

DESIGN CONDITIONS  
 0.465" OPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

1272 ACSR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

REV	DATE	APP	DESCRIPTION	TMP	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

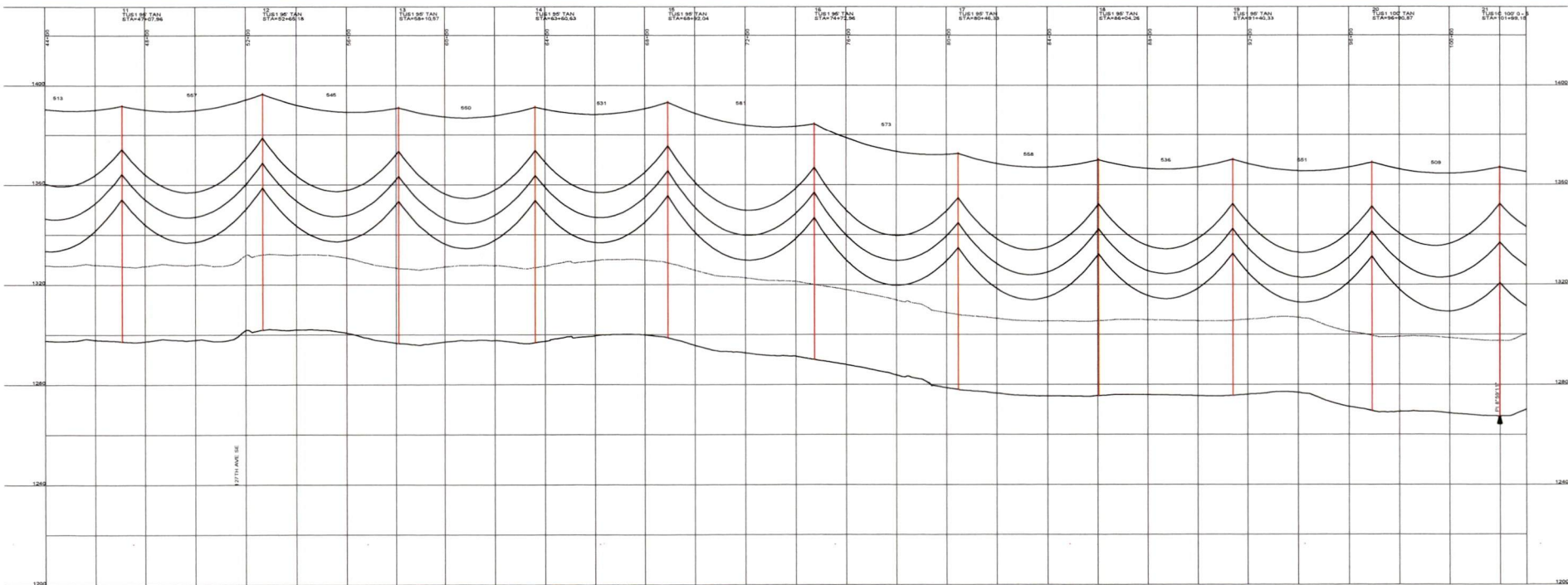
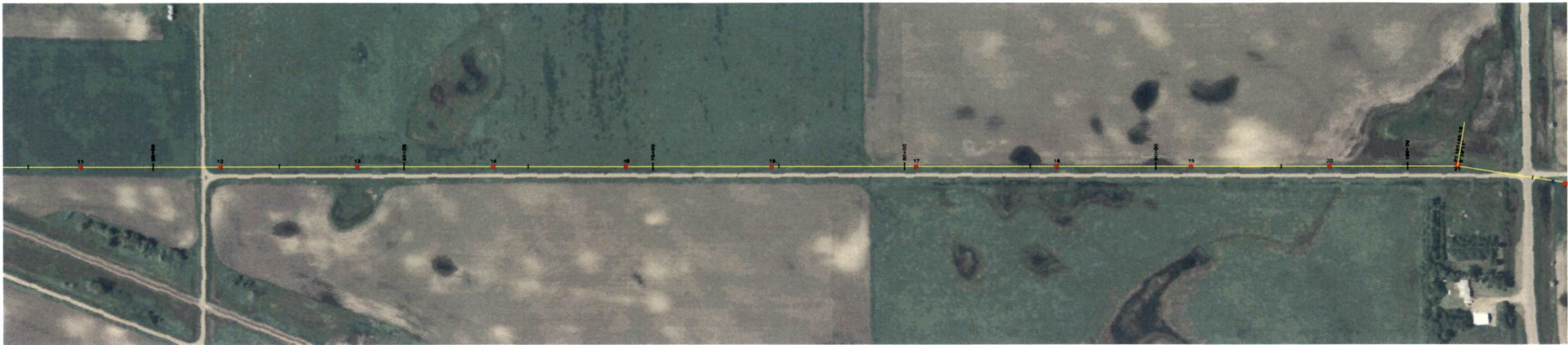
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

A STANLEY GROUP COMPANY  
 ENGINEERING, ENVIRONMENTAL AND  
 CONSTRUCTION SERVICES - WORLDWIDE

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**





DESIGN CONDITIONS:  
 0.465' CPQW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE: 30'

1272 ACBR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	TMP	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

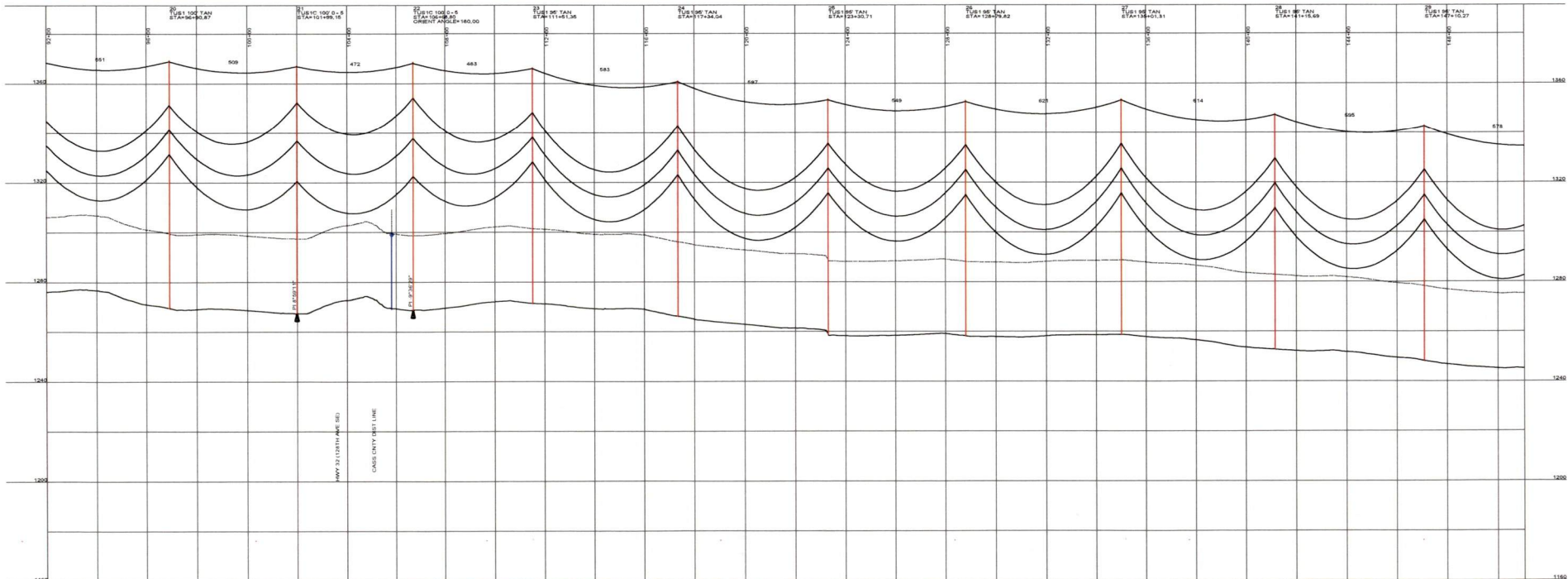
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

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 ENGINEERING, ENVIRONMENTAL AND  
 CONSTRUCTION SERVICES - WORLDWIDE

DESIGNED T. FRANCIS  
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 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**






DESIGN CONDITIONS  
 0.465' OPW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE 30'

1272 ACSR 45/7 'BITTERN'  
 20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	TMP	DFT
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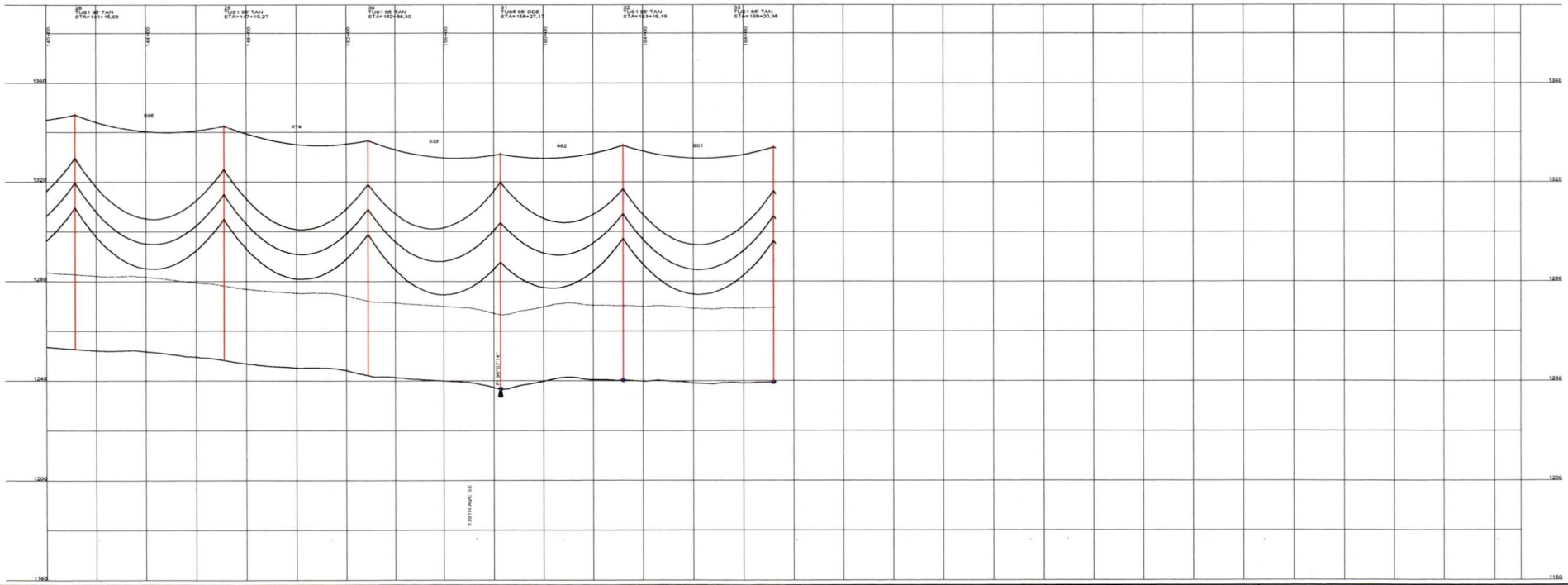
DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

↑ NORTH

**WIND GENERATION TIE**      **3 OF 73**



DESIGN CONDITIONS  
 0.465' CPGW, 24 FIBER 1272 AC/SR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F, INITIAL 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE: 30'

REV	DATE	APP	DESCRIPTION	DFTR
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF

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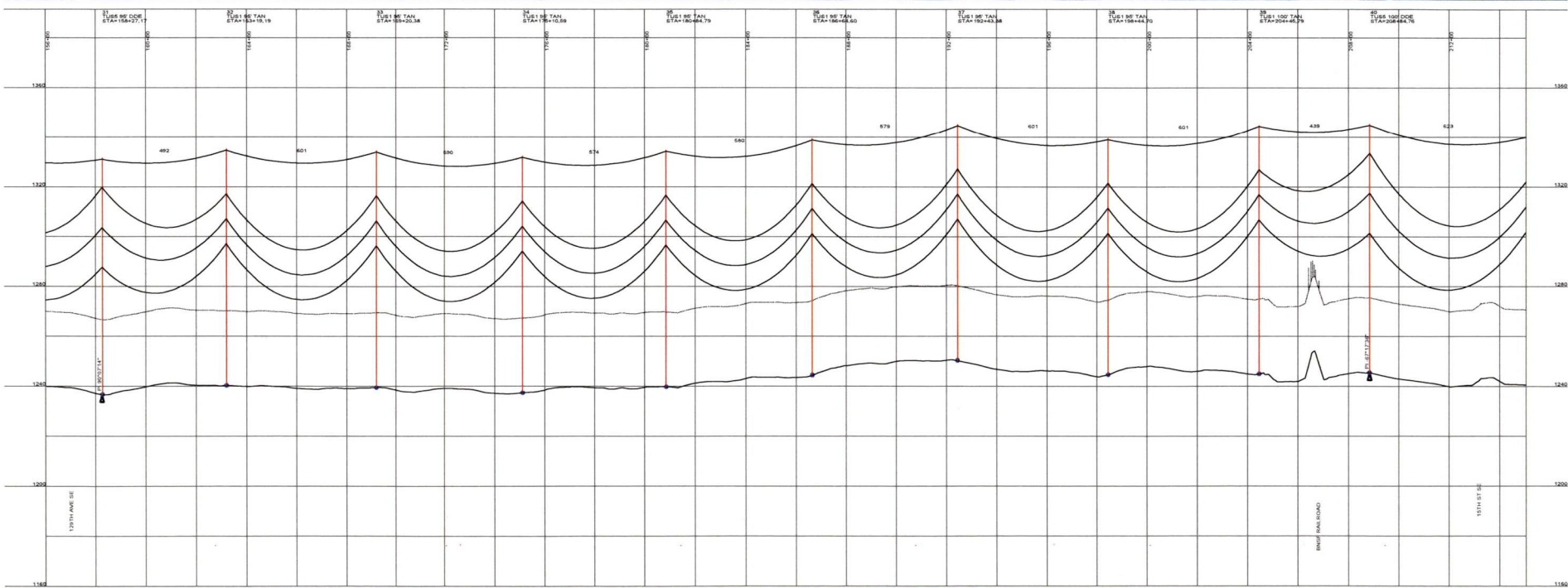
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

**WIND GENERATION TIE 4 OF 73**



DESIGN CONDITIONS  
 0.465" CPWV, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE: 30'

1272 ACSR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	TMP	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

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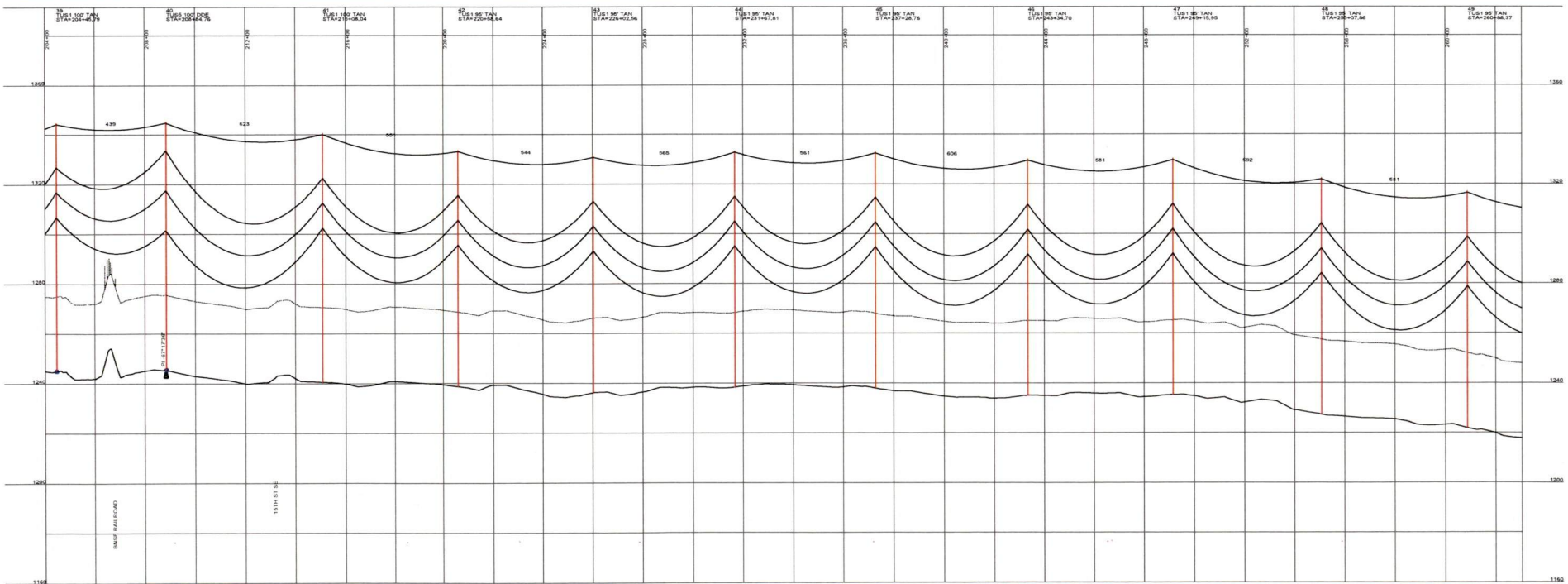
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 5 OF 73



DESIGN CONDITIONS  
 0.465" CPW; 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE 30'

1272 ACBR 457 "BITTERN"

20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	DTR
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF



**Stanley Consultants inc.**

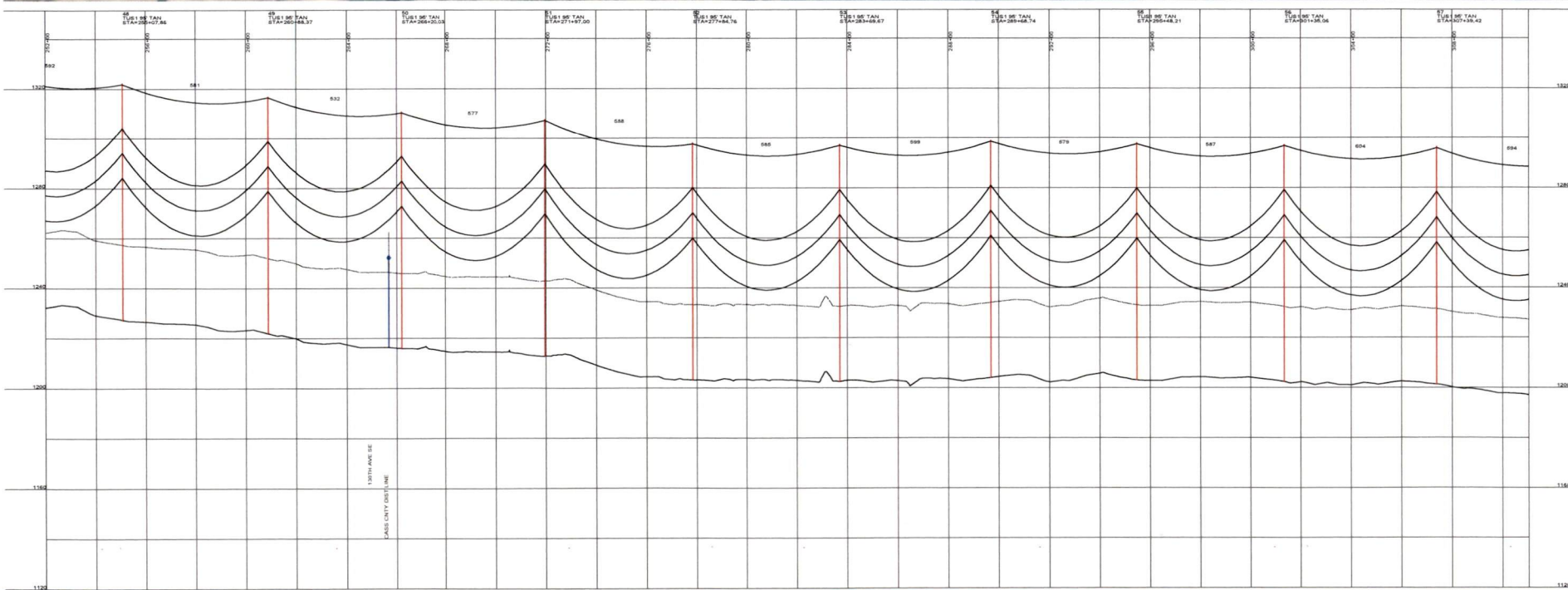
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 ENGLEWOOD, CO 80112

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 ENGINEERING, ENVIRONMENTAL AND  
 CONSTRUCTION SERVICES - WORLDWIDE

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**





DESIGN CONDITIONS  
 0.465' OF GW, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE 30'

1272 AC SR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	DPTH
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	

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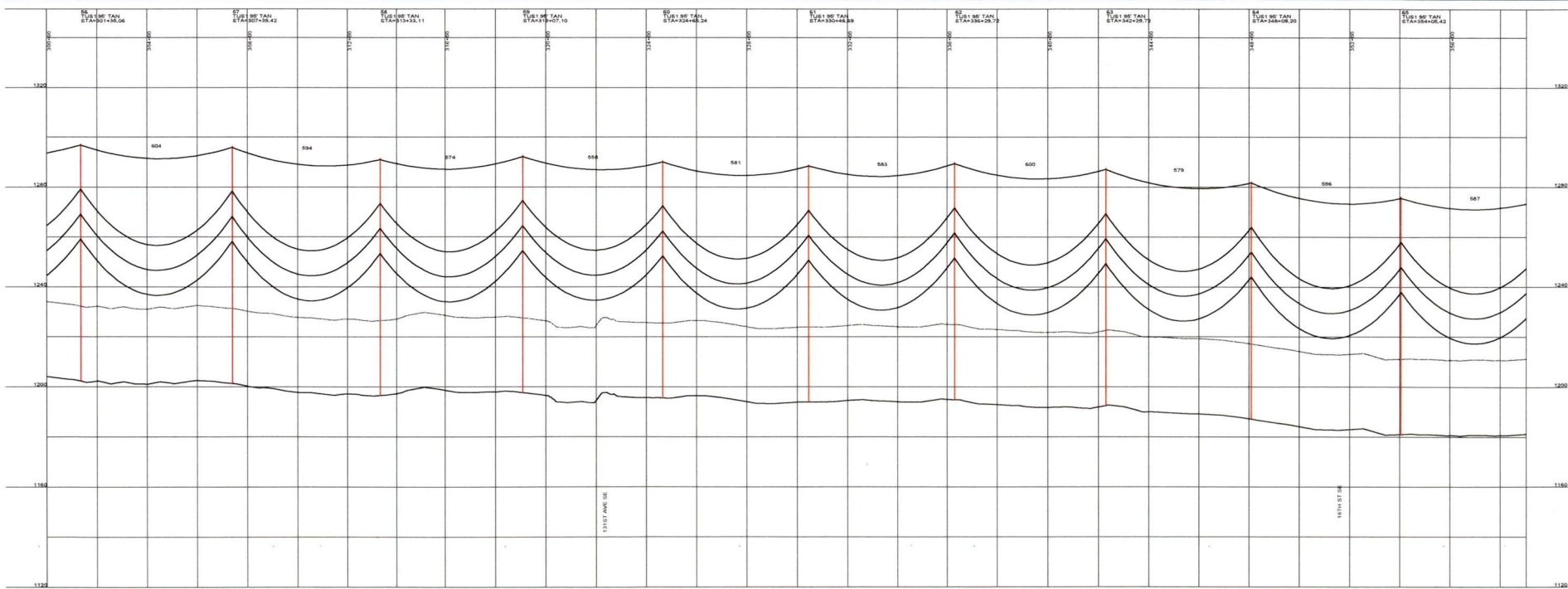
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. ← HORIZ. SCALE  
 40.0 FT. ← VERT. SCALE

WIND GENERATION TIE 7 OF 73



DESIGN CONDITIONS:  
 0.465" CPW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE: 30'

1272 AC@R 45/7 "BITTERN"

REV	DATE	APP	DESCRIPTION	TMP	DPTH
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		



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 CONSTRUCTION SERVICES - WORLDWIDE

5200 E. MINERAL AVE,  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

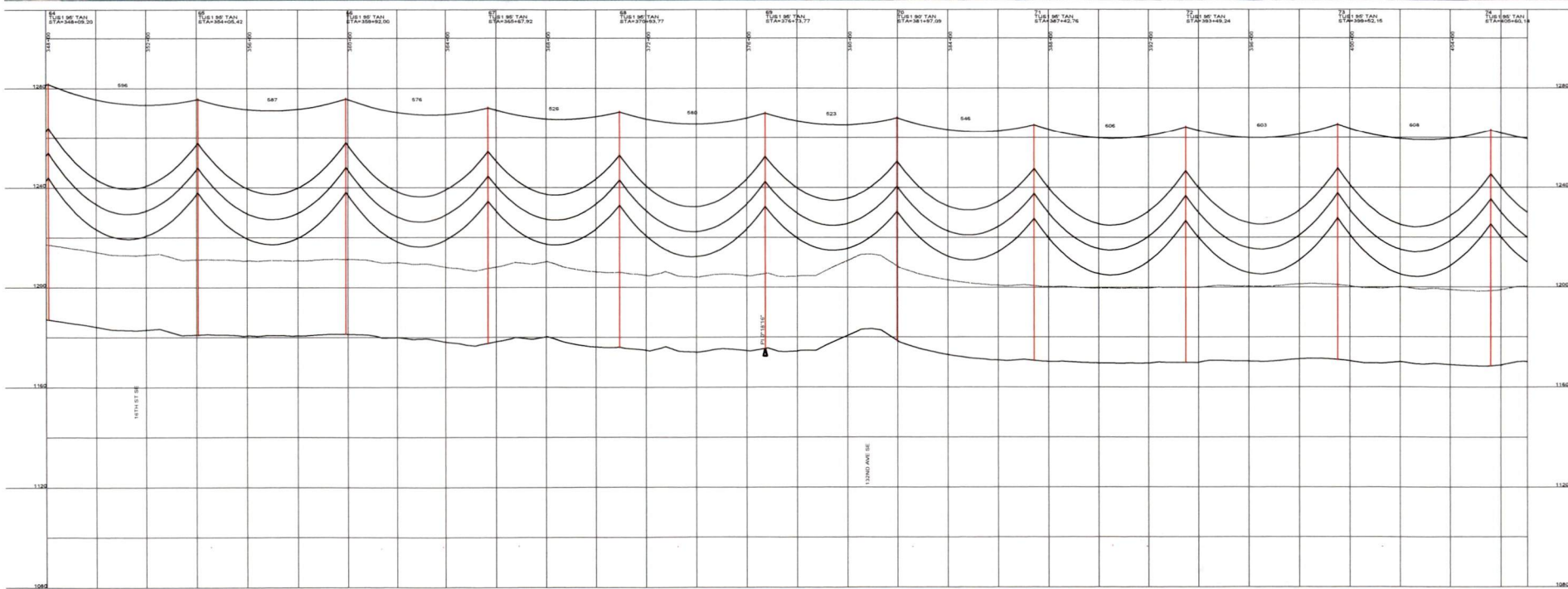
**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

WIND GENERATION TIE

8 OF 73

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

NORTH



DESIGN CONDITIONS  
 5.465' CPGW, 24 FIBER  
 20% RT6 @ -20 DEGREES F. INITIAL CLEARANCE LINE 30'

1372 AC SR 45/7 'BITTERN'

20% RT6 @ -20 DEGREES F. INITIAL CLEARANCE LINE 30'

REV	DATE	APP	DESCRIPTION	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF

**Stanley Consultants INC.**

9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

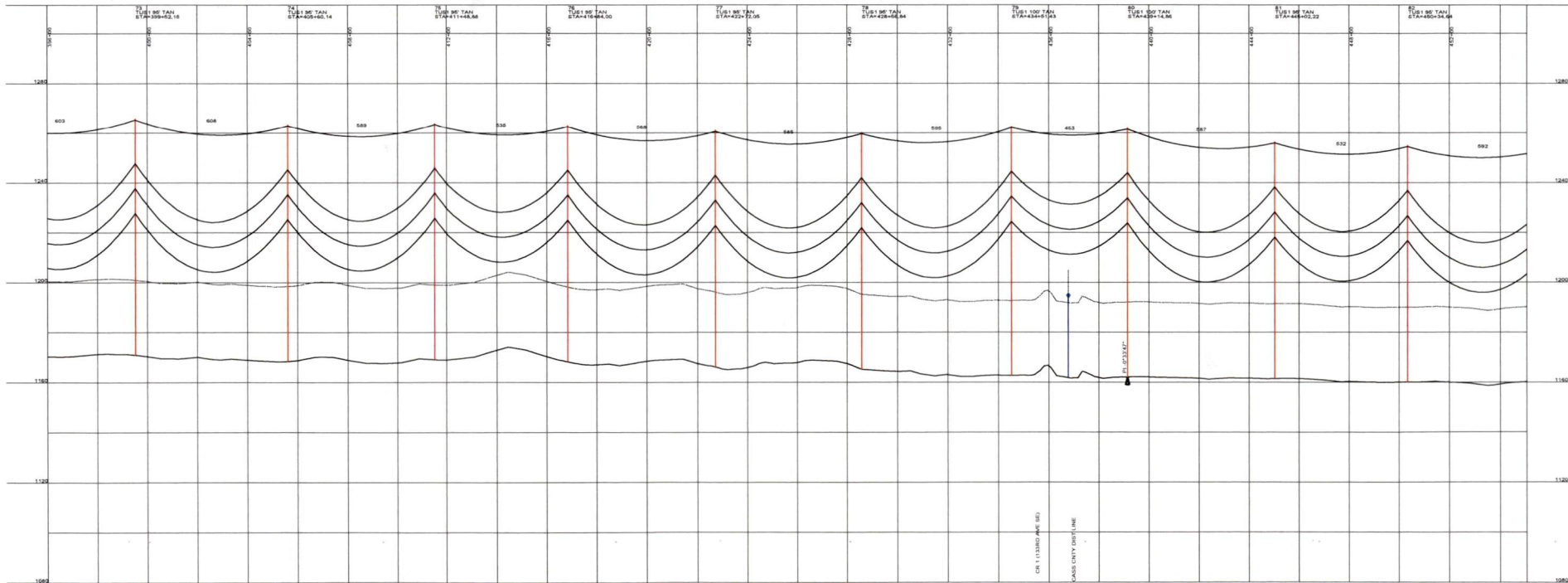
A STANLEY GROUP COMPANY  
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 CONSTRUCTION SERVICES - WORLDWIDE

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

450.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

**WIND GENERATION TIE** 9 OF 73



DESIGN CONDITIONS:  
 0.465" CPQW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE: 30'

1273 ACSP 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	DATE	APP
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

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 ENGINEERING, ENVIRONMENTAL AND  
 CONSTRUCTION SERVICES - WORLDWIDE

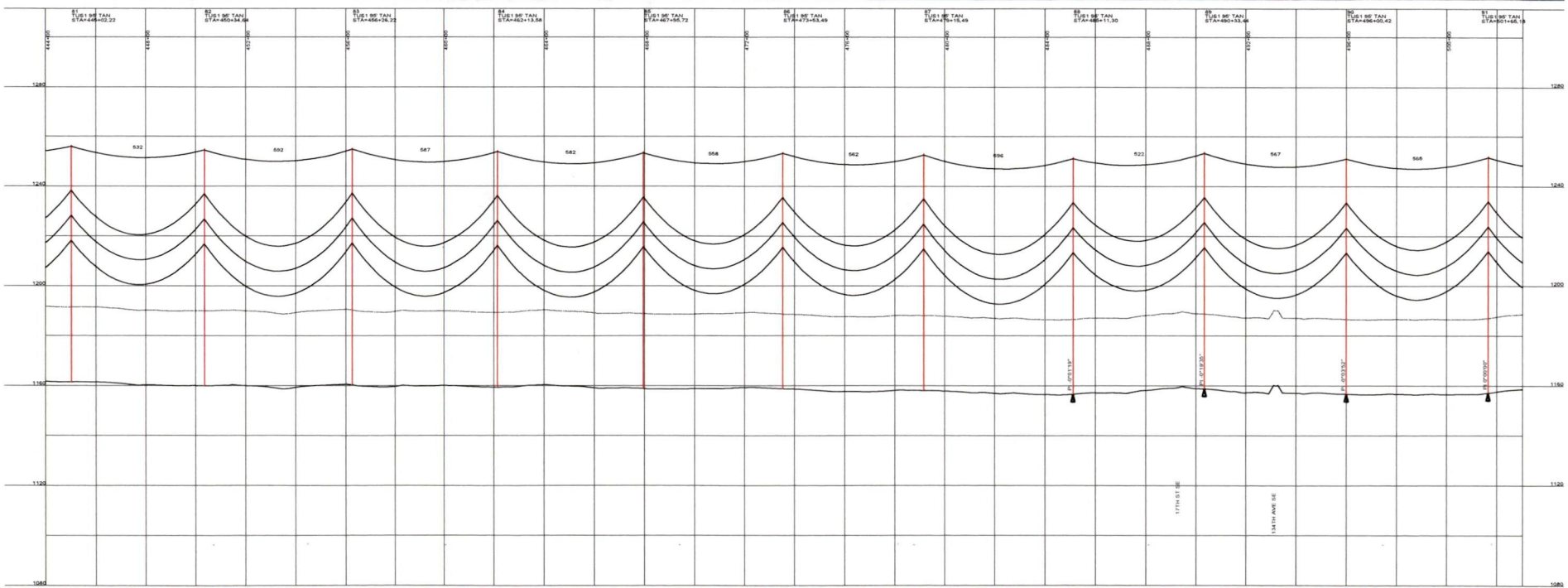
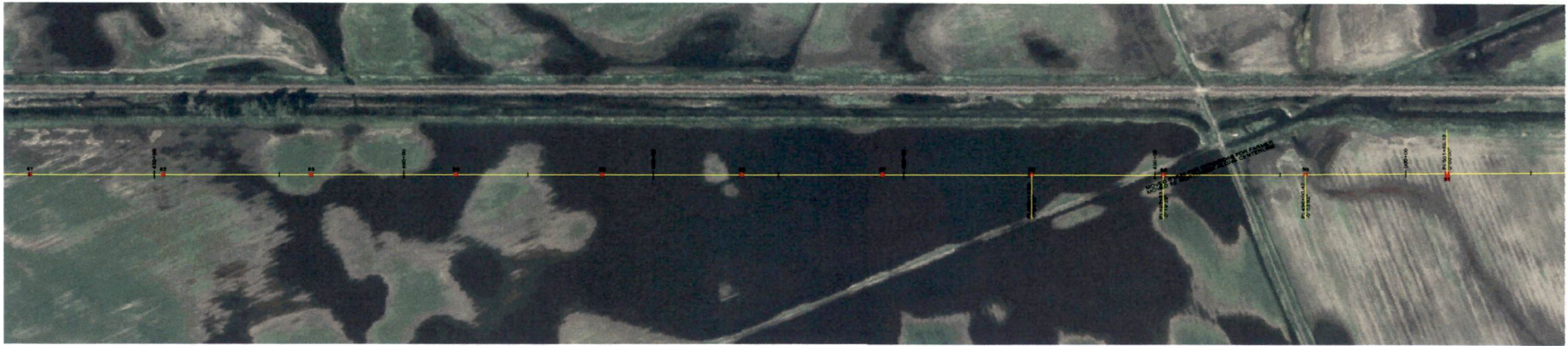
5200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

