

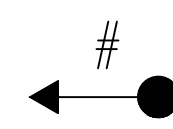
Fox Run Substation

Luminaire list

Φ_{Total} 333540 lm	P_{Total} 3040.0 W	Luminous efficacy 109.7 lm/W
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pcs.	Manufacturer	Article No.	Article name	P	Φ	Luminous efficacy
20	Appleton	I/AMLGL8W	AREAMASTER LED 19500 LUMENS NEMA 7X7 CLEAR GLASS	152.0 W	16677 lm	109.7 lm/W

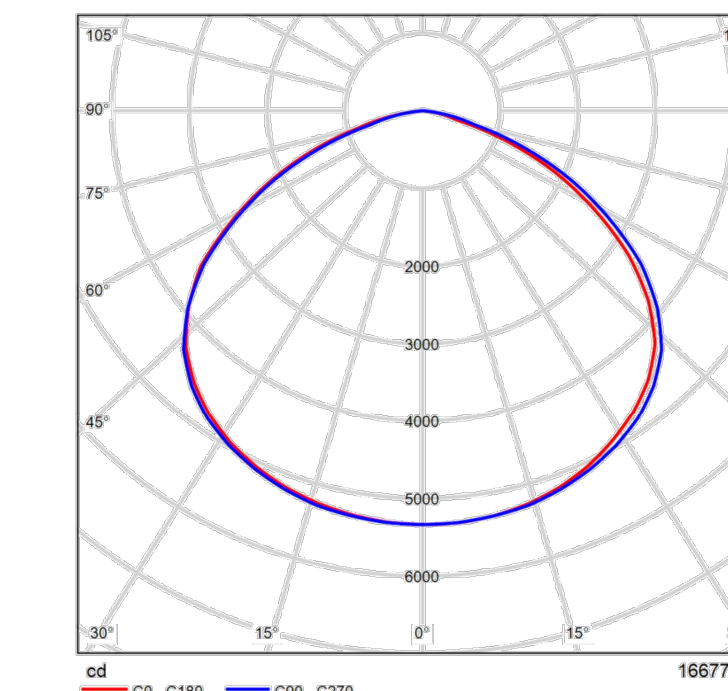
Luminaire No. & Direction



Appleton - AREAMASTER LED 19500 LUMENS NEMA 7X7 CLEAR GLASS



Article No.	I/AMLGL8WG6
P	152.0 W
$\Phi_{Luminaire}$	16677 lm
Luminous efficacy	109.7 lm/W
CCT	3114 K
CRI	83



Polar LDC

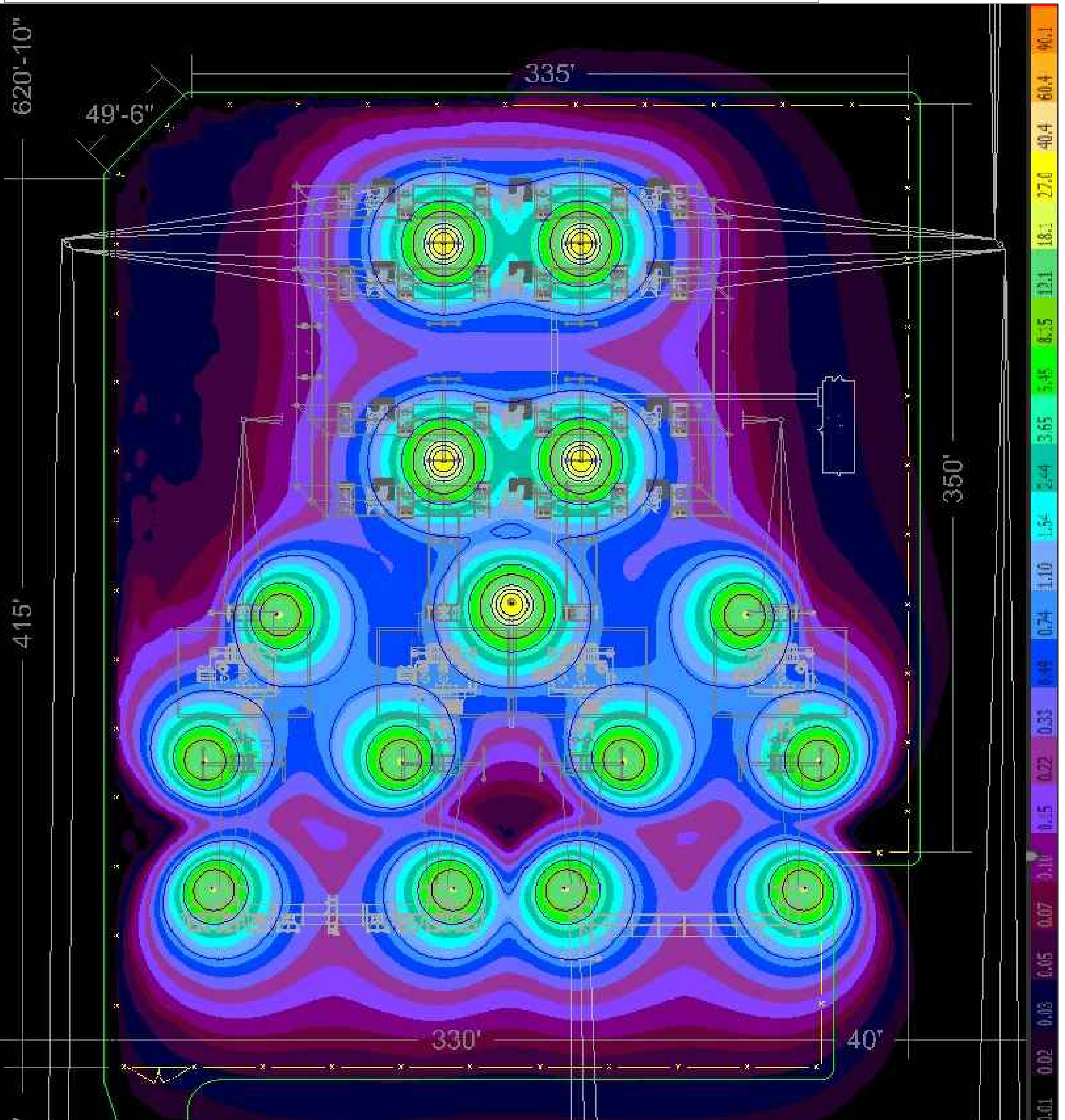
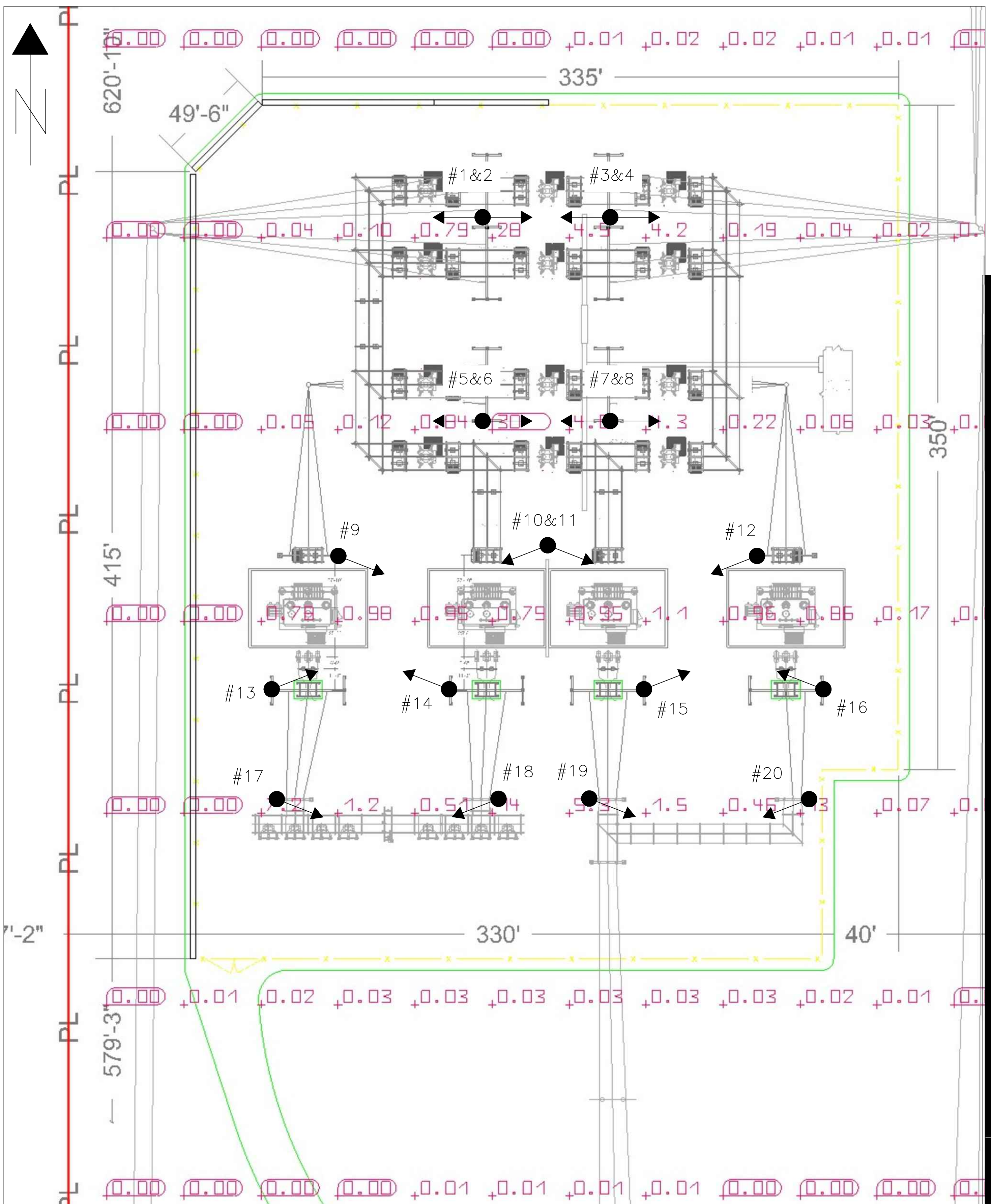
Areamaster LED Gen2 Flood light Series
 Pole Mount
 19500 LUMENS, 3000 K CCT, NEMA 7X7
 Yoke Mount
 BU-120-277 Vac, 50/60Hz,
 BH-347-480 Vac, 50/60Hz
 3/4" NPT Hub
 7 x7 OPTICS
 Warm White
 CLEAR GLASS

Class 1, Division 2, Groups A, B, C, D
 Class 1, Zone 2, GROUP IIC
 TYPE 3R, 4, 4X
 IP66/67
 Suitable for Use in Wet Locations
 Marine Outside (Salt Water)

Refer to catalog for additional options

NOTES:

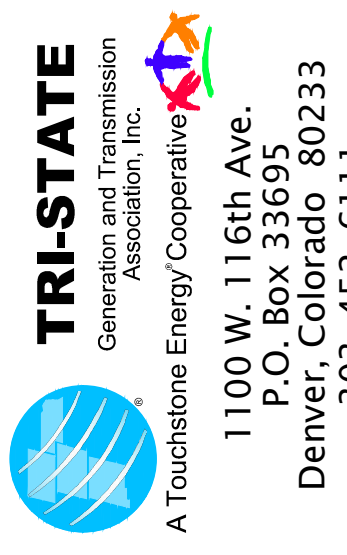
1. THE TILT ANGLE OF THE LIGHTS SHALL BE AT 20-DEGREE ABOVE HORIZON PLANE ANGLED TOWARDS THE GROUND SURFACE.
2. LIGHTS SHALL BE MOUNTED 15- FEET ABOVE GRADE.
3. CALCULATIONS SHOWN ARE MAINTAINED HORIZONTAL FOOTCANDALES TAKEN AS SHOWN IN CALCULATIONS SUMMARY.
4. FIXTURE ORIENTATION IS SUCH THAT 0 IS TO THE RIGHT OF DRAWING AND 90 IS TO THE TOP OF THE DRAWING.
5. LUMINARY LUMENS EQUAL LUMENS LEAVING LUMINARY WITH EFFICIENCY CONSIDERED.



PLAN PREPARER CONTACT:
 KENT UTLEY
 TRI-STATE G&T
 303-254-3170
 kutley@tristategt.org

FOX RUN SUBSTATION

115/69/12.47KV
 LIGHTING PLAN
 17090 SHAHARA RD, MONUMENT CO
 PARCEL # 6121003005
 TRI-STATE GENERATION & TRANSMISSION
 ASSOCIATION, INCORPORATED



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

Light Plan

No.	Date	Appd.	Rev.
7			
6			
5			
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2			
1			

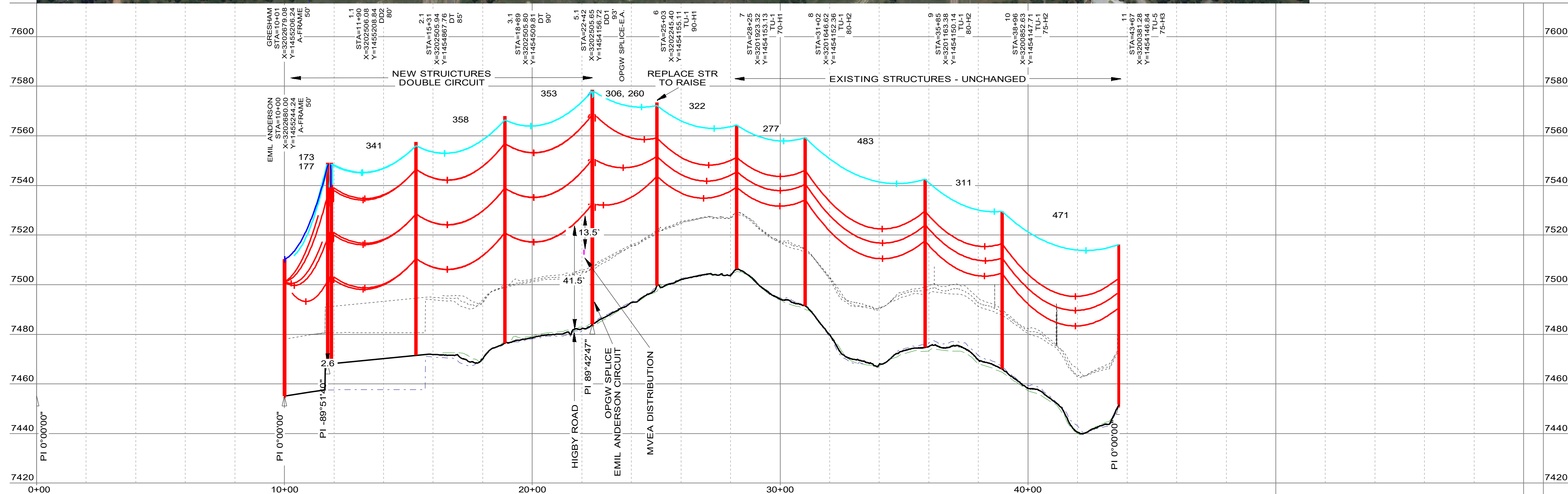
Dwg. No.	Mfr.	Reference Drawings

PATH: C:\Users\kenutl\OneDrive - Tri-State Generation and Transmission Association, Inc\kenutl\Projects\Fox Run Substation\EL_Pose County_Docs\Light_Plan.dwg



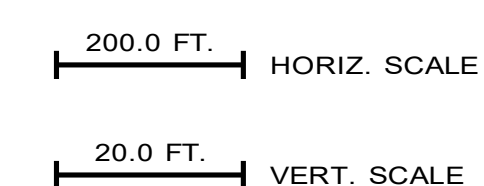
Preliminary

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.



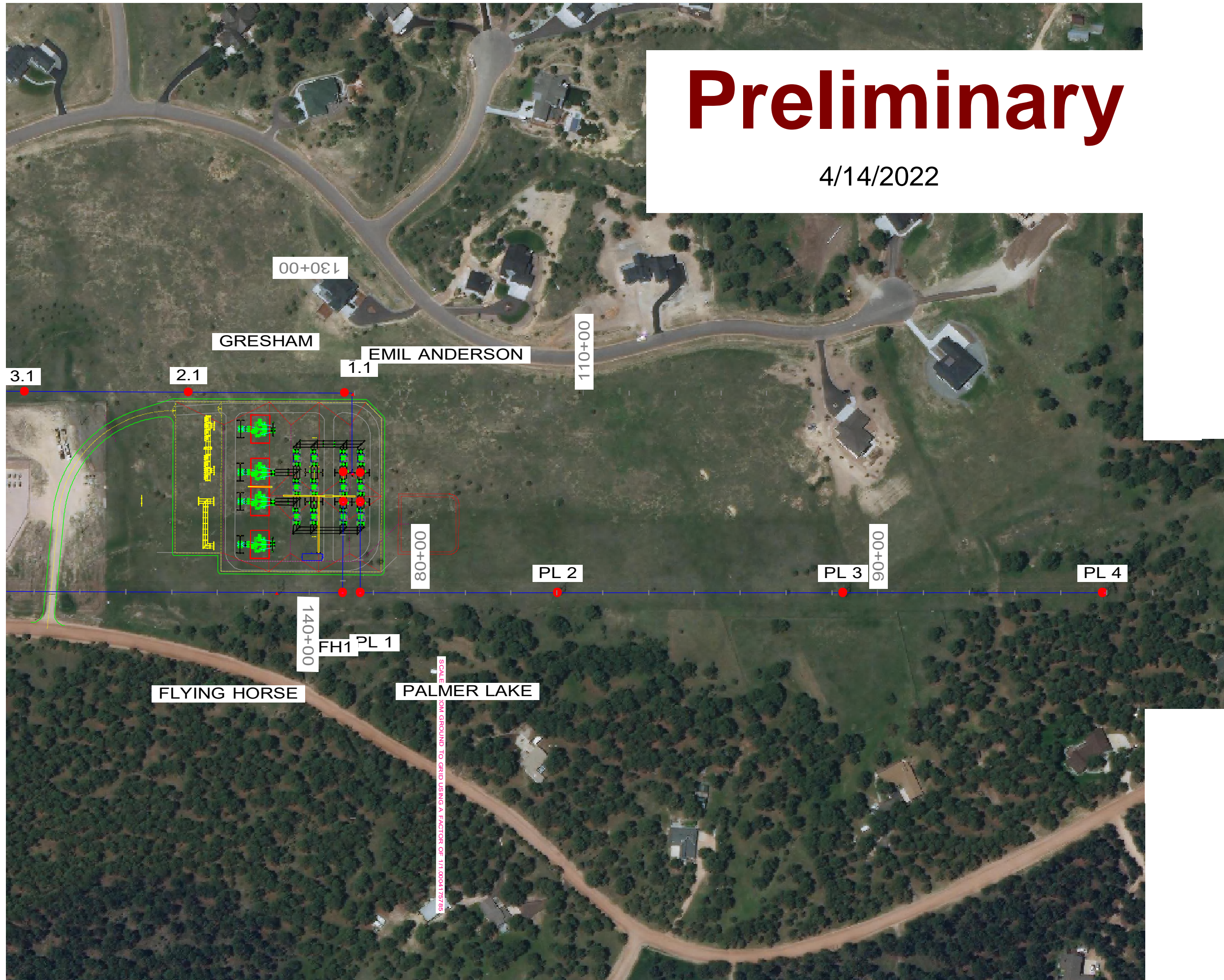
FOX RUN - FOX RUN TAP
 115 KV

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

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

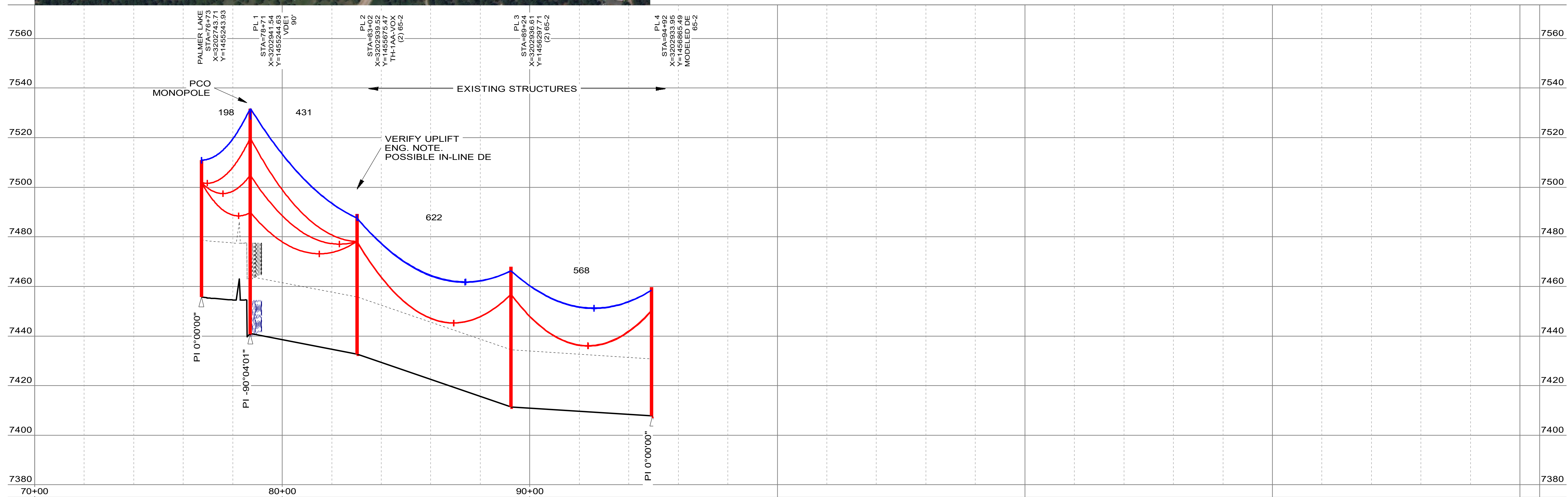
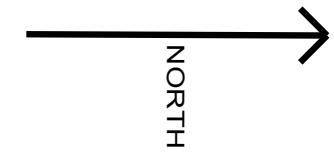
T2301-G-01-001

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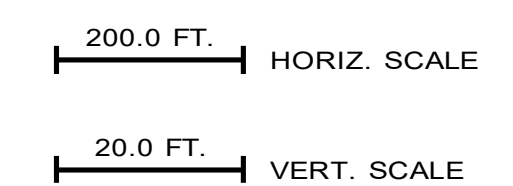
Preliminary

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)

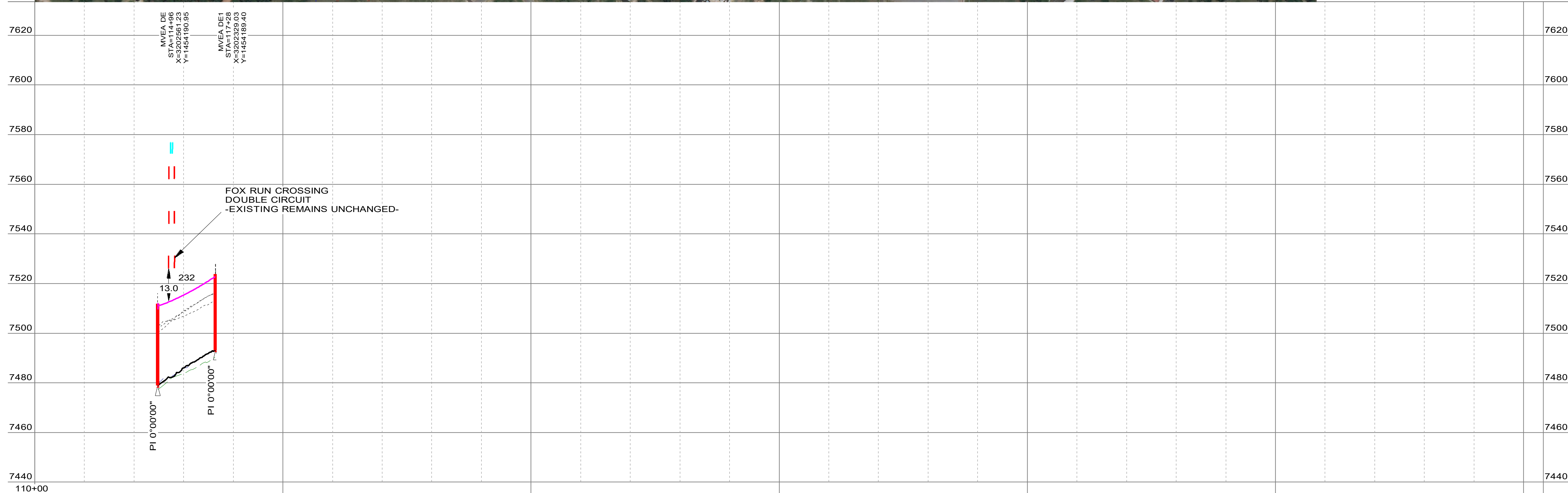
NOTES:
 CLEARANCE LINE SHOWN AT 23.0'
 COORDINATES IN CO CENTRAL NAD83
 COORDINATES IN US-SURVEY FOOT.



