

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - US 52 - FESSENDEN TO CARRINGTON											STATE	PROJECT NO.		SECTION NO.	SHEET NO.
										ND	INF-X-3-052(053)185		81	1	
HORIZONTAL ALIGNMENT				CURVE DATA		US PUBLIC LAND SURVEY DATA				SURVEY CONTROL POINTS					
PNT	STATION	NORTHING	EASTING	ARC DEFINITION		CORNER	IRN	NORTHING	EASTING	PNT	NORTHING	EASTING	ELEV	STATION	OFFSET
US 52 (SCL_HWY52_RP185)						T-148-N R-70-W				MONUMENT DESCRIPTION					
Begin	9765+42.92	239327.75	2179489.07			NW Cor Sec 7	1-C	242045.70	2178172.34	GPS20	168839.44	2184151.67	1776.08	10485+76	80' Rt
Station Equation US 52 (SCL_HWY52_RP185) at ND 15 (EX_HWY15)						NW Cor Sec 18	1-E	236764.71	2178229.47	#5 Rebar w/ Aluminum NDDOT control cap					
US 52	9796+93.44	236836.68	2181417.88			NE Cor Sec 18	3-E	236881.42	2183400.06	GPS21	182669.49	2184131.35	1738.51	10347+47	56' Lt
ND 15	0+00.00	236836.68	2181417.88	Curve SCS140098		E 1/4 Cor Sec 18	3-F	234230.22	2183427.50	#5 Rebar w/ Aluminum NDDOT control cap					
TS	9818+61.68	235122.28	2182745.32	PI = 9829+74.89		S 1/4 Cor Sec 18	2-G	231535.63	2180813.06	GPS22	198625.46	2183906.46	1689.73	Outside Alignment	
SC	9821+61.68	234881.93	2182924.80	Delta = 37° 09' 02" (RT)		SE Cor Sec 18	3-G	231578.70	2183454.72	#5 Rebar w/ Aluminum NDDOT control cap					
PI SCS140098	9829+74.89	234242.08	2183426.85	Da = 2° 00' 00"		S 1/4 Cor Sec 17	4-G	231602.13	2186096.22	GPS23	213144.18	2183600.45	1619.38	Outside Alignment	
CS	9837+19.30	233428.78	2183430.13	R = 2864.93		S 1/4 Cor Sec 19	2-J	226251.78	2180872.20	#5 Rebar w/ Aluminum NDDOT control cap					
ST	9840+19.30	233128.93	2183438.50	L = 1557.63		SE Cor Sec 19	3-J	226285.33	2183522.98	GPS24	230578.54	2183385.92	1609.43	9865+69	82' Rt
Rec Sec Cor	9855+69.62	231578.70	2183454.72	Ls = 300.00		SE Cor Sec 20	5-J	226329.35	2188797.32	#5 Rebar w/ Aluminum NDDOT control cap					
Rec Sec Cor	9908+63.44	226285.33	2183522.98	Sc = 2° 59' 59"		S 1/4 Cor Sec 30	2-L	220960.02	2180940.50	GPS25	234993.87	2183102.10	1616.81	9821+70	209' Lt
Rec Sec Cor	9961+62.49	220986.66	2183586.70	Ts = 1113.21		SE Cor Sec 30	3-L	220986.66	2183586.70	#5 Rebar w/ Aluminum NDDOT control cap					
Rec 1/4 Cor	9988+26.40	218322.91	2183616.51			SE Cor Sec 29	5-L	221033.37	2188859.13	GPS26	241070.11	2178116.45	1612.33	Outside Alignment	
Rec Sec Cor End	10014+50.07	215699.40	2183645.72			E 1/4 Cor Sec 31	3-M	218322.91	2183616.51	#5 Rebar w/ Aluminum NDDOT control cap					
						SE Cor Sec 31	3-N	215699.40	2183645.72	GPS31	168386.22	2192165.24	1746.02	10571+51	96' Lt
US 52 (SCL_HWY52_RP195)						T-147-N R-70-W				#5 Rebar w/ Aluminum NDDOT control cap					
Begin	10312+00.00	186129.40	2183540.44	Curve C140259		E 1/4 Cor Sec 6	3-B	213095.38	2183673.29	GPS32	168517.01	2207429.60	1713.23	10724+17	86' Lt
PC	10314+51.20	185903.93	2183651.19	PI = 10322+97.19		SE Cor Sec 6	3-C	210454.26	2183702.03	#5 Rebar w/ Aluminum NDDOT control cap					
Sec line Xing	10321+97.15 (Bk Tan)	185234.39	2183980.06	Delta = 24° 58' 33" (RT)		E 1/4 Cor Sec 18	3-F	202523.84	2183793.94	GPS33	168758.62	2223906.08	1675.12	10888+95	100' Lt
PI C140259	10322+97.19	185144.59	2184024.16	Da = 1° 30' 00"		SE Cor Sec 18	3-G	199864.13	2183824.73	#5 Rebar w/ Aluminum NDDOT control cap					
PT	10331+16.30	184298.78	2184041.64	R = 3,819.83	Curve C7	E 1/4 Cor Sec 19	3-H	197220.29	2183848.63	GPS34	168884.07	2239716.63	1632.01	11047+03	94' Lt
Twp line Xing	10334+08.96	184006.19	2184047.68	T = 845.99	PI = 10379+78.11	SE Cor Sec 19	3-J	194588.32	2183870.54	#5 Rebar w/ Aluminum NDDOT control cap					
PC	10354+85.56	181930.03	2184090.57	L = 1,665.10	Delta = 1° 50' 42" (LT)	SW Cor Sec 30	1-L	189254.25	2178802.67	GPS35	169003.92	2255413.29	1615.33	11204+03	100' Rt
PI C6	10360+18.71	181397.00	2184101.59		Da = 0° 12' 00"	SE Cor Sec 30	3-L	189296.91	2183921.78	#5 Rebar w/ plastic cap stamped "SURVEY CONTROL"					
PT	10365+51.73	180863.92	2184092.76	Curve C6	R = 28,647.90	SW Cor Sec 31	1-N	183966.14	2178854.38						
PC	10375+16.82	179898.97	2184076.78	PI = 10360+18.71	T = 461.30	SE Cor Sec 31	3-N	184005.74	2183997.68						
PI C7	10379+78.11	179437.74	2184069.14	Delta = 2° 07' 56" (RT)	L = 922.51	SE Cor Sec 32	5-N	184053.43	2189286.31						
PT	10384+39.33	178976.50	2184076.36	Da = 0° 12' 00"											
Rec Sec Cor	10386+52.96	178762.89	2184079.70	R = 28,647.90											
Rec Sec Cor	10439+39.38	173477.11	2184161.95	T = 533.15											
				L = 1,066.17											
						<input type="checkbox"/> Assumed Coordinates									
						<input checked="" type="checkbox"/> All coordinates on this sheet are Wells County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota North Zone Combination Factor (cf) = 0.9998895									
NOTES: Sheet 1 of 4 - Wells County Sheet 1 of 6 - Total Alignment based on the following R/W plats: Proj. No. F-704(1) (0052_168_1960_08_30), Proj. No. F-704(3) (0052_186_1967_08_11), Proj. No. PWA 376 (0052_184_1967_08_11), Proj. No. F-3-052(02)198 (0052_198_1977_10_07)				Date Survey Completed 10/25/21						All coordinates and measurements on this document derived from the International Foot definition.		<div>REGISTERED PROFESSIONAL LAND SURVEYOR WILLIAM J. HADDICK LS-6294 DATE 03/15/2022 NORTH DAKOTA</div>			
						INITIALIZING BENCH MARK NDGPS Station (OPUS)		<input checked="" type="checkbox"/> NAVD-88							
								<input type="checkbox"/> _____							
						<input type="checkbox"/> GEOID12B <input type="checkbox"/> _____		<input checked="" type="checkbox"/> GEOID18							

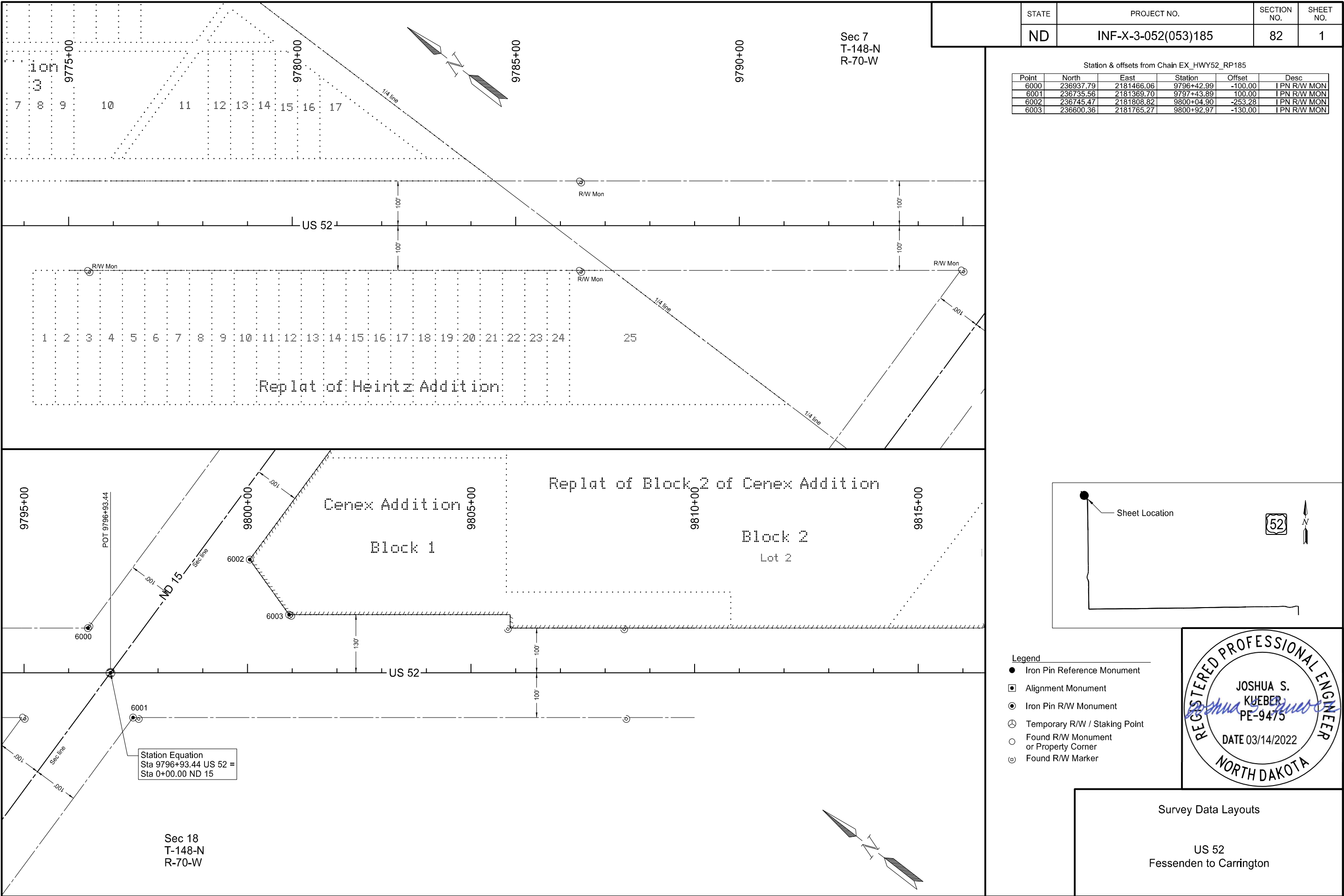
PRELIMINARY SURVEY COORDINATE AND CURVE DATA - US 52 - FESSENDEN TO CARRINGTON								STATE	PROJECT NO.		SECTION NO.	SHEET NO.			
							ND		INF-X-3-052(053)185		81	2			
HORIZONTAL ALIGNMENT				CURVE DATA		US PUBLIC LAND SURVEY DATA			SURVEY CONTROL POINTS						
PNT	STATION	NORTHING	EASTING	ARC DEFINITION		CORNER	IRN	NORTHING	EASTING	PNT	NORTHING	EASTING	ELEV	STATION	OFFSET
US 52 (SCL_HWY52_RP195) continued						T-146-N R-70-W				MONUMENT DESCRIPTION					
STA EQ US52 (SCL_HWY52_RP195, EX_HWY52_RP198) at ND200 (EX_HWY200)						SW Cor Sec 6	1-C	178718.98	2178905.02	REFERENCE MARKERS					
US 52	10492+25.76	168191.33	2184241.45			SE Cor Sec 6	3-C	178762.89	2184079.70	R Mkr #	Northing	Easting	Station	Offset	Alignment
ND 200	14180+86.56	168191.33	2184241.45			SE Cor Sec 5	5-C	178849.66	2189358.99	185	239341.48	2179434.97		Outside Alignment	
Rec Sec Cor End	10492+25.76	168191.33	2184241.45			SW Cor Sec 7	1-E	173442.22	2178955.33	186	235125.27	2182697.24	9818+30	36' Rt	SCL_HWY52_RP185
						SE Cor Sec 7	3-E	173477.11	2184161.95	187	230070.38	2183434.41	9870+78	40' Rt	SCL_HWY52_RP185
US 52/ND 200 (EX_HWY52_RP198)						SE Cor Sec 8	5-E	173560.55	2189433.26	188	224803.08	2183500.26	9923+45	41' Rt	SCL_HWY52_RP185
Rec Sec Cor Begin	10492+25.76	168191.33	2184241.45			NE Cor Sec 16	7-E	173610.02	2194718.57	189	219530.51	2183563.15	9976+18	40' Rt	SCL_HWY52_RP185
STA EQ US52 (SCL_HWY52_RP195, EX_HWY52_RP198) at ND200 (EX_HWY200)						NE Cor Sec 15	9-E	173641.22	2200013.23	190	214252.80	2183621.24		Outside Alignment	
US 52	10492+25.76	168191.33	2184241.45			NE Cor Sec 14	11-E	173659.50	2205307.94	191	209000.05	2183679.46		Outside Alignment	
ND 200	14180+86.56	168191.33	2184241.45			NE Cor Sec 13	13-E	173773.01	2210597.57	192	203735.20	2183739.78		Outside Alignment	
Rec Sec Cor	10544+94.50	168255.63	2189509.80			SW Cor Sec 18	1-G	168146.02	2179025.12	193	198350.49	2183800.23		Outside Alignment	
Rec Sec Cor	10597+75.83	168323.82	2194790.68			SE Cor Sec 18	3-G	168191.33	2184241.45	195	187957.81	2183131.64		Outside Alignment	
Rec Sec Cor	10650+63.61	168358.47	2200078.35			SE Cor Sec 17	5-G	168255.63	2189509.80	196	182706.07	2184039.69	10347+09	35' Rt	SCL_HWY52_RP195
Rec Sec Cor	10703+66.80	168400.95	2205381.37			SE Cor Sec 16	7-G	168323.82	2194790.68	197	177475.42	2184060.16	10399+40	40' Rt	SCL_HWY52_RP195
Rec Sec Cor	10756+56.04	168478.90	2210670.03			SE Cor Sec 15	9-G	168358.47	2200078.35	198	172243.17	2184141.43	10451+73	39' Rt	SCL_HWY52_RP195
Rec 1/4 Cor	10782+09.32	168515.89	2213223.05			SE Cor Sec 14	11-G	168400.95	2205381.37	199	168176.53	2185534.17	10505+18	31' Rt	EX_HWY52_RP198
Rec Sec Cor	10808+57.88	168563.41	2215871.18			SE Cor Sec 13	13-G	168478.90	2210670.03	200	168245.01	2190827.97	10558+12	28' Rt	EX_HWY52_RP198
Rec 1/4 Cor	10835+15.12	168601.45	2218528.15			SW Cor Sec 20	3-J	162910.51	2184316.71	201	168302.77	2196145.62	10611+31	30' Rt	EX_HWY52_RP198
Rec Sec Cor	10861+68.54	168626.49	2221181.45			SE Cor Sec 20	5-J	162968.10	2189581.69	205	168556.32	2217323.71	10823+10	28' Rt	EX_HWY52_RP198
Rec Sec Cor	10914+54.72	168688.23	2226467.27			SE Cor Sec 21	7-J	163032.45	2194865.09	206	168613.98	2222610.22	10875+97	29' Rt	EX_HWY52_RP198
Rec 1/4 Cor	10940+96.10	168725.66	2229108.38			SE Cor Sec 22	9-J	163075.69	2200160.89	207	168681.03	2227913.73	10929+01	28' Rt	EX_HWY52_RP198
Rec Sec Cor	10967+65.85	168754.50	2231777.98			SE Cor Sec 23	11-J	163124.78	2205451.05	210	168800.97	2243757.70	11087+45	29' Rt	EX_HWY52_RP198
STA EQ US 52/ND200 (EX_HWY52_RP198) at ND 30 (EX_HWY30) Rec Sec Cor						SE Cor Sec 24	13-J	163193.07	2210744.42	211	168965.62	2249047.53	11140+38	29' Rt	EX_HWY52_RP198
US52/ND200 (Bk)	11020+43.09	168796.66	2237055.05							212	169058.74	2254357.99	11193+49	28' Rt	EX_HWY52_RP198
US52/ND200 (Ahd)	11020+41.60	168796.66	2237055.05												
ND 30	4661+39.52	168796.66	2237055.05	Curve C200125											
Rec 1/4 Cor	11047+01.53	168789.70	2239714.98	PI = 11060+36.26											
PC	11057+48.23	168784.95	2240761.66	Delta = 1° 26' 24" (RT)											
PI C200125	11060+36.26	168783.64	2241049.69	Da = 0° 15' 00"											
PT	11063+24.26	168775.10	2241337.60	R = 22,918.30											
				T = 288.03											
				L = 576.04											
NOTES: Sheet 2 of 4 - Wells County Sheet 2 of 6 - Total Alignment based on the following R/W plats: Proj. No. F-704(1) (0052_168_1960_08_30), Proj. No. F-704(3) (0052_186_1967_08_11), Proj. No. PWA 376 (0052_184_1967_08_11), Proj. No. F-3-052(02)198 (0052_198_1977_10_07)				Date Survey Completed 10/25/21	<input type="checkbox"/> Assumed Coordinates <input checked="" type="checkbox"/> All coordinates on this sheet are Wells County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota North Zone Combination Factor (cf) = 0.9998895				All coordinates and measurements on this document derived from the International Foot definition.		REGISTERED PROFESSIONAL LAND SURVEYOR WILLIAM J. HADDICK LS-6294 DATE 03/15/2022 NORTH DAKOTA				
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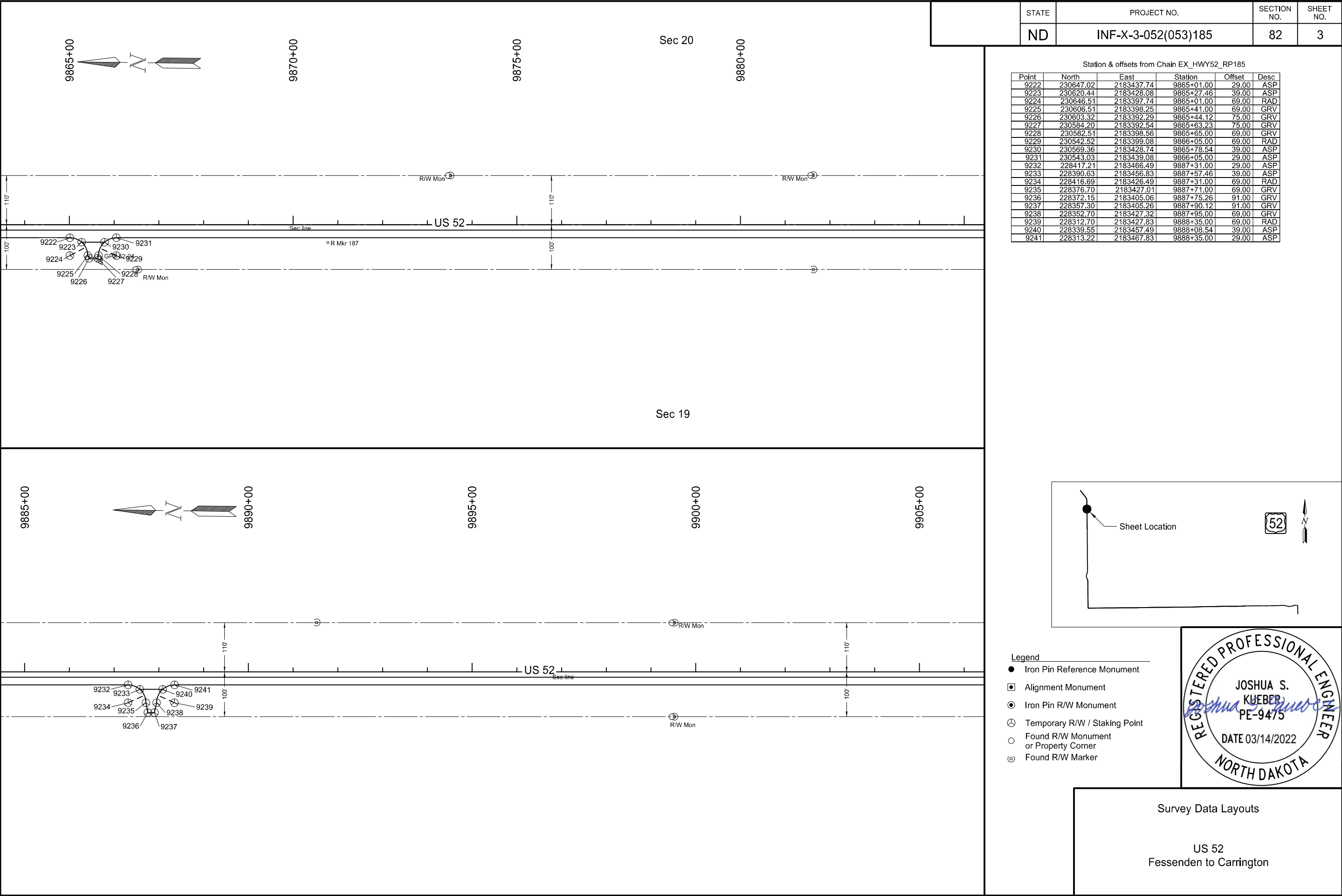
PRELIMINARY SURVEY COORDINATE AND CURVE DATA - US 52 - FESSENDEN TO CARRINGTON											STATE	PROJECT NO.	SECTION NO.	SHEET NO.	
										ND		INF-X-3-052(053)185	81	3	
HORIZONTAL ALIGNMENT				CURVE DATA		US PUBLIC LAND SURVEY DATA				SURVEY CONTROL POINTS					
PNT	STATION	NORTHING	EASTING	ARC DEFINITION		CORNER	IRN	NORTHING	EASTING	PNT	NORTHING	EASTING	ELEV	STATION	OFFSET
US 52/ND 200 (EX_HWY52_RP198) continued						T-146-N R-69-W				MONUMENT DESCRIPTION					
PC	11064+56.15	168771.19	2241469.42	Curve C200128		NE Cor Sec 18	3-E	173855.11	2215810.80						
PI C200128	11068+36.90	168759.89	2241850.01	PI = 11068+36.90		NE Cor Sec 17	5-E	173908.50	2221094.57						
PT	11072+17.38	168773.88	2242230.51	Delta = 3° 48' 22" (LT)		NE Cor Sec 16	7-E	173985.74	2226391.29						
Rec Sec Cor	11073+24.02	168777.80	2242337.08	Da = 0° 30' 00"		NE Cor Sec 15	9-E	174050.20	2231693.48						
Rec Sec Cor	11124+76.13	168967.16	2247485.71	R = 11459.20		NE Cor Sec 14	11-E	174087.02	2236984.74						
Rec Sec Cor	11177+68.86	169060.13	2252777.62	T = 380.76		PI = 11247+52.92	NE Cor Sec 13	13-E	174038.32	2242268.57					
PC	11226+85.68	169142.74	2257693.75	L = 761.23		Delta = 1° 40' 56" (LT)	S 1/4 Cor Sec 18	2-G	168515.89	2213223.05					
Rec Sec Cor PI C200136	11230+53.23	169148.91	2258061.25			Da = 0° 15' 00"	SE Cor Sec 18	3-G	168563.41	2215871.18					
PT	11234+20.71	169166.87	2258428.35	Curve 200136		R = 22918.30	S 1/4 Cor Sec 17	4-G	168601.45	2218528.15					
PC	11235+64.83	169173.91	2258572.30	PI = 11230+53.23		T = 336.47	SE Cor Sec 17	5-G	168626.49	2221181.45					
PI C200402	11239+01.88	169190.38	2258908.94	Delta = 1° 50' 15" (LT)		L = 672.89	SE Cor Sec 16	7-G	168688.23	2226467.27					
PT	11242+38.73	169187.03	2259245.97	Da = 0° 15' 00"			S 1/4 Cor Sec 15	8-G	168725.66	2229108.38					
PC	11244+16.46	169185.26	2259423.69	R = 22918.30		Curve C200152	SE Cor Sec 15	9-G	168754.50	2231777.98					
PI C200403	11247+52.92	169181.92	2259760.14	T = 367.55		PI = 11389+31.27	SE Cor Sec 14	11-G	168796.66	2237055.05					
PT	11250+89.34	169188.46	2260096.54	L = 735.03		Delta = 1° 54' 41" (LT)	S 1/4 Cor Sec 13	12-G	168789.70	2239714.98					
Rec Sec Cor	11283+47.62	169251.74	2263354.21			Da = 0° 15' 00"	SE Cor Sec 13	13-G	168777.80	2242337.08					
Rec 1/4 Cor	11310+03.41	169295.74	2266009.64	Curve C200402		R = 22918.30	SE Cor Sec 19	3-J	163277.93	2215984.69					
Rec Sec Cor	11336+53.23	169334.95	2268659.17	PI = 11239+01.88		T = 382.31	SE Cor Sec 20	5-J	163335.01	2221292.80					
PC	11385+48.96	169341.80	2273554.88	Delta = 3° 22' 10" (RT)		L = 764.55	SE Cor Sec 21	7-J	163397.61	2226572.03					
Rec Sec Cor PI C200152	11389+31.27	169342.34	2273937.19	Da = 0° 30' 00"			SE Cor Sec 22	9-J	163470.57	2231849.80					
PT	11393+13.51	169355.62	2274319.27	R = 11459.20			SE Cor Sec 23	11-J	163514.30	2237143.74					
US 52/ND 200 continues in Foster County on Sheet 5 of 6				T = 337.05			SE Cor Sec 24	13-J	163523.73	2242411.73					
				L = 673.90											
ND 15 (EX_HWY15)															
Begin	0+00.00	236836.68	2181417.88												
Station Equation US 52 (SCL_HWY52_RP185) at ND 15 (EX_HWY15)															
US 52	9796+93.44	236836.68	2181417.88												
ND 15	0+00.00	236836.68	2181417.88												
Rec Sec Cor End	19+82.68	236881.42	2183400.06												
NOTES: Sheet 3 of 4 - Wells County Sheet 3 of 6 - Total Alignment based on the following R/W plats: Proj. No. F-704(1) (0052_168_1960_08_30), Proj. No. F-704(3) (0052_186_1967_08_11), Proj. No. PWA 376 (0052_184_1967_08_11), Proj. No. F-3-052(02)198 (0052_198_1977_10_07)				Date Survey Completed 10/25/21		<div><div><input type="checkbox"/> Assumed Coordinates</div><div><input checked="" type="checkbox"/> All coordinates on this sheet are Wells County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota North Zone Combination Factor (cf) = 0.9998895</div></div>									
										All coordinates and measurements on this document derived from the International Foot definition.		<div><div>REGISTERED PROFESSIONAL LAND SURVEYOR</div><div>WILLIAM J. HADDICK LS-6294</div><div>DATE 08/15/2022</div><div>NORTH DAKOTA</div></div>			
										INITIALIZING BENCH MARK NDGPS Station (OPUS)					
										<input checked="" type="checkbox"/> NAVD-88 <input type="checkbox"/> _____					
										<input type="checkbox"/> GEOID12B <input type="checkbox"/> _____ <input checked="" type="checkbox"/> GEOID18					

