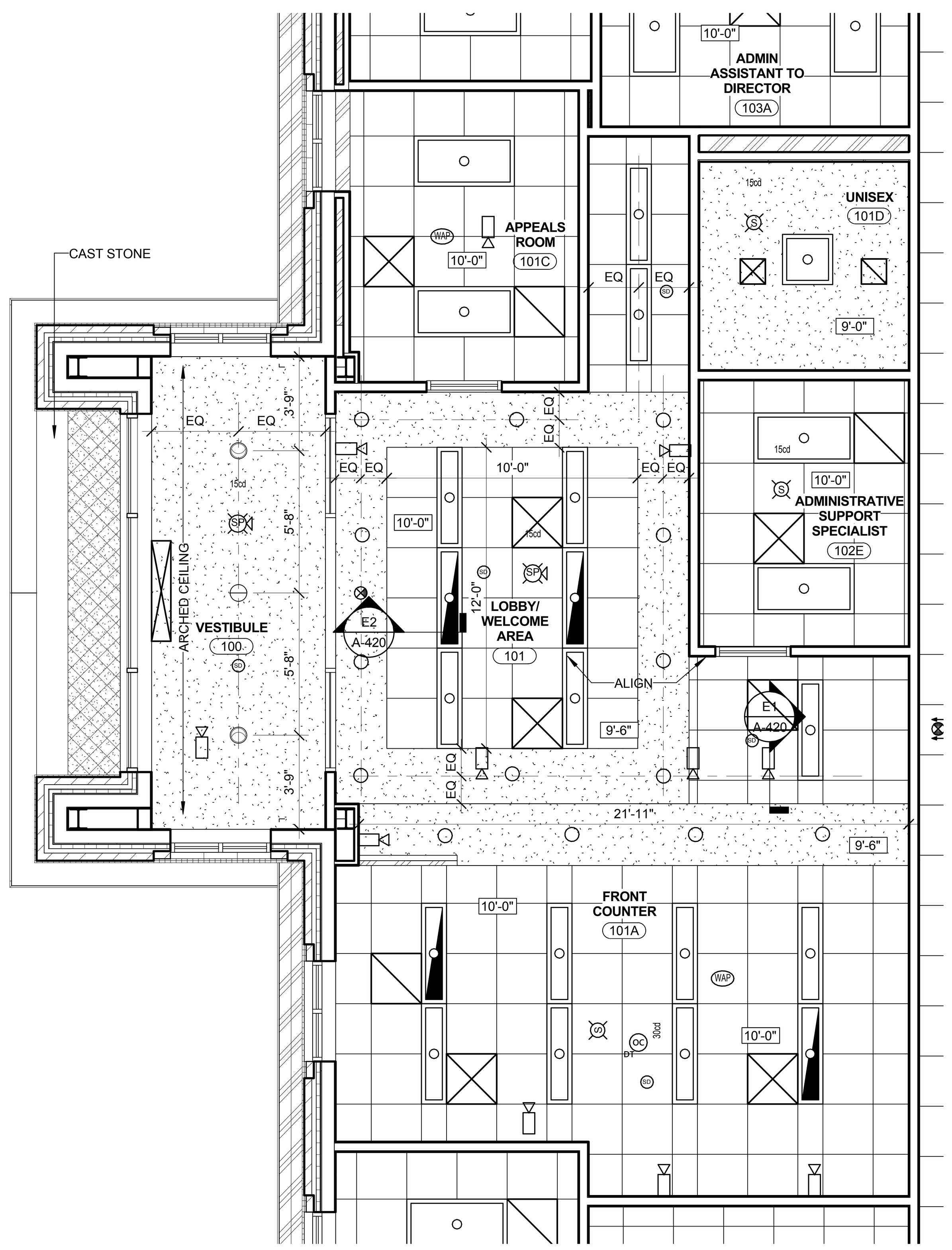
E3 DETAIL @ SHADOWBOX
1 1/2" = 1'-0"



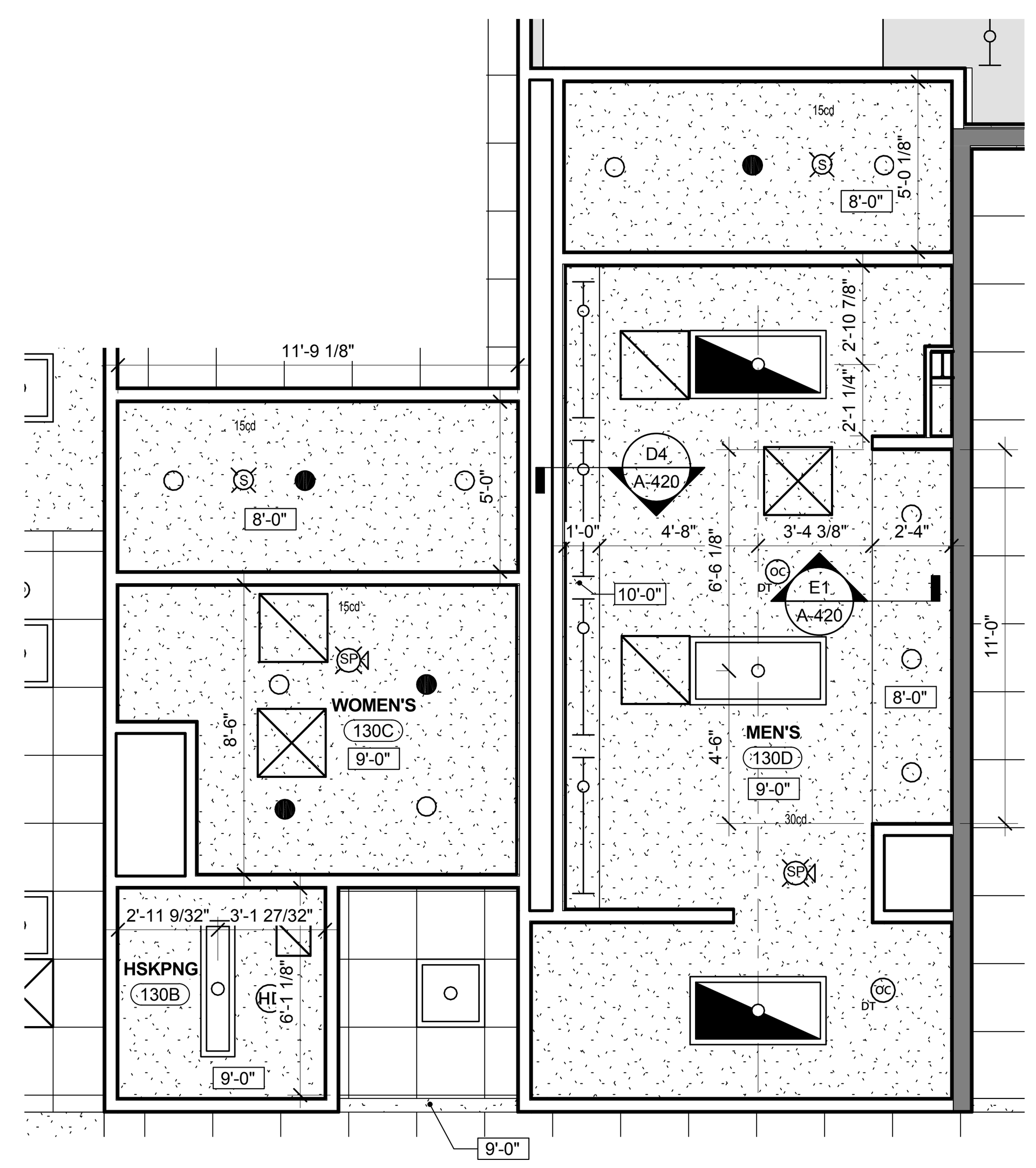
E5 ACT TO ACT TRANSITION
1 1/2" = 1'-0"



D4 DETAIL @ LIGHT COVE
1 1/2" = 1'-0"

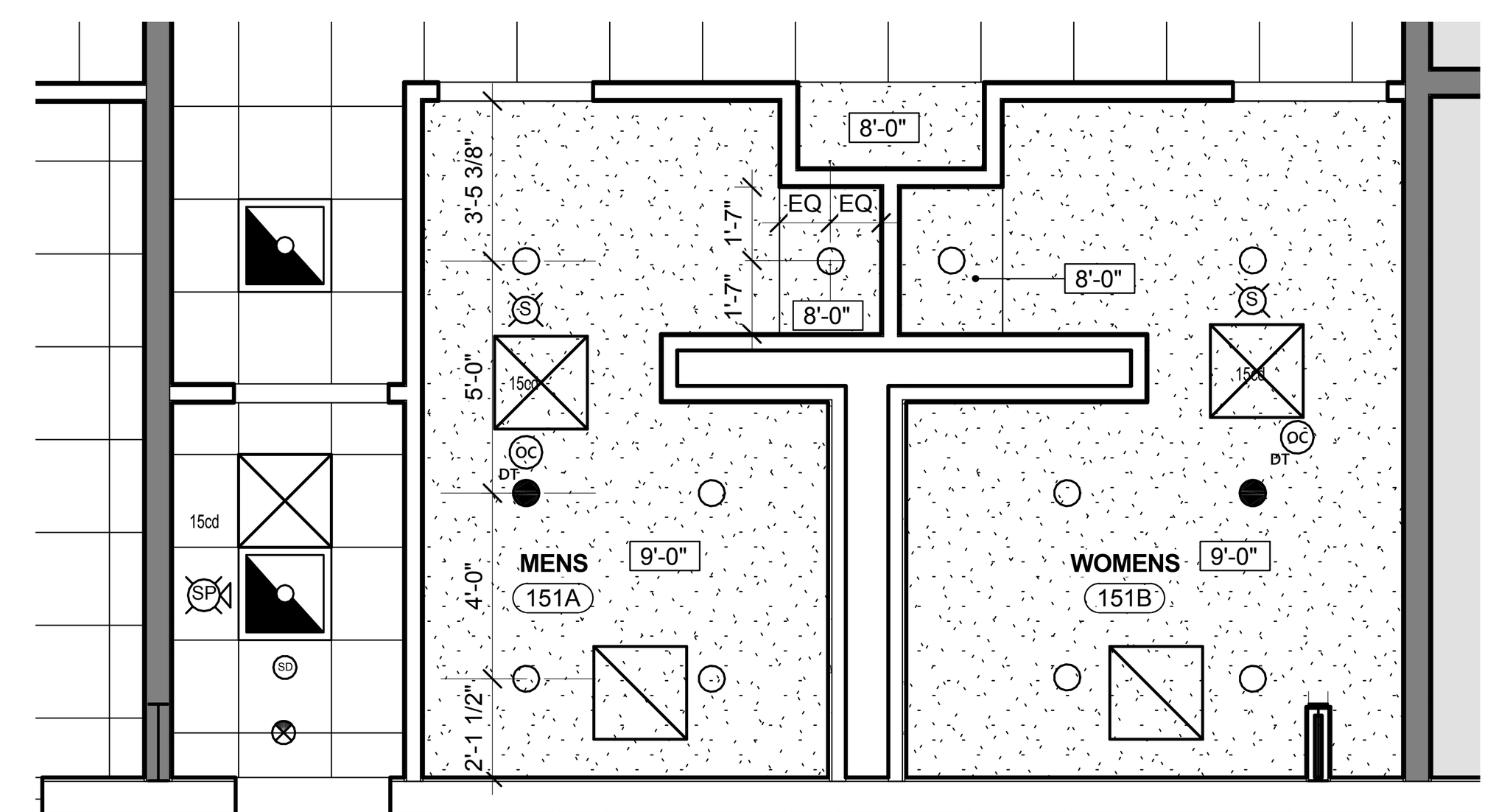


C1 ENLARGED NORTH LOBBY
1/4" = 1'-0"

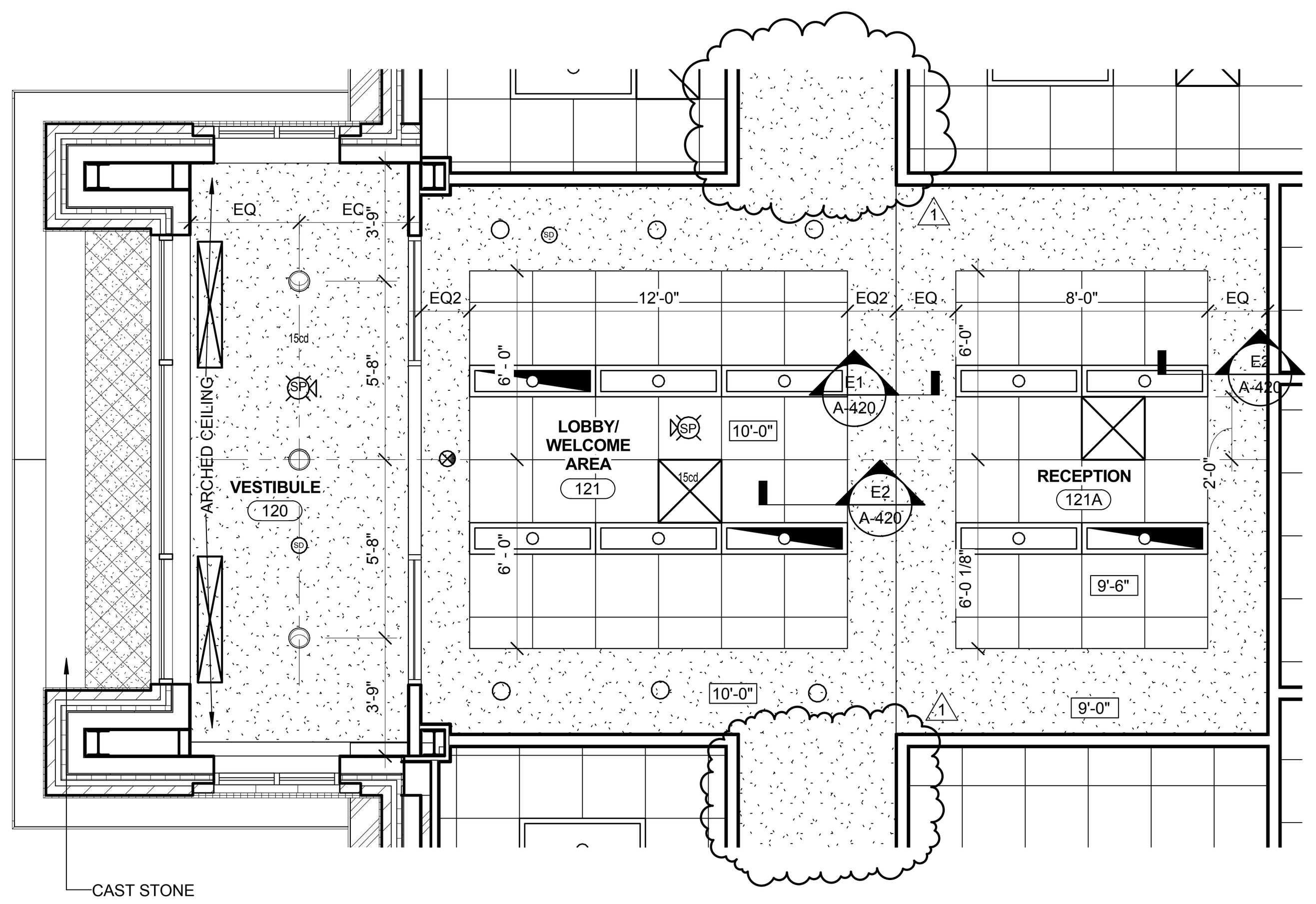


NOTE: DIMENSIONS ARE TO FACE OF GYP AND EXCLUDE TILE FINISH

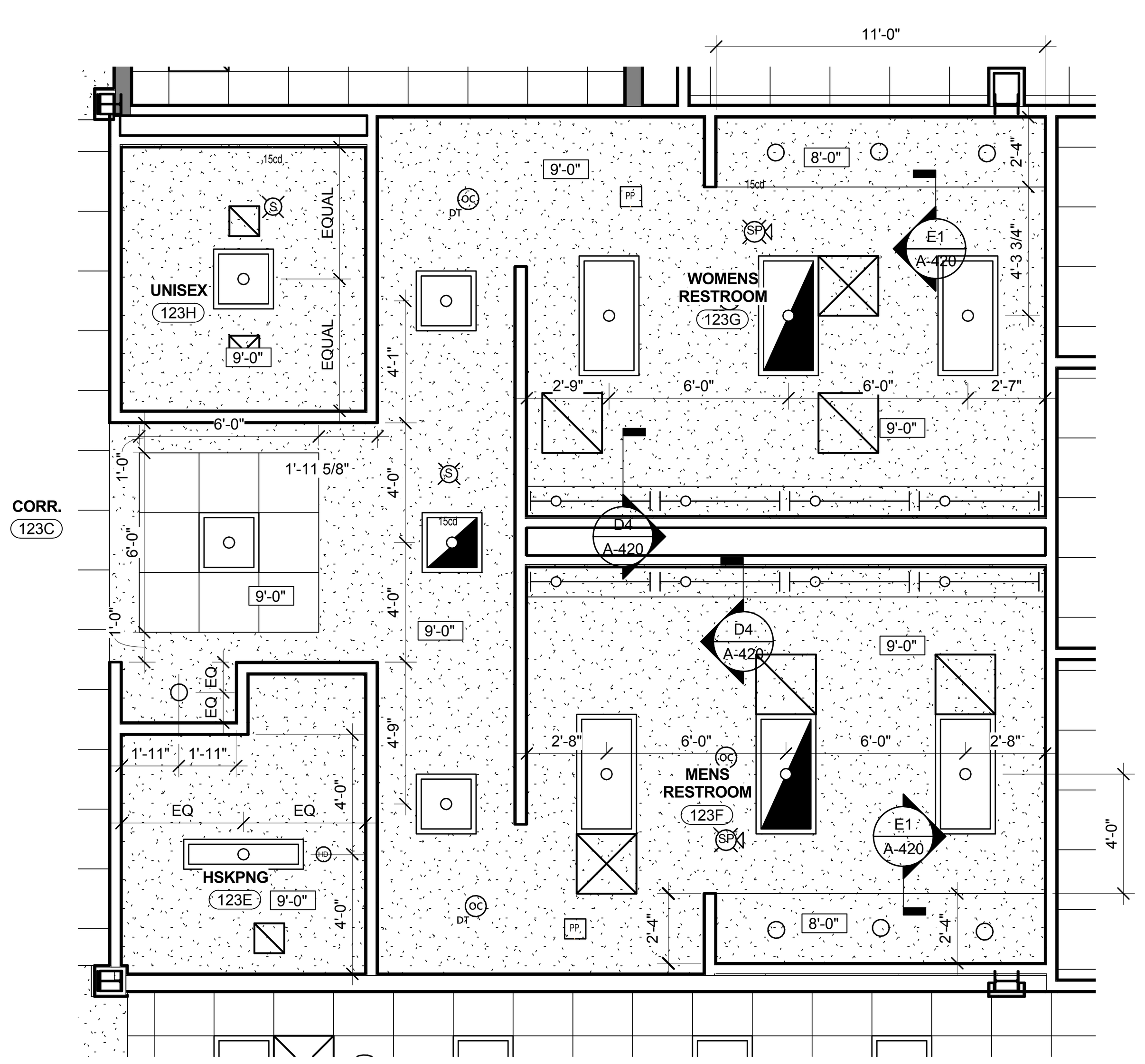
C3 ENLARGED RESTROOM 2
1/4" = 1'-0"



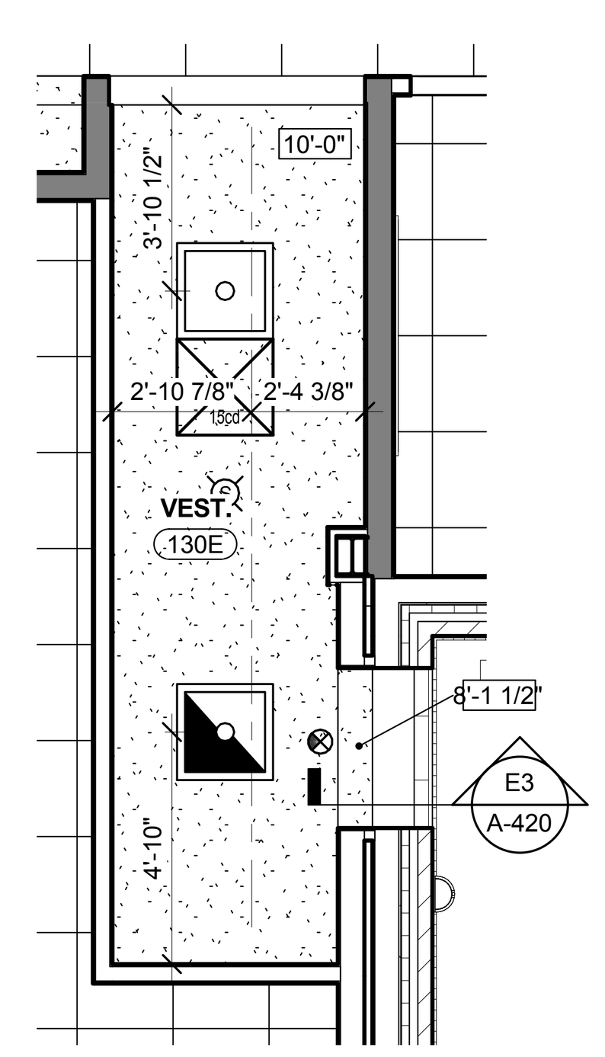
C4 ENLARGED WAREHOUSE RESTROOM
1/4" = 1'-0"



A1 ENLARGED SOUTH LOBBY
1/4" = 1'-0"



A3 ENLARGED RESTROOM
1/4" = 1'-0"



A4 VESTIBULE 130E
1/4" = 1'-0"

REFLECTED CEILING PLAN SHEET NOTES

1. SEE SHEET A001 FOR WALL TYPES AND HEIGHT OF WALLS ABOVE CEILING.
2. SEE FINISH SCHEDULE FOR CEILING TYPES & MATERIALS IN EACH ROOM / AREA.
3. INTERIOR DIMENSIONS INDICATED ARE TO FACE OF FINISH AND CENTERLINES OF COLUMNS, UNO.
4. CEILING GRIDS/TILES TO BE CENTERED IN ALL ROOMS UNLESS NOTED OTHERWISE. PARTIAL TILES AT ROOM PERIMETERS SHALL NOT BE LESS THAN 6" IN EITHER DIMENSION.
5. ALL CEILINGS TO BE 10'-0" AFF, UNO. CEILING HEIGHTS SHOWN ON THE REFLECTED CEILING PLANS ARE NON-TYPICAL AND SPECIFIC TO THE AREA INDICATED. REFER TO INTERIOR ELEVATIONS FOR THE HEIGHTS OF SOFFITS ABOVE CASEWORK.
6. SEE ELECTRICAL, FIRE ALARM AND FIRE PROTECTION DRAWINGS FOR SPECIAL SYSTEMS, SMOKE DETECTORS, LIGHTING AND WALL MOUNTED FIXTURES NOT SHOWN ON THIS SHEET. COORDINATE LOCATIONS OF ALL FIXTURES NOT INDICATED WITH LAYOUT INDICATED ON THIS SHEET.
7. LIGHT FIXTURES AND MECHANICAL DIFFUSERS ARE SHOWN FOR POSITIONING IN FINISH CEILING SYSTEM. COORDINATE WITH MECHANICAL AND ELECTRICAL DRAWINGS FOR FIXTURE TYPES, MECHANICAL DIFFUSERS, WALL MOUNTED FIXTURES AND INSTALLATION OF FIXTURES IN SPACES WITHOUT CEILINGS. (LIGHTING AND HVAC DIFFUSERS ARE SHOWN FOR COORDINATION ONLY - SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR SPECIFIC INFORMATION).
8. SEE MECHANICAL FLOOR PLANS FOR EXTENT OF EXPOSED DUCTWORK IN EXPOSED STRUCTURE AREAS WITHOUT CEILINGS.
9. EXTEND PERIMETER WALLS AND FINISH TO STRUCTURE ABOVE AT EXPOSED STRUCTURE AREAS. PAINT ALL EXPOSED DUCTWORK, PIPING, HANGERS, ETC…
10. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR MOUNTING LOCATIONS OF ITEMS WHERE NO CEILING IS INDICATED.
11. CENTER LIGHTS, DIFFUSERS, EXIT SIGNS SMOKE DETECTORS, SPEAKERS, GENERAL ALARM SPEAKERS/STROBES & MISC DEVICES IN CEILING TILES WHERE THEY ARE LOCATED. ALIGN MULTIPLE ITEM CENTER OR EDGES.
12. LOCATE MECHANICAL GRILLES AND DIFFUSERS SHOWN IN CORNERS OR NEAR WALL TO 12" OFF WALLS, UNO.
13. INSTALL ACCESS PANELS IN GYPSUM BOARD CEILINGS AT DUCT DAMPER CONTROLS, DUCT MOUNTED SMOKE DETECTORS, MANUAL DUCT CONTROLS, ETC.
14. ALL SINGLE LIGHT FIXTURES SHALL BE CENTERED IN THE CEILING WITHIN THEY OCCUR.
15. LOCATE SPRINKLER HEADS IN THE CENTER ZONE OF THE CEILING TILE. ALIGN CORRIDOR SPRINKLER HEADS IN THE SAME LINE PARALLEL TO THE WALL WITHIN EACH SPECIFIC CEILING CONSTRUCTION.
16. SPRINKLER HEADS, OTHER THAN CONCEALED, SHALL BE FULLY RECESSED (CENTER IN CEILING TILE).
17. ALL GWB CEILINGS TO RECEIVE CONCEALED SPRINKLER HEADS.

RCP LEGEND

- 2X2 CEILING PANEL
- STUCCO
- GYPSUM BOARD
- EXPOSED STRUCTURE - PAINTED
- ALUMINUM SOFFIT
- OC — OCCUPANCY SENSOR
- SD — SMOKE DETECTOR
- HD — HEAT DETECTOR
- MD — MULTI DETECTOR (SMOKE, CO, HEAT)
- WAP — WIRELESS ACCESS PORT
- 10'-0" — HEIGHT (FEET, INCHES) ABOVE FINISHED FLOOR, 10'-0" U.N.O.
- HIGH BAY LED FIXTURE
- 1 X 4 LED FIXTURE
- 2 X 4 LED FIXTURE
- 2 X 2 LED FIXTURE
- RECESSED LED FIXTURE
- 4' STRIP LED FIXTURE
- SUPPLY AIR DIFFUSER
- RETURN AIR DIFFUSER
- EXHAUST FAN
- CAMERAS
- S — FIRE STROBE
- SP — FIRE ARLM SPEAKER WITH STROBE

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE TYPE W1 U.N.O. SEE A-003 FOR CONSTRUCTION OF SUBSYSTEMS
2. SEE SHEET A-004 FOR CONSTRUCTION OF PARTITION TYPES
3. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE G32 U.N.O.

- NON-RATED WALL. EXTEND GYP. BD. AND FRAMING TO STRUCTURE ABOVE.
- NON-RATED WALL. EXTEND GYP. BD. TO MIN. 4" ABOVE FINISHED CEILING AND FRAMING TO STRUCTURE ABOVE.
- 1 HR-RATED BARRIER; EXTEND TO THE UNDERSIDE OF THE DECK ABOVE.
- 2 HR-RATED BARRIER; EXTEND TO THE UNDERSIDE OF THE DECK ABOVE.

- FEC — FIRE EXTINGUISHER CABINET
- FEB — FIRE EXTINGUISHER BRACKET
- CG — CORNER GUARD

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REVISIONS:

No.	Description	Date
1	Addendum No. 6	09/19/2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: PF
CHECKED BY: SH

ENLARGED RCP'S AND DETAILS

A-420

BUILDING BID DOCUMENTS

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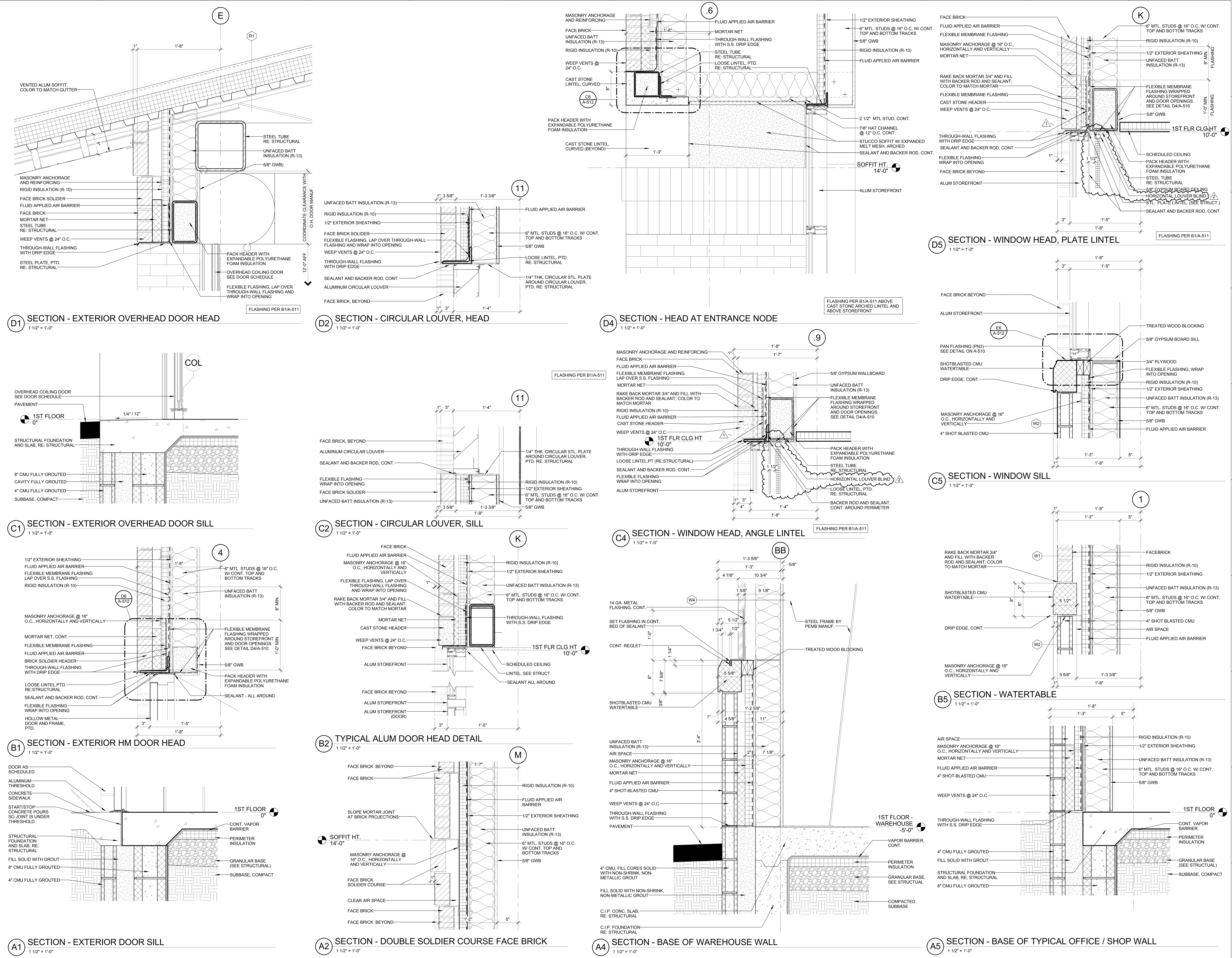

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No.	Description	Date
1	Addendum No. 5	09/11/2017
2	Addendum No. 6	09/19/2017

PROJECT:	9202-164730
SCO ID:	16-15656-02B
ITEM: 315	CODE: 41526
DATE:	AUGUST 21, 2017
DRAWN BY:	RD
CHECKED BY:	SH

SECTION DETAILS (EXTERIOR)

A-511

BUILDING BID DOCUMENTS

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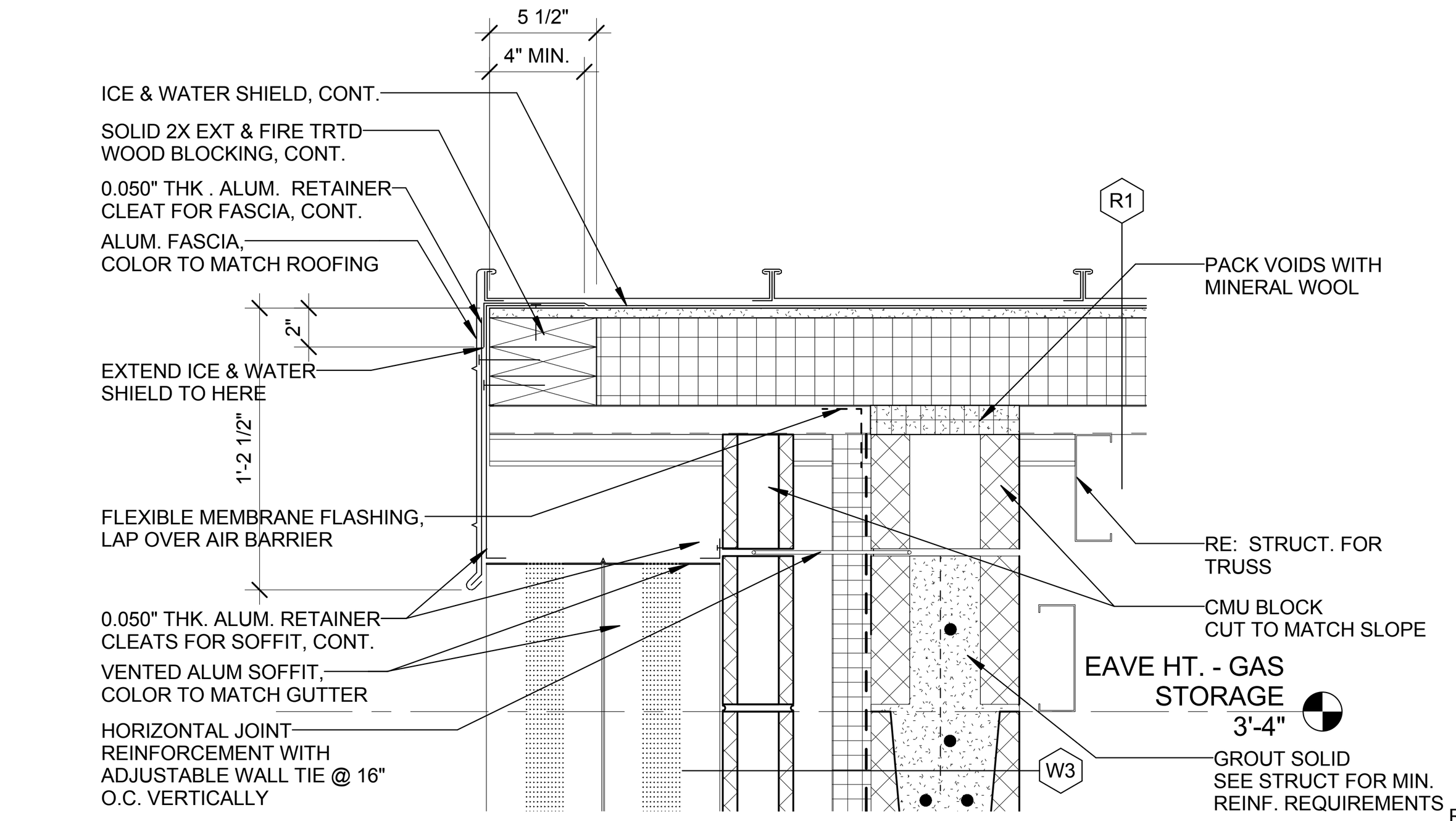
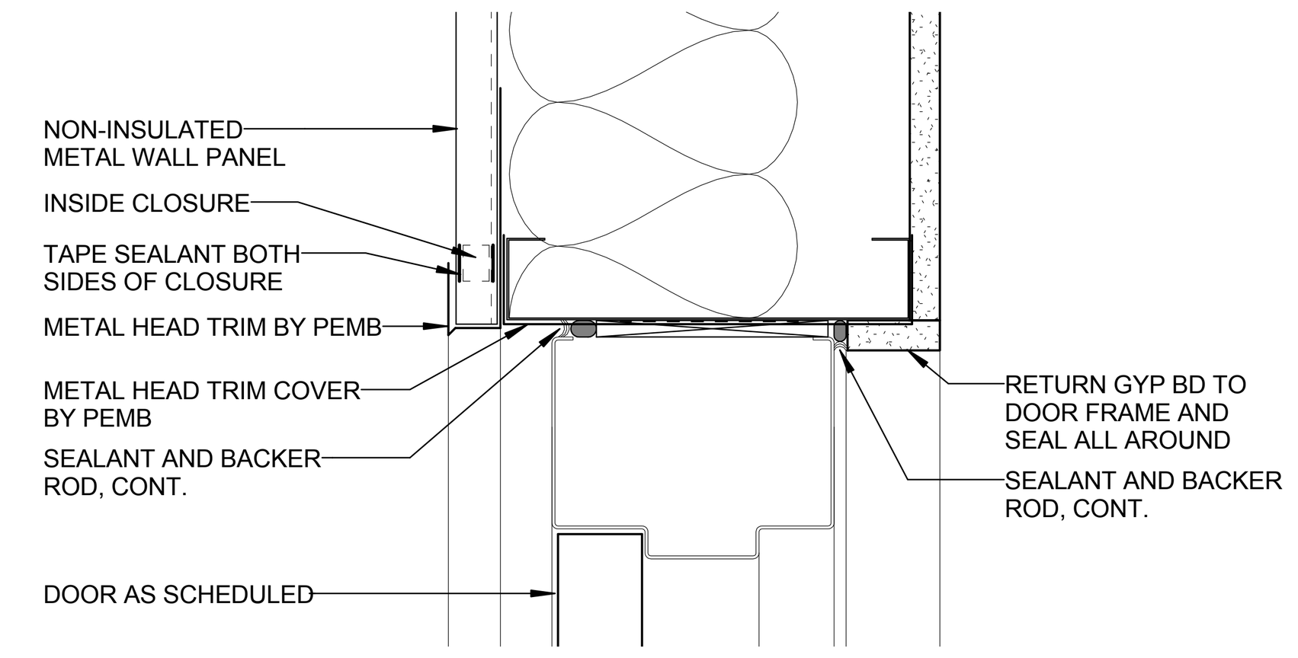
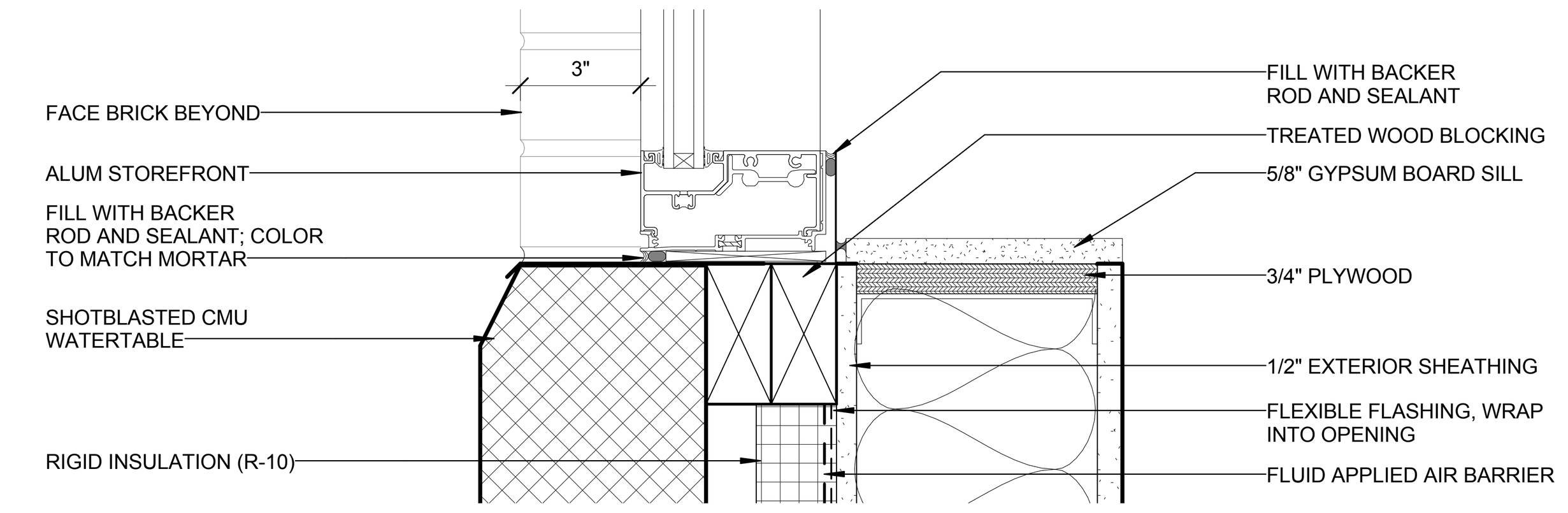


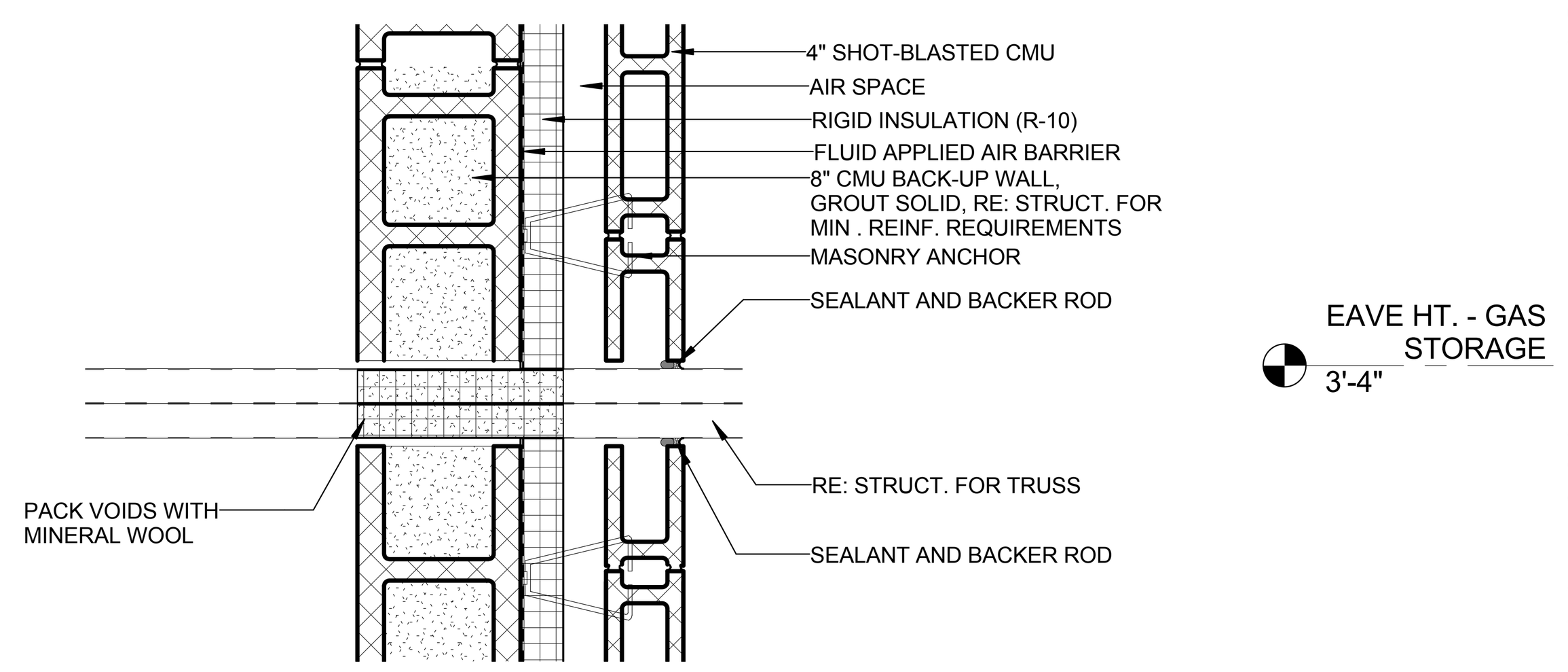
E2 SECTION DETAIL - GAS STORAGE AT GABLE END
1 1/2" = 1'-0"



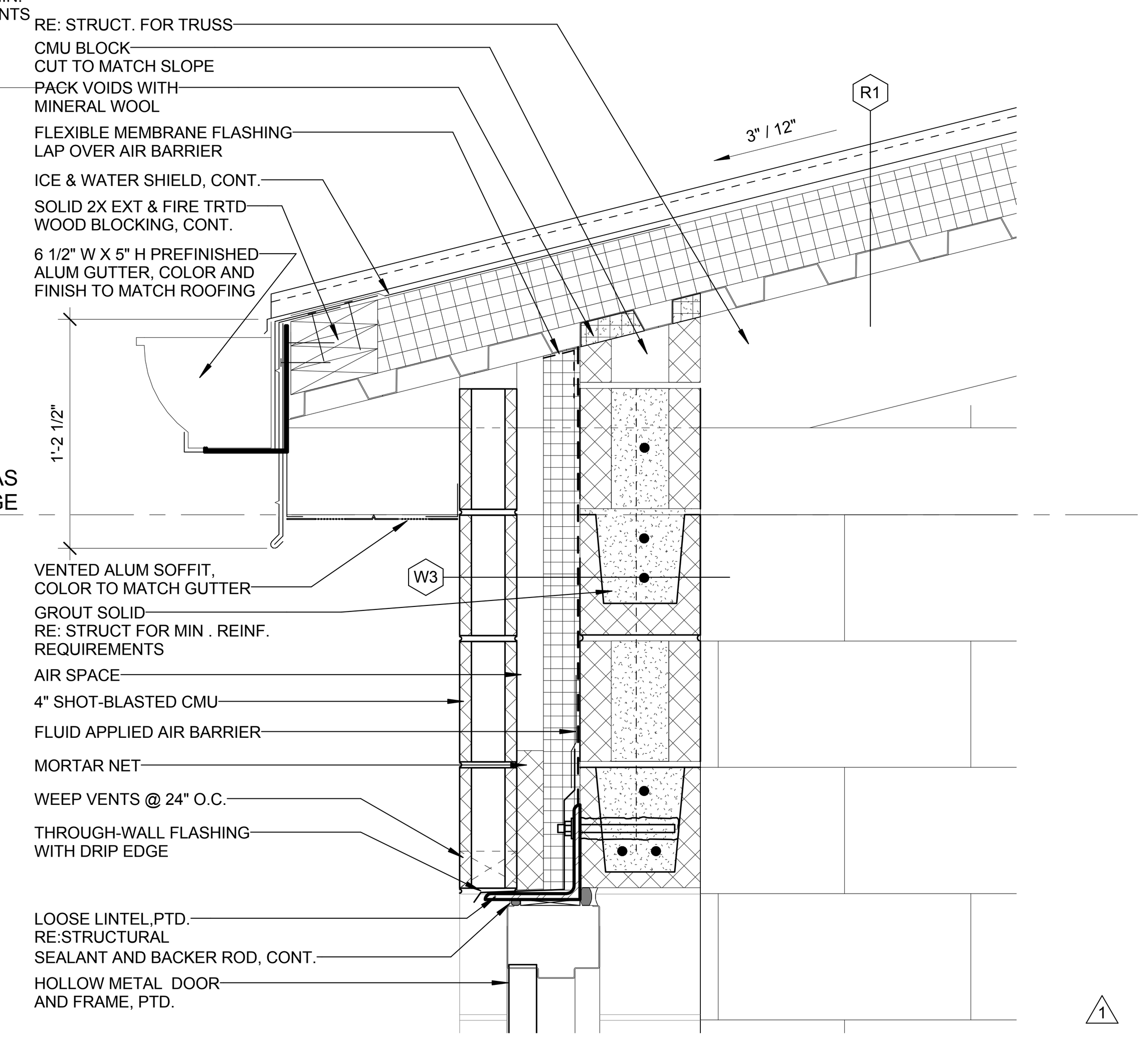
E3 TYPICAL DOOR HEAD @ PEMB
3" = 1'-0"



