

August 19, 2013

**ATTENTION ALL REQUEST FOR BID (RFB) HOLDERS**

**RFB NO. 313072- ADDENDUM NO. 5**

**ALLIANT ENERGY CENTER PAVILIONS**

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**BIDS DUE:** THURSDAY, AUGUST 22, 2013, 2:00 PM. DUE DATE AND TIME ARE NOT CHANGED BY THIS ADDENDUM.

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This Addendum is issued to modify, explain or clarify the original Request for Bid (RFB) and is hereby made a part of the RFB. Please attach this Addendum to the RFB. **Bidders must acknowledge all Addenda on the Bid Form.**

**PLEASE MAKE THE FOLLOWING CHANGES:**

**1. Structural Questions:**

- A. Chocker Course: Is a dense layer of imported well graded and gravel with no more than 5 percent by weight passing a No. 200 U.S. Standard sieve as defined in the geotechnical report.
- B. Slab Reinforcement Bar: Reference 3/S301B. The slab reinforcement bars are place around the column in the slab-on-grade and will be in the diamond block-out.
- C. Canopy Framing: Reference S202 and note the HSS18x6x 5/16 roof framing structure.

**2. Addendum 4**

- A. Delete Section 05 53 00 – Bar Gratings and replace with revised section that is attached to this addendum.

**3. Section Instructions To Bidders**

- A. Page 10, Section 24 Liquidated Damages, delete paragraphs and replace with paragraphs as follows:
  - “A. Should the contractor fail to complete the work within the time agreed upon in the contract or within such extra time as may be allowed by written extensions approved by Dane County, contractor shall pay to Dane County liquidated damages in the amount of Two Hundred and Thirty Five Thousand Dollars (\$235,000) beyond said agreed upon completion date listed on the Bid Form. The entire project from demolition to occupancy permit (of Pavilion Areas B+C+D and the First Floor Lobby, Restrooms, and Concession Areas of the Pre-Function Building) must occur between October 6, 2013 and April 1, 2014 to allow the Alliant Energy Center to honor contracted events. A noted exception to final completion of the Work is the work of Section 32 12 15 Asphalt Paving which is dependent upon availability of material and appropriate weather conditions. If asphalt paving cannot be completed by April 7, 2014, a temporary surface acceptable to County must be in place on all proposed asphalt pavement areas from April 7, 2014 to April 14,

2014. Refer to Section 32 12 15 - Asphalt paving for temporary surface material placement and removal. All traces of the alternative surfacing must be removed and the asphalt pavement base course must meet specifications and be approved by the County and Architect before permanent paving can commence.

“B. Liquidated damages established hereunder shall be considered and treated not as a penalty but as fixed, agreed, and liquidated damages due Dane County from the contractor by reason of inconvenience to the public, added cost of engineering and supervision, maintenance of detours and other items that have caused an expenditure of public funds resulting from the contractor’s failure to complete the work within the time specified in the contract.

“C. Permitting the contractor to continue on the job and to finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, shall not result in a waiver of any of Dane County’s rights under the contract.”

**4. Section 03 30 00 – Cast in Place Concrete**

- A. Page 03 30 00-10, Change Item 2.5, Mix Proportioning table, Note (4) to “Not Used”
- B. Page 03 30 00-16, Delete Item 3.8, H.

**5. Section 07 42 -00 – Metal Wall Panels**

- A. Revise paragraph 2.2.C.2 as follows:
  - 1. Metal Panels 2 and 3 Color: Metal Panel Supplier Custom Metallic color to match Architect's sample.
- B. Additional Information: Because subject panels are a custom color and unlikely to be available in limited quantities, it is the intention that supplier for this section will purchase metal panel material for panels 2 from the Division 13 Metal Building Systems supplier.

**6. Section 13 34 19 – Metal Building Systems**

- A. Page 1, at 1.2, add the following paragraph:

“C. Coordinate the purchase of wall panel material by Division 07 42 00 – Metal Wall Panels from the PEMB manufacturer so that a sufficient quantity of identical material is produced for the entire project at one time.” (The intent is that Wall Panel 2 provided for the pre-function building by Section 07 42 00 is obtained from the same source as the PEMB wall panels.)

**7. Section 23 05 13 – Electrical Provisions of HVAC Work**

- A. Paragraph 2.1.A.: Delete Allis-Chalmers Corporation and Louis Allis Div.; Litton Industrail Products Inc. from the list of manufacturers.
- B. Paragraph 2.2.A.: Delete Allen-Bradley Company from the list of manufacturers.

**8. Section 23 05 14 – Variable Frequency Drives**

- A. Paragraph 2.1.O.: Delete Allied, Bradley, Eaton, Louis Allis, Robicon, Reliance, Square D, and Toshiba from the list of manufacturers.

**9. Section 23 05 19 - Gauges**

- A. Paragraph 2.1.A.: Delete Marsh, and Weksler from the list of manufacturers.

**10. Section 23 05 29 – Supports and Anchors**

A. Paragraph 2.1.A.: Delete Erico, Cooper, and Unistrut from the list of manufacturers.

**11. Section 23 05 48 – Vibration Isolation**

A. Paragraph 2.1.A.: Delete Amber/Booth Co., Mason Industries Inc., and Vibration Mountings and Controls Inc. from the list of manufacturers.

**12. Section 23 05 93 – Testing, Adjusting, and Balancing**

Delete the entire section. Work shall be performed under separate contract.

**13. Section 23 11 23 – Natural Gas Piping Systems**

A. Paragraph 2.3.B.1.: Delete Jenkins Bros. and Lunkenheimer Company from the list of manufacturers.

**14. Section 23 23 00 – Refrigerant Piping**

A. Paragraph 2.4.E.: Delete Emerson Electric Co., Parker-Hannifin Corp., and Refrigeration & Air Cond. Div. from the list of manufacturers.

**15. Section 23 34 13 – Axial Fans**

A. Paragraph 2.1.F.: Delete Soler & Palau from the list of manufacturers.

**16. Section 23 34 23 – Power & Gravity Ventilators**

A. Paragraph 2.1.B.7.: Delete Soler & Palau from the list of manufacturers.

**17. Section 23 36 17 – Terminal Units - Electric**

A. Paragraph 2.1.F.:

1. Delete Berko, Brasch, Cadet, Chromalox, Federal Pacific, Interther, McGraw Edison, Marked Nuton, Raypack, TPI and Zell-Aire from the list of manufacturers.
2. Add Q-Mark (Marley Engineered Products); Vulcan to the list of manufacturers.

**18. Section 23 63 13 – Air Cooled Condensers**

A. Paragraph 2.1.A.: Delete Lennox Industries Inc from the list of manufacturers.

**19. Section 26 05 74 – Overcurrent Protective Device and Arc-Flash Study**

A. Add section 26 05 74 included with this addendum to the Electrical Specifications for this project.

**20. Section 32 12 16 Asphalt Paving**

A. Replace section with the attached.

**21. Sheet C205**

A. At the description of demolition for building S-3, revise to read: “The existing building superstructure will be removed by Owner. Existing light fixtures will be salvaged by Owner and turned over to Contractor at the beginning of construction. Demolition of all existing substructure will remain the work of the Contractor.”

**22. Sheets C302 and C402**

A. The building called out as Area F/Storage Shed is considered Alternate Bid #3. Base bid should include grading the area to subgrade elevations (maintain positive drainage to the west) and restoration as lawn.

**23. Sheet C502**

- B. The building called out as Area F/Storage Shed is considered Alternate Bid #3. Base bid shall include grading the area to subgrade elevations (maintain positive drainage to the west) and restoration as lawn.
- C. Clarification: The note “Connect (1) downspout drain to storm nl/mh #20” shall be included as a part of Alternate Bid #3.

**24. Sheet S201A**

- A. Replace Sheet S201A with revised Sheet S201A, issued with this Addendum.

**25. Sheet S201B**

- Replace Sheet S201B with revised Sheet S201B, issued with this Addendum.

**26. Sheet S202**

- A. Replace Sheet S202 with revised Sheet S202, issued with this Addendum.

**27. Sheet A203A**

- A. Roof Plans, add note: “At all roofs with tapered insulation, the average R-value shall be R-30.”

**28. Sheet A506**

- B. Replace Sheet A506 with revised Sheet A506, issued with this Addendum.

**29. Sheet A508**

- C. Detail 2/A508: all interior surfaces of the walkable plenum shall be finished with 3/4” structural concrete panel deck (floor, walls and ceiling).

**30. Sheets A801, A803, & A804**

- A. Architectural Details at Stone Panel Sills and Opening Headers – (9/A801, 10/A801, 6/A803, 9/A803, 3/A804, 7/A804):
  - a. Add Note : “CONTINUOUS FLASHING TO EXTEND TO WALL SHEATING/AIR BARRIER, BEHIND RIDGID INSULATION.”
  - b. Add note: “WEEPS AT 24 INCHES o.c.”

**31. Sheet M301**

- A. 8/M301: Revise fan mezzanine structural support of equipment. See clouded areas of revised sheet M301 issued with this addendum

**32. Sheet E301**

- B. See clouded areas of revised sheet E301 that is issued with this addendum

**33. Sheet E401**

- A. See revised sheet E401 that is issued with this addendum.

**34. Sheet E402**

- B. See clouded areas of revised sheet E402 that is issued with this addendum.

If any additional information about this Addendum is needed, please call J. Eric Urtes, AIA at 608/266-4798 [urt.es.eric@countyofdane.com](mailto:urt.es.eric@countyofdane.com).

Sincerely,  
*J. Eric Urtes, AIA*  
Project Manager

Enclosures:  
05 53 13 Bar Gratings  
32 12 16 Asphalt paving  
26 05 74 Overcurrent Protective Device and Arc-Flash Study  
Sheet S201A, 30"x42" drawing dated 08-19-13  
Sheet S201B, 30"x42" drawing dated 08-19-13  
Sheet S202, 30"x42" drawing dated 08-19-13  
Sheet A506, 30"x42" drawing dated 08-19-13  
Sheet M301, 30"x42" drawing dated 08-19-13  
Sheet E301, 30"x42" drawing dated 08-19-13  
Sheet E401, 30"x42" drawing dated 08-19-13  
Sheet E402, 30"x42" drawing dated 08-19-13

**SECTION 05 53 13 - BAR GRATINGS**

**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 metal bar gratings and metal supports for gratings.
- B. Related Requirements:
  - 1. Section 05 12 00 "Structural Steel Framing" for structural-steel framing system components.
  - 2. Section 05 55 00 "Metal Fabrications" for grating treads and landings of steel-framed stairs.

1.3 COORDINATION

- A. Coordinate installation of anchorages for gratings and supports. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
  - 1. Clips and anchorage devices for gratings.
  - 2. Paint products.
- B. Shop Drawings: Include plans, sections, details, and attachments to other work.

1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with gratings by field measurements before fabrication.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Alfab, Inc.
  - 2. American Stair, Inc.
  - 3. Lapeyre Stair Inc.
  - 4. Mc Nichols Co.

### **2.2 PERFORMANCE REQUIREMENTS**

- A. Structural Performance: Gratings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Limit deflection to L/360 or 1/4 inch, whichever is less.

### **2.3 METAL BAR GRATINGS**

- A. Metal Bar Grating Standards: Comply with NAAMM MBG 531, "Metal Bar Grating Manual."
- B. Pressure-Locked, Rectangular-Bar Aluminum Grating: Fabricated by swaging crossbars between bearing bars.
  - 1. Bearing Bar Spacing: As indicated in the drawings.
  - 2. Bearing Bar Depth: As indicated in the drawings.
  - 3. Bearing Bar Thickness: As indicated in the drawings..
  - 4. Crossbar Spacing: As indicated in the drawings.
  - 5. Traffic Surface: Plain.

### **2.4 ALUMINUM**

- A. General: Provide alloy and temper recommended by aluminum producer for type of use indicated, with not less than the strength and durability properties of alloy, and temper designated below for each aluminum form required.
- B. Extruded Bars and Shapes: ASTM B 221, alloys as follows:
  - 1. 6061-T6 or 6063-T6, for bearing bars of gratings and shapes.
  - 2. 6061-T1, for grating crossbars.
- C. Aluminum Sheet: ASTM B 209, Alloy 5052-H32.

### **2.5 FASTENERS**

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
  - 1. Provide stainless-steel fasteners for fastening aluminum.
- B. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, nuts, and, where indicated, flat washers; ASTM F 593 for bolts and ASTM F 594 for nuts, Alloy Group 1.
- C. Post-Installed Anchors: Torque-controlled expansion or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
  - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
  - 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

## 2.6 MISCELLANEOUS MATERIALS

- A. Bituminous Paint: Cold-applied asphalt emulsion complying with
- B. ASTM D 1187/D 1187M.

## 2.7 FABRICATION

- A. Shop Assembly: Fabricate grating sections in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch material cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form from materials of size, thickness, and shapes indicated, but not less than that needed to support indicated loads.
- D. Fit exposed connections accurately together to form hairline joints.
- E. Welding: Comply with AWS recommendations and the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.



- F. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space the anchoring devices to secure gratings, frames, and supports rigidly in place and to support indicated loads.
- G. Fabricate cutouts in grating sections for penetrations indicated. Arrange cutouts to permit grating removal without disturbing items penetrating gratings.
  - 1. Edge-band openings in grating that interrupt four or more bearing bars with bars of same size and material as bearing bars.
- H. Do not notch bearing bars at supports to maintain elevation.

## 2.8 GRATING FRAMES AND SUPPORTS

- A. Fabricate from metal shapes, plates, and bars of welded construction to sizes, shapes, and profiles indicated and as necessary to receive gratings. Miter and weld connections for perimeter angle frames. Cut, drill, and tap units to receive hardware and similar items.
  - 1. Unless otherwise indicated, fabricate from same basic metal as gratings.
  - 2. Equip units indicated to be cast into concrete or built into masonry with integrally welded anchors. Unless otherwise indicated, space anchors 24 inches o.c. and provide minimum anchor units in the form of steel straps 1-1/4 inches wide by 1/4 inch thick by 8 inches long.

## 2.9 ALUMINUM FINISHES

- A. Mill finish where indicated.
- B. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I where indicated.

## **PART 3 - EXECUTION**

### 3.1 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing gratings to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing gratings. Set units accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
- C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete or masonry.
- D. Fit exposed connections accurately together to form hairline joints.
  - 1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade the

surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

- E. Attach toeplates to gratings by welding at locations indicated.
- F. Field Welding: Comply with AWS recommendations and the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
- G. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

### 3.2 INSTALLING METAL BAR GRATINGS

- A. General: Install gratings to comply with recommendations of referenced metal bar grating standards that apply to grating types and bar sizes indicated, including installation clearances and standard anchoring details.
- B. Attach removable units to supporting members with type and size of clips and fasteners indicated or, if not indicated, as recommended by grating manufacturer for type of installation conditions shown.
- C. Attach nonremovable units to supporting members by welding where both materials are same; otherwise, fasten by bolting as indicated above.

END SECTION 05 53 13

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1 **SECTION 260574 - OVERCURRENT PROTECTIVE DEVICE AND ARC-FLASH STUDY**

2 **PART 1 - GENERAL**

3 1.1 RELATED DOCUMENTS

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

6 1.2 SUMMARY

7 A. Section includes a computer-based, arc-flash study to determine the arc-flash hazard dis-  
8 tance and the incident energy to which personnel could be exposed during work on or near electrical  
9 equipment.

10 1.3 DEFINITIONS

11 A. Existing to Remain: Existing items of construction that are not to be removed and that are  
12 not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

13 B. One-Line Diagram: A diagram which shows, by means of single lines and graphic sym-  
14 bols, the course of an electric circuit or system of circuits and the component devices or parts used  
15 therein.

16 C. Protective Device: A device that senses when an abnormal current flow exists and then  
17 removes the affected portion from the system.

18 D. SCCR: Short-circuit current rating.

19 E. Service: The conductors and equipment for delivering electric energy from the serving  
20 utility to the wiring system of the premises served.

21 1.4 SUBMITTALS

22 A. Submit the following submittals at the same time as the distribution equipment and pro-  
23 tective devices submittals.

- 24 1. Submittals shall be in digital form.  
25 2. Coordination-study input data including completed program input data sheets.  
26 3. Arc-flash study input data, including completed computer program input data  
27 sheets.  
28 4. Arc-flash study report; signed, dated, and sealed by a qualified professional en-  
29 gineer.  
30 5. The results of the arc flash study shall be reflected in the distribution equipment  
31 and system protective device submittals.  
32 6. Overcurrent protective device coordination study report; signed, dated and  
33 sealed by a qualified registered professional engineer.  
34 7. The results of the coordination study shall be reflected in the distribution equip-  
35 ment and system protective device submittals.

1 1.5 CLOSEOUT SUBMITTALS

2 A. Maintenance procedures according to requirements in NFPA 70E shall be provided in the  
3 equipment manuals.

4 B. Operation and Maintenance Procedures: In addition to items specified in Section 017823  
5 "Operation and Maintenance Data," provide maintenance procedures for use by Owner's personnel that  
6 comply with requirements in NFPA 70E.

7 C. Include from the Protective Device Coordination Study Report a one line diagram, protec-  
8 tive device coordination study and time-current coordination curves.

9 1.6 QUALITY ASSURANCE

10 A. Studies shall use computer programs that are distributed nationally and are in wide use.  
11 Software algorithms shall comply with requirements of standards and guides specified in this Section.  
12 Manual calculations are unacceptable.

13 B. Arc-Flash Study Software Developer Qualifications: An entity that owns and markets  
14 computer software used for studies, having performed successful studies of similar magnitude on elec-  
15 trical distribution systems using similar devices.

16 1. The computer program shall be developed under the charge of a licensed pro-  
17 fessional engineer who holds IEEE Computer Society's Certified Software Development Pro-  
18 fessional certification.

19 C. Arc-Flash Study Specialist and Coordination Study Specialist Qualifications: Professional  
20 engineer in charge of performing the study, analyzing the arc flash, and documenting recommendations,  
21 licensed in the state where Project is located. All elements of the study shall be performed under the di-  
22 rect supervision and control of this professional engineer.

23 PART 2 - PRODUCTS

24 2.1 COMPUTER SOFTWARE DEVELOPERS

25 A. Software Developers: Subject to compliance with requirements, available software devel-  
26 opers offering software that may be used for the Work include, but are not limited to, the following]:

- 27 1. ESA Inc.
- 28 2. Operation Technology, Inc.
- 29 3. Power Analytics, Corporation.
- 30 4. SKM Systems Analysis, Inc.

31 B. Comply with IEEE 1584 and NFPA 70E.

32 C. Analytical features of device coordination study computer software program shall have  
33 the capability to calculate "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.

34 D. Computer software program shall be capable of plotting and diagramming time-current  
35 characteristic curves as part of its output. Computer software program shall report device settings and  
36 ratings of all overcurrent protective devices and shall demonstrate selective coordination by computer  
37 generated, time-current coordination plots.

38

- 1     2.2   SHORT-CIRCUIT STUDY REPORT CONTENT
- 2           A.     Executive summary.
- 3           B.     Study descriptions, purpose, basis and scope.
- 4           C.     One-line diagram, showing the following:
- 5                 1.           Protective device designations and ampere ratings.
- 6                 2.           Cable size and lengths.
- 7                 3.           Transformer kilovolt ampere (kVA) and voltage ratings.
- 8                 4.           Motor and generator designations and kVA ratings.
- 9                 5.           Switchgear, switchboard, motor-control center and panelboard designations.
- 10          D.     Study Input Data: As described in "Power System Data" Article.
- 11          E.     Short-Circuit Study Output:
- 12                 1.           Interrupting Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
- 13
- 14                         1)     Voltage.
- 15                         2)     Calculated symmetrical fault-current magnitude and angle.
- 16                         3)     Fault-point X/R ratio.
- 17                         4)     No AC Decrement (NACD) ratio.
- 18                         5)     Equivalent impedance.
- 19                         6)     Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a
- 20                                 symmetrical basis.
- 21                         7)     Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a total
- 22                                 basis.
- 23          F.     Incident Energy and Flash Protection Boundary Calculations:
- 24                 1.           Arcing fault magnitude.
- 25                 2.           Protective device clearing time.
- 26                 3.           Duration of arc.
- 27                 4.           Arc-flash boundary.
- 28                 5.           Working distance.
- 29                 6.           Incident energy.
- 30                 7.           Hazard risk category.
- 31                 8.           Recommendations for arc-flash energy reduction.
- 32          G.     Fault study input data, case descriptions, and fault-current calculations including a definition of terms and guide for interpretation of the computer printout.
- 33

34     2.3   PROTECTIVE DEVICE COORDINATION STUDY REPORT CONTENTS

- 35           A.     Executive summary.
- 36           B.     Study descriptions, purpose, basis and scope. Include case descriptions, definition of
- 37           terms and guide for interpretation of the computer printout.
- 38           C.     One-line diagram, showing the following:

1. Protective device designations and ampere ratings.
  2. Cable size and lengths.
  3. Transformer kilovolt ampere (kVA) and voltage ratings.
  4. Motor and generator designations and kVA ratings.
  5. Switchgear, switchboard, motor-control center, and panelboard designations.
- D. Study Input Data: As described in "Power System Data" Article.
- E. Short-Circuit Study:
1. Low-Voltage Fault Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
    - a. Voltage.
    - b. Calculated fault-current magnitude and angle.
    - c. Fault-point X/R ratio.
    - d. Equivalent impedance.
  2. Momentary Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
    - a. Voltage.
    - b. Calculated symmetrical fault-current magnitude and angle.
    - c. Fault-point X/R ratio.
    - d. Calculated asymmetrical fault currents:
      - 1) Based on fault-point X/R ratio.
      - 2) Based on calculated symmetrical value multiplied by 1.6.
      - 3) Based on calculated symmetrical value multiplied by 2.7.
  3. Interrupting Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
    - a. Voltage.
    - b. Calculated symmetrical fault-current magnitude and angle.
    - c. Fault-point X/R ratio.
    - d. No AC Decrement (NACD) ratio.
    - e. Equivalent impedance.
    - f. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a symmetrical basis.
    - g. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a total basis.
- F. Protective Device Coordination Study:
1. Report recommended settings of protective devices, ready to be applied in the field. Use manufacturer's data sheets for recording the recommended setting of overcurrent protective devices when available.
    - a. Phase and Ground Relays:
      - 1) Device tag.
      - 2) Relay current transformer ratio and tap, time dial, and instantaneous pickup value.
      - 3) Recommendations on improved relaying systems, if applicable.

- 1           b.     Circuit Breakers:
- 2                 1)     Adjustable pickups and time delays (long time, short time, ground).
- 3                 2)     Adjustable time-current characteristic.
- 4                 3)     Adjustable instantaneous pickup.
- 5                 4)     Recommendations on improved trip systems, if applicable.

- 6           c.     Fuses: Show current rating, voltage, and class.