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - US 52 - FESSENDEN TO CARRINGTON									STATE	PROJECT NO.	SECTION NO.	SHEET NO.								
								ND		INF-X-3-052(053)185	81	5								
HORIZONTAL ALIGNMENT				CURVE DATA		US PUBLIC LAND SURVEY DATA			SURVEY CONTROL POINTS											
PNT	STATION	NORTHING	EASTING	ARC DEFINITION		CORNER	IRN	NORTHING	EASTING	PNT	NORTHING	EASTING	ELEV	STATION	OFFSET					
US 52/ND 200 (EX_HWY52_RP215)						T-146-N R-67-W			MONUMENT DESCRIPTION											
(continued from Wells County on Sheet 3)				Curve C200152		NW Cor Sec 18	1-E	174584.28	2273797.11	GPS52-37	169706.92	2286641.88	1607.51	11517+11	97' Lt					
PC	11385+48.96	169336.55	2273484.39	PI	= 11389+31.27	NE Cor Sec 18	3-E	174805.81	2278978.44	#5 Rebar w/ Aluminum NDDOT control cap										
Rec Sec Cor PI C200152	11389+31.27	169337.09	2273866.69	Delta	= 1° 54' 41" (LT)	NE Cor Sec 17	5-E	174882.47	2284265.99	GPS52-38	169371.03	2304223.31	1589.21	11693+70	86' Rt					
PT	11393+13.51	169350.37	2274248.77	Da	= 0° 15' 00"	Curve C200405	NE Cor Sec 16	7-E	174915.17	2289549.54	#5 Rebar w/ Aluminum NDDOT control cap									
PC	11437+63.38	169505.02	2278695.96	R	= 22918.33	PI	= 11581+97.08	NE Cor Sec 15	9-E	174965.95	2294832.13	REFERENCE MARKERS								
Rec Sec Cor PI C200158	11441+10.94	169517.10	2279043.31	T	= 382.31	Delta	= 1° 04' 27" (LT)	NE Cor Sec 14	11-E	175028.34	2300118.57									
PT	11444+58.46	169522.15	2279390.82	L	= 764.55	Da	= 0° 15' 00"	NE Cor Sec 13	13-E	175087.07	2305390.05									
Rec Sec Cor	11494+08.64	169594.13	2284340.48		R	= 22918.30	SW Cor Sec 18	1-G	169337.09	2273866.70	R Mkr #					Northing	Easting	Station	Offset	Alignment
PC	11545+36.37	169628.21	2289468.09		Curve C200158	T	= 214.82	SE Cor Sec 18	3-G	169517.10	2279043.31					219	169603.42	2291254.34	11563+22	29' Rt
Rec Sec Cor PI C200049	11546+96.67	169629.27	2289628.39	PI	= 11441+10.94	L	= 429.63	SE Cor Sec 17	5-G	169594.13	2284340.48	220	169673.96	2296565.47	11616+34	28' Rt	EX_HWY52_RP215			
PT	11548+56.97	169628.10	2289788.69	Delta	= 1° 09' 30" (RT)		SE Cor Sec 16	7-G	169629.28	2289628.39	221	169877.19	2301858.24	11669+33	28' Rt	EX_HWY52_RP215				
PC	11552+50.55	169625.21	2290182.26	Da	= 0° 10' 00"	Curve C200177	SE Cor Sec 15	9-G	169683.41	2294908.31										
PI C200404	11554+46.33	169623.77	2290378.03	R	= 34377.48	PI	= 11589+97.40	S 1/4 Cor Sec 14	10-G	169713.68						2297557.19				
PT	11556+42.09	169625.68	2290573.79	T	= 347.55	Delta	= 1° 02' 41" (RT)	SE Cor Sec 14	11-G	169745.73						2300206.39				
PC	11579+82.26	169648.48	2292913.85	L	= 695.08	Da	= 0° 15' 00"	SE Cor Sec 13	13-G	169842.66						2305476.00				
PI C200405	11581+97.08	169650.57	2293128.66		R	= 22918.30	SW Cor Sec 19	1-J	164092.89	2273956.98										
PT	11584+11.89	169656.69	2293343.39		Curve C200049	T	= 208.98	SE Cor Sec 19	3-J	164228.12	2279134.29									
PC	11587+88.42	169667.41	2293719.77	PI	= 11546+96.67	L	= 417.94	SE Cor Sec 20	5-J	164301.08	2284419.30									
PI C200177	11589+97.40	169673.37	2293928.67	Delta	= 0° 48' 05" (RT)		SE Cor Sec 21	7-J	164344.39	2289711.49										
PT	11592+06.36	169675.51	2294137.63	Da	= 0° 15' 00"	Curve C200406	SE Cor Sec 22	9-J	164401.56	2294995.71										
Rec Sec Cor	11599+77.08	169683.41	2294908.31	R	= 22918.30	PI	= 11641+33.89	SE Cor Sec 23	11-J	164461.71	2300288.25									
Rec 1/4 Cor	11626+26.14	169713.68	2297557.19	T	= 160.30	Delta	= 3° 20' 34" (LT)	SE Cor Sec 24	13-J	164536.04	2305560.80									
PC	11636+32.34	169725.17	2298563.33	L	= 320.60	Da	= 0° 20' 00"	T-146-N R-66-W												
PI C200406	11641+33.89	169730.90	2299064.84		R	= 17188.80	NE Cor Sec 18	3-E	175191.91	2310616.49										
Sec line Xing	(Ahd Tan)	169732.13	2299082.42		Curve C200404	T	= 501.54	SE Cor Sec 18	3-G	169900.88	2310716.44									
PT	11646+35.14	169765.86	2299565.17	PI	= 11554+46.33	L	= 1002.80	SE Cor Sec 17	5-G	169983.72	2315987.11									
Sec line Xing	11652+76.85	169810.60	2300205.31	Delta	= 0° 58' 44" (LT)		SE Cor Sec 19	3-J	164613.36	2310811.38										
				Da	= 0° 15' 00"															
				R	= 22918.30															
				T	= 195.78															
				L	= 391.54															
NOTES: Sheet 1 of 2 - Foster County Sheet 5 of 6 - Total Alignment based on the following R/W plats: Proj. No. F-3-052(02)198 (0052_198_1977_10_07) N.H.R.P. No. 151 (0052_215_1935_05_03)				Date Survey Completed 10/25/21		<input type="checkbox"/> Assumed Coordinates				All coordinates and measurements on this document derived from the International Foot definition. INITIALIZING BENCH MARK NDGPS Station (OPUS) <input checked="" type="checkbox"/> NAVD-88 <input type="checkbox"/> _____ <input type="checkbox"/> GEOID12B <input type="checkbox"/> _____ <input checked="" type="checkbox"/> GEOID18										
						<input checked="" type="checkbox"/> All coordinates on this sheet are Foster County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota North Zone Combination Factor (cf) = 0.9999205														

3/14/20229:25:28 AMKORY.KLEINKNECHT G:\2021\21.01304\30052185.053\Survey\Foster_County\081CD_F_005.dgn

REGISTERED PROFESSIONAL LAND SURVEYOR
WILLIAM J. HADDICK
LS-6294
DATE 03/15/2022
NORTH DAKOTA



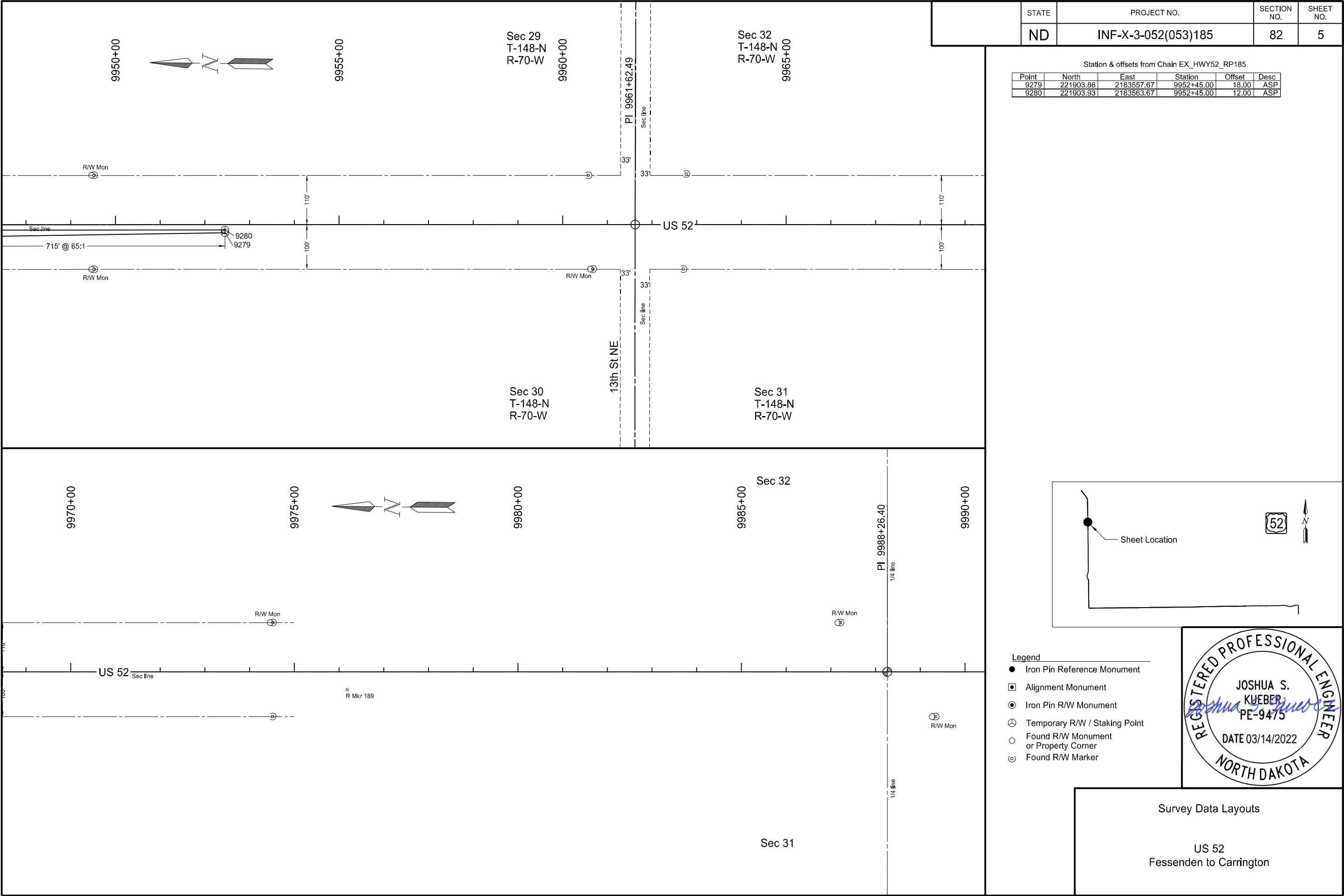


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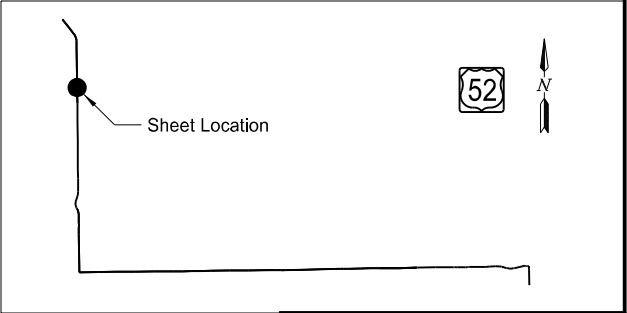
JOSH.KUEBER

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	INF-X-3-052(053)185	82	5

Station & offsets from Chain EX_HWY52_RP185					
Point	North	East	Station	Offset	Desc
9279	221903.86	2183557.67	9952+45.00	18.00	ASP
9280	221903.93	2183563.67	9952+45.00	12.00	ASP

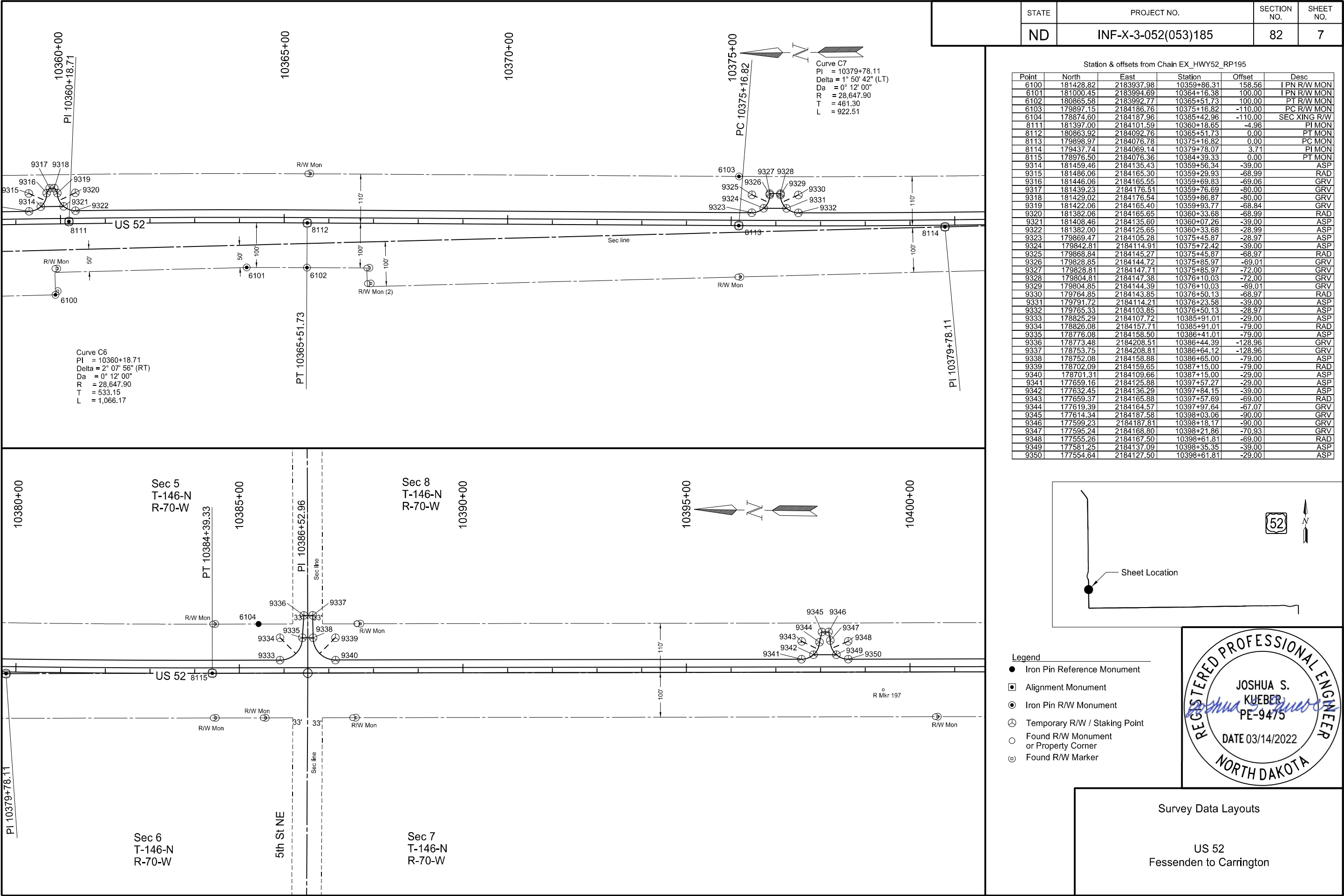


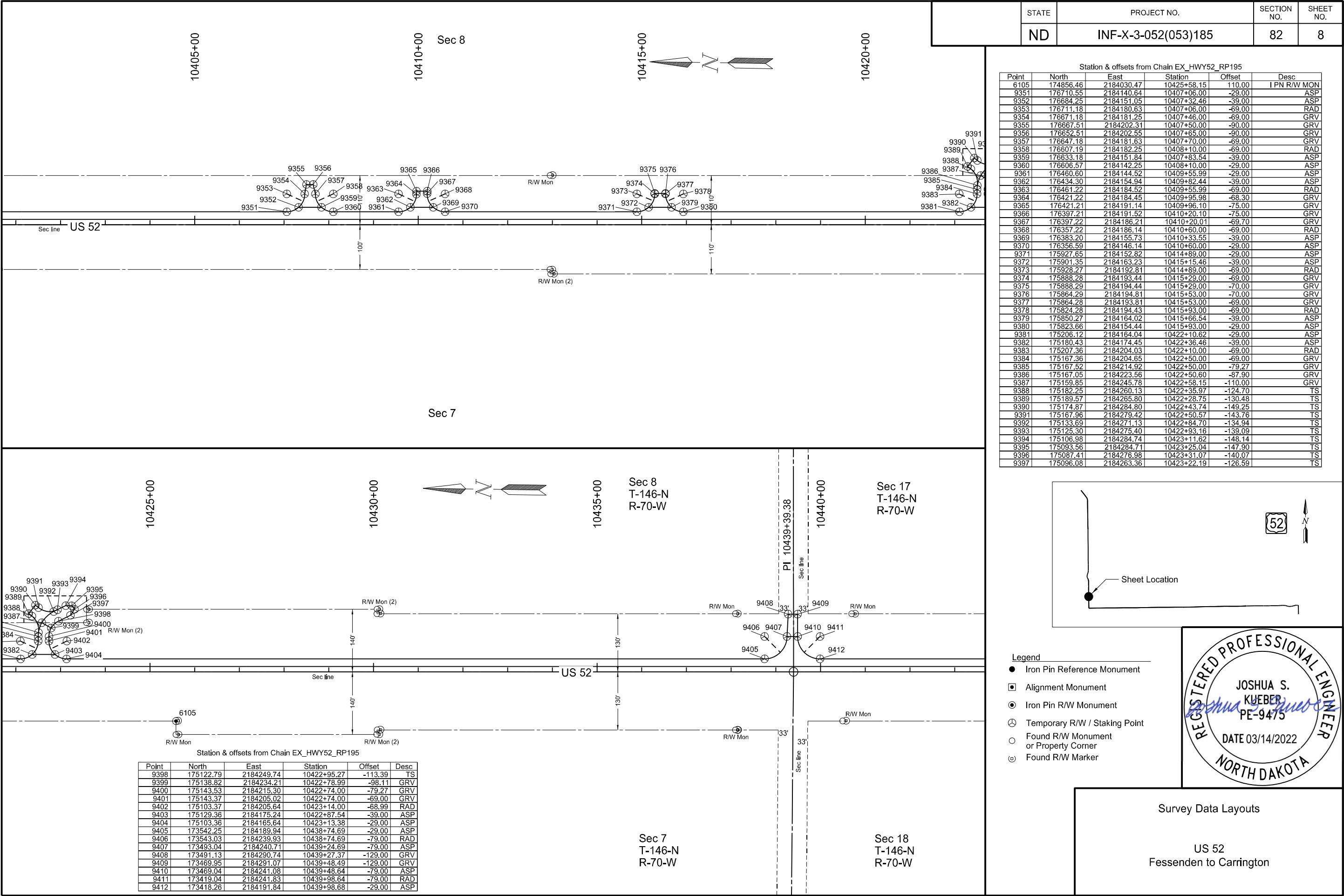
- Legend
- Iron Pin Reference Monument
 - Alignment Monument
 - ⊙ Iron Pin R/W Monument
 - ⊕ Temporary R/W / Staking Point
 - Found R/W Monument or Property Corner
 - ⊖ Found R/W Marker