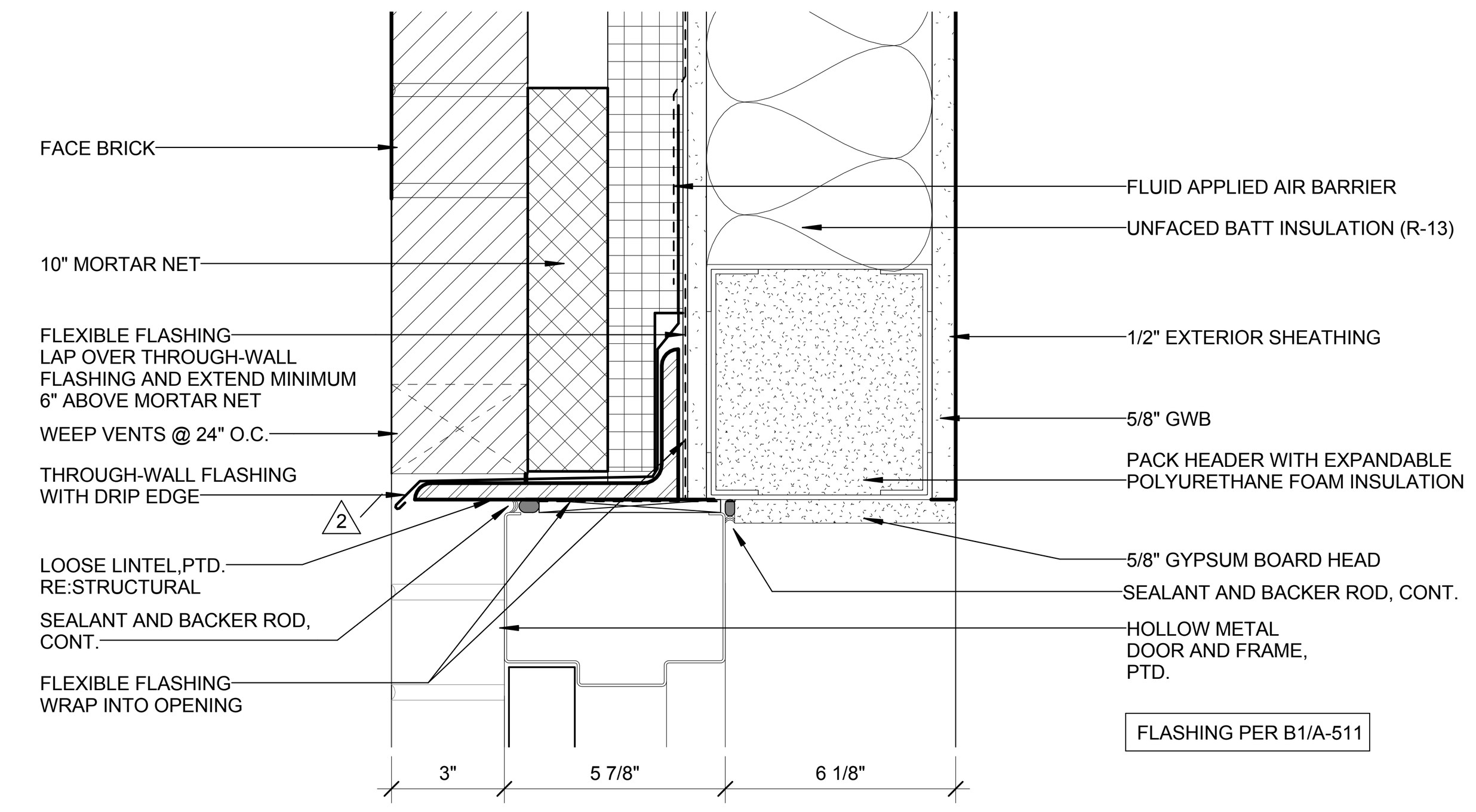
E6 TYPICAL WINDOW SILL
3" = 1'-0"



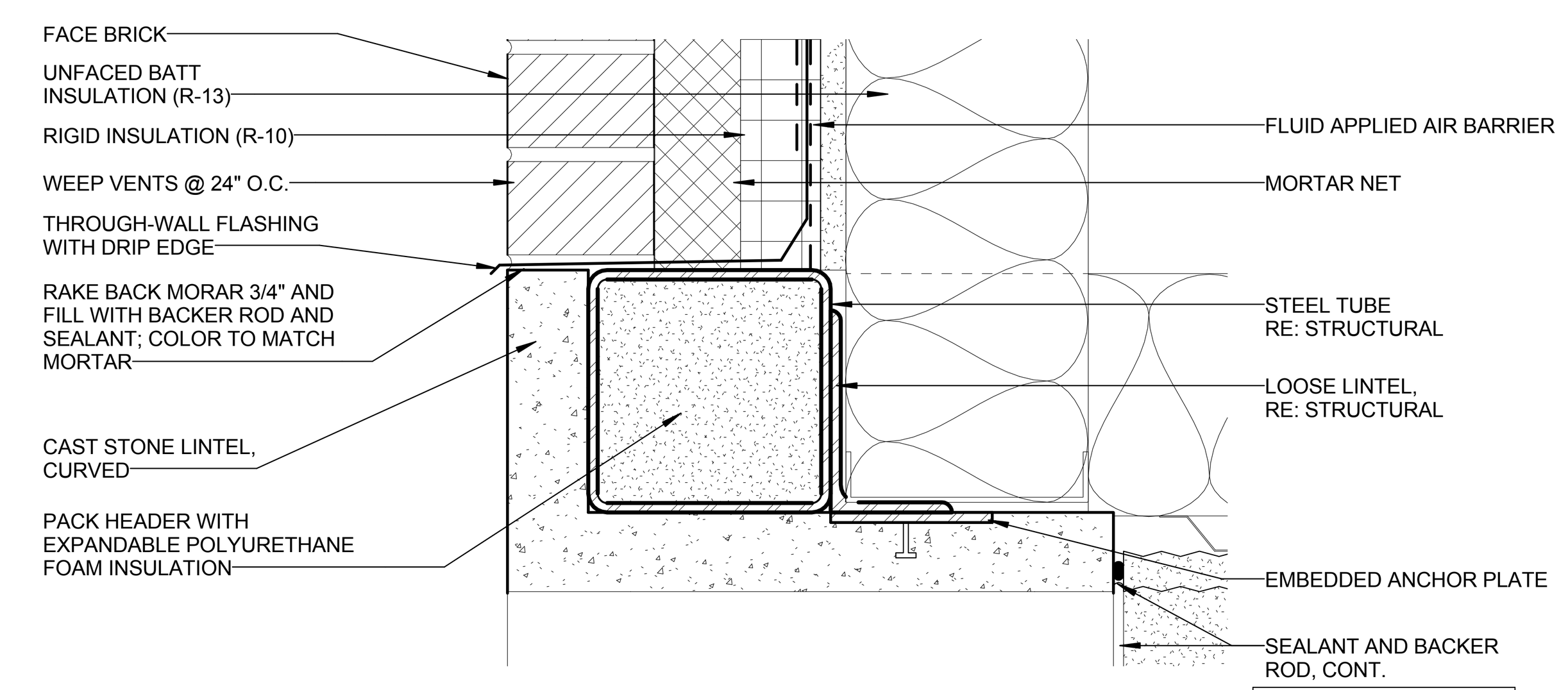
D2 PLAN DETAIL - GAS STORAGE
1 1/2" = 1'-0"



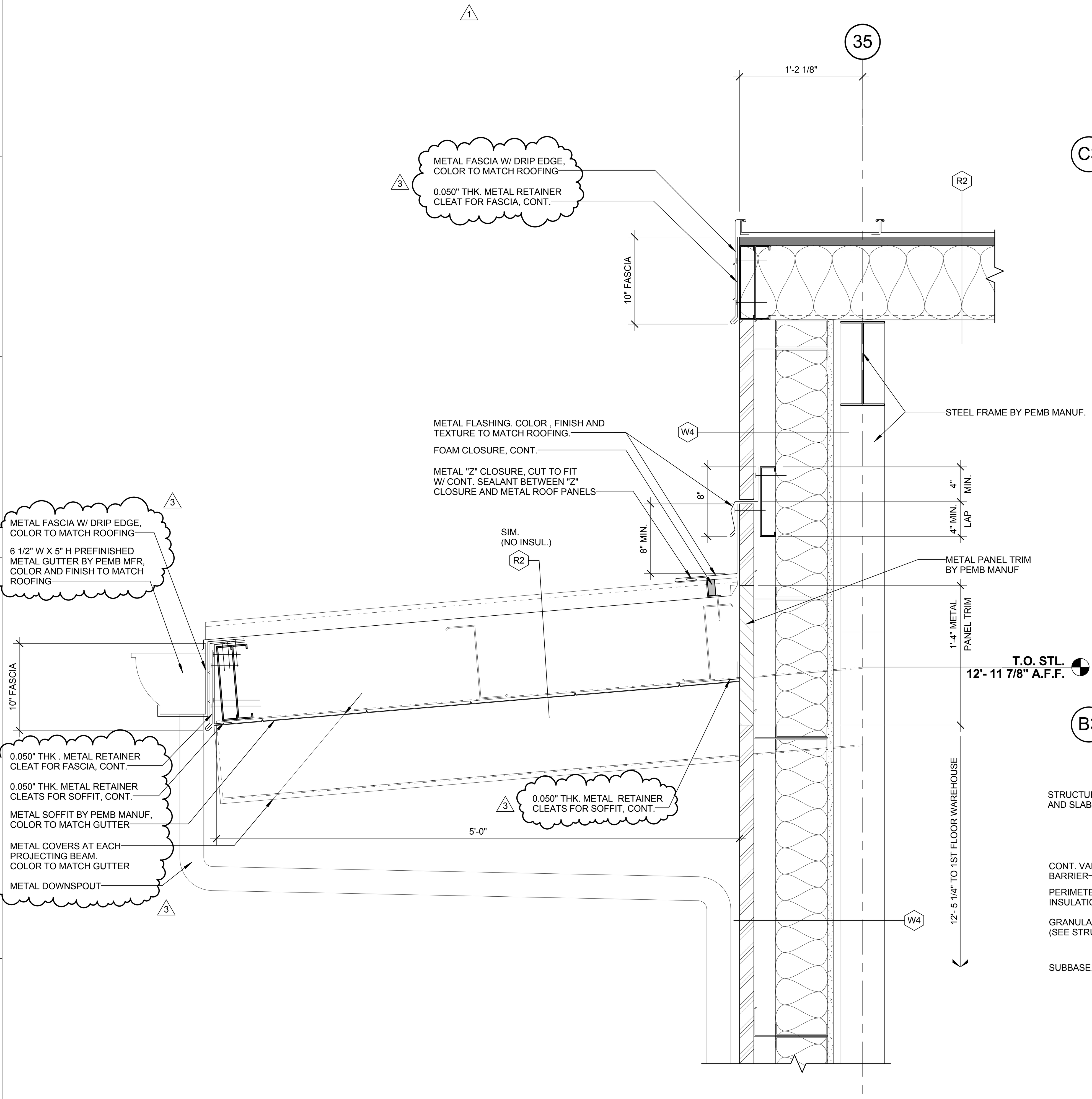
C3 SECTION-GAS STORAGE DOOR HEAD
1 1/2" = 1'-0"



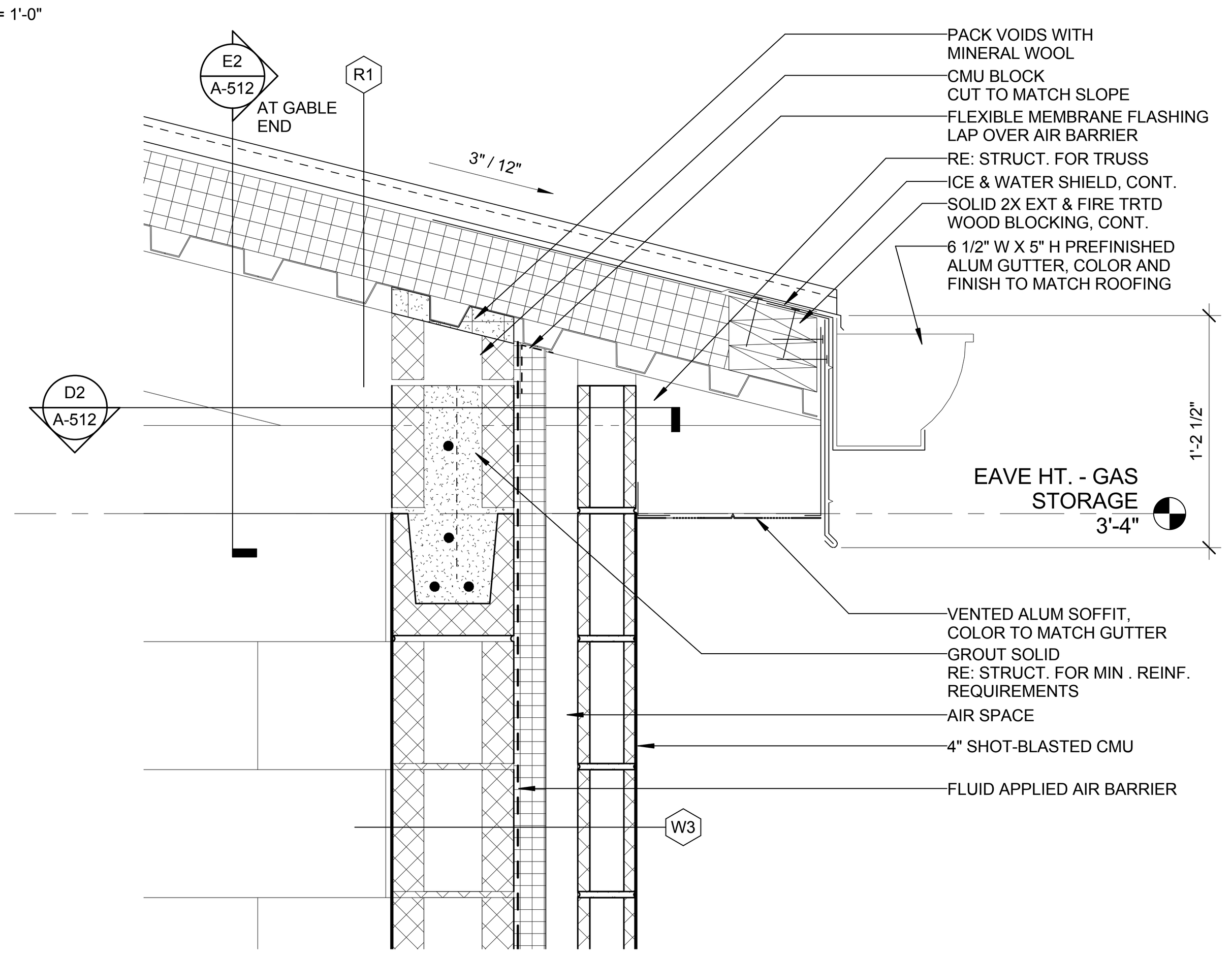
D6 TYPICAL DOOR HEAD
3" = 1'-0"



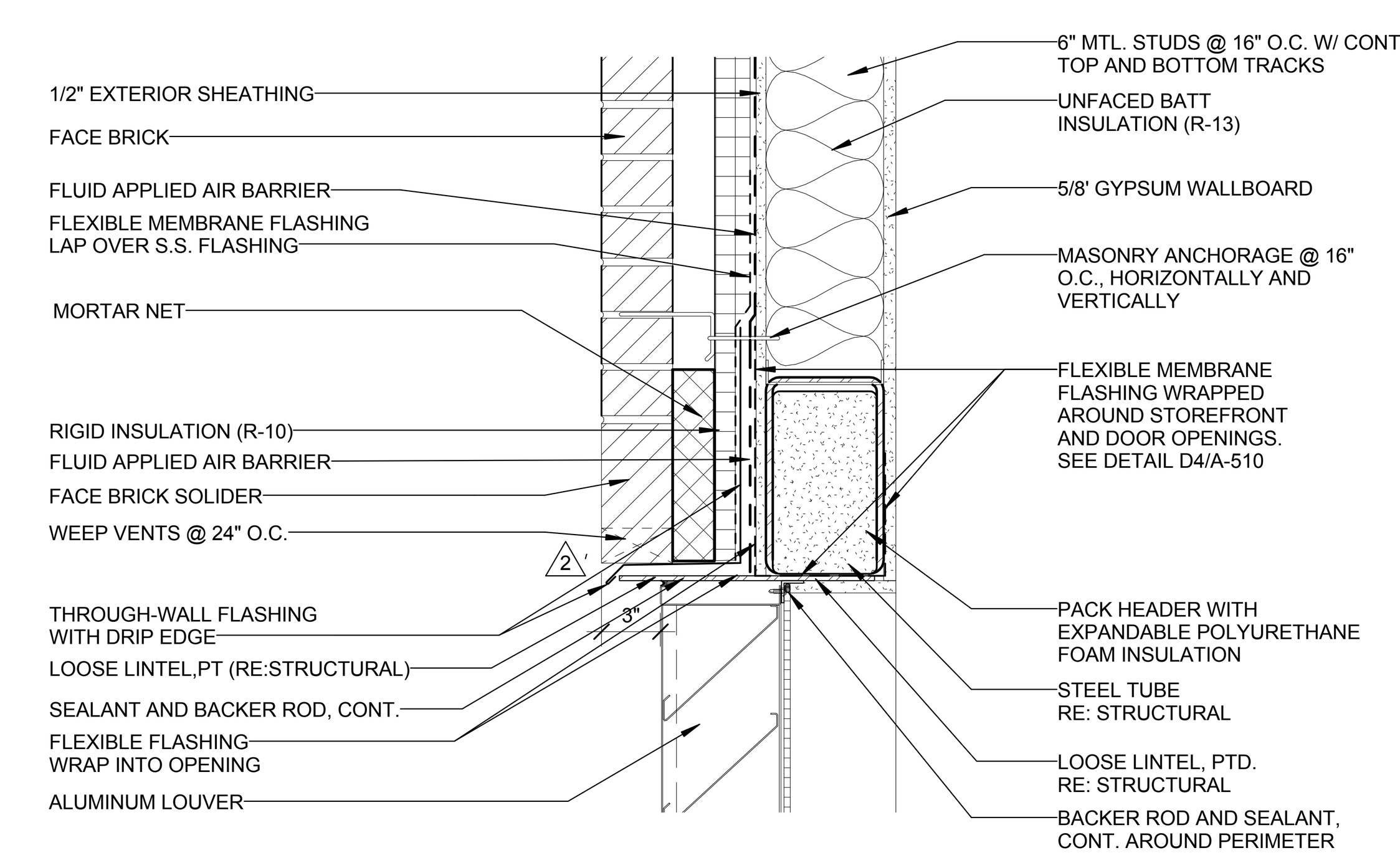
C6 CAST STONE HEAD DETAIL
3" = 1'-0"



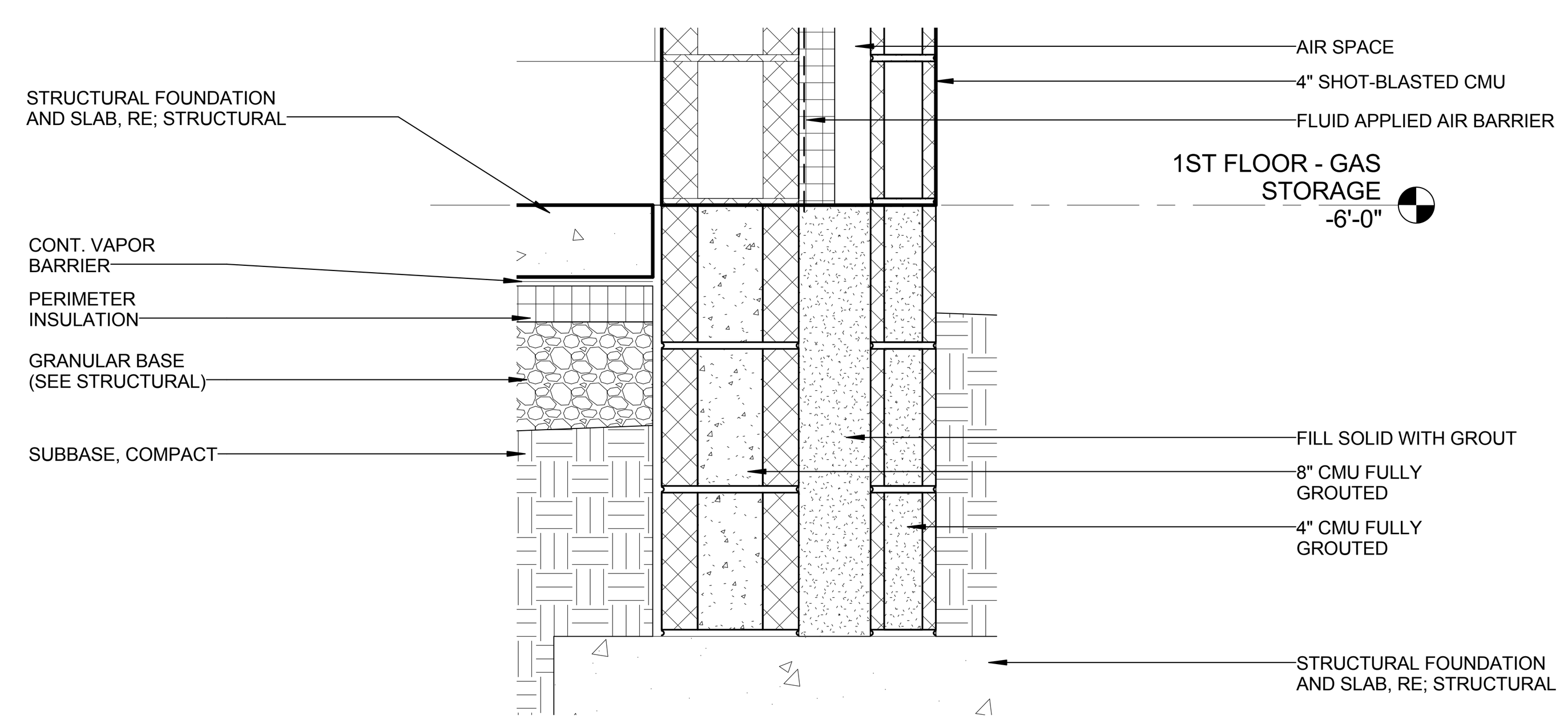
A1 SECTION - WAREHOUSE CANOPY
1 1/2" = 1'-0"



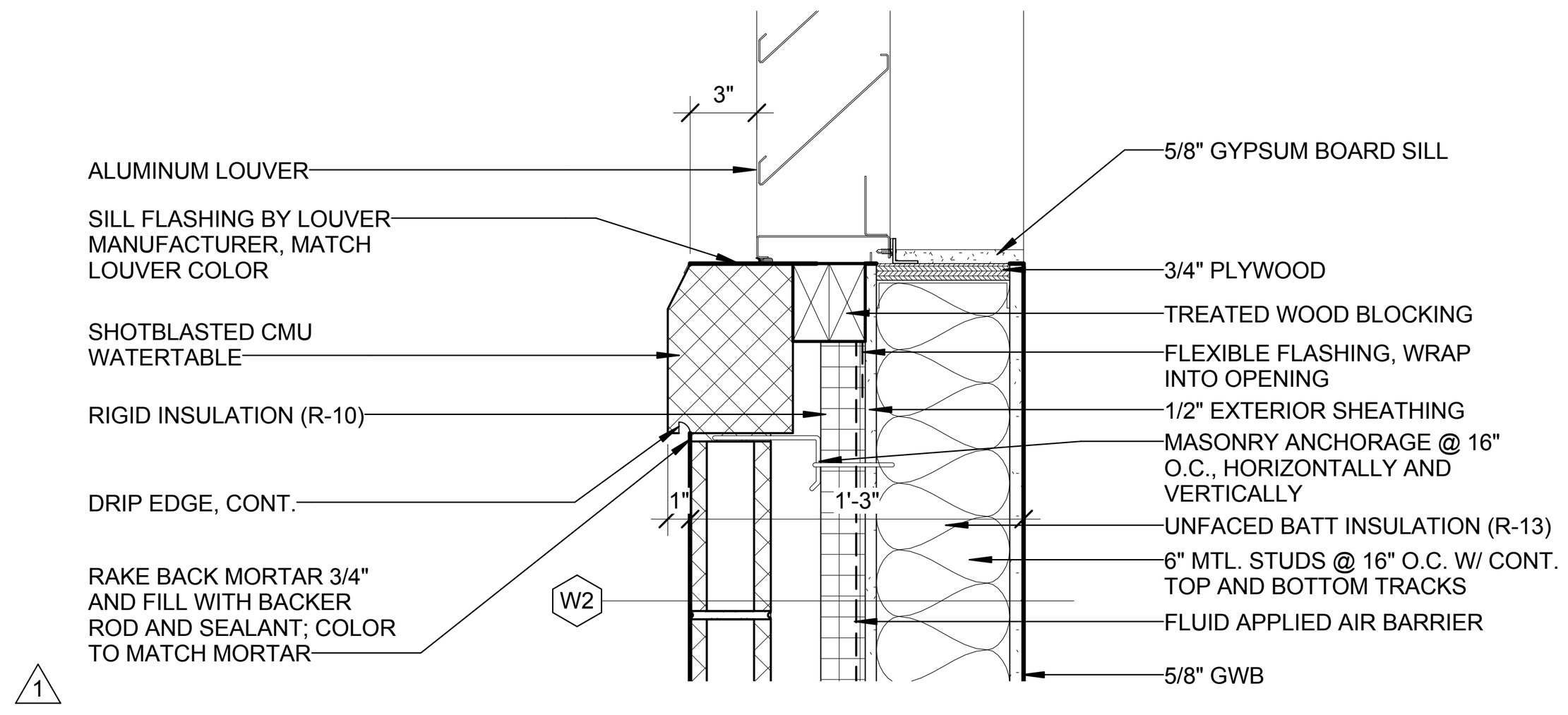
B3 SECTION- GAS STORAGE
1 1/2" = 1'-0"



B5 SECTION - LOUVER HEAD
1 1/2" = 1'-0"



A3 SECTION-GAS STORAGE WALL
1 1/2" = 1'-0"



A5 SECTION - LOUVER SILL
1 1/2" = 1'-0"

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2	Addendum No. 5	09/11/2017
3	Addendum No. 6	09/19/2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: RD
CHECKED BY: SH

SECTION DETAILS (EXTERIOR)

A-512

BUILDING BID DOCUMENTS

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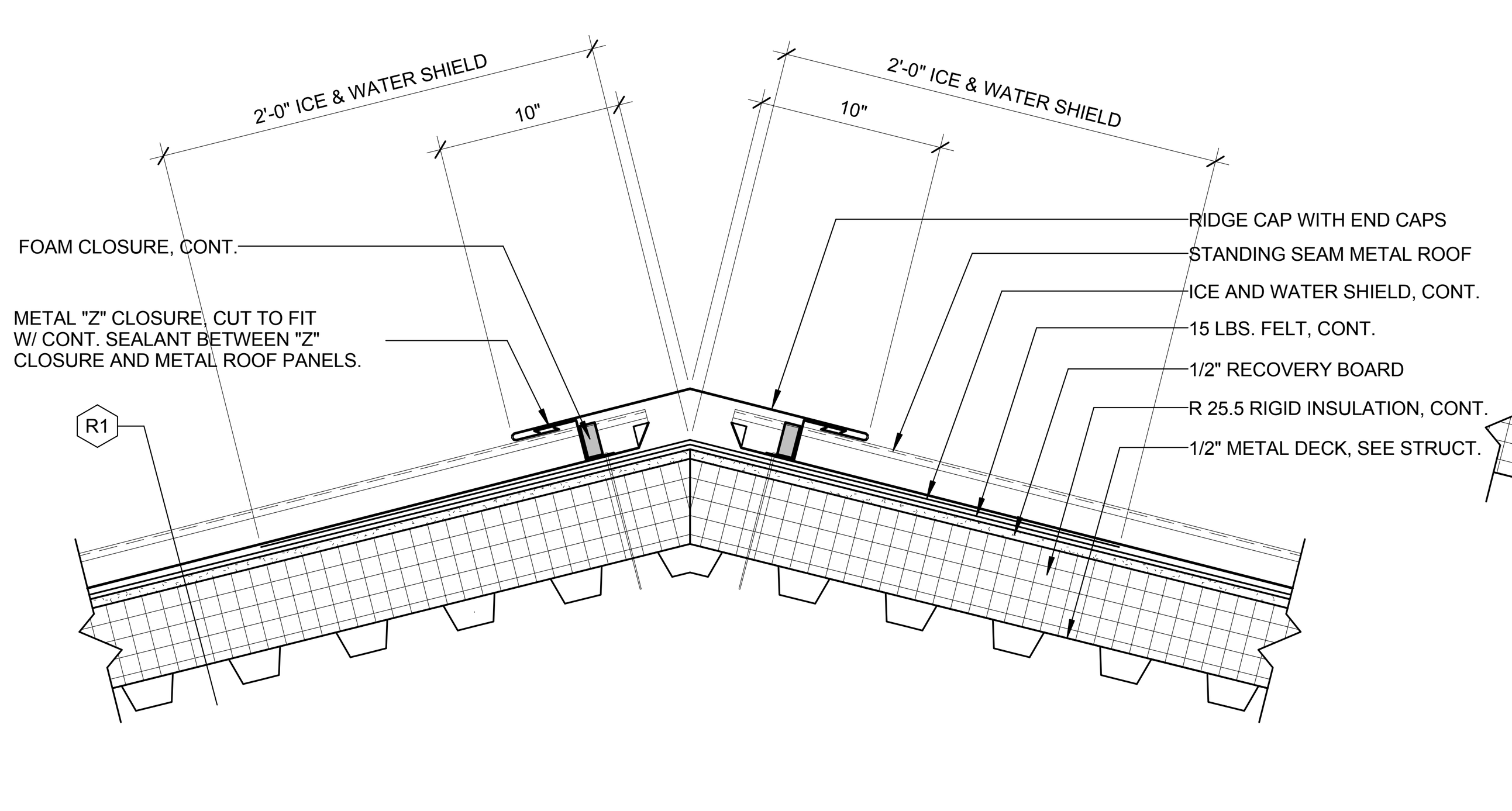
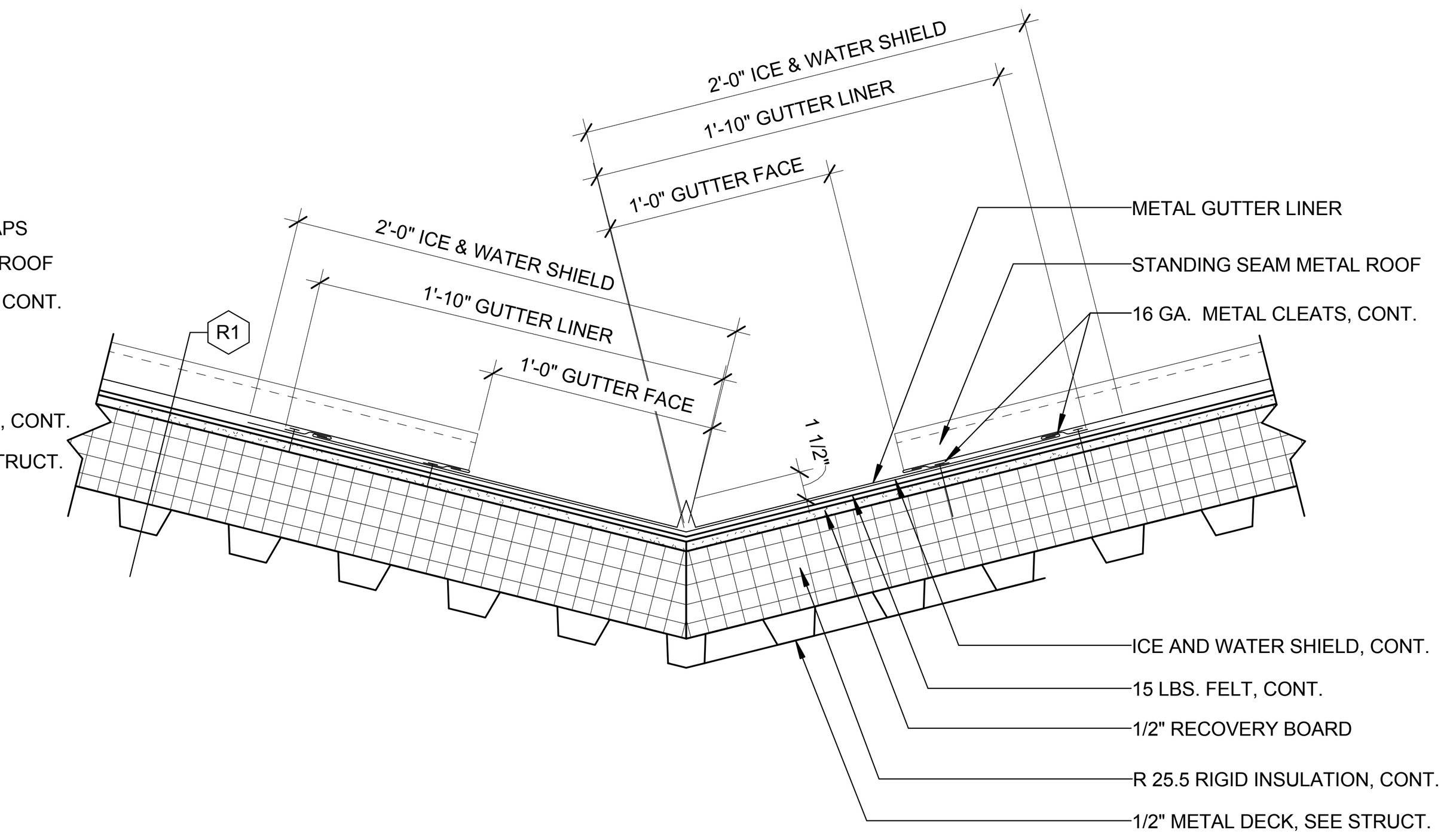
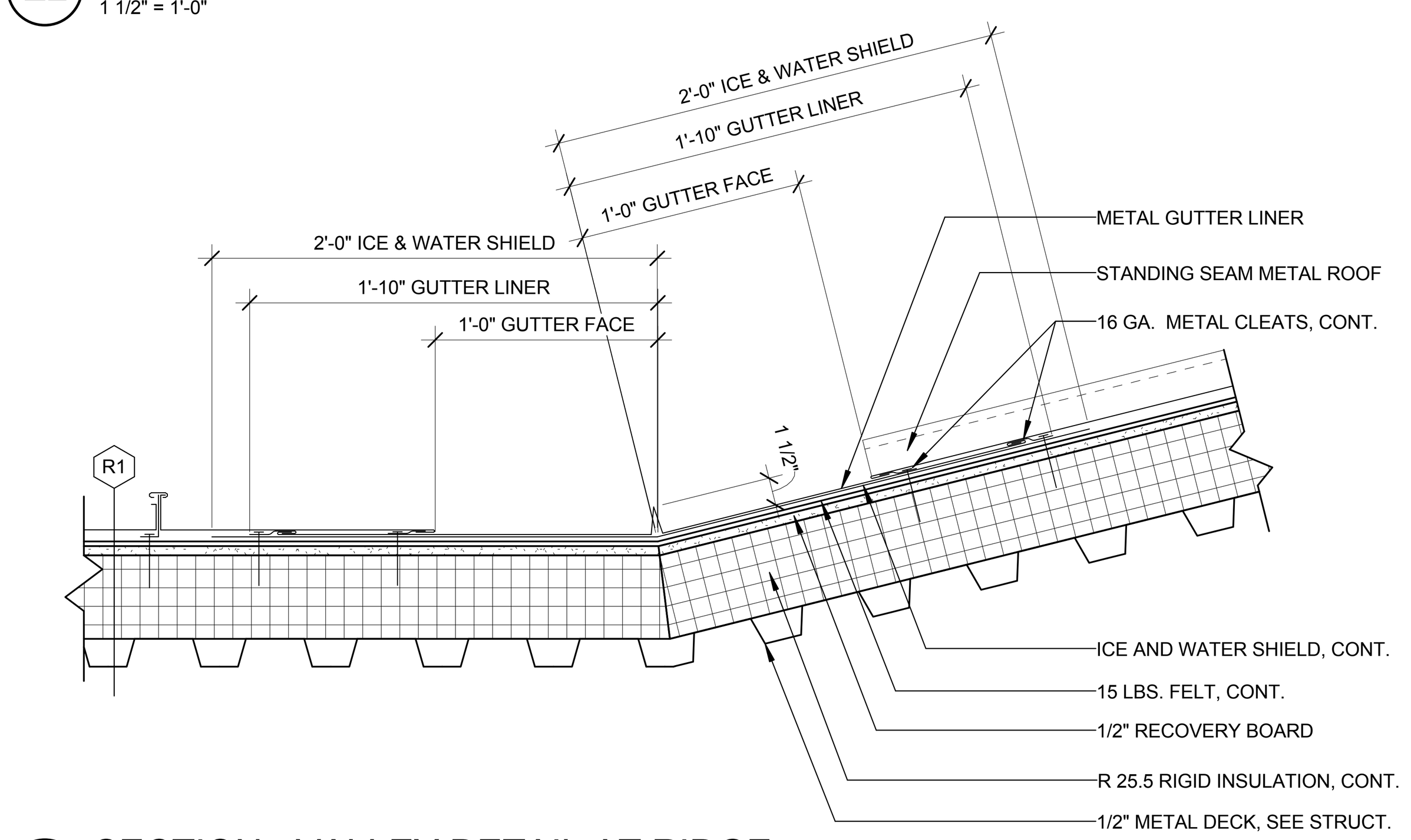


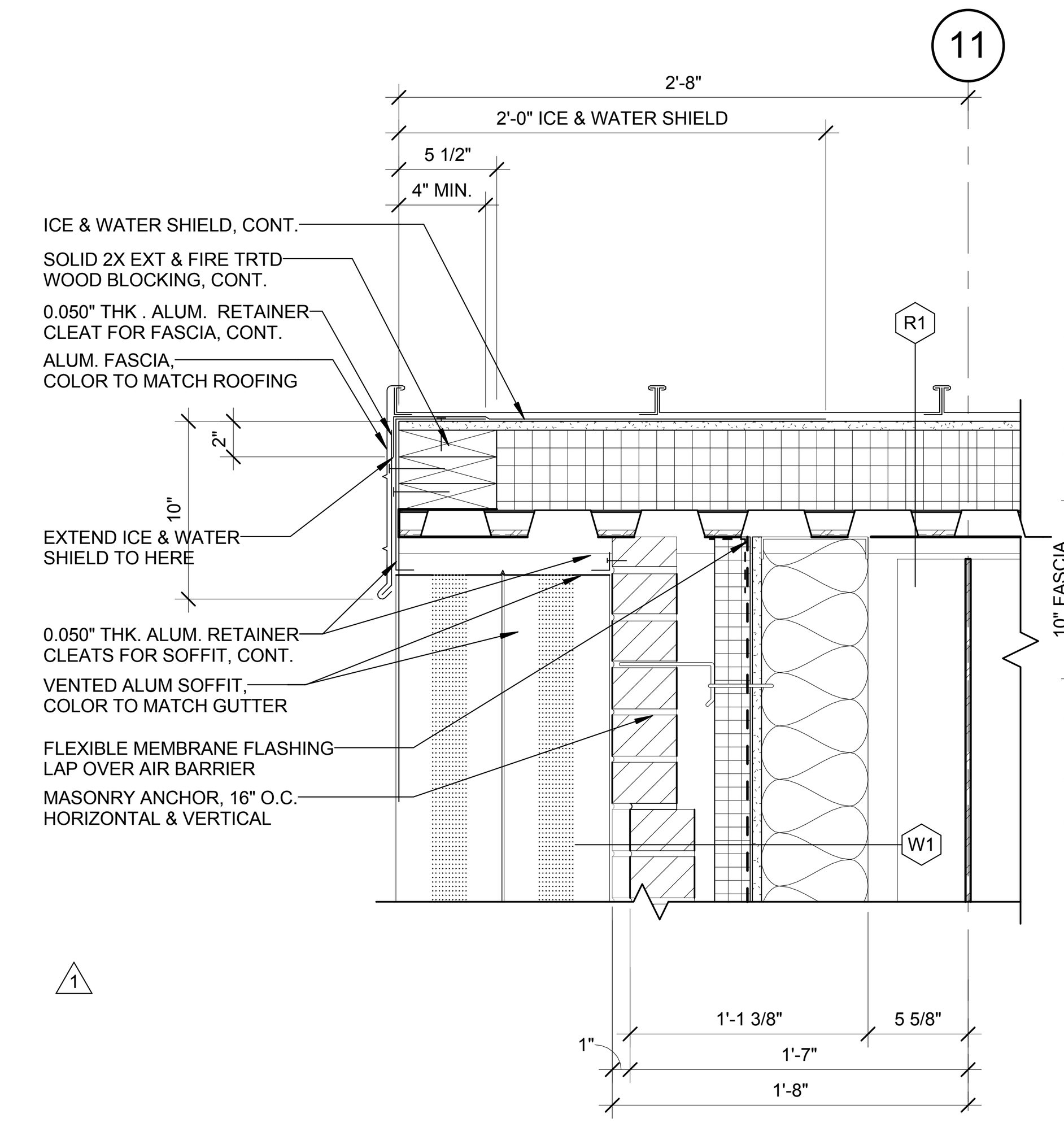
E1 SECTION - TYPICAL RIDGE DETAIL
1 1/2" = 1'-0"



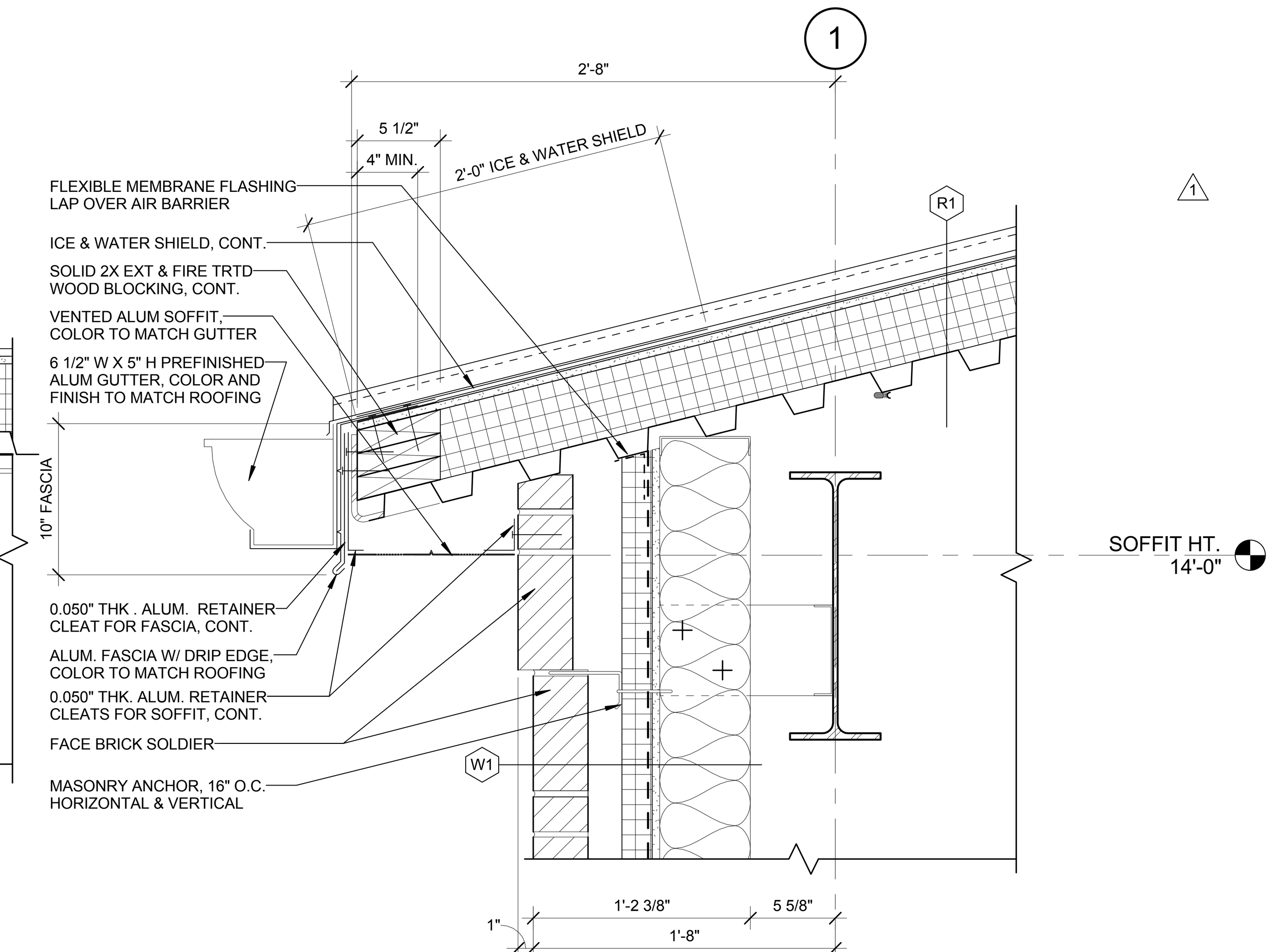
E2 SECTION - TYPICAL VALLEY DETAIL
1 1/2" = 1'-0"



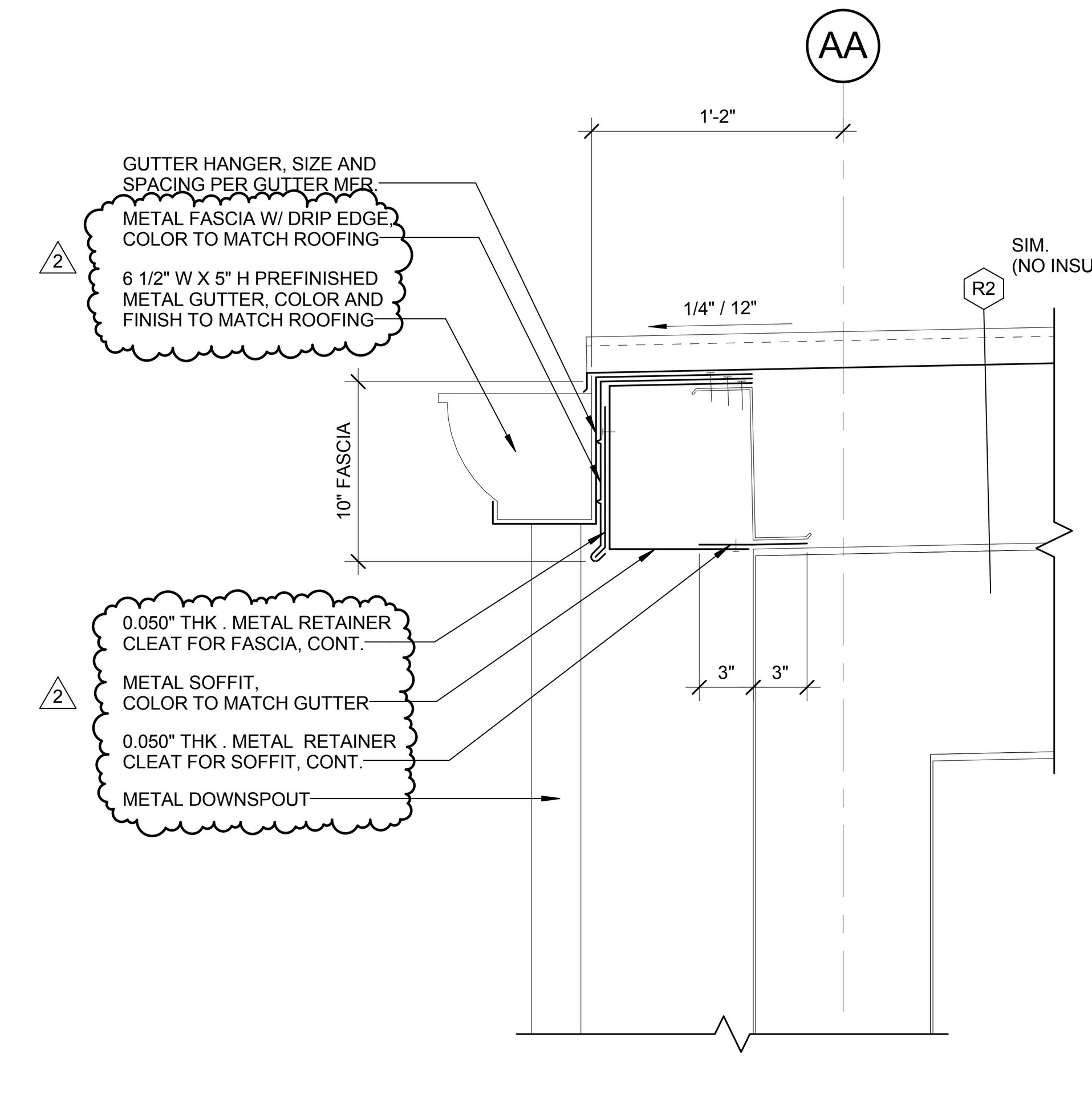
D2 SECTION - VALLEY DETAIL AT RIDGE
1 1/2" = 1'-0"



