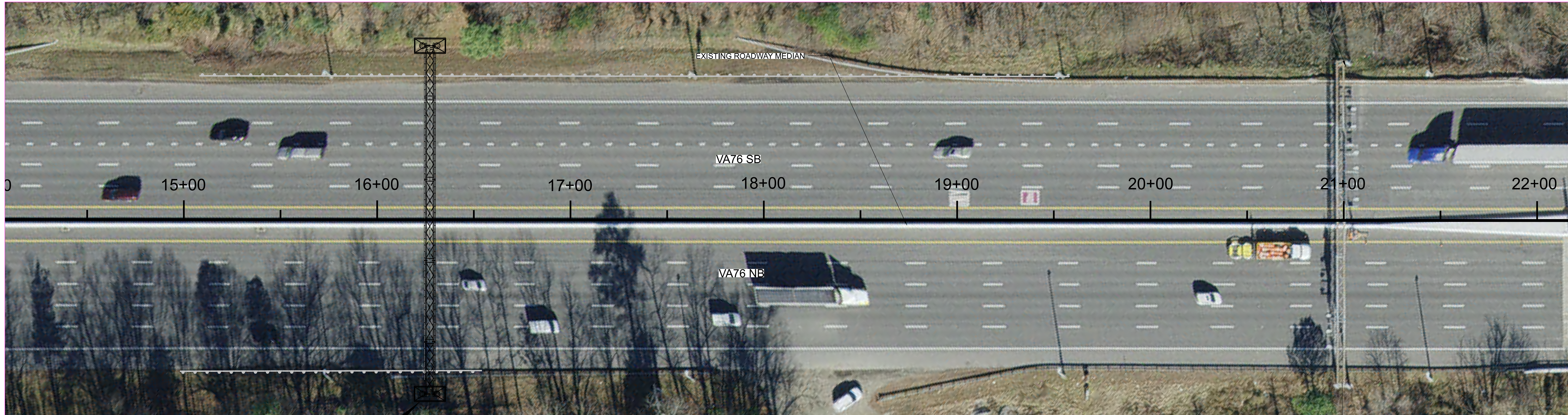




PROJECT LOCATION

**POWHITE PKWAY GANTRY LOCATION**

EXISTING GANTRY



PROPOSED GANTRY

455'-0"

**POWHITE PKWAY GANTRY PLAN**

**DRAFT**

- NOTES:
1. FOR GENERAL NOTES, SEE DRAWING S-3
  2. FOR STRUCTURES DETAILS . SEE DRAWING S-4 & S-6
  3. FOR FOUNDATION DETAILS SEE DRAWING S-7

ID	DATE	BY	DESCRIPTION

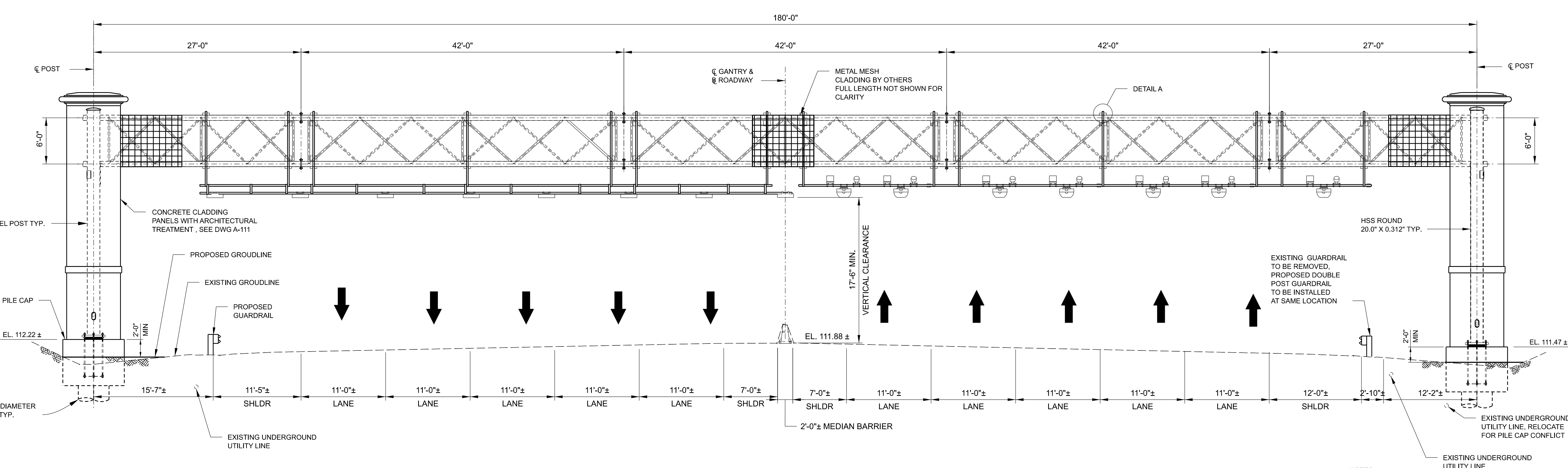
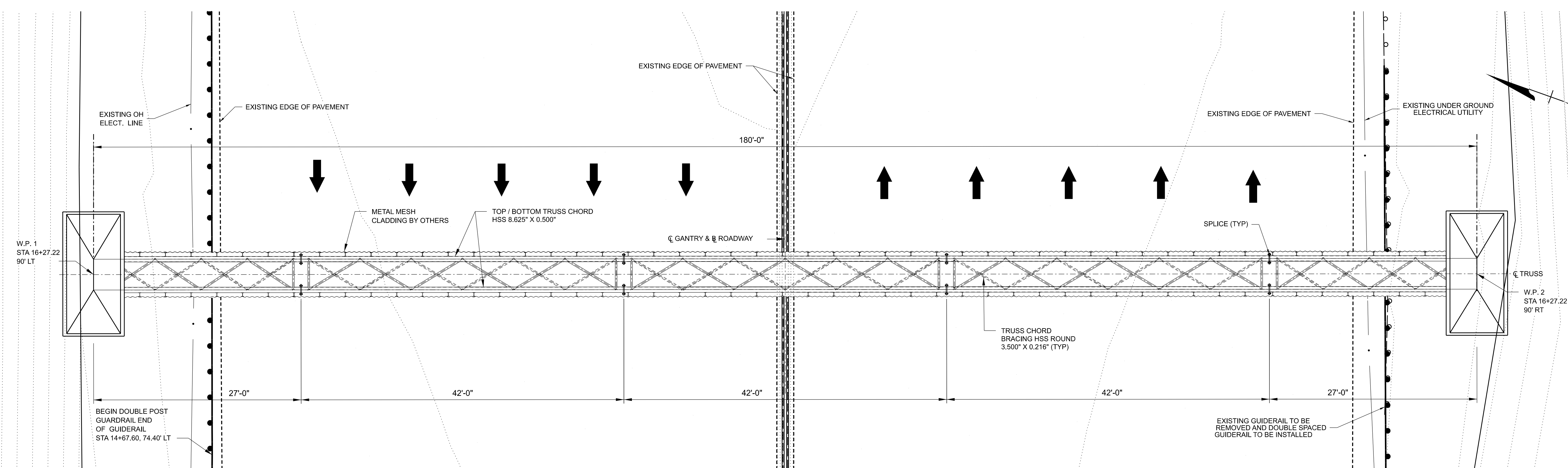
PROJECT	<b>RICHMOND METROPOLITAN TRANSPORTATION AUTHORITY RMTA</b>
DRAWN BY	G. Garayburu
CHECKED BY	L. Sun
APPROVED	S. Lee

SCALE	
TITLE	<b>GANTRY SITE PLAN</b>

DATE	10/16/2024
SHEET	S-1

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- NOTES:
1. FOR GENERAL NOTES, SEE DWG. S-3.
  2. FOR DETAILS, SEE DWG. S-4 TO S-5.
  3. FOR FOUNDATION, SEE DWG S-6.
  4. FOR DETAIL A, SEE DWG S-5.
  5. FOR WORK POINTS, SEE DWG S-4.
  6. FOR AET EQUIPMENTS, SEE EQUIPMENT LAYOUT DRAWINGS FOR DETAILS.

DRAFT

PROJECT				RICHMOND METROPOLITAN TRANSPORTATION AUTHORITY RMTA		DESIGNED BY	G. Garayburu	SCALE	1" = 10'	TITLE	GANTRY PLAN AND ELEVATION		DATE	10/16/2024
DRAWN BY						CHECKED BY	L. Sun						REV	S-2
APPROVED BY						DATE	S. Lee							

GENERAL NOTES:

1. CONTRACTOR SHALL BE FAMILIAR WITH THE PROPOSED MOTION SENSITIVE TOLL EQUIPMENT TO BE MOUNTED TO THE SUPPORT STRUCTURE AND SHALL COORDINATE ALL WORK WITH THE SYSTEMS INTEGRATOR RESPONSIBLE FOR THE ERECTION OF THIS EQUIPMENT. THE CONTRACTOR SHALL PAY PARTICULAR ATTENTION TO MOUNTING REQUIREMENTS FOR TOLLING EQUIPMENT. ALL EQUIPMENT MOUNTING REQUIREMENTS DEPICTED WITHIN THIS CONTRACT SHALL BE VERIFIED PRIOR TO PREPARATION OF SHOP DRAWINGS.
2. OVERHEAD ETC STRUCTURE IS DESIGNED IN ACCORDANCE WITH THE FOLLOWING DESIGN CODES THE LATEST EDITION AS APPLICABLE:
  - A. AASHTO SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS" (LTS 6) DATED 2013 AND ALL INTERIMS
  - B. VDOT GUIDELINES TO AASHTO STANDARD SPECIFICATIONS LTS 6, 2013 WITH 2015 INTERIMS
  - C. AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC. (AISC) MANUAL OF STEEL CONSTRUCTION (15TH EDITION)
  - D. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 9 EDITION (2020)
  - E. AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM).
  - F. AWS D1.1 STRUCTURAL WELDING CODE - STEEL
3. CONCRETE FOR FOOTINGS SHALL BE CLASS A3 (3500 psi)
4. REINFORCING STEEL SHALL CONFORM TO A615. GRADE 60, WITH A YIELD STRENGTH FOR DESIGN OF  $f_y = 60000$  PSI. ALL SPLICES SHALL BE LAPPED AS PER BAR LAP CHARTS, SEE VDOT DESIGN GUIDELINES PART 2 CHAPTER 7, REINFORCING STEEL.
5. REINFORCING STEEL SHALL CONFORM TO A615. GRADE 60, WITH A YIELD STRENGTH FOR DESIGN OF  $f_y = 60000$  psi. ALL SPLICES SHALL BE LAPPED AS PER BAR LAP CHARTS. MINIMUM CLEAR COVER FOR REINFORCING STEEL SHALL BE 2" EXCEPT FOR THE FOLLOWING LOCATIONS:
 

LOCATION CLEAR COVER

FOOTINGS — BOTTOM AND SIDES 3 IN.
6. ALL STRUCTURAL MAIN TUBES SHALL CONFORM TO ASTM A500 .GRADE C SHALL ALSO MEET CURRENT CHARPY V NOTCH TOUGHNESS IMPACT REQUIREMENTS FOR M270, ZONE 2. ALL OTHER TUBES SHALL CONFORM TO A53 GRADE B. ALL STEEL PLATES, W SHAPES AND MISCELLANEOUS SHAPES SHALL CONFORM TO A709, GRADE 50. CHORD SPLICE MATERIAL SHALL ALSO MEET THE CHARPY V NOTCH TOUGHNESS REQUIREMENTS FOR M270. ZONE 2.
7. ALL CONNECTION BOLTS SHALL CONFORM TO ASTM F3125. GRADE A325. BOLTS OVER 1 1/2" DIAMETER SHALL CONFORM TO A449. ALL WASHERS SHALL CONFORM TO F436 AND NUTS A194. GRADE 2H. U BOLTS SHALL CONFORM TO A276. TYPE 304 (STAINLESS STEEL) OR A307. FLAT WASHERS AND HEX LOCK NUTS SHALL BE USED FOR U BOLTS. ALL ANCHOR BOLTS SHALL CONFORM TO F1554. GRADE 55 S1. ALL BOLTS SHALL HAVE A FLAT WASHER UNDER THE ELEMENT BEING TURNED.
8. OVERHEAD ETC STRUCTURE SHALL BE GALVANIZED TO CONFORM TO A123. ALL HARDWARE WITH THE EXCEPTION OF STAINLESS STEEL SHALL BE GALVANIZED TO CONFORM TO A153.
9. BASE PLATES SHALL BE IN FULL CONTACT WITH ALL FLAT WASHERS. GROUT SHALL NOT BE PLACED BETWEEN THE BASE PLATE AND CONCRETE PEDESTAL.
10. ALL WELD SIZES NOT INDICATED SHALL COMPLY WITH AWS D1.1. BRIDGE WELDING CODE.
11. FOR ELECTRONIC TOLL EQUIPMENT LAYOUT AND MOUNTING DETAILS. SEE AET DRAWINGS.
12. ANCHOR BOLTS SHALL UTILIZE A STEEL TEMPLATE TO SET AND KEEP ANCHOR BOLTS PLUMB DURING FOUNDATION CONSTRUCTION. ALL ANCHOR BOLTS SHALL BE TIGHTENED USING TURN OF NUT METHOD (30° MIN. TO 45° MAX. AFTER SNUG TIGHT). COST OF ANCHOR BOLTS, NUTS, WASHERS, AND STEEL ANCHOR PLATES ARE INCIDENTAL TO THE PRICE PAID EERMEONCRETE FOR SUPPORT STRUCTURE PEDESTALS OR GRADE BEAMS.
13. THE APPROXIMATE LOCATION OF ALL KNOWN UTILITIES IS SHOWN. THE CONTRACTOR SHALL VERIFY THE FINAL LOCATION OF ALL UTILITIES SHOWN. AND THE EXISTENCE OF ANY OTHER UNKNOWN UTILITIES. PRIOR TO THE START OF ANY CONSTRUCTION OPERATIONS.
14. Design Loads
 