**WIND GENERATION TIE** 10 OF 73



DESIGN CONDITIONS:  
 0.455' GROW, 24" FIBER  
 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE: 30'

1272 ACBR 457 "BITTERN"  
 20% RTS @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	DFT#
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMP

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 9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

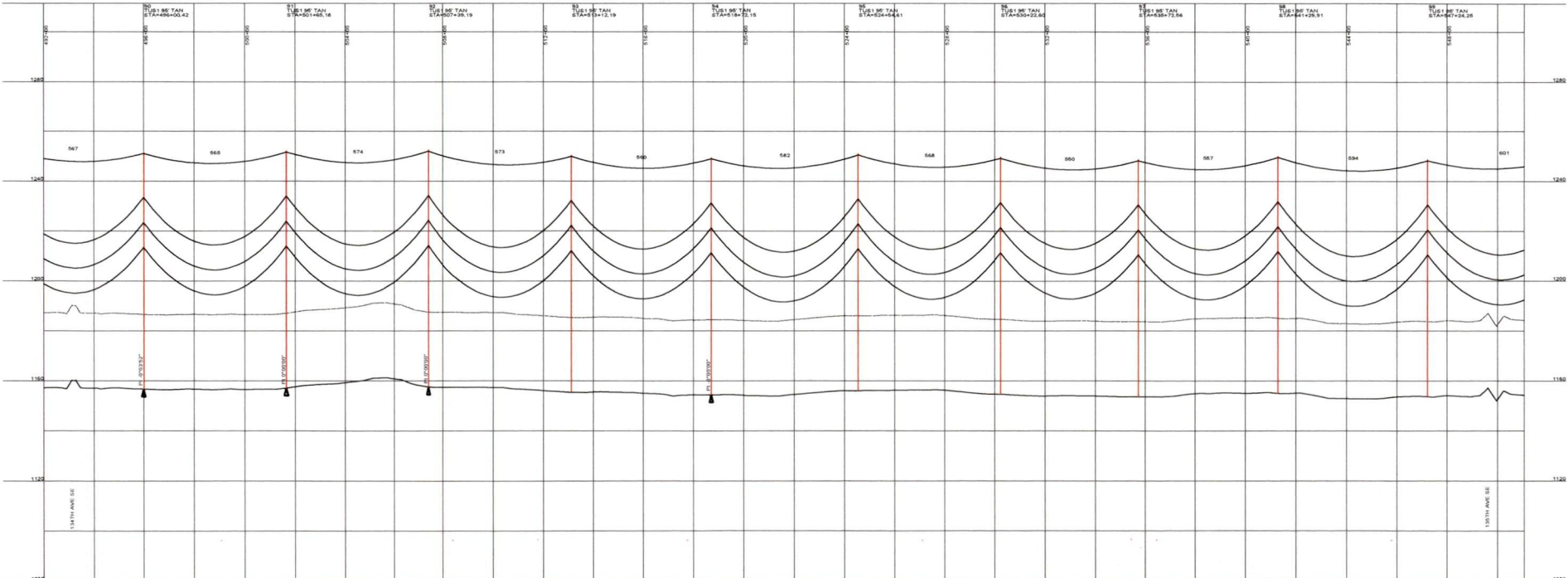
A STANLEY GROUP COMPANY  
 ENGINEERING, ENVIRONMENTAL AND  
 CONSTRUCTION SERVICES - WORLDWIDE

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 11 OF 73



DESIGN CONDITIONS:  
 0.445" OPDW, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE: 30'

1272 ACBR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	TMP	DFTM
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

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 9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

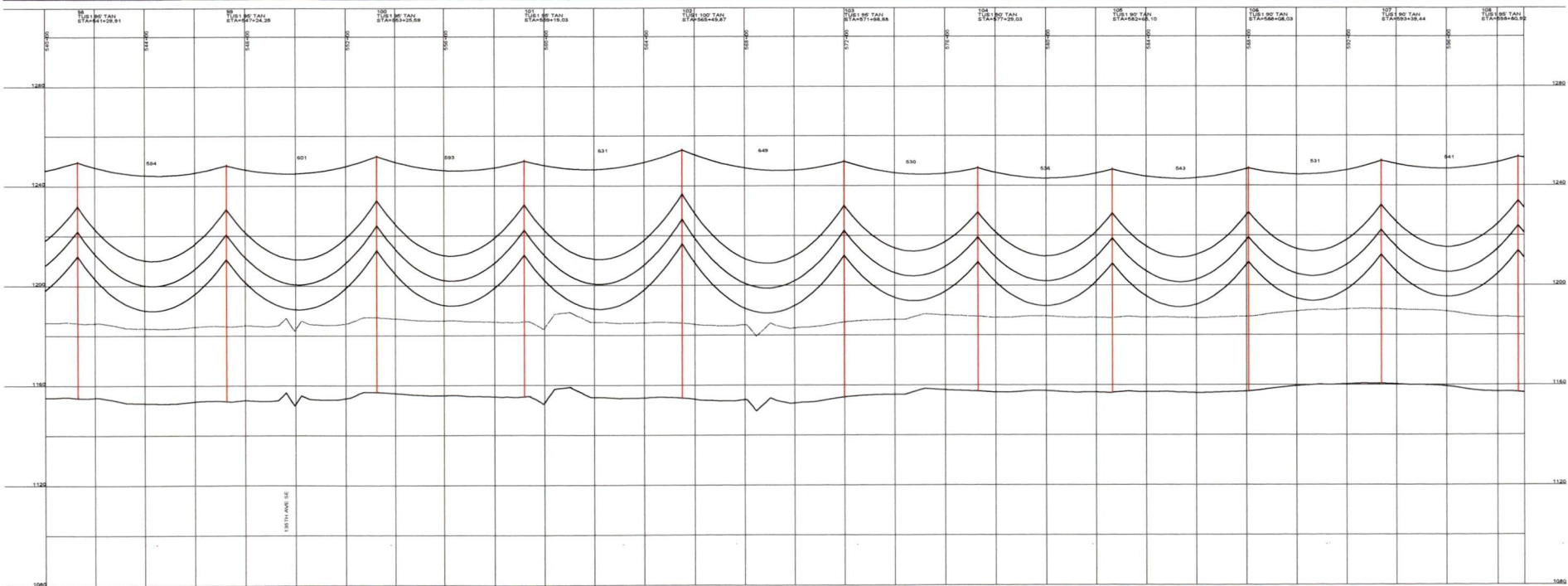
A STANLEY GROUP COMPANY  
 ENGINEERING, ENVIRONMENTAL AND  
 CONSTRUCTION SERVICES - WORLDWIDE

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

450.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

**WIND GENERATION TIE** 12 OF 73



DESIGN CONDITIONS:  
 0.465" OPDW, 24 FIBER  
 20% RTS @ -30 DEGREES F. INITIAL  
 CLEARANCE LINE 3'

1272 ACBR 457' BITTERN'

20% RTS @ -30 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	TMP	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		



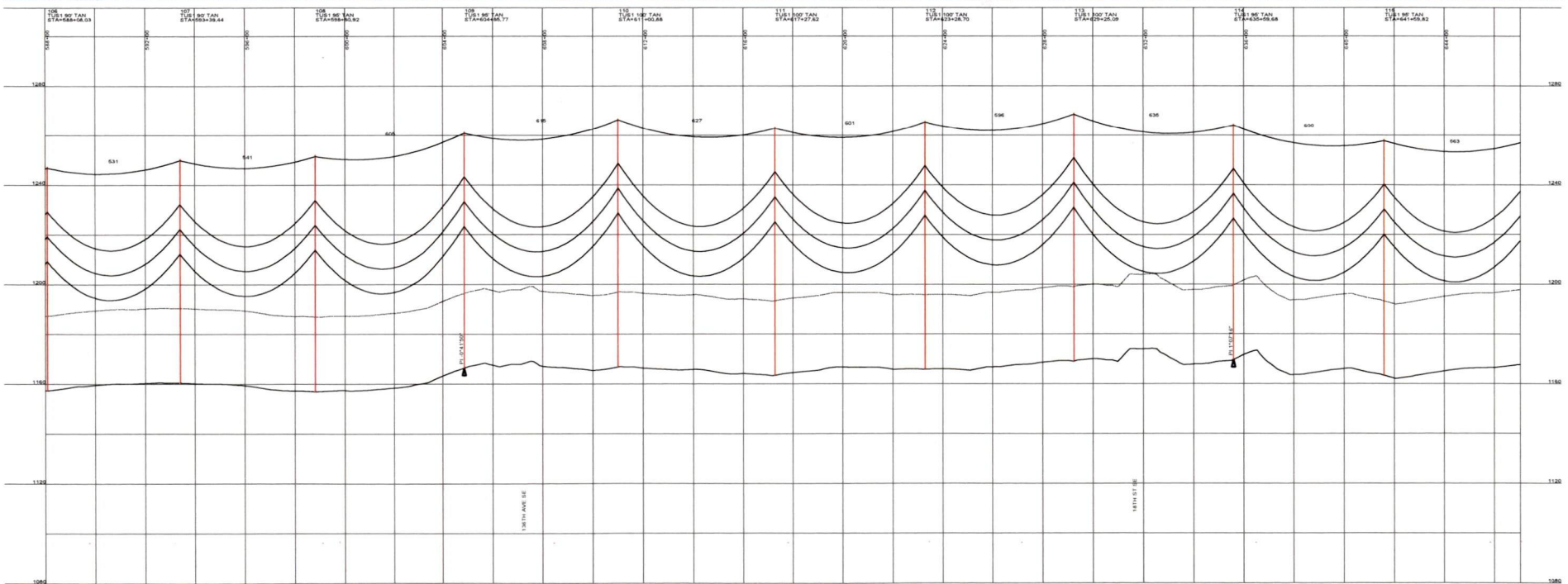
8200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

A STANLEY GROUP COMPANY  
 ENGINEERING, ENVIRONMENTAL AND  
 CONSTRUCTION SERVICES - WORLDWIDE

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**





DESIGN CONDITIONS  
 0.465" OPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE 30'

1272 ACER 45/7 "BITTERN"

20% RTS @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	DPTH
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF

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 CONSTRUCTION SERVICES - WORLDWIDE

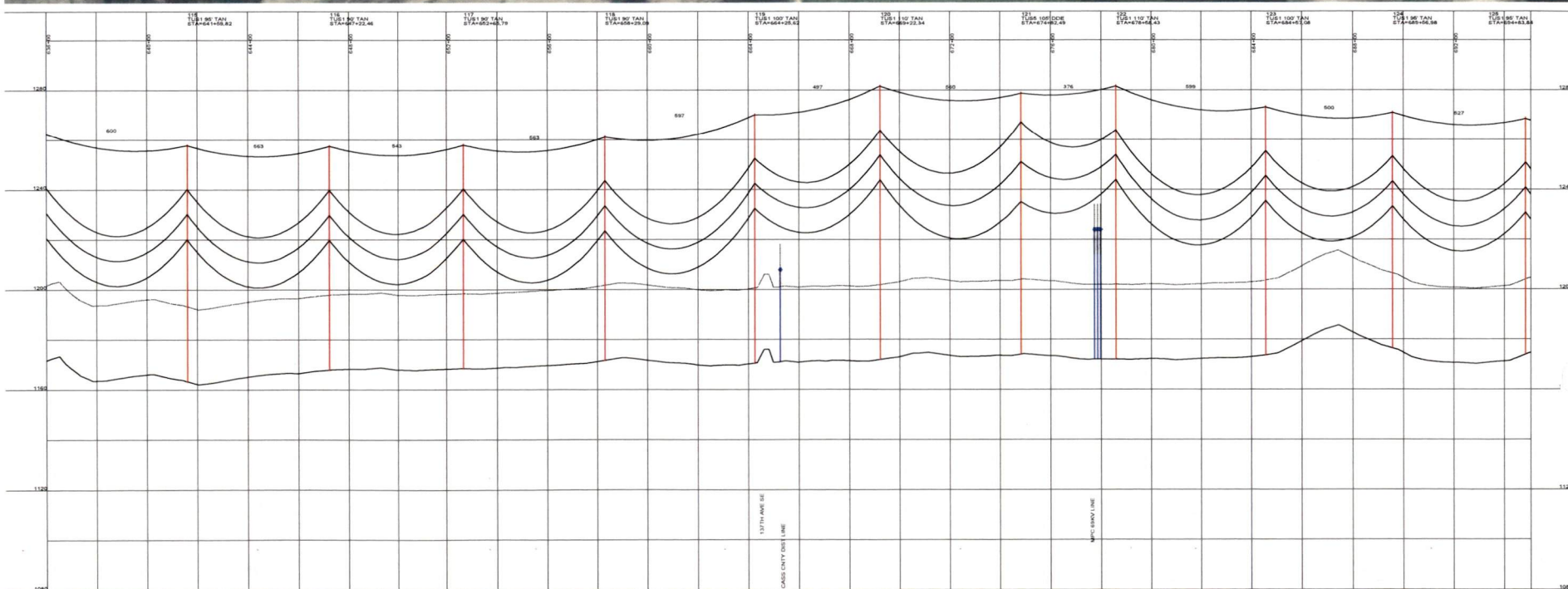
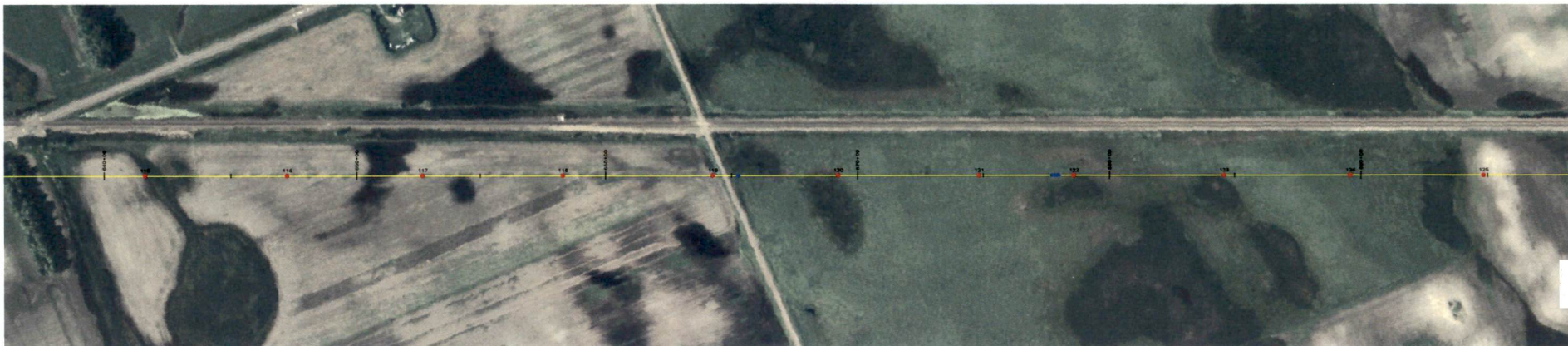
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. ← HORIZ. SCALE  
 40.0 FT. ← VERT. SCALE

WIND GENERATION TIE 14 OF 73



DESIGN CONDITIONS  
 0.465" OP/OW, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE 30'

1272 ACIR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	DPTH
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF

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 ENGLEWOOD, CO 80112

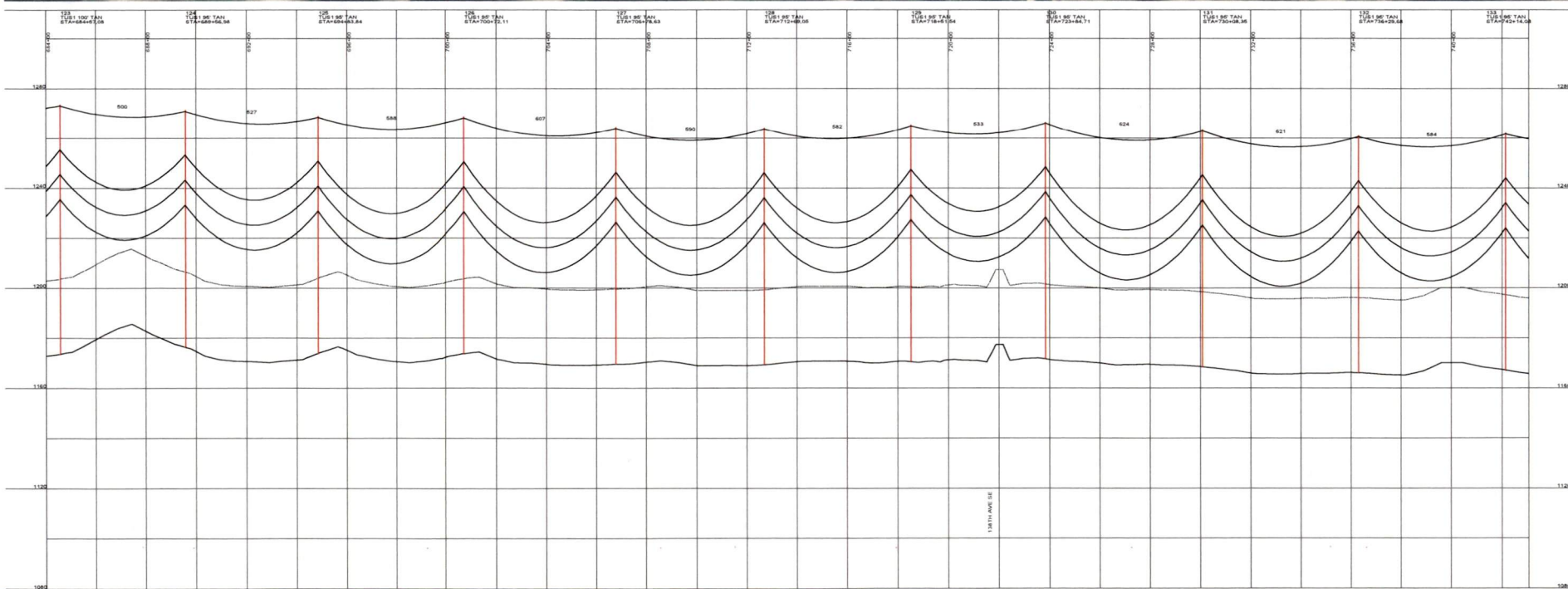
A STANLEY GROUP COMPANY  
 ENGINEERING, ENVIRONMENTAL AND  
 CONSTRUCTION SERVICES - WORLDWIDE

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. ———— HORIZ. SCALE  
 40.0 FT. ———— VERT. SCALE

**WIND GENERATION TIE**      15 OF 73



DESIGN CONDITIONS  
 0.465" CPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE 30'

1272 ACER 48/7 "BITTERN"

20% RTS @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	TMP	DFH
0	05/06/08	MFJ	ISSUED FOR CONSTRUCTION		

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 ENGINEERING, ENVIRONMENTAL AND  
 CONSTRUCTION SERVICES - WORLDWIDE

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 SUITE 400  
 ENGLEWOOD, CO 80112

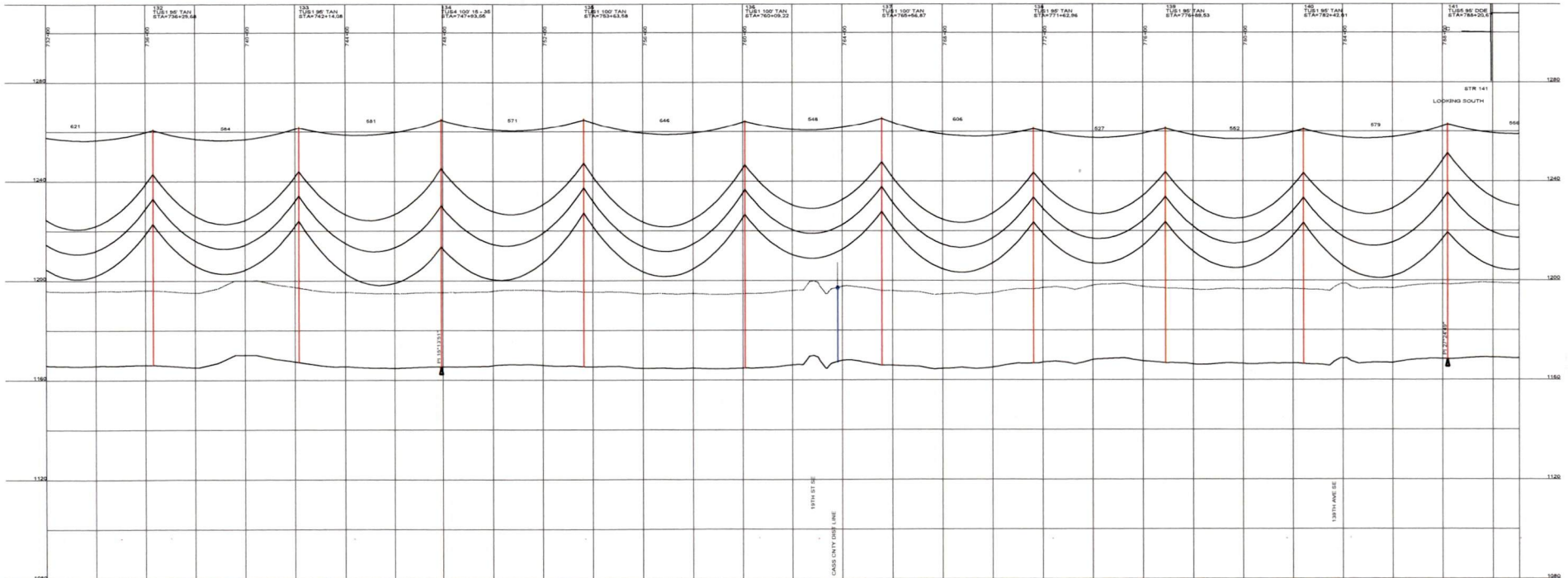
DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 05/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. ———— HORIZ. SCALE  
 40.0 FT. ———— VERT. SCALE

WIND GENERATION TIE

16 OF 73



DESIGN CONDITIONS  
 0.465" CP/W, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE 30'

1272 ACBR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F. INITIAL

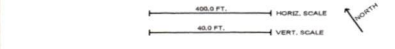
REV	DATE	APP	DESCRIPTION	DFTR
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF

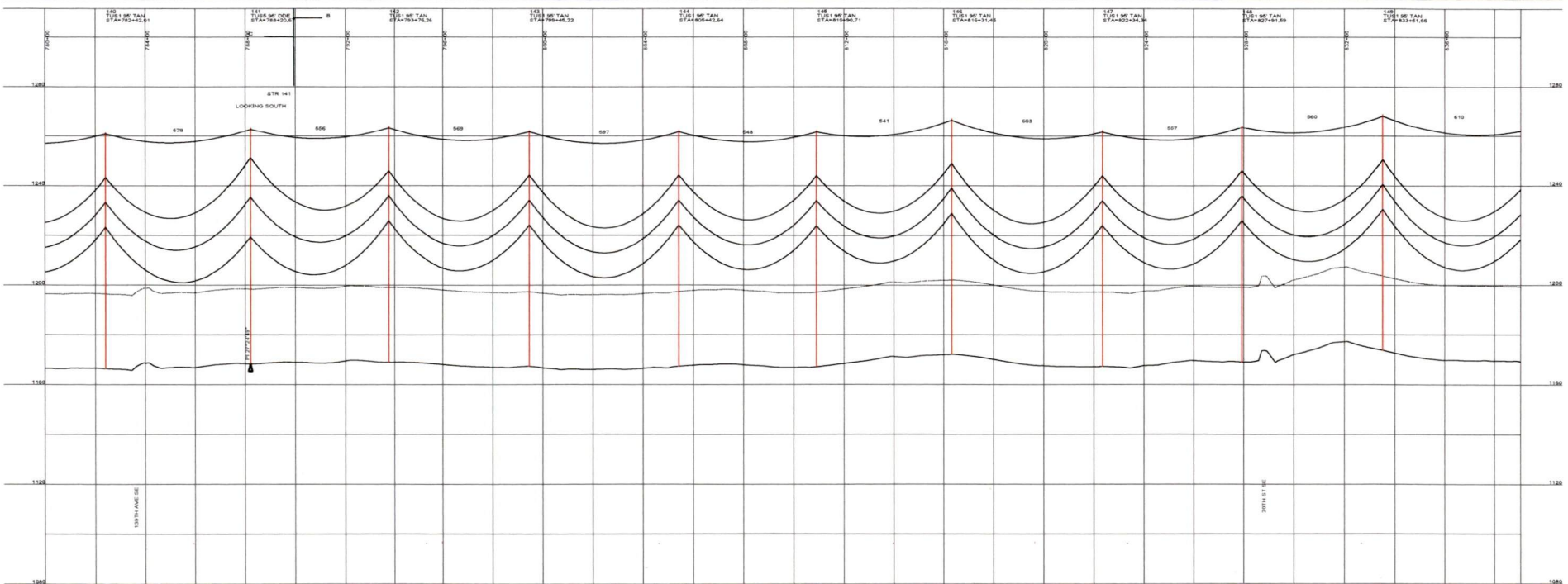
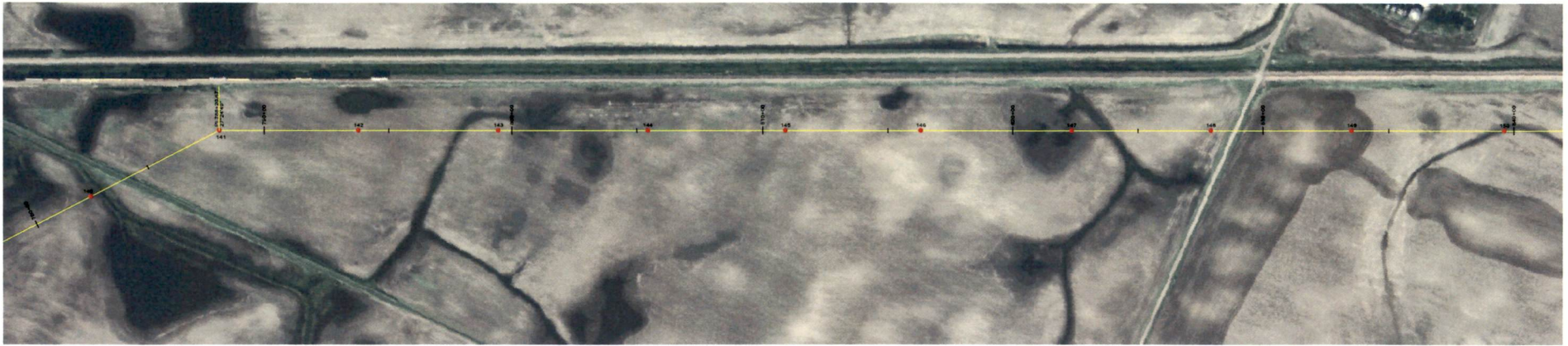
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 ENGINEERING, ENVIRONMENTAL AND  
 CONSTRUCTION SERVICES - WORLDWIDE

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**





DESIGN CONDITIONS  
 0.45" CRGW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

1272 ACBR 457 "BITTERY"  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

REV	DATE	APP	DESCRIPTION	TMF	DFTS
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

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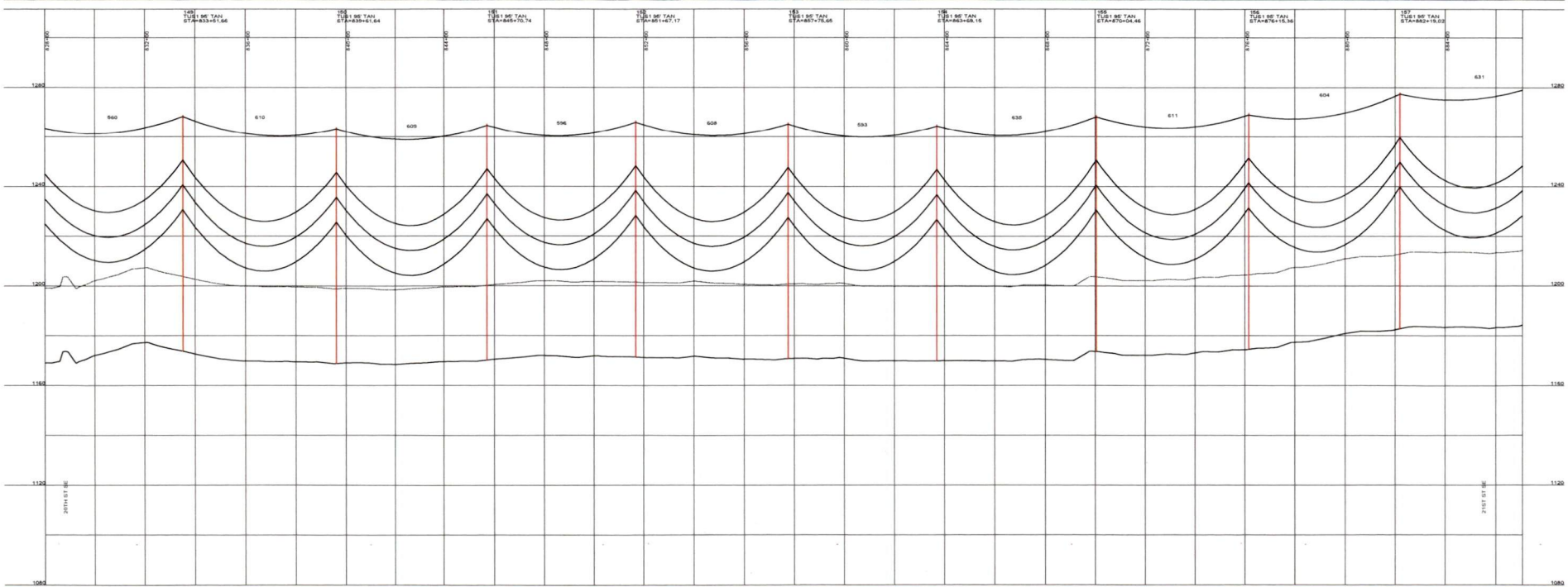
8200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
 GRAND FORKS, ND

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 18 OF 73



DESIGN CONDITIONS:  
 0.465' CROWN, 2.4' FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE: 30'

1272 AC SR 45/7 "BITTERN"

REV	DATE	APP	DESCRIPTION	DFT
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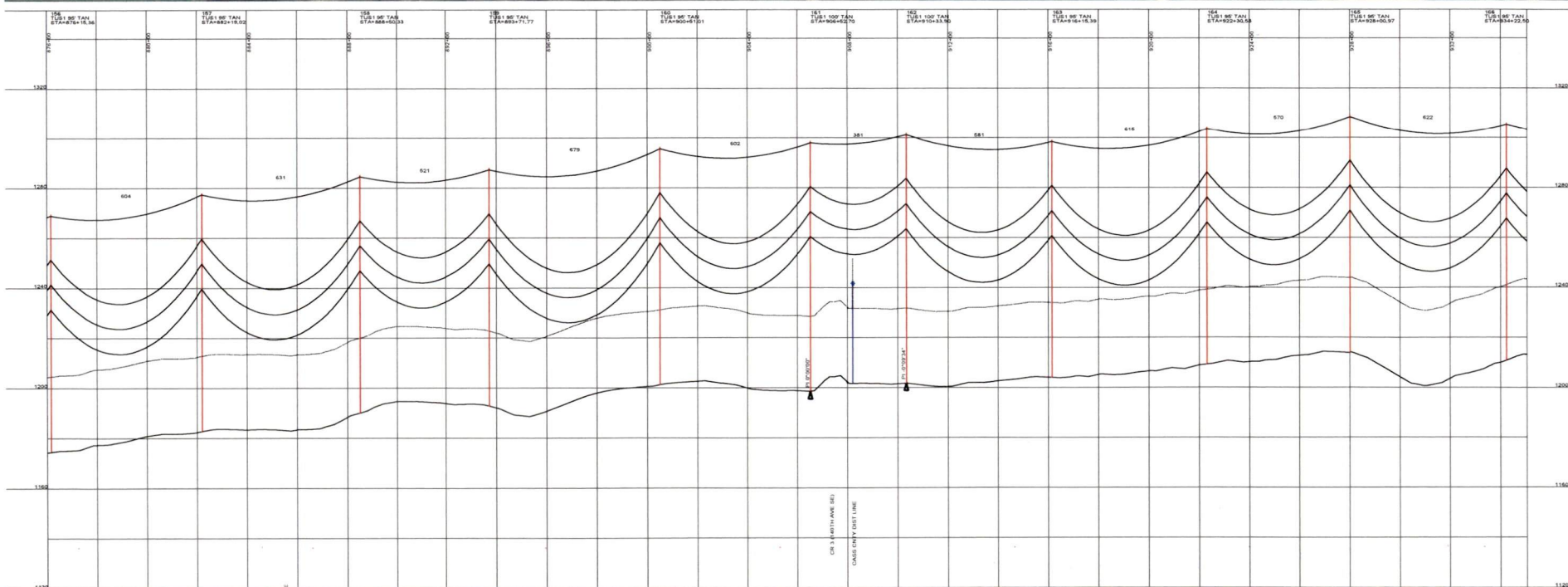
9200 E. MINERAL AVE.,  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
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 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

**WIND GENERATION TIE** 19 OF 73



DESIGN CONDITIONS:  
 0.465' OPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'  
 1272 AC/SR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

REV	DATE	APP	DESCRIPTION	TMF	DFTR
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		



