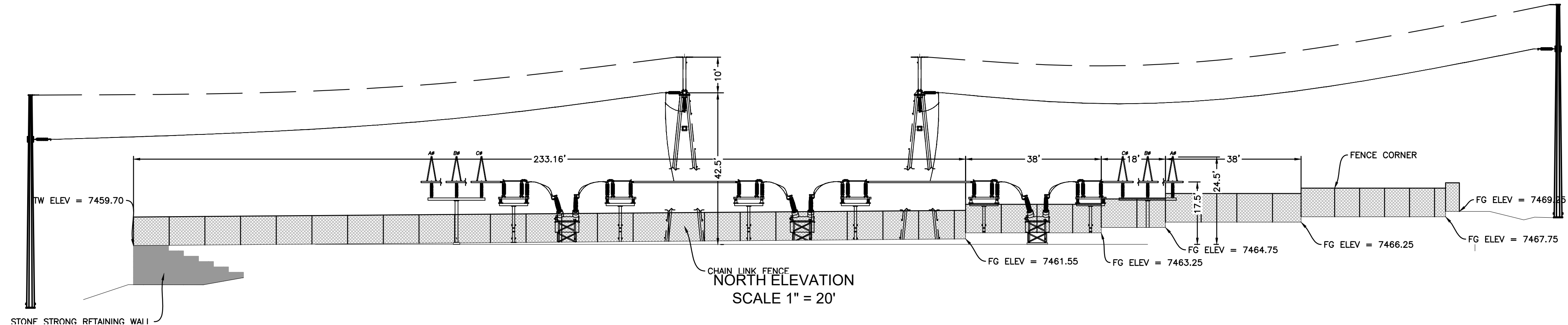
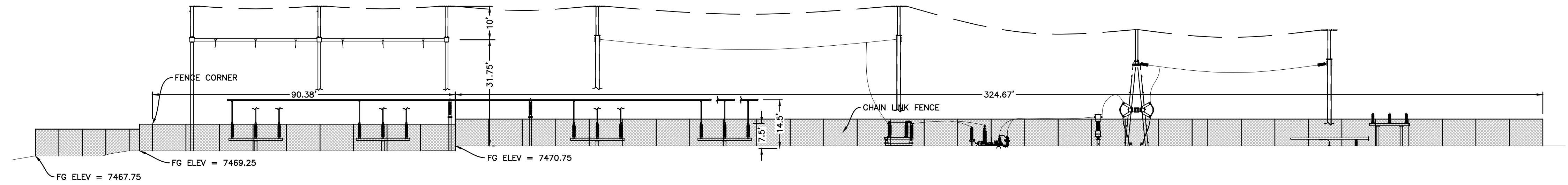


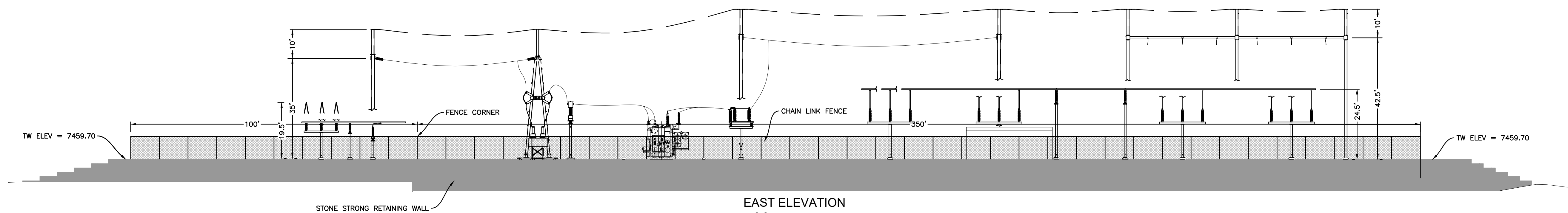
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SCALE 1" = 20'



NORTH ELEVATION  
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WEST ELEVATION  
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EAST ELEVATION  
SCALE 1" = 20'

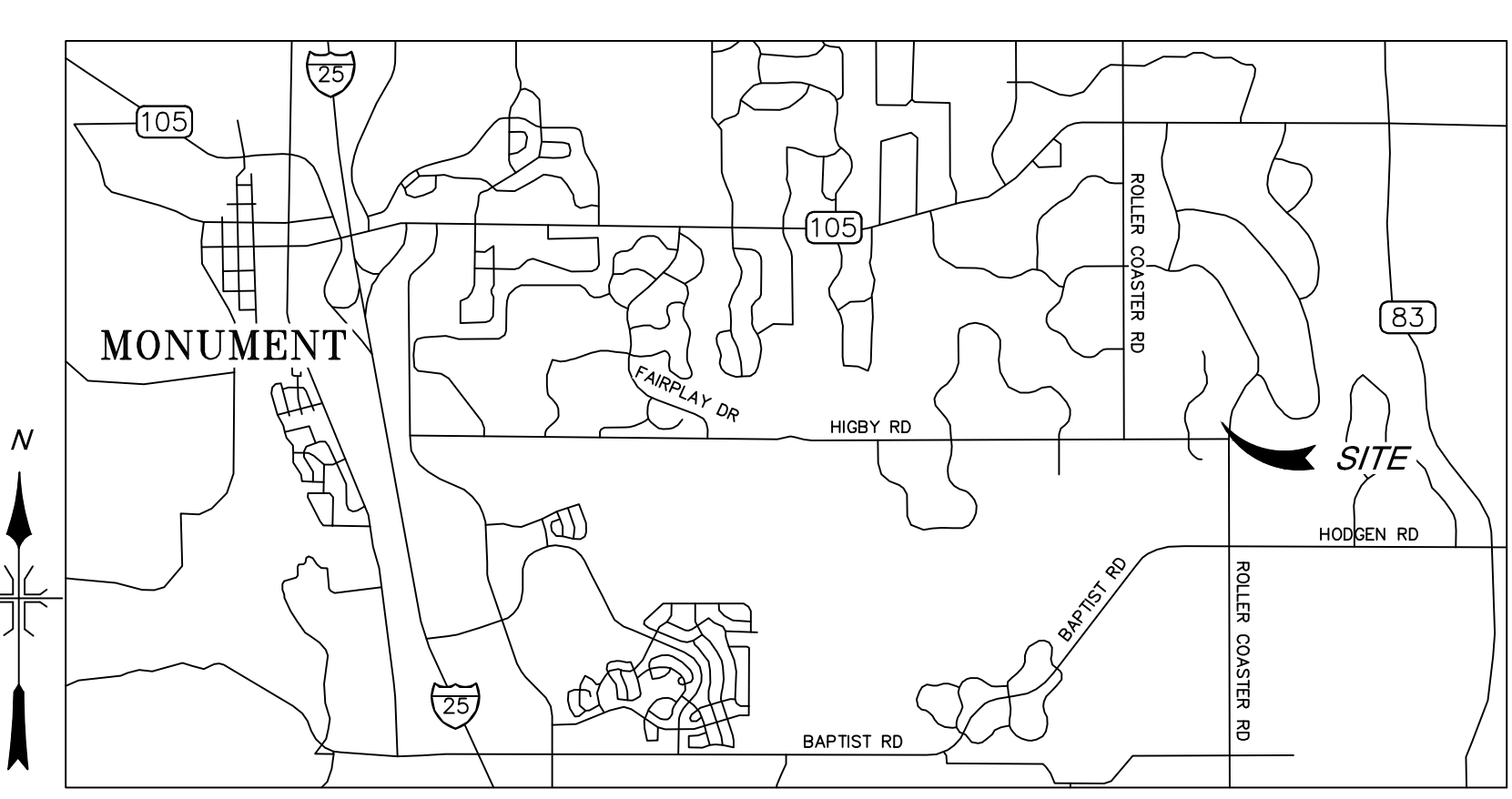
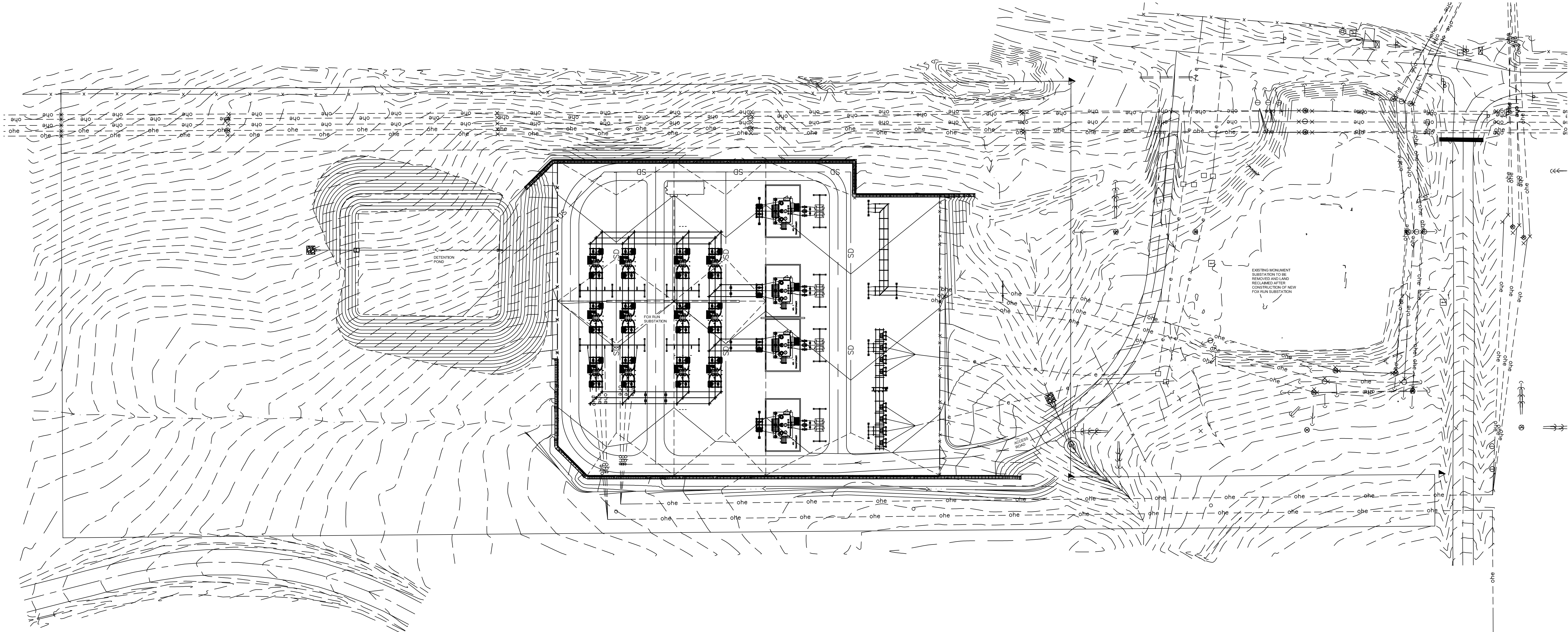
FOX RUN SUBSTATION		ELEVATION VIEWS	
TRI-STATE GENERATION & TRANSMISSION ASSOCIATION, INCORPORATED		1100 W. 116th Ave. P.O. Box 33695 Denver, Colorado 80233 303-452-6111	
UPDATED BY: KENUTL		5/17/2022 4:56 PM   Contract: .	
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No.	Date	Dwn.	Appd.
7			
6			
5			
4			
3			
2			
1			
Revision		M.F.	
Reference Drawings		Migr.	
Drawing Title		Dwg. No.	

**TRI-STATE**  
Generation and Transmission Association, Inc.  
A Tri-State Energy Cooperative  
1100 W. 116th Ave.  
P.O. Box 33695  
Denver, Colorado 80233  
303-452-6111

Dwn: TMC Date: 04/27/22  
Appd: Date: .

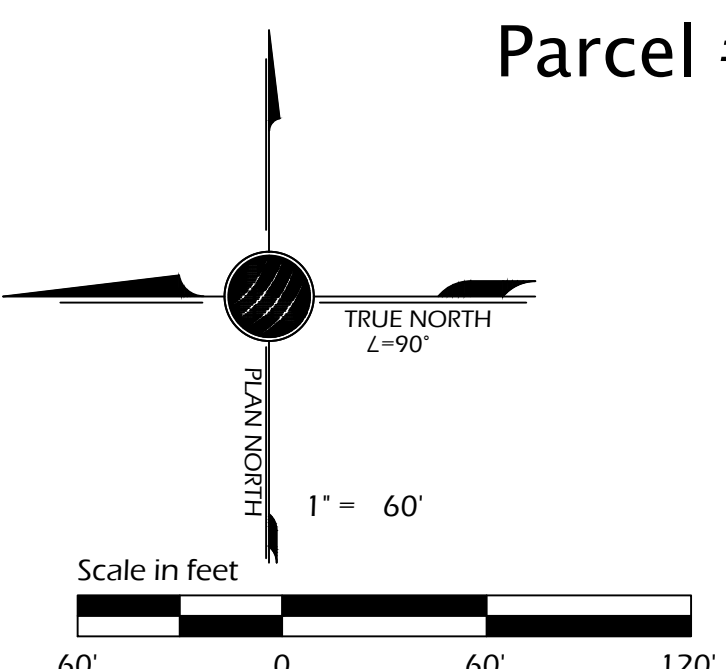
ELEVATIONS





VICINITY MAP  
N.T.S.

Site Coordinates (Lat/Long): 39.0808, -104.7858  
 Address: 17090 Shalara Road, Monument, CO  
 Parcel # 6121003005



**GENERAL NOTES**

THESE ARE CONSTRUCTION DOCUMENT LANDSCAPE PLANS FOR THE SITE LANDSCAPING AT THE FOX RUN SUBSTATION LOCATED APPROXIMATELY AT THE CORNER OF HIGBY RD AND ROLLER COASTER RD IN EL PASO COUNTY, CO.

1. THE EXTENT OF THIS LANDSCAPE INSTALLATION INCLUDES:  
 - SEEDING OF NATIVE GRASSES OF DISTURBED AREAS  
 - SEEDING OF RECLAIMED MONUMENT SUBSTATION
2. THE EXISTING LANDSCAPE, WITHIN THE NEW WORK AREA IS MOSTLY FIELD GRASS WITH SCATTERED TREES.
3. AFTER FINAL STABILIZATION OF THE SEEDED AREA, MAINTENANCE SHALL BE MINIMAL AND MIGHT REQUIRE MOWING AS NEEDED.
4. EXISTING UTILITIES - UNDERGROUND AND OTHERWISE EXIST ALONG THE CORRIDOR AND PROJECT AREA. ALL CONTRACTORS SHALL PROTECT IN PLACE ALL EXISTING UTILITIES DURING CONSTRUCTION. EXISTING UTILITIES NOTED ON THESE DRAWINGS ARE FOR REFERENCE ONLY AND MAY NOT ILLUSTRATE ALL UTILITIES THAT EXIST. ADDITIONAL COMMUNICATION CABLE SUCH AS TELEPHONE AND CABLE TV MAY EXIST ON OR NEAR THIS PROPERTY. LANDSCAPE CONTRACTOR SHALL LOCATE ALL UTILIZES PRIOR TO CONSTRUCTION AND NOTIFY OWNER OF ANY POTENTIAL CONFLICTS WITH PROPOSED CONSTRUCTION. ALL RESPONSIBLE FOR DAMAGES RESULTING FROM HITTING EXISTING UTILITIES.
5. ALL CONSTRUCTION IS TO ADHERE TO EL PASO COUNTY AND STATE OF COLORADO STANDARDS UNLESS OTHERWISE NOTED.
6. SOIL PREPARATION FOR LANDSCAPE AREAS SHALL CONSIST OF DISKING AND DRAGGING DISTURBED AND COMPACTED AREAS ONLY. DRILL SEEDING OF ENTIRE NATIVE SEED AREA, MULCHING WITH WEED FREE STRAW MULCH AND CRIMPING. INSTALL PLANTERS MIX TOPSOIL AROUND ALL TREES PER DETAILS.
7. YARD LIGHTING WILL ONLY BE LIT DURING EMERGENCIES.

**LANDSCAPE TABULATIONS**

1	ITEM	%	QTY	UNIT
2	6' TALL CHAINLINK PERIMETER FENCE		1621	LF
3	GRAVEL SUBSTATION YARD/DRIVEWAY	27	176,346	SF
4	NATIVE SEED REVEGETATION	15	100,188	SF
5	UNDISTURBED	58	376,272	SF
	TOTAL SITE AREA -	100	652,806	SF

**SEEDING SPECIFICATION**

QTY	UNIT	NAME	RATE	MIX
200	LBS	LOW GROW MIX	25 LBS/ ACRES	30% EPHRALM CRESTED WHEATGRASS 25% SHEEP FESCUE 20% PERENNIAL RYE 15% CHEWINGS FESCUE 10% CANADA BLUEGRASS

**LANDSCAPE VARIANCE**

THE NEW SUBSTATION AND ELECTRICAL UTILITIES BEING CONSTRUCTED WILL NOT BE MANNED FACILITIES. AS SUCH NO WATER SOURCES ARE REQUIRED NOR PLANNED FOR AT THIS SITE. IN EFFORT TO CONSERVE COLORADO WATER RESOURCES, TRI-STATE G&T REQUEST A VARIANCE TO EL PASO COUNTIES TREE LANDSCAPING REQUIREMENTS.

**LEGEND**

- - - - - EXISTING PROPERTY FENCE
- - - - - EXISTING UNDERGROUND POWER
- - - - - EXISTING COUNTY ROAD R.O.W.
- - - - - EXISTING CULVERT
- sd - - - - - PROPOSED SUBDRAIN
- stm - - - - - PROPOSED CULVERT
- - - - - PROPOSED GRADE BRAKE LINE
- - - - - PROPOSED SUBSTATION FENCE
- - - - - PROPOSED DRAINAGE FLOWLINE
- + + + + + NEW NATIVE SEEDING
- o - - - - - EXISTING TREE

FOX RUN SUBSTATION  
 LANDSCAPE PLAN  
 TRI-STATE GENERATION & TRANSMISSION ASSOCIATION, INCORPORATED  
 UPDATED BY: KENUTL 11/9/2022 7:31 AM Contract: 11/9/2022 7:31 AM  
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**TRI-STATE**  
 Generation and Transmission Association, Inc.  
 A Touchstone Energy Cooperative  
 1100 W. 116th Ave.  
 P.O. Box 33695  
 Denver, Colorado 80233  
 303-452-6111

Dwn: TMC	Date: 12/16/21
Appd: KGU	Date: 10/31/22

LANDSCAPE PLAN

No.	Date	Appd.	Revision	M.F.	Dwg. No.	Mfgr.	Reference Drawings
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5							
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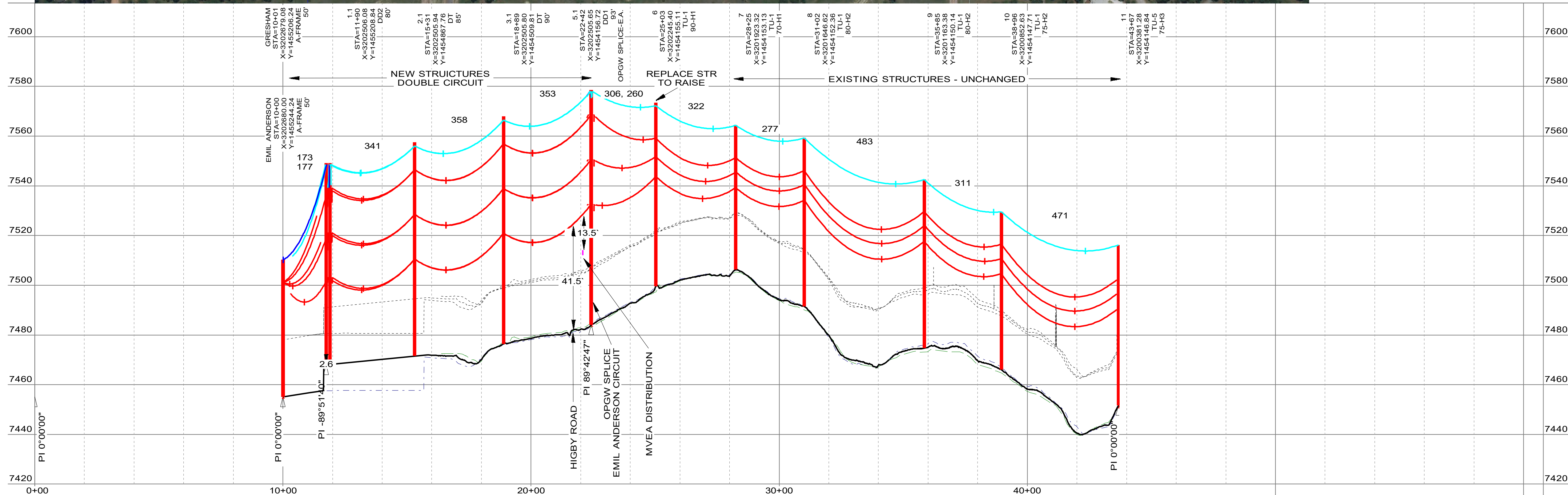
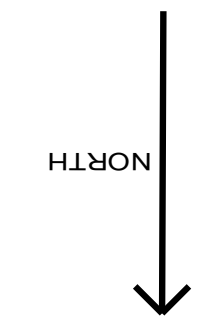






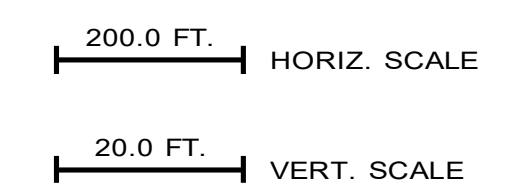
# Preliminary

4/14/2022



- EMIL ANDERSON - 1.1, AFL OPGW DNO-7054 CC-37/47/547, RULING SPAN 179 (FT), TENSION 150 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F INITIAL 146 (LBS)
- EMIL ANDERSON - 1.1, 477 KCMIL 26/7 STRANDS HAWK ACSR, RULING SPAN 183 (FT), TENSION 350 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED MAXIMUM OPERATING TEMP (212°F) INITIAL 318 (LBS)
- GRESHAM - 1.1, AFL OPGW DNO-7054 CC-37/47/547, RULING SPAN 167 (FT), TENSION 150 (LBS) AT 60 (DEG F) CREEP, DISPLAYED 120 DEG F MAX SAG 145 (LBS)
- GRESHAM - 1.1, 3/8 INCH HS 7 STRANDS STEEL, RULING SPAN 172 (FT), TENSION 150 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F CREEP 144 (LBS)
- GRESHAM - 1.1, 477 KCMIL 26/7 STRANDS HAWK ACSR, RULING SPAN 163 (FT), TENSION 350 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED MAXIMUM OPERATING TEMP (212°F) MAX SAG 311 (LBS)
- 1.1 - 5.1, AFL OPGW DNO-7054 CC-37/47/547, RULING SPAN 352 (FT), TENSION 1000 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F CREEP 757 (LBS)
- 1.1 - 5.1, 477 KCMIL 26/7 STRANDS HAWK ACSR, RULING SPAN 348 (FT), TENSION 2200 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 212 DEG. F MAX SAG 1183 (LBS)
- 1.1 - 5.1, 477 KCMIL 26/7 STRANDS HAWK ACSR, RULING SPAN 353 (FT), TENSION 2200 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED MAXIMUM OPERATING TEMP (212°F) INITIAL 1199 (LBS)
- 5.1 - 11, AFL OPGW DNO-7054 CC-37/47/547, RULING SPAN 388 (FT), TENSION 1930 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F CREEP FE
- 5.1 - G1, 3/8 INCH EHS 7 STRANDS STEEL, RULING SPAN 308 (FT), TENSION 975 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F CREEP 721 (LBS)
- 5.1 - G1, AFL OPGW DNO-7054 CC-37/47/547, RULING SPAN 295 (FT), TENSION 975 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F CREEP 695 (LBS)
- 5.1 - 11, 477 KCMIL 26/7 STRANDS HAWK ACSR, RULING SPAN 387 (FT), TENSION 2505 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED MAXIMUM OPERATING TEMP (212°F) MAX SAG FE
- 5.1 - G1, 477 KCMIL 26/7 STRANDS HAWK ACSR, RULING SPAN 295 (FT), TENSION 2086 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED MAXIMUM OPERATING TEMP (212°F) CREEP 1050 (LBS)

NOTES:  
 CLEARANCE LINE SHOWN AT 23.0'  
 COORDINATES IN CO CENTRAL NAD83  
 COORDINATES IN US-SURVEY FOOT.



FOX RUN - FOX RUN TAP  
 115 KV

PLAN AND PROFILE  
 WO: 50002438/50032556  
 TRI-STATE GENERATION & TRANSMISSION  
 ASSOCIATION, INCORPORATED

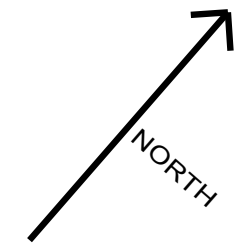
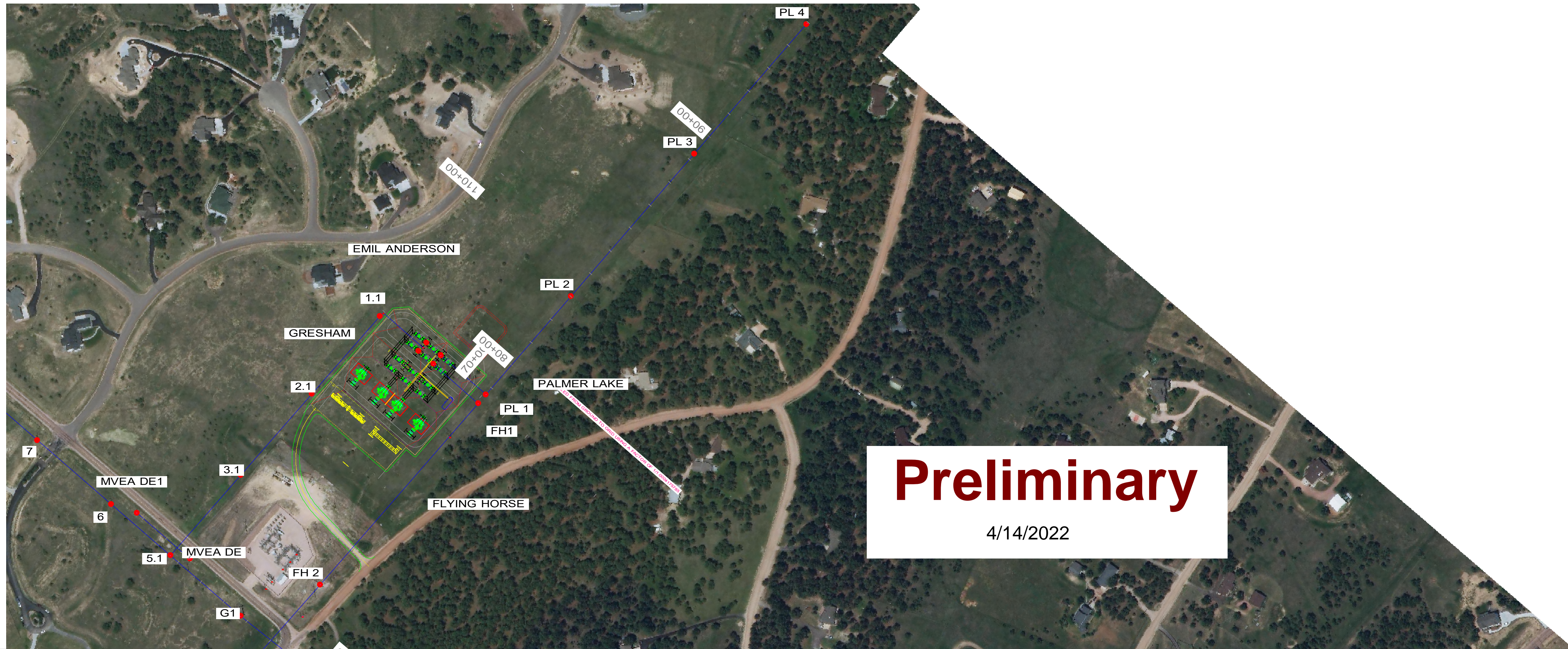
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APPD:	DATE:

T2301-G-01-001

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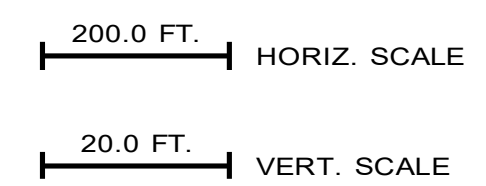


**Preliminary**  
4/14/2022



- 5.1 - G1, 3/8 INCH EHS 7 STRANDS STEEL, RULING SPAN 308 (FT), TENSION 975 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F CREEP 721 (LBS)
- 5.1 - G1, AFL OPGW DNO-7054 CC-37/47/547, RULING SPAN 295 (FT), TENSION 975 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F CREEP 695 (LBS)
- 5.1 - G1, 477 KCMIL 26/7 STRANDS HAWK ACSR, RULING SPAN 295 (FT), TENSION 2086 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED MAXIMUM OPERATING TEMP (212°F) CREEP 1050 (LBS)
- G1 - P2, 3/8 INCH HS 7 STRANDS STEEL, RULING SPAN 368 (FT), TENSION 1057 (LBS) AT 60 (DEG F) CREEP, DISPLAYED 120 DEG F CREEP 811 (LBS)
- G1 - P2, AFL OPGW 8 FIBER ALUMACORE AC-53/449, RULING SPAN 380 (FT), TENSION 1189 (LBS) AT 60 (DEG F) CREEP, DISPLAYED 120 DEG F CREEP 849 (LBS)
- G1 - P2, 477 KCMIL 26/7 STRANDS HAWK ACSR, RULING SPAN 374 (FT), TENSION 2234 (LBS) AT 60 (DEG F) CREEP, DISPLAYED MAXIMUM OPERATING TEMP (212°F) CREEP 1336 (LBS)

NOTES:  
 CLEARANCE LINE SHOWN AT 23.0'  
 COORDINATES IN CO CENTRAL NAD83  
 COORDINATES IN US-SURVEY FOOT.



