



MADISON WATER UTILITY
CITY OF MADISON WATER UTILITY
119 E. OLIN AVE.
MADISON, WI 53713

CITY OF MADISON WATER UTILITY
UNIT WELL 19 TREATMENT SYSTEM ADDITION
2626 LAKE MENDOTA DRIVE
MADISON, WISCONSIN

This drawing is an instrument of service and shall remain the property of Short Ekliff Hendrickson, Inc. (SEH). This drawing, concepts and ideas contained herein shall not be used, reproduced, revised, or related without the express written approval of SEH. Submission or distribution of this drawing to non-official or regulatory requirements or for purposes in connection with the project is not to be construed as publication or derogation of any of the rights of SEH.

SEH Project MADJW 167818
Checked By NRD, SMJ
Drawn By ALM

Project Status Issue Date
BIDDING DOCUMENTS OCTOBER, 2023

REVISION SCHEDULE		
REV. #	DESCRIPTION	DATE
1	ADDENDUM 3	11/20/2023

GENERAL STRUCTURAL NOTES

GS002

- Where topping is called for, plank shall receive a transverse broom finish at plant and shall have keys grouted minimum 4 days before topping is placed. Immediately before placing topping, pressure-wash surface of plank and blow clean with oil-free compressed air, then rub with cement slurry as a curing compound, working just ahead of concrete placement. Surface to be free of standing water but slurry must be wet when topping is placed. Wet cure topping (burlap/epoxy) for a minimum of 7 days. Topping slabs shall be reinforced with 6x6 - W2.9 x W2.9 welded wire fabric (flat sheets only) macrosynthetic fibrous reinforcing integral to the mix.
- All horizontal joints and reveals in wall panels shall align within 1/2 inch or 1/2 of joint dimension, whichever is less, at all joints between panels.
- All exposed connection components shall be stainless steel type 316 / painted steel / steel with three coat paint system: moisture-cured zinc-rich urethane primer, epoxy, urethane. (pick one)

REINFORCING STEEL

- All concrete is reinforced concrete unless specifically called out as unreinforced. Reinforce all concrete not otherwise shown with same steel as in similar sections or areas. Any details not shown shall be detailed per ACI 315 and meet requirements of ACI 318, current editions.
- All reinforcing steel shall conform to the requirements of ASTM A615 grade 60 steel. Reinforcing steel shall not be welded without authorization of the SER, and if welded shall be A706 grade 60 steel. Reinforcing to be welded shall only be welded to structural steel, and other reinforcing, unless specifically noted on the drawings. Welded plain wire fabric shall be supplied in sheets, not rolls, and conform to the requirements of ASTM A185.
- Clear minimum cover of concrete over reinforcing steel shall be as follows unless specifically noted otherwise:
 - 2" Concrete placed against earth
 - 2" Top mat of base slabs to receive waterstops at wall joint
 - 2" All other concrete
- All reinforcing shall be tied to crossing reinforcing on at least every other bar (every bar at perimeter), and sufficiently to resist displacement from workers and placement of concrete.
- All footing dowels shall be accurately positioned and wired in place before casting footings concrete. Where not noted, provide and install hooked dowels of same size and spacing as vertical reinforcement in all columns and walls. Position all anchor bolts with templates.
- Bar lap table can be found on the first general sheet of the structural drawings.
- Bar lap lengths in concrete and 90 degree and hooks shall be in accordance with the bar lap table unless noted otherwise. This table lists class 'B' laps. For epoxy coated reinforcing steel, increase lap length by 50% with c-c bar spacing < 6db and cover to center of bar < 3db, otherwise increase by 20%. For masonry reinforcing, use fc = 3000 psi lapped.
- Bars marked continuous, corner bars, and all vertical steel shall be valued in accordance with table above at splices and embedments, unless shown otherwise. Splice top bars near midspan and splice bottom bars over supports, unless noted otherwise.
- Bar support accessories shall be as specified in latest edition of the ACI detailing handbook and the concrete reinforcing steel institute design handbook. Maximum accessory spacing shall be 4'-0" on center, and all accessories on exposed surfaces shall have plastic coated ends. Chairs shall be supported on sand plates as required to keep from sinking into subgrade. WVF shall be supported by continuous bolsters or bars on chairs sufficiently close to prevent sheets from sagging appreciably during concrete placement. Support rebar used at contractor's option shall be extra bars provided by contractor, not taken from design reinforcing.
- Where potentially exposed to de-icing salts, stoop, apron, sidewalk and floor reinforcing shall be epoxy coated.

CONCRETE REPAIR

- Locate and remove areas of loose, delaminated, or damaged concrete. Saw cut outside perimeter of damaged areas to a minimum depth of approximately 3/4 inch; do not cut reinforcing. Tally areas removed for payment. Sandblast area to be patched and blow clean. Protect surroundings and workers from dust and hazards associated with this work.
- Where half or more of the perimeter of reinforcing bar is exposed, bond between reinforcing bar and surrounding concrete is broken, or reinforcing bar is corroded, remove concrete from entire perimeter of bar to provide minimum 3/4 inch clearance behind bar. Clean and coat exposed surface of bar with bonding agent (Sika Amatec 110, Sonoprep, or Euclid Cor-Bond).
- Dampen patch area and apply mortar scrub coat, keeping moist until patch is applied.
- Patch with polymer-modified cementitious patching mortar (Dayton Superior HD-50, Euclid Verti-coat, Master Builders Emaco R320, Sikatop 121, or Sonopatch 100). Cure according to manufacturer's recommendations.

CONCRETE BLOCK MASONRY

- Concrete block used in exterior walls or load bearing walls shall meet the following minimum requirements:
 - Concrete masonry units: 2,000 PSI
 - Mortar, ASTM C-270-10 Type S UNO
 - Grout, ASTM C-476-10 fg = 3,000 PSI, Slump: 8-11 inches
- The contractor shall provide adequate temporary bracing for all masonry walls during construction.
- Concrete block shall be laid in running bond pattern typical unless noted otherwise. No vertical (head) joint shall be continuous for more than one block height. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and foundation walls and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities which are not required to have wall joints, but a 22" square box is required to have one in each wall. For this purpose, a T-intersection counts as a corner at the intersecting wall but not at the continuing wall.
- Alternatively, a low-shrinkage mix may be proposed, and shrinkage measured for the specific concrete mix to be used in the walls, and the maximum construction joint spacing determined by the equation: Spacing = 2.0 / (sh + 0.03), where "sh" is the shrinkage in percent from the 35-day shrinkage test described below; and the spacing is limited to 50 feet. Concrete placed in the walls shall have the same or lesser water content as that used in the test. If a Shrinkage Reducing Admixture or Shrinkage Compensating Admixture is used, it shall be used as the manufacturer's recommended dosage. Measurement of shrinkage shall be according to ASTM C157, except that the specimens should be cured in a lime saturated bath for 7 days rather than 28 days. Shrinkage shall be reported based on measurements at the end of the 7-day moist cure, and at 28 days after cessation of curing. If Shrinkage Compensating Admixture is used, measurement shall be 12 hours after placing rather than 7 days; full 7-day time both cure and 28-day drying shall still be followed.
- Concrete base slabs in liquid-holding structures:
 - Concrete walls in liquid-holding structures shall have waterstopped construction joints at a maximum spacing of 20 feet for concrete proportioned according to these Notes and the specification. Full horizontal reinforcing shall extend through these joints and be developed each side of joint. At least 36 hours shall pass between adjacent wall pours in liquid-holding structures. Joint spacing in walls shall be measured at the inside surface between corners in a straight line or along a curve, but not around corners. For example, an 18" square box is not required to have wall joints, but a 22" square box is required to have one in each wall. For this purpose, a T-intersection counts as a corner at the intersecting wall but not at the continuing wall.
 - Alternatively, shrinkage may be proposed, and shrinkage measured for the specific concrete mix to be used in the walls, and the maximum construction joint spacing determined by the equation: Spacing = 2.0 / (sh + 0.03), where "sh" is the shrinkage in percent from the 35-day shrinkage test described below; and the spacing is limited to 50 feet. Concrete placed in the walls shall have the same or lesser water content as that used in the test. If a Shrinkage Reducing Admixture or Shrinkage Compensating Admixture is used, it shall be used as the manufacturer's recommended dosage. Measurement of shrinkage shall be according to ASTM C157, except that the specimens should be cured in a lime saturated bath for 7 days rather than 28 days. Shrinkage shall be reported based on measurements at the end of the 7-day moist cure, and at 28 days after cessation of curing. If Shrinkage Compensating Admixture is used, measurement shall be 12 hours after placing rather than 7 days; full 7-day time both cure and 28-day drying shall still be followed.
- Concrete base slabs in liquid-holding structures:
 - Concrete walls in liquid-holding structures shall have waterstopped construction joints at a maximum spacing of 40 feet in each direction, with full reinforcing through the joint and developed each side of each joint. At least 36 hours shall pass between adjacent slab pours in liquid-holding structures.
 - Alternatively, shrinkage may be measured as specified above for the specific concrete mix to be used in the base slab, and the maximum spacing determined by the equation: Spacing = 4.0 / (sh + 0.03), where "sh" is the shrinkage in percent from the 35-day shrinkage test described above and the spacing is limited to 100 feet. Concrete placed in the base slab shall have the same or lesser water content as that used in the test. If a Shrinkage Reducing Admixture is used, it shall be used as the manufacturer's recommended dosage.
- Concrete slabs on grade in non-liquid-holding structures:
 - Contraction joint spacing in non-liquid-holding steel-reinforced slabs on grade (building floors) shall be spaced at a maximum of 24 x Thickness, but not more than 15 feet, in each direction. Contraction joint spacing in fiber-reinforced slabs on grade shall be spaced at a maximum of 30 x Thickness, but not more than 18 feet, in each direction. A slab of dimension 20 feet or less does not need to be divided by a contraction joint in that direction except as required by aspect ratio. The aspect ratio of any panel shall not exceed 1.50. Unless noted on drawings, Contractor shall submit proposed contraction joint spacing for review. Joints shall intersect columns. Where slab is reinforced with bars #4 or greater, cut or interrupt every other bar at each contraction joint. Joint depth shall be slab thickness / 4, with a minimum of 1". If sawcut, joints shall be cut as soon as it is possible to do so without revealing the concrete, but no later than 12 hours after placement.
 - Contraction joint spacing in steel-reinforced slabs on grade (building floors) with two mats of reinforcing shall have a 1 1/2" chamfer strip at bottom of slab and a sawcut or formed joint 1 1/2" deep at same location, top of slab. Cut or interrupt every other bar of each mat at each contraction joint.
 - Construction joints in building floor slabs on grade shall provide for shear transfer across the joint, using plate dowels such as Diamond dowels. Round or square dowel rods shall not be used. Reinforcing bars may be used where shown on drawings, e.g. at stoop or apron joints. Plate dowels shall be provided per manufacturer's recommendations and spaced at manufacturer's recommended spacing (18 inches max for wheeled traffic on slab, 24 inches max otherwise). If subject to de-icing salt, plate dowels shall be galvanized or epoxy coated.
- Concrete in non-liquid-holding structures other than slabs on grade:
 - Concrete walls in non-liquid-holding structures shall have construction or contraction joints at a maximum spacing of 60 feet.
 - Footings carrying such walls shall have construction or contraction joints at a maximum spacing of 120 feet.
 - Half the longitudinal reinforcing shall be interrupted at these joints unless noted otherwise.
 - Space control joints at maximum 10'-0" on center each way for topping slabs on precast plank.

WATERSTOPS

- Waterstops in new construction shall be 6-inch PVC, center bulb, ribbed, unless specifically noted otherwise.
- At splices, meter all intersecting connections at 45 degrees and use a manufacturer approved heating iron to make full contact butt joints. At areas under more than 10 feet of hydrostatic head, all welded field splices shall receive a bead of flowable hydrophilic waterstop such as Adeka P-201 on each side of waterstop at weld.
- For construction joints at hardened concrete, hydrophilic waterstops may be proposed by the contractor in lieu of adhered split-T PVC waterstop. Such material shall be selected considering water head to be resisted, concrete cover in all directions, reinforcing present through the joint, and whatever the waterstop is continually immersed. Contractor's proposal shall include waterstop information and contact information for the technical representative of the waterstop supplier along with the representative's written recommendation of the type of waterstop to be used. Hydrophilic waterstop shall not be used unless this process is followed.

PRECAST CONCRETE

- Prior to installation, the precast concrete manufacturer shall submit structural calculations and plans to the architect/engineer for review. The structural calculations shall contain an original Professional Engineer's seal and signature by the design engineer licensed in the state where the project is located. Where precast is used as a structural shear diaphragm, calculations shall include shear capacity data for the members in question, topped or untopped.
- Precast concrete units shall be designed for all potential loading conditions including initial handling and erection stresses, all superimposed dead, live, and lateral loads shown on the contract drawings, and all concentrated loads from mechanical equipment and lifting points. General contractor shall verify mechanical loads with the mechanical contractor and provide to precast designer and SER before design.
- The precast concrete manufacturer shall be responsible for the design and installation of all precast connection hardware including hangers, embed plates, anchors, clip angles, headers at openings, etc. that are cast into or form a part of the precast units. Precast manufacturer shall provide 1/8 inch thick continuous bearing strips beneath hollowcore slabs and masonry or concrete supports.
- All roof and wall opening dimensions and locations shown on the plans shall be verified by the contractor and roof manufacturer. Wall openings not contained within a panel width shall be protected by posts or other means during transport and erection.
- Precast wall panels shall be fully grouted at base.
- Joints between plank shall be pulled flush and grouted. Maximum distance between edges of planks is 4 inches at any joint. Where partial wall planks are required, edge of ripped plank shall be smooth and straight.

FOUNDATIONS

- CAUTION:** Existing underground utilities may exist anywhere on the site. Notify owner and Digger's hotline (800) 242-8511 prior to disturbing any ground or excavation.
- Material Definitions and Gradients:**
 - Non-frost-susceptible fill
 - 100% passing 1" sieve
 - < 50% passing #40 sieve
 - < 6% passing #200 sieve
 - < 2% organic content
 - Aggregate Base
 - 100% passing 1" sieve
 - 70-100% passing 3/4" sieve
 - 45-90% passing 3/8" sieve
 - 35-80% passing #4 sieve
 - 20-65% passing #10 sieve
 - 10-35% passing #40 sieve
 - 3-10% passing #200 sieve
 - < 2% organic content
 - Large aggregates through #4 have minimum 25% fractured faces or crushed (per gradation)
 - Aggregate Filter/Base
 - 100% passing 1" sieve
 - 85-100% passing 3/4" sieve
 - 45-90% passing 3/8" sieve
 - 20-60% passing #4 sieve
 - 0-10% passing #10 sieve
 - 0-6% passing #200 sieve
 - < 2% organic content
 - Granular Structural Backfill
 - 100% passing 1" sieve
 - 0-65% passing #10 sieve
 - 0-65% passing #40 sieve
 - 0-10% passing #200 sieve
 - < 2% organic content
- Structural foundations consist of wall and spread footings established on material capable of safely supporting 2,500 PSF as recommended by CEC inc testing in report C22051-10 dated 01/20/2023. The structural engineer is not responsible for the accuracy or content of the subsurface soil conditions described in the specifications, test borings, or geotechnical report. A licensed geotechnical engineer shall be present during construction to test, inspect and verify all assumed soil conditions as required.
- Subgrade tank walls shall be backfilled with Granular Structural Backfill or Non-Frost Susceptible Fill (as defined above) within 2 feet of the wall. Tank walls are not designed to resist lateral load (leak testing or backfilling) until the wall concrete has achieved its full design strength, 14 days minimum. Submit concrete testing verifying this before leak testing or backfilling.
- Foundation walls shall be adequately braced during backfilling and compaction to prevent movement or structural damage. Bracing shall remain in place until permanent bracing is in place and until concrete achieves sufficient strength to resist imposed loads.
- When placing compacted fill adjacent to foundation walls and piers, place backfill at equal rates on both sides to prevent overturning or structural damage.
- Refer to the specifications for a list of structures that require leak testing prior to backfilling.
- Away from walls, place fill in 8 inch loose lifts and compact to 95 percent Modified Proctor beneath foundations. When placing compacted fill adjacent to foundation walls and piers, place backfill at equal rates on both sides to prevent overturning or structural damage.
- Contractor shall provide for dewatering at excavations from either surface water or seepage.
- Moisture content in soils beneath building locations should not be allowed to vary after footing excavations and after grading for slabs on grade are completed to a degree that would de-stabilize the compacted soil. If subgrade materials become desiccated or softened by water or other conditions, remove and replace with engineered fill as recommended by the geotechnical engineer. Do not place concrete on frozen ground, not allow ground beneath foundations to freeze. All foundation work shall be placed on substrate approved and tested by geotechnical engineer of record.
- Do not place backfill on frozen subgrade. Do not place freeze backfill.
- Slabs on grade shall be constructed on a subgrade of native material compacted to at least 95 percent modified proctor, and 6 inches of Aggregate Base or Aggregate Filter/Base (as defined above) or WisDOT base aggregate course (dense) below the slab compacted to 95 percent modified proctor density unless noted otherwise in geotechnical report. In wet or potentially wet situations, use Aggregate Filter/Base (as defined above).
- Grading: where not specifically shown on the plans, it is intended that all excavated and backfilled areas shall be graded to slope away from buildings and other structures.

CONCRETE

- An independent testing agency shall cast 4 six inch test cylinders (5 if 56 day strength is allowed) or an additional cylinder if four inch cylinders are used, for each 75 cubic yards of each concrete mix placed or for each day's operation, whichever is the lesser amount. The testing agency shall cast, cure, and test the specimens in accordance with ASTM C31 and ASTM C39. Air, temperature, and slump shall be tested at minimum for the first truck and every third truck thereafter (1st, 4th, 7th, etc.) or when a change in properties is noticed, at the final location (test after pump, not at truck).
- The contractor shall be responsible for the design of formwork to comply with the dimensions indicated on the plans, maintaining proper alignment during concrete pouring operations. Special care shall be taken with formwork for self-consolidating concrete.
- All concrete except as noted in the following paragraphs shall meet the following requirements:
 - Compressive Strength: fc = 4,000 PSI min at 28 days
 - Water / (cement + pozzolan) ratio: 0.45 max (0.40 max if exposed to sulfates)
- Concrete used in exterior flatwork and stoop slabs shall meet the following requirements:
 - Compressive Strength: fc = 4,500 PSI min at 28 days
 - Water / (cement + pozzolan) ratio: 0.45 max
 - Portland cement content: 450 pounds per cubic yard min
- Grout fill in hydraulic structures shall meet the following requirements:
 - Compressive Strength: fc = 3,000 PSI min at 28 days
 - Water / (cement + pozzolan) ratio: 0.45 max
 - Macro-fibers per specifications
- Concrete and grout exposed to frost (including foundation walls) shall be air entrained 6% +/- .1%.
- Slump shall be 4 inches +/- 1 inch without water reducing admixtures. With water reducing admixtures, concrete mix design shall state design slump and field tests shall be +/- 1 inch. Slump is used primarily as a measure of concrete consistency, truck to truck. If slump is outside these ranges, water content (water:cementitious ratio) shall be checked against allowable; and concrete rejected, accepted, or adjusted to that basis.
- Water-reducing admixtures conforming to ASTM C494 added to the mix at manufacturer's dosage rates may be used for improved workability.
- Do not add water to concrete at the jobsite without written approval of the SER, and in no case in excess of the water in the approved mix design.
- No chloride containing admixtures are allowed.
- Concrete used in tank slabs and walls shall have Xypex, Euclid Vandex AM-10, Penetron, or BASF Masterlife 300d admixture added to the mix at manufacturer's dosage rates (minimum 2% of cementitious content; maximum of 2 percent of cementitious content in potable water tanks). Concrete used in areas subject to de-icing salts (including stoop slabs and aprons) shall have Certicor MCI added to the mix at manufacturer's recommended dosage rates.
- All concrete is normal weight unless specifically noted otherwise.
- Cement shall be Portland cement type 1 conforming to ASTM C150 or Portland Limestone Cement type 1L conforming to ASTM C595. Up to 30% cement can be replaced with flyash and up to 50% with GGBFS (50% combined max.). Aggregate for normal weight concrete shall conform to ASTM C33. Water is to be potable or demonstrated to have no harmful effects on concrete. Fly ash shall be demonstrated by test to contain minimum 18 percent CAO except as noted in next paragraph. When fly ash is used in concrete to be air entrained, air entraining shall be adjusted as required for LOI per recent experience of ready mix supplier.
- Measured from the time water and cement are batched together, no more than 90 minutes shall elapse until concrete is placed. This time shall be reduced by two minutes for every degree that concrete temperature exceeds 75 degrees Fahrenheit. These criteria may be relaxed by the use of set-controlling admixtures.
- Protect concrete in accordance with ACI 305 and ACI 306 for hot weather concreting and cold weather concreting respectively. In cold weather, heat is required if outside temperature falls below 30 degrees any time during first three days. Reinforcing shall be 40 degrees or warmer at time of concrete placement. Concrete temperature shall be recorded every morning and shall be kept above 40 degrees in all locations for 7 days. Concrete shall not be exposed to combustion products (use electric heat, ducted heater or ground heat). Keep protection in place minimum 24 hours after cessation of heating to provide gradual cool-down.
- When air temperature is above 85 degrees, provide mist, shading, windscreens and other protection as required for 12 hours after placing.
- Concrete being placed shall be protected from rain. If rain falls on concrete before it has set, or within 3 hours of placement in any event, contractor shall bear cost of testing to prove concrete is unaffected, and shall remove and replace affected concrete to the satisfaction of the engineer.

GENERAL STRUCTURAL NOTES

- These notes do not replace the specifications but are to be read in conjunction with them. Any discrepancies or conflicts between the two shall be brought to the attention of the Structural Engineer of Record (SER) for resolution. In these Notes and the Specifications, the word "shall" means "has a duty to."
- These drawings are for this specific project (SEH project number MADJWU-167818) and no other use is authorized. Contact SER, Saura Jost 651.302.7663.

GOVERNING BUILDING CODE

2018 Wisconsin Commercial Building Code
2015 International Building Code as adopted and amended by the state building code

DESIGN CODES AND STANDARDS:

ACI Manual of Concrete Practice
ACI 318, 301 Building Code Requirements & Specifications for Structural Concrete
ACI 350 Environmental Engineering Concrete Structures
ACI 530 / TMS 402 / ASCE 5 Building Code Requirements & Specifications for Masonry Structures
AISC 360, 303 Specification for Structural Steel Buildings
CRSI Manual of Standard Practice
PCI MNL 116 PCI Manual for Quality Control
PCI MNL 120 PCI Design Handbook - Precast and Prestressed Concrete
PCI MNL 123 PCI Connections Manual

DESIGN LOADS PER ASCE 7-10

Risk category III		
1. Live load:		
Floor slabs	150 PSF UNO	
Elevated walkways	100 PSF	
Roof live load	20 PSF	
2. Dead load:		
Superimposed roof load	15 PSF	
3. Snow loads:		
Ground snow load	30 PSF	
Importance factor	1.10	
Roof snow load (Wellhouse)	23.1 PSF + drifting & unbalanced	
Roof snow load (Backwash Tank)	25.4 PSF	
Snow exposure factor	1.0	
Thermal factor (Wellhouse)	1.0	
Thermal factor (Backwash Tank)	1.1	
4. Wind loads:		
Wind speed (3 sec gust)	120 mph	
Wind exposure	C	
Mean roof height	15 feet	
Kd	0.85	
Kzt	1.0	
G	0.85 (rigid building)	
Structure is:	Enclosed	
Internal press coef	+0.18	
Interior walls	5 PSF lateral load	
5. Seismic loads:		
Site class	C	
Ss	0.084 g	
S1	0.046 g	
Fa	1.2	
Fv	1.7	
Sds	0.067 g	
Sd1	0.052 g	
Ie	1.25	
Seismic design category	A	
6. Soil conditions:		
Allowable soil bearing pressure (assumed)	2,500 PSF	
Measured groundwater elevation at the time of drilling	NOT ENCOUNTERED AT THE TIME OF DRILLING	
Dewater as required to keep excavations dry		
Frost depth	48 inches (heated building) 60 inches (unheated structure)	
Anticipated max differential settlement	1/2 inch	
Anticipated max total settlement	1 inch	
Sand backfill (assumed/per geotechnical report):		
Wet unit weight	120 PCF	
Angle of Internal Friction	30 degrees	
At rest pressure coefficient, Ko	0.5	
Subgrade modulus Wellhouse	150 PCI	
Subgrade modulus Backwash Tank	150 PCI	
7. Precast plank loading, where not noted on drawings:		
Superimposed dead load indicated above (roofs)	5 PSF	
Roof live load (suspended MEPP)	10 PSF	
Lifting loads	Loads as shown on the drawings	
Roof live load	20 PSF	
If mechanical units shown on the drawings are greater than 20 PSF within their footprints apply the difference within their footprints.		

DESIGN / CONSTRUCTION CRITERIA

- The contractor shall verify dimensions and conditions before construction and notify the engineer of any discrepancies, inconsistencies, or difficulties affecting the work before proceeding.
- All material, workmanship, and details shall be in accordance with typical competent construction practices, current manufacturer's recommendations, and all applicable codes and government regulations.
- The contractor shall coordinate all disciplines, verifying size and location of all openings, whether shown on structural drawings or not, as called for on process, architectural, mechanical, electrical or other drawings. All conflicts, inconsistencies, or other difficulties affecting structural work shall be called to the architect and engineer's attention for direction before proceeding.
- Equipment and structural anchor rod sizes, types, embedment, and patterns shall be verified with the manufacturer or fabricator. All anchor patterns shall be templated to ensure accuracy of placement.
- The contractor shall supply all necessary temporary bracing, shoring, guying, or other means to avoid excessive stresses and to hold structural elements in place during construction.
- Job site safety (including excavations) is the sole responsibility of the general contractor and their subcontractors.
- The engineer is not responsible for construction means, methods, techniques or practices. Where drawings and details imply this, they are provided to show final construction. If contractor desires to use different means and methods than implied by these drawings, submit similar details for review.
- Standard or typical structural details are intended to illustrate design concepts and to specify material and required physical dimensions matching or similar to the referenced locations in the drawing set. Standard details apply whether or not they are cut on the drawings.
- There is no provision for future vertical or horizontal expansion in the design.

EXISTING CONSTRUCTION

- Before proceeding with any work within the existing facility, the contractor shall familiarize himself with existing structural and other conditions. It shall be the contractor's responsibility to design, provide, and erect all necessary bracing, shoring and other safeguards to maintain all parts of the existing work in a safe condition during the process of demolition and construction and to protect from damage those portions of the existing work which are to remain.
- The contractor shall field verify the dimensions, elevations, etc. necessary for the proper construction and alignment of the new portions of the work to the existing work. The contractor shall make all measurements necessary for fabrication and erection of structural members. Any discrepancy shall be immediately brought to the attention of the engineer.
- Any existing construction damaged in the removal of adjacent elements shall be replaced at the contractor's expense. Where existing concrete elements are to be demolished and reinforcing is not required to remain, cut existing reinforcing flush with concrete to remain and coat with epoxy, unless covered with concrete in final construction.



MADISON WATER UTILITY
CITY OF MADISON WATER UTILITY
119 E. OLIN AVE.
MADISON, WI 53713

CITY OF MADISON WATER UTILITY
UNIT WELL 19 TREATMENT SYSTEM ADDITION

2626 LAKE MENDOTA DRIVE
MADISON, WISCONSIN

This drawing is an instrument of service and shall remain the property of Short Elliott Hendrickson, Inc. (SEH). This drawing, concepts and ideas contained herein shall not be used, reproduced, revised, or retained without the express written approval of SEH.
Submission or distribution of this drawing to meet official or regulatory requirements or for purposes in connection with the project is not to be construed as publication or derogation of any of the rights of SEH.
COPYRIGHT © 2022
Short Elliott Hendrickson, Inc.
All Rights Reserved.