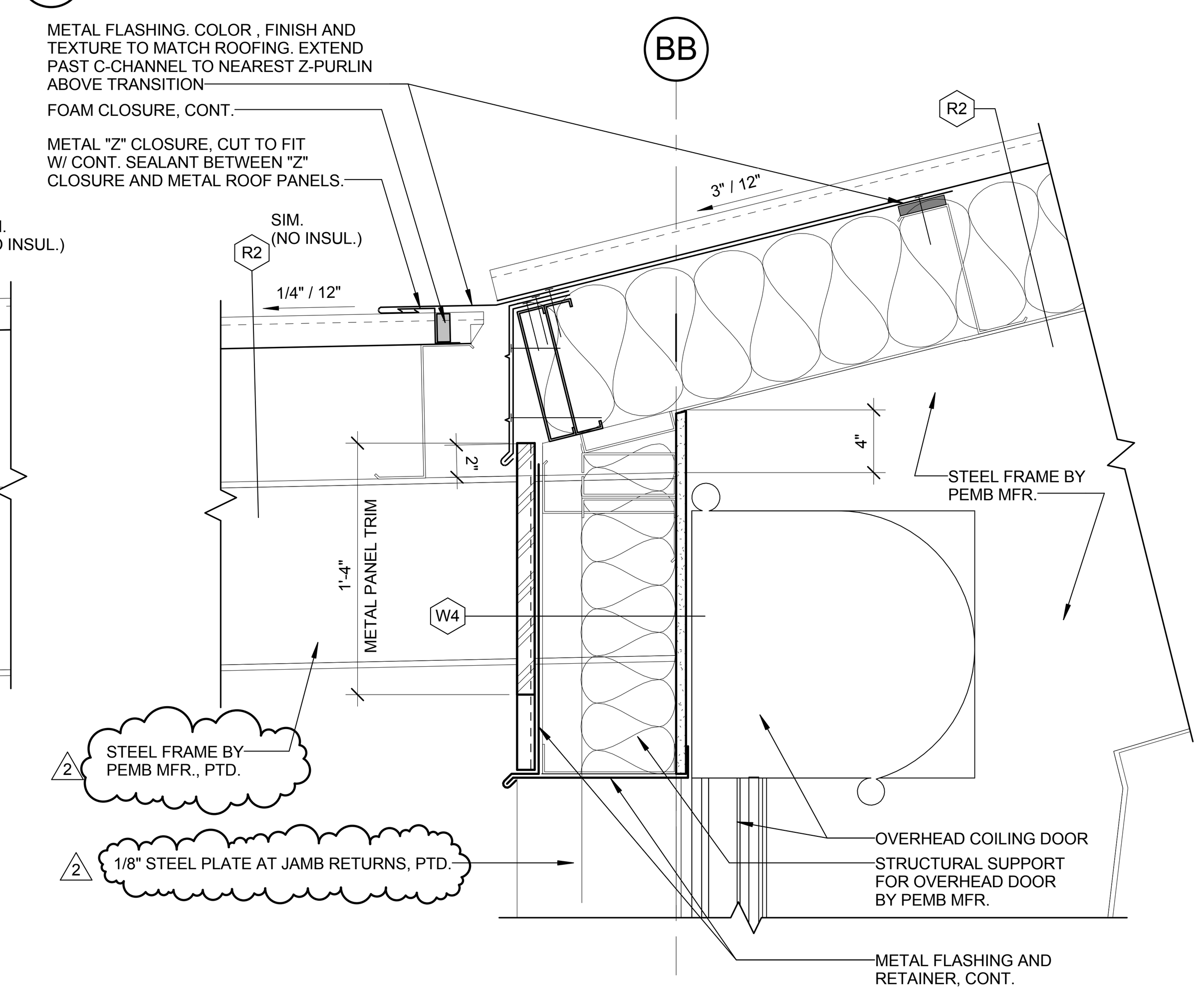
D4 SECTION - ROOF, EAVE ALONG GABLE END
1 1/2" = 1'-0"



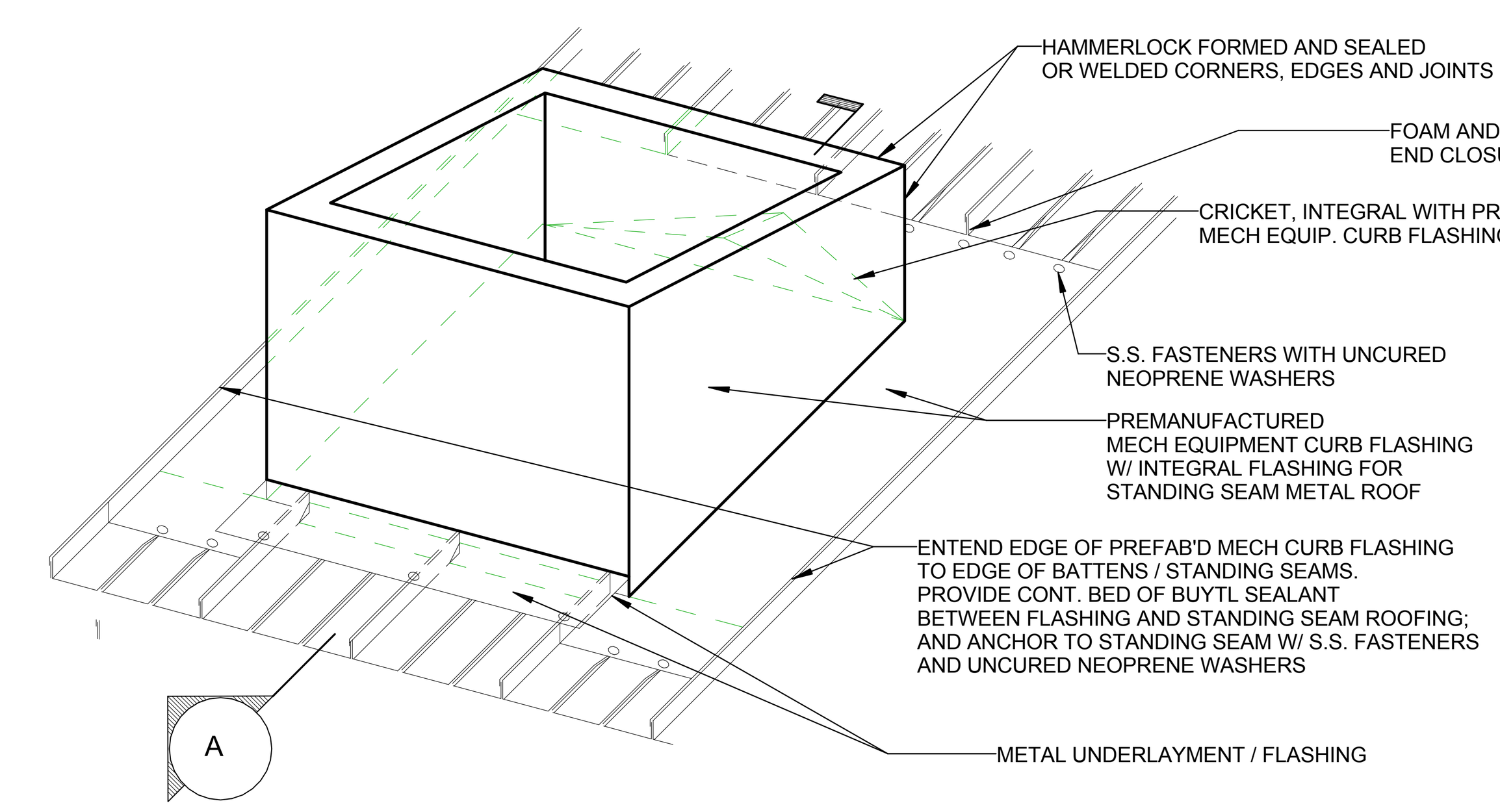
D5 SECTION - TYPICAL ROOF EAVE AT GUTTER
1 1/2" = 1'-0"



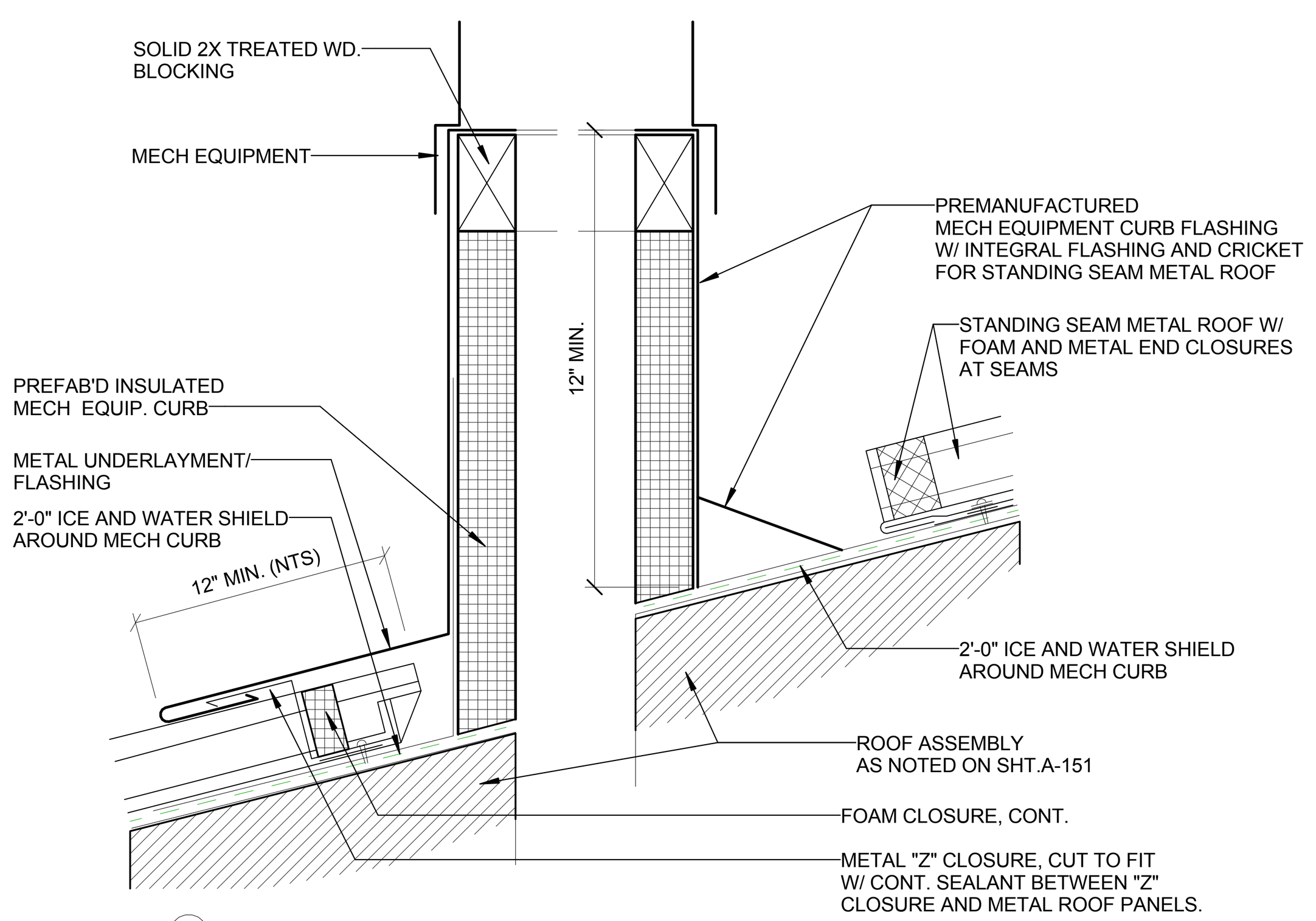
C4 SECTION - EAVE AT LOADING DOCK
1 1/2" = 1'-0"



C5 SECTION - ROOF TRANSITION AT LOADING DOCK
1 1/2" = 1'-0"

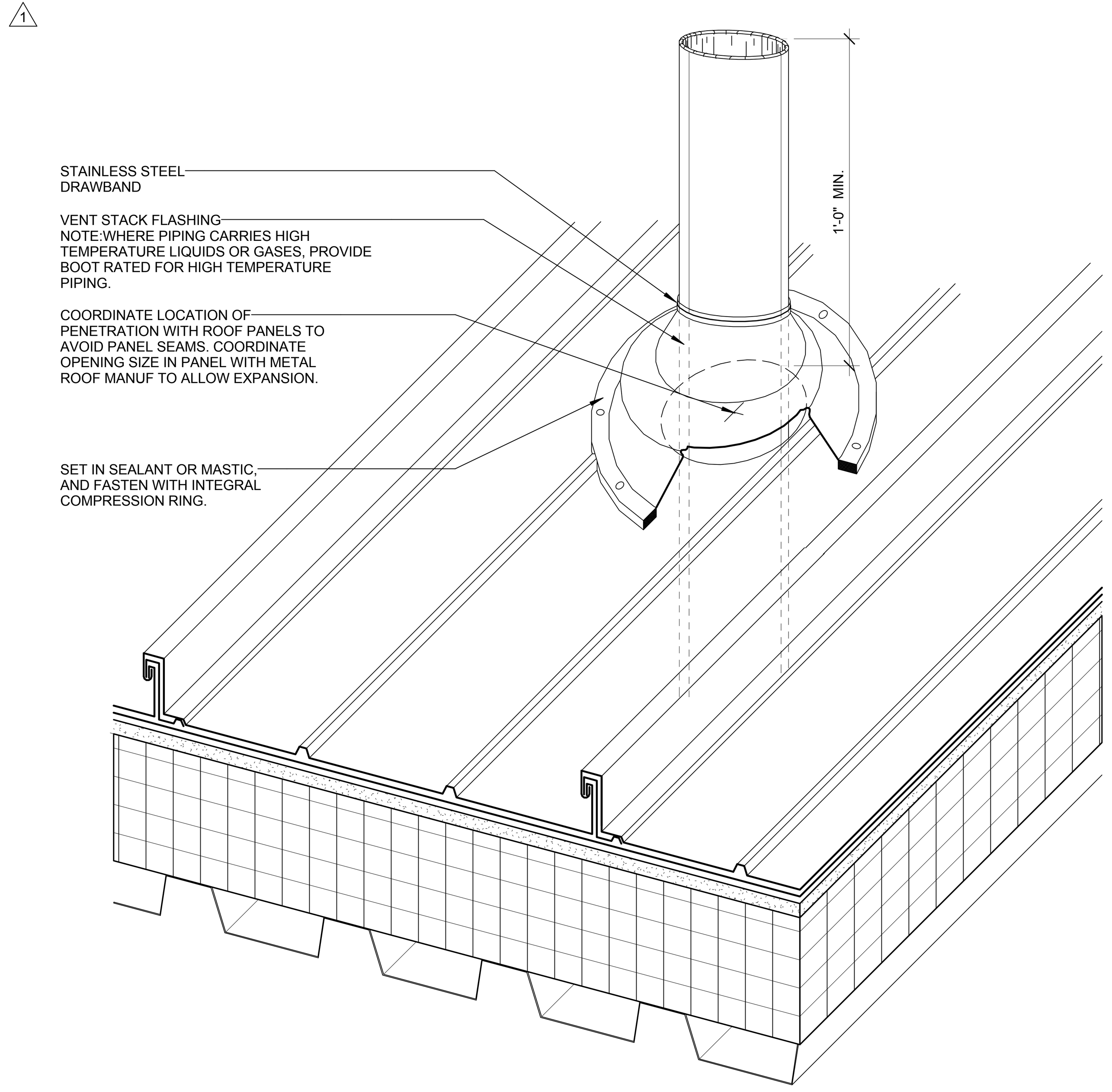


B AXONOMETRIC

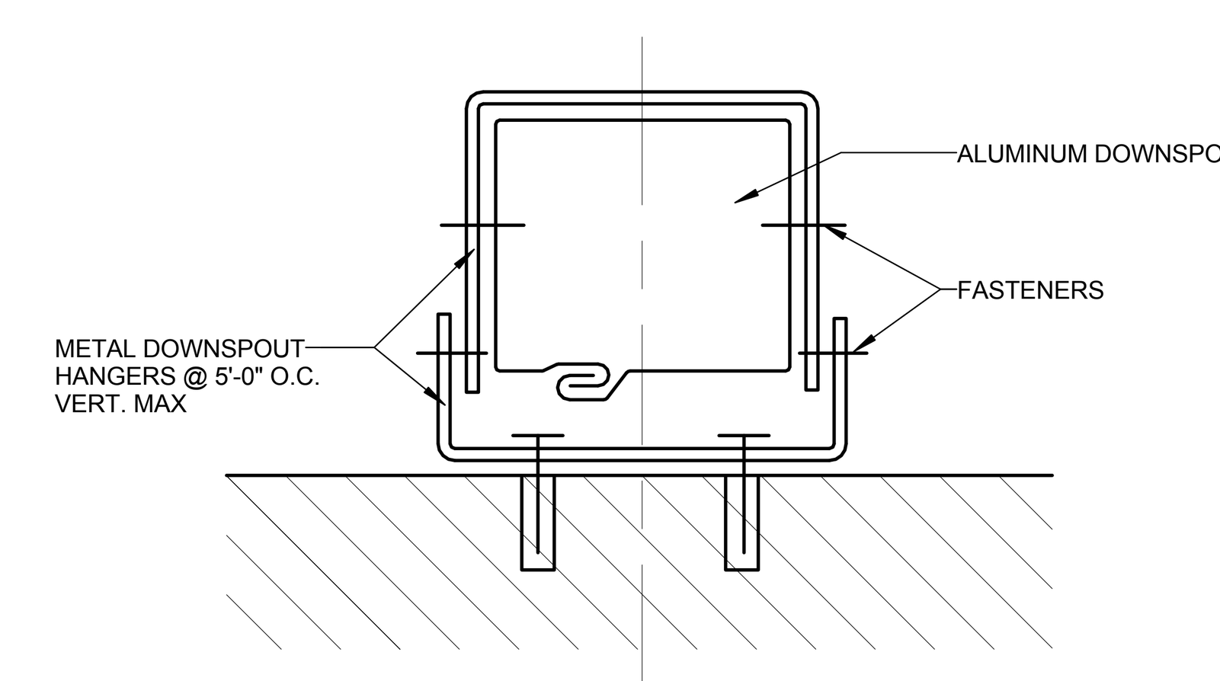


A SECTION

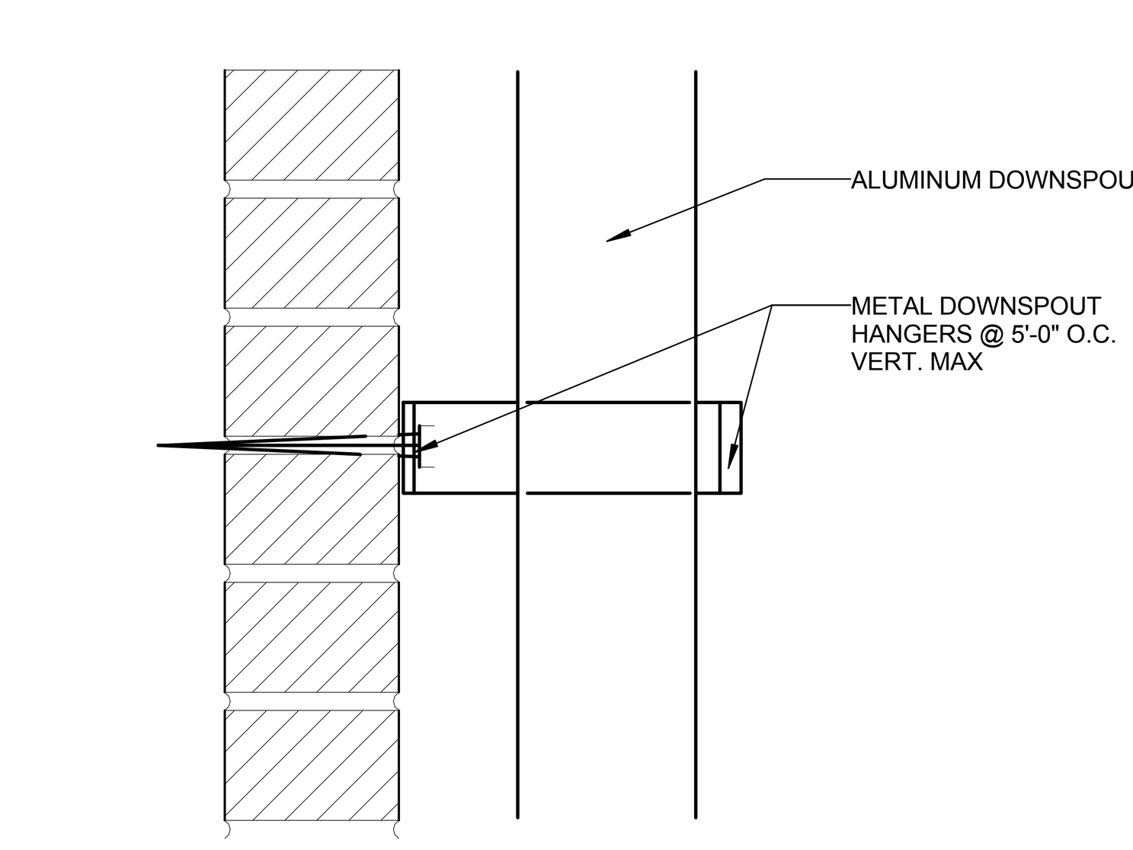
A1 EQUIPMENT CURB DETAIL
NTS



A4 DETAIL - ROOF VENT FLASHING
3" = 1'-0"



PLAN



SECTION

A6 PLAN & SECTION - DOWNSPOUT DETAIL
3" = 1'-0"

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1	Addendum No. 4	08/28/207
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PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: KF
CHECKED BY: SH

ROOF DETAILS

A-551

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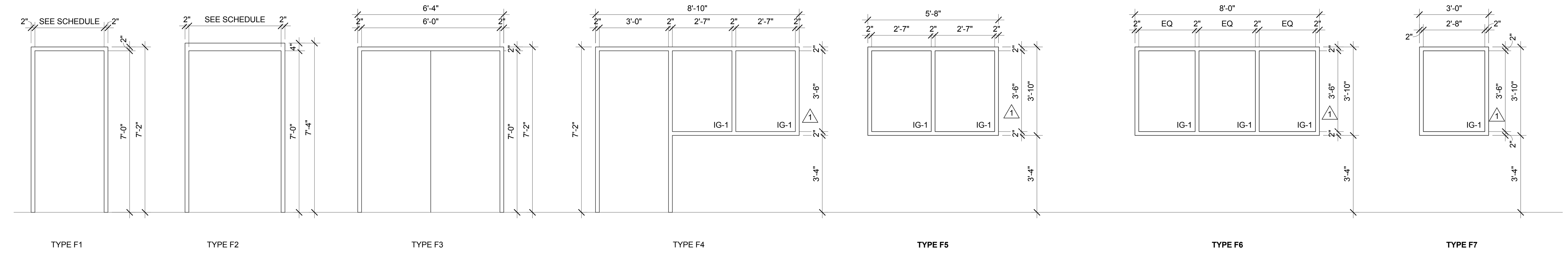
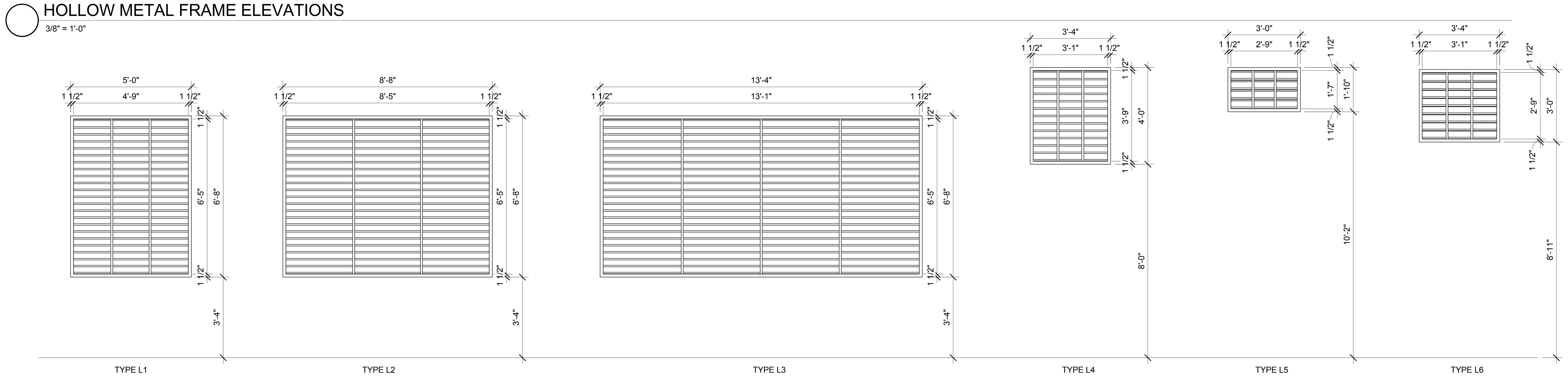


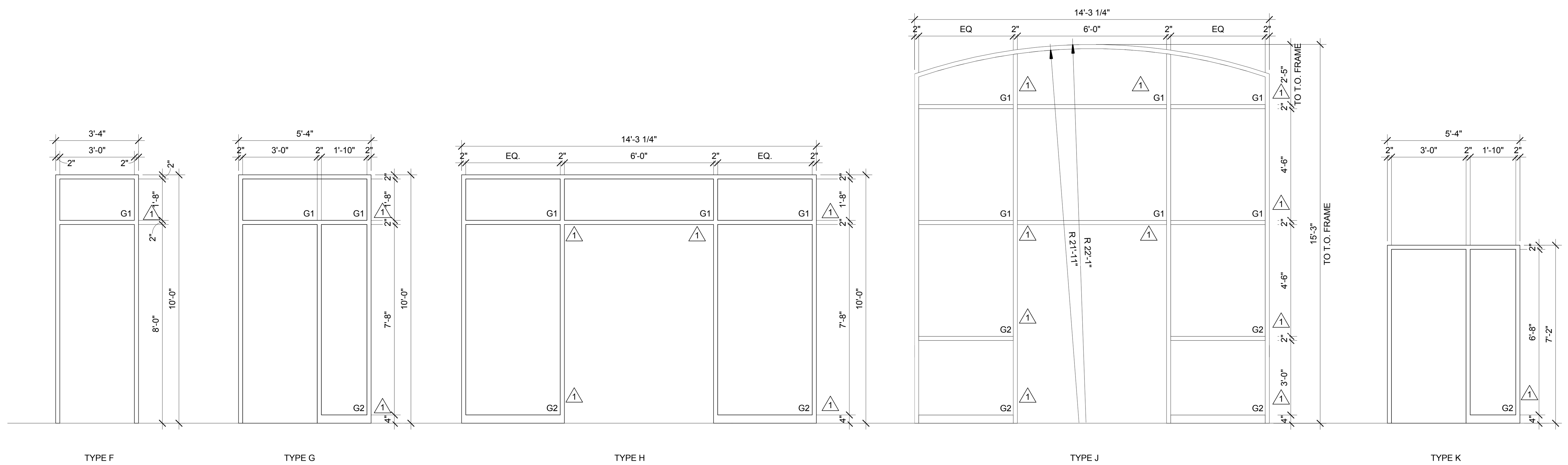
HOLLOW METAL FRAME ELEVATIONS

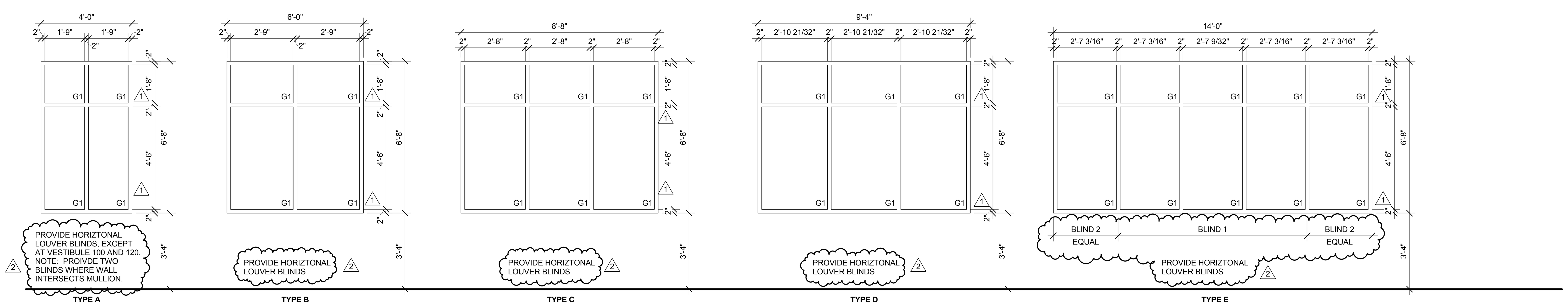
3/8" = 1'-0"



LOUVER ELEVATIONS

3/8" = 1'-0"





ALUMINUM STOREFRONT ELEVATIONS

3/8" = 1'-0"

GLAZING LEGEND

G1	1" INSULATED LOW-E GLASS, TYPICAL UNO
G2	SAME AS G1 EXCEPT BOTH LITES TEMPERED
IG-1	1/4" MONOLITHIC GLASS, TEMPERED

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SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: ZS
CHECKED BY: SH

FRAME, LOUVER, AND STOREFRONT ELEVATIONS

A-603

BUILDING BID DOCUMENTS

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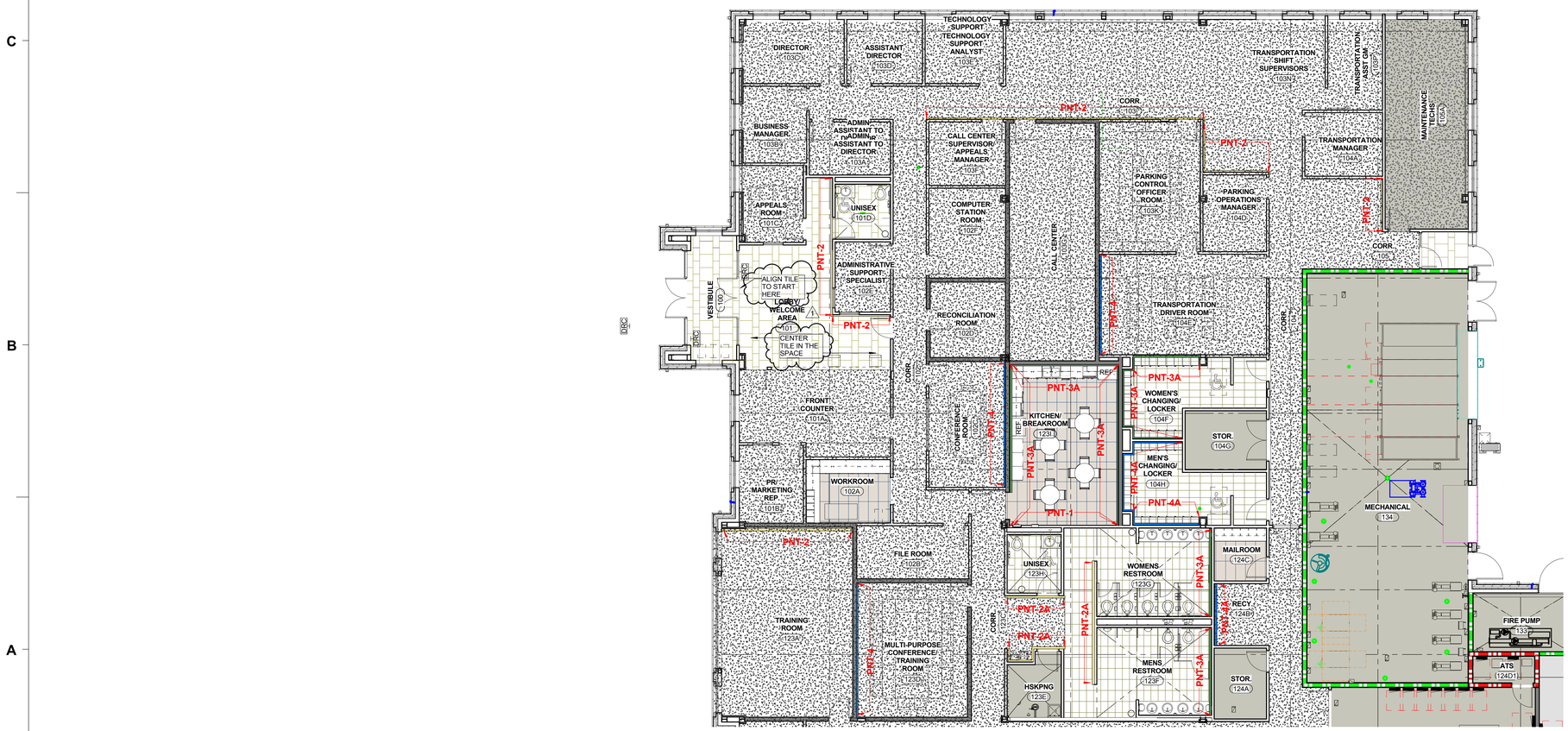


A1 OFFICE/SHOPS PARTIAL FINISH FLOOR PLAN - PATS
1/8" = 1'-0"

ROOM FINISH PLAN SHEET NOTES

1. PRIOR TO INSTALLATION AND FABRICATION, CONTRACTOR SHALL COORDINATE WITH ARCHITECT AND INTERIOR DESIGNER TO REVIEW ALL FLOOR PATTERNS, FINISHES AND DOCUMENTATION INFORMATION

2. PRIOR TO PAINTING, PAINTING CONTRACTOR SHALL SUBMIT TO ARCHITECT/INTERIOR DESIGNER EACH PAINT COLOR FINISH ON A 8 1/2" X 11" SHEET OF CHIPBOARD FOR PRELIMINARY APPROVAL. FOR FINAL APPROVAL BY OWNER AND ARCHITECT PRIOR TO PAINTING, THE PAINTING CONTRACTOR SHALL PAINT EACH PAINT COLOR WITH THE DESIGNATED FINISH ON A 4' X 4' PIECE OF GYPSUM BOARD. SAMPLE BOARDS SHALL BE REVIEWED AND APPROVED AT THE JOB SITE WITH THE APPROPRIATE LIGHTING.

3. INSTALLERS OF EACH FINISH MATERIAL SHALL INSPECT BOTH THE SUBSTRATE AND CONDITIONS UNDER WHICH WORK IS TO BE PERFORMED. INSTALLER SHALL NOT PROCEED UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN AN ACCEPTABLE MANNER TO ALL PARTIES AND MEET ALL MANUFACTURER'S REQUIREMENTS

4. ALL INTERIOR FINISHES SHALL COMPLY WITH SECTION 803 OF RESTRICTIONS OF COMBUSTIBLE MATERIALS OF THE INTERNATIONAL BUILDING CODE.

5. THE INTENT IS TO PROVIDE A COMPLETE FINISHED INTERIOR WHETHER OR NOT SPECIFICALLY INDICATED. ITEMS SHALL BE FINISHED AND/OR PAINTED AS DIRECTED BY DESIGNER, WHETHER OR NOT SPECIFICALLY SCHEDULED OR INDICATED ON DRAWINGS

6. TILE SUBCONTRACTOR SHALL USE LATEX ADDITIVE IN SETTING BED PER MANUFACTURER'S RECOMMENDATIONS UNLESS OTHERWISE NOTED

7. INSTALL ALL VINYL COMPOSITION TILE IN THE SAME DIRECTION UNLESS OTHERWISE NOTED

8. CARPET INSTALLER SHALL SUBMIT SEAMING SHOP DRAWING FOR ALL AREAS SPECIFIED TO RECEIVE CARPET FLOORING PRIOR TO COMMENCEMENT OF WORK

9. PAINT ALL EXPOSED AND SEMI-EXPOSED WOOD BLOCKING AND METAL SUPPORTS TO MATCH ADJACENT SURFACES. COORDINATE WITH INTERIOR DESIGNER

10. PAINTED FINISH ON METAL SURFACES SHALL BE SMOOTH, CLEAR AND FREE OF ALL BRUSH MARKS

11. WHERE WOOD BASE IS SPECIFIED, CAULK AT TOP OF BASE AND WALL WITH COLORED CAULK TO MATCH WOOD STAIN

12. INSTALL TRANSITION STRIP AT THRESHOLD WHERE DIFFERING FLOORING MATERIALS ABUTT, UNLESS OTHERWISE NOTED. COORDINATE COLOR/FINISH WITH DESIGNER

13. PAINT METAL WALL-MOUNTED ACCESS DOORS, GRILLES, RETURN AIR GRILLES, COVER PLATES, FAN COIL UNITS, FIRE EQUIPMENT CABINETS, AND ELECTRICAL CABINETS TO MATCH ADJACENT SURFACE UNLESS OTHERWISE NOTED.

14. ALL FLOOR FINISH CHANGES SHALL OCCUR AT THE CENTER LINE OF CLOSED DOORS.

15. FLOOR PATTERN TO CONTINUE UNDER ALL OPEN WOODWORK/ WORKSURFACES.

16. FLOORING CONTRACTOR SHALL MAKE ADJUSTMENTS TO ACCOMMODATE FOR ANY DIFFERENCES IN THE PILE HEIGHT OF THE CARPET.

17. PRIOR TO ORDERING, SUB-CONTRACTORS FOR FLOORING, PAINTING, AND MILLWORK SHALL SUBMIT TO ARCHITECT / INTERIOR DESIGNER AN 8" X 8" SAMPLE OF EACH MATERIAL SPECIFIED FOR FINAL APPROVAL.

18. IF ANY DISCREPANCIES OR OMISSIONS ARE NOTED IN THESE DRAWINGS, CONTACT INTERIOR DESIGNER OR ARCHITECT PRIOR TO ORDERING OR COMMENCING WORK.

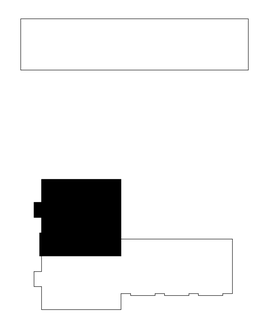
19. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CHECK LEAD TIMES ON FINISHES IN ORDER TO AVOID DELAYING WORK.

20. ALIGN GROUT JOINTS AT FLOOR, BASE, AND WALL TILE.

MATERIAL FINISH LEGEND

- POLISHED CONCRETE
- SEALED CONCRETE
- VCT
- LVT
- TILE PTF-1/PTF-2
- TILE PTF-3
- CARPET CPT-1/2/3
- CARPET CPT-4
- CARPET CPT-5

KEYPLAN



UNC CHARLOTTE

FACILITIES OPERATIONS / PARKING SERVICES COMPLEX

LS3P

227 WEST TRADE STREET SUITE 700
CHARLOTTE, NORTH CAROLINA 28202
TEL. 704.333.6686 FAX 704.333.2926
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JOHN SCOTT HUTCHESON 8326 NORTH CAROLINA REGISTERED ARCHITECT CHARLOTTE, N.C. 9/19/2017

LS3P ASSOCIATES LTD REGISTERED ARCHITECTURAL COMPANY CERT. NO. 50417 CHARLOTTE, NORTH CAROLINA

MEMBERS OF THE AMERICAN INSTITUTE OF ARCHITECTS

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No.	Description	Date
1	Addendum No. 6	09/19/2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: AR
CHECKED BY: SH

OFFICE/SHOPS PARTIAL FINISH FLOOR PLAN - PATS

A-721A

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BUILDING BID DOCUMENTS

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ROOM FINISH PLAN SHEET NOTES

1. PRIOR TO INSTALLATION AND FABRICATION, CONTRACTOR SHALL COORDINATE WITH ARCHITECT AND INTERIOR DESIGNER TO REVIEW ALL FLOOR PATTERNS, FINISHES AND DOCUMENTATION INFORMATION

2. PRIOR TO PAINTING, PAINTING CONTRACTOR SHALL SUBMIT TO ARCHITECT/INTERIOR DESIGNER EACH PAINT COLOR FINISH ON A 8 1/2" X 11" SHEET OF CHIPBOARD FOR PRELIMINARY APPROVAL. FOR FINAL APPROVAL BY OWNER AND ARCHITECT PRIOR TO PAINTING, THE PAINTING CONTRACTOR SHALL PAINT EACH PAINT COLOR WITH THE DESIGNATED FINISH ON A 4' X 4' PIECE OF GYPSUM BOARD. SAMPLE BOARDS SHALL BE REVIEWED AND APPROVED AT THE JOB SITE WITH THE APPROPRIATE LIGHTING.

3. INSTALLERS OF EACH FINISH MATERIAL SHALL INSPECT BOTH THE SUBSTRATE AND CONDITIONS UNDER WHICH WORK IS TO BE PERFORMED. INSTALLER SHALL NOT PROCEED UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN AN ACCEPTABLE MANNER TO ALL PARTIES AND MEET ALL MANUFACTURER'S REQUIREMENTS

4. ALL INTERIOR FINISHES SHALL COMPLY WITH SECTION 803 OF RESTRICTIONS OF COMBUSTIBLE MATERIALS OF THE INTERNATIONAL BUILDING CODE.

5. THE INTENT IS TO PROVIDE A COMPLETE FINISHED INTERIOR WHETHER OR NOT SPECIFICALLY INDICATED. ITEMS SHALL BE FINISHED AND/OR PAINTED AS DIRECTED BY DESIGNER, WHETHER OR NOT SPECIFICALLY SCHEDULED OR INDICATED ON DRAWINGS

6. TILE SUBCONTRACTOR SHALL USE LATEX ADDITIVE IN SETTING BED PER MANUFACTURER'S RECOMMENDATIONS UNLESS OTHERWISE NOTED

7. INSTALL ALL VINYL COMPOSITION TILE IN THE SAME DIRECTION UNLESS OTHERWISE NOTED

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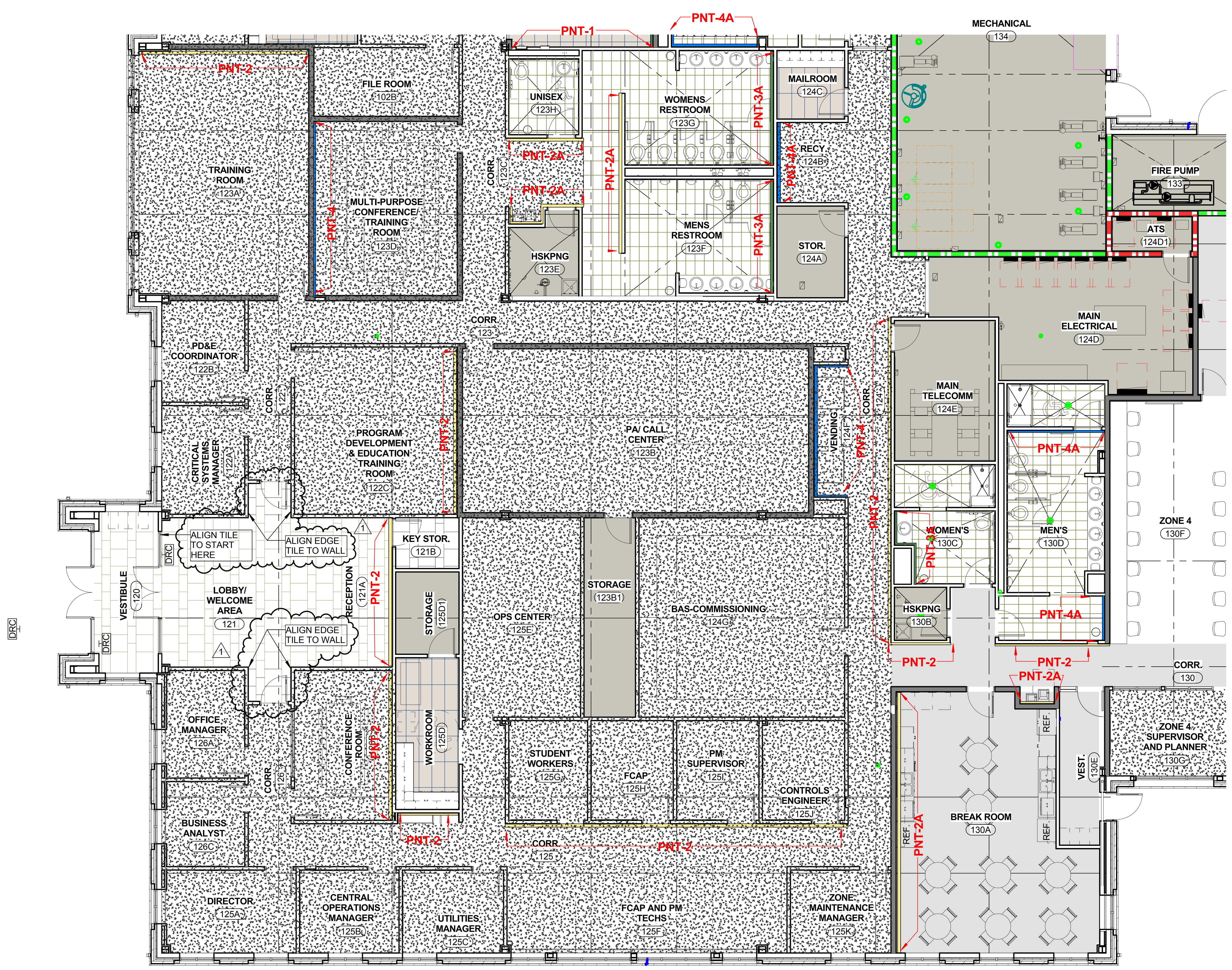
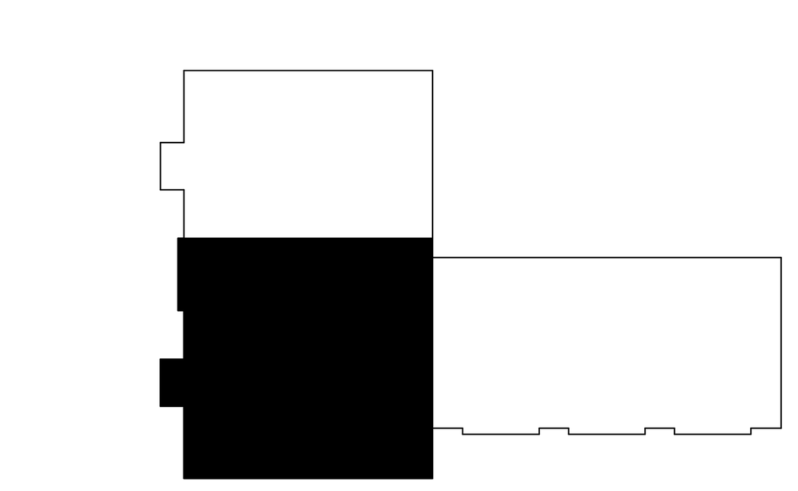


A1 OFFICE SHOPS PARTIAL FINISH FLOOR PLAN - FO

1/8" = 1'-0"

KEYPLAN



WILLIAM SCOTT BAKER REGISTERED ARCHITECT 8326 NORTH CAROLINA CHARLOTTE, N.C. 9/19/2017

LS3P ASSOCIATES LTD. REGISTERED ARCHITECTURAL COMPANY CERT. NO. 50417 NORTH CAROLINA CHARLOTTE, NORTH CAROLINA

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GAS-FIRED WATER HEATER SCHEDULE

SYM.	DESCRIPTION	STORAGE (GALLONS)	GAS BURNER DATA			FLUE SIZE	SELECTION BASED ON		REMARKS
			INLET PRESS. (IN. W.C.)	BTU/HR INPUT	GPH RECOVERY @ 80°F RISE		MANUFACTURER	MODEL	
WH1	GAS FIRED WATER HEATER	100	8	150,000	223	4"	A.O. SMITH	BTH-150	1-6

REMARKS:
1. EQUIVALENT MANUFACTURERS: BOCK, BRADFORD WHITE, LOCHINVAR.
2. ELECTRICAL REQUIREMENTS: 120V, 15 AMP BREAKER.
3. WATER HEATER SHALL MEET OR EXCEED THE REQUIREMENTS OF ASHRAE 90.1.
4. PROVIDE HEATER WITH ACID NEUTRALIZATION KIT FOR CONDENSATE.
5. INSTALL DIRECT VENT PIPING PER MANUFACTURER'S DIRECTIONS. CPVC PIPING OR STAINLESS STEEL SHALL BE USED FOR VENT PIPING MATERIAL. PVC PIPING IS NOT ACCEPTABLE.
6. PROVIDE CARBON MONOXIDE DETECTOR ADJACENT TO WATER HEATERS. INTERLOCK CARBON MONOXIDE DETECTOR WITH BAS.