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5								
4								
3								
2								
1	JTL	3/24/22	JTL	ISSUE PER CPN-0449 AND CPN-0458				

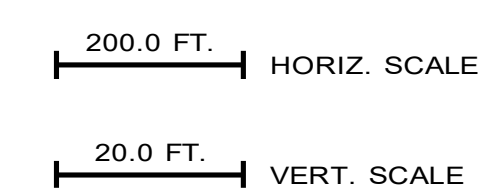
FOX RUN - FOX RUN TAP
 115 KV
 PLAN AND PROFILE
 WO: 50002438/50032556
 TRI-STATE GENERATION & TRANSMISSION
 ASSOCIATION, INCORPORATED

DWN: JTL
 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.



NO.	DATE	DWN.	APPD.	REVISION	M.F.	DWG. NO.	M.FGR.	DRAWING TITLE	REFERENCE DRAWINGS
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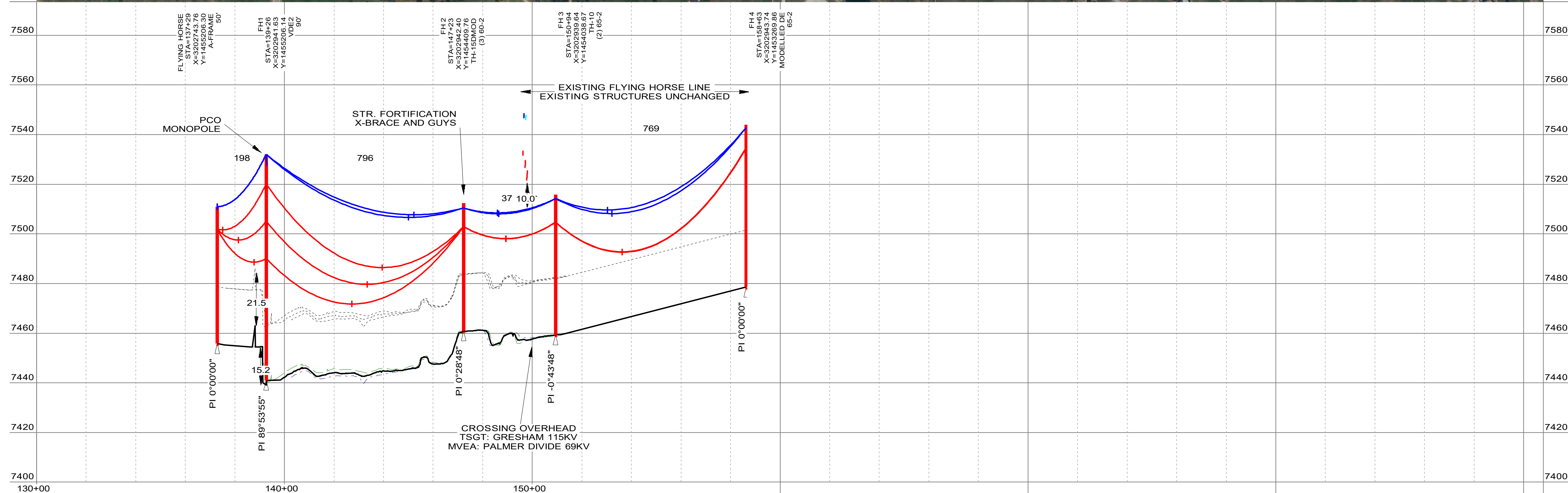
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PLAN AND PROFILE		DATE:
WO: 50002438/50032556		
TRI-STATE GENERATION & TRANSMISSION ASSOCIATION, INCORPORATED		

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

T2301-G-01-004

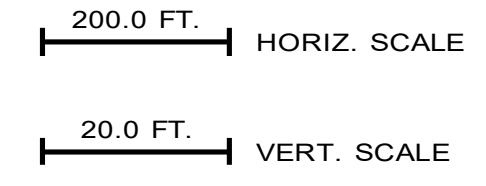


Preliminary
4/14/2022



- 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.



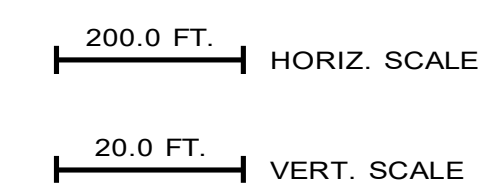
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5								
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2								
1	4/14/22	JTL	JTL	ISSUE PER CON-0449 AND CON-0458				

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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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)

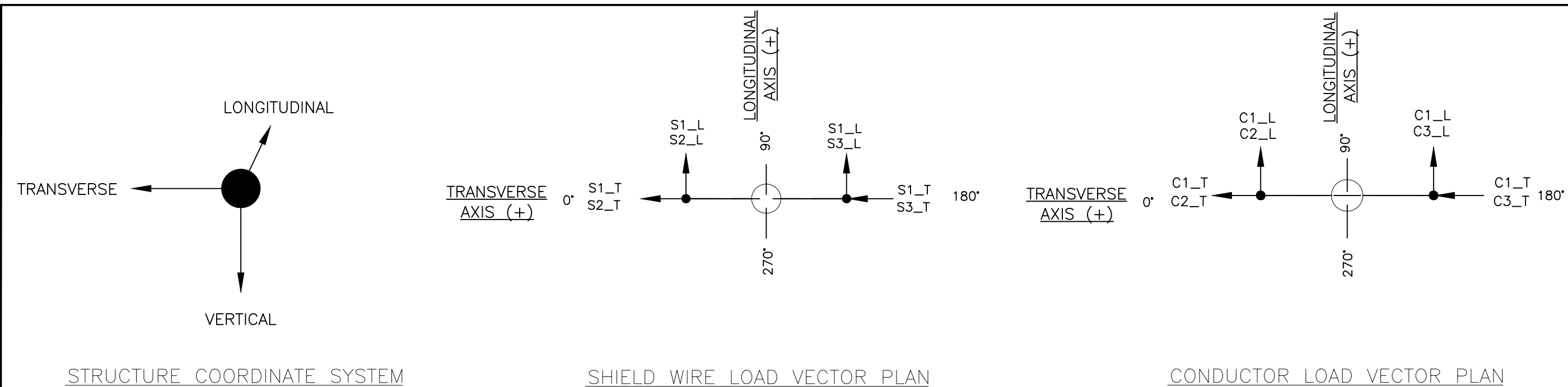
NOTES:
 CLEARANCE LINE SHOWN AT 23.0'
 COORDINATES IN CO CENTRAL NAD83
 COORDINATES IN US-SURVEY FOOT.



NO.	DATE	DWN.	APPD.	REVISION	M.F.	DWG. NO.	M.FGR.	DRAWING TITLE	REFERENCE DRAWINGS
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3									
4									
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FOX RUN - FOX RUN TAP
 115 KV
 PLAN AND PROFILE
 WO: 50002438/50032556
 TRI-STATE GENERATION & TRANSMISSION
 ASSOCIATION, INCORPORATED

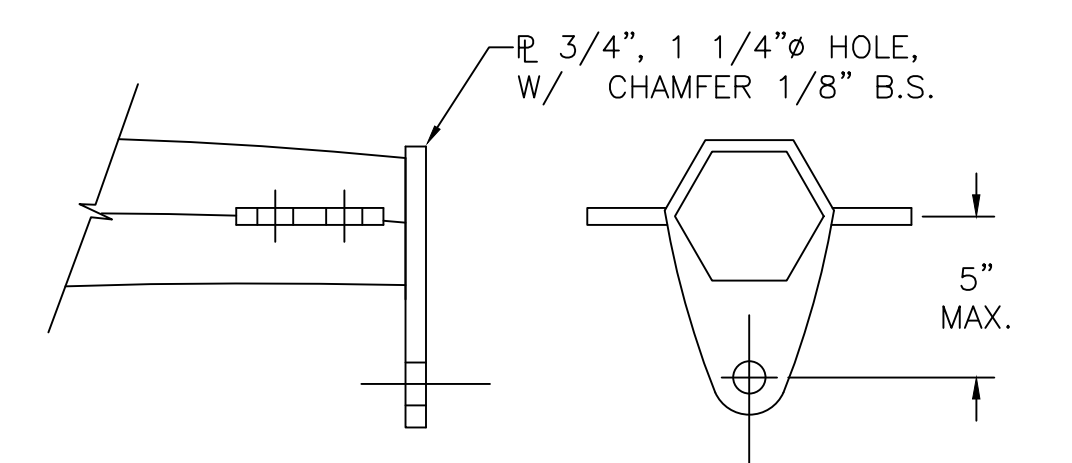
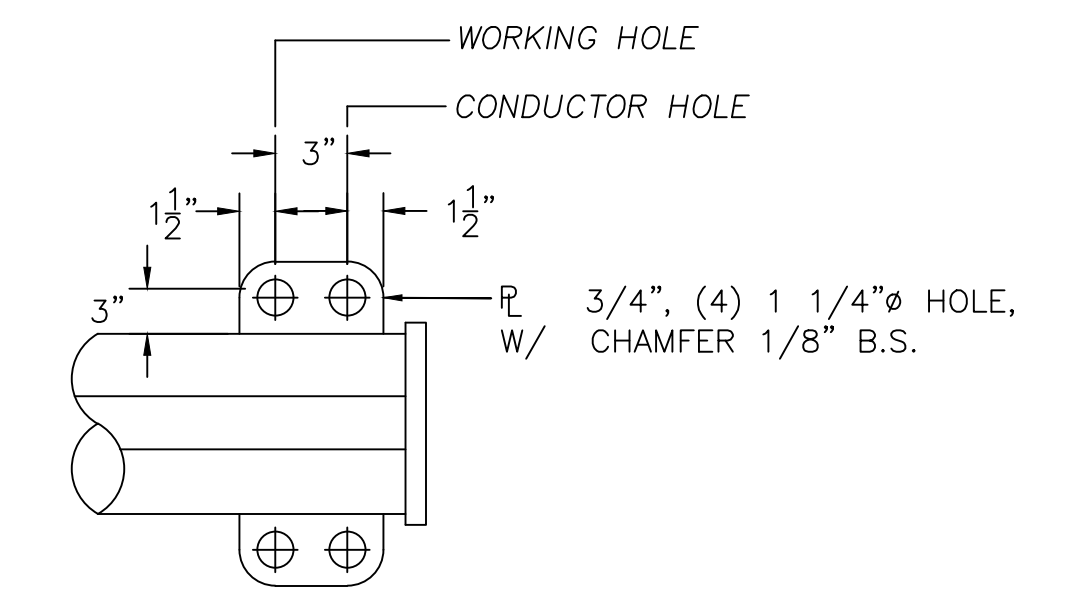
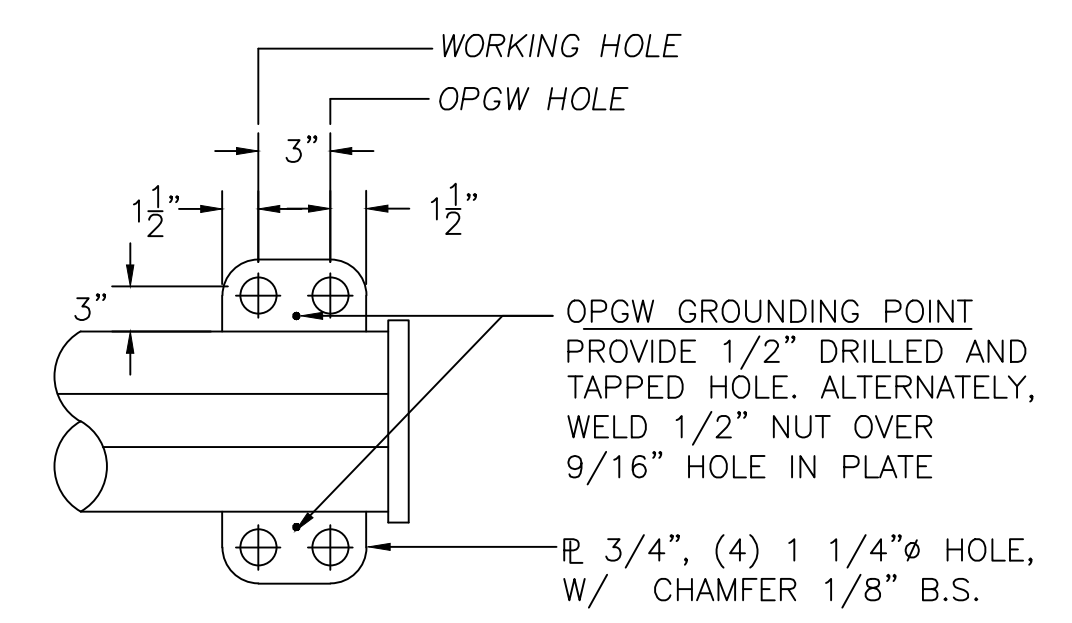
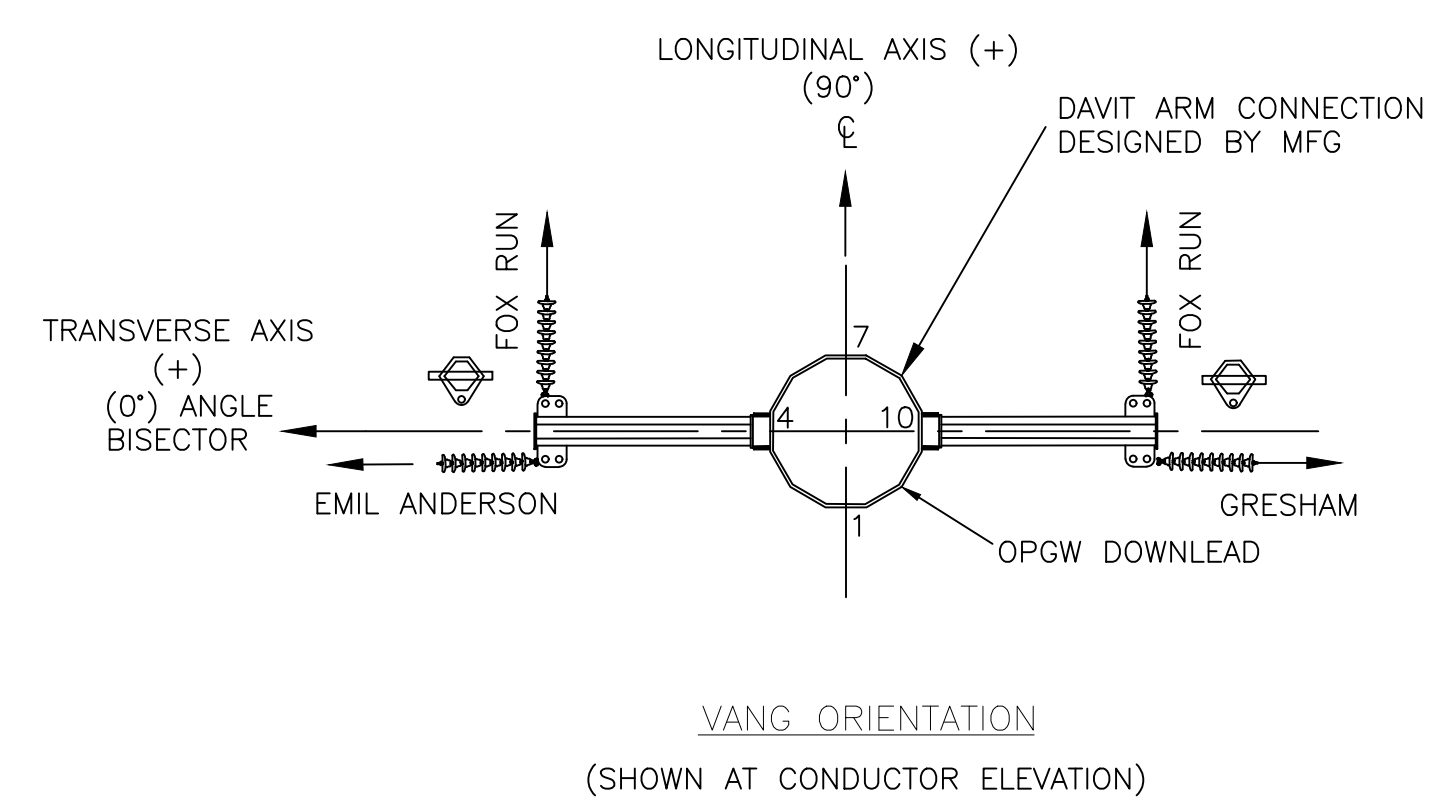
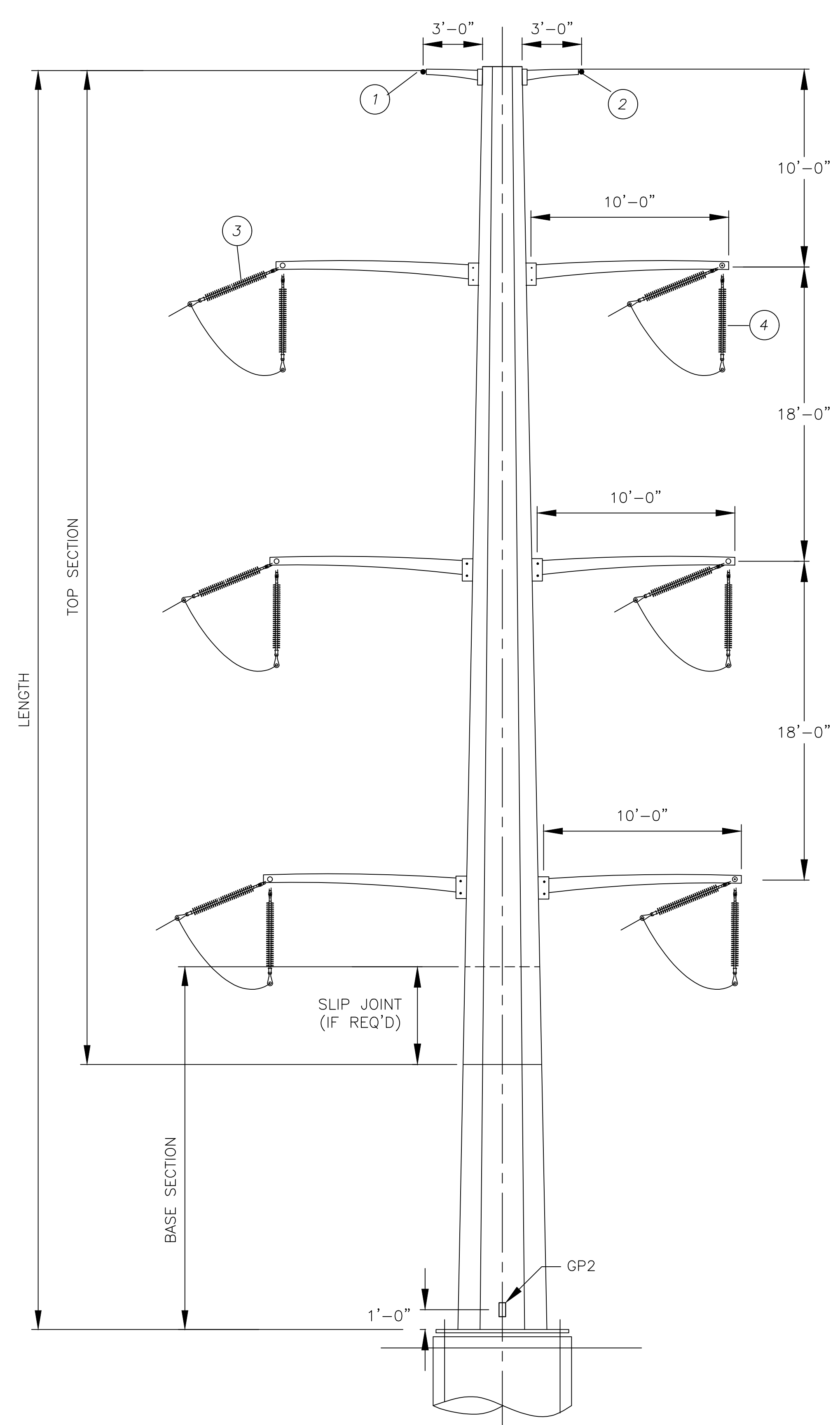
DWN: JTL DATE: 3/24/22
 APPD: JTL DATE:



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

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



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/FT³

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 SPICES.
- 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.)