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1	4/14/22	JTL							

**FOX RUN - FOX RUN TAP**  
 115 KV  
**PLAN AND PROFILE**  
 WO: 50002438/50032556  
 TRI-STATE GENERATION & TRANSMISSION  
 ASSOCIATION, INCORPORATED

UPDATED BY: \_\_\_\_\_ CONTRACT: \_\_\_\_\_

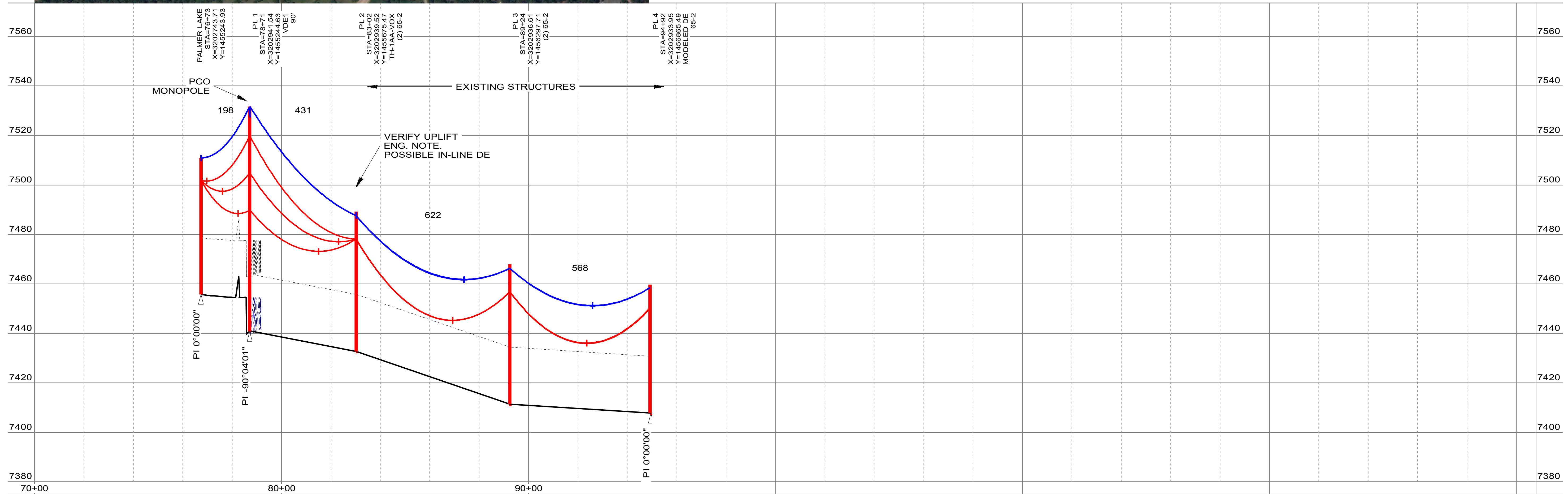
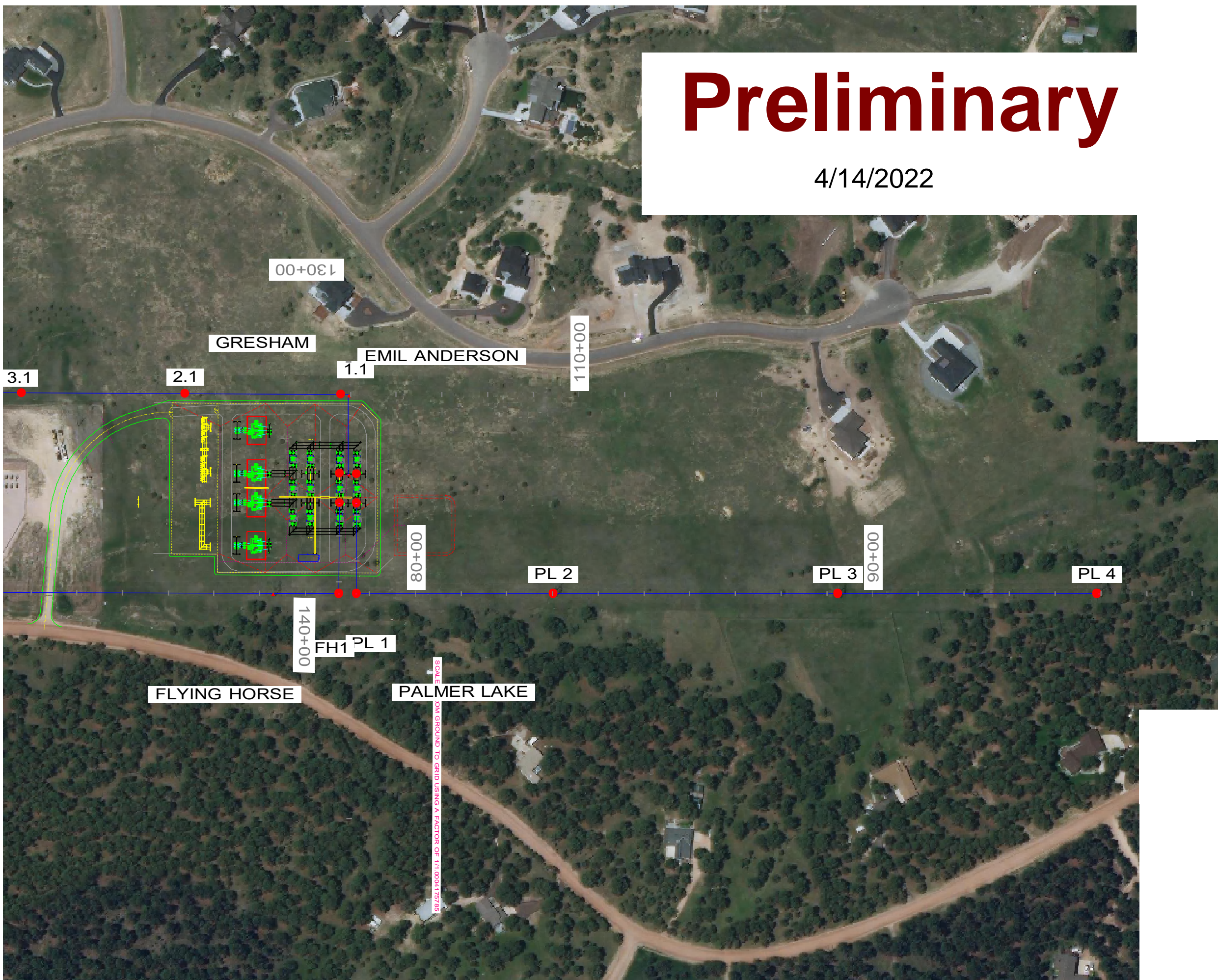
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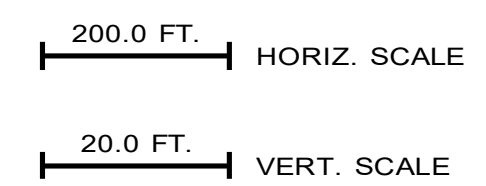
# Preliminary

4/14/2022



PALMER LAKE - PL 1, 3/8 INCH HS 7 STRANDS STEEL, RULING SPAN 197 (FT), TENSION 300 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F MAX SAG 256 (LBS)  
 PALMER LAKE - PL 1, 477 KCMIL 26/7 STRANDS HAWK ACSR, RULING SPAN 198 (FT), TENSION 750 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED MAXIMUM OPERATING TEMP (212°F) MAX SAG 547 (LBS)  
 PL 1 - PL 4, 1/2 INCH EHS 7 STRANDS STEEL, RULING SPAN 557 (FT), TENSION 2319 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F CREEP 1934 (LBS)  
 PL 1 - PL 4, 1/2 INCH EHS 7 STRANDS STEEL, RULING SPAN 557 (FT), TENSION 2275 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F CREEP 1904 (LBS)  
 PL 1 - PL 4, 477 KCMIL 26/7 STRANDS HAWK ACSR, RULING SPAN 557 (FT), TENSION 2253 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED MAXIMUM OPERATING TEMP (212°F) CREEP 1525 (LBS)

NOTES:  
 CLEARANCE LINE SHOWN AT 23.0'  
 COORDINATES IN CO CENTRAL NAD83  
 COORDINATES IN US-SURVEY FOOT.

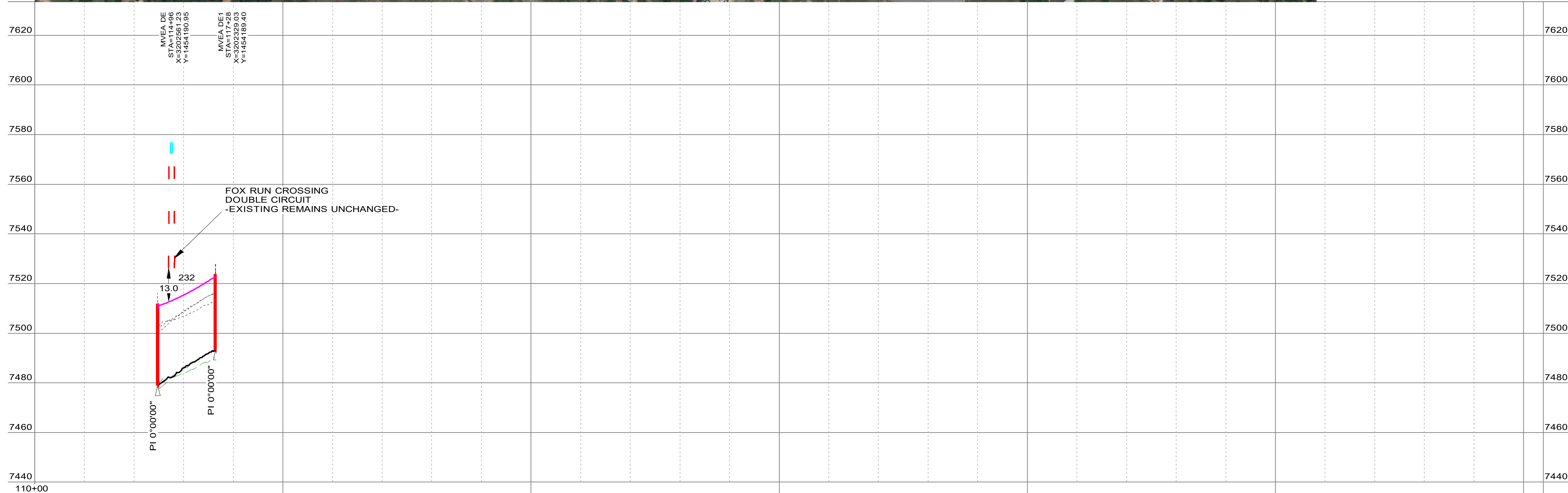


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1	JTL	3/24/22	JTL	ISSUE PER CPN-0449 AND CPN-0458				

FOX RUN - FOX RUN TAP  
 115 KV  
 PLAN AND PROFILE  
 WO: 50002438/50032556  
 TRI-STATE GENERATION & TRANSMISSION  
 ASSOCIATION, INCORPORATED

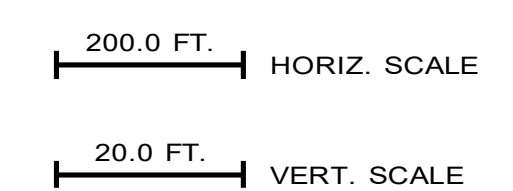
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 APPD: JTL  
 DATE: 3/24/22





MVEA DE - MVEA DE1, 266.8 KCMIL 26/7 STRANDS PARTRIDGE ACSR - ADAPTED FROM 1970'S PUBLICLY AVAILABLE DATA, RULING SPAN 232 (FT), TENSION 4000 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 60 DEG. F MAX SAG 2684 (LBS)

NOTES:  
 CLEARANCE LINE SHOWN AT 23.0'  
 COORDINATES IN CO CENTRAL NAD83  
 COORDINATES IN US-SURVEY FOOT.



FOX RUN - FOX RUN TAP  
 115 KV

PLAN AND PROFILE  
 WO: 50002438/50032556  
 TRI-STATE GENERATION & TRANSMISSION  
 ASSOCIATION, INCORPORATED

DWN:	JTL	DATE:	3/24/22
APPD:	JTL	DATE:	

T2301-G-01-004

NO.	DATE	DWN.	APPD.	REVISION
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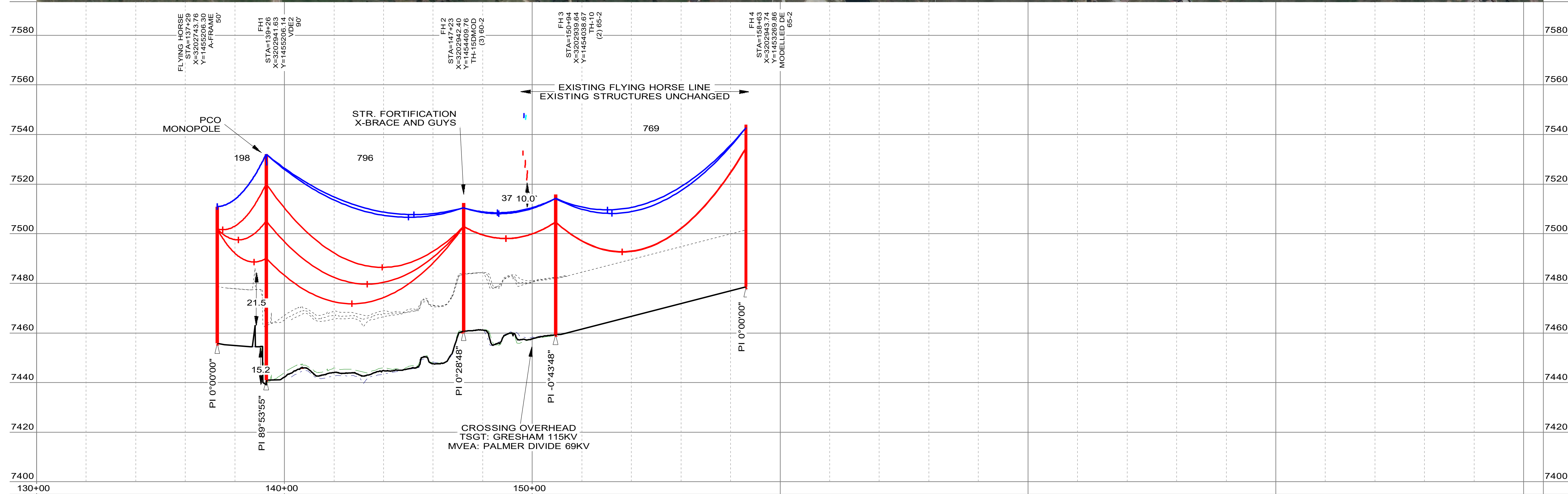
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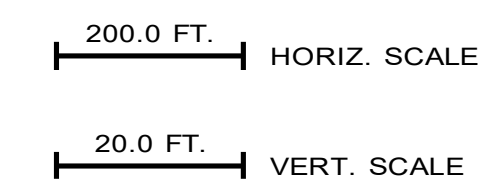


**Preliminary**  
4/14/2022



- FLYING HORSE - FH1, 3/8 INCH HS 7 STRANDS STEEL, RULING SPAN 197 (FT), TENSION 300 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F CREEP 266 (LBS)
- FLYING HORSE - FH1, 477 KCMIL 26/7 STRANDS HAWK ACSR, RULING SPAN 197 (FT), TENSION 750 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED MAXIMUM OPERATING TEMP (212°F) CREEP 548 (LBS)
- FH1 - FH 2, 1/2 INCH EHS 7 STRANDS STEEL, RULING SPAN 796 (FT), TENSION 4058 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F CREEP 3356 (LBS)
- FH1 - FH 2, 1/2 INCH EHS 7 STRANDS STEEL, RULING SPAN 796 (FT), TENSION 4616 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F CREEP 3781 (LBS)
- FH1 - FH 2, 477 KCMIL 26/7 STRANDS HAWK ACSR, RULING SPAN 795 (FT), TENSION 3267 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED MAXIMUM OPERATING TEMP (212°F) CREEP 2140 (LBS)
- FH 2 - FH 4, 5/8 INCH EHS 7 STRANDS STEEL, RULING SPAN 666 (FT), TENSION 4616 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F CREEP 3843 (LBS)
- FH 2 - FH 4, 5/8 INCH EHS 7 STRANDS STEEL, RULING SPAN 666 (FT), TENSION 4058 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED 120 DEG F CREEP 3454 (LBS)
- FH 2 - FH 4, 477 KCMIL 26/7 STRANDS HAWK ACSR, RULING SPAN 666 (FT), TENSION 3267 (LBS) AT 60 (DEG F) INITIAL, DISPLAYED MAXIMUM OPERATING TEMP (212°F) CREEP 1966 (LBS)

NOTES:  
CLEANANCE LINE SHOWN AT 23.0'  
COORDINATES IN CO CENTRAL NAD83  
COORDINATES IN US-SURVEY FOOT.



NO.	DATE	APPD.	DWN.	REVISED	M.F.	DWG. NO.	M.FGR.	DRAWING TITLE	REFERENCE DRAWINGS
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**FOX RUN - FOX RUN TAP**  
115 KV

**PLAN AND PROFILE**  
WO: 50002438/50032556  
TRI-STATE GENERATION & TRANSMISSION ASSOCIATION, INCORPORATED

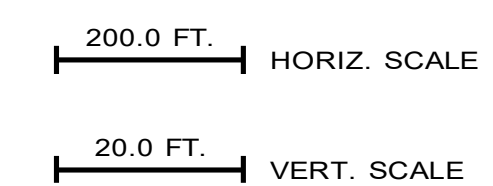
UPDATED BY: \_\_\_\_\_ CONTRACT: \_\_\_\_\_





G1 - P2, 3/8 INCH HS 7 STRANDS STEEL, RULING SPAN 368 (FT), TENSION 1057 (LBS) AT 60 (DEG F) CREEP, DISPLAYED 120 DEG F CREEP 811 (LBS)  
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NOTES:  
 CLEARANCE LINE SHOWN AT 23.0'  
 COORDINATES IN CO CENTRAL NAD83  
 COORDINATES IN US-SURVEY FOOT.



REFERENCE DRAWINGS		M.F.		REVISION		APPD.		CONTRACT	
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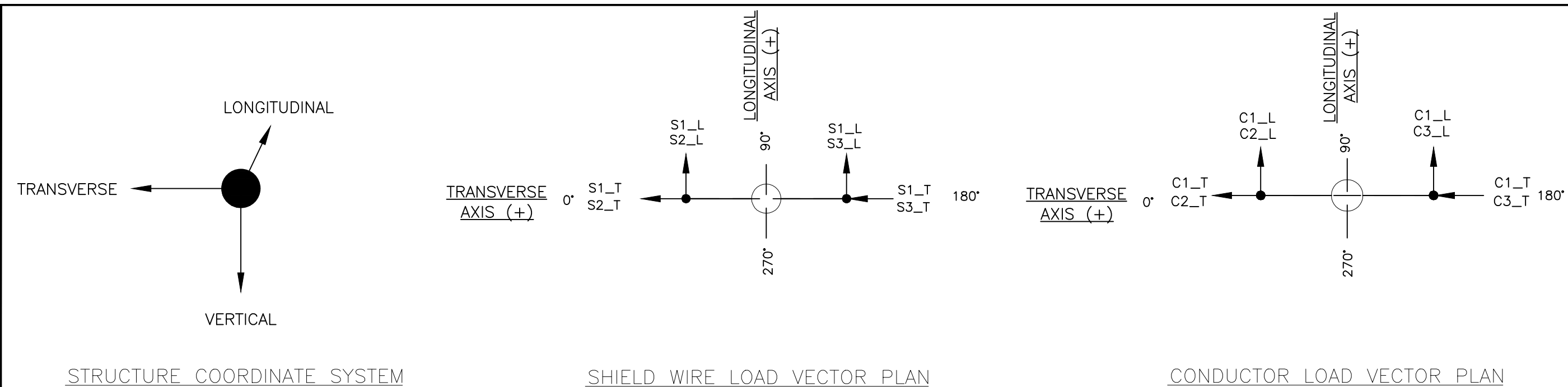
ISSUE PER CPN-049 AND CPN-048

FOX RUN - FOX RUN TAP  
 115 KV  
 PLAN AND PROFILE  
 WO: 50002438/50032556  
 TRI-STATE GENERATION & TRANSMISSION  
 ASSOCIATION, INCORPORATED

UPDATED BY: \_\_\_\_\_ CONTRACT: \_\_\_\_\_

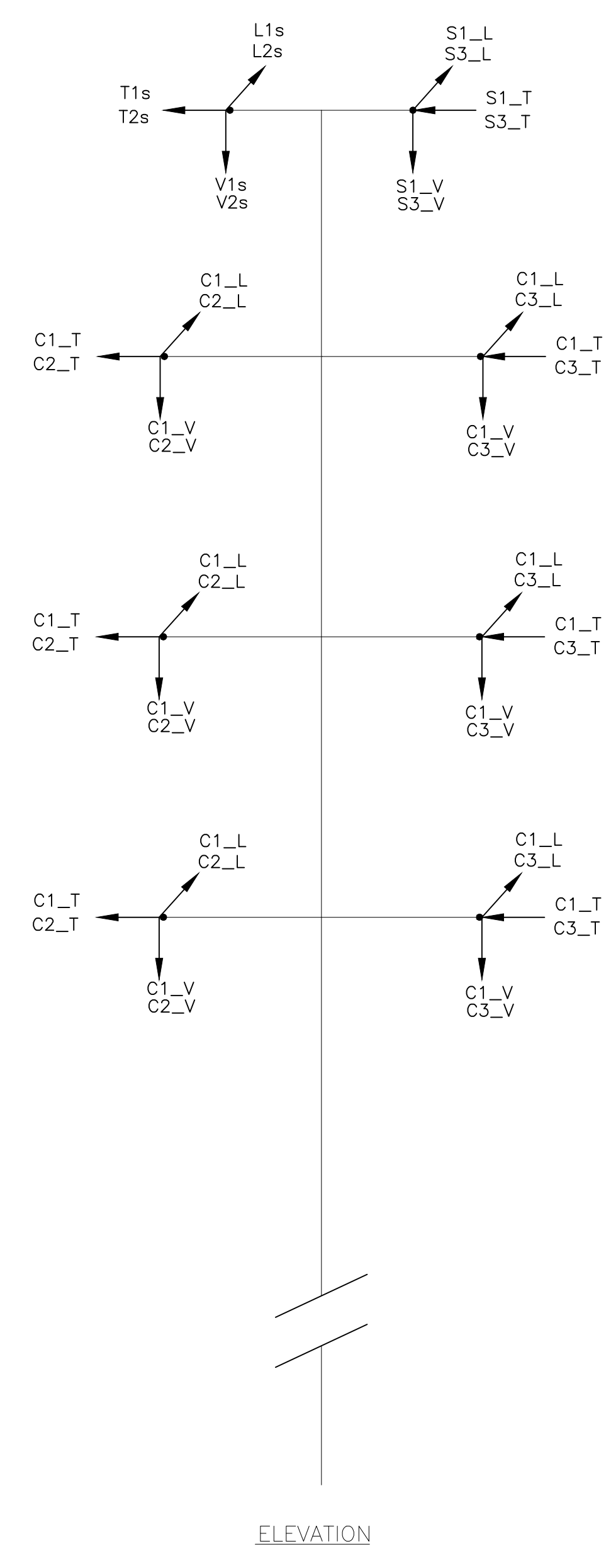
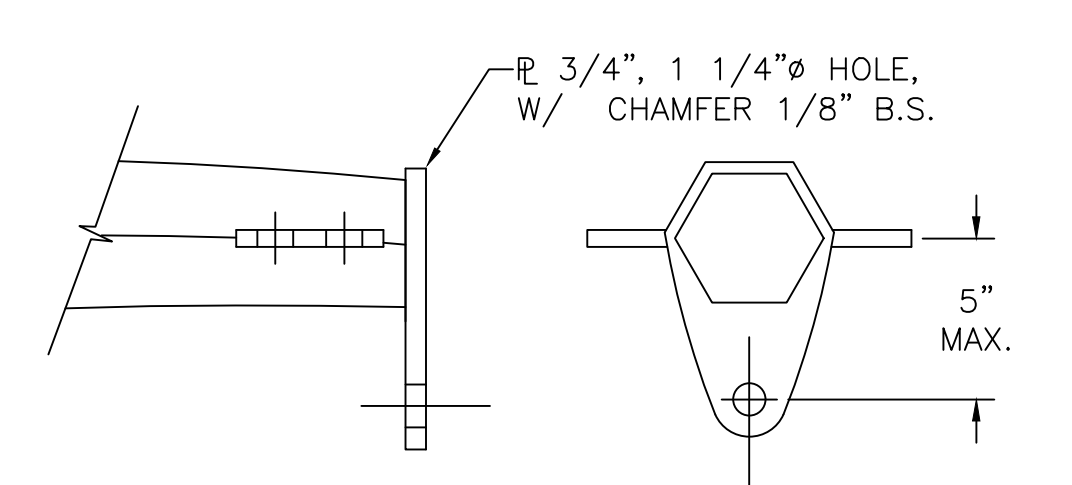
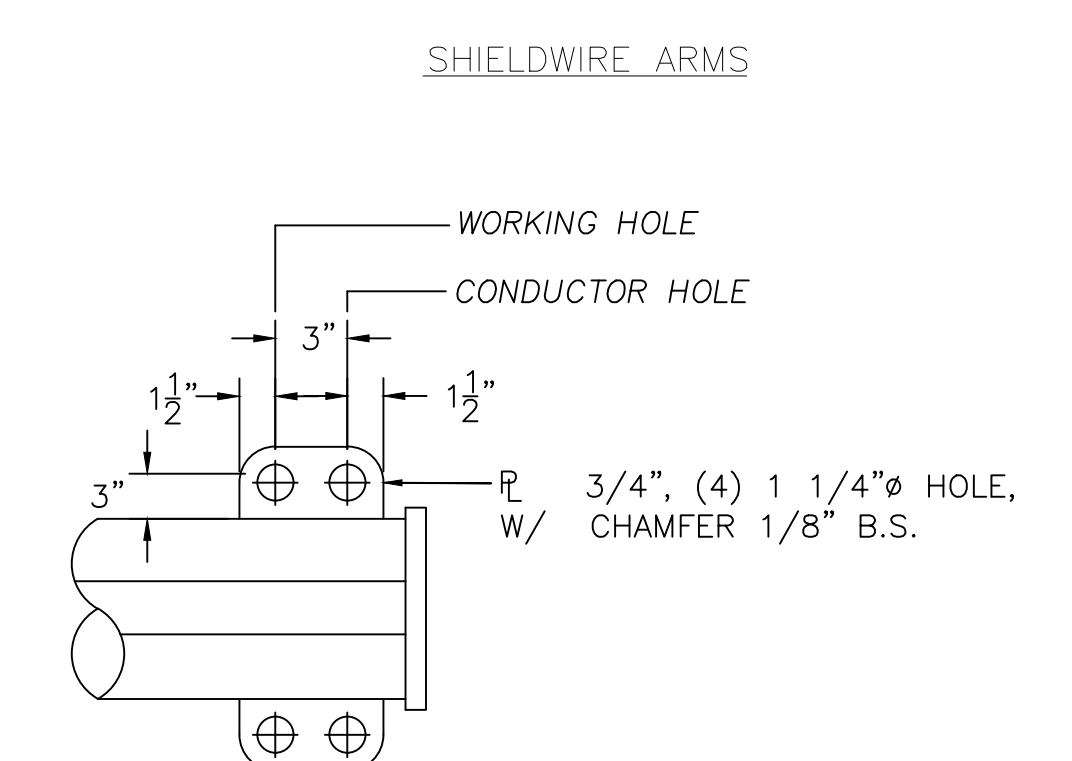
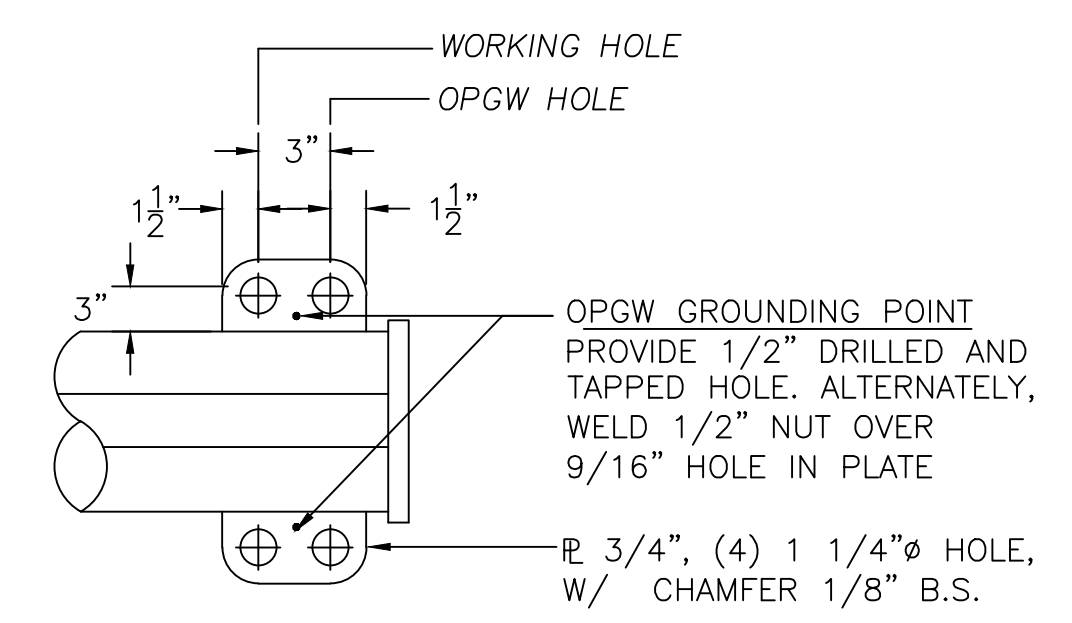
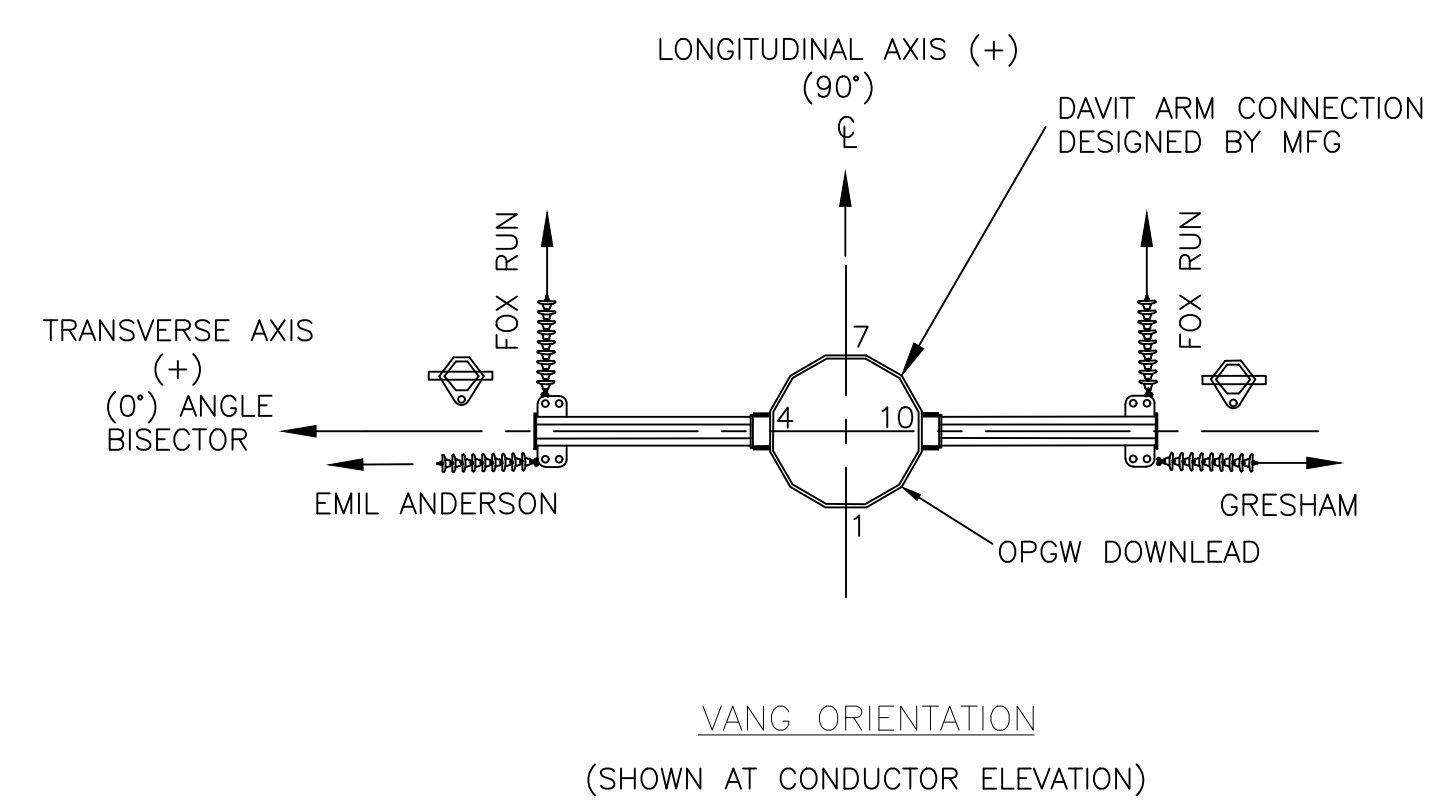
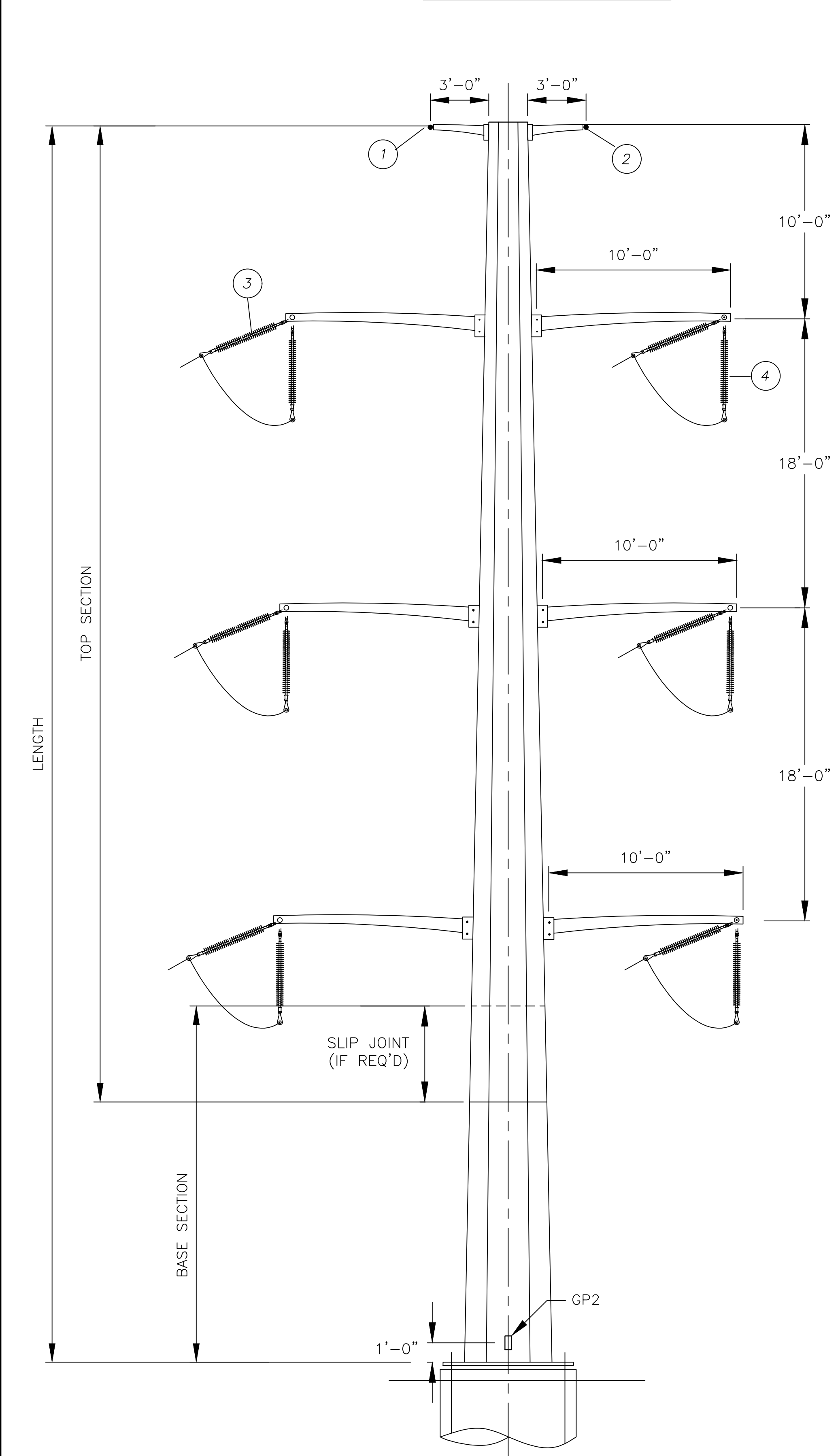
T2301-G-01-006