SEH Project MADWU 167818
Checked By NRD, SMJ
Drawn By ALM

Project Status Issue Date
BIDDING DOCUMENTS OCTOBER, 2023

REVISION SCHEDULE		
REV. #	DESCRIPTION	DATE
1	ADDENDUM 3	11/20/2023

GENERAL STRUCTURAL NOTES

GS003

METAL DECK

- Metal deck shall span a minimum of two continuous spans UNO. Deck design is based on products of Vulcraft Corporation, and any substitutions shall meet that standard. Where not explicitly noted, roof deck is wide rib.
- Openings through deck which cut one flute need not be reinforced. Openings which cut two flutes shall be reinforced with a hot rolled equal-leg angle the size of the deck depth, minimum 1/8 inch thick, extending 12 inches past the opening, on each side of the opening, fastened with minimum 2 - #10 screws each side of opening. Openings which cut more than two flutes shall be framed to surrounding supports with frames as detailed in the drawings.
- Manufacturer shall be a member of the Steel Deck Institute (SDI). Detail, manufacture, and install deck and accessories in accordance with SDI and OSHA.
- Welding and welder qualifications shall be in accordance with AWS D1.3.
- Deck shall be fastened to underlying framing with 5/8 inch diameter puddle welds at spacing as indicated on the drawings, unless headed studs are to be applied. Contractor may submit shot pins (PAF) for approval as a substitute for puddle welds. Side lap edges shall be joined with minimum of one #10 screw in each deck span, unless more screws are indicated in the drawings.
- Where spray-on fireproofing is required, the general contractor shall verify that the deck finish is compatible with fireproofing. Coordinate with architect.
- All roof opening dimensions and locations shown on the plans shall be verified by the contractor and roof manufacturer.

SHOP DRAWING REVIEW

- Short Elliott Hendrickson Inc. (SEH) will review the general contractor's (GC) shop drawings and related submittals (as indicated below) with respect to the ability of the detailed work, when complete, to be a properly functioning integral element of the overall structural system designed by SEH. In general, submittals will not be reviewed for correct quantities or construction considerations. SEH shall review shop drawings and related materials with comments provided that each submission has met the requirements herein. SEH shall return without comment unrequired material or submissions without GC approval stamp.
- Any items requiring submittal of calculation packages shall have calculations submitted prior to or as part of the shop drawing submittal they accompany. Shop drawings submitted prior to submittal of required calculations will be rejected. All calculations shall be sealed and signed by an engineer licensed in the state of the project. The supplier's engineer must provide calculations for all systems and connections that differ from the drawings. Design shall comply with the requirements in these notes, the drawings and the specifications. Prior to submittal of a shop drawing or any related material to SEH, the GC shall:
 - Review each submission for conformance with the means, methods, techniques, sequences and operations of construction and safety precautions and programs incidental thereto, all of which are the sole responsibility of the GC.
 - Review and approve each submission.
 - Stamp each submission as approved.
- SEH shall assume that no submission comprises a variation from the contract documents unless the GC advises SEH with written documentation. Should SEH require more than ten (10) working days to perform the review, SEH shall so notify the GC. Submittals shall include drawings and related material (if any) as indicated below.
 - Concrete mix designs and material certificates including admixtures, compounds applied to the concrete after placement, and associated product data. See specifications.
 - Aggregate tests and concrete test history for each mix design, with the submission of concrete mix designs.
 - Reinforcing steel shop drawings including erection drawings and bending details. Bar list will not be reviewed for correct quantities. Include elevations of all reinforced concrete masonry walls and all concrete walls with footing steps or other elevation changes, at a scale no smaller than 1/8" = 1'-0" showing all required reinforcing.
 - Grout mix designs (for CMU) and CMU block certification.
 - Structural steel and metal fabrication shop drawings including erection drawings and piece details.
 - Stairs and railing. Details on the drawings for the following items have been designed by the SER: railing systems, connection of railings and stringers to the primary structure. All other items shall be designed by the supplier's engineer to match intent of the construction drawings.
 - Metal deck shop drawings.
 - Precast shop drawings including reinforcing, bearing details, and design calculations.

REQUIRED INSPECTION

- Required inspection and testing is required according to the table on the first general sheet of the structural drawings. Refer to specification section 01 45 10 for responsibilities. Contractor shall coordinate with SER, testing agency and geotechnical engineer throughout the project.
 - Required Inspections shall be performed in accordance with IBC Chapter 17.
 - Required Inspection of reinforcing steel and anchor rod placement shall be performed prior to concrete placement or during anchor rod installation for adhesive anchors.
 - Continuous inspection during concrete placement is required.
 - Conduct concrete slump tests in accordance with ASTM C143.
 - Obtain set of a four (4) concrete test cylinders each time concrete is placed. Make test cylinders in accordance with ASTM C39.
 - See these Notes for testing of Post-Installed anchors and rebar where installation is not witnessed.
 - It is assumed that shop welding will be performed on the premises of a fabricator registered and approved to perform such work without Required Inspection. G/C shall submit fabricator documents, standards, and procedures in accordance with IBC 1705.2.
 - It is assumed that precast concrete will be cast on the premises of a fabricator registered and approved to perform such work without Required Inspection. G/C shall submit fabricator documents, standards, and procedures in accordance with IBC 1705.2.
 - Reports of Required Inspections shall be provided, at the frequency noted above, to the Owner, Contractor, and Engineer of Record by the firm contracted to perform Required Inspections.
 - Special Inspection criteria presented above and in specification shall apply to all footings and foundation walls, but does not apply to non-structural slab on grade and site work concrete.

POST INSTALLED ANCHOR RODS AND DOWELS

- Unless noted otherwise, anchors and reinforcing dowels installed in concrete or concrete masonry shall be as noted below. Post-installed anchors shall only be used where shown on the construction documents. Anchors not shown or noted on the drawings, those required by the contractor solely for his means and methods, or those required by mechanical/electrical and carrying less than 100 pounds of non-safety-related items, do not require special inspection.
- Approved manufacturers are: HILTI, ITW / Redhead, Simpson, Dewalt / Powers, and Rawl.
 - Post installed anchors shall have current ICC approval in accordance with ACI 308 and ICC ES corresponding to anchor base material.
 - Submit product data and current ICC ES report or IAPMO report showing product is compliant with project code requirements for review.
 - Contractor shall arrange for manufacturer's rep to train all installers on the complete installation process. A letter of procedure stating method of drilling, the product for use, the complete installation procedure, manufacturer training date and a list of the personnel trained on anchor installation shall be submitted to the engineer.
 - Substitution requests of alternate products must be approved in writing by structural engineer of record prior to use by providing technical data that the substituted product is capable of meeting performance requirements of specified products including but not limited to the following basis of design parameters ACI 308.2 or ACI 308.4 qualifications.
- Permanent anchors exposed to earth, weather, or corrosive environments, including all anchors in wet areas of WWTP and water treatment plant work, and anchors engaging stainless steel or aluminum members, shall be stainless steel type AISI 304 or 316; anchors in contact with sewage or chloride deicer runoff shall be type 316. Otherwise, anchors shall be zinc plated, minimum ASTM A36 material unless ASTM A193 grade B7 is noted in the drawings, and shall be according to ASTM F1554. Reinforcing dowels shall be of the same size (I.N.O.), material and coating (if any) as the continuing reinforcing.
- Where expansion anchors are called for, contractor may substitute screw type anchors with self-tapping threads or adhesive anchors of the same size and embedment, subject to review of capacity by the engineer for the product substituted. Where adhesive anchors are called for, other types shall not be substituted. Screw type anchors shall not be re-used on permanent work.
- Adhesive shall have a current ICC ES report. Use high viscosity adhesive and placement devices in consultation with the manufacturer for overhead work. Adhesive anchors in overhead or horizontal installation shall be subject to continuous special inspection during installation and shall only be performed by installers certified per ACI/CRSI Adhesive Anchor Certification Program Section 17.8.2 or Engineer approved equivalent. Use low temperature formulations for cold weather work. Do not apply load to anchors until their capacity has been assured.
- Anchors installed in concrete masonry and precast hollow core concrete shall be installed in cores grouted solid. Minimum grout strength $f_g = 3,000$ PSI. Minimum 12 inches of grout each way along horizontal cores from anchor. Vertical cores shall be grouted full height. Anchors installed in masonry shall not be installed within 1 1/2 inches of any head joint unless block are square end and mortared across full width of head joint, or filled bond beam.
- Holes shall be drilled dry, cleaned, and maintained until installation in accordance with manufacturer's recommendations and ICC-ES report using standard rotary-impact bits and oil-free compressed air. Diamond core bits shall not be used unless specifically approved by the manufacturer.
- The general contractor shall engage a testing company to locate existing reinforcing bars, PT tendons, and embedded items, by non-destructive means (GPR, X-ray, or other approved means) prior to drilling for installation of anchors. Notify EOR of any conflicts with existing embedded items. Do not cut or damage existing reinforcing or embedded items unless approved by the EOR.
- Maintain critical spacing and end/corner distances as recommended by manufacturer unless specifically noted otherwise in the drawings.
- Unless noted otherwise, anchors shall be installed to the following minimum embedments:

	Diameter	Crk Concrete	Grouted CMU
Expansion:	3/8 inch	3 inches	
	1/2 inch	3 1/4 inches	4 1/2 inches
	5/8 inch	4 inches	5 inches
Screw:	3/4 inch	4 3/4 inches	6 1/4 inches
	3/8 inch	3 inches	
	1/2 inch	4 1/2 inches	
Adhesive*:	5/8 inch	4 3/4 inches	
	3/4 inch	6 1/4 inches	
	3/8 inch	3 3/8 inches	
	1/2 inch	4 1/2 inches	5 1/2 inches
	5/8 inch	5 5/8 inches	5 5/8 inches
	3/4 inch	6 3/4 inches	6 3/4 inches

*For adhesive at reinforcing bars, increase embedment above by 33%.

- Except as noted, all anchors shall have intermittent special structural inspection by one of the following. Load tests shall be to 150 percent of service capacity or 75 percent of ultimate strength, with no appreciable slip, permanent deformation, or concrete damage. Anchors which fail this test shall be replaced at no cost to the project. Two failures in a given installation shall result in mandatory load testing at double the rate noted below.
 - Expansion and screw anchors:
 - Witness installation with torque wrench according to manufacturer's recommendations and requirements of ICC report;
 - Test all anchors with torque wrench after installation (including load test of 5 percent of installed anchors); or
 - Load test of 10 percent of installed anchors by supplier or third party inspector
 - Adhesive anchor rods and dowels:
 - Witness installation according to manufacturer's recommendations and requirements of ICC report; or
 - Load test of 10 percent of installed anchors by supplier or third party inspector

STRUCTURAL METALS/ FRP

- All structural steel shall be as follows:
 - Wide flange beams and columns shall be ASTM A992, grade 50 steel.
 - All miscellaneous steel (angles, channels, plate) shall be ASTM A992, A529, or A36 steel (min. $F_y = 36$ KSI).
 - Rectangular steel tubes (HSS) shall be ASTM A500, grade C steel ($f_y = 50$ KSI).
 - Pipe shall be ASTM A53 ($f_y = 35$ KSI) unless A500 grade C (46 KSI) is noted.
 - Other shapes shall be ASTM A36 (36 KSI).
- Splicing or modification of members in the field is prohibited without prior written approval of the SER.
- All primary member bolted connections shall be two bolt minimum.
- Fabrication and erection shall be in accordance with the latest edition of the AISC Manual of Steel Construction, Code of Standard Practice for Steel Buildings and Bridges, except as follows:
 - To paragraph 3.1, add "The project architectural drawings are a part of the structural steel design drawings by reference and must be used concurrently with the structural steel design drawings for any information not shown on the structural steel design drawings".
 - Delete paragraph 3.2 and insert the following: "architectural, process, electrical and mechanical plans shall be used as a supplement to the structural steel design drawings to define detail configurations and construction information".
 - Paragraph 3.3 modify the last sentence to read, "in case of discrepancies between the structural steel plans and plans of other disciplines or existing conditions, such discrepancies shall be called to the architect / engineer's attention for resolution".
- All aluminum shapes shall be ASTM B209, B308, alloy 6061-T6, except handrail may be 6063-T5 or -T6. All welding shall be performed by a certified welder using compatible electrodes in accordance with the requirements of AWS D1.2 and visually inspected. Where designed by the fabricator, aluminum alloy and temper shall be stated on shop drawings.
- All steel shall receive a primer coat unless galvanized, refer to specification manual.
- Unless galvanized, all steel shall receive a three coat paint system: moisture-cured zinc-rich urethane primer, epoxy, urethane. All steel shall be cleaned to SSPC SP-10 (near white blast clean) and maintained in this state until painted. Refer to specification manual.
- All exposed steel shall be galvanized. Damaged galvanizing shall be repaired by application of cold galvanizing compound such as ZRC (minimum 3 coats). Paint finish per architectural.
- All steel welding shall be performed by a certified welder using E70 electrodes in accordance with the requirements of AWS D1.1 "Structural Welding Code" and visually inspected. Full-pen welds shall also be inspected by NDT methods such as ultrasonic, mag particle, or dye pen.
- All field welded connections shall be chipped, ground where required, wire brush cleaned and painted to match the paint system.
- All bolts not otherwise specified shall be 3/4" diameter high strength (ASTM A325-N). All bolts shall be fully pretensioned. Any non-twist off bolts shall have 10 percent checked with a torque wrench by the special inspector. All beam connections shall be designed per the AISC Manual of Steel Construction "Framed Beam Connections" for the indicated reactions but at least 0.60 x beam total shear capacity shown in the allowable uniform load tables, whichever is greater.
- All copes shall be made with a 1 inch minimum radius.
- All anchor rods shall be minimum 3/4" diameter ASTM F1554 grade 36 / ASTM A276 Stainless Steel type 304 OR 306 unless noted otherwise. Where headed rods are noted or specified, bent rods shall not be furnished; rods may be headed or nutted, with the nut tack welded at the bottom end of the anchor or double nutted.
- Metal/FRP stairways, platforms and grates shall be provided and constructed with adequate design characteristics (100 PSF live load capacity UNO) and structural configurations in accordance with the fabricator's shop drawings as approved by the engineer. All stairways, platforms and grates shall satisfy all requirements of the project documents. All stair runs longer than 10 feet between laterally rigid supports, and all two-post bents, shall have diagonal bracing fastened to the bottom flanges of the stringers and center of posts UNO.
- All cut or raw surfaces of FRP shall be coated with compatible epoxy meeting NSF 61.



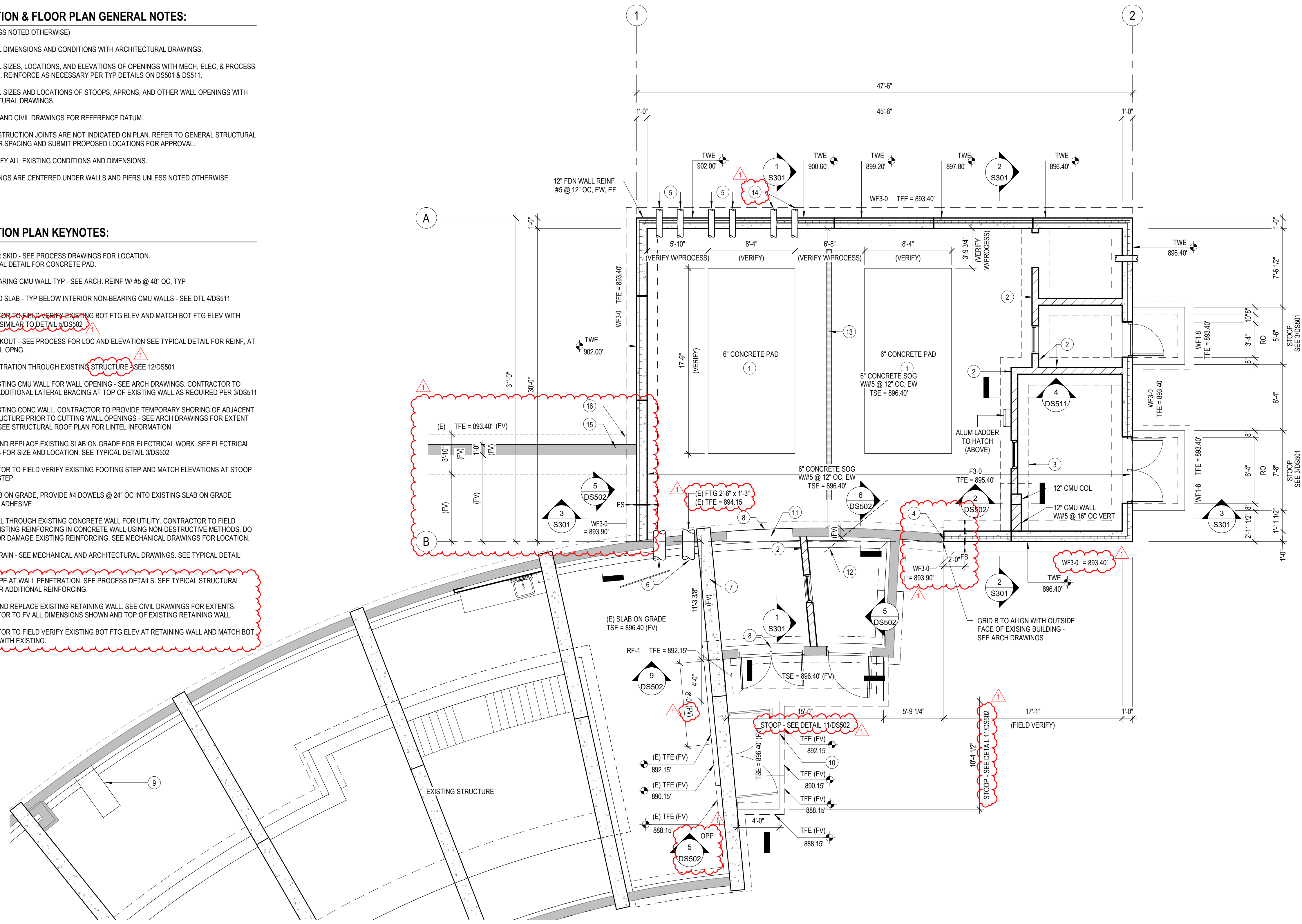
FOUNDATION & FLOOR PLAN GENERAL NOTES:

(TYPICAL UNLESS NOTED OTHERWISE)

- VERIFY ALL DIMENSIONS AND CONDITIONS WITH ARCHITECTURAL DRAWINGS.
- VERIFY ALL SIZES, LOCATIONS, AND ELEVATIONS OF OPENINGS WITH MECH, ELEC, & PROCESS DRAWINGS. REINFORCE AS NECESSARY PER TYP DETAILS ON DS501 & DS11.
- VERIFY ALL SIZES AND LOCATIONS OF STOOPS, APRONS, AND OTHER WALL OPENINGS WITH ARCHITECTURAL DRAWINGS.
- SEE ARCH AND CIVIL DRAWINGS FOR REFERENCE DATUM.
- SLAB CONSTRUCTION JOINTS ARE NOT INDICATED ON PLAN. REFER TO GENERAL STRUCTURAL NOTES FOR SPACING AND SUBMIT PROPOSED LOCATIONS FOR APPROVAL.
- FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS.
- ALL FOOTINGS ARE CENTERED UNDER WALLS AND PIERS UNLESS NOTED OTHERWISE.

FOUNDATION PLAN KEYNOTES:

- 96K FILTER SKID - SEE PROCESS DRAWINGS FOR LOCATION. SEE TYPICAL DETAIL FOR CONCRETE PAD.
- 8" NON-BEARING CMU WALL TYP - SEE ARCH. REINF W/ #5 @ 48" OC, TYP
- THICKENED SLAB - TYP BELOW INTERIOR NON-BEARING CMU WALLS - SEE DTL 4/DS511
- CONTRACTOR TO FIELD VERIFY EXISTING BOT FTG ELEV AND MATCH BOT FTG ELEV WITH EXISTING. SIMILAR TO DETAIL 11/DS502
- PIPE BLOCKOUT - SEE PROCESS FOR LOC AND ELEVATION SEE TYPICAL DETAIL FOR REINF, AT CONC WALL OPNG.
- PIPE PENETRATION THROUGH EXISTING STRUCTURE - SEE 12/DS501
- DEMO EXISTING CMU WALL FOR WALL OPENING - SEE ARCH DRAWINGS. CONTRACTOR TO PROVIDE ADDITIONAL LATERAL BRACING AT TOP OF EXISTING WALL AS REQUIRED PER 3/DS511
- DEMO EXISTING CONC WALL. CONTRACTOR TO PROVIDE TEMPORARY SHORING OF ADJACENT ROOF STRUCTURE PRIOR TO CUTTING WALL OPENINGS - SEE ARCH DRAWINGS FOR EXTENT AND LOC. SEE STRUCTURAL ROOF PLAN FOR LINTEL INFORMATION
- REMOVE AND REPLACE EXISTING SLAB ON GRADE FOR ELECTRICAL WORK. SEE ELECTRICAL DRAWINGS FOR SIZE AND LOCATION. SEE TYPICAL DETAIL 3/DS502
- CONTRACTOR TO FIELD VERIFY EXISTING FOOTING STEP AND MATCH ELEVATIONS AT STOOP FOOTING STEP
- AT (E) SLAB ON GRADE, PROVIDE #4 DOWELS @ 24" OC INTO EXISTING SLAB ON GRADE W/STRUCT ADHESIVE
- CORE DRILL THROUGH EXISTING CONCRETE WALL FOR UTILITY. CONTRACTOR TO FIELD VERIFY EXISTING REINFORCING IN CONCRETE WALL USING NON-DESTRUCTIVE METHODS. DO NOT CUT OR DAMAGE EXISTING REINFORCING. SEE MECHANICAL DRAWINGS FOR LOCATION.
- TRENCH DRAIN - SEE MECHANICAL AND ARCHITECTURAL DRAWINGS. SEE TYPICAL DETAIL 12/DS502
- CAST IN PIPE AT WALL PENETRATION. SEE PROCESS DETAILS. SEE TYPICAL STRUCTURAL DETAIL FOR ADDITIONAL REINFORCING.
- REMOVE AND REPLACE EXISTING RETAINING WALL. SEE CIVIL DRAWINGS FOR EXTENTS. CONTRACTOR TO FV ALL DIMENSIONS SHOWN AND TOP OF EXISTING RETAINING WALL
- CONTRACTOR TO FIELD VERIFY EXISTING BOT FTG ELEV AT RETAINING WALL AND MATCH BOT FTG ELEV WITH EXISTING



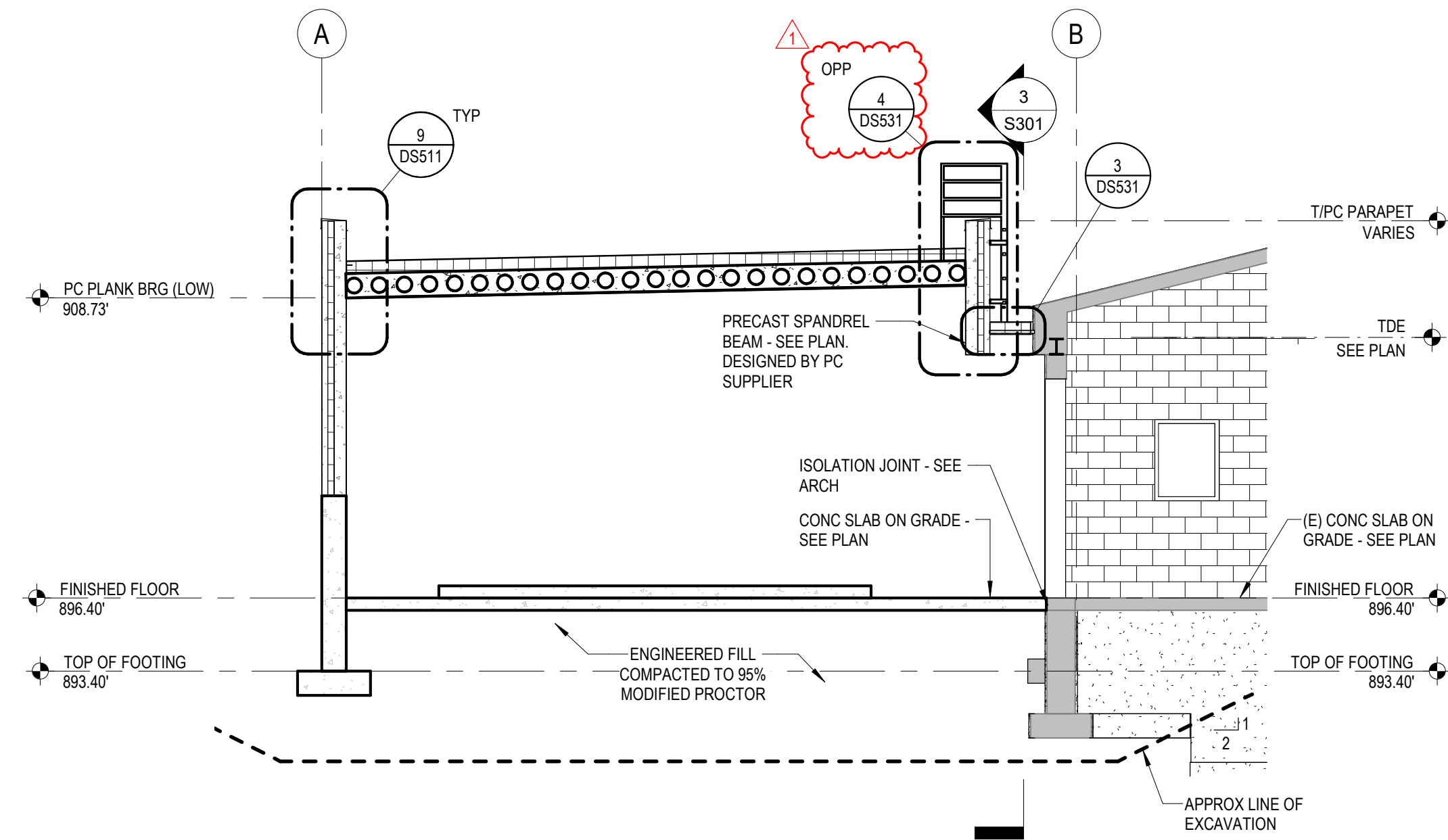
1 FOUNDATION & FLOOR PLAN
S101 3/16" = 1'-0"



FOOTING SCHEDULE		
MARK	SIZE	REINFORCING
F3-0	3'-0" x 3'-0" x 1'-0"	(3) #5 EA-WAY, BOTTOM
RF-1	1'-0" x 1'-0" (FV) TO MATCH EXISTING DEPTH	SEE DETAIL 9/DS502
WF-1-8	1'-6" WIDE x 1'-0" DEEP x CONTINUOUS	(2) #8 REBAR CONTINUOUS, BOTTOM
WF-3-0	3'-0" WIDE x 1'-0" DEEP x CONTINUOUS	(3) #5 REBAR CONTINUOUS, BOTTOM