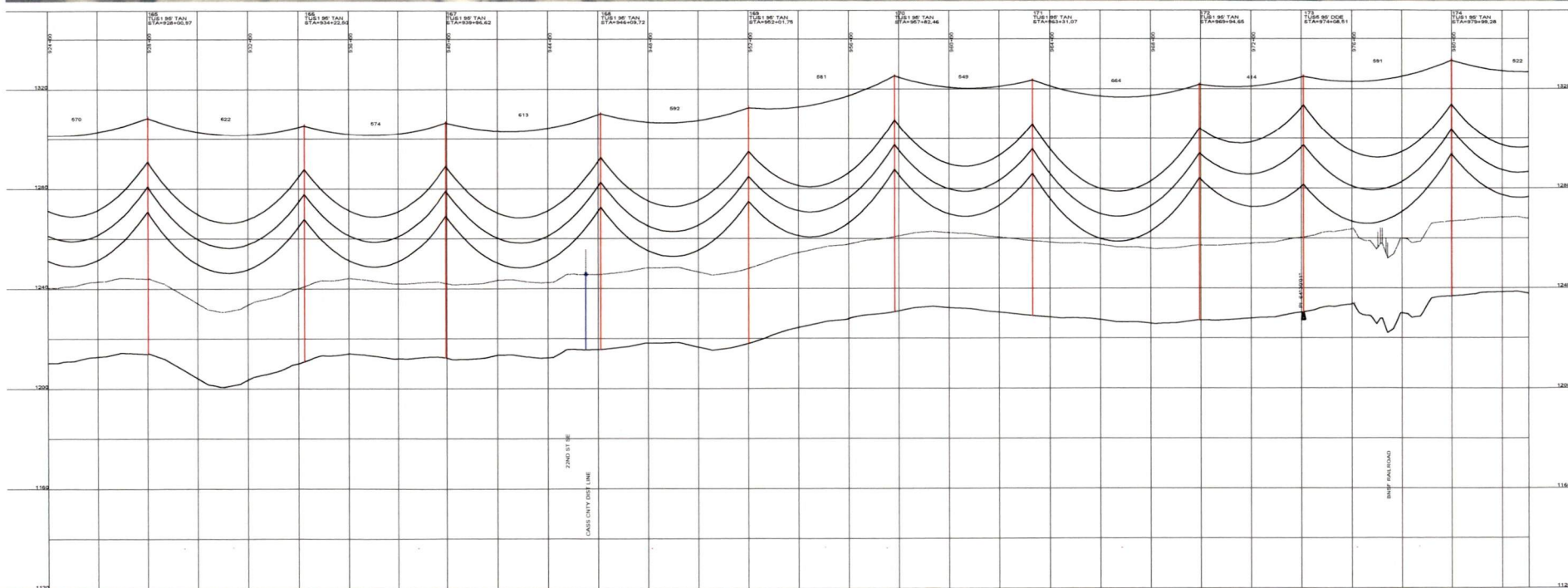
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 CONSTRUCTION SERVICES - WORLDWIDE

9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED J. FRANCIS  
 DRAWN J. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**






DESIGN CONDITIONS  
 0.465' CPGW; 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE 30'

1272 ACSR 45/7 "BITTERY"

20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	DFTR
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF



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 ENGINEERING, ENVIRONMENTAL AND  
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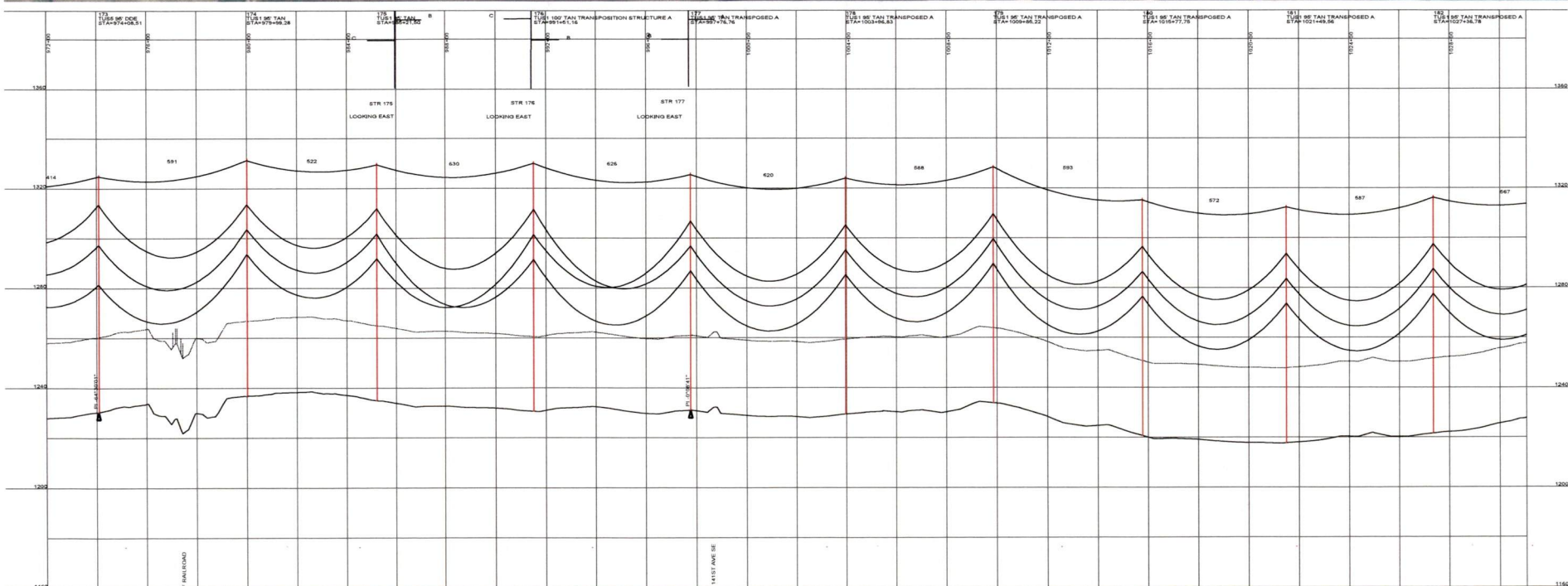
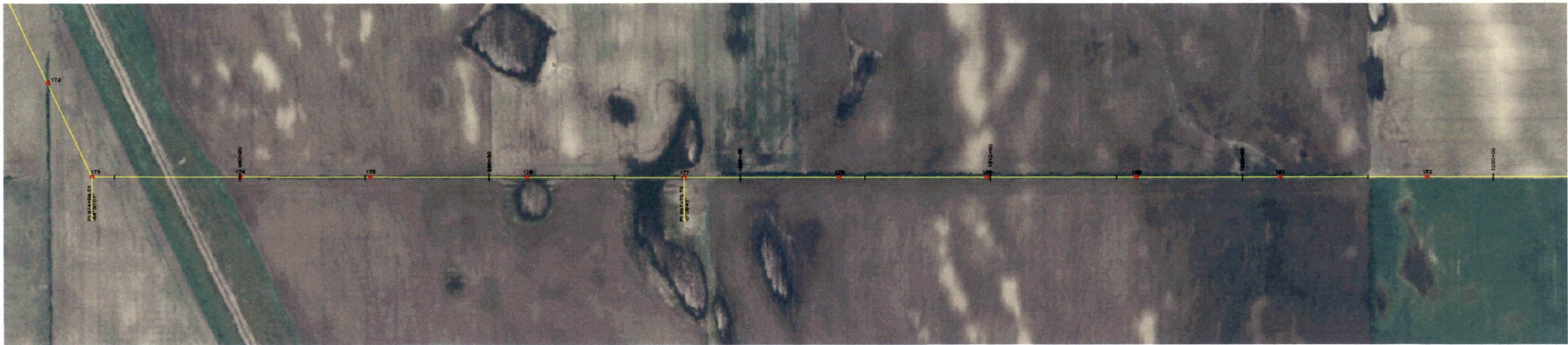
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 05/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

**WIND GENERATION TIE 21 OF 73**



DESIGN CONDITIONS  
 0.465' OPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE 30'

1272 AC8R 45/7 "BITTERN"

20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF



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9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

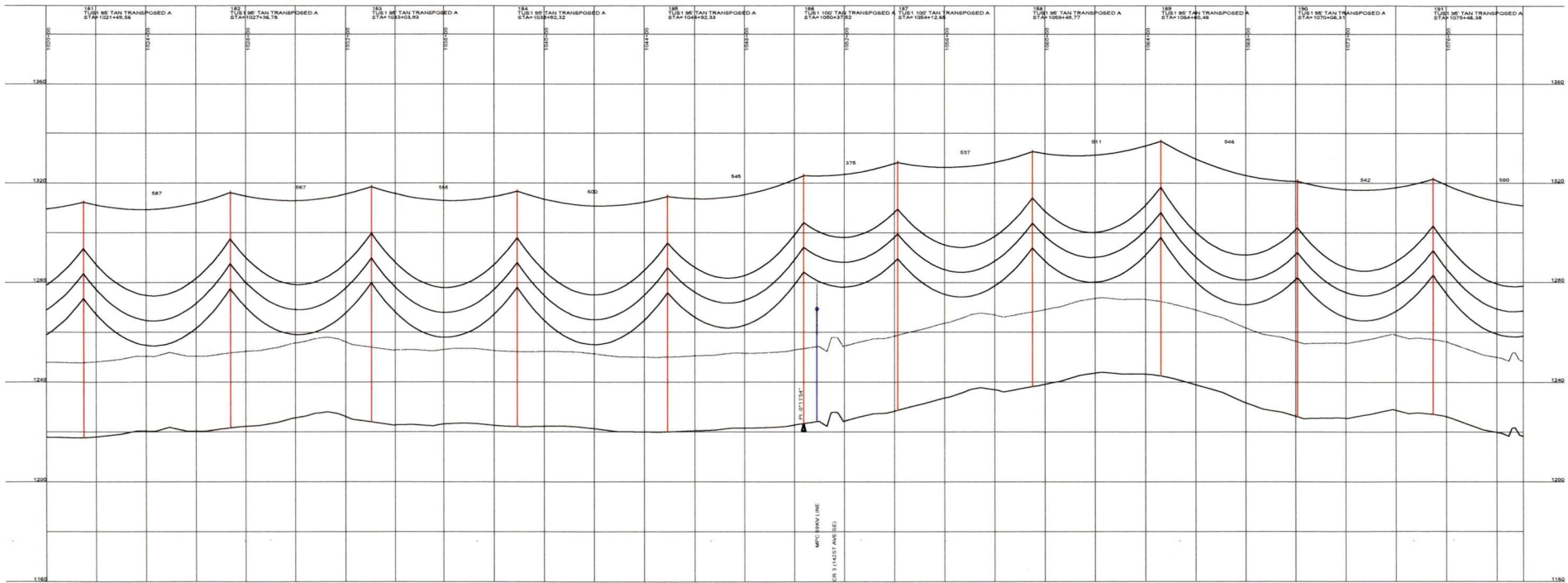
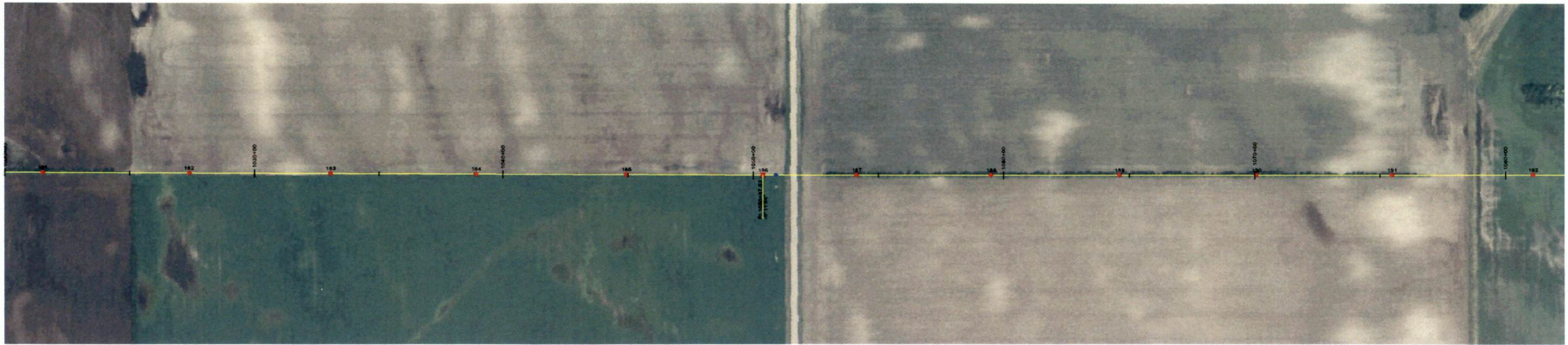
DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

↑ NORTH

**WIND GENERATION TIE 22 OF 73**



DESIGN CONDITIONS  
 0.465" O.P.O.W., 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE 30'

1372 ACER 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	TMF	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

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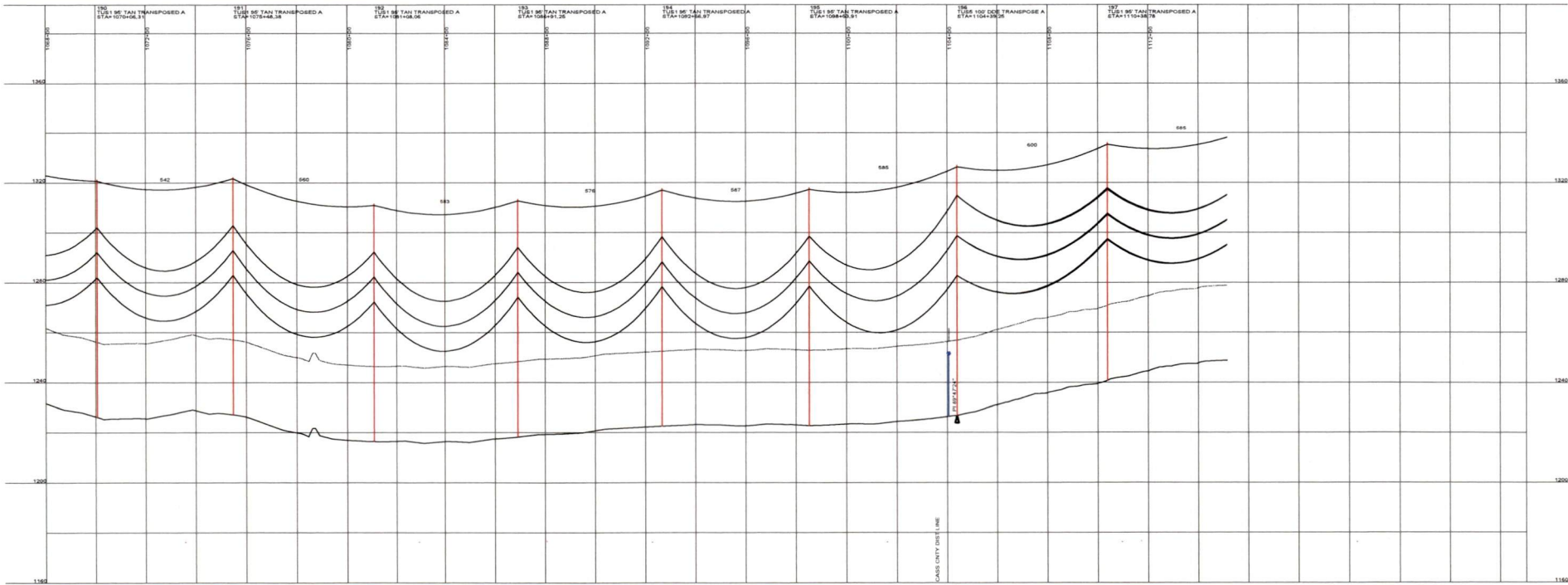
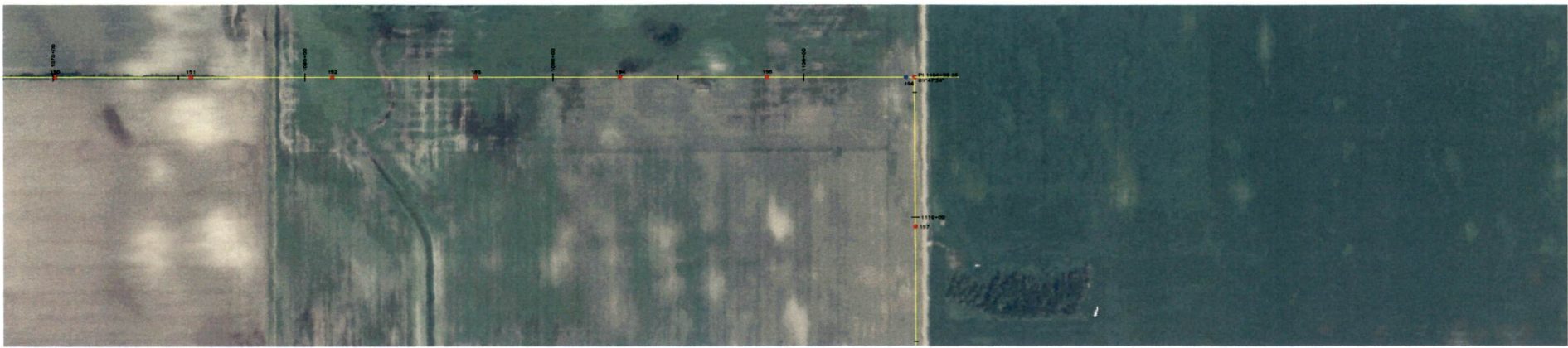
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
 GRAND FORKS, ND

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 23 OF 73



DESIGN CONDITIONS  
 0.485" CROWN, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

1272 ACBR 45/7 "BITTERN"

20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

REV	DATE	APP	DESCRIPTION	DTM
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	



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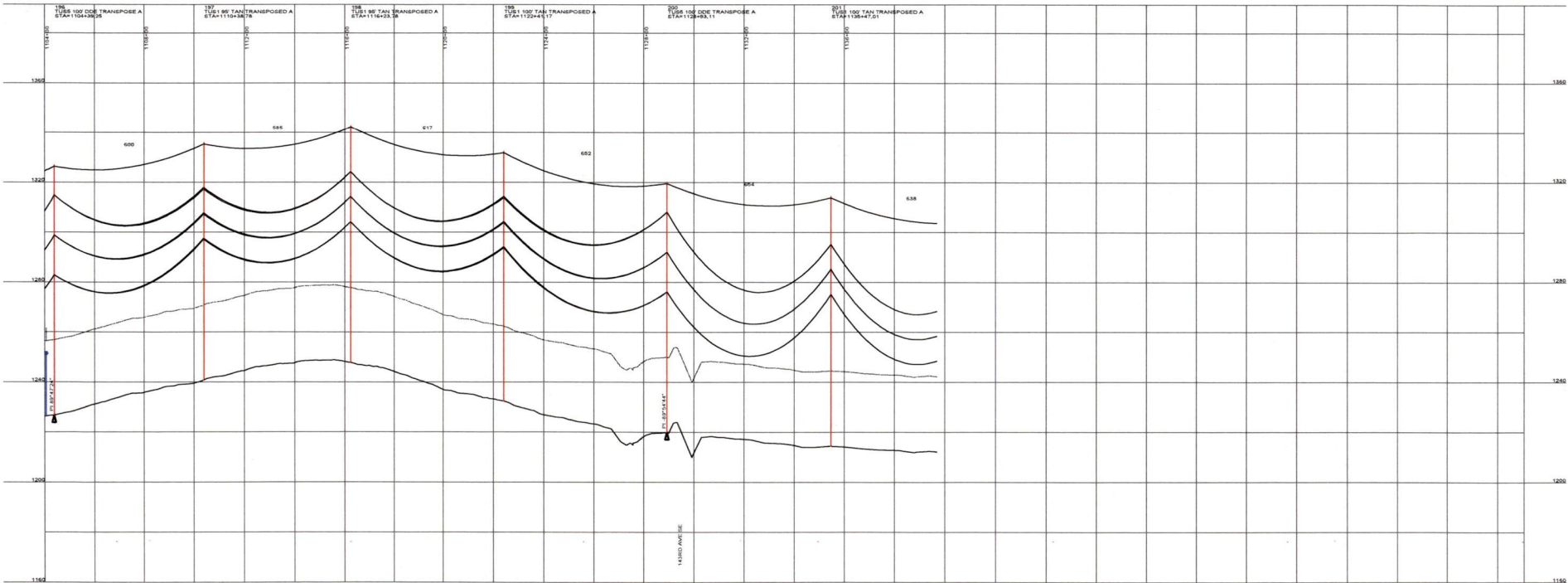
DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

↑ NORTH

WIND GENERATION TIE 24 OF 73



DESIGN CONDITIONS:  
 0.465" GRIDW. 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL CLEARANCE LINE 30'

1272 ACER 45/7 "BITTERRY"  
 20% RTS @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	DFT/
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF

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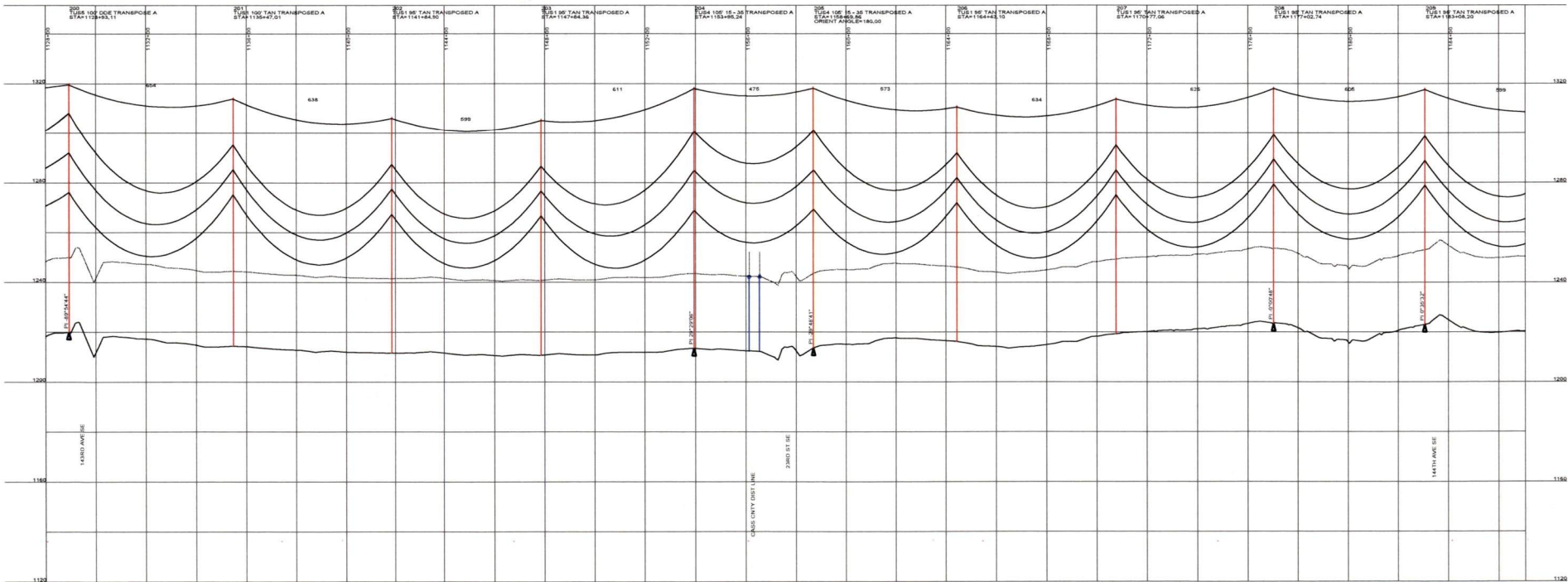
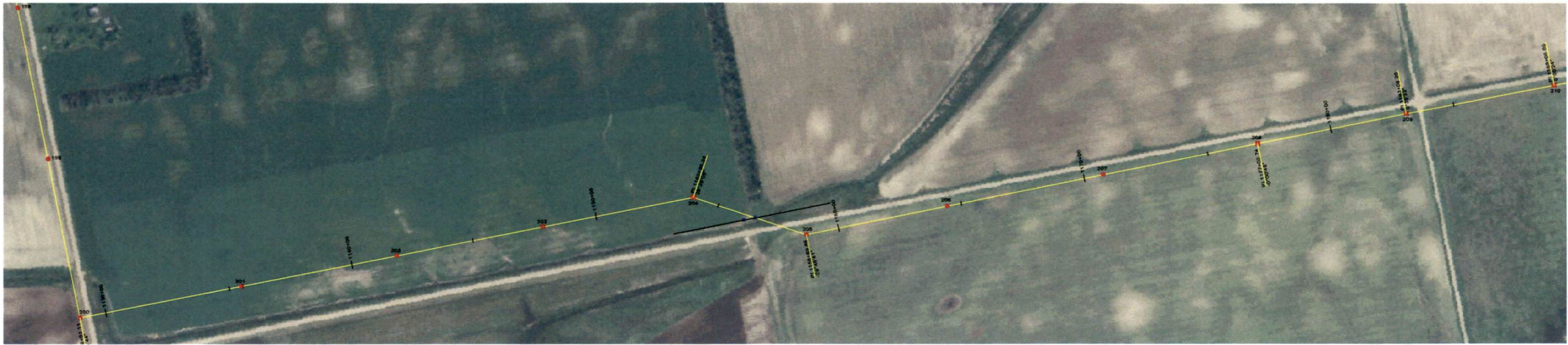
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

**WIND GENERATION TIE** 25 OF 73



DESIGN CONDITIONS  
 0.465' CPGW, 24 FIBER  
 20% RT6 @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE: 30'

1272 AC SR 45/7 'BITTERN'  
 20% RT6 @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	TMF	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		



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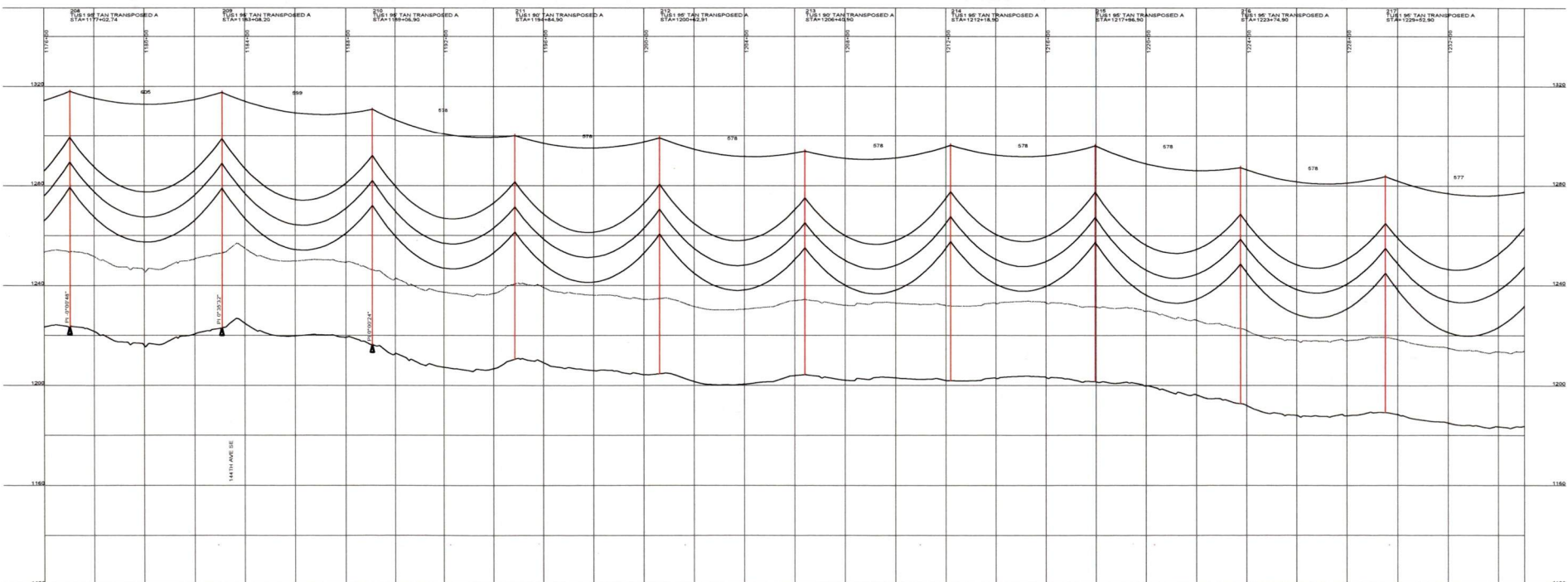
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 26 OF 73



DESIGN CONDITIONS  
 0.465" CRWD, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

1272 ACBR 45/7 "BITTERN"

20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMP

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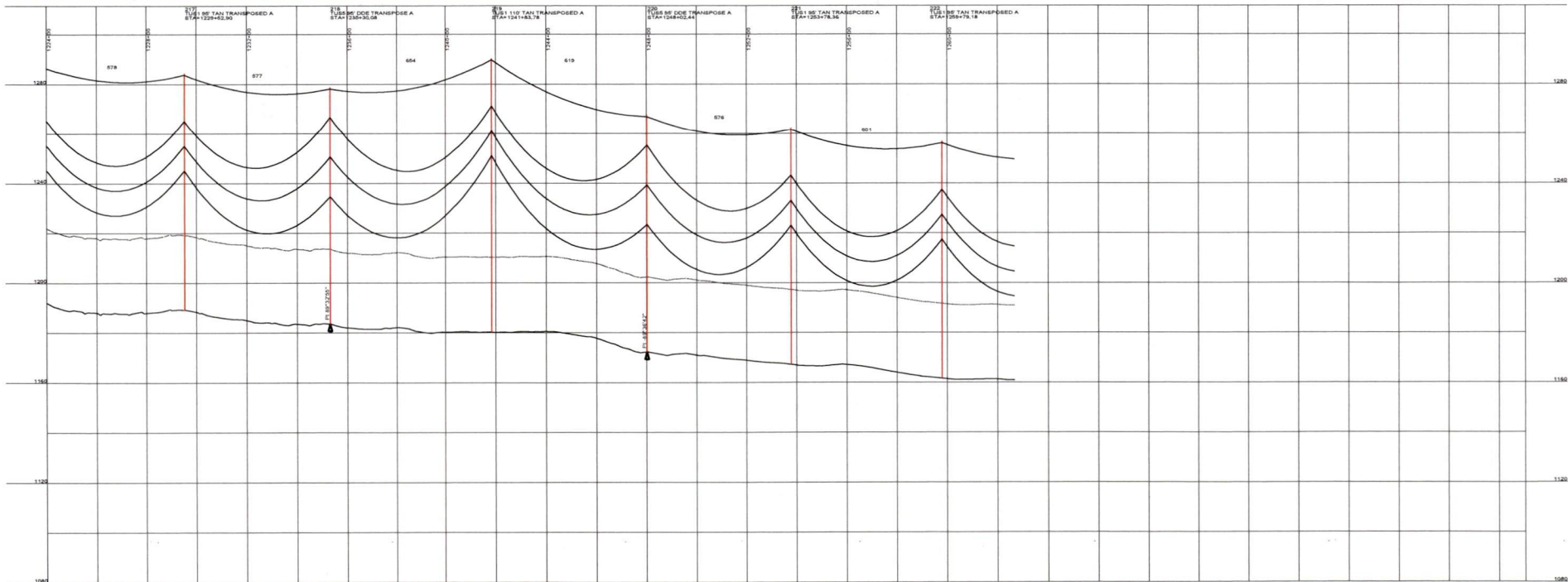
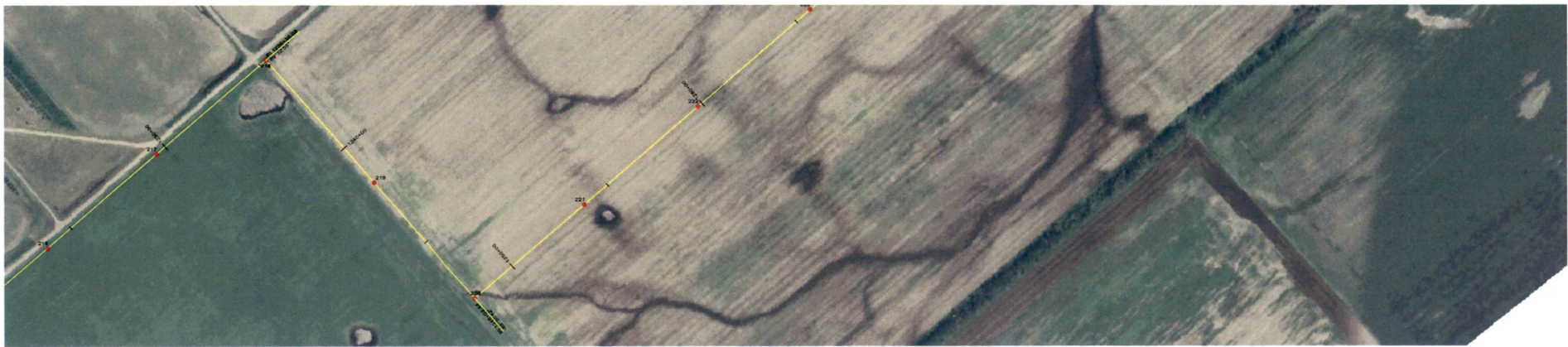
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 27 OF 73



DESIGN CONDITIONS  
 0.465' OPGW, 24 FIBER 1272 ACER 45/7 "BITTERN"  
 20% RTS @ -30 DEGREES F, INITIAL 20% RTS @ -30 DEGREES F, INITIAL  
 CLEARANCE LINE: 30'

REV	DATE	APP	DESCRIPTION	TMF	DFTF
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		



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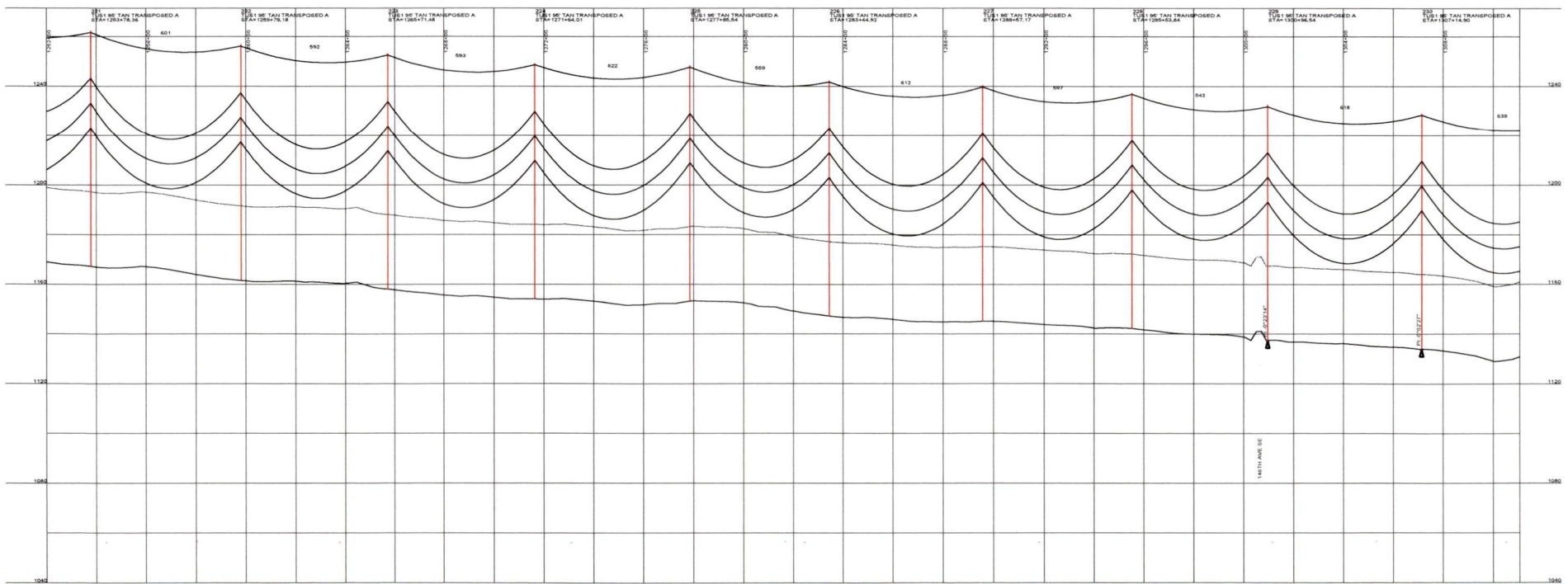
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE


**WIND GENERATION TIE** 28 OF 73



DESIGN CONDITIONS:  
 0.465" CROW, 24 FIBER  
 20% RT8 @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE: 30'

1732 AC SR 45/7 "BITTERN"  
 20% RT8 @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	TMP	DPTH
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		



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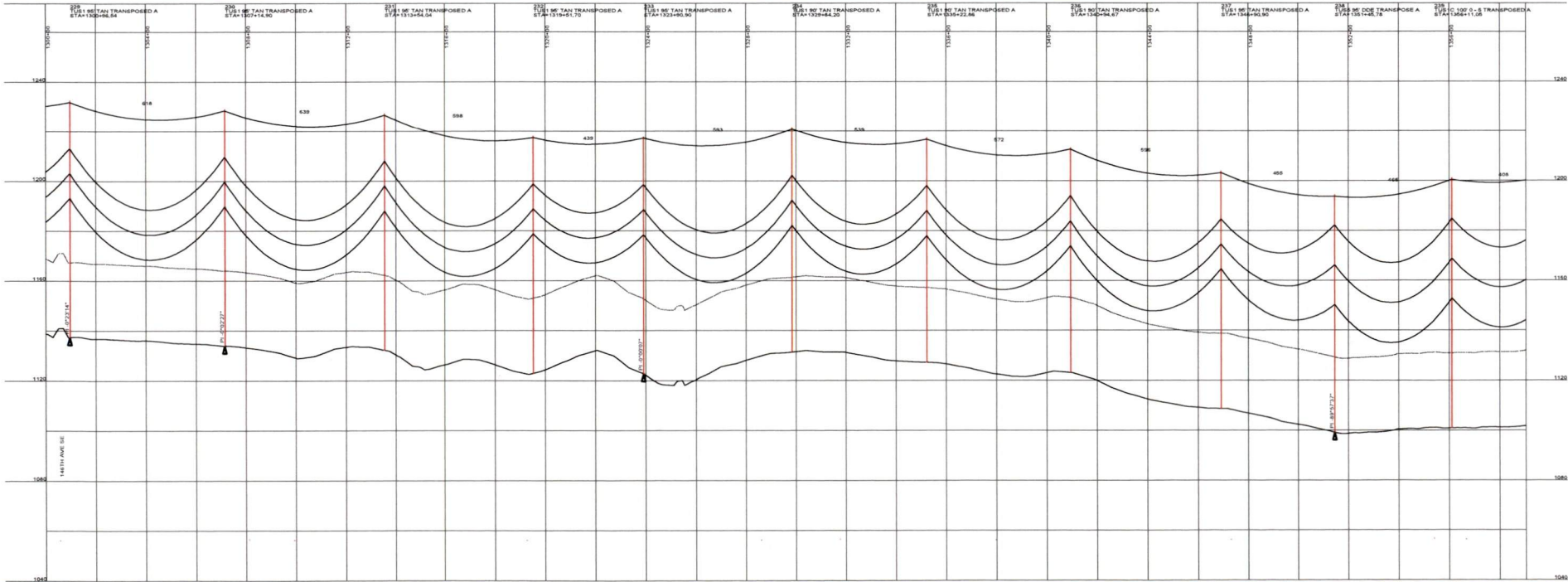
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 29 OF 73



DESIGN CONDITIONS  
 0.485' CROWN, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE 30'

1272 AC/SR 45/7 "BITTERY"  
 20% RTS @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	DFTS	TMF
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

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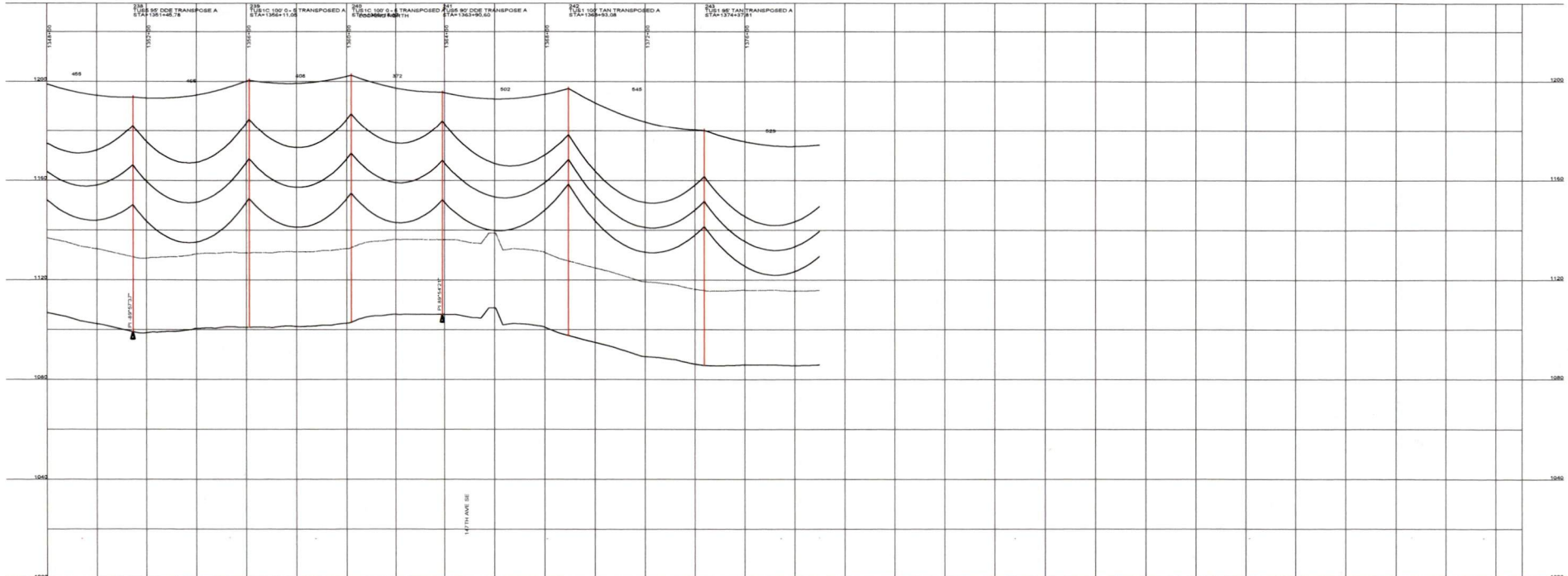
6200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 30 OF 73



DESIGN CONDITIONS:  
 0.465" O.D.W, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE: 30'

1272 AC6R 45/7 "BITTERN"

REV	DATE	APP	DESCRIPTION	DTM
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	



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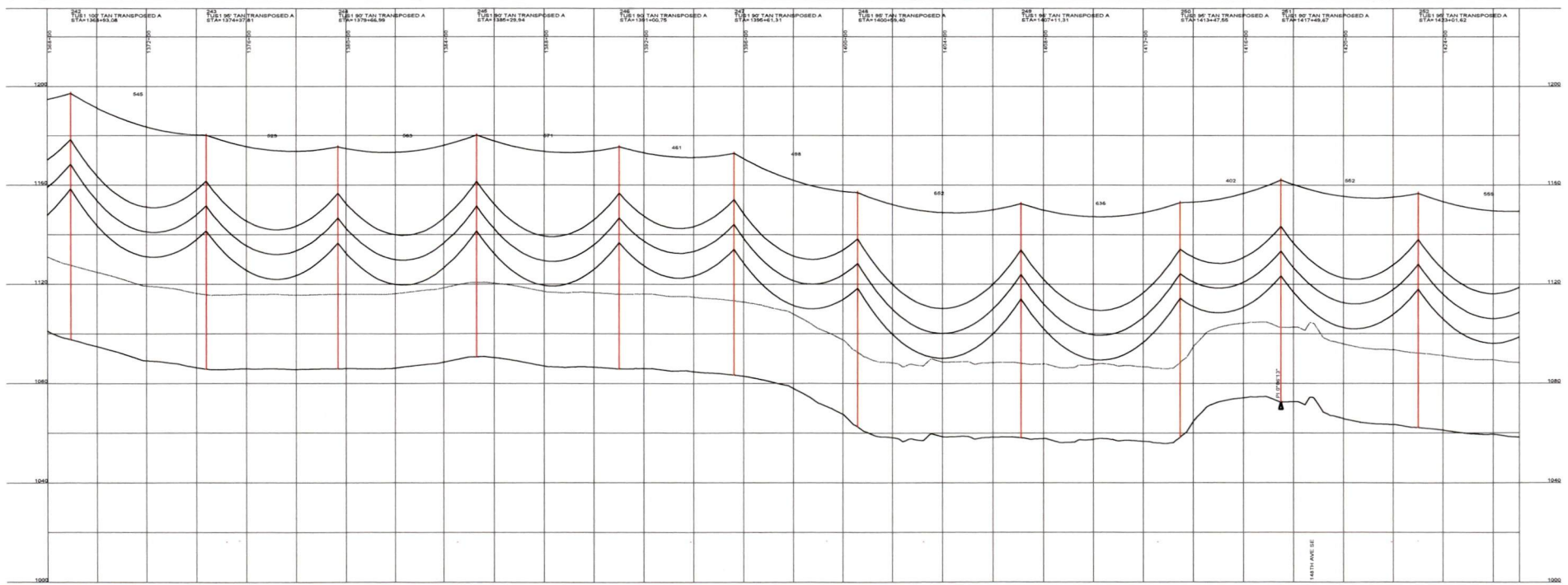
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

**WIND GENERATION TIE**      31 OF 73



DESIGN CONDITIONS  
 0.465' CROWN, 24' FIBER  
 20% RTB @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE: 30'

1272 ACER 45/7 "BITTERN"  
 20% RTB @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	TEMP	DPTH
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		



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 CONSTRUCTION SERVICES - WORLDWIDE

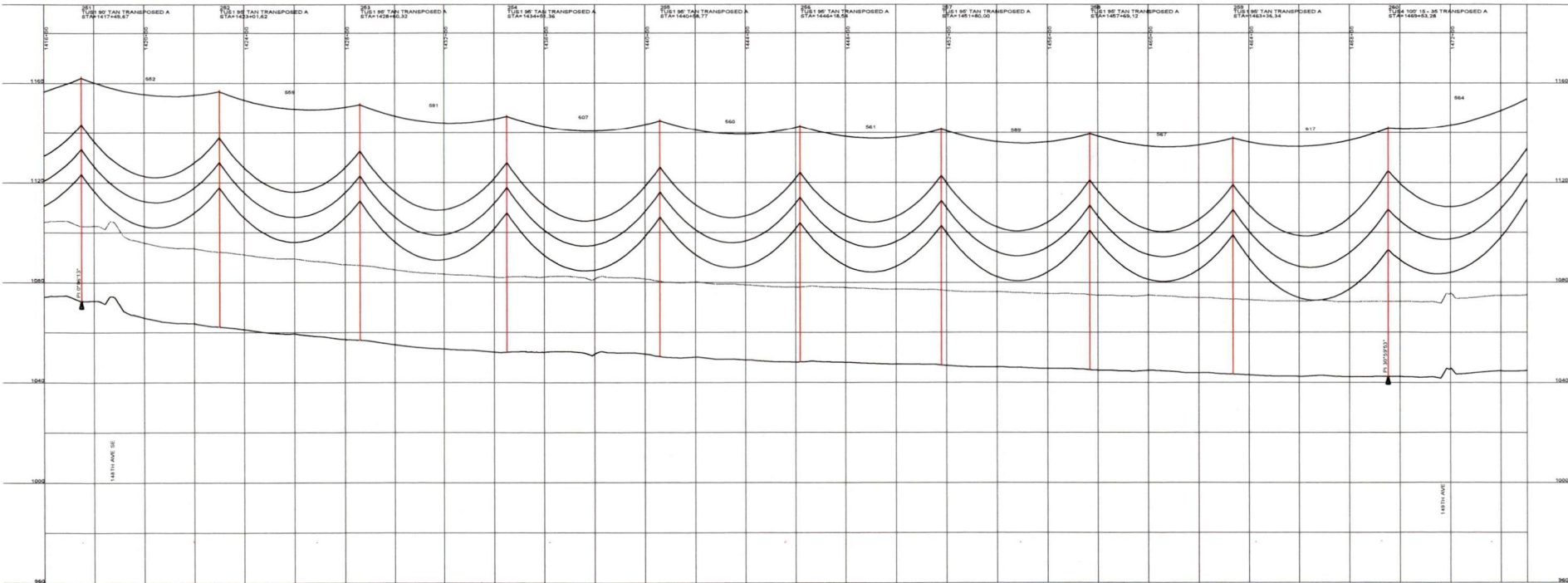
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

450.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 32 OF 73



DESIGN CONDITIONS:  
 0.465' GRID, 24 FIBER  
 1272 ACIR 45/7 "BITTERY"  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE 30'

REV	DATE	APP	DESCRIPTION	DFTB	TMF
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

**Stanley Consultants INC.**  
 9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

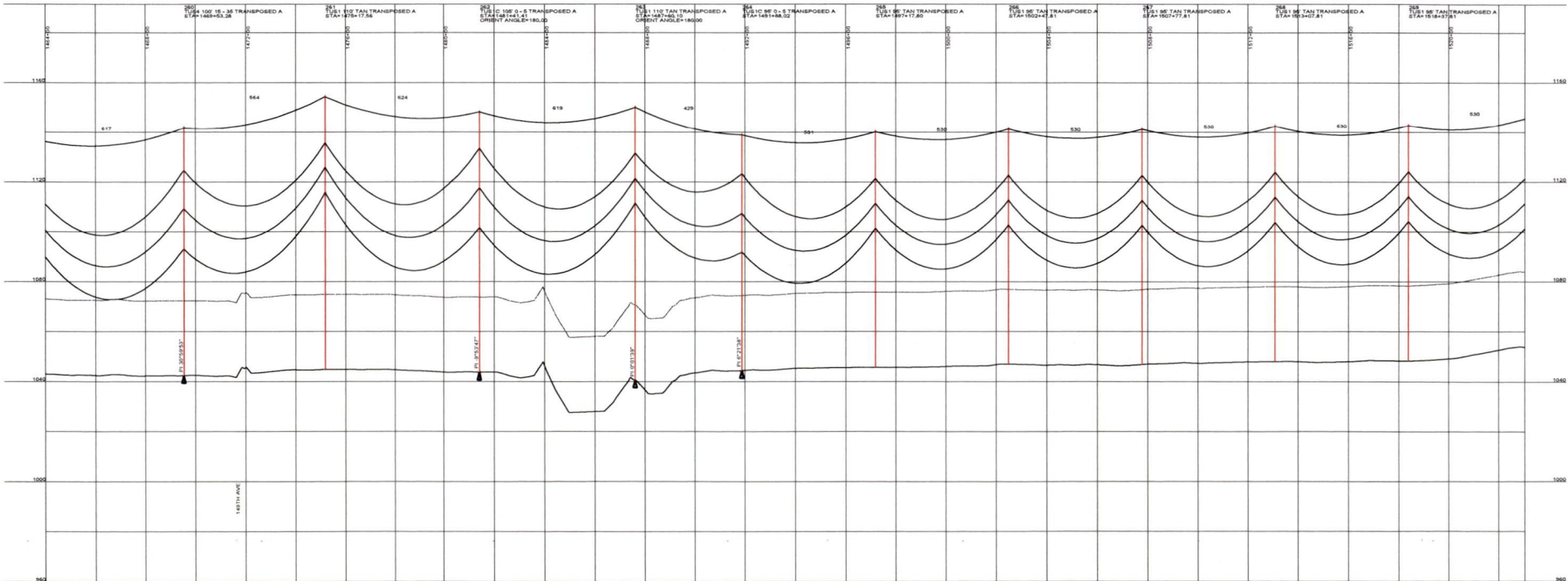
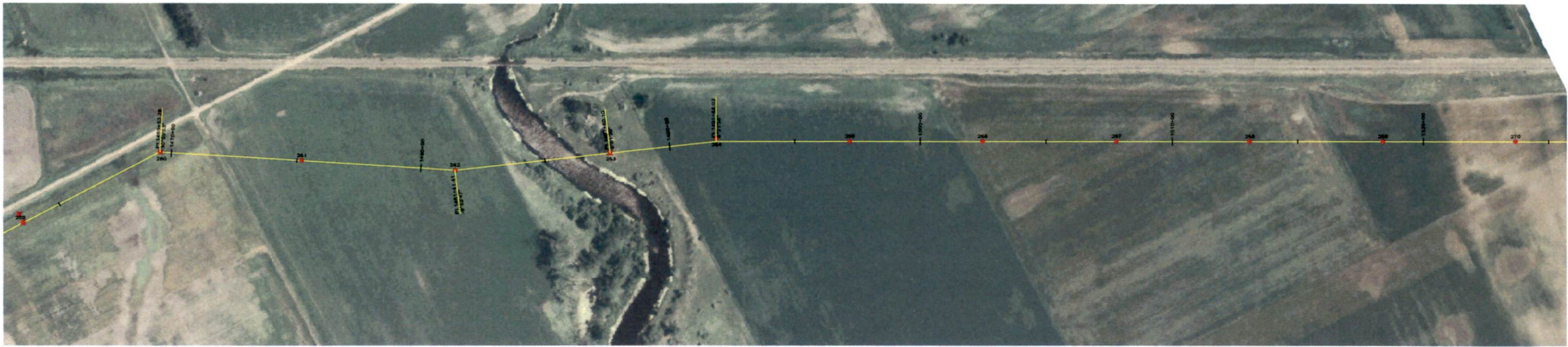
A STANLEY GROUP COMPANY  
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 CONSTRUCTION SERVICES - WORLDWIDE

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 33 OF 73



DESIGN CONDITIONS:  
 6.445" OPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE: 30'

1272 ACBR 457 'BITTERRY'  
 20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	TMF	DFTB
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

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 CONSTRUCTION SERVICES - WORLDWIDE

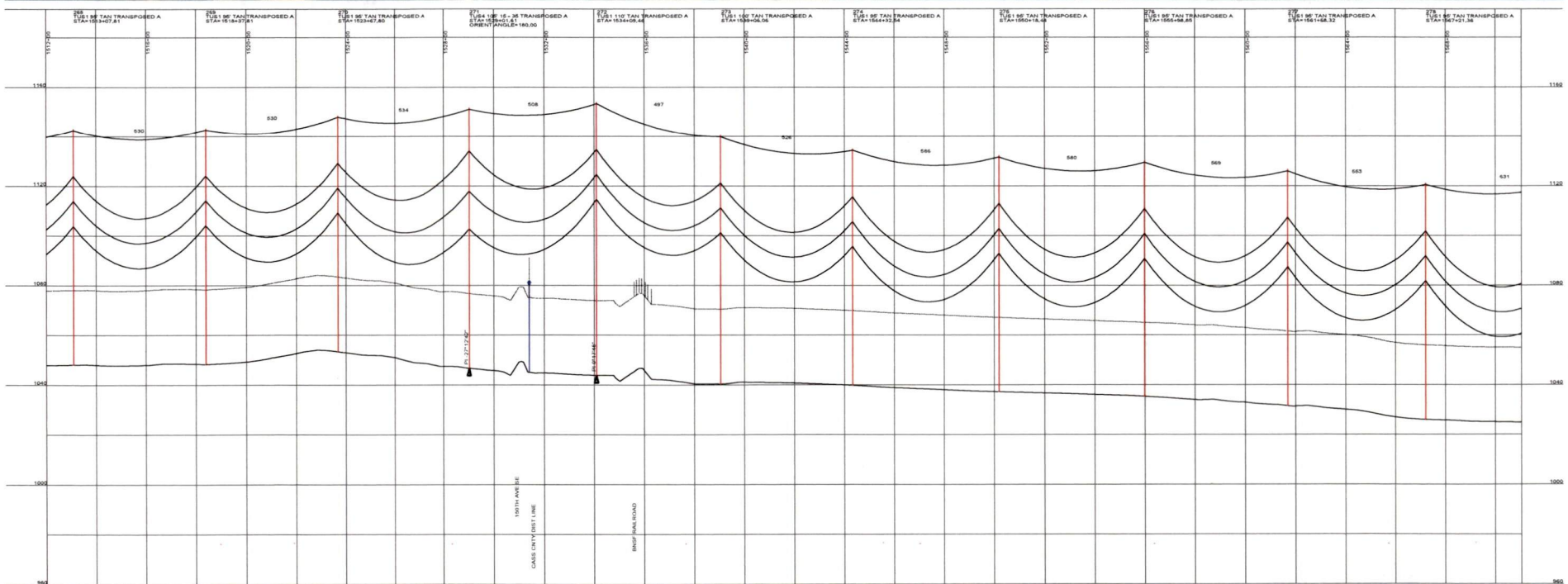
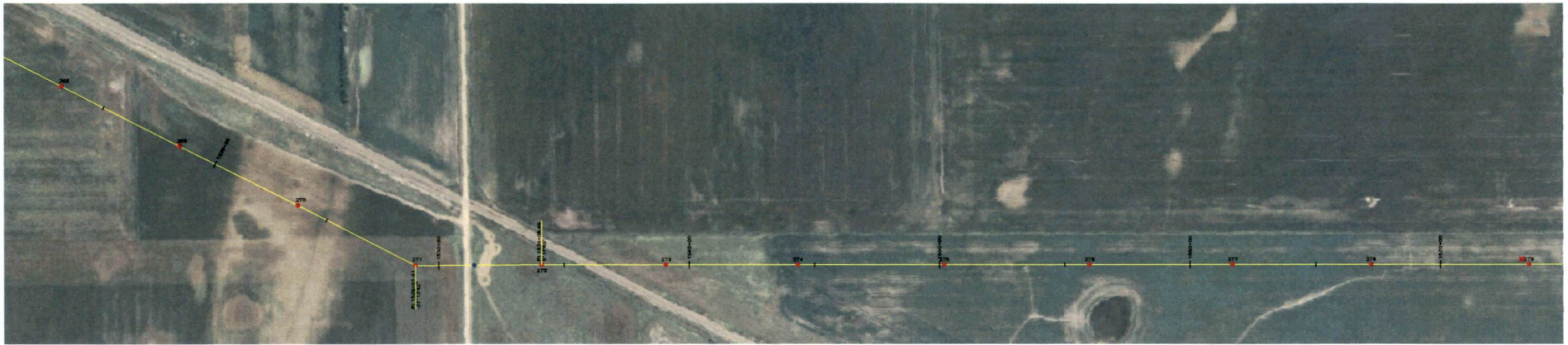
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**


400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

**WIND GENERATION TIE** 34 OF 73



DESIGN CONDITIONS:  
 0.465" OPGW, 24 FIBER 1272 ACSR 407 "BITTERN"  
 20% RTS @ -20 DEGREES F, INITIAL 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE 30'

REV	DATE	APP	DESCRIPTION	DTR	TMF
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		



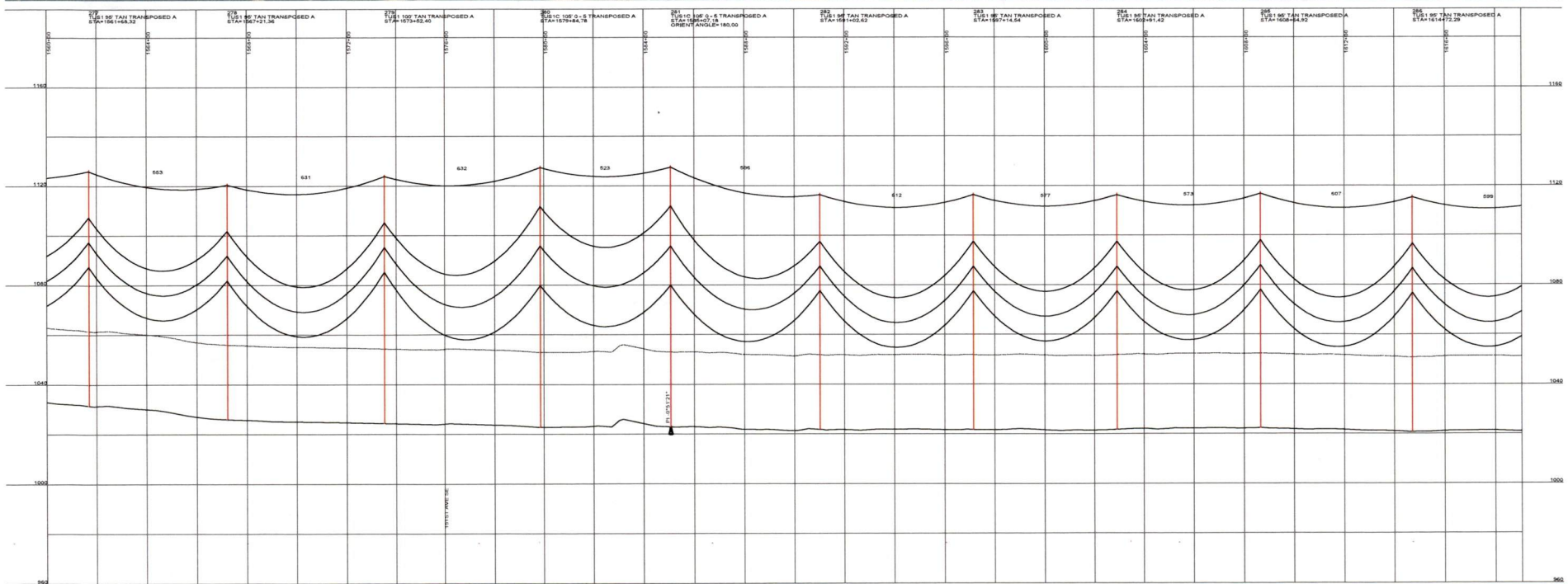
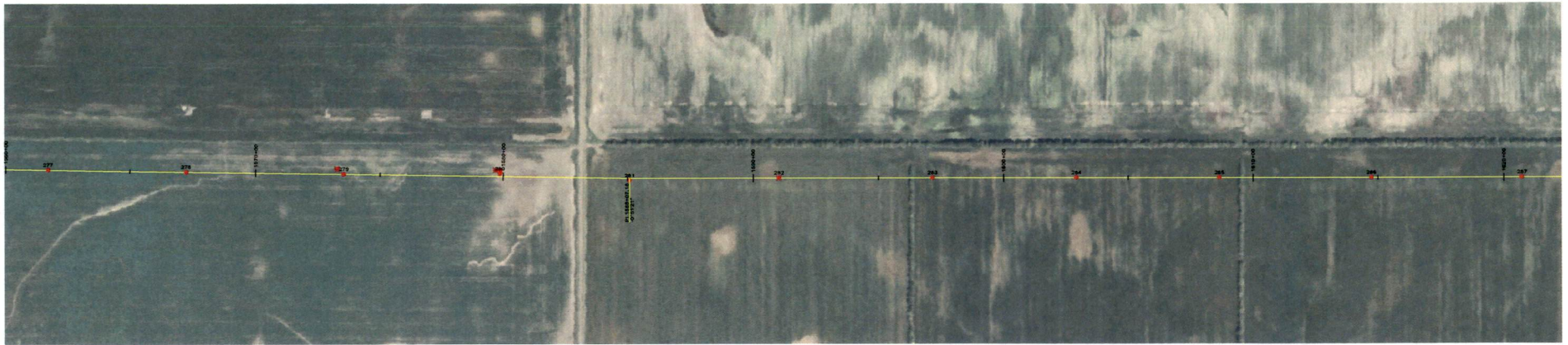
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

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 ENGINEERING, ENVIRONMENTAL AND  
 CONSTRUCTION SERVICES - WORLDWIDE

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**





DESIGN CONDITIONS:  
 0.465' OPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE: 30'

1272 ACSR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE: 30'

REV	DATE	APP	DESCRIPTION	DISTR
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF



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 ENGINEERING, ENVIRONMENTAL AND CONSTRUCTION SERVICES - WORLDWIDE

6200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

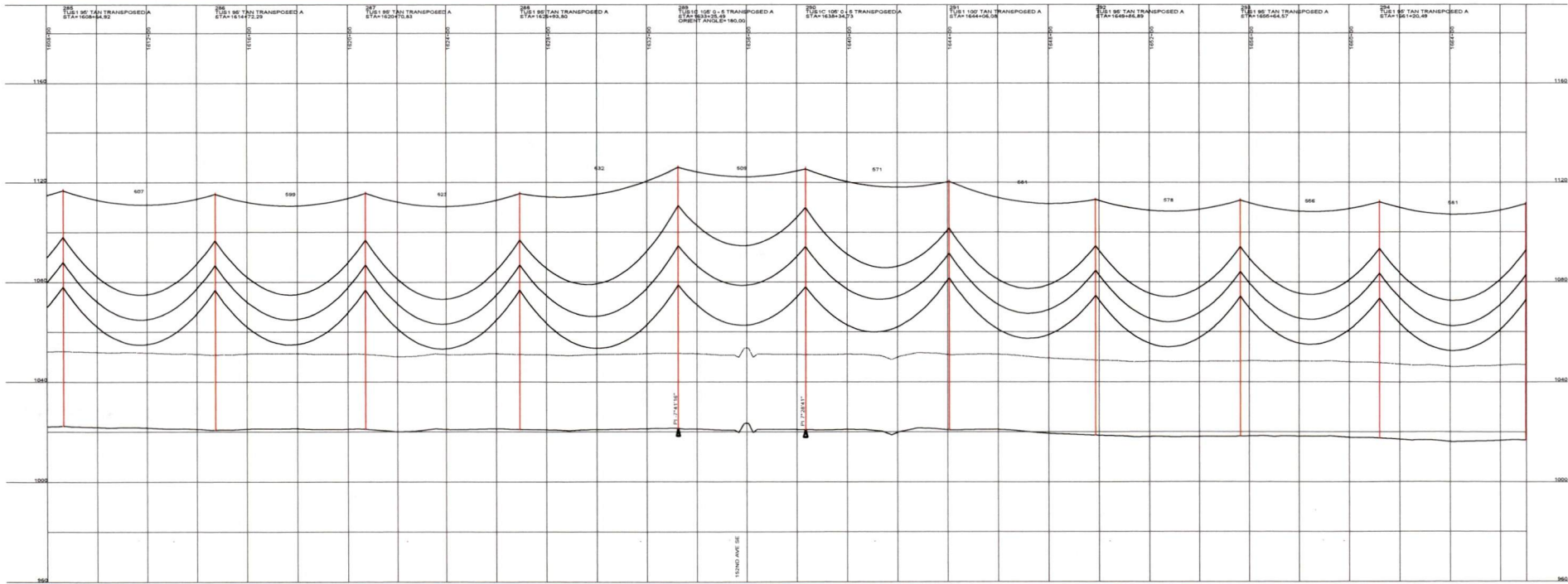
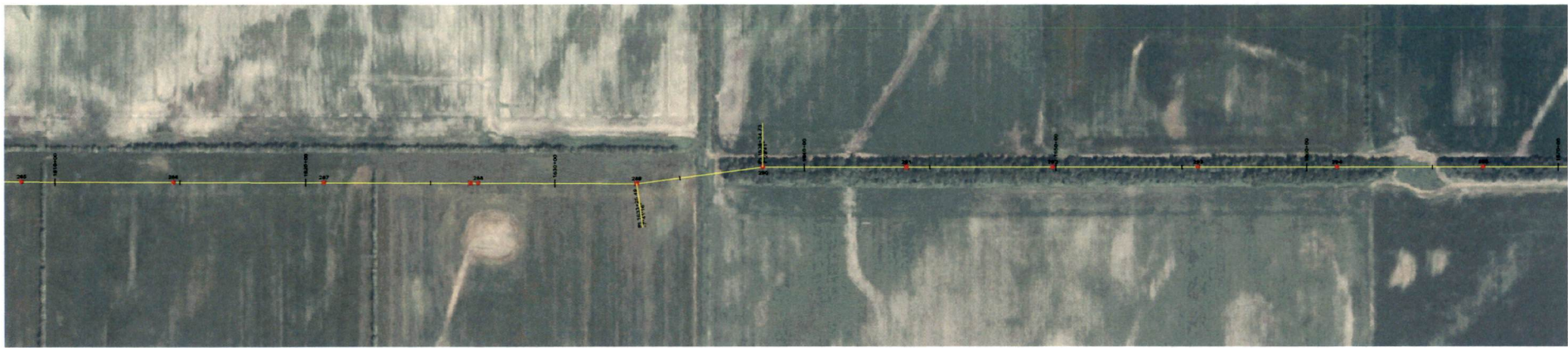
DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLBOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

↑ NORTH

**WIND GENERATION TIE**      36 OF 73



DESIGN CONDITIONS  
 0.465" CROWN, 24 FIBER  
 20% RT6 @ -20 DEGREES F. INITIAL CLEARANCE LINE 30'

1272 ACER 45/7 "BITTERN"  
 20% RT6 @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	DATE
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF

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 SUITE 400  
 ENGLEWOOD, CO 80112