SHIELD WIRE STRUCTURE LOADS WITH OLF (KIPS)															
LOAD CASES	TEMP (°F)	WIND (PSF)	ICE (IN)	LOAD FACTORS			S1 (Fox Run Sub)			S2 (Emil Anderson)			S3 (Gresham)		
				WIND	TENS.	VERT.	V	T	L	V	T	L	V	T	L
1 NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	1.0	0.8	7.0	0.7	8.0	0.5	1.5	-10.4	-0.8
2 NESC 250C EXTREME WIND	60	20.7	0.0	1.00	1.00	1.00	0.4	0.4	3.1	0.5	3.8	0.5	1.4	-10.5	-0.6
3 NESC 250D CONC. ICE & WIND	15	6.4	0.50	1.00	1.00	1.00	0.4	0.3	3.5	0.4	4.0	0.5	0.6	-4.7	-0.4
4 TRI-STATE EXTREME ICE	32	0.0	1.0	1.00	1.00	1.10	1.0	-0.1	5.3	0.8	6.0	0.1	1.5	-8.3	0.3
5 TRI-STATE EXTREME WIND	60	25.6	0.0	1.10	1.00	1.00	0.5	0.5	3.9	0.5	4.3	0.6	0.7	-5.3	-0.6
6 DEFLECTION	60	2.0	0.0	1.00	1.00	1.00	0.4	0.2	1.9	0.4	2.7	0.4	0.5	-3.4	0.3
7 BROKEN SHIELD WIRE	0	4.0	0.5	1.00	1.30	1.00	0.5	0.4	5.3	0.5	6.0	0.4	0.9	-7.5	-0.4
8 DIFFERENTIAL ICE (HALF BACK)	32	0.0	0.5	1.00	1.00	1.00	0.5	-0.2	3.8	0.4	3.7	0.2	0.7	-4.2	0.3
9 DIFFERENTIAL ICE (HALF AHEAD)	32	0.0	0.5	1.00	1.00	1.00	0.4	-0.3	3.0	0.5	4.0	0.3	0.9	-5.5	0.5
10 DE AHEAD - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	0.0	0.0	0.0	0.7	8.0	0.5	1.5	-10.4	-0.8
11 DE BACK - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	0.7	0.5	7.0	0.0	0.0	0.0	1.5	-10.4	-0.8
12 CONSTRUCTION	60	4.0	0.0	1.65	1.65	1.65	0.4	-0.4	4.3	0.5	5.8	0.3	0.9	-5.6	0.4

CONDUCTOR STRUCTURE LOADS WITH OLF (KIPS)															
LOAD CASES	TEMP (°F)	WIND (PSF)	ICE (IN)	LOAD FACTORS			C1 (Fox Run Sub)			C2 (Emil Anderson)			C3 (Gresham)		
				WIND	TENS.	VERT.	V	T	L	V	T	L	V	T	L
1 NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	1.5	0.8	10.2	1.4	10.3	0.8	1.3	-9.5	-0.8
2 NESC 250C EXTREME WIND	60	20.7	0.0	1.00	1.00	1.00	0.7	0.6	5.0	0.7	4.6	0.7	0.8	-4.2	-0.4
3 NESC 250D CONC. ICE & WIND	15	6.4	0.50	1.00	1.00	1.00	0.6	0.4	5.0	0.6	5.0	0.8	0.7	-4.3	-0.6
4 TRI-STATE EXTREME ICE	32	0.0	1.0	1.00	1.00	1.10	1.3	-0.4	7.3	1.3	7.6	0.6	1.5	-6.8	0.7
5 TRI-STATE EXTREME WIND	60	25.6	0.0	1.10	1.00	1.00	0.7	0.7	5.5	0.6	5.5	1.0	0.8	-4.8	-0.5
6 DEFLECTION	60	2.0	0.0	1.00	1.00	1.00	0.6	0.2	3.1	0.6	3.2	0.4	0.6	-2.9	0.3
7 BROKEN SHIELD WIRE	0	4.0	0.5	1.00	1.30	1.00	0.8	0.3	7.7	0.7	7.9	0.7	0.9	-7.1	-0.6
8 DIFFERENTIAL ICE (HALF BACK)	32	0.0	0.5	1.00	1.00	1.00	0.8	-0.3	5.5	0.6	4.7	0.4	0.6	-4.3	0.5
9 DIFFERENTIAL ICE (HALF AHEAD)	32	0.0	0.5	1.00	1.00	1.00	0.6	-0.4	4.7	0.8	5.5	0.5	0.9	-4.9	0.5
10 DE AHEAD - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	0.0	0.0	0.0	1.4	10.3	0.8	1.3	-9.5	-0.8
11 DE BACK - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	1.2	0.6	10.2	0.0	0.0	0.0	1.3	-9.5	-0.8
12 CONSTRUCTION	60	4.0	0.0	1.65	1.65	1.65	0.8	-0.5	7.5	0.8	7.5	0.7	1.0	-6.9	0.7



# Preliminary

4/14/2022

**DESIGN DATA:**

477 KCMIL ACSR 26/7 HAWK CONDUCTOR (ALL CONDUCTOR)  
 DNO-7054 OPGW (ALL OPGW)  
 WIND SPAN = - (AHEAD); WIND SPAN = - (BACK);  
 WEIGHT SPAN = -DESIGN LINE ANGLE  
 (80-95 DEGREE LEFT, 80-90 DEGREE RIGHT)  
 SOLID ICE DENSITY OF 57 LBS/FT<sup>3</sup>

**NOTES:**

- ALL DESIGN AND FABRICATION SHALL BE IN ACCORDANCE WITH TRI-STATE "TRANSMISSION LINE TAPERED TUBULAR STEEL POLE STRUCTURES" SPECIFICATION.
- LOADS ARE ULTIMATE VALUES AND INCLUDE LOAD FACTORS FOR EACH LOAD CASE.
- STRUCTURE AND ATTACHMENTS SHALL BE DESIGNED FOR THE SIMULTANEOUS APPLICATION OF DEAD LOAD OF THE STRUCTURE INCLUDING THE APPROPRIATE LOAD FACTOR, WIND ON THE STRUCTURE, AND WIRE LOADS FOR EACH LOAD CASE.
- WIND PRESSURES SHOWN ON LOAD CASE TABLE ARE IN PSF AND BASED ON A SHAPE FACTOR OF 1.0 FOR 12-SIDED SECTIONS. WIND PRESSURES INCLUDE LOAD FACTORS FOR EACH LOAD CASE.
- LIMIT POLE DEFLECTION TO 2% OF STRUCTURE HEIGHT FOR DEFLECTION LOAD CASE. ALL WIRES INTACT. CAMBER MAY BE UTILIZED TO COMPLY WITH THIS REQUIREMENT.
- APPLY WIND ON STRUCTURE WHICH RESULTS IN THE MOST SEVERE EFFECT.
- STRUCTURE TO BE DESIGNED FOR INTACT AND FULL DEADEND LOADING CONDITIONS FOR LOAD CASES 1 - 5.
- MATERIAL SHALL BE WEATHERING STEEL.
- DAVIT ARMS SHALL ATTACH TO THE POLE WITH A BOLTED CONNECTION TO WELDED THROUGH ARM BRACKETS AND DESIGNED BY THE MANUFACTURER.
- OPGW SPLICE LOCATED ON THIS POLE. PROVIDE DOWNLEAD CLAMP BRACKETS AND SPLICE CASE MOUNTING BRACKETS.
- NAME PLATE SHALL BE WELDED ON ALL STRUCTURES. TEXT MUST BE PERMANENTLY LEGIBLE, AND MUST INCLUDE MANUFACTURER'S NAME, DATE OF FABRICATION, STRUCTURE NUMBER, COMPLETE STRUCTURE LENGTH, COMPLETE STRUCTURE WEIGHT, AND GROUND LINE MOMENT CAPACITY IN KIP-FEET.
- SEE DWG. T2301-G-13-0XX FOR STEEL DETAILS.
- LOCATE DETAIL 2 GROUNDING PADS ON BOTH SIDES OF ALL CONNECTIONS AND SPLICES.
- POLE SECTIONS SHALL HAVE BOLTED FLANGE CONNECTIONS ON THIS POLE ONLY.
- ANCHOR BOLTS SHALL BE EQUALLY SPACED AROUND THE BASE PLATE WITH 2.5" MINIMUM SPACE BETWEEN BOLTS.
- ANCHOR BOLT TEMPLATE AND EACH POLE SECTION SHALL BE MARKED ON THE ANGLE BISECTOR WITH AN OBVIOUS MARKING METHOD AIDING CONSTRUCTION.
- PROVIDE LADDER CLIPS FOR FULL LENGTH OF POLE AND AND WORKING CLIPS FOR THE TOP 55' OF THE POLE.
- AERIAL NUMBER SIGN REQUIRED, SEE DETAIL.
- TOP DIAMETER: 12" MINIMUM; ANCHOR BOLT DIAMETER: 86" MAX; TAPER: 0.45 INCH PER FT MAXIMUM. (ALTERNATIVES MAY BE PROPOSED.)

STRUCTURE #	HEIGHT (FT)	ACTUAL LINE ANGLE
5.1	95'-0"	0°

**FOX RUN - FOX RUN TAP**

115KV DD1  
 OUTLINE AND DESIGN  
 DOUBLE CIRCUIT AND DEADEND  
 TRI-STATE GENERATION & TRANSMISSION  
 ASSOCIATION, INCORPORATED

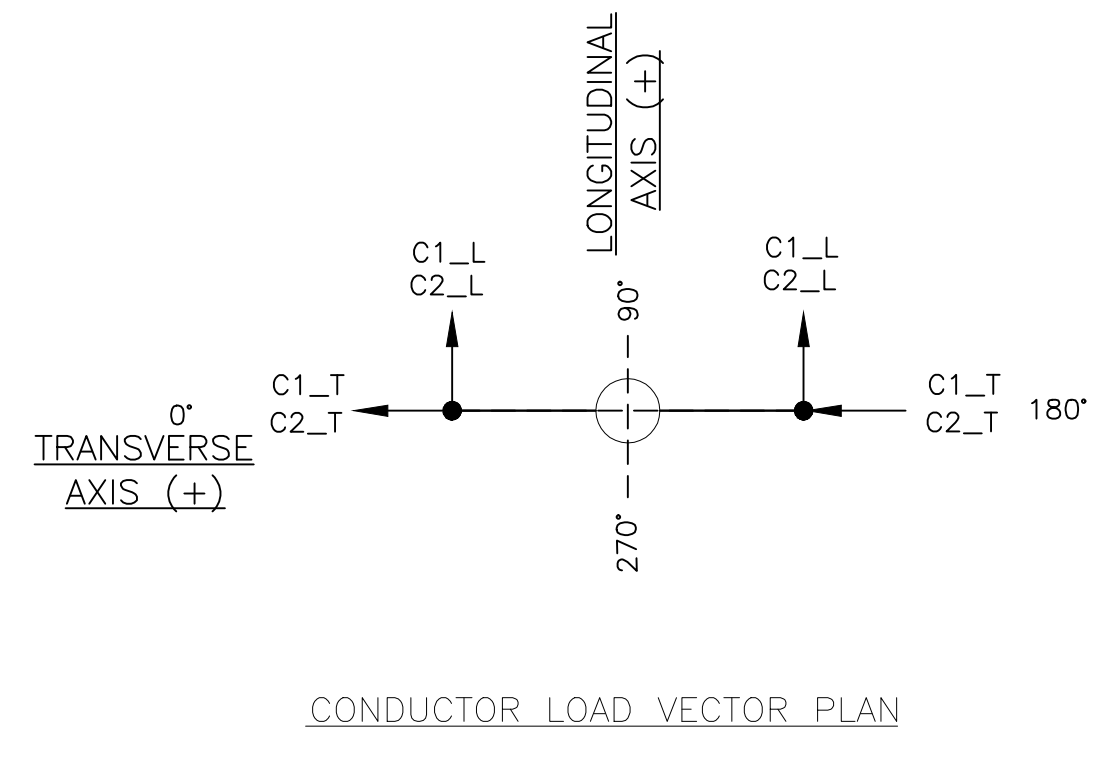
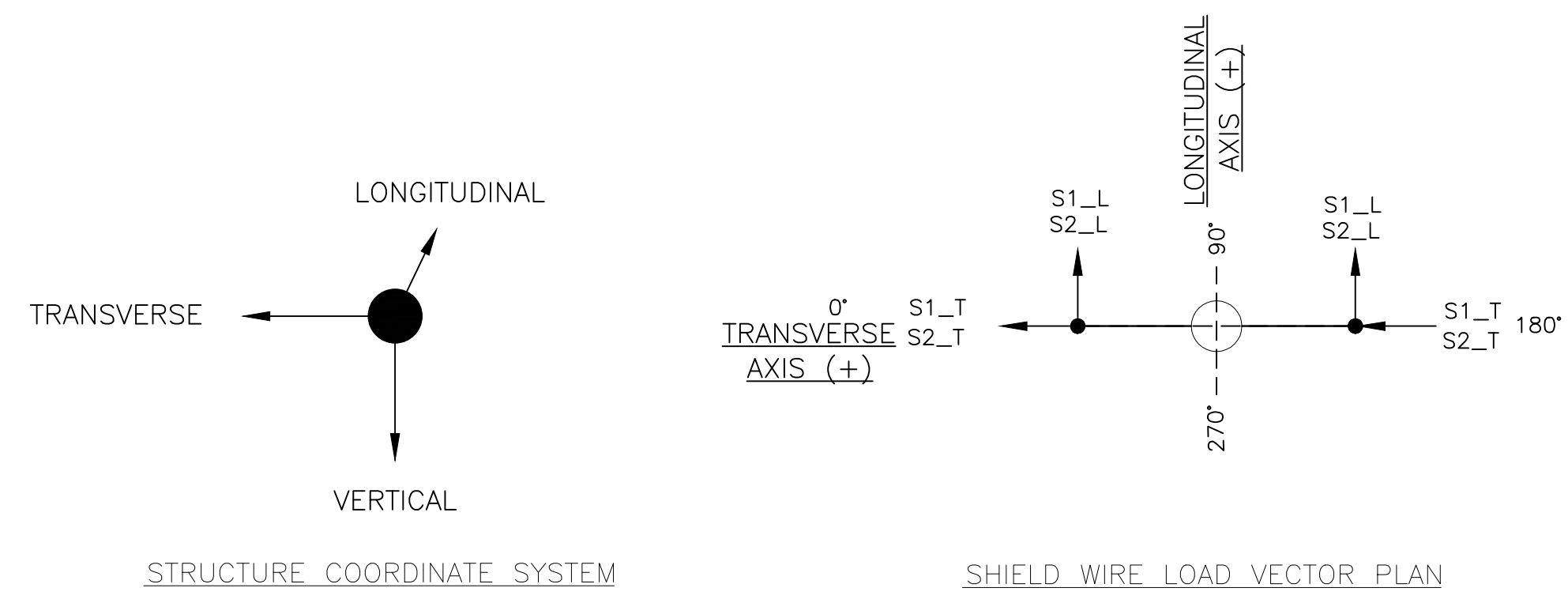
UPDATED BY: ADAOU 4/12/2022 8:09 AM

**TRI-STATE**  
 Generation and Transmission  
 Association, Inc.  
 A Touchstone Energy Cooperative  
 1100 W. 116th Ave.  
 P.O. Box 33695  
 Denver, Colorado 80233  
 303-432-0111

Dwn: ARO	Date: 04-12-22
Appd: JTL	Date: 04-12-22

T2301-G-13-001

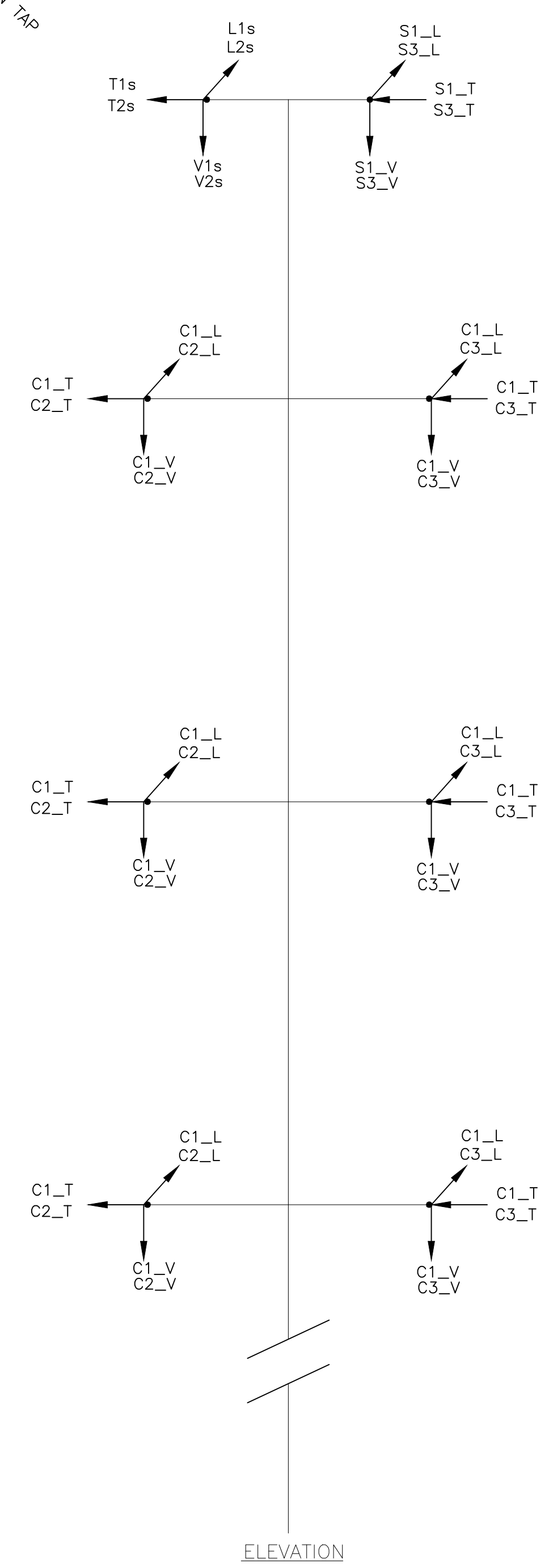
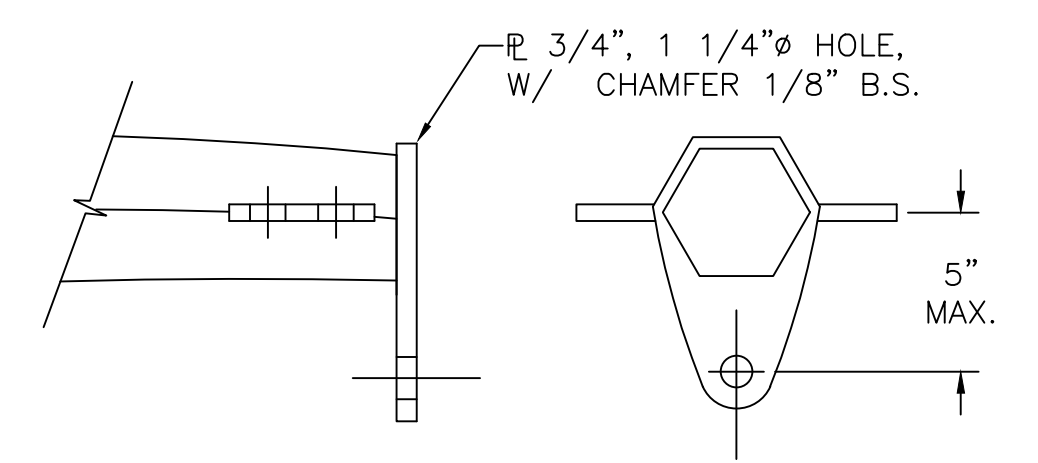
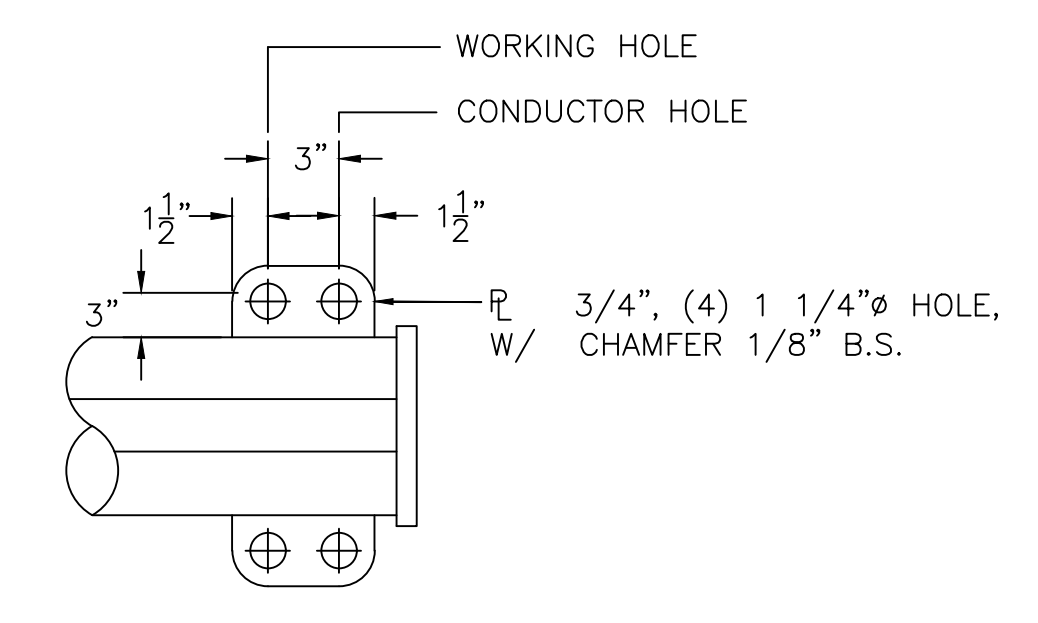
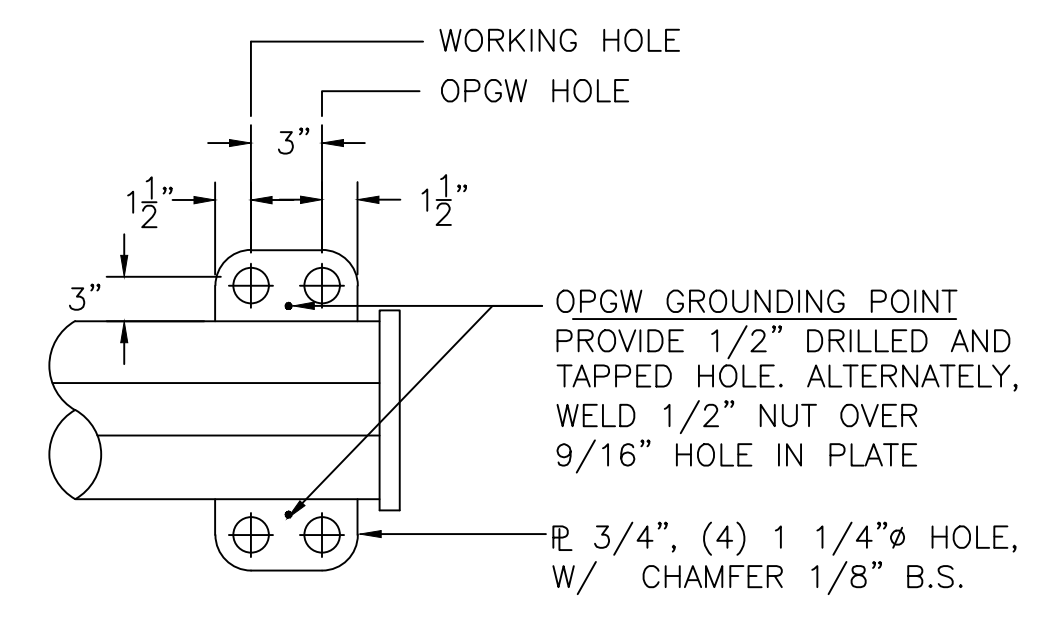
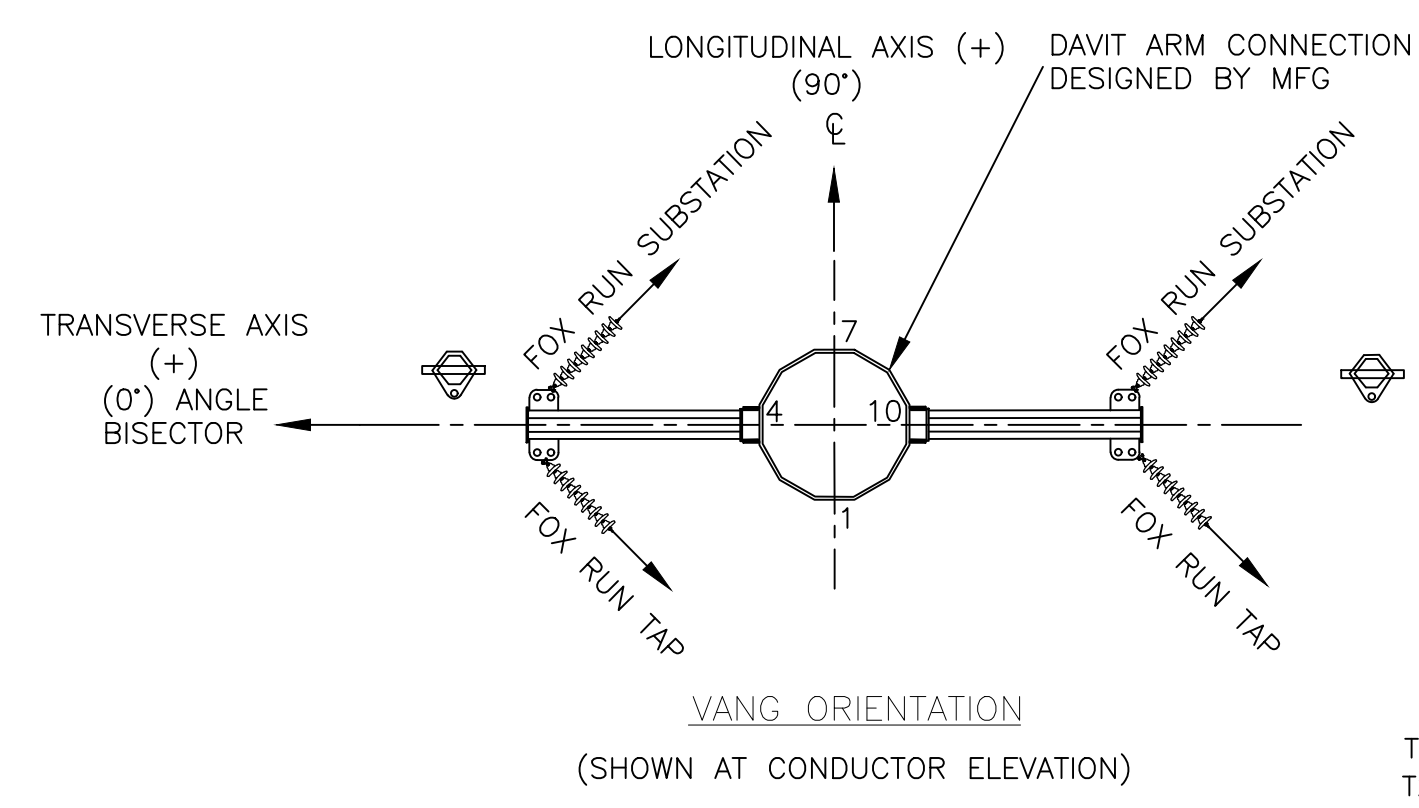
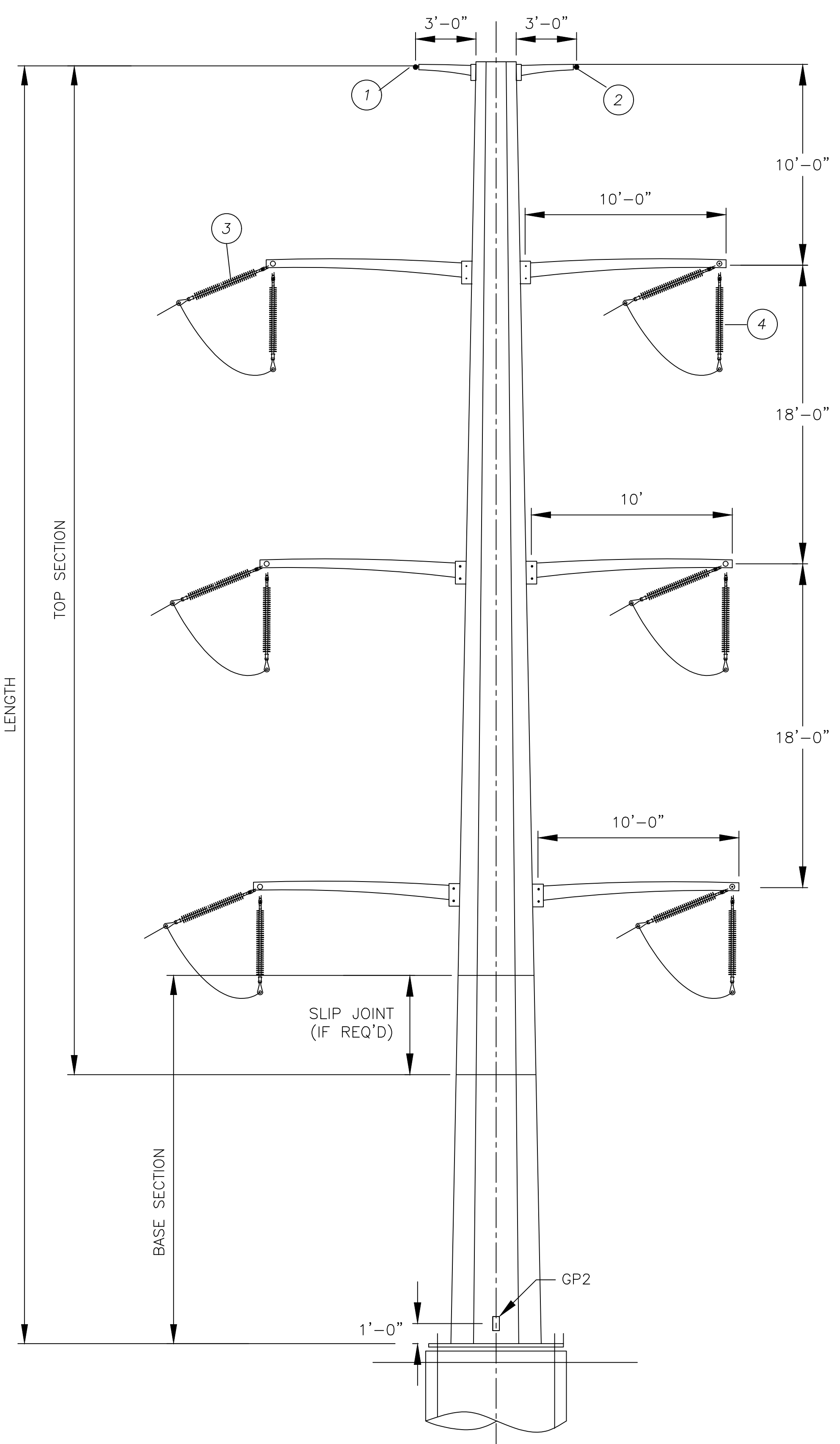