7           G.     Time-Current Coordination Curves: Determine settings of overcurrent protective devices  
8 to achieve selective coordination. Graphically illustrate that adequate time separation exists between  
9 devices installed in series, including power utility company's upstream devices. Prepare separate sets of  
10 curves for the switching schemes and for emergency periods where the power source is local genera-  
11 tion. Show the following information:

- 12           1.           Device tag and title, one-line diagram with legend identifying the portion of the  
13 system covered.
- 14           2.           Terminate device characteristic curves at a point reflecting maximum symmet-  
15 rical or asymmetrical fault current to which the device is exposed.
- 16           3.           Identify the device associated with each curve by manufacturer type, function,  
17 and, if applicable, tap, time delay, and instantaneous settings recommended.
- 18           4.           Plot the following listed characteristic curves, as applicable:
  - 19                 a.     Power utility's overcurrent protective device.
  - 20                 b.     Medium-voltage equipment overcurrent relays.
  - 21                 c.     Medium- and low-voltage fuses including manufacturer's minimum melt, total  
22 clearing, tolerance, and damage bands.
  - 23                 d.     Low-voltage equipment circuit-breaker trip devices, including manufacturer's  
24 tolerance bands.
  - 25                 e.     Transformer full-load current, magnetizing inrush current, and ANSI through-fault  
26 protection curves.
  - 27                 f.     Cables and conductors damage curves.
  - 28                 g.     Ground-fault protective devices.
  - 29                 h.     Motor-starting characteristics and motor damage points.
  - 30                 i.     Generator short-circuit decrement curve and generator damage point.
  - 31                 j.     The largest feeder circuit breaker in each motor-control center and panelboard.
- 32           5.           Series rating on equipment allows the application of two series interrupting de-  
33 vices for a condition where the available fault current is greater than the interrupting rating of  
34 the downstream equipment. Both devices share in the interruption of the fault and selectivity is  
35 sacrificed at high fault levels. Maintain selectivity for tripping currents caused by overloads.
- 36           6.           Provide adequate time margins between device characteristics such that selec-  
37 tive operation is achieved.
- 38           7.           Comments and recommendations for system improvements.

39     2.4   ARC-FLASH WARNING LABELS

40           A.     Comply with requirements in Section 260553 "Identification for Electrical Systems." Pro-  
41 duce a 3.5-by-5-inch thermal transfer label of high-adhesion polyester for each work location included in  
42 the analysis.

43           B.     The label shall have an orange header with the wording, "WARNING, ARC-FLASH  
44 HAZARD," and shall include the following information taken directly from the arc-flash hazard analysis:



- 1 1. Location designation.
- 2 2. Nominal voltage.
- 3 3. Flash protection boundary.
- 4 4. Hazard risk category.
- 5 5. Incident energy.
- 6 6. Working distance.
- 7 7. Engineering report number, revision number, and issue date.

8 C. Labels shall be machine printed, with no field-applied markings.

## 9 PART 3 - EXECUTION

### 10 3.1 EXAMINATION

11 A. Examine Project overcurrent protective device submittals. Proceed with arc-flash study  
12 only after relevant equipment submittals have been assembled. Overcurrent protective devices that  
13 have not been submitted and approved prior to arc-flash study may not be used in study.

### 14 3.2 SHORT-CIRCUIT STUDY

15 A. Perform study following the general study procedures contained in IEEE 399.

16 B. Calculate short-circuit currents according to IEEE 551.

17 C. Base study on the device characteristics supplied by device manufacturer.

18 D. Study electrical distribution system from normal and alternate power sources throughout  
19 electrical distribution system for Project. Include studies of system-switching configurations and alter-  
20 nate operations that could result in maximum fault conditions.

21 E. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault  
22 and single line-to-ground fault at each of the following:

- 23 1. Electric utility's supply termination point.
- 24 2. Switchgear.
- 25 3. Low-voltage switchgear.
- 26 4. Motor-control centers.
- 27 5. Standby generators and automatic transfer switches.
- 28 6. Branch circuit panelboards.

### 29 3.3 PROTECTIVE DEVICE COORDINATION STUDY

30 A. Comply with IEEE 242 for calculating short-circuit currents and determining coordination  
31 time intervals.

32 B. Comply with IEEE 399 for general study procedures.

33 C. The study shall be based on the device characteristics supplied by device manufacturer.

34 D. Begin analysis at the service and at the generator, extending down to the system over-  
35 current protective devices as follows:

- 36 1. All overcurrent protective devices in all branch circuit panelboards.

- 1 E. Transformer Primary Overcurrent Protective Devices:
- 2 1. Device shall not operate in response to the following:
- 3 a. Inrush current when first energized.
- 4 b. Self-cooled, full-load current or forced-air-cooled, full-load current,
- 5 whichever is specified for that transformer.
- 6 c. Permissible transformer overloads according to IEEE C57.96 if required
- 7 by unusual loading or emergency conditions.
- 8 2. Device settings shall protect transformers according to IEEE C57.12.00, for fault
- 9 currents.
- 10 F. Motor Protection:
- 11 1. Select protection for low-voltage motors according to IEEE 242 and NFPA 70.
- 12 2. Select protection for motors served at voltages more than 600 V according to
- 13 IEEE 620.
- 14 G. Conductor Protection: Protect cables against damage from fault currents according to
- 15 ICEA P-32-382, ICEA P-45-482, and protection recommendations in IEEE 242. Demon-
- 16 strate that equipment withstands the maximum short-circuit current for a time equivalent
- 17 to the tripping time of the primary relay protection or total clearing time of the fuse. To de-
- 18 termine temperatures that damage insulation, use curves from cable manufacturers or
- 19 from listed standards indicating conductor size and short-circuit current.
- 20 H. Generator Protection: Select protection according to manufacturer's written recommenda-
- 21 tions and to IEEE 242.
- 22 I. The calculations shall include the ac fault-current decay from induction motors, synchro-
- 23 nous motors, and asynchronous generators and shall apply to low- and medium-voltage,
- 24 three-phase ac systems. The calculations shall also account for the fault-current dc dec-
- 25 rement, to address the asymmetrical requirements of the interrupting equipment.
- 26 1. For grounded systems, provide a bolted line-to-ground fault-current study for ar-
- 27 eas as defined for the three-phase bolted fault short-circuit study.
- 28 J. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault
- 29 and single line-to-ground fault at each of the following:
- 30 1. Electric utility's supply termination point.
- 31 2. Switchgear.
- 32 3. Unit substation primary and secondary terminals.
- 33 4. Low-voltage switchgear.
- 34 5. Motor-control centers.
- 35 6. Standby generators and automatic transfer switches.
- 36 7. Branch circuit panelboards.
- 37 8. <Insert significant locations in the system>.
- 38 K. Protective Device Evaluation:
- 39 1. Evaluate equipment and protective devices and compare to short-circuit ratings.
- 40 2. Adequacy of switchgear, motor-control centers, and panelboard bus bars to with-
- 41 stand short-circuit stresses.

1                   3.     Any application of series-rated devices shall be recertified, complying with re-  
2                                    requirements in NFPA 70.

3

4     3.4   ARC-FLASH HAZARD ANALYSIS

5           A.     Comply with NFPA 70E and its Annex D for hazard analysis study.

6           B.     Use the short-circuit study output and the field-verified settings of the overcurrent devic-  
7                                    es.

8           C.     Calculate maximum and minimum contributions of fault-current size.

9                   1.           The minimum calculation shall assume that the utility contribution is at a mini-  
10                                    mum and shall assume no motor load.

11                   2.           The maximum calculation shall assume a maximum contribution from the utility  
12                                    and shall assume motors to be operating under full-load conditions.

13           D.     Calculate the arc-flash protection boundary and incident energy at locations in the electri-  
14                                    cal distribution system where personnel could perform work on energized parts.

15           E.     Include medium- and low-voltage equipment locations, except 240-V ac and 208-V ac  
16                                    systems fed from transformers less than 125 kVA.

17           F.     Safe working distances shall be specified for calculated fault locations based on the cal-  
18                                    culated arc-flash boundary, considering incident energy of 1.2 cal/sq.cm.

19           G.     Incident energy calculations shall consider the accumulation of energy over time when  
20                                    performing arc-flash calculations on buses with multiple sources. Iterative calculations shall take into ac-  
21                                    count the changing current contributions, as the sources are interrupted or decremented with time. Fault  
22                                    contribution from motors and generators shall be decremented as follows:

23                   1.           Fault contribution from induction motors should not be considered beyond three  
24                                    to five cycles.

25                   2.           Fault contribution from synchronous motors and generators should be decayed  
26                                    to match the actual decrement of each as closely as possible (e.g., contributions from perma-  
27                                    nent magnet generators will typically decay from 10 per unit to three per unit after 10 cycles).

28           H.     Arc-flash computation shall include both line and load side of a circuit breaker as follows:

29                   1.           When the circuit breaker is in a separate enclosure.

30                   2.           When the line terminals of the circuit breaker are separate from the work loca-  
31                                    tion.

32           I.     Base arc-flash calculations on actual overcurrent protective device clearing time. Cap  
33                                    maximum clearing time at two seconds based on IEEE 1584, Section B.1.2.

34     3.5   POWER SYSTEM DATA

35           A.     Obtain all data necessary for the conduct of the arc-flash hazard analysis.

36                   1.           Verify completeness of data supplied on the one-line diagram on Drawings. Call  
37                                    discrepancies to the attention of Architect.

- 1           2.           For new equipment, use characteristics submitted under the provisions of action  
2           submittals and information submittals for this Project.  
3           3.           For existing equipment, whether or not relocated, obtain required electrical distri-  
4           bution system data by field investigation and surveys, conducted by qualified technicians and  
5           engineers.

6           B.           Gather and tabulate the following input data to support coordination study. Comply with  
7           recommendations in IEEE 1584 and NFPA 70E as to the amount of detail that is required to be acquired  
8           in the field. Field data gathering shall be under the direct supervision and control of the engineer in  
9           charge of performing the study, and shall be by the engineer or its representative who holds NETA ETT  
10          Level III certification or NICET Electrical Power Testing Level III certification.

- 11          1.           Product Data for overcurrent protective devices specified in other Sections and  
12          involved in overcurrent protective device coordination studies. Use equipment designation  
13          tags that are consistent with electrical distribution system diagrams, overcurrent protective de-  
14          vice submittals, input and output data, and recommended device settings.  
15          2.           Obtain electrical power utility impedance at the service.  
16          3.           Power sources and ties.  
17          4.           For transformers, include kVA, primary and secondary voltages, connection type,  
18          impedance, X/R ratio, taps measured in per cent, and phase shift.  
19          5.           For reactors, provide manufacturer and model designation, voltage rating and  
20          impedance.  
21          6.           For circuit breakers and fuses, provide manufacturer and model designation. List  
22          type of breaker, type of trip and available range of settings, SCCR, current rating, and breaker  
23          settings.  
24          7.           Generator short-circuit current contribution data, including short-circuit reactance,  
25          rated kVA, rated voltage, and X/R ratio.  
26          8.           For relays, provide manufacturer and model designation, current transformer ra-  
27          tios, potential transformer ratios, and relay settings.  
28          9.           Busway manufacturer and model designation, current rating, impedance, lengths,  
29          and conductor material.  
30          10.          Motor horsepower and NEMA MG 1 code letter designation.  
31          11.          Low-voltage cable sizes, lengths, number, conductor material and conduit mate-  
32          rial (magnetic or nonmagnetic).

### 33          3.6    LABELING

34          A.           Apply one arc-flash label for 600-V ac, 480-V ac, and applicable 208-V ac panelboards  
35          and disconnects and for each of the following locations:

- 36          1.           Motor-control center.  
37          2.           Low-voltage switchboard.  
38          3.           Switchgear.  
39          4.           Control panel.

### 40          3.7    APPLICATION OF WARNING LABELS

41          A.           Install the arc-fault warning labels under the direct supervision and control of the Arc-  
42          Flash Study Specialist.

1     3.8   DEMONSTRATION

2             A.     Engage the Arc-Flash Study Specialist to train Owner's maintenance personnel in the po-  
3     tential arc-flash hazards associated with working on energized equipment and the significance of the  
4     arc-flash warning labels.

5     END OF SECTION 260574

**SECTION 32 12 16 – ASPHALT PAVING**

**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. Hot-mix asphalt patching.
2. Hot-mix asphalt paving.
3. Hot-mix asphalt paving overlay.
4. Asphalt surface treatments.
5. Pavement-marking paint.
6. Wheel Stops

B. Related Requirements:

1. Section 31 10 00 "Site Clearing" for demolition and removal of existing asphalt pavement.
1. Section 31 20 00 "Earth Moving" for subgrade preparation, fill material, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.

1.3 STANDARD SPECIFICATIONS

- A. Where reference is made to the "Standard Specifications", it shall be construed to mean the pertinent section of the Wisconsin Department of Transportation (WDOT) Standard Specifications for Road and Structure Construction, current edition, and all supplemental and interim supplemental specifications, as they may pertain, except the method of measurement and basis of payment shall not apply.
- B. Where reference is made to the "Geotechnical Report", it shall be construed to mean the "Geotechnical Exploration Proposed Barns and maintenance Building Alliant Energy Center Grounds, Madison, Wisconsin" dated April 15, 2013.

#### 1.4 DEFINITION

- A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

#### 1.5 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
  - 1. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
- B. Material Certificates: For each paving material, from manufacturer.

#### 1.6 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of WisDOT for asphalt paving work.
- B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pavement-marking materials to project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
- B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

#### 1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
  - 1. Prime Coat: Minimum surface temperature of 60 deg F.
  - 2. Tack Coat: Minimum surface temperature of 60 deg F.
  - 3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
  - 4. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
  - 5. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

- B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40°F for oil-based materials 55°F for water-based materials, and not exceeding 95°.

## **PART 2 - PRODUCTS**

### 2.1 GENERAL

- A. All materials and methods for on-site pavement shall conform to recommendations in the Geotechnical Report.
- B. All materials and methods for on-site pavement shall conform to WDOT Standard Specifications. Where conflicts between this specification and the WDOT Standard Specifications exist, requirements of the WDOT shall govern.

### 2.2 ASPHALT MATERIALS

- A. Provide asphaltic pavement per WDOT Standard Specifications Section 460.2 and 460.3 and the Pavement Design section of the Geotechnical Report
- B. Mixture Type:
  - 1. Type 1 Asphalt: E-0.3, Section 460, Table 460-2 of the WDOT Standard Specifications.
  - 2. Type 2 Asphalt: E-1, Section 460, Table 460-2 of the WDOT Standard Specifications.
- C. Bituminous material: Per WDOT Standard Specifications, of suitable grade and consistency for application.
- D. Tack Coat: Per WDOT Standard Specifications.
- E. Water: Potable.

### 2.3 AUXILIARY MATERIALS

- A. Paving Geotextile: Per Geotechnical Report
- B. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, Type II, with drying time of less than 45 minutes.
  - 1. Color: White.
- C. WHEEL STOPS
  - 1. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, 4-1/2 inches high by 9 inches wide by 72 inches long. Provide chamfered corners and drainage slots on underside and holes for anchoring to substrate.



2. Dowels: Galvanized steel, 3/4 inch in diameter, 10-inch minimum length.

D. Temporary Mulch or Sand Surface:

If asphalt paving cannot be completed by April 9, 2014, an alternative surface acceptable to County must be in place on all proposed asphalt pavement areas from April 9, 2014 to April 14, 2014. Acceptable surfaces include a 6" depth of bark/wood chip mulch or 4" depth of sand. The bark/wood chips must meet the requirements of the material that Dane County currently obtains from the City of Madison.

### **PART 3 - EXECUTION**

#### 3.1 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to begin paving.
- B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding per Geotechnical Report
- C. Proceed with paving only after unsatisfactory conditions have been corrected.

#### 3.2 PATCHING

- A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.
- B. Tack Coat: Before placing patch material, apply tack coat uniformly to vertical asphalt surfaces abutting the patch. Apply at a rate of 0.05 to 0.15 gal./sq. yd.
  - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
  - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
- C. Placing Patch Material: Fill excavated pavement areas with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

#### 3.3 REPAIRS

- A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.
  - 1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.
- B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch.
  - 1. Clean cracks and joints in existing hot-mix asphalt pavement.
  - 2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.
  - 3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.

### 3.4 SURFACE PREPARATION

- A. General:
  - 1. Sawcut existing asphalt edges to provide a clean joint to match into with the new asphalt.
  - 2. Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
- B. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd.
  - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
  - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
- C. Temporary Mulch and Sand:

All traces of the alternative surfacing must be removed by whatever means necessary prior to the placement of the base course and asphalt pavement. Prior to the placement of the asphalt pavement base course the removal of the temporary surface must be approved by the County and Engineer before paving can commence.

### 3.5 PAVING GEOTEXTILE INSTALLATION

- A. Apply tack coat uniformly to existing pavement surfaces at a rate of 0.20 to 0.30 gal./sq. yd.

- B. Place paving geotextile promptly according to manufacturer's written instructions. Broom or roll geotextile smooth and free of wrinkles and folds. Overlap longitudinal joints 4 inches and transverse joints 6 inches.
  - 1. Protect paving geotextile from traffic and other damage and place hot-mix asphalt paving overlay the same day.

### 3.6 PLACING HOT-MIX ASPHALT

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
  - 1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
  - 2. Spread mix at a minimum temperature of 250 deg F.
  - 3. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
  - 4. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.
  - 1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Overlap mix placement about 1 to 1-1/2 inches from strip to strip to ensure proper compaction of mix along longitudinal joints.
  - 2. Complete a section of asphalt base course before placing asphalt surface course.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

### 3.7 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
  - 1. Clean contact surfaces and apply tack coat to joints.
  - 2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
  - 3. Offset transverse joints, in successive courses, a minimum of 24 inches.

4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."
5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
6. Compact asphalt at joints to a density within 2 percent of specified course density.

### 3.8 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
  1. Complete compaction before mix temperature cools to 185 deg F.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
  1. Average Density: 96 percent of reference laboratory density according to AASHTO T 245, but not less than 94 percent or greater than 100 percent.
  2. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent or greater than 96 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

### 3.9 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
  - 1. Base Course: Plus or minus 1/2 inch.
  - 2. Surface Course: Plus 1/4 inch, no minus.
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
  - 1. Base Course: 1/4 inch.
  - 2. Surface Course: 1/8 inch.

### 3.10 PAVEMENT MARKING

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Engineer.
- B. Allow paving to age for 30 days before starting pavement marking.
- C. Sweep and clean surface to eliminate loose material and dust.
- D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

### 3.11 WHEEL STOPS

- A. Securely attach wheel stops to paving with not less than two galvanized-steel dowels located at one-quarter to one-third points. Install dowels in drilled holes in the paving and bond dowels to wheel stop. Recess head of dowel beneath top of wheel stop.

### 3.12 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
- D. In-Place Density: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549

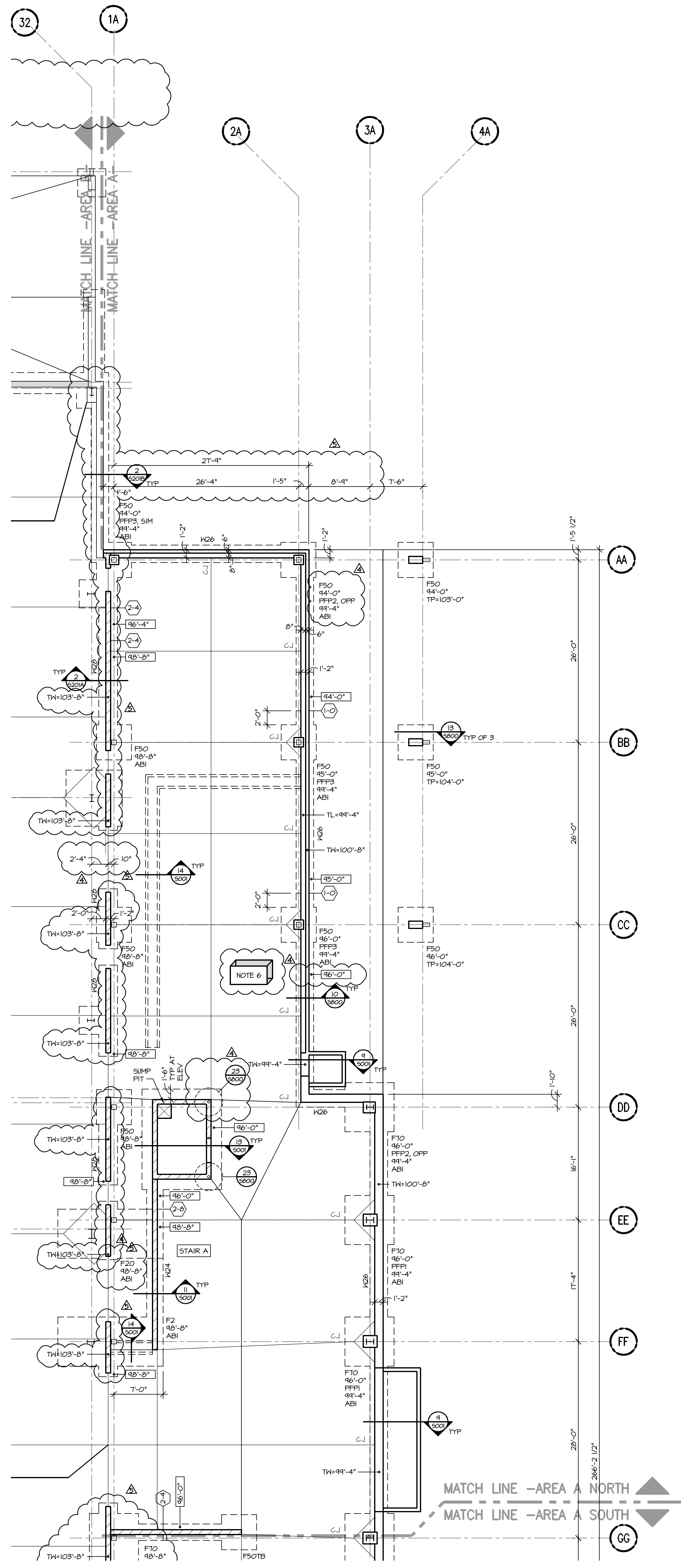
- E. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.13 DISPOSAL

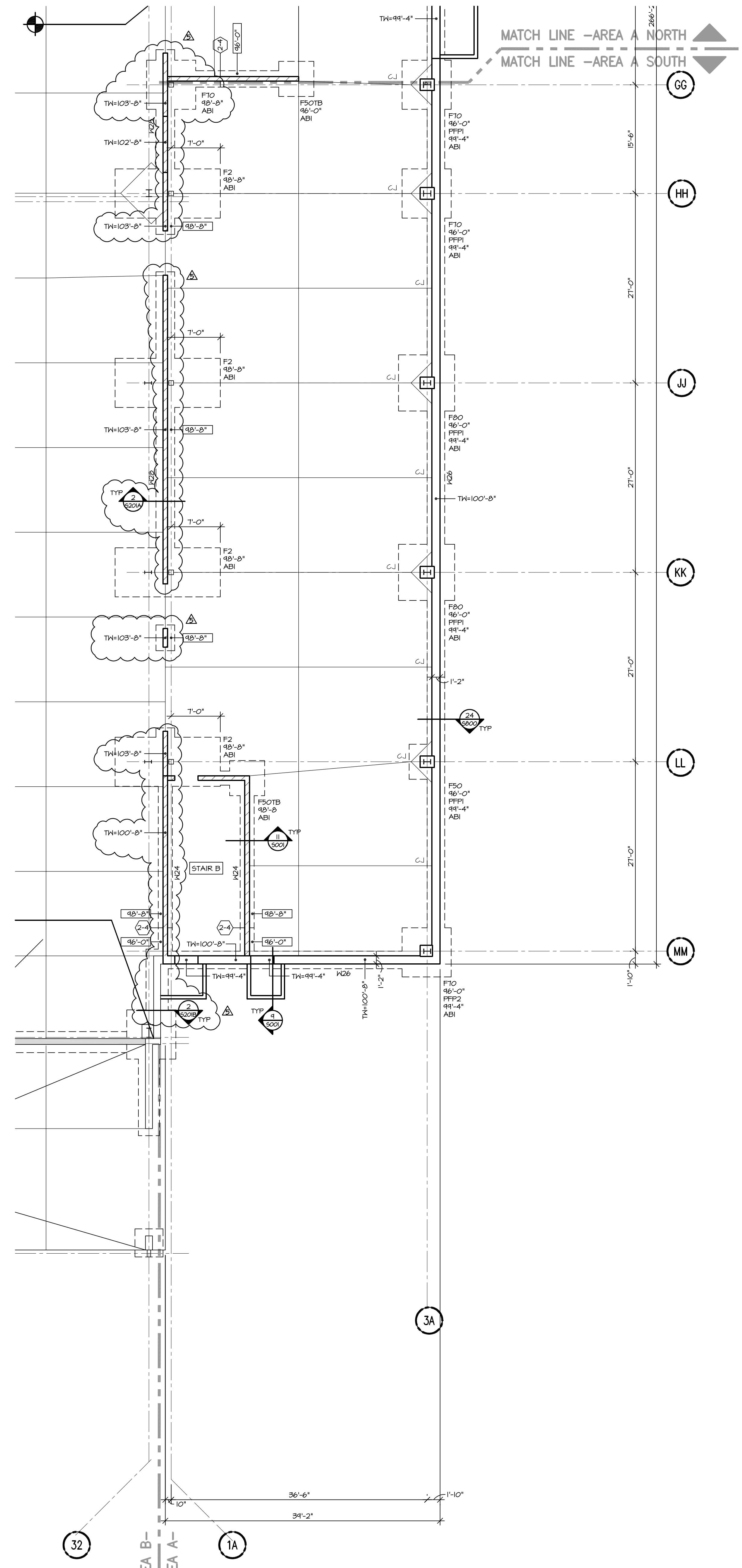
- A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.
- B. Do not allow milled materials to accumulate on-site.