3

ELECTRIC WATER HEATER SCHEDULE

SYM.	DESCRIPTION	STORAGE (GALLONS)	GPH RECOVERY	ELECTRICAL DATA				SELECTION BASED ON		REMARKS
				KW	VOLTS	PHASE	HERTZ	MANUFACTURER	MODEL	
WH2	TANKLESS WATER HEATER	-	61°F RISE @ 1.0 GPM	9.0	277	1	60	EEMAX	EX90T	4
WH3	TANKLESS WATER HEATER	-	56°F RISE @ 0.5 GPM	4.1	277	1	60	EEMAX	EX4277T EE	4
WH4	ELECTRIC WATER HEATER	120	221 GPH @ 100°F RISE	54.0	480	3	60	A.O. SMITH	DRE-120-54.0	1,2,3

REMARKS:
1. EQUIVALENT MANUFACTURERS: BOCK, BRADFORD WHITE, LOCHINVAR.
2. WATER HEATER SHALL MEET OR EXCEED THE REQUIREMENTS OF ASHRAE 90.1
3. BASIS-OF-DESIGN WATER HEATER CONTAINS (9) 6.0 KW ELEMENTS, WITH SIMULATNEOUS OPERATION.
4. EQUIVALENT MANUFACTURERS: BOSCH, BRADFORD WHITE, CHRONOMITE.

3

EXPANSION TANK SCHEDULE

SYM.	DESCRIPTION	VOLUME (GALLONS)	DIAMETER (INCHES)	HEIGHT (INCHES)	SELECTION BASED ON		REMARKS
					MANUFACTURER	MODEL	
ET1	BLADDER TYPE EXPANSION TANK	6.4	12	15.375	AMTROL	ST-12	1, 2
ET4	BLADDER TYPE EXPANSION TANK	6.4	12	15.375	AMTROL	ST-12	1, 2

REMARKS:
1. EQUIVALENT MANUFACTURERS: BELL & GOSSETT, WESSELS COMPANY.
2. EXPANSION TANK SHALL BE CHARGE TO MEET FINAL OPERATING PRESSURE FOR DOMESTIC WATER SYSTEM.

PUMP SCHEDULE

SYM	DESCRIPTION	TYPE	CAPACITY		ELECTRICAL DATA				SELECTION BASED ON		REMARKS
			GPM	HEAD (FT)	HP	VOLTS	PH	HZ	MANUFACTURER	MODEL	
RCP1	HW RECIRC PUMP	IN-LINE	4	6	1/12	120	1	60	BELL & GOSSETT	NBF-9F/LW	1,2,3
RCP4	HW RECIRC PUMP	IN-LINE	4	6	1/12	120	1	60	BELL & GOSSETT	NBF-9F/LW	1,2,3
BP1	DUPLEX VARIABLE SPEED WATER BOOSTER PACKAGE	END SUCTION	60 EACH	104	5 EACH	480	3	60	HY-FAB	MVP-850-460	1,4,5

REMARKS:
1. EQUIVALENT MANUFACTURERS: GRUNDFOS, PACE, SYNCROFLO, TACO
2. PUMP SHALL BE ALL BRONZE CONSTRUCTION.
3. PROVIDE AUTOMATIC TIMER KIT AND AQUASTAT EQUAL TO BELL & GOSSETT MODEL TC-1 AND AQS-3/4
4. PROVIDE BOOSTER PUMP PACKAGE WITH FX-60V HYDRO-PNUEMATIC TANK
5. PROVIDE WITH BACNET MS/TP COMMUNICATION MODULE FOR OUTPUT TO BAS. COORDINATE CONNECTION TO BAS SYSTEM WITH CONTROLS CONTRACTOR.

3

MIXING VALVE SCHEDULE

SYM.	DESCRIPTION	MAXIMUM GPM	MINIMUM GPM	PRESSURE LOSS (PSI)	LEAVING WATER TEMP. (°F)	SELECTION BASED ON		REMARKS
						MANUFACTURER	MODEL	
MV1	THERMOSTATIC MIXING VALVE CONTROL STATION	115	1	5	115	LEONARD	4NB-LF	1,2
MV2	THERMOSTATIC MIXING VALVE	4.5	0.5	5	110	SYMMONS	7-225-CK SERIES	1

REMARKS:
1. EQUIVALENT MANUFACTURERS: ACORN, LAWLER, POWERS
2. HIGH-LOW MANIFOLD.

3

INTERCEPTOR SCHEDULE

SYM.	DESCRIPTION	INLET/ OUTLET SIZE	FLOW RATE (GPM)	CAPACITY		SELECTION BASED ON		REMARKS
				WATER (GALLONS)	OIL (GALLONS)	MANUFACTURER	MODEL	
OIL1	OIL INTERCEPTOR	4	100	300	156	PROCEPTOR	OMC 300	1,2,3

REMARKS:
1. EQUIVALENT MANUFACTURERS: SCHEIR, XERXES, HIGHLAND TANK, ZURN
2. INSTALL BELOW GRADE FOR HEAVY VEHICULAR TRAFFIC
3. PROVIDE MULTI-LEVEL OIL MOINTOR

BACKFLOW PREVENTER SCHEDULE

SYM.	DESCRIPTION	SYSTEM	DESCRIPTION	MANUF.	MODEL	COMMENTS
BFP1	REDUCED PRESSURE PRINCIPLE ASSEMBLE	DOMESTIC WATER	REDUCED PRESSURE PRINCIPLE ASSEMBLY 2"	ZURN WILKINS	375V-OSY	
BFP2	REDUCED PRESSURE PRINCIPLE ASSEMBLE	MAKE-UP WATER	REDUCED PRESSURE PRINCIPLE ASSEMBLY 1"	ZURN WILKINS	975XL	

PLUMBING FIXTURE AND EQUIPMENT SCHEDULE

SYM.	DESCRIPTION	CONNECTIONS (IN.)				SPECIFICATION	REMARKS
		W	V	CW	HW		
P1	WATER CLOSET, HET, ELONGATED BOWL, WALL HUNG, FLUSH VALVE, SENSOR, HARD-WIRED, 1.28 GPF	4"	2"	1-1/2"	-	FIXTURE: ZURN Z5615-BWL SEAT: CHURCH 9500CT FLUSH VALVE: ZURN ZEMS6000PL-HET MATERIAL: VITREOUS CHINA COLOR: WHITE CARRIER: ZURN Z-1203 SERIES	SEAT HEIGHT 15" AFF SEE NOTE 4 BELOW
P1A	WATER CLOSET, HET, ADA COMPLIANT, ELONGATED BOWL, WALL HUNG, FLUSH VALVE, SENSOR, HARD-WIRED, 1.28 GPF	4"	2"	1-1/2"	-	FIXTURE: ZURN Z5615-BWL SEAT: CHURCH 9500CT FLUSH VALVE: ZURN ZEMS6000PL-HET MATERIAL: VITREOUS CHINA COLOR: WHITE CARRIER: ZURN Z-1203 SERIES	PROVIDE LEVER ON WIDE SIDE OF STALL SEAT HEIGHT 17"-19" AFF SEE NOTE 4 BELOW
P2	URINAL, HEU, ADA COMPLIANT, WALL MOUNTED, FLUSH VALVE, SENSOR, HARD-WIRED, 0.125 GPF	2"	1-1/2"	3/4"	-	FIXTURE: ZURN Z5758 FLUSH VALVE: ZURN ZEMS6003PL-ULF COLOR: WHITE MATERIAL: VITREOUS CHINA CARRIER: ZURN FLOOR MOUNTED URINAL CARRIER	FIXTURE LIP HEIGHT 24"AFF SEE NOTE 4 BELOW
P2A	URINAL, HEU, ADA COMPLIANT, WALL MOUNTED, FLUSH VALVE, SENSOR, HARD-WIRED, 0.125 GPF	2"	1-1/2"	3/4"	-	FIXTURE: ZURN Z5758 FLUSH VALVE: ZURN ZEMS6003PL-ULF COLOR: WHITE MATERIAL: VITREOUS CHINA CARRIER: ZURN FLOOR MOUNTED URINAL CARRIER	FIXTURE LIP HEIGHT 17"AFF SEE NOTE 4 BELOW
P3A	LAVATORY, ADA COMPLIANT, SINK UNDER-MOUNTED OVAL BOWL, GRID DRAIN, SENSOR FAUCET, HARD-WIRED, 0.25 GPC	2"	1-1/2"	1/2"	1/2"	FIXTURE: ZURN Z5220 DRAIN: ZURN Z8743 GRID STRAINER FAUCET: ZURN Z6950-XL-IM-S-CWB, 0.25 GPC P-TRAP: ZURN Z-8701 (1-1/4" x 1-1/2", 17 GA.) SUPPLIES/STOPS: ZURN 8806-LR-LK MATERIAL: VITREOUS CHINA	SEE NOTES 1 & 4 BELOW
P4A	ELECTRIC WATER COOLER, ADA WALL MOUNTED, SINGLE COOLER, STAINLESS STEEL FINISH, BOTTLE FILLER, FLEXIBLE BUBBLER	2"	1-1/2"	1/2"	-	FIXTURE: ELKAY LZWS-LBPBM28K P-TRAP: ZURN Z-8701 (1-1/4" X 1-1/2", 17 GA.) SUPPLIES/STOPS: ZURN 8806-LR-LK CARRIER: FLOOR MOUNTED CHAIR CARRIER	BUBBLER HEIGHT 34" AFF
P5A	2-COMP, STAINLESS STEEL SINK, ADA COMPLIANT, 42" x 18" x 5.5" (19" x 16" BOWLS), FOUR HOLE PUNCH, KITCHEN FAUCET, 1.5 GPM OUTLET, BASKET STRAINERS	2"	1-1/2"	1/2"	1/2"	FIXTURE: ELKAY ELUHAD4218 DRAIN: ELKAY LK35L, BASKET STRAINER FAUCET: ZURN Z82300-XL-CP8-HS (1.5 GPM) P-TRAP: ZURN 8703 (1-1/2"X2", 17 GA.) SUPPLIES/STOPS: ZURN 8806-LR-LK	PROVIDE MINIMUM CLEARANCES BELOW SINK TO MEET ADA REQUIREMENTS. SEE NOTE 1 BELOW
P5B	2-COMP. STAINLESS STEEL SINK, ADA COMPLIANT, 42" x 18" x 5.5" (19" x 16" BOWLS), FOUR HOLE PUNCH, KITCHEN FAUCET, 1.5 GPM OUTLET, BASKET STRAINERS	2"	1-1/2"	1/2"	1/2"	FIXTURE: ELKAY ELUHAD4218 DRAIN: ELKAY LK35L, BASKET STRAINER FAUCET: ZURN Z82300-XL-CP8-HS (1.5 GPM) P-TRAP: ZURN 8703 (1-1/2"X2", 17 GA.) SUPPLIES/STOPS: ZURN 8806-LR-LK	PROVIDE MINIMUM CLEARANCES BELOW SINK TO MEET ADA REQUIREMENTS. SEE NOTES 1 & 5 BELOW
P5C	LAUNDRY TUB, MOLDED COMPOSITE 21-1/2"L x 23"W x 13-7/16"D FLOOR MOUNTED PROVIDE (1.5 GPM) AERATOR	2"	1-1/2"	1/2"	1/2"	FIXTURE: FIAT FL-1 FAUCET: ZURN Z812G6-XL (1.5 GPM) DRAIN: 1-1/2" PLUG DRAIN P-TRAP: ZURN 8703 (1-1/2"x2", 17 GA.) SUPPLIES/STOPS: ZURN 8806-LR	PROVIDE ACCESSORY KIT WITH (4) LEGS
P6A	SHOWER, ROLL-IN ADA COMPLIANT, TRENCH DRAIN, PRESSURE BALANCED SHOWER VALVE, 1.5 GPM WALL SHOWERHEAD AND HAND HELD SHOWER WITH HOSE AND SLIDE BAR.	2"	1-1/2"	1/2"	1/2"	FIXTURE: COMFORT DESIGN XST 6232 TR.75 SHOWER TRIM: LEONARD 4500S-D2L-H14-515P(G)30 DRAIN: ZURN ZS880, STAINLESS STEEL, GRATE TO BE SELECTED BY ARCH. P-TRAP: 2" TRAP	REFER TO ARCHITECTURAL DETAIL FOR ADDITIONAL SURROUND INFORMATION AND SHOWER TRIM HEIGHTS AND LOCATIONS. GROUT BASE SOLID
P7	MOP SINK TERRAZZO 28" x 28" x 12" BUMPER GUARDS	3"	1-1/2"	1/2"	1/2"	BASIN: FIAT TSBCR-1100 DRAIN: FIAT 1453-BB FAUCET: FIAT 830-AA ACCESSORIES: MSG2828 SS WALL GUARDS ACCESSORIES: 832-AA HOSE & BRACKET ACCESSORIES: 889-CC MOP HANGER ACCESSORIES: E-88-AA BUMPERGUARDS	
P8	EMERGENCY EYEWASH / SHOWER POLISHED CHROME FINISH STAINLESS STEEL SHOWERHEAD AND RECEPTOR, WITH MIXING VALVE ADA COMPLIANT	4"	2"	1-1/4"	1"	FIXTURE: GUARDIAN G8F1909SSH-BC-TMV MOUNT PULL ROD AT ADA COMPLIANT HEIGHT TMV: GUARDIAN G3800LF	PROVIDE TEST KIT WITH BUCKET. PROVIDE 2" P-TRAP FOR EYEWASH DRAIN AT BASE OF UNIT.
P9	EMERGENCY EYE WASH WALL MOUNTED, STAINLESS STEEL, STAY-OPEN BALL VALVE, TWO SPRAY HEADS, WITH MIXING VALVE	2"	1-1/2"	1/2"	1/2"	FIXTURE: GUARDIAN G1814BC-TMV MIXING VALVE: GUARDIAN G3600LF P-TRAP: ZURN 8703 (1-1/2" X 2", 17 GA.)	INSTALL PER ANSI Z358.1
P10	EMERGENCY EYE WASH WALL MOUNTED, STAINLESS STEEL, STAY-OPEN BALL VALVE, TWO SPRAY HEADS	2"	1-1/2"	1/2"	1/2"	FIXTURE: GUARDIAN G1814BC P-TRAP: ZURN 8703 (1-1/2" X 2", 17 GA.)	INSTALL PER ANSI Z358.1
SA	SHOCK ARRESTOR	-	-	-	-	EQUIPMENT: SIOUX CHIEF 650 SERIES SIZE PER P.D.I. REQUIREMENTS	SEE SIZING TABLE THIS SHEET.
HB1	WALL HYDRANT AUTOMATIC DRAINING, FREEZELESS, ANTI-SIPHON VACUUM BREAKER	-	-	3/4"	-	EQUIPMENT: WOODFORD 65EP	MOUNT 18" AFF.
HB2	HOSE BIBB AUTOMATIC DRAINING, ANTI-SIPHON VACUUM BREAKER	-	-	3/4"	-	EQUIPMENT: WOODFORD 24	MOUNT 24" AFF.
HB3	YARD HYDRANT NON-FREEZE, AUTOMATIC DRAINING, VACUUM BREAKER	-	-	3/4"	-	EQUIPMENT: WOODFORD Y95 FINISH: BRASS BOX	
FCO	FLOOR CLEANOUT ADJUSTABLE, CAST IRON BODY, COATED CAST IRON TOP	SEE DWG	-	-	-	CLEANOUT: ZURN ZN-1400	GAS / WATER TIGHT ABS PLUG
WCO	WALL CLEANOUT CAST IRON BODY, STAINLESS STEEL WALL PLATE	SEE DWG	-	-	-	CLEANOUT: ZURN ZS-1468	GAS / WATER TIGHT ABS PLUG
YCO	YARD CLEANOUT ADJUSTABLE, CAST IRON BODY, COATED CAST IRON TOP	SEE DWG	-	-	-	CLEANOUT: ZURN ZN-1474 IN AN 18"L x 18"W x 6"D CONCRETE PAD.	GAS / WATER TIGHT ABS PLUG
CO	END OF LINE PLUG CLEANOUT CAST BRONZE	-	-	-	-	CLEANOUT: ZURN Z-1470	
FD1	FLOOR DRAIN CAST IRON BODY	SEE DWG	-	-	-	DRAIN: ZURN ZN-415-VP STRAINER: ZURN 6"ØD TYPE B FINISH: POLISHED NICKEL BRONZE	PROVIDE TRAP PRIMER WITH 1/2" COPPER SUPPLY TO TRAP.
FD2	FLOOR DRAIN, MECHANICAL ROOM CAST IRON BODY SEDIMENT BUCKET	SEE DWG	-	-	-	DRAIN: ZURN Z-556-Y STRAINER: ZURN 8"Ø FINISH: COATED CAST IRON	SEE NOTE 2 BELOW
TD1	TRENCH DRAIN, 6'-8" LONG, INTEGRAL FRAMES, DUCTILE IRON SLOTTED GRATE	4"	2"	-	-	DRAIN: ZURN Z886-HD-DGC, 1 SECTION WITH 2 CLOSED END CAPS AND A 4" BOTTOM OUTLET P-TRAP: 4" DEEP SEAL	
FS1	FLOOR SINK 12" x 12" x 6" STAINLESS STEEL BODY AND GRATE	SEE DWG	-	-	-	DRAIN: ZURN Z-1750-KC-2 STRAINER: 12"x12" STAINLESS STEEL (TYPE 304) P-TRAP: DEEP SEAL (MATCH DRAIN SIZE)	
TP1	TRAP PRIMER PROVIDE DISTRIBUTION UNIT WHEN SERVING MORE THAN ONE DRAIN	-	-	1/2"	-	PRIMER: PPP "OREGON #1"	PROVIDE TRAP PRIMER WITH 1/2" COPPER SUPPLY TO TRAP.
IMB1	ICE MAKER BOX	-	-	1/2"	-	EQUIPMENT: GUY GRAY BIM-875 MATERIAL: 16 GAUGE STEEL WITH EPOXY FINISH	
IWB	INDIRECT WASTE BOX RECESSED WHITE ABS BOX & FRAME, WITH INTEGRAL SHOCK ARRESTOR	2"	1-1/2"	-	-	FIXTURE: SIOUX CHIEF 696-3 "OX ROX" FUNNEL: SIOUX CHIEF 696-CF, 1-1/2" AIR GAP	
CS1	BALANCING VALVE	-	-	3/4"	-	EQUIPMENT: CIRCUIT SOLVER CS-3/4"-120	PROVIDE 3/4"-120 UNLESS OTHERWISE NOTED ON PLAN.

NOTES:
1. PROVIDE PRE-MANUFACTURED INSULATION KIT FOR EXPOSED TRIM UNDER SINK. COORDINATE WITH ARCHITECT PRIOR TO ORDERING.
2. PROVIDE SURESEAL INLINE FLOOR DRAIN TRAP SEALER IN FLOOR DRAIN FOR WATERLESS TRAP SEAL.
3. CONTRACTOR SHALL VERIFY IF GFI TYPE ELECTRICAL OUTLET IS REQUIRED WITH ELECTRICAL CONTRACTOR. PROVIDE GFI TYPE OUTLET IF REQUIRED.
4. PROVIDE "-HW6" HARD-WIRED CONVERTER AND "-MJ" MINI JUNCTION BOX IN EACH ROOM AT FIXTURE LOCATION TO POWER UP TO 8 SENSOR FIXTURES. COORDINATE WITH E.C. AND ARCHITECT PRIOR TO PERFORMING ANY WORK.
5. PROVIDE VALVED CW SUPPLY TO ADJACENT ICEMAKER. PROVIDE BACKFLOW PREVENTER EQUAL TO WATTS SD3 PRIOR TO CONNECTION TO ICEMAKER. DRAIN BACKFLOW PREVENTER AND ICEMAKER TO FLOOR DRAIN WITH AIR GAP. PROVIDE TRAP PRIMER WITH 1/2" CW SUPPLY FOR ICEMAKER FLOOR DRAIN.

2
1

APPROVED EQUALS:	SPECIFIED PRODUCT:	ACCEPTED EQUAL:
THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MODEL WHICH MOST CLOSELY MATCHES THE SPECIFIED PRODUCT. PROVIDE PRODUCTS MADE BY THE MANUFACTURER'S LISTED.	ZURN (VITREOUS CHINA FIXTURES) ZURN (SENSOR FLUSH VALVES) ZURN (SENSOR FAUCETS) ZURN (MANUAL FAUCETS) ELKAY (S.S. SINKS) ELKAY (WATER COOLERS) ZURN (SUPPLY STOPS) ZURN (DRAINS, CARRIERS) FIAT (UTILITY) LEONARD (SHOWER VALVES)	AMERICAN STANDARD, KOHLER, TOTO KOHLER, SLOAN, TOTO CHICAGO, KOHLER, SLOAN, TOTO CHICAGO, KOHLER ACCORN, JUST HAWS, OASIS BRASSCRAFT, E.B.C., MCGUIRE J.R. SMITH, WADE FLORESTONE, STERN WILLIAMS DELTA, MOEN COMMERCIAL, LAWLER, SYMMONS

SHOCK ARRESTOR SIZING TABLE

DRAWING SYMBOL	FIXTURE UNITS	PDI WH201 STANDARD DESIGNATION	ARRESTOR SIZE	APPROVED MANUFACTURERS
SA-A	1-11	A	1/2"	- SIOUX CHIEF - WATTS - PPP INC.
SA-B	12-32	B	3/4"	
SA-C	33-60	C	1"	
SA-D	61-113	D	1-1/4"	REMARKS
SA-E	114-154	E	1-1/2"	INSTALL SHOCK ARRESTORS PER PDI WH201 GUIDELINES
SA-F	155-330	F	2"	

PLUMBING LOAD SUMMARY

LOAD	FIXTURE UNITS	FLOW
OFFICE: SANITARY WASTE	125 DFU	-
OFFICE: DOMESTIC WATER	263 FU	103 GPM
WAREHOUSE: SANITARY WASTE	30 DFU	-
WAREHOUSE: DOMESTIC WATER	66 FU	56 GPM

GAS LOAD SUMMARY (BASE BID)

LOAD	CONSUMPTION (CFH)
DOMESTIC WATER HEATER: WH1	150
MECHANICAL BOILER: HWB-1	1,250
MECHANICAL BOILER: HWB-2	1,250
RADIANT HEATER: GRH-1	40
RADIANT HEATER: GRH-2	40
RADIANT HEATER: GRH-3	40
RADIANT HEATER: GRH-4	50
TOTAL	2,820

NOTES:
FARTHEST POINT OF DELIVERY FROM GAS METER (TO 2 PSI GAS PRESSURE REGULATOR AT WATER HEATERS IN MECHANICAL ROOM) = ±300 FT.

FUEL GAS CODE TABLE FOR ABOVE GRADE 2 PSI PIPING: 2012 NCFGC - TABLE 402.4(3)
SCHEDULE 40 METALLIC PIPE, 2 PSI INLET PRESSURE, 1 PSI PRESSURE DROP.

FUEL GAS CODE TABLE FOR ABOVE GRADE LOW PRESSURE PIPING: NCFGC 2012 - TABLE 402.4(2)
SCHEDULE 40 METALLIC PIPE, 0.5 PSI INLET PRESSURE, 0.5" W.C. PRESSURE DROP.

*-AVAILABLE AT PRESSURE REGULATOR

GAS LOAD SUMMARY (ALTERNATE #10)

LOAD	CONSUMPTION (CFH)
DOMESTIC WATER HEATER: WH1	150
MECHANICAL BOILER: HWB-1	1,250
MECHANICAL BOILER: HWB-2	1,250
TOTAL	2,650

NOTES:
FARTHEST POINT OF DELIVERY FROM GAS METER (TO 2 PSI GAS PRESSURE REGULATOR AT WATER HEATERS IN MECHANICAL ROOM) = ±100 FT.

FUEL GAS CODE TABLE FOR ABOVE GRADE 2 PSI PIPING: 2012 NCFGC - TABLE 402.4(3)
SCHEDULE 40 METALLIC PIPE, 2 PSI INLET PRESSURE, 1 PSI PRESSURE DROP.

FUEL GAS CODE TABLE FOR ABOVE GRADE LOW PRESSURE PIPING: NCFGC 2012 - TABLE 402.4(2)
SCHEDULE 40 METALLIC PIPE, 0.5 PSI INLET PRESSURE, 0.5" W.C. PRESSURE DROP.

*-AVAILABLE AT PRESSURE REGULATOR

ALTERNATE NOTE AS IT RELATES TO GAS PIPING:
THIS ALTERNATE REFLECTS THE UPDATED GAS LOAD SUMMARY RESULTING FROM THE REMOVED GAS-FIRED RADIANT HEATERS GRH-1 (3 EACH) AND GRH-2 (2 EACH).

3

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LS3P

227 WEST TRADE STREET SUITE 700
CHARLOTTE, NORTH CAROLINA 28202
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NORTH CAROLINA PROFESSIONAL SEAL 26023 ENGINEER GEORGE C. FOWLER III
9/19/17

REVISIONS:

No.	Description	Date
1	Addendum #4	8.28.2017
2	Addendum #5	9.11.2017
3	Addendum #6	9.19.2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: RPD
CHECKED BY: DAR

PLUMBING SCHEDULES

P-002

OPTIMA #: 16-0265 2 OF 12

BUILDING BID DOCUMENTS

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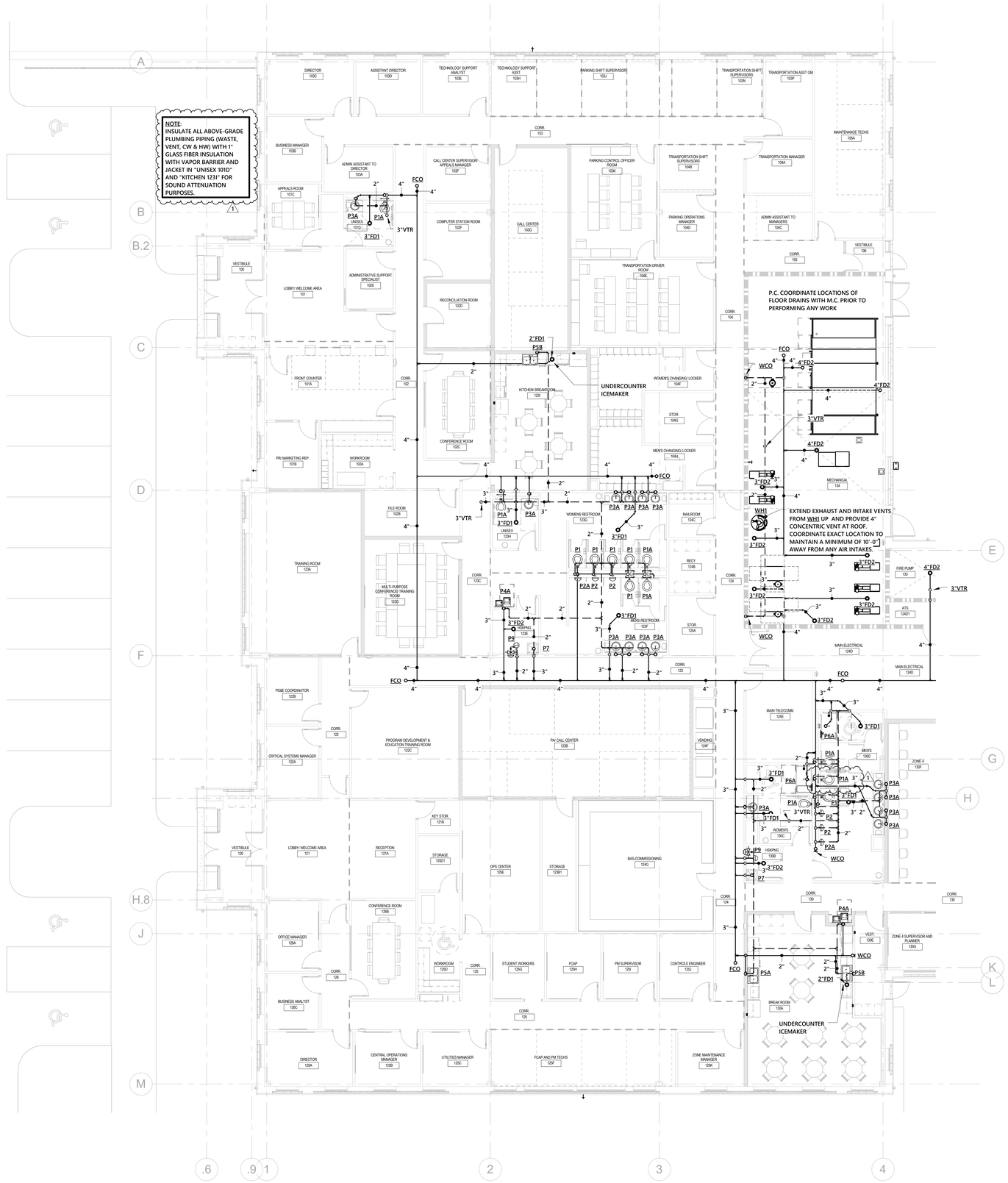

1 FLOOR PLAN - PATS/FO - WASTE & VENT

1/8" = 1'-0"

SCALE: 1/8"=1'-0"

PROJECT NORTH TRUE NORTH

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9/19/17

MEMBERS OF THE AMERICAN INSTITUTE OF ARCHITECTS

REVISIONS:

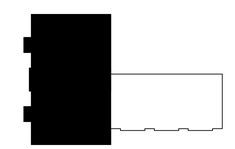
No.	Description	Date
1	Addendum #6	9.19.2017

PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE G32 U.N.O.
   - NON-RATED PARTITION TO CEILING
   - NON-RATED PARTITION TO DECK
   - 1 HR. RATED PARTITION TO DECK
   - 2 HR. RATED PARTITION TO DECK

NOTE: SEE SHEET A-004 FOR CONSTRUCTION OF PARTITION TYPES.

KEYPLAN



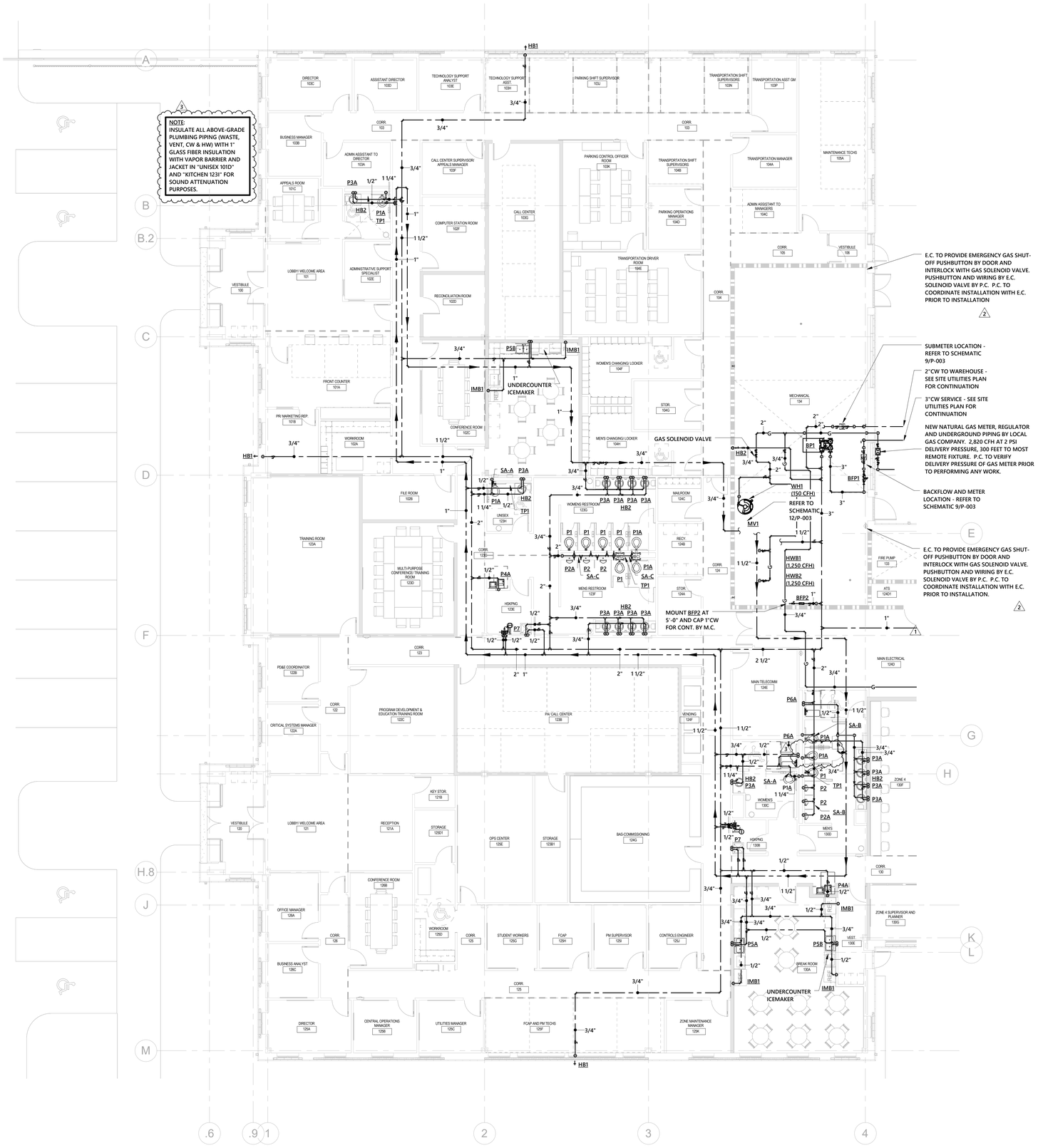
PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 **CODE:** 41526
DATE: AUGUST 21, 2017
DRAWN BY: RPD
CHECKED BY: DAR

FLOOR PLAN - PATS/FO - WASTE AND VENT

P-101A

OPTIMA #: 16-0265 5 OF 12

BUILDING BID DOCUMENTS



1 FLOOR PLAN - PATS/FO - WATER & GAS

1/8" = 1'-0" 8 6 4 2 0 8 16

SCALE: 1/8"=1'-0"

PROJECT NORTH TRUE NORTH

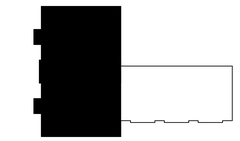
PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE G32 U.N.O.

- NON-RATED PARTITION TO CEILING
- NON-RATED PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

NOTE: SEE SHEET A-004 FOR CONSTRUCTION OF PARTITION TYPES.

KEYPLAN



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PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 **CODE:** 41526
DATE: AUGUST 21, 2017
DRAWN BY: RPD
CHECKED BY: DAR

FLOOR PLAN - PATS/FO - WATER AND GAS

P-201A

OPTIMA #: 16-0265 9 OF 12

BUILDING BID DOCUMENTS

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VAV BOX SCHEDULE (HOT WATER HEAT)

SYMBOL	CFM MAXIMUM	CFM MINIMUM	HOT WATER COIL BTUH	HOT WATER COIL GPM	HOT WATER COIL RUNOUT	ENVIRO-TEC SDR	RUNOUT SIZE	REMARKS
1.1	250	100	4000	0.3	1/2	5	8	
1.2	310	130	6000	0.4	1/2	6	8	
1.3	150	60	3000	0.2	1/2	4	8	
1.4	295	120	5000	0.4	1/2	5	8	
1.5	320	130	6000	0.4	1/2	6	8	
1.6	600	240	10000	0.7	1/2	8	10	SOUND ATTENUATOR
1.7	700	280	12000	0.8	1/2	8	10	
1.8	840	340	14000	1.0	1/2	9	12	
1.9	370	150	6000	0.4	1/2	6	8	
1.10	120	50	2000	0.2	1/2	4	8	
1.11	220	90	4000	0.3	1/2	5	8	
1.12	500	200	8000	0.6	1/2	7	10	
1.13	430	180	8000	0.6	1/2	7	10	
1.14	400	160	7000	0.5	1/2	7	8	
1.15	800	320	13000	0.9	1/2	9	12	
1.16	300	120	5000	0.4	1/2	6	8	
1.17	375	150	6000	0.4	1/2	6	8	
1.18	450	180	8000	0.6	1/2	7	10	
1.19	540	220	9000	0.6	1/2	7	10	
1.20	400	400	16000	1.1	1/2	7	8	
1.21	1100	440	18000	1.2	1/2	10	12	
1.22	500	200	8000	0.6	1/2	7	10	
1.23	450	450	18000	1.2	1/2	7	10	
1.24	535	220	9000	0.6	1/2	7	10	
1.25	650	260	11000	0.8	1/2	8	10	
1.26	1125	450	18000	1.2	1/2	10	12	SOUND ATTENUATOR
1.27	450	180	8000	0.6	1/2	7	10	
1.28	650	260	11000	0.8	1/2	8	10	
1.29	450	180	8000	0.6	1/2	6	8	
1.30	775	310	13000	0.9	1/2	8	12	
1.31	425	170	7000	0.5	1/2	7	10	
1.32	375	150	6000	0.4	1/2	6	8	
1.33	230	100	4000	0.3	1/2	5	8	
1.34	530	220	9000	0.6	1/2	7	10	
1.35	310	130	6000	0.4	1/2	6	8	
1.36	750	300	12000	0.8	1/2	8	10	
1.37	580	240	10000	0.7	1/2	7	10	
1.38	300	120	5000	0.4	1/2	6	8	
1.39	350	350	14000	1.0	1/2	6	8	
1.40	750	300	12000	0.8	1/2	8	10	
1.41	500	200	8000	0.6	1/2	7	10	
1.42	850	340	14000	1.0	1/2	9	12	
1.43	500	200	8000	0.6	1/2	7	10	
1.44	500	200	8000	0.6	1/2	7	10	
1.45	600	240	10000	0.7	1/2	8	10	
1.46	450	180	8000	0.6	1/2	7	10	
1.47	850	340	14000	1.0	1/2	9	12	
1.48	450	180	8000	0.6	1/2	7	10	
1.49	450	180	8000	0.6	1/2	7	10	
1.50	300	120	5000	0.4	1/2	6	8	
1.51	400	160	7000	0.5	1/2	7	8	
1.52	650	650	26000	1.8	1/2	8	10	
2.1	650	260	11000	0.8	1/2	8	10	
2.2	780	320	13000	0.9	1/2	8	12	
2.3	380	160	7000	0.5	1/2	6	8	
2.4	550	220	9000	0.6	1/2	7	10	
2.5	325	130	6000	0.4	1/2	6	8	
2.6	200	200	8000	0.6	1/2	5	8	
2.7	350	140	6000	0.4	1/2	6	8	
2.8	230	100	4000	0.3	1/2	5	8	

NOTES:
1. MINIMUM INLET PRESSURE TO TERMINAL UNITS SHALL BE 0.75" W.G.
2. MAXIMUM PRESSURE DROP THROUGH TERMINAL UNITS SHALL BE 0.25" S.P.
3. FURNISH TERMINAL UNITS WITH: FACTORY MOUNTED DDC CONTROLS, ACOUSTICAL LINING, THERMOSTAT, CONTROL VOLTAGE TRANSFORMER.
4. MECHANCIAL CONTRACTOR SHALL EXTEND CONTROL POWER WIRING (120 V) FROM J-BOX TO VAV BOX. 120 V J-BOX BY ELECTRICAL CONTRACTOR, WIRING FROM J-BOX AND FINAL CONNECTION TO UNIT BY MECHANICAL CONTRACTOR. COORDINATE LOCATION OF 120 V J-BOXES WITH ELECTRICAL CONTRACTOR.
5. DDC CONTROLS SHALL BE FURNISHED TO THE BOX MANUFACTURER BY THE CONTROLS VENDOR. BOX MANUFACTURER SHALL FACTORY MOUNT AND WIRE CONTROLS. INSTALLATION OF CONTROLS SHALL INCLUDE CONTROLS TRANSFORMER, CONTROL COVER, AND ALL WIRING AND LABOR FOR A COMPLETE AND OPERATIONAL SYSTEM.
6. THE ABOVE NOTED HEATING VALUES ARE BASED ON E.A.T. OF 60°F AND A L.A.T. OF 95°F
7. PROVIDE MINIMUM 2 ROW HEATING COILS

MEASUREMENT & VERIFICATION NOTE

THIS IS A NORTH CAROLINA STATE CONSTRUCTION PROJECT WITH MANDATED MEASUREMENT AND VERIFICATION OF POST-OCCUPANCY WATER, AND ELECTRIC CONSUMPTION. DESIGN ANALYSIS AND PROJECTED CONSUMPTION WILL BE COMPARED TO ACTUAL USAGE AT BOTH 10 MONTH AND 12 MONTH POST-OCCUPANCY INTERVALS.

THE COMMISSIONING AGENT AND OWNER WILL PROVIDE WATER AND ELECTRIC CONSUMPTION AND TRENDING DATA FROM THE MEASUREMENT AND VERIFICATION SYSTEM AT THE 10 MONTH AND 12 MONTH INTERVALS. THIS INFORMATION WILL BE PROVIDED TO THE ENGINEER FOR EVALUATION AND COMPARISON TO THE DESIGN ANALYSIS, ENERGY MODEL SIMULATION AND CONSUMPTION GOALS OF THE PROJECT.

RESULTS DEVIATING BY GREATER THAN 15% FROM PROJECTIONS WILL BE FURTHER ANALYZED AND A SYSTEM ADJUSTMENT REPORT PROVIDED FROM THE ENGINEER TO THE OWNER FOR SUGGESTED OPERATIONAL MODIFICATIONS.

COMMISSIONING NOTE

MECHANICAL CONTRACTOR SHALL COORDINATE WITH OWNER'S COMMISSIONING AGENT AND PROVIDE ALL NECESSARY TIME, MATERIALS, AND PROCEDURES REQUIRED FOR A FULLY COMMISSIONED PROJECT.

EQUIVALENT MANUFACTURERS LISTING

LISTING OF MANUFACTURER'S NAME DOES NOT GUARANTEE APPROVAL. ALL EQUIPMENT MUST MEET OR EXCEED QUALITY AND CAPACITIES OF SPECIFIED EQUIPMENT. FINAL APPROVAL WILL BE BASED ON EQUIPMENT SUBMITTALS. ANY MANUFACTURER NOT LISTED BUT WISHING TO BID THIS PROJECT SHALL SUBMIT A WRITTEN REQUEST A MINIMUM OF 14 DAYS PRIOR TO BID DATE OR AS INDICATED IN THE SPECIFICATIONS, PRIOR APPROVAL IS REQUIRED FOR ALL MANUFACTURERS NOT LISTED. SEE SPECIFICATIONS FOR ADDITIONAL REQUIRMENTS.

FANS : COOK, GREENHECK, PENN, TWIN CITY, BIGASS, MACRO-AIR, PATTERSON
AIR DISTRIBUTION : CARNES, METAL*AIRE, NAILOR, PRICE, TITUS, ACUTHERM
FIRE DAMPERS : NAILOR, RUSKIN, POTTORFF, PREFCO, SAFE-AIRE
DUCTLESS SPLIT SYSTEMS : DAIKIN, MITSUBISHI, PANASONIC, EMI
DDC CONTROLS : ALC, SCHNEIDER, ALERTON, HOFFMAN BUILDING TECH, JCI, ECS, PLATINUM BLDG SOL
PUMPS & HYDRONIC EQUIPMENT : ARMSTRONG, BELL & GOSSETT, GRUNDFOS, TACO
FAN COIL UNITS : CARRIER, INTERNATIONAL, TRANE, DAIKIN
FACTORY ASSEMBLED MODULAR AIR HANDLERS : DAIKIN-MCQUAY, TRANE, CARRIER, JCI
UNIT HEATERS : MCQUAY, TRANE, CARRIER, PRICE, REZNOR
VARIABLE FREQUENCY DRIVES : ABB, CUTLER HAMMER, DANFOSS, SQUARE D
TERMINAL UNITS : PRICE, NAILOR, METAL*AIRE, TITUS, JCI
AIR COOLED CHILLERS : TRANE, CARRIER, DAIKIN, JCI
CONDENSING BOILERS : AERCO, FULTON, LAARS, LOCHINVAR, RAYPAK
DUST COLLECTOR: DONALDSON TORIT, CAMFILL FARR, STERNVENT, FILTER ONE
WELDING EXHAUST FILTRATION SYSTEM: LINCOLN, AIR FLOW SYSTEMS, CAMFIL FARR, VENT AIRE
RADIANT HEATERS : SPACE RAY, RE-VERBER-RAY, ROBERTS GORDON, SCHWANK

NOTE:
ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, SHEET METAL, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.

GRILLE AND DIFFUSER SCHEDULE

SYMBOL	SERVICE	CFM RANGE	FACE SIZE	NECK SIZE	TYPE	OBD	PRICE
A	SUPPLY	51-125	24x24	6"	SQ. PLAQUE	YES	SPD
		126-225	24x24	8"	SQ. PLAQUE	YES	SPD
		226-350	24x24	10"	SQ. PLAQUE	YES	SPD
		351-425	24x24	12"	SQ. PLAQUE	YES	SPD
B	SUPPLY	0 - 125	12x12	6"	SQ. PLAQUE	YES	SPD
C	EXHAUST	0 - 125	12x12	6"/6x6	PERF	NO	PDDR
D*	RETURN	51-125	24x24	8"	PERF	NO	PDDR
		126-225	24x24	10"	PERF	NO	PDDR
		226-350	24x24	12"	PERF	NO	PDDR
		351-425	24x24	14"	PERF	NO	PDDR
E	EXHAUST	126-225	24x24	8"	PERF	YES	PDDR
		226-350	24x24	10"	PERF	YES	PDDR
		351-425	24x24	12"	PERF	YES	PDDR
F	RETURN	0 - 125	12x12	6"/6x6	PERF	NO	PDDR
G	SUPPLY	0-100	(1) .5" SLOT 36"L (6" INLET)		LINEAR SLOT	YES	SDA-50
		101 - 185	(2) .75" SLOT 48"L (8" INLET)		LINEAR SLOT	YES	SDA-75
		186-265	(3) .75" SLOT 48"L (10" INLET)		LINEAR SLOT	YES	SDA-75
		266-385	(4) .75" SLOT 48"L (10" INLET)		LINEAR SLOT	YES	SDA-75

NOTES:
1. ALL DEVICES SHALL BE FURNISHED WITH AN ENAMEL OFF-WHITE FINISH, PROVIDE COLOR SAMPLE SELECTIONS TO ARCH FOR REVIEW.
2. ALL DEVICES SHALL BE FURNISHED WITH FRAMES SUITABLE FOR TYPE OF INSTALLATION REQUIRED.
3. PROVIDE MINIMUM FACE SIZE WITH SPECIFIED NECK SIZE FOR ALL AIR DISTRIBUTION EXPOSED OR LOCATED IN HARD CEILINGS. PROVIDE SHEET-METAL RUN-OUTS (NO FLEX) FOR ALL EXPOSED AIR DISTRIBUTION.

** PROVIDE OBD FOR ALL AIR DISTRIBUTION WHERE RUNOUT DUCTS ARE LOCATED ABOVE HARD CEILINGS. OBD ADJUSTMENT SCREW SHALL BE CONCEALED BEHIND THE BLADES OF THE GRILLE.

* RETURN AIR GRILLE AIRFLOW IS BASED OF SUPPLY AIRFLOW PROVIDED TO ROOM

RETURN AIR PLENUM

THIS PROJECT WILL UTILIZE THE ABOVE CEILING SPACE FOR A RETURN AIR PLENUM, ALL ABOVE CEILING UTILITIES PROVIDED UNDER THIS PROJECT SHALL BE PLENUM RATED AND HAVE A FLAME SPREAD INDEX NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50

2012 NORTH CAROLINA ENERGY CONSERVATION CODE

COMMERCIAL ENERGY EFFICIENCY - MECHANICAL SUMMARY

501.1 METHOD OF COMPLIANCE
- [ ] NC SPECIFIC COMCHECK PROVIDED
- [x] 2012 NCECC CHAPTER 5
- [x] 24% IMPROVEMENT OVER ASHRAE 90.1-2007 (ENERGY MODEL - EQUAL TO ASHRAE 90.1-2010)

501.2 APPLICATION COMPLIANCE
- [ ] 506.2.1 EFFICIENT MECH EQUIPMENT
- [x] 506.2.2 REDUCED LTG DENSITY
- [ ] 506.2.3 ENERGY RECOVERY SYSTEMS
- [ ] 506.2.4 HI EFFICIENCY DOMESTIC HW
- [ ] 506.2.5 ONSITE RENEWABLE ENERGY
- [ ] 506.2.6 DAYLIGHTING CONTROLS

301.1 CLIMATE ZONE 3A - MECKLENBURG COUNTY, NORTH CAROLINA

DESIGN CONDITIONS
EXTERIOR (ASHRAE 90.1-2010 TABLE D-1)
WINTER DRY BULB 21.6° F.
SUMMER DRY BULB 94.2° F.
SUMMER WET BULB 74.7° F.