Dead Loads:	
MASH CLADDING	102 LBS/100 SF, 61% VOID RATIO
CONCRETE CLADDING	121 KIPS PER TOWER
AET EQUIPMENT, SUPPORT FRAME AND PIPES (TOTAL WEIGHT FOR EACH ITEM)	
LASER SCANNER	405 LBS
VISCAM CAMERA	265 LBS
LED FLESH	233 LBS
DVAS CAMERA	40 LBS
SURVEILLANCE CAMERA	4 LBS
ANTENNA	497 LBS
AET EQUIPMENTSUPPORT FRAME	459 LBS
PIPES	12313 LBS

WIND LOADS:	
WIND SPEED	90 MPH

**DRAFT**



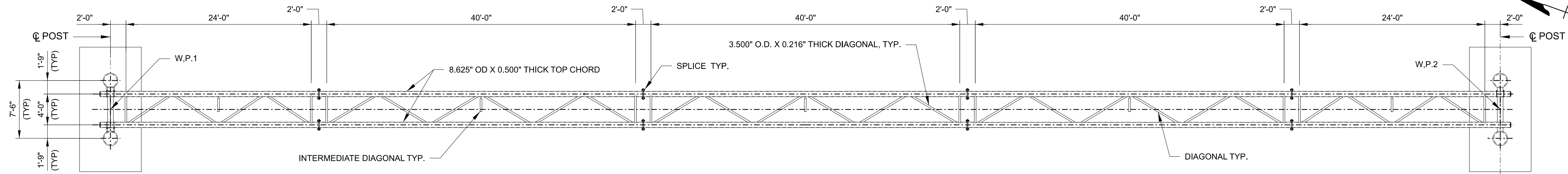
NO.	DATE	BY	DESCRIPTION

**RICHMOND METROPOLITAN  
TRANSPORTATION AUTHORITY  
RMTA**

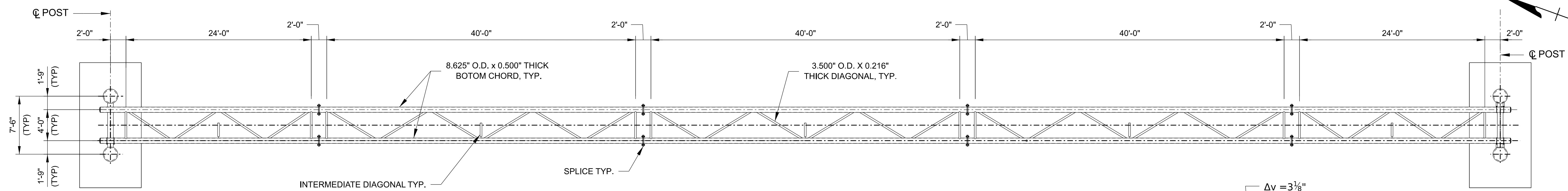
DRAWN BY <b>G.Garayburu</b>	SCALE
VERIFIED BY	NO. OF
APPROVED <b>I. Sun</b>	TITLE
<b>S. Lee</b>	

**GENERAL NOTES**

DATE <b>10/16/2024</b>	DRAWN/ISS
REV no	SHEET
	<b>S-3</b>

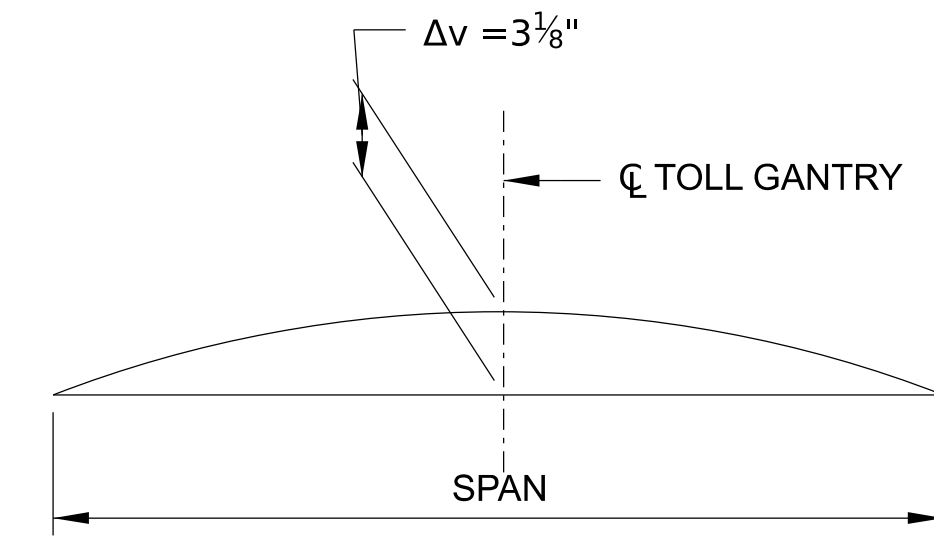


TOP CHORD PLAN  
SCALE: 1/2" = 1'-0"

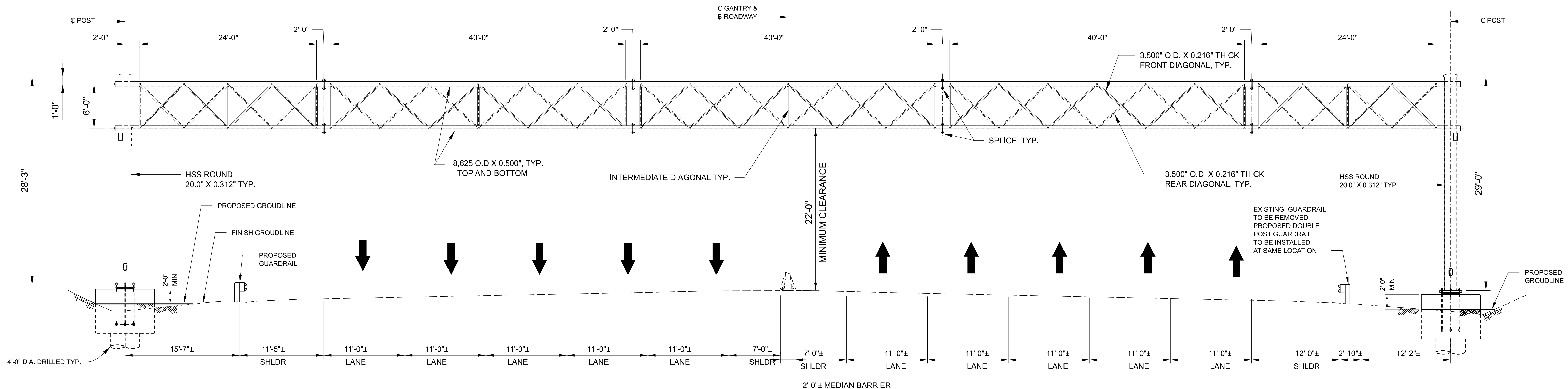


BOTTOM CHORD PLAN  
SCALE: 1/2" = 1'-0"

WORKING POINT DATA				
MARK	STATION	OFFSET	NORTHING	EASTING
W.P. 1	16+27.22	90.00 LT	3720554.806	11772825.136
W.P. 2	16+27.22	90.00 RT	3720412.708	11772935.625



CAMBER DIAGRAM  
SCALE: N.T.S



OVERHEAD GANTRY STRUCTURE ELEVATION  
SCALE: 1/2" = 1'-0"

