

COORDINATION

A. The Contractor shall compare the Architectural, Structural, Mechanical, Electrical, Plumbing, and other series drawings and report any discrepancies between each set of drawings and within each set of drawings prior to fabrication and installation of any structural members.

B. Only larger sleeve openings and framed openings in structural framing component members are indicated on the Structural Drawings. However, all sleeves, inserts and openings, including frames and/or sleeves shall be provided for passage, provision and/or incorporation of the work of the contract, including but not limited to Mechanical, Electrical and Plumbing work. This work shall include the coordination of sizes, alignment, dimensions, position, locations, elevations and grades as required to serve the intended purpose. Openings not indicated on the Structural Drawings, but required as noted above, shall be submitted to the Engineer for review.

C. Refer to Architectural, Mechanical, Electrical and Plumbing drawings for floor elevations, slopes, drains and location of depressed and elevated floor areas.

D. Compatibility of the structure and provisions for enclosure equipment supported on or from structural components shall be verified as to size, dimensions, clearances, accessibility, weights and reaction with the equipment for which the structure has been designed prior to submission of shop drawings and data for each piece of equipment and for structural components. Differences shall be noted on the submittals.

E. The details designated as "Typical Details" apply generally to the Structural Drawings in all areas where conditions are similar to those described in the details.

F. All structural elements of the project have been designed by the Engineer to resist the required code vertical and lateral forces that could occur in the final completed structure only. It is the responsibility of the Contractor to provide all required bracing during construction to maintain the stability and safety of all structural elements during the construction process until the lateral-load resisting or stability-providing system is completely installed and the structure is completely tied together. Temporary supports shall not result in the overstress or damage of the elements to be braced nor any elements used as brace supports.

G. The Contract Structural Drawings and Specifications represent the finished structure, and except where specifically shown, do not indicate the means or methods of construction. The Contractor and their Sub-Contractors shall supervise and direct the Work and shall be solely responsible for all construction means, methods, procedures, techniques, sequences and safety measures including, but not limited to, adherences to all OSHA guidelines. The Engineer shall not have control of, and shall not be responsible for, construction means, methods, techniques, sequences or procedures, for safety precautions and programs in connection with the Work, for the acts or omissions of the Contractor, Subcontractors, or any other person performing any of the Work, or for the failure of any of these persons to carry out the Work in accordance with the Structural Contract Documents.

H. Where conflict exists among the various parts of the Structural Contract Documents, Structural Drawings, Structural Notes, and Specifications, the strictest requirements, as indicated by the Engineer, shall govern.

I. Periodic site observation by field representatives of Encotech is solely for the purpose of determining if the Work is proceeding in accordance with the Structural Contract Documents. This limited site observation is not intended to be a check of the quality or quantity of the Work, but rather a periodic check in an effort to inform the Owner against defects and deficiencies in the work of the Contractor.

CODES & REFERENCED REPORTS

A. The General Building Code used as the basis for the structural design is as follows:

1. International Building Code, 2015 Edition with City of Austin amendments.

B. Structural Concrete: Building Code Requirements for Reinforced Concrete, American Concrete Institute, ACI 318, as referenced by the General Building Code.

C. Concrete Masonry: Building Code Requirements for Concrete Masonry Structures, TMS (The Masonry Society) 402-16, as referenced by the General Building Code.

D. Structural Steel: Manual of Steel Construction, American Institute of Steel Construction Inc., ANSI/AISC 360, as referenced by the General Building Code.

E. Geotechnical Report: Foundation elements have been designed in accordance with information provided in the following geotechnical report:

Geotechnical Engineer: HDR

Report Number: 10123906

Date: 07-08-2020

DESIGN LOADS

A. Dead Loads include the self-weight of the structural elements and the following superimposed loads:

1. Ceiling and Mechanical at roof: 10 psf

B. Live Loads

OCCUPANCY OR USE

UNIFORM (psf)

CONCENTRATED (lbs.)

1. Mechanical rooms (large), central plant250Equip. Wt.

2. Roof - Unreduced (see Note 2)20N/A

C. Snow Loads

1. Ground snow load, Pg: 5 psf

D. Wind Loads

1. Wind lateral load on structural frame is based on ASCE7-10 using the following:

a. Basic Wind Speed (Ultimate)120 mph

b. ExposureC

c. Internal Pressure Coefficient, GCpi± 0.18

d. Risk CategoryIII

2. Components and cladding wind pressures:

ISOMETRIC VIEW

PLAN VIEW

NET DESIGN WIND PRESSURE, P_{net}, (PSF) FOR COMPONENTS & CLADDING

EFFECTIVE WIND AREA (SQ. FT.)					
ZONE	10	20	50	100	500
ZONE 1	16.0	16.0	16.0	16.0	
	-36.1	-36.1	-36.1	-36.1	
ZONE 2	16.0	16.0	16.0	16.0	
	-41.7	-40.9	-39.8	-38.9	
ZONE 2 OH	16.0	16.0	16.0	16.0	
	-50.2	-49.3	-48.2	-47.4	
ZONE 3	16.0	16.0	16.0	16.0	
	-55.8	-50.7	-44.0	-38.9	
ZONE 3 OH	16.0	16.0	16.0	16.0	
	-78.4	-69.9	-58.7	-50.2	
ZONE 4	30.5	29.1	27.3	26.0	22.8
	-33.0	-31.6	-29.9	-28.5	-25.4
ZONE 5	30.5	29.1	27.3	26.0	22.8
	-40.6	-37.9	-34.3	-31.6	-25.4

DESIGN LOADS CONTINUED

- Pressures for Tributary Areas in between the listed values may be linearly interpolated.

- Negative value signifies pressure acting away from the surface (suction).

- Edge and Corner zone distances shall be determined in accordance with referenced standard.

* Pressures are for gross uplift conditions. Refer to roof plan(s) for net uplift values for design of joists, joist girders, and bridging.

E. Seismic Loads

1. The structure and structural components of the enclosure have been designed in accordance with General Building Code with the following criteria for Austin, Texas per IBC 2015:

a. Seismic Importance Factor, IE1.25

b. Risk CategoryIII

c. Mapped Spectral Response Accelerations

i. S_s (%g)0.063

ii. S₁ (%g)0.033

d. Site ClassD (assumed)

e. Spectral Response Coefficients

i. SDS0.067

ii. SD10.052

f. Seismic Design CategoryA

g. Basic Seismic-force-resisting system:Ordinary Reinforced Masonry Shear Walls

h. Design Base Shear, V0.01W, W=Effective seismic weight of structure

i. Seismic Response Coefficient(s), C_s0.034

j. Response Modification Factor(s), R2

k. Analysis Procedure UsedEquivalent Lateral Force Procedure

F. Balcony Railing and Guardrails: The balcony railings and guardrails shall be designed for 50 pounds/ft load applied horizontally at right angles to the top rail or a 200 pound concentrated load applied in any direction at any point along the top rail, whichever is greater. The railing shall have attachment devices to adequately anchor to the supporting structure for the loading indicated. Intermediate rails and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds on an area not to exceed 12-inches by 12-inches including openings and space between rails and located so as to produce the maximum load effect. Resulting reactions due to these loads need not be combined with the design loads for handrails or guardrails. See Arch drawings for railing and guardrails.

DRILLED PIERS

A. Due to the topography of the site, a geotechnical investigation is not possible at this time and will be completed once clearing operations have been completed. The design of the structure is based on preliminary recommendations provided by the geotechnical engineer, based on their experience with nearby sites. A geotechnical investigation will be used to confirm the preliminary recommendations and if necessary, the design of the foundation and retaining walls will be revised to reflect the actual values.

B. Pier design is based on the following design criteria:

1. Side friction: 4 ksf

C. Pier design is in accordance with the recommendations in the referenced geotechnical report.

D. Bearing stratum shown on the pier details is limestone.

E. Piers not specifically located on the plan shall be located on centerline of column above. Where no column occurs, locate on centerline of wall or beam.

F. Provide dowels from piers into concrete above using same bar size and number as shown for pilaster/column/wall above. Where beam occurs, use dowels of same size and number as pier reinforcing steel. Extend dowels into pier and pilaster or column as shown on the Structural Drawings. Extend dowels 30 bar diameters into pier and beam or wall unless noted otherwise on the Structural Drawings.

G. Elevation of top of piers, unless noted otherwise on the Structural Drawings, is at the bottom of the deepest intersecting beam or wall supported by the pier.

H. Reinforcing cage shall be held securely away from earth at sides and bottom by sets of 3 spacers at a maximum spacing of 8 ft. along the length of the cage and 1'-0" from the bottom.

I. Pier reinforcing and concrete shall be placed immediately after drilling operations are complete; in no case shall a pier be drilled that cannot be placed by the end of the workday.

J. See plans for pier sizes, reinforcing and depth.

K. The contractor shall verify depths of piers before pier steel is cut. Pier steel may be delivered to the jobsite in standard lengths and cut as required. Provide 64 bar diameter laps in all vertical pier reinforcing, unless noted otherwise in drawings.

L. Reinforcing steel shop drawings shall include placing drawings for templates to set dowels in piers.

M. Top of pier shall be of the specified diameter. Form top of pier above ground. Any concrete extending beyond the specified diameter shall be removed.

N. Temporary steel casing may be required during pier drilling operations. Prior to the placement of concrete, any seepage water shall be removed from the pier holes. Special construction procedures in accordance with ACI 336.1 and ACI 336.3R and specifications shall be followed during extraction of the casing and during concrete placement.

O. All piers shall be inspected by a representative of a qualified geotechnical laboratory in order to ensure that the proposed bearing material has been reached in accordance with the recommendations given in the geotechnical report.

P. The contractor shall make and maintain accurate records of the drilled pier depths, bearing stratum, depth of penetration into bearing stratum, diameter and location (including off center eccentricities), and shall submit this information to the Engineer.

PATTERNS LEGEND

SLAB DEPRESSION/ MECH. ZONE

CMU IN SECTION

CONCRETE IN SECTION

CONSTRUCTION BY OTHERS

EARTH (UNDISTURBED)

EARTH/FILL (COMPACTED)

GROUT/SAND IN SECTION

ROCK

STEEL IN SECTION

ENCOTECH

ENGINEERING CONSULTANTS

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Austin, Texas 78759 | 512.338.1101

HDR

Texas P.E. Firm

Registration No. F-754

PROJECT MANAGER

W.D. WEHNER

DESIGNED BY

AR / FRV

DRAWN BY

AR

CHECKED BY

FRV

DATE

JANUARY 21, 2021

PROJECT NUMBER

10123906

1

05/18/2021

RFI030

0

01/21/2021

CONFORMED CONTRACT DRAWINGS

ISSUE

DATE

DESCRIPTION

STATE OF TEXAS

F. ROMO DE VIVAR

117502

REGISTERED PROFESSIONAL ENGINEER

05/18/2021

ULLRICH WTP

LOW SERVICE PUMP

STATION

ELECTRICAL FEED RENEWAL

STRUCTURAL NOTES

0 1" 2"

FILENAME

18051 Ullrich_LSPS

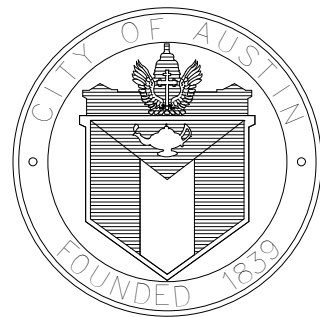
SCALE

SHEET

S00-001

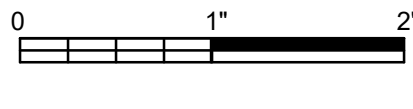
1	2	3	4	5	6	7	8
CAST-IN-PLACE CONCRETE		STRUCTURAL MASONRY		STRUCTURAL STEEL CONNECTIONS		METAL DECKS	
A. CLASSES OF CONCRETE		A. Minimum compressive strength of the masonry (f'm) shall be 1,500 pounds per square inch.		A. Welded Connections		A. Metal Roof Deck	
CoA Conc. Class	Min Strength (psi) 28-day 7-day	Agg. Type	Max w/c	Notes	1. All welding shall conform to ANSI/AWS D1.1, latest edition	Location	Gauge
S	4000 2800	NWT	0.45	See note d.	2. Fillet welds with no size specified shall be 3/16 inch or minimum size required by AISC, whichever is larger.	SDI Deck Type	Deck Depth (in)
a. "NWT" refers to normal concrete having air dry unit weight of approximately 145 PCF.		B. Mortar shall conform to ASTM C270, Type S. Masonry cement shall not be used.		B. Bolted Connections		Sheet Width (in)	Min. Ix (in4)
b. Maximum water-cementitious ratio (w/c) by weight		C. Concrete masonry units shall be hollow load bearing units which conform to ASTM C90, with a minimum net compressive strength as follows:		1. Unless noted otherwise on the Structural Drawings, bolts shall be 3/4 inch diameter and conform to ASTM A325. Bolts shall be designed using values for bearing type bolts with thread allowed in the shear plane.		Min. Sp (in3)	Min. Sn (in3)
c. "Strength" is required compressive cylinder strength at an age of 28 days.		f'm (psi)	Net Area Compressive Strength of CMU Block (psi)	2. Bolts shall be tightened to "snug tight" as defined by AISC, unless noted otherwise on the Structural Drawings.		Typ. UNO 22 WR 1.5 36 0.169 0.186 0.194	
d. As described in the City of Austin Item 403S "Concrete for Structures" Table 5.		1500	1900	C. Structural steel connections not specifically detailed on the Structural Drawings shall be designed and detailed by the Contractor under the direct supervision of a professional engineer licensed in the state having jurisdiction at the project site. Sealed calculations for all connections designed by the Contractor shall be submitted for the Architect's files.		Sp = positive section modulus in3 Sn = negative section modulus in3 I = moment of inertia in4	
Mix Usage Schedule:				D. Roof edge angles shall be continuous and shall be spliced only at supports. Splices shall be butt welded to develop full capacity of the member.		2. Roof deck shall be galvanized.	
Description of use	Concrete Class	CoA Agg. Grade	Slump	Air entrainment	E. For connections not specifically addressed by these notes or the Structural Drawings, provide fillet welds at all contact surfaces sufficient to develop the tensile strength of the smaller member at the joint.		3. Sheet steel for galvanized roof deck and accessories shall conform to ASTM A653, Structural Quality, with a minimum yield strength of 33 ksi. Galvanizing shall conform to ASTM A653 with a minimum coating of G60 as defined in A653.
Piers, Structural Slab, ,Beam, and Slab-on-grade foundation.	S	4" (1" nom. size)	1"-3"	4.5%	E. See Joist Loading Plan for joist design wind pressures.		4. Sheet steel for prime painted roof deck and accessories shall conform to ASTM A1008 with a minimum yield strength of 33 ksi.
B. Cementitious materials used in mix designs may be replaced with fly ash in accordance with Items 403S.		E. Reinforce concrete masonry unit joints with ladder type hot dip galvanized cold-drawn steel conforming to ANSI/ASTM A82, with W1.7 side rods with W1.7 cross rods.		D. Joist manufacturer shall design chords of joists to support a nominal concentrically-applied load of 100 pounds between all panel points without requiring additional reinforcing. This additional load has been accounted for in the overall design loads and is not additive to those specified.		5. Roof deck shall be continuous over four or more supports.	
C. Horizontal construction joints in concrete placements shall be permitted only where indicated on the Structural Drawings. All vertical construction joints shall be made in the center of spans in accordance with the typical details. Contractor shall submit proposed locations for construction joints not shown on the Structural Drawings for review by the Architect and Engineer. Additional construction joints may require additional reinforcing as specified by the Engineer which shall be provided by the contractor at no additional cost to the owner.		1. Space joint reinforcing at 16 inches o.c. unless noted otherwise.		E. All hangers or attachments to joists shall be placed concentric with the top and bottom chord(s). Hangers with reactions in excess of 100 pounds must be located at the panel points of the joist, or the chord(s) shall be reinforced in accordance with the "Typical Details."		6. Place deck panels on structural supports and adjust to final position with ends lapped 2 inches over structural supports. Provide minimum end bearing of 2 inches.	
D. Submittal: Submit mix designs in accordance with specifications Item 403S		2. Lap joint reinforcing 14 inches at splices.		F. Provide flat bearing for all joists. Bear joists on supports in accordance with SJI Specifications.		7. Roof deck connections shall be as follows:	
E. Concrete sampling for quality assurance: In accordance with Item 403S		3. Provide prefabricated joint reinforcing corner pieces at all wall corners and intersections.		G. Joists shall be connected to their supports in accordance with SJI Specifications and as indicated by the joist manufacturer.		Support Connx Pattern	
CONCRETE REINFORCING		4. Joint reinforcing shall be discontinuous at control and expansion joints.		H. Shop painting: Joists shall receive a shop-coat of the joist manufacturer's standard rust inhibitive primer conforming to the Steel Structures Painting Council Specification, SSPC No. 15, or better.		Support Fastener	
A. Concrete reinforcement for the project shall conform to the following:		F. Lap reinforcing bars in grouted masonry as noted below. Splices in reinforcing shall be staggered so that not more than 1/2 of all bars are spliced at the same location.		I. Submittals: Submit shop drawings including setting plans and shop tickets indicating standard designations, bridging, camber, material strengths, spacing, joist seat extensions and connection details. Submit calculations for all joists for which standard load tables are not applicable. Calculations must be submitted prior to or with shop drawings. Calculations shall be signed and sealed by a registered professional engineer licensed in the state having jurisdiction at the project site. Calculations will be retained for the Architects file and shall not be approved or returned.		Sidelap Fastener/ No per span	
1. All reinforcing steel shall be new billet steel in accordance ASTM A615, Grade 60, unless noted otherwise in the Structural Drawings or these notes.		1. Vertical bars: 60 bar diameters		J. Power driven fasteners shall be selected by the Contractor for the combinations of deck gauge and deck support member thickness. Submit proposed fasteners with complete manufacturer's information, including diaphragm shear values for the Engineer to review.		Typical Enclosure	
B. Detailing of reinforcing steel shall conform to the American Concrete Institute 315 Detailing Manual and all hooks and bends in reinforcing bars shall conform to ACI detailing standards, unless noted otherwise on the Structural Drawings.		2. Bond beams: 40 bar diameters		DESIGN BY OTHERS		Interior Field	
C. In unscheduled beams and slabs, detail reinforcing as follows:		3. Lintels: Do no splice		A. In accordance with the Specifications the items listed below are not included in the Contract Documents. Design of these elements shall be the responsibility of the Contractor, and shall be designed and sealed by a registered professional engineer licensed in the state having jurisdiction at the project site.		Perimeter Band	
1. Class A lap beam top reinforcing bars at mid span.		STRUCTURAL STEEL		1. Embedded assemblies and inserts, clamps, hangers, trapezes, unistrut, etc. for the support of MEP systems.		Ridge Band	
2. Class A lap beam bottom reinforcing bars at the supports.		A. Material		2. Embedded assemblies, inserts, and/or hangers for fire suppression systems.		Corner Zones	
3. Provide Class B lap at other location pending Engineer's approval.		1. All hot rolled steel members shall be new and conform to ASTM specification A6.		B. Design of the items listed above shall be in accordance with the General Building Code, and shall include all attachments to the structure.		See Design Wind Load information or plans for "a" dimension and Interior Fields, Perimeter Band, Ridge Band, and Corner Zones wind loads.	
4. Provide standard hooks in top bars at cantilever and discontinuous ends of beams, walls and slabs.		2. ASTM Specification and Grade - clearly mark the grade on each member.		C. See Joist Loading Plan for joist design wind pressures.		PW = Arc Spot Weld (Puddle Weld)	
5. Provide corner bars for all horizontal bars at the inside and outside faces of intersecting beams or walls. Corner bars are not required if horizontal bars are hooked.		3. Unless Noted otherwise on the Structural Drawings, structural steel members shall be:		D. Joist manufacturer shall design chords of joists to support a nominal concentrically-applied load of 100 pounds between all panel points without requiring additional reinforcing. This additional load has been accounted for in the overall design loads and is not additive to those specified.		a. 0.1 times the enclosure lesser plan dimension.	
6. Provide 2-#4 diagonal bars at all slab re-entrant corners placed under the top mat of steel.		a. W-shapes shall conform to ASTM A992.		E. All hangers or attachments to joists shall be placed concentric with the top and bottom chord(s). Hangers with reactions in excess of 100 pounds must be located at the panel points of the joist, or the chord(s) shall be reinforced in accordance with the "Typical Details."		b. 0.4 times the eave height.	
D. Welding of reinforcing steel will not be permitted unless specifically shown on the Structural Drawings.		b. Channels shall conform to ASTM A36.		F. Provide flat bearing for all joists. Bear joists on supports in accordance with SJI Specifications.		c. Minimum width of 4 feet.	
E. Heat shall not be used in the fabrication or installation of reinforcement.		c. Angles shall conform to ASTM A36.		G. Joists shall be connected to their supports in accordance with SJI Specifications and as indicated by the joist manufacturer.		11. Submittal: Submit deck layout plans and details indicating deck type, fastening methods and layout, support locations, projections, openings and reinforcement, and any other pertinent details and accessories.	
F. Reinforcing steel clear cover shall be as follows:		d. Square or rectangular hollow structural shape members shall conform to ASTM A500 Grade B, Fy = 46 ksi.		H. Shop painting: Joists shall receive a shop-coat of the joist manufacturer's standard rust inhibitive primer conforming to the Steel Structures Painting Council Specification, SSPC No. 15, or better.			
1. Beams 1 1/2" Int., 2" ext. exposure		e. Structural steel plate shall conform to ASTM A36.		I. Submittals: Submit shop drawings including setting plans and shop tickets indicating standard designations, bridging, camber, material strengths, spacing, joist seat extensions and connection details. Submit calculations for all joists for which standard load tables are not applicable. Calculations must be submitted prior to or with shop drawings. Calculations shall be signed and sealed by a registered professional engineer licensed in the state having jurisdiction at the project site. Calculations will be retained for the Architects file and shall not be approved or returned.			
2. Columns 1 1/2" Int., 2" ext. exposure		f. Any other steel shall conform to ASTM A36.		J. Power driven fasteners shall be selected by the Contractor for the combinations of deck gauge and deck support member thickness. Submit proposed fasteners with complete manufacturer's information, including diaphragm shear values for the Engineer to review.			
3. Drilled Piers 3"		B. Fabrication		DESIGN BY OTHERS			
4. One way slabs 3/4"		1. Splicing of structural steel members is prohibited without prior approval of the Engineer as to location and type of splice to be made. Any member having splice not shown and detailed on shop drawings will be rejected.		A. In accordance with the Specifications the items listed below are not included in the Contract Documents. Design of these elements shall be the responsibility of the Contractor, and shall be designed and sealed by a registered professional engineer licensed in the state having jurisdiction at the project site.			
5. Slab-on-grade 3/4" top, 3" bottom		2. Dimensional tolerances of fabricated structural steel shall conform to Section 6.4 of the AISC Code of Standard Practice unless noted otherwise on the Structural Drawings.		1. Embedded assemblies and inserts, clamps, hangers, trapezes, unistrut, etc. for the support of MEP systems.			
a. "Exterior Exposure" refers to concrete exposed to earth or weather		3. Shop painting: Paint structural steel with one coat of manufacturer's standard red oxide primer applied at a rate to provide a uniform dry film thickness of 2.5 mils.		2. Embedded assemblies, inserts, and/or hangers for fire suppression systems.			
G. Submittal: Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Details and Detailing of Concrete Reinforcement". Do not reproduce the Structural Drawings for use as shop drawings.		C. Erection		B. Design of the items listed above shall be in accordance with the General Building Code, and shall include all attachments to the structure.			
		1. Erection tolerances of anchor bolts, embedded items, and all structural steel unless specified otherwise on the Structural Drawings shall conform to the AISC Code of Standard Practice.					
		2. Field cutting of structural steel or any field modifications to structural steel shall not be made without prior approval of the Engineer.					
		3. Contractor shall protect any unprimed structural steel from detrimental effects of corrosion, as required, until the steel is enclosed and protected by the new construction.					
		4. Hot dip galvanize after fabrication all structural steel items and connections permanently exposed to the weather, whether specified on the Structural Drawings or not. Such items include, but are not limited to:					
		a. Shelf angles					
		b. All embedded plates in concrete					
		c. Enclosure cladding support steel in space not air conditioned and/or exposed to moisture outside the exterior waterproofing surface if any.					
		d. Railing exposed to weather.					
		e. Examine the Architectural and Structural Drawings for other items required to be hot dipped galvanized. Galvanize all nuts, bolts, and washers used in connection with such steel. Field welded connections shall have welds protected with "Z.R.C. Cold Galvanizing Compound" as manufactured by Z.R.C. Company.					
		D. Contractor shall coordinate structural steel fireproofing requirements. All interior structural steel, including steel joists, scheduled or indicated to receive spray applied fireproofing shall be delivered to the project site unprimed. Steel exposed to corrosive conditions after installation shall be primed with a protective coating which does not diminish the bond between the spray applied fireproofing, and the steel substrate. Any primer, and/or coating applied to structural steel shall be approved for use in the applicable U.L. Fire Resistance Assembly used on the project.					
		E. Submittal: Provide drawings showing details for fabrication and shop assembly of members, erection plans and details. Include details of connections, camber, weld profiles and sizes and spacing. Shop and erection drawings shall not be made using reproductions of the Structural Drawings.					

			PROJECT MANAGER	W.D. WEHNER
			DESIGNED BY	AR / FRV
			DRAWN BY	AR
0	01/21/2021	CONFORMED CONTRACT DRAWINGS		
ISSUE	DATE	DESCRIPTION		
			CHECKED BY	FRV
			DATE	OCTOBER 2020
			PROJECT NUMBER	10123906



ULLRICH WTP
LOW SERVICE PUMP
STATION
ELECTRICAL FEED RENEWAL

STRUCTURAL NOTES



SCALE

1	2	3	4	5	6	7	8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
The following Statement and Schedules of Inspections are those Special Inspections and Tests that shall be performed for this project. Special Inspectors shall reference these plans and IBC Chapter 17 for all special inspection requirements. The owner shall retain an “approved agency” per IBC 1703 to provide special inspections for this project. Special Inspectors shall be qualified persons per IBC 1704.2.1. Special inspection reports shall be provided on a weekly basis. Submit copies of all inspection reports to the Architect/Engineer and the Authority Having Jurisdiction for review. In addition to special inspection reports and tests, submit reports and certificates noted in IBC 1704.5 to the Authority Having Jurisdiction. Final special inspection reports will be required by each special inspection firm per IBC 1704.2.4. STATEMENT OF SPECIAL INSPECTIONS: This statement of Special Inspections has been written with the understanding that the Building Official will: - Review and approve the qualifications of the Special Inspectors - Monitor the special inspection activity on the project site to assure that Special Inspectors are qualified and performing their duty as state within this statement. - Review all Special Inspection Reports submitted to them by the Special Inspector Perform inspections as required by IBC Section 110.3. SPECIAL INSPECTION OF SHOP FABRICATED STRUCTURAL LOAD BEARING MEMBERS Special inspection of shop fabricated, structural load bearing members shall be verified by the Special Inspector per Section 1704.2.5 SPECIAL INSPECTION OF STRUCTURAL STEEL Special inspection of Structural Steel shall be per IBC Section 1705.2.1. A qualified Special Inspector of an “approved agency” providing Quality Assurance (QA) Special Inspections for the project shall review and confirm the Fabricator and Erector’s Quality Control (QC) procedures for completeness and adequacy relative to AISC 360-10 Chapter N, AISC 303-10 Code of Standard Practice, AWS D1.1-2010 Structural Welding Code, and 2015 IBC code requirements for the fabricator’s scope of work. - QA Agency providing Special Inspections shall provide personnel meeting the minimum qualification requirements for Inspection and Nondestructive Testing NDT per AISC 360-10 Section N4. - Verify Fabricator and Erector QC Program per AISC 360-10 Section N2. - Inspection of welds and bolts by both QC and QA personnel shall be per the Schedule of Special Inspections below. All provisions of AWS D1.1-2010 Structural Welding Code for statically loaded structures shall apply. - Nondestructive Testing (NDT) of welds: - Non-Destructive Testing (NDT) of welded joints per AISC 360-10 N5.5. - Risk Category for determination of extent of NDT per AISC 360 N5.5b is noted in the Design Loads section of the Structural Notes. - NDT performed shall be documented and reports shall identify the tested weld by piece mark and location of the piece. - For field work, the NDT report shall identify the tested weld by location in the structure, piece mark and location of the piece. - Additional Inspection tasks per AISC 360-10 Section N5.7 SPECIAL INSPECTION OF COLD-FORMED STEEL DECK Special inspections and qualification of welding special inspectors for cold-formed steel roof deck shall be in accordance with the quality assurance and inspection requirements of SDI QA/QC. SPECIAL INSPECTION OF CONCRETE CONSTRUCTION Special inspection and tests of concrete construction shall be performed in accordance with this section and Table 1705.3 with the following exceptions: - Special inspections shall not be required for: - Isolated spread concrete footings of enclosures three stories or less above the grade plane fully supported on earth or rock. - Continuous footings supporting walls of enclosures three stories or less above the grade plane that are fully supported on earth or rock where: - The footings support walls of light frame construction. - The footings are designed in accordance with IBC Table 1809.7. - The structural design of the footing is based on a specified compressive strength, f'_c, not more than 2,500 psi. - Nonstructural concrete supported directly on the ground, including prestressed slabs on grade, where the effective prestress in the concrete is less than 150 psi - Concrete foundation walls constructed in accordance with Table 1807.1.6.2. - Concrete patios, driveways, and sidewalks, on grade. POST-INSTALLED ANCHORS TO CONCRETE AND MASONRY: Special Inspections of post-installed anchors to concrete and masonry shall comply with IBC Section 1703. Inspections shall be in accordance with the requirements set forth in the approved ICC Evaluation Report and as indicated by the design requirements specified on the drawings. Refer to the POST-INSTALLED ANCHORS AND DOWELS section of the Structural Notes for anchors that are the basis of the design. Special Inspector shall verify anchors are as specified in the POST-INSTALLED ANCHORS AND DOWELS section of the Structural Notes or as otherwise specified on the drawings. Substitutions require approval by the SER and require substantiating calculations and current 2015 IBC recognized ICC Evaluation Services (ES) Report. Special Inspector shall document in their Special Inspection Report compliance with each of the elements required within the applicable ICC Evaluation Services (ES) Report. PREFABRICATED CONSTRUCTION Special Inspections of all prefabricated construction shall conform to IBC Section 1703.				SCHEDULES OF SPECIAL INSPECTIONS: <table><tr><th colspan="5">TABLE 1705.2.3</th></tr><tr><th colspan="4">REQUIRED SPECIAL INSPECTIONS AND TESTS OF STEEL JOISTS & JOIST GIRDERS</th><th rowspan="3">REQUIRED? Y/N</th></tr><tr><th rowspan="2">VERIFICATION AND INSPECTION TASK</th><th colspan="2">FREQUENCY DURING TASK</th><th rowspan="2">REFERENCED STANDARD</th></tr><tr><th>CONTINUOUS</th><th>PERIODIC</th></tr><tr><td>1. Installation of open-web steel joists and joist girders.</td><td></td><td></td><td>SJI specifications listed in Section 2207.1</td><td>Y</td></tr><tr><td>a. End Connections — welding or bolted</td><td>—</td><td>X</td><td></td><td></td></tr><tr><td>b. Bridging — horizontal or diagonal</td><td>—</td><td>—</td><td></td><td></td></tr><tr><td>2. Standard bridging</td><td></td><td></td><td>SJI specifications listed in Section 2207.1</td><td>Y</td></tr><tr><td></td><td>—</td><td>X</td><td></td><td></td></tr><tr><td>3. Bridging that differs from the SJI specifications listed in Section 2207.1</td><td></td><td></td><td>X</td><td>Y</td></tr></table> <table><tr><th colspan="5">TABLE 1705.3</th></tr><tr><th colspan="5">REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION</th></tr><tr><th rowspan="2">VERIFICATION AND INSPECTION TASK</th><th colspan="2">FREQUENCY</th><th rowspan="2">REFERENCED STANDARD</th><th rowspan="2">IBC REFERENCE</th><th rowspan="2">REQUIRED? Y/N</th></tr><tr><th>CONTINUOUS</th><th>PERIODIC</th></tr><tr><td>1. Inspect reinforcement, including pre-stressing tendons, and verify placement.</td><td>—</td><td>X</td><td>ACI 318 Ch. 20, 25.2, 25.3, 26.6.1-26.6.3</td><td>1908.4</td><td>Y</td></tr><tr><td>2. Reinforcing bar welding:</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>a. Verify weldability of reinforcing bars other than ASTM A706.</td><td>—</td><td>X</td><td>AWS D1.4 ACI 318: 26.6.5</td><td>—</td><td>N</td></tr><tr><td>b. Inspect single pass fillet weld maximum 5/16”.</td><td>—</td><td>X</td><td></td><td></td><td></td></tr><tr><td>c. Inspect all other welds.</td><td>X</td><td>—</td><td></td><td></td><td></td></tr><tr><td>3. Inspect anchors cast in concrete.</td><td>—</td><td>X</td><td>ACI 318: 17.8.2</td><td>—</td><td>Y</td></tr><tr><td>4. Inspect anchors post-installed in hardened concrete members:</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>a. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads.</td><td>X</td><td>—</td><td>ACI 318: 17.8.2.4</td><td>—</td><td>Y</td></tr><tr><td>b. Mechanical anchors and adhesive anchors not defined in 4a.</td><td>—</td><td>X</td><td>ACI 318: 17.8.2</td><td>—</td><td></td></tr><tr><td>5. Verify use of required design mix.</td><td>—</td><td>X</td><td>ACI 318: Ch. 19, 26.4.3, 26.4.4</td><td>1904.1-3</td><td>Y</td></tr><tr><td>6. Prior to concrete placement, fabricate specimens, for strength tests, perform slump and air content tests, and determine the temperature of the concrete.</td><td>X</td><td>—</td><td>ASTM C172 ASTM C31 ACI 318: 26.12</td><td>1908.10</td><td>Y</td></tr><tr><td>7. Inspect concrete and shotcrete placement for proper application techniques.</td><td>X</td><td>—</td><td>ACI 318: 26.5</td><td>1908.6-8</td><td>Y</td></tr><tr><td>8. Verify maintenance of specified curing temperature and techniques.</td><td>—</td><td>X</td><td>ACI 318 :26.5.3 - 26.5.5</td><td>1908.9</td><td>Y</td></tr><tr><td>9. Inspect Prestressed concrete for:</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>a. Application of prestressing forces</td><td>X</td><td>—</td><td></td><td>—</td><td>N</td></tr><tr><td>b. Grouting of bonded prestressing tendons.</td><td>X</td><td>—</td><td>ACI 318: 26.10</td><td>—</td><td>N</td></tr><tr><td>10. Inspect erection of precast concrete members.</td><td>—</td><td>X</td><td>ACI 318: 26.11.2</td><td>—</td><td>N</td></tr><tr><td>11. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.</td><td>—</td><td>X</td><td>ACI 318: 26.11.2</td><td>—</td><td>Y</td></tr><tr><td>12. Inspect formwork for shape, location and dimensions of the concrete member being formed.</td><td>—</td><td>X</td><td>ACI 318: 26.11.1.2(b)</td><td>—</td><td>Y</td></tr></table> <table><tr><th colspan="5">TABLE 1705.6</th></tr><tr><th colspan="4">REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS</th><th rowspan="3">REQUIRED? Y/N</th></tr><tr><th rowspan="2">VERIFICATION AND INSPECTION TASK</th><th colspan="2">FREQUENCY DURING TASK LISTED</th></tr><tr><th>CONTINUOUS</th><th>PERIODIC</th></tr><tr><td>1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.</td><td>—</td><td>X</td><td>Y</td></tr><tr><td>2. Verify excavations are extended to proper depth and have reached proper material</td><td>—</td><td>X</td><td>Y</td></tr><tr><td>3. Perform classification and testing of compacted fill materials</td><td>—</td><td>X</td><td>Y</td></tr><tr><td>4. Verify use of proper materials, densities and lift thickness during placement and compaction of compacted fill</td><td>X</td><td>—</td><td>Y</td></tr><tr><td>5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.</td><td>—</td><td>X</td><td>Y</td></tr></table>				TABLE 1705.2.3					REQUIRED SPECIAL INSPECTIONS AND TESTS OF STEEL JOISTS & JOIST GIRDERS				REQUIRED? Y/N	VERIFICATION AND INSPECTION TASK	FREQUENCY DURING TASK		REFERENCED STANDARD	CONTINUOUS	PERIODIC	1. Installation of open-web steel joists and joist girders.			SJI specifications listed in Section 2207.1	Y	a. End Connections — welding or bolted	—	X			b. Bridging — horizontal or diagonal	—	—			2. Standard bridging			SJI specifications listed in Section 2207.1	Y		—	X			3. Bridging that differs from the SJI specifications listed in Section 2207.1			X	Y	TABLE 1705.3					REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION					VERIFICATION AND INSPECTION TASK	FREQUENCY		REFERENCED STANDARD	IBC REFERENCE	REQUIRED? Y/N	CONTINUOUS	PERIODIC	1. Inspect reinforcement, including pre-stressing tendons, and verify placement.	—	X	ACI 318 Ch. 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4	Y	2. Reinforcing bar welding:						a. Verify weldability of reinforcing bars other than ASTM A706.	—	X	AWS D1.4 ACI 318: 26.6.5	—	N	b. Inspect single pass fillet weld maximum 5/16”.	—	X				c. Inspect all other welds.	X	—				3. Inspect anchors cast in concrete.	—	X	ACI 318: 17.8.2	—	Y	4. 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	—	Y	b. Mechanical anchors and adhesive anchors not defined in 4a.	—	X	ACI 318: 17.8.2	—		5. Verify use of required design mix.	—	X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1-3	Y	6. 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: 26.12	1908.10	Y	7. Inspect concrete and shotcrete placement for proper application techniques.	X	—	ACI 318: 26.5	1908.6-8	Y	8. Verify maintenance of specified curing temperature and techniques.	—	X	ACI 318 :26.5.3 - 26.5.5	1908.9	Y	9. Inspect Prestressed concrete for:						a. Application of prestressing forces	X	—		—	N	b. Grouting of bonded prestressing tendons.	X	—	ACI 318: 26.10	—	N	10. Inspect erection of precast concrete members.	—	X	ACI 318: 26.11.2	—	N	11. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	—	X	ACI 318: 26.11.2	—	Y	12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	—	X	ACI 318: 26.11.1.2(b)	—	Y	TABLE 1705.6					REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS				REQUIRED? Y/N	VERIFICATION AND INSPECTION TASK	FREQUENCY DURING TASK LISTED		CONTINUOUS	PERIODIC	1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	—	X	Y	2. Verify excavations are extended to proper depth and have reached proper material	—	X	Y	3. Perform classification and testing of compacted fill materials	—	X	Y	4. Verify use of proper materials, densities and lift thickness during placement and compaction of compacted fill	X	—	Y	5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.	—	X	Y	<table><tr><th colspan="5">TABLE 1705.8</th></tr><tr><th colspan="3">REQUIRED SPECIAL INSPECTIONS AND TESTS OF CAST-IN-PLACE DEEP FOUNDATION ELEMENTS</th><th rowspan="3">REQUIRED? Y/N</th></tr><tr><th rowspan="2">VERIFICATION AND INSPECTION TASK</th><th colspan="2">FREQUENCY DURING TASK LISTED</th></tr><tr><th>CONTINUOUS</th><th>PERIODIC</th></tr><tr><td>1. Inspect drilling operation and maintain complete and accurate records for each element.</td><td>X</td><td>—</td><td>Y</td></tr><tr><td>2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), and adequate end-bearing strata capacity. Record concrete or grout volumes.</td><td>X</td><td>—</td><td>Y</td></tr><tr><td>3. For concrete elements, perform tests and additional special inspections in accordance with Section 1705.3</td><td>—</td><td>—</td><td>Y</td></tr></table> <table><tr><th colspan="5">TABLE 1705.4</th></tr><tr><th colspan="5">REQUIRED SPECIAL INSPECTIONS AND TESTS OF MASONRY CONSTRUCTION - LEVEL B</th></tr><tr><th colspan="5">MINIMUM TESTS</th></tr><tr><td colspan="5">Verification of Slump flow and Visual Stability Index (VSI) as delivered to the project site in accordance with Article 1.5.B.1.b.3 for self-consolidating grout Verification of f_m and f_{aac} in accordance with Article 1.4B prior to construction, Except where specifically exempt by the Code</td></tr><tr><th colspan="5">MINIMUM SPECIAL INSPECTIONS</th></tr><tr><th rowspan="2">VERIFICATION AND INSPECTION TASK</th><th colspan="2">FREQUENCY</th><th colspan="2">REFERENCE FOR CRITERIA</th><th rowspan="2">REQUIRED? Y/N</th></tr><tr><th>CONTINUOUS</th><th>PERIODIC</th><th>TMS402/ ACI 530/ ACSE 5</th><th>TMS602/ ACI 530.1/ ACSE 6</th></tr><tr><td>1. Verify compliance with the approved submittals</td><td>—</td><td>X</td><td></td><td>Art. 1.5</td><td>Y</td></tr><tr><td>2. As masonry construction begins, verify that the following are in compliance:</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>a. Proportions of site-prepared mortar.</td><td>—</td><td>X</td><td></td><td>Art. 2.1, 2.6 A</td><td>Y</td></tr><tr><td>b. Construction of mortar joints.</td><td>—</td><td>X</td><td></td><td>Art. 3.3 B</td><td>Y</td></tr><tr><td>c. Grade and size of pre-stressing tendons and anchorages.</td><td>—</td><td>X</td><td></td><td>Art. 2.4 B, 2.4 H</td><td>N</td></tr><tr><td>d. Location of reinforcement, connectors, and pre-stressing tendons and anchorages</td><td>—</td><td>X</td><td></td><td>Art. 3.4, 3.6 A</td><td>Y</td></tr><tr><td>e. Pre-stressing technique</td><td>—</td><td>X</td><td></td><td>Art. 3.6 B</td><td>N</td></tr><tr><td>f. Properties of thin-bed mortar for AAC masonry</td><td>X(a)</td><td>X(b)</td><td></td><td>Art. 2.1 C</td><td>N</td></tr><tr><td>3. Prior to grouting, verify that the following are in compliance:</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>a. Grout space.</td><td>—</td><td>X</td><td></td><td>Art. 3.2 D, 3.2 F</td><td>Y</td></tr><tr><td>b. Grade, type and size of reinforcement and anchor bolts, and pre-stressing tendons and anchorages.</td><td>—</td><td>X</td><td>Sec. 6.1</td><td>Art. 2.4, 3.4</td><td>Y</td></tr><tr><td>c. Placement of reinforcement, connectors, and pre-stressing tendons and anchorages</td><td>—</td><td>X</td><td>Sec. 6.1, 6.2.1, 6.2.6, 6.2.7</td><td>Art. 3.2 E, 3.4, 3.6 A</td><td>Y</td></tr><tr><td>d. Proportions of site-prepared grout and prestressing grout for bonded tendons.</td><td>—</td><td>X</td><td></td><td>Art. 2.6B, 2.4G.1.b</td><td>Y</td></tr><tr><td>e. Construction of mortar joints.</td><td>—</td><td>X</td><td></td><td>Art. 3.3 B</td><td>Y</td></tr><tr><td>4. Verify during construction:</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>a. Size and location of structural elements.</td><td>—</td><td>X</td><td></td><td>Art. 3.3 F</td><td>Y</td></tr><tr><td>b. Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction.</td><td>—</td><td>X</td><td>Sec. 1.2.1(e), 6.1.4.3, 6.2.1</td><td></td><td>Y</td></tr><tr><td>c. Welding of reinforcement.</td><td>X</td><td>—</td><td>Sec. 8.1.6.7.2, 9.3.3.4(c), 11.3.3.4(b)</td><td></td><td>N</td></tr><tr><td>d. Preparation, construction, and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).</td><td>—</td><td>X</td><td></td><td>Art. 1.8 C, 1.8 D</td><td>Y</td></tr><tr><td>e. Application and measurement of prestressing force.</td><td>X</td><td>—</td><td></td><td>Art. 3.6 B</td><td>N</td></tr><tr><td>f. Placement of grout and prestressing grout for bonded tendons is in compliance.</td><td>X</td><td>—</td><td></td><td>Art. 3.5, 3.6 C</td><td>N</td></tr><tr><td>g. Placement of AAC masonry units and construction of thin-bed mortar joints</td><td>X(a)</td><td>X(b)</td><td></td><td>Art. 3.3 B.9, 3.3 F.1.b</td><td>N</td></tr><tr><td>5. Observe preparation of grout specimens, mortar specimens, and/or prisms</td><td>—</td><td>X</td><td></td><td>Art. 1.5</td><td>N</td></tr><tr><td colspan="5">(a) Required for the first 5000 square feet of AAC masonry (b) Required after the first 5000 square feet of AAC masonry</td></tr></table>				TABLE 1705.8					REQUIRED SPECIAL INSPECTIONS AND TESTS OF CAST-IN-PLACE DEEP FOUNDATION ELEMENTS			REQUIRED? Y/N	VERIFICATION AND INSPECTION TASK	FREQUENCY DURING TASK LISTED		CONTINUOUS	PERIODIC	1. Inspect drilling operation and maintain complete and accurate records for each element.	X	—	Y	2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), and adequate end-bearing strata capacity. Record concrete or grout volumes.	X	—	Y	3. For concrete elements, perform tests and additional special inspections in accordance with Section 1705.3	—	—	Y	TABLE 1705.4					REQUIRED SPECIAL INSPECTIONS AND TESTS OF MASONRY CONSTRUCTION - LEVEL B					MINIMUM TESTS					Verification of Slump flow and Visual Stability Index (VSI) as delivered to the project site in accordance with Article 1.5.B.1.b.3 for self-consolidating grout Verification of f_m and f_{aac} in accordance with Article 1.4B prior to construction, Except where specifically exempt by the Code					MINIMUM SPECIAL INSPECTIONS					VERIFICATION AND INSPECTION TASK	FREQUENCY		REFERENCE FOR CRITERIA		REQUIRED? Y/N	CONTINUOUS	PERIODIC	TMS402/ ACI 530/ ACSE 5	TMS602/ ACI 530.1/ ACSE 6	1. Verify compliance with the approved submittals	—	X		Art. 1.5	Y	2. As masonry construction begins, verify that the following are in compliance:						a. Proportions of site-prepared mortar.	—	X		Art. 2.1, 2.6 A	Y	b. Construction of mortar joints.	—	X		Art. 3.3 B	Y	c. Grade and size of pre-stressing tendons and anchorages.	—	X		Art. 2.4 B, 2.4 H	N	d. Location of reinforcement, connectors, and pre-stressing tendons and anchorages	—	X		Art. 3.4, 3.6 A	Y	e. Pre-stressing technique	—	X		Art. 3.6 B	N	f. Properties of thin-bed mortar for AAC masonry	X(a)	X(b)		Art. 2.1 C	N	3. Prior to grouting, verify that the following are in compliance:						a. Grout space.	—	X		Art. 3.2 D, 3.2 F	Y	b. Grade, type and size of reinforcement and anchor bolts, and pre-stressing tendons and anchorages.	—	X	Sec. 6.1	Art. 2.4, 3.4	Y	c. Placement of reinforcement, connectors, and pre-stressing tendons and anchorages	—	X	Sec. 6.1, 6.2.1, 6.2.6, 6.2.7	Art. 3.2 E, 3.4, 3.6 A	Y	d. Proportions of site-prepared grout and prestressing grout for bonded tendons.	—	X		Art. 2.6B, 2.4G.1.b	Y	e. Construction of mortar joints.	—	X		Art. 3.3 B	Y	4. Verify during construction:						a. Size and location of structural elements.	—	X		Art. 3.3 F	Y	b. Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction.	—	X	Sec. 1.2.1(e), 6.1.4.3, 6.2.1		Y	c. Welding of reinforcement.	X	—	Sec. 8.1.6.7.2, 9.3.3.4(c), 11.3.3.4(b)		N	d. Preparation, construction, and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).	—	X		Art. 1.8 C, 1.8 D	Y	e. Application and measurement of prestressing force.	X	—		Art. 3.6 B	N	f. Placement of grout and prestressing grout for bonded tendons is in compliance.	X	—		Art. 3.5, 3.6 C	N	g. Placement of AAC masonry units and construction of thin-bed mortar joints	X(a)	X(b)		Art. 3.3 B.9, 3.3 F.1.b	N	5. Observe preparation of grout specimens, mortar specimens, and/or prisms	—	X		Art. 1.5	N	(a) Required for the first 5000 square feet of AAC masonry (b) Required after the first 5000 square feet of AAC masonry					<table><tr><th colspan="4">REQUIRED SPECIAL INSPECTIONS FOR STEEL CONSTRUCTION</th></tr><tr><th colspan="2">AISC 360 TABLE N5.4-1: INSPECTION TASKS PRIOR TO WELDING</th><th>QC</th><th>QA</th><th>REQUIRED? Y/N</th></tr><tr><td>1. Welding procedure specifications (WPSs) available</td><td></td><td>P</td><td>P</td><td>Y</td></tr><tr><td>2. Manufacturer certifications for welding consumables available</td><td></td><td>P</td><td>P</td><td>Y</td></tr><tr><td>3. Material identification (type/grade)</td><td></td><td>O</td><td>O</td><td>Y</td></tr><tr><td>4. Welder identification system</td><td></td><td>O</td><td>O</td><td>Y</td></tr><tr><td>5. Fit-up of groove welds (including joint geometry)</td><td></td><td></td><td></td><td></td></tr><tr><td>a. Joint preparation</td><td></td><td></td><td></td><td></td></tr><tr><td>b. Dimensions (alignment, root opening, root face, bevel)</td><td></td><td>O</td><td>O</td><td>Y</td></tr><tr><td>c. Cleanliness (condition of steel surfaces)</td><td></td><td></td><td></td><td></td></tr><tr><td>d. Tacking (tack weld quality and location)</td><td></td><td></td><td></td><td></td></tr><tr><td>e. Backing type and fit (if applicable)</td><td></td><td></td><td></td><td></td></tr><tr><td>6. Configuration and finish of access holes</td><td></td><td>O</td><td>O</td><td>Y</td></tr><tr><td>7. Fit-up of fillet welds</td><td></td><td></td><td></td><td></td></tr><tr><td>a. Dimensions (alignment, gaps at root)</td><td></td><td>O</td><td>O</td><td>Y</td></tr><tr><td>b. Cleanliness (condition of steel surfaces)</td><td></td><td></td><td></td><td></td></tr><tr><td>c. Tacking (tack weld quality and location)</td><td></td><td></td><td></td><td></td></tr><tr><td>5. Check welding equipment</td><td></td><td>O</td><td>—</td><td>Y</td></tr><tr><th colspan="2">AISC 360 TABLE N5.4-2: INSPECTION TASKS DURING WELDING</th><th>QC</th><th>QA</th><th></th></tr><tr><td>1. Use of qualified welders</td><td></td><td>O</td><td>O</td><td>Y</td></tr><tr><td>2. Control and handling of welding consumables</td><td></td><td></td><td></td><td></td></tr><tr><td>a. Packaging</td><td></td><td>O</td><td>O</td><td>Y</td></tr><tr><td>b. Exposure control</td><td></td><td></td><td></td><td></td></tr><tr><td>3. No welding over cracked tack welds</td><td></td><td>O</td><td>O</td><td>Y</td></tr><tr><td>4. Environmental conditions</td><td></td><td></td><td></td><td></td></tr><tr><td>a. Wind speed within limits</td><td></td><td>O</td><td>O</td><td>Y</td></tr><tr><td>b. Precipitation and temperature</td><td></td><td></td><td></td><td></td></tr><tr><td>5. WPS followed</td><td></td><td></td><td></td><td></td></tr><tr><td>a. Settings on welding equipment</td><td></td><td></td><td></td><td></td></tr><tr><td>b. Travel speed</td><td></td><td></td><td></td><td></td></tr><tr><td>c. Selected welding materials</td><td></td><td>O</td><td>O</td><td>Y</td></tr><tr><td>d. Shielding gas type/flow rate</td><td></td><td></td><td></td><td></td></tr><tr><td>e. Preheat applied</td><td></td><td></td><td></td><td></td></tr><tr><td>f. Interpass temperature maintained (min./max.)</td><td></td><td></td><td></td><td></td></tr><tr><td>g. Proper position (F, V, H, OH)</td><td></td><td></td><td></td><td></td></tr><tr><td>6. Welding techniques</td><td></td><td></td><td></td><td></td></tr><tr><td>a. Interpass and final cleaning</td><td></td><td>O</td><td>O</td><td>Y</td></tr><tr><td>b. Each pass within profile limitations</td><td></td><td></td><td></td><td></td></tr><tr><td>c. Each pass meets quality requirements</td><td></td><td></td><td></td><td></td></tr><tr><th colspan="2">AISC 360 TABLE N5.4-3: INSPECTION TASKS AFTER WELDING</th><th>QC</th><th>QA</th><th></th></tr><tr><td>1. Welds cleaned</td><td></td><td>O</td><td>O</td><td>Y</td></tr><tr><td>2. Size, length and location of welds</td><td></td><td>P</td><td>P</td><td>Y</td></tr><tr><td>3. Welds meet visual acceptance criteria</td><td></td><td></td><td></td><td></td></tr><tr><td>a. Crack prohibition</td><td></td><td></td><td></td><td></td></tr><tr><td>b. Weld/base-metal fusion</td><td></td><td></td><td></td><td></td></tr><tr><td>c. Crater cross section</td><td></td><td>P</td><td>P</td><td>Y</td></tr><tr><td>d. Weld profiles</td><td></td><td></td><td></td><td></td></tr><tr><td>e. Weld size</td><td></td><td></td><td></td><td></td></tr><tr><td>f. Undercut</td><td></td><td></td><td></td><td></td></tr><tr><td>g. Porosity</td><td></td><td></td><td></td><td></td></tr><tr><td>4. Arc strikes</td><td></td><td>P</td><td>P</td><td>Y</td></tr><tr><td>5. k-area</td><td></td><td>P</td><td>P</td><td>Y</td></tr><tr><td>6. Backing removed and weld tabs removed (if required)</td><td></td><td>P</td><td>P</td><td>Y</td></tr><tr><td>7. Repair activities</td><td></td><td>P</td><td>P</td><td>Y</td></tr><tr><td>8. Document acceptance or rejection of welded joint or member</td><td></td><td>P</td><td>P</td><td>Y</td></tr><tr><th colspan="2">AISC 360 TABLE N5.6-1: INSPECTION TASKS PRIOR TO BOLTING</th><th>QC</th><th>QA</th><th></th></tr><tr><td>1. Manufacturer’s certifications available for fastener materials</td><td></td><td>O</td><td>P</td><td>N</td></tr><tr><td>2. Fasteners marked in accordance with ASTM requirements</td><td></td><td>O</td><td>O</td><td>N</td></tr><tr><td>3. Proper fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane)</td><td></td><td>O</td><td>O</td><td>N</td></tr><tr><td>4. Proper bolting procedure selected for joint detail</td><td></td><td>O</td><td>O</td><td>N</td></tr><tr><td>5. Proper fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane)</td><td></td><td>O</td><td>O</td><td>N</td></tr><tr><td>6. Pre-installation verification testing by installation personnel observed and documented for fastener assemblies and methods used</td><td></td><td>P</td><td>O</td><td>N</td></tr><tr><td>7. Proper storage provided for bolts, nuts, washers and other fastener components</td><td></td><td>O</td><td>O</td><td>N</td></tr><tr><th colspan="2">AISC 360 TABLE N5.6-2: INSPECTION TASKS DURING BOLTING</th><th>QC</th><th>QA</th><th></th></tr><tr><td>1. Fastener assemblies, of suitable condition, placed in all holes and washers (if required) are positioned as required</td><td></td><td>O</td><td>O</td><td>N</td></tr><tr><td>2. Joint brought to the snug-tight condition prior to the pretensioning operation</td><td></td><td>O</td><td>O</td><td>N</td></tr><tr><td>3. Fastener component not turned by the wrench prevented from rotating</td><td></td><td>O</td><td>O</td><td>N</td></tr><tr><td>4. Fasteners are pretensioned in accordance with the RCSC Specification, progressing systematically from the most rigid point toward the free edges</td><td></td><td>O</td><td>O</td><td>N</td></tr><tr><th colspan="2">AISC 360 TABLE N5.6-3: INSPECTION TASKS AFTER BOLTING</th><th>QC</th><th>QA</th><th></th></tr><tr><td>1. Document acceptance or rejection of bolted connections</td><td></td><td>P</td><td>P</td><td>N</td></tr></table>				REQUIRED SPECIAL INSPECTIONS FOR STEEL CONSTRUCTION				AISC 360 TABLE N5.4-1: INSPECTION TASKS PRIOR TO WELDING		QC	QA	REQUIRED? Y/N	1. Welding procedure specifications (WPSs) available		P	P	Y	2. Manufacturer certifications for welding consumables available		P	P	Y	3. Material identification (type/grade)		O	O	Y	4. Welder identification system		O	O	Y	5. Fit-up of groove welds (including joint geometry)					a. Joint preparation					b. Dimensions (alignment, root opening, root face, bevel)		O	O	Y	c. Cleanliness (condition of steel surfaces)					d. Tacking (tack weld quality and location)					e. Backing type and fit (if applicable)					6. Configuration and finish of access holes		O	O	Y	7. Fit-up of fillet welds					a. Dimensions (alignment, gaps at root)		O	O	Y	b. Cleanliness (condition of steel surfaces)					c. Tacking (tack weld quality and location)					5. Check welding equipment		O	—	Y	AISC 360 TABLE N5.4-2: INSPECTION TASKS DURING WELDING		QC	QA		1. Use of qualified welders		O	O	Y	2. Control and handling of welding consumables					a. Packaging		O	O	Y	b. Exposure control					3. No welding over cracked tack welds		O	O	Y	4. Environmental conditions					a. Wind speed within limits		O	O	Y	b. Precipitation and temperature					5. WPS followed					a. Settings on welding equipment					b. Travel speed					c. Selected welding materials		O	O	Y	d. Shielding gas type/flow rate					e. Preheat applied					f. Interpass temperature maintained (min./max.)					g. Proper position (F, V, H, OH)					6. Welding techniques					a. Interpass and final cleaning		O	O	Y	b. Each pass within profile limitations					c. Each pass meets quality requirements					AISC 360 TABLE N5.4-3: INSPECTION TASKS AFTER WELDING		QC	QA		1. Welds cleaned		O	O	Y	2. Size, length and location of welds		P	P	Y	3. Welds meet visual acceptance criteria					a. Crack prohibition					b. Weld/base-metal fusion					c. Crater cross section		P	P	Y	d. Weld profiles					e. Weld size					f. Undercut					g. Porosity					4. Arc strikes		P	P	Y	5. k-area		P	P	Y	6. Backing removed and weld tabs removed (if required)		P	P	Y	7. Repair activities		P	P	Y	8. Document acceptance or rejection of welded joint or member		P	P	Y	AISC 360 TABLE N5.6-1: INSPECTION TASKS PRIOR TO BOLTING		QC	QA		1. Manufacturer’s certifications available for fastener materials		O	P	N	2. Fasteners marked in accordance with ASTM requirements		O	O	N	3. Proper fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane)		O	O	N	4. Proper bolting procedure selected for joint detail		O	O	N	5. Proper fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane)		O	O	N	6. Pre-installation verification testing by installation personnel observed and documented for fastener assemblies and methods used		P	O	N	7. Proper storage provided for bolts, nuts, washers and other fastener components		O	O	N	AISC 360 TABLE N5.6-2: INSPECTION TASKS DURING BOLTING		QC	QA		1. Fastener assemblies, of suitable condition, placed in all holes and washers (if required) are positioned as required		O	O	N	2. Joint brought to the snug-tight condition prior to the pretensioning operation		O	O	N	3. Fastener component not turned by the wrench prevented from rotating		O	O	N	4. Fasteners are pretensioned in accordance with the RCSC Specification, progressing systematically from the most rigid point toward the free edges		O	O	N	AISC 360 TABLE N5.6-3: INSPECTION TASKS AFTER BOLTING		QC	QA		1. Document acceptance or rejection of bolted connections		P	P	N
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1. Inspect reinforcement, including pre-stressing tendons, and verify placement.	—	X	ACI 318 Ch. 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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a. Verify weldability of reinforcing bars other than ASTM A706.	—	X	AWS D1.4 ACI 318: 26.6.5	—	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
b. Inspect single pass fillet weld maximum 5/16”.	—	X																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
c. Inspect all other welds.	X	—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
3. Inspect anchors cast in concrete.	—	X	ACI 318: 17.8.2	—	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
4. 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	—	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
b. Mechanical anchors and adhesive anchors not defined in 4a.	—	X	ACI 318: 17.8.2	—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
5. Verify use of required design mix.	—	X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1-3	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
6. 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: 26.12	1908.10	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
7. Inspect concrete and shotcrete placement for proper application techniques.	X	—	ACI 318: 26.5	1908.6-8	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
8. Verify maintenance of specified curing temperature and techniques.	—	X	ACI 318 :26.5.3 - 26.5.5	1908.9	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
9. Inspect Prestressed concrete for:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
a. Application of prestressing forces	X	—		—	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
b. Grouting of bonded prestressing tendons.	X	—	ACI 318: 26.10	—	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
10. Inspect erection of precast concrete members.	—	X	ACI 318: 26.11.2	—	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
11. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	—	X	ACI 318: 26.11.2	—	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	—	X	ACI 318: 26.11.1.2(b)	—	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	—	X	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
2. Verify excavations are extended to proper depth and have reached proper material	—	X	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
3. Perform classification and testing of compacted fill materials	—	X	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
4. Verify use of proper materials, densities and lift thickness during placement and compaction of compacted fill	X	—	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.	—	X	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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1. Inspect drilling operation and maintain complete and accurate records for each element.	X	—	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), and adequate end-bearing strata capacity. Record concrete or grout volumes.	X	—	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
3. For concrete elements, perform tests and additional special inspections in accordance with Section 1705.3	—	—	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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Verification of Slump flow and Visual Stability Index (VSI) as delivered to the project site in accordance with Article 1.5.B.1.b.3 for self-consolidating grout Verification of f_m and f_{aac} in accordance with Article 1.4B prior to construction, Except where specifically exempt by the Code																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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1. Verify compliance with the approved submittals	—	X		Art. 1.5	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
2. As masonry construction begins, verify that the following are in compliance:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
a. Proportions of site-prepared mortar.	—	X		Art. 2.1, 2.6 A	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
b. Construction of mortar joints.	—	X		Art. 3.3 B	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
c. Grade and size of pre-stressing tendons and anchorages.	—	X		Art. 2.4 B, 2.4 H	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
d. Location of reinforcement, connectors, and pre-stressing tendons and anchorages	—	X		Art. 3.4, 3.6 A	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
e. Pre-stressing technique	—	X		Art. 3.6 B	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
f. Properties of thin-bed mortar for AAC masonry	X(a)	X(b)		Art. 2.1 C	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
3. Prior to grouting, verify that the following are in compliance:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
a. Grout space.	—	X		Art. 3.2 D, 3.2 F	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
b. Grade, type and size of reinforcement and anchor bolts, and pre-stressing tendons and anchorages.	—	X	Sec. 6.1	Art. 2.4, 3.4	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
c. Placement of reinforcement, connectors, and pre-stressing tendons and anchorages	—	X	Sec. 6.1, 6.2.1, 6.2.6, 6.2.7	Art. 3.2 E, 3.4, 3.6 A	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
d. Proportions of site-prepared grout and prestressing grout for bonded tendons.	—	X		Art. 2.6B, 2.4G.1.b	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
e. Construction of mortar joints.	—	X		Art. 3.3 B	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
4. Verify during construction:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
a. Size and location of structural elements.	—	X		Art. 3.3 F	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
b. Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction.	—	X	Sec. 1.2.1(e), 6.1.4.3, 6.2.1		Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
c. Welding of reinforcement.	X	—	Sec. 8.1.6.7.2, 9.3.3.4(c), 11.3.3.4(b)		N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
d. Preparation, construction, and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).	—	X		Art. 1.8 C, 1.8 D	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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f. Placement of grout and prestressing grout for bonded tendons is in compliance.	X	—		Art. 3.5, 3.6 C	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
g. Placement of AAC masonry units and construction of thin-bed mortar joints	X(a)	X(b)		Art. 3.3 B.9, 3.3 F.1.b	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
5. Observe preparation of grout specimens, mortar specimens, and/or prisms	—	X		Art. 1.5	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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3. Material identification (type/grade)		O	O	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
4. Welder identification system		O	O	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
5. Fit-up of groove welds (including joint geometry)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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b. Dimensions (alignment, root opening, root face, bevel)		O	O	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
c. Cleanliness (condition of steel surfaces)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
d. Tacking (tack weld quality and location)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
e. Backing type and fit (if applicable)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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7. Fit-up of fillet welds																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
a. Dimensions (alignment, gaps at root)		O	O	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
b. Cleanliness (condition of steel surfaces)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
c. Tacking (tack weld quality and location)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
5. Check welding equipment		O	—	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
AISC 360 TABLE N5.4-2: INSPECTION TASKS DURING WELDING		QC	QA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1. Use of qualified welders		O	O	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
2. Control and handling of welding consumables																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
a. Packaging		O	O	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
b. Exposure control																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
3. No welding over cracked tack welds		O	O	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
4. Environmental conditions																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
a. Wind speed within limits		O	O	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
b. Precipitation and temperature																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
5. WPS followed																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
a. Settings on welding equipment																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
b. Travel speed																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
c. Selected welding materials		O	O	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
d. Shielding gas type/flow rate																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
e. Preheat applied																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
f. Interpass temperature maintained (min./max.)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
g. Proper position (F, V, H, OH)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
6. Welding techniques																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
a. Interpass and final cleaning		O	O	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
b. Each pass within profile limitations																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
c. Each pass meets quality requirements																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
AISC 360 TABLE N5.4-3: INSPECTION TASKS AFTER WELDING		QC	QA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1. Welds cleaned		O	O	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
2. Size, length and location of welds		P	P	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
3. Welds meet visual acceptance criteria																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
a. Crack prohibition																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
b. Weld/base-metal fusion																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
c. Crater cross section		P	P	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
d. Weld profiles																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
e. Weld size																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
f. Undercut																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
g. Porosity																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
4. Arc strikes		P	P	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
5. k-area		P	P	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
6. Backing removed and weld tabs removed (if required)		P	P	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
7. Repair activities		P	P	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
8. Document acceptance or rejection of welded joint or member		P	P	Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
AISC 360 TABLE N5.6-1: INSPECTION TASKS PRIOR TO BOLTING		QC	QA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1. Manufacturer’s certifications available for fastener materials		O	P	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
2. Fasteners marked in accordance with ASTM requirements		O	O	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
3. Proper fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane)		O	O	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
4. Proper bolting procedure selected for joint detail		O	O	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
5. Proper fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane)		O	O	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
6. Pre-installation verification testing by installation personnel observed and documented for fastener assemblies and methods used		P	O	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
7. Proper storage provided for bolts, nuts, washers and other fastener components		O	O	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
AISC 360 TABLE N5.6-2: INSPECTION TASKS DURING BOLTING		QC	QA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1. Fastener assemblies, of suitable condition, placed in all holes and washers (if required) are positioned as required		O	O	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
2. Joint brought to the snug-tight condition prior to the pretensioning operation		O	O	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
3. Fastener component not turned by the wrench prevented from rotating		O	O	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
4. Fasteners are pretensioned in accordance with the RCSC Specification, progressing systematically from the most rigid point toward the free edges		O	O	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
AISC 360 TABLE N5.6-3: INSPECTION TASKS AFTER BOLTING		QC	QA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1. Document acceptance or rejection of bolted connections		P	P	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