FOX RUN - FOX RUN TAP

115KV DD1

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

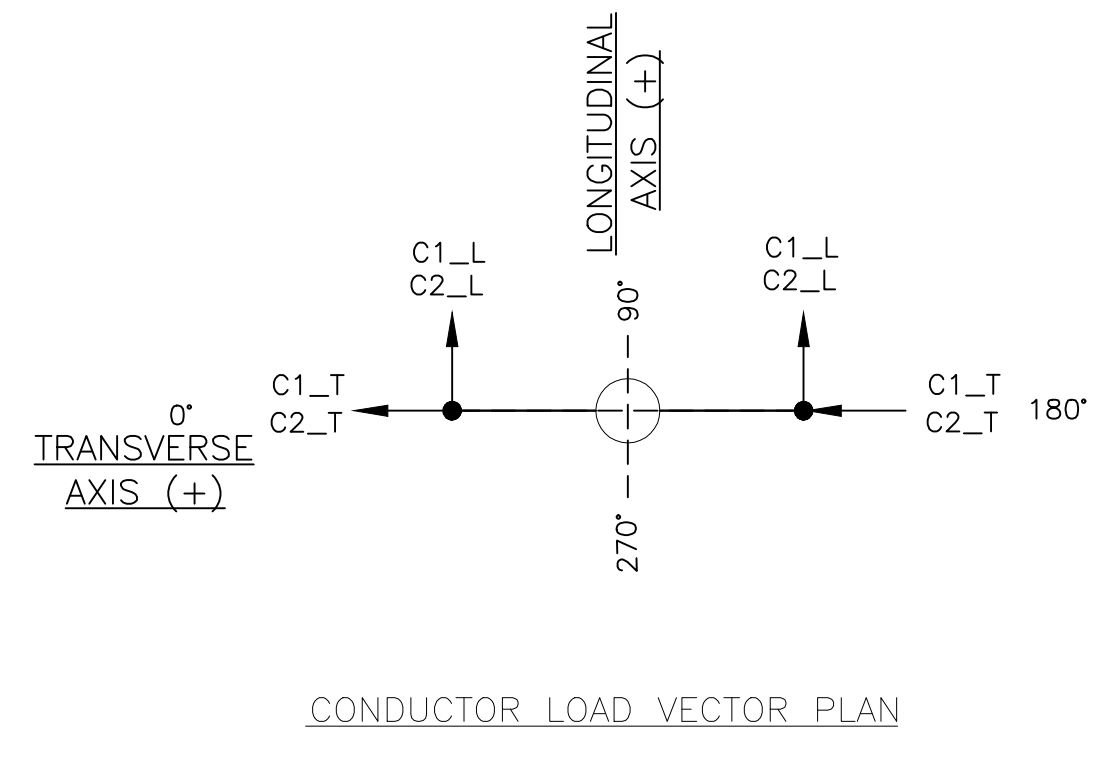
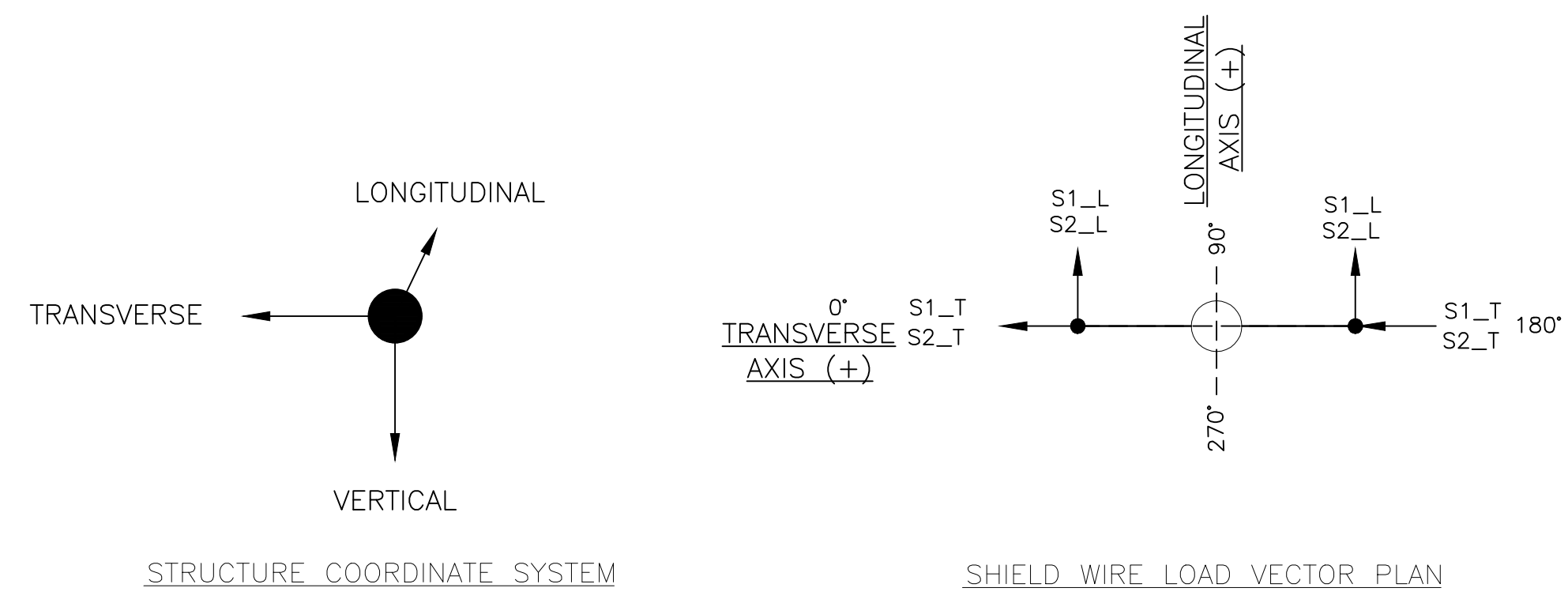
1100 W. 116th Ave.
 P.O. Box 33695
 Denver, Colorado 80233
 303-432-0111

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

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

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

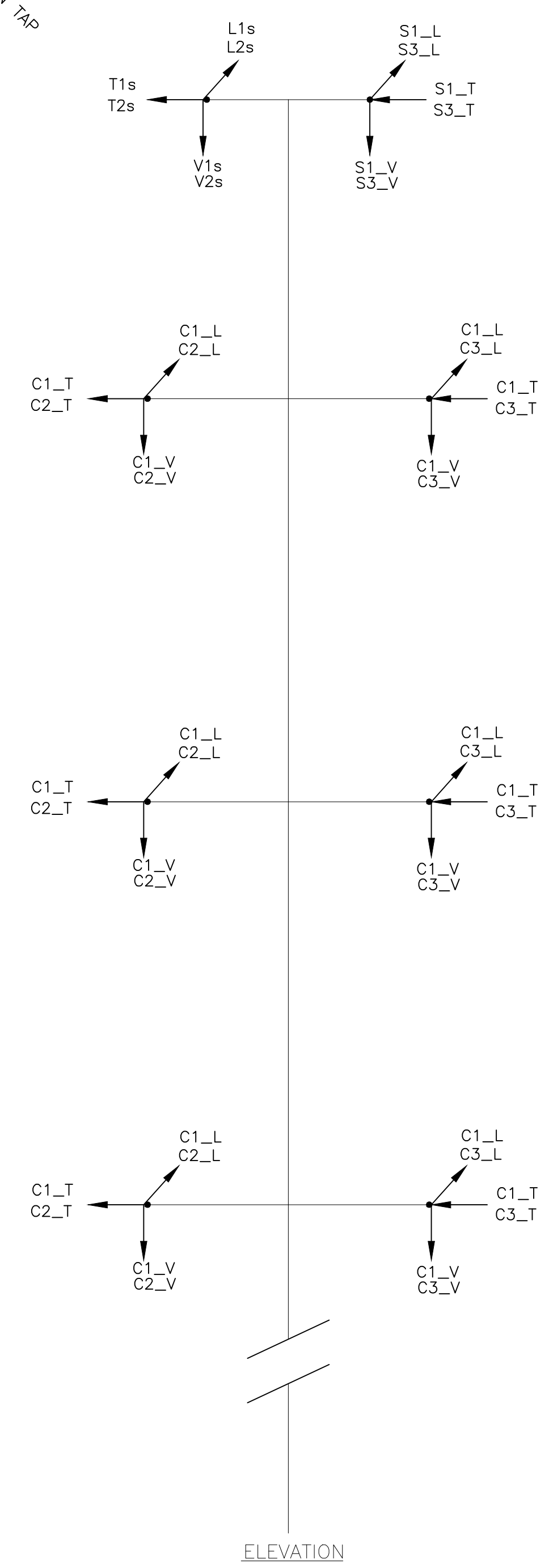
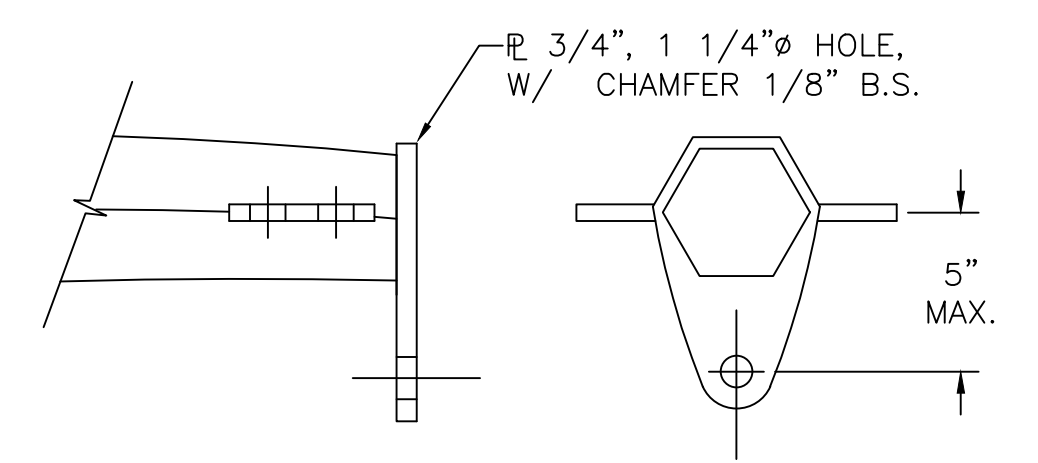
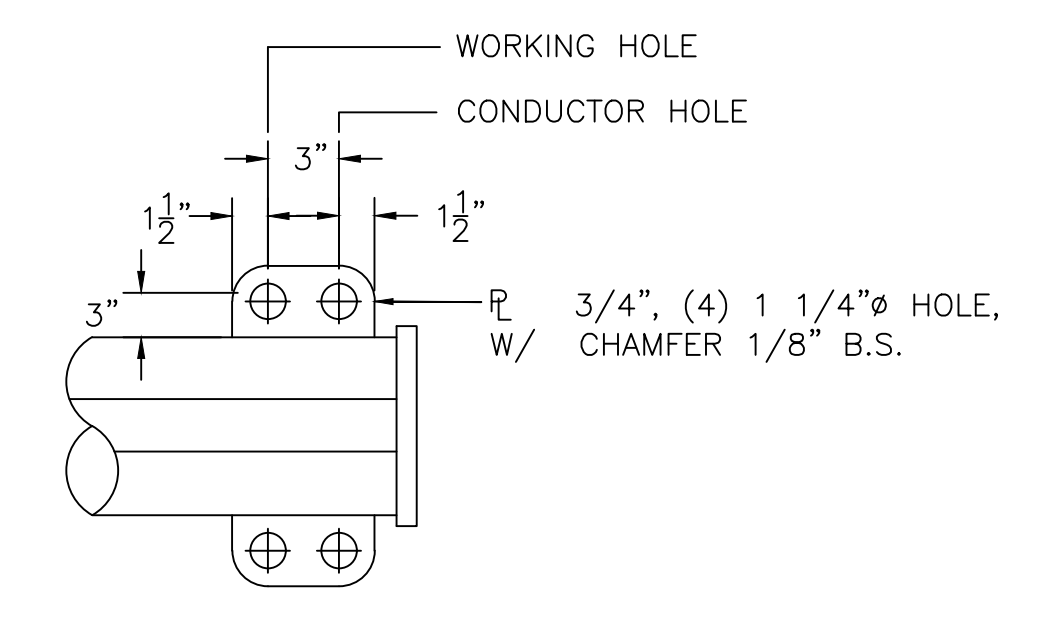
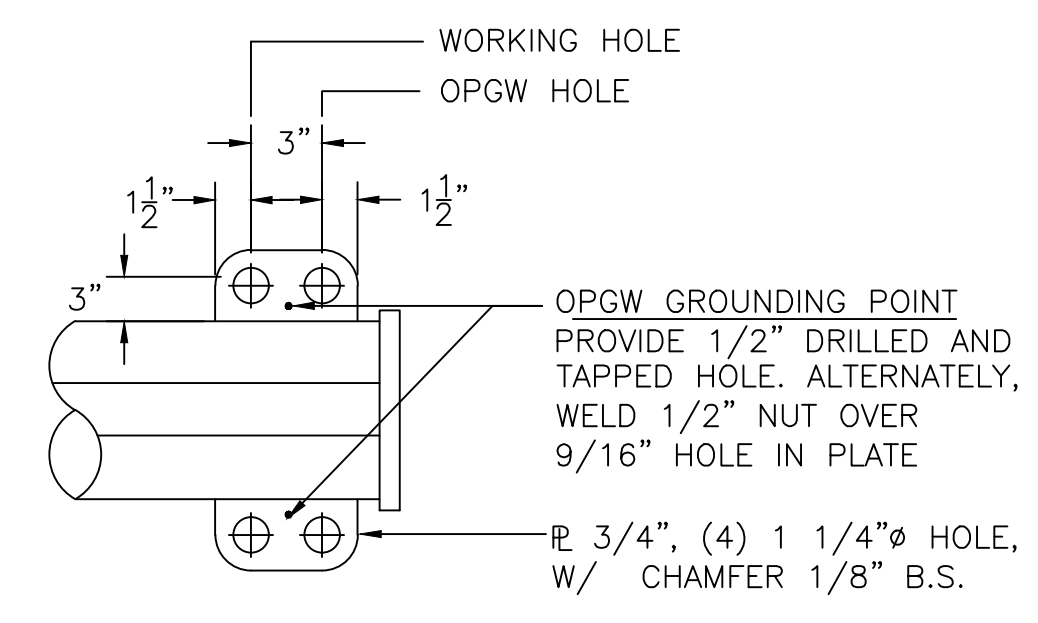
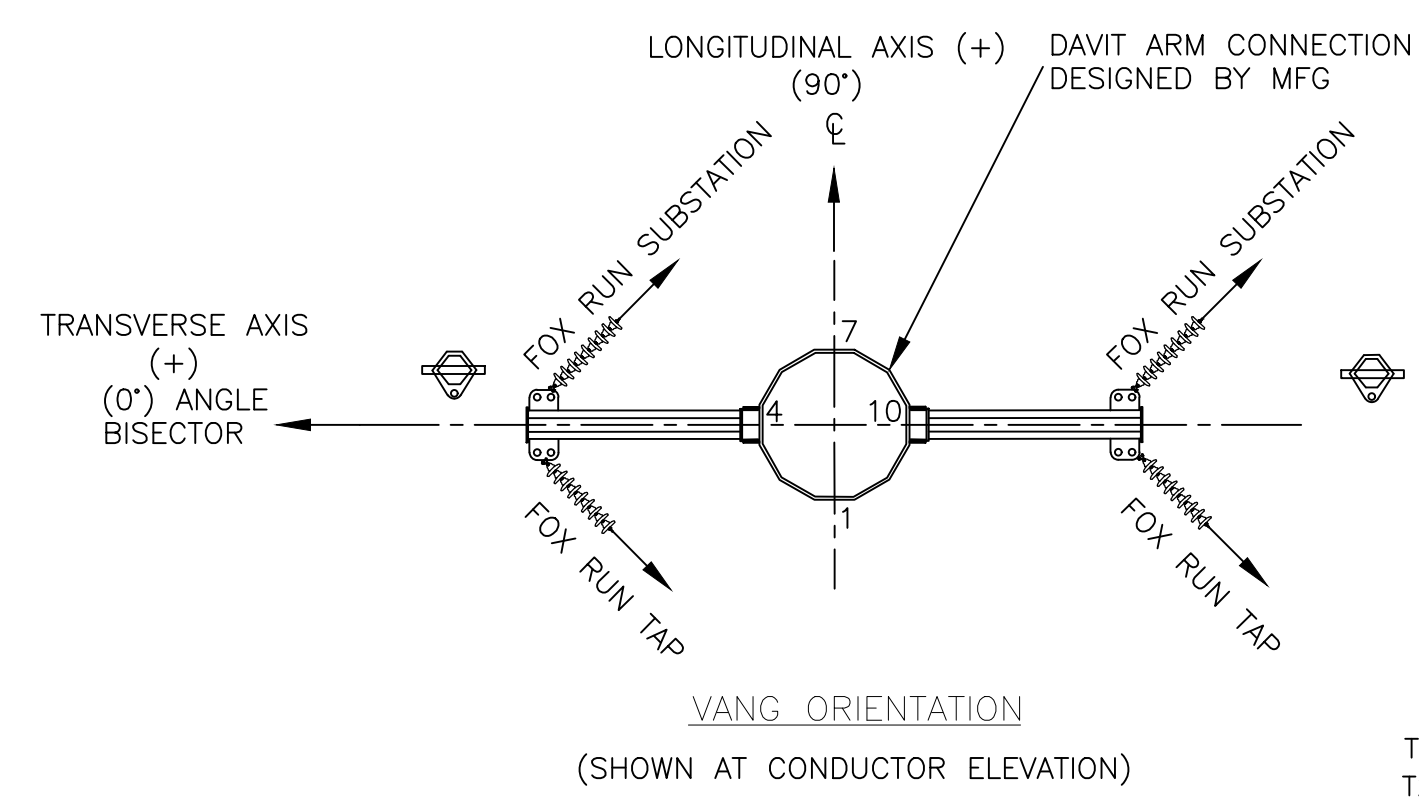
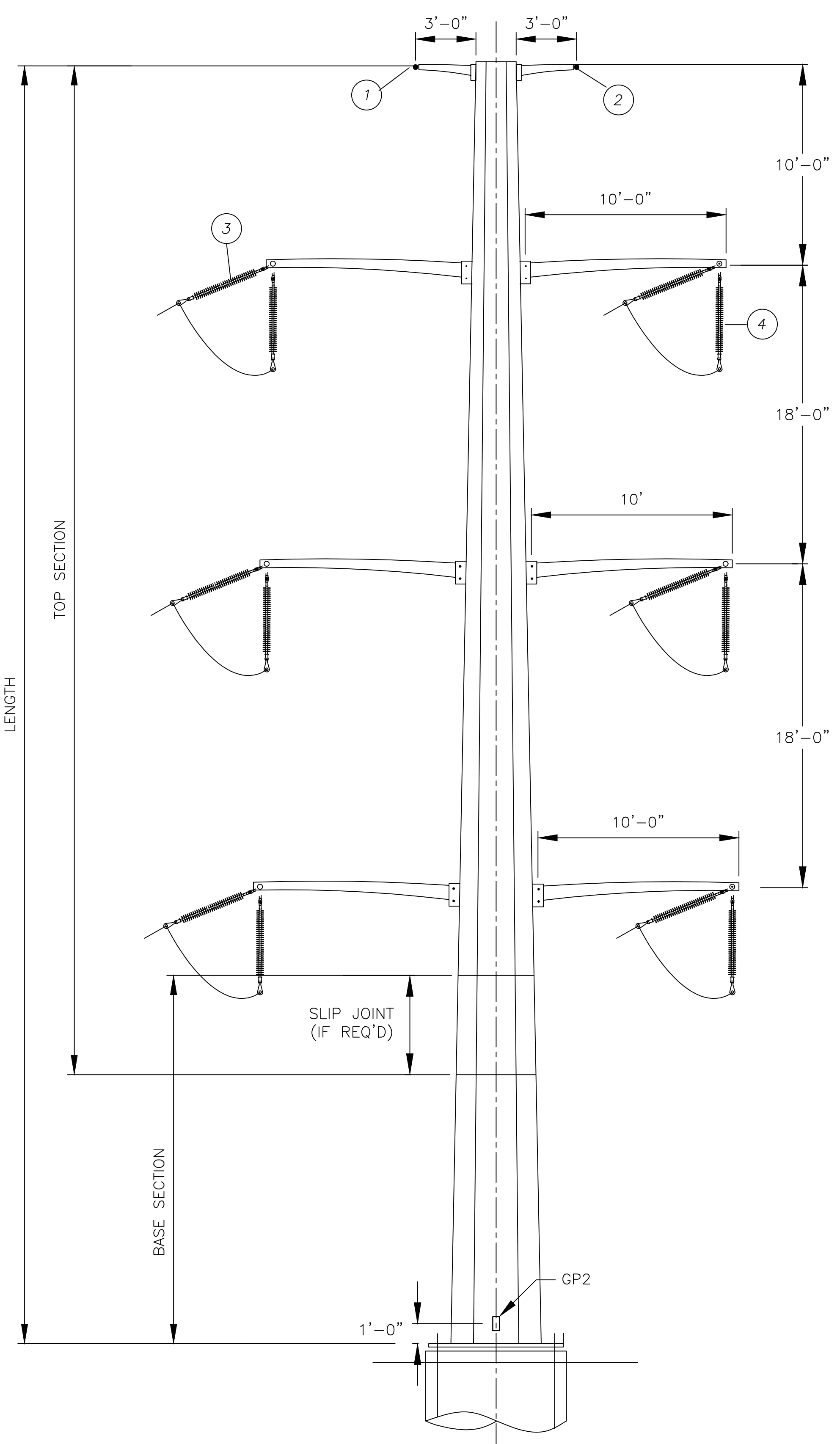
T2301-G-13-001



