

SHIELDWIRE	
3/8" EHS STEEL 7-STRAND	
STR #	DESIGN TENSION (R.S.)
CENTER SUB TO 2	3000# @ 452' R.S.
2 TO 3	3000# @ 811' R.S.
3 TO 4	5095# @ 943' R.S.
4 TO 6	4014# @ 715' R.S.
6 TO 9	4053# @ 727' R.S.
9 TO 12	4875# @ 760' R.S.

SHIELDWIRE	
OPGW: DNO-3825 CC-57-465	
STR #	DESIGN TENSION (R.S.)
CENTER SUB TO 2	3000# @ 452' R.S.
2 TO 3	3000# @ 778' R.S.
3 TO 4	5095# @ 874' R.S.
4 TO 6	4648# @ 711' R.S.
6 TO 9	4689# @ 720' R.S.
9 TO 12	5478# @ 760' R.S.

230KV CONDUCTOR	
CONDUCTOR: 959.6 ACSS/TW 22/7 "SUWANNEE"	
STR #	DESIGN TENSION (R.S.)
CENTER SUB TO 3	6000# @ 615' R.S.
3 TO 4	6000# @ 908' R.S.
4 TO 6	9214# @ 712' R.S.
6 TO 9	9287# @ 723' R.S.
9 TO 11	9723# @ 838' R.S.
11 TO 12	9638# @ 838' R.S.

NOTE:
ALL TENSIONS @ NESC HVY, 0°F, 5" ICE, APSF
WIND ALL PHASE CONDUCTORS DISPLAYED @ 302°F.
FINAL SHIELD WIRE DISPLAYED @ -20°F, INITIAL

SUB 6A
STA=0+00.00
CENTER SUB

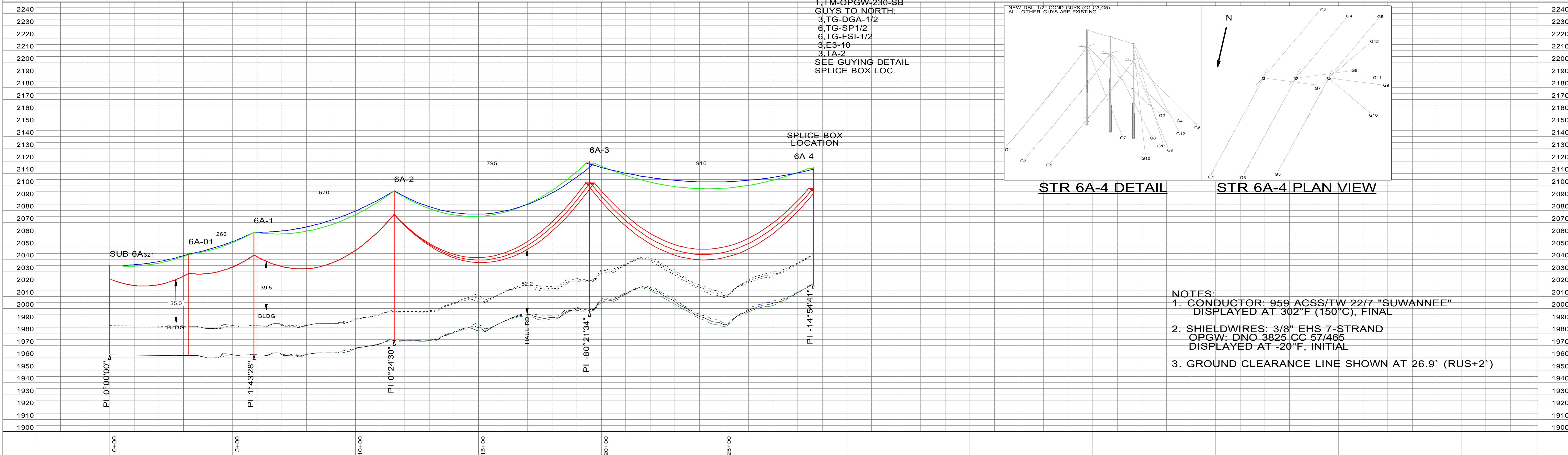
6A-01
STA=3+21.00
TH-230
(2) 95-2

6A-1
STA=5+87.30
B TOWER
100'

6A-2
STA=11+57.68
TST-230-S-H-140.0-21176A
(2) 140-H2
(2) 8GR
SPLICE BOX LOC.