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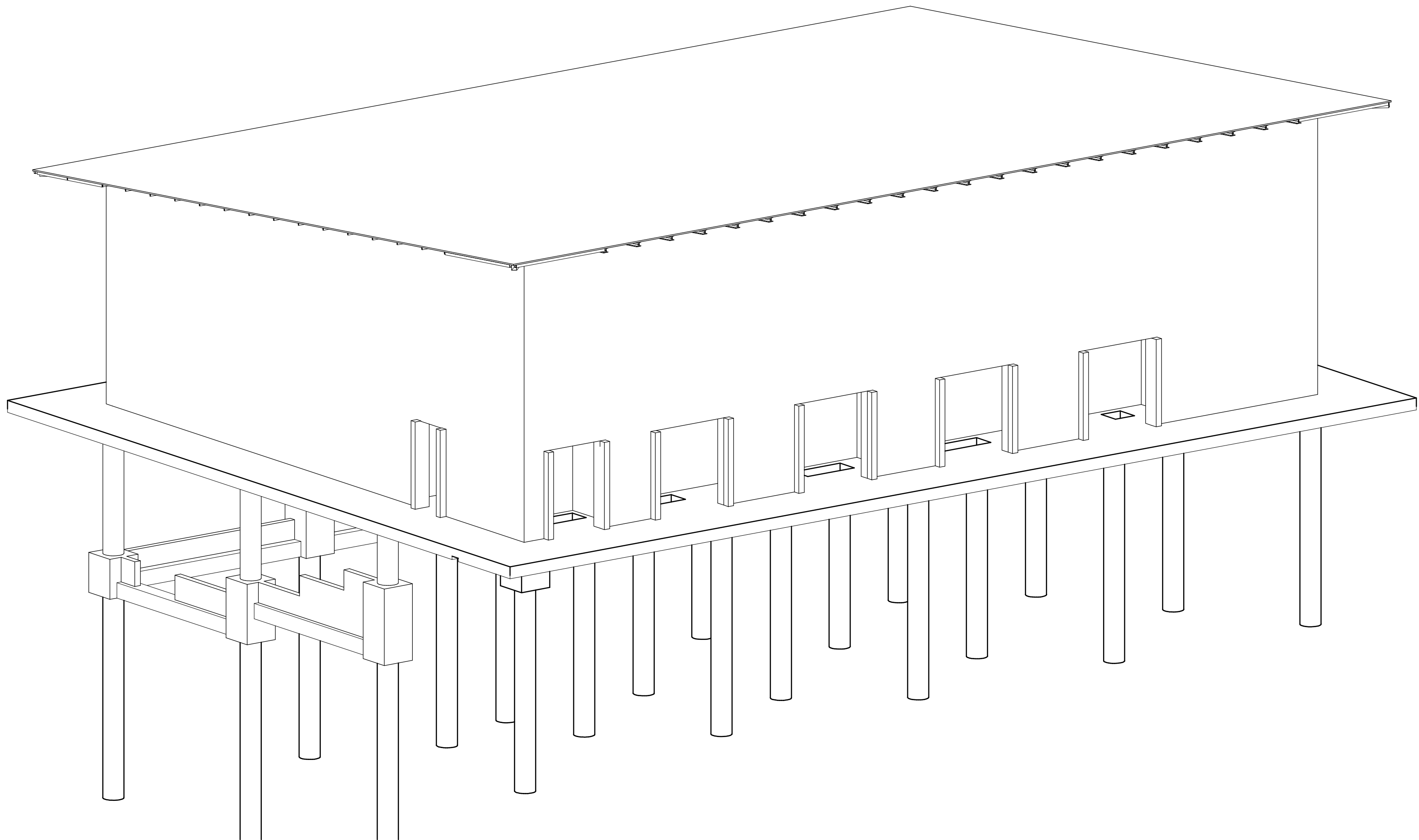
8

D

C

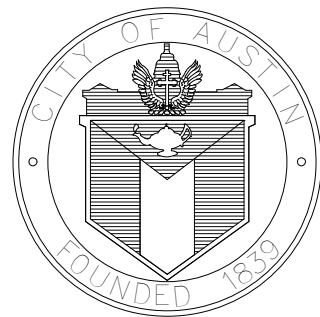
B

A



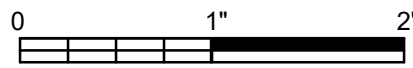
0	01/21/2021	CONFORMED CONTRACT DRAWINGS
ISSUE	DATE	DESCRIPTION

PROJECT MANAGER		W.D. WEHNER
DESIGNED BY	AR / FRV	
DRAWN BY	AR	
CHECKED BY	FRV	
DATE	OCTOBER 2020	
PROJECT NUMBER	10123906	

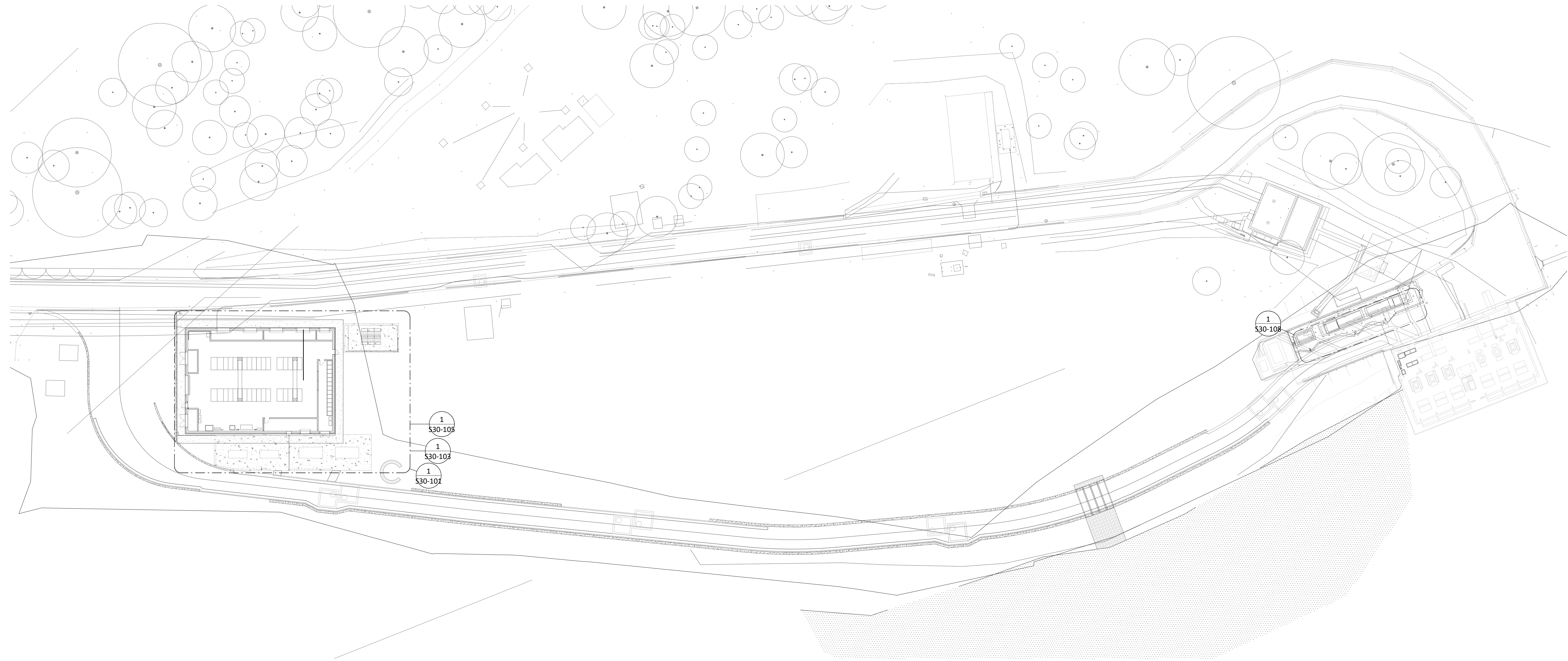


ULLRICH WTP
LOW SERVICE PUMP
STATION
ELECTRICAL FEED RENEWAL

3D ISOMETRIC VIEW



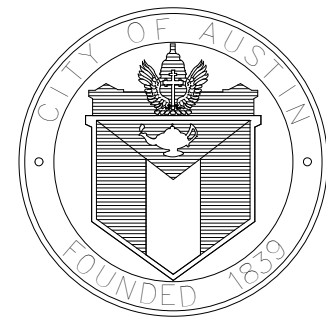
FILENAME 18051 Ullrich_LSPS
SCALE



1 STRUCTURAL SITE PLAN
SCALE: 1/32" = 1'-0"

CONFORMED CONTRACT DRAWINGS		
ISSUE	DATE	DESCRIPTION
0	01/21/2021	CONFORMED CONTRACT DRAWINGS

PROJECT MANAGER		W.D. WEHNER
DESIGNED BY	AR / FRV	
DRAWN BY	AR	
CHECKED BY	FRV	
DATE	OCTOBER 2020	
PROJECT NUMBER	10123906	

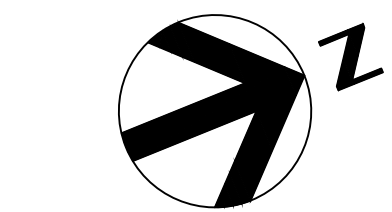
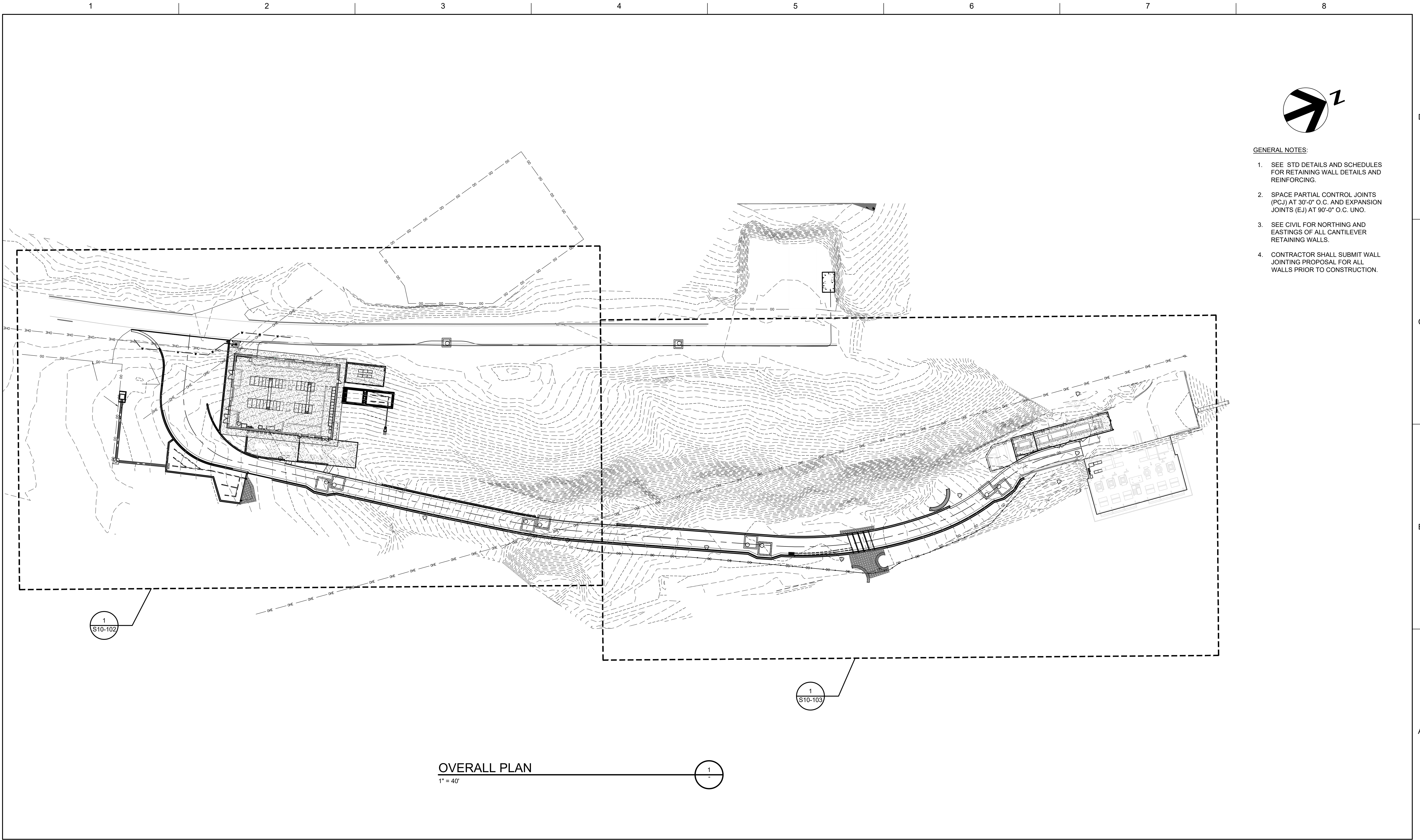


ULLRICH WTP
LOW SERVICE PUMP
STATION
ELECTRICAL FEED RENEWAL

STRUCTURAL SITE PLAN



FILENAME | 18051 Ullrich_LSPS
SCALE



GENERAL NOTES:

1. SEE STD DETAILS AND SCHEDULES FOR RETAINING WALL DETAILS AND REINFORCING.
2. SPACE PARTIAL CONTROL JOINTS (PCJ) AT 30'-0" O.C. AND EXPANSION JOINTS (EJ) AT 90'-0" O.C. UNO.
3. SEE CIVIL FOR NORTHING AND EASTINGS OF ALL CANTILEVER RETAINING WALLS.
4. CONTRACTOR SHALL SUBMIT WALL JOINTING PROPOSAL FOR ALL WALLS PRIOR TO CONSTRUCTION.

OVERALL PLAN
1" = 40'



ISSUE	DATE	DESCRIPTION
0	01/21/2021	CONFORMED CONTRACT DRAWINGS

PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906

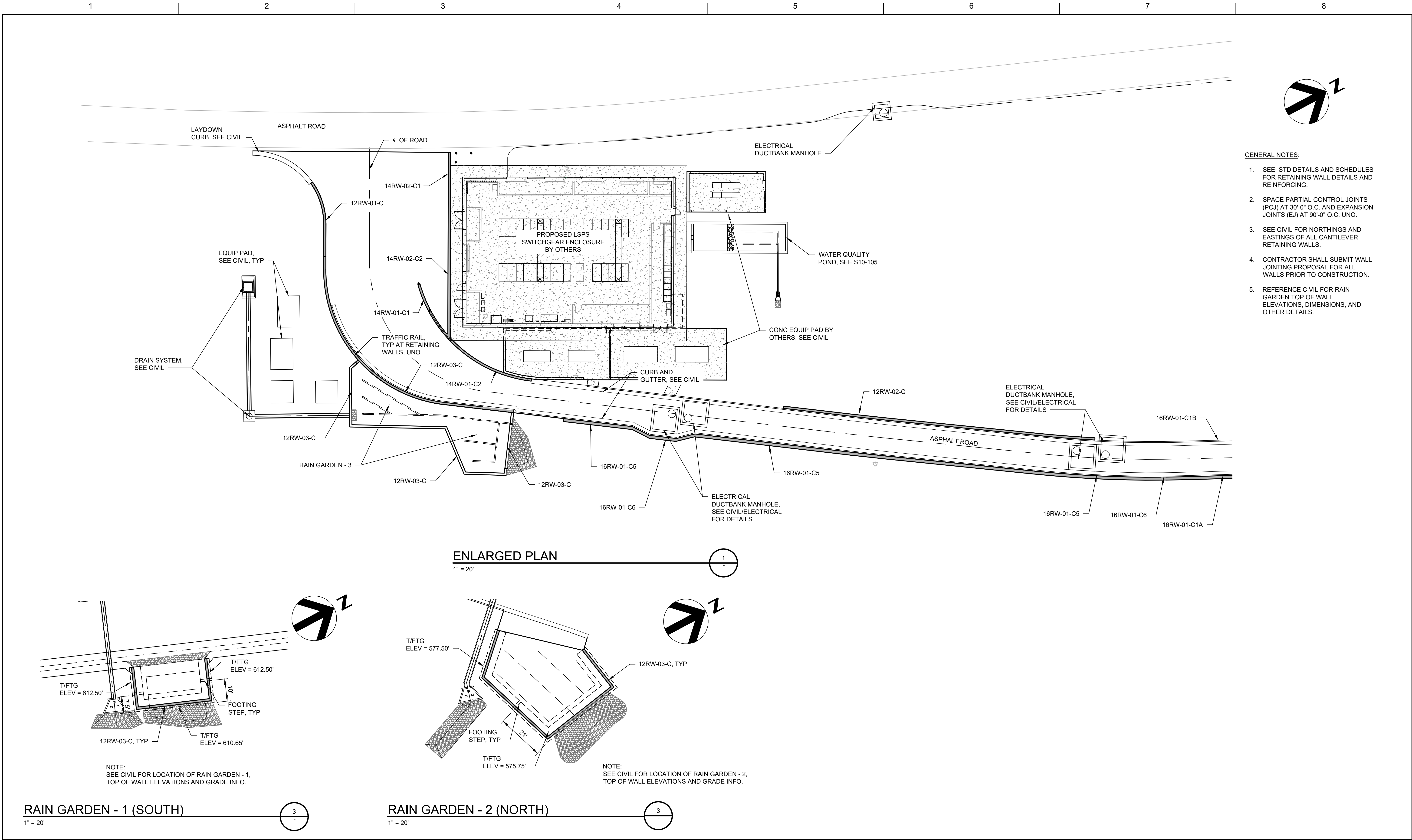


ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL



STRUCTURAL
RETAINING WALL
OVERALL PLAN

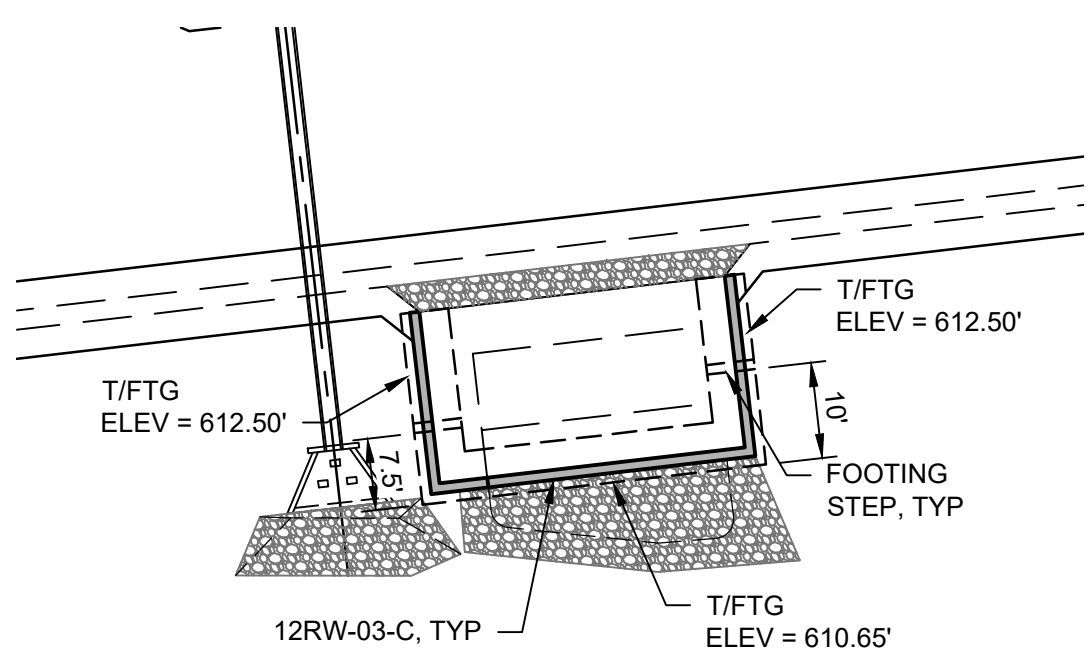
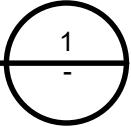
FILENAME | S-101.dwg
SCALE | 1" = 40'



- GENERAL NOTES:
1. SEE STD DETAILS AND SCHEDULES FOR RETAINING WALL DETAILS AND REINFORCING.
 2. SPACE PARTIAL CONTROL JOINTS (PCJ) AT 30'-0" O.C. AND EXPANSION JOINTS (EJ) AT 90'-0" O.C. UNO.
 3. SEE CIVIL FOR NORTHINGS AND EASTINGS OF ALL CANTILEVER RETAINING WALLS.
 4. CONTRACTOR SHALL SUBMIT WALL JOINTING PROPOSAL FOR ALL WALLS PRIOR TO CONSTRUCTION.
 5. REFERENCE CIVIL FOR RAIN GARDEN TOP OF WALL ELEVATIONS, DIMENSIONS, AND OTHER DETAILS.

ENLARGED PLAN

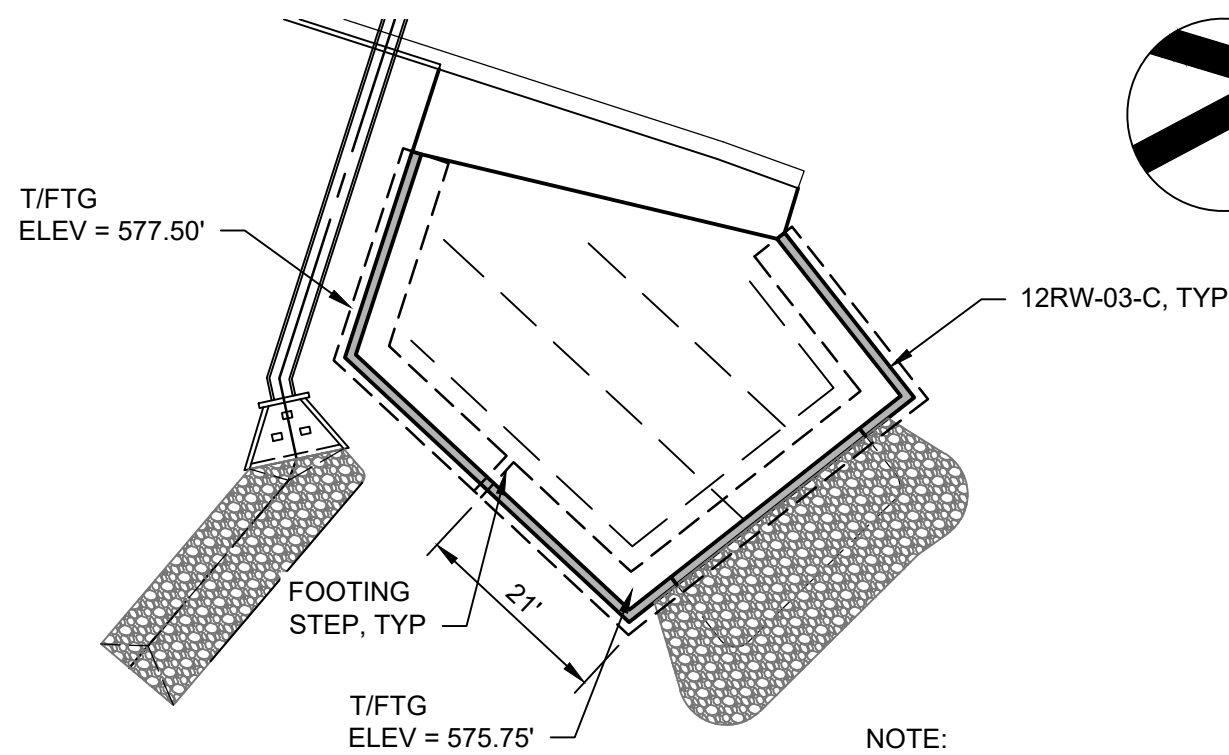
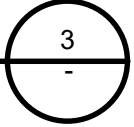
1" = 20'



NOTE:
SEE CIVIL FOR LOCATION OF RAIN GARDEN - 1,
TOP OF WALL ELEVATIONS AND GRADE INFO.

RAIN GARDEN - 1 (SOUTH)

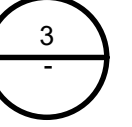
1" = 20'



NOTE:
SEE CIVIL FOR LOCATION OF RAIN GARDEN - 2,
TOP OF WALL ELEVATIONS AND GRADE INFO.

RAIN GARDEN - 2 (NORTH)

1" = 20'

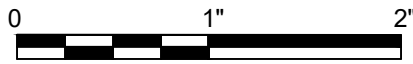


ISSUE	DATE	DESCRIPTION
0	01/21/2021	CONFORMED CONTRACT DRAWINGS

PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906



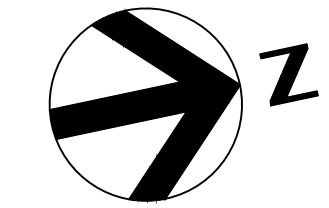
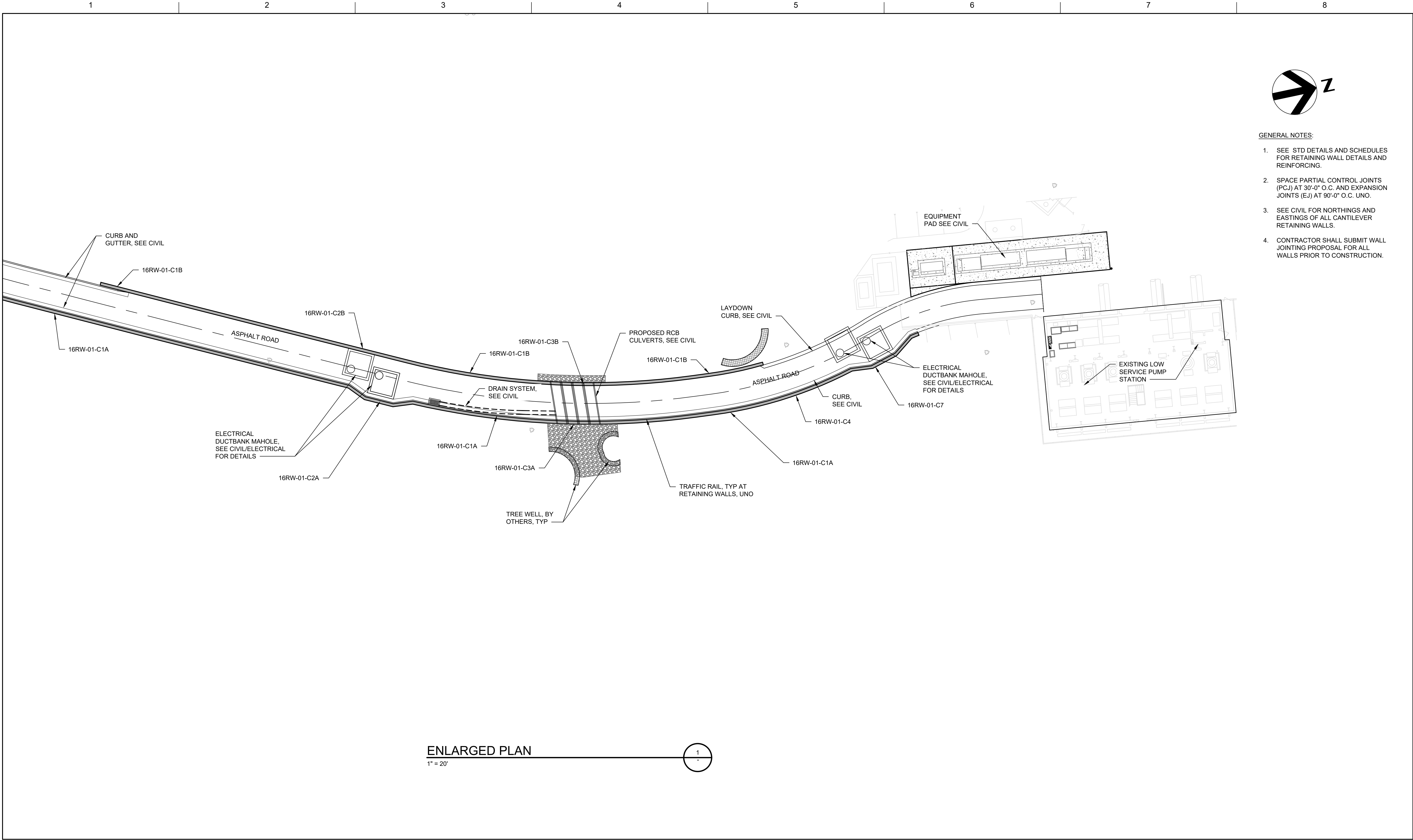
ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL



STRUCTURAL
RETAINING WALL
ENLARGED PLAN

FILENAME | S10-102.dwg
SCALE | 1" = 10'

SHEET 59 of 350
S10-102

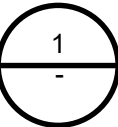


GENERAL NOTES:

1. SEE STD DETAILS AND SCHEDULES FOR RETAINING WALL DETAILS AND REINFORCING.
2. SPACE PARTIAL CONTROL JOINTS (PCJ) AT 30'-0" O.C. AND EXPANSION JOINTS (EJ) AT 90'-0" O.C. UNO.
3. SEE CIVIL FOR NORTHINGS AND EASTINGS OF ALL CANTILEVER RETAINING WALLS.
4. CONTRACTOR SHALL SUBMIT WALL JOINTING PROPOSAL FOR ALL WALLS PRIOR TO CONSTRUCTION.

ENLARGED PLAN

1" = 20'

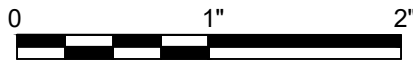


ISSUE	DATE	DESCRIPTION
0	01/21/2021	CONFORMED CONTRACT DRAWINGS

PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906

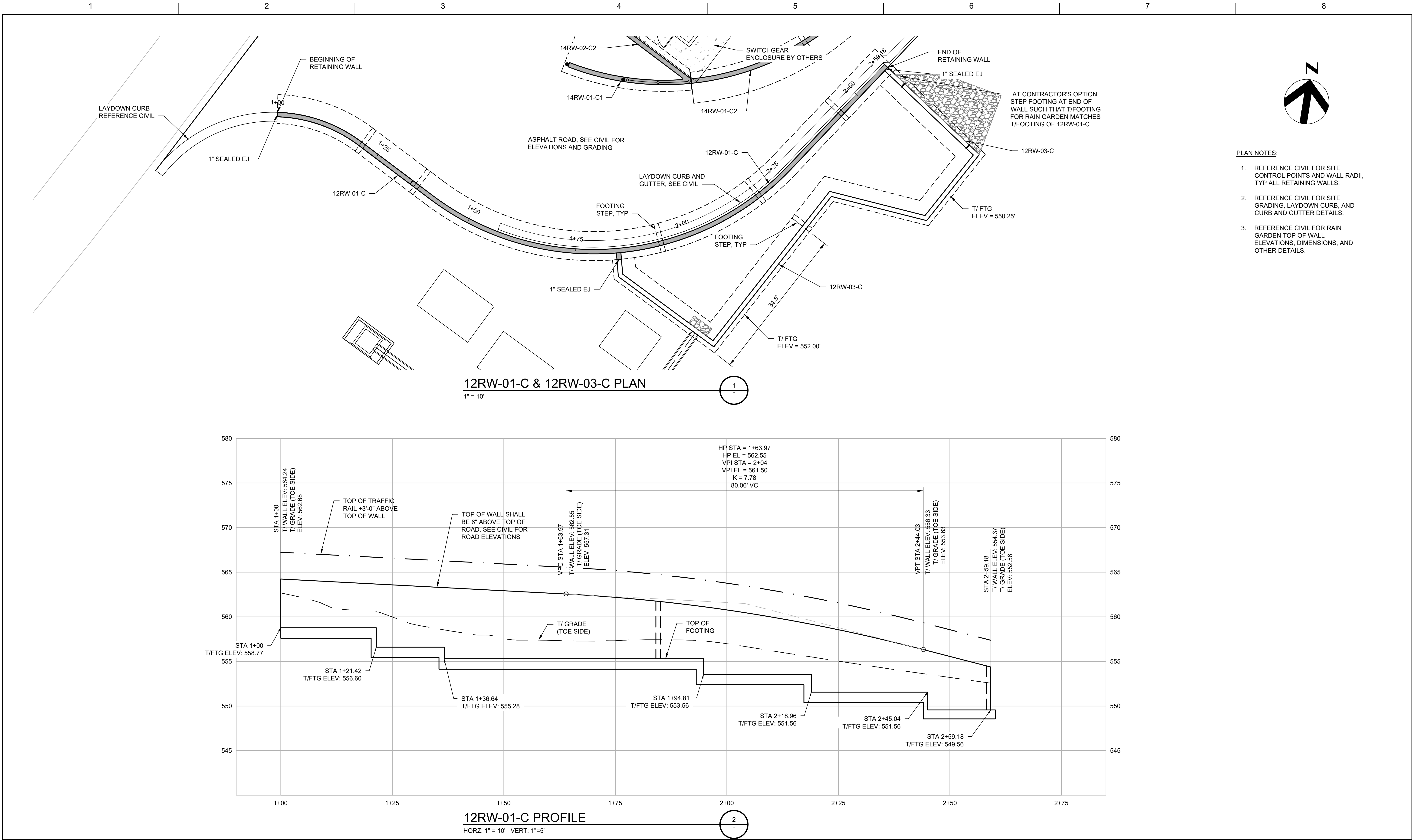


ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL



FILENAME	S10-103.dwg
SCALE	1" = 20'

STRUCTURAL
RETAINING WALL
ENLARGED PLAN

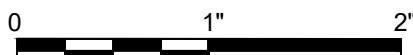


0	01/21/2021	CONFORMED CONTRACT DRAWINGS
ISSUE	DATE	DESCRIPTION

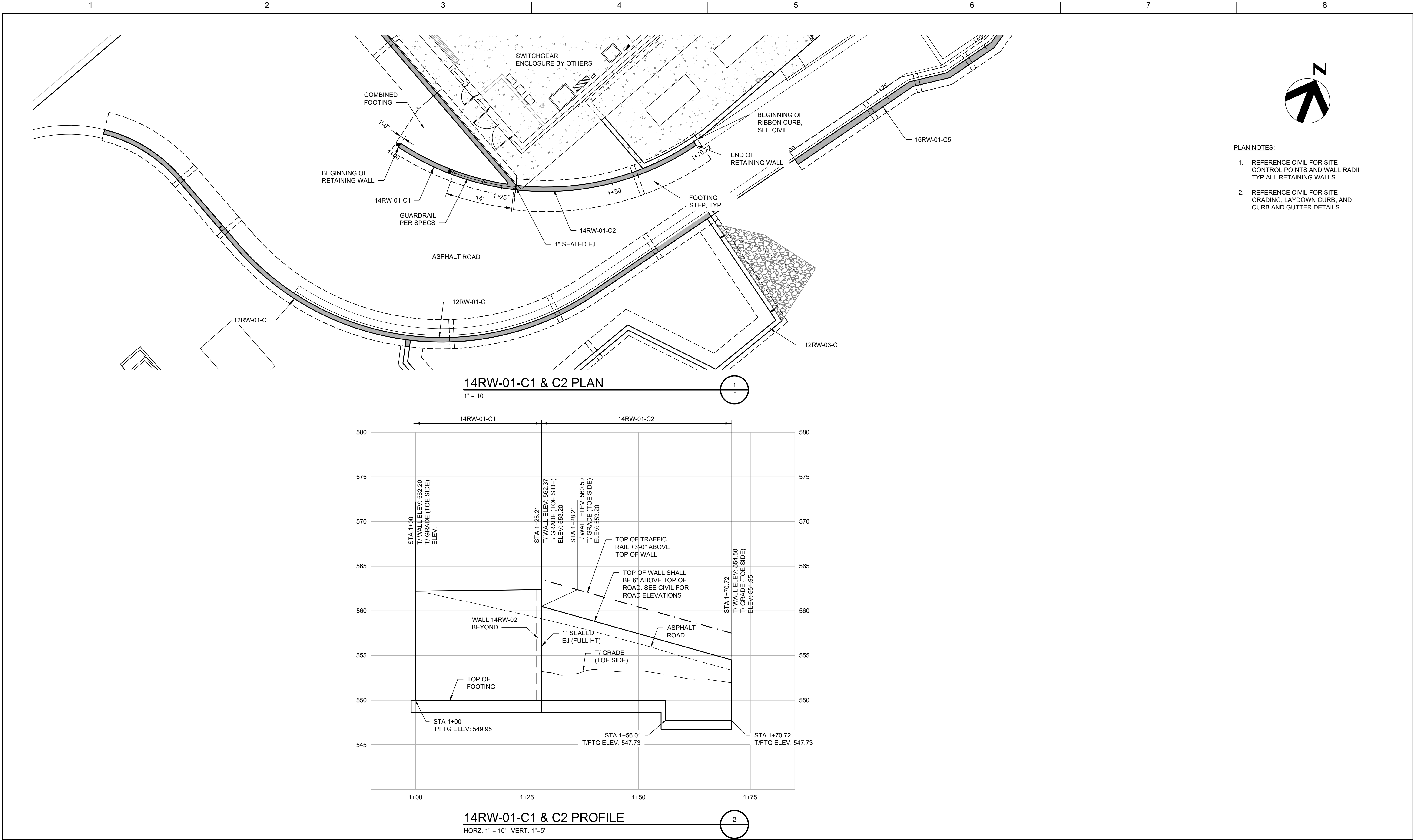
PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906



ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL



FILENAME | S10-201.dwg
SCALE | 1" = 10'

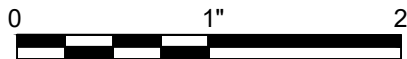


0	01/21/2021	CONFORMED CONTRACT DRAWINGS
ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906

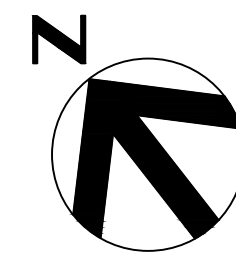
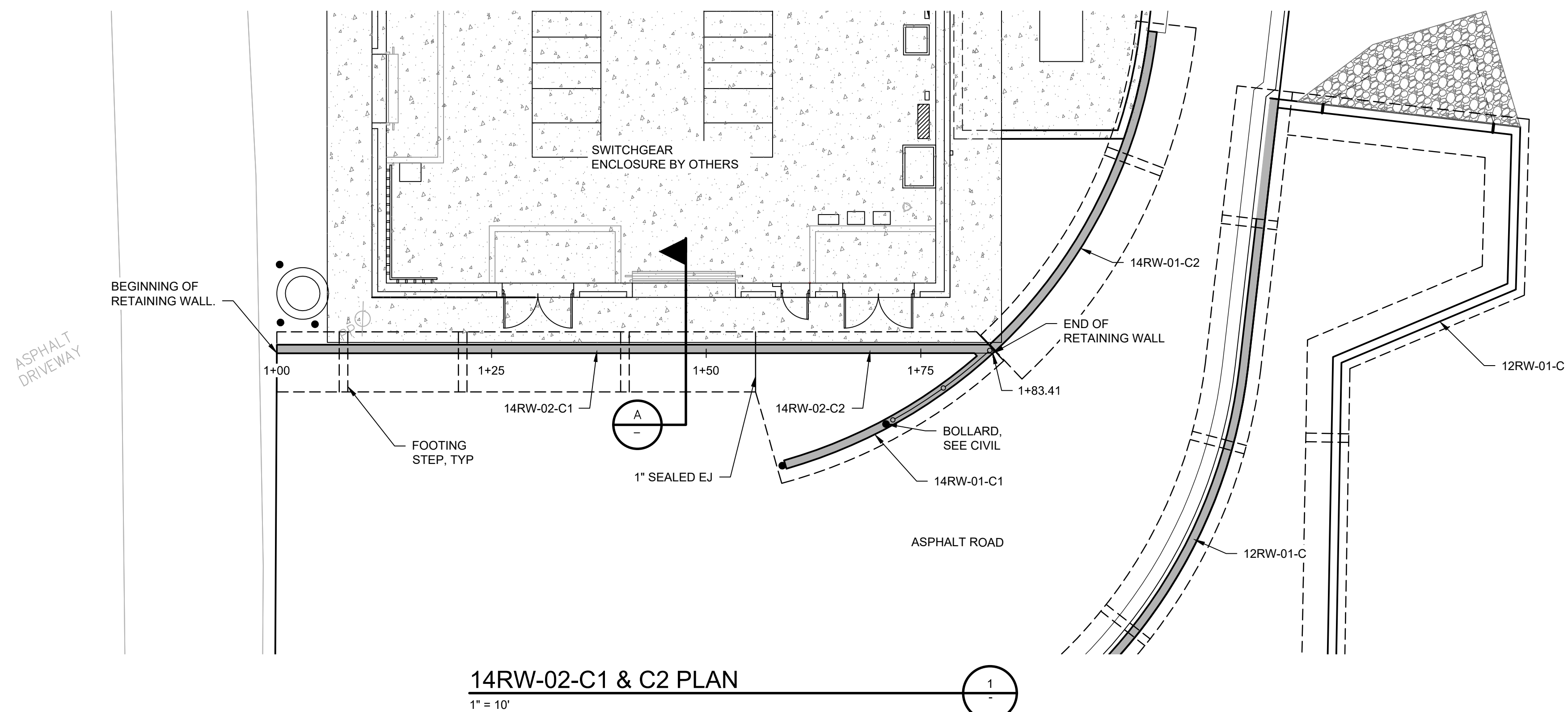


ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL



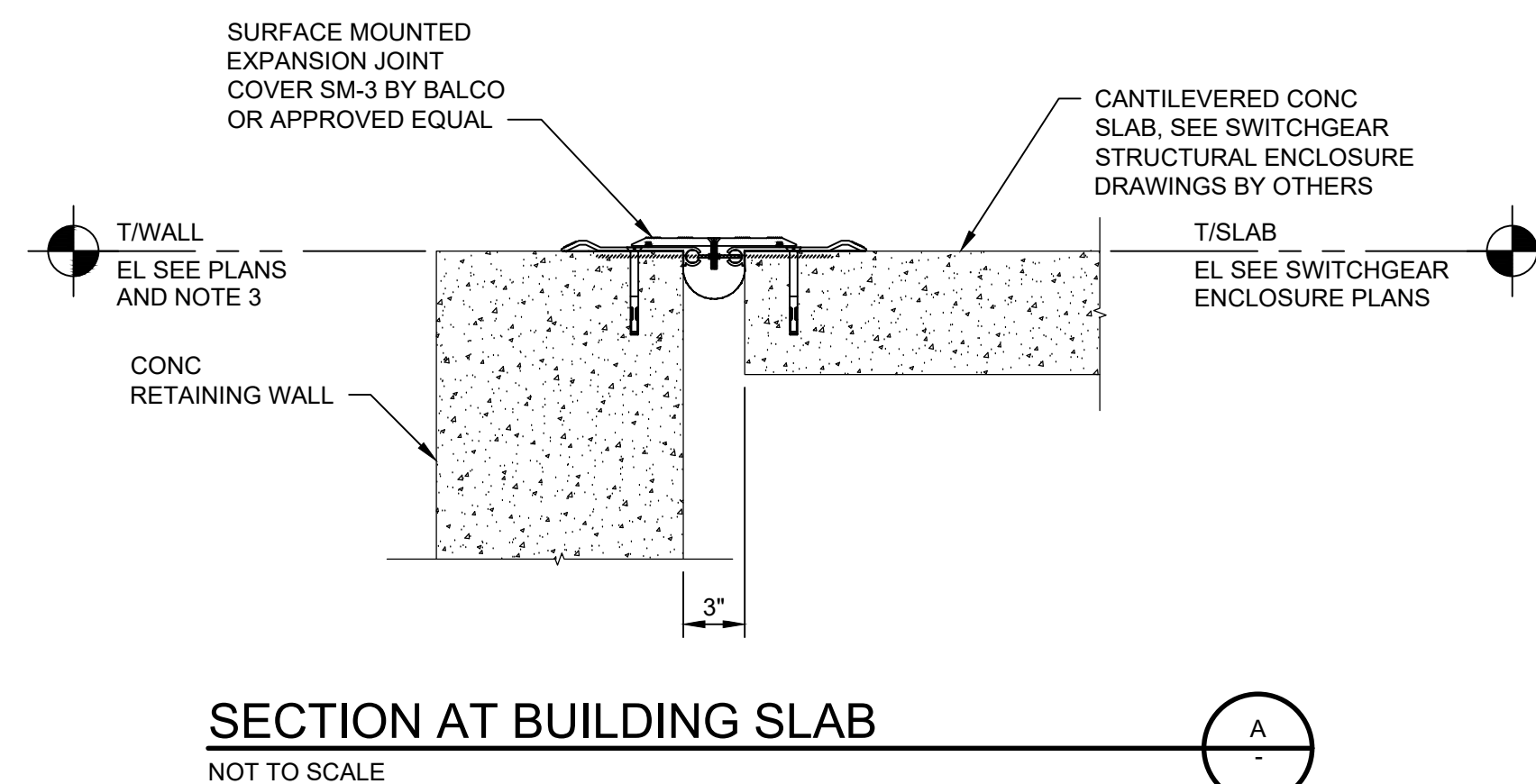
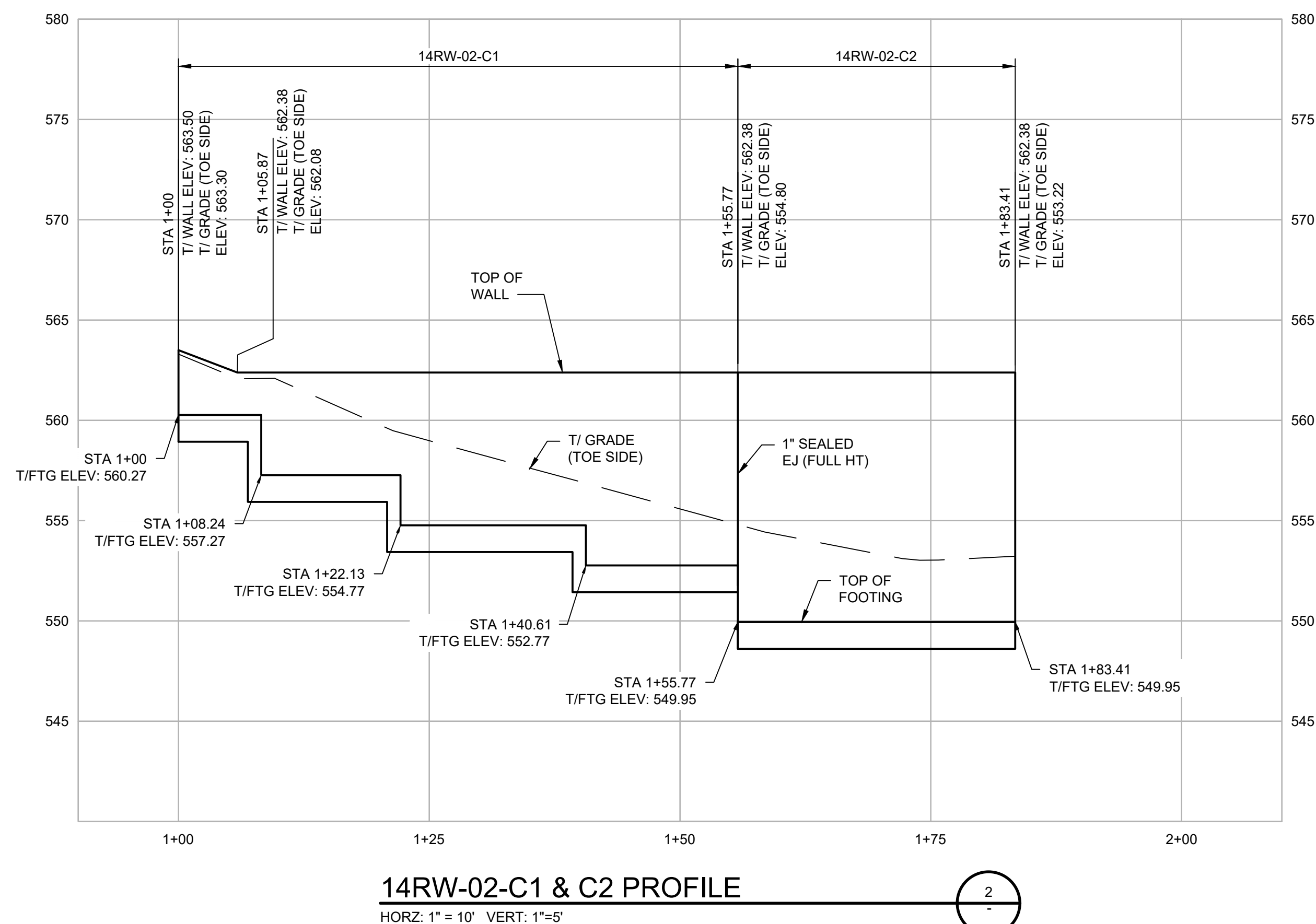
STRUCTURAL
RETAINING WALL
PLAN AND PROFILE

FILENAME | S10-202.dwg
SCALE | 1" = 10'



PLAN NOTES:

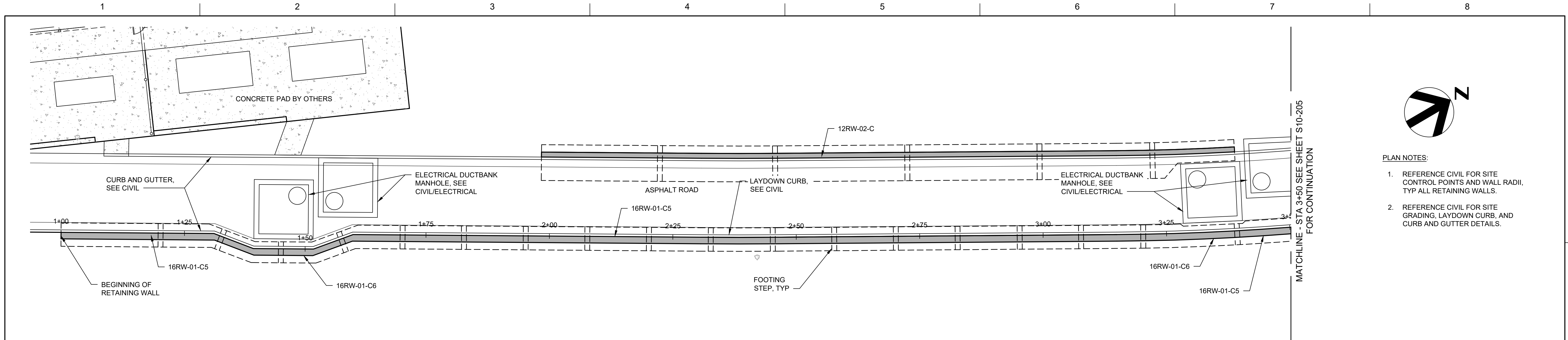
1. REFERENCE CIVIL FOR SITE CONTROL POINTS AND WALL RADII, TYP ALL RETAINING WALLS.
2. REFERENCE CIVIL FOR SITE GRADING, LAYDOWN CURB, AND CURB AND GUTTER DETAILS.
3. TOP OF RETAINING WALL ELEVATION SHALL MATCH ADJACENT ENCLOSURE SLAB.