INTERIOR (2012 NCECC SECTION 302.1)		WAREHOUSE (CONDITIONED)
WINTER DRY BULB	72° F.	70° F.
SUMMER DRY BULB	75° F.	78° F.

*PROVIDE 5°F DEADBAND PER 503.2.4.2

503.2 HEATING & COOLING LOADS AND EQUIPMENT & SYSTEM SIZING
BUILDING HEATING LOAD 1800 MBH
BUILDING COOLING LOAD 135 TONS
INSTALLED HEATING CAPACITY REFER TO SCHEDULES
INSTALLED COOLING CAPACITY REFER TO SCHEDULES

503.2.3 & 506.2.1 - REQUIRED & INCREASED HVAC EQUIPMENT PERFORMANCE
SYSTEM DESCRIPTION - 4 PIPE AIR HANDLERS, FAN COIL UNITS, DUCTED SPLIT SYSTEMS, PACKAGED UNITS
- [x] MINIMUM HVAC EQUIPMENT EFFICIENCY COMPLIANCE - TABLE 503.2.3
- [ ] INCREASED HVAC EQUIPMENT EFFICIENCY COMPLIANCE - TABLE 506.2.1

EQUIP TYPE	SIZE CATEGORY (BTUH)	SUBCATEGORY	503.2.3 MINIMUM EFFICIENCY (b)	506.2.1 INCREASED EFFICIENCY	DESIGN EFFIC.
TABLE 5.3.2.3(1) - UNITARY AIR CONDITIONERS AND CONDENSING UNITS					
AIR COND, AIR COOLED	< 65,000 (<= 5 TONS)	SPLIT SYSTEM & SINGLE PACKAGE	13.0 SEER	15.0 SEER 12.5 EER	SEE SCHEDULE
AIR COND, AIR COOLED	>= 65,000 & < 135,000	SPLIT SYSTEM & SINGLE PACKAGE	11.2 EER (c)	12.0 EER 12.4 IPLV	SEE SCHEDULE
AIR COND, AIR COOLED	>= 135,000 & < 240,000	SPLIT SYSTEM & SINGLE PACKAGE	11.0 EER (c)	12.0 EER 12.4 IPLV	SEE SCHEDULE

b. IPLVS ARE ONLY APPLICABLE TO EQUIPMENT WITH CAPACITY MODULATION.
c. DEDUCT 0.2 FROM THE REQUIRED EERS AND IPLVS FOR UNITS WITH A HEATING SECTION OTHER THAN ELECTRIC RESISTANCE HEAT.

503.2.4 THRU 503.2.9
- [x] HVAC SYSTEMS ARE FULLY COMPLIANT WITH THE REQUIREMENTS FOR HVAC SYSTEM CONTROL, VENTILATION, ENERGY RECOVERY, DUCT AND PLENUM INSULATION AND SEALING, PIPING INSULATION, AND SYSTEM COMPLETION.

503.2.10 - AIR SYSTEM DESIGN AND CONTROL
- [ ] ALL FANS INSTALLED ON THE PROJECT ARE BELOW 5 HP AND ARE EXEMPT FROM THESE REQUIREMENTS.
- [x] FANS ABOVE 5 HP MEET THE CFM LIMITATIONS SHOWN BELOW:

OPTION 1 - FAN SYSTEM MOTOR NAMEPLATE HP - TABLE 503.2.10.1(1)

SYSTEM/UNIT	ALLOWABLE MOTOR BRAKE HP	DESIGN MOTOR BRAKE HP	DESIGN CFM
AHU-1 SUPPLY	37.5HP	35HP	SEE SCHEDULE
AHU-1 RETURN	9.5HP	7.5HP	SEE SCHEDULE
AHU-2 SUPPLY	9.2HP	8HP	SEE SCHEDULE
AHU-2 RETURN	N/A	N/A	SEE SCHEDULE
AHU-3 SUPPLY	7.2HP	6.5HP	SEE SCHEDULE
AHU-3 RETURN	N/A	N/A	SEE SCHEDULE

503.3 - SIMPLE HVAC SYSTEMS AND EQUIPMENT (PRESCRIPTIVE)
- [ ] PROJECT CONSISTS OF ONLY DX SINGLE ZONE SYSTEMS FULLY COMPLIANT WITH THE SIMPLE PRESCRIPTIVE REQUIREMENTS OF 503.3.

503.4 - COMPLEX HVAC SYSTEMS AND EQUIPMENT (PRESCRIPTIVE)
- [x] PROJECT CONSISTS OF HVAC SYSTEMS FULLY COMPLIANT WITH THE COMPLEX PRESCRIPTIVE REQUIREMENTS OF 503.4.

ELECTRICAL/MECHANICAL DEMARCATION

REFER TO DETAIL 13/M-5.02 FOR MECHANICAL CONTRACTOR'S RESPONSIBILITIES RELATED TO ELECTRICAL DISCONNECTS, STARTERS AND WIRING OF MECHANICAL EQUIPMENT. ALL DISCONNECTS, STARTERS AND WIRING (LOAD SIDE OF DISCONNECTS) SHALL BE FURNISHED AND INSTALLED BY M.C. UNLESS OTHERWISE NOTED IN DETAIL 13/M-5.02. COORDINATE ALL ELECTRICAL REQUIREMENTS WITH E.C. PRIOR TO ASSEMBLING SHOP DRAWING SUBMITTALS OR ORDERING EQUIPMENT.

COORDINATION DRAWINGS

PER SPECIFICATION SECTION 01 31 00 PROJECT MANAGEMENT AND COORDINATION, THE MECHANICAL CONTRACTOR SHALL ORGANIZE COORDINATION MEETINGS TO DEVELOP A SET OF COORDINATION DRAWINGS WITH ALL CONTRACTORS (ELECTRICAL, MECHANICAL, PLUMBING, FIRE PROTECTION, IT/DATA, AND GENERAL CONTRACTOR). THE MECHANICAL CONTRACTOR WILL HAVE THE LEAD RESPONSIBILITY FOR THE COORDINATION DRAWINGS. THE MECHANICAL CONTRACTOR SHALL PRODUCE THE ORIGINAL DRAWINGS AND FORWARD THE DRAWINGS TO EACH OF THE OTHER CONTRACTORS FOR THEM TO ADD THEIR SYSTEMS TO THIS SET OF COORDINATION DRAWINGS. THE CONTRACTORS WILL DEVELOP THE DRAWINGS IN THIS ORDER: MECHANICAL, FIRE PROTECTION, PLUMBING, ELECTRICAL, IT/DATA, AND GENERAL. THIS SHALL ALSO BE THE ORDER OF PRECEDENCE FOR INSTALLATION OF SYSTEMS. ANY RELOCATION OF SYSTEM ROUTINGS WILL BE FOUND IN THE COORDINATION PHASE AND NOTICED BY EACH OF THE CONTRACTORS. THESE DRAWINGS, WHEN COMPLETED, SHALL BE SIGNED OFF BY ALL OF THE ABOVE LISTED PARTIES. DRAWINGS SHALL BE COMPLETED PRIOR TO FABRICATION AND INSTALLATION OF DUCTWORK AND PIPING SYSTEMS, OR PURCHASE OF EQUIPMENT. THE FOLLOWING ITEMS REPRESENT THE MINIMUM REQUIREMENTS AND COORDINATION DRAWINGS:

1. ALL COORDINATION DRAWINGS WILL BE PRODUCED AT 1/4"= 1'-0" SCALE
2. COORDINATION DRAWINGS WILL BE DISTRIBUTED ON REPRODUCIBLE MATERIAL 48"x36"
4. COORDINATION DRAWINGS ARE NOT SHOP DRAWINGS AND ARE REQUIRED IN ADDITION TO SHOP DRAWINGS.
5. ONCE THE COMPLETE COORDINATION DRAWINGS HAVE BEEN COMPILED, THE MECHANICAL CONTRACTOR WILL DISTRIBUTE ONE SIGNED SET TO EACH OF THE FOLLOWING CONTRACTORS: ELECTRICAL, PLUMBING, FIRE PROTECTION, AND GENERAL. ADDITIONAL SETS WILL BE SENT TO THE OWNER, ARCHITECT, AND ENGINEER.

MECHANICAL GENERAL NOTES

1. DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATION OF DOORS, WINDOWS, CEILING DIFFUSERS, ETC.
2. ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, SHEET METAL, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. THIS INCLUDES ANY MODIFICATIONS TO ANY ASSOCIATED MECHANICAL, PLUMBING, OR ELECTRICAL SYSTEMS REQUIRED BY THIS SPECIFIC MANUFACTURER'S INSTALLATION INSTRUCTIONS.
3. ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL CONSTRUCTED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS. ALL SUPPLY, RETURN AND OUTSIDE AIR DUCTWORK SHALL BE WRAPPED WITH 2" THICK DUCT WRAP WITH VAPOR BARRIER. INSULATION (INCLUDING FLEXIBLE DUCT INSULATION) SHALL HAVE A MINIMUM INSTALLED R-VALUE OF 5.0. TRANSFER DUCTS SHALL BE LINED WITH 1" THICK CLOSED CELLULAR FOAM LINER FOR ACOUSTICAL PURPOSES. DUCT DIMENSIONS ON PLANS ARE FREE AREA SIZE. PROVIDE RIGID INSULATION BLOCK AT ALL SUPPORT LOCATIONS, REFER TO SPECS, AND DETAIL-6/M-502 FOR DOUBLE WALL DUCT REQUIREMENTS
4. ALL DUCTWORK SHALL BE SEALED PER THE REQUIREMENTS OF THE INTERNATIONAL MECHANICAL CODE. SEAL LOW PRESSURE SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCTWORK FOR SMACNA SEAL CLASS A, SMACNA LEAKAGE CLASS 12, REFER TO SPECIFICATION SECTION 233113 FOR PRESSURE CLASSIFICATION SYSTEM REQUIREMENTS.
5. ALL MEDIUM PRESSURE DUCTWORK MAINS WILL BE SUBJECT TO PRESSURE TESTING PER SMACNA GUIDELINES (REGARDLESS OF DUCT PRESSURE CLASSIFICATION).
6. ALL PIPING, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS AND ROOF SHALL BE FLASHED AND COUNTERFLASHED IN A WATERPROOF MANNER.
7. ALL PIPING AND DUCTWORK LOCATIONS SHALL BE COORDINATED WITH THE WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS, TO AVOID INTERFERENCE.
8. TEST AND BALANCE CONTRACTOR WILL BE PROVIDED BY THE CONSTRUCTION MANAGER. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL EQUIPMENT, VALVES, DAMPERS AND ACCESSORIES REQUIRED TO BALANCE THE SYSTEM WATER AND AIR FLOWS AS SPECIFIED. THE MECHANICAL CONTRACTOR AND SHALL ASSIST THE TEST AND BALANCE CONTRACTOR CONTRACTED BY THE CONSTRUCTION MANAGER DURING TESTING AND BALANCING. ALL MECHANICAL SYSTEMS SHALL BE BALANCED TO THE PERFORMANCE SPECIFICATIONS INDICATED ON PLANS, ANY EQUIPMENT OR SYSTEM FOUND TO BE DEFICIENT WILL BE CORRECTED AND RETESTED AT NO COST TO THE OWNER. TEST AND BALANCE CONTRACTOR WILL BE AABC OR NEBB CERTIFIED.
9. UPON PROJECT COMPLETION, THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE OWNER INSTALLATION INFORMATION IN ACCORDANCE WITH DIVISION 01 OF THE SPECIFICATIONS INCLUDING BUT NOT BE LIMITED TO: RECORD SUBMITTALS (WITH ANY SUBMITTAL REVIEW COMMENTS ADDRESSED), O&M MANUALS FOR EACH PIECE OF EQUIPMENT INCLUDING ALL SELECTED OPTIONS, THE NAME AND ADDRESS OF AT LEAST ONE SERVICE AGENCY, FULL CONTROL SYSTEM O&M AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, SCHEMATICS, FULL SEQUENCE OF OPERATION, AND PROGRAMMED SETPOINTS.
10. PROVIDE A ONE YEAR WARRANTY FOR ALL WORK PERFORMED BEGINNING ON THE DATE OF FINAL SCO INSPECTION/ACCEPTANCE
11. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE AND FILTER REMOVAL.
12. CONDENSATE DRAIN PIPING SHALL BE BE SCHEDULE TYPE "L" HARD DRAWN COPPER AND SHALL BE INSULATED PER THE SPECIFICATIONS. DRAINS FROM ALL COOLING COILS SHALL BE TRAPPED. DRAIN SIZE SHALL BE EQUIPMENT DRAIN CONNECTION SIZE (3/4" MINIMUM) WITH A MINIMUM DEPTH OF 4" OR 1.5 TIMES THE UNIT FAN TSP, WHICHEVER IS GREATER.
13. ALL REFRIGERANT PIPE SHALL BE NITROGENIZED ACR COPPER TUBE. SIZE, INSULATE, AND INSTALL REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS.
14. ANY DEVICE REQUIRING A THERMOSTAT FOR CONTROL SHALL BE FURNISHED WITH A THERMOSTAT WHETHER INDICATED ON THE DRAWINGS OR NOT.
15. INSTALL THE TOP OF ALL THERMOSTATS, SENSORS, AND SWITCHES AT 4'-0" (MAXIMUM) ABOVE FINISH FLOOR. COORDINATE EXACT THERMOSTAT LOCATION WITH OWNER PRIOR TO INSTALLATION. ANY DEVICE ON A PERIMETER WALL SHALL BE MOUNTED ON A FOAM-FILLED ELECTRICAL BOX, WITH ALL GAPS BETWEEN BOX AND WALL SEALED TO PREVENT INFILTRATION.
16. MECHANICAL CONTRACTOR SHALL LOCATE EXHAUST FANS, OUTLETS, AND GAS FLUES A MINIMUM OF 20'-0" FROM ANY OUTSIDE AIR INTAKE.
17. CHILLED WATER PIPING AND FITTINGS BELOW GRADE SHALL BE FACTORY PREINSULATED AS MANUFACTURED BY THERMACOR(OR EQUAL). CARRIER PIPE SHALL BE SCHEDULE 40 ASTM A53 GRADE B BEVELED FOR WELDING. INSULATION SHALL BE FOAMED IN-PLACE CLOSED CELL POLYURETHANE FOAM COMPLETELY FILLING THE ANNULUS BETWEEN THE CARRIER PIPE AND HPDE JACKETING. OUTER JACKETING SHALL BE HDPE.
18. ALL CHILLED WATER, AND HOT WATER PIPING SHALL MEET THE REQUIREMENTS OF SECTION 232113. ALL PIPING SHALL BE INSULATED PER SPECIFICATION SECTION 230700. ALL PIPING JACKETING, LABELING AND IDENTIFICATION SHALL MEET THE REQUIREMENTS OF SECTION 230553 (COLOR-CODED PVC JACKETING REQUIRED IN MECHANICAL ROOMS). MINIMUM PIPE SIZE SHALL BE 3/4".
19. ALL BRANCH CHILLED WATER AND HOT WATER PIPING SHALL PITCH UP IN DIRECTION OF FLOW WITH MANUAL AIR VENTS AT ALL HIGH POINTS AND 1/2" DRAIN VALVES AT ALL LOW POINTS.
20. PROVIDE UNIONS, FLANGES OR COUPLINGS AT CONNECTION TO ALL VALVES AND EQUIPMENT. DO NOT USE DIRECT WELDED OR THREADED CONNECTIONS TO VALVES, EQUIPMENT OR OTHER APPARATUS.
21. PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METALS.
22. EQUIPMENT OPERATED DURING CONSTRUCTION SHALL USE FILTERED MEDIA TO PREVENT CONSTRUCTION DEBRIS FROM ENTERING COILS, DUCTWORK SYSTEMS, AIR TERMINALS ETC. AT COMPLETION OF CONSTRUCTION, MECHANICAL CONTRACTOR SHALL CLEAN ALL SYSTEMS WITH ALL CONTROL DEVICES WIDE OPEN AND REMOVE ANY REMAINING DEBRIS PRIOR TO TEST AND BALANCING. MECHANICAL CONTRACTOR SHALL REPLACE ALL FILTRATION WITH NEW FILTERS AT COMPLETION OF CONSTRUCTION. ANY DUCTWORK, AIR TERMINALS, AND/OR OTHER EQUIPMENT UPSTREAM OF FILTRATION SHALL BE CLEANED THOROUGHLY OF CONSTRUCTION DEBRIS BEFORE HANDING OVER TO OWNER. COORDINATE WITH OWNER/CM FOR ANY FILTER MAINTENANCE PROGRAM REQUIREMENTS.
23. ALL EQUIPMENT CONCRETE PAD SIZES FOR MECHANICAL EQUIPMENT SHALL BE CONFIRMED WITH APPROVED SHOP DRAWING SUBMITTALS AND ASSOCIATED UNIT MANUFACTURER ANCHOR LOCATIONS PRIOR TO FABRICATION/INSTALLATION. THE MECHANICAL AND PLUMBING CONTRACTORS SHALL COORDINATE THE EXACT LOCATION OF MECHANICAL EQUIPMENT HOUSEKEEPING PADS WITH THE FLOOR DRAIN LOCATIONS PRIOR TO INSTALLATION OF DRAINS.
24. ALL PIPING AND DUCTWORK SHALL BE SUPPORTED IN ACCORDANCE WITH THE SPECIFICATIONS, AND FURTHER SUPPORTS OR HANGERS SHALL BE PROVIDED AS REQUIRED TO PREVENT THE WEIGHT OF PIPING BEING PLACED ON EQUIPMENT.
25. DUCTWORK AND PIPING PASSING THROUGH/ABOVE ELECTRICAL ROOMS SHALL BE CLOSELY COORDINATED WITH THE ELECTRICAL CONTRACTOR. DUCTWORK OR PIPING SHALL NOT BE LOCATED ABOVE ELECTRICAL PANELS.
26. EXTEND ALL DRAIN LINES TO NEAREST FLOOR DRAIN OR AS INDICATED SO ROUTED AS TO AVOID INTERFERENCE WITH PASSAGEWAYS AND MAINTENANCE.
27. ALL VALVES AND SPECIALTIES SHALL BE LINE SIZE UNLESS NOTED OTHERWISE, USING ECCENTRIC REDUCERS (FLAT ON BOTTOM) WHENEVER PIPING TRANSITIONS ARE REQUIRED. AT INLINE PUMP SUCTION THE ECCENTRIC REDUCER SHALL BE FLAT ON TOP OF PIPE.
28. THIS PROJECT WILL BE COMMISSIONED IN ACCORDANCE WITH THE MANDATORY NORTH CAROLINA STATE CONSTRUCTION THIRD-PARTY COMMISSIONING REQUIREMENTS. MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE OWNER'S COMMISSIONING AGENT AND PROVIDE ALL NECESSARY TIME, MATERIALS, AND PROCEDURES REQUIRED FOR A FULLY COMMISSIONED PROJECT. SEE COMMISSIONING SPECIFICATION SECTION 019100 IN PROJECT MANUAL FOR FURTHER INFORMATION.
29. PRIOR TO TURNING ALL HYDRONIC SYSTEMS OVER TO THE OWNER SYSTEMS, A SYSTEM FLUSHING AND CHEMICAL TREATMENT REPORT SHALL BE PROVIDED AND VERIFIED BY THE OWNERS COMMISSIONING AGENT.
30. CONTROLS VALVES, DAMPERS, AND BAS CONTROLLERS SHALL BE INSTALLED A MAXIMUM OF 2 FEET ABOVE THE CEILING AND WHERE INSTALLED ABOVE AN INACCESSIBLE CEILING A MINIMUM OF 2'x2' ACCESS DOOR SHALL BE PROVIDED. COORDINATE WITH ARCHITECTURAL PLANS FOR LOCATIONS AND CEILING TYPES.
31. VALVES MOUNTED 12' OR GREATER A.F.F SHALL BE PROVIDED WITH CHAIN OPERATORS.
32. ALL MOTORS PROVIDED FOR EQUIPMENT IN MECHANICAL ROOM SHALL BE PROVIDED WITH A T.E.F.C. ARRANGEMENT.
33. ALL CLOSED LOOP PIPING SYSTEMS SHALL BE FLUSHED USING PRODUCT AND SERVICES BY EXPERIENCED WATER SOLUTIONS INC. BY-PASS VALVES SHALL BE PROVIDED FOR ALL EQUIP. INCLUDING TERMINAL UNITS.
34. REFER TO SPECIFICATIONS FOR GAS PIPING REQUIREMENTS
35. ALL ISOLATION VALVES, TERMINAL UNITS, CONTROLS, ETC. REQUIRING ACCESS SHALL BE INSTALLED WITHIN 18" OF THE CEILING FOR SERVICE ACCESSIBILITY. LOCATIONS SHALL BE INDICATED ON THE CEILING GRID PER THE SPECIFICATIONS.
36. ALL CONTROL WIRING SHALL BE IN CONDUIT

MECHANICAL DRAWING INDEX

DRAWING LIST - MECHANICAL

MECHANICAL LEGEND

SYMBOL	DESCRIPTION	ABBR.
CHS	CHILLED WATER SUPPLY	CHS
CHR	CHILLED WATER RETURN	CHR
HWS	HOT WATER SUPPLY	HWS
HWR	HOT WATER RETURN	HWR
G	NATURAL GAS	G
D	CONDENSATE DRAIN	D
PC	PUMPED CONDENSATE	PC
CW	COLD WATER MAKE-UP	CW
R	REFRIGERANT PIPING	R
	BUTTERFLY VALVE	
	3-PIECE BALL VALVE	
	CHECK VALVE	
	STRAINER WITH BLOWDOWN VALVE WITH HOSE CONN.	
	BALANCING VALVE	
	B&G CIRCUIT SETTER	
	UNION	
	THERMOMETER	
P	PRESSURE GAGE & COCK	
	GAGE COCK	
	FLOW SWITCH	
	ECCENTRIC REDUCER	
	CONCENTRIC REDUCER	
	CONTROL VALVE	
DP	DIFFERENTIAL PRESSURE SENSOR	
T	TEMPERATURE GAUGE	
FM	FLOW METER	
	GAS COCK	
	PRESSURE REDUCING/REGULATING VALVE	
S	SOLENOID VALVE	
3WV	3-WAY VALVE	
T / T CO2	THERMOSTAT / COMBO TSTAT/CO2 SENSOR (4'-0" AFF TO TOP)	
H	HUMIDISTAT (4'-0" AFF TO TOP)	
S	SWITCH (4'-0" AFF TO TOP)	
P	WALL MOUNTED BUILDING PRESSURE SENSOR	
PS	MANUAL PULL STATION	
	SUPPLY AIR DIFFUSER (4-WAY)	
	SUPPLY AIR DIFFUSER (3-WAY)	
	RETURN AIR GRILLE	
	RETURN AIR GRILLE WITH SOUND ATTENUATION (SEE DETAIL)	
	EXHAUST AIR GRILLE	
	DOUBLE LINE DUCTWORK	
	SINGLE LINE DUCTWORK	
FD	FIRE DAMPER W/ ACCESS DOOR (SEE DETAIL)	
20/14	20"x14" FLAT OVAL DUCT	
20x14	20"x14" RECTANGULAR DUCT	
20x14L	20"x14" RECTANGULAR DUCT LINED	
8" ⌀	8" DIAMETER ROUND DUCT	
DD	DUCT MOUNTED SMOKE DETECTOR W/ ACCESS DOOR	
SP	STATIC-PRESSURE SENSOR	
M	MOTORIZED DAMPER	
BD	BACKDRAFT DAMPER	
C	CARBON MONOXIDE SENSOR	
CO2	CARBON DIOXIDE SENSOR	
U	UNDERCUT DOOR	
	LOW PRESSURE STEAM TRAP	
	HIGH PRESSURE STEAM TRAP	
M.C.	MECHANICAL CONTRACTOR	
E.C.	ELECTRICAL CONTRACTOR	
P.C.	PLUMBING CONTRACTOR	
N.I.C.	NOT IN CONTRACT	
AFF	ABOVE FINISHED FLOOR	
DN	DOWN	
UP	UP	

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 17228 RONALD V. ALMOND
9/19/17

MEMBERS OF THE AMERICAN INSTITUTE OF ARCHITECTS

REVISIONS:

No.	Description	Date
1	Addendum #5	9.11.2017
2	Addendum #6	9.19.2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: CAH
CHECKED BY: RVA

MECHANICAL LENDEND, NOTES AND SCHEDULES

M-001

OPTIMA #: 16-0265

BUILDING BID DOCUMENTS

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9/19/2017 2:46:21 PM

SEQUENCE OF OPERATION

A COMPLETE AND OPERATIONAL DDC CONTROL SYSTEM (BAS) SHALL BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATIONS (SECTION 230900) AND AS INTENDED ON THESE PLANS. ALL CONTROL POINTS AND EQUIPMENT SEQUENCES OF OPERATION LISTED IN SPECIFICATION SECTION 230900 SHALL BE CONSIDERED IN ADDITION TO THOSE LISTED HERE. IN THE EVENT THAT THE VERBIAGE IS IN CONFLICT OR CONTRADICTS THE REQUIREMENTS LISTED HERE, THE QUESTION SHALL BE ASKED BEFORE BIDDING OR THE MORE STRINGENT SHALL APPLY AT THE ENGINEER'S DISCRETION.

NOTE: NEW BAS SHALL BE INTEGRATED WITH THE OWNER'S EXISTING CAMPUS BAS SYSTEM. BAS CONTRACTOR SHALL INCLUDE ALL NECESSARY HARDWARE AND SOFTWARE TO FULLY INTEGRATE NEW SYSTEM WITH THE EXISTING SYSTEM. MECHANICAL CONTRACTOR SHALL COORDINATE ALL EQUIPMENT COMMUNICATION REQUIREMENTS WITH CONTROLS VENDOR PRIOR TO ORDERING EQUIPMENT.

CHILLER PLANT

CHILLER AND CHILLED WATER PUMPS SHALL BE STOPPED/STARTED BY THE BAS ON A PROGRAMMED BASIS. CHILLERS CH-1 , PRIMARY CHILLED WATER PUMPS P-1 , P-2 , AND SECONDARY CHILLED WATER PUMPS P-3 , P-4 SHALL BE CONTROLLED TO PROVIDE CHILLED WATER TO THE SYSTEM. THE OPERATING PRIMARY PUMP AND OPERATING SECONDARY PUMP SHALL BE STARTED WHEN ANY ZONE IS IN THE OCCUPIED MODE AND THE OUTSIDE AIR TEMPERATURE IS ABOVE 50° F. (ADJ) AND ANY CHILLED WATER CONTROL VALVE HAS A CALL/DEMAND FOR CHILLED WATER. PRIMARY PUMPS, P-1 , P-2 , AND SECONDARY PUMPS, P-3 , P-4, SHALL BE CONTROLLED IN A OPERATING/STAND-BY CONFIGURATION. BAS SHALL ALTERNATE OPERATING/STAND-BY EQUIPMENT TO EQUALIZE RUN TIME.

SECONDARY PUMP SPEED SHALL BE CONTROLLED BY DIFFERENTIAL PRESSURE SENSOR IN THE PIPING SYSTEM TO MAINTAIN SYSTEM PRESSURE. AS AIR HANDLING EQUIPMENT 2-WAY CONTROL VALVES OPEN, OPERATING PUMP SPEED SHALL BE INCREASED VIA VARIABLE FREQUENCY DRIVE TO MAINTAIN SYSTEM PRESSURE SETPOINT.

UPON A CALL FOR CHILLED WATER, THE OPERATING PRIMARY PUMP SHALL BE STARTED. THE CHILLER SHALL BE ENABLED. CHILLER FLOW SWITCH SHALL ENERGIZE CHILLER CONTROL CIRCUIT AND START CHILLER. CHILLER FACTORY CONTROLS SHALL OPERATE CHILLER TO MAINTAIN A SECONDARY CHILLED WATER SUPPLY TEMPERATURE OF 45° F. (ADJ). BAS SHALL SEND AN ALARM TO THE CENTRAL STATION IF THE SECONDARY CHILLED WATER SUPPLY TEMPERATURE RISES MORE THAN 3° F. (ADJ.) ABOVE THE SETPOINT CONTINUOUSLY FOR A PERIOD OF 15 MINUTES (ADJ.)

BAS SHALL INTERFACE WITH CHILLER CONTROL PANEL TO ALLOW ALL CHILLER MONITOR, CONTROL AND ALARM FUNCTIONS SPECIFIED WITH THE UNIT TO BE EXECUTED/REPORTED THROUGH THE BAS, INCLUDING SUPPLY AND RETURN TEMPERATURES AND FLOW RATES, CHILLER STATUS AND PUMP STATUS.

CHILLED WATER SUPPLY TEMPERATURE RESET SCHEDULE (ADJ)
45° F. CHS AT 85° F. O.A. TEMP. (OR ABOVE)
50° F. CHS AT 60° F. O.A. TEMP. (OR BELOW)
CHS SHALL VARY LINEARLY BETWEEN THE HIGH AND LOW SETPOINTS.(AS MEASURED IN CHS LOOP)

OPERATING/STANDBY ROTATION:

CHILLERS
ROTATE 168 HOURS (SIMILAR TO BOILERS)

PRIMARY PUMPS
PRIMARY PUMP ROTATION IS PERFORMED ON AN OPERATOR SELECTABLE TIME INTERVAL, WHICH SHOULD BE CHOSEN TO BE DIFFERENT THAN THE CHILLER ROTATION SCHEDULE. WHEN THE ROTATION OCCURS, IF THE PRIMARY OPERATING PUMP IS ENABLED, IT WILL REMAIN ENABLED UNTIL PROOF OF FLOW HAS BEEN PROVEN FROM THE NEW "OPERATING" PUMP. OPERTATING PRIMARY PUMP SHALL BE ROTATED AUTOMATICALLY TO INCLUDE ALL TWO PUMPS ON A ROTATING BASIS AT TIME INTERVALS OF 168 HOURS RUNTIME (ADJ.). SHOULD AN OPERATING PUMP FAIL, THE STAND-BY PUMP SHOULD BE STARTED AUTOMATICALLY AND ALARM SHALL BE SENT TO THE CENTRAL STATION.

SECONDARY PUMPS
SECONDARY PUMP ROTATION IS PERFORMED ON AN OPERATOR SELECTABLE TIME INTERVAL, WHICH SHOULD BE CHOSEN TO BE DIFFERENT THAN THE CHILLER ROTATION SCHEDULE. WHEN THE ROTATION OCCURS, IF THE SECONDARY OPERATING PUMP IS ENABLED, IT WILL REMAIN ENABLED UNTIL PROOF OF FLOW HAS BEEN PROVEN FROM THE NEW "OPERATING" PUMP. DURING PUMP OPERATION, THE SPEED SIGNAL WILL BE SLOWLY DECREASED TO ZERO ON THE OLD "OPERATING" PUMP TO ALLOW THE NEW "OPERATING" PUMP TO SMOOTHLY ACCEPT THE LOAD AND THEN THE OLD "OPERATING" PUMP WILL BE DISABLED. OPERATING SECONDARY CHILLED WATER PUMP SHALL BE ROTATED AUTOMATICALLY TO INCLUDE ALL TWO PUMPS ON A ROTATING BASIS AT TIME INTERVALS OF 168 HOURS RUNTIME (ADJ.). SHOULD AN OPERATING PUMP FAIL, THE STAND-BY PUMP SHOULD BE STARTED AUTOMATICALLY AND ALARM SHALL BE SENT TO THE CENTRAL STATION.

EMERGENCY OPERATION:
UPON RECEIPT OF A STATUS SIGNAL FROM THE GENERATOR/BUILDING ATS; (GENERATOR RUNNING/OPERATIONAL), ONLY (1) CHILLER/ASSOCAITED PUMPS SHALL OPERATE AND THE OTHER CHILLER/ASSOCAITED PUMPS SHALL SHUTDOWN/REMAIN OFF. AFTER RELEASE OF GENERATOR STATUS (OFF) BOTH CHILLERS/ASSOCIATED PUMPS SHALL BE CAPABLE OF OPERATION

HOT WATER PLANT

SYSTEM SHALL BE STOPPED/STARTED BY THE BAS ON A PROGRAMMED BASIS UPON LOSS OF THE HOT WATER SET POINT. BOILERS SHALL BE CYCLED ON AUTOMATICALLY AT TIME INTERVALS OF 168 HOURS RUNTIME TO ALLOW FOR BOILER USE AND OPERATION.

PRIMARY HOT WATER PUMPS (P-5 & P-6) AND SECONDARY HOT WATER PUMPS (P-7 , P-8) SHALL BE ENABLED WITH LEAD BOILER AND ASSOCIATED PRIMARY HOT WATER PUMP AND LEAD SECONDARY HOT WATER PUMP STARTED BY THE BAS WHEN ANY ZONE IS IN THE OCCUPIED MODE AND THE OUTSIDE AIR TEMPERATURE IS BELOW 60° F (ADJ) AND MIN 3 VAV HOT WATER CONTROL VALVE HAS A CALL/DEMAND FOR HOT WATER ZONE HAS A DEMAND FOR HEATING OR THE SYSTEM HAS A CALL FOR DEHUMIDIFICATION. BOILERS AND PRIMARY PUMPS SHALL BE STAGED BY THE BOILERS FACTORY CONTROLS AND CASCADING SEQUENCER AS REQUIRED TO MAINTAIN THE SECONDARY HOT WATER SUPPLY TEMPERATURE PER THE RESET SCHEDULE BELOW. SECONDARY PUMPS SHALL BE CONTROLLED IN A LEAD/LAG/STAND-BY CONFIGURATION.

SECONDARY HOT WATER SUPPLY TEMPERATURE RESET SCHEDULE (ADJ)
160° F. HWS AT 30° F. O.A. TEMP. (OR BELOW)
120° F. HWS AT 60° F. O.A. TEMP. (OR ABOVE)
NOTE: HWS SETPOINT SHALL VARY LINEARLY BETWEEN THE HIGH AND LOW SETPOINTS.

LEAD/LAG ROTATION:
BOILERS
BOILER LEAD/LAG ROTATION IS PERFORMED ON AN OPERATOR SELECTABLE TIME INTERVAL OR BY AN OPERATOR INITIATED MANUAL SWITCH. UPON A CALL FOR A LEAD/LAG ROTATION SWITCH, THE OLD LEAD BOILER WILL REMAIN ENABLED UNTIL THE NEW LEAD BOILER HAS PICKED UP THE LOAD. THE OLD LEAD CHILLER WILL BE DEMAND LIMITED SLOWLY TO ZERO AND THEN DISABLED NORMALLY. LEAD BOILER SHALL BE ROTATED AUTOMATICALLY AT TIME INTERVALS OF 168 HOURS RUNTIME (ADJ.). SHOULD THE LEAD BOILER (OR ASSOCIATED PRIMARY PUMP) FAIL, THE LAG BOILER SHALL BE STARTED AUTOMATICALLY AND AN ALARM SHALL BE SENT TO THE CENTRAL STATION.

PRIMARY PUMPS
PRIMARY PUMPS SHALL BE CONTROLLED BY THEIR ASSOCIATED BOILER TO OPERATE WITH BOILER.

SECONDARY PUMPS
SECONDARY PUMP ROTATION IS PERFORMED ON AN OPERATOR SELECTABLE TIME INTERVAL, WHICH SHOULD BE CHOSEN TO BE DIFFERENT THAN THE BOILER ROTATION SCHEDULE. WHEN THE ROTATION OCCURS, IF THE SECONDARY OPERATING PUMP IS ENABLED, IT WILL REMAIN ENABLED UNTIL PROOF OF FLOW HAS BEEN PROVEN FROM THE NEW OPERATING PUMP. DURING PUMP OPERATION, THE SPEED SIGNAL WILL BE SLOWLY DECREASED TO ZERO ON THE OLD OPERATING PUMP TO ALLOW THE NEW OPERATING PUMP TO SMOOTHLY ACCEPT THE LOAD AND THEN THE OLD OPERATING PUMP WILL BE DISABLED. OPERATING SECONDARY HOT WATER PUMP SHALL BE ROTATED AUTOMATICALLY TO INCLUDE ALL TWO PUMPS ON A ROTATING BASIS AT TIME INTERVALS OF 168 HOURS RUNTIME (ADJ.). SHOULD AN OPERATING PUMP FAIL, THE STAND-BY PUMP SHOULD BE STARTED AUTOMATICALLY AND ALARM SHALL BE SENT TO THE CENTRAL STATION.

A CARBON MONOXIDE/OXYGEN DEPLETION SENSOR SHALL BE PROVIDED IN THE BOILER ROOM AND SHALL SEND AN ALARM TO THE CENTRAL BAS IF ACTIVATED.

EMERGENCY GAS SHUTOFF SWITCH SHALL BE INTERLOCKED WITH ALL THE BOILERS IN THE ASSOCIATED BOILER ROOM AND SHALL SHUT DOWN ALL BOILERS UPON ACTIVATION

VARIABLE VOLUME AIR HANDLING UNITS (AHU-1)

ALL UNITS SHALL BE STOPPED/STARTED ON A PROGRAMMED BASIS THROUGH THE BAS. (1)

WHILE IN THE OCCUPIED MODE, THE UNIT SUPPLY FAN(S) (WHERE MULTIPLE FANS ARE PROVIDED FANS SHALL OPERATE TOGETHER, AND UPON LOSS OF A SINGLE FAN, REMAINING FAN OR FANS SHALL CONTINUE TO OPERATE PER THE BELOW SEQUENCE) SHALL OPERATE CONTINUOUSLY. SUPPLY FAN SPEED SHALL BE CONTROLLED BY A VARIABLE FREQUENCY DRIVE AND DUCT MOUNTED STATIC PRESSURE SENSOR. THE STATIC PRESSURE SENSOR SETPOINT SHALL BE RESET USING A TRIM AND RESPOND ALGORITHM BASED ON ZONE AIR FLOW REQUIREMENTS FROM A LOW SETTING OF 0.75" (ADJ.) TO A HIGH SETTING OF 1.50" (ADJ.). ON A CALL FOR MORE AIRFLOW AT THE ZONE LEVEL AND THE SPACE TEMPERATURE ABOVE SETPOINT, THE SETPOINT SHALL BE RESET TO THE HIGHER VALUE. AS ZONE TEMPERATURE SETPOINT IS SATISFIED AND THE AIRFLOW DEMAND DECREASES, THE SETPOINT SHALL RESET TO THE LOWER VALUE. RETURN FAN SHALL BE STARTED AND RELIEF DAMPERS SHALL BE MODULATED AS REQUIRED TO MAINTAIN BUILDING PRESSURIZATION AS OUTSIDE AIR DAMPERS MODULATE OPEN. EACH UNIT SHALL BE PROVIDED WITH A PRESSURIZATION SENSOR LOCATED AS INDICATED ON THE PLANS. (1)

RETURN FAN (IF EQUIPPED) SHALL BE STARTED AND STOPPED WITH SUPPLY FAN, AND SHALL BE MODULATED BASED ON TRACKING THE SUPPLY AIR FLOW WITH A CONSTANT DIFFERENTIAL OFFSET UTILIZING THE RETURN AIRFLOW STATION AND SHALL BE EQUAL TO THE BUILDING EXHAUST ASSOCIATED WITH THAT UNIT. THE DIFFERENTIAL SHALL BE ADJUSTED TO ALLOW FOR THE BUILDING PRESSURE TO REMAIN POSITIVE. BUILDING PRESSURE SHALL BE MONITORED AND AT ANY TIME THE RETURN AIR FAN SPEED SHALL BE ADJUSTED TO MAINTAIN A POSITIVE PRESSURE SETPOINT IN THE UNIT OA/RA MIXING SECTION 0.1" WC (ADJ.). THE UNIT RETURN DAMPER AND RELIEF DAMPERS SHALL BE MODULATED TO PROVIDE THE OA AIRFLOW SEQUENCE NOTED BELOW.

A DISCHARGE AIR SENSOR SHALL CONTROL UNIT COOLING AND HEATING CONTROL VALVES TO MAINTAIN THE ROOFTOP UNIT SUPPLY AIR TEMPERATURE PER THE FOLLOWING SUPPLY AIR TEMPERATURE (SAT) RESET SCHEDULE:

SUPPLY AIR TEMPERATURE RESET:
WHEN COOLING IS REQUIRED, CONTROL MODULE SHALL MONITOR ALL VAV TERMINALS AND RECALCULATE SUPPLY AIR TEMPERATURE BASED ON THE MOST DEMANDING ZONE WITHIN THE SETPOINT RANGE (55 °F AND 65 °F, 60 °F INITIAL). FOR EVERY COOLING REQUEST AT THE ZONE LEVEL, SETPOINT WILL BE TRIMMED BY 0.5 ° (ADJUSTABLE) AND WHEN NO REQUESTS ARE PRESENT, 1°F (ADJUSTABLE) WILL BE ADDED TO THE SETPOINT. SUPPLY AIR TEMPERATURE SETPOINT IS OVERRIDDEN AND SUPPLY AIR TEMPERATURE DEFAULTS TO 55 °F IF THE RETURN AIR RELATIVE HUMIDITY RISES ABOVE 60% RH (ADJUSTABLE). SETPOINT REMAINS 55 °F UNTIL RETURN AIR RELATIVE HUMIDITY FALLS BELOW 55% RH (ADJUSTABLE)

BAS SHALL PROVIDE ECONOMIZER OPERATION TO PROVIDE "FREE COOLING" WHEN OUTDOOR AIR CONDITIONS ALLOW. UPON BAS DETERMINATION THAT OUTSIDE AIR ENTHALPY IS BELOW RETURN AIR ENTHALPY IN COOLING MODE, THE OUTSIDE AIR, RETURN AIR AND RELIEF AIR DAMPERS SHALL MODULATE TO MAINTAIN UNIT DISCHARGE AIR TEMPERATURE. IF "ECONOMIZER" CONTROL IS INSUFFICIENT TO MAINTAIN DISCHARGE AIR TEMPERATURE, THE UNIT COOLING CYCLE SHALL FUNCTION AS OUTLINED ABOVE. UPON A DROP IN DISCHARGE AIR TEMPERATURE BELOW SETPOINT, THE OUTSIDE AIR AND RELIEF AIR DAMPERS SHALL MODULATE CLOSED UNTIL THE MINIMUM OUTSIDE AIR POSITION IS REACHED. BUILDING PRESSURE SHALL BE MONITORED AND DAMPERS SHALL BE ADJUSTED TO PREVENT AN OVERPRESSURIZATION OF THE SPACE WHERE THE BUILDING PRESSURE SENSORS ARE LOCATED.

CONTROLS SHALL PROVIDE FOR MORNING WARM-UP AND NIGHT SETBACK DURING UNOCCUPIED TIMES. UPON UNIT START-UP, IF RETURN AIR TEMPERATURE IS BELOW 65° F. (ADJ) OR ABOVE 75° F. (ADJ), THE OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED AND THE HEATING OR COOLING CONTROL VALVES SHALL OPEN TO THE HEATING OR COOLING COILS AS REQUIRED TO RAISE OR LOWER THE RETURN AIR TEMPERATURE. WHEN RETURN AIR TEMPERATURE RISES ABOVE 62° F. (ADJ) OR FALLS BELOW 78° F. (ADJ), THE UNIT SHALL BE CONTROLLED AS OUTLINED ABOVE.

WHILE IN THE UNOCCUPIED MODE, THE UNIT SUPPLY FAN SHALL BE OFF, THE CHILLED WATER AND HOT WATER CONTROL VALVES SHALL BE CLOSED TO THE UNIT AND THE TERMINAL UNIT SPACE TEMPERATURE SETPOINTS SHALL BE SET TO UNOCCUPIED SETTINGS OF 60° FOR HEATING (ADJ) AND 85° FOR COOLING (ADJ). UPON A CALL FOR HEATING OR COOLING TO MEET UNOCCUPIED SETPOINTS, THE UNIT FAN SHALL BE STARTED AND THE HEATING OR CHILLED WATER CONTROL VALVES SHALL BE OPENED TO THE HEATING OR COOLING COIL AS REQUIRED BY THE SPACE TEMPERATURE. THE BOILER PLANT OR CHILLER PLANT SHALL ALSO BE STARTED AS REQUIRED TO SATISFY SETPOINTS. THE UNIT AND ASSOCIATED CENTRAL PLANT SHALL OPERATE FOR A MINIMUM OF 30 MINUTES (OR AS REQUIRED TO SATISFY UNOCCUPIED SETPOINT) AND SHALL NOT BE ALLOWED TO RESTART FOR A MINIMUM OF 15 MINUTES FOLLOWING SATISFACTION OF UNOCCUPIED SETPOINT AND SYSTEM SHUT-DOWN.

OUTSIDE AIR INTAKE SHALL BE PROVIDED WITH (2) MOTORIZED DAMPERS (1) SIZED FOR MINIMUM OUTSIDE (2-POSITION) AND (1) SIZED FOR THE REMAINING CO2 CONTROL AND ECONOMIZER OUTSIDE AIRFLOW (MODULATING). ON UNIT START UP, THE O.A. DAMPERS SHALL REMAIN CLOSED UNTIL THE RETURN AIR TEMPERATURE RISES ABOVE 65° (ADJ) OR FALLS BELOW 78° (ADJ). ONCE RETURN AIR TEMPERATURE IS SATISFIED, THE MINIMUM O.A. INTAKE DAMPER SHALL BE OPEN WHILE THE AIR HANDLING UNIT IS IN THE OCCUPIED MODE, DAMPER SHALL OPEN TO MAINTAIN THE MINIMUM OUTSIDE AIRFLOW. DAMPER SHALL REMAIN CLOSED WHILE THE UNIT IS IN THE UNOCCUPIED MODE. BAS SHALL BE CAPABLE OF OPENING AND CLOSING OUTSIDE AIR DAMPERS.

CO2 SENSORS MOUNTED IN THE SPACE (RETURN DUCT FOR VERIFICATION ONLY) SHALL MODULATE THE CO2/ECONOMIZER OUTSIDE AIR DAMPER BASED ON CO2 LEVELS IN THE SPACE. DAMPER SHALL MODULATE OPEN AS REQUIRED TO MAINTAIN A SPACE CO2 LEVEL OF 700 PPM ABOVE THE OUTSIDE AIR CO2 LEVEL. AN ALARM SHALL BE ACTIVATED IF THE SPACE CO2 LEVEL RISES ABOVE 1200 PPM.

CO2 CONTROL SHALL APPLY TO AIR HANDLING UNITS - AHU 1,2

SMOKE DETECTOR SHALL BE PROVIDED IN THE RETURN DUCT (UPSTREAM OF THE OUTSIDE AIR DUCT CONNECTION). DETECTOR SHALL SHUT DOWN SUPPLY AND RELIEF FAN UPON ACTIVATION.

A FREEZE-STAT SHALL BE LOCATED IN THE MIXED AIR STREAM TO SHUT-DOWN SUPPLY FAN IF THE MIXED AIR TEMPERATURE FALLS BELOW 40° F. FREEZE-STAT SHALL HAVE MANUAL RESET ONLY. (FREEZESTAT SHALL BE LOCATED DOWNSTREAM OF PREHEAT COIL.)

STATIC PRESSURE RESET SHALL BE PROVIDED TO POLL ALL BOXES AND ADJUST STATIC PRESSURE SETPOINT DOWN UNTIL (1) BOX IS IN FULL COOLING

THE ASSOCIATED HOT WATER PUMP (P-9) SERVING THE HOT WATER PREHEAT COIL SHALL BE ACTIVATED WHEN THE OAT DROPS TO 45°F (ADJ.) AND THE PREHEAT COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN A MINIMUM COIL DISCHARGE AIR TEMPERATURE PER THE RESET SCHEDULE..

UNIT HEATERS

A SPACE TEMPERATURE SENSOR SHALL CONTROL UNIT HEATER FAN AND HOT WATER CONTROL VALVE TO MAINTAIN SPACE TEMPERATURE, 65° F. (ADJ) WITH SPACE TEMPERATURE ABOVE SETPOINT, FAN SHALL REMAIN OFF AND CONTROL VALVE SHALL REMAIN CLOSED. AS SPACE TEMPERATURE FALLS BELOW SETPOINT, THE FAN SHALL BE STARTED AND THE HOT WATER VALVE SHALL OPEN TO THE UNIT TO SATISFY SETPOINT.