SHIELD WIRE STRUCTURE LOADS WITH OLF (KIPS)												
LOAD CASES	TEMP (°F)	WIND (PSF)	ICE (IN)	LOAD FACTORS			S1 (FOX RUN SUB)			S2 (FOX RUN TAP)		
				WIND	TENS.	VERT.	V	T	L	V	T	L
1 NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	1.2	-2.2	3.1	0.6	-5.2	-5.5
2 NESC 250C EXTREME WIND	60	20.7	0.0	1.00	1.00	1.00	0.6	-0.8	1.5	0.5	-2.7	-2.9
3 NESC 250D CONC. ICE & WIND	15	6.4	0.50	1.00	1.00	1.00	0.7	-0.6	0.8	-0.2	-2.4	-2.5
4 TRI-STATE EXTREME ICE	32	0.0	1.0	1.00	1.00	1.10	2	-2.1	2.3	0.7	-4.2	-4.2
5 TRI-STATE EXTREME WIND	60	25.6	0.0	1.10	1.00	1.00	0.6	-0.8	1.5	-0.3	-2.2	-2.8
6 DEFLECTION	60	2.0	0.0	1.00	1.00	1.00	0.4	-0.6	0.6	0.4	-1.3	-1.4
7 BROKEN SHIELD WIRE	0	4.0	0.5	1.00	1.30	1.00	0.8	-1.3	1.6	0.3	-3	-3.1
8 DIFFERENTIAL ICE (HALF BACK)	32	0.0	0.5	1.00	1.00	1.00	0.5	-0.9	0.8	0.5	-2.2	-2.6
9 DIFFERENTIAL ICE (HALF AHEAD)	32	0.0	0.5	1.00	1.00	1.00	0.8	-1.3	1.2	0.3	-2.2	-2.2
10 DE AHEAD - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	0	0	0	0.6	-5.2	-5.5
11 DE BACK - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	1.2	-2.2	3.1	0	0	0
12 CONSTRUCTION	60	4.0	0.0	1.65	1.65	1.65	0.8	-0.9	1.1	0.5	-3.3	-3.5

CONDUCTOR STRUCTURE LOADS WITH OLF (KIPS)												
LOAD CASES	TEMP (°F)	WIND (PSF)	ICE (IN)	LOAD FACTORS			C1 (FOX RUN SUB)			C2 (FOX RUN TAP)		
				WIND	TENS.	VERT.	V	T	L	V	T	L
1 NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	1.2	-2.5	2.6	1.1	-7.5	-7.9
2 NESC 250C EXTREME WIND	60	20.7	0.0	1.00	1.00	1.00	0.7	-0.7	1.2	0.6	-3.5	-4
3 NESC 250D CONC. ICE & WIND	15	6.4	0.50	1.00	1.00	1.00	0.7	-0.5	0.8	0.6	-3.6	-3.8
4 TRI-STATE EXTREME ICE	32	0.0	1.0	1.00	1.00	1.10	1.5	-2.5	2.3	1.2	-5.5	-5.5
5 TRI-STATE EXTREME WIND	60	25.6	0.0	1.10	1.00	1.00	0.7	-1.1	1.4	0.6	-3.8	-4.5
6 DEFLECTION	60	2.0	0.0	1.00	1.00	1.00	0.6	-1.2	1.2	0.6	-2.4	-2.5
7 BROKEN SHIELD WIRE	0	4.0	0.5	1.00	1.30	1.00	0.7	-1.4	1.4	0.6	-5.6	-5.9
8 DIFFERENTIAL ICE (HALF BACK)	32	0.0	0.5	1.00	1.00	1.00	0.5	-0.9	0.9	0.6	-4.1	-4.1
9 DIFFERENTIAL ICE (HALF AHEAD)	32	0.0	0.5	1.00	1.00	1.00	0.7	-0.9	1.1	0.6	-3.1	-3.1
10 DE AHEAD - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	0	0	0	1.1	-7.5	-7.9
11 DE BACK - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	1.2	-2.5	2.6	0	0	0
12 CONSTRUCTION	60	4.0	0.0	1.65	1.65	1.65	0.8	-1.1	1.1	4.2	-5.6	-5.9

STRUCTURE #	HEIGHT (FT)	ACTUAL LINE ANGLE
1.1	80'-0"	+90° RIGHT



# Preliminary

4/14/2022

DESIGN DATA:

477 KCMIL ACSR 26/7 HAWK CONDUCTOR (ALL CONDUCTOR)  
 DNO-7054 OPGW (ALL SHIELD WIRE)  
 WIND SPAN = - (AHEAD); WIND SPAN = - (BACK); WEIGHT SPAN = -  
 DESIGN LINE ANGLE (80 - 100 DEGREE RIGHT)  
 SOLID ICE DENSITY OF 57 LBS/FT<sup>3</sup>

NOTES:

- ALL DESIGN AND FABRICATION SHALL BE IN ACCORDANCE WITH TRI-STATE "TRANSMISSION LINE TAPERED TUBULAR STEEL POLE STRUCTURES" SPECIFICATION.
- LOADS ARE ULTIMATE VALUES AND INCLUDE LOAD FACTORS FOR EACH LOAD CASE.
- STRUCTURE AND ATTACHMENTS SHALL BE DESIGNED FOR THE SIMULTANEOUS APPLICATION OF DEAD LOAD OF THE STRUCTURE INCLUDING THE APPROPRIATE LOAD FACTOR, WIND ON THE STRUCTURE, AND WIRE LOADS FOR EACH LOAD CASE.
- WIND PRESSURES SHOWN ON LOAD CASE TABLE ARE IN PSF AND BASED ON A SHAPE FACTOR OF 1.0 FOR 12-SIDED SECTIONS. WIND PRESSURES INCLUDE LOAD FACTORS FOR EACH LOAD CASE.
- LIMIT POLE DEFLECTION TO 2% OF STRUCTURE HEIGHT FOR DEFLECTION LOAD CASE. ALL WIRES INTACT. CAMBER MAY BE UTILIZED TO COMPLY.
- APPLY WIND ON STRUCTURE WHICH RESULTS IN THE MOST SEVERE EFFECT.
- STRUCTURE TO BE DESIGNED FOR INTACT AND FULL DEADEND LOADING CONDITIONS FOR LOAD CASES 1 - 5.
- MATERIAL SHALL BE WEATHERING STEEL.
- DAVIT ARMS SHALL ATTACH TO THE POLE WITH A BOLTED CONNECTION TO WELDED THROUGH ARM BRACKETS AND DESIGNED BY THE MANUFACTURER.
- NAME PLATE SHALL BE WELDED ON ALL STRUCTURES. TEXT MUST BE PERMANENTLY LEGIBLE, AND MUST INCLUDE MANUFACTURER'S NAME, DATE OF FABRICATION, STRUCTURE NUMBER, COMPLETE STRUCTURE LENGTH, COMPLETE STRUCTURE WEIGHT, AND GROUND LINE MOMENT CAPACITY IN KIP-FEET.
- SEE DWG. T2301-G-13-0XX FOR STEEL DETAILS.
- LOCATE DETAIL 2 GROUNDING PADS ON BOTH SIDES OF ALL CONNECTIONS AND SPLICES.
- ANCHOR BOLTS SHALL BE EQUALLY SPACED AROUND THE BASE PLATE WITH 2.5" MINIMUM SPACE BETWEEN BOLTS.
- ANCHOR BOLT TEMPLATE AND EACH POLE SECTION SHALL BE MARKED ON THE ANGLE BISECTOR WITH AN OBVIOUS MARKING METHOD AIDING CONSTRUCTION.
- PROVIDE LADDER CLIPS FOR FULL LENGTH OF POLE AND WORKING CLIPS FOR THE TOP 55' OF THE POLE.
- AERIAL NUMBER SIGNS REQUIRED, SEE DETAIL.
- TOP DIAMETER: 12" MINIMUM; ANCHOR BOLT CIRCLE: 72" MAXIMUM; TAPER: 0.45 INCH PER FOOT MAXIMUM. (ALTERNATIVES MAY BE PROPOSED.)

**FOX RUN - FOX RUN TAP**

115KV DD2  
 OUTLINE AND DESIGN  
 DOUBLE CIRCUIT DEADEND  
 TRI-STATE GENERATION & TRANSMISSION  
 ASSOCIATION, INCORPORATED

1100 W. 116th Ave.  
 P.O. Box 33695  
 Denver, Colorado 80233  
 303-452-6111

DATE: 4/19/2022 3:36 PM  
 CONTRACT: 477 KCMIL ACSR 26/7 HAWK CONDUCTOR (ALL CONDUCTOR)  
 DNO-7054 OPGW (ALL SHIELD WIRE)  
 WIND SPAN = - (AHEAD); WIND SPAN = - (BACK); WEIGHT SPAN = -  
 DESIGN LINE ANGLE (80 - 100 DEGREE RIGHT)  
 SOLID ICE DENSITY OF 57 LBS/FT<sup>3</sup>

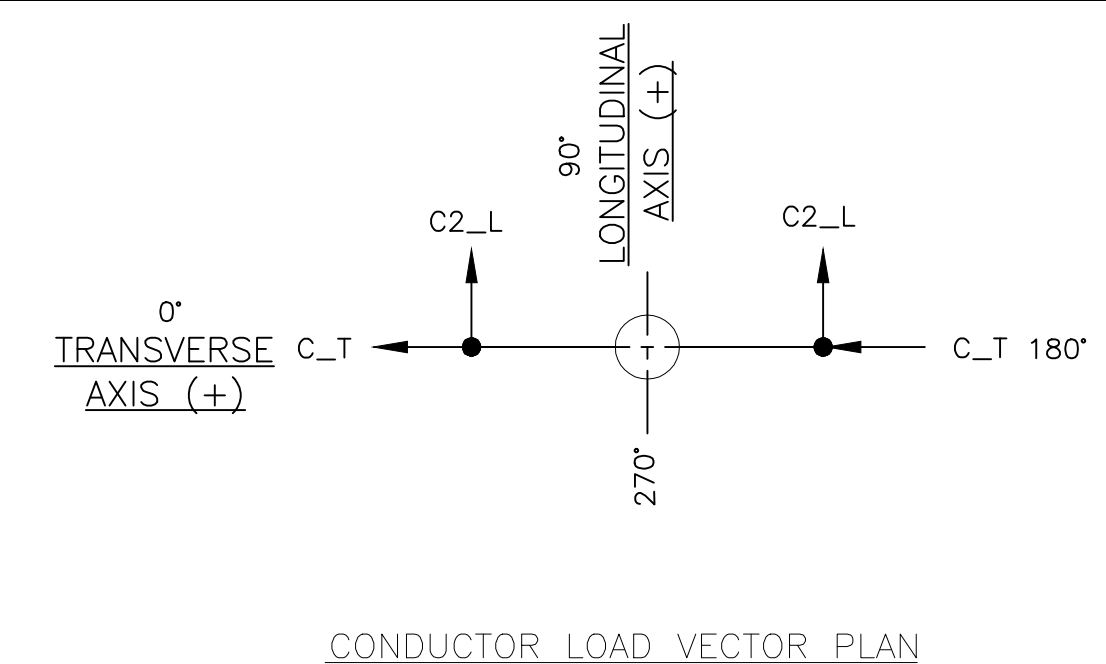
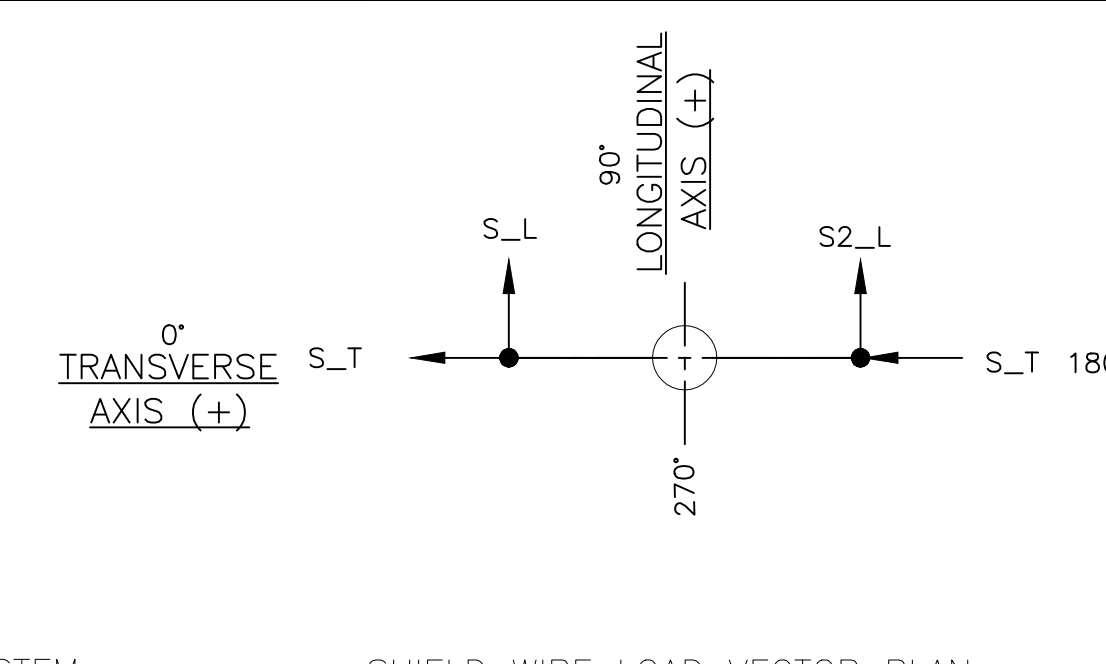
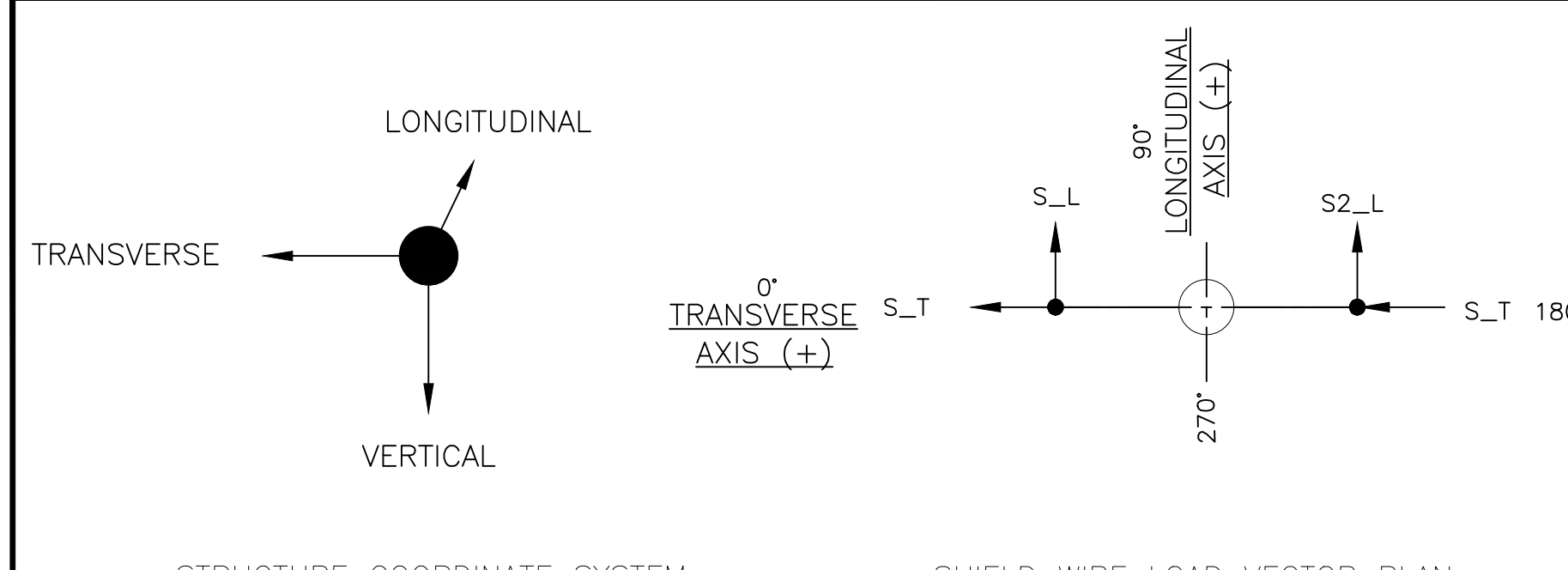
NO. 1  
 DATE 4/12/22  
 DWG. ARO  
 APPD. JTL

REVISIONS:  
 NO. 1  
 DATE 4/12/22  
 DWG. ARO  
 APPD. JTL

ISSUE PER CEN 0449 AND CEN 0458  
 MFG. Reference Drawings  
 Drawing Title

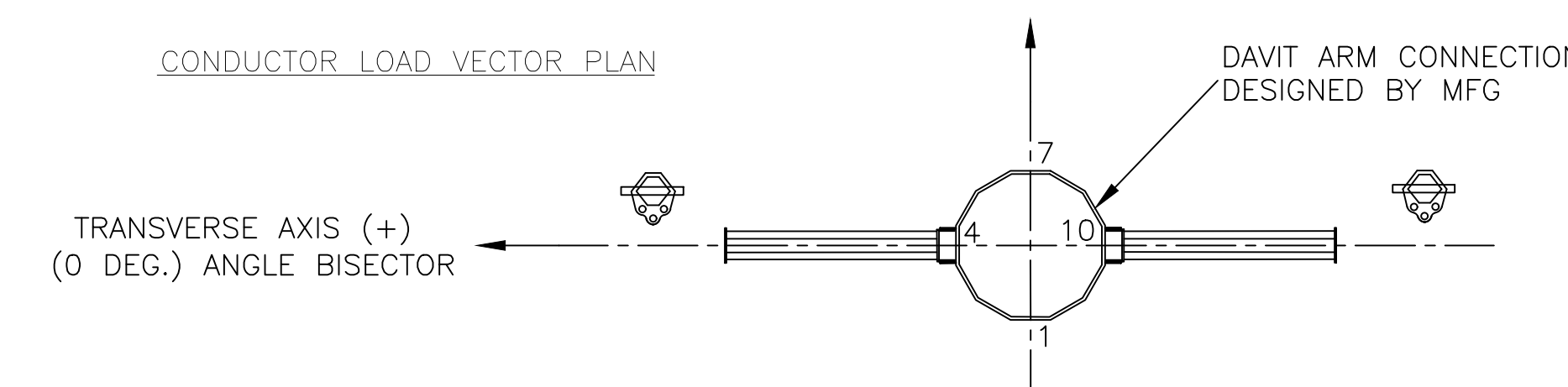
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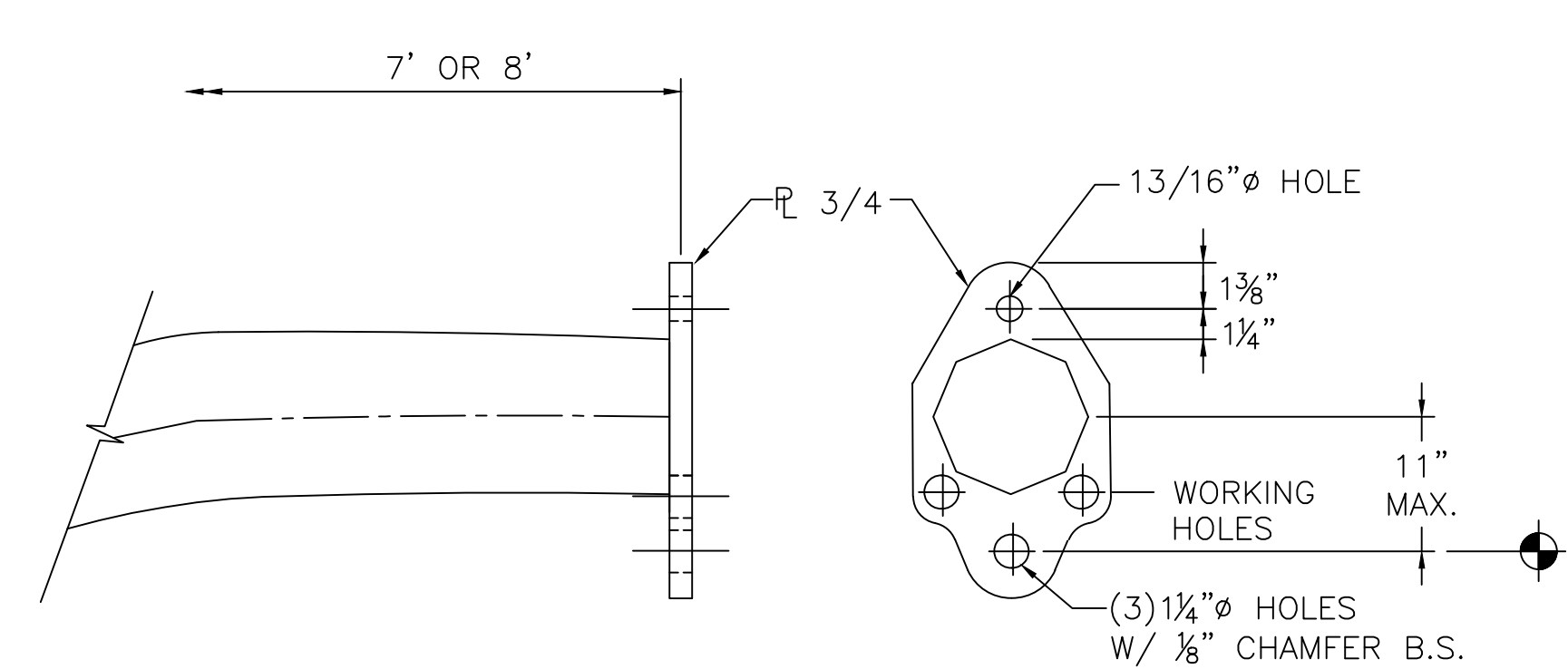
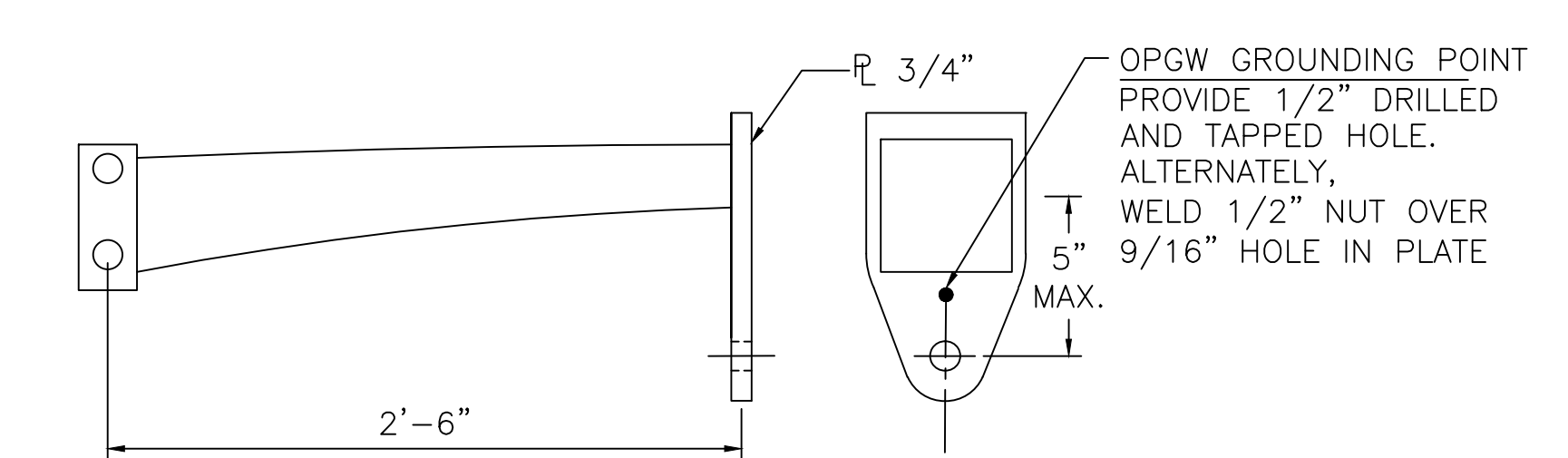
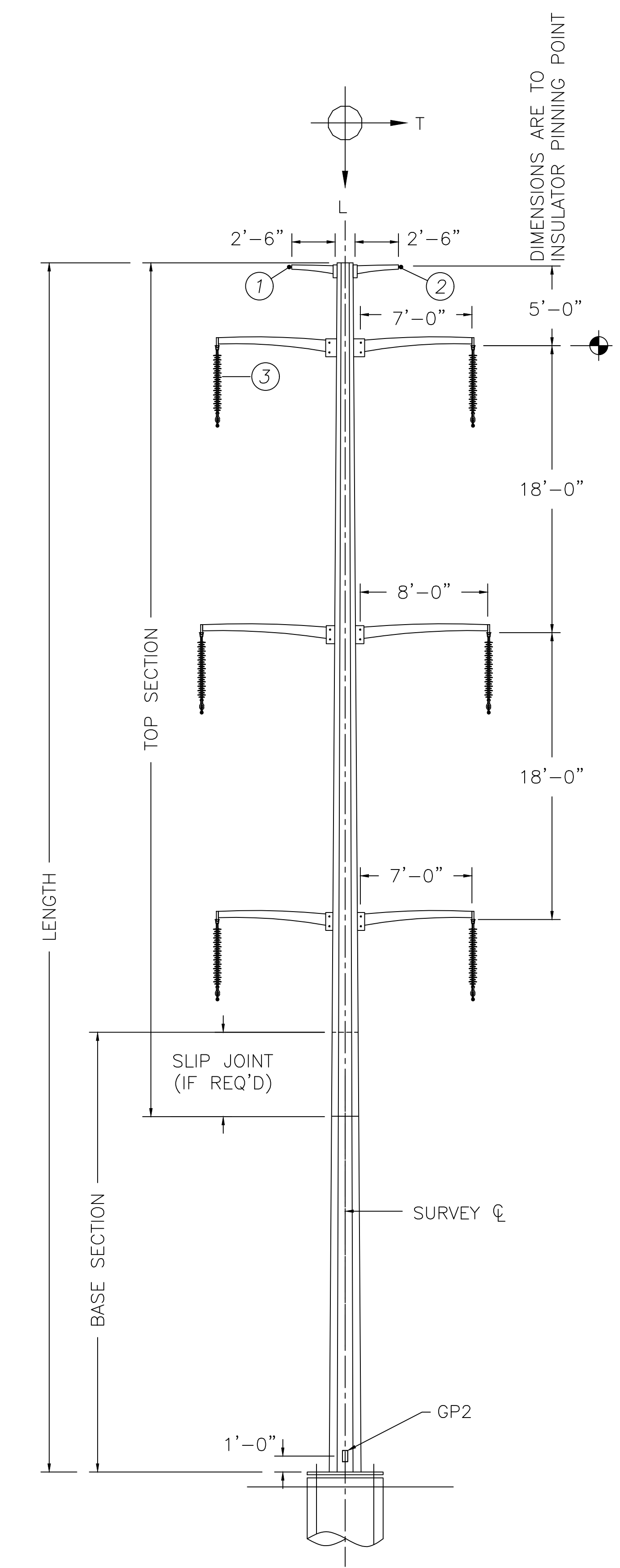
TANGENT STRUCTURE LOADS WITH OLF (KIPS)												
LOAD CASES	TEMP (°F)	WIND (PSF)	ICE (IN)	LOAD FACTORS			S			C		
				WIND	TENSION	VERTICAL	V	T	L	V	T	L
1 NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	1.2	1.4	0.2	1.8	2.1	0.2
2 NESC 250C EXTREME WIND	60	20.7	0.0	1.10	1.00	1.00	1.0	1.5	0.2	1.4	2.7	0.2
3 NESC 250D CONC. ICE & WIND	15	6.4	0.50	1.10	1.00	1.00	1.0	1.2	0.2	1.0	1.5	0.2
4 TRI-STATE EXTREME ICE (1")	32	0.0	1.0	1.00	1.00	1.10	2.0	0.5	0.2	2.3	0.5	0.2
5 TRI-STATE EXTR. WIND (100 mph)	60	25.6	0.0	1.10	1.00	1.00	0.6	1.4	0.2	1.0	3.2	0.2
6 DEFLECTION	60	2.0	0.0	1.00	1.00	1.00	0.3	0.1	0.1	0.5	0.3	0.1

STRUCTURE #	HEIGHT (FT)	ACTUAL LINE ANGLE
2.1	85'-0"	0'
3.1	90'-0"	0'

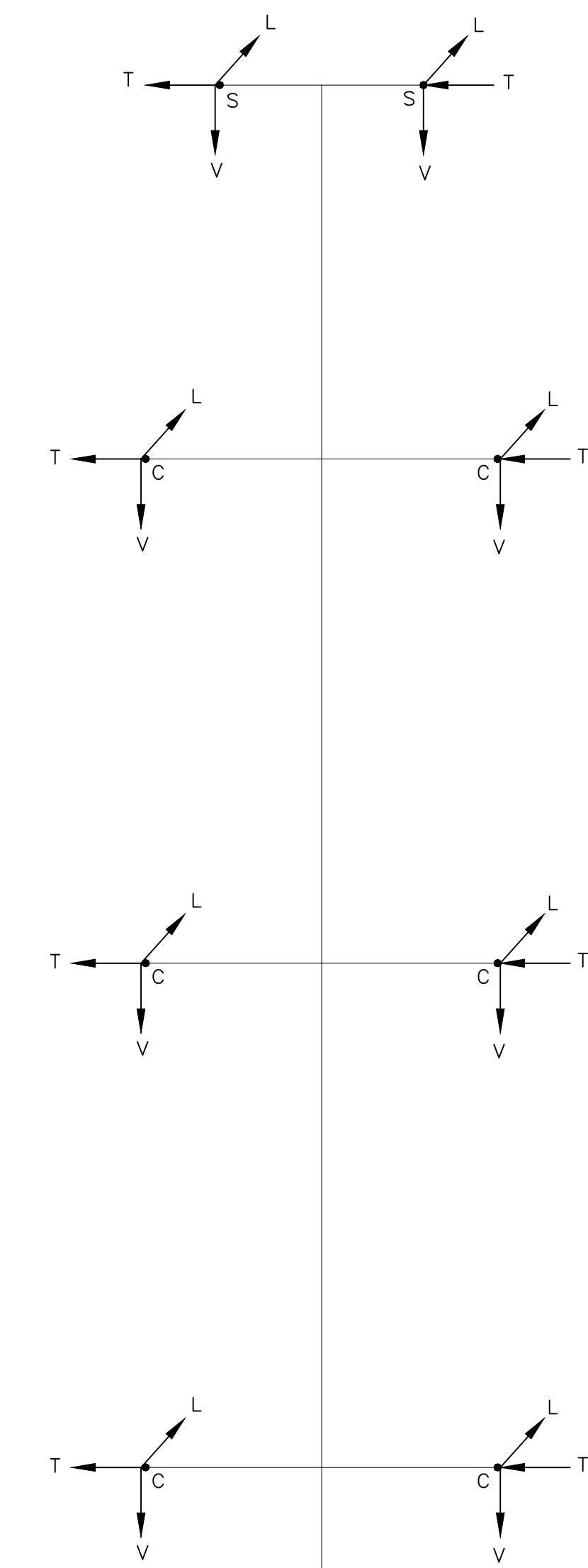


# Preliminary

4/14/2022



END PLATE DETAIL TO FIT AB CHANCE HOT-LINE TOOL. FINAL DIMENSIONS TO BE VERIFIED.