ISSUE	DATE	DESCRIPTION
0	01/21/2021	CONFORMED CONTRACT DRAWINGS

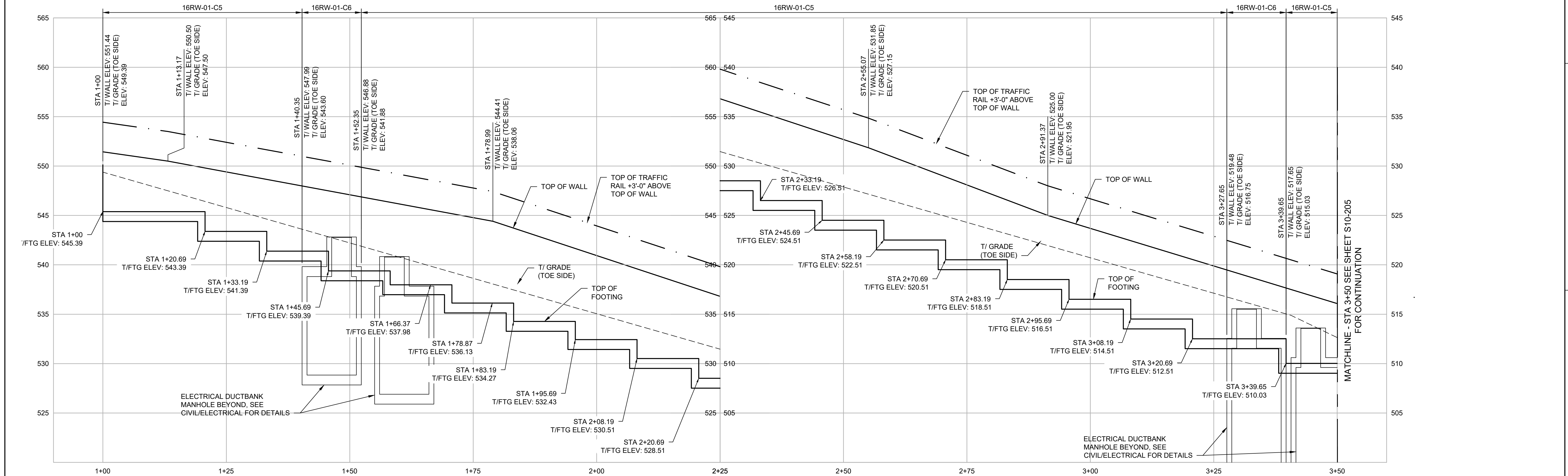
PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906





- PLAN NOTES:
1. REFERENCE CIVIL FOR SITE CONTROL POINTS AND WALL RADII, TYP ALL RETAINING WALLS.
 2. REFERENCE CIVIL FOR SITE GRADING, LAYDOWN CURB, AND CURB AND GUTTER DETAILS.

16RW-01-C5 & C6 PLAN
1" = 10'



16RW-01-C5 & C6 PROFILE
HORZ: 1" = 10' VERT: 1" = 5'



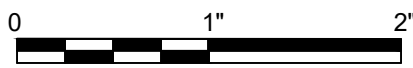
0	01/21/2021	CONFORMED CONTRACT DRAWINGS
ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906

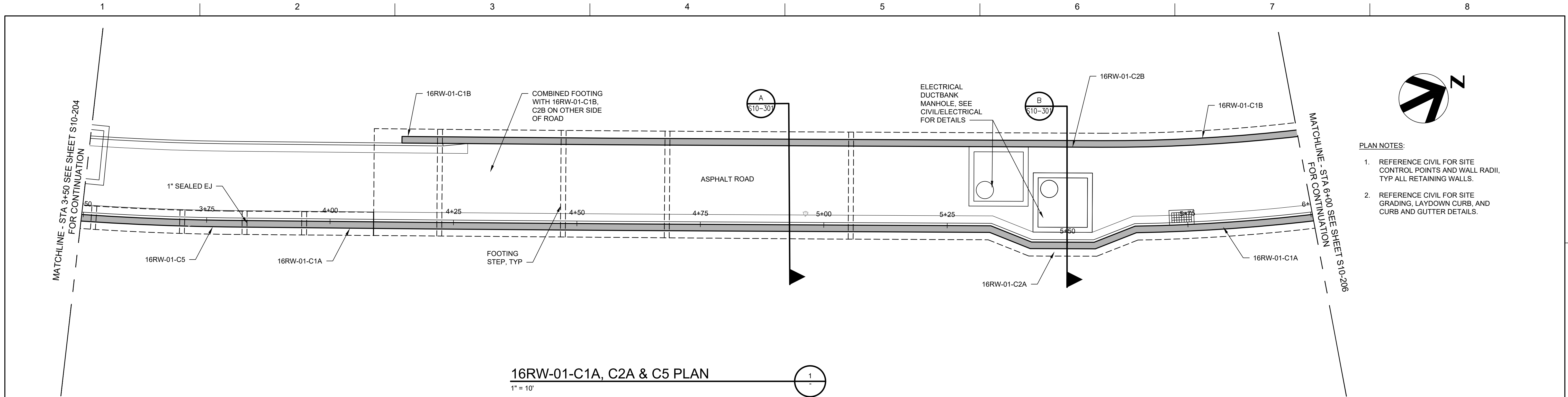


ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL

STRUCTURAL
RETAINING WALL
PLAN AND PROFILE

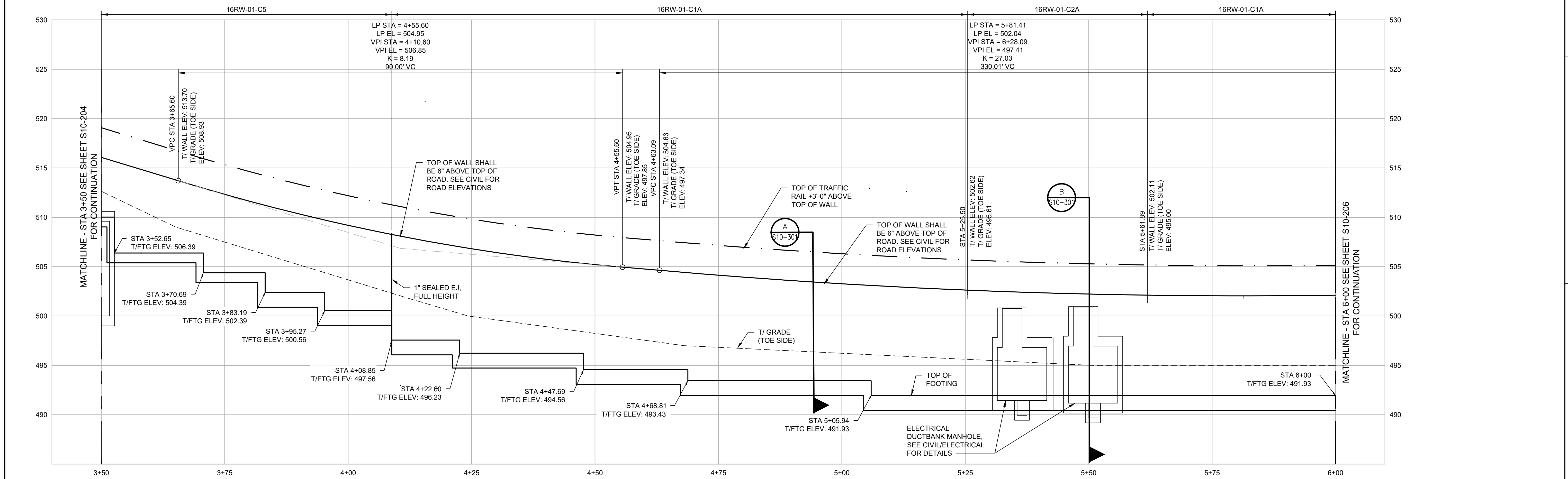


FILENAME | S10-207.dwg
SCALE | 1" = 10'



16RW-01-C1A, C2A & C5 PLAN

1" = 10'



16RW-01-C1A, C2A & C5 PROFILE

HORIZ: 1" = 10' VERT: 1" = 5'



Texas P.E. Firm
Registration No. F-754

Q	01/21/2021	CONFORMED CONTRACT DRAWINGS
ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906



ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL



STRUCTURAL
RETAINING WALL
PLAN AND PROFILE

FILENAME | S10-204.dwg
SCALE | 1" = 10'

SHEET 66 of 350
S10-205

1

2

3

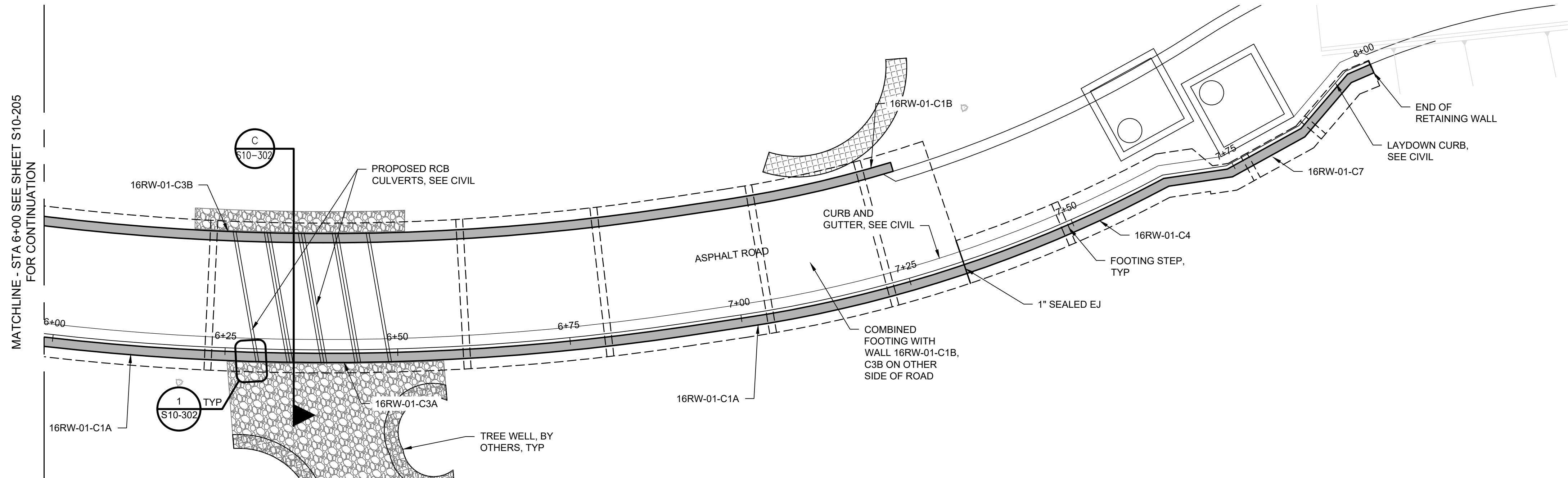
4

5

6

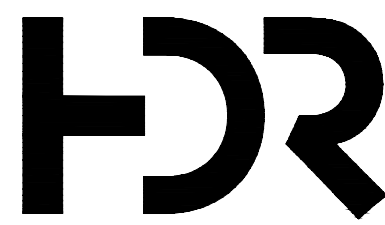
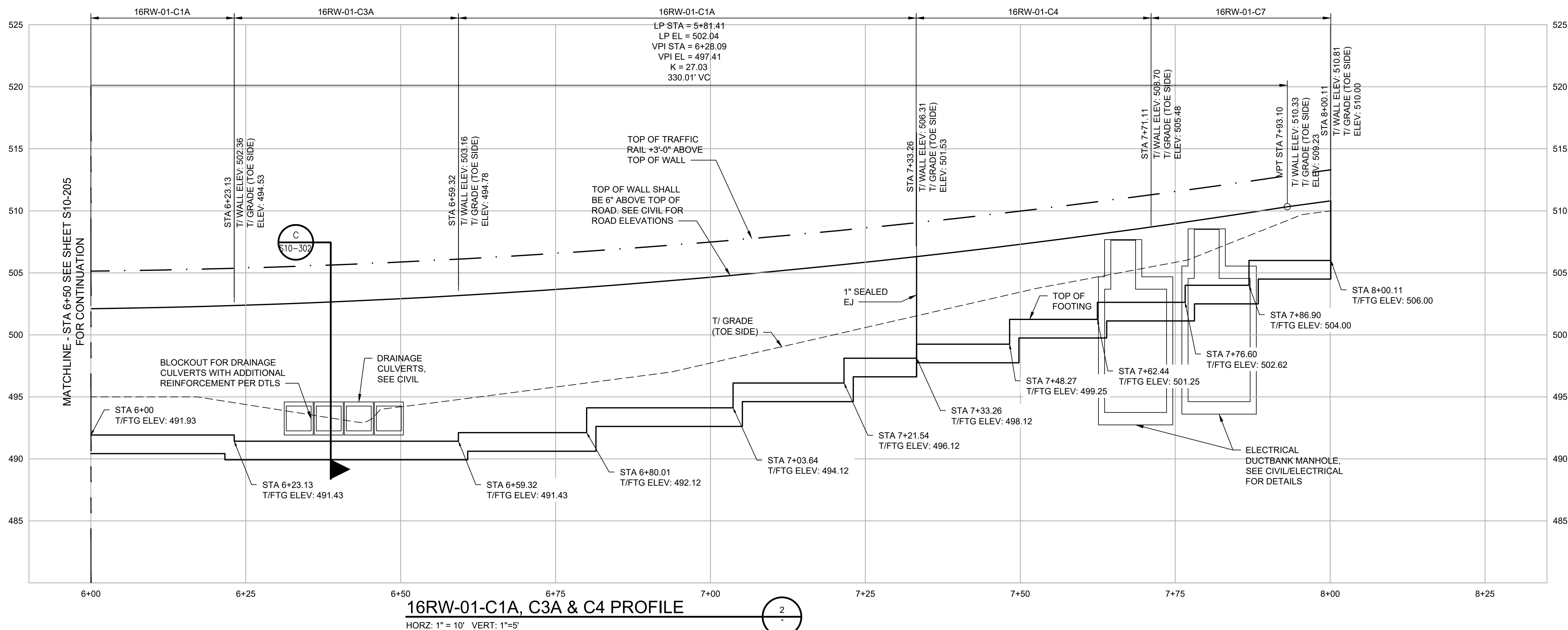
7

8



PLAN NOTES:

1. REFERENCE CIVIL FOR SITE CONTROL POINTS AND WALL RADII, TYP ALL RETAINING WALLS.
2. REFERENCE CIVIL FOR SITE GRADING, LAYDOWN CURB, AND CURB AND GUTTER DETAILS.



Texas P.E. Firm
Registration No. F-754

ISSUE	DATE	DESCRIPTION
0	01/21/2021	CONFORMED CONTRACT DRAWINGS

PROJECT MANAGER W. D. WEHNER

DESIGNED BY LEM

DRAWN BY HDG

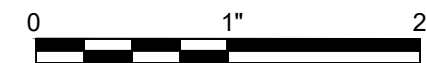
CHECKED BY CAZ

DATE OCTOBER 2020

PROJECT NUMBER 10123906



ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL



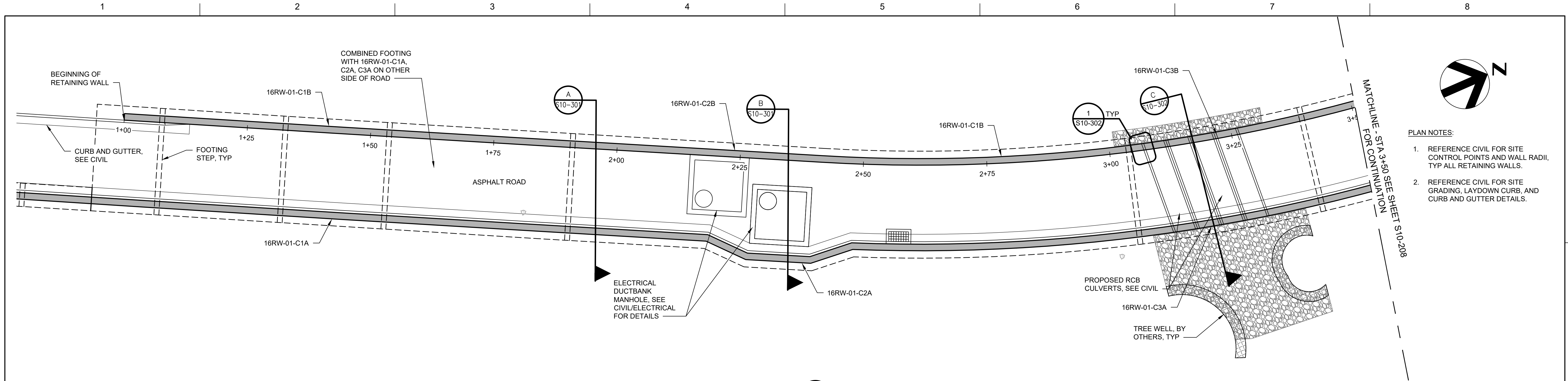
STRUCTURAL
RETAINING WALL
PLAN AND PROFILE

FILENAME S10-204.dwg

SCALE 1" = 10'

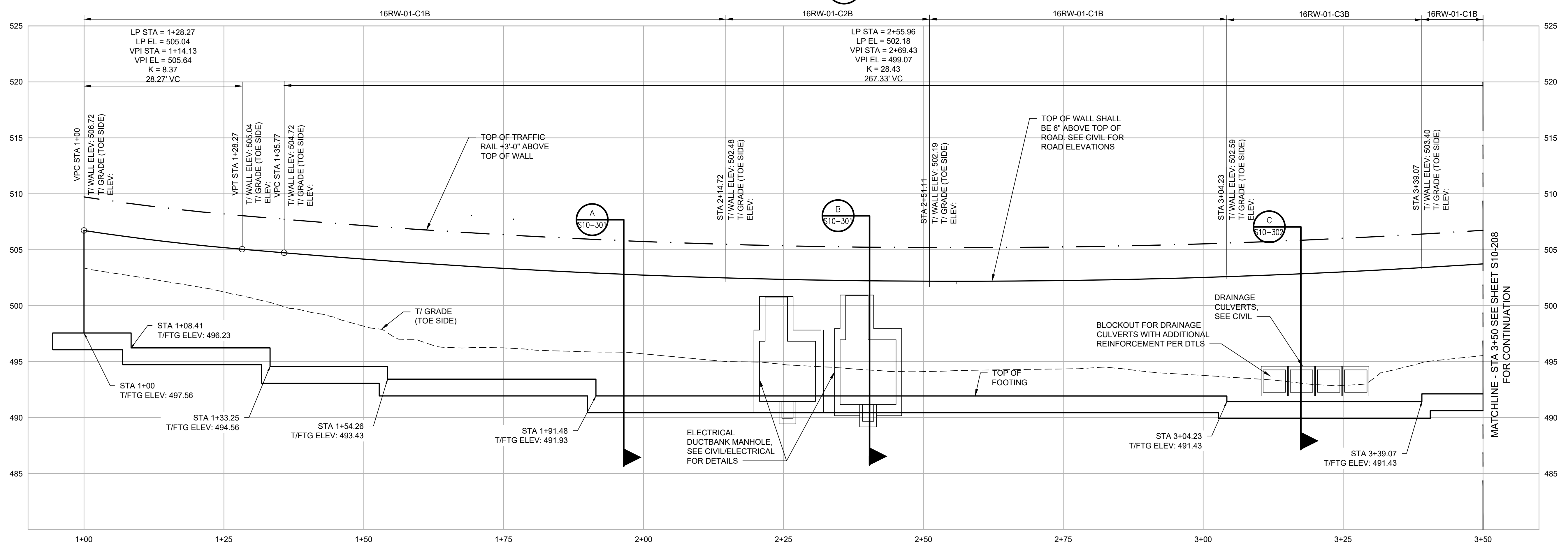
SHEET 67 of 350

S10-206



- PLAN NOTES:
1. REFERENCE CIVIL FOR SITE CONTROL POINTS AND WALL RADII, TYP ALL RETAINING WALLS.
 2. REFERENCE CIVIL FOR SITE GRADING, LAYDOWN CURB, AND CURB AND GUTTER DETAILS.

16RW-01-C1B, C2B & C3B PLAN
1" = 10'



16RW-01-C1B, C2B & C3B PROFILE
HORZ: 1" = 10' VERT: 1" = 5'



0	01/21/2021	CONFORMED CONTRACT DRAWINGS
ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906

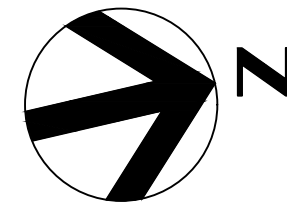
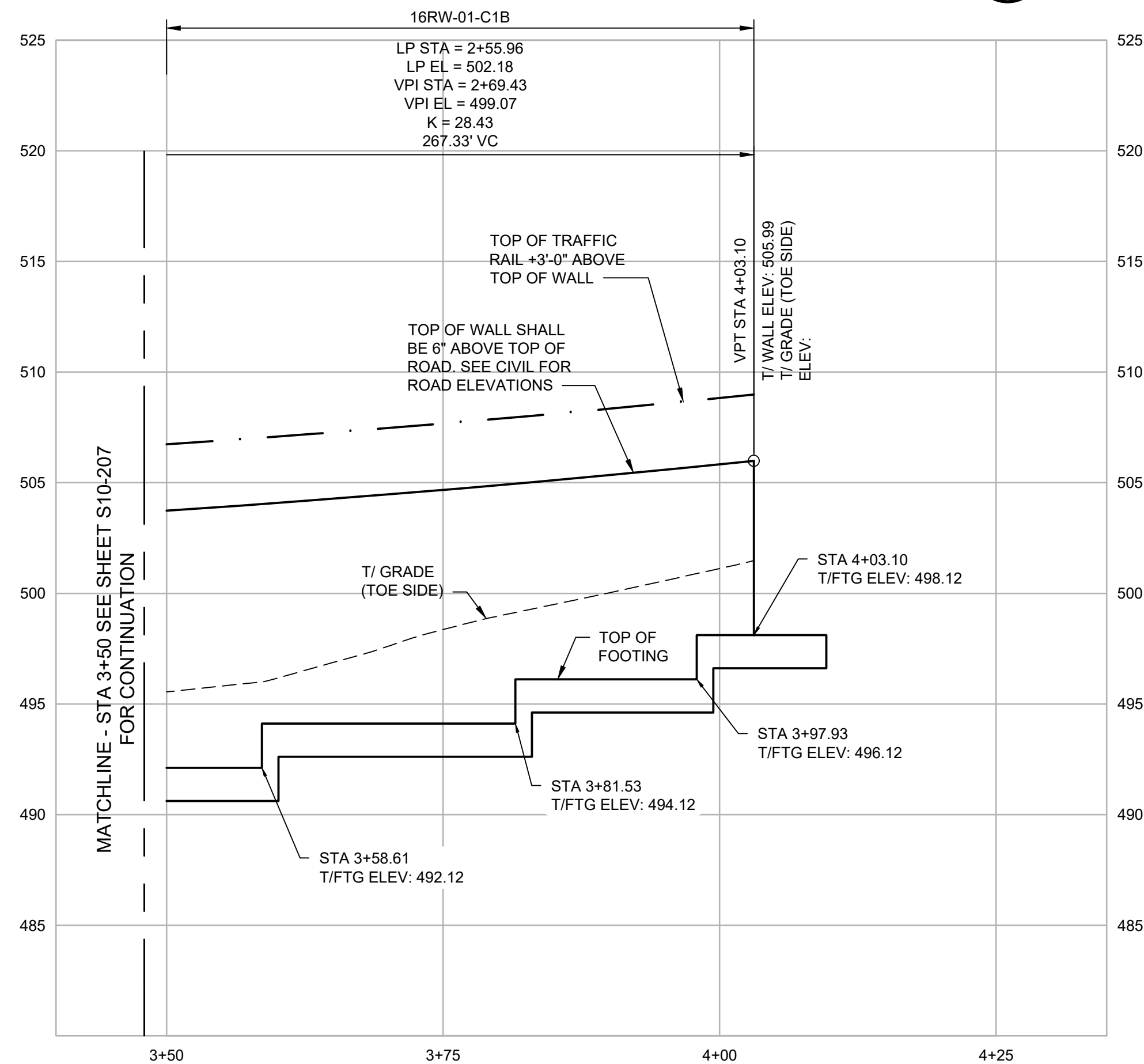
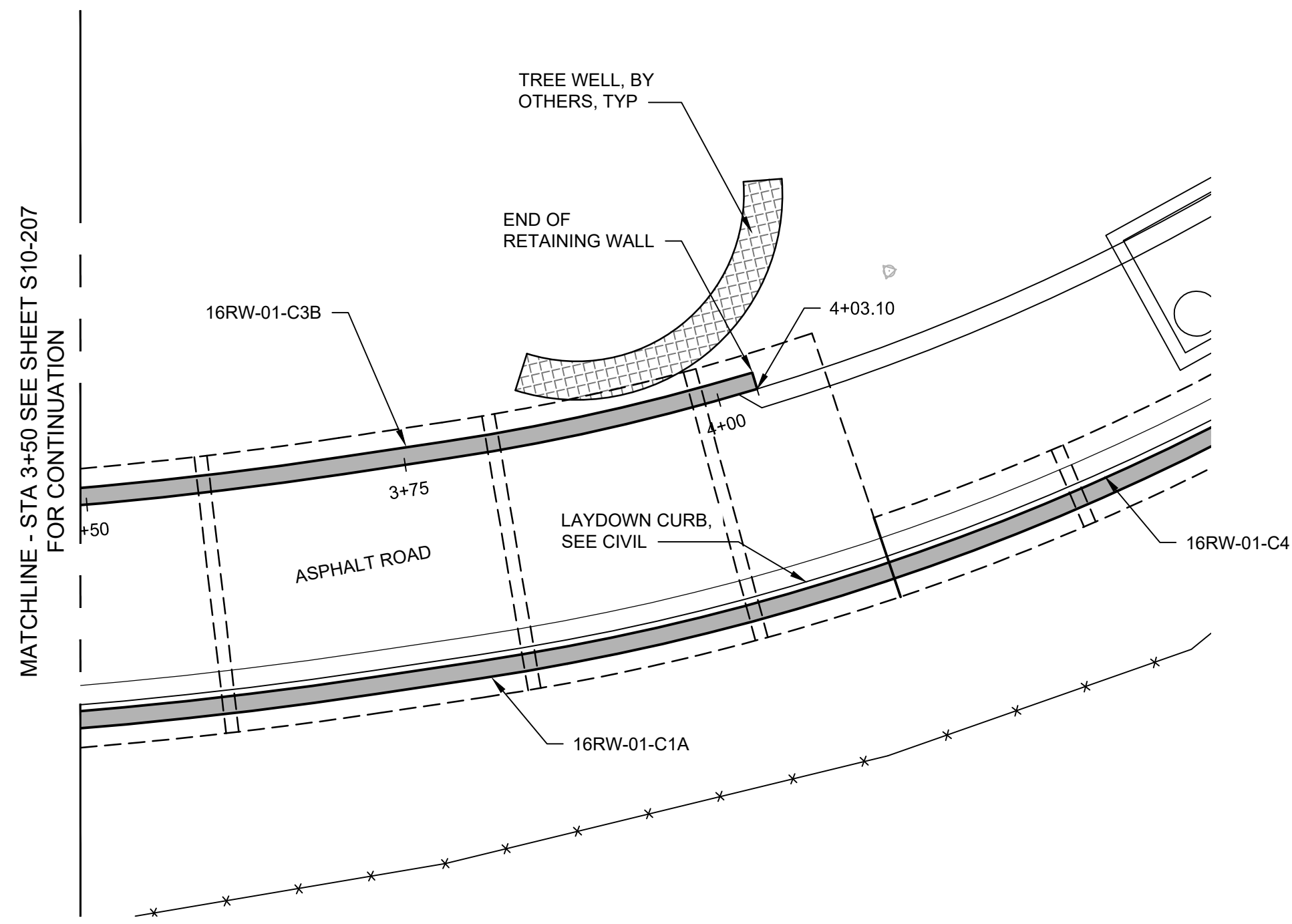


ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL

STRUCTURAL
RETAINING WALL
PLAN AND PROFILE

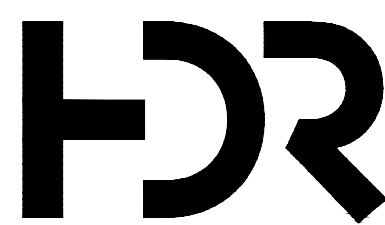


FILENAME | S10-204.dwg
SCALE | 1" = 10'



PLAN NOTES:

1. REFERENCE CIVIL FOR SITE CONTROL POINTS AND WALL RADII, TYP ALL RETAINING WALLS.
2. REFERENCE CIVIL FOR SITE GRADING, LAYDOWN CURB, AND CURB AND GUTTER DETAILS.



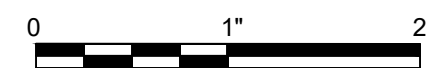
Texas P.E. Firm
Registration No. F-754

ISSUE	DATE	DESCRIPTION
0	01/21/2021	CONFORMED CONTRACT DRAWINGS

PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906



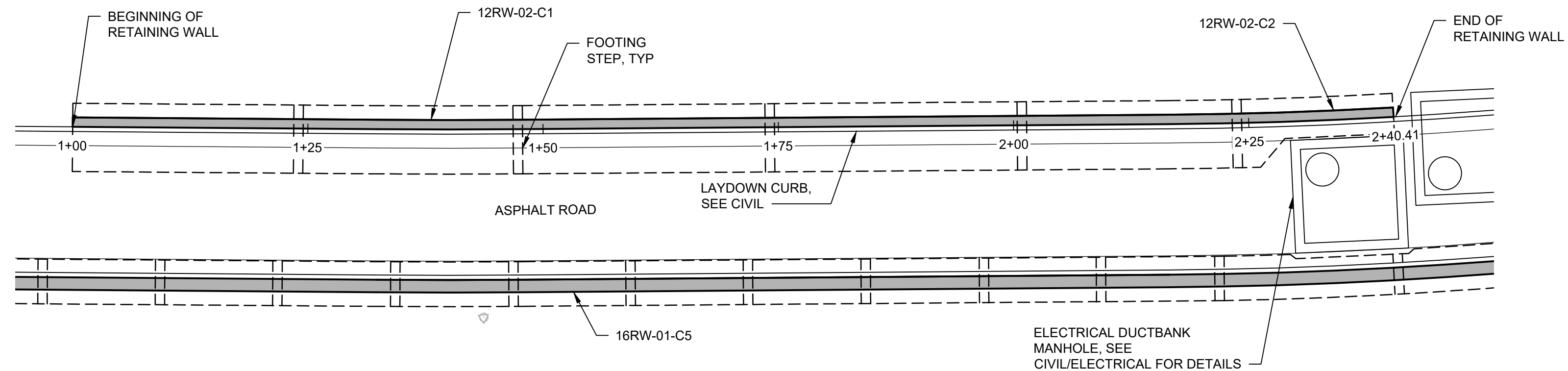
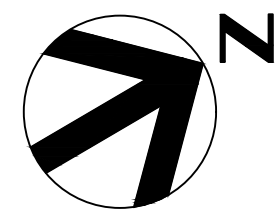
ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL

STRUCTURAL
RETAINING WALL
PLAN AND PROFILE

FILENAME | S10-207.dwg
SCALE | 1" = 10'

SHEET 69 of 350

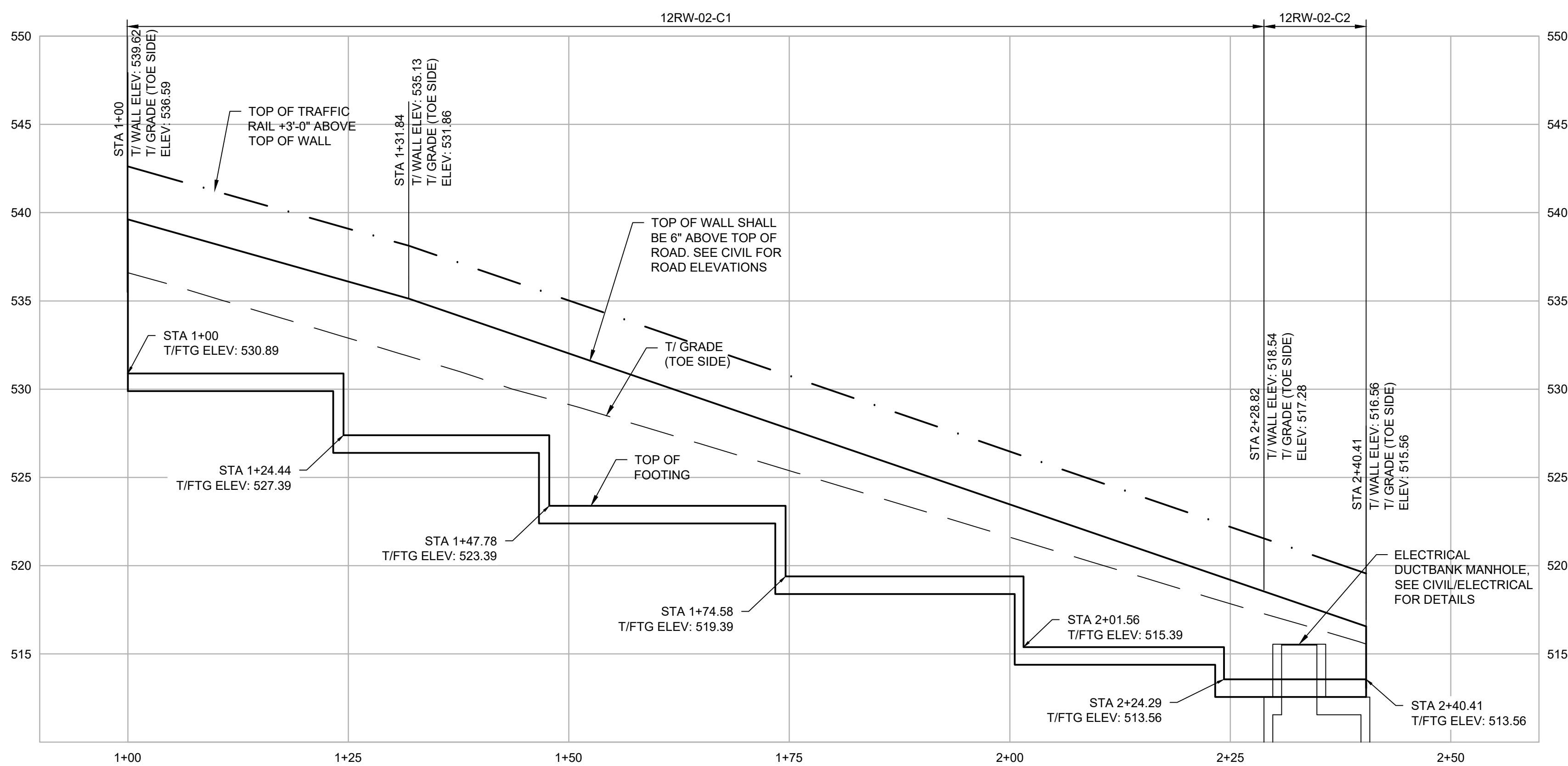
S10-208

**PLAN NOTES:**

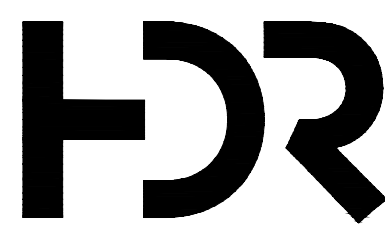
1. REFERENCE CIVIL FOR SITE CONTROL POINTS AND WALL RADII. TYP ALL RETAINING WALLS.
2. REFERENCE CIVIL FOR SITE GRADING, LAYDOWN CURB, AND CURB AND GUTTER DETAILS.

12RW-02-C1 & C2 PLAN

1" = 10'

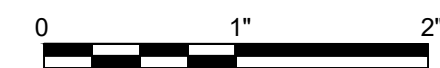
**12RW-02-C1 & C2 PROFILE**

HORZ: 1" = 10' VERT: 1"=5'

Texas P.E. Firm
Registration No. F-754

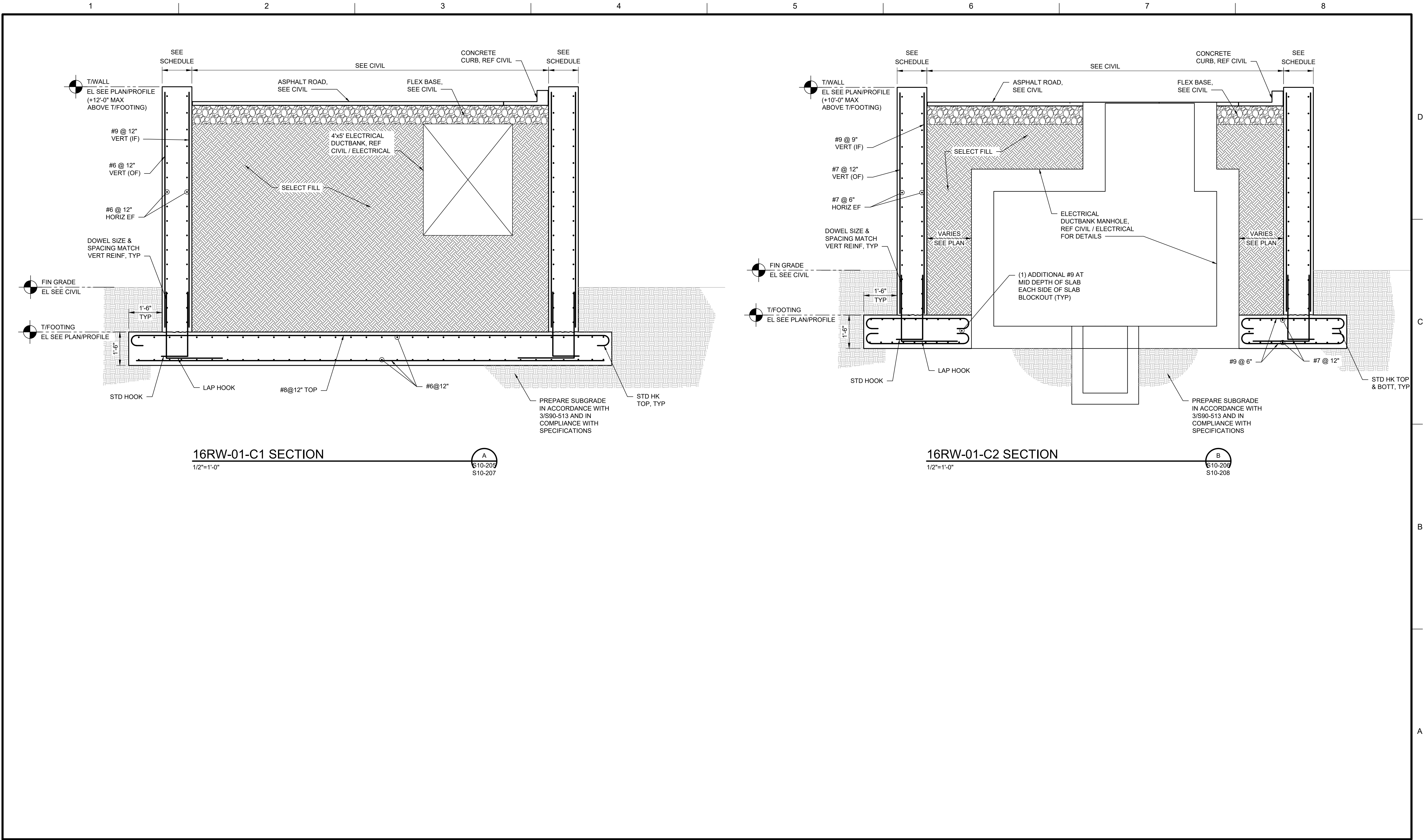
ISSUE	DATE	DESCRIPTION
0	01/21/2021	CONFORMED CONTRACT DRAWINGS

PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906

**ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL****STRUCTURAL
RETAINING WALL
PLAN AND PROFILE**FILENAME | S10-207.dwg
SCALE | 1" = 10'

SHEET 70 of 350

S10-209

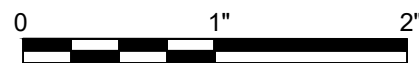


0	01/21/2021	CONFORMED CONTRACT DRAWINGS
ISSUE	DATE	DESCRIPTION

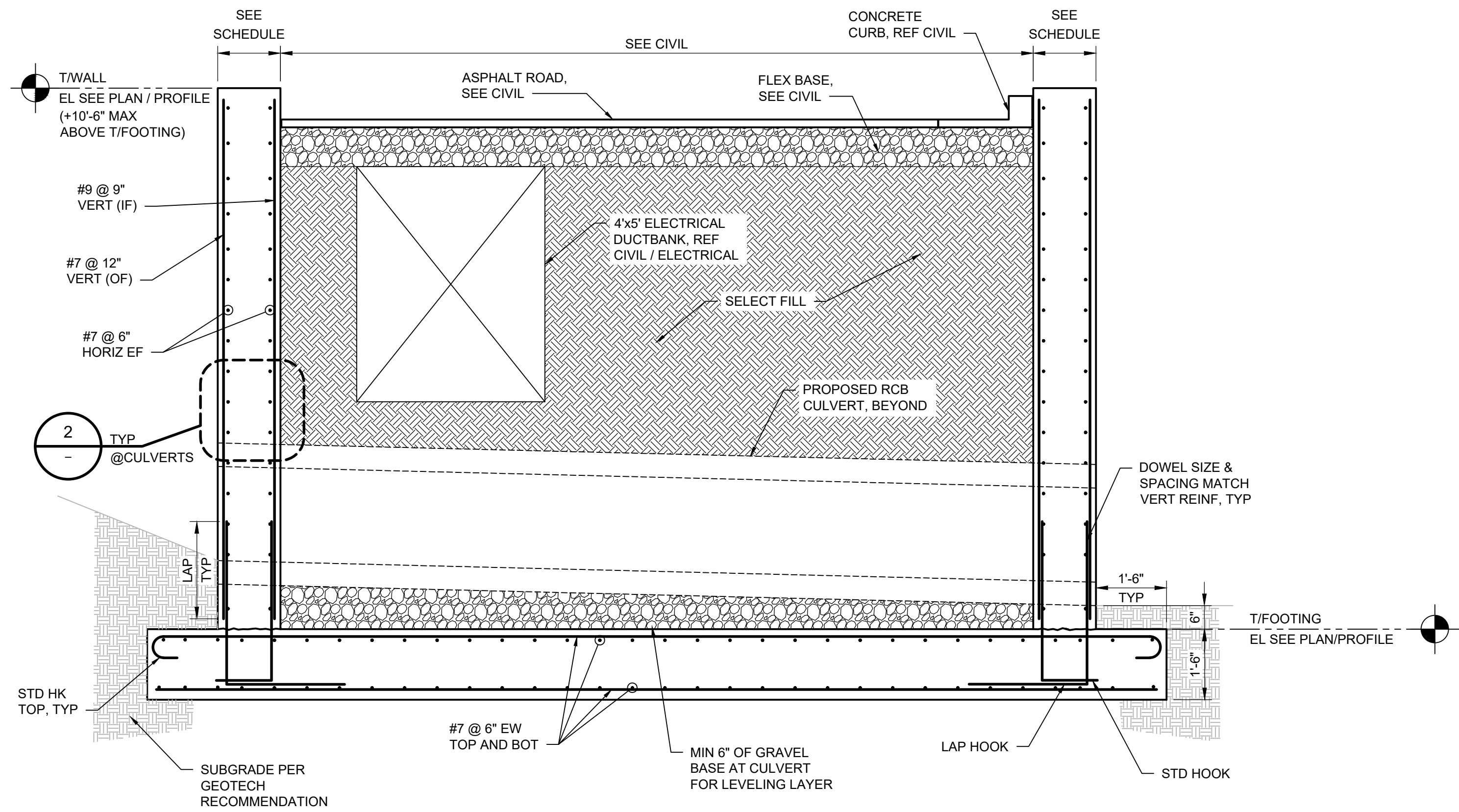
PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906



ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL

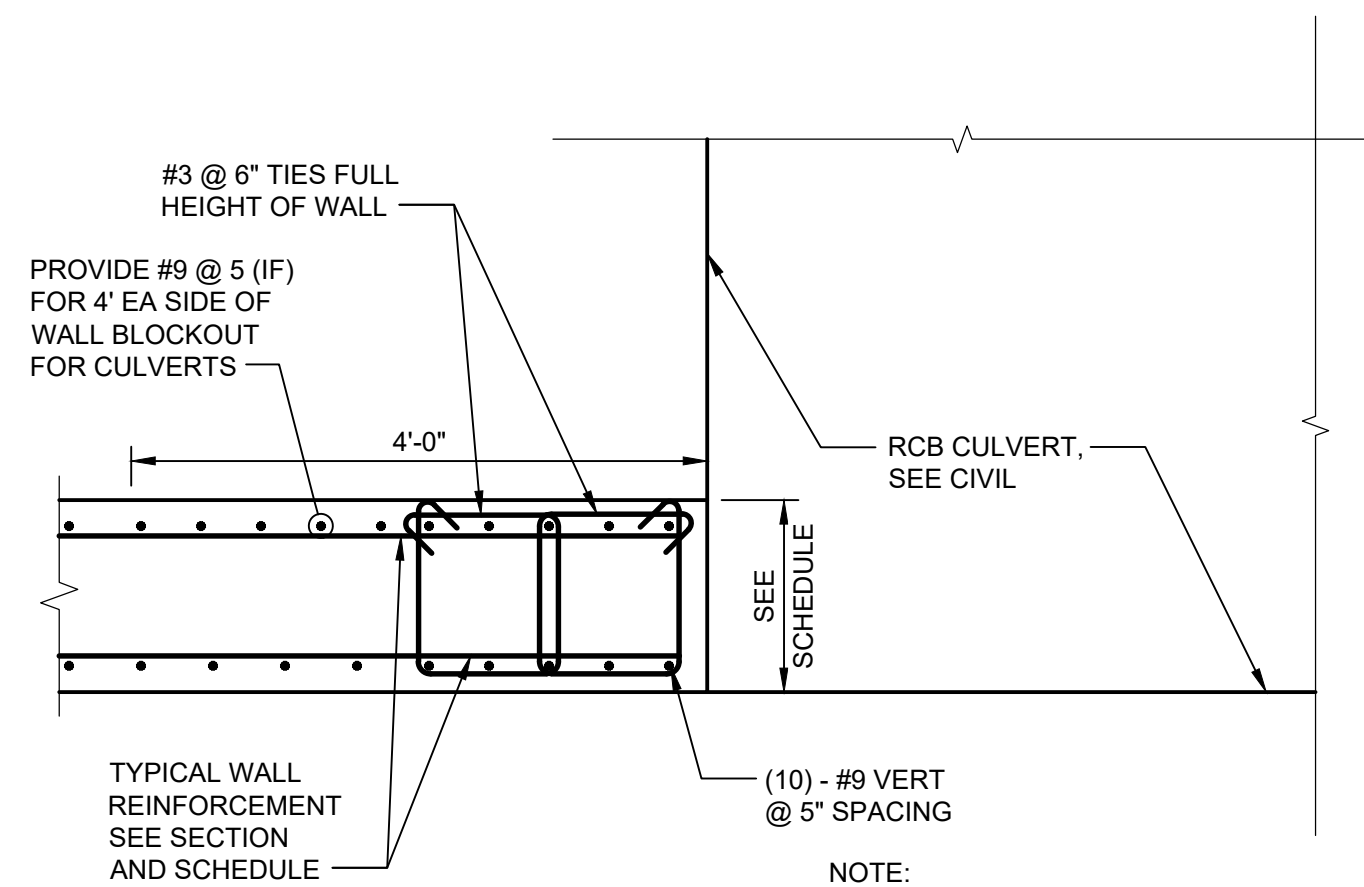
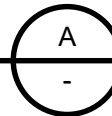


STRUCTURAL RETAINING WALL SECTIONS	
FILENAME	S10-301.dwg
SCALE	1/2" = 1'-0"



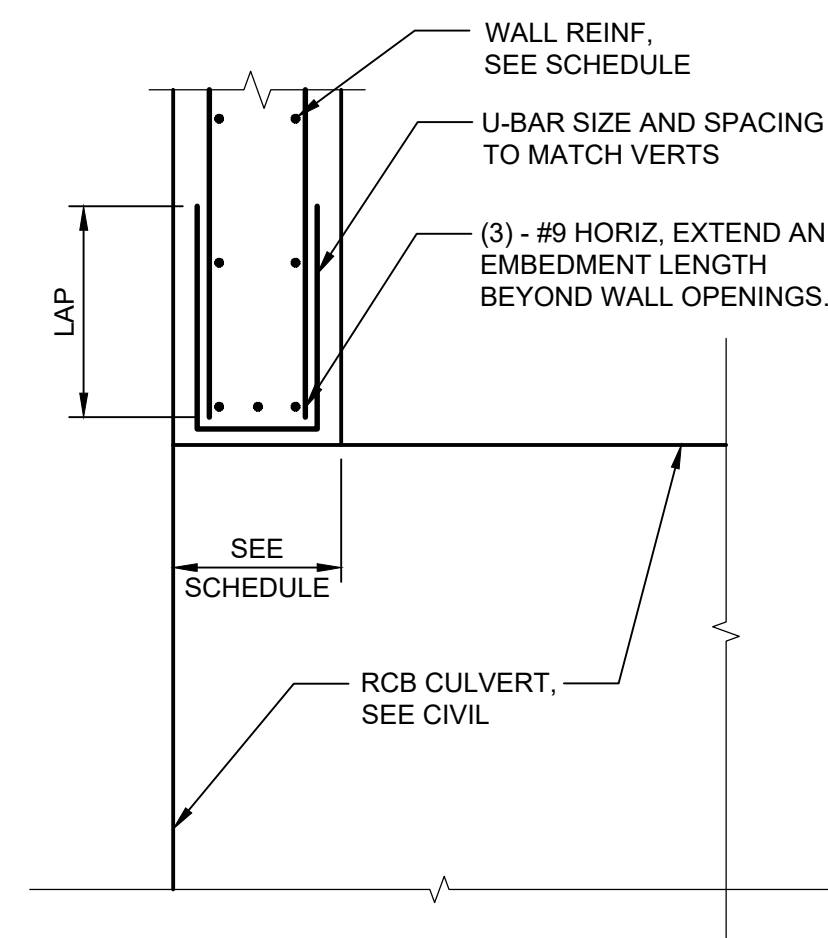
16RW-01-C3 SECTION

1/2"=1'-0"



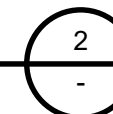
WALL DETAIL AT RCB

3/4"=1'-0"



WALL DETAIL AT RCB

3/4"=1'-0"



Texas P.E. Firm
Registration No. F-754

ISSUE	DATE	DESCRIPTION
0	01/21/2021	CONFORMED CONTRACT DRAWINGS

PROJECT MANAGER W. D. WEHNER

DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906



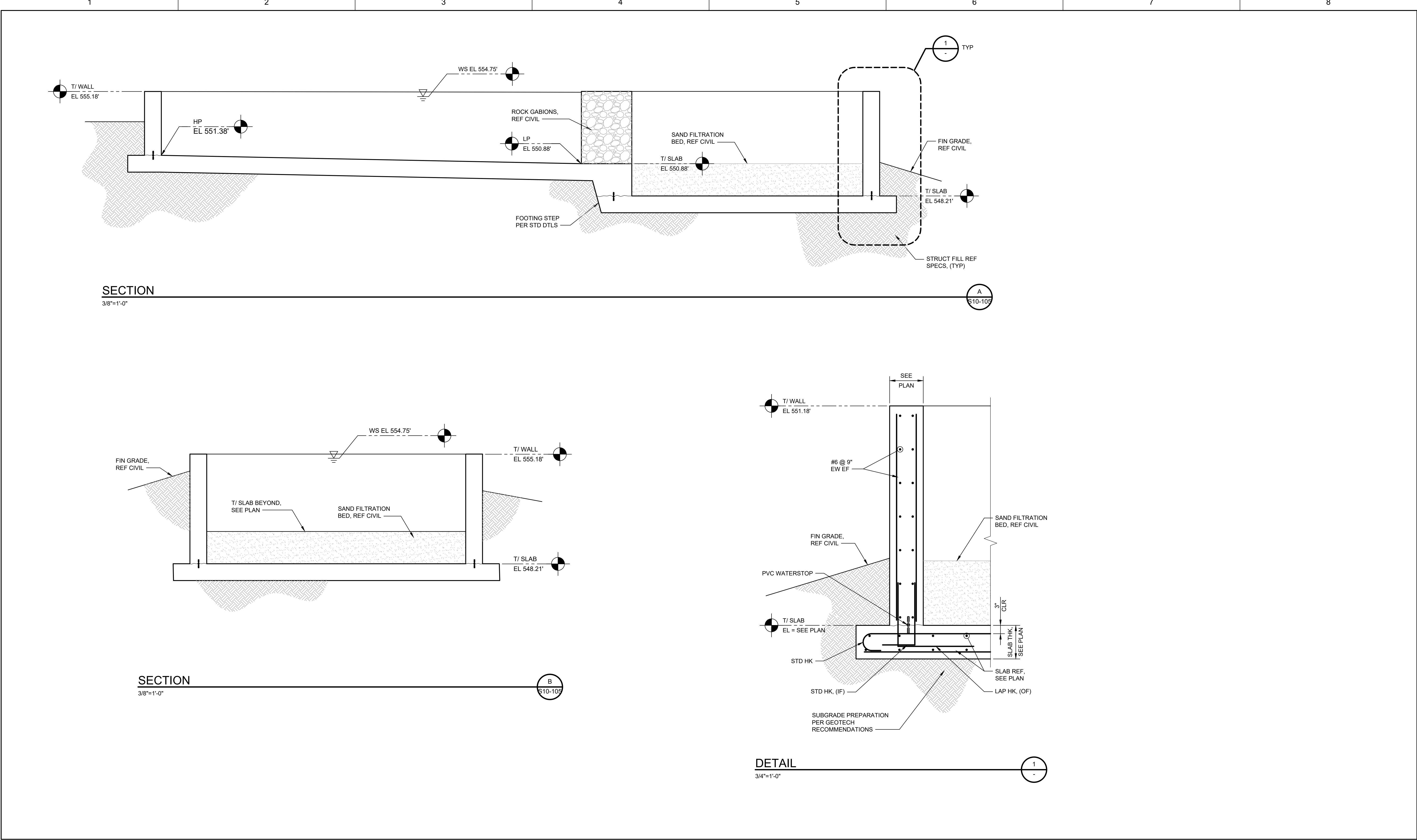
ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL



STRUCTURAL
RETAINING WALL
SECTIONS

FILENAME S10-301.dwg
SCALE AS NOTED

SHEET 72 of 350
S10-302

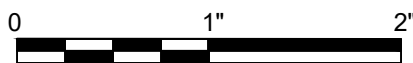


0	01/21/2021	CONFORMED CONTRACT DRAWINGS
ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906