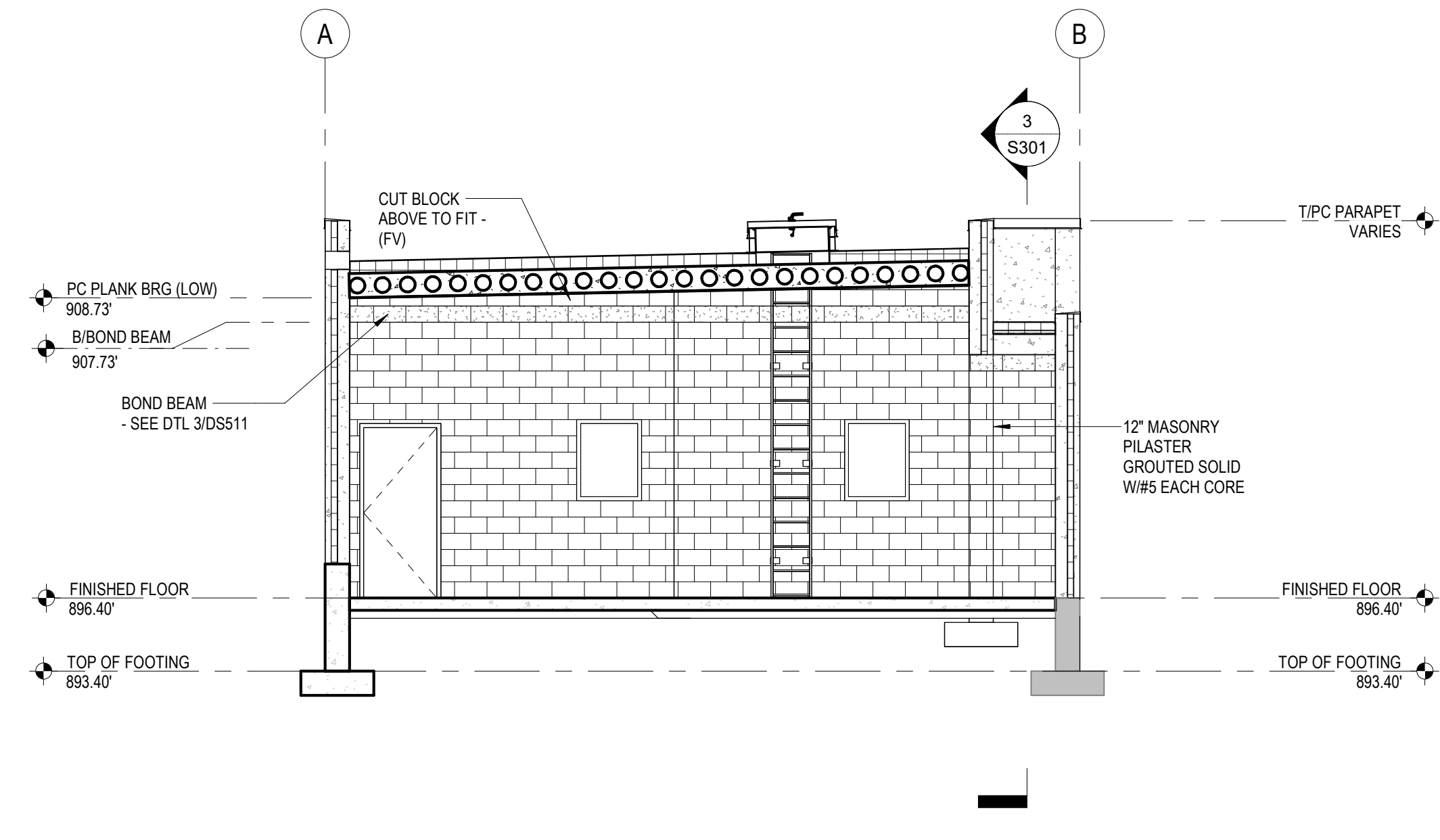
REVISION SCHEDULE

REV. #	DESCRIPTION	DATE
1	ADDENDUM 3	11/20/2023

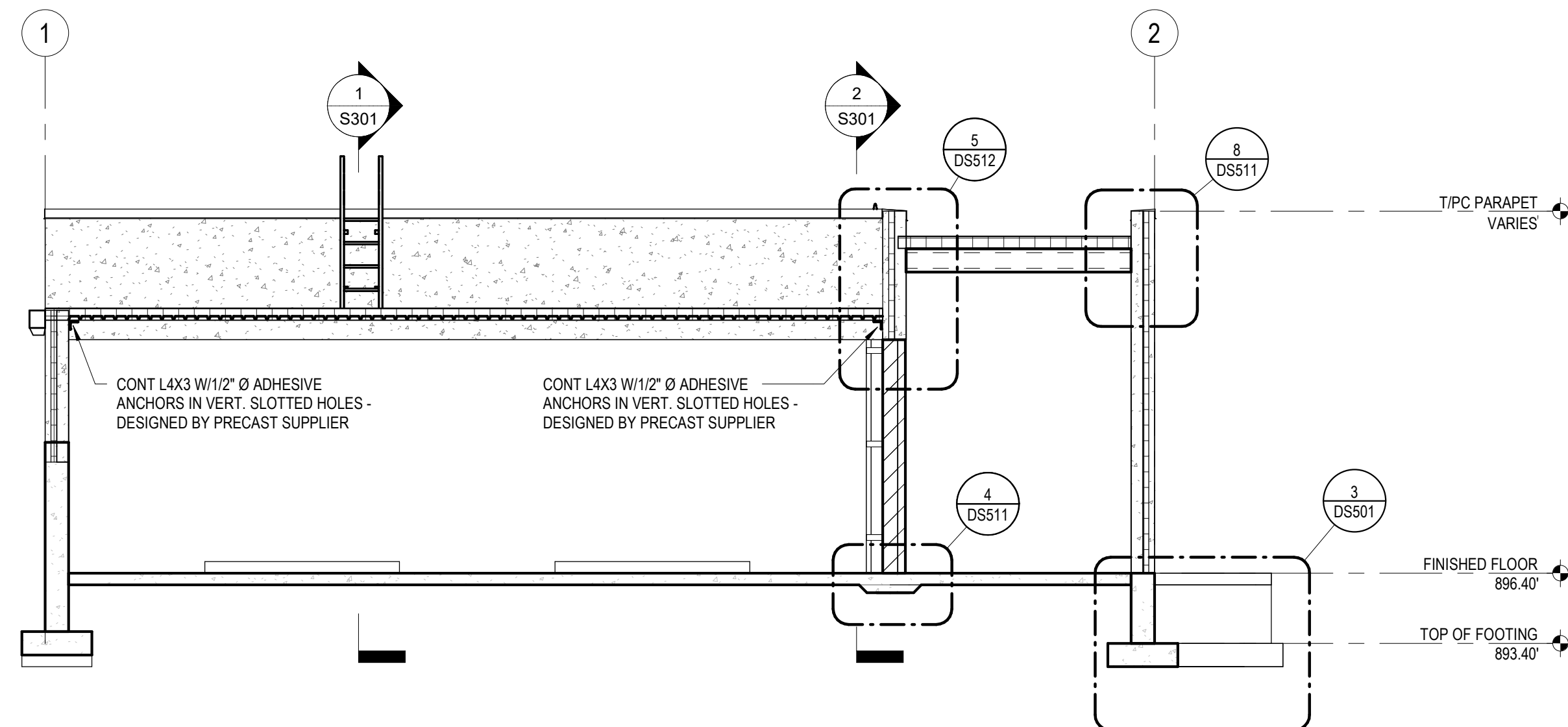


1 BUILDING SECTION
3/16" = 1'-0"
0 4 8 12

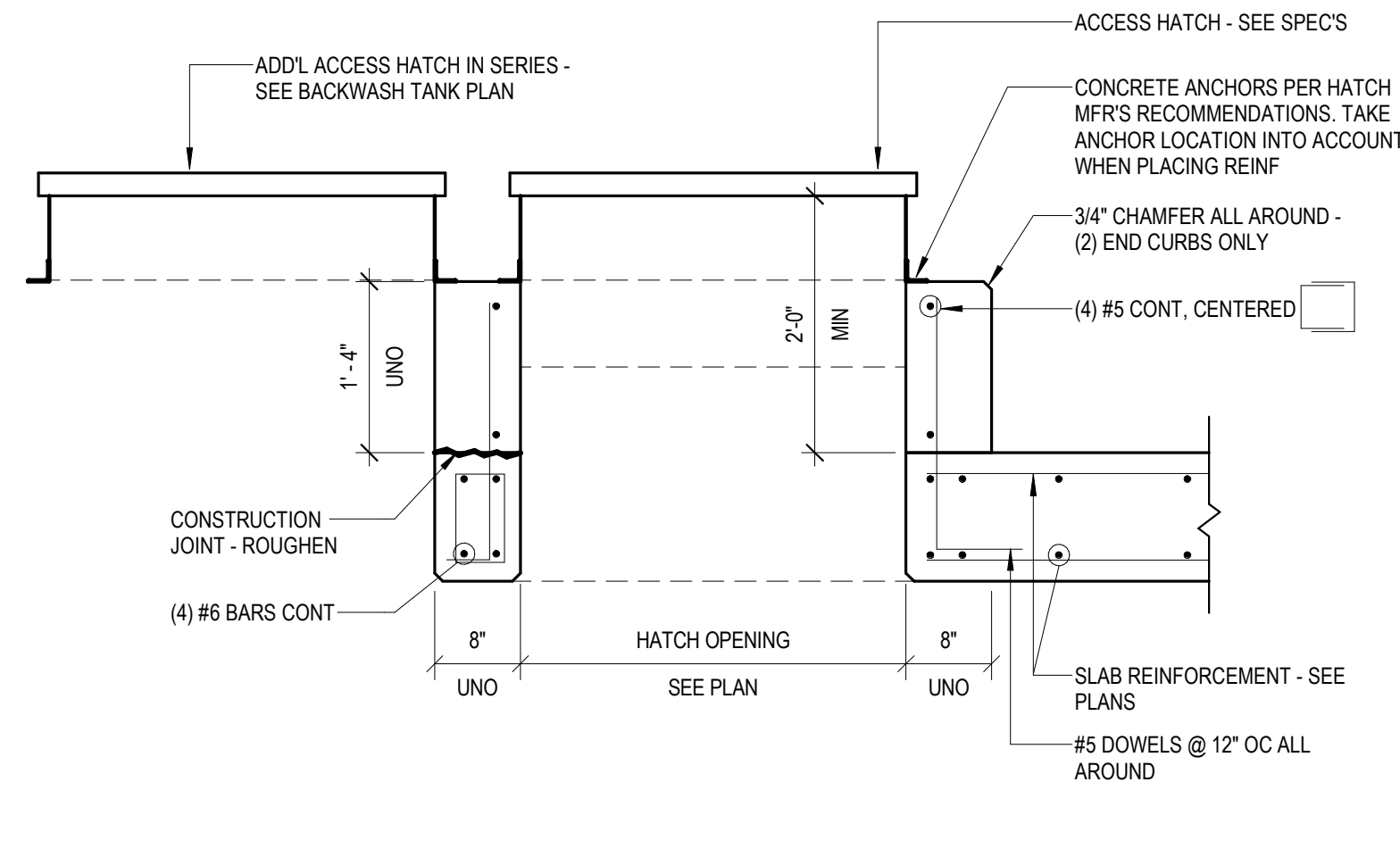
- NOTES:
- DO NOT BACKFILL PORTION OF FOUNDATION WALL ABOVE FFE UNTIL SOG IS POURED.
 - SOIL CORRECTION AND EXCAVATION INFO SHOWN IN THIS SECTION IS REPRESENTATIVE OF THE ENTIRE BUILDING. THIS INFORMATION IS NOT SHOWN IN OTHER SECTIONS VIEWS, BUT SHOULD BE ACCOUNTED THERE ALSO. GEOTECHNICAL ENGINEER TO CONFIRM LIMITS OF EXCAVATION.



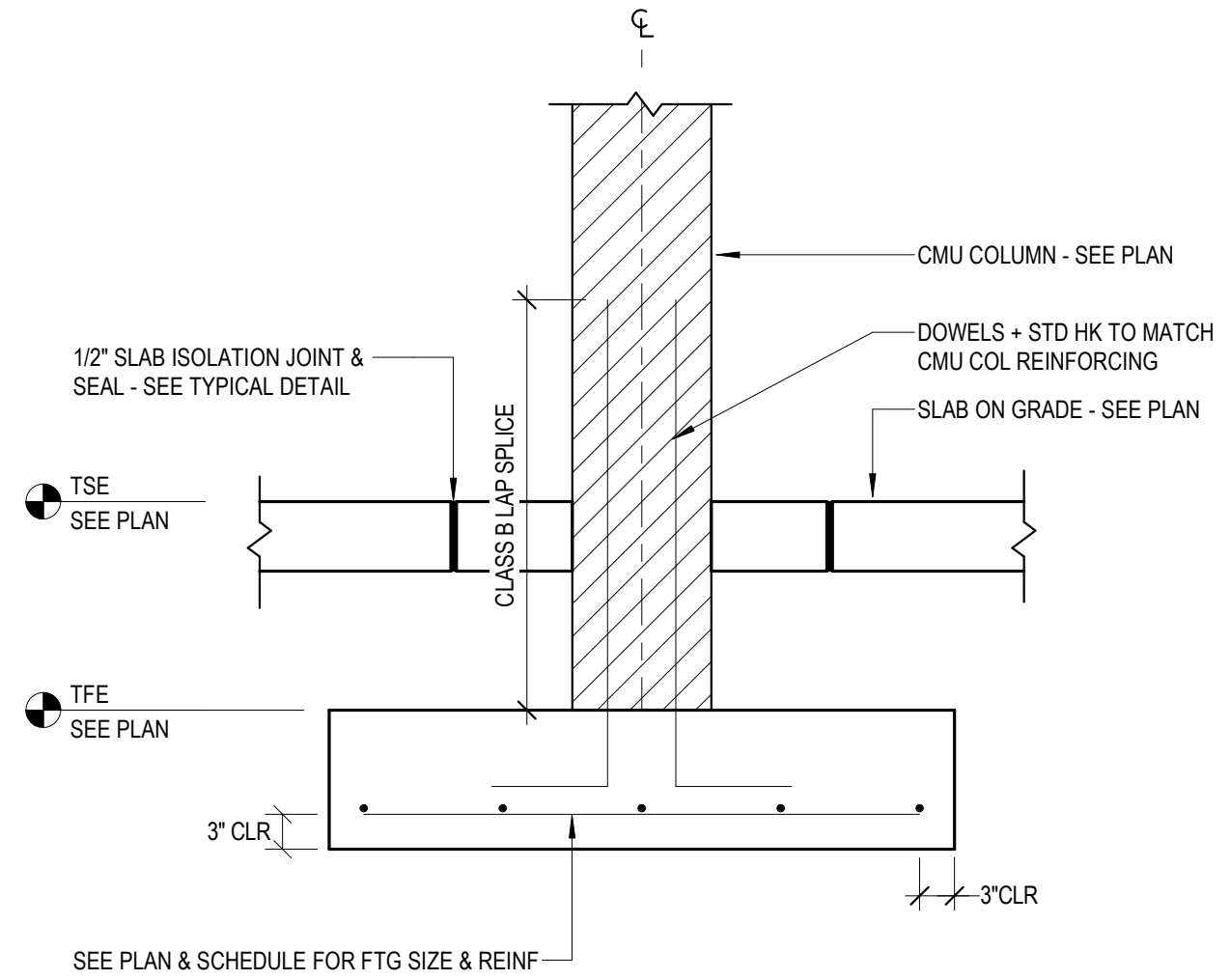
2 BUILDING SECTION
3/16" = 1'-0"
0 4 8 12



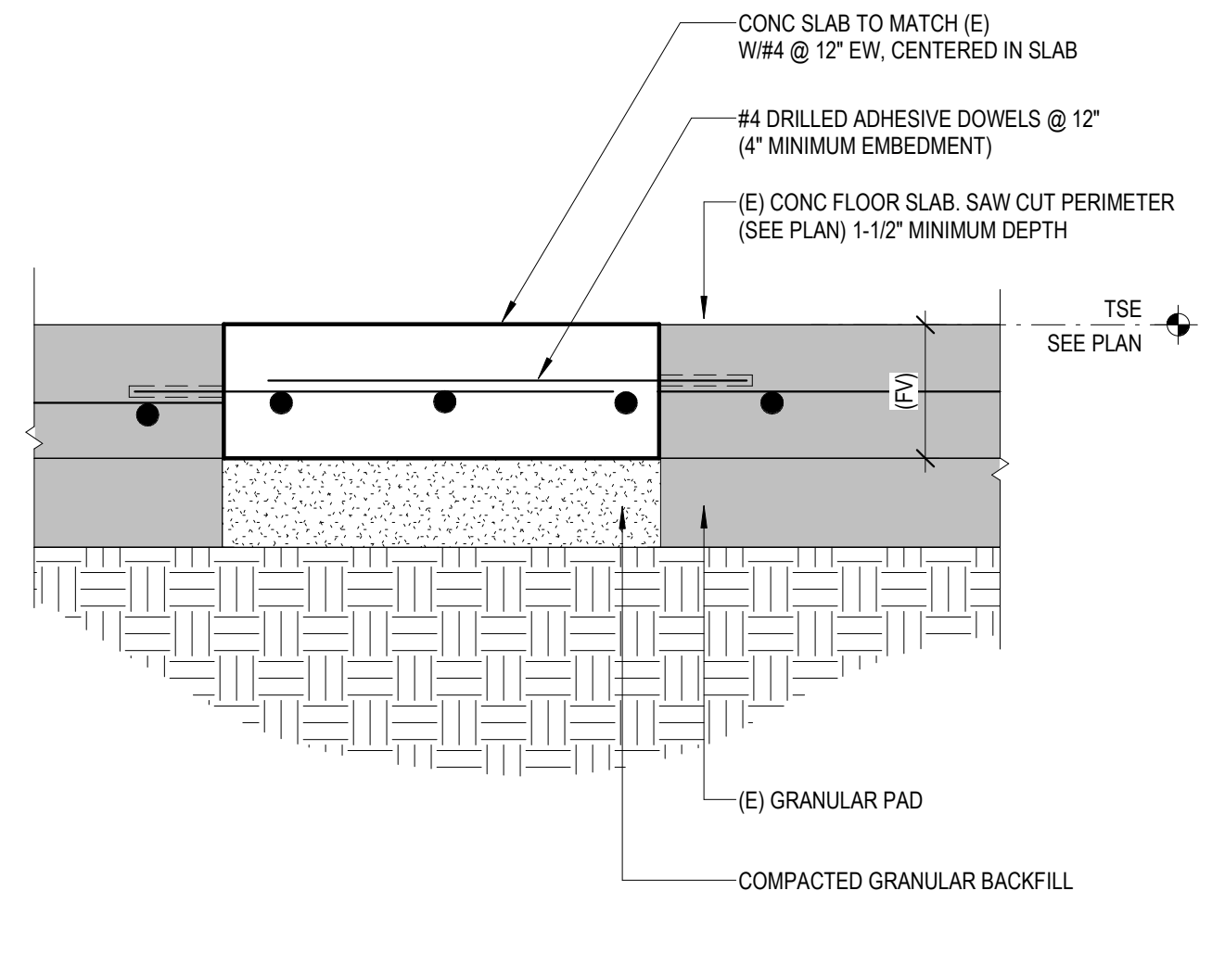
3 BUILDING SECTION
3/16" = 1'-0"
0 4 8 12