Survey Data Layouts

US 52
Fessenden to Carrington



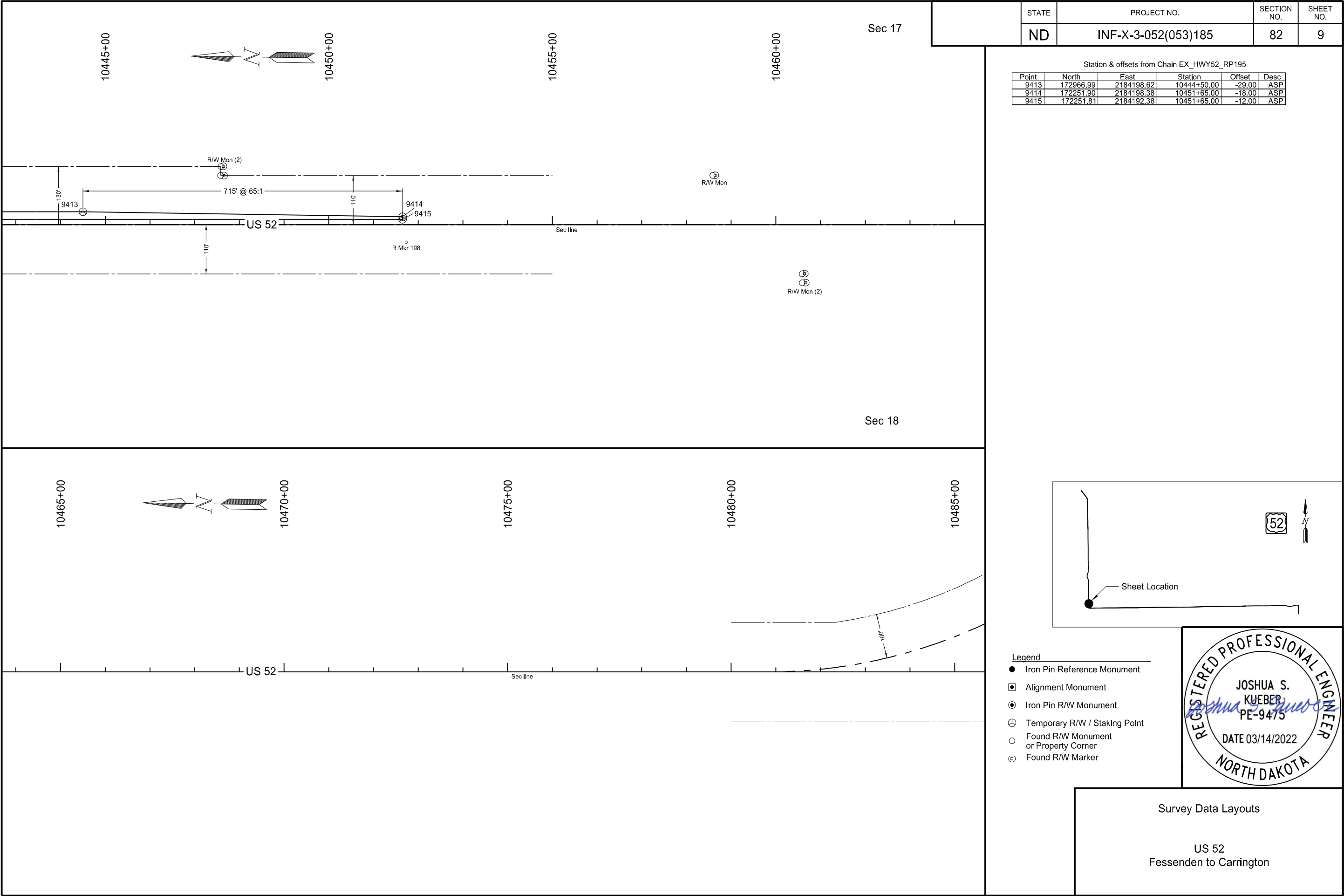


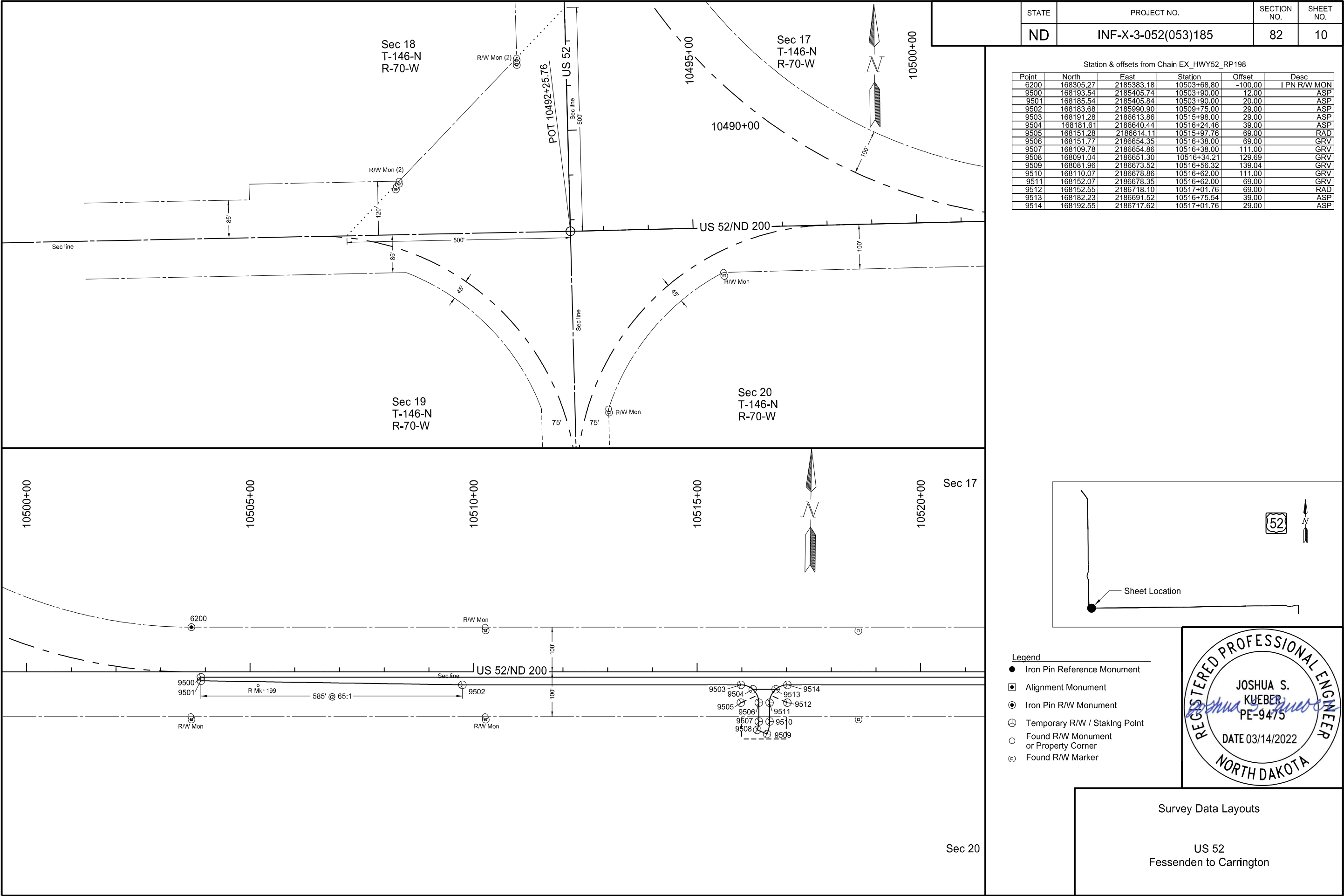
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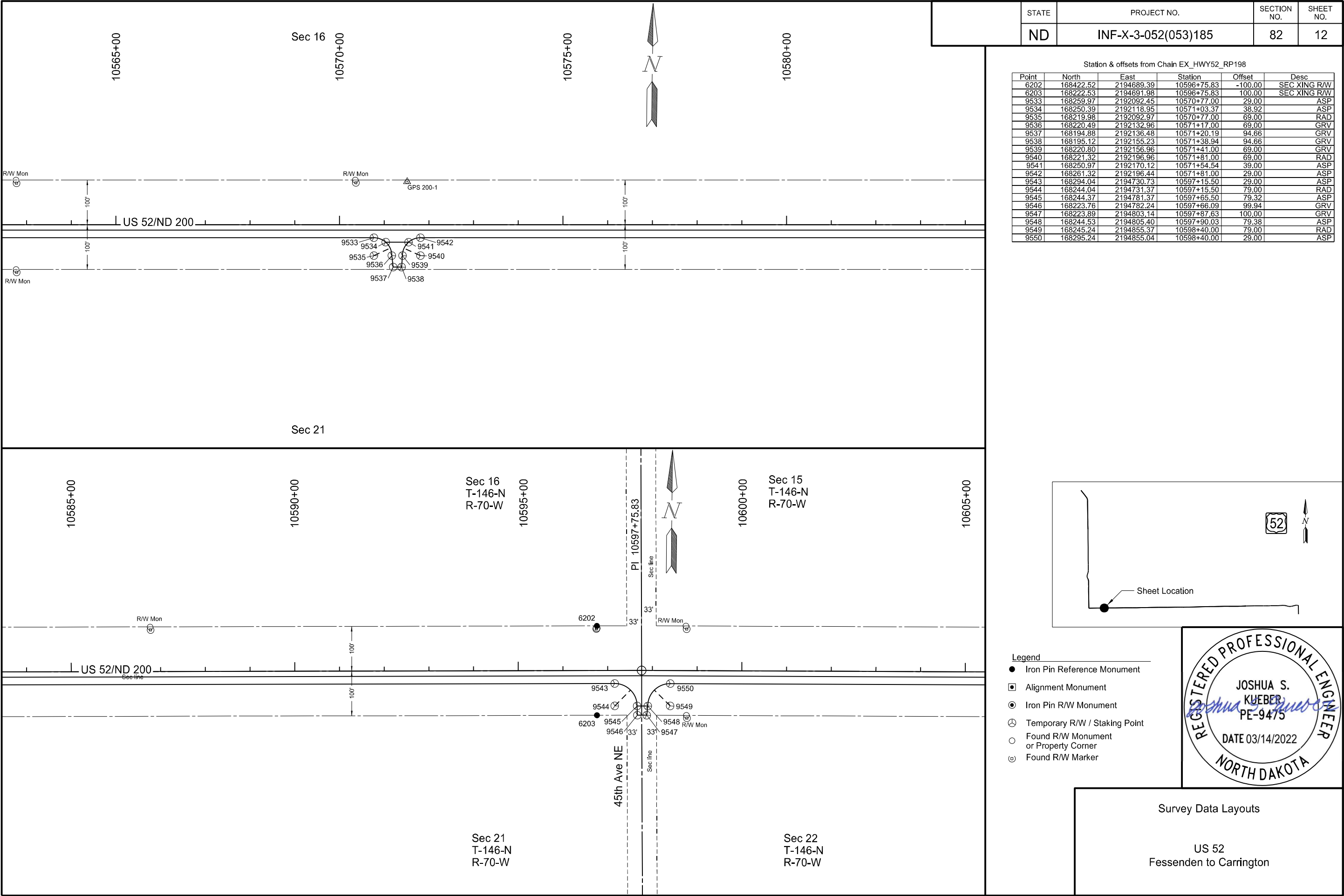
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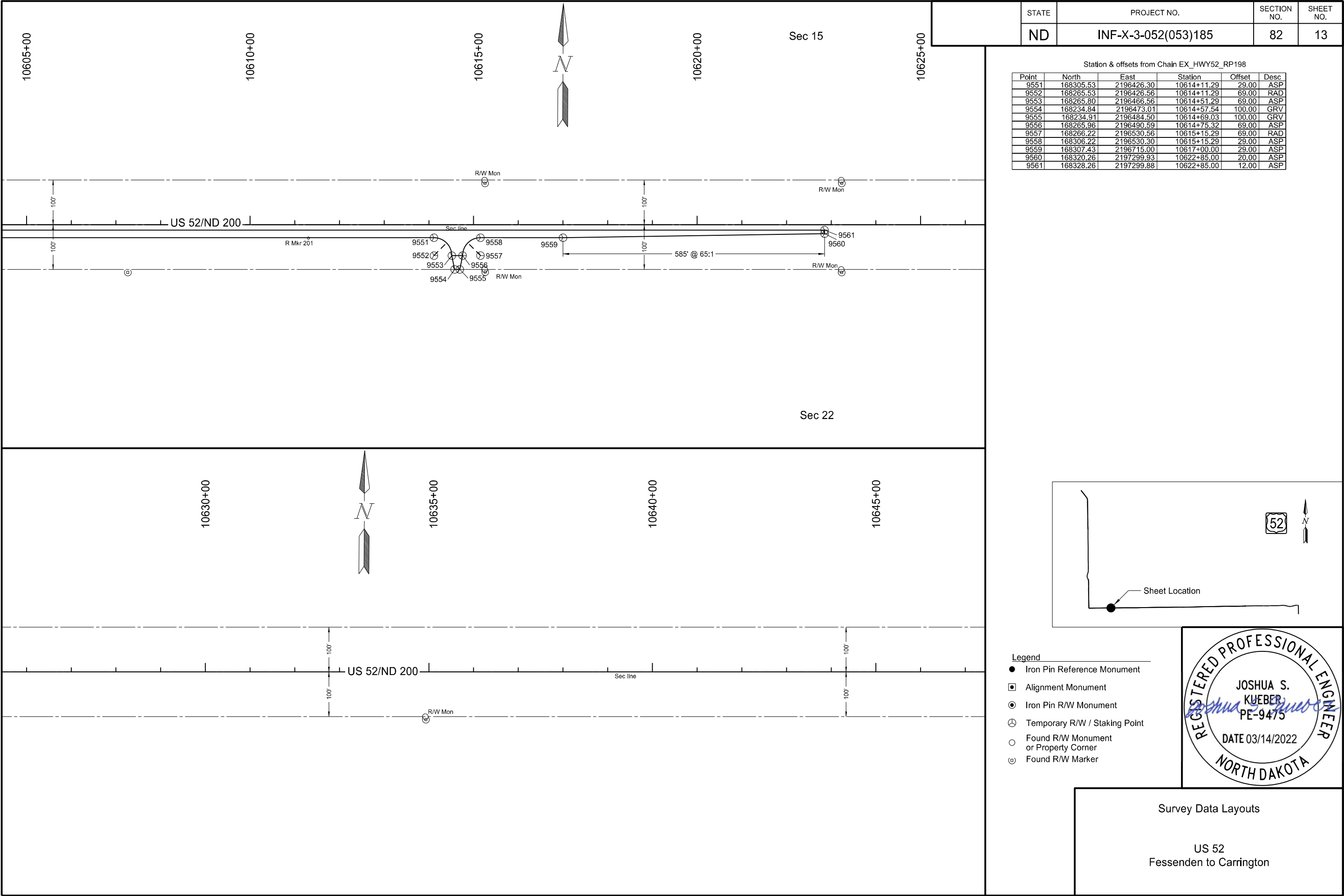
JOSH.KUEBER

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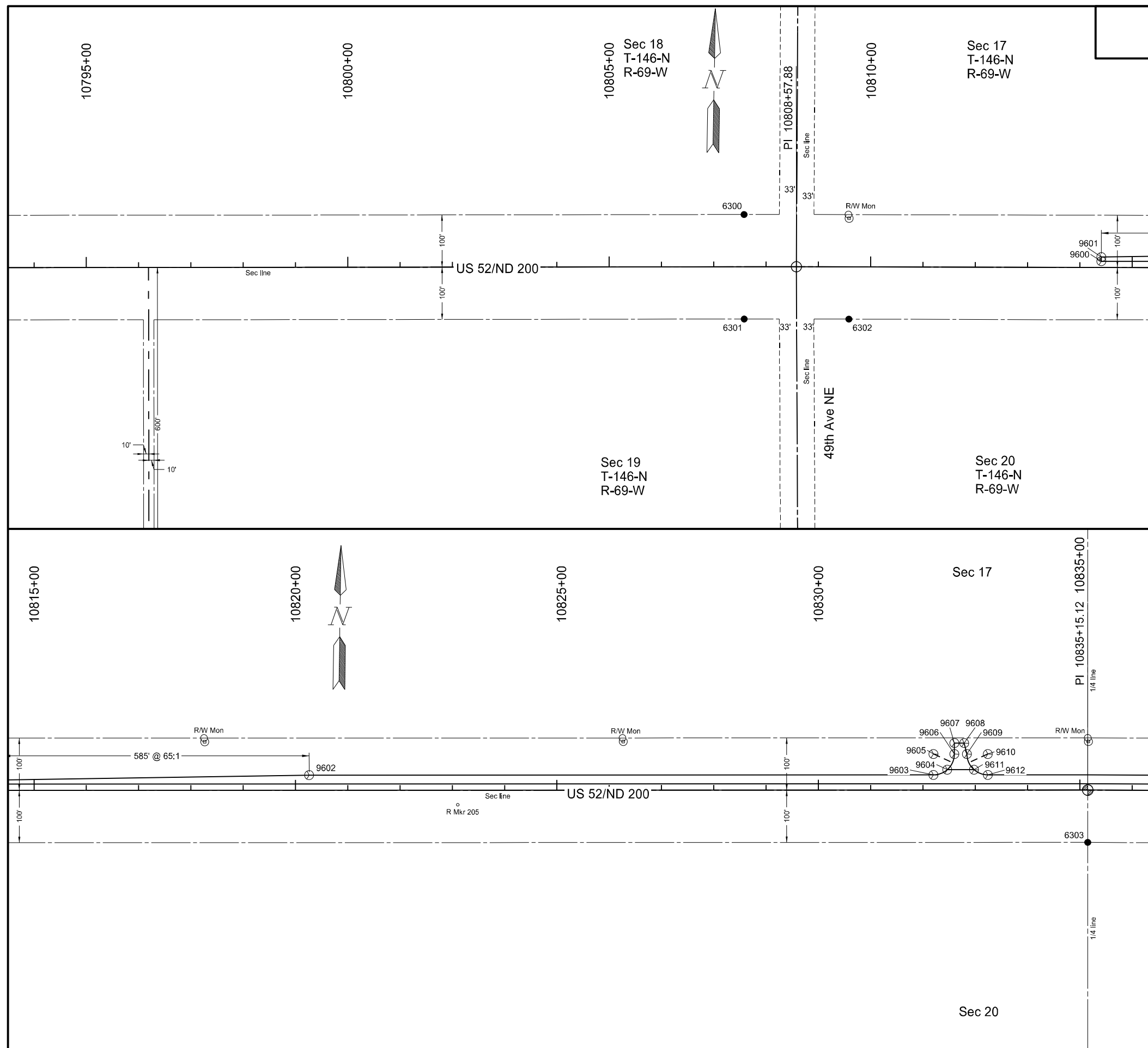


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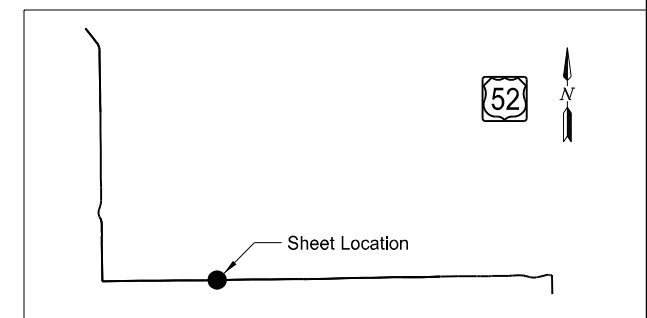
JOSH.KUEBER

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	INF-X-3-052(053)185	82	14

Station & offsets from Chain EX_HWY52_RP198					
Point	North	East	Station	Offset	Desc
6300	186861.60	2215769.40	10807+57.88	-100.00	SEC XING R/W
6301	186841.63	2215772.99	10807+57.88	100.00	SEC XING R/W
6302	186844.86	2215973.33	10809+58.60	100.00	SEC XING R/W
6303	186850.46	2218529.58	10835+15.61	100.00	1/4 XING MON
9600	186853.76	2216454.07	10814+41.00	-12.00	ASP
9601	186891.76	2216453.95	10814+41.00	-20.00	ASP
9602	186809.13	2217038.76	10820+26.00	-29.00	ASP
9603	186826.22	2218232.64	10832+20.00	-29.00	ASP
9604	186836.59	2218258.95	10832+46.46	-39.00	ASP
9605	186866.21	2218232.07	10832+20.00	-69.00	RAD
9606	186866.78	2218272.07	10832+60.00	-69.00	GRV
9607	186868.78	2218271.77	10832+60.00	-90.00	GRV
9608	186868.05	2218290.56	10832+78.80	-90.00	GRV
9609	186867.13	2218296.06	10832+84.00	-69.00	GRV
9610	186867.70	2218336.06	10833+24.00	-69.00	RAD
9611	186837.33	2218310.04	10832+97.54	-39.00	ASP
9612	186827.71	2218336.63	10833+24.00	-29.00	ASP

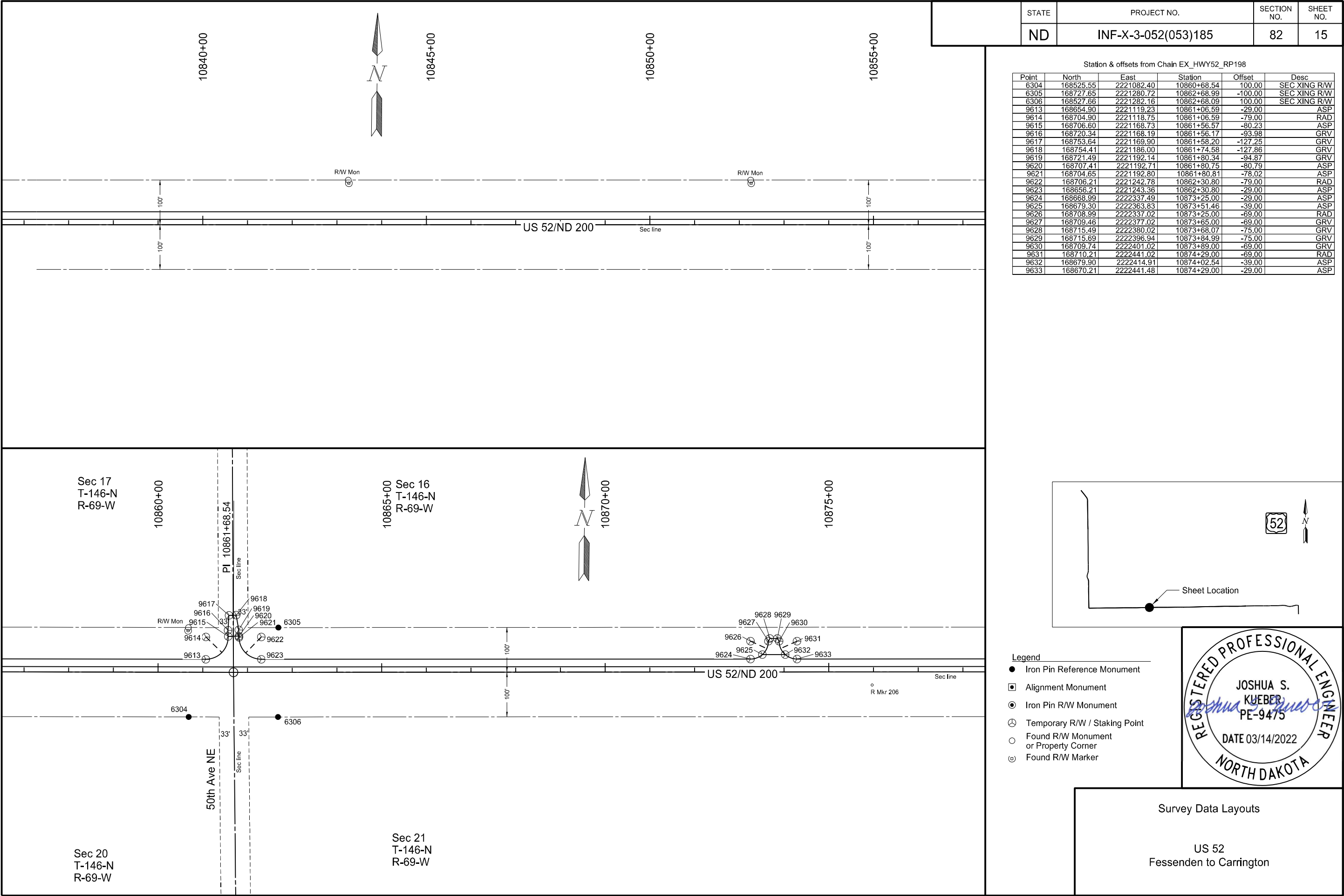


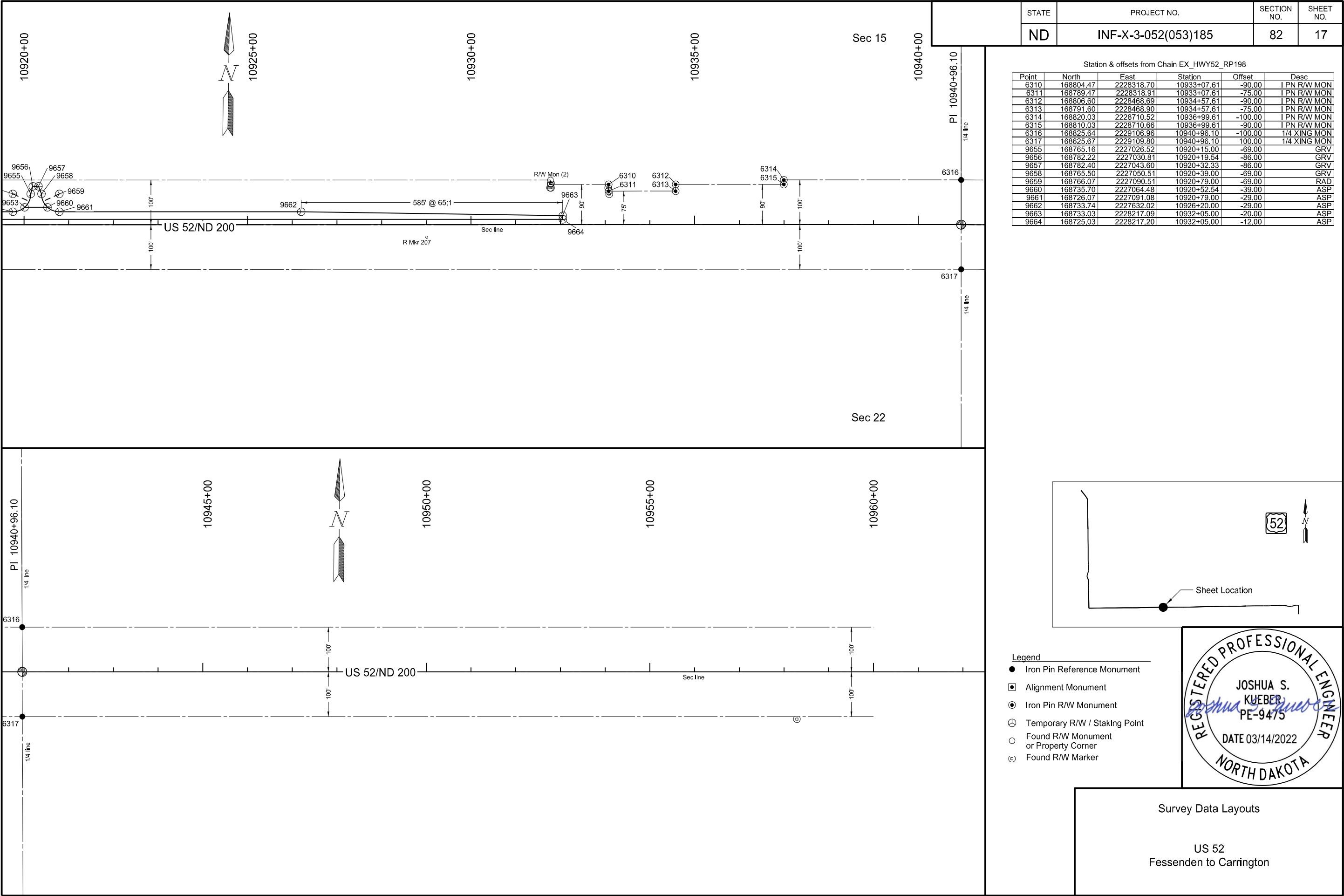
- | Legend | |
|--------|---------------------------------------|
| ● | Iron Pin Reference Monument |
| ■ | Alignment Monument |
| ⦿ | Iron Pin R/W Monument |
| ⊕ | Temporary R/W / Staking Point |
| ○ | Found R/W Monument or Property Corner |
| Ⓢ | Found R/W Marker |