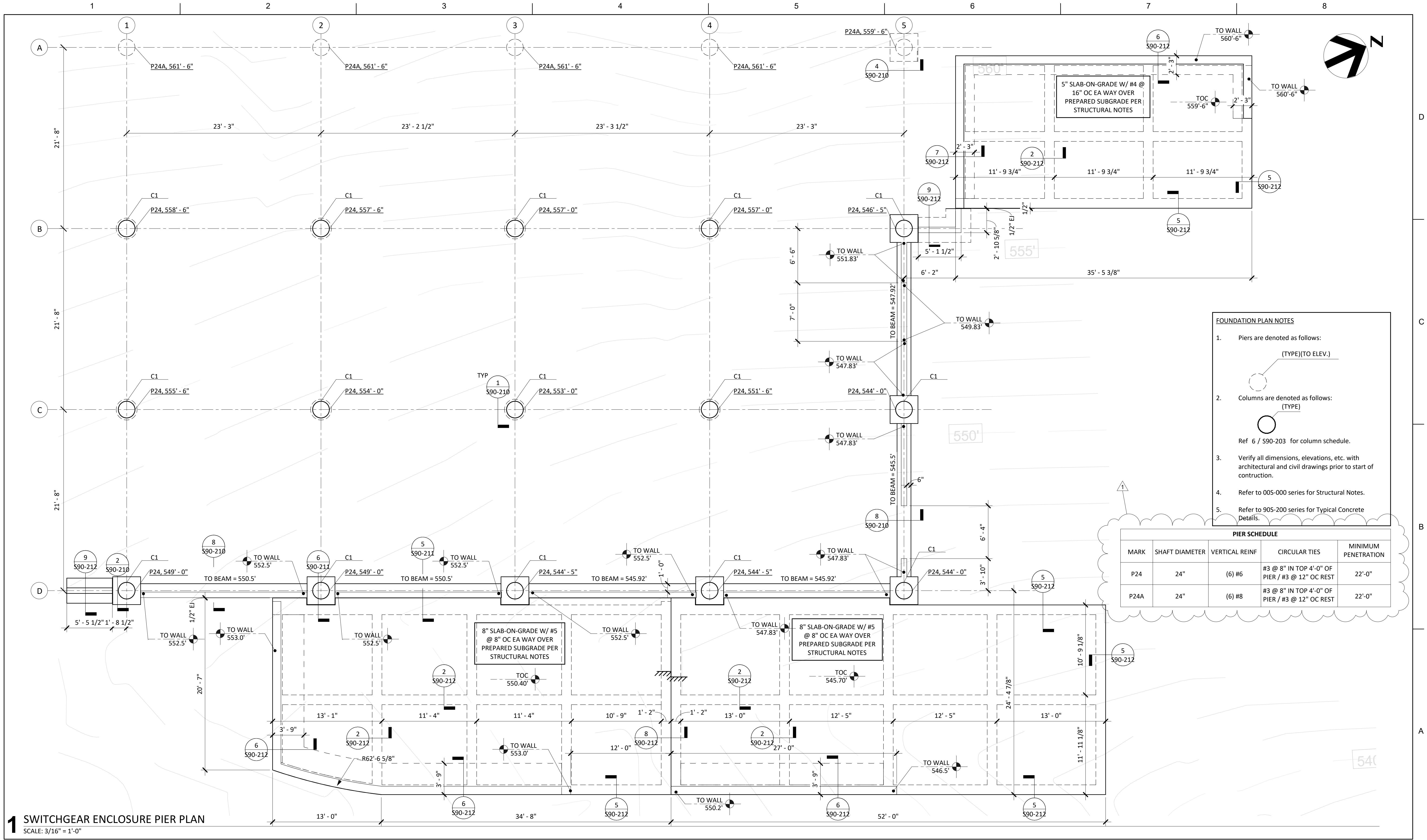


ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL



FILENAME | S10-305.dwg
SCALE | AS NOTED

STRUCTURAL
WATER QUALITY POND
WALL SECTIONS AND DETAILS



1 SWITCHGEAR ENCLOSURE PIER PLAN
SCALE: 3/16" = 1'-0"

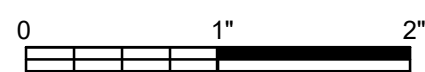
ISSUE	DATE	DESCRIPTION
1	05/18/2021	RFI030
0	01/21/2021	CONFORMED CONTRACT DRAWINGS

PROJECT MANAGER	W.D. WEHNER
DESIGNED BY	AR / FRV
DRAWN BY	AR
CHECKED BY	FRV
DATE	JANUARY 21, 2021
PROJECT NUMBER	10123906



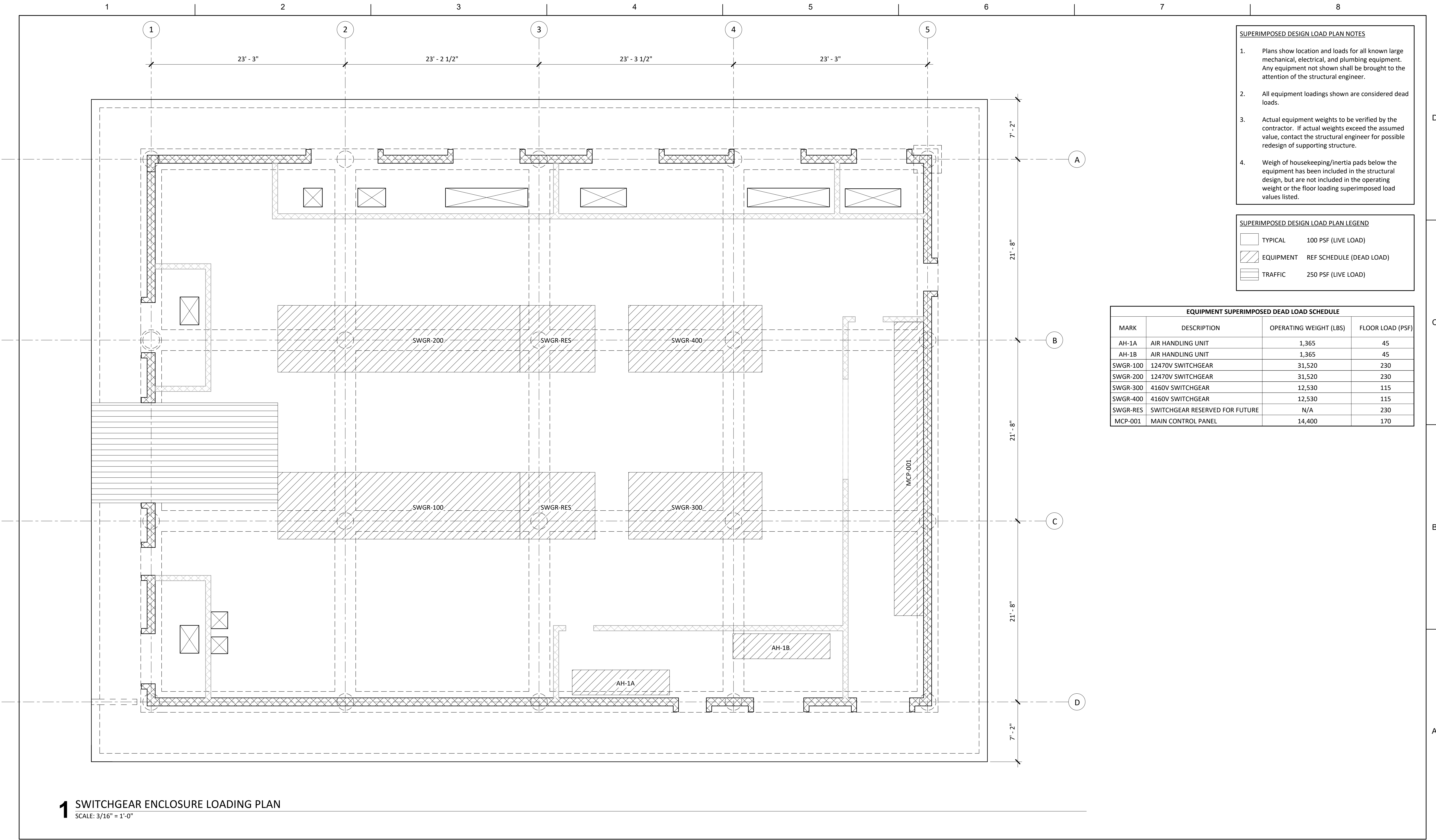
ULLRICH WTP
LOW SERVICE PUMP
STATION
ELECTRICAL FEED RENEWAL

PIER AND TRANSFORMER PAD PLAN



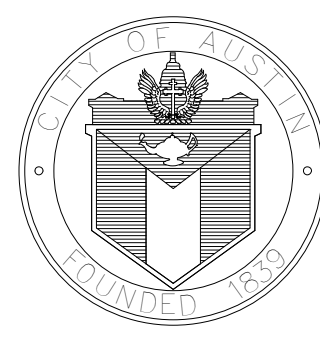
FILENAME 18051 Ullrich_LSPS
SCALE

SHEET
S30-101



CONFORMED CONTRACT DRAWINGS		
0	01/21/2021	
ISSUE	DATE	DESCRIPTION

PROJECT MANAGER		W.D. WEHNER
DESIGNED BY		AR / FRV
DRAWN BY		AR
CHECKED BY		FRV
DATE		OCTOBER 2020
PROJECT NUMBER		10123906

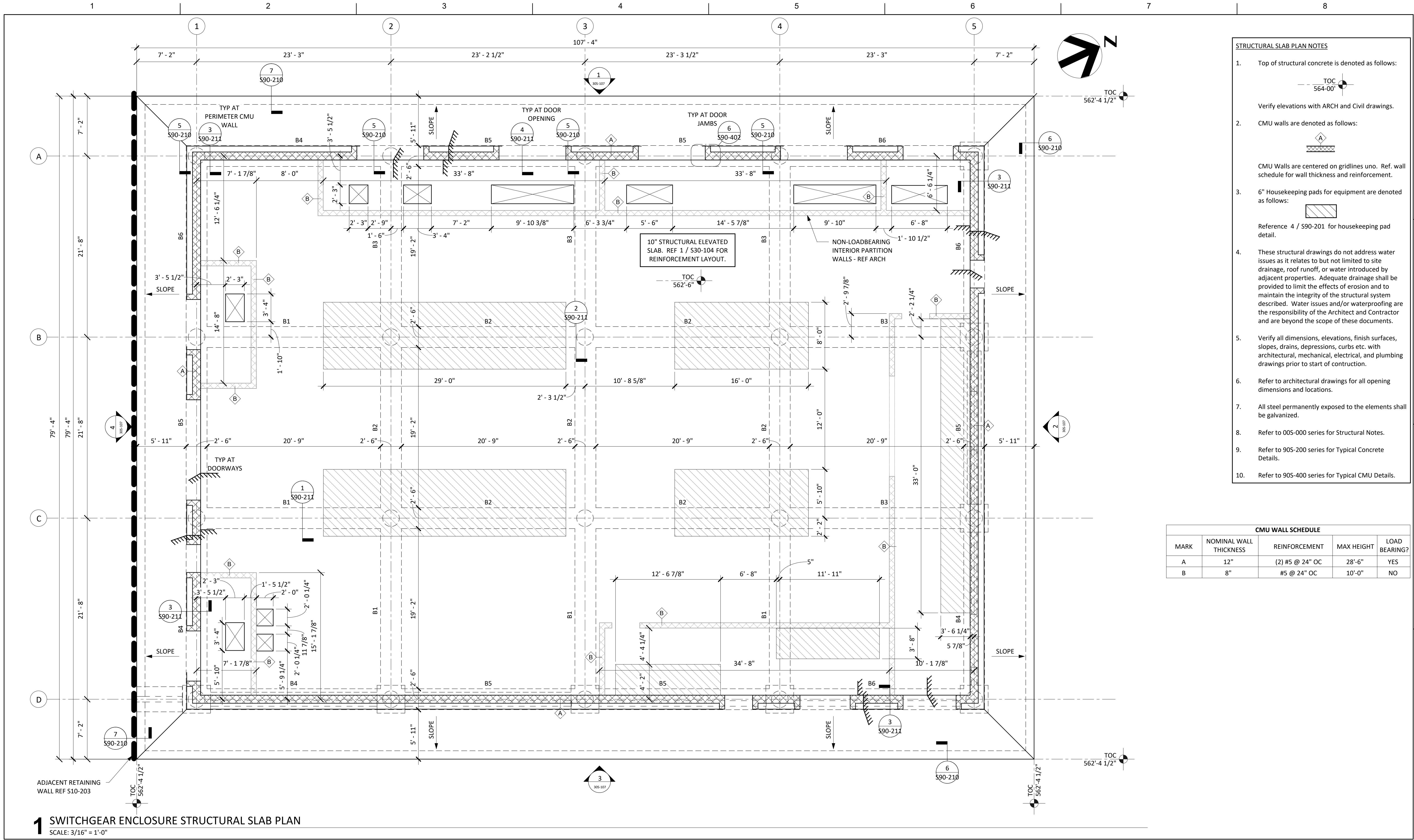


ULLRICH WTP
LOW SERVICE PUMP
STATION
ELECTRICAL FEED RENEWAL

SWITCHGEAR ENCLOSURE LOADING
PLAN



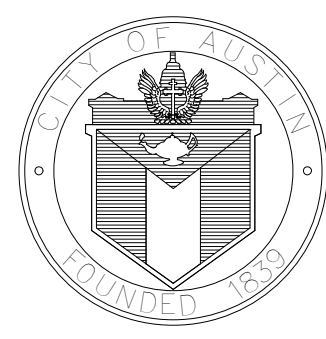
FILENAME | 18051 Ullrich_LSPS
SCALE



1 SWITCHGEAR ENCLOSURE STRUCTURAL SLAB PLAN
SCALE: 3/16" = 1'-0"

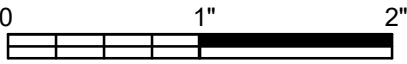
PROJECT MANAGER		
DESIGNED BY		
DRAWN BY		
CHECKED BY		
DATE		
PROJECT NUMBER		
0	01/21/2021	CONFORMED CONTRACT DRAWINGS
ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	W.D. WEHNER
DESIGNED BY	AR / FRV
DRAWN BY	AR
CHECKED BY	FRV
DATE	OCTOBER 2020
PROJECT NUMBER	10123906

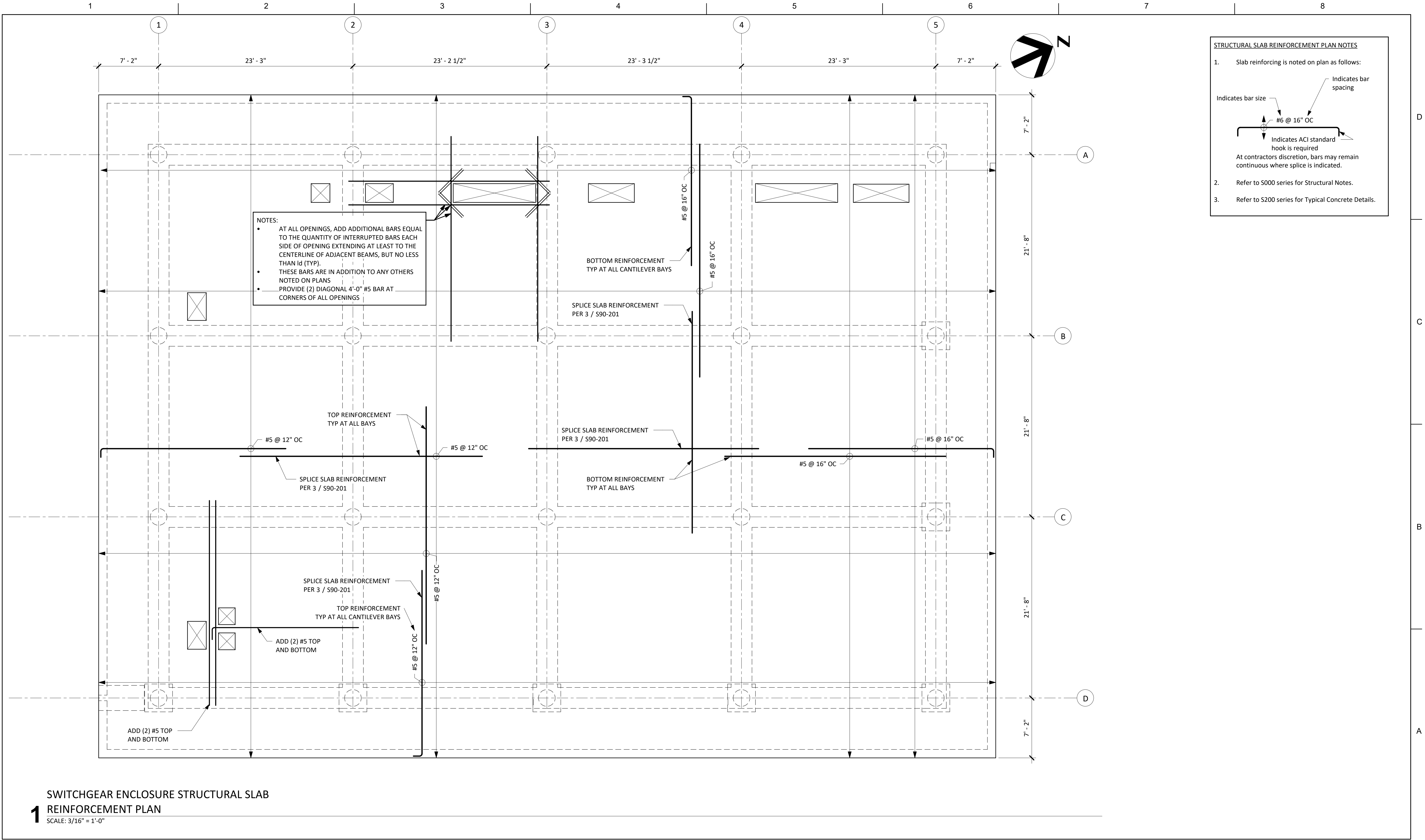


ULLRICH WTP
LOW SERVICE PUMP
STATION
ELECTRICAL FEED RENEWAL

STRUCTURAL SLAB PLAN



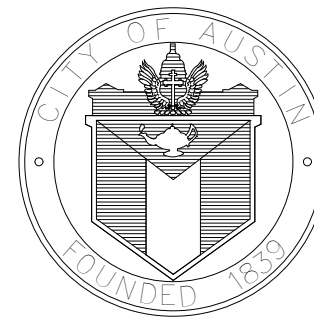
FILENAME | 18051 Ullrich_LSPS
SCALE

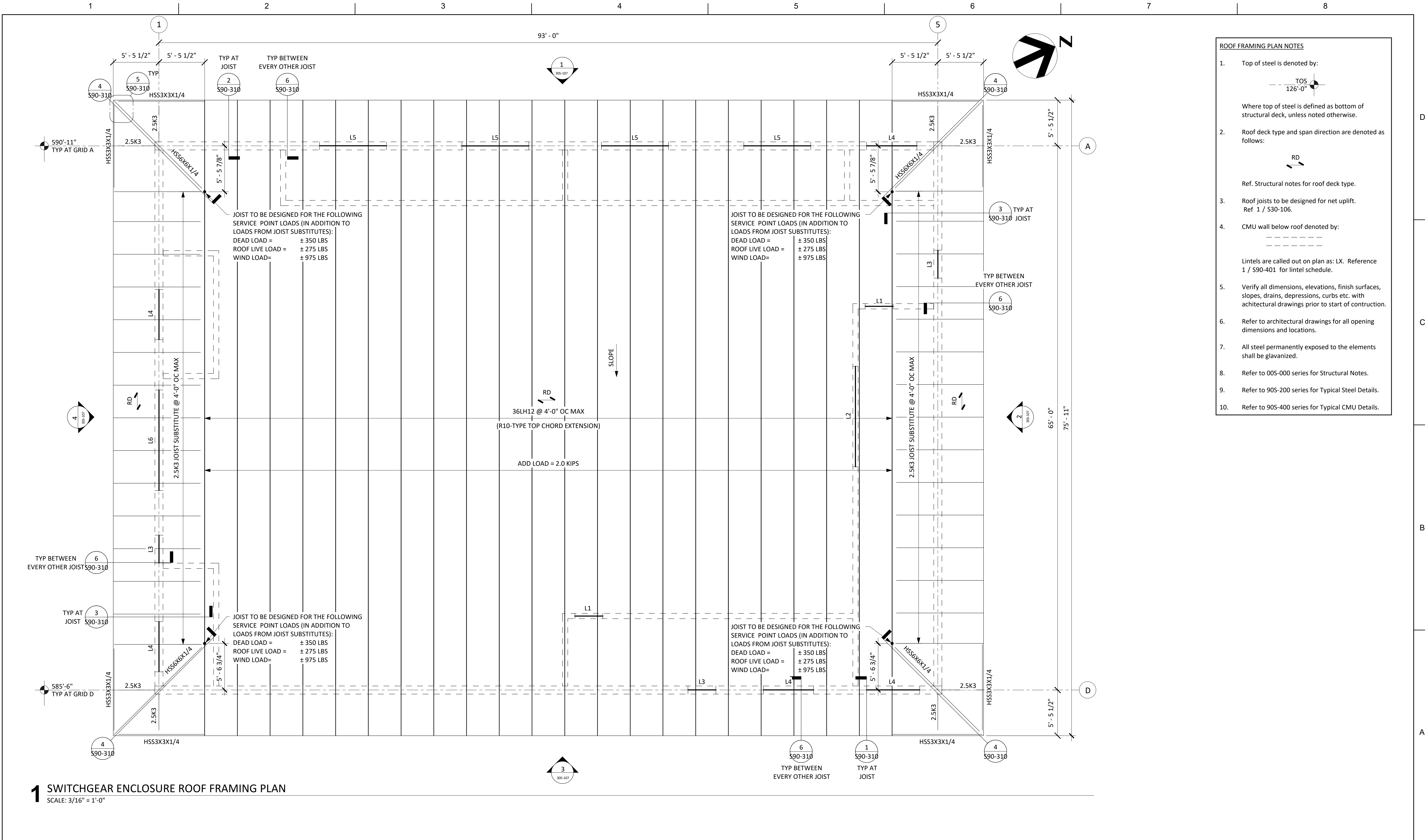


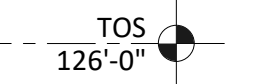
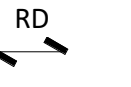
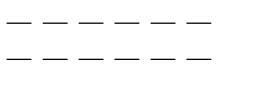
SWITCHGEAR ENCLOSURE STRUCTURAL SLAB
1 REINFORCEMENT PLAN
SCALE: 3/16" = 1'-0"

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- ROOF FRAMING PLAN NOTES**
- Top of steel is denoted by:

Where top of steel is defined as bottom of structural deck, unless noted otherwise.
 - Roof deck type and span direction are denoted as follows:

Ref. Structural notes for roof deck type.
 - Roof joists to be designed for net uplift. Ref 1 / S30-106.
 - CMU wall below roof denoted by:

Lintels are called out on plan as: LX. Reference 1 / S90-401 for lintel schedule.
 - Verify all dimensions, elevations, finish surfaces, slopes, drains, depressions, curbs etc. with achitrectural drawings prior to start of construction.
 - Refer to architectural drawings for all opening dimensions and locations.
 - All steel permanently exposed to the elements shall be glavanized.
 - Refer to 005-000 series for Structural Notes.
 - Refer to 905-200 series for Typical Steel Details.
 - Refer to 905-400 series for Typical CMU Details.

1 SWITCHGEAR ENCLOSURE ROOF FRAMING PLAN
SCALE: 3/16" = 1'-0"

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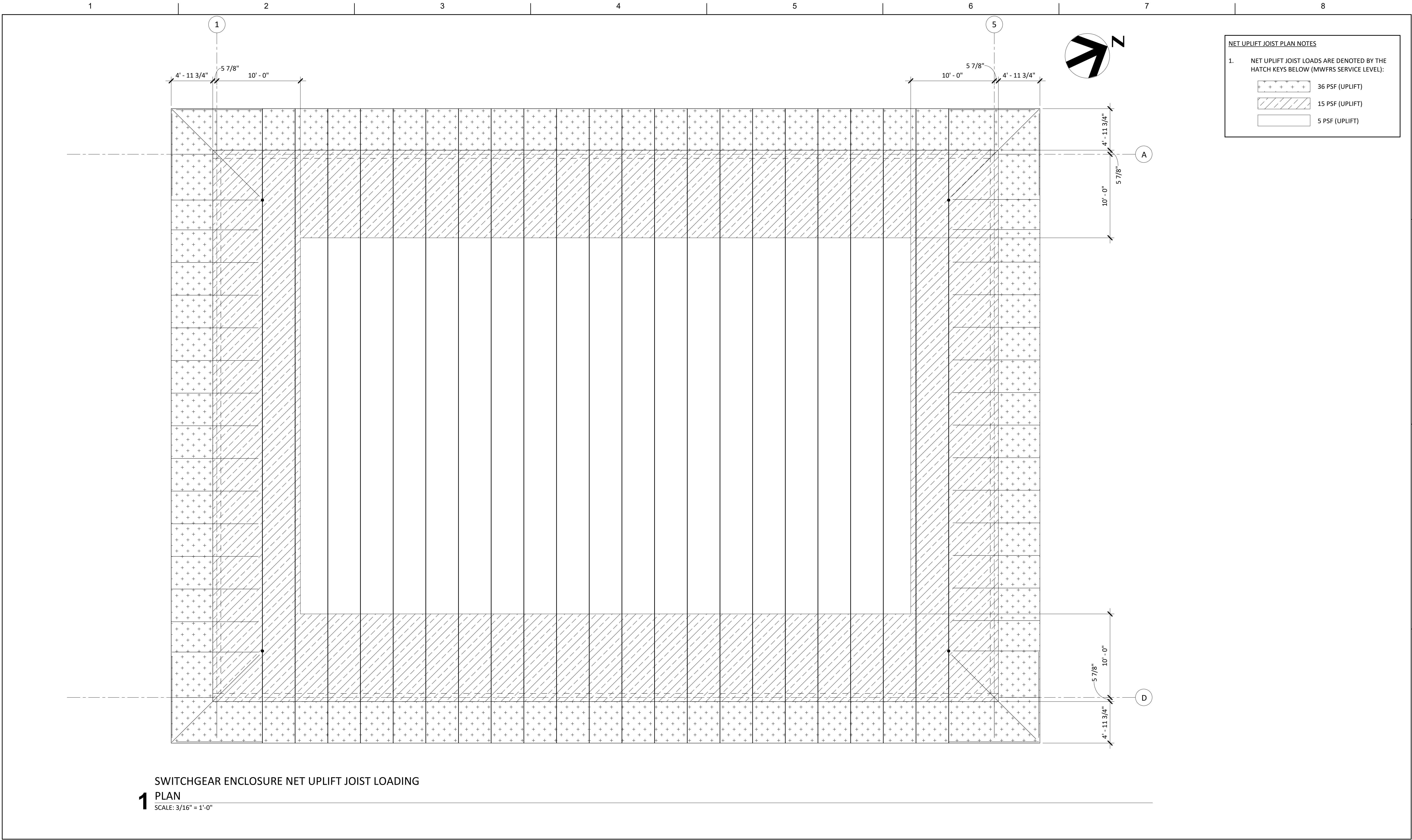


ULLRICH WTP
LOW SERVICE PUMP
STATION
ELECTRICAL FEED RENEWAL

ROOF FRAMING PLAN



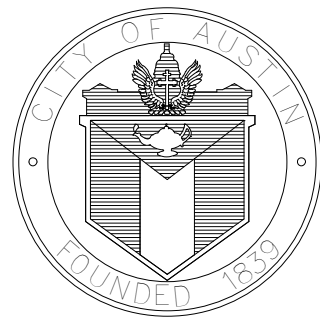
FILENAME 18051 Ullrich_LSPS
SCALE



SWITCHGEAR ENCLOSURE NET UPLIFT JOIST LOADING
1 PLAN
SCALE: 3/16" = 1'-0"

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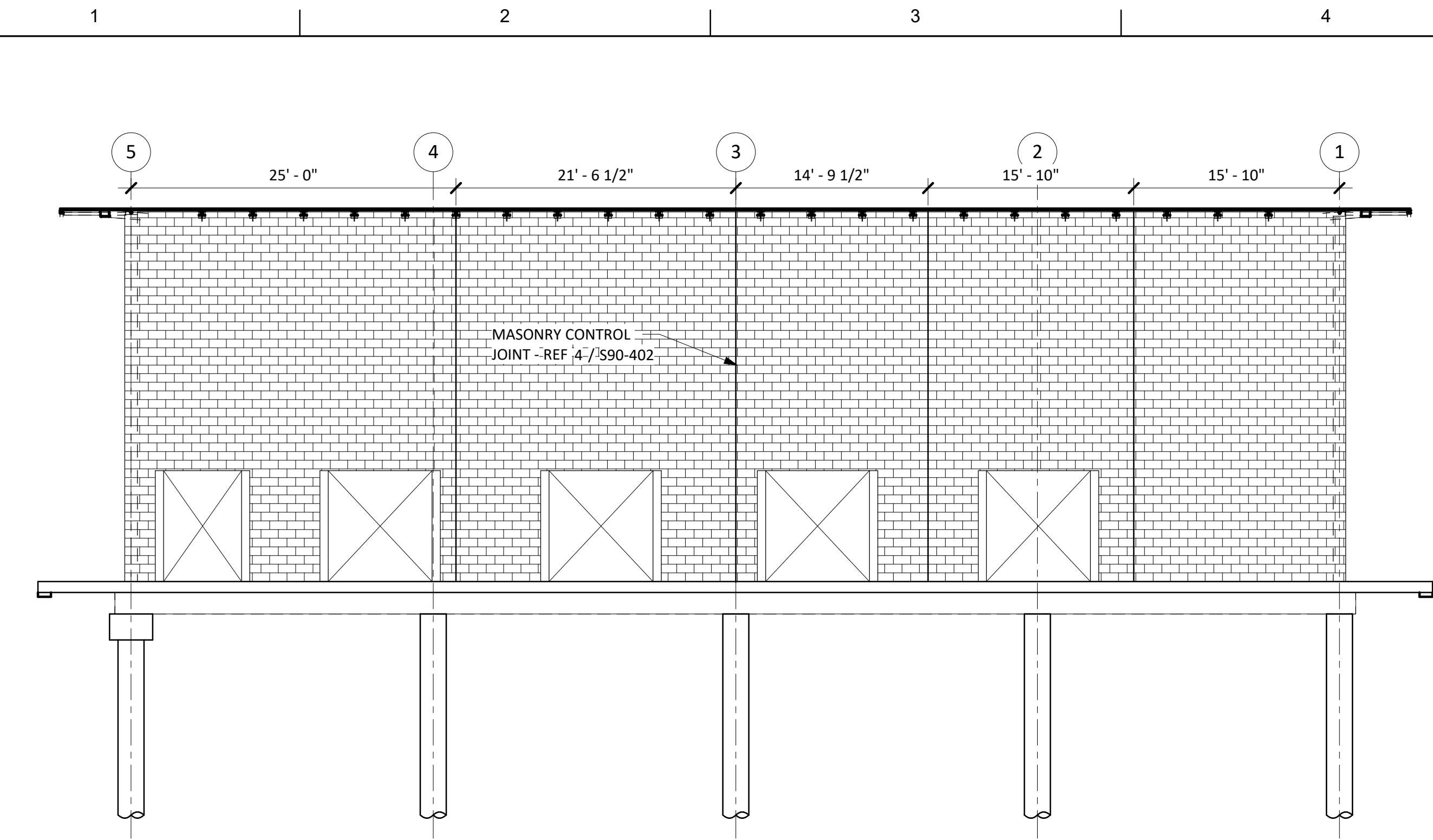


ULLRICH WTP
LOW SERVICE PUMP
STATION
ELECTRICAL FEED RENEWAL

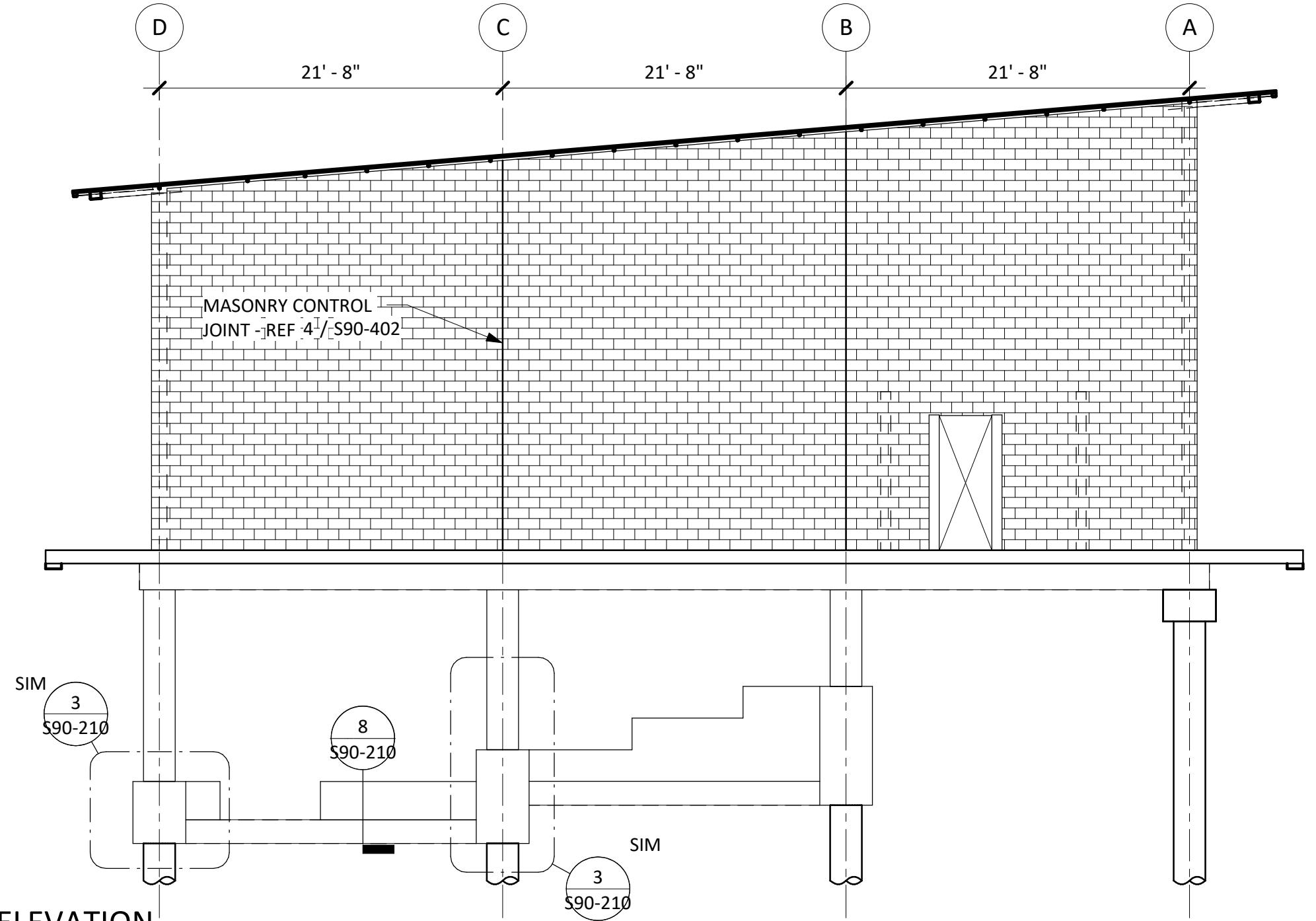
NET UPLIFT JOIST LOADING PLAN



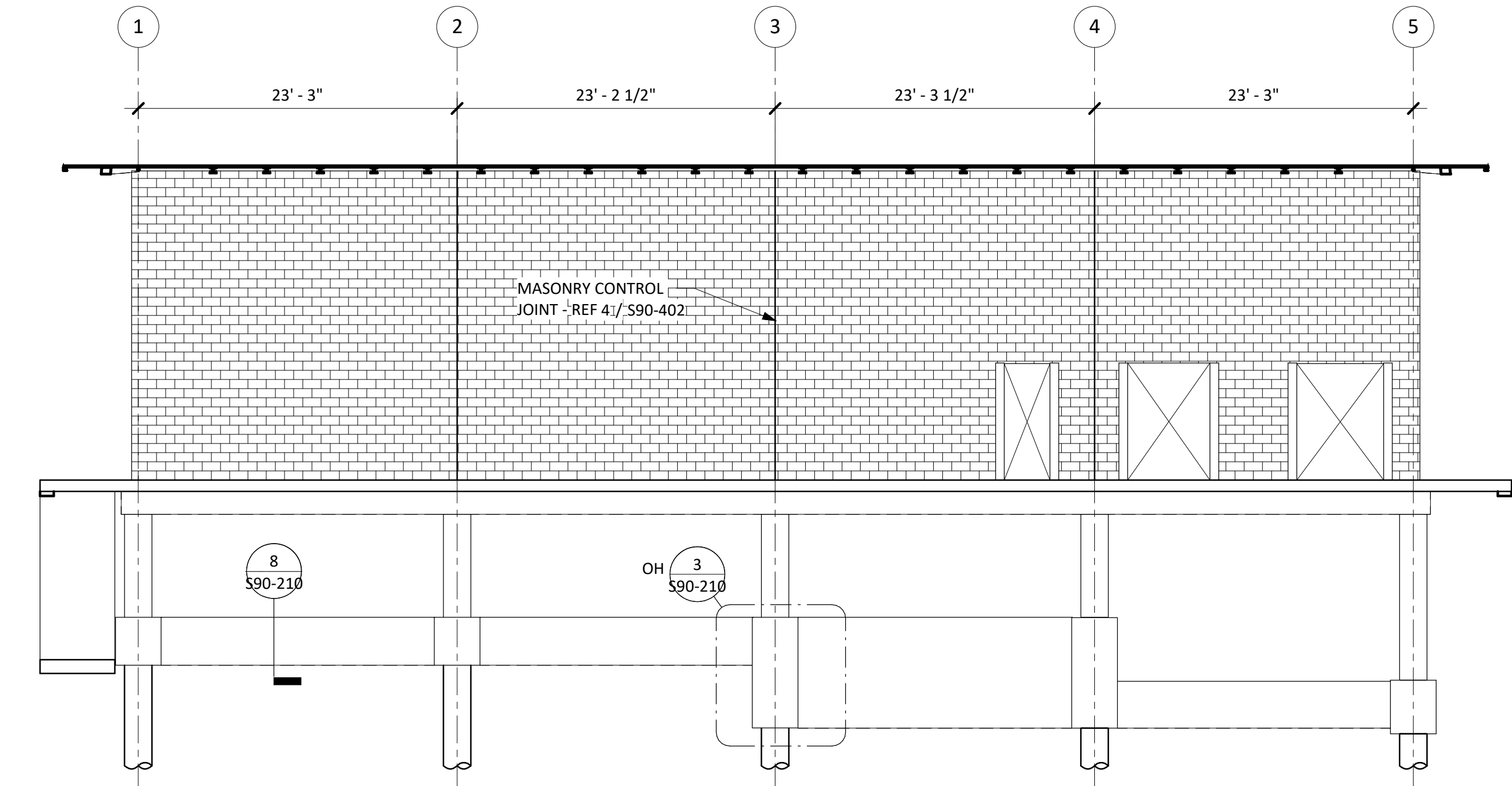
FILENAME | 18051 Ullrich_LSPS
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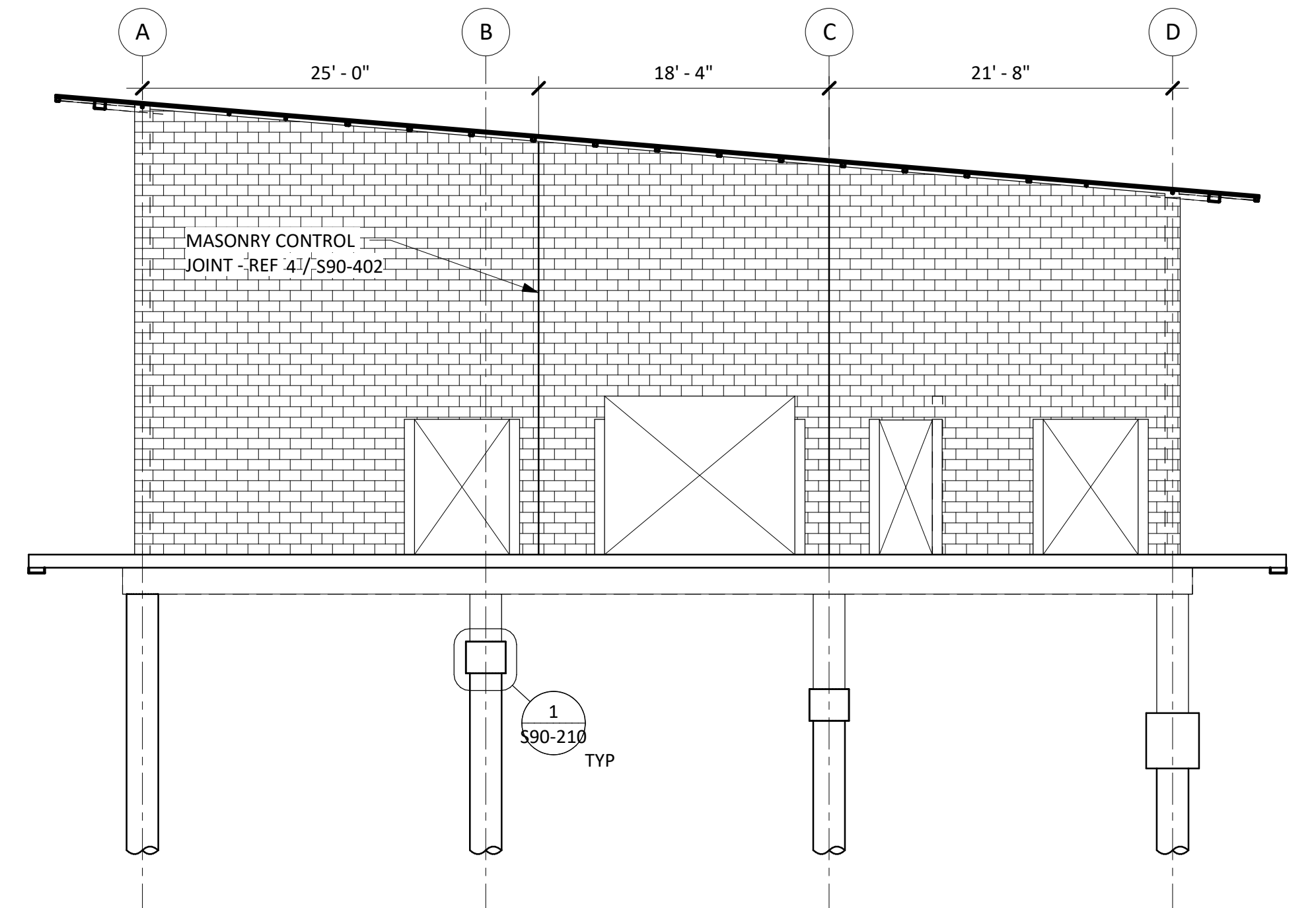
1 NORTH ELEVATION
SCALE: 1/8" = 1'-0"



2 EAST ELEVATION
SCALE: 1/8" = 1'-0"



3 SOUTH ELEVATION
SCALE: 1/8" = 1'-0"

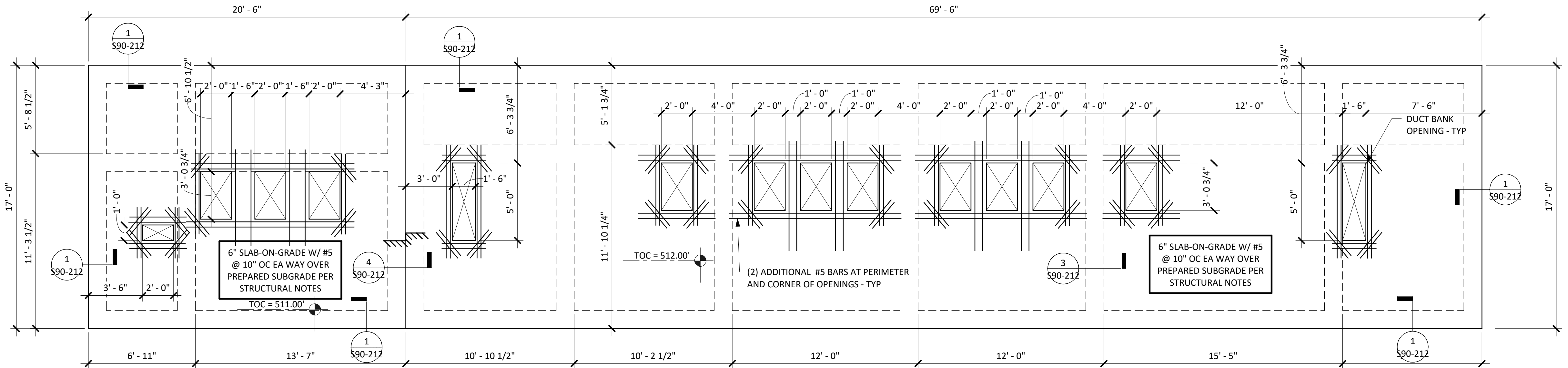


4 WEST ELEVATION
SCALE: 1/8" = 1'-0"

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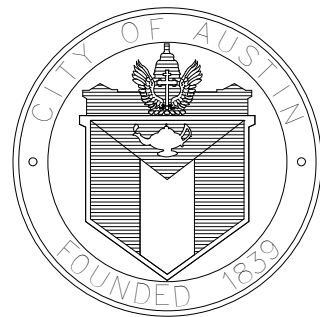


- SLAB PLAN NOTES**
- Slab opening locations shown are based on electrical backgrounds and provided for convenience. Final locations must be verified prior to forming or placing concrete. Structural is not responsible for locations of openings within slab.
 - Refer to 00S-000 series for Structural Notes.
 - Refer to 90S-200 series for Typical Concrete Details.

1 OUTDOOR ELECTRICAL AREA FOUNDATION PLAN
SCALE: 1/4" = 1'-0"

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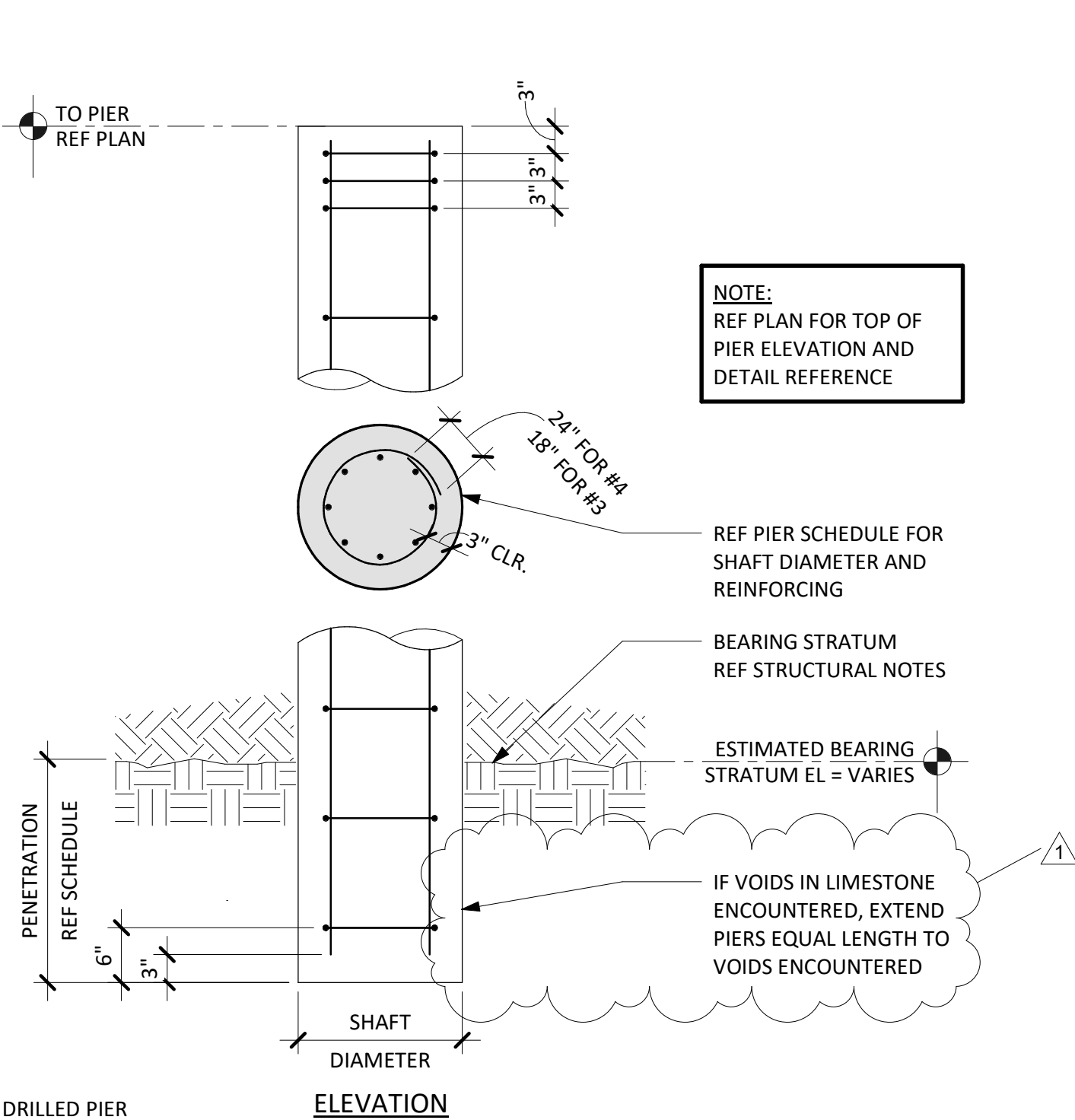


ULLRICH WTP
LOW SERVICE PUMP
STATION
ELECTRICAL FEED RENEWAL

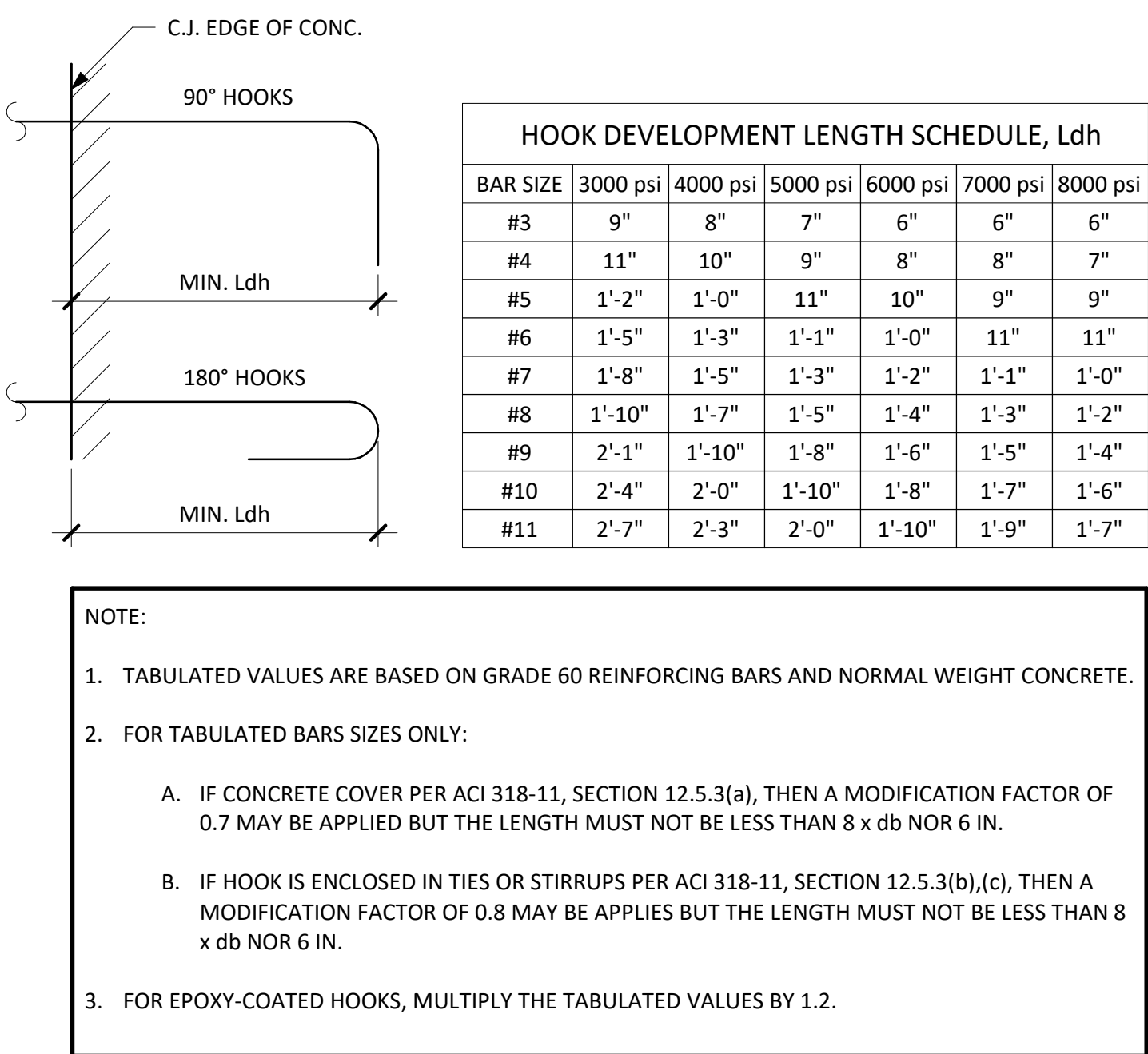
OUTDOOR ELECTRICAL AREA
FOUNDATION PLAN



FILENAME | 18051 Ullrich_LSPS
SCALE



1 TYPICAL DETAIL
SCALE: NTS



2 TYPICAL DETAIL
SCALE: NTS

REINFORCEMENT SPLICE LENGTH BEAM SCHEDULE												
	f'c=3000 psi CONCRETE		f'c=4000 psi CONCRETE		f'c=5000 psi CONCRETE		f'c=6000 psi CONCRETE		f'c=7000 psi CONCRETE		f'c=8000 psi CONCRETE	
CLASS BAR SIZE	"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"
#3	1'-5"	1'-10"	1'-3"	1'-7"	1'-1"	1'-5"	1'-0"	1'-4"	1'-0"	1'-4"	1'-0"	1'-4"
#4	1'-10"	2'-5"	1'-7"	2'-1"	1'-5"	1'-10"	1'-4"	1'-8"	1'-3"	1'-7"	1'-2"	1'-6"
#5	2'-4"	3'-0"	2'-0"	2'-7"	1'-10"	2'-4"	1'-8"	2'-1"	1'-6"	2'-0"	1'-5"	1'-10"
#6	2'-9"	3'-7"	2'-5"	3'-1"	2'-2"	2'-9"	2'-0"	2'-7"	1'-10"	2'-4"	1'-8"	2'-2"
#7	4'-0"	5'-3"	3'-6"	4'-6"	3'-1"	4'-1"	2'-10"	3'-8"	2'-8"	3'-5"	2'-6"	3'-2"
#8	4'-7"	6'-0"	4'-0"	5'-2"	3'-7"	4'-7"	3'-3"	4'-3"	3'-0"	3'-11"	2'-10"	3'-8"
#9	5'-2"	6'-10"	4'-6"	5'-10"	4'-0"	5'-3"	3'-8"	4'-9"	3'-5"	4'-5"	3'-2"	4'-1"
#10	5'-10"	7'-8"	5'-1"	6'-7"	4'-6"	5'-10"	4'-1"	5'-4"	3'-10"	4'-11"	3'-7"	4'-8"
#11	6'-6"	8'-6"	5'-7"	7'-3"	5'-0"	6'-6"	4'-7"	5'-11"	4'-3"	5'-6"	4'-0"	5'-2"

NOTE:

1. WHERE SPLICE TYPE IS NOT INDICATED, USE CLASS "B" SPLICE.

2. LAP LENGTHS LISTED ABOVE APPLY UNDER THE FOLLOWING CONDITIONS:

- A. BEAM AND COLUMN BARS ARE SPACED AT LEAST 1 BAR DIAMETER OC WITH CLEAR COVER NOT LESS THAN 1 BAR DIA.
- B. WALL AND SLAB BARS ARE SPACED AT LEAST 2 BAR DIA OC.
- C. FOR UNCOATED AND ZINC-COATED (GALVANIZED) REINFORCEMENT.
- D. FOR REINFORCEMENT THAT CONFORMS DEFORMED NEW BILLET STEEL BARS IN ACCORDANCE TO ASTM A615 GR. 60.

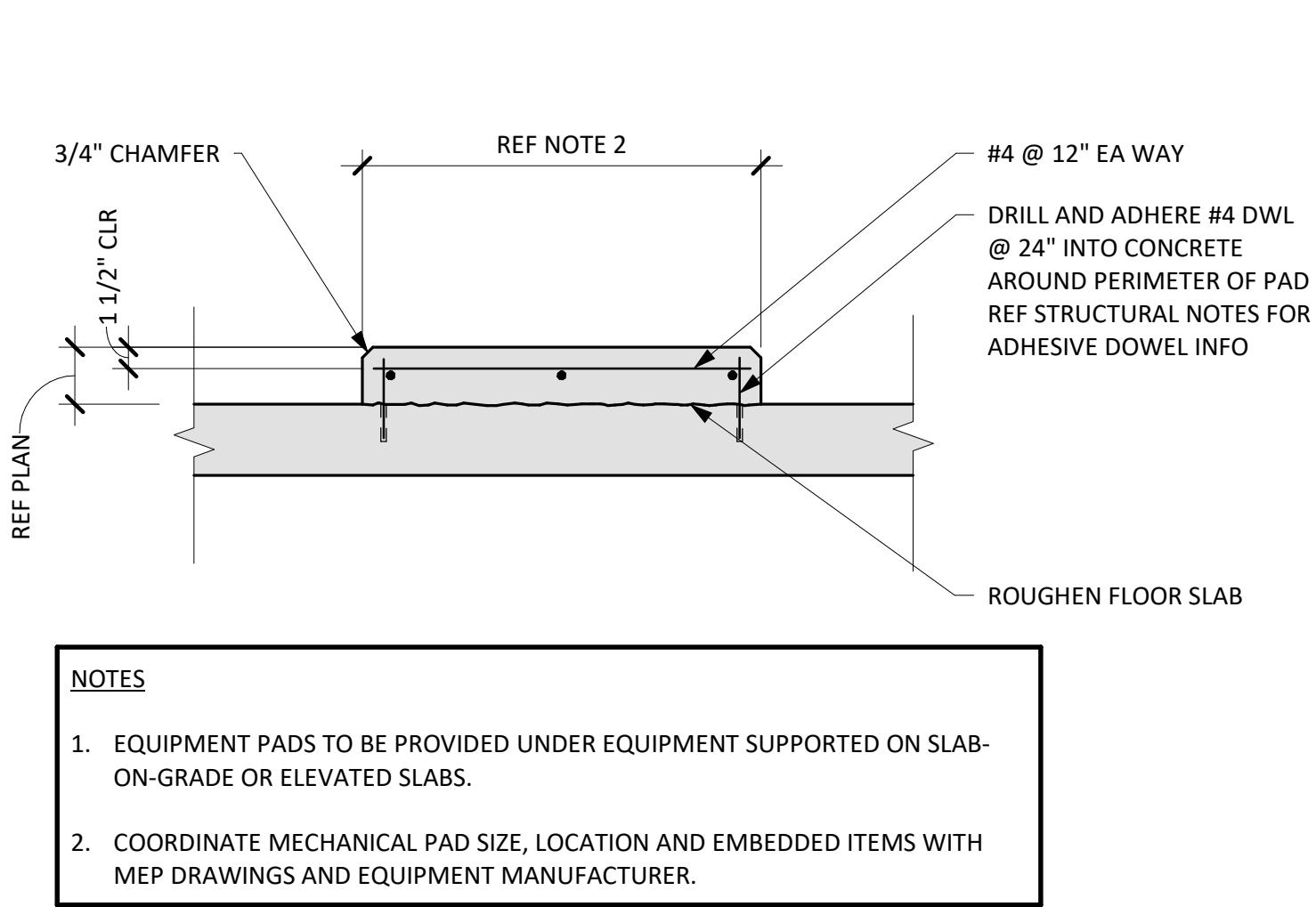
3. FOR HORIZ TOP BARS WITH 12" OF CONCRETE CAST BELOW, MULTIPLY TABULATIONS BY 1.3.