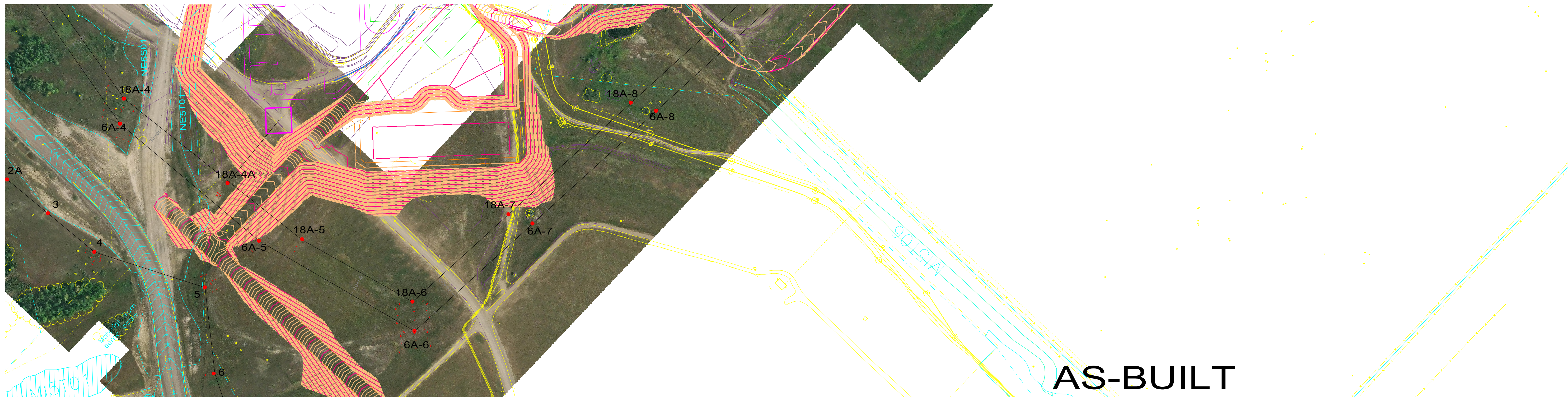
6A-3
STA=19+52.74
TSD-230-S-DE90-140.0-21176A
(3) 140-H7
(14) TG-AFP3/4, 2 X TG-PP3/4
(14) TA-2 @ 5K FT*LBS
(14) E3-10
(3) 8GR

6A-4
STA=28+63.07
TSD-230-S-DE90-110.0-21176A
(3) 110-H7
(14) TG-AFP3/4, 2 X TG-PP3/4
(14) TA-2 @ 5K FT*LBS
(14) E3-10
(3) 8GR
3, TM-959.6-230-DE
1, TM-OHW-230-DE
1, TM-OPGW-230-DE
1, TM-OPGW-230-SB
GUYS TO NORTH:
3, TG-DGA-1/2
6, TG-SP1/2
6, TG-FSI-1/2
3, E3-10
3, TA-2
SEE GUYING DETAIL
SPLICE BOX LOC.