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/FT³

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

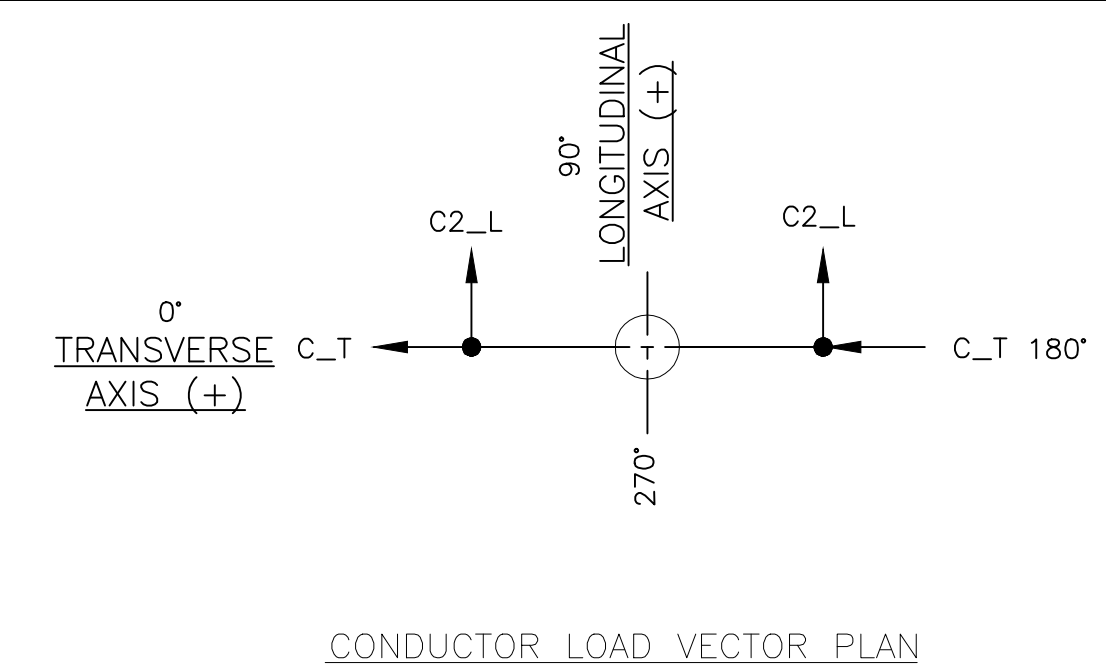
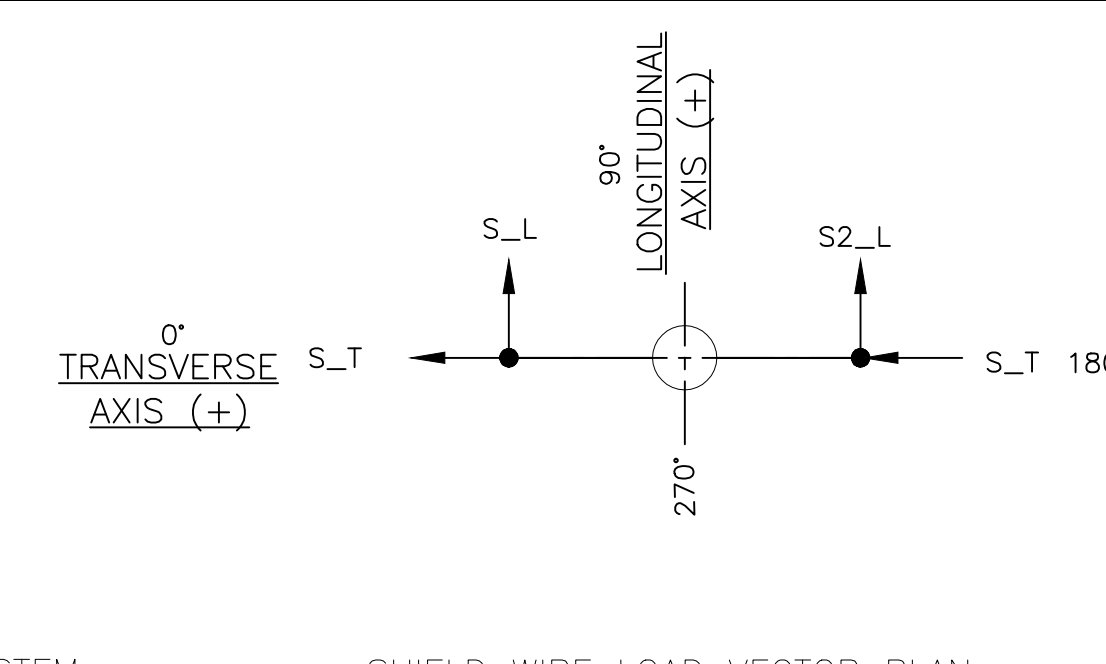
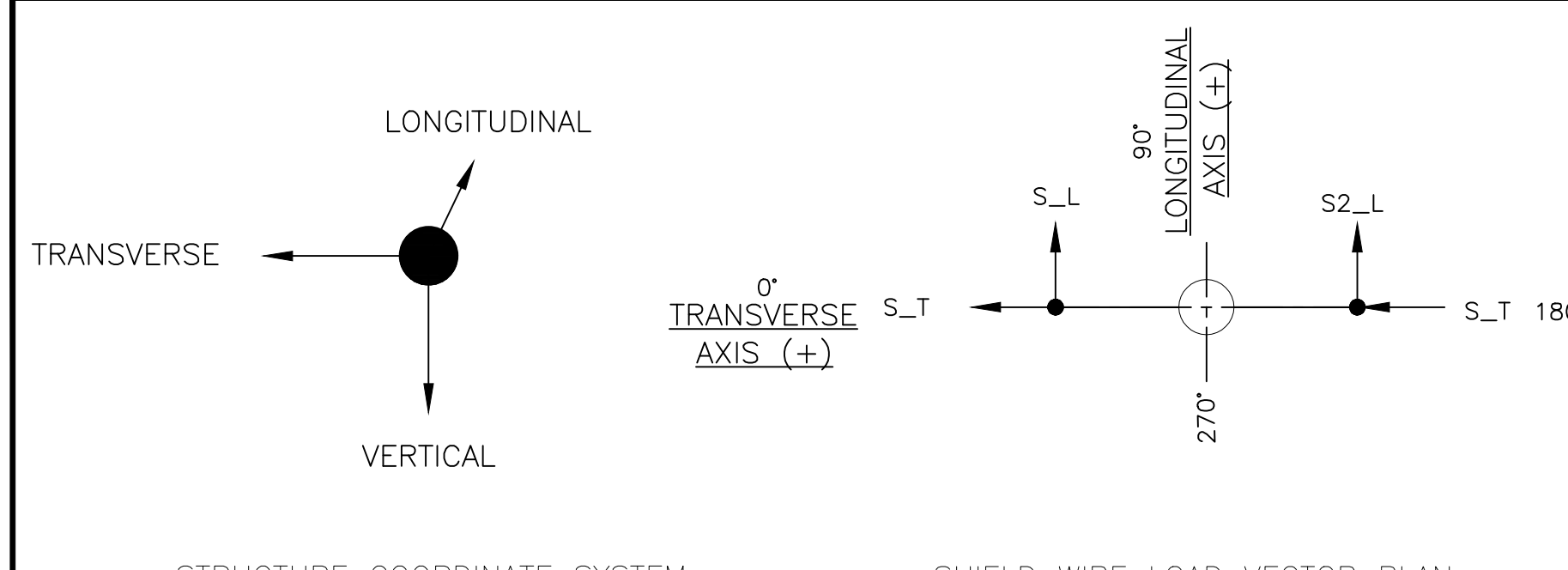
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NO. 1
 DATE: 4/12/22
 APPD: JTL
 DWN: ARO

REVISION: ISSUE PER CPN 0449 AND CPN 0458

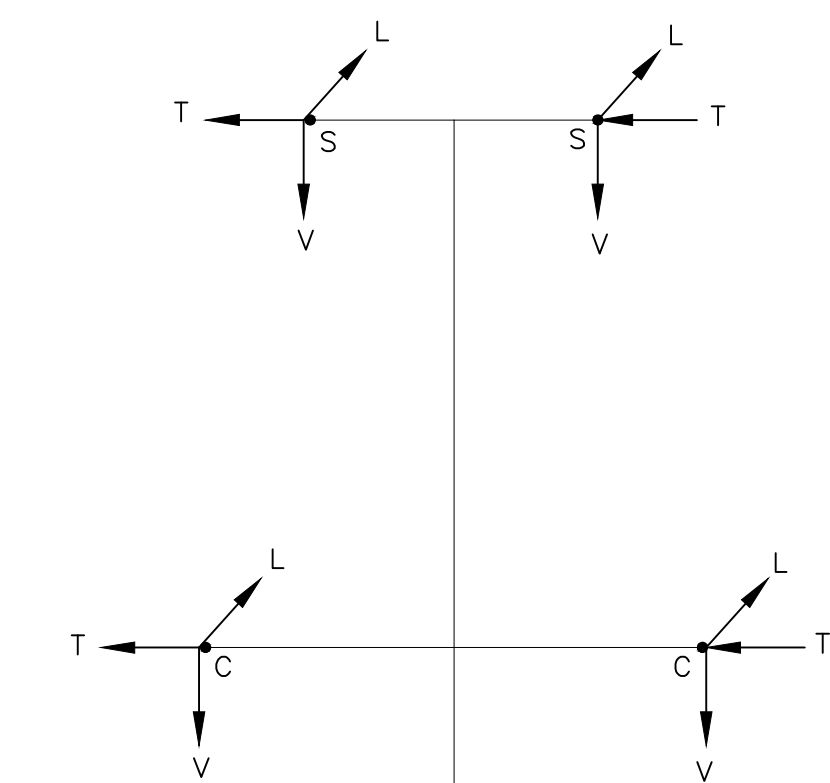
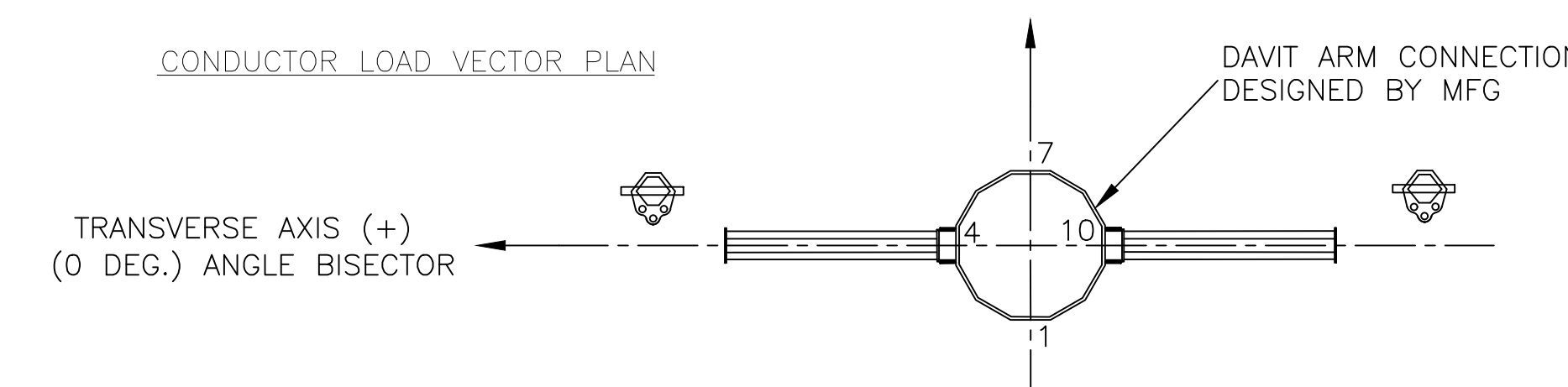
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T2301-G-13-002



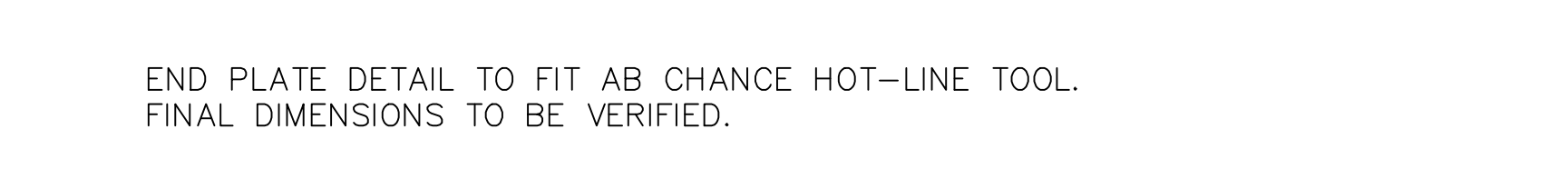
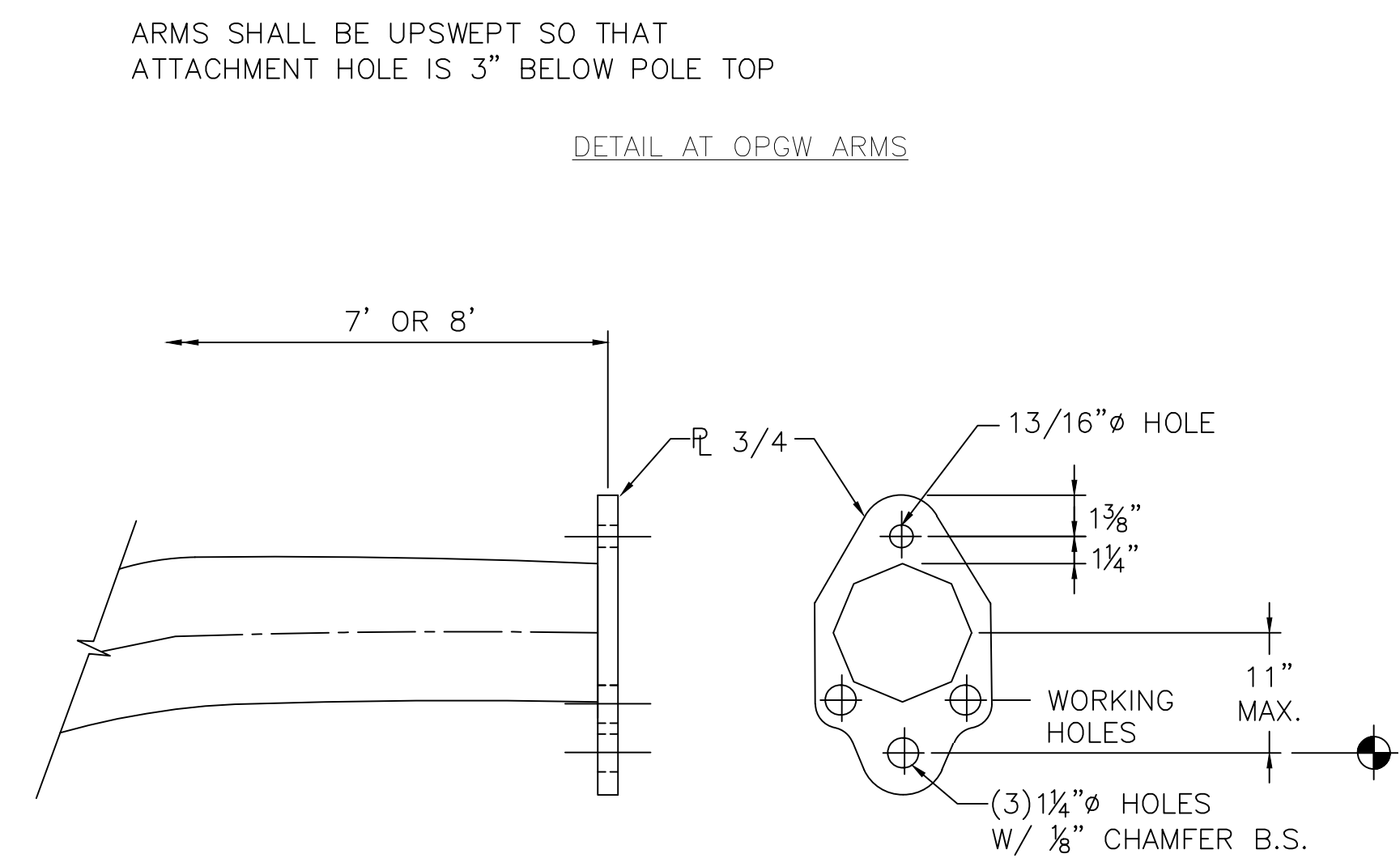
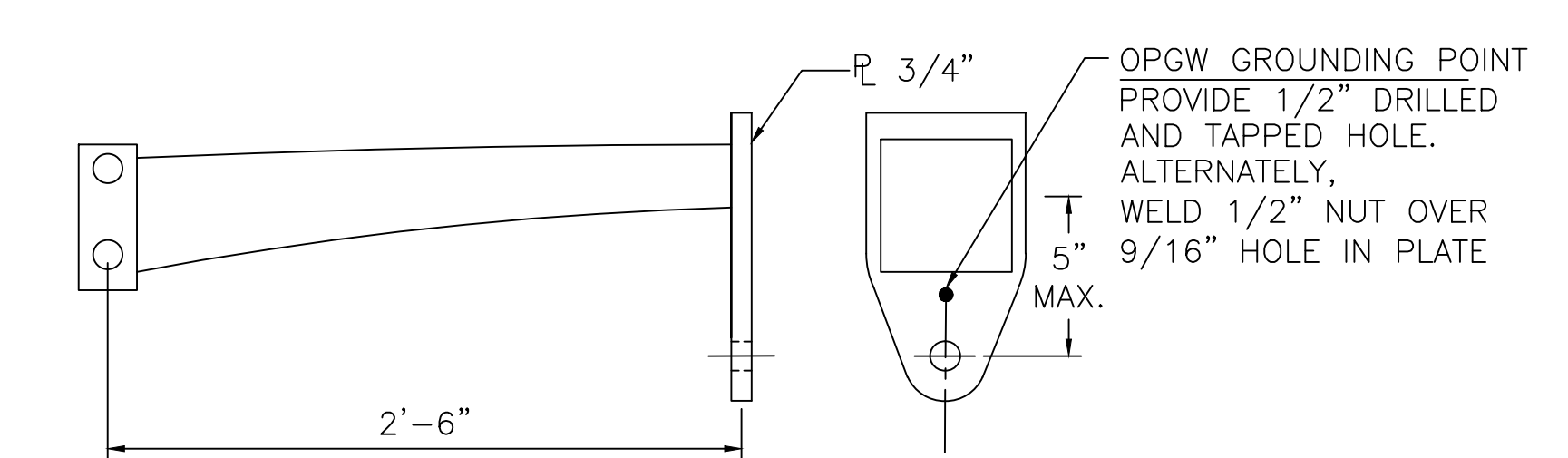
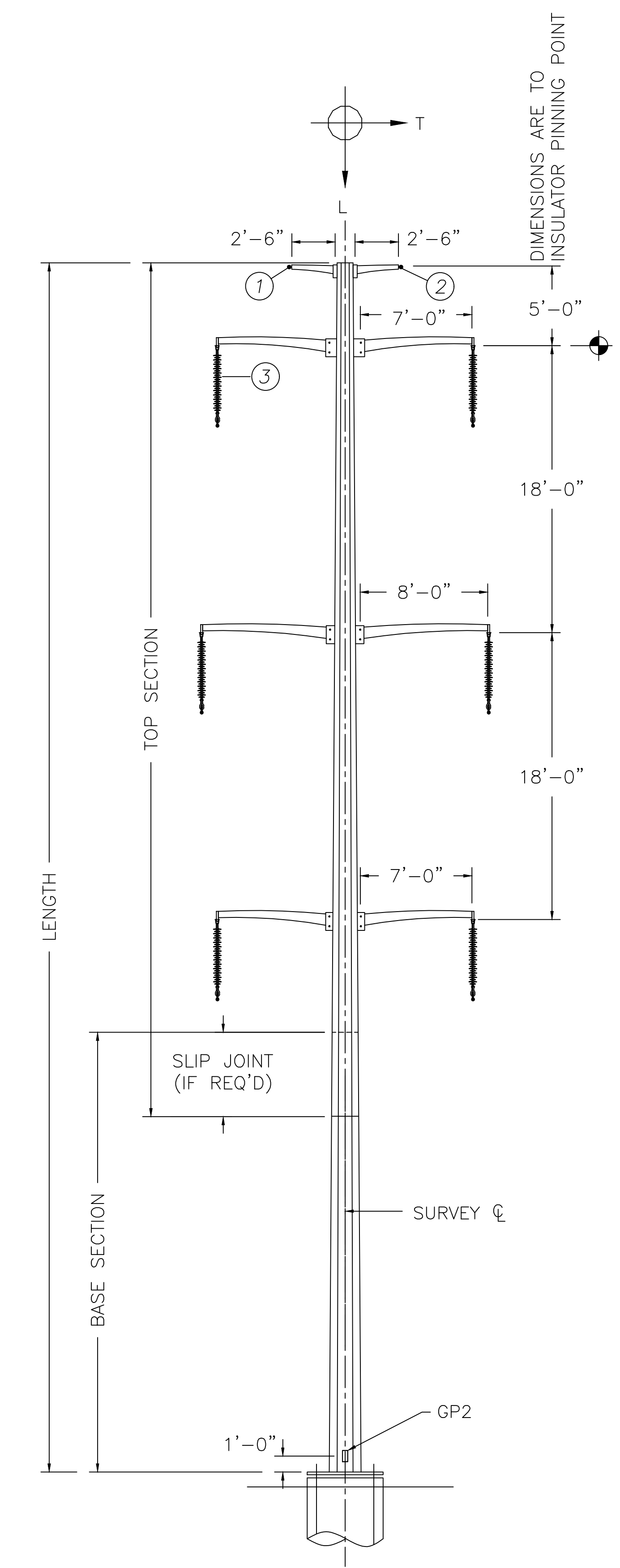
TANGENT STRUCTURE LOADS WITH OLF (KIPS)												
LOAD CASES	TEMP (°F)	WIND (PSF)	ICE (IN)	LOAD FACTORS			S			C		
				WIND	TENSION	VERTICAL	V	T	L	V	T	L
1 NESC 250B HEAVY	0	4.0	0.5	2.50	1.65	1.50	1.2	1.4	0.2	1.8	2.1	0.2
2 NESC 250C EXTREME WIND	60	20.7	0.0	1.10	1.00	1.00	1.0	1.5	0.2	1.4	2.7	0.2
3 NESC 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