DESIGN DATA:

477 KCMIL ACSR 26/7 HAWK CONDUCTOR (ALL CONDUCTORS)  
 DNO-7054 OPGW (ALL OPGW SHIELD WIRE)  
 WIND SPAN = - ; WEIGHT SPAN = -  
 DESIGN LINE ANGLE (-5 to +5 DEGREE)  
 SOLID ICE DENSITY OF 57 LBS/FT<sup>3</sup>

NOTES:

- ALL DESIGN AND FABRICATION SHALL BE IN ACCORDANCE WITH TRI-STATE "TRANSMISSION LINE TAPERED TUBULAR STEEL POLE STRUCTURES" SPECIFICATION.
- LOADS ARE ULTIMATE VALUES AND INCLUDE LOAD FACTORS FOR EACH LOAD CASE.
- STRUCTURE AND ATTACHMENTS SHALL BE DESIGNED FOR THE SIMULTANEOUS APPLICATION OF DEAD LOAD OF THE STRUCTURE INCLUDING THE APPROPRIATE LOAD FACTOR, WIND ON THE STRUCTURE, AND WIRE LOADS FOR EACH LOAD CASE.
- WIND PRESSURES SHOWN ON LOAD CASE TABLE ARE IN PSF AND BASED ON A SHAPE FACTOR OF 1.0 FOR 12-SIDED SECTIONS. WIND PRESSURES INCLUDE LOAD FACTORS FOR EACH LOAD CASE.
- LIMIT POLE DEFLECTION TO 2% OF STRUCTURE HEIGHT FOR DEFLECTION LOAD CASE. ALL WIRES INTACT. CAMBER MAY BE UTILIZED TO COMPLY.
- APPLY WIND ON STRUCTURE WHICH RESULTS IN THE MOST SEVERE EFFECT.
- STRUCTURE TO BE DESIGNED FOR INTACT AND FULL DEADEND LOADING CONDITIONS FOR LOAD CASES 1 - 5.
- MATERIAL SHALL BE WEATHERING STEEL.
- DAVIT ARMS SHALL ATTACH TO THE POLE WITH A BOLTED CONNECTION TO A WELDED THROUGH ARM BRACKETED AND DESIGNED BY THE MANUFACTURER.
- NAME PLATE SHALL BE WELDED ON ALL STRUCTURES. TEXT MUST BE PERMANENTLY LEGIBLE, AND MUST INCLUDE MANUFACTURER'S NAME, DATE OF FABRICATION, STRUCTURE NUMBER, COMPLETE STRUCTURE LENGTH, COMPLETE STRUCTURE WEIGHT, AND GROUND LINE MOMENT CAPACITY IN KIP-Feet.
- SEE DWG. T2301-G-13-0XX FOR STEEL DETAILS.
- LOCATE DETAIL 2 GROUNDING PADS ON BOTH SIDES OF ALL CONNECTIONS AND SPLICES.
- ANCHOR BOLTS SHALL BE EQUALLY SPACED AROUND THE BASE PLATE WITH 2.5" MINIMUM SPACE BETWEEN BOLTS.
- ANCHOR BOLT TEMPLATE AND EACH POLE SECTION SHALL BE MARKED ON THE ANGLE BISECTOR USING OBVIOUS MARKINGS AIDING CONSTRUCTION.
- TOP DIAMETER: 12" MINIMUM; ANCHOR BOLT CIRCLE: 46" MAXIMUM; TAPER: 0.30 INCH PER FT. MAXIMUM. (ALTERNATIVES MAY BE PROPOSED.)

FOX RUN - FOX RUN TAP

115KV DT

OUTLINE AND DESIGN

TRI-STATE GENERATION & TRANSMISSION ASSOCIATION, INCORPORATED

1100 W. 116th Ave.  
 P.O. Box 33695  
 Denver, Colorado 80233  
 303-452-6111

4/19/2022 3:35 PM

4/12/22

ARO

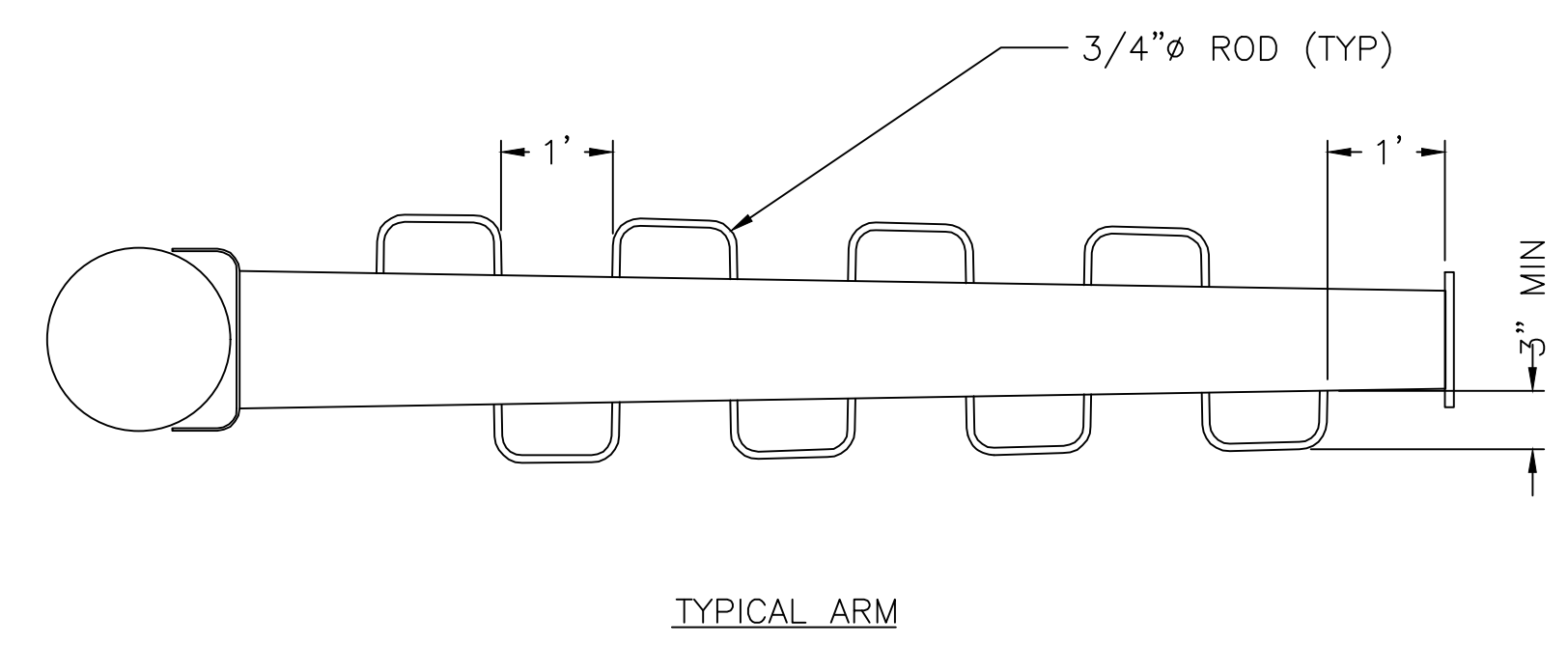
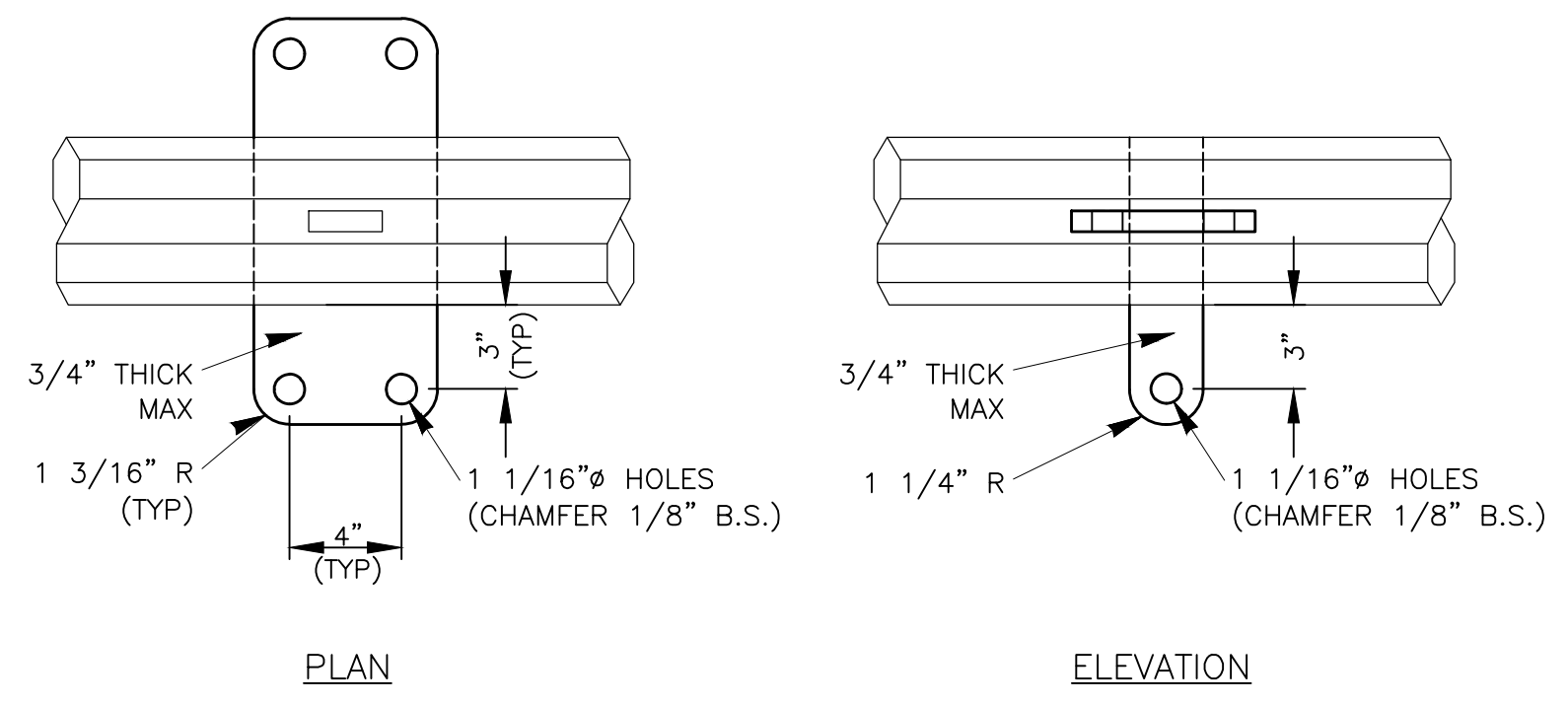
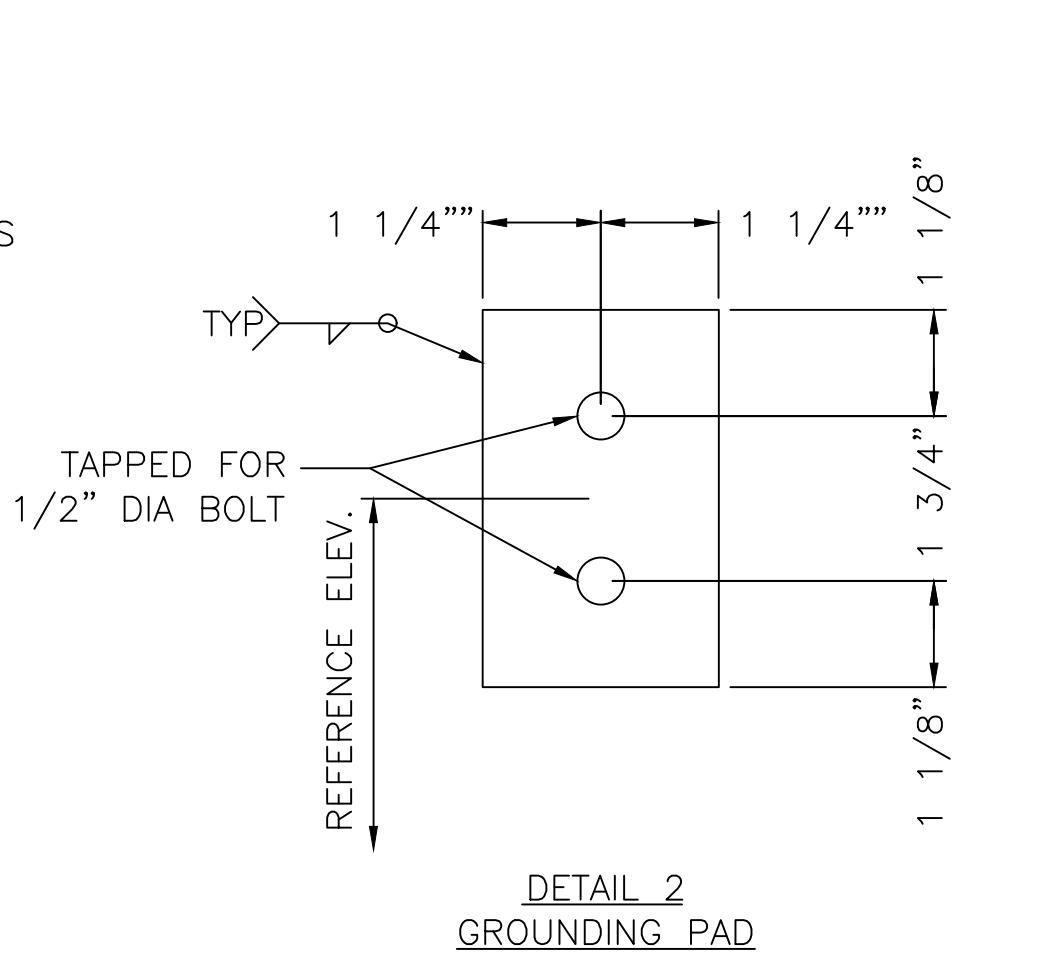
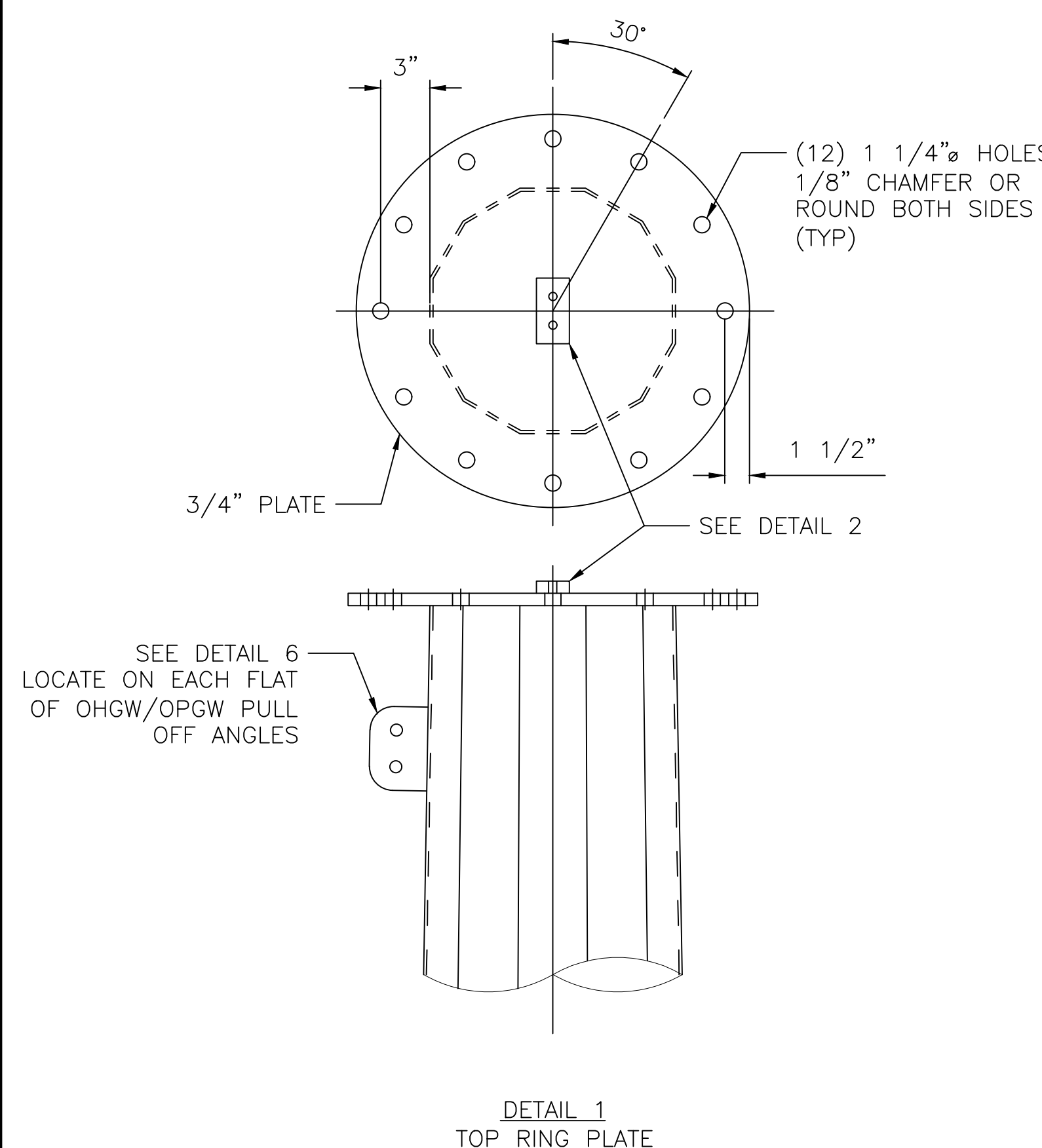
JTL

12-22

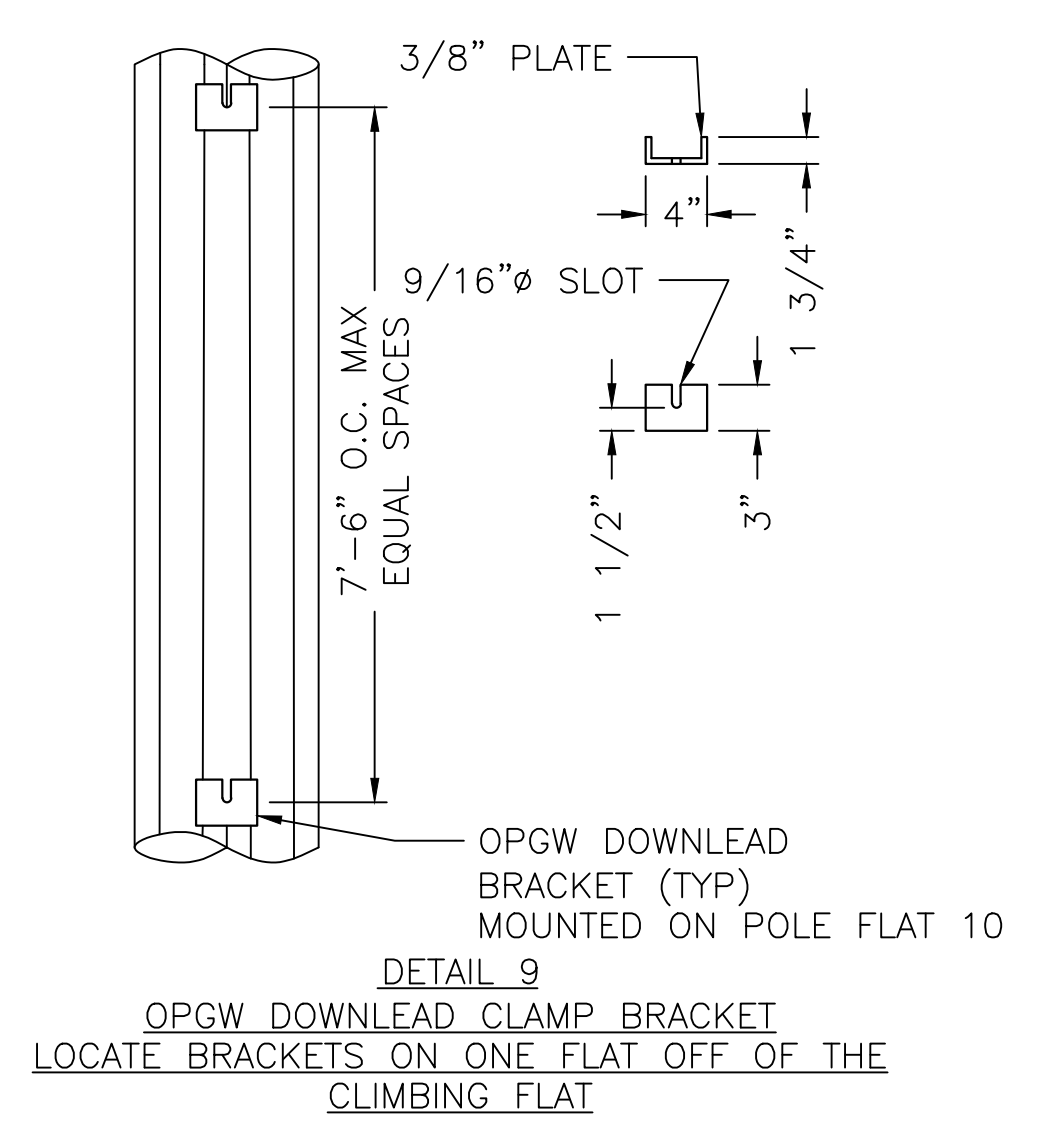
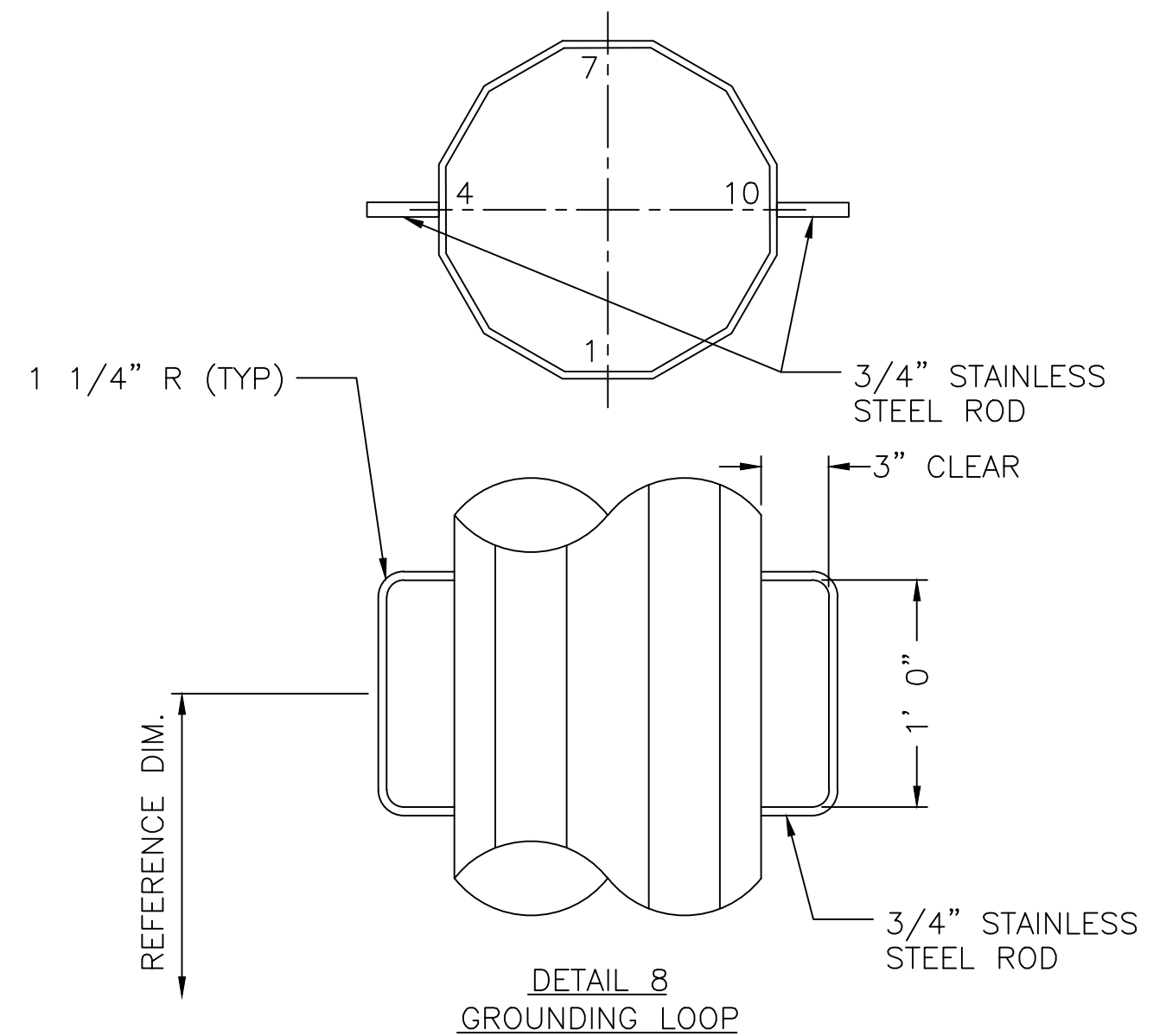
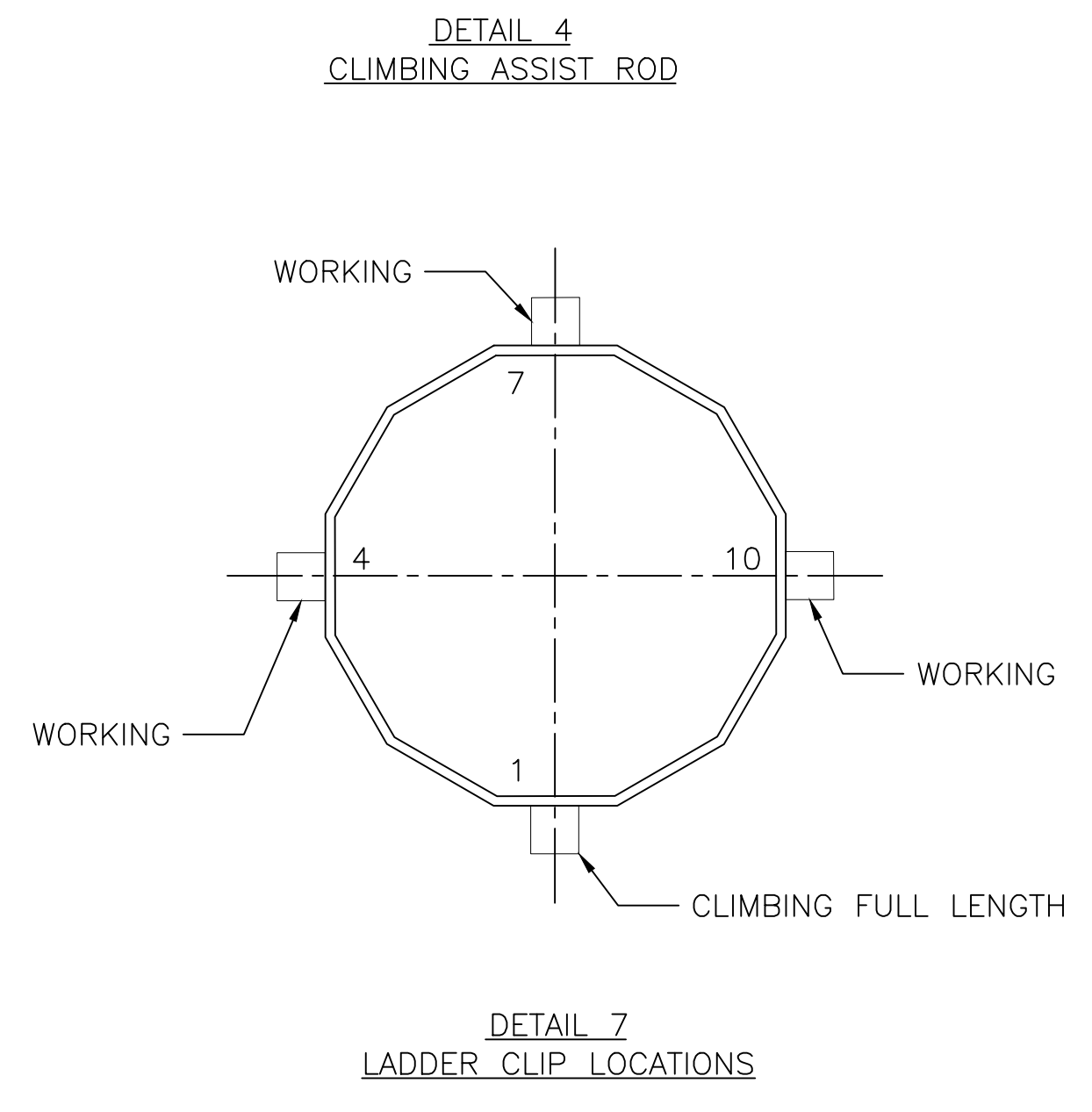
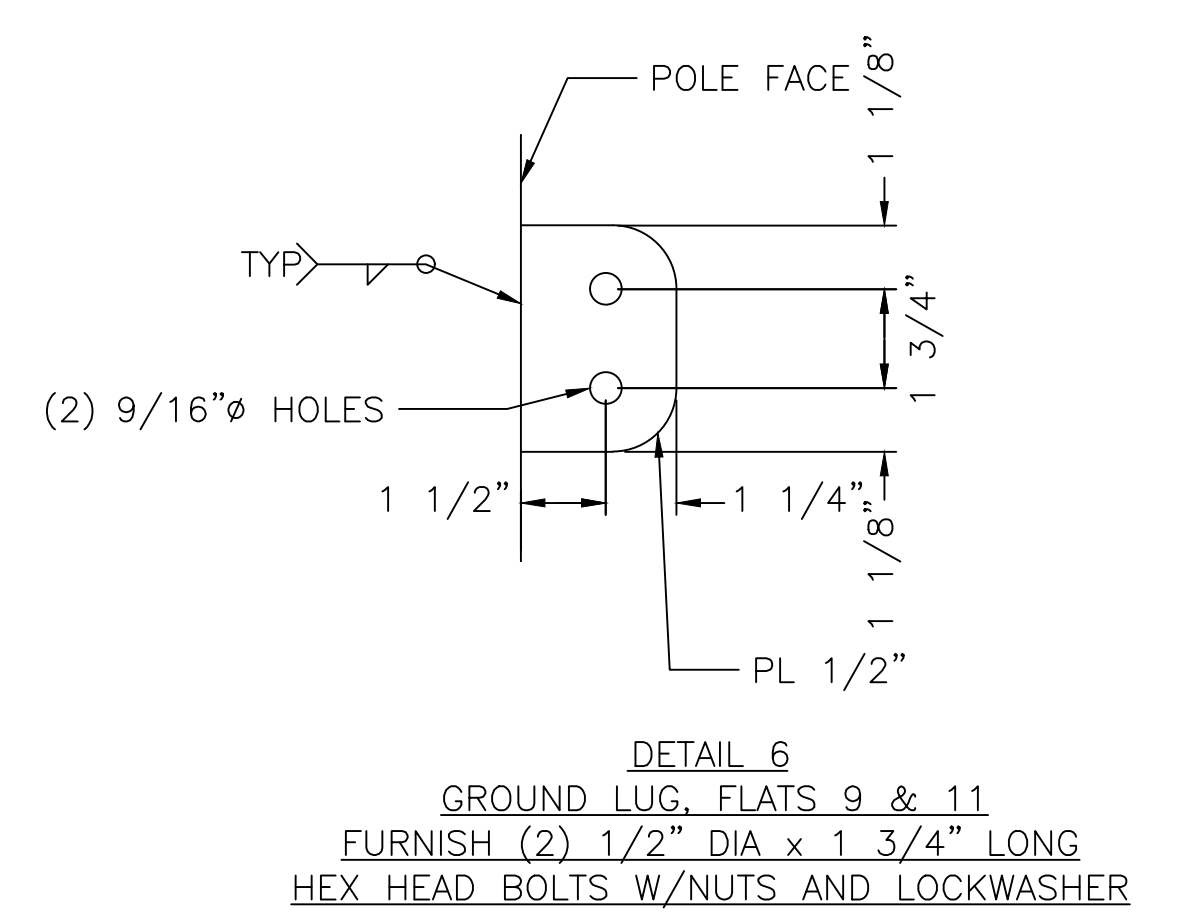
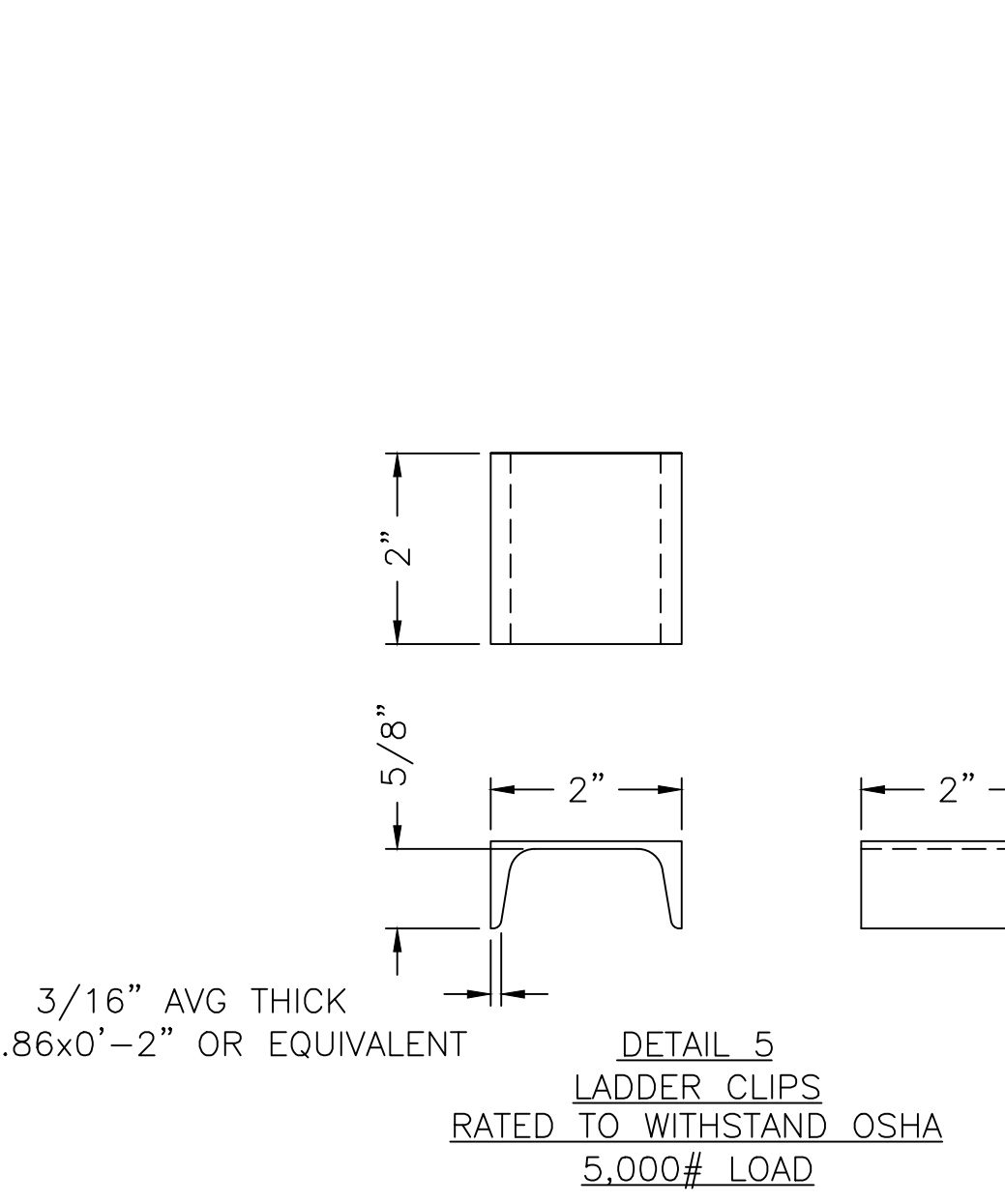
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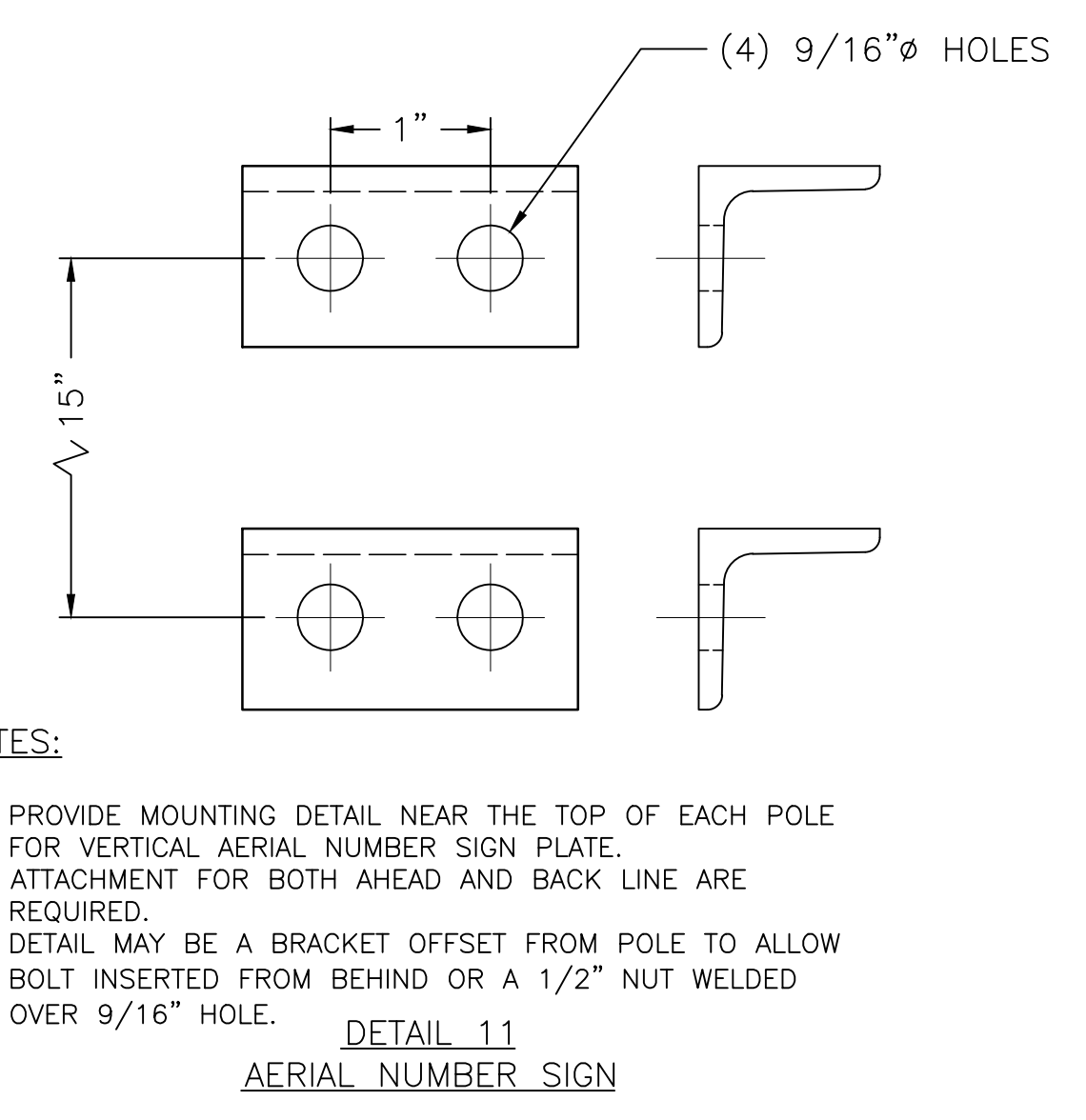
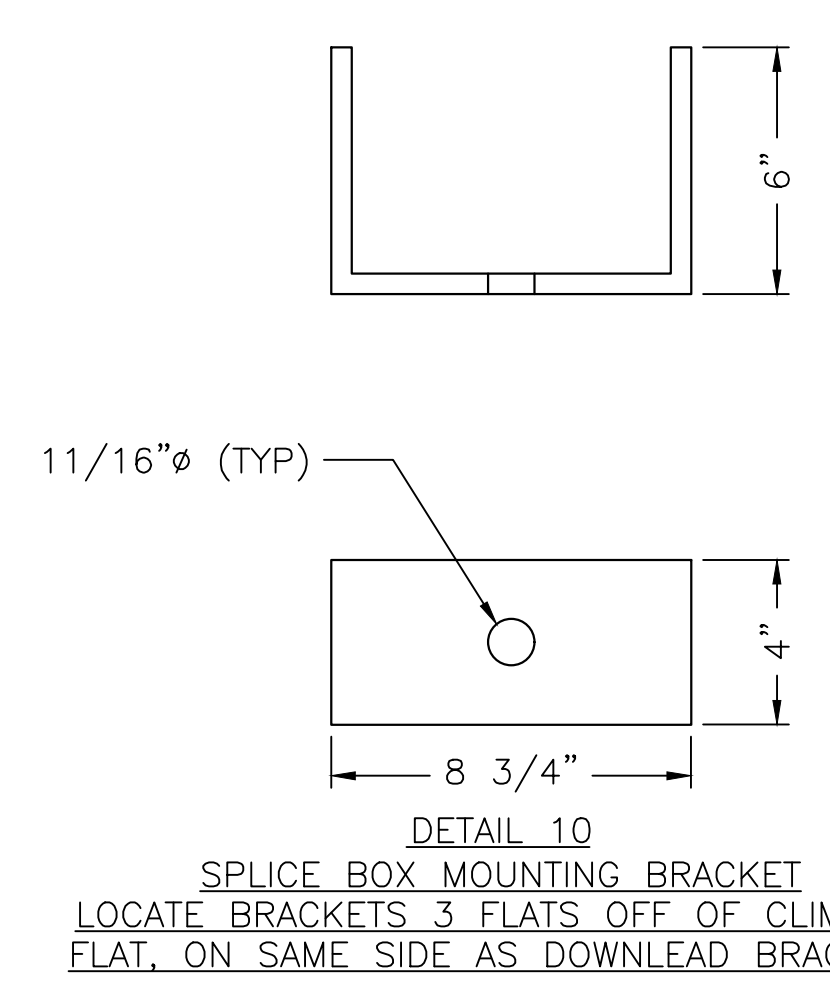