- NOTES:
- CONDUCTOR: 959 ACSS/TW 22/7 "SUWANNEE"
DISPLAYED AT 302°F (150°C), FINAL
 - SHIELDWIRES: 3/8" EHS 7-STRAND
OPGW: DNO 3825 CC 57/465
DISPLAYED AT -20°F, INITIAL
 - GROUND CLEARANCE LINE SHOWN AT 26.9' (RUS+2')

NO.	DATE	REVISIONS	BY	PROJECT #	R22.12030	DRAWN BY:	CMA	NORTH	200.0 FT. HORIZ. SCALE	FROM: CENTER	230KV TRANS. LINE 006A	MINNKOTA POWER COOPERATIVE, INC. GRAND FORKS, N. DAK.
0	01/05/2026	AS-BUILT	CMA	WO #		CHECKED BY:	MPE		SCALE:	TO: MANDAN		
						APPROVED:	CMA		DATE:	JULY 2023		



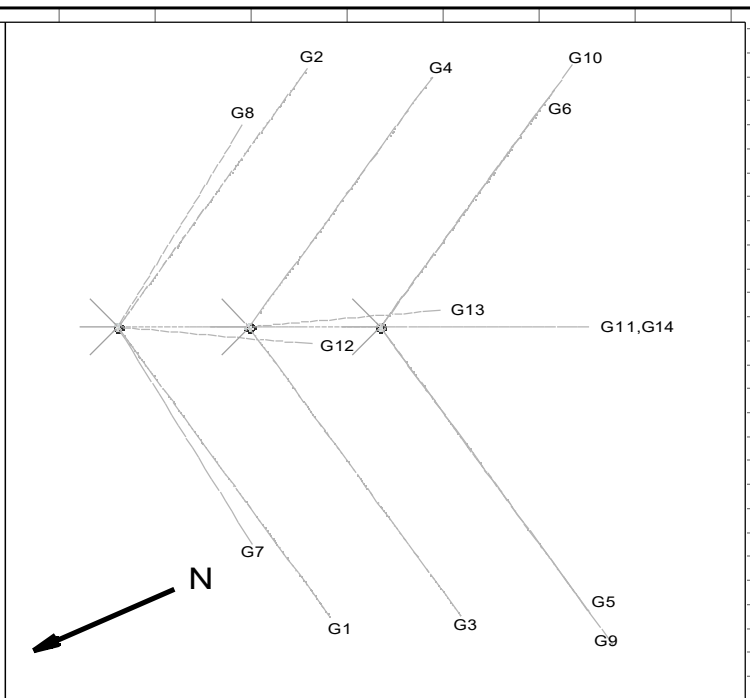
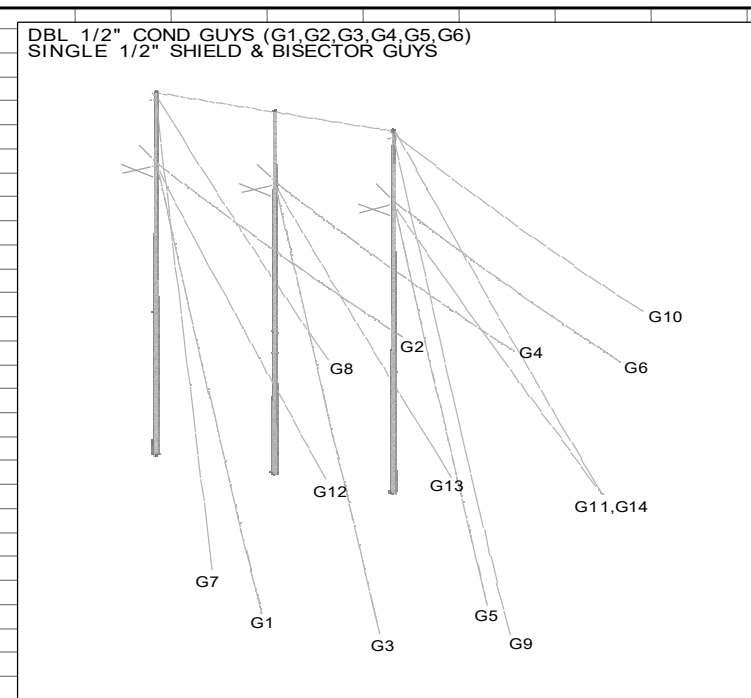
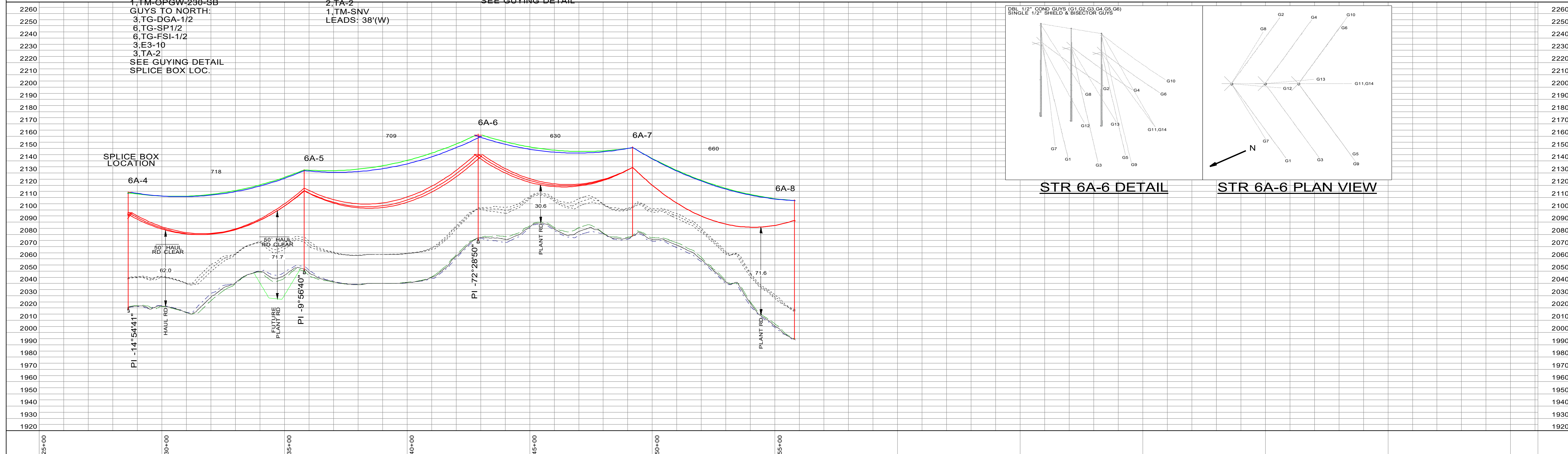
6A-4
 STA=28+63.07
 TSD-230-S-DE90-110.0-21176A
 (3) 110-H7
 (14) TG-AFP3/4, 2 X TG-PP3/4
 (14) TA-2 @ 5K FT*LBS
 (14) E3-10
 (3) 8GR
 3, TM-959.6-230-DE
 1, TM-OHW-230-DE
 1, TM-OPGW-230-DE
 1, TM-OPGW-230-SB
 GUYS TO NORTH:
 3, TC-DGA-1/2
 6, TC-SP1/2
 6, TC-FSI-1/2
 3, E3-10
 3, TA-2
 SEE GUYING DETAIL
 SPLICE BOX LOC.