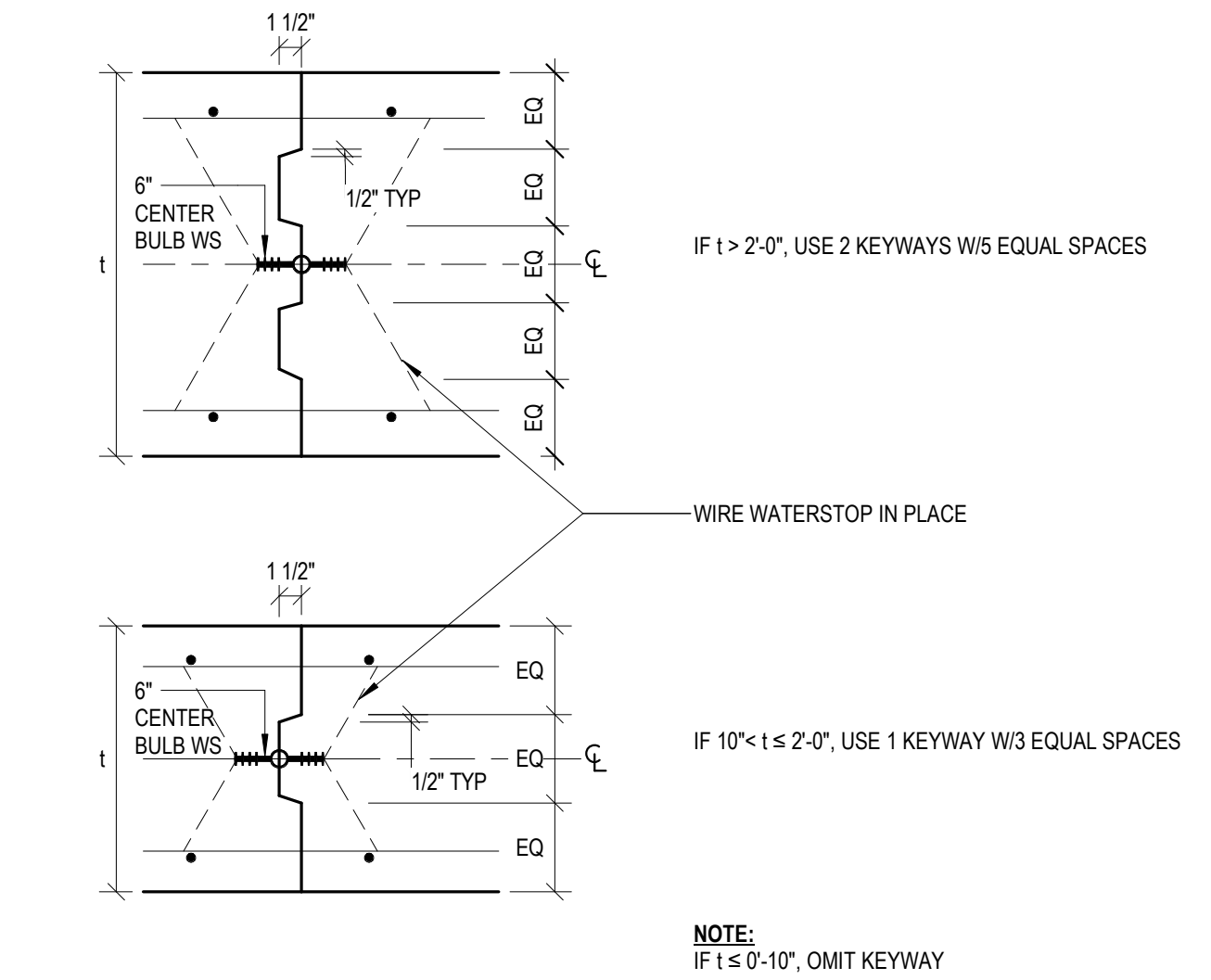
1 ACCESS HATCH CURB DETAIL
DS502 NOT TO SCALE



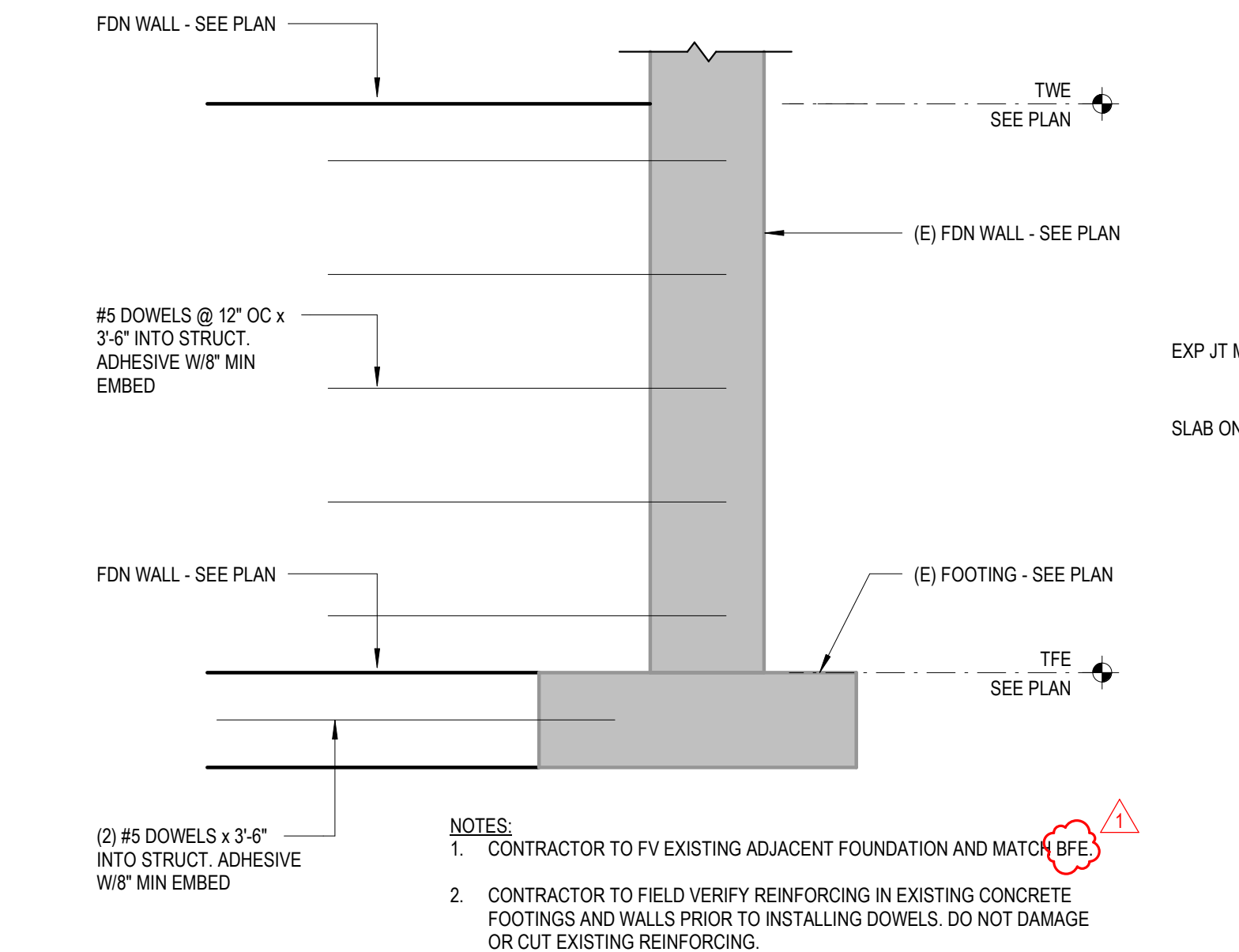
2 INTERIOR COLUMN FOOTING DETAIL
DS502 NOT TO SCALE



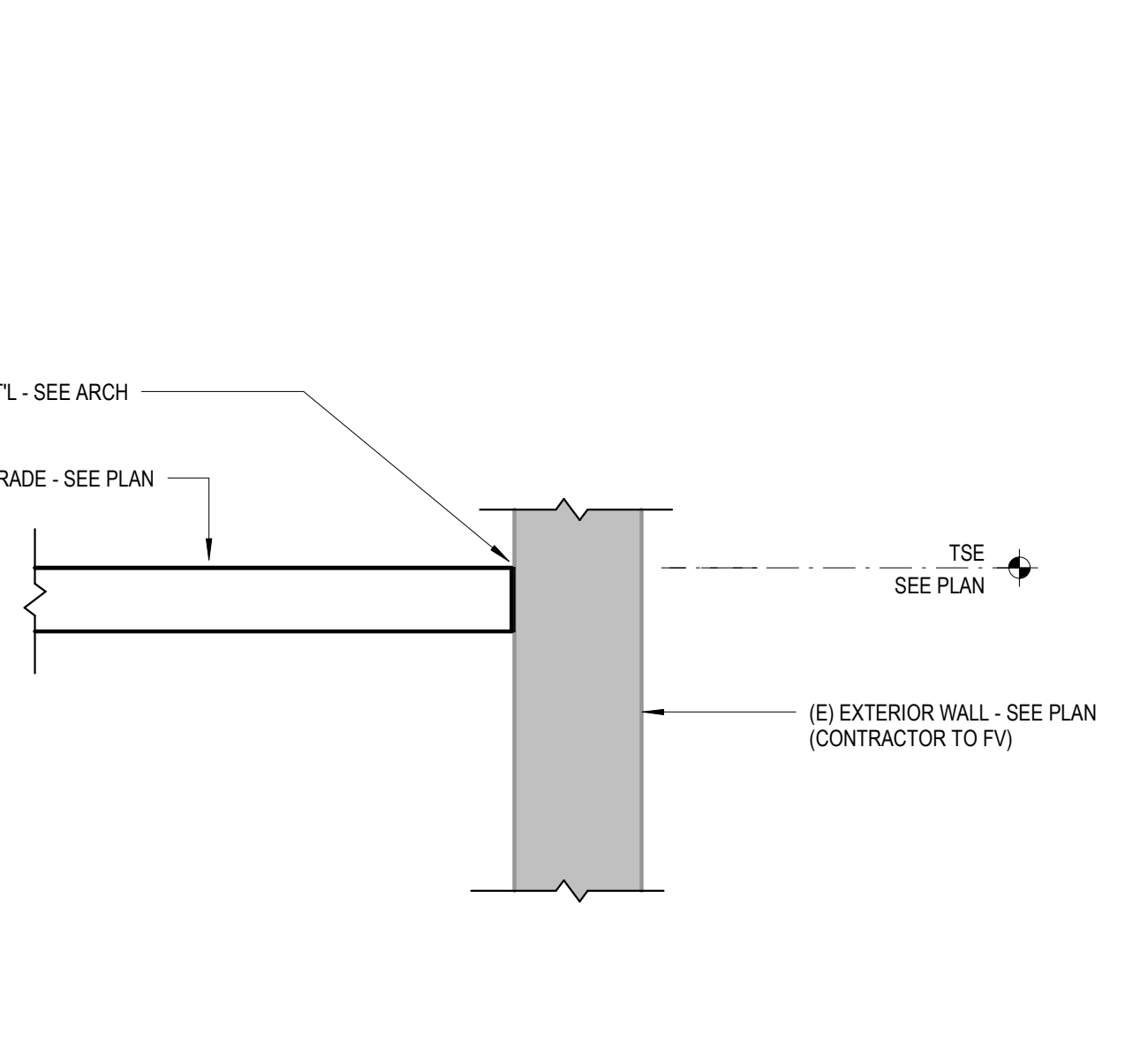
3 DETAIL AT EXISTING SLAB ON GRADE
DS502 NOT TO SCALE



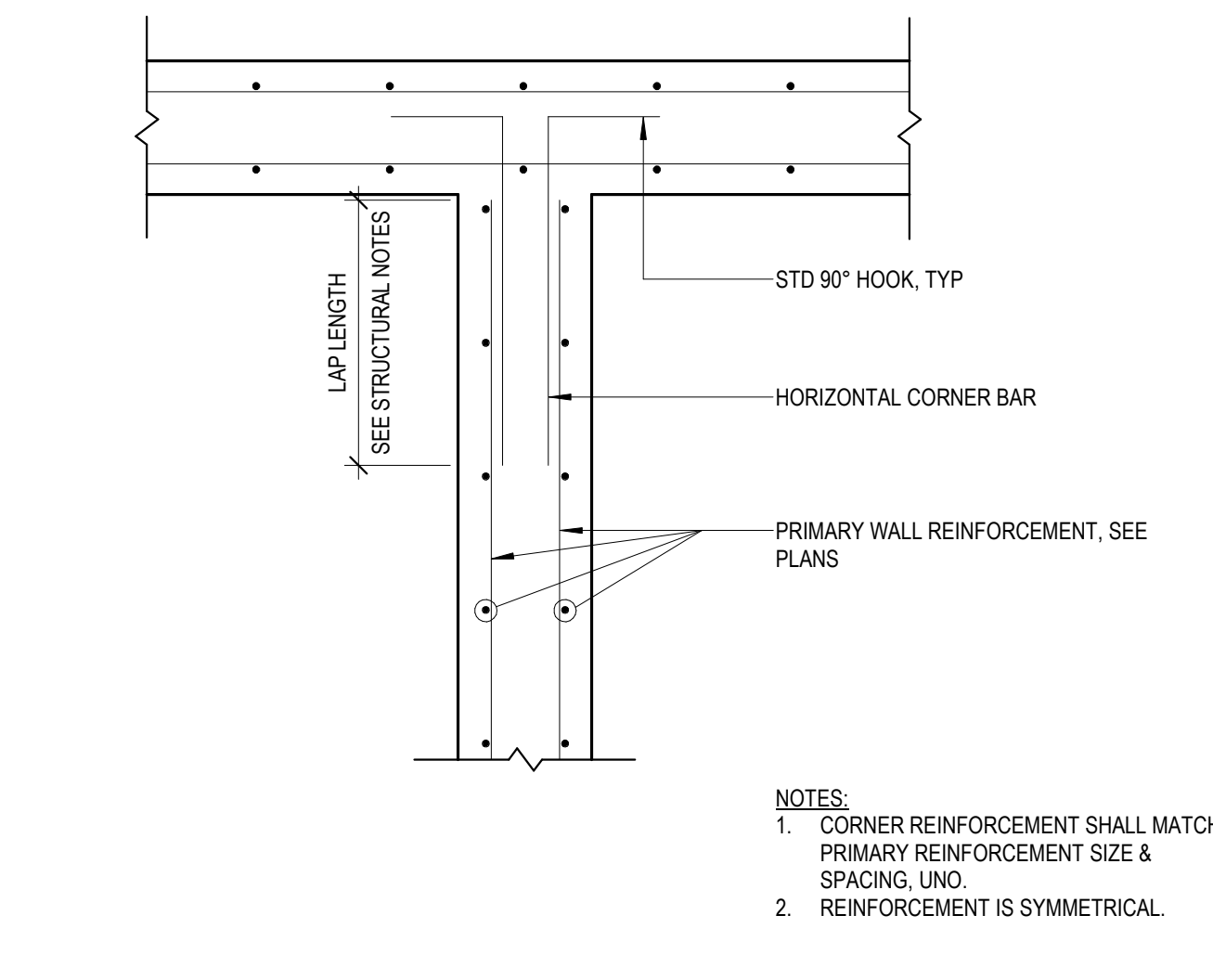
4 WALL CONSTRUCTION JOINT DETAIL
DS502 NOT TO SCALE



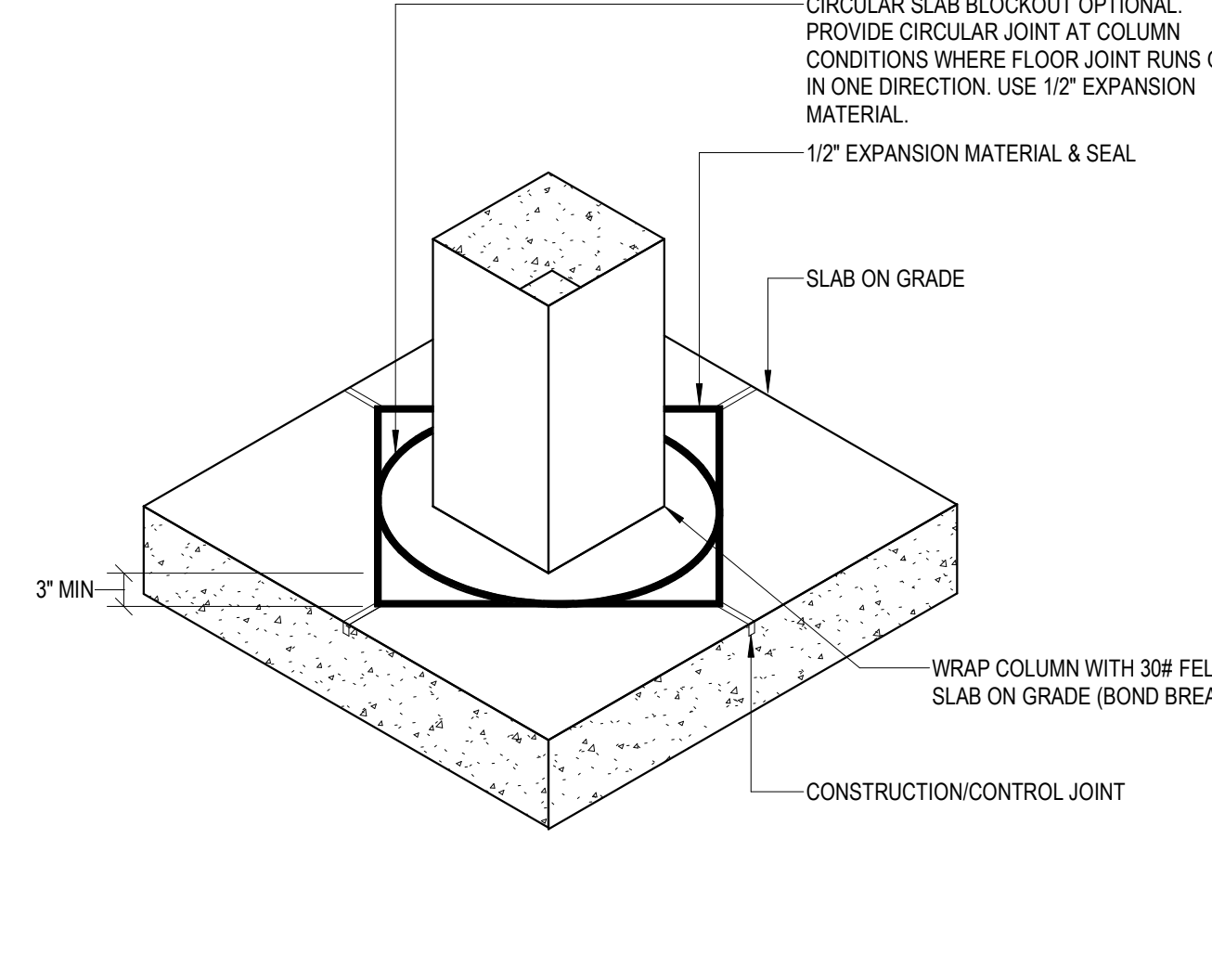
5 SECTION
DS502 NOT TO SCALE



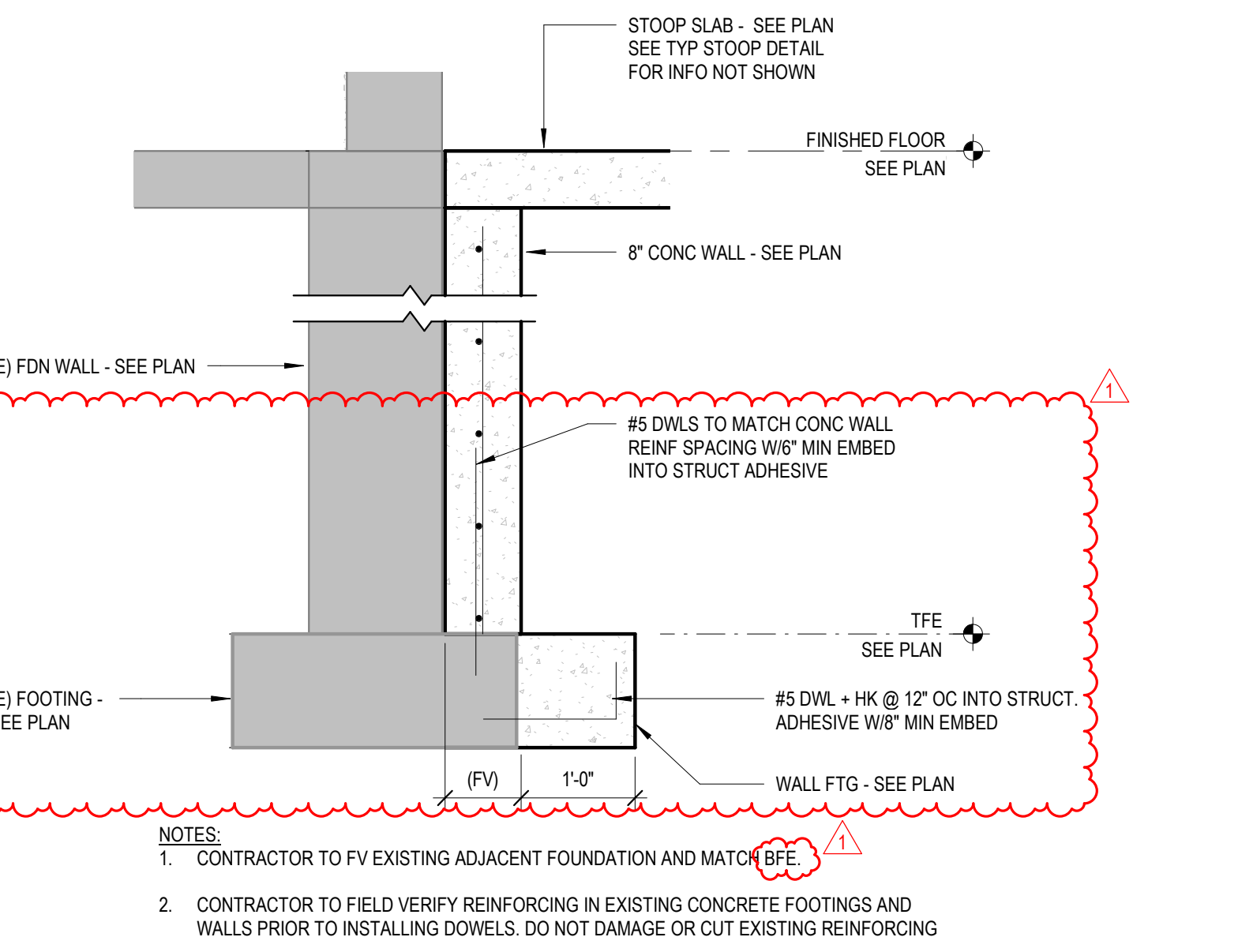
6 SECTION
DS502 NOT TO SCALE



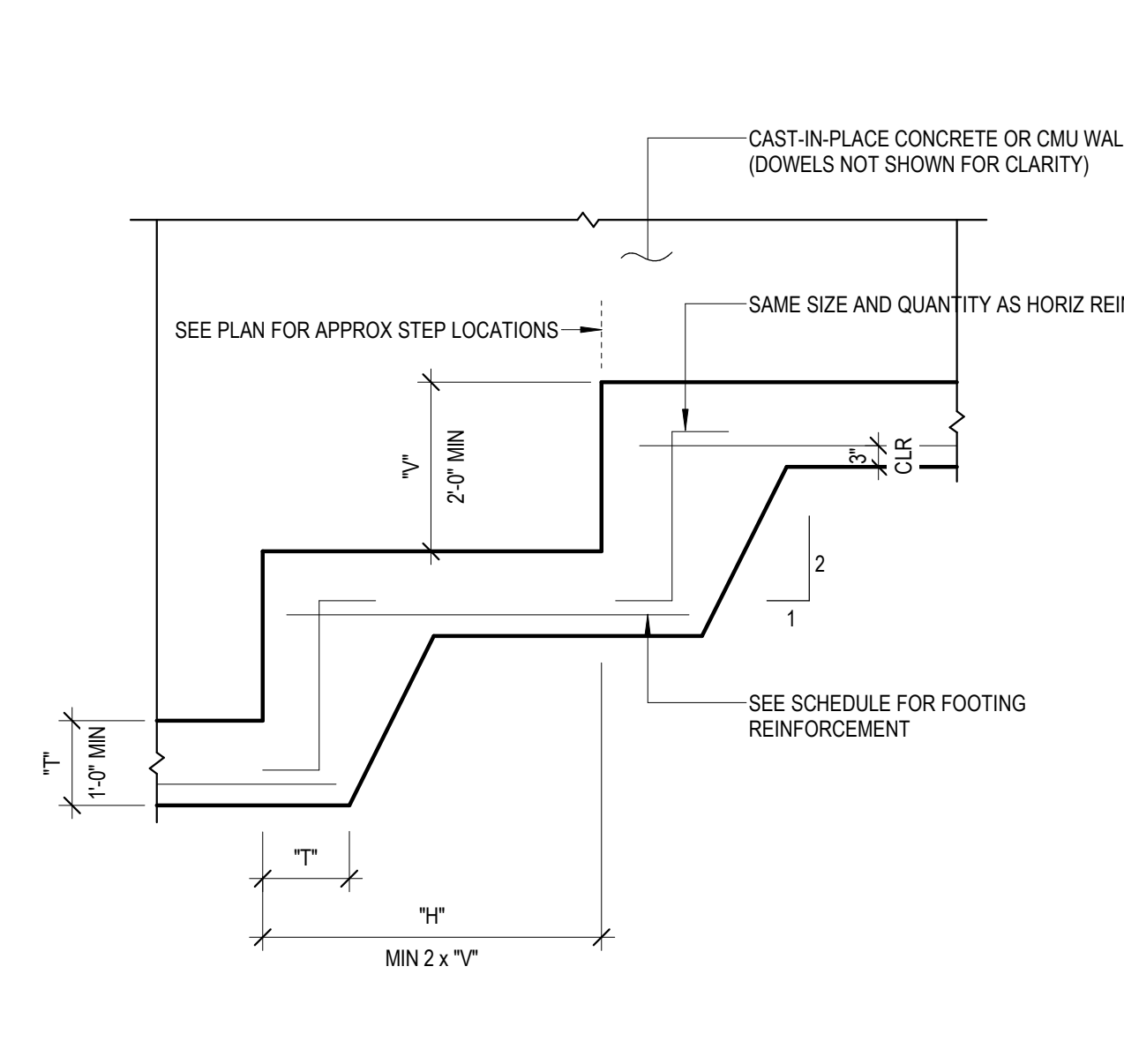
7 WALL INTERSECTION REINFORCEMENT DETAIL
DS502 NOT TO SCALE



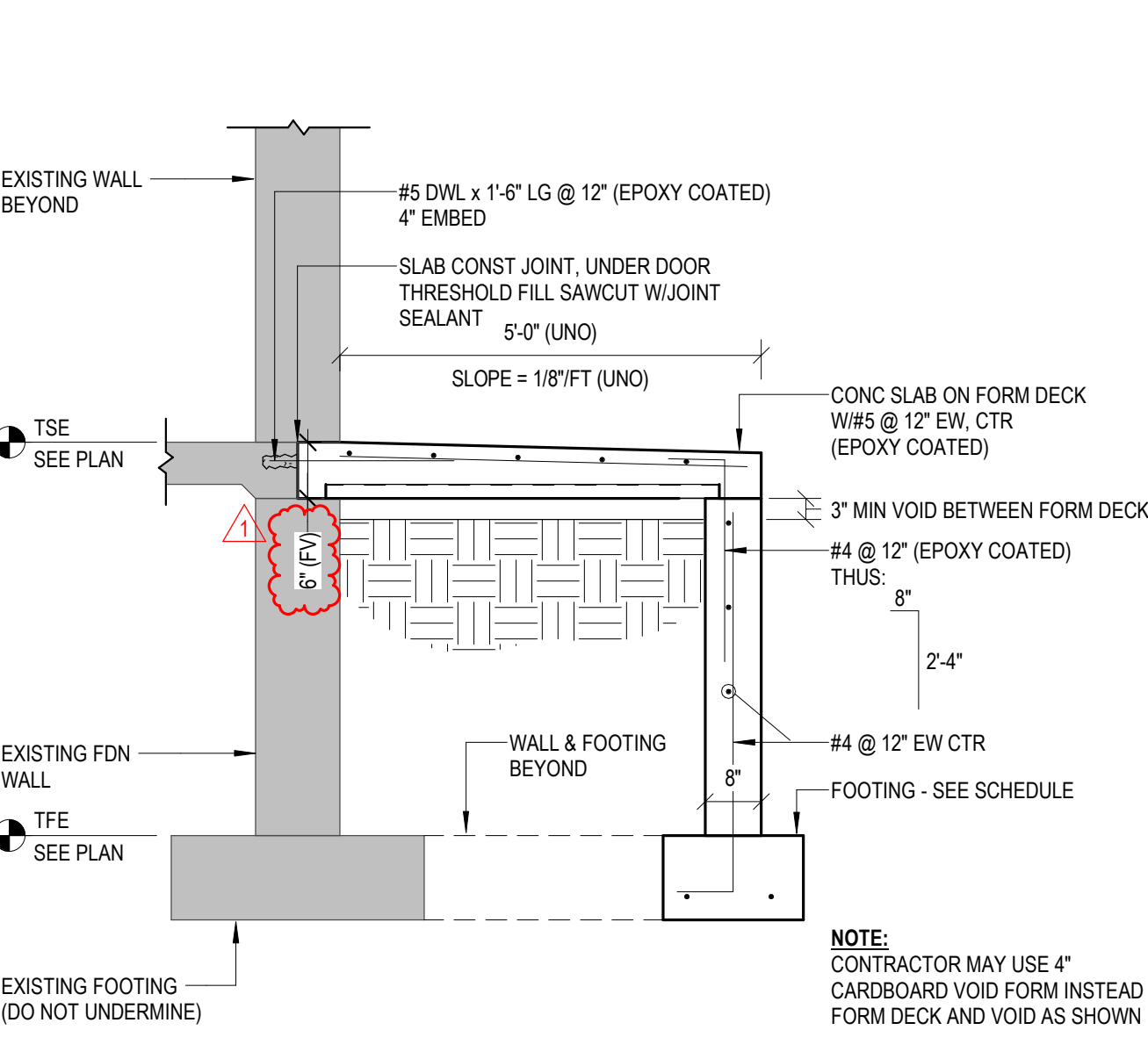
8 ISOLATION JOINT DETAIL AT CONCRETE COLUMN
DS502 NOT TO SCALE



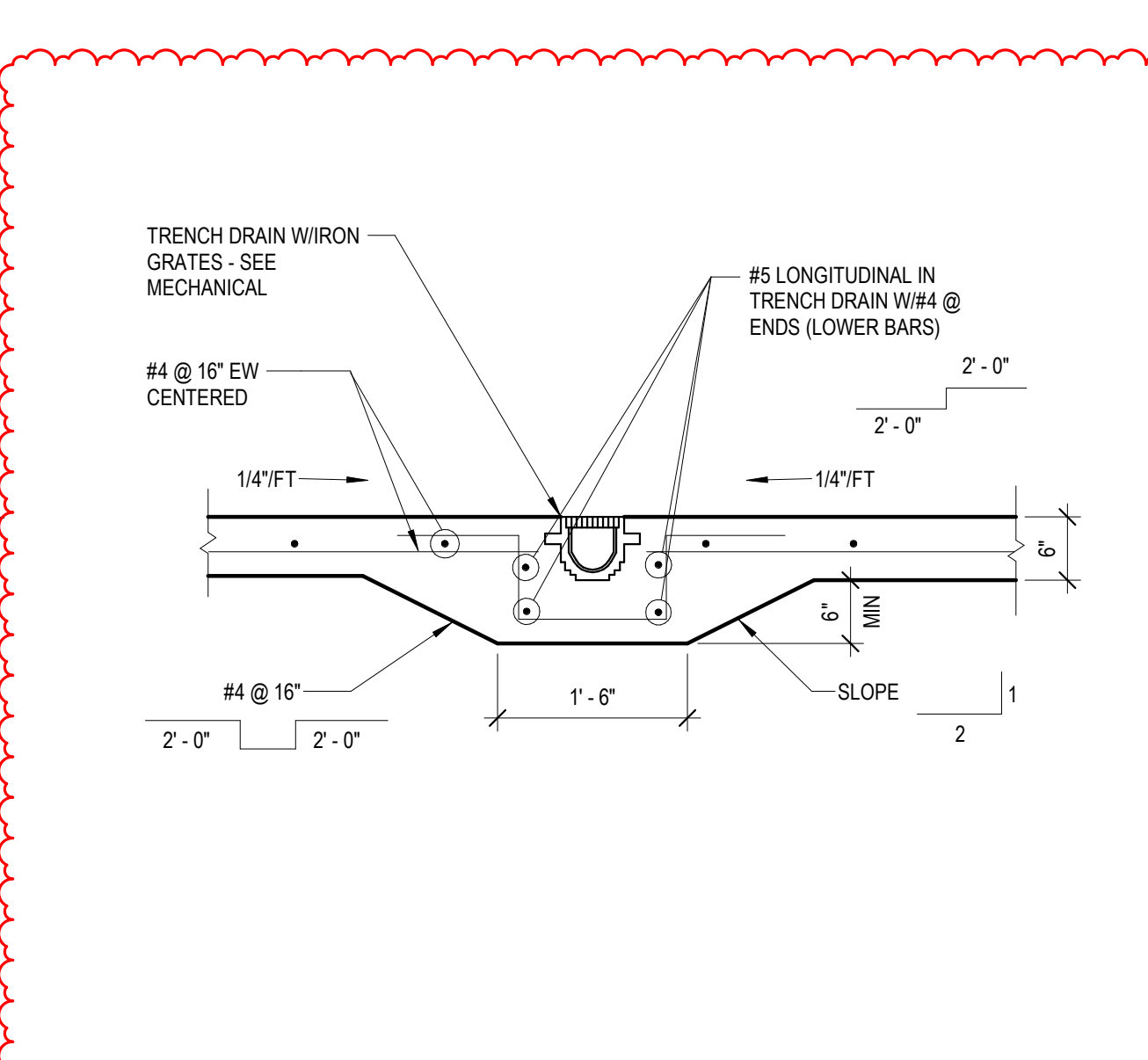
9 SECTION
DS502 NOT TO SCALE



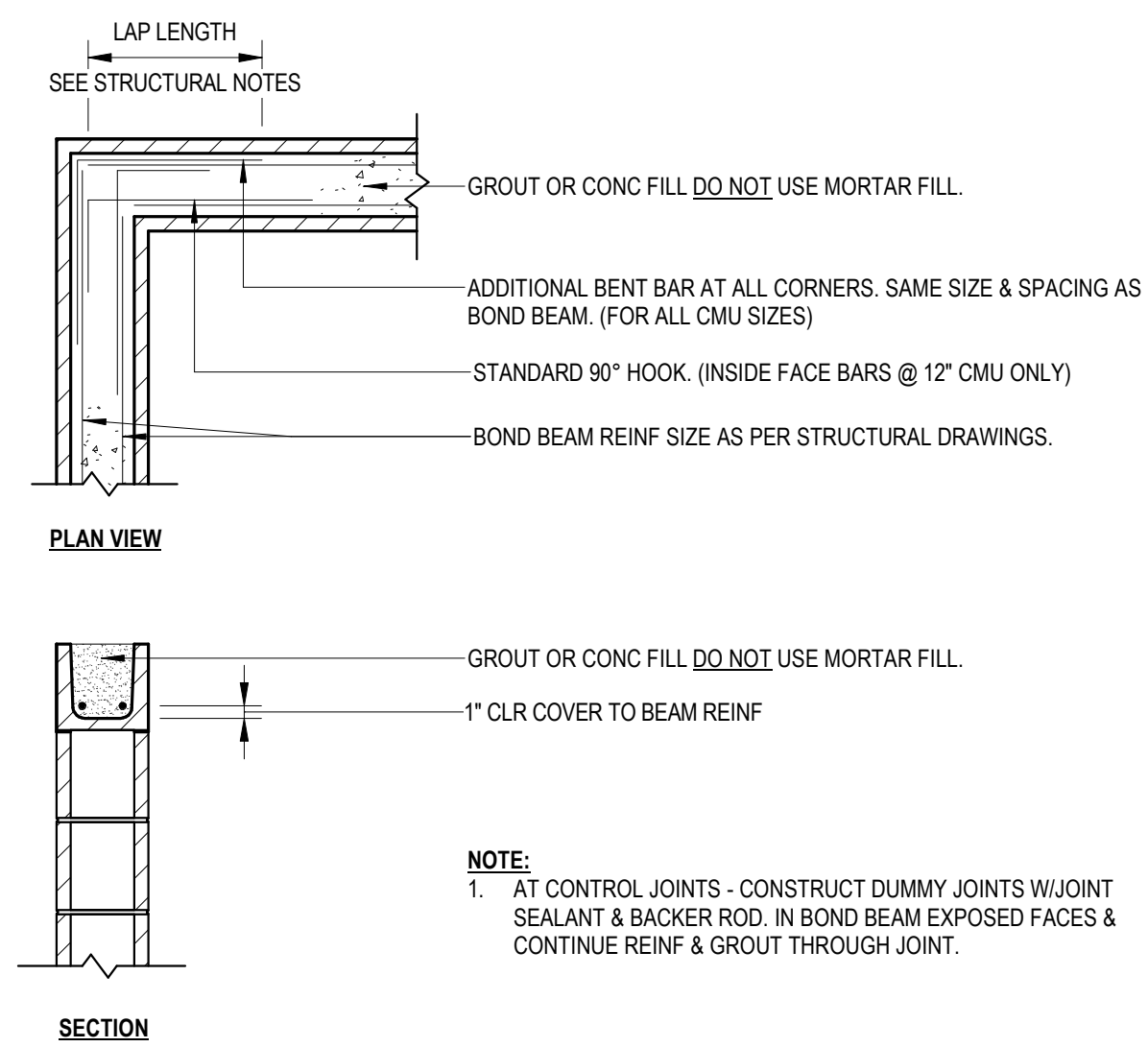
10 FOOTING STEP DETAIL
DS502 NOT TO SCALE