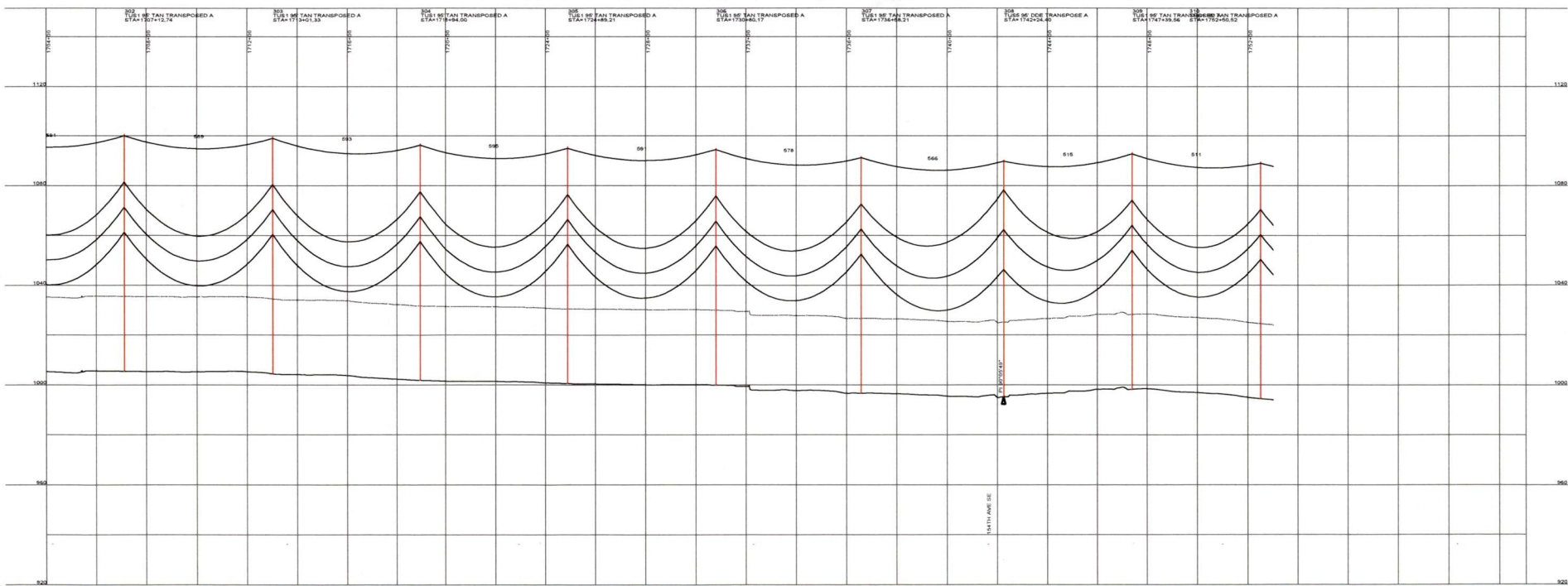
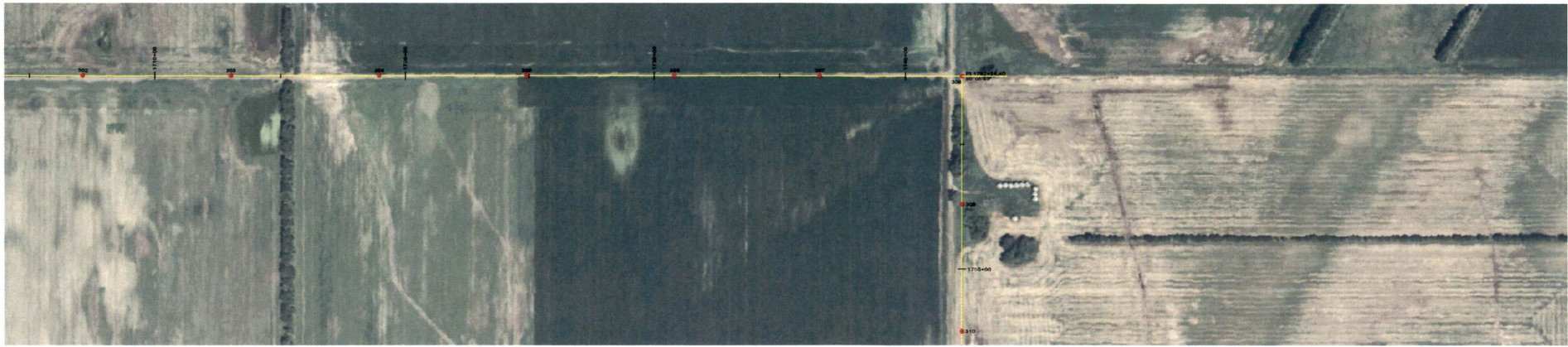
DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 37 OF 73





DESIGN CONDITIONS:  
 0.465' CROWN, 24 FIBER  
 20% RT6 @ -20 DEGREES F, INITIAL CLEARANCE LINE: 30'

1272 AC SR 45/7 "BITTERN"

20% RT6 @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	TMP	DPTH
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		



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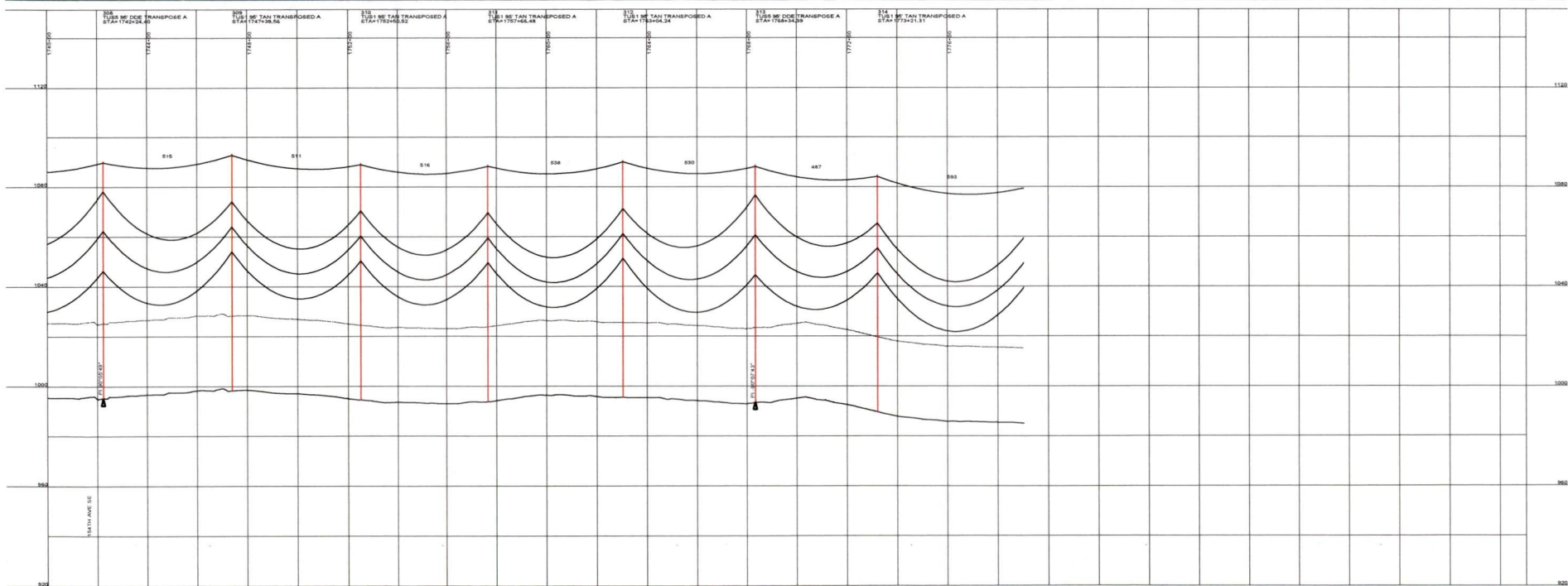
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 39 OF 73



DESIGN CONDITIONS  
 0.465" OPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL CLEARANCE LINE 30'

1372 ACBR 46/7 "BITTERN"

20% RTS @ -20 DEGREES F. INITIAL

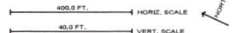
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0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF


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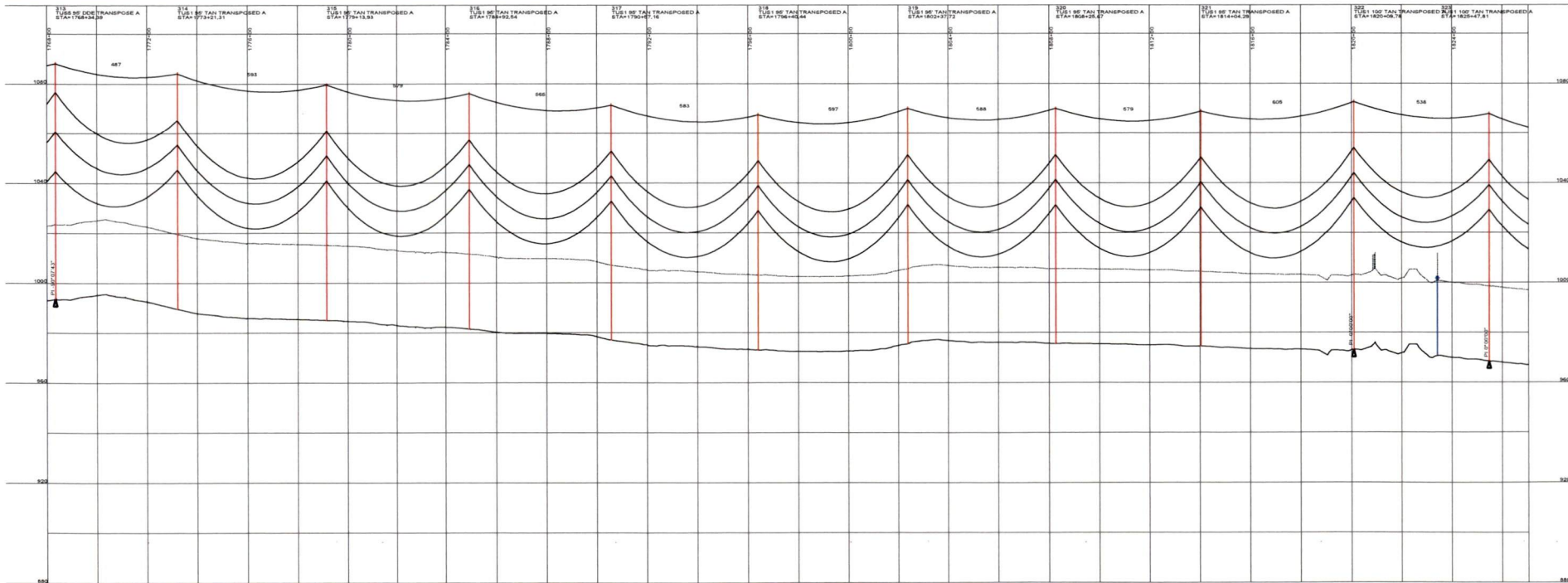
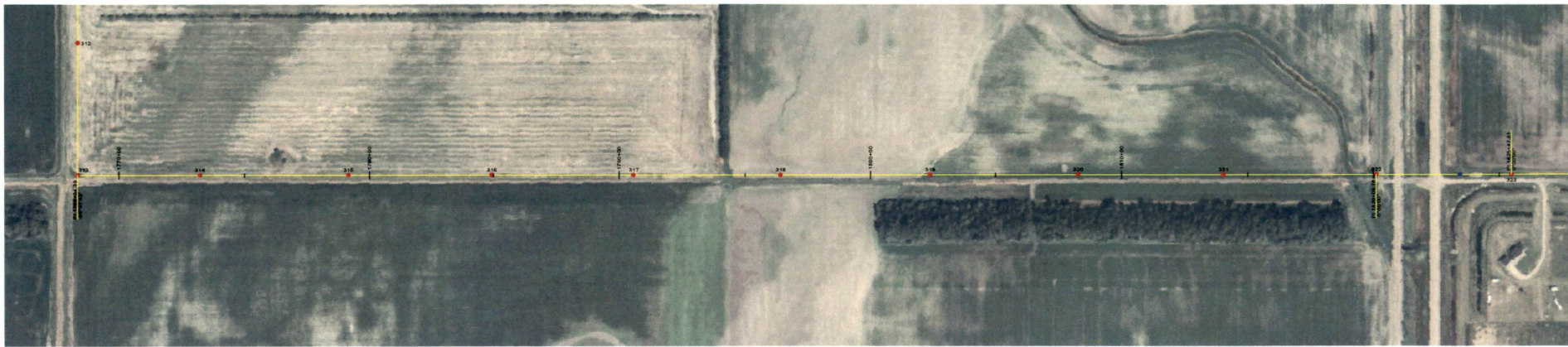
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**



**WIND GENERATION TIE**      **40 OF 73**



DESIGN CONDITIONS:  
 0.45° CPQW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE: 30'

1273 ACER 45/7 "BITTERN"

20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	DPTH
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF


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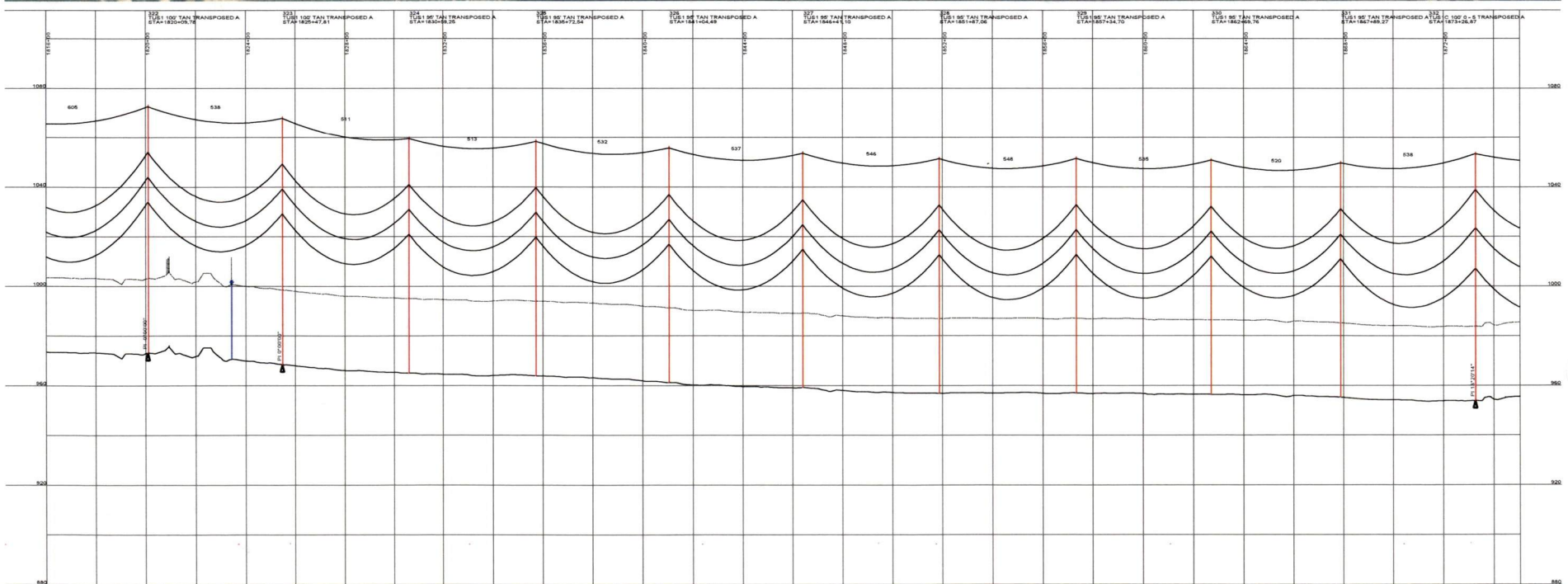
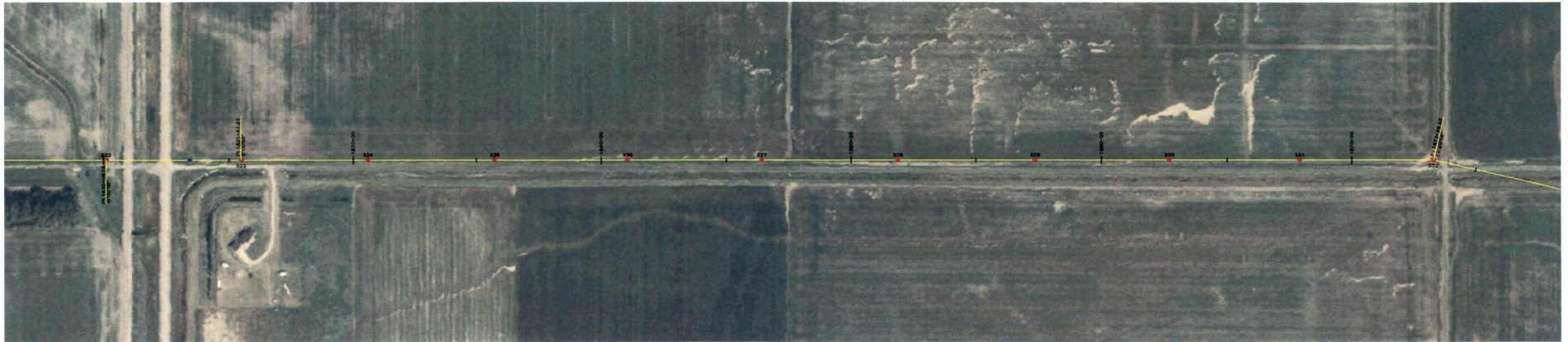
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. ← HORIZ. SCALE  
 40.0 FT. ← VERT. SCALE  
 ↑ NORTH

**WIND GENERATION TIE**      41 OF 73



DESIGN CONDITIONS  
 0.465" OPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE: 30'

1372 ACER 46/7 "BITTERN"

20% RTS @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	TMF	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

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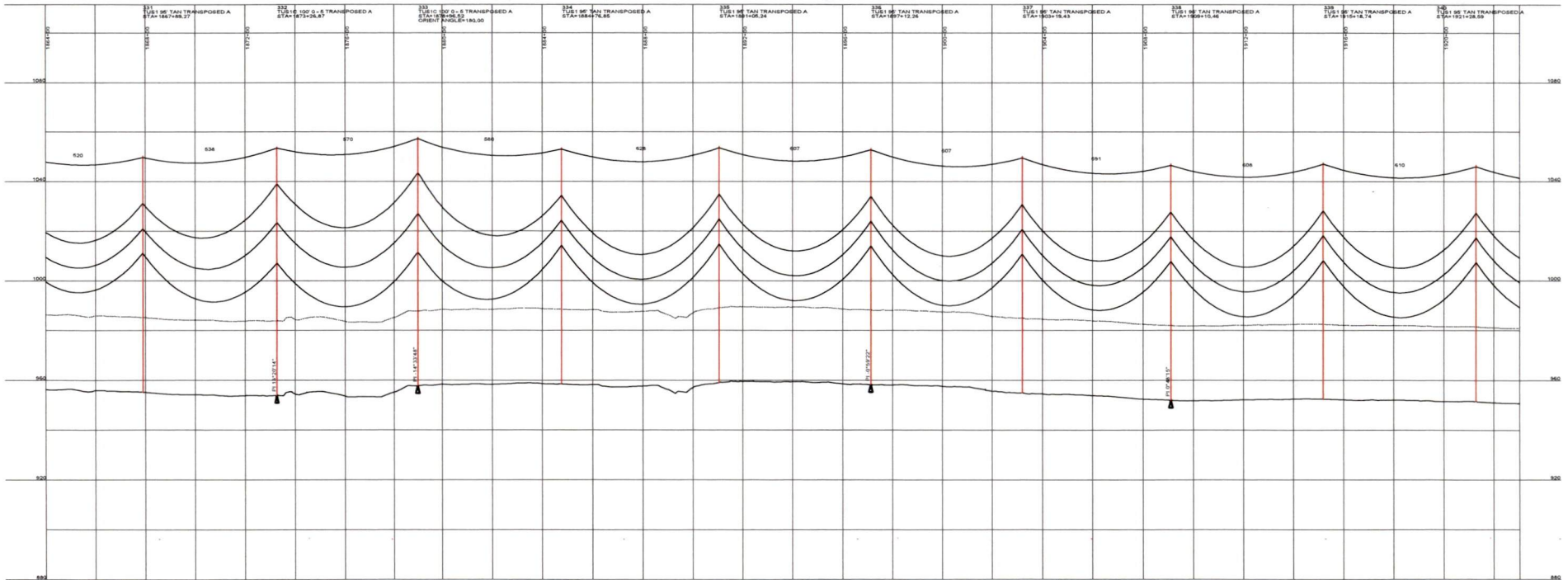
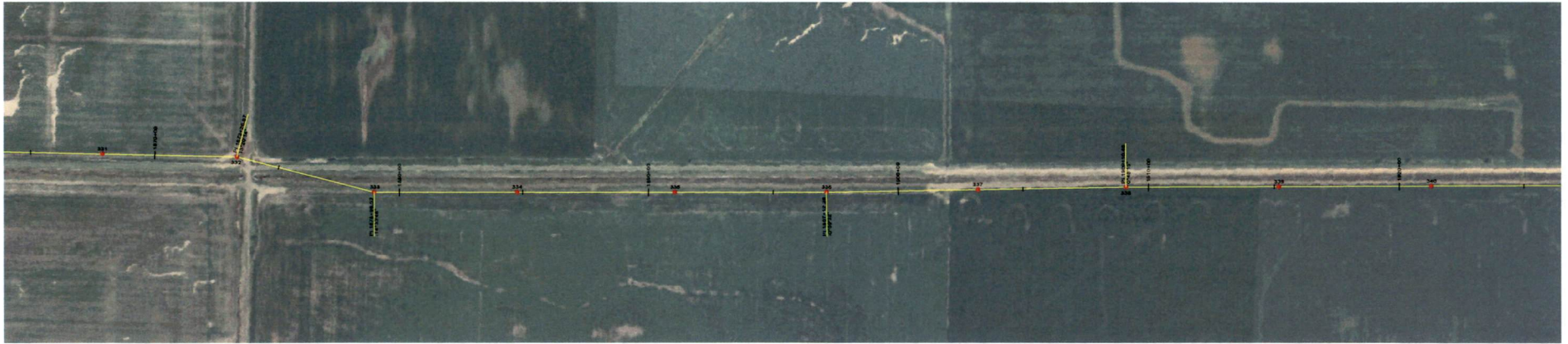
DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

NORTH ↑

**WIND GENERATION TIE 42 OF 73**



DESIGN CONDITIONS  
 0.465" CPW; 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

1272 ACER 45/7 "BITTERN"

20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

REV	DATE	APP	DESCRIPTION	DFTR
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF

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 ENGLEWOOD, CO 80112

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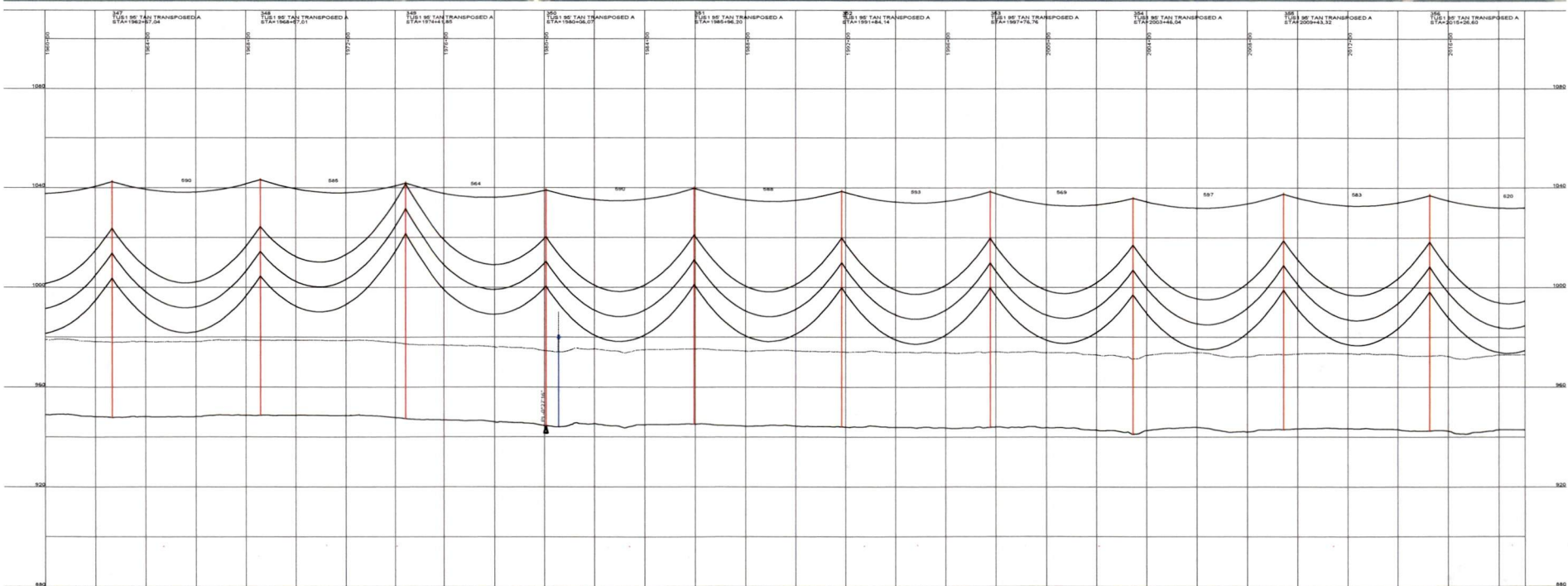
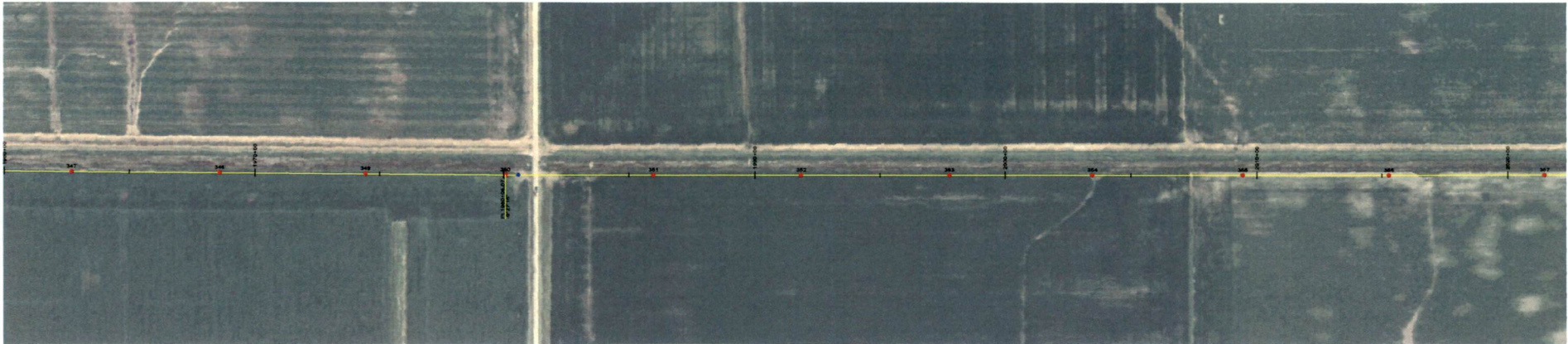
DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 43 OF 73





DESIGN CONDITIONS:  
 0.465" OPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE 30'

1373 ACER 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	DFTR
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF

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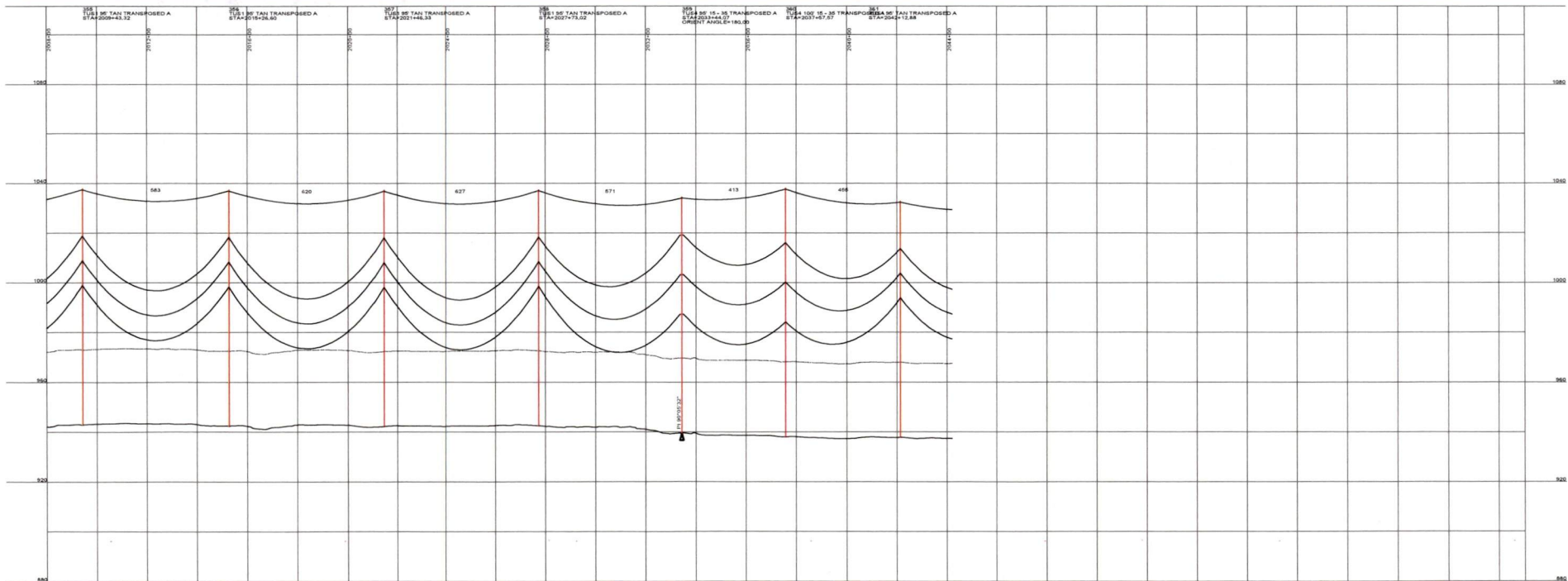
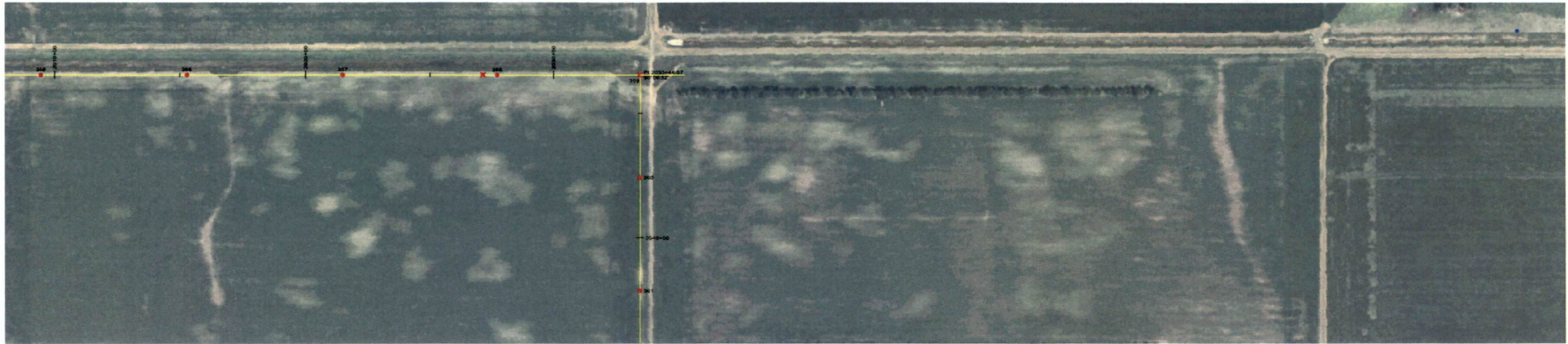
DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 05/05/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

↑ NORTH

**WIND GENERATION TIE 45 OF 73**



DESIGN CONDITIONS:  
 0.465" OPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE: 30'

1372 ACBR 467 'BITTERRY'  
 20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	TMF	DFTB
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

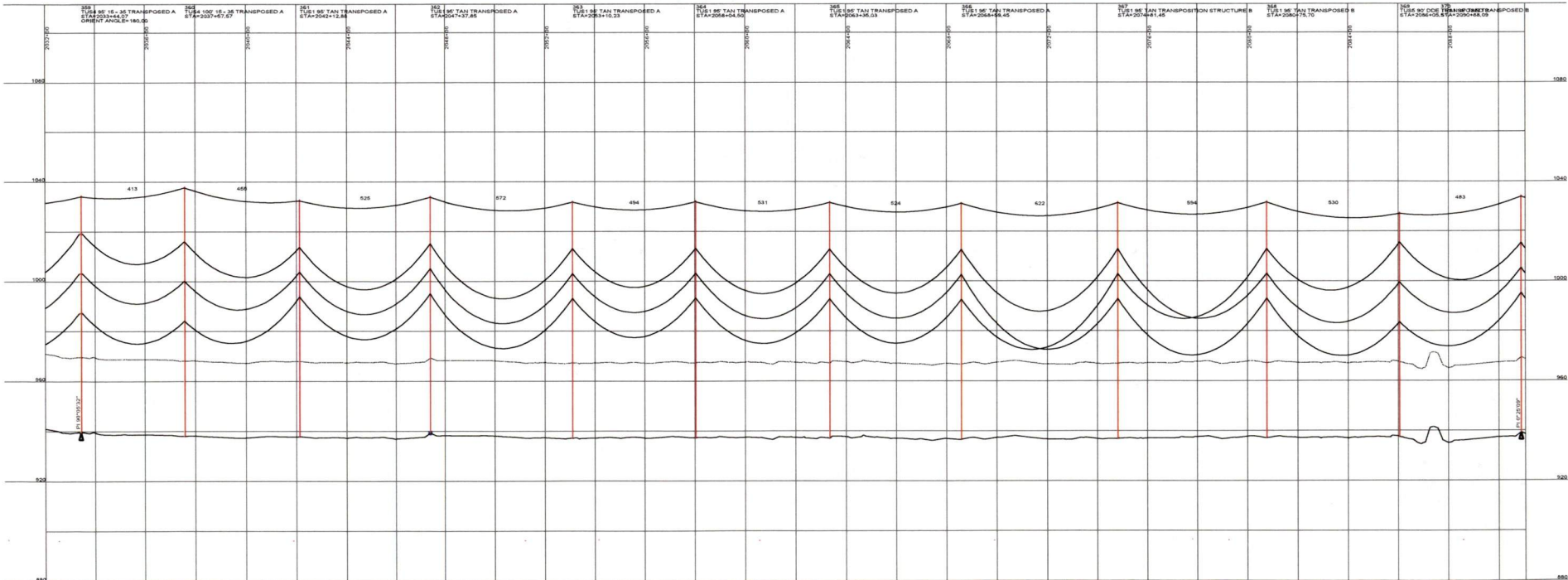
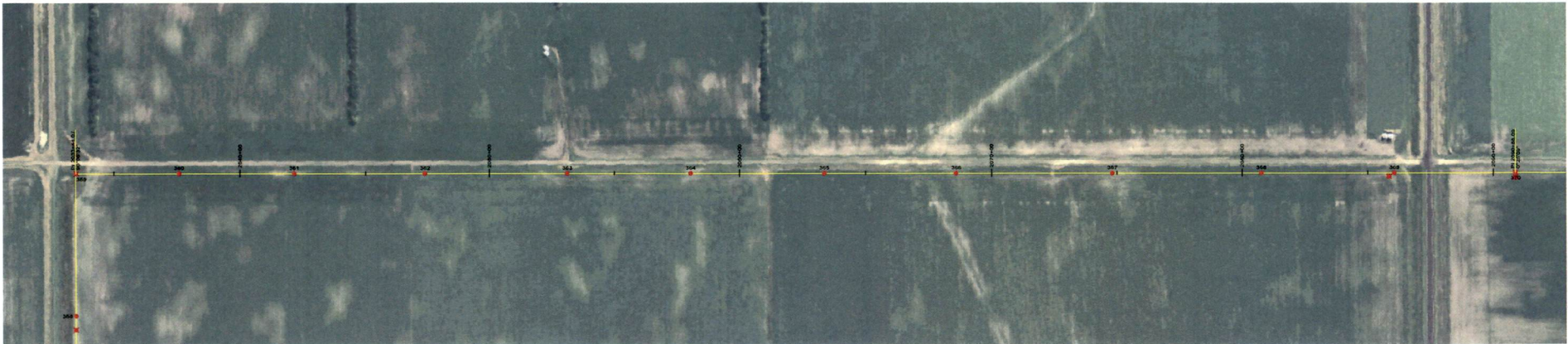
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 SUITE 400  
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DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**