- 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/FT³
- NOTES:
1. ALL DESIGN AND FABRICATION SHALL BE IN ACCORDANCE WITH TRI-STATE "TRANSMISSION LINE TAPERED TUBULAR STEEL POLE STRUCTURES" SPECIFICATION.
 2. LOADS ARE ULTIMATE VALUES AND INCLUDE LOAD FACTORS FOR EACH LOAD CASE.
 3. 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.
 4. 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.
 5. LIMIT POLE DEFLECTION TO 2% OF STRUCTURE HEIGHT FOR DEFLECTION LOAD CASE. ALL WIRES INTACT. CAMBER MAY BE UTILIZED TO COMPLY.
 6. APPLY WIND ON STRUCTURE WHICH RESULTS IN THE MOST SEVERE EFFECT.
 7. STRUCTURE TO BE DESIGNED FOR INTACT AND FULL DEADEND LOADING CONDITIONS FOR LOAD CASES 1 - 5.
 8. MATERIAL SHALL BE WEATHERING STEEL.
 9. DAVIT ARMS SHALL ATTACH TO THE POLE WITH A BOLTED CONNECTION TO A WELDED THROUGH ARM BRACKETED AND DESIGNED BY THE MANUFACTURER.
 10. 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.
 11. SEE DWG. T2301-G-13-0XX FOR STEEL DETAILS.