MISC. EXHAUST FANS

PROVIDE WALL SWITCHES, WALL THERMOSTATS, INTERLOCKS, ETC. AS INDICATED ON THE FAN SCHEDULE TO CONTROL FANS AS INDICATED ON PLANS.

TOILET EXHAUST FANS

BAS SHALL OPERATE EXHAUST FANS ON A PROGRAMMED SCHEDULE.

WELDING AREA GENERAL EXHAUST FAN

FAN SHALL BE PROVIDED WITH HAND-OFF-AUTO SWITCH. FAN SHALL BE CAPABLE OF BEING OPERATED IN MANUAL MODE (ON OR OFF), AND IN AUTOMATIC MODE, UPON SENSING OF CURRENT (BY CURRENT SENSORS) ON ASSOCIATED DEDICATED WELDER CIRCUIT FAN AND ASSOCIATED MOTOR OPERATED DAMPER ON OUTSIDE AIR HOOD SHALL OPEN/TURN ON. AFTER NO CURRENT IS SENSED ON ASSOCIATED WELDER CIRCUITS, FAN AND DAMPER SHALL OPERATE FOR 10 MINS (ADJ.), THEN CLOSE/TURN OFF. ALL DIGITAL/ANALOG RELAYS TO PULL SIGNAL FROM CT PROVIDED IN ELECTRICAL PANEL (BY EC), SHALL BE BY CONTROLS CONTRACTOR

VARIABLE VOLUME AIR HANDLING UNITS (3) (AHU-2&3)

ALL UNITS SHALL BE STOPPED/STARTED ON A PROGRAMMED BASIS THROUGH THE BAS.

WHILE IN THE OCCUPIED MODE, THE UNIT SUPPLY FAN(S) (WHERE MULTIPLE FANS ARE PROVIDED FANS SHALL OPERATE TOGETHER, AND UPON LOSS OF A SINGLE FAN, REMAINING FAN OR FANS SHALL CONTINUE TO OPERATE PER THE BELOW SEQUENCE) SHALL OPERATE CONTINUOUSLY. SUPPLY FAN SPEED SHALL BE CONTROLLED BY A VARIABLE FREQUENCY DRIVE AND DUCT MOUNTED STATIC PRESSURE SENSOR. THE STATIC PRESSURE SENSOR SETPOINT SHALL BE RESET USING A TRIM AND RESPOND ALGORITHM BASED ON ZONE AIR FLOW REQUIREMENTS FROM A LOW SETTING OF 0.75" (ADJ.) TO A HIGH SETTING OF 1.50" (ADJ.). ON A CALL FOR MORE AIRFLOW AT THE ZONE LEVEL AND THE SPACE TEMPERATURE ABOVE SETPOINT, THE SETPOINT SHALL BE RESET TO THE HIGHER VALUE. AS ZONE TEMPERATURE SETPOINT IS SATISFIED AND THE AIRFLOW DEMAND DECREASES, THE SETPOINT SHALL RESET TO THE LOWER VALUE. EACH UNIT SHALL BE PROVIDED WITH A PRESSURIZATION SENSOR LOCATED AS INDICATED ON THE PLANS.

A DISCHARGE AIR SENSOR SHALL CONTROL UNIT COOLING AND HEATING CONTROL VALVES TO MAINTAIN THE ROOFTOP UNIT SUPPLY AIR TEMPERATURE PER THE FOLLOWING SUPPLY AIR TEMPERATURE (SAT) RESET SCHEDULE:

SUPPLY AIR TEMPERATURE RESET:
WHEN COOLING IS REQUIRED, CONTROL MODULE SHALL MONITOR ALL VAV TERMINALS AND RECALCULATE SUPPLY AIR TEMPERATURE BASED ON THE MOST DEMANDING ZONE WITHIN THE SETPOINT RANGE (55 °F AND 65 °F, 60 °F INITIAL). FOR EVERY COOLING REQUEST AT THE ZONE LEVEL, SETPOINT WILL BE TRIMMED BY 0.5 ° (ADJUSTABLE) AND WHEN NO REQUESTS ARE PRESENT, 1°F (ADJUSTABLE) WILL BE ADDED TO THE SETPOINT. SUPPLY AIR TEMPERATURE SETPOINT IS OVERRIDDEN AND SUPPLY AIR TEMPERATURE DEFAULTS TO 55 °F IF THE RETURN AIR RELATIVE HUMIDITY RISES ABOVE 60% RH (ADJUSTABLE). SETPOINT REMAINS 55 °F UNTIL RETURN AIR RELATIVE HUMIDITY FALLS BELOW 55% RH (ADJUSTABLE)

BAS SHALL PROVIDE ECONOMIZER OPERATION TO PROVIDE "FREE COOLING" WHEN OUTDOOR AIR CONDITIONS ALLOW. UPON BAS DETERMINATION THAT OUTSIDE AIR ENTHALPY IS BELOW RETURN AIR ENTHALPY IN COOLING MODE, THE OUTSIDE AIR, RETURN AIR AND RELIEF AIR DAMPERS SHALL MODULATE TO MAINTAIN UNIT DISCHARGE AIR TEMPERATURE. IF "ECONOMIZER" CONTROL IS INSUFFICIENT TO MAINTAIN DISCHARGE AIR TEMPERATURE, THE UNIT COOLING CYCLE SHALL FUNCTION AS OUTLINED ABOVE. UPON A DROP IN DISCHARGE AIR TEMPERATURE BELOW SETPOINT, THE OUTSIDE AIR AND RELIEF AIR DAMPERS SHALL MODULATE CLOSED UNTIL THE MINIMUM OUTSIDE AIR POSITION IS REACHED. BUILDING PRESSURE SHALL BE MONITORED AND DAMPERS SHALL BE ADJUSTED TO PREVENT AN OVERPRESSURIZATION OF THE SPACE WHERE THE BUILDING PRESSURE SENSORS ARE LOCATED.

CONTROLS SHALL PROVIDE FOR MORNING WARM-UP AND NIGHT SETBACK DURING UNOCCUPIED TIMES. UPON UNIT START-UP, IF RETURN AIR TEMPERATURE IS BELOW 65° F. (ADJ) OR ABOVE 75° F. (ADJ), THE OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED AND THE HEATING OR COOLING CONTROL VALVES SHALL OPEN TO THE HEATING OR COOLING COILS AS REQUIRED TO RAISE OR LOWER THE RETURN AIR TEMPERATURE. WHEN RETURN AIR TEMPERATURE RISES ABOVE 62° F. (ADJ) OR FALLS BELOW 78° F. (ADJ), THE UNIT SHALL BE CONTROLLED AS OUTLINED ABOVE.

WHILE IN THE UNOCCUPIED MODE, THE UNIT SUPPLY FAN SHALL BE OFF, THE CHILLED WATER AND HOT WATER CONTROL VALVES SHALL BE CLOSED TO THE UNIT AND THE TERMINAL UNIT SPACE TEMPERATURE SETPOINTS SHALL BE SET TO UNOCCUPIED SETTINGS OF 60° FOR HEATING (ADJ) AND 85° FOR COOLING (ADJ). UPON A CALL FOR HEATING OR COOLING TO MEET UNOCCUPIED SETPOINTS, THE UNIT FAN SHALL BE STARTED AND THE HEATING OR CHILLED WATER CONTROL VALVES SHALL BE OPENED TO THE HEATING OR COOLING COIL AS REQUIRED BY THE SPACE TEMPERATURE. THE BOILER PLANT OR CHILLER PLANT SHALL ALSO BE STARTED AS REQUIRED TO SATISFY SETPOINTS. THE UNIT AND ASSOCIATED CENTRAL PLANT SHALL OPERATE FOR A MINIMUM OF 30 MINUTES (OR AS REQUIRED TO SATISFY UNOCCUPIED SETPOINT) AND SHALL NOT BE ALLOWED TO RESTART FOR A MINIMUM OF 15 MINUTES FOLLOWING SATISFACTION OF UNOCCUPIED SETPOINT AND SYSTEM SHUT-DOWN.

OUTSIDE AIR INTAKE SHALL BE PROVIDED WITH (2) MOTORIZED DAMPERS (1) SIZED FOR MINIMUM OUTSIDE (2-POSITION) AND (1) SIZED FOR THE REMAINING CO2 CONTROL AND ECONOMIZER OUTSIDE AIRFLOW (MODULATING). ON UNIT START UP, THE O.A. DAMPERS SHALL REMAIN CLOSED UNTIL THE RETURN AIR TEMPERATURE RISES ABOVE 65° (ADJ) OR FALLS BELOW 78° (ADJ). ONCE RETURN AIR TEMPERATURE IS SATISFIED, THE MINIMUM O.A. INTAKE DAMPER SHALL BE OPEN WHILE THE AIR HANDLING UNIT IS IN THE OCCUPIED MODE, DAMPER SHALL OPEN TO MAINTAIN THE MINIMUM OUTSIDE AIRFLOW. DAMPER SHALL REMAIN CLOSED WHILE THE UNIT IS IN THE UNOCCUPIED MODE. BAS SHALL BE CAPABLE OF OPENING AND CLOSING OUTSIDE AIR DAMPERS.

SMOKE DETECTOR SHALL BE PROVIDED IN THE RETURN DUCT (UPSTREAM OF THE OUTSIDE AIR DUCT CONNECTION). DETECTOR SHALL SHUT DOWN SUPPLY FAN UPON ACTIVATION.

A FREEZE-STAT SHALL BE LOCATED IN THE MIXED AIR STREAM TO SHUT-DOWN SUPPLY FAN IF THE MIXED AIR TEMPERATURE FALLS BELOW 40° F. FREEZE-STAT SHALL HAVE MANUAL RESET ONLY. (FREEZESTAT SHALL BE LOCATED DOWNSTREAM OF PREHEAT COIL.)

FAN COIL UNITS

FAN COIL UNITS SHALL BE STOPPED/STARTED ON A PROGRAMMED BASIS THROUGH THE BAS.

WHILE IN THE OCCUPIED MODE, THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY. A WALL MOUNTED TEMPERATURE SENSOR SHALL BE UTILIZED TO MAINTAIN SPACE TEMPERATURE OF 72° (ADJ). CHILLED WATER CONTROL VALVE SHALL MODULATE OPEN TO THE COIL ON A RISE IN TEMPERATURE ABOVE SENSOR SETPOINT. AS THE TEMPERATURE SPACE FALLS BELOW SETPOINT, CHILLED WATER CONTROL VALVE SHALL CLOSE AND HOT WATER CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN SPACE TEMPERATURE. (2)

WHERE NOTED ON FCU SCHEDULE THE MINIMUM OA AIRFLOW SHALL BE PROVIDED VIA INTERLOCKED OA-MOTOR OPERATED DAMPER, OUTSIDE AIR ROOF HOOD, AND RELIEF AIR-MOTOR OPERATED DAMPER, AND RELIEF FAN / HOOD. DAMPERS SHALL BE OPEN DURING ALL TIMES FCU IS IN OPERATION. MOTOR OPERATED DAMPER IN OA DUCT SHALL BE MODULATING TYPE BALANCED TO PROVIDE MIN. OUTSIDE AIR LISTED IN SCHEDULE AND PARTIAL ECONOMIZER NOTED BELOW.

BAS SHALL PROVIDE PARTIAL ECONOMIZER OPERATION TO PROVIDE "FREE COOLING" WHEN OUTDOOR AIR CONDITIONS ALLOW. UPON BAS DETERMINATION THAT OUTSIDE AIR ENTHALPY IS BELOW RETURN AIR ENTHALPY IN COOLING MODE, THE OUTSIDE AIR, AND RELIEF DAMPER/FAN SHALL MODULATE/OPERATE TO MAINTAIN UNIT DISCHARGE AIR TEMPERATURE. IF "ECONOMIZER" CONTROL IS INSUFFICIENT TO MAINTAIN DISCHARGE AIR TEMPERATURE, THE UNIT COOLING CYCLE SHALL FUNCTION AS OUTLINED ABOVE. UPON A DROP IN DISCHARGE AIR TEMPERATURE BELOW SETPOINT, THE OUTSIDE AIR AND RELIEF AIR DAMPERS/FANS SHALL MODULATE CLOSED UNTIL THE MINIMUM OUTSIDE AIR POSITION IS REACHED.

WHILE IN THE UNOCCUPIED MODE, THE UNIT SUPPLY FAN SHALL BE OFF, THE CHILLED WATER AND HOT WATER CONTROL VALVES SHALL BE CLOSED TO THE UNIT AND THE SPACE TEMPERATURE SETPOINTS SHALL BE SET TO UNOCCUPIED SETTINGS OF 60° FOR HEATING (ADJ) AND 85° FOR COOLING (ADJ). UPON A CALL FOR HEATING OR COOLING TO MEET UNOCCUPIED SETPOINTS, THE UNIT FAN SHALL BE STARTED AND THE HEATING OR CHILLED WATER CONTROL VALVES SHALL BE OPENED TO THE HEATING OR COOLING COIL AS REQUIRED BY THE SPACE TEMPERATURE. THE BOILER PLANT OR CHILLER PLANT SHALL ALSO BE STARTED AS REQUIRED TO SATISFY SETPOINTS. THE UNIT AND ASSOCIATED CENTRAL PLANT SHALL OPERATE FOR A MINIMUM OF 30 MINUTES (OR AS REQUIRED TO SATISFY UNOCCUPIED SETPOINT) AND SHALL NOT BE ALLOWED TO RESTART FOR A MINIMUM OF 15 MINUTES (ADJ.) FOLLOWING SATISFACTION OF UNOCCUPIED SETPOINT AND SYSTEM SHUT-DOWN.

DRAIN PAN FLOAT ALARM SHALL BE INTERLOCKED WITH UNIT OPERATION, AND SHALL SHUTDOWN UNIT UPON BEING ACTIVATED.

HEAT TAPE

HEAT TAPE FOR ABOVE GRADE EXTERIOR PIPING AND CHILLER HEATER SHALL PROVIDE FREEZE PROTECTION FOR EXTERIOR CHILLED WATER SYSTEMS, THESE SYSTEM SHALL BE PROVIDED WITH EMERGENCY POWER TO CONTINUE FREEZE PROTECTION DURING A POWER OUTAGE. A TEMPERATURE SENSOR SHALL BE PROVIDED WITHIN THE INSULATION ON ALL EXTERIOR PIPING WITH HEAT TAPE TO VERIFY HEAT TAPE OPERATION. IF TEMPERATURE FALLS BELOW 35° F. (ADJ), AN ALARM SHALL BE SENT AND THE PRIMARY CHILLED WATER PUMPS (P-1, P-2,) SHALL BE STARTED.

WATER HEATER

BAS SHALL HAVE GLOBAL CONTROL OVER DOMESTIC WATER HEATING SYSTEM.

OFFICE / SHOPS:
- WH1: HEATER SET TO 140 DEGREES, WITH MIXING VALVE DELIVERING 120-DEGREE SUPPLY
- RCP1: SUPPLY AT 120 DEGREES AND RETURN AT 110 DEGREES
- HIGH TEMP ALARM AT 125 DEGREES

WAREHOUSE:
- WH4: HEATER SET TO 140 DEGREES (NO MAIN MIXING VALVE)
- RCP4: SUPPLY AT 140 DEGREES AND RETURN AT 130 DEGREES (DUE TO EMERGENCY SHOWERS)
- HIGH TEMP ALARM AT 150 DEGREES

WATER HEATER SHALL CYCLE ON AND OFF BASED ON TANK TEMPERATURE, TO MAINTAN NOTED TEMPERATURES. AN ALARM SHALL BE GENERATED SHOULD TANK DEVIATE FROM SETPOINT BY 10° EITHER HIGH OR LOW. AN ALARM SHALL ALSO BE GENERATED SHOULD THE DOMESTIC HWS TEMPERATURE DEVIATE FROM SETPOINT BY 10° EITHER HIGH OR LOW. CIRCULATION PUMPS SHALL OPERATE BASED ON THE AQUASTAT TEMPERATURE SETTINGS. A TEMPERATURE SENSOR SHALL BE MOUNTED IN THE END OF THE LINE CAPABLE OF OVERRIDING THE PUMP SHOULD THE LOOP TEMPERATURE FALL BELOW NOTED TEMPERATURES FOR RCP-1 & 4. BAS SHALL ALSO MONITOR BOTH DOMESTIC HWR TEMPERATURES AND DOMESTIC WATER SUPPLY TEMPERATURE FOR TRACKING PURPOSES. COORDINATE ALL TEMPERATURE SENSOR LOCATIONS WITH PLUMBING CONTRACTOR.

DUCTLESS SPLIT SYSTEMS:

UNITS SHALL PROVIDE COOLING ON A CONTINUOUS BASIS. SUPPLY FAN SHALL RUN CONTINUOUSLY AND COOLING CYCLE SHALL CYCLE WITH A CALL FOR COOLING TO MAINTAIN ROOM TEMPERATURE SETPOINT OF 75° F. (ADJ.). UNITS SHALL BE PROVIDED WITH STANDALONE FACTORY CONTROLS. BAS SHALL MONITOR SYSTEM STATUS AND SHALL ALSO MONITOR ROOM TEMPERATURE WITH A WALL MOUNTED TEMPERATURE SENSOR. AN ALARM SHALL BE GENERATED UPON AN EQUIPMENT FAILURE OR IF THE ROOM TEMPERATURE RISES ABOVE 85° F. (ADJ.)

DUCT MOUNTED SMOKE DETECTORS:

SMOKE DETECTOR SHALL BE PROVIDED IN THE RETURN DUCT PRIOR TO THE OUTSIDE AIR DUCT CONNECTION. DETECTOR SHALL INTERFACE WITH FIRE ALARM SYSTEM AND SHUT-DOWN UNIT FANS UPON ACTIVATION. A NOTIFICATION ALARM SHALL BE GENERATED WHEN A SMOKE DETECTOR IS ACTIVATED. SMOKE DETECTORS SHALL BE INDICATED ON EQUIPMENT GRAPHICS WITH WHICH DETECTOR IS ASSOCIATED.

VARIABLE AIR VOLUME BOXES

A TEMPERATURE SENSOR SHALL BE UTILIZED TO MAINTAIN SPACE TEMPERATURE SETPOINT OF 72° (ADJ). ON RISE IN SPACE TEMPERATURE ABOVE SETPOINT, THE VOLUME DAMPER SHALL OPEN AS REQUIRED TO MAINTAIN SPACE TEMPERATURE. ON DROP IN SPACE TEMPERATURE BELOW SETPOINT, THE VOLUME DAMPER SHALL CLOSE UNTIL THE MINIMUM DAMPER POSITION IS REACHED. THE HOT WATER CONTROL VALVE SHALL BE MODULATED OPEN TO THE HEATING COIL AND THE TERMINAL UNIT DAMPER SHALL OPEN TO THE MIN CFM AS INDICATED IN THE SCHEDULE. AS THE TEMPERATURE RISES ABOVE SET POINT THE HOT WATER CONTROL VALVE SHALL CLOSE AND THE DAMPER SHALL RETURN TO THE MINIMUM POSITION.

WHEN WARM AIR IS SENSED BY THE TERMINAL UNIT DURING MORNING WARM-UP, THE DAMPER SHALL RESPOND TO THE SPACE TEMPERATURE. THE TERMINAL UNIT DAMPER SHALL OPEN ON A CALL FOR HEATING AND SHALL REMAIN CLOSED IF THE SPACE TEMPERATURE IS AT OR ABOVE OCCUPIED SETPOINT.

THE TEMPERATURE SENSOR SHALL BE PROVIDED WITH AN OVERRIDE FUNCTION THAT WILL PLACE THE SYSTEM IN THE OCCUPIED MODE FOR A PERIOD OF UP TO 2 HOURS. THE OVERRIDE SHALL ACTIVATE THE SYSTEM AHU AND THE HEATING OR COOLING CENTRAL PLANT AS REQUIRED TO MAINTAIN SPACE TEMPERATURE. TEMPERATURE SENSORS SHALL HAVE A MIN 5°F DEADBAND

FREEZE PROTECTION (LOSS OF POWER)

HEAT TAPE FOR EXTERIOR PIPING AT CHILLER SHALL BE PROVIDED WITH EMRGENCY POWER TO PROVIDE FREEZE PROTECTION. A TEMPERATURE SENSOR SHALL BE PROVIDED WITHIN THE INSULATION ON ALL EXTERIOR PIPING WITH HEAT TAPE TO VERIFY HEAT TAPE OPERATION. IF TEMPERATURE FALLS BELOW 35° F. (ADJ), AN ALARM SHALL BE SENT.

DUST COLLECTOR

PROVIDE CONTROL RELAY FOR AUTOMATIC SHUTDOWN WHEN SIGNAL RECEIVED FROM (FA/EPO) SYSTEM

OPERATION SHALL BE VIA A WALL MOUNTED CONTROL BOX WITH PUSH BUTTON MAGNETIC STARTER PROGRAMMED TO RUN DUST COLLECTOR FOR 4 HOURS (ADJ), THEN SHUT OFF,

ASSOCIATED MOTOR OPERATED DAMPER IN OA PLENUM SHALL BE OPEN WHENEVER DUST COLLECTOR IS IN OPERATION, AND CLOSED WHEN NOT IN OPERATION.

PROVIDE WITH MANUAL OVERRIDE FOR ON/OFF OPERATION

UTILITY MONITORING:
THE INTENT OF THE SYSTEM IS TO CONSTANTLY MEASURE THE NOTED UTILITIES. THE CONTROLS CONTRACTOR (SYSTEM INTEGRATOR) WILL PROVIDE THE DATA LOGGING DEVICES AS REQUIRED TO MONITOR THE BUILDING UTILITIES FOR THIS PROJECT.

UTILITY MONITORING NOTES:
1. DOMESTIC WATER AND NATURAL GAS PULSE METERS SHALL BE PROVIDED AND INSTALLED BY THE PLUMBING CONTRACTOR. METERS SHALL PROVIDE BOTH CUBIC FEET (CF) TOTAL USAGE AND CUBIC FEET PER HOUR (CFH) DEMAND.
2. ELECTRICAL CIRCUITS AND CT'S FOR MONITORING POWER SHALL BE PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL ALSO PROVIDE AND INSTALL 3-PHASE AND MULTI-CIRCUIT METERS.
3. THE CONTROLS CONTRACTOR (SYSTEM INTEGRATOR) SHALL COORDINATE COMMUNICATION PROTOCOL REQUIREMENTS FOR ALL METERS AND MONITORING DEVICES WITH ALL OTHER DIVISIONS TO ENSURE SYSTEM COMPATIBILITY.
4. DATA LOGGER SHALL BE EQUAL TO TRIDIUM JACE

CONTROL SYSTEM NOTES

1. SEE SPECIFICATIONS (SECTION 230900) FOR ADDITIONAL REQUIREMENTS.
2. THE SEQUENCE OF OPERATION OF OPERATION AND POINTS LIST IS INTENDED TO COMMUNICATE THE MINIMUM REQUIREMENTS AND GENERAL DESIGN INTENT TO THE CONTROLS CONTRACTOR AND IS NOT INTENDED TO BE A FULLY DEVELOPED OR COMPLETE SEQUENCE OF OPEARTION. IN THE CONTROLS SUBMITTAL THE CONTROLS CONTRACTOR SHALL FULLY DEVELOP THE SEQUENCE OF OPERATIONS FOR ALL SYSTEMS IDENTIFIED AN SHALL PRESENT ALL SETPOINTS, CONTROL PARAMETERS, TIME DELAYS, ALARM POINTS, ETC. AS REQUIRED TO COMPLY WITH THE DESIGN INTENT. THE CONTROLS CONTRACTOR SHALL INCORPORATE STANDARD FEATURES SUCH AS MINIMUM RUN TIME DELAYS AND DEAD BANDS TO PREVENT SHORT CYCLING. ALL MONITORED POINTS SHALL INCLUDE EARLY HIGH/LOW ALARM NOTIFICATIONS PRIOR TO REQUIRED CORRECTIVE ACTIONS OR UNIT SHUT-DOWNS. CONTROL CONTRACTOR SHALL SPECIFY IN THE CONTROL SUBMITTAL FAIL SAFE POSITION FOR OUT OF RANGE, FAIL SAFE POSITIONING FOR OPEN CIRCUITS OR LOSS OF COMMUNICATION.
3. SYSTEM SHALL USE CAMPUS SYSTEM GLOBAL OUTSIDE AIR TEMPERATURE AND HUMIDITY SENSORS FOR PRIMARY SYSTEM OPERATION. LOCAL OUTSIDE AIR TEMPERATURE AND HUMIDITY SENSORS SHALL BE PROVIDED FOR SYSTEM OPERATION UPON LOSS OF NETWORK COMMUNICATION.
4. ALL CONTROL SETPOINTS SHALL BE ADJUSTABLE AND TRENDABLE. INDICATED TEMPERATURE SETPOINTS SHOULD BE USED FOR ORIGINAL SYSTEM SET-UP. ANY CHANGES IN SETPOINT SETTINGS REQUIRED FOR INTENDED SYSTEM OPERATION SHALL BE NOTED ON AS-BUILT CONTROL DRAWINGS.
5. FLOW SWITCHES OR ADJUSTABLE TYPE CURRENT SWITCHES SHALL BE PROVIDED IN THE PIPING OF EACH PUMP TO VERIFY PUMP STATUS.
6. IONIZATION TYPE DUCT SMOKE DETECTORS SHALL BE FURNISHED AND WIRED TO THE FIRE ALARM SYSTEM BY THE ELECTRICAL CONTRACTOR. MECHANICAL CONTRACTOR SHALL INSTALL DETECTORS IN THE DUCT AND WIRE UNIT FROM FIRE ALARM SYSTEM (DRY CONTACTS) FOR UNIT SHUT-DOWN UPON ACTIVATION.
7. ELECTRICAL CONTRACTOR SHALL PROVIDE DEDICATED 120V CIRCUIT(S) IN A J-BOX FOR CONTROL POWER. CONTROLS CONTRACTOR SHALL EXTEND 120V POWER FROM J-BOX TO CONTROL PANELS, DAMPER ACTUATORS, TRANSFORMERS, ETC. AS REQUIRED FOR OPERATION OF CONTROL SYSTEM.
8. BAS SHALL ALLOW GLOBAL OPERATION OF VAV HOT WATER CONTROL VALVES.
9. SYSTEM GRAPHICS SHALL INCLUDE ALL SMOKE DAMPER LOCATIONS AND SHALL PROVIDE STATUS AND GENERATE AN ALARM UPON ACTIVATION.
10. LOCATE MAIN DDC CONTROL PANEL(S) IN MECHANICAL ROOM. COORDINATE EXACT LOCATION PANEL WITH ALL OTHER TRADES PRIOR TO INSTALLATION.
11. PER NORTH CAROLINA STATE CONSTRUCTION REQUIREMENTS FOR MAJOR FACILITIES, THIS PROJECT WILL MEASURE AND TRACK ALL ELECTRICAL, GAS AND WATER CONSUMPTION. REFER TO 'MEASUREMENT AND VERIFICATION' NOTE ON DRAWING M001 AND SPECIFICATION SECTION 230900 FOR ADDITIONAL REQUIREMENTS.
12. PROVIDE EXPORT TAGGING AND CONTROLS PROGRAMMING AS REQUIRED TO FULLY INTEGRATE WITH THE UNIVERSITY BAS SERVER PLATFORM TO SIMPLIFY IMPORTING TO EXISTING ALC PLATFORM, POINTS LIST, AND GRAPHIC CONTROL SCREENS. TAGGING REQUIRED ON ALL PROJECTS. POINTS SHALL BE TAGGED APPROPRIATELY WITH HAYSTACK, NIAGARA, AND UNCC TAG LIBRARIES. EQUIPMENT SHALL BE TAGGED WITH THE SAME NAME AS ON THE DRAWINGS
13. PROVIDE ALL CONTROL PANELS WITH 3RD PARTY U.L. LISTING

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 17228 RONALD V. ALMOND
9/19/17

REVISIONS:

No.	Description	Date
1	Addendum #4	8.28.2017
2	Addendum #6	9.19.2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: CAH
CHECKED BY: RVA

MECHANICAL SEQUENCE OF OPERATIONS

M-005

OPTIMA #: 16-0265

BUILDING BID DOCUMENTS

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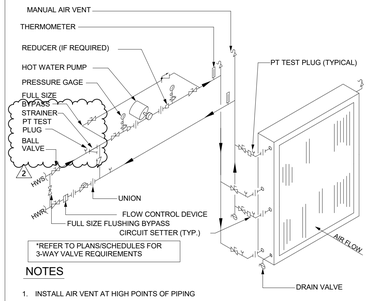
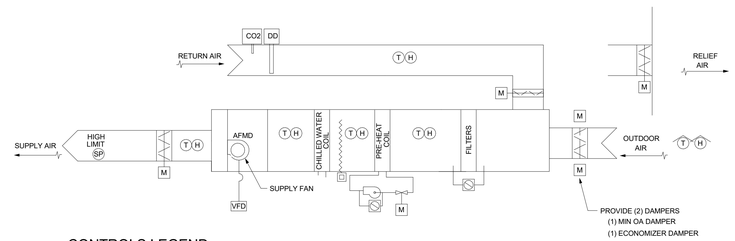


*REFER TO PLANS/SCHEDULES FOR 3-WAY VALVE REQUIREMENTS

NOTES

1. INSTALL AIR VENT AT HIGH POINTS OF PIPING
2. INSTALL DRAIN VALVES AT LOW POINTS OF PIPING
3. EXTEND COIL VENTS AND DRAINS (IF PROVIDED BY COIL MANUFACTURER) THROUGH AIR HANDLING UNIT HOUSING
4. INSTALL FLOW CONTROL DEVICE MINIMUM OF 10 PIPE DIAMETERS STRAIGHT PIPE (OR MORE IF REQUIRED BY MANUFACTURER) DOWNSTREAM OF NEAREST FITTING (DETAIL IS FOR PREHEAT COIL, FOR REHEAT COIL DO NOT PROVIDE PUMP, ASSOCIATED VALVING, & INTERCONNECTING PIPING WITH CHECK VALVE)

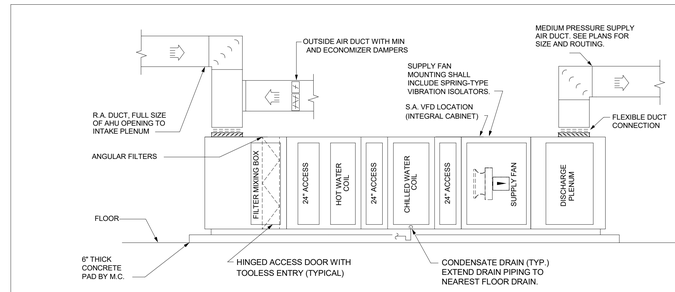
1 HOT WATER COIL W/ PUMP DETAIL
NO SCALE



CONTROLS LEGEND

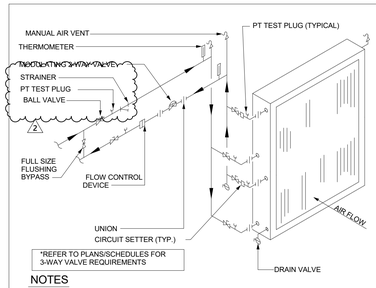
- TEMPERATURE SENSOR
- RELATIVE HUMIDITY SENSOR
- MOTOR OPERATED DAMPER
- HIGH LIMIT STATIC PRESSURE SENSOR
- DUCT MOUNTED SMOKE DETECTOR BY E.C.
- PUMP
- FREEZE DETECTION THERMOSTAT (MANUAL RESET)
- AIR FLOW MONITORING DEVICE
- DIFFERENTIAL PRESSURE SWITCH
- 2-WAY CONTROL VALVE
- N.O. NORMALLY OPEN
- N.C. NORMALLY CLOSED
- VFD VARIABLE FREQUENCY DRIVE

2 AHU (2 & 3) CONTROL DIAGRAM
NO SCALE



NOTES:
AHU SHALL BE INSTALLED ON A 6" THICK CONCRETE HOUSEKEEPING PAD. AHU PAD SHALL BE REINFORCED WITH 6x6-10/10 WIRE MESH. MECHANICAL CONTRACTOR SHALL CLOSELY COORDINATE EXACT LOCATIONS WITH OTHER TRADES TO AVOID CONFLICTS PRIOR TO FINAL LOCATION OF PADS.

3 AIR HANDLER (1+2&3) DETAIL
NO SCALE

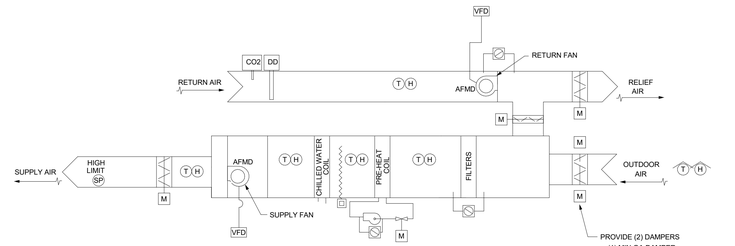


*REFER TO PLANS/SCHEDULES FOR 3-WAY VALVE REQUIREMENTS

NOTES

1. INSTALL AIR VENT AT HIGH POINTS OF PIPING
2. INSTALL DRAIN VALVES AT LOW POINTS OF PIPING
3. EXTEND COIL VENTS AND DRAINS (IF PROVIDED BY COIL MANUFACTURER) THROUGH AIR HANDLING UNIT HOUSING
4. INSTALL FLOW CONTROL DEVICE MINIMUM OF 10 PIPE DIAMETERS STRAIGHT PIPE (OR MORE IF REQUIRED BY MANUFACTURER) DOWNSTREAM OF NEAREST FITTING

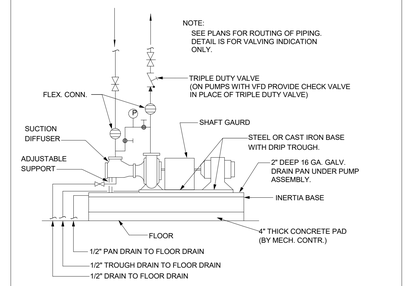
4 CHILLED WATER COIL DETAIL
NO SCALE



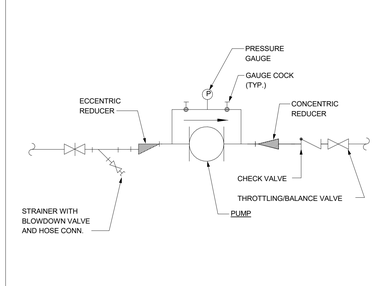
CONTROLS LEGEND

- TEMPERATURE SENSOR
- RELATIVE HUMIDITY SENSOR
- MOTOR OPERATED DAMPER
- HIGH LIMIT STATIC PRESSURE SENSOR
- DUCT MOUNTED SMOKE DETECTOR BY E.C.
- PUMP
- FREEZE DETECTION THERMOSTAT (MANUAL RESET)
- AIR FLOW MONITORING DEVICE
- DIFFERENTIAL PRESSURE SWITCH
- 2-WAY CONTROL VALVE
- N.O. NORMALLY OPEN
- N.C. NORMALLY CLOSED
- VFD VARIABLE FREQUENCY DRIVE

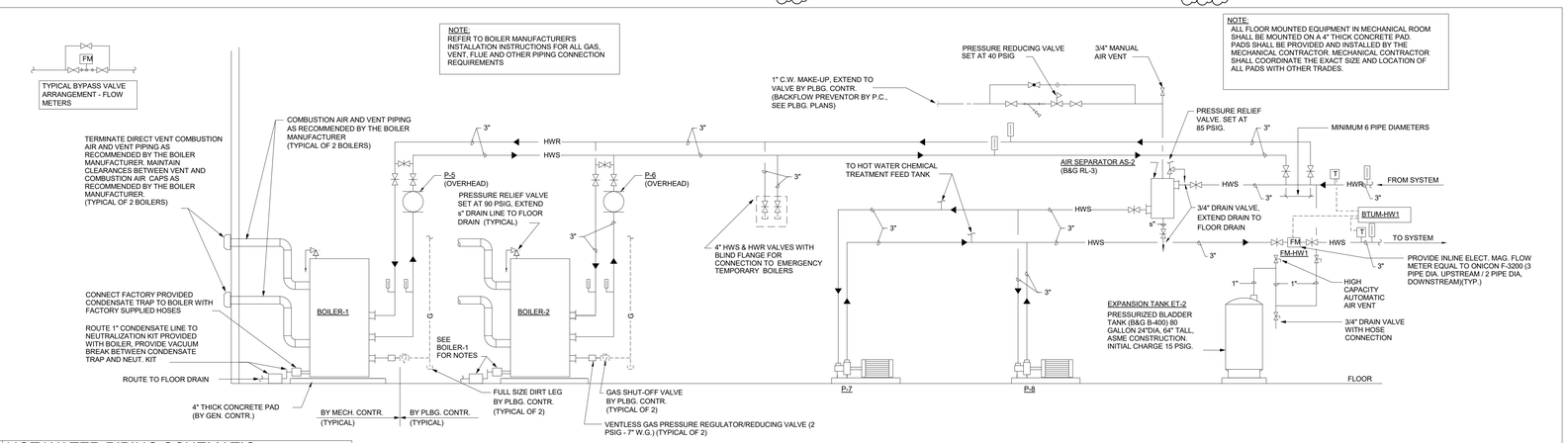
5 AHU-1 CONTROL DIAGRAM
NO SCALE



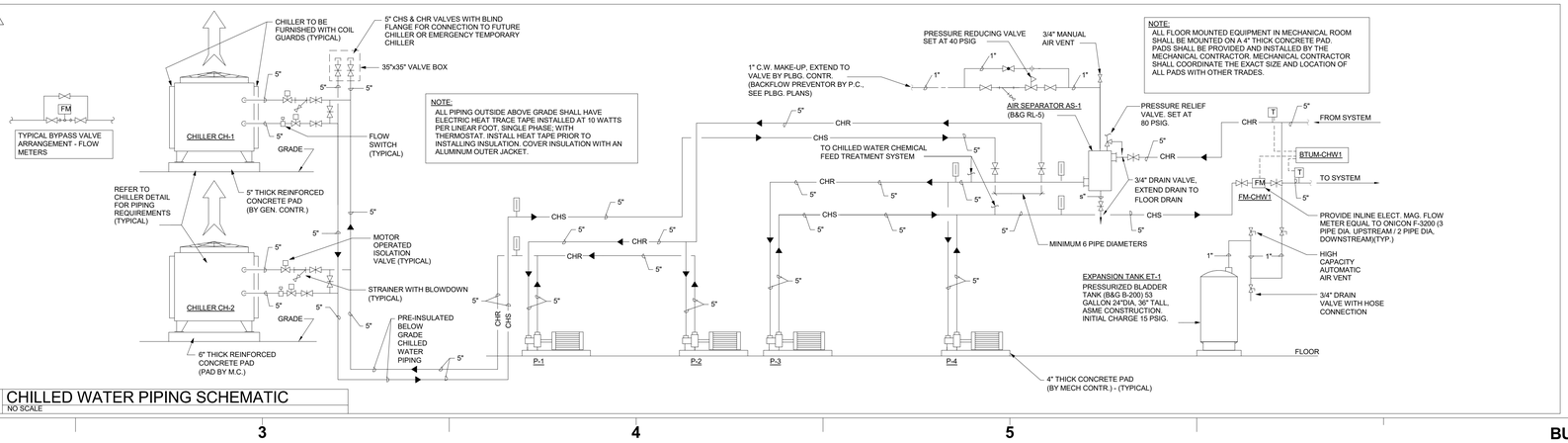
6 PUMP PIPING DETAIL
NO SCALE



7 INLINE PUMP DETAIL
NO SCALE



8 HOT WATER PIPING SCHEMATIC
NO SCALE



9 CHILLED WATER PIPING SCHEMATIC
NO SCALE

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9/19/17

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1	Addendum #4	8.28.2017
2	Addendum #6	9.19.2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: CAH
CHECKED BY: RVA

ENLARGED MECHANICAL ROOM DETAILS

M-403

OPTIMA #: 16-0265

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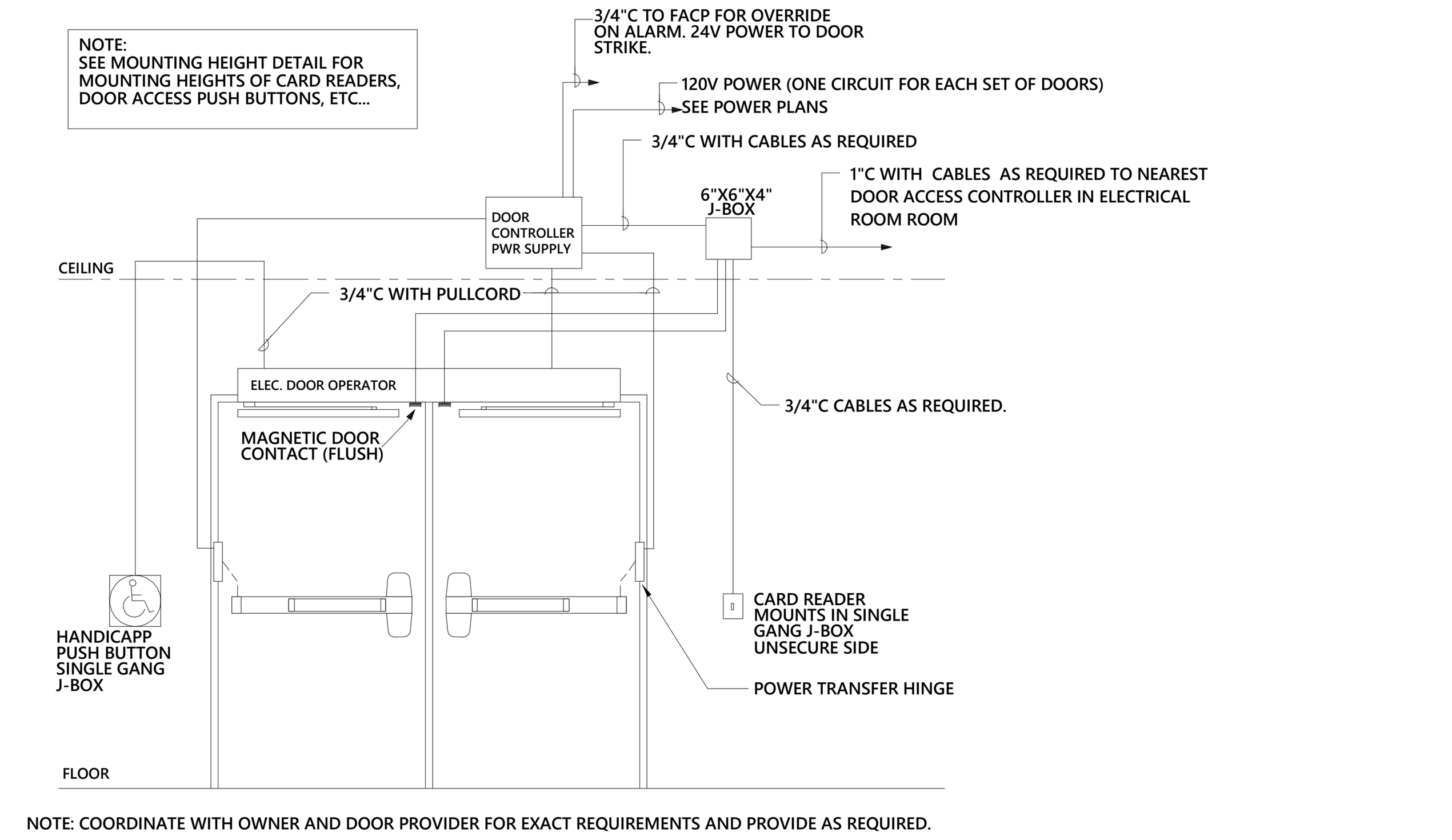
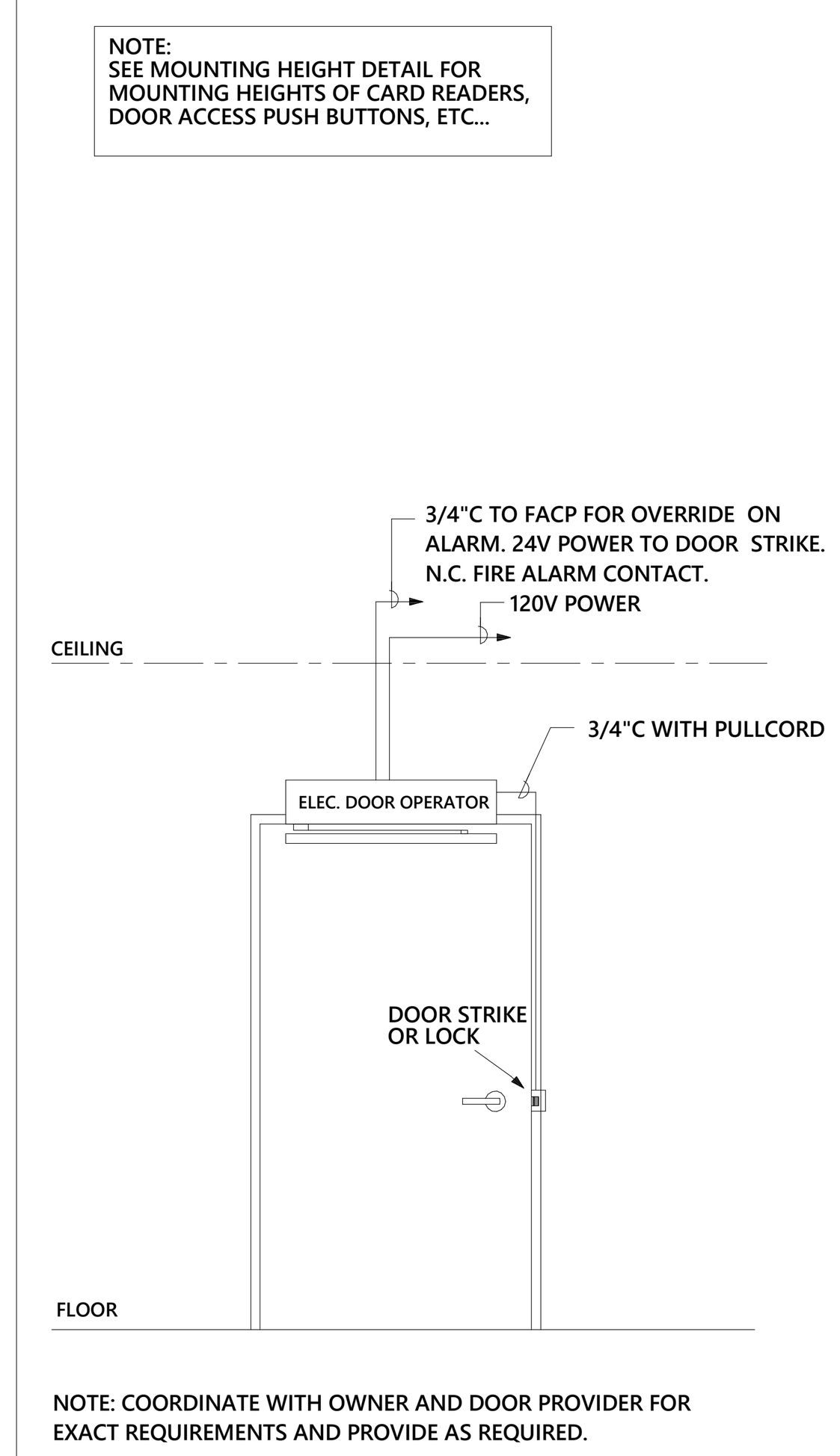
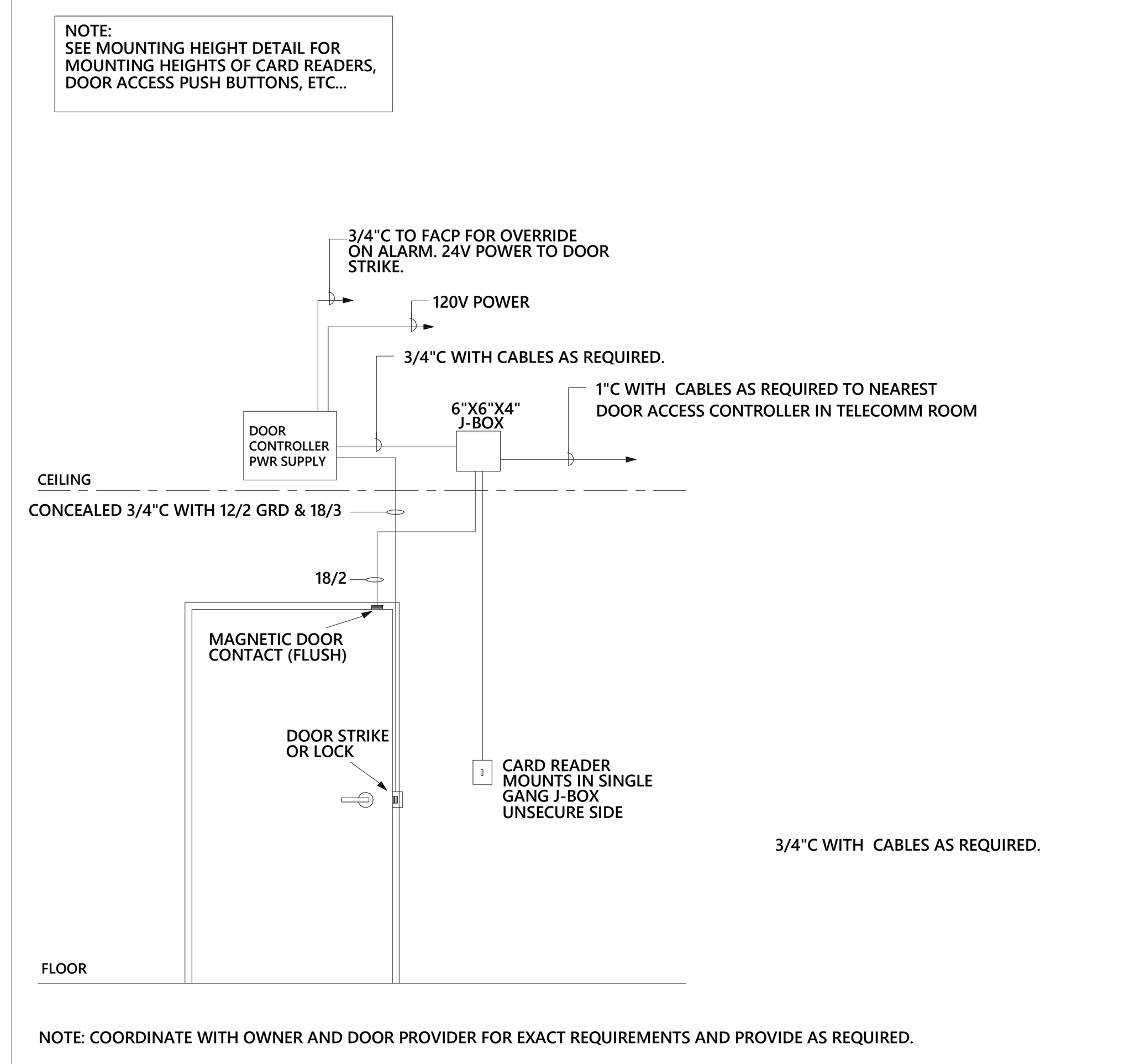