**DRAFT**



ID	DATE	BY	DESCRIPTION

PROJECT: RICHMOND METROPOLITAN TRANSPORTATION AUTHORITY RMTA

DRAWN BY: G. Garayburu  
 VERIFIED BY: L. Sun  
 APPROVED: S. Lee

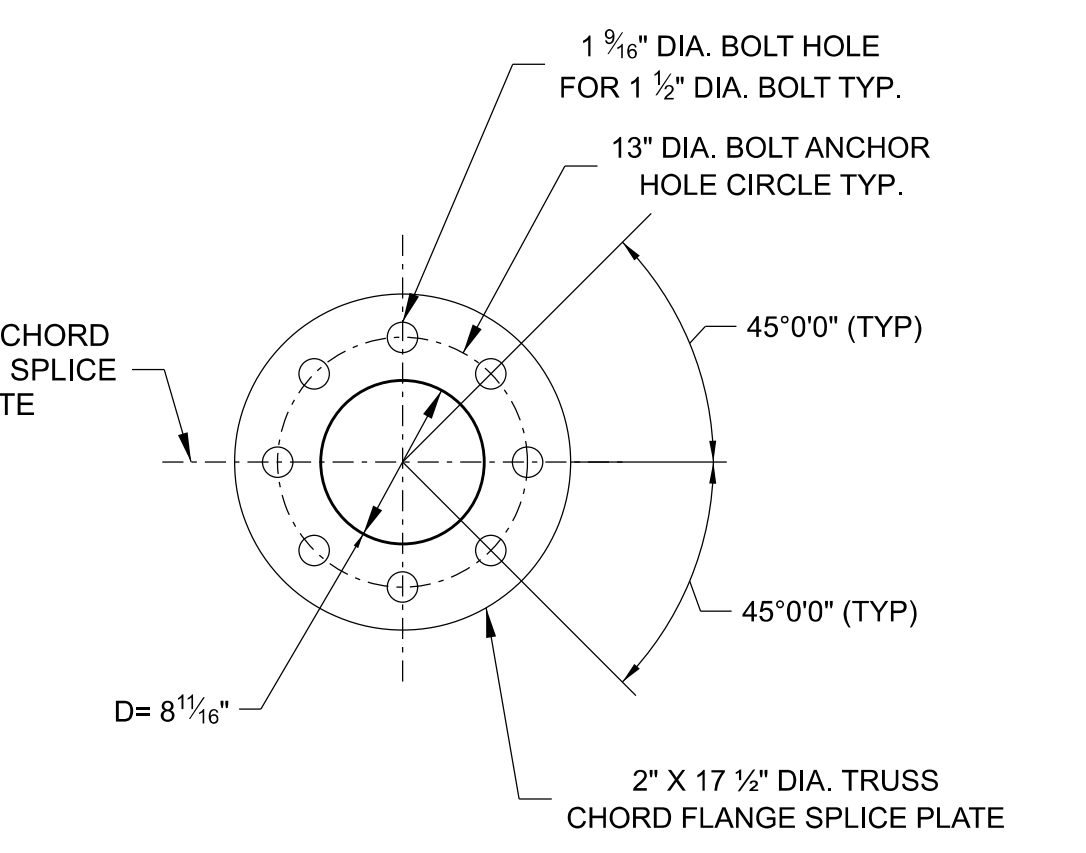
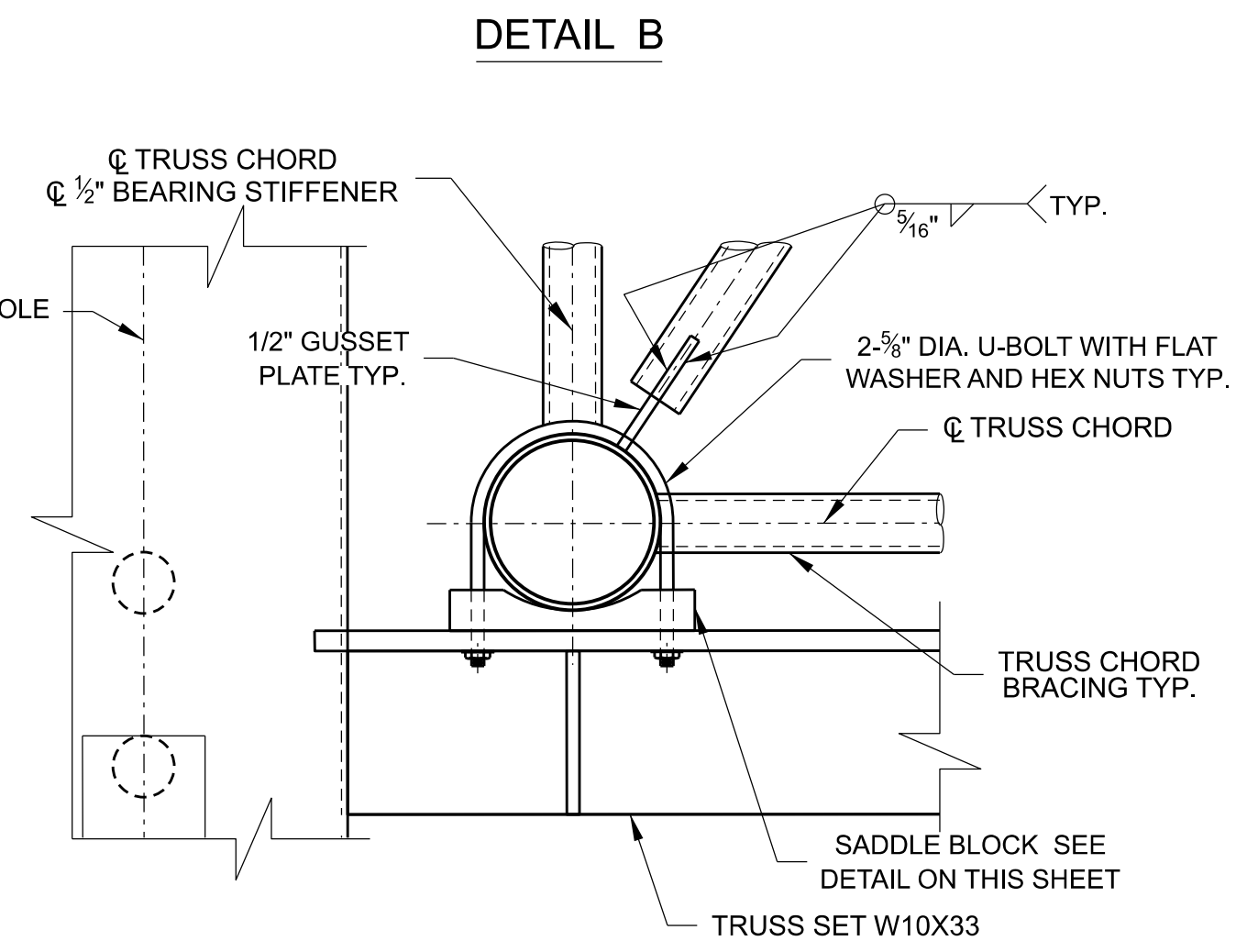
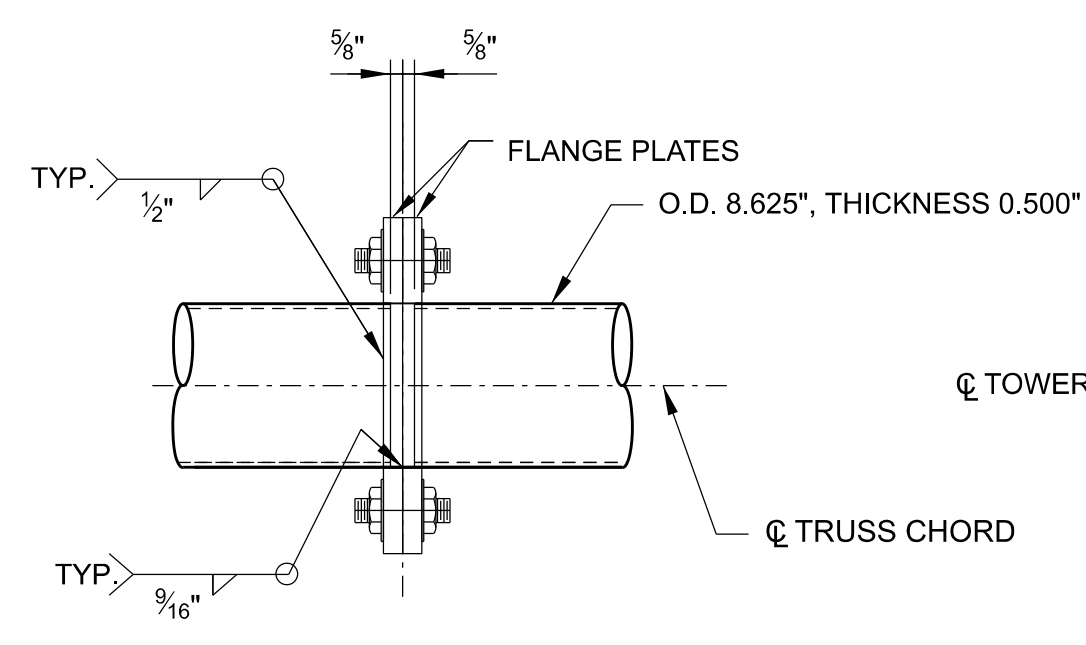
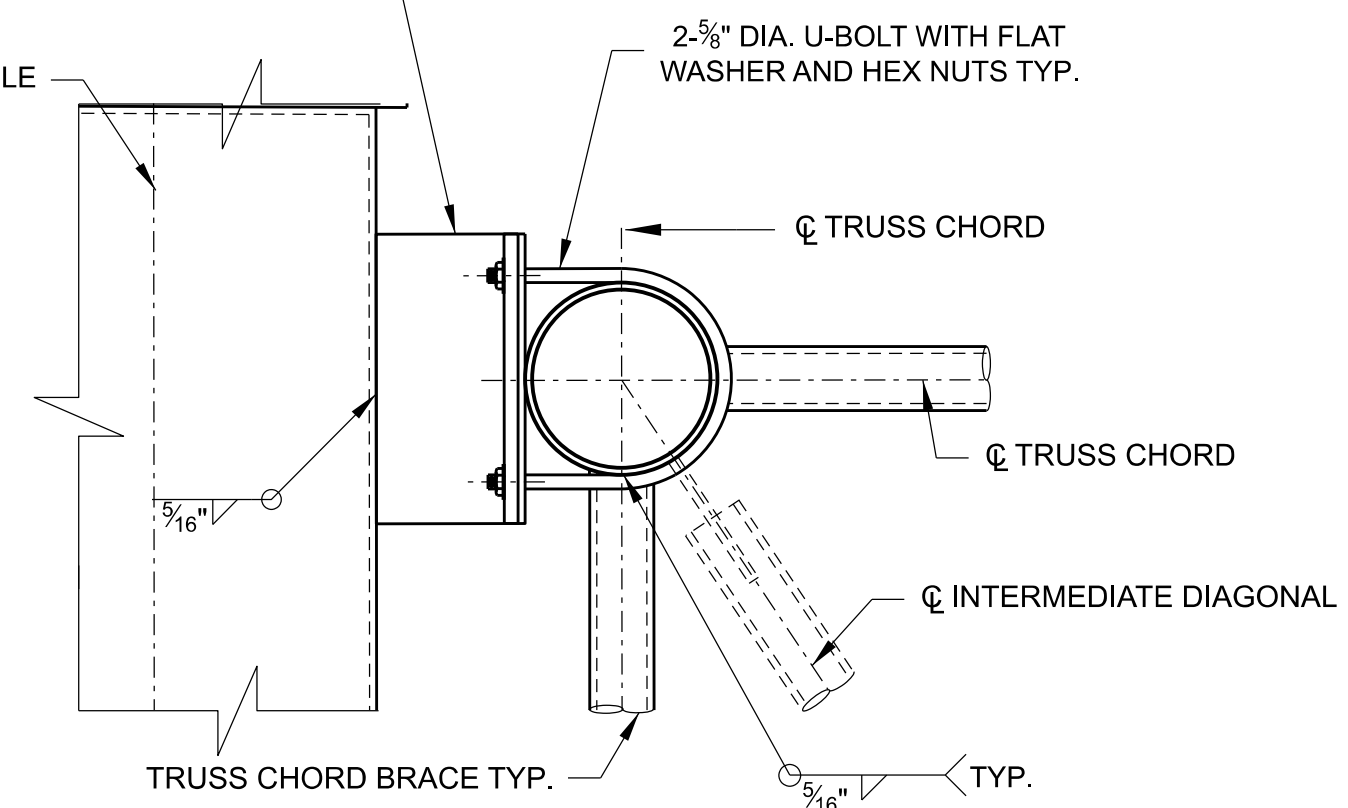
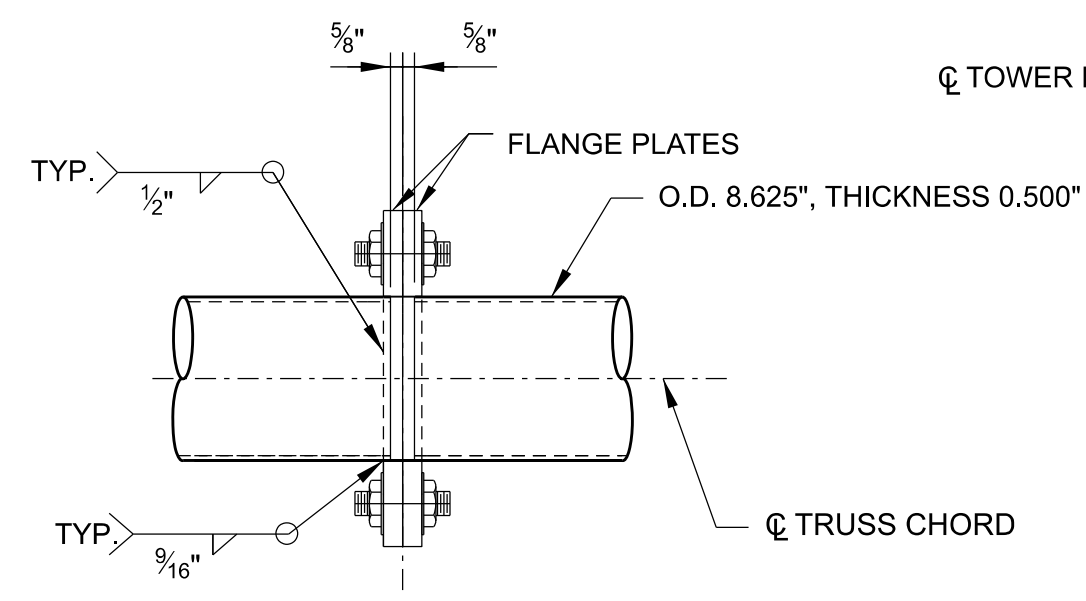
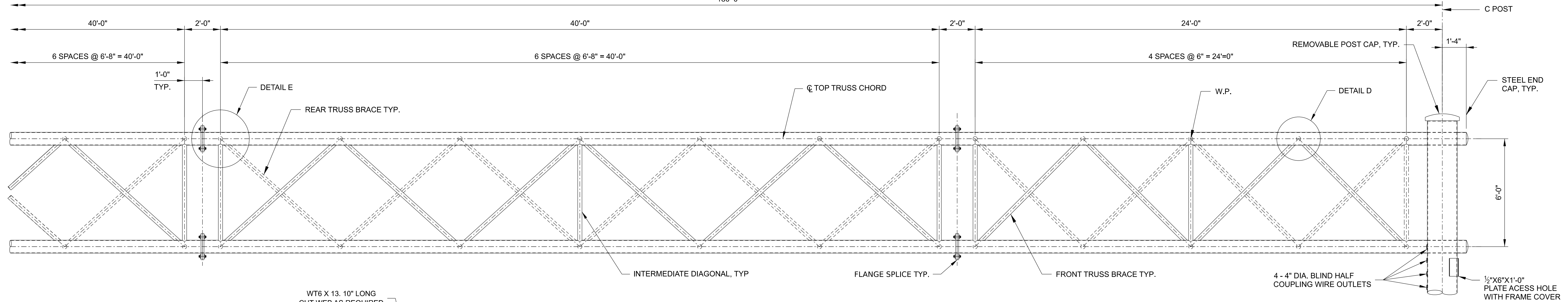
SCALE: 1/2" = 1'-0"  
 TITLE: GANTRY DETAILS 1