 12. LOCATE DETAIL 2 GROUNDING PADS ON BOTH SIDES OF ALL CONNECTIONS AND SPLICES.
 13. ANCHOR BOLTS SHALL BE EQUALLY SPACED AROUND THE BASE PLATE WITH 2.5" MINIMUM SPACE BETWEEN BOLTS.
 14. ANCHOR BOLT TEMPLATE AND EACH POLE SECTION SHALL BE MARKED ON THE ANGLE BISECTOR USING OBVIOUS MARKINGS AIDING CONSTRUCTION.
 15. 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

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4/12/22

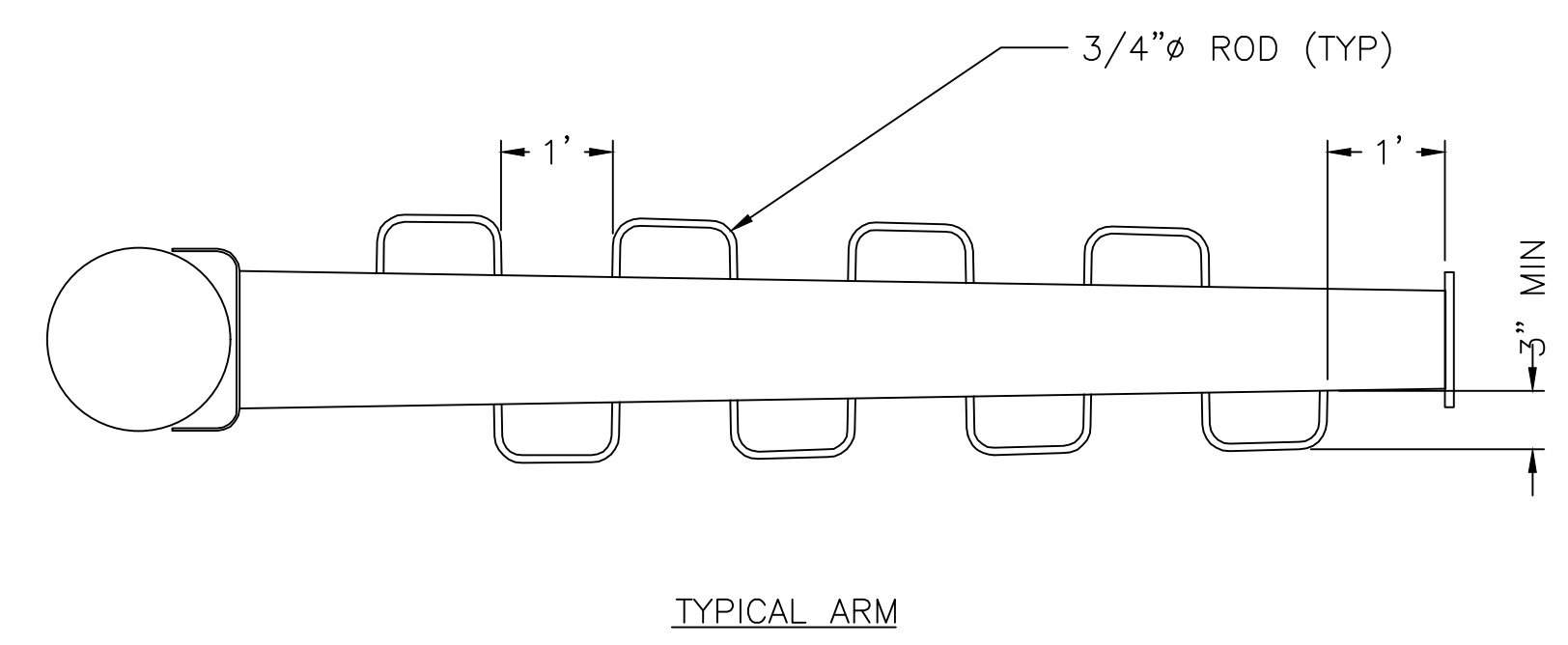
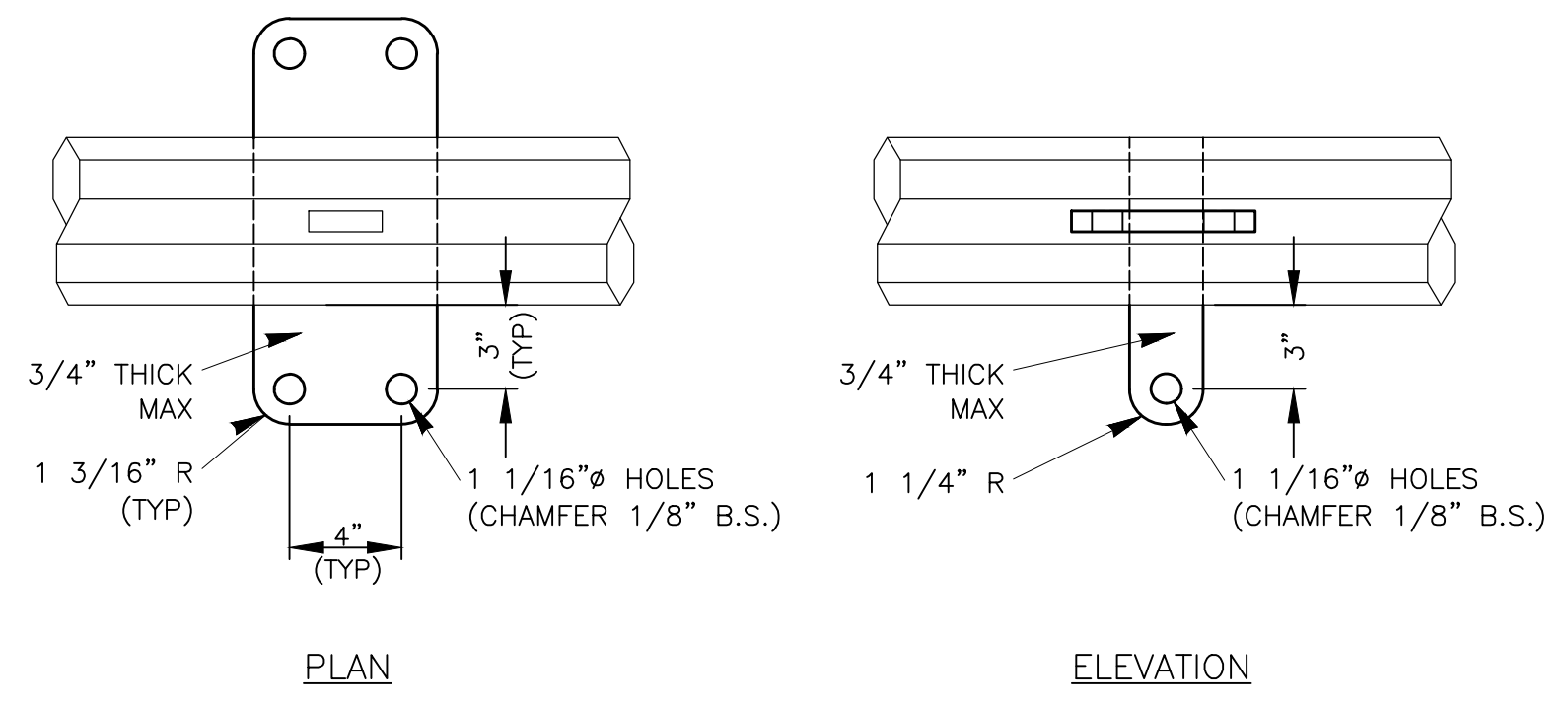
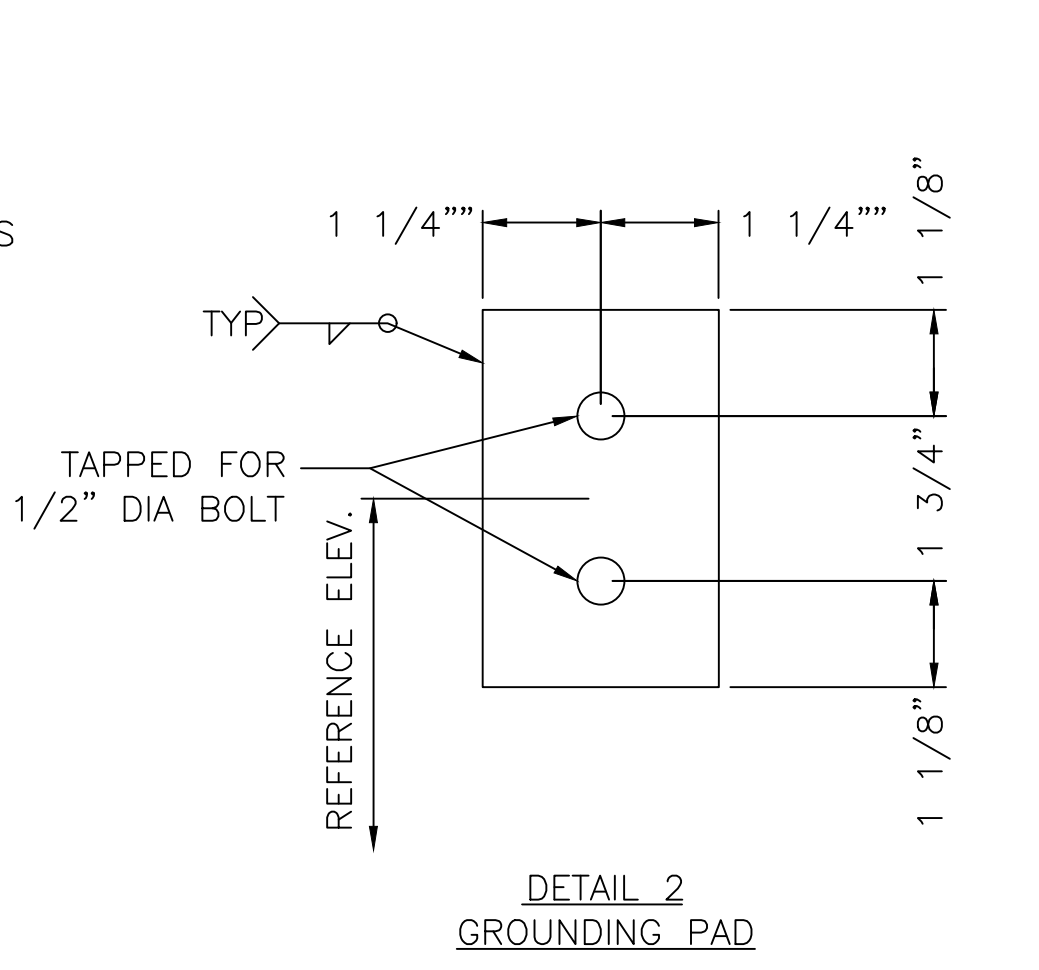
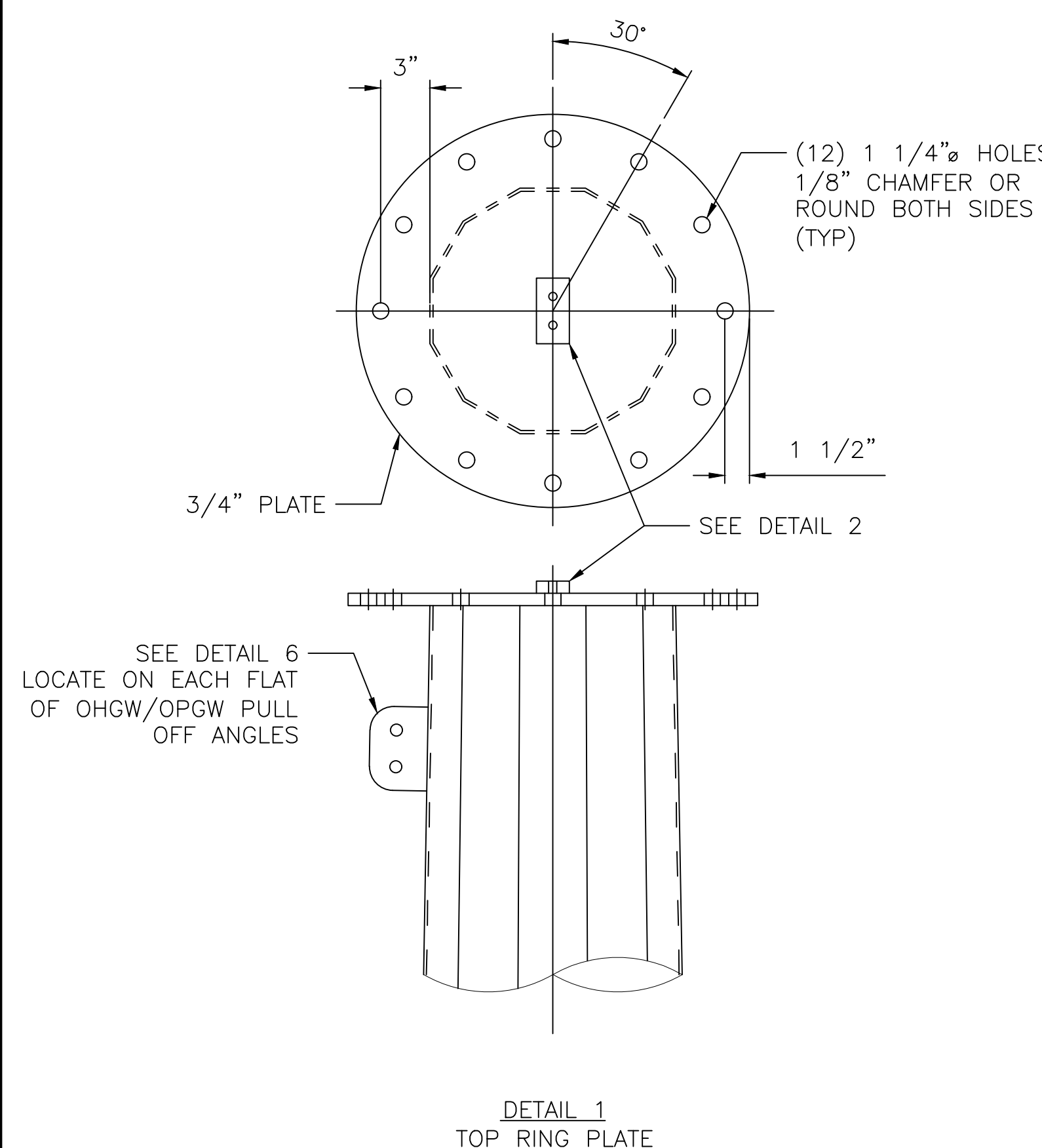
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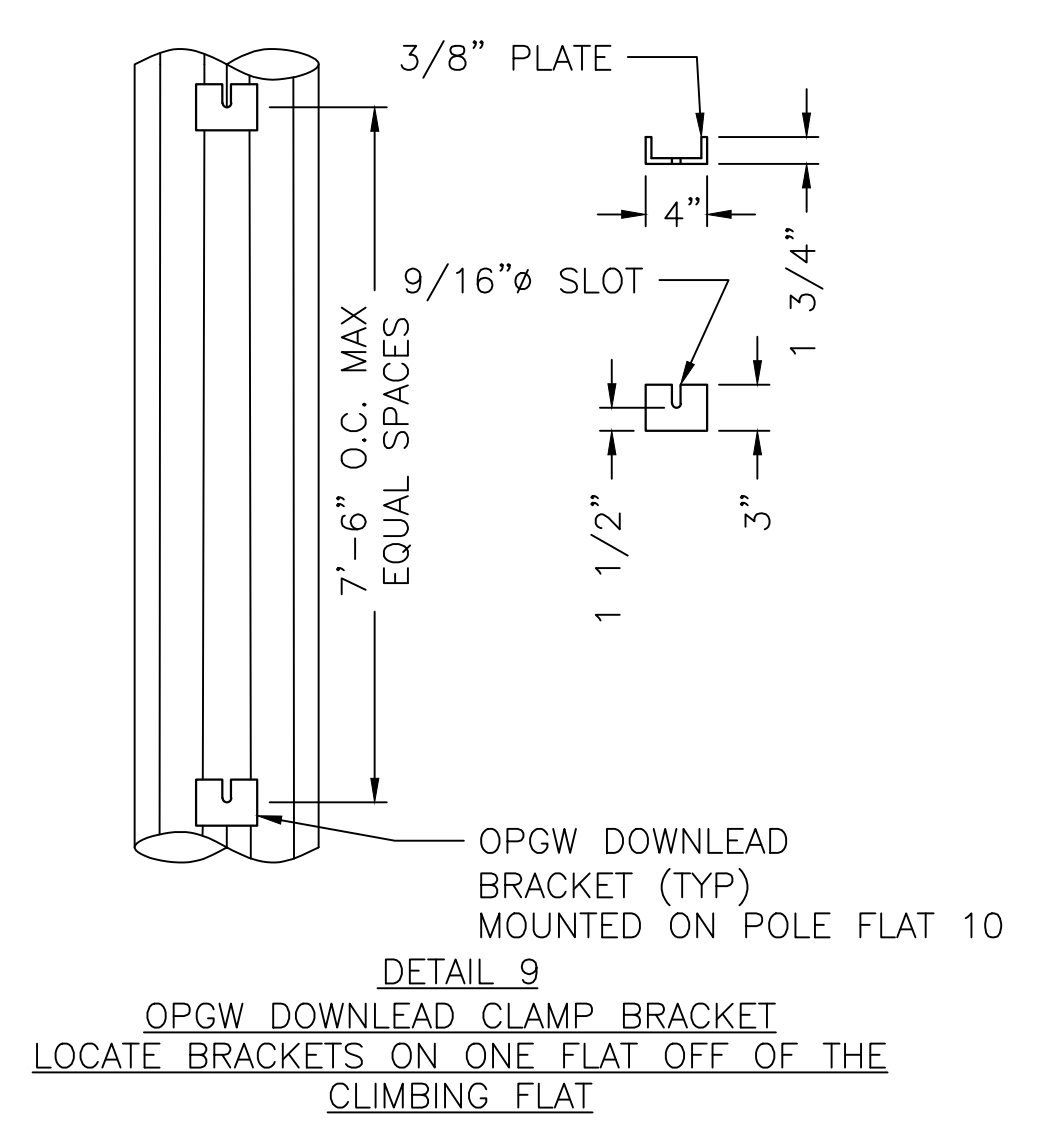
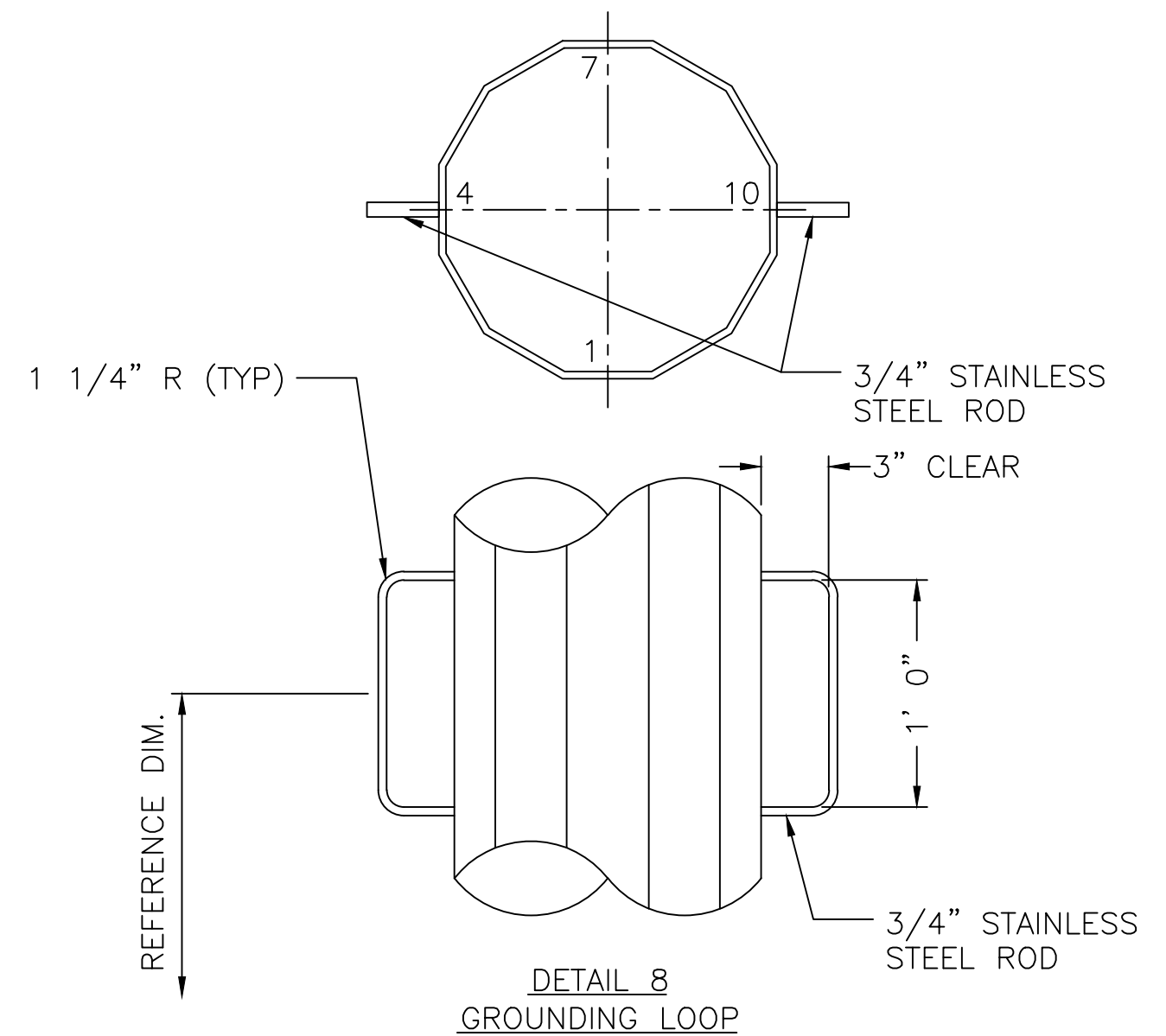
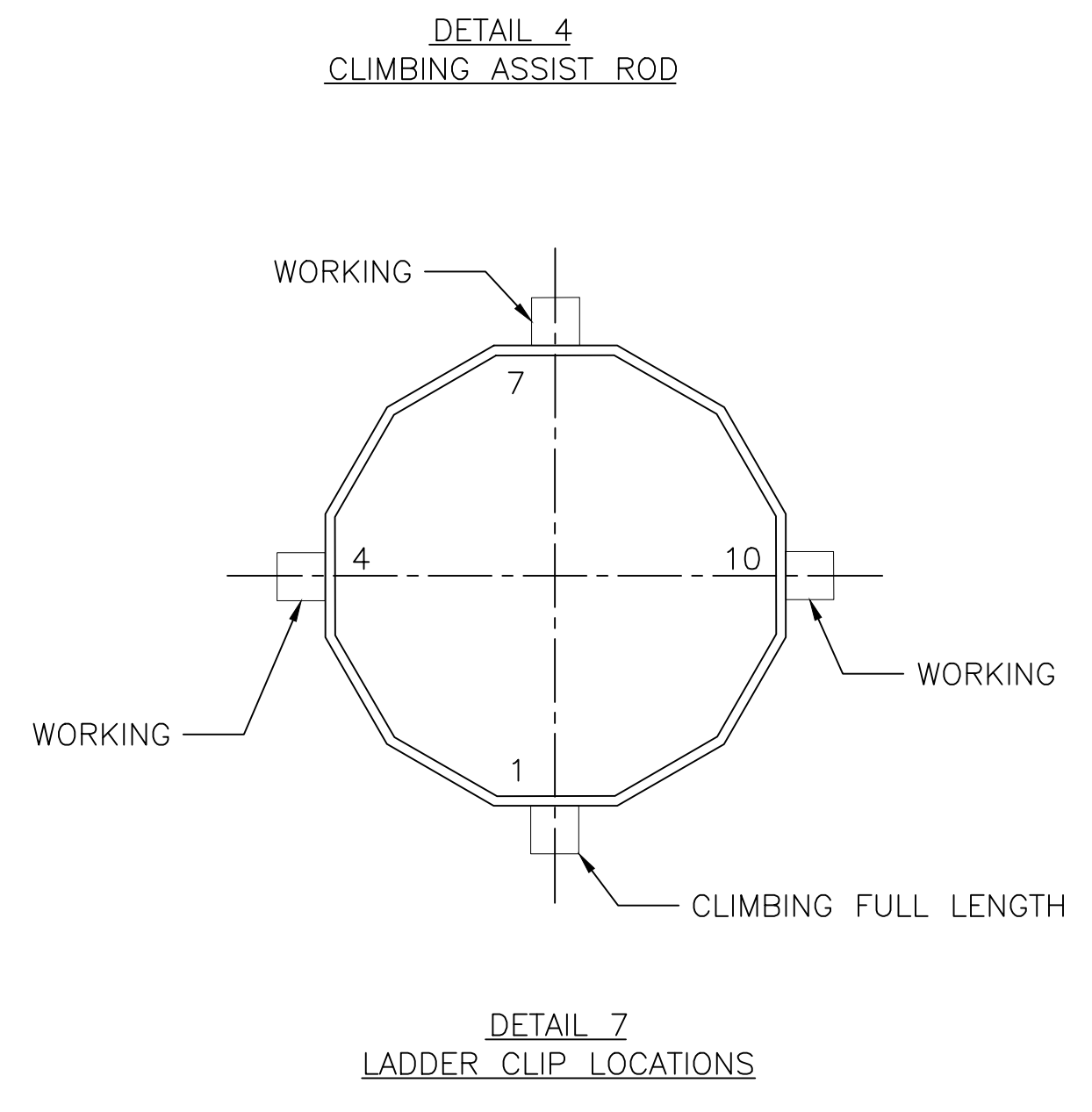
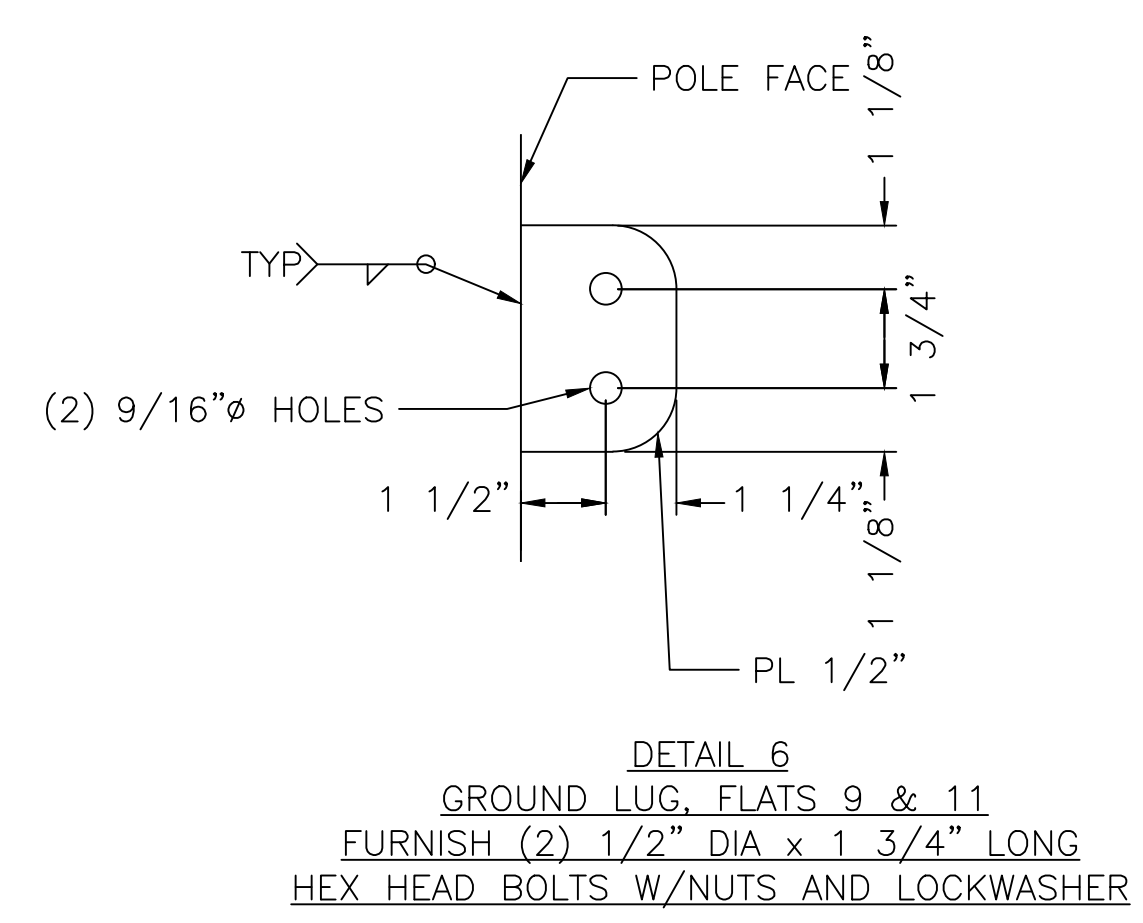
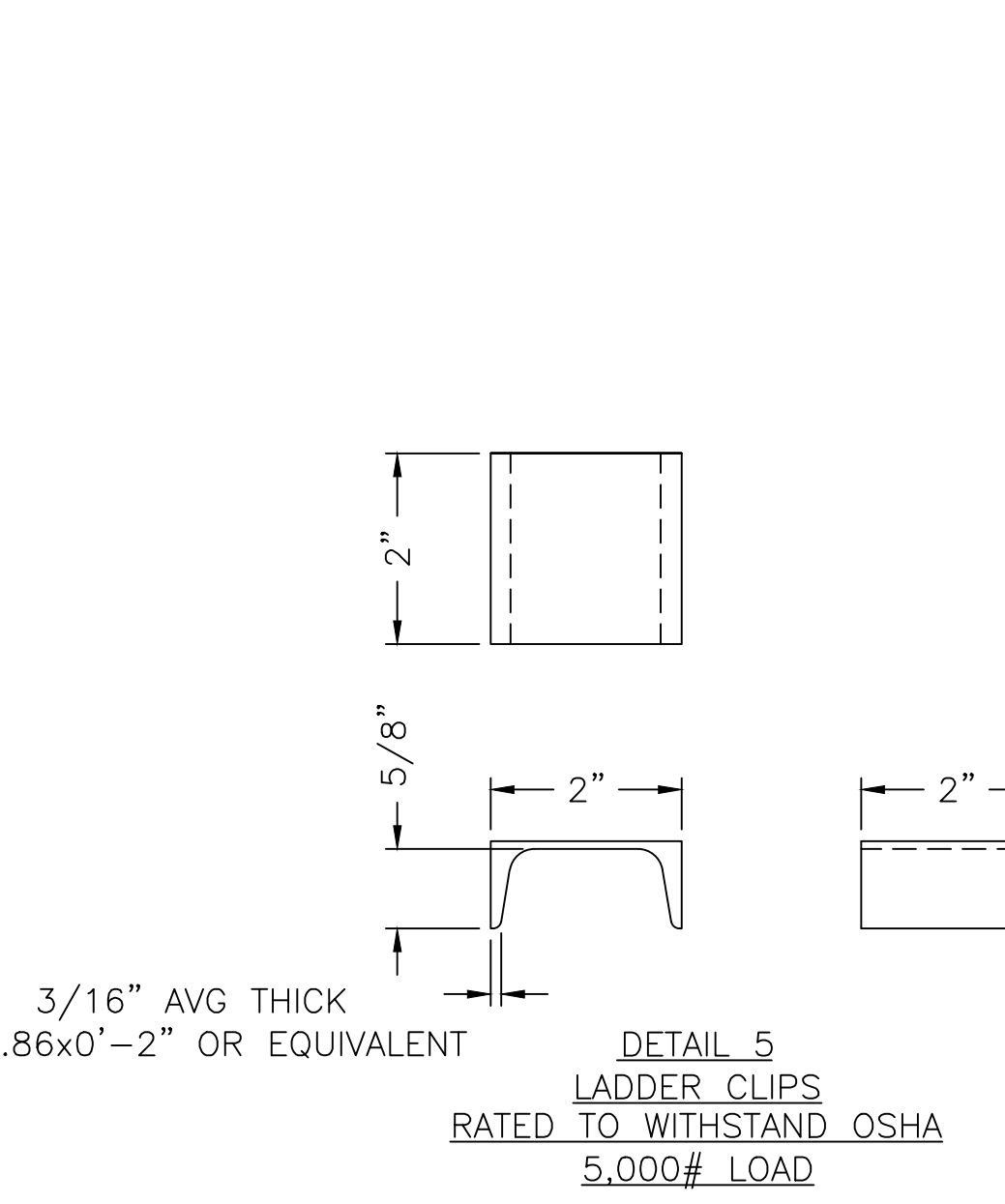
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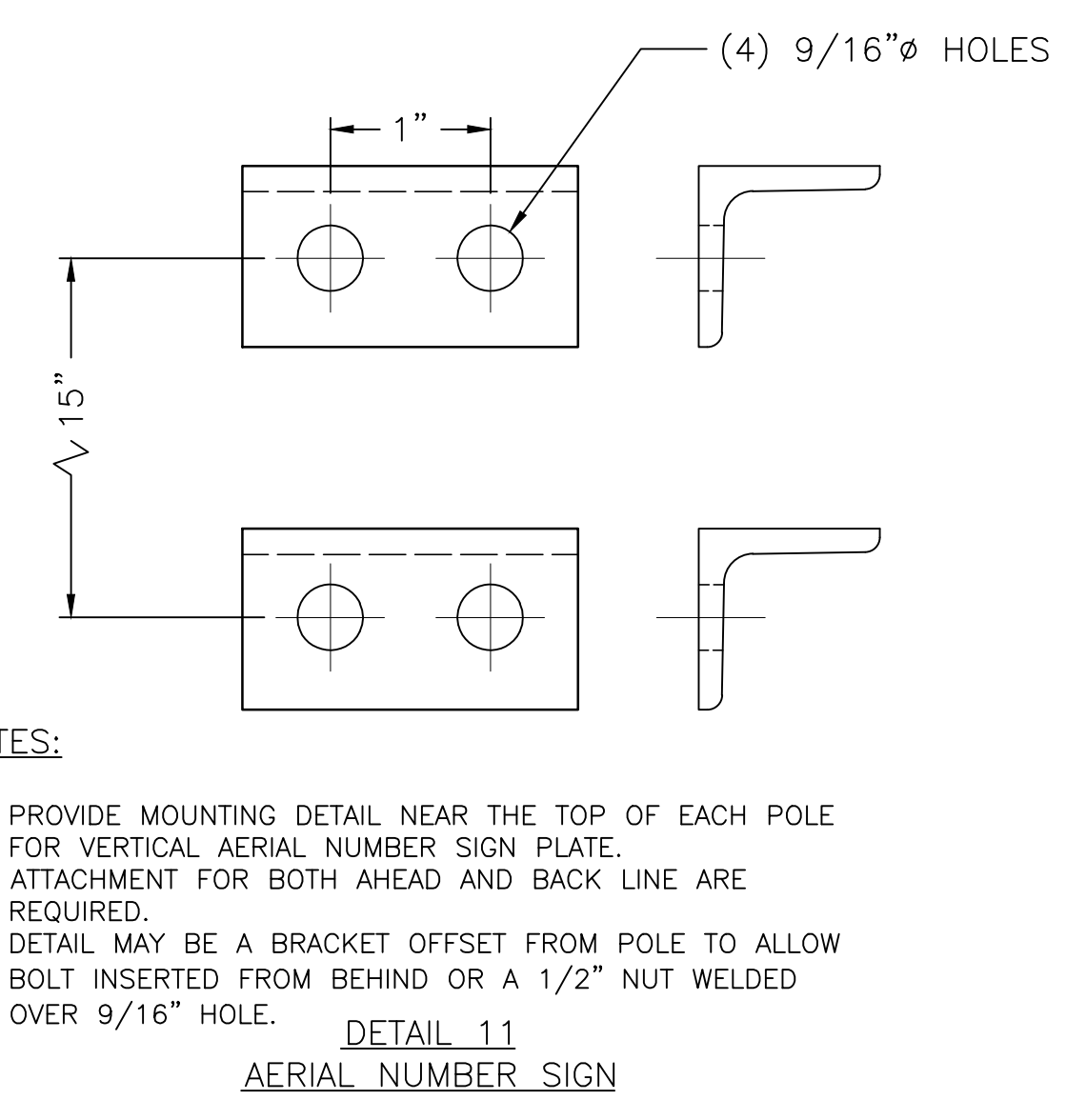
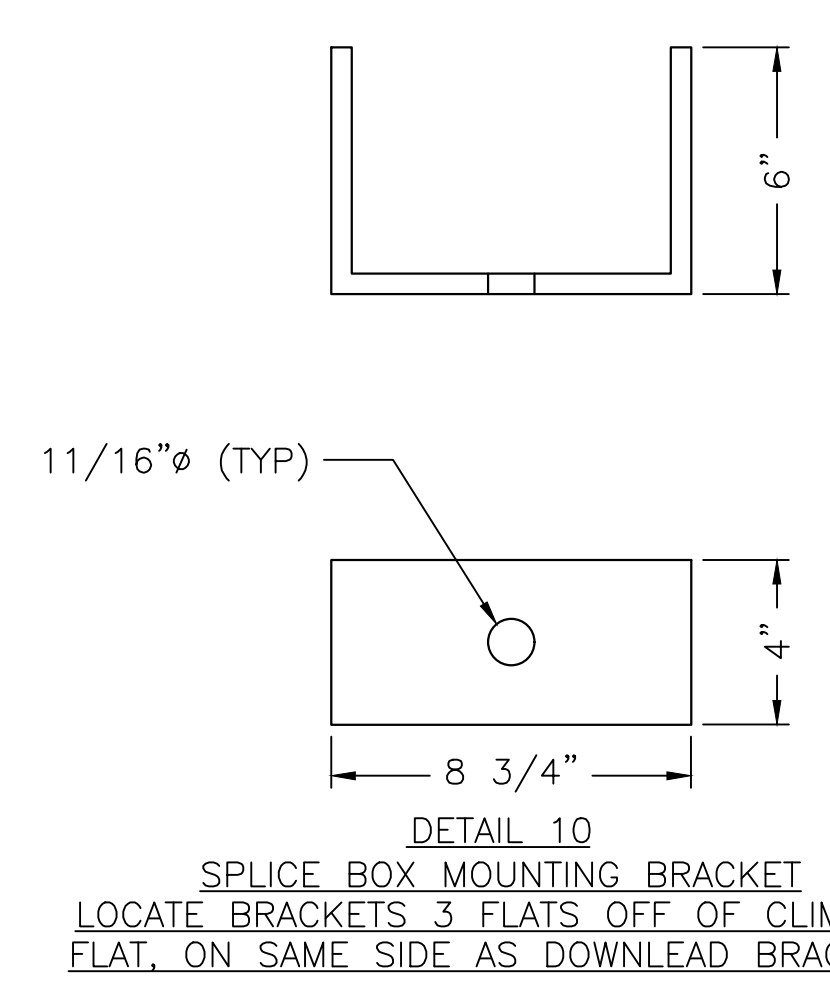