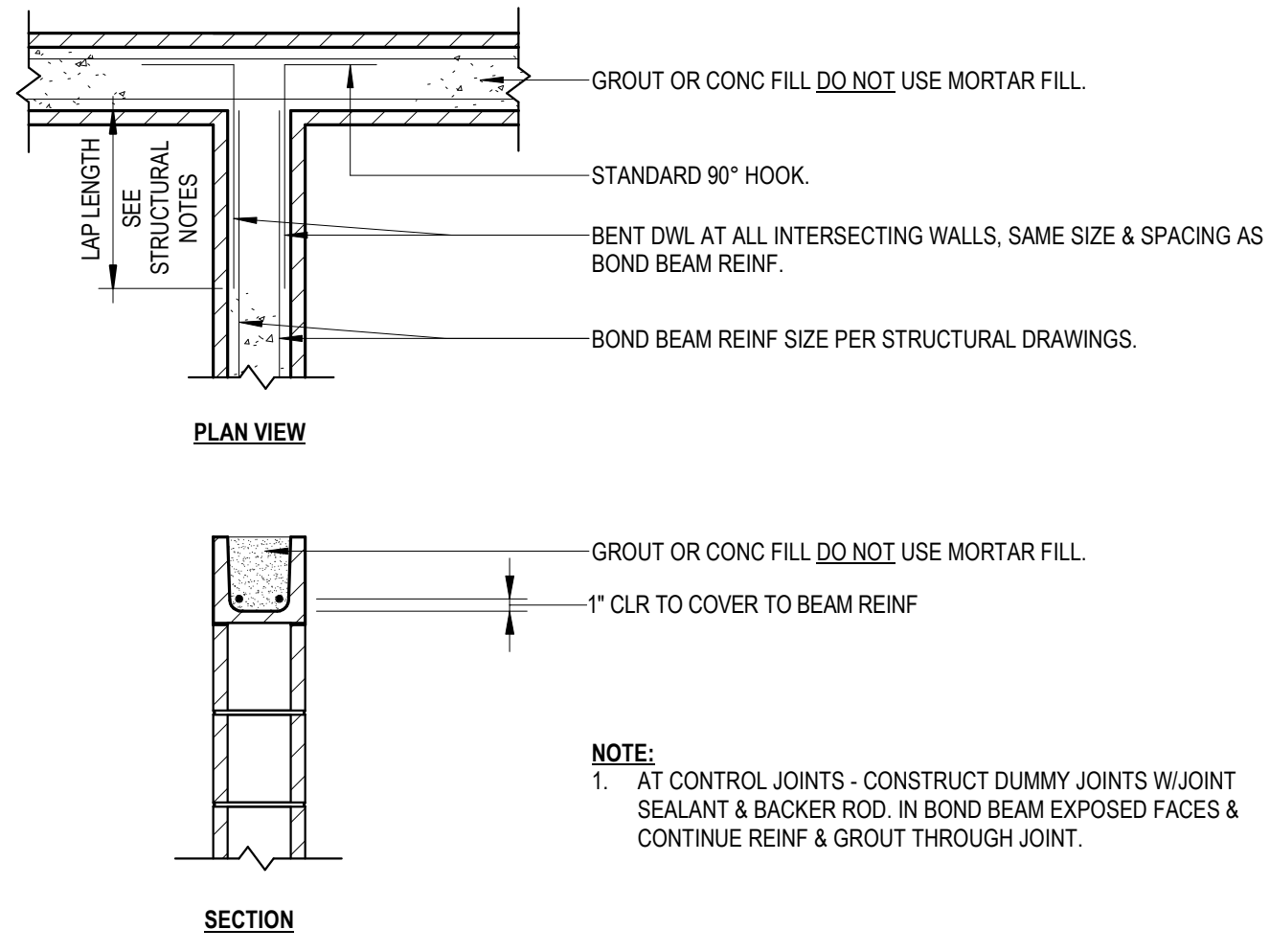
11 CONCRETE STOOP AT EXISTING BUILDING
DS502 NOT TO SCALE



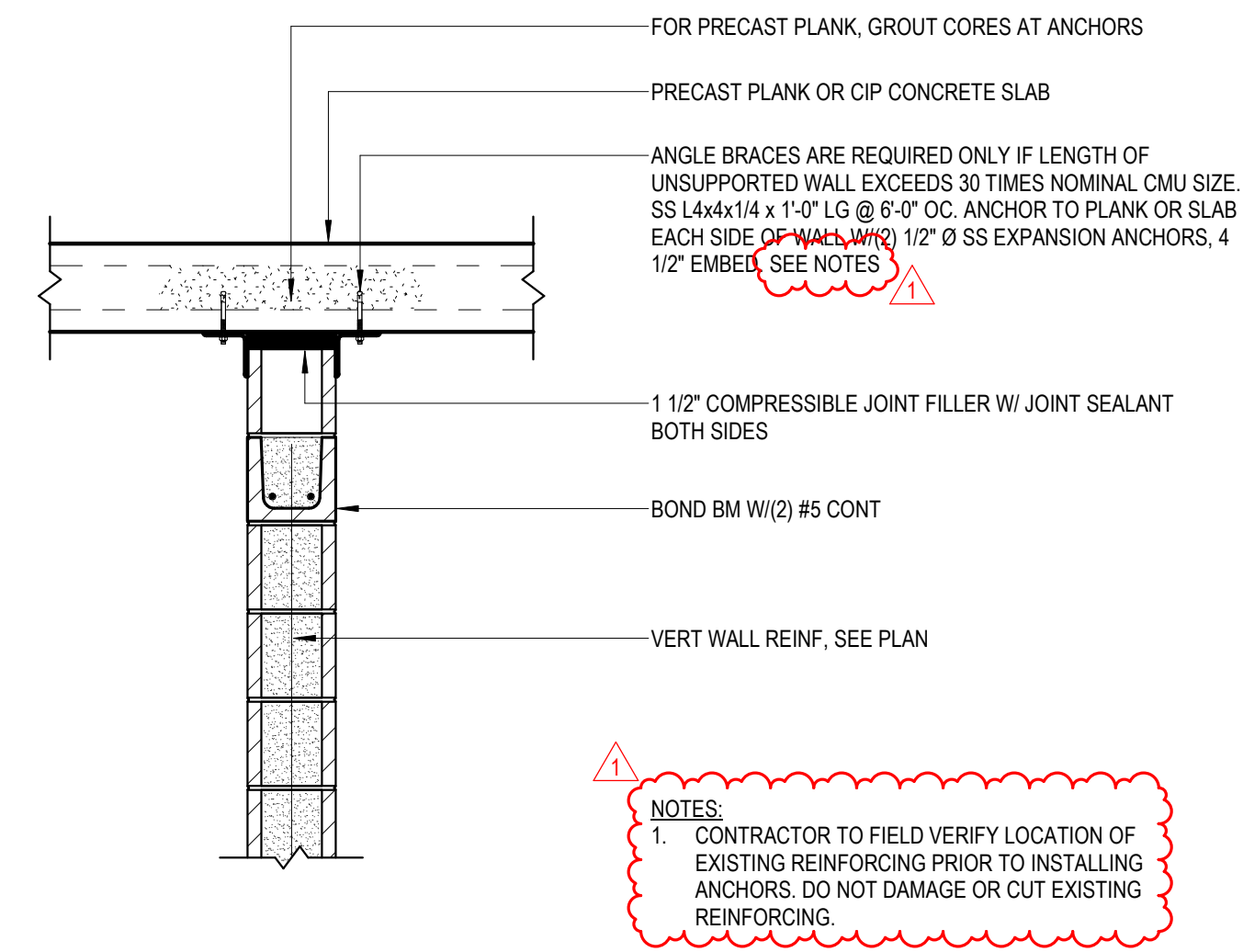
12 TRENCH DRAIN DETAIL
DS502 NOT TO SCALE



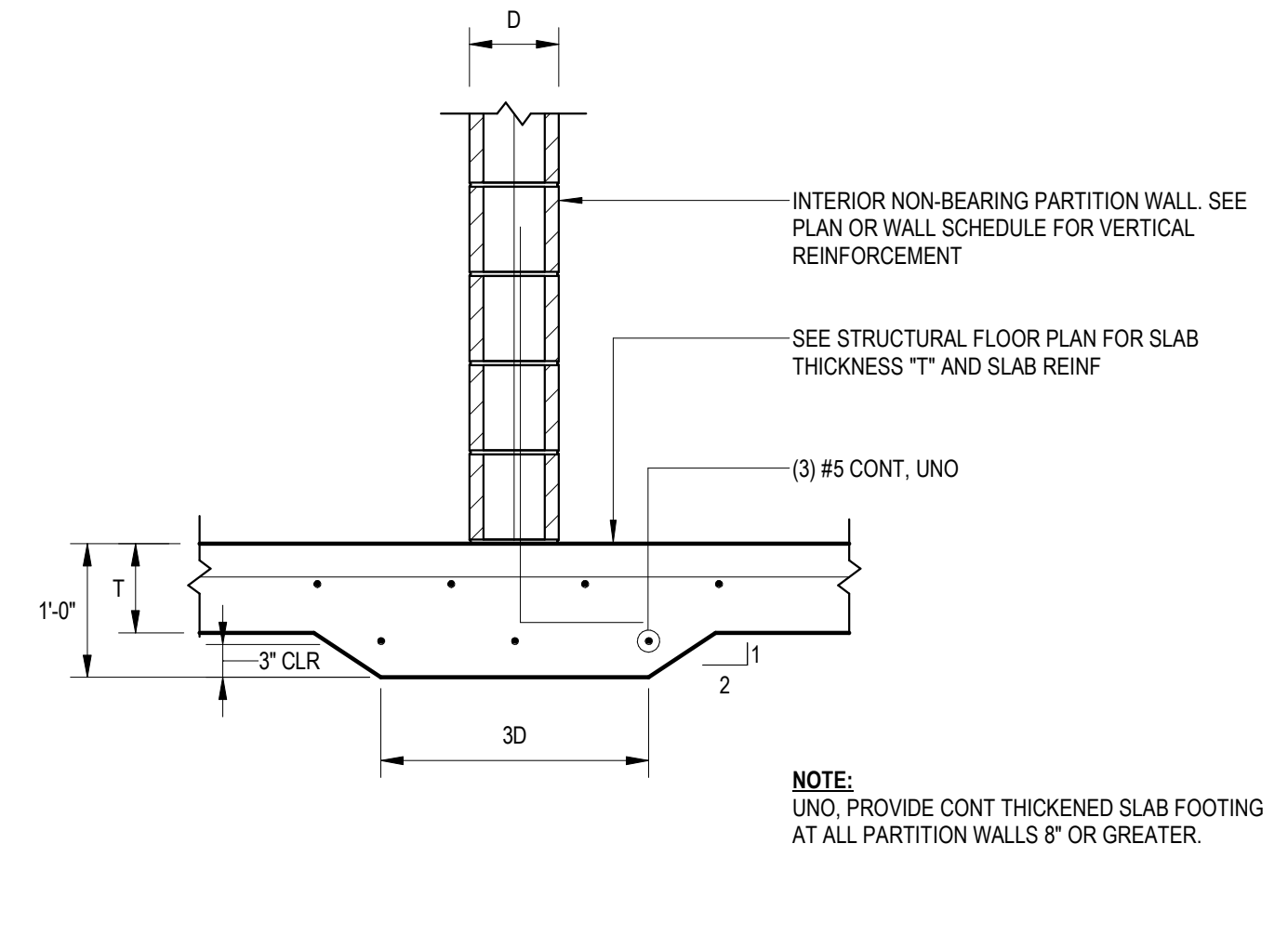
1 BOND BEAM CORNER REINF. DETAIL
DS511 NOT TO SCALE



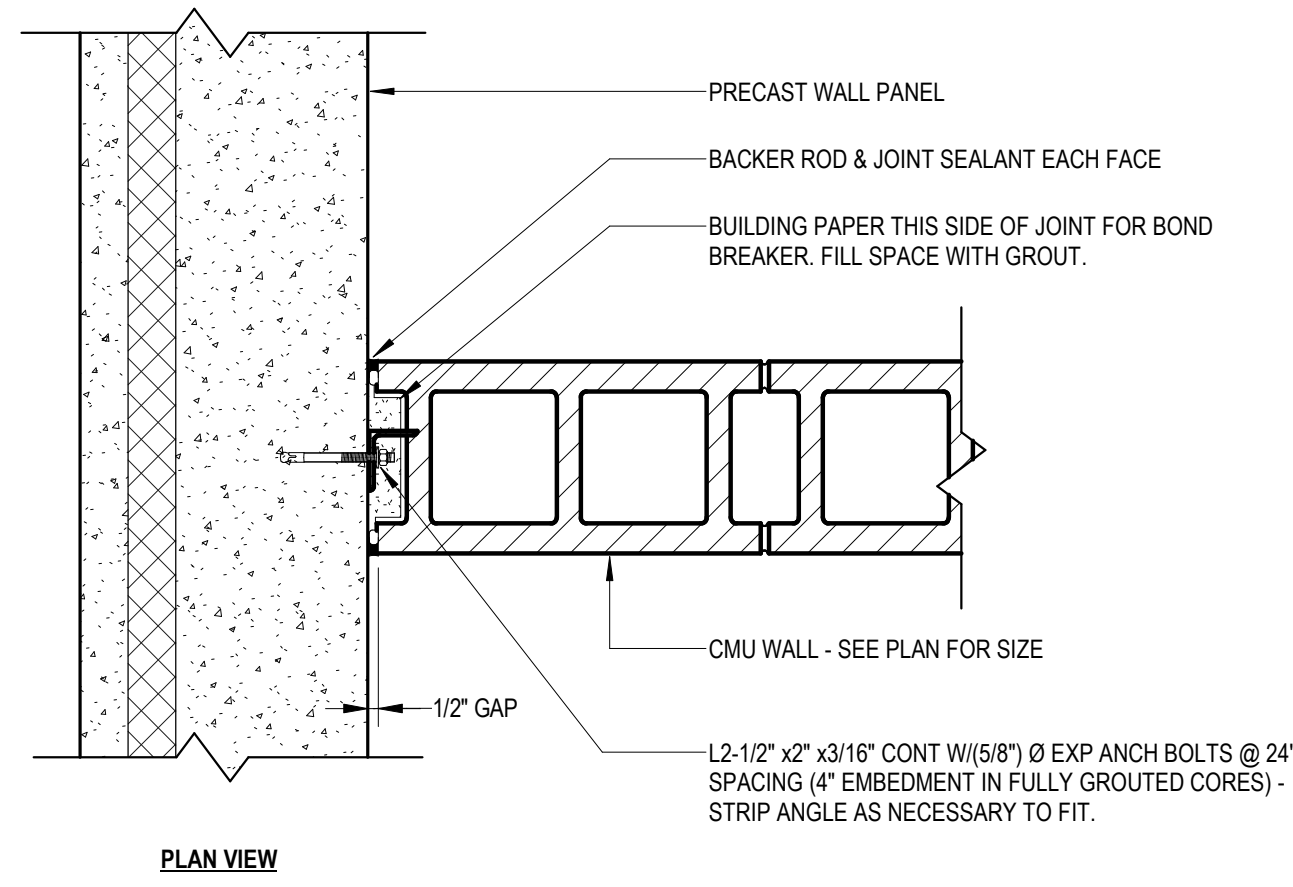
2 BOND BEAM INTERSECTION REINF. DETAIL
DS511 NOT TO SCALE



3 CMU PARTITION WALL TOP DETAIL
DS511 NOT TO SCALE



4 THICKENED SLAB AT NON-BEARING CMU WALL
DS511 NOT TO SCALE

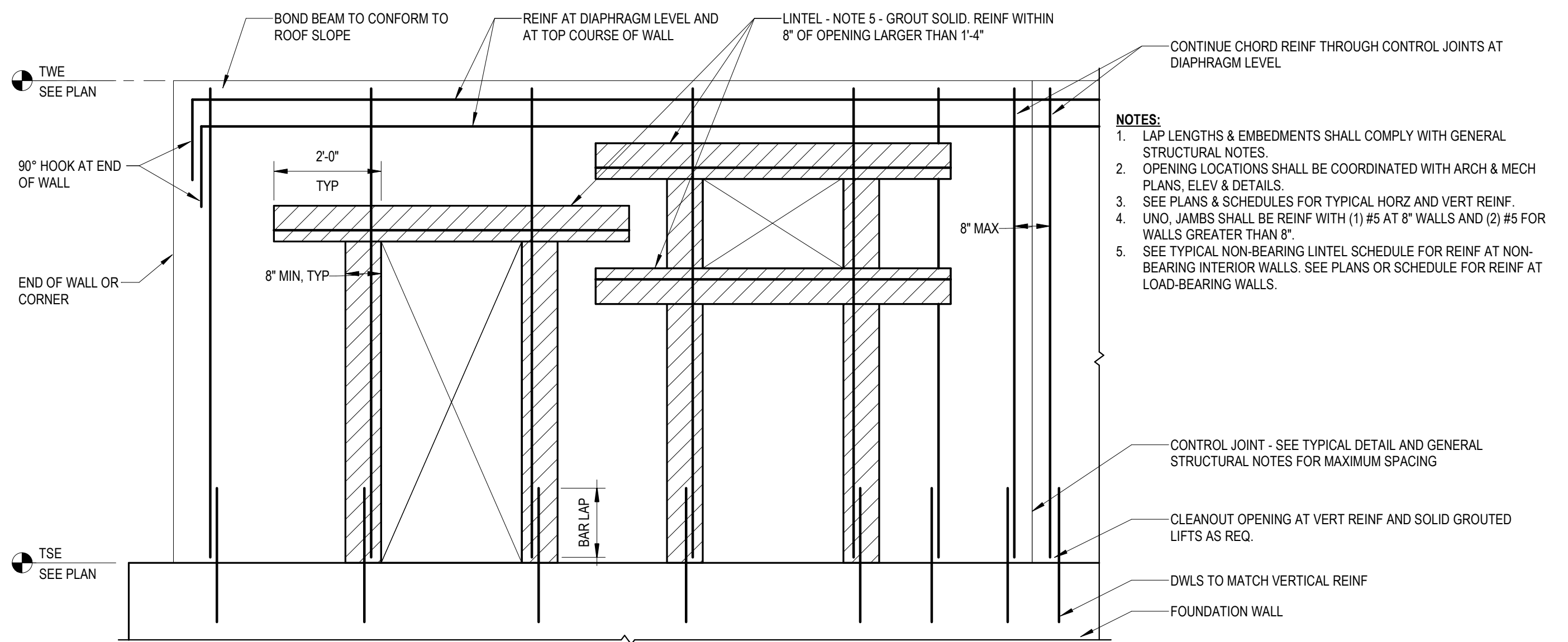


5 CMU TO PRECAST WALL CONNECTION DETAIL
DS511 NOT TO SCALE

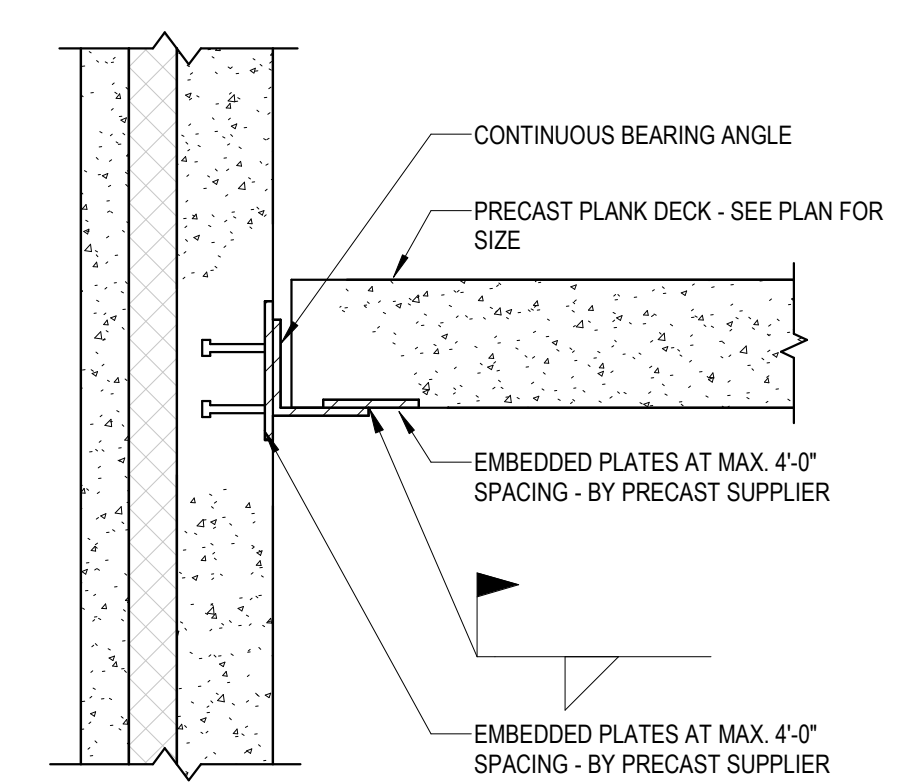
NON-BEARING MASONRY LINTEL SCHEDULE

	6" CMU WALL	8" CMU WALL	12" CMU WALL	16" CMU WALL
ROUGH OPENING WIDTH (LINTEL SPAN)				
0'-0" - 3'-4"	(1) #4	(2) #4	(2) #4	(2) #4
3'-5" - 6'-4"		(2) #4	(2) #4	(2) #4
6'-5" - 8'-4"		(2) #5	(2) #5	(2) #5

MASONRY LINTEL NOTES:
1. LINTEL BLOCKS SHALL BE GROUTED SOLID. DO NOT USE MORTAR. $F'_m = 3000$ PSI MIN
2. 8" MIN BEARING EACH END FOR BLOCK LINTELS. CORES BENEATH LINTEL BEARING SHALL BE GROUTED SOLID. PROVIDE (2) VERTICAL WALL BARS (#5 MIN) BELOW EACH BEARING END UNO.

