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September 7, 2023

ADDENDUM NO. 4  
City of Madison, Engineering Division

CONTRACT NO. 8595  
MADISON PUBLIC MARKET

This addendum is issued to modify, explain or correct the original Drawings, Specifications, or Contract Documents marked as **Madison Public Market, Contract #8595, as issued on July 20, 2023** and is hereby made a part of the contract documents.

Please acknowledge this addendum on page E1 of the contract documents and/or in Section E: Bidder's Acknowledgement on Bid Express.

Electronic version of these documents can be found on Bid Express at <https://www.bidexpress.com/> and the City of Madison web site at <http://www.cityofmadison.com/business/PW/contracts/openforBid.cfm>

If you are unable to download plan revisions associated with the addendum, please contact the Engineering office at (608) 266-4751 to receive the material by another method.

For questions regarding this bid, contact:

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Sincerely,

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James M. Wolfe, P.E.  
City Engineer



This addendum modifies the following documents:

1. 8595 Contract.pdf
2. Exhibit-A\_drawings.pdf
3. Exhibit-B\_specifications\_volume1.pdf
4. Exhibit-C\_specifications\_volume2.pdf
5. Exhibit-D\_specifications\_volume3.pdf

Please attach these Addendum documents to the Drawings and Project manual in your possession.

**1. GENERAL CONTRACT CONDITIONS**

- A. No change

**2. GENERAL QUESTIONS AND ANSWERS**

- A. *“Per Section 01 10 00 Summary, 1.3 Work By Owner, C. Concurrent Work, The owner shall install Bale-1 and Lift-1 as per the drawings and Section 11 51 00 and 11 13 19 respectively. Per Section 11 13 19 Stationary Loading Dock Equipment, Item 1.2A states that the owner is to provide and install LIFT-1 but per Section 11 51 01 Owner Provided Equipment Responsibility Matrix, LIFT-1 and BALE-1 are listed as being installed by the GC. Please confirm which is correct”*
- i. **LIFT-1 and BALE-1 are to be purchased by the owner and installed by the GC. 11 51 00 “Owner Provided equipment as issued in 09-June 2023 “Bid Documents” is correct. Section 01 10 00 “Summary” has been corrected via this addendum.**
- B. *“Per Section 01 10 00 Summary, 1.3 Work By Owner, D. Subsequent Work, The owner shall furnish and install all kitchen equipment per the Food Service Drawings and Specification Section 11 40 00. Per Section 11 40 00, Food Service Equipment it clearly states what each trade is responsible for providing but does not confirm via this spec section that the owner is responsible for providing and installing the food service equipment. Per Plan Sheet FS104 Equipment List, there exists a conflict with the two previous mentioned spec sections as there is equipment listed to be furnished by the City and Installed by the GC and also equipment furnished and installed by the GC. Please confirm owner will provide and install the food service equipment or if GC is to furnish and install.”*
- i. **The Equipment List Responsibility Matrix on sheet FS101 as issued in 09-June-2023 “Bid Documents” is correct. The discrepancy in section 01 10 00 “Summary” has been corrected via this addendum.**
- C. *“Per Section 01 74 19 Construction Waste Management and Disposal, 3.2 Hazardous and Toxic Waste, A, The owner shall be responsible under separate contract for removal of any asbestos related materials. Please confirm abatement is complete and supply the necessary all clear letter of post abatement inspection which will be required for DNR notice of demolition.”*
- i. **Asbestos abatement is complete. Necessary documentation for DNR Notice of Demolition shall be delivered to the awarded General Contractor.**
- D. *“Please confirm extents of cleaning of existing interior surfaces via specification or drawing notating requirements as this is not currently defined in the construction documents but is noted as required prior to painting of the interior surfaces.”*
- i. **The surface preparation requirements for existing surfaces to receive new paint are described in 09 91 23 “Interior Painting”. ‘A’-series Finish Plans, Interior Elevations, RCPs and other drawings and details note which surfaces are to receive new finishes. Coordinate with Floor and Demolition plans to determine location of existing walls which are to be prepped per 09 91 23.**



- ii. We have added finish tags to A700's and A500' drawings to clarify notations between the two. This is for coordination clarity only. Work clouded in this addendum does not represent the only extent of painting at existing surfaces. Coordinate with full Architectural set per 2.4.1.*
- E. "One additional item that I just came across as it relates to the resinous flooring. Section 09 67 23 Resinous Flooring calls for EPOXY-1 to be a 4-part decorative flake system with the basis of design being the Tennant Flake DB system. Sheet G002 calls for EPOXY-1 to be a Sherwin Williams product Resufloor MPE, PT & Resutile HTS 100 (Satin). Please confirm the desired intent as there is conflicts between the documents."*
- i. **Tennant Epoxy Flooring was purchased by Sherwin Williams. Sheet G002 is correct. Section 09 67 23 "Resinous Flooring" has been corrected via this addendum with equivalent Sherwin Williams system.***
- F. "Please confirm project schedule given the current lead times of electrical gear range anywhere from 60 to 70 weeks from receipt of order. Receipt of order will take 4 weeks from award of contract to low responsible bidder. If GC is awarded per timeline as noted in the contract per Section 109.7 for start work letter to be issued by November 7, 2023, electrical gear would be delivered on or about April 8, 2025. GC would need 16 weeks post delivery of electrical gear to complete all installation, startup, commissioning, testing and turnover resulting in a completion date of the project on or about July 31, 2025, which would result in Contract Closeout being August 31st, 2025, 7 months later than as required per Section 109.7 Time of Completion."*
- i. **Under Sec. 109.8 of the Standard Specifications, should the Contractor find it impossible to complete the work on or before the time for completion as specified in the contract, the Contractor may make a written request for an extension of time, which extension may be granted if the Board of Public Works finds that the work is delayed because of conditions beyond the control of the Contractor. The City is aware of extended lead times for some electrical gear and, should Contractor be unable to secure necessary equipment due to supply chain issues outside of the control of the Contractor, will work with the awarded Contractor to develop an equitable schedule for long procurement times related to specific electrical gear and related work (i.e. installation, startup, commissioning, and testing) if it is proven that delivery dates cannot meet the specified schedule. While an extension of time may be granted under Sec. 109.8, all other building elements shall be completed per the current Construction Closeout date listed in the Contract under SECTION 109.7 TIME OF COMPLETION.***
- ii. **See Section 4 SPECIFICATIONS of this document where specification 26 23 00 is deleted and specification 26 24 13 is added.***
- G. "Can you verify the roofing system that will be used to patch and flash into the existing roofing on the building at 202 N. First Street. The new curb flashings and roof patching will not get a separate roof warranty, they will be part of the existing roof warranty already in place."*
- i. **Project assumes that existing roof is Firestone 60 mil TPO Roofing, white, fully adhered.***
- ii. **Note that 2013 Re-roof documents included in Bid Reference 5 "Drawings and Existing Conditions" notes the existing roofing as EPDM. This Reference document is incorrect.***
- H. "I need to know where the walk-in condensing units are being located and what an estimated line run will be in order to give an accurate quote for those items".*
- i. **FS condensing equipment is located on roof and labeled in 'A' series drawings.***
- I. "In the spec (Section 263100- Photovoltaic System, 2.5 Roof Attachment), it lists two options for a flat roof install, the first one, U-Anchor EPDM (should be for TPO), is a system that has a bolt that will penetrate the roof membrane and requires a TPO patch at each penetration. The second one is for a Rack system that only requires a ballast weight to hold it down, SolarDock, (no penetrations, no patch). Which system*



should be included? Also, if it's the U-Anchor, who will be supplying and installing the anchors? We would be doing the TPO patching."

- i. Photovoltaic System shown in drawings and specifications is a basis of design only. The actual design of Photovoltaic System, including racking and anchors, shall be performed by General Contractor's photovoltaic system subcontractor. The type of anchor used is up to them and will depend on the proposed weight of the system as there are limits, described in the Structural Criteria and Loading schedule on S001, on what additional roof loads the structure can support.
  - ii. **If possible, the racking and anchorage should be designed as a ballasted system.** As noted, the system weight must conform to the Structural Design and Loading Criteria on S001.
  - iii. Coordinate with your Bidding General Contractor and their preferred Photovoltaic Subcontractor to determine which anchor type they will use. In the event that TPO patch fittings are required, the quantity of such should be determined in coordination with the bidding contractor and reflected in their overall bid.
  - iv. Anchor types used must maintain existing roof warranty
- J. "Per drawing table of contents, several drawings are missing, please provide the following drawings:"
- i. These drawings appeared in the sheet list by error. The Cover Sheet has been re-issued with a corrected sheet list via this Addendum.
- K. "Per demolition spec a 2hr firewatch is required; this seems excessive, can this be reduced to a 30 minute firewatch?"
- i. Firewatch may be reduced to 30 Minutes.
- L. "Spec 071416 references a drainage mat but no drainage mat can be seen in any of the drawing details, please provide drainage mat locations."
- i. Drainage mat is not used, provide water proofing manufacturers protection course to protect waterproofing during backfilling pe 07 14 16
- M. "Please confirm the intent of the waterproofing is to excavate the top 2 feet of soil and waterproof the existing foundation to 2' below grade at all locations? Does this apply to the ancillary building as well?"
- i. Yes, as a part of installation of new envelope system at lower extent of main building, Water Proofing shall be installed to 2' below grade.
  - ii. No, Ancillary building envelope is only being recoated. No waterproofing is planned at ancillary building.
- N. "Documents are conflicting as to provides LIFT-1, please clarify who provides and installs this item."
- i. See question and answer "2.1" above.
- O. "Who is responsible for providing the bike repair station? Contractor or owner?"
- i. The General Contractor shall provide and install the specified bike repair station.
- P. "Please confirm per DPW standard spec the contractor is responsible for builders risk insurance. Is there any additional equipment that needs to be captured under the policy?"
- i. See the Public Works specification for insurance requirements.
- Q. "Please provide retaining wall tow of wall elevations on the landscaping plans"
- i. See Updated Sheet L200
- R. "Please provide a drawing depicting heavy duty vs light duty pavement, we are unsure what the intended scope is based on plan comments."



- i. See Updated Sheets L001, L002, L100. L200**
- S.** *"Please clarify is the standard duty pavement is 3 or 4 inches of asphalt? There is conflicting information in the documents"*
- i. See Updated Sheet L100**
- T.** *"We were unable to locate the concrete-2 floor finish, where is this intended to occur?"*
- i. CONC-2 is not a finish. It is only used to denote an existing concrete floor VS a new concrete floor assembly – for instance, RM125 on 1/A102S.**
- ii. New finishes installed over existing concrete floors are described in A700's**
- U.** *"Is the plant maintenance truly an entire season as described in the spec? we have never seen a maintenance plan for that long of a duration and want to confirm that this is truly intended for the project."*
- i. Plant maintenance period is for the entire growing season as outlined in section 32 93 00. Plantings installed prior to June 15 shall be maintained for the duration of the growing season (until November 1). Plantings installed after September 1 shall be maintained for the remainder of the growing season (until November 1) AND for the entire growing season of the following year (April 1 – November 1).**
- V.** *"C405 mentions a membrane around the stormtech chambers, stormtech does not provide this membrane, please advise what material the membrane should be."*
- i. See Attachment: "8595\_C405-Construction Details-5\_Addendum-4.pdf"**
- W.** *"Who is responsible for temporary utility consumption charges during construction? Owner or contractor?"*
- i. The Contractor is responsible for temporary utility consumption charges.**
- X.** *"I am wondering if we might be able to bid this with a tilt up that is a lower tilt, at 10 Degrees."*
- i. Per Drawing notes and 26 31 00, Photovoltaic System as described in these drawings is a basis of design. Bidding contractor may propose any photovoltaic system that meets the requirements of the project drawings and specifications.**
- ii. Note that there are limits to what the existing roof structure can accommodate. Please refer to "Structural Criteria and Loads" on S001. A ballasted system may be difficult to achieve given the limitations.**
- iii. Note that photovoltaic system, as designed, considers key placement factors and any revisions should accommodate these:**
- (1) 10' min. clearance from roof edges**
  - (2) Acceptable access lanes between rows**
  - (3) Not be located – to all extents possible – around exhaust hood fans.**
- Y.** *"Volume damper specifies dampers with frames and blade & jamb seals. Volume dampers are typical used for balancing, not positive shut off like control dampers. Can we provide volume dampers standard balancing dampers?"*
- i. Bid Documents call for good-quality manual balancing dampers from reputable manufacturers. They should remain as specified.**
- Z.** *"Section 03 10 30 Maintenance of Cast-In-Place Concrete reference EPOXY-2 under the Section Summary. A product is not called out on G002 nor in Section 09 67 23 Resinous Flooring. This is open to bidder interpretation and very vague. Additionally, this specification references that the GC is responsible*



to coordinate and ensure that the existing floor coating is cleanable to a point of passing a Department of Health inspection. How will this be achieved given that the existing floor coating is laden with oil, grease, diesel fuel and dirt? Please provide specification of existing floor coating so GC's can understand if and how it can be cleaned to achieve the desired result."

- i. EPOXY-2 has been removed from 03 10 30 via this addendum. It was meant to describe a product to be used in rehabilitating concrete floors.
- ii. Rather than specify a product, section 03 10 30 describes a process for repairing and rehabilitating damaged floors. Acceptable manufacturers and products, based on performance characteristics and testing, are noted in 03 10 30 Part 2.

AA. "Please confirm desired intent of LEED Certification of the project. Specification Section 01 81 13 lists the goal as LEED Gold but at the pre-bid meeting it was stated that the goal is LEED Silver. Also provide Specification Section 01 81 13.14 as it relates to LEED Sustainability requirements mentioned throughout the specifications"

- i. The Project is targeting LEED Gold. LEED Silver is the minimum required for all city projects.
- ii. References to 01 81 13.14 throughout Project Manual shall refer to this section 01 81 13."

BB. "Specification Section 03 35 43 Polished Concrete Flooring references there exists a Design Reference Sample. Please provide photos of the reference sample to understand the desired level of finish

- i. See modifications to 03 35 43 as issued in this addendum
- ii. Samples / Mockups for concrete finishing will be reviewed per 03 35 43, 1.5, C
- iii. Acceptable level of finishing shall be selected as per 03 35 43, 2.1

CC. "Specification Section 07 71 00 Roof Specialties notes to provide the roof copings per G002 material ID list. Roof Copings are not listed on the G002 material ID list and the specifications suggest that the copings are to be Metal Era and not shop fabricated steel copings. Please provide Basis of Design for products of this specification section."

- i. Roof copings may be any manufactured product or formed assembly satisfying performance requirements noted in 07 71 00.
- ii. Roof Copings colored to match PT-3D (RAL 7043)

DD. Specification Section 08 80 00 Glazing does not call for Bird Glazing as required per City of Madison. Please confirm locations at which bird glass will be required.

- i. Project Design, Specification and Approvals began prior to adoption of Bird Safe Glass Ordinance. Project does not include Bird Safe Glass and is approved as such.

### 3. ACCEPTABLE EQUIVALENTS

A. Air-Cooled Condensers Substitution Request

- i. **Request Approved.** Multistack added to list of manufacturers. See Section 4 Specifications, J of this document for an updated specification.

B. Scroll-Water Chillers Substitution Request

- i. **Request Approved.** Multistack added to list of manufacturers. See Section 4 Specifications, K of this document for an updated specification.

C. Rain Water Harvesting Substitution Request

- i. **Request Approved.** RMS Rainwater Management Solutions added to list of manufacturers. See Section 4 Specifications, I of this document for an updated specification.

### 4. SPECIFICATIONS



- A. 00 01 10 Table of Contents
    - i. Delete section 07 53 23
    - ii. Add section 07 54 23
    - iii. Add section 22 16 35
    - iv. Delete Section 26 23 00
    - v. Add Section 26 24 13
  - B. 01 10 00 Summary
    - i. Part 1.3, C, 1 Revised
    - ii. Part 1.3, C, 4 Added
    - iii. Part 1.3, D, 1 Revised
    - iv. Part 1.3, D, 2 Added
  - C. 03 01 30 Maintenance of Cast in Place Concrete
    - i. Removed obsolete "EPOXY-2" reference.
  - D. 03 30 00 Cast-in-place Concrete
    - i. Part 1.4/A/1, revise from Owner to GC for responsibility to employ an Inspection Agency.
  - E. 03 35 43 Polished Concrete Finishing
    - i. Removed Part 1.3
  - F. 07 54 23 Thermoplastic-Polyolefin (TPO) Roofing
    - i. Added Section
  - G. 09 67 23 Resinous Flooring
    - i. Remove Part 1.1, A, 3
    - ii. Remove Part 2.3
  - H. 11 13 19 Stationary Loading Dock Equipment
    - i. Revised Part 1.2
  - I. 22 13 65 Rainwater Harvesting System for Non-portable Toilet Supply
    - i. Added Section
  - J. 23 63 13 Air-cooled Refrigerant Condensers
    - i. Revised Part 1.7, A
    - ii. Revised Part 2.1, A
    - iii. Revised Part 2.2, G, I
  - K. 23 64 23 Scroll Water Chillers
    - i. Revised Part 2.1, A
  - L. 26 24 13 Switchboards
    - i. Added Section
  - M. 26 31 00 Photovoltaic System Performance Requirements
    - i. Revised Part 2.5, A, B
  - N. 31 23 00 Foundation Excavating and Backfilling
    - i. Part 1.4/A/1, revise from Owner to GC for responsibility to employ an Inspection Agency.
  - O. 31 26 00 Steel Helical Piles
    - i. Part 1.4/A/1, revise from Owner to GC for responsibility to employ an Inspection Agency.
5. DRAWINGS
- A. G000-"COVER"
    - i. Corrected sheet list to remove sheets included by mistake in Bid Documents issuance Sheet List
  - B. G002-"MATERIAL ID REFERENCES"
    - i. Deleted EPDM-1
    - ii. Added TPO-1
  - C. G003-"TYPES AND SYSTEMS"
    - i. Removed references to EPDM-1, throughout. Replaced with TPO-1
  - D. C201 "EROSION CONTROL PLAN"



- i. Storm pipe and storm structure removed from the MMSD parking lot.
- ii. Sidewalk crossing MMSD driveway removed.
- E. C101 "UTILITY PLAN"**
  - i. Storm pipe and storm structure removed from the MMSD parking lot.
  - ii. Sidewalk crossing MMSD driveway removed.
- F. C201 "CONSTRUCTION DETAILS-5"**
  - i. Liner Note with specifications for liner added for clarification.
- G. S101S "FOUNDATION PLAN – SOUTH"**
  - i. Revise helical pile load schedule.
- H. L001 "FIRE ACCESS"**
  - i. Modified extents of asphalt replacement at MMSD driveway apron
- I. L002 "SEMI TRAILER TURNING TEMPLATE AND VISION TRIANGLES"**
  - i. Modified extents of asphalt replacement at MMSD driveway apron
- J. L100 "LAYOUT PLAN"**
  - i. Modified extents of asphalt replacement at MMSD driveway apron
  - ii. Added clarifying labels to pavement types along Johnson St.
  - iii. Added 'CFCI' note to bike repair station callout. Contractor is responsible for providing this bike repair station. See detail 8/L501 for additional information.
  - iv. Added pavement hatches and legend to clarify extents of different pavement types
- K. L200 "GRADING PLAN"**
  - i. Modified extents of asphalt replacement at MMSD driveway apron, and modified grading
  - ii. Added Top of Wall Elevations to all remaining seatwalls. The overall heights of these walls vary from 1-3', but the TW elevations should remain constant.
- L. L300 "TREE PLANTING PLAN"**
  - i. Modified lawn seed extents adjacent to MMSD building
- M. L311 "DETAIL PLANTING PLAN"**
  - i. Modified lawn seed extents adjacent to MMSD building
- N. L312 "DETAIL PLANTING PLAN"**
  - i. Modified lawn seed extents adjacent to MMSD building
- O. L501 "HARDSCAPE DETAILS"**
  - i. Modified Standard Duty Asphalt Detail 6/L501 to 3" thickness to match layout plan callouts
- P. D101N-"LEVEL 1 DEMOLITION"**
  - i. Updated Demolition Notes related to removal / salvage of existing glass wall
- Q. D101S-"LEVEL 1 DEMOLITION"**
  - i. Updated Demolition Notes related to removal / salvage of existing glass wall
- R. D102N-"MEZZANINE LEVEL DEMOLITION"**
  - i. Updated Demolition Notes related to removal / salvage of existing glass wall
- S. D102S-"MEZZANINE LEVEL DEMOLITION"**
  - i. Updated Demolition Notes related to removal / salvage of existing glass wall
- T. D103N-"ROOF DEMOLITION"**
  - i. Updated Demolition Notes related to removal / salvage of existing glass wall
- U. D201-"DEMOLITION ELEVATIONS"**
  - i. Updated Demolition Notes related to removal / salvage of existing glass wall
- V. A101S-"LEVEL 1 – SOUTH"**
  - i. Removed scope related to salvage and reconstruction of glass wall sliding panels in south hall
- W. A103-"ROOF PLAN"**
  - i. Revised Add Alternate 3 Notes clarifying PV system anchoring
- X. A103N-"ROOF PLAN – NORTH"**
  - i. Revised Add Alternate 3 Notes clarifying PV system anchoring
- Y. A103S-"ROOF PLAN – SOUTH"**





i. Revised Add Alternate 3 Notes clarifying PV system anchoring

**Z. A121S-"LEVEL 1 REFLECTED CEILING PLAN – SOUTH"**

i. Removed scope related to salvage and reconstruction of glass wall sliding panels in south hall

**AA. A353-"EXTERIOR DETAILS"**

i. Added Notes clarifying PV system anchoring

ii. Revised Material ID tag "EPDM-1" to "TPO-1"

**BB. A503-"INTERIOR ELEVATIONS - SOUTH HALL"**

i. Removed scope related to salvage and reconstruction of glass wall sliding panels in south hall

**CC. A535-"INTERIOR WALL SECTIONS"**

i. Removed scope related to salvage and reconstruction of glass wall sliding panels in south hall

**DD. A553-"INTERIOR DETAILS"**

i. Removed scope related to salvage and reconstruction of glass wall sliding panels in south hall

**EE. A554-"INTERIOR DETAILS"**

i. Removed scope related to salvage and reconstruction of glass wall sliding panels in south hall

**FF. A701N-"LEVEL 1 FINISH PLAN-NORTH"**

i. Modified finish plan general notes clarifying painting of existing CMU walls and CONC-1 polished concrete floors

**GG. A701S-"LEVEL 1 FINISH PLAN-SOUTH"**

i. Modified finish plan general notes clarifying painting of existing CMU walls and CONC-1 polished concrete floors

**HH. A702S-"MEZZANINE LEVEL-NORTH"**

i. Modified finish plan general notes clarifying painting of existing CMU walls and CONC-1 polished concrete floors

**6. PROPOSAL**

A. No change

## 4. SPECIFICATIONS

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10	00 31 46	Permits	
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12	00 43 43	Wage Rates Form	
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**MSR LTD**  
**05 SEPTEMBER 2023**

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- 2 01 95 00 Measurement and Verification

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- 18 05 31 00 Steel Deck
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- 21 05 50 00 Metal Fabrications
- 22 05 51 13 Metal Pan Stairs
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- 39 07 24 19 Exterior Insulation and Finish System (EIFS)
- 40 07 25 00 Weather Barriers
- 41 07 27 15 Nonbituminous Self-Adhering Sheet Air Barriers
- 42 07 41 13.13 Formed Metal Roof Panels
- 43 ~~07 53 23 Ethylene Propylene Diene Monomer (EDPM) Roofing~~ **(Deleted Addendum 4 dated 09/05/2023)**
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- 48 07 72 00 Roof Accessories
- 49 07 84 13 Penetration Firestopping
- 50 07 92 00 Joint Sealants
- 51 07 92 19 Acoustical Joint Sealants
- 52

1 **DIVISION 08 - OPENINGS**  
2 08 11 13 Hollow Metal Doors and Frames  
3 08 31 13 Access Doors and Frames  
4 08 33 13 Coiling Counter Doors  
5 08 33 23 Overhead Coiling Doors  
6 08 33 26 Overhead Coiling Grilles  
7 08 36 13 Sectional Doors  
8 08 41 13 Aluminum-Framed Entrances and Storefronts  
9 08 44 13 Glazed Aluminum Curtain Walls  
10 08 61 00 Roof Windows  
11 08 71 00 Door Hardware  
12 08 80 00 Glazing  
13 08 91 00 Fixed Louvers

14 **DIVISION 09 - FINISHES**  
15 09 22 16 Non-structural Metal Framing  
16 09 29 00 Gypsum Board  
17 09 30 13 Ceramic Tiling  
18 09 51 13 Acoustical Panel Ceilings  
19 09 65 13 Resilient Base and Accessories  
20 09 67 23 Resinous Flooring  
21 09 68 13 Tile Carpeting  
22 09 84 36 Sound-Absorbing Ceiling Units  
23 09 91 13 Exterior Painting  
24 09 91 23 Interior Painting  
25 09 96 53 Elastomeric Coatings

26 **DIVISION 10 - SPECIALTIES**  
27 10 11 00 Visual Display Units  
28 10 14 23 Room-Identification Panel Signage  
29 10 14 53 Traffic Signage  
30 10 22 13 Wire Mesh Partitions  
31 10 26 00 Wall and Door Protection  
32 10 28 00 Toilet, Bath, and Laundry Accessories  
33 10 44 13 Fire Protection Cabinets  
34 10 44 16 Fire Extinguishers  
35 10 55 00.13 USPS-Delivery Postal Specialties  
36 10 82 00 Grilles and Screens

37 **DIVISION 11 - EQUIPMENT**  
38 11 13 19 Stationary Loading Dock Equipment  
39 11 40 00 Foodservice Equipment  
40 11 51 00 Common Requirements for Equipment  
41 Owner Provided Equipment List

42 **DIVISION 12 - FURNISHINGS**  
43 12 36 16 Metal Countertops  
44 12 36 61 Simulated Stone Countertops  
45 12 93 00 Site Furnishings

46 **DIVISION 13 - SPECIAL CONSTRUCTION**  
47 Not Used

48 **DIVISION 14 - CONVEYING EQUIPMENT**  
49 14 24 00 Hydraulic Elevators  
50

1 **VOLUME III (DIVISIONS 21 – 33)**

2 **DIVISION 21 – FIRE SUPPRESSION**

- 3 21 05 00 Basic Fire Suppression Requirements
- 4 21 05 05 Fire Suppression Demolition for Remodeling
- 5 21 05 29 Fire Suppression Supports and Anchors
- 6 21 05 53 Fire Suppression Identification
- 7 21 13 00 Fire Protection

8 **DIVISION 22 – PLUMBING**

- 9 22 05 17 Sleeves and Sleeve Seals for Plumbing Piping
- 10 22 05 18 Escutcheons for Plumbing Piping
- 11 22 05 19 Meters and Gages for Plumbing Piping
- 12 22 05 23.12 Ball Valves for Plumbing Piping
- 13 22 05 23.14 Check Valves for Plumbing Piping
- 14 22 05 29 Hangers and Supports for Plumbing Piping and Equipment
- 15 22 05 53 Identification for Plumbing Piping and Equipment
- 16 22 07 19 Plumbing Piping Insulation
- 17 22 11 16 Domestic Water Piping
- 18 22 11 19 Domestic Water Piping Specialties
- 19 22 11 23.21 Inline, Domestic-Water Pumps
- 20 22 13 16 Sanitary Waste and Vent Piping
- 21 22 13 19 Sanitary Waste Piping Specialties
- 22 22 13 19.13 Sanitary Drains
- 23 22 13 23 Sanitary Waste Interceptors
- 24 **22 16 35 Rainwater Harvesting System for Non-Potable Toilet Supply** (Added Addendum 4 dated
- 25 **09/05/2023)**
- 26 22 14 13 Facility Storm Drainage Piping
- 27 22 14 23 Storm Drainage Piping Specialties
- 28 22 14 63 Facility Storm-Water Retention Tanks
- 29 22 31 00 Domestic Anti-scale Systems
- 30 22 34 00 Fuel-Fired, Domestic-Water Heaters
- 31 22 42 13.13 Commercial Water Closets
- 32 22 42 13.16 Commercial Urinals
- 33 22 42 16.13 Commercial Lavatories
- 34 22 42 16.16 Commercial Sinks
- 35 22 47 13 Drinking Fountains

36 **DIVISION 23 - HEATING VENTILATING AND AIR CONDITIONING**

- 37 23 05 17 Sleeves and Sleeve Seals for HVAC Piping
- 38 23 05 18 Escutcheons for HVAC Piping
- 39 23 05 19 Meters and Gages for HVAC Piping
- 40 23 05 23.12 Ball Valves for HVAC Piping
- 41 23 05 23.14 Check Valves for HVAC Piping
- 42 23 05 48.13 Vibration Controls for HVAC
- 43 23 05 53 Identification for HVAC Piping and Equipment
- 44 23 05 93 Testing, Adjusting, and Balancing for HVAC
- 45 23 07 13 Duct Insulation
- 46 23 07 16 HVAC Equipment Insulation
- 47 23 07 19 HVAC Piping Insulation
- 48 23 09 00 Instrumentation and Control for HVAC
- 49 23 09 13.33 Control Valves
- 50 23 09 13.43 Control Dampers
- 51 23 11 23 Facility Natural-Gas Piping
- 52 23 21 13 Hydronic Piping
- 53 23 21 16 Hydronic Piping Specialties
- 54 23 21 23 Hydronic Pumps
- 55 23 23 00 Refrigerant Piping
- 56 23 25 13 Water Treatment for Closed-Loop Hydronic Systems
- 57 23 31 13 Metal Ducts
- 58 23 33 00 Air Duct Accessories
- 59 23 34 23 HVAC Power Ventilators

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1	23 34 33.13	Commercial Air Curtains
2	23 34 39	High-Volume, Low-Speed Fans
3	23 35 33	Listed Kitchen Ventilation System Exhaust Ducts
4	23 37 13	Diffusers, Registers and Grilles
5	23 38 13	Commercial-Kitchen Hoods
6	23 52 16	Condensing Boilers
7	23 63 13	Air-Cooled Refrigerant Condensers
8	23 64 23	Scroll Water Chillers
9	23 73 13.16	Indoor, Semi-Custom Air-Handling Units
10	23 82 19	Fan Coil Units
11	23 82 39.13	Cabinet Unit Heaters

**DIVISION 26 - ELECTRICAL**

12		
13	26 05 19	Low-Voltage Electrical Power Conductors and Cables
14	26 05 23	Control-Voltage Electrical Power Cables
15	26 05 26	Grounding and Bonding for Electrical Systems
16	26 05 29	Hangers and Supports for Electrical Systems
17	26 05 33	Raceways and Boxes for Electrical Systems
18	26 05 39	Underfloor Raceways for Electrical Systems
19	26 05 43	Underground Ducts and Raceways for Electrical Systems
20	26 05 53	Identification for Electrical Systems
21	26 22 13	Low-Voltage Distribution Transformers
22	<del>26 23 00</del>	<del>Low-Voltage Switchgear</del>
23	<b>26 24 13</b>	<b>Switchboards</b>
24	26 24 16	Panelboards
25	26 27 13	Electricity Metering
26	26 27 26	Wiring Devices
27	26 28 13	Fuses
28	26 28 16	Enclosed Switches and Circuit Breakers
29	26 31 00	Photovoltaic System Performance Requirements
30	26 33 23.11	Central Battery Equipment for Emergency Lighting
31	26 52 13	Emergency and Exit Lighting

**(Deleted Addendum 4 dated 09/05/2023)**  
**(Added Addendum 4 dated 09/05/2023)**

**DIVISION 27 – COMMUNICATIONS**

32		
33	27 05 00	Basic Communications Systems Requirements
34	27 05 26	Communications Bonding
35	27 05 28	Interior Communication Pathways
36	27 05 53	Identification and Administration
37	27 11 00	Communication Equipment Rooms (CER)
38	27 13 00	Backbone Cabling Requirements
39	27 15 00	Horizontal Cabling Requirements
40	27 17 10	Testing
41	27 17 20	Support and Warranty
42	27 21 33	Wireless Access Points (WAP)

**DIVISION 28 - ELECTRONIC SAFETY AND SECURITY**

43		
44	28 05 00	Basic Electronic Safety and Security Systems Requirements
45	28 13 00	Access Control System (Keyscan)
46	28 26 05	Rescue Assistance Communication
47	28 46 21.11	Addressable Fire-Alarm Systems

**DIVISION 31 – EARTHWORK**

48		
49	31 05 13	Soils for Earthwork
50	31 10 00	Site Clearing and Removals
51	31 23 00	Foundation Excavation and Backfilling
52	31 23 17	Trenching and Backfilling
53	31 25 13	Erosion Controls
54	31 26 00	Steel Helical Piles

55

1	<b>DIVISION 32 - EXTERIOR IMPROVEMENTS</b>
2	32 12 16 Asphalt Paving
3	32 13 00 Concrete Paving
4	32 31 13 Chain Link Fences and Gates
5	32 31 19 Metal Fences and Gates
6	32 32 23 Segmental Retaining Walls
7	32 91 13 Soil Preparation
8	32 92 00 Turf and Grasses
9	32 93 00 Plants

10	<b>DIVISION 33 - UTILITIES</b>
11	33 11 13 Water Utility Distribution Piping
12	33 31 13 Sanitary Utility Sewerage Piping
13	33 41 00 Storm Utility Drainage Piping

14 **END OF DOCUMENT**



SECTION 01 10 00

SUMMARY

PART 1 – GENERAL

[1.1 RELATED DOCUMENTS](#)

[1.2 SUMMARY](#)

[1.3 WORK BY OWNER](#)

[1.4 OWNER-FURNISHED PRODUCTS](#)

[1.5 COORDINATION WITH OCCUPANTS](#)

[1.6 SPECIFICATION AND DRAWING CONVENTIONS](#)

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes:

1. Work by Owner.
2. Future work.
3. Owner-furnished products.
4. Coordination with occupants.
5. Specification and drawing conventions.

- B. Related Requirements:

1. Section 01 81 13.14 "Sustainable Design Requirements" for submittal and product requirements.
2. Section 01 50 00 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

**1.3 WORK BY OWNER**

- A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.
- B. Preceding Work: Owner will perform the following construction operations at Project site. Those operations are scheduled to be substantially complete before work under this Contract begins.
1. Reconstruction of streets, sidewalks and right-of-ways along E Johnson and E 1st Streets shall have been completed.
  2. Owner shall decommission and remove from project site, any equipment noted on drawings to be 'removed by Owner'. Including used oil reservoirs and other pieces of equipment related to the building's former use as a City Fleet Services Garage.
- C. Concurrent Work: Owner will perform the following construction operations at Project site. Those operations will be conducted simultaneously with Work under this Contract.
1. Owner shall furnish, **for Contractor install** BALE-1 and LIFT-1 as indicated and provided for in Drawings and Specified in Division 11 Section 11 51 00 and Section 11 13 19 respectively.

**(Addendum 4 dated 09/05/23)**

2. Owner shall coordinate with Owner's Trash Services Vendor to select final compacting dumpster equipment (DUMP-1 as noted in drawings and Master Equipment List) and shall provide coordinating information as required. Owner's Trash Services Vendor shall provide equipment compatible with design provisions for space and electrical at trash enclosure.
3. Contractor shall allow Owner access during work hours to construction for installation of A/V and IT equipment.
4. **Owner shall Furnish, for Contractor install, any equipment noted as such in Food Service (FS) drawings and Specifications Section 11 40 00 Food Service Equipment, and Specifications Section 11 51 00 Master Equipment List.**

- 1           a.     **Contractor is responsible for determining suitable installation timeline for any**  
2                   **equipment noted as Owner Furnished, Contractor Installed. Contractor shall**  
3                   **coordinate with Owner to ensure timely delivery, by Owner, of Owner Provided**  
4                   **Equipment to satisfy requirements of Contractors Construction Schedule.**

5 (Addendum 4 dated 09/05/23)  
6

- 7     D.     Subsequent Work: Owner will perform the following additional work at site after Substantial Completion.  
8           Completion of that work will depend on successful completion of preparatory Work under this Contract.

- 9     1.     Owner shall furnish and install ~~all~~ **any** kitchen equipment noted as such on food service (FS)  
10           drawings and Specifications Section 11 40 00 - Food Service Equipment. Note that ONLY  
11           equipment noted specifically **as such** in these locations shall be Owner Furnished and Installed.  
12           Equipment described elsewhere shall be furnished and Installed by GC.

13 (Addendum 4 dated 09/05/23)  
14

- 15     2.     **Note that, Per Paragraph 1.3, 4 of this Specifications Section, some Owner Provided,**  
16           **Contractor Installed Equipment may be installed after Substantial Completion.**

17 (Addendum 4 dated 09/05/23)  
18

- 19     3.     Owner shall install balance of all equipment noted as Owner installed as noted on Master  
20           Equipment List (Section 11 51 00).

21 **1.4     OWNER-FURNISHED PRODUCTS**

- 22     A.     Owner will furnish products indicated. The Work of the GC includes receiving, unloading, handling, storing,  
23           protecting, and installing Owner-furnished products and making building services connections.

- 24     B.     Owner-Furnished Products:

- 25     1.     Refer to Drawings and MEP specifications.

26 **1.5     COORDINATION WITH OCCUPANTS**

- 27     A.     Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to  
28           place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work,  
29           provided such occupancy does not interfere with completion of the Work. Such placement of equipment  
30           and limited occupancy shall not constitute acceptance of the total Work.

- 31     1.     Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to  
32           be occupied prior to Owner acceptance of the completed Work.

- 33     2.     Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner  
34           occupancy.

- 35     3.     Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and  
36           required tests and inspections shall be successfully completed. On occupancy, Owner will operate  
37           and maintain mechanical and electrical systems serving occupied portions of Work.

- 38     4.     On occupancy, Owner will assume responsibility for maintenance and custodial service for  
39           occupied portions of Work.

40 **1.6     SPECIFICATION AND DRAWING CONVENTIONS**

- 41     A.     Specification Content: The Specifications use certain conventions for the style of language and the  
42           intended meaning of certain terms, words, and phrases when used in particular situations. These  
43           conventions are as follows:

- 44     1.     Imperative mood and streamlined language are generally used in the Specifications. The words  
45           "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is  
46           used within a sentence or phrase.

- 47     2.     Specification requirements are to be performed by Contractor unless specifically stated otherwise.

- 48     B.     Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all  
49           Sections in the Specifications.

- 50     C.     Drawing Coordination: Requirements for materials and products identified on Drawings are described in  
51           detail in the Specifications. One or more of the following are used on Drawings to identify materials and  
52           products:

- 53     1.     Keynoting: Materials and products are identified by reference keynotes referencing Specification  
54           Section numbers found in this Project Manual.

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1 PART 2 - PRODUCTS (Not Used)

2 PART 3 - EXECUTION (Not Used)

3

END OF SECTION 01 10 00

SECTION 03 01 30

MAINTENANCE OF CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

- 1.1 [RELATED DOCUMENTS](#)
- 1.2 [SUMMARY](#)
- 1.3 [PREINSTALLATION MEETINGS](#)
- 1.4 [ACTION SUBMITTALS](#)
- 1.5 [QUALITY ASSURANCE](#)
- 1.6 [DELIVERY, STORAGE, AND HANDLING](#)
- 1.7 [FIELD CONDITIONS](#)

PART 2 – PRODUCTS

- 2.1 [MATERIALS, GENERAL](#)
- 2.2 [BONDING AGENTS](#)
- 2.3 [PATCHING MORTAR](#)
- 2.4 [OTHER MATERIALS](#)
- 2.5 [MIXES](#)

PART 3 – EXECUTION

- 3.1 [EXAMINATION](#)
- 3.2 [PREPARATION](#)
- 3.3 [APPLICATION](#)

**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. Removal of deteriorated and contaminated SOG concrete surfaces and patching as required **(EPOXY-2)**.

**(Addendum 4 dated 09/05/23)**

- B. Related Requirements:
  - 1. Section 01 81 13 "Sustainable Design Requirements" for submittal and product requirements.
  - 2. Section 03 30 00 "Cast-In-Place Concrete" for concrete requirements.
  - 3. Section 03 35 43 "Polished Concrete Finishing".
  - 4. Section 01 43 39 – Mockups for description of construction required to complete a mockup submittal for review.

**1.3 PREINSTALLATION MEETINGS**

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

**1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product. Include construction details, material descriptions, chemical composition, physical properties, test data, and mixing, preparation, and application instructions.
- B. Sustainability:
  - 1. Health Product Declaration. Submit complete Health Product Declaration with full disclosure of known hazards in compliance with the Health Product Declaration open Standard.
  - 2. Product Data for Credit IEQ 4.1: For adhesives and sealants used inside the weatherproofing system, documentation including printed statement of VOC content.
    - a. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.
  - 3. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
  - 4. Regional Materials: Products shall be manufactured within 500 miles of Project site.
  - 5. Product Data: Certification of product manufacturing origin.

1 **1.5 QUALITY ASSURANCE**

- 2 A. Manufacturer Qualifications: Each manufactured bonding-agent, cementitious and patching-mortar,  
3 manufacturer shall employ factory-trained technical representatives who are available for consultation and  
4 Project-site inspection and assistance at no additional cost.  
5 B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by  
6 manufacturer to apply packaged patching-mortar materials and polymer sealers.  
7 C. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for materials and  
8 execution.  
9 1. Removal and Patching: Remove and repair an approximately 50 sq. ft. area of deteriorated  
10 concrete.  
11 2. Approval of mockups does not constitute approval of deviations from the Contract Documents  
12 contained in mockups unless Architect specifically approves such deviations in writing.  
13 3. Subject to compliance with requirements, approved mockups may become part of the completed  
14 Work if undisturbed at time of Substantial Completion.

15 **1.6 DELIVERY, STORAGE, AND HANDLING**

- 16 A. Comply with manufacturer's written instructions for minimum and maximum temperature requirements and  
17 other conditions for storage.  
18 B. Store cementitious materials off the ground, under cover, and in a dry location.  
19 C. Store aggregates covered and in a dry location; maintain grading and other required characteristics and  
20 prevent contamination.

21 **1.7 FIELD CONDITIONS**

- 22 A. Cold-Weather Requirements for Cementitious Materials: Do not apply unless concrete-surface and air  
23 temperatures are above 40 deg F and will remain so for at least 48 hours after completion of Work.  
24 B. Cold-Weather Requirements for Cementitious Materials: Comply with the following procedures:  
25 1. When air temperature is below 40 deg F, heat patching-material ingredients and existing concrete  
26 to produce temperatures between 40 and 90 deg F.  
27 2. When mean daily air temperature is between 25 and 40 deg F, cover completed Work with  
28 weather-resistant insulating blankets for 48 hours after repair or provide enclosure and heat to  
29 maintain temperatures above 32 deg F within the enclosure for 48 hours after repair.  
30 3. When mean daily air temperature is below 25 deg F, provide enclosure and heat to maintain  
31 temperatures above 32 deg F within the enclosure for 48 hours after repair.  
32 C. Hot-Weather Requirements for Cementitious Materials: Protect repair work when temperature and  
33 humidity conditions produce excessive evaporation of water from patching materials. Provide artificial  
34 shade and wind breaks, and use cooled materials as required. Do not apply to substrates with  
35 temperatures of 90 deg F and above.

36 **PART 2 - PRODUCTS**

37 **2.1 MATERIALS, GENERAL**

- 38 A. Source Limitations: Obtain each color, grade, finish, type, and variety of product from single source with  
39 resources to provide products of consistent quality in appearance and physical properties.  
40 B. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.

41 **2.2 BONDING AGENTS**

- 42 A. Latex Bonding Agent: ASTM C 1059/C 1059M, Type I at interior locations.  
43 1. Products: Subject to compliance with requirements, available products that may be incorporated  
44 into the Work include, but are not limited to, the following:  
45 a. Latex Bonding Agent, Type I (Redispersible):  
46 1) Dayton Superior Corporation; Superior Concrete Bonder (J-41) Conspec, Weldtite.  
47 2) Euclid Chemical Company (The), an RPM company; Euco Weld, Tammsweld.  
48 3) L&M; Everweld  
49 4) W. R. Meadows, Inc.; Intralok.

50 **2.3 PATCHING MORTAR**

- 51 A. Patching Mortar, General:  
52 1. Only use patching mortars that are recommended by manufacturer for each applicable horizontal  
53 use orientation.  
54 2. Product shall be suitable for polishing. Refer to Section 03 35 43 "Polished Concrete Finishing".

- 1 3. Color and Aggregate Texture: Provide patching mortar and aggregates of colors and sizes  
2 necessary to produce patching mortar that matches existing, adjacent, exposed concrete. Blend  
3 several aggregates if necessary to achieve suitable matches.
- 4 4. Coarse Aggregate for Patching Mortar: ASTM C 33, washed aggregate, Size No. 8, Class 5S. Add  
5 to patching-mortar mix only as permitted by patching-mortar manufacturer.
- 6 B. Polymer-Modified, Cementitious Patching Mortar: Packaged, dry mix for repair of concrete and that  
7 contains a latex additive as either a dry powder or a separate liquid that is added during mixing.
  - 8 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products  
9 that may be incorporated into the Work include, but are not limited to, the following:
    - 10 a. Dayton Superior Corporation; Recrete 20.
    - 11 b. Euclid Chemical Company (The); an RPM company; Eucopatch.
    - 12 c. L&M; Fastrak 15.
    - 13 d. W. R. Meadows, Inc; Meadow Patch 20.
  - 14 2. Compressive Strength: Not less than 4000 psi at 28 days when tested according to ASTM C 109/C  
15 109M.

#### 16 2.4 OTHER MATERIALS

- 17 A. Portland Cement: ASTM C 150, Type I, II, or III unless otherwise indicated.

#### 18 2.5 MIXES

- 19 A. General: Mix products, in clean containers, according to manufacturer's written instructions.
  - 20 1. Do not add water, thinners, or additives unless recommended by manufacturer.
  - 21 2. When practical, use manufacturer's premeasured packages to ensure that materials are mixed in  
22 proper proportions. When premeasured packages are not used, measure ingredients using  
23 graduated measuring containers; do not estimate quantities or use shovel or trowel as unit of  
24 measure.
  - 25 3. Do not mix more materials than can be used within time limits recommended by manufacturer.  
26 Discard materials that have begun to set.
- 27 B. Dry-Pack Mortar: Mix patching-mortar dry ingredients with just enough liquid to form damp cohesive  
28 mixture that can be squeezed by hand into a ball but is not plastic.
- 29 C. Concrete: Comply with Section 03 30 00 "Cast-in-Place Concrete."

### 30 PART 3 - EXECUTION

#### 31 3.1 EXAMINATION

- 32 A. Notify Architect seven days in advance of dates when areas of deteriorated or delaminated concrete will  
33 be located.
- 34 B. Refer to Drawings for areas requiring resurfacing.
- 35 C. Determine depth of contaminated concrete floor surface by sample coring.

#### 36 3.2 PREPARATION

- 37 A. Ensure that supervisory personnel are on-site and on duty when concrete maintenance work begins and  
38 during its progress.
- 39 B. Preparation for Removal of Deteriorated Concrete: Examine construction to be repaired to determine best  
40 methods to safely and effectively perform concrete maintenance work. Examine adjacent work to  
41 determine what protective measures will be necessary. Make explorations, probes, and inquiries as  
42 necessary to determine condition of construction to be removed in the course of repair.
  - 43 1. Verify that affected utilities have been disconnected and capped.
  - 44 2. Inventory and record the condition of items to be removed for reinstallation or salvage.
  - 45 3. Protect floors and other surfaces along haul routes from damage, wear, and staining.
- 46 C. Concrete Removal:
  - 47 1. Saw-cut perimeter of areas indicated for removal to a depth of at least 1/2 inch.
  - 48 2. Remove deteriorated and delaminated concrete by breaking up and dislodging from reinforcement.
  - 49 3. Remove additional concrete if necessary to provide a depth of removal of at least 1 inch over entire  
50 removal area.
  - 51 4. To be confirmed by core samples and mock-up.
  - 52 5. Thoroughly clean removal areas of loose concrete, dust, and debris.

- 1     **3.3     APPLICATION**
- 2     A.     General: Comply with manufacturer's written instructions and recommendations for application of products,  
3           including surface preparation.
- 4     B.     Latex Bonding Agent, Type I: Apply to concrete by brush roller or spray. Allow to dry before placing  
5           patching mortar or concrete.
- 6     C.     Placing Patching Mortar: Place as follows unless otherwise recommended in writing by manufacturer:
- 7           1.     Provide forms where necessary to confine patch to required shape.
- 8           2.     Wet substrate and forms thoroughly and then remove standing water.
- 9           3.     General Placement: Place patching mortar by troweling toward edges of patch to force intimate  
10           contact with edge surfaces. For large patches, fill edges first and then work toward center, always  
11           troweling toward edges of patch. At fully exposed reinforcing bars, force patching mortar to fill  
12           space behind bars by compacting with trowel from sides of bars.
- 13          4.     Finishing: Allow surfaces of lifts that are to remain exposed to become firm and then finish to a  
14           surface matching adjacent concrete as approved by mock-up.
- 15          5.     Curing: Wet-cure cementitious patching materials, including polymer-modified cementitious  
16           patching materials, for not less than seven days by water-fog spray or water-saturated absorptive  
17           cover.
- 18     D.     Concrete: Place according to Section 03 30 00 "Cast-in-Place Concrete" and as follows:
- 19           1.     Pretreatment: Apply epoxy bonding agent to reinforcement and concrete substrate.
- 20           2.     Standard Placement:
- 21                 a.     At unformed surfaces, screed concrete to produce a surface that when finished with  
22                 patching mortar will match required profile and surrounding concrete.
- 23           3.     Wet-cure concrete for not less than seven days by leaving forms in place or keeping surfaces  
24           continuously wet by water-fog spray or water-saturated absorptive cover.

25

**END OF SECTION**

SECTION 03 30 00  
CAST-IN-PLACE CONCRETE

- 1
- 2
- 3 PART 1 – GENERAL
- 4 1.1 SECTION INCLUDES
- 5 1.2 RELATED WORK
- 6 1.3 REFERENCES
- 7 1.4 TESTING AND INSPECTION
- 8 1.5 SUBMITTALS
- 9 1.6 DELIVERY STORAGE AND HANDLING
- 10 PART 2 – PRODUCTS
- 11 2.1 CONCRETE MATERIALS
- 12 2.2 ADMIXTURES
- 13 2.3 CURING PRODUCTS
- 14 2.4 MISCELLANEOUS MATERIALS
- 15 2.5 STRENGTH AND PROPERTIES
- 16 PART 3 – EXECUTION
- 17 3.1 PREPARATION
- 18 3.2 SLABS
- 19 3.3 CONSTRUCTION JOINTS
- 20 3.4 CONCRETE PLACEMENT
- 21 3.5 CONCRETE FINISHES AND TOLERANCES
- 22 3.6 CONCRETE SLAB FINISHES AND TOLERANCES
- 23 3.7 CONCRETE CURING
- 24 3.8 SLAB CURING
- 25 3.9 PENETRATING LIQUID FLOOR TREATMENTS
- 26 3.10 JOINT FILLING
- 27 3.11 APPLICATION OF FLOOR SEALER - FINISH COAT
- 28 3.12 COLD WEATHER CONCRETING
- 29 3.13 HOT WEATHER PROTECTION
- 30 3.14 FIELD QUALITY ASSURANCE
- 31 3.15 REPAIR OF DEFECTIVE AREAS
- 32 3.16 CEMENT GROUT AND DRY-PACK
- 33 3.17 CLEANING

34 PART 1 - GENERAL

35 1.1 SECTION INCLUDES

- 36 A. All items required for executing and completing the cast-in-place concrete work and related work
- 37 shown on the drawings or specified herein. Work shall include installation of items furnished in other
- 38 sections of these specifications.
  
- 39 B. Concrete paving, walks, and curbs are specified in Division 3 or 32.
  
- 40 C. Structural notes indicated on the drawings regarding cast-in-place concrete shall be considered a
- 41 part of this specification.

42 1.2 RELATED WORK

- 43 A. Pertinent Sections of Division 01.
- 44 B. Section 03 10 00 - Concrete Formwork.
- 45 C. Section 03 20 00 - Concrete Reinforcement.
- 46 D. Section 05 31 00 - Steel Deck.



1    **1.3    REFERENCES**

2            A.        Codes and Standards: Comply with the provisions of the following codes, specifications, and  
3                   standards, except where more stringent requirements are shown or specified. Where any provision  
4                   of other pertinent codes and standards conflict with this specification, the more stringent provision  
5                   shall govern.

- 6            1.        ACI 117 - Specification for Tolerances for Concrete Construction and Materials.
- 7            2.        ACI 301 - Specifications for Structural Concrete.
- 8            3.        ACI 302.1R - Guide to Concrete Floor and Slab Construction.
- 9            4.        ACI 302.2R - Guide for Concrete Slabs that Received Moisture-Sensitive Flooring Materials.
- 10           5.        ACI 304R - Guide to Measuring, Mixing, Transporting, and Placing Concrete.
- 11           6.        ACI 305.1 - Specification for Hot Weather Concreting.
- 12           7.        ACI 306.1 - Guide to Cold Weather Concreting.
- 13           8.        ACI 308R - Guide to External Curing of Concrete.
- 14           9.        ACI 309R - Guide for Consolidation of Concrete.
- 15           10.       ACI 318 - Building Code Requirements for Structural Concrete.
- 16           11.       ACI 347R - Guide to Formwork for Concrete.
- 17           12.       ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the  
18                   Field.
- 19           13.       ASTM C33 - Standard Specification for Concrete Aggregates.
- 20           14.       ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete  
21                   Specimens.
- 22           15.       ASTM C42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed  
23                   Beams of Concrete.
- 24           16.       ASTM C94 - Standard Specification for Ready-Mixed Concrete.
- 25           17.       ASTM C138 - Standard Test Method for Density (Unit Weight), Yield, and Air Content  
26                   (Gravimetric) of Concrete.
- 27           18.       ASTM C143 - Standard Test Method for Slump of Hydraulic Cement Concrete.
- 28           19.       ASTM C150 - Standard Specification for Portland Cement.
- 29           20.       ASTM C157 - Standard Test Method for Length Change of Hardened Hydraulic-Cement  
30                   Mortar and Concrete
- 31           21.       ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
- 32           22.       ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
- 33           23.       ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the  
34                   Volumetric Method.
- 35           24.       ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the  
36                   Pressure Method.
- 37           25.       ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
- 38           26.       ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing  
39                   Concrete.
- 40           27.       ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
- 41           28.       ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural  
42                   Pozzolan for Use in Concrete.
- 43           29.       ASTM C1017 - Standard Specification for Chemical Admixtures for Use in Producing  
44                   Flowing Concrete.
- 45           30.       ASTM C1059 - Standard Specification for Latex Agents for Bonding Fresh to Hardened  
46                   Concrete.
- 47           31.       ASTM C1064 - Standard Test Method for Temperature of Freshly Mixed Hydraulic Cement  
48                   Concrete.
- 49           32.       ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates  
50                   for Use in Construction and Criteria for Testing Agency Evaluation.
- 51           33.       ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout  
52                   (Nonshrink).
- 53           34.       ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete  
54                   Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- 55           35.       ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting.
- 56           36.       ASTM E154 - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth  
57                   Under Concrete Slabs, on Walls, or as Ground Cover.
- 58           37.       ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection,  
59                   Testing, or Inspection.

- 1 38. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact  
2 with Soil or Granular Fill under Concrete Slabs.  
3 39. Concrete Reinforcing Steel Institute (CRSI) - Manual of Standard Practice.

4 **1.4 TESTING AND INSPECTION**

5 A. Inspection and Testing:

6 1. The Owner **GC** shall employ an Inspection Agency to perform the duties and responsibilities  
7 specified below. **(Addendum 4 dated 09/05/23)**

8 2. Refer to architectural, civil, mechanical, and electrical specifications for testing and  
9 inspection requirements of non-structural components.

10 3. Work performed on the premises of a fabricator approved by the building official need not  
11 be tested and inspected per the table below. The fabricator shall submit a certificate of  
12 compliance that the work has been performed in accordance with the approved plans and  
13 specification to the building official and the Architect and Engineer of Record.

14 4. Duties of the Inspection Agency:

15 a. Perform all testing and inspection required per the Testing and Inspection  
16 Schedule indicated below.

17 b. Furnish inspection reports to the building official, the Owner, the Architect, the  
18 Engineer of Record, and the General Contractor. The reports shall be completed  
19 and furnished within 48 hours of inspected work.

20 c. Submit a final signed report stating whether the work requiring Inspection was, to  
21 the best of the Inspection Agency's knowledge in conformance with the approved  
22 plans and specifications.

23 5. Structural Component Testing and Inspection Schedule for Section 03 30 00 is as follows:

Concrete and Concrete Placement	Continuous	Periodic	Referenced Standard
Review of proposed mix design and supporting test results		X	
Inspect anchors cast in concrete		X	ACI 318: 17.8.2
Inspect anchors post-installed in hardened concrete members.			
A. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads.	X		ACI 318: 17.8.2.4
B. Mechanical anchors and adhesive anchors not defined in row above.		X	ACI 318: 17.8.2
Verify use of required design mix		X	ACI 318: Ch. 19, 26.4.3, 26.4.4
Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X		ASTM C172, ASTM C31, ACI 318: 26.4, 26.12
Inspection of concrete placement for proper application techniques	X		ACI 318: 26.5
Verify maintenance of specified curing temperature and techniques.		X	ACI 318: 26.5.3-26.5.5
Verify in-situ concrete strength prior to removal of shores and forms from beams and structural slabs		X	ACI 318: 26.11.2

- 1 B. Sampling and testing requirements:
- 2 1. Maintain records verifying materials used are of the specified and accepted types and sizes  
3 and are in conformance with the requirements of the Contract Documents.
- 4 2. Use of testing services will not relieve the Contractor of the responsibility to furnish materials  
5 and construction in full compliance with the Contract Documents.
- 6 3. Take samples of fresh concrete at the job site for each mix design placed each day.  
7 Sampling and testing shall be done after the final addition and proper mixing of any water  
8 or admixtures that are added on site.
- 9 a. Personnel and testing equipment shall meet the requirements of ASTM E329.
- 10 b. Testing Frequency: Obtain at least one composite sample for each 150 cu. yd. or  
11 5,000 sq. ft. of surface area, whichever is less or fraction thereof of each concrete  
12 mixture placed each day.
- 13 1) On a given project, if the total volume of concrete is such that the  
14 frequency of testing required above would provide less than five strength  
15 tests for a given class of concrete, tests shall be made from at least five  
16 randomly selected batches or from each batch if fewer than five batches  
17 are used.
- 18 c. A strength test shall be the average of the strengths of two 6x12 inch or three 4x8  
19 inch cylinders made from the same sample of concrete and tested at 28 days.
- 20 4. For each sample of fresh concrete, perform the following duties:
- 21 a. Measure and record slump in accordance with ASTM C143.
- 22 b. Measure and record temperature in accordance with ASTM C1064.
- 23 1) Provide one test hourly when air temperature is 40°F and below and when  
24 80°F and above, and one test for each composite sample.
- 25 c. Measure and record air content by volume in accordance with either ASTM C231  
26 or ASTM C173.
- 27 d. Mold three 6x12 inch or four 4x8 inch cylinders (laboratory cylinders) in accordance  
28 with ASTM C31 to be laboratory-cured. Protect from moisture loss and maintain at  
29 60°F to 80°F for 24 to 48 hours before moving. Deliver cylinders to testing  
30 laboratory for curing and testing.
- 31 e. Mold one cylinder (field cylinder) in accordance with ASTM C31 to be field-cured.  
32 Field cylinder shall be placed as near as possible to the in-place concrete from  
33 which it was taken, protected, and cured in the same manner. Deliver field-cured  
34 cylinder to testing laboratory, and measure and record compressive strength in  
35 accordance with ASTM C39. Field cylinder shall be used to determine if concrete  
36 footings, walls, or piers have reached the required compressive strength for steel  
37 erection to begin.
- 38 5. Measure and record compressive strength in accordance with ASTM C39 for laboratory  
39 cylinders. Test one laboratory cylinder at 7 days and all other cylinders at 28 days.  
40 Acceptance is based on the average of the two 6x12 inch or three 4x8 inch laboratory cured  
41 28-day tests. Notify Architect in the event strength levels do not meet the acceptance  
42 requirements of ACI 318.
- 43 a. Any additional cylinders molded for Contractor to have a compressive strength test  
44 done before seven days shall be at the Contractor's expense.

- 1                    6.        Prepare and submit test reports to the Architect, Engineer, Contractor, and Supplier.  
2                    Reports shall be completed and furnished within 48 hours of testing. Refer to description in  
3                    Submittals.
- 4                    7.        When strength of field-cured cylinders is less than 85 percent of companion laboratory-  
5                    cured cylinders, Contractor shall evaluate operations and provide corrective procedures for  
6                    protecting and curing in-place concrete.
- 7                    8.        Should the strength of any grade of concrete for any portion of work, as indicated by molded  
8                    test cylinders, fall below the minimum 28-day compressive strength specified on the  
9                    drawings, upon approval of the Structural Engineer of Record (SEOR), the concrete supplier  
10                   shall adjust the concrete mix for remaining portion of construction so that the resulting  
11                   concrete meets the minimum strength requirements.

12    **1.5        SUBMITTALS**

- 13                   A.        Concrete Materials: Submit information on concrete materials as listed below.
- 14                   1.        Cementitious materials: Submit type, class, producer name, and certification not more than  
15                   90 days old of compliance with applicable ASTM standard.
- 16                   2.        Aggregates: Submit type, pit or quarry location, producer name, gradations, specific gravity,  
17                   water content, and certification not more than 90 days old.
- 18                   3.        Admixtures: Submit product data sheet. Product data shall include: dosages and  
19                   performance data, brand names, producers, chloride ion concentrations, and certifications  
20                   of compliance with applicable ASTM standard. Certifications shall not be more than 90 days  
21                   old.
- 22                   4.        Water: Submit name of source.
- 23                   B.        Product Data: Prepare and submit product and performance data for materials and accessories,  
24                   including patching compounds, joint systems, curing compounds, finish materials and other concrete  
25                   related items.
- 26                   C.        Testing Agency Qualifications: When requested, the proposed testing agencies shall submit data on  
27                   qualifications for acceptance.
- 28                   D.        Concrete Mix Design:
- 29                   1.        Concrete mix design submittals shall be submitted to the SEOR for review and approval at  
30                   least 14 days prior to placing concrete.
- 31                   2.        Submit concrete mixture proportions and characteristics for each concrete mix. Include  
32                   standard deviation analysis or trial batch data with mix design. Submit historical field test  
33                   data to demonstrate the average compressive strength for approval. Concrete mix  
34                   proportions, materials, and handling methods for field test data or trial batches shall be the  
35                   same as used for the work. Include the following information for each mix design:
- 36                   a.        Water/cementitious materials ratio.  
37                   b.        Slump per ASTM C143  
38                   c.        Air content per ASTM C231 or ASTM C173  
39                   d.        Unit weight of concrete per ASTM C138  
40                   e.        Compressive strength at 28 days per ASTM C39
- 41                   3.        If trial batches are used, submit representative samples of each proposed ingredient to  
42                   independent testing laboratory for use in preparation of mix design.
- 43                   4.        Include alternate mix designs when characteristics of materials, project conditions, weather,  
44                   test results, or other circumstances warrant adjustments. Indicate amounts of mix water to  
45                   be withheld for later addition at Project site.

- 1                    5.        Provide a record copy of the final mix designs and test results to the testing agency prior to  
2                    commencement of the concrete work.
- 3                    E.        Test Reports: Submit laboratory test reports for concrete materials, mix design, compressive  
4                    strength, slump, air content, and temperature. Each report shall indicate date of sampling, date of  
5                    test, mix design, and location of concrete in structure.
- 6                    F.        Repair Methods: When stains, rust, efflorescence, and surface deposits must be removed, submit  
7                    the proposed method of removal.
- 8                    G.        Certificates: Submit written certification regarding the design mix from the ready-mix supplier and the  
9                    admixture manufacturer stating all concrete and admixtures do not contain chloride ions in excess of  
10                    concentrations specified herein.
- 11                    H.        Placement Notification: Notify the Architect at least 24 hours in advance of concrete placement.
- 12                    I.        Adjustments: Submit any adjustments to mixture proportions or changes in materials, suppliers, or  
13                    sources, along with supporting documentation, during the course of the work.
- 14                    J.        Cold Weather Procedure Submittal: Refer to Cold Weather Concreting article in Part 3 for more  
15                    information.
- 16                    K.        Record Documents: Accurately record actual locations of embedded utilities and components that  
17                    are concealed from view.

18    **1.6    DELIVERY, STORAGE, AND HANDLING**

- 19                    A.        Cementitious materials: Store cementitious materials in dry weather tight buildings, bins, or silos that  
20                    exclude contaminants.
- 21                    B.        Aggregates: Store and handle aggregate in a manner that will avoid segregation and prevent  
22                    contamination with other materials or other sizes of aggregates. Store aggregates so as to drain  
23                    freely.
- 24                    C.        Admixtures: Protect stored admixtures against contamination, evaporation, or damage. Protect liquid  
25                    admixtures from freezing and temperature changes, which would adversely affect their performance.  
26                    Handle chemical admixtures in accordance with manufacturer's instructions.

27    **PART 2 - PRODUCTS**

28    **2.1    CONCRETE MATERIALS**

- 29                    A.        Portland Cement: Portland cement shall conform to ASTM C150, Type I Normal, and be a standard  
30                    brand of Portland cement. Use one brand of cement throughout project, unless approved in writing  
31                    by the Engineer. Cement, which conforms to ASTM C150 Type II, may be used if it also meets the  
32                    requirements of ASTM C150 Type I. Cement used in concrete shall be of the same brand and type  
33                    as the cement used in the concrete represented by the submitted field test data or used in the trial  
34                    mixtures. Maintain consistent cement color throughout project unless directed otherwise by  
35                    architectural requirements.
- 36                    1.        Total replacement of Portland cement by supplementary cementitious materials in design  
37                    mixture shall not exceed 50% (by weight).
- 38                    B.        Supplementary Cementitious Materials
- 39                    1.        Fly Ash: Fly ash shall conform to ASTM C618, Class C or Class F. Replacement of Portland  
40                    cement by fly ash shall not exceed the following (percentages are by weight):
- 41                    a.        Concrete Flatwork: 20 percent.  
42                    b.        Mass Concrete (more than two feet thick): 50 percent.

- 1 c. All other concrete: 25 percent.  
 2 d. Concrete to be placed in cold weather as defined herein: No fly ash allowed unless  
 3 the cold weather procedure submitted has compensated for the increased setting  
 4 time and decreased rate of strength gain due to cold weather and fly ash.
- 5 2. Slag Cement: ASTM C989, Grade 100 or 120.
- 6 a. Ground Granulated Blast-Furnace Slag Limit: 50% by weight of total cementitious  
 7 materials.
- 8 b. In mass concrete more than 2 feet thick, the usage rate may be 80% by weight of  
 9 total cementitious materials.
- 10 3. Combined Fly Ash and Ground Granulated Blast-Furnace Slag:
- 11 a. Supplementary Cementitious Materials Limit: 50% with fly ash not exceeding 25%  
 12 by weight of total cementitious materials.
- 13 b. In mass concrete more than 2 feet thick: 80% with fly ash not exceeding 50% by  
 14 weight of total cementitious materials.
- 15 C. Coarse Aggregate for Normal Weight Concrete: Comply with ASTM C33. Provide coarse aggregate  
 16 from a single source for exposed concrete. Gradations shall be similar to that described in the  
 17 following table:

COARSE AGGREGATE GRADATIONS							
SIEVE SIZE - PERCENT PASSING							
Grade No.	1-1/2"	1"	3/4"	1/2"	3/8"	No. 4	No. 16
4	90-100 Note 1	20-55	0-15	---	0-5		---
57	100	95-100	---	25-60	0-10	0-10	---
67		100	90-100	---	20-55	0-10	---
89	---	---	---	100	90-100	20-55	0-10

- 18 1. Shall be 100 percent passing the 2" sieve.
- 19 D. Fine Aggregate for Normal Weight Concrete: Comply with ASTM C33. Provide fine aggregate from  
 20 a single source for exposed concrete. Fine aggregate shall consist of washed sand. Gradations shall  
 21 be similar to that described in the following table:

FINE AGGREGATE GRADATIONS							
SIEVE SIZE - PERCENT PASSING							
Grade No.	3/8	No. 4	No. 8	No. 16	No. 50	No. 80	No. 100
FA	100	95-100	80-100	50-85	5-30	---	0-10

- 22 E. Do not use aggregates containing deleterious substances that could cause spalling on any exterior  
 23 exposed surface. These include, but are not limited to the following:
- 24 1. Organic impurities.  
 25 2. Ferrous metals.  
 26 3. Soluble salts.

- 1 4. Coal, lignite, or other lightweight materials.  
2 5. Soft particles.  
3 6. Clay lumps and friable particles.  
4 7. Cherts of less than 2.40 specific gravity.
- 5 F. Water: Mixing water for concrete shall meet the requirements of ASTM C94. Water shall be clean  
6 and free from injurious amounts of acids, alkalis, organic materials, chloride ions and oils deleterious  
7 to concrete or reinforcing steel.
- 8 G. Testing agency shall be given access to plants and stockpiles to obtain samples for testing for  
9 compliance with the Contract Documents.
- 10 **2.2 ADMIXTURES**
- 11 A. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other  
12 admixtures. Calcium chloride thiocyanates or admixtures containing intentionally added chlorides are  
13 not permitted.
- 14 B. Water Reducing Admixture: Material shall comply with ASTM C494, Type A. Acceptable  
15 manufacturers and products include:
- 16 1. BASF Corporation - MasterPozzolith Series or MasterPolyheed Series.  
17 2. Euclid Chemical Company - Eucon WR Series.  
18 3. Sika Chemical Corp. - Plastocrete 161.  
19 4. GRT – Polychem 400 NC.  
20 5. Grace Construction Products - WRDA 82.
- 21 C. High Range Water Reducing Admixture (superplasticizer): Material shall comply with ASTM C494,  
22 Type F or Type G. Acceptable manufacturers and products include:
- 23 1. BASF Corporation - MasterRheobuild 1000 or MasterGlenium Series.  
24 2. Euclid Chemical Company - Eucon 37 or Plastol Series.  
25 3. Sika – ViscoCrete 2100.  
26 4. GRT – Melchem.  
27 5. Grace Construction Products - Mira 110.
- 28 D. High Range Water Reducing, Slump Retaining Admixture: Material shall comply with ASTM C494,  
29 Type F or Type G. Acceptable manufacturers and products include:
- 30 1. BASF Corporation - MasterGlenium 7700.  
31 2. Euclid Chemical Company - Eucon 537, Eucon 1037, or Plastol Series.  
32 3. Sika – Sikament 686.  
33 4. GRT – Melchem – M.  
34 5. Grace Construction Products – ADVA FLEX.
- 35 E. Non-Chloride Accelerator: Material shall comply with ASTM C494, Type C or Type E, and not contain  
36 a higher chloride ion concentration than municipal drinking water. Acceptable manufacturers and  
37 products include:
- 38 1. BASF Corporation - MasterSet FP 20 or MasterSet AC 534.  
39 2. Euclid Chemical Company - Accelguard Series.  
40 3. Sika Chemical Corp. - Sika Rapid-1.  
41 4. GRT – Polychem HE.  
42 5. Grace Construction Products – Lubricon NCA.
- 43 F. Air Entraining Admixture: Air entraining admixture shall comply with ASTM C260, and be certified by  
44 the manufacturer to be compatible with other admixtures to be used. Acceptable manufacturers and  
45 products include:
- 46 1. BASF Corporation - MasterAir Series.  
47 2. Euclid Chemical Company - Air-Mix or AEA Series.

- 1 3. Sika Chemical Corporation - Sika-Aer.
- 2 4. GRT – Polychem VR.
- 3 5. Grace Construction Products - Darex II or Daravair 1000.

4 G. Admixtures used in concrete shall be the same brand, type, and dosage used in concrete represented  
5 by field test data or used in trial mixes.

### 6 2.3 CURING PRODUCTS

7 1. Moisture Retaining Cover: Plastic Film: Use 6 mil polyethylene film sheet materials that  
8 meet the requirements of ASTM C171.

9 2. White burlap-polyethylene sheet meeting ASTM C171.

10 3. Reinforced Curing Paper complying with ASTM C171.

11 4. Moisture Retaining Fabric: A naturally colored, non-woven, polypropylene fabric with a 4-  
12 mil, non-perforated reflective (white) polyethylene coating containing stabilizers to resist  
13 degradation from ultraviolet light. Fabric shall exhibit low permeability and high moisture  
14 retention. Acceptable manufacturers and products include:

15 a. PNA Construction Technologies, Inc.: Hydracure S16.

16 b. PNA Construction Technologies, Inc.: Hydracure M5.

17 c. Reef Industries Incorporated: Transguard 4000.

18 B. Dissipating Resin Curing Compound: Clear, waterborne, membrane-forming curing compound  
19 complying with ASTM C309, Type 1, Class B shall be composed of hydrocarbon resins and  
20 dissipating agents that begin to break down upon exposure to ultraviolet light and traffic  
21 approximately 4 to 6 weeks after application, providing a film that is removable with standard  
22 degreasing agents, and mechanized scrubbing actions so as to not impair the later addition of applied  
23 finishes.

24 1. Curing compounds used on interior enclosed environments shall be a water-borne product  
25 and VOC compliant as required by the U.S. EPA Architectural Coating Rule.

26 C. Non-dissipating Curing Compound: Clear, membrane-forming curing compound complying with  
27 ASTM C309, Type 1, Class B.

28 1. Curing compounds used on interior enclosed environments shall be a water-borne product  
29 and VOC compliant as required by the U.S. EPA Architectural Coating Rule.

30 D. Curing and Sealing Compound: Clear, membrane-forming curing and sealing compound complying  
31 with ASTM C309, Type 1, and ASTM C1315, Type 1, Class A. Compound shall dry to a clear finish,  
32 resist yellowing due to ultraviolet degradation and provide a long-lasting finish that has high  
33 resistance to chemicals, oil, grease, deicing salts, and abrasion.

34 1. Curing and sealing compounds used on interior enclosed environments shall be a water-  
35 borne product and VOC compliant as required by the U.S. EPA Architectural Coating Rule.

### 36 2.4 MISCELLANEOUS MATERIALS

37 A. Patching Mortar: Non-shrink, non-slump, non-metallic, quick setting. Acceptable manufacturers and  
38 products:

39 1. Euclid Chemical Company - Eucospeed.

40 2. BASF Corporation - MasterEmaco N 424.

41 3. Adhesive Technologies. - Hard Rok Vertipatch.

42 4. W.R. Meadows - Speed Crete (Red Line).

43 5. Dayton Superior – Re-Crete 20 minute.

44 6. SpecChem - Precast Patch.



- 1 B. Cement Grout: Mix 1 part Portland cement, 2-1/2 to 3 parts fine aggregate, and enough water for  
2 required consistency. Depending on use, consistency may range from mortar consistency to a  
3 mixture that will flow under its own weight. Do not mix more than the amount that can be used within  
4 30 minutes. Retempering is not permitted. Use for leveling, preparing setting pads, beds, construction  
5 joints (with liquid bonding admixture) and similar uses. Do not use for grouting under bearing plates  
6 or structural members in place.
- 7 C. Dry-Pack: Mix 1 part Portland cement, 2 parts fine aggregate, and enough water to hydrate cement  
8 and provide a mixture that can be molded with the hands into a stable ball (a stiff mix). Do not mix  
9 more than the amount that can be used within 30 minutes.
- 10 D. Expansion Joint Material: Preformed, resilient, non-extruding asphalt-impregnated fiber conforming  
11 to ASTM D1751. Thickness of expansion joint material shall be 1/2" unless noted otherwise on the  
12 drawings.
- 13 E. Magnesium phosphate patching cement specially designed for cold weather grouting and anchoring.  
14 Acceptable Manufacturer:
- 15 1. BASF Corporation - MasterEmaco T545.  
16 2. Euclid Chemical Company - Eucospeed MP.
- 17 F. Vapor Retarder: ASTM E 1745, Class A, not less than 10 mils (0.25 mm) thick. Acceptable  
18 manufacturers and products:
- 19 1. Stego Industries, LLC - Stego Wrap.  
20 2. W.R. Meadows, Inc. - Perminator.  
21 3. Raven Industries - Vapor Block  
22 4. Insulation Solutions - Viper VaporCheck II.
- 23 G. Penetrating Liquid Floor Treatment: Chemically reactive, waterborne solution of inorganic silicate or  
24 silicate materials and proprietary components; odorless; colorless; that penetrates, hardens, and  
25 densifies concrete surfaces. Acceptable manufacturers and products:
- 26 1. BASF Corporation - MasterKure HD 200WB.  
27 2. Conspec Marketing & Manufacturing Co., Inc. - Intraseal  
28 3. Curecrete Chemical Co., Inc. - Ashford Formula  
29 4. Dayton Superior Corporation - Day-Chem Sure Hard (J-17)  
30 5. Euclid Chemical Company - Eucosil  
31 6. L&M Construction Chemicals, Inc. - Seal Hard  
32 7. Vexcon Chemicals, Inc - Vexcon Starseal PS  
33 8. SpecChem - SpecHard
- 34 H. Control Joint Filler: Flexible, single-component polyurethane sealant with backer rod compliant with  
35 ASTM C 920, Type S, Grade P, Class 25. Apply sealant per manufacturers written recommendations.  
36 Acceptable manufacturers and products:
- 37 1. Dayton Superior – Perma 230 SL.  
38 2. Euclid Chemical Company – Eucolastic I.  
39 3. BASF Corporation - MasterSeal SL 1.

40 **2.5 STRENGTH AND PROPERTIES**

- 41 A. Concrete Mix Designs: Refer to drawings for specified compressive strength. Proportion concrete  
42 mixes according to the properties in the following tables. The concrete supplier may produce a mix  
43 at a lower water-cement ratio to allow for adjustment of slump at the site by adding water. The addition  
44 of site water shall be in accordance with ASTM C94, and the total water-cement ratio shall not exceed  
45 the value specified below.

Class	Coarse Aggregate Gradation	Fine Aggregate Gradation	Range of Slump	Max. w/c	Air Content	Other Requirements
A	57 or 67	FA	1" to 4"	0.40	5% to 8%	
B	57 or 67	FA	1" to 4"	0.45	5% to 8%	
C	57 or 67	FA	1" to 4"	0.50	—	
D	57 or 67	FA	4" to 6"	0.50	—	Use water reducing admixture to achieve slump specified
E	4 or 57	FA	1" to 4"	0.50	—	
F	4 or 57	FA	5" to 8"	0.50	—	Use retarder
G	89	FA	5" to 8"	0.50	—	
H	Lightweight	FA	5" max	0.5	4% to 7%	Maximum 107-116 pcf dry density

- 1 Note: w/c = water-cementitious materials ratio.
- 2 B. Schedule of Concrete Classes: Provide concrete of the specified class according to the following
- 3 schedule.
- 4 1. Footings: Class E
- 5 2. Exterior foundation walls and piers: Class B
- 6 3. Interior piers: Class C
- 7 4. Interior slabs on grade: Class D
- 8 5. Interior slab on metal decks: Class D
- 9 6. Unless noted otherwise: Class B
- 10 C. Slump of Superplasticized Concrete: Concrete containing high-range water reducing admixtures
- 11 (superplasticizer) shall have 8" maximum slump, unless otherwise approved by Structural Engineer.
- 12 D. Accelerators: Add non-chloride accelerator to all concrete slabs placed at air temperatures below
- 13 50°F only when approved in the mix design. Use of admixtures will not relax cold weather placement
- 14 requirements.
- 15 E. Water Reducer: Add water reducing admixture or high range water reducing admixtures
- 16 (superplasticizers) as follows:
- 17 1. All pumped concrete.
- 18 2. Fiber reinforced concrete.
- 19 3. As required for placement or workability.
- 20 4. As required by high temperatures, low humidity, or other adverse placement conditions.
- 21 5. Concrete with water-cementitious materials ratio below 0.50.
- 22 F. No other admixtures shall be used unless approved by SEOR.
- 23 G. Chlorides: Admixtures or other ingredients including aggregates containing calcium chloride or more
- 24 than 0.05% chloride ions by weight shall not be used.
- 25 H. Workability: Concrete shall have a workability such that it will fill the forms without voids,
- 26 honeycombs, or rock pockets with proper vibration without permitting materials to separate or excess
- 27 water to collect on the surface.

1 I. Concrete Temperatures: Minimum concrete temperature of fresh concrete varies in relation to  
2 average air temperature over a 24-hour period as follows:

- |   |    |                              |                                |
|---|----|------------------------------|--------------------------------|
| 3 | 1. | Air temperature below 0°F    | Concrete temperature 70°F min. |
| 4 | 2. | Air temperature 0°F to 30°F  | Concrete temperature 65°F min. |
| 5 | 3. | Air temperature 30°F to 50°F | Concrete temperature 50°F min. |
| 6 | 4. | Air temperature above 50°F   | No minimum temperature         |

7 The maximum temperature of concrete at the time of delivery shall be 90°F. When concrete  
8 temperature exceeds 90°F, concrete supplier shall attempt to reduce temperature by shading  
9 aggregates and cement and cooling mix water. When these methods fail to reduce concrete  
10 temperature below 90°F, supplier shall use ice in the water to reduce the concrete temperature. Use  
11 set retarding admixtures only when approved in the mix design.

## 12 PART 3 - EXECUTION

### 13 3.1 PREPARATION

- 14 A. Verify requirements for concrete cover over reinforcement.
- 15 B. Verify that anchors, seats, plates, reinforcement, and other items to be cast into concrete are  
16 accurately placed, positioned securely, and will not cause hardship in placing concrete.
- 17 C. Do not place concrete until data on materials and mix designs have been approved, Architect has  
18 been notified, and all other affected trades have coordinated their work.
- 19 D. Remove snow, ice, frost, water, mud, and other foreign material from surfaces, reinforcing bars and  
20 embedded items against which concrete will be placed.
- 21 E. Prepare previously placed concrete by cleaning with sandblasting, steel brush, or water blast to  
22 expose aggregate to minimum 1/4" amplitude.
- 23 F. Sandblast all existing concrete surfaces older than 28 days against which concrete is to be placed,  
24 unless directed otherwise in writing by Architect/Engineer.

### 25 3.2 SLABS

- 26 A. Slab on Grade:
- 27 1. All interior slabs on grades shall have a polyethylene vapor retarder conforming to ASTM  
28 E1745. Lap all joints minimum 6" and seal edges with adhesive tape. Fit vapor retarder  
29 around utilities and seal with adhesive tape as required. Place, protect, and repair vapor-  
30 retarder sheets according to ASTM E 1643 and manufacturer's written instructions.
- 31 2. Refer to drawings and Section 31 23 00 for required sub-grade preparation beneath slabs  
32 on grade.
- 33 3. Where vapor retarder is not used below slab on grade, wet sub-grade below slab prior to  
34 placing concrete. Subgrade shall be moist with no free water and no muddy or soft spots.
- 35 4. Saw cut control joints: Cut with power saws equipped with shatterproof abrasive or  
36 diamond-rimmed blades. Cut joints into concrete when cutting action will not tear, abrade,  
37 or otherwise damage surface and before concrete develops random contraction cracks.  
38 Control joints shall be located along column lines, with intermediate joints spaced at a  
39 maximum distance of 36 times the slab thickness, unless noted otherwise. Control joints  
40 shall be continuous, not staggered or offset. Slab panels shall have a maximum length to  
41 width ratio of 1.5 to 1. Provide additional control joints at all reentrant or isolated corners  
42 formed in the slab on grade. Refer to drawings for typical control joint detail.

- 1 5. Provide isolation joints around each column and along foundation walls. Form isolation  
2 joints with 1/2" expansion joint material. Extend isolation joint material full width and depth  
3 of joint, terminating flush with finished concrete surface, unless otherwise indicated.
- 4 6. Depress slabs as required for mats architectural finishes. Obtain layout and locations from  
5 Architect.
- 6 7. Verify completion of all under slab work with mechanical and electrical trades before placing  
7 slabs.
- 8 8. Slope slabs as indicated on drawings and to provide positive drainage. Slope slab keeping  
9 bottom level and varying top. Maintain minimum thickness of concrete as indicated on  
10 drawings. Refer to floor finishes for tolerances.
- 11 B. All supported slabs, including slabs-on-steel decking and cast-in-place concrete slabs:
- 12 1. Supported slabs have deflections that may cause areas of concrete to have thicknesses  
13 greater than indicated on the drawings. Contractor is expected to provide that volume as  
14 needed to finish the floor at the specified elevation. If specified floor finish tolerances are  
15 not achieved during the concrete floor construction the Contractor shall install, at no cost to  
16 the project, a self-leveling cementitious underlayment (BASF Corporation - MasterTop 110  
17 SL or approved equivalent) to correct the floor flatness and levelness.

18 **3.3 CONSTRUCTION JOINTS**

- 19 A. Slabs: Where slab pour is to receive a subsequent topping or additional concrete, expose aggregate  
20 in top surface by brooming in two directions at right angles to each other.
- 21 B. Vertical: Locate vertical construction joints in walls not farther than a maximum of 100 feet on center.  
22 Coordinate joint locations with architectural design.
- 23 C. Horizontal: Locate horizontal joints in walls at underside of slabs and at the top of slabs and footings  
24 unless otherwise indicated. At least 24 hours shall elapse between placing concrete in a wall and  
25 placing concrete in an area supported by the walls, unless approved in writing by Structural Engineer.
- 26 D. Reinforcing: Stop all welded wire reinforcement and/or reinforcing at construction joint in slabs on  
27 grade and provide dowel bars as detailed. Provide reinforcement at other construction joints as  
28 detailed. Roughen and thoroughly clean the surface of the concrete, remove all laitance, and wet the  
29 surface before placing new concrete against the joint. Slush vertical joints with a neat cement grout  
30 before placing new concrete. Roughen entire surface at construction joints to remove surface paste  
31 and expose aggregate.

32 **3.4 CONCRETE PLACEMENT**

- 33 A. Place concrete as continuously as possible until placement is complete. Do not place against  
34 concrete that has attained initial set, except at authorized joints. If, for any reason, concrete pour is  
35 delayed for more than 45 minutes, bulkhead off pour at last acceptable construction joint. Immediately  
36 remove excess concrete and clean forms.
- 37 B. Do not begin to place concrete during periods of rain, sleet or snow unless adequate protection is  
38 provided.
- 39 C. No concrete shall be cast onto or against sub-grades containing free water, frost, ice or snow. If earth  
40 at bottom of forms has dried out, rewet so the soil is moist, but free of standing water and mud.
- 41 D. Notify the architect in advance if concrete is to be pumped.
- 42 E. Do not place concrete until all reinforcement is in place, forms have been thoroughly cleaned and  
43 approval has been given.
- 44 F. Do not accept concrete delivered to the job site more than 90 minutes after initial mixing.

- 1 G. Concrete from its point of release to mixers, hoppers, or conveyances, shall not be permitted to drop  
2 more than 5 feet (10 feet for concrete containing high range water reducers). Deposit concrete  
3 directly into conveyances and directly from conveyances to final points of deposit. Sufficient  
4 transportation equipment in good working order shall be on hand before work begins. All conveying  
5 equipment must be clean and kept clean during concreting operations. Take every possible  
6 precaution to prevent segregation or loss of ingredients.
- 7 H. Regulate rate of placement so concrete surface is kept level throughout; a minimum being permitted  
8 to flow from one area to another. Use tremie heads spaced at approximately 10-foot intervals for  
9 placing concrete in walls. Control rate of placement consistent with form design.
- 10 I. Deposit concrete in one continuous operation until section being placed has been completed. For  
11 slab thicknesses greater than 12 inches, prevent excessive segregation of aggregate and high  
12 temperatures in accordance with ACI 304 and ACI 308. Place concrete in wall forms in layers not  
13 greater than 12 inches in depth, each layer being compacted by internal vibration before succeeding  
14 layer is placed.
- 15 J. Place concrete as near as possible to its final position to prevent segregation or loss of materials. Do  
16 not use vibrators to transport concrete within forms. Consolidate concrete in walls, columns, beams  
17 and slabs or joist construction thicker than 8" with internal vibrators (8,000 to 12,000 VPM). Slabs  
18 less than 8" thick may be consolidated with internal vibrators (9,000 to 13,500 VPM) or vibrating  
19 screeds supported on forms, boards or rails, approved by SEOR, supplement vibration by forking or  
20 spading by hand along surfaces adjacent to forms and construction joints. Be sure an adequate  
21 number of operating vibrator units are on hand to properly consolidate quantity of concrete to be  
22 placed, including spares for emergency use.
- 23 1. Vertically insert and remove handheld vibrators at constant intervals 18 to 30 inches apart.  
24 Vibrate concrete the maximum amount and time required for complete consolidation,  
25 without segregation, and release of entrapped air bubbles, but in no instance exceed 15  
26 seconds per square foot of exposed surface.
- 27 K. Re-tempering of concrete shall not be permitted. Concrete that has stood more than 15 minutes after  
28 leaving the mixer shall be discarded.
- 29 L. Exercise care in placing concrete over waterproof membranes, rigid insulation and/or protection  
30 boards to avoid damaging those materials. Report damage immediately, and do not proceed until  
31 damage is repaired.
- 32 M. Remove loose debris from hardened surfaces of previous pours, thoroughly wet and slush with a  
33 neat cement grout immediately before placing new concrete, or apply bonding compound to surface  
34 and let dry before placing new concrete.
- 35 N. Protect existing concrete work to be exposed to view and other finished materials from damage and  
36 staining resulting from concreting operations. Handle concrete carefully to avoid dripping and  
37 spillage. Remove spilled concrete from existing surfaces immediately. Covering sills, ledges, and  
38 other surfaces with protective coverings may be necessary to protect the work.
- 39 O. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work  
40 of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place  
41 construction. Provide other miscellaneous concrete filling indicated or required to complete Work.
- 42 P. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as  
43 shown on drawings. Set anchor rods for machines and equipment at correct elevations, complying  
44 with diagrams or templates of manufacturer furnishing machines and equipment.
- 45 Q. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-  
46 in inserts and accessories as shown on drawings. Screed, tamp, and trowel-finish concrete surfaces.

1    **3.5    CONCRETE FINISHES AND TOLERANCES**

- 2           A.       Exposed Smooth Formed Surfaces: Remove forms and perform necessary repairs and patch to  
3                    produce surface finish-3.0 as specified in ACI 301. Apply the following to smooth-formed finished  
4                    concrete exposed to view in the finished work. Confirm finishes with architect prior to concrete  
5                    placement by submitting shop drawings indicating locations of all types of finishes.
- 6                    1.       Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete  
7                                surfaces and rub with carborundum brick or another abrasive until producing a uniform color  
8                                and texture. Do not apply cement grout other than that created by the rubbing process.
- 9           B.       Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces  
10                   adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed  
11                   surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed  
12                   surfaces, unless otherwise indicated.

13    **3.6    CONCRETE SLAB FINISHES AND TOLERANCES**

- 14           A.       Trowel Finish:
- 15                    1.       Screed concrete to an even plane, float, then power trowel the surface.
- 16                    2.       Hand trowel the surface smooth and free of trowel marks. Continue hand troweling until a  
17                                ringing sound is produced as the floor is troweled.
- 18                    3.       Provide trowel finish as indicated on the drawings and at the following locations:
- 19                                a.       Concrete floors exposed in finished work unless otherwise indicated.
- 20                                b.       Slabs to receive curing compounds and sealers.
- 21                                c.       Slabs to receive resilient flooring or carpet.
- 22                                d.       Slabs to receive waterproof membranes.
- 23           B.       Fine Broom Finish:
- 24                    1.       Screed concrete to an even plane, float, then power trowel the surface. Provide fine hair  
25                                broom finish perpendicular to slope, free of loose particles, ridges, projections, voids and  
26                                concrete droppings.
- 27                    2.       Provide fine broom finish as indicated on the drawings and at the following locations:
- 28                                a.       Stoop slabs.
- 29                                b.       Raised curbs and walkway areas.
- 30                                c.       Slabs to receive thin set ceramic tile.
- 31           C.       Broom Finish:
- 32                    1.       Screed concrete to an even plane and then float. Immediately after concrete has received  
33                                a floated finish, give the concrete surface a coarse transverse scored texture by drawing a  
34                                coarse broom across the surface.
- 35                    2.       Provide as indicated on the drawings and at the following locations:
- 36                                a.       ADA ramp slabs.
- 37                                b.       Exterior walkway slabs.
- 38           D.       Floor Finish Tolerances: Floor finish tolerances shall be measured by placing a freestanding  
39                    (unleveled) 10-foot straightedge anywhere on the slab and allowing it to rest upon two high spots  
40                    within 72 hours after placement of slab and removal of shoring (if present). The gap at any point  
41                    between the straightedge and the floor (and between the high spots) shall not exceed:
- 42                    1.       Slab on Grade: 1/4"

1 E. Slab Drainage: Finish all concrete slabs to proper elevations to ensure that all surface moisture will  
2 drain freely to floor drains, and that no puddle areas exist. Contractor shall bear the cost of corrections  
3 to provide positive drainage.

4 F. Special Tolerances for Concrete Slabs: No abrupt change in vertical elevation of 1/4" or more is  
5 acceptable at the interface between slabs and within areas where pedestrian traffic is expected:

6 **3.7 CONCRETE CURING**

7 A. Freshly placed concrete shall be protected from premature drying and excessively hot temperatures.

8 B. Concrete other than high-early strength shall be maintained above 50°F and in a moist condition for  
9 at least the first 7 days after placement, except when special curing is used. Special curing  
10 procedures shall not be used without written permission from the SEOR.

11 C. Formed surfaces shall be cured by leaving the formwork in place during the curing period.

12 D. Protect concrete from excessive changes in temperature during the curing period and at the  
13 termination of the curing process. Changes in the temperature of the concrete shall be as uniform as  
14 possible and shall not exceed 5°F in any one hour or 50°F in any 24-hour period.

15 E. Protect concrete from injury from the elements until full strength is developed. Protect from  
16 mechanical injury.

17 F. During cold weather construction, all footings shall be protected from frost penetration until the  
18 building is enclosed and temporary heat is provided.

19 **3.8 SLAB CURING**

20 A. Begin curing after finishing concrete, but not before free water has disappeared from concrete  
21 surface. Use one of the methods described below.

22 B. Moisture-Retaining-Cover Curing for Concrete Floors Not Exposed in Final Condition: Cover  
23 concrete surface with waterproof sheet material as soon as finishing operations are complete and  
24 the concrete is sufficiently hard to be undamaged by covering. The cover shall be placed flat on the  
25 concrete surface, avoiding wrinkles. Sprinkle concrete with water as necessary during application of  
26 covering. Place in widest practicable width, with sides and ends lapped at least 12 inches, and seal  
27 with waterproof tape or adhesive. Verify that the concrete is continuously wet under the sheets;  
28 otherwise, add water through soaker hoses under the sheets. Weight down covering to prevent  
29 displacement. Immediately repair any holes or tears during the curing period using polyethylene  
30 sheet and waterproof tape. Curing process shall be maintained for a minimum of 7 days.

31 C. Moisture-Retaining-Fabric Curing for Concrete Floors to Remain Exposed: Cover concrete surface  
32 with moisture retaining fabric as soon as finishing operations are complete and the concrete is  
33 sufficiently hard to be undamaged by covering. The cover shall be installed in accordance with  
34 manufacturer's written recommendations, in largest practical widths. Wet the slab to rejection, then  
35 thoroughly wet fabric side of cover and install with poly side up. Lap over adjacent covers a minimum  
36 of 18". Wet all laps and outside edges to prevent displacement and to ensure intimate contact with  
37 concrete and adjacent covers. Rewet as necessary and protect covers from damage during curing  
38 process.

39 1. After minimum 7-day cure, remove moisture retaining fabric in sections.

40 2. A maximum of 3,500 square feet of concrete curing cover may be removed at any one time.  
41 At no time shall the exposed area be permitted to dry prior to completion of the floor  
42 scrubbing process.

- 1 3. Using a high-powered floor scrubber capable of a minimum 80 pounds head pressure, and  
2 a mild citrus-based detergent that does not damage or mar the surface in any way, scrub  
3 the floor to remove any minerals or soluble salts that may have accumulated at the floor  
4 surface. Rinse area thoroughly with clean fresh water. Remove water and allow floor to dry.  
5 If whitening occurs during drying, repeat scrubbing process before floor dries until no  
6 whitening occurs during drying.
- 7 4. All areas of the floor shall remain wet during floor scrubbing process. Expose only the  
8 amount of floor surface that can be cleaned before any drying occurs without exceeding the  
9 maximum allowable exposed area.
- 10 D. Curing Compound: Apply uniformly in continuous operation by low pressure spray equipment or roller  
11 as soon as finishing operations are complete, free water on the surface has disappeared and no  
12 water sheen can be seen. Follow the manufacturer's written instructions. Recoat areas subjected to  
13 heavy rainfall within three hours after initial application. Maintain continuity of coating and repair  
14 damage during curing period. Verify compatibility of the curing compound with paint, finishes, or  
15 toppings that require positive bond to the concrete. If curing compound is not compatible with paint  
16 finishes or toppings, utilize a dissipating curing compound and remove in accordance with the  
17 manufacturer's recommendations.

18 **3.9 PENETRATING LIQUID FLOOR TREATMENTS**

- 19 A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment  
20 according to manufacturer's written instructions.
- 21 B. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface  
22 repairs in accordance with manufacturer's written instructions.
- 23 C. Do not apply to concrete that is less than seven days old.
- 24 D. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat  
25 brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second  
26 coat in a similar manner if surface is rough or porous.

27 **3.10 JOINT FILLING**

- 28 A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
- 29 B. Do not fill joints until construction traffic has permanently ceased.
- 30 C. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of  
31 joint clean and dry.
- 32 D. Install semi-rigid joint filler in saw-cut joints and in formed joints. Overfill joint and trim joint filler flush  
33 with top of joint after hardening.

34 **3.11 APPLICATION OF FLOOR SEALER - FINISH COAT**

- 35 A. Give concrete floors as indicated in Room Finish Schedule and where exposed in finished Work,  
36 second coat of curing and sealing compound immediately prior to Substantial Completion.
- 37 B. Clean floors and apply sealer strictly according to manufacturer's instructions. Dilution and coverage  
38 shall be as recommended by the manufacturer. Apply sealer evenly.

39 **3.12 COLD WEATHER CONCRETING**

- 40 A. Definition: Cold weather shall be defined as a period when for more than three successive days the  
41 average daily outdoor temperature drops below 40°F. The average daily temperature is the average  
42 of the highest and lowest temperature during the period from midnight to midnight. When  
43 temperatures above 50°F occur during more than half of any 24-hour duration, the period shall not  
44 be regarded as cold weather.



- 1 B. All cast-in-place concrete work occurring during cold weather shall conform to all requirements of  
2 ACI 306.1, "Standard Specification for Cold Weather Concreting", published by the American  
3 Concrete Institute, Detroit, Michigan, except as modified by the contract documents or this  
4 specification.
- 5 C. Planning: The General Contractor, concrete contractor, concrete supplier and the architect shall have  
6 a pre-construction conference to outline the cold weather concreting operations concerning the  
7 placing, finishing, curing and protection of the concrete during cold weather. Pre-construction  
8 conference shall occur before cold weather is expected to occur.
- 9 D. Detailed procedure submittal: Concrete contractor shall prepare and submit for review detailed  
10 procedures for the production, transportation placement, protection, curing and temperature  
11 monitoring of concrete during cold weather. Include procedures to be implemented upon abrupt  
12 changes in weather conditions. Do not begin cold weather concreting until these procedures have  
13 been reviewed and approved.
- 14 E. Mixing: Concrete flatwork poured in cold weather shall be proportioned to obtain a lower slump to  
15 minimize the amount of bleed water during finishing. All bleed water should be skimmed off flatwork  
16 prior to troweling. Concrete that will be exposed to cycles of freezing and thawing while saturated  
17 should be properly air entrained as outlined in this specification.
- 18 F. Protection of Concrete: Cure and protect concrete against damage from freezing for a minimum  
19 period of 72 hours, unless approved by the structural engineer. The protection period may be reduced  
20 according to ACI 306.1 requirements. Concrete contractor shall submit a letter of request to reduce  
21 the protection period, by outlining the method used to achieve the reduction per ACI 306.1.

- 22 1. When practical for the construction schedule, formwork shall be insulated and remain in  
23 place for at least the required protection period.

- 24 G. Concrete Temperatures: The minimum temperature of concrete immediately after placement shall  
25 be as specified in the following table.

Section Size	Minimum temperature of concrete as placed and maintained during the protection period	Maximum gradual decrease in surface temperature during any 24 hours after the end of the protection.	Mixing Temperatures		
			Above 30°F	0 to 30°F	Below 0°F
< 12 in	55°F	50°F	60°F	65°F	70°F
12-36 in	50°F	40°F	55°F	60°F	65°F
36-72 in	50°F	30°F	50°F	55°F	60°F
> 72 in	50°F	20°F	45°F	50°F	55°F

- 26 H. Mixing Temperatures: As the ambient air temperature decreases the concrete mixing temperature  
27 shall be increased to compensate for the heat lost in the period between mixing and placement. The  
28 concrete supplier shall use one or both of the following methods for increasing the concrete  
29 temperature.
- 30 1. Heating the mixing water to a temperature necessary to offset the temperature losses during  
31 transport. Supplier shall not heat water to temperatures in excess of 140°F, without taking  
32 special precautions as outlined in ACI 306.
- 33 2. Heating the aggregate with a circulated steam piping system.

- 1 I. Temperature measurements: The Contractor shall be responsible for monitoring and recording the  
2 concrete temperatures during placement and throughout the protection period.
- 3 1. Inspection personnel shall keep a record of the date, time, outside air temperature,  
4 temperature of concrete as placed, and weather conditions.
- 5 2. Temperature of the concrete and the outside air shall be recorded at regular intervals but  
6 not less than twice in a 24-hour period. The record shall include temperatures at several  
7 points within the enclosure and on the concrete surface of sufficient frequency to determine  
8 a range of temperatures.
- 9 3. Inspection agency shall submit the temperature logs to the Architect for permanent job  
10 records.

11 **3.13 HOT WEATHER PROTECTION**

- 12 A. Definition: Hot weather shall be defined as any combination of high ambient temperature, low relative  
13 humidity, high winds and intense solar radiation that leads to higher than usual evaporation. The  
14 table below defines low relative humidity based on air temperature. For a given air temperature, if  
15 the relative humidity is equal to or less than the specified minimum, provisions for hot weather  
16 concreting shall be as follows:

Air Temperature	Minimum Relative Humidity
105°F	90%
100°F	80%
95°F	70%
90°F	60%
85°F	50%
80°F	40%
75°F	30%

- 17 B. Scheduling: When hot weather is expected, adjust concrete placement schedules to avoid placing or  
18 finishing during the period from noon until 3:00 pm. When possible, slab pours should be delayed  
19 until the building is enclosed to protect the concrete from wind and direct sunlight, Construction  
20 schedule shall account for 7-day moist curing period.
- 21 C. Mixing: Concrete supplier shall adjust mix designs and admixtures to minimize slump loss. Concrete  
22 shall be mixed at a water-cement, which is lower than the specified maximum to allow for the  
23 adjustment of slump by addition of water in the field. Water reduction shall be accomplished without  
24 reducing initial slump by increasing dosage of water reducing admixture.
- 25 D. Preparation: Do not order concrete earlier than is required to avoid delays. Cool forms, subgrades  
26 and reinforcing bars with water spray from fog nozzle prior to concrete placement.
- 27 E. Delivery: Site traffic shall be coordinated and delivery times scheduled to minimize waiting times for  
28 concrete trucks.
- 29 F. Placement: Preparations shall be made to place and consolidate the concrete at the fastest possible  
30 rate. Maintain a continuous flow of concrete to the job site to avoid development of cold joints, during  
31 placement of slabs, apply fog spray to prevent moisture loss without causing surplus water to stand  
32 on concrete surface.
- 33 G. Finishing: Finish concrete as fast as practical. Continue fogging concrete during finishing. Where  
34 fogging is not possible, apply sprayable moisture-retaining film between finishing passes.
- 35 H. Curing: Formed concrete shall be covered with a waterproof material to retain moisture. Flat work  
36 shall be moisture cured as described in this specification. Moist curing shall continue for at least 7  
37 days.

1    **3.14    FIELD QUALITY ASSURANCE**

- 2           A.       Independent Testing Agency and Special Inspector shall each perform their prescribed inspection,  
3                    sampling, and testing services as described in Part 1 of this specification section.
- 4           B.       In cases where samples have not been taken or tests conducted as specified or strength of laboratory  
5                    test cylinders for a particular portion of the structure fails to meet requirements of ACI 301, for  
6                    evaluation of concrete strength, Structural Engineer shall have the right to order compressive or  
7                    flexural test specimens or both be taken from the hardened concrete according to ASTM C42, load  
8                    tests according to ACI 318, or such other tests as may be necessary to clearly establish the strength  
9                    of the in situ concrete, and such tests shall be paid for by the Contractor. Where cores have been  
10                   cut from work, Contractor shall fill void with dry-pack and patch the finish the match the adjacent  
11                   existing surfaces.

12    **3.15    REPAIR OF DEFECTIVE AREAS**

- 13           A.       All repair of defective areas shall be made, with prior approval of Architect and SEOR as to method  
14                    and procedure, in accordance with Section 5 of ACI 301, except specified bonding compound must  
15                    be used. Cosmetic repairs of minor defects in exposed concrete surfaces shall be in a manner  
16                    acceptable to the Architect. Defective areas shall be deemed when:
- 17                    1.       Tests on core or prism specimens fail to show specified strengths.  
18                    2.       Not formed as indicated or detailed.  
19                    3.       Not plumb or level where so indicated or required to receive subsequent work.  
20                    4.       Not true to intended grades and levels.  
21                    5.       Cut, filled, or resurfaces, unless under direction of the SEOR.  
22                    6.       Debris is embedded therein.  
23                    7.       Not fully in conformance with provisions of the drawings.  
24                    8.       Damaged by hot or cold weather conditions.  
25                    9.       Mixing time exceeds 90 minutes from ready-mix plant to the time of deposit.
- 26           B.       Patch form tie holes at the following locations:
- 27                    1.       Unfinished exposed concrete (not scheduled for painting, plus at board formed concrete  
28                    finish).
- 29                    2.       All other areas: Prime voids with bonding compound and fill with patching mortar. Strike  
30                    flush without overlap, float to uniform texture to match adjacent surfaces.
- 31                    3.       Exposed areas scheduled for spray texture:
- 32                    a.       Remove projections and protrusions: 1/16" or larger.  
33                    b.       Remove continuous ridges 1/32" or larger.  
34                    c.       Fill voids and pin holes.
- 35                    4.       Exposed areas scheduled for paint or epoxy:
- 36                    a.       Remove projections, ridges, and other protrusions 1/32" or larger.  
37                    b.       Fill voids and pin holes 1/16" or larger.
- 38                    5.       Exposed areas not scheduled for paint or other finishes:
- 39                    a.       Remove projections, ridges and other protrusions not conforming to requirements  
40                    specified under Section 03 10 00.  
41                    b.       Fill voids and pin holes not conforming to requirements specified under Section  
42                    03 10 00.
- 43           C.       All structural repairs shall be made, with prior approval of the Architect/Engineer, as to method and  
44                    procedure, using the specified epoxy adhesive and/or epoxy mortar.

- 1 D. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls,  
2 air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and  
3 other discolorations that cannot be removed by cleaning.
- 4 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than  
5 1/2 inch in any dimension in solid concrete but not less than 1 inch in depth. Make edges of  
6 cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes  
7 and voids with bonding agent. Fill and compact with patching mortar before bonding agent  
8 has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with  
9 bonding agent.
- 10 2. Repair defects on surfaces exposed to view by blending white Portland cement and  
11 standard Portland cement so that, when dry, patching mortar will match surrounding color.  
12 Patch a test area at inconspicuous locations to verify mixture and color match before  
13 proceeding with patching. Compact mortar in place and strike off slightly higher than  
14 surrounding surface.
- 15 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural  
16 performance as determined by Architect.
- 17 E. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify  
18 surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to  
19 drain for trueness of slope and smoothness; use a sloped template.
- 20 1. Repair finished surfaces containing defects. Surface defects include spalls, popouts,  
21 honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate  
22 to reinforcement or completely through unreinforced sections regardless of width, and other  
23 objectionable conditions.
- 24 2. After concrete has cured at least 14 days, correct high areas by grinding.
- 25 3. Correct localized low areas during or immediately after completing surface finishing  
26 operations by cutting out low areas and replacing with patching mortar. Finish repaired  
27 areas to blend into adjacent concrete.
- 28 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment.  
29 Prepare, mix, and apply repair underlayment and primer according to manufacturer's written  
30 instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match  
31 adjacent floor elevations.
- 32 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low  
33 areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor  
34 elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's  
35 written instructions to produce a smooth, uniform, plane, and level surface.
- 36 6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter,  
37 by cutting out and replacing with fresh concrete. Remove defective areas with clean, square  
38 cuts and expose steel reinforcement with at least 3/4-inch clearance all around. Dampen  
39 concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching  
40 concrete of same materials and mix as original concrete except without coarse aggregate.  
41 Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner  
42 as adjacent concrete.
- 43 7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.  
44 Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose  
45 particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching  
46 mortar before bonding agent has dried. Compact patching mortar and finish to match  
47 adjacent concrete. Keep patched area continuously moist for at least 72 hours.

1    **3.16    CEMENT GROUT AND DRY-PACK**

2            A.        Cement Grout: Thoroughly mix sufficient quantities to avoid combining different batches of grout mix.  
3                            Ensure that grout completely fills all spaces and voids. Level, screed, or cut flush excess grout to  
4                            produce smooth, neat, even exposed surfaces.

5            B.        Dry-Pack: Thoroughly blend dry ingredients prior to mixing with water. Forcibly pack mixture to  
6                            complete fill voids and spaces.

7    **3.17    CLEANING**

8            A.        Clean exposed concrete to remove laitance, efflorescence and stains.

9    **END OF SECTION**

SECTION 03 35 43

POLISHED CONCRETE FINISHING

PART 1 – GENERAL

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- 1.3 [DEFINITIONS](#)
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PART 2 – PRODUCTS

- 2.1 [POLISHING \(CONC-2\)](#)
- 2.2 [LIQUID FLOOR TREATMENTS](#)
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PART 3 – EXECUTION

- 3.1 [EXAMINATION](#)
- 3.2 [SCHEDULE OF FINISHES](#)
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**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 finishing, including scoring, grouting and sealing.
- B. Related Sections:
  - 1. Section 01 81 13.14 "Sustainable Design Requirements" for submittal and product requirements.
  - 2. As placed horizontal concrete: Refer to Section 03 30 00 – Cast-In-Place 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.~~

~~(Addendum 4 dated 05 September 2023)~~

**1.4 ACTION SUBMITTALS**

- A. Product Data: Manufacturer's technical data, including Material Safety Data Sheet (MSDS) and installation instructions, for each product specified.
- B. LEED Submittals:
  - 1. Indoor Environmental Quality
    - a. Product Data for Credit IEQ 4.2: For interior field-applied traffic coatings, documentation including printed statement of VOC content.
- C. 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.

**1.5 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Minimum 10 years of documented experience producing the specified products.
- B. Installer Qualifications: Minimum 5 years of documented experience with work of similar scope and complexity required by this Project.
- C. Mockups: Build mockups 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. Mockup: Refer to Section 01 43 39 – Mockups for description of construction required to complete a mockup submittal for review.

- 1 2. Construct an 8 feet by 8 feet for each mockup at location indicated on the Drawings.
- 2 3. Provide individual mockups for each gloss level required.
- 3 a. Mock-up to demonstrated LVL 1 ground finish and LVL 2 honed
- 4 b. Existing Epoxy tie in to new Polished Concrete
- 5 c. Mock-up Finish: Unsealed concrete.
- 6 d. Mock-up Finish: Sealed concrete with non-slip additive.
- 7 4. Construct mockup using materials, processes, and techniques required for the work. Incorporate
- 8 representative scored joints according to Project requirements.
- 9 5. Mockup to be sealed by the Installer who will actually perform the work for the Project.
- 10 6. Notify Architect and Owner a minimum of seven calendar days in advance of the date scheduled
- 11 for each mockup construction.
- 12 7. Obtain the Architect's and Owner's acceptance of each mockup prior to commencement of the
- 13 work.
- 14 8. Each mockup to remain until completion of the work to serve as a quality control standard for the
- 15 work. Provide suitable protections to preclude damage to mockup.
- 16 9. Demonstrate curing, finishing, and protecting of polished concrete.
- 17 10. Test section shall be prepared and treated as specified to verify and approve the suitability of the
- 18 product for the intended purpose. The entire surface of the test section shall be inspected after
- 19 completion to verify and approve the adequacy of the wet and dry slip resistance.
- 20 11. Subject to compliance with requirements, approved mockups may become part of the completed
- 21 Work if undisturbed at time of Substantial Completion.

22 **1.6 PREINSTALLATION CONFERENCE**

- 23 A. Seven calendar days prior to scheduled date of installation, conduct a meeting at Project site to discuss
- 24 requirements, including application methods. Attendees to include Architect, Owner, Contractor, Installer,
- 25 and manufacturer's authorized field representative.

26 **PART 2 - PRODUCTS**

27 **2.1 POLISHING**

- 28 A. Polished New Placed Concrete (**CONC-1**):
- 29 1. LVL 1 ground finish or LVL 2 honed as required for a consistent finish.
  - 30 2. Level as approved by mock-up.
- 31 B. Polished Existing Concrete (**CONC-2**): Finish level as approved by mock-up.
- 32 1. LVL 1 ground finish or LVL 2 honed as required for a consistent finish.
  - 33 2. Level as approved by mock-up.

34 **2.2 LIQUID FLOOR TREATMENTS**

- 35 A. Chemically Reactive Liquid Floor Hardener: Clear, waterborne solution of inorganic silicate or silicate
- 36 materials and proprietary components; odorless; that penetrates, hardens, and is suitable for polished
- 37 concrete surfaces.
- 38 1. Product: Consolideck LS as manufactured by Prosoco
  - 39 2. Form: Clear, water-like liquid.
  - 40 3. pH: 11.0
  - 41 4. Active Content: 14.5 percent
  - 42 5. Total Solids: 14.5 percent
  - 43 6. VOC Content: 0 grams per Liter. Complies with all known national, state and district AIM VOC
  - 44 regulations.
  - 45 7. Flash Point: Not flammable
  - 46 8. Freeze Point: 32 degrees Fahrenheit (0 degrees Celsius)
  - 47

- 1 B. Liquid Floor Sealer: Clear, solvent solution of neat silane materials and proprietary components; that  
2 penetrates surface, and is suitable for polished concrete surfaces.  
3 1. Product: SLX100® Water & Oil Repellent <350 as manufactured by Prosoco  
4 2. Form: Clear liquid, slight solvent odor  
5 3. Specific Gravity: 0.913  
6 4. Active Content: 93 percent  
7 5. pH: not applicable  
8 6. Flash Point: 80 degrees F (27 degrees C) ASTM D 3278  
9 7. Freeze Point: less than -22 degrees F (less than -30 degrees C)  
10 8. VOC Content: Reactive Penetrating Sealer: maximum content is 350 grams per Liter.  
11 9. Alternate: Consolideck® PolishGuard as manufactured by Prosoco.  
12 C. Non-Slip Additive:  
13 1. Increte Systems SHUR-GRIP:  
14 a. Composition: Clear spherical polypropylene powder.  
15 b. Particle Size: 50 Mesh.  
16 c. Application: 8 fluid oz/ gallon of sealer.  
17 D. Liquid Floor Sealer: Copolymer lithium silicate hardener.  
18 1. Product: Consolideck® LSGuard as manufactured by Prosoco.  
19 2. Form: Opaque white liquid  
20 3. Specific Gravity: 1.08  
21 4. pH: 11.0  
22 5. Active Content: 22 percent  
23 6. Total Solids: 22 percent (ASTM D2369)  
24 7. VOC Content: less than 100 g/L. Complies with all known national, state and district AIM VOC  
25 regulations.  
26 8. Flash Point: greater than 212 degrees Fahrenheit (greater than 22 degrees Celsius) ASTM D3278  
27 9. Freeze Point: 32 degrees Fahrenheit (0 degrees Celsius)

28 **2.3 SCORED JOINT GROUT**

- 29 A. Sanded grout using liquid acrylic grout additive  
30 B. Sand-Portland Cement Grout: Consisting of white or gray cement and white or colored aggregate as  
31 required to produce color indicated.  
32 C. High-Performance Tile Grout: ANSI A118.7.  
33 1. Polymer Type: Acrylic resin or styrene-butadiene rubber in liquid-latex form for addition to  
34 prepackaged dry-grout mix.  
35 2. Grout Color: To be determined with mock-up construction.

36 **PART 3 - EXECUTION**

37 **3.1 EXAMINATION**

- 38 A. Examine areas and conditions under which the concrete work will be performed and identify conditions  
39 detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions  
40 have been corrected.  
41 B. Quality Control:  
42 1. Each batch of concrete shall comply with the approved design mix.  
43 2. Each batch shall be batched, transported, placed, finished and cured consistent with conditions  
44 documented for the approved mock-up.  
45 3. Each batch of concrete shall to be tested for finish quality and any non-compliance with the mock-  
46 up is to be reported to Architect.  
47 C. Interior Applications: Concrete substrates shall have a moisture vapor emission rate of less than 5  
48 lbs./1000 sq. ft. per 24 hour based on a 72 hour test period according to ASTM F 1869.

49 **3.2 SCHEDULE OF FINISHES**

- 50 A. Application: Toilet rooms, and food service areas.  
51 1. Finish: Sealed polished concrete with non-slip additive.  
52 B. Application: General areas scheduled for polished concrete.  
53 1. Finish: Unsealed polished concrete.  
54



- 1 **3.3 PREPARATION**
- 2 A. Surface Preparation:
- 3 1. The surface of the concrete shall be lightly mechanically abraded to remove weak cement paste
- 4 and contaminants. The final surface preparation should approximate a Concrete Surface Profile of
- 5 1, (CSP1 as designated by the International Concrete Repair Institute, Alexandria, Virginia).
- 6 Methods for mechanical abrasion include:
- 7 a. Pressure Washing: Use a pressure washer equipped with a fan tip and rated for a minimum
- 8 pressure capability of 4000 psi.
- 9 b. Scrubbing with a rotary floor machine with a brush.
- 10 c. Light sanding of the surface.
- 11 2. Rinse concrete substrates until rinse water is completely clean.
- 12 3. Surfaces shall be tested to receive sealer by spotting with water. Water should immediately darken
- 13 the substrate and be readily absorbed. If water beads and does not penetrate or only penetrates in
- 14 some areas, perform additional surface preparation and testing. On denser concrete floors, sand
- 15 lightly to open up surfaces. Retest and continue surface preparation until water spots immediately
- 16 darken and uniformly penetrate concrete surfaces.
- 17 **3.4 POLISHING**
- 18 A. Polished New Concrete: Finish level as approved by mock-up.
- 19 1. Class B - Fine aggregate (salt and pepper) Finish. (Fine aggregate exposure with little or no
- 20 medium aggregate at random locations).
- 21 2. Level: As approved by mock-up.
- 22 B. Apply polished concrete finish system to cured and prepared slabs to match accepted mockup.
- 23 1. Machine grind floor surfaces to receive polished finishes level and smooth.
- 24 a. Remove existing coatings (for thick coatings, use a 16- or 20-grit diamond abrasive or more
- 25 aggressive tool specifically for coating removal).
- 26 b. Seal cracks and joints with an epoxy or other semi-rigid filler.
- 27 c. Grind with a 30- or 40-grit metal-bonded diamond.
- 28 d. Grind with an 80-grit metal-bonded diamond.
- 29 e. Grind with a 150-grit metal-bonded diamond (or finer, if desired).
- 30 2. Apply a chemical hardener to densify the concrete.
- 31 3. Continue polishing with progressively finer-grit diamond polishing pads to gloss level, to match
- 32 approved mockup.
- 33 a. Polish with a 100- or 200-grit resin-bond diamond, or a combination of the two.
- 34 b. Polish with a 400-grit resin-bond diamond.
- 35 c. Polish with an 800-grit resin-bond diamond.
- 36 4. Control and dispose of waste products produced by grinding and polishing operations.
- 37 C. Scoring: Score decorative jointing in concrete surfaces 1/8 inch deep with diamond blades to match
- 38 pattern indicated. Rinse until water is clear.
- 39 1. Joint Width and Pattern: Refer to Drawings.
- 40 2. Grout joints.
- 41 3. Grout joints before sealing application.
- 42 **3.5 SEALING APPLICATION**
- 43 A. Apply sealer and non-slip additive according to manufacturer's printed instructions. Maintain a wet edge at
- 44 all times.
- 45 B. Allow sealer to completely dry before applying additional coats.
- 46 C. Apply second coat of sealer at 90 degrees to the direction of the first coat using the same application
- 47 method and rates.
- 48 D. Seal horizontal joints in areas subject to pedestrian traffic.

49 **END OF SECTION**

SECTION 07 54 23

THERMOPLASTIC-POLYOLEFIN (TPO) ROOFING

PART 1 – GENERAL

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- 1.2 SUMMARY
- 1.3 DEFINITIONS
- 1.4 SYSTEM DESCRIPTION (ROOF-1)
- 1.5 PREINSTALLATION MEETINGS
- 1.6 ACTION SUBMITTALS
- 1.7 INFORMATIONAL SUBMITTALS
- 1.8 CLOSEOUT SUBMITTALS
- 1.9 QUALITY ASSURANCE
- 1.10 DELIVERY, STORAGE, AND HANDLING
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PART 2 – PRODUCTS

- 2.1 MANUFACTURERS
- 2.2 PERFORMANCE REQUIREMENTS
- 2.3 THERMOPLASTIC POLYOLEFIN (TPO) ROOFING (TPO-1)
- 2.4 AUXILIARY ROOFING MATERIALS
- 2.5 ROOF INSULATION (INSUL-4)
- 2.6 SUBSTRATE BOARD (THERMAL BARRIER)
- 2.8 INSULATION ACCESSORIES

PART 3 – EXECUTION

- 3.1 EXAMINATION
- 3.2 PREPARATION
- 3.3 ROOFING INSTALLATION, GENERAL
- 3.4 SUBSTRATE BOARD INSTALLATION
- 3.5 INSULATION INSTALLATION
- 3.6 ADHERED MEMBRANE ROOFING INSTALLATION
- 3.7 BASE FLASHING INSTALLATION
- 3.8 FIELD QUALITY CONTROL
- 3.9 PROTECTING AND CLEANING

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. Adhered Thermoplastic-Polyolefin (TPO) Roofing (**ROOF-1**).
  - 2. Roof system application at PV system and rack on metal deck substrate.
  - 3. Cover board
  - 4. Roof insulation.
  - 5. Thermal barrier.
- B. Related Requirements:
  - 1. Section 01 81 13.14 "Sustainable Design Requirements" for submittal and product requirements.
  - 2. Section 06 10 00 "Rough Carpentry" for wood nailers, curbs, and blocking.
  - 3. Section 07 01 50.19 "Preparation for Reroofing" for protection of and repair of warranted existing roofing.
  - 4. Section 07 62 00 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings.
  - 5. Section 07 92 00 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.
  - 6. Section 22 14 23 "Storm Drainage Piping Specialties" for roof drains.
  - 7. Section 26 31 00 "Photovoltaic System Performance Requirements" for PV racking system.

1 **1.3 DEFINITIONS**

- 2 A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and  
3 Waterproofing Manual" apply to work of this Section.  
4 B. Sheet Metal Terminology and Techniques: SMACNA Architectural Sheet Metal Manual.

5 **1.4 SYSTEM DESCRIPTION (ROOF-1)**

- 6 A. Basis of Design: Roof system over steel structural deck is composed of two layers of Firestone ISO 95+  
7 GL fully adhered insulation over thermal barrier installed as an air barrier, one layer of Firestone ISOGARD  
8 HD cover board, Firestone fully adhered 60-mil UltraPly TPO - White. 20-year Firestone Warranty  
9 provided.  
10 B. Basis of Design: Roof system for work required and repair of existing warranted roof. Refer to Section  
11 070150.19 - Preparation for Reroofing.  
12 C. PV panels on racking system anchored to existing roof assembly where scheduled.

13 **1.5 PREINSTALLATION MEETINGS**

- 14 A. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site.  
15 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency  
16 representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and  
17 installers whose work interfaces with or affects roofing, including installers of roof accessories and  
18 roof-mounted equipment.  
19 2. Review methods and procedures related to roofing installation, including manufacturer's written  
20 instructions.  
21 3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel,  
22 equipment, and facilities needed to make progress and avoid delays.  
23 4. Examine deck substrate conditions and finishes for compliance with requirements, including  
24 flatness and fastening.  
25 5. Review structural loading limitations of roof deck during and after roofing.  
26 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs,  
27 and condition of other construction that affects roofing system.  
28 7. Review governing regulations and requirements for insurance and certificates if applicable.  
29 8. Review temporary protection requirements for roofing system during and after installation.  
30 9. Review roof observation and repair procedures after roofing installation.  
31 B. Preinstallation Roofing Conference: Conduct conference at Project site.  
32 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency  
33 representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and  
34 installers whose work interfaces with or affects roofing, including installers of roof accessories and  
35 roof-mounted equipment.  
36 2. Review methods and procedures related to roofing installation, including manufacturer's written  
37 instructions.  
38 3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel,  
39 equipment, and facilities needed to make progress and avoid delays.  
40 4. Examine deck substrate conditions and finishes for compliance with requirements, including  
41 flatness and fastening.  
42 5. Review structural loading limitations of roof deck during and after roofing.  
43 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs,  
44 and condition of other construction that affects roofing system.  
45 7. Review governing regulations and requirements for insurance and certificates if applicable.  
46 8. Review temporary protection requirements for roofing system during and after installation.  
47 9. Review roof observation and repair procedures after roofing installation.

48 **1.6 ACTION SUBMITTALS**

- 49 A. Product Data: For each type of product.  
50 B. LEED Submittals:  
51 1. Product Data for Credit IEQ 4.1: For adhesives and sealants used inside the weatherproofing  
52 system, documentation including printed statement of VOC content.  
53 2. Building Life-Cycle Impact Reduction Statement for insulation and membrane.  
54 3. Building Product Disclosures – EPDs 3rd party statement for insulation and membrane..

- 1 C. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other  
2 work, including:  
3 1. Base flashings and membrane terminations.  
4 2. Roof plan showing orientation of steel roof deck and orientation of roofing and fastening spacings  
5 and patterns for mechanically fastened roofing.  
6 3. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

7 **1.7 INFORMATIONAL SUBMITTALS**

- 8 A. Qualification Data: For Installer and manufacturer.  
9 B. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with  
10 requirements specified in "Performance Requirements" Article.  
11 1. Submit evidence of complying with performance requirements.  
12 C. Product Test Reports: For components of roofing system, tests performed by manufacturer and witnessed  
13 by a qualified testing agency.  
14 D. Research/Evaluation Reports: For components of roofing system, from ICC-ES.  
15 E. Product Test Reports: For components of roofing system, tests performed by manufacturer and witnessed  
16 by a qualified testing agency.  
17 F. Field quality-control reports.  
18 G. Sample Warranties: For manufacturer's special warranties.

19 **1.8 CLOSEOUT SUBMITTALS**

- 20 A. Maintenance Data: For roofing system to include in maintenance manuals.

21 **1.9 QUALITY ASSURANCE**

- 22 A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for roofing system identical to that  
23 used for this Project.  
24 B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system  
25 manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special  
26 warranty.

27 **1.10 DELIVERY, STORAGE, AND HANDLING**

- 28 A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with  
29 manufacturer's name, product brand name and type, date of manufacture, approval or listing agency  
30 markings, and directions for storing and mixing with other components.  
31 B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within  
32 the temperature range required by roofing system manufacturer. Protect stored liquid material from direct  
33 sunlight.  
34 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.  
35 C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture,  
36 soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written  
37 instructions for handling, storing, and protecting during installation.  
38 D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of  
39 deck.

40 **1.11 FIELD CONDITIONS**

- 41 A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit  
42 roofing system to be installed according to manufacturer's written instructions and warranty requirements.

43 **1.12 WARRANTY**

- 44 A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in  
45 materials or workmanship within specified warranty period.  
46 1. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, cover  
47 boards, roofing accessories, and other components of roofing system.

- 1           2.     Warranty shall cover damage to roof membrane by installation of approved plaza deck and PV
- 2                     array components.
- 3           3.     Warranty Period: 20 years NDL from date of Substantial Completion.

4     **PART 2 - PRODUCTS**

5     **2.1     MANUFACTURERS**

- 6       A.     Source Limitations: Obtain components including roof insulation fasteners for roofing system from same
- 7             manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.
- 8       B.     Basis-of-Design Product: Subject to compliance with requirements, provide Firestone Building Products

9     **2.2     PERFORMANCE REQUIREMENTS (ROOF -1)**

- 10    A.     General Performance: Installed roofing system and flashings shall withstand specified uplift pressures,
- 11             thermally induced movement, and exposure to weather without failure due to defective manufacture,
- 12             fabrication, installation, or other defects in construction. Roof system and flashings shall remain watertight.
- 13           1.     Accelerated Weathering: Roof membrane shall withstand 2000 hours of exposure when tested
- 14                     according to ASTM G152, ASTM G154, or ASTM G155.
- 15           2.     Impact Resistance: Roof membrane shall resist impact damage when tested according to
- 16                     ASTM D3746, ASTM D4272, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.
- 17    B.     Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials
- 18             under conditions of service and application required, as demonstrated by roof membrane manufacturer
- 19             based on testing and field experience.
- 20    C.     Roofing System Design: Tested by a qualified testing agency to resist the following uplift pressures:
- 21           1.     Corner Uplift Pressure: 120 lbf/sq. ft.
- 22           2.     Perimeter Uplift Pressure: 90 lbf/sq. ft.
- 23           3.     Field-of-Roof Uplift Pressure: 60 lbf/sq. ft.
- 24    D.     ENERGY STAR Listing: Roofing system shall be listed on the DOE's ENERGY STAR "Roof Products
- 25             Qualified Product List" for low-slope roof products.
- 26    E.     Energy Performance: Roofing system shall have a minimum three-year aged reflectance solar reflectance
- 27             of not less than 0.55 and an emissivity of not less than 0.75 when tested according to CRRC-1.
- 28    F.     Exterior Fire-Test Exposure: ASTM E108 or UL 790, Class A; for application and roof slopes indicated;
- 29             testing by a qualified testing agency. Identify products with appropriate markings of applicable testing
- 30             agency.

31    **2.3     THERMOPLASTIC POLYOLEFIN (TPO) ROOFING (TPO-1)**

- 32    A.     TPO Sheet: ASTM D6878/D6878M, internally fabric- or scrim-reinforced TPO sheet.
- 33           1.     Source Limitations: Obtain components for roofing system from roof membrane manufacturer or
- 34                     manufacturers approved by roof membrane manufacturer.
- 35           2.     Thickness: 60 mils (1.5 mm), nominal.
- 36           3.     Exposed Face Color: White.
- 37    B.     Recycling:
- 38           1.     Contractor shall divert all of the following materials from disposal at the landfill.
- 39               a.     Metals including edge metal, copings, counter flashings, expansion /control joint covers, and
- 40                     all non-contaminated metal pails.
- 41               b.     Plastics, including packaging materials, pails, and containers.
- 42               c.     Cardboard, including packaging materials and roll cores.
- 43               d.     Wood, including demolished nailers, demolished plywood, demolished wood plank decking,
- 44                     damaged pallets, and new wood or plywood scrap and pieces.
- 45           2.     Contractor shall package the debris as required by the recycler.
- 46           3.     Contractor shall transport the debris to approved recyclers.
- 47           4.     Pallets in a condition to be reused shall not be land filled.
- 48           5.     Metal or plastic pails and containers that are contaminated with adhesive, mastic, coatings, and
- 49                     similar materials are excluded.

- 1 **2.4 AUXILIARY ROOFING MATERIALS**
- 2 A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and  
3 compatible with other roofing components.
- 4 1. Adhesive and Sealants: Comply with VOC limits of authorities having jurisdiction.
- 5 B. Sheet Flashing: Manufacturer's standard unreinforced TPO sheet flashing, of same color as TPO sheet.
- 6 C. Prefabricated Flashings: As recommended by roof membrane manufacturer.
- 7 D. Bonding Adhesive: Manufacturer's standard, water based.
- 8 E. Slip Sheet: Manufacturer's standard, of thickness required for application.
- 9 F. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars,  
10 approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.
- 11 G. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance  
12 provisions in FM Approvals 4470, designed for fastening roofing components to substrate, and acceptable  
13 to roofing system manufacturer.
- 14 H. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings,  
15 preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and  
16 other accessories.
- 17 **2.5 ROOF INSULATION (INSUL-4)**
- 18 A. General: Preformed roof insulation boards manufactured or approved by EPDM roofing manufacturer,  
19 selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.
- 20 B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer  
21 on both major surfaces.
- 22 1. Basis-of-Design Product: Subject to compliance with requirements, provide Firestone Building  
23 Products Firestone ISO 95+ GL with fiberglass facer for fully adhered assembly or comparable  
24 product.
- 25 C. Polyisocyanurate Cover Board: ASTM C 1289, Type II, Class 1, Grade 3.
- 26 1. Basis-of-Design Product: Subject to compliance with requirements, provide Firestone Building  
27 Products ISOGARD HD or comparable product.
- 28 D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for  
29 sloping to drain. Fabricate to slopes indicated.
- 30 **2.6 SUBSTRATE BOARD (THERMAL BARRIER AT STEEL DECK) (SHTG-1)**
- 31 A. Substrate Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum board or  
32 ASTM C 1278/C 1278M, fiber-reinforced gypsum board.
- 33 1. Thickness: 1/2 inch (13 mm).
- 34 2. Surface Finish: Factory primed.
- 35 3. Products: Subject to compliance with requirements, provide one of the following:
- 36 a. CertainTeed Corporation; GlasRoc Sheathing Type X.
- 37 b. Georgia-Pacific Corporation; Dens Deck DuraGuard.
- 38 c. National Gypsum Company; Gold Bond eXP Extended Exposure Sheathing.
- 39 d. USG Corporation; Securock Glass Mat Roof Board.
- 40 B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance  
41 provisions in FM Approvals 4470, designed for fastening substrate panel to roof deck.
- 42 C. Sealant and Flashing Tape: Installation accessories to provide a continuous plane of air/vapor barrier.
- 43 D. Air Barrier Accessories: Tape, sealants and coated fabric to establish an air barrier at the top surface of  
44 the thermal barrier which is continuous with building AVB system.
- 45 **2.7 INSULATION ACCESSORIES**
- 46 A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and  
47 compatibility with other roofing system components.
- 48 B. Fasteners: Factory-coated steel fasteners with metal or plastic plates complying with corrosion-resistance  
49 provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and  
50 acceptable to roofing system manufacturer.
- 51 C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation  
52 to substrate or to another insulation layer as follows:
- 53 1. Full-spread, spray-applied, low-rise, two-component urethane adhesive.

- 1 D. Protection Mat: Woven or nonwoven polypropylene, polyolefin, or polyester fabric; water permeable and  
2 resistant to UV degradation; type and weight as recommended by roofing system manufacturer for  
3 application.

4 **PART 3 - EXECUTION**

5 **3.1 EXAMINATION**

- 6 A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and  
7 other conditions affecting performance of the Work.  
8 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain  
9 bodies are securely clamped in place.  
10 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations  
11 and terminations and that nailers match thicknesses of insulation.  
12 B. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in  
13 Section 053123 "Steel Roof Decking".  
14 C. Proceed with installation only after unsatisfactory conditions have been corrected.

15 **3.2 PREPARATION**

- 16 A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing system installation  
17 according to roofing system manufacturer's written instructions. Remove sharp projections.  
18 B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating  
19 onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is  
20 forecast.

21 **3.3 INSTALLATION OF ROOFING, GENERAL**

- 22 A. Install roofing system according to roofing system manufacturer's written instructions.  
23 B. Complete terminations and base flashings and provide temporary seals to prevent water from entering  
24 completed sections of roofing system at end of workday or when rain is forecast. Remove and discard  
25 temporary seals before beginning Work on adjoining roofing.  
26 C. Install roof membrane and auxiliary materials to tie in to existing roofing to maintain weathertightness of  
27 transition and to not void warranty for existing roofing system.

28 **3.4 SUBSTRATE BOARD INSTALLATION (STEEL DECK)**

- 29 A. Install underlayment board with long joints in continuous straight lines, with end joints staggered not less  
30 than 24 inches (610 mm) in adjacent rows.  
31 1. At steel roof decks, install underlayment board at right angle to flutes of deck.  
32 a. Locate end joints over crests of steel roof deck.  
33 2. Tightly butt substrate boards together.  
34 3. Cut substrate board to fit tight around penetrations and projections, and to fit tight to intersecting  
35 sloping roof decks.  
36 4. Fasten substrate board to top flanges of steel deck according to recommendations in FM Global  
37 Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification.  
38 5. Continuously seal side and end joints with tape.  
39 6. Completely seal substrate boards at terminations, obstructions, and penetrations to prevent air and  
40 moisture vapor movement into roofing system.

41 **3.5 INSULATION INSTALLATION**

- 42 A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left  
43 exposed at the end of the workday.  
44 B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.  
45 C. Install tapered insulation under area of roofing to conform to slopes indicated.  
46 D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is  
47 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints  
48 of previous layer a minimum of 6 inches in each direction.

- 1 E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not
- 2 restrict flow of water.
- 3 F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered
- 4 between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
- 5 1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
- 6 G. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered
- 7 between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover
- 8 boards together adhere to insulation.
- 9 1. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.
- 10 2. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and
- 11 maintaining insulation in place.
- 12 3. Set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing
- 13 and maintaining insulation in place.

14 **3.6 INSTALLATION OF ADHERED ROOFING**

- 15 A. Adhere roof membrane over area to receive roofing according to roofing system manufacturer's written
- 16 instructions.
- 17 B. Unroll roof membrane and allow to relax before installing.
- 18 C. Start installation of roofing in presence of roofing system manufacturer's technical personnel and Owner's
- 19 testing and inspection agency.
- 20 D. Accurately align roof membrane, and maintain uniform side and end laps of minimum dimensions required
- 21 by manufacturer. Stagger end laps.
- 22 E. Bonding Adhesive: Apply to substrate and underside of roof membrane at rate required by manufacturer,
- 23 and allow to partially dry before installing roof membrane. Do not apply to splice area of roof membrane.
- 24 F. In addition to adhering, mechanically fasten roof membrane securely at terminations, penetrations, and
- 25 perimeter of roofing.
- 26 G. Apply roof membrane with side laps shingled with slope of roof deck where possible.
- 27 H. Seams: Clean seam areas, overlap roof membrane, and hot-air weld side and end laps of roof membrane
- 28 and sheet flashings, to ensure a watertight seam installation.
- 29 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roof
- 30 membrane and sheet flashings.
- 31 2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
- 32 3. Repair tears, voids, and lapped seams in roof membrane that do not comply with requirements.
- 33 I. Spread sealant bed over deck-drain flange at roof drains, and securely seal roof membrane in place with
- 34 clamping ring.

35 **3.7 INSTALLATION OF BASE FLASHING**

- 36 A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing
- 37 system manufacturer's written instructions.
- 38 B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially
- 39 dry. Do not apply to seam area of flashing.
- 40 C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- 41 D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end
- 42 laps to ensure a watertight seam installation.
- 43 E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.
- 44 F. PV Rack Anchor Installation:
- 45 1. Prepare the roof surface by removing all loose debris and clean the area in accordance with the
- 46 roofing manufacture recommendations
- 47 2. Apply an approved Seam Slice Adhesive Primer to the roof membrane where the Double Sided Die
- 48 Cut Adhesive will be placed and allow to dry before continuing.
- 49 3. Peel back half of the release liner exposing the adhesive.
- 50 4. Carefully align the Double Side Die Cut Adhesive and place into the desired position. Do not stretch
- 51 or pull the adhesive.
- 52 5. Apply an approved Seam Slice Adhesive Primer to the underside of the U-Anchor 2400 Single Ply
- 53 cover and allow to dry before continuing.
- 54 6. Remove the top release liner and place into position.
- 55 7. Center and place the U-Anchor 2000 over the Double Sided Die Cut Adhesive avoiding wrinkles.
- 56 8. Using a weighted membrane roller firmly roll the entire surface of the U-Anchor membrane cover to
- 57 ensure a proper bond is achieved.





SECTION 09 67 23  
RESINOUS FLOORING

- 1  
2  
3 PART 1 – GENERAL  
4 [1.1 SUMMARY](#)  
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15 [2.3 SEALED CAST IN PLACE CONCRETE \(CONC-1\)](#)  
16 **(Addendum 4 dated 09/05/23)**  
17 PART 3 – EXECUTION  
18 [3.1 PREPARATION](#)  
19 [3.2 APPLICATION](#)

20 **PART 1 - GENERAL**

21 **1.1 SUMMARY**

- 22 A. Section includes:  
23 1. Resinous flooring systems (**EPOXY-1**).  
24 2. Concrete floor patch/sealer (**SL-1**).  
25 3. ~~Sealed cast in place concrete (**CONC-1**)~~

26 **(Addendum 4 dated 09/05/23)**

- 27 B. Related Requirements:  
28 1. Section 01 81 13.14 "Sustainable Design Requirements" for submittal and product requirements.  
29 2. Section 03 30 00 "Cast-in-Place Concrete" for concrete forming and finishing to receive resinous  
30 flooring.  
31 3. Section 03 35 43 "Polished Concrete Finishing" for sealer components as part of the floor polishing  
32 system.  
33 4. Section 09 91 23 "Interior Painting" for resinous floor painting of floor graphics.

34 **1.2 PREINSTALLATION MEETINGS**

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

36 **1.3 ACTION SUBMITTALS**

- 37 A. Product Data: For each type of product.  
38 B. Sustainability:  
39 1. Indoor Environmental Quality  
40 a. Product Data for Credit IEQ 4.2: For interior field-applied traffic coatings, documentation  
41 including printed statement of VOC content.  
42 C. Samples: For each type of exposed finish required.

43 **1.4 INFORMATIONAL SUBMITTALS**

- 44 A. Qualification Data: For Installer.  
45 1. Product Test Reports: Test data for traffic coating products and traffic coating system, by qualified  
46 testing agency, indicating proposed traffic coating meets performance requirements.  
47 2. Warranty: Sample of unexecuted manufacturer and installer special warranties.  
48 3. Field quality control reports.

49 **1.5 CLOSEOUT SUBMITTALS**

- 50 A. Maintenance data.

1 **1.6 MAINTENANCE MATERIAL SUBMITTALS**

- 2 A. Furnish extra materials, from the same product run, that match products installed and that are packaged  
3 with protective covering for storage and identified with labels describing contents.  
4 1. Refer to Section 01 78 43 - Spare Parts and Extra Materials for submittal procedures.  
5 2. CONC-1: Provide repair kit for 900 sq ft of each material and color applied.

6 **1.7 QUALITY ASSURANCE**

- 7 A. Installer Qualifications:  
8 1. Applicator regularly engaged, for a minimum of 5 years, in application of resinous flooring systems  
9 of similar type to that specified.  
10 2. Employ persons trained for application of resinous flooring systems.  
11 B. Mockups: Apply mockups of each coating system (COAT-#) system indicated and each color and finish  
12 selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic  
13 effects and set quality standards for materials and execution.  
14 1. Mockup: Refer to Section 01 43 39 – Mockups for description of construction required to complete  
15 a mockup submittal for review.  
16 2. Architect will select one surface to represent surfaces and conditions for application of each finish  
17 system.  
18 a. Existing EPOXY tie into new EPOXY-1.  
19 b. Epoxy system to demonstrate traffic coating pattern  
20 c. Other Items: Architect will designate items or areas required.  
21 3. Final approval of color selections will be based on mockups.  
22 a. If preliminary color selections are not approved, apply additional mockups of additional  
23 colors selected by Architect at no added cost to Owner.  
24 4. Approval of mockups does not constitute approval of deviations from the Contract Documents  
25 contained in mockups unless Architect specifically approves such deviations in writing.  
26 a. Retain subparagraph below if the intention is to make an exception to the default  
27 requirement in Section 01 40 00 "Quality Requirements" for demolishing and removing  
28 mockups.  
29 5. Subject to compliance with requirements, approved mockups may become part of the completed  
30 Work if undisturbed at time of Substantial Completion.

31 **1.8 FIELD CONDITIONS**

- 32 A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate  
33 temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring  
34 application.  
35 B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting  
36 conditions during resinous flooring application.  
37 C. Close spaces to traffic during resinous flooring application and for 24 hours after application unless  
38 manufacturer recommends a longer period.

39 **1.9 WARRANTY**

- 40 A. Manufacturer's Warranty: Manufacturer agrees to repair or replace traffic coating that fails in materials or  
41 workmanship within specified warranty period.  
42 1. Failures include, but are not limited to, the following:  
43 a. Adhesive or cohesive failures.  
44 b. Abrasion or tearing failures.  
45 c. Surface crazing or spalling.  
46 d. Intrusion of water, oils, gasoline, grease, salt, deicer chemicals, or acids into deck substrate.  
47 2. Warranty Period: Five years from date of Substantial Completion.

48 **PART 2 - PRODUCTS**

49 **2.1 RESINOUS FLOORING SYSTEM (EPOXY-1)**

- 50 A. Resinous Flooring System: Abrasion-, impact-, and chemical-resistant, aggregate-filled, and resin-based  
51 monolithic floor surfacing designed to produce a seamless floor and integral cove base where scheduled.  
52 B. Basis-of-Design Product: Subject to compliance with requirements, provide **Sherwin Williams Resufloor**  
53 **systems comparable to specified Tennant Flake DB. Tennant Coatings Incorporated products as**  
54 **manufactured by Sherwin Williams** or comparable product by one of the following:  
55 (Addendum 4 dated 09/05/23)

- 1 C. Manufacturers:
- 2 1. Advanced Polymer Technology Corporation.
- 3 2. BASF Corporation; Construction Systems.
- 4 3. Neogard; a division of Jones-Blair, Inc.
- 5 4. Tremco Incorporated.
- 6 D. Tennant Flake DB.
- 7 1. First Broadcast Coat with decorative vinyl flake (micro): Eco-MPE pigmented, 10-12 mils.
- 8 2. Second Broadcast Coat with decorative vinyl flake (micro): Eco-MPE, 15 mils.
- 9 3. Grout Coat: Eco-TCP, 15 mils.
- 10 4. Topcoat: Eco-TCP, 8 mils.
- 11 5. Color: As selected by Architect from manufacturer's full range.
- 12 E. Eco-MPE: A neutral, two-component, high solids epoxy.
- 13 1. Percent Solids, by weight (by volume), ASTM D1475, A + B: 95.45 (94.56).
- 14 2. Volatile Organic Compound-VOC, ASTM D3960, Mixed A + B: 0.41 lb./gal (49 g/L).
- 15 3. Abrasion Resistance, mg loss, Taber Abraser, C-17 Taber Abrasion Wheel, 1,000 gram load, 1,000
- 16 revolutions, ASTM D4060: 83.1.
- 17 4. Coefficient of Friction-COF, James Friction Tester, ASTM D2047: 0.59-0.62.
- 18 5. Adhesion to Concrete, ASTM D5441: 732 psi (4.48 MPa) concrete failed.
- 19 6. Adhesion to Concrete, ASTM D7234: 450 psi (3.10 MPa) concrete failed.
- 20 7. Compressive Strength, ASTM D695: 13,500 psi (93.079 MPa).
- 21 8. Tensile Strength, ASTM D2370: 8,000 psi (55.158 MPa).
- 22 9. Percent Elongation, ASTM D2370: 5.
- 23 10. Shore D Hardness, ASTM D2240: 80-85 @ 0 sec, 75-80 @ 15 sec.
- 24 F. Eco-TCP: A two-component, high solids, thick coat polyaspartic.
- 25 1. Percent Solids, by weight (by volume), ASTM D1475, A + B: 91.59 (91.47).
- 26 2. Volatile Organic Compounds-VOC, ASTM 3960: 0.30 lb./gal (37 g/L).
- 27 3. Abrasion Resistance, mg loss, Taber Abraser (CS-17 Taber Abrasion Wheel, 1,000 gram load,
- 28 1,000 revolutions), ASTM D4060: 43.
- 29 4. Wet Static Coefficient of Friction, BOT 3000, ANSI/NFSI B101.1: 0.99.
- 30 5. Resistance to Yellowing, As measured using ASTM D2244 after 1000 consecutive hours UV
- 31 exposure in QUV, ASTM G154, <20 increase of yellowing units (CIE Lab Δb
- 32 6. Tensile Strength, ASTM D2370: 6,913 psi (47.66 MPa).
- 33 7. Percent Elongation, ASTM D2370: 8.
- 34 8. Thermal Stability/Heat resistance, MIL-D-3134J Section 4.6.3: No slip/flow, softening or change in
- 35 appearance.
- 36 9. Water Absorption, 24-hour immersion, ASTM C413: 0.2 percent weight increase.
- 37 G. Decorative Flake: Water-based resin material, inorganic minerals, additives, integrally pigmented.
- 38 1. Shape: Random.
- 39 2. Size: Micro.
- 40 3. Surface Texture: Smooth.
- 41 4. Color: Selected by Architect.

## 42 2.2 CONCRETE FLOOR PATCH/ SEALER (SL-1).

- 43 A. Existing floor repair and finish:
- 44 B. **Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin Williams**
- 45 **Resufloor systems comparable to specified Tennant Eco-HF 250 and Eco-FPE. Tennant Coatings**
- 46 **Incorporated products as manufactured by Sherwin Williams or comparable product by one of the**
- 47 **following:**
- 48 C. **Manufacturers:**
- 49 1. **Advanced Polymer Technology Corporation.**
- 50 2. **BASF Corporation; Construction Systems.**
- 51 3. **Neogard; a division of Jones-Blair, Inc.**
- 52 4. **Tremco Incorporated.**

### 53 (Addendum 4 dated 09/05/23)

- 54 A. Patching:
- 55 1. Eco-HF 250: High-performance, three-component epoxy resurfacer designed for trowel-patching
- 56 potholes in concrete floors.
- 57 a. Abrasion Resistance, mg loss ASTM D4060\* 85 Taber Abraser.
- 58 b. Coefficient of Friction (COF) James Friction Tester ASTM D2047 >0.7.
- 59 c. Compressive Strength, psi (kPa) ASTM D695 15,000 (103,500).
- 60 d. Shore D Hardness ASTM D2240 80-85 @ 0 sec. 75-80 @ 15 sec
- 61 e. UV/Light Stability: Will turn yellow or amber over time.

- 1 f. VOC Compliance: Solvent-free; 0.0 VOC.
- 2 2. Eco-FPE: Three component, quick-setting epoxy resurfacers, is designed for trowel-patching small
- 3 cracks and holes in concrete floors.
- 4 a. Compressive Strength, psi (kPa) ASTM D695 >15,000 (103,500)
- 5 b. Shore D Hardness ASTM D2240 80-85 @ 0 sec 75-80 @ 15 sec
- 6 c. UV/Light Stability Will turn yellow or amber over time.
- 7 d. VOC Compliance: Solvent-free; 0.0 VOC.
- 8 B. Finish:
- 9 1. As selected by Architect from standard and custom colors. Intent is to match existing.
- 10 C. Sealing:
- 11 1. Eco-PT: Epoxy topcoat applied to patching products to provide a sealed traffic ready floor.
- 12 2. Complies with SCAQMD VOC regulations--<100 g/L.
- 13 3. Application Thickness, wet mils [mm] - 5-8 (0.13-0.20 mils) per coat. One coat.

14 ~~2.3 SEALED CAST IN PLACE CONCRETE (CONC 4):~~

- 15 ~~A. Finish: Eco-PT: Epoxy topcoat used over primer and build coat to provide a sealed traffic ready floor.~~
- 16 ~~Application Thickness, wet mils [mm] - 5-8 (0.13-0.20 mils) per coat. One coat.~~
- 17 ~~B. Primer: Eco-MPE. 3 mils (0.08 mm) wet/dry film. One coat.~~
- 18 ~~C. Build Coat: Eco-MPE. 10 mils (0.25 mm) wet/dry film. One coat.~~

19 (Addendum 4 dated 09/05/23)

20 **PART 3 - EXECUTION**

21 **3.1 PREPARATION**

- 22 A. Prepare and clean substrates according to resinous flooring manufacturer's written instructions for
- 23 substrate indicated. Provide clean, dry substrate for resinous flooring application.
- 24 B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing
- 25 compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous
- 26 flooring.
- 27 1. Roughen concrete substrates as follows:
- 28 a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the
- 29 dispensed shot within the apparatus, and recirculates the shot by vacuum pickup. Steel shot
- 30 blast concrete to a minimum surface profile of ICRI 310.2R, CSP 5.
- 31 b. Comply with ASTM C 811 requirements unless manufacturer's written instructions are more
- 32 stringent.
- 33 2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written
- 34 instructions.
- 35 3. Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels
- 36 according to manufacturer's written instructions.
- 37 4. Alkalinity and Adhesion Testing: Verify that concrete substrates have pH within acceptable range.
- 38 Perform tests recommended by manufacturer. Proceed with application only after substrates pass
- 39 testing.
- 40 C. Patching and Filling: Use patching and fill material to fill holes and depressions in substrates according to
- 41 manufacturer's written instructions.
- 42 D. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's
- 43 written instructions.

44 **3.2 APPLICATION**

- 45 A. Apply components of resinous flooring system according to manufacturer's written instructions to produce
- 46 a uniform, monolithic wearing surface of thickness indicated.
- 47 1. Expansion and Isolation Joint Treatment: At substrate expansion and isolation joints, comply with
- 48 resinous flooring manufacturer's written instructions.
- 49 B. Primer: Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- 50 C. Integral Cove Base (where scheduled – refer to drawings): Apply cove base mix to wall surfaces before
- 51 applying flooring. Apply according to manufacturer's written instructions. Round internal and external
- 52 corners.
- 53 1. Integral Cove Base: 4 inches high.
- 54 D. Troweled or Screeded Body Coats: Apply troweled or screeded body coats in thickness indicated for
- 55 flooring system. Hand or power trowel and grout to fill voids. When body coats are cured, remove trowel
- 56 marks and roughness using method recommended by manufacturer.



SECTION 11 13 19

STATIONARY LOADING DOCK EQUIPMENT

PART 1 – GENERAL

[1.1 RELATED DOCUMENTS](#)

[1.2 SUMMARY](#)

[1.3 PREINSTALLATION MEETINGS](#)

[1.4 DEFINITIONS](#)

[1.5 SUBMITTALS](#)

PART 2 – PRODUCTS

[2.1 PERFORMANCE REQUIREMENTS](#)

[2.2 RECESSED SCISSOR LIFT \(LIFT-1\)](#)

PART 3 – EXECUTION

[3.1 EXAMINATION](#)

[3.2 PREPARATION](#)

[3.3 INSTALLATION](#)

**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. Recessed SCISSOR LIFT provided and installed by Owner (LIFT-1).~~

2. **Recessed SCISSOR LIFT provided by Owner and installed by Contractor (LIFT-1).**

**(Addendum 2 dated 08/31/2023)**

3. Owner to provide lift manufacturer's "bumper post" to be installed by Contractor **(BOLL-1)**

4. Light-communication systems.

**1.3 PREINSTALLATION MEETINGS**

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

1. Inspect and discuss electrical roughing-in, equipment bases, and other preparatory work specified elsewhere.

**1.4 DEFINITIONS**

- A. Operating Range: Maximum amount of travel above and below the loading dock level.

B. Working Range: Recommended amount of travel above and below the loading dock level for which loading and unloading operations can take place.

**1.5 SUBMITTALS**

- A. Product and Shop Drawing information provided by Owner to Contractor for rough-in and pit construction.

B. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for stationary loading dock equipment.

2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

C. Shop Drawings: For stationary loading dock equipment.

1. Include plans, elevations, sections, details, and attachments to other work.

2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of anchors and field connection.

D. Light-Communication Systems:

1. Product Data.

2. Shop Drawings.

3. Include diagrams for power, signal, and control wiring.

1 **PART 2 - PRODUCTS**

2 **2.1 PERFORMANCE REQUIREMENTS**

- 3 A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a  
4 qualified testing agency, and marked for intended location and application.

5 **2.2 RECESSED SCISSOR LIFT (LIFT-1)**

- 6 A. General: Recessed, hinged-lip-type dock levelers designed for permanent installation in concrete pits  
7 preformed in the edge of loading platform; of type, function, operation, capacity, size, and construction  
8 indicated; and complete with controls, safety devices, and accessories required.

9 B. Platform:

- 10 1. Platform Size: As indicated on Drawings.  
11 2. Frame: Clean-pit type, designed to support leveler at sides of pit, with no supports at front of pit  
12 floor.  
13 3. Owner to provide lift manufacturer's "bumper post" (**BOLL-1**) to be installed by Contractor.

14 **PART 3 - EXECUTION**

15 **3.1 EXAMINATION**

- 16 A. Examine areas and conditions, with Installer present, for compliance with requirements for installation  
17 tolerances and other conditions affecting performance of the Work.  
18 B. Examine roughing-in for electrical systems for loading dock equipment to verify actual locations of  
19 connections before equipment installation.  
20 C. Examine walls and floors of pits for suitable conditions where recessed loading dock equipment is to be  
21 installed. Pits shall be plumb and square and properly sloped for drainage from back to front of loading  
22 dock.  
23 D. Proceed with installation only after unsatisfactory conditions have been corrected.

24 **3.2 PREPARATION**

- 25 A. Coordinate size and location of loading dock equipment indicated to be attached to or recessed into  
26 concrete or masonry, and furnish anchoring devices with templates, diagrams, and instructions for their  
27 installation.  
28 B. Clean recessed pits of debris.

29 **3.3 INSTALLATION**

- 30 A. General: Install loading dock equipment as required for a complete installation.  
31 1. Rough-in electrical connections.

32 **END OF SECTION**



SECTION 22 13 65

RAINWATER HARVESTING SYSTEM FOR NON-POTABLE TOILET SUPPLY

PART 1 – GENERAL

[1.1 SUMMARY](#)

[1.2 PROCESS OVERVIEW](#)

[1.3 SUBMITTALS](#)

[1.4 DELIVERY, STORAGE, AND HANDLING](#)

PART 2 – PRODUCTS

[2.1 MANUFACTURERS](#)

[2.2 HYDRAULIC FILTER](#)

[2.3 MAIN STORAGE CISTERNS](#)

[2.4 RAINWATER TRANSFER TO PROCESSING SKID](#)

[2.5 FINAL FILTRATION](#)

[2.6 UV SANITATION SYSTEM](#)

[2.7 DAY TANK](#)

[2.8 MUNICIPAL MAKE-UP SYSTEM](#)

[2.9 BLADDER TANK](#)

[2.10 PROCESSING SKID](#)

[2.11 REPRESSURIZATION PUMPS](#)

[2.12 CHLORINE INJECTION SYSTEM](#)

[2.13 OTHER COMPONENTS](#)

[2.14 RAINWATER CONTROL SYSTEM](#)

[2.15 BUILDING-AUTOMATION-SYSTEM INTERFACE](#)

PART 3 – EXECUTION

[3.1 INSTALLATION & TESTING](#)

[3.2 OPERATIONS & MAINTENANCE TRAINING](#)

[3.3 WARRANTY](#)

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Work Included: Furnish and install a complete rainwater harvesting system. The system shall be designed to automatically collect rainwater roof runoff. The water shall be treated and used for toilet flushing.
- B. System shall contain all components necessary to process, store and pressurize the harvested water including, but not limited to:
  - 1. Cascade Pre-Filtration
  - 2. Main Storage Tanks
  - 3. Treatment Pump
  - 4. Final Filtration System
  - 5. UV Sanitation System
  - 6. Municipal Make-Up System
  - 7. Pressurization Pumps
  - 8. Residual Chlorine System
  - 9. Bladder Tank
  - 10. Rainwater Control System
- C. Related Requirements:
  - 1. Section 01 81 13.14 "Sustainable Design Requirements" for submittal and product requirements.

**1.2 PROCESS OVERVIEW**

- A. Rainwater Collection: Rainwater shall be collected from a total 31,000 square feet of rooftop and pre-filtered through a hydraulic-jump filter. After pre-filtration, rainwater will enter the first of two 6,500-gallon HDPE tanks ganged together to provide a total of nearly 13,000-gallons of rainwater storage. Water from the second tank shall be drawn through a floating filter in the tank via a flooded suction pump and conveyed

1 through the Wahaso RW-UV25-500 processing equipment (final filtration and sterilization) to a Processed  
2 Water Holding Tank. Processed water shall then be pressurized to non-potable lines serving toilets in the  
3 building. A chlorine injection system provides a small amount of disinfectant residual to protect water quality  
4 down steam. All processing equipment will be skid-mounted and located in a utility area. All system functions  
5 and tracking shall be operated by Wahaso WCS 200 control system, located in the utility area. The system  
6 shall automatically add municipal water when the cistern is empty or any critical operational issue is  
7 encountered.

8 B. Filtration:

- 9 1. The captured water will be pre-filtered through a cascade hydraulic jump filter that will screen out all  
10 particulates larger than 90 microns at a rate up to 240 GPM. Sediment and other suspended solids  
11 are flushed out during higher rain flow events.

12 C. Water Storage, Monitoring, and Control:

- 13 1. Harvested water shall be stored in two 6,500-gallon black HDPE tanks ganged together to provide a  
14 total of nearly 13,000-gallons.

15 D. Water Transfer:

- 16 1. A 25-GPM flooded suction pump on the treatment skid shall send water from the cisterns through the  
17 water treatment system and into the Processed Water Holding Tank (PWHT).

18 E. Water Treatment:

- 19 1. Wahaso RW-UV30-500 system shall provide two-stage mechanical filtration and sanitation via U.V.

20 F. Processed Water Holding Tank

- 21 1. Processed water shall be held in a 500-gallon polyethylene tank and include a make-up system and  
22 recirculation through sanitation system to maintain water quality.

23 G. Pressurization

- 24 1. Skid-mounted duplex pumps shall provide required pressurization of 40 GPM @ 35 PSI,

25 H. System Monitoring and Control:

- 26 1. A master control system shall be included to monitor and data log system operational parameters.  
27 The control system shall control tank level and equipment operation per custom software and shall  
28 provide alarms to the Building Automation System.  
29 2. A Visual Display shall interface with the control system and additional communication software shall  
30 interface with the Building Automation System.  
31 3. All control panels shall be NEMA 12 and UL Listed.

- 32 I. All system components shall be skid mounted and pre-plumbed, wired, and tested prior to shipment. Vendor  
33 shall provide on-site supervision support, operations manual, and operator training for building maintenance  
34 staff.

35 **1.3 SUBMITTALS**

- 36 A. Provide all submittals, including the following, as specified in Division 1.

- 37 B. Contractor's Drawings: Submit shop drawings, including arrangement and erection drawings of the water  
38 harvesting equipment and control equipment; installation templates; schematic control diagrams, electrical  
39 connection diagrams, and complete description of the control system.

- 40 C. Quality Control Submittals: Submit the following:

- 41 1. Manufacturer's certified performance and material records as specified.

- 42 D. Operation and Maintenance Manuals: Submit Operation and Maintenance (O&M) instructions for the water  
43 harvesting equipment.

44 **1.4 DELIVERY, STORAGE, AND HANDLING**

- 45 A. Deliver, store, and handle all water harvesting equipment as specified in Division 1 and as follows:

- 46 1. Protect all electrical equipment from the weather during transit and storage by suitable means,  
47 including shrink wrapping or hand wrapping and taping.  
48 2. Equipment Skids shall be suitably packaged in crates for safe transit and storage on site in advance  
49 of installation.  
50 3. Installation Manual shall be provided with equipment and separate from O & M manuals.

51 **PART 2 - PRODUCTS**

- 1 **2.1 MANUFACTURERS**
- 2 A. All water harvesting equipment shall be provided by the Contractor through a single vendor with a minimum of
- 3 five years of experience in building similar systems;
- 4 B. Basis-of-Design Product: Subject to compliance with requirements, provide Water Harvesting Solutions
- 5 (WAHASO) or comparable product by one of the following:
- 6 1. Highdro® Rainwater Harvesting Systems as engineered and manufactured by Highland Tank.
- 7 2. Approved Equal. **3. RMS Rainwater Management Solutions (Added Addendum 4 dated 09/05/2023)**
- 8 C. Delegated Design: Vendor shall engage a qualified professional engineer, as defined in Section 014000
- 9 "Quality Requirements," to design the rainwater harvesting system and its integration into the building
- 10 plumbing system.
- 11 1. Acceptable component manufacturers are listed below. Other manufacturers of equivalent products shall
- 12 be submitted for approval.
- 13 D. The Contractor, through the vendor, shall have the responsibility of matching all components and providing a
- 14 fully functional system.
  
- 15 **2.2 HYDRAULIC FILTER**
- 16 A. General: Provide a filter. Filter to be suitable for in tank or external applications. Body to be injection molded
- 17 with a 12-inch inlet, 8-inch filtered outlet and 12-inch bypass for high flows. The self-cleaning action from
- 18 the turbulent hydraulic jump reduces maintenance requirements. Average efficiency to be 98%.
- 19 B. Filter(s) must be designed to meet the flow rate that will allow debris and sediment to be captured in order
- 20 to keep the cistern clean. This is imperative for the proper function of the downstream equipment.
- 21 C. Capacity and Characteristics:
- 22 1. Filtered Flow Rate: Up to 240 GPM for 100% capture
- 23 2. High Flow Bypass Rate (Max): 1674 GPM
- 24 3. Filtration: 800-micron
- 25 4. Inlet: 12 inches
- 26 5. Treated Water Outlet: 8 inches
- 27 6. Bypass Outlet: 12 inches
- 28 7. Quantity: 1
- 29 D. Approved Manufacturer: PURAIN DN 300 or approved equal.
- 30

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1     **2.3     MAIN STORAGE CISTERNS**

- 2     A.     General: Main storage cistern shall be capable of holding up to 13,000 gallons (1,740 ft<sup>3</sup>) and will be
- 3             provided by the manufacturer. Two 6,500-gallon HDPE flat-bottom tanks shall be ganged together to achieve
- 4             the total storage capacity. Each tank to be 153" tall and 120" in diameter and black in color.
- 5     B.     Tank Fittings
- 6             1.     18" Manway
- 7             2.     8" Filtered Water Inlet in Tank A with 8" Smoothing Inlet
- 8             3.     8" Equalization Fittings at Base of Tank A & B
- 9             4.     8" Fittings at Top of Tank A & B for Overflow to Storm System
- 10            5.     4" Fittings for U-Vent
- 11            6.     2" Fitting at base of Tank B to Transfer Pump.
- 12            7.     2" Fitting at top of Tank B for Level Sensor

13    **2.4     RAINWATER TRANSFER TO PROCESSING SKID**

- 14    A.     General: A submersible transfer pump shall be provided and located in the cistern. Pump will transfer water
- 15             through the processing skid and to the day tank.
- 16    B.     Capacity and Characteristics:
- 17             1.     Water Transfer Pump Capacity: 25 GPM @ 35 PSI
- 18             2.     Number of Pumps: One
- 19             3.     Discharge Pipe Size: 2-inch FNPT.
- 20             4.     Motor Horsepower: 1.0
- 21             5.     Electrical Characteristics:
- 22                 a.     Volts: 460
- 23                 b.     Phases: 3
- 24                 c.     Hertz: 60
- 25    C.     Manufacturer: Grundfos CM Series or approved equal.

26    **2.5     FINAL FILTRATION**

- 27    A.     General: Wahaso RW-UV25-250 treatment skid shall provide a two-step filtration system containing a
- 28             mechanical self-cleaning and bag filters mounted on the processing skid.
- 29    B.     **Mechanical Filter:** Filter to include 20 second backflush cycle that is activated by differential pressure or
- 30             time-based duration. Filter to screen to 50 microns. Requires 2" drain line to sewer system for effluent (by
- 31             others).
- 32    C.     Approved Manufacturer: Tekleen or approved equal.
- 33    D.     Bag Filter: Provide Bag Filter Final Filtration, 5 micron: HDPE housing and 5 µ filter bag. Differential
- 34             pressure sensor to alert Rainwater Control System when bag requires changing.
- 35    E.     Approved Manufacturer: Pentair 420 Series or approved equal.
- 36    F.     Both filters shall be mounted to Wahaso processing skid.

37    **2.6     UV SANITATION SYSTEM**

- 38    A.     General: Provide a UV sanitation system mounted on common skid with all plumbing and electrical
- 39             connections pre-fabricated prior to delivery. Includes alarms for UV malfunction and automatic changeover
- 40             to domestic water in the event of such malfunction.
- 41    B.     Design: The Wahaso UV Sanitation System, shall be in compliance with the following design criteria:
- 42             1.     System shall be capable of sanitizing water at a rate of 25 GPM
- 43             2.     All materials shall be non-corrosive.
- 44             3.     Electrical Requirements: 120V single phase, 60 Hz
- 45    C.     A recirculation pump shall move water stored in the PWHT past the UV system to maintain sanitation of
- 46             treated water. Grundfos CM Series 1 HP 30 GPM @ 20 PSI
- 47    D.     Mounted to Wahaso processing skid.
- 48    E.     Manufacturer: Viqua Pro 30 series.

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1 **2.7 DAY TANK**

- 2 A. Provide skid-mounted Processed Water Holding Tank, (Day Tank), as described below.
- 3 B. Provide a 550 Gallon, (2,080 liters), 48" diameter x 75", high flat bottom closed top High Density Polyethylene
- 4 Tank. Tank designed for water with a specific gravity of 1.9. Include an 18" manway with a screw-on lid and
- 5 the following fittings:
- 6 a. 2-inch threaded half-coupling for level sensor
- 7 b. 2-inch threaded half-coupling for treated water inlet at top
- 8 c. 2-inch threaded half-coupling for vent
- 9 d. 3-inch inlet and fittings for air-gap funnel
- 10 e. 2-inch flanged outlet for water out to re-pressurization pumps
- 11 f. 1-1/2-inch threaded half-coupling for service drain.
- 12 C. All fittings shall be thermal plastic welded to tank with triple bead welds.
- 13 D. Mounted to Wahaso processing skid.

14 **2.8 MUNICIPAL MAKE-UP SYSTEM**

- 15 A. General: System shall include a method to automatically add water from the municipal water supply to the
- 16 PWHT when the cistern is empty or a critical function of the treatment system fails. The Rainwater Control
- 17 System shall monitor water levels in the cistern and PWHT and critical functions and add municipal make-
- 18 up as needed to maintain a minimum level in the PWHT.
- 19 B. Municipal water from a 2" line addition shall be regulated by a solenoid valve through an air gap funnel at
- 20 the top of the PWHT.
- 21 C. Valve to be 2" brass body 115VAC normally closed solenoid valve rated for 100% duty cycle.
- 22 D. Approved Manufacturer: Burkert 5282 or equal.

23 **2.9 BLADDER TANK**

- 24 A. General: Provide a diaphragm-type expansion tank to repressurization system to accept and hold
- 25 pressurized water from the repressurization pumps. The tank shall maintain minimum operating pressure
- 26 necessary to provide harvested water to the irrigation system.
- 27 B. Furnish and install a 52.0-gallon pre-charged vertical steel expansion tank with integral, heavy duty butyl
- 28 blend diaphragm and lined dome as part of the repressurization system. The tank shall have a 1" NPTF
- 29 system connection, and a 0.302"-32 charging valve connection to facilitate on-site charging of the tank to
- 30 meet system requirements.
- 31 C. Air and water connections shall be brazed to the tank and each tank shall be equipped with an outlet
- 32 pressure gauge.
- 33 D. Manufacturer: AA Tank or approved equal.

34 **2.10 PROCESSING SKID**

- 35 A. Filtration components, sanitation components and controls shall be mounted on a high-density polyethylene
- 36 skid. Skid shall be constructed of 3/4" HDPE with internal rib supports and side skirts with fork lift access on
- 37 all 4 sides. All piping to be Schedule 80 PVC.

38 **2.11 REPRESSURIZATION PUMPS**

- 39 A. General: Duplex Pumps shall convey water from the PWHT to the non-potable supply lines to toilets in the
- 40 facility. Repressurization shall each include two (2) cast iron and 304SS construction pumps with Variable
- 41 speed pressure booster pumping system controls and ANSI 150 Flanged Suction and Discharge Fittings.
- 42 Pumps shall be multistage design. Supply voltage shall be 460 VAC 3 phase.
- 43 1. Each pump shall be capable of producing 40 GPM @35 PSI.
- 44 2. Control Panel shall include Alarm Package, Run/Fault lights. System to run on lead-lag configuration.
- 45 3. Other controls shall include Variable Speed Drives with controls and interface to RWCS Main Panel
- 46 and BAS System. Hydro-pneumatic diaphragm surge tank shall be included.
- 47 4. All pumps shall be pre-plumbed, pre-wired and tested prior to shipment.
- 48

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- 1 B. Capacity and Characteristics:
- 2 1. System Capacity: 40 GPM @ 35 PSI
- 3 2. Number of Pumps: Two
- 4 3. Discharge Pipe Size: 2-inch FNPT
- 5 4. Motor Horsepower: 3.0
- 6 5. Electrical Characteristics:
- 7 a. Volts: 460
- 8 b. Phases: 3
- 9 c. Hertz: 60
- 10 C. Mounted to Wahaso processing skid.
- 11 D. Approved manufacturer: Grundfos CR Series or approved equal.

12 **2.12 CHLORINE INJECTION SYSTEM**

- 13 A. A small amount of liquid chlorine shall be injected into the pressurized non-potable outlet to maintain a low-
- 14 level residual at the toilet fixtures
- 15 B. System shall pump liquid chlorine from a 5-gallon or 50-gallon container (supplied locally) at an adjustable,
- 16 metered rate. At the point of injection, a Venturi mixer shall thoroughly mix the chlorine with the pressurized
- 17 stream.

18 **2.13 OTHER COMPONENTS**

- 19 A. Cistern Level Sensors: Provide stainless steel submersible pressure transmitter length to suit cistern depth.
- 20 Install sensor in 1-1/2 inch PVC, schedule 80 pipe open at bottom. *Flowline Delta Span LD-32 or equal.*
- 21 B. Flow Meters: Provide paddlewheel flow meter for harvested water used and municipal water used. Meter to
- 22 have digital mA output, low flow capability, polypropylene body. *Signet or approved equal.*

23 **2.14 RAINWATER CONTROL SYSTEM**

- 24 A. General: Provide Rainwater Control system with monitor to control Supply Tank levels, Pumps and Valves.
- 25 System to include Wahaso Series 20 Control Logic Software as described below.
- 26 1. Specific Operating Data and alarm conditions as required by the Building Automatic System (BAS)
- 27 shall be provided through MODBUS communication protocol as specified by the Engineer. Bacnet
- 28 available at additional cost.
- 29 2. A Touch Screen Display shall allow pages of system information to be displayed and levels of security
- 30 by specific security code access will allow operators and management to change system operating
- 31 parameters. Touch Screen Display shall be capable of remote viewing through network connection.
- 32 3. All Controls to be housed in a NEMA 12 UL Listed Enclosure.
- 33 B. Data Input Points shall include:
- 34 1. Differential Pressure - Bag Filtration
- 35 2. Main Storage Tank Level
- 36 3. Discharge Pressure - Pump
- 37 4. Municipal Water Valve Position
- 38 5. UV Light Bulb Usage (hours)
- 39 6. Chlorine Supply Low Level Alert
- 40 7. Motor fault alarms – all drive motors
- 41 8. Hours run monitor – all drive motors and filters
- 42 9. Manual-Off-Auto Control Switches for all drives and automatic valves
- 43 10. Emergency Stop
- 44 C. Control Output Points shall include:
- 45 1. Municipal Valve – Open/Close
- 46 2. Pump - Run
- 47 3. BAS Mod-Bus Interface Communications
- 48 D. Data Log: Process Controller shall function as a datalogger to log the following parameters:
- 49 1. Monthly and Year to Date Rainwater Harvested
- 50 2. Tank Volume in Gallon Units for Main Storage Tank
- 51 3. Volume of Harvested Water sent to Toilet Fixtures
- 52 4. Volume of Municipal Make Up required

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- 1           5.     Hours run for all pump motors
- 2           6.     Automatic pump alternation
- 3           7.     Flow rates, pressure outputs and alarms on pumps
- 4           8.     Historical Log of Alarm History
- 5     E.     Touch Screen: The Process Controller shall communicate with the Touch Screen. The Touch Screen shall
- 6           be security level protected and programmed to display overall system operations, alarm states, maintenance
- 7           instructions and logged data. The Touch Screen shall be a 7" full-color display and shall include graphics
- 8           to show the following:
- 9           1.     Water Level in cistern and PWHT
- 10          2.     Pump Discharge Pressure
- 11          3.     Green/Red indicator for Valve Open or Valve Closed Position for all automatic valves
- 12          4.     Green/Red indicator for pump run status
- 13          5.     UV Light Bulb Usage
- 14          6.     Low Chlorine Level Alert
- 15          7.     Alarm Condition Alerts
- 16          8.     Separate Pages for information on each major component accessed by pressing the touch screen
- 17                 on that item
- 18          9.     Separate Page for Alarms History
- 19          10.    Separate Page for Data Logged for required parameters.
- 20          11.    Security accessed pages for maintenance information
- 21          12.    Security accessed pages for changing critical set points
- 22     F.     Manufacturer: Wahaso WCS-200 or approved equal.

23     **2.15     BUILDING-AUTOMATION-SYSTEM INTERFACE**

- 24     A.     The following data information shall be available to the Building Automation System through the Wahaso
- 25           control system with MODBUS protocol. Bacnet available at additional cost.
- 26           1.     Main Storage Tank Volume level in Gallons
- 27           2.     Differential Pressures of Bag Filter
- 28           3.     Condition - Alarms
- 29           4.     Discharge Pressure of Repressurization Pump
- 30           5.     UV Light Bulb Usage
- 31           6.     Status of UV System, normal or alarm
- 32           7.     Low Chlorine Level Alert
- 33           8.     Other information that shall be available includes:
- 34                 a.     Hours Run for all motors.
- 35                 b.     Volume of Municipal Water required for make up
- 36                 c.     Data logging for daily water harvested
- 37                 d.     Maintenance Alerts for filters

38     **PART 3 - EXECUTION**

39     **3.1     INSTALLATION & TESTING**

- 40     A.     Install all rainwater harvesting equipment in accordance with manufacturer's recommendations and
- 41           approved shop drawings as specified in Division 1.
- 42     B.     Piping and Accessories: Install all piping connections and accessories, as specified or shown on Contract
- 43           Drawings, in accordance with respective manufacturer's recommendations.
- 44     C.     Manufacturer's Service Representative: Provide services of qualified representative or vendor to inspect
- 45           installation, make any necessary adjustments, test equipment, and instruct operating personnel in operation
- 46           and maintenance of water harvesting equipment.

47     **3.2     OPERATIONS & MAINTENANCE TRAINING**





**SECTION 236313**

**AIR-COOLED REFRIGERANT CONDENSERS**

- 1
- 2
- 3
- 4 PART 1 - GENERAL
- 5 1.1 SYSTEM DESCRIPTION
- 6 1.2 SYSTEM DESCRIPTON
- 7 1.3 ACTION SUBMITTALS
- 8 1.4 QUALITY ASSURANCE
- 9 1.5 COORDINATION
- 10 1.6 DELIVERY, STORAGE AND HANDLING
- 11 1.7 **WARRANTY: (Addendum 4 dated 05 September 23)**
- 12 PART 2 - PRODUCTS
- 13 2.1 MANUFACTURERS
- 14 2.2 EQUIPMENT
- 15 PART 3 - EXECUTION
- 16 3.1 EXAMINATION
- 17 3.2 INSTALLATION
- 18 3.3 CONNECTIONS
- 19 3.4 FIELD QUALITY CONTROL
- 20 3.5 STARTUP SERVICE
- 21 3.6 DEMONSTRATION
- 22

23 **PART 1 - GENERAL**

- 24 **1.1 SYSTEM DESCRIPTION**
- 25 A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and
- 26 Division 01 Specification Sections, apply to this Section.
  
- 27 **1.2 SYSTEM DESCRIPTON**
- 28 A. Outdoor-mounted, air-cooled condenser suitable for refrigerant R-410A or R-134a on the ground or rooftop
- 29 installation. The 09DPS unit shall have one refrigeration circuit and the 09DPM unit shall have two
- 30 independent refrigeration circuits capable of field conversion to single circuit. Unit shall have air-cooled coils,
- 31 propeller-type condenser fans, a control box, and shall discharge condenser air vertically upward as shown
- 32 on certified drawings. Unit shall be used in refrigeration circuit with 30MPA or 30HXA air-cooled
- 33 condenserless chillers.
  
- 34 **1.3 ACTION SUBMITTALS**
- 35 A. Product Data: For each air-cooled refrigerant condenser. Include rated capacities, operating characteristics,
- 36 furnished specialties, and accessories. Include equipment dimensions, weights and structural loads,
- 37 required clearances, method of field assembly, components, and location and size of each field connection.
- 38 B. LEED Submittals:
- 39 1. Product Data for Prerequisite EA 2: Documentation indicating that units comply with applicable
- 40 requirements in ASHRAE/IESNA 90.1.
- 41 2. Product Data for Credit EA 4: Documentation indicating that air-cooled refrigerant condensers and
- 42 refrigerants comply.

- 1 **1.4 QUALITY ASSURANCE**
- 2 A. Unit construction shall comply with latest edition of ASHRAE 15 Safety Code, UL 1995, and ASME applicable
- 3 codes (U.S.A. codes).
- 4 B. Unit shall be manufactured in a facility registered to ISO 9001 Manufacturing Quality Standard.
- 5 C. Base unit shall be constructed in accordance with UL standards and CSA.
- 6 D. Unit cabinet shall be capable of withstanding 500-hour salt-spray exposure per ASTM B117 (scribed
- 7 specimen).
- 8 E. Design pressure shall be 650 psig.
- 9 F. Unit shall be functional checked at the factory.
- 10 G. Unit shall be rated using refrigerants R-410A and R-134a. Ratings shall be listed at minimum (5° F
- 11 subcooling) and maximum (15° F subcooling) refrigerant charge.
- 12 H. ASHRAE/IESNA 90.1 Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6 - "Heating,
- 13 Ventilating, and Air-Conditioning."
- 14 **1.5 COORDINATION**
- 15 A. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified
- 16 in Section 077200 "Roof Accessories."
- 17 B. Coordinate location of refrigerant piping and electrical rough-ins.
- 18 **1.6 DELIVERY, STORAGE AND HANDLING**
- 19 A. Unit shall be shipped as single package and shall be stored and handled per unit manufacturer's
- 20 recommendations.
- 21 **1.7 WARRANTY:**
- 22 A. **Special Warranty: Manufacturer agrees to repair or replace components of air cooled condensers**
- 23 **that fail in materials or workmanship within specified warranty period.**
- 24 1. **Extended warranties include, but are not limited to, the following:**
- 25 a. **Compete condenser including refrigerant and oil charge.**
- 26 b. **Parts and labor.**
- 27 2. **Warranty Period: Five years from date of Substantial Completion (Addendum 4 dated 05**
- 28 **September 2023).**

29 **PART 2 - PRODUCTS**

- 30 **2.1 MANUFACTURERS**
- 31 A. Manufacturers: Subject to compliance with requirements, provide product indicated on Drawings or
- 32 comparable product by one of the following:
- 33 1. Carrier Corporation; a unit of United Technologies Corp.
- 34 2. **MultiStack (Addendum 4 dated 05 September 2023).**
- 35 **2.2 EQUIPMENT**
- 36 A. General:
- 37 1. Factory assembled, single-piece, air-cooled remote condenser. Contained within the unit enclosure
- 38 shall be all factory wiring, piping, controls, nitrogen holding charge, and special features required
- 39 prior to field start-up.
- 40 B. Unit Cabinet:
- 41 1. Cabinet shall be galvanized steel casing with a baked enamel powder or pre-painted finish.
- 42 2. Cabinet shall be capable of withstanding 500-hr salt spray test in accordance with ASTM (U.S.A.) B-
- 43 117 standard.
- 44 3. Control box access panels shall be removable for service access.
- 45 4. Lifting holes shall be provided to facilitate rigging.
- 46 C. Fans:
- 47 1. Condenser fans shall be direct-drive propeller type, discharging air vertically upward.
- 48 2. All condenser fan motors shall be totally enclosed 3-phase type with permanently lubricated ball
- 49 bearings, class F insulation and internal, automatic-reset thermal overload protection.
- 50 3. Shafts shall have inherent corrosion resistance.
- 51 4. Fan blades shall be statically and dynamically balanced.
- 52 5. Condenser-fan openings shall be equipped with PVC-coated steel wire safety guards.
- 53 D. Condenser Coils:

- 1 1. Coil shall be air-cooled microchannel heat exchanger (MCHX) and shall have a series of flat tubes  
2 containing a series of multiple, parallel flow microchannels layered between the refrigerant manifolds.  
3 Microchannel coils shall consist of a two-pass arrangement. Coil construction shall consist of  
4 aluminum alloys for the fins, tubes and manifolds in combination with a corrosion-resistant coating  
5 on the tubes.
- 6 2. Tubes shall be cleaned, dehydrated, and sealed.
- 7 3. Assembled condenser coils shall be leak tested and pressure tested at 650 psig.
- 8 E. Refrigeration Components:
  - 9 1. Refrigeration circuit components shall include liquid line temperature relief device and nitrogen  
10 holding charge.
- 11 F. Controls and Safeties:
  - 12 1. Unit controls shall include:
    - 13 a. Unit shall have a temperature fusible plug for safety on each refrigerant circuit.
    - 14 b. Self-contained low voltage control circuit.
    - 15 c. Cycle condenser fans to maintain proper head pressure control.
- 16 G. Operating Characteristics:
  - 17 1. Unit shall be capable of rejecting the required heat at the required cfm and be capable of operating  
18 down to moderate ambient temperatures with standard factory supplied fan cycling.
  - 19 2. Head pressure fan cycling control utilizes temperature switches for 09DP018-035 and 065 units.
  - 20 3. Head pressure fan cycling control utilizes temperature and pressure switches for 09DP040-060 and  
21 075-130 units.
  - 22 4. ~~Operation to -20 F shall be possible with Motormaster® head pressure control.~~ **(Addendum 4 dated**  
23 **05 September 2023)**
- 24 H. Electrical Requirements:
  - 25 1. A dual power supply of the correct voltage shall be required for each series unit. A 3-phase power  
26 circuit voltage and a 24 volt single-phase control circuit shall be required.
  - 27 2. The number of control circuits shall depend on the unit application, whether it is matched with one  
28 unit or two units.
  - 29 3. Power supplies for all units shall enter the control box through factory-punched entrance holes in the  
30 control box shelf.
  - 31 4. Terminal blocks shall be supplied for field wiring connections.
  - 32 5. Units shall utilize electromechanical fan cycling head pressure controls to control proper head  
33 pressure.
- 34 I. Special Features:
  - 35 1. ~~Low Ambient Control:~~
    - 36 a. ~~Control shall regulate fan motor speed in response to the saturated condensing temperature~~  
37 ~~of the unit. The control shall be capable of operating with outdoor temperatures at -20 F.~~
    - 38 b. ~~Motormaster® low ambient control shall be available as a factory-installed option or field-~~  
39 ~~installed accessory for all units.~~
  - 40 2. ~~Optional E-Coated MCHX Condenser Coil:~~
    - 41 a. ~~E-coated aluminum microchannel coils shall have a flexible epoxy polymer coating uniformly~~  
42 ~~applied to all coil external surface areas without material bridging between fins or louvers.~~  
43 ~~Coating process shall ensure complete coil encapsulation, including all exposed fin edges. E-~~  
44 ~~coat thickness of 0.8 to 1.2 mil with top coat having a uniform dry film thickness from 1.0 to~~  
45 ~~2.0 mil on all external coil surface areas, including fin edges, shall be provided. E-coated coils~~  
46 ~~shall have superior hardness characteristics of 2H per ASTM D3363-00 and cross-hatch~~  
47 ~~adhesion of 4B-5B per ASTM D3359-02. E-coated products shall have superior impact~~  
48 ~~resistance with no cracking, chipping or peeling per NSF/ANSI 51-2002 Method 10.2 (U.S.A.~~  
49 ~~Standards). E-coated aluminum microchannel coils shall be capable of withstanding an 8,000-~~  
50 ~~hour salt spray test in accordance with the ASTM (American Society for Testing and Materials)~~  
51 ~~(U.S.A.) B-117 Standard. (Addendum 4 dated 05 September 2023)~~
  - 52 3. Sound Reduction:
    - 53 a. Low sound fan for sound reduction is available as a factory-installed option or field-installed  
54 accessory for all units.
    - 55 b. Low sound fans shall be direct driven, 9-blade, airfoil cross-section type with reinforced  
56 polymer construction and shrouded axial fan. Fan shall be statically and dynamically balanced  
57 with inherent corrosion resistance.
  - 58 4. Non-Fused Disconnect:
    - 59 a. A non-fused disconnect is available as a factory- installed option for all units having single  
60 point power connection units.
  - 61 5. High Short Circuit Current Rating (SCCR):

- 1 a. The optional high SCCR interrupt capability shall allow the unit to tolerate a ~~65~~ **35 kVA**  
2 **(Addendum 4 dated 05 September 2023)** (208/230v, 380v and 460-v units) or 25 kA (575-  
3 v units) short circuit current for a brief period of time while protecting downstream  
4 components. The high SCCR option shall provide a higher level of protection than the  
5 standard unit (option for 60 Hz only). High interrupt shall be available as factory-installed  
6 option on all units.
- 7 6. Security Grilles/Hail Guards:  
8 a. Units shall be supplied with factory-installed or field-installed louvered, sheet metal panels  
9 which securely fasten to the unit to provide condenser coil protection against hail and physical  
10 damage.
- 11 7. Vibration Isolation Pads:  
12 a. Neoprene vibration isolation pads (24 in. x 3 in. x 1/4 in.) shall be available for field installation  
13 to reduce vibration transmission from the compressor through the floor and into the  
14 conditioned space.
- 15 8. Wind Baffle Kit:  
16 a. Field-installed accessory kit shall provide wind baffles for use with low ambient temperature  
17 operation.  
18

19 **PART 3 - EXECUTION**

20 **3.1 EXAMINATION**

- 21 A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for  
22 installation tolerances and other conditions affecting performance of air-cooled refrigerant condensers.  
23 B. Examine roughing-in for refrigerant piping systems to verify actual locations of piping connections before  
24 equipment installation.  
25 C. Examine walls, floors, and roofs for suitable conditions where air-cooled condensers will be installed.  
26 D. Proceed with installation only after unsatisfactory conditions have been corrected.

27 **3.2 INSTALLATION**

- 28 A. Install units level and plumb, firmly anchored in locations indicated; maintain manufacturer's recommended  
29 clearances.  
30 B. Equipment Mounting:  
31 1. Comply with requirements for vibration isolation devices specified in Section 230548.13 "Vibration  
32 Controls for HVAC."  
33 C. Maintain manufacturer's recommended clearances for service and maintenance.  
34 D. Loose Components: Install electrical components, devices, and accessories that are not factory mounted.

35 **3.3 CONNECTIONS**

- 36 A. Piping installation requirements are specified in Section 232113 "Hydronic Piping" and Section 232116  
37 Hydronic Piping Specialties." Drawings indicate general arrangement of piping, fittings, and specialties.  
38 B. Install piping adjacent to machine to allow service and maintenance.  
39 C. Refrigerant Piping: Connect piping to unit with pressure relief, service valve, filter-dryer, and moisture  
40 indicator on each refrigerant-circuit liquid line. Refrigerant piping and specialties are specified in Section  
41 232300 "Refrigerant Piping."

42 **3.4 FIELD QUALITY CONTROL**

- 43 A. Perform tests and inspections.  
44 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test,  
45 and adjust components, assemblies, and equipment installations, including connections, and to  
46 assist in testing.  
47 B. Tests and Inspections:  
48 1. Perform electrical test and visual and mechanical inspection.  
49 2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks  
50 exist.  
51 3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor  
52 rotation and unit operation. Complete manufacturer's starting checklist.  
53 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.  
54 5. Verify proper airflow over coils.  
55 C. Verify that vibration isolation and flexible connections properly dampen vibration transmission to structure.

- 1 D. Air-cooled refrigerant condensers will be considered defective if they do not pass tests and inspections.
- 2 E. Prepare test and inspection reports.

3 **3.5 STARTUP SERVICE**

- 4 A. Engage a factory-authorized service representative to perform startup service.
  - 5 1. Complete installation and startup checks according to manufacturer's written instructions and
  - 6 perform the following:
    - 7 a. Inspect for physical damage to unit casing.
    - 8 b. Verify that access doors move freely and are weathertight.
    - 9 c. Clean units and inspect for construction debris.
    - 10 d. Verify that all bolts and screws are tight.
    - 11 e. Adjust vibration isolation and flexible connections.
    - 12 f. Verify that controls are connected and operational.
  - 13
  - 14 2. Lubricate bearings on fan motors.
  - 15 3. Verify that fan wheel is rotating in the correct direction and is not vibrating or binding.
  - 16 4. Start unit according to manufacturer's written instructions and complete manufacturer's startup
  - 17 checklist.
  - 18 5. Measure and record airflow and air temperature rise over coils.
  - 19 6. Verify proper operation of capacity control device.
  - 20 7. Verify that vibration isolation and flexible connections properly dampen vibration transmission to
  - 21 structure.
  - 22 8. After startup and performance test, lubricate bearings.

23 **3.6 DEMONSTRATION**

- 24 A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust,
- 25 operate, and maintain air-cooled refrigerant condensers.

26 **END OF SECTION**

SECTION 236423

SCROLL WATER CHILLERS

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- 5 PART 1 - GENERAL
- 6 1.1 RELATED DOCUMENTS
- 7 1.2 SYSTEM DESCRIPTION
- 8 1.3 ACTION SUBMITTALS
- 9 1.4 QUALITY ASSURANCE
- 10 1.5 DELIVERY, STORAGE AND HANDLING
- 11 1.6 COORDINATION
- 12 PART 2 - PRODUCTS
- 13 2.1 EQUIPMENT
- 14 PART 3 - EXECUTION
- 15 3.1 EXAMINATION
- 16 3.2 WATER CHILLER INSTALLATION
- 17 3.3 CONNECTIONS
- 18 3.4 STARTUP SERVICE
- 19 3.5 DEMONSTRATION

20 **PART 1 - GENERAL**

21 **1.1 RELATED DOCUMENTS**

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

24 **1.2 SYSTEM DESCRIPTION**

- 25 A. Microprocessor controlled liquid-cooled condenserless liquid chiller utilizing scroll type compressors.

26 **1.3 ACTION SUBMITTALS**

- 27 A. Product Data: Include refrigerant, rated capacities, operating characteristics, furnished specialties, and
- 28 accessories.
- 29 1. Performance at ARI standard conditions and at conditions indicated.
- 30 2. Performance at ARI standard unloading conditions.
- 31 3. Minimum evaporator flow rate.
- 32 4. Refrigerant capacity of water chiller.
- 33 5. Oil capacity of water chiller.
- 34 6. Fluid capacity of evaporator.
- 35 7. Characteristics of safety relief valves.

36 **1.4 QUALITY ASSURANCE**

- 37 A. Unit performance shall be rated per AHRI (Air-Conditioning, Heating and Refrigeration Institute) Standard
- 38 550/590 and 551/591, latest edition (U.S.A.) at standard rating conditions.
- 39 B. All units shall be ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) 90.1
- 40 compliant.
- 41 C. Unit construction shall comply with ANSI (American National Standards Institute)/ASHRAE 15 Safety
- 42 Standard (latest revision) and NEC (National Electrical Code).
- 43 D. Unit shall be certified in accordance with ISO (International Organization for Standardization) 9001
- 44 manufacturing quality standard.
- 45 E. Unit shall be ETL and ETL, Canada certified.

46 **1.5 DELIVERY, STORAGE AND HANDLING**

- 47 A. Unit shall be shipped factory-assembled with all piping and wiring, pre-charged with a holding charge of
- 48 nitrogen and shall be stored and handled according to manufacturer's recommendations.
- 49 B. Unit controls shall be capable of withstanding 150 F storage temperatures in the control compartment.
- 50

- 1 C. Chiller and starter should be stored indoors, protected from construction dirt and moisture. An inspection  
2 should be conducted under shipping tarps, bags, or crates to be sure water has not collected during transit.  
3 Protective shipping covers should be kept in place until machine is ready for installation. The inside of the  
4 protective cover should meet the following criteria:  
5 1. Temperature is between 40 F and 120 F.  
6 2. Relative humidity is between 10% and 80% (non-condensing).

7 **1.6 COORDINATION**

- 8 A. Coordinate sizes and locations of concrete bases with actual equipment provided.

9 **PART 2 - PRODUCTS**

10 **2.1 MANUFACTURERS**

- 11 A. Manufacturers: Subject to compliance with requirements, provide product indicated on Drawings or  
12 comparable product by one of the following:  
13 1. Carrier Corporation; a unit of United Technologies Corp.  
14 2. **MultiStack (Addendum 4 dated 05 September 2023)**

15 **2.2 EQUIPMENT**

- 16 A. General:  
17 1. Single-piece liquid chiller consisting of compressor(s), BPHE (brazed-plate heat exchanger)  
18 evaporator, controls, safeties, and any hardware required before start-up.  
19 B. Unit Cabinet:  
20 1. Frame shall be of heavy-gage galvanized steel with an electrostatically applied baked enamel finish.  
21 2. The unit shall pass through a standard 36-inch door and shall not exceed 57 inches in length.  
22 C. Compressor:  
23 1. Fully hermetic scroll type compressors.  
24 2. Direct drive, 3500 rpm, protected by line break device, suction gas cooled motor.  
25 3. External vibration isolation - rubber in shear.  
26 4. Staging of compressors shall provide unloading capability. Digital compressor unloading shall be  
27 provided for further staging capacity..  
28 D. Evaporator:  
29 1. Evaporator shall be rated for a maximum refrigerant pressure of 505 psig for sizes 015 and 020, 565  
30 psig for sizes 030 to 045, and 653 psig for sizes 050 to 071, and shall be tested for a maximum water-  
31 side pressure of 300 psig.  
32 2. Shall be single-pass, ANSI type 316 stainless steel, brazed plate construction.  
33 3. Shall be insulated with 3/4-inch closed-cell, polyvinyl-chloride foam with a maximum K factor of 0.28.  
34 4. Unit shall be provided with a factory-installed flow switch.  
35 5. Unit shall be provided with entering and leaving chilled water temperature sensors and water  
36 pressure access port.  
37 6. A strainer with a minimum of 40 mesh must be installed within 10 ft of the heat exchanger fluid inlet  
38 to prevent debris from clogging the heat exchanger. This strainer shall be required and shall be  
39 available as an accessory.  
40 E. Refrigerant Components:  
41 1. Each chiller shall contain the following: sight glass; filter drier; liquid line isolation valve; expansion  
42 valve; and charging port.  
43 2. Expansion valve TXV thermostatic expansion valve shall be located within 12 inches of the  
44 evaporator with no bend between expansion valve and evaporator in accordance with evaporator  
45 manufacturer recommendation.  
46 F. Controls, Safeties and Diagnostics:  
47 1. Controls:  
48 a. Unit controls shall include the following minimum components:  
49 1) Microprocessor.  
50 2) Power and control circuit terminal blocks.  
51 3) ON/OFF control switch.  
52 4) Thermistor is installed to measure evaporator entering and leaving fluid temperatures.  
53 5) Terminal block for temporary and/or permanent interface to the Carrier Comfort  
54 Network® or similar building system control.  
55 b. Microprocessor with non-volatile memory. Battery backup system shall not be accepted.  
56 c. Control transformer to serve all controllers, contactors, relays, and control components.

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- d. Replaceable solid-state relay panels and controllers.
  - e. Pressure transducers (used to calculate saturated suction temperature and saturated condensing temperature).
  - f. Provision for field installation of accessory sensor to measure compressor return gas temperature (suction gas thermistor).
  - g. Terminals shall be provided in the control box for wiring of accessory field-installed condenser temperature sensors.
  - h. Unit controls shall be capable of performing the following functions:
    - 1) Capacity control based on leaving chilled fluid temperature and compensated by rate of change of return-fluid temperature.
    - 2) Limiting of the chilled fluid temperature pulldown rate at start-up to 1° F per minute to prevent excessive demand spikes (charges) at start-up.
    - 3) Seven-day time schedule.
    - 4) Leaving chilled fluid temperature reset from return fluid.
    - 5) Dual chiller control for parallel chiller applications (common leaving chilled water sensor required).
    - 6) Timed maintenance scheduling to signal maintenance activities.
2. Diagnostics:
- a. The control panel shall include, as standard, a scrolling marquee display capable of indicating the safety lockout condition by displaying a code for which an explanation may be scrolled at the display.
  - b. Information included for display shall be:
    - 1) Compressor lockout.
    - 2) Loss of charge.
    - 3) Low fluid flow.
    - 4) Evaporator freeze protection.
    - 5) Thermistor malfunction.
    - 6) Entering and leaving-fluid temperature.
    - 7) Circuit suction and discharge pressure.
    - 8) Time of day.
  - c. Display module, in conjunction with the microprocessor, must also be capable of displaying the output (results) of a service test. Service test shall verify operation of every switch, thermistor, and compressors before chiller is started.
  - d. Diagnostics shall include the ability to review a list of the 20 most recent alarms with clear language descriptions of the alarm event. Display of alarm codes without the ability for clear language descriptions shall be prohibited.
  - e. An alarm history buffer shall allow the user to store no less than 20 alarm events with clear language descriptions, time and date stamp event entry.
  - f. The chiller controller shall include a connection port for communicating with the local equipment network and the Carrier Comfort Network (CCN) system.
  - g. The control system shall allow software upgrade without the need for new hardware modules.
3. Safeties:
- a. Unit shall be equipped with sensors and all necessary components in conjunction with the control system to provide the unit with the following protections:
    - 1) Loss of refrigerant charge protection.
    - 2) Low fluid flow detection.
    - 3) Low chilled fluid temperature protection.
    - 4) Low control voltage (to unit) protection.
    - 5) High-pressure switch.
    - 6) Reverse rotation.
    - 7) Overcurrent protection.
    - 8) Loss of phase.
  - b. Compressors shall be equipped with the following protections:
    - 1) High discharge temperature protection.
    - 2) Electrical overload through the use of definite-purpose contactors and motor overload protection through internal compressor overload or external current overload.
    - 3) Circuit breakers shall open all 3 phases in the event of an overload in any one phase (single-phasing condition).
    - 4) Circuit breakers for short circuit protection.
- G. Operating Characteristics:
1. Unit shall be capable of starting with up to 95 F fluid temperature entering the evaporator.



- 1           2.     Unit shall be capable of operating with variable evaporator fluid flow, up to 10% change in flow rate
- 2                     per minute.
- 3     H.     Electrical Requirements:
- 4           1.     Single-point electrical power connection with compressors factory-wired to a terminal block in the
- 5                     control panel. Compressor sensors and system pressure transducers shall be factory-wired to the
- 6                     unit controller.
- 7           2.     Control interface shall be accessed through low voltage terminal strip or terminal strip.
- 8     I.     Chilled Water Circuit:
- 9           1.     Chilled water circuit shall be rated for 300 psig.
- 10          2.     Solid-state flow switch with integral relay shall be factory installed and wired.
- 11     J.     Special Features:
- 12           a.     Sound Enclosure Panels:
- 13                     b.     This acoustic package shall be either factory-installed or field-installed and shall entirely
- 14                     enclose the compressor section to further reduce radiated sound.
- 15                     c.     Vibration Isolators (Springs):
- 16                     d.     Vibration isolators shall be field-installed before the unit is set into its final location and shall
- 17                     reduce vibration transmission through the mounting area of the chiller.
- 18          2.     Non-Fused Disconnect:
- 19           a.     The non-fused disconnect shall be factory installed and shall disconnect all power to the unit
- 20                     (including control circuit power).
- 21           b.     Strainer:
- 22           c.     A Y strainer shall be available in sizes 1.5 to 6 in. with a minimum of 40 mesh for field
- 23                     installation.
- 24          3.     Remote Enhanced Display:
- 25           a.     Unit shall be supplied with indoor-mounted, remote, 40-character per line, 16-line display
- 26                     panel for field installation.
- 27          4.     Energy Management Module (EMM):
- 28           a.     A factory or field-installed module shall provide the following energy management capabilities:
- 29                     4 to 20 mA signals for leaving fluid temperature reset, cooling set point or demand limit control;
- 30                     2-point demand limit control (from 15% to 100%) activated by a remote contact closure; and
- 31                     discrete input for "Ice Done" indication for ice storage system interface. EMM shall be capable
- 32                     of:
- 33                     1)     Leaving temperature reset from space temperature, outdoor temperature, or 4 to 20
- 34                     mA signal.
- 35                     2)     Demand limit or load shed via field-supplied 4 to 20 mA signal or 2-step discrete
- 36                     contact closure.
- 37          5.     BACnet Translator Control:
- 38           a.     Unit shall be supplied with field-installed interface between the chiller and a BACnet Local
- 39                     Area Network (LAN, i.e., MS/TP EIA-485).
- 40           b.     Digital Compressor Option:
- 41           c.     Shall provide factory-installed digital compressor to provide additional steps of capacity (not
- 42                     available on sizes 015, 050-071).
- 43          6.     Compressor Insulation:
- 44           a.     Compressor insulation is designed to insulate scroll compressors and prevent water vapor
- 45                     from condensing on the colder compressor surface.
- 46           b.     Compressor Sound Blankets:
- 47           c.     Units can be ordered with acoustically insulated sound blankets installed around the
- 48                     compressors to reduce radiated sound levels.
- 49          7.     Water Manifold Piping Option:
- 50           a.     Shall provide piping that allows more than one chiller module to be piped together in parallel.
- 51                     Combination valves shall also be provided.
- 52          8.     BACnet Communication Option:
- 53           a.     Shall provide factory-installed communication capability with a BACnet MS/TP network.
- 54                     Allows integration with i-Vu® Open control system or a BACnet building automation system.
- 55

1 **PART 3 - EXECUTION**

2 **3.1 EXAMINATION**

- 3 A. Before water chiller installation, examine roughing-in for equipment support, anchor-bolt sizes and locations,  
4 piping, and electrical connections to verify actual locations, sizes, and other conditions affecting water chiller  
5 performance, maintenance, and operations.  
6 1. Water chiller locations indicated on Drawings are approximate. Determine exact locations before  
7 roughing-in for piping and electrical connections.  
8 B. Proceed with installation only after unsatisfactory conditions have been corrected.

9 **3.2 WATER CHILLER INSTALLATION**

- 10 A. Install water chillers on support structure indicated.  
11 B. Equipment Mounting:  
12 1. Install water chillers on cast-in-place concrete equipment bases. Comply with requirements for  
13 equipment bases and foundations specified in Section 033000 "Cast-in-Place Concrete."  
14 2. Comply with requirements for vibration isolation devices specified in Section 230548.13 "Vibration  
15 Controls for HVAC."  
16 C. Maintain manufacturer's recommended clearances for service and maintenance.  
17 D. Charge water chiller with refrigerant if not factory charged and fill with oil if not factory installed.  
18 E. Install separate devices furnished by manufacturer and not factory installed.

19 **3.3 CONNECTIONS**

- 20 A. Comply with requirements in Section 232113 "Hydronic Piping" and Section 232116 Hydronic Piping  
21 Specialties." Drawings indicate general arrangement of piping, fittings, and specialties.  
22 B. Comply with requirements in Section 232300 "Refrigerant Piping." Drawings indicate general arrangement  
23 of piping, fittings, and specialties.  
24 C. Install piping adjacent to chiller to allow service and maintenance.  
25 D. Evaporator Fluid Connections: Connect to evaporator inlet with shutoff valve, strainer, flexible connector,  
26 thermometer, and plugged tee with pressure gage. Connect to evaporator outlet with shutoff valve, balancing  
27 valve, flexible connector, thermometer, plugged tee with pressure gage, flow meter, and drain connection  
28 with valve. Make connections to water chiller with a union, flange, or mechanical coupling.  
29 E. Refrigerant Pressure Relief Valve Connections: For water chillers installed indoors, extend vent piping to  
30 the outside without valves or restrictions. Comply with ASHRAE 15.  
31 F. Connect each drain connection with a union and drain pipe and extend pipe, full size of connection, to floor  
32 drain. Provide a shutoff valve at each connection if required.

33 **3.4 STARTUP SERVICE**

- 34 A. Engage a factory-authorized service representative to perform startup service.  
35 B. Inspect field-assembled components, equipment installation, and piping and electrical connections for  
36 proper assemblies, installations, and connections.  
37 C. Complete installation and startup checks according to manufacturer's written instructions and perform the  
38 following:  
39 1. Verify that refrigerant charge is sufficient and water chiller has been leak tested.  
40 2. Verify that pumps are installed and functional.  
41 3. Verify that thermometers and gages are installed.  
42 4. Operate water chiller for run-in period.  
43 5. Check bearing lubrication and oil levels.  
44 6. Verify that refrigerant pressure relief device for chillers installed indoors is vented outside.  
45 7. Verify proper motor rotation.  
46 8. Verify static deflection of vibration isolators, including deflection during water chiller startup and  
47 shutdown.  
48 9. Verify and record performance of water chiller protection devices.  
49 10. Test and adjust controls and safeties. Replace damaged or malfunctioning controls and equipment.  
50 D. Prepare a written startup report that records results of tests and inspections.

51 **3.5 DEMONSTRATION**

- 52 A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust,  
53 operate, and maintain water chillers.

54 **END OF SECTION**

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**SECTION 262413**  
**SWITCHBOARDS**

**PART 1 - GENERAL**

- 1.1 SUMMARY
- 1.2 COORDINATION
- 1.3 ACTION SUBMITTALS
- 1.4 INFORMATIONAL SUBMITTALS
- 1.5 CLOSEOUT SUBMITTALS
- 1.6 MAINTENANCE MATERIAL SUBMITTALS
- 1.7 DELIVERY, STORAGE, AND HANDLING
- 1.8 WARRANTY

**PART 2 - PRODUCTS**

- 2.1 SWITCHBOARDS
- 2.2 SURGE PROTECTION DEVICES
- 2.3 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES
- 2.4 INSTRUMENTATION
- 2.5 CONTROL POWER
- 2.6 ACCESSORY COMPONENTS AND FEATURES

**PART 3 - EXECUTION**

- 3.1 EXAMINATION
- 3.2 PREPARATION
- 3.3 INSTALLATION
- 3.4 CONNECTIONS
- 3.5 IDENTIFICATION
- 3.6 FIELD QUALITY CONTROL
- 3.7 ADJUSTING
- 3.8 PROTECTION

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Switchboards.
  - 2. Surge protection devices.
  - 3. Disconnecting and overcurrent protective devices.
  - 4. Instrumentation.
  - 5. Control power.
  - 6. Accessory components and features.

**1.2 COORDINATION**

- A. Coordinate layout and installation of switchboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Coordinate sizes and locations of concrete bases with actual equipment provided.

**1.3 ACTION SUBMITTALS**

- A. Product Data:
  - 1. Switchboards.
  - 2. Overcurrent protective devices.
  - 3. Surge protection devices.
  - 4. Ground-fault protection devices.
  - 5. Accessories.
  - 6. Other components.

- 53 7. Include dimensions and manufacturers' technical data on features, performance, electrical
- 54 characteristics, ratings, accessories, and finishes.
- 55 B. Shop Drawings: For each switchboard and related equipment.
- 56 1. Include dimensioned plans, elevations, sections, and details, including required clearances and service
- 57 space around equipment. Show tabulations of installed devices, equipment features, and ratings.
- 58 2. Detail enclosure types for types other than UL 50E, Type 1.
- 59 3. Detail bus configuration, current, and voltage ratings.
- 60 4. Detail short-circuit current rating of switchboards and overcurrent protective devices.
- 61 5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices
- 62 and auxiliary components.
- 63 6. Include time-current coordination curves for each type and rating of overcurrent protective device
- 64 included in switchboards. Include selectable ranges for each type of overcurrent protective device.
- 65 7. Include schematic and wiring diagrams for power, signal, and control wiring.
- 66 C. Field Quality-Control Submittals:
- 67 1. Field Quality-Control Reports:
- 68 a. Test procedures used.
- 69 b. Test results that comply with requirements.
- 70 c. Results of failed tests and corrective action taken to achieve test results that comply with
- 71 requirements.

72 **1.4 INFORMATIONAL SUBMITTALS**

- 73 A. Manufacturers' Published Instructions: Record copy of official installation and testing instructions issued to
- 74 Installer by manufacturer for the following:
- 75 1. Handling, storing, and providing temporary heat.
- 76 2. Mounting accessories and anchoring devices.
- 77 3. Testing and adjusting overcurrent protective devices.

78 **1.5 CLOSEOUT SUBMITTALS**

- 79 A. Warranty documentation.

80 **1.6 MAINTENANCE MATERIAL SUBMITTALS**

- 81 A. Spare Parts: Furnish to Owner spare parts, for repairing switchboards, that are packaged with protective
- 82 covering for storage on-site and identified with labels describing contents. Include the following:
- 83 1. Control-Power Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than
- 84 two of each size and type.
- 85 2. Fuses for Fused Power-Circuit Devices: Equal to 10 percent of quantity installed for each size and type
- 86 but no fewer than three of each size and type.
- 87 3. Indicating Lights: Equal to 10 percent of quantity installed for each size and type but no less than one
- 88 of each size and type.
- 89 B. Special Tools: Furnish to Owner proprietary equipment, keys, and software required to operate, maintain,
- 90 repair, adjust, or implement future changes to switchboards, that are packaged with protective covering for
- 91 storage on-site and identified with labels describing contents. Include the following:
- 92 1. Accessory Set: Include tools and miscellaneous items required for overcurrent protective device test,
- 93 inspection, maintenance, and operation.

94 **1.7 DELIVERY, STORAGE, AND HANDLING**

- 95 A. Deliver switchboards in sections or lengths that can be moved past obstructions in delivery path.
- 96 B. Remove loose packing and flammable materials from inside switchboards and install temporary electric heating
- 97 (250 W per section) to prevent condensation.
- 98 C. Handle and prepare switchboards for installation in accordance with NECA 400 and NEMA PB 2.1.

99 **1.8 WARRANTY**

- 100 A. Special Manufacturer Extended Warranty: Manufacturer warrants that switchboard performs in accordance
- 101 with specified requirements and agrees to provide repair or replacement of components that fail to perform as
- 102 specified within extended-warranty period.
- 103 1. Extended-Warranty Period: Three years from date of Substantial Completion; full coverage for labor,
- 104 materials, and equipment.

105 **PART 2 - PRODUCTS**

106 **2.1 SWITCHBOARDS**

- 107 A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- 108 1. Square D; Schneider Electric USA.
- 109 2. Siemens
- 110 3. ABB
- 111 B. Source Limitations: Obtain switchboards, overcurrent protective devices, components, and accessories from
- 112 single source from single manufacturer.
- 113 C. Electrical Components, Devices, and Accessories: Listed and labeled in accordance with NFPA 70, by
- 114 qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended
- 115 location and application.
- 116 D. Comply with NEMA PB 2.
- 117 E. Comply with NFPA 70.
- 118 F. Comply with UL 891.
- 119 G. Front-Connected, Front-Accessible Switchboards:
- 120 1. Main Devices: Panel Fixed, individually mounted.
- 121 2. Branch Devices: Panel mounted.
- 122 3. Sections front and rear aligned.
- 123 H. Indoor Enclosures: Steel, UL 50E, Type 1.
- 124 I. Enclosure Finish for Indoor Units: Factory-applied finish in manufacturer's standard gray finish over rust-
- 125 inhibiting primer on treated metal surface.
- 126 J. Barriers: Between adjacent switchboard sections.
- 127 K. Insulation and isolation for main bus of main section and main and vertical buses of feeder sections.
- 128 L. Service Entrance Rating: Switchboards intended for use as service entrance equipment may contain from one
- 129 to six service disconnecting means with overcurrent protection, neutral bus with disconnecting link, grounding
- 130 electrode conductor terminal, and main bonding jumper.
- 131 M. Bus Transition and Incoming Pull Sections: Matched and aligned with basic switchboard.
- 132 N. Hinged Front Panels: Allow access to circuit breaker, metering, accessory, and blank compartments.
- 133 O. Buses and Connections: Three phase, four wire unless otherwise indicated.
- 134 1. Provide phase bus arrangement A, B, C from front to back, top to bottom, and left to right when viewed
- 135 from front of switchboard.
- 136 2. Phase- and Neutral-Bus Material:
- 137 a. Hard-drawn copper of 98 percent conductivity, silver-plated.
- 138 3. Copper feeder circuit-breaker line connections.
- 139 4. Ground Bus: 1/4 by 2 inch hard-drawn copper of 98 percent conductivity, equipped with mechanical or
- 140 compression connectors for feeder and branch-circuit ground conductors.
- 141 5. Main-Phase Buses and Equipment-Ground Buses: Uniform capacity for entire length of switchboard's
- 142 main and distribution sections. Provide for future extensions from both ends.
- 143 6. Disconnect Links:
- 144 a. Isolate neutral bus from incoming neutral conductors.
- 145 b. Bond neutral bus to equipment-ground bus for switchboards utilized as service equipment or
- 146 separately derived systems.
- 147 7. Neutral Buses: 100 percent of ampacity of phase buses unless otherwise indicated, equipped with
- 148 mechanical connectors for outgoing circuit neutral cables. Brace bus extensions for busway feeder
- 149 neutral bus.
- 150 8. Isolation Barrier Access Provisions: Permit checking of bus-bolt tightness.
- 151 P. Future Devices: Equip compartments with mounting brackets, supports, bus connections, and appurtenances
- 152 at full rating of circuit-breaker compartment.
- 153

154 **2.2 SURGE PROTECTION DEVICES**

- 155 A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- 156 1. Square D; Schneider Electric USA.
- 157 2. Siemens
- 158 3. ABB
- 159 B. SPDs: Listed and labeled in accordance with UL 1449, Type 1.

- 160 C. Features and Accessories:
- 161 1. Indicator light display for protection status.
- 162 2. Surge counter.
- 163 D. Peak Surge Current Rating: Minimum single-pulse surge current withstand rating per phase may not be less
- 164 than 200 kA. Peak surge current rating must be arithmetic sum of ratings of individual MOVs in each mode.
- 165 E. SCCR: Equal or exceed 200 kA.
- 166 F. Nominal Rating: 20 kA.

### 167 2.3 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- 168 A. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault
- 169 currents.
- 170 1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and
- 171 instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker
- 172 frame sizes 100 A and larger.
- 173 2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front- mounted, field-
- 174 adjustable trip setting.
- 175 3. Electronic trip circuit breakers with RMS sensing; field-replaceable rating plug or field- replicable
- 176 electronic trip; and the following field-adjustable settings:
- 177 a. Instantaneous trip.
- 178 b. Long- and short-time pickup levels.
- 179 c. Long and short time adjustments.
- 180 d. Ground-fault pickup level, time delay, and I squared t response, where indicated on drawings.
- 181 4. Ground-Fault Equipment Protection (GFEP) Circuit Breakers: Class B ground-fault protection (30 mA
- 182 trip).
- 183 5. MCCB Features and Accessories:
- 184 a. Standard frame sizes, trip ratings, and number of poles.
- 185 b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor material.
- 186 c. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-
- 187 delay settings, push-to-test feature, and ground-fault indicator.

### 188 2.4 INSTRUMENTATION

- 189 A. Instrument Transformers: NEMA EI 21.1, and the following:
- 190 1. Potential Transformers: NEMA EI 21.1; 120 V, 60 Hz, single, tapped, or double secondary;
- 191 disconnecting type with integral fuse mountings. Burden and accuracy must be consistent with
- 192 connected metering and relay devices.
- 193 2. Current Transformers: NEMA EI 21.1; 5 A, 60 Hz, secondary; bar or window type; double secondary
- 194 winding and secondary shorting device. Burden and accuracy must be consistent with connected
- 195 metering and relay devices.
- 196 3. Control-Power Transformers: Dry type, mounted in separate compartments for units larger than 3 kVA.
- 197 4. Current Transformers for Neutral and Ground-Fault Current Sensing: Connect secondary wiring to
- 198 ground overcurrent relays, via shorting terminals, to provide selective tripping of main and tie circuit
- 199 breaker. Coordinate with feeder circuit-breaker, ground-fault protection.
- 200 B. Multifunction Digital-Metering Monitor: Microprocessor-based unit suitable for three- or four- wire systems and
- 201 with the following features:
- 202 1. Switch-selectable digital display of the following values with maximum accuracy tolerances as indicated:
- 203 a. Phase Currents, Each Phase: Plus or minus 0.5 percent.
- 204 b. Phase-to-Phase Voltages, Three Phase: Plus or minus 0.5 percent.
- 205 c. Phase-to-Neutral Voltages, Three Phase: Plus or minus 0.5 percent.
- 206 d. Megawatts: Plus or minus 1 percent.
- 207 e. Megavars: Plus or minus 1 percent.
- 208 f. Power Factor: Plus or minus 1 percent.
- 209 g. Frequency: Plus or minus 0.1 percent.
- 210 h. Accumulated Energy, Megawatt Hours: Plus or minus 1 percent; accumulated values unaffected
- 211 by power outages up to 72 hours.
- 212 i. Megawatt Demand: Plus or minus 1 percent; demand interval programmable from five to 60
- 213 minutes.
- 214 2. Mounting: Display and control unit flush or semiflush mounted in instrument compartment door.

- 215 **2.5 CONTROL POWER**
- 216 A. Control Circuits:
- 217 1. 120 V(ac), supplied through secondary disconnecting devices from control-power transformer.

- 218 **2.6 ACCESSORY COMPONENTS AND FEATURES**
- 219 A. Mounting Accessories: For anchors, mounting channels, bolts, washers, and other mounting accessories,
- 220 comply with requirements in manufacturer's instructions.

221 **PART 3 - EXECUTION**

- 222 **3.2 EXAMINATION**
- 223 A. Receive, inspect, handle, and store switchboards in accordance with NECA 400 and NEMA PB 2.1.
- 224 1. Lift or move panelboards with spreader bars and manufacturer-supplied lifting straps following
- 225 manufacturer's published instructions.
- 226 2. Use rollers, slings, or other manufacturer-approved methods if lifting straps are not furnished.
- 227 3. Protect from moisture, dust, dirt, and debris during storage and installation.
- 228 4. Install temporary heating during storage in accordance with manufacturer's published instructions.
- 229 B. Examine switchboards before installation. Reject switchboards that are moisture damaged or physically
- 230 damaged.
- 231 C. Examine elements and surfaces to receive switchboards for compliance with installation tolerances and other
- 232 conditions affecting performance of the Work or that affect performance of equipment.
- 233 D. Proceed with installation only after unsatisfactory conditions have been corrected.

- 234 **3.3 PREPARATION**
- 235 A. Installation Pathway: Remove and replace access fencing, doors, lift-out panels, and structures to provide
- 236 pathway for moving switchboards into place.

- 237 **3.4 INSTALLATION**
- 238 A. Comply with manufacturer's published instructions.
- 239 B. Reference Standards:
- 240 1. Switchboards and Accessories: Unless more stringent requirements are specified in Contract
- 241 Documents or manufacturers' published instructions, comply with NECA 400.
- 242 2. Consult Engineer for resolution of conflicting requirements.
- 243 C. Special Techniques:
- 244 1. Equipment Mounting: Install switchboards on concrete base, 4 inch nominal thickness. Comply with
- 245 requirements for concrete base specified in Section 260529 "Hangers and Supports for Electrical
- 246 Systems."
- 247 a. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install
- 248 dowel rods on 18 inch centers around full perimeter of concrete base.
- 249 b. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base
- 250 and anchor into structural concrete floor.
- 251 c. Place and secure anchorage devices. Use setting drawings, templates, diagrams, published
- 252 instructions, and directions furnished with items to be embedded.
- 253 d. Install anchor bolts to elevations required for proper attachment to switchboards.
- 254 e. Anchor switchboard to building structure at top of switchboard if required or recommended by
- 255 manufacturer.
- 256 2. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, straps and brackets, and
- 257 temporary blocking of moving parts from switchboard units and components.
- 258 3. Operating Instructions: Frame and mount printed basic operating instructions for switchboards,
- 259 including control and key interlocking sequences and emergency procedures. Fabricate frame of
- 260 finished wood or metal and cover instructions with clear acrylic plastic. Mount on front of switchboards.
- 261 4. Install filler plates in unused spaces of panel-mounted sections.
- 262 5. Install overcurrent protective devices, surge protection devices, and instrumentation.
- 263 a. Set field-adjustable switches and circuit-breaker trip ranges.

- 264 **3.5 CONNECTIONS**
- 265 A. Bond conduits entering underneath switchboard to equipment ground bus with bonding conductor sized in
- 266 accordance with NFPA 70.
- 267 B. Support and secure conductors within switchboard in accordance with NFPA 70.
- 268 C. Extend insulated equipment grounding cable to busway ground connection and support cable at intervals in
- 269 vertical run.

- 270 **3.6 IDENTIFICATION**
- 271 A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying
- 272 with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- 273 B. Switchboard Nameplates: Label each switchboard compartment with nameplate complying with requirements
- 274 for identification specified in Section 260553 "Identification for Electrical Systems."
- 275 C. Device Nameplates: Label each disconnecting and overcurrent protective device and each meter and control
- 276 device mounted in compartment doors with nameplate complying with requirements for identification specified
- 277 in Section 260553 "Identification for Electrical Systems."
- 278 D. Service Equipment Label: Labeled, by qualified electrical testing laboratory recognized by authorities having
- 279 jurisdiction, for use as service equipment for switchboards with one or more service disconnecting and
- 280 overcurrent protective devices.

- 281 **3.7 FIELD QUALITY CONTROL**
- 282 A. Field tests and inspections must be witnessed by Tenant.
- 283 B. Tests and Inspections:
- 284 1. Acceptance Testing:
- 285 a. Test insulation resistance for each switchboard bus, component, connecting supply, feeder, and
- 286 control circuit. Open control and metering circuits within switchboard and remove neutral
- 287 connection to surge protection and other electronic devices prior to insulation test. Reconnect
- 288 after test.
- 289 b. Test continuity of each circuit.
- 290 2. Test ground-fault protection of equipment for service equipment in accordance with NFPA 70.
- 291 3. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance
- 292 Testing Specification. Certify compliance with test parameters.
- 293 4. Correct malfunctioning units on-site where possible, and retest to demonstrate compliance; otherwise,
- 294 replace with new units and retest.
- 295 5. Perform the following infrared scan tests and inspections, and prepare reports:
- 296 a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final
- 297 Acceptance, perform infrared scan of each switchboard. Remove front panels so joints and
- 298 connections are accessible to portable scanner.
- 299 b. Follow-up Infrared Scanning: Perform additional follow-up infrared scan of each switchboard 11
- 300 months after date of Substantial Completion.
- 301 c. Instruments and Equipment:
- 302 1) Use infrared scanning device designed to measure temperature or to detect significant
- 303 deviations from normal values. Provide calibration record for device.
- 304 6. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning
- 305 controls and equipment.
- 306 C. Nonconforming Work:
- 307 1. Switchboard will be considered defective if it does not pass tests and inspections.
- 308 2. Remove and replace defective units and retest.
- 309 D. Collect, assemble, and submit test and inspection reports, including certified report that identifies switchboards
- 310 included and that describes scanning results. Include notation of deficiencies detected, remedial action taken,
- 311 and observations after remedial action.
- 312
- 313 E. Manufacturer Services:
- 314 1. Engage factory-authorized service representative to support field tests and inspections.

- 315 **3.8 ADJUSTING**
- 316 A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by
- 317 manufacturer.
- 318 B. Set field-adjustable circuit-breaker trip ranges as specified in Section 260573.16 "Coordination Studies."



319 **3.9 PROTECTION**  
320 A. Temporary Heating: Apply temporary heat, to maintain temperature in accordance with manufacturer's  
321 published instructions, until switchboard is ready to be energized and placed into service.  
322

323 **END OF SECTION 262413**

SECTION 26 31 00

PHOTOVOLTAIC SYSTEM PERFORMANCE REQUIREMENTS

PART 1 - GENERAL

- 1.1 DESCRIPTION
- 1.2 DEFINITIONS
- 1.3 SUBMITTALS
- 1.4 QUALITY ASSURANCE
- 1.5 COORDINATION
- 1.6 WARRANTY

PART 2 - PRODUCTS

- 2.1 SOLAR PANELS
- 2.2 INVERTERS
- 2.3 PV WIRING
- 2.4 COMBINER BOX
- 2.5 RACKING & ROOF ATTACHMENT & ROOF PENETRATIONS
- 2.6 METERING
- 2.7 INTERNET BASED MONITORING

PART 3 - EXECUTION

- 3.1 EXAMINATION
- 3.2 ARRAY REQUIREMENTS
- 3.3 ELECTRICAL INSTALLATION
- 3.4 IDENTIFICATION
- 3.5 FIELD QUALITY CONTROL

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This section includes general performance requirements that apply to installing a roof mounted solar electric (PV) system for this project
- B. Contractor is the Designer of Record for this system. Contractor is required to provide a Structural PE (Professional Engineer) Stamp for the structural design and an Electrical PE Stamp for the overall system design.
- C. Both the structural and electrical stamps are to be provided from experienced PV designers with at least 5 similar completed projects.
- D. Contractor is required to have experience with at least 5 similar completed PV projects.
- E. Product specifications included in this section are the Basis for Design. Design substitutions shall meet the minimum performance requirements defined in this section. Contractor shall select number of inverters and perform string sizing.
- F. Related Work and Requirements:
  - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- G. Incentive Paperwork:
  - 1. Contractor to provide support with Owner's application for Focus on Energy incentives.

**1.2 DEFINITIONS**

- A. MPPT: Maximum power point tracking.
- B. STC: Standard test conditions, 1000 W/m<sup>2</sup>, 1.5 air mass, and 25°C cell temperature.
- C. NABCEP: North American Board of Certified Energy Practitioners
- D. PTC: PV USA Test Conditions, 1000 W/m<sup>2</sup>, 1.5 air mass, 20°C air temperature, and 1 meter/sec. wind speed.
- E. Voc: Open circuit voltage
- F. Isc: Short circuit current.

**1.3 SUBMITTALS**

- A. Experience: Submit resumes for individuals involved with the design and construction of the PV System. Submit references and summaries of five similar projects that these individuals have completed.

- 1 B. Product Data: For each type of component indicated below. Include rated capacities, operating  
2 characteristics, and furnished specialties and accessories. All product data submittals shall be  
3 submitted for review by Owner prior to purchasing any materials or equipment.
  - 4 1. Solar panels
  - 5 2. Combiner boxes and fuses
  - 6 3. Grid tied inverters, including efficiency data.
  - 7 4. Solar panel structural system, including rail, clamps, and brackets.
  - 8 5. Manufacturer's installation instructions.
- 9 C. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required  
10 clearances, method of field assembly, components, and location and size of each field connection. All  
11 shop drawings shall be submitted for review by Owner prior to purchasing any materials or equipment.
  - 12 1. Dimensioned AutoCAD plan drawings of equipment including solar panel array, inverters,  
13 disconnects, combiner boxes, metering, and electrical routing.
  - 14 2. Provide AutoCAD drafted three-line wiring diagram of solar PV system indicating ratings of all  
15 panels and inverters, wire and conduit types and sizes, and disconnects.
  - 16 3. Wiring Diagrams: Power, signal, and control wiring.
- 17 D. Design Calculations
  - 18 1. The following design calculations shall be performed by Contractor and submitted for review by  
19 Owner prior to purchasing any materials or equipment.
    - 20 a. Electrical calculations, including string sizing, inverter selection, and voltage losses.
    - 21 b. Structural calculations, including rail spans, wind and snow loading, required ballast  
22 weights, and roof strength calculations.
- 23 E. Permitting and Agreements
  - 24 1. The following permits and agreements shall be prepared by Contractor on behalf of the Owner.  
25 All approved permits and agreements shall be submitted for review by Owner prior to purchasing  
26 any materials or equipment.
    - 27 a. Utility interconnection agreement
    - 28 b. Building permit
    - 29 c. Electrical permit
- 30 F. As built drawings:
  - 31 1. Dimensioned AutoCAD plan drawings of equipment including solar panel array, inverters,  
32 disconnects, combiner boxes, metering, and electrical routing.
  - 33 2. Provide AutoCAD drafted three-line diagram of solar PV system indicating ratings of all panels  
34 and inverters, wire and conduit types and sizes, and disconnects.
- 35 G. Field quality-control test reports.
  - 36 1. Include voltages and power output for each string. Measure and record solar intensity during  
37 testing. Include time, date, and weather conditions of test.
- 38 H. Operation and Maintenance Data: For panels, inverter, metering, and monitoring. In addition to items  
39 specified in Division 01 include the following:
  - 40 1. Instructions for operating equipment.
  - 41 2. Identification of operating limits which may result in hazardous or unsafe conditions.
  - 42 3. Document ratings of equipment and each major component.
  - 43 4. Technical Data Sheets.
  - 44 5. Wiring Diagrams.
  - 45 6. Parts list.
- 46 I. Warranty: Copies of all manufacturer's and installer's warranties.

47 **1.4 QUALITY ASSURANCE**

- 48 A. Installer Qualifications:
  - 49 1. Maintenance Proximity: Not more than four hours' normal travel time from Installer's place of  
50 business to Project site.
  - 51 2. Installer must have PV Installer certification through NABCEP.
- 52 B. Source Limitations: Obtain panels from a single manufacturer, of a single type and rating. Obtain  
53 inverters from a single manufacturer, of a single type and a single rating.
- 54 C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article  
55 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- 56 D. Comply with NFPA 70 and all applicable state and local codes

57 **1.5 COORDINATION**

- 58 A. Coordinate metering and interconnection agreement with electric utility. Contractor shall pay all  
59 interconnection fees including the application review fee, engineering review fee, and distribution  
60 system study fee. Contractor shall submit all required forms to utility.

1 **1.6 WARRANTY**

- 2 A. Installer must provide a two year installation warranty covering any defects of the installation.  
3 B. Panel Warranty Period:  
4 1. 5 years workmanship warranty.  
5 2. 10 year 90% linear power output warranty.  
6 3. 25 year 80% linear power output warranty.  
7 C. Inverter Warranty Period: 15 year warranty.

8 **PART 2 - PRODUCTS**

9 **2.1 SOLAR PANELS**

- 10 A. Available Manufacturers: Subject to compliance with performance requirements, manufacturers offering  
11 products that may be incorporated into the Work include:  
12 1. Heliene  
13 2. CertainTEED  
14 3. LG Solar  
15 4. Hanwha Q-cells  
16 5. Canadian Solar  
17 B. If an alternate product is proposed, bid is to document how the proposed solution is more cost effective  
18 to the owner. Due to the fast-changing nature of the photovoltaic industry, alternates may be necessary  
19 and will be considered. Follow substitution request procedure per 01 25 13.  
20 C. Capacities and Characteristics:  
21 1. All panels shall be of a single type from a single manufacturer.  
22 2. Power Output Ratings: STC rated power of approximately 450 watts.  
23 3. DC Array size of 200 kW +/- 5%  
24 4. AC Energy Produced between 240,000 and 270,000 kWh/yr based on the following assumptions:  
25 a. <http://pvwatts.nrel.gov/pvwatts.php> (PV Watts version 1) for 200 N. First St., Madison, Wisc.  
26 b. Module Type: Standard  
27 c. Array Type: Fixed (roof mount)  
28 d. System Losses: 14%  
29 e. Tilt: 20 degrees  
30 f. Azimuth: 215 degrees  
31 g. DC to AC Size Ratio: 1.2  
32 h. Inverter Efficiency: 96%  
33 i. Ground Coverage Ratio: 0.4  
34  
35 5. Power tolerance of less than 5% variation (maximum minus minimum). Minimum tolerance of -  
36 0%.  
37 6. Manufactured in the U.S., Mexico or Canada  
38 7. Nameplates: To identify electrical characteristics, manufacturer's name and address, and model  
39 and serial number of component.  
40 8. Module efficiency: minimum 17.00%  
41 9. 60-cell  
42 D. Materials and construction  
43 1. Monocrystalline or Polycrystalline  
44 2. Junction box with bypass diodes.  
45 3. Output Connections: Factory wired separate positive and negative leads sized per division 26  
46 wire requirements with locking quick disconnects, rated for use in direct sunlight. Shall meet all  
47 requirements of NEC article 690.33.  
48 4. Anodized aluminum frame with drainage holes and grounding holes.  
49 5. Operating temperature range of -40°C to +85°C.  
50 6. Withstand 1" diameter hail at 50 mph without damage.  
51 7. Load rated at 5400 Pa (113 psf) when used with two rail system.

52 **2.2 INVERTERS**

- 53 A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products  
54 that may be incorporated into the Work include:  
55 1. SMA  
56 2. Fronius  
57 3. Solar Edge with P600 Optimizers (1 Optimizer per 2 panels) – Basis of Design

- 1 B. If an alternate product is proposed, bid is to document how the proposed solution is more cost effective
- 2 to the owner. Due to the fast-changing nature of the photovoltaic industry, alternates may be necessary
- 3 and will be considered. Follow substitution request procedure per 01 25 13.
- 4 C. Standards
- 5 1. IEEE 1547
- 6 2. UL 1741 – anti-islanding.
- 7 D. Electrical characteristics
- 8 1. AC kW rating: Minimum DC-to-AC ratio of 1.2
- 9 a. Provide (4) inverters rated for a total of 200 kW DC input
- 10 2. Output voltage: 480VAC (-12%, +10%), 3 phase.
- 11 3. Frequency: 60 Hz sine wave
- 12 4. Input voltage: Coordinated with solar array.
- 13 5. Max Voc: Coordinated with solar array.
- 14 6. Max DC current: Coordinated with solar array.
- 15 7. Startup voltage: Coordinated with solar array.
- 16 8. Output power factor: Unity
- 17 9. DC to AC conversion efficiency:
- 18 a. 97.5% CEC rated efficiency
- 19 10. A/C and D/C rapid shutdown compliant with NEC 2017
- 20 E. Features
- 21 1. Transformerless design.
- 22 2. Forward facing DC disconnect
- 23 3. DC side ground fault protection.
- 24 4. Inverter must limit power output to nameplate value. If connected to an array capable of
- 25 producing more than the inverter's capacity, the inverter must limit the power without damage.
- 26 5. Maximum power point tracking over the range of voltages of the array, at the ambient
- 27 temperatures of the site.
- 28 6. User navigable display.
- 29 7. LED status lights on enclosure.
- 30 8. Communication port for diagnostics and communication port for communication with multiple
- 31 inverters and internet interface device.
- 32 9. NEMA 3R enclosure

### 33 2.3 PV WIRING

- 34 A. Type PV-WIRE, #10AWG, from array to combiner box, and where used as a jumper for connection
- 35 between panels.
- 36 B. UV-Stabilized Cable Ties:
- 37 1. Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one
- 38 piece, self-locking, Type 6/6 nylon.
- 39 2. Minimum Width: 3/16 inch (5 mm).
- 40 3. Tensile Strength at 73 °F (23 °C), According to ASTM D 638: 12,000 psi (82.7 MPa).
- 41 4. Temperature Range: -40 to +185 °F (-40 to +85 °C).
- 42 5. Color: Black.
- 43 C. Ampacity of PV source circuits shall be a minimum of 156% of the sum of parallel strings short circuit
- 44 currents.
- 45 1. Shall be sized to limit voltage drop to 1.5% from array to inverter during full production at MPPT
- 46 voltage at maximum ambient temperature.
- 47 2. Shall be in metallic conduit from combiner box, if installed, to inverter.

### 48 2.4 COMBINER BOX

- 49 A. If needed, Available Manufacturers: Subject to compliance with requirements, manufacturers offering
- 50 products that may be incorporated into the Work include:
- 51 1. Blue Oak
- 52 2. SMA
- 53 3. MidNite solar
- 54 B. If an alternate product is proposed, bid is to document how the proposed solution is more cost effective
- 55 to the owner. Due to the fast-changing nature of the photovoltaic industry, alternates may be necessary
- 56 and will be considered. Follow substitution request procedure per 01 25 13.
- 57 C. Capacities and Characteristics:
- 58 1. DC current and voltage ratings coordinated with array.
- 59 2. Positive and negative combiner blocks.
- 60 a. Number of poles coordinated with array.

- 1 3. DC voltage fuses in fingersafe fuse holder.
- 2 D. Materials and construction
- 3 1. Powder coated steel, NEMA 3R enclosure.
- 4 2. Knockouts
- 5 3. Stainless steel hardware.

6 **2.5 RACKING & ROOF ATTACHMENT & ROOF PENETRATIONS**

- 7 A. **Racking and Roof System Design must meet Structural and Architectural requirements. See**
- 8 **structural roof loading requirements and Architectural roof penetration requirements specific to**
- 9 **this project. (Addendum 4 dated 09/05/2023).**
- 10 B. Tilt Angle of Panels: 20 degrees from horizontal **as basis of design. (Addendum 4 dated 09/05/23)**
- 11 C. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products
- 12 that may be incorporated into the Work include:
- 13 1. Products for systems on flat roofs:
- 14 a. Anchor Products, <http://www.anchorp.com/> , U-anchor 2000 EPDM
- 15 2. Products for ballasted systems on flat roofs:
- 16 a. Schletter Windsafe
- 17 b. SolarDock
- 18 c. Iron Ridge
- 19 3. Products for pitched roofs:
- 20 a. S-5 Clamps (for standing seam installations)
- 21 1.) Use S-5-U, S-5-S, or the required clamp for the specific roofing product.
- 22 2.) S-5 mini clamps are not acceptable.
- 23 b. EcoFasten GreenFasten or QuickFoot (for composite shingle installations)

24 **2.6 METERING**

- 25 A. Refer to Division 26 specifications.

26 **2.7 INTERNET BASED MONITORING**

- 27 A. Provide standard package from inverter manufacturer and connect to the City Network. Coordinate with
- 28 Owner. Contractor is required to test monitoring to confirm it is functioning.

29 **PART 3 EXECUTION**

30 **3.1 EXAMINATION**

- 31 A. Examine roughing-in of electrical connections. Verify actual locations of connections before panel
- 32 installation.
- 33 B. Proceed with installation only after unsatisfactory conditions have been corrected.

34 **3.2 ARRAY REQUIREMENTS**

- 35 A. Install panels on racking designed for solar (PV) panels.
- 36 B. Coordinate installation with roof shop drawings.
- 37 C. Structural Performance: Installation shall withstand all local wind and snow loads, and all local building
- 38 department requirements.
- 39 D. If applicable, Slip sheet is to be used between ballasted racking and roof membrane
- 40 E. All fastening hardware must be stainless steel.
- 41 F. All materials must be metallurgically compatible where different materials are in contact with each other.
- 42 G. Roof penetrations shall be made watertight using methods that are standard to the roofing industry, are
- 43 approved by the roofing manufacturer, and that protect the warranty of the roof.
- 44 H. The panels shall be connected in arrays with the following characteristics:
- 45 1. Total DC peak STC rated power of all panels in the array shall be minimum 125 kW. The panels
- 46 shall be divided into even arrays between the inverters.
- 47 2. The panels shall be installed only in the area outlined on the architectural roof drawing.
- 48 3. If an alternate layout is proposed, bid is to document how the proposed solution is more cost
- 49 effective to the owner. Follow substitution request procedure per 01 25 13.
- 50 4. If needed, Each array shall be provided with a combiner box.
- 51 5. The panels shall be installed with long axis running north south as shown on architectural roof
- 52 drawing.
- 53 6. PV panel cables may be installed exposed where routed directly behind panels, but all cables
- 54 shall be installed in a section of conduit where crossing part of the roof not under a panel.

- 1 Conduit running across roof shall be supported on roof using Cooper B-Line Dura-Blok or  
2 equivalent.
- 3 7. All PV panel cables shall be installed in a neat and workmanship like manner. Excess wire shall  
4 be coiled and bundled neatly and supported securely in an area where they are not subject to  
5 environmental degradation, such as from wind, sun, and animals. Attach PV panel cables to  
6 racking with zip-ties listed for use in direct sunlight.
- 7 8. Panels shall be connected in series and parallel to match voltage and current ratings of inverter,  
8 across all ambient temperatures common to site (-25°C to 40°C).
- 9 a. Open circuit voltage of array on coldest day of year in full sunlight shall not exceed  
10 maximum operating voltage rating of inverter, panels, or any other equipment.
- 11 b. Open circuit voltage on warmest day of year in morning sunlight conditions (200W/m2  
12 irradiance) shall exceed inverter startup voltage. Voltage under operating MPPT  
13 conditions, minus any voltage drop over conductors, shall exceed minimum inverter input  
14 voltage.
- 15 c. Available short circuit current multiplied by 1.25 shall not exceed ratings for the inverter or  
16 any panels.
- 17 d. All series strings of panels shall have same performance characteristics.

18 **3.3 ELECTRICAL INSTALLATION**

- 19 A. Ground equipment according to Division 26
- 20 1. Size grounding conductors per NEC articles 250 and 690.
- 21 2. All conductive equipment enclosures must be grounded.
- 22 3. All panel frames must be grounded.
- 23 a. The removal of any panel shall not interrupt a grounded conductor to another photovoltaic  
24 source circuit.
- 25 B. Install wiring, combiner boxes, conduit, disconnects, inverter, web based monitoring hardware, sensors  
26 and other equipment according to Division 26.
- 27 C. Connect wiring according to Division 26.

28 **3.4 IDENTIFICATION**

- 29 A. Identify and label system components according to Division 26.
- 30 1. Provide a unique label for each inverter, PV output circuit, combiner box, PV Source circuit, and  
31 panel. Labeling shall match labeling shown on as-built diagram and plan provided by contractor.
- 32 B. Provide all labeling required by NEC article 690, including, but not limited to:
- 33 1. Label disconnects capable of being energized from both directions as such.
- 34 2. Provide plaque at utility service disconnect per article 690.56B. Field verify exact location.
- 35 3. Label each photovoltaic disconnecting means per NEC article 690.53.

36 **3.5 FIELD QUALITY CONTROL**

- 37 A. Perform tests and inspections as indicated below and prepare test reports. Correct any deficiencies.
- 38 1. Visually inspect all connections.
- 39 2. Visually inspect all supports.
- 40 3. Measure Voc of each individual string of panels under full sunlight.
- 41 a. Verify Voc of all strings are balanced.
- 42 b. Verify measured Voc against calculated Voc for the ambient temperature. Extrapolate  
43 Voc to temperatures expected at site, and verify they are within inverters ratings.
- 44 4. Measure Isc of each string of panels.
- 45 5. Verify correct operation of inverter.
- 46 6. Verify correct operation of complete system.
- 47 7. Replace any defective panels. Panels shall be replaced at contractor's expense.

48 **3.6 DEMONSTRATION**

- 49 A. Simulate power outage by interrupting normal source, and demonstrate that system disconnects from  
50 utility.
- 51 B. Provide owner's maintenance personnel with minimum two hour training session and in compliance with  
52 Div 1 Training Requirements.
- 53 1. Provide training on function of each piece of equipment.
- 54 2. Provide training on maintaining the system.
- 55 3. Explain means of disconnecting the system, and principals of operation and safety.

56 **END OF SECTION**

57

58

SECTION 31 23 00  
FOUNDATION EXCAVATING AND BACKFILLING

1  
2  
3 PART 1 – GENERAL  
4 1.1 SECTION INCLUDES  
5 1.2 RELATED WORK  
6 1.3 REFERENCES  
7 1.4 TESTING AND INSPECTION  
8 1.5 SUBMITTALS  
9 1.6 PROTECTION  
10 PART 2 – PRODUCTS  
11 2.1 MATERIALS  
12 PART 3 – EXECUTION  
13 3.1 PREPARATION  
14 3.2 EXCAVATION  
15 3.3 BACKFILLING  
16 3.4 COMPACTION  
17 3.5 FOUNDATIONS  
18 3.6 SLAB-ON-GRADE  
19 3.7 UTILITY TRENCH BACKFILL (AT SLAB-ON-GRADE LOCATIONS)  
20 3.8 TOLERANCES

21 **PART 1 - GENERAL**

22 **1.1 SECTION INCLUDES**

- 23 A. Foundation, excavating, and backfilling within five feet of the building perimeter. Work shall include,  
24 but not be limited to, the following items:
- 25 1. Removal of all unacceptable soil.  
26 2. Furnish and install acceptable fill.  
27 3. Prepare subgrade for footings and slab on grade.
- 28 B. The following items are not a part of this specification:
- 29 1. Utility trenching and related backfilling outside the building footprint.  
30 2. Subgrade for exterior walks and paving.
- 31 C. Structural notes indicated on the drawings regarding foundation excavating and backfilling shall be  
32 considered part of this specification.

33 **1.2 RELATED WORK**

- 34 A. Pertinent Section of Division 01.  
35 B. Pertinent Sections of Division 31.

36 **1.3 REFERENCES**

- 37 A. Codes and Standards: Comply with the provisions of the following codes, specifications and  
38 standards, except where more stringent requirements are shown or specified. Where any provisions  
39 of other pertinent codes and standards conflict with this specification, the more stringent provision  
40 shall govern.
- 41 1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.  
42 2. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil  
43 Using Standard Effort.  
44 3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil  
45 Using the Modified Effort.  
46 4. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes  
47 (Unified Soil Classification System).



- 1 5. ASTM D2940 - Standard Specification for Graded Aggregate Material for Bases or
- 2 Subbases for Highways or Airports.
- 3 6. ASTM D4253 - Standard Test Methods for Maximum Index Density and Unit Weight of Soils
- 4 Using a Vibratory Table.
- 5 7. ASTM D4254 - Standard Test Methods for Minimum Index Density and Unit Weight of Soils
- 6 and Calculation of Relative Density.
- 7 8. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of
- 8 Soils.
- 9 9. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and
- 10 Soil-Aggregate by Nuclear Methods (Shallow Depth).
- 11 10. Wisconsin Department of Transportation (WisDOT): WisDOT Standard Specifications for
- 12 Road and Bridge Construction.

13 **1.4 TESTING AND INSPECTION**

14 A. Inspection and Testing:

- 15 1. The Owner GC shall employ an Inspection Agency to perform the duties and responsibilities
- 16 specified below. **(Addendum 4 dated 09/05/23)**
- 17 2. Refer to architectural, civil, mechanical, and electrical specifications for testing and
- 18 inspection requirements of non-structural components.
- 19 3. Duties of the Inspection Agency:
  - 20 a. Perform all testing and inspection required per the Testing and Inspection
  - 21 Schedule indicated below.
  - 22 b. Furnish inspection reports to the building official, the Owner, the Architect, the
  - 23 Engineer of Record, and the General Contractor. The reports shall be completed
  - 24 and furnished within 48 hours of inspected work.
  - 25 c. Submit a final signed report stating whether the work requiring Inspection was, to
  - 26 the best of the Inspection Agency's knowledge in conformance with the approved
  - 27 plans and specifications.
- 28 4. Structural Component Testing and Inspection Schedule for Section 31 23 00 is as follows:

	Continuous	Periodic
Foundation Preparation		
Verify materials below shallow footings are adequate to achieve the design bearing capacity.		X
Verify excavations are extended to proper depth and have reached proper material.		X
Perform classification and testing of compacted fill materials.		X
Verify use of proper materials, densities, and lift thicknesses during placement and compaction of compacted fill.	X	
Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.		X

29 B. Minimum testing frequency and locations:

- 30 1. Laboratory Testing:
  - 31 a. Granular fill: One representative gradation test for each type of material.



1 **PART 2 - PRODUCTS**

2 **2.1 MATERIALS**

3 A. General: Provide borrow soil materials when sufficient acceptable soil materials are not available  
4 from excavations.

5 B. Acceptable soils shall comply with the following:

6 1. Meet ASTM D2487 soil classification groups GW, GP, GM, SW, SP, SM or a combination  
7 of these group symbols;

8 2. Be free of rock or gravel larger than 3 inches in any dimension;

9 3. Be free of debris, waste, frozen materials, vegetation and other deleterious materials;

10 4. Have a liquid limit less than 45 and a plasticity index less than 20.

11 5. Be approved by the Inspection Agency.

12 C. Unacceptable soils shall be defined as following:

13 1. ASTM D2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, PT or a  
14 combination of these group symbols.

15 2. Unacceptable soils also to include acceptable soils not maintained within 2 percent of  
16 optimum moisture content at time of compaction.

17 D. Free-Draining Granular Fill: Free-draining granular fill shall comply with the following:

18 1. Be a naturally or artificially graded mixture of natural or crushed gravel, crushed stone.

19 2. Be clean and free of fines.

20 3. Comply with ASTM D2940.

21 4. Be uniformly graded as follows:

COARSE AGGREGATE GRADATIONS						
SIEVE SIZE - PERCENT PASSING						
Grade No.	1-1/2"	1"	3/4"	1/2"	3/8"	No. 4
CA7	100	95 ± 5	-	45 ± 15	-	5 max

22 5. Be approved by the Inspection Agency.

23 E. Engineered Fill and Utility Base Course shall comply with the following:

24 1. Be a naturally or artificially graded mixture of natural or crushed gravel, crushed stone,  
25 natural or crushed sand;

26 2. Comply with ASTM D2940;

1 3. Be uniformly graded as follows:

COARSE AGGREGATE GRADATIONS						
SIEVE SIZE - PERCENT PASSING						
Grade No.	1-1/2"	1"	1/2"	No. 4	No. 16	No. 200
CA6	100 to 90	95 ± 5	75 ± 15	43 ± 13	25 ± 15	8 ± 4

2 4. Be approved by the Inspection Agency.

3 F. Material Applications: Provide and install material meeting with the above requirements as follows:

4 1. General fill: Acceptable soils.

5 2. Backfill at over-excavated areas beneath footings: Engineered fill.

6 3. Sub-grade layer beneath slabs-on-grade: Refer to drawings.

7 **PART 3 - EXECUTION**

8 **3.1 PREPARATION**

9 A. Identify and verify required lines, levels, contours and benchmark elevations for the work are as  
10 indicated.

11 B. Protect plant life, lawns, other features and vegetation to remain as a portion of the final landscaping.

12 C. Free groundwater is not expected during excavation. Contractor shall provide for de-watering of  
13 excavations from surface water, ground water or seepage.

14 D. Identify known underground utility locations with stakes and flags.

15 **3.2 EXCAVATION**

16 A. All excavations shall be safely and properly backfilled.

17 B. All abandoned footings, utilities and other structures that interfere with new construction shall be  
18 removed.

19 C. All unacceptable material and organic material shall be removed from below all proposed slabs-on-  
20 grade and the exposed natural soil shall be proof rolled and the compaction verified by the soils  
21 testing firm prior to placing fill. Proof-roll with a loaded tandem dump truck, loaded ready-mix truck,  
22 roller, or equivalent weight vehicle. Materials exhibiting weakness, such as those exhibiting rutting or  
23 pumping, shall be removed and replaced with acceptable compacted fill material.

24 D. Do not excavate within the 45-degree bearing splay of any adjacent foundations.

25 E. Remove lumped subsoil, boulders and rock up to 1/3 cubic yard (measured by volume). Provide  
26 Owner with unit price per cubic yard for obstructions larger than 1/3 cubic yard.

27 F. Outside 45-degree bearing splay of foundations, correct areas over excavated with aggregate at no  
28 additional cost to the Owner.

29 G. Within the 45-degree bearing splay of foundations, correct areas over excavated with 2000 psi  
30 concrete fill at no additional cost to the Owner. Notify the Architect prior to performing such work.

31 H. Hand trim final excavation to remove all loose material.

1 I. Contractor shall form all dams and perform other work necessary for keeping the excavation clear of  
2 water during the progress of the work and, at his own expense, shall pump or otherwise remove all  
3 surface and perched water which accumulates in the excavations. Perched water that cannot be de-  
4 watered in 48 hours of continuous pumping at a minimum rate of 60 gpm in dry weather shall be  
5 considered ground water.

6 J. Stockpile excavated material in the area designated and remove excess material not being used,  
7 from the site.

8 **3.3 BACKFILLING**

9 A. Verify foundation perimeter drainage system is complete and has been inspected prior to backfilling  
10 against foundation walls.

11 B. Support pipe and conduit during placement and compaction of bedding fill.

12 C. Systematically backfill to allow necessary time for natural settlement. Do not backfill over porous,  
13 wet, spongy or frozen subgrade surfaces.

14 D. Backfill areas to contours and elevations with unfrozen materials.

15 E. Unless noted otherwise on the drawings, make grade changes gradual.

16 F. Unless noted otherwise on the drawings, slope grade away from the building a minimum of 2 inches  
17 in 10 feet.

18 G. Contractor shall procure the approval of the subgrade from the Inspection Agency prior to the start  
19 of any filling or bedding operations.

20 H. Do not begin any backfill operations against any concrete walls until the concrete has achieved its  
21 specified strength.

22 I. Do not backfill against below grade walls without necessary bracing to support the walls or until  
23 supporting slab or framing is installed and has been anchored to the wall per the drawings.

24 J. Place and mechanically compact granular fill in continuous layers not to exceed loose lifts of 10 inch  
25 depth.

26 K. Employ a placement method that does not disturb or damage adjacent utilities, vapor barriers,  
27 foundation perimeter drainage and foundation waterproofing.

28 L. All surplus fill materials are to be removed from the site.

29 M. Fill material stockpiles shall be free of unacceptable soil materials.

30 N. After work is complete, remove all excess stockpile material and repair stockpile area to its original  
31 condition.

32 **3.4 COMPACTION**

33 A. Compact all fill that will support building footings or floor slabs to 95 percent of the maximum dry  
34 density in accordance with ASTM D1557. For relative cohesionless fill materials, where the percent  
35 passing the #200 sieve is less than 10 and the moisture density curve indicates only slight sensitivity  
36 to changing moisture content, compaction requirements should be changed to 75 percent relative  
37 density in accordance with ASTM D4253 and ASTM D4254.

38 B. Compact all fills that support paving and landscape per civil specifications.

1    **3.5    FOUNDATIONS**

- 2           A.       Each footing excavation should be cleared of all obstructions and other organic or deleterious  
3                    materials.
- 4           B.       Localized areas of unstable or unacceptable material may be discovered during the stripping and  
5                    excavation operation and may require over-excavation and backfilling. The Inspection Agency shall  
6                    be present during the proof rolling to evaluate any localized areas and make recommendations  
7                    regarding over-excavation, backfilling and recompaction of these areas. Fill placement and  
8                    compaction shall be inspected and tested by the Inspection Agency.
- 9           C.       Footing elevations shown on the drawings designate a minimum depth of footing where an  
10                   appropriate soil bearing pressure is expected. Footings, piers and/or walls shall be lowered or  
11                   extended as required to reach soil meeting the design bearing pressure. This work shall be performed  
12                   per the recommendations of the Inspection Agency.
- 13          D.       All footing excavations shall be recompacted by hand-operated, vibratory compaction equipment,  
14                   except where compaction will degrade the integrity of subgrade soils. In these instances, bottom of  
15                   footing excavations should be hand-trimmed to remove loosened material.
- 16          E.       All excavation and recompacted surfaces shall be inspected and tested to a depth of 2.0 feet below  
17                   the excavated elevation by the Inspection Agency. Additional field density tests should be performed  
18                   for each one foot of fill material placed. Any areas not in compliance with the compaction  
19                   requirements should be corrected and re-tested prior to placement of fill material.
- 20          F.       For foundation areas where over excavation is performed, place and mechanically compact  
21                   Engineered fill material in continuous layers not to exceed loose lifts of 10 inch depth.

22    **3.6    SLAB-ON-GRADE**

- 23           A.       All disturbed areas after the clearing and stripping operation should be proof-rolled and recompacted  
24                   with a heavy vibratory drum roller (approved by the Inspection Agency) in the static mode. The  
25                   compactor should make a minimum of 10 passes, with a minimum of one foot overlap of each pass.  
26                   The compactor speed should be less than 0.2 MPH.
- 27           B.       The Inspection Agency shall monitor proof-rolling and compaction operations. This area should then  
28                   be tested for compaction to a depth of 2.0 feet below the compacted surface prior to the placement  
29                   of any structural fill material.
- 30           C.       Refer to drawings for required sub-grade preparation beneath slabs-on-grade.

31    **3.7    UTILITY TRENCH BACKFILL (AT SLAB-ON-GRADE LOCATIONS)**

- 32           A.       Excavate and backfill utility trenches under wall footings as shown on the drawings.
- 33           B.       Place utility base course on subgrades free of mud, frost, snow, or ice.
- 34           C.       Place and compact utility base course on trench bottoms and where indicated.
- 35           D.       Lay underground utilities on 6" sand bedding, which meets the acceptable criteria of Section 2.1,B.
- 36           E.       Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for  
37                   joints, fittings, and bodies of conduits.
- 38           F.       After connection joints are made, any misalignment can be corrected by tamping the sand around  
39                   the utilities.
- 40           G.       Place and compact initial backfill of acceptable sand to a height of 6 inches over the utility pipe or  
41                   conduit in 6 inches layer meeting specified compaction requirements.

- 1 H. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and  
2 along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit.
- 3 I. Place and compact final backfill using acceptable soil to final subgrade elevation meeting specified  
4 compaction requirements.
- 5 J. Backfill voids with acceptable soil while installing and removing shoring and bracing.
- 6 K. Inspection Agency shall monitor, and test compacted backfill to verify final compaction meets the  
7 specified requirement.

8 **3.8 TOLERANCES**

- 9 A. Top surface of backfilling under paved areas: Plus or minus ½ inch from required elevation.
- 10 B. Top surface of general backfilling: Plus or minus 1 inch from required elevation.

11 **END OF SECTION**

**SECTION 31 26 00**  
**STEEL HELICAL PILES**

1  
2  
3 PART 1 – GENERAL  
4 1.1 SECTION INCLUDES  
5 1.2 RELATED WORK  
6 1.3 REFERENCES  
7 1.4 TESTING AND INSPECTION  
8 1.5 DEFINITIONS  
9 1.6 QUALITY ASSURANCE  
10 1.7 BID REQUIREMENTS  
11 1.8 SUBMITTALS  
12 1.9 SUBSURFACE CONDITIONS  
13 1.10 PILE LOAD TESTING  
14 1.11 DELIVERY STORAGE AND HANDLING  
15 PART 2 – PRODUCTS  
16 2.1 MANUFACTURER  
17 PART 3 – EXECUTION  
18 3.1 SITE CONDITIONS  
19 3.2 INSTALLATION  
20 3.3 TERMINATION CRITERIA  
21 3.4 TOLERANCES  
22 3.5 CLEANUP

23 **PART 1 - GENERAL**

24 **1.1 SECTION INCLUDES**

- 25 A. All items required for executing and completing the steel helical pile work and related work shown on  
26 the drawings or specified herein.
- 27 B. Structural notes indicated on the drawings regarding steel helical piles should be considered a part  
28 of this specification.

29 **1.2 RELATED WORK**

- 30 A. Pertinent Sections of Division 01.  
31 B. Section 03 20 00 - Concrete Reinforcement.  
32 C. Section 03 30 00 - Cast-in-Place Concrete.  
33 D. Section 31 23 00 - Foundation Excavating and Backfilling.

34 **1.3 REFERENCES**

- 35 A. Codes and Standards: Comply with the provisions of the following codes, specifications, and  
36 standards except where more stringent requirements are shown or specified. Where any provisions  
37 of other pertinent codes and standards conflict with this specification, the more stringent provision  
38 shall govern.
- 39 1. ASCE 20 - Standard Guidelines for the Design and Installation of Pile Foundations.  
40 2. ASME B18.2.1 - Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex,  
41 Hex Flange, Lobed Head, and Lag Screws (Inch Series).  
42 3. ASTM A29 - Standard Specification for General Requirements for Steel Bars, Carbon and  
43 Alloy, Hot-Wrought.  
44 4. ASTM A36 - Standard Specification for Carbon Structural Steel.  
45 5. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated,  
46 Welded and Seamless.  
47 6. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and  
48 Steel Products.



- 1 7. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- 2 8. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High
- 3 Temperature or High Pressure Service and Other Special Purpose Applications.
- 4 9. ASTM A252 - Standard Specification for Welded and Seamless Steel Pipe Piles.
- 5 10. ASTM A320 - Standard Specification for Alloy-Steel and Stainless Steel Bolting for Low-
- 6 Temperature Service.
- 7 11. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel
- 8 Structural Tubing in Rounds and Shapes.
- 9 12. ASTM A513 - Standard Specification for Electric-Resistance-Welded Carbon and Alloy
- 10 Steel Mechanical Tubing.
- 11 13. ASTM A536 - Standard Specification for Ductile Iron Castings.
- 12 14. ASTM A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium
- 13 Structural Steel.
- 14 15. ASTM A618 - Standard Specification for Hot-Formed Welded and Seamless High-Strength
- 15 Low-Alloy Structural Tubing.
- 16 16. ASTM A656 - Standard Specification for Hot-Rolled Structural Steel, High-Strength Low-
- 17 Alloy Plate with Improved Formability.
- 18 17. ASTM A958 - Standard Specification for Steel Castings, Carbon and Alloy, with Tensile
- 19 Requirements, Chemical Requirements Similar to Standard Wrought Grades.
- 20 18. ASTM A1018 - Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils,
- 21 Hot-Rolled, Carbon, Commercial, Drawing, Structural, High-Strength Low-Alloy, High-
- 22 Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
- 23 19. ASTM D1143 - Standard Test Methods for Deep Foundations Under Static Axial
- 24 Compressive Load.
- 25 20. ASTM D3689 - Standard Test Methods for Deep Foundations Under Static Axial Tensile
- 26 Load.
- 27 21. ASTM D3966 - Standard Test Methods for Deep Foundations Under Lateral Load.
- 28 22. ASTM F3125 - Standard Specification for High Strength Structural Bolts, Steel and Alloy
- 29 Steel, Heat Treated, 120 ksi and 150 ksi Minimum Tensile Strength, Inch Dimensions.
- 30 23. AWS B2.1 - Specification for Welding Procedure and Performance Qualification.
- 31 24. AWS D1.1 - Structural Welding Code - Steel.
- 32 25. AWS D1.4 - Structural Welding Code – Reinforced Steel.
- 33 26. ICC AC358 - Acceptance Criteria for Helical Piles Systems and Devices.
- 34 27. OSHA Excavation Safety Guidelines.
- 35 28. SAE J429 - Mechanical and Material Requirements for Externally Threaded Fasteners.

36 **1.4 TESTING AND INSPECTION**

37 A. Inspection and Testing:

- 38 1. The **Owner GC** shall employ an Inspection Agency to perform the duties and responsibilities
- 39 specified below. **(Addendum 4 dated 09/05/23)**
- 40 2. Refer to architectural, civil, mechanical, and electrical specifications for testing and
- 41 inspection requirements of non-structural components.
- 42 3. Work performed on the premises of a fabricator approved by the building official need not
- 43 be tested and inspected per the table below. The fabricator shall submit a certificate of
- 44 compliance that the work has been performed in accordance with the approved plans and
- 45 specification to the building official and the Architect and Engineer of Record.
- 46 4. Duties of the Inspection Agency:
  - 47 a. Perform all testing and inspection required per approved testing and inspection
  - 48 program.



- 1 8. Geotechnical Capacity: The maximum load that can be resisted through the bearing of the  
2 helix plates in the soil or highly weathered rock in which they are embedded as  
3 characterized by the available subsurface soils, rock and groundwater information, and  
4 geotechnical testing data, without exceeding the specified performance criteria.
- 5 9. Helical Pile: Consists of one or more helix plates attached to a central shaft and load transfer  
6 device for attachment to a structure. May also include surface coating or other corrosion  
7 protection means.
- 8 10. Helical Anchor: Same as a Helical Pile. Term generally used when axial tension is the  
9 primary service load.
- 10 11. Helix Plate (Helices): Generally round steel plate formed into a helical spiral and welded to  
11 the central steel shaft.
- 12 12. Installation Angle: Angle of inclination between the longitudinal axis of the helical pile and  
13 the horizontal.
- 14 13. Lead Section: The first helical pile component installed into the soil. It consists of one or  
15 more helical plates welded to the central steel shaft.
- 16 14. Limit State: A condition beyond which a helical pile component or interface becomes no  
17 longer useful for its intended function (serviceability limit state) or to be unsafe (strength  
18 limit state).
- 19 15. Loads: Forces or other actions as defined that must be resisted by the piles. Permanent  
20 loads are those loads in which variations over time are rare or of small magnitude. All other  
21 loads are variable loads. Refer also to Service Load below.
- 22 16. Load Factor: A factor that accounts for deviations of the actual load from the service load  
23 (load resistance factor design).
- 24 17. Load Test: A procedure to test the capacity and relation of load to deflection by applying a  
25 compression, tension, and/or lateral load on the helical pile.
- 26 18. Mechanical Strength: The maximum compressive, tension, and/or lateral load capable of  
27 being resisted by the structural elements of a helical pile.
- 28 19. Pile Design Professional: Individual or firm responsible for the design of helical piles, helical  
29 anchors, and brackets.
- 30 20. Reveal: The distance from ground surface to the end of the last installed extension of a pile,  
31 measured along the pile's longitudinal axis.
- 32 21. Pitch: The distance measured along the axis of the shaft between the leading and trailing  
33 edges of the helix plate.
- 34 22. Safety Factor: The ratio of the ultimate resistance to the service load used for the design of  
35 any helical pile component or interface.
- 36 23. Service Load: The total magnitude of the unfactored loads, determined by the Owner's  
37 Representative, that must be resisted by the piles.
- 38 24. Torque: The measure of the rotational force times the moment arm needed to overcome the  
39 shear strength of the soil measured in ft-lb. Torque is used as an empirical approach for  
40 predicting the ultimate capacity of a helical pile.



- 1                    7.        The helical pile top attachment shall effectively distribute the design load to the concrete  
2                    foundations such that the concrete bearing stress does not exceed those in the ACI Building  
3                    Code and the bending stress in the steel plates does not exceed AISC allowable stresses  
4                    for steel members.
- 5                    8.        If on-site load testing is to be performed, the piles shall be designed such that the maximum  
6                    test load does not exceed 90% of the manufacturer's rated mechanical strength of any pile  
7                    component or load transfer device.

8    **1.7        BID REQUIREMENTS**

- 9                    A.        Steel Helical Piles: Bids shall be provided for the lump sum amount based on the number of piles,  
10                    estimated length, and total footage as shown in the drawings and/or specifications.
- 11                    B.        The Pile Contractor shall examine the construction site and conditions under which piles are to be  
12                    installed, and notify the General Contractor and Architect in writing prior to bidding of any conditions  
13                    detrimental to proper and timely completion of work.
- 14                    C.        Helical Pile Length: Base the length of the helical piles on the length listed on the drawings and in  
15                    the Geotechnical Engineering Report. The elevation identifying the bottom of the shaft is an  
16                    approximate length for consistent bidding purposes only. The actual length will be determined in the  
17                    field from the actual elevation of the bearing stratum to be verified by the Inspection Agency.
- 18                    D.        Unit prices shall be issued to the Architect prior to construction as part of the submittal package.
- 19                    E.        Adjustments in the Contract Price will be made due to changes in the number and length of piles,  
20                    based on unit prices established in Section 01 21 00 - Allowances as follows:
- 21                    1.        Payment for helical piles will be made on the total length of helical piles installed and  
22                    accepted. Actual length and shaft diameter may change due to job conditions. Adjusted  
23                    payment will be made based on net variations to the total quantities, based on design  
24                    dimensions.
- 25                    2.        Provide the following unit costs if additions to, or deductions from, work, are required and  
26                    authorized in writing by Architect/Engineer:
- 27                    a.        Additional length of helical pile (\$/per foot)  
28                    b.        Subtracted length of helical pile (\$/per foot)  
29                    c.        Load test (lump sum per test)

30    **1.8        SUBMITTALS**

- 31                    A.        Shop drawings:
- 32                    1.        Prepare and submit to the Architect/Engineer, for review and approval, working drawings  
33                    and relevant structural design calculations for the helical pile system or systems intended  
34                    for use. All design submittal shall be sealed by a Registered Professional Engineer currently  
35                    licensed in the state where the project is located.
- 36                    2.        Product Data:
- 37                    a.        Product designations for helix sections, extension sections, and all ancillary  
38                    products to be supplied at each helical pile location.  
39                    b.        Evaluation approved by the applicable building code authority (e.g., International  
40                    Code Council Evaluation Services (ICC-ES)).  
41                    c.        Corrosion protection and pile top attachment.

- 1 d. Manufacturer's published mechanical strengths for the pile assemblies, including  
2 load transfer devices per current ICC-ES report, calculations, and/or full-scale  
3 testing.
- 4 3. Design Data:
- 5 a. Calculated geotechnical capacity of piles based on geotechnical information. The  
6 design submittal prepared by the pile designer shall indicate that the selected piles  
7 can be installed to achieve the performance requirements.
- 8 b. Minimum effective torsional resistance criteria.
- 9 c. Maximum allowable installation torque of pile.
- 10 d. Proposed production quality control plan, including method and equipment to be  
11 used to measure torsional resistance during installation.
- 12 e. Procedures and acceptance criteria for any proposed performance and/or proof  
13 testing.
- 14 4. Submit a detailed description of the construction procedures proposed for use to the  
15 Architect/Engineer for review. This shall include a schedule of major equipment resources.
- 16 5. The working drawings shall include helical pile installation details giving:
- 17 a. Helical pile number, location, and pattern by assigned identification number
- 18 b. Helical pile design load
- 19 c. Type and size of central steel shaft
- 20 d. Number and diameter of helix plates
- 21 e. Minimum overall length
- 22 f. Minimum effective installation torque
- 23 g. Inclination of helical pile
- 24 h. Helical pile attachment to structure relative to grade beam, pile cap, etc.
- 25 i. Cutoff elevation
- 26 6. Submit shop drawings for all structural steel, including the helical pile components,  
27 corrosion protection system, pile top attachment, and helix details, to the Architect/Engineer  
28 for review and approval.
- 29 7. Submit for review and acceptance the proposed helical pile load testing procedure. The  
30 testing program shall be provided two (2) weeks prior to starting the load testing. This helical  
31 pile verification load testing proposal shall be in general conformance with ASTM D1143  
32 and/or D3689, and shall indicate the minimum following information:
- 33 a. Type and accuracy of apparatus for measuring load
- 34 b. Type and accuracy of apparatus for applying load
- 35 c. Type and accuracy of apparatus for measuring the pile deformation
- 36 d. Type and capacity of reaction load system, including sealed design drawings
- 37 e. Hydraulic jack calibration report
- 38 8. Submit to the Architect/Engineer calibration reports for each test jack, pressure gauge, and  
39 master pressure gauge to be used. The calibration tests shall have been performed by an  
40 independent testing laboratory, and tests shall have been performed within one year of the  
41 date submitted. Testing shall not commence until the Architect/Engineer has approved the  
42 jack, pressure gauge, and master pressure gauge calculations.
- 43 9. Work shall not begin until the appropriate submittals have been received, reviewed, and  
44 approved in writing by the Architect/Engineer. Note that any additional time required due to  
45 incomplete or unacceptable submittals shall not be cause for delay or impact claims. All  
46 costs associated with incomplete or unacceptable submittals shall be the responsibility of  
47 the Contractor.

- 1                    10.      Welding certificates.
- 2                    11.      Unit costs: Submit as outlined in this section.
- 3                    12.      The Contractor shall submit to the Architect copies of calibration reports for each torque  
4                    indicator or torque motor, and all load test equipment to be used on the project. The  
5                    calibration tests shall have been performed within 45 working days of the date submitted.  
6                    Helical pile installation and testing shall not proceed until the Architect/Engineer has  
7                    received the calibration reports. These calibration reports shall include, but are not limited to,  
8                    the following information:
- 9                    a.        Name of project and Contractor
- 10                    b.        Name of testing agency
- 11                    c.        Identification (serial number) of device calibrated
- 12                    d.        Description of calibrated testing equipment
- 13                    e.        Date of calibration
- 14                    f.        Calibration data
- 15                    13.      Installation Reports: The installing contractor shall provide the Owner, or his authorized  
16                    representative, copies of individual helical pile installation records within 24 hours after each  
17                    installation is completed. Formal copies shall be submitted within 48 hours after installation.  
18                    These installation records shall include, but are not limited to, the following information:
- 19                    a.        Name of project and Contractor
- 20                    b.        Name of Contractor's supervisor during installation
- 21                    c.        Date and time of installation
- 22                    d.        Installation equipment type and operator name
- 23                    e.        Type of torque indicator used
- 24                    f.        Location of helical pile or helical anchor by grid location, diagram, or assigned  
25                    identification number
- 26                    g.        Pile reveal
- 27                    h.        Type and configuration of lead section with length of shaft and number and size of  
28                    helical bearing plates
- 29                    i.        Type and configuration of extension sections with length and number and size of  
30                    helical bearing plates, if any
- 31                    j.        Final elevation of top of shaft and cutoff length, if any
- 32                    k.        Total length of installed pile
- 33                    l.        As-built installation angle of pile
- 34                    m.        Torque measurements at three-foot depth intervals
- 35                    n.        Final installation torque
- 36                    o.        Effective torsional resistance and calculated geotechnical capacity based on  
37                    effective torsional resistance and/or as derived from the pre-production test  
38                    program
- 39                    p.        Comments pertaining to interruptions, obstructions, or other relevant information
- 40                    q.        Unless specified otherwise on the drawings or by local codes, the pile design  
41                    professional, or an inspection agency accepted by the Architect/Engineer, shall  
42                    observe and document at least 10 percent of helical pile and helical anchor  
43                    installations.
- 44                    B.      Post Construction:
- 45                    1.      The following records shall be prepared for the Owner. The records shall be completed  
46                    within 24 hours after each pile installation is completed. The records shall include the  
47                    following minimum information:
- 48                    a.        Pile drilling duration and observations
- 49                    b.        Information on soil and rock encountered, including description of strata, water,  
50                    etc.

- 1 c. Approximate final tip elevation
  - 2 d. Cutoff elevation
  - 3 e. Rated load capacities
  - 4 f. Description of unusual installation behavior or conditions
  - 5 g. Any deviations from the intended parameters
  - 6 h. Torque attained, where applicable
  - 7 i. Pile materials and dimensions
  - 8 j. Helical pile test records, analysis, and details
- 9 2. Submit as-built drawings showing the location of the piles, their depth and inclination, and  
10 details of their composition.

11 **1.9 SUBSURFACE CONDITIONS**

- 12 A. The Geotechnical Report, including logs of soil borings as shown on the boring location plan, shall  
13 be considered to be representative of the in-situ subsurface conditions likely to be encountered on  
14 the project site. Said Geotechnical Report shall be used as the basis for helical pile design using  
15 generally accepted engineering judgment and methods.
- 16 B. The Geotechnical Report shall be provided for purposes of bidding. If, during helical pile installation,  
17 subsurface conditions of a type and location are encountered of a frequency that were not reported,  
18 inferred, and/or expected at the time of preparation of the bid, the additional costs required to  
19 overcome such conditions shall be considered as extras to be paid for by the Owner.

20 **1.10 PILE LOAD TESTING**

- 21 A. If pile testing is required, the Installing Contractor shall furnish all labor, equipment, and pre-  
22 production helical piles necessary to accomplish the testing as shown in the previously submitted  
23 and approved pile design submittals. The Installing Contractor shall apply the specified loads for the  
24 specified durations and record the specified data for the specified number of piles. No deviations  
25 from the test plan(s) will be allowed without explicit approval in writing from the Owner/Owner's  
26 Representative. Pile testing shall be in accordance with the load testing procedures and performance  
27 requirements deemed suitable for the application by the Owner/Owner's Representative, or pile  
28 designer.
- 29 B. Helical Pile Compression Tests:
- 30 1. Compression tests shall be performed following the "quick test" procedure described in  
31 ASTM D1143 specifications.
  - 32 2. Load tests shall be observed and documented by the Inspection Agency.
  - 33 3. Unless otherwise shown on the drawings, the maximum test load shall be 200% of the  
34 allowable load shown on the drawings.
  - 35 4. The locations of helical piles to be tested shall be determined by the Contractor, unless  
36 noted on the drawings.
  - 37 5. Installation methods, procedures, equipment, products, and final installation torque shall be  
38 identical to the production helical piles to the extent practical, except where otherwise  
39 approved by the Owner or Architect/Engineer.
  - 40 6. A load test shall be deemed acceptable provided the maximum test load is applied without  
41 helical pile failure and the deflection of the pile head at the design load is less than 1-inch,  
42 unless noted otherwise on the drawings. Failure is defined when continuous jacking is  
43 required to maintain the load.



- 1 C. Helical Anchor Tension Tests:
- 2 1. Contractor shall perform the number of proof load tests shown on the drawings.
- 3 2. Proof load tests shall be performed following the procedure described in ASTM D3689  
4 specifications.
- 5 3. Proof load tests shall be observed and documented by the Inspection Agency.
- 6 4. Unless otherwise shown on the drawings, the maximum test load shall be 150% of the  
7 allowable load shown on the drawings.
- 8 5. The locations of helical anchors to be tested shall be determined by the Contractor, unless  
9 shown on the drawings.
- 10 6. Installation methods, procedures, equipment, products, and final installation torque shall be  
11 identical to the production anchors to the extent practical, except where otherwise approved  
12 by the Owner or Architect/Engineer.
- 13 7. A proof load test shall be deemed acceptable provided the maximum test load is applied  
14 without helical anchor failure. Failure is when continuous jacking is required to maintain the  
15 load.
- 16 D. Helical Pile Lateral Load Tests:
- 17 1. Contractor shall perform the number of lateral load tests shown on the drawings.
- 18 2. Lateral load tests shall be performed following the "free head" procedure described in ASTM  
19 D3966 specifications.
- 20 3. Lateral load tests shall be observed and documented by the Inspection Agency.
- 21 4. Unless otherwise shown on the drawings, the maximum test load shall be 200% of the  
22 allowable lateral load shown on the drawings.
- 23 5. The locations of test helical piles shall be determined by the Contractor, unless shown on  
24 the drawings.
- 25 6. Installation methods, procedures, equipment, products, and final installation torque shall be  
26 identical to the production piles to the extent practical, except where otherwise approved by  
27 the Owner or Architect/Engineer.
- 28 7. A lateral load test shall be deemed acceptable provided the lateral deflection of the pile  
29 head measured at the ground surface at the maximum test load is equal to or less than 1-  
30 inch.
- 31 E. If a load test fails the foregoing acceptance criteria, the Contractor shall modify the helical pile or  
32 helical anchor design and/or installation methods and retest the modified pile or anchor as directed  
33 by the Owner or Architect/Engineer. These modifications include, but are not limited to, de-rating the  
34 load capacity, modifying the installation methods and equipment, increasing the minimum final  
35 installation torque, changing the helical configuration, or changing the product (e.g., duty).  
36 Modifications that require changes to the structure shall have prior review and acceptance of the  
37 Owner. Any modifications of design or construction procedures, and any retesting required, shall be  
38 at the Contractor's expense.

1 F. The Contractor shall provide the Owner and Architect/Engineer copies of load test reports confirming  
2 configuration and construction details within one (1) week after completion of the load tests. This  
3 written documentation will either confirm the load capacity as required on the working drawings or  
4 propose changes based on the results of the tests. At a minimum, the documentation shall include,  
5 but is not limited to, the following information:

- 6 1. Name of project and installing contractor
- 7 2. Name of installing contractor's supervisor during installation
- 8 3. Name of third party test agency, if any
- 9 4. Type of test, pre-production or production test
- 10 5. Date, time, and duration of test
- 11 6. Unique identifier and location of helical pile tested
- 12 7. Test procedure (ASTM D1143, D3689, or D3966)
- 13 8. List of any deviations from procedure
- 14 9. Test criteria, performance or proof
- 15 10. Description of calibrated testing equipment and test setup
- 16 11. Testing equipment calibration data
- 17 12. Type and configuration of helical pile or helical anchor including lead section, number and  
18 type of extension sections, and manufacturer's product identification numbers
- 19 13. Load steps and duration of each load increment
- 20 14. Incremental and cumulative pile-head movement at each load step
- 21 15. Comments pertaining to test procedure, equipment adjustments, or other relevant  
22 information
- 23 16. Reaction frame/pile installation and verification data, as required by Owner or pile designer
- 24 17. Incremental and cumulative pile-head movement at each load step
- 25 18. Signatures as required by local jurisdiction

26 **1.11 DELIVERY, STORAGE AND HANDLING**

27 A. All helical pile, helical anchor, and bracket assemblies shall be free of structural defects and protected  
28 from damage. Store helical piles, helical anchors, and bracket assemblies on wood pallets or  
29 supports to keep from contacting the ground. Damage to materials shall be cause for rejection.

30 **PART 2 - PRODUCTS**

31 **2.1 MANUFACTURER**

- 32 A. AB Chance Company, a subsidiary of Hubbel Corp., 210 North Allen Street, Centralia, MO 65240-  
33 1395; or Aluma-Form/Dixie, 3625 Old Getwell Road, Memphis, TN 38118.
- 34 B. Foundation Supportworks®, Inc., 12330 Cary Circle, Omaha, NE 68128.
- 35 C. Pier Tech Systems, 17813 Edison Avenue, Suite 100, Chesterfield, MO 63005.
- 36 D. Magnum Piering, Inc., 6082 Schumacher Park Drive, West Chester, OH 45069.
- 37 E. Helical Anchors, Inc., 5101 Boone Avenue North, Minneapolis, MN 55428.
- 38 F. Techno Metal Post/Techno Pieux, 1005 Richards Rd., Hartland, WI 53029.

39 **PART 3 - EXECUTION**

40 **3.1 SITE CONDITIONS**

- 41 A. Prior to commencing helical pile installation, the Contractor shall inspect the work of all other trades  
42 and verify that all said work is completed to the point where helical piles may commence without  
43 restriction.
- 44 B. The Contractor shall verify that all helical piles may be installed in accordance with all pertinent codes  
45 and regulations regarding such items as underground obstructions, right-of-way limitations, utilities,  
46 etc.

1 C. In the event of a discrepancy, the Contractor shall notify the Architect/Engineer. The Contractor shall  
2 not proceed with helical pile installation in areas of discrepancies until said discrepancies have been  
3 resolved. All costs associated with unresolved discrepancies shall be the responsibility of the Owner.

4 **3.2 INSTALLATION**

5 A. Before entering a construction site to begin work, the Installing Contractor shall provide proof of  
6 insurance coverage as stated in the general specifications and/or contract.

7 B. Installing Contractor shall furnish and install all helical piles per the project plans and approved pile  
8 design submittals. In the event of conflict between the project plans and the approved pile design  
9 documentation, the Installing Contractor shall not begin construction on any affected items until such  
10 conflict has been resolved.

11 C. The Installing Contractor shall conduct construction operations in a manner to ensure the safety of  
12 persons and property in the vicinity of the work. Personnel shall comply with safety procedures that  
13 are both in accordance with OSHA standards and specified in established project safety plan.

14 D. The Installing Contractor or Owner shall request marking of underground utilities by an underground  
15 utility location service, as required by law, and shall avoid contact with all marked underground  
16 facilities. It is the responsibility of the Owner to provide to the Installing Contractor all private utility  
17 information.

18 E. The portion of the construction site occupied by the Installing Contractor, his/her equipment, and  
19 his/her material stockpiles shall be kept reasonably clean and orderly.

20 F. Installation of helical piles may be observed by representatives of the Owner for quality assurance  
21 purposes. The Installing Contractor shall notify the Owner's Representative at least 24 hours prior to  
22 pile installation operations. All helical pile sections and ancillary products shall be marked as  
23 necessary to allow correlation with the pile design submittals before shipment from the manufacturer.

24 G. The helical pile installation technique shall be such that it is consistent with the geotechnical,  
25 logistical, environmental, and load carrying conditions of the project. The lead section shall be  
26 positioned at the location as shown on the pile design drawings. Inclined helical piles can be  
27 positioned perpendicular to the ground to assist in initial advancement into the soil before the required  
28 installation angle shall be established. After initial penetration, the required installation angle shall be  
29 established. The helical pile sections shall be engaged and advanced into the soil in a smooth,  
30 continuous manner at a rate of rotation of 5 to 25 rpm. Sufficient crowd shall be applied to uniformly  
31 advance the helical pile sections a minimum of 80% of the distance equal to the pitch of the helix  
32 plate per revolution. The rate of rotation and magnitude of crowd shall be adjusted for different soil  
33 conditions and depths. Extension sections shall be provided to obtain the required minimum overall  
34 depth/length and minimum effective torsional resistance as shown on the project plans.

35 **3.3 TERMINATION CRITERIA**

36 A. The specified minimum overall depth/length criteria and minimum effective torsional resistance  
37 criterion must be satisfied prior to terminating the helical pile installation. In the event any helical pile  
38 fails to meet these production quality control criteria, the following pre-qualified remedies are  
39 authorized:

40 1. If the installation fails to meet the minimum effective torsional resistance criterion at the  
41 minimum embedment depth/length:

42 a. Continue the installation to greater depth/length in the specified bearing stratum  
43 until the effective torsional resistance criterion is met, provided continued  
44 installation does not exceed any applicable maximum length. or,

45 b. Demonstrate acceptable pile performance through load testing. or,

- 1 c. Replace the pile with one having a different helix configuration. The replacement  
2 pile must not exceed any applicable maximum embedment length and either be  
3 embedded to a length that places its last helix at least three times its own diameter  
4 beyond the position of the first helix of the replaced pile and meet the minimum  
5 effective torsional resistance criterion, or pass load testing.
- 6 2. If the torque measured during installation reaches the helical pile's allowable torque rating  
7 prior to reaching the minimum embedment depth/length criterion, with approval from the  
8 Owner/Owner's Representative, terminate the installation, then proceed with one of the  
9 following recommended actions:
- 10 a. Replace the pile with one having a shaft with a higher torsional strength rating.  
11 This replacement pile must be installed to satisfy the minimum embedment  
12 depth/length criterion. It must also be embedded to a depth/length that places its  
13 last helix at least three times its own diameter beyond the position of the first helix  
14 of the replaced pile without exceeding any applicable maximum embedment  
15 depth/length requirements, and it must meet the minimum effective torsional  
16 resistance criterion. or,
- 17 b. Replace or modify the pile with one having a different helix configuration. This  
18 replacement or modified pile must be installed to satisfy the minimum embedment  
19 depth/length criterion. It must also be embedded to a depth/length that places its  
20 last helix at least three times its own diameter beyond the position of the first helix  
21 of the replaced pile without exceeding any applicable maximum embedment  
22 depth/length requirements, and it must meet the minimum effective torsional  
23 resistance criterion. or,
- 24 c. If allowed or approved by the Owner/Owner's Representative, remove and reinstall  
25 the pile at a position at least three times the diameter of the largest helix away from  
26 the initial location. Original minimum embedment depth/length and effective  
27 torsional resistance criteria must be met for the repositioned pile. This pile  
28 repositioning may require the installation of additional helical piles with service  
29 loads adjusted for these spacing changes.
- 30 3. If the installation reaches a specified maximum embedment depth/length without achieving  
31 the minimum effective torsional resistance criterion:
- 32 a. If approved by the Owner/Owner's Representative, remove and reinstall the pile at  
33 a position at least three times the diameter of the largest helix away from the initial  
34 location. Original minimum installation depth/length and effective torsional  
35 resistance criteria must be met for the repositioned pile. This pile repositioning may  
36 require the installation of additional helical piles with service loads adjusted for  
37 these spacing changes. or,
- 38 b. Demonstrate acceptable pile performance through load testing. or,
- 39 c. Reduce the load capacity of the helical pile and install additional pile(s) as  
40 necessary. The reduced capacity and additional pile location shall be subject to  
41 the approval of the Owner/Owner's Representative. or,
- 42 d. Replace the pile with one having a different helix configuration. This replacement  
43 pile must be embedded to a depth/length that places its last helix at least three  
44 times its own diameter beyond the position of the first helix of the replaced pile.  
45 This replacement pile must be installed to satisfy the minimum embedment  
46 depth/length criterion, and it must meet the minimum effective torsional resistance  
47 criterion.

- 1                    4.        If a helical pile fails to meet acceptance criteria in a load test:
- 2                    a.        Install the pile to a greater depth/length and installation torque and re-test, provided
- 3                    any maximum embedment depth/length criterion is not exceeded. or,
- 4                    b.        Replace the pile with one having more and/or larger helix plates. It must be
- 5                    embedded to a depth/length that places its last helix at least three times its own
- 6                    diameter beyond the position of the first helix of the replaced pile without exceeding
- 7                    any applicable maximum embedment depth/length requirements. This
- 8                    replacement pile must be re-tested. or,
- 9                    c.        If approved by the Owner's Representative, de-rate the load capacity of the helical
- 10                    pile and install additional piles. Additional piles must be installed at positions at
- 11                    least three times the diameter of the largest helix away from any other pile locations
- 12                    and approved by the Owner's Representative. Piles installed in cohesive soils shall
- 13                    not be spaced closer than four helix diameters.
- 14                    5.        Load testing to qualify a helical pile under any of the remedial actions outlined in Article 1.9
- 15                    shall not be used to satisfy load testing frequency requirements shown in the project plans
- 16                    or the approved design submittals.
- 17                    6.        If a helical pile fails a production quality control criterion for any other reason, including
- 18                    damage during installation, any proposed remedy must be approved by the Owner/Owner's
- 19                    Representative prior to implementation.

20    **3.4    TOLERANCES**

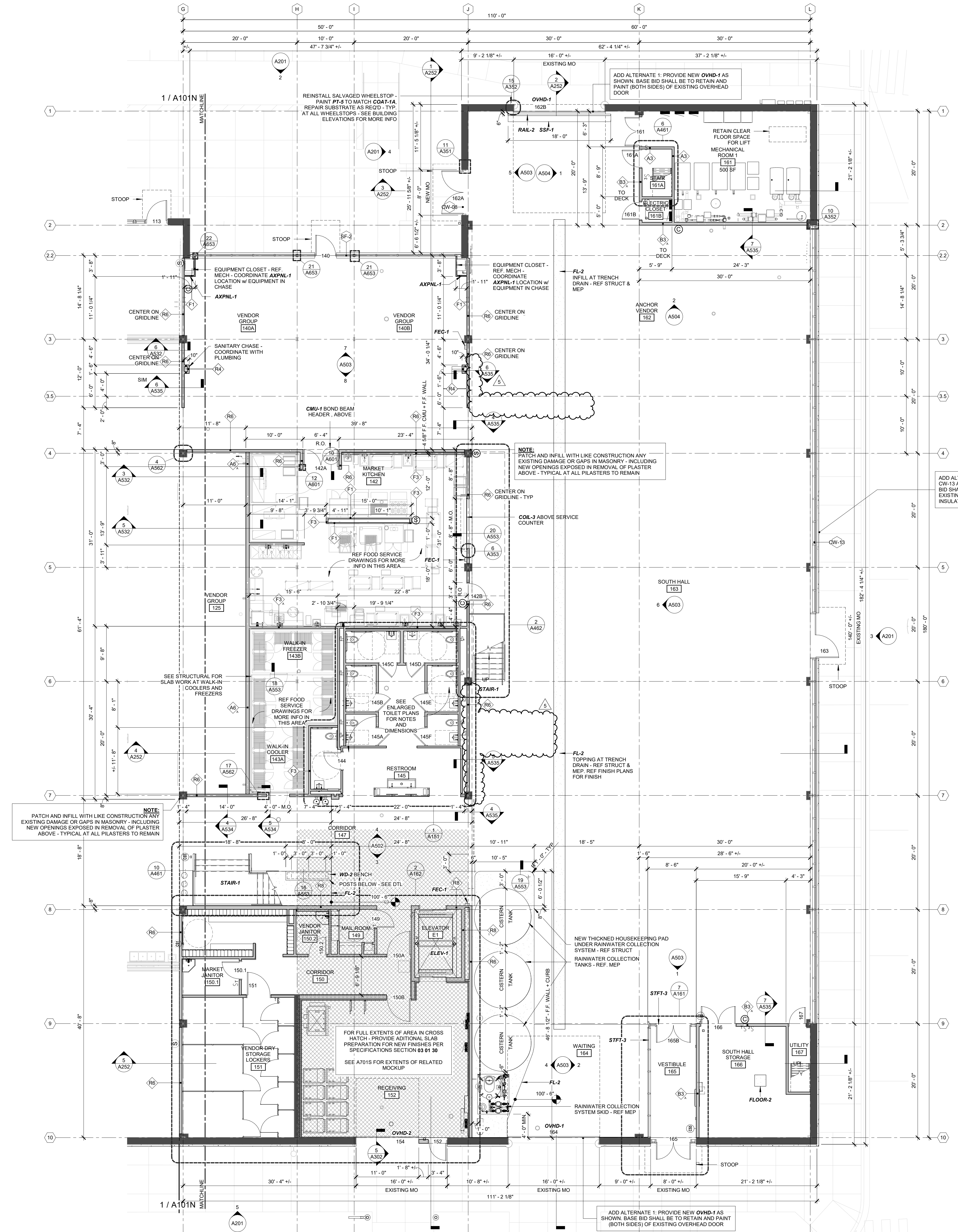
- 21                    A.        When helical pile placement is shown on the project plans, production piles shall be placed such that
- 22                    the pile head is within 3 inches laterally and longitudinally and 1/2 inch vertically to plan; and the pile
- 23                    shaft alignment is within 1 degree of the installation angle shown on the project plans.

24    **3.5    CLEANUP**

- 25                    A.        The Installing Contractor shall remove any and all material, equipment, tools, building materials,
- 26                    concrete forms, debris, or other items belonging to the Installing Contractor or used under the
- 27                    Installing Contractor's direction.

28    **END OF SECTION**

## 5. DRAWINGS



**FLOOR PLAN GENERAL NOTES**

- REFER TO FINISH PLANS FOR SPECIFIC MATERIAL FINISHES & TAGS. SHORT FORM MATERIAL I.D. LIST IS LOCATED ON SHEET G001 AND IS FOR REFERENCE ONLY. SEE INDIVIDUAL SPECIFICATION SECTIONS FOR MATERIAL I.D. INFORMATION. IN CASE OF DISCREPANCY, SPECIFICATION SHALL TAKE PRECEDENT.
- SEE LIFE SAFETY (CODE PLANS) FOR LOCATION AND RATINGS OF FIRE RATED WALL ASSEMBLIES.
- SEE WALL TYPES SHEETS FOR WALL ASSEMBLIES.
- AT ANY LOCATIONS WHERE PENETRATIONS ARE REQUIRED IN RATED WALL OR ASSEMBLIES PROVIDE FIRE CALLING OR FIRE STOPPING AS REQUIRED TO MAINTAIN RATED WALLING.
- ELECTRICAL FIXTURES, DEVICES, ETC SHOWN ON ARCHITECTURAL PLANS ARE FOR REFERENCE ONLY. SEE ELECTRICAL FOR INFORMATION.
- SITE INFORMATION SHOWN IS FOR REFERENCE ONLY. REFER TO CIVIL AND LANDSCAPE DRAWINGS FOR SITE SCOPE.
- REFER TO ELEVATIONS FOR GLAZING TYPES.
- DIMENSIONS LABELED 'GRID' ARE TO STRUCTURAL GRID. DIMENSIONS LABELED 'C' ARE TO CENTER LINE OF HSS COLUMN IN CANOPY ASSEMBLY. ALL OTHER DIMENSIONS ARE TO FINISH FACE OF WALL ASSEMBLY, UNLESS NOTED OTHERWISE.
- EXISTING STRUCTURE - DIMENSIONS TO EXISTING ELEMENTS IN FIELD MAY VARY FROM WHAT IS INDICATED IN THESE DRAWINGS - GC SHALL BE RESPONSIBLE FOR IDENTIFYING AND COORDINATING COMMON DIMENSION POINTS ACROSS ALL TRADES AND FULL SCOPE OF NEW WORK. DIMENSIONS WITH +/- SUFFIX MAY VARY. DIMENSIONS WITHOUT +/- SHALL BE HELD.
- WALL TYPE TAGS REFER TO BASE WALL CONSTRUCTION. REFER TO FINISH PLANS, INTERIOR ELEVATIONS AND SYSTEMS DRAWINGS FOR WALL FINISHES ATTACHED TO BASE WALL TYPES.
- ALL EXISTING FLOORS, CEILING AND WALLS TO REMAIN SHALL HAVE BEEN CLEANED PRIOR TO COMMENCEMENT OF NEW WORK. REFER TO DEMOLITION GENERAL NOTES AND SPECIFICATIONS SECTION 02 41 19 'SELECTIVE DEMOLITION' DO NOT PERFORM WORK OVER IMPROPERLY PREPARED SURFACES.
- AT LOCATIONS WHERE CONCRETE SLABS ON GRADE WERE DEMOLISHED TO ACCOMMODATE NEW BELOW GRADE WORK, REPLACE SLABS WITH LIKE CONSTRUCTION TIED INTO EXISTING SLABS TO REMAIN PER TYPICAL STRUCTURAL NOTES AND DETAILS. GC SHALL COORDINATE ACTUAL EXTENTS OF REPLACEMENT WORK PER REQUIREMENTS OF 02 41 19 'SELECTIVE DEMOLITION' AT REPLACEMENT SLABS. PROVIDE FINISHES AS INDICATED ON FINISH PLANS.
- TO EXTENTS POSSIBLE, ALL EXISTING FLOOR FINISHES SHALL REMAIN, UNLESS OTHERWISE NOTED. PROTECT EXISTING FINISHES DURING CONSTRUCTION. REFER TO STRUCTURAL FOR PATCHING OF SLABS, UNLESS NOTED OTHERWISE - SEE FINISH PLAN FOR FINISHES OVER PATCHED AREAS (IF ANY).
- ALL WORK IN VENDOR STALL AREAS NOT DESCRIBED IN THESE DOCUMENTS SHALL BE BY FUTURE TENANT INFILL PROJECTS. REFERENCE OTHER DISCIPLINES FOR FULL SCOPE OF WORK TO BE PERFORMED IN THESE AREAS UNDER THIS PROJECT.
- SEE A110 SHEETS FOR ARCHITECTURAL STEEL CANOPY DRAWINGS AND GENERAL NOTES. SEE A110 SHEETS FOR ADDITIONAL INTERIOR WALL SECTION REFERENCES DESCRIBING GEOMETRY OF INTERIOR STEEL CANOPIES.
- SEE MILLWORK DRAWINGS FOR ALL CASEWORK SHOWN - FREESTANDING OR BUILT-IN.
- SEE REFLECTED CEILING PLANS AND WALL SECTIONS FOR CONSTRUCTION ABOVE ALUMINUM STOREFRONT.
- SOME EQUIPMENT NOTED IN THESE DOCUMENTS SHALL BE OWNER FURNISHED AND OWNER INSTALLED. THESE LOCATIONS ARE NOTED IN DRAWINGS AND OWNER SCHEDULED IN OWNER PROVIDED EQUIPMENT LIST IN PROJECT SPECIFICATIONS. AT THESE LOCATIONS, GC SHALL PROVIDE ALL SERVICES - POWER, DATA, OPENINGS, BLOCKING, ETC FOR FUTURE OWNER INSTALLATION OF EQUIPMENT.
- PROVIDE IN WALL BLOCKING AT ALL WALL MOUNTED SHELVING CASEWORK, FUTURE AV EQUIPMENT BY OWNER, TOILET ACCESSORIES ETC - LOCATIONS. COORDINATE WITH INTERIOR ELEVATIONS.
- COORDINATE WITH BUILDING OWNER FOR REMOVAL OF ANY HAZARDOUS MATERIALS UNCOVERED OR DISCOVERED ON SITE.

**WALL AND PARTITION KEY**

NEW WALLS AND PARTITIONS  
EXISTING WALLS AND PARTITIONS

Architecture and Interiors

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Landscape Architect **Ken Saiki Design**  
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Structural Engineering, Fire Protection Engineering, Technology and AV **IMEG Corporation, Inc. IMEG**  
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Madison, WI 53562

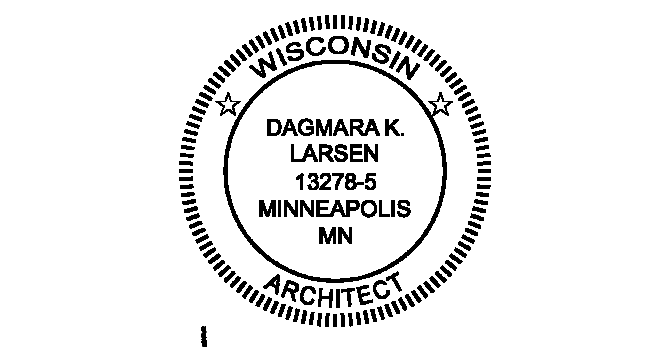
Lighting Design **Mazzetti, Inc. MAZZETTI**  
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Commercial Kitchen Design **Boelter Premier Boelter premier**  
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202 N First St, Madison, WI 53704

Project No. 20180026.00

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.



Signature *Dagmara K. Larson*  
Print Name *Dagmara Larson*  
Date 2023.06.09 License No. 13278-5

**ADDENDUM 4**

**ISSUE / REVISION**

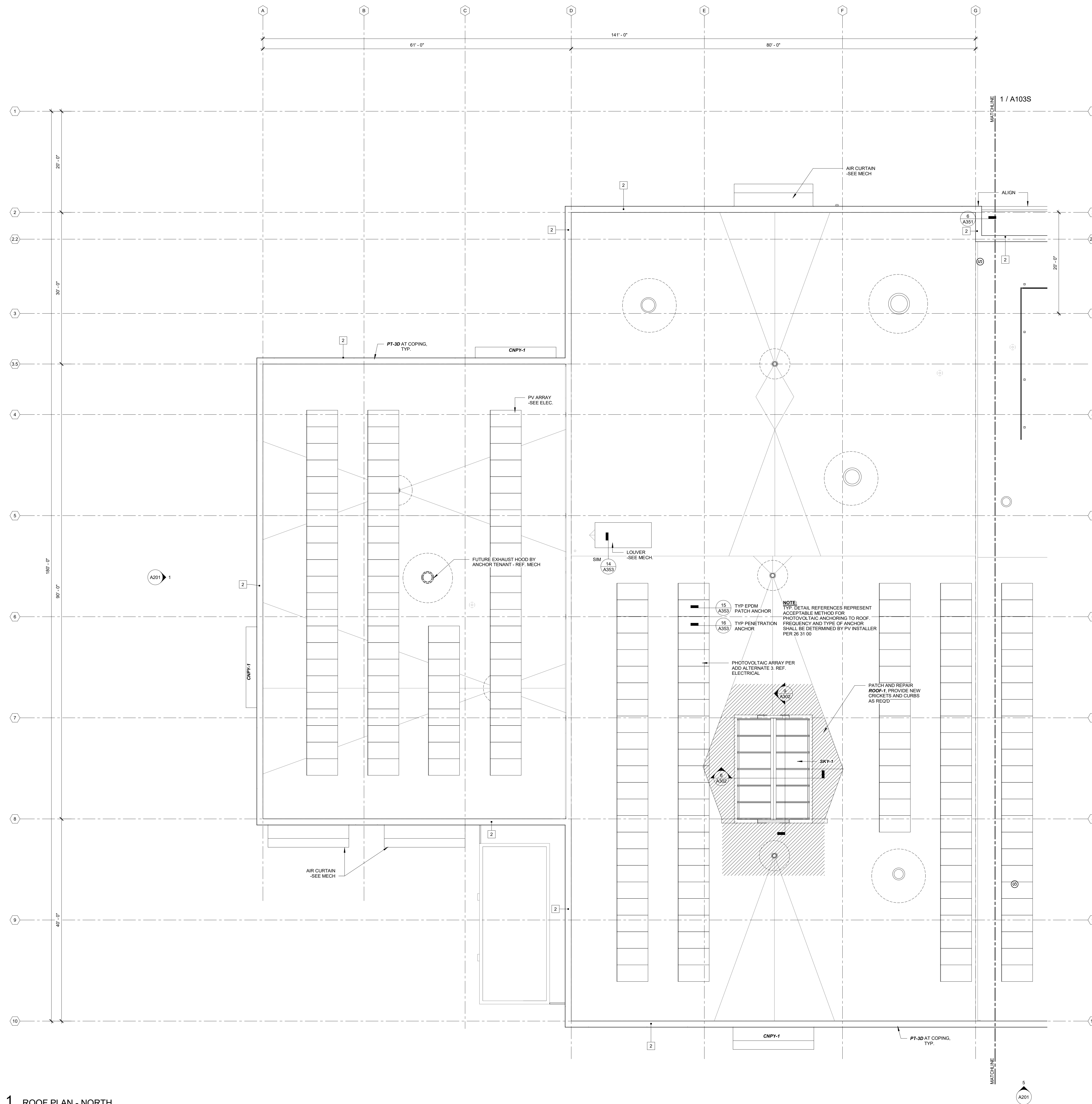
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5	2023.09.05	ADDENDUM 4

LEVEL 1 - SOUTH

**A101S**

**1 LEVEL 1 PLAN - SOUTH**  
A101S 1/8" = 1'-0"





**ROOF PLAN GENERAL NOTES**

- PROTECT ALL EXISTING ROOF MEMBRANE TO REMAIN.
- REPLACE / TIE-INTO EXISTING ROOFING AS NEEDED TO CREATE NEW OPENINGS, OVER RUNS AND PENETRATIONS PER REQUIREMENTS OF NEW WORK. GC IS RESPONSIBLE FOR DETERMINING EXTENT OF REMOVAL AND REPLACEMENT - REGIONS SHOWN IN PLAN ARE FOR REFERENCE ONLY.
- PROVIDE PROTECTIVE MEMBRANE AND CATCH PAN AROUND EXHAUST HOODS PER EPDM MANUFACTURER RECOMMENDATIONS AND WARRANTY REQUIREMENTS.
- ALL NEW WORK OR MODIFICATION TO EXISTING ROOF SHALL BE DONE IN ACCORDANCE WITH ROOF MFR'S BEST PRACTICE AND SHALL NOT VOID ORIGINAL ROOF WARRANTY.
- PHOTOVOLTAIC ARRAY SPACING FOR REFERENCE - SEE ELECTRICAL SHEETS PER 26 31 00 FOR MORE INFO.
- ALL EXISTING COPING CAP TO BE PAINTED, PT-3D CONTRACTOR OPTION TO REPLACE IN FULL AT NO ADDED COST.
- MECHANICAL EQUIPMENT SHOWN ON ARCHITECTURAL PLANS IS FOR REFERENCE ONLY - REFER TO MEP SHEETS FOR MORE INFORMATION.
- ALL ROOF DRAINS ARE NEW UNLESS NOTED OTHERWISE - REF PLUMBING DRAWINGS FOR MORE INFO. FOLLOW ROOF MFR'S BEST PRACTICES TO ENSURE WARRANTY.
- PATCH ALL EXISTING PENETRATIONS IF NOT REUSED IN NEW WORK. NEW WORK SHALL BE IN ACCORDANCE WITH ROOF MFR'S BEST PRACTICES AND SHALL NOT VOID WARRANTY.

**ADD ALTERNATE No. 3**  
 BASE BID SHALL BE TO COMPLETELY OMIT ALL DEMOLITION AND NEW WORK RELATED TO INSTALLATION OF PHOTOVOLTAIC ARRAY. ADD ALTERNATE SHALL BE TO PROVIDE PHOTO VOLTAIC ARRAY AS DESCRIBED IN FULL PROJECT DRAWINGS AND SPECIFICATIONS. SEE SPECIFICATIONS SECTION 01 23 00.

**ADD ALTERNATE 3 NOTES**

- REFERENCE ELECTRICAL DRAWINGS AND SPECIFICATION SECTIONS FOR DESCRIPTION OF PHOTOVOLTAIC WORK.
- PER 26 31 00 DESIGN OF PHOTOVOLTAIC SYSTEM RACKING AND ANCHORAGE IS BY PHOTOVOLTAIC INSTALLER. NOTE REQUIREMENTS OF STRUCTURAL CRITERIA AND LOADING ON SO1 FOR PHOTOVOLTAIC SYSTEM. INSTALLER SHALL UTILIZE BALLASTED ANCHORAGE IF POSSIBLE. IF NOT POSSIBLE, PATCH FITTING SHALL BE USED. FULL PENETRATION ANCHORS SHALL ONLY BE USED AS NECESSARY AND SHALL BE APPROVED BY OWNER PRIOR TO USE.
- TYPE AND FREQUENCY OF ANCHORING SHALL BE DETERMINED BY PV SUPPLIER / INSTALLER PER 26 31 00.
- ADD ALTERNATE 3 PRICING SHALL INCLUDE COST OF ANCHORING PV SYSTEM. PROVIDE PER INSTANT PRICING FOR TYP ACCEPTABLE DETAILS.

**NOTE:**  
 TYP. DETAIL REFERENCES REPRESENT ACCEPTABLE METHOD FOR PHOTOVOLTAIC ANCHORING TO ROOF. FREQUENCY AND TYPE OF ANCHOR SHALL BE DETERMINED BY PV INSTALLER PER 26 31 00.

15 TYP EPDM PATCH ANCHOR (A353)  
 16 TYP PENETRATION ANCHOR (A353)

**1 ROOF PLAN - NORTH**  
 A103N 1/8" = 1'-0"

Architecture and Interiors

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Project No. 20180052.00

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 202 N First St, Madison, WI 53704

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.

Architect Seal

Signature *Dagmara K. Larsen*  
 Print Name Dagmara Larsen  
 Date 2023.06.09 License No. 13278-5

**ADDENDUM 4**

**ISSUE / REVISION**

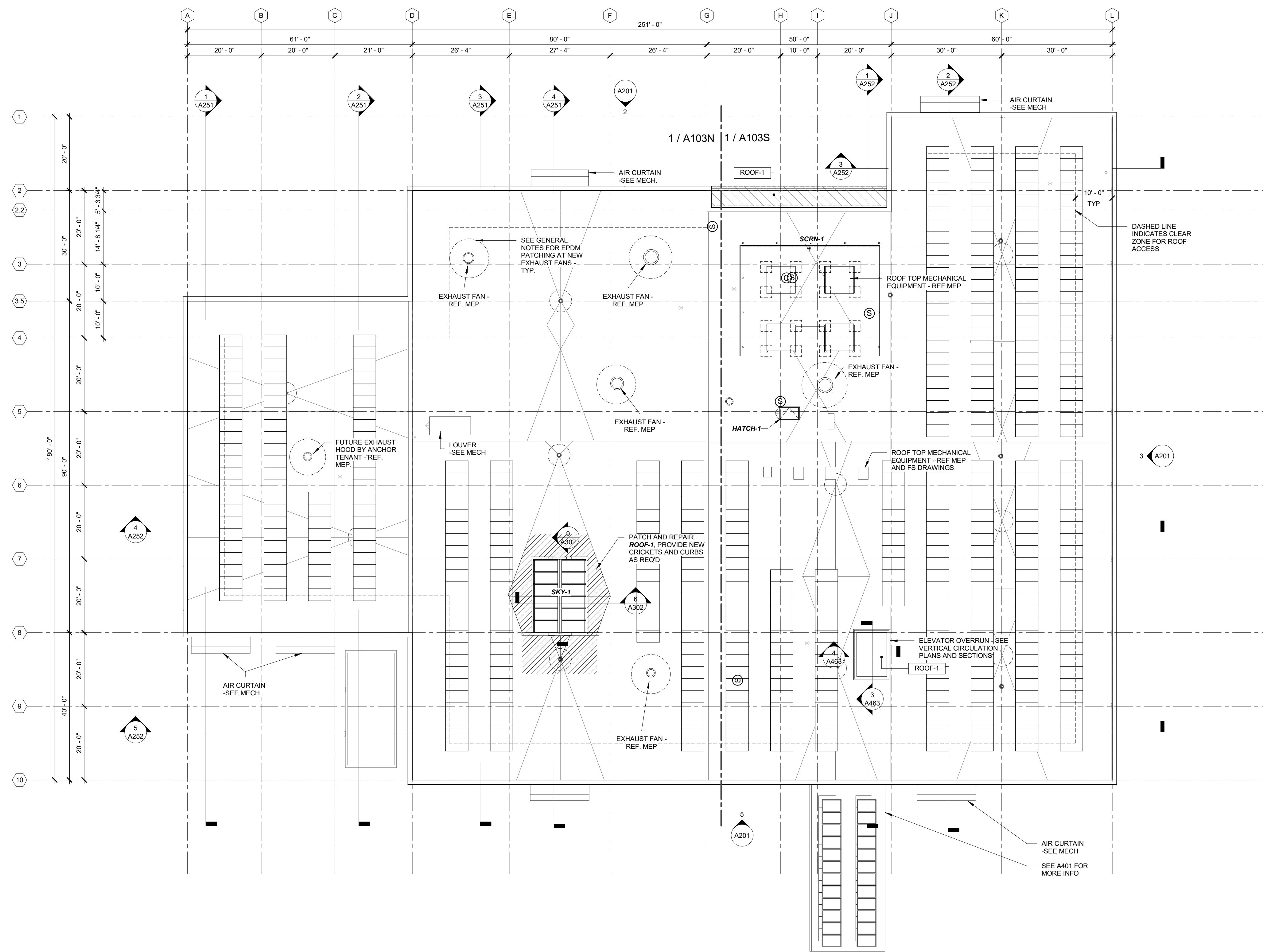
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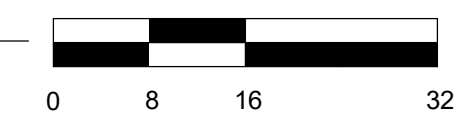
**ROOF PLAN - NORTH**

**A103N**





1 ROOF PLAN - REFERENCE  
A103 1/16" = 1'-0"



**ROOF PLAN GENERAL NOTES**

- PROTECT ALL EXISTING ROOF MEMBRANE TO REMAIN.
- REPLACE / TIE-INTO EXISTING ROOFING AS NEEDED TO CREATE NEW OPENINGS, OVER RUNS AND PENETRATIONS PER REQUIREMENTS OF NEW WORK. GC IS RESPONSIBLE FOR DETERMINING EXTENT OF REMOVAL AND REPLACEMENT - REGIONS SHOWN IN PLAN ARE FOR REFERENCE ONLY.
- PROVIDE PROTECTIVE MEMBRANE AND CATWALK PAN AROUND EXHAUST HOODS PER EPDM MANUFACTURER RECOMMENDATIONS AND WARRANTY REQUIREMENTS.
- ALL NEW WORK OR MODIFICATION TO EXISTING ROOF SHALL BE DONE IN ACCORDANCE WITH ROOF MFR'S BEST PRACTICE AND SHALL NOT VOID ORIGINAL ROOF WARRANTY.
- PHOTOVOLTAIC ARRAY SUPPORT FOR REFERENCE - SEE ELECTRICAL SHEETS **202.11.01 FOR MORE INFO**.
- ALL EXISTING COPING CAP TO BE PAINTED, **PP-30** CONTRACTOR OPTION TO REPLACE IN FULL AT NO ADDED COST.
- MECHANICAL EQUIPMENT SHOWN ON ARCHITECTURAL PLANS IS FOR REFERENCE ONLY - REFER TO MEP SHEETS FOR MORE INFORMATION.
- ALL ROOF DRAINS ARE NEW UNLESS NOTED OTHERWISE - REF PLUMBING DRAWINGS FOR MORE INFO. FOLLOW ROOF MFR'S BEST PRACTICES TO ENSURE WARRANTY.
- PATCH ALL EXISTING PENETRATIONS IF NOT REUSED IN NEW WORK. NEW WORK SHALL BE IN ACCORDANCE WITH ROOF MFR'S BEST PRACTICES AND SHALL NOT VOID WARRANTY.

**ADD ALTERNATE No. 3**  
BASE BID SHALL BE TO COMPLETELY OMIT ALL DEMOLITION AND NEW WORK RELATED TO INSTALLATION OF PHOTOVOLTAIC ARRAY. ADD ALTERNATE SHALL BE TO PROVIDE PHOTO VOLTAIC ARRAY AS DESCRIBED IN FULL PROJECT DRAWINGS AND SPECIFICATIONS. SEE SPECIFICATIONS SECTION 01 23 00.

**ADD ALTERNATE 3 NOTES**

- REFERENCE ELECTRICAL DRAWINGS AND SPECIFICATION SECTIONS FOR DESCRIPTION OF PHOTOVOLTAIC WORK.
- PER 28 31 00 DESIGN OF PHOTOVOLTAIC SYSTEM RACKING AND ANCHORAGE IS BY PHOTOVOLTAIC INSTALLER. NOTE REQUIREMENTS OF STRUCTURAL CRITERIA AND LOADING ON S001 FOR PHOTOVOLTAIC SYSTEM. INSTALLER SHALL UTILIZE BALLASTED ANCHORAGE IF POSSIBLE. IF NOT POSSIBLE, PATCH FITTING SHALL BE USED. FULL PENETRATION ANCHORS SHALL ONLY BE USED AS NECESSARY AND SHALL BE APPROVED BY OWNER PRIOR TO USE.
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- ADD ALTERNATE 3 PRICING SHALL INCLUDE COST OF ANCHORING PV SYSTEM. PROVIDE PER INSTANCE PRICING FOR TYP ACCEPTABLE DETAILS.

Architecture and Interiors

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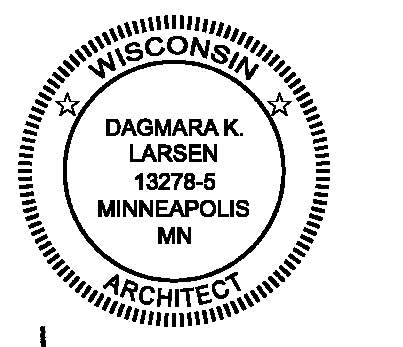
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I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.

Architect Seal



Signature *Dagmara K. Larsen*  
Print Name **Dagmara Larsen**  
Date 2023.06.09 License No. 13278-5

**ADDENDUM 4**

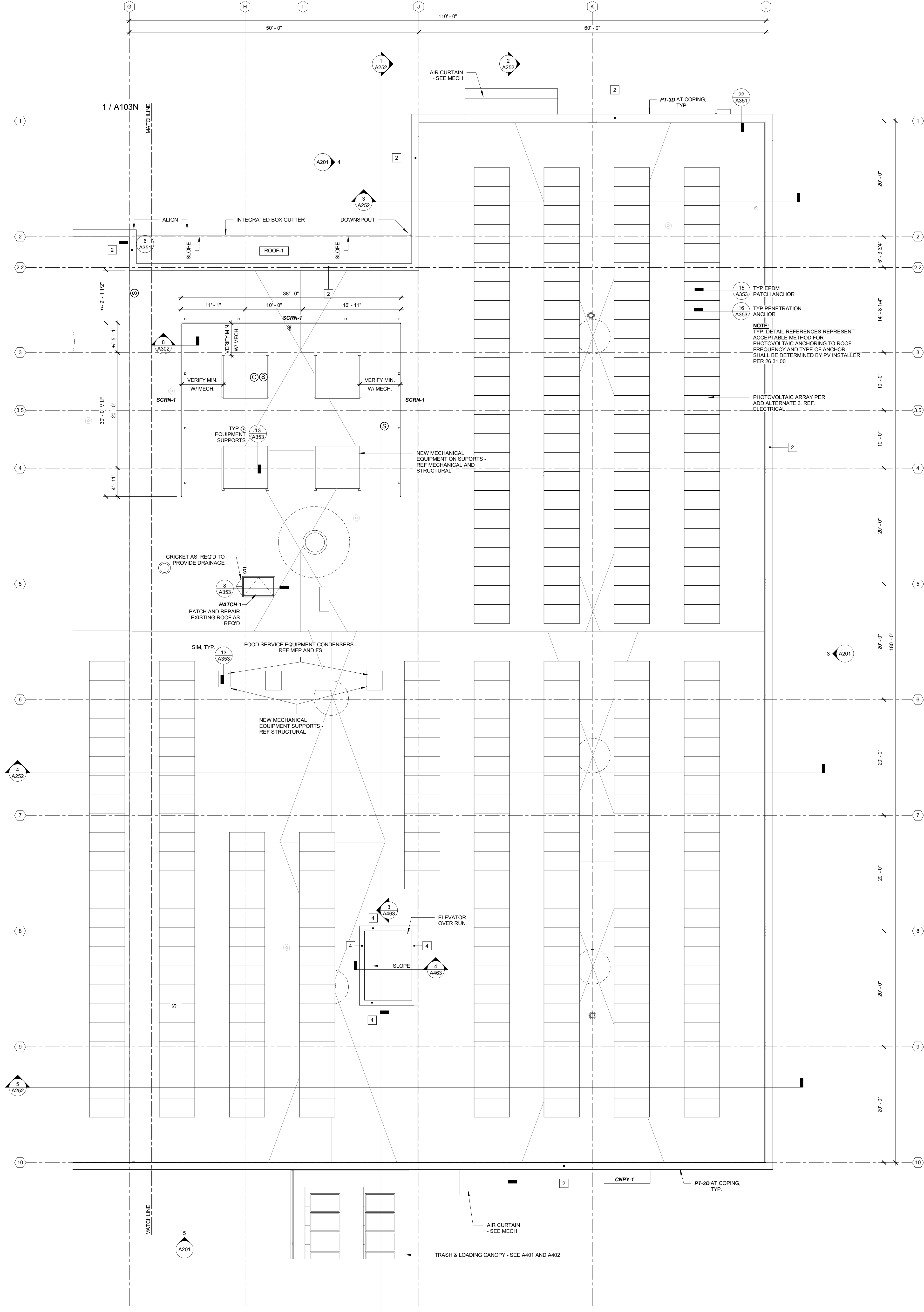
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1	2023.08.09	BID DOCUMENTS
5	2023.09.05	ADDENDUM 4

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ROOF PLAN

**A103**



**ROOF PLAN GENERAL NOTES**

- PROTECT ALL EXISTING ROOF MEMBRANE TO REMAIN.
- REPLACE / REPAIR EXISTING ROOFING AS NEEDED TO CREATE NEW OPENINGS, OVER RUNS AND PENETRATIONS PER REQUIREMENTS OF NEW WORK. GC IS RESPONSIBLE FOR DETERMINING EXTENT OF REMOVAL AND REPLACEMENT - REGIONS SHOWN IN PLAN ARE FOR REFERENCE ONLY.
- PROVIDE PROTECTIVE MEMBRANE AND CATCH PAN AROUND EXHAUST HOODS PER EPDM MANUFACTURER RECOMMENDATIONS AND WARRANTY REQUIREMENTS.
- ALL NEW WORK OR MODIFICATION TO EXISTING ROOF SHALL BE DONE IN ACCORDANCE WITH ROOF MFR'S BEST PRACTICE AND SHALL NOT VOID ORIGINAL ROOF WARRANTY.
- PHOTOVOLTAIC ARRAY SUPPORTS FOR REFERENCE - SEE ELECTRICAL SHEETS A1031 OR FOR MORE INFO.
- ALL EXISTING COPING CAP TO BE PAINTED, PT-3D. CONTRACTOR OPTION TO REPLACE IN FULL AT NO ADDED COST.
- MECHANICAL EQUIPMENT SHOWN ON ARCHITECTURAL PLANS IS FOR REFERENCE ONLY - REFER TO MEP SHEETS FOR MORE INFORMATION.
- ALL ROOF DRAINS ARE NEW UNLESS NOTED OTHERWISE - REF PLUMBING DRAWINGS FOR MORE INFO. FOLLOW ROOF MFR'S BEST PRACTICES TO ENSURE WARRANTY.
- PATCH ALL EXISTING PENETRATIONS IF NOT REUSED IN NEW WORK. NEW WORK SHALL BE IN ACCORDANCE WITH ROOF MFR'S BEST PRACTICES AND SHALL NOT VOID WARRANTY.

**ADD ALTERNATE No. 3**  
 BASE BID SHALL BE TO COMPLETELY OMIT ALL DEMOLITION AND NEW WORK RELATED TO INSTALLATION OF PHOTOVOLTAIC ARRAY. ADD ALTERNATE SHALL BE TO PROVIDE PHOTOVOLTAIC ARRAYS AS DESCRIBED IN FULL PROJECT DRAWINGS AND SPECIFICATIONS. SEE SPECIFICATIONS SECTION 01 20 00.

**ADD ALTERNATE 3 NOTES**

- REFERENCE ELECTRICAL DRAWINGS AND SPECIFICATION.
- PER 28 31 00 DESIGN OF PHOTOVOLTAIC SYSTEM RACKING AND ANCHORAGE IS BY PHOTOVOLTAIC INSTALLER. NOTE REQUIREMENTS OF STRUCTURAL CRITERIA AND LOADING ON SLOI FOR PHOTOVOLTAIC SYSTEM. INSTALLER SHALL UTILIZE BALLASTED ANCHORAGE IF POSSIBLE. IF NOT POSSIBLE, PATCH FITTINGS SHALL BE USED. FULL PENETRATION ANCHORS SHALL ONLY BE USED AS NECESSARY AND SHALL BE APPROVED BY CONTRACTOR USE.
- TYPE AND FREQUENCY OF ANCHORING SHALL BE DETERMINED BY PV SUPPLIER / INSTALLER PER 28 31 00.
- ADD ALTERNATE 3 PRICING SHALL INCLUDE COST OF ANCHORING PV SYSTEM. PROVIDE PER INSTANT PRICING FOR TYP. ACCEPTABLE DETAILS.

**NOTE:**  
 TYP. DETAIL REFERENCES REPRESENT ACCEPTABLE METHOD FOR PHOTOVOLTAIC ANCHORING TO ROOF. FREQUENCY AND TYPE OF ANCHOR SHALL BE DETERMINED BY PV INSTALLER PER 28 31 00.

1 ROOF PLAN -- SOUTH  
 A103S 1/8" = 1'-0"

Architecture and Interiors  
**MSRDesign**  
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Landscape Architect  
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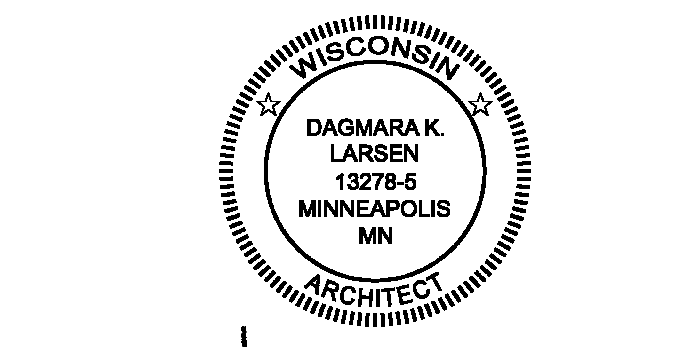
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Signature *Dagmara K. Larsen*  
 Print Name Dagmara Larsen  
 Date 2023.06.09 License No. 13278-5

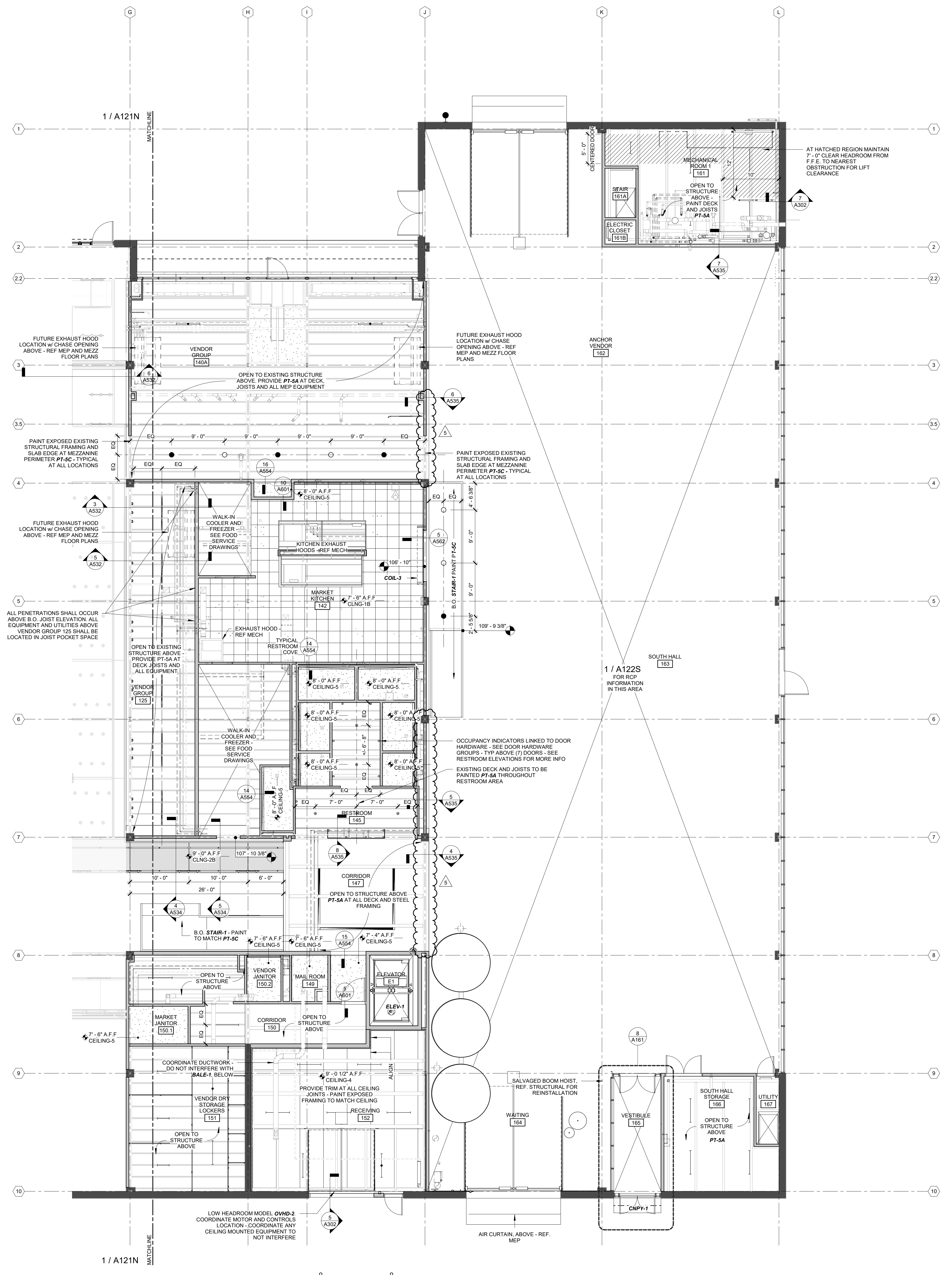
**ADDENDUM 4**

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5	2023.09.05	ADDENDUM 4

Roofing ©2019 Chicago Metal Roofing & Remediates, Ltd.

ROOF PLAN - SOUTH  
**A103S**



- ### REFLECTED CEILING PLAN GENERAL NOTES
- ALL EXISTING ROOF AND SLAB DECKS TO REMAIN, AS WELL AS RELATED STRUCTURAL EXPOSED STRUCTURAL FRAMING SHALL HAVE BEEN CLEANED AT CONCLUSION OF DEMOLITION PHASE AS PER REQUIREMENTS OF SECTION 02 41 19 SELECTIVE DEMOLITION OF THE PROJECT SPECIFICATIONS. DO NOT INSTALL NEW FINISHES OVER, OR UNDERTAKE ADDITIONAL SURFACE PREPARATION ON SURFACES WHICH HAVE NOT BEEN CLEANED PER THIS REQUIREMENT.
  - ADDITIONAL SPECIFIC SURFACE PREPARATION MAY BE REQUIRED IN ADDITION TO CLEANING WORK PERFORMED IN DEMOLITION PHASE. REFER TO SPECIFIC SURFACE PREPARATION REQUIREMENTS OF NEW FINISHES AS DESCRIBED IN PROJECT SPECIFICATIONS.
  - BASE EXTENTS OF NEW FINISHES APPLIED TO EXISTING SURFACES ARE DESCRIBED IN THESE REFLECTED CEILING PLANS. CONTRACTOR SHALL NOTIFY OWNER AND ARCHITECT IMMEDIATELY OF EXISTING FINISHES WHICH NO LONGER MEET THE REQUIREMENTS OF CONTRACT FINISH DUE TO DAMAGE INCURRED DURING CLEANING PROCESS.
  - DUCTWORK, PIPING, CONDUIT, ETC RUN THROUGH AREAS WHERE CEILING AND DECKS ARE INDICATED TO BE PAINTED, SHALL BE PAINTED TO MATCH CEILING OR DECK.
  - SEE MEP FOR LAYOUTS OF DUCTWORK, PIPING AND MAJOR MEP ITEMS. ALL ITEMS IN OPEN HIGH BAY SPACES ARE AESTHETICALLY SENSITIVE. DEVIATIONS FROM MEP DRAWINGS SHALL BE COORDINATED WITH ARCHITECT ON SITE.
  - MEP ITEMS NOT SHOWN ON PLANS - BRANCH SPRINKLER PIPING, CONDUIT, ETC - COORDINATE LOCATIONS WITH ARCHITECT - ROUTE WITH MAIN UTILITIES WHERE POSSIBLE.
  - STRUCTURAL DECK TO BE LEFT EXPOSED SHALL BE FREE FROM ANY CONSTRUCTION MATERIALS AND OBSOLETE EQUIPMENT.
  - LIGHTING AND DEVICE SYMBOLS ON THIS DRAWING INDICATE PRESENCE OF FIXTURE FOR LAYOUT, POSITION, AND COORDINATION PURPOSES. REFER TO MECHANICAL, ELECTRICAL, AND LIGHTING DRAWINGS FOR ADDITIONAL INFORMATION.
  - ALL LIGHTING AND DEVICES ARE DIMENSIONED FROM THE CENTER LINE OF THE COMPONENT TO CENTER LINE OF STRUCTURAL GRID.
  - REFER TO 'G' SERIES SYSTEMS SHEETS FOR CEILING TYPES.
  - REFER TO A110 SHEET FOR INFORMATION ON STEEL CANOPY FRAMING.
  - SEE CANOPY SECTIONS REFERENCED ON 110' RCP FOR CONDITIONS AT CANOPY CEILING EDGES AND OTHER AREAS.
  - DASHED LINES ON ENLARGED PLANS INDICATE VARIOUS STRUT-1 FRAMING ABOVE - SEE DETAILS FOR TYPE AND LOCATION. STRUT-1 FRAMING SUGGESTED REPRESENTS BASIS OF DESIGN - GC SHALL BE RESPONSIBLE FOR SELECTING FINAL SYSTEM COMPONENTS TO SATISFY DESIGN INTENT AND REQUIREMENTS.
  - ALL STRUT-1 FRAMING SHALL BE PAINTED PT-5C.
  - ALL FACE FASTENERS IN CEILING PANELS SHALL BE INSTALLED IN CONSISTENT SPACING, ALIGNED AND JUSTIFIED. GC SHALL COORDINATE AND SUBMIT FOR REVIEW. ALL REQUIRED SPACERS, FASTENERS, ETC TO ACHIEVE INSTALLATION DATUM INDICATED IN THESE DRAWINGS.
  - COORDINATE WITH BUILDING OWNER FOR REMOVAL OF ANY HAZARDOUS MATERIALS UNCOVERED OR DISCOVERED ON SITE.

### CEILING TYPES LEGEND

	CEILING-5 PT-1A, U.N.O.		CEILING-2A/2B OR SPAC-F AT DECK		EXPOSED
	CEILING-1A/1B		CEILING-3	NOTE - OTHER SYSTEMS MAY BE PRESENT - SEE PLANS	

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Architect Seal

Signature *Dagmara K. Larson*  
Print Name Dagmara Larson  
Date 2023.06.09 License No. 13278-5

**ADDENDUM 4**

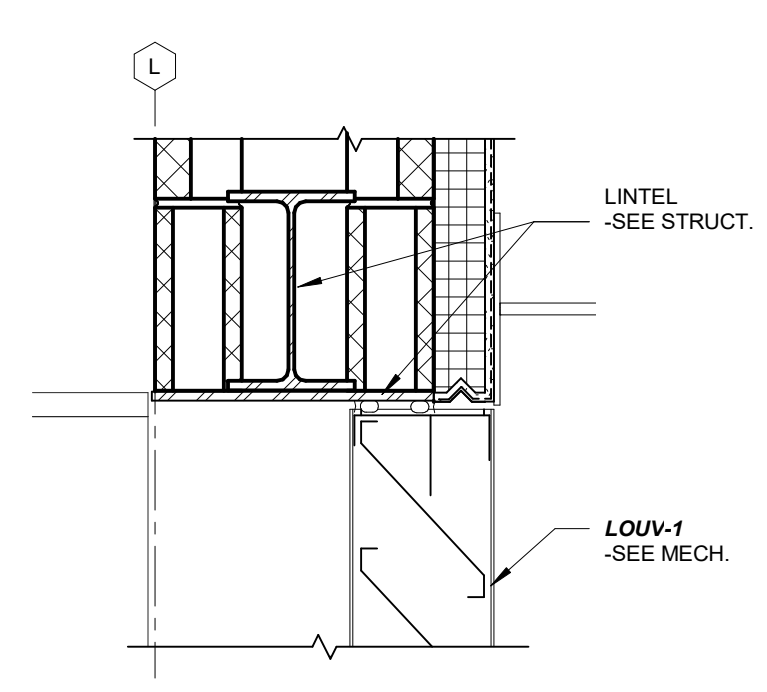
**ISSUE / REVISION**

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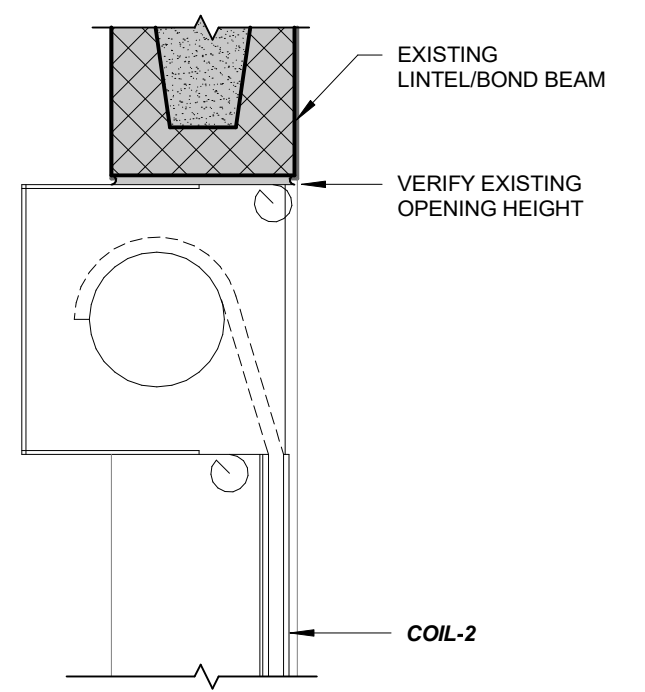
LEVEL 1 REFLECTED CEILING PLAN - SOUTH

# A121S

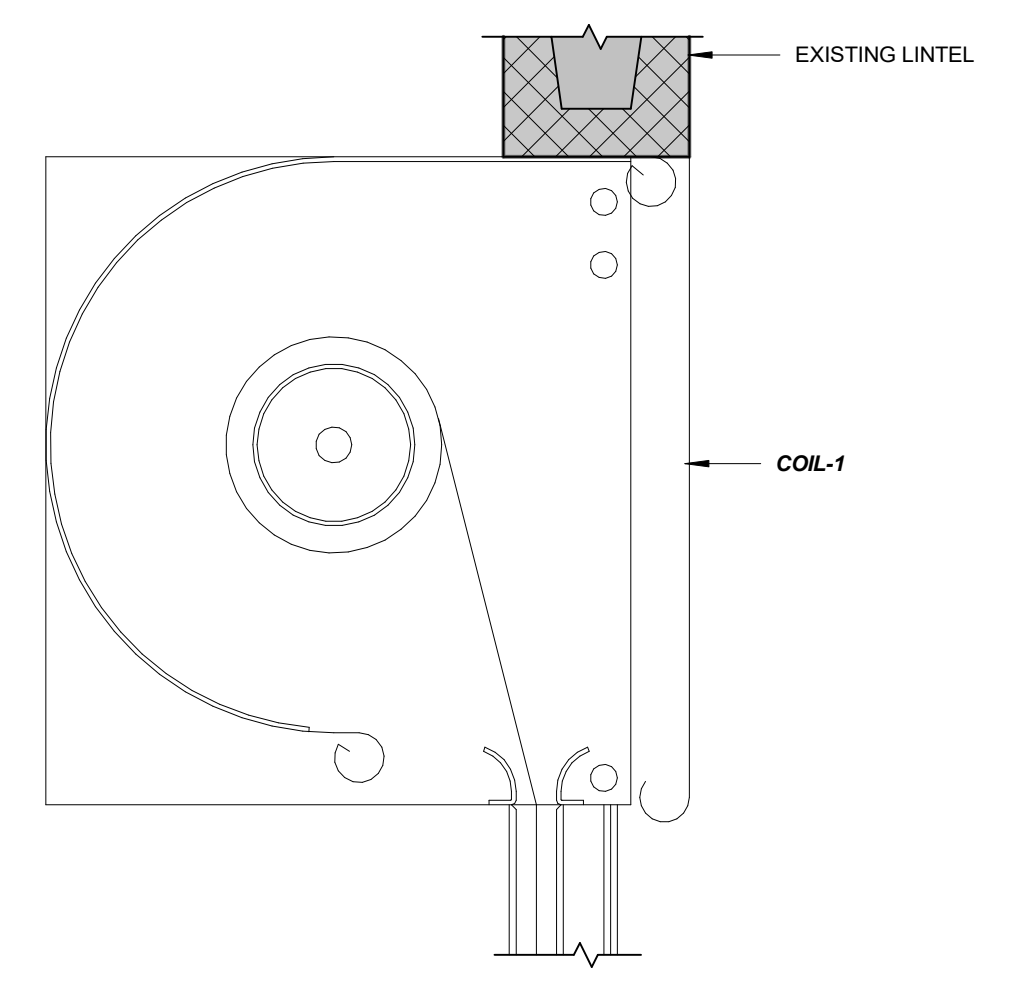
1 LEVEL 1 REFLECTED CEILING PLAN - SOUTH  
A121S 1/8" = 1'-0"



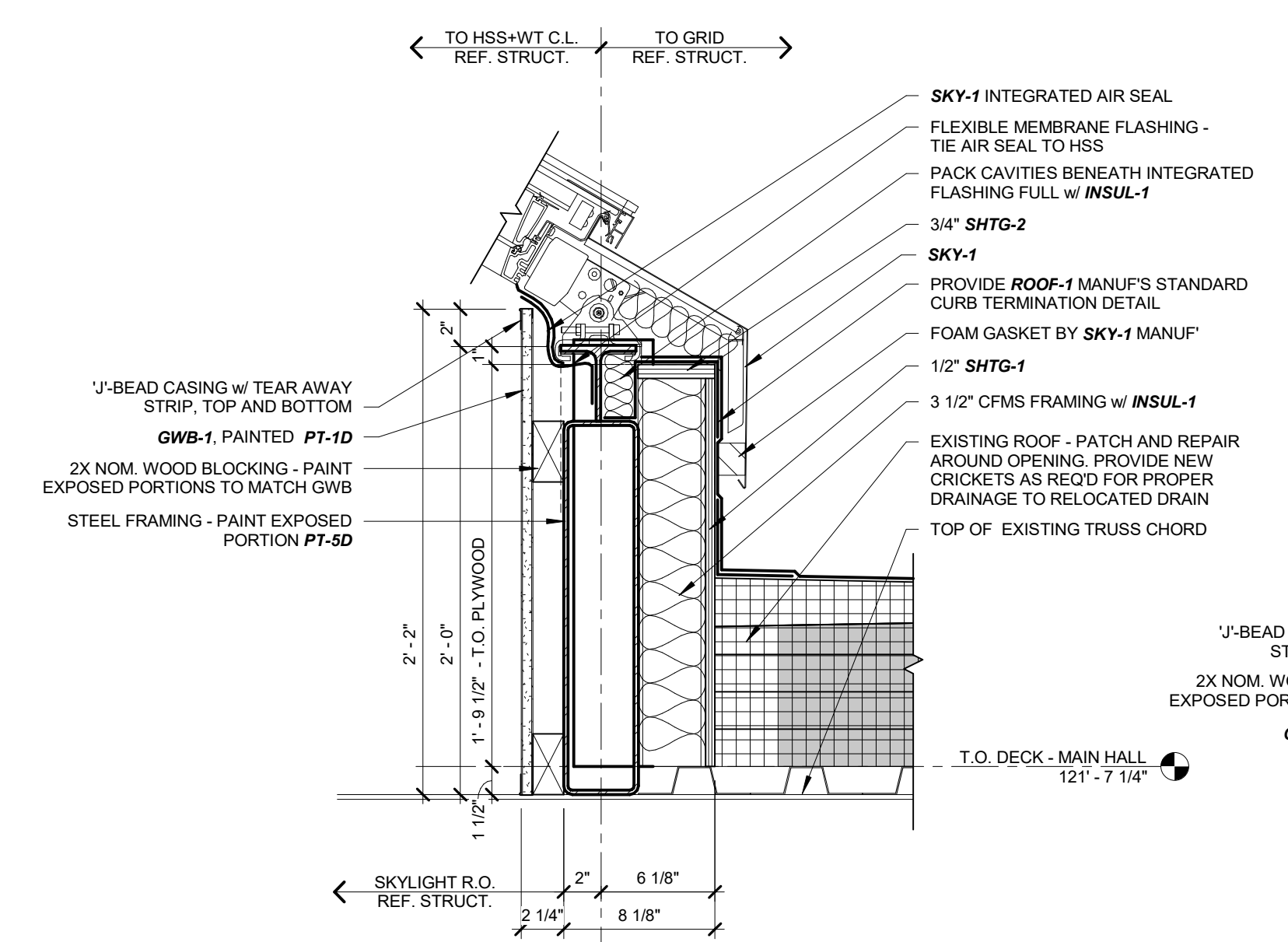
**1 LOUVER - HEAD**  
A353 1 1/2" = 1'-0"



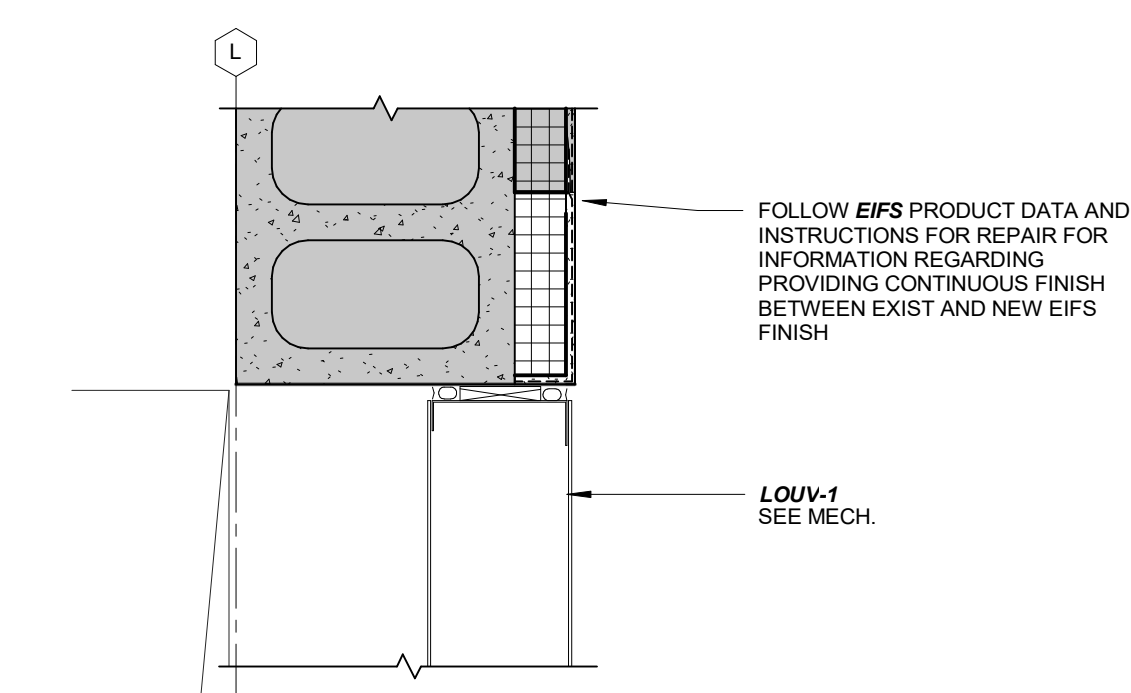
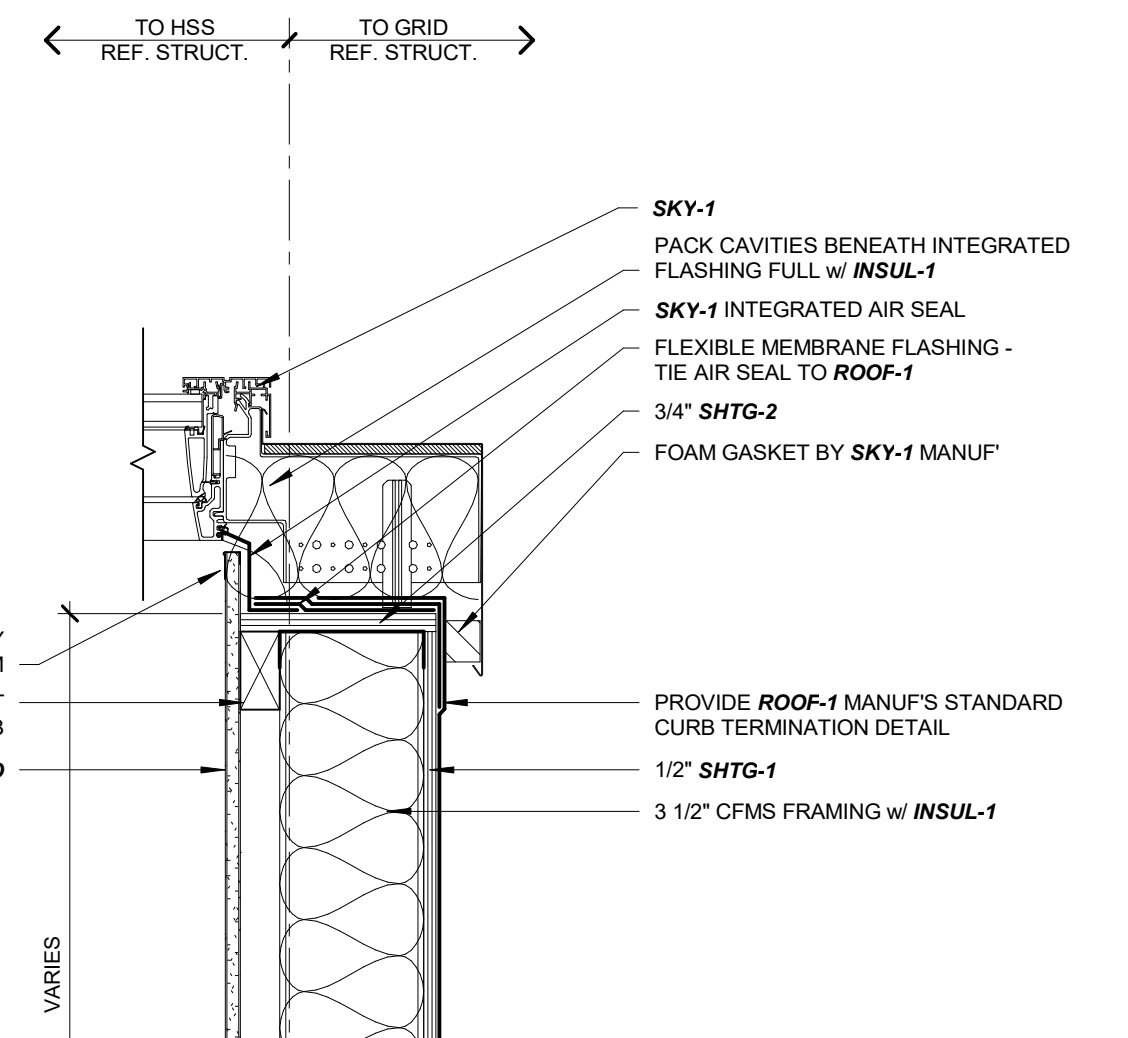
**2 COIL-2 HEAD**  
A353 1 1/2" = 1'-0"



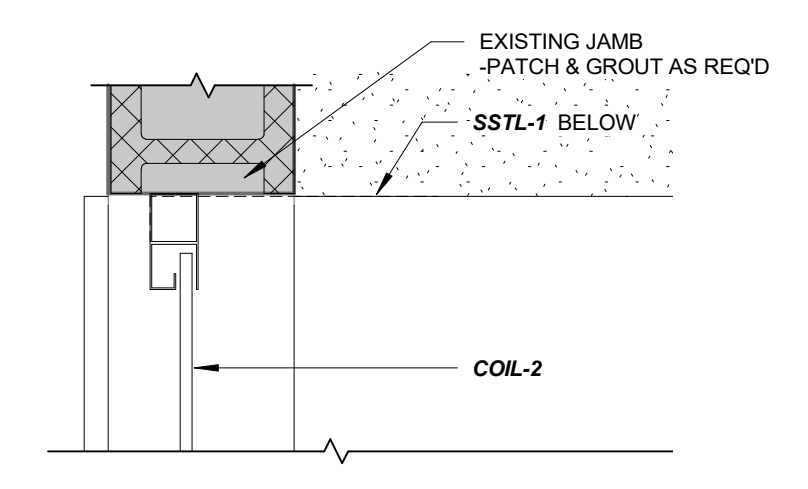
**3 COIL-1 HEAD**  
A353 1 1/2" = 1'-0"



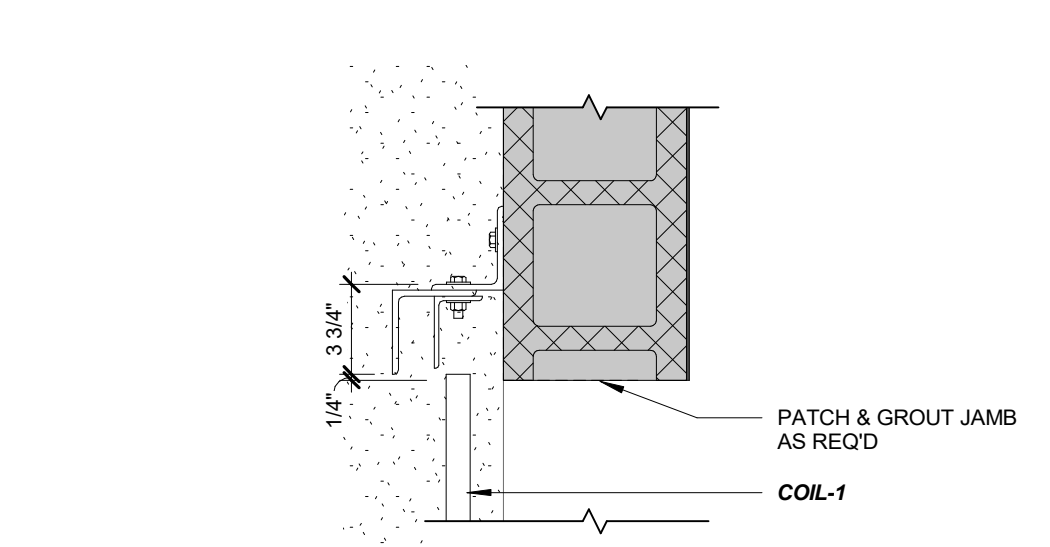
**4 SKYLIGHT ROOF TRANSITION**  
A353 1 1/2" = 1'-0"



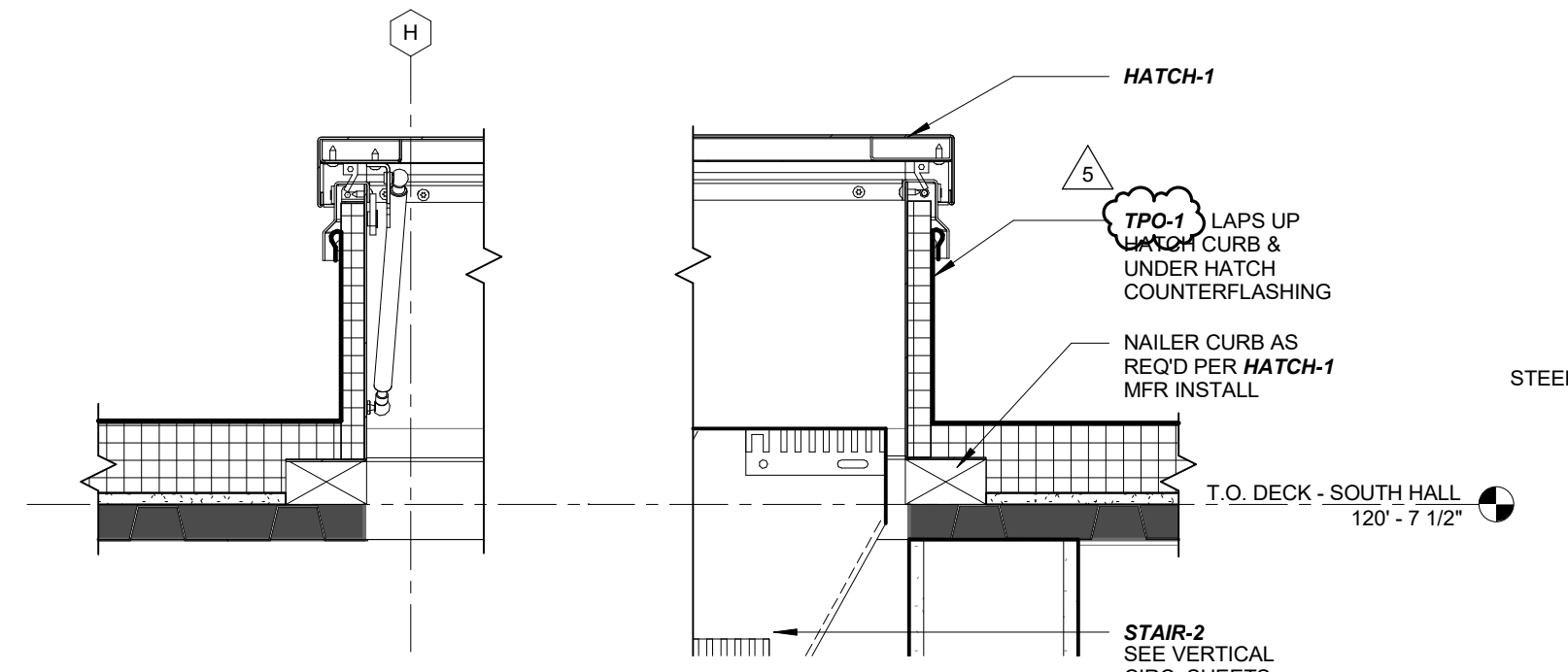
**5 LOUVER - JAMB**  
A353 1 1/2" = 1'-0"



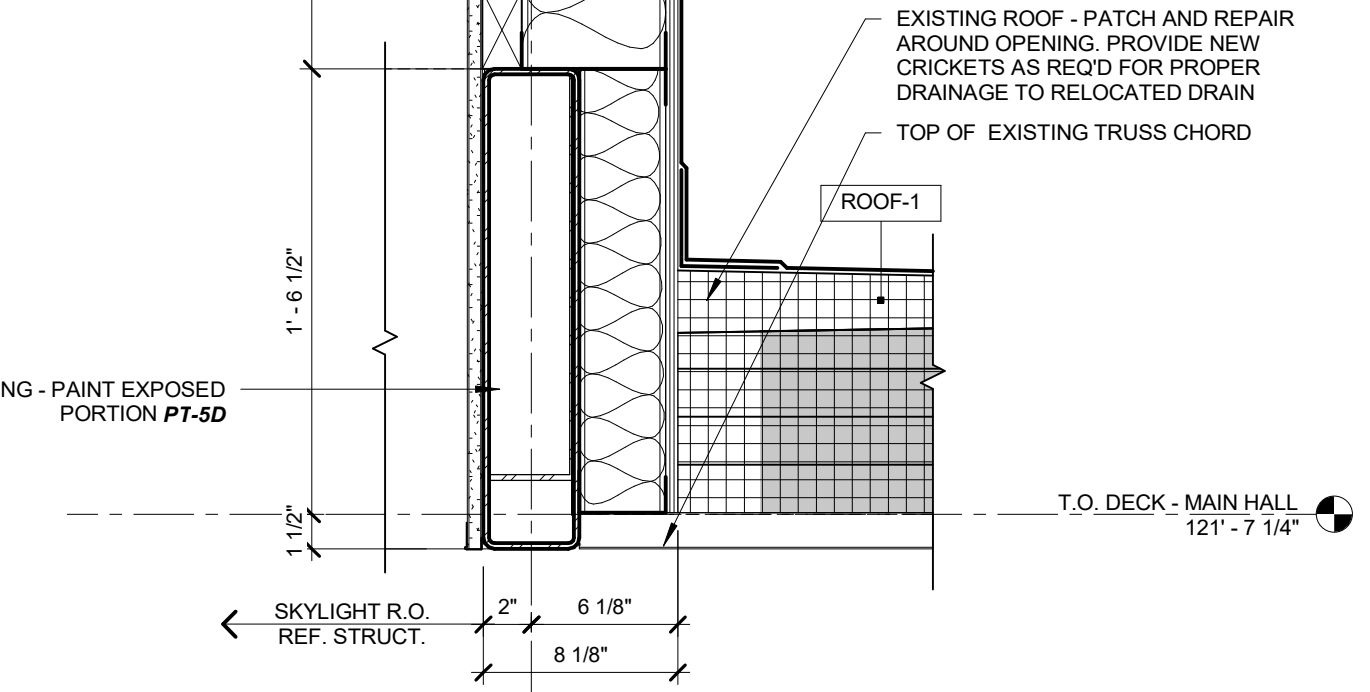
**6 COIL-2 JAMB**  
A353 1 1/2" = 1'-0"



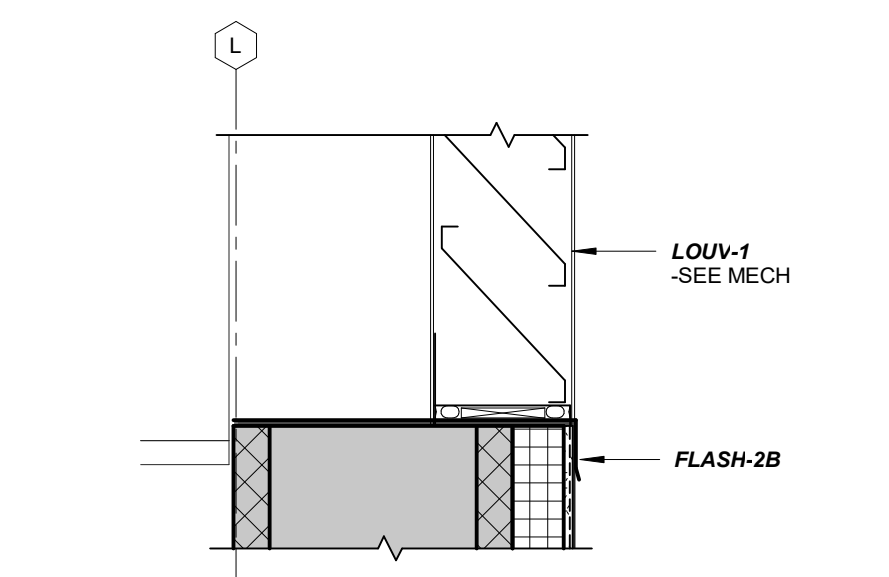
**7 COIL-1 JAMB**  
A353 1 1/2" = 1'-0"



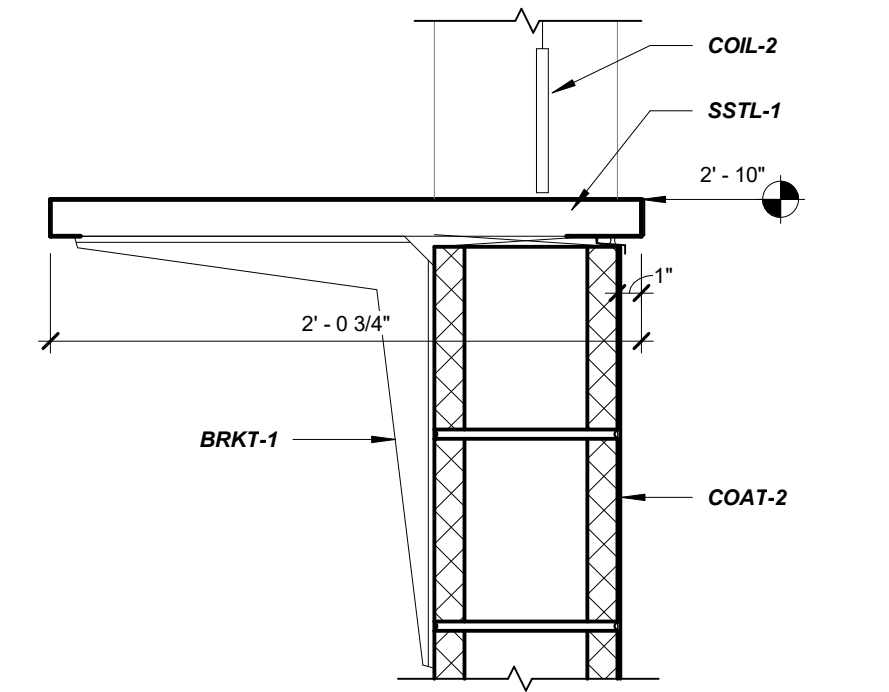
**8 ROOF HATCH**  
A353 1 1/2" = 1'-0"



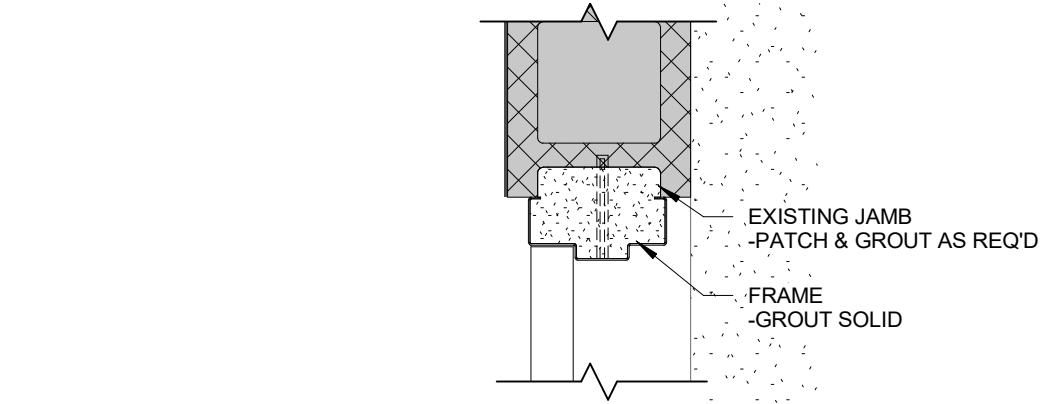
**9 EXT DTL - SKYLIGHT LONGITUDINAL CURB**  
A353 1 1/2" = 1'-0"



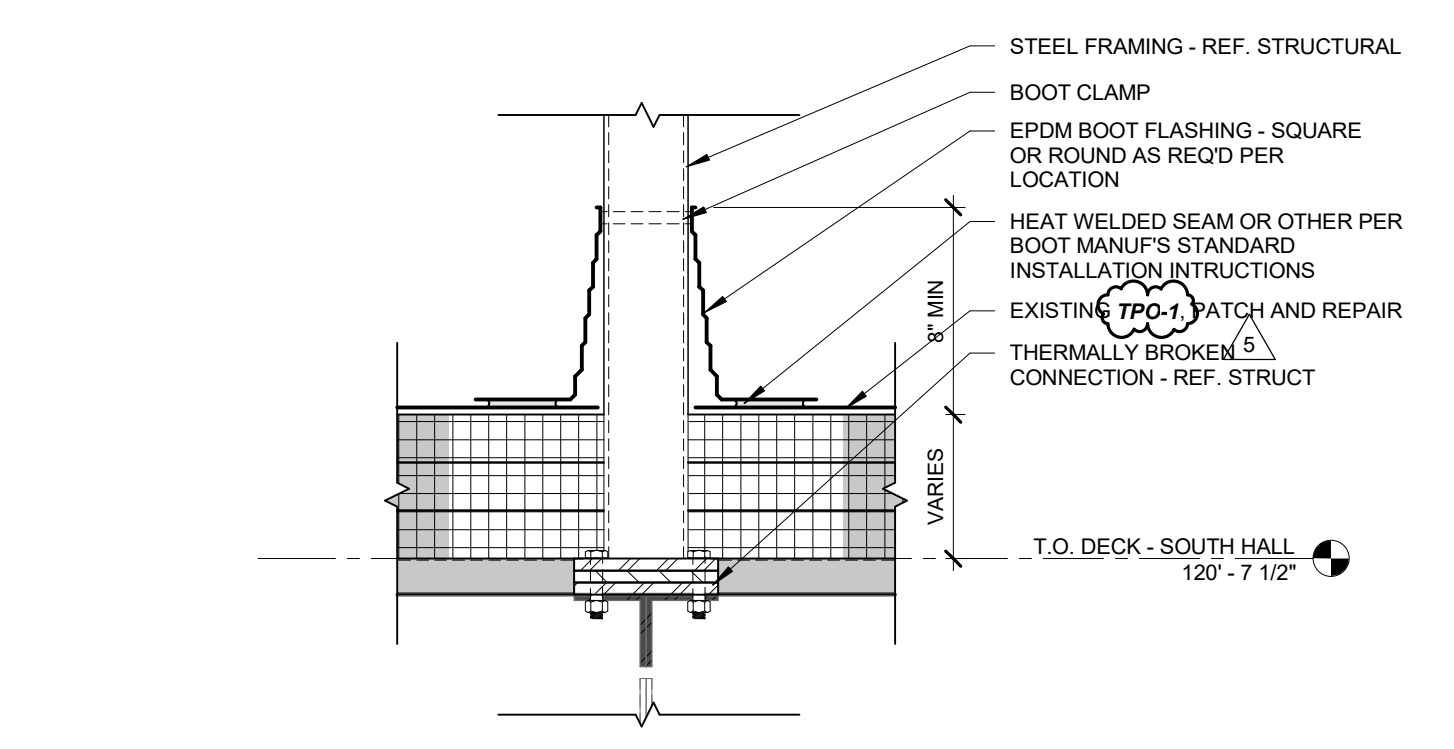
**10 LOUVER - SILL**  
A353 1 1/2" = 1'-0"



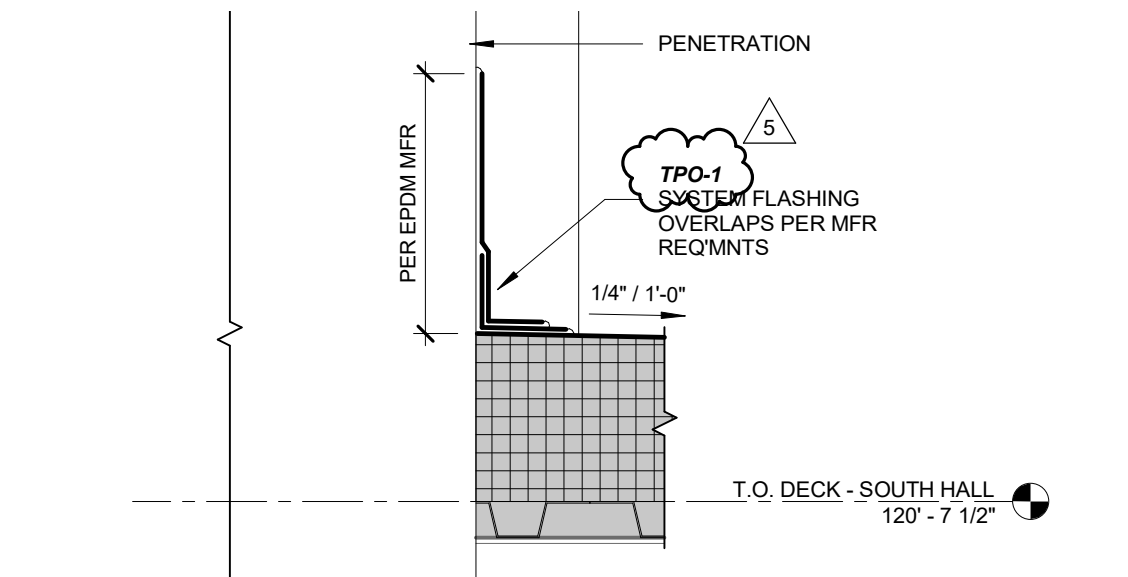
**11 COIL-2 SILL COUNTER**  
A353 1 1/2" = 1'-0"



**12 DOOR JAMB AT 8\"/>**

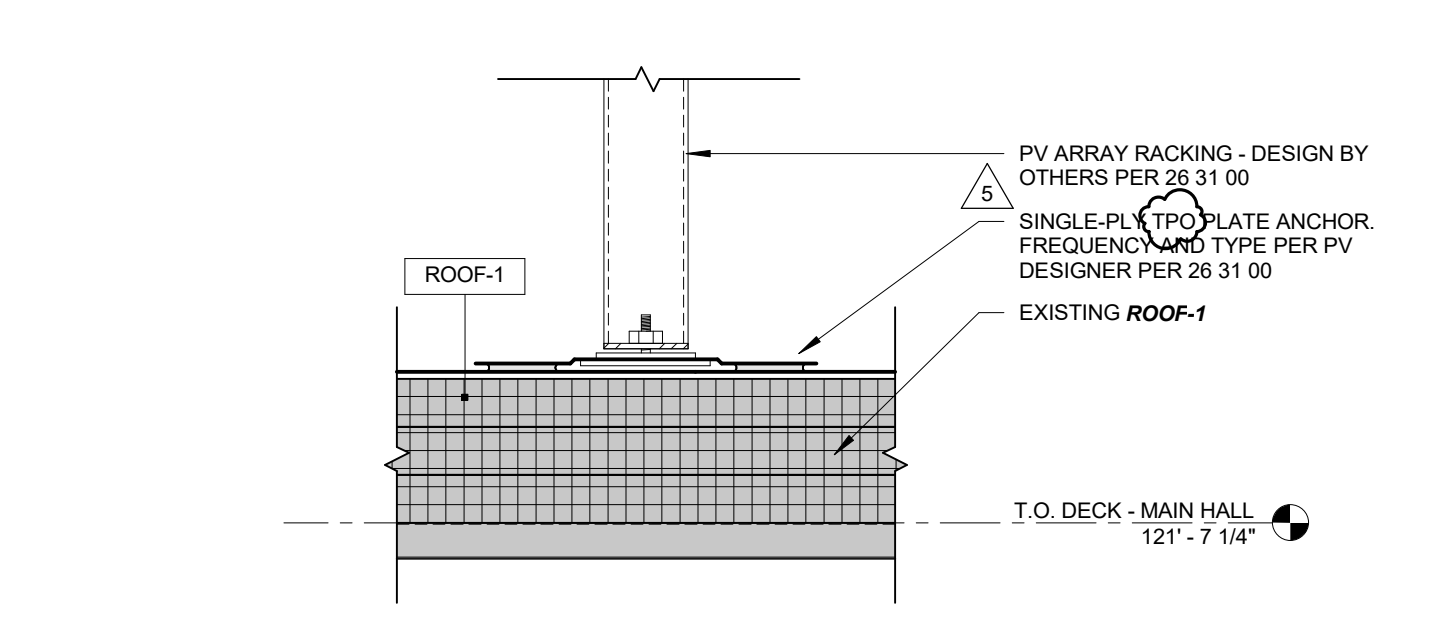


**13 EXT DTL - EQUIPMENT SUPPORT PENETRATION**  
A353 1 1/2" = 1'-0"

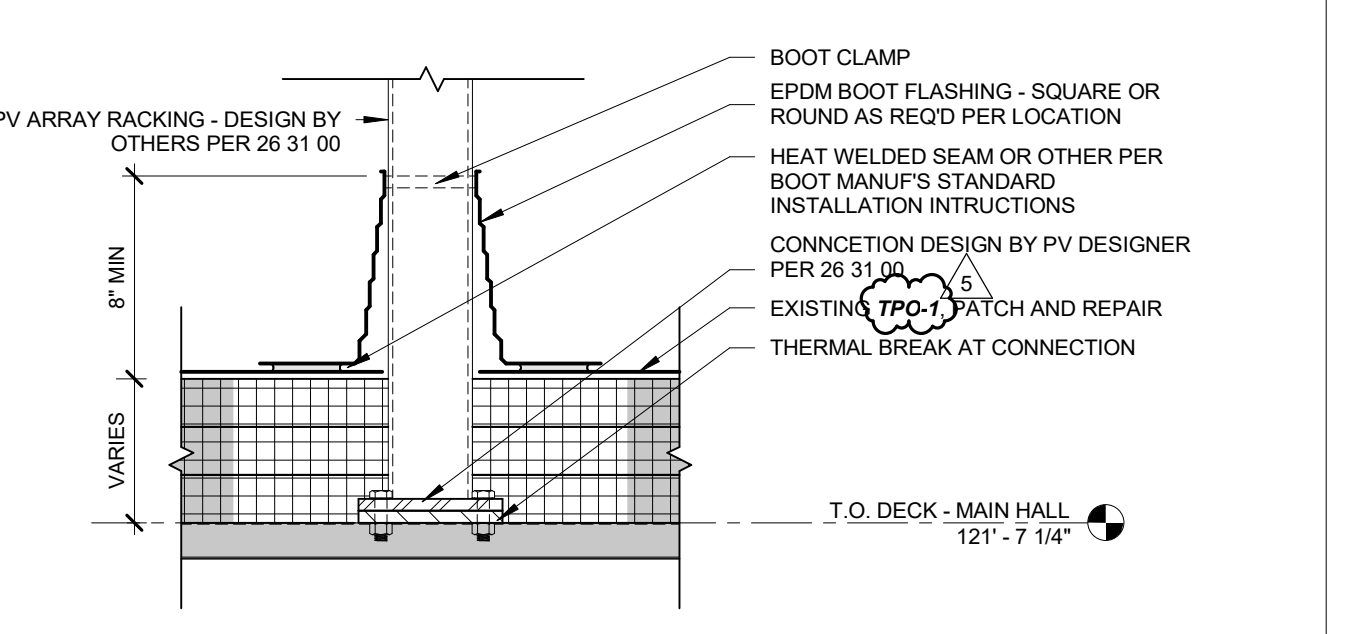


**14 TYP ROOF PENETRATIONS - CURBS, EQUIPMENT**  
A353 1 1/2" = 1'-0"

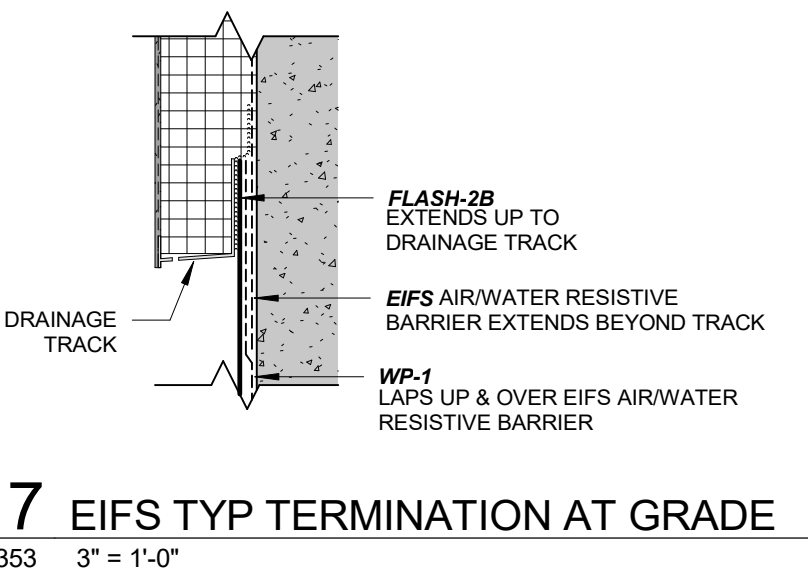
PER 26 31 00 DESIGN OF PHOTOVOLTAIC SYSTEM RACKING AND ANCHORAGE IS BY PHOTOVOLTAIC INSTALLER. NOTE REQUIREMENTS OF STRUCTURAL CRITERIA AND LOADING ON S001 FOR PHOTOVOLTAIC SYSTEM. INSTALLER SHALL UTILIZE BALLASTED ANCHORAGE IF POSSIBLE. IF NOT POSSIBLE, PATCH FITTING SHALL BE USED. FULL PENETRATION ANCHORS SHALL ONLY BE USED AS NECESSARY AND SHALL BE APPROVED BY OWNER PRIOR TO USE.



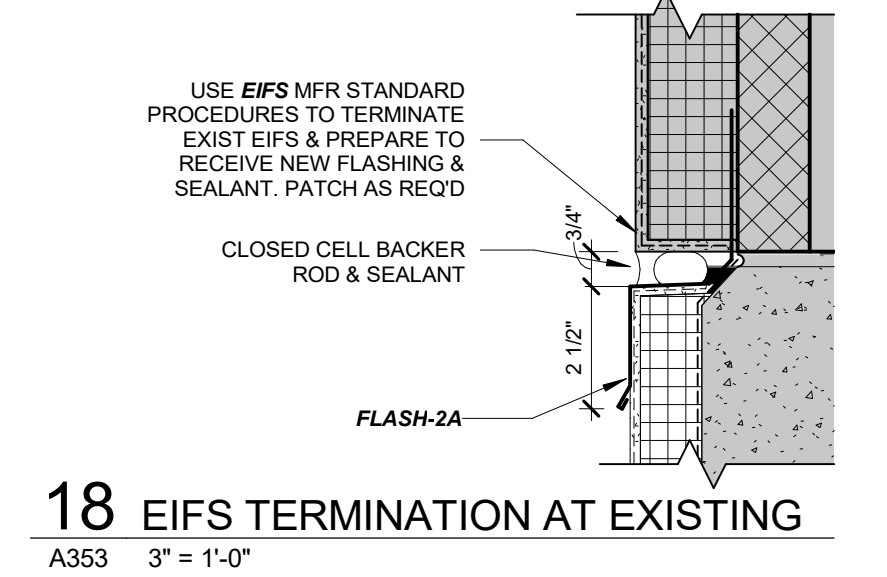
**15 EXT DTL - PV PATCH ANCHOR**  
A353 1 1/2" = 1'-0"



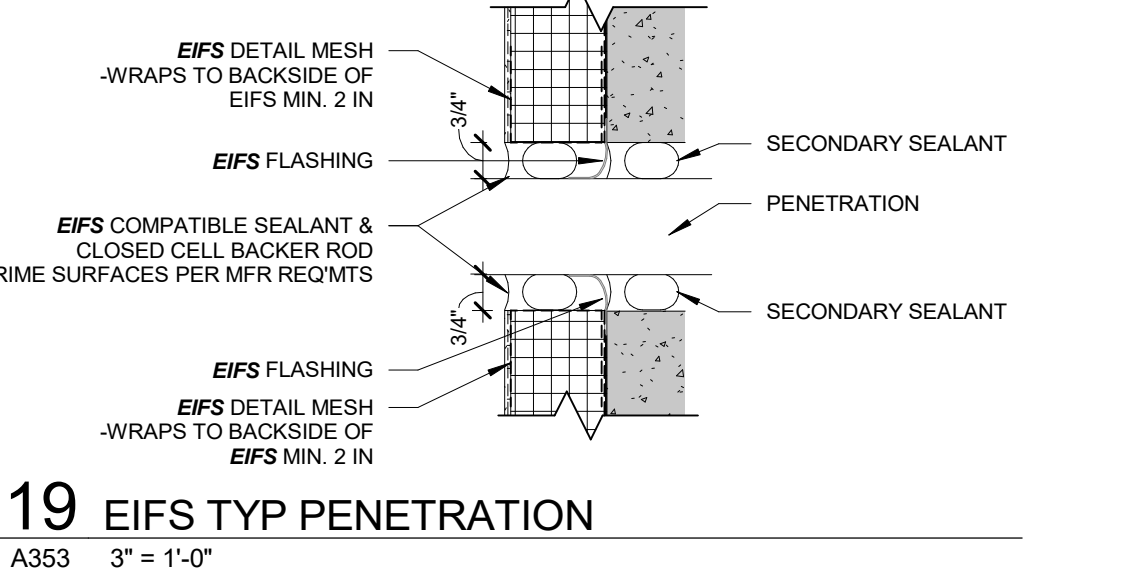
**16 EXT DTL - PV PENETRATION ANCHOR**  
A353 1 1/2" = 1'-0"



**17 EIFS TYP TERMINATION AT GRADE**  
A353 3\"/>



**18 EIFS TERMINATION AT EXISTING**  
A353 3\"/>



**19 EIFS TYP PENETRATION**  
A353 3\"/>

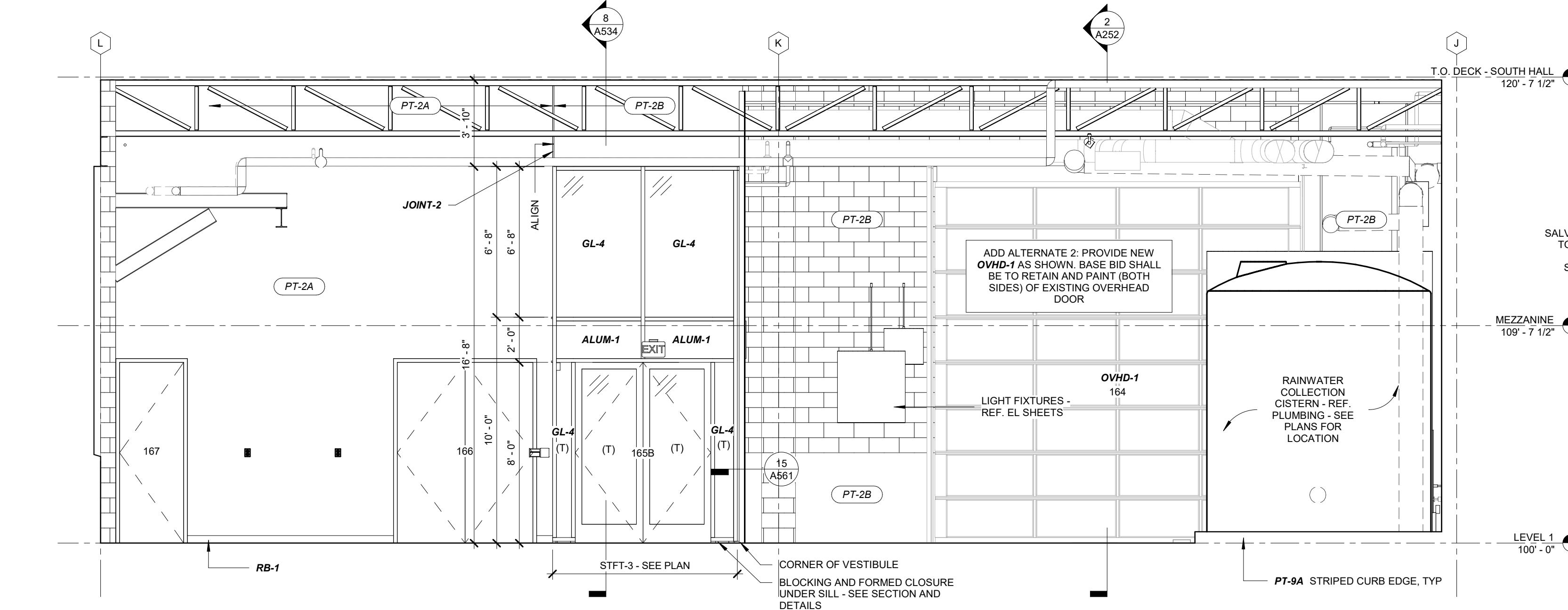
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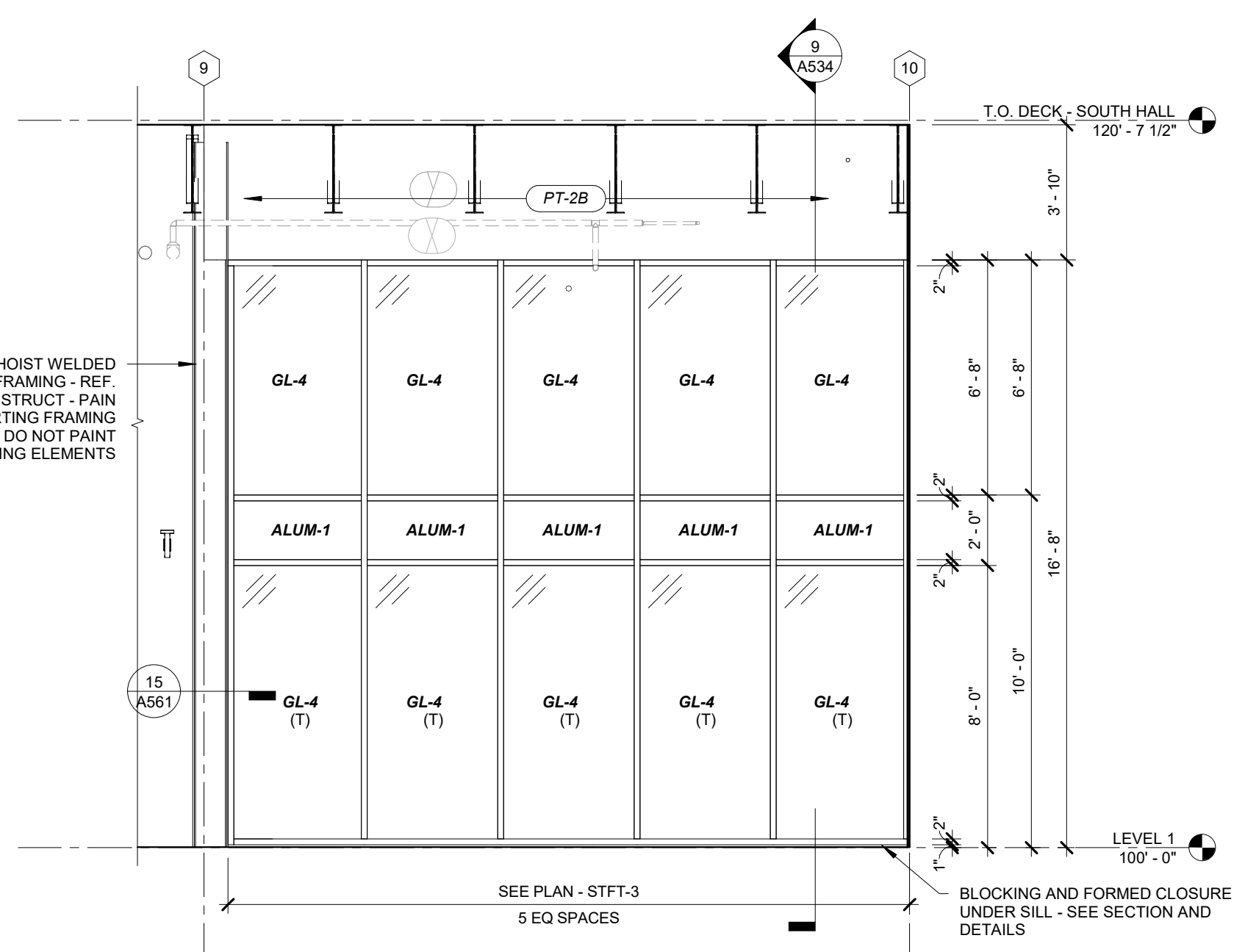
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 Architect Seal  
  
 Signature: *Dagmara Larson*  
 Print Name: Dagmara Larson  
 Date: 2023.06.09 License No. 13278-5

**ADDENDUM 4**  
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 1 2023.08.09 BID DOCUMENTS  
 5 2023.09.05 ADDENDUM 4

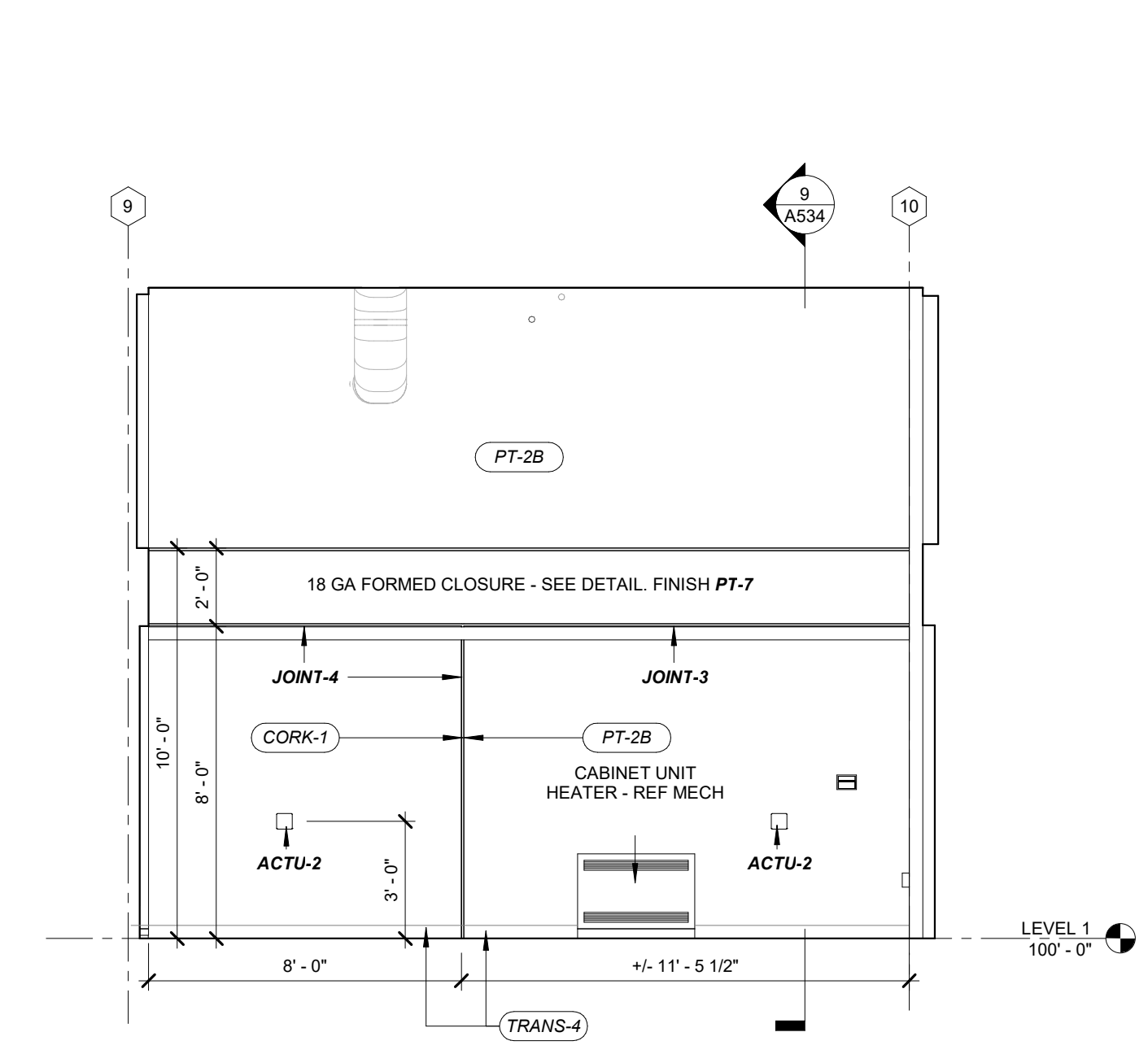
EXTERIOR DETAILS  
**A353**



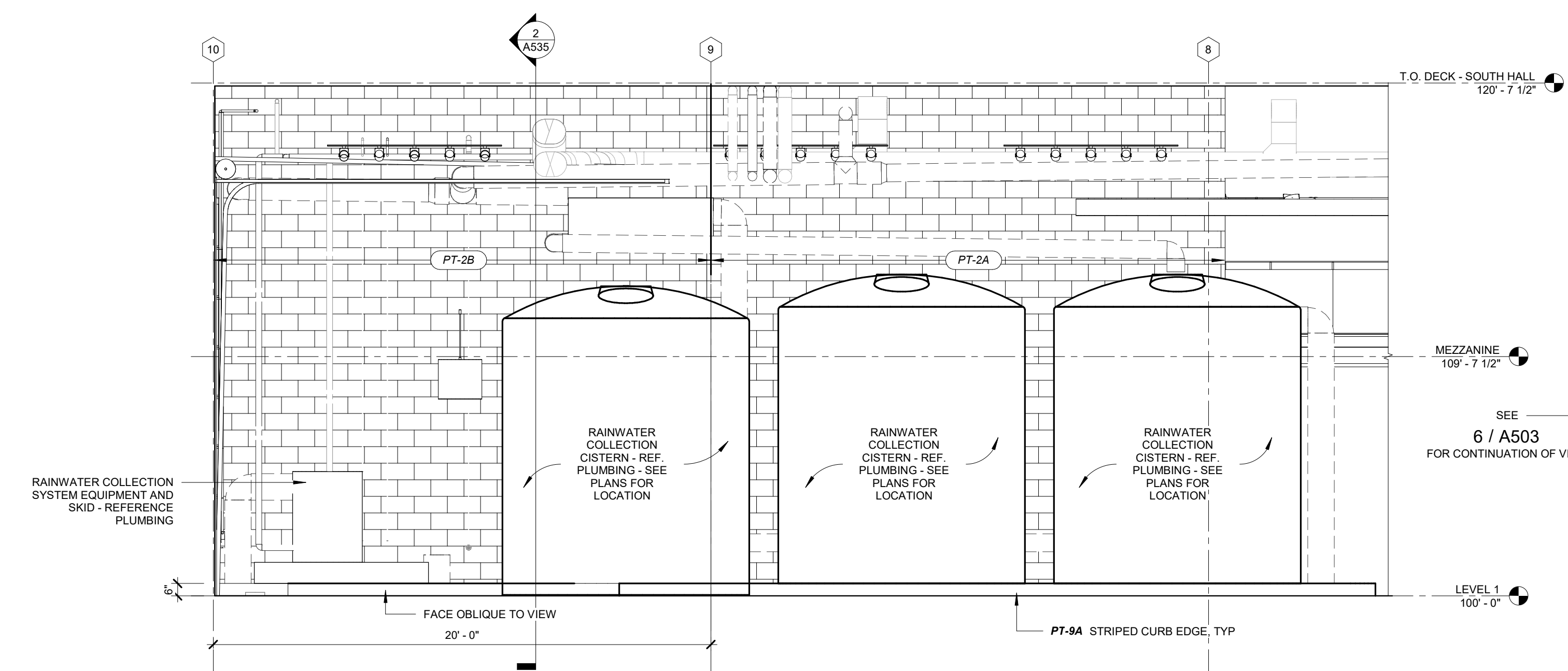
**1 INT ELEVATION - SOUTH HALL 163 - W**  
A503 1/4" = 1'-0"



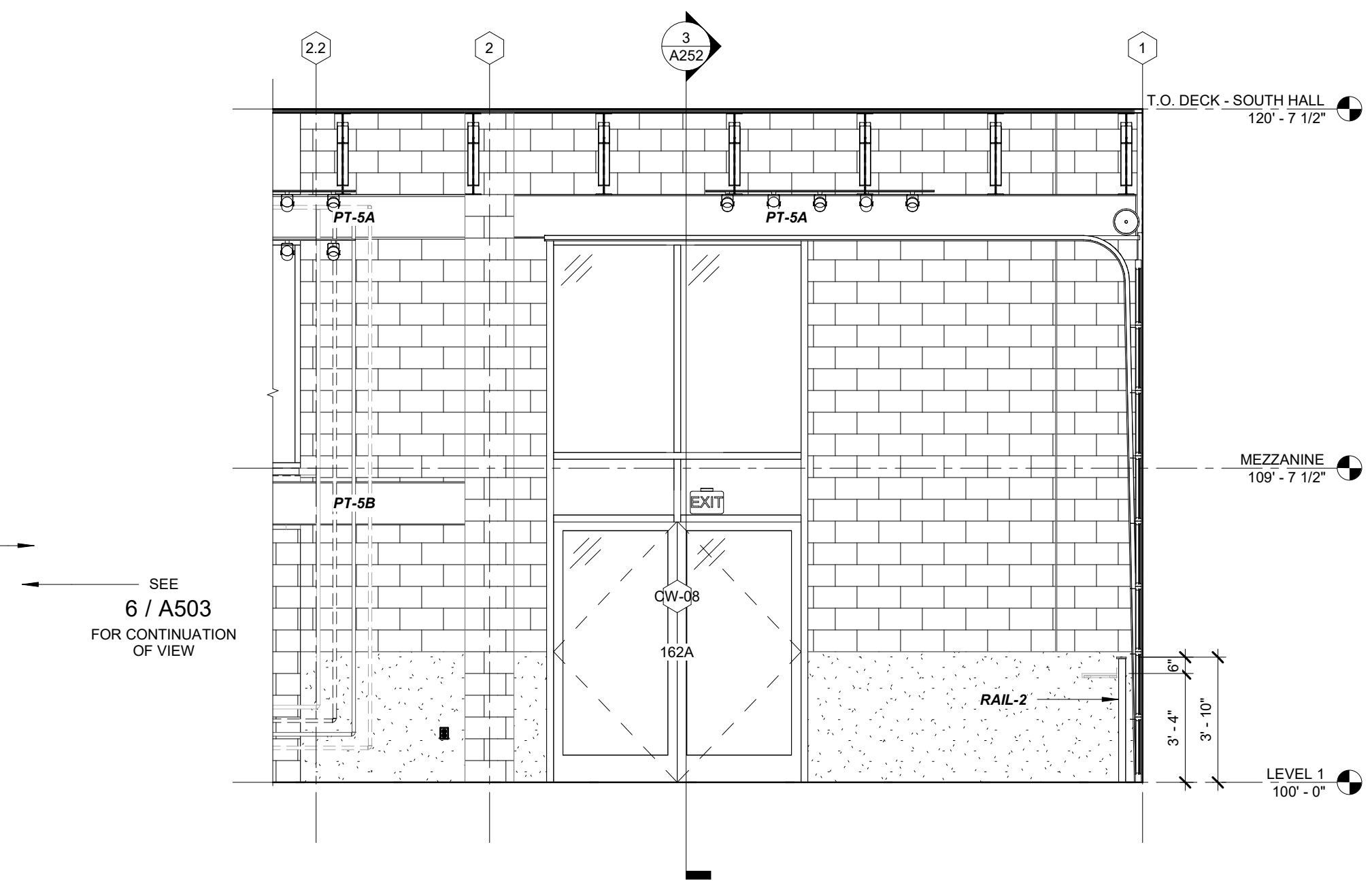
**2 INT ELEVATION - WAITING 164 - S**  
A503 1/4" = 1'-0"



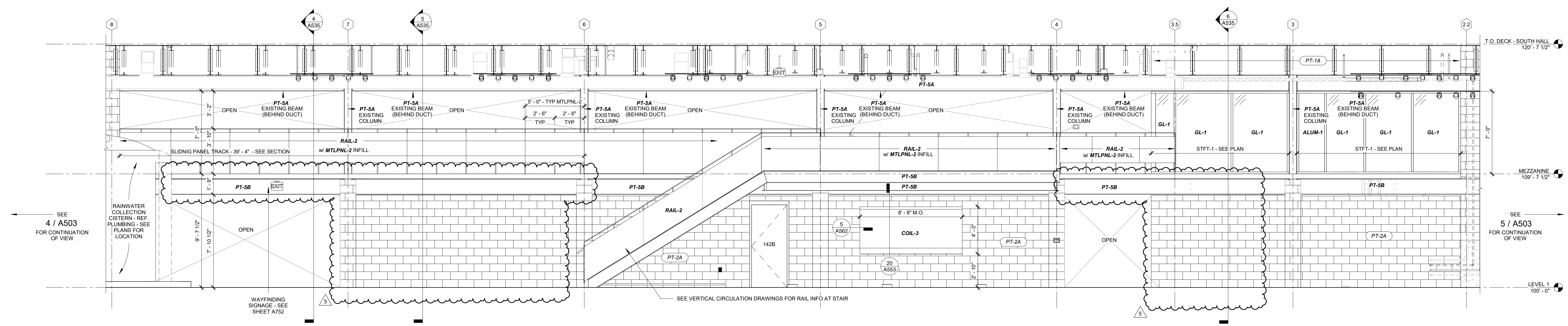
**3 SOUTH INT ELEV - S HALL VESTIBULE**  
A503 1/4" = 1'-0"



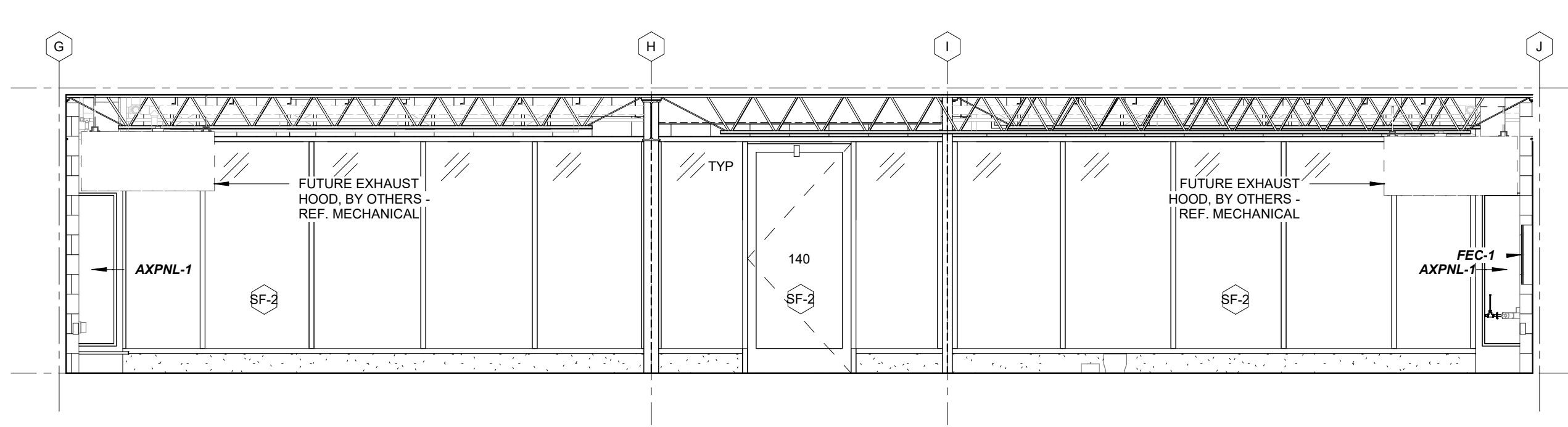
**4 INT ELEVATION - WAITING 164 - N**  
A503 1/4" = 1'-0"



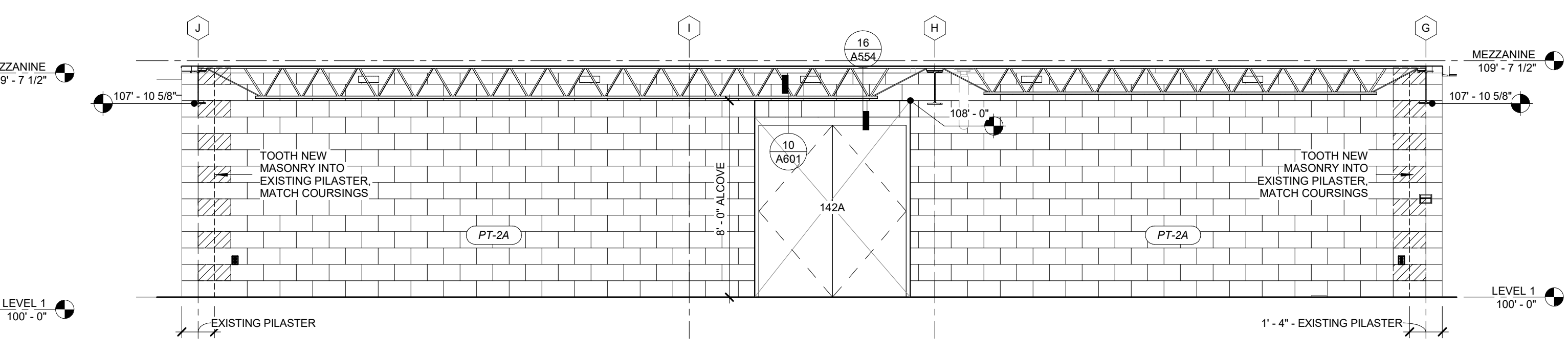
**5 INT ELEVATION - ANCHOR VENDOR 162 - N**  
A503 1/4" = 1'-0"



**6 INT ELEVATION - SOUTH HALL 163 - N**  
A503 1/4" = 1'-0"



**7 INT ELEVATION - VENDOR GROUP 10 - E**  
A503 1/4" = 1'-0"



**8 INT ELEVATION - VENDOR GROUP 10 - W**  
A503 1/4" = 1'-0"

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 Architect Seal  
  
 Signature *Dagmara K. Larsen*  
 Print Name: Dagmara Larsen  
 Date: 2023.06.09 License No. 13278-5

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INTERIOR  
 ELEVATIONS - SOUTH  
 HALL

**A503**

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Signature: *Dagmara K. Larsen*  
 Print Name: Dagmara Larsen  
 Date: 2023.06.09 License No. 13278-5

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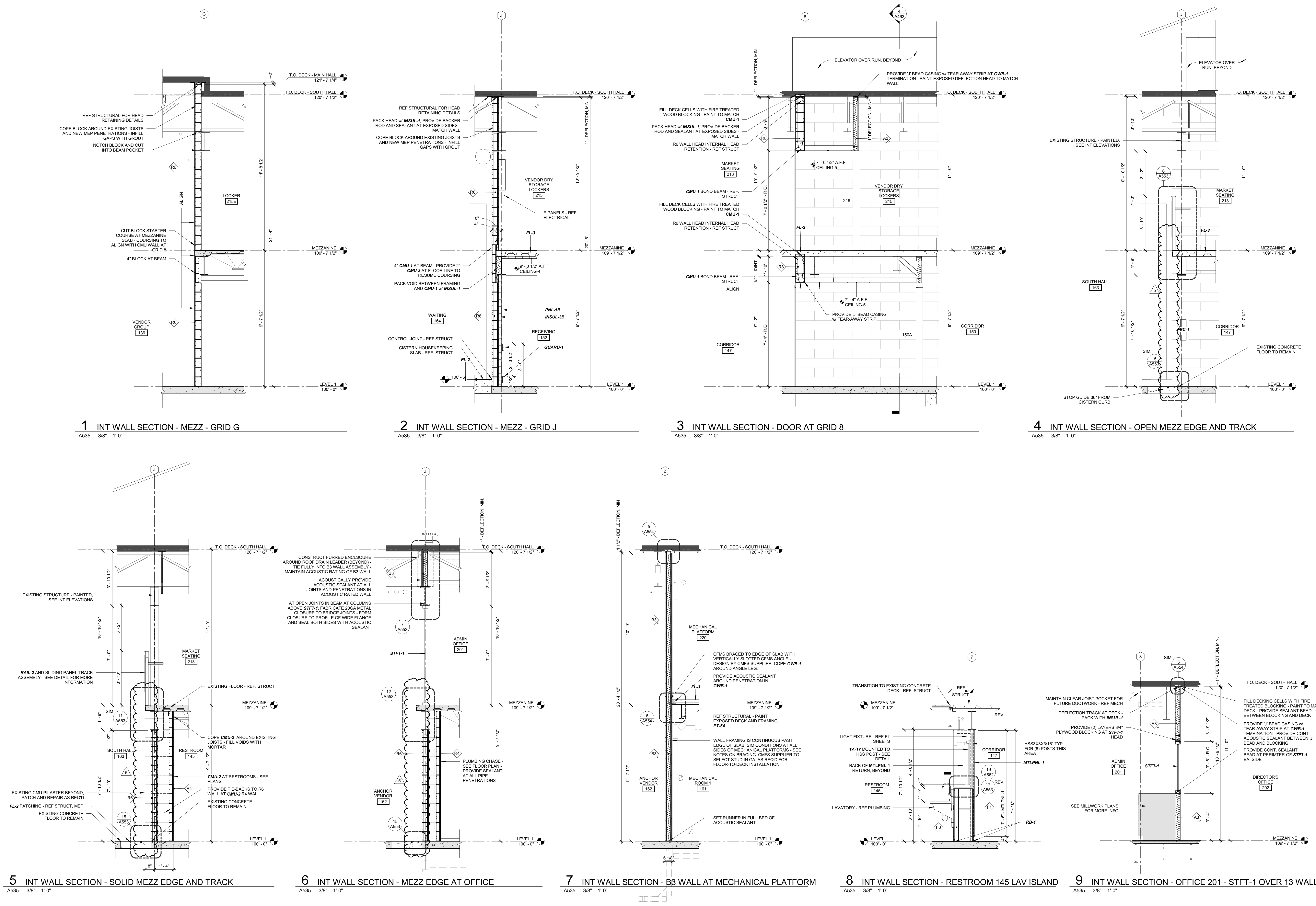
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5	2023.09.05	ADDENDUM 4

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**INTERIOR WALL SECTIONS**

**A535**



1 INT WALL SECTION - MEZZ - GRID G A535 3/8" = 1'-0"  
 2 INT WALL SECTION - MEZZ - GRID J A535 3/8" = 1'-0"  
 3 INT WALL SECTION - DOOR AT GRID 8 A535 3/8" = 1'-0"  
 4 INT WALL SECTION - OPEN MEZZ EDGE AND TRACK A535 3/8" = 1'-0"  
 5 INT WALL SECTION - SOLID MEZZ EDGE AND TRACK A535 3/8" = 1'-0"  
 6 INT WALL SECTION - MEZZ EDGE AT OFFICE A535 3/8" = 1'-0"  
 7 INT WALL SECTION - B3 WALL AT MECHANICAL PLATFORM A535 3/8" = 1'-0"  
 8 INT WALL SECTION - RESTROOM 145 LAV ISLAND A535 3/8" = 1'-0"  
 9 INT WALL SECTION - OFFICE 201 - STFT-1 OVER 13 WALL A535 3/8" = 1'-0"

**1 INT DTL - CANOPY 4 - CEILING 2 CEILING 3 OFFSET**  
A553 1 1/2" = 1'-0" 2 / A534

**2 INT DTL - CANOPY 4 - PERIMETER CHANNEL w LIGHT**  
A553 1 1/2" = 1'-0" 2 / A534

**3 INT DTL - CANOPY 4 - INTERIOR CHANNEL**  
A553 1 1/2" = 1'-0" 3 / A534

**4 INT DTL - CANOPY 4 - POST LIGHT**  
A553 1 1/2" = 1'-0" 1 / A122N

**5 INT DTL - TYP RAIL-2 POST**  
A553 1 1/2" = 1'-0" 1 / A464

**6 INT DTL - TRACK RAIL-2 AND OPENING**  
A553 1 1/2" = 1'-0" 12 / A464

**7 INT DTL - STFT-1 HEAD AT OFFICE**  
A553 1 1/2" = 1'-0" 1 / A122S

**8 INT DTL - CANOPY 2 - RAIL-2 AT CORR 124 AWNING**  
A553 1 1/2" = 1'-0" 3 / A532

**9 INT DTL - NEW MEZZ EDGE AT GRID 7**  
A553 1 1/2" = 1'-0" 5 / A532

**10 INT DTL - VENDOR WALK-IN HEAD**  
A553 1 1/2" = 1'-0" 5 / A534

**11 INT DTL - SLIDING PANEL HEAD**  
A553 1 1/2" = 1'-0" 5 / A535

**12 INT DTL - STFT-1 SILL AT MEZZ EDGE IN OFFICE**  
A553 1 1/2" = 1'-0" 6 / A532

**13 INT DTL - TOP OF RESTROOM 145 SCREEN**  
A553 1 1/2" = 1'-0" 22 / A562

**14 INT DTL - VENDOR WALK-IN THRESHOLD**  
A553 1 1/2" = 1'-0" 5 / A534

**15 INT DTL - SLIDING PANEL - SILL**  
A553 1 1/2" = 1'-0" 4 / A535

**16 INT DTL - CURB BENCH**  
A553 1 1/2" = 1'-0" 1 / A101S

**17 INT DTL - RESTROOM 145 - LAV COUNTER**  
A553 1 1/2" = 1'-0" 8 / A535

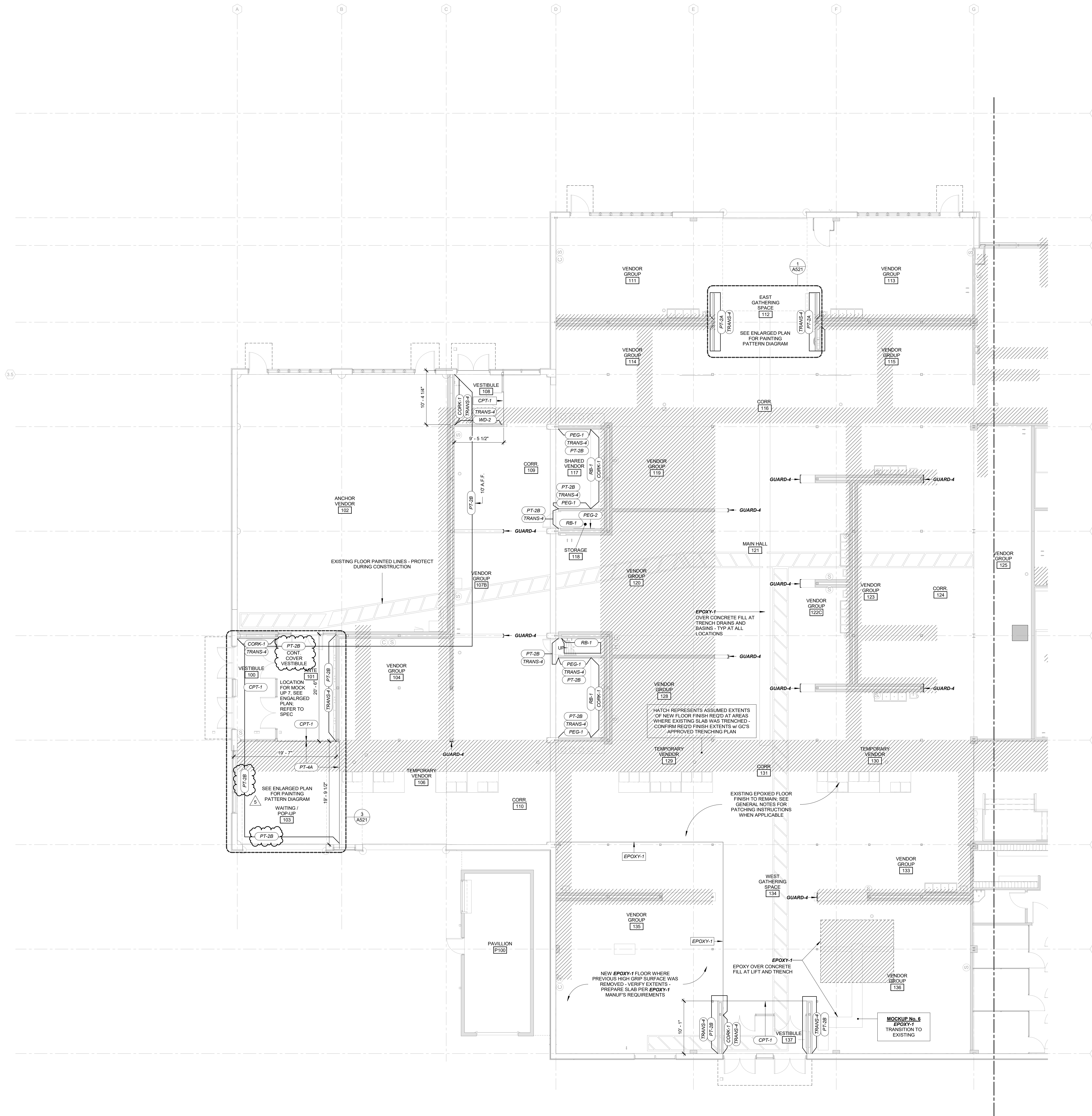
**18 INT DTL - FREEZER THRESHOLD**  
A553 1 1/2" = 1'-0" 1 / A101S

**19 INT DTL - HOUSE KEEPING PAD**  
A553 1 1/2" = 1'-0" 1 / A101S

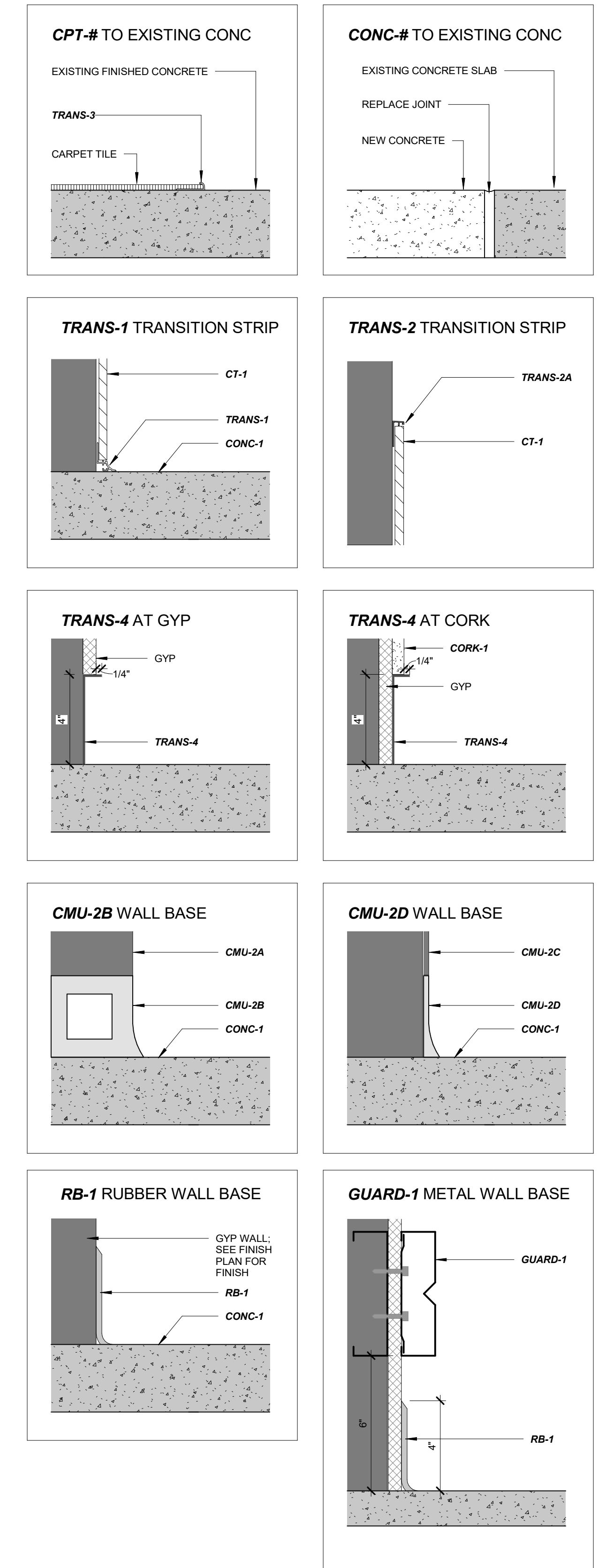
**20 INT DTL - MARKET KITCHEN 142 - COUNTER**  
A553 1 1/2" = 1'-0" 1 / A101S







- ### FINISH PLAN KEY
- | FLOOR FINISH | WALL FINISH          | WINDOW TREATMENT |
|--------------|----------------------|------------------|
| CPT-1-A      | PT-1-A               | SHADE-1          |
| STYLE COLOR  | STYLE / COLOR FINISH | STYLE            |
- NOTES:**
- SEE PROJECT SPECIFICATION FOR KEY TO FINISH CODES.
  - COORDINATE EXTENT OF FLOOR AND WALL FINISHES WITH MILLWORK DRAWINGS.
  - SEE SHEETS A151 FOR RESTROOM ELEVATIONS SHOWING WALL TILE PATTERNS & PAINT LOCATIONS ABOVE.
  - ALL GWB CEILINGS TO BE PAINTED PT-1A U.N.O.
  - ALL ELECTRICAL ROOMS, JANITOR'S CLOSETS AND MECHANICAL ROOMS TO BE PAINTED PT-2A U.N.O.
  - INSTALLER RESPONSIBLE FOR FIELD VERIFYING ALL QUANTITIES, DIMENSIONS AND CONDITIONS FOR WINDOW TREATMENTS. ALL SHADES SHALL BE FULL WIDTH WITH NO SEAMS OR BATTENS. INSTALLER RESPONSIBLE FOR SUBMITTING SHOP DRAWINGS FOR APPROVAL.
  - VENDOR STALL DEMISING WALLS TO RECEIVE LEVEL 0 GYP FINISH. COORDINATE WITH ARCHITECTURAL FLOOR PLANS FOR DEMISING WALL LOCATIONS.
  - UNLESS NOTE OTHERWISE, ALL NEW GWB AND CMU WALLS TO BE PAINTED PT-2A U.N.O.
  - HATCHED AREA INDICATES ASSUMED EXTENT OF NEW FINISHES RECD. AT AREAS OF EXISTING SLAB WHICH HAVE BEEN PATCHED AND REPLACED - REF DEMO DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ACTUAL EXTENTS AND FINAL SQUARE FOOTAGE OF PATCH AND REPLACE WORK AT ALL EXISTING FLOORS.
  - U.N.O. PROVIDE EPOXY-1 AT ALL LOCATIONS WHERE EXISTING SLAB HAS BEEN PATCHED AND REPLACED. NEW FINISH SURFACE SHALL BE FLUSH AND LEVEL WITH EXISTING. JOINT BETWEEN NEW AND EXISTING EPOXY FINISHES SHALL BE STRAIGHT AND UNIFORM. PREP JOINT AS PER EPOXY-1 MANUF'S RECOMMENDATIONS.
  - SEE ARCHITECTURAL STEEL DRAWINGS A110N AND A110S FOR ADDITIONAL FINISH NOTES AT VENDOR STEEL CANOPIES.
  - REFERENCE PROJECT MANUAL SPECIFICATIONS FOR SURFACE PREP FOR ALL EXPOSURE SURFACES TO RECEIVE FINISHES.
  - REFER TO 02 35 43 FOR EXPOSED CONCRETE POLISHING AND FINISHED WHERE CONC-1 IS NOTE AS FLOOR FINISH ON FINISH PLANS AND DETAILS.



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Project No. 2018006.00

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202 N First St, Madison, WI 53704

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.

Architect Seal

Signature *Dagmara K. Larsen*  
Print Name Dagmara Larsen  
Date 2023.06.09 License No. 13278-5

**ADDENDUM 4**

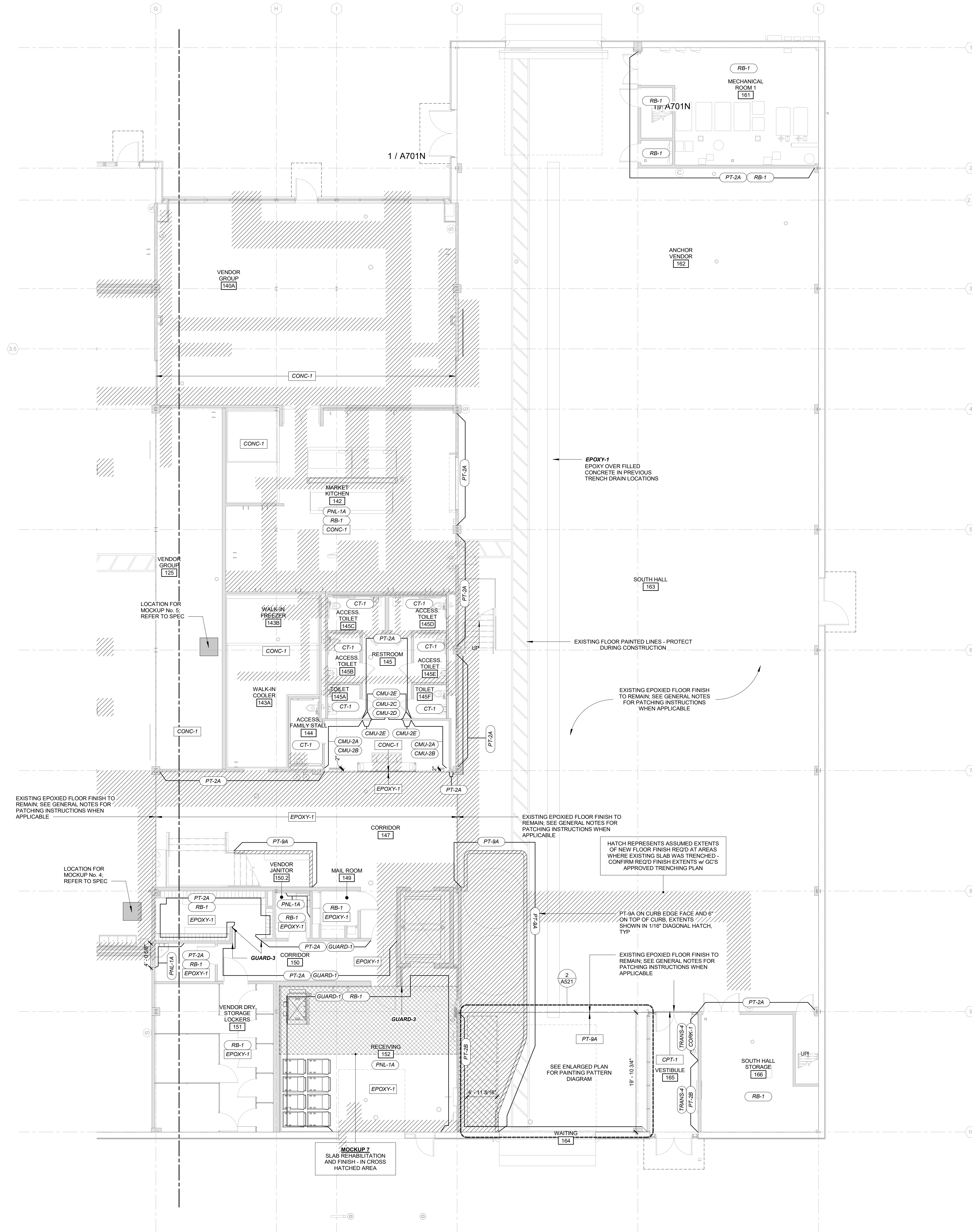
**ISSUE / REVISION**

Mark	Date	Description
1	2023.06.09	BID DOCUMENTS
5	2023.09.05	ADDENDUM 4

**1** LEVEL 1 FINISH PLAN NORTH  
A701N 1/8" = 1'-0"

TRANSITION DETAILS  
3" = 1'-0"

LEVEL 1 FINISH PLAN - NORTH  
**A701N**



**FINISH PLAN KEY**

FLOOR FINISH (OPT-1)	WALL FINISH (PT-1)	WINDOW TREATMENT (SHADE)
STYLE COLOR	STYLE / COLOR FINISH	STYLE

- NOTES:**
- SEE PROJECT SPECIFICATION FOR KEY TO FINISH CODES.
  - COORDINATE EXTENT OF FLOOR AND WALL FINISHES WITH MILLWORK DRAWINGS.
  - SEE SHEETS A151 FOR RESTROOM ELEVATIONS SHOWING WALL TILE PATTERNS & PAINT LOCATIONS ABOVE.
  - ALL GWB CEILINGS TO BE PAINTED PT-1A U.N.O.
  - ALL ELECTRICAL ROOMS, JANITOR'S CLOSETS AND MECHANICAL ROOMS TO BE PAINTED PT-2A U.N.O.
  - INSTALLER RESPONSIBLE FOR FIELD VERIFYING ALL QUANTITIES, DIMENSIONS AND CONDITIONS FOR WINDOW TREATMENTS. ALL SHADES SHALL BE FULL WIDTH WITH NO SEAMS OR BATTENS. INSTALLER RESPONSIBLE FOR SUBMITTING SHOP DRAWINGS FOR APPROVAL.
  - VENDOR STALL DIMSING WALLS TO RECEIVE LEVEL 0 GYP FINISH. COORDINATE WITH ARCHITECTURAL FLOOR PLANS FOR DIMSING WALL LOCATIONS.
  - UNLESS NOTE OTHERWISE, ALL NEW GWB AND CMU WALLS TO BE PAINTED PT-2A U.N.O.
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  - SEE ARCHITECTURAL STEEL DRAWINGS A110N AND A110S FOR ADDITIONAL FINISH NOTES AT VENDOR STEEL CANOPIES.
  - REFERENCE PROJECT MANUAL SPECIFICATIONS FOR SURFACE PREP FOR ALL EXPOSING SURFACES.
  - REFER TO 02 28 43 FOR EXPOSED CONCRETE POLISHING AND FINISHED WHERE COVC-1 IS NOTE AS FLOOR FINISH ON FINISH PLANS AND DETAILS.

**1 LEVEL 1 FINISH PLAN SOUTH**  
A701S 1/8" = 1'-0"

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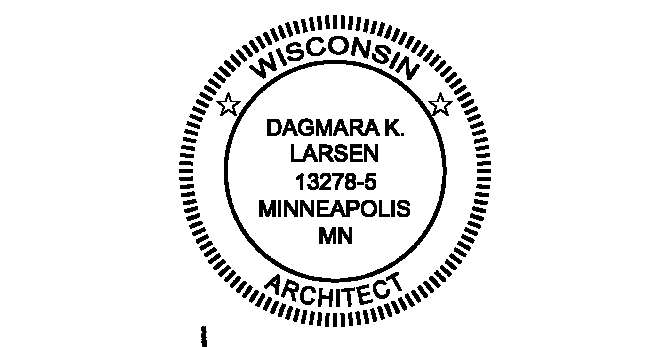
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 Project No. 2018005.00

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.



Signature *Dagmara K. Larsen*  
Print Name *Dagmara Larsen*  
Date 2023.06.09 License No. 13278-5

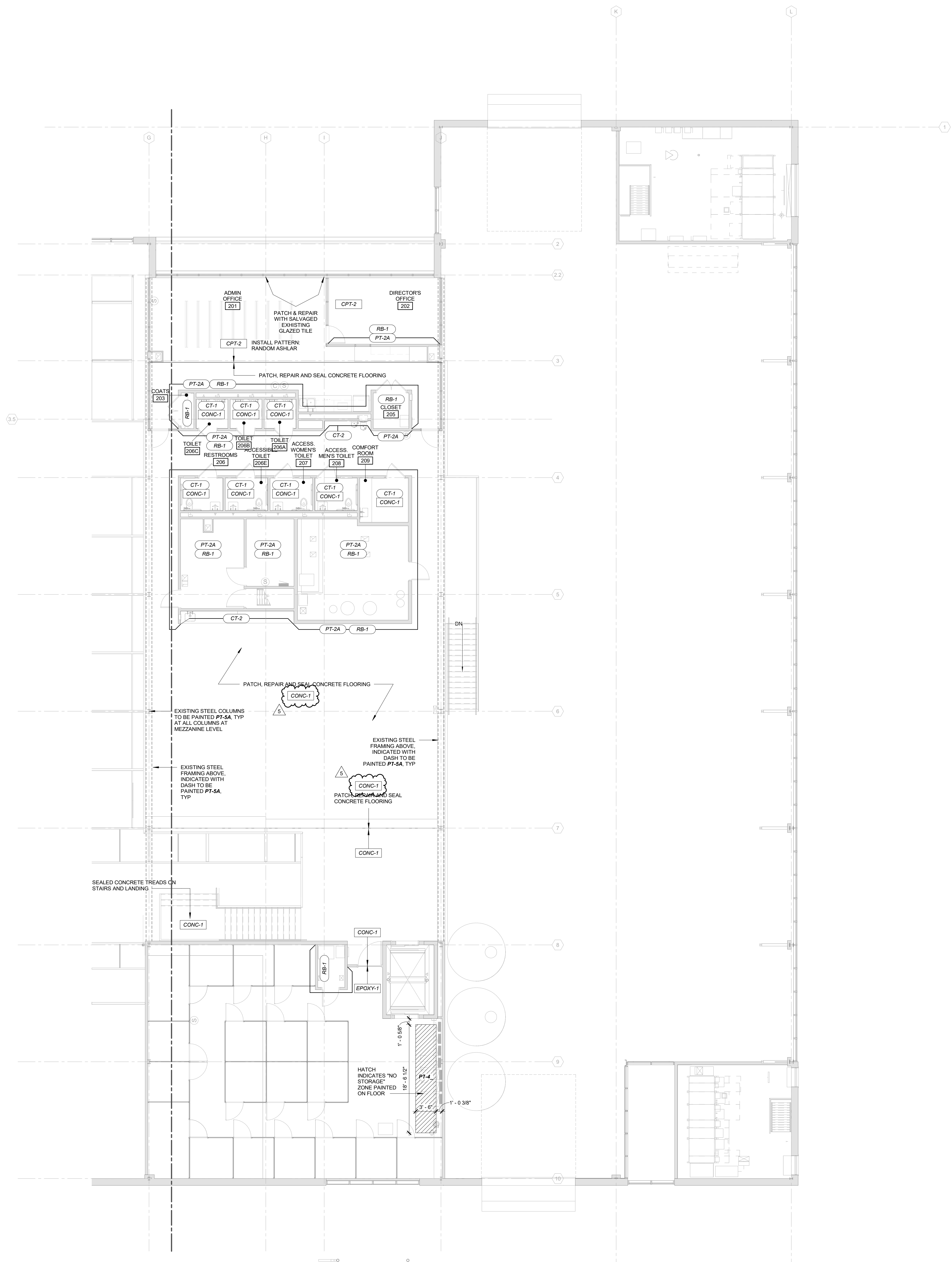
**ADDENDUM 4**

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5	2023.09.05	ADDENDUM 4

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**LEVEL 1 FINISH PLAN - SOUTH**

# A701S



- ### FINISH PLAN KEY
- | FLOOR FINISH | WALL FINISH          | WINDOW TREATMENT |
|--------------|----------------------|------------------|
| CPT-1, A     | PT-1, A              | SHADE-1          |
| STYLE COLOR  | STYLE / COLOR FINISH | STYLE            |
- NOTES:**
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  - REFERENCE PROJECT MANUAL SPECIFICATIONS FOR SURFACE PREP FOR ALL EXPOSURE SURFACES.
  - REFER TO 23 28 43 FOR EXPOSED CONCRETE POLISHING AND FINISHED WHERE CONC-1 IS NOTE AS FLOOR FINISH ON FINISH PLANS AND DETAILS.

**1** MEZZANINE LEVEL FINISH PLAN  
A702S 1/8" = 1'-0"

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Architect Seal

**DAGMARA K. LARSEN**  
13278-5  
MINNEAPOLIS  
MN  
ARCHITECT

Signature *Dagmara Larsen*  
Print Name Dagmara Larsen  
Date 2023.06.09 License No. 13278-5

**ADDENDUM 4**

**ISSUE / REVISION**

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1	2023.08.09	BID DOCUMENTS
5	2023.09.05	ADDENDUM 4

MEZZANINE LEVEL  
FINISH PLAN - SOUTH

**A702S**

PUBLIC STREET - WIDTH VARIES  
NORTH FIRST STREET

EAST DAYTON STREET

PUBLIC STREET - WIDTH VARIES  
NORTH FIRST STREET

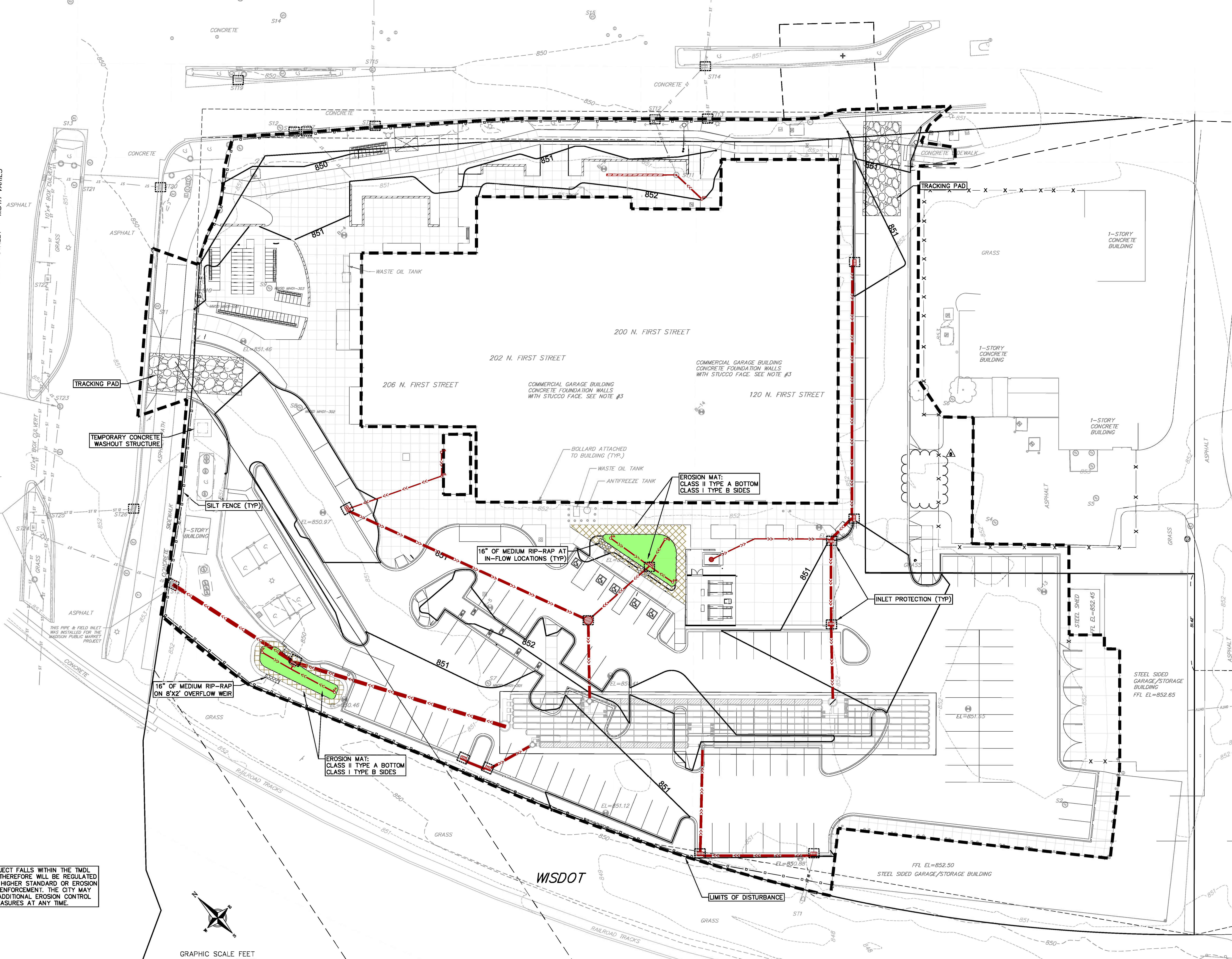
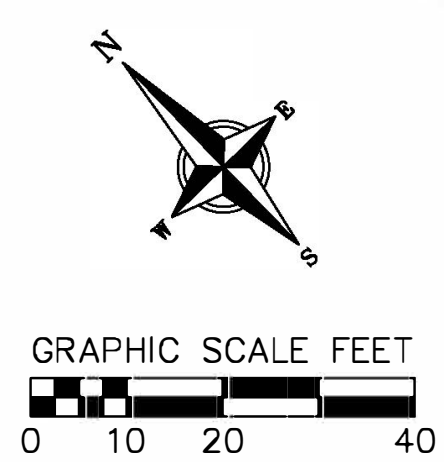
EAST JOHNSON STREET  
PUBLIC STREET - WIDTH VARIES

ST23 LOCATION APPROXIMATE FROM CITY/PROJECT PLANS - PROJECT #S: 5992-09-14, 5992-09-15 & 5992-09-16

STORM SHOWN PER MARKINGS IN FIELD. NO SHARP TURNS OR PLANS FOUND TO CONFIRM THESE MARKINGS.

THIS PIPE & FIELD INLET WAS INSTALLED FOR THE MADISON PUBLIC MARKET PROJECT.

THIS PROJECT FALLS WITHIN THE TMDL ZONE AND THEREFORE WILL BE REGULATED TO MEET A HIGHER STANDARD OR EROSION CONTROL ENFORCEMENT. THE CITY MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES AT ANY TIME.



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- Structural Engineering,  
Fire Protection Engineering, Technology and AV  
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- Lighting Design  
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- Commercial Kitchen Design  
**Boelter Premier Boelter premier**  
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**MADISON PUBLIC MARKET**  
202 N First St, Madison, WI 53704

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.

Architect Seal  
SARAH CHURCH  
E-39369  
MADISON, WI  
PROFESSIONAL ENGINEER

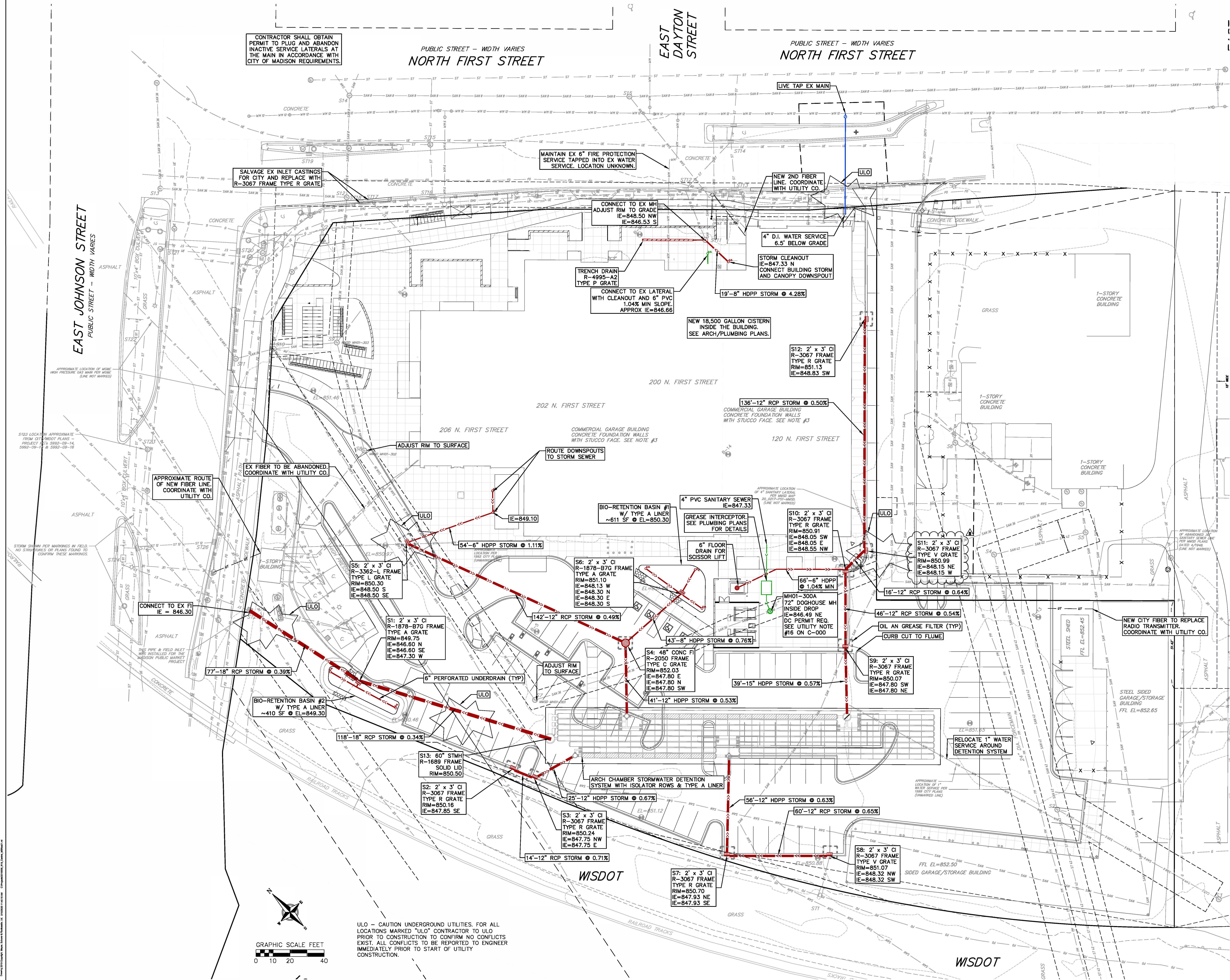
Signature: Sarah V. Church  
Print Name: Sarah V. Church  
Date: 08/08/23 License No: 000000000

**BID DOCUMENTS**

**ISSUE / REVISION**

Mark	Date	Description
1	2023.08.09	BID DOCUMENTS
2	2023.09.05	ADDENDUM 4

**EROSION CONTROL PLAN**  
**C201**



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Project No. 201800020

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 MADISON, WI  
 PROFESSIONAL ENGINEER

Signature *Sarah Church*  
 Print Name Sarah Church  
 Date 8/31/2023 License No.

**BID DOCUMENTS**

**ISSUE / REVISION**  
 Mark Date Description  
 5 2023.08.09 NO DOCUMENTS  
 5 2023.05.05 ADDENDUM A

**UTILITY PLAN**

**C301**

# ARCH CHAMBER STORMWATER DETENTION SYSTEM

## MADISON PUBLIC MARKET MADISON, WI

### SC-310 STORMTECH CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH SC-310.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE OR POLYETHYLENE COPOLYMERS.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.6 OF ASTM F2922 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
  - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
  - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.85 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
  - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2922 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

### IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310 SYSTEM

- STORMTECH SC-310 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
  - STONESHOOTER LOCATED OFF THE CHAMBER BED.
  - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
  - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELLED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4" (20.0 mm).
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

### NOTES FOR CONSTRUCTION EQUIPMENT

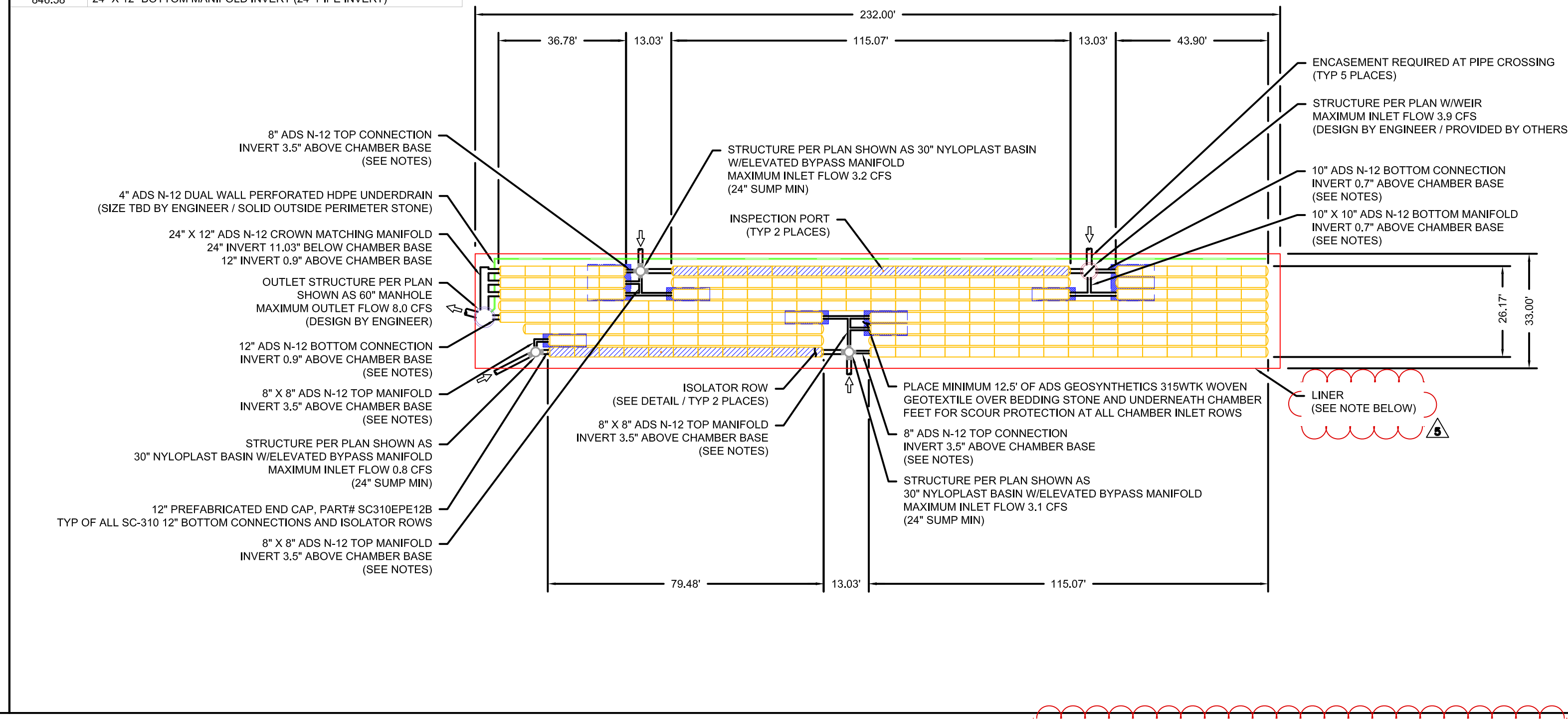
- STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
  - THE USE OF CONSTRUCTION EQUIPMENT OVER SC-310 & SC-740 CHAMBERS IS LIMITED:
    - NO EQUIPMENT IS ALLOWED ON BASE CHAMBERS.
    - NO RUBBER Tired LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
    - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
  - FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.
- USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.
- CONTACT STORMTECH AT 1-888-892-2684 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT	
223	STORMTECH SC-310 CHAMBERS
36	STORMTECH SC-310 END CAPS
6	STONE ABOVE (in)
6	STONE BELOW (in)
40	"N" STONE VOID
9120	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED)
7656	SYSTEM AREA (ft <sup>2</sup> )
530	SYSTEM PERIMETER (ft)

PROPOSED ELEVATIONS	
856.83	MINIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)
850.83	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC)
850.33	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
850.33	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT)
850.33	MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT)
849.33	TOP OF STONE
848.83	TOP OF SC-310 CHAMBER
847.79	8" TOP MANIFOLD INVERT
847.58	12" ISOLATOR ROW CONNECTION INVERT
847.58	24" X 12" BOTTOM MANIFOLD (12" INVERT)
847.56	10" BOTTOM MANIFOLD INVERT
847.50	BOTTOM OF SC-310 CHAMBER
847.00	UNDERDRAIN INVERT
847.00	BOTTOM OF STONE
846.58	24" X 12" BOTTOM MANIFOLD INVERT (24" PIPE INVERT)

- ### NOTES
- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECHNICAL NOTE 6.32 FOR MANIFOLD SIZING GUIDANCE.
  - DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
  - THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
  - ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS. TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTEXTILE PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.



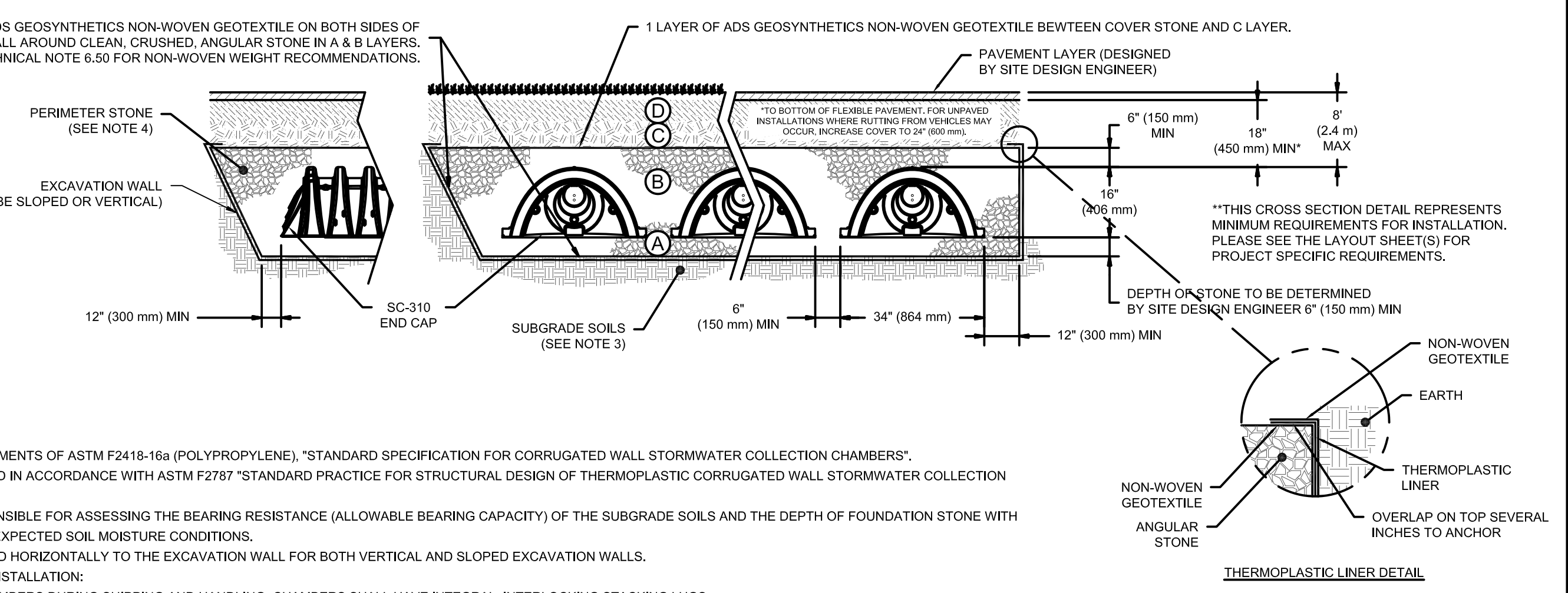
**NOTE:**  
DETENTION SYSTEM DETAILS SHALL SERVE AS THE BASIS OF DESIGN.  
CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER AND CITY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.  
SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

**LINER NOTE:**  
HDPE LINER CRITERIA:  
MINIMUM THICKNESS SHALL BE 60 MILS.  
DESIGN ACCORDING TO THE CRITERIA IN TABLE 3 OF NRCS 313, WASTE STORAGE FACILITY TECHNICAL STANDARD.  
INSTALL ACCORDING TO NRCS WISCONSIN CONSTRUCTION SPECIFICATION 202, POLYETHYLENE GEOMEMBRANE LINING.  
  
GEOSYNTHETIC CLAY LINER CRITERIA:  
DESIGN ACCORDING TO THE CRITERIA IN TABLE 4 OF NRCS 313, WASTE STORAGE FACILITY TECHNICAL STANDARD.  
INSTALL ACCORDING TO NRCS WISCONSIN CONSTRUCTION SPECIFICATION 203, GEOSYNTHETIC CLAY LINER.

### ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT	
D	<b>FINAL FILL:</b> FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	<b>INITIAL FILL:</b> FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE.  MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145 <sup>1</sup> A-1, A-2, A-3  OR AASHTO M43 <sup>2</sup> 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 93% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	<b>EMBEDMENT STONE:</b> FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 <sup>2</sup> 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	<b>FOUNDATION STONE:</b> FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 <sup>2</sup> 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. <sup>2,3</sup>

**PLEASE NOTE:**  
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".  
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) MAX LIFTS USING TWO FULL COVERS WITH A VIBRATORY COMPACTOR.  
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.  
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



- ### NOTES:
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
  - SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
  - THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
  - PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
  - REQUIREMENTS FOR HANDLING AND INSTALLATION:
    - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
    - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
    - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.6 OF ASTM F2922 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

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Project No. 2016060030

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.

Architect Seal  
**SARAH CHURCH**  
E-39369  
MADISON, WI  
PROFESSIONAL ENGINEER

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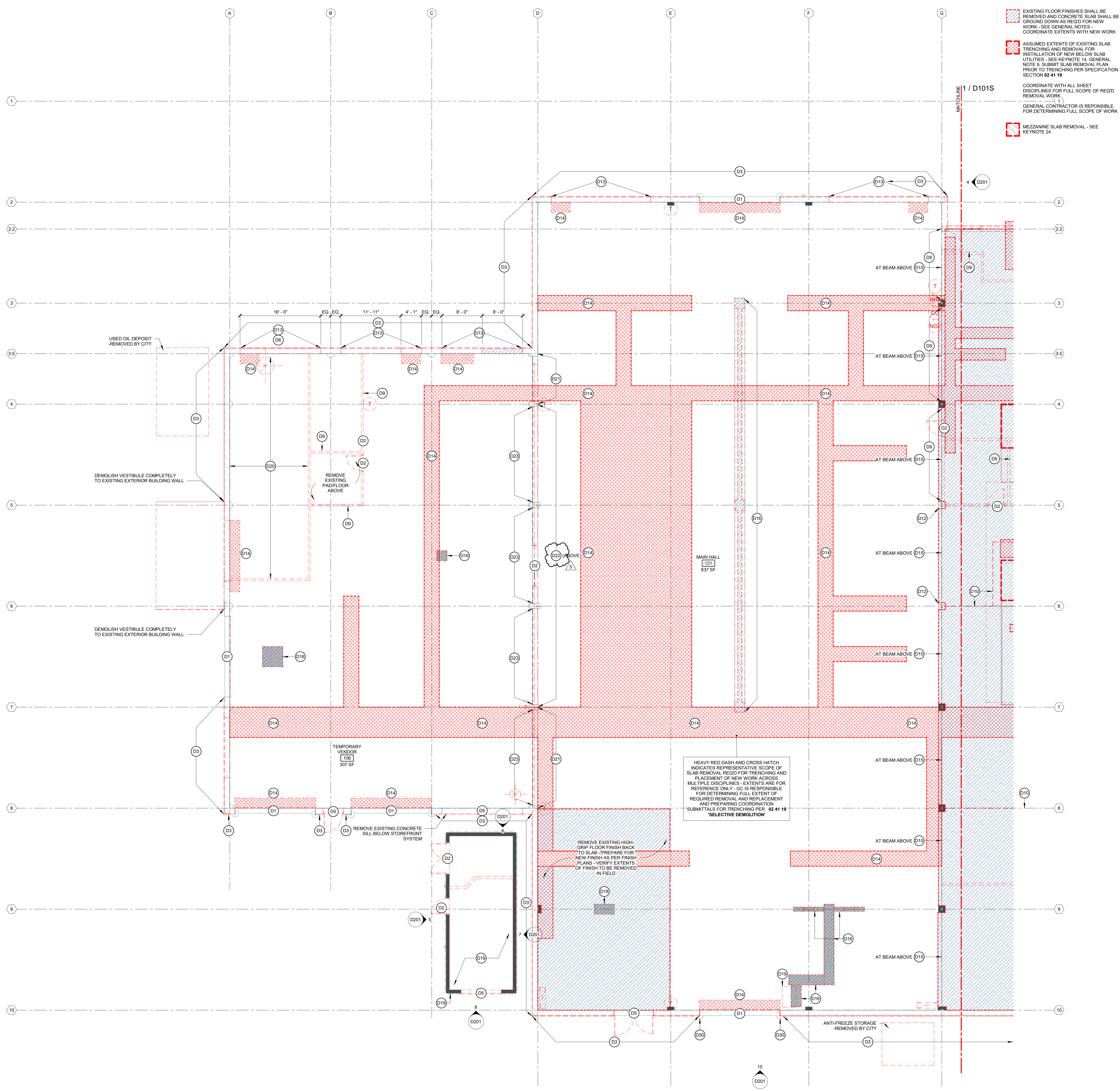
**BID DOCUMENTS**

**ISSUE / REVISION**

Mark	Date	Description
1	2023.08.09	BID DOCUMENTS
5	2023.09.05	ADDENDUM 4

CONSTRUCTION  
DETAILS - 5

# C405



**DEMOLITION PLAN LEGEND**

- EXISTING FLOOR FINISHES SHALL BE REMOVED AND CONCRETE SLAB SHALL BE GROUND DOWN AS REQ'D FOR NEW WORK - SEE GENERAL NOTES COORDINATE EXTENTS WITH NEW WORK
- ASSUMED EXTENTS OF EXISTING SLAB TRENCHING AND REMOVAL FOR INSTALLATION OF NEW BELOW SLAB UTILITIES - SEE KEYNOTE 14, GENERAL NOTE 9, SUBMIT SLAB REMOVAL PLAN PRIOR TO TRENCHING PER SPECIFICATION SECTION 02 41 19
- COORDINATE WITH ALL SHEET DISCIPLINES FOR FULL SCOPE OF REMOVAL WORK
- GENERAL CONTRACTOR IS RESPONSIBLE FOR DETERMINING FULL SCOPE OF WORK
- MEZZANINE SLAB REMOVAL - SEE KEYNOTE 24

**DEMOLITION GENERAL NOTES**

1. ALL CONTRACTORS WISHING TO SUBMIT BIDS FOR WORK IN THESE DOCUMENTS SHALL VISIT PROJECT SITE PRIOR TO SUBMITTING A BID AND SHALL VERIFY EXISTING CONDITIONS AND SCOPE OF WORK.
2. ALL LOOSE DEBRIS IS TO BE REMOVED BY DEMOLITION CONTRACTOR
3. NOTIFY ARCHITECT IMMEDIATELY IF FIELD CONDITIONS ARE OTHER THAN WHAT IS SHOWN ON PLANS
4. WHERE DEMOLITION WORK ABUTS OR INTERSECTS EXISTING CONSTRUCTION WHICH IS TO REMAIN, REFER TO NEW CONSTRUCTION DOCUMENTS FOR EXTENTS OF REMOVAL. PROTECT ALL EXISTING CONSTRUCTION TO REMAIN.
5. INTERIOR SURFACE CLEANING SHALL BE PERFORMED DURING DEMOLITION PHASE OF WORK. CONTRACTOR SHALL CLEAN ALL INTERIOR SURFACES TO REMAIN (FLOORS, WALLS, ROOF DECK, STRUCTURAL FRAMING, ETC.) AS PER REQUIREMENTS OF SECTION 02 41 19 'SELECTIVE DEMOLITION' OF THE PROJECT SPECIFICATIONS. CONTRACTOR SHALL PERFORM THIS WORK AFTER REMOVAL OF ALL ITEMS TO BE DEMOLISHED AND PRIOR TO COMMENCING NEW WORK
6. CONTRACTOR SHALL CONDUCT CLEANING WORK DESCRIBED IN DEMOLITION GENERAL NOTE 5 IN A MANNER WHICH PRESERVES, TO ALL REASONABLE EXTENT, EXISTING INTERIOR FINISHES TO REMAIN. CONTRACTOR SHALL INSPECT RESULTS OF CLEANING WORK AND SHALL NOTIFY ARCHITECT AND OWNER OF ANY EXISTING FINISHES TO REMAIN WHICH HAVE BEEN DAMAGED
7. COORDINATE REMOVAL OF ELEMENTS WHICH MAY CONTAIN HAZARDOUS MATERIALS - I.E. PIPE WRAP, CONTAMINATED SOILS, ETC WITH ABATEMENT CONTRACTOR. NOTIFY OWNER IMMEDIATELY IF HAZARDOUS MATERIALS ARE ENCOUNTERED. HAZARDOUS MATERIALS ABATEMENT IS NOT PART OF THE WORK SHOWN IN THESE DOCUMENTS.
8. GENERAL LOCATIONS WHERE EXISTING EIFS FINISHES ARE REMOVED IN ENTIRETY FOR REPLACEMENT WITH NEW FINISHES ARE NOTED ON EXTERIOR DEMOLITION ELEVATIONS WITH KEYED NOTES. NOTIFY ARCHITECT IF REMOVAL EXTENTS MUST BE OTHER THAN WHAT IS SHOWN IN ELEVATIONS. AT THESE LOCATIONS, EIFS SYSTEMS SHALL BE REMOVED IN REGULAR ORTHOGONAL SECTIONS. LINES OF REMOVAL SHALL BE PLUMB AND LEVEL. EXISTING EIFS AT THESE LOCATIONS SHALL BE REMOVED IN ITS ENTIRETY - I.E. FINISH, MESH, INSULATION AND ADHESIVE, AND SUBSTRATE SHALL BE PREPARED FOR NEW PATCHED EIFS SYSTEM.
9. EXTENTS OF SLAB TRENCHING SHOWN ON ARCHITECTURAL DEMOLITION DRAWINGS FOR PLACEMENT OF BELOW GRADE UTILITIES AND STRUCTURAL WORK IS APPROXIMATE AND MAY NOT REPRESENT FULL EXTENT OF THIS WORK. CONTRACTOR SHALL VERIFY SCOPE OF SLAB REMOVAL WORK WITH REQUIREMENTS OF MEP AND STRUCTURAL AND NEW WORK SCOPE. VERIFY THE EXTENTS OF ALL SLAB REMOVAL WORK WITH ARCHITECT BEFORE PERFORMING.
10. EXTENTS OF SLAB GRINDING SHOWN ON ARCHITECTURAL DEMOLITION DRAWINGS FOR REFINISHING OF EXISTING FLOORS IS APPROXIMATE AND MAY NOT REPRESENT FULL EXTENT OF THIS WORK. CONTRACTOR SHALL VERIFY FULL EXTENT OF THIS WORK WITH FINISH PLANS AND SURFACE PREPARATION REQUIREMENTS OF SPECIFIED NEW FLOOR FINISHES AS PER PROJECT SPECIFICATIONS
11. WHERE FINISH FLOORING IS TO BE REMOVED, REMOVE ALL MATERIAL - I.E. FASTENERS, ADHESIVES, AND BACKING, TO SLAB BELOW. PREPARE SLAB SURFACE FOR NEW FINISH AS PER REQUIREMENTS OF NEW WORK.
12. ALL OBSOLETE OR ABANDONED MECHANICAL, ELECTRICAL, AND PLUMBING EQUIPMENT - I.E. CONDUIT, FITTINGS, DUCTWORK, HANGERS, CONTROLS, FIXTURES, ETC. - SHALL BE REMOVED. COORDINATE WITH MEP REMOVAL DRAWINGS.
13. WHERE PARTITIONS ARE REMOVED, REMOVE ALL ITEMS CONTAINED WITHIN - INCLUDING BUT NOT LIMITED TO DOORS, HARDWARE, FRAMES, SILLCASTS, MECHANICAL AND ELECTRICAL EQUIPMENT, ETC. TO STRUCTURE ABOVE AND BELOW, UNLESS NOTED OTHERWISE.
14. ALL EXISTING CEILINGS SHALL BE REMOVED, WHERE CEILINGS ARE REMOVED, REMOVE CEILING FINISH AND SUSPENSION SYSTEM ALONG WITH ALL ASSOCIATED FASTENERS, FITTINGS, AND MEP EQUIPMENT. COORDINATE WITH MEP REMOVAL DRAWINGS.
15. SEE DEMOLITION KEYNOTES FOR SPECIFIC INFORMATION ON ITEMS TO BE REMOVED BY LOCATION

**KEYED NOTES (DEMOLITION)**

- D01 REMOVE EXISTING OVERHEAD DOOR AND ALL FRAME/HARDWARE/MOTOR COMPONENTS BACK TO ROUGH OPENING
- D02 REMOVE EXISTING DOOR(S) AND FRAME(S) TO ROUGH OPENING
- D03 REMOVE EIFS PANEL FROM CONCRETE WALL/CMU. CLEAN CONCRETE/CMU TO PREPARE FOR NEW WATERPROOFING OR CLADDING - COORDINATE W/ NEW WORK
- D04 CUT AND REMOVE SECTION OF DAMAGED EXISTING EIFS SYSTEM BACK TO SUBSTRATE. PREPARE SUBSTRATE FOR NEW PATCH AND REPAIR WORK AS PER EIFS-2 MANUFACTURER'S RECOMMENDATION
- D05 REMOVE EXISTING STOREFRONT GLAZING SYSTEM AND ALL FLASHING/TRANSILLS BACK TO ROUGH OPENING. DEMOLISH/GRIND OUT ANY MISC. STEEL AND BRACING IN OPENING UNLESS SPECIFICALLY NOTED TO REMAIN IN NEW WORK. PATCH AND REPAIR MASONRY FOR NEW CURTAIN WALL SYSTEM
- D06 REMOVE PORTION OF EXTERIOR MASONRY WALL COMPLETELY. REMOVE EXISTING EIFS FINISH AS REQ'D TO TOOTH IN NEW CMU - REF. EXTERIOR ELEVATIONS
- D07 REMOVE PART OF EXISTING FLOOR/ROOF IN PREPARATION FOR ELEVATOR SHAFT
- D08 REMOVE EXISTING STAIR COMPLETELY
- D09 REMOVE EXISTING INTERIOR WALL COMPLETELY
- D10 REMOVE EXISTING INTERIOR WIRE PARTITION; SALVAGE, CLEAN, AND STORE FOR REUSE
- D11 REMOVE EXISTING PLUMBING FIXTURES AND PLUMBING WALL CAVITY
- D12 REMOVE EXISTING CMU COLUMN WRAP AND ANY TIE BACKS OR ANCHORS TO B.O. SLAB OR DECK ABOVE. PREPARE NEWLY EXPOSED STEEL FOR NEW FINISH - REF. FINISH PLANS
- D13 REMOVE EXISTING EXTERIOR CONCRETE WALL TO 8". SEE NEW WORK FOR EXTENTS. SAW CUT CONCRETE CLEANLY, ALIGNED WITH CMU JAMBS ABOVE TO CREATE CLEAN ROUGH OPENING FOR NEW CURTAIN WALL. PREP FOR NEW CMU WORK TO PATCH AND TOOTH IN NEW JAMB BLOCKS.
- D14 SAW CUT AND DEMOLISH EXISTING SLAB AS REQ'D FOR COMPLETION OF NEW MEP OR STRUCTURAL WORK BELOW SLAB. REGIONS DIMENSIONED SHALL BE REMOVED AS NOTED. ALL OTHER AREAS, GC SHALL COORDINATE ACTUAL REMOVAL REQUIREMENTS WITH NEW WORK.
- D15 DEMOLISH EXISTING PLASTER CEILING AND SOFFIT WRAP AND ALL SUSPENSION - FRAMING, HANGERS, RODS, DECK CLIPS, ETC. BACK TO DECK. CLEAN NEWLY EXPOSED STEEL DECK, JOIST AND FRAMING - REF. ARCHITECTURAL CEILING PLANS FOR ANY NEW FINISHES
- D16 EXISTING CONCRETE FILL AT FORMER TRENCHES AND BASINS TO BE REMOVED OR GROUND DOWN TO DEPTH AS REQ'D TO PROVIDE NEW CONCRETE TOPPING SUBSTRATE. REF TO REQUIREMENTS OF NEW WORK. REF. STRUCT
- D17 COORDINATE NEW PLATFORM CONSTRUCTION AND LOCATION OF EXISTING RAIL AND SUPPORT. IF RAIL IS IN CONFLICT WITH NEW WORK, DEMOLISH RAIL AND SUPPORT AT THIS BAY
- D18 EXISTING OWNERS EQUIPMENT TO BE DECOMMISSIONED AND REMOVED BY OWNER - COORDINATE WITH OWNER FOR SALVAGE REQUIREMENTS
- D19 EXISTING PAINT BOOTH AND ALL RELATED EQUIPMENT - FANS, POWER, DUCTWORK, ETC. SHALL BE REMOVED. ALL EXISTING OPENINGS IN SLAB, WALLS AND ROOF SHALL BE PREPARED FOR REPAIR AND PATCHING IN NEW WORK
- D20 EXISTING CRANE RAIL AND ASSOCIATE EQUIPMENT TO BE RETAINED. PROTECT IN PLACE
- D21 EXISTING STEEL AND GLASS WINDOW WALL TO BE PARTIALLY DEMOLISHED. RETAIN MAJOR FRAMING. REMOVE ANY TOGGLE CLIPS, GLAZING COMPOUND OR OTHER INFILL PANEL REMNANTS LEFT FROM OWNER ABATEMENT
- D22 CLEAN EXISTING STEEL AND MAJOR FRAMING COMPONENTS REMNANT FROM ABATED GLASS WINDOW WALL. PROVIDE TEMPORARY SUPPORT AND PROTECT IN PLACE - REF. STRUCTURAL
- D23 SAW CUT STRAIGHT AND DEMOLISH CONCRETE WALL BELOW STEEL AND GLASS TO BELOW NEW WORK - REF. ARCHITECTURAL DETAILS AT THIS LOCATION. CONCRETE PIERS AT COLUMN BASES SHALL REMAIN - REF. STRUCTURAL FOR EXTENTS OF WALL TO REMAIN
- D24 REMOVE MEZZANINE FLOOR SLAB AND FRAMING - REFER TO STRUCTURAL
- D25 EXISTING CRANE RAIL AND ASSOCIATE EQUIPMENT TO BE RETAINED. PROTECT IN PLACE
- D26 DEMOLISH EXISTING SLAB AS REQUIRED FOR NEW KITCHEN EQUIPMENT - REFERENCE STRUCTURAL
- D27 REFERENCE PLUMBING DRAWINGS FOR WORK ASSOCIATED WITH NEW COMMERCIAL KITCHEN EQUIPMENT IN THIS AREA. REMOVE OR MODIFY SLABS AS REQ'D
- D28 DEMOLISH EXTERIOR LIGHT FIXTURE. PREPARE EXISTING EIFS FOR PATCH AND REPAIR
- D29 DEMOLISH EXTERIOR SIGNAGE AND ALL RELATED FASTENERS AND HARDWARE - PREPARE EXISTING EIFS FOR PATCH AND REPAIR
- D30 SALVAGE EXISTING WHEEL STOP - REPAIR CONCRETE SUBSTRATE AND PREPARE FOR NEW FINISH WORK
- D31 DEMOLISH EXISTING CANOPY FASCIA, FLASHING, EPDM MEMBRANE AND SOFFIT MATERIAL AS REQ'D TO ACCOMMODATE NEW WORK IN THIS AREA - REF. ARCHITECTURAL DETAILS
- D32 REMOVE EXISTING ROOF SYSTEM AND STRUCTURAL DECK FOR NEW ROOF PENETRATION - COORDINATE WITH ARCHITECTURAL AND M.E.P. NEW WORK. PROVIDE TEMPORARY ENCLOSURE AT ALL NEW ROOF PENETRATIONS
- D33 REMOVE EXISTING ROOF SYSTEM AND STRUCTURAL DECK FOR NEW SKYLIGHT - COORDINATE WITH ARCHITECTURAL AND STRUCT NEW WORK. PROVIDE TEMPORARY ENCLOSURE AT ALL NEW ROOF PENETRATIONS
- D34 SALVAGE EXISTING GLAZED TILE AND BULLNOSE TRIM. REUSE FOR PATCHING AT MEZZANINE LEVEL. SEE PLANS & INTERIOR ELEVATIONS FOR EXTENT OF NEW WORK.

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Project No. 2018006.00

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I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.

**ARCHITECT SEAL**

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MN  
ARCHITECT

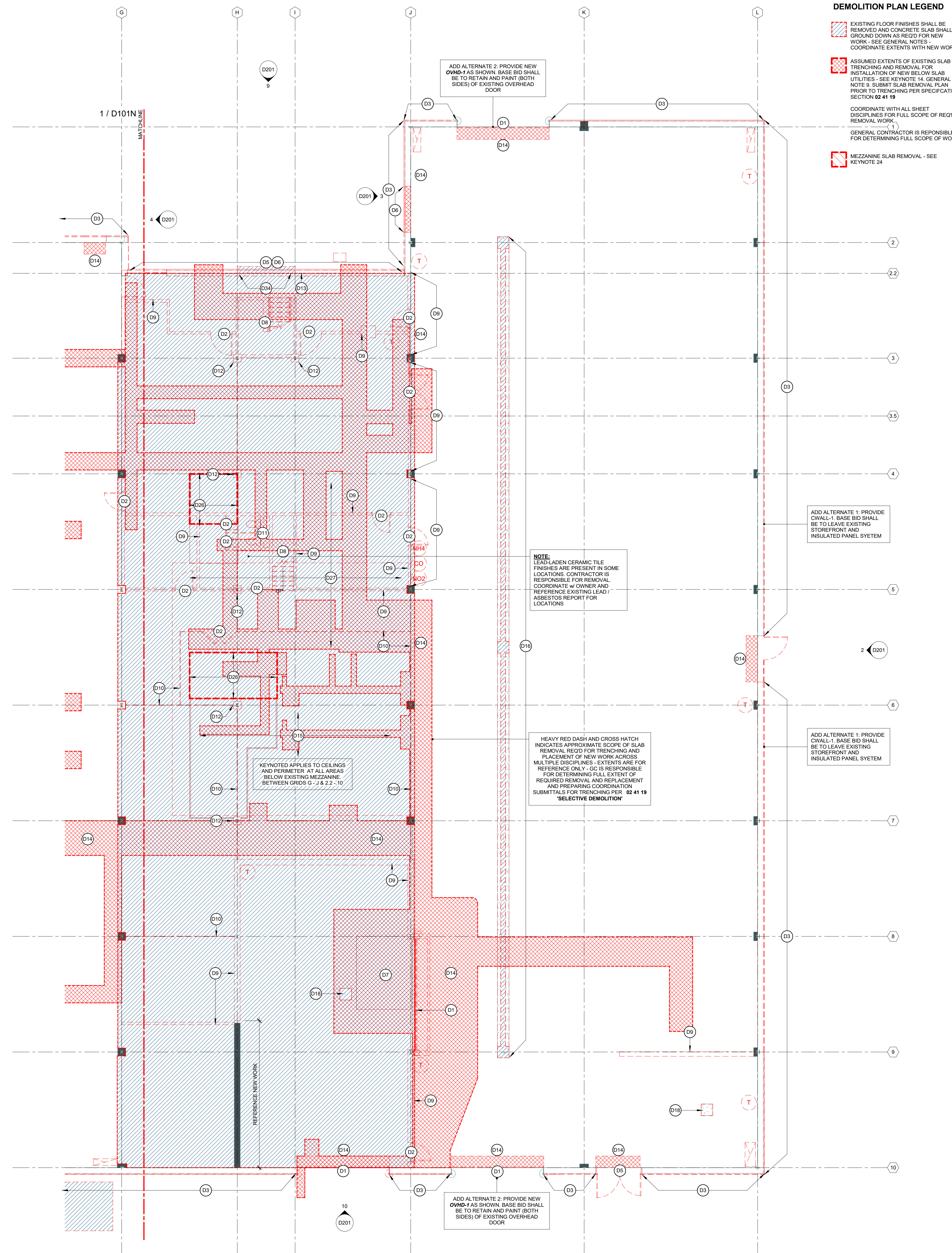
Signature: *Dagmar K. Larsen*  
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Date: 2023.06.09 License No.: 13278-6

**ADDENDUM 4**

**ISSUE / REVISION**

Mark	Date	Description
1	2023.06.09	BID DOCUMENTS
5	2023.09.05	ADDENDUM 4

**1 LEVEL 1 DEMO -- NORTH**  
D101N 1/8" = 1'-0"



**DEMOLITION PLAN LEGEND**

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- MEZZANINE SLAB REMOVAL - SEE KEYNOTE 24

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6. CONTRACTOR SHALL CONDUCT CLEANING WORK DESCRIBED IN DEMOLITION GENERAL NOTE 5 IN A MANNER WHICH PRESERVES, TO ALL REASONABLE EXTENT, EXISTING INTERIOR FINISHES TO REMAIN. CONTRACTOR SHALL INSPECT RESULTS OF CLEANING WORK AND SHALL NOTIFY ARCHITECT AND OWNER OF ANY EXISTING FINISHES TO REMAIN WHICH HAVE BEEN DAMAGED.
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8. GENERAL LOCATIONS WHERE EXISTING EIFS FINISHES ARE REMOVED IN ENTIRETY (FOR REPAIR OR REPLACEMENT) ARE NOTED ON EXTERIOR DEMOLITION ELEVATIONS WITH KEYED NOTES. NOTIFY ARCHITECT IF REMOVAL EXTENTS MUST BE OTHER THAN WHAT IS SHOWN IN ELEVATIONS. AT THESE LOCATIONS, EIFS SYSTEMS SHALL BE REMOVED IN REGULAR ORTHOGONAL SECTIONS. LINES OF REMOVAL SHALL BE PLUMB AND LEVEL. EXISTING EIFS AT THESE LOCATIONS SHALL BE REMOVED IN ITS ENTIRETY - I.E. FINISH, MESH, INSULATION AND ADHESIVE, AND SUBSTRATE SHALL BE PREPARED FOR NEW PATCHED EIFS SYSTEM.
9. EXTENTS OF SLAB TRENCHING SHOWN ON ARCHITECTURAL DEMOLITION DRAWINGS FOR PLACEMENT OF BELOW GRADE UTILITIES AND STRUCTURAL WORK IS APPROXIMATE AND MAY NOT REPRESENT FULL EXTENT OF THIS WORK. CONTRACTOR SHALL VERIFY RECD SCOPE OF SLAB REMOVAL WORK WITH REQUIREMENTS OF MEP AND STRUCTURAL AND NEW WORK SCOPE. VERIFY THE EXTENTS OF ALL SLAB REMOVAL WORK WITH ARCHITECTURAL DEMOLITION DRAWINGS.
10. EXTENTS OF SLAB GRINDING SHOWN ON ARCHITECTURAL DEMOLITION DRAWINGS FOR REFINISHING OF EXISTING FLOORS IS APPROXIMATE AND MAY NOT REPRESENT FULL EXTENT OF THIS WORK. CONTRACTOR SHALL VERIFY FULL EXTENT OF THIS WORK WITH FINISHING PLAN AND SURFACE PREPARATION REQUIREMENTS OF SPECIFIED NEW FLOOR FINISHES AS PER PROJECT SPECIFICATIONS.
11. WHERE FINISH FLOORING IS TO BE REMOVED, REMOVE ALL MATERIAL - I.E. FASTENERS, ADHESIVES, AND BACKING, TO SLAB BELOW. PREPARE SLAB SURFACE FOR NEW FINISH AS PER REQUIREMENTS OF NEW WORK.
12. ALL OBSOLETE OR ABANDONED MECHANICAL, ELECTRICAL, AND PLUMBING EQUIPMENT - I.E. CONDUIT, FITTINGS, DUCTWORK, HANGERS, CONTROLS, FIXTURES, ETC - SHALL BE REMOVED. COORDINATE WITH MEP REMOVAL DRAWINGS.
13. WHERE PARTITIONS ARE REMOVED, REMOVE ALL ITEMS CONTAINED WITHIN - INCLUDING BUT NOT LIMITED TO DOORS, HARDWARE, FRAMES, SILLDRAFTS, MECHANICAL AND ELECTRICAL EQUIPMENT, ETC - TO STRUCTURE ABOVE AND BELOW, UNLESS NOTED OTHERWISE.
14. ALL EXISTING CEILING SHALL BE REMOVED, WHERE CEILING ARE REMOVED, REMOVE CEILING FINISH AND SUSPENSION SYSTEM ALONG WITH ALL ASSOCIATED FASTENERS, FITTINGS, AND MEP EQUIPMENT. COORDINATE WITH MEP REMOVAL DRAWINGS.
15. SEE DEMOLITION KEYNOTES FOR SPECIFIC INFORMATION ON ITEMS TO BE REMOVED BY LOCATION

**KEYED NOTES (DEMOLITION)**

- D01 REMOVE EXISTING OVERHEAD DOOR AND ALL FRAME/HARDWARE/MOTOR COMPONENTS BACK TO ROUGH OPENING
- D02 REMOVE EXISTING DOOR(S) AND FRAME(S) TO ROUGH OPENING
- D03 REMOVE EIFS PANEL FROM CONCRETE WALL/CMU CLEAN CONCRETE/CMU TO PREPARE FOR NEW WATERPROOFING OR CLADDING - COORDINATE WITH NEW WORK
- D04 CUT AND REMOVE SECTION OF DAMAGED EXISTING EIFS SYSTEM BACK TO SUBSTRATE. PREPARE SUBSTRATE FOR NEW PATCH AND REPAIR WORK AS PER EIFS-2 MANUFACTURER'S RECOMMENDATION
- D05 REMOVE EXISTING STOREFRONT GLAZING SYSTEM AND ALL FLASHING/TRANSMISSIONS BACK TO ROUGH OPENING. DEMOLISH/GROUND OUT ANY MISC. STEEL AND BRACING IN OR NEAR STOREFRONT UNLESS SPECIFICALLY NOTE TO REMAIN IN NEW WORK. PATCH AND REPAIR MASONRY FOR NEW CURTAIN WALL SYSTEM
- D06 REMOVE PORTION OF EXTERIOR MASONRY WALL COMPLETELY. REMOVE EXISTING EIFS FINISH AS REQ'D TO TOOTH IN NEW CMU - REF. EXTERIOR ELEVATIONS
- D07 REMOVE PART OF EXISTING FLOOR/ROOF IN PREPARATION FOR ELEVATOR SHAFT
- D08 REMOVE EXISTING STAIR COMPLETELY
- D09 REMOVE EXISTING INTERIOR WALL COMPLETELY
- D10 REMOVE EXISTING INTERIOR WIRE PARTITION; SALVAGE, CLEAN, AND STORE FOR REUSE
- D11 REMOVE EXISTING PLUMBING FIXTURES AND PLUMBING WALL CAVITY
- D12 REMOVE EXISTING CMU COLUMN WRAP AND ANY THE BACKS OR ANCHORS TO B.O. SLAB OR DECK ABOVE. PREPARE NEWLY EXPOSED STEEL FOR NEW FINISH - REF. FINISH PLANS
- D13 REMOVE EXISTING EXTERIOR CONCRETE WALL TO 8". SEE NEW WORK FOR EXTENTS. SAW CUT CONCRETE CLEANLY, ALIGNED WITH CMU JAMBS ABOVE TO CREATE CLEAN ROUGH OPENING FOR NEW CURTAIN WALL. PREP. FOR NEW CMU WORK TO PATCH AND TOOTH IN NEW JAMB BLOCKS.
- D14 SAW CUT AND DEMOLISH EXISTING SLAB AS REQ'D FOR COMPLETION OF NEW MEP OR STRUCTURAL WORK BELOW SLAB. REGIONS DIMENSIONED SHALL BE REMOVED AS NOTED. ALL OTHER AREAS, GC SHALL COORDINATE ACTUAL REMOVAL REQUIREMENTS WITH NEW WORK.
- D15 DEMOLISH EXISTING PLASTER CEILING AND SOFFIT WRAP AND ALL SUSPENSION - FRAMING HANGERS, RODS, DECK CLIPS, ETC BACK TO DECK. CLEAN NEWLY EXPOSED STEEL DECK, JOIST AND FRAMING - REF. ARCHITECTURAL CEILING PLANS FOR ANY NEW FINISHES
- D16 EXISTING CONCRETE FILL AT FORMER TRENCHES AND BASINS TO BE REMOVED OR GROUND DOWN TO DEPTH AS REQ'D TO PROVIDE NEW CONCRETE TOPPING. SUBSTRATE. REF. TO REQUIREMENTS OF NEW WORK REF. STRUCT
- D17 COORDINATE NEW PLATFORM CONSTRUCTION AND LOCATION OF EXISTING RAIL AND SUPPORT. IF RAIL IS IN CONFLICT WITH NEW WORK, DEMOLISH RAIL AND SUPPORT AT THIS BAY
- D18 EXISTING OWNER'S EQUIPMENT TO BE DECOMMISSIONED AND REMOVED BY OWNER - COORDINATE WITH OWNER FOR SALVAGE REQUIREMENTS
- D19 EXISTING PAINT BOOTH AND ALL RELATED EQUIPMENT - FANS, POWER, DUCTWORK, ETC SHALL BE REMOVED. ALL EXISTING OPENINGS IN SLAB, WALLS AND ROOF SHALL BE PREPARED FOR REPAIR AND PATCHING IN NEW WORK
- D20 EXISTING STEEL AND GLASS WINDOW WALL TO BE PARTIALLY DEMOLISHED. RETAIN MAJOR FRAMING. REMOVE ANY TOGGLE CLIPS, GLAZING COMPOUND, OR OTHER INFILL PANEL REMNANTS LEFT FROM OWNER ABATEMENT
- D21 CLEAN EXISTING STEEL AND MAJOR FRAMING COMPONENTS REMNANT FROM ABATED GLASS WINDOW WALL. PROVIDE TEMPORARY SUPPORT AND PROTECT FROM DAMAGE - REF. STRUCTURAL
- D22 SAW CUT CONCRETE AND DEMOLISH EXISTING WALL BELOW STEEL AND GLASS TO BELOW F.F.E. AS REQ'D FOR NEW WORK - REF. ARCHITECTURAL DETAILS AT THIS LOCATION. CONCRETE PIERS AT COLUMN BASES SHALL REMAIN - REF. STRUCTURAL FOR EXTENTS OF WALL TO REMAIN
- D23 REMOVE MEZZANINE FLOOR SLAB AND FRAMING - REFER TO STRUCTURAL
- D24 EXISTING CRANE RAIL AND ASSOCIATE EQUIPMENT TO BE RETAINED. PROTECT IN PLACE
- D25 DEMOLISH EXISTING SLAB AS REQUIRED FOR NEW KITCHEN EQUIPMENT - REFERENCE STRUCTURAL
- D26 REFERENCE PLUMBING DRAWINGS FOR WORK ASSOCIATED WITH NEW COMMERCIAL KITCHEN EQUIPMENT IN THIS AREA. REMOVE OR MODIFY SLABS AS REQ'D
- D27 DEMOLISH EXTERIOR LIGHT FIXTURE. PREPARE EXISTING EIFS FOR PATCH AND REPAIR
- D28 DEMOLISH EXTERIOR SIGNAGE AND ALL RELATED FASTENERS AND HARDWARE - PREPARE EXISTING EIFS FOR PATCH AND REPAIR
- D29 SALVAGE EXISTING WHEEL STOP - REPAIR CONCRETE SUBSTRATE AND PREPARE FOR NEW FINISH WORK
- D30 DEMOLISH EXISTING CANOPY FASCIA, FLASHING, EPDM MEMBRANE AND SOFFIT MATERIAL AS REQ'D TO ACCOMMODATE NEW WORK IN THIS AREA - REF. ARCHITECTURAL DETAILS
- D31 REMOVE EXISTING ROOF SYSTEM AND STRUCTURAL DECK FOR NEW ROOF PENETRATION - COORDINATE WITH ARCHITECTURAL AND M.E.P. NEW WORK. PROVIDE TEMPORARY ENCLOSURE AT ALL NEW ROOF PENETRATIONS
- D32 REMOVE EXISTING ROOF SYSTEM AND STRUCTURAL DECK FOR NEW SKYLIGHT - COORDINATE WITH ARCHITECTURAL AND STRUCTURE NEW WORK. PROVIDE TEMPORARY ENCLOSURE AT ALL NEW ROOF PENETRATIONS
- D33 SALVAGE EXISTING GLAZED TILE AND BULLNOSE TRIM REUSE FOR PATCHING AT MEZZANINE LEVEL. SEE PLANS & INTERIOR ELEVATIONS FOR EXTENT OF NEW WORK.
- D34

**1 LEVEL 1 DEMO -- SOUTH**  
D101S 1/8" = 1'-0"

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Lighting Design

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Commercial Kitchen Design

**Boelter Premier Boelter premier**  
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**MADISON PUBLIC MARKET**  
202 N First St, Madison, WI 53704

Project No. 2016006.00

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.

Architect Seal

**DAGMAR K. LARSEN**  
13278-S  
MINNEAPOLIS  
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ARCHITECT

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Print Name: Dagmar K. Larsen  
Date: 2023.06.09 License No.: 13278-S

**ADDENDUM 4**

**ISSUE / REVISION**

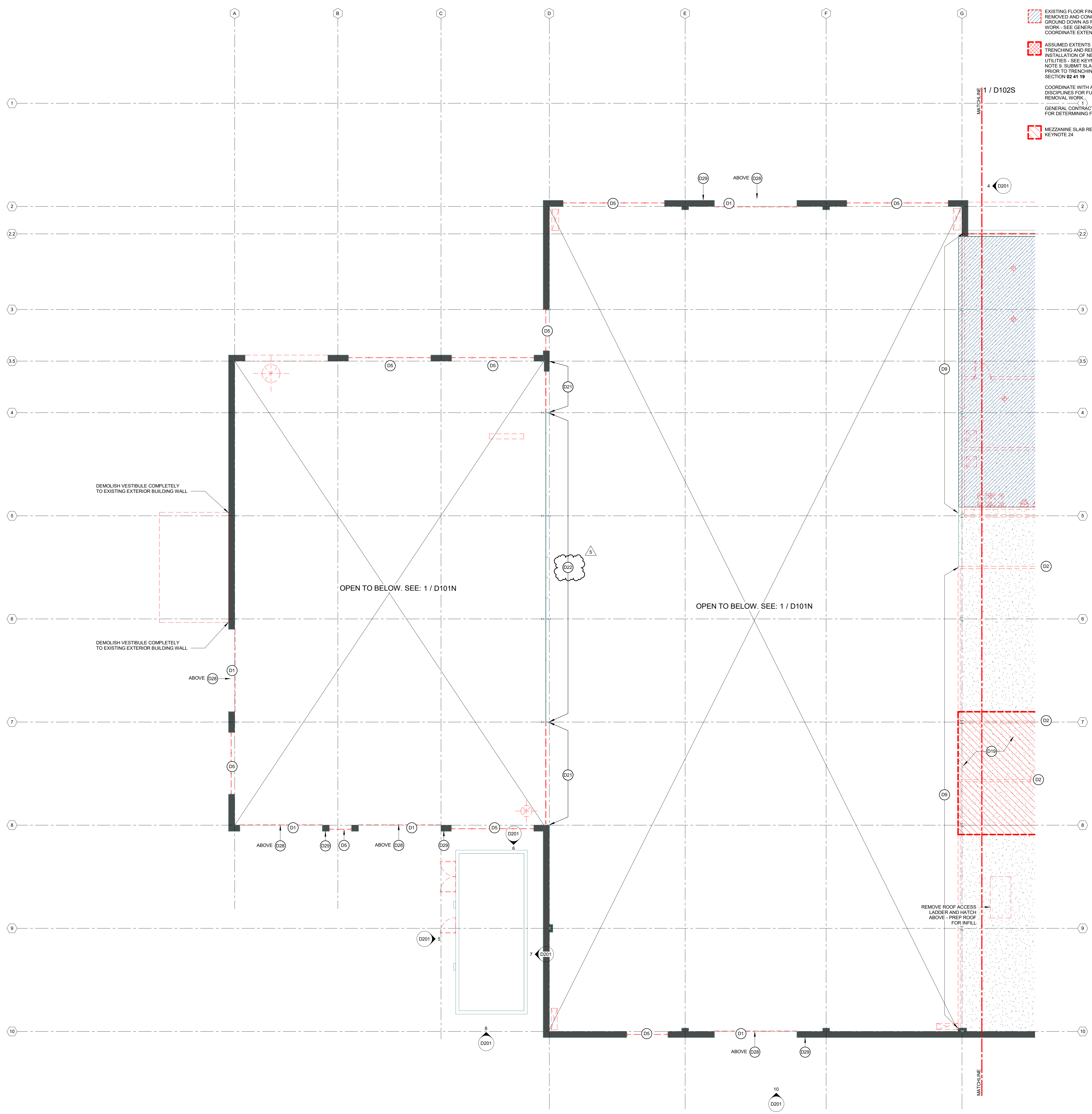
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1	2023.06.09	BID DOCUMENTS

Issued: 07/07/2023

**LEVEL 1 DEMOLITION - SOUTH**

**D101S**





**DEMOLITION PLAN LEGEND**

- EXISTING FLOOR FINISHES SHALL BE REMOVED AND CONCRETE SLAB SHALL BE GROUND DOWN AS REQ'D FOR NEW WORK - SEE GENERAL NOTES COORDINATE EXTENTS WITH NEW WORK
- ASSUMED EXTENTS OF EXISTING SLAB TRENCHING AND REMOVAL FOR INSTALLATION OF NEW BELOW SLAB UTILITIES - SEE KEYNOTE 14, GENERAL NOTE 9. SUBMIT SLAB REMOVAL PLAN PRIOR TO TRENCHING PER SPECIFICATION SECTION 02 41 19
- COORDINATE WITH ALL SHEET DISCIPLINES FOR FULL SCOPE OF REQ'D REMOVAL WORK
- GENERAL CONTRACTOR IS RESPONSIBLE FOR DETERMINING FULL SCOPE OF WORK
- MEZZANINE SLAB REMOVAL - SEE KEYNOTE 24

**DEMOLITION GENERAL NOTES**

1. ALL CONTRACTORS WISHING TO SUBMIT BIDS FOR WORK IN THESE DOCUMENTS SHALL VISIT PROJECT SITE PRIOR TO SUBMITTING A BID AND SHALL VERIFY EXISTING CONDITIONS AND SCOPE OF WORK.
2. ALL LOOSE DEBRIS IS TO BE REMOVED BY DEMOLITION CONTRACTOR
3. NOTIFY ARCHITECT IMMEDIATELY IF FIELD CONDITIONS ARE OTHER THAN WHAT IS SHOWN ON PLANS
4. WHERE DEMOLITION WORK ABUTS OR INTERSECTS EXISTING CONSTRUCTION WHICH IS TO REMAIN, REFER TO NEW CONSTRUCTION DOCUMENTS FOR EXTENTS OF REMOVAL. PROTECT ALL EXISTING CONSTRUCTION TO REMAIN.
5. INTERIOR SURFACE CLEANING SHALL BE PERFORMED DURING DEMOLITION PHASE OF WORK. CONTRACTOR SHALL CLEAN ALL INTERIOR SURFACES TO REMAIN (FLOORS, WALLS, ROOF DECK, STRUCTURAL FRAMING, ETC.) AS PER REQUIREMENTS OF SECTION 02 41 19 'SELECTIVE DEMOLITION' OF THE PROJECT SPECIFICATIONS. CONTRACTOR SHALL PERFORM THIS WORK AFTER REMOVAL OF ALL ITEMS TO BE DEMOLISHED AND PRIOR TO COMMENCING NEW WORK
6. CONTRACTOR SHALL CONDUCT CLEANING WORK DESCRIBED IN DEMOLITION GENERAL NOTE 5 IN A MANNER WHICH PRESERVES, TO ALL REASONABLE EXTENT, EXISTING INTERIOR FINISHES TO REMAIN. CONTRACTOR SHALL INSPECT RESULTS OF CLEANING WORK AND SHALL NOTIFY ARCHITECT AND OWNER OF ANY EXISTING FINISHES TO REMAIN WHICH HAVE BEEN DAMAGED.
7. COORDINATE REMOVAL OF ELEMENTS WHICH MAY CONTAIN HAZARDOUS MATERIALS - I.E. PIPE WRAP, CONTAMINATED SOILS, ETC WITH ABATEMENT CONTRACTOR. NOTIFY OWNER IMMEDIATELY IF HAZARDOUS MATERIALS ARE ENCOUNTERED. HAZARDOUS MATERIALS ABATEMENT IS NOT PART OF THE WORK SHOWN IN THESE DOCUMENTS.
8. GENERAL LOCATIONS WHERE EXISTING EIFS FINISHES ARE REMOVED IN ENTIRETY FOR REPLACEMENT ARE NOTED ON EXTERIOR DEMOLITION ELEVATIONS WITH KEYED NOTES. NOTIFY ARCHITECT IF REMOVAL EXTENTS MUST BE OTHER THAN WHAT IS SHOWN IN ELEVATIONS. AT THESE LOCATIONS, EIFS SYSTEMS SHALL BE REMOVED IN REGULAR ORTHOGONAL SECTIONS. LINES OF REMOVAL SHALL BE PLUMB AND LEVEL. EXISTING EIFS AT THESE LOCATIONS SHALL BE REMOVED IN ITS ENTIRETY - I.E. FINISH, MESH, INSULATION AND ADHESIVE, AND SUBSTRATE SHALL BE PREPARED FOR NEW PATCHED EIFS SYSTEM.
9. EXTENTS OF SLAB TRENCHING SHOWN ON ARCHITECTURAL DEMOLITION DRAWINGS FOR PLACEMENT OF BELOW GRADE UTILITIES AND STRUCTURAL WORK IS APPROXIMATE AND MAY NOT REPRESENT FULL EXTENT OF THIS WORK. CONTRACTOR SHALL VERIFY REQ'D SCOPE OF SLAB REMOVAL WORK WITH REQUIREMENTS OF MEP AND STRUCTURAL AND NEW WORK SCOPE. VERIFY THE EXTENTS OF ALL SLAB REMOVAL WORK WITH ARCHITECT BEFORE PERFORMING.
10. EXTENTS OF SLAB GRINDING SHOWN ON ARCHITECTURAL DEMOLITION DRAWINGS FOR REFINISHING OF EXISTING FLOORS IS APPROXIMATE AND MAY NOT REPRESENT FULL EXTENT OF THIS WORK. CONTRACTOR SHALL VERIFY FULL EXTENTS OF THIS WORK WITH FINISH PLANS AND SURFACE PREPARATION REQUIREMENTS OF SPECIFIED NEW FLOOR FINISHES AS PER PROJECT SPECIFICATION
11. WHERE FINISH FLOORING IS TO BE REMOVED, REMOVE ALL MATERIAL - I.E. FASTENERS, ADHESIVES, AND BACKING, TO SLAB BELOW. PREPARE SLAB SURFACE FOR NEW FINISH AS PER REQUIREMENTS OF NEW WORK.
12. ALL OBSOLETE OR ABANDONED MECHANICAL, ELECTRICAL, AND PLUMBING EQUIPMENT - I.E. CONDENS. FITTINGS, DUCTWORK, HANGERS, CONTROLS, FIXTURES, ETC. - SHALL BE REMOVED. COORDINATE WITH MEP REMOVAL DRAWINGS.
13. WHERE PARTITIONS ARE REMOVED, REMOVE ALL ITEMS CONTAINED WITHIN - INCLUDING BUT NOT LIMITED TO DOORS, HARDWARE, FRAMES, SILLDRIFTS, MECHANICAL AND ELECTRICAL EQUIPMENT, ETC. TO STRUCTURE ABOVE AND BELOW, UNLESS NOTED OTHERWISE.
14. ALL EXISTING CEILINGS SHALL BE REMOVED, WHERE CEILINGS ARE REMOVED, REMOVE CEILING FINISH AND SUSPENSION SYSTEM ALONG WITH ALL ASSOCIATED FASTENERS, FITTINGS, AND MEP EQUIPMENT. COORDINATE WITH MEP REMOVAL DRAWINGS.
15. SEE DEMOLITION KEYNOTES FOR SPECIFIC INFORMATION ON ITEMS TO BE REMOVED BY LOCATION

**KEYED NOTES (DEMOLITION)**

- D1 REMOVE EXISTING OVERHEAD DOOR AND ALL FRAME/HARDWARE/MOTOR COMPONENTS BACK TO ROUGH OPENING
- D2 REMOVE EXISTING DOOR(S) AND FRAME(S) TO ROUGH OPENING
- D3 REMOVE EIFS PANEL FROM CONCRETE WALL/CMU. CLEAN CONCRETE/CMU TO PREPARE FOR NEW WATERPROOFING OR CLADDING - COORDINATE WITH NEW WORK
- D4 CUT AND REMOVE SECTION OF DAMAGED EXISTING EIFS SYSTEM BACK TO SUBSTRATE. PREPARE SUBSTRATE FOR NEW PATCH AND REPAIR WORK AS PER EIFS MANUFACTURER'S RECOMMENDATION
- D5 REMOVE EXISTING STOREFRONT GLAZING SYSTEM AND ALL FLASHING/TRANSILLS BACK TO ROUGH OPENING. DEMOLISH/GRIND OUT ANY MISC. STEEL AND BRACING IN OPENING UNLESS SPECIFICALLY NOTE TO REMAIN IN NEW WORK. PATCH AND REPAIR MASONRY FOR NEW CURTAIN WALL SYSTEM
- D6 REMOVE PORTION OF EXTERIOR MASONRY WALL COMPLETELY. REMOVE EXISTING EIFS FINISH AS REQ'D TO TOOTH IN NEW CMU - REF. EXTERIOR ELEVATIONS
- D7 REMOVE PART OF EXISTING FLOOR/ROOF IN PREPARATION FOR ELEVATOR SHAFT
- D8 REMOVE EXISTING STAIR COMPLETELY
- D9 REMOVE EXISTING INTERIOR WALL COMPLETELY
- D10 REMOVE EXISTING INTERIOR WIRE PARTITION; SALVAGE, CLEAN, AND STORE FOR REUSE
- D11 REMOVE EXISTING PLUMBING FIXTURES AND PLUMBING WALL CAVITY
- D12 REMOVE EXISTING CMU COLUMN WRAP AND ANY TIE BACKS OR ANCHORS TO B.S. SLAB OR DECK ABOVE. PREPARE NEWLY EXPOSED STEEL FOR NEW FINISH - REF. FINISH PLANS
- D13 REMOVE EXISTING EXTERIOR CONCRETE WALL TO 8". SEE NEW WORK FOR EXTENTS. SAW CUT CONCRETE CLEANLY, ALIGNED WITH CMU JAMBS ABOVE TO CREATE CLEAN ROUGH OPENING FOR NEW CURTAIN WALL. PREP FOR NEW CMU WORK TO PATCH AND TOOTH IN NEW JAMB BLOCKS.
- D14 SAW CUT AND DEMOLISH EXISTING SLAB AS REQ'D FOR COMPLETION OF NEW MEP OR STRUCTURAL WORK BELOW SLAB. REGIONS DIMENSIONED SHALL BE REMOVED AS NOTED. ALL OTHER AREAS, GC SHALL COORDINATE ACTUAL REMOVAL REQUIREMENTS WITH NEW WORK.
- D15 DEMOLISH EXISTING PLASTER CEILING AND SOFFIT WRAP AND ALL SUSPENSION - FRAMING HANGERS, RODS, DECK CLIPS, ETC. BACK TO DECK. CLEAN NEWLY EXPOSED STEEL, DECK, JOIST AND FRAMING - REF. ARCHITECTURAL CEILING PLANS FOR ANY NEW FINISHES
- D16 EXISTING CONCRETE FILL AT FORMER TRENCHES AND BASINS TO BE REMOVED OR GROUND DOWN TO DEPTH AS REQ'D TO PROVIDE NEW CONCRETE TOPPING/SUBSTRATE. REF. TO REQUIREMENTS OF NEW WORK. REF. STRUCT
- D17 COORDINATE NEW PLATFORM CONSTRUCTION AND LOCATION OF EXISTING RAIL AND SUPPORT. IF RAIL IS IN CONFLICT WITH NEW WORK, DEMOLISH RAIL AND SUPPORT AT THIS BAY
- D18 EXISTING OWNERS EQUIPMENT TO BE DECOMMISSIONED AND REMOVED BY OWNER - COORDINATE WITH OWNER FOR SALVAGE REQUIREMENTS
- D19 EXISTING PAINT BOOTH AND ALL RELATED EQUIPMENT - FANS, POWER, DUCTWORK, ETC. SHALL BE REMOVED. ALL EXISTING OPENINGS IN SLAB, WALLS AND ROOF SHALL BE PREPARED FOR REPAIR AND PATCHING IN NEW WORK
- D20 EXISTING STEEL AND GLASS WINDOW WALL TO BE PARTIALLY DEMOLISHED. RETAIN MAJOR FRAMING, REMOVE ANY TOGGLE CLIPS, GLAZING COMPOUND OR OTHER INFILL PANEL REMNANTS LEFT FROM OWNER ABATEMENT
- D21 CLEAN EXISTING STEEL AND MAJOR FRAMING COMPONENTS REMNANT FROM ABATED GLASS WINDOW WALL. PROVIDE TEMPORARY SUPPORT AND PROTECT IN PLACE - REF. STRUCTURAL FOR EXTENTS OF WALL TO REMAIN
- D22 SAW CUT CONCRETE WALL BELOW STEEL AND BELOW STEEL AND GLASS TO BELOW F.F.E. AS REQ'D FOR NEW WORK - REF. ARCHITECTURAL DETAILS AT THIS LOCATION. CONCRETE PIERS AT COLUMN BASES SHALL REMAIN - REF. STRUCTURAL FOR EXTENTS OF WALL TO REMAIN
- D24 REMOVE MEZZANINE FLOOR SLAB AND FRAMING - REFER TO STRUCTURAL
- D25 EXISTING CRANE RAIL AND ASSOCIATE EQUIPMENT TO BE RETAINED. PROTECT IN PLACE
- D26 DEMOLISH EXISTING SLAB AS REQUIRED FOR NEW KITCHEN EQUIPMENT - REFERENCE STRUCTURAL
- D27 REFERENCE PLUMBING DRAWINGS FOR WORK ASSOCIATED WITH NEW COMMERCIAL KITCHEN EQUIPMENT IN THIS AREA. REMOVE OR MODIFY SLABS AS REQ'D
- D28 DEMOLISH EXTERIOR LIGHT FIXTURE. PREPARE EXISTING EIFS FOR PATCH AND REPAIR
- D29 DEMOLISH EXTERIOR SIGNAGE AND ALL RELATED FASTENERS AND HARDWARE - PREPARE EXISTING EIFS FOR PATCH AND REPAIR
- D30 SALVAGE EXISTING WHEEL STOP - REPAIR CONCRETE SUBSTRATE AND PREPARE FOR NEW FINISH WORK
- D31 DEMOLISH EXISTING CANOPY FASCIA, FLASHING, EPDM MEMBRANE AND SOFFIT MATERIAL AS REQ'D TO ACCOMMODATE NEW WORK IN THIS AREA - REF. ARCHITECTURAL DETAILS
- D32 REMOVE EXISTING ROOF SYSTEM AND STRUCTURAL DECK FOR NEW ROOF PENETRATION. COORDINATE WITH ARCHITECTURAL AND M.E.P. NEW WORK. PROVIDE TEMPORARY ENCLOSURE AT ALL NEW ROOF PENETRATIONS
- D33 REMOVE EXISTING ROOF SYSTEM AND STRUCTURAL DECK FOR NEW SKYLIGHT - COORDINATE WITH ARCHITECTURAL AND STRUCT NEW WORK. PROVIDE TEMPORARY ENCLOSURE AT ALL NEW ROOF PENETRATIONS
- D34 SALVAGE EXISTING GLAZED TILE AND BULLNOSE TRIM REUSE FOR PATCHING AT MEZZANINE LEVEL. SEE PLANS & INTERIOR ELEVATIONS FOR EXTENT OF NEW WORK.

**1 LEVEL 2 DEMO -- NORTH**  
 D102N 1/8" = 1'-0"

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 Fire Protection Engineering, Technology and AV

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Commercial Kitchen Design

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**Boelter premier**

**MADISON PUBLIC MARKET**  
 202 N First St, Madison, WI 53704

Project No. 2018006.00

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.

Architect Seal

**DAGMAR K. LARSON**  
 13278-5  
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 ARCHITECT

Signature: *Dagmar Larson*  
 Print Name: Dagmar Larson  
 Date: 2023.06.09 License No.: 13278-5

**ADDENDUM 4**

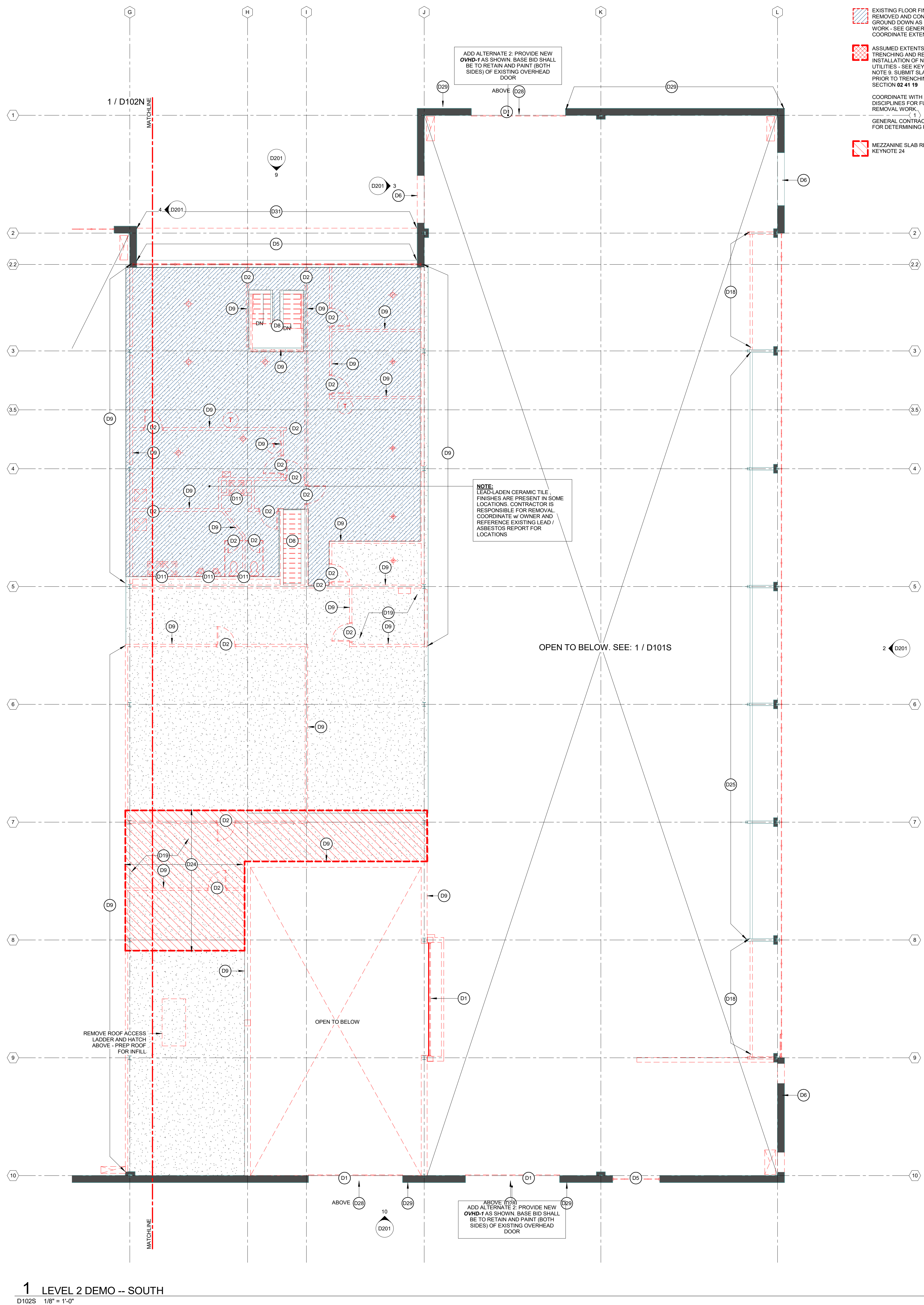
**ISSUE / REVISION**

Mark	Date	Description
1	2023.06.09	BID DOCUMENTS
5	2023.09.05	ADDENDUM 4

**MEZZANINE LEVEL  
 DEMOLITION - NORTH**

**D102N**

Issued: 07/10/2023 10:00 AM



**DEMOLITION PLAN LEGEND**

- EXISTING FLOOR FINISHES SHALL BE REMOVED AND CONCRETE SLAB SHALL BE GROUND DOWN AS REQ'D FOR NEW WORK - SEE GENERAL NOTES COORDINATE EXTENTS WITH NEW WORK
- ASSUMED EXTENTS OF EXISTING SLAB TRENCHING AND REMOVAL FOR INSTALLATION OF NEW BELOW SLAB UTILITIES - SEE KEYNOTE 14, GENERAL NOTE 9. SUBMIT SLAB REMOVAL PLAN PRIOR TO TRENCHING PER SPECIFICATION SECTION 02 41 19
- COORDINATE WITH ALL SHEET DISCIPLINES FOR FULL SCOPE OF DEMOLITION WORK
- GENERAL CONTRACTOR IS RESPONSIBLE FOR DETERMINING FULL SCOPE OF WORK
- MEZZANINE SLAB REMOVAL - SEE KEYNOTE 24

**DEMOLITION GENERAL NOTES**

1. ALL CONTRACTORS WISHING TO SUBMIT BIDS FOR WORK IN THESE DOCUMENTS SHALL VISIT PROJECT SITE PRIOR TO SUBMITTING A BID AND SHALL VERIFY EXISTING CONDITIONS AND SCOPE OF WORK
2. ALL LOOSE DEBRIS IS TO BE REMOVED BY DEMOLITION CONTRACTOR
3. NOTIFY ARCHITECT IMMEDIATELY IF FIELD CONDITIONS ARE OTHER THAN WHAT IS SHOWN ON PLANS
4. WHERE DEMOLITION WORK ABUTS OR INTERSECTS EXISTING CONSTRUCTION WHICH IS TO REMAIN, REFER TO NEW CONSTRUCTION DOCUMENTS FOR EXTENTS OF REMOVAL. PROTECT ALL EXISTING CONSTRUCTION TO REMAIN.
5. INTERIOR SURFACE CLEANING SHALL BE PERFORMED DURING DEMOLITION PHASE OF WORK. CONTRACTOR SHALL CLEAN ALL INTERIOR SURFACES TO REMAIN (FLOORS, WALLS, ROOF DECK, STRUCTURAL FRAMING, ETC.) AS PER REQUIREMENTS OF SECTION 02 41 19 SELECTIVE DEMOLITION OF THE PROJECT SPECIFICATIONS. CONTRACTOR SHALL PERFORM THIS WORK AFTER REMOVAL OF ALL ITEMS TO BE DEMOLISHED AND PRIOR TO COMMENCING NEW WORK
6. CONTRACTOR SHALL CONDUCT CLEANING WORK DESCRIBED IN DEMOLITION GENERAL NOTE 5 IN A MANNER WHICH PRESERVES, TO ALL REASONABLE EXTENT, EXISTING INTERIOR FINISHES TO REMAIN. CONTRACTOR SHALL INSPECT RESULTS OF CLEANING WORK AND SHALL NOTIFY ARCHITECT AND OWNER OF ANY EXISTING FINISHES TO REMAIN WHICH HAVE BEEN DAMAGED
7. COORDINATE REMOVAL OF ELEMENTS WHICH MAY CONTAIN HAZARDOUS MATERIALS - I.E. PIPE WRAP, CONTAMINATED SOILS, ETC WITH ABATEMENT CONTRACTOR. NOTIFY OWNER IMMEDIATELY IF HAZARDOUS MATERIALS ARE ENCOUNTERED. HAZARDOUS MATERIALS ABATEMENT IS NOT PART OF THE WORK SHOWN IN THESE DOCUMENTS.
8. GENERAL LOCATIONS WHERE EXISTING EIFS FINISHES ARE REMOVED IN ENTIRETY FOR REPAIR OR REPLACEMENT ARE NOTED ON EXTERIOR DEMOLITION ELEVATIONS WITH KEYED NOTES. NOTIFY ARCHITECT IF REMOVAL EXTENTS MAY BE OTHER THAN WHAT IS SHOWN IN ELEVATIONS. AT THESE LOCATIONS, EIFS SYSTEMS SHALL BE REMOVED IN REGULAR ORTHOGONAL SECTIONS. LINES OF REMOVAL SHALL BE PLUMB AND LEVEL. EXISTING EIFS AT THESE LOCATIONS SHALL BE REMOVED IN ITS ENTIRETY - I.E. FINISH, MESH, INSULATION AND ADHESIVE, AND SUBSTRATE SHALL BE PREPARED FOR NEW PATCHED EIFS SYSTEM.
9. EXTENTS OF SLAB TRENCHING SHOWN ON ARCHITECTURAL DEMOLITION DRAWINGS FOR PLACEMENT OF BELOW GRADE UTILITIES AND STRUCTURAL WORK IS APPROXIMATE AND MAY NOT REPRESENT FULL EXTENT OF THIS WORK. CONTRACTOR SHALL VERIFY SCOPE OF SLAB REMOVAL WORK WITH REQUIREMENTS OF MEP AND STRUCTURAL AND NEW WORK SCOPE. VERIFY THE EXTENTS OF ALL SLAB REMOVAL WORK WITH ARCHITECT BEFORE PERFORMING.
10. EXTENTS OF SLAB GRINDING SHOWN ON ARCHITECTURAL DEMOLITION DRAWINGS FOR REFINISHING OF EXISTING FLOORS IS APPROXIMATE AND MAY NOT REPRESENT FULL EXTENT OF THIS WORK. CONTRACTOR SHALL VERIFY FULL EXTENT OF THIS WORK WITH FINISH PLANS AND SURFACE PREPARATION REQUIREMENTS OF SPECIFIED NEW FLOOR FINISHES AS PER PROJECT SPECIFICATION.
11. WHERE FINISH FLOORING IS TO BE REMOVED, REMOVE ALL MATERIAL - I.E. FASTENERS, ADHESIVES, AND BACKING, TO SLAB BELOW. PREPARE SLAB SURFACE FOR NEW FINISH AS PER REQUIREMENTS OF NEW WORK.
12. ALL OBSOLETE OR ABANDONED MECHANICAL, ELECTRICAL, AND PLUMBING EQUIPMENT - I.E. CONDUIT, FITTINGS, DUCTWORK, HANGERS, CONTROLS, FIXTURES, ETC - SHALL BE REMOVED. COORDINATE WITH MEP REMOVAL DRAWINGS.
13. WHERE PARTITIONS ARE REMOVED, REMOVE ALL ITEMS CONTAINED WITHIN - INCLUDING BUT NOT LIMITED TO DOORS, HARDWARE, FRAMES, SILLDRAPES, MECHANICAL AND ELECTRICAL EQUIPMENT, ETC - TO STRUCTURE ABOVE AND BELOW, UNLESS NOTED OTHERWISE.
14. ALL EXISTING CEILINGS SHALL BE REMOVED. WHERE CEILINGS ARE REMOVED, REMOVE CEILING FINISH AND SUSPENSION SYSTEM ALONG WITH ALL ASSOCIATED FASTENERS, FITTINGS, AND MEP EQUIPMENT. COORDINATE WITH MEP REMOVAL DRAWINGS.
15. SEE DEMOLITION KEYNOTES FOR SPECIFIC INFORMATION ON ITEMS TO BE REMOVED BY LOCATION

**KEYED NOTES (DEMOLITION)**

- D01** REMOVE EXISTING OVERHEAD DOOR AND ALL FRAME/HARDWARE/MOTOR COMPONENTS BACK TO ROUGH OPENING
- D02** REMOVE EXISTING DOOR(S) AND FRAME(S) TO ROUGH OPENING
- D03** REMOVE EIFS PANEL FROM CONCRETE WALL/CMU CLEAN CONCRETE/CMU TO PREPARE FOR NEW WATERPROOFING OR CLADDING - COORDINATE WITH NEW WORK
- D04** CUT AND REMOVE SECTION OF DAMAGED EXISTING EIFS SYSTEM BACK TO SUBSTRATE, PREPARE SUBSTRATE FOR NEW PATCH AND REPAIR WORK AS PER EIFS-2 MANUFACTURER'S RECOMMENDATION
- D05** REMOVE EXISTING STOREFRONT GLAZING SYSTEM AND ALL FLASHING/TRANSOMS BACK TO ROUGH OPENING. DEMOLISH/GRIND OUT ANY MISC. STEEL AND BRACING IN OPENING UNLESS SPECIFICALLY NOTE TO REMAIN IN NEW WORK. PATCH AND REPAIR MASONRY FOR NEW CURTAIN WALL SYSTEM
- D06** REMOVE PORTION OF EXTERIOR MASONRY WALL COMPLETELY. REMOVE EXISTING EIFS FINISH AS REQ'D TO TOOTH IN NEW CMU - REF. EXTERIOR ELEVATIONS
- D07** REMOVE PART OF EXISTING FLOOR/ROOF IN PREPARATION FOR ELEVATOR SHAFT
- D08** REMOVE EXISTING STAIR COMPLETELY
- D09** REMOVE EXISTING INTERIOR WALL COMPLETELY
- D10** REMOVE EXISTING INTERIOR WIRE PARTITION; SALVAGE, CLEAN, AND STORE FOR REUSE
- D11** REMOVE EXISTING PLUMBING FIXTURES AND PLUMBING WALL CAVITY
- D12** REMOVE EXISTING CMU COLUMN WRAP AND ANY TIE BACKS OR ANCHORS TO B.S. SLAB OR DECK ABOVE. PREPARE NEWLY EXPOSED STEEL FOR NEW FINISH - REF. FINISH PLANS
- D13** REMOVE EXISTING EXTERIOR CONCRETE WALL TO 8". SEE NEW WORK FOR EXTENTS. SAW CUT CONCRETE CLEANLY, ALIGNED WITH CMU JAMBS ABOVE TO CREATE CLEAN ROUGH OPENING FOR NEW CURTAIN WALL. PREP FOR NEW CMU WORK TO PATCH AND TOOTH IN NEW JAMB BLOCKS.
- D14** SAW CUT AND DEMOLISH EXISTING SLAB AS REQ'D FOR COMPLETION OF NEW MEP OR STRUCTURAL WORK BELOW SLAB. REGIONS DIMENSIONED SHALL BE REMOVED AS NOTED. ALL OTHER AREAS, GC SHALL COORDINATE ACTUAL REMOVAL REQUIREMENTS WITH NEW WORK.
- D15** DEMOLISH EXISTING PLASTER CEILING AND SOFFIT WRAP AND ALL SUSPENSION - FRAMING HANGERS, RODS, DECK CLIPS, ETC BACK TO DECK. CLEAN NEWLY EXPOSED STEEL, DECK, JOIST AND FRAMING - REF. ARCHITECTURAL CEILING PLANS FOR ANY NEW FINISHES
- D16** EXISTING CONCRETE FILL AT FORMER TRENCHES AND BASINS TO BE REMOVED OR GROUND DOWN TO DEPTH AS REQ'D TO PROVIDE NEW CONCRETE TOPPING SUBSTRATE. REF. TO REQUIREMENTS OF NEW WORK REF. STRUCT
- D17** COORDINATE NEW PLATFORM CONSTRUCTION AND LOCATION OF EXISTING RAIL AND SUPPORT. IF RAIL IS IN CONFLICT WITH NEW WORK, DEMOLISH RAIL AND SUPPORT AT THIS BAY
- D18** EXISTING OWNER'S EQUIPMENT TO BE DECOMMISSIONED AND REMOVED BY OWNER - COORDINATE WITH OWNER FOR SALVAGE REQUIREMENTS
- D19** EXISTING PAINT BOOTH AND ALL RELATED EQUIPMENT - FANS, POWER, DUCTWORK, ETC SHALL BE REMOVED. ALL EXISTING OPENINGS IN SLAB, WALLS AND ROOF SHALL BE PREPARED FOR REPAIR AND PATCHING IN NEW WORK
- D20** EXISTING CRANE RAIL AND ASSOCIATE EQUIPMENT TO BE RETAINED. PROTECT IN PLACE
- D21** EXISTING STEEL AND GLASS WINDOW WALL TO BE PARTIALLY DEMOLISHED. RETAIN MAJOR FRAMING, REMOVE ANY TOSSEL CLIPS, GLAZING COMPOUND OR OTHER INFILL PANEL REMNANTS LEFT FROM OWNER ABATEMENT
- D22** CLEAN EXISTING STEEL AND MAJOR FRAMING COMPONENTS REMNANT FROM ABATED GLASS WINDOW WALL. PROVIDE TEMPORARY SUPPORT AND PROTECT IN PLACE - REF. STRUCTURAL
- D23** SAW CUT CONCRETE WALL BELOW STEEL AND GLASS TO BELOW F.F.E. AS REQ'D FOR NEW WORK - REF. ARCHITECTURAL DETAILS AT THIS LOCATION. CONCRETE PIERS AT COLUMN BASES SHALL REMAIN - REF. STRUCTURAL FOR EXTENTS OF WALL TO REMAIN
- D24** REMOVE MEZZANINE FLOOR SLAB AND FRAMING - REFER TO STRUCTURAL
- D25** EXISTING CRANE RAIL AND ASSOCIATE EQUIPMENT TO BE RETAINED. PROTECT IN PLACE
- D26** DEMOLISH EXISTING SLAB AS REQUIRED FOR NEW KITCHEN EQUIPMENT - REFERENCE STRUCTURAL
- D27** REFERENCE PLUMBING DRAWINGS FOR WORK ASSOCIATED WITH NEW COMMERCIAL KITCHEN EQUIPMENT IN THIS AREA. REMOVE OR MODIFY SLABS AS REQ'D
- D28** DEMOLISH EXTERIOR LIGHT FIXTURE. PREPARE EXISTING EIFS FOR PATCH AND REPAIR
- D29** DEMOLISH EXTERIOR SIGNAGE AND ALL RELATED FASTENERS AND HARDWARE - PREPARE EXISTING EIFS FOR PATCH AND REPAIR
- D30** SALVAGE EXISTING WHEEL STOP - REPAIR CONCRETE SUBSTRATE AND PREPARE FOR NEW FINISH WORK
- D31** DEMOLISH EXISTING CANOPY FASCIA, FLASHING, EPDM MEMBRANE AND SOFFIT MATERIAL AS REQ'D TO ACCOMMODATE NEW WORK IN THIS AREA - REF. ARCHITECTURAL DETAILS
- D32** REMOVE EXISTING ROOF SYSTEM AND STRUCTURAL DECK FOR NEW ROOF PENETRATION. COORDINATE WITH ARCHITECTURAL AND M.E.P. NEW WORK. PROVIDE TEMPORARY ENCLOSURE AT ALL NEW ROOF PENETRATIONS
- D33** REMOVE EXISTING ROOF SYSTEM AND STRUCTURAL DECK FOR NEW SKYLIGHT - COORDINATE WITH ARCHITECTURAL AND STRUCT NEW WORK. PROVIDE TEMPORARY ENCLOSURE AT ALL NEW ROOF PENETRATIONS
- D34** SALVAGE EXISTING GLAZED TILE AND BULLNOSE TRIM REUSE FOR PATCHING AT MEZZANINE LEVEL. SEE PLANS & INTERIOR ELEVATIONS FOR EXTENT OF NEW WORK.

**1 LEVEL 2 DEMO -- SOUTH**  
D102S 1/8" = 1'-0"

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Landscape Architect

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Fire Protection Engineering, Technology and AV

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Madison, WI 53562

Lighting Design

**Mazzetti, Inc. MAZZETTI**  
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Denver, CO 80202 | 720.644.5044

Commercial Kitchen Design

**Boelter Premier Boelter premier**  
7120 Northland Terrace,  
Minneapolis, MN 55428 | 763.544.8800

**MADISON PUBLIC MARKET**  
202 N First St, Madison, WI 53704

Project No: 20180608.00

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.

Architect Seal

**DAGMAR K. LARSON**  
13278-S  
MINNEAPOLIS  
MN  
ARCHITECT

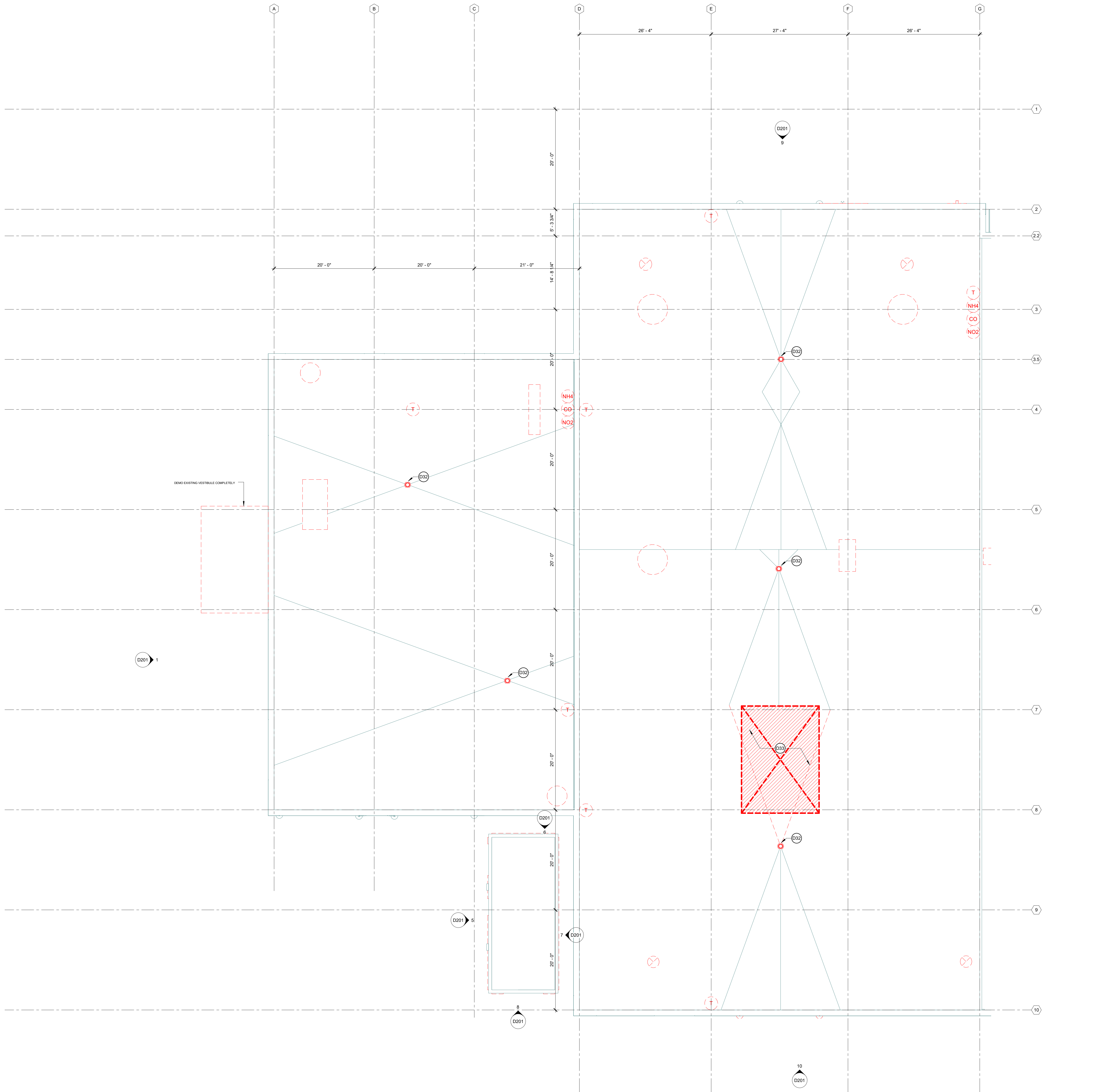
Signature: *Dagmar Larson*  
Print Name: Dagmar Larson  
Date: 2023.06.09 License No.: 13278-S

**ADDENDUM 4**

Mark	Date	Description
1	2023.06.09	BID DOCUMENTS

MEZZANINE LEVEL  
DEMOLITION - SOUTH

**D102S**



**1** ROOF PLAN - REFERENCE  
D103N 1/8" = 1'-0"

**DEMOLITION GENERAL NOTES**

1. ALL CONTRACTORS WISHING TO SUBMIT BIDS FOR WORK IN THESE DOCUMENTS SHALL VISIT PROJECT SITE PRIOR TO SUBMITTING A BID AND SHALL VERIFY EXISTING CONDITIONS AND SCOPE OF WORK.
2. ALL LOOSE DEBRIS IS TO BE REMOVED BY DEMOLITION CONTRACTOR
3. NOTIFY ARCHITECT IMMEDIATELY IF FIELD CONDITIONS ARE OTHER THAN WHAT IS SHOWN ON PLANS
4. WHERE DEMOLITION WORK ADJUTS OR INTERSECTS EXISTING CONSTRUCTION WHICH IS TO REMAIN, REFER TO NEW CONSTRUCTION DOCUMENTS FOR EXTENTS OF REMOVAL. PROTECT ALL EXISTING CONSTRUCTION TO REMAIN.
5. INTERIOR SURFACE CLEANING SHALL BE PERFORMED DURING DEMOLITION PHASE OF WORK. CONTRACTOR SHALL CLEAN ALL INTERIOR SURFACES TO REMAIN (FLOORS, WALLS, ROOF DECK, STRUCTURAL FRAMING, ETC.) AS PER REQUIREMENTS OF SECTION 02 41 19 "SELECTIVE DEMOLITION" OF THE PROJECT SPECIFICATIONS. CONTRACTOR SHALL PERFORM THIS WORK AFTER REMOVAL OF ALL ITEMS TO BE DEMOLISHED AND PRIOR TO COMMENCING NEW WORK.
6. CONTRACTOR SHALL CONDUCT CLEANING WORK DESCRIBED IN DEMOLITION GENERAL NOTE 5 IN A MANNER WHICH PRESERVES, TO ALL REASONABLE EXTENT, EXISTING INTERIOR FINISHES TO REMAIN. CONTRACTOR SHALL INSPECT RESULTS OF CLEANING WORK AND SHALL NOTIFY ARCHITECT AND OWNER OF ANY EXISTING FINISHES TO REMAIN WHICH HAVE BEEN DAMAGED.
7. COORDINATE REMOVAL OF ELEMENTS WHICH MAY CONTAIN HAZARDOUS MATERIALS - I.E. PIPE WRAP, CONTAMINATED SOILS, ETC WITH ABATEMENT CONTRACTOR. NOTIFY OWNER IMMEDIATELY IF HAZARDOUS MATERIALS ARE ENCOUNTERED. HAZARDOUS MATERIALS ABATEMENT IS NOT PART OF THE WORK SHOWN IN THESE DOCUMENTS.
8. GENERAL LOCATIONS WHERE EXISTING EIFS FINISHES ARE REMOVED IN ENTIRETY (FOR REPLACEMENT OR PATCH AND REPAIR) ARE NOTED ON EXTERIOR DEMOLITION ELEVATIONS WITH KEYED NOTES. NOTIFY ARCHITECT IF REMOVAL EXTENTS MUST BE OTHER THAN WHAT IS SHOWN IN ELEVATIONS. AT THESE LOCATIONS, EIFS SYSTEMS SHALL BE REMOVED IN REGULAR ORTHOGONAL SECTIONS. LINES OF REMOVAL SHALL BE PLUMB AND LEVEL. EXISTING EIFS AT THESE LOCATIONS SHALL BE REMOVED IN ITS ENTIRETY - I.E. FINISH, MESH, INSULATION AND ADHESIVE. AND SUBSTRATE SHALL BE PREPARED FOR NEW PATCHED EIFS SYSTEM.
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10. EXTENTS OF SLAB GRINDING SHOWN ON ARCHITECTURAL DEMOLITION DRAWINGS FOR REFINISHING OF EXISTING FLOORS IS APPROXIMATE AND MAY NOT REPRESENT FULL EXTENT OF THIS WORK. CONTRACTOR SHALL VERIFY FULL EXTENT OF THIS WORK WITH FINISH PLANS AND SURFACE PREPARATION REQUIREMENTS OF SPECIFIED NEW FLOOR FINISHES AS PER PROJECT SPECIFICATIONS.
11. WHERE FINISH FLOORING IS TO BE REMOVED, REMOVE ALL MATERIAL - I.E. FASTENERS, ADHESIVES, AND BACKING, TO SLAB BELOW. PREPARE SLAB SURFACE FOR NEW FINISH AS PER REQUIREMENTS OF NEW WORK.
12. ALL OBSOLETE OR ABANDONED MECHANICAL, ELECTRICAL, AND PLUMBING EQUIPMENT - I.E. CONDUIT, FITTINGS, DUCTWORK, HANGERS, CONTROLS, FIXTURES, ETC - SHALL BE REMOVED. COORDINATE WITH MEP REMOVAL DRAWINGS.
13. WHERE PARTITIONS ARE REMOVED, REMOVE ALL ITEMS CONTAINED WITHIN - INCLUDING BUT NOT LIMITED TO DOORS, HARDWARE, FRAMES, SILLDRIFTS, MECHANICAL AND ELECTRICAL EQUIPMENT, ETC. TO STRUCTURE ABOVE AND BELOW, UNLESS NOTED OTHERWISE.
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- D04 CUT AND REMOVE SECTION OF DAMAGED EXISTING EIFS SYSTEM BACK TO SUBSTRATE. PREPARE SUBSTRATE FOR NEW PATCH AND REPAIR WORK AS PER EIFS-C MANUFACTURER'S RECOMMENDATION
- D05 REMOVE EXISTING STOREFRONT GLAZING SYSTEM AND ALL FLASHING/TRANSILLS BACK TO ROUGH OPENING. DEMOLISH/GRIND OUT ANY MISC. STEEL AND BRACING IN OPENINGS UNLESS SPECIFICALLY NOTED TO REMAIN IN NEW WORK. PATCH AND REPAIR MASONRY FOR NEW CURTAIN WALL SYSTEM
- D06 REMOVE PORTION OF EXTERIOR MASONRY WALL COMPLETELY. REMOVE EXISTING EIFS FINISH AS REQD TO TOOTH IN NEW CMU - REF. EXTERIOR ELEVATIONS
- D07 REMOVE PART OF EXISTING FLOOR/ROOF IN PREPARATION FOR ELEVATOR SHAFT
- D08 REMOVE EXISTING STAIR COMPLETELY
- D09 REMOVE EXISTING INTERIOR WALL COMPLETELY
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- D12 REMOVE EXISTING CMU COLUMN WRAP AND ANY TIE BACKS OR ANCHORS TO B.O. SLAB OR DECK ABOVE. PREPARE NEWLY EXPOSED STEEL FOR NEW FINISH - REF. FINISH PLANS
- D13 REMOVE EXISTING EXTERIOR CONCRETE WALL TO 8". SEE NEW WORK FOR EXTENTS. SAW CUT CONCRETE CLEANLY, ALIGNED WITH CMU JAMBS ABOVE TO CREATE CLEAN, ROUGH OPENING FOR NEW CURTAIN WALL. PREP. FOR NEW CMU WORK TO PATCH AND TOOTH IN NEW JAMB BLOCKS.
- D14 SAW CUT AND DEMOLISH EXISTING SLAB AS REQD FOR COMPLETION OF NEW MEP OR STRUCTURAL WORK BELOW SLAB. REGIONS DIMENSIONED SHALL BE REMOVED AS NOTED. ALL OTHER AREAS, CC SHALL COORDINATE ACTUAL REMOVAL REQUIREMENTS WITH NEW WORK.
- D15 DEMOLISH EXISTING PLASTER CEILING AND SOFFIT FRAMING AND ALL SUSPENSION - FRAMING, HANGERS, RODS, DECK CLIPS, ETC. BACK TO DECK. CLEAN NEWLY EXPOSED STEEL DECK, JOIST AND FRAMING - REF. ARCHITECTURAL CEILING PLANS FOR ANY NEW FINISHES
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- D17 COORDINATE NEW PLATFORM CONSTRUCTION AND LOCATION OF EXISTING RAIL AND SUPPORT. IF RAIL IS IN CONFLICT WITH NEW WORK, DEMOLISH RAIL AND SUPPORT AT THIS BAY
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- D20 EXISTING STEEL AND GLASS WINDOW WALL TO BE PARTIALLY DEMOLISHED. RETAIN MAJOR FRAMING. REMOVE ANY TOGGLE CLIPS, GLAZING COMPOUND OR OTHER INFILL PANEL REMNANTS LEFT FROM OWNER ABATEMENT
- D21 CLEAN EXISTING STEEL AND MAJOR FRAMING COMPONENTS REMAINT FROM ABATED GLASS WINDOW WALL. PROVIDE TEMPORARY SUPPORT AND PROTECT IN PLACE - REF. STRUCTURAL
- D22 SAW CUT STRAIGHT AND DEMOLISH CONCRETE WALL BELOW STEEL AND GLASS TO BELOW F.F. AS REQD FOR NEW WORK - REF. ARCHITECTURAL DETAILS AT THIS LOCATION. CONCRETE PIERS AT COLUMN BASES SHALL REMAIN - REF. STRUCTURAL FOR EXTENTS OF WALL TO REMAIN.
- D23 REMOVE MEZZANINE FLOOR SLAB AND FRAMING - REFER TO STRUCTURAL
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- D28 DEMOLISH EXTERIOR SIGNAGE AND ALL RELATED FASTENERS AND HARDWARE - PREPARE EXISTING EIFS FOR PATCH AND REPAIR
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- D32 REMOVE EXISTING ROOF SYSTEM AND STRUCTURAL DECK FOR NEW SKYLIGHT - COORDINATE WITH ARCHITECTURAL AND STRUCT NEW WORK. PROVIDE TEMPORARY ENCLOSURE AT ALL NEW ROOF PENETRATIONS
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Commercial Kitchen Design **Boelter Premier Boelter premier**  
7120 Northland Terrace,  
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**MADISON PUBLIC MARKET**  
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Project No. 2018008.00

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.

Architect Seal

Signature *Dagmara Larson*  
Print Name **Dagmara Larson**  
Date 2023.06.09 License No. 13278-5

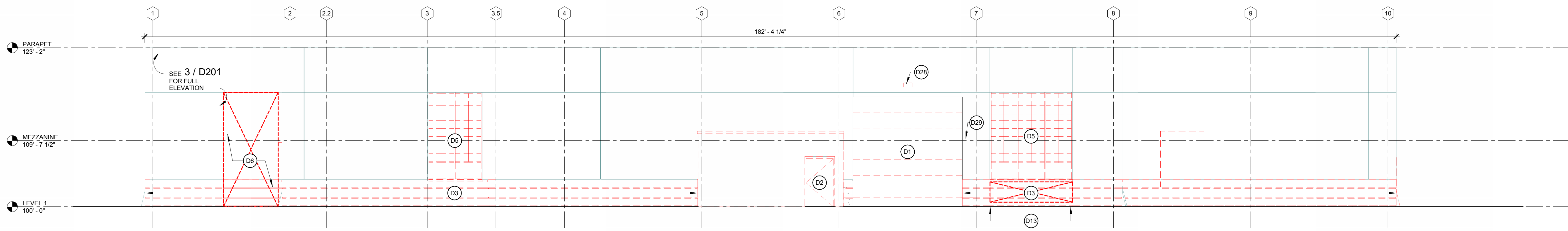
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Mark	Date	Description
1	2023.06.09	BID DOCUMENTS

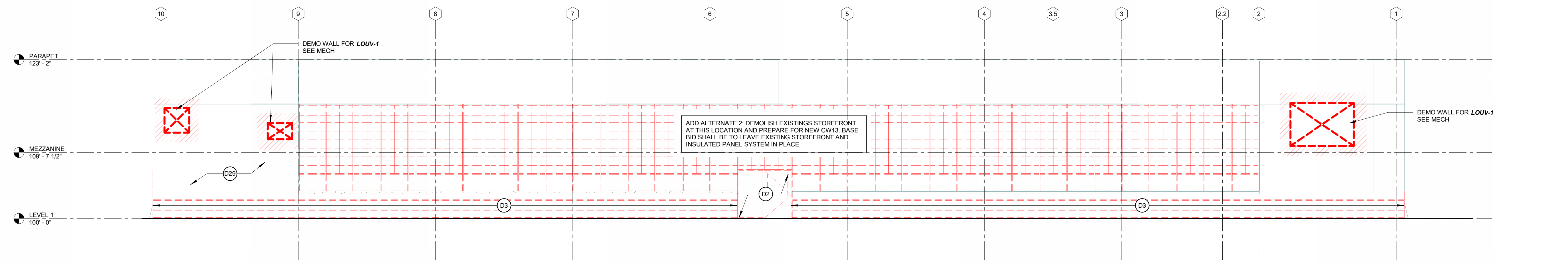
Roofing ©2018 Chicago Metal Sales & Resources, Ltd.

**ROOF DEMOLITION - NORTH**

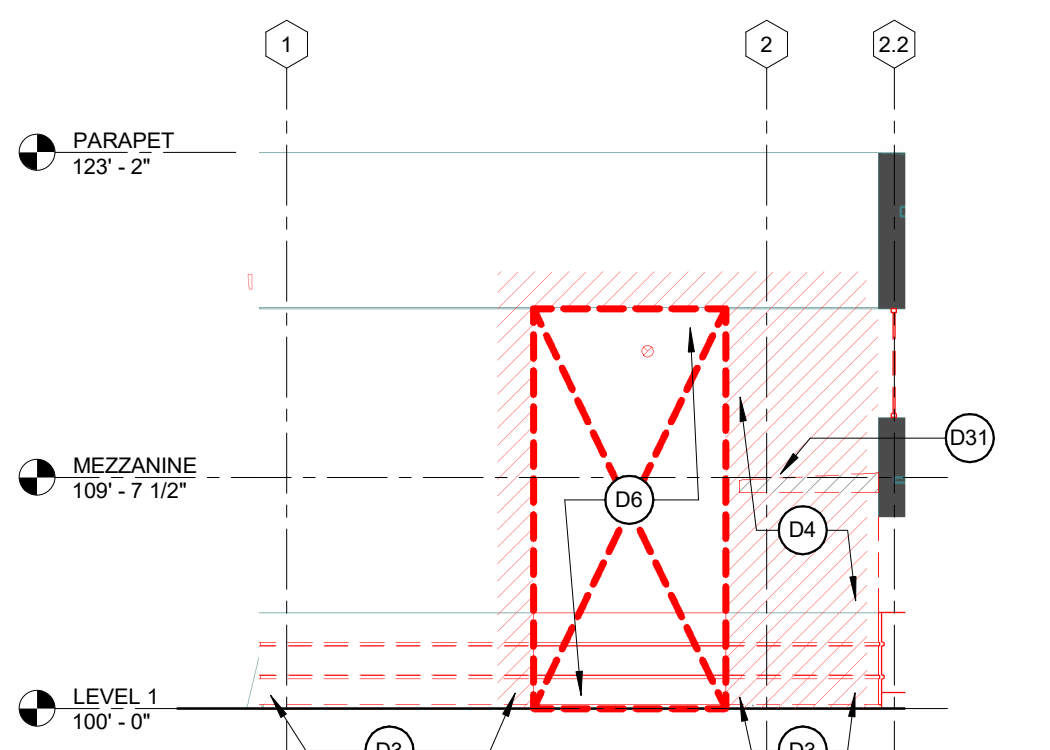
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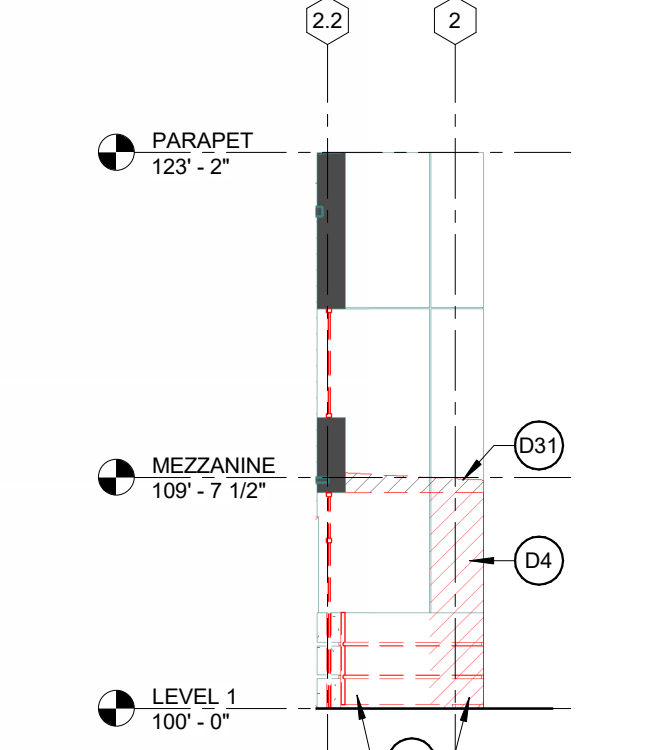
**1 DEMO ELEVATION - NORTH**  
D201 1/8" = 1'-0"



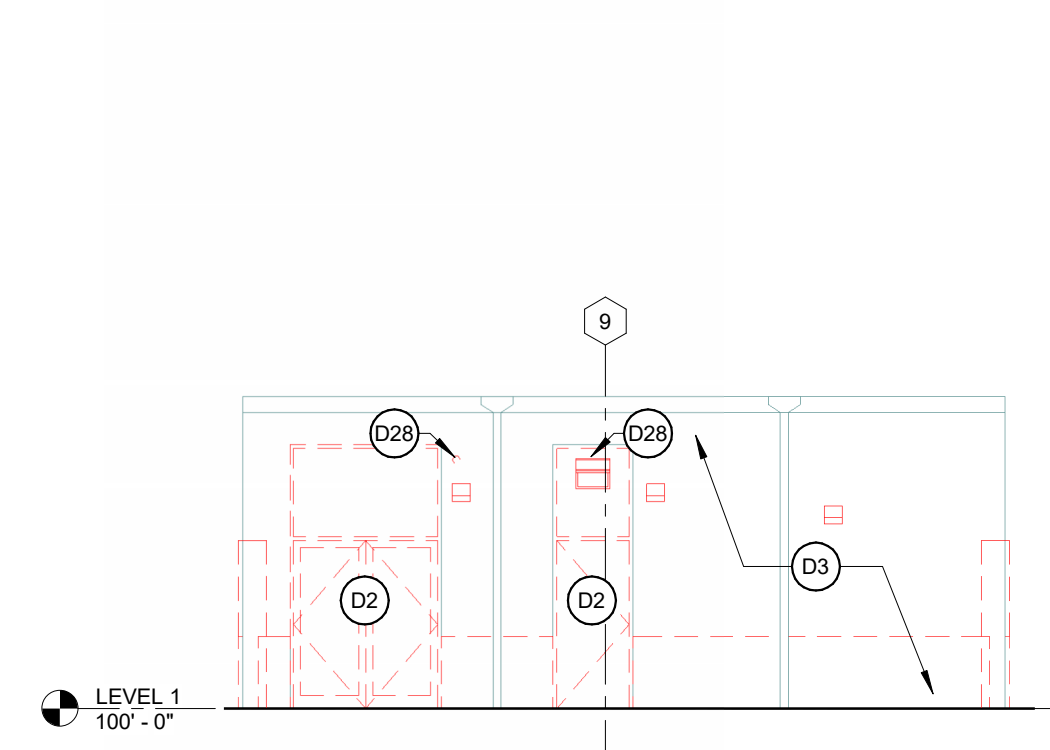
**2 DEMO ELEVATION - SOUTH**  
D201 1/8" = 1'-0"



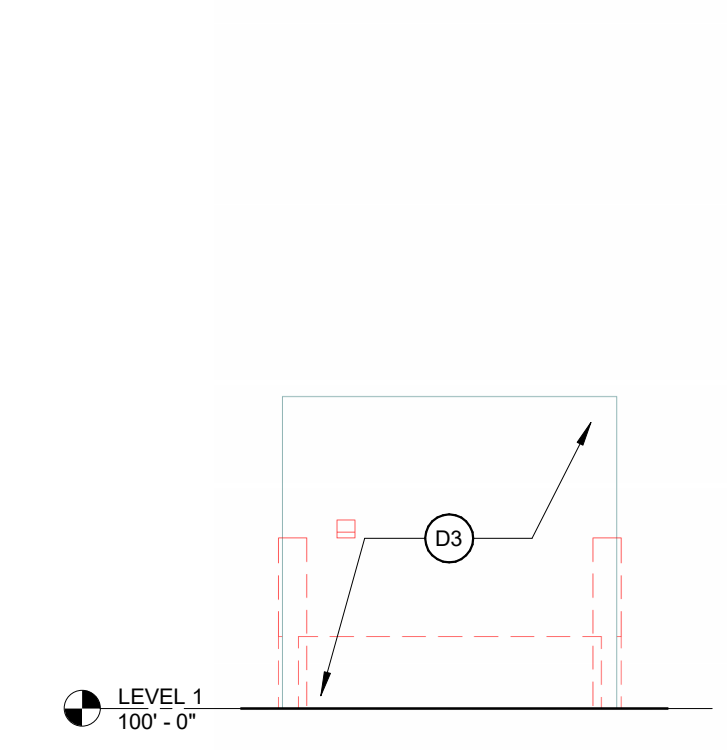
**3 DEMO ELEVATION - PARTIAL NORTH**  
D201 1/8" = 1'-0"



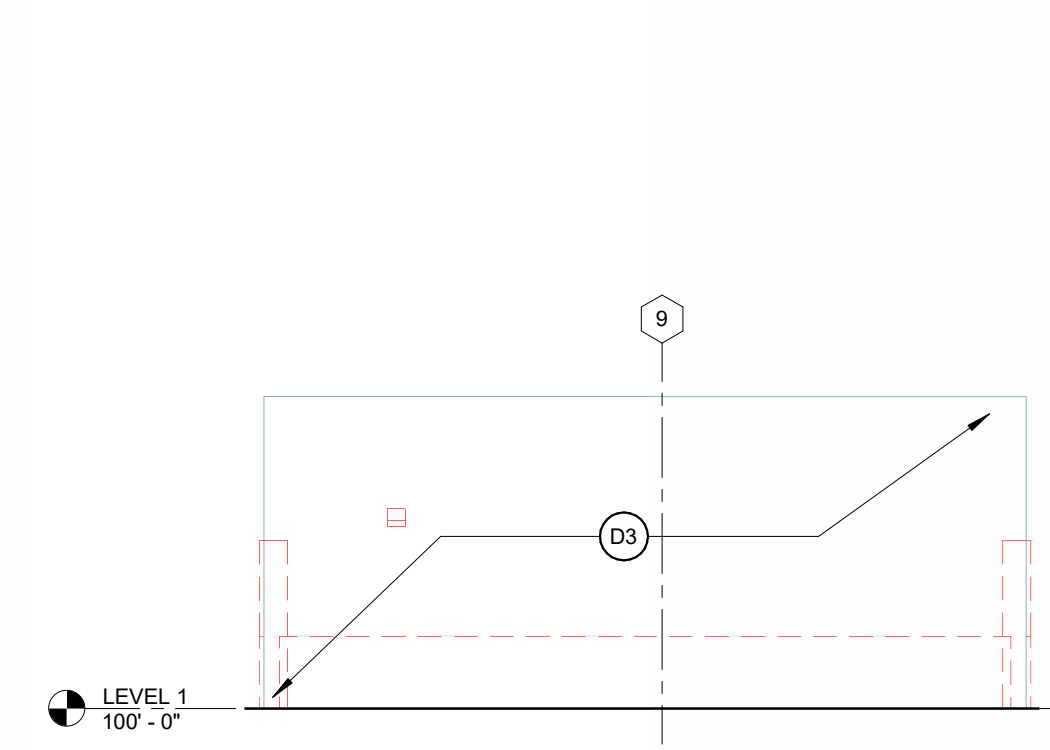
**4 DEMO ELEVATION - PARTIAL SOUTH**  
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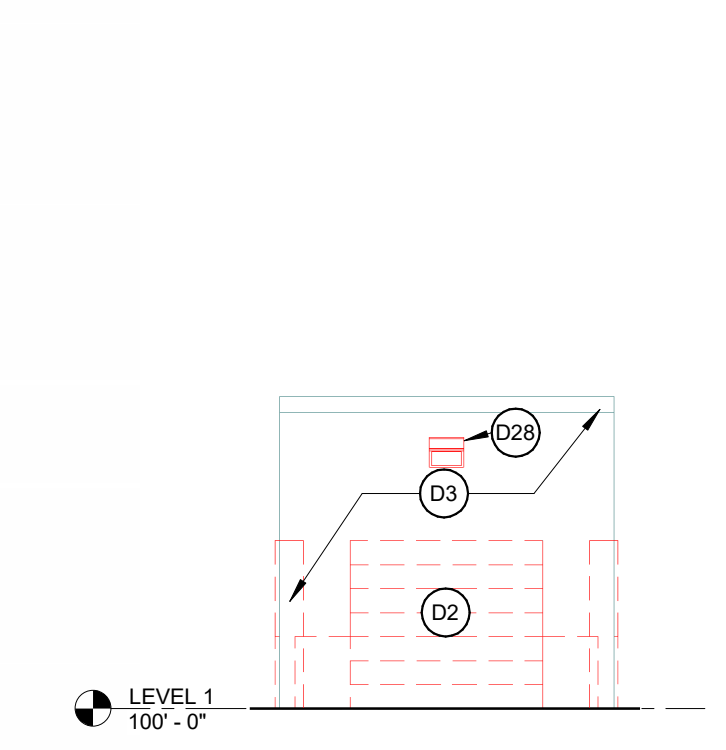
**5 ANCILLARY BUILDING - NORTH**  
D201 1/8" = 1'-0"



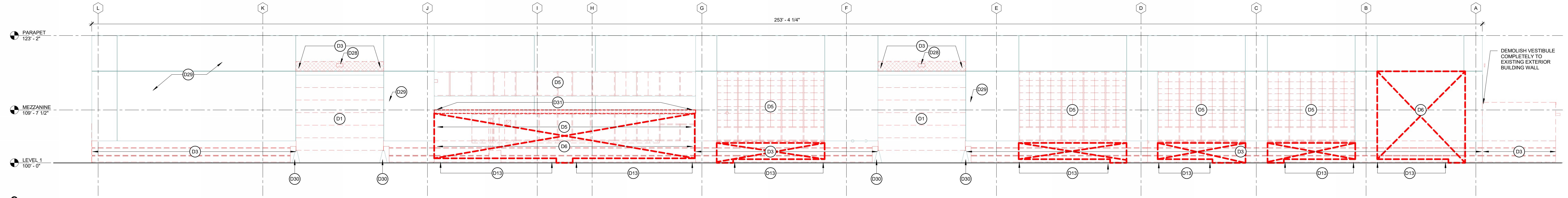
**6 ANCILLARY BUILDING - EAST**  
D201 1/8" = 1'-0"



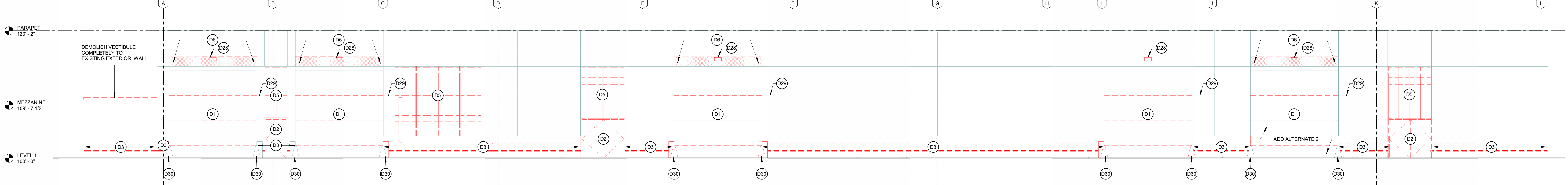
**7 ANCILLARY BUILDING - SOUTH**  
D201 1/8" = 1'-0"



**8 ANCILLARY BUILDING - WEST**  
D201 1/8" = 1'-0"



**9 DEMO ELEVATION - EAST**  
D201 1/8" = 1'-0"



**10 DEMO ELEVATION - WEST**  
D201 1/8" = 1'-0"

- KEYED NOTES (DEMOLITION)**
- D01 REMOVE EXISTING OVERHEAD DOOR AND ALL FRAME/HARDWARE/MOTOR COMPONENTS BACK TO ROUGH OPENING
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  - D03 REMOVE EIFS PANEL FROM CONCRETE WALL/CMU
  - D04 CLEAN CONCRETE/CMU TO PREPARE FOR NEW WATERPROOFING OR CLADDING - COORDINATE W/ NEW WORK
  - D05 CUT AND REMOVE SECTION OF DAMAGED EXISTING EIFS SYSTEM BACK TO SUBSTRATE. PREPARE SUBSTRATE FOR NEW PATCH AND REPAIR WORK AS PER EIFS MANUFACTURER'S RECOMMENDATION
  - D06 REMOVE EXISTING STOREFRONT GLAZING SYSTEM AND ALL FLASHING/TRIMS/SLABS BACK TO ROUGH OPENING. DEMOLISH/GRIND OUT ANY MISC. STEEL AND BRACING IN OPENING UNLESS SPECIFICALLY NOTE TO REMAIN IN NEW WORK. PATCH AND REPAIR MASONRY FOR NEW CURTAIN WALL SYSTEM
  - D07 REMOVE PORTION OF EXTERIOR MASONRY WALL COMPLETELY. REMOVE EXISTING EIFS FINISH AS REQ'D TO TOOTH IN NEW CMU - REF. EXTERIOR ELEVATIONS
  - D08 REMOVE PART OF EXISTING FLOOR/ROOF IN PREPARATION FOR ELEVATOR SHAFT
  - D09 REMOVE EXISTING STAIR COMPLETELY
  - D10 REMOVE EXISTING INTERIOR WALL COMPLETELY
  - D11 REMOVE EXISTING INTERIOR WIRE PARTITION. SALVAGE, CLEAN, AND STORE FOR REUSE
  - D12 REMOVE EXISTING PLUMBING FIXTURES AND PLUMBING WALL CAVITY
  - D13 REMOVE EXISTING CMU COLUMN WRAP AND ANY TIE BACKS OR ANCHORS TO B.O. SLAB OR DECK ABOVE. PREPARE NEWLY EXPOSED STEEL FOR NEW FINISH - REF. FINISH PLANS
  - D14 REMOVE EXISTING EXTERIOR CONCRETE WALL TO 6" - SEE NEW WORK FOR EXTENTS. SAW CUT CONCRETE CLEANLY, ALIGNED WITH CMU JAMBS ABOVE TO CREATE CLEAN ROUGH OPENING FOR NEW CURTAIN WALL. PREP FOR NEW CMU WORK TO PATCH AND TOOTH IN NEW JAMB BLOCKS.
  - D15 SAW CUT AND DEMOLISH EXISTING SLAB AS REQ'D FOR COMPLETION OF NEW MEP OR STRUCTURAL WORK BELOW AS REQ'D. REGIONS DIMENSIONED SHALL BE REMOVED AS NOTED. ALL OTHER AREAS, GC SHALL COORDINATE ACTUAL REMOVAL REQUIREMENTS WITH NEW WORK.
  - D16 DEMOLISH EXISTING PLASTER CEILING AND SOFFIT WRAP AND ALL SUSPENSION - FRAMING HANGERS, RODS, DECK CLIPS, ETC. BACK TO DECK. CLEAN NEWLY EXPOSED STEEL DECK, JOIST AND FRAMING - REF. ARCHITECTURAL CEILING PLANS FOR ANY NEW FINISHES
  - D17 EXISTING CONCRETE FILL AT FORMER TRENCHES AND BASINS TO BE REMOVED OR GROUND DOWN TO DEPTH AS REQ'D TO PROVIDE NEW CONCRETE TOPPING SUBSTRATE. REF. TO REQUIREMENTS OF NEW WORK. REF. STRUCT
  - D18 COORDINATE NEW PLATFORM CONSTRUCTION AND LOCATION OF EXISTING RAIL AND SUPPORT. IF RAIL IS IN CONFLICT WITH NEW WORK, DEMOLISH RAIL AND SUPPORT AT THIS BAY
  - D19 EXISTING OWNERS EQUIPMENT TO BE DECOMMISSIONED AND REMOVED BY OWNER - COORDINATE WITH OWNER FOR SALVAGE REQUIREMENTS
  - D20 EXISTING PAINT BOOTH AND ALL RELATED EQUIPMENT - FANS, POWER DUCTWORK, ETC. SHALL BE REMOVED. ALL EXISTING OPENINGS IN SLAB WALLS AND ROOF SHALL BE PREPARED FOR REPAIR AND PATCHING IN NEW WORK
  - D21 EXISTING STEEL AND GLASS WINDOW WALL TO BE PARTIALLY DEMOLISHED. RETAIN MAJOR FRAMING. REMOVE ANY TOGGLE CLIPS, GLAZING COMPOUND OR OTHER INFILL PANEL REMNANTS LEFT FROM OWNER ABATEMENT
  - D22 CLEAN EXISTING STEEL AND MAJOR FRAMING COMPONENTS REMNANT FROM ABATED GLASS WINDOW WALL. PROVIDE TEMPORARY SUPPORT AND PROTECT IN PLACE - REF. STRUCTURAL
  - D23 SAW CUT STRAIGHT AND DEMOLISH EXISTING CONCRETE WALL BELOW STEEL AND GLASS TO BELOW F.F.E. AS REQ'D FOR NEW WORK - REF. ARCHITECTURAL DETAILS AT THIS LOCATION. CONCRETE PIERS AT COLUMN BASES SHALL REMAIN - REF. STRUCTURAL FOR EXTENTS OF WALL TO REMAIN.
  - D24 REMOVE MEZZANINE FLOOR SLAB AND FRAMING - REFER TO STRUCTURAL
  - D25 EXISTING CRANE RAIL AND ASSOCIATE EQUIPMENT TO BE RETAINED. PROTECT IN PLACE
  - D26 DEMOLISH EXISTING SLAB AS REQUIRED FOR NEW KITCHEN EQUIPMENT - REFERENCE STRUCTURAL
  - D27 REFERENCE PLUMBING DRAWINGS FOR WORK ASSOCIATED WITH NEW COMMERCIAL KITCHEN EQUIPMENT IN THIS AREA. REMOVE OR MODIFY SLABS AS REQ'D
  - D28 DEMOLISH EXTERIOR LIGHT FIXTURE. PREPARE EXISTING EIFS FOR PATCH AND REPAIR
  - D29 DEMOLISH EXTERIOR SIGNAGE AND ALL RELATED FASTENERS AND HARDWARE - PREPARE EXISTING EIFS FOR PATCH AND REPAIR
  - D30 SALVAGE EXISTING WHEEL STOP - REPAIR CONCRETE SUBSTRATE AND PREPARE FOR NEW FINISH WORK
  - D31 DEMOLISH EXISTING CANOPY FASCIA, FLASHING, EPDM MEMBRANE AND SOFFIT MATERIAL, AS REQ'D TO ACCOMMODATE NEW WORK IN THIS AREA - REF. ARCHITECTURAL DETAILS
  - D32 REMOVE EXISTING ROOF SYSTEM AND STRUCTURAL DECK FOR NEW ROOF PENETRATION - COORDINATE WITH ARCHITECTURAL AND M.E.P. NEW WORK. PROVIDE TEMPORARY ENCLOSURE AT ALL NEW ROOF PENETRATIONS
  - D33 REMOVE EXISTING ROOF SYSTEM AND STRUCTURAL DECK FOR NEW SKYLIGHT - COORDINATE WITH ARCHITECTURAL AND STRUCT NEW WORK. PROVIDE TEMPORARY ENCLOSURE AT ALL NEW ROOF PENETRATIONS
  - D34 SALVAGE EXISTING GLAZED TILE AND BULLNOSE TRIM. REUSE FOR PATCHING AT MEZZANINE LEVEL. SEE PLANS & INTERIOR ELEVATIONS FOR EXTENT OF NEW WORK.

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I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.

Architect Seal

Signature *Dagmara Larsen*  
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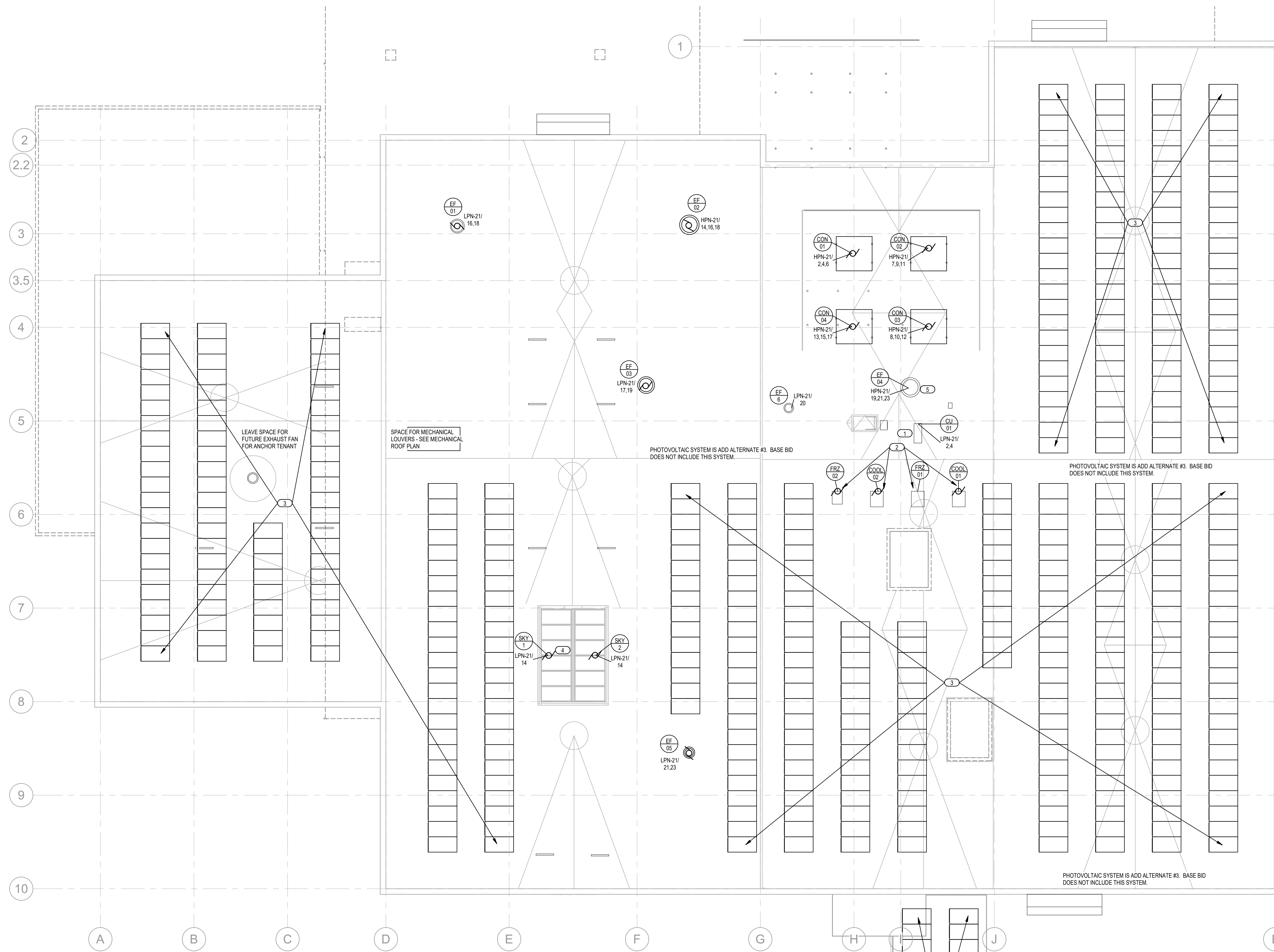
**ADDENDUM 4**

**ISSUE / REVISION**

Mark	Date	Description
1	2023.06.09	BID DOCUMENTS

DEMOLITION ELEVATIONS

**D201**



**1 ROOF ELECTRICAL POWER AND SYSTEMS PLAN**  
1" = 10'-0"

**GENERAL NOTES**

A. SEE SHEET E100 FOR ADDITIONAL GENERAL NOTES THAT APPLY.

B. VERIFY ROUGH-IN REQUIREMENTS OF ALL OWNER FURNISHED EQUIPMENT PRIOR TO INSTALLATION. COORDINATE WITH ARCHITECTURAL AND STRUCTURAL PLANS BEFORE MAKING ANY ROOF PENETRATIONS.

**KEYED NOTES**

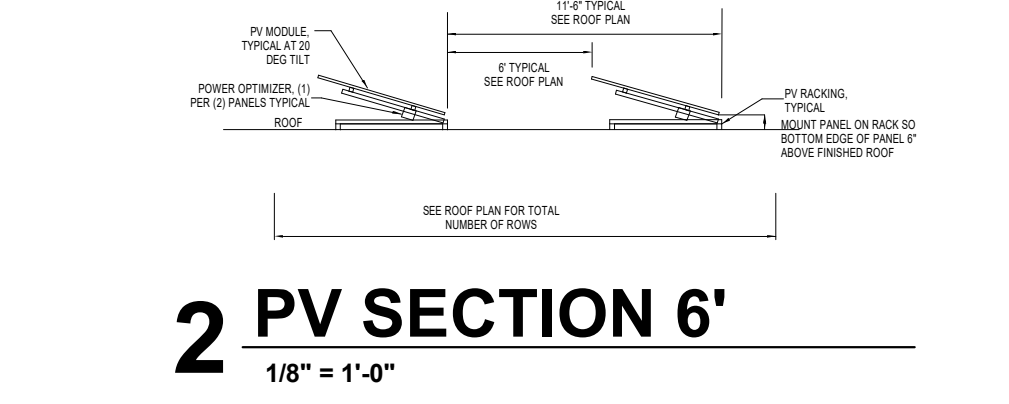
1. CU-1 IS PART OF MINI-SPLIT AIR CONDITIONING SYSTEM. POWER RUNS TO ROOFTOP CU-1, AND FROM CU-1 TO EVAP-1 IN IT ROOM. SEE SHEET E102S.

2. CONDENSING UNITS FOR WALK-IN COOLERS AND FREEZERS SUPPLIED BY KITCHEN SUPPLIER. EC TO PROVIDE POWER AND CONTROL WIRING AND WIRE COMPRESSOR TO EVAPORATOR BLOWER COIL - SEE SHEET E101S. SEE SHEET F3201 AND COOLER AND FREEZER INSTALLATION INSTRUCTIONS FOR WIRING TO GROUND FLOOR COOLER AND FREEZER.

3. PHOTOVOLTAIC ARRAY TO BE PROVIDED UNDER ADD ALTERNATE #3. FINAL ARRAY CONFIGURATION TO FOLLOW THIS DESIGN LAYOUT, BUT BE DETERMINED BY PROVIDER.

4. SKYLIGHT OPERATION MOTORS LOCATED UNDER SKYLIGHT - SEE ARCH. SHEET A352. MOTOR TO HAVE CONNECTION TO BAS.

5. EXHAUST FAN 04 TO HAVE SHUNT TRIP BREAKER - SEE HPN-21 AND LPN-21 PANEL SCHEDULES.



**GENERAL PHOTOVOLTAIC NOTES**

A. INSTALLING CONTRACTOR SHALL PROVIDE SUBMITTALS OF ALL EQUIPMENT INSTALLED WITHIN THE COMPLETED SYSTEM. SUBMITTALS SHALL INCLUDE PHYSICAL LAYOUT DRAWINGS AND INTERCONNECTION DIAGRAMS. THIS DESIGN IS BASIS OF DELEGATED DESIGN ONLY.

B. THE PHOTOVOLTAIC (PV) SYSTEM SHALL INCLUDE RAPID SHUTDOWN MEETING THE 2017 NEC REQUIREMENTS AT A MINIMUM.

C. THE PV SYSTEM SHALL INCLUDE LABELING AS REQUIRED WITHIN THE NEC. LABELING SHALL INCLUDE A PLACARD AT THE ELECTRICAL SERVICE IDENTIFYING THE LOCATION OF INVERTERS AND RAPID SHUTDOWN DEVICES - SEE SHEET E100 FOR DISCONNECT LOCATION.

D. COORDINATE INSTALLATION OF THE PV SYSTEM WITH THE UTILITY. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL APPLICATION, INSPECTIONS, AND ADDITIONAL REQUIREMENTS THE UTILITY MAY HAVE FOR AN INTERACTIVE SYSTEM. THE OWNER SHALL PAY ANY PERMIT COSTS.

E. DC STRINGS AND INVERTED AC POWER SHALL EACH INCLUDE DISCONNECTING MEANS AND FUSE PROTECTION.

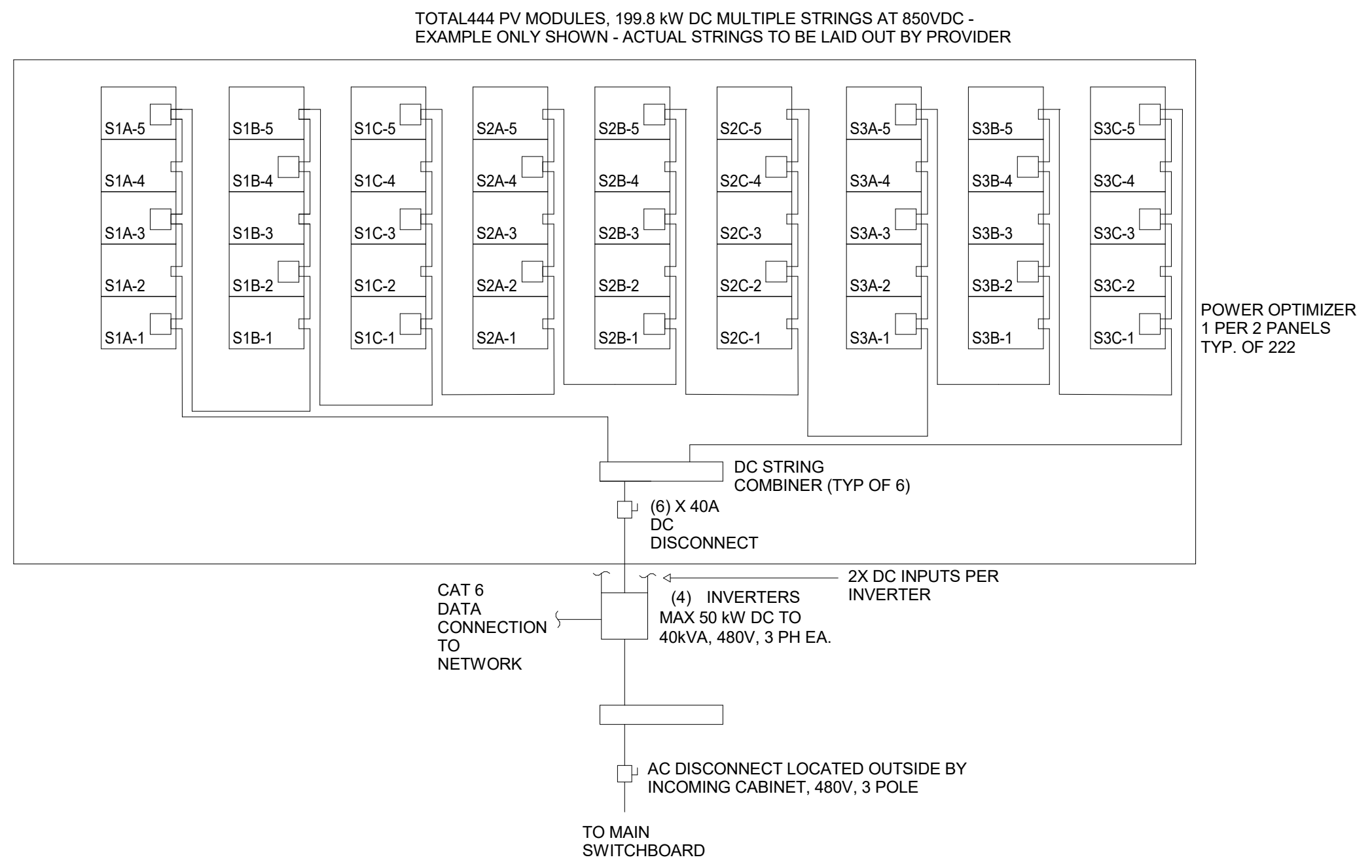
F. SEE ARCHITECTURAL AND ELECTRICAL ROOF PLANS AND DETAILS FOR FURTHER INFORMATION ON PHYSICAL LAYOUT.

**BASIS OF PV SYSTEM DESIGN**

MODULES: SEE SPECIFICATION FOR MANUFACTURERS & MODELS  
 MAX POWER: 450W  
 OPEN CIRCUIT VOLTAGE: 51.9V MAX  
 SHORT CIRCUIT CURRENT: 11A MAX  
 DIMENSIONS: 40" X 76.7" X 1.3"

INVERTER: SOLAREEDGE THREE-PHASE INVERTER 480V GRID.  
 INPUT  
 MAX DC POWER: 50 kW  
 MAX INPUT VOLTAGE DC- TO DC: 1000VDC  
 NOMINAL INPUT VOLTAGE DC- TO DC: 850VDC  
 MAXIMUM INPUT CURRENT: 45ADC  
 OUTPUT  
 RATED AC OUTPUT: 40 kVA  
 AC OUTPUT VOLTAGE NOMINAL (L-NL-L): 480V  
 AC FREQUENCY (NOMINAL): 60 HZ  
 MAX CONTINUOUS OUTPUT CURRENT (PER PHASE): 40  
 RAPID SHUTDOWN - ADD ON KIT COMMUNICATES WITH OPTIMIZERS.  
 POWER OPTIMIZER: SOLAREEDGE P20

RACK: SEE SPECIFICATION. REFER TO STRUCTURAL DESIGN CRITERIA ON SHEET 5001 FOR MAXIMUM ROOF LOADINGS.



**3 PHOTOVOLTAIC PANEL LAYOUT DETAILS**  
1/8" = 1'-0"

Project No. M10.19.04  
**MADISON PUBLIC MARKET**  
 200 N First St. Madison, WI 53704

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Engineer under the Laws of the State of Wisconsin.  
 Engineer Seal

Signature \_\_\_\_\_  
 Print Name \_\_\_\_\_  
 Date \_\_\_\_\_ License No. \_\_\_\_\_

**Addendum 4**

**ISSUE / REVISION**

Mark	Date	Description
1	2023.08.09	BID DOCUMENTS
5	2023.09.05	Addendum 4

**ROOF POWER AND SYSTEM PLAN**

**E103**

Switchboard: SBN-1						
Location: MECHANICAL ROOM 1 57		Volts: 480/277 Wye		A.I.C. Rating: 65 KAIC		
Supply From:		Phases: 3		Mains Type:		
Mouning:		Wires: 4		Mains Rating: 2000 A		
Top/Bottom Feed: BOTTOM				MCB Rating: 2000 A		
<b>Notes:</b> PROVIDE METER FOR OVERALL LOAD WITH CONNECTION TO BAS.						
CKT	Circuit Description	# of Poles	Frame Size	Trip Rating	Load	Remarks
SBN-11	SURGE PROTECTIVE DEVICE	3	--	60 A	0 VA	
SBN-12	ACC-1	3	125 A	110 A	69650 VA	
SBN-13	ACC-2	3	125 A	110 A	69650 VA	
SBN-14	ACC-3	3	125 A	110 A	69650 VA	
SBN-15	ACC-4	3	125 A	110 A	69650 VA	
SBN-16	HPN-11	3	400 A	400 A	250880 VA	
SBN-17	HPN-12	3	400 A	225 A	720 VA	UTILITY METER FOR ANCHOR TENANT
SBN-18	HPN-13	3	400 A	225 A	0 VA	UTILITY METER FOR ANCHOR TENANT
SBN-19	HPN-21	3	400 A	400 A	91062 VA	OWNER METER FOR VENDOR LOAD
SBN-110	T-22	3	400 A	175 A	90031 VA	
SBN-111	HPN-24-L	3	100 A	100 A	24381 VA	METERED FOR LIGHTING LOAD
SBN-112	ELEV-1	3	100 A	70 A	43825 VA	
SBN-113	PHOTOVOLTAIC ARRAY	3	--	225 A	0 VA	UP TO 180 KVA FEEDING IN
SBN-114	PREPARED SPACE		225 A			
SBN-115	PREPARED SPACE		225 A			
SBN-116	PREPARED SPACE		225 A			
SBN-117	PREPARED SPACE		225 A			
SBN-118	PREPARED SPACE		225 A			
<b>Total Conn. Load:</b>					773097 VA	
<b>Total Amps:</b>					930 A	
Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals		
HVAC Blowers	36456 VA	100.00%	36456 VA			
Lighting	22705 VA	125.00%	28381 VA			
Motor	127215 VA	108.61%	138171 VA			
HVAC Cooling	405700 VA	100.00%	405700 VA	<b>Total Conn. Load:</b> 773097 VA		
HVAC Heating	700 VA	100.00%	700 VA	<b>Total Est. Demand:</b> 723185 VA		
Power	14400 VA	100.00%	14400 VA	<b>Total Conn. Current:</b> 930 A		
HVAC	24520 VA	100.00%	24520 VA	<b>Total Est. Demand Current:</b> 870 A		
<b>Total Est. Demand - NC:</b>						

MOTOR SCHEDULE														
EQUIP NAME	EQUIP NO.	EQUIPMENT DESCRIPTION	LOCATION	Voltage	Phase	Q	FLA	MA	CONDUIT & WIRE SIZE	DISCONNECT BY	DISCONNECT TYPE	PANEL	CIRCUIT NUMBER	NOTE
AC	01	AIR CURTAIN	ANCHOR VENDOR 151	480 V	3	15	21	11000 VA	3/4" (3) #10 (1) #10 G	MFR		HPN-11	37,38,41	
AC	02	AIR CURTAIN	SOUTH HALL 152	480 V	3	15	21	11000 VA	3/4" (3) #10 (1) #10 G	MFR		HPN-11	38,40,42	
AC	04	AIR CURTAIN	E GATHERING 108	480 V	3	15	21	11000 VA	3/4" (3) #10 (1) #10 G	MFR		HPN-11	43,45,47	
AC	05	AIR CURTAIN	CORRIDOR 110	480 V	3	15	21	11000 VA	3/4" (3) #10 (1) #10 G	MFR		HPN-11	50,52,54	
AC	06	AIR CURTAIN	WAITING 103	480 V	3	15	21	11000 VA	3/4" (3) #10 (1) #10 G	MFR		HPN-11	44,46,48	
ACC	01	CHILLER	MECH ROOM 150	480 V	3		87.4	69650 VA	1-1/4" (3) #2 (1) #6G	MFR	VFD	SBN-1	SBN-12	
ACC	02	CHILLER	MECH ROOM 150	480 V	3		87.4	69650 VA	1-1/4" (3) #2 (1) #6G	MFR	VFD	SBN-1	SBN-13	
ACC	03	CHILLER	MECH ROOM 150	480 V	3		87.4	69650 VA	1-1/4" (3) #2 (1) #6G	MFR	VFD	SBN-1	SBN-14	
ACC	04	CHILLER	MECH ROOM 150	480 V	3		87.4	69650 VA	1-1/4" (3) #2 (1) #6G	MFR	VFD	SBN-1	SBN-15	
AHU	01	AIR HANDLING UNIT	MECH PLATFORM 220	480 V	3	15	18	14350 VA	3/4" (3) #12 (1) #12 G	MFR	VFD	HPN-11	7,11	
AHU	2R	AIR HANDLING UNIT RETURN	SOUTH HALL 152	480 V	3	2	4.8	2300 VA	3/4" (3) #12 (1) #12 G	MFR	VFD	HPN-11	8,10,12	
AHU	2S	AIR HANDLING UNIT SUPPLY	SOUTH HALL 152	480 V	3	3	4.8	2300 VA	3/4" (3) #12 (1) #12 G	MFR	VFD	HPN-11	8,10,12	
AHU	2W	AIR HANDLING UNIT WHEEL	SOUTH HALL 152	120 V	1	0.5	3.2	375 VA	3/4" (2) #12 (1) #12 G	MFR	VFD	LPN-11	16	
B	01	BOILER	MECH ROOM 150	120 V	1	16	160 VA	3/4" (2) #12 (1) #12 G	EC	MRS		LPN-11	17	
B	2	BOILER	MECH ROOM 150	120 V	1	16	160 VA	3/4" (2) #12 (1) #12 G	EC	MRS		LPN-11	19	
CB	01	CARDBOARD BALER	LOADING 148	480 V	3	10	14	7500 VA	3/4" (3) #12 (1) #12 G	MFR		HPN-14	7,9,11	
CC	01	COOLER COIL	WALK-IN 143A	120 V	1	1.6	200 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	23	
CC	02	COOLER COIL	MARKET KITCHEN 142	120 V	1	1.6	200 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	25	
CF	1	CIRCULATION FAN	MAIN HALL 111	120 V	1	7.7	900 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	42	
CF	2	CIRCULATION FAN	MAIN HALL 111	120 V	1	7.7	900 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	44	
CF	3	CIRCULATION FAN	MAIN HALL 111	120 V	1	7.7	900 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	46	
CF	4	CIRCULATION FAN	MAIN HALL 111	120 V	1	7.7	900 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	48	
CF	5	CIRCULATION FAN	MAIN HALL 111	120 V	1	7.7	900 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	50	
CF	6	CIRCULATION FAN	MAIN HALL 111	120 V	1	7.7	900 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	52	
CF	7	CIRCULATION FAN	SOUTH HALL 152	480 V	3	2	3.4	1500 VA	3/4" (3) #12 (1) #12 G	MFR		HPN-11	14,16,18	
CF	8	CIRCULATION FAN	SOUTH HALL 152	480 V	3	2	3.4	1500 VA	3/4" (3) #12 (1) #12 G	MFR		HPN-11	14,16,18	
CF	9	CIRCULATION FAN	SOUTH HALL 152	480 V	3	2	3.4	1500 VA	3/4" (3) #12 (1) #12 G	MFR		HPN-11	14,16,18	
COMP	DP	DRY PIPE COMPRESSOR	STORAGE 215	120 V	1	0.87	100 VA	3/4" (3) #12 (1) #12 G	EC	MRS		LPN-21	15	
CON	01	CHILLER CONDENSER	ROOF	480 V	3	12.3	10250 VA	3/4" (3) #12 (1) #12 G	EC	VFD		HPN-21	2,4,6	
CON	02	CHILLER CONDENSER	ROOF	480 V	3	12.3	10250 VA	3/4" (3) #12 (1) #12 G	EC	VFD		HPN-21	7,9,11	
CON	03	CHILLER CONDENSER	ROOF	480 V	3	12.3	10250 VA	3/4" (3) #12 (1) #12 G	EC	VFD		HPN-21	8,10,12	
CON	04	CHILLER CONDENSER	ROOF	480 V	3	12.3	10250 VA	3/4" (3) #12 (1) #12 G	EC	VFD		HPN-21	13,15,17	
COOL	01	WALK-IN COOLER	ROOF	208 V	1	1.5	10.9	2380 VA	3/4" (3) #12 (1) #12 G	EC	MRS	LPN-21	6,8	
COOL	02	WALK-IN COOLER	ROOF	208 V	1	1.5	10.9	2380 VA	3/4" (3) #12 (1) #12 G	EC	MRS	LPN-21	2,2	
CP	1	CIRCULATION PUMP	UTILITY 212	120 V	1	0.5	60 VA	3/4" (2) #12 (1) #12 G	EC	MRS		LPN-21	2,4	
CJ	01	COOLING UNIT	ROOF	120 V	1	0.35	73 VA	3/4" (3) #12 (1) #12 G	EC	MRS		LPN-21	24	
CUH	01	CABINET HEATER	VESTIBULE 100	120 V	1	1.2	140 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	27	
CUH	02	CABINET HEATER	VESTIBULE 112	120 V	1	1.2	140 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	29	
CUH	03	CABINET HEATER	VESTIBULE 137	120 V	1	1.2	140 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	29	
CUH	04	CABINET HEATER	LOADING 148	120 V	1	1.2	140 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	31	
CUH	05	CABINET HEATER	VESTIBULE 165	120 V	1	1.2	140 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	30	
DISP		DISPOSER	MARKET KITCHEN 142	208 V	1	2	7.7	1600 VA	3/4" (3) #12 (1) #12 G	EC	MRS	LPN-11A	24,26	
DO	1	DOOR OPENER	ANCHOR VENDOR 162	120 V	1	1	12	375 VA	3/4" (2) #12 (1) #12 G	N/A		LPN-11	32	
DO	2	DOOR OPENER	ANCHOR VENDOR 162	120 V	1	1	12	375 VA	3/4" (2) #12 (1) #12 G	N/A		LPN-11	34	
DO	3	DOOR OPENER	LOADING 148	120 V	1	1	12	375 VA	3/4" (2) #12 (1) #12 G	N/A		LPN-11	35	
DO	4	DOOR OPENER	E GATHERING 108	120 V	1	1	12	380 VA	3/4" (2) #12 (1) #12 G	N/A		LPN-11	36	
DO	5	DOOR OPENER	NORTH ENTRY 102	120 V	1	1	12	380 VA	3/4" (2) #12 (1) #12 G	N/A		LPN-11	37	
DO	6	DOOR OPENER	NORTH ENTRY 102	120 V	1	1	12	380 VA	3/4" (2) #12 (1) #12 G	N/A		LPN-11	38	
EF	01	EXHAUST FAN	ROOF	208 V	1	3	10.6	2235 VA	3/4" (3) #10 (1) #10 G	MFR		LPN-21	16,18	
EF	02	EXHAUST FAN	ROOF	480 V	3	7.5	11	8765 VA	3/4" (3) #12 (1) #12 G	MFR		HPN-21	14,16,18	
EF	03	EXHAUST FAN	ROOF	208 V	1	5	16.7	3475 VA	3/4" (3) #10 (1) #10 G	MFR		LPN-21	17,19	
EF	04	EXHAUST FAN	ROOF	480 V	3	7.5	11	8765 VA	3/4" (3) #12 (1) #12 G	MFR	SHUNT	HPN-21	16,21,23	
EF	05	EXHAUST FAN	ROOF	208 V	1	2	13.2	1500 VA	3/4" (3) #12 (1) #12 G	MFR		LPN-21	21,23	
EF	06	EXHAUST FAN	ROOF	120 V	1	1	10.3	250 VA	3/4" (2) #12 (1) #12 G	MFR		LPN-21	20	
ELEV	1	ELEVATOR	ELEVATOR E1	480 V	3	56	43825 VA	1-1/4" (3) #4 (1) #6G	EC	SHUNT	SBN-1	SBN-112		
EVAP	01	EVAPORATOR	DATA & IT 211	120 V	1	0.35	73 VA	3/4" (3) #12 (1) #12 G	SEE CU-1	SEE CU-1		LPN-11	20,22	
FC	01	FREZER COIL	WALK-IN 148B	208 V	1	1.5	12.6	2820 VA	3/4" (3) #12 (1) #12 G	EC	MRS	LPN-11	16	
FC	02	FREZER COIL	MARKET KITCHEN 142	208 V	1	1.5	12.6	2820 VA	3/4" (3) #12 (1) #12 G	EC	MRS	LPN-11	24,26	
FCU	01	FAN COIL UNIT	VENDOR GROUP 1	120 V	1	0.75	13.2	560 VA	3/4" (2) #12 (1) #12 G	MFR		LPN-11	1	
FCU	02	FAN COIL UNIT	CORRIDOR 105	120 V	1	0.75	13.2	560 VA	3/4" (2) #12 (1) #12 G	MFR		LPN-11	2	
FCU	03	FAN COIL UNIT	VENDOR GROUP 1	120 V	1	0.75	13.2	560 VA	3/4" (2) #12 (1) #12 G	MFR		LPN-11	3	
FCU	04	FAN COIL UNIT	VENDOR GROUP 8	120 V	1	0.75	13.2	560 VA	3/4" (2) #12 (1) #12 G	MFR		LPN-11	4	
FCU	05	FAN COIL UNIT	VENDOR GROUP 9	120 V	1	0.75	13.2	560 VA	3/4" (2) #12 (1) #12 G	MFR		LPN-11	5	
FCU	07	FAN COIL UNIT	MAIN HALL 111	120 V	1	0.75	13.2	560 VA	3/4" (2) #12 (1) #12 G	MFR		LPN-11	7	
FCU	08	FAN COIL UNIT	MAIN HALL 111	120 V	1	0.75	13.2	560 VA	3/4" (2) #12 (1) #12 G	MFR		LPN-11	8	
FCU	09	FAN COIL UNIT	VENDOR GROUP 5	120 V	1	0.75	13.2	560 VA	3/4" (2) #12 (1) #12 G	MFR		LPN-11	9	
FCU	10	FAN COIL UNIT	VENDOR GROUP 3	120 V	1	0.75	13.2	560 VA	3/4" (2) #12 (1) #12 G	MFR		LPN-11	10	
FCU	11	FAN COIL UNIT	VENDOR GROUP 4	120 V	1	0.75	13.2	560 VA	3/4" (2) #12 (1) #12 G	MFR		LPN-11	11	
FCU	12	FAN COIL UNIT	VENDOR GROUP 10	120 V	1	0.75	90 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	12	
FCU	13	FAN COIL UNIT	STORAGE 214	120 V	1	0.75	90 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	13	
FCU	14	FAN COIL UNIT	UTILITY 212	120 V	1	0.75	90 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	14	
FCU	15	FAN COIL UNIT	CLOSET 205	120 V	1	0.75	90 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	15	
FCU	16	FAN COIL UNIT	VENDOR GROUP 10	120 V	1	0.75	90 VA	3/4" (2) #12 (1) #12 G	MFR			LPN-11	12	
FRZ	01	WALK-IN FREEZER	ROOF	208 V	1	2	18.1	3765 VA	3/4" (3) #10 (1) #10 G	EC	MRS	LPN-21	7,9	
FRZ	02	WALK-IN FREEZER	ROOF	208 V	1	1.5	12.6	2820 VA	3/4" (3) #12 (1) #12 G	EC	MRS	LPN-21		

# MADISON PUBLIC MARKET

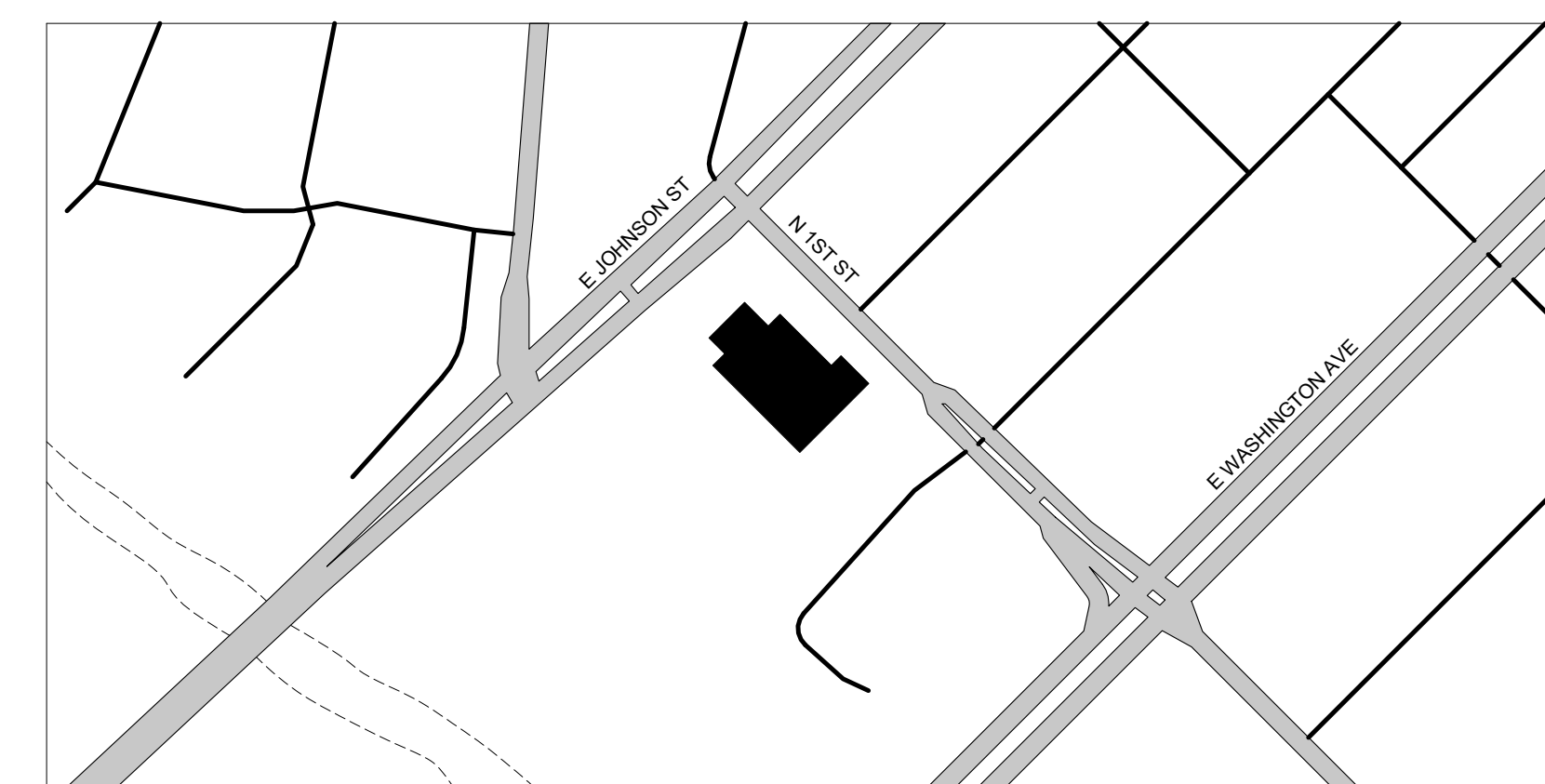
202 N First St, Madison, WI 53704

Contract No.: 8595

MUNIS No.: 10069



SMT NO	SHEET NAME	SMT NO	SHEET NAME	SMT NO	SHEET NAME
0000	COVER	D001	DEMOLITION ELEVATIONS	E600	ELECTRICAL SCHEDULES
G001	ABBREVIATIONS & SYMBOLS	A001	ARCHITECTURAL	E601	ELECTRICAL SCHEDULES
G002	MATERIAL ID REFERENCES	A002	SITE PLAN	E602	ELECTRICAL SCHEDULES
G003	TYPES AND SYSTEMS	A101	LEVEL 1 & MEZZANINE LEVEL REFERENCE PLANS		
G005	BUILDING CODE SUMMARY	A101N	LEVEL 1 - NORTH		
G006	SUSTAINABILITY METRICS	A101S	LEVEL 1 - SOUTH		
		A102N	MEZZANINE LEVEL - NORTH		
		A102S	MEZZANINE LEVEL - SOUTH		
		A103	ROOF PLAN		
		A103N	ROOF PLAN - NORTH		
		A103S	ROOF PLAN - SOUTH		
		A110	LEVEL 1 - CANOPY STEEL PLAN		
		A121	LEVEL 1 & MEZZANINE REFERENCE REFLECTED CEILING PLANS		
		A121N	LEVEL 1 REFLECTED CEILING PLAN - NORTH		
		A121S	LEVEL 1 REFLECTED CEILING PLAN - SOUTH		
		A122N	MEZZANINE LEVEL REFLECTED CEILING PLAN NORTH		
		A122S	MEZZANINE LEVEL REFLECTED CEILING PLAN SOUTH		
		A151	TOILET ROOM PLANS AND ELEVATIONS		
		A152	TOILET ROOM PLANS AND ELEVATIONS		
		A161	ENLARGED PLANS - VESTIBULES		
		A162	ENLARGED PLANS - STORAGE		
		A201	BUILDING ELEVATIONS		
		A251	BUILDING SECTIONS		
		A301	EXT. WALL SECTIONS		
		A302	EXT. WALL SECTIONS		
		A331	EXTERIOR DETAILS		
		A332	EXTERIOR DETAILS		
		A333	EXTERIOR DETAILS		
		A401	TRASH AND COOKING AREA - PLANS AND ELEVATIONS		
		A402	TRASH AND COOKING AREA - SECTIONS AND DETAILS		
		A404	ANNULARY BUILDING		
		A461	VERTICAL CIRCULATION - STAIR A & PLATFORM LADDERS		
		A462	VERTICAL CIRCULATION - STAIR B		
		A463	VERTICAL CIRCULATION - ELEVATOR PLANS SECTIONS AND DETAILS		
		A464	VERTICAL CIRCULATION - STAIR DETAILS		
		A501	INTERIOR ELEVATIONS - ENTRY HALL		
		A502	INTERIOR ELEVATIONS - MAIN HALL		
		A503	INTERIOR ELEVATIONS - SOUTH HALL		
		A504	INTERIOR ELEVATIONS - SOUTH HALL AND LOWER MEZZANINE		
		A505	INTERIOR ELEVATIONS - STORAGE		
		A521	INTERIOR PATTERNS		
		A531	INTERIOR CANOPY SECTIONS		
		A532	INTERIOR CANOPY SECTIONS		
		A533	INTERIOR CANOPY SECTIONS		
		A534	INTERIOR CANOPY SECTIONS		
		A535	INTERIOR WALL SECTIONS		
		A551	INTERIOR DETAILS		
		A552	INTERIOR DETAILS		
		A553	INTERIOR DETAILS		
		A554	INTERIOR DETAILS		
		A561	INTERIOR PLAN DETAILS		
		A562	INTERIOR PLAN DETAILS		
		A601	DOOR SCHEDULES, TYPES AND DETAILS		
		A651	WINDOW TYPES AND DETAILS		
		A652	WINDOW TYPES AND DETAILS		
		A653	WINDOW TYPES AND DETAILS		
		A701N	LEVEL 1 FINISH PLAN - NORTH		
		A701S	LEVEL 1 FINISH PLAN - SOUTH		
		A702N	MEZZANINE LEVEL FINISH PLAN - NORTH		
		A702S	MEZZANINE LEVEL FINISH PLAN - SOUTH		
		A750	SIGNAGE SCHEDULE AND NOTES		
		A751	SIGNAGE PLANS		
		A752	SIGNAGE ELEVATIONS		
		A801	LEVEL 1 & MEZZANINE MILLWORK REFERENCE PLANS		
		A802	ENLARGED MILLWORK PLANS		
		A851	MILLWORK ELEVATIONS		
		A852	MILLWORK ELEVATIONS		
		A853	MILLWORK SECTIONS		
		A854	MILLWORK SECTIONS		
		A901N	LEVEL 1 FURNITURE PLAN - NORTH - REFERENCE ONLY		
		A901S	LEVEL 1 FURNITURE PLAN - SOUTH		
		A902S	MEZZANINE LEVEL FURNITURE PLAN - SOUTH		
		ED101N	LEVEL 1 POWER AND SYSTEMS DEMOLITION PLAN - NORTH		
		ED101S	LEVEL 1 POWER AND SYSTEMS DEMOLITION PLAN - SOUTH		
		ED102	MEZZANINE LEVEL POWER AND SYSTEMS DEMOLITION PLAN		
		ELECTRICAL - ARCHITECTURAL LIGHTING			
		EL001	LIGHTING COVER SHEET		
		EL002	LUMINAIRE SCHEDULES		
		EL003	LIGHTING CONTROLS SHEET		
		EL100	SITE LIGHTING PLAN		
		EL101	SITE PHOTOMETRIC PLAN		
		EL102	EXTERIOR LUMINAIRE SCHEDULE AND CUTS		
		EL103	EXTERIOR LUMINAIRE CUTS		
		EL121N	LEVEL 1 LIGHTING PLAN - NORTH		
		EL121S	LEVEL 1 LIGHTING PLAN - SOUTH		
		EL122N	LEVEL 2 LIGHTING PLAN - NORTH		
		EL122S	LEVEL 2 LIGHTING PLAN - SOUTH		
		ELECTRICAL			
		E000	ELECTRICAL NOTES, LEGENDS & ABBREVIATIONS		
		E100	ELECTRICAL SITE PLAN		
		E101N	LEVEL 1 POWER AND SYSTEMS PLAN - NORTH		
		E101S	LEVEL 1 POWER AND SYSTEMS PLAN - SOUTH		
		E102N	MEZZANINE LEVEL POWER AND SYSTEM PLAN - NORTH		
		E102S	MEZZANINE LEVEL POWER AND SYSTEM PLAN - SOUTH		
		E103	ROOF POWER AND SYSTEMS PLAN		
		E111N	LEVEL 1 LIGHTING POWER PLAN - NORTH		
		E111S	LEVEL 1 LIGHTING POWER PLAN - SOUTH		
		E112N	LEVEL 2 LIGHTING POWER PLAN - NORTH		
		E112S	LEVEL 2 LIGHTING POWER PLAN - SOUTH		
		E201N	LEVEL 1 FIRE DETECTION PLAN - NORTH		
		E201S	LEVEL 1 - FIRE DETECTION PLAN - SOUTH		
		E202S	MEZZANINE LEVEL FIRE DETECTION PLAN - SOUTH		
		E401	ENLARGED ELECTRICAL PLANS		
		E501	ELECTRICAL ONE-LINE DIAGRAM		
		E502	ELECTRICAL DETAILS		
		E600	ELECTRICAL SCHEDULES		
		E601	ELECTRICAL SCHEDULES		
		E602	ELECTRICAL SCHEDULES		
		MECHANICAL DEMOLITION			
		MD101N	LEVEL 1 MECHANICAL DEMOLITION - NORTH		
		MD101S	LEVEL 1 MECHANICAL DEMOLITION - SOUTH		
		MD102N	MEZZANINE LEVEL MECHANICAL DEMOLITION - NORTH		
		MD102S	MEZZANINE MECHANICAL DEMOLITION - SOUTH		
		MD103N	ROOF MECHANICAL DEMOLITION - NORTH		
		MD103S	ROOF MECHANICAL DEMOLITION - SOUTH		
		MECHANICAL			
		M001	MECHANICAL NOTES, LEGENDS & ABBREVIATIONS		
		M101N	LEVEL 1 MECHANICAL DUCTWORK - NORTH		
		M101S	LEVEL 1 MECHANICAL DUCTWORK - SOUTH		
		M102N	MEZZANINE MECHANICAL DUCTWORK - NORTH		
		M102S	MEZZANINE MECHANICAL DUCTWORK - SOUTH		
		M201N	LEVEL 1 MECHANICAL PIPING - NORTH		
		M201S	LEVEL 1 MECHANICAL PIPING - SOUTH		
		M202N	MEZZANINE MECHANICAL PIPING - NORTH		
		M202S	MEZZANINE MECHANICAL PIPING - SOUTH		
		M303N	ROOF MECHANICAL - NORTH		
		M303S	ROOF MECHANICAL - SOUTH		
		M401	ENLARGED MECHANICAL PLANS		
		M402	MECHANICAL SECTIONS		
		M403	MECHANICAL SECTIONS		
		M501	MECHANICAL DETAILS		
		M502	MECHANICAL DETAILS		
		M601	MECHANICAL SCHEDULES		
		M602	MECHANICAL SCHEDULES		
		M603	MECHANICAL SCHEDULES		
		M701	MECHANICAL SCHEMATICS		
		M702	MECHANICAL SCHEMATICS		
		M703	MECHANICAL SCHEMATICS		
		PLUMBING DEMOLITION			
		PD100N	LEVEL 1 PLUMBING BELOW GRADE DEMOLITION - NORTH		
		PD100S	LEVEL 1 PLUMBING BELOW GRADE DEMOLITION - SOUTH		
		PD101N	LEVEL 1 PLUMBING ABOVE GRADE DEMOLITION - NORTH		
		PD101S	LEVEL 1 PLUMBING ABOVE GRADE DEMOLITION - SOUTH		
		PD102N	MEZZANINE PLUMBING DEMOLITION - NORTH		
		PD102S	MEZZANINE PLUMBING DEMOLITION - SOUTH		
		PD103N	ROOF PLUMBING DEMOLITION - NORTH		
		PD103S	ROOF PLUMBING DEMOLITION - SOUTH		
		PLUMBING			
		P001	PLUMBING LEGENDS, SYMBOLS & ABBREVIATIONS		
		P101	PLUMBING SITE PLAN		
		P100N	LEVEL 1 PLUMBING BELOW GRADE - NORTH		
		P100S	LEVEL 1 PLUMBING BELOW GRADE - SOUTH		
		P101N	LEVEL 1 PLUMBING ABOVE GRADE - NORTH		
		P101S	LEVEL 1 PLUMBING ABOVE GRADE - SOUTH		
		P102N	MEZZANINE PLUMBING - NORTH		
		P102S	MEZZANINE PLUMBING - SOUTH		
		P103N	ROOF PLUMBING - NORTH		
		P103S	ROOF PLUMBING - SOUTH		
		P401	ENLARGED PLUMBING PLANS		
		P501	PLUMBING DETAILS		
		P601	PLUMBING SCHEDULES		
		P602	PLUMBING SCHEDULES		
		P701	PLUMBING SANITARY ISOMETRICS		
		P702	PLUMBING STORM ISOMETRICS		
		P703	PLUMBING WATER SUPPLY ISOMETRICS		
		FIRE PROTECTION DEMOLITION			
		FD101N	LEVEL 1 DEMOLITION - FIRE PROTECTION - NORTH		
		FD101S	LEVEL 1 DEMOLITION - FIRE PROTECTION - SOUTH		
		FD102N	MEZZANINE DEMOLITION - FIRE PROTECTION - NORTH		
		FD102S	MEZZANINE DEMOLITION - FIRE PROTECTION - SOUTH		
		FIRE PROTECTION			
		F000	FIRE PROTECTION COVER SHEET		
		F101N	LEVEL 1 - FIRE PROTECTION - NORTH		
		F101S	LEVEL 1 - FIRE PROTECTION - SOUTH		
		F102N	MEZZANINE LEVEL - FIRE PROTECTION - NORTH		
		F102S	MEZZANINE LEVEL - FIRE PROTECTION - SOUTH		
		F200	FIRE PROTECTION DETAILS AND SCHEDULES		
		TECHNOLOGY			
		T000	TECHNOLOGY COVER SHEET		
		T001	SITE PLAN - TECHNOLOGY		
		T101N	LEVEL 1 - TECHNOLOGY - NORTH		
		T101S	LEVEL 1 - TECHNOLOGY - SOUTH		
		T102N	MEZZANINE LEVEL - TECHNOLOGY - NORTH		
		T102S	MEZZANINE LEVEL - TECHNOLOGY - SOUTH		
		T300	TECHNOLOGY DETAILS		
		T400	TECHNOLOGY RISERS AND SCHEDULES		
		T500	TECHNOLOGY SCHEDULES		
		FOOD SERVICE			
		FS101	FOOD SERVICE EQUIPMENT PLAN		
		FS201	ELECTRICAL ROUGH-INS		
		FS301	PLUMBING ROUGH-INS		
		FS401	SPECIAL CONDITIONS PLAN		
		FS501	FOOD SERVICE ELEVATIONS		



1 VICINITY MAP  
G000 NOT TO SCALE

Architecture and Interiors

**MSRDesign**  
510 Marquette Avenue South, Suite 200  
Minneapolis, MN 55402 | 612. 375. 0336

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Landscape Architect

**Ken Saiki Design**  
1110 S. Park St.  
Madison, WI 53715 | 608. 251. 3600

Structural Engineering,  
Fire Protection Engineering, Technology and AV

**IMEG Corporation, Inc.**  
1800 Dering Way, Suite 200,  
Madison, WI 53562

Lighting Design

**Mazzetti, Inc.**  
1999 Broadway, Suite 2205,  
Denver, CO 80202 | 720. 644. 5044

Commercial Kitchen Design

**Boelter Premier**  
7120 Northland Terrace,  
Minneapolis, MN 55428 | 763. 544. 8800

PUBLIC IMPROVEMENT PROJECT APPROVED:	PUBLIC IMPROVEMENT DESIGN APPROVED BY:
RES-XX-00XXXX	CITY ENGINEER
FILE ID XXXXXX	MONTH DAY, YEAR
DATE- MONTH DAY, YEAR	DATE
BY THE COMMON COUNCIL OF MADISON, WI	

**MATERIAL / ID LIST NOTES**

- INFORMATION IN SCHEDULE IS FOR REFERENCE ONLY. INFORMATION IS SUMMARY AND NOT COMPLETE. REFER TO PROJECT MANUAL FOR FULL SPECIFICATION INFORMATION FOR ALL MATERIALS AND PRODUCTS.
- INFORMATION IN PROJECT MANUAL SPECIFICATIONS SHALL SUPERCEDE INFORMATION IN THIS SCHEDULE IN THE EVENT OF ANY DISCREPANCIES. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING ALL TRADES REFER TO FULL SPECIFICATIONS IN PROJECT MANUAL.
- THIS SCHEDULE INCLUDES OWNER PROVIDED EQUIPMENT - REFER TO EQUIPMENT LIST IN PROJECT MANUAL.

ID	DESCRIPTION	SPEC SECTION	Spec Data
ACPN-1	RIGID BOARD ACOUSTIC INSULATION	097500	MFR: OWENS CORNING MODEL: SELECT SOUND BLACK ACOUSTIC BOARD THICKNESS: 5/8"
ACRYLIC-1	SOLID ACRYLIC PANEL	066113	MFR: FLUZZ POLYGLAC STYLE: SOLID ACRYLIC SHEET; CAPACITY: 500 LB. COLOR: CLEAR (FLM-1) THICKNESS: 10MM NOTE: PROVIDE MANUF'S STANDARD EDGE TRIM AND COMPATIBLE DUAL CHANNEL CONNECTOR FOR JOINTS.
ACRYLIC-2A	ACRYLIC SIGNAGE	10 14 23	MFR: ENCOMPASS; STYLE: ECO-PRESS ACRYLIC ; GAUGE: 1/8" THICK; PAINTED TO MATCH PT. A; NOTE: SEE SIGNAGE SHEETS AND DETAILS.
ACRYLIC-2B	ACRYLIC SIGNAGE	10 14 23	MFR: ENCOMPASS; STYLE: ECO-PRESS ACRYLIC ; GAUGE: 1/8" THICK; PAINTED TO MATCH PT. B; NOTE: SEE SIGNAGE SHEETS AND DETAILS.
ACRYLIC-3A	ADA RAISED LETTERING AND BRAILLE	10 14 23	MFR: DESIGNER SIGN; STYLE: STANDARD TEXT AND BACKGROUND ADA COLORS; COLOR: 31143 CNDR; NOTE: SEE SIGNAGE DETAILS.
ACRYLIC-3B	ADA RAISED LETTERING AND BRAILLE	10 14 23	MFR: DESIGNER SIGN; STYLE: STANDARD TEXT AND BACKGROUND ADA COLORS; COLOR: 3X1-305 LIGHT GREY; NOTE: SEE SIGNAGE DETAILS.
ACTU-1	DOOR ACTUATOR	087100	MFR: BEA; STYLE: 36 inch full length actuator; MODEL: 1107; COLOR: CLEAR COAT STAINLESS STEEL.
ACTU-2	DOOR ACTUATOR	087100	MFR: BEA; STYLE: 4.75 inch actuator; NOTE: 4.75 IN SQUARE PUSH PLATE; COLOR: CLEAR COAT STAINLESS STEEL.
ALUM-1	ALUMINUM SPANDREL PANEL	084413	MFR: FRY REGLET; STYLE: DA-1 RECESSED PICTURE HANGING SYSTEM; COLOR: MATCH WALL; ACCESSORIES: DRIM-50, QTY (20).
ART-1	PICTURE HANGER REVEAL	092900	MFR: FRY REGLET; STYLE: DA-1 RECESSED PICTURE HANGING SYSTEM; COLOR: MATCH WALL; ACCESSORIES: DRIM-50, QTY (20).
BAFL-1	ACOUSTIC CEILING BAFFLE	098436	MFR: TURF; STYLE: 1/2" Thick Large; COLOR: 04 Light Grey; GAUGE: 1/2"
BALE-1	LOW HEADROOM CARDBOARD BALER	EQUIPMENT	MFR: BAKER; STYLE: 1/2" VERTICAL BALER BASIS OF DESIGN: MANUF: BRAMAND; MODEL: 225 FINISH: SUBMIT MANUF'S STANDARD COLOR CHART FOR SELECTION. DIMENSIONS: 69"X X 50" D X 79" H; BALE SIZE: 18" X 30" X 30" H; POWER: 200/230/480V 3-PHASE
BIN-1	WASTE COLLECTION CART	EQUIPMENT	OWNER PROVIDED EQUIPMENT BASIS OF DESIGN; MFR: GLOBAL INDUSTRIAL STYLE: DELUXE BLUE PLASTIC RECYCLING TILT TRUCK; CAPACITY: 1/2 CUBIC YARD - 750LB; COLOR: GRAY
BIN-2	RECYCLING COLLECTION CART	EQUIPMENT	OWNER PROVIDED EQUIPMENT BASIS OF DESIGN; MFR: GLOBAL INDUSTRIAL STYLE: DELUXE BLUE PLASTIC RECYCLING TILT TRUCK; CAPACITY: 1/2 CUBIC YARD - 750LB; COLOR: GRAY
BOLL-1	LIFT-1 MANUF'S BUMPER POST	111319	MFR: Type info here and keep semicolon at end. COLOR: Type info here and keep semicolon at end.
BOLL-2	STEEL BOLLARD WITH CONCRETE FILL	055000	MFR: Type info here and keep semicolon at end. COLOR: Type info here and keep semicolon at end.
BOLT-1	HEAVY-DUTY CANE BOLT	060520	MFR: ABBEY TRADING; MODEL: ABB-520-300-GRABBOLE-01; SIZE: 1/2" MATERIAL: STEEL WITH CONCRETE INFILL; INSTALL: REFERRED.
BRKT-1	WALL BRACKET	064023	MFR: MCKEET; MODEL: SW54B - 21 MEDIUM BASIC WORK SURFACE SUPPORT; COLOR: 01 LINE WHITE; FINISH: BRUSH (92)
CMU-1	CONCRETE MASONRY UNIT	042000	CONCRETE MASONRY UNIT IN SIZES AND CONFIGURATION AS INDICATED ON DRAWINGS. REFERENCE SPECIFICATIONS.
CMU-2A	GLAZED BLOCK (CMU)	042000	MFR: Spectra Glaze; PRODUCT: 4" GLAZED BLOCK - SINGLE SIDE; MODEL: 4S COLOR: LT OIVE NOMINAL SIZE: 4"X X 8"X X 16"
CMU-2B	GLAZED BLOCK COVERED BASE (CMU)	042000	MFR: Spectra Glaze; PRODUCT: 4" GLAZED BLOCK - SINGLE SIDED WITH COVE BASE; MODEL: 4G COLOR: LT OIVE NOMINAL SIZE: 4"X X 8"X X 16"
CMU-2C	GLAZED BLOCK COVERED BASE CAP (CMU)	042000	MFR: Spectra Glaze; PRODUCT: 4" GLAZED BLOCK - SINGLE SIDED WITH COVE BASE; MODEL: 4CCO COLOR: LT OIVE NOMINAL SIZE: 4"X X 8"X X 16"
CMU-2D	GLAZED BLOCK EDGE CAP (CMU)	042000	MFR: Spectra Glaze; PRODUCT: 4" GLAZED BLOCK - SINGLE SIDED WITH COVE BASE; MODEL: 4CCO COLOR: LT OIVE NOMINAL SIZE: 4"X X 8"X X 16"
CMU-2E	GLAZED BLOCK DOUBLE SIDED (CMU)	042000	MFR: Spectra Glaze; PRODUCT: 4" GLAZED BLOCK - SINGLE SIDED WITH COVE BASE; MODEL: 4ST COLOR: DP OIVE NOMINAL SIZE: 4"X X 8"X X 16"
CMU-3	CONCRETE MASONRY UNIT (CMU) - SOLID	042000	SOLID CONCRETE MASONRY UNIT IN SIZES AND CONFIGURATIONS AS SHOWN IN DRAWINGS. REFER TO SPECIFICATIONS.
CNYP-1	CANOPY	084413	MFR: CIVALL-1 MFR; MODEL: SO 89-GL COMPRESSION STRENGTH: 20 PSI MINIMUM; REINFORCING: BLACK GLASS REINFORCED MAT LAMINATED; R-VALUE: 10.0 MINIMUM
COAT-1A	ARCHITECTURAL COATING	072419	MFR: DRIVVT; STYLE: WEAR-ELASTIC - SAND/PEBBLE; APPLICATION: SPRAY OR BRUSH APPLIED; COLOR: RB 708.77; COLOR: RAL 7047.
COAT-1B	ARCHITECTURAL COATING	072419	MFR: DRIVVT; STYLE: WEAR-ELASTIC - SAND/PEBBLE; APPLICATION: SPRAY OR BRUSH APPLIED; COLOR: RB 708.77; COLOR: RAL 7047.
COAT-2	ELASTOMERIC ARCHITECTURAL COATING AND RESTORATION	099853	MFR: DRIVVT; STYLE: WEAR-ELASTIC - SAND/PEBBLE; APPLICATION: TROWEL-APPLIED; COLOR: WHITE
COL-1	OVERHEAD COLING DOOR	083323	MFR: RAYNOR; STYLE: DRASHUTTER; SLATS: FLAT (FF) FINISH: ARMOR BRITTE POWDERCOAT, COLOR: TBO; MFR: RAYNOR; STYLE: DURASHUTTER; MODEL: CP CONSTRUCTION: 22 GA STEEL, FLAT PROFILE, SLIP-IN OPERATION CRANK
COL-2	OVERHEAD COLING SHUTTER	083313	MFR: RAYNOR; STYLE: DURASHUTTER; CONSTRUCTION: 22 GA STEEL, FLAT PROFILE, SLIP-IN OPERATION CRANK
COL-3	OVERHEAD COLING GRILLE	08 33 28	MFR: RAYNOR; STYLE: DURASHUTTER; OPERATION MANUAL; FINISH: CLEAR ANODIZED; MOUNT: FACEMOUNT; GRILLE PATTERN: GRID STRAIGHT PATTERN;
CONC-1	SEALED GASH IN PLACE CONCRETE	096723 / 033543	EXISTING CONCRETE SLABS WITH FINISHES AS INDICATED ON DRAWINGS - REFER TO SPECIFICATIONS
CONC-2	POLISHED CONCRETE	033543	EXISTING CONCRETE SLABS WITH VARIOUS NEW FINISHES AS DESCRIBED IN DRAWINGS. REFERENCE SPECIFICATIONS
COR-1	TACKABLE WALL PANEL	101100	MFR: FORMER; PRODUCT: BULLETIN BOARD; COLOR: BLACK OIVE; CONTENT: cork, inseed oil, glue; THICKNESS: 6.0 mm; ROLL DIMENSIONS: 1.22 m X 2.28 m; RECYCLED CONTENT: 43%
CPT-1	WALK OFF CARPET TILE	096813	MFR: MOHWAK; STYLE: First Step II, GT315QL315; COLOR: 989 OIBSDAN.
CPT-2	CARPET TILE	096813	MFR: Interface; STYLE: Step Up; INSTALL: Adher. COLOR: 100335 Coat.
CT-1	CERAMIC WALL TILE	093013	MFR: Nemo; STYLE: Seta; COLOR: 10 OIVE; SIZE: 12"x12".
CT-2	CERAMIC WALL TILE	093013	MFR: Freckley Tile; STYLE: Pinks; SIZE: 9-13/16" x 3-3/4" COLOR: Serice Glass (V3) BODY: Recycled Clay INSTALL: Pattern: Best
OWALL-1	GLAZED ALUMINUM CURTAIN WALL SYSTEM	084413	MFR: KAWNEER ALUMINUM CURTAINWALL SYSTEM; MODEL: 180 WALL SYSTEM 1; COLOR: BLACK ANODIZED
DM-1	DRAINAGE MAT	071416	MFR: HENRY CO. PRODUCT: 180 ANODIZED
DUMP-1	SELF COMPACTING DUMPSTER	EQUIPMENT	OWNER PROVIDED EQUIPMENT;
EFS-1	EXTERIOR INSULATION AND FINISH SYSTEMS	072419	MFR: DRIVVT; REINFORCING MESH: PANZER MEZH 20 02; WEATHER BARRIER: BACKSTOP N-VB SPRAY; BASE COAT: DRIVVT; TOP COAT: DEMANDOT; COLOR: PER ELEVATIONS
EFS-2	EXTERIOR INSULATION AND FINISH SYSTEMS	072419	MFR: DRIVVT; STYLE: NONMENTIONICIOUS BASE COAT (NCR); COLOR: PER ELEVATIONS; TEXTURE: FREESTYLE.

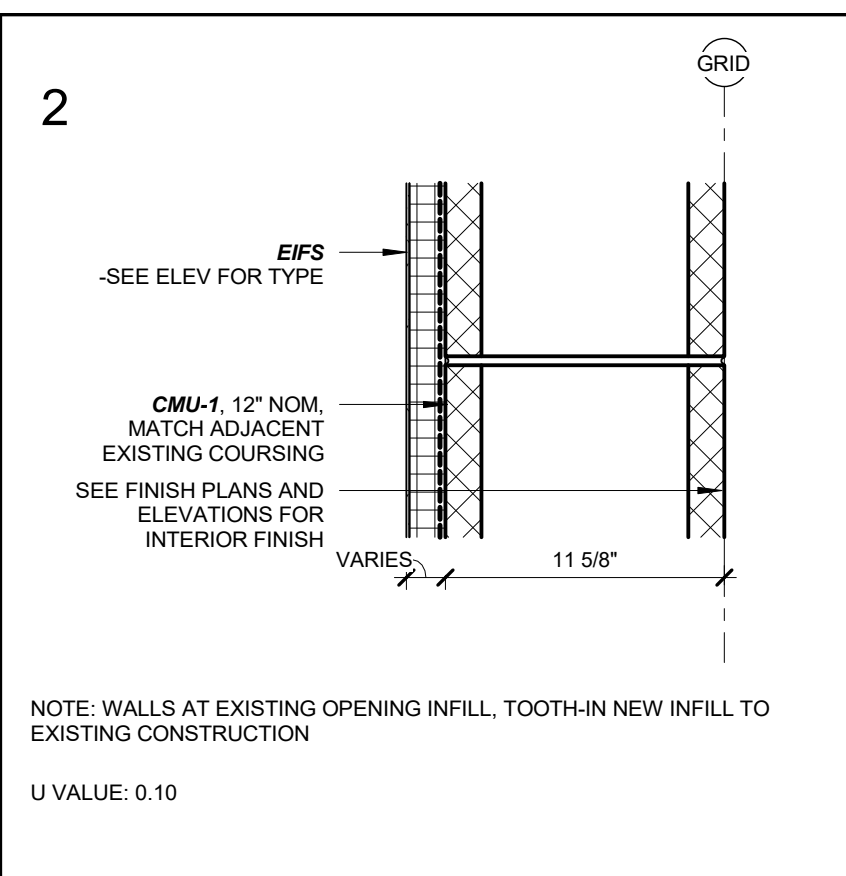
ID	DESCRIPTION	SPEC SECTION	Spec Data
ELEV-1	PUBLIC / SERVICE ELEVATOR	142400	MFR: THYSSENKRUPP; MODEL: ENDURAM MR; THICKNESS: ABOVE GROUND, 1-STAGE; SPEED: 80 FPM; COLOR: 5000 LB OPENINGS: FRONT & REAR ALIGNED; DOOR TYPE: 4-1/2" TWOSPEED, RH LH WALL/ENTRY FINISH: #4 BRUSHED STAINLESS STEEL; CEILING: METAL PAN DOWNLIGHT; ACCESSORY: * FLAT BAR HANDRAIL.
EPOXY-1	RESINOUS FLOORING	096723	MFR: SHERWIN WILLIAMS; MODEL: RESURLO MPE PT 1 & RESULTIE HTS 100 (SATIN); COLOR: TO MATCH EXISTING EPOXY FLOORING.*
FE-1	FIRE EXTINGUISHER CABINET - SURFACE MOUNTED	104416	MFR: PRODUCT: SURFACE-MOUNTED FIRE EXTINGUISHER CABINET; MATERIALS: STEEL;
FE-2	FIRE EXTINGUISHER CABINET - SEMI RECESSED	104416	MFR: PRODUCT: SEMI-RECESSED FIRE EXTINGUISHER CABINET; MATERIALS: STEEL;
FENCE-1	METAL FENCES AND GATES	323119	MFR: EAGLE DESIGN GALVANIZED METAL FENCE; TOP STYLE: LETTERING TOP PICKET; HEIGHT: 8'-0"; COLOR: BLACK; GATES: DOUBLE CANILEVER, SINGLE CANTILEVER, AND SINGLE SWING, MANUAL OPERATION.
FENCE-2	CHAIN LINK FENCE AND GATES	323113	MFR: AMERICAN FENCE CO. PRODUCT: VINYL-COATED CHAIN LINK FENCE; COLOR: BLACK; ACCESSORIES: BLACK PRIVACY SLATS THROUGHOUT, BLACK COVER CAPS GATES: DOUBLE & SINGLE CANTILEVER, MANUAL OPERATION, PRIVACY SLATS.
FILM-1	PVC-FREE VINYL FILM	086313	PRODUCT: ALKALIPHATIC SMOOTH ; APPLICATION: VERTICAL; COLOR: WHITE TYPE: ALUMINUM FOIL BASE MEDIA LOCATIONS: ON GLASS AS INDICATED IN DRAWINGS.
FLASH-1	ALUMINUM BRAKE FRAMED FLASHING- PREFINISHED	076200	COLOR: TO MATCH C/WALL-ALUM FRAME;
FLASH-2A	GALVANIZED STEEL BRAKE FORMED FLASHING- PREFINISHED	076200	COLOR: TO MATCH C/WALL-ALUM FRAME;
FLASH-2B	GALVANIZED STEEL BRAKE FORMED SHEET- PREFINISHED	076200	COLOR: TO MATCH C/WALL-ALUM FRAME;
GL-1	1" INSULATED GLASS UNIT	088000	MFR: OLDCASTLE; STYLE: SOLARBAR 60; COLOR: CLEAR + CLEAR; SPACER COLOR: BLACK; TEMPERED: YES, BOTH LITES
GL-2	1" INSULATED GLASS UNIT WITH TEMPERED LITE	088000	MFR: OLDCASTLE; STYLE: SOLARBAR 60 STARPHIRE; COLOR: CLEAR + CLEAR; SPACER COLOR: BLACK; TEMPERED: BOTH LITES
GL-3	1" INSULATED GLASS UNIT LAMINATED AND TEMPERED	088000	MFR: OLDCASTLE; STYLE: SOLARBAR 60 STARPHIRE; COLOR: CLEAR + CLEAR; SPACER COLOR: BLACK; TEMPERED: BOTH LITES
GL-4	1/4" CLEAR FULLY TEMPERED GLASS	088000	MONOLITHIC GLASS IN THICKNESSES AS RECD FOR CONFIGURATIONS SHOWN IN DRAWINGS. REFER TO SPECIFICATIONS.
GUARD-1	WALL MOUNTED STAINLESS STEEL CRASH RAIL	102600	MFR: WALLGUARD COM; MODEL: LATTICE 2162; COLOR: STAINLESS STEEL; SIZE: 1 1/2" X 3 1/2" NOTE: PROVIDE MANUFACTURER'S STANDARD WALL BRACKETS AND FINISH CAPS
GUARD-2	FLOOR MOUNTED STAINLESS STEEL CRASH RAIL	102600	MFR: WALLGUARD COM; MODEL: LATTICE 2162; COLOR: STAINLESS STEEL; SIZE: 1 1/2" X 3 1/2" NOTE: PROVIDE MANUFACTURER'S STANDARD WALL BRACKETS AND FINISH CAPS
GUARD-3	CORNER GUARD	102600	MFR: KOTLER STEEL CORNER GUARD; A674; STYLE: Stainless Steel
GUARD-4	CORNER GUARD	102600	MFR: AJOVA; STYLE: Flush Mount Bobased Polymer End Wall COLOR: 01 Line White
GWB-1	Gypsum Wall Board - 5/8" PT	092900	Gypsum Wall Board, 5/8" UNLESS NOTED OTHERWISE
GWB-2	Gypsum Wall Board - Type 'X' - 5/8"	092900	Gypsum Wall Board, 5/8" UNLESS NOTED OTHERWISE
GWB-3	1/2" CEEMENT BOARD	092900	1/2" CEEMENT BOARD
HATCH-1	ROOFTOP HATCH	077200	MFR: PERSONEL II ROOF HATCH; MODEL: BASIS
HINGE-1	CONTINUOUS STEEL HINGE	060600	MFR: MONROE PUMP; PRODUCT: HEAVY DUTY CONTINUOUS HINGE, NO HOLES; MATERIAL: STEEL; LENGTH: 84"
INSUL-1	FIBERGLASS BATT INSULATION	072100	MFR: OWENS CORNING; PRODUCT: ECO TOUCH UNFACED FIBERGLASS BATT INSULATION;
INSUL-2	EXTRUDED POLYSTYRENE BOARD INSULATION	072100	MFR: DOW CHEMICAL; THICKNESS AS DESCRIBED IN DRAWINGS TYPE: TYPE IV, 20 PSI FOR EXTERIOR WALL CAVITY
INSUL-3A	POLYISOCYANURATE FINISHED BOARD INSULATION	072100	MFR: DOW CHEMICAL; THICKNESS AS DESCRIBED IN DRAWINGS TYPE: TYPE IV, 20 PSI FOR EXTERIOR WALL CAVITY
INSUL-3B	PLYWOOD FACED INSULATED PANEL	072100	MFR: HUNTER PANELS; PRODUCT: XLI PLY; THICKNESS: 2 1/2" R-VALUE: 13.1; INSTALLATION: OVER CMU SUBSTRATE - PROVIDE OWNER'S STANDARD FASTENERS AND FASTEN PER STANDARD INSTALLATION INSTRUCTIONS FOR CMU SUBSTRATE
INSUL-4	POLYISOCYANURATE BOARD INSULATION	075323	MFR: FRESTONE; MODEL: SO 89-GL COMPRESSION STRENGTH: 20 PSI MINIMUM; REINFORCING: BLACK GLASS REINFORCED MAT LAMINATED; R-VALUE: 10.0 MINIMUM
INSUL-5	BELOW GRADE EXTRUDED POLYSTYRENE BOARD INSULATION	072100	MFR: DOW CHEMICAL; THICKNESS AS DESCRIBED IN DRAWINGS; TYPE: TYPE IV, 20 PSI FOR EXTERIOR WALL CAVITY FOR USE BELOW GRADE
INSUL-6	STONE WOOL FIRESTOPPING	072100	R-VALUE: 3 INCH; THICKNESS AS REQ'D PER DRAWINGS; FIRE PERFORMANCE: ASTM E 138; CANAL DETECTION RAL FABRICATED FROM STANARD STEEL SHAPES
INSUL-7	STONE WOOL INSULATION	072100	CANAL DETECTION RAL FABRICATED FROM STANARD STEEL SHAPES
INSUL-8	SEMI-RIGID STONE WOOL INSULATION	072100	CANAL DETECTION RAL FABRICATED FROM STANARD STEEL SHAPES
JOINT-1	MILLWORK TRIM ANGLE	092900	MFR: FRY REGLET OR APPROVED EQUAL ALTERNATE; STYLE: MWRL10; COLOR: BLACK
JOINT-2	DRYWALL SLIP JOINT	092900	MFR: CLARK DIERICH OR APPROVED EQUAL ALTERNATE; STYLE: 1/2" REVEAL DRYWALL SLIP JOINT; PRODUCT: 4088-50 COLOR: BLACK
JOINT-3	DRYWALL CHANNEL REVEAL BEAD	092900	MFR: FRY REGLET OR APPROVED EQUAL ALTERNATE; STYLE: MWRL10; COLOR: BLACK
JOINT-4	DRYWALL Z REVEAL BEAD	092900	MFR: FRY REGLET OR APPROVED EQUAL ALTERNATE; STYLE: MWRL10; COLOR: BLACK
LIFT-1	PT RECESSED SCISSOR LIFT	111319	MFR: KELLEY; PRODUCT: 1 1/2" DIA SCISSOR STEEL HANDRAIL; CONFIGURATION: AS INDICATED ON DRAWINGS. PROVIDE IN CONFIGURED AND WITH BRACKETS AS REQ'D; CONSTRUCTION: RETURN ENDS TO GUARDRAILS AS INDICATED ON DRAWINGS. ALL JOINTS AND CONNECTIONS TO BE FULLY WELDED - GRIND WELD SMOOTH.
LINO-1	LINOLEUM - MILLWORK	064120	MFR: Fyroc; STYLE: Furniture Linoleum; COLOR: 4184 Oive;
LOCK-1A	OWNER PROVIDED VENDOR PERSONAL ITEMS LOCKER	EQUIPMENT	MFR: FORMER; STYLE: PHENOLIC Z-TIER US-STYLE LOCKER WITH BENCH; COLOR: Black; LOCK: Foreman Hasp; SIZE: 12"x12"x20"; NOTE: With coordinating sloped top attachment, typ.
LOCK-1B	VENDOR PERSONAL ITEMS LOCKER	EQUIPMENT	MFR: FORMER; STYLE: PHENOLIC Z-TIER US-STYLE LOCKER; COLOR: Black; LOCK: Foreman Hasp; SIZE: 12"x12"x20"; NOTE: With coordinating sloped top attachment, typ.
LOUV-1	ARCHITECTURAL EXTERIOR LOUVER	089100	MFR: Interface; TYPE: DRAINABLE BLADES WITH HEAVY CHANNEL FRAME AND IRRO SCREEN; FINISH: Z COAT 70% PDVF OR EQUAL; MOUNTING: FINISH WITH EXTERIOR FLAT FLANGE FOR INSTALLATION
MA-1A	WASTE BASKET WITH DOLLY	064100	MFR: RUBERMAN; STYLE: VENTED SLJM JMB8 29 GA SKU: FG345006LA DOLLY: SLJM JMB8 29 GA SKU: FG345006LA COLOR: Black;
MA-1B	WASTE BASKET WO DOLLY	064100	MFR: RUBERMAN; STYLE: VENTED SLJM JMB8 29 GA SKU: FG345006LA MODEL: H4154;
MA-2	PULL HANDLE	064100	MFR: Richelieu; STYLE: Contemporary Metal Pull P288; PRODUCT: BPC288(8490); COLOR: Matte Black
MA-3	SHELF STANDARD	064100	MFR: Knape & Vogt; PRODUCT: 1801182 Series, Shelved Slotted Standard, Wall Mounted, OSP, BLK 63; COLOR: Black;
MA-4	SHELF STANDARD BRACKET	064100	MANUF: Knape & Vogt; PRODUCT: 1801182 Series, Bracket, 182BP BLK 12.5; COLOR: Black;
MA-6	HEAVY DUTY LOCKING CASTER	064100	MANUF: McMaster-Carr; PRODUCT: Leveling Caster with Nonmarking Black Nylon Wheel DESCRIPTION: 2 1/2" Diameter, Thumbset Adjustment, Black Aluminum Frame
MA-7	RESETTABLE COMBINATION CAM LOCK	064100	MANUF: McAlister-Carr; PRODUCT: Resettable Combination Cam Lock DESCRIPTION: Black Painted Zinc, for 3/8" Maximum Thickness
MA-8	PULL HANDLE	064100	MANUF: Richelieu; PRODUCT: DM4BL; DESCRIPTION: Black NOTE: Can be cut to required length and must be installed using wood screws (not included). No grooves needed;

ID	DESCRIPTION	SPEC SECTION	Spec Data
MA-9	FLATWARE CYLINDER	064100	MANUF: Brown; PRODUCT: Stainless Steel Flatware Cylinder STYLE: 1/2" DIA SIZE: 3/8" dia x 5.5" H
MA-10	FALSE TOE BASE	084100	MANUF: Richelieu; STYLE: 1/2" DIA COLOR: White FINISH: Mill, finish over with RB-1
MA-11	WASTE BASKET SMALL	064100	MANUF: Rubberman; PRODUCT: FCJ12; LIDNER: FGL12 Square Rigid Plastic Liner;
MA-12	GLIDE HARDWARE WITH WASTE BINS	064100	MFR: Knape and Vogt; PRODUCT: P0MTM15-2-35W; ACCESSORY: Include (2) G735PB-NH Waste Bins.
MA-13	ADA SHROUD	064100	MANUF: RAKKS; PRODUCT: CUSTOM ADA COMPLIANT ALUMINUM VANITY BRACKET; SIZE: CUSTOM, SEE MILLWORK SECTION; FINISH: CUSTOM, SEE MILLWORK ELEVATIONS;
MAIL-1	CLUSTER MAILBOX	105000	MFR: Firestorm Mailboxes; STYLE: 40 compliant Cluster Mailbox Parcel Box; PRODUCT: AC4S-2P; COLOR: White; INSTALLATION: Recessed; DOORS: 16 Tenant, 2 Parcel Lockers
MAIL-2	CLUSTER PARCEL MAILBOX	105000	MFR: Firestorm Mailboxes; STYLE: 40 compliant Cluster Mailbox Parcel Box; PRODUCT: AC4S-2P; COLOR: White; INSTALLATION: Recessed; DOORS: 2 Parcel Lockers
MICRO-1	OWNER PROVIDED MICROWAVE	EQUIPMENT	MFR: GE; STYLE: COUNTER TOP MICROWAVE; SKU: JES14589SS; FINISH: BLACK ANODIZED STEEL.
MLPML-1	PERFORATED METAL PANEL	097500	MFR: MONICOLOR; MODEL: PERFORATED METAL SQUARE; PATTERN: 1/2" SQUARE ON 1/2" CENTER, 30% OPEN; MATERIAL: 1696 L218; MATERIAL: CARBON STEEL; GAUGE: 18; FINISH: P7
MLPML-2	WELDED WIRE MESH RAILING INFILL	097300	MFR: MONICOLOR AS APPROVED EQUAL ALTERNATE; PRODUCT: PREFABRICATE RAILING INFILL PANEL; MATERIAL: PROVIDE RAKE, TRANSITION, AND RECTANGULAR PANELS WITH INFILL PRECUT AND ASSEMBLED WITH FINISH AS PER DRAWINGS; INFILL PATTERN: SQUARE 2" X 2" WELDED WIRE MESH; FINISH: SEE DRAWINGS; MODEL: No: 58523000; MATERIAL: CARBON STEEL; COLOR: 10 GA WIRE (130) FINISH: PREFINISHED CUSTOM POWDERCOAT TO MATCH COLOR OF RAIL
MLPML-3	CORRUGATED DECK ROOFING	74113 13	SIZING: STANDARD 1-1/2" DEPTH; SIDE LAP: OVERLAPPING FOR DRAINAGE;
MLPML-4	FLAT LOCK PANEL SYSTEM	076419	MFR: AMERICAD; MODEL: AC-5000; SIZING: FINISH: BLACK ANODIZED, TO MATCH CURTAINWALL.
MLPML-5	PERFORATED METAL PANEL	097500	MFR: MONICOLOR; MODEL: LATTICE 2162; PATTERN: 1/2" SQUARE ON 1 1/16" CENTER, 53% OPEN; MATERIAL: 1696 L218; GAUGE: 12; FINISH: GALVANIZED AND SATE PAINTED;
OVHD-1	OVERHEAD DOOR	083613	MFR: RAYNOR; STYLE: ALUMAVIEW AVO20; COLOR: BLACK ANODIZED FINISH;
OVHD-2	OVERHEAD DOOR	083613	MFR: RAYNOR; STYLE: THERMASEAL TM220; COLOR: BLACK TO MATCH BLACK ANODIZED C/W FRAME; TRACK: LOW HEAD ROOM.
PEG-1	METAL PEG BOARD	083013	MFR: Diamond Lite; STYLE: Pegboard MX, Metal, Custom Size; SIZE: Custom size, see elevation; EDGE: Finished flange by manufacturer; COLOR: Black; MOUNT: With Backing Board;
PEG-2	METAL PEG BOARD	083013	MFR: Diamond Lite; STYLE: Pegboard MX, Metal; COLOR: Black; EDGE: Finished flange by manufacturer; COLOR: Black; MOUNT: With Backing Board;
PNL-1A	WALL PROTECTION PANEL	089123	MFR: AJOVA; STYLE: Sheet Wall Protection, Models WB-40; CONTENT: Bobased, PVC-free Polymer sheet; COLOR: Black
PNL-1B	WALL PROTECTION PANEL	089123	MFR: AJOVA; STYLE: Sheet Wall Protection, Models WB-40; CONTENT: Bobased, PVC-free Polymer sheet; COLOR: Silver Gray
PT-1	ACRYLIC LATEX PAINT, FLAT	099123	MFR: Benjamin Moore; STYLE: Ultra Spec5 500 INTERIOR EGGSHELL FINISH NSB.
PT-2	ACRYLIC LATEX PAINT, EGGSHELL	099123	MFR: Benjamin Moore; STYLE: Type info here and keep semicolon at end. COLOR: Type info here and keep semicolon at end.
PT-3	INT SCRUBBER PAINT	099113	MFR: Scuff-A-Dub; PRODUCT: Scuff-A-Dub Max.
PT-4	TRAFFIC STRIPING FLOOR PAINT	099123	MFR: RUST-OLEUM; STYLE: 2200 Striped Traffic Zone Striping Paint.
PT-5	INTERIOR METAL PAINT	099123	MFR: Benjamin Moore; STYLE: Superior HP DTM Acrylic Semi-Gloss P29.
PT-6	EXTERIOR PAINT - STEEL	099113	MFR: SHERWIN WILLIAMS; PRODUCT: MICROPRAY 1046 MIDCOAT AND PIGMENTED ACRYLON 100 TOPCOAT.
PT-7	BLACKENING FINISH FOR MILD STEEL	099123	MFR: PEACOCK LABORATORIES; PRODUCT: PREBLACKENING; STYLE: TRANSPARENT BLACKENING LAQUER FOR MILD STEEL; COLOR: TRANSPARENT BLACK; APPLICATION: SPRAYED; CONCENTRATION: DILUTE PER MANUFACTURERS APPLICATION INSTRUCTIONS; NOTE: SEE MOCKUP SCHEDULE FOR REQUIRED APPLICATION MOCKUPS
PT-A	PAINT COLOR - EXISTING WHITE	099123	MFR: Benjamin Moore; STYLE: 2121-70; COLOR: Chantilly Lace;
PT-B	PAINT COLOR - GREY	099123	MFR: Benjamin Moore; STYLE: 1617; COLOR: Chestnut Heart.
PT-C	PAINT COLOR - MATCH COAT-1A	099113	COLOR: MATCH COAT-1A;
PT-D	PAINT COLOR - MATCH COAT-1B	099113	COLOR: RAL 7043;
RAL-1	CANE RAIL	097300	CANE DETECTION RAL FABRICATED FROM STANARD STEEL SHAPES MATERIAL: CARBON STEEL; RAIL: 3/4" X 3" BAR, ALL JOINTS FULLY WELDED AND GRIND SMOOTH; POSTS AND BASES: 3/4" X 1 1/2" BAR; FINISH: P7.
RAL-2	STEEL GUARDRAIL w/ MTPML-2 INFILL	097300	FABRICATED STEEL HANDRAIL w/ INFILL PANEL CONFIGURED AS PER DRAWINGS. MATERIAL: CARBON STEEL; PICKET: CARBON STEEL BAR STOCK 3/4" X 2 1/2" TOP AND END FULLY WELDED AND GRIND SMOOTH - PROVIDE FASTENING TABS FOR INFILL PANEL. TOP RAIL: CARBON STEEL BAR STOCK 3/4" X 3" - ALL JOINTS FULLY WELDED AND GRIND SMOOTH. PICKET SPACING: 4' O.C. OR AS NOTED ON DRAWINGS; INFILL PANEL: MLPML-2; FINISH: P7-5B.
RAL-3	TUBE HANDRAIL	095213	PRODUCT: 1 1/2" DIA SCHED 40 STEEL HANDRAIL; CONFIGURATION: AS INDIC

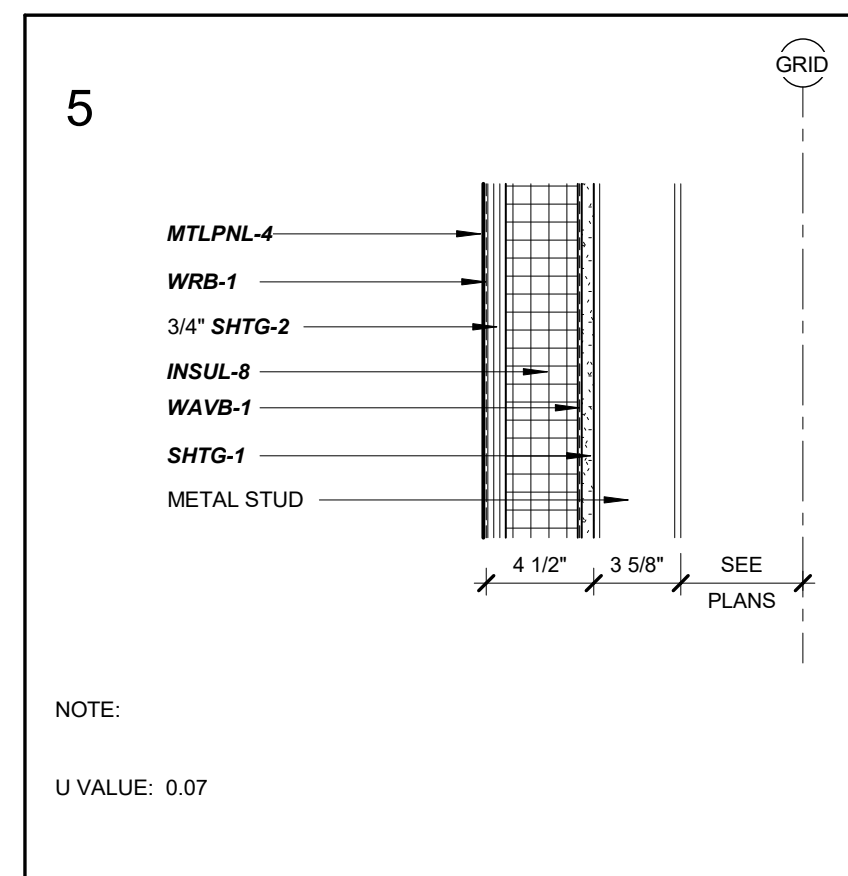
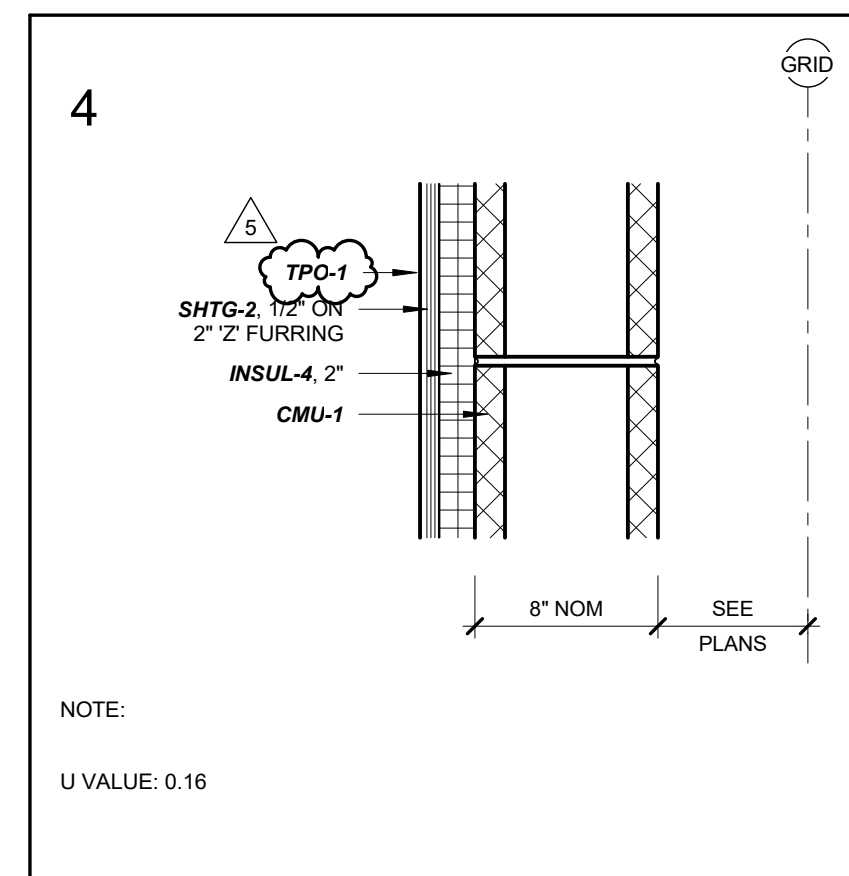


**EXTERIOR WALL TYPES**

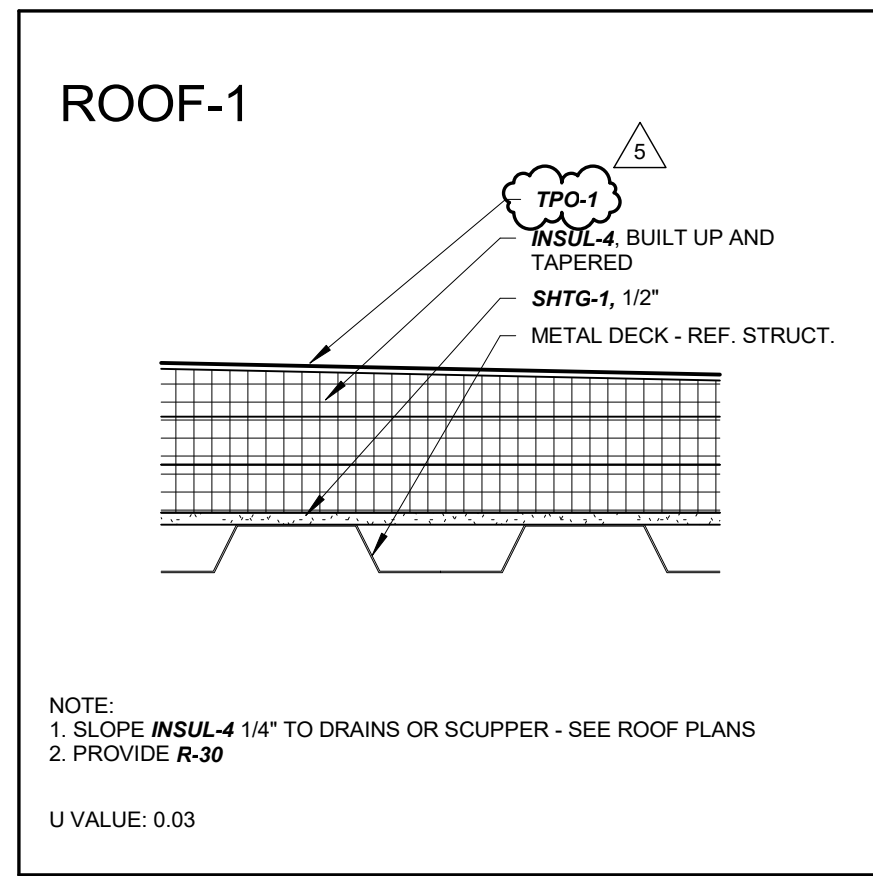
WALL TYPE 1 - NOT USED



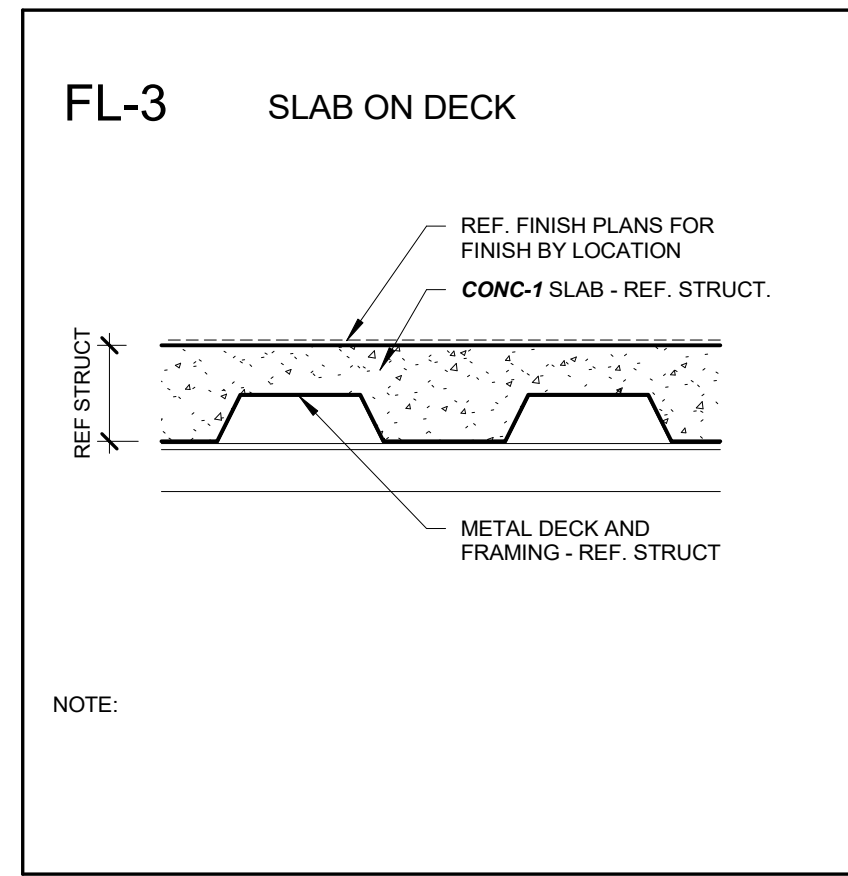
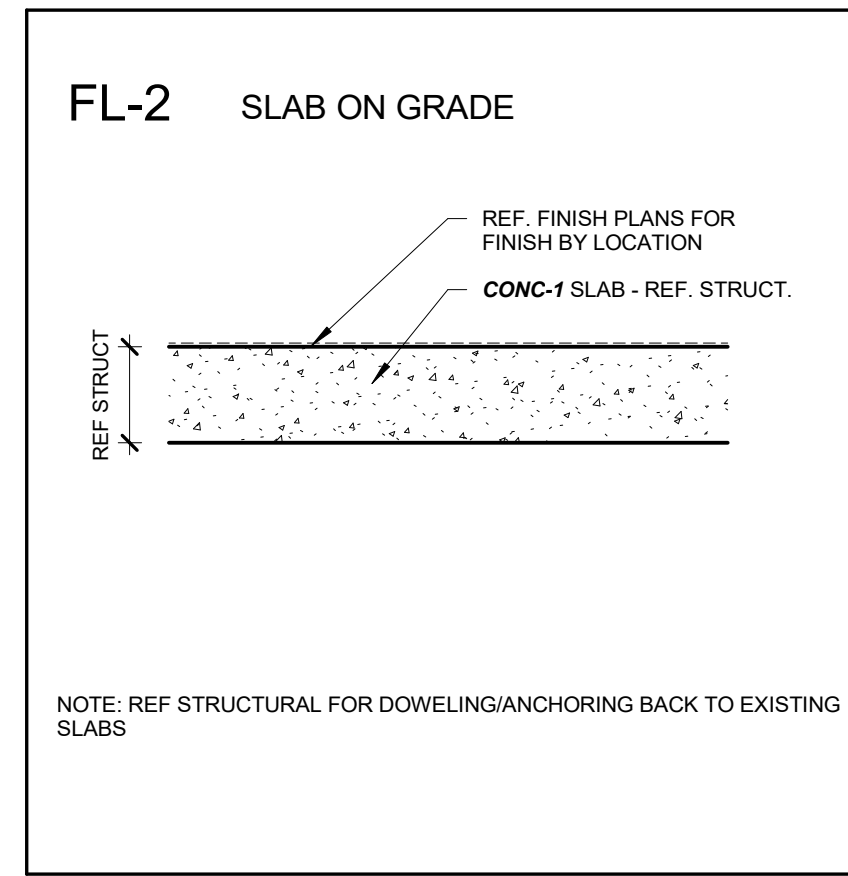
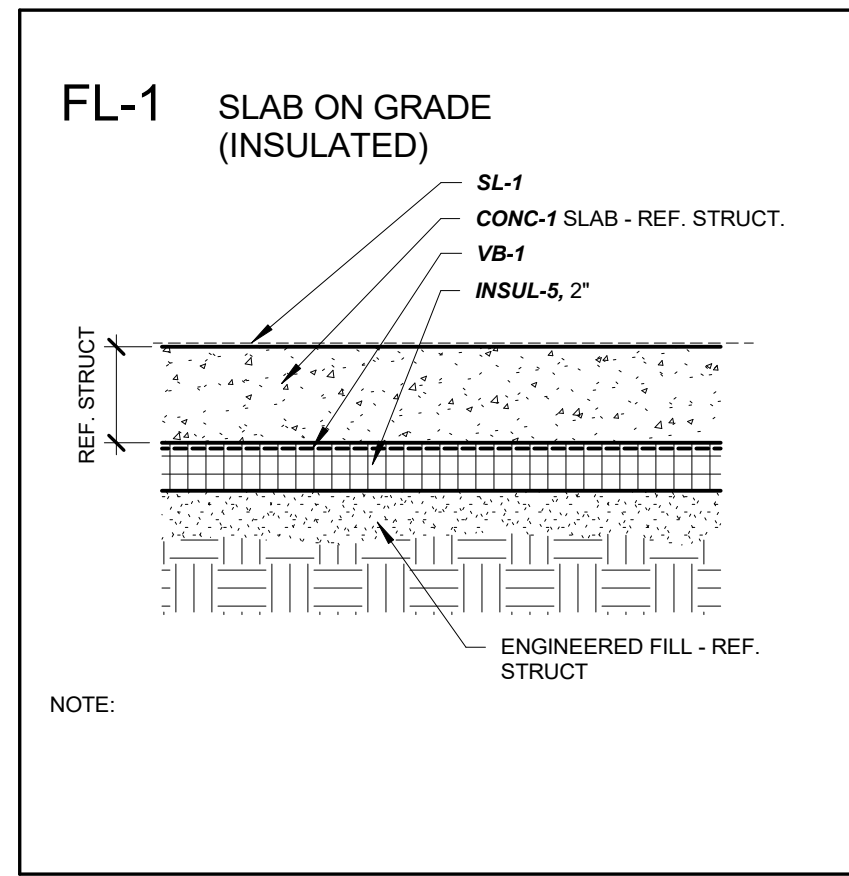
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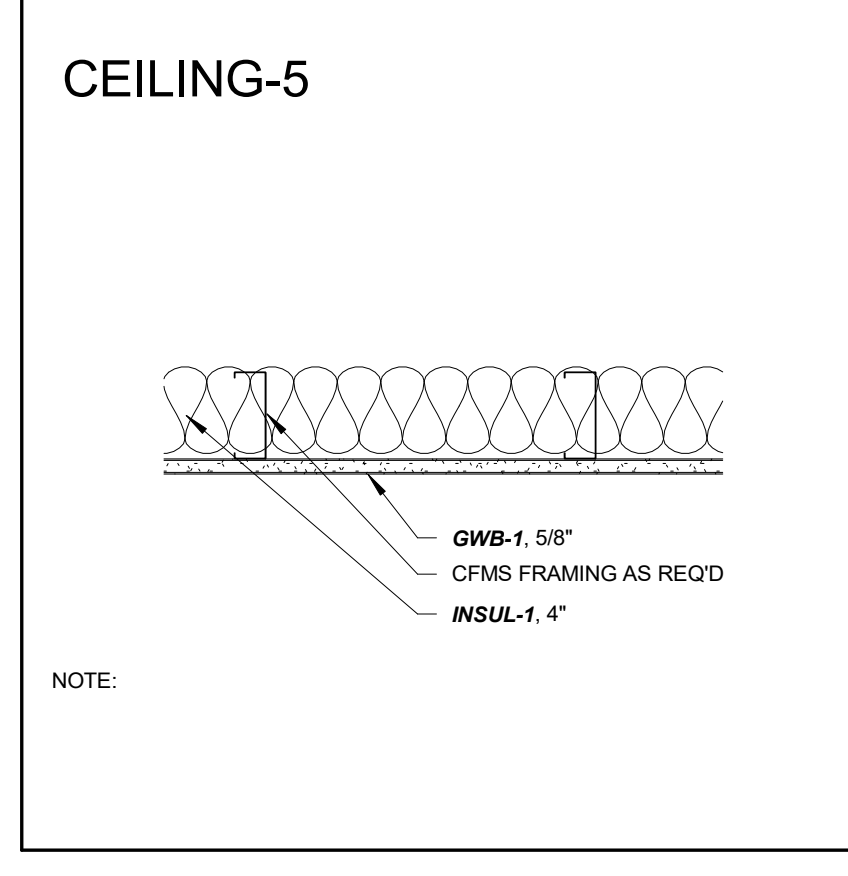
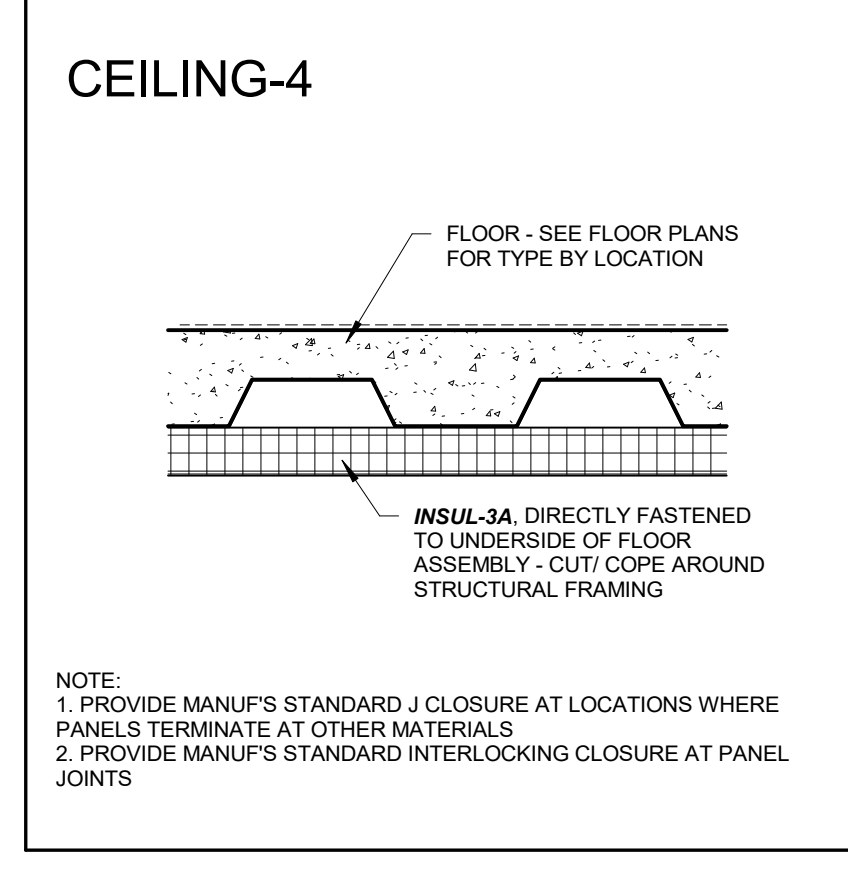
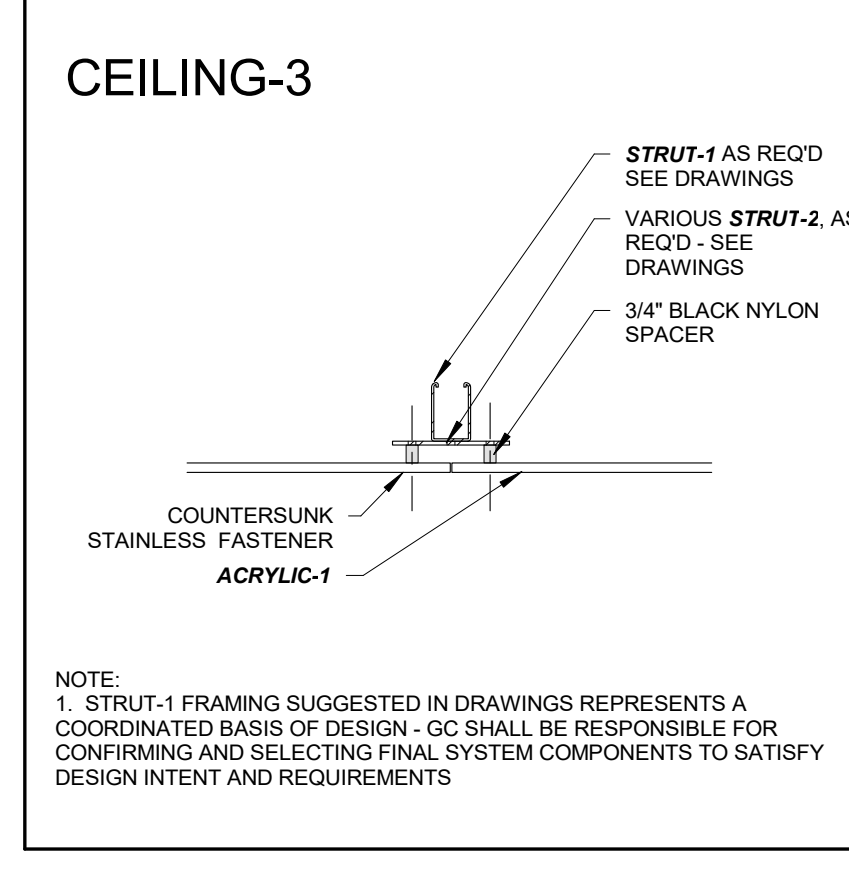
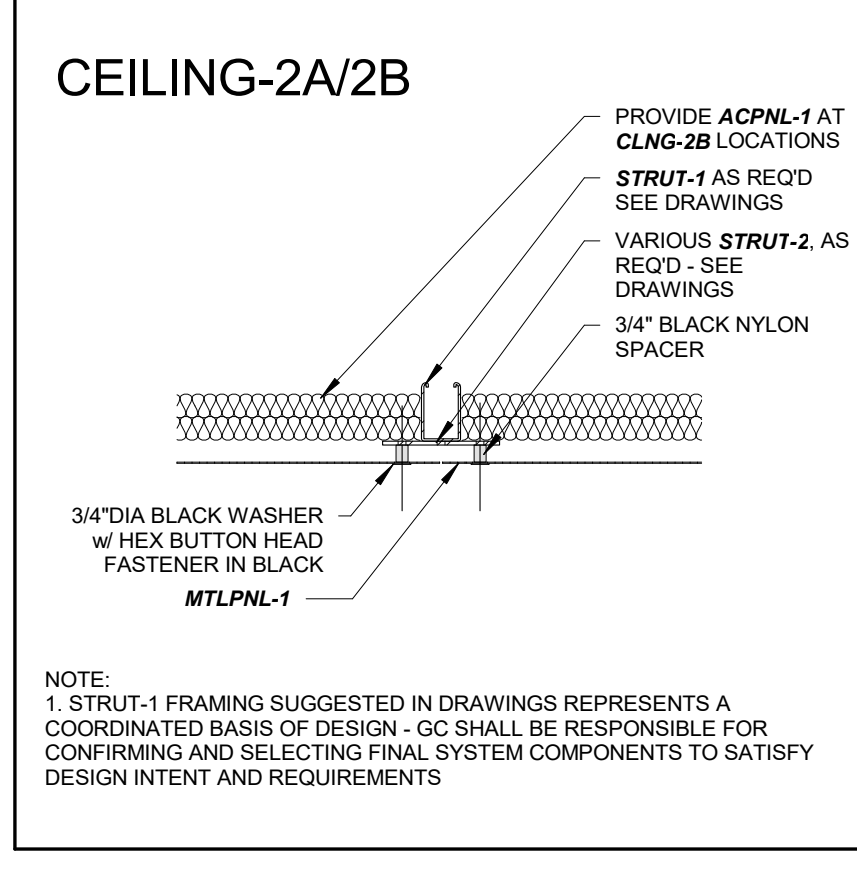
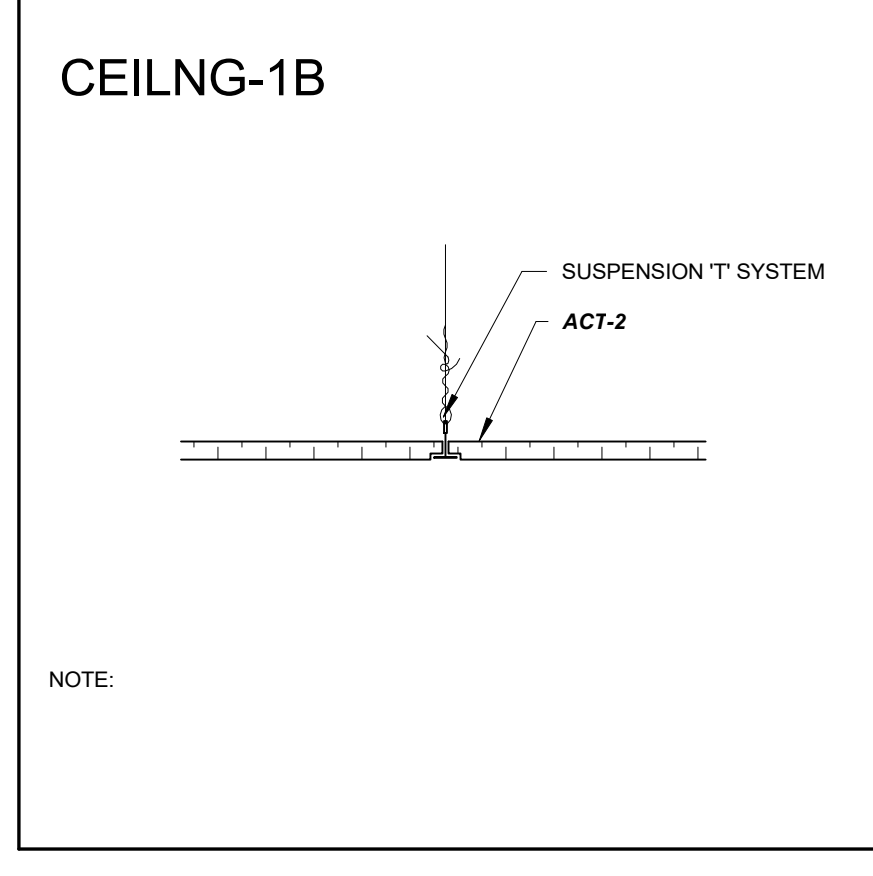
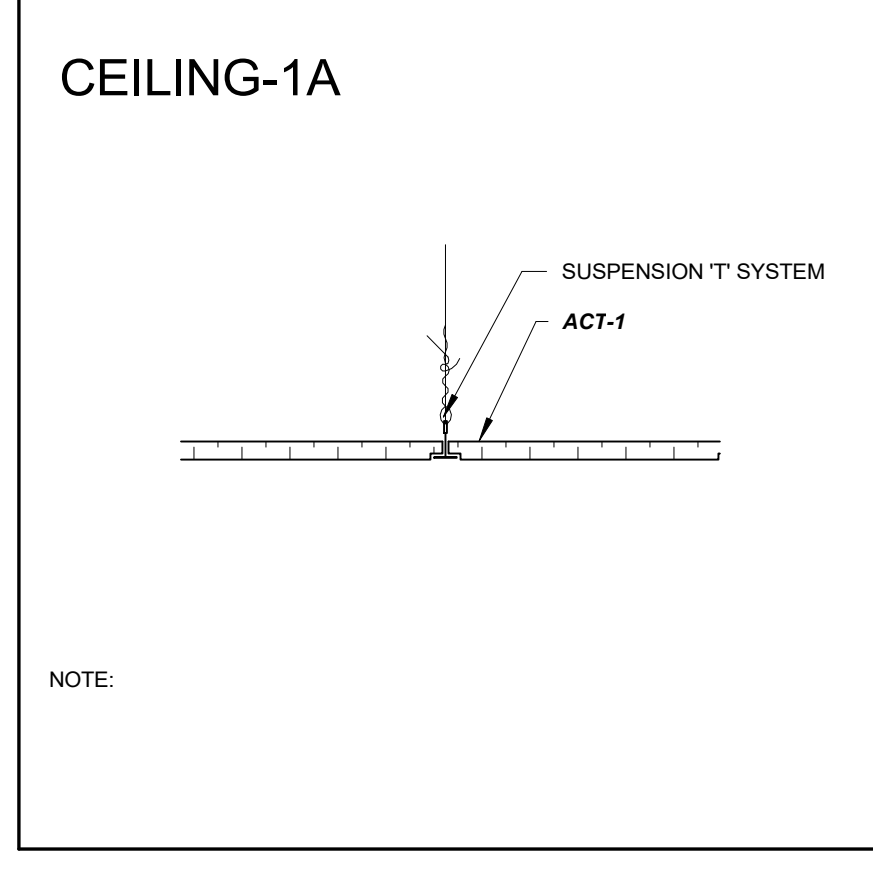
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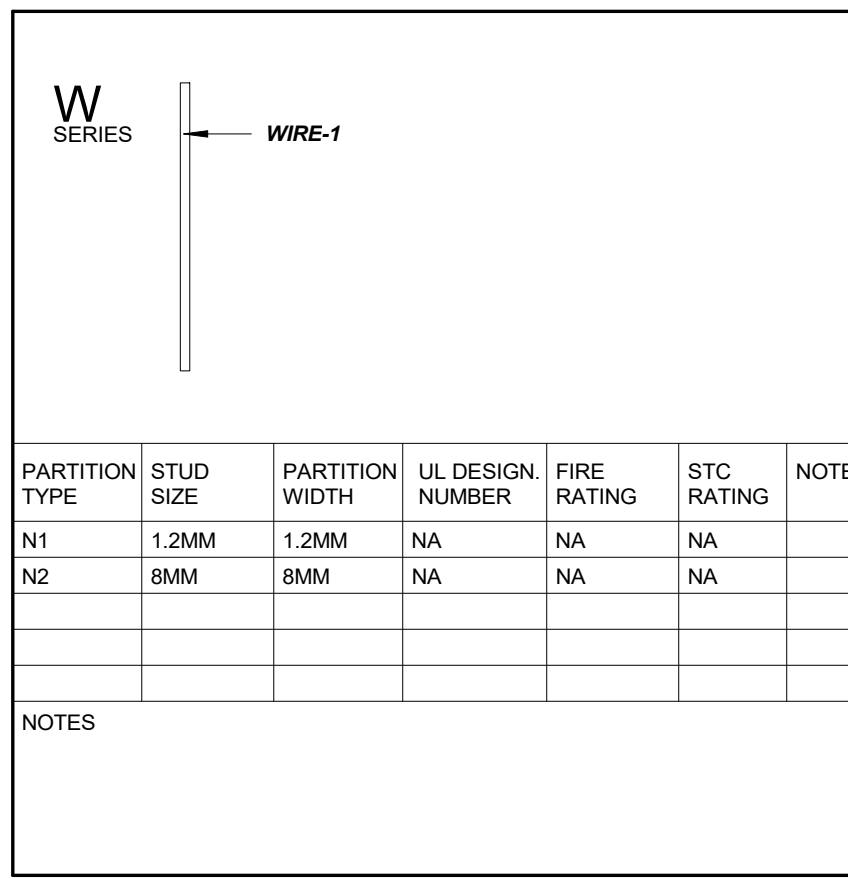
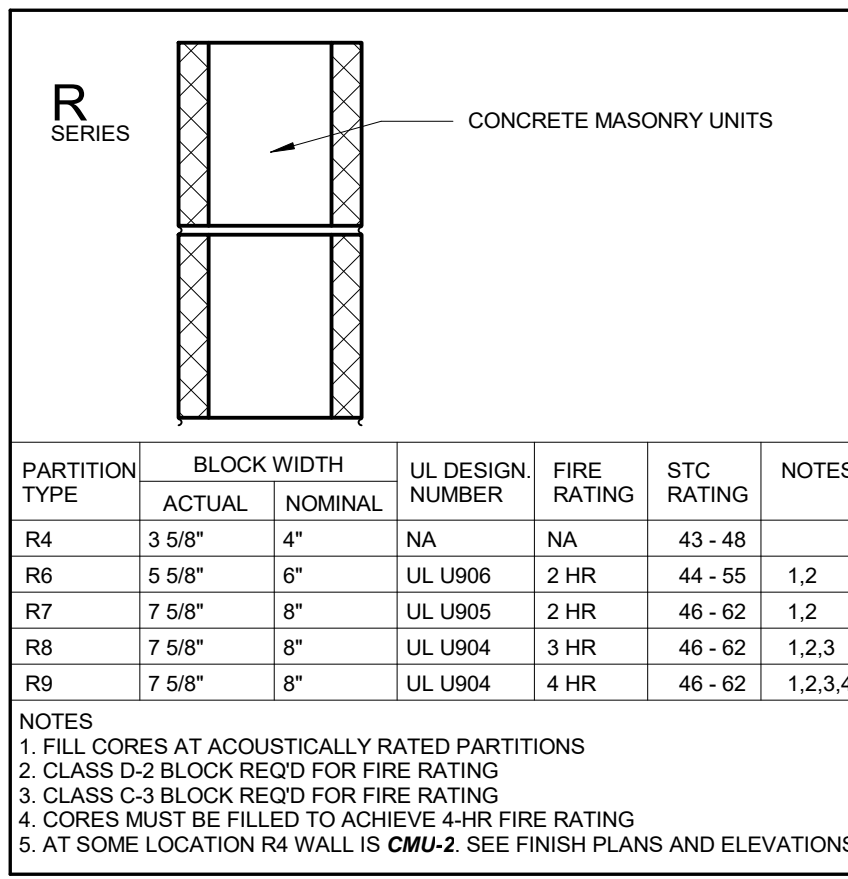
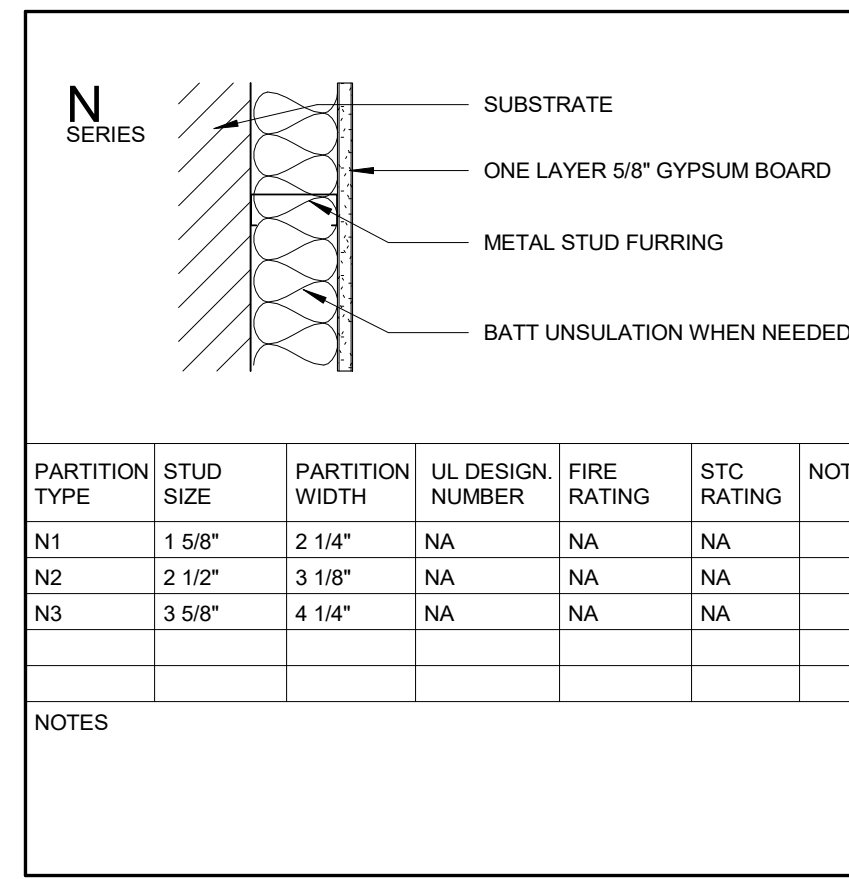
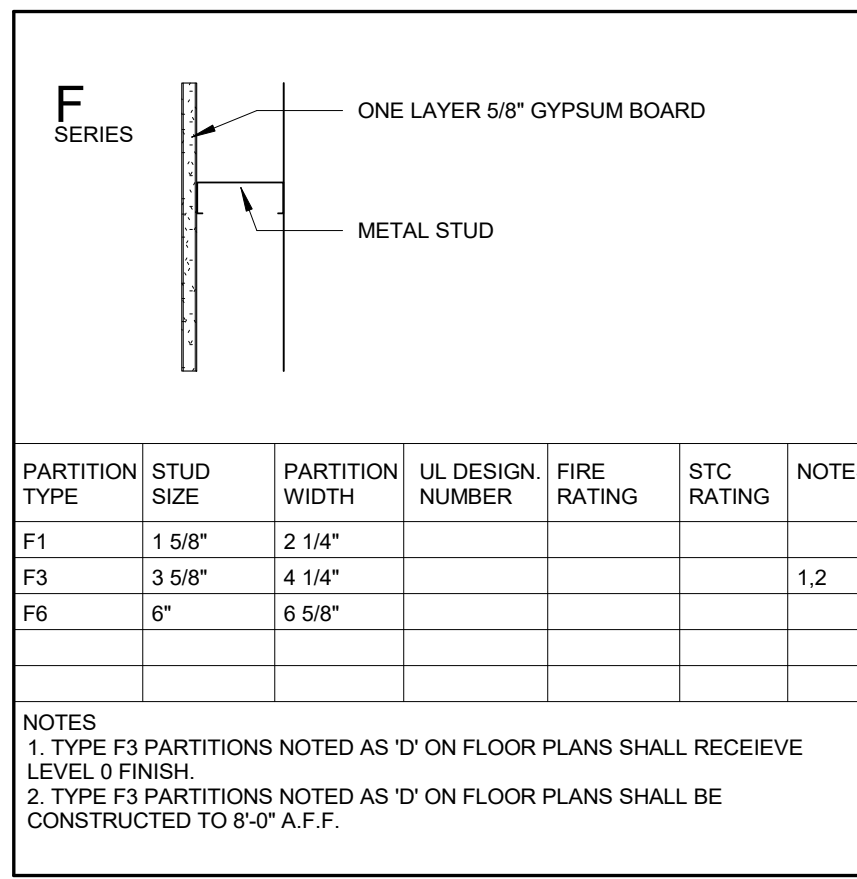
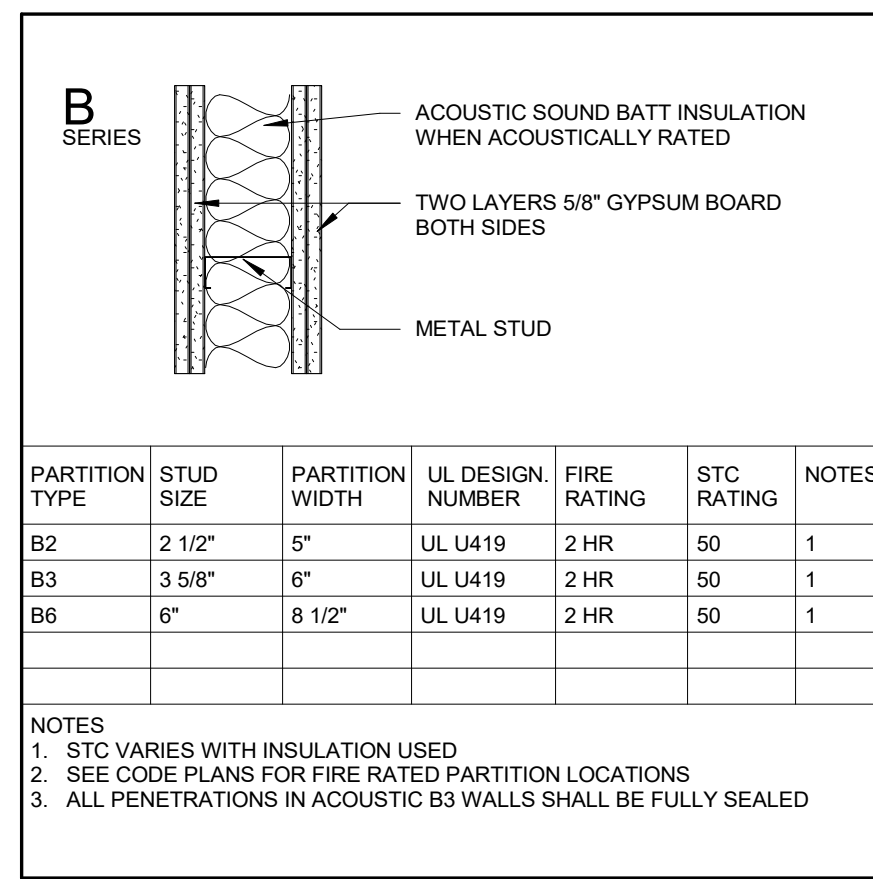
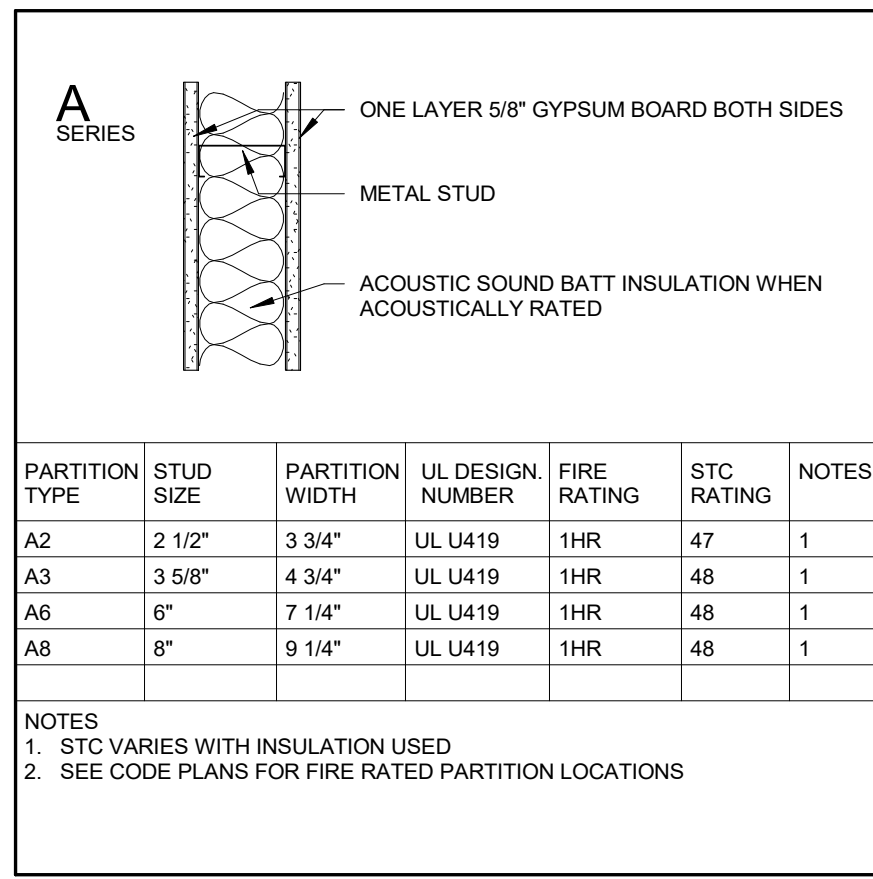
**FLOOR TYPES**



**CEILING TYPES**



**INTERIOR PARTITION TYPES**



**GENERAL NOTES**

SEE PLANS FOR SPECIFIC PARTITION TYPES USED.

- INTERIOR PARTITIONS TYPES TO BE INDICATED BY THIS SYMBOL ON FLOOR PLANS.
 

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RATING

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WALL FINISH (DEMISING WALL)

ACOUSTICALLY RATED
- GAUGE, SPACING, AND PERFORMANCE REQUIREMENTS OF METAL STUDS TO BE DETERMINED BY SPECIFICATIONS.
- TYPE "X" GYPSUM BOARD REQUIRED AT RATED PARTITIONS ONLY.
- FIRE RATED OR ACOUSTICALLY RATED PARTITIONS TO EXTEND TO ROOF OR FLOOR DECK ABOVE UNLESS NOTED OTHERWISE. PROVIDE REQUIRED CLOSURE TO MAINTAIN FIRE OR ACOUSTICAL RATING. PROVIDE APPROPRIATE DEFLECTION JOINT AT TOP OF PARTITION TO ELIMINATE CRUSHING OF PARTITION.
- AT NON-RATED PARTITIONS IN ROOMS WITH FINISHED CEILING, GYPSUM BOARD TO GO TO DECK UNLESS NOTED OTHERWISE.
- PENETRATIONS IN FIRE RATED OR ACOUSTICAL RATED PARTITIONS AND CONNECTIONS TO THESE PARTITIONS BY OTHER PARTITIONS SHALL BE PER PARTITION MANUFACTURER'S WRITTEN RECOMMENDATIONS OR ULL REQUIREMENTS FOR FIRE TEST AND ACOUSTICAL TEST RATINGS.
- REFER TO SPEC FOR BACKER AT PARTITIONS SCHEDULED TO RECEIVE CERAMIC TILE. PROVIDE TILE BACKER BOARD TO PARTITIONS IN SHOWERS, HIGH MOISTURE AREAS OR SIMILAR AREAS AND WHERE NOTED. INSTALLATION OF MOISTURE RESISTANT GYPSUM BOARD OR TILE BACKER BOARD SHALL NOT REDUCE FIRE OR ACOUSTICAL RATINGS FOR ANY PARTITION.

- ACOUSTICALLY RATED PARTITIONS SHALL HAVE CONTINUOUS SOUND BATT INSULATION AND ACOUSTICAL CAULKING UNLESS OTHERWISE NOTED. STAGGER JOINT BOXES A MINIMUM OF 2" BETWEEN PENETRATIONS AT ACOUSTICALLY RATED OR FIRE RATED PARTITIONS
- THERMALLY SEPARATED PARTITIONS SHALL HAVE VAPOR BARRIER AND THERMAL INSULATION AS SPECIFIED UNLESS OTHERWISE NOTED.
- VERIFY WITH STRUCTURAL ALL NON-BEARING MASONRY PARTITION THAT ARE NOT ADEQUATELY BRACED BY FIXED ELEMENTS PRIOR TO ERECTION.
- REFER TO STRUCTURAL DRAWINGS FOR INTERIOR STRUCTURAL PARTITIONS.
- PROVIDE BLOCKING AND BACKER SUPPORT FOR ALL EQUIPMENT ATTACHMENT AND MOUNTING. COORDINATE LOCATION OF BLOCKING AND BACKER MATERIAL WITH OWNER AND CONTRACTOR SUPPLIED EQUIPMENT PRIOR TO CONSTRUCTION OF PARTITION. SEE FURNITURE PLAN FOR FURNITURE LOCATIONS THAT REQUIRE BLOCKING.
- STC RATINGS INDICATED MINIMUM WALL REQUIREMENTS WITH SOUND BATT INSULATION. REFER TO GYPSUM ASSOCIATION BULLETIN #800 AND THE ULL MANUAL FOR DETAILED CONSTRUCTION TECHNIQUES TO ACHIEVE STC RATINGS.
- WALLS WITH FINISH 'D' TAG ARE DEMISING WALLS. DEMISING WALLS SHALL HAVE LEVEL 'D' GWB FINISH AT ALL SURFACE FACING VENDOR GROUPS OR TENANT SPACES. FINAL FINISH BY FUTURE CONTRACTOR

Architecture and Interiors

**MSRDesign**  
510 Marquette Avenue South, Suite 200  
Minneapolis, MN 55402 | 612.375.0336

MEP Engineer **Salas O'Brien**

**Salas O'Brien**  
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Civil Engineer **Vierbicher**  
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Madison, WI 53717 | 608.826.0532

Landscape Architect **Ken Saiki Design**  
1110 S. Park St.  
Madison, WI 53715 | 608.251.3600

Structural Engineering, Fire Protection Engineering, Technology and AV  
**IMEG Corporation, Inc. IMEG**  
1800 Deming Way, Suite 200,  
Madison, WI 53662

Lighting Design **Mazzetti, Inc. MAZZETTI**  
1999 Broadway, Suite 2205  
Denver, CO 80202 | 720.644.5044

Commercial Kitchen Design **Boelter Premier Boelter premier**  
7120 Northland Terrace,  
Minneapolis, MN 55428 | 763.544.8800

**MADISON PUBLIC MARKET**  
 202 N First St, Madison, WI 53704  
 Project No. 20180062.00

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.

Architect Seal

Signature *Dagmara K. Larsen*  
Print Name Dagmara Larsen  
Date 2023.06.09 License No. 13278-S

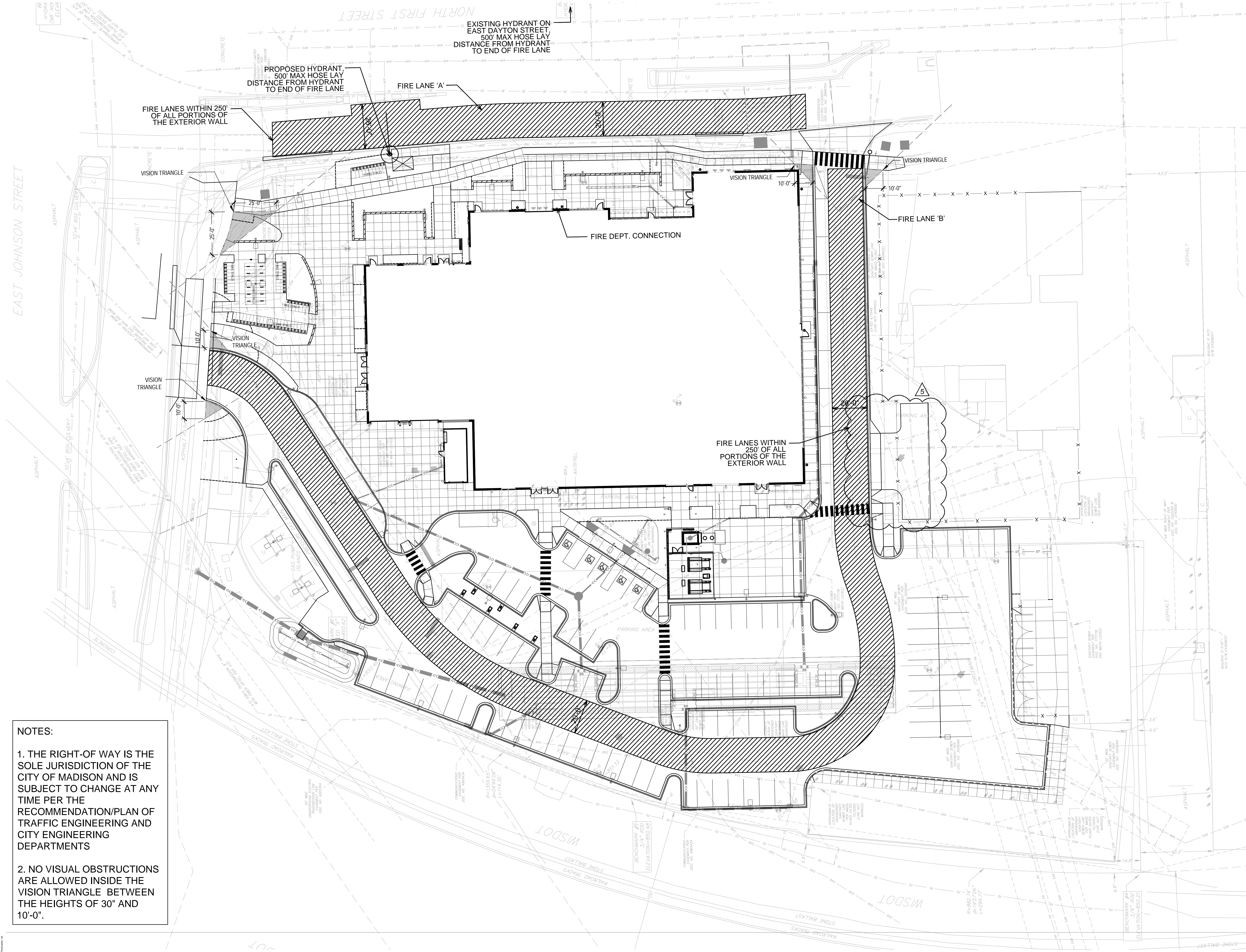
**ADDENDUM 4**

**ISSUE / REVISION**

Mark	Date	Description
1	2023.06.09	BID DOCUMENTS
5	2023.06.05	ADDENDUM 4

TYPES AND SYSTEMS

**G003**



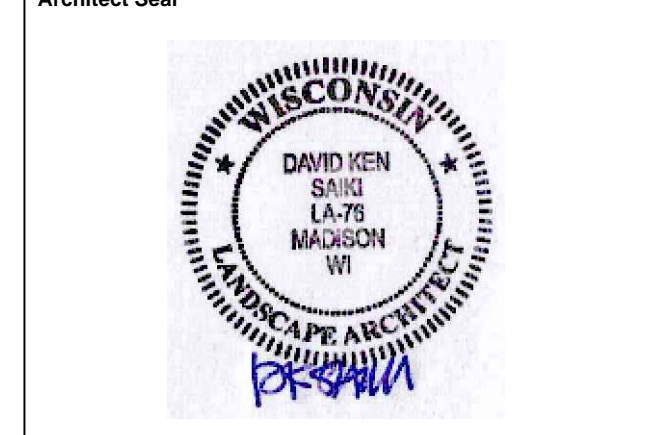
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- MEP Engineer  
**Salas O'Brien**  
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Bloomington, MN 55425 | 651.379.9121
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- Commercial Kitchen Design  
**Boelter Premier**  
7120 Northland Terrace,  
Minneapolis, MN 55426 | 763.544.8800

Project No: 2018000.00  
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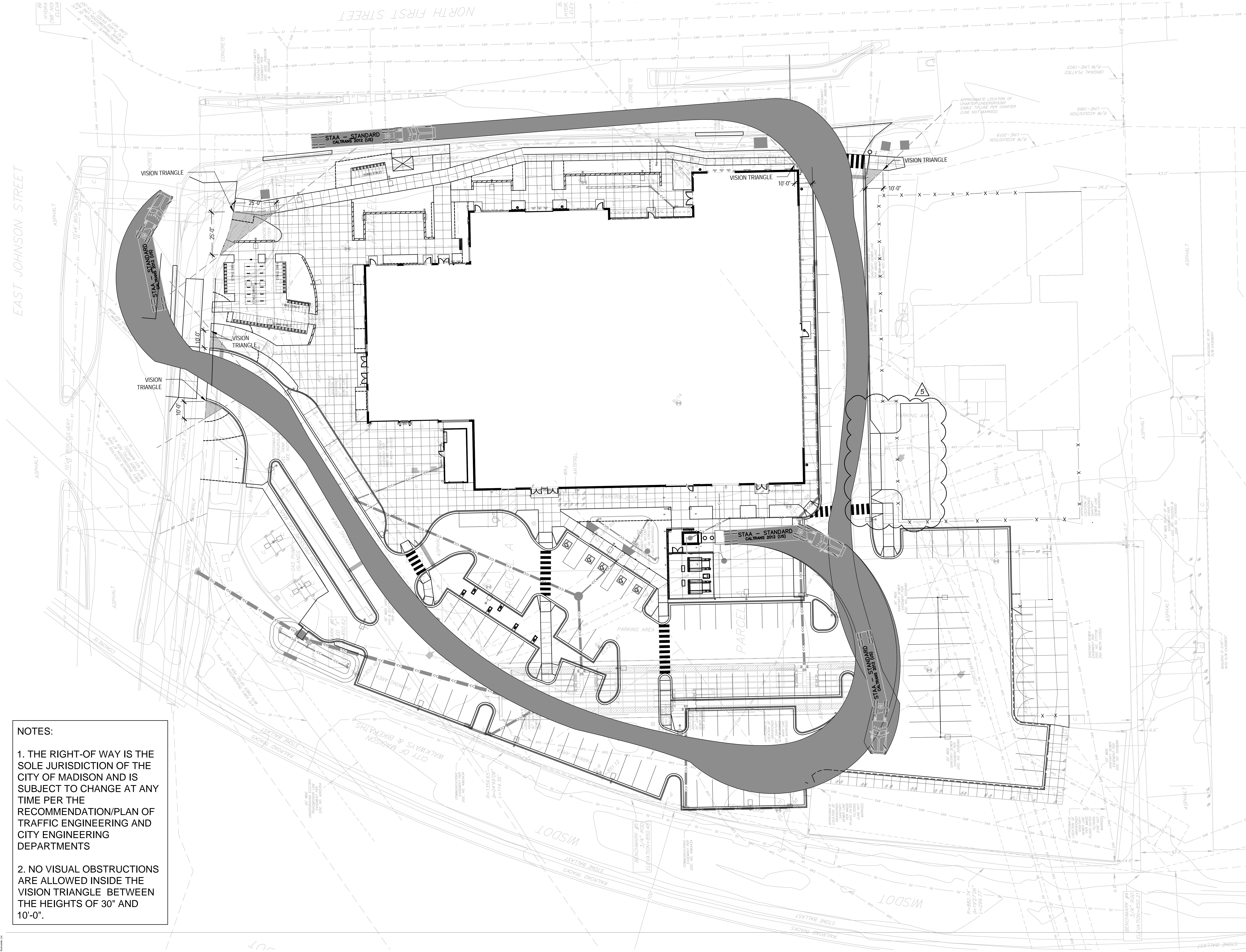


Signature \_\_\_\_\_  
 Print Name \_\_\_\_\_  
 Date \_\_\_\_\_ License No. \_\_\_\_\_

**ADDENDUM 4**

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Mark Date	Description
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**FIRE ACCESS**  
**L001**



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- MEP Engineer **Salas O'Brien**  
2901 Metro Drive, Suite 225  
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- Civil Engineer **Vierbicher**  
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Fire Protection Engineering, Technology and AV  
**IMEG Corporation, Inc. IMEG**  
1800 Deming Way, Suite 200,  
Madison, WI 53662
- Lighting Design **Mazzetti, Inc.**  
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- Commercial Kitchen Design **Boelter Premier**  
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Minneapolis, MN 55428 | 763.544.8800

Project No: 2018006.00

# MADISON PUBLIC MARKET

202 N First St, Madison, WI 53704

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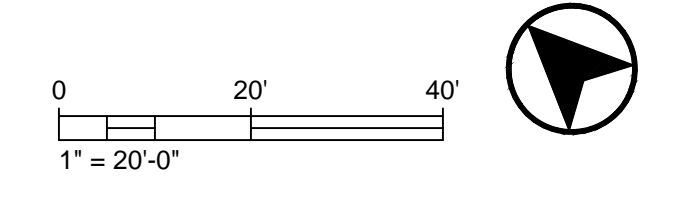
Signature \_\_\_\_\_  
Print Name \_\_\_\_\_  
Date \_\_\_\_\_ License No \_\_\_\_\_

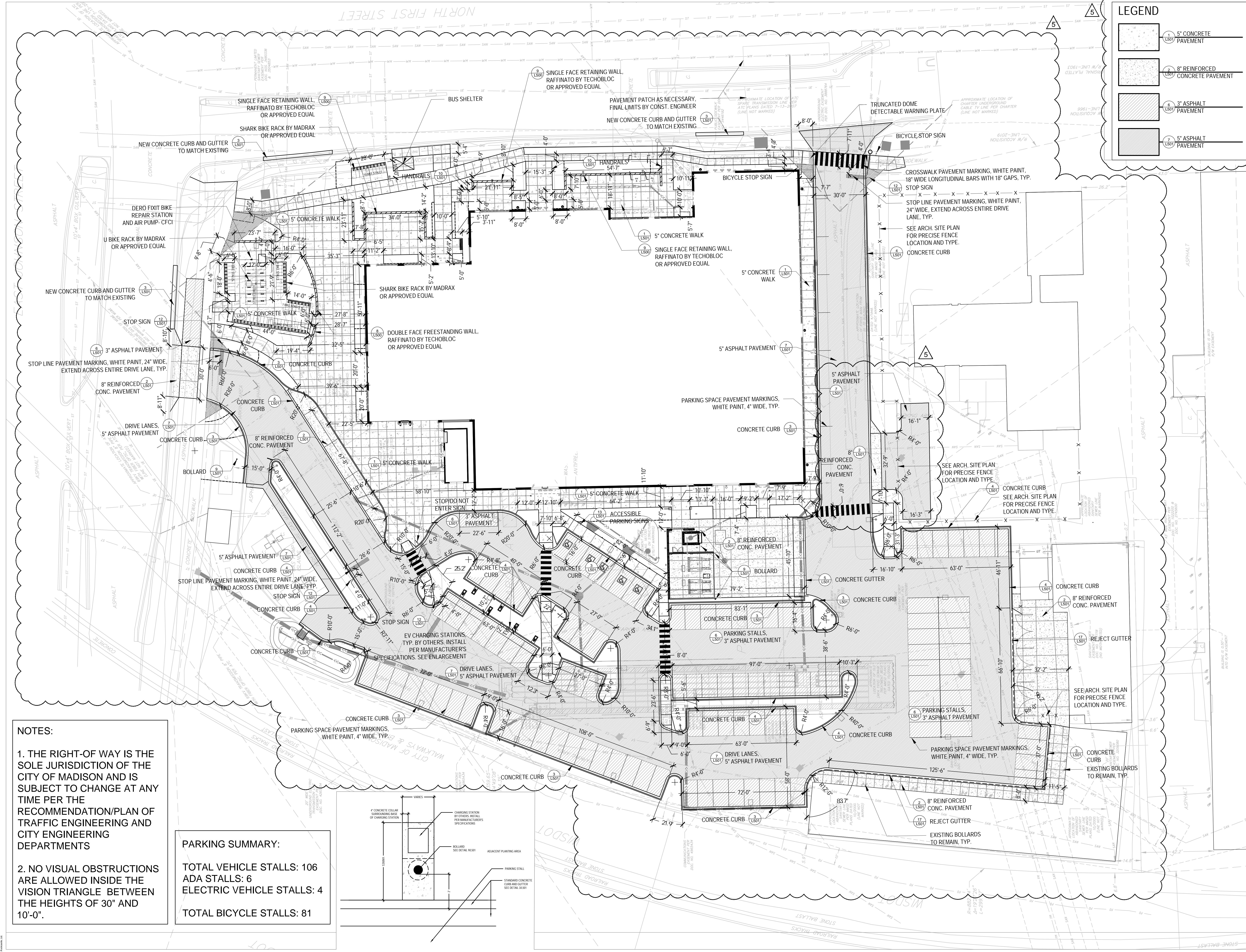
**ADDENDUM 4**

ISSUE / REVISION	Mark Date	Description
	2023.06.09	BID DOCUMENTS
	2023.09.05	ADDENDUM 4

SEMI TRAILER TURNING TEMPLATE AND VISION TRIANGLES

# L002





### LEGEND

- 1. 5" CONCRETE PAVEMENT
- 2. 8" REINFORCED CONCRETE PAVEMENT
- 3. 3" ASPHALT PAVEMENT
- 4. 5" ASPHALT PAVEMENT

Architecture and Interiors  
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Commercial Kitchen Design  
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# MADISON PUBLIC MARKET

202 N First St, Madison, WI 53704

Project No: 2018008.00

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Architect Seal

Signature \_\_\_\_\_  
 Print Name \_\_\_\_\_  
 Date \_\_\_\_\_ License No. \_\_\_\_\_

**ADDENDUM 4**

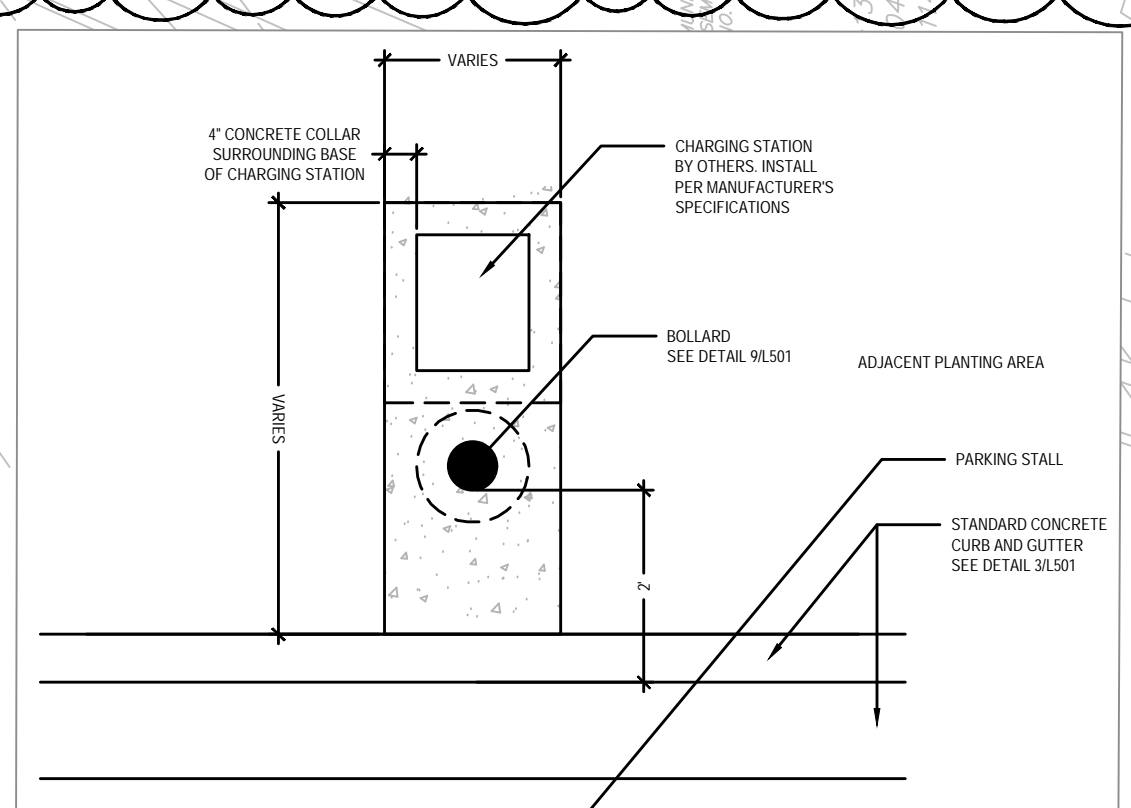
ISSUE / REVISION	Mark	Date	Description
		2023.06.09	BID DOCUMENTS
		2023.09.05	ADDENDUM 4

**NOTES:**

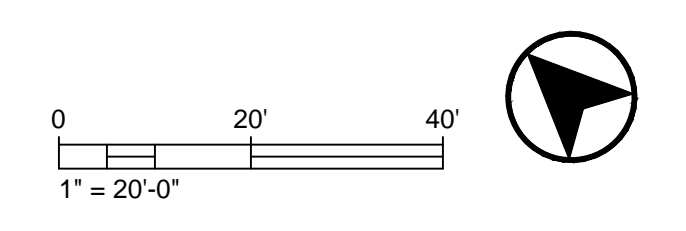
1. THE RIGHT-OF WAY IS THE SOLE JURISDICTION OF THE CITY OF MADISON AND IS SUBJECT TO CHANGE AT ANY TIME PER THE RECOMMENDATION/PLAN OF TRAFFIC ENGINEERING AND CITY ENGINEERING DEPARTMENTS
2. NO VISUAL OBSTRUCTIONS ARE ALLOWED INSIDE THE VISION TRIANGLE BETWEEN THE HEIGHTS OF 30'-0" AND 10'-0".

**PARKING SUMMARY:**

TOTAL VEHICLE STALLS:	106
ADA STALLS:	6
ELECTRIC VEHICLE STALLS:	4
TOTAL BICYCLE STALLS:	81

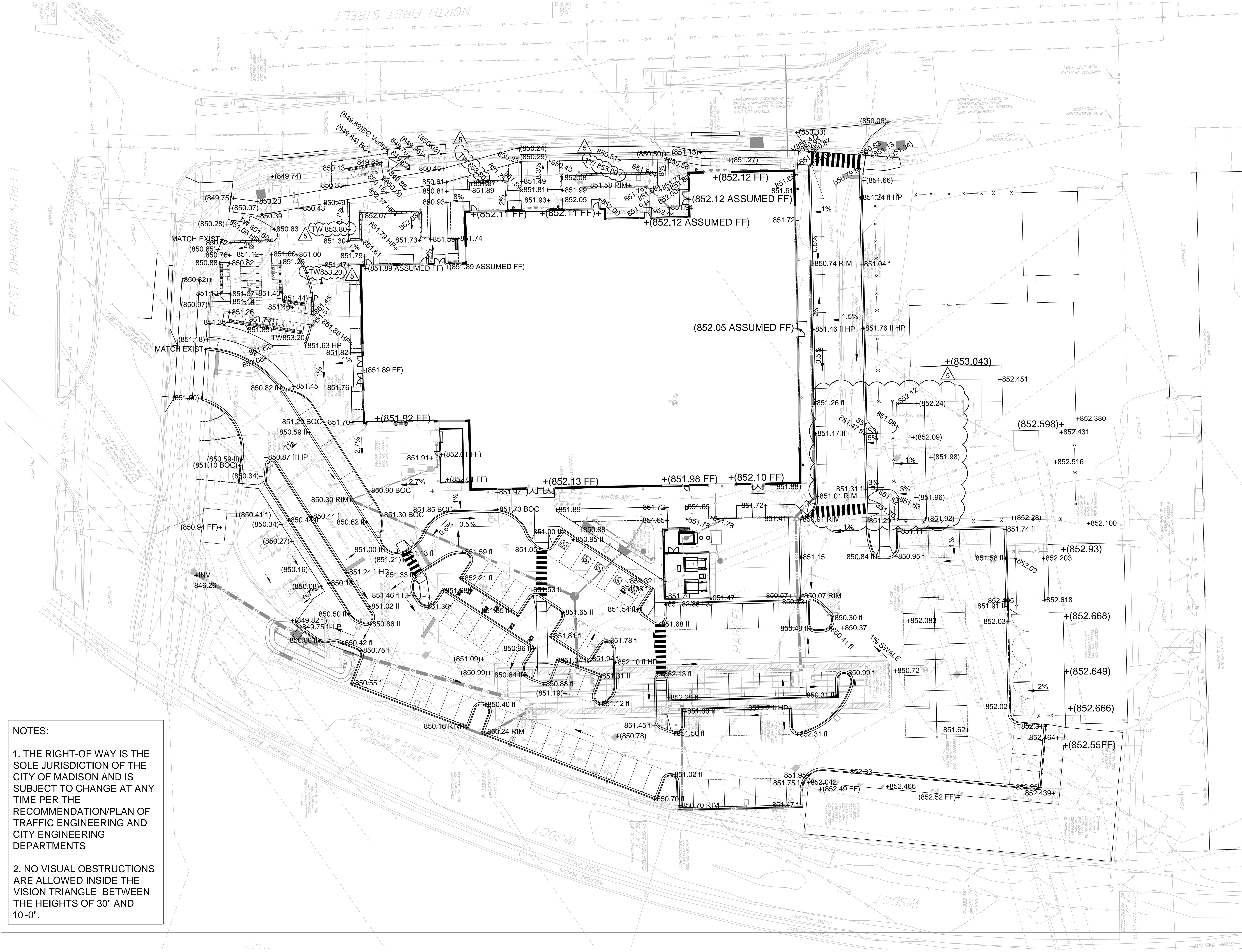


EV CHARGING STATION ENLARGEMENT



# LAYOUT PLAN

## L100



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Civil Engineer  
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Landscape Architect  
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 Fire Protection Engineering, Technology and AV  
**IMEG Corporation, Inc. IMEG**  
 1800 Deming Way, Suite 200,  
 Madison, WI 53762

Lighting Design  
**Mazzetti, Inc.**  
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Commercial Kitchen Design  
**Boelter Premier**  
 7120 Northland Terrace,  
 Minneapolis, MN 55428 | 763.544.8800

Project No: 2018008.00

# MADISON PUBLIC MARKET

202 N First St, Madison, WI 53704

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Architect Seal

Signature \_\_\_\_\_  
 Print Name \_\_\_\_\_  
 Date \_\_\_\_\_ License No \_\_\_\_\_

**ADDENDUM 4**

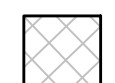
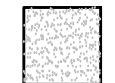
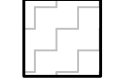
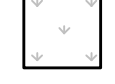

ISSUE / REVISION	
Mark Date	Description
2023.06.09	BD DOCUMENTS
2023.06.09	ADDENDUM 4

GRADING PLAN

# L200

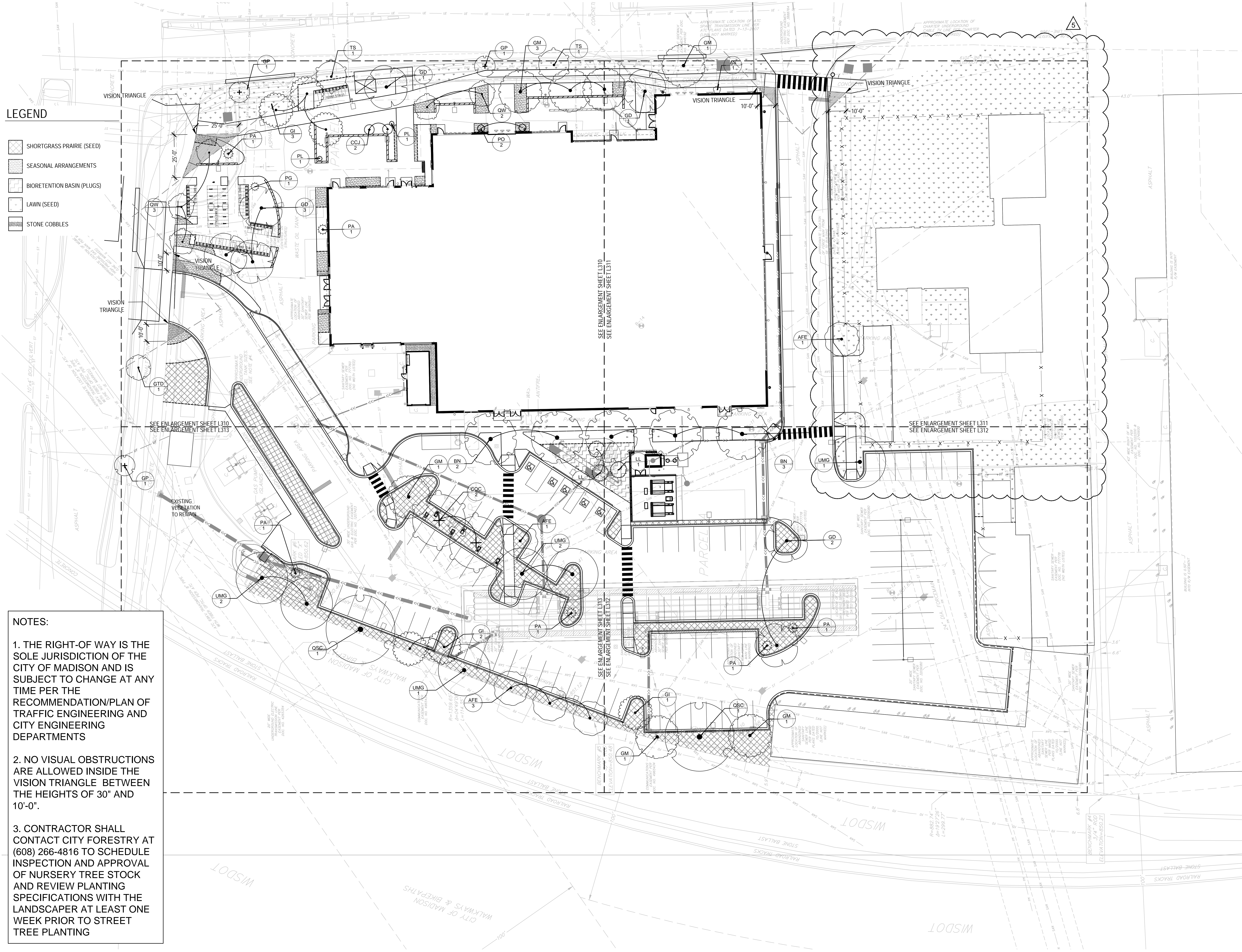
0 20' 40'  
1" = 20'-0"

**LEGEND**

-  SHORTGRASS PRAIRIE (SEED)
-  SEASONAL ARRANGEMENTS
-  BIORETENTION BASIN (PLUGS)
-  LAWN (SEED)
-  STONE COBBLES

**NOTES:**

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2. NO VISUAL OBSTRUCTIONS ARE ALLOWED INSIDE THE VISION TRIANGLE BETWEEN THE HEIGHTS OF 30" AND 10'-0".
3. CONTRACTOR SHALL CONTACT CITY FORESTRY AT (608) 266-4816 TO SCHEDULE INSPECTION AND APPROVAL OF NURSERY TREE STOCK AND REVIEW PLANTING SPECIFICATIONS WITH THE LANDSCAPER AT LEAST ONE WEEK PRIOR TO STREET TREE PLANTING



Architecture and Interiors  
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Landscape Architect  
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 Madison, WI 53662

Lighting Design  
**Mazzetti, Inc.**  
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Commercial Kitchen Design  
**Boelter Premier**  
 7120 Northland Terrace,  
 Minneapolis, MN 55428 | 763.544.8800

Project No: 2018006.00  
**MADISON PUBLIC MARKET**  
 202 N First St, Madison, WI 53704

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Signature \_\_\_\_\_  
 Print Name \_\_\_\_\_  
 Date \_\_\_\_\_ License No \_\_\_\_\_

**ADDENDUM 4**

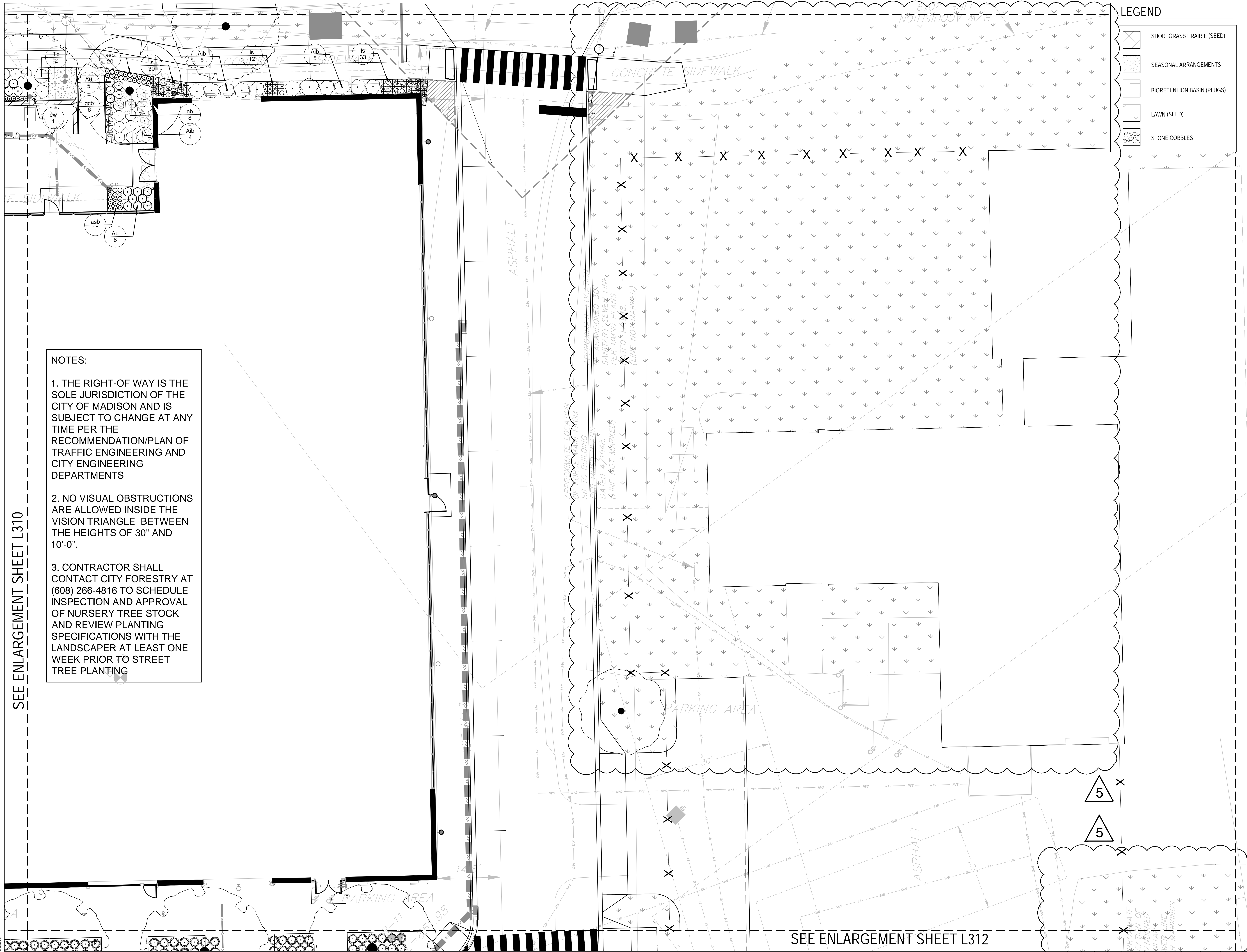
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**TREE PLANTING PLAN**

# L300



**LEGEND**

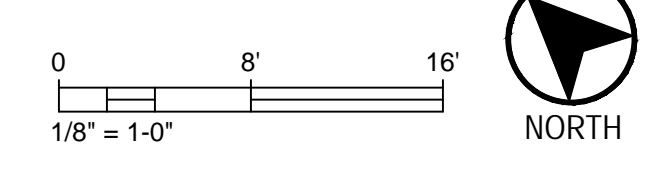
- SHORTGRASS PRAIRIE (SEED)
- SEASONAL ARRANGEMENTS
- BIORETENTION BASIN (PLUGS)
- LAWN (SEED)
- STONE COBBLES

**NOTES:**

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SEE ENLARGEMENT SHEET L310

SEE ENLARGEMENT SHEET L312



Architecture and Interiors  
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Commercial Kitchen Design  
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Project No: 2018006100  
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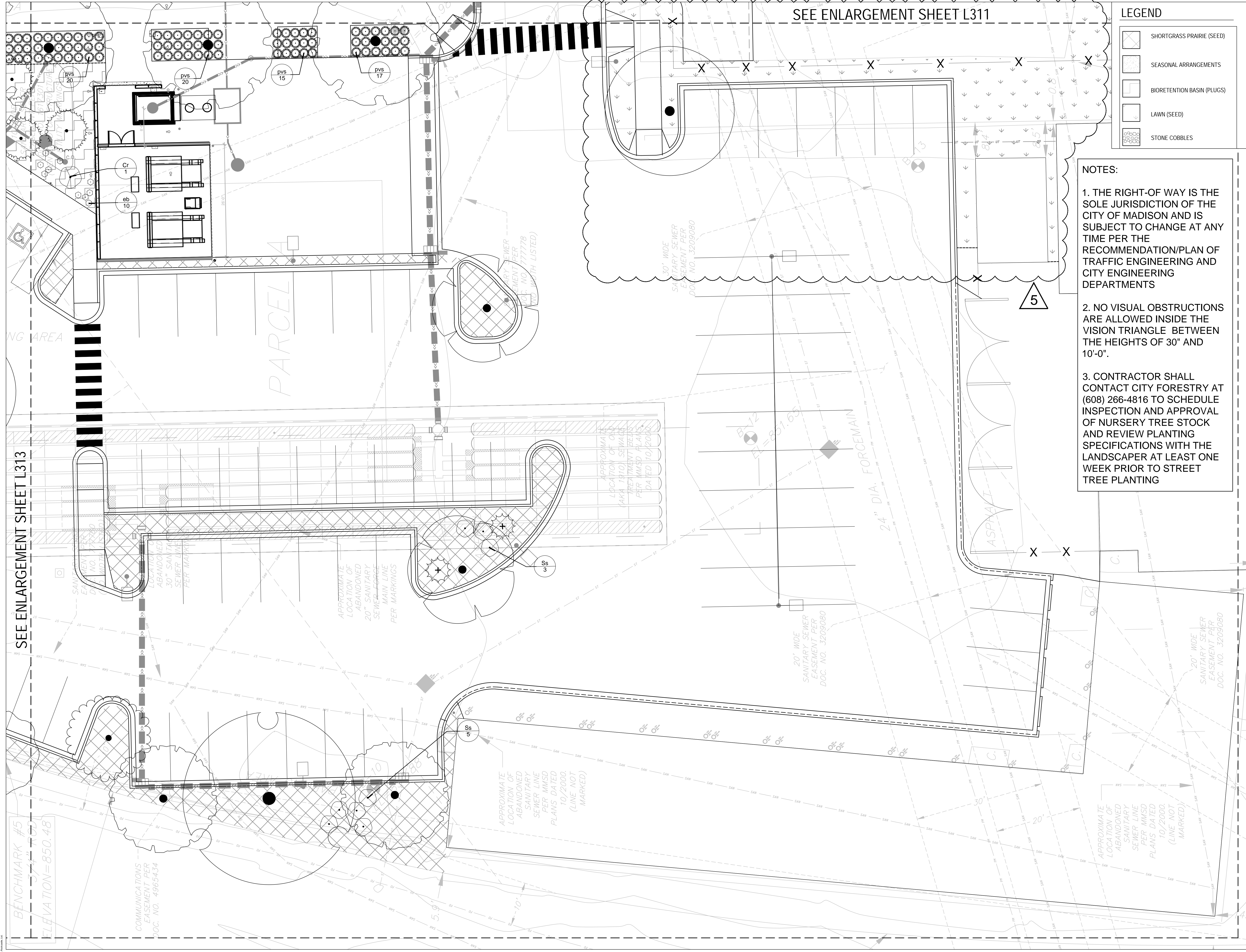


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**ADDENDUM 4**

Mark Date	Description
2023.06.09	BID DOCUMENTS
2023.09.05	ADDENDUM 4

DETAIL PLANTING PLAN  
**L311**



SEE ENLARGEMENT SHEET L311

**LEGEND**

	SHORTGRASS PRAIRIE (SEED)
	SEASONAL ARRANGEMENTS
	BIORETENTION BASIN (PLUGS)
	LAWN (SEED)
	STONE COBBLES

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SEE ENLARGEMENT SHEET L313

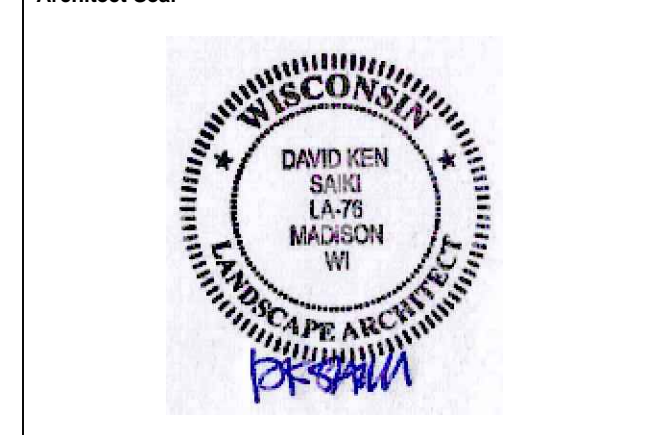
BENCHMARK #5  
ELEVATION = 850.48

Architecture and Interiors	
<b>MSRDesign</b> 510 Marquette Avenue South, Suite 200 Minneapolis, MN 55402   612.375.0356	
MEP Engineer	<b>Salas O'Brien</b> 2901 Metro Drive, Suite 225 Bloomington, MN 55425   651.379.9121
Civil Engineer	<b>Vierbicher</b> 999 Fourier Dr., Suite 201, Madison, WI 53717   608.826.0532
Landscape Architect	<b>Ken Saiki Design</b> 1110 S. Park St. Madison, WI 53715   608.251.3600
Structural Engineering, Fire Protection Engineering, Technology and AV	<b>IMEG Corporation, Inc. IMEG</b> 1800 Deming Way, Suite 200, Madison, WI 53662
Lighting Design	<b>Mazzetti, Inc.</b> 1999 Broadway, Suite 2205 Denver, CO 80202   720.644.5044
Commercial Kitchen Design	<b>Boelter Premier</b> 7120 Northland Terrace, Minneapolis, MN 55428   763.544.8800

Project No: 20170006.00

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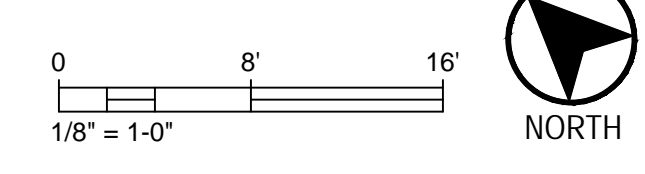
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**ADDENDUM 4**

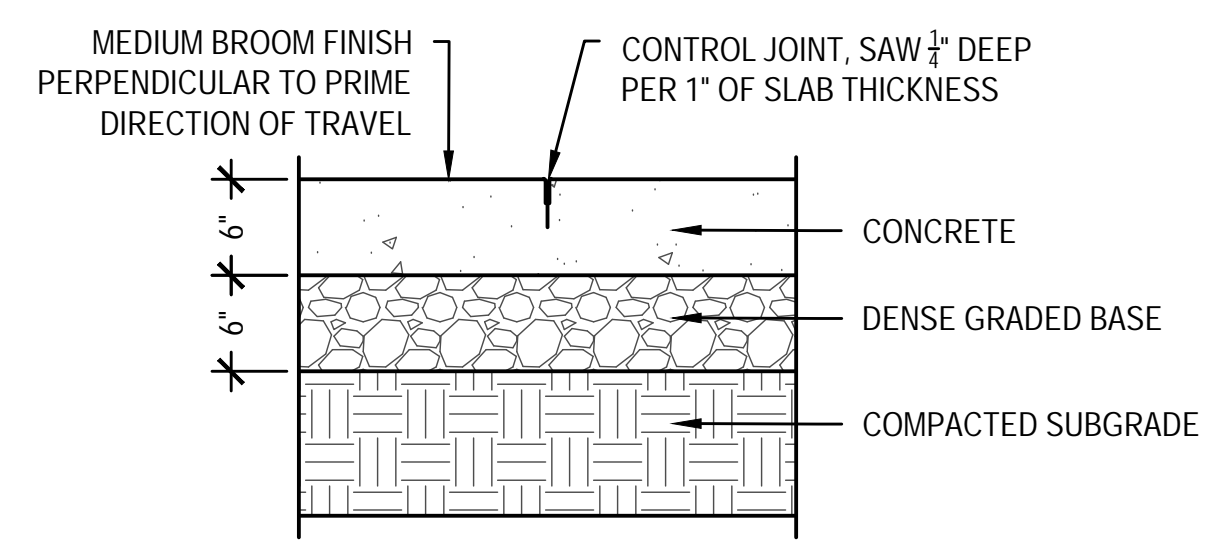
Issue / Revision	Mark Date	Description
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2	2023.09.05	ADDENDUM 4

DETAIL PLANTING PLAN

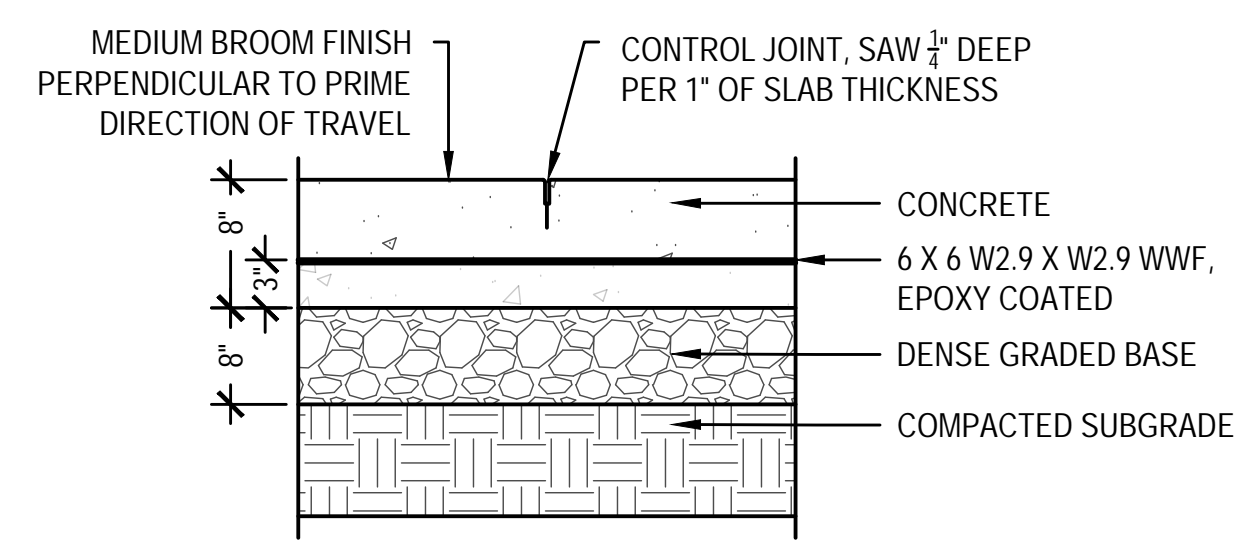
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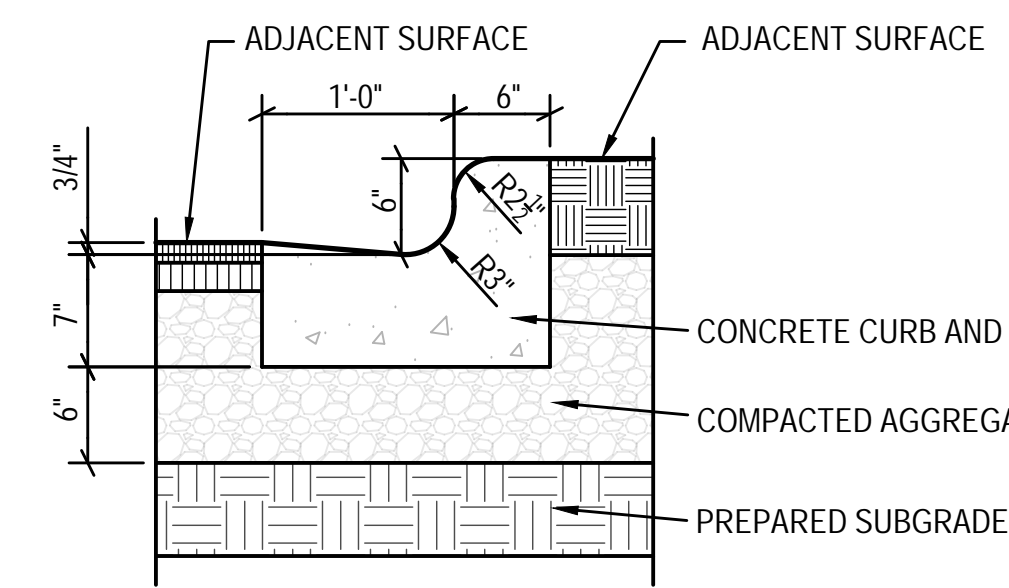




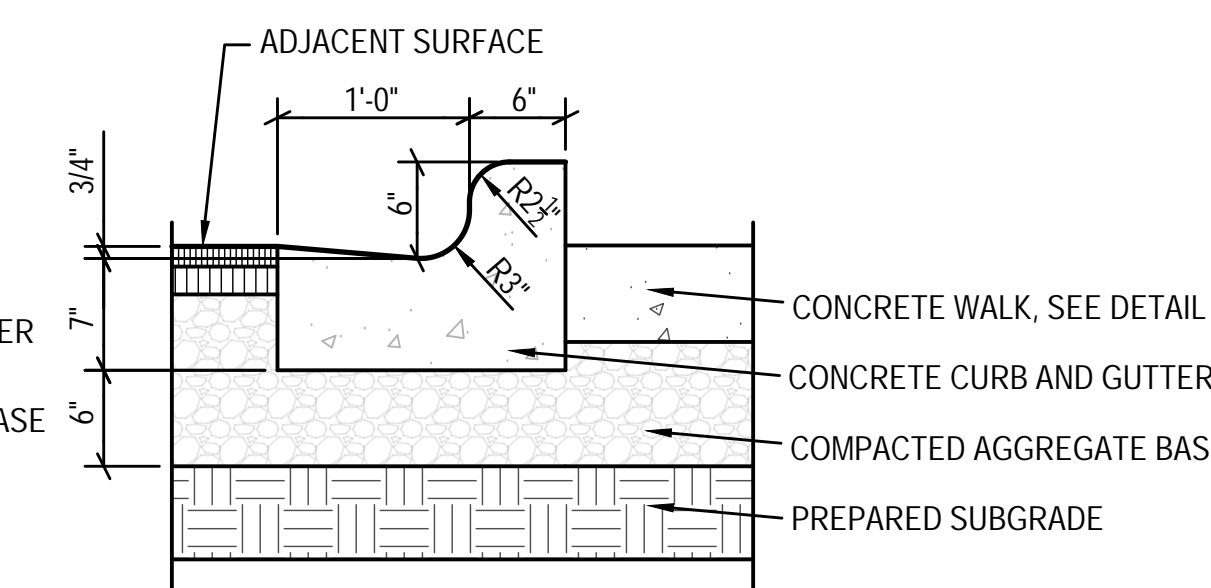
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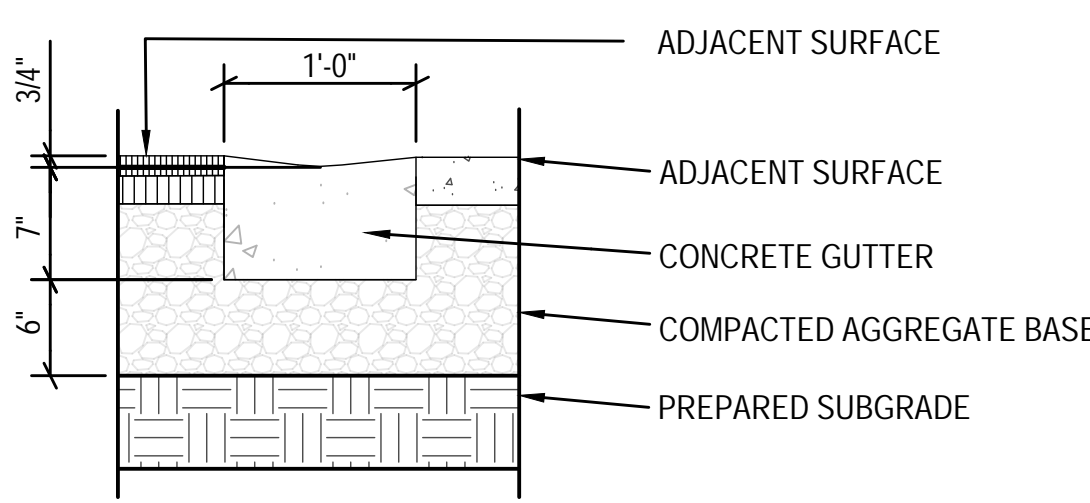
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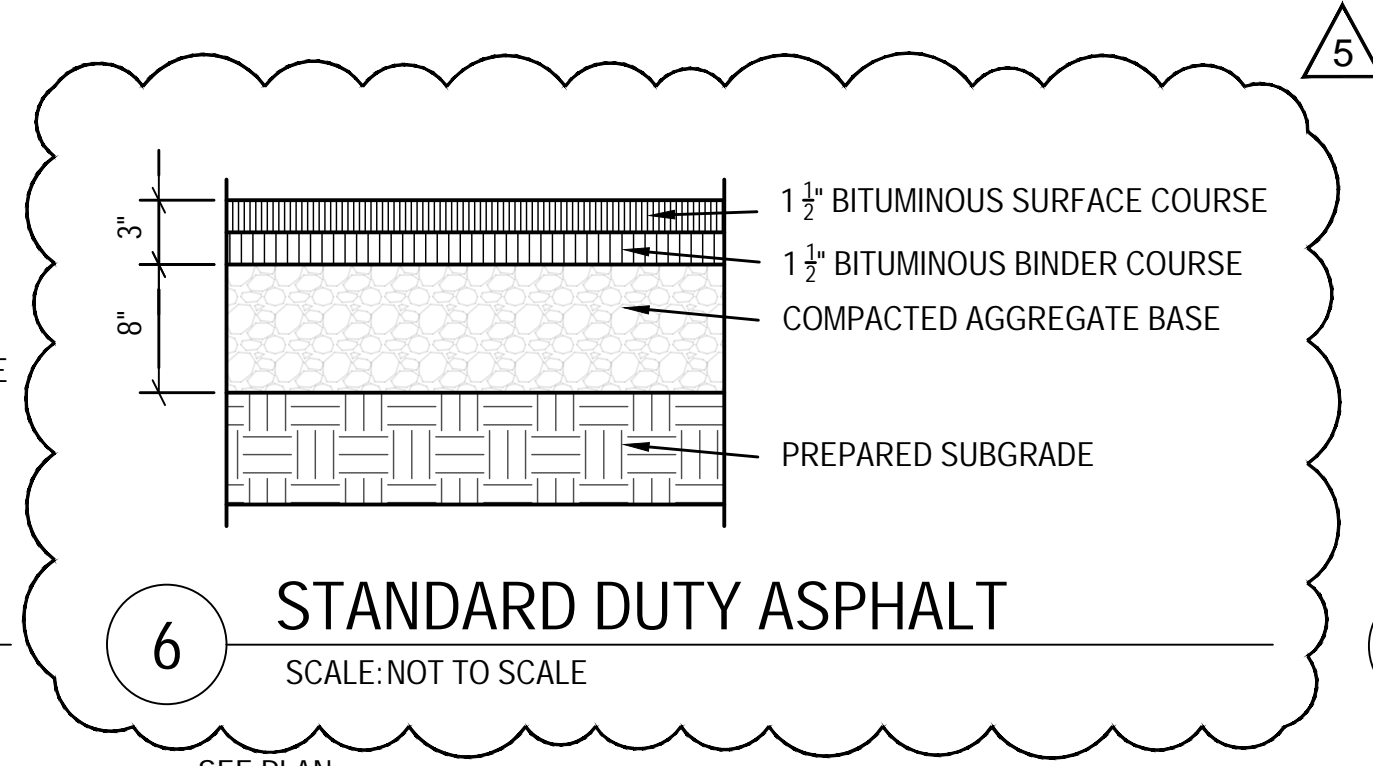
**3 CONCRETE CURB AND GUTTER**  
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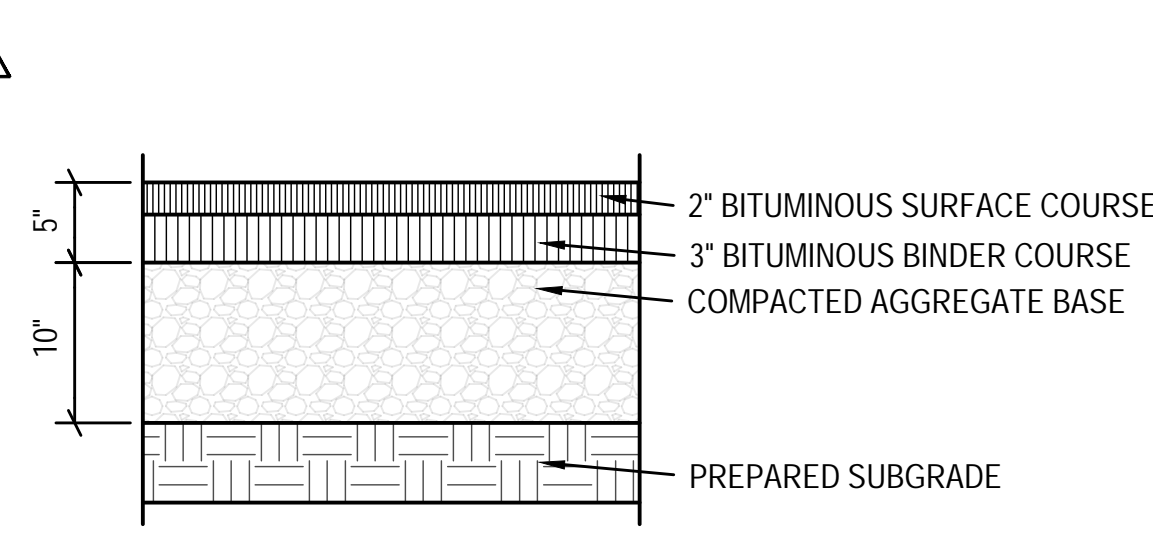
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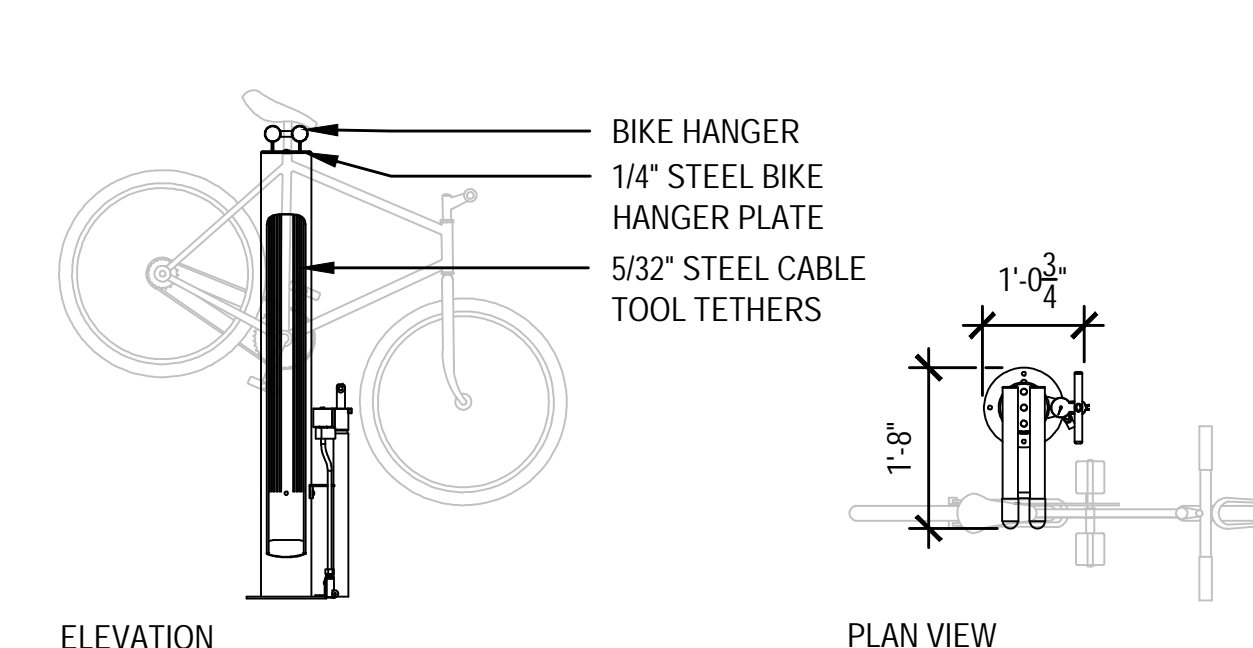
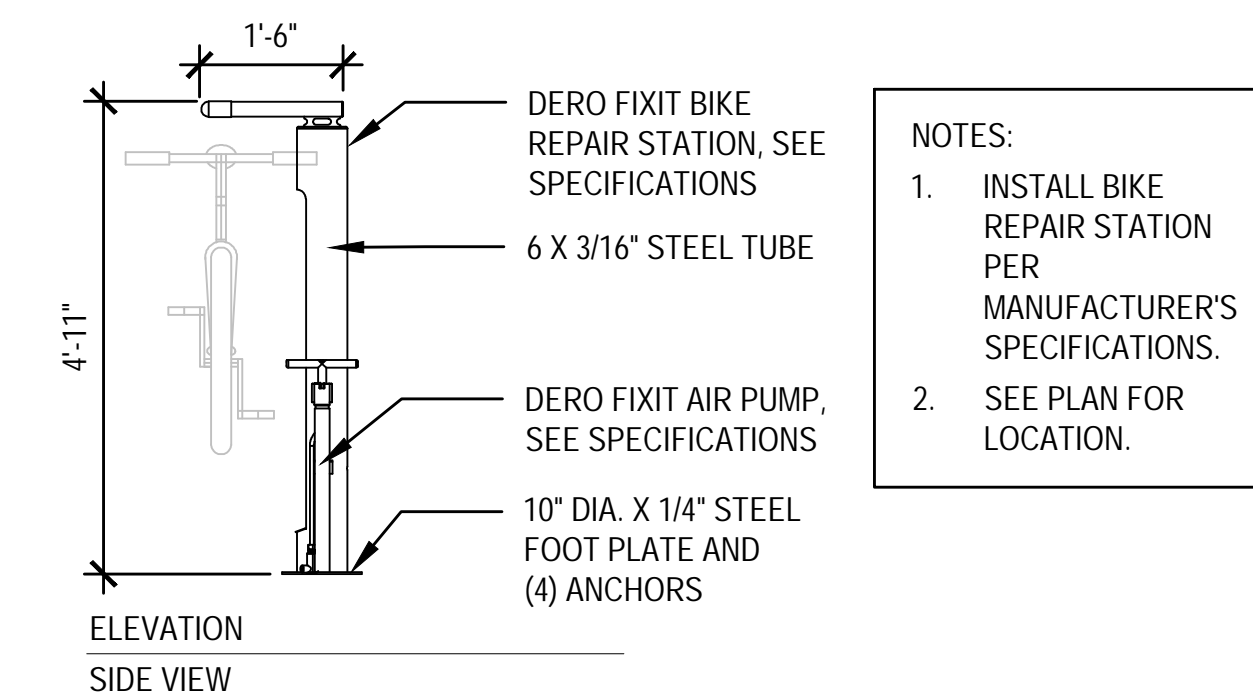
**5 CONCRETE GUTTER**  
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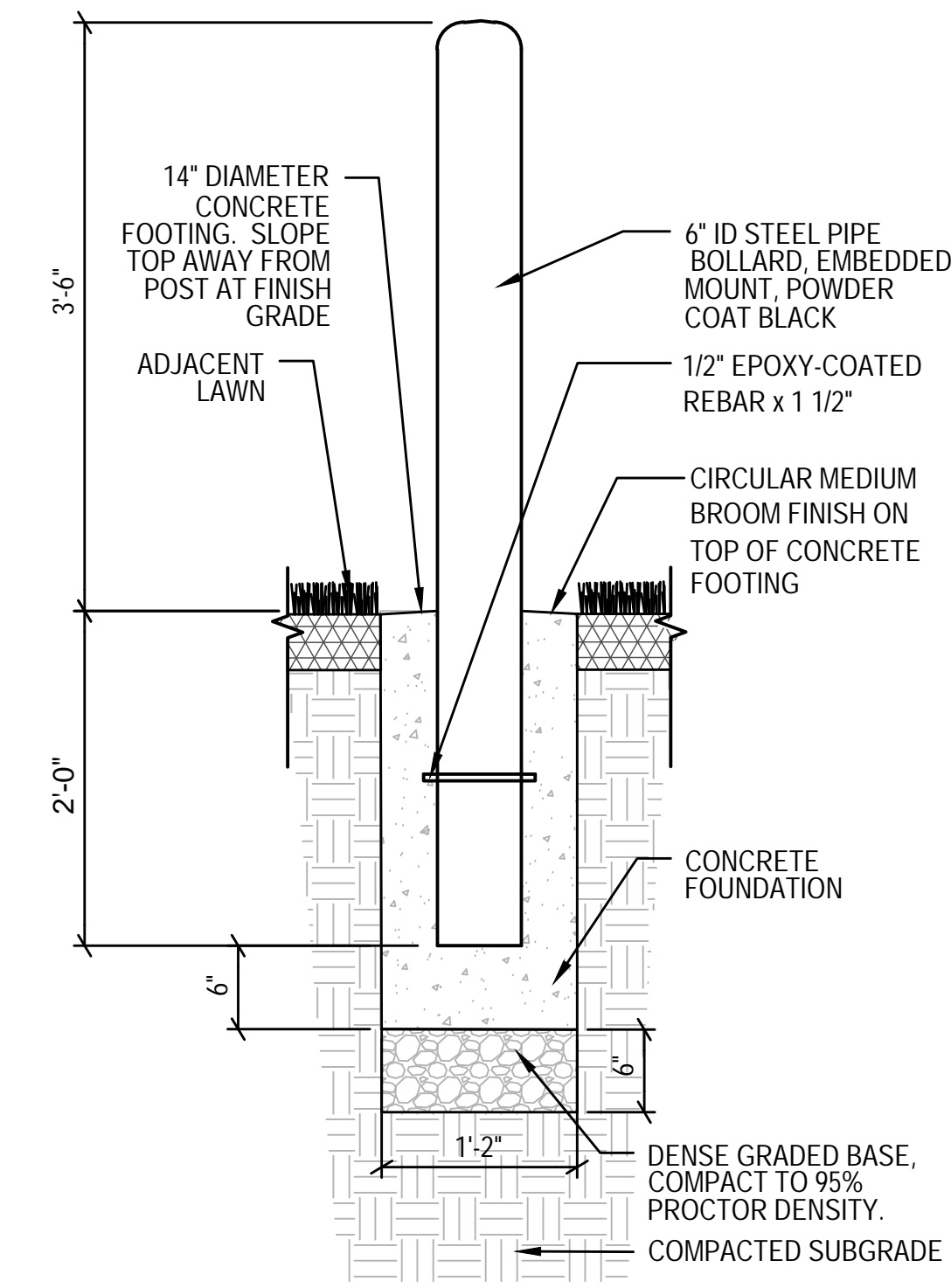
**6 STANDARD DUTY ASPHALT**  
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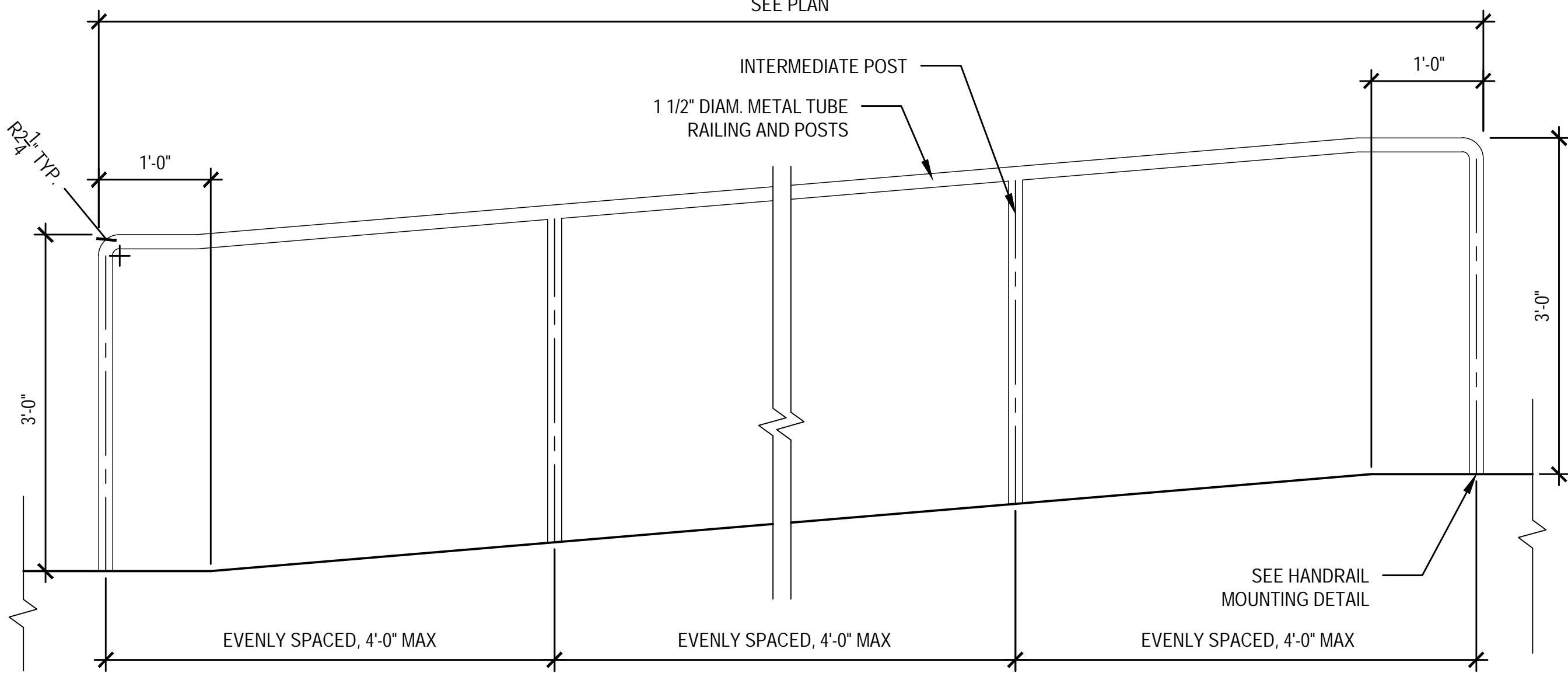
**7 HEAVY DUTY ASPHALT**  
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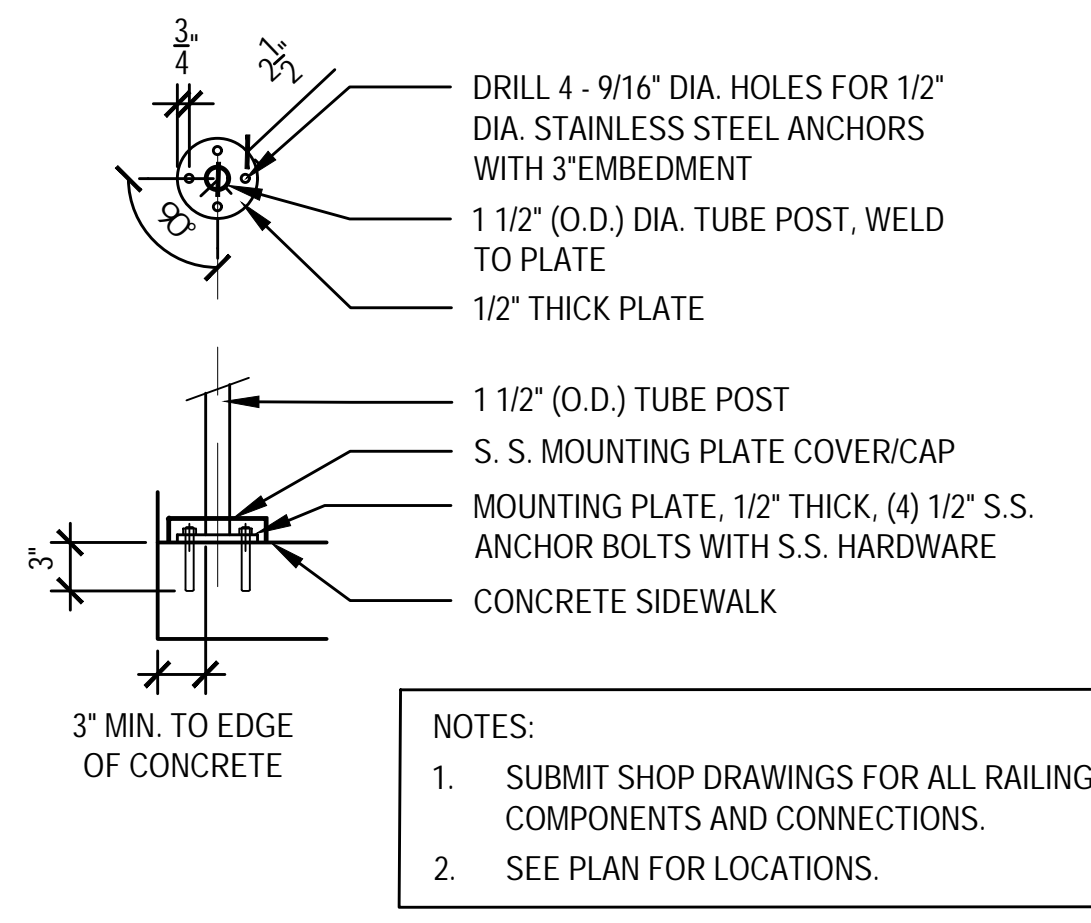
**8 BIKE REPAIR STATION AND AIR PUMP**  
SCALE: NOT TO SCALE



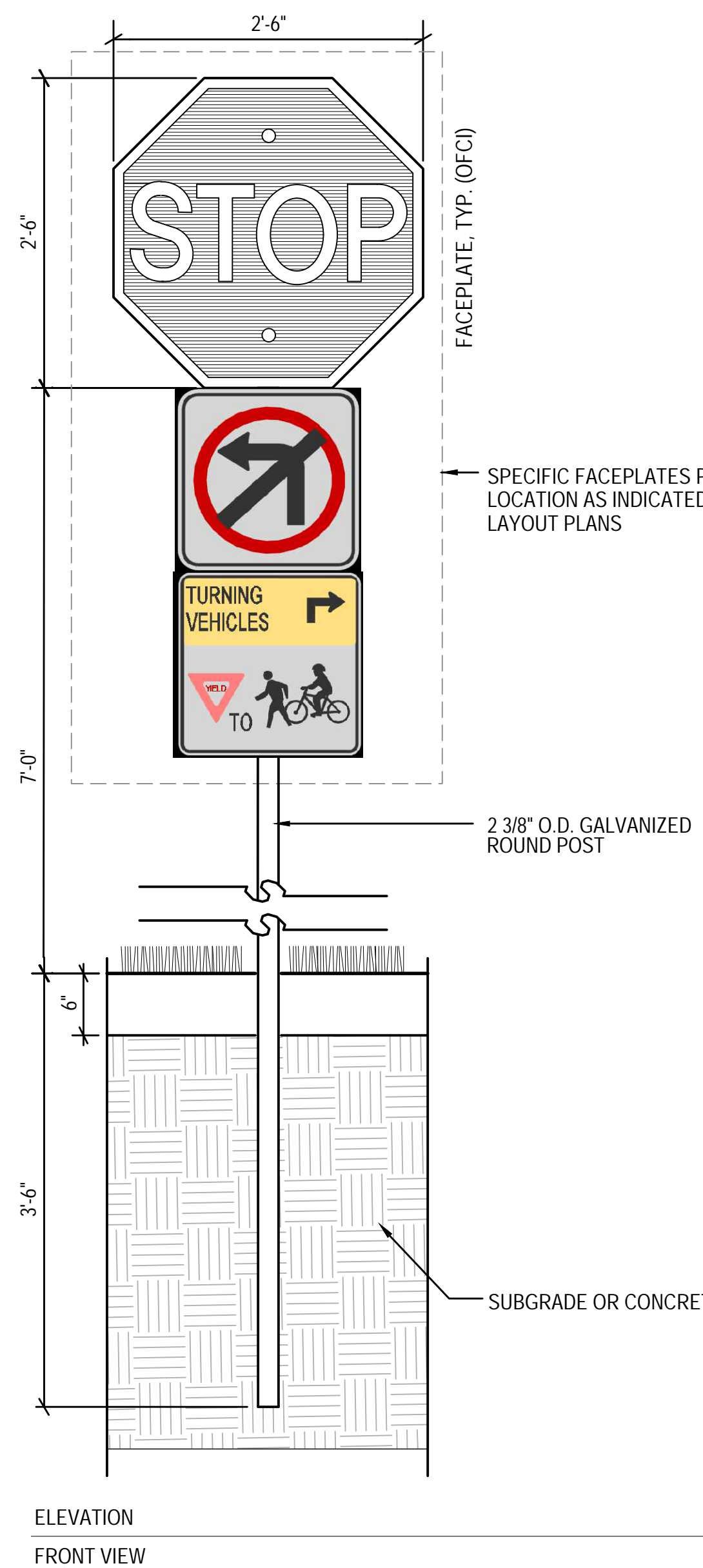
**9 BOLLARD**  
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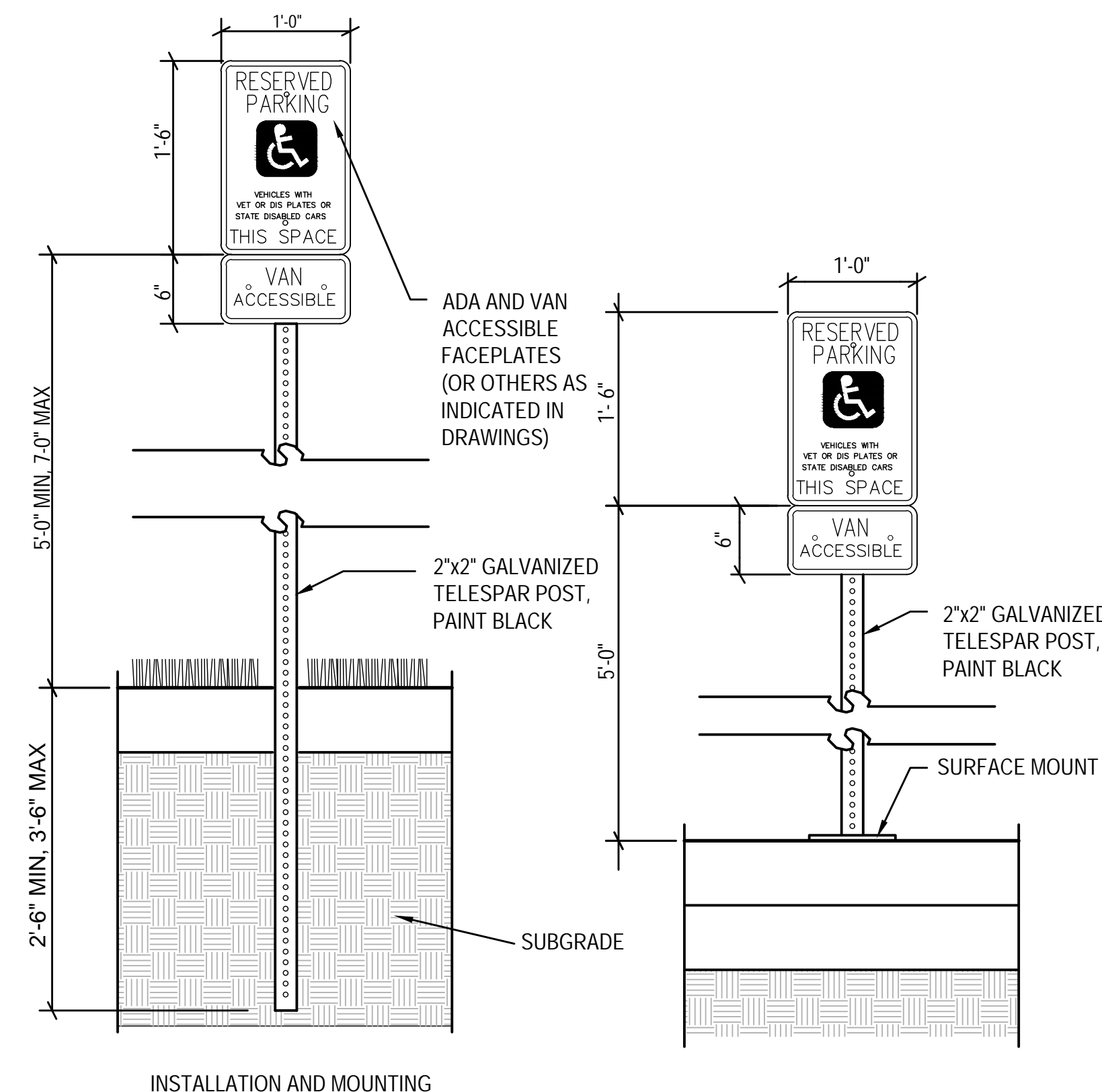
**10 HANDRAIL**  
SCALE: NOT TO SCALE



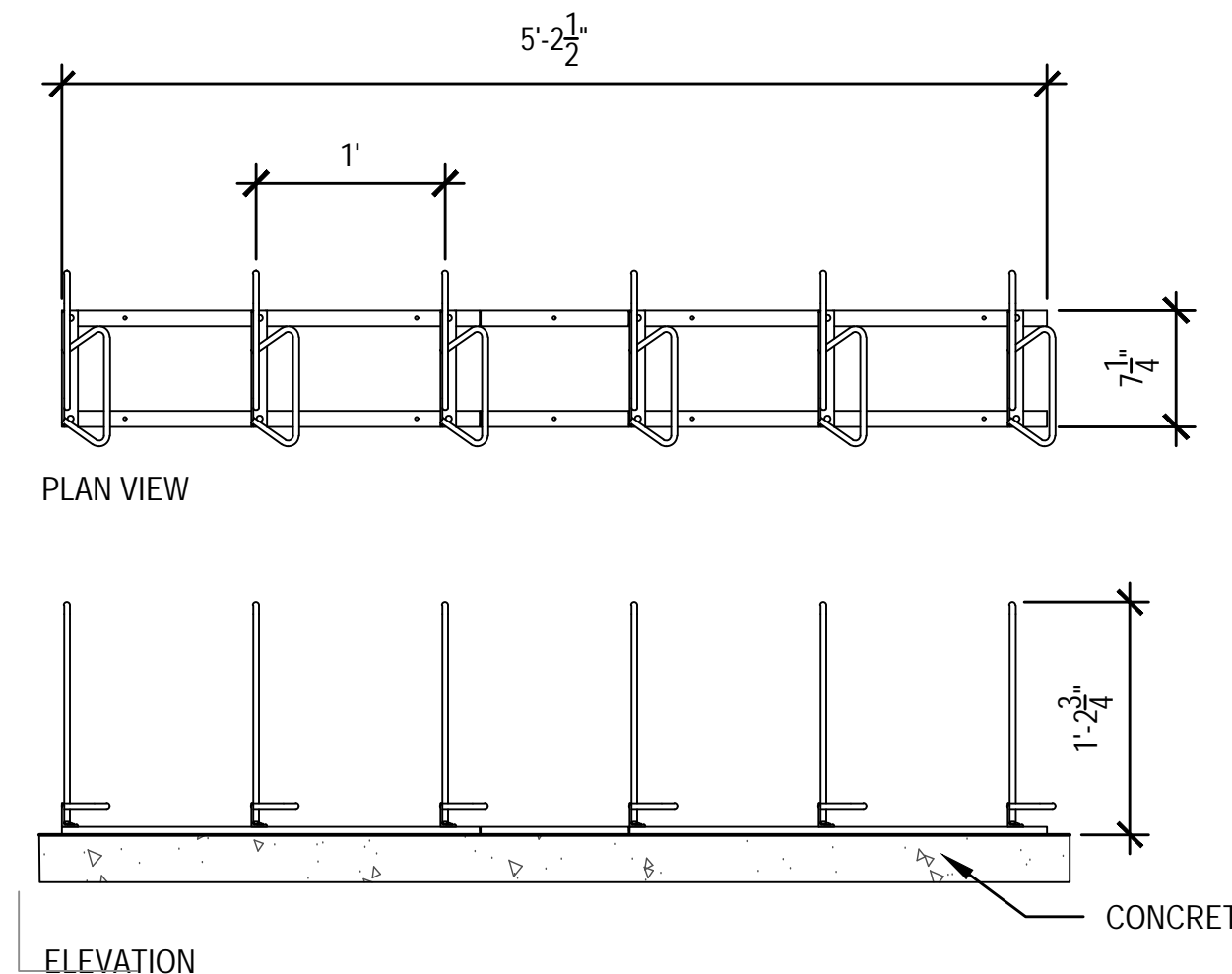
**11 HANDRAIL MOUNTING**  
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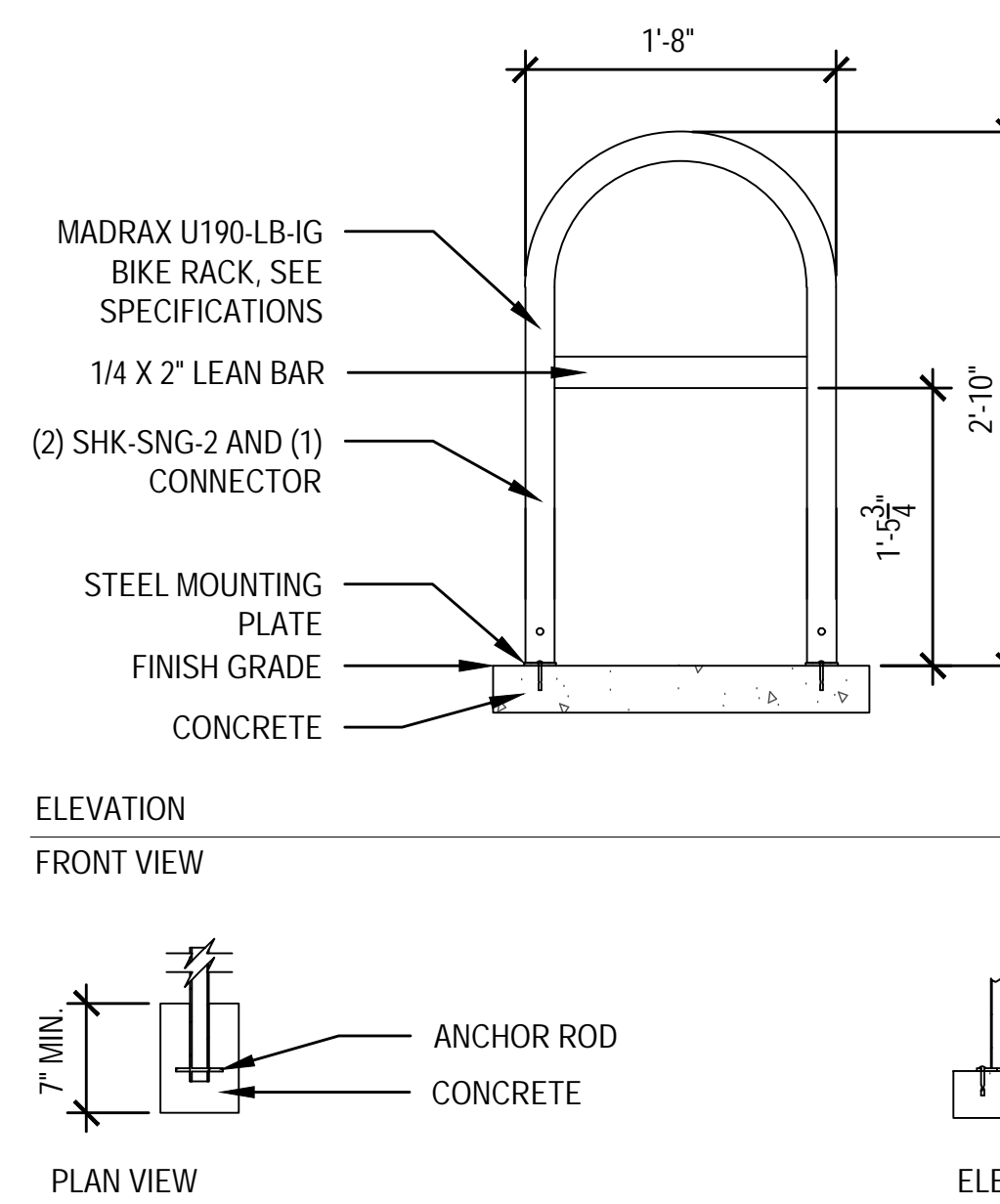
**12 STOP SIGN**  
SCALE: NOT TO SCALE



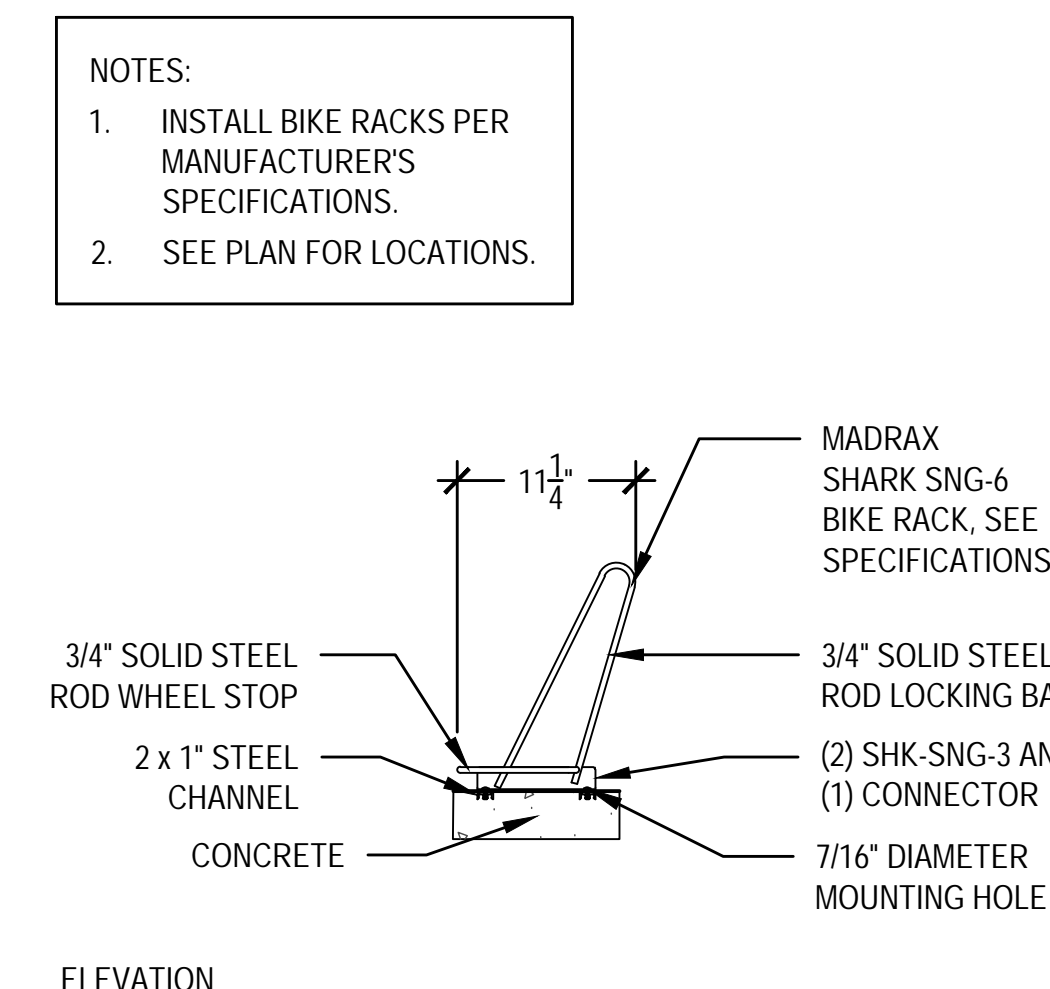
**13 ACCESSIBLE PARKING STALL SIGN**  
SCALE: NOT TO SCALE



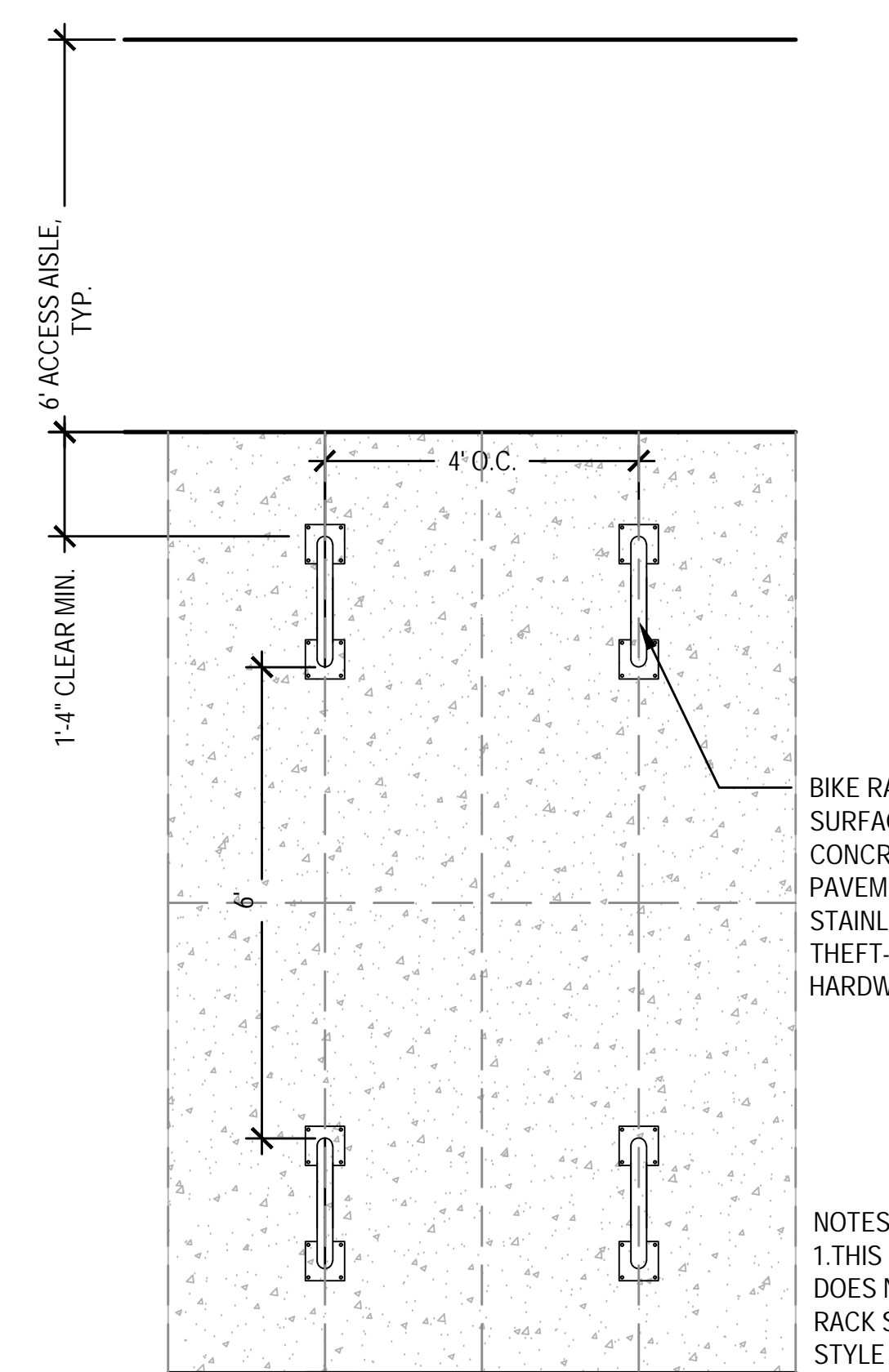
**14 SHARK BIKE RACK**  
SCALE: NOT TO SCALE



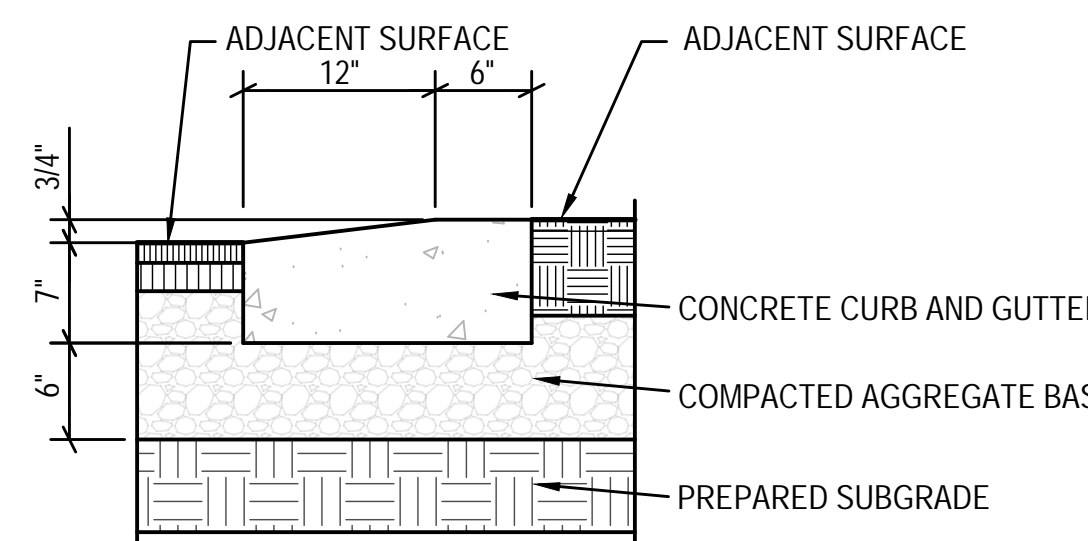
**15 U BIKE RACK**  
SCALE: NOT TO SCALE



**16 U BIKE RACK SPACING DETAIL**  
SCALE: NOT TO SCALE



**16 U BIKE RACK SPACING DETAIL**  
SCALE: NOT TO SCALE

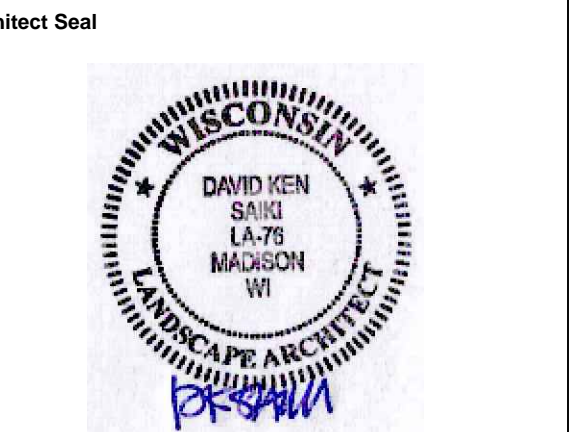


**17 REJECT GUTTER**  
SCALE: NOT TO SCALE

Architecture and Interiors	
<b>MSRDesign</b> 510 Marquette Avenue South, Suite 200 Minneapolis, MN 55402   612.375.0336	
MEP Engineer	<b>Salas O'Brien</b>
<b>Salas O'Brien</b> 2901 Metro Drive, Suite 225 Bloomington, MN 55425   651.379.9121	
Civil Engineer	
<b>Vierbicher</b> 999 Fourier Dr., Suite 201, Madison, WI 53717   608.826.0532	
Landscape Architect	
<b>Ken Saiki Design</b> 1110 S. Park St. Madison, WI 53715   608.251.3600	
Structural Engineering, Fire Protection Engineering, Technology and AV	
<b>IMEG Corporation, Inc. IMEG</b> 1800 Deming Way, Suite 200, Madison, WI 53662	
Lighting Design	
<b>Mazzetti, Inc.</b> 1999 Broadway, Suite 2205 Denver, CO 80202   720.644.5044	
Commercial Kitchen Design	
<b>Boelter Premier</b> 7120 Northland Terrace, Minneapolis, MN 55428   763.544.8800	

**MADISON PUBLIC MARKET**  
202 N First St, Madison, WI 53704

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.

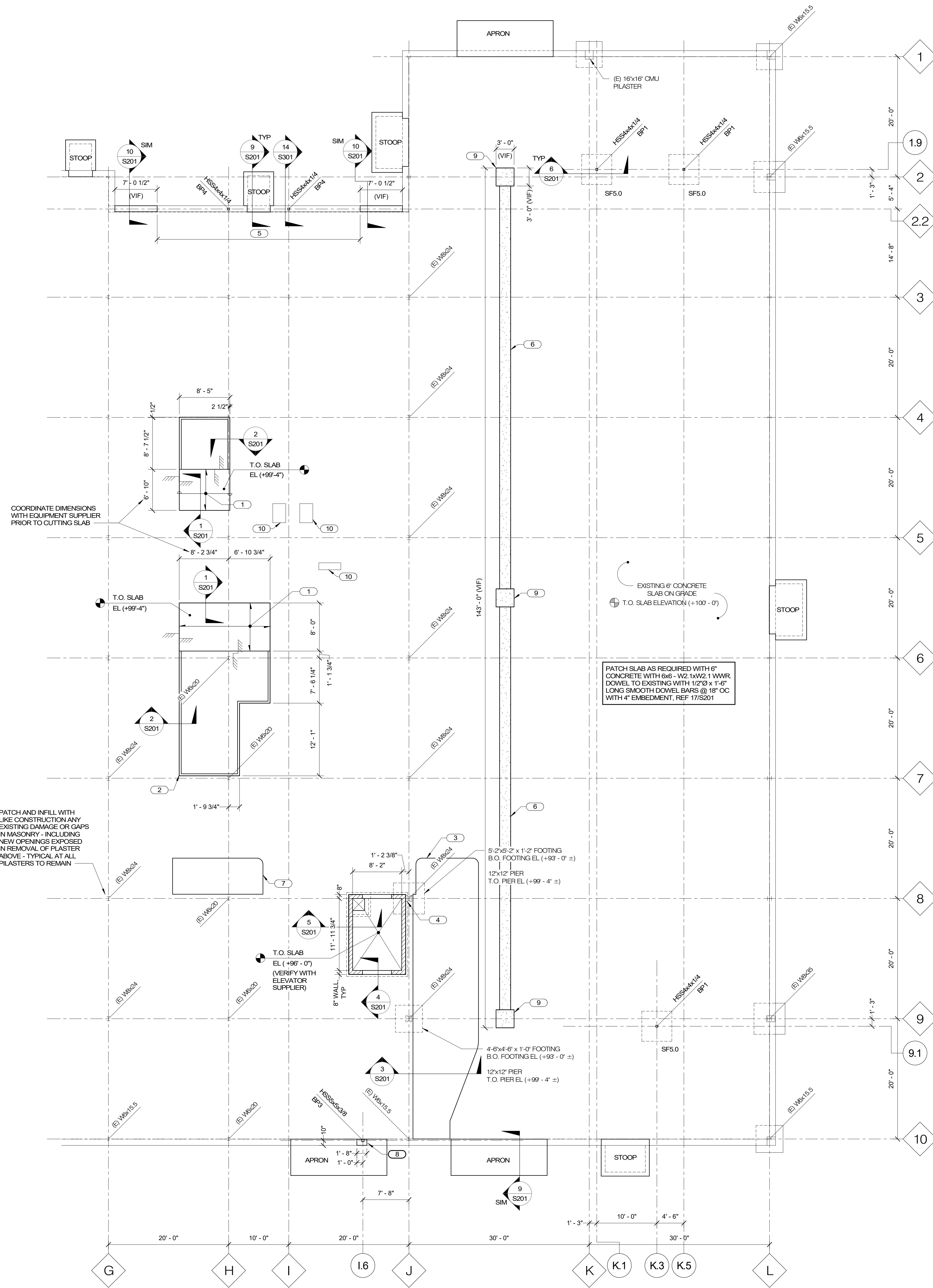


Signature \_\_\_\_\_  
Print Name \_\_\_\_\_  
Date \_\_\_\_\_ License No. \_\_\_\_\_

**ADDENDUM 4**

Mark Date	Description
2023.06.09	BID DOCUMENTS
2023.09.05	ADDENDUM 4

**HARDSCAPE DETAILS**  
**L501**



LOACTION	DEAD LOAD	SNOW LOAD	WIND LOAD
11/1.1, 11/1.7	2.2 K	2.2 K	6.8 K
12/1.1, 12/1.7	1.6 K	1.6 K	2.6 K
13/1.1, 13/1.7	2.2 K	2.2 K	3.7 K
CF3.0	1.4 KLF	-	1.0 KLF UP OR DOWN

**NOTES:**

- ALL LOADS ARE UNFACTORED VERTICAL LOADS, UNO.

MARK	LENGTH	WIDTH	THICKNESS	REINFORCING	
				LONG DIRECTION	SHORT DIRECTION
SF5.0	5'-0"	5'-0"	1'-0"	(6) #5	(6) #5
SF6.0	6'-0"	6'-0"	1'-0"	(6) #5	(6) #5

MARK	THICKNESS	REINFORCING		REMARKS
		LONG DIRECTION	SHORT DIRECTION	
PC4	2'-0"	(8) #6	(8) #6	

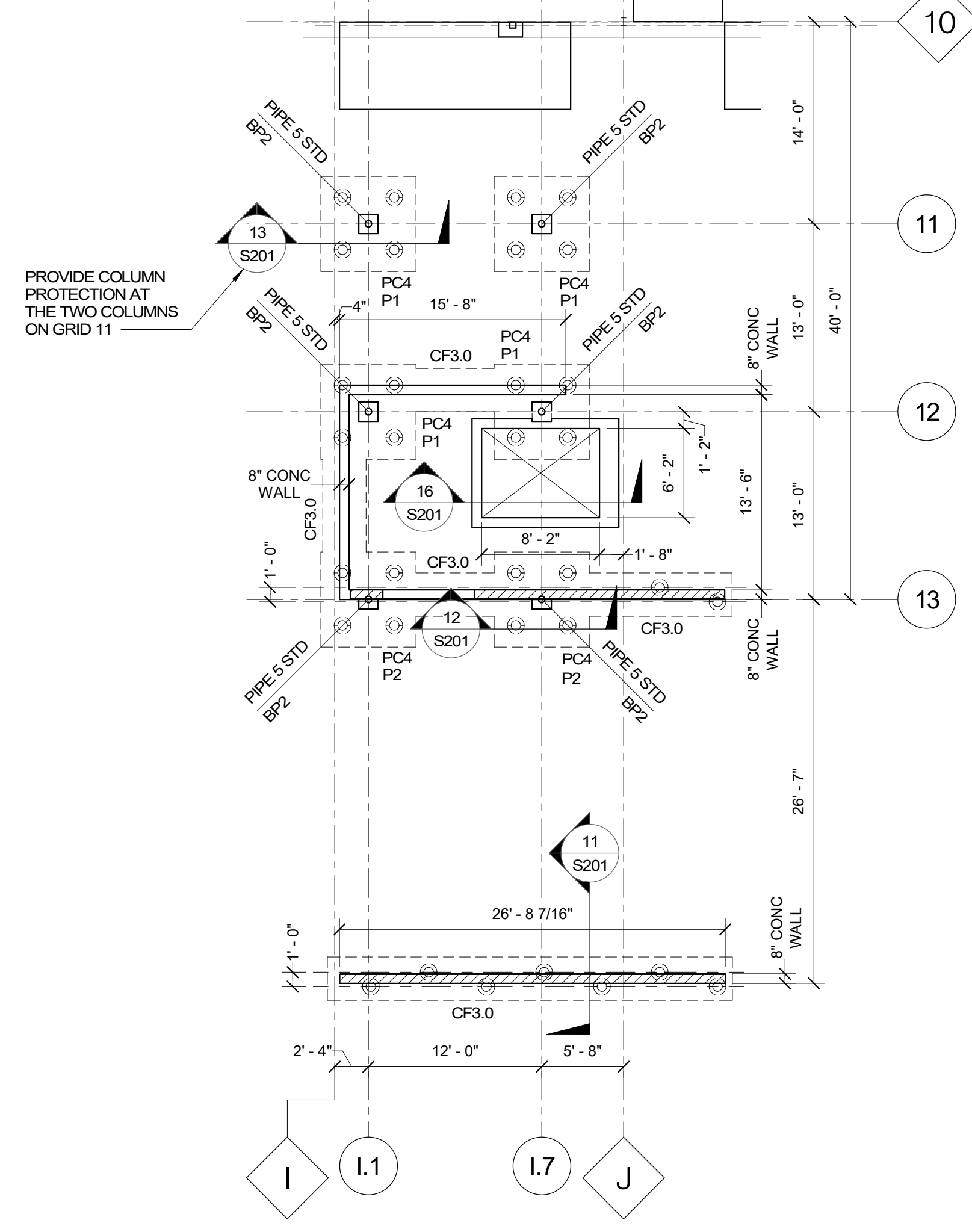
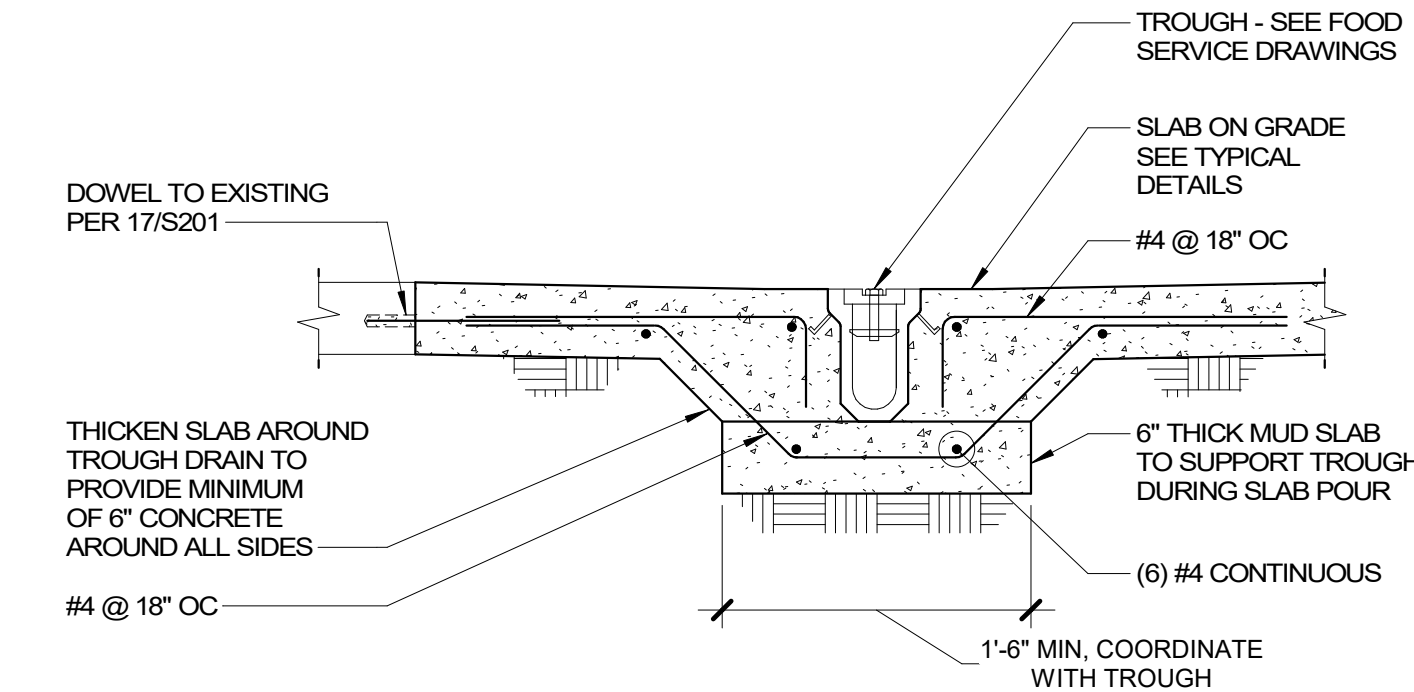
**NOTES:**

- REFER TO S201 FOR PILE CAP DETAILS.
- PROVIDE STANDARD 90° HOOK EACH END OF REINFORCING BARS.

MARK	WIDTH	THICKNESS	REINFORCING	
			LONG DIRECTION	SHORT DIRECTION
CF3.0	3'-0"	2'-0"	(3) #5	-

- NOTES:**
- TOP OF INTERIOR FOOTING EL (+99'-4") UNO.
  - TOP OF EXTERIOR PILE CAP AND CONTINUOUS FOOTINGS EL (+96'-0") UNO. REFER TO S201 FOR DETAILS.
  - TOP OF FOUNDATION WALL EL (+100'-8") UNO.
  - TOP OF PIER EL (+99'-0") UNO. REFER TO S201 FOR DETAILS.
  - REFER TO S301 FOR BASE PLATE DETAILS.
  - PROVIDE 2" x 6" x 2" CORNER BARS FOR FOOTING AND WALL INTERSECTIONS. BAR SIZE AND QUANTITY TO MATCH LONGITUDINAL AND HORIZONTAL BARS.
  - REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS NOT GIVEN HERE.
  - HELICAL PILE (HP) DESIGN SHALL MEET THE SPECIFIED LOADING AS SHOWN ON PLAN. FOR BIDDING PURPOSES, HP QUANTITY SHALL BE AS SHOWN ON PLAN AND DEPTH SHALL BE 25 FEET BELOW THE BOTTOM OF FOUNDATION ELEVATION. CONTINUOUS FOOTINGS DESIGNED FOR MAX HP SPACING OF 6'-0" OC, STAGGERED ALONG LENGTH OF FOOTING. CONTACT A/E IF MODIFICATIONS TO FOOTING SIZES AER REQUIRED.

- KEYNOTES:**
- 4" CONCRETE SLAB ON GRADE WITH 6#6 - W2.1W2.1 WWR. TOP OF SLAB EL (+99'-4").
  - 2" SAWCUT JOINT AROUND COOLER.
  - 12" THICK ISOLATED PAD FOR WATER HARVESTING SYSTEM. T.O. SLAB ELEVATION (+100'-0"). COORDINATE DIMENSIONS WITH ARCHITECTURAL DRAWINGS AND EQUIPMENT SUPPLIER OR OWNER.
  - DOWEL HORIZONTAL WALL REINFORCING INTO EXISTING CONCRETE 4" WITH ADHESIVE PER S301.
  - AT GLAZING, SAWCUT EXISTING CONCRETE WALL DOWN TO (+100'-8").
  - AT DOORS: SAWCUT EXISTING CONCRETE WALL DOWN TO (+99'-4").
  - EXISTING FLOOR TRENCH FILLED WITH CONCRETE. GRIND DOWN EXISTING CONCRETE 2" AND POUR NEW CONCRETE TOPPING WITH FIBER REINFORCING.
  - 6" HOUSEKEEPING PAD WITH 6#6 - W2.1W2.1 WWR. TOP OF SLAB EL (+100'-6"). REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS.
  - CONCRETE CURB PER 10/S201. EXTEND HSS COLUMN DOWN TO T.O. (E) FOUNDATION WALL (+99'-6", VIF) AND ENCASE IN CONCRETE CURB.
  - EXISTING CATCH BASIN FILLED WITH GRAVEL WITH CONCRETE CAP. CONTRACTOR OPTION TO GRIND DOWN EXISTING CONCRETE 2" AND POUR NEW CONCRETE TOPPING WITH FIBER REINFORCING OR DEMO EXISTING CAP AND POUR NEW CONCRETE CAP WITH FIBER REINFORCING.
  - FLOOR TROUGH - COORDINATE LOCATION AND INSTALLATION REQUIREMENTS WITH FOOD SERVICE EQUIPMENT SUPPLIER. SEE S101S.



**IMEG**  
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REF. SCALE IN INCHES PROJECT #1900007.00

- Architecture and Interiors
- MSRDesign**  
510 Marquette Avenue South, Suite 200  
Minneapolis, MN 55402 | 612.375.0336
- MEP Engineer **Salas O'Brien**  
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Bloomington, MN 55425 | 612.379.9121
- Civil Engineer **Vierbicher**  
989 Founier Dr., Suite 201  
Madison, WI 53717 | 608.826.0532
- Landscape Architect **Ken Saiki Design**  
1110 S. Park St.  
Madison, WI 53715 | 608.251.3600
- Structural Engineering, Fire Protection Engineering, Technology and AV **IMEG Corporation, Inc. IMEG**  
1800 Deming Way, Suite 200,  
Madison, WI 53002
- Lighting Design **Mazzetti, Inc. MAZZETTI**  
1999 Broadway, Suite 2205  
Denver, CO 80202 | 720.644.5044
- Commercial Kitchen Design **Boelter Premier Boelter premier**  
7120 Northland Terrace,  
Minneapolis, MN 55428 | 763.544.8800

Project No. 201900007.00

**MADISON PUBLIC MARKET**  
202 N First St, Madison, WI 53704

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the Laws of the State of Wisconsin.

Seal

Print Name: Abby Pertzbom  
Date: 05.28.2021 License No.: 387456

**ADDENDUM 4**

**ISSUE / REVISION**

Mark	Date	Description
1	2023.08.09	BID DOCUMENTS
5	2023.09.05	ADDENDUM 4

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FOUNDATION PLAN - SOUTH

**S101S**