END SECTION 32 12 16

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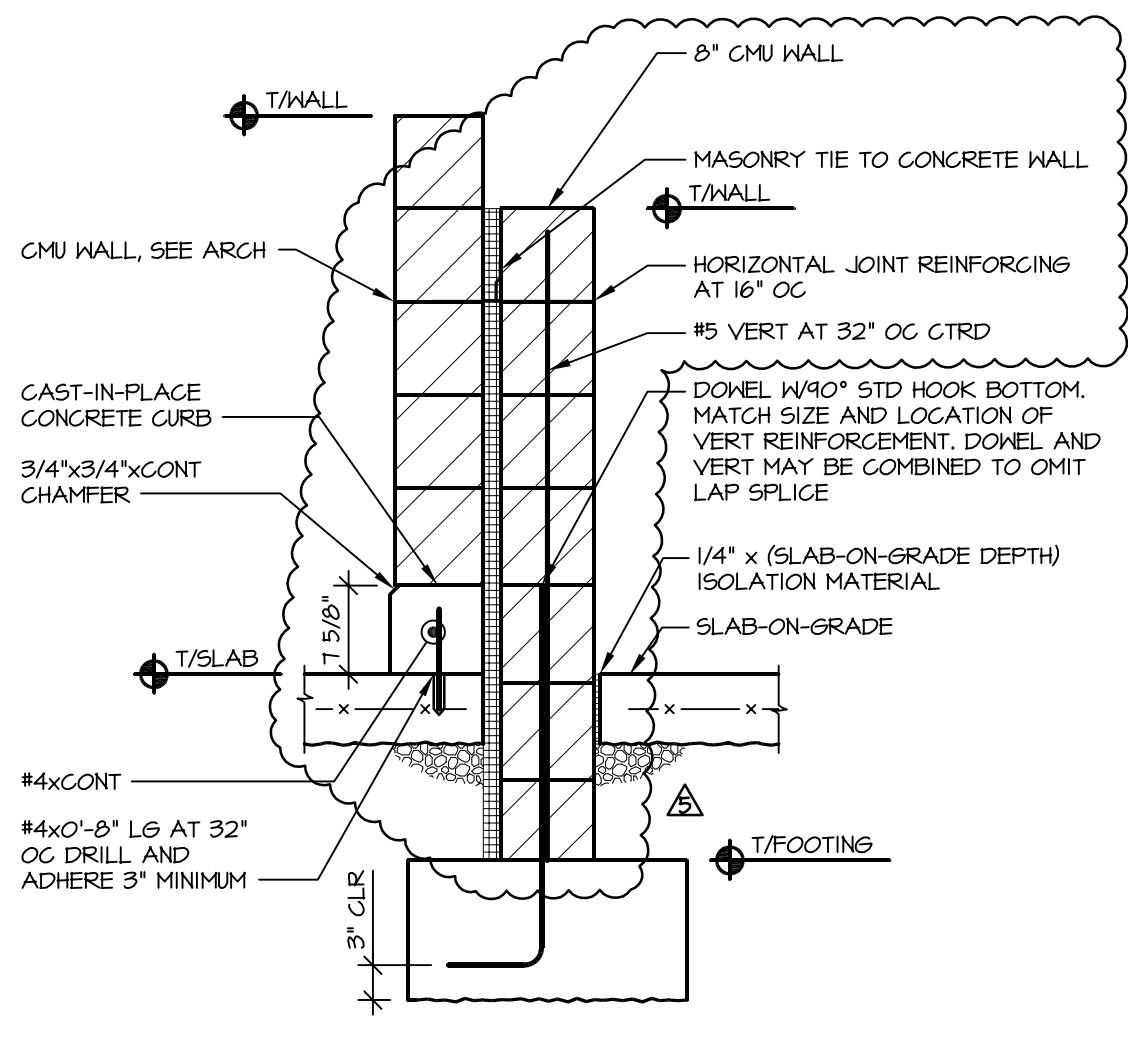


1 FOUNDATION PLAN - AREA A NORTH  
SCALE: 1/8" = 1'-0"

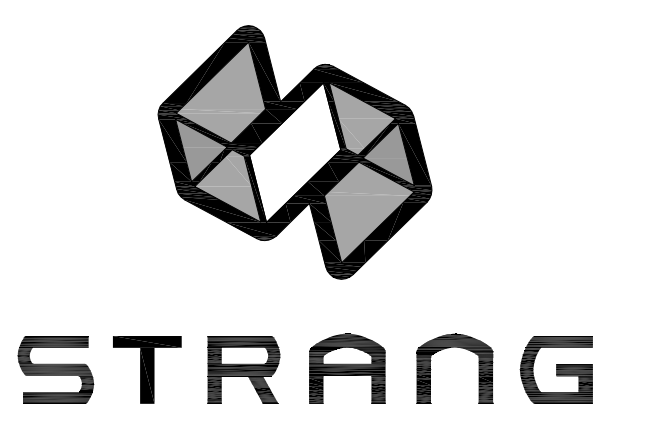


2 FOUNDATION PLAN - AREA A SOUTH  
SCALE: 1/8" = 1'-0"

- FOUNDATION PLAN NOTES:
- 1) FINISH SLAB ELEVATION = 100'-0". TYP. UNO TOP OF FOOTING ELEVATION = VARIES, SEE PLAN.
  - 2) SLAB-ON-GRADE TO BE 6" THICK WITH W#6x6/M4.0x4.0 2' OFF TOP OF SLAB ON 4" CHOKER COARSE ON 10 MIL VAPOR REFRAGER ON AN 8" LAYER OF FREE-DRAINING MATERIAL. SEE ARCH FOR SLAB ELEVATIONS. PROVIDE NET-GURE AT SLAB-ON-GRADE FOR EPOXY FLOOR FINISH.
  - 3) OVER-EXCAVATION PER DETAIL 1/5001 MAY BE REQUIRED TO REMOVE EXISTING UNDOCUMENTED FILL AND UNSUITABLE BEARING SOIL.
  - 4) TYPICAL DETAILS THAT APPLY TO PLAN INCLUDE:
    - 2/5001 FOOTING STEP DETAIL
    - 3/5001 FOOTING STEP DETAIL
    - 4/5001 CONCRETE WALL JOINT DETAIL
    - 5/5001 PIPE PASSING UNDER WALL FOOTING
    - 6/5001 SLAB ON GRADE JOINT DETAIL
    - 8/5001 CONCRETE WALL OPENING DETAIL
    - 9/5001 STOOP DETAIL
    - 12/5001 CORNER REINFORCEMENT DETAIL
  - 5) SEE 8000 FOR PIER DETAILS.
  - 6) PROVIDE NET-GURE SLAB-ON-GRADE AT FLOOR SLABS RECEIVING SEALED FLOOR FINISH. SEE FINISH SCHEDULE AND PROJECT SPECIFICATION MANUAL.



2 WALL SECTION  
SCALE: 3/4" = 1'-0"



ARCHITECTURE  
ENGINEERING  
INTERIOR DESIGN

STRANG INC.  
8411 MINERAL POINT ROAD  
MADISON, WI 53705-4335  
T/ 608 278 9200  
F/ 608 278 9204

CONSULTANT  
ARNOLD & O'SHERIDAN, INC.  
728 HEARTLAND TRAIL  
MADISON, WI 53717

T/ 608 821 8500  
F/ 608 821 8501  
A&O PROJECT #130172  
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DATE 08-01-13  
PROJECT NO. 2013027\_02  
PROJECT TITLE

ALLIANT ENERGY  
CENTER PAVILIONS  
BID # 313072

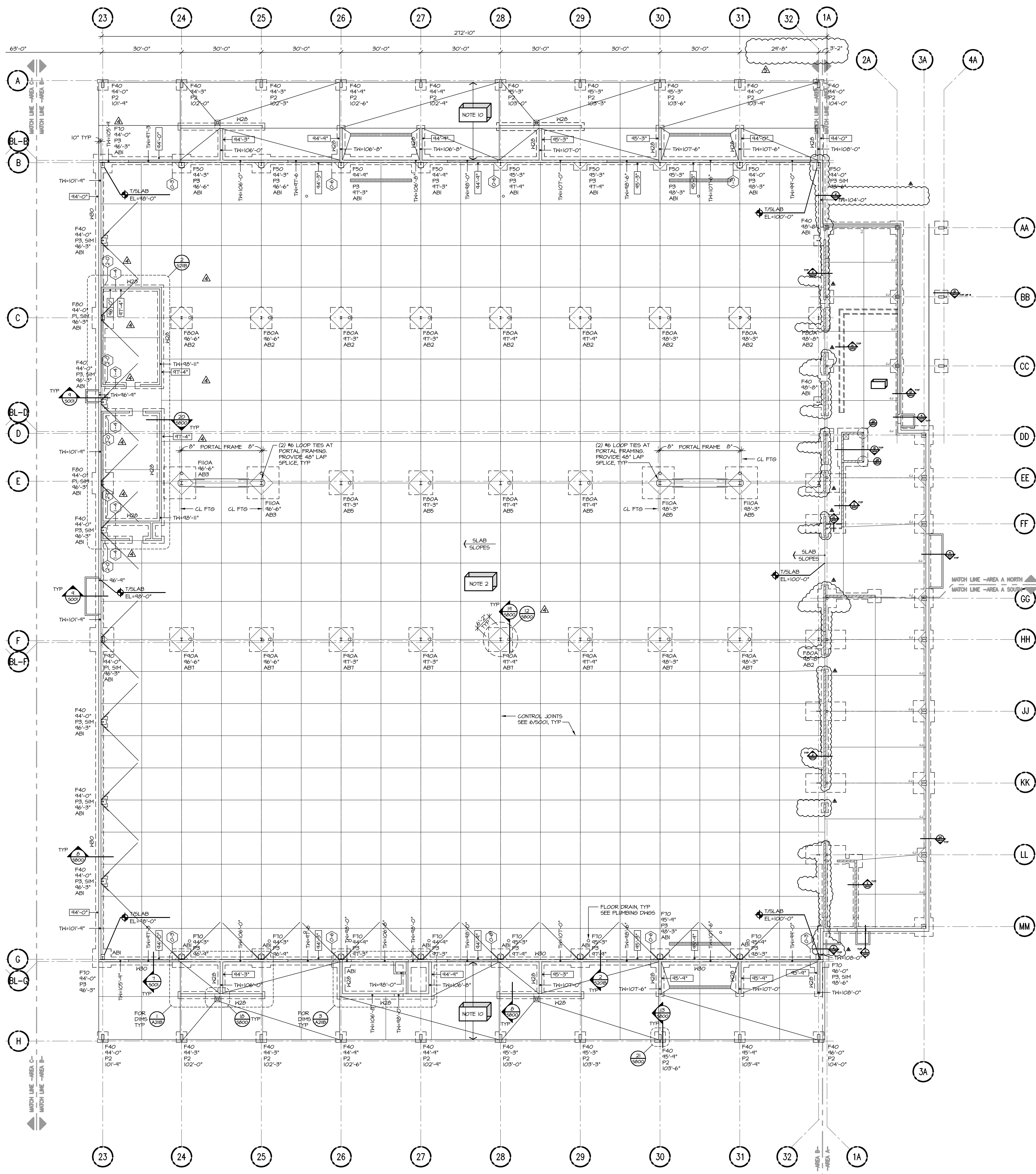
1919 ALLIANT ENERGY CENTER WAY  
MADISON, WISCONSIN 53713

SHEET TITLE  
FOUNDATION PLAN  
AREA A

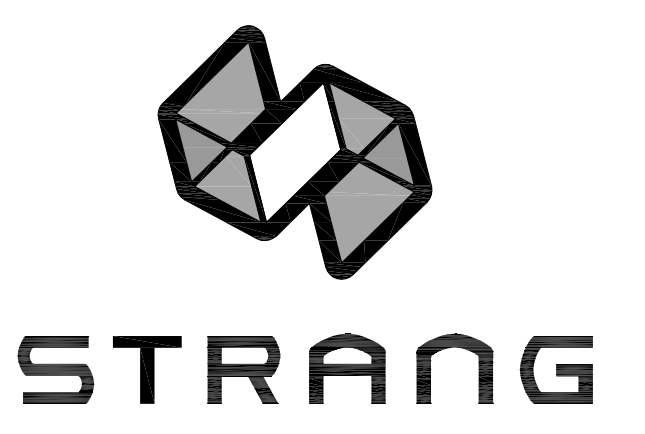
SHEET NO.  
S201A





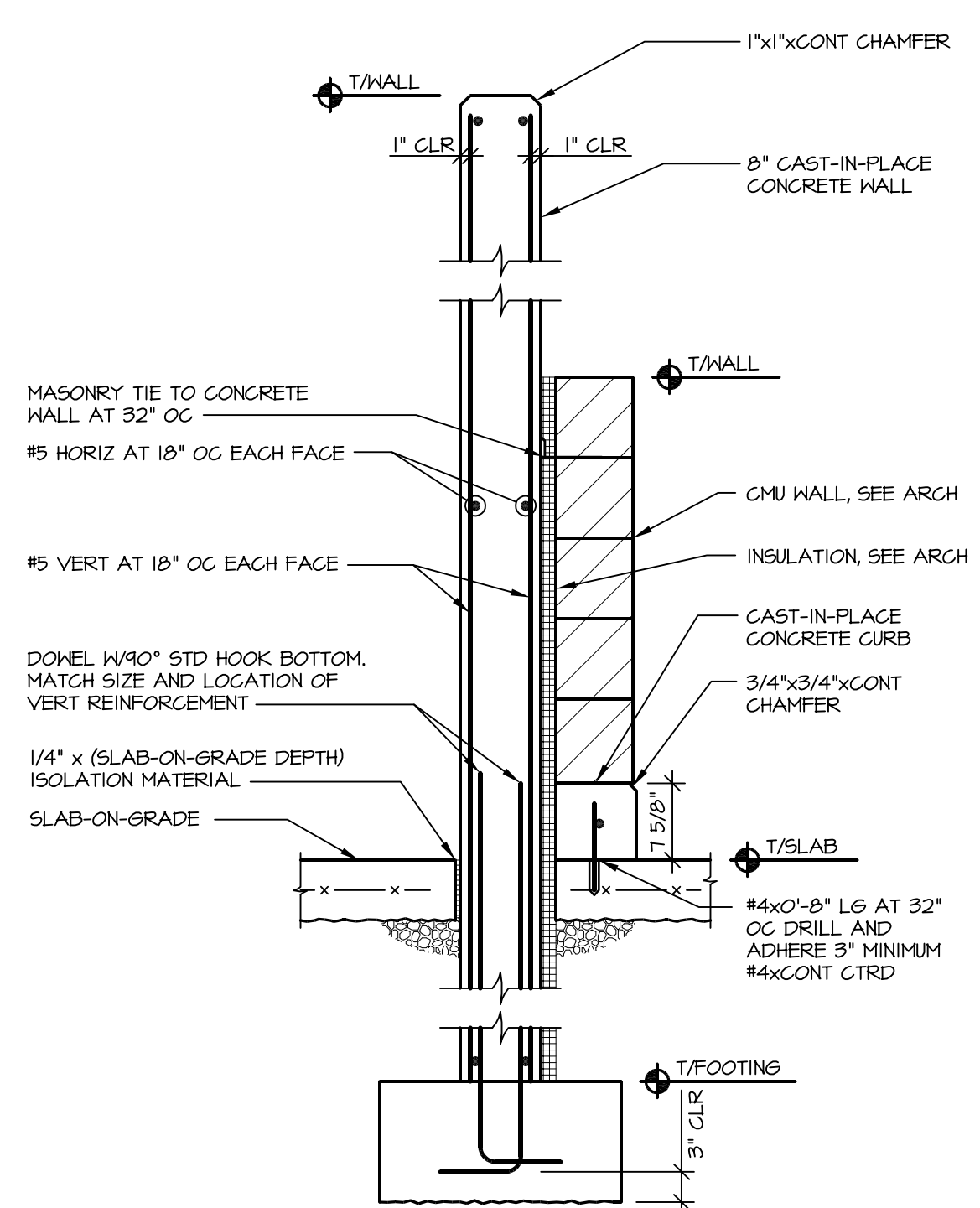


- FOUNDATION PLAN NOTES:**
- 1) FINISH SLAB ELEVATION = SLOPES. SEE PLAN TOP OF FOOTING ELEVATION = VARISES. SEE PLAN
  - 2) SLAB-ON-GRADE TO BE 6" THICK WITH #4@6x6@4.0x4.0 2" OFF TOP OF SLAB ON 4" CHOKER COURSE ON 10 ML VAPOR RETARDER ON AN 8" LAYER OF FREE DRAINING MATERIAL. SEE ARCH FOR SLAB ELEVATIONS.
  - 3) OVER-EXCAVATION PER DETAIL USOCI MAY BE REQUIRED TO REMOVE EXISTING UNDOCUMENTED FILL AND UNSUITABLE BEARING SOIL.
  - 4) TYPICAL DETAILS THAT APPLY TO PLAN INCLUDE:  
 2/5000 FOOTING STEP DETAIL (MASONRY)  
 3/5000 FOOTING STEP DETAIL (CONCRETE)  
 4/5000 CONCRETE WALL JOINT DETAIL  
 5/5000 PIPE PASSING UNDER WALL FOOTING  
 6/5000 SLAB ON GRADE JOINT DETAIL  
 7/5000 OVERHEAD DOOR AT APRON  
 8/5000 CONCRETE WALL OPENING DETAIL  
 9/5000 STICOP DETAIL  
 12/5000 CORNER REINFORCEMENT DETAIL
  - 5) TYPICAL WHERE SLAB-ON-GRADE ABUTS WALL OR COLUMN PROVIDE 1/4" x (500 DEPTH) ISOLATION FILLER STRIP. SET STRIP 1/4" BELOW FINISH SLAB ELEVATION.
  - 6) ALL FOUNDATION FOOTING AND PIER SIZES TO BE VERIFIED/ CONFIRMED WITH METAL BUILDING FINAL DESIGN. SIZES/ORIENTATIONS SHOWN ARE BASED ON PRELIMINARY INFORMATION ONLY.
  - 7) SEE 5800 FOR PIER DETAILS, TYPICAL.
  - 8) SEE A211B FOR WASH BAY AND STORAGE AREA DIMENSIONS.
  - 9) PROVIDE A SMOOTH RUBBED FINISH ON CAST-IN-PLACE CONCRETE WALLS AND PIERS THAT ARE EXPOSED TO VIEW. EXTEND SMOOTH RUBBED FINISH TO 2' BELOW GRADE.
  - 10) 6" THICK EXTERIOR CONCRETE SLAB-ON-GRADE. REINFORCE WITH #4@6x6@4.0x4.0 ON 4" CHOKER COURSE. VAPOR RETARDER IS NOT REQUIRED.