6A-5
 STA=35+80.74
 TST-230-S-SA
 (2)95-1 STL EQUIV.
 SET (E) POLE 15'-9" DEEP
 SET (W) POLE 12'-0" DEEP
 2, TM-SVD-OPGW(1AH/1BK)
 2, TM-SVD-OHW(1AH/1BK)
 2, TG-SP1/2
 2, TG-FSI-1/2
 2, E3-10
 2, TA-2
 1, TM-SNV
 LEADS: 38'(W)

6A-6
 STA=42+89.54
 TSD-230-S-DE
 (3)100-H1 STL EQUIV.
 SET (NE) POLE 12'-0" DEEP
 SET (E) POLE 15'-9" DEEP
 SET (M) POLE 15'-0" DEEP
 SET (SW) POLE 16'-0" DEEP
 20, TG-SP1/2
 20, TG-FSI-1/2
 14, E3-10
 13, TA-2
 SEE GUYING DETAIL

6A-7
 STA=49+20.00
 TST-230-S-H
 (2)85-1 STL EQUIV.
 SET (N) POLE 11'-6" DEEP
 SET (S) POLE 12'-6" DEEP
 2, TM-SVD-OPGW(1AH/1BK)
 2, TM-SVD-OHW(1AH/1BK)

6A-8
 STA=55+80.00
 TST-230-S-H
 (2)130-H1 STL EQUIV.
 SET (N) POLE 15'-3" DEEP
 SET (S) POLE 16'-6" DEEP
 2, X-BRACES



NO.	DATE	REVISIONS	BY	PROJECT #	R22.12030	DRAWN BY:	CMA		200.0 FT. HORIZ. SCALE 40.0 FT. VERT. SCALE DATE: JULY 2023	FROM: CENTER TO: MANDAN STR NO. 4 TO STR NO. 8	230KV TRANS. LINE 006A MPC ASSET:	MINNKOTA POWER COOPERATIVE, INC. GRAND FORKS, N. DAK. SHEET 2 OF 4
0	01/05/2026	AS-BUILT	CMA	WO #	CHECKED BY:	MPE						
					APPROVED:	CMA						