- NOTES:
1. CLIMBING ASSIST ROD TO BE WELDED TO ALL ARMS ON BOTH SIDES AS SHOWN.
  2. ROD SHALL EXTEND TO WITHIN 1'-0" TO 1'-6" OF ARM CONNECTION.
  3. EACH ROD TO SUPPORT 5,000 LB. VERTICAL LOAD AT ANY LOCATION.



# Preliminary

4/14/2022



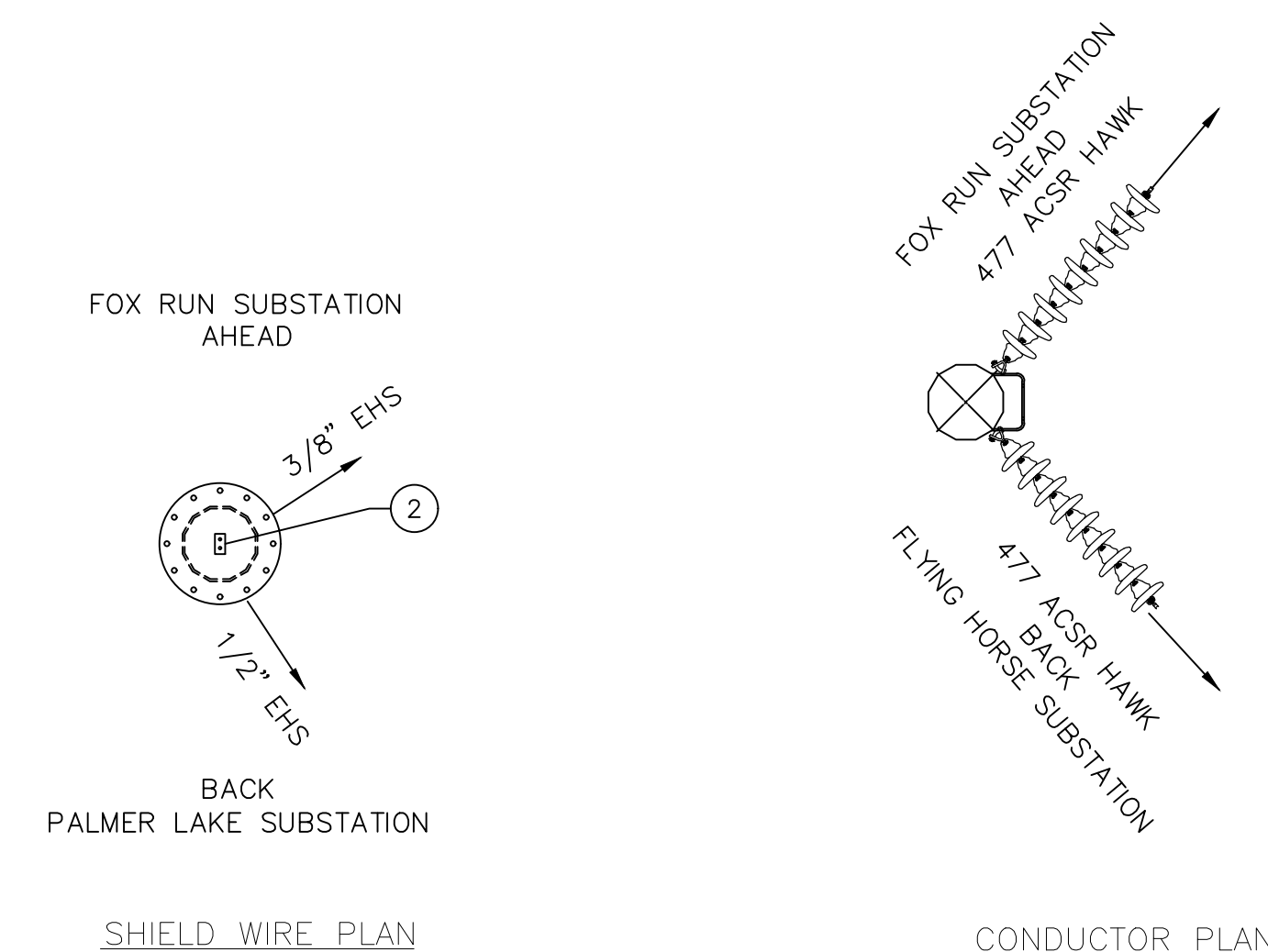
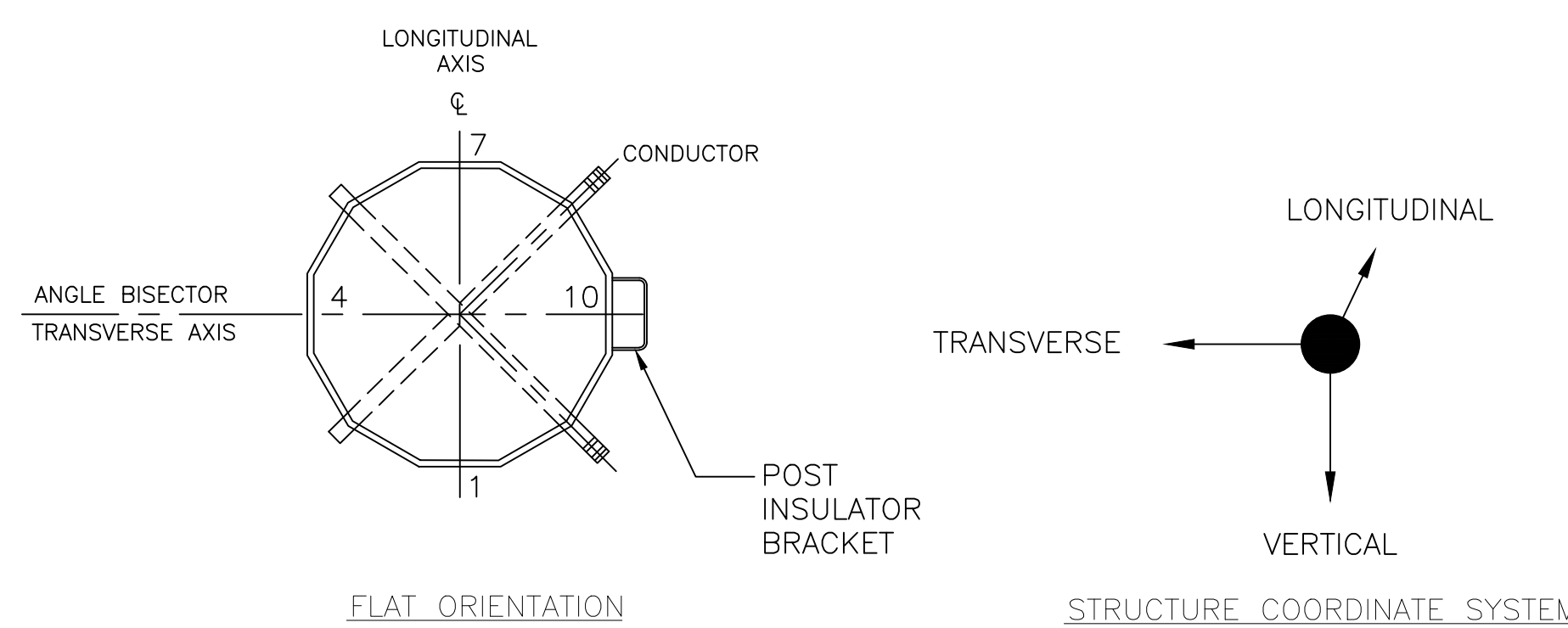
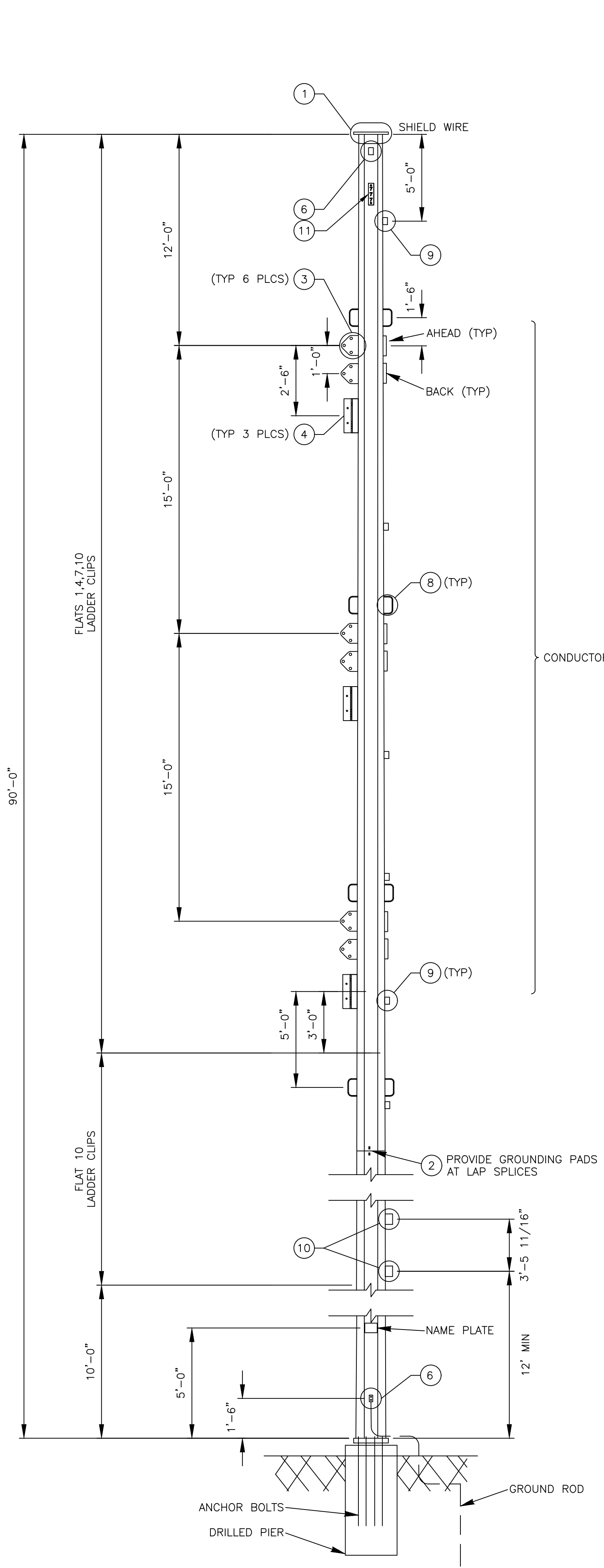
- NOTES:
1. INSTALL ONE GROUND LOOP PER PHASE WIRE AT 1'-6" ABOVE:
    - A. EACH DAVIT ARM ATTACHMENT.
    - B. EACH PHASE WIRE POLE VANG (RUNNING ANGLE)
    - C. EACH PAIR OF PHASE WIRE POLE VANGS (DEADEND), ON THE BISECTOR ANGLE
  2. ALSO INSTALL ONE GROUND LOOP AT MINIMUM 5- FEET BELOW THE LOWEST PHASE WIRE ELEVATION (INCLUDING DEADEND JUMPER STRUT INSULATORS) ON SAME FLATS CONDUCTOR PULLOFF ATTACHMENTS. OKAY TO RELOCATE THIS GROUND LOOP FURTHER DOWN THE POLE AS NECESSARY TO AVOID CONFLICTS. NO GROUND LOOPS ALLOWED BETWEEN JACKING NUTS AND WITHIN 1-FOOT OF OUTERMOST JACKING NUTS. NO GROUND LOOPS ALLOWED WITHIN 1-FOOT BELOW MALE ENDS MAXIMUM SLIP JOINT LAP.
  3. DIMENSIONS ARE TO BEND LINE.
  4. WELDS TO ATTACH MAINTENANCE PROVISIONS TO STRUCTURES SHALL DEVELOP THE ULTIMATE TENSILE STRENGTH OF THE ATTACHED PART.
  5. FABRICATOR SHALL COORDINATE LOCATION OF MAINTENANCE PROVISIONS SUCH THAT THEY DO NOT INTERFERE WITH OTHER STRUCTURE PROVISIONS OR ATTACHMENTS.

Drawing Title		Reference Drawings	
Migr.		Dwg. No.	
N.F.		Revision	
JTL		ISSUE PER CPM 049 AND CPM 045B	
ARO		Date	
4/12/22		1	
7		6	
5		4	
3		2	
1		1	
FOX RUN - FOX RUN TAP		115KV	
VERTICAL DEADEND		OUTLINE AND DESIGN	
TRI-STATE GENERATION & TRANSMISSION		ASSOCIATION, INCORPORATED	
UPDATED BY: ADAOLU		4/19/2022 3:35 PM	
Dwn:		Date:	
ARO		04-12-22	
Appd:		Date:	
JTL		04-12-22	
T2301-G-13-004			

**TRI-STATE**  
Generation and Transmission  
Association, Inc.  
A Touchstone Energy Cooperative

1100 W. 116th Ave.  
P.O. Box 33695  
Denver, Colorado 80233  
303-452-0111



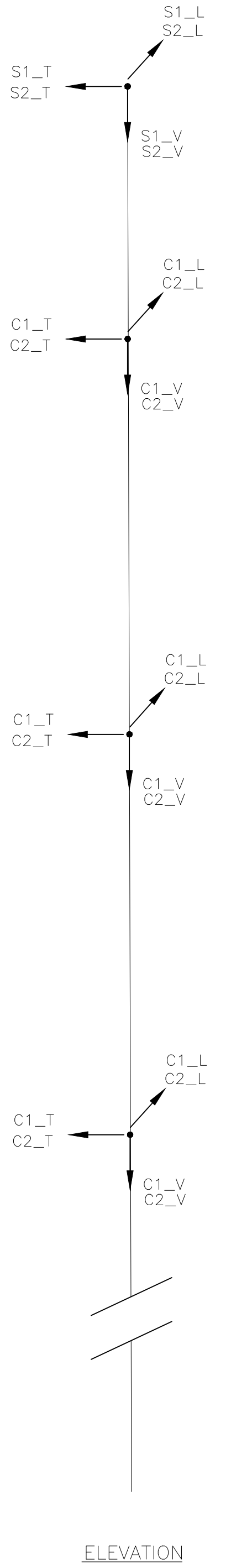


**Preliminary**  
4/14/2022

SHIELD WIRE LOADS WITH OLF (KIPS)												
LOAD CASES	TEMP (°F)	WIND (PSF)	ICE (IN)	LOAD FACTORS			S1 (Fox Run Sub)			S2 (Palmer Lake Sub)		
				WIND	TENS.	VERT.	V	T	L	V	T	L
1 NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	2.2	6.5	-6.5	3	13.5	13
2 NESC 250C EXTREME WIND	60	20.7	0.0	1.00	1.00	1.00	0.8	2.5	-2.5	1.5	6	5.5
3 NESC 250D CONC. ICE & WIND	15	6.4	0.50	1.00	1.00	1.00	0.6	1.9	-1.6	1.3	5	5
4 TRI-STATE EXTREME ICE	32	0.0	1.0	1.00	1.00	1.10	1.1	4	-4	3	10	10
5 TRI-STATE EXTREME WIND	60	25.6	0.0	1.10	1.00	1.00	0.6	2.8	-2.8	1.3	6.3	5.8
6 DEFLECTION	60	2.0	0.0	1.00	1.00	1.00	0.5	1.3	-1.3	1	3.6	3.6
7 BROKEN SHIELD WIRE	0	4.0	0.5	1.00	1.30	1.00	0.6	3.5	-3.5	1.6	9	9
8 DIFFERENTIAL ICE (HALF BACK)	32	0.0	0.5	1.00	1.00	1.00	0.9	2.6	-2.6	1.5	5	5
9 DIFFERENTIAL ICE (HALF AHEAD)	32	0.0	0.5	1.00	1.00	1.00	0.6	1.9	-1.9	1.5	6.5	6.5
10 DE AHEAD - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	0	0	0	3	13.5	13
11 DE BACK - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	2	6	-5.5	0	0	0
12 CONSTRUCTION	60	4.0	0.0	1.65	1.65	1.65	0.8	3.1	-3.1	1.8	7.8	7.8

CONDUCTOR LOADS WITH OLF (KIPS)												
LOAD CASES	TEMP (°F)	WIND (PSF)	ICE (IN)	LOAD FACTORS			C1 (Fox Run Sub)			C2 (Palmer Lake Sub)		
				WIND	TENS.	VERT.	V	T	L	V	T	L
1 NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	1.5	4	-4	2.2	8	7.5
2 NESC 250C EXTREME WIND	60	20.7	0.0	1.00	1.00	1.00	0.8	2.2	-2.2	1.1	3.8	3.3
3 NESC 250D CONC. ICE & WIND	15	6.4	0.50	1.00	1.00	1.00	0.8	1.3	-1.3	1.2	3	3
4 TRI-STATE EXTREME ICE	32	0.0	1.0	1.00	1.00	1.10	1.3	2.9	-2.9	2	5.8	5.8
5 TRI-STATE EXTREME WIND	60	25.6	0.0	1.10	1.00	1.00	0.7	2.4	-2.4	1	4.1	3.5
6 DEFLECTION	60	2.0	0.0	1.00	1.00	1.00	0.5	0.8	-0.8	0.7	1.8	1.8
7 BROKEN SHIELD WIRE	0	4.0	0.5	1.00	1.30	1.00	0.8	2.4	-2.4	1.3	5.5	5.5
8 DIFFERENTIAL ICE (HALF BACK)	32	0.0	0.5	1.00	1.00	1.00	0.8	1.8	-1.8	1.2	3	3
9 DIFFERENTIAL ICE (HALF AHEAD)	32	0.0	0.5	1.00	1.00	1.00	0.6	1.5	-1.5	1.5	3.9	3.9
10 DE AHEAD - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	0	0	0	2.2	8	7.5
11 DE BACK - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	1.1	4	-4	0	0	0
12 CONSTRUCTION	60	4.0	0.0	1.65	1.65	1.65	4.2	1.6	-1.6	1.5	4.2	4.2

STRUCTURE #	HEIGHT (FT)	ACTUAL LINE ANGLE
PL1	90'-0"	90° (LEFT)



**DESIGN DATA:**

477 KCMIL ACSR 26/7 HAWK CONDUCTOR  
 1/2" EHS 7-STRAND STEEL OPGW  
 WIND SPAN = - (AHEAD); WIND SPAN = - (BACK)  
 DESIGN LINE ANGLE (-80° - -95°)  
 SOLID ICE DENSITY OF 57 LBS/FT<sup>3</sup>

**NOTES:**

- ALL DESIGN AND FABRICATION SHALL BE IN ACCORDANCE WITH TRI-STATE "TRANSMISSION LINE TAPERED TUBULAR STEEL POLE STRUCTURES" SPECIFICATION.
- LOADS ARE ULTIMATE VALUES AND INCLUDE LOAD FACTORS FOR EACH LOAD CASE.
- STRUCTURE AND ATTACHMENTS SHALL BE DESIGNED FOR THE SIMULTANEOUS APPLICATION OF DEAD LOAD OF THE STRUCTURE INCLUDING THE APPROPRIATE LOAD FACTOR, WIND ON THE STRUCTURE, AND WIRE LOADS FOR EACH LOAD CASE.
- WIND PRESSURES SHOWN ON LOAD CASE TABLE ARE IN PSF AND ARE BASED ON A SHAPE FACTOR OF 1.0 FOR 12-SIDED SECTIONS. WIND PRESSURES INCLUDE LOAD FACTORS FOR EACH LOAD CASE.
- LIMIT POLE DEFLECTION TO 2% OF STRUCTURE HEIGHT FOR DEFLECTION LOAD CASE. ALL WIRES INTACT.
- APPLY WIND ON STRUCTURE WHICH RESULTS IN THE MOST SEVERE EFFECT.
- STRUCTURE TO BE DESIGNED FOR INTACT AND FULL DEADEND LOADING CONDITIONS FOR LOAD CASES 1-5.
- MATERIAL SHALL BE WEATHERING STEEL
- NAME PLATE SHALL BE WELDED ON ALL STRUCTURES. TEXT MUST BE PERMANENTLY LEGIBLE, AND MUST INCLUDE MANUFACTURER'S NAME, DATE OF FABRICATION, STRUCTURE NUMBER, COMPLETE STRUCTURE LENGTH, COMPLETE STRUCTURE WEIGHT, AND GROUND LINE MOMENT CAPACITY IN KIP-Feet.
- SEE DWG. T1005-G-13-016 FOR STEEL DETAILS.
- LOCATE DETAIL 2 GROUNDING PADS ON BOTH SIDES OF ALL CONNECTIONS AND SPLICES.
- ANCHOR BOLTS SHALL BE EQUALLY SPACED AROUND THE POLE DIAMETER, WITH A MINIMUM 2.5" CLEAR SPACE BETWEEN THE BOLTS.
- TOP DIAMETER: 12" MINIMUM; ANCHOR BOLT DIAMETER: 62" MAXIMUM; TAPER: 0.4 INCH PER FOOT MAXIMUM. (ALTERNATIVES MAY BE PROPOSED.)
- LADDER CLIPS SHALL BE INCLUDED TO CLIMB THE ENTIRE POLE, AND WORKING CLIPS SHALL BE INCLUDED ON THE TOP 50' OF THE POLE.
- POLES MAY BE SINGLE PIECE OR MAY INCLUDE A SINGLE SLIP JOINT.