4. WHERE A LARGER BAR LAPS A SMALLER BAR, THE SMALLER SCHEDULED LAP LENGTH APPLIES.

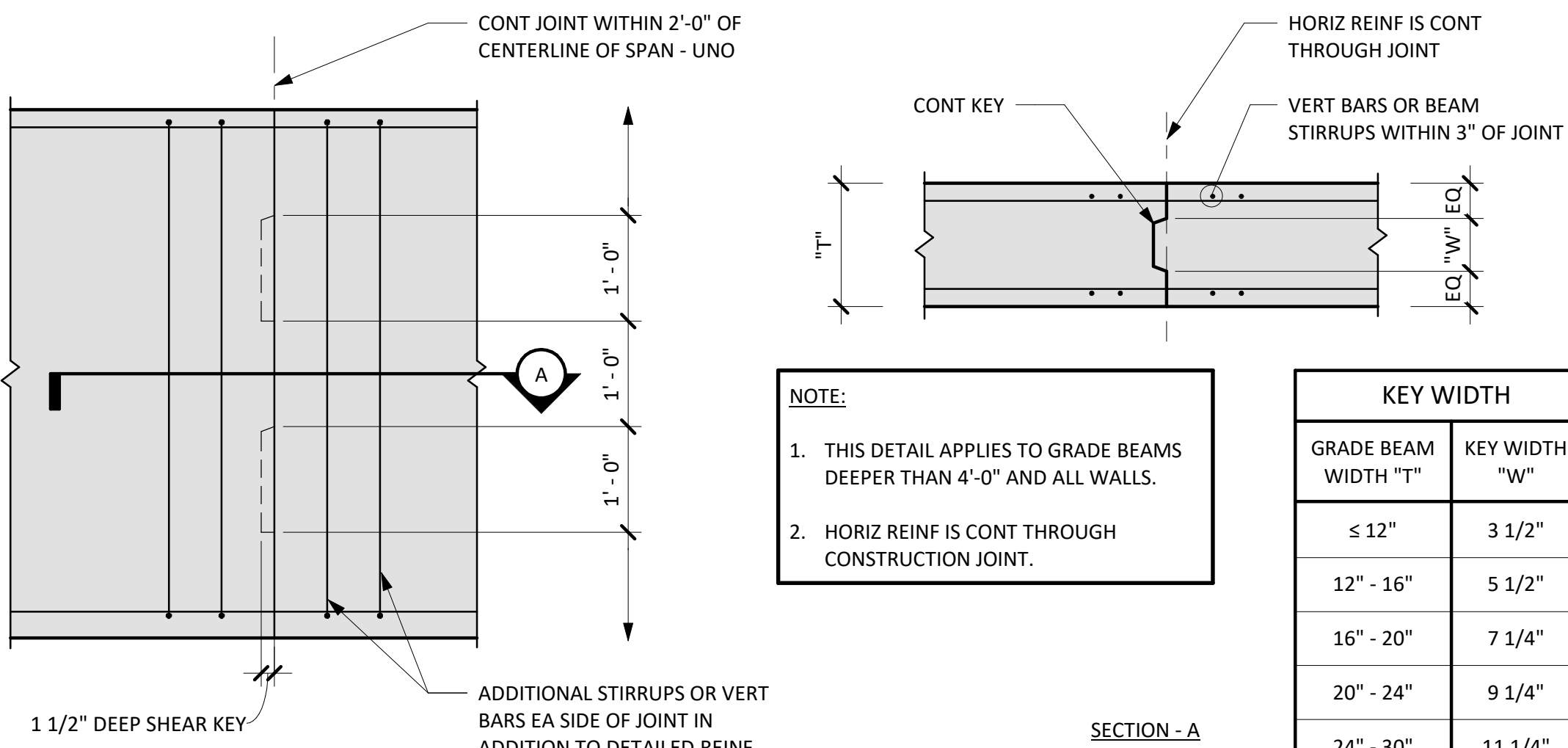
5. REFER TO "CONCRETE REINFORCING" SECTION OF THE STRUCTURAL NOTES FOR FURTHER INFORMATION.

6. FOR CMU REINFORCEMENT SPLICE LENGTH SCHEDULE, SEE CMU DETAILS.

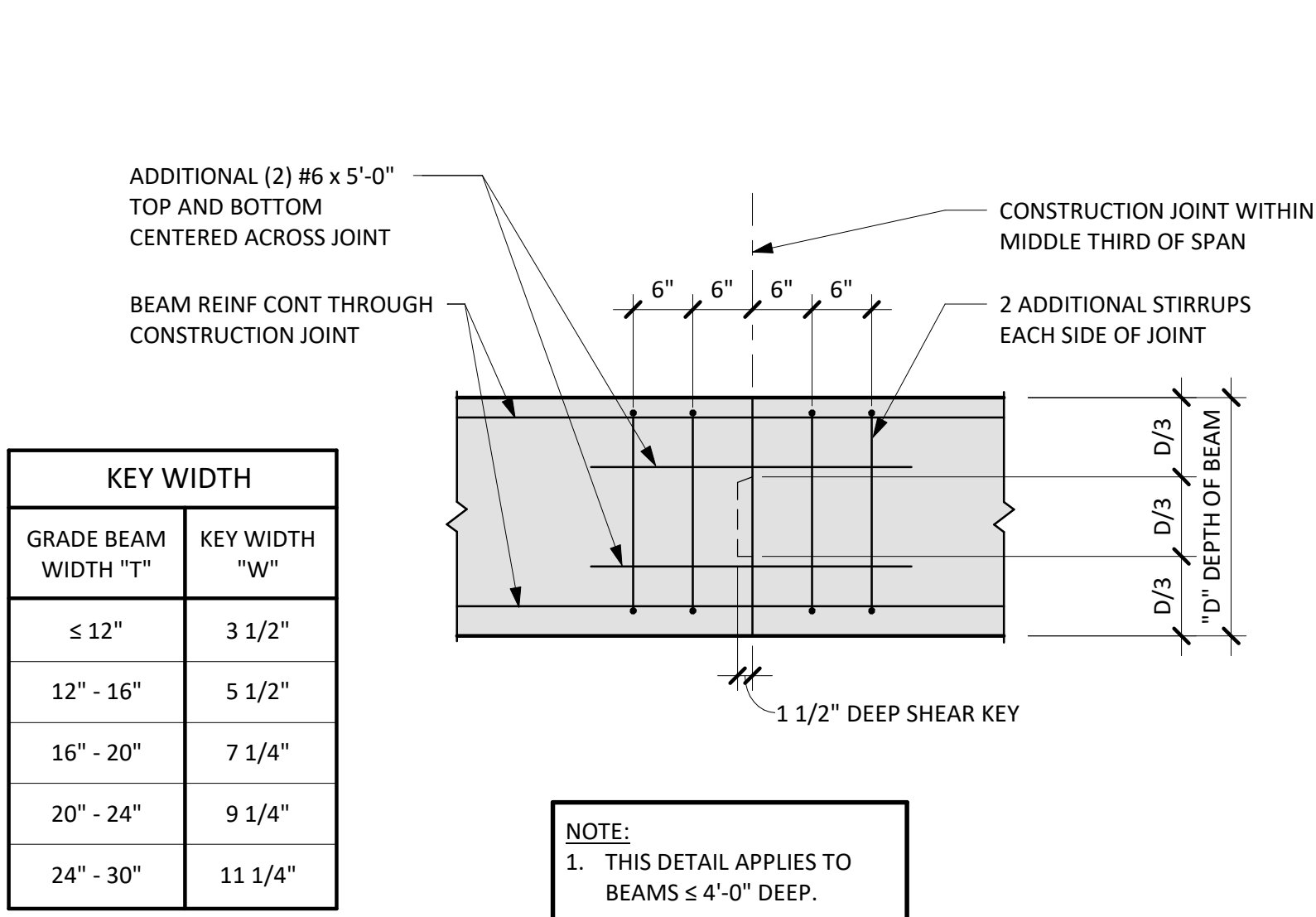
3 TYPICAL DETAIL
SCALE: NTS



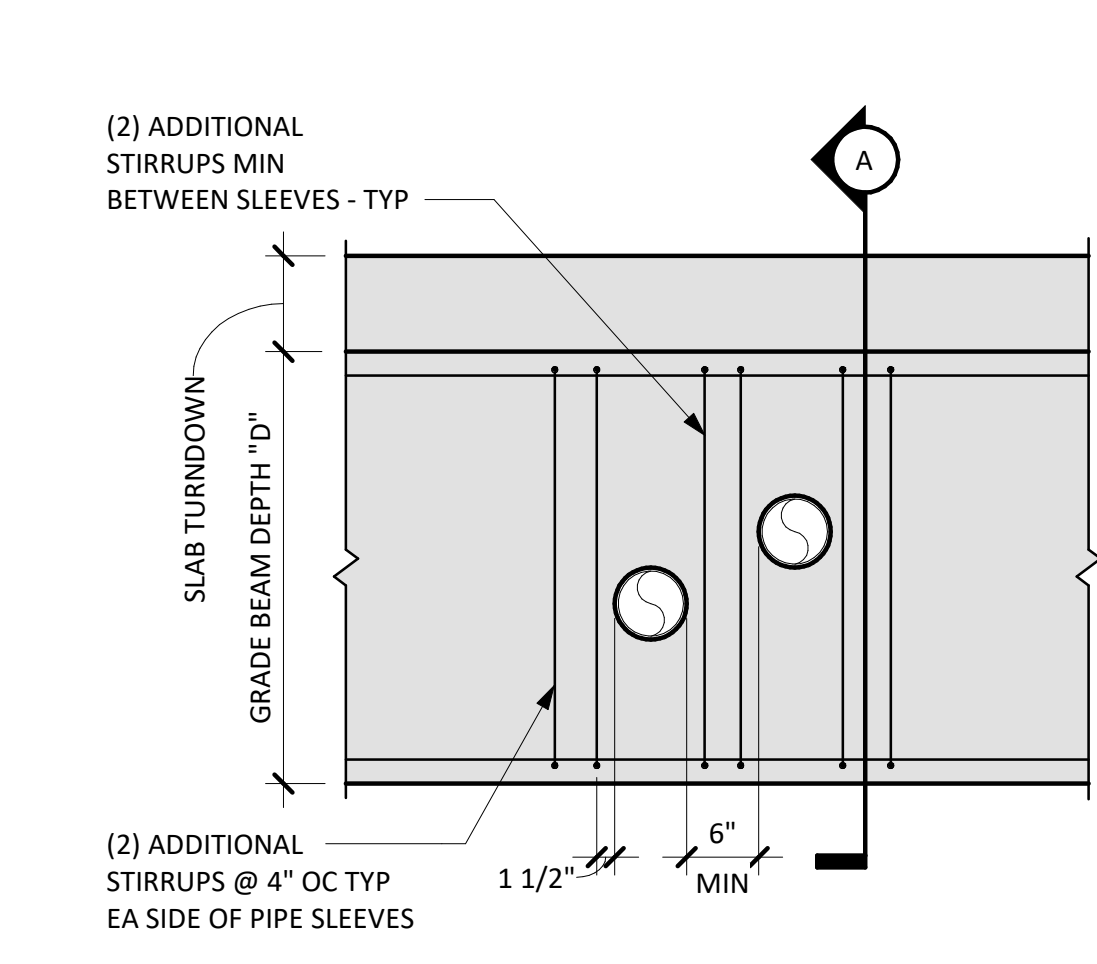
4 TYPICAL DETAIL
SCALE: NTS



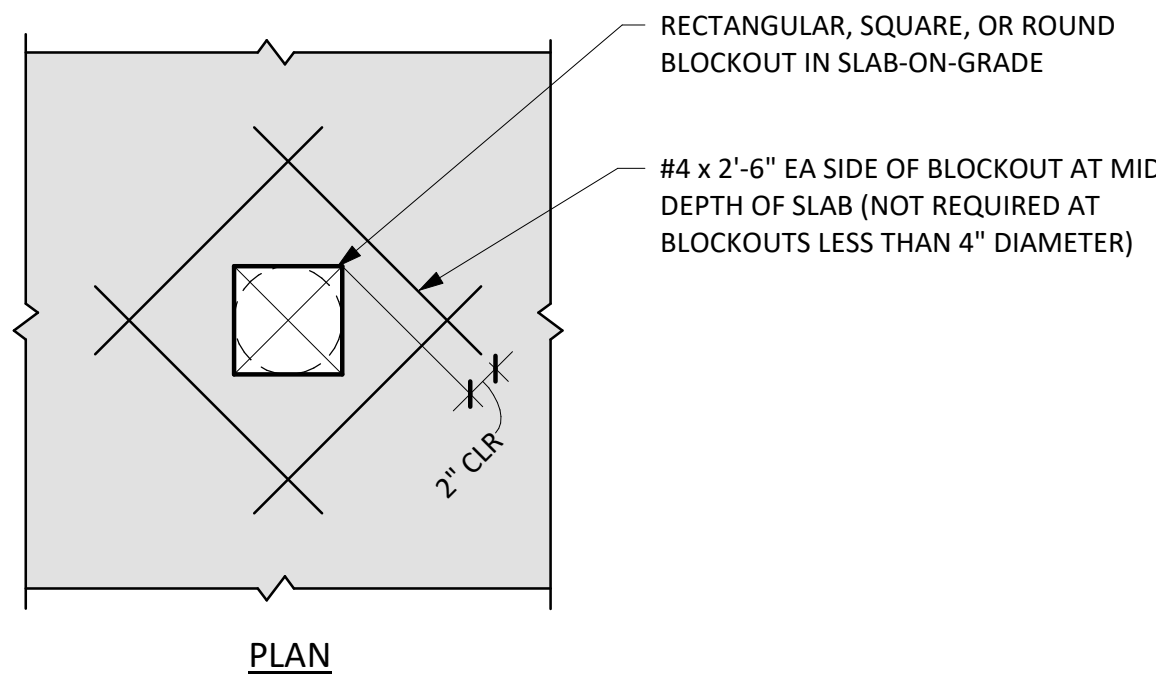
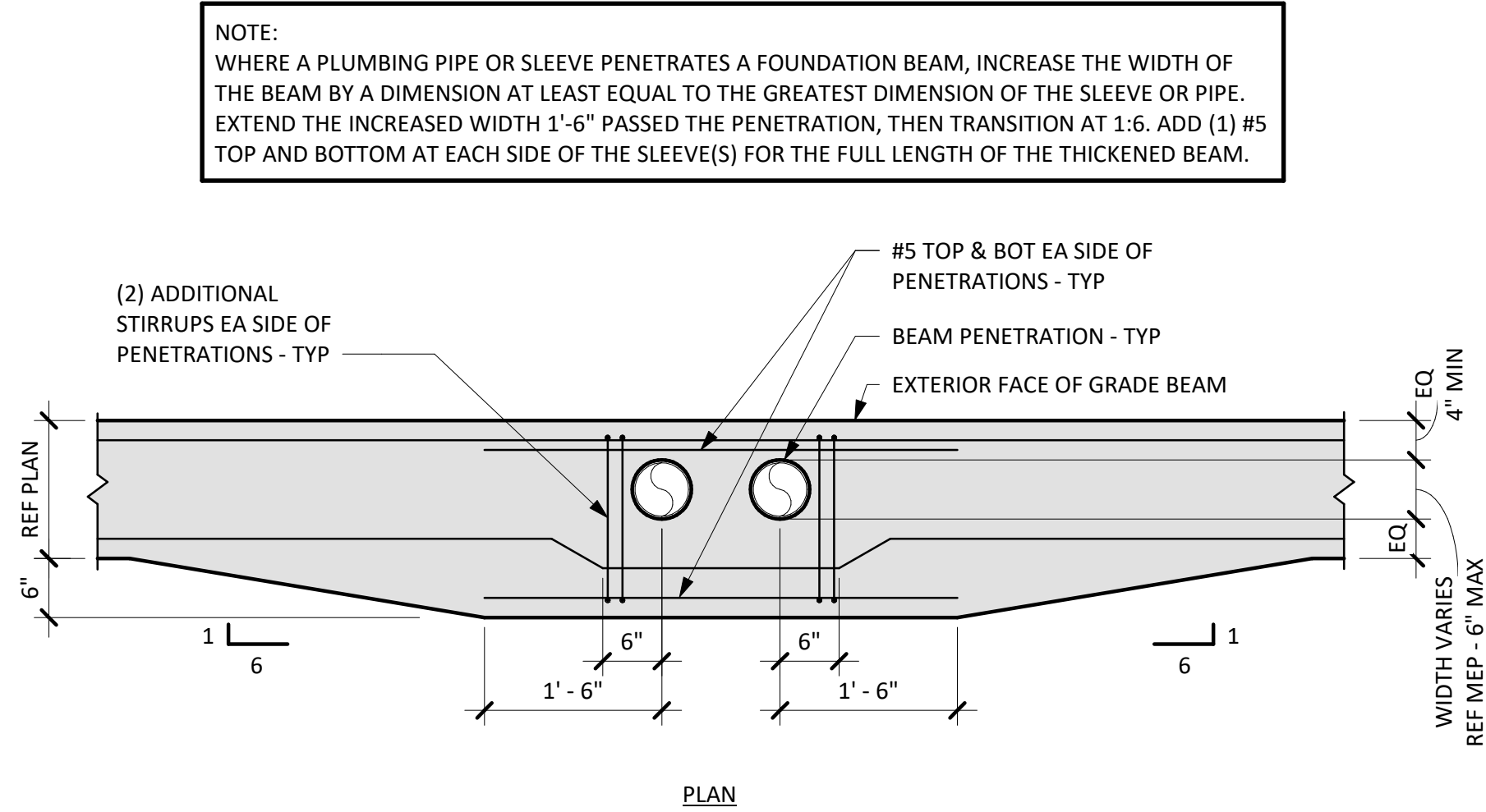
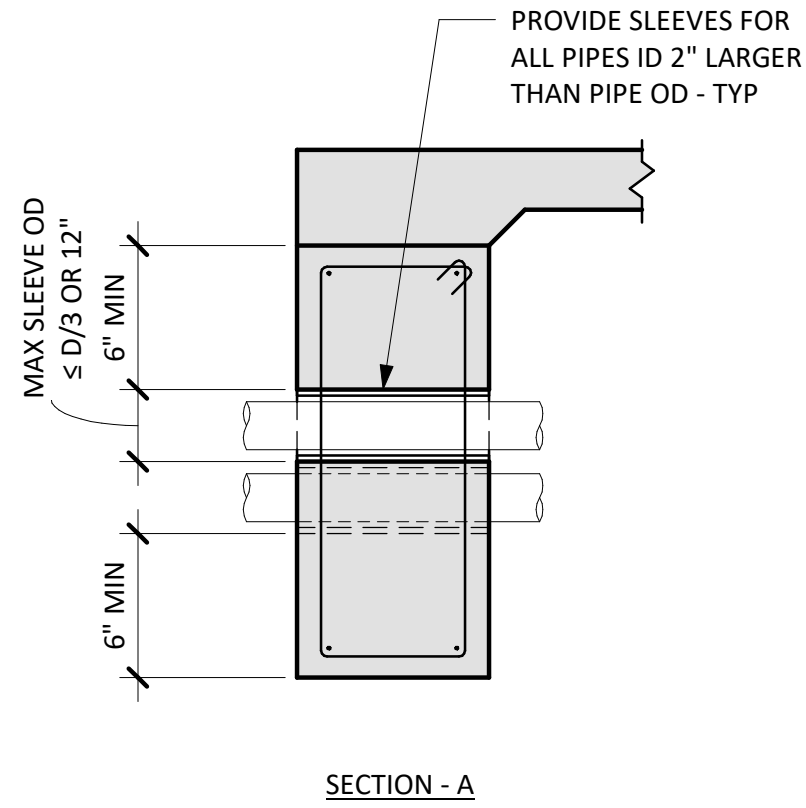
5 TYPICAL DETAIL
SCALE: NTS



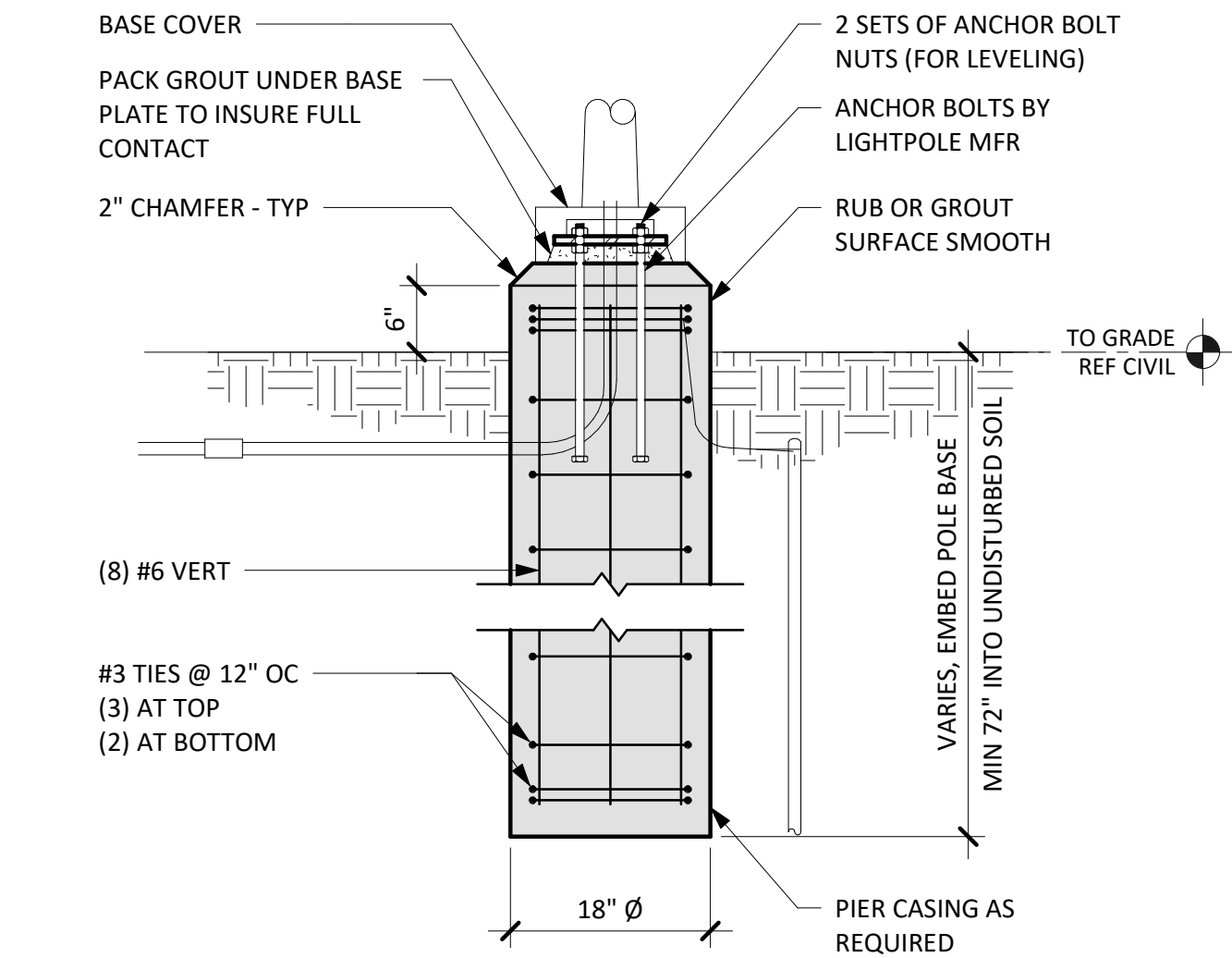
6 TYPICAL DETAIL
SCALE: NTS



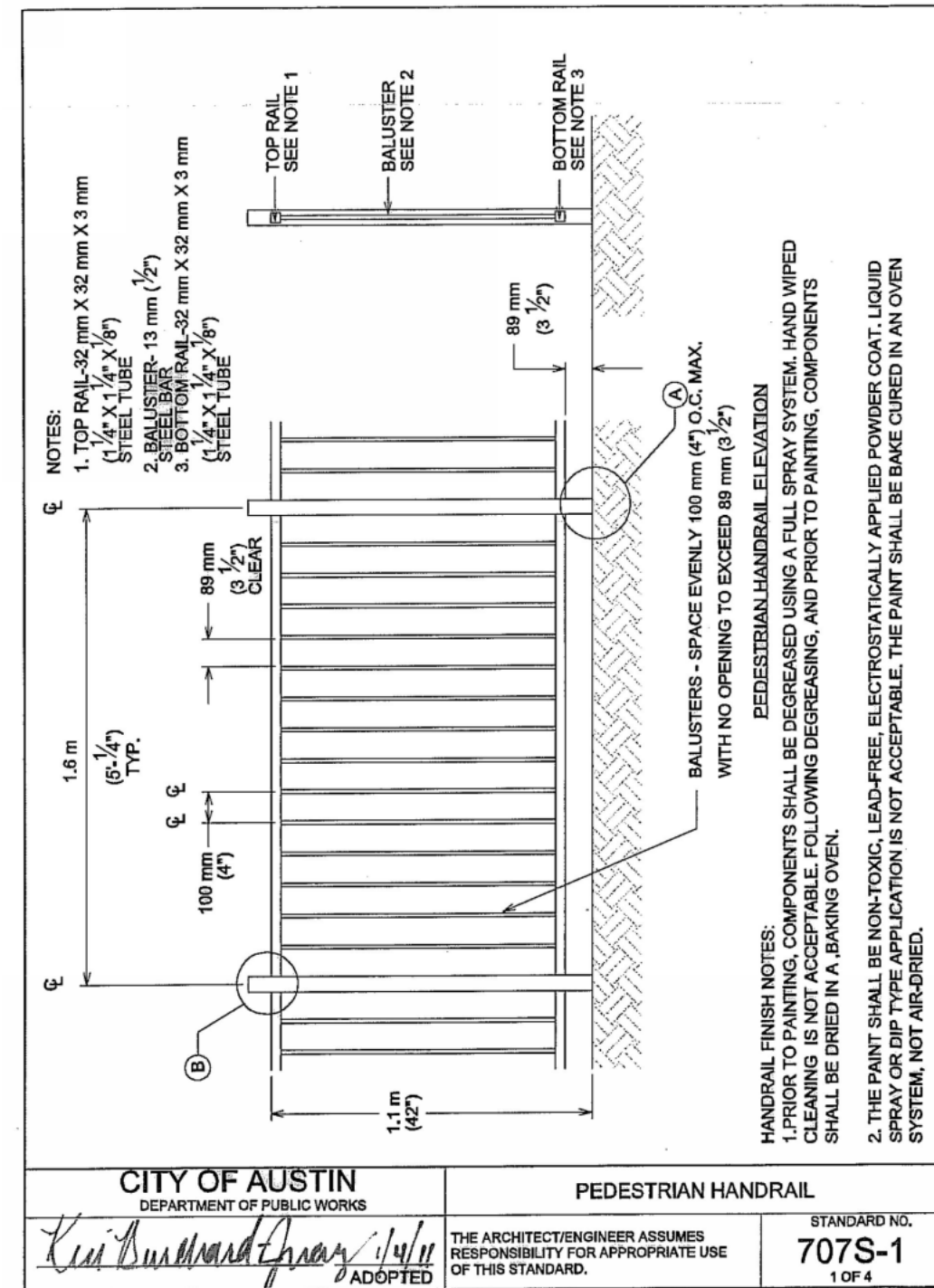
1 HORIZONTAL GRADE BEAM PENETRATION
SCALE: NTS



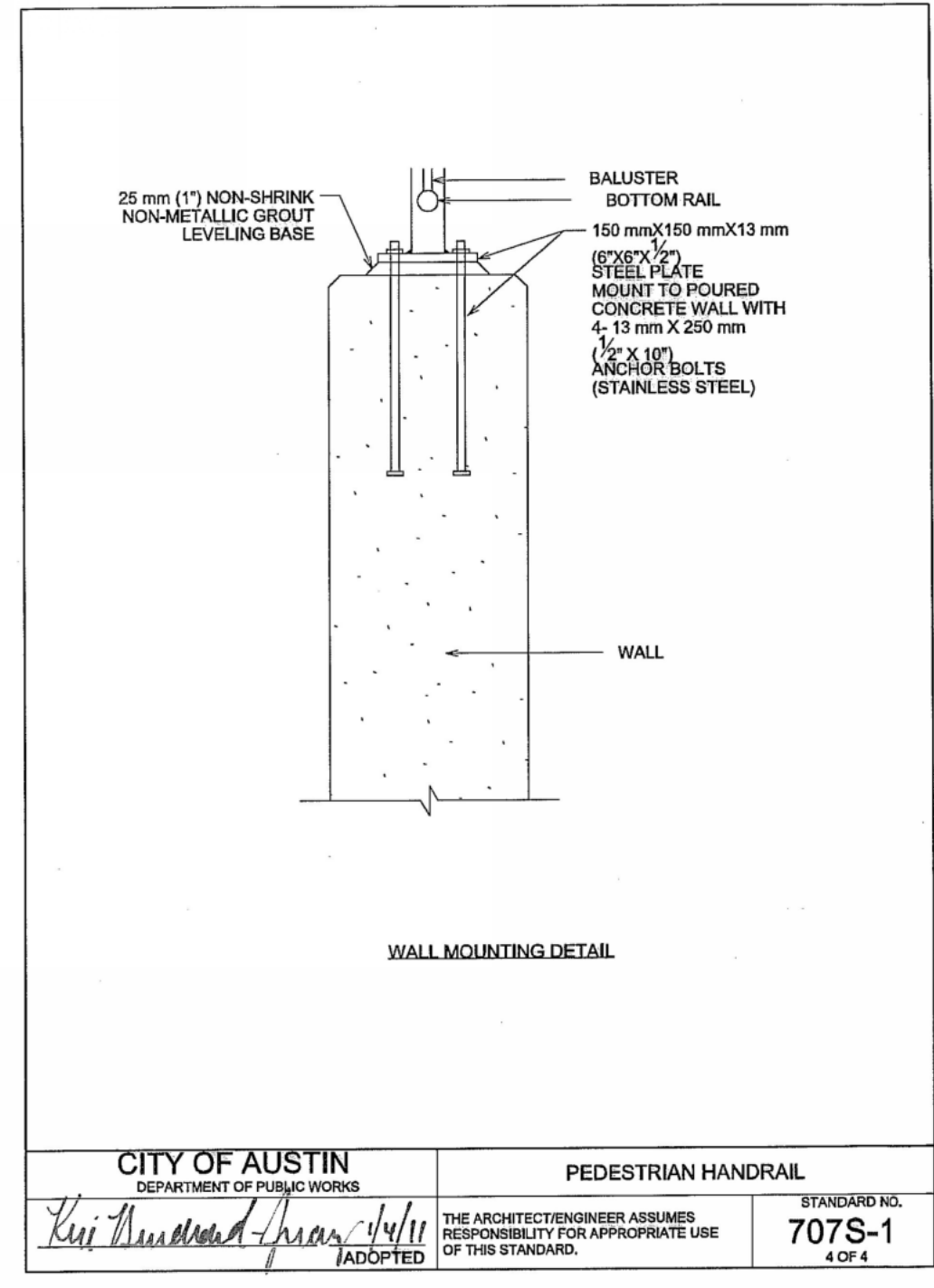
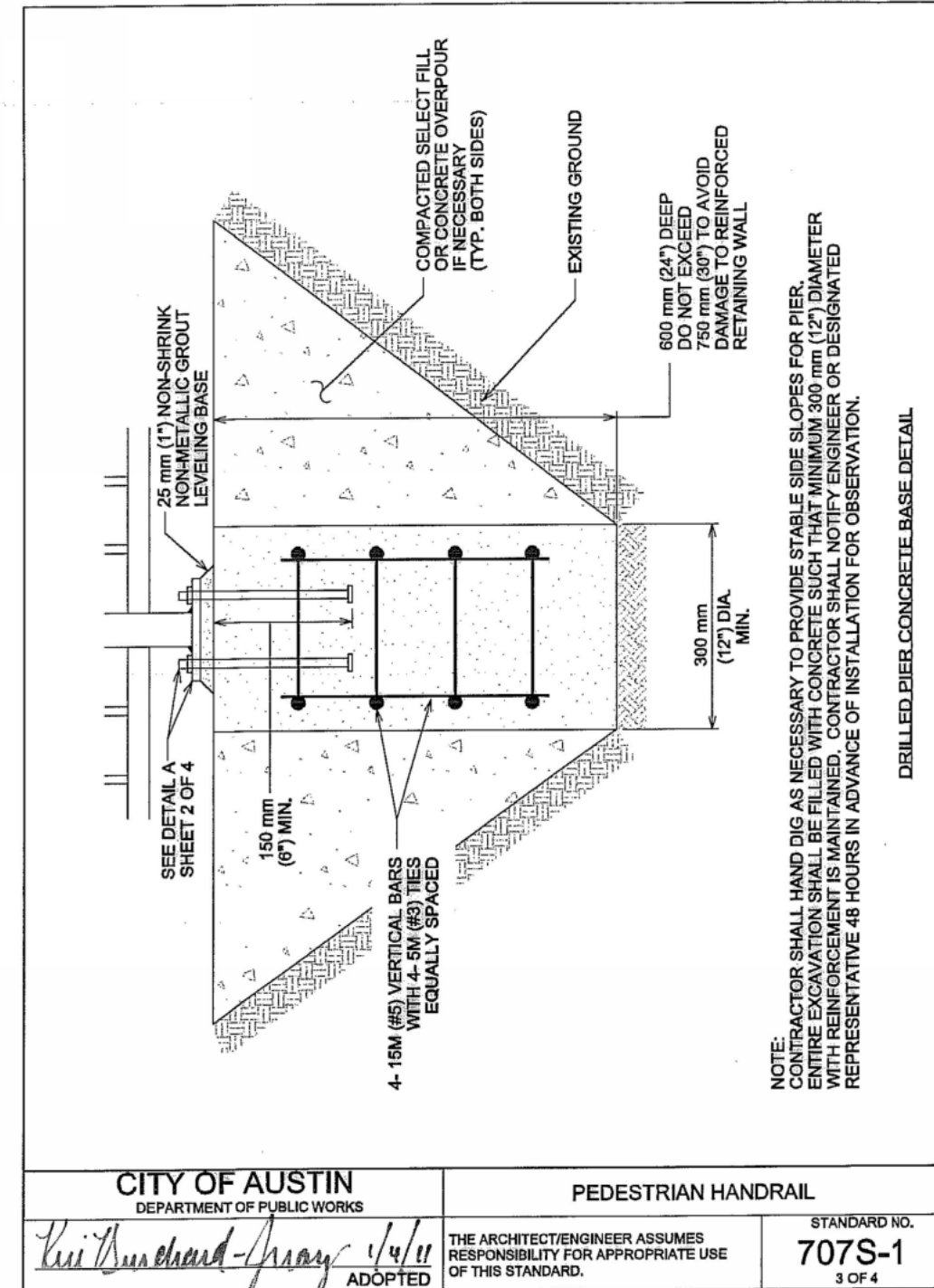
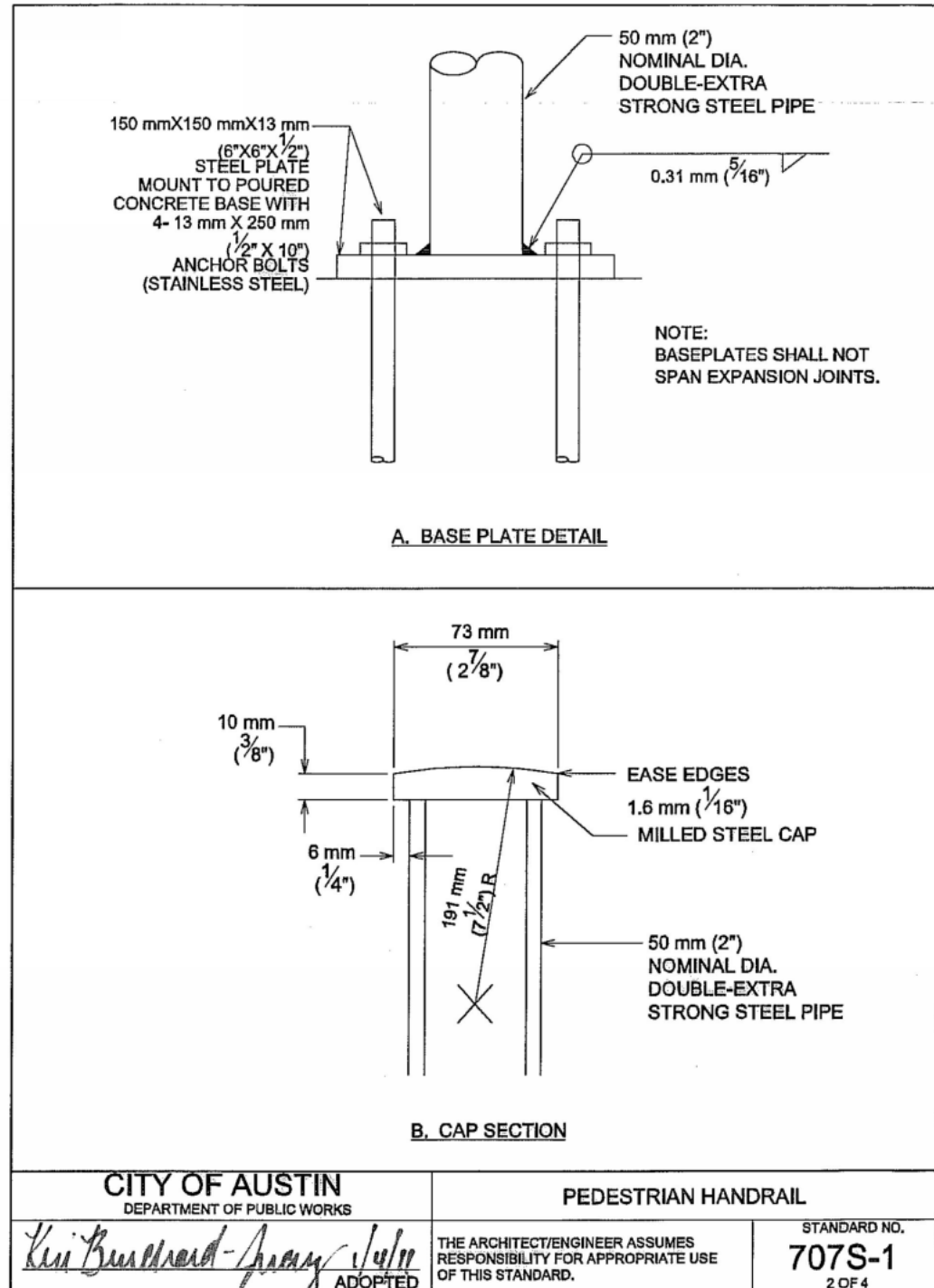
3 VERTICAL SLAB PENETRATION
SCALE: NTS

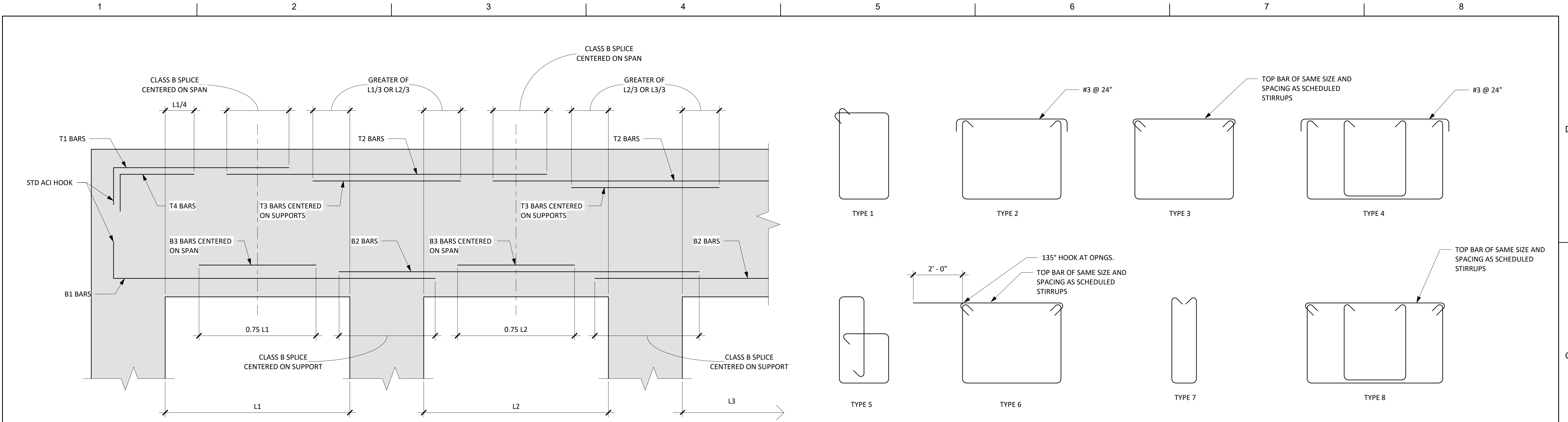


4 LIGHT POLE BASE
SCALE: 3/4" = 1'-0"



5 CITY OF AUSTIN STANDARD PEDESTRIAN HAND RAIL DETAILS
SCALE: NTS





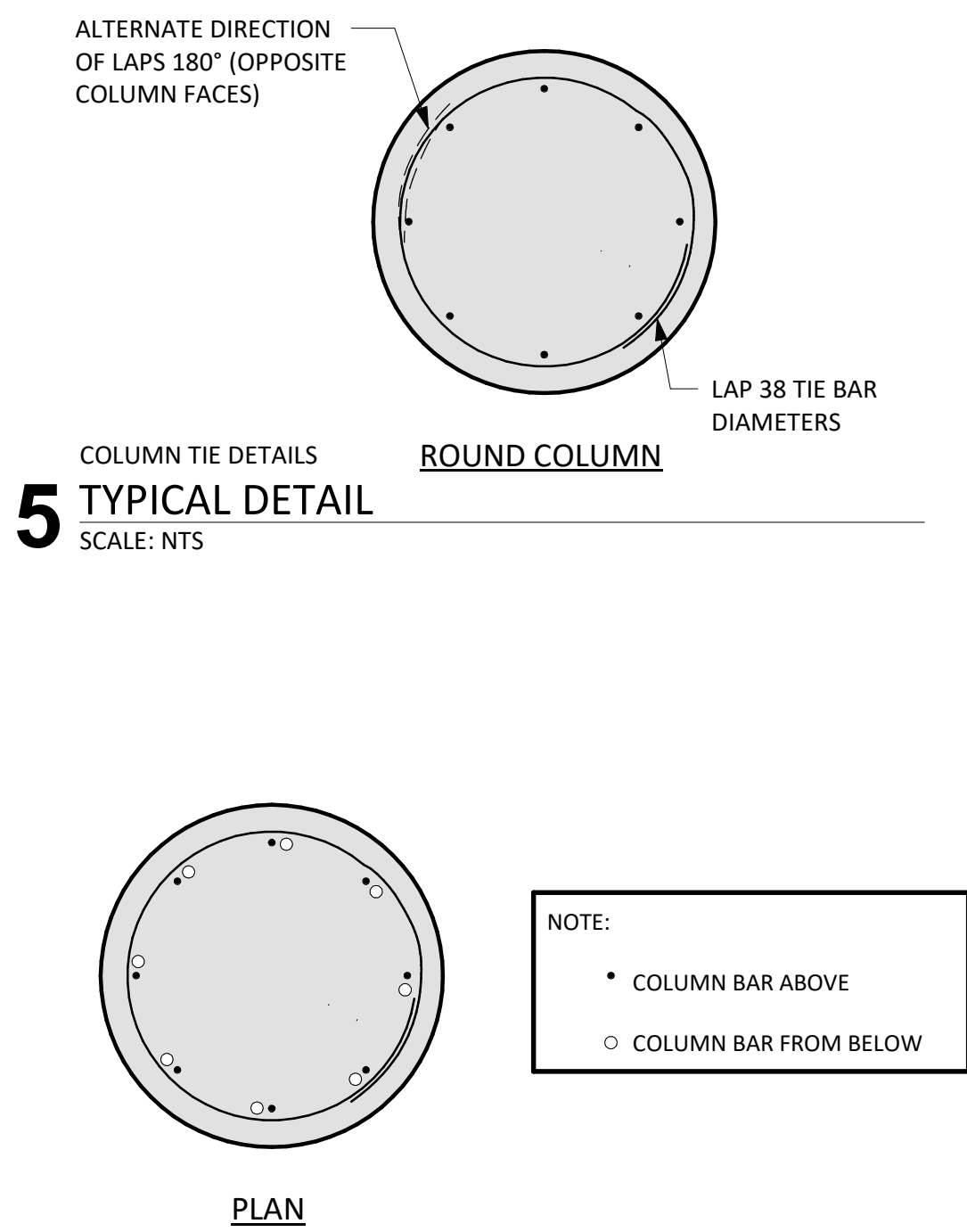
1 BAR PLACEMENT DIAGRAM
TYPICAL DETAIL
SCALE: NTS

2 STIRRUP TYPES
TYPICAL DETAIL
SCALE: NTS

CONCRETE BEAM SCHEDULE													
CONCRETE			REINFORCEMENT - TOP				REINFORCEMENT - BOT.				SHEAR REINFORCING		
MARK	WIDTH	DEPTH	NO.	SIZE	TYPE	NOTES	NO.	SIZE	TYPE	NOTES	SIZE	TYPE	SPACING EACH END
B1	30	30	4	#8	T1		4	#8	B1		#4	2	1@3, R@12
			4	#8	T2								
			2	#8	T3								
B2	30	30	4	#8	T2		4	#8	B2		#4	2	1@3, R@12
			2	#8	T3								
B3	30	30	4	#8	T1	1	4	#8	B1	1	#4	2	1@3, R@12
B4	30	30	4	#9	T1		4	#9	B1		#4	3	1@3, 10@10, R@12
			4	#9	T2								
			2	#9	T3								
B5	30	30	4	#9	T2		4	#8	B2		#4	3	1@3, 10@10, R@12
			2	#9	T3								
B6	30	30	4	#9	T1	1	4	#9	B1	1	#4	3	1@3, 10@10, R@12

Notes: 1 Opposite Hand

3 CONCRETE BEAM SCHEDULE
TYPICAL DETAIL
SCALE: 12" = 1'-0"

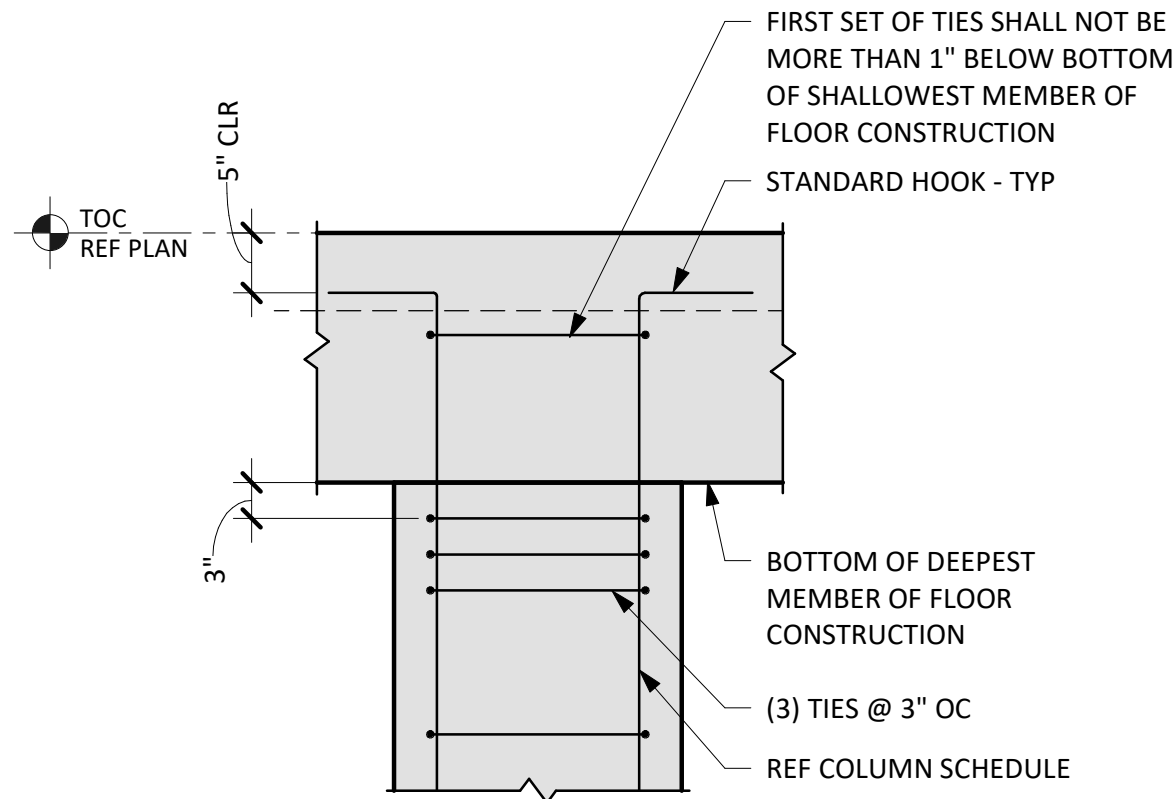


5 COLUMN TIE DETAILS
TYPICAL DETAIL
SCALE: NTS

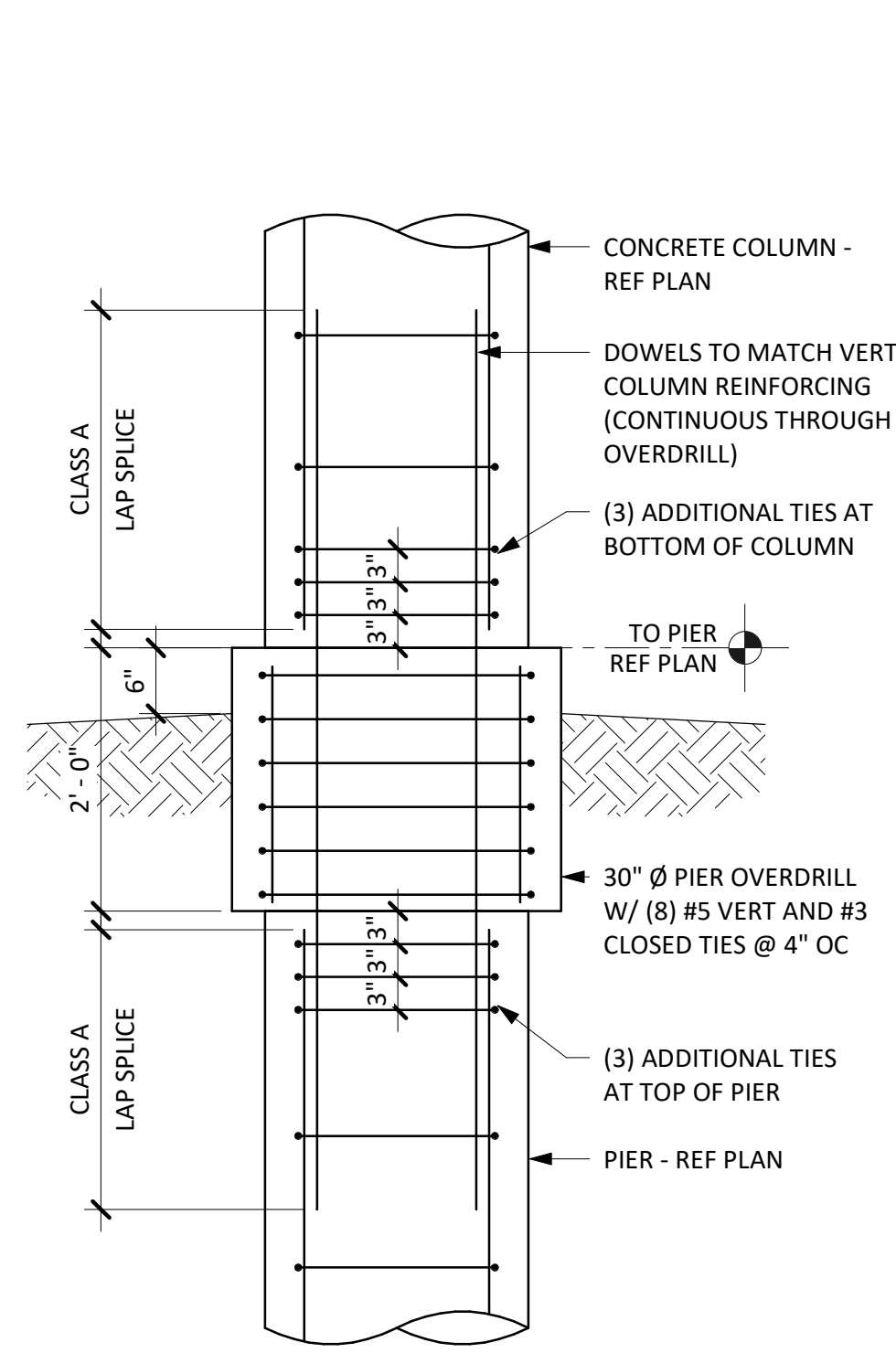
7 LAPPED SPlice IN CIRCULAR COLUMN
TYPICAL DETAIL
SCALE: NTS

COLUMN SCHEDULE			
MARK	DIAMETER	VERTICAL BARS	TIES
C1	24"	(6) #8	#3 @ 12" OC

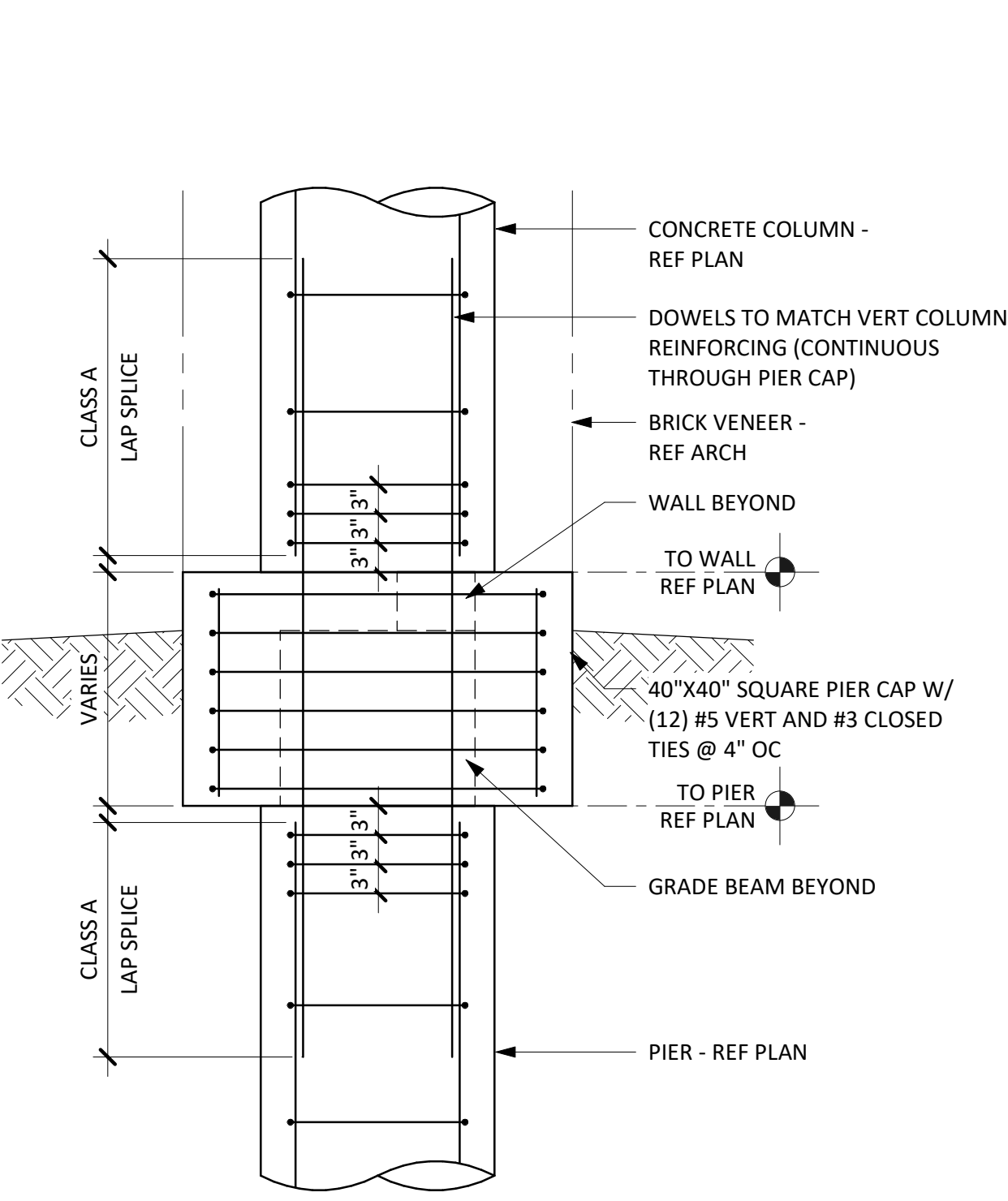
6 COLUMN SCHEDULE
TYPICAL DETAIL
SCALE: 12" = 1'-0"