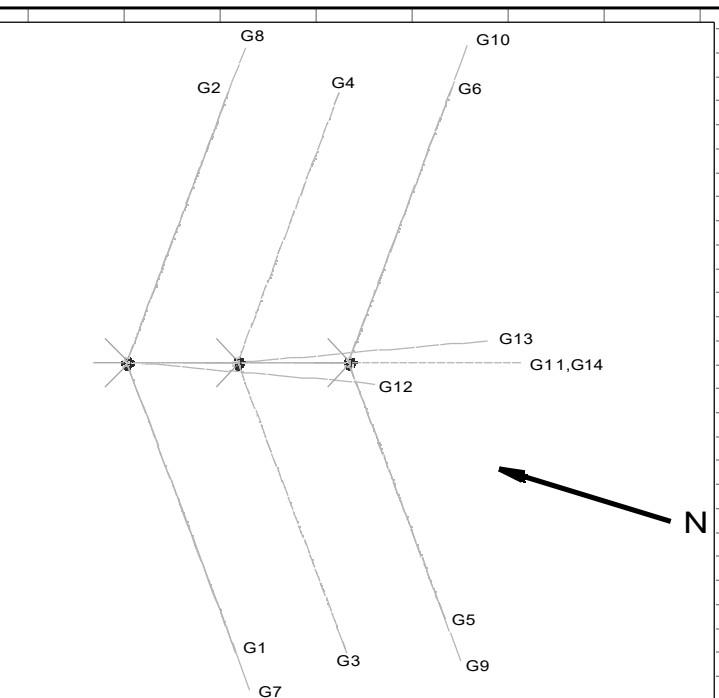
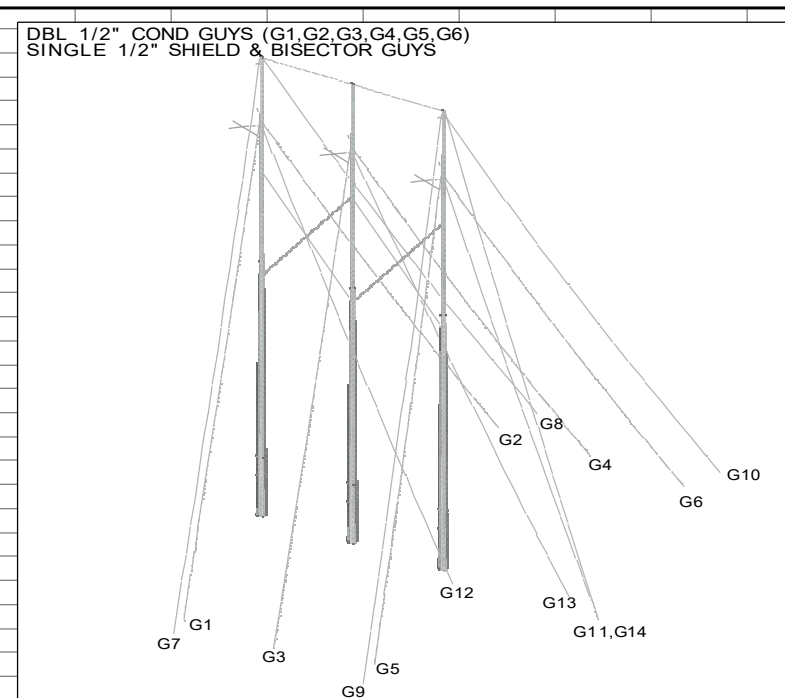
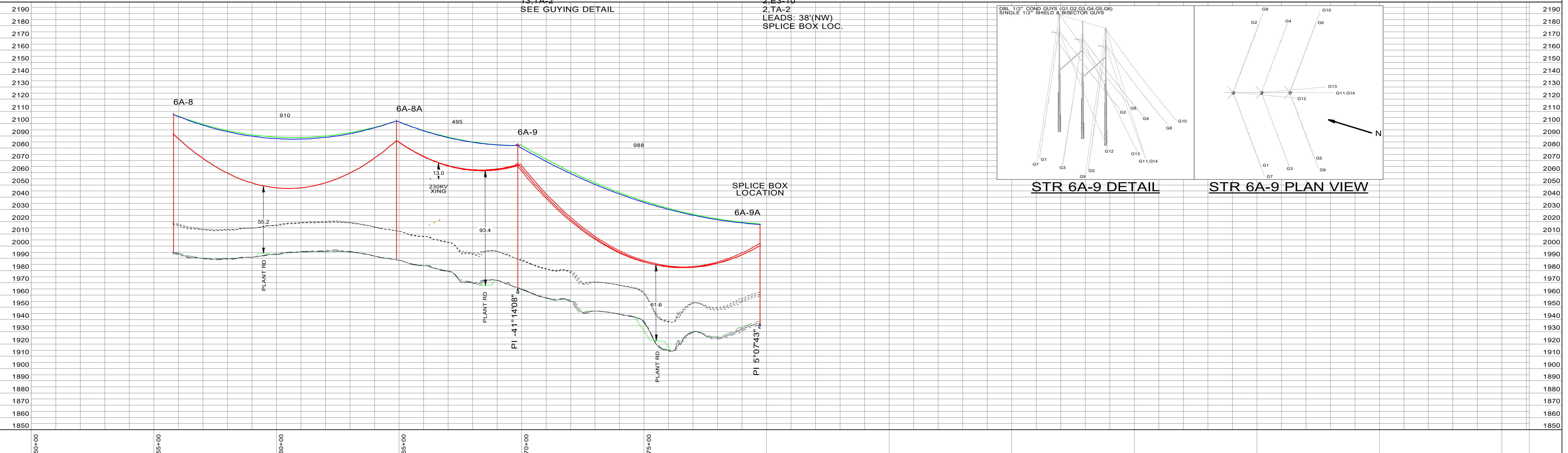