DESIGN CONDITIONS  
 0.465" CPQW, 24 FBFR  
 20% RT6 @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'  
 1272 ACBR 45/7 "BITTERY"  
 20% RT6 @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

REV	DATE	APP	DESCRIPTION	DTFR
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF

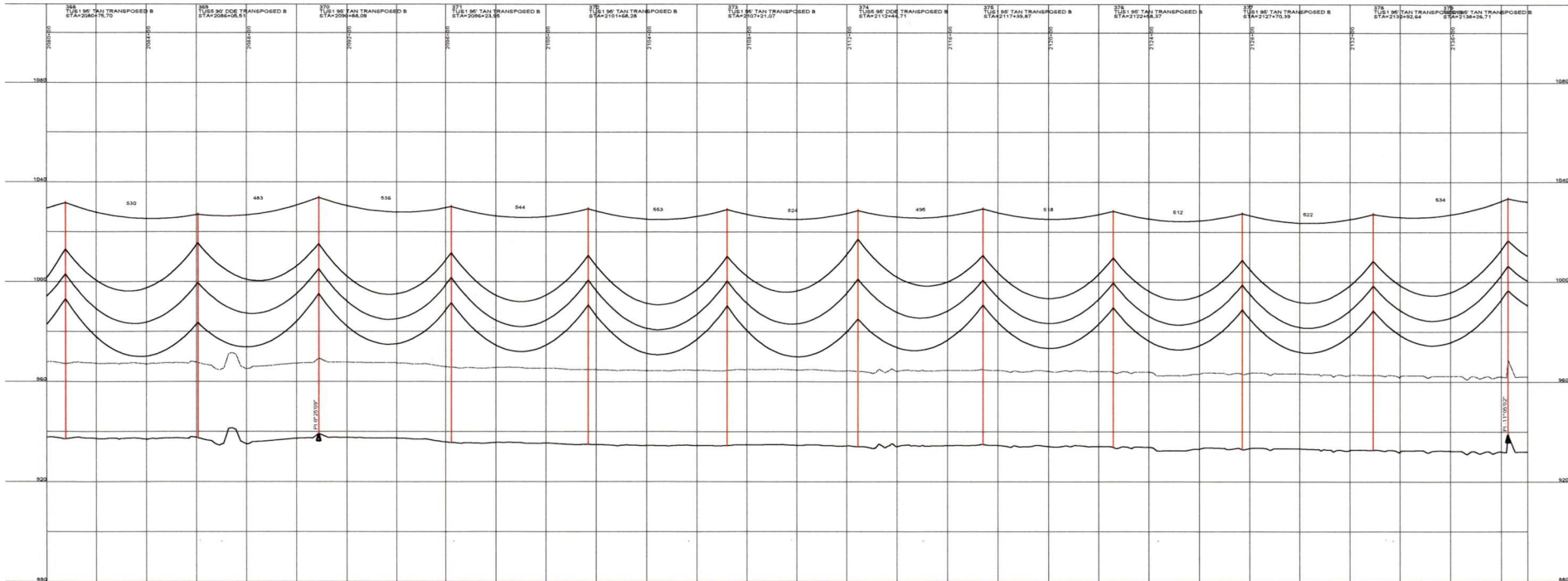
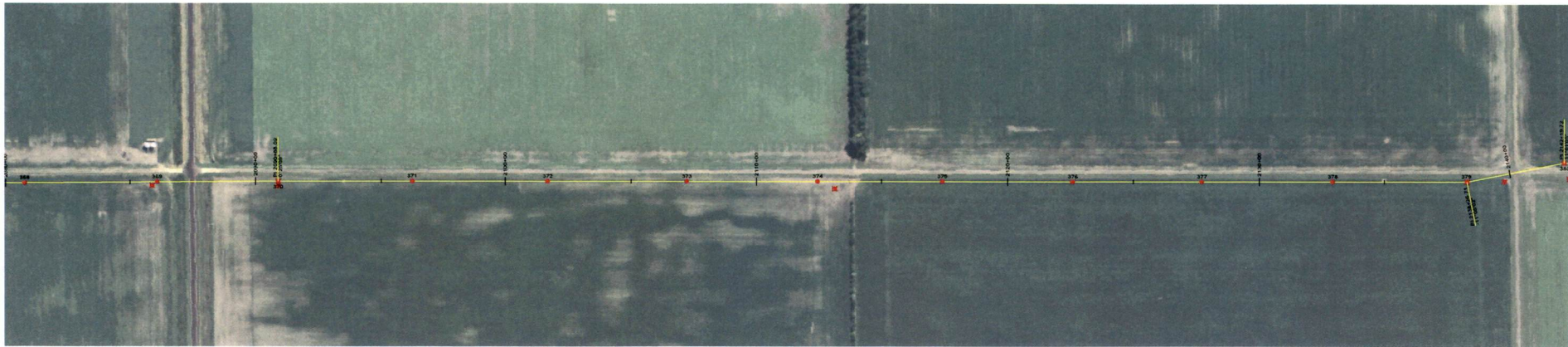
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 SUITE 400  
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 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**





DESIGN CONDITIONS  
 0.465" OPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL CLEARANCE LINE: 30'

1272 AC SR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF

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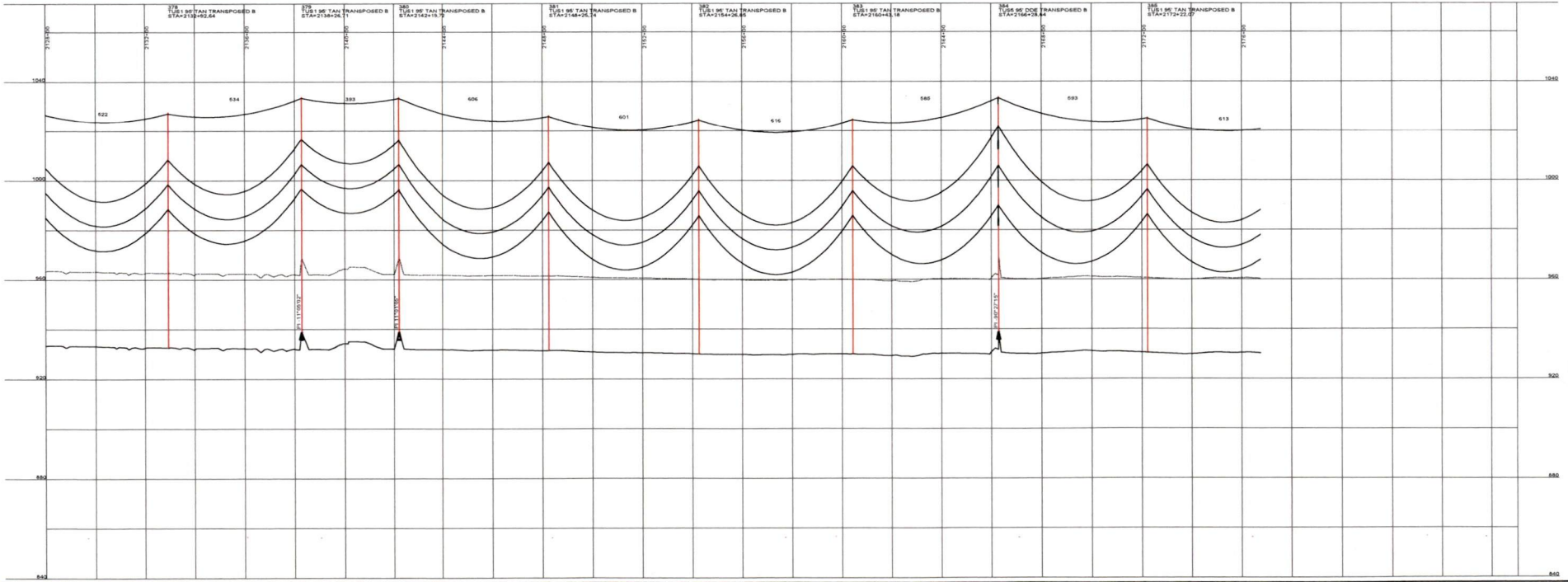
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
 GRAND FORKS, ND

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 48 OF 73



DESIGN CONDITIONS  
 0.445" OPGW, 24 FIBER  
 20% RTB @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

1272 ACBR 457 'BITTERN'  
 20% RTB @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

REV	DATE	APP	DESCRIPTION	DMR
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	

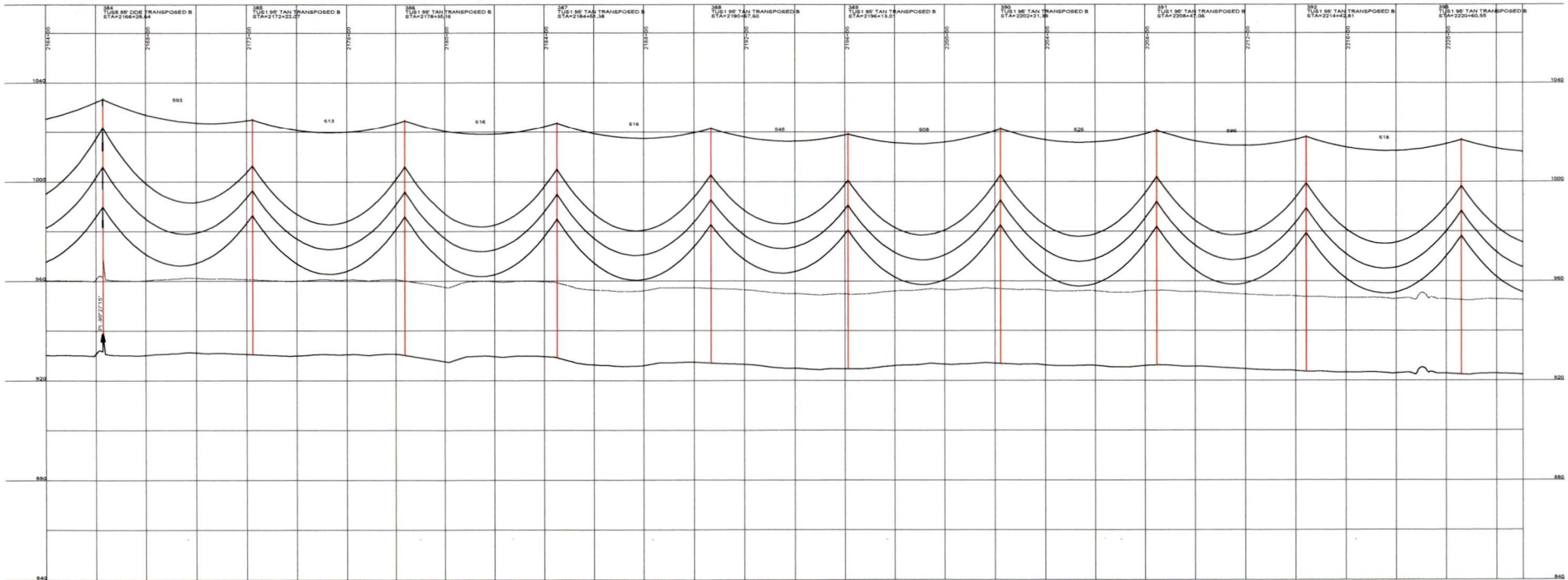
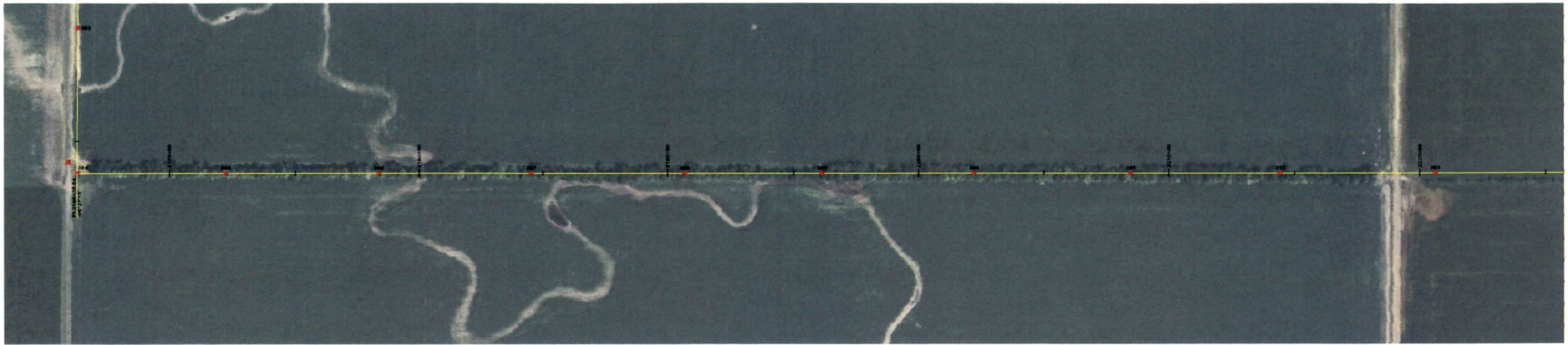
5200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

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 CONSTRUCTION SERVICES - WORLDWIDE

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**





DESIGN CONDITIONS  
 0.465' GROW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE 30'

1273 ACSR 45/7 "BITTERRY"  
 20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	TMF	DPTH
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

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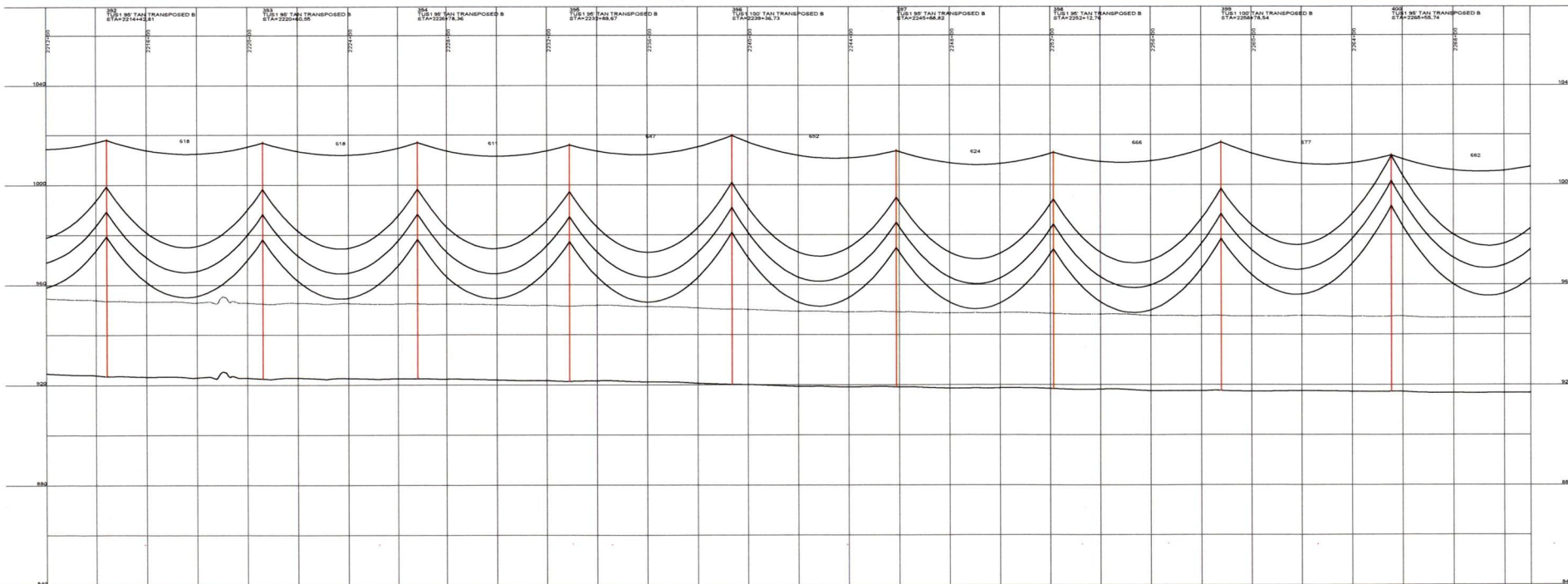
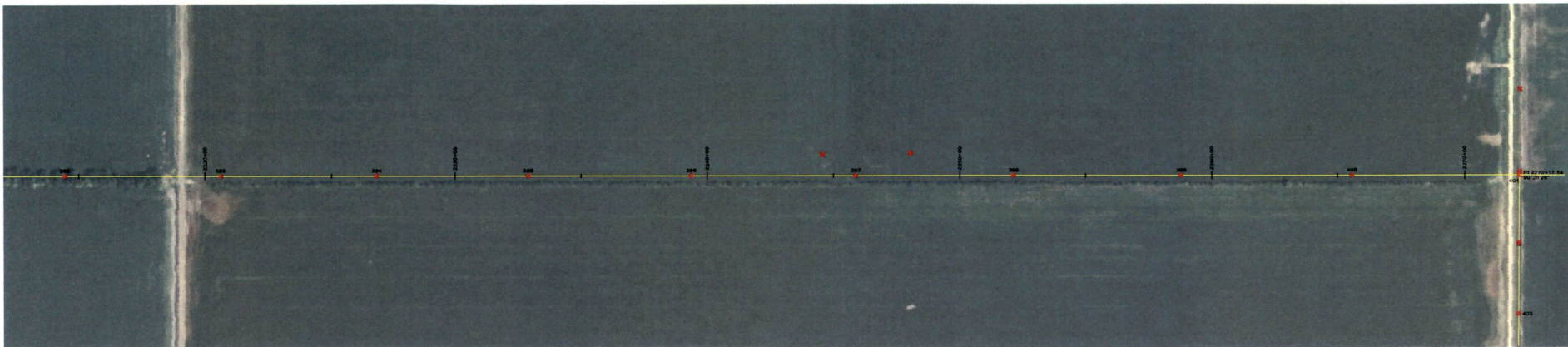
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**


450.0 FT. HORIZ. SCALE  
 45.0 FT. VERT. SCALE

WIND GENERATION TIE 50 OF 73



DESIGN CONDITIONS  
 0.465" OPWV, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'  
 1272 ACBR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	DTR
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF



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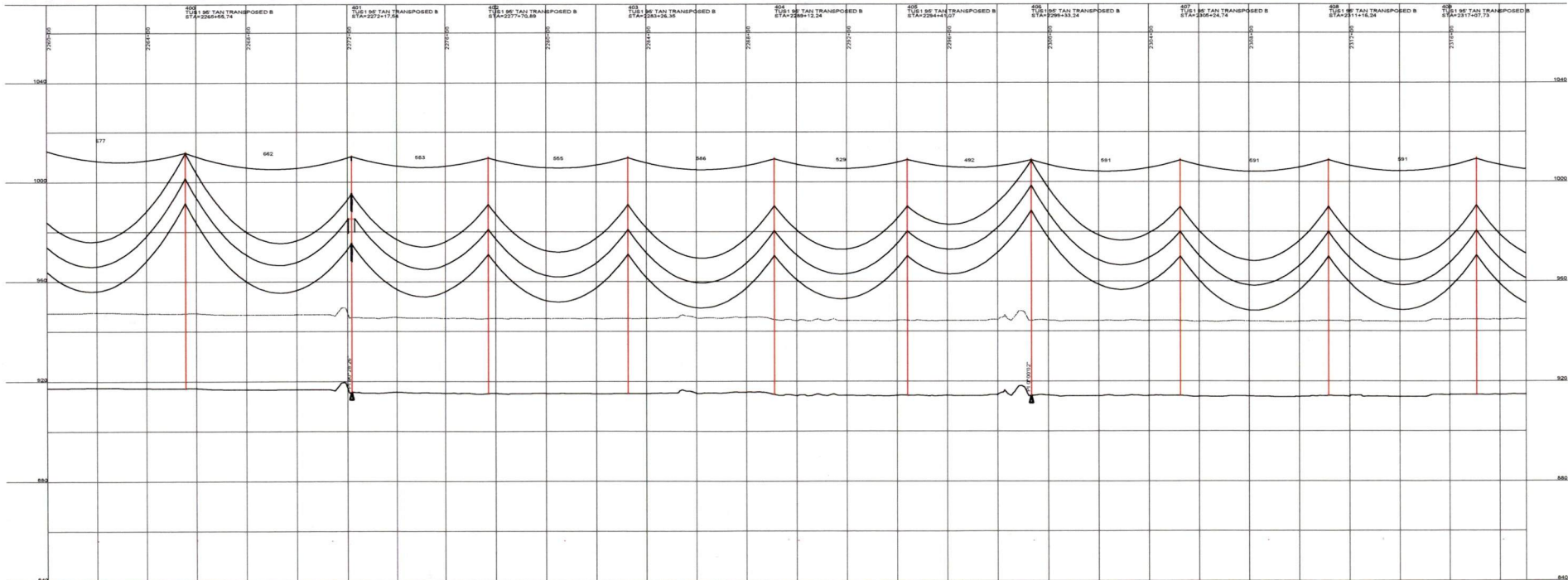
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 05/05/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 51 OF 73



DESIGN CONDITIONS  
 0.465" OPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE: 30'

1272 ACSR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	DTM
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF



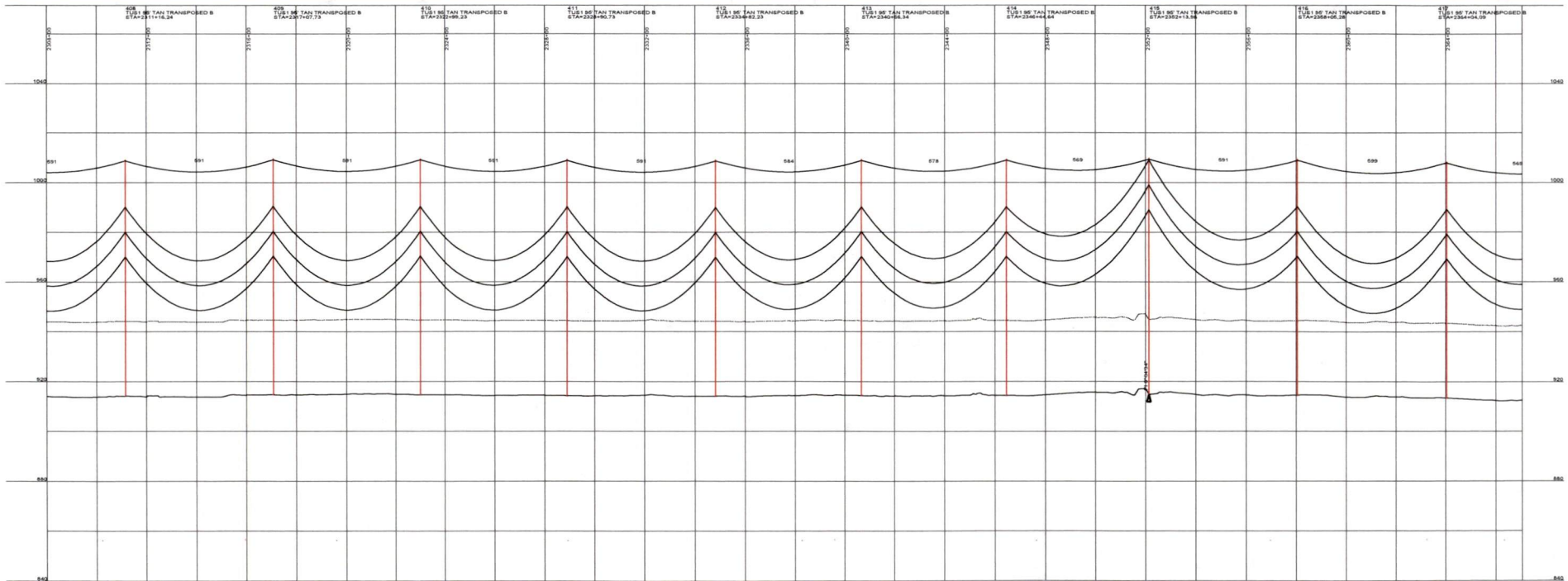
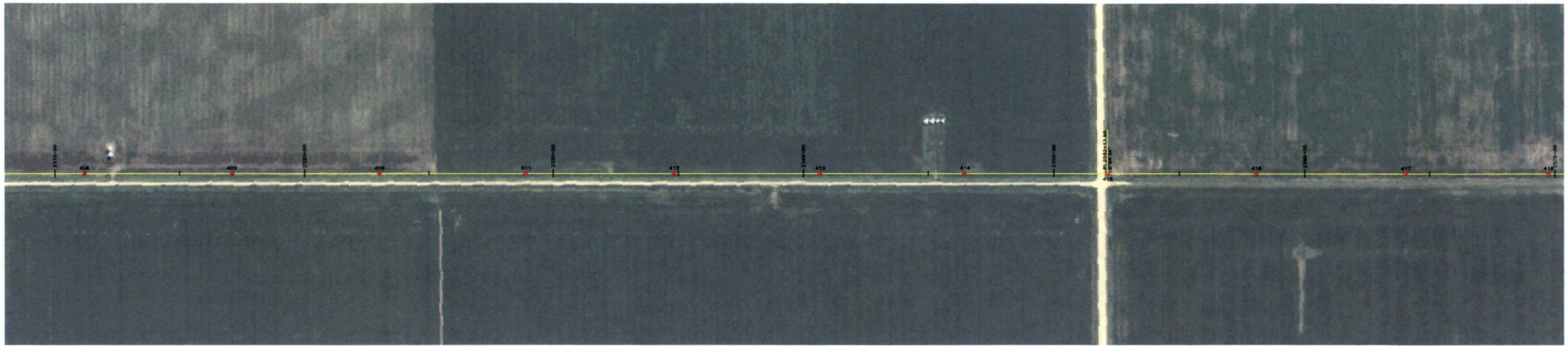
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 CONSTRUCTION SERVICES - WORLDWIDE

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 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**





DESIGN CONDITIONS  
 0.465" CROW, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE: 30'

1272 ACSB 457 "BITTERY"  
 20% RTS @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	DATE	DFTR
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

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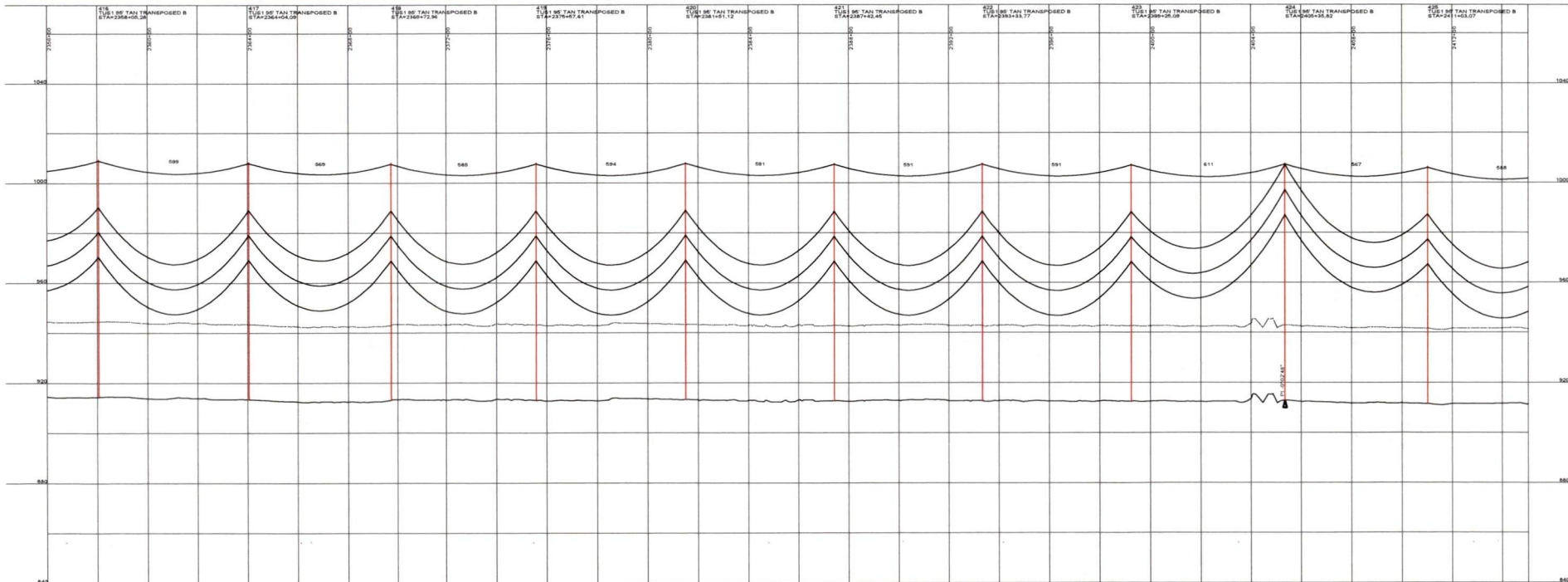
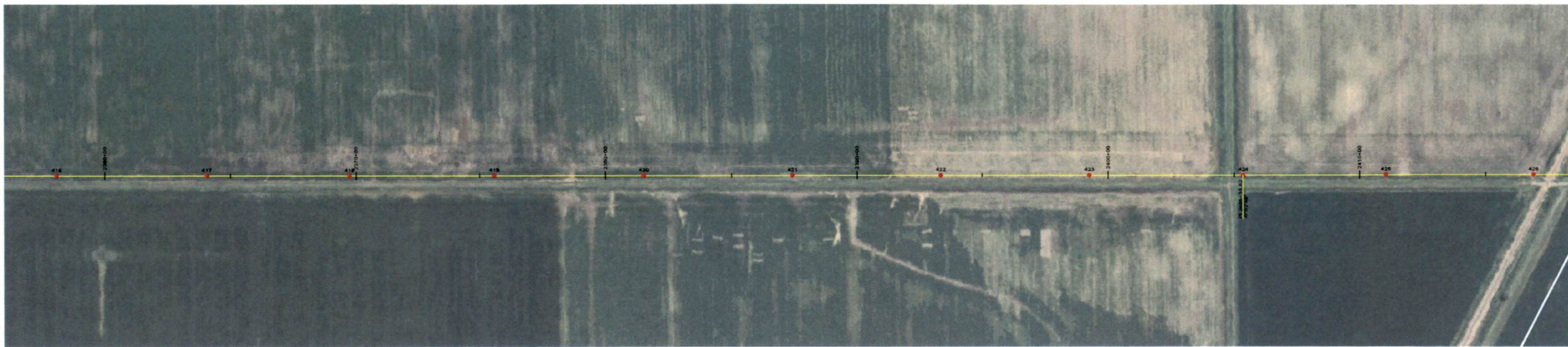
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

450.0 FT. HORIZ. SCALE  
 45.0 FT. VERT. SCALE

WIND GENERATION TIE 53 OF 73



DESIGN CONDITIONS:  
 0.465' CPOGW, 24 FIBER 1272 AC/SR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F, INITIAL 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE 30'

REV	DATE	APP	DESCRIPTION	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF

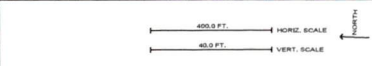


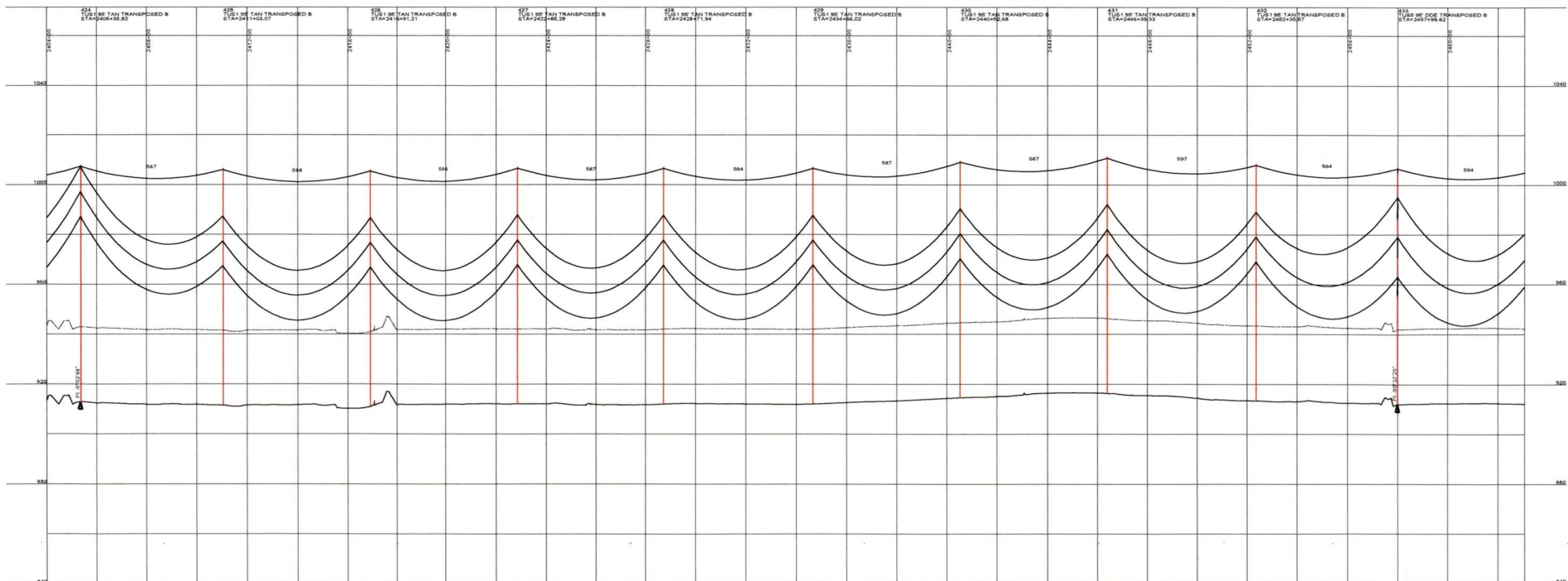
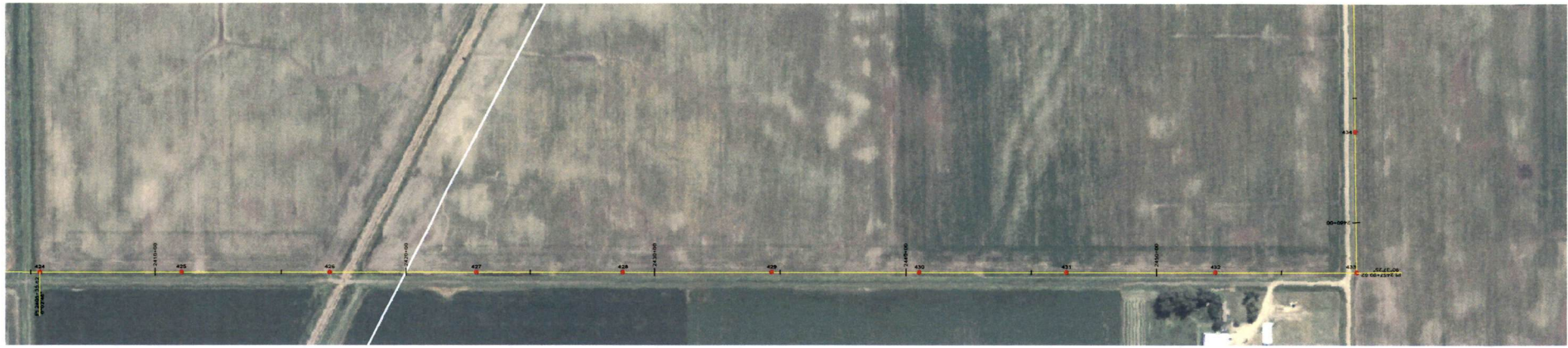
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 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLBOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**