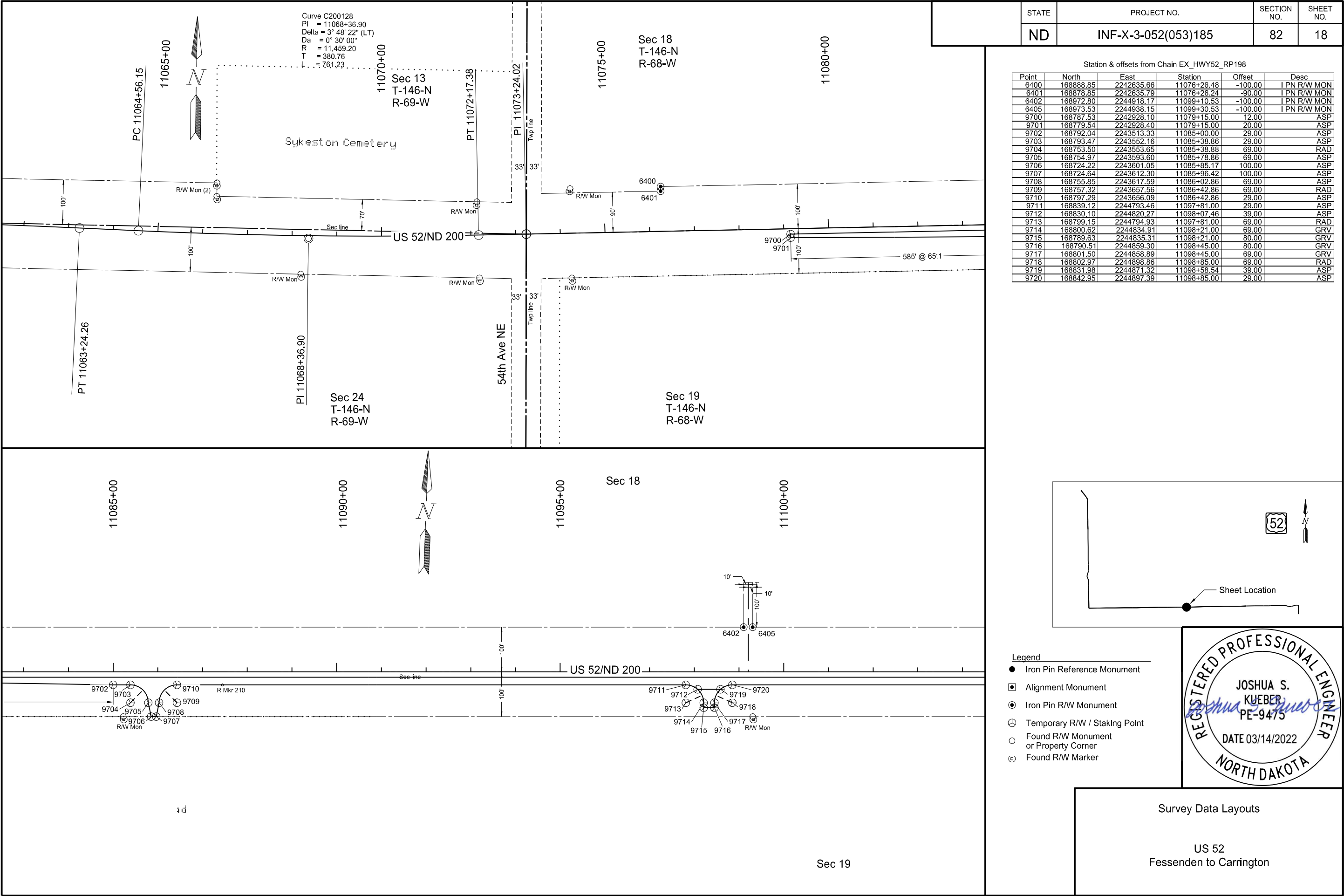


Survey Data Layouts

US 52
Fessenden to Carrington





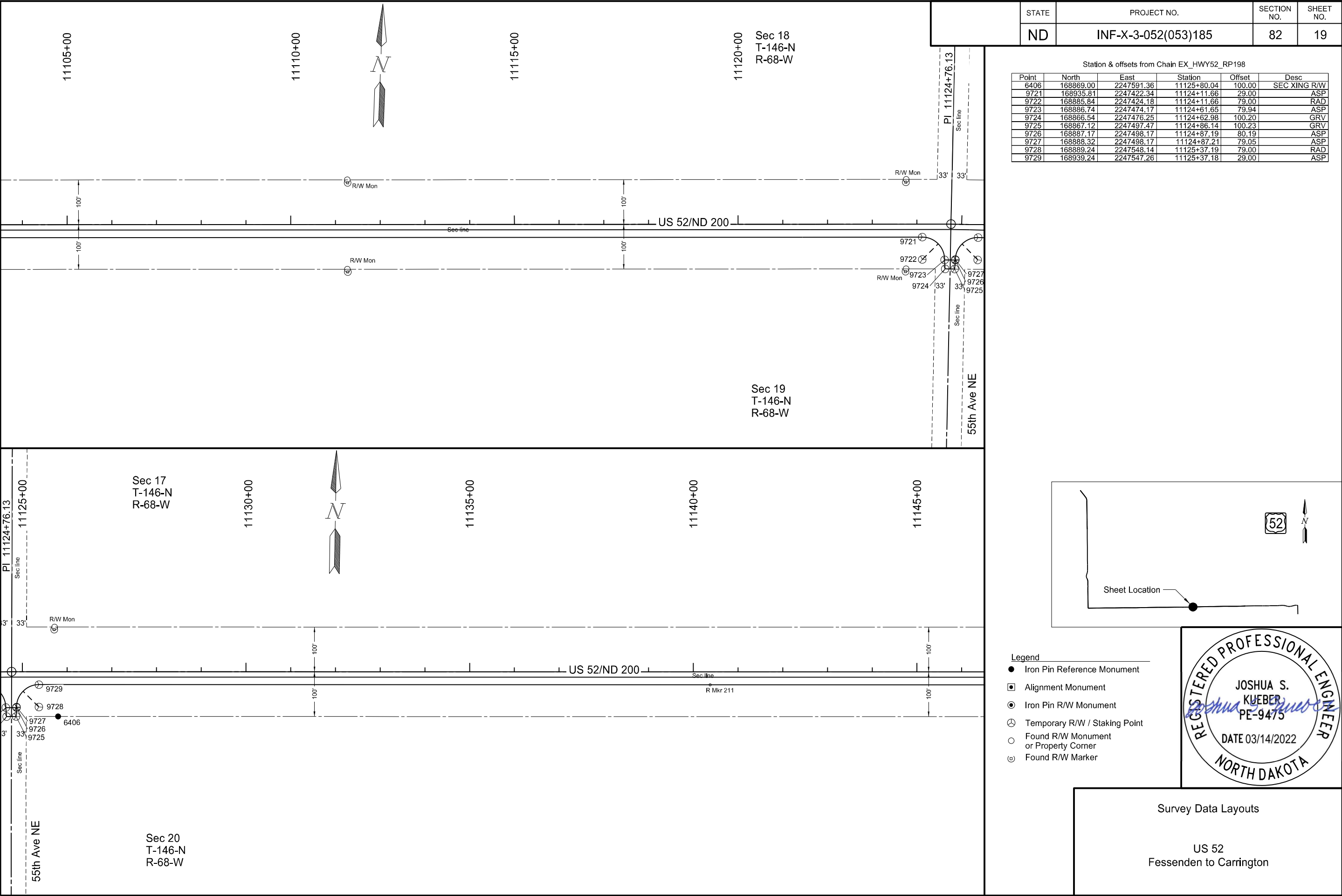


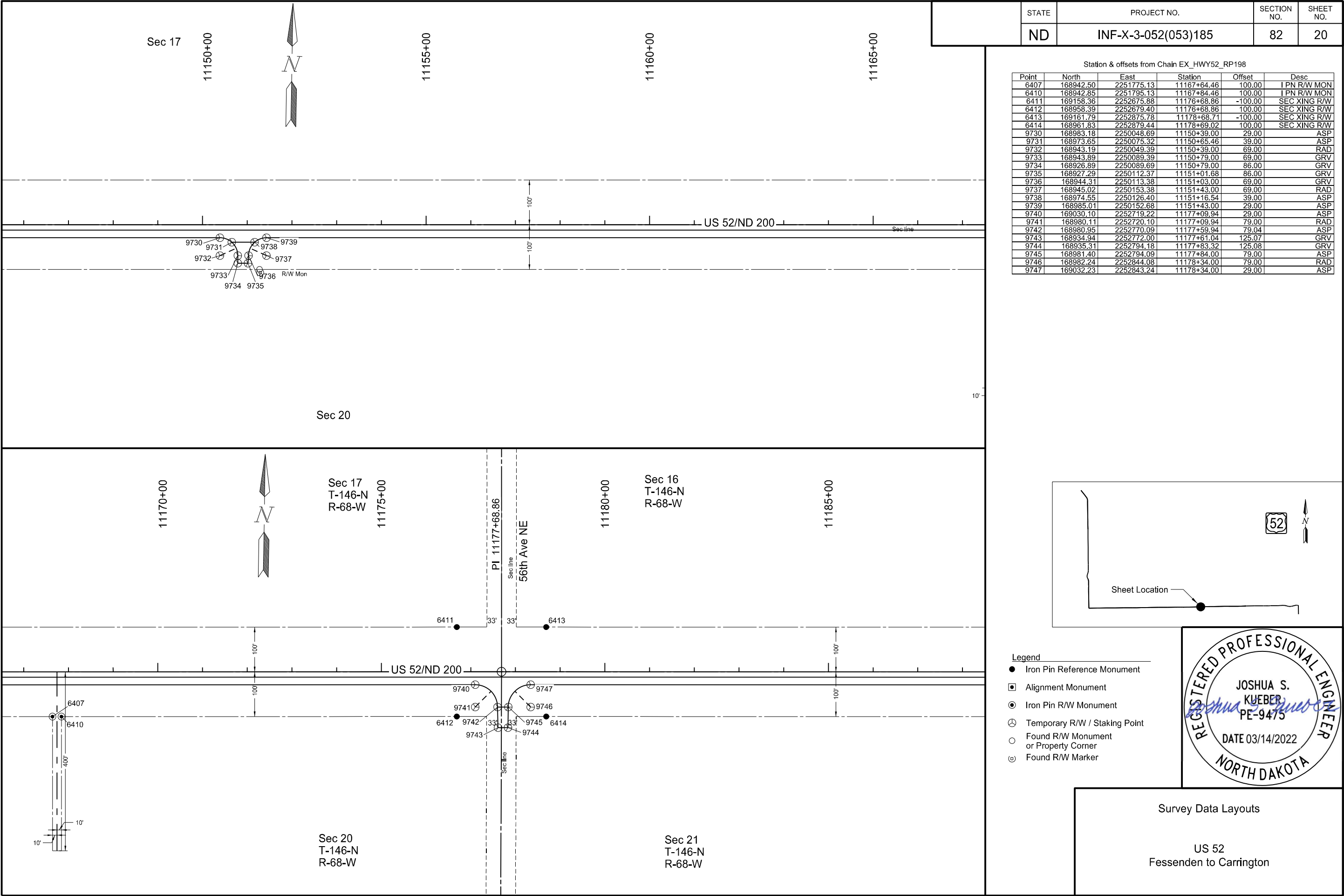
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JOSH.KUEBER

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REGISTERED PROFESSIONAL ENGINEER

JOSHUA S. KUEBER

PE-9475

DATE 03/14/2022

NORTH DAKOTA

Survey Data Layouts

US 52

Fessenden to Carrington

Sec 17

11150+00

11155+00

11160+00

11165+00

US 52/ND 200

Sec line

100'

100'

10'

Sec 20

11170+00

11175+00

11180+00

11185+00

US 52/ND 200

Sec line

100'

100'

100'

100'

10'

10'

Sec 17 T-146-N R-68-W

Sec 16 T-146-N R-68-W

Sec 20 T-146-N R-68-W

Sec 21 T-146-N R-68-W

56th Ave NE

PI 11177+68.86

6411

6413

9740

9747

9741

9746

9742

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9745

9744

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6414

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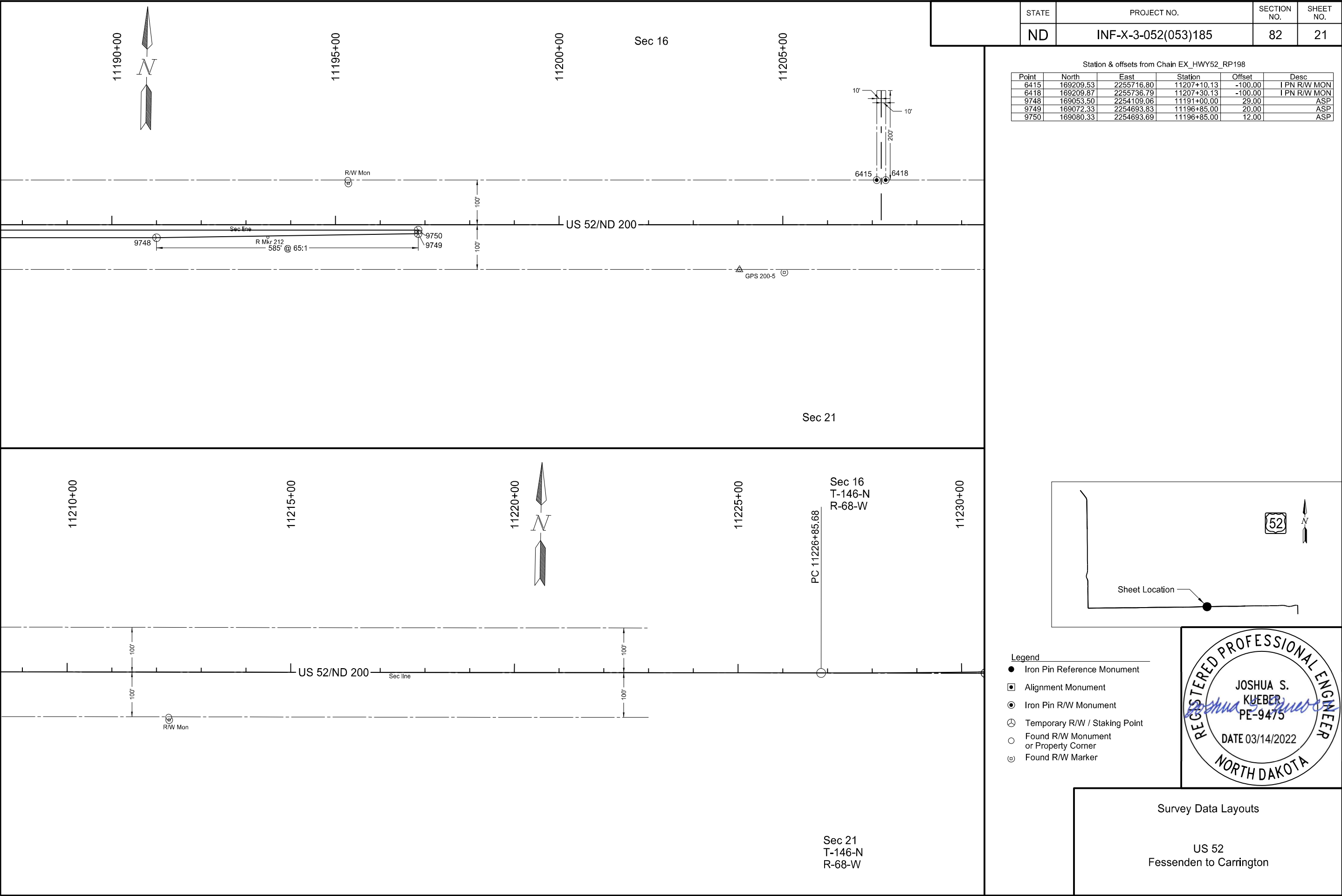
R/W Mon

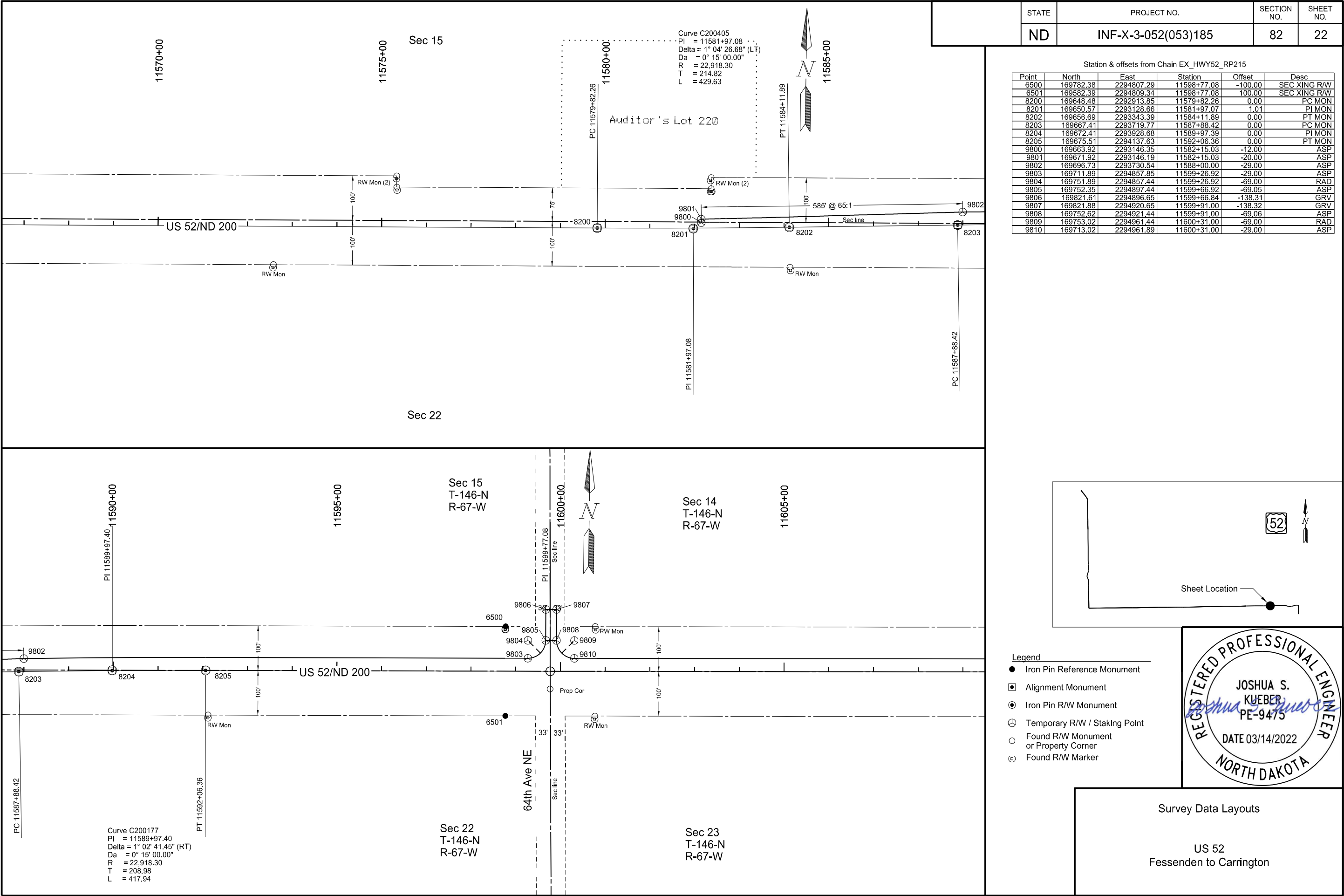
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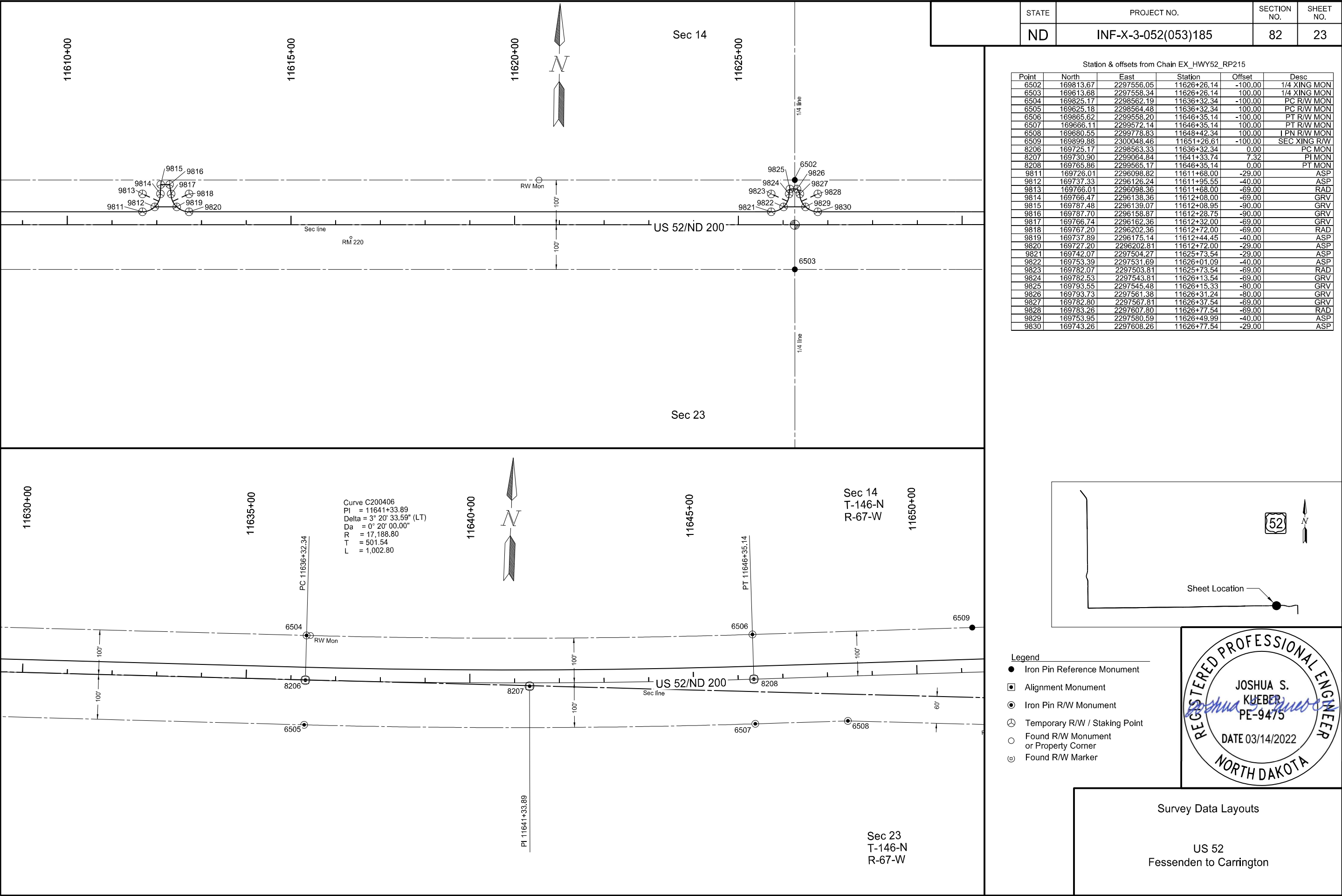
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JOSH.KUEBER