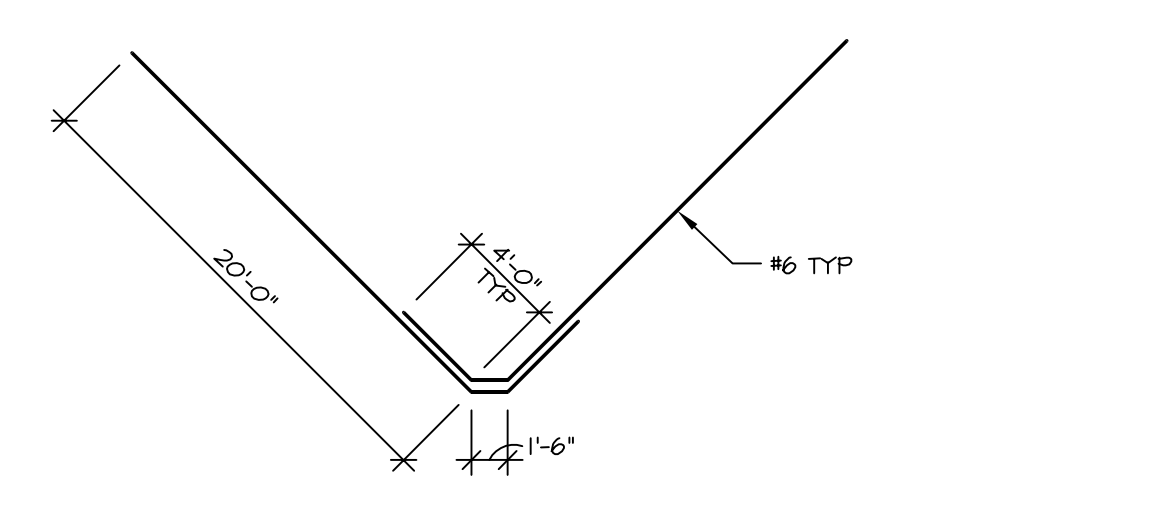


ARCHITECTURE  
ENGINEERING  
INTERIOR DESIGN

STRANG INC.  
8411 MINERAL POINT ROAD  
MADISON, WI 53705-4335  
T/ 608 278 8200  
F/ 608 278 8204

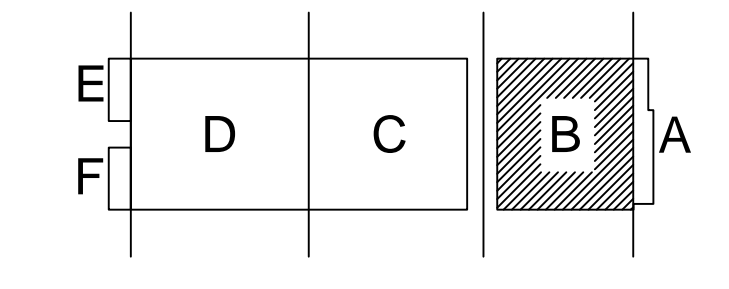


2 WALL SECTION  
SCALE: 3/4" = 1'-0"



3 PAVILION SLAB REINFORCEMENT  
SCALE: NONE

FOUNDATION PLAN - AREA B  
SCALE: 1/16" = 1'-0"



KEY PLAN

CONSULTANT	
ARNOLD & O'SHERIDAN, INC. 728 HEARTLAND TRAIL MADISON, WI 53717	
T/ 608 821 8500 F/ 608 821 8501	A&O PROJECT #130172
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REVISIONS	5 ADDENDUM #5 8/19/13

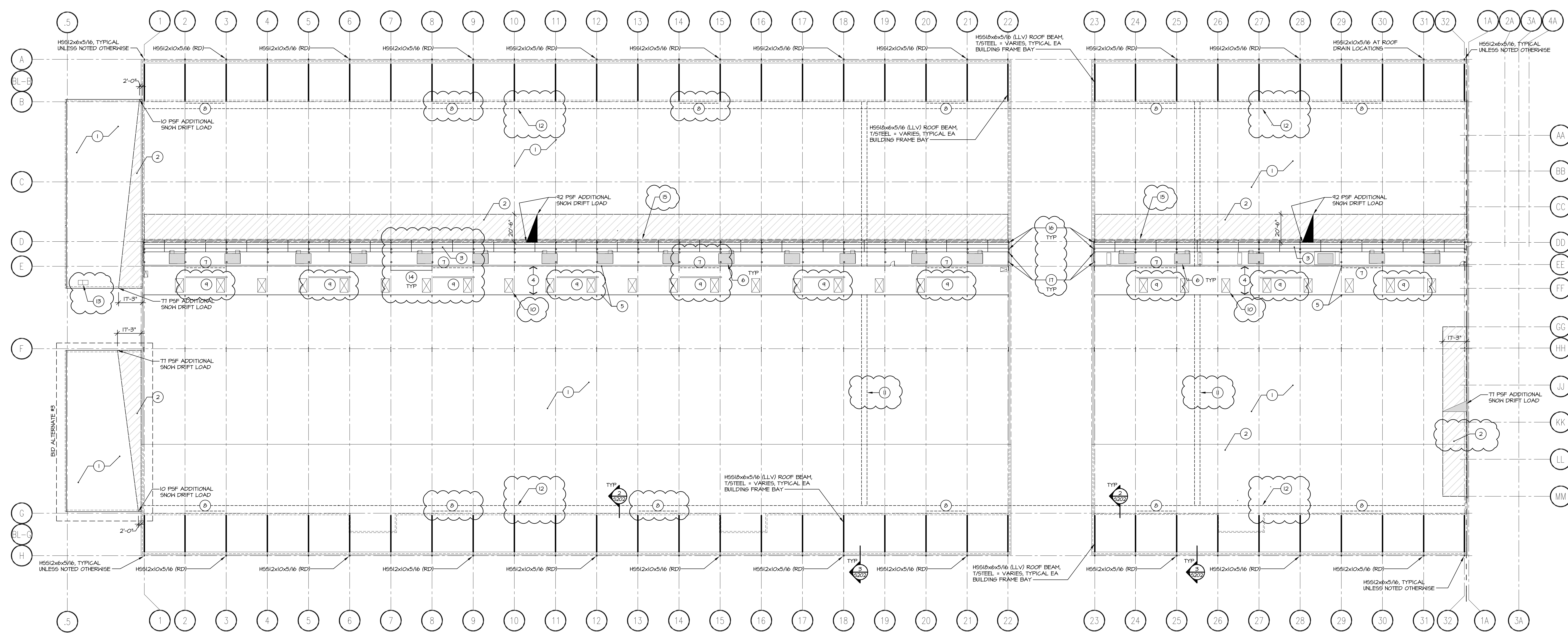
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CHECKED	TJD
DATE	08-01-13
PROJECT NO.	2013027_02
PROJECT TITLE	

ALLIANT ENERGY  
CENTER PAVILIONS  
BID # 313072

1919 ALLIANT ENERGY CENTER WAY  
MADISON, WISCONSIN 53713

SHEET TITLE  
FOUNDATION PLAN  
AREA B

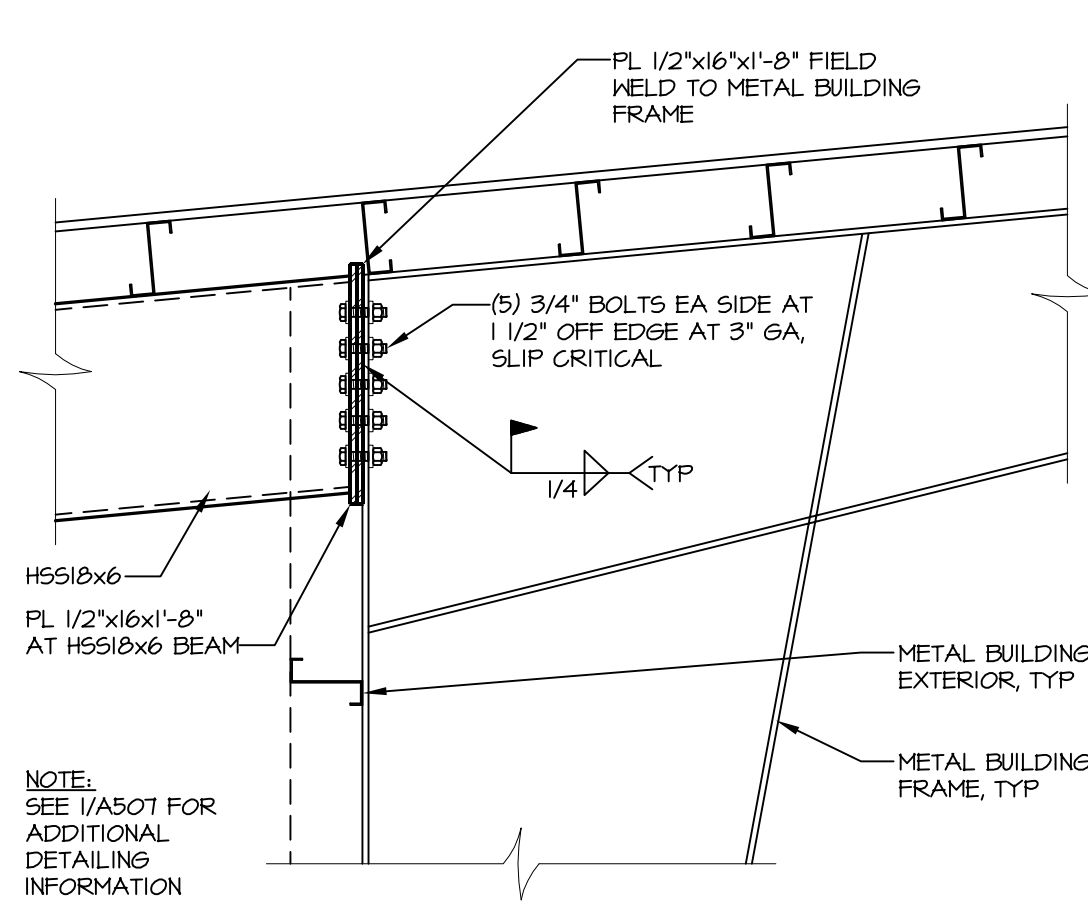
SHEET NO.  
S201B



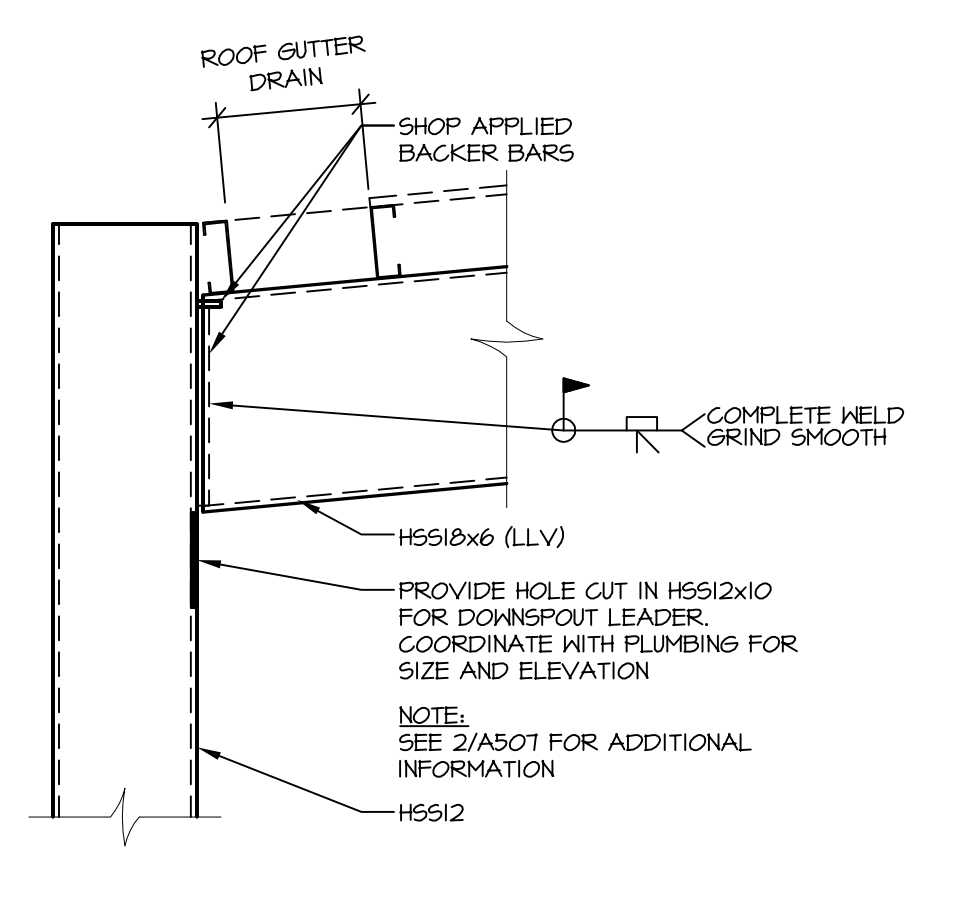
**MEZZANINE AND ROOF LOADS**  
SCALE: 1/32" = 1'-0"

- KEYED NOTES:**
- TYPICAL ROOF SNOW LOAD AND 5 PSF COLLATERAL DEAD LOAD. THE NOTED COLLATERAL DEAD LOADS ARE FOR HVAC SUPPLY SOCKS, LIGHTING AND ADDITIONAL MISCELLANEOUS DEAD LOADS. PROVIDE THE NOTED COLLATERAL DEAD LOAD AT THE ROOF OVER MECHANICAL EQUIPMENT CHASE.
  - SNOW DRIFT LOAD THAT IS IN ADDITION TO THE TYPICAL ROOF SNOW LOAD.
  - 20 PSF LIVE LOAD IN ADDITION TO SNOW LOAD FOR ELEVATED ACCESS WALKWAY.
  - WALKABLE PLENUM 20 PSF LIVE LOAD, 10 PSF COLLATERAL DEAD LOAD.
  - PLENUM WALL, 10 PSF COLLATERAL DEAD LOAD, +/- 5 PSF LATERAL AIR MOVEMENT PRESSURE.
  - SEE MECHANICAL DRAWINGS FOR ADDITIONAL INFO.
  - PORTAL FRAME BAY.
  - LATERAL BRACE BAY.
  - AIR BAFFLE WALL, 80 PLF COLLATERAL DEAD LOAD AT THE PLENUM FLOOR, LATERAL LIVE LOAD IS 80 PLF AT THE PLENUM FLOOR AND PRE-ENGINEERED METAL BUILDING (PEMB) ROOF DUE TO AIR FLOW VELOCITIES.
  - HOLE IN PLENUM FLOOR AND MECHANICAL DUCTWORK BELOW, PROVIDE 80 PSF COLLATERAL DEAD LOAD FOR MECHANICAL DUCTWORK SUPPORTED FROM THE PEMB FRAME FOR THE PLENUM CHASE.
  - DUAL WIRES TO SUPPORT SUPPLY AIR DUCTWORK SOCK (3 PLF), EACH WIRE IS TENSIONED TO 500 LBS. THE WIRE IS SUPPORTED APPROXIMATELY AT 10'-0" FROM THE PEMB STRUCTURE, TYPICAL EACH BUILDING BAY.
  - GAS-FIRED RADIANT HEATERS AT 5 PLF COLLATERAL DEAD LOAD SUPPORTED BY THE PEMB ROOF STRUCTURE. COMBUSTION IS 50 LB EACH AND 100 LBS AT THE ROOF EXHAUST FAN. SEE HVAC DRAWINGS FOR THIS EQUIPMENT LOCATION.
  - PEMB ROOF SUPPORT MAKE-UP AIR HANDLING UNIT, 1500 LBS COLLATERAL DEAD LOAD.
  - COLD-FORMED STEEL FRAMING FLOOR STRUCTURE SUPPORTED ON PEMB FRAME FOR THE AIR PLENUM, TYPICAL ALL BAYS.
  - SCREEN WALL, 10 PSF COLLATERAL DEAD LOAD AND +/- 5 PSF LATERAL WIND LOAD.
  - 6" MINIMUM DIA SUPPORT POST WITH 3/8" MINIMUM CAP PLATE TO MATCH SUPPORT PIPE. PIPE SUPPORTS ARE BY PEMB SUPPLIER. SEE 4/5/2022. TYPICAL AT ADJACENT TO GRIDLINE E, AT GRIDLINES 1 THROUGH 22, AND GRIDLINES 23 THROUGH 32.
  - 8" MINIMUM DIA SUPPORT POST WITH 1/2" MINIMUM CAP PLATE TO MATCH SUPPORT PIPE. PIPE SUPPORTS ARE BY PEMB SUPPLIER. SEE 4/5/2022. TYPICAL AT ADJACENT TO GRIDLINE E, AT GRIDLINES 1 THROUGH 22, AND GRIDLINES 23 THROUGH 32.

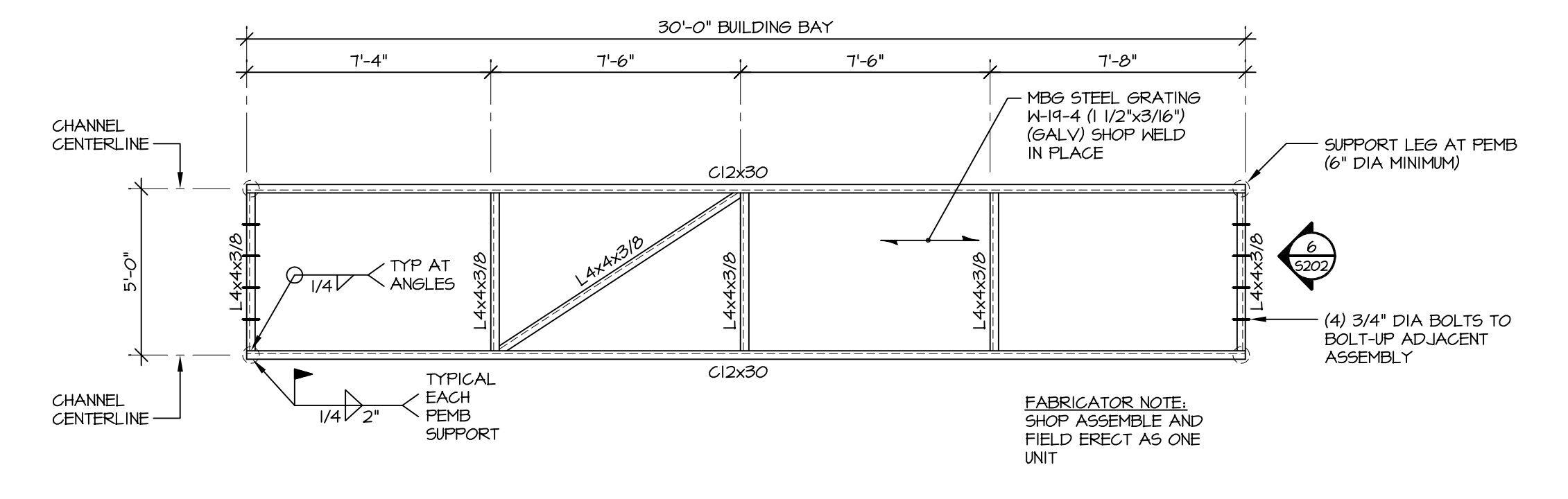
**NOTE:**  
ALL LOADS IMPOSED ON THE PRE-ENGINEERED METAL BUILDING MAY NOT BE NOTED ON THIS DRAWING. PRE-ENGINEERED METAL BUILDING SUPPLIER IS RESPONSIBLE FOR REVIEWING ALL DRAWINGS FOR LOADS IMPOSED ON THE PRE-ENGINEERED METAL BUILDING.



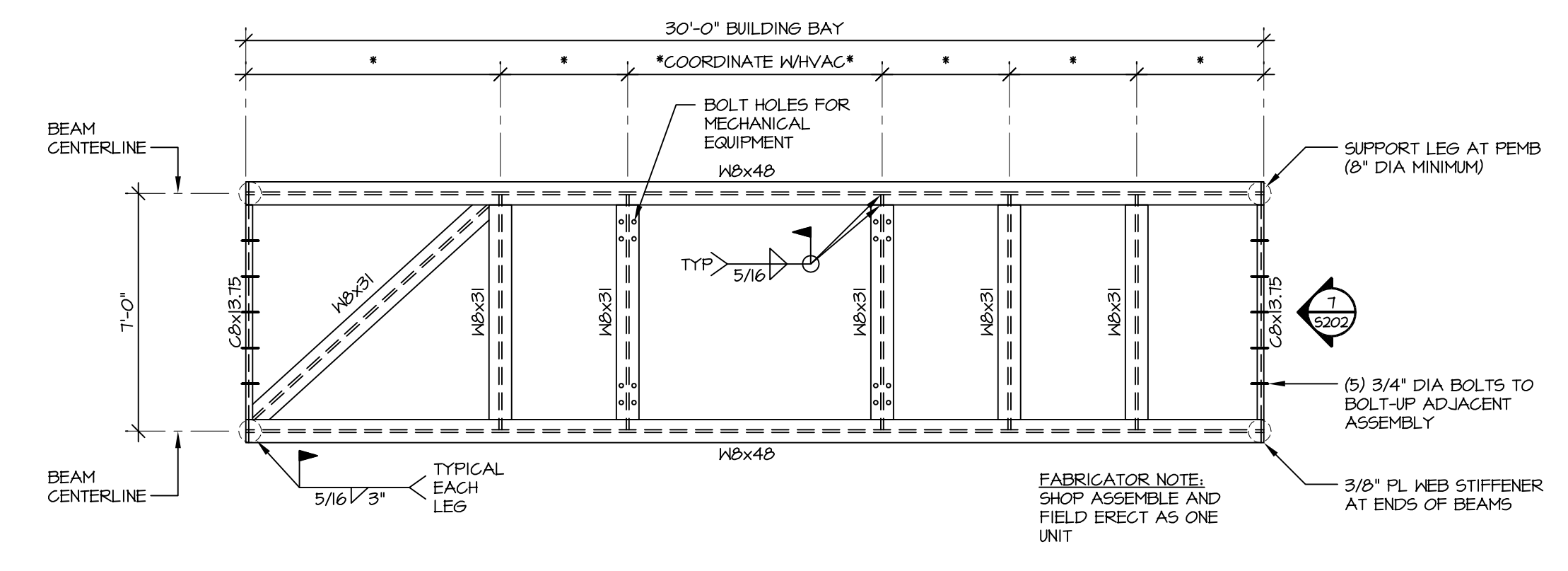
**2 TYP FRAME CONNECTION**  
SCALE: 3/4" = 1'-0"



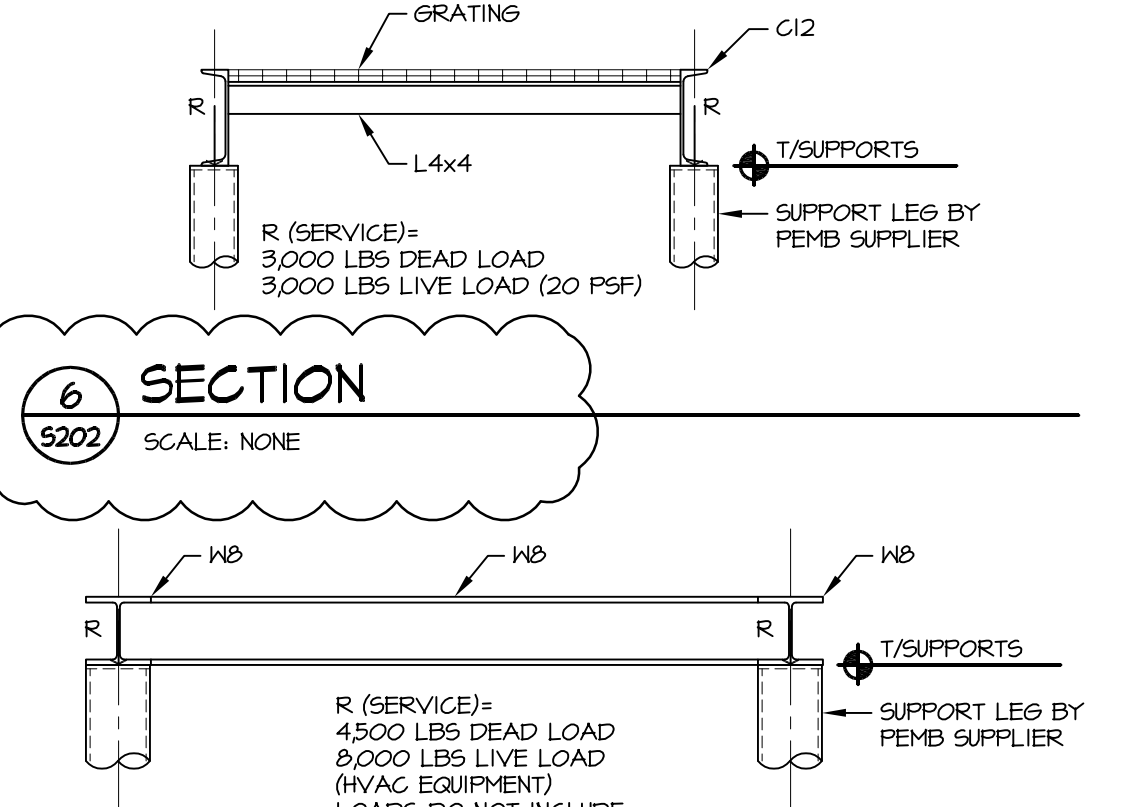
**3 TYP FRAME CONNECTION**  
SCALE: 3/4" = 1'-0"