DESIGN CONDITIONS  
 0.445" CRWD, 24 FIBER  
 20% RT8 @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE 30'

1272 ACSR 45/7 "BITTERN"  
 20% RT8 @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	DTM
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	



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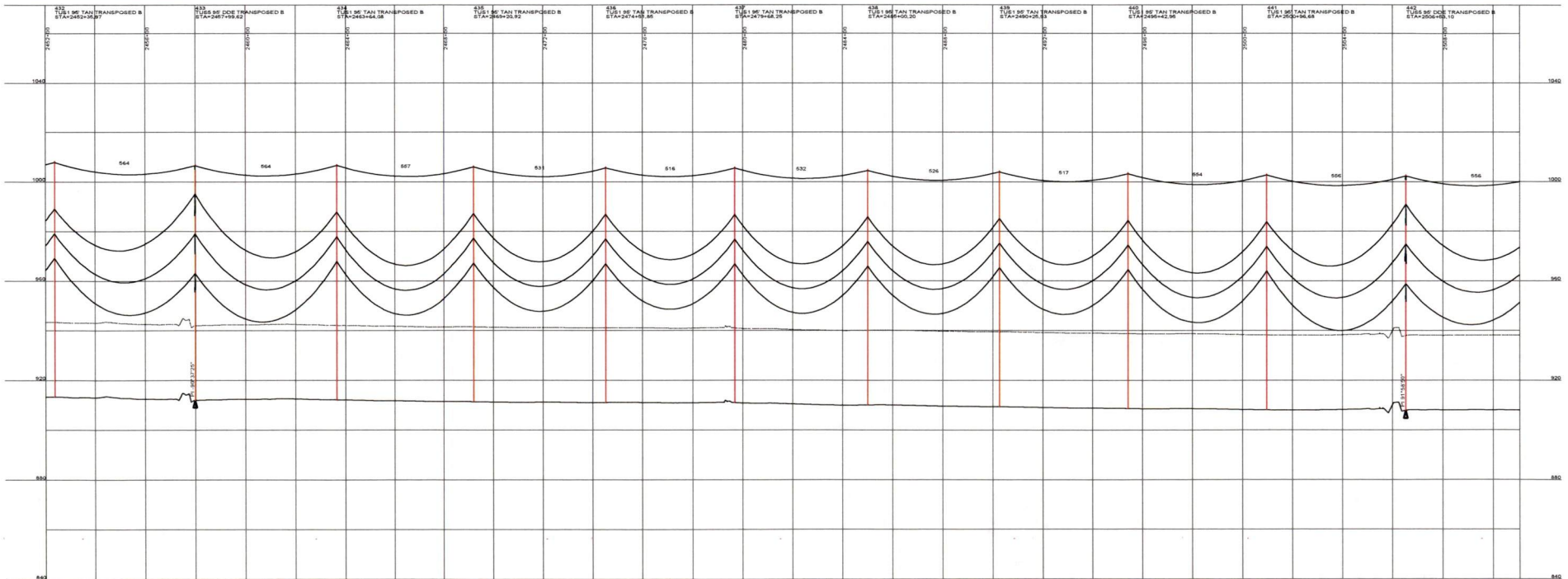
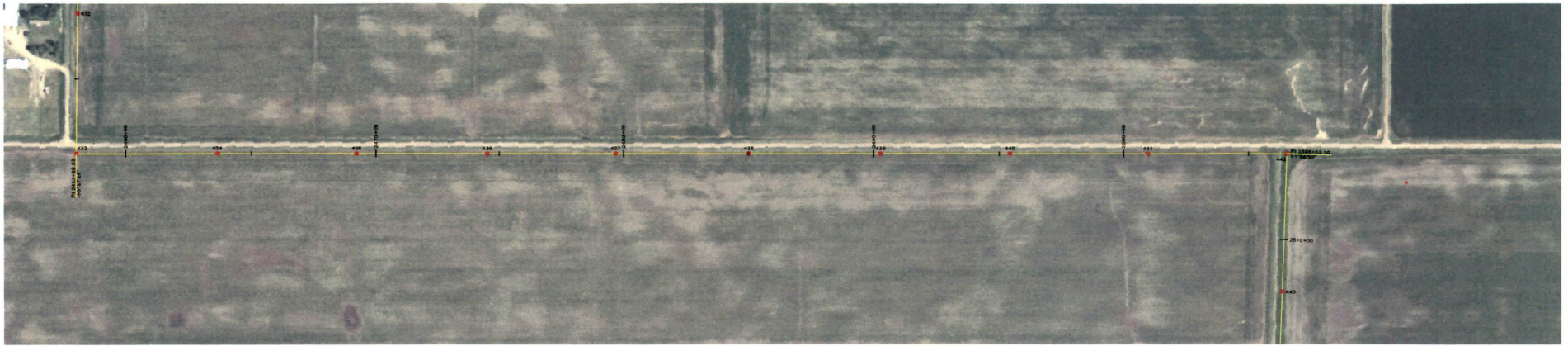
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE 55 OF 73



DESIGN CONDITIONS:  
 0.45% CROWN, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE: 30'

1273 AC6R 45/7 "BITTERN"

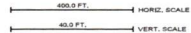

REV	DATE	APP	DESCRIPTION	TMF	DPTH
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		


 9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

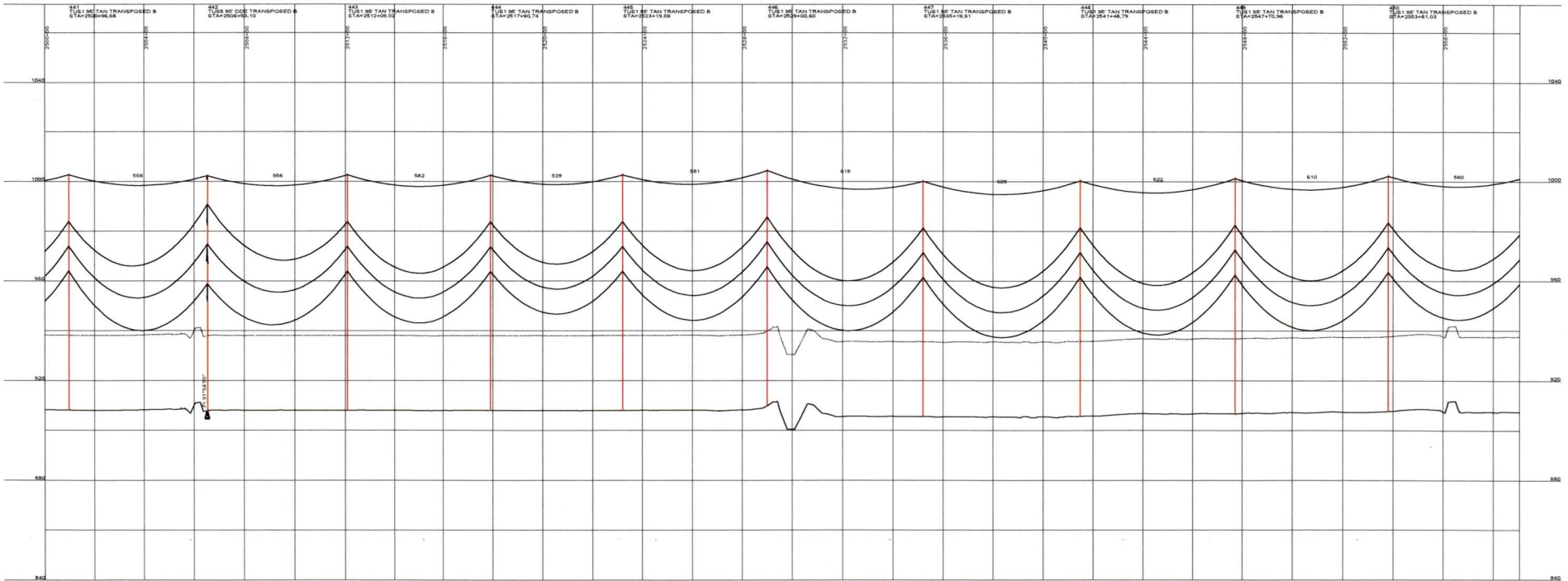
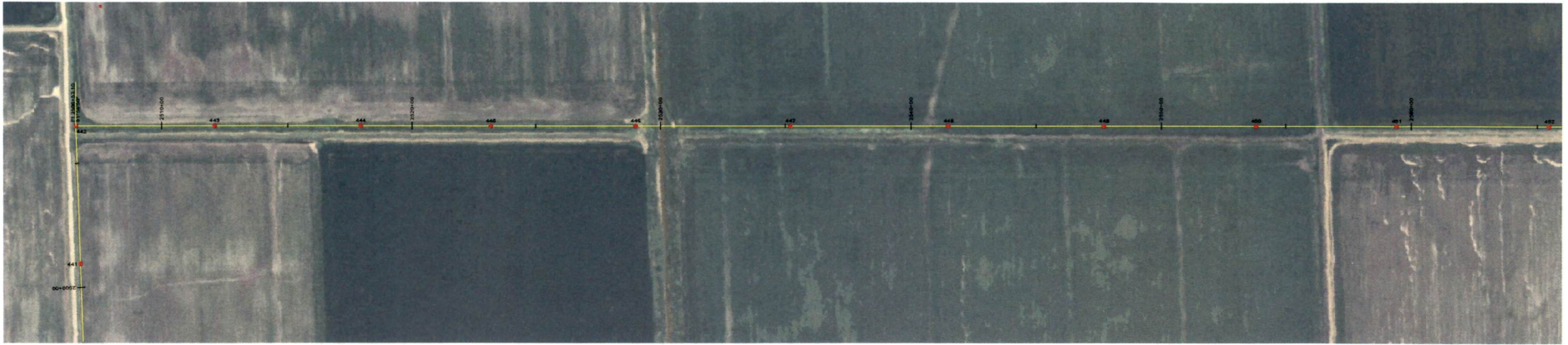
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DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

**WIND GENERATION TIE**      56 OF 73



DESIGN CONDITIONS  
 0.465" COPW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE 30'

172 ACER 45/7 "BITTERN"

20% RTS @ -20 DEGREES F, INITIAL




REV	DATE	APP	DESCRIPTION	DTFR
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF


 9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

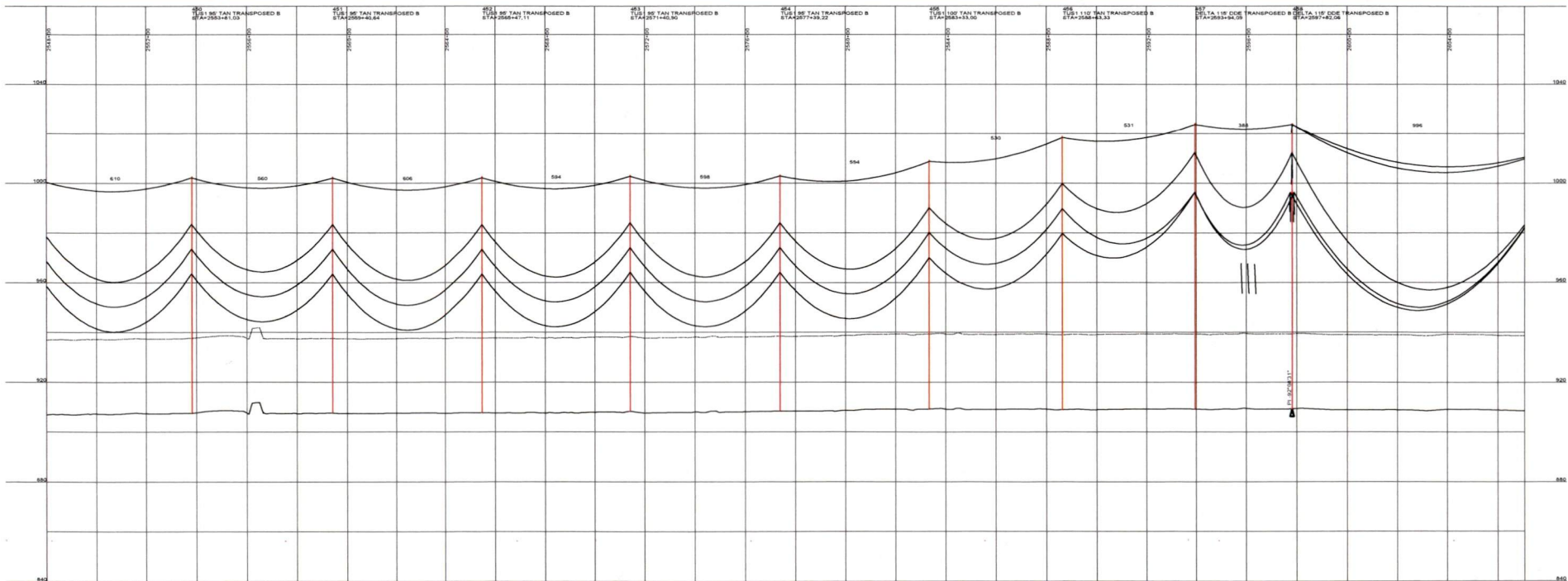
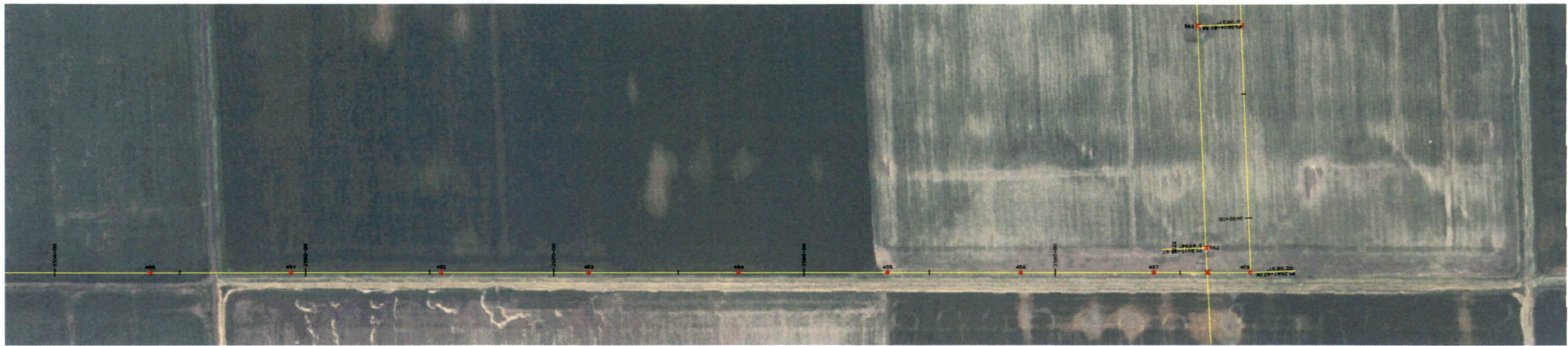
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 ENGINEERING, ENVIRONMENTAL AND  
 CONSTRUCTION SERVICES - WORLDWIDE

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

 HORIZ. SCALE  
 VERT. SCALE  
 NORTH

**WIND GENERATION TIE**      57 OF 73



DESIGN CONDITIONS:  
 0.465" CPOW, 24 FIBER  
 20% PTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE: 3'

1772 ACBR 457 "BITTERY"  
 20% PTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	TMF	DFTF
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

**Stanley Consultants INC.**  
 9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

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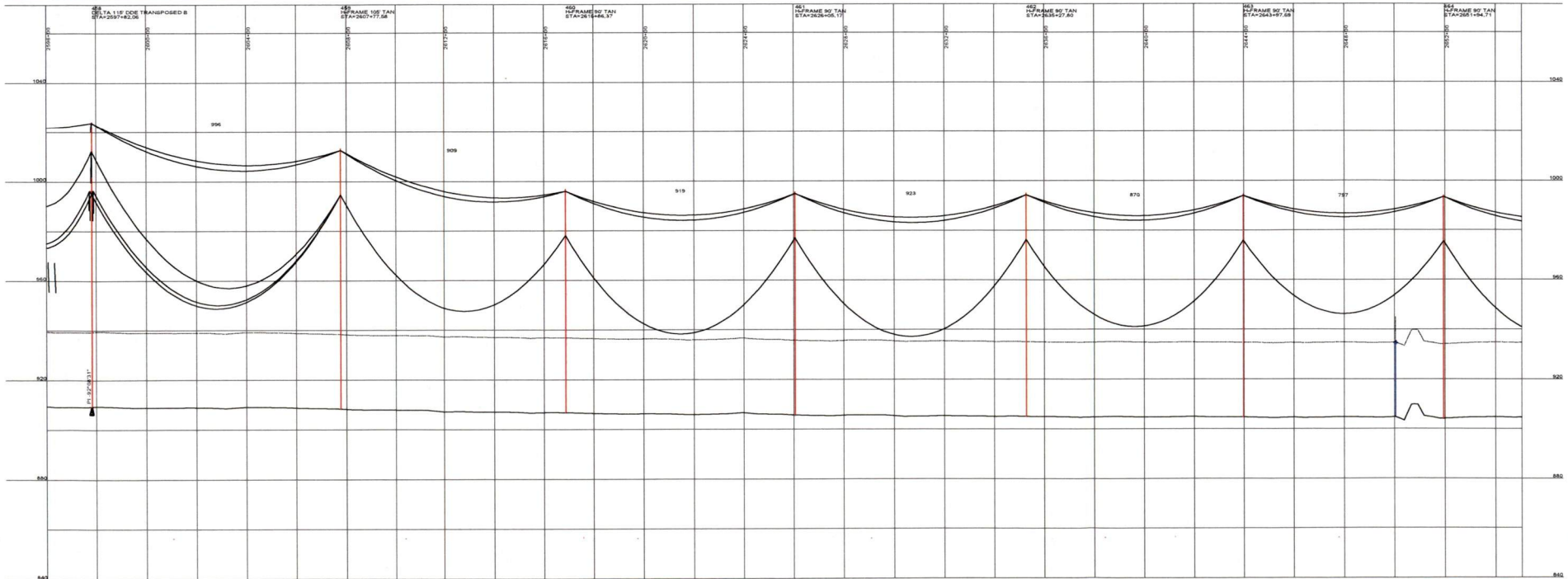
DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

WIND GENERATION TIE

58 OF 73



DESIGN CONDITIONS  
 0.465" CPW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE 30'

1272 AC SR 457' BITTERN'

20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF

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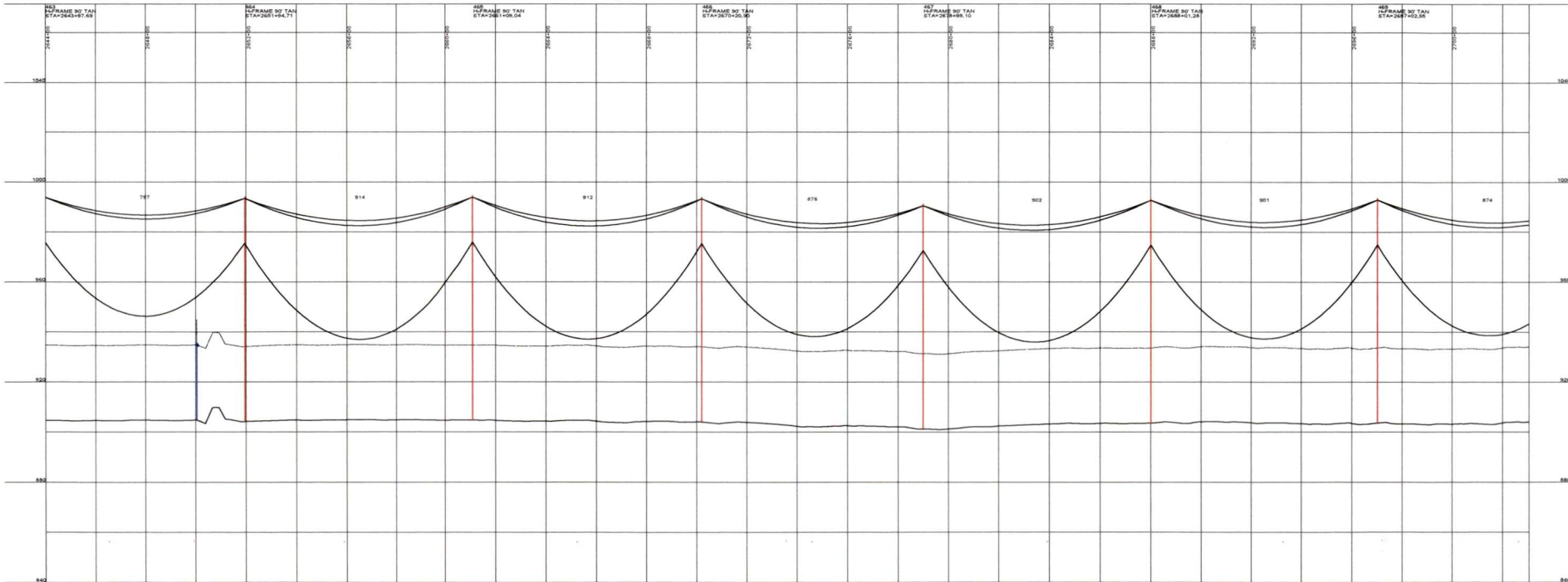
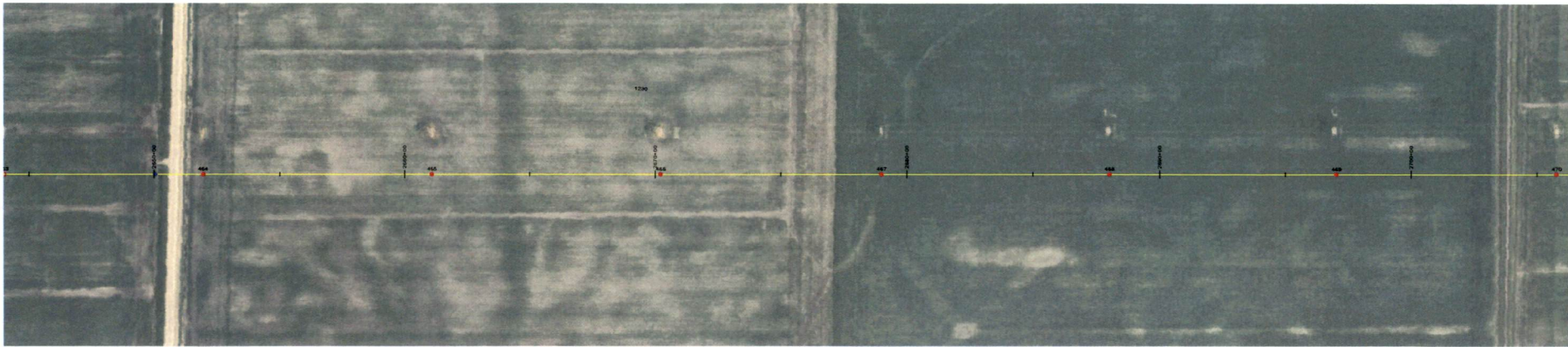
DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLBOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

NORTH ↑

**WIND GENERATION TIE** 59 OF 73



DESIGN CONDITIONS  
 0.465' CPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE 30'

1272 ACSR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	TMP	DPTH
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

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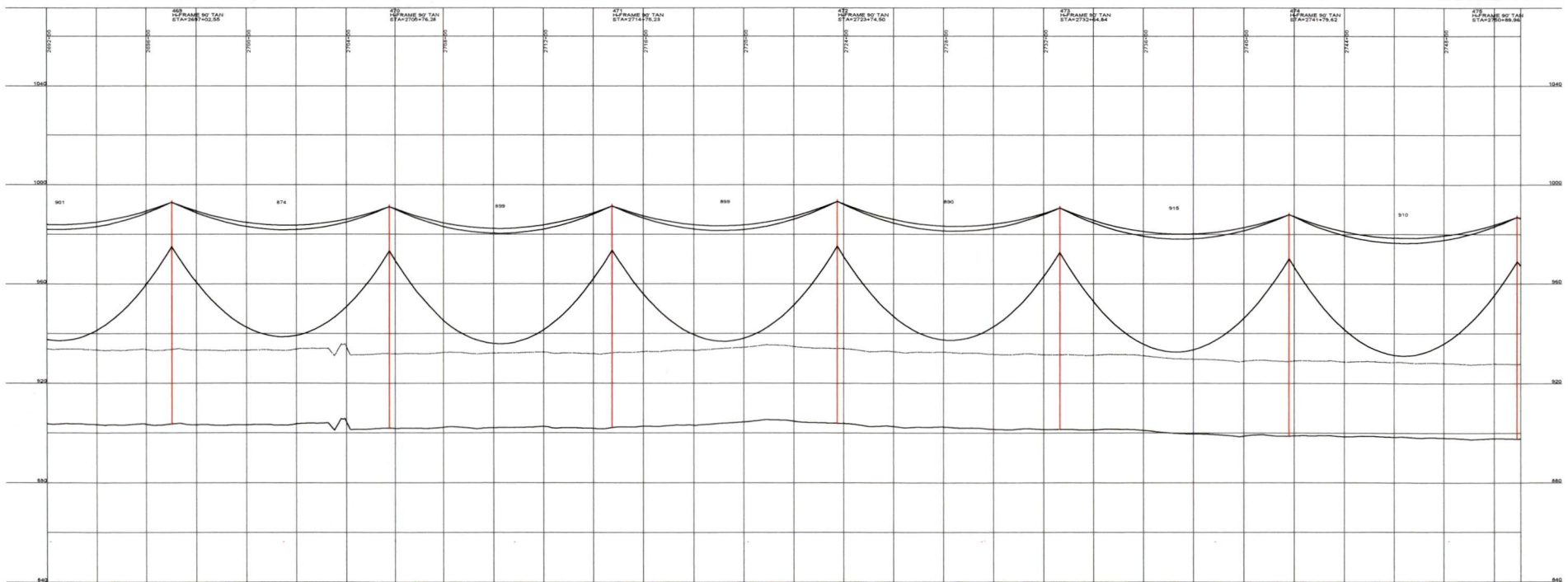
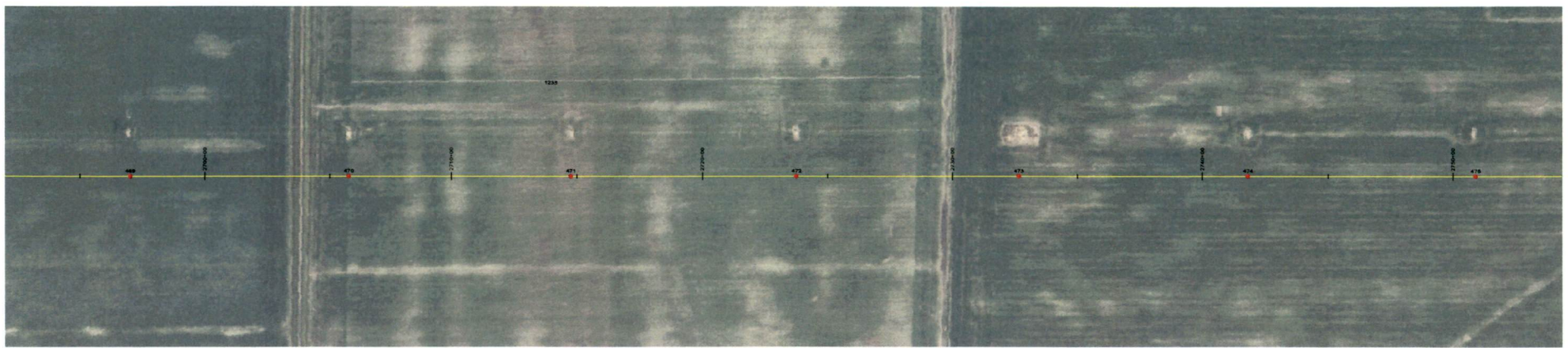
DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

NORTH


**WIND GENERATION TIE** 60 OF 73



DESIGN CONDITIONS  
 0.465' CPQW, 24 FIBER  
 20% RT6 @ -20 DEGREES F. INITIAL CLEARANCE LINE: 30'

1372 ACSR 45/7 "BITTERN"  
 20% RT6 @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	DTM
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	



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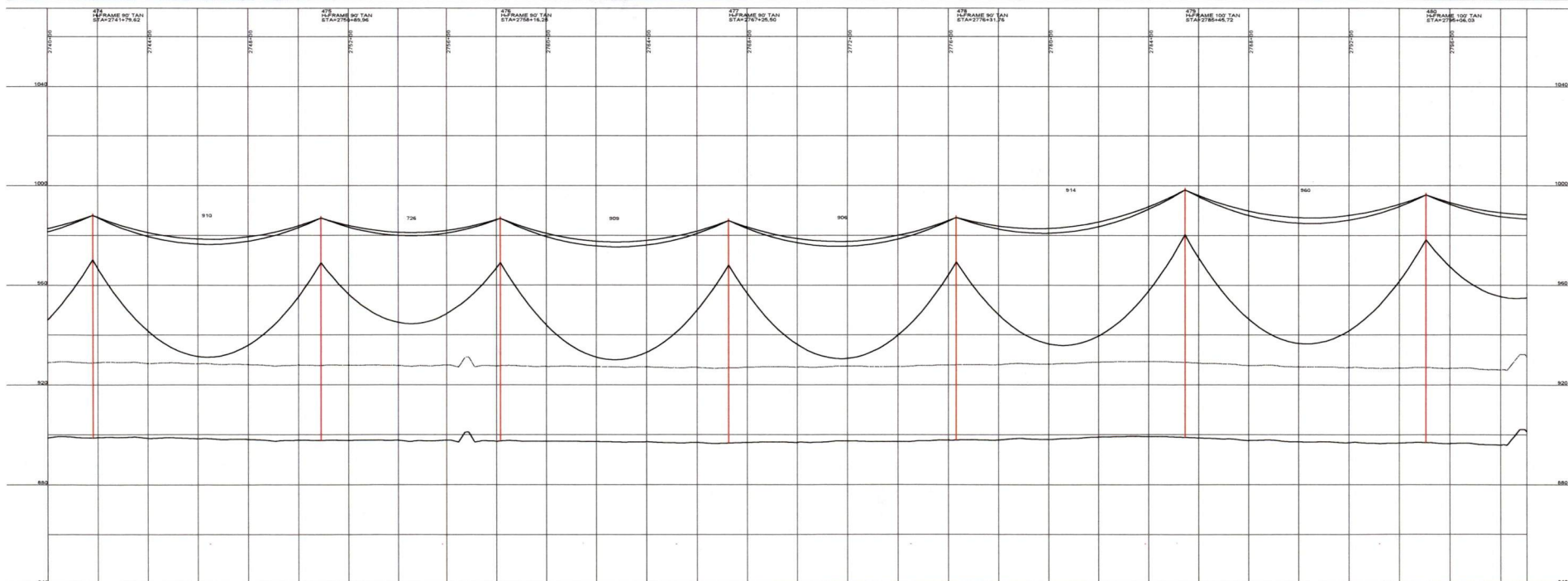
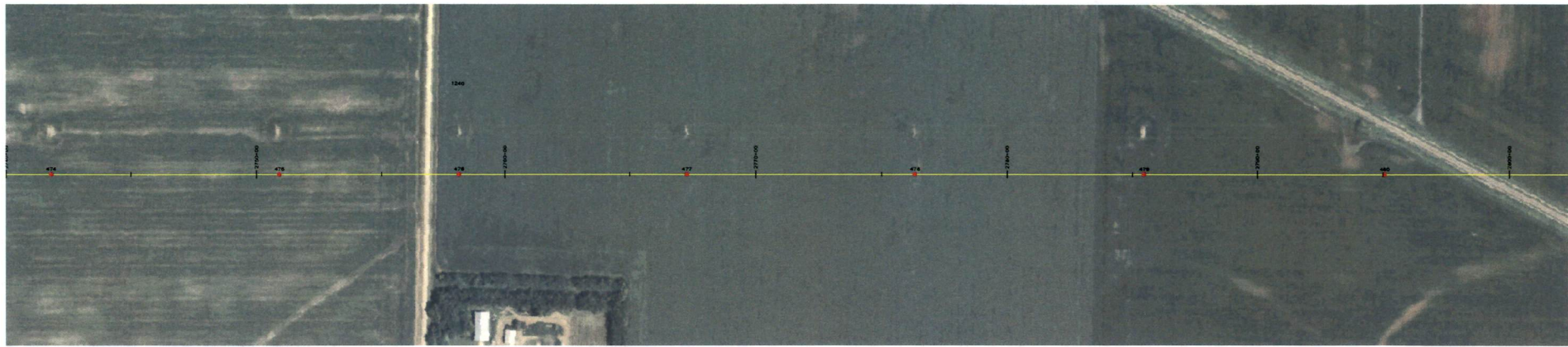
DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
 GRAND FORKS, ND

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

NORTH ↑

**WIND GENERATION TIE** 61 OF 73



DESIGN CONDITIONS:  
 0.465" OP/W, 24 FIBER  
 20% RT6 @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE 30'

1272 ACSR 45/7 "BITTERN"  
 20% RT6 @ -20 DEGREES F. INITIAL

REV	DATE	APP	DESCRIPTION	DTM
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	