FOX RUN - FOX RUN TAP

115KV VDEZ

OUTLINE AND DESIGN

VERTICAL DEADEND

TRI-STATE GENERATION & TRANSMISSION ASSOCIATION, INCORPORATED

UPDATED BY: ADAOU 4/20/2022 9:32 AM

Revision

Dwg. No.

Mgr.

Drawing Title

No.	Date	Appd.	Rev.
7	4/12/22	ARO	
6		JTL	
5			
4			
3			
2			
1			

**TRI-STATE**  
Generation and Transmission Association, Inc.  
A Touchstone Energy Cooperative

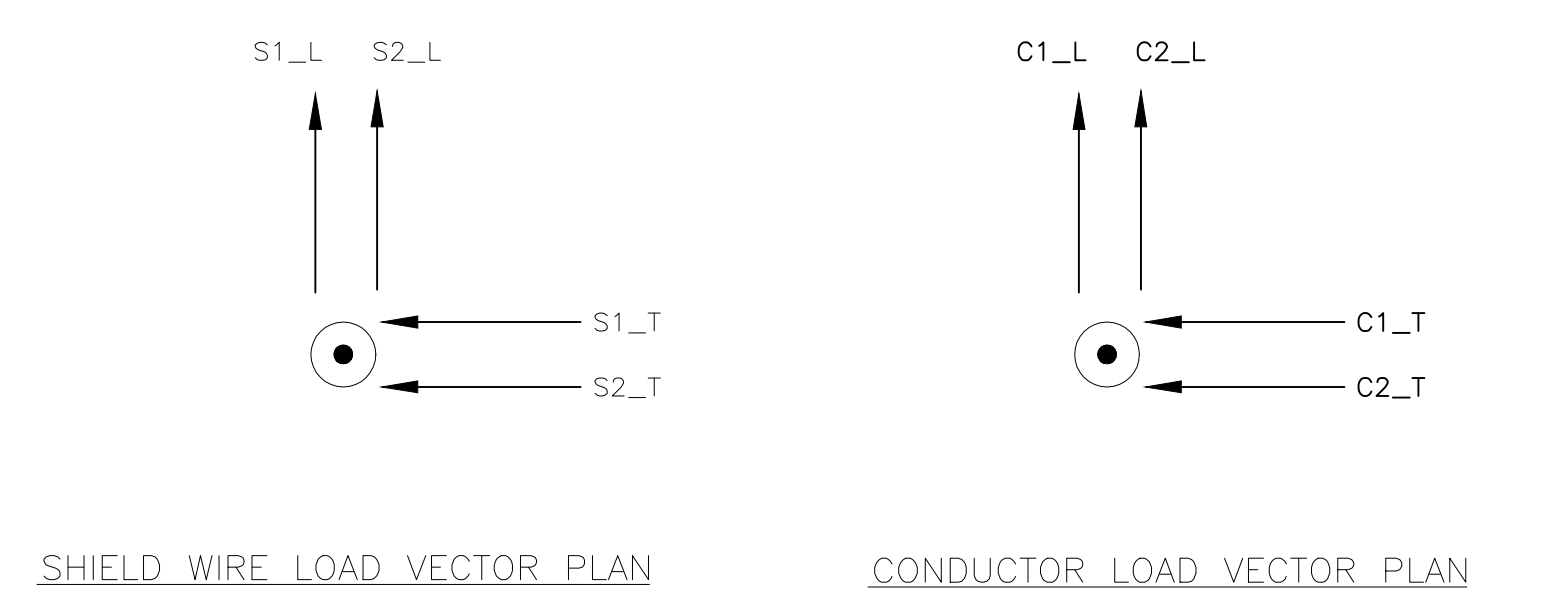
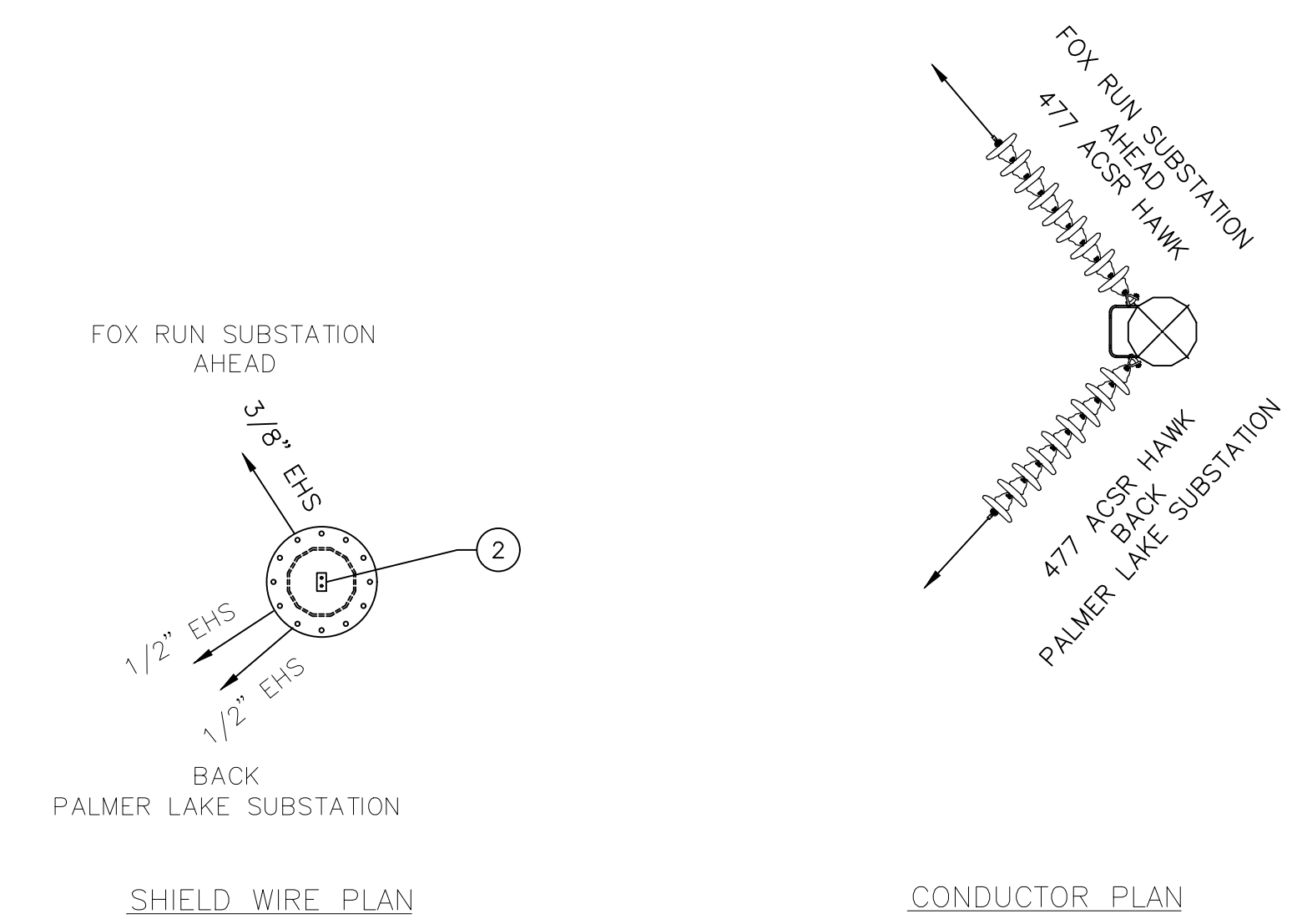
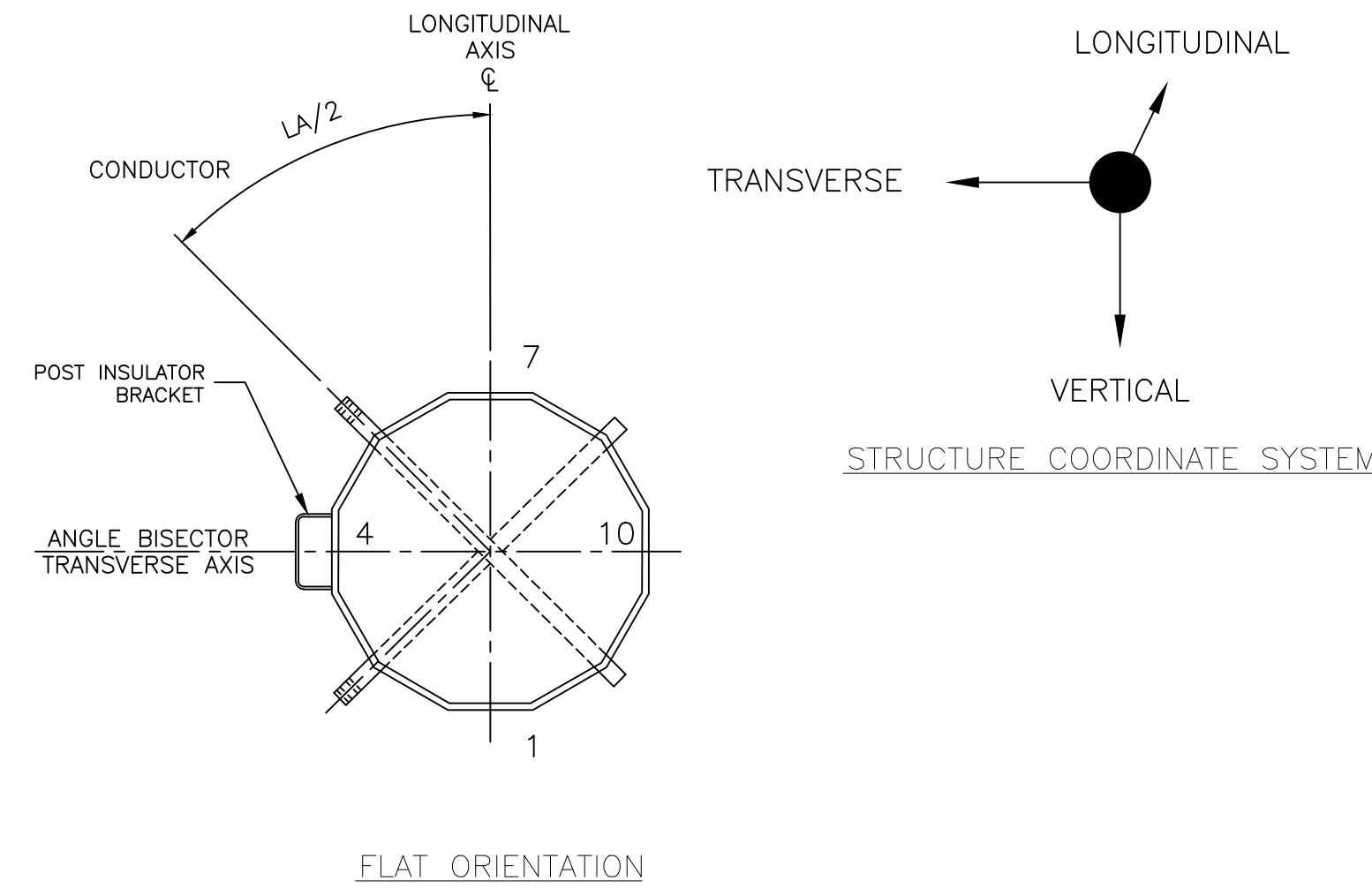
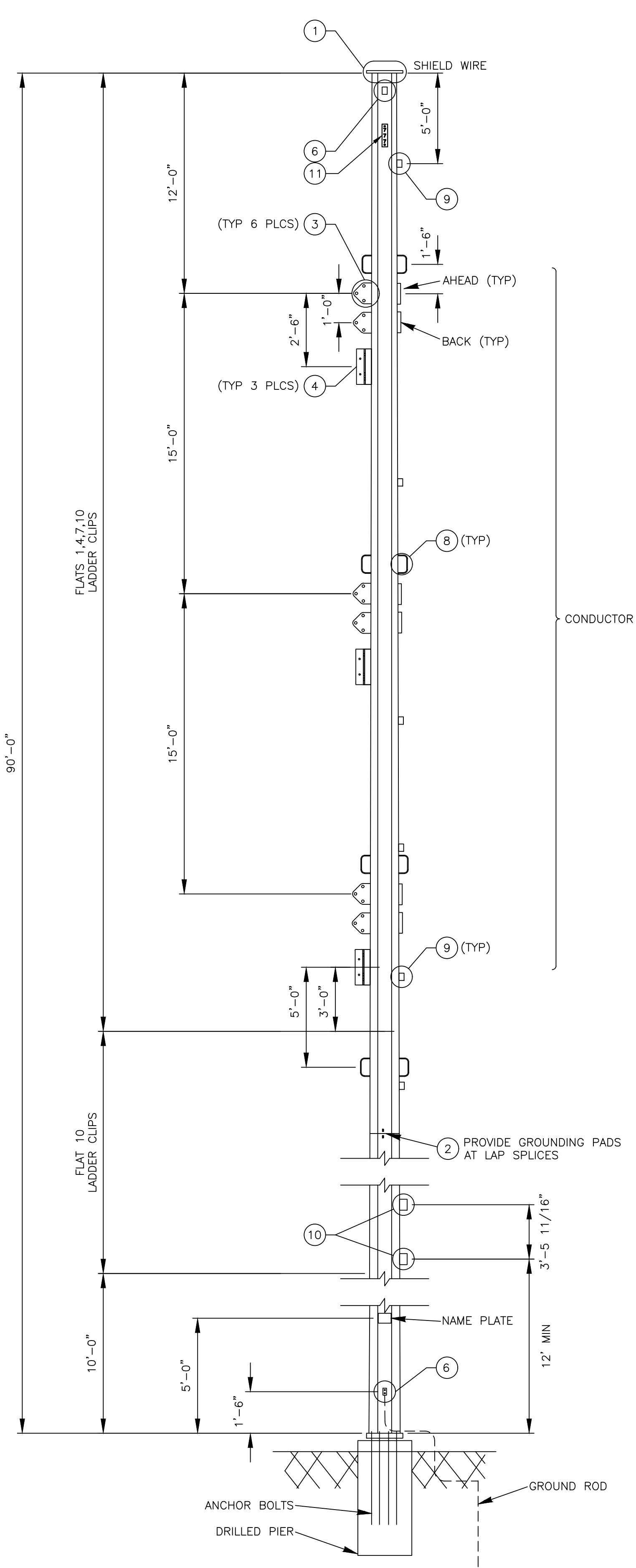
1100 W. 116th Ave.  
P.O. Box 33695  
Denver, Colorado 80233  
303-432-0111

Dwn: ARO Date: 04-12-22

Appd: JTL Date: 04-12-22

T2301-G-13-005

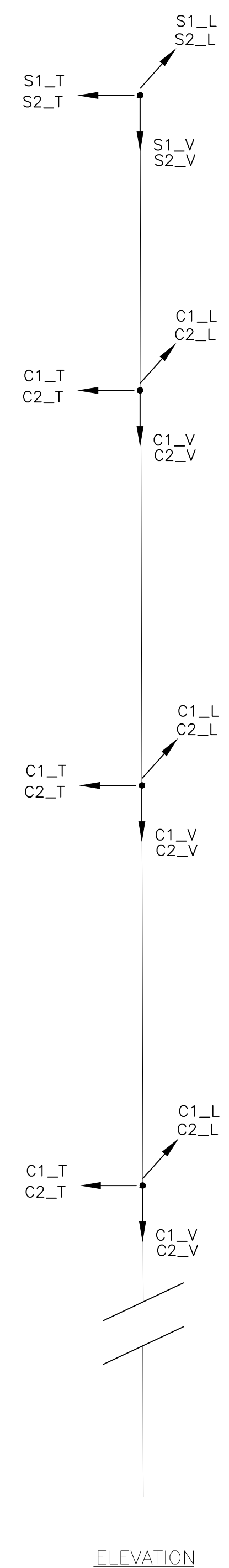




SHIELD WIRE LOADS WITH OLF (KIPS)												
LOAD CASES	TEMP (°F)	WIND (PSF)	ICE (IN)	LOAD FACTORS			S1 (Fox Run)			S2 (Flying Horse)		
				WIND	TENS.	VERT.	V	T	L	V	T	L
1 NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	1.4	-3.8	-3.8	2.3	-20	19
2 NESC 250C EXTREME WIND	60	20.7	0.0	1.00	1.00	1.00	0.8	-1.6	-1.6	1.3	-9	8
3 NESC 250D CONC. ICE & WIND	15	6.4	0.50	1.00	1.00	1.00	0.8	-1.1	-1.1	1.1	-7.9	7.9
4 TRI-STATE EXTREME ICE	32	0.0	1.0	1.00	1.00	1.10	1.3	-3.1	-3.1	3	-13.9	13.4
5 TRI-STATE EXTREME WIND	60	25.6	0.0	1.10	1.00	1.00	0.8	-1.3	-1.6	1.3	-9.3	8.1
6 DEFLECTION	60	2.0	0.0	1.00	1.00	1.00	0.2	-0.5	-0.5	0.7	-6.3	6.3
7 BROKEN SHIELD WIRE	0	4.0	0.5	1.00	1.30	1.00	0.8	-2.3	-2.2	1.4	-14	13.8
8 DIFFERENTIAL ICE (HALF BACK)	32	0.0	0.5	1.00	1.00	1.00	0.8	-1.8	-1.8	1.3	-8.5	8.5
9 DIFFERENTIAL ICE (HALF AHEAD)	32	0.0	0.5	1.00	1.00	1.00	0.6	-1.1	-1.1	1.4	-9.5	9.8
10 DE AHEAD - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	0	0	0	2.3	-20	19
11 DE BACK - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	1.4	-3.8	-3.8	0	0	0
12 CONSTRUCTION	60	4.0	0.0	1.65	1.65	1.65	0.8	-1.3	-1.3	1.5	-13.2	13

CONDUCTOR LOADS WITH OLF (KIPS)												
LOAD CASES	TEMP (°F)	WIND (PSF)	ICE (IN)	LOAD FACTORS			C1 (Fox Run)			C2 (Flying Horse)		
				WIND	TENS.	VERT.	V	T	L	V	T	L
1 NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	1.4	-3.6	-3.3	1.8	-10.4	9.6
2 NESC 250C EXTREME WIND	60	20.7	0.0	1.00	1.00	1.00	0.8	-1.9	-1.6	1	-4.8	3.9
3 NESC 250D CONC. ICE & WIND	15	6.4	0.50	1.00	1.00	1.00	0.8	-1.4	-1.3	1.1	-3.8	3.3
4 TRI-STATE EXTREME ICE	32	0.0	1.0	1.00	1.00	1.10	1.3	-2.8	-2.8	2.2	-7.3	7.3
5 TRI-STATE EXTREME WIND	60	25.6	0.0	1.10	1.00	1.00	0.8	-2	-1.9	1.1	-5.2	4.4
6 DEFLECTION	60	2.0	0.0	1.00	1.00	1.00	0.3	-0.6	-0.6	0.8	-2.2	2.1
7 BROKEN SHIELD WIRE	0	4.0	0.5	1.00	1.30	1.00	0.7	-2.5	-2.5	1.3	-7	6.6
8 DIFFERENTIAL ICE (HALF BACK)	32	0.0	0.5	1.00	1.00	1.00	0.9	-1.8	-1.8	0.9	-3.9	3.9
9 DIFFERENTIAL ICE (HALF AHEAD)	32	0.0	0.5	1.00	1.00	1.00	0.6	-1.3	-1.3	1.3	-4.9	4.9
10 DE AHEAD - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	0	0	0	1.8	-10.4	9.6
11 DE BACK - NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	1.4	-3.6	-3.3	0	0	0
12 CONSTRUCTION	60	4.0	0.0	1.65	1.65	1.65	0.8	-1.8	-1.8	4.6	-5.4	5.3

STRUCTURE #	HEIGHT (FT)	ACTUAL LINE ANGLE
FH1	90'-0"	-90' (LEFT)



**DESIGN DATA:**  
 477 KCMIL ACSR 26/7 HAWK CONDUCTOR  
 1/2" EHS 7-STRAND STEEL OPGW  
 WIND SPAN = - (AHEAD); WIND SPAN = - (BACK)  
 DESIGN LINE ANGLE (-80' - -95')  
 SOLID ICE DENSITY OF 57 LBS/FT<sup>3</sup>

- NOTES:**
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  - LOADS ARE ULTIMATE VALUES AND INCLUDE LOAD FACTORS FOR EACH LOAD CASE.
  - STRUCTURE AND ATTACHMENTS SHALL BE DESIGNED FOR THE SIMULTANEOUS APPLICATION OF DEAD LOAD OF THE STRUCTURE INCLUDING THE APPROPRIATE LOAD FACTOR, WIND ON THE STRUCTURE, AND WIRE LOADS FOR EACH LOAD CASE.
  - WIND PRESSURES SHOWN ON LOAD CASE TABLE ARE IN PSF AND ARE BASED ON A SHAPE FACTOR OF 1.0 FOR 12-SIDED SECTIONS. WIND PRESSURES INCLUDE LOAD FACTORS FOR EACH LOAD CASE.
  - LIMIT POLE DEFLECTION TO 2% OF STRUCTURE HEIGHT FOR DEFLECTION LOAD CASE. ALL WIRES INTACT.
  - APPLY WIND ON STRUCTURE WHICH RESULTS IN THE MOST SEVERE EFFECT.
  - STRUCTURE TO BE DESIGNED FOR INTACT AND FULL DEADEND LOADING CONDITIONS FOR LOAD CASES 1-5.
  - MATERIAL SHALL BE WEATHERING STEEL.
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  - SEE DWG. T1005-G-13-016 FOR STEEL DETAILS.
  - LOCATE DETAIL 2 GROUNDING PADS ON BOTH SIDES OF ALL CONNECTIONS AND SPLICES.
  - ANCHOR BOLTS SHALL BE EQUALLY SPACED AROUND THE POLE DIAMETER, WITH A MINIMUM 2.5" CLEAR SPACE BETWEEN THE BOLTS.
  - TOP DIAMETER: 12" MINIMUM; ANCHOR BOLT DIAMETER: 62" MAXIMUM; TAPER: 0.4 INCH PER FOOT MAXIMUM. (ALTERNATIVES MAY BE PROPOSED.)
  - LADDER CLIPS SHALL BE INCLUDED TO CLIMB THE ENTIRE POLE, AND WORKING CLIPS SHALL BE INCLUDED ON THE TOP 50' OF THE POLE.
  - POLES MAY BE SINGLE PIECE OR MAY INCLUDE A SINGLE SLIP JOINT.

# Preliminary

4/14/2022

**FOX RUN - FOX RUN TAP**  
 115KV VDE1  
 OUTLINE AND DESIGN  
 VERTICAL DEADEND  
 TRI-STATE GENERATION & TRANSMISSION ASSOCIATION, INCORPORATED  
 UPDATED BY: ADAUL 4/20/2022 9:33 AM | Contact:

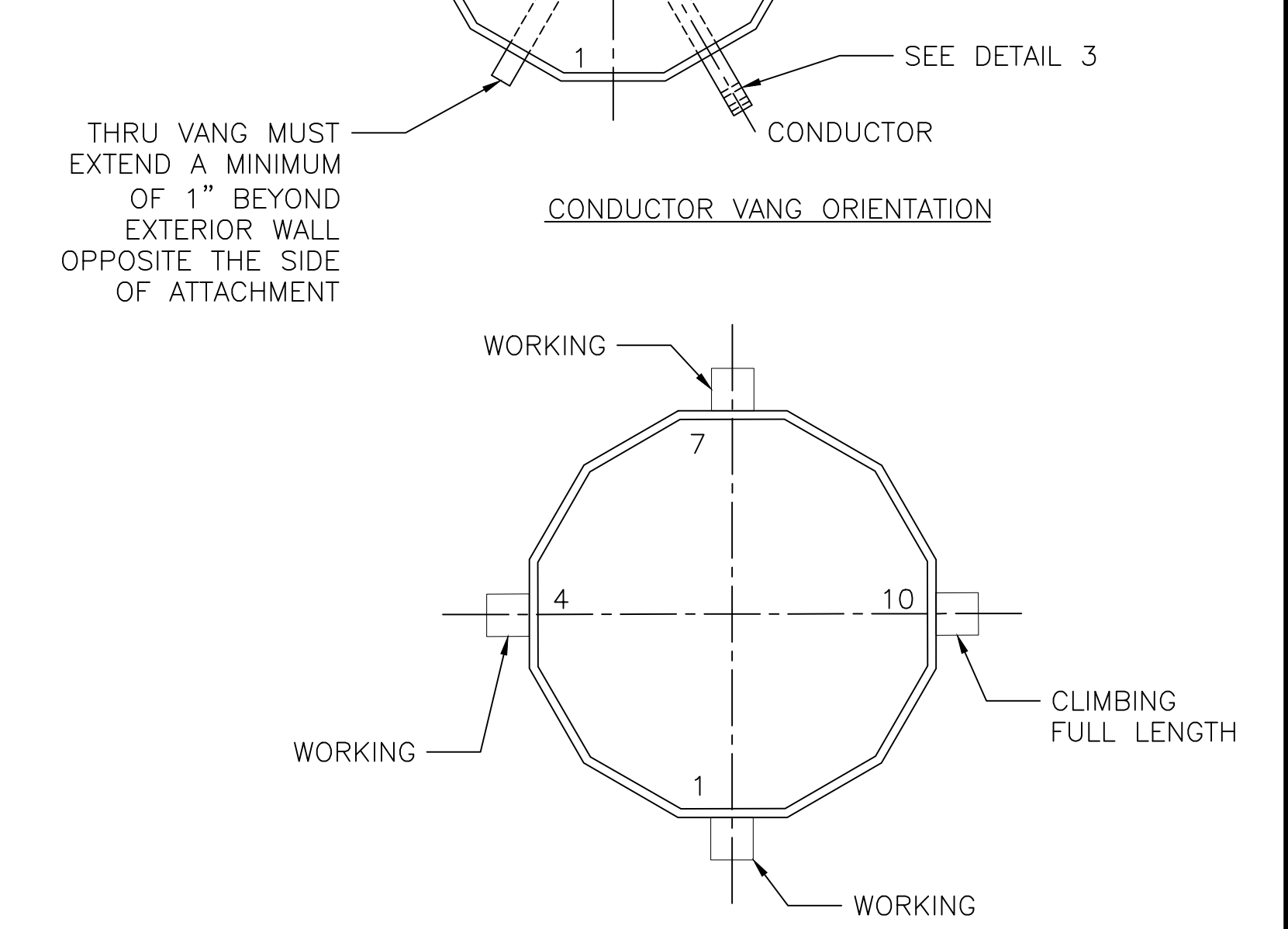
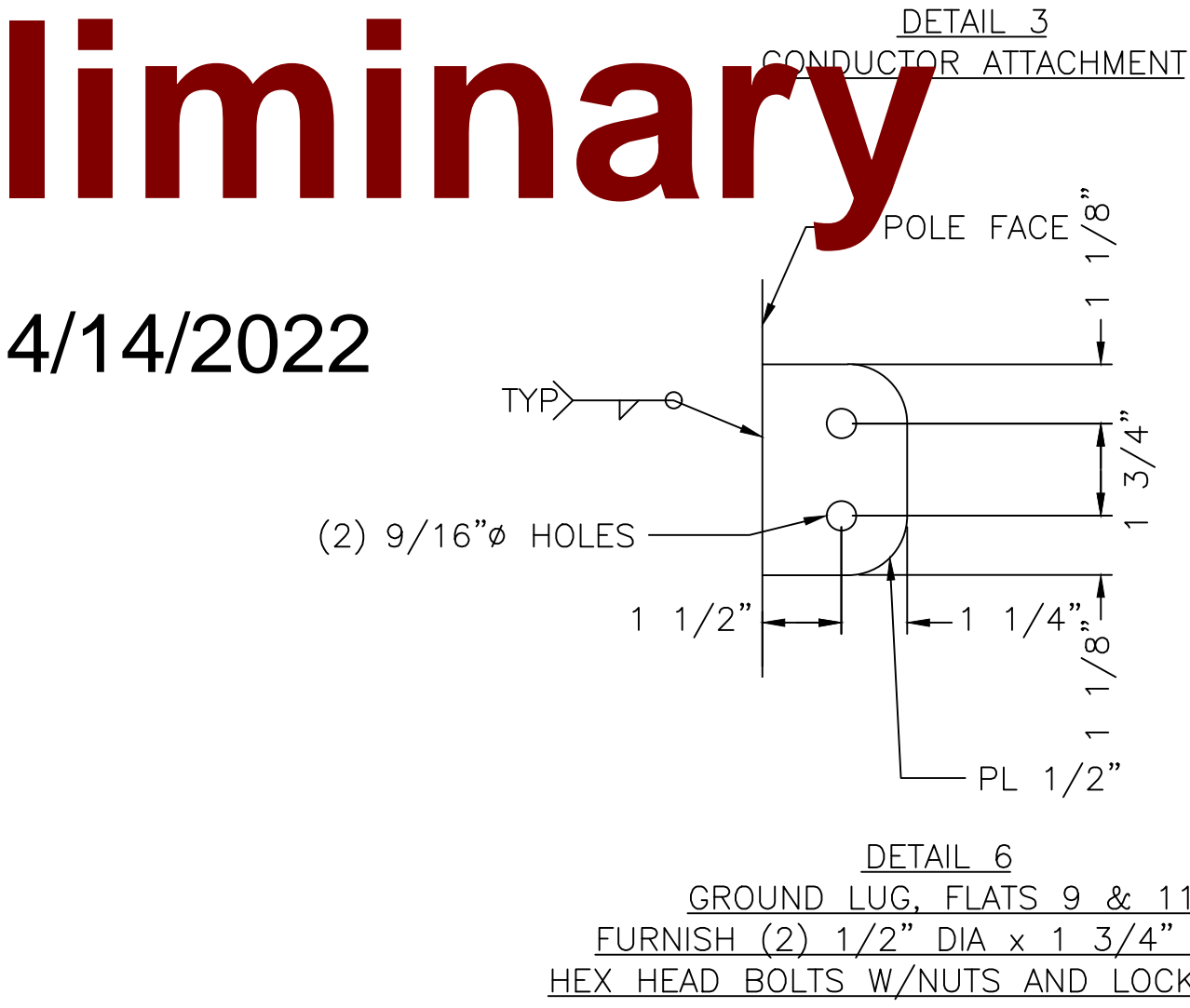
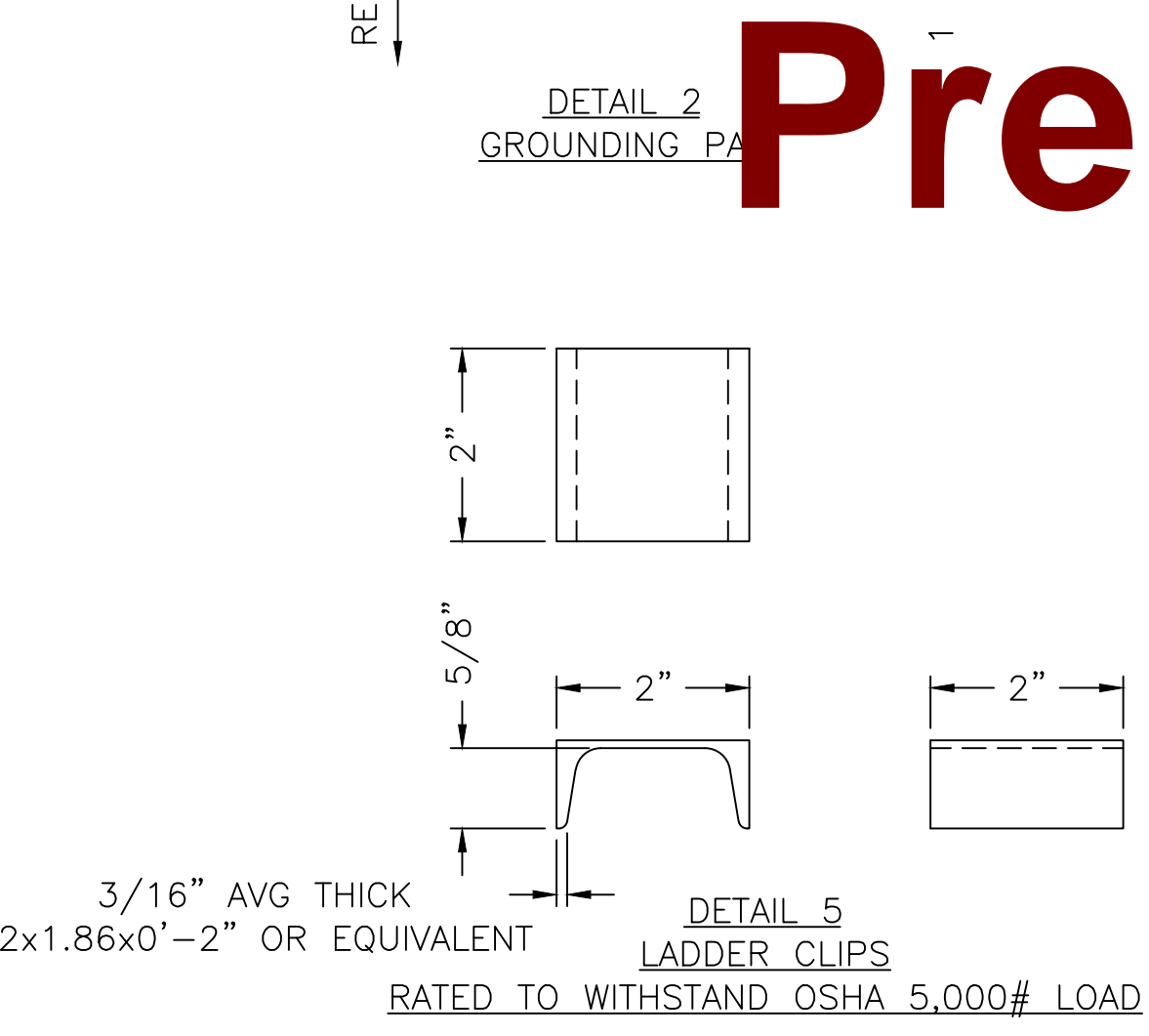
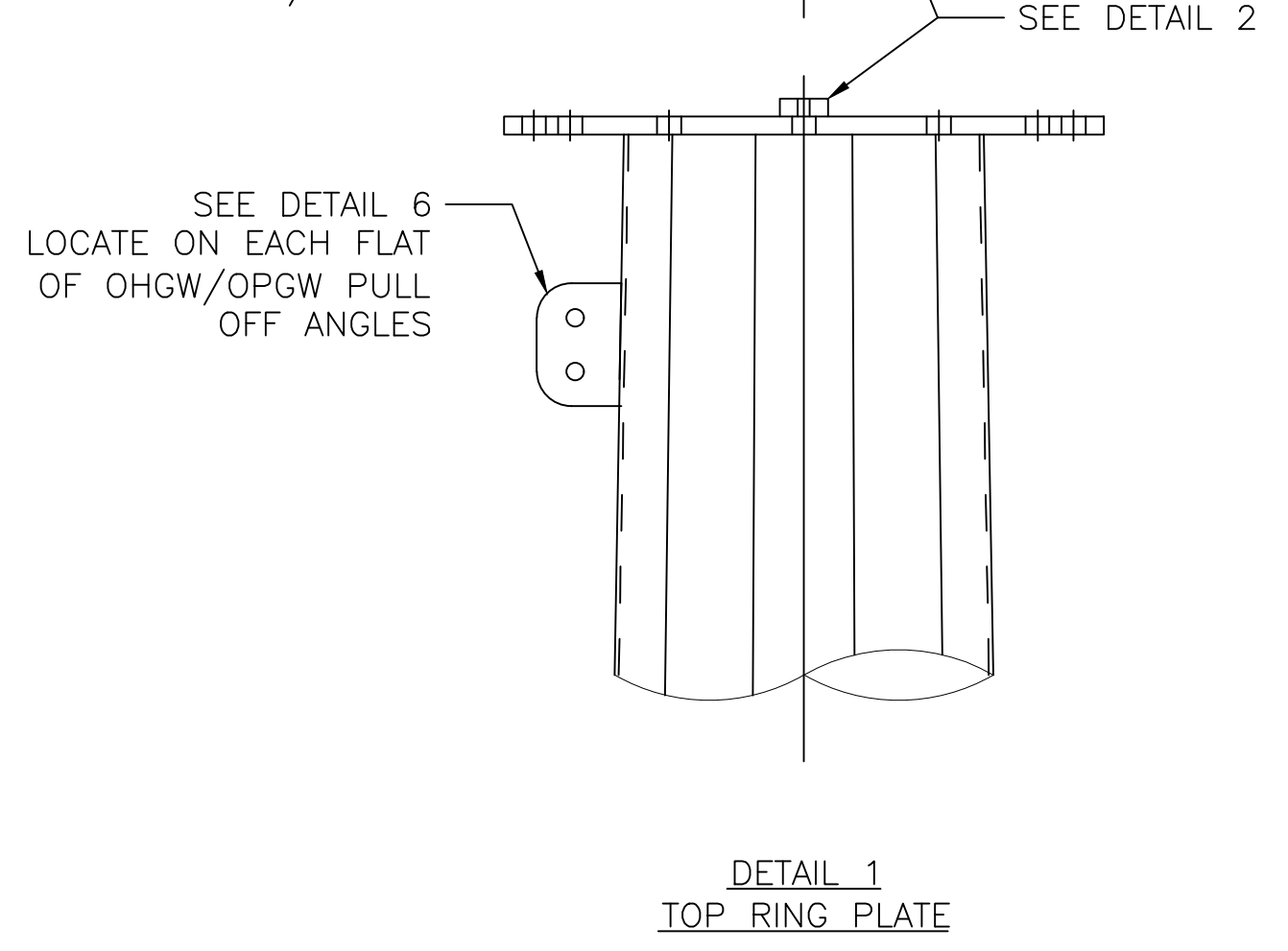
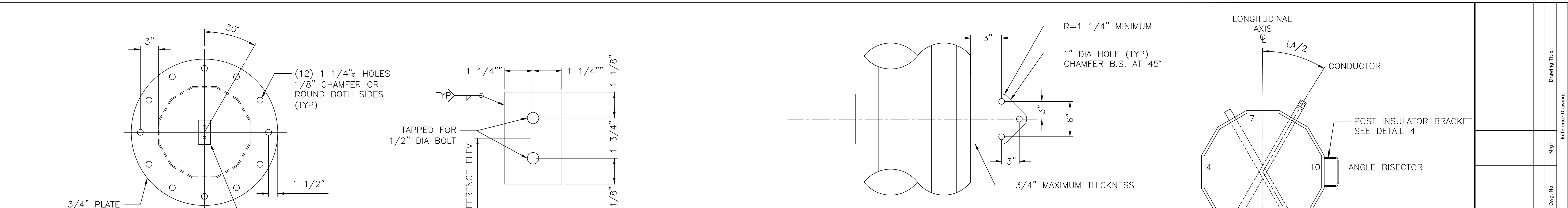
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1	4/12/22	ARO	JTL	ISSUE PER CPN 049 AND CPN 0458