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11610+00

11615+00

11620+00

11625+00

11630+00

11635+00

11640+00

11645+00

11650+00

Sec 14

Sec 23

Sec 14

Sec 23

US 52/ND 200

US 52/ND 200

RM 220

PC 11636+32.34

PT 11646+35.14

PI 11641+33.89

9811

9812

9813

9814

9815

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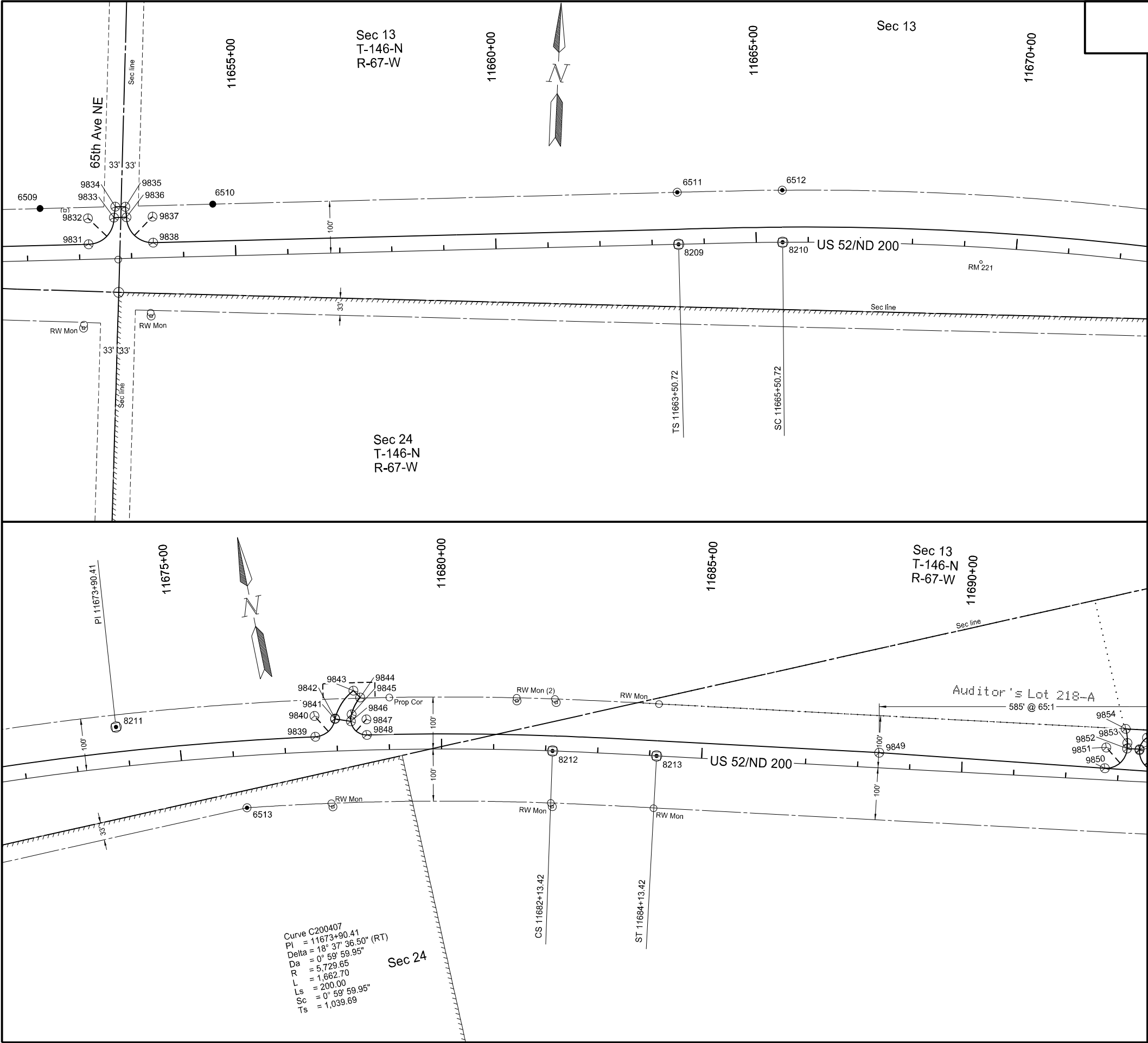
6508

6509

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8208



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	INF-X-3-052(053)185	82	24

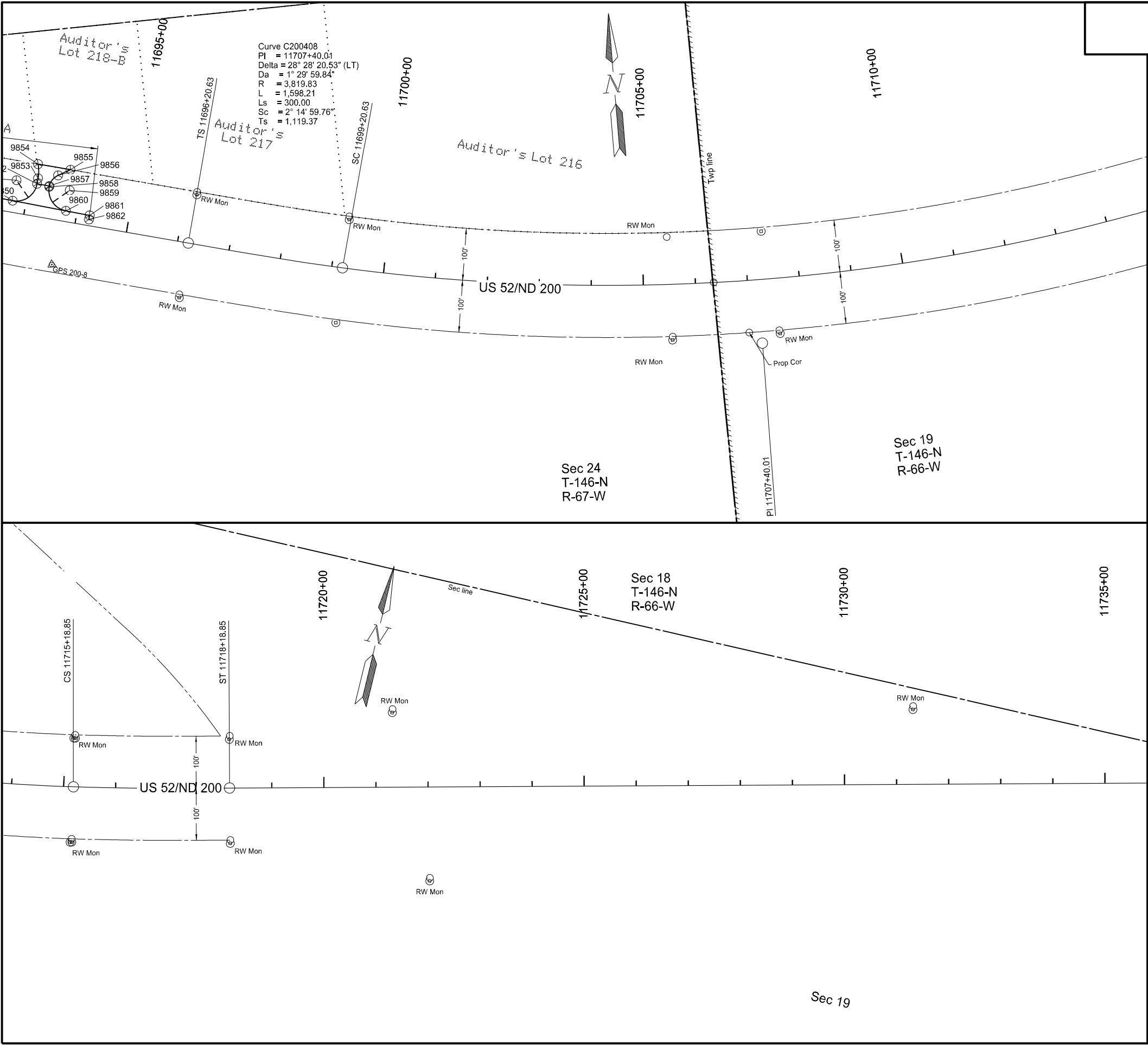
Station & offsets from Chain EX_HWY52_RP215					
Point	North	East	Station	Offset	Desc
6509	169899.88	2300048.46	11651+26.61	-100.00	SEC XING R/W
6510	169923.01	2300379.43	11654+58.38	-100.00	SEC XING R/W
6511	169985.21	2301269.59	11663+50.72	-100.00	TS R/W MON
6512	169998.10	2301470.93	11665+50.72	-100.00	SC R/W MON
6513	169755.45	2302529.04	11676+19.42	100.00	I PN R/W MON
8209	169885.45	2301276.57	11663+50.72	0.00	TS MON
8210	169898.23	2301476.16	11665+50.72	0.00	SC MON
8211	169957.93	2302313.73	11673+82.07	-76.83	PI MON
8212	169744.72	2303125.91	11682+13.42	0.00	CS MON
8213	169695.34	2303319.71	11684+13.42	0.00	ST MON
9831	169835.42	2300144.58	11652+18.00	-29.00	ASP
9832	169885.30	2300141.10	11652+18.00	-79.00	RAD
9833	169888.80	2300190.98	11652+68.00	-79.01	ASP
9834	169909.96	2300192.69	11652+71.18	-100.00	GRV
9835	169910.50	2300211.87	11652+90.35	-99.21	GRV
9836	169890.47	2300214.92	11652+92.00	-79.01	ASP
9837	169893.95	2300264.79	11653+42.00	-79.00	RAD
9838	169844.07	2300268.28	11653+42.00	-29.00	ASP
9839	169862.84	2302685.01	11677+58.93	-29.00	ASP
9840	169902.34	2302691.32	11677+58.93	-69.00	RAD
9841	169888.72	2302728.94	11677+97.80	-61.63	ASP
9842	169889.59	2302729.25	11677+97.97	-62.53	GRV
9843	169935.00	2302774.35	11678+34.25	-114.86	GRV
9844	169919.40	2302784.36	11678+46.56	-101.22	GRV
9845	169890.94	2302761.81	11678+29.48	-69.32	GRV
9846	169878.25	2302757.89	11678+27.79	-56.15	ASP
9847	169875.92	2302787.80	11678+57.36	-59.00	RAD
9848	169846.38	2302782.56	11678+57.36	-29.00	ASP
9849	169615.66	2303739.78	11688+40.00	-29.00	ASP
9850	169499.48	2304158.41	11692+74.40	-22.32	ASP
9851	169538.02	2304169.11	11692+75.02	-62.31	RAD
9852	169527.92	2304207.81	11693+15.02	-62.31	ASP

Legend

- Iron Pin Reference Monument
- ▣ Alignment Monument
- ⊙ Iron Pin R/W Monument
- ⊕ Temporary R/W / Staking Point
- Found R/W Monument or Property Corner
- ⊖ Found R/W Marker

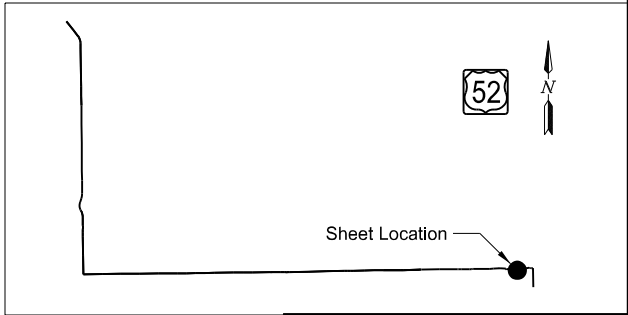
Survey Data Layouts

US 52
Fessenden to Carrington



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	INF-X-3-052(053)185	82	25

Station & offsets from Chain EX_HWY52_RP215					
Point	North	East	Station	Offset	Desc
9853	169538.25	2304210.53	11693+15.04	-73.00	GRV
9854	169565.57	2304212.79	11693+10.32	-100.00	GRV
9855	169549.57	2304274.06	11693+73.65	-100.00	GRV
9856	169540.73	2304249.45	11693+52.07	-85.23	GRV
9857	169521.84	2304231.09	11693+39.07	-62.31	ASP
9858	169520.31	2304230.63	11693+39.02	-60.71	ASP
9859	169510.20	2304269.33	11693+79.02	-60.71	RAD
9860	169471.66	2304258.63	11693+78.40	-20.72	ASP
9861	169459.20	2304303.54	11694+25.00	-20.00	ASP
9862	169451.46	2304301.52	11694+25.00	-12.00	ASP



- Legend
- Iron Pin Reference Monument
 - ▣ Alignment Monument
 - ⊙ Iron Pin R/W Monument
 - ⊕ Temporary R/W / Staking Point
 - Found R/W Monument or Property Corner
 - ⊖ Found R/W Marker



Survey Data Layouts

US 52
Fessenden to Carrington

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	82	26

Beginning chain EX_HWY52_RP185 description

Point 1N239,327.7477 E 2,179,489.0663 Sta 9765+42.92

Course from 1 to 2 S 37° 45' 01.03" E Dist 3,150.5161

Point 2N236,836.6771 E 2,181,417.8792 Sta 9796+93.44

Course from 2 to TS SCS140098B S 37° 45' 01.03" E Dist 2,168.2385

Spiral SCS140098B Type 1 Spiral Element

Angle 2° 59' 59.47" (RT) P 1.3088 BK S 37° 45' 01.03" E

LS 300.0000 K 149.9863 AH S 34° 45' 01.57" E

R 2,864.9300 LT200.0287 CB S 36° 45' 01.29" E

YS5.2347 ST100.0261 Defl 0° 59' 59.74"

XS 299.9178 LC299.9635 Deg 1° 59' 59.65"

Spiral Coordinates

Point North East Station

TS 235,122.2802 2,182,745.3209 9818+61.68

PI 234,964.1202 2,182,867.7827 9820+61.71

SC 234,881.9345 2,182,924.7979 9821+61.68

CC 233,248.9158 2,180,570.8493

Curve Data

Curve SCS140098

P.I. Station9829+60.26 N 234,225.7859 E 2,183,379.9918

Delta = 31° 09' 03.48" (RT)

Degree = 1° 59' 59.65"

Tangent= 798.5816

Length =1,557.6250

Radius =2,864.9300

External = 109.2180

Long Chord =1,538.5114

Mid. Ord. = 105.2073

P.C. Station9821+61.68 N 234,881.9345 E 2,182,924.7979

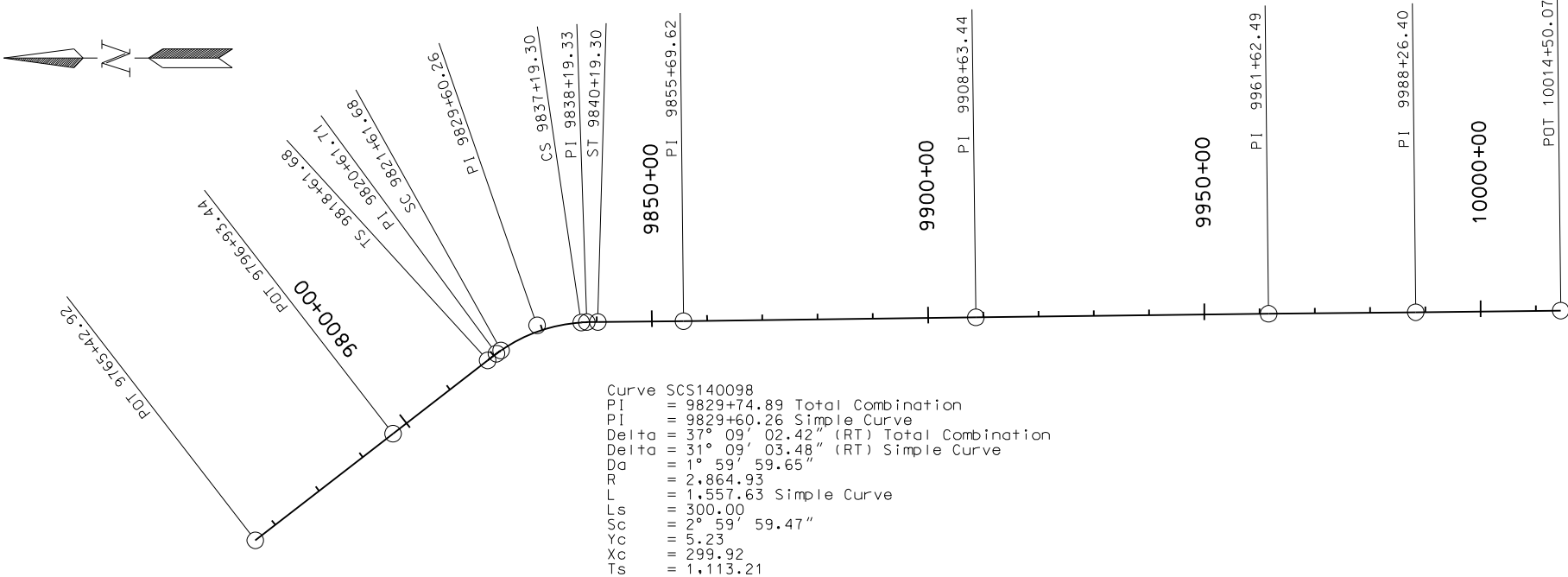
P.T. Station9837+19.30 N 233,428.7797 E 2,183,430.1277

C.C. N 233,248.9158 E 2,180,570.8493

Back = S 34° 45' 01.57" E

Ahead = S 3° 35' 58.08" E

Chord Bear = S 19° 10' 29.82" E



Spiral SCS140098A Type 2 Spiral Element

Angle 2° 59' 59.47" (RT) P 1.3088 BK S 3° 35' 58.08" E

LS 300.0000 K 149.9863 AH S 0° 35' 58.61" E

R 2,864.9300 LT200.0287 CB S 1° 35' 58.35" E

YS5.2347 ST100.0261 Defl 0° 59' 59.74"

XS 299.9178 LC299.9635 Deg 1° 59' 59.65"

Spiral Coordinates

Point North East Station

CS 233,428.7797 2,183,430.1277 9837+19.30

PI 233,328.9509 2,183,436.4075 9838+19.33

ST 233,128.9331 2,183,438.5008 9840+19.30

CC 233,248.9158 2,180,570.8493

Course from ST SCS140098A to 140167 S 0° 35' 58.48" E Dist 1,550.3200

Point 140167N231,578.6980 E 2,183,454.7240 Sta 9855+69.62

Course from 140167 to 140100 S 0° 44' 19.64" E Dist 5,293.8131

Point 140100N226,285.3250 E 2,183,522.9820 Sta 9908+63.44

Course from 140100 to 140101 S 0° 41' 20.12" E Dist 5,299.0531

Point 140101N220,986.6550 E 2,183,586.6960 Sta 9961+62.49

Course from 140101 to 140113 S 0° 38' 28.45" E Dist 2,663.9118

Point 140113N218,322.9100 E 2,183,616.5090 Sta 9988+26.40

Course from 140113 to 140121 S 0° 38' 16.76" E Dist 2,623.6727

Point 140121N215,699.4000 E 2,183,645.7230 Sta 10014+50.07

Ending chain EX_HWY52_RP185 description

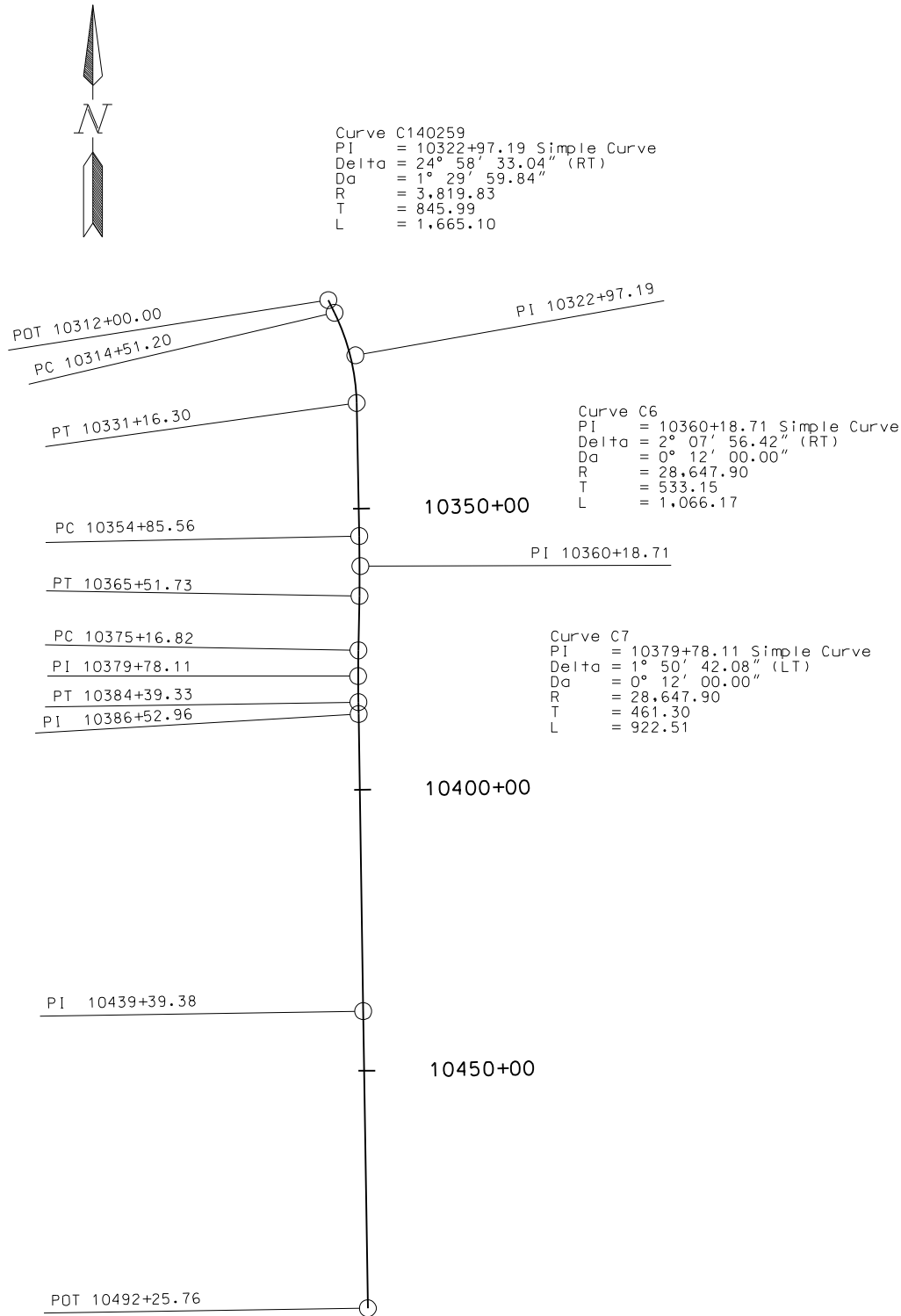


Alignment Layout
EX_HWY52_RP185

US 52
Fessenden to Carrington
Wells County

Note: Same information as shown on Section 81 Sheet 1

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	82	27



Beginning chain EX_HWY52_RP195 description

Point 5N186,129.3972 E 2,183,540.4442 Sta 10312+00.00

Course from 5 to PC C140259 S 26° 09' 33.85" E Dist 251.1980

Curve Data

Curve C140259

P.I. Station 10322+97.19 N 185,144.5920 E 2,184,024.1620

Delta = 24° 58' 33.04" (RT)

Degree = 1° 29' 59.84"