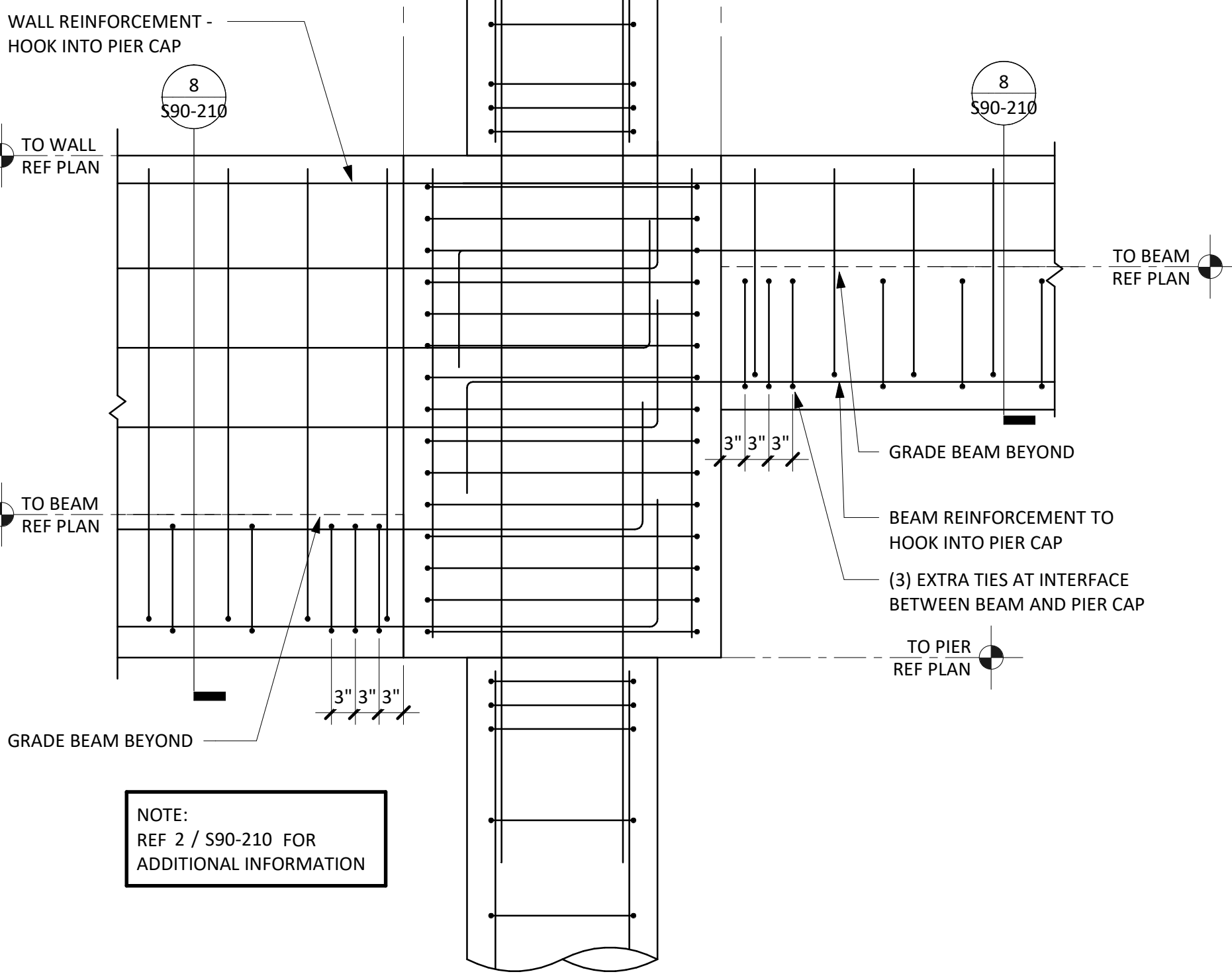
4 COLUMN TERMINATION
TYPICAL DETAIL
SCALE: NTS



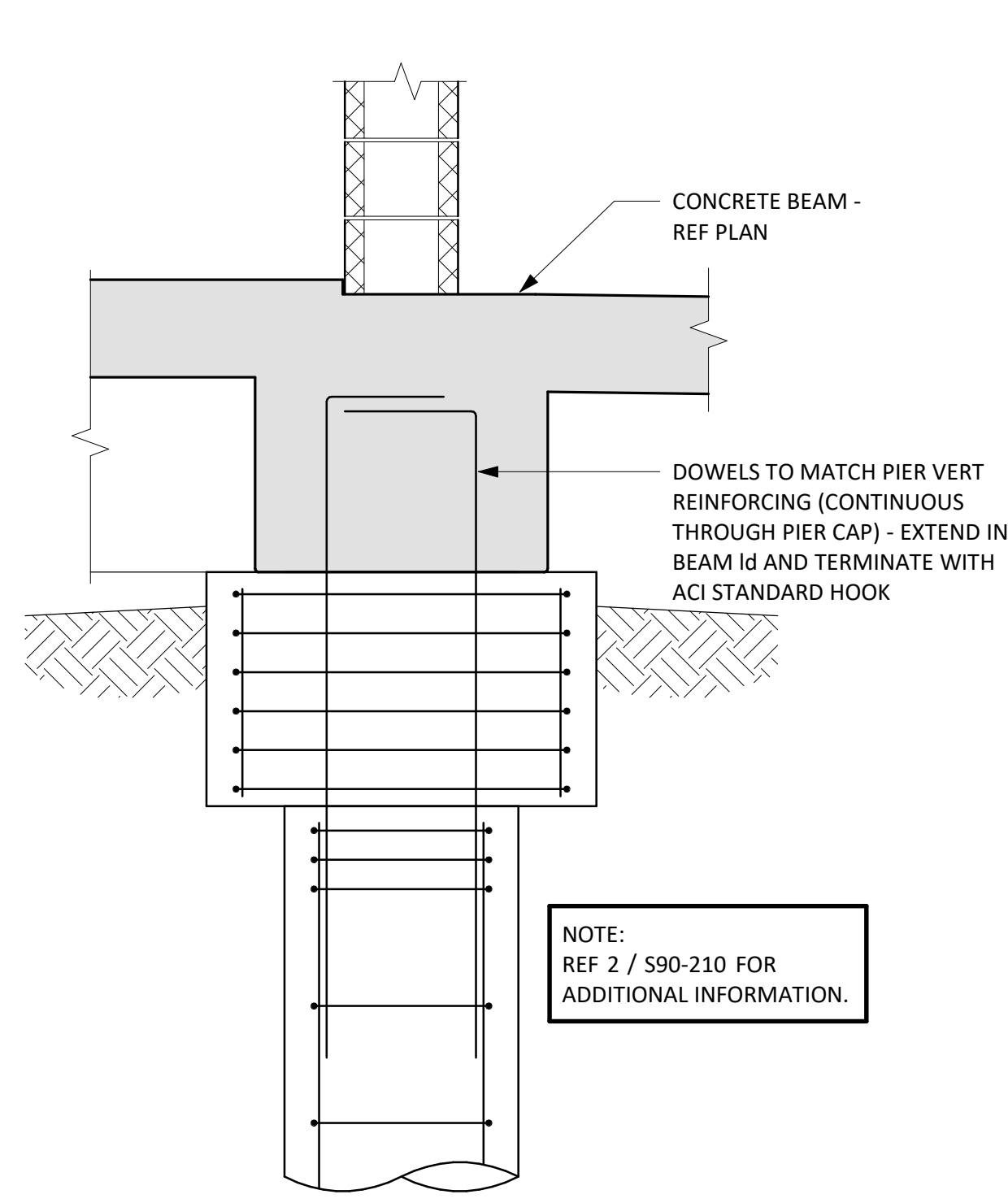
1 SECTION
SCALE: 3/4" = 1'-0"



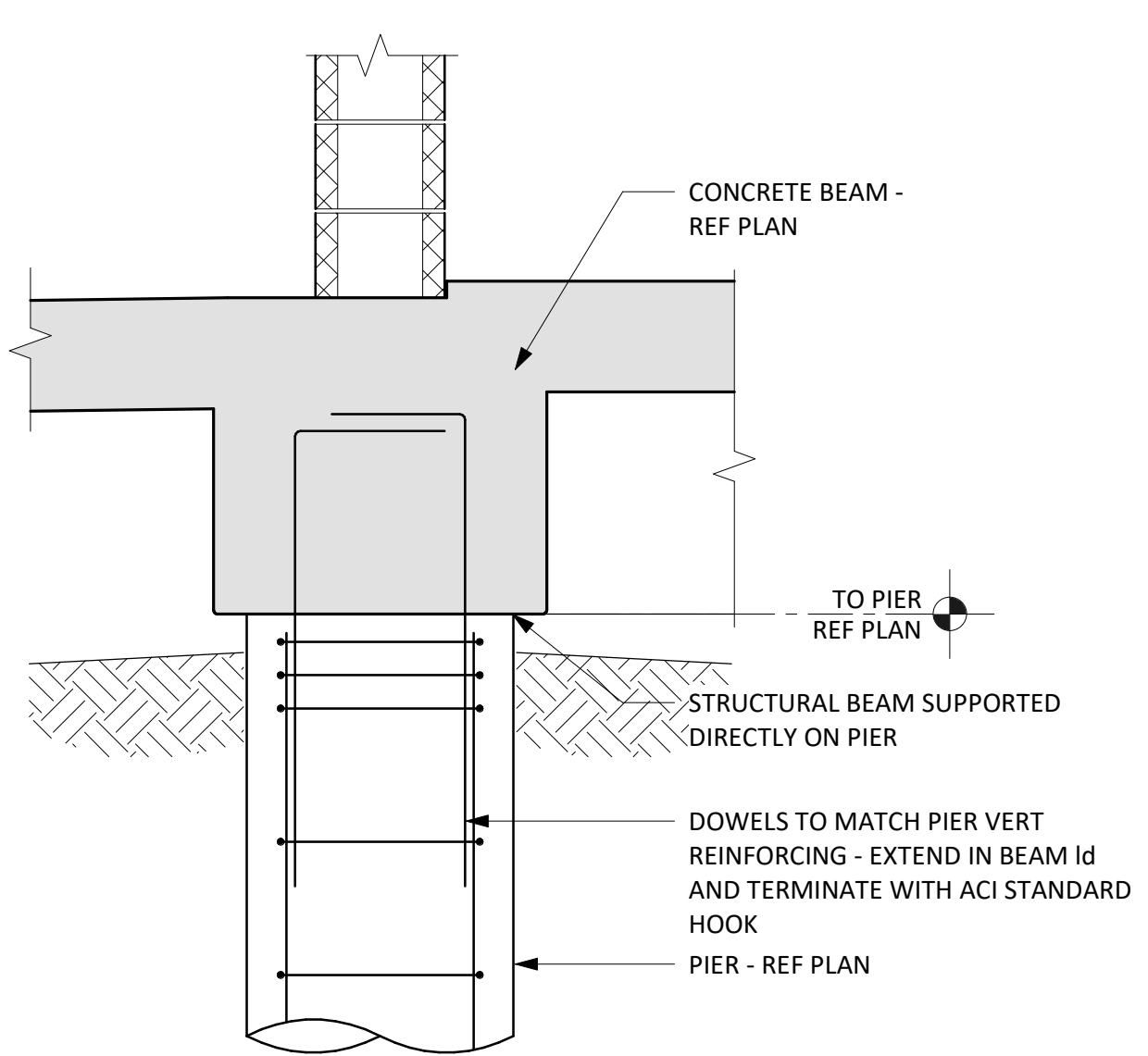
2 SECTION
SCALE: 3/4" = 1'-0"



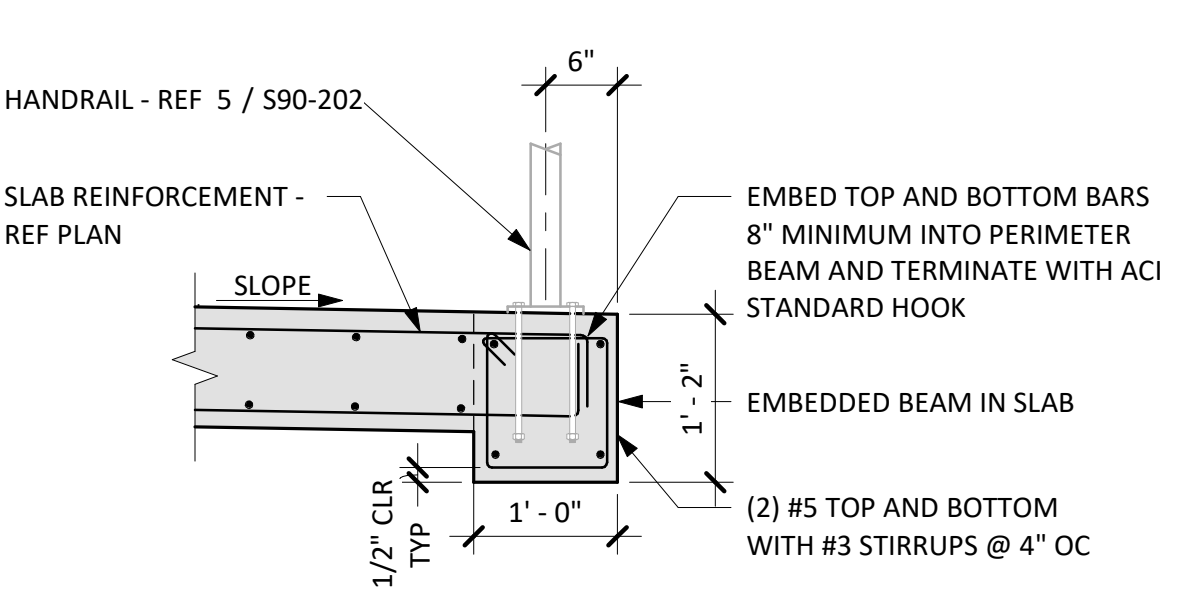
3 DETAIL
SCALE: 3/4" = 1'-0"



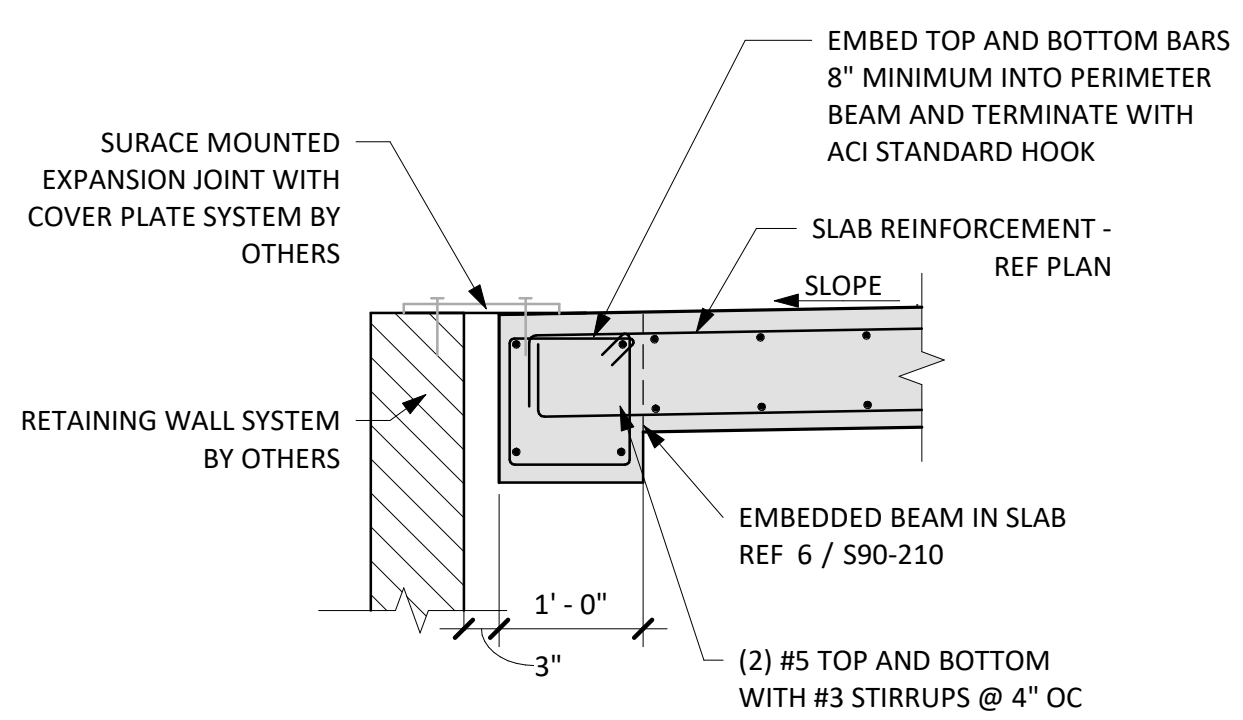
4 SECTION
SCALE: 3/4" = 1'-0"



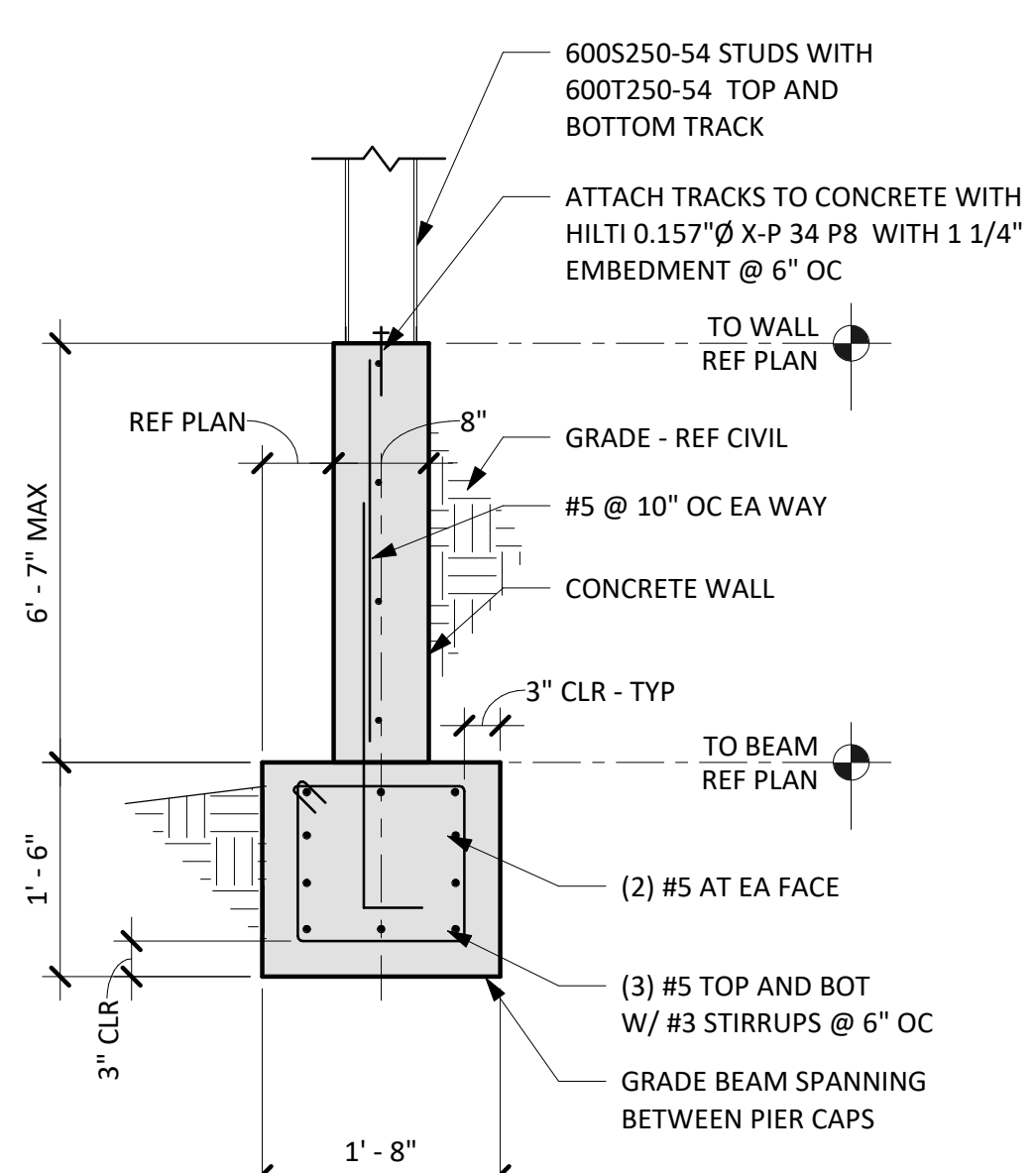
5 SECTION
SCALE: 3/4" = 1'-0"



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



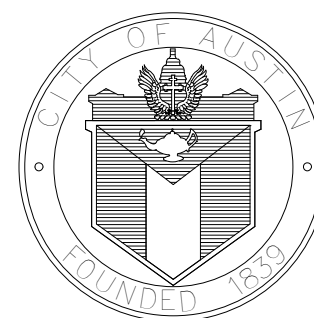
7 SECTION
SCALE: 3/4" = 1'-0"

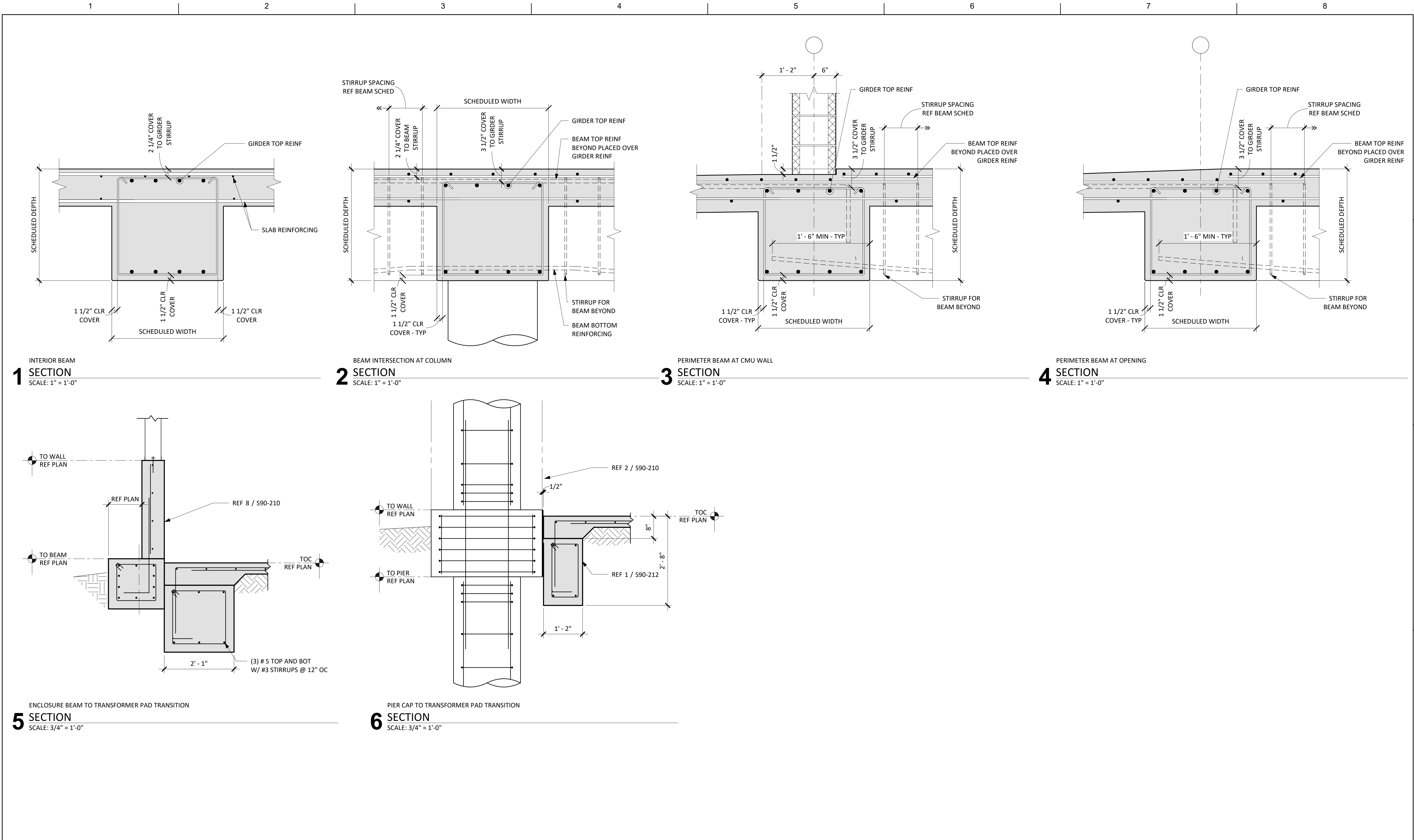


8 SECTION
SCALE: 3/4" = 1'-0"

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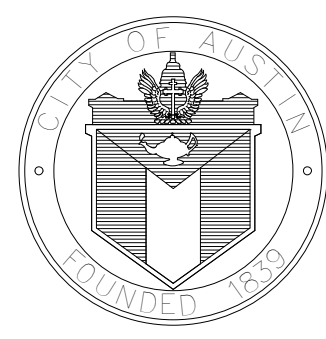
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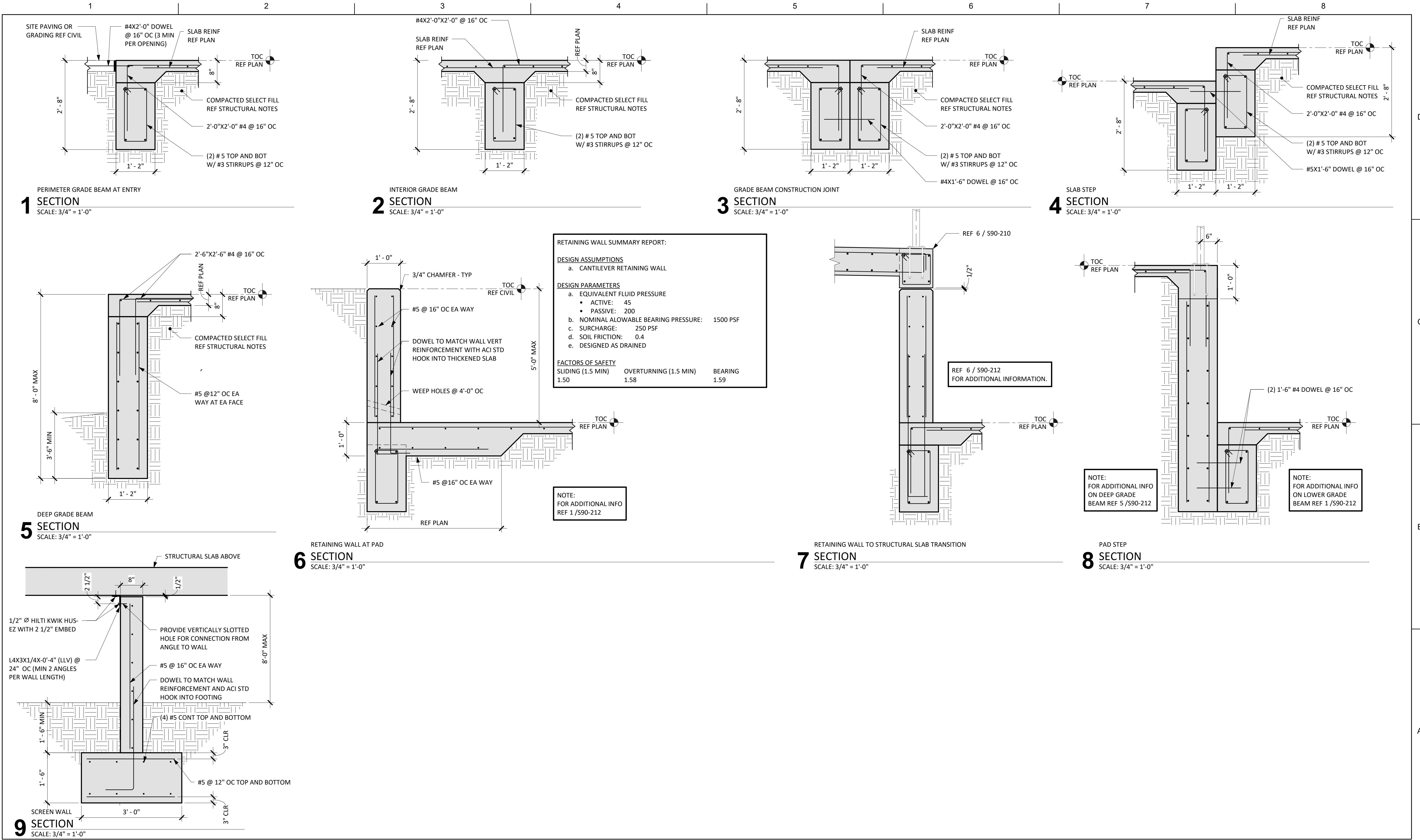


ULLRICH WTP
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CONCRETE FRAMING DETAILS

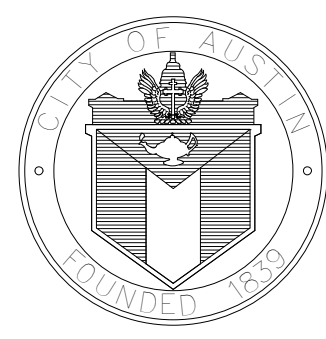


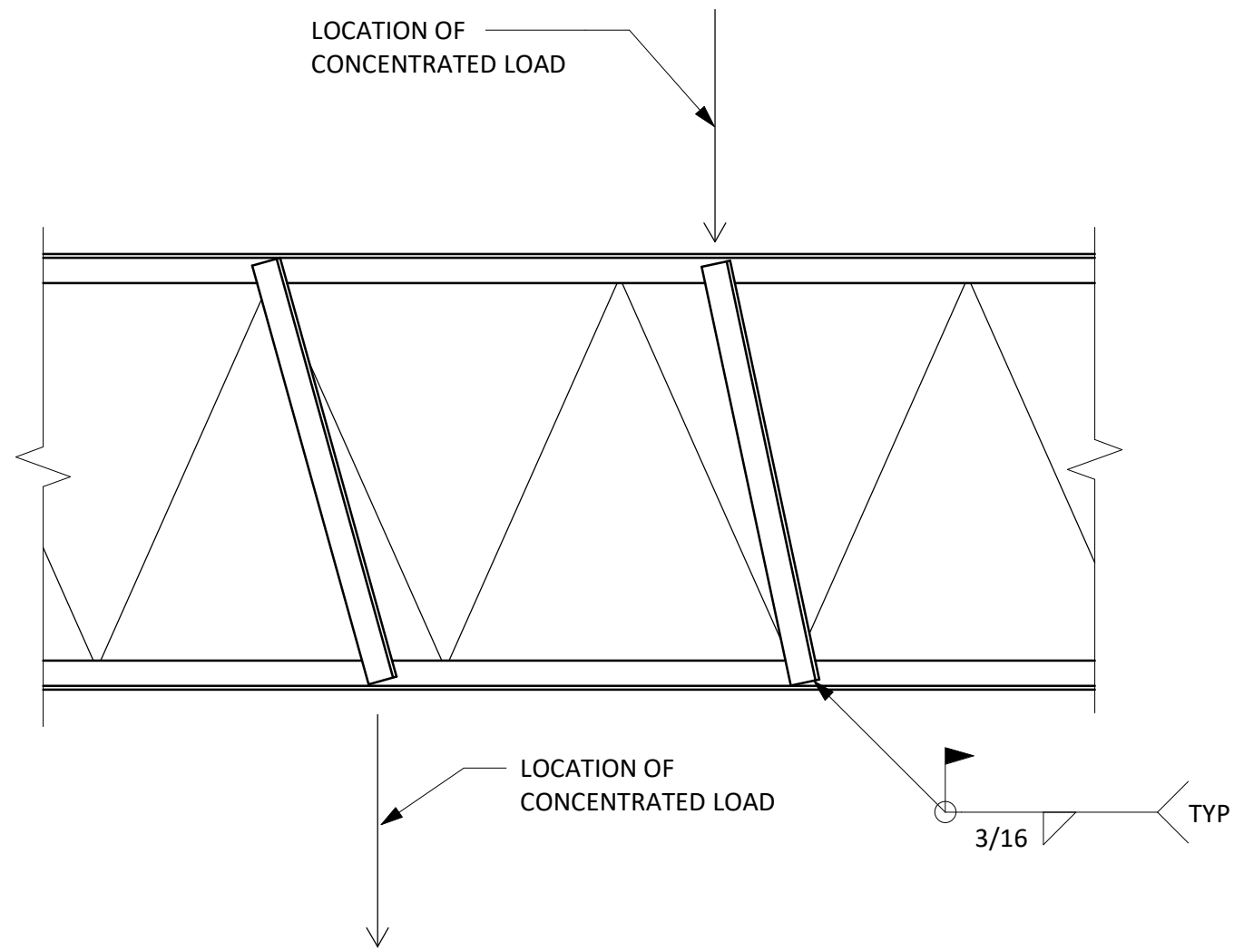
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SCALE



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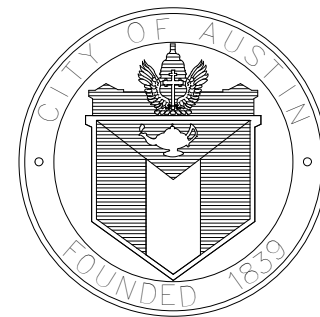


- NOTES:
1. THIS DETAIL APPLIES WHERE EVER A CONCENTRATED LOAD GREATER THAN 100 POUND OCCURS MORE THAN 4" AWAY FROM A JOIST TOP OR BOTTOM CHORD PANEL POINT. MAXIMUM LOAD TO BE APPLIED WITHOUT CONSULTATION WITH ENGINEER IS 250 POUNDS. DO NOT PLACE CONCENTRATED LOADS CLOSER THAN 4'-0" OC.
 2. ALL HANGERS OR ATTACHMENTS TO JOISTS SHALL BE PLACED CONCENTRIC WITH THE TOP AND BOTTOM CHORD(S) AND SHALL NOT ATTACH TO ONLY ONE ANGLE OF CHORD.

JOIST CHORD REINFORCEMENT
1 TYPICAL DETAIL
SCALE: NDS

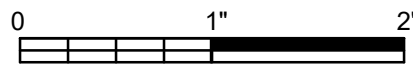
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		10123906

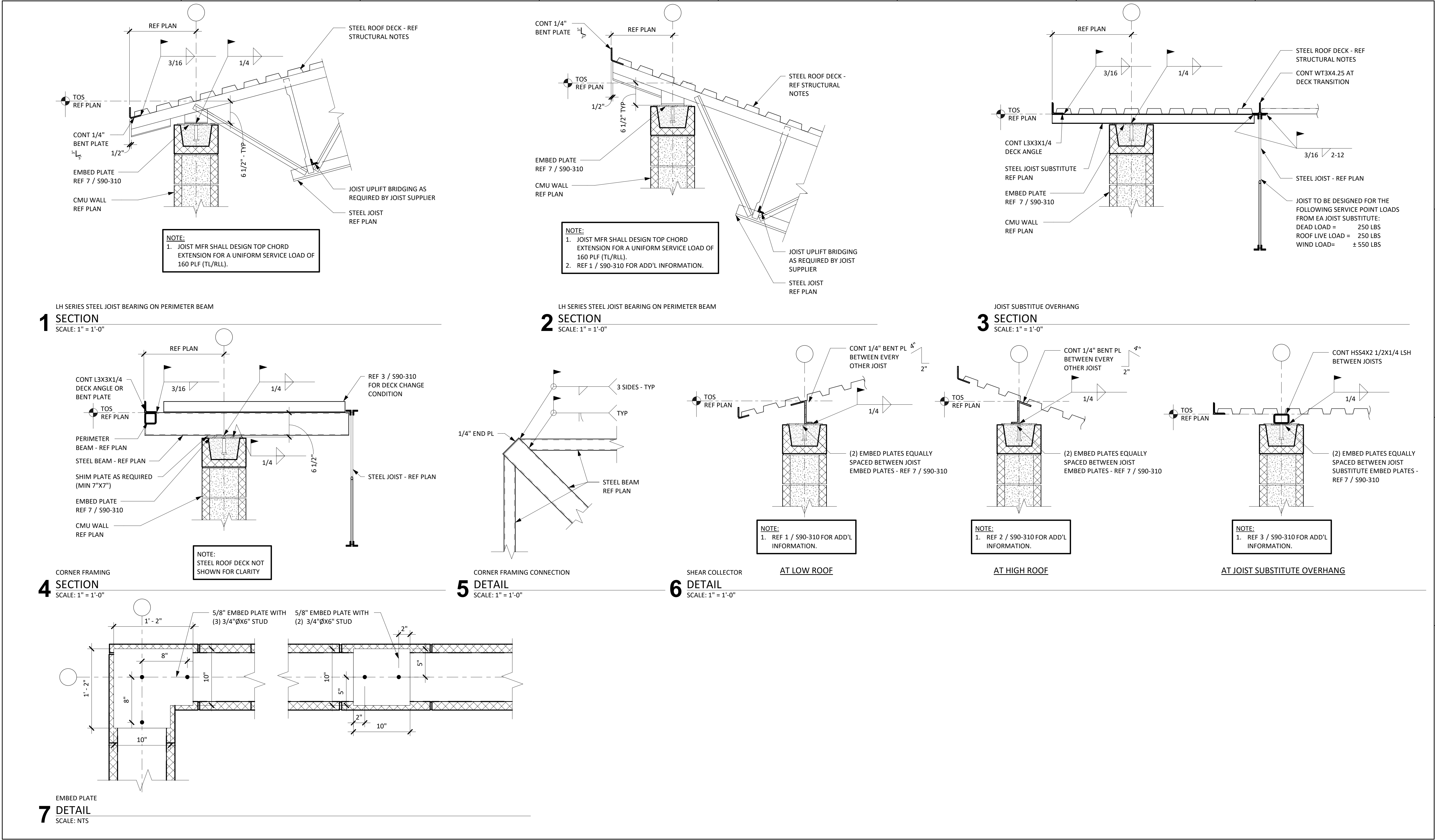


ULLRICH WTP
LOW SERVICE PUMP
STATION
ELECTRICAL FEED RENEWAL

TYPICAL STEEL DETAILS

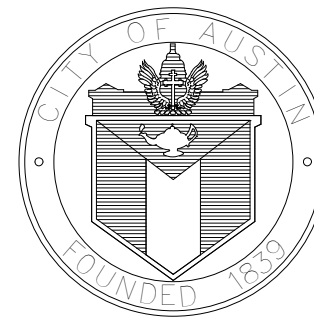


FILENAME | 18051 Ullrich_LSPS
SCALE



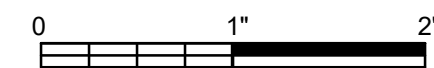
ISSUE	DATE	DESCRIPTION
0	01/21/2021	CONFORMED CONTRACT DRAWINGS

PROJECT MANAGER	W.D. WEHNER
DESIGNED BY	AR / FRV
DRAWN BY	AR
CHECKED BY	FRV
DATE	OCTOBER 2020
PROJECT NUMBER	10123906



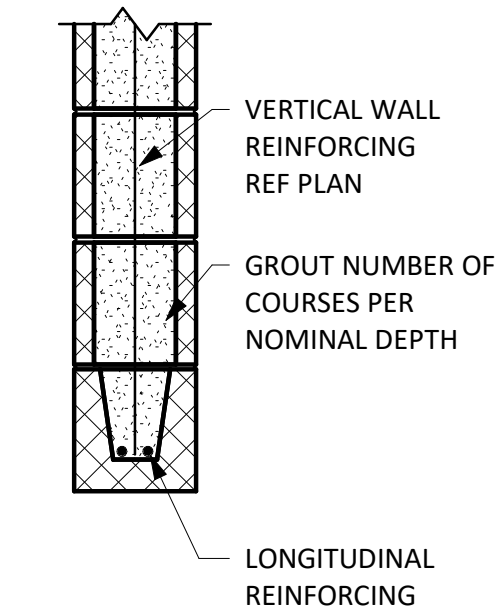
ULLRICH WTP
LOW SERVICE PUMP
STATION
ELECTRICAL FEED RENEWAL

STEEL FRAMING DETAILS



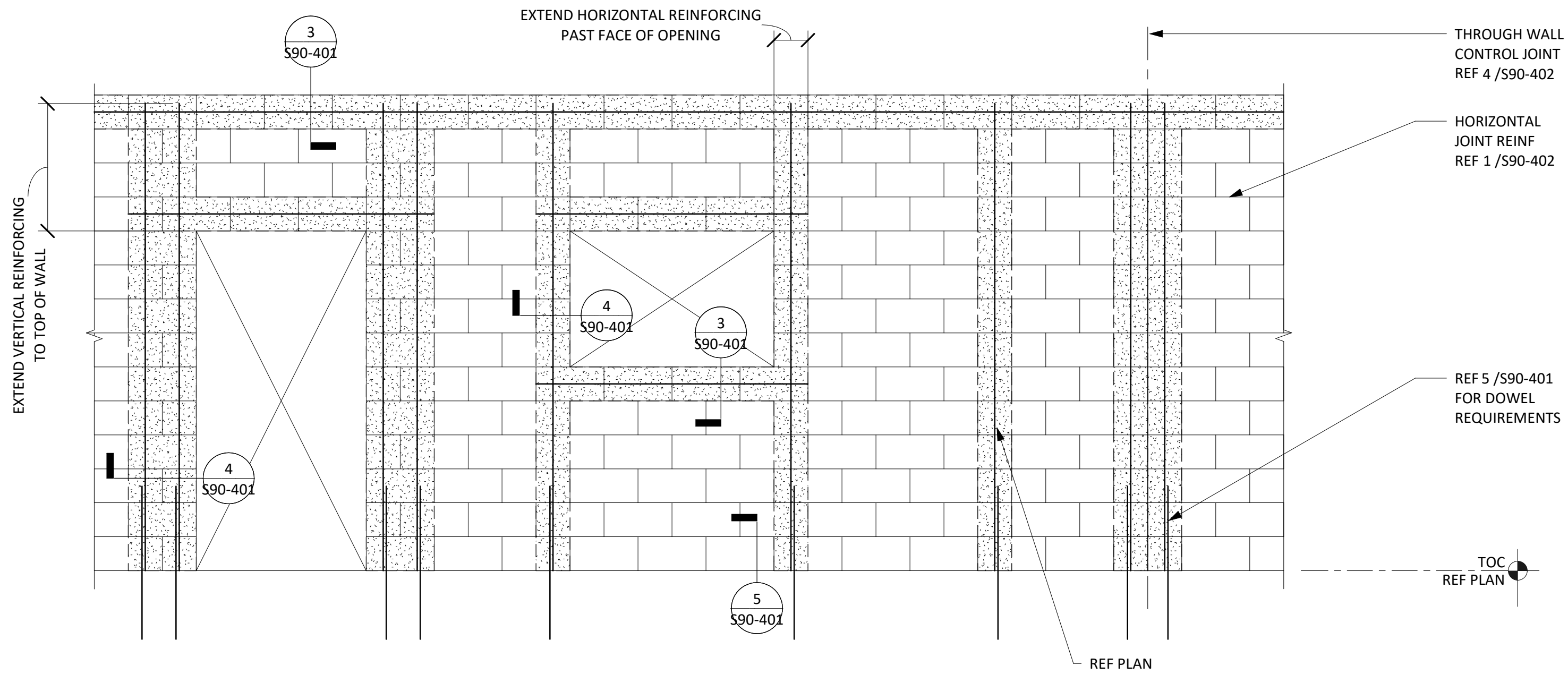
FILENAME | 18051 Ullrich_LSPS
SCALE

LOAD BEARING LINTEL SCHEDULE						
MARK	DIAGRAM	NOMINAL DEPTH	NOMINAL WIDTH	REINFORCING		BEARING
				LONGITUDINAL	STIRRUPS	
L1		8"	8"	(2) #5	-	8"
L2		16"	8"	(2) #5	-	16"
L3*		16"	12"	(2) #5	-	16"
L4*		32"	12"	(2) #5	-	16"
L5*		40"	12"	(2) #5	-	16"
L6*		48"	12"	(3) #6	-	16"



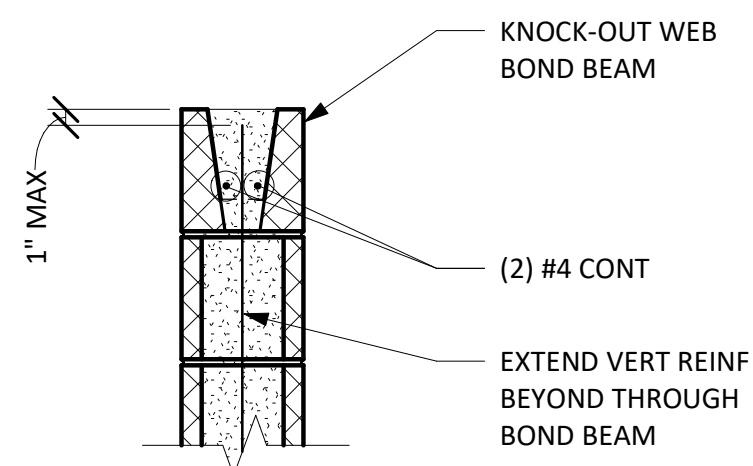
LINTEL SECTION

- NOTES:
1. LINTELS SHALL REMAIN SHORED UNTIL MASONRY CONSTRUCTION ABOVE HAS CURED FOR A MINIMUM OF 14 DAYS.
 2. REFER TO ARCHITECTURAL DRAWINGS FOR OPENING SIZE AND LOCATION.
 3. VERTICAL CONTROL JOINTS SHALL NOT CROSS LINTEL REINFORCEMENT.
- * REF 6 / S90-401 FOR BRICK SHELF ANGLE SUPPORT.



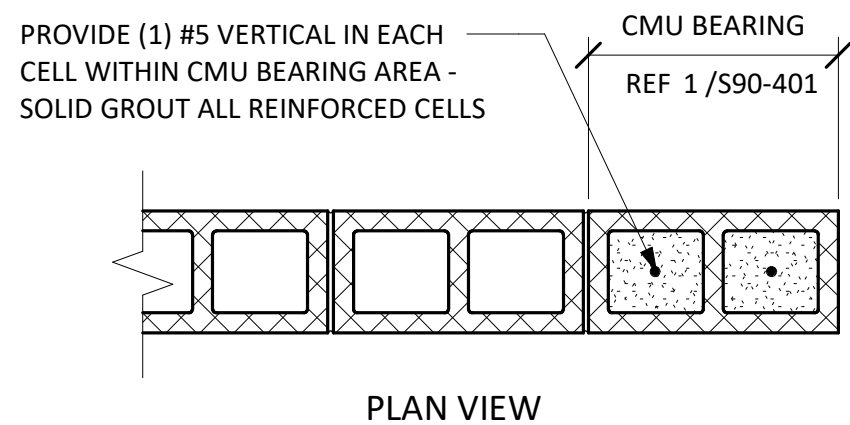
1 TYPICAL DETAIL

LOAD BEARING LINTEL SCHEDULE
SCALE: NTS



3 TYPICAL DETAIL

CMU BOND BEAM
SCALE: NTS



- NOTE:
1. REFER TO TYPICAL CMU WALL ELEVATION FOR ADDITIONAL INFORMATION.

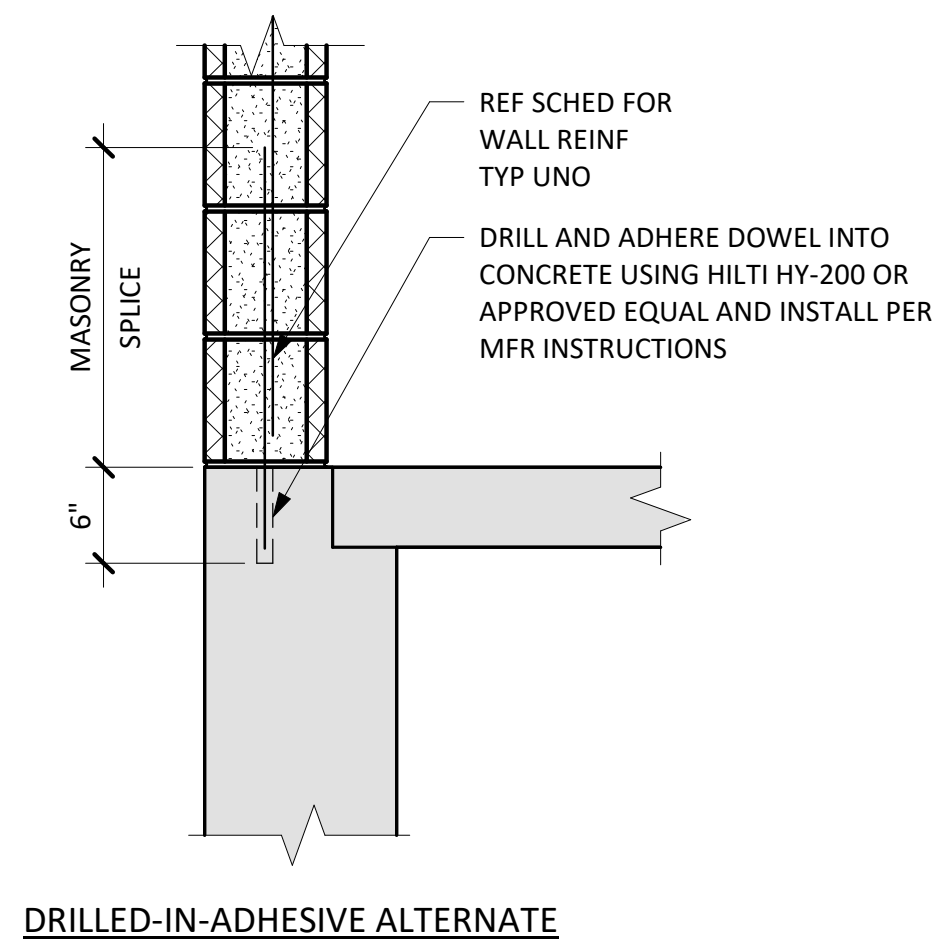
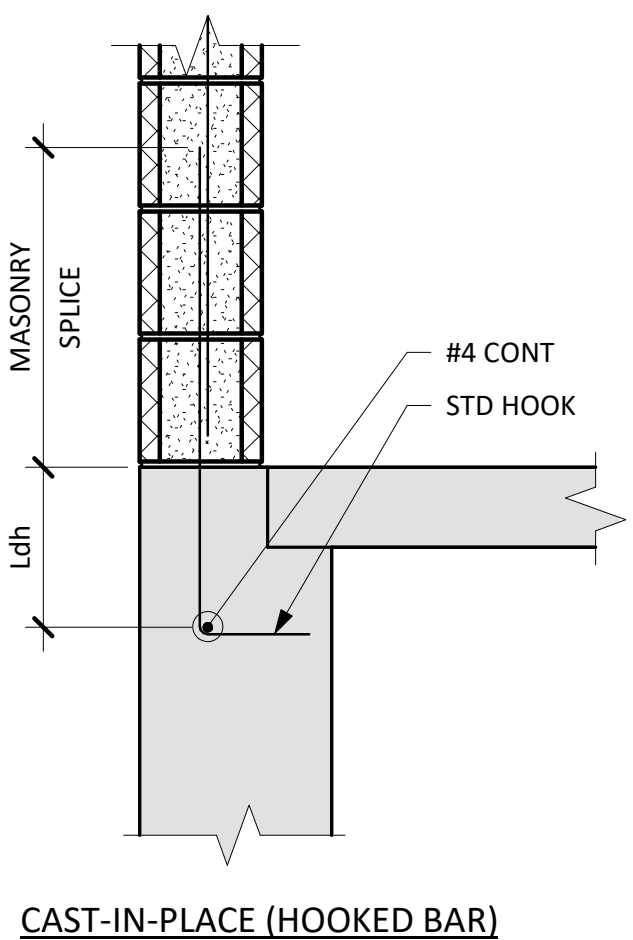
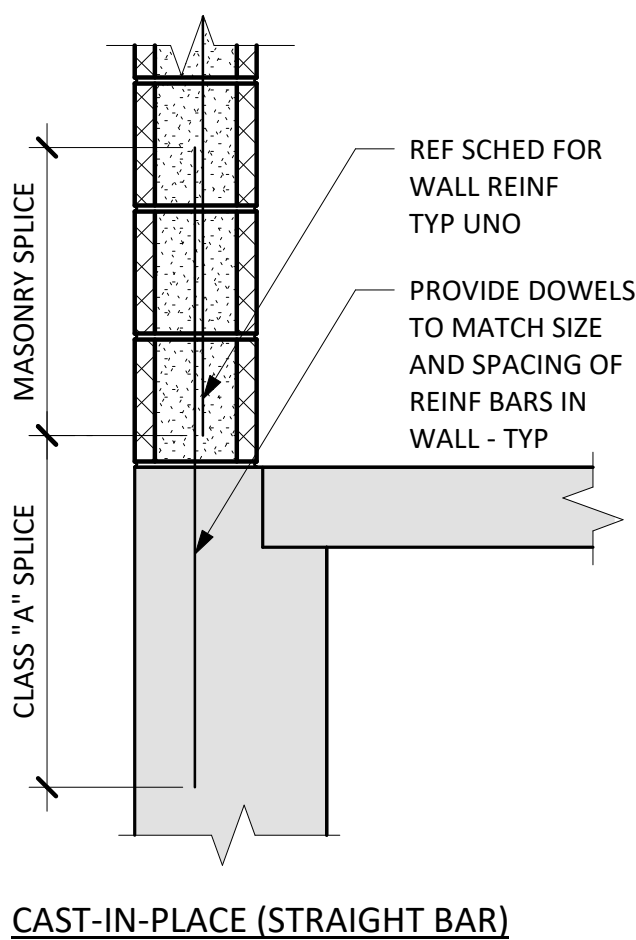
4 TYPICAL DETAIL

CMU JAMB
SCALE: NTS

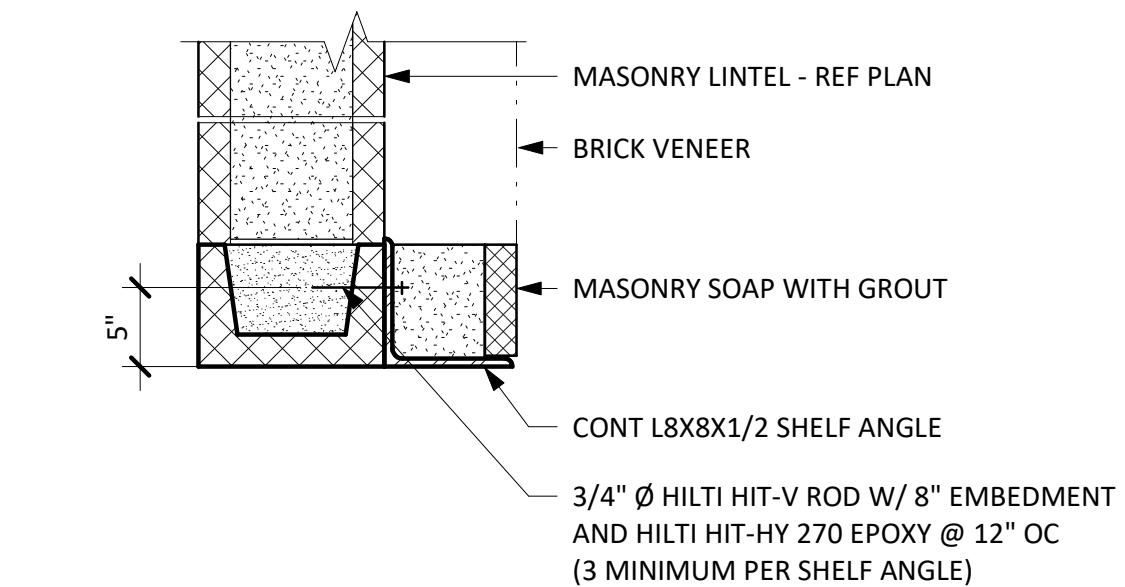
5 TYPICAL DETAIL

CMU WALL ANCHORAGE
SCALE: NTS

MASONRY SPLICE LENGTH (INCHES)				
BAR #	NOMINAL MASONRY SIZE			
	6"	8"	12"	
#4	24"	16"	12"	
#5	32"	24"	16"	
#6	60"	48"	30"	