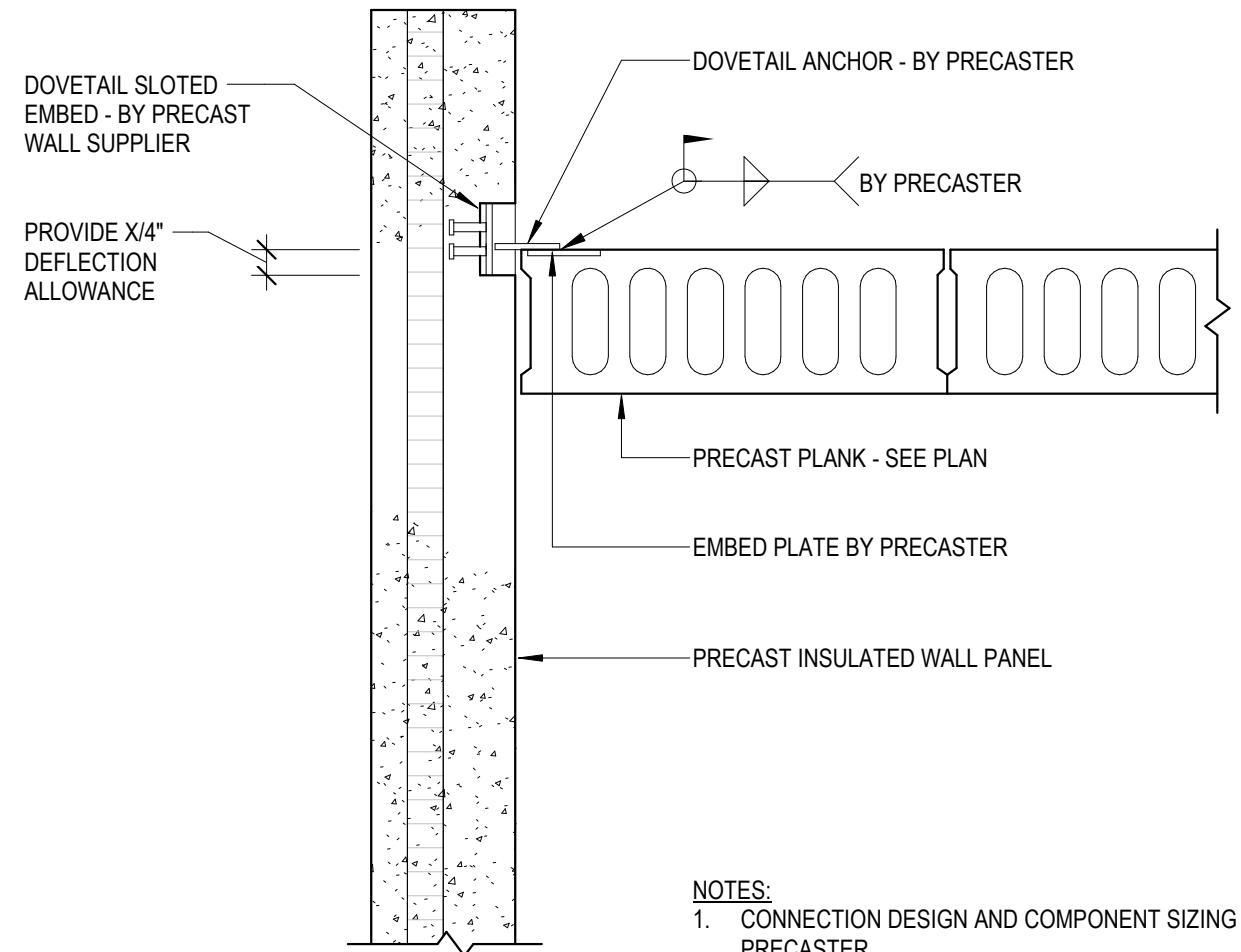


7 CMU WALL REINFORCING SCHEMATIC
DS511 NOT TO SCALE



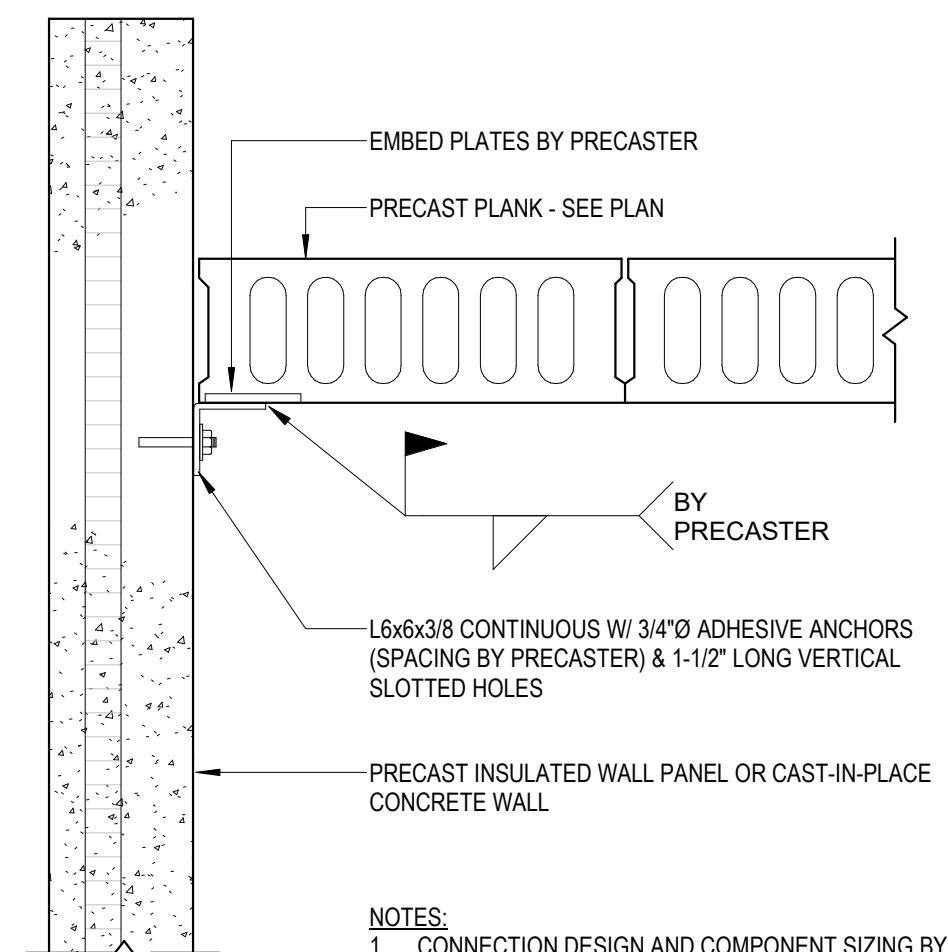
NOTES:
1. CONNECTION DESIGN BY PRECAST CONTRACTOR. SUBMIT CALCS FOR REVIEW.
2. ALL EXPOSED CONNECTION COMPONENTS SHALL BE STAINLESS STEEL TYPE 316
3. HORIZONTAL SHEAR = 215#/FT. SERVICE (WIND) LOAD.
4. VERTICAL SERVICE REACTIONS: DL=679#/FT, LL=2733/FT + POINT LOADS AS SHOWN ON DRAWINGS

8 PLANK TO WALL PANEL BEARING CONNECTION
DS511 NOT TO SCALE



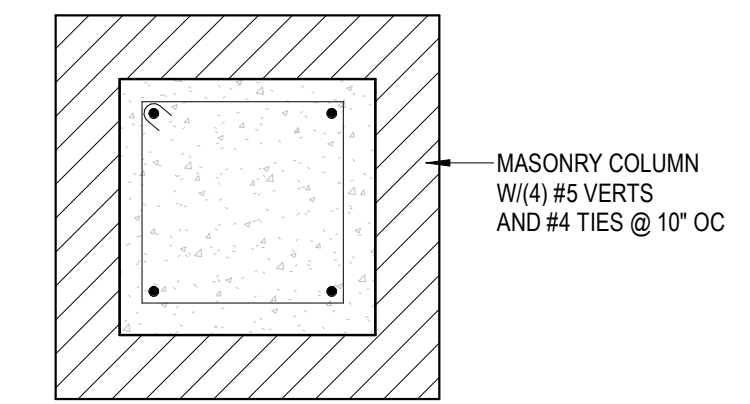
NOTES:
1. CONNECTION DESIGN AND COMPONENT SIZING BY PRECASTER.
2. ALL CONNECTION COMPONENTS SHALL BE STAINLESS STEEL.
3. SEE PLANS FOR LATERAL LOAD TRANSFER REQUIREMENTS

9 WALL PANEL TO ROOF PLANK CONNECTION
DS511 NOT TO SCALE



NOTES:
1. CONNECTION DESIGN AND COMPONENT SIZING BY PRECASTER.
2. ALL CONNECTION COMPONENTS SHALL BE STAINLESS STEEL.

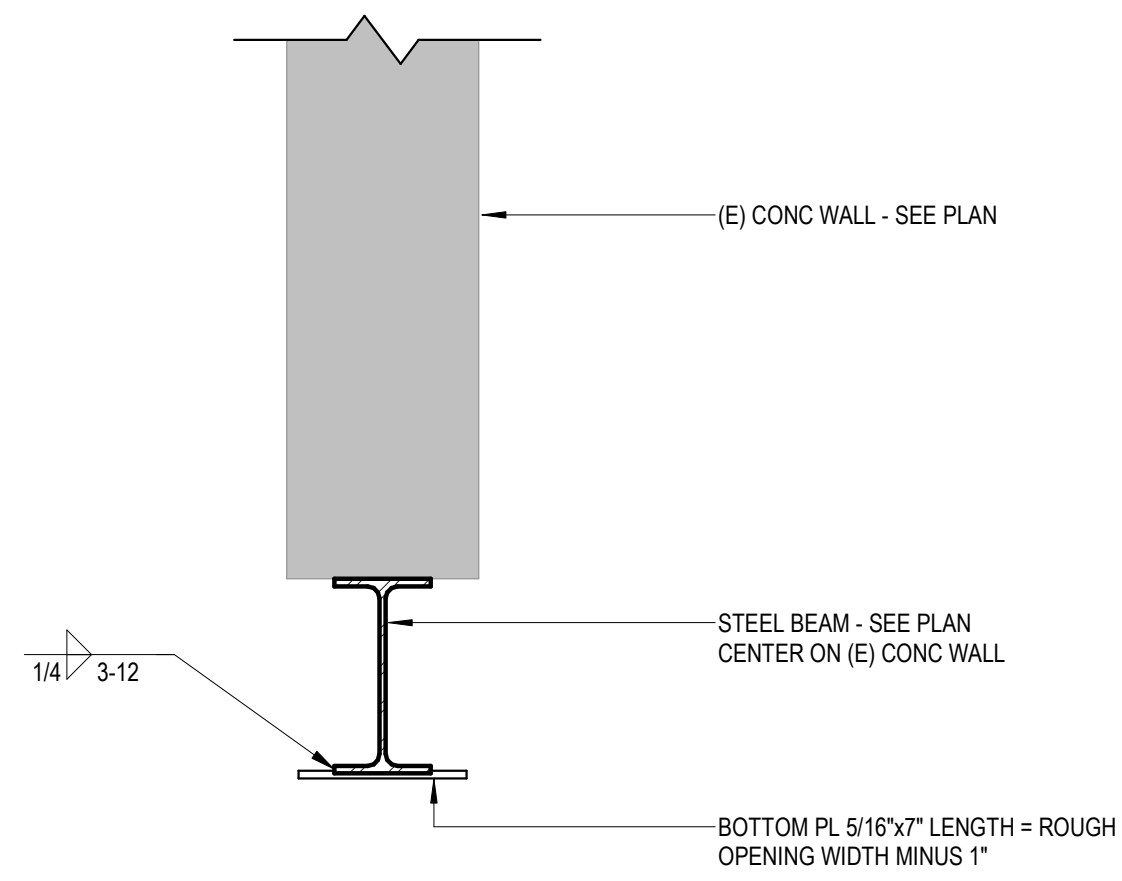
10 WALL PANEL TO ROOF PLANK CONNECTION
DS511 NOT TO SCALE



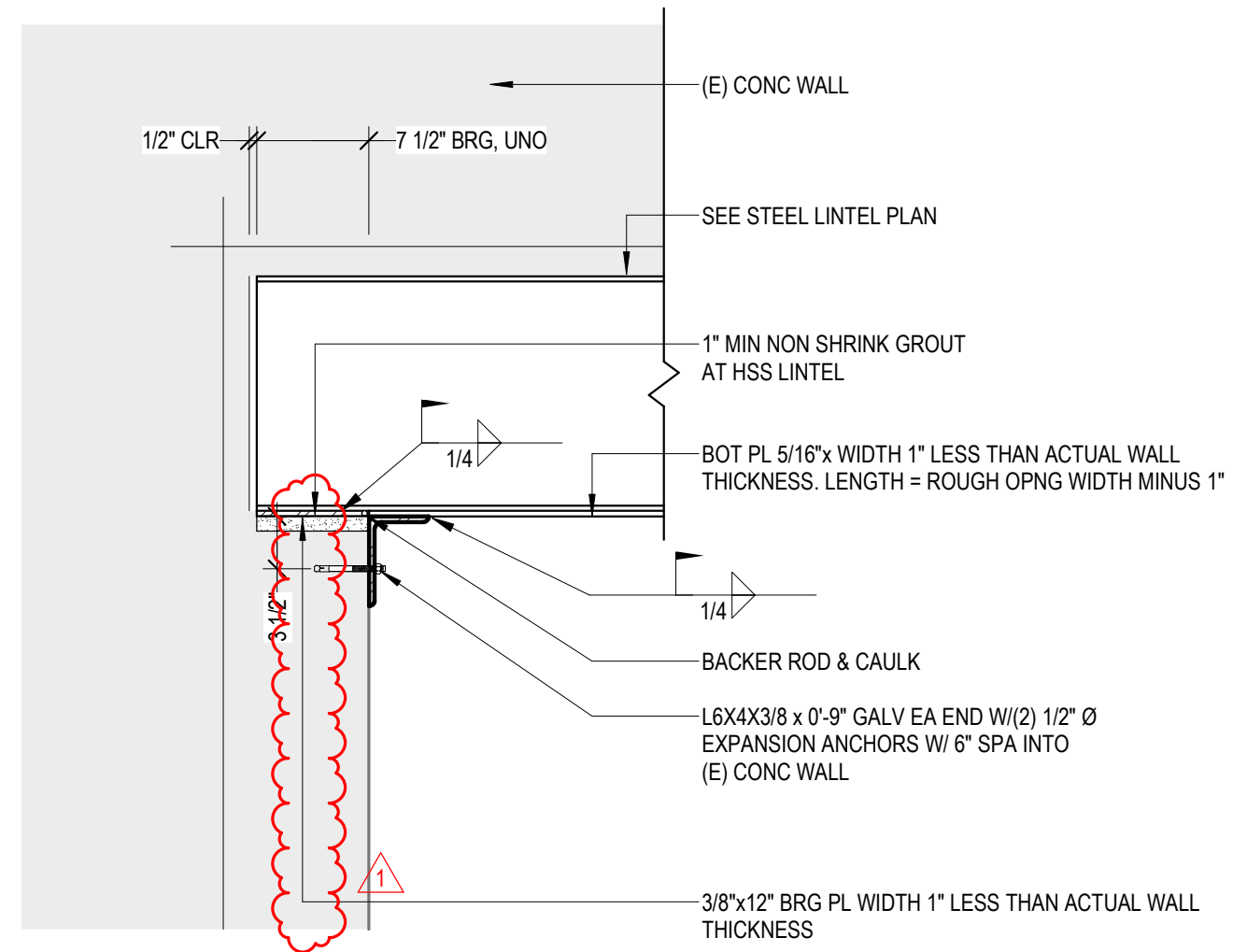
NOTES:
1. PROVIDE HOOKED DOWELS TO FOUNDATION TO LAP WITH VERTICAL REINFORCING. MATCH SIZE AND NUMBER OF VERTICAL REINFORCING BARS.

11 MASONRY COLUMN DETAIL
DS511 NOT TO SCALE

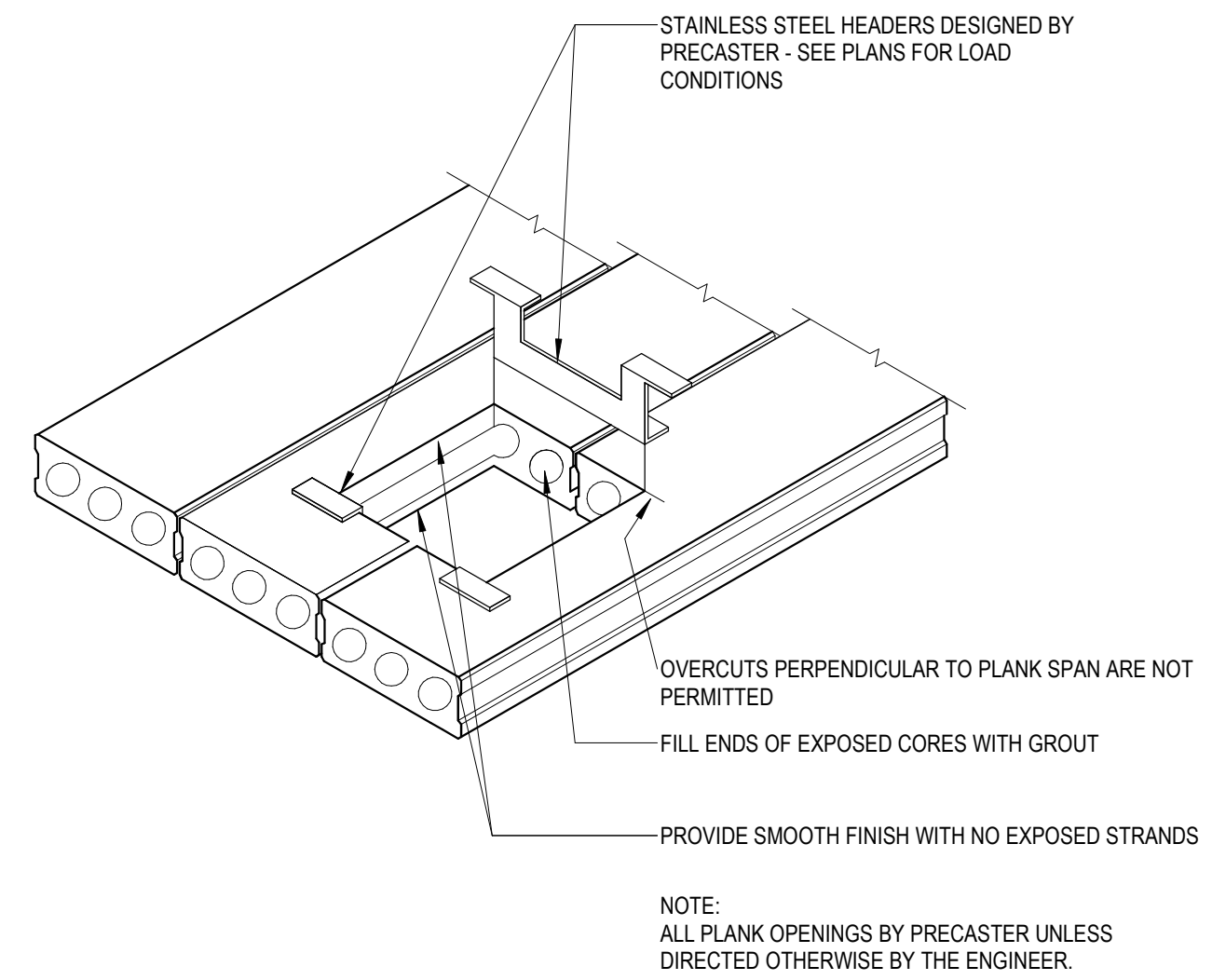
REVISION SCHEDULE		
REV. #	DESCRIPTION	DATE
1	ADDENDUM 3	11/20/2023



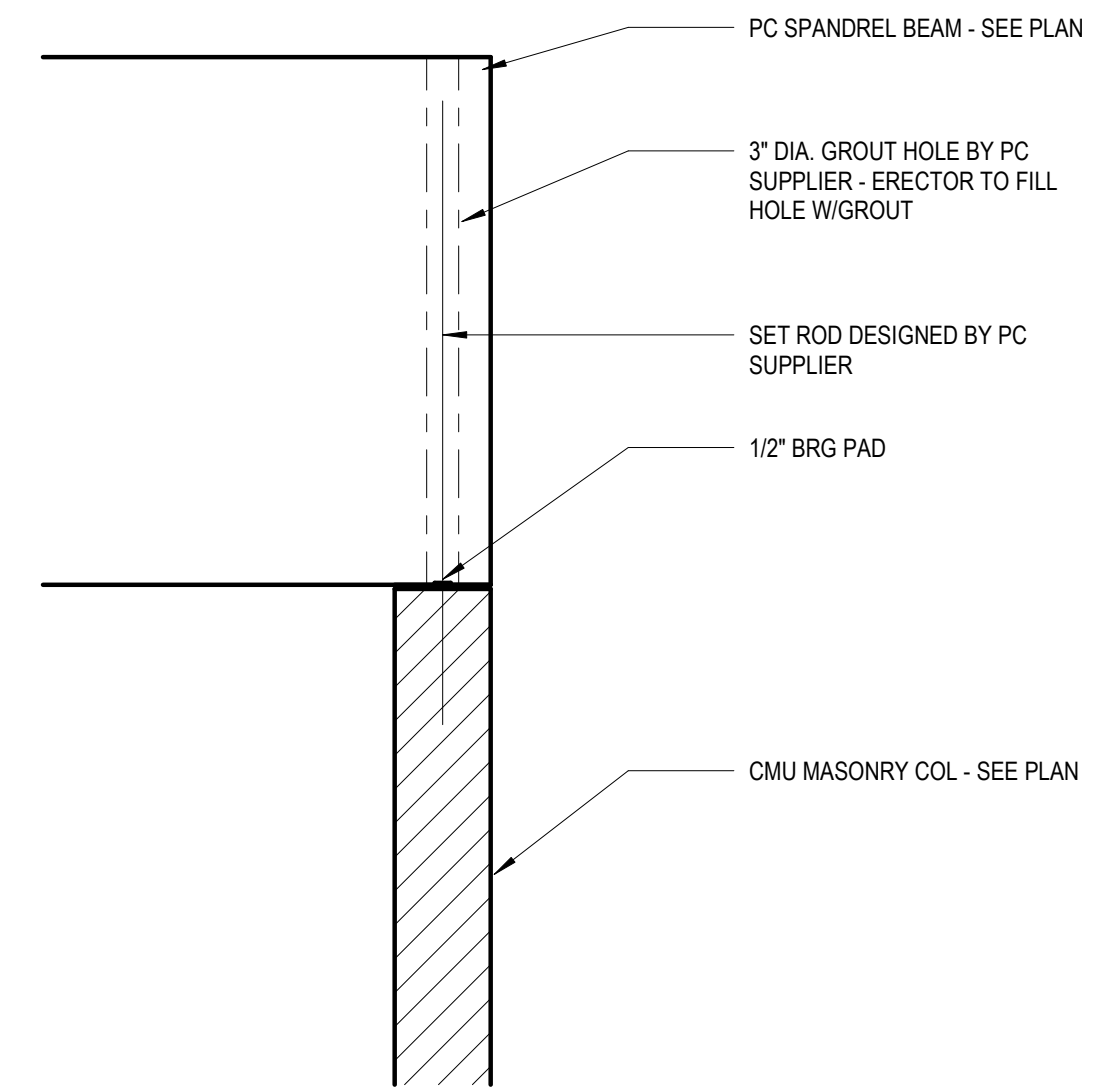
1 STEEL LINTEL SECTION
DS512 NOT TO SCALE



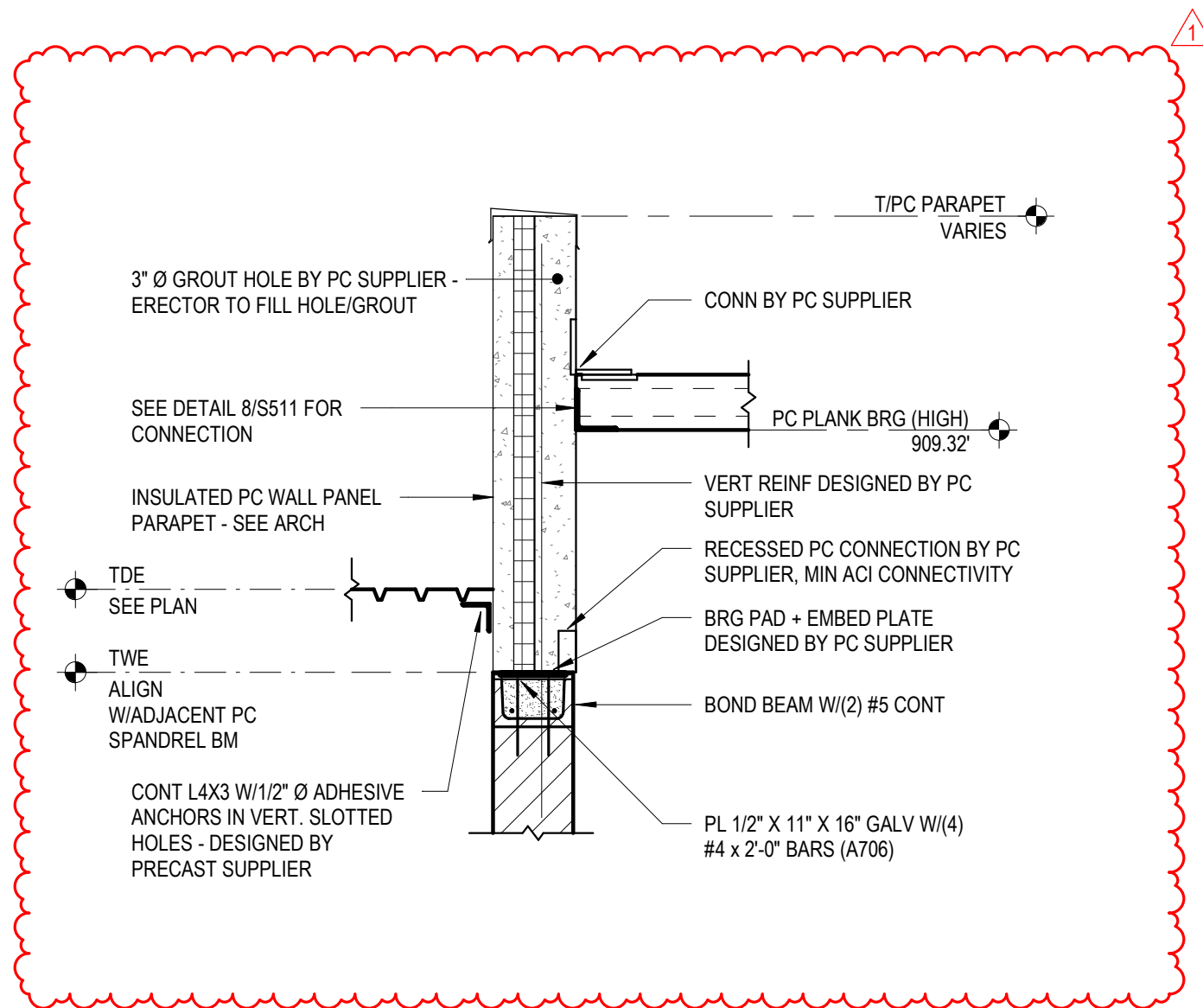
2 STEEL LINTEL ELEVATION
DS512 NOT TO SCALE



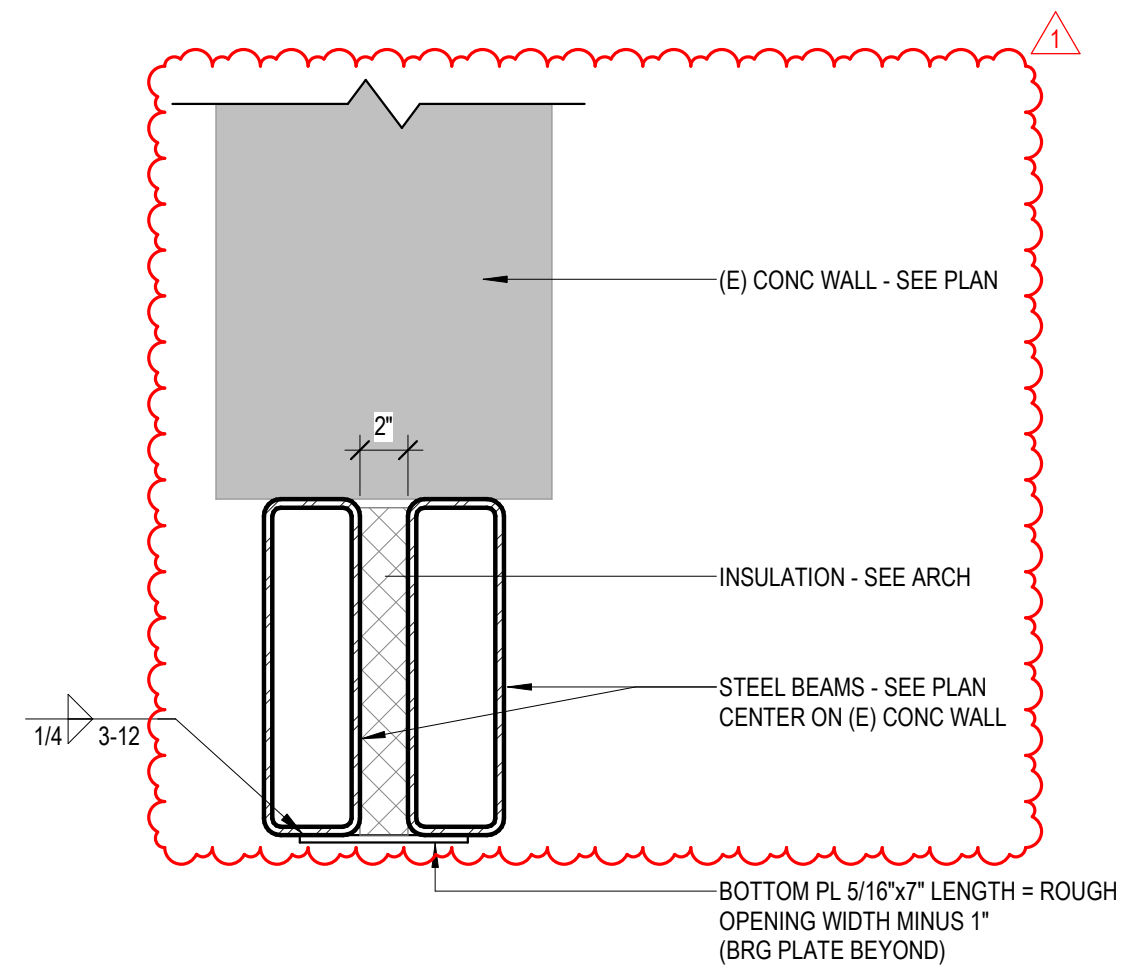
3 TYPICAL PLANK OPENING WITH HEADERS
DS512 NOT TO SCALE



4 PC SPANDREL TO CMU COL
DS512 NOT TO SCALE



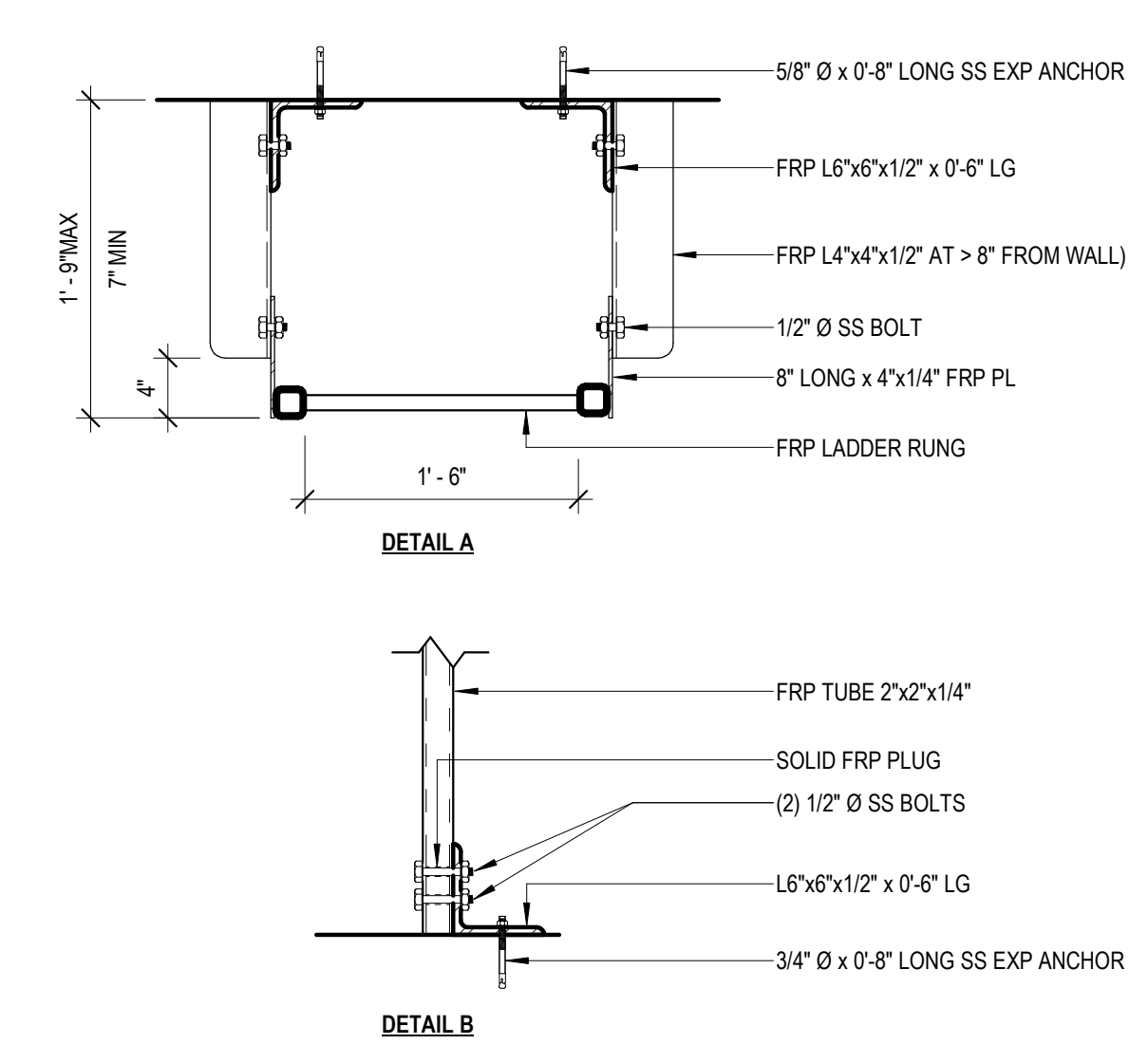
5 PC SPANDREL TO CMU WALL
DS512 NOT TO SCALE