Tangent= 845.9912

Length=1,665.1049

Radius =3,819.8300

External = 92.5609

Long Chord =1,651.9528

Mid. Ord. = 90.3710

P.C. Station 10314+51.20 N 185,903.9291 E 2,183,651.1899

P.T. Station 10331+16.30 N 184,298.7813 E 2,184,041.6364

C.C. N 184,219.8807 E 2,180,222.6213

Back = S 26° 09' 33.85" E

Ahead = S 1° 11' 00.81" E

Chord Bear = S 13° 40' 17.33" E

Course from PT C140259 to PC C6 S 1° 11' 00.81" E Dist 2,369.2566

Curve Data

Curve C6

P.I. Station 10360+18.71 N 181,396.9974 E 2,184,101.5870

Delta = 2° 07' 56.42" (RT)

Degree = 0° 12' 00.00"

Tangent= 533.1466

Length=1,066.1701

Radius = 28,647.9000

External = 4.9606

Long Chord =1,066.1085

Mid. Ord. = 4.9597

P.C. Station 10354+85.56 N 181,930.0302 E 2,184,090.5746

P.T. Station 10365+51.73 N 180,863.9239 E 2,184,092.7589

C.C. N 181,338.2932 E 2,155,448.7866

Back = S 1° 11' 00.81" E

Ahead = S 0° 56' 55.61" W

Chord Bear = S 0° 07' 02.60" E

Course from PT C6 to PC C7 S 0° 56' 55.61" W Dist 965.0867

Curve Data

Curve C7

P.I. Station 10379+78.11 N 179,437.7374 E 2,184,069.1400

Delta = 1° 50' 42.08" (LT)

Degree = 0° 12' 00.00"

Tangent= 461.2953

Length= 922.5109

Radius = 28,647.9000

External = 3.7137

Long Chord = 922.4710

Mid. Ord. = 3.7132

P.C. Station 10375+16.82 N 179,898.9695 E 2,184,076.7784

P.T. Station 10384+39.33 N 178,976.4985 E 2,184,076.3554

C.C. N 179,424.6002 E 2,212,720.7506

Back = S 0° 56' 55.61" W

Ahead = S 0° 53' 46.46" E

Chord Bear = S 0° 01' 34.58" W

Course from PT C7 to 866 S 0° 53' 46.46" E Dist 213.6347

Point 866 N178,762.8900 E 2,184,079.6970 Sta 10386+52.96

Course from 866 to 200331 S 0° 53' 29.31" E Dist 5,286.4159

Point 200331N173,477.1140 E 2,184,161.9460 Sta 10439+39.38

Course from 200331 to 200017 S 0° 51' 42.06" E Dist 5,286.3818

Point 200017N168,191.3300 E 2,184,241.4460 Sta 10492+25.76

Ending chain EX_HWY52_RP195 description

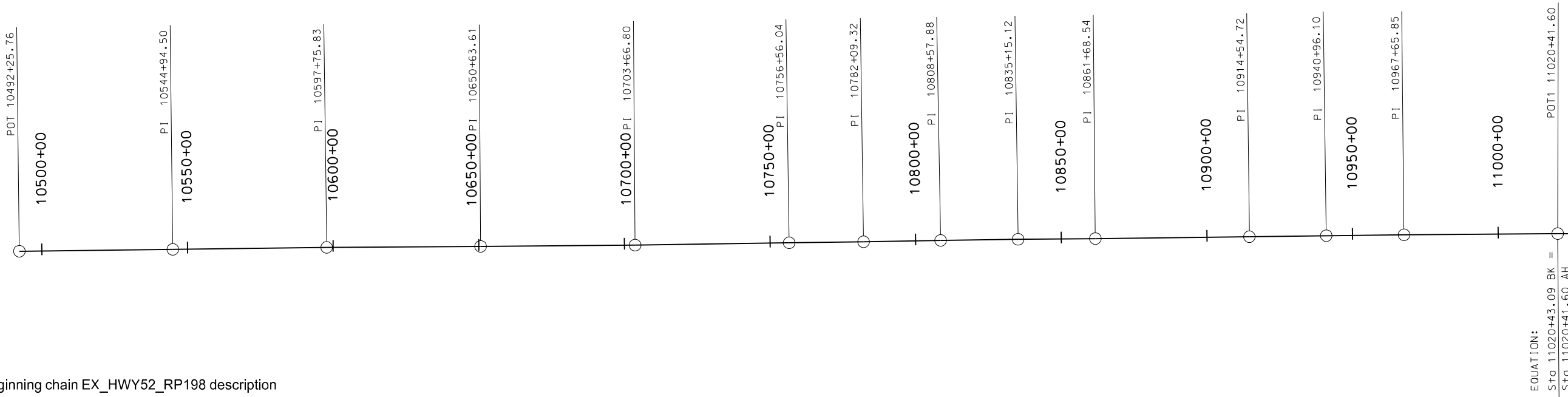
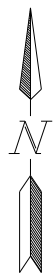


Alignment Layout
EX_HWY52_RP195

US 52
Fessenden to Carrington
Wells County

Note: Same information as shown on Section 81 Sheet 1 - 2

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	82	28



Beginning chain EX_HWY52_RP198 description

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Point 200017N168,191.3300 E 2,184,241.4460 Sta 10492+25.76
Course from 200017 to 200018 N 89° 18' 02.75" E Dist 5,268.7424

Point 200018N168,255.6280 E 2,189,509.7960 Sta 10544+94.50
Course from 200018 to 200019 N 89° 15' 36.85" E Dist 5,281.3212
Point 200019N168,323.8150 E 2,194,790.6770 Sta 10597+75.83
Course from 200019 to 200021 N 89° 37' 28.25" E Dist 5,287.7885
Point 200021N168,358.4680 E 2,200,078.3520 Sta 10650+63.61
Course from 200021 to 200023 N 89° 32' 27.55" E Dist 5,303.1832
Point 200023N168,400.9530 E 2,205,381.3650 Sta 10703+66.80
Course from 200023 to 200400 N 89° 09' 20.07" E Dist 5,289.2404
Point 200400N168,478.9030 E 2,210,670.0310 Sta 10756+56.04
Course from 200400 to 200107 N 89° 10' 11.69" E Dist 2,553.2870
Point 200107N168,515.8930 E 2,213,223.0500 Sta 10782+09.32
Course from 200107 to 200024 N 88° 58' 19.18" E Dist 2,648.5523

Point 200024N168,563.4110 E 2,215,871.1760 Sta 10808+57.88
Course from 200024 to 200112 N 89° 10' 47.56" E Dist 2,657.2442

Point 200112N168,601.4450 E 2,218,528.1480 Sta 10835+15.12
Course from 200112 to 200026 N 89° 27' 33.24" E Dist 2,653.4172
Point 200026N168,626.4880 E 2,221,181.4470 Sta 10861+68.54
Course from 200026 to 200028 N 89° 19' 50.83" E Dist 5,286.1796
Point 200028N168,688.2290 E 2,226,467.2660 Sta 10914+54.72
Course from 200028 to 200115 N 89° 11' 17.31" E Dist 2,641.3802

Point 200115N168,725.6550 E 2,229,108.3810 Sta 10940+96.10
Course from 200115 to 200030 N 89° 22' 51.47" E Dist 2,669.7518
Point 200030N168,754.4990 E 2,231,777.9770 Sta 10967+65.85
Course from 200030 to 200033 N 89° 32' 32.25" E Dist 5,277.2434
Point 200033N168,796.6560 E 2,237,055.0520 Sta 11020+43.09
Course from 200033 to 9014 S 89° 51' 00.29" E Dist 0.0005

End Region 1
Equation: Sta 11020+43.09 (BK) = Sta 11020+41.60 (AH) -----
Begin Region 2



Alignment Layout
EX_HWY52_RP198

US 52
Fessenden to Carrington
Wells County

Note: Same information as shown on Section 81 Sheet 2 - 3

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	82	30

Course from 200039 to 200135 N 88° 59' 36.57" E Dist 5,292.7326

Point 200135N169,060.1310 E 2,252,777.6240 Sta 11177+68.86

Course from 200135 to PC C200136 N 89° 02' 14.37" E Dist 4,916.8208

Curve Data

Curve C200136

P.I. Station 11230+53.23 N 169,148.9140 E 2,258,061.2450

Delta = 1° 50' 15.27" (LT)

Degree = 0° 15' 00.00"

Tangent= 367.5461

Length= 735.0292

Radius = 22,918.3000

External = 2.9470

Long Chord = 734.9977

Mid. Ord. = 2.9466

P.C. Station 11226+85.68 N 169,142.7388 E 2,257,693.7508

P.T. Station 11234+20.71 N 169,166.8701 E 2,258,428.3522

C.C.N 192,057.8040 E 2,257,308.6989

Back = N 89° 02' 14.37" E

Ahead = N 87° 11' 59.10" E

Chord Bear = N 88° 07' 06.74" E

Course from PT C200136 to PC C200402 N 87° 11' 59.10" E Dist 144.1170

Curve Data

Curve C200402

P.I. Station 11239+01.88 N 169,190.3770 E 2,258,908.9420

Delta = 3° 22' 10.16" (RT)

Degree = 0° 29' 59.99"

Tangent= 337.0473

Length= 673.9003

Radius = 11,459.2000

External = 4.9557

Long Chord = 673.8032

Mid. Ord. = 4.9535

P.C. Station 11235+64.83 N 169,173.9109 E 2,258,572.2972

P.T. Station 11242+38.73 N 169,187.0285 E 2,259,245.9726

C.C.N 157,728.3940 E 2,259,132.1263

Back = N 87° 11' 59.10" E

Ahead = S 89° 25' 50.74" E

Chord Bear = N 88° 53' 04.18" E

Course from PT C200402 to PC C200403 S 89° 25' 50.74" E Dist 177.7244

Curve Data

Curve C200403

P.I. Station 11247+52.92 N 169,181.9200 E 2,259,760.1390

Delta = 1° 40' 55.98" (LT)

Degree = 0° 15' 00.00"

Tangent= 336.4674

Length= 672.8864

Radius = 22,918.3000

External = 2.4697

Long Chord = 672.8622

Mid. Ord. = 2.4695

P.C. Station 11244+16.45 N 169,185.2628 E 2,259,423.6882

P.T. Station 11250+89.34 N 169,188.4555 E 2,260,096.5429

C.C.N 192,102.4317 E 2,259,651.3799

Back = S 89° 25' 50.74" E

Ahead = N 88° 53' 13.28" E

Chord Bear = N 89° 43' 41.27" E

Course from PT C200403 to 200042 N 88° 53' 13.28" E Dist 3,258.2778

Point 200042N169,251.7440 E 2,263,354.2060 Sta 11283+47.62

Course from 200042 to 200148 N 89° 03' 03.01" E Dist 2,655.7944

Point 200148N169,295.7380 E 2,266,009.6360 Sta 11310+03.41

Course from 200148 to 200045 N 89° 09' 07.90" E Dist 2,649.8211

Point 200045N169,334.9460 E 2,268,659.1670 Sta 11336+53.23

Course from 200045 to PC C200152 N 89° 55' 11.20" E Dist 4,895.7203

Curve Data

Curve C200152

P.I. Station 11389+31.27 N 169,342.3360 E 2,273,937.1930

Delta = 1° 54' 40.96" (LT)

Degree = 0° 15' 00.00"

Tangent= 382.3109

Length= 764.5509

Radius = 22,918.3000

External = 3.1885

Long Chord = 764.5154

Mid. Ord. = 3.1881

P.C. Station 11385+48.95 N 169,341.8007 E 2,273,554.8825

P.T. Station 11393+13.51 N 169,355.6224 E 2,274,319.2730

C.C.N 192,260.0782 E 2,273,522.7936

Back = N 89° 55' 11.20" E

Ahead = N 88° 00' 30.24" E

Chord Bear = N 88° 57' 50.72" E

Course from PT C200152 to 200158 N 88° 00' 30.24" E Dist 4,797.5891

Point 200158N169,522.3530 E 2,279,113.9640 Sta 11441+11.09

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Ending chain EX_HWY52_RP198 description



Alignment Layout
EX_HWY52_RP198

US 52
Fessenden to Carrington
Wells County

Note: Same information as shown on Section 81 Sheet 2 - 3

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	82	32

Beginning chain EX52_3 description
=====

Point 200045N169,329.6960 E 2,268,588.8330 Sta 11336+53.40

Course from 200045 to PC C200152 N 89° 55' 11.19" E Dist 4,895.5572

Curve Data

Curve C200152

P.I. Station 11389+31.27 N 169,337.0860 E 2,273,866.6950

Delta = 1° 54' 40.94" (LT)

Degree = 0° 15' 00.00"

Tangent= 382.3099

Length= 764.5490

Radius = 22,918.3300

External = 3.1885

Long Chord = 764.5135

Mid. Ord. = 3.1881

P.C. Station 11385+48.96 N 169,336.5507 E 2,273,484.3854

P.T. Station 11393+13.51 N 169,350.3724 E 2,274,248.7740

C.C.N 192,254.8582 E 2,273,452.2955

Back = N 89° 55' 11.19" E

Ahead = N 88° 00' 30.26" E

Chord Bear = N 88° 57' 50.72" E

Course from PT C200152 to PC C200158 N 88° 00' 30.26" E Dist 4,449.8787

Curve Data

Curve C200158

P.I. Station 11441+10.94 N 169,517.0970 E 2,279,043.3060

Delta = 1° 09' 30.47" (RT)

Degree = 0° 10' 00.00"

Tangent= 347.5512

Length= 695.0788

Radius = 34,377.4800

External = 1.7568

Long Chord = 695.0669

Mid. Ord. = 1.7567

P.C. Station 11437+63.38 N 169,505.0186 E 2,278,695.9647

P.T. Station 11444+58.46 N 169,522.1505 E 2,279,390.8205

C.C.N 135,148.3048 E 2,279,890.6820

Back = N 88° 00' 30.26" E

Ahead = N 89° 10' 00.73" E

Chord Bear = N 88° 35' 15.49" E

Course from PT C200158 to 200163 N 89° 10' 00.73" E Dist 4,950.1798

Point 200163N169,594.1280 E 2,284,340.4770 Sta 11494+08.64

Course from 200163 to PC C200049 N 89° 37' 09.05" E Dist 5,127.7292

Curve Data

Curve C200049

P.I. Station 11546+96.67 N 169,629.2750 E 2,289,628.3900

Delta = 0° 48' 05.37" (RT)

Degree = 0° 15' 00.00"

Tangent= 160.3006

Length = 320.5960

Radius = 22,918.3000

External = 0.5606

Long Chord = 320.5934

Mid. Ord. = 0.5606

P.C. Station 11545+36.37 N 169,628.2096 E 2,289,468.0929

P.T. Station 11548+56.97 N 169,628.0981 E 2,289,788.6863

C.C.N 146,710.4158 E 2,289,620.4199

Back = N 89° 37' 09.05" E

Ahead = S 89° 34' 45.59" E

Chord Bear = S 89° 58' 48.27" E

Course from PT C200049 to PC C200404 S 89° 34' 45.59" E Dist 393.5817

Curve Data

Curve C200404

P.I. Station 11554+46.33 N 169,623.7710 E 2,290,378.0280

Delta = 0° 58' 43.88" (LT)

Degree = 0° 15' 00.00"

Tangent= 195.7758

Length = 391.5422

Radius = 22,918.3000

External = 0.8362

Long Chord = 391.5374

Mid. Ord. = 0.8361

P.C. Station 11552+50.55 N 169,625.2084 E 2,290,182.2574

P.T. Station 11556+42.09 N 169,625.6783 E 2,290,573.7946

C.C.N 192,542.8907 E 2,290,350.5239

Back = S 89° 34' 45.59" E

Ahead = N 89° 26' 30.53" E

Chord Bear = N 89° 55' 52.47" E

Course from PT C200404 to PC C200405 N 89° 26' 30.53" E Dist 2,340.1651

Curve Data

Curve C200405

P.I. Station 11581+97.08 N 169,650.5690 E 2,293,128.6600

Delta = 1° 04' 26.68" (LT)

Degree = 0° 15' 00.00"

Tangent= 214.8216

Length = 429.6306

Radius = 22,918.3000

External = 1.0068

Long Chord = 429.6243

Mid. Ord. = 1.0067

P.C. Station 11579+82.26 N 169,648.4762 E 2,292,913.8486

P.T. Station 11584+11.89 N 169,656.6881 E 2,293,343.3944

C.C.N 192,565.6886 E 2,292,690.5779

Back = N 89° 26' 30.53" E

Ahead = N 88° 22' 03.85" E

Chord Bear = N 88° 54' 17.19" E

Course from PT C200405 to PC C200177 N 88° 22' 03.85" E Dist 376.5328

Curve Data

Curve C200177

P.I. Station 11589+97.40 N 169,673.3660 E 2,293,928.6650

Delta = 1° 02' 41.45" (RT)

Degree = 0° 15' 00.00"

Tangent= 208.9753

Length = 417.9390

Radius = 22,918.3000

External = 0.9527

Long Chord = 417.9332

Mid. Ord. = 0.9527

P.C. Station 11587+88.42 N 169,667.4134 E 2,293,719.7745

P.T. Station 11592+06.36 N 169,675.5084 E 2,294,137.6293

C.C.N 146,758.4129 E 2,294,372.5910

Back = N 88° 22' 03.85" E

Ahead = N 89° 24' 45.31" E

Chord Bear = N 88° 53' 24.58" E

Course from PT C200177 to 200065 N 89° 24' 45.31" E Dist 770.7222



Alignment Layout
EX_HWY52_RP215

US 52
Fessenden to Carrington
Foster County

Note: Same information as shown on Section 81 Sheet 5 - 6

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	82	33

Point 200065N169,683.4100 E 2,294,908.3110 Sta 11599+77.08

Course from 200065 to PC C200406 N 89° 20' 43.40" E Dist 3,655.2596

Curve Data

Curve C200406

P.I. Station 11641+33.89 N 169,730.9010 E 2,299,064.8430

Delta = 3° 20' 33.59" (LT)

Degree = 0° 20' 00.00"

Tangent= 501.5437

Length=1,002.8029

Radius = 17,188.8000

External = 7.3156

Long Chord =1,002.6607

Mid. Ord. = 7.3125

P.C. Station 11636+32.34 N 169,725.1709 E 2,298,563.3320

P.T. Station 11646+35.14 N 169,765.8631 E 2,299,565.1667

C.C.N 186,912.8491 E 2,298,366.9519

Back = N 89° 20' 43.40" E

Ahead = N 86° 00' 09.81" E

Chord Bear = N 87° 40' 26.60" E

Course from PT C200406 to TS C200407B N 86° 00' 09.81" E Dist 1,715.5757

Spiral C200407B Type 1 Spiral Element

Angle 0° 59' 59.95" (RT) P 0.2909 BK N 86° 00' 09.81" E

LS 200.0000 K 99.9990 AH N 87° 00' 09.76" E

R 5,729.6500 LT133.3355 CB N 86° 20' 09.79" E

YS1.1635 ST 66.6686 Defl 0° 19' 59.98"

XS 199.9939 LC199.9973 Deg 0° 59' 59.95"

Spiral Coordinates

Point North	East	Station
-----	-----	-----
TS	169,885.4543	2,301,276.5690 11663+50.72
PI	169,894.7490	2,301,409.5801 11664+84.06
SC	169,898.2350	2,301,476.1575 11665+50.72
CC	164,176.4231	2,301,775.7534

Curve Data

Curve C200407

P.I. Station 11673+87.96 N 169,942.0129 E 2,302,312.2479

Delta = 16° 37' 36.59" (RT)

Degree = 0° 59' 59.95"

Tangent= 837.2357

Length =1,662.7040

Radius =5,729.6500

External = 60.8468

Long Chord =1,656.8760

Mid. Ord. = 60.2074

P.C. Station 11665+50.72 N 169,898.2350 E 2,301,476.1575

P.T. Station 11682+13.42 N 169,744.7240 E 2,303,125.9067

C.C.N 164,176.4231 E 2,301,775.7534

Back = N 87° 00' 09.76" E

Ahead = S 76° 22' 13.65" E

Chord Bear = S 84° 41' 01.94" E

Spiral C200407A Type 2 Spiral Element

Angle 0° 59' 59.95" (RT) P 0.2909 BK S 76° 22' 13.65" E

LS 200.0000 K 99.9990 AH S 75° 22' 13.69" E

R 5,729.6500 LT133.3355 CB S 75° 42' 13.67" E

YS1.1635 ST 66.6686 Defl 0° 19' 59.98"

XS 199.9939 LC199.9973 Deg 0° 59' 59.95"

Spiral Coordinates

Point North	East	Station
-----	-----	-----
CS	169,744.7240	2,303,125.9067 11682+13.42
PI	169,729.0140	2,303,190.6979 11682+80.09
ST	169,695.3377	2,303,319.7105 11684+13.42
CC	164,176.4231	2,301,775.7534

Course from ST C200407A to TS C200408B S 75° 22' 13.69" E Dist 1,207.2091

Spiral C200408B Type 1 Spiral Element

Angle 2° 14' 59.76" (LT) P 0.9817 BK S 75° 22' 13.69" E

LS 300.0000 K 149.9923 AH S 77° 37' 13.45" E

R 3,819.8300 LT200.0162 CB S 76° 07' 13.58" E

YS3.9264 ST100.0147 Defl 0° 44' 59.89"

XS 299.9537 LC299.9794 Deg 1° 29' 59.84"

Spiral Coordinates

Point North	East	Station
-----	-----	-----
TS	169,390.4352	2,304,487.7809 11696+20.63
PI	169,339.9175	2,304,681.3123 11698+20.65
SC	169,318.4756	2,304,779.0016 11699+20.63
CC	173,049.4895	2,305,597.9254

Curve Data

Curve C200408

P.I. Station 11707+31.61 N 169,144.6134 E 2,305,571.1173

Delta = 23° 58' 21.00" (LT)

Degree = 1° 29' 59.84"

Tangent= 810.9719

Length=1,598.2133

Radius =3,819.8300

External = 85.1382

Long Chord =1,586.5813

Mid. Ord. = 83.2820

P.C. Station 11699+20.63 N 169,318.4756 E 2,304,779.0016

P.T. Station 11715+18.85 N 169,307.5835 E 2,306,365.5455

C.C.N 173,049.4895 E 2,305,597.9254

Back = S 77° 37' 13.45" E

Ahead = N 78° 24' 25.54" E

Chord Bear = S 89° 36' 23.96" E

Spiral C200408A Type 2 Spiral Element

Angle 2° 14' 59.76" (LT) P 0.9817 BK N 78° 24' 25.54" E

LS 300.0000 K 149.9923 AH N 76° 09' 25.78" E

R 3,819.8300 LT200.0162 CB N 76° 54' 25.66" E

YS3.9264 ST100.0147 Defl 0° 44' 59.89"

XS 299.9537 LC299.9794 Deg 1° 29' 59.84"



Alignment Layout
EX_HWY52_RP215

US 52
Fessenden to Carrington
Foster County

Note: Same information as shown on Section 81 Sheet 5 - 6

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	82	34

Spiral Coordinates

Point North East Station

CS	169,307.5835	2,306,365.5455	11715+18.85
PI	169,327.6821	2,306,463.5199	11716+18.86
ST	169,375.5379	2,306,657.7267	11718+18.85
CC	173,049.4895	2,305,597.9254	

Course from ST C200408A to TS C200199B N 76° 09' 25.78" E Dist 2,353.5555

Spiral C200199B Type 1 Spiral Element

Angle 4° 29' 58.13" (RT) P 1.9628 BK N 76° 09' 25.78" E
LS 300.0000 K 149.9692 AH N 80° 39' 23.91" E
R 1,910.0800 LT200.0646 CB N 77° 39' 24.87" E
YS7.8496 ST100.0588 Defl 1° 29' 59.09"
XS 299.8150 LC299.9178 Deg 2° 59' 58.75"

Spiral Coordinates

Point North East Station

TS	169,938.6484	2,308,942.9247	11741+72.40
PI	169,986.5158	2,309,137.1786	11743+72.47
SC	170,002.7604	2,309,235.9099	11744+72.40
CC	168,118.0211	2,309,546.0125	

Curve Data

Curve C200199

P.I. Station 11747+15.17 N 170,042.1738 E 2,309,475.4566
Delta = 14° 29' 12.09" (RT)
Degree = 2° 59' 58.75"
Tangent= 242.7674
Length= 482.9455
Radius =1,910.0800
External = 15.3658
Long Chord = 481.6601
Mid. Ord. = 15.2432
P.C. Station 11744+72.40 N 170,002.7604 E 2,309,235.9099
P.T. Station 11749+55.35 N 170,020.4103 E 2,309,717.2465
C.C.N 168,118.0211 E 2,309,546.0125
Back = N 80° 39' 23.91" E
Ahead = S 84° 51' 24.01" E
Chord Bear = N 87° 53' 59.95" E