DATE: 10/16/2024  
 SHEET: S-4

PROJECT: RICHMOND METROPOLITAN TRANSPORTATION AUTHORITY RMTA

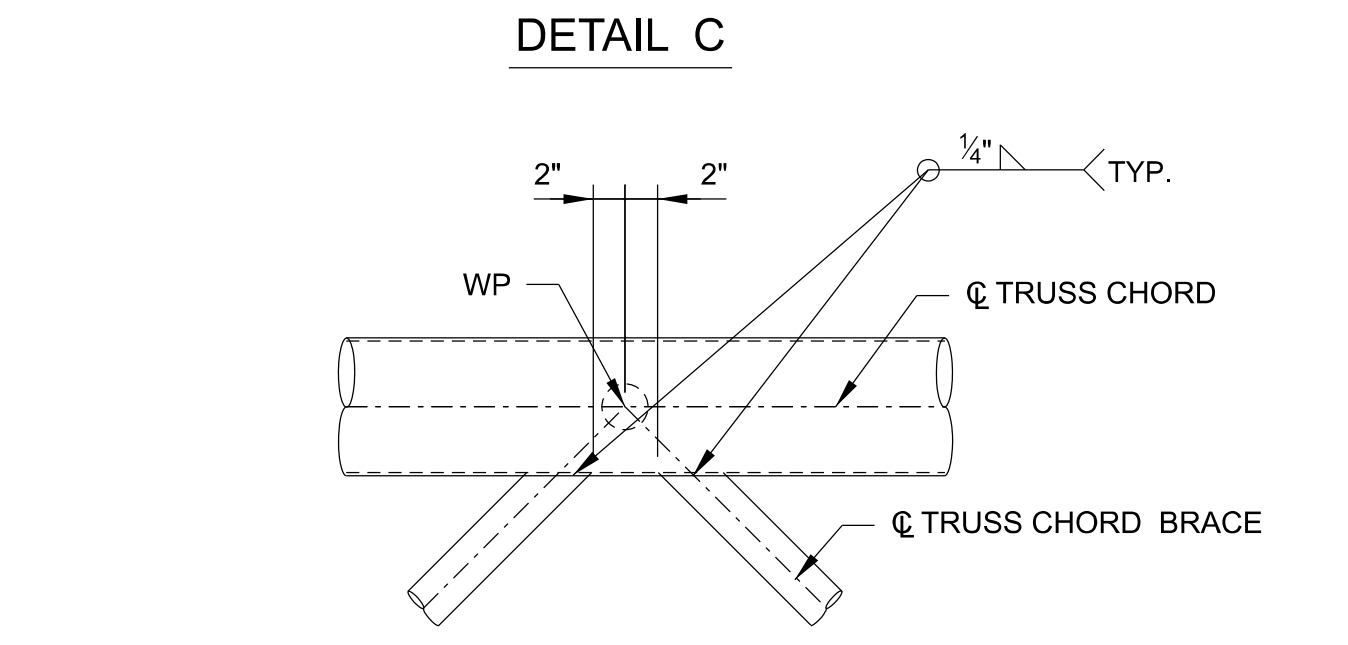


180'-0"



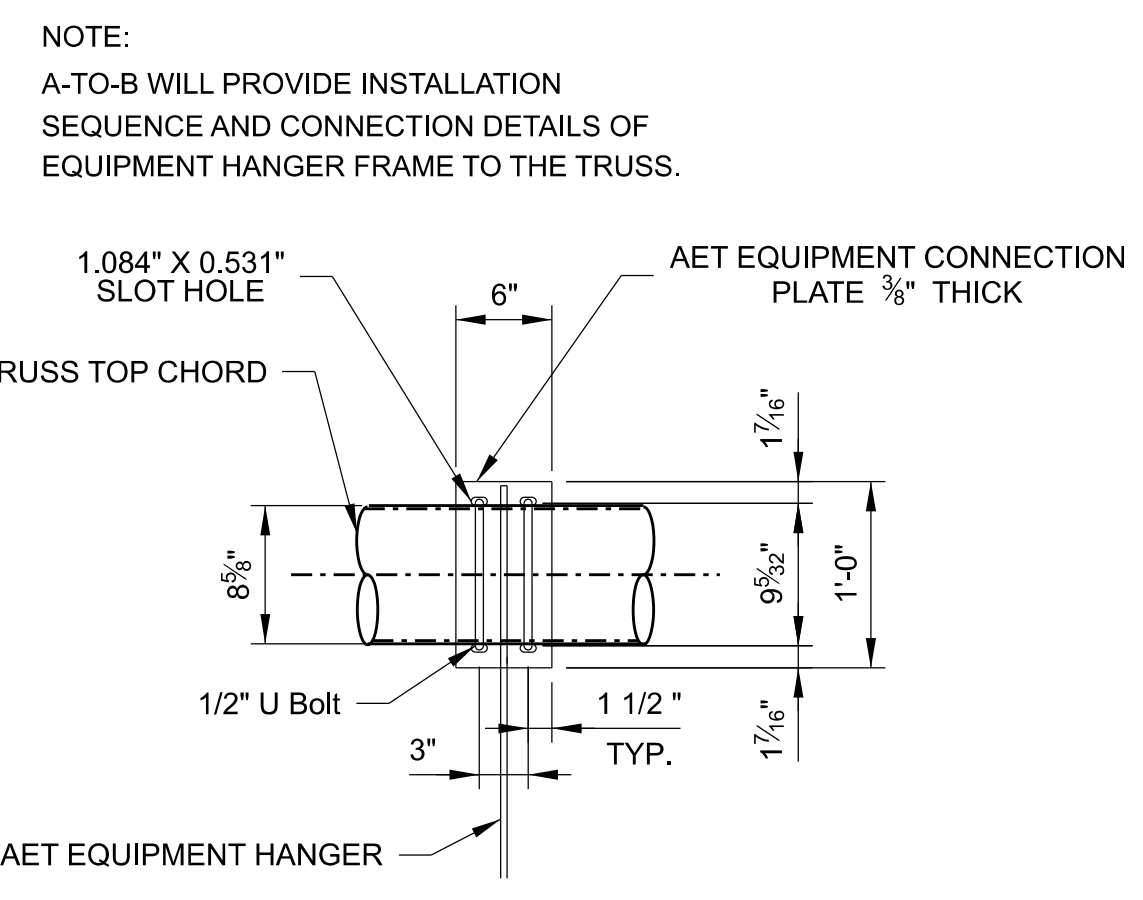
TRUSS CHORD FLANGE SPLICE DETAIL

DRAFT

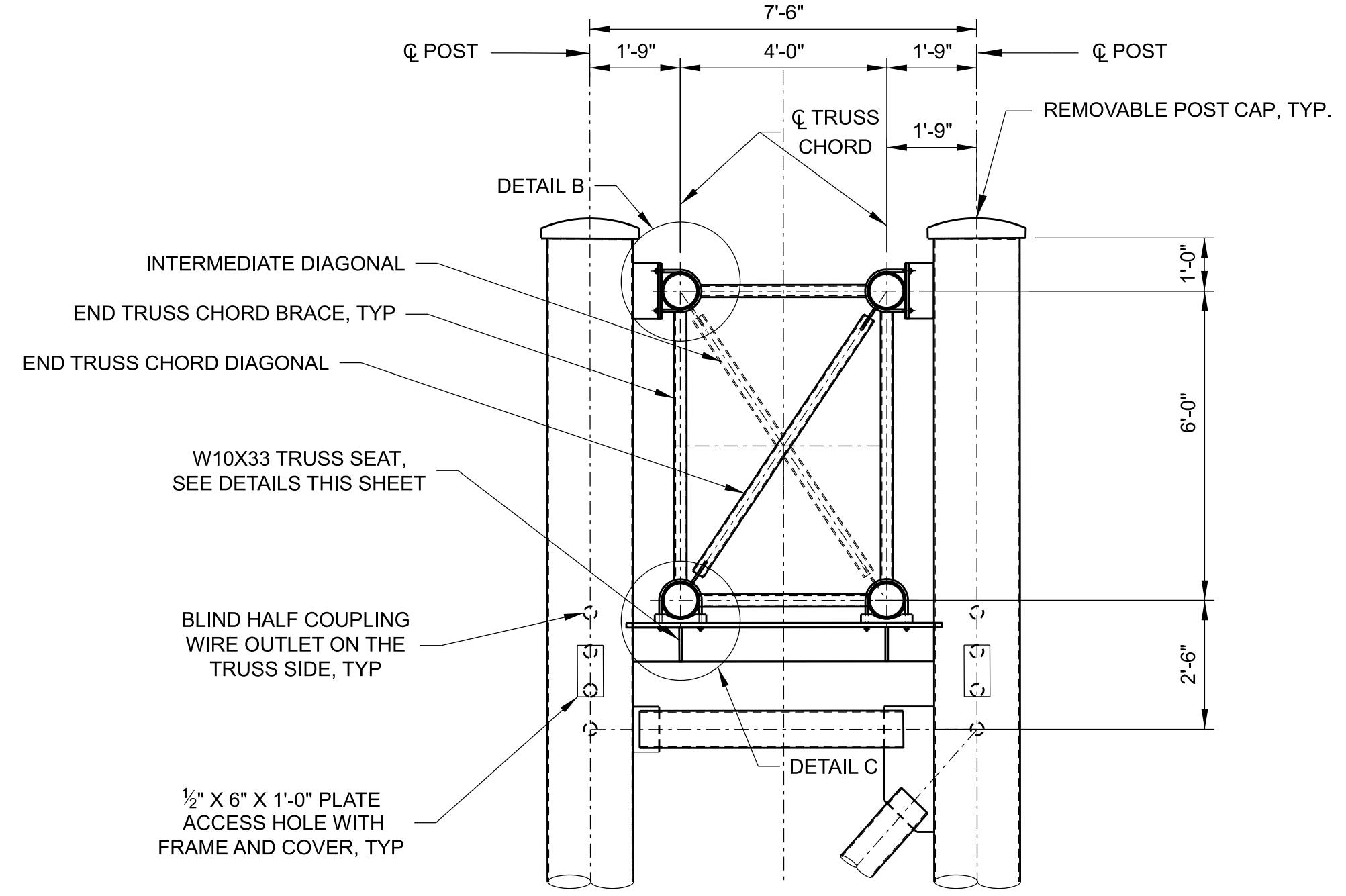


DETAIL E SCALE 1" = 1'-0"

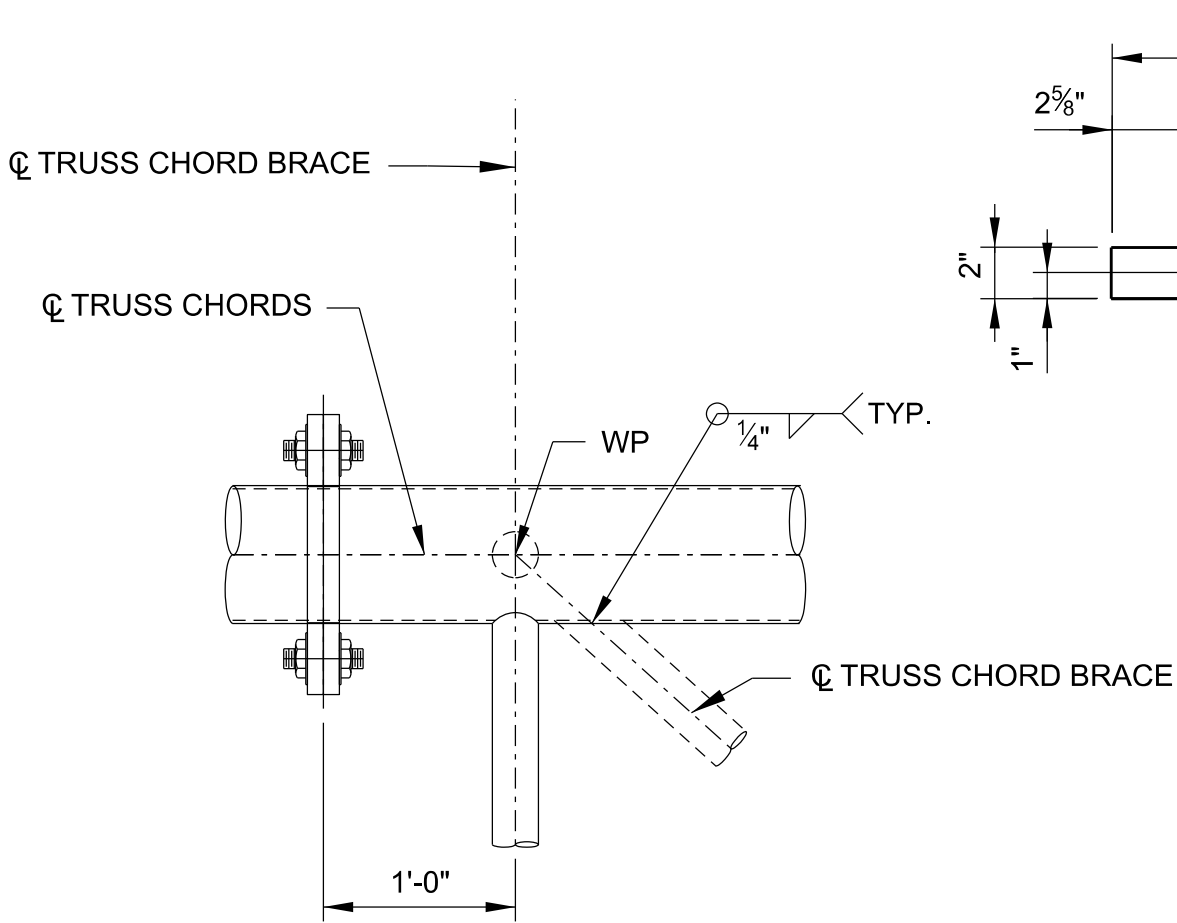
PARTIAL TRUSS ELEVATION SCALE 3/8" = 1'-0"