**4 ACCESS WALKWAY AT MECHANICAL SPACE**  
SCALE: NONE



**5 MECHANICAL EQUIPMENT SUPPORT ASSEMBLY**  
SCALE: NONE



**6 SECTION**  
SCALE: NONE



**7 SECTION**  
SCALE: NONE



CONSULTANT  
**ARNOLD & O'SHERIDAN, INC.**  
728 HEARTLAND TRAIL  
MADISON, WI 53717

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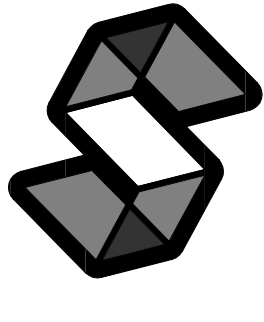
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08-01-13  
PROJECT NO.  
2013027.02  
PROJECT TITLE

**ALLIANT ENERGY  
CENTER PAVILIONS  
BID # 313072**

1919 ALLIANT ENERGY CENTER WAY  
MADISON, WISCONSIN 53713

SHEET TITLE  
**STRUCTURAL  
MEZZANINE AND  
ROOF LOADS**

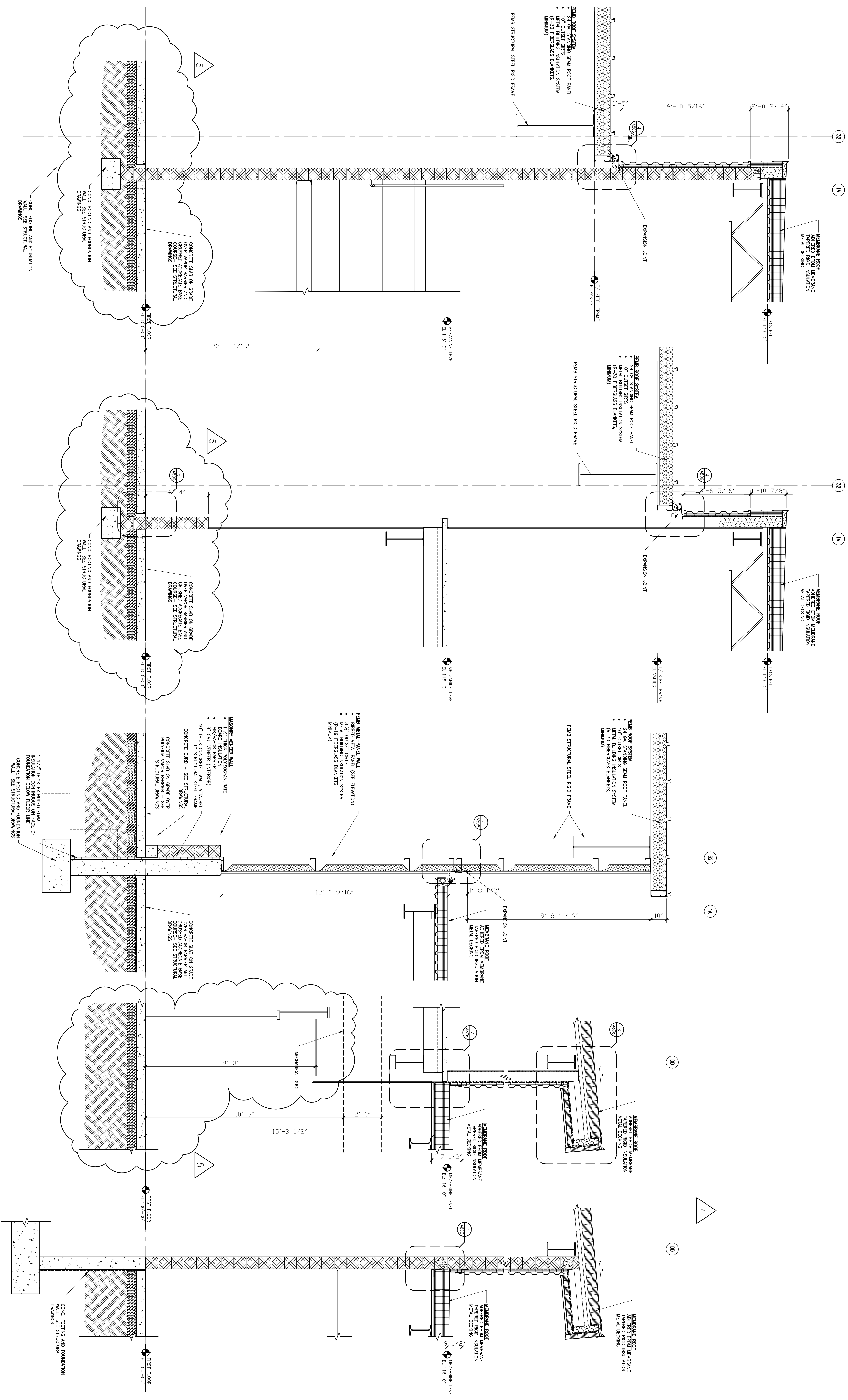
SHEET NO.  
**S202**



**STRANG**

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ENGINEERING  
INTERIOR DESIGN

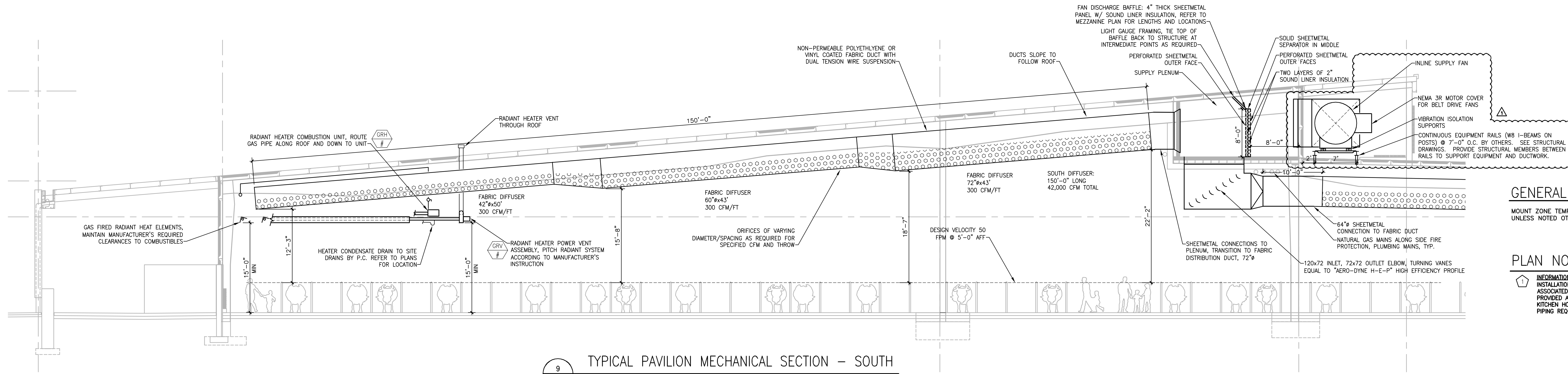
STRANG INC.  
6111 WINTERL POINT ROAD  
MADISON, WI 53705-4392  
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CHECKED	
DATE	08-01-13
PROJECT NO.	2013027.02
PROJECT TITLE	ALLIANT ENERGY CENTER PAVILIONS
BID #	313072
1919 ALLIANT ENERGY CENTER WAY MADISON, WI 53713	

SHEET TITLE  
**WALL SECTIONS**

SHEET NO.  
**A506**



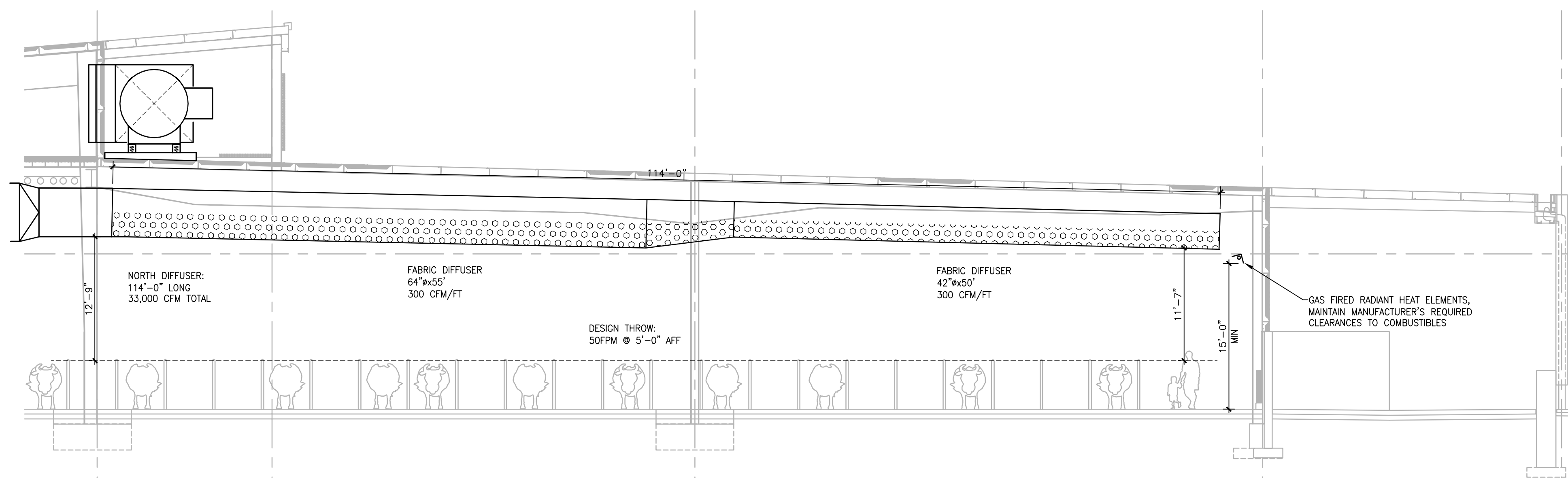
9 TYPICAL PAVILION MECHANICAL SECTION - SOUTH  
SCALE: 1/8" = 1'-0"

**GENERAL NOTES**

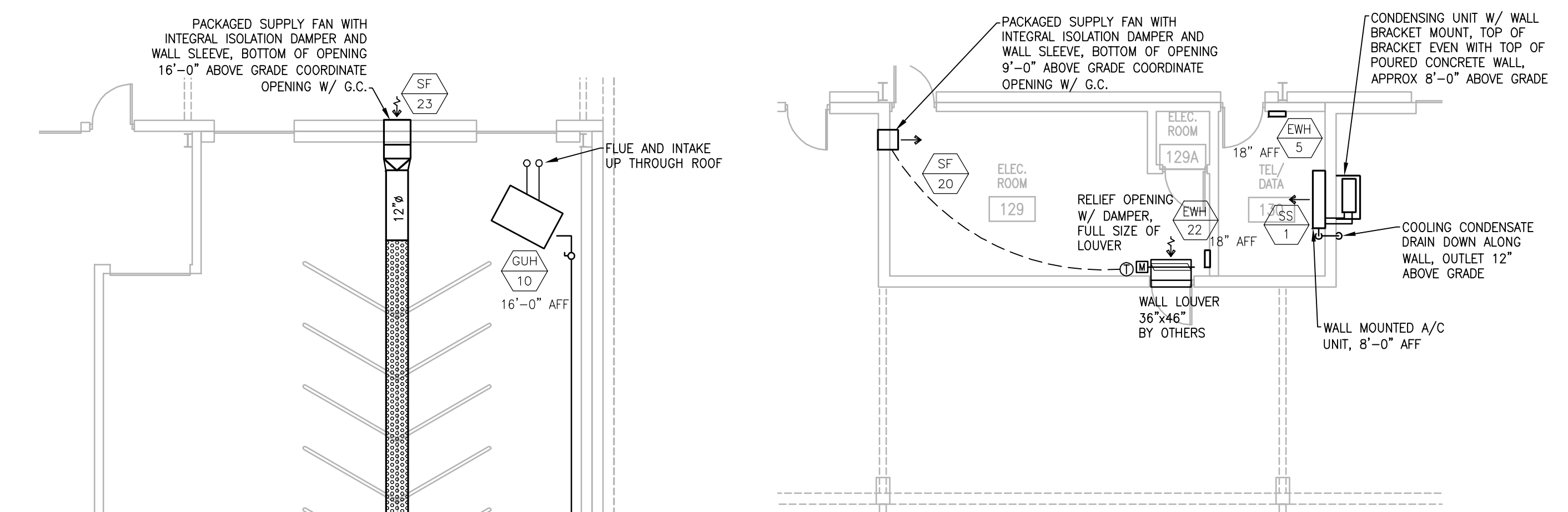
MOUNT ZONE TEMPERATURE SENSORS @ 60" AFF UNLESS NOTED OTHERWISE.

**PLAN NOTES**

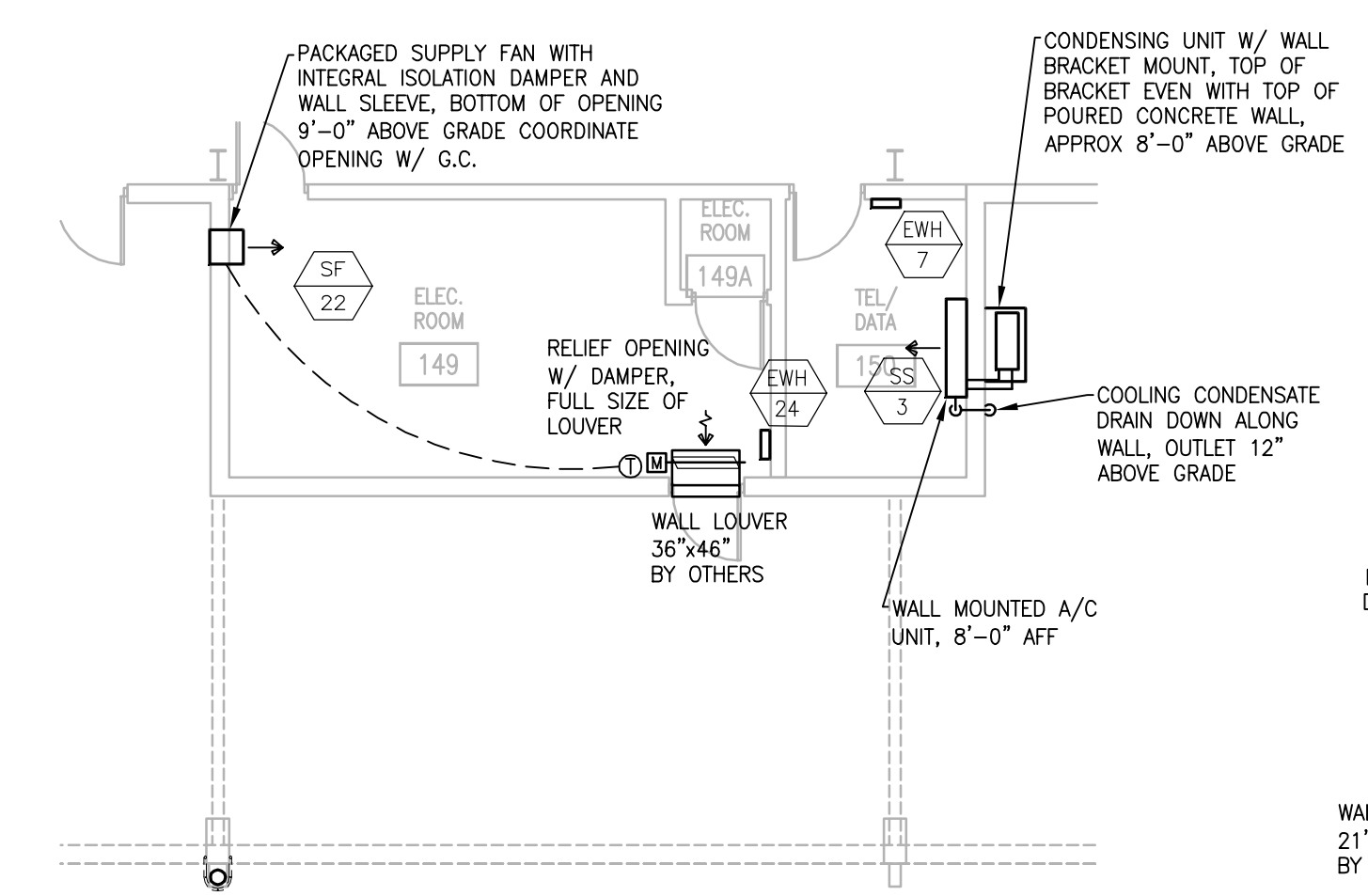
INFORMATIONAL BID: PROVIDE COSTS ASSOCIATED WITH THE PURCHASE AND INSTALLATION OF EXHAUST FAN (EF-4) AND SUPPLY FAN (SF-24) ASSOCIATED WITH CONCESSIONS. INCLUDE PRICE OF ALL MANUFACTURER PROVIDED ACCESSORIES AND CONTROL WORK REQUIRED TO INTERLOCK WITH KITCHEN HOOD. DO NOT INCLUDE COSTS ASSOCIATED WITH DUCTWORK AND PIPING REQUIRED TO SERVE THE EQUIPMENT.



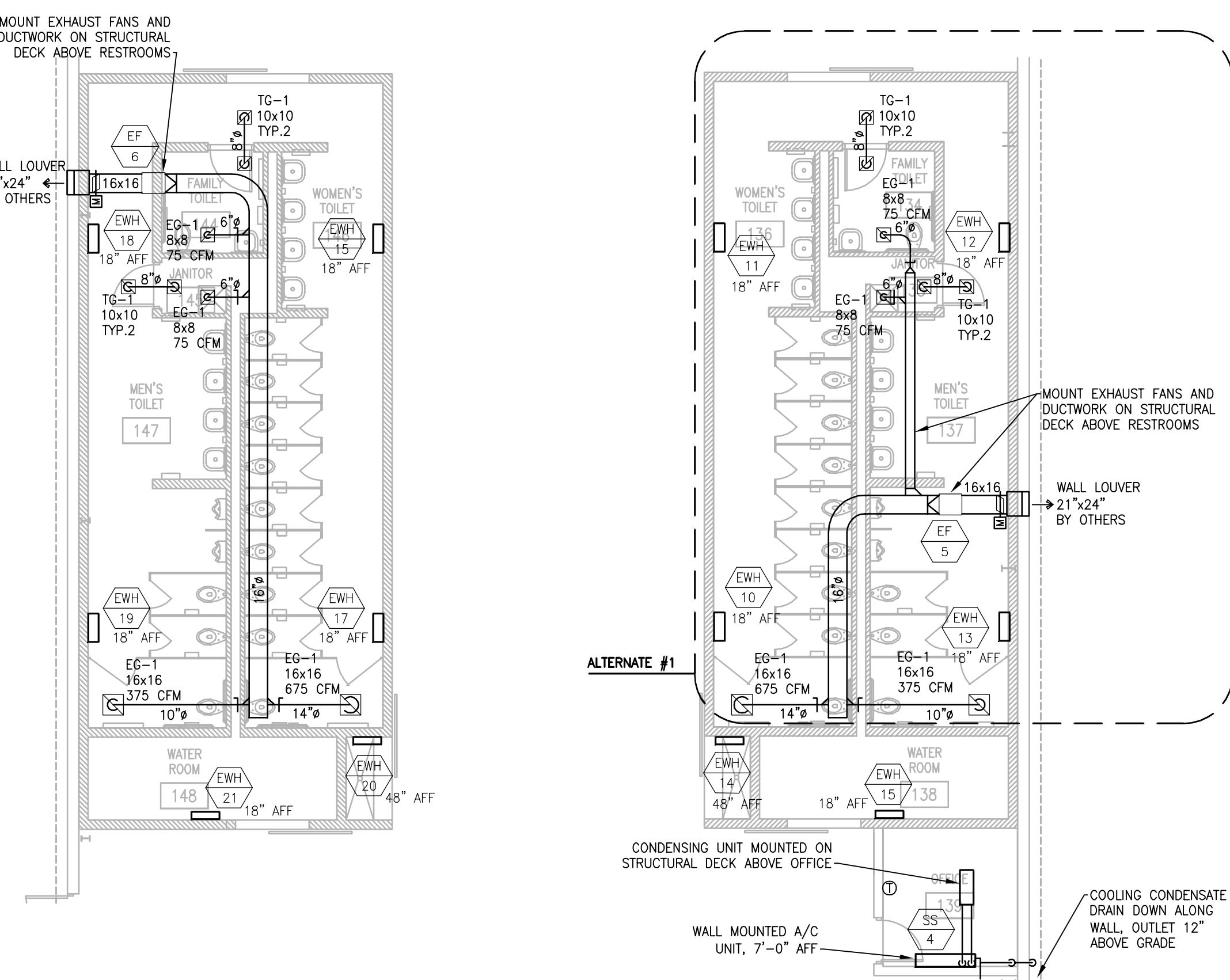
8 TYPICAL PAVILION MECHANICAL SECTION - NORTH  
SCALE: 1/8" = 1'-0"