1 TYPICAL OPEN OPTIONS SYSTEM DOUBLE DOOR; CARD READER, ADA DOOR OPENER & DOOR PROP ALARM
NO SCALE



2 ADA DOOR OPERATOR
NO SCALE

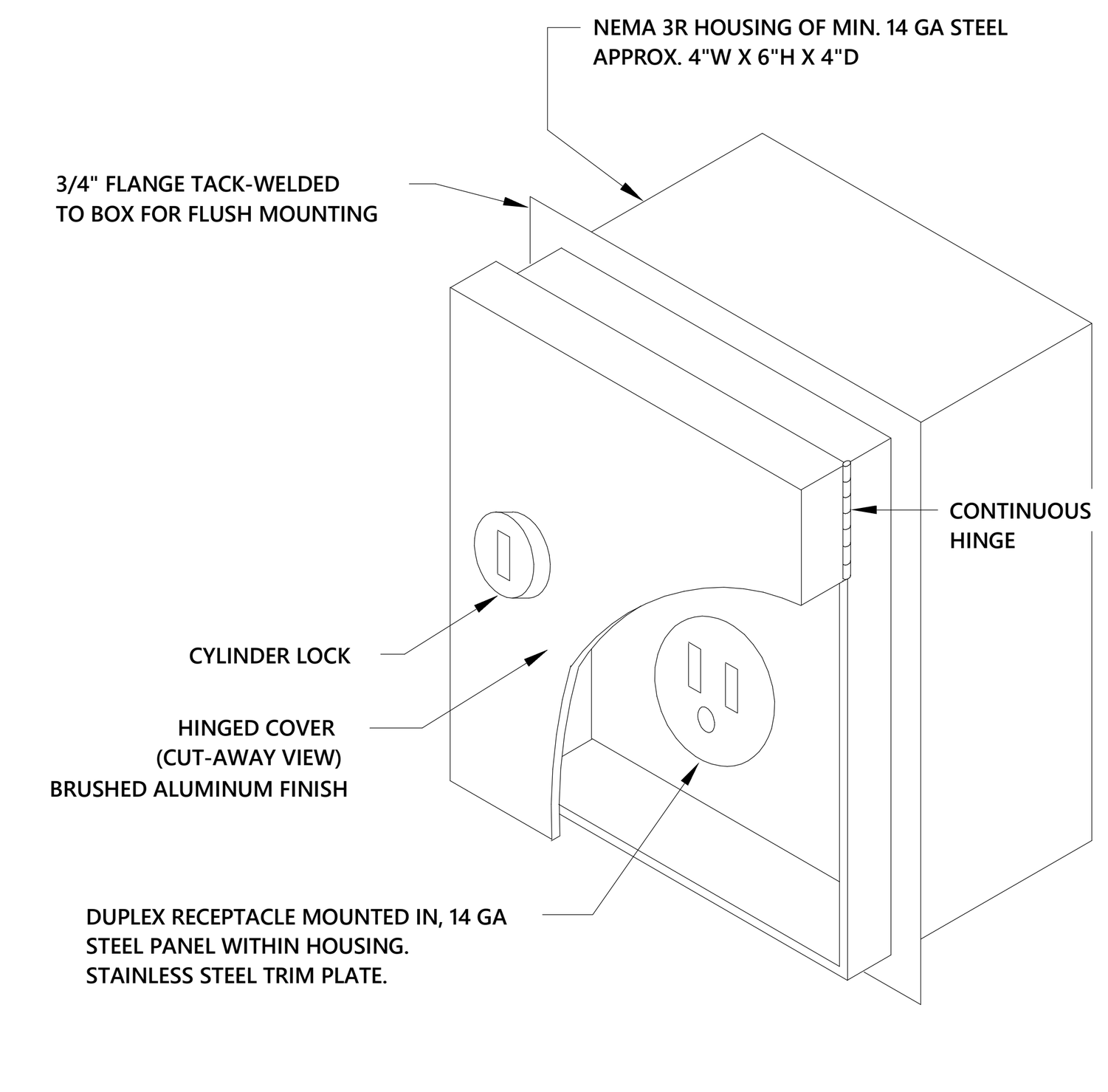


3 CARD READER/DOOR PROP ALARM DIAGRAM
NO SCALE

ACCESS CONTROL GENERAL NOTES:

1. THE E.C. SHALL PROVIDE AND INSTALL A COMPLETE WORKING SYSTEM BASED AROUND THE OPEN OPTIONS ACCESS CONTROL SYSTEM (INCLUDING THE CONTROL PANELS, UPS, WIRING AND INTEGRATION). THE E.C. IS TO INTEGRATE ALL DOOR ACCESS CONTROLS AND COMPONENTS INTO THE ACCESS CONTROL SYSTEM. CARD READERS ARE PROVIDED BY OTHERS, EXCEPT THE E.C. IS TO PROVIDE CARD READERS (BLACKBOARD DR4200) AT DOORS 100A, 100B, 120A AND AT EXTERIOR MAN DOOR IN FENCE NOTED ON SITE PLAN, SHEET E-010. THE E.C. IS ALSO TO PROVIDE EXTERIOR PEDESTALS, PUSH BUTTONS, DOOR CONTACTS, ETC... AT THE TWO SETS OF DOORS AT VESTIBULES 100 AND 120.
2. VERIFY THE QUANTITY OF ENCLOSURES REQUIRED FOR THE OPEN OPTIONS SYSTEM. PROVIDE THE PROPER NUMBER OF CIRCUITS AS REQUIRED FOR VERIFIED QUANTITIES OF ENCLOSURES.
3. THE E.C. IS TO CONTACT THE OWNER'S SECURITY E.C. TO OBTAIN PRICING AND INSTALLATION OF A COMPLETE WORKING SYSTEM.
4. DEVICE CABLING FOR THE OPEN OPTIONS SYSTEM WILL BE YELLOW SHEATHED. DOOR ACCESS CABLE NEEDS TO BE A COMPOSITE CABLE WITH ALL CABLES NEEDED FOR THE DOOR UNDER ONE SHEATH. THIS IS A NEW REQUIREMENT FOR THE SECURITY SYSTEM CABLING.
5. THE E.C. IS TO PROVIDE THE CORRECT NUMBER OF DNA LICENSE.

1



5 LOCKABLE RECEPTACLE ENCLOSURE
NO SCALE

UTILITY MONITORING SYSTEM NOTES

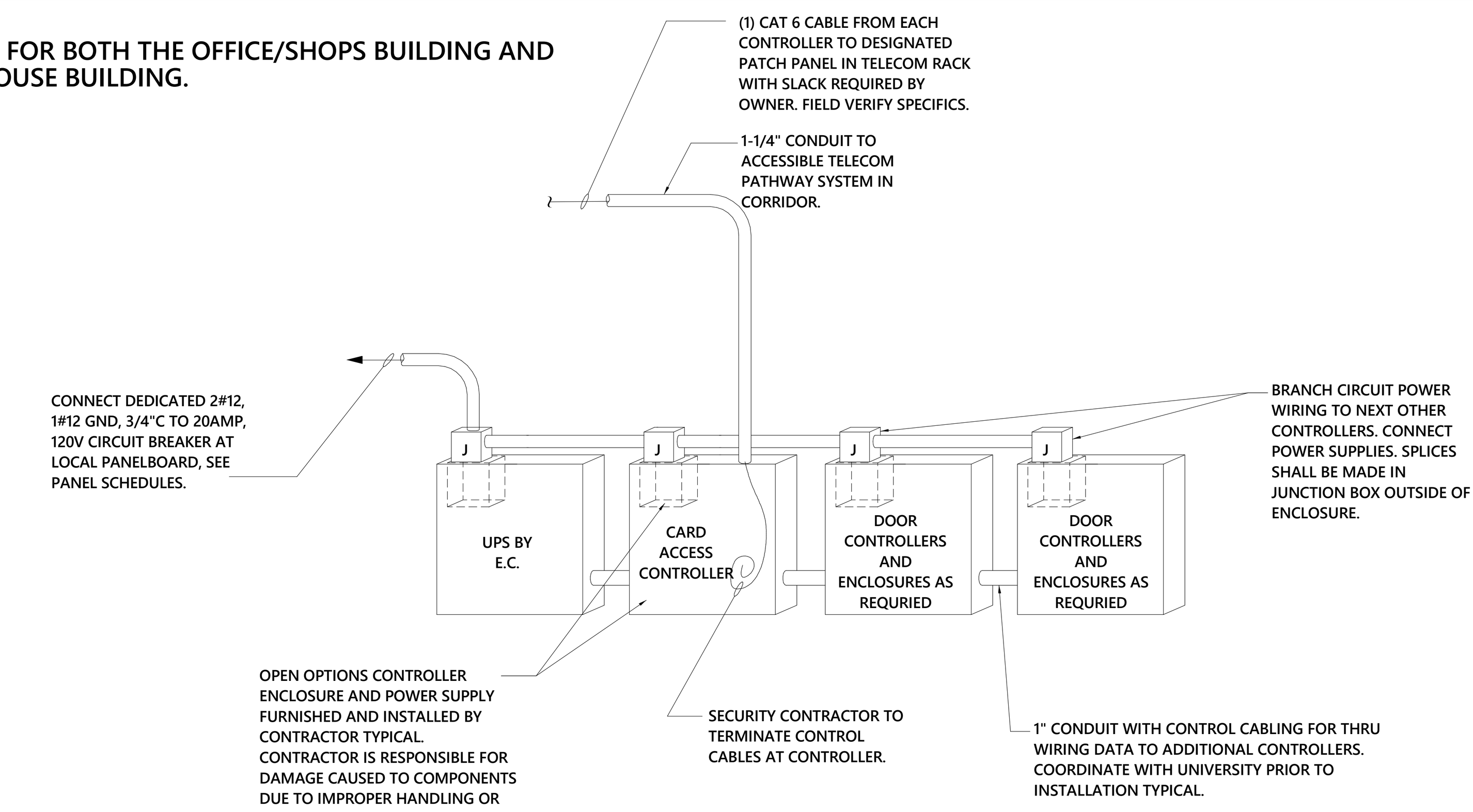
SYSTEM DESCRIPTION:

THE UTILITY RESOURCE MONITORING SYSTEM IS PROVIDED BY THE MECHANICAL CONTRACTOR. METERS AND MONITORING DEVICES ARE PROVIDED AS NOTED BELOW. THE INTENT OF THE SYSTEM IS TO CONSTANTLY MEASURE AND DISPLAY THE ENERGY (ELECTRICAL AND NATURAL GAS) AND WATER (DOMESTIC, CHILLED WATER, AND HOT WATER) BEING CONSUMED BY THE BUILDING. THE INFORMATION SHALL BE MADE PUBLIC VIA THE INTERNET AND VIA UNCC'S EXISTING UTILITY MONITORING DASHBOARD SYSTEM, PERISCOPE BY ACTIVELOGIX. THE SYSTEM INTEGRATOR IS RESPONSIBLE FOR PROVIDING TRENDS FOR INTEGRATION INTO PERISCOPE. THE SYSTEM INTEGRATOR WILL PROVIDE AN ENERGY/UTILITY DASHBOARD FOR PROJECT USING PERISCOPE. ALL ELECTRICAL CIRCUITS FOR MONITORING ELECTRICITY ARE SHOWN ON THE ELECTRICAL PANEL SCHEDULES.

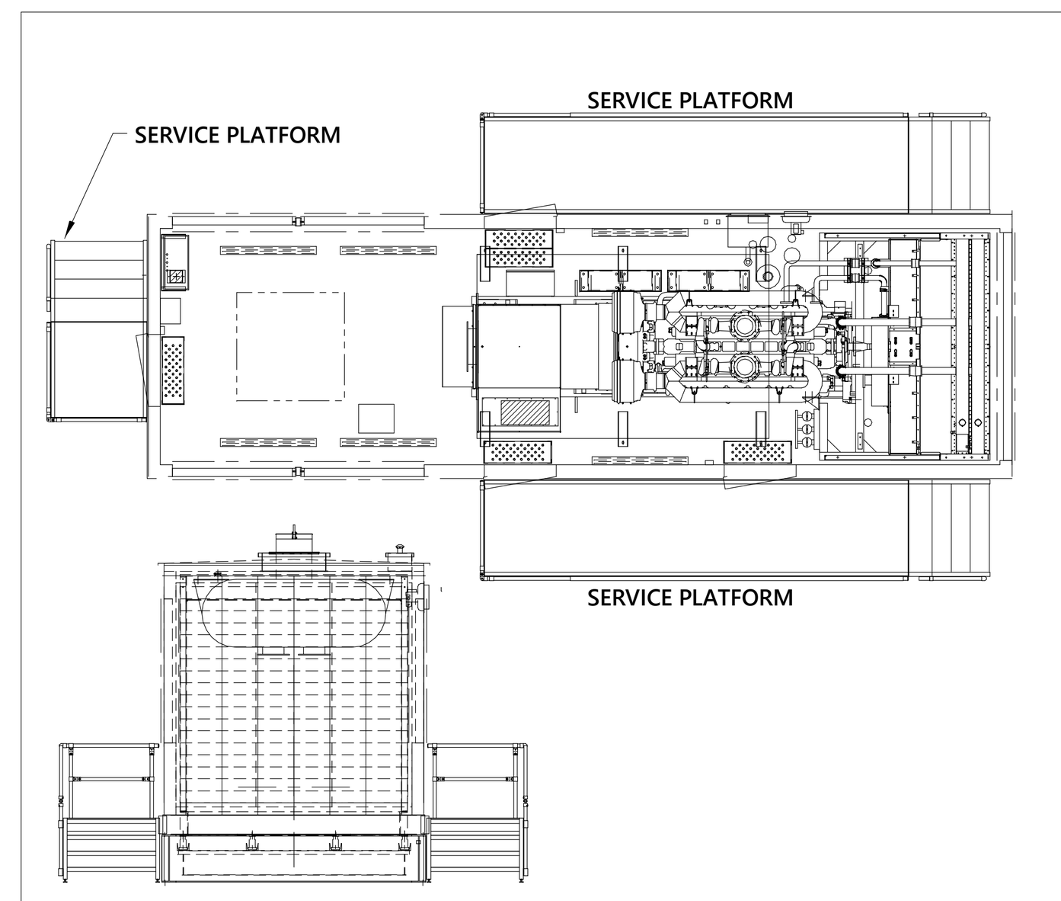
ELECTRICAL GENERAL NOTES (PROVIDED BY THE ELECTRICAL CONTRACTOR):

1. PROVIDE A MULTIPLE CIRCUIT POLYPHASE METER THAT MEASURES PHASE VOLTAGE, PHASE CURRENT, ENERGY, POWER AND POWER DEMAND AND HAS A MODBUS RTU 2-WIRE OUTPUT. PROVIDE PROPERLY SIZED CURRENT TRANSFORMERS.
2. SEE PANEL SCHEDULES FOR CT SIZES, QUANTITIES AND LOCATIONS
3. SEE DRAWINGS FOR QUANTITIES AND TYPES OF CURRENT TRANSFORMERS AND METERS.
4. DO NOT MIX VOLTAGES WITH METERS. DIFFERENT VOLTAGE PANELS WILL REQUIRE SEPARATE METERS.
5. PROVIDE A 3-POLE 15A BREAKER IN EACH PANEL BEING MONITORED FOR VOLTAGE REFERENCE.
6. METERING DEVICES SHALL BE BY DENT INSTRUMENTS, VERIS, OR EMON

TYPICAL FOR BOTH THE OFFICE/SHOPS BUILDING AND WAREHOUSE BUILDING.



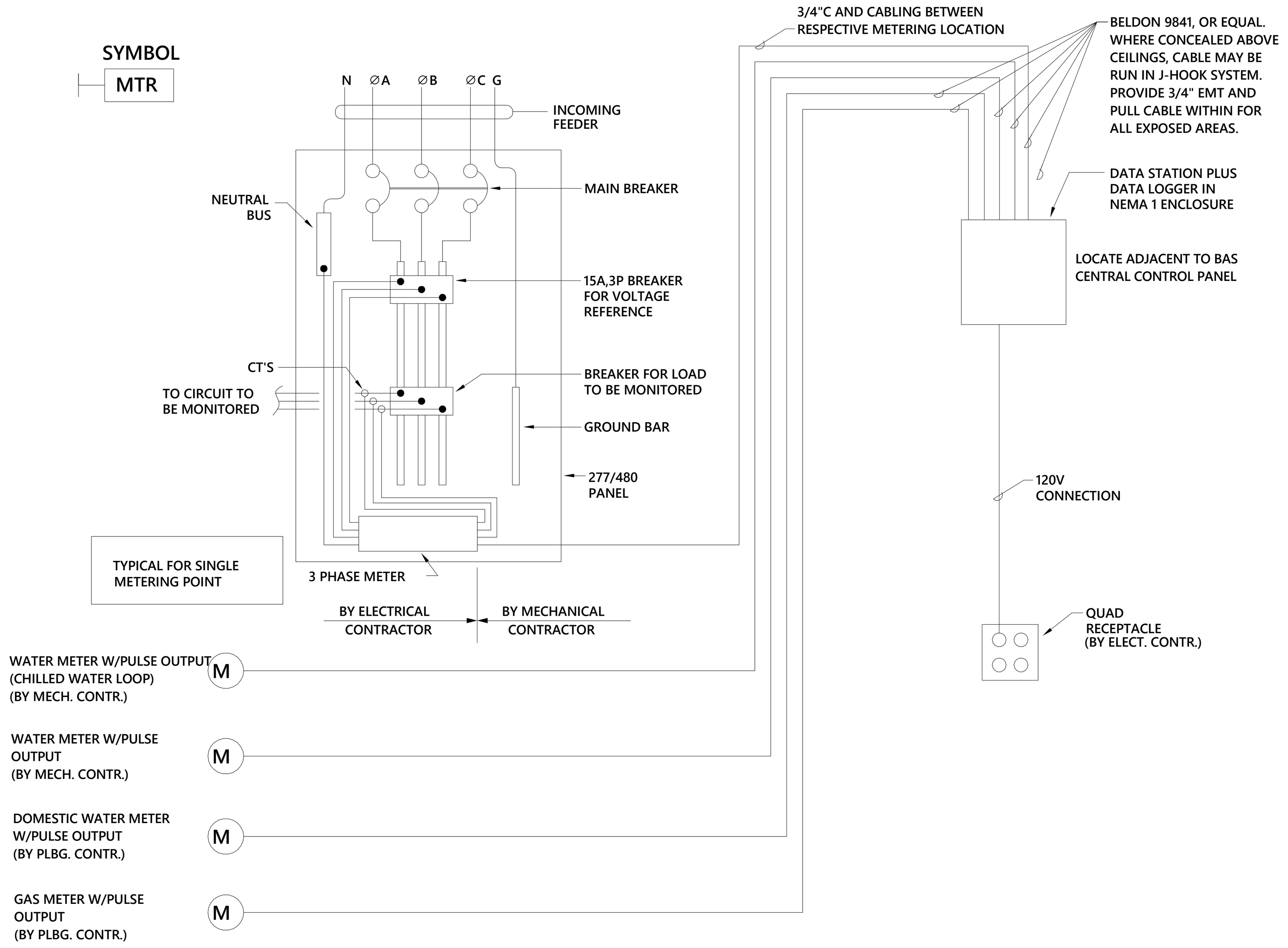
4 OPEN OPTIONS SYSTEM CONTROLLER DIAGRAM
NO SCALE



NOTES:
1. PROVIDE STEP ASSEMBLY WITH LANDING ASSEMBLY, HAND RAIL AND SERVICE PLATFORM FOR GENERATOR. SERVICE PLATFORM SHALL BE STEEL, PROVIDED WITH GRATES THAT IS SLIP RESISTANT. RAILINGS SHALL BE ALUMINUM.
2. SERVICE PLATFORM SHALL MAINTAIN NEC 110 REQUIRED CLEARANCES.
3. CONCRETE PAD SHALL BE EXTENDED OUT TO PROVIDE BASE OF SERVICE PLATFORM.

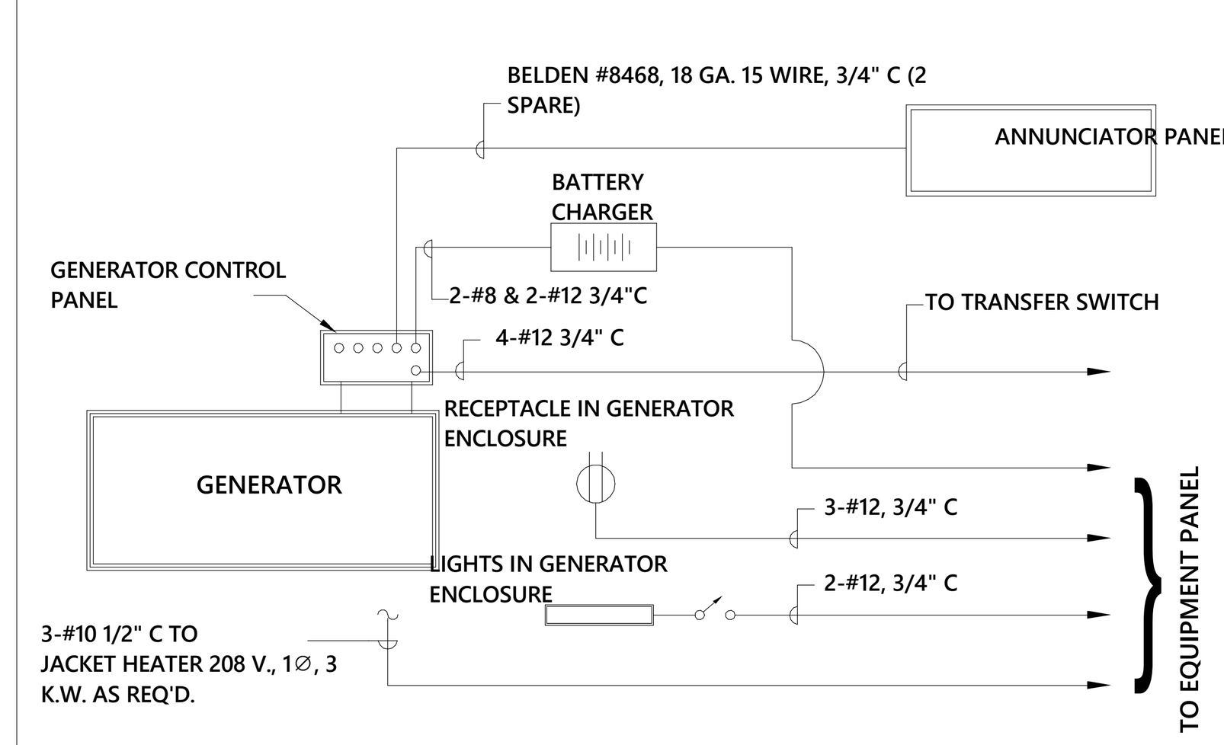
6 GENERATOR SERVICE PLATFORM
NO SCALE

9/19/17



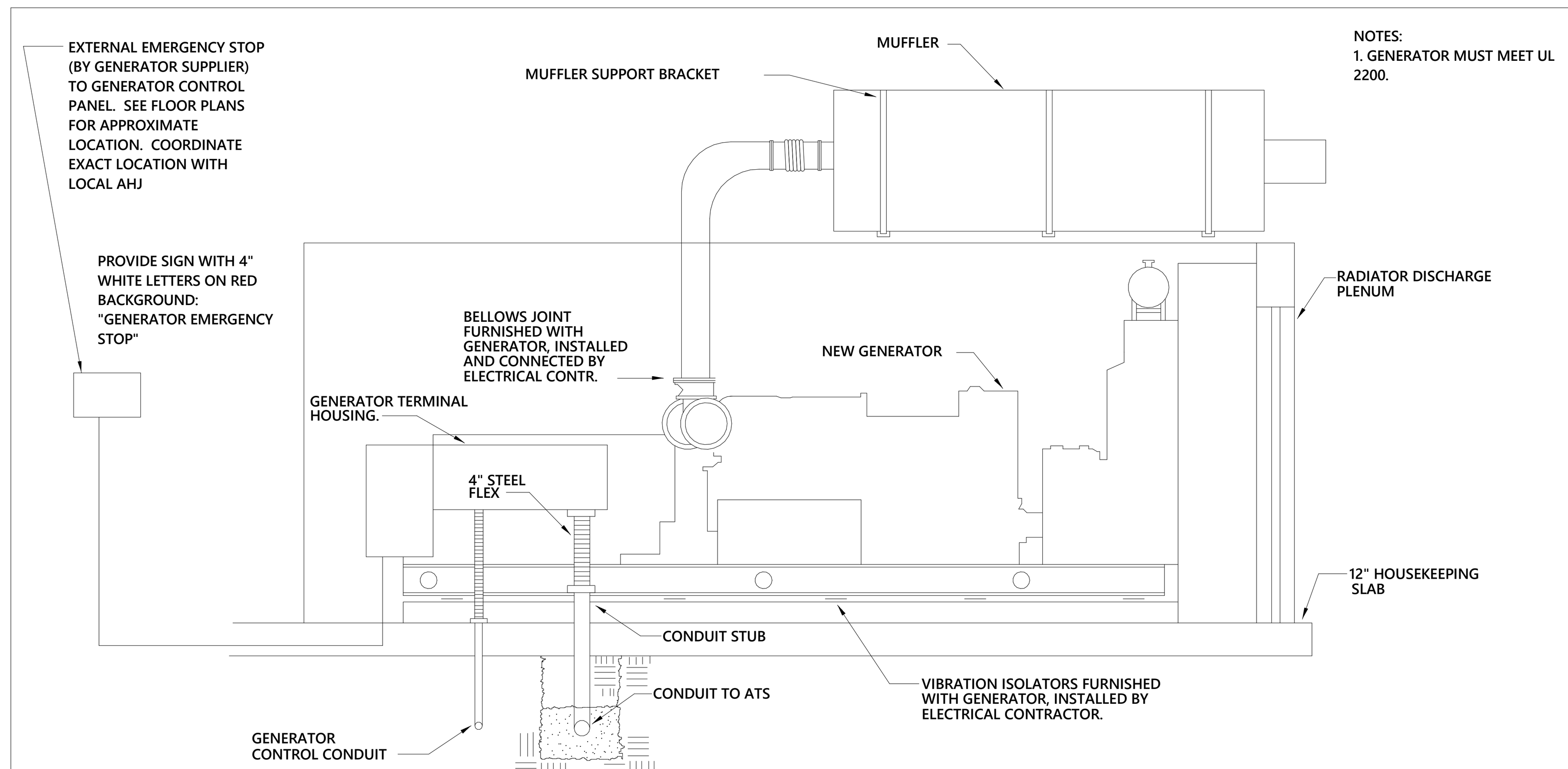
7 UTILITY MONITORING DETAIL
DIAGRAMMATIC

NOTE:
THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR TO ENSURE THAT ALL METERING/MONITORING DEVICES HAVE THE PROPER COMMUNICATION PROTOCOL (BACNET MSTP) FOR FULL INTEGRATION WITH THE UTILITY MONITORING SYSTEM. PROVIDE SHORTING BLOCKS.



NOTES:
1. ALL CONDUIT ENTERING AND EXIT THE GENERATOR SHALL HAVE CONDUIT SEAL OFFS.

8 STANDBY GENERATOR SYSTEM DIAGRAM
NO SCALE



NOTES:
1. GENERATOR MUST MEET UL 2200.

9 SECTION AT WEATHERPROOF GENERATOR HOUSING
NO SCALE

REVISIONS:

No.	Description	Date
1	Addendum #6	9.19.2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: J. Holcolmb
CHECKED BY: M. Mazzone

ELECTRICAL DETAILS

E-008

OPTIMA #: 16-0265

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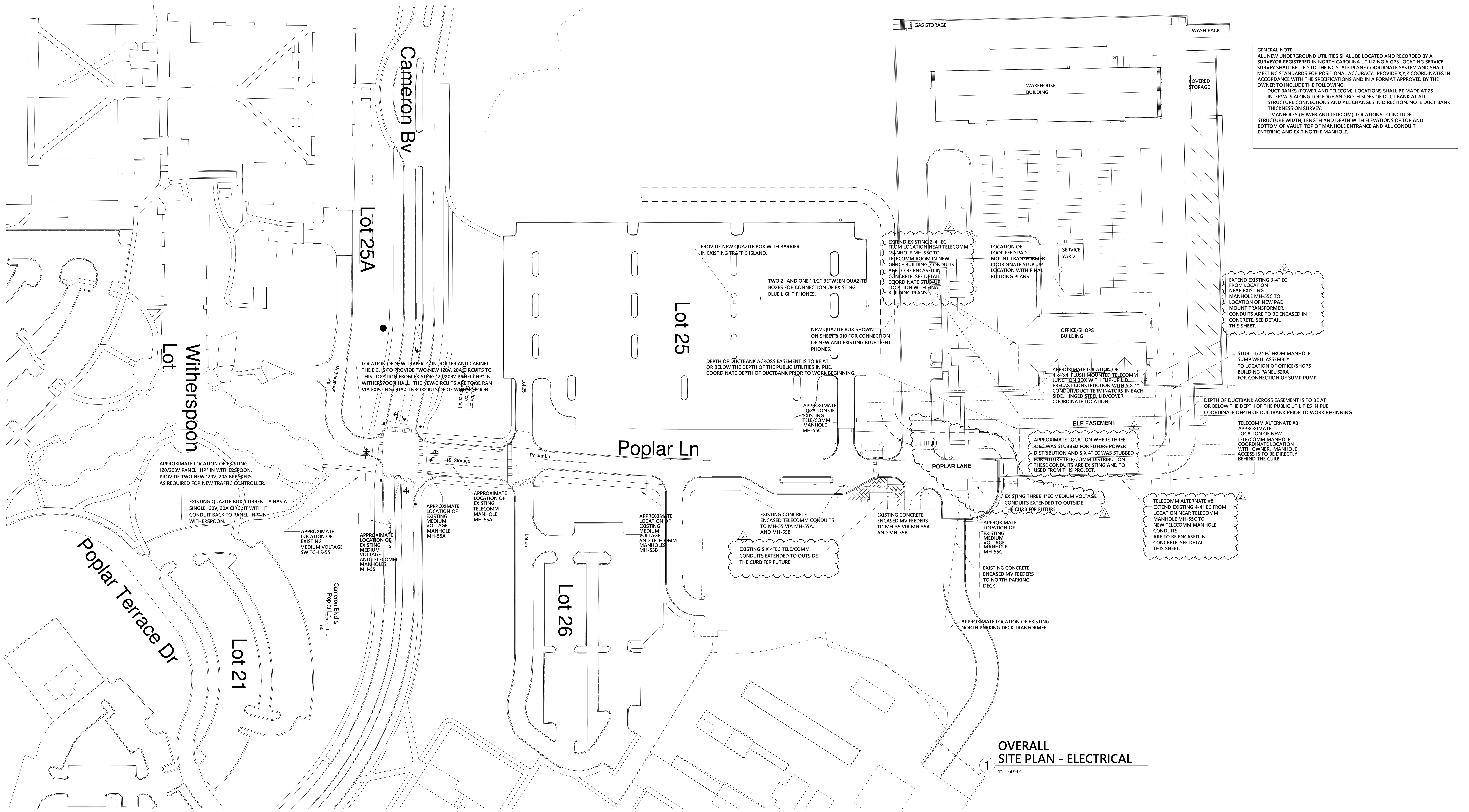
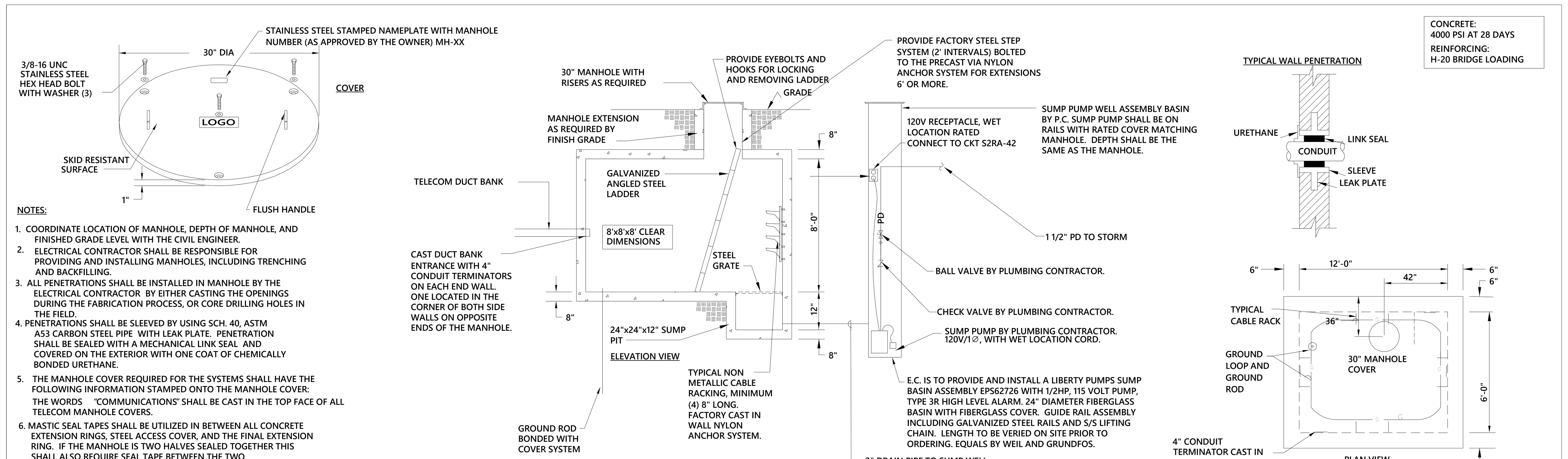


GENERAL NOTE:

ALL NEW UNDERGROUND UTILITIES SHALL BE LOCATED AND RECORDED BY A SURVEYOR REGISTERED IN NORTH CAROLINA UTILIZING A GPS LOCATING SERVICE. SURVEY SHALL BE TIED TO THE NC STATE PLANE COORDINATE SYSTEM AND SHALL MEET NC STANDARDS FOR POSITIONAL ACCURACY. PROVIDE X,Y,Z COORDINATES IN ACCORDANCE WITH THE SPECIFICATIONS AND IN A FORMAT APPROVED BY THE OWNER TO INCLUDE THE FOLLOWING:

- DUCT BANKS (POWER AND TELECOM), LOCATIONS SHALL BE MADE AT 25' INTERVALS ALONG TOP EDGE AND BOTH SIDES OF DUCT BANK AT ALL STRUCTURE CONNECTIONS AND ALL CHANGES IN DIRECTION. NOTE DUCT BANK THICKNESS ON SURVEY.
- MANHOLES (POWER AND TELECOM), LOCATIONS TO INCLUDE STRUCTURE WIDTH, LENGTH AND DEPTH WITH ELEVATIONS OF TOP AND BOTTOM OF VAULT, TOP OF MANHOLE ENTRANCE AND ALL CONDUIT ENTERING AND EXITING THE MANHOLE.

1 OVERALL SITE PLAN - ELECTRICAL
1" = 60'-0"



NOTES:

1. COORDINATE LOCATION OF MANHOLE, DEPTH OF MANHOLE, AND FINISHED GRADE LEVEL WITH THE CIVIL ENGINEER.
2. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING MANHOLES, INCLUDING TRENCHING AND BACKFILLING.
3. ALL PENETRATIONS SHALL BE INSTALLED IN MANHOLE BY THE ELECTRICAL CONTRACTOR BY EITHER CASTING THE OPENINGS DURING THE FABRICATION PROCESS, OR CORE DRILLING HOLES IN THE FIELD.
4. PENETRATIONS SHALL BE SLEEVED BY USING SCH. 40, ASTM A53 CARBON STEEL PIPE WITH LEAK PLATE. PENETRATION SHALL BE SEALED WITH A MECHANICAL LINK SEAL AND COVERED ON THE EXTERIOR WITH ONE COAT OF CHEMICALLY BONDED URETHANE.
5. THE MANHOLE COVER REQUIRED FOR THE SYSTEMS SHALL HAVE THE FOLLOWING INFORMATION STAMPED ONTO THE MANHOLE COVER:
   THE WORDS "COMMUNICATIONS" SHALL BE CAST IN THE TOP FACE OF ALL TELECOM MANHOLE COVERS.
6. MASTIC SEAL TAPES SHALL BE UTILIZED IN BETWEEN ALL CONCRETE EXTENSION RINGS, STEEL ACCESS COVER, AND THE FINAL EXTENSION RING. IF THE MANHOLE IS TWO HALVES SEALED TOGETHER THIS SHALL ALSO REQUIRE SEAL TAPE BETWEEN THE TWO.

3 PRE-CAST MANHOLE DETAIL - COMMUNICATIONS (TELCOMM ALTERNATE #8)
NO SCALE

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DRAWN BY: J. Holcolmb
CHECKED BY: M. Mazzone

ELECTRICAL SITE PLAN - OVERALL

E-009

PROJECT NORTH TRUE NORTH

OPTIMA #: 16-0265

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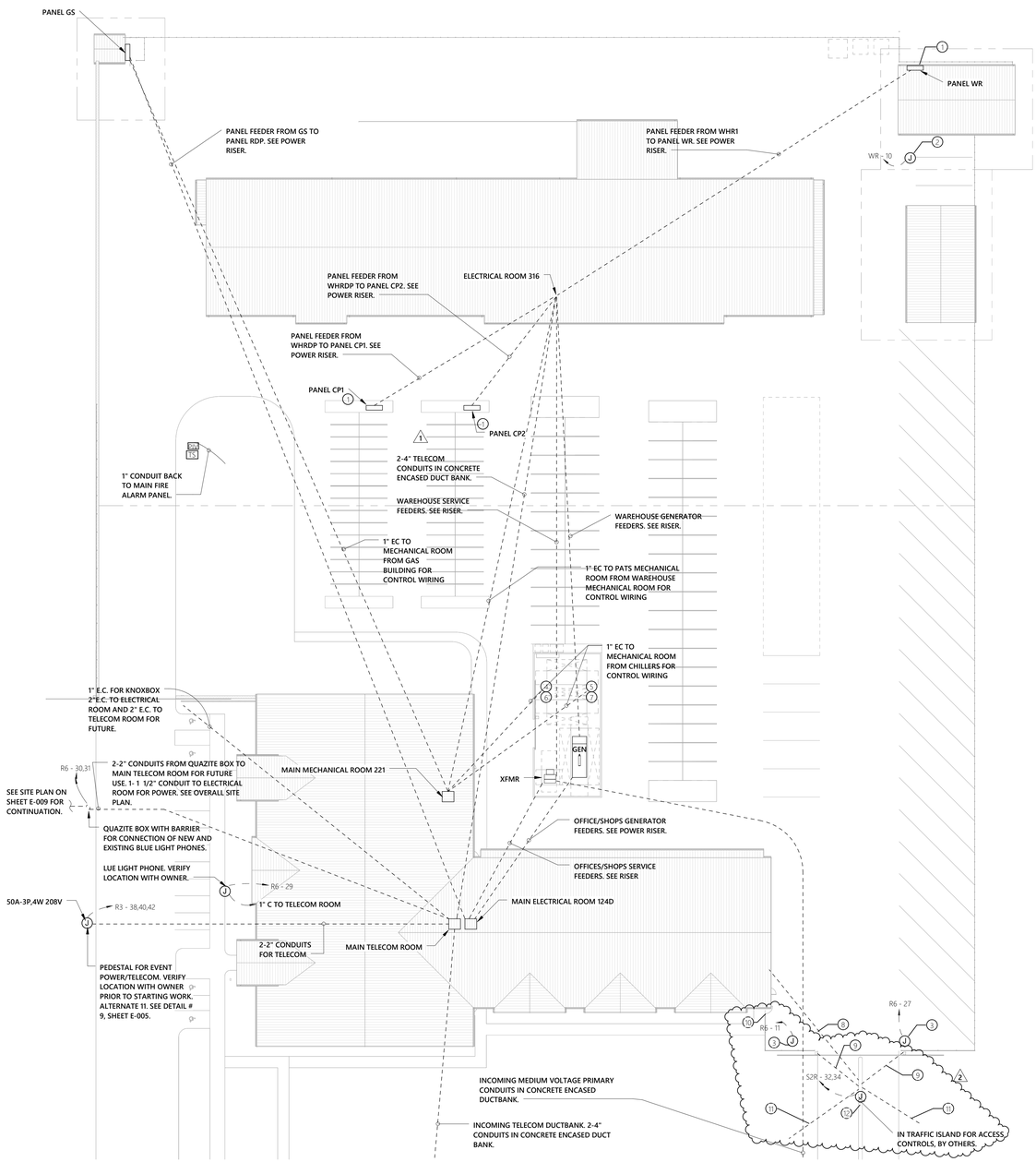

1 ELECTRICAL SITE PLAN - POWER
1" = 30'-0"

KEYED NOTES: (X)

1. PROVIDE UNI-STRUT STRUCTURE TO MOUNT PANEL. COORDINATE LOCATION WITH OWNER
2. J-BOX FOR CONNECTION TO HOT BOX.
3. PROVIDE AND INSTALL 30A/F20-1P-3R DISCONNECT FOR GATE OPERATOR. VERIFY POWER REQUIREMENTS PRIOR TO ROUGH-IN.
4. PROVIDE 400/F250-3P-3R DISCONNECT FOR CHILLER #1. CIRCUITED TO MDP-7.
5. PROVIDE 400/F250-3P-3R DISCONNECT FOR CHILLER #2. CIRCUITED TO MDP-8.
6. PROVIDE J-BOX FOR 20A, 120V CIRCUIT FOR CHILLER#1 CONTROLS. CIRCUIT TO RM-14.
7. PROVIDE J-BOX FOR 20A, 120V CIRCUIT FOR CHILLER#2 CONTROLS. CIRCUIT TO RM-26.
8. PROVIDE 2" EC FROM TRAFFIC ISLAND TO KEY SHOP WALL MOUNTED TELECOM RACK LOCATION.
9. PROVIDE 1-1/2" EC FROM TRAFFIC ISLAND TO GATE OPERATOR.
10. PROVIDE 1"EC FROM MAN GATE TO KEY SHOP WALL MOUNTED TELECOM RACK LOCATION. PROVIDE BLACKBOARD DR4200 CARD READER.
11. E.C. IS TO PROVIDE/INSTALL ADDITIONAL CONDUIT FROM THE TRAFFIC ISLAND TO FUTURE LICENCE PLATE READER LOCATIONS. THE E.C. IS TO PROVIDE TWO 1"EC FROM THE TRAFFIC ISLAND TO EACH FUTURE LICENSE PLATE READER LOCATION. THERE ARE TWO FUTURE LICENSE PLACE READER LOCATIONS, APPROXIMATELY 50FT FROM THE TRAFFIC ISLAND. COORDINATE THESE LOCATIONS WITH THE OWNER PRIOR TO ROUGH-IN.
12. E.C. IS TO COORDINATE ANY ADDITIONAL CONDUITS NEEDED FOR IN-ROAD PRESSURE LOOPS, ETC., PRIOR TO ROUGH-IN.

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028297 BRANDON L. MILLER

9/19/17

REVISIONS:

No.	Description	Date
1	Addendum #5	9.11.2017
2	Addendum #6	9.19.2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: J. Holcolmb
CHECKED BY: M. Mazzone

ELECTRICAL SITE PLAN - ELECTRICAL

E-010

OPTIMA #: 16-0265

PROJECT NORTH TRUE NORTH

BUILDING BID DOCUMENTS

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1 OFFICE/SHOPS - REFLECTED CEILING PLAN - PATS/FO - LIGHTING

1/8" = 1'-0"

8 6 4 2 0 8 16

SCALE: 1/8"=1'-0"

GENERAL NOTES:

1. SET TIME OUT ON ALL OCCUPANCY SENSORS TO 'MAX'.
2. CONNECT ALL EXIT SIGNS AND EMERGENCY POWER FOR GENERATOR TRANSFER DEVICES BETWEEN COLUMN LINES A THROUGH C TO CIRCUIT LS-16.
3. CONNECT ALL EXIT SIGNS AND EMERGENCY POWER FOR GENERATOR TRANSFER DEVICES BETWEEN COLUMN LINES C THROUGH F TO CIRCUIT LS-18.
4. CONNECT ALL EXIT SIGNS AND EMERGENCY POWER FOR GENERATOR TRANSFER DEVICES BETWEEN COLUMN LINES F THROUGH M TO CIRCUIT LS-20.
5. CONNECT ALL "OWL1" AND "OWL2" FIXTURES AS SHOWN. ROUTE THROUGH CIRCUIT LIGHTING CONTACTOR LC-1. REFER TO DETAIL #10/E006.
6. ALL LIGHTS NOTED AS 'NL' SHALL SERVE AS NIGHT LIGHTS CONNECT TO CIRCUITS SHOWN OR NOTED.
7. CONNECT EMERGENCY CIRCUIT TO GENERATOR TRANSFER DEVICES IN ADDITION TO NORMAL CIRCUIT SHOWN ROUTED TO FIXTURE.
8. LOCATE POWERPACKS, SHOWN IN AREAS WITH HARD CEILINGS, ABOVE NEAREST ACCESSIBLE CEILING.

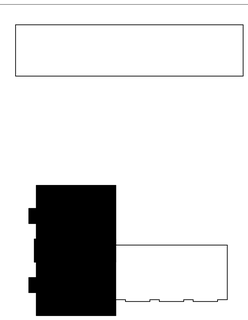
PARTITION LEGEND

1. ALL EXTERIOR WALLS TO BE W1 U.N.O.
2. ALL INTERIOR METAL STUD PARTITIONS TO BE TYPE G32 U.N.O.

- NON-RATED PARTITION TO CEILING
- NON-RATED PARTITION TO DECK
- 1 HR. RATED PARTITION TO DECK
- 2 HR. RATED PARTITION TO DECK

NOTE: SEE SHEET A-004 FOR CONSTRUCTION OF PARTITION TYPES.