Spiral C200199A Type 2 Spiral Element

Angle 4° 29' 58.13" (RT) P 1.9628 BK S 84° 51' 24.01" E
LS 300.0000 K 149.9692 AH S 80° 21' 25.88" E
R 1,910.0800 LT200.0646 CB S 81° 51' 24.97" E
YS7.8496 ST100.0588 Defl 1° 29' 59.09"
XS 299.8150 LC299.9178 Deg 2° 59' 58.75"

Spiral Coordinates

Point North East Station

CS	170,020.4103	2,309,717.2465	11749+55.35
PI	170,011.4403	2,309,816.9024	11750+55.41
ST	169,977.9284	2,310,014.1404	11752+55.35
CC	168,118.0211	2,309,546.0125	

Course from ST C200199A to PC C200202 S 80° 21' 25.88" E Dist 269.6763

Curve Data

Curve C200202

P.I. Station 11757+34.56 N 169,897.6570 E 2,310,486.5860
Delta = 10° 26' 49.73" (LT)
Degree = 2° 29' 59.30"
Tangent= 209.5401
Length = 417.9185
Radius =2,292.0100
External = 9.5584
Long Chord = 417.3398
Mid. Ord. = 9.5187
P.C. Station 11755+25.02 N 169,932.7561 E 2,310,280.0064
P.T. Station 11759+42.94 N 169,900.5985 E 2,310,696.1055
C.C.N 172,192.3826 E 2,310,663.9306
Back = S 80° 21' 25.88" E
Ahead = N 89° 11' 44.39" E
Chord Bear = S 85° 34' 50.74" E

Course from PT C200202 to 8000 N 89° 11' 44.39" E Dist 20.3385

End Region 1

Equation: Sta 11759+63.28 (BK) = Sta 11759+56.32 (AH) -----

Begin Region 2

Point 8000 N169,900.8840 E 2,310,716.4420 Sta 11759+56.32

Course from 8000 to 200063 S 1° 01' 43.11" E Dist 5,288.3752

Point 200063N164,613.3610 E 2,310,811.3800 Sta 11812+44.70

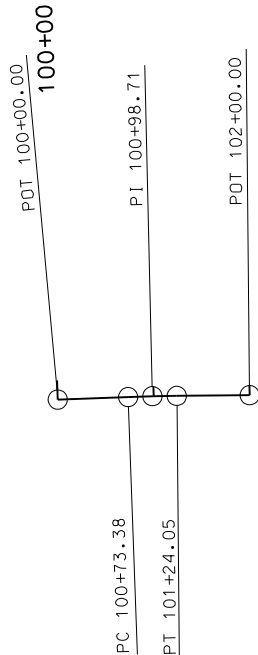
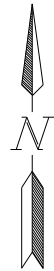
Ending chain EX_HWY52_RP215 description



Alignment Layout
EX_HWY52_RP215

US 52
Fessenden to Carrington
Foster County

Note: Same information as shown on Section 81 Sheet 5 - 6



Curve PR_15TH_ST1
PI = 100+98.71 Simple Curve
Delta = 1° 27' 05.42" (RT)
Da = 2° 51' 53.24"
R = 2,000.00
T = 25.33
L = 50.67

Beginning chain PR_15TH_ST description

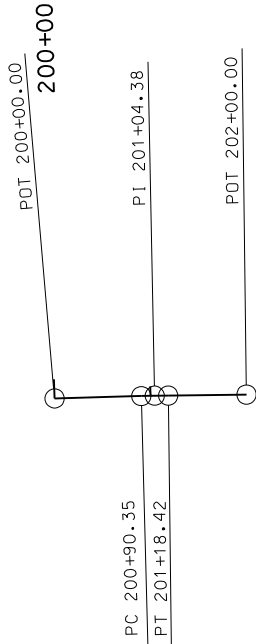
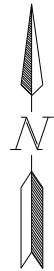
Point 9000 N231,576.7312 E 2,183,254.7636 Sta100+00.00
Course from 9000 to PC PR_15TH_ST1 N 87° 56' 55.96" E Dist 73.3795

Curve Data

Curve PR_15TH_ST1
P.I. Station 100+98.71 N 231,580.2643 E 2,183,353.4147
Delta = 1° 27' 05.42" (RT)
Degree = 2° 51' 53.24"
Tangent= 25.3349
Length = 50.6671
Radius =2,000.0000
External = 0.1605
Long Chord = 50.6658
Mid. Ord. = 0.1604
P.C. Station 100+73.38 N 231,579.3575 E 2,183,328.0960
P.T. Station 101+24.05 N 231,580.5294 E 2,183,378.7483
C.C. N 229,580.6390 E 2,183,399.6784
Back = N 87° 56' 55.96" E
Ahead = N 89° 24' 01.39" E
Chord Bear = N 88° 40' 28.67" E

Course from PT PR_15TH_ST1 to 9001 N 89° 24' 01.39" E Dist 75.9534
Point 9001 N231,581.3243 E 2,183,454.6975 Sta102+00.00

Ending chain PR_15TH_ST description



Curve PR_14TH_ST1
PI = 201+04.38 Simple Curve
Delta = 0° 48' 14.72" (RT)
Da = 2° 51' 53.24"
R = 2,000.00
T = 14.03
L = 28.07

Beginning chain PR_14TH_ST description

Point 9002 N226,283.7166 E 2,183,322.9959 Sta200+00.00

Course from 9002 to PC PR_14TH_ST1 N 88° 27' 25.68" E Dist 90.3496

Curve Data

Curve PR_14TH_ST1
P.I. Station 201+04.38 N 226,286.5271 E 2,183,427.3420
Delta = 0° 48' 14.72" (RT)
Degree = 2° 51' 53.24"
Tangent= 14.0342
Length = 28.0680
Radius =2,000.0000
External = 0.0492
Long Chord = 28.0678
Mid. Ord. = 0.0492
P.C. Station 200+90.35 N 226,286.1492 E 2,183,413.3128
P.T. Station 201+18.42 N 226,286.7081 E 2,183,441.3750
C.C. N 224,286.8743 E 2,183,467.1625
Back = N 88° 27' 25.68" E
Ahead = N 89° 15' 40.40" E
Chord Bear = N 88° 51' 33.04" E

Course from PT PR_14TH_ST1 to 9003 N 89° 15' 40.40" E Dist 81.5824

Point 9003 N226,287.7600 E 2,183,522.9506 Sta202+00.00

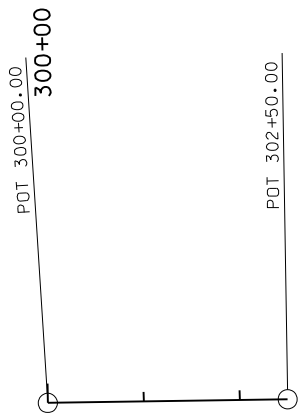
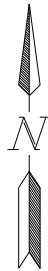
Ending chain PR_14TH_ST description



Alignment Layout
PR_15TH_ST, PR_14TH_ST

US 52
Fessenden to Carrington
Wells County

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	ND	INF-X-3-052(053)185	82	36



Beginning chain PR_5TH_ST description

Point 9008 N178,762.8544 E 2,184,079.6976 Sta300+00.00

Course from 9008 to 9009 N 89° 06' 30.69" E Dist 250.0000

Point 9009 N178,766.7440 E 2,184,329.6672 Sta302+50.00

Ending chain PR_5TH_ST description

Curve Data

Curve PR_10422+62FD1

P.I. Station 401+10.44 N 175,156.0095 E 2,184,246.2779

Delta = 63° 52' 43.77" (RT)

Degree =114° 35' 29.61"

Tangent= 31.1700

Length = 55.7448

Radius = 50.0000

External = 8.9200

Long Chord = 52.9022

Mid. Ord. = 7.5696

P.C. Station 400+79.27 N 175,155.5246 E 2,184,215.1117

P.T. Station 401+35.02 N 175,128.2400 E 2,184,260.4349

C.C. N 175,105.5306 E 2,184,215.8896

Back = N 89° 06' 30.69" E

Ahead = S 27° 00' 45.54" E

Chord Bear = S 58° 57' 07.42" E

Course from PT PR_10422+62FD1 to PC PR_10422+62FD2 S 27° 00' 45.54" E Dist 32.9614

Curve Data

Curve PR_10422+62FD2

P.I. Station 401+99.06 N 175,071.1812 E 2,184,289.5237

Delta = 63° 44' 14.37" (LT)

Degree =114° 35' 29.61"

Tangent= 31.0843

Length = 55.6213

Radius = 50.0000

External = 8.8747

Long Chord = 52.7974

Mid. Ord. = 7.5370

P.C. Station 401+67.98 N 175,098.8744 E 2,184,275.4056

P.T. Station 402+23.60 N 175,071.5881 E 2,184,320.6054

C.C. N 175,121.5838 E 2,184,319.9509

Back = S 27° 00' 45.54" E

Ahead = N 89° 15' 00.09" E

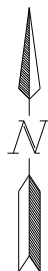
Chord Bear = S 58° 52' 52.72" E

Course from PT PR_10422+62FD2 to 9007 N 89° 15' 00.09" E Dist 76.3995

Point 9007 N175,072.5881 E 2,184,396.9984 Sta403+00.00

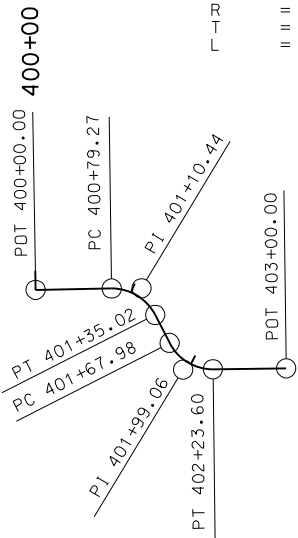
=====

Ending chain PR_10422+62FD description



Curve PR_10422+62FD1
PI = 401+10.44 Simple Curve
Delta = 63° 52' 43.77" (RT)
Da = 114° 35' 29.61"
RT = 50.00
T = 31.17
L = 55.74

Curve PR_10422+62FD2
PI = 401+99.06 Simple Curve
Delta = 63° 44' 14.37" (LT)
Da = 114° 35' 29.61"
RT = 50.00
T = 31.08
L = 55.62



Beginning chain PR_10422+62FD description

Point 9006 N175,154.2912 E 2,184,135.8484 Sta400+00.00

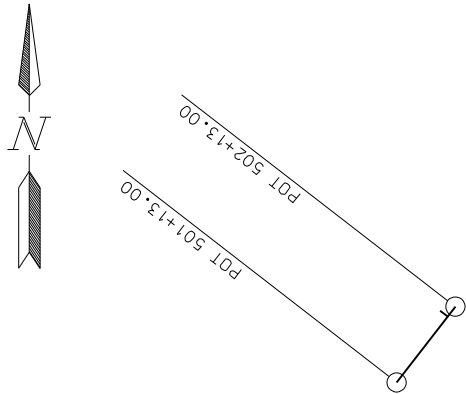
Course from 9006 to PC PR_10422+62FD1 N 89° 06' 30.69" E Dist 79.2729



Alignment Layout
PR_5TH_ST, PR_10422+62FD

US 52
Fessenden to Carrington
Wells County

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Beginning chain PR_10422+FD_2 description
=====

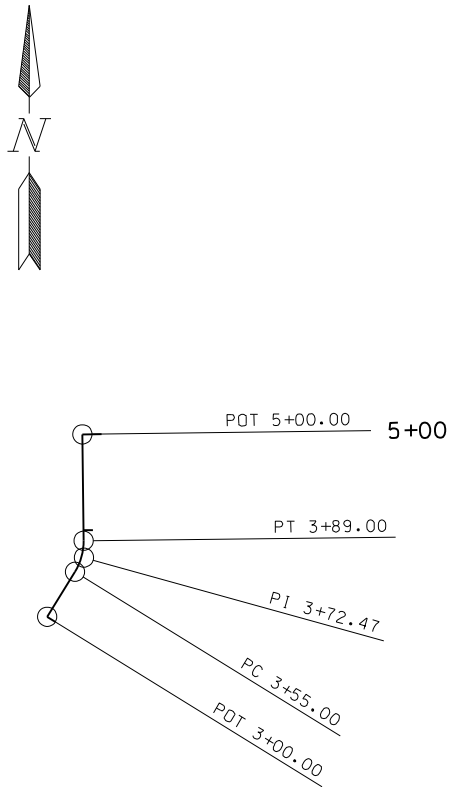
Point 9033 N175,145.0614 E 2,184,246.5053 Sta501+13.00

Course from 9033 to 9032 N 37° 45' 25.00" E Dist 100.0000

Point 9032 N175,224.1229 E 2,184,307.7366 Sta502+13.00

=====

Ending chain PR_10422+FD_2 description



Beginning chain PR_10516+50FD description
=====

Point 9030 N168,030.8414 E 2,186,628.9172 Sta 3+00.00

Course from 9030 to PC PR_10516+50FD1 N 31° 46' 06.29" E Dist 55.0000

Curve Data

Curve PR_10516+50FD1

P.I. Station 3+72.47 N 168,092.4541 E 2,186,667.0718

Delta = 32° 28' 03.54" (LT)

Degree = 95° 29' 34.68"

Tangent= 17.4700

Length = 34.0000

Radius = 60.0000

External = 2.4916

Long Chord = 33.5470

Mid. Ord. = 2.3923

P.C. Station 3+55.00 N 168,077.6014 E 2,186,657.8740

P.T. Station 3+89.00 N 168,109.9229 E 2,186,666.8586

C.C. N 168,109.1907 E 2,186,606.8630

Back = N 31° 46' 06.29" E

Ahead = N 0° 41' 57.25" W

Chord Bear = N 15° 32' 04.52" E

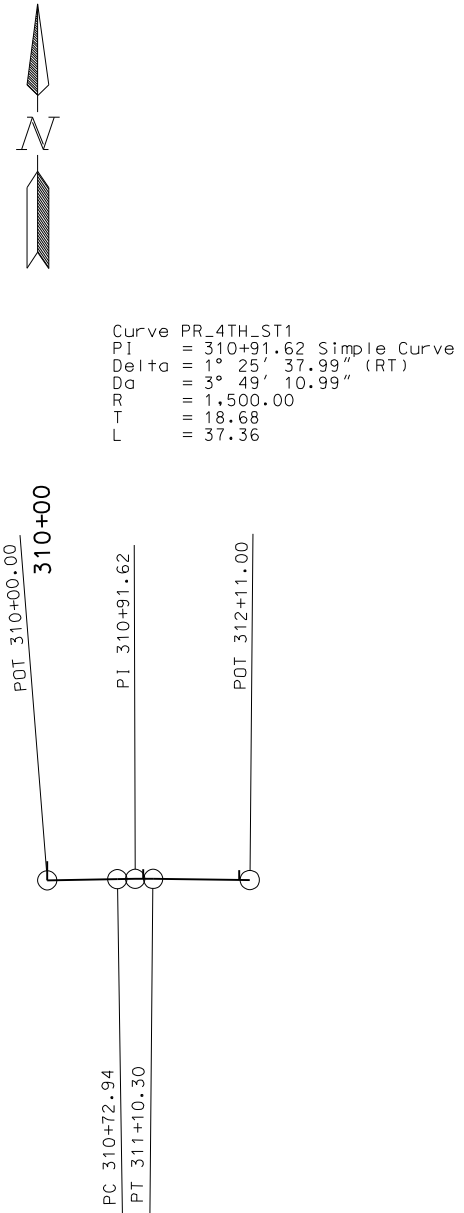
Course from PT PR_10516+50FD1 to 9031 N 0° 41' 57.25" W Dist 111.0000

Point 9031 N168,220.9146 E 2,186,665.5040 Sta 5+00.00

=====

Ending chain PR_10516+50FD description

Curve PR_10516+50FD1
PI = 3+72.47 Simple Curve
Delta = 32° 28' 03.54" (LT)
Da = 95° 29' 34.68"
R = 60.00
T = 17.47
L = 34.00



Beginning chain PR_4TH_ST description
=====

Point 9025 N173,479.4934 E 2,184,161.9090 Sta310+00.00

Course from 9025 to PC PR_4TH_ST1 N 89° 06' 30.69" E Dist 72.9353

Curve Data

Curve PR_4TH_ST1

P.I. Station 310+91.62 N 173,480.9188 E 2,184,253.5164

Delta = 1° 25' 37.99" (RT)

Degree = 3° 49' 10.99"

Tangent= 18.6832

Length = 37.3645

Radius =1,500.0000

External = 0.1163

Long Chord = 37.3636

Mid. Ord. = 0.1163

P.C. Station 310+72.94 N 173,480.6282 E 2,184,234.8354

P.T. Station 311+10.30 N 173,480.7442 E 2,184,272.1988

C.C. N 171,980.8097 E 2,184,258.1733

Back = N 89° 06' 30.69" E

Ahead = S 89° 27' 51.32" E

Chord Bear = N 89° 49' 19.68" E

Course from PT PR_4TH_ST1 to 9026 S 89° 27' 51.32" E Dist 100.7003

Point 9026 N173,479.8026 E 2,184,372.8947 Sta312+11.00

=====

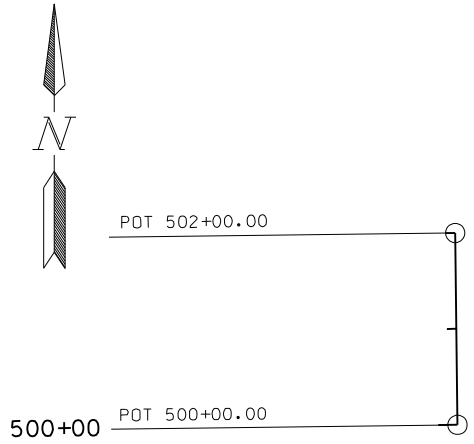
Ending chain PR_4TH_ST description

Curve PR_4TH_ST1
PI = 310+91.62 Simple Curve
Delta = 1° 25' 37.99" (RT)
Da = 3° 49' 10.99"
R = 1,500.00
T = 18.68
L = 37.36



Alignment Layout
PR_10422+62FD_2, PR_4TH_ST
PR_10516+50FD
US 52
Fessenden to Carrington
Wells County

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Beginning chain PR_44TH_AVE description
=====

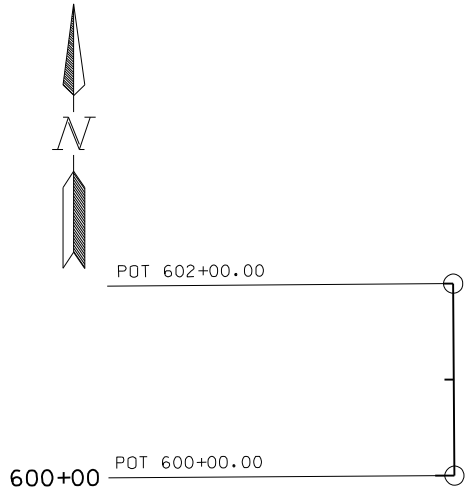
Point 9021 N168,055.6001 E 2,189,508.7331 Sta500+00.00

Course from 9021 to 9022 N 0° 41' 57.25" W Dist 200.0000

Point 9022 N168,255.5852 E 2,189,506.2924 Sta502+00.00

=====

Ending chain PR_44TH_AVE description



Beginning chain PR_45TH_AVE description
=====

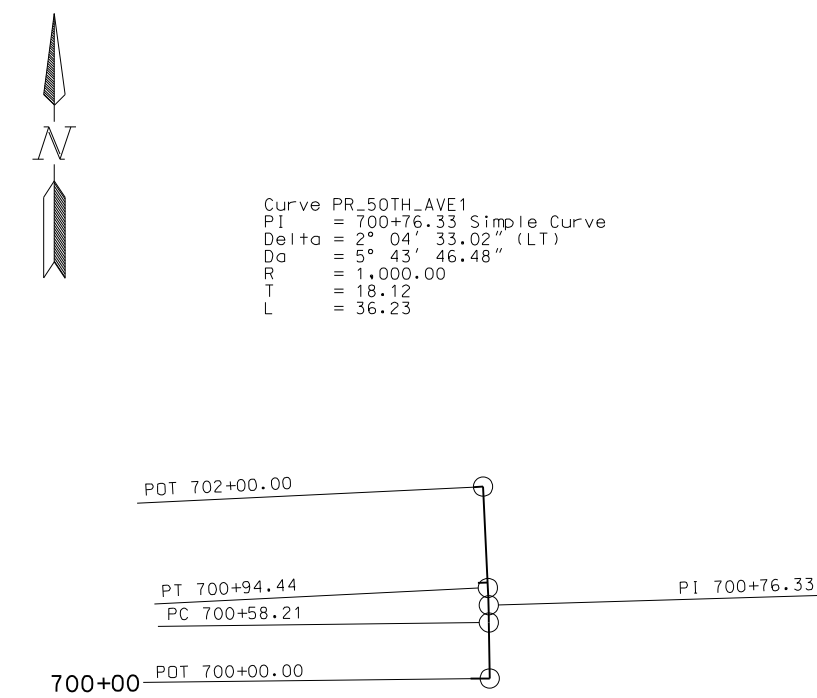
Point 9023 N168,123.8335 E 2,194,794.1626 Sta600+00.00

Course from 9023 to 9024 N 0° 22' 31.75" W Dist 200.0000

Point 9024 N168,323.8293 E 2,194,792.8519 Sta602+00.00

=====

Ending chain PR_45TH_AVE description



Curve PR_50TH_AVE1
PI = 700+76.33 Simple Curve
Delta = 2° 04' 33.02" (LT)
Da = 5° 43' 46.48"
R = 1,000.00
T = 18.12
L = 36.23

Beginning chain PR_50TH_AVE description
=====

Point 9012 N168,626.4934 E 2,221,181.9086 Sta700+00.00

Course from 9012 to PC PR_50TH_AVE1 N 0° 40' 09.17" W Dist 58.2143

Curve Data

Curve PR_50TH_AVE1
P.I. Station 700+76.33 N 168,702.8196 E 2,221,181.0170
Delta = 2° 04' 33.02" (LT)
Degree = 5° 43' 46.48"
Tangent= 18.1171
Length = 36.2302
Radius =1,000.0000
External = 0.1641
Long Chord = 36.2282
Mid. Ord. = 0.1641
P.C. Station 700+58.21 N 168,684.7037 E 2,221,181.2287
P.T. Station 700+94.44 N 168,720.9159 E 2,221,180.1494
C.C. N 168,673.0240 E 2,220,181.2969
Back = N 0° 40' 09.17" W
Ahead = N 2° 44' 42.18" W
Chord Bear = N 1° 42' 25.68" W

Course from PT PR_50TH_AVE1 to 9013 N 2° 44' 42.18" W Dist 105.5555

Point 9013 N168,826.3503 E 2,221,175.0941 Sta702+00.00

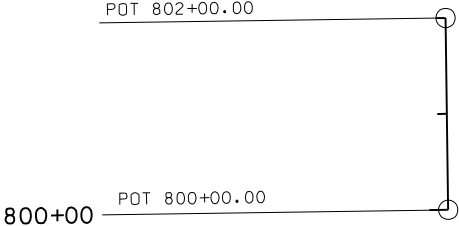
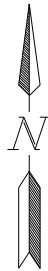
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Ending chain PR_50TH_AVE description



Alignment Layout
PR_44TH_AVE, PR_45TH_AVE
PR_50TH_AVE
US 52
Fessenden to Carrington
Wells County

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Beginning chain PR_51ST_AVE description
=====

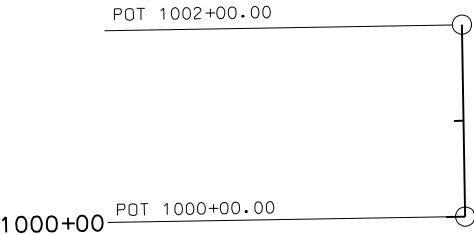
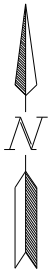
Point 9010 N168,688.1973 E 2,226,464.5482 Sta800+00.00

Course from 9010 to 9011 N 0° 48' 42.69" W Dist 200.0000

Point 9011 N168,888.1772 E 2,226,461.7144 Sta802+00.00

=====

Ending chain PR_51ST_AVE description



Beginning chain PR_56TH_AVE description
=====

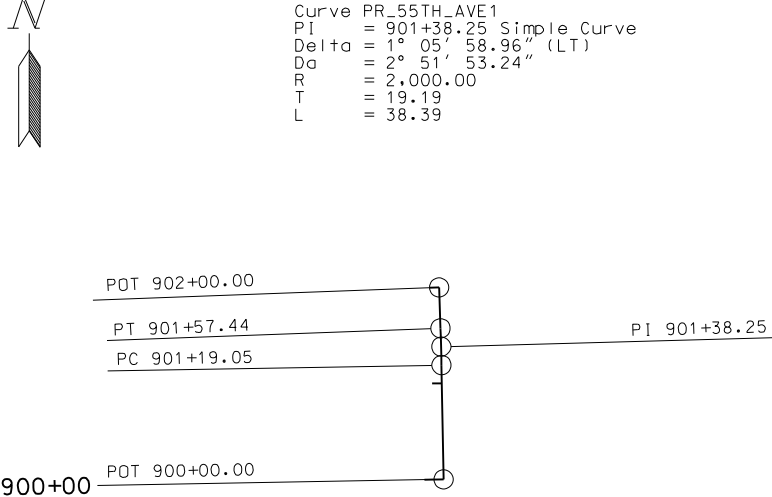
Point 9019 N168,860.2120 E 2,252,784.1207 Sta 1000+00.00