Tri-State Generation and Transmission Association, Inc. A Touchstone Energy Cooperative  
 1100 W. 116th Ave.  
 P.O. Box 33695  
 Denver, Colorado 80233  
 303-452-0111

Dwn: ARO Date: 04-12-22  
 Appd: JTL Date: 04-12-22

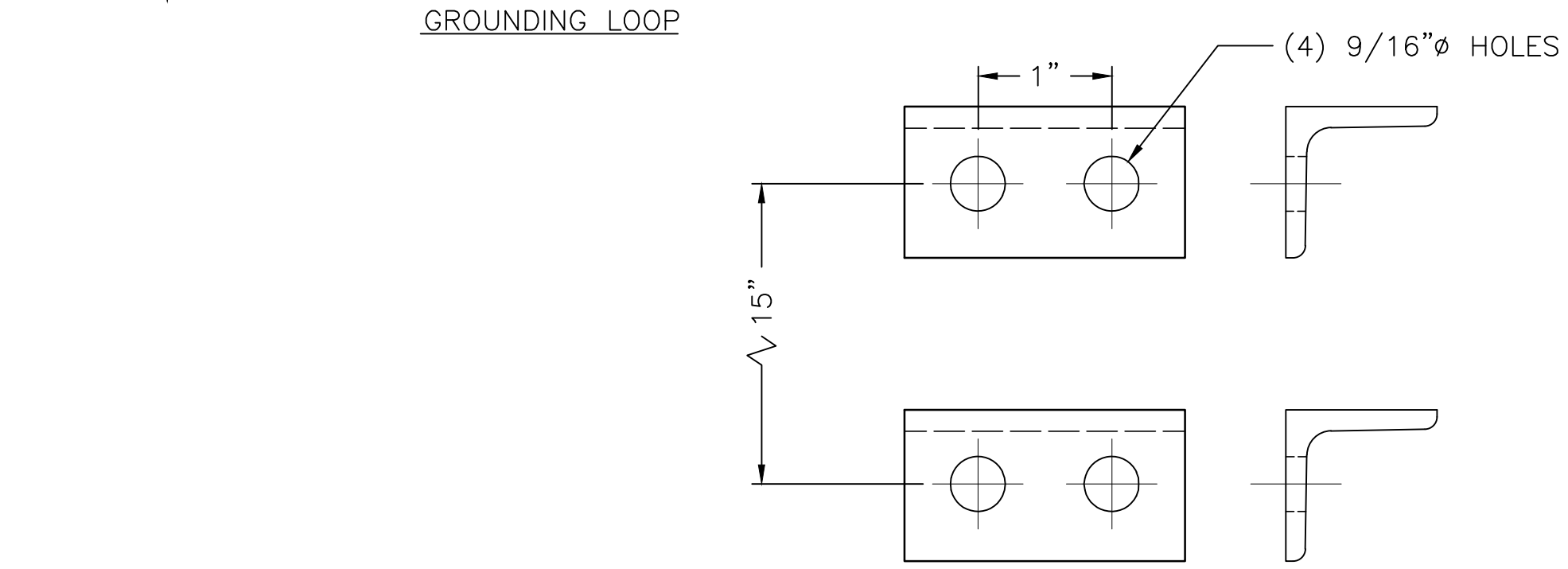
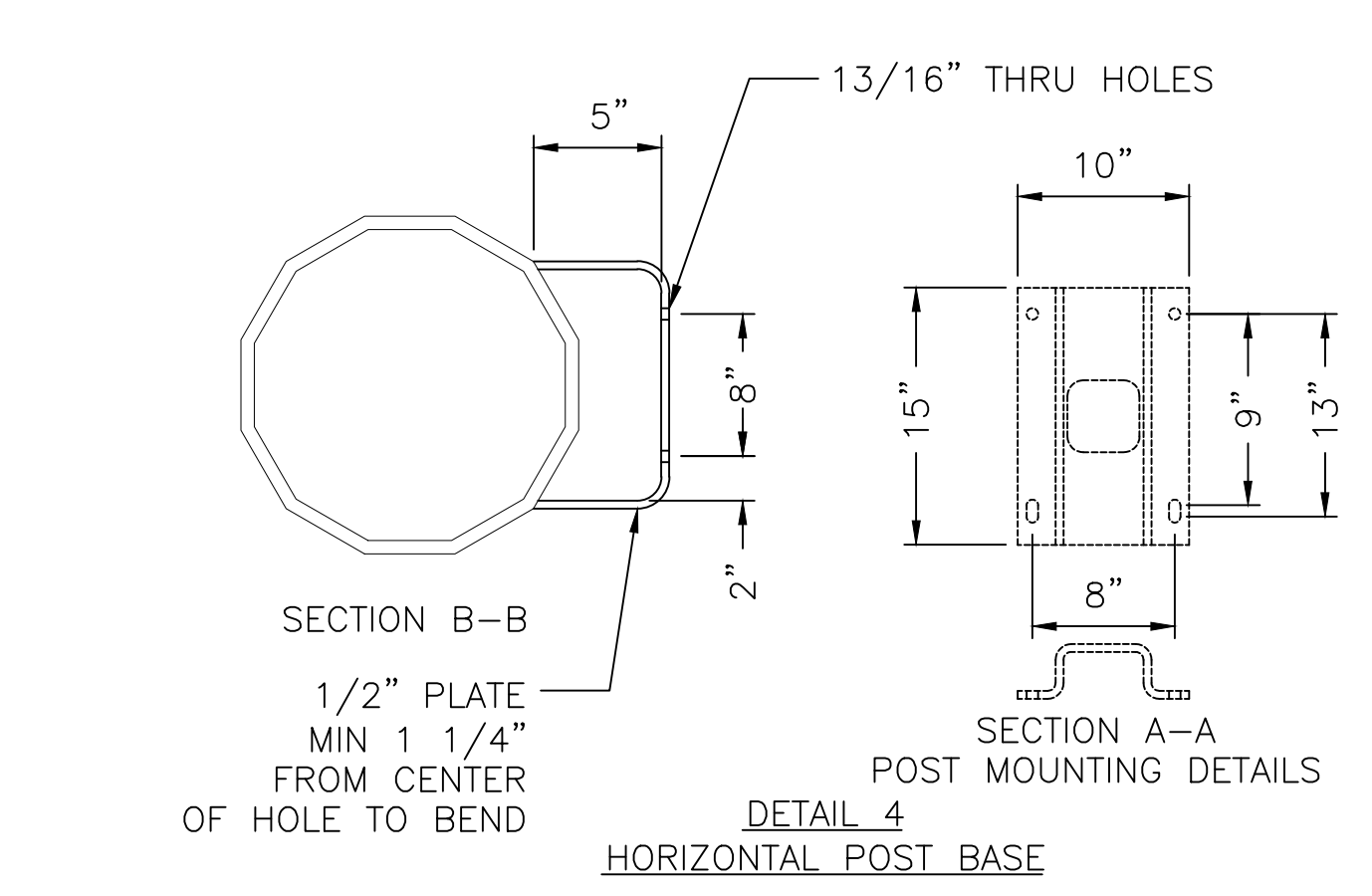
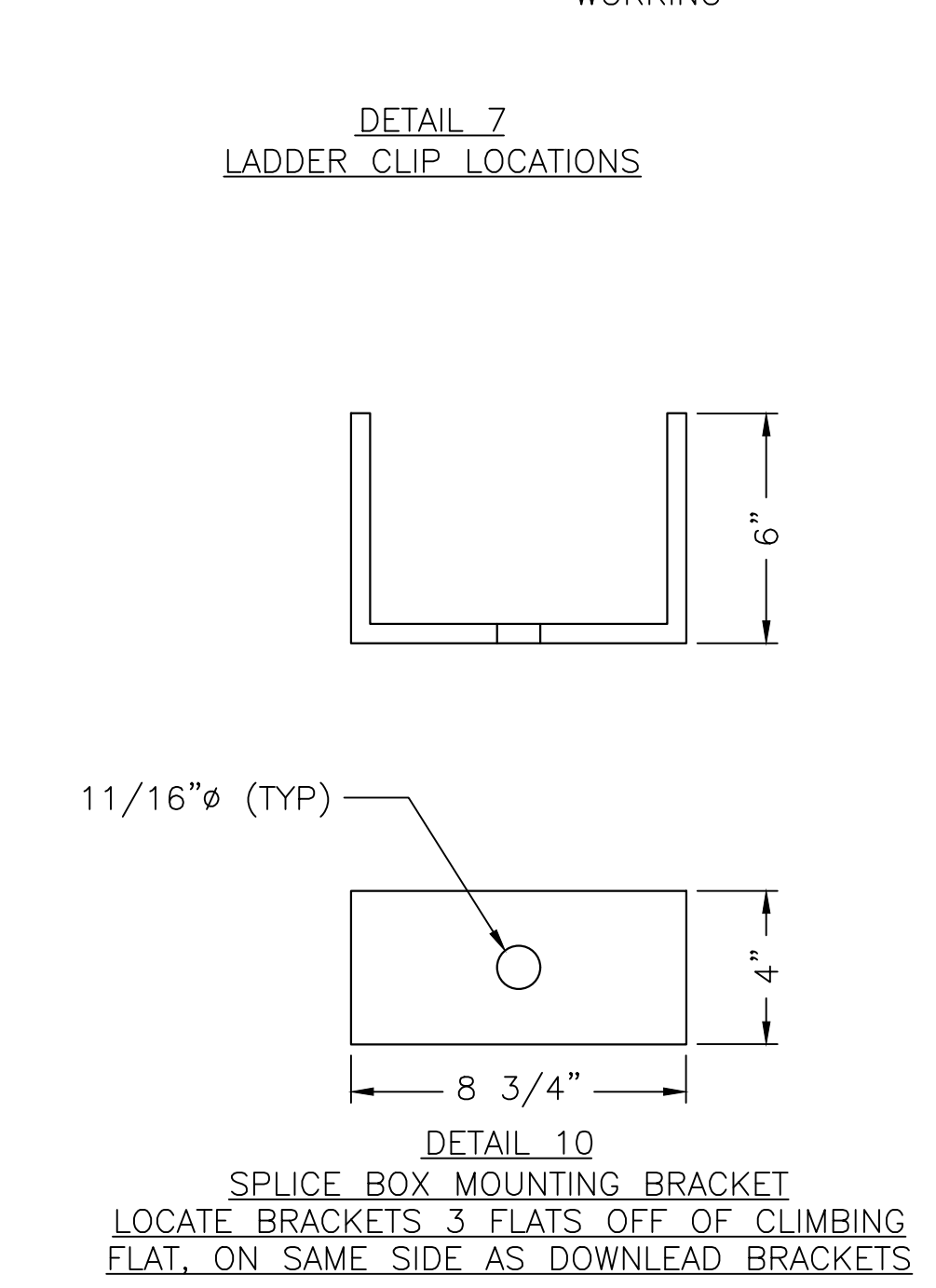
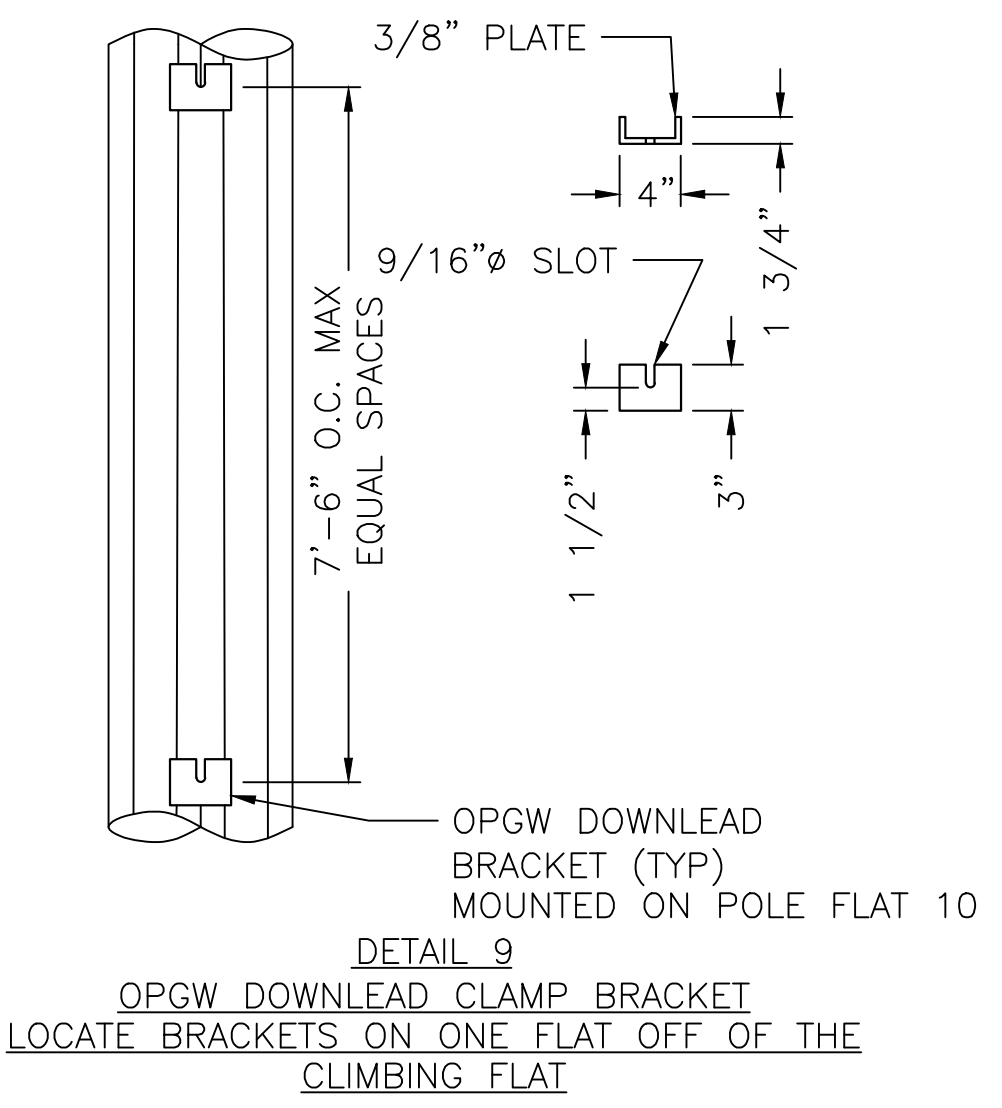
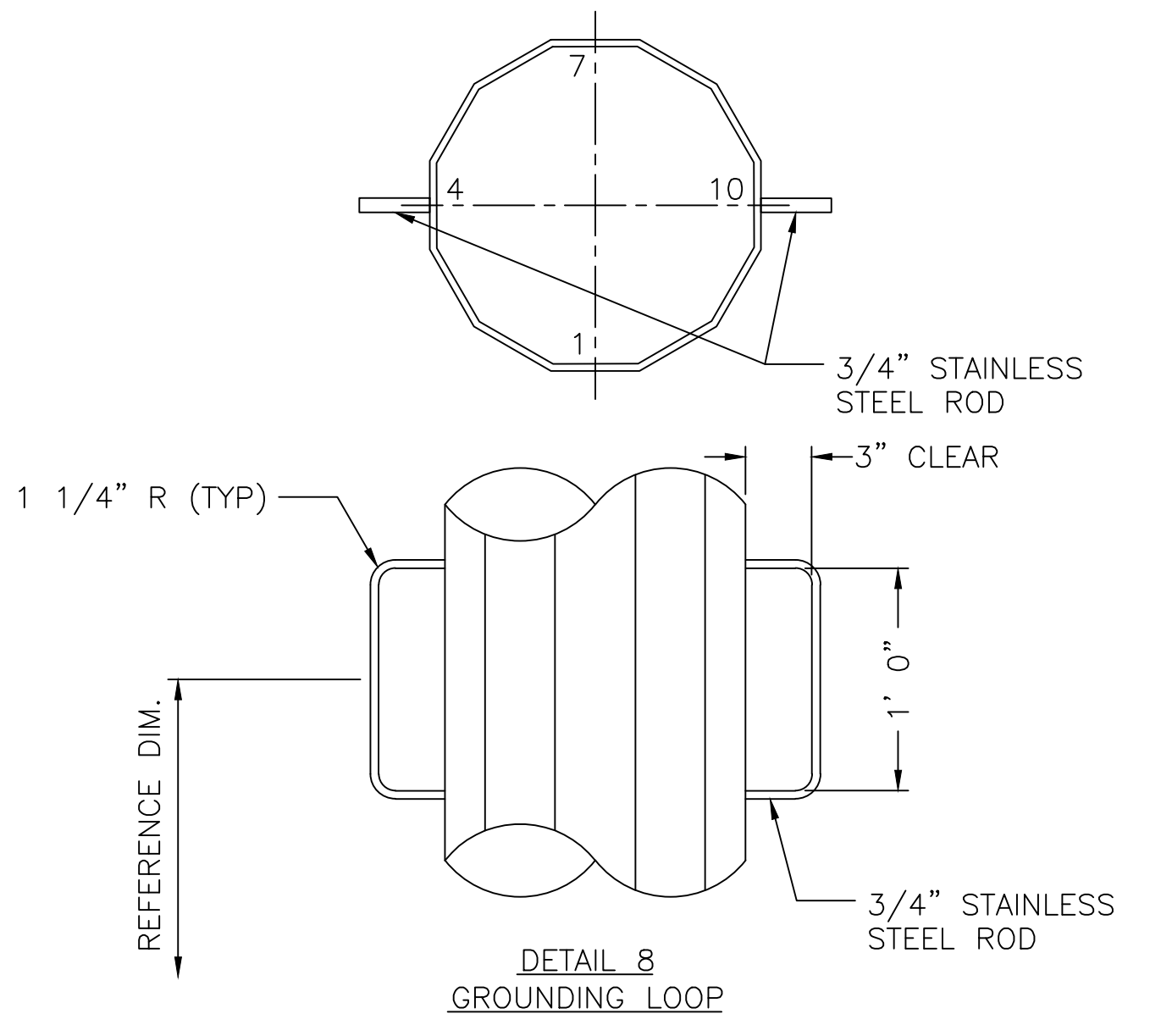
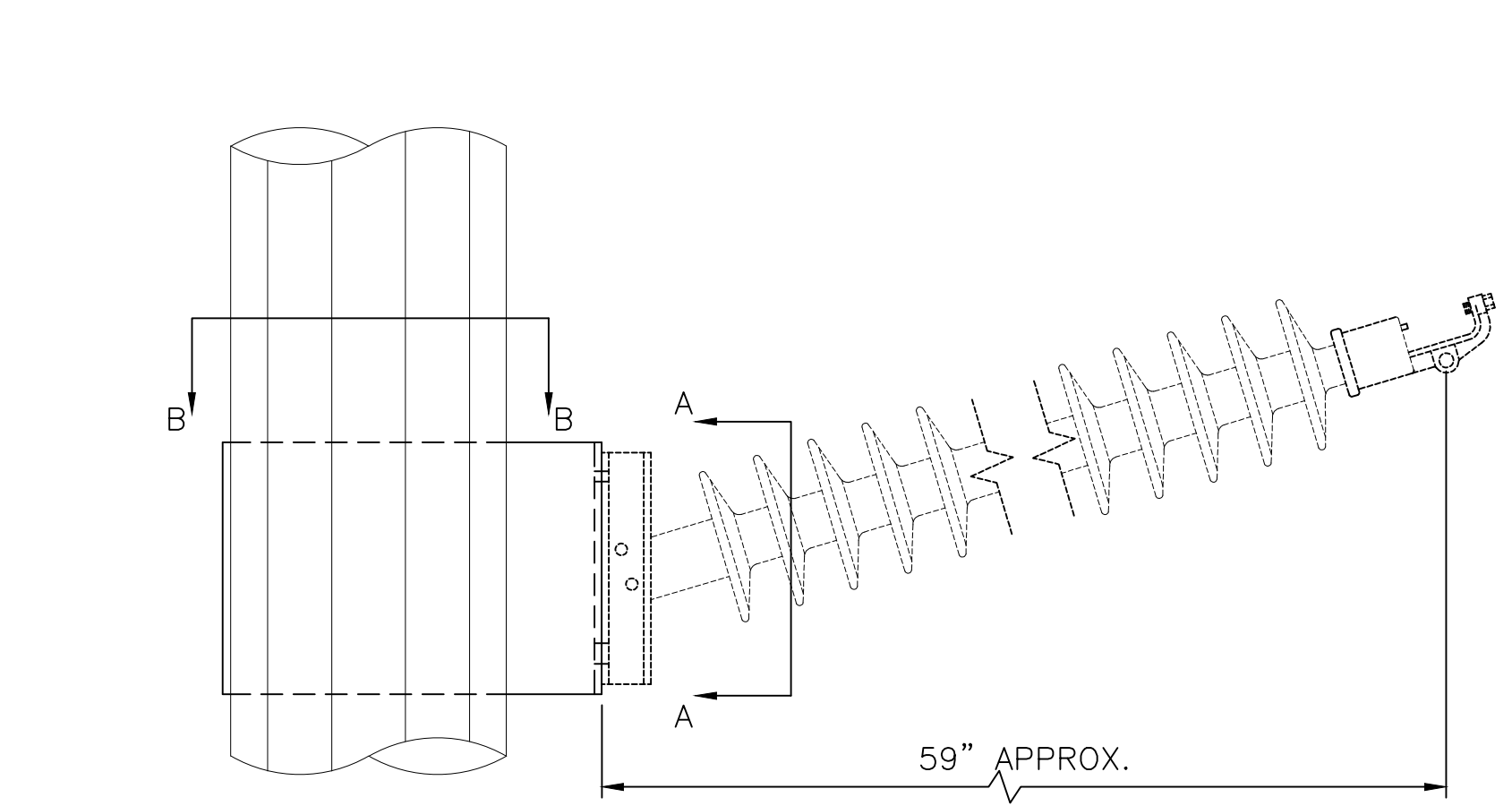
T2301-G-13-006





**Preliminary**

4/14/2022



**NOTES:**

1. PROVIDE MOUNTING DETAIL NEAR THE TOP OF EACH POLE FOR VERTICAL AERIAL NUMBER SIGN PLATE.
2. ATTACHMENT FOR BOTH AHEAD AND BACK LINE ARE REQUIRED.
3. DETAIL MAY BE A BRACKET OFFSET FROM POLE TO ALLOW BOLT INSERTED FROM BEHIND OR A 1/2" NUT WELDED OVER 9/16" HOLE.

**NOTES:**

1. INSTALL ONE GROUND LOOP PER PHASE WIRE AT 1'-6" ABOVE:
  - A. EACH DAVIT ARM ATTACHMENT.
  - B. EACH PHASE WIRE POLE VANG (RUNNING DEAD)
  - C. EACH PAIR OF PHASE WIRE POLE VANGS (DEADEND), ON THE BISECTOR ANGLE
2. ALSO INSTALL ONE GROUND LOOP AT MINIMUM 5- FEET BELOW THE LOWEST PHASE WIRE ELEVATION (INCLUDING DEADEND JUMPER STRUT INSULATORS) ON SAME FLATS AS CONDUCTOR PULLOFF ATTACHMENTS. OKAY TO RELOCATE THIS GROUND LOOP FURTHER DOWN THE POLE AS NECESSARY TO AVOID CONFLICTS. NO GROUND LOOPS ALLOWED BETWEEN JACKING NUTS AND WITHIN 1-FOOT OF OUTERMOST JACKING NUTS. NO GROUND LOOPS ALLOWED WITHIN 1-FOOT BELOW MALE ENDS MAXIMUM SLIP JOINT LAP.
3. DIMENSIONS ARE TO BEND LINE.
4. WELDS TO ATTACH MAINTENANCE PROVISIONS TO STRUCTURES SHALL DEVELOP THE ULTIMATE TENSILE STRENGTH OF THE ATTACHED PART.
5. FABRICATOR SHALL COORDINATE LOCATION OF MAINTENANCE PROVISIONS SUCH THAT THEY DO NOT INTERFERE WITH OTHER STRUCTURE PROVISIONS OR ATTACHMENTS.

**FOX RUN - FOX RUN TAP**  
 115KV  
 VERTICAL DEADEND  
 OUTLINE AND DESIGN

TRI-STATE Generation and Transmission Association, Inc.  
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Dwg. No. Mgr. Drawing Title Reference Drawings

T2301-G-13-007