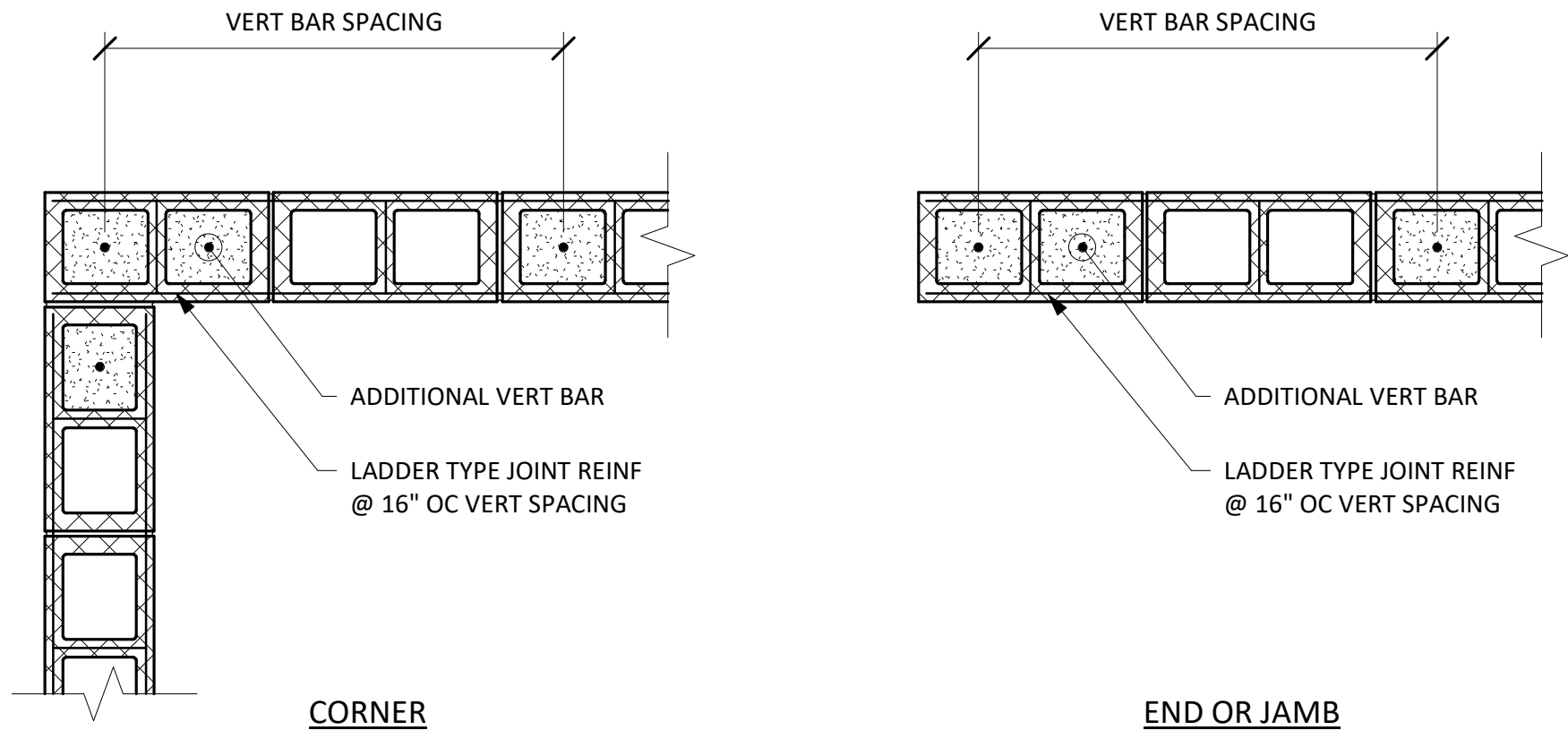


- NOTES:
1. MASONRY DOWEL TO MATCH SIZE AND SPACING OF VERTICAL WALL REINF - TYP



6 TYPICAL DETAIL

SHELF ANGLE TO MASONRY LINTEL CONNECTION
SCALE: 1" = 1'-0"

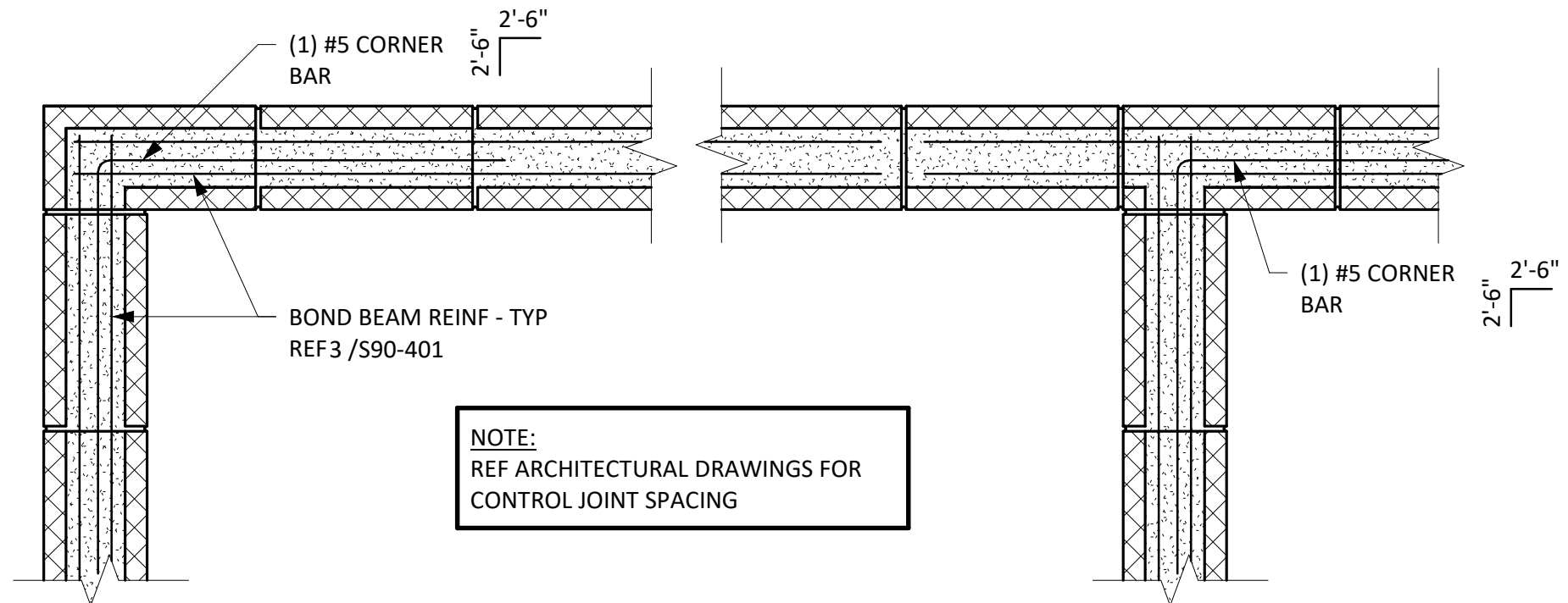


CMU WALL REINFORCING
1 TYPICAL DETAIL
SCALE: NTS

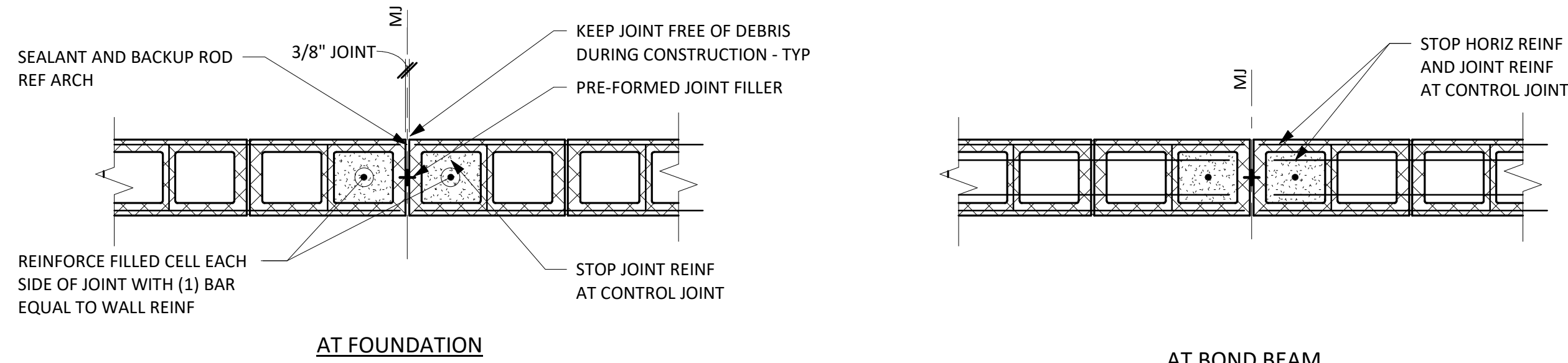
BAR SIZE	LAP LENGTH	
	BOND BEAMS	VERTICAL REINF
#4	1'-8"	2'-6"
#5	2'-1"	3'-2"
#6	2'-6"	3'-9"
#7	2'-11"	4'-5"

NOTES:
1. SPLICES FOR VERTICAL REINF SHALL BE STAGGERED IN ADJACENT CELLS SO THAT NO MORE THAN 1/2 OF ALL BARS ARE SPLICED AT THE SAME LOCATION.
2. DO NOT SPLICE BARS IN LINTELS

CMU WALL LAP SPLICE SCHEDULE
2 TYPICAL DETAIL
SCALE: NTS

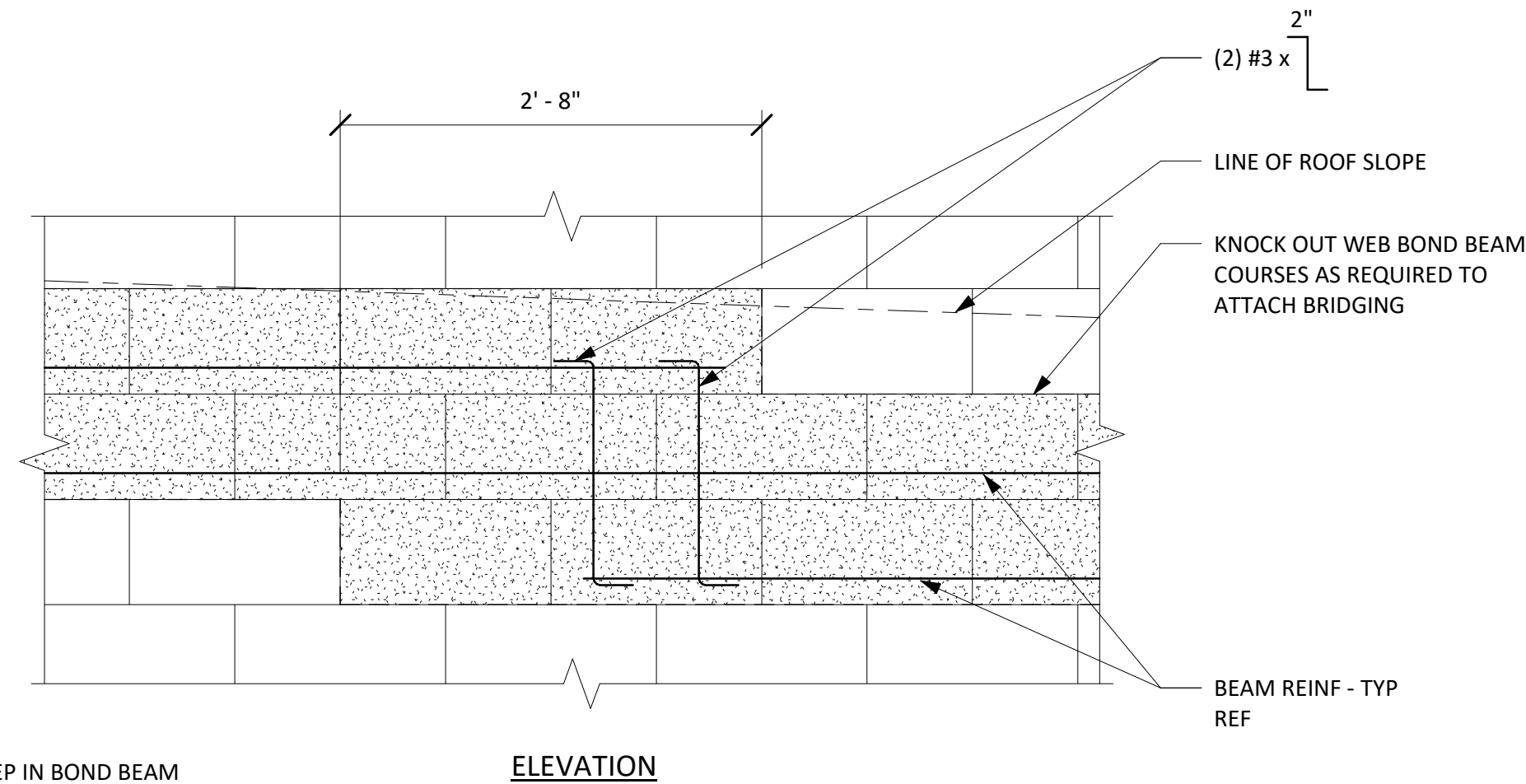


CORNER BARS AT BOND BEAMS
3 TYPICAL DETAIL
SCALE: NTS

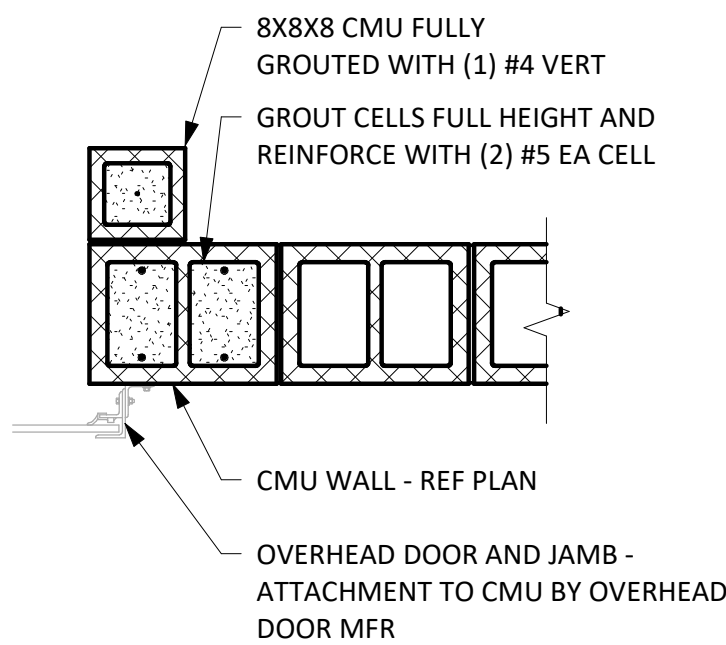


MASONRY CONTROL JOINT
4 TYPICAL DETAIL
SCALE: NTS

- NOTES:
1. COORDINATE MASONRY CONTROL JOINT SPACING WITH ARCHITECT
2. TYPICAL MASONRY CONTROL JOINT SPACING IS 2x WALL HEIGHT, BUT NOT TO EXCEED 25'-0"



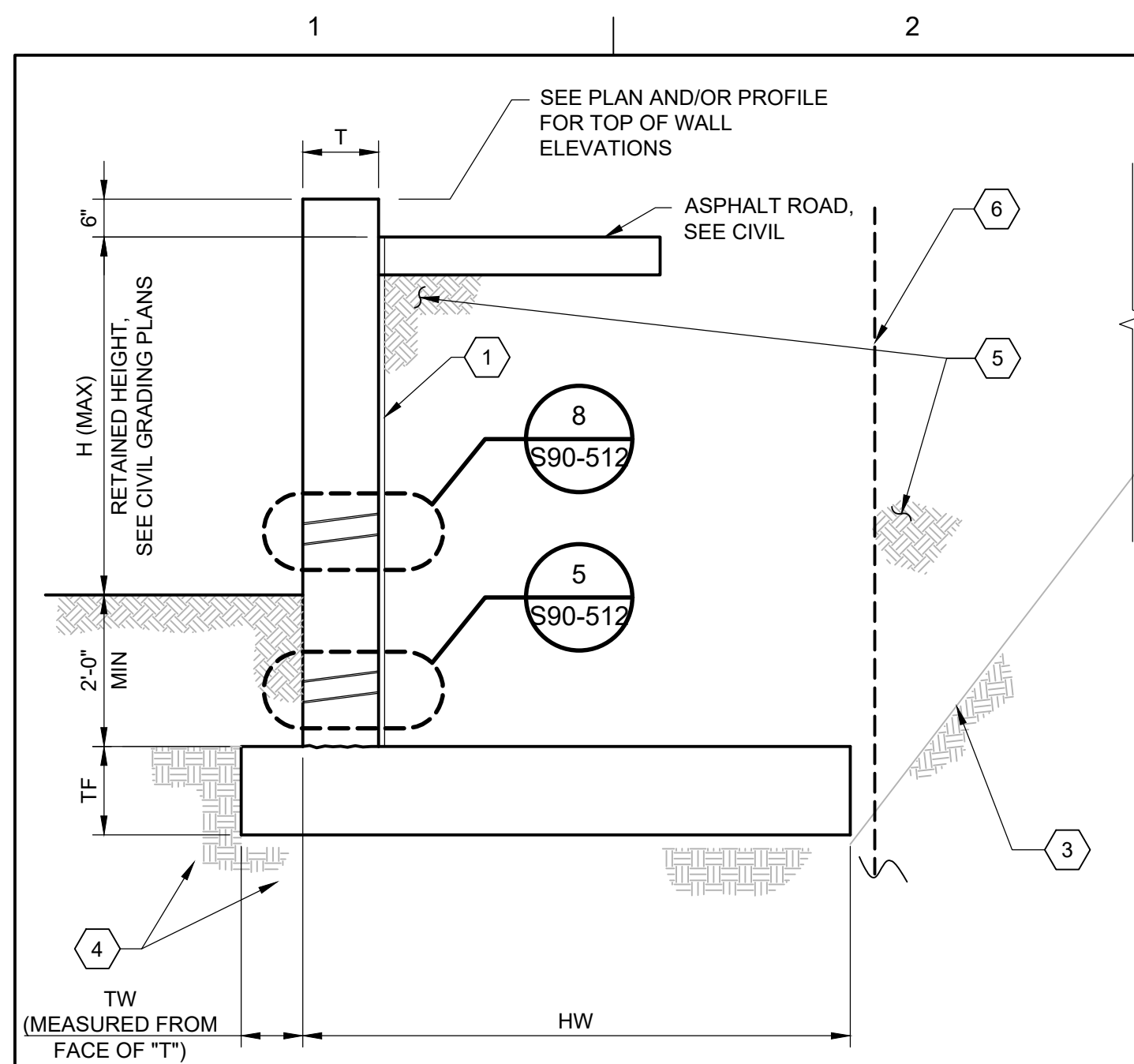
STEP IN BOND BEAM
5 TYPICAL DETAIL
SCALE: NTS



JAMB SUPPORT AT OVERHEAD DOORS
6 TYPICAL DETAIL
SCALE: 3/4" = 1'-0"

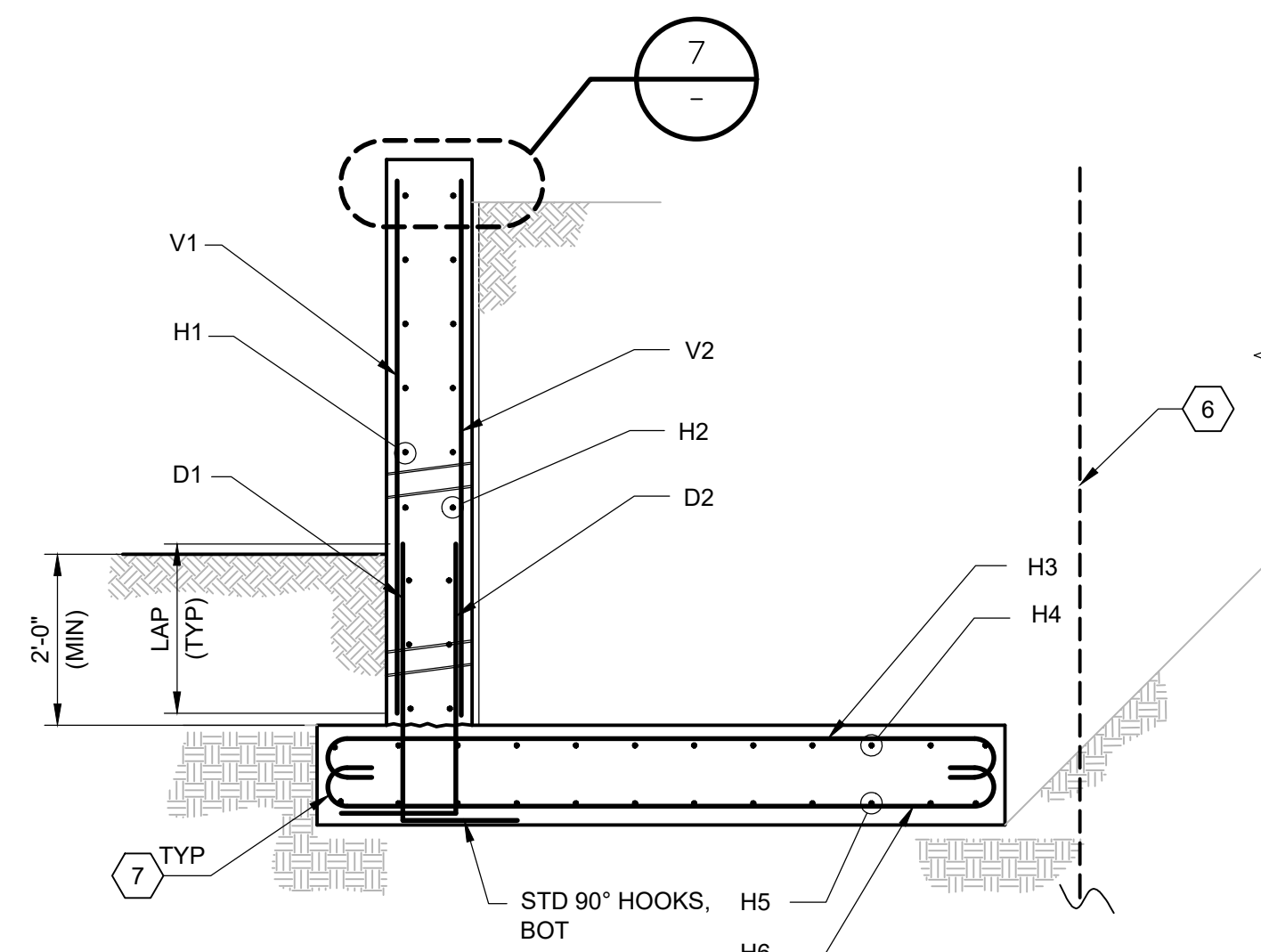
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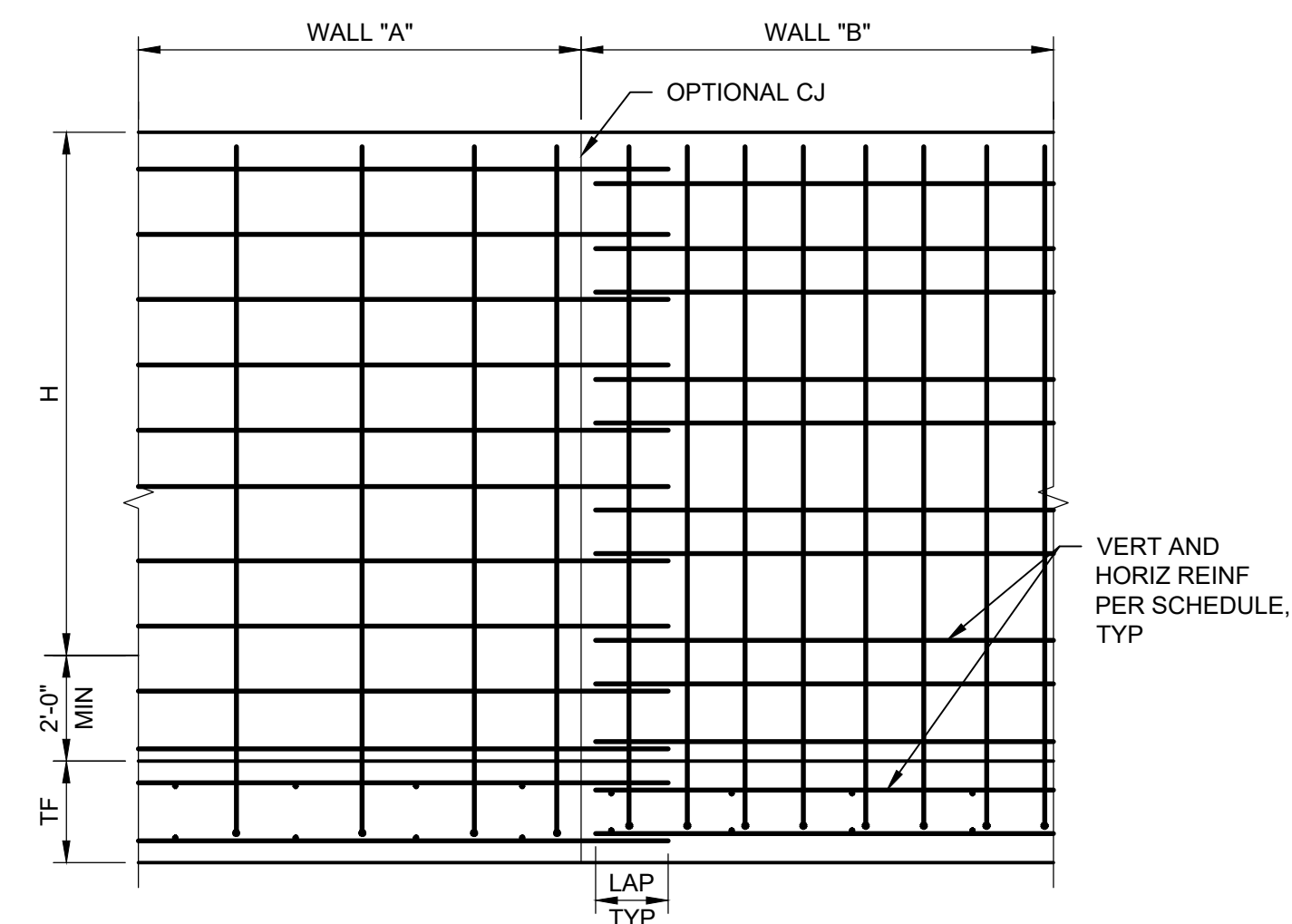
TYPICAL CONCRETE RETAINING WALL

1/2"=1'-0"



TYPICAL CONCRETE RETAINING WALL REINFORCING

1/2"=1'-0'



NOTES:

1. DETAIL APPLIES WHERE WALLS CHANGE FROM ONE WALL CALLOUT TO ANOTHER. PROVIDE LAP FOR HORIZ REINF IN WALLS AND FOOTINGS PER STD DTLS.
2. REFERENCE PLANS AND WALL SCHEDULE FOR WALL CALLOUTS AND REINF REQUIREMENTS.

TYPICAL REINFORCEMENT TRANSITION BETWEEN WALL TYPES

1/2"=1'-0'

	RETAINING WALL GLOBAL STABILITY TABLE					
	OVERTURNING		SLIDING		BEARING	
MARK	ACTUAL	MIN. REQ'D.	ACTUAL	MIN. REQ'D.	ACTUAL	MIN. REQ'D.
12RW-01-C	2.8	1.5	1.8	1.5	1.4	1.0
12RW-02-C1	3.2	1.5	1.9	1.5	1.5	1.0
12RW-02-C2	5.1	1.5	3.7	1.5	2.7	1.0
12RW-03-C	4.3	1.5	2.9	1.5	1.3	1.0
14RW-01-C1	NOTE 3	1.5	NOTE 3	1.5	1.0	1.0
14RW-01-C2	2.1	1.5	1.5	1.5	1.2	1.0
14RW-02-C1	2.2	1.5	1.5	1.5	1.4	1.0
14RW-02-C2	NOTE 3	1.5	NOTE 3	1.5	1.0	1.0
16RW-01-C1A/B	NOTE 3	1.5	NOTE 3	1.5	1.0	1.0
16RW-01-C2A/B	NOTE 3	1.5	NOTE 3	1.5	1.0	1.0
16RW-01-C3A/B	NOTE 3	1.5	NOTE 3	1.5	1.0	1.0
16RW-01-C4	3.0	1.5	NOTE 3	1.9	1.5	1.0
16RW-01-C5	2.0	1.5	1.4	1.6	1.1	1.0
16RW-01-C6	1.6	1.5	2.6	1.5	1.1	1.0
16RW-01-C7	1.8	1.5	1.8	1.5	1.1	1.0

"NOTES:
1. FACTOR OF SAFETY SHOWN ARE FOR WORST CASE WALL DESIGNS FOR THE GIVEN RETAINING WALL MARK. ACTUAL FACTORS OF SAFETY VARY DEPENDING ON GRADING.
2. REFERENCE SITE RETAINING WALL NOTES, THIS SHEET, FOR NET ALLOWABLE BEARING PRESSURES AND WALL DESIGN PARAMETERS.
3. WALLS HAVE COMBINED FOOTING. F.O.S AGAINST OVERTURNING & SLIDING > 1.5."

CONCRETE RETAINING WALL SCHEDULE																
MARK	H (MAX) (ft)	T (in)	TW (ft)	HW (ft)	TF (in)	V1	V2	H1	H2	H3	H4	H5	H6	D1	D2	NOTES
12RW-01-C	6	12	2	5	14	#5 @ 12	#6 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#6 @ 12	
12RW-02-C1	7.5	12	1.5	5.75	14	#5 @ 12	#6 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#6 @ 12	
12RW-02-C2	2	12	1.5	2.5	14	#5 @ 12	#6 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#6 @ 12	
12RW-03-C	5.5	12	1	4	14	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	REFERENCE CIVIL FOR T/WALL ELEVATIONS.
14RW-01-C1	12	14	1.5	SEE NOTES	16	#5 @ 12	#7 @ 6	#5 @ 12	#5 @ 12	#7 @ 6	#7 @ 6	#7 @ 6	#7 @ 6	#7 @ 6	#5 @ 12	#7 @ 6
14RW-01-C2	8.5	14	1.5	5.5	16	#5 @ 12	#6 @ 10	#5 @ 12	#5 @ 12	#5 @ 10	#5 @ 10	#5 @ 10	#5 @ 10	#5 @ 10	#5 @ 12	#6 @ 10
14RW-02-C1	8	14	1.5	5.5	16	#5 @ 12	#6 @ 10	#5 @ 12	#5 @ 12	#5 @ 10	#5 @ 10	#5 @ 10	#5 @ 10	#5 @ 10	#5 @ 12	#6 @ 10
14RW-02-C2	9.5	14	1.5	SEE NOTES	16	#5 @ 12	#7 @ 6	#5 @ 12	#5 @ 12	#7 @ 6	#7 @ 6	#7 @ 6	#7 @ 6	#7 @ 6	#5 @ 12	#7 @ 6
16RW-01-C1A/B	9.75	16	1.5	SEE NOTES	18	#6 @ 12	#9 @ 12	#6 @ 12	#6 @ 12	#8 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#9 @ 12
16RW-01-C2A/B	10	16	1.5	SEE NOTES	18	#7 @ 12	#9 @ 9	#7 @ 6	#7 @ 6	#9 @ 6	#7 @ 12	#7 @ 12	#9 @ 6	#7 @ 12	#9 @ 9	COMBINED FOOTING. TOP OF FOOTING 1'-0" BELOW BOTTOM OF ELECTRICAL MANHOLE.
16RW-01-C3A/B	10	16	1.5	SEE NOTES	18	#7 @ 12	#9 @ 9	#7 @ 6	#7 @ 6	#7 @ 6	#7 @ 6	#7 @ 6	#7 @ 6	#7 @ 12	#9 @ 9	"COMBINED FOOTING AT CULVERTS. SEE PLANS AND SECTIONS FOR ADDITIONAL DETAILS. PROVIDE #9 @ 5 VERT (IF) FOR 4' EACH SIDE OF CULVERT BLOCKOUT."
16RW-01-C4	5.5	16	1.5	5	16	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	
16RW-01-C5	5.75	16	1.5	3.75	12	#5 @ 12	#6 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	
16RW-01-C6	5.67	16	1.5	2.75	18	#5 @ 12	#6 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#5 @ 12	#6 @ 12	RETAINING WALL @ MANHOLE 1A.
16RW-01-C7	5	16	2	2	16	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	RETAINING WALL @ MANHOLE.

KEY NOTES

- 1 CONTINUOUS WALL DRAINAGE COMPOSITE SYSTEM. PROVIDE MIRAFI 140N FOR FILTER FABRIC AND MIRAFI G100W OR APPROVED EQUAL. THE MINIMUM FLOW RATE FOR THE DRAINAGE COMPOSITE SHALL BE 145 GALS/MIN/SF IN ACCORDANCE WITH ASTM D4491. INSTALL WALL DRAINAGE COMPOSITE SYSTEM IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
- 2 10"x10" SQUARE OF DRAINAGE BOARD, INSTALL WITH PLASTIC FACE TOWARD WALL, SECURE PER MFR RECOMMENDATIONS AND FOLD GEOTEXTILE AROUND EDGES TO SEAL.
- 3 CONTRACTOR IS RESPONSIBLE TO CLASSIFY SOIL TYPE AND PROVIDE SAFE SOIL SLOPE BASED ON CLASSIFICATION.
- 4 APPROVED, UNDISTURBED SUBGRADE OR STRUCTURAL FILL.
- 5 SELECT FILL, SEE SPECIFICATIONS.
- 6 TEMPORARY EARTH RESTRAINT AS REQUIRED AND PER CONTRACTOR'S OPTION, DESIGNED BY CONTRACTOR IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- 7 PROVIDE STD HOOKS (180 DEGREE AS REQD BY FOOTING THICKNESS) FOR H3 AND H6 REINF.

SITE RETAINING WALL NOTES:

1. SEE STANDARD DRAWINGS FOR GENERAL STRUCTURAL NOTES AND STANDARD DETAILS.
2. SEE SITE-CIVIL PLANS FOR GRADING INFORMATION AND WALL ALIGNMENT.
3. SEE CIVIL DRAWINGS FOR ALL EXTERIOR PAVING AND FLATWORK.
4. WALL PARTIAL CONTRACT JOINTS SHALL BE PROVIDED EVERY 30 FT (MAX). ONE (1) INCH WIDE EXPANSION JOINTS SHALL BE PROVIDED AT 90 FT (MAX) SPACING IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
5. FOOTINGS FOR RETAINING WALLS SHALL BE PLACED ON PREPARED SUBGRADES PER DETAIL 3/S90-513.
6. NET ALLOWABLE BEARING PRESSURE: 2750 PSF FOR CASE 1 SHOWN IN DETAIL 3/S90-513. 1750 PSF FOR CASE 2 SHOWN IN DETAIL 3/S90-513 SUBGRADE TESTING FOR FOOTINGS SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS.
7. RETAINING WALL DESIGN PARAMETERS:
 - A. FILL/BACKFILL UNIT WEIGHT: 135 PCF.
 - B. UPPER 2/3 HEIGHT

AT-REST EFP:	60 PCF
ACTIVE EFP:	40 PCF
 - C. LOWER 1/3 HEIGHT

AT-REST EFP:	90 PCF
ACTIVE EFP:	80 PCF
 - D. PASSIVE PRESSURE : 250 PCF (NEGLECT 12" OVER TOE FOR SLIDING RESISTANCE)
 - E. SURCHARGE ON HEEL SIDE OF WALLS: 270 PSF VERTICAL SURCHARGE FOR ROADWAYS
 - F. SOIL/FOOTING FRICTION: 0.50



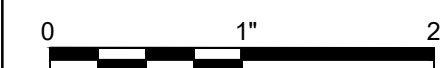
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ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL

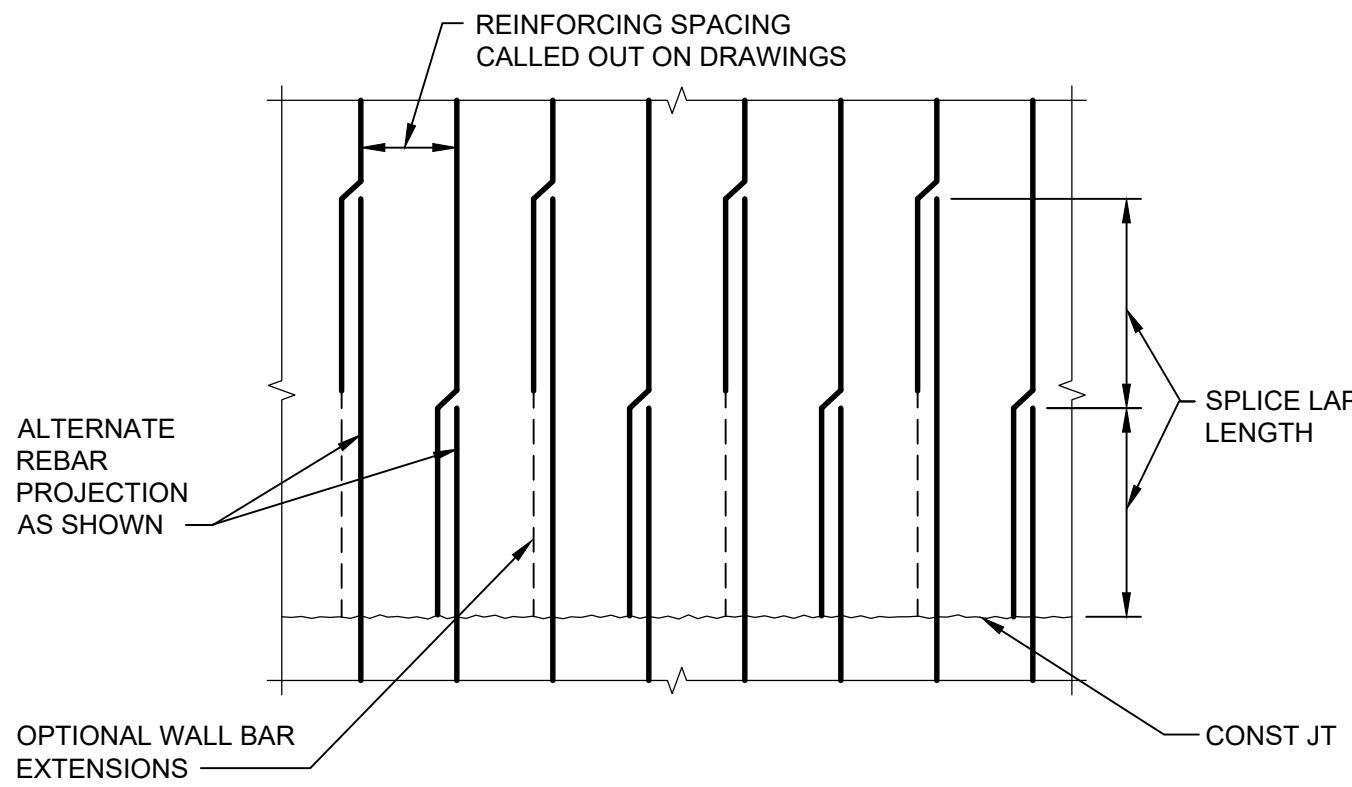
STRUCTURAL RETAINING WALL STANDARD DETAILS



FILENAME	S90-511
SCALE	AS NOTED

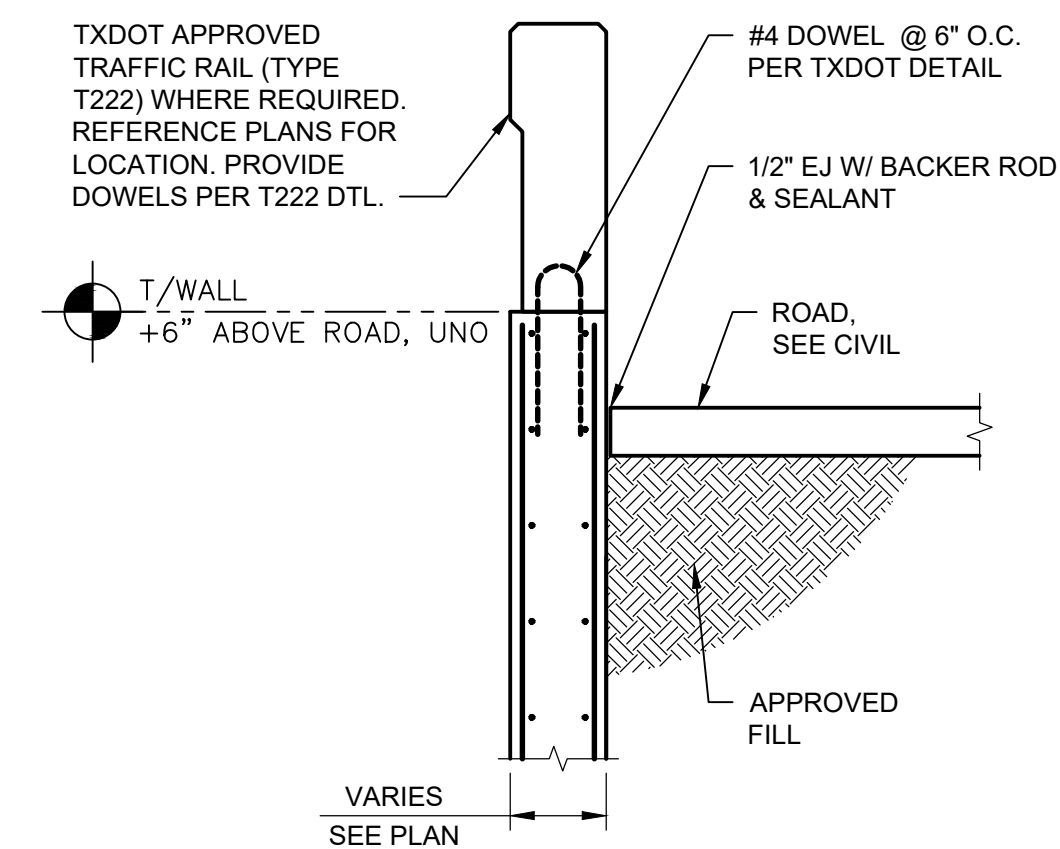
SHEET 92 of 350

S90-511



STAGGERED REINFORCING AT CONSTRUCTION JOINT

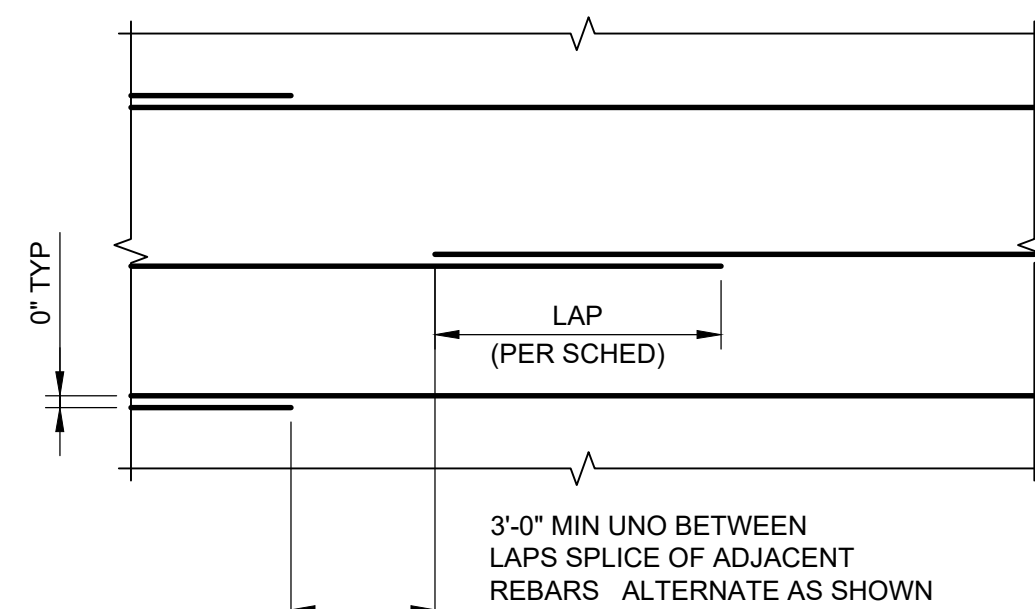
3/4"=1'-0"



SLAB INTO SIDE

TOP OF WALL CONDITON

1/2"=1'-0"

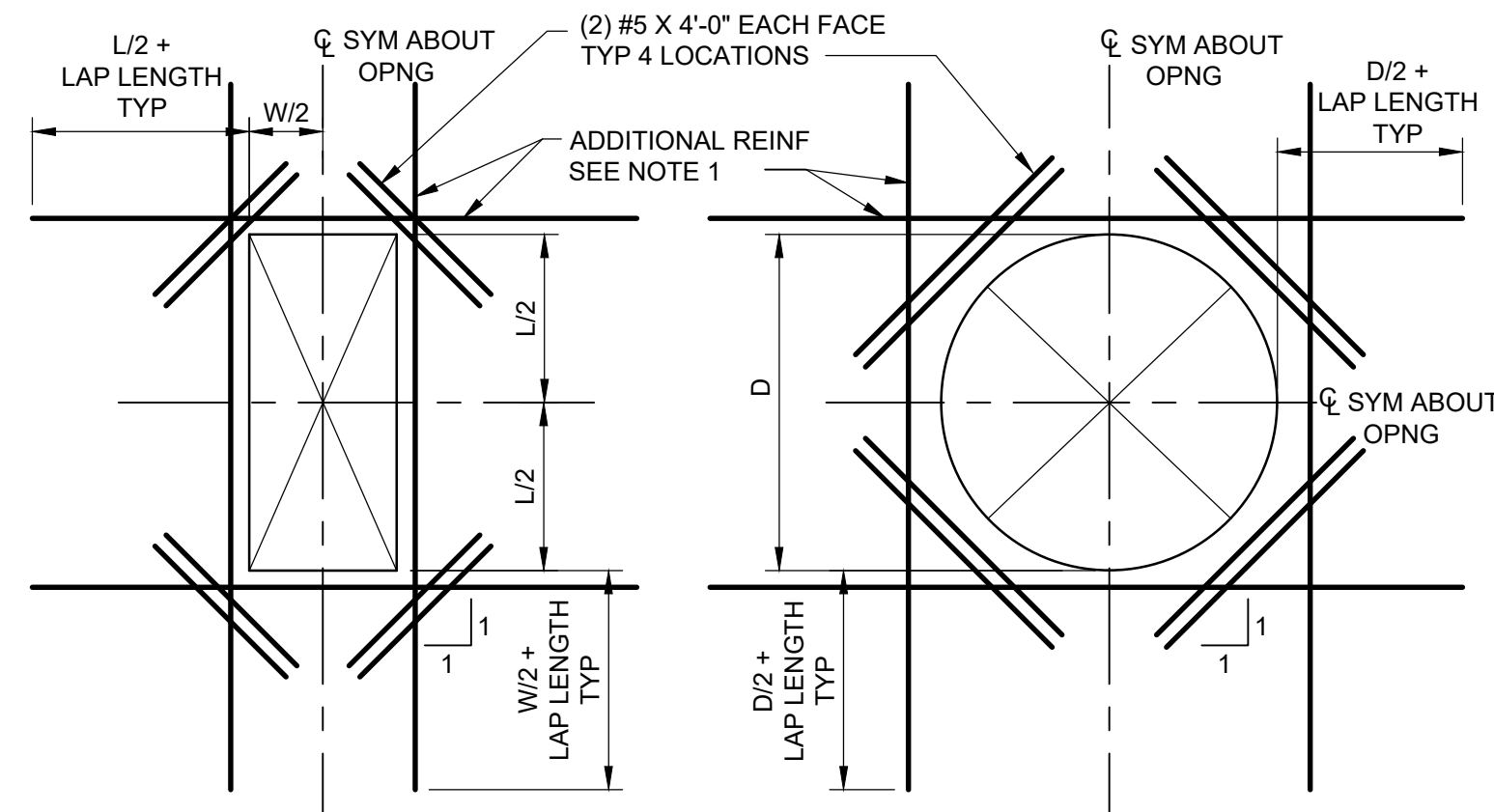


NOTE:

1. APPLIES TO SLABS IN BOTH DIRECTIONS AND WALL HORIZONTAL REINFORCEMENT.

REINFORCING SPLICE NOT AT CONSTRUCTION JOINT

NTS



RECTANGULAR OPNG DETAIL

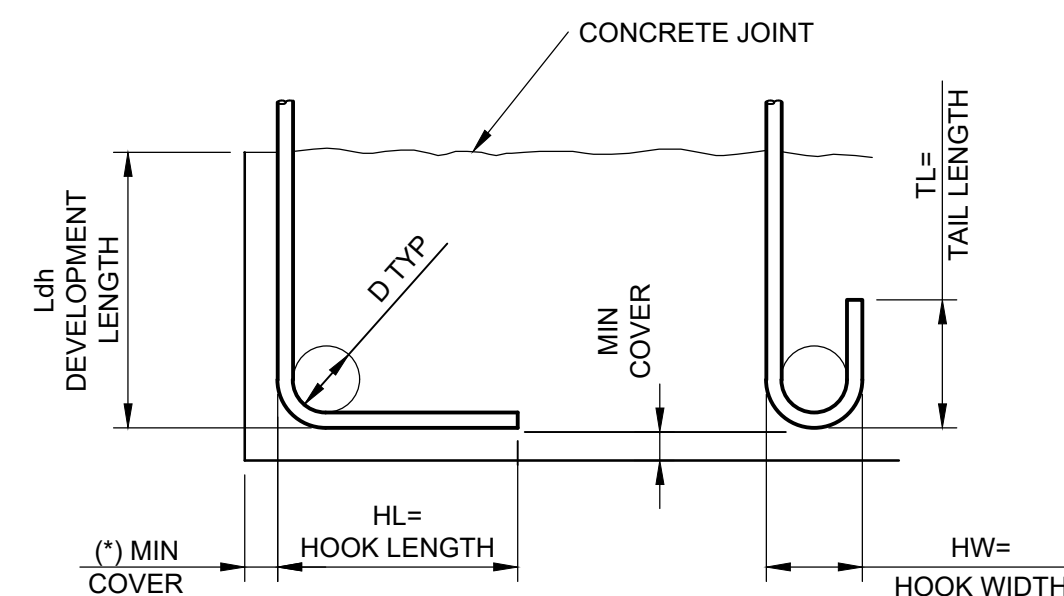
CIRCULAR OPNG DETAIL

NOTES:

1. PROVIDE ADDITIONAL REINFORCING THE SAME SIZE AS DISCONTINUOUS REINFORCEMENT AT OPENING. QUANTITY OF REINFORCING IN EACH DIRECTION SHALL BE EQUAL TO OR ONE GREATER THAN THE NUMBER OF DISCONTINUOUS BARS. PLACE 1/2 OF ADDITIONAL REINFORCING BARS EACH SIDE OF OPENING. PLACE ADDITIONAL REINFORCEMENT AT 3" OC (TYPICAL BOTH DIRECTIONS AND ALL LAYERS OF REINFORCEMENT). START FIRST BAR 2" CLEAR TO OPENING.
2. EXTEND ADDITIONAL REINFORCING BEYOND EDGE OF OPENING AS SHOWN ABOVE. ADDITIONAL BARS MAY TERMINATE AT THE END OF THE WALL WITH A STANDARD HOOK WHERE THE LENGTH OF THE WALL WILL NOT PERMIT BARS TO EXTEND AS SHOWN ABOVE.
3. TYPICAL WALL OR SLAB REINFORCING NOT SHOWN FOR CLARITY. TERMINATE TYPICAL REINFORCING 2" CLEAR TO OPENING.
4. OPENINGS 12" OR LESS IN SLABS AND OPENINGS 18" OR LESS IN WALLS. NO EXTRA REBAR ARE REQUIRED UNLESS SHOWN OTHERWISE. TYPICAL REINFORCING SHALL BE RESPAVED (NOT CUT) TO ALLOW FOR OPENINGS TO BE MADE.
5. UNLESS SHOWN OTHERWISE ON DRAWINGS, PROVIDE EXTRA REINFORCING AROUND OPENINGS AS SHOWN AND INDICATED ABOVE.
6. PROVIDE ADDITIONAL DOWELS PER NOTE 1 ABOVE FOR ALL OPENINGS NEAR THE FLOOR SLAB, BASE SLAB, OR CORNERS.

EXTRA REINFORCING AROUND OPENINGS

NTS



90 DEG STD HOOK

180 DEG STD HOOK

BAR SIZE	GRADE 60	HL	HW	TL	D	f _c =4.0 OR 4.5 KSI	
						L _{dh}	*
#3		6"	3"	3"	2 1/4"	6"	
#4		8"	4"	4 1/2"	3"	7"	
#5		10"	5"	5"	3 3/4"	9"	
#6		1'-0"	6"	6"	4 1/2"	10"	
#7		1'-2"	7"	7"	5 1/4"	12"	
#8		1'-4"	8"	8"	6"	14"	
#9		1'-7"	11 3/4"	10 1/2"	9 1/2"	15"	
#10		1'-10"	1'-1 1/4"	11 1/2"	10 3/4"	17"	
#11		2'-0"	1'-2 3/4"	1'-1"	12"	19"	

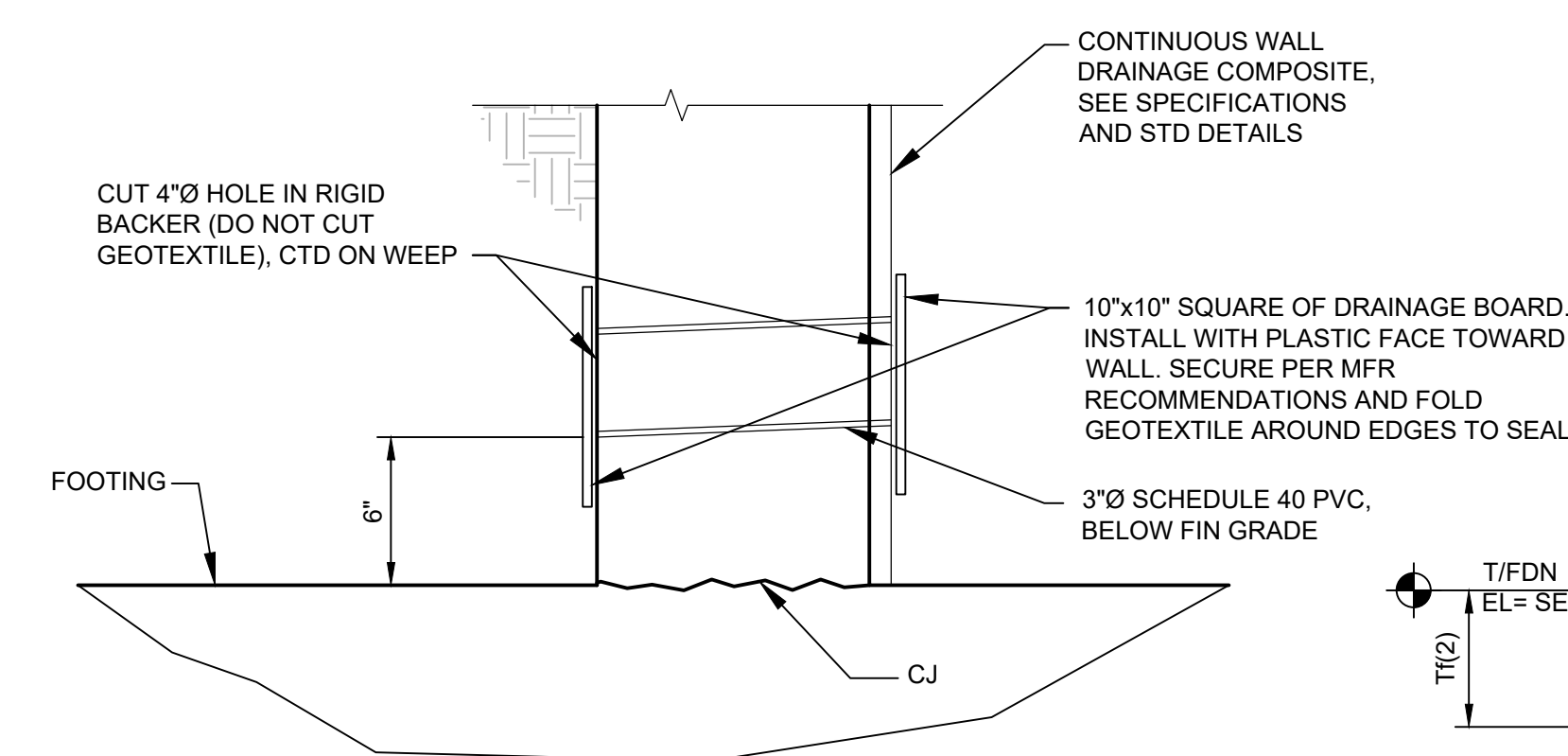
* COMPLYING WITH MINIMUM COVER REQUIREMENTS OF ACI 318. OTHERWISE L_{dh} MUST BE RE-CALCULATED.

NOTES:

1. SPACE WEEP DRAINS 5' (MAX) UNIFORMLY ALONG WALL.

TYPICAL WEEP DRAIN BELOW GRADE

1 1/2"=1'-0"



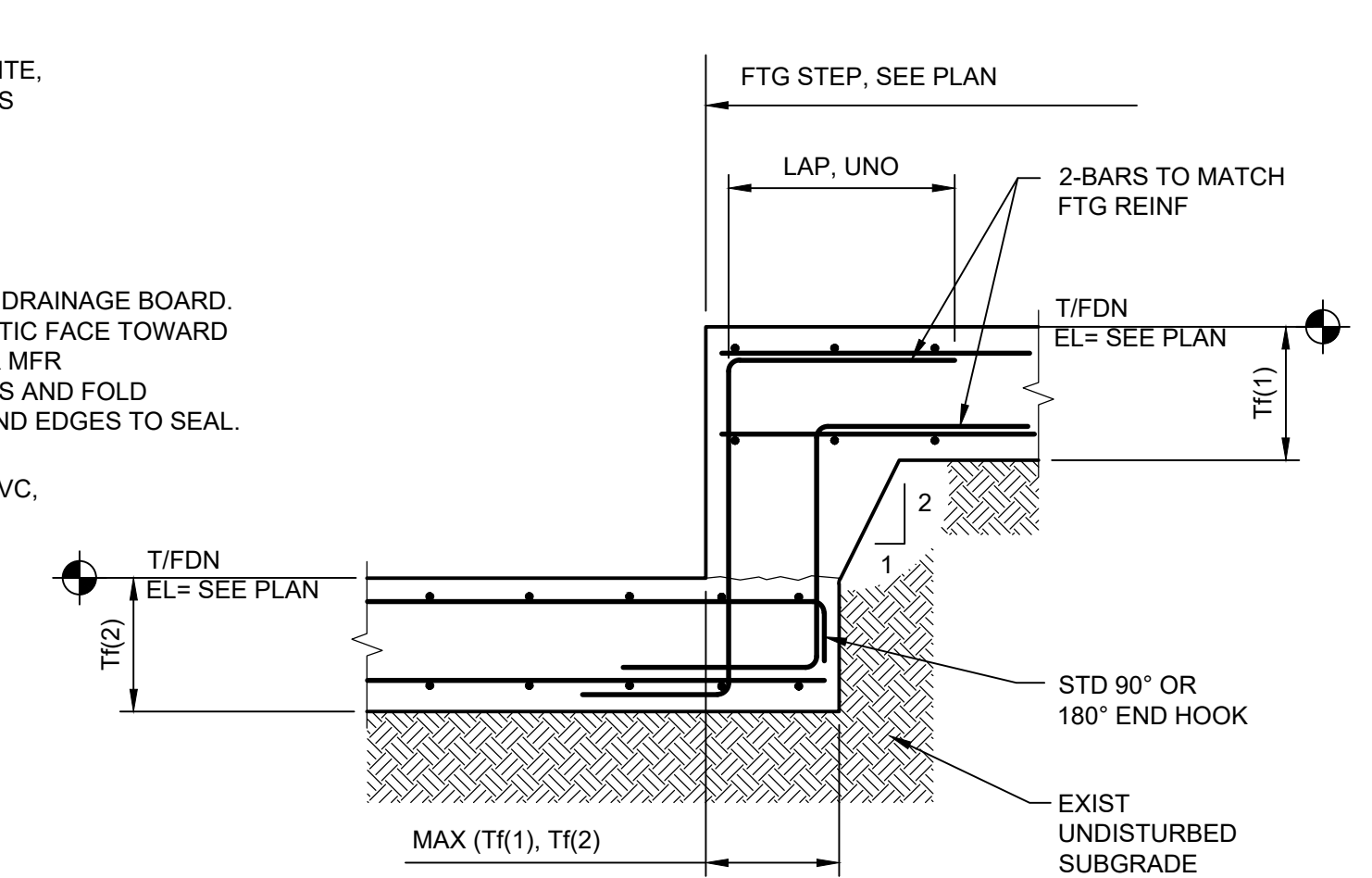
NOTES:

1. LAP LENGTHS SHOWN ARE FOR CLASS "B" TENSION SPLICES.
2. LAP LENGTHS AND EMBEDMENTS SHOWN ARE FOR BARS SPACED LATERALLY ≥ FIVE TIMES THE BAR DIAMETER (CENTER TO CENTER) AND FOR MINIMUM COVER IN ACCORDANCE WITH ACI.
3. IF SPACING IS < 5 TIMES BAR DIAMETER (CENTER TO CENTER), INCREASE LAP LENGTH AND EMBEDMENT PER ACI-318.
4. TOP REINFORCING IS HORIZONTAL STEEL SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE REINFORCING.