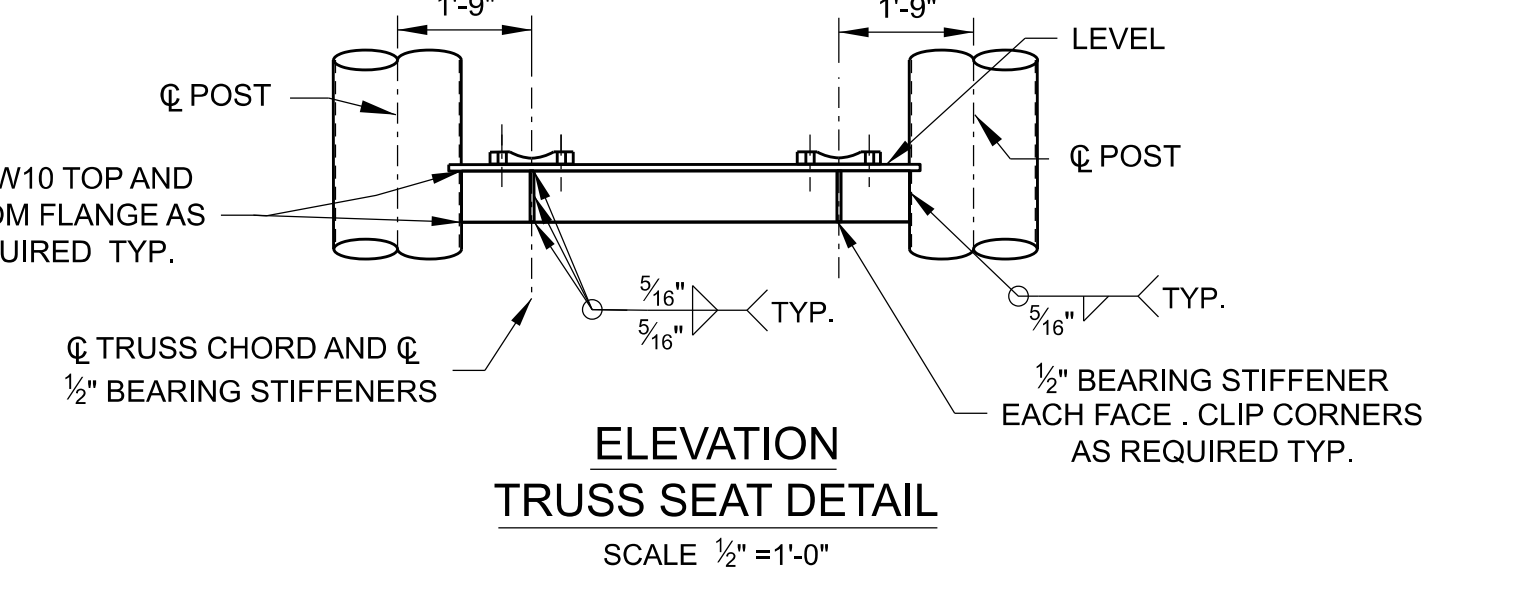
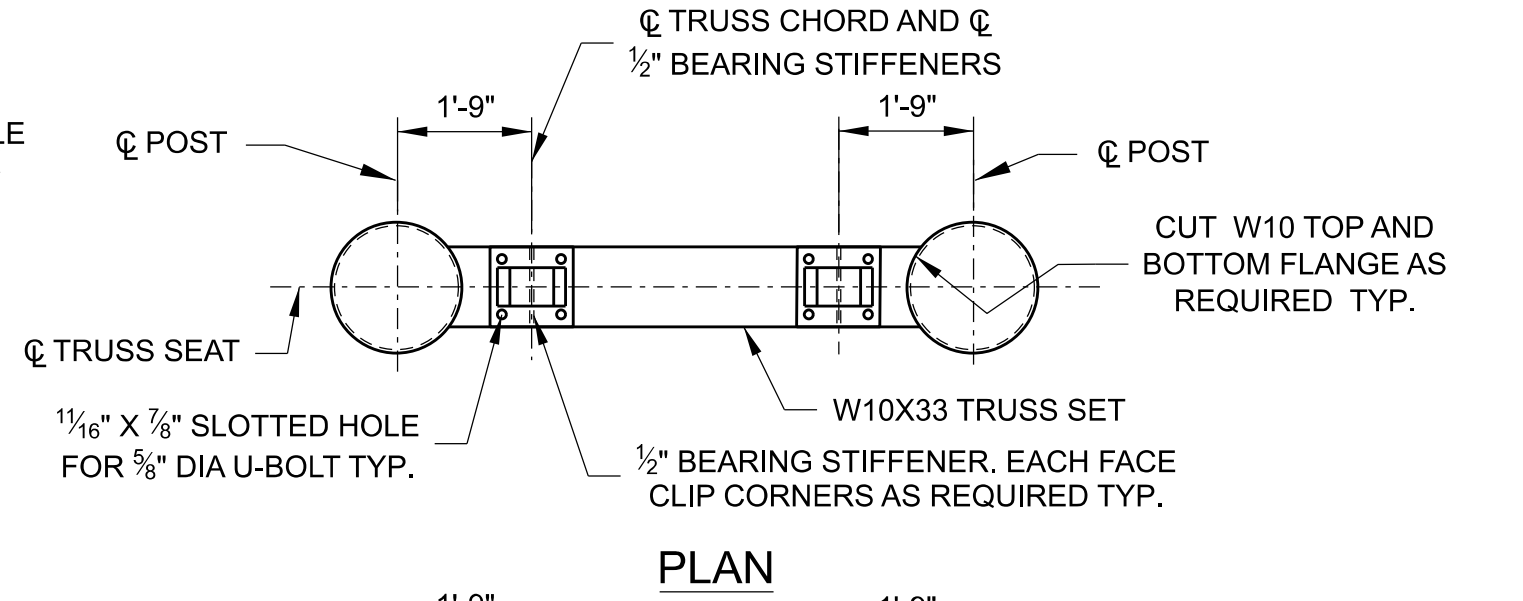
DETAIL A AET EQUIPMENT TO TRUSS CONNECTION DETAILS SCALE 1" = 1'-0"



PARTIAL SIDE ELEVATION SCALE 1/2" = 1'-0"



DETAIL E SCALE 1" = 1'-0"