NOTES:
1. CLIMBING ASSIST ROD TO BE WELDED TO ALL ARMS ON BOTH SIDES AS SHOWN.
2. ROD SHALL EXTEND TO WITHIN 1'-0" TO 1'-6" OF ARM CONNECTION.
3. EACH ROD TO SUPPORT 5,000 LB. VERTICAL LOAD AT ANY LOCATION.



Preliminary

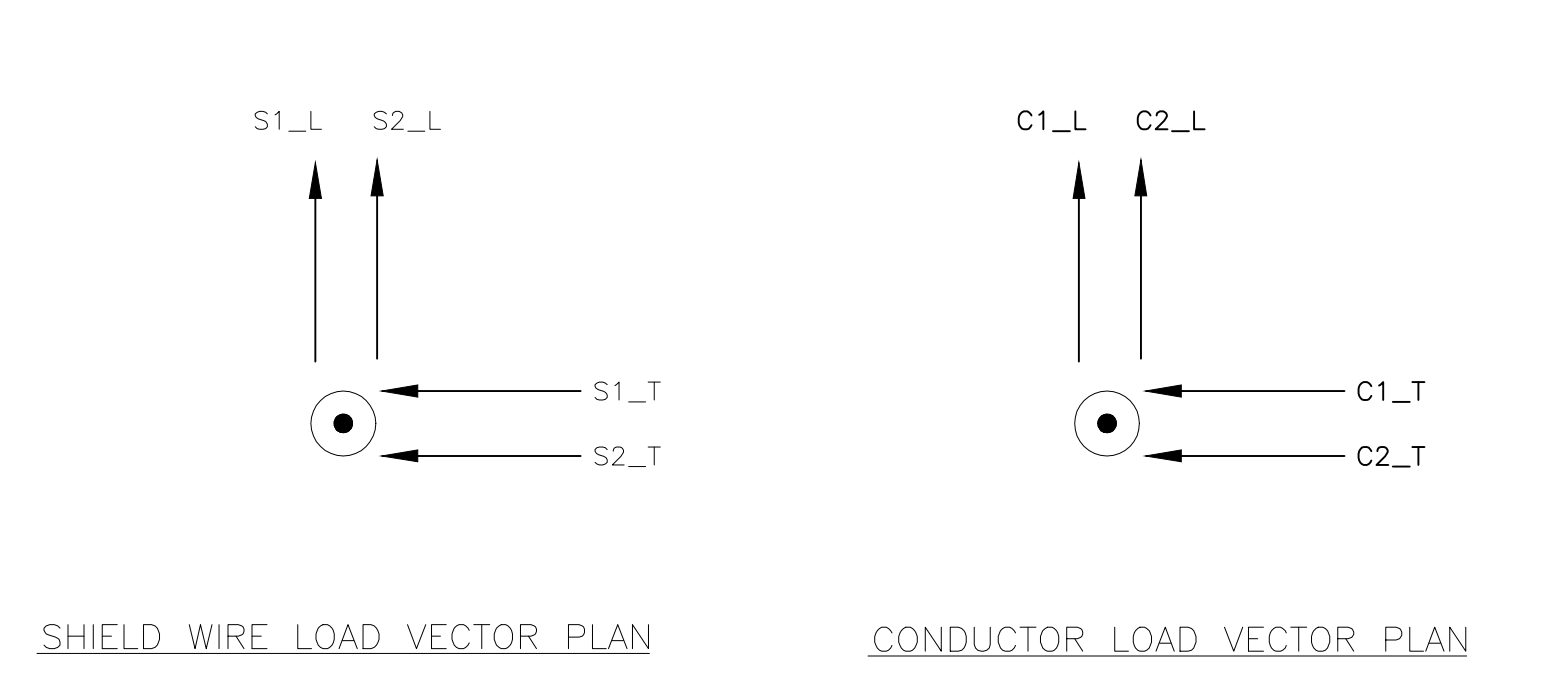
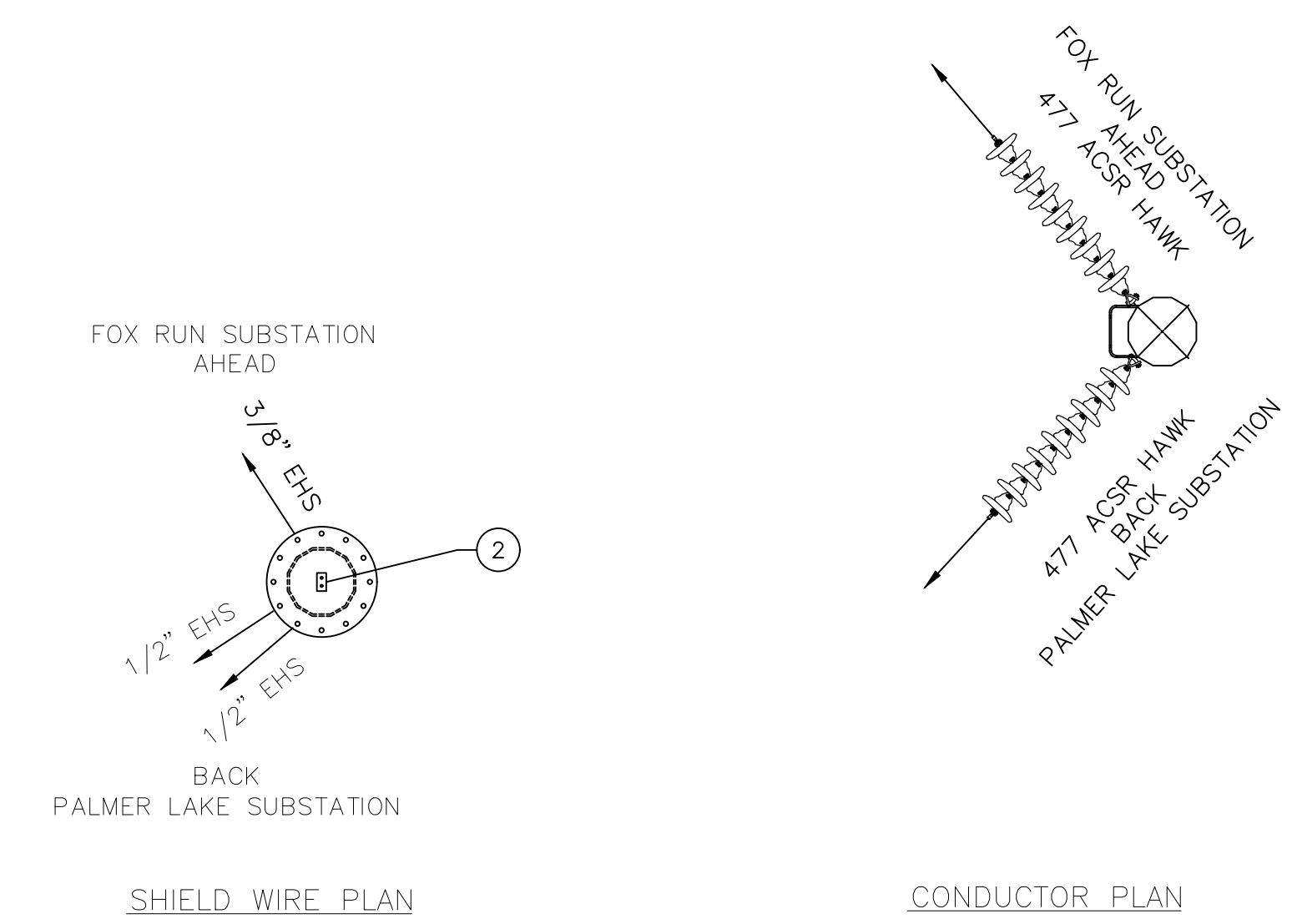
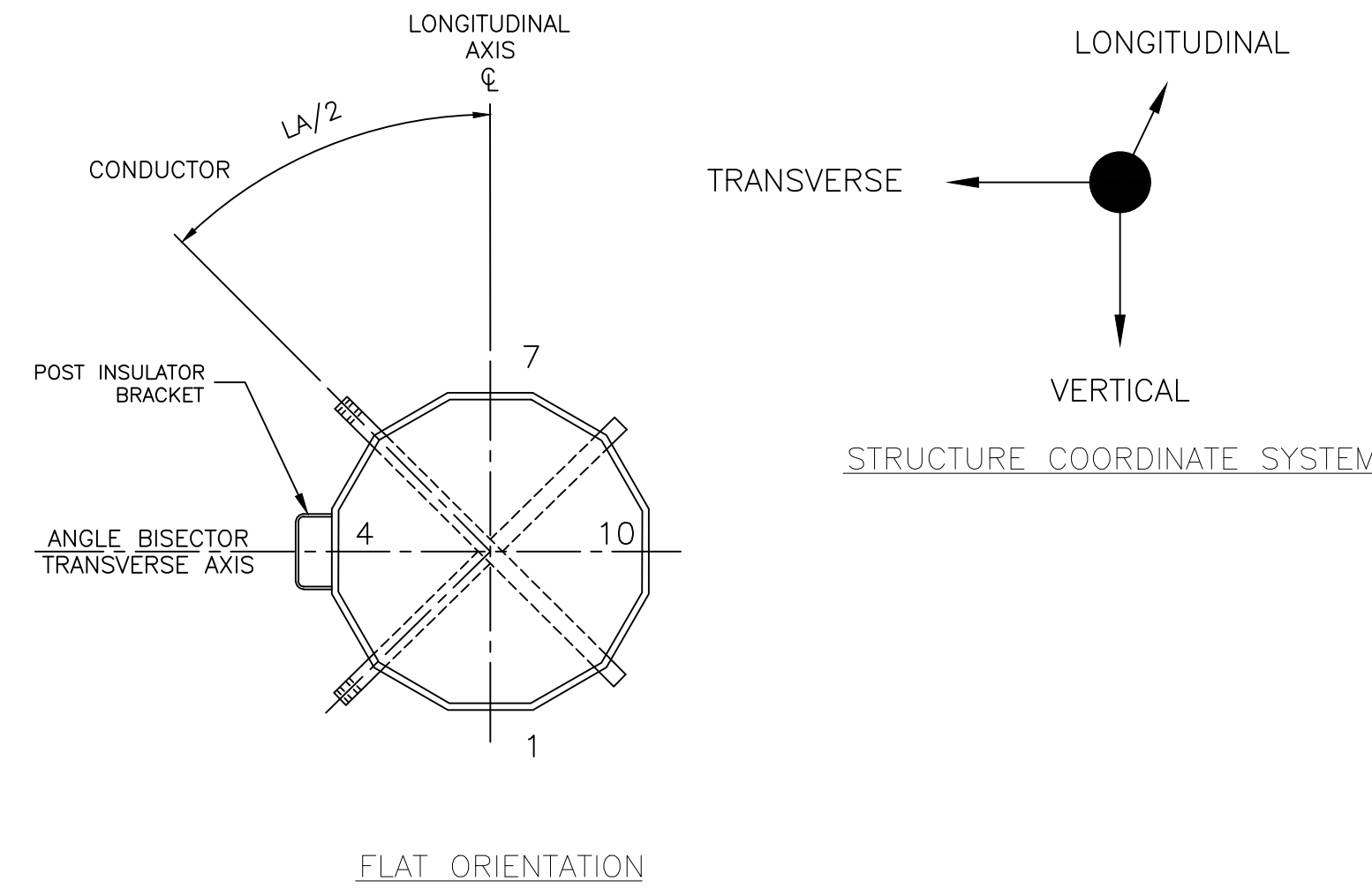
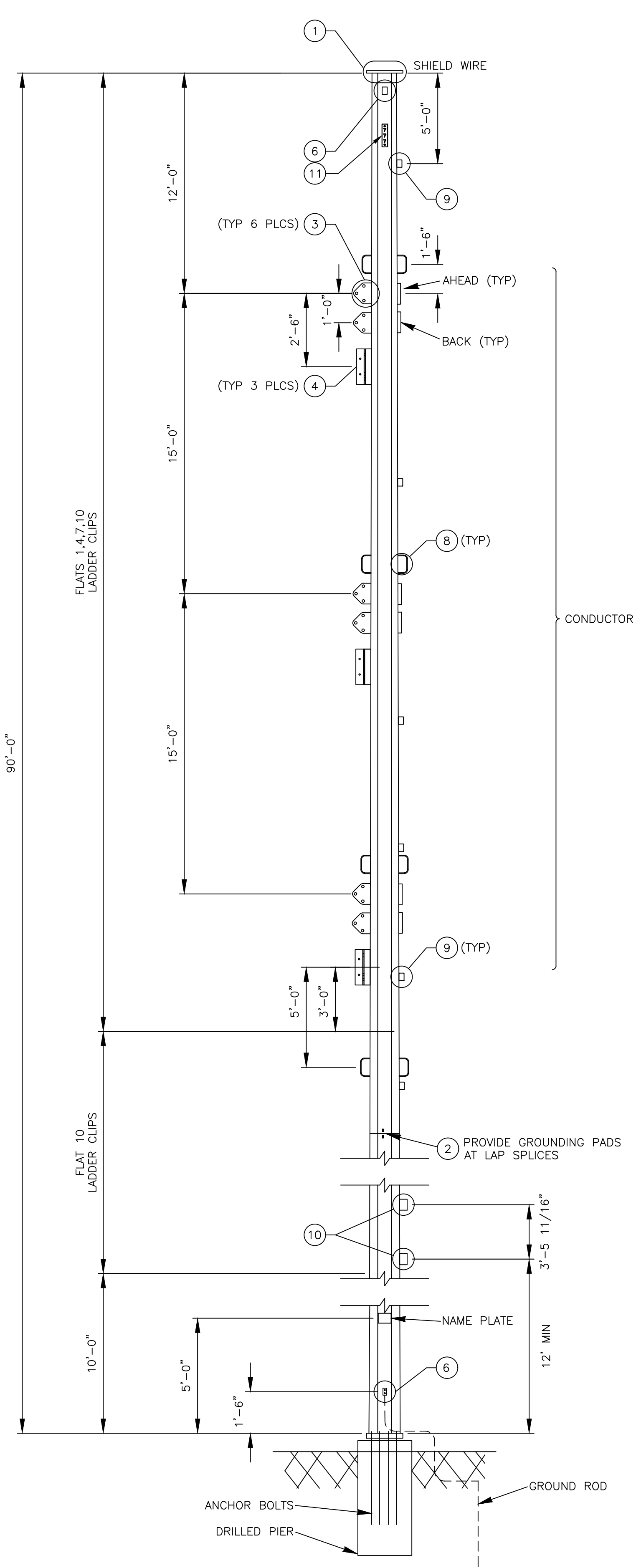
4/14/2022



NOTES:
1. 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 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.

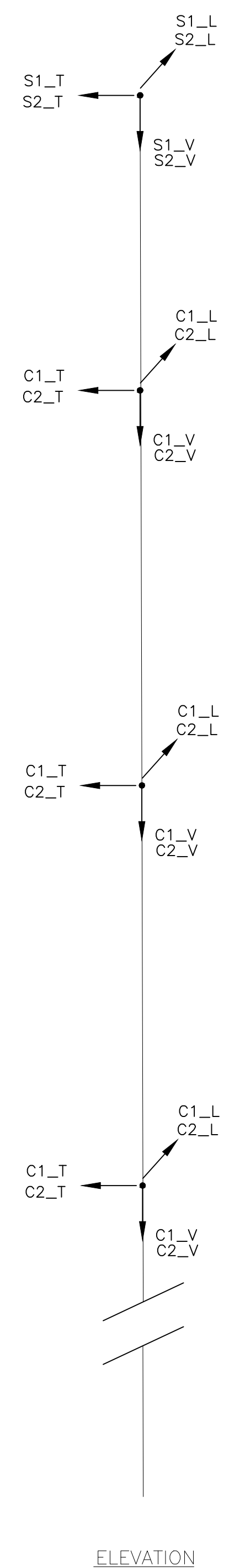
Drawing Title		Reference Drawings	
Migr.		Dwg. No.	
N.F.		Revision	
JTL		ISSUE PER CPM 049 AND CPM 045B	
ARO		Date	
4/12/22		1	
7		6	
5		4	
3		2	
1		1	
FOX RUN - FOX RUN TAP		115KV	
VERTICAL DEADEND		OUTLINE AND DESIGN	
TRI-STATE GENERATION & TRANSMISSION		ASSOCIATION, INCORPORATED	
UPDATED BY: ADAOLU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



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/FT³

- 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.

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:

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

No.	Date	Dwn.	Appd.	Revision
7				
6				
5				
4				
3				
2				
1	4/12/22	ARO	JTL	ISSUE PER CPN 0449 AND CPN 0458

Dwg. No. Mgr. Reference Drawings

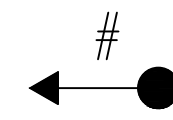
T2301-G-13-006

Fox Run Substation
Luminaire list

Φ_{Total} 333540 lm	P_{Total} 3040.0 W	Luminous efficacy 109.7 lm/W
-----------------------------	-------------------------	---------------------------------

pcs.	Manufacturer	Article No.	Article name	P	Φ	Luminous efficacy
20	Appleton	I/AMLGL8W	AREAMASTER LED 19500 LUMENS NEMA 7X7 CLEAR GLASS	152.0 W	16677 lm	109.7 lm/W

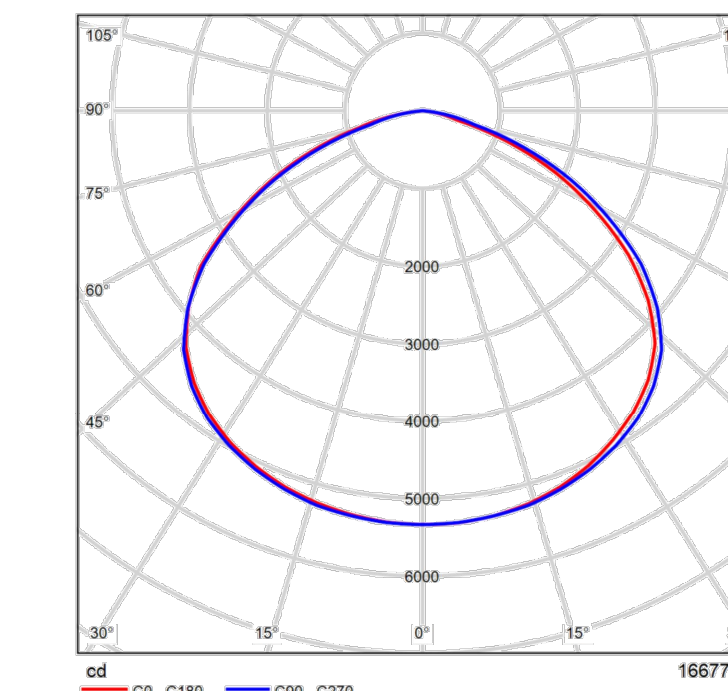
Luminaire No. & Direction



Appleton - AREAMASTER LED 19500 LUMENS NEMA 7X7 CLEAR GLASS



Article No.	I/AMLGL8WG6
P	152.0 W
$\Phi_{Luminaire}$	16677 lm
Luminous efficacy	109.7 lm/W
CCT	3114 K
CRI	83



Polar LDC

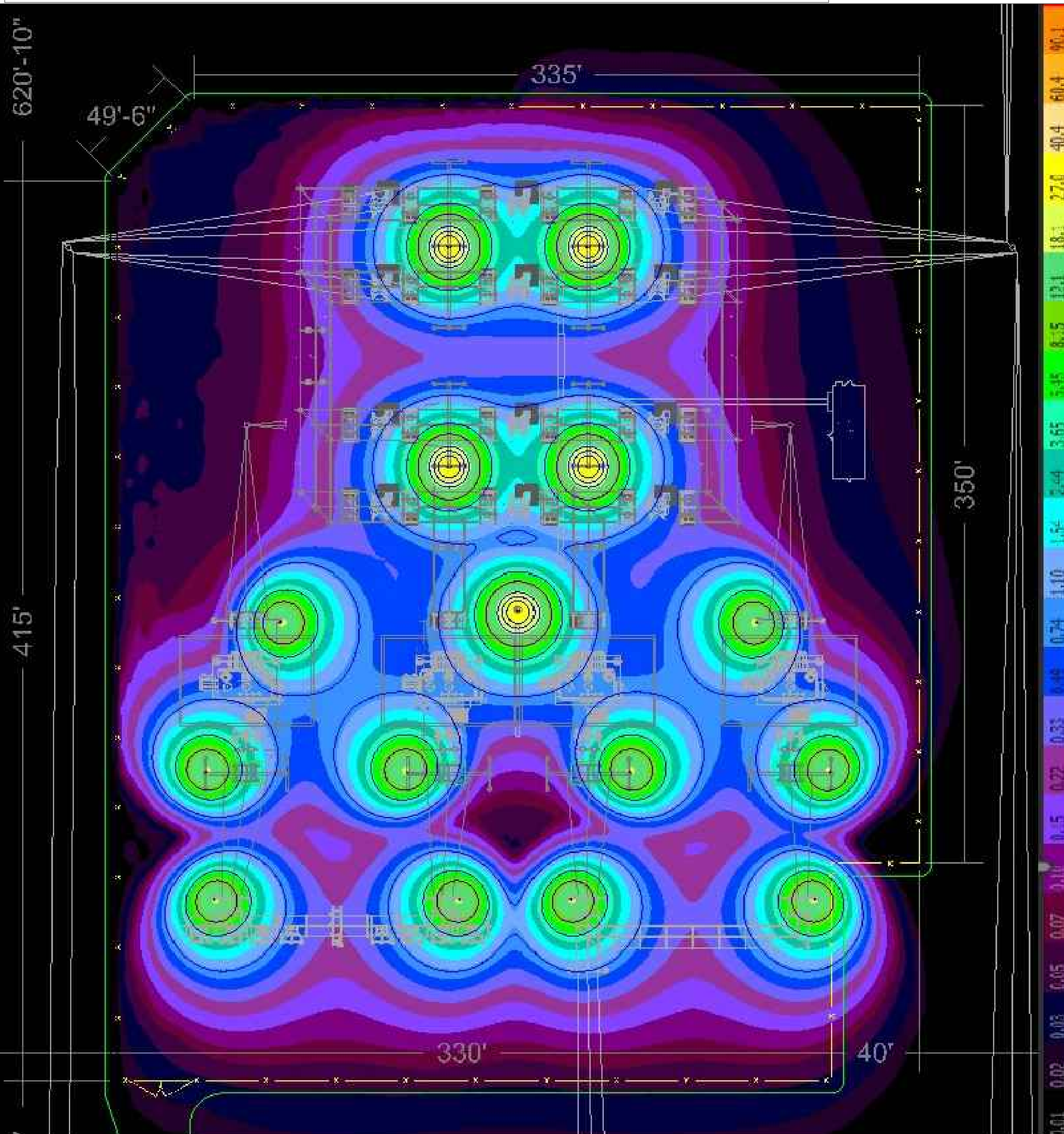
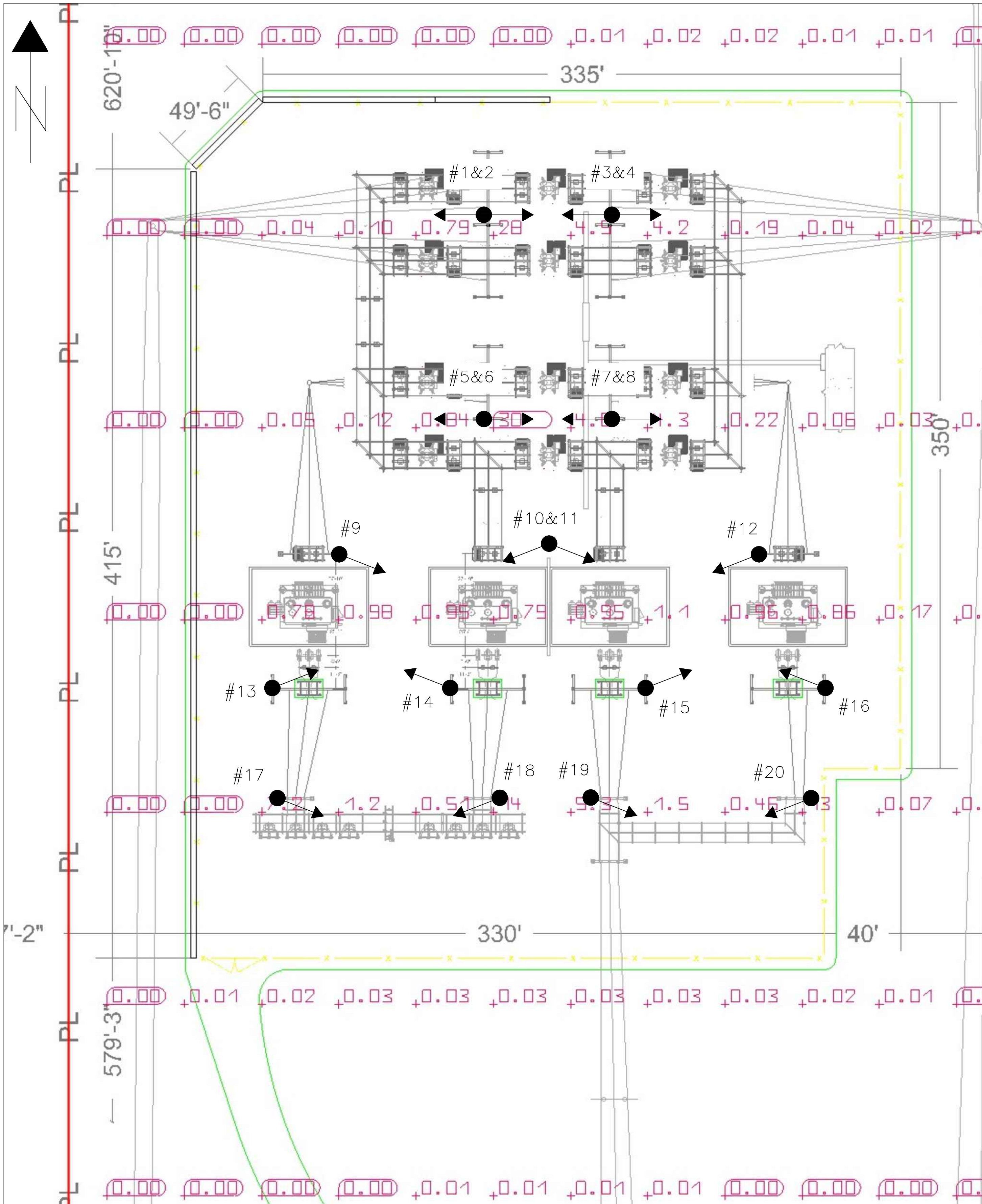
Areamaster LED Gen2 Flood light Series
Pole Mount
19500 LUMENS, 3000 K CCT, NEMA 7X7
Yoke Mount
BU-120-277 Vac, 50/60Hz,
BH-347-480 Vac, 50/60Hz
3/4" NPT Hub
7 x7 OPTICS
Warm White
CLEAR GLASS

Class 1, Division 2, Groups A, B, C, D
Class 1, Zone 2, GROUP IIC
TYPE 3R, 4, 4X
IP66/67
Suitable for Use in Wet Locations
Marine Outside (Salt Water)

Refer to catalog for additional options

NOTES:

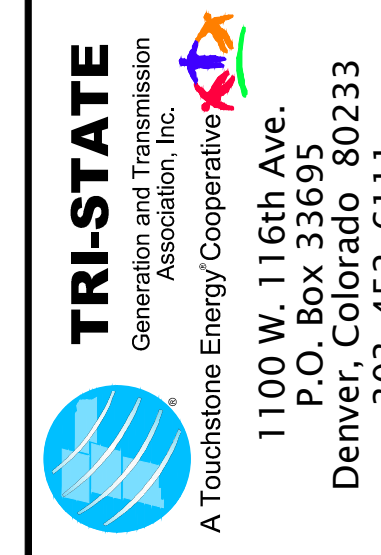
1. THE TILT ANGLE OF THE LIGHTS SHALL BE AT 20-DEGREE ABOVE HORIZON PLANE ANGLED TOWARDS THE GROUND SURFACE.
2. LIGHTS SHALL BE MOUNTED 15- FEET ABOVE GRADE.
3. CALCULATIONS SHOWN ARE MAINTAINED HORIZONTAL FOOTCANDALS TAKEN AS SHOWN IN CALCULATIONS SUMMARY.
4. FIXTURE ORIENTATION IS SUCH THAT 0 IS TO THE RIGHT OF DRAWING AND 90 IS TO THE TOP OF THE DRAWING.
5. LUMINARY LUMENS EQUAL LUMENS LEAVING LUMINARY WITH EFFICIENCY CONSIDERED.