KEYPLAN



PROJECT NORTH TRUE NORTH

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NORTH CAROLINA REGISTERED ARCHITECT 028297 PROFESSIONAL
9/19/17

MEMBERS OF THE AMERICAN INSTITUTE OF ARCHITECTS

REVISIONS:

No.	Description	Date
1	Addendum #5	9.11.2017
2	Addendum #6	9.19.2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: J. Holcolmb
CHECKED BY: M. Mazzone

REFLECTED CEILING PLAN - PATS/FO - LIGHTING

E-201A

OPTIMA #: 16-0265

BUILDING BID DOCUMENTS

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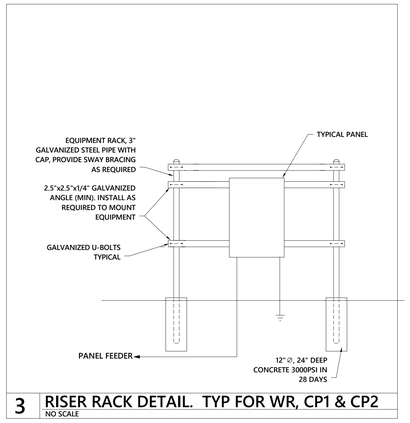
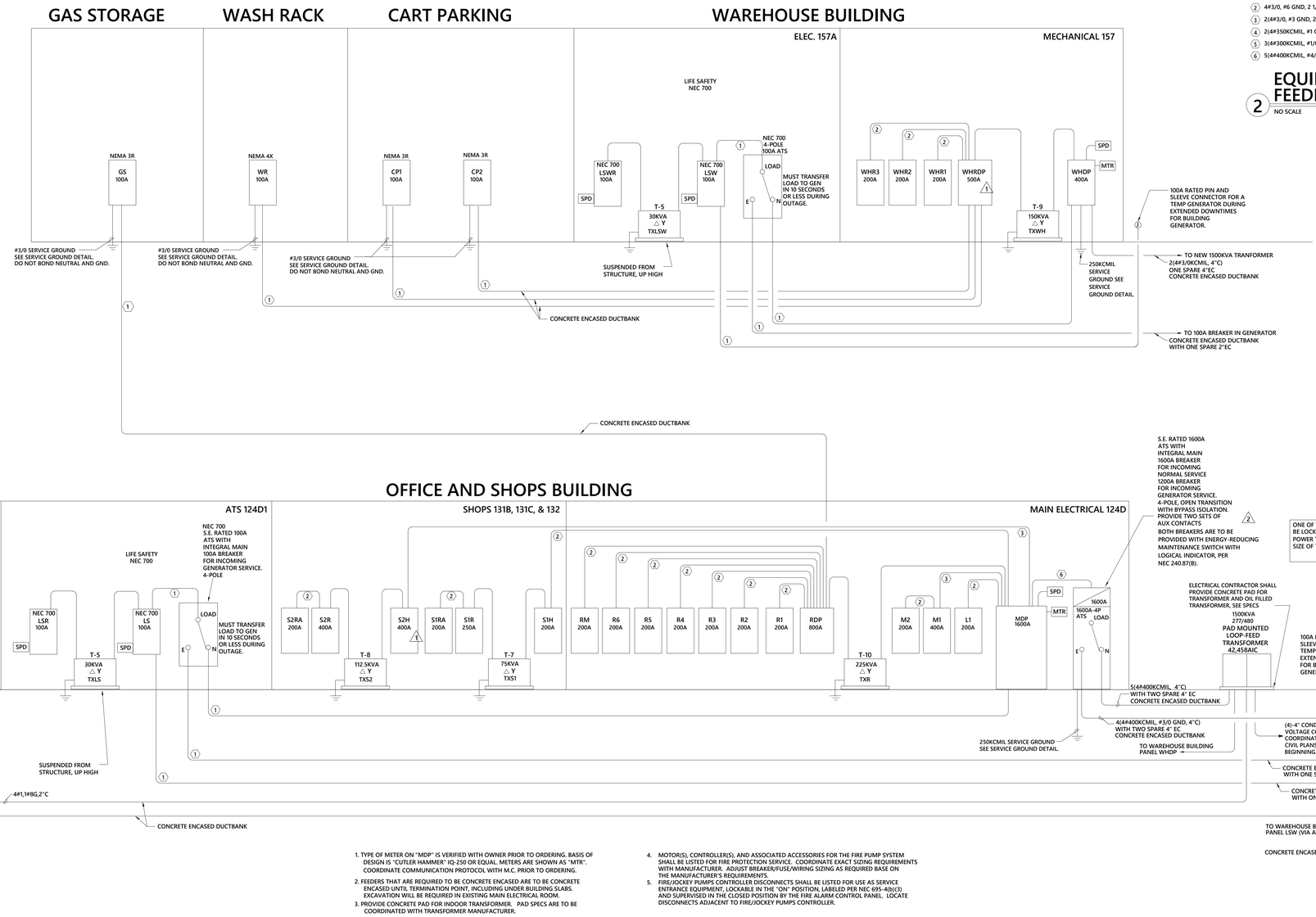


3 RISER RACK DETAIL. TYP FOR WR, CP1 & CP2
NO SCALE

DRY-TYPE TRANSFORMER SCHEDULE

TRANSF. TYPE	PRIMARY VOLTAGE	SECONDARY VOLTAGE	KVA	SQUARE "D"	PRIMARY	SECONDARY	GROUNDING ELECTRODE CONDUCTOR	SIZE
T-5	480	208/120 Y	30		(3)-#8, #10 Gnd. -3/4 "C. 50 AMP	(4)-#3, #8 Gnd. -1 1/2" C. 100 A	#8	25/14
T-6	480	208/120 Y	45		(3)-#4, #8 Gnd. -1 1/4" C. 70 AMP	(4)-#1/0, #6 Gnd. -2" C. 150 A	#6	30/20
T-7	480	208/120 Y	75		(3)-#1, #6 Gnd. -1 1/2" C. 125 AMP	(4)-#4/0, #2 Gnd. -2 1/2" C. 225 A	#2	30/20
T-8	480	208/120 Y	112.5		(3)-#2/0, #6 Gnd. -1 1/2" C. 175 AMP	(2) SETS(4)-#3/0, #1/0 Gnd. - 2"C. 400 A	#1/0	35/29
T-9	480	208/120 Y	150		(3)-#4/0, #4 Gnd. -2 1/2" C. 225 AMP	(2)-SETS (4)-#250, #1/0 Gnd., -3"C 500A	#1/0	41/32
T-10	480	208/120 Y	225		(3) #500kcmil, #3 Gnd. 3" C. 350 AMP	(3)-SETS (4)-#300kcmil, #2/0 Gnd. -3" C. EA. / 800 AMP	#2/0	48/30

NOTE: NOT ALL SIZES OR TYPES MAY BE USED.



1 4#3, #8 GND, 2"C
2 4#3/0, #6 GND, 2 1/2"C
3 2(4#3/0, #3 GND, 2 1/2"C)
4 2(4#350KCMIL, #1 GND, 3"C)
5 3(4#300KCMIL, #1/0 GND, 3"C)
6 5(4#400KCMIL, #4/0 GND, 4"C)

EQUIPMENT AND FEEDER LEGEND

2 NO SCALE

1. TYPE OF METER ON "MDP" IS VERIFIED WITH OWNER PRIOR TO ORDERING. BASIS OF DESIGN IS "CUTLER HAMMER" IQ-250 OR EQUAL. METERS ARE SHOWN AS "MTR". COORDINATE COMMUNICATION PROTOCOL WITH M.C. PRIOR TO ORDERING.
2. FEEDERS THAT ARE REQUIRED TO BE CONCRETE ENCASED ARE TO BE CONCRETE ENCASED UNTIL TERMINATION POINT, INCLUDING UNDER BUILDING SLABS. EXCAVATION WILL BE REQUIRED IN EXISTING MAIN ELECTRICAL ROOM.
3. PROVIDE CONCRETE PAD FOR INDOOR TRANSFORMER. PAD SPECS ARE TO BE COORDINATED WITH TRANSFORMER MANUFACTURER.
4. MOTOR(S), CONTROLLER(S), AND ASSOCIATED ACCESSORIES FOR THE FIRE PUMP SYSTEM SHALL BE LISTED FOR FIRE PROTECTION SERVICE. COORDINATE EXACT SIZING REQUIREMENTS WITH MANUFACTURER. ADJUST BREAKER/FUSE/WIRING SIZING AS REQUIRED BASE ON THE MANUFACTURER'S REQUIREMENTS.
5. FIRE/JOCKEY PUMPS CONTROLLER DISCONNECTS SHALL BE LISTED FOR USE AS SERVICE ENTRANCE EQUIPMENT, LOCKABLE IN THE "ON" POSITION, LABELED PER NEC 695-4(b)(3) AND SUPERVISED IN THE CLOSED POSITION BY THE FIRE ALARM CONTROL PANEL. LOCATE DISCONNECTS ADJACENT TO FIRE/JOCKEY PUMPS CONTROLLER.

1 POWER RISER DIAGRAM
1/8" = 1'-0"

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NORTH CAROLINA PROFESSIONAL 028297 ENGINEER BRANDON M. MILLER
9/19/17

REVISIONS:

No.	Description	Date
1	Addendum #4	8.28.2017
2	Addendum #5	9.11.2017
3	Addendum #6	9.19.2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: J. Holcolmb
CHECKED BY: M. Mazzone

POWER RISER

E-501

OPTIMA #: 16-0265

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BUILDING BID DOCUMENTS

PANEL: R1

VOLTAGE: 208Y/120 **MAIN TYPE:** MLO **MFR:**
MOUNTING: SURFACE **PHASE:** 3 **TYPE:**
MAIN: 200 A **WIRE:** 4 **AIC:** 22,000 AMPS SYMMETRICAL

LOAD SERVED	Wire Size	TRIP	CKT NO	POLES	A		B		C		POLES	CKT NO	TRIP	Wire Size	LOAD SERVED
RECEPTACLES - BREAK 123I	12	20 A	1	1	0.2	0.7					1	2	20 A	12	RECEPTACLES - CONF. 102C
COUNTER RECEPTACLES - BREAK 123I	12	20 A	3	1			0.4	1.3			1	4	20 A	12	RECEPTACLES - BREAK 130A & 130
RECEPTACLES - BREAK 123I	12	20 A	5	1					0.7	1.1	1	6	20 A	12	RECEPTACLES - CONF. 123D
RECEPTACLES - OFFICE 103A	12	20 A	7	1	0.9	1.4					1	8	20 A	12	RECEPTACLES - OFFICES 122A & 122B
EWC - 123C (NOTE 7)	12	20 A	9	1			1.2	1.3			1	10	20 A	12	RECEPTACLES - OFFICE 103C
FLOOR BOX - CONF. 102C	12	20 A	11	1					1.0	1.2	1	12	20 A	12	REFRIGERATOR - BREAK 123I (NOTE 7)
RECEPTACLES - OFFICES 125B & 125C	12	20 A	13	1	1.4	0.4					1	14	20 A	12	EWC - 130 (NOTE 7)
RECEPTACLES - OFFICES 125I & 125J	12	20 A	15	1			1.4	0.9			1	16	20 A	12	RECEPTACLES - CONF. 126B
RECEPTACLES - OFFICES 103D & 103E	12	20 A	17	1					1.4	0.4	1	18	20 A	12	RECEPTACLES - VESTIBULE 100
RECEPTACLES - OFFICE 104A	12	20 A	19	1	0.7	0.7					1	20	20 A	12	RECEPTACLES - OFFICE 102E
RECEPTACLES - OFFICE 125G	12	20 A	21	1			0.7	0.9			1	22	20 A	12	RECEPTACLES - OFFICE 103P
RECEPTACLES - OFFICE 125K	12	20 A	23	1					0.7	0.9	1	24	20 A	12	RECEPTACLES - CORRIDOR 123 & 124
MICROWAVE - BREAK 130A	12	20 A	25	1	1.0	1.0					1	26	20 A	12	MICROWAVE - BREAK 130A
VENDING - 124F (NOTE 7)	12	20 A	27	1			1.0	1.0			1	28	20 A	12	MICROWAVE - BREAK 130A
EQUIPMENT RACK - CALL CTR 103G	12	20 A	29	1					0.5	1.0	1	30	20 A	12	MICROWAVE - BREAK 130A
FLOOR BOX - TRAINING 123A	12	20 A	31	1	0.4	1.1					1	32	20 A	12	RECEPTACLES - OFFICE 104D
MICROWAVE - BREAK 123I	12	20 A	33	1			1.0	0.9			1	34	20 A	12	RECEPTACLES - OFFICES 102F & 103F
MICROWAVE - BREAK 123I	12	20 A	35	1					1.0	1.4	1	36	20 A	12	RECEPTACLES - OFFICES 126A & 126C
REFRIGERATOR - BREAK 123I (NOTE 7)	12	20 A	37	1	1.2	1.3					1	38	20 A	12	RECEPTACLES - OFFICES 101C & 103B
REFRIGERATOR - BREAK 130A (NOTE 7)	12	20 A	39	1			1.2	0.7			1	40	20 A	12	RECEPTACLES - OFFICES 105D
REFRIGERATOR - BREAK 130A (NOTE 7)	12	20 A	41	1					1.2	1.1	1	42	20 A	12	RECEPTACLES - OFFICES 125A

LOAD	Connected Load	Demand Factor	Estimated Demand	NOTES:
LIGHTS	0.00 kVA	0.00%	0.00 kVA	1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
HEATING	0.00 kVA	0.00%	0.00 kVA	2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
COOLING	0.00 kVA	0.00%	0.00 kVA	3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
VENTILATION	0.00 kVA	0.00%	0.00 kVA	4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
MOTORS	0.00 kVA	0.00%	0.00 kVA	5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
KITCHEN	6.40 kVA	65.00%	4.16 kVA	6. PROVIDE METAL DIRECTORY FRAME.
RECEPTACLES	30.91 kVA	66.17%	20.46 kVA	7. PROVIDE CLASS A GFI (6mA-PERSONNEL) BRKR (250' MAX).
WATER HEATER	0.00 kVA	0.00%	0.00 kVA	
MISC.	2.56 kVA	100.00%	2.56 kVA	
Spare	0.00 kVA	0.00%	0.00 kVA	

TOTAL KVA (CONNECTED):	39.9 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	27.2 kVA	103 A	117 A	115 A
TOTAL AMP. (CONNECTED):	111 A	TOTAL PER PHASE: (CONNECTED @ 125%)		
TOTAL AMP. (DEMAND):	75 A	129 A	146 A	144 A

PANEL: RDP

VOLTAGE: 208Y/120 **MAIN TYPE:** MCB **MFR:**
MOUNTING: SURFACE **PHASE:** 3 **TYPE:**
MAIN: 800 A **WIRE:** 4 **AIC:** 22,000 AMPS SYMMETRICAL

LOAD SERVED	Wire Size	TRIP	CKT NO	POLES	A		B		C		POLES	CKT NO	TRIP	Wire Size	LOAD SERVED
			1		12.4	10.4						2			
PANEL "R1"	**	200 A	3	3			13.9	11.7			3	4	200 A	**	PANEL "R2"
			5						13.6	10.6		6			
			7		7.6	6.2						8			
PANEL "R3"	**	200 A	9	3			8.6	5.4			3	10	200 A	**	PANEL "R4"
			11						8.1	4.5		12			
			13		15.2	9.4						14			
PANEL "R5"	**	200 A	15	3			14.7	9.4			3	16	200 A	**	PANEL "R6"
			17						17.4	8.9		18			
			19		7.4	0.2						20			
PANEL "RM"	**	200 A	21	3			9.9	1.1			3	22	100 A	**	PANEL "GS"
			23						8.0	1.1		24			
			25		0.0	0.0					2	26	125 A	--	GENERATOR PANEL
SPARE	--	100 A	27	3			0.0	0.0				28			
			29						0.0	0.0	1	30	0 A	--	SPARE
SPARE	--	20 A	31	1	0.0	0.0					1	32	20 A	--	SPARE
SPARE	--	20 A	33	1			0.0	0.0			1	34	20 A	--	SPARE
SPARE	--	20 A	35	1					0.0	0.0	1	36	20 A	--	SPARE
SPARE	--	20 A	37	1	0.0	0.0					1	38	20 A	--	SPARE
SPARE	--	20 A	39	1			0.0	0.0			1	40	20 A	--	SPARE
SPARE	--	20 A	41	1					0.0	0.0	1	42	20 A	--	SPARE

LOAD	Connected Load	Demand Factor	Estimated Demand	NOTES:
LIGHTS	0.00 kVA	0.00%	0.00 kVA	1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
HEATING	0.00 kVA	0.00%	0.00 kVA	2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
COOLING	6.66 kVA	100.00%	6.66 kVA	3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
VENTILATION	5.10 kVA	100.00%	5.10 kVA	4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
MOTORS	10.46 kVA	104.40%	10.92 kVA	5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
KITCHEN	10.32 kVA	65.00%	6.71 kVA	6. PROVIDE METAL DIRECTORY FRAME.
RECEPTACLES	130.86 kVA	53.82%	70.43 kVA	7. ** - SEE POWER RISER DIAGRAM FOR WIRE SIZE
WATER HEATER	0.05 kVA	100.00%	0.05 kVA	
MISC.	52.13 kVA	100.00%	52.13 kVA	
Spare	18.00 kVA	100.00%	18.00 kVA	

TOTAL KVA (CONNECTED):	233.6 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	170.0 kVA	573 A	626 A	606 A
TOTAL AMP. (CONNECTED):	648 A	TOTAL PER PHASE: (CONNECTED @ 125%)		
TOTAL AMP. (DEMAND):	472 A	716 A	783 A	758 A

SWITCHBOARD: MDP

VOLTAGE: 480Y/277 **PHASE:** 3 **WIRE:** 4 **MANUFACTURER:**
MOUNTING: FLOOR **TYPE:**
MAIN: 1600A MCB **AIC:** 65000

MAIN CB NOTES: 100% RATED
MAIN BREAKER SHALL BE PROVIDED WITH ENERGY-REDUCING MAINTENANCE SWITCH WITH LOCAL INDICATOR. NEC 240.87(B)
PROVIDE MAIN BREAKER SHALL BE PROVIDE WITH WITH ADJUSTABLE LSI & GFP TRIP FUNCTIONS.

CKT/ID	LOAD SERVED	FRAME	TRIP	POLE	FEEDER	NOTES	Load
1	PANEL "L1"	200 A	200 A	3	NOTE 8	NOTE 8	22.60 kVA
2	PANEL "M1"	400 A	400 A	3	NOTE 8	NOTE 8	145.87 kVA
3	PANEL "RDP" (VIA TXR TRANSFORMER)	400 A	350 A	3	NOTE 8	NOTE 8	215.60 kVA
4	PANEL "S1H"	200 A	200 A	3	NOTE 8	NOTE 8	123.83 kVA
5	PANEL "S2H"	400 A	400 A	3	NOTE 8	NOTE 8	179.26 kVA
6	PANEL "LS" (VIA ATS)	100 A	100 A	3	NOTE 8	NOTE 8	18.72 kVA
7	CHILLER #1	250 A	250 A	3	4-250KCMIL,1#4G,2-1/2"C.	4-250KCMIL,1#4G,2-1/2"C.	151.82 kVA
8	CHILLER #2	250 A	250 A	3	4-250KCMIL,1#4G,2-1/2"C.	4-250KCMIL,1#4G,2-1/2"C.	151.82 kVA
9	SPD	30 A	30 A	3	SEE DETAIL #3/E-007	SEE DETAIL #3/E-007	0.00 kVA
10	SPARE	--	200 A	3			0.00 kVA
11	SPARE	--	200 A	3			0.00 kVA
12	SPARE	--	400 A	3			0.00 kVA
		Total Conn. Load:	1029.22...				
		Total Amps:	1238 A				

Load Classification	Connected Load	Demand Factor	Estimated Demand	NOTES:
LIGHTS	28.38 kVA	125.00%	35.47 kVA	1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
HEATING	0.00 kVA	0.00%	0.00 kVA	2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
COOLING	310.30 kVA	100.00%	310.30 kVA	3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
VENTILATION	48.24 kVA	100.00%	48.24 kVA	4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
MOTORS	124.45 kVA	103.36%	128.63 kVA	5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
KITCHEN	10.32 kVA	65.00%	6.71 kVA	6. PROVIDE METAL DIRECTORY FRAME.
RECEPTACLES	154.92 kVA	53.23%	82.46 kVA	7. THIS PANEL SHALL BE U.L. LISTED FOR USE AS S.E. EQUIP.
WATER HEATER	21.35 kVA	100.00%	21.35 kVA	8. ** - SEE POWER RISER DIAGRAM FOR WIRE SIZE
MISC.	106.05 kVA	100.00%	106.05 kVA	9. PROVIDE WITH TYPE 1 SPD (120kA/MODE, 240kA/PHASE MIN).
Spare	213.00 kVA	100.00%	213.00 kVA	10. PROVIDE CT SHORTING BLOCKS.

TOTAL LOAD PER PHASE (CONNECTED)		
1206 A	1228 A	1212 A
TOTAL LOAD PER PHASE @125% (CONNECTED)		
1507 A	1535 A	1515 A
TOTAL DEMAND:		964.43 kVA
TOTAL DEMAND:		1160 A

PANEL: R2

VOLTAGE: 208Y/120 **MAIN TYPE:** MLO **MFR:**
MOUNTING: SURFACE **PHASE:** 3 **TYPE:**
MAIN: 200 A **WIRE:** 4 **AIC:** 22,000 AMPS SYMMETRICAL

LOAD SERVED	Wire Size	TRIP	CKT NO	POLES	A		B		C		POLES	CKT NO	TRIP	Wire Size	LOAD SERVED
CONTROL POWER - PLUMBING DEVICES	12	20 A	1	1	0.0	0.2					1	2	20 A	12	LIGHTING CONTACTOR LC-1 & LC-2
COUNTER RECEPTACLES - 130A	12	20 A	3	1			0.4	0.5			1	4	20 A	12	FURNITURE - 103G
COUNTER RECEPTACLES - 130A	12	20 A	5	1					0.4	0.5	1	6	20 A	12	FURNITURE - 103G
RECEPTACLES - ZONE 4 130F	12	20 A	7	1	0.5	0.7					1	8	20 A	12	RECEPTACLES - OFFICE 130G
RECEPTACLES - WORKROOM 102A	12	20 A	9	1			0.7	1.0			1	10	20 A	12	VENDING - 124F (NOTE 7)
RECEPTACLES - CORRIDOR 130 & 131	12	20 A	11	1					0.9	0.2	1	12	20 A	12	TIME CLOCK & KEY BOX - CORR. 131
RECEPTACLES - OFFICES 130M & 130P	12	20 A	13	1	1.4	1.0					1	14	20 A	12	RECEPTACLES - ZONE 5 130H
RECEPTACLES - OFFICES 130I & 130K	12	20 A	15	1			1.4	1.0			1	16	20 A	12	RECEPTACLES - ZONE 6 130J
VENDING - 124F (NOTE 7)	12	20 A	17	1					1.0	1.0	1	18	20 A	12	RECEPTACLES - ZONE 5 130H
RECEPTACLES - ZONE 4 130F	12	20 A	19	1	1.0	1.0					1	20	20 A	12	RECEPTACLES - ZONE 5 130H
RECEPTACLES - ZONE 6 130J	12	20 A	21	1			1.0	1.0			1	22	20 A	12	RECEPTACLES - ZONE 4 130F
RECEPTACLES - ZONE 5 130H	12	20 A	23	1					1.0	1.0	1	24	20 A	12	RECEPTACLES - ZONE 4 130F
RECEPTACLES - STEAM TECH 130N	12	20 A	25	1	1.0	1.0					1	26	20 A	12	RECEPTACLES - STEAM TECH 130N
RECEPTACLES - STEAM TECH 130N	12	20 A	27	1			1.0	1.0			1	28	20 A	12	RECEPTACLES - H.V. TECH 130L
RECEPTACLES - FIRE TECH 130Q	12	20 A	29	1					1.0	1.0	1	30	20 A	12	RECEPTACLES - FIRE TECH 130Q
RECEPTACLES - ZONE 6 130J	12	20 A	31	1	1.0	1.0					1	32	20 A	12	RECEPTACLES - H.V. TECH 130L
RECEPTACLES - STEAM TECH 130N	12	20 A	33	1			1.0	1.0			1	34	20 A	12	RECEPTACLES - H.V. TECH 130L
RECEPTACLES - H.V. TECH 130L	12	20 A	35	1					1.0	1.0	1	36	20 A	12	RECEPTACLES - ZONE 6 130J
			37		0.4	0.4						38			
FURNITURE - 103G	12	20 A	39	3			0.4	0.4			3	40	20 A	12	FURNITURE - 103G
			41						0.4	0.4		42			

LOAD	Connected Load	Demand Factor	Estimated Demand	NOTES:
LIGHTS	0.00 kVA	0.00%	0.00 kVA	1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
HEATING	0.00 kVA	0.00%	0.00 kVA	2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
COOLING	0.00 kVA	0.00%	0.00 kVA	3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
VENTILATION	0.00 kVA	0.00%	0.00 kVA	4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
MOTORS	0.00 kVA	0.00%	0.00 kVA	5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
KITCHEN	0.72 kVA	80.00%	0.58 kVA	6. PROVIDE METAL DIRECTORY FRAME.
RECEPTACLES	29.98 kVA	66.68%	19.99 kVA	7. PROVIDE CLASS A GFI (6mA-PERSONNEL) BRKR (250' MAX).
WATER HEATER	0.00 kVA	0.00%	0.00 kVA	
MISC.	2.00 kVA	100.00%	2.00 kVA	
Spare	0.00 kVA	0.00%	0.00 kVA	

TOTAL KVA (CONNECTED):	32.7 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	22.6 kVA	87 A	97 A	88 A
TOTAL AMP. (CONNECTED):	91 A	TOTAL PER PHASE: (CONNECTED @ 125%)		
TOTAL AMP. (DEMAND):	63 A	109 A	122 A	111 A

PANEL: R3

VOLTAGE: 208Y/120 **MAIN TYPE:** MLO **MFR:**
MOUNTING: SURFACE **PHASE:** 3 **TYPE:**
MAIN: 200 A **WIRE:** 4 **AIC:** 22,000 AMPS SYMMETRICAL

LOAD SERVED	Wire Size	TRIP	CKT NO	POLES	A		B		C		POLES	CKT NO	TRIP	Wire Size	LOAD SERVED
FURNITURE - 123B	12	20 A	1	1	0.0	0.9					1	2	20 A	12	RECEPTACLES - CORRIDOR 125 & 126
RECEPTACLES - BAS 124G	12	20 A	3	1			0.4	1.0			1	4	20 A	12	DEDICATED RECEPTACLE - TRAIN.122C
RECEPTACLES - COUNTER 101A	12	20 A	5	1					0.5	0.5	1	6	20 A	12	FURNITURE - 101A
RECEPTACLES - LOCKERS 104F, G, & H	12	20 A	7	1	0.9	0.5					1	8	20 A	12	FURNITURE - 103J
DEDICATED RECEPTACLE - TRAIN.122C	12	20 A	9	1			1.0	0.5			1	10	20 A	12	FURNITURE - 103J
RECEPTACLES - EXTERIOR	12	20 A	11	1					1.3	0.5	1	12	20 A	12	REC - 252 & 254 (HAIR DRYERS)
FURNITURE - 105A	12	20 A	13	1	0.7	0.5					1	14	20 A	12	FLOOR BOX & REC. - LOBBY 101
FURNITURE - 123B	12	20 A	15	1			0.7	1.0			1	16	20 A	12	MICROWAVE - BREAK 130A
RECEPTACLES - OFFICE 125H	12	20 A	17	1					0.7	1.0	1	18	20 A	12	MICROWAVE - BREAK 130A
			19		0.0	1.0					1	20	20 A	12	RECEPTACLES - BAS 124G
FURNITURE - 123B	12	20 A	21	3			0.0	1.0			1	22	20 A	12	RECEPTACLES - BAS 124G
			23						0.0	0.5	1	24	20 A	12	RECEPTACLES - BAS 124G
			25		0.4	0.4						26			
FURNITURE - 101A	12	20 A	27	3			0.4	0.4			3	28	20 A	12	FURNITURE - 103J
			29						0.4	0.4		30			
			31		0.4	0.5						32			
FURNITURE - 103J	12	20 A	33	3			0.4	0.5			3	34	20 A	12	FURNITURE - 105A
			35						0.4	0.5		36			
			37		0.5	1.0						38			
FURNITURE - 123B	12	20 A	39	3			0.5	1.0			3	40	50 A	6	EXTERIOR PEDESTAL POWER
			41						0.5	1.0		42			

LOAD	Connected Load	Demand Factor	Estimated Demand	NOTES:
LIGHTS	0.00 kVA	0.00%	0.00 kVA	1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
HEATING	0.00 kVA	0.00%	0.00 kVA	2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
COOLING	0.00 kVA	0.00%	0.00 kVA	3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
VENTILATION	0.00 kVA	0.00%	0.00 kVA	4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
MOTORS	0.00 kVA	0.00%	0.00 kVA	5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
KITCHEN	2.00 kVA	100.00%	2.00 kVA	6. PROVIDE METAL DIRECTORY FRAME.
RECEPTACLES	17.40 kVA	78.74%	13.70 kVA	
WATER HEATER	0.00 kVA	0.00%	0.00 kVA	
MISC.	5.00 kVA	100.00%	5.00 kVA	
Spare	0.00 kVA	0.00%	0.00 kVA	

TOTAL KVA (CONNECTED):	24.4 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	20.7 kVA	64 A	73 A	68 A
TOTAL AMP. (CONNECTED):	68 A	TOTAL PER PHASE: (CONNECTED @ 125%)		
TOTAL AMP. (DEMAND):	57 A	79 A	91 A	86 A

PANEL: R4

VOLTAGE: 208Y/120 **MAIN TYPE:** MLO **MFR:**
MOUNTING: SURFACE **PHASE:** 3 **TYPE:**
MAIN: 200 A **WIRE:** 4 **AIC:** 22,000 AMPS SYMMETRICAL

LOAD SERVED	Wire Size	TRIP	CKT NO	POLES	A (LOAD KVA)		B (LOAD KVA)		C (LOAD KVA)		POLES	CKT NO	TRIP	Wire Size	LOAD SERVED
RECEPTACLE - FIRE PUMP 133	12	20 A	1	1	0.2	0.4					1	2	20 A	12	FURNITURE - 104C
FURNITURE - 102F	12	20 A	3	1			0.5	0.5			1	4	20 A	12	RECEPTACLES - FILE 102B
RECEPTACLES - TRAINING 123A	12	20 A	5	1					1.1	1.1	1	6	20 A	12	RECEPTACLES - TRAINING 123A
RECEPTACLES - RESTROOM 123E-H	12	20 A	7	1	0.7	2.1					1	8	20 A	12	RECEPTACLES - LOBBY / STOR. 121 &...
RECEPTACLES - EXTERIOR	12	20 A	9	1			0.9	0.7			1	10	20 A	12	TVS - TECH 130N & 130Q
TVS - ZONE 4 & 5 130F & 130H	12	20 A	11	1					0.7	0.5	1	12	20 A	12	TIME CLOCK & KEY BOX - CORR. 105
TVS - TECH 130J & 130L	12	20 A	13	1	0.7	1.1					1	14	20 A	12	RECEPTACLES - BATHROOM 130B, C, & D
RECEPTACLES - OFFICE 101B	12	20 A	15	1			0.7	0.4				16			
			17						0.7	0.4	3	18	20 A	12	FURNITURE 102F
FURNITURE 104B & 104C	12	20 A	19	3	0.7	0.4						20			
			21				0.7	0.9			1	22	20 A	12	RECEPTACLES - CORRIDOR 102 & 103
SPARE	--	20 A	23	1					0.0	0.0	1	24	20 A	--	SPARE
SPARE	--	20 A	25	1	0.0	0.0					1	26	20 A	--	SPARE
SPARE	--	20 A	27	1			0.0	0.0			1	28	20 A	--	SPARE
SPARE	--	20 A	29	1					0.0	0.0	1	30	20 A	--	SPARE
SPARE	--	20 A	31	1	0.0	0.0					1	32	20 A	--	SPARE
SPARE	--	20 A	33	1			0.0	0.0			1	34	20 A	--	SPARE
SPARE	--	20 A	35	1					0.0	0.0	1	36	20 A	--	SPARE
SPARE	--	20 A	37	1	0.0	0.0					1	38	20 A	--	SPARE
SPARE	--	20 A	39	1			0.0	0.0			1	40	20 A	--	SPARE
SPARE	--	20 A	41	1					0.0	0.0	1	42	20 A	--	SPARE

LOAD	Connected Load	Demand Factor	Estimated Demand	NOTES:
LIGHTS	0.00 kVA	0.00%	0.00 kVA	1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
HEATING	0.00 kVA	0.00%	0.00 kVA	2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
COOLING	0.00 kVA	0.00%	0.00 kVA	3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
VENTILATION	0.00 kVA	0.00%	0.00 kVA	4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
MOTORS	0.00 kVA	0.00%	0.00 kVA	5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
KITCHEN	0.00 kVA	0.00%	0.00 kVA	6. PROVIDE METAL DIRECTORY FRAME.
RECEPTACLES	16.10 kVA	81.05%	13.05 kVA	
WATER HEATER	0.00 kVA	0.00%	0.00 kVA	
MISC.	0.00 kVA	0.00%	0.00 kVA	
Spare	0.00 kVA	0.00%	0.00 kVA	

TOTAL KVA (CONNECTED):	16.1 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	13.1 kVA	53 A	46 A	38 A
TOTAL AMP. (CONNECTED):	45 A	TOTAL PER PHASE: (CONNECTED @ 125%)		
TOTAL AMP. (DEMAND):	36 A	66 A	58 A	47 A

PANEL: R5

VOLTAGE: 208Y/120 **MAIN TYPE:** MLO **MFR:**
MOUNTING: SURFACE **PHASE:** 3 **TYPE:**
MAIN: 200 A **WIRE:** 4 **AIC:** 22,000 AMPS SYMMETRICAL

LOAD SERVED	Wire Size	TRIP	CKT NO	POLES	A (LOAD KVA)		B (LOAD KVA)		C (LOAD KVA)		POLES	CKT NO	TRIP	Wire Size	LOAD SERVED
RECEPTACLES - CALL CTR 123B	12	20 A	1	1	0.2	0.5					1	2	20 A	12	MOTORIZED DOOR - VESTIBULE 100
RECEPTACLES - CALL CTR 123B	12	20 A	3	1			0.2	0.5			1	4	20 A	12	MOTORIZED DOOR - VESTIBULE 120
IT RECEPTACLE - TELECOM 124E	12	20 A	5	1					0.5	1.1	1	6	20 A	12	FLOOR BOX & RECS - TRAIN 122C
DEDICATED RECEPTACLE - TRAIN.122C	12	20 A	7	1	1.0	1.0					1	8	20 A	12	PROJECTOR & RECS - OPS 125E
RECEPTACLES - CALL CTR 123B	12	20 A	9	1			0.5	0.9			1	10	20 A	12	RECEPTACLES - OPS 125E
RECEPTACLES - BAS 124G	12	20 A	11	1					0.5	2.5	2	12	30 A	10	IT RECEPTACLE - TELECOM 124E
REFRIGERATOR - BREAK 130A (NOTE 7)	12	20 A	13	1	1.2	2.5						14			
FLOOR BOX & RECS - BAS 124G	12	20 A	15	1			1.0	2.5			2	16	30 A	10	IT RECEPTACLE - TELECOM 124E
IT RECEPTACLE - TELECOM 124E	12	20 A	17	1					0.5	2.5		18			
IT RECEPTACLE - TELECOM 124E	12	20 A	19	1	0.5	0.5					1	20	20 A	12	IT RECEPTACLE - TELECOM 124E
RECEPTACLES - BAS 124G	12	20 A	21	1			0.5	0.5			1	22	20 A	12	IT RECEPTACLE - TELECOM 124E
DEDICATED RECEPTACLE - TRAIN.122C	12	20 A	23	1					1.0	1.1	1	24	20 A	12	RECEPTACLES - ELEC & MECH 124D &...
DEDICATED RECEPTACLE - TRAIN.122C	12	20 A	25	1	1.0	1.6					2	26	20 A	12	IT RECEPTACLE - TELECOM 124E
DEDICATED RECEPTACLE - TRAIN.122C	12	20 A	27	1			1.0	1.6				28			
IT RECEPTACLE - TELECOM 124E	12	20 A	29	2					1.6	0.5	1	30	20 A	12	RECEPTACLES - MECHANICAL 134
			31		1.6	1.6					2	32	20 A	12	IT RECEPTACLE - TELECOM 124E
IT RECEPTACLE - TELECOM 124E	12	20 A	33	2			1.6	1.6				34			
			35						1.6	1.6	2	36	20 A	12	IT RECEPTACLE - TELECOM 124E
RECEPTACLES - CALL CTR 103G	12	20 A	37	1	0.5	1.6						38			
IT RECEPTACLE - TELECOM 124E	12	20 A	39	2			1.6	0.9			1	40	20 A	12	TV & QUAD REC - CALL CTR 103G
			41						1.6	1.0	1	42	20 A	12	COPIER - CALL CTR 103G

LOAD	Connected Load	Demand Factor	Estimated Demand	NOTES:
LIGHTS	0.00 kVA	0.00%	0.00 kVA	1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
HEATING	0.00 kVA	0.00%	0.00 kVA	2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
COOLING	0.00 kVA	0.00%	0.00 kVA	3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
VENTILATION	0.00 kVA	0.00%	0.00 kVA	4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
MOTORS	0.00 kVA	0.00%	0.00 kVA	5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
KITCHEN	1.20 kVA	100.00%	1.20 kVA	6. PROVIDE METAL DIRECTORY FRAME.
RECEPTACLES	11.34 kVA	94.09%	10.67 kVA	7. PROVIDE CLASS A GFI (6mA-PERSONNEL) BRKR (250' MAX).
WATER HEATER	0.00 kVA	0.00%	0.00 kVA	
MISC.	34.70 kVA	100.00%	34.70 kVA	
Spare	0.00 kVA	0.00%	0.00 kVA	

TOTAL KVA (CONNECTED):	47.2 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	46.6 kVA	127 A	122 A	146 A
TOTAL AMP. (CONNECTED):	131 A	TOTAL PER PHASE: (CONNECTED @ 125%)		
TOTAL AMP. (DEMAND):	129 A	159 A	153 A	182 A

PANEL: R6

VOLTAGE: 208Y/120 **MAIN TYPE:** MLO **MFR:**
MOUNTING: SURFACE **PHASE:** 3 **TYPE:**
MAIN: 200 A **WIRE:** 4 **AIC:** 22,000 AMPS SYMMETRICAL

LOAD SERVED	Wire Size	TRIP	CKT NO	POLES	A (LOAD KVA)		B (LOAD KVA)		C (LOAD KVA)		POLES	CKT NO	TRIP	Wire Size	LOAD SERVED
RECEPTACLES - FCAP TECH 125F	12	20 A	1	1	0.4	0.5					1	2	20 A	12	RECEPTACLES - FCAP TECH 125F
RECEPTACLES - FCAP TECH 125F	12	20 A	3	1			0.4	0.7			1	4	20 A	12	RECEPTACLES - MAILROOM 124C
RECEPTACLES - FCAP TECH 125F	12	20 A	5	1					0.5	0.9	1	6	20 A	12	TV & QUAD REC - CALL CTR 103G
TV & REC - PARK. CTRL 103K	12	20 A	7	1	0.9	1.0					1	8	20 A	12	RECEPTACLES QUADS - PARK. CTRL...
FLOOR BOX & RECS - CONF. 126B	12	20 A	9	1			0.5	1.3			1	10	20 A	12	TV & QUAD REC - CALL CTR 103G
EXTERIOR GATE	12	20 A	11	1					1.0	1.2	1	12	20 A	12	RECEPTACLES - MTN. TECH 105A
RECEPTACLES - TRANS. 104E	12	20 A	13	1	1.1	1.2					1	14	20 A	12	RECEPTACLES - MTN. TECH 105A
TV & QUAD REC - CALL CTR 103G	12	20 A	15	1			1.7	0.5			1	16	20 A	12	PLOTTER - WORKROOM 125D
RECEPTACLES QUADS - PARK. CTRL...	12	20 A	17	1					1.5	0.5	1	18	20 A	12	RECEPTACLES QUADS - PARK. CTRL...
PLOTTER - WORKROOM 102A	12	20 A	19	1	0.5	0.7					1	20	20 A	12	RECEPTACLES - WORKROOM 125D
TV'S - CONF. 102C	12	20 A	21	1			0.7	1.0			1	22	20 A	12	RECEPTACLES QUADS - TRANS. 104E
TV'S - CONF. 123D	12	20 A	23	1					0.7	1.0	1	24	20 A	12	RECEPTACLES QUADS - TRANS. 104E
RECEPTACLES QUADS - TRANS. 104E	12	20 A	25	1	1.0	1.2					1	26	20 A	12	UC ICEMAKER - BREAK 130A (NOTE 7)
EXTERIOR GATE	12	20 A	27	1			1.0	1.2			1	28	20 A	12	UC ICEMAKER - BREAK 123I (NOTE 7)
BLUE LIGHT PHONE	12	20 A	29	1					0.8	0.8	1	30	20 A	12	BLUE LIGHT PHONE
BLUE LIGHT PHONE	12	20 A	31	1	0.8	0.0					1	32	20 A	--	SPARE
PLENUM BOX - TRANS. DRIVER 104E	12	20 A	33	1			0.2	0.0			1	34	20 A	--	SPARE
PLENUM BOX - CONF. ROOM 102C	12	20 A	35	1					0.2	0.0	1	36	20 A	--	SPARE
PLENUM BOX - MP CONF. ROOM 123D	12	20 A	37	1	0.2	0.0					1	38	20 A	--	SPARE
PLENUM BOX - TRAINING ROOM 123A	12	20 A	39	1			0.2	0.0			1	40	20 A	--	SPARE
SPARE	--	20 A	41	1					0.0	0.0	1	42	20 A	--	SPARE

LOAD	Connected Load	Demand Factor	Estimated Demand	NOTES:
LIGHTS	0.00 kVA	0.00%	0.00 kVA	1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
HEATING	0.00 kVA	0.00%	0.00 kVA	2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
COOLING	0.00 kVA	0.00%	0.00 kVA	3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
VENTILATION	0.00 kVA	0.00%	0.00 kVA	4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
MOTORS	0.00 kVA	0.00%	0.00 kVA	5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
KITCHEN	0.00 kVA	0.00%	0.00 kVA	6. PROVIDE METAL DIRECTORY FRAME.
RECEPTACLES	22.94 kVA	71.79%	16.47 kVA	7. PROVIDE CLASS A GFI (6mA-PERSONNEL) BRKR (250' MAX).
WATER HEATER	0.00 kVA	0.00%	0.00 kVA	
MISC.	4.74 kVA	100.00%	4.74 kVA	
Spare	0.00 kVA	0.00%	0.00 kVA	

TOTAL KVA (CONNECTED):	27.7 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	21.2 kVA	79 A	79 A	74 A
TOTAL AMP. (CONNECTED):	77 A	TOTAL PER PHASE: (CONNECTED @ 125%)		
TOTAL AMP. (DEMAND):	59 A	98 A	99 A	93 A

PANEL: RM

VOLTAGE: 208Y/120 **MAIN TYPE:** MLO **MFR:**
MOUNTING: SURFACE **PHASE:** 3 **TYPE:**
MAIN: 200 A **WIRE:** 4 **AIC:** 22,000 AMPS SYMMETRICAL

LOAD SERVED	Wire Size	TRIP	CKT NO	POLES	A (LOAD KVA)		B (LOAD KVA)		C (LOAD KVA)		POLES	CKT NO	TRIP	Wire Size	LOAD SERVED
UH-1	12	20 A	1	1	0.0	0.1					1	2	20 A	12	WATER METER CONNECTION
F-4 & F-5	12	20 A	3	1			0.9	0.9			1	4	20 A	12	F-6 & F-7
WH1 & RCP1	12	15 A	5	1					0.1	0.7	1	6	20 A	12	VAV 1.20 - 1.26
VAV 1.1 - 1.6	12	20 A	7	1	0.6	0.5					1	8	20 A	12	VAV 1.46 - 1.51
ODU-2 / AC-2	10	30 A	9	2			2.2	0.5			1	10	20 A	12	B-2
			11						2.2	0.5	1	12	20 A	12	VAV 1.41 - 1.45
VAV 1.13 & 1.19	12	20 A	13	1	0.7	1.0					1	14	20 A	12	CHILLER#1 CONTROLS
VAV 1.34 - 1.40	12	20 A	15	1			0.7	0.0			1	16	20 A	--	SPARE
SPARE	--	20 A	17	1					0.0	0.7	1	18	20 A	12	VAV 1.7 - 1.12 & 1.52
SPARE	--	20 A	19	1	0.0	0.5					1	20	20 A	12	B-1
FCU-8	12	20 A	21	1			1.1	1.1			1	22	20 A	12	FCU-5
GRH-1 & GRH-2 (NOTE 8)	12	20 A	23	1					1.0	1.1	1	24	20 A	12	P-9
VAV 1.27 - 1.33	12	20 A	25	1	0.7	1.0					1	26	20 A	12	CHILLER#2 CONTROLS
WEFS-1	12	20 A	27	1			1.8	0.0			1	28	20 A	--	SPARE
FCU-6	12	20 A	29	1					1.1	0.0	1	30	20 A	--	SPARE
FCU-7	12	20 A	31	1	1.1	1.1					1	32	20 A	12	FCU-4
SOLENOID CONTROL CIRCUIT	12	20 A	33	1			0.0	0.0			1	34	20 A	--	SPARE
SPARE	--	0 A	35	1					0.0	0.0	1	36	20 A	--	SPARE
SPARE	--	0 A	37	1	0.0	0.0					1	38	20 A	--	SPARE
ACCESS CONTROL	12	20 A	39	1			0.5	0.0			1	40	20 A	12	HEAT TAPE - CHILLER #1 (NOTE 7)
ACCESS CONTROL	12	20 A	41	1					0.5	0.0	1	42	20 A	12	HEAT TAPE - CHILLER #1 (NOTE 7)

LOAD	Connected Load	Demand Factor	Estimated Demand	NOTES:
LIGHTS	0.00 kVA	0.00%	0.00 kVA	1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
HEATING	0.00 kVA	0.00%	0.00 kVA	2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
COOLING	4.49 kVA	100.00%	4.49 kVA	3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
VENTILATION	5.10 kVA	100.00%	5.10 kVA	4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
MOTORS	10.46 kVA	104.40%	10.92 kVA	5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
KITCHEN	0.00 kVA	0.00%	0.00 kVA	6. PROVIDE METAL DIRECTORY FRAME.
RECEPTACLES	2.00 kVA	100.00%	2.00 kVA	7. PROVIDE CLASS A GFI (6mA-PERSONNEL) BRKR (250' MAX).
WATER HEATER	0.05 kVA	100.00%	0.05 kVA	8. BREAKER CIRCUIT IS FOR BASE BID ONLY.
MISC.	3.12 kVA	100.00%	3.12 kVA	REMOVE IF ALTERNATE IS CHOSEN
Spare	0.00 kVA	0.00%	0.00 kVA	9. IF ALTERNATE IS CHOSEN, REFER TO ALTERNATE "RM" PANEL ON SHEET...
				FOR ADDITIONAL CIRCUITS REQUIRED IN THIS PANEL.

TOTAL KVA (CONNECTED):	25.2 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	25.7 kVA	62 A	83 A	67 A
TOTAL AMP. (CONNECTED):	70 A	TOTAL PER PHASE: (CONNECTED @ 125%)		
TOTAL AMP. (DEMAND):	71 A	77 A	104 A	84 A

R1	RDP	MDP
R2	R3	R4
R5	R6	RM

UNC CHARLOTTE

FACILITIES OPERATIONS / PARKING SERVICES COMPLEX

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028297 BRANDON L. MILLER
9/19/17

REVISIONS:

No.	Description	Date
1	Addendum #4	8.28.2017
2	Addendum #6	9.19.2017

PROJECT: 9202-164730
SCO ID: 16-15656-02B
ITEM: 315 CODE: 41526
DATE: AUGUST 21, 2017
DRAWN BY: J. Holcolmb
CHECKED BY: M. Mazzone

PANEL SCHEDULES

E-602

OPTIMA #: 16-0265

BUILDING BID DOCUMENTS