ED	DATE	BY	DESCRIPTION

PROJECT: RICHMOND METROPOLITAN TRANSPORTATION AUTHORITY RMTA

DESIGNED BY: G. Garayburu

CHECKED BY: L. Sun

APPROVED BY: S. Lee

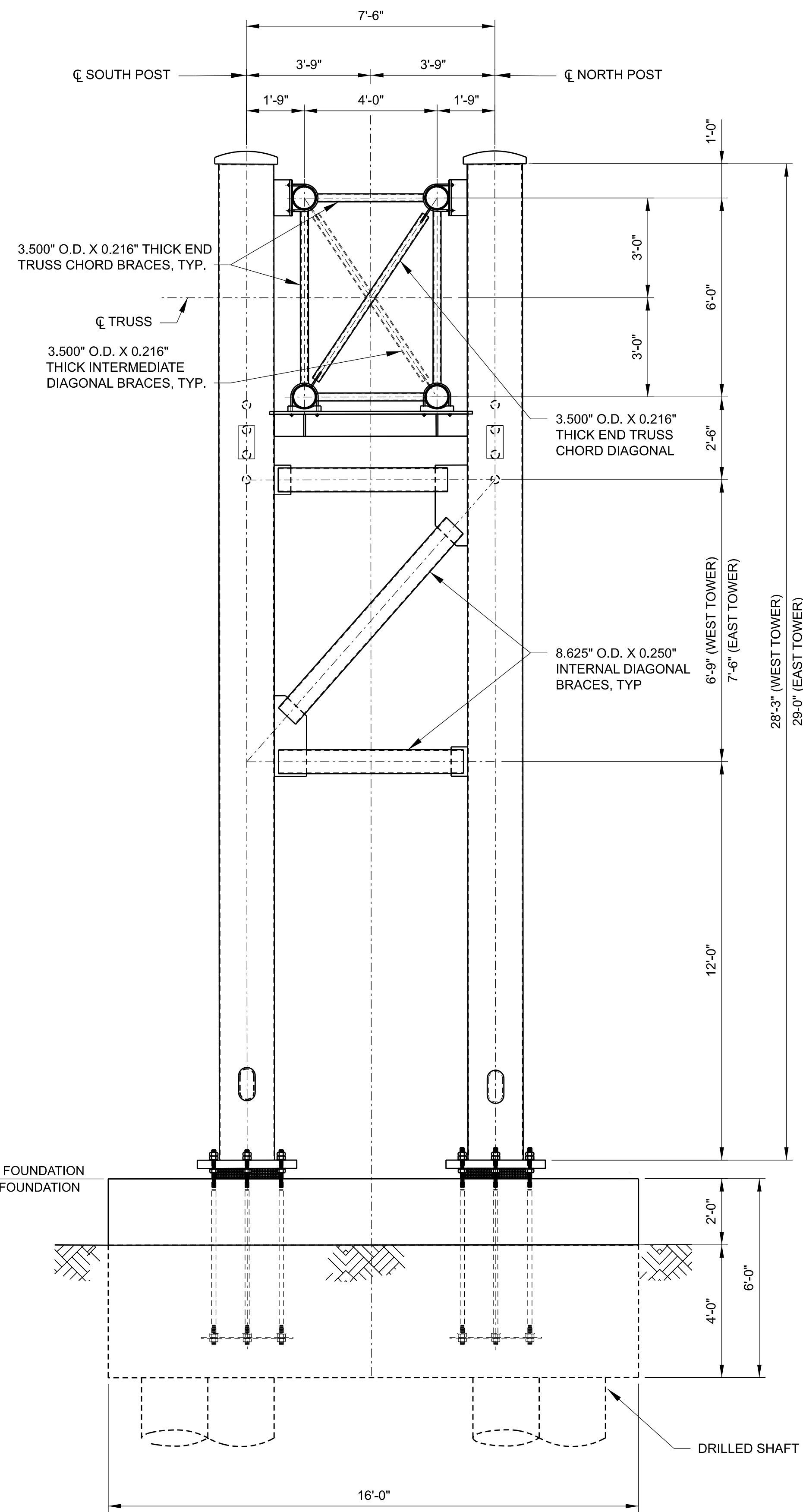
SCALE	NO.	TITLE

DATE	REVISION	BY	DESCRIPTION
10/16/2024			

PROJECT: GANTRY DETAILS 2

SHEET: S-5

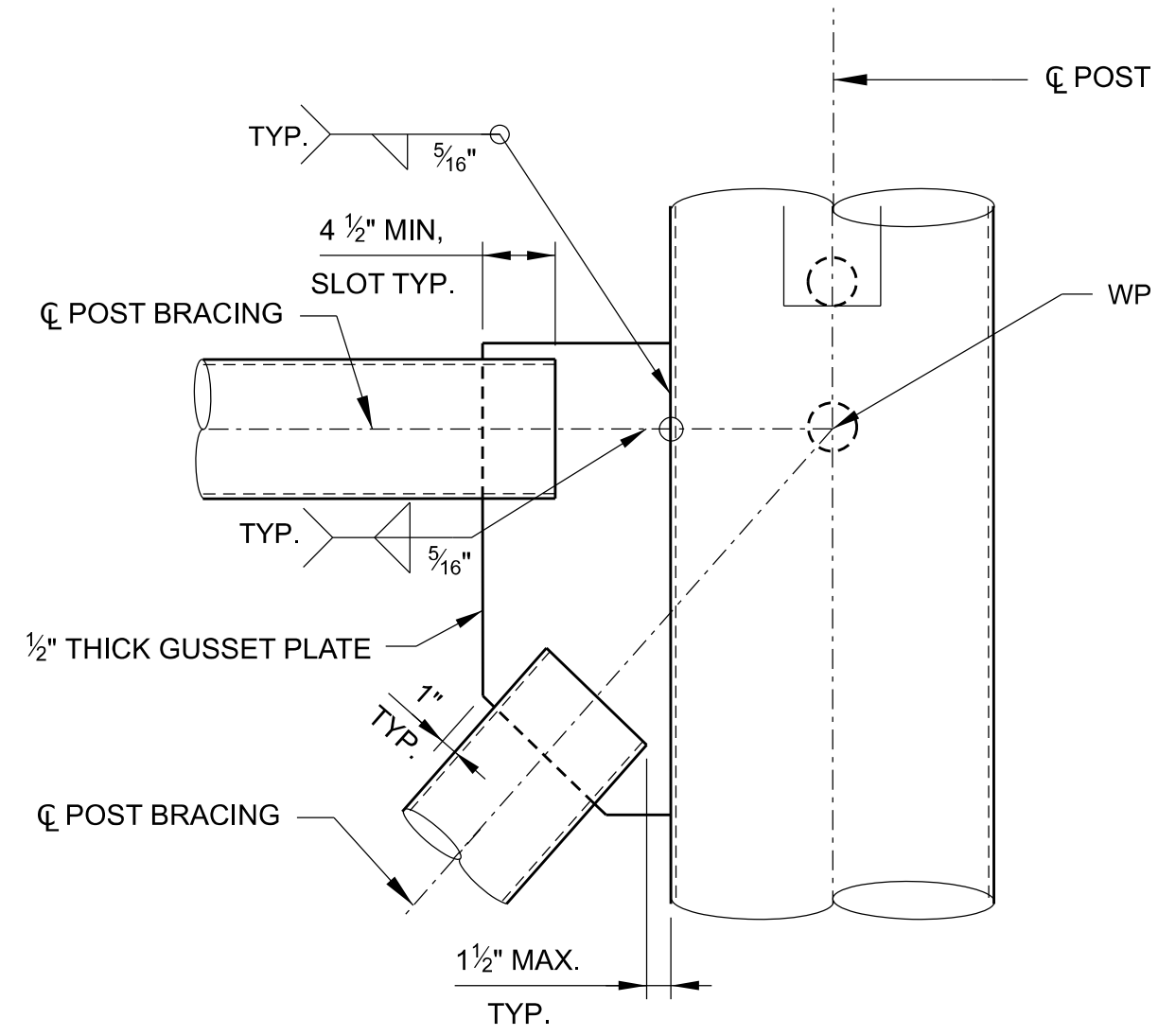




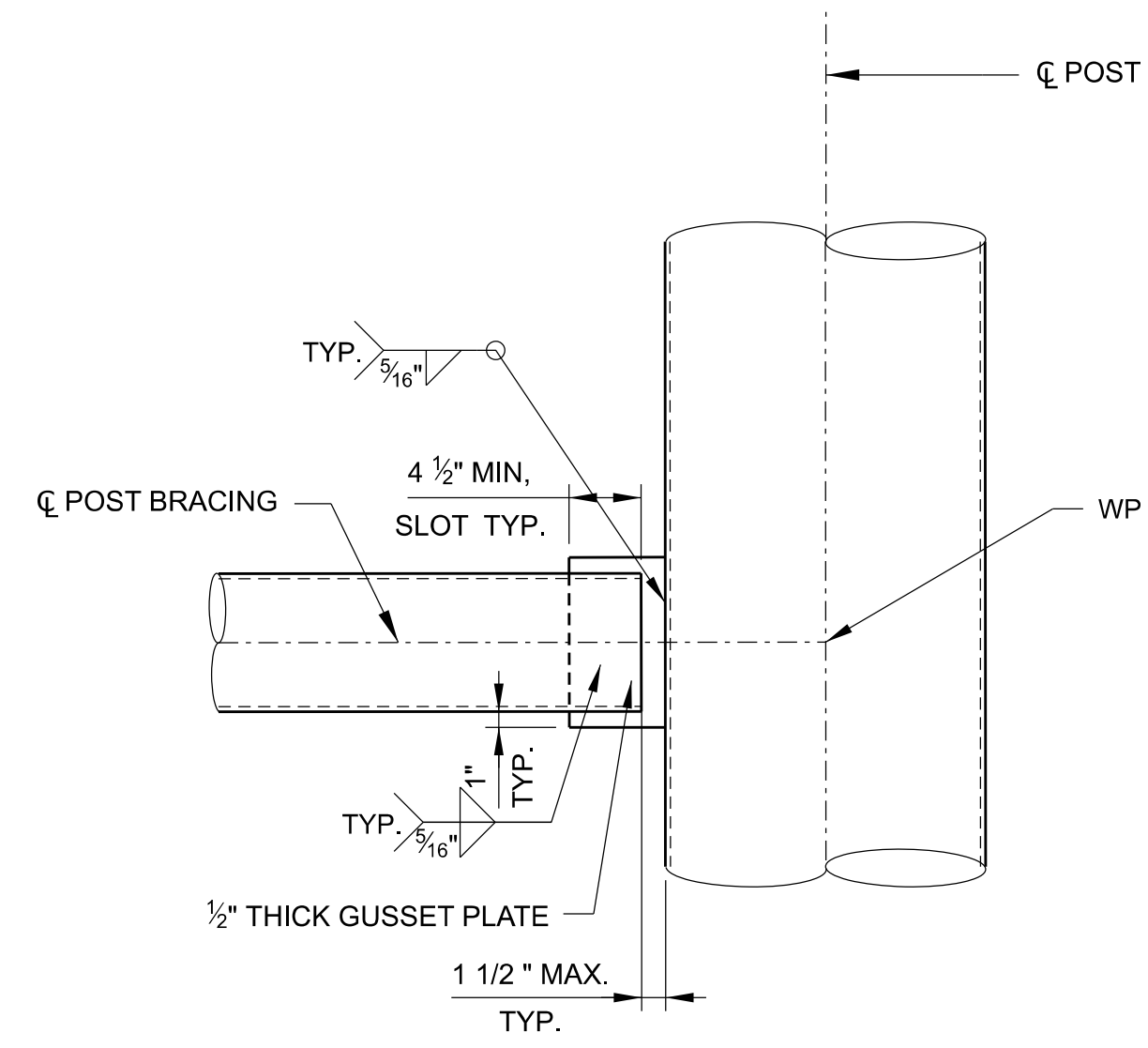
EL. 112.22 ± WEST FOUNDATION  
EL. 111.47 ± EAST FOUNDATION

**DRAFT**

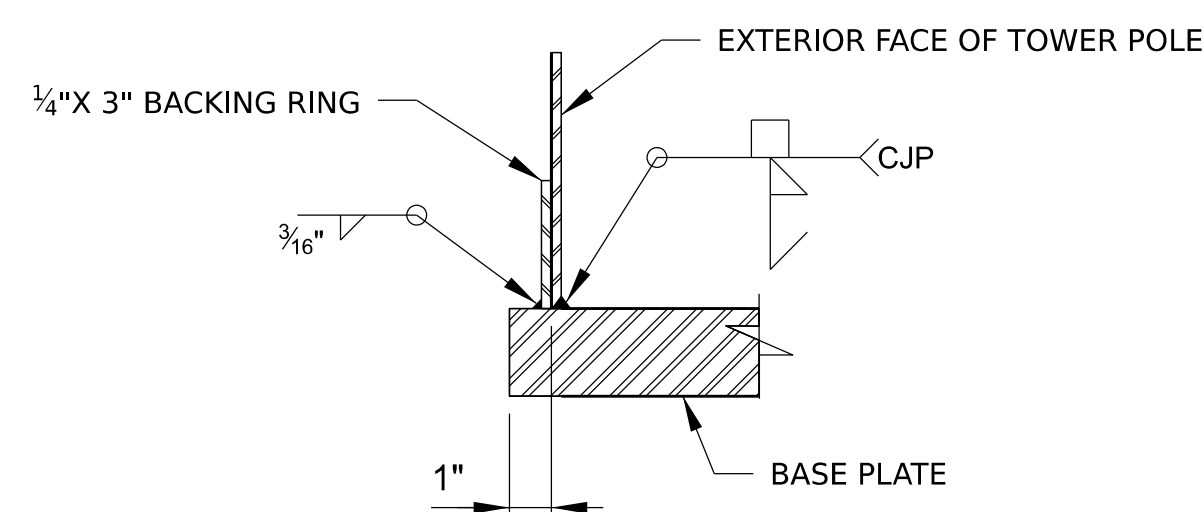
**POST ELEVATION**  
POSTS AT NB SHOWN, SB SIMILAR  
SCALE = 1/2" = 1'-0"



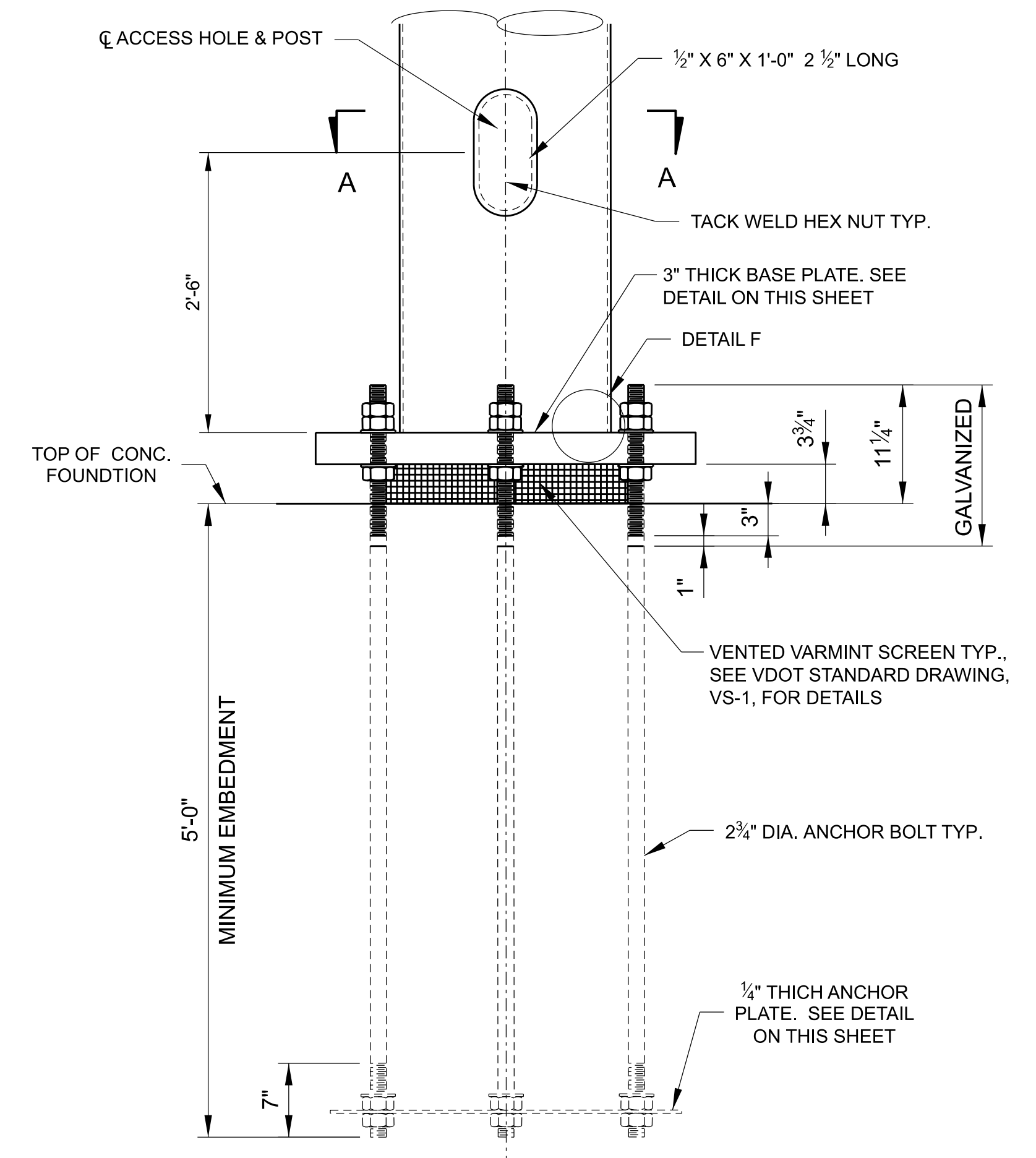
**END BRACE DUAL CONNECTION**  
SCALE = 3/8" = 1'-0"



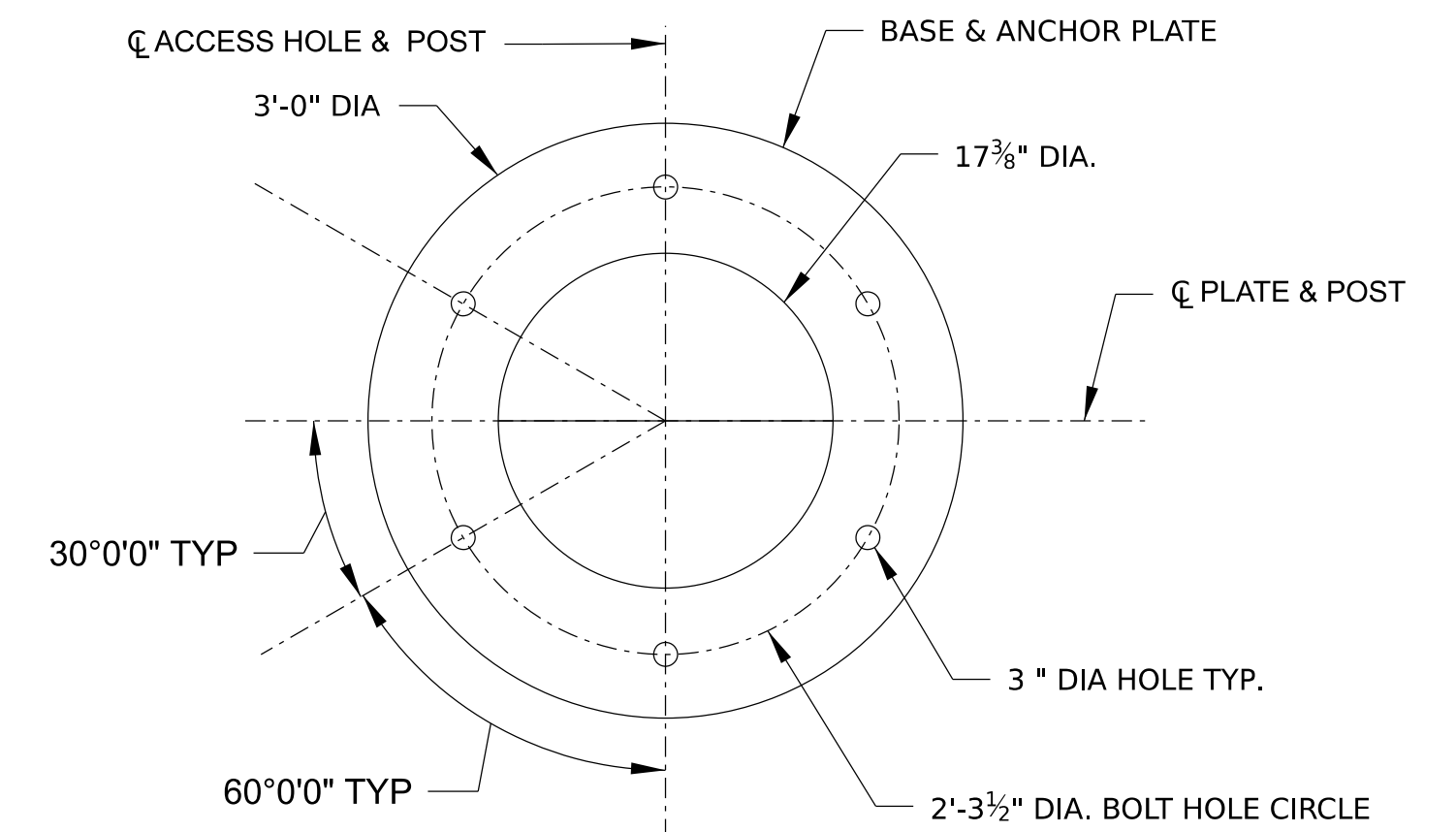
**POST BRACING DETAIL**  
END BRACE SINGLE CONNECTION  
SCALE = 3/8" = 1'-0"