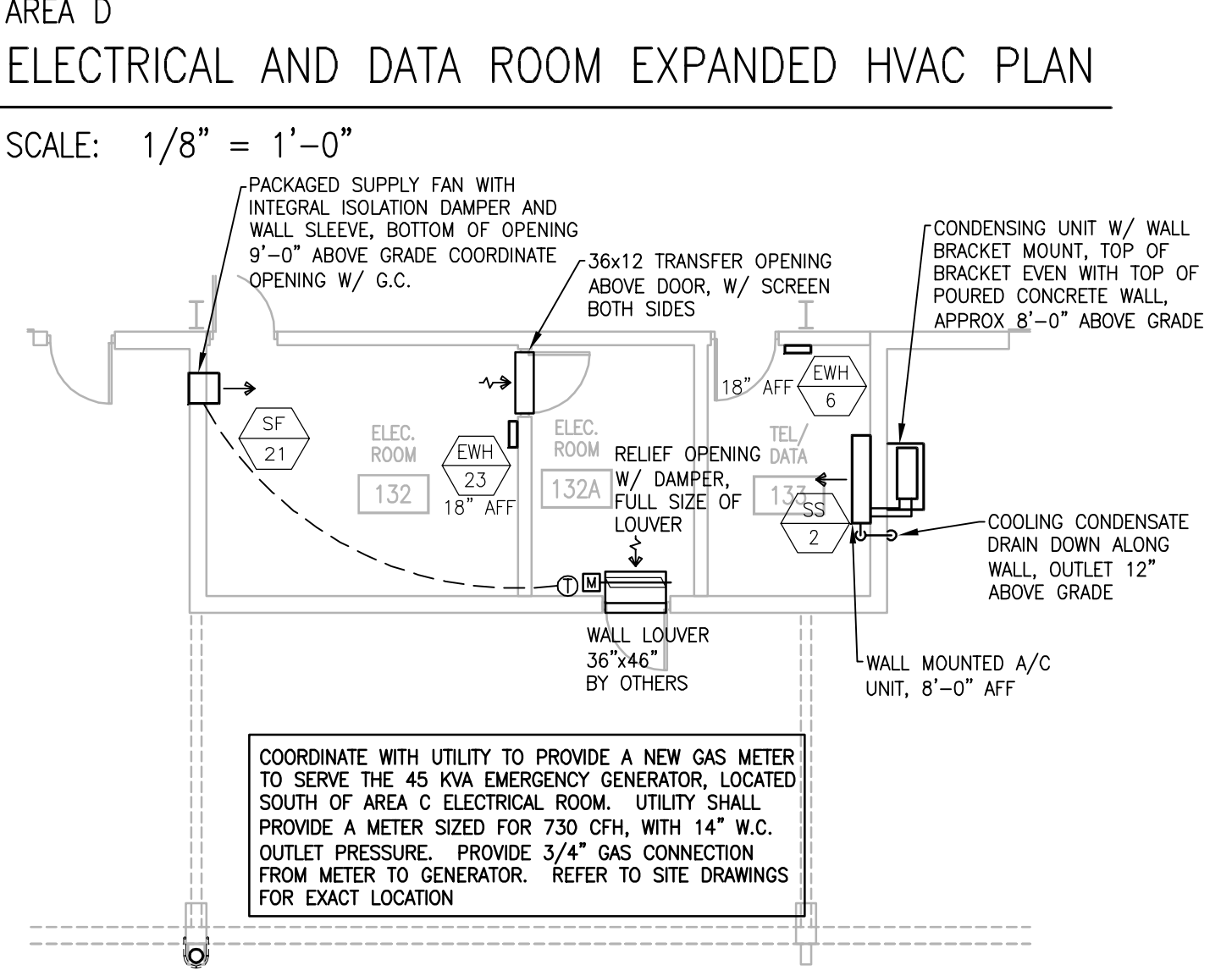
2 AREA B ELECTRICAL AND DATA ROOM EXPANDED HVAC PLAN  
SCALE: 1/8" = 1'-0"



7 AREA D ELECTRICAL AND DATA ROOM EXPANDED HVAC PLAN  
SCALE: 1/8" = 1'-0"



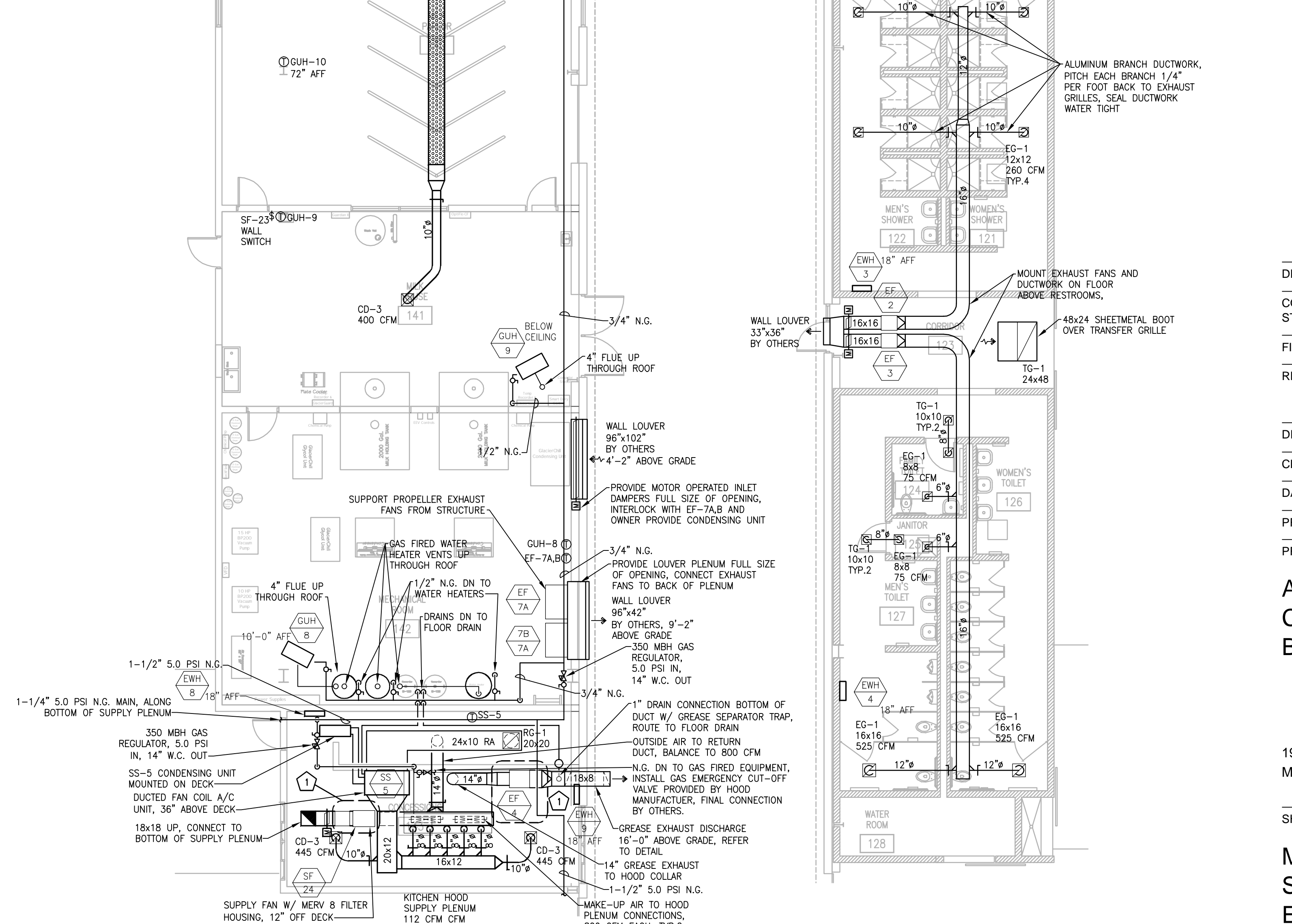
4 BUILDING 2 WEST RESTROOM EXPANDED HVAC PLAN  
SCALE: 1/8" = 1'-0"



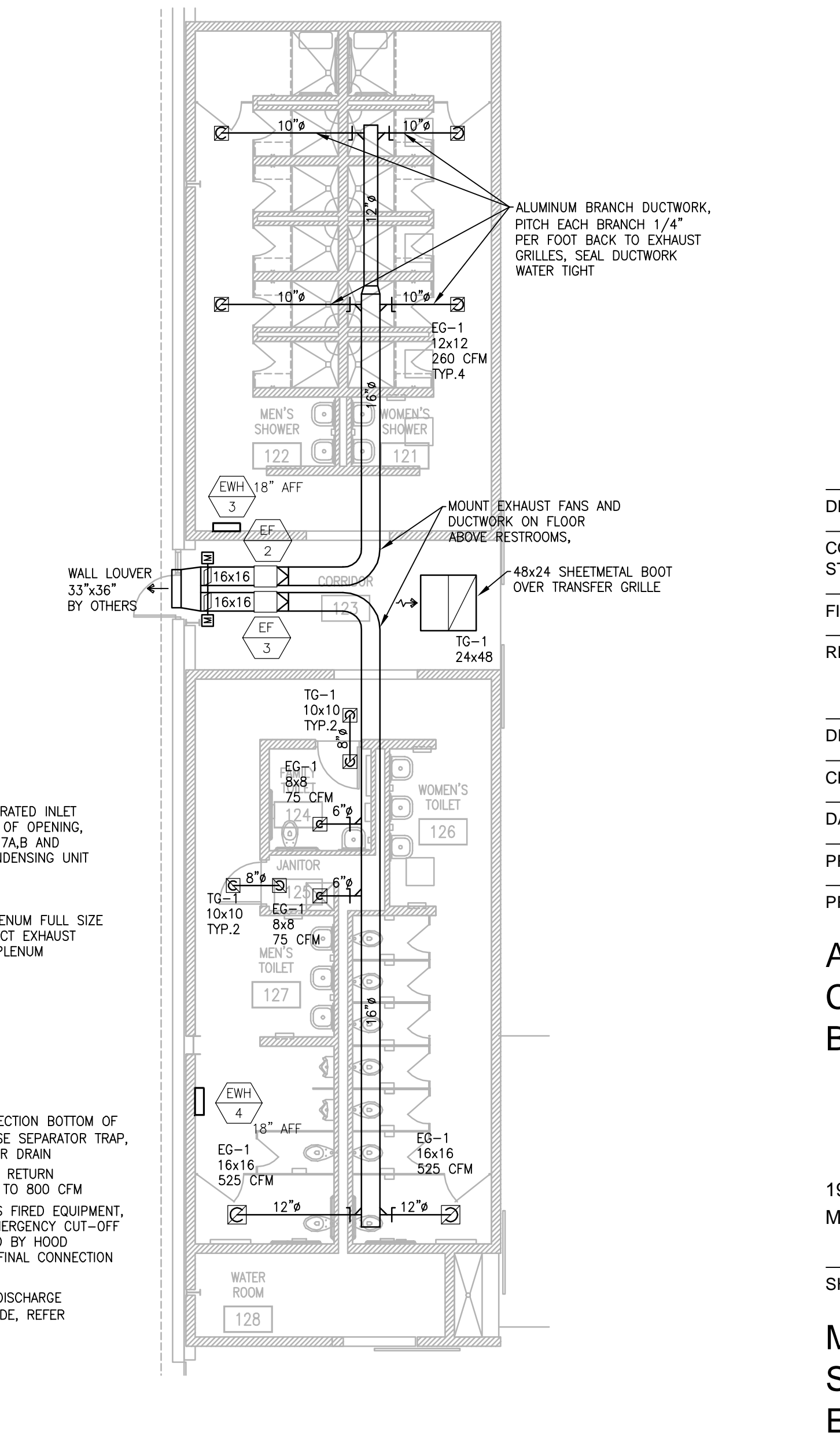
6 AREA C ELECTRICAL AND DATA ROOM EXPANDED HVAC PLAN  
SCALE: 1/8" = 1'-0"



5 BUILDING 2 WEST RESTROOM EXPANDED HVAC PLAN  
SCALE: 1/8" = 1'-0"



3 BUILDING 2 CONCESSION AND MILK PARLOR EXPANDED HVAC PLAN  
SCALE: 1/8" = 1'-0"



1 BUILDING 1 RESTROOM AND SHOWER EXPANDED HVAC PLAN  
SCALE: 1/8" = 1'-0"

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REVISIONS	ADDENDUM #4 - 8/15/2013 ADDENDUM #5 - 8/19/2013

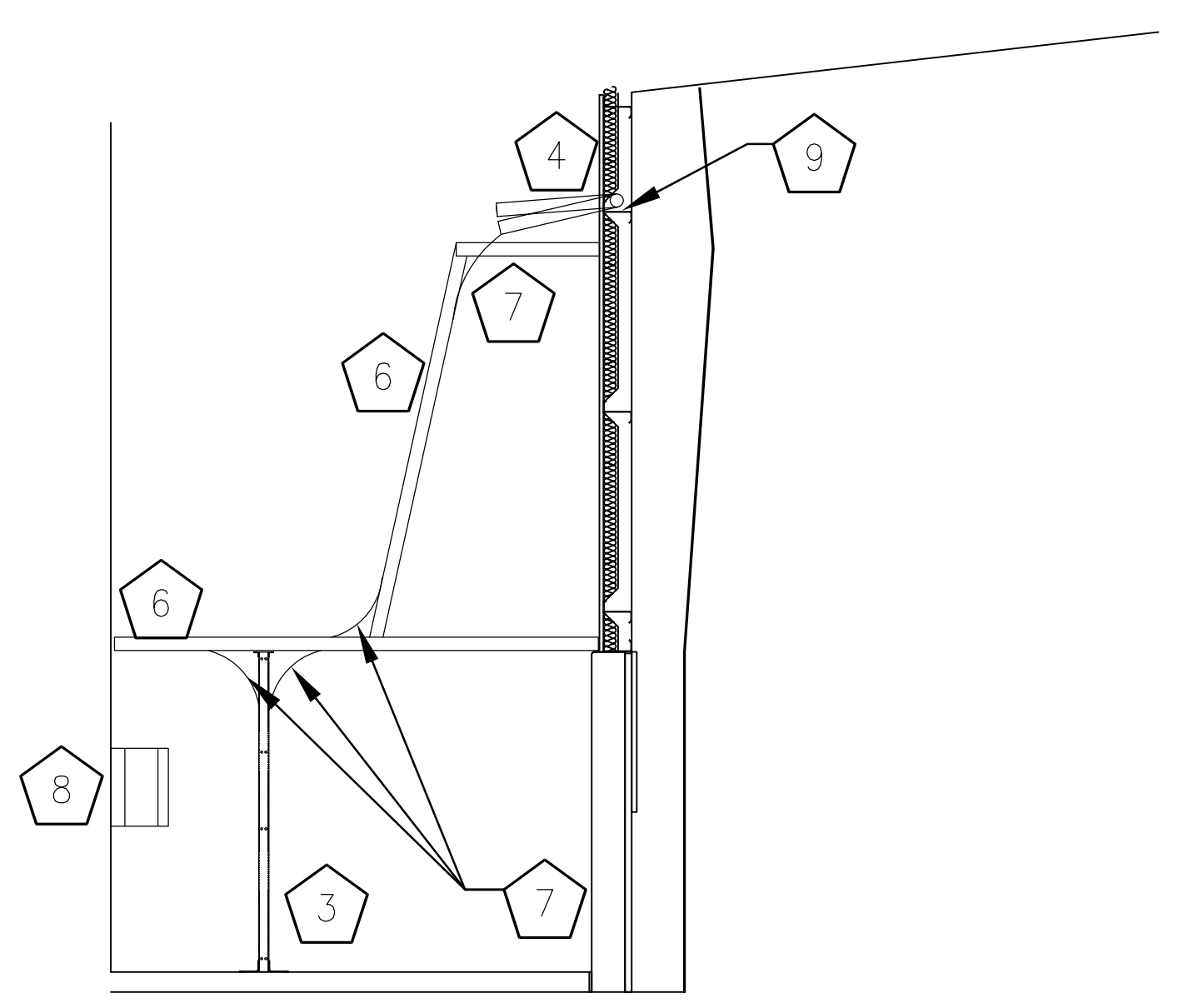
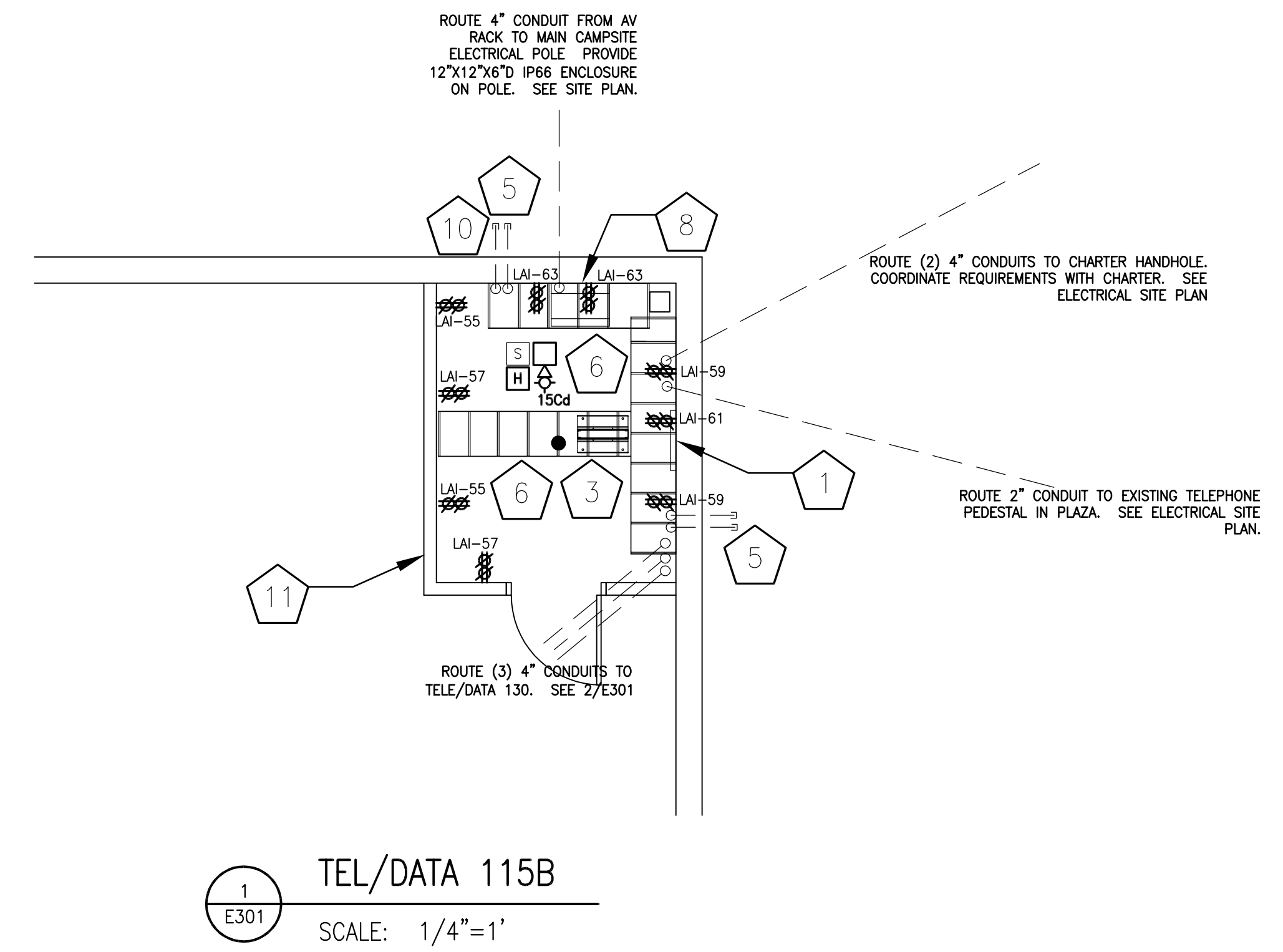
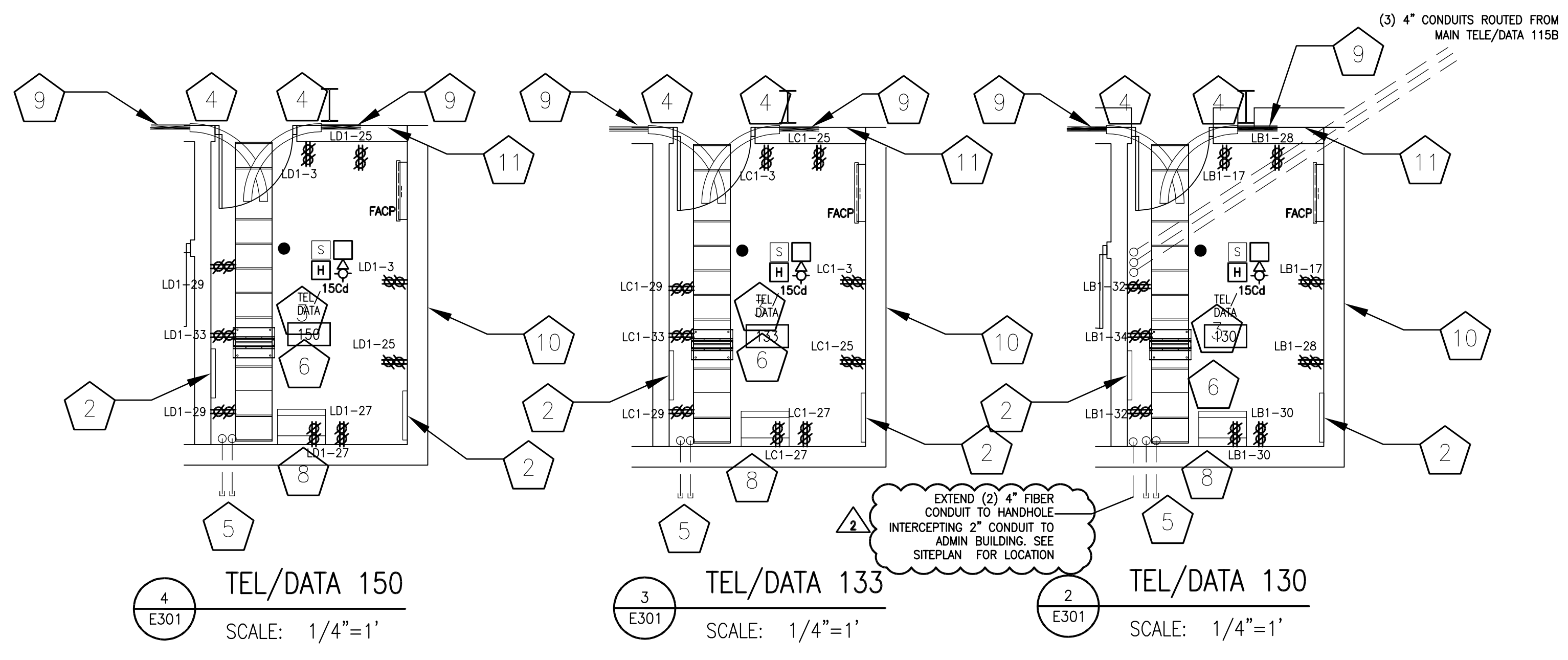
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DATE	08-01-13
PROJECT NO.	2013027_02

PROJECT TITLE  
**ALLIANT ENERGY CENTER PAVILIONS  
BID # 313072**

1919 ALLIANT ENERGY CENTER WAY  
MADISON, WI 53713

SHEET TITLE  
**MECHANICAL  
SECTIONS AND  
EXPANDED PLANS**

SHEET NO.  
**M301**



#	ENLARGED PLAN NOTES
1	24" LONG TELECOMMUNICATIONS MAIN GROUNDING BUSBAR (TMGB). SEE SPECIFICATIONS FOR REQUIREMENTS.
2	24" LONG TELECOMMUNICATIONS GROUNDING BUSBAR (TGB). SEE SPECIFICATIONS FOR REQUIREMENTS.
3	96" TALL FLOOR MOUNTED, 2-POST 19" RACK. SEE SPECIFICATIONS. PROVIDE ALL EQUIPMENT, VERTICAL AND HORIZONTAL WIRE MANAGEMENT AND ACCESSORIES REQUIRED IN SPECIFICATIONS AND AS TYPICAL FOR A COMPLETE AND FINISHED INSTALLATION TO APPLICABLE EIA/ITA STANDARDS AND INDUSTRY STANDARDS.
4	4" CONDUIT SWEEPS FROM STRUCTURAL GIRT INTO TELE/DATA ROOM. PROVIDE SUPPORT AS REQUIRED.
5	PROVIDE (2) 4" CONDUITS STUBBED 5' BEYOND PAVEMENT (INTO GRASSY AREA)
6	18" LADDER RACK. SUPPORT PER MANUFACTURER'S REQUIREMENTS.
7	PROVIDE WATERFALLS AS NEEDED TO MAINTAIN BEND RADIUS.
8	WALL MOUNTED A/V RACK FOR MOBILE TELEVISION COMPANY. 12U, 18" RACK. HINGED BACK, HINGED LOCKABLE DOOR. STARTECH RK1219WALHM OR EQUAL. PROVIDE FIBER PATCH PANEL AS SHOWN ON E402. LOCATE RECEPTACLE SHOWN INSIDE RACK.
9	ROUTE CABLING ON STRUCTURAL GIRT AS SHOWN. EC SHALL INSPECT GIRT PRIOR TO CABLE PULLING, AND ENSURE CABLES ARE NOT PULLED OR LAID ACROSS SHARP CUTS OR EDGES. FIBER OPTIC CABLES SHALL BE ROUTED IN FIBER INNERDUCT TO PROTECT FROM CUTS OR ABRASIONS.
10	PROVIDE WALL PASS-THROUGH ASSEMBLY IN THIS LOCATION. SEE 2/E402. LOCATE 36" AFF.
11	PROVIDE WALL PASS-THROUGH ASSEMBLY IN THIS LOCATION. SEE 2/E402. LOCATE 18" AFF.