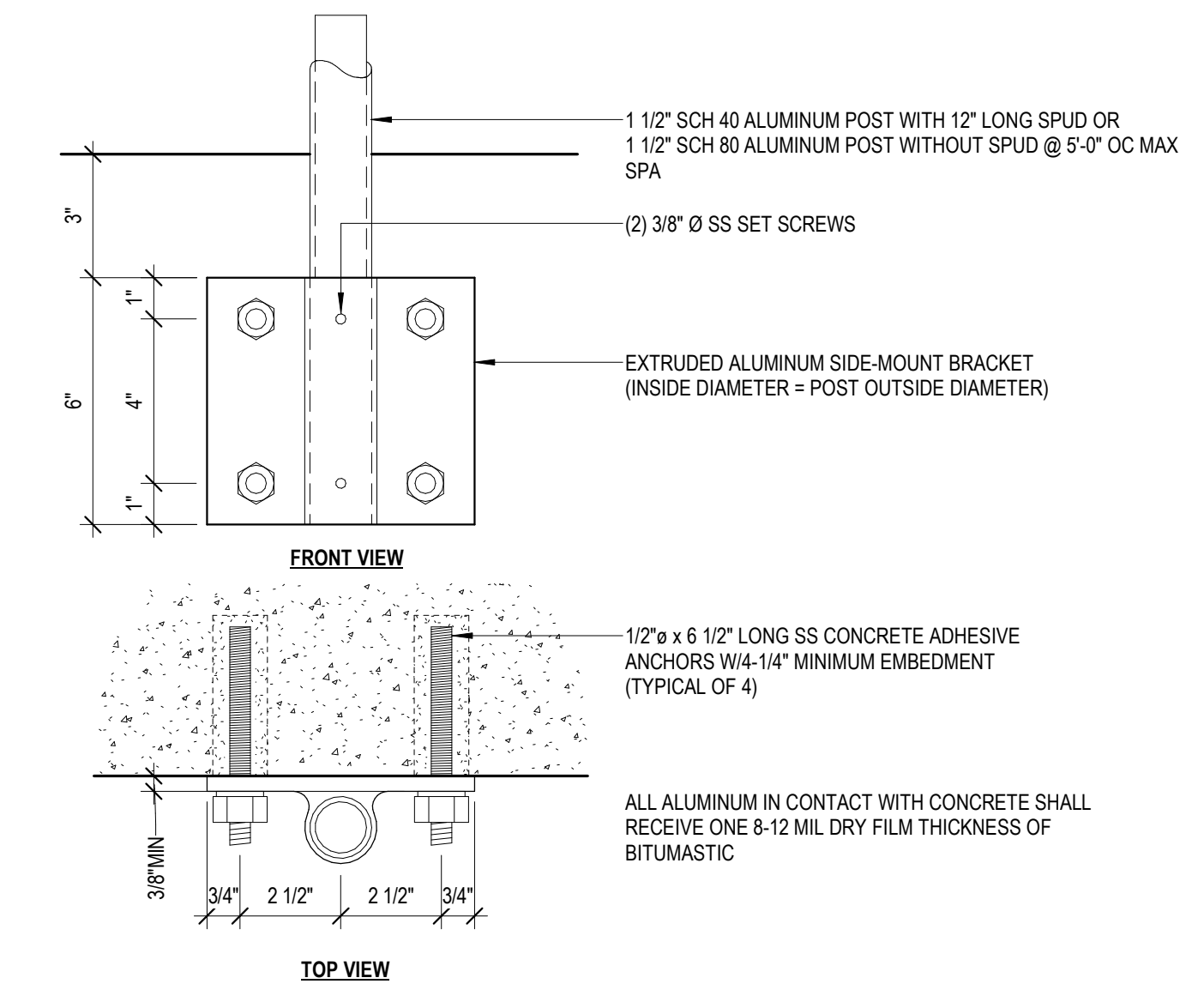
6 STEEL LINTEL SECTION
DS512 NOT TO SCALE

NOTES
1. SEE DETAIL 2/S512 FOR INFO NOT SHOWN

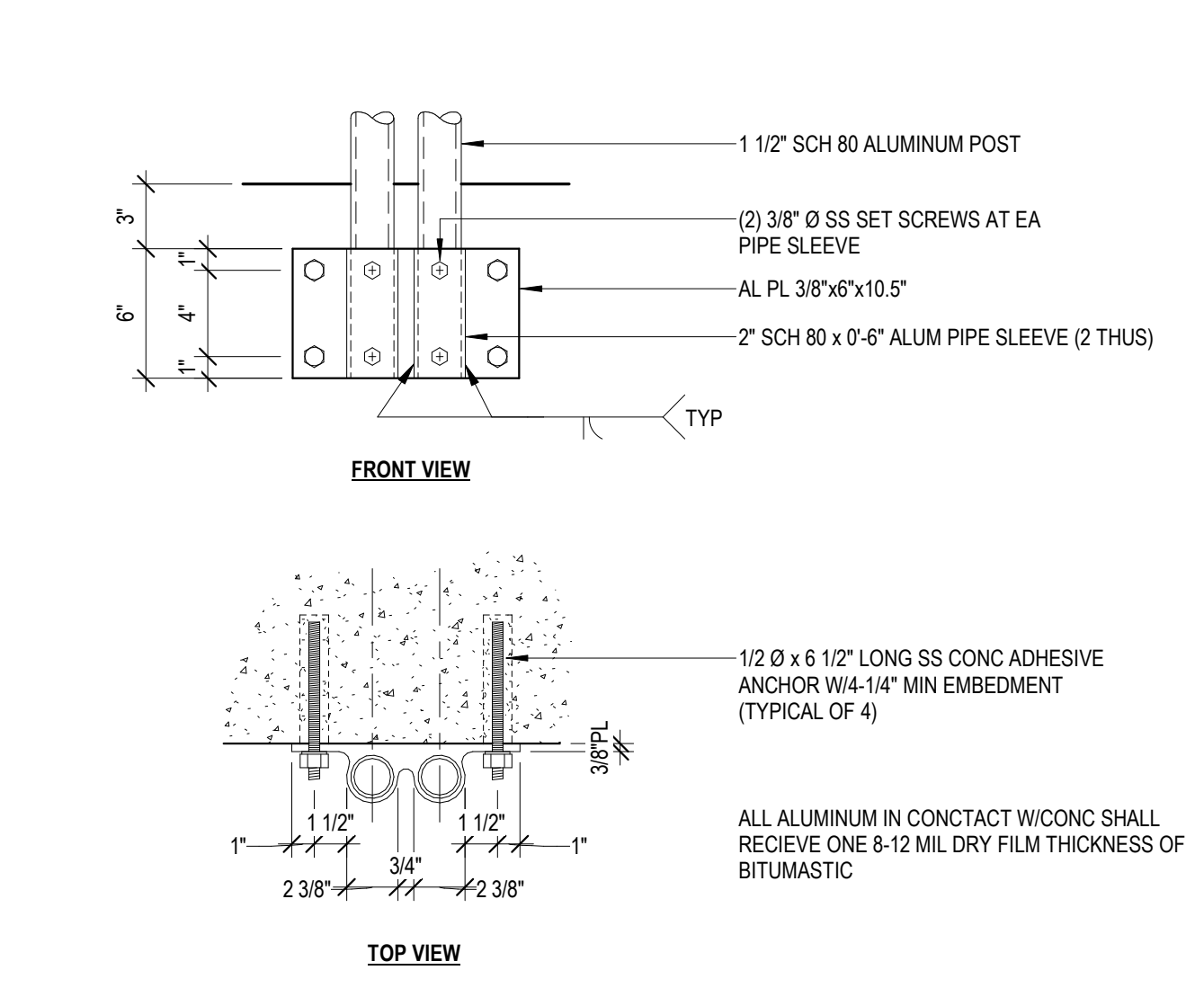
REVISION SCHEDULE		
REV. #	DESCRIPTION	DATE
1	ADDENDUM 3	11/20/2023



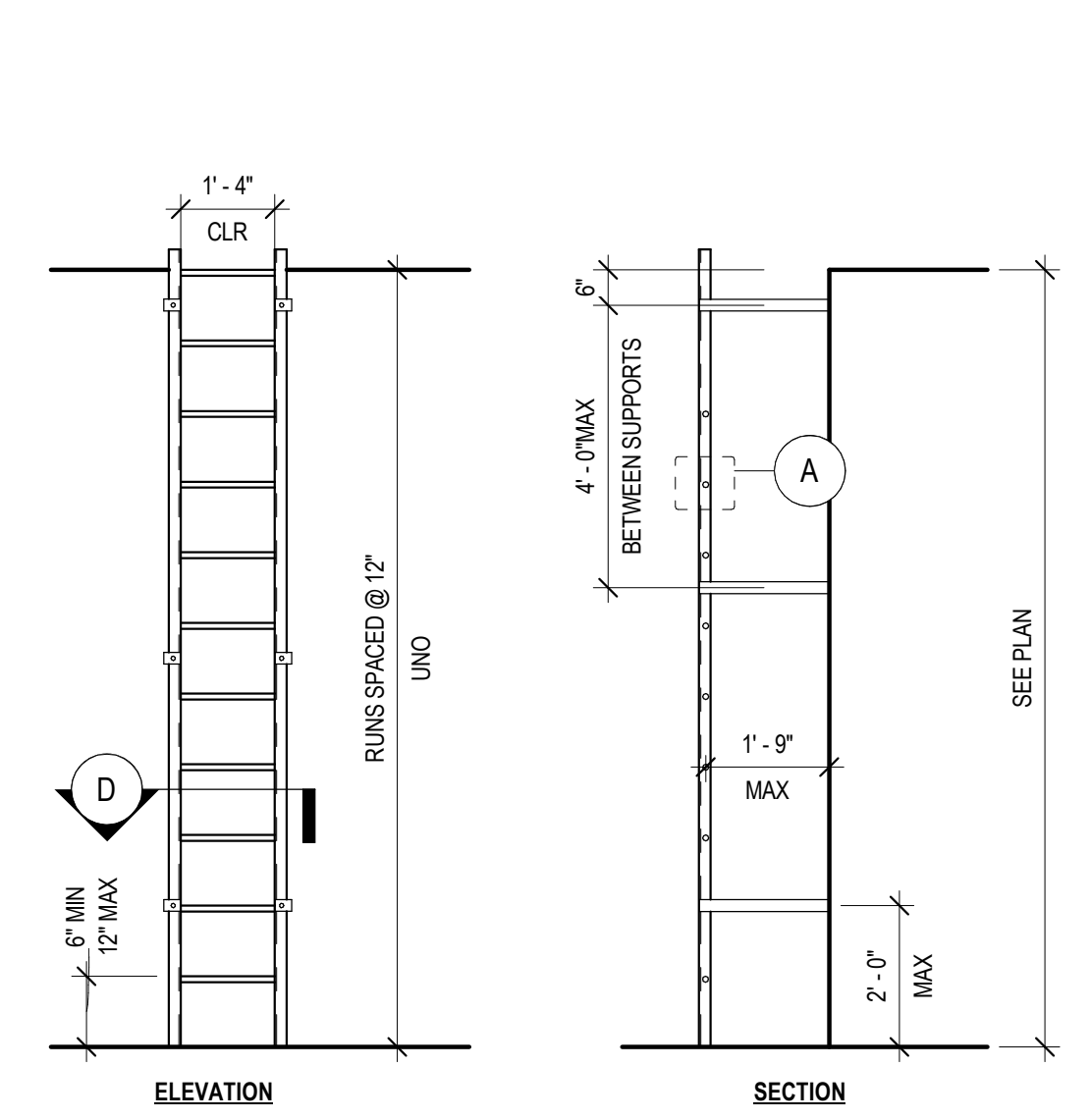
2 FRP LADDER DETAIL
DS531 NOT TO SCALE



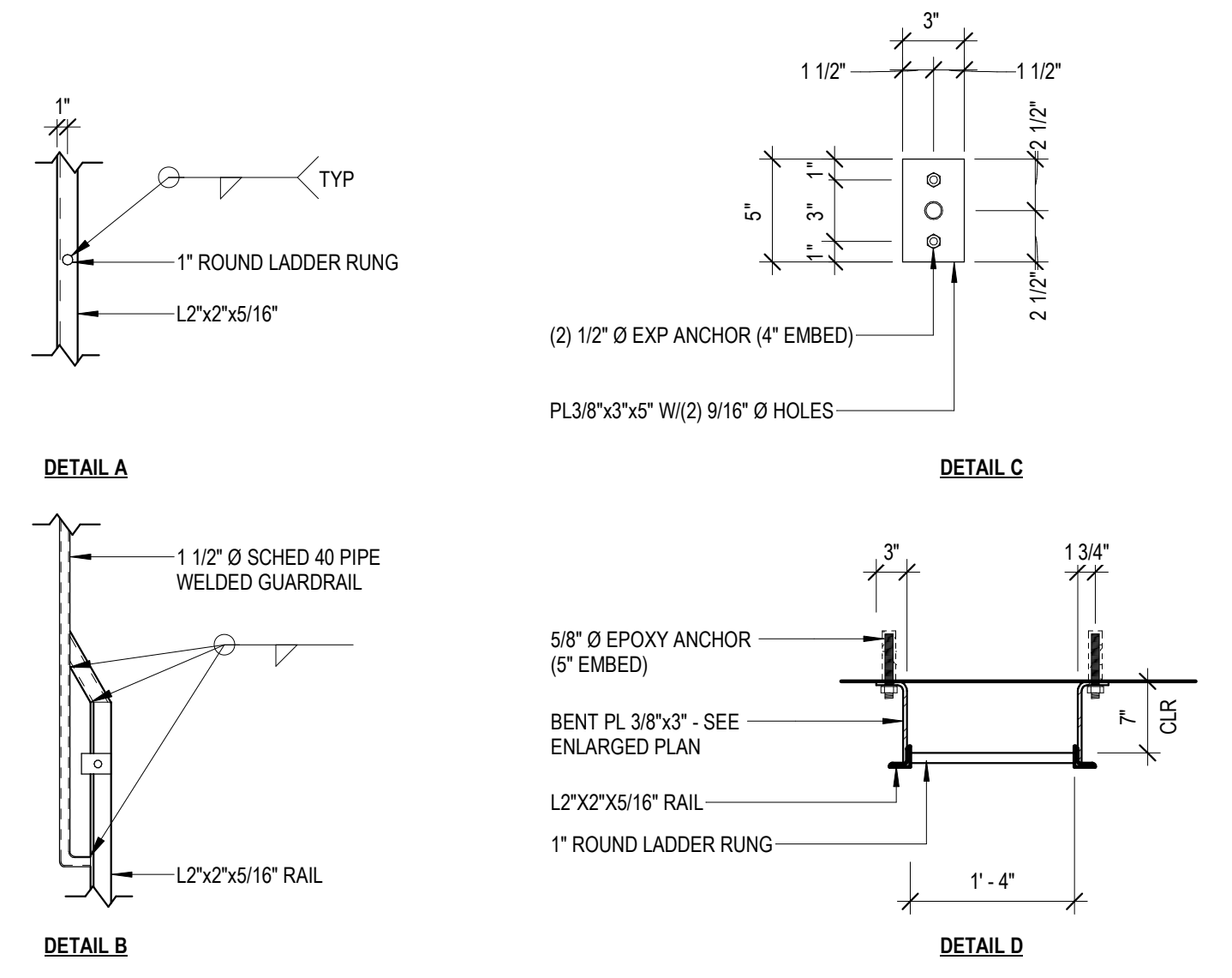
5 ALUM POST SIDE-MOUNT BRACKET
DS531 NOT TO SCALE



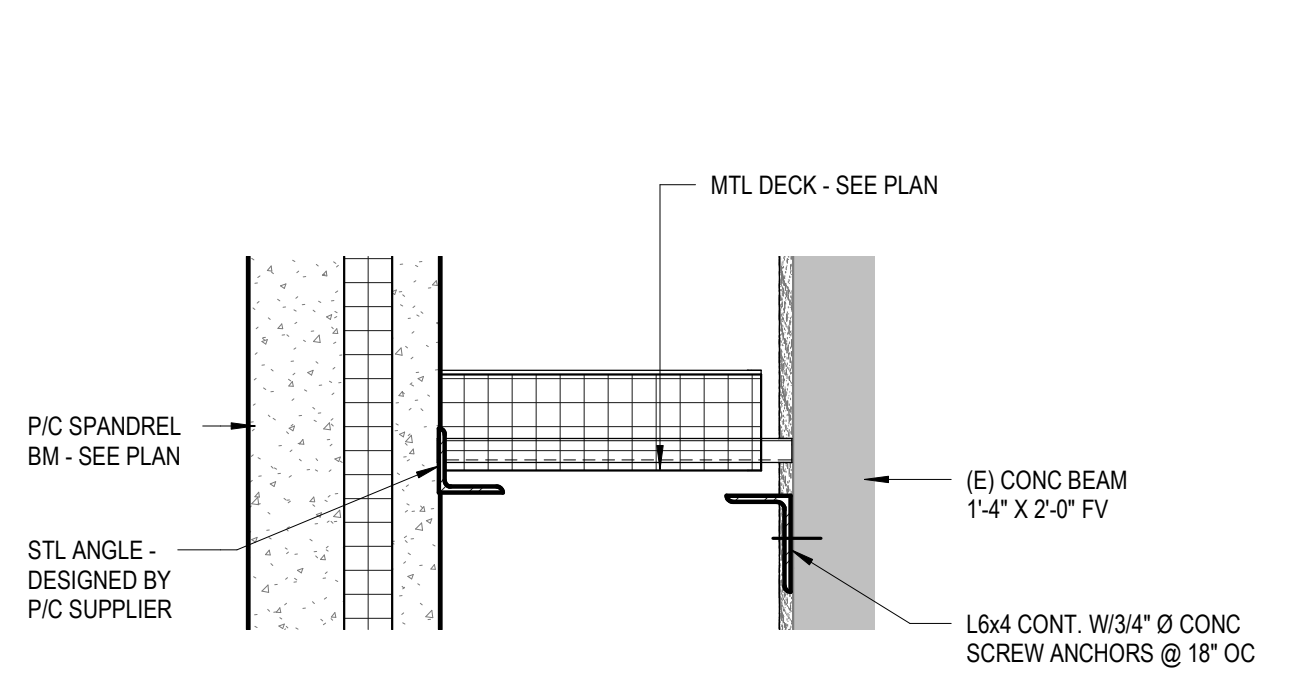
6 ALUM POST SIDE-MOUNT BRACKET AT REMOVABLE SECTION
DS531 NOT TO SCALE



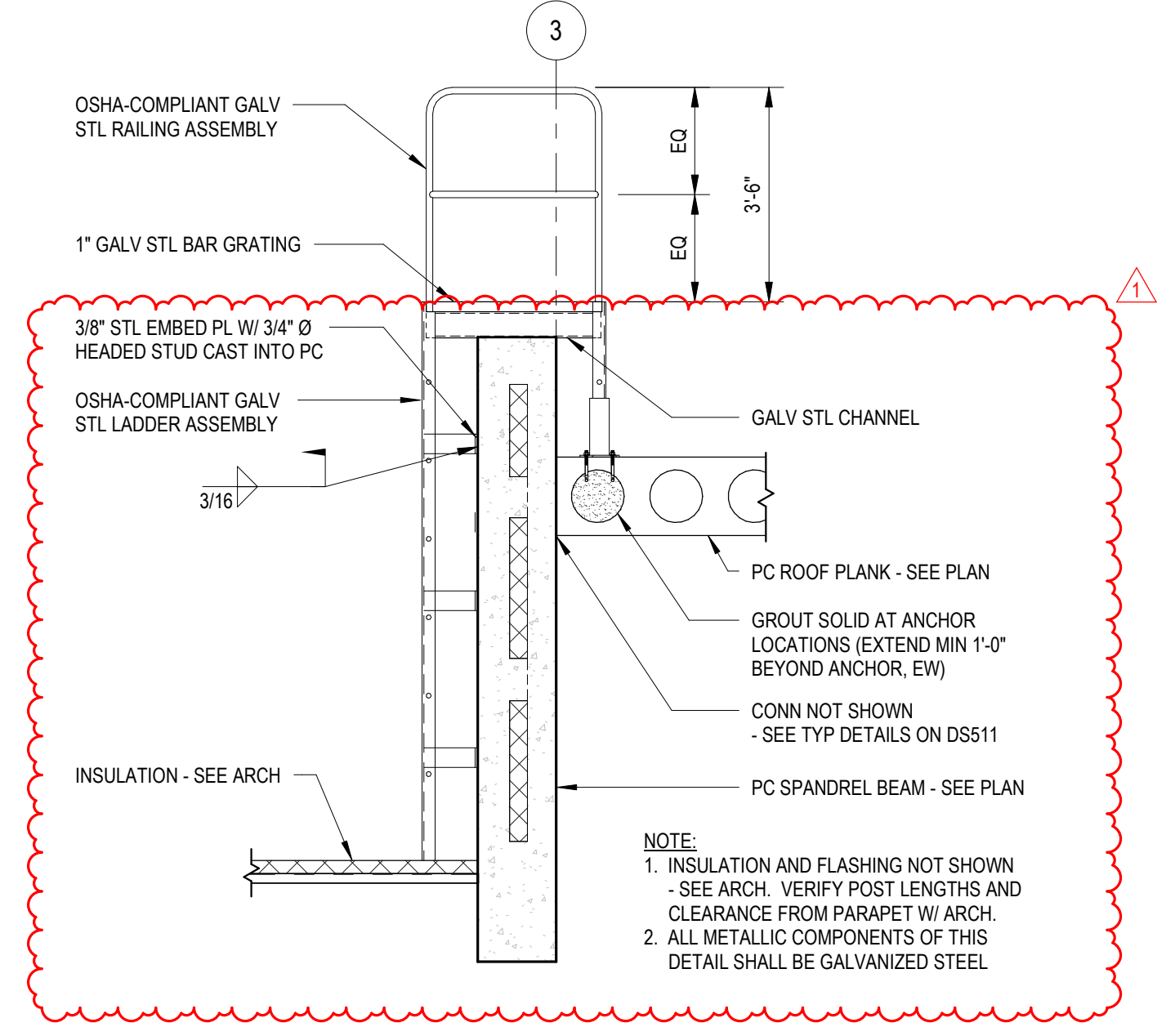
1 ALUMINUM LADDER DETAIL
DS531 NOT TO SCALE



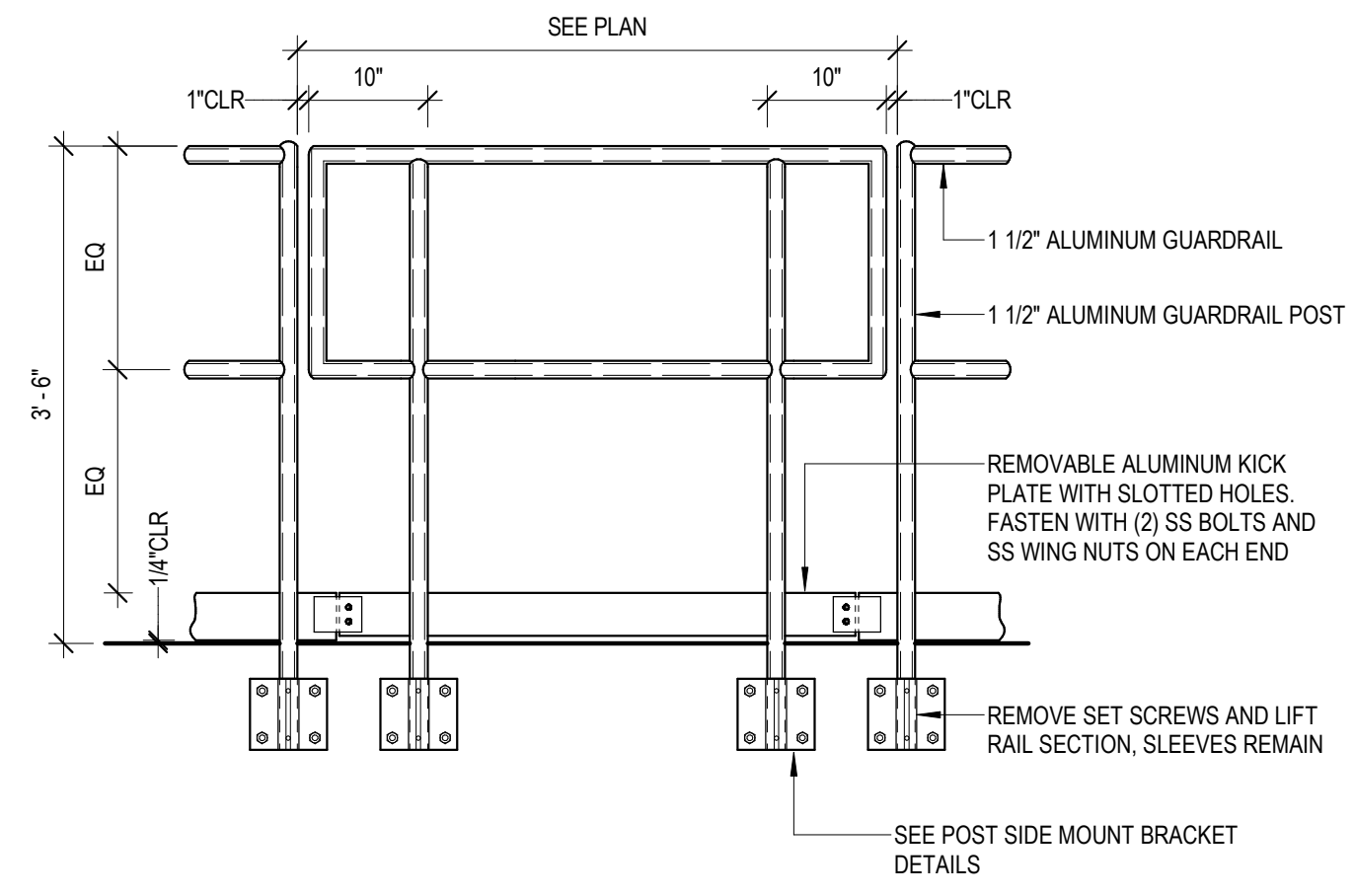
4 LADDER CONNECTION DETAIL
DS531 NOT TO SCALE



- NOTES:
- LOCATE EXISTING REINFORCEMENT AND OTHER EMBEDDED ITEMS PRIOR TO INSTALLATION OF ANCHORS. DO NOT DAMAGE EXISTING REINFORCING OR OTHER EMBEDDED ITEMS.
 - FIELD DRILL HOLES INTO STEEL FRAMING.
 - CONTRACTOR'S OPTION TO SEGMENT CONT. ANGLE AT CURVED EXISTING CONC. BEAM