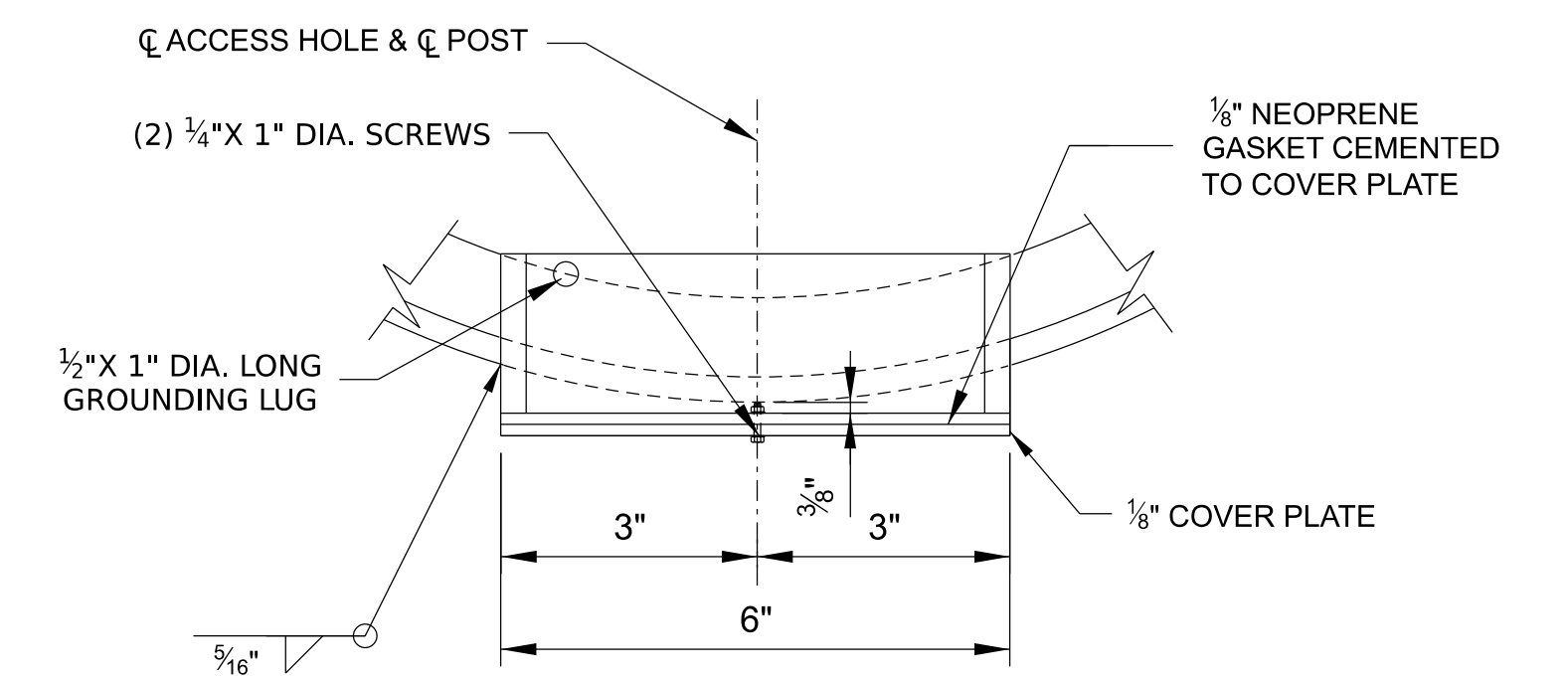
**DETAIL F**  
BASE PLATE TO POLE WELD DETAIL



**POST BRACING DETAIL**  
SCALE = 3/8" = 1'-0"



**BASE & ANCHOR PLATE DETAIL**



**SECTION A-A**  
ACCESS HOLE DETAIL



NO.	DATE	BY	DESCRIPTION

**RICHMOND METROPOLITAN  
TRANSPORTATION AUTHORITY  
RMTA**

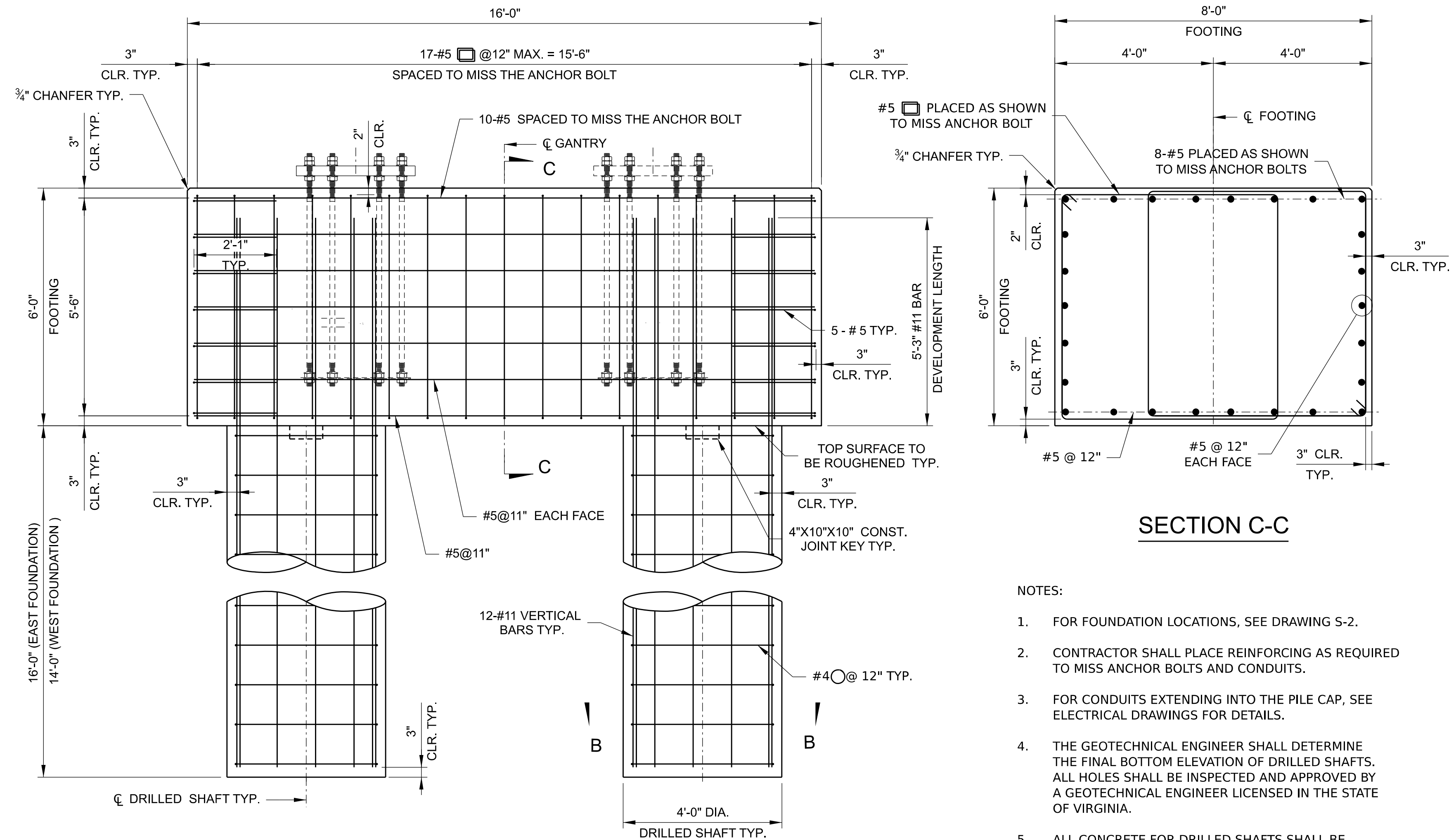
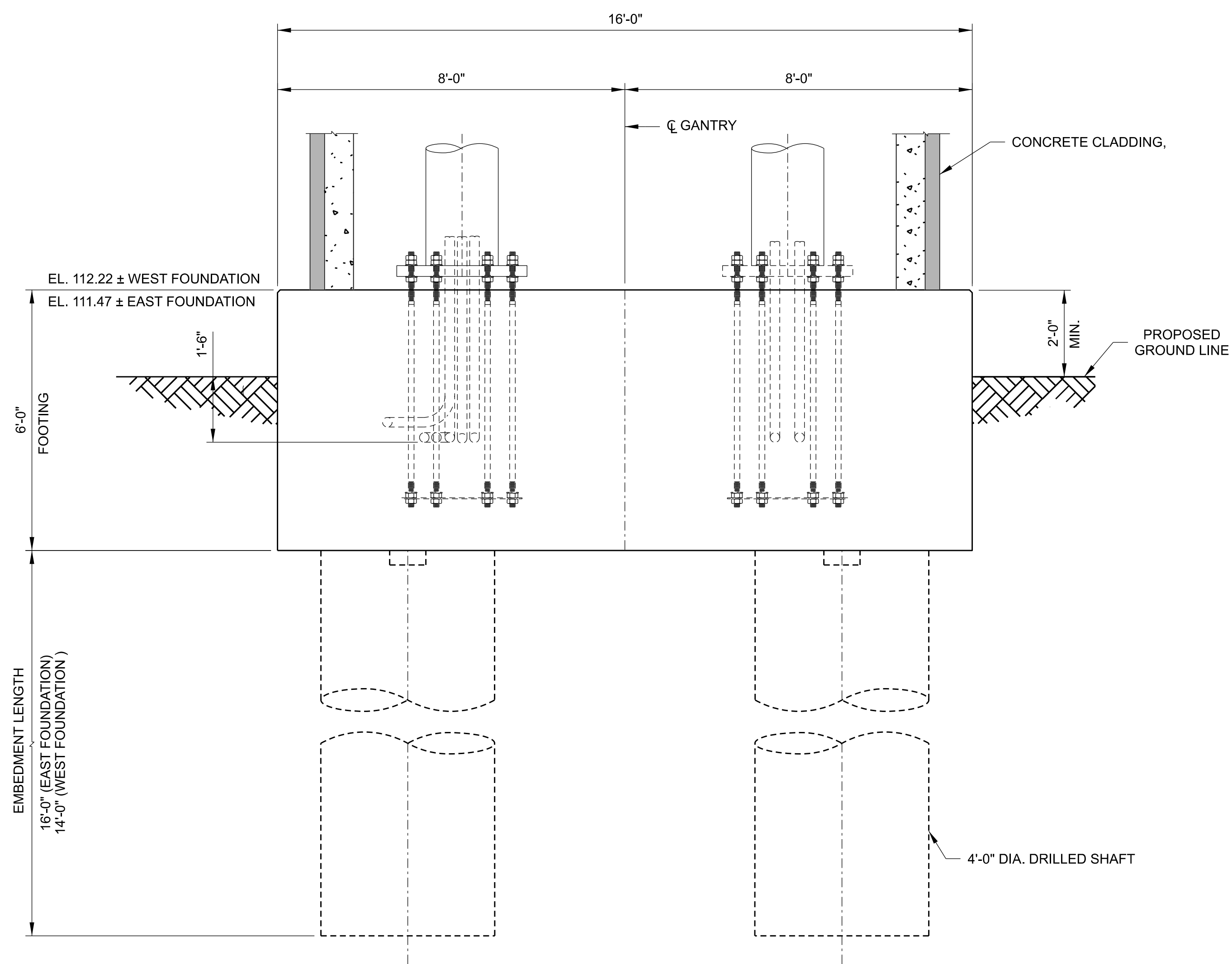
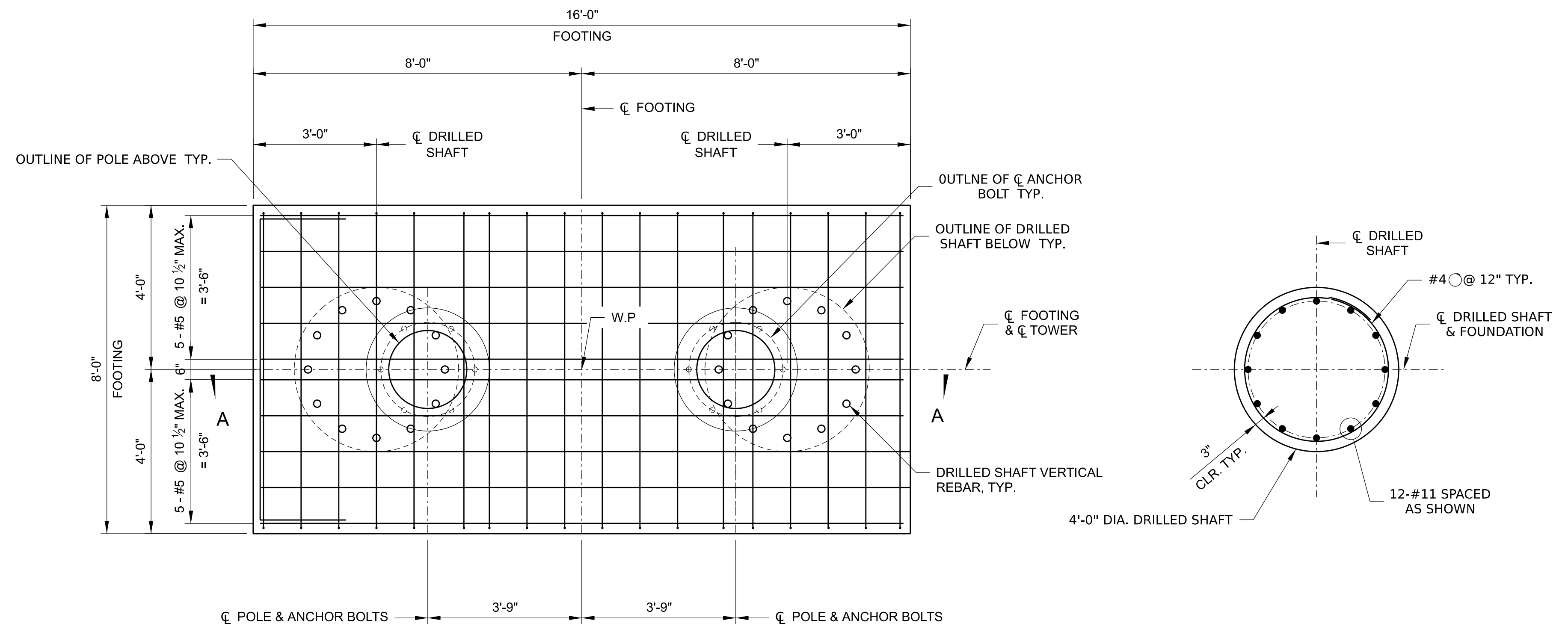
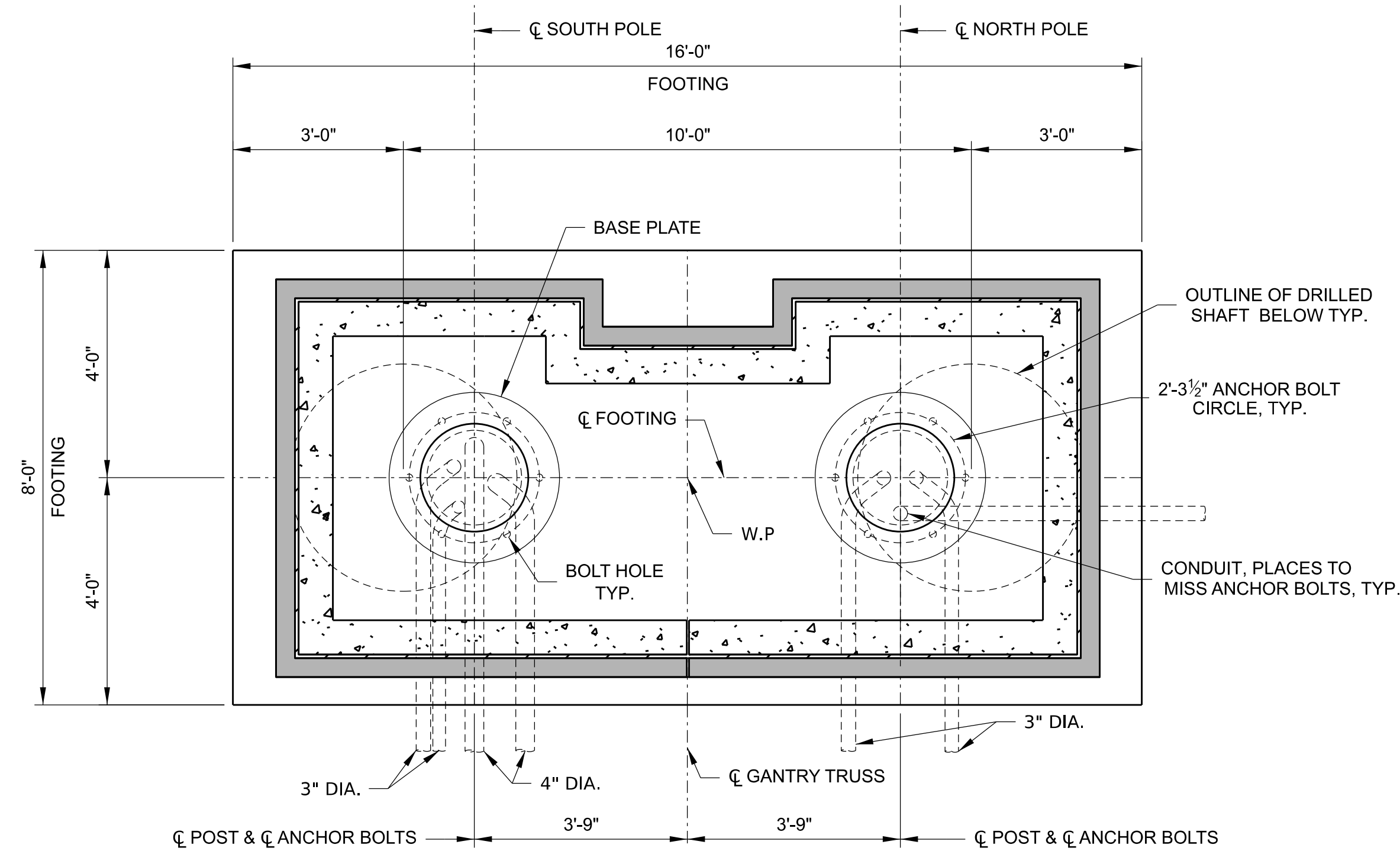
DRAWN BY: G. Garayburu  
CHECKED BY: L. Sun  
APPROVED: S. Lee