5  
E301  
CONDUIT/LADDER RACK ELEVATION  
TEL/DATA 130, 133, 150  
SCALE: 1/4"=1'

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REVISIONS	ADDENDUM #4 8/15/2013 ADDENDUM #5 8/19/2013

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DATE	08-01-13
PROJECT NO.	2013027_02
PROJECT TITLE	

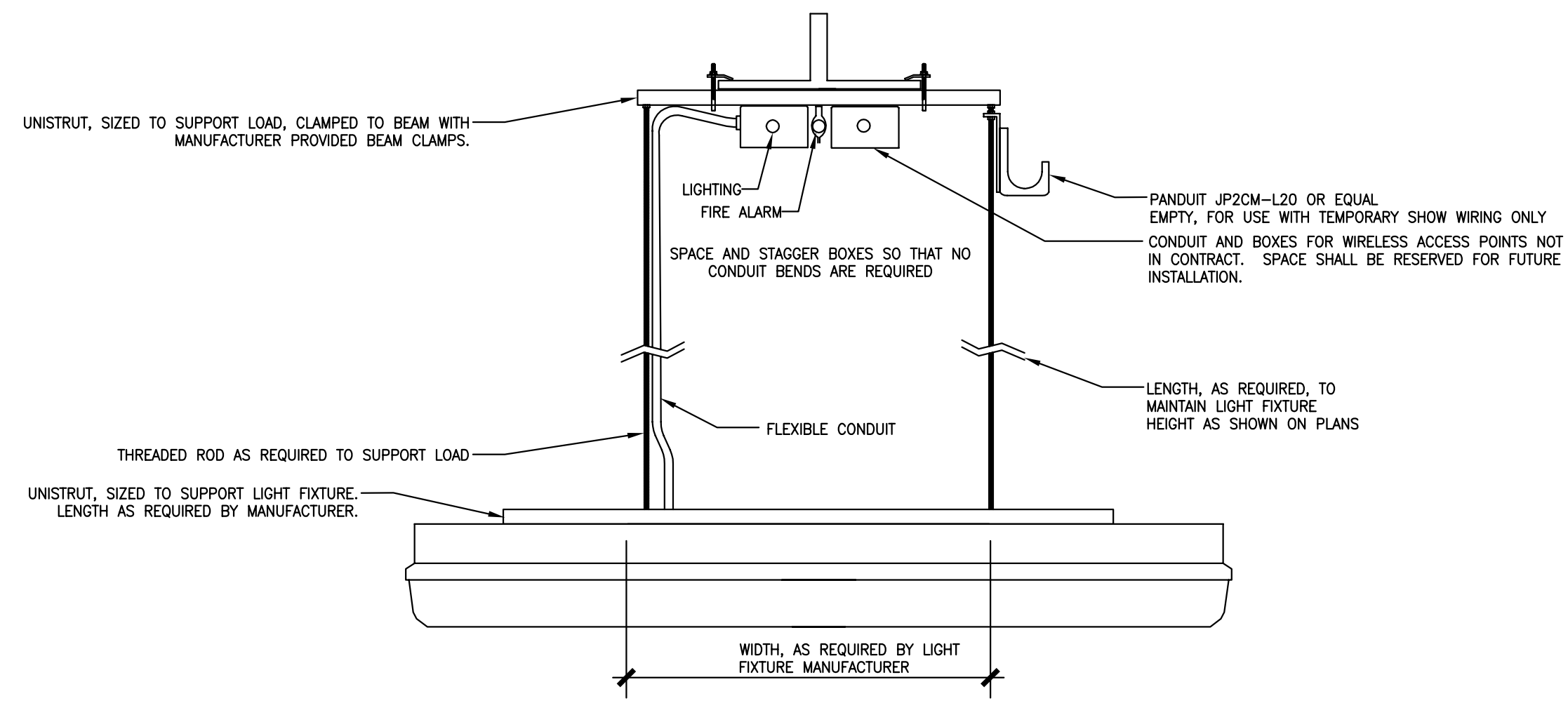
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CENTER PAVILIONS  
BID # 313072

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MADISON, WI 53713

SHEET TITLE  
ENLARGED  
ELECTRICAL PLANS

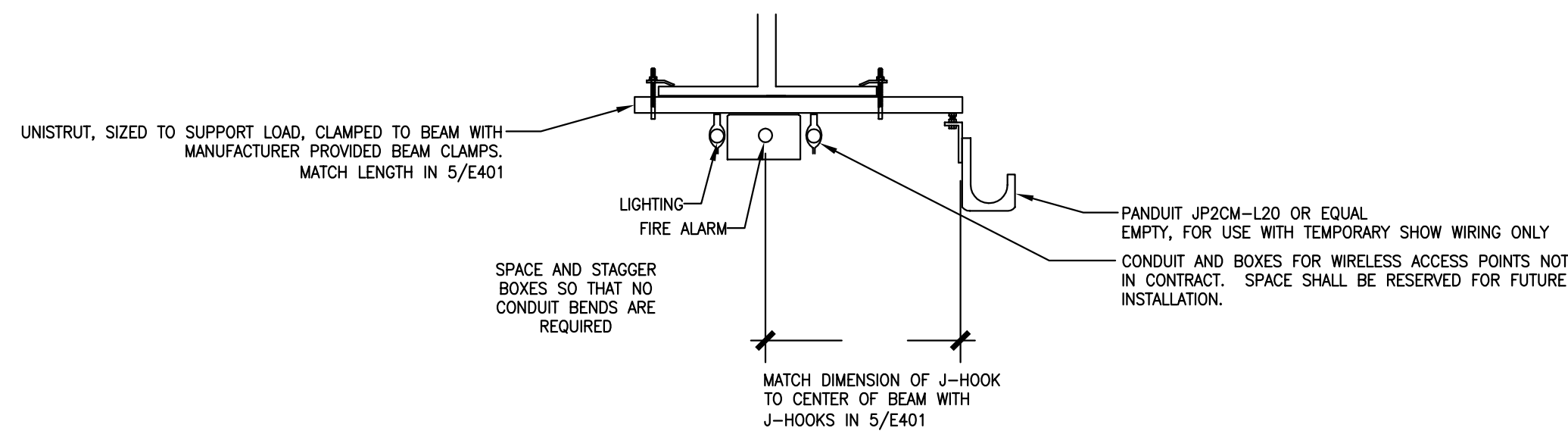
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E301

MICHAEL LIBBY 2008-6-30 2:27 PM K:\2013\013027-ALLIANT ENERGY CENTER LIVESTOCK & EXHIBITION SPACE EXPANSION\013027\_02-E301.DWG



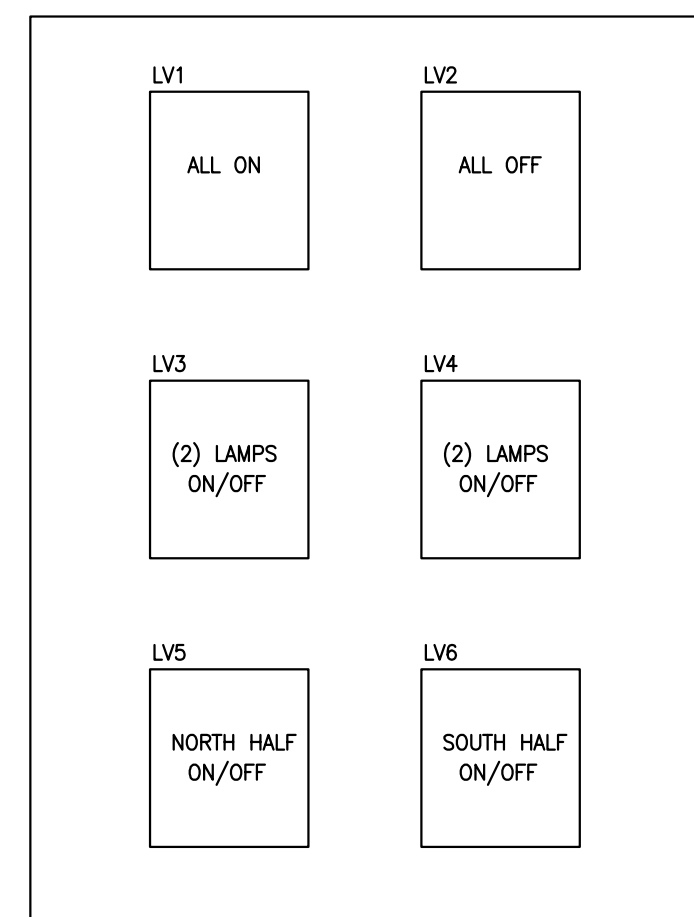
AT LIGHT FIXTURE LOCATIONS  
PAVILION LIGHTING, FIRE ALARM, DATA  
CONDUIT AND SUPPORT SYSTEM

6  
E401 SCALE: N.T.S.



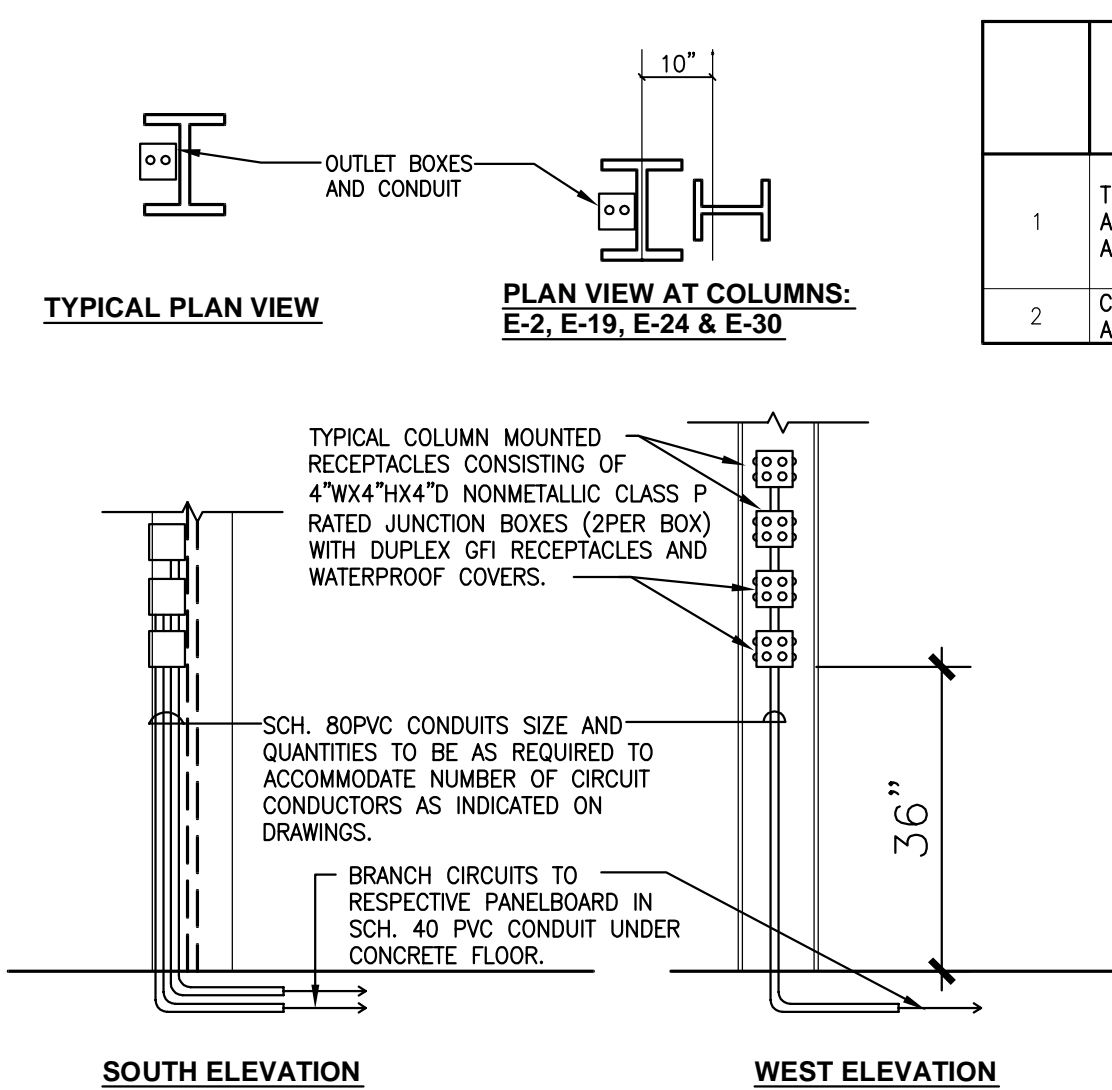
BETWEEN LIGHT FIXTURE LOCATIONS  
PAVILION LIGHTING, FIRE ALARM, DATA  
CONDUIT AND SUPPORT SYSTEM

7  
E401 SCALE: N.T.S.



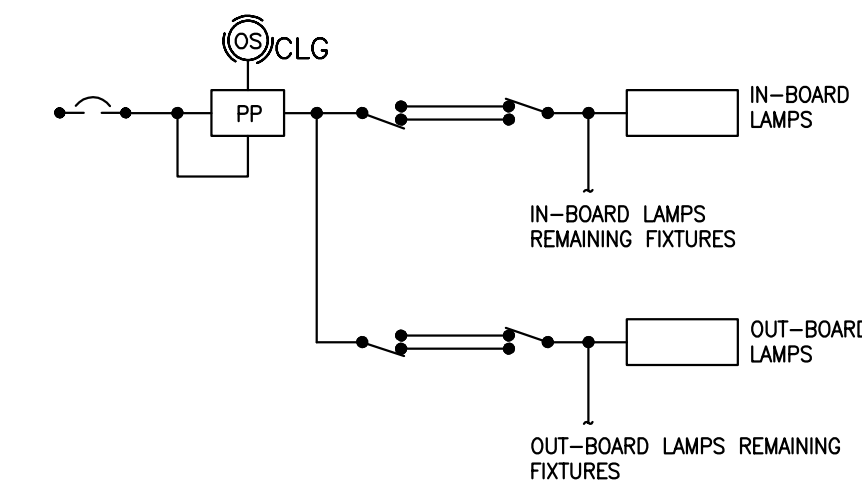
LOW VOLTAGE SWITCH SCENES

8  
E401 SCALE: N.T.S.



RECEPTACLES AT COLUMN DETAIL

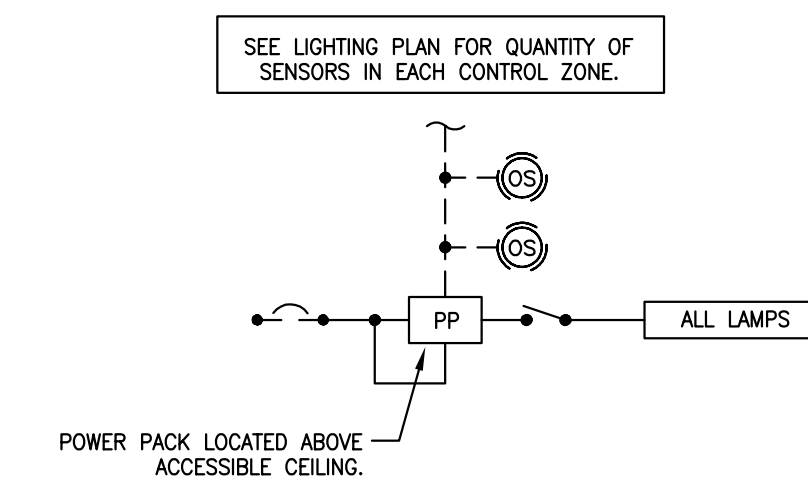
10  
E401 SCALE: N.T.S.



DETAIL IS SCHEMATIC AND INTENDED TO ILLUSTRATE SWITCHING INTENT. VERIFY ACTUAL INSTALLATION WITH MANUFACTURER'S REQUIREMENTS.

3-WAY SWITCHING  
CEILING OCCUPANCY SENSOR  
W/ TWO LEVELS LIGHTING

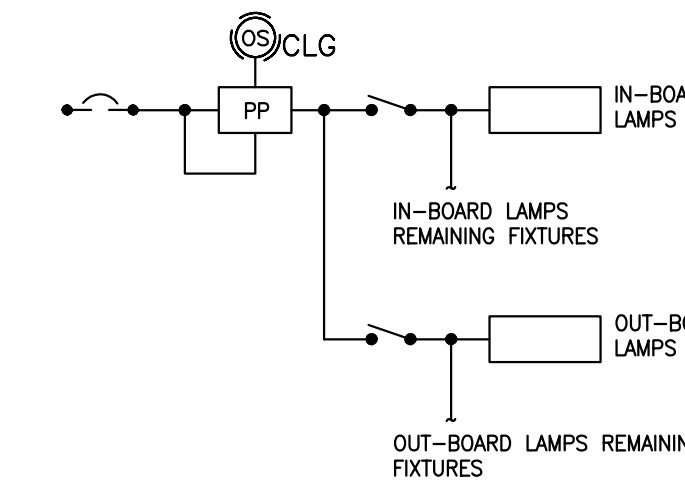
4  
E401 SCALE: N.T.S.



DETAIL IS SCHEMATIC AND INTENDED TO ILLUSTRATE SWITCHING INTENT. VERIFY ACTUAL INSTALLATION WITH MANUFACTURER'S REQUIREMENTS.

CEILING OCCUPANCY SENSOR  
W/ SINGLE POLE SWITCH

1  
E401 SCALE: N.T.S.



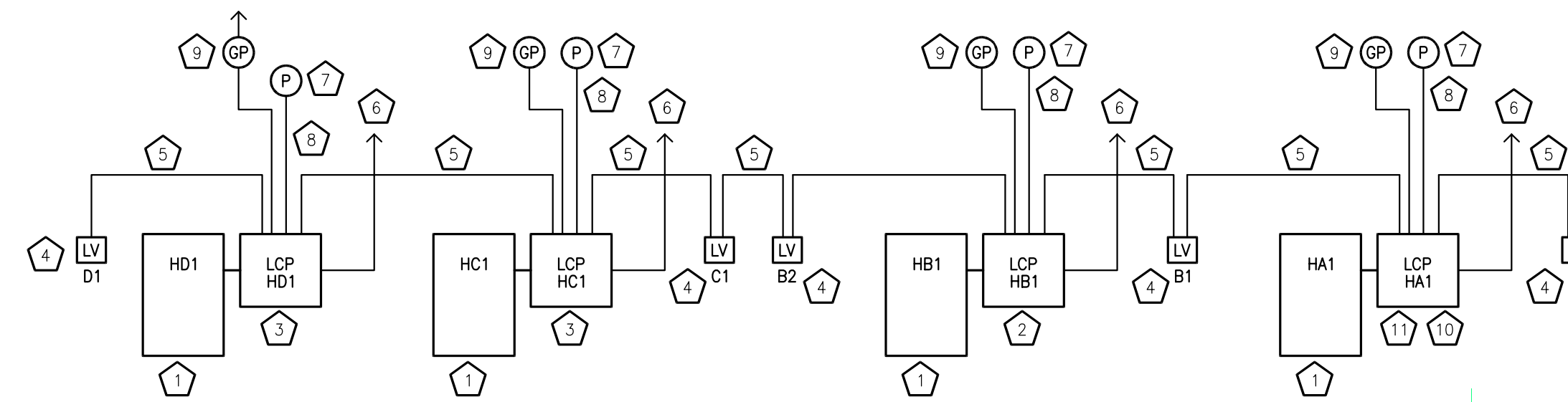
DETAIL IS SCHEMATIC AND INTENDED TO ILLUSTRATE SWITCHING INTENT. VERIFY ACTUAL INSTALLATION WITH MANUFACTURER'S REQUIREMENTS.