6A-8
 STA=55+80.00
 TST-230-S-H
 (2)130-H1 STL EQUIV.
 SET (N) POLE 15'-3" DEEP
 SET (S) POLE 16'-6" DEEP
 2,X-BRACES

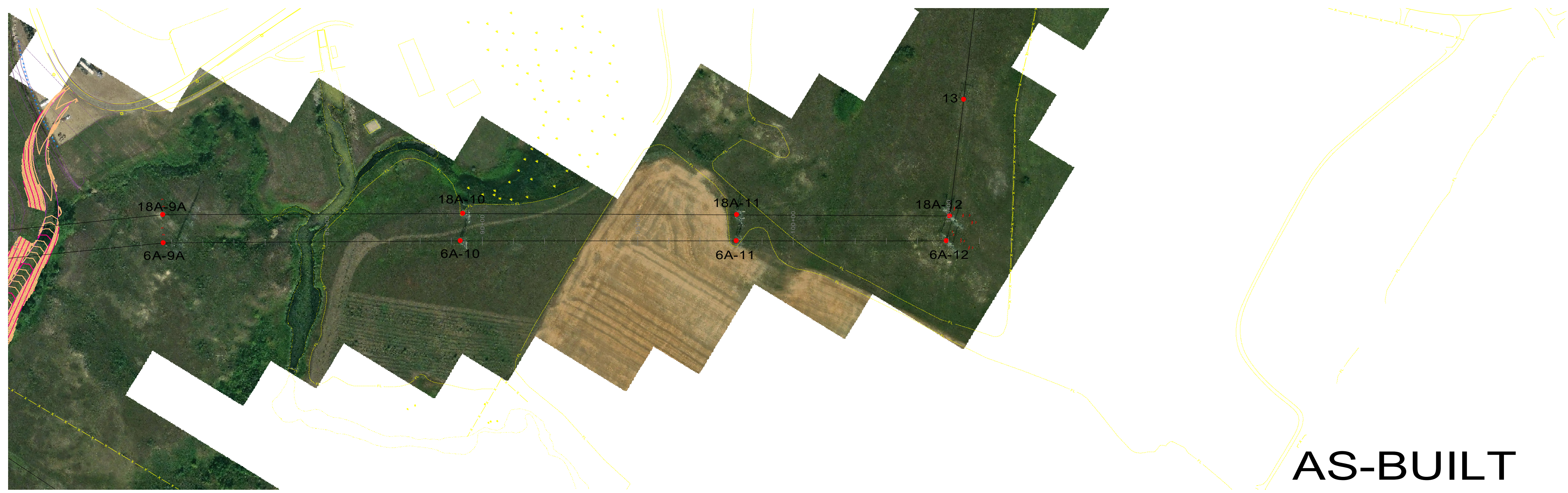
6A-8A
 STA=64+90.00
 TST-230-S-H
 (2)130-H1 STL EQUIV.
 SET (N) POLE 15'-6" DEEP
 SET (S) POLE 15'-6" DEEP
 2,X-BRACES
 3, TM-SVD-OPGW(1AH/2BK)
 3, TM-SVD-OHGW(1AH/2BK)

6A-9
 STA=69+84.90
 TSD-230-S-DE
 (3)135-H3 STL EQUIV.
 SET (N) POLE 17'-0" DEEP
 SET (M) POLE 16'-6" DEEP
 SET (S) POLE 15'-9" DEEP
 X-BRACES
 20 TG-SP1/2
 20 TG-FSI-1/2
 14 E3-10
 13 TA-2
 SEE GUYING DETAIL

6A-9A
 STA=79+72.53
 TST-230-S-SA
 (2)95-H1 STL EQUIV.
 SET (NW) POLE 11'-6" DEEP
 SET (SE) POLE 15'-0" DEEP
 1, TM-OPGW-230-SB
 4, TM-SVD-OPGW(2AH/2BK)
 4, TM-SVD-OHGW(2AH/2BK)
 2, TG-SP1/2
 2, TG-FSI-1/2
 2 E3-10
 2 TA-2
 LEADS: 38'(NW)
 SPLICE BOX LOC.