PLAN PREPARER CONTACT:
KENT UTLEY
TRI-STATE G&T
303-254-3170
kutley@tristategt.org

FOX RUN SUBSTATION

115/69/12.47KV
LIGHTING PLAN
17090 SHAHARA RD, MONUMENT CO
PARCEL # 6121003005
TRI-STATE GENERATION & TRANSMISSION
ASSOCIATION, INCORPORATED



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

Light Plan

No.	Date	Appd.
7		
6		
5		
4		
3		
2		
1		

Revision	Dwg. No.	Mfr.	Drawing Title

RE: [EXTERNAL] PPR2244

Myers, Karl <kmyers@tristategt.org>

Mon 4/24/2023 6:02 PM

To: Kylie Bagley <KylieBagley@elpasoco.com>

 1 attachments (97 KB)

Tree Planting Plan Updated 4.19.23.pdf;

CAUTION: This email originated from outside the El Paso County technology network. Do not click links or open attachments unless you recognize the sender and know the content is safe. Please call IT Customer Support at 520-6355 if you are unsure of the integrity of this message.

Kylie:

Thank you for taking the time to discuss the landscaping plans for Tri-State's Fox Run Substation (PPR2244) with me over the phone last Friday. I would like to follow up on our conversation and provide you with more details regarding the proposed landscape plan.

As we discussed, Tri-State has been collaborating with the Caldwell's, who own the property just west of the new substation, to address their concerns regarding the visibility of the transmission structure from their property. Although they have been aware of the substation for some time, they recently realized that the transmission structure would be closer and taller than they expected.

Tri-State is limited in our ability to add trees to on our parcel because it would be hazardous to the safe operation of the facility. We opted instead to compensate the Caldwell's to plant trees on their property. The trees will be planted where they want them for maximum screening effectiveness, and they will also install a drip irrigation system to keep them alive and thriving.

Tri-State will be covering all the Caldwell's landscaping expenses, including a contingency to account for any trees that do not survive. The Caldwell's are amenable to this arrangement, have no further concerns with the substation development, and we will shortly have a signed agreement to this effect.

Please find attached a landscape plan that shows the proposed layout of 28 trees that will be added to the Caldwell landscape. I trust that this plan provides you the additional landscaping information you requested as the county completes its review of our development plan.

Please keep me posted on the review and acceptance of this information. If you have any questions or concerns, please do not hesitate to contact me at 303.916.5367.

Karl

Karl W. Myers

Transmission Siting, Permitting & Environmental Planning Manager

Tri-State Generation & Transmission Assoc., Inc.

303.916.5367

kmyers@tristategt.org

From: Kylie Bagley <KylieBagley@elpasoco.com>
Sent: Wednesday, April 19, 2023 3:13 PM
To: Myers, Karl <kmyers@tristategt.org>
Subject: [EXTERNAL] PPR2244

CAUTION: This email originated from outside of Tri-State. DO NOT click links or open attachments unless you recognize and/or trust the sender. Contact the IT Service Desk with questions or concerns.

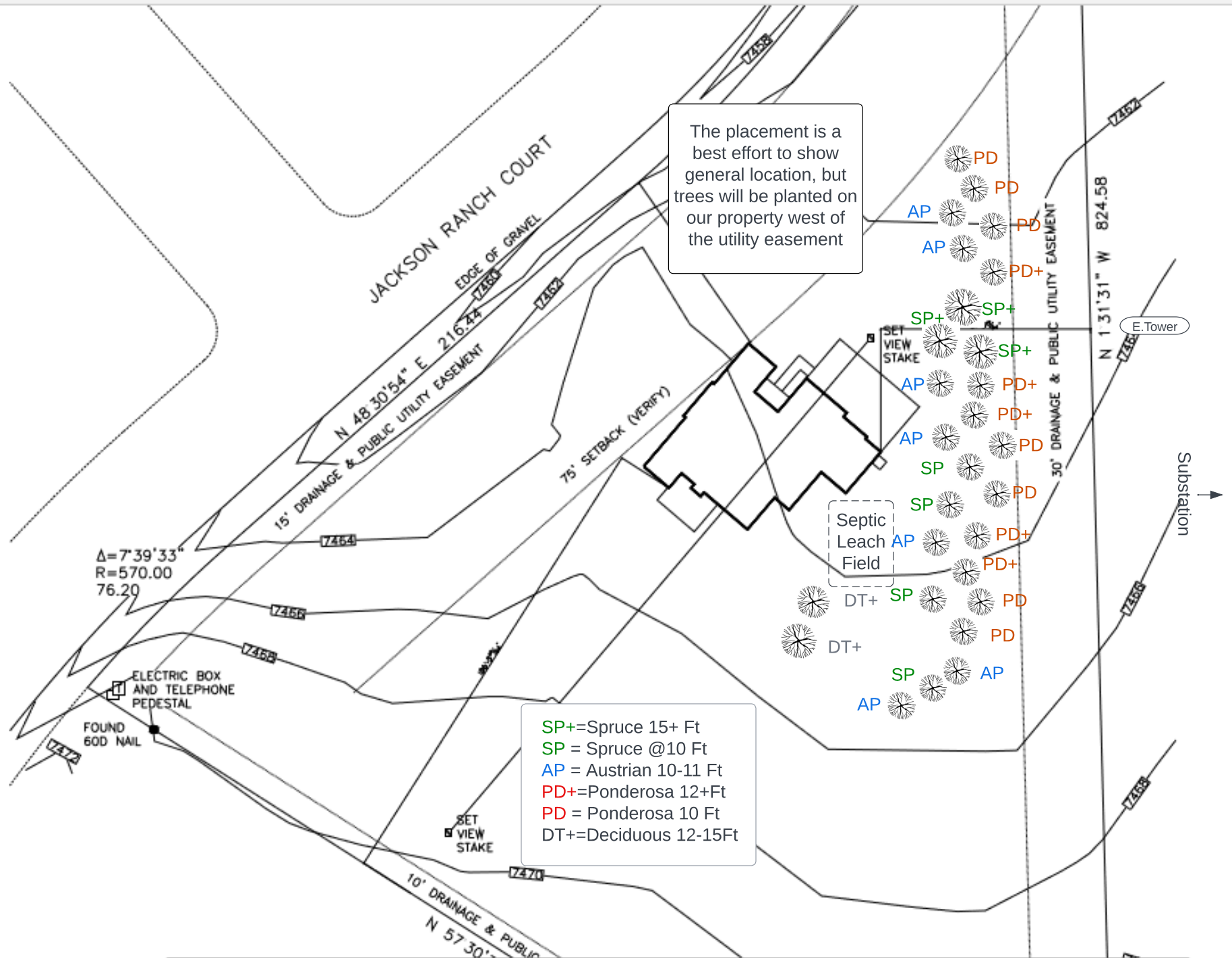
Karl,

I sent your site development plan to my manager for approval. After looking at your alternative landscape plan he is wondering if you would be amicable to adding shrubs to the property along with the native grasses seeing as trees would be a hazard to the facility.

Thank you,

	<p>Kylie Bagley Planner II El Paso County Planning & Community Development (719) 520-6323 Office hours: Monday – Friday 7:30am-4:00pm Planningdevelopment.elpasoco.com</p>
---	---

TREE PLANTING SCREEN FOR NEW SUBSTATION



The placement is a best effort to show general location, but trees will be planted on our property west of the utility easement

- SP+=Spruce 15+ Ft
- SP = Spruce @10 Ft
- AP = Austrian 10-11 Ft
- PD+=Ponderosa 12+Ft
- PD = Ponderosa 10 Ft
- DT+=Deciduous 12-15Ft

Δ=7°39'33"
R=570.00
76.20

ELECTRIC BOX AND TELEPHONE PEDESTAL

FOUND 60D NAIL

SET VIEW STAKE

Septic Leach Field

E. Tower

Substation →

JACKSON RANCH COURT

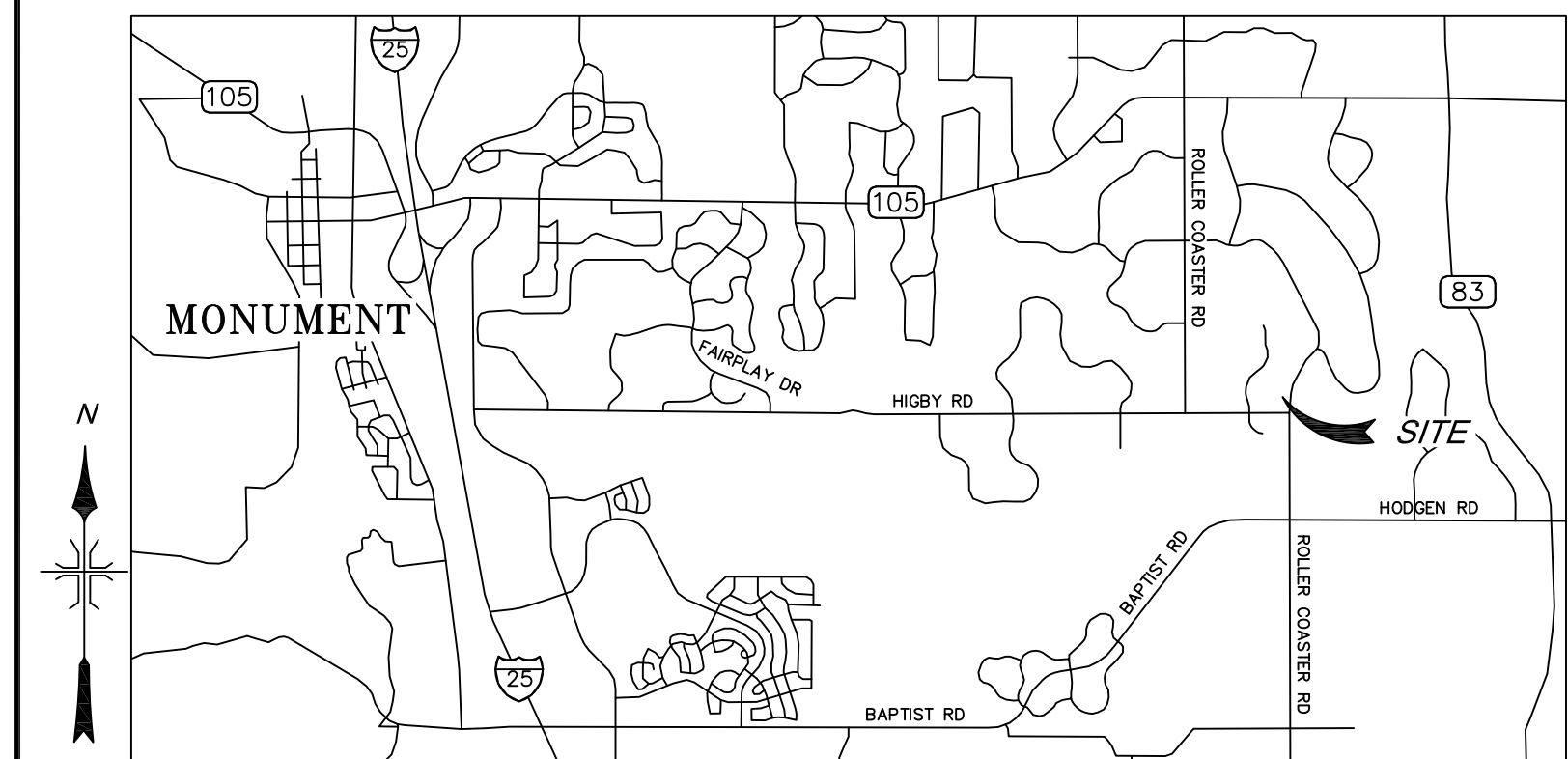
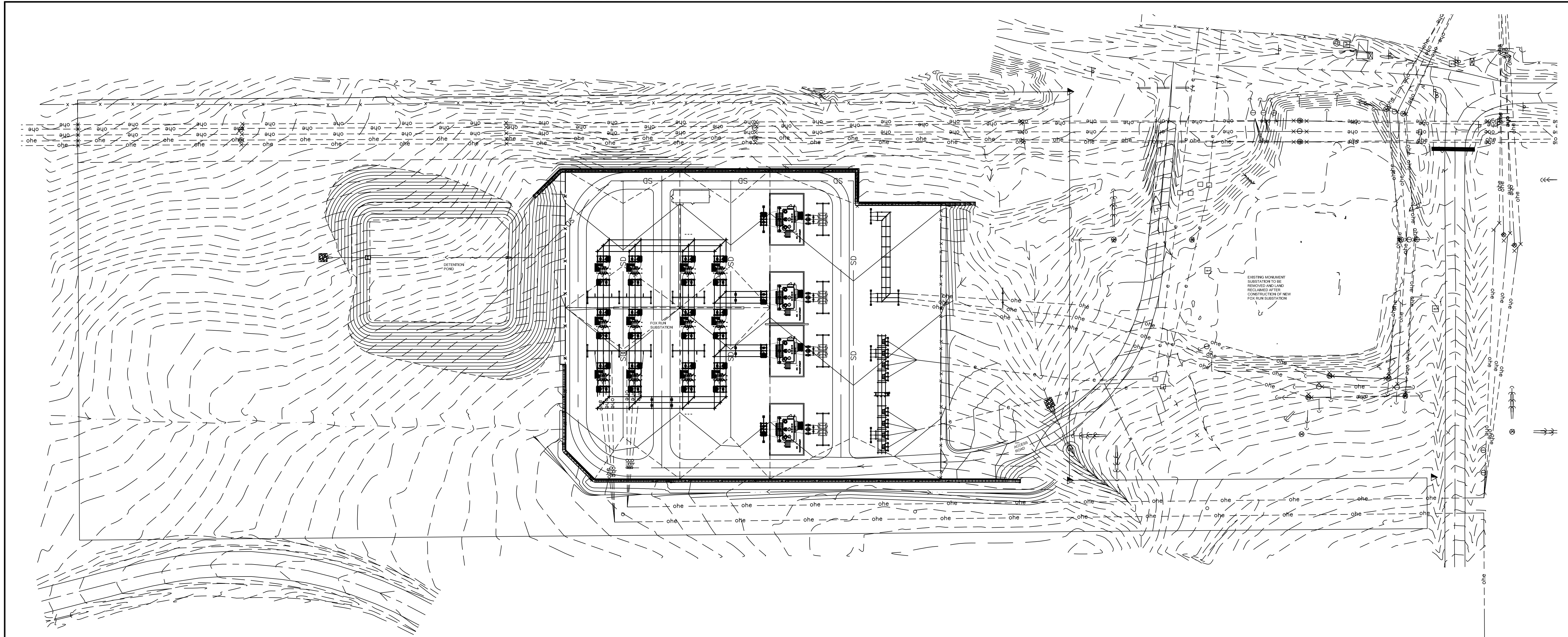
N 48 30'54" E 216.44'
15' DRAINAGE & PUBLIC UTILITY EASEMENT

75' SETBACK (VERIFY)

30' DRAINAGE & PUBLIC UTILITY EASEMENT

N 1 31'31" W 824.58

10' DRAINAGE & PUBLIC
N 57 30'



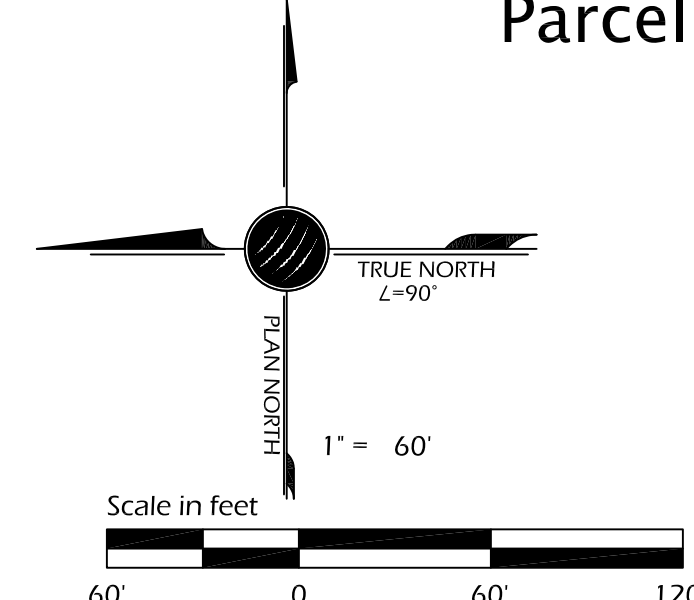
VICINITY MAP

N.T.S.

Site Coordinates (Lat/Long): 39.0808, -104.7858

Address: 1980 E Higby 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 WEEF 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

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
- ○ ○ ○ ○ EXISTING TREE

FOX RUN SUBSTATION		LANDSCAPE PLAN	
TRI-STATE GENERATION & TRANSMISSION ASSOCIATION, INCORPORATED			
1100 W. 116th Ave. P.O. Box 33695 Denver, Colorado 80233 303-452-6111			
UPDATED BY: KENULT T1/1/2022 10:30 AM Contract: ...			
PATH: C:\Users\kenult\OneDrive - Tri-State Generation and Transmission Association, Inc\kenult\Projects\Fox Run Substation\802% Civil Dwg\ Landscape Plan.dwg			
7		M.F.	Revision
6		M.F.	Revision
5		M.F.	Revision
4		M.F.	Revision
3		M.F.	Revision
2		M.F.	Revision
1		M.F.	Revision
No.	Date	Dwn.	Appd.
LANDSCAPE PLAN			

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

Drawn: TMC Date: 12/16/21
App'd: KGU Date: 10/31/22



November 15, 2022

Kari Parsons
El Paso County Planning and Zoning
2880 International Circle, Suite 110
Colorado Springs, CO 80910

**RE: Letter of Intent Site Development Plan for the Monument Substation Replacement
PCD File # PPR-22-044**

Dear Kari Parsons,

Introduction

Tri-State Generation and Transmission Association Inc. (Tri-State) requests review of the proposed Site Development Plan in support of the Monument Substation Project. Pursuant to the El Paso County 1041 process Tri-State applied for a 1041 Exemption for the project. County approval was received in March 2021 (File # ADM2110). The 14.92-acre substation property (7 acres of project disturbance) is located at 1980 E. Higby RD within the zoning district RR-5 and parcel number 6121003005.

Project Description

The current Monument Substation operates with a single bus electrical configuration that has ongoing and historical reliability issues. The substation has a primary purpose of delivering and transforming power to a voltage of 12.47 kV.

To solve the ongoing reliability problems at Monument Substation, Tri-State and member system Mountain View Electric Association (MVEA) have initiated a project to reconfigure the electrical arrangement/scheme of the substation. The substation is currently configured as a single bus, with four (4) 115 kV transmission lines and associated breakers. The substation replacement will change the arrangement to a breaker and a half bus arrangement. This new arrangement will provide more reliability to the entire substation while giving more operational flexibility to the existing system. To facilitate the new arrangement the two existing transmission lines, need minor modifications to facilitate the placement of the new substation.

The existing substation serves approximately 433 homes. To maintain service to these homes while achieving the required upgrades, the new substation equipment will need to be constructed adjacent to the existing substation. As new equipment is installed, a phased transfer of service to the new equipment will be implemented. Once the project is completed, all equipment within the existing substation footprint will be removed and disturbed areas will be reclaimed. MVEA owns the land under the current Monument Substation (Parcel# 6100000088) and Tri-State owns four adjacent parcels to the north and west (Parcel #s 6121003005, 6121003009, 6121003008, and 6121003007).



Ms. Kari Parsons
November 15, 2022
Page 2

No new transmission lines or upgraded transmission service into the substation are associated with the project. Minor reconfiguration of conductors will be needed to interconnect to the new substation equipment in the immediate vicinity of the substation.

Request for Alternative Landscape Plan

Pursuant to El Paso County Land Development Code Section 6.2.2.A.4 an alternate landscape plan is being requested for this project. Per the landscape tabulation table in the submitted landscape plan, no trees are listed. Trees cannot be within the fenced substation yard. To ensure the safety of the bulk electric system and to minimize the risk of fire no vegetation is permitted in electric substations or within a buffer of electric transmission lines. This safety measure is consistent with actions of other electric utilities in the region and consistent with best management practices from national groups such as the North American Electric Reliability Corporation. The minor realignment of the transmission/distribution lines owned by Tri-State, Colorado Springs Utilities, and MVEA impose significant safety constraints with planting trees on the property. The project location is in a rural area and the old substation parcel will be reclaimed with native, drought tolerant, low growth species consistent with other grass areas nearby. Tri-State has committed to work with the impacted neighbor to offer financing for landscaping on their property.

Tri-State requests that the Director waive the requirement of planting trees for this landscape plan.

Steady State Traffic Generation (post construction)

Vehicles associated with maintaining the substation are generally pickup trucks or an occasional bucket truck and will have a negligible impact to transportation infrastructure. Such vehicles will likely only access the Project site on a bi-monthly basis.

Road Impact Statement

The Project construction traffic will be incorporated into the existing roadway network without noticeable impact. The added Project construction traffic will be less than typical daily fluctuations in traffic volume and represents no measurable impact to streets and intersections. It is anticipated that construction activities will neither block roadways nor impede daily traffic volume due to the location of the Project and the proposed type of construction.



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November 15, 2022
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On Site Buildings

Tri-State will have an unmanned Electrical Equipment Enclosure on site about 1,200 sq. ft. in size. This will house all the equipment used to monitor and control the operation of the substation.

Sincerely,

Karl W. Myers
Transmission Siting Permitting & Environmental Planning Manager