CEILING OCCUPANCY SENSOR  
W/ TWO LEVELS LIGHTING

2  
E401 SCALE: N.T.S.

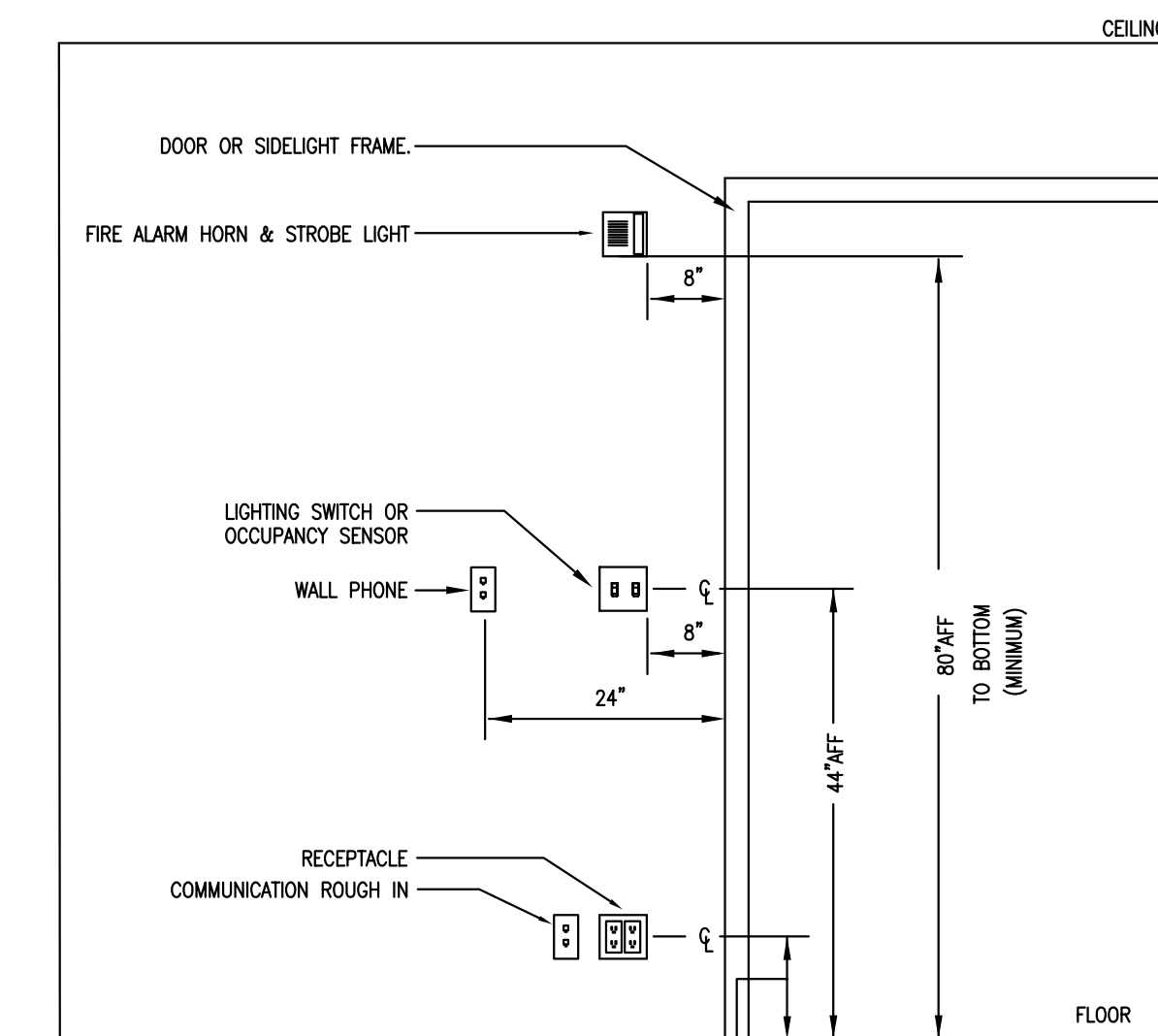
GENERAL PLAN NOTES FOR DETAIL 5	
1	THIS DIAGRAM IS NOT INTENDED TO BE A FIELD WIRING DIAGRAM THAT INDICATES SPECIFIC WIRING AND CONNECTION REQUIREMENTS. DIAGRAM INDICATES GENERAL SYSTEM COMPONENTS AND ARRANGEMENT ONLY. COMPLETE SYSTEM INSTALLATION SHALL BE AS RECOMMENDED BY EQUIPMENT MANUFACTURER ACCORDING TO SHOP DRAWINGS AND FIELD WIRING DIAGRAMS FURNISHED BY THE MANUFACTURER.
2	VERIFY ALL LOCATIONS FOR EQUIPMENT ON SITE WITH OWNER.
3	EQUIPMENT CATALOG NUMBERS LISTED ON DIAGRAM IS EQUIPMENT MANUFACTURED BY L&G.

DETAIL 5 - SPECIFIC NOTES	
1	480 / 277V BRANCH CIRCUIT PANEL SERVING LIGHTING IN RESPECTIVE AREA. REFER TO LIGHTING FLOOR PLANS FOR CIRCUIT NUMBERS.
2	LIGHTING RELAY MASTER CONTROL PANEL CAT. NO. GR2432 LT INT 32NCL DTC MOD DV/GR2432 LT ENC SM NE1.
3	LIGHTING RELAY REMOTE CONTROL PANEL CAT. NO. GR2432 LT INT 32NCL REMOTE DV/GR2432 LT ENC SM NE1.
4	LOCAL LOW VOLTAGE MANUAL CONTROL SWITCH CH6 WP BWH PWH. VERIFY QUANTITY OF BUTTONS TO ACCOMMODATE NUMBER OF CONTROL ZONES. INCLUDE ENGRAVED NAMEPLATES TO IDENTIFY ZONES SERVED.
5	CAT 5 PATCH CABLE WITH RJ45 CONNECTORS.
6	277V VOLT LIGHTING CIRCUITS, SEE DRAWINGS FOR CIRCUIT NUMBERS.
7	OUTDOOR DIGITAL PHOTOSENSOR GR2400PCC12W0 MOUNT WHERE APPROVED BY ARCHITECT ON NORTHSIDE OF BUILDING.
8	#18
9	INDOOR GLOBAL PHOTOSENSORS #2W1/GR2400PCC3 FOR CONTROL OF SKYLIGHT DAYLIT AREAS. BASE BID CONTROL WITH PHOTOSENSORS. ALL BID MANUAL DEVICES. VERIFY QUANTITY REQUIRED ON FLOOR PLANS.
10	LOCATE A SECOND RELAY PANEL ON THE MEZZANINE LEVEL.
11	LIGHTING RELAY REMOTE CONTROL PANEL CAT. NO. GR2416 LT INT 16NCL REMOTE DV/GR2416 LT ENC SM NE1.



LIGHTING CONTROL SYSTEM DIAGRAM

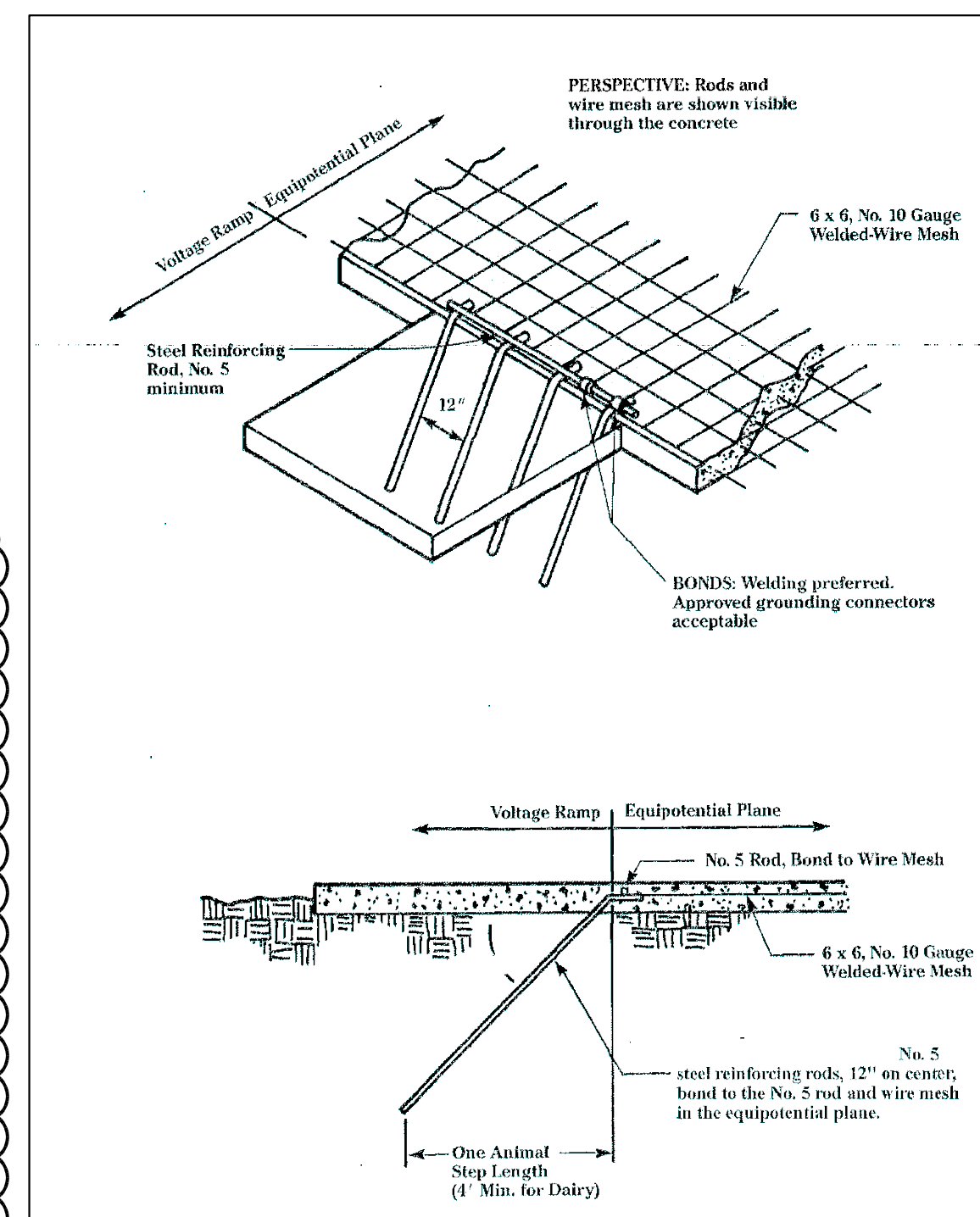
5  
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GENERAL NOTES:  
NOT ALL DEVICES WILL BE PRESENT AT EACH ROOM ENTRY. THE INTENT OF THIS ELEVATION TO EMPHASIZE THAT A VERTICAL ALIGNMENT OF DEVICES IS REQUIRED.

DEVICE MOUNTING DETAIL

3  
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MILKING PARLOR TRANSITION RAMP DETAIL

9  
E401 SCALE: N.T.S.

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REVISIONS	ADDENDUM #5 08/19/13

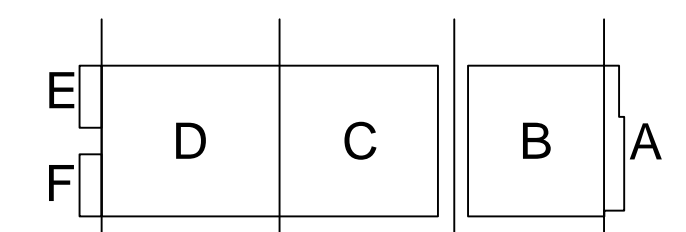
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PROJECT NO.	2013027_02
PROJECT TITLE	

ALLIANT ENERGY  
CENTER PAVILIONS  
BID # 313072

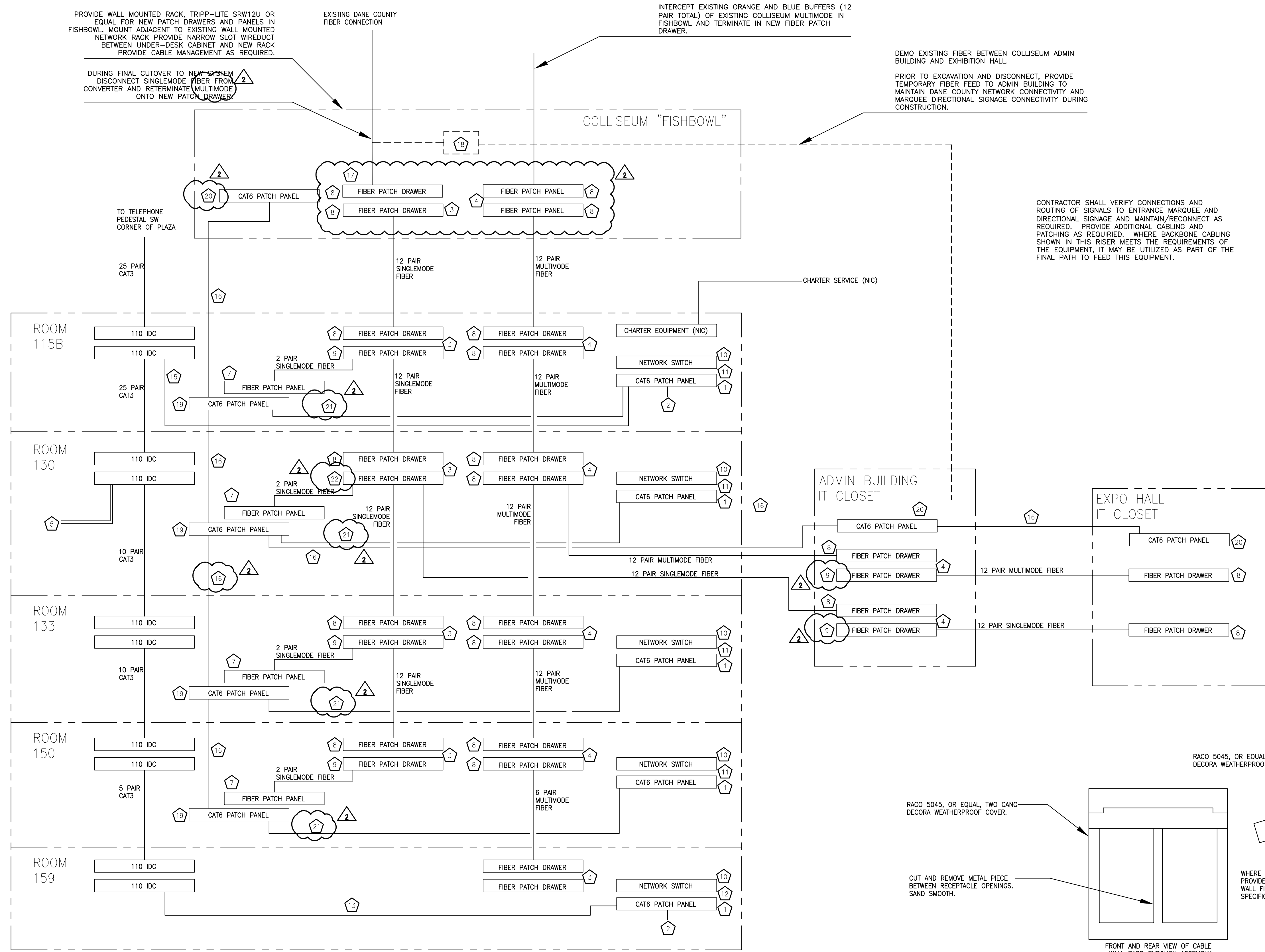
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MADISON, WI 53713

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ELECTRICAL DETAILS

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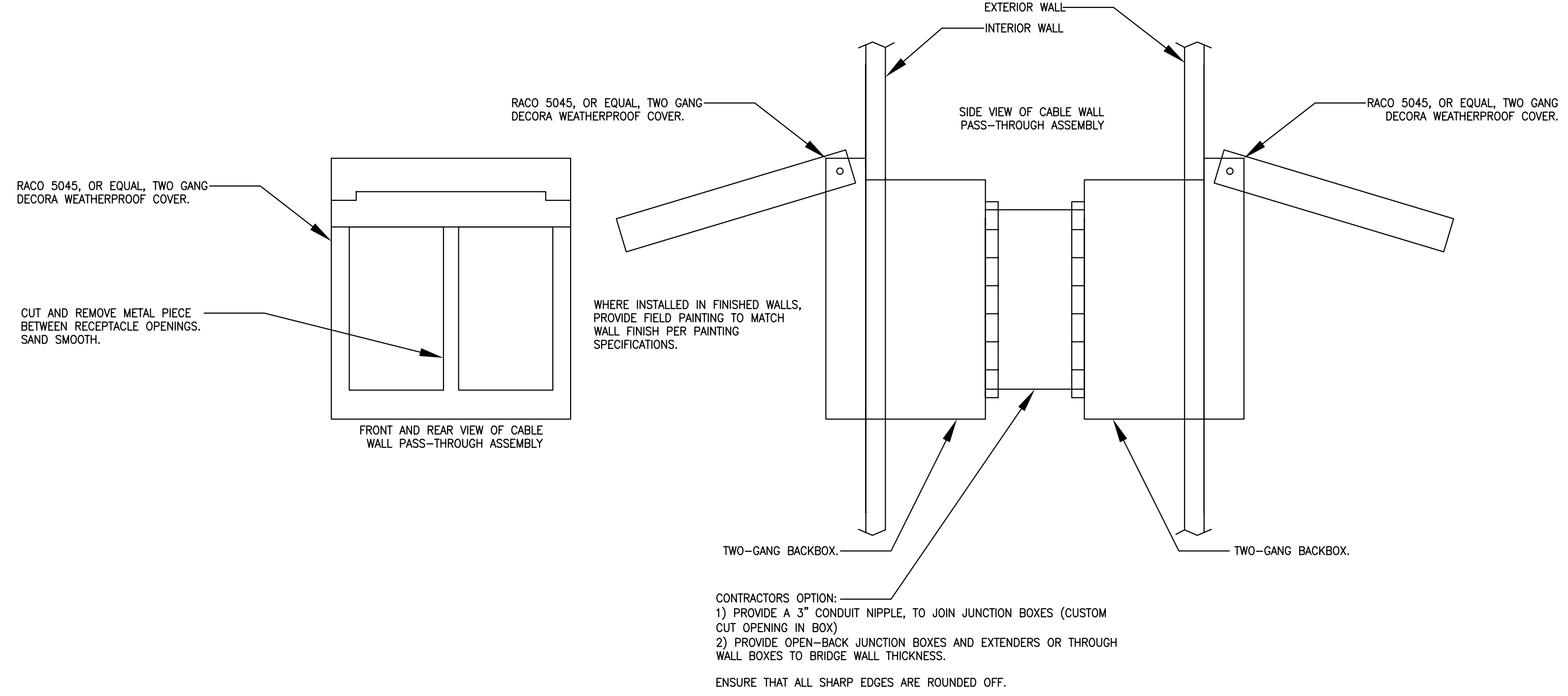
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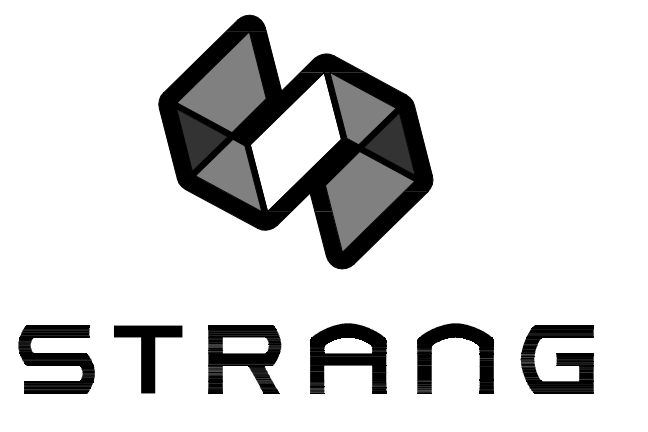
1 IT RISER.  
SCALE: NONE

IT RISER-GENERAL NOTES	
1	THIS DIAGRAM IS NOT INTENDED TO BE A FIELD WIRING DIAGRAM THAT INDICATES SPECIFIC WIRING AND CONNECTION REQUIREMENTS. DIAGRAM INDICATES GENERAL SYSTEM COMPONENTS AND ARRANGEMENT ONLY. COMPLETE SYSTEM INSTALLATION SHALL BE AS RECOMMENDED EA/TIA AND ACCORDING TO SHOP DRAWINGS AND FIELD WIRING DIAGRAMS FURNISHED BY THE MANUFACTURERS.
2	VERIFY ALL LOCATIONS FOR EQUIPMENT ON SITE WITH OWNER.
3	ACTIVE NETWORK EQUIPMENT, INCLUDING NETWORK SWITCHES, WIRELESS ACCESS POINTS (AND ASSOCIATED CONTROLLERS) AND CAT-6 CABLES AND CONDUIT TO WIRELESS ACCESS POINTS IS NOT IN CONTRACT. THESE ITEMS ARE INCLUDED IN AN ALLOWANCE CARRIED BY THE GENERAL CONTRACTOR.
4	ALL EQUIPMENT SHOWN SHALL BE MOUNTED IN EQUIPMENT RACKS SHOWN IN EACH ROOM, UNLESS OTHERWISE NOTED.
5	NETWORK OUTAGES SHALL BE KEPT TO A MINIMUM IN EXISTING BUILDINGS. ALL OUTAGES SHALL BE COORDINATED WITH THE OWNER 2 WEEKS PRIOR TO OUTAGES. ALL OUTAGE DATES ARE SUBJECT TO ALLIANT ENERGY CENTER APPROVAL BASED ON EVENTS AND OTHER FACTORS.

IT RISER-SPECIFIC NOTES	
1	PATCH PANEL SHALL HAVE A MINIMUM OF 48 PORTS TO SUPPORT WIRELESS ACCESS POINTS AND EVENT-SPECIFIC HORIZONTAL NETWORK CABLING NOT IN CONTRACT. HARDWIRED DATA OUTLET WIRING, SHOWN ON PLANS, IS PART OF THIS QUANTITY (NOT IN ADDITION TO IT).
2	PATCH PANEL SHALL HAVE A MINIMUM OF 12 PORTS TO SUPPORT FUTURE HORIZONTAL NETWORK CABLING NOT IN CONTRACT. HARDWIRED DATA OUTLET WIRING, SHOWN ON PLANS, IS PART OF THIS QUANTITY (NOT IN ADDITION TO IT).
3	PROVIDE (3) DUPLEX FIBER PATCH CABLES.
4	PROVIDE (6) DUPLEX FIBER PATCH CABLES.
5	2 PAIRS TO FIRE ALARM SYSTEM COMMUNICATOR.
6	TO MAINTENANCE SHOP OFFICE PHONES.
7	4 PORT MINIMUM, LOCATED IN WALL AV CABINET. PROVIDE PATCH PANELS WITH ST CONNECTORS IN WALL A/V CABINET. (ALL OTHER SINGLEMODE CONNECTIONS UTILIZE LC CONNECTORS)
8	12 PORT (DUPLEX) MINIMUM.
9	16 PORT (DUPLEX) MINIMUM.
10	ACTIVE NETWORK EQUIPMENT NOT IN CONTRACT.
11	PROVIDE (48) CAT6 PATCH CABLES.
12	PROVIDE (3) CAT6 PATCH CABLES.
13	PROVIDE (3) CAT3 110 IDC TO RJ45 PATCH CABLES FOR TELEPHONE CONNECTION TO OFFICES, VIA CAT6 PATCH PANEL. UTILIZE CAT6 CABLE TO THE OUTLETS AS SHOWN ON THE PLANS.
14	CAT6 CABLE TO WIRED DATA OUTLETS. SEE PLANS FOR QUANTITY AND LOCATIONS.
15	PROVIDE (4) CAT3 110 IDC TO RJ45 PATCH CABLES FOR TELEPHONE CONNECTION TO OFFICES, VIA CAT6 PATCH PANEL. UTILIZE CAT6 CABLE TO THE OUTLETS AS SHOWN ON THE PLANS.
16	(4) CAT6 CABLES (FOR THE USE OF THE MOBILE TELEVISION CONTRACTOR) OF A DIFFERENT COLOR THAN OTHER NETWORK CABLING TERMINATE EACH END OF CABLE ON PATCH PANELS AS SHOWN.
17	RETERMINATE EXISTING INCOMING SINGLEMODE FIBER ONTO A NEW PATCH PANEL IN NEW CABINET.
18	REMOVE EXISTING SINGLEMODE TO MULTIMODE CONVERTER ONCE CONSTRUCTION IS COMPLETE. TURN OVER TO OWNER.
19	MINIMUM 16 PORT CAT6 PATCH PANEL LOCATED IN AV RACK.
20	MINIMUM 8 PORT CAT6 PATCH PANEL LOCATED IN EXISTING RACK.
21	(2) CAT6 CABLES FROM NETWORK RACK TO AV RACK.
22	30 PORT (DUPLEX) MINIMUM.



2 A/V CABLE PASS THROUGH ASSEMBLY  
SCALE: NONE



ARCHITECTURE  
ENGINEERING  
INTERIOR DESIGN

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CHECKED	AS
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