Course from 9019 to 9020 N 0° 57' 45.63" W Dist 200.0000

Point 9020 N169,060.1837 E 2,252,780.7605 Sta 1002+00.00

=====

Ending chain PR_56TH_AVE description



Curve PR_55TH_AVE1
PI = 901+38.25 Simple Curve
Delta = 1° 05' 58.96" (LT)
Da = 2° 51' 53.24"
R = 2,000.00
T = 19.19
L = 38.39

Beginning chain PR_55TH_AVE description
=====

Point 9015 N168,767.1425 E 2,247,488.2772 Sta900+00.00

Course from 9015 to PC PR_55TH_AVE1 N 1° 00' 23.59" W Dist 119.0541

Curve Data

Curve PR_55TH_AVE1
P.I. Station 901+38.25 N 168,905.3695 E 2,247,485.8486
Delta = 1° 05' 58.96" (LT)
Degree = 2° 51' 53.24"
Tangent= 19.1941
Length = 38.3871
Radius =2,000.0000
External = 0.0921
Long Chord = 38.3865
Mid. Ord. = 0.0921
P.C. Station 901+19.05 N 168,886.1783 E 2,247,486.1858
P.T. Station 901+57.44 N 168,924.5506 E 2,247,485.1432
C.C. N 168,851.0448 E 2,245,486.4944

Back = N 1° 00' 23.59" W
Ahead = N 2° 06' 22.54" W
Chord Bear = N 1° 33' 23.06" W

Course from PT PR_55TH_AVE1 to 9016 N 2° 06' 22.54" W Dist 42.5588

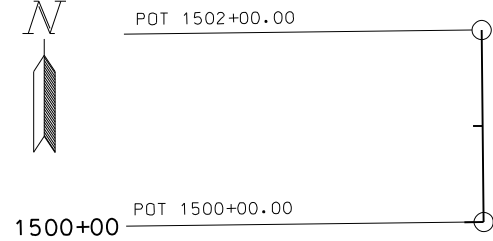
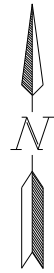
Point 9016 N168,967.0807 E 2,247,483.5790 Sta902+00.00

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Ending chain PR_55TH_AVE description



Alignment Layout
PR_51ST_AVE, PR_56TH_AVE
PR_55TH_AVE
US 52
Fessenden to Carrington
Wells County



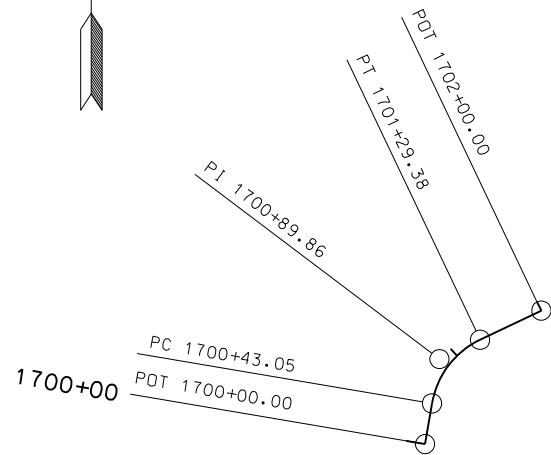
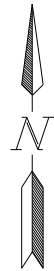
Beginning chain PR_64TH_AVE description

Point 9000 N169,683.4319 E 2,294,910.2285 Sta 1500+00.00

Course from 9000 to 9001 N 0° 39' 16.60" W Dist 200.0000

Point 9001 N169,883.4188 E 2,294,907.9435 Sta 1502+00.00

Ending chain PR_64TH_AVE description



Beginning chain PR_11678+10PD description

Point 9004 N169,825.9128 E 2,302,730.8212 Sta 1700+00.00

Course from 9004 to PC PR_11678+10PD1 N 9° 35' 43.25" E Dist 43.0519

Curve Data

Curve PR_11678+10PD1

P.I. Station 1700+89.86 N 169,914.5176 E 2,302,745.8002

Delta = 54° 57' 31.99" (RT)

Degree = 63° 39' 43.12"

Tangent= 46.8100

Length = 86.3292

Radius = 90.0000

External = 11.4454

Long Chord = 83.0575

Mid. Ord. = 10.1541

P.C. Station 1700+43.05 N 169,868.3625 E 2,302,737.9975

P.T. Station 1701+29.38 N 169,934.6298 E 2,302,788.0692

C.C. N 169,853.3605 E 2,302,826.7383

Back = N 9° 35' 43.25" E

Ahead = N 64° 33' 15.24" E

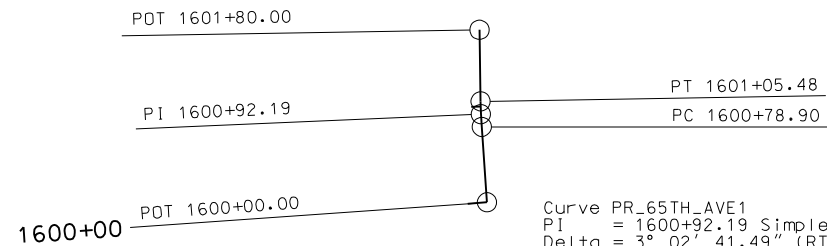
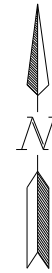
Chord Bear = N 37° 04' 29.25" E

Course from PT PR_11678+10PD1 to 9005 N 64° 33' 15.24" E Dist 70.6189

Point 9005 N169,964.9717 E 2,302,851.8376 Sta 1702+00.00

Ending chain PR_11678+10PD description

Curve PR_11678+10PD1
PI = 1700+89.86 Simple Curve
Delta = 54° 57' 31.99" (RT)
Da = 63° 39' 43.12"
R = 90.00
T = 46.81
L = 86.33



Curve PR_65TH_AVE1
PI = 1600+92.19 Simple Curve
Delta = 3° 02' 41.49" (RT)
Da = 11° 27' 32.96"
R = 500.00
T = 13.29
L = 26.57

Beginning chain PR_65TH_AVE description

Point 9002 N169,810.8154 E 2,300,208.4531 Sta 1600+00.00

Course from 9002 to PC PR_65TH_AVE1 N 3° 59' 50.19" W Dist 78.9037

Curve Data

Curve PR_65TH_AVE1

P.I. Station 1600+92.19 N 169,902.7836 E 2,300,202.0264

Delta = 3° 02' 41.49" (RT)

Degree = 11° 27' 32.96"

Tangent= 13.2888

Length = 26.5714

Radius = 500.0000

External = 0.1766

Long Chord = 26.5683

Mid. Ord. = 0.1765

P.C. Station 1600+78.90 N 169,889.5271 E 2,300,202.9528

P.T. Station 1601+05.48 N 169,916.0706 E 2,300,201.8055

C.C. N 169,924.3816 E 2,300,701.7364

Back = N 3° 59' 50.19" W

Ahead = N 0° 57' 08.70" W

Chord Bear = N 2° 28' 29.45" W

Course from PT PR_65TH_AVE1 to 9003 N 0° 57' 08.70" W Dist 74.5249

Point 9003 N169,990.5852 E 2,300,200.5668 Sta 1601+80.00

Ending chain PR_65TH_AVE description



Alignment Layout
PR_64TH_AVE, PR_65TH_AVE
PR_11678+10PD
US 52
Fessenden to Carrington
Foster County

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	INF-X-3-052(053)185	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED			TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
			BY PHASE NO.					
			1	2	3			
E5-1-48	48"x48"	EXIT GORE					35	
G20-1-60	60"x24"	ROAD WORK NEXT __ MILES	4	4		4	28	112
G20-1b-60	60"x24"	NO WORK IN PROGRESS (Sign and installation only)					18	
G20-2-48	48"x24"	END ROAD WORK	12	12		12	26	312
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)					18	
G20-10-108	108"x48"	CONTRACTOR SIGN	3	3		3	70	210
G20-50a-72	72"x36"	ROAD WORK NEXT __ MILES RT & LT ARROWS	8	8		8	43	344
G20-52a-72	72"x24"	ROAD WORK NEXT __ MILES RT or LT ARROW	7	7		7	36	252
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE \$80 WHEN WORKERS PRESENT	12	12		12	59	708
I2-5-96	96"x48"	PROJECT FUNDING SIGN	3	3		3	59	177
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)					10	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)					10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)					10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)					7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)					7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)					7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)					7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)					7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT					15	
M4-10-48	48"x18"	DETOUR (INSIDE ARROW) RIGHT or LEFT (Mounted on barricade)					7	
M5-1-21	21"x15"	ADVANCE TURN ARROW RT or LT (Mounted on route marker post)					7	
M5-1-30	30"x21"	ADVANCE TURN ARROW RT or LT (Mounted on route marker post)					9	
M6-1-21	21"x15"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)					7	
M6-1-30	30"x21"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)					9	
M6-3-21	21"x15"	DIRECTIONAL ARROW UP (Mounted on route marker post)					7	
R1-1-48	48"x48"	STOP	12	4		12	32	384
R1-2-60	60"x60"	YIELD					29	
R2-1-36	36"x48"	SPEED LIMIT __ (Portable only)	24	24		24	30	720
R2-1-48	48"x60"	SPEED LIMIT					39	
R2-1aP-24	24"x18"	MINIMUM FEE \$80 (Mounted on Speed Limit post)	12	12		12	10	120
R3-2-48	48"x48"	NO LEFT TURN					35	
R4-1-48	48"x60"	DO NOT PASS					39	
R4-7-48	48"x60"	KEEP RIGHT					39	
R5-1-48	48"x48"	DO NOT ENTER					35	
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)					14	
R7-1-12	12"x18"	NO PARKING ANY TIME					11	
R10-6-24	24"x36"	STOP HERE ON RED					16	
R11-2-48	48"x30"	ROAD CLOSED (Mounted on barricade)					12	
R11-2a-48	48"x30"	STREET CLOSED (Mounted on barricade)					12	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)					15	
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)					15	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC (Mounted on barricade)					15	
W1-3-48	48"x48"	REVERSE TURN RIGHT or LEFT					35	
W1-4-48	48"x48"	REVERSE CURVE RIGHT or LEFT					35	
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT					35	
W1-6-48	48"x24"	ONE DIRECTION LARGE ARROW					26	
W3-1-48	48"x48"	STOP AHEAD					35	
W3-3-48	48"x48"	SIGNAL AHEAD					35	
W3-4-48	48"x48"	BE PREPARED TO STOP		12		12	35	420
W3-5-48	48"x48"	SPEED REDUCTION AHEAD	12	12		12	35	420
W4-2-48	48"x48"	LANE ENDS RIGHT or LEFT					35	
W5-1-48	48"x48"	ROAD NARROWS					35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE					35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW					35	
W6-3-48	48"x48"	TWO WAY TRAFFIC					35	
W8-1-48	48"x48"	BUMP					35	

[illegible][illegible]

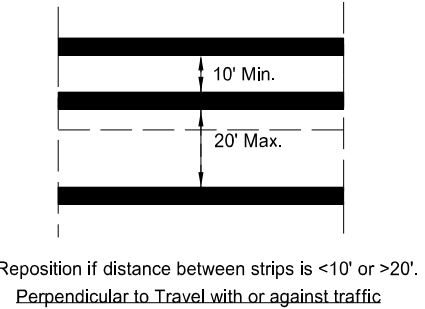
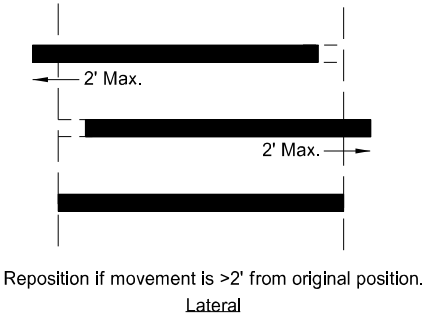
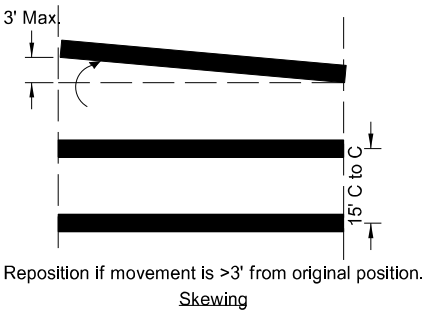
SPEC & CODE			
704-1000	TRAFFIC CONTROL SIGNS	TOTAL UNITS	6831

[illegible]

NOTE:
If additional signs are required, units will be calculated using the formula from Section III-18.06 of the Design Manual.
<http://www.dot.nd.gov/>



Traffic Control Devices List



PORTABLE RUMBLE STRIPS ARRAY
TYPES OF MOVEMENT AND MAXIMUM ALLOWANCES

- Notes:
1. Number of devices were calculated using 40 mph. Speed determined in the field based on location and conditions.
 2. Re-establish the speed limit. Determine the exact speed limit in the field, dependent on location and conditions.
 3. Sign R2-1aP-24 is not required when pilot car operation is used.
 4. Rumble strips are not used on a non paved surface or in a pre-construction speed zone of 25 mph or less.

Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 60 mph)	360	360	360
Rural - High Speed (over 60 mph to 65 mph)	720	720	720



KEY

Work area

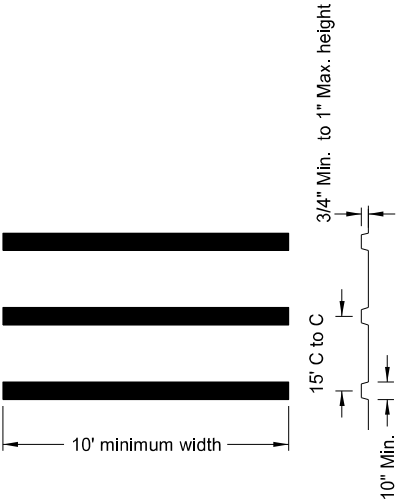
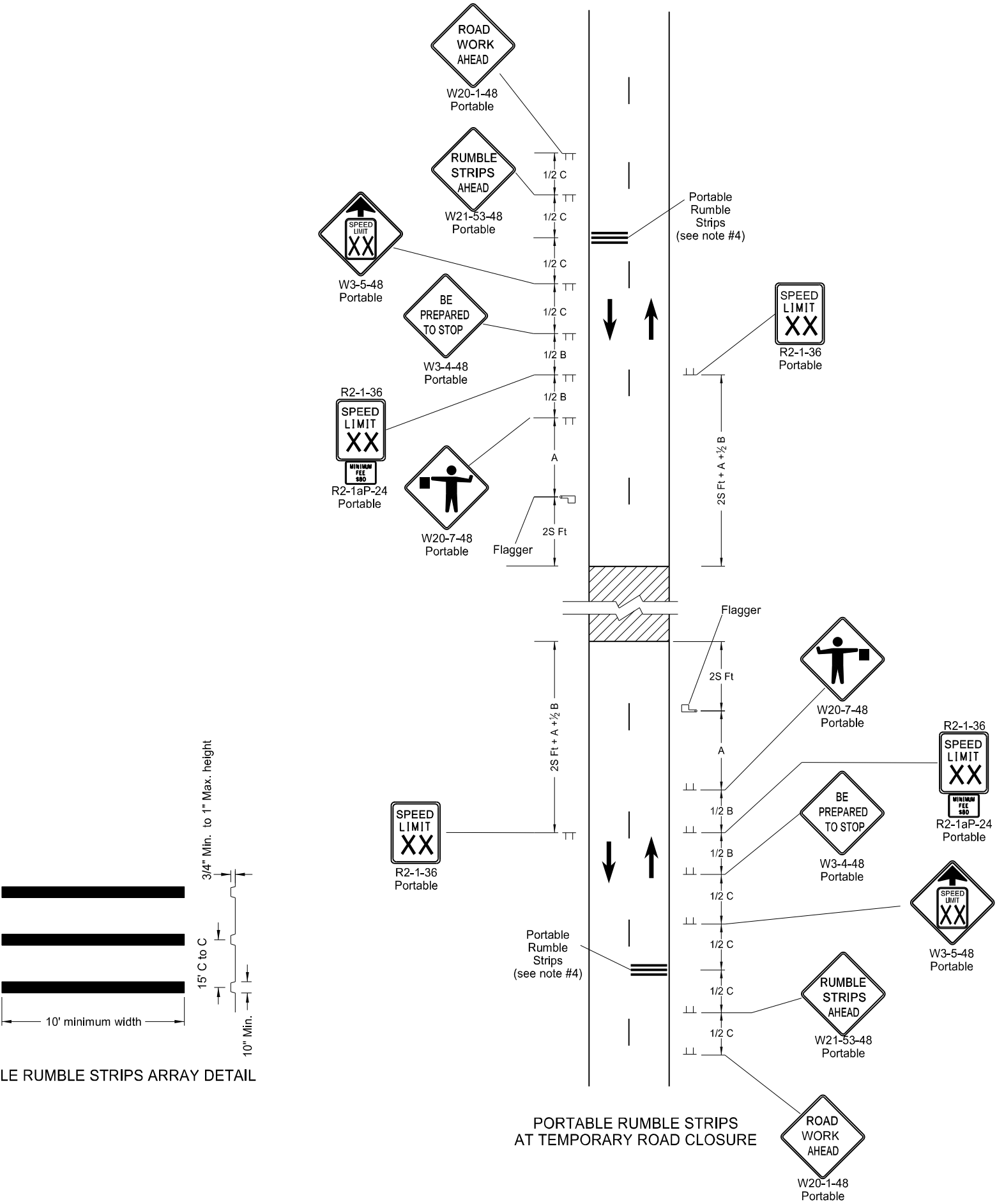
Flagger

Sign

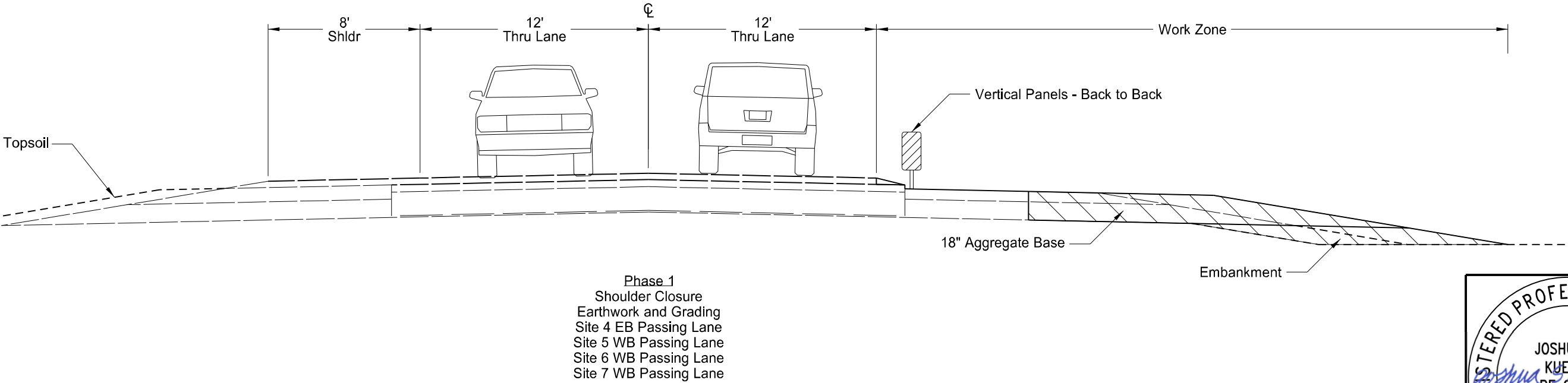
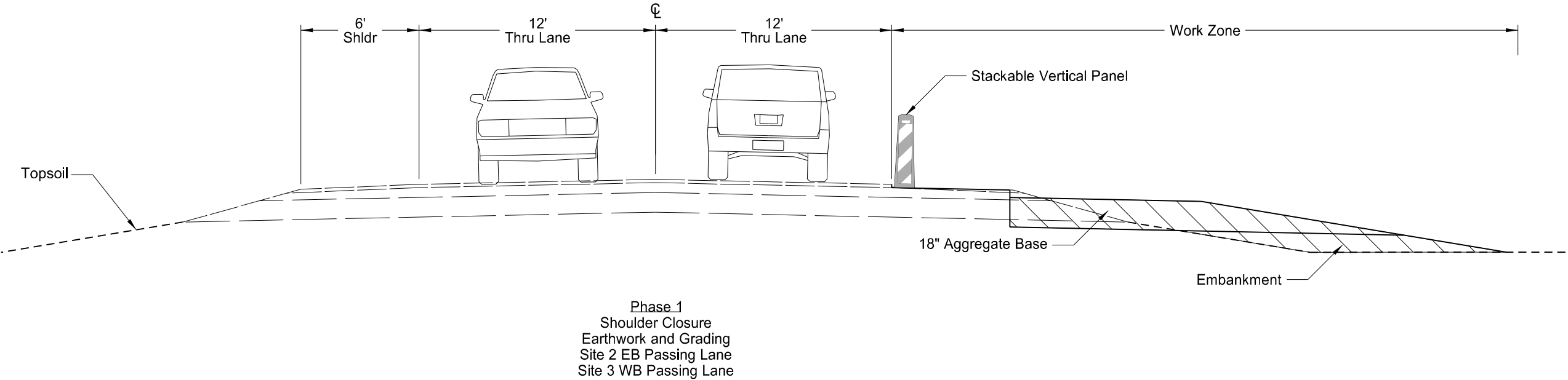
S = Numerical value of speed limit or 85th percentile.

Work Zone Traffic Control
Two-Lane Portable Rumble Strips

US 52
Fessenden to Carrington



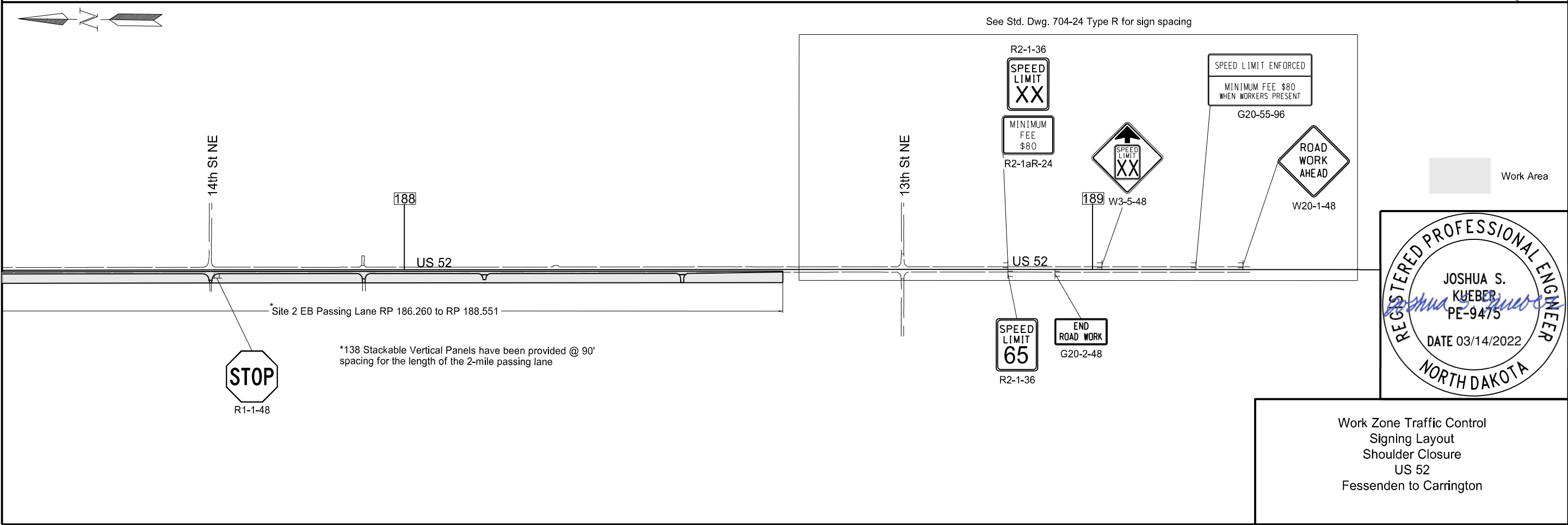