SCALE:      TITLE:      SHEET: S-6

**GANTRY DETAILS 3**

DATE: 10/16/2024  
SHEET: S-6





- NOTES:
- FOR FOUNDATION LOCATIONS, SEE DRAWING S-2.
  - CONTRACTOR SHALL PLACE REINFORCING AS REQUIRED TO MISS ANCHOR BOLTS AND CONDUITS.
  - FOR CONDUITS EXTENDING INTO THE PILE CAP, SEE ELECTRICAL DRAWINGS FOR DETAILS.
  - THE GEOTECHNICAL ENGINEER SHALL DETERMINE THE FINAL BOTTOM ELEVATION OF DRILLED SHAFTS. ALL HOLES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER LICENSED IN THE STATE OF VIRGINIA.
  - ALL CONCRETE FOR DRILLED SHAFTS SHALL BE CLASS A3 (3500 PSI).

DRAFT



ELEVATION  
CONDUITS IN PILE CAP

RICHMOND METROPOLITAN  
TRANSPORTATION AUTHORITY  
RMTA

SECTION A-A

GANTRY FOOTING DETAILS

ID	DATE	BY	DESCRIPTION

PROJECT	SCALE	DATE	TITLE	SHEET NO.	DATE	DESIGNER
RICHMOND METROPOLITAN TRANSPORTATION AUTHORITY RMTA		10/16/2024	GANTRY FOOTING DETAILS	S-7		



**ETS** Engineering and Testing Services, Inc  
 5226 Indian River Road  
 Virginia Beach, Virginia, 23464  
 Telephone: 757-306-1040  
 Fax: 757-306-1042

**BORING NUMBER B-1 South Bound** PAGE 1 OF 1

CLIENT HNTB Corporation PROJECT NAME New AET Gantry-Powhite Parkway  
 PROJECT NUMBER ETS-24E120 PROJECT LOCATION Richmond, VA  
 DATE STARTED 5/13/24 COMPLETED 5/13/24 GROUND ELEVATION \_\_\_\_\_ HOLE SIZE 3 inches  
 DRILLING CONTRACTOR FDI GROUND WATER LEVELS: \_\_\_\_\_  
 DRILLING METHOD MUD AT TIME OF DRILLING --- Dry  
 LOGGED BY S.Raut,EIT CHECKED BY R. Acharya, PhD, PE AT END OF DRILLING ---  
 NOTES \_\_\_\_\_ AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								PL	MC	LL	
								20	40	60	80
								☐ FINES CONTENT (%) ☐			
								20	40	60	80
0		5" TOPSOIL									
		(SM) IGM, Tan brown-orange f-c silty SAND with trace clay, very dense, moist Refusal @1.75 ft	SPT 1	57	4-12-28-50/3"						
		(SP-SM) IGM, Tan brown-orange f-c poorly graded SAND with silt, very dense, moist	SPT 2	89	22-50/3"						
			SPT 3	80	30-50/4"						
			SPT 4	100	50/4"						
			SPT 5	57	14-50/1"						
			NR 6	0	50/2"						
			NR 7	0	50/2"						

Bottom of borehole at 20.0 feet.

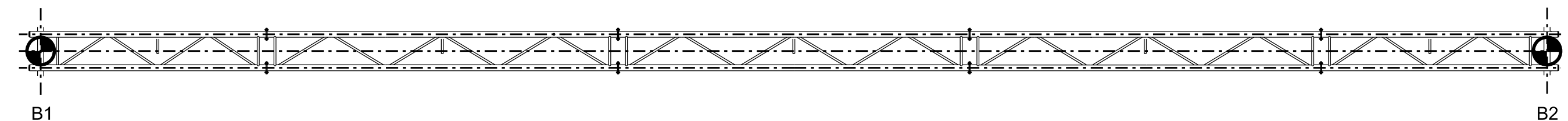
**ETS** Engineering and Testing Services, Inc  
 5226 Indian River Road  
 Virginia Beach, Virginia, 23464  
 Telephone: 757-306-1040  
 Fax: 757-306-1042

**BORING NUMBER B-2 North Bound** PAGE 1 OF 1

CLIENT HNTB Corporation PROJECT NAME New AET Gantry-Powhite Parkway  
 PROJECT NUMBER ETS-24E120 PROJECT LOCATION Richmond, VA  
 DATE STARTED 5/13/24 COMPLETED 5/13/24 GROUND ELEVATION \_\_\_\_\_ HOLE SIZE 3 inches  
 DRILLING CONTRACTOR FDI GROUND WATER LEVELS: \_\_\_\_\_  
 DRILLING METHOD MUD AT TIME OF DRILLING --- Dry  
 LOGGED BY S.Raut,EIT CHECKED BY R. Acharya, PhD, PE AT END OF DRILLING ---  
 NOTES \_\_\_\_\_ AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								PL	MC	LL	
								20	40	60	80
								☐ FINES CONTENT (%) ☐			
								20	40	60	80
0		3" TOPSOIL									
		(SM) IGM, Tan brown-orange f-c silty SAND with trace clay, medium dense to very dense, moist	SPT 42		1-2-9-13 (11)						
			SPT 50		15-31-41-23 (72)						
			SPT 42		13-12-17-21 (29)						
		(SP-SM) IGM, Tan brown-orange f-c poorly graded SAND with silt, very dense, moist	SPT 100		50/3"						
			SPT 67		50/3"						
		Light tan gray -white GRANITE, RQD (%) = 31.8, RMR rating= "POOR ROCK" 11.5'-13.5'- highly weathered, very soft, intensely factured, uniaxial compressive strength = 0 psi	RC (35)								
		13.5'-15.0'-lightly weathered, moderately hard, highly factured, average uniaxial compressive strength =5730 psi									
		Slightly Weathered moderately hard light tan gray -white GRANITE, RQD (%) = 68.8, RMR rating= "FAIR ROCK", moderately factured, average uniaxial compressive strength =6300 psi	RC (69)								

Bottom of borehole at 20.0 feet.



**DRAFT**

BORING LOG LOCATION  
 SCALE: 1/4" = 1'-0"



ID	DATE	BY	DESCRIPTION

PROJECT	DRAWN BY	SCALE	TITLE
RICHMOND METROPOLITAN TRANSPORTATION AUTHORITY RMTA	G.Garayburu		BORING LOGS
	I. Sun		
	S. Lee		

DATE	BY	DESCRIPTION
10/16/2024		

DATE	BY	DESCRIPTION
10/16/2024		

BORING LOGS

S-8