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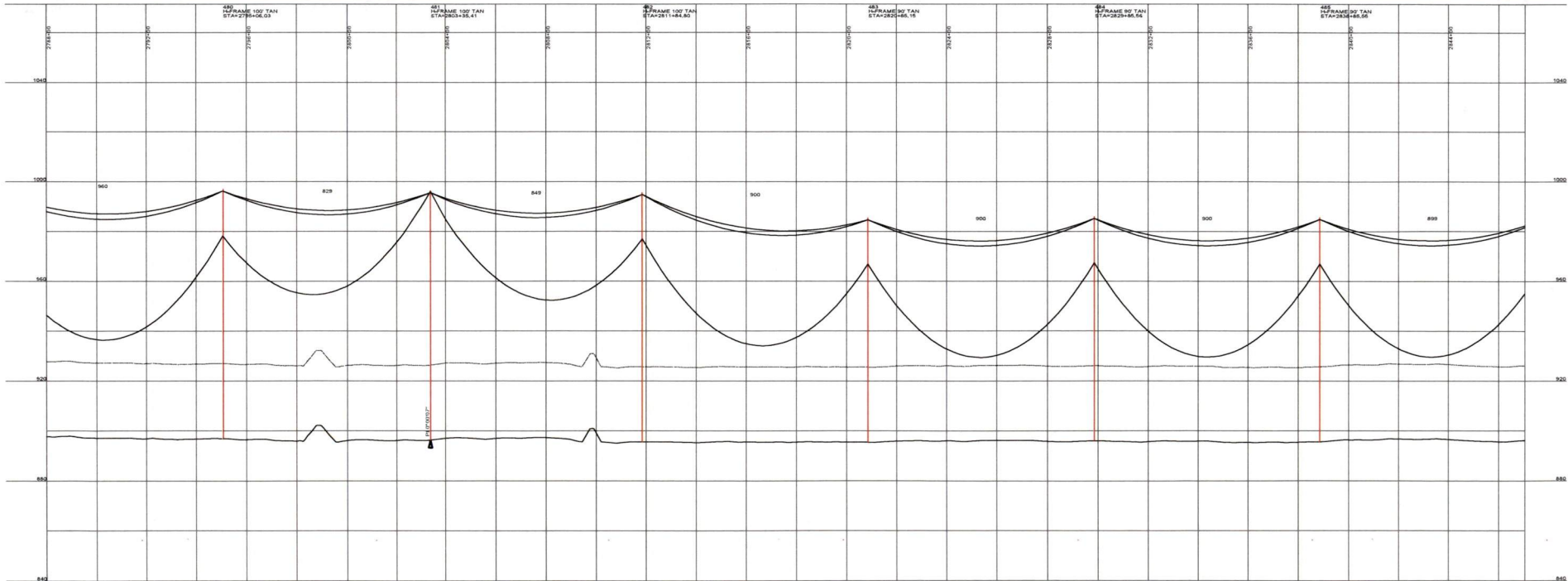
DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

↑ NORTH

WIND GENERATION TIE 62 OF 73



DESIGN CONDITIONS:  
 0.465" CROWN, 24 FIBER  
 20% RT8 @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

1272 ACBR 45/7 "BITTERN"  
 20% RT8 @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	TMF	DPTH
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

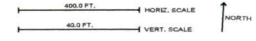


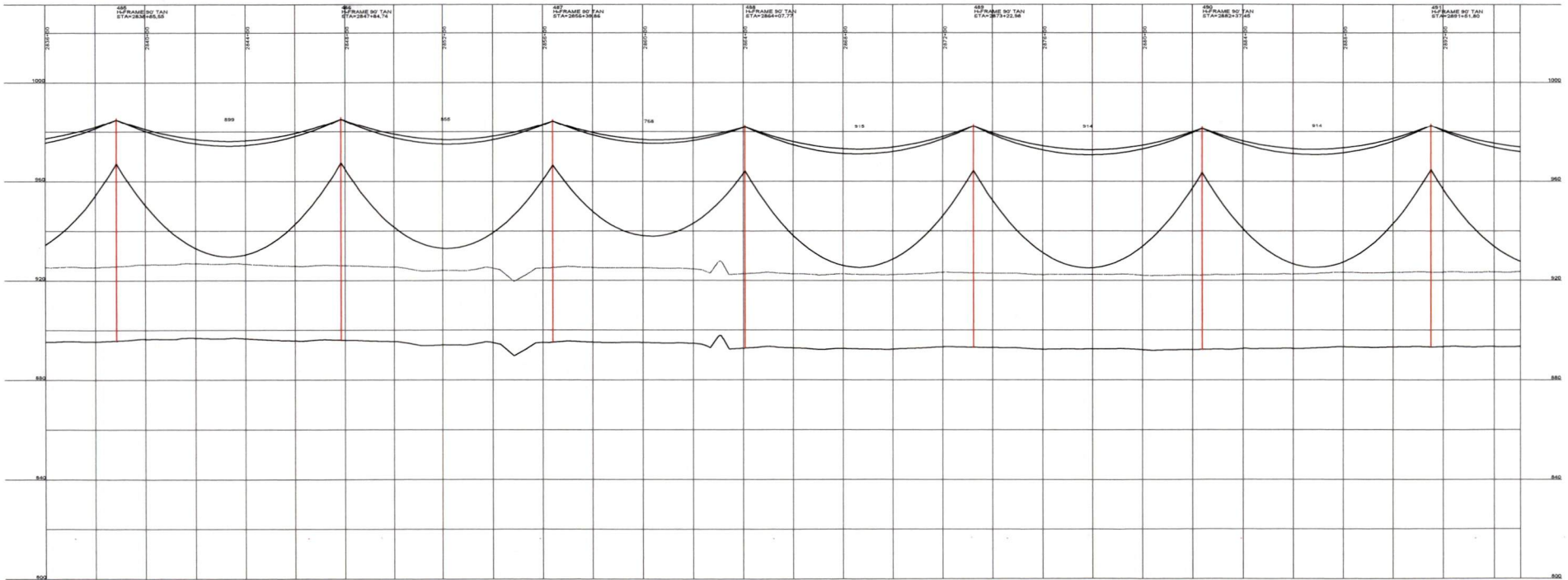
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 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**






DESIGN CONDITIONS  
 0.465" CPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

1272 ACIR 45/7 "BITTERN"

20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF

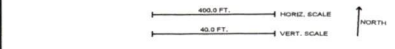


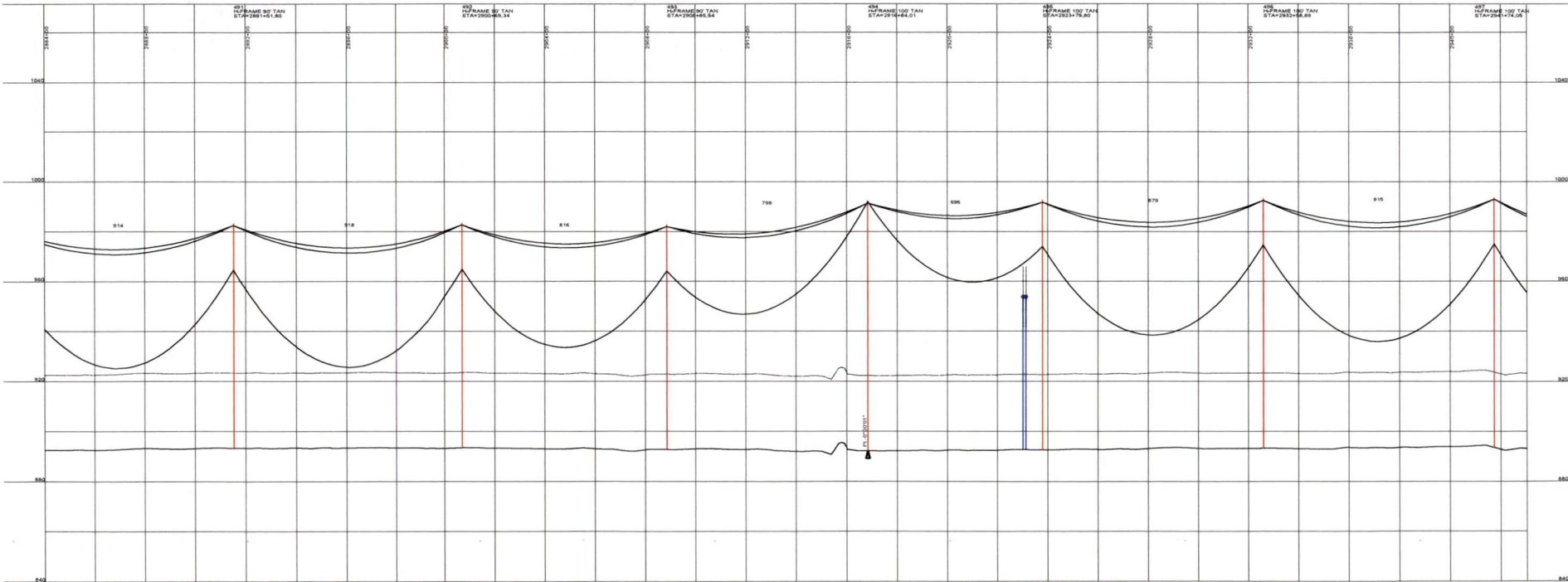
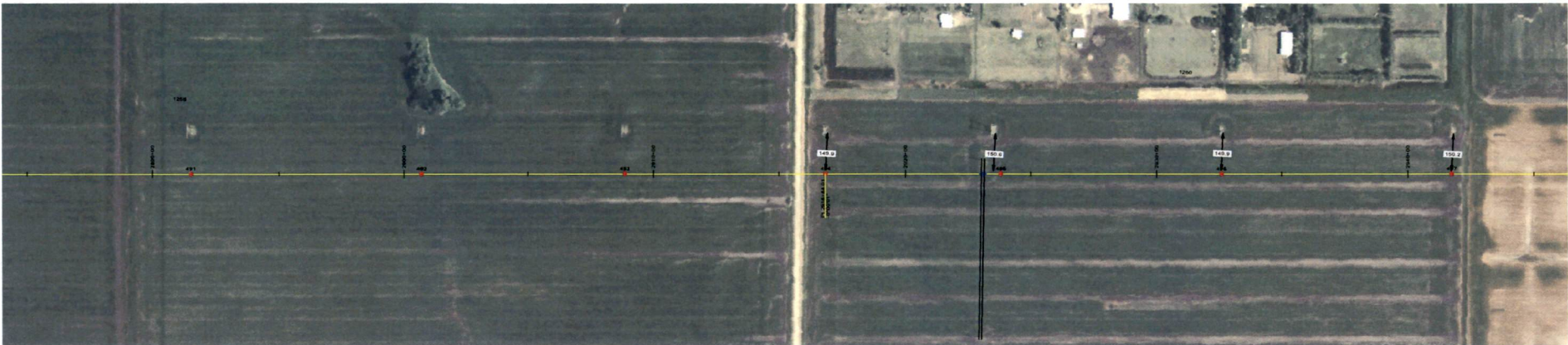
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DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**





DESIGN CONDITIONS: 1273 ACBR 457 'BITTERY'  
 0.445" OPW, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE '3'

REV	DATE	APP	DESCRIPTION	DATE	APP	DESCRIPTION
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION			

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 SUITE 400  
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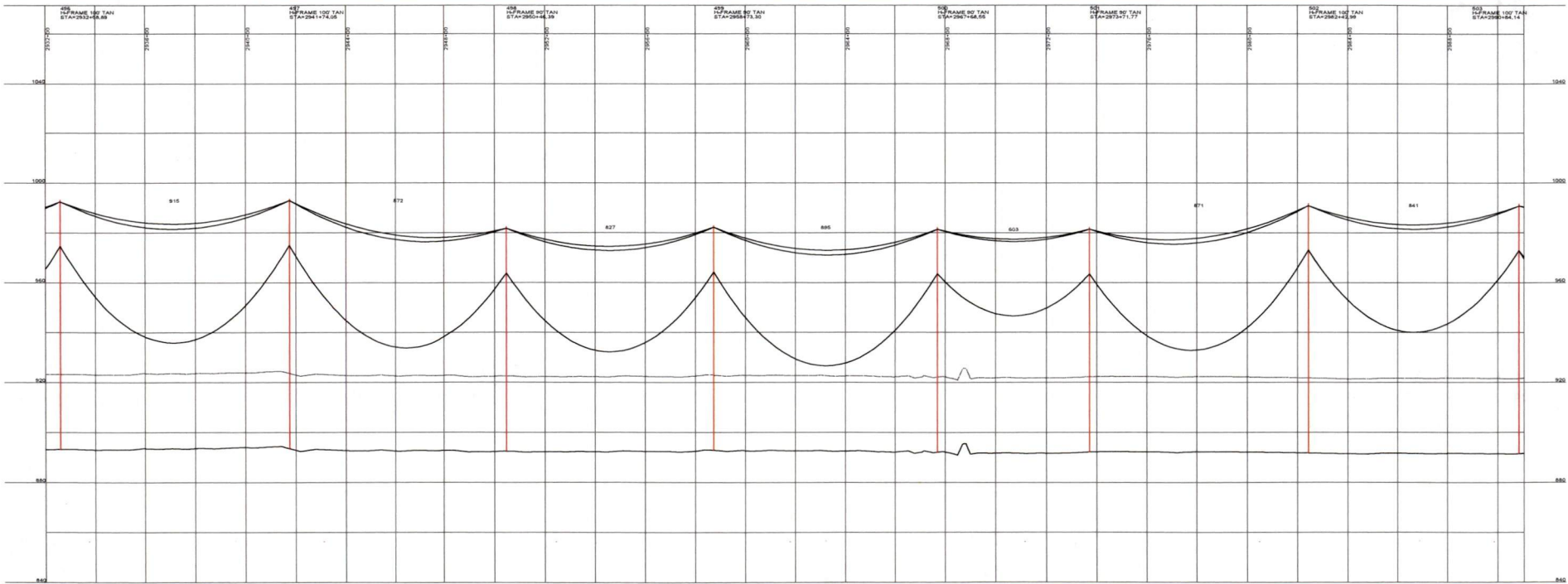
DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

450.0 FT. HORIZ. SCALE  
 45.0 FT. VERT. SCALE

↑ NORTH

**WIND GENERATION TIE** 65 OF 73



DESIGN CONDITIONS:  
 0.485' CROWN, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'

1272 ACER 457 "BITTERN"

20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	T.M.F.	D.F.T.F.
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		

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DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

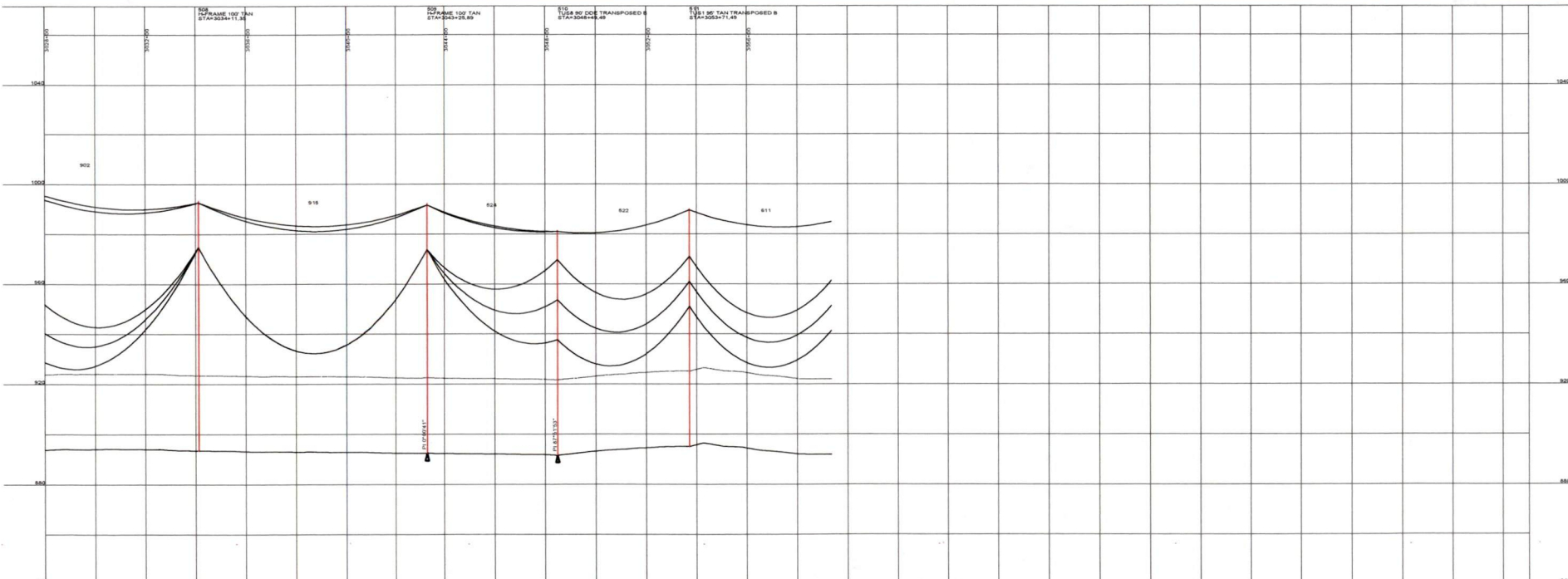
**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

↑ NORTH


**WIND GENERATION TIE** 66 OF 73





DESIGN CONDITIONS: 1272 ACSP 457 "BITTERY"  
 0.465" OPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL CLEARANCE LINE 37'

REV	DATE	APP	DESCRIPTION	TMF	DFTS
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		



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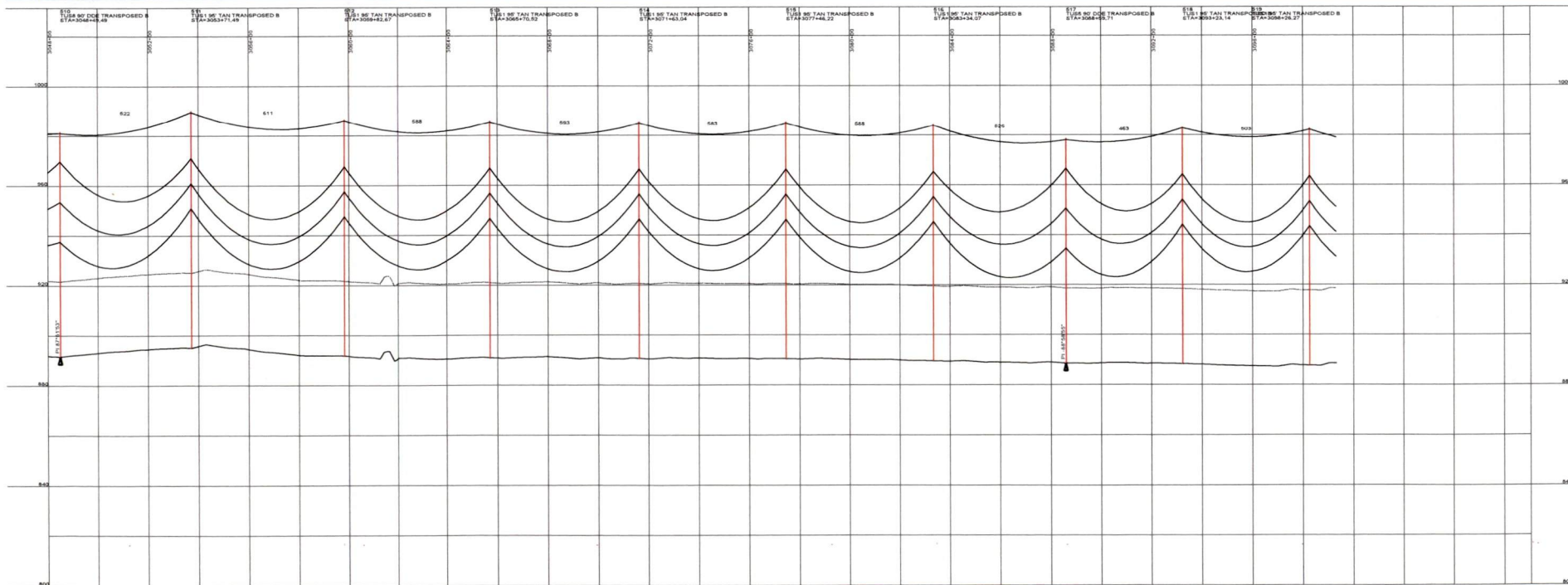
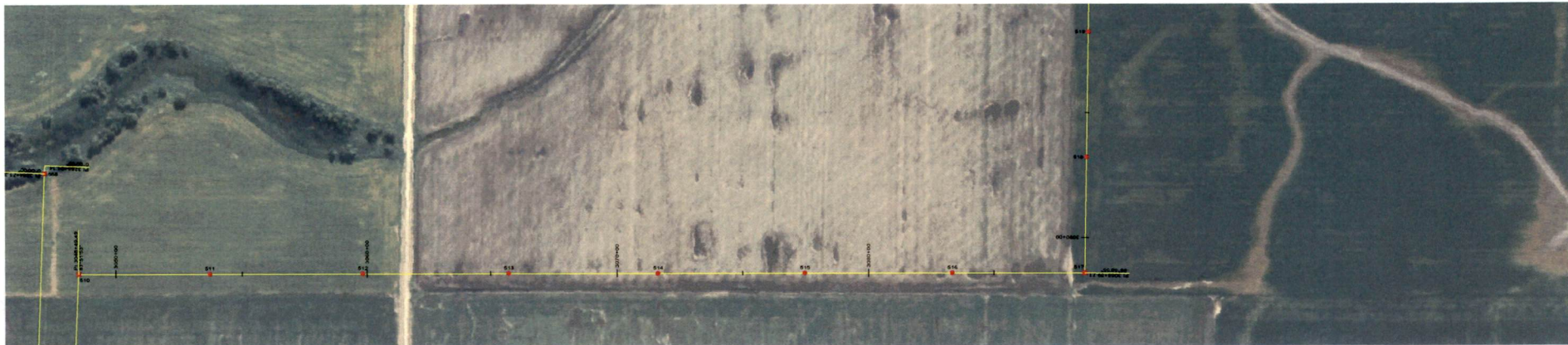
6200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. ———— HORIZ. SCALE  
 40.0 FT. ———— VERT. SCALE

**WIND GENERATION TIE** **68 OF 73**



DESIGN CONDITIONS:  
 0.465' CPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F, INITIAL CLEARANCE LINE: 30'  
 1272 ACSR 45/7 "BITTERRY"  
 20% RTS @ -20 DEGREES F, INITIAL

REV	DATE	APP	DESCRIPTION	TMF	DPTH
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		



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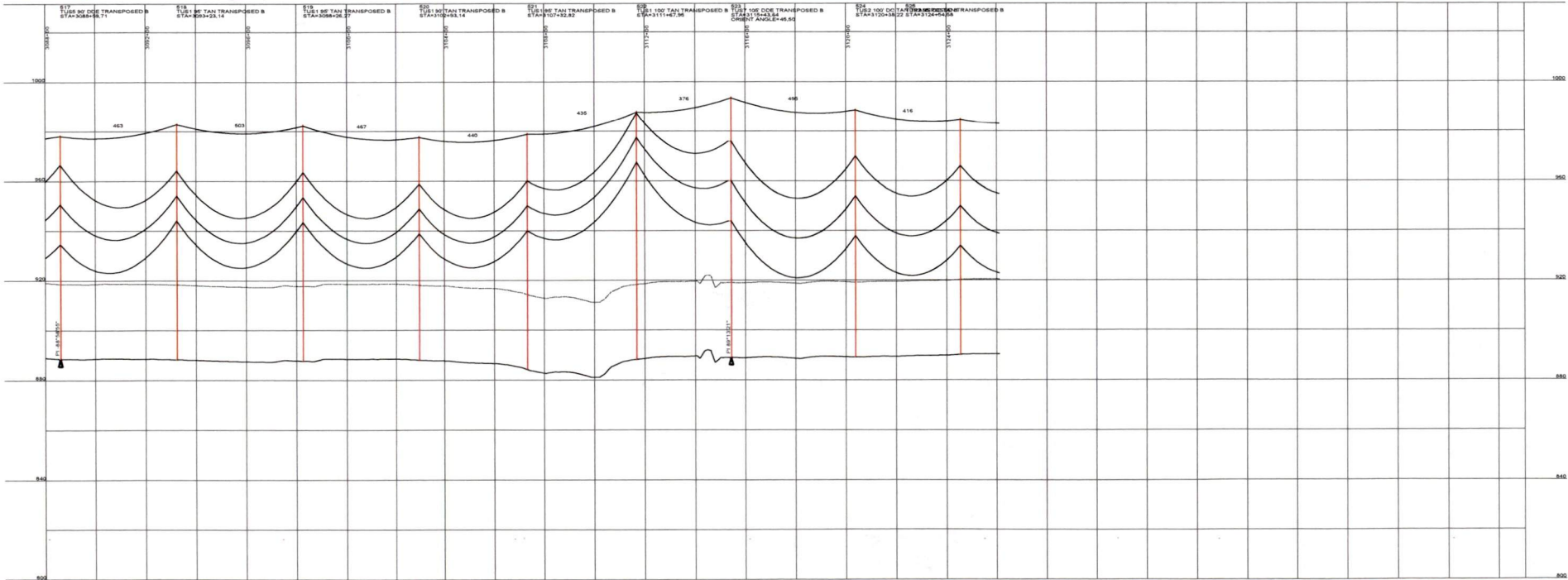
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE  
 40.0 FT. VERT. SCALE

**WIND GENERATION TIE** 69 OF 73



DESIGN CONDITIONS:  
 0.465" CPGW, 24 FIBER  
 20% RTB @ -20 DEGREES F, INITIAL CLEARANCE LINE 30'  
 1272 ACBR 45/7 "BITTERN"

REV	DATE	APP	DESCRIPTION	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF

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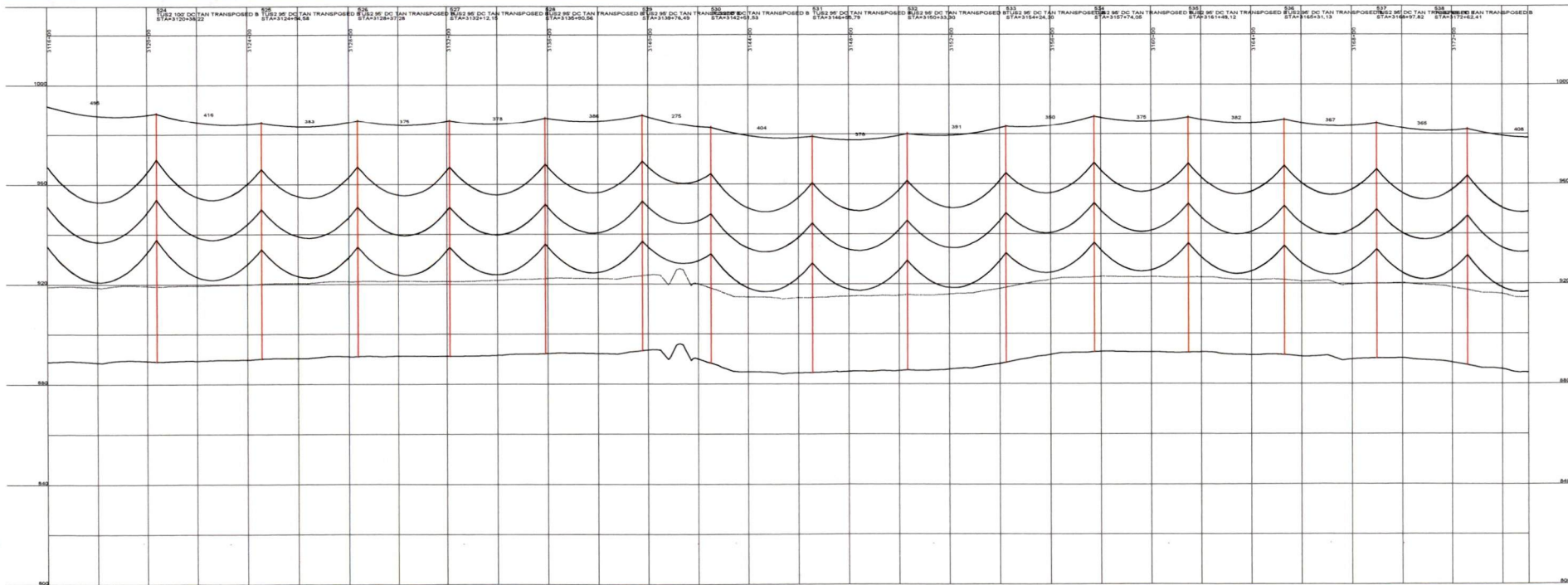
9200 E. MINERAL AVE.  
 SUITE 400  
 ENGLEWOOD, CO 80112

DESIGNED: T. FRANCIS  
 DRAWN: T. FRANCIS  
 CHECKED: H. DILLABOUGH  
 APPROVED: M. JURGEMEYER  
 APPROVED: \_\_\_\_\_  
 DATE: 05/05/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**


400.0 FT. ———— HORIZ. SCALE  
 40.0 FT. ———— VERT. SCALE

WIND GENERATION TIE 70 OF 73



DESIGN CONDITIONS:  
 0.485" OPGW, 24 FIBER  
 20% RTS @ 00 DEGREES F. INITIAL 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE 30'

REV	DATE	APP	DESCRIPTION	TMP	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION		




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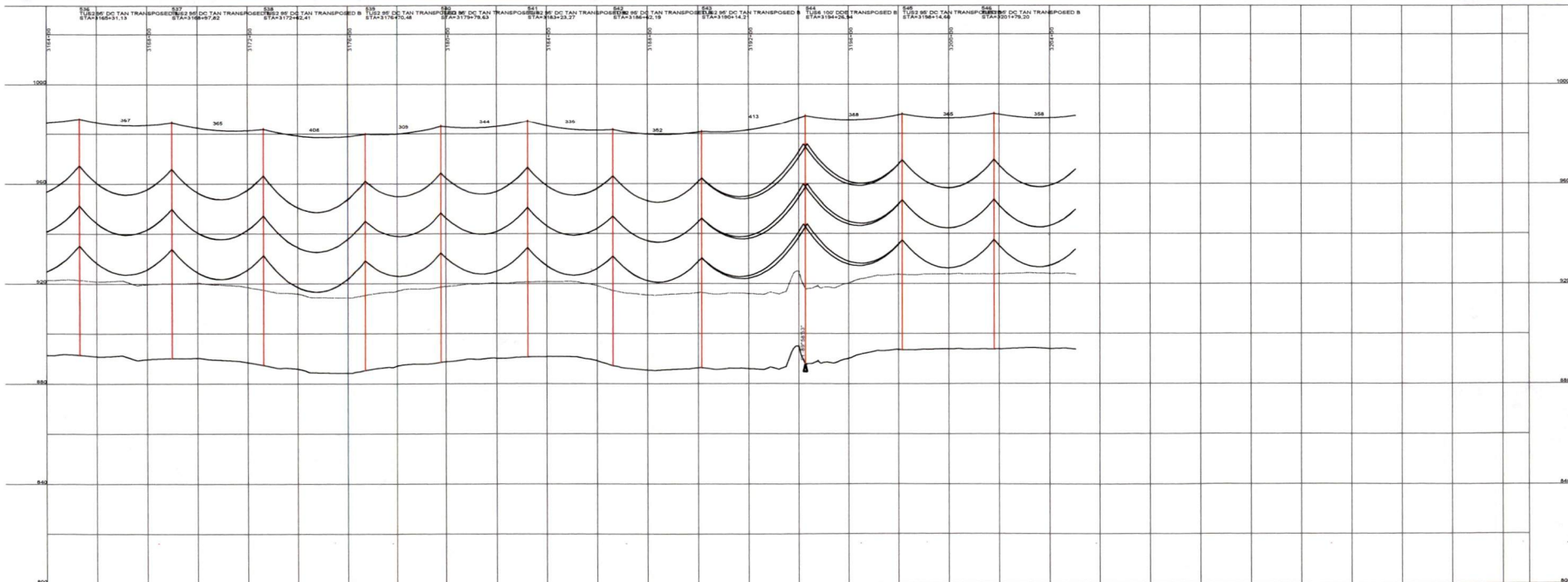
9200 E. MINERAL AVE.  
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 ENGLEWOOD, CO 80112

DESIGNED T. FRANCIS  
 DRAWN T. FRANCIS  
 CHECKED H. DILLABOUGH  
 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

WIND GENERATION TIE 71 OF 73





DESIGN CONDITIONS:  
 0.465' OPGW, 24 FIBER 1272 ACSR 45/7 "BITTERN"  
 20% RTS @ -20 DEGREES F, INITIAL 20% RTS @ -20 DEGREES F, INITIAL  
 CLEARANCE LINE 30'

REV	DATE	APP	DESCRIPTION	DFT
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	TMF



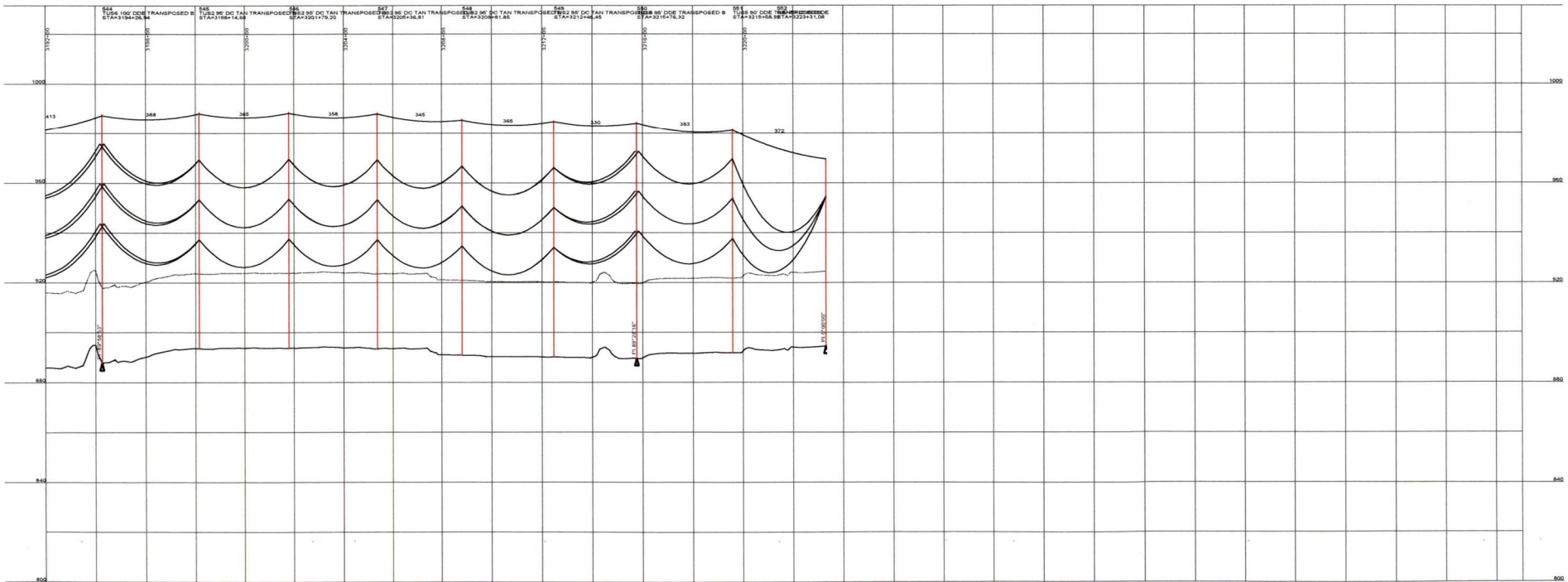
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 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**





DESIGN CONDITIONS:  
 0.465" OPGW, 24 FIBER  
 20% RTS @ -20 DEGREES F. INITIAL 20% RTS @ -20 DEGREES F. INITIAL  
 CLEARANCE LINE: 30'

REV	DATE	APP	DESCRIPTION	DTM
0	06/06/08	MFJ	ISSUED FOR CONSTRUCTION	

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 APPROVED M. JURGEMEYER  
 APPROVED \_\_\_\_\_  
 DATE 06/06/08

**MINNKOTA POWER COOPERATIVE**  
**GRAND FORKS, ND**

400.0 FT. HORIZ. SCALE

40.0 FT. VERT. SCALE

↑ NORTH

**WIND GENERATION TIE 73 OF 73**