BAR SIZE	f _c = 4.0 - 5.0 ksi f _y = 60.0 ksi			
	LAP LENGTH (IN.)		DEVELOPMENT LENGTH L _d (IN.)	
	TOP	OTHER	TOP	OTHER
#3	16	16	12	12
#4	19	16	15	12
#5	24	20	19	15
#6	29	23	22	18
#7	42	33	33	25
#8	48	38	37	29
#9	60	47	46	36
#10	74	57	57	44
#11	89	69	68	53

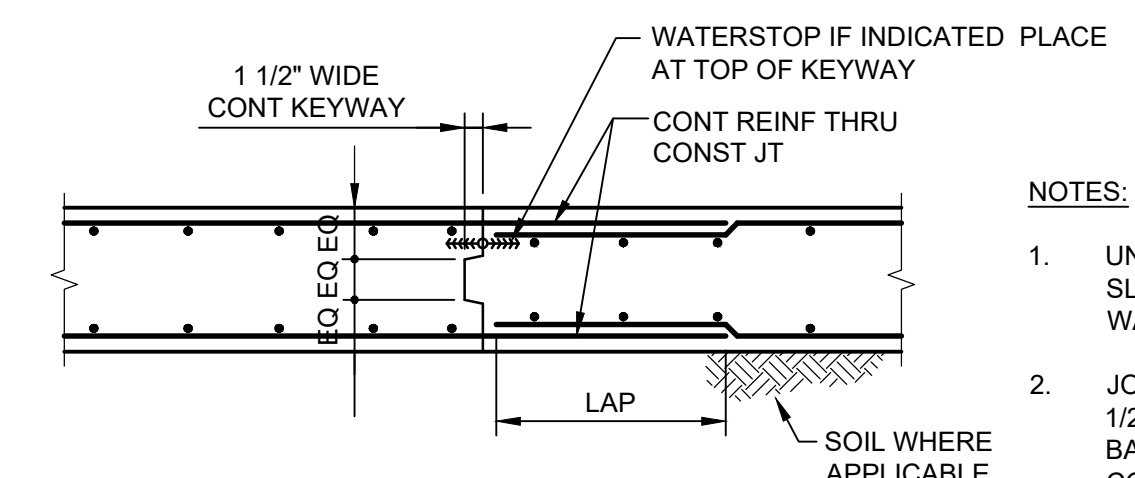
LAP LENGTHS

NTS

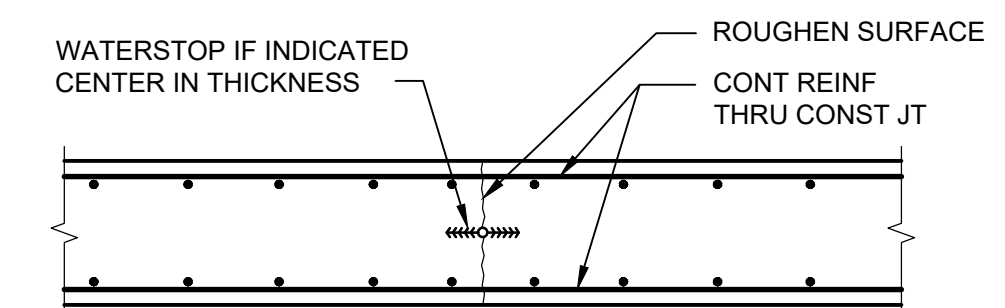


TYPICAL DETAIL BEAM/FOOTING STEP DETAIL

NTS



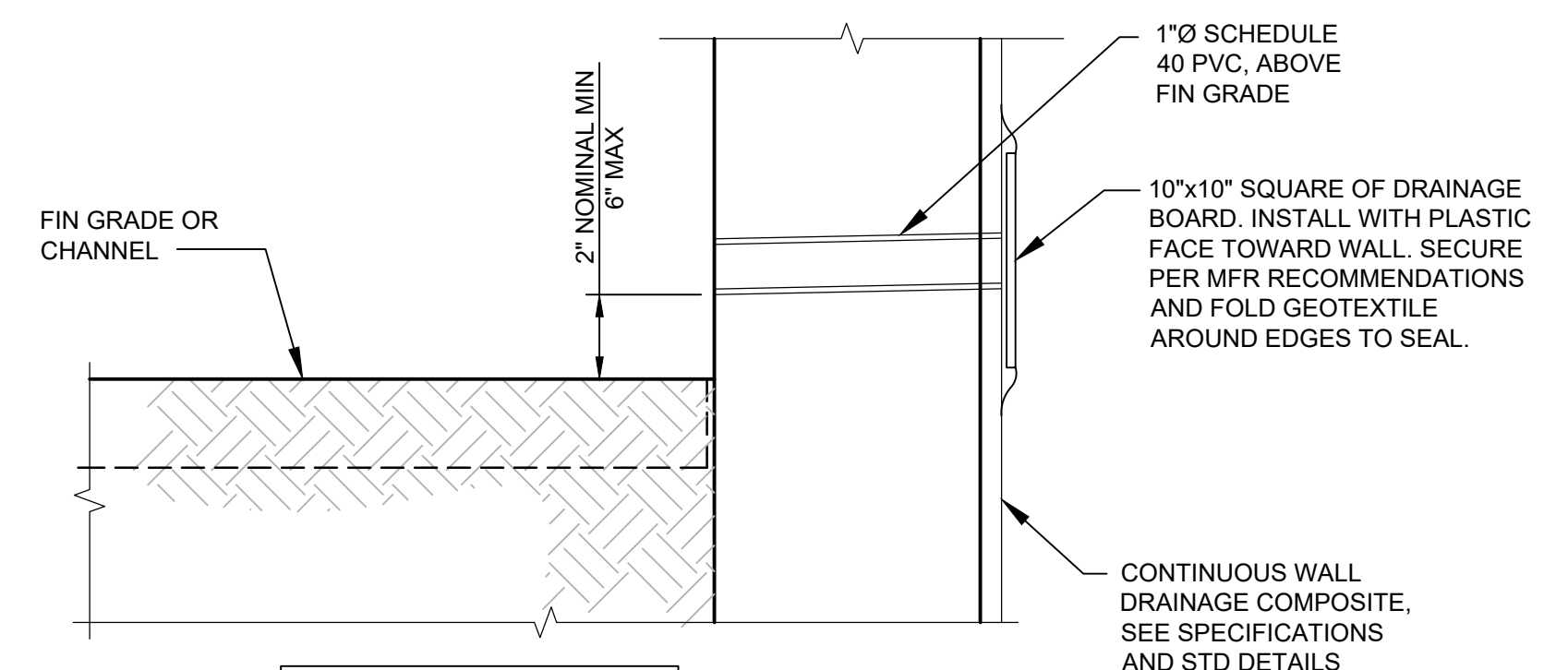
KEYED CONSTRUCTION JOINT (KCJ)



ROUGHEN CONSTRUCTION JOINT (CJ)

CONSTRUCTION JOINT

NTS



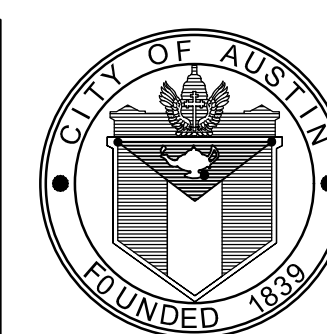
TYPICAL WEEP DRAIN ABOVE GRADE

1 1/2"=1'-0"



ISSUE	DATE	DESCRIPTION
0	01/21/2021	CONFORMED CONTRACT DRAWINGS

PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906



ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL

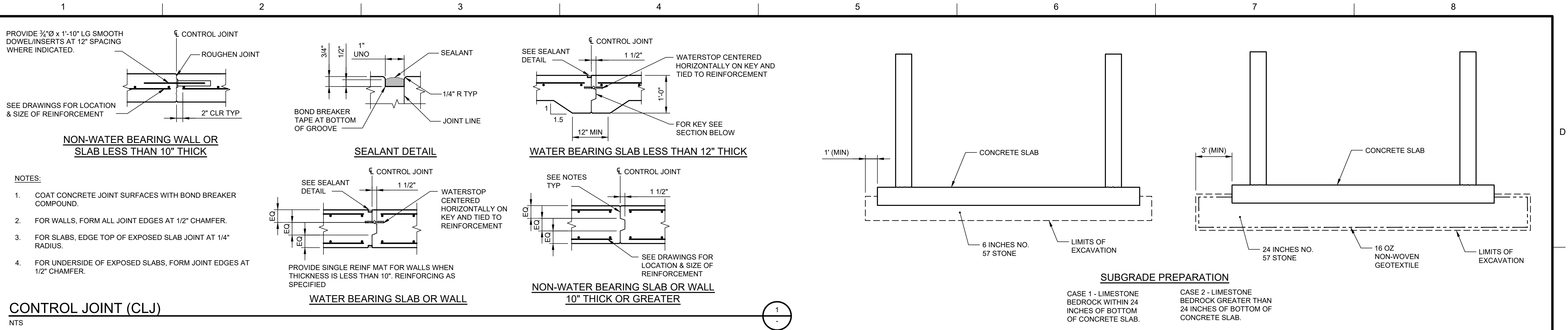
STRUCTURAL RETAINING WALL STANDARD DETAILS



FILENAME | S90-512.dwg
SCALE | AS NOTED

SHEET 93 of 350

S90-512

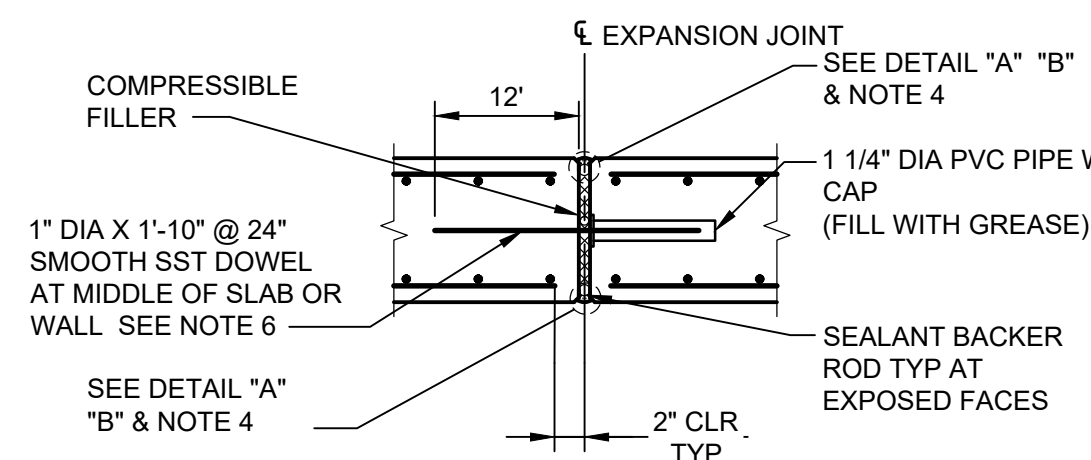


CONTROL JOINT (CLJ)

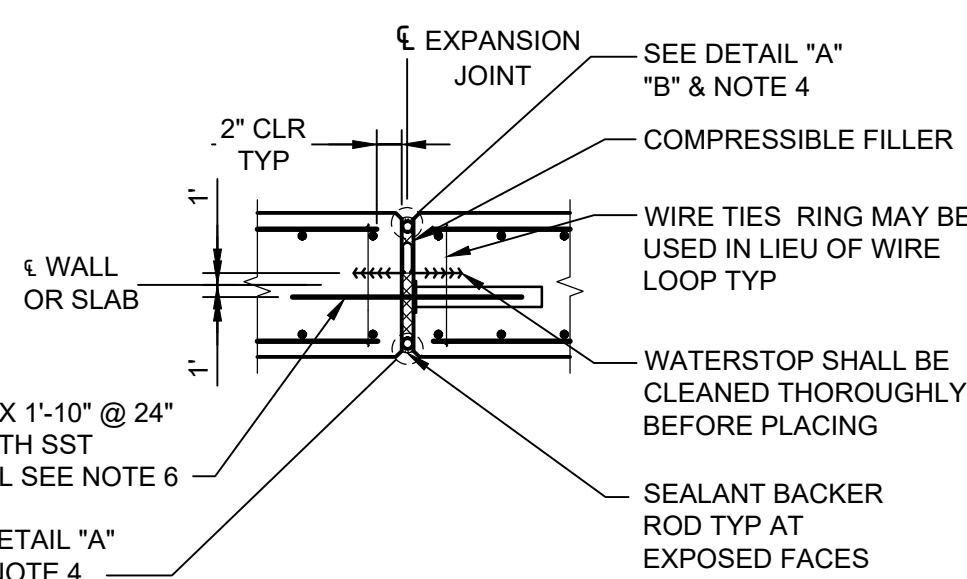
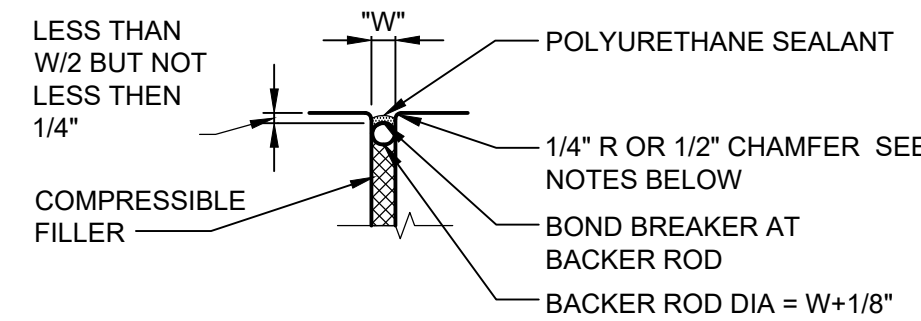
NTS

NOTES:

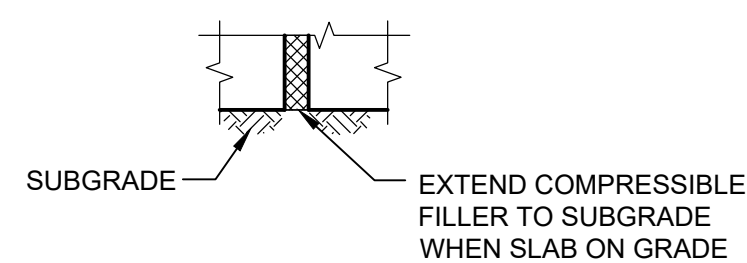
1. FOR WALLS, FORM ALL JOINT EDGES AT 1/2" CHAMFER.
2. FOR UNDER SIDE OF EXPOSED SLABS, FORM JOINT EDGES AT 1/2" CHAMFER.
3. FOR SLABS, PROVIDE 1/4" RADIUS TOOLED EDGES AT TOP SURFACE
4. USE DETAIL "B" AT UNDERSIDE OF SLABS ON GRADE ONLY. USE DETAIL "A" AT ALL OTHER LOCATIONS.
5. "W" = 1" WIDE UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
6. SMOOTH DOWEL AND PVC ASSEMBLY AT EXPANSION JOINTS SHALL USE GREENSTREAK "SPEED DOWEL" NO. PSD12/#TTX (BASE CODE PSD/#7BX).



DETAIL "A" EXPOSED FACE

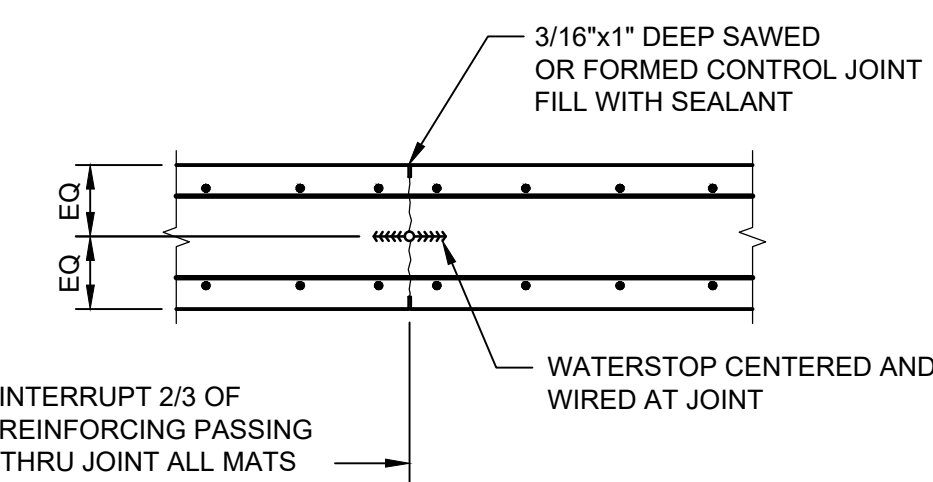


DETAIL "B" SOIL SIDE



EXPANSION JOINTS WITH SEALANT (EJ)

NTS



NOTES:

1. ONLY WATER BEARING SLABS OR WALLS REQUIRE WATERSTOP.
2. JOINT MAY BE FORMED WITH 1/2" CHAMFER STRIPS BACK-TO-BACK AT WALLS, CONTRACTOR'S OPTION.
3. TO BE USED ONLY WHERE CALLED FROM IN THE CONTRACT DOCUMENTS, OR AS PERMITTED BY THE ENGINEER.

PARTIAL MOVEMENT CONTROL JOINT (PCLJ)

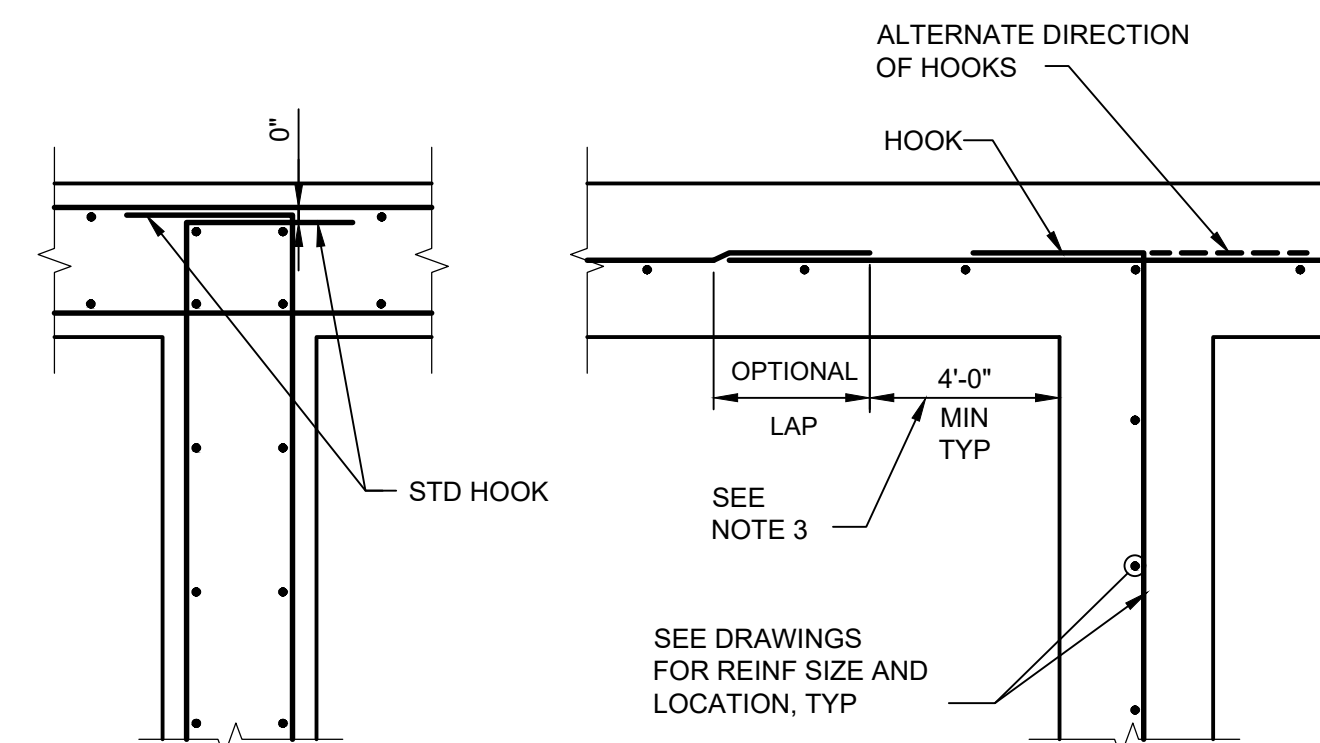
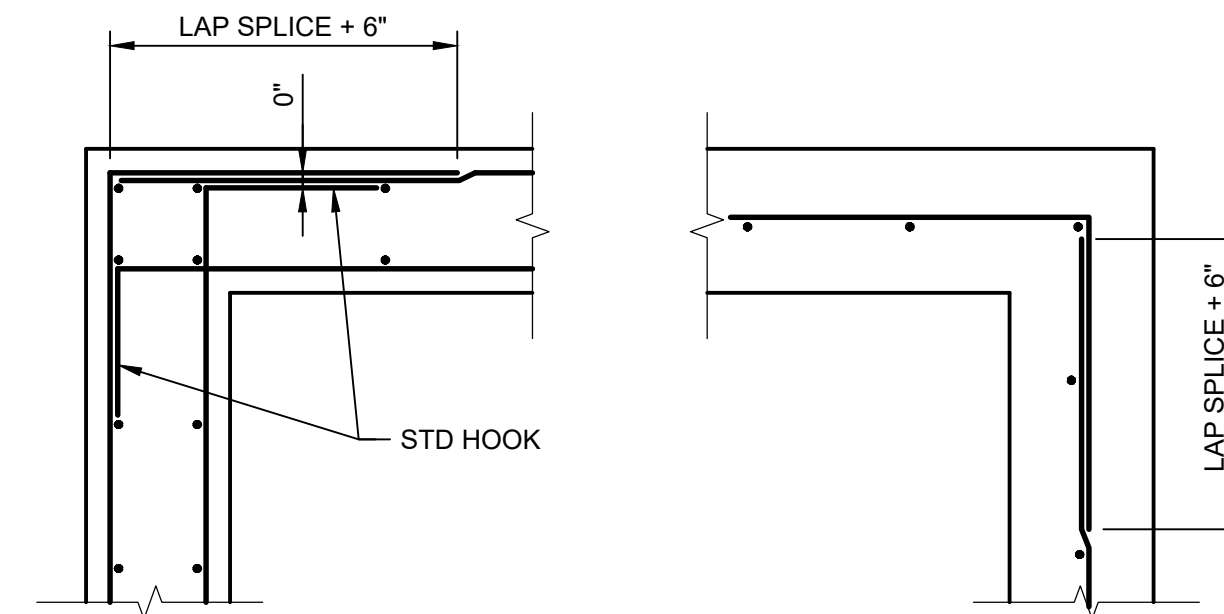
NTS

WALL REINFORCEMENT AT CORNERS AND INTERSECTIONS

NTS

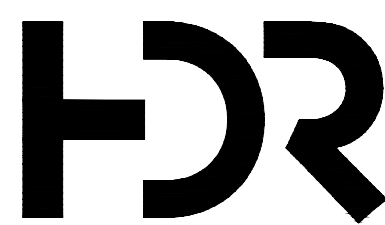
TYPICAL SUBGRADE PREPERATION REQUIREMENTS

NTS



NOTES:

1. ALL HOOKS SHALL BE STD 90 DEGREE HOOKS UNO.
2. SEE DRAWINGS FOR ADDITIONAL HORIZONTAL BARS. STAGGER BETWEEN TYPICAL REINF SPACING, EXTEND TO 1/5 OF DISTANCE TO NEAREST ADJACENT WALL IN EACH DIRECTION, UNO.
3. OPTIONAL LAP LOCATION. APPLIES TO BOTH DOUBLE AND SINGLE LAYER CONDITIONS TYP.



Texas P.E. Firm
Registration No. F-754

0	01/21/2021	CONFORMED CONTRACT DRAWINGS
ISSUE	DATE	DESCRIPTION

PROJECT MANAGER W. D. WEHNER

DESIGNED BY LEM

DRAWN BY HDG

CHECKED BY CAZ

DATE OCTOBER 2020

PROJECT NUMBER 10123906



ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL

**STRUCTURAL
RETAINING WALL
STANDARD DETAILS**



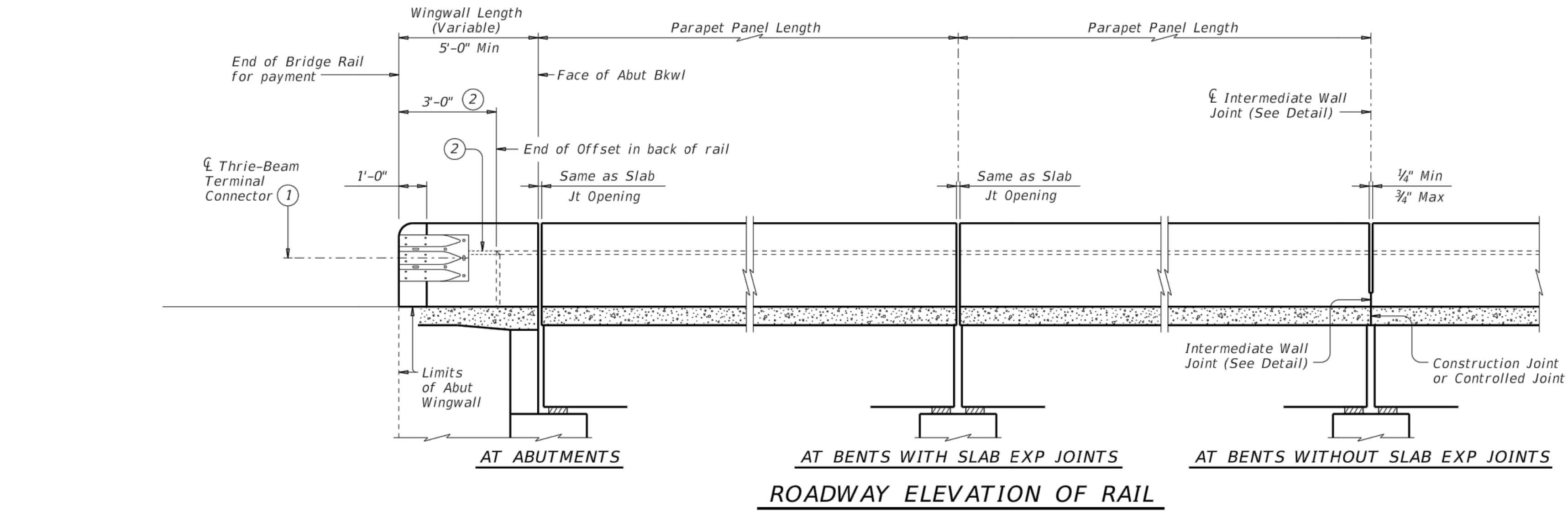
FILENAME S90-512.dwg
SCALE AS NOTED

SHEET 94 of 350

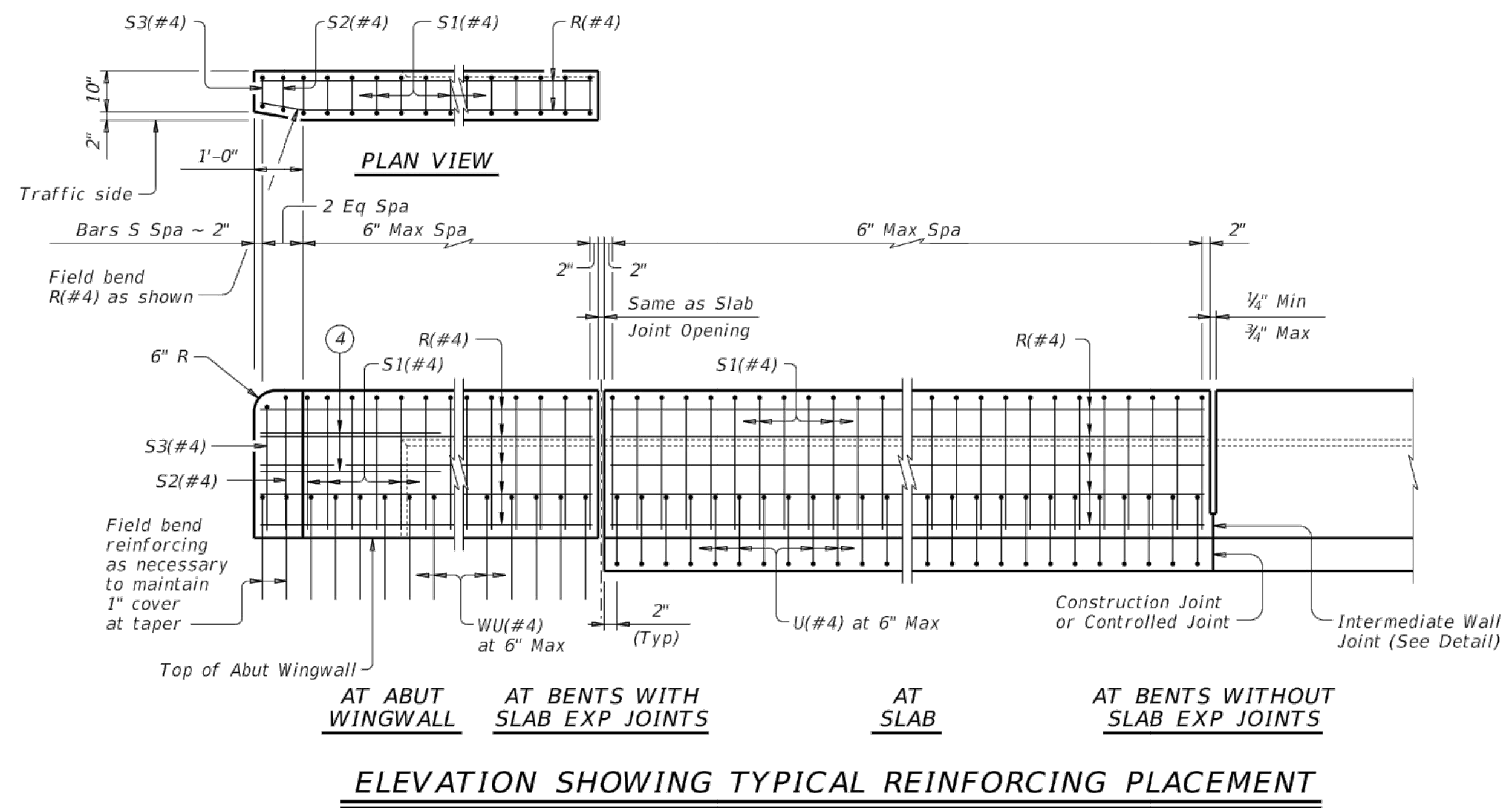
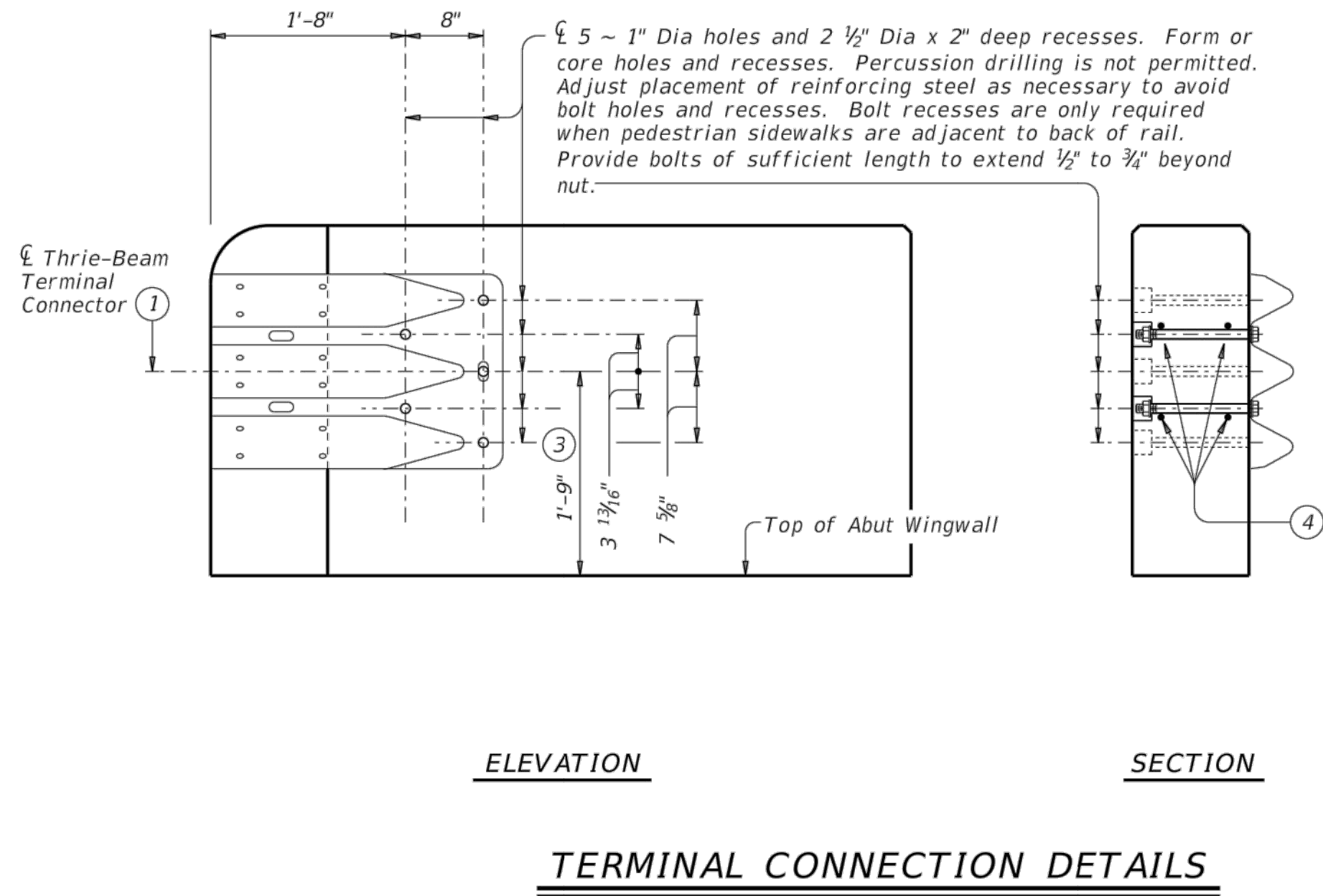
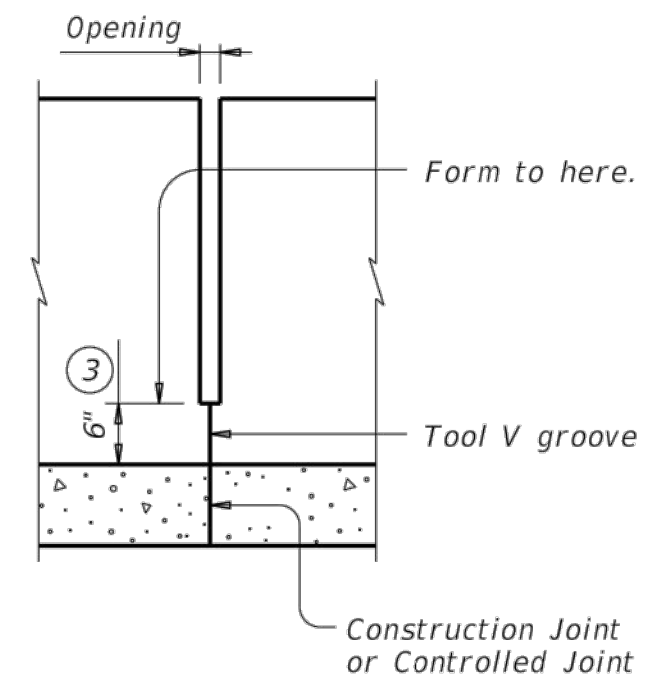
S90-513

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DATE:
FILE:



INTERMEDIATE WALL JOINT DETAIL
Provide at all interior bents without slab expansion joints.



- Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
- Back of rail offset may, with Engineer's approval, be continued to the end of the railing.
- Increase 2" for structures with overlay.
- Place 4 additional Bars R(#4) 3'-8" in length inside Bars S(#4) and centered 2'-0" from end of rail when Terminal Connections are required. Field bend as needed.

SHEET 1 OF 2

		Bridge Division Standard	
TRAFFIC RAIL			
TYPE T222			
FILE: r1std003-18.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
CONT: TxDOT	SECT: March 2018	JOB: HIGHWAY	CK: TxDOT
REVISIONS		SHEET NO.	
DIST		COUNTY	



Texas P.E. Firm
Registration No. F-754

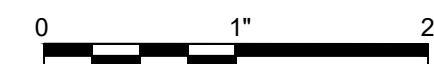
ISSUE	DATE	DESCRIPTION
0	01/21/2021	CONFORMED CONTRACT DRAWINGS

PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
DRAWN BY	HDG
CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906



ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL

STRUCTURAL
RETAINING WALL
TXDOT STANDARD DETAILS



FILENAME | S90-514.dwg
SCALE | AS NOTED

SHEET 95 of 350
S90-514

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DATE:
FILE:



Texas P.E. Firm
Registration No. F-754

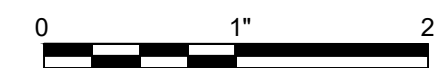
0	01/21/2021	CONFORMED CONTRACT DRAWINGS
ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	W. D. WEHNER
DESIGNED BY	LEM
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CHECKED BY	CAZ
DATE	OCTOBER 2020
PROJECT NUMBER	10123906



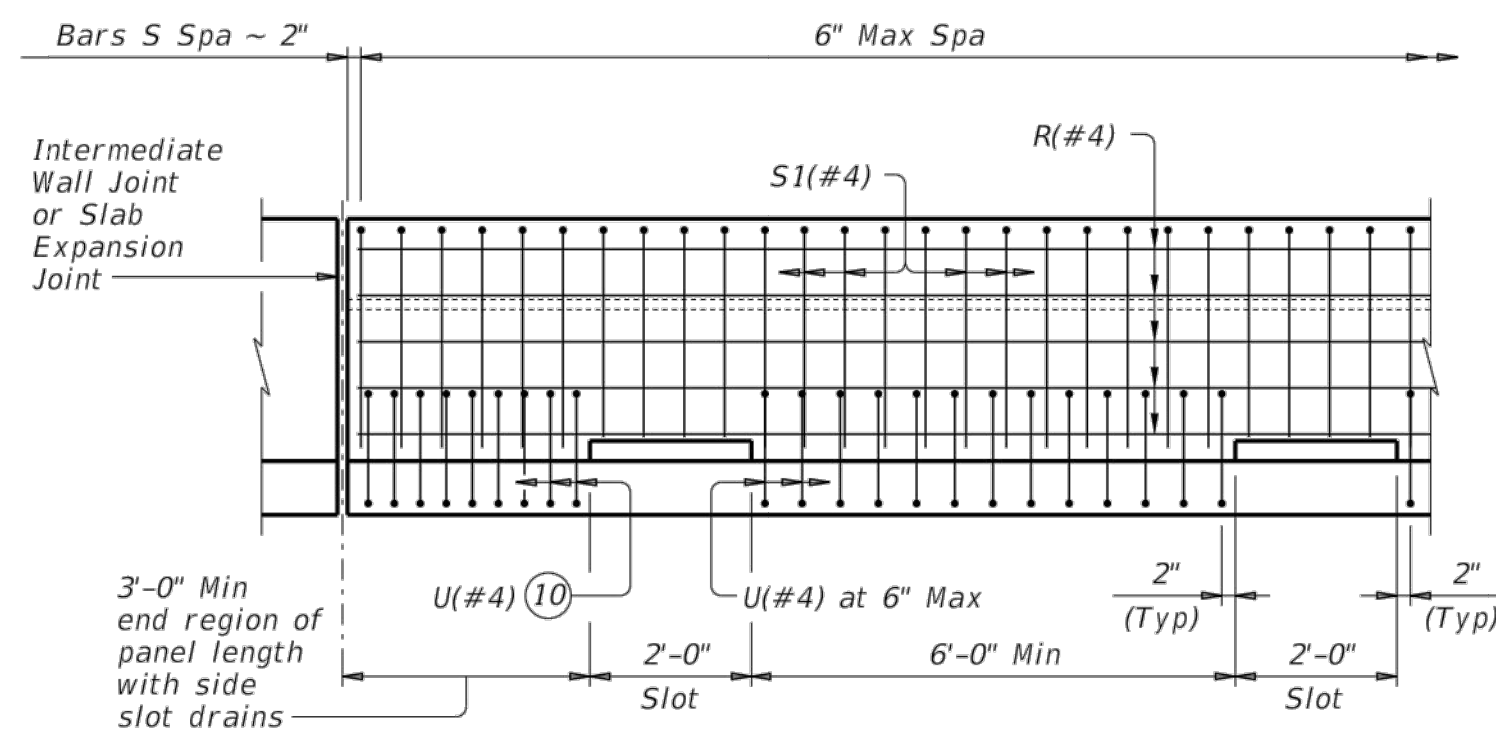
ULLRICH WTP
LOW SERVICE PUMP STATION
ELECTRICAL FEED RENEWAL

STRUCTURAL
RETAINING WALL
TXDOT STANDARD DETAILS



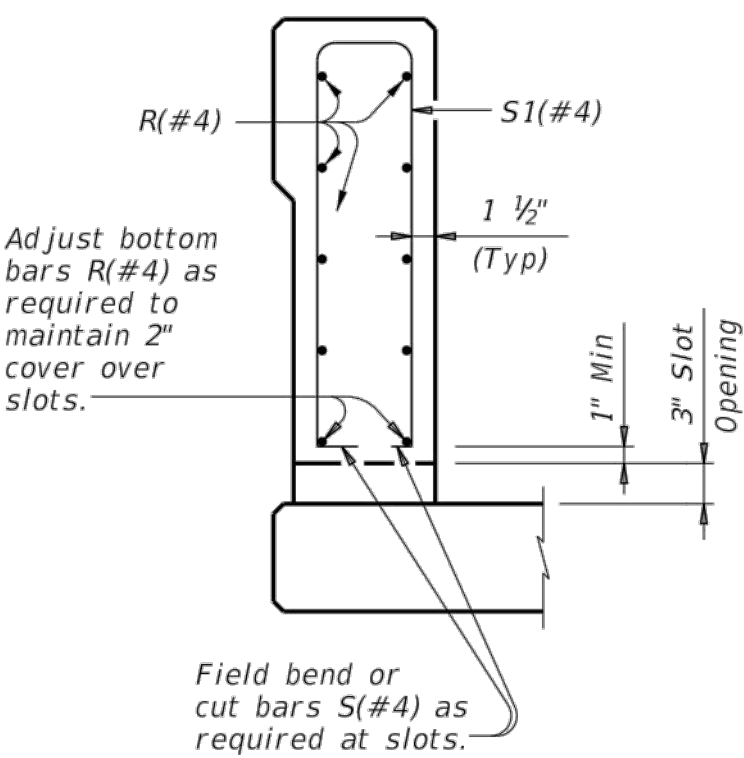
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SCALE	AS NOTED

SHEET 96 of 350
S90-515

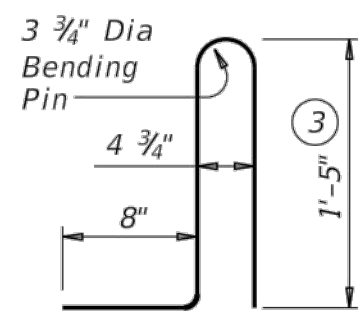


OPTIONAL SIDE SLOT DRAIN DETAIL

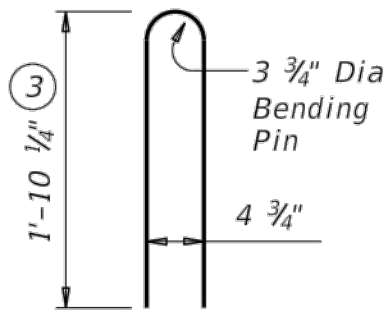
Note: Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Drains should not be placed over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway surface and a sidewalk surface, side drain slots will not be permitted.



**SECTION THRU
OPTIONAL SIDE SLOT DRAIN**

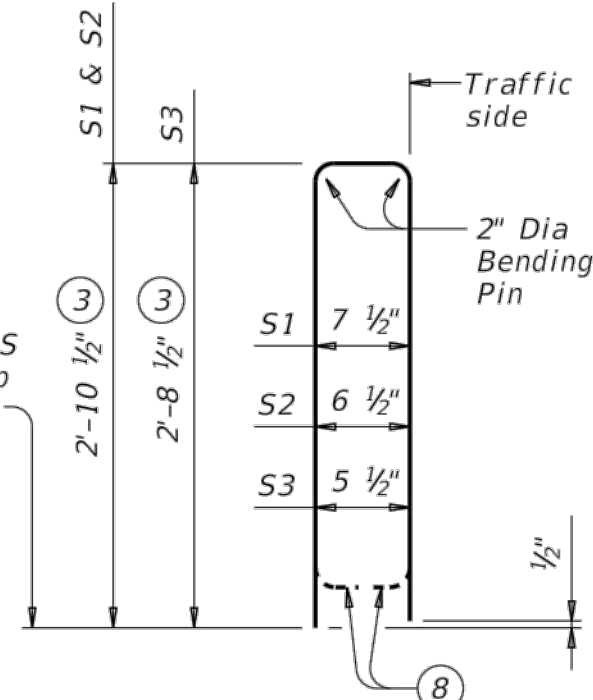


BARS U (#4)

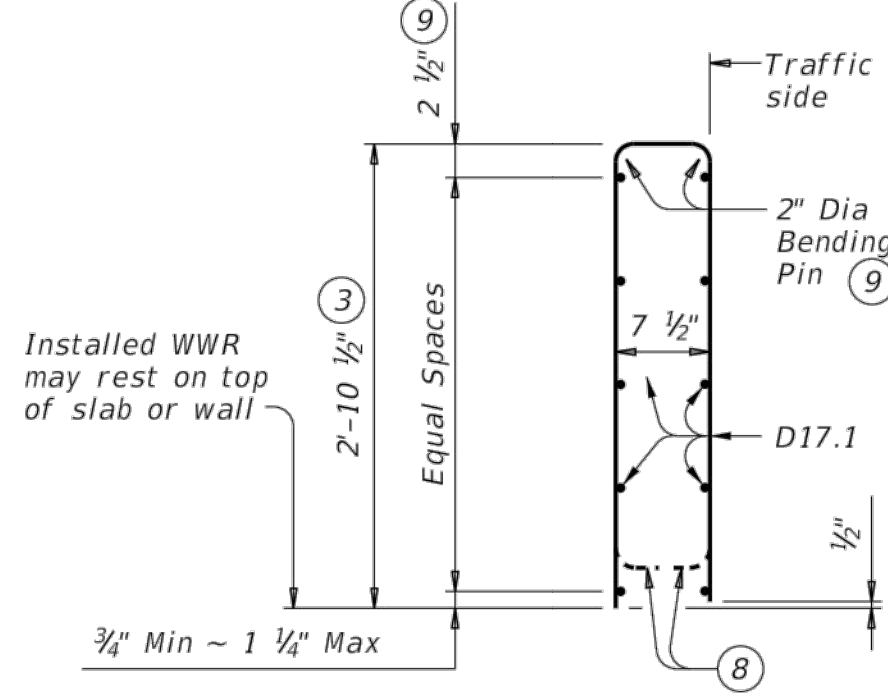


BARS WU (#4)

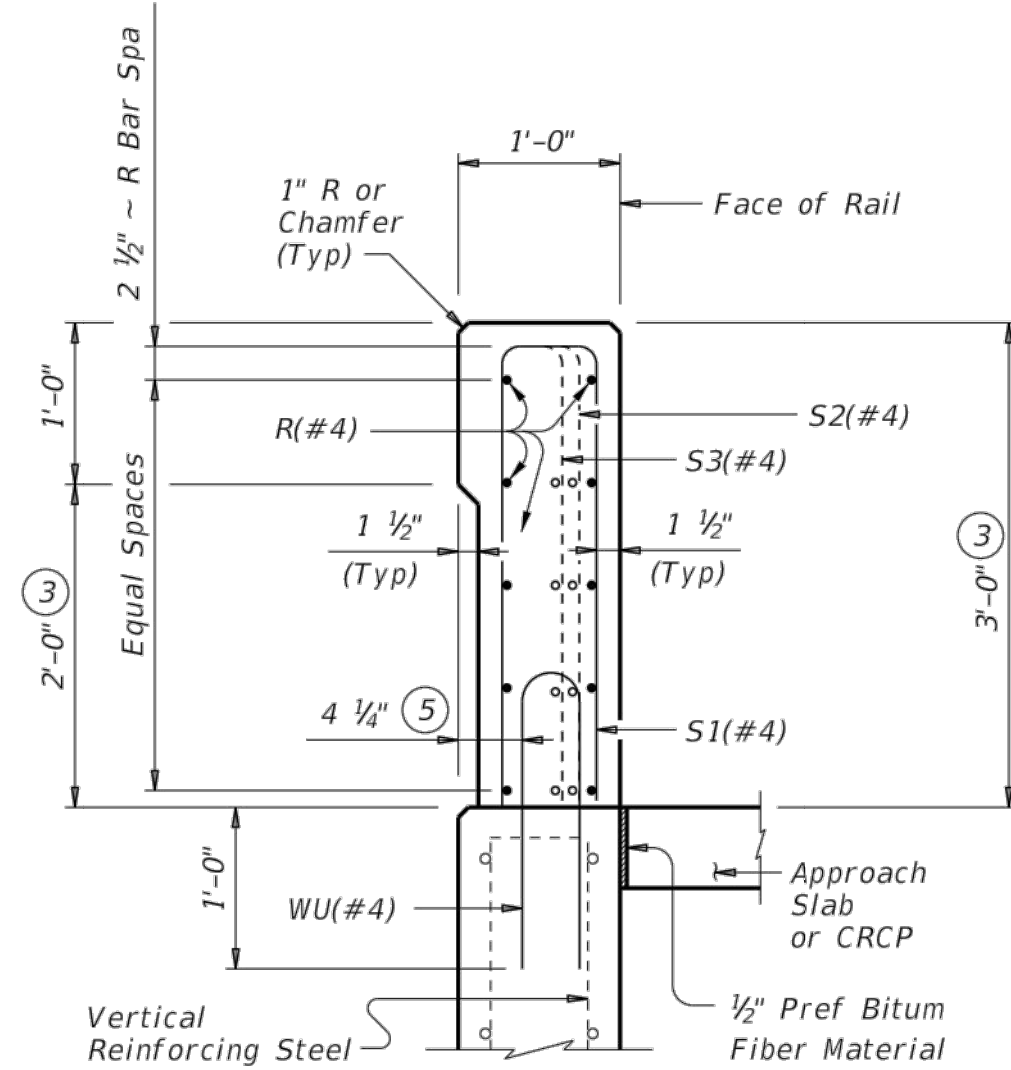
Installed Bars S may rest on top of slab or wall



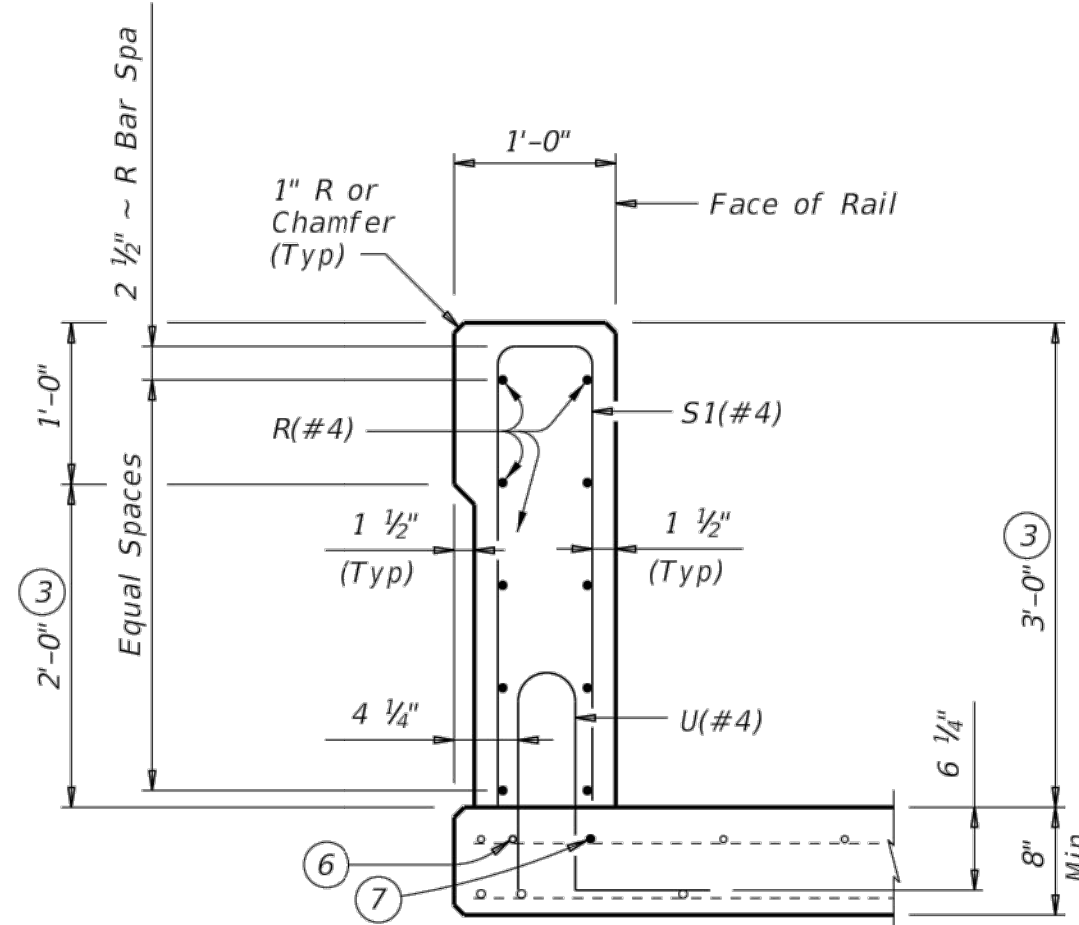
BARS S (#4)



**OPTIONAL WELDED WIRE
REINFORCEMENT (WWR)**



**ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS**



ON BRIDGE SLAB

SECTIONS THRU RAIL

- ③ Increase 2" for structures with overlay.
- ⑤ 5 1/4" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.
- ⑥ As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars will be furnished at the Contractors expense.
- ⑦ Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.
- ⑧ Bend or cut as required to clear drain slots.
- ⑨ No longitudinal wires may be in top center of cage.
- ⑩ Space U(#4) bars at 4" Max when end region of panel length is less than 6'-0" to side slot drain. Space U(#4) bars at 6" Max when end region of panel length is 6'-0" and greater to side slot drain.

CONSTRUCTION NOTES:

This railing may be constructed with slip-forms when approved by the Engineer, with equipment approved by the Engineer. Sensor control for both line and grade must be provided. Tack welding to provide bracing for slip-form operations is acceptable. Welding can be performed at a minimum spacing of 3 ft between the cage and the anchorage. It is permissible to weld to U, WU and S bars at any location on the cage. If increased bracing is needed, additional anchorage devices must be added and welding must be performed in the upper two thirds of the cage. Face of rail and parapet must be vertical transversely unless otherwise shown in the plans or approved by the Engineer. Chamfer all exposed concrete corners.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.
Provide Grade 60 reinforcing steel.
Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.
Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U and WU unless noted otherwise. Deformed WWR (ASTM 1064) may be substituted for Bars R and S, as shown. Provide the same laps as required for reinforcing bars.
Provide bar laps, where required, as follows:
Uncoated or galvanized ~ #4 = 1'-7"
Epoxy coated ~ #4 = 2'-5"

GENERAL NOTES:

This rail has been successfully evaluated by full-scale crash test to meet MASH TL-4 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less. Do not use this railing on bridges with expansion joints providing more than 5" movement.
Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.
Shop drawings are not required for this rail.
Average weight of railing with no overlay is 413 plf.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

SHEET 2 OF 2

Texas Department of Transportation		Bridge Division Standard	
TRAFFIC RAIL			
TYPE T222			
FILE: r1std003-18.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT March 2018	CONT	SECT	JOB
REVISIONS		HIGHWAY	
DIST		COUNTY	SHEET NO.