NO.	DATE	REVISIONS	BY	PROJECT #	R22.12030	DRAWN BY:	CMA		200.0 FT. HORIZ. SCALE 40.0 FT. VERT. SCALE	FROM: CENTER TO: MANDAN	230KV TRANS. LINE 006A	MINNKOTA POWER COOPERATIVE, INC. GRAND FORKS, N. DAK.	
0	01/05/2026	AS-BUILT	CMA	WO #		CHECKED BY:	MPE		DATE:	JULY 2023	STR NO. 8 TO STR NO. 9A	MPC ASSET:	SHEET 3 OF 4
						APPROVED:	CMA						

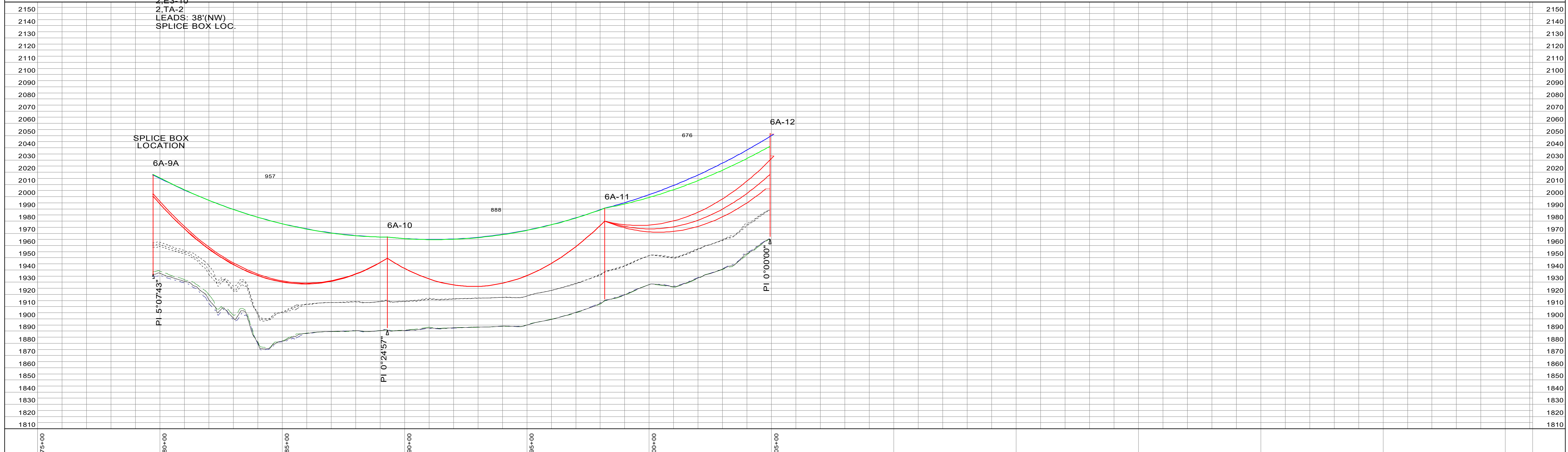


6A-9A
 STA=79+72.53
 TST-230-S-SA
 (2)95-H1 STL EQUIV.
 SET (NW) POLE 11'-6" DEEP
 SET (SE) POLE 15'-0" DEEP
 1 TM-OPGW-230-SB
 4 TM-SVD-OPGW(2AH/2BK)
 4 TM-SVD-OHW(2AH/2BK)
 2 TG-SP1/2
 2 TG-FSI-1/2
 2 E3-10
 2 TA-2
 LEADS: 38'(NW)
 SPLICE BOX LOC.

6A-10
 STA=89+29.36
 A TOWER
 75'

6A-11
 STA=98+17.76
 B TOWER
 75'

6A-12
 STA=104+93.67
 D TOWER
 85'.75'.50'
 26 GUY & ANCHORS



NO.	DATE	REVISIONS	BY	PROJECT #	R22.12030	DRAWN BY:	CMA		200.0 FT. HORIZ. SCALE 40.0 FT. VERT. SCALE DATE: JULY 2023	FROM: CENTER TO: MANDAN STR NO. 9A TO STR NO. 12	230KV TRANS. LINE 006A MPC ASSET:	MINNKOTA POWER COOPERATIVE, INC. GRAND FORKS, N. DAK. SHEET 4 OF 4
0	01/05/2026	AS-BUILT	CMA	WO #	CHECKED BY:	MPE						
					APPROVED:	CMA						