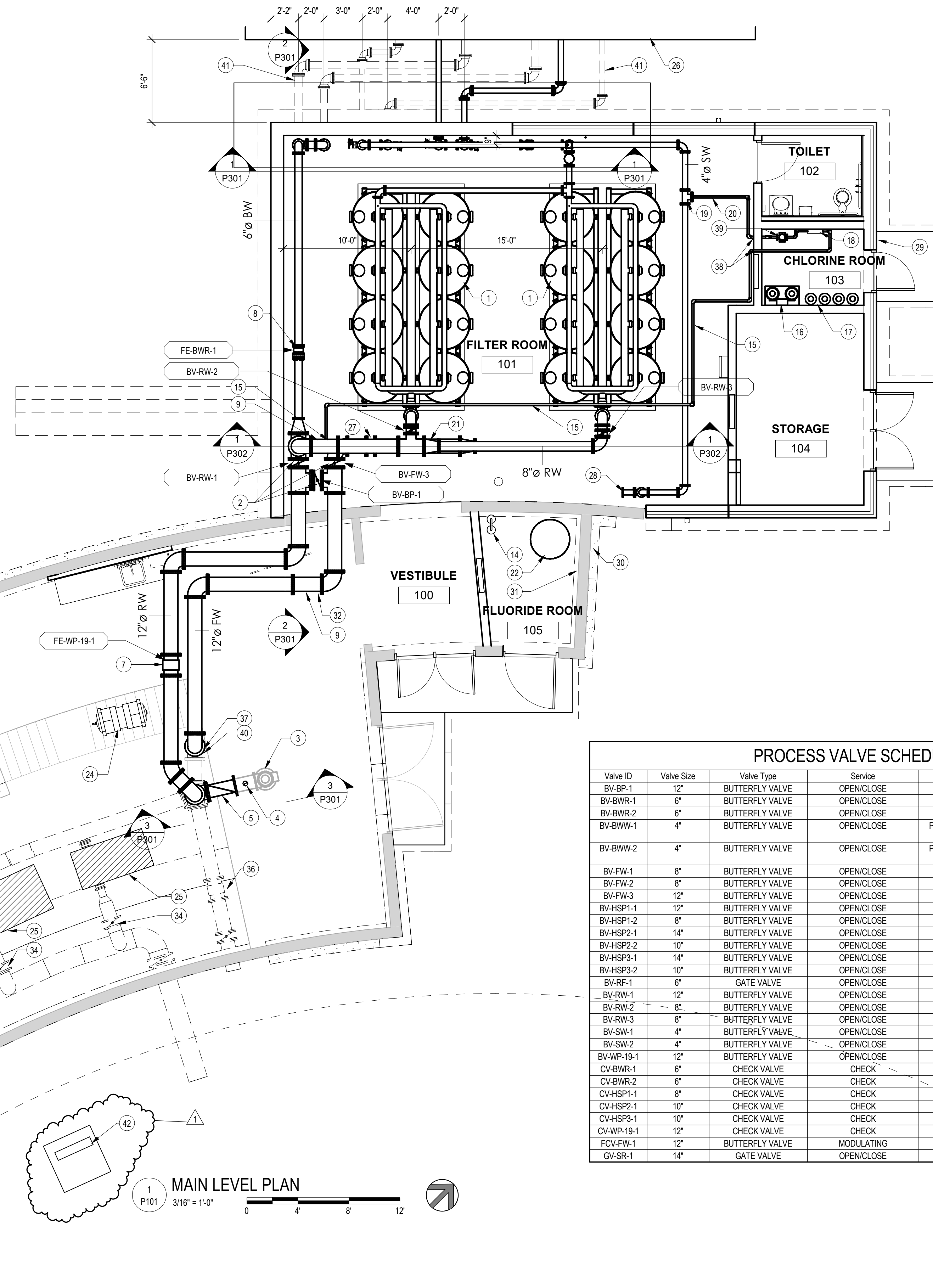
4 LADDER CONNECTION DETAIL
DS531 NOT TO SCALE



7 ALUMINUM REMOVABLE GUARDRAIL SECTION (2 RAILS)
DS531 NOT TO SCALE

KEYNOTES

- 1 FILTER SKID
- 2 12" BUTTERFLY VALVE FILTER BYPASS VALVE w/ CHAINWHEEL OPERATOR
- 3 EXISTING VERTICAL TURBINE WELL PUMP
- 4 TAP PIPE FOR 4" VERTICAL PIPE FOR AIR-VACUUM RELEASE
- 5 INSTALL 12" CHECK VALVE
- 6 REPLACE EXISTING 14" GATE VALVE IN KIND
- 7 12" MAGNETIC FLOW METER w/ REMOTE READOUT
- 8 6" MAGNETIC FLOW METER w/ REMOTE READOUT
- 9 12" FLANGED STATIC MIXER w/ CHEMICAL INJECTION PORTS - ORIENT MIXER SUCH THAT INJECTION PORTS ARE INDEXED 45° DOWN FROM HORIZONTAL - INSTALL VALVE ON FEED LINE TO ALLOW CHEMICAL TUBE REPLACEMENT
- 10 CUT IN 12x6 TEE INTO EXISTING RESERVOIR FILL LINE - SEE MECH. FOR CONT.
- 11 CHEMICAL TANKS. PROVIDE CHAIN RAILING TO ENSURE SECUREMENT OF TANKS. 2 TANKS IN USE, 4 TANKS IN STORAGE.
- 12 COAT THE INSIDE OF THE CONTAINMENT WELL (FLOOR, SIDE WALLS, AND TOPS OF PARTIAL HEIGHT WALLS) WITH CHEMICAL-RESISTANT COATING
- 13 CONTAINMENT CURB
- 14 EMERGENCY EYE WASH STATION- REFER TO PLUMBING DRAWINGS
- 15 1.5" SCH. 80 PVC CHLORINE SOLUTION PIPE
- 16 DUAL 150 POUND CHLORINE GAS CYLINDER SCALE w/ CYLINDER SWITCHING UNIT
- 17 STORAGE AREA FOR FOUR GAS CYLINDERS WITH SAFETY CHAINS
- 18 CHLORINE SOLUTION MAKEUP PANEL
- 19 4x4 TEE WITH BLIND FLANGE TAPPED FOR 1" SCH 80 PVC MOTIVE WATER
- 20 1.5" SCH 80 PVC NON-POTABLE MOTIVE WATER PIPE
- 21 12x8 ECCENTRIC REDUCER w/ FLAT ON TOP
- 22 160 GALLON FLUORIDE TANK
- 23 REPLACE EXISTING MANUAL 6" BUTTERFLY VALVE WITH 6" PNEUMATICALLY OPERATED BUTTERFLY VALVE - VALVE IN VERTICAL - SEE PAGE 01P901
- 24 REPLACE EXISTING AIR COMPRESSOR AND DRYER LOCATED UNDER STAIRS
- 25 REPLACE EXISTING HIGH SERVICE PUMPS (HSP) - SEE PAGE 01P901
- 26 PROPOSED BACKWASH TANK (STRUCTURE 02)
- 27 12" ELECTRICALLY MODULATING FILTER INFLUENT RATE CONTROL VALVE
- 28 CONNECT 4" TO 4" RPZ - SEE MECHANICAL FOR CONTINUATION
- 29 VENT CHLORINE THROUGH WALL ABOVE DOOR
- 30 2" SCH 40 PVC FLUORIDE TANK VENT THROUGH WALL
- 31 MOUNT FLUORIDE CHEMICAL FEED EQUIPMENT ON WALL SHELF ABOVE CONTAINMENT
- 32 ROUTE FLUORIDE CHEMICAL FEED TUBING TO INJECTION CONNECTION ON STATIC MIXER
- 33 SEE PHOTO 2 ON SHEET 01/P901 FOR EXISTING VALVES REPLACEMENT
- 34 REPLACE TWO BUTTERFLY VALVES AND ONE CHECK VALVE ON EACH PUMP INLET AND OUTLET - SEE PHOTO 3 ON SHEET 01/P901 FOR EXISTING VALVES REPLACEMENT
- 35 CONNECT CHLORINE SOLUTION WATER TO CHEMICAL INJECTION POINT ON THE STATIC MIXER
- 36 EXISTING FLOW METER TO BE USED AS FINISHED WATER FLOW METER
- 37 TAP PIPE WITH 1/2" TAP AND BALL VALVE FOR CHLORINE ANALYSIS. ROUTE TUBE TO ADJACENT EXISTING CHLORINE ANALYZER PANEL.
- 38 SEAL WALL PENETRATIONS w/ FIRE CAULK
- 39 CHLORINE MOTIVE WATER BOOSTER PANEL - SEE DETAIL H1DP504
- 40 INSTALL SMOOTH END SAMPLE TAP ON VERTICAL PIPE WITHIN REACH OF UPPER FLOOR LEVEL
- 41 INSTALL SCHEDULE 10 WELDED CARBON STEEL PIPE SLEEVES AROUND PIPES BETWEEN STRUCTURES IN THIS AREA
- 42 INSTALL SUBMERSIBLE MIXER THROUGH EXISTING HATCH IN EXISTING BELOW GRADE STORAGE TANK. MIXER IS PLACED DIRECTLY ON TANK FLOOR AND PROVIDED WITH RETRIEVAL TRAM. SEE ELECTRICAL SITE PLAN FOR ADDITIONAL INFORMATION



PROCESS VALVE SCHEDULE				
Valve ID	Valve Size	Valve Type	Service	Operator Type
BV-BP-1	12"	BUTTERFLY VALVE	OPEN/CLOSE	CHAIN WHEEL
BV-BWR-1	6"	BUTTERFLY VALVE	OPEN/CLOSE	LEVER
BV-BWR-2	6"	BUTTERFLY VALVE	OPEN/CLOSE	LEVER
BV-BWW-1	4"	BUTTERFLY VALVE	OPEN/CLOSE	PNEUMATIC ACTUATOR w/ HARD STOPS TO BE SET DURING STARTUP
BV-BWW-2	4"	BUTTERFLY VALVE	OPEN/CLOSE	PNEUMATIC ACTUATOR w/ HARD STOPS TO BE SET DURING STARTUP
BV-FW-1	8"	BUTTERFLY VALVE	OPEN/CLOSE	CHAIN WHEEL
BV-FW-2	8"	BUTTERFLY VALVE	OPEN/CLOSE	CHAIN WHEEL
BV-FW-3	12"	BUTTERFLY VALVE	OPEN/CLOSE	CHAIN WHEEL
BV-HSP1-1	12"	BUTTERFLY VALVE	OPEN/CLOSE	HAND WHEEL
BV-HSP1-2	8"	BUTTERFLY VALVE	OPEN/CLOSE	ELECTRIC ACTUATOR
BV-HSP2-1	14"	BUTTERFLY VALVE	OPEN/CLOSE	HAND WHEEL
BV-HSP2-2	10"	BUTTERFLY VALVE	OPEN/CLOSE	ELECTRIC ACTUATOR
BV-HSP3-1	14"	BUTTERFLY VALVE	OPEN/CLOSE	HAND WHEEL
BV-HSP3-2	10"	BUTTERFLY VALVE	OPEN/CLOSE	ELECTRIC ACTUATOR
BV-RF-1	6"	GATE VALVE	OPEN/CLOSE	PNEUMATIC ACTUATOR
BV-RW-1	12"	BUTTERFLY VALVE	OPEN/CLOSE	CHAIN WHEEL
BV-RW-2	8"	BUTTERFLY VALVE	OPEN/CLOSE	HAND WHEEL
BV-RW-3	8"	BUTTERFLY VALVE	OPEN/CLOSE	HAND WHEEL
BV-SW-1	4"	BUTTERFLY VALVE	OPEN/CLOSE	PNEUMATIC ACTUATOR
BV-SW-2	4"	BUTTERFLY VALVE	OPEN/CLOSE	PNEUMATIC ACTUATOR
BV-WP-19-1	12"	BUTTERFLY VALVE	OPEN/CLOSE	CHAIN WHEEL
CV-BWR-1	6"	CHECK VALVE	CHECK	DAMPENED SWING
CV-BWR-2	6"	CHECK VALVE	CHECK	DAMPENED SWING
CV-HSP1-1	8"	CHECK VALVE	CHECK	DAMPENED SWING
CV-HSP2-1	10"	CHECK VALVE	CHECK	DAMPENED SWING
CV-HSP3-1	10"	CHECK VALVE	CHECK	DAMPENED SWING
CV-WP-19-1	12"	CHECK VALVE	CHECK	DAMPENED SWING
FGV-FW-1	12"	BUTTERFLY VALVE	MODULATING	ELECTRIC MODULATOR
GV-SR-1	14"	GATE VALVE	OPEN/CLOSE	HAND WHEEL

MAIN LEVEL PLAN
 1 P101
 3/16" = 1'-0"
 0 4' 8' 12'

Project Owner
MADISON WATER UTILITY

CITY OF MADISON WATER UTILITY
UNIT WELL 19 TREATMENT SYSTEM ADDITION
 WELLHOUSE 19
 2526 LAKE MENODOTA DRIVE
 MADISON, WISCONSIN

This drawing is an instrument of service and shall remain the property of Short Elliott Hendrickson, Inc. (SEH). This drawing, concepts and ideas contained herein shall not be used, reproduced, revised, or related without the express written approval of SEH. Submission or distribution of this drawing to meet official or regulatory requirements or for purposes in connection with the project is not to be construed as publication in derogation of any of the rights of SEH.

SEH Project MADWU 167818
 Checked By MS
 Drawn By LAP

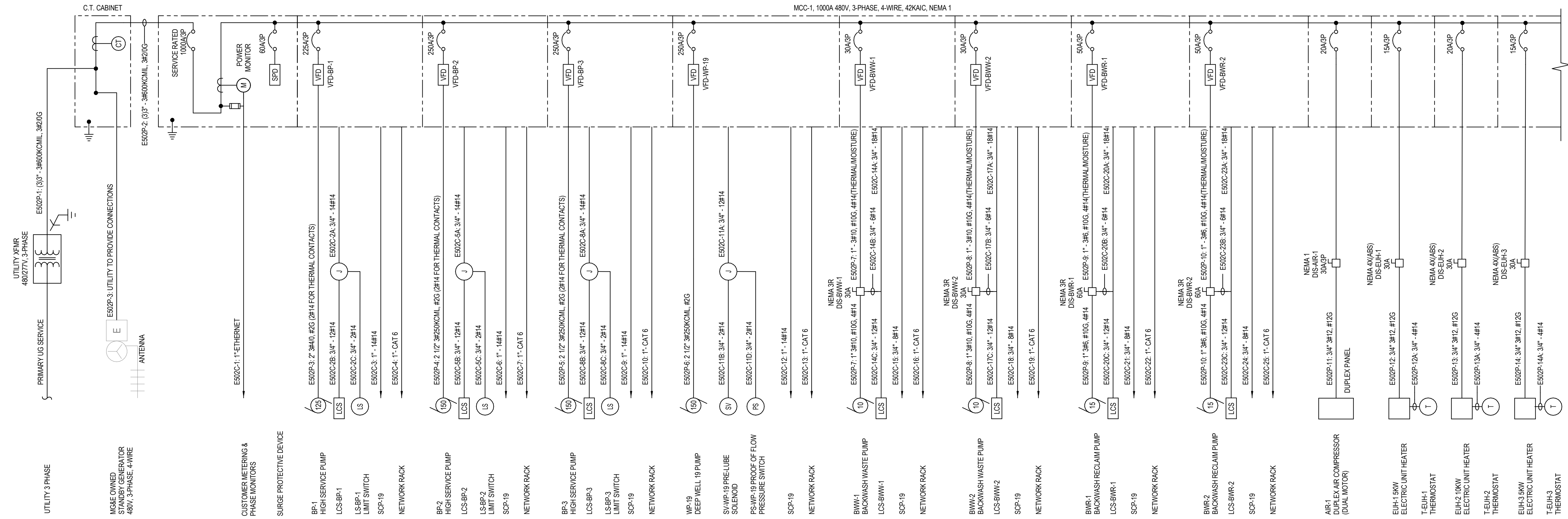
Project Status Issue Date
 BIDDING DOCUMENTS OCTOBER, 2023

REVISION SCHEDULE		
REV. #	DESCRIPTION	DATE
1	ADDENDUM NO. 3	11/20/2023

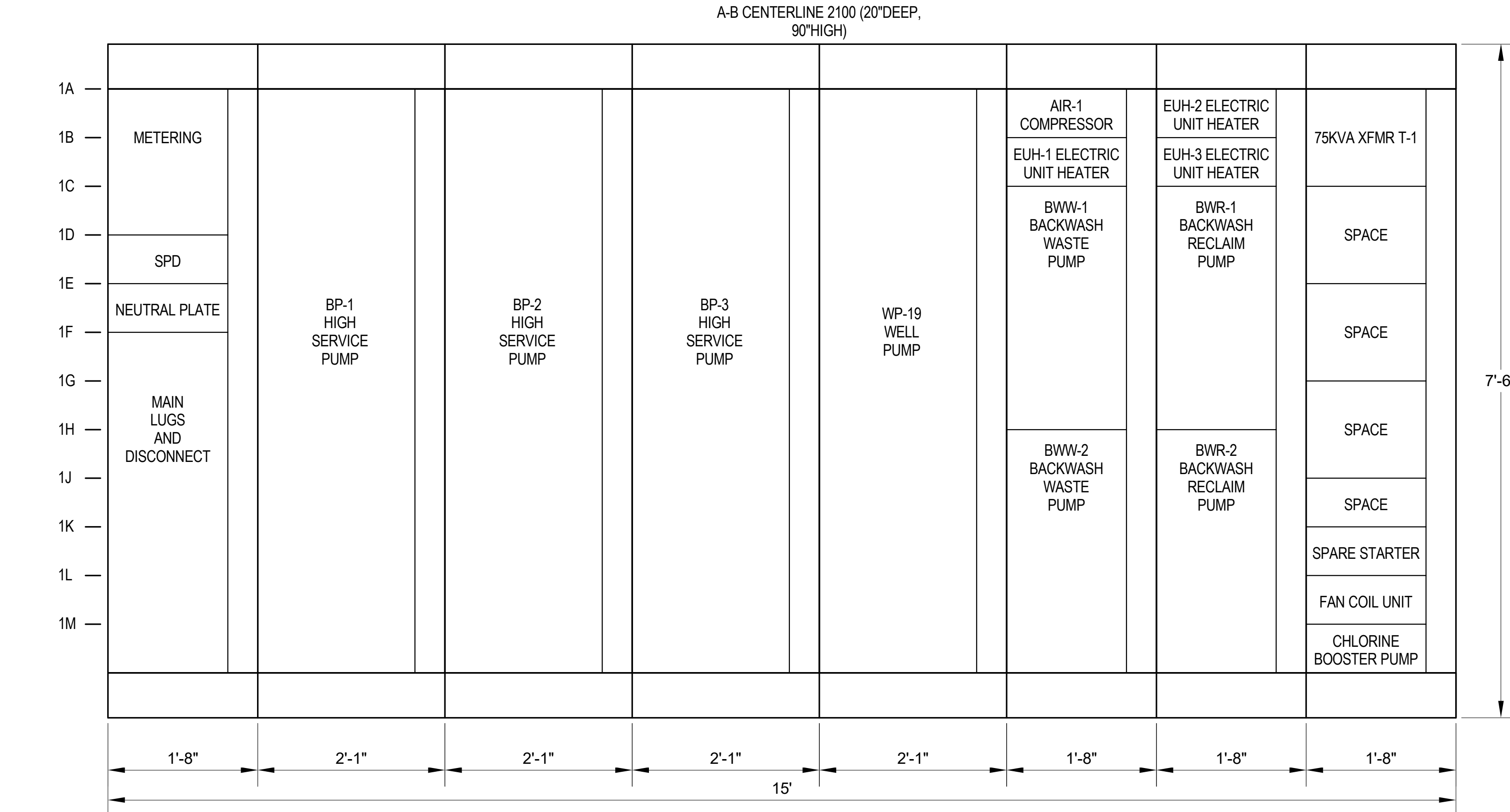
PROCESS PLAN

01
P101

11/20/2023 3:11:03 PM



MCC ONE-LINE DIAGRAM
E502 NOT TO SCALE



MCC ELEVATION
E502 NOT TO SCALE



Project Owner

**CITY OF MADISON WATER UTILITY
UNIT WELL 19 TREATMENT SYSTEM ADDITION**
2526 LAKE MENOTA DRIVE
MADISON, WISCONSIN

This drawing is an instrument of service and shall remain the property of Short Elliott Hendrickson, Inc. (SEH). This drawing, concepts and ideas contained herein shall not be used, reproduced, revised, or related without the express written approval of SEH. Submission or distribution of this drawing to meet official or regulatory requirements or for purposes in connection with the project is not to be construed as publication in derogation of any of the rights of SEH.

SEH Project: MADWU 167818
Checked By: CBW
Drawn By: DBH

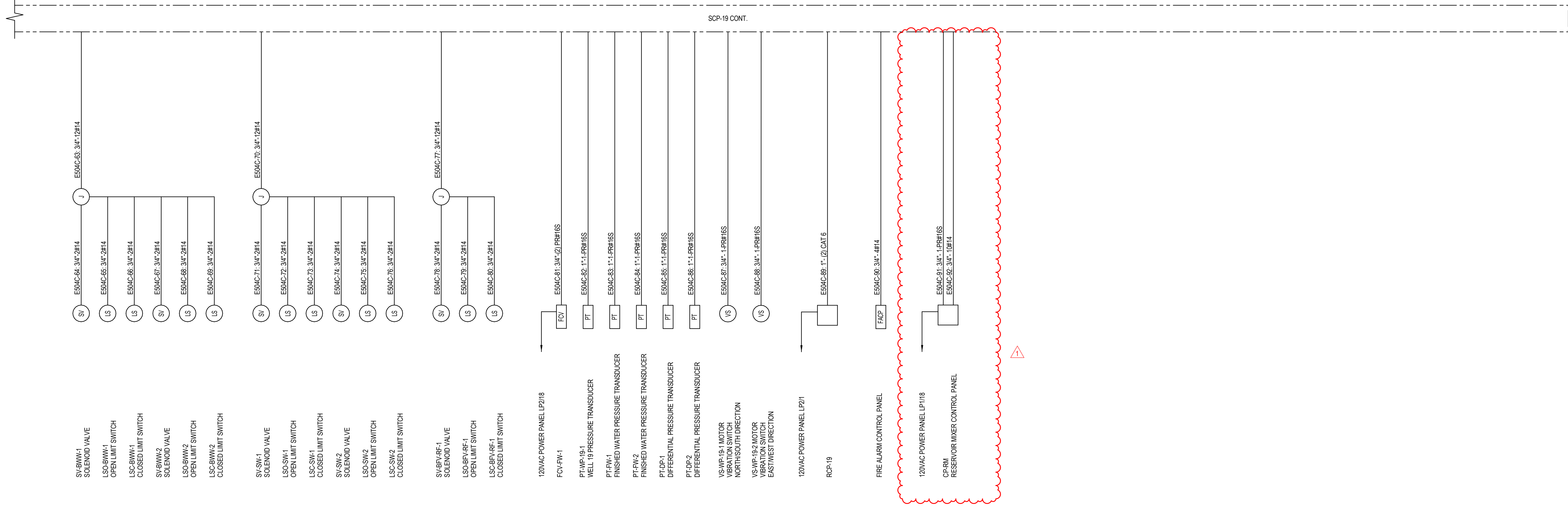
Project Status: Issue Date
BIDDING DOCUMENTS: OCTOBER, 2023

REVISION SCHEDULE		
REV. #	DESCRIPTION	DATE
1	ADDENDUM 3	11/20/2023

ONE-LINE DIAGRAM

**01
E502**

1
E504 SCP-19 ONE-LINE DIAGRAM CONTINUED
NOT TO SCALE



CITY OF MADISON WATER UTILITY
UNIT WELL 19 TREATMENT SYSTEM ADDITION
2526 LAKE MENDOTA DRIVE
MADISON, WISCONSIN

This drawing is an instrument of service and shall remain the property of Short Elliott Hendrickson, Inc. (SEH). This drawing, concepts and ideas contained herein shall not be used, reproduced, revised, or related without the express written approval of SEH.

Submission or distribution of this drawing to meet official or regulatory requirements or for purposes in connection with the project is not to be construed as publication in derogation of any of the rights of SEH.

COPYRIGHT © 2022
Short Elliott Hendrickson, Inc.
All Rights Reserved.

SEH Project MADWU 167818
Checked By CBW
Drawn By DDH

Project Status Issue Date
BIDDING DOCUMENTS OCTOBER, 2023

REV. #	DESCRIPTION	DATE
1	ADDENDUM 3	11/20/2023

ONE-LINE DIAGRAM

01
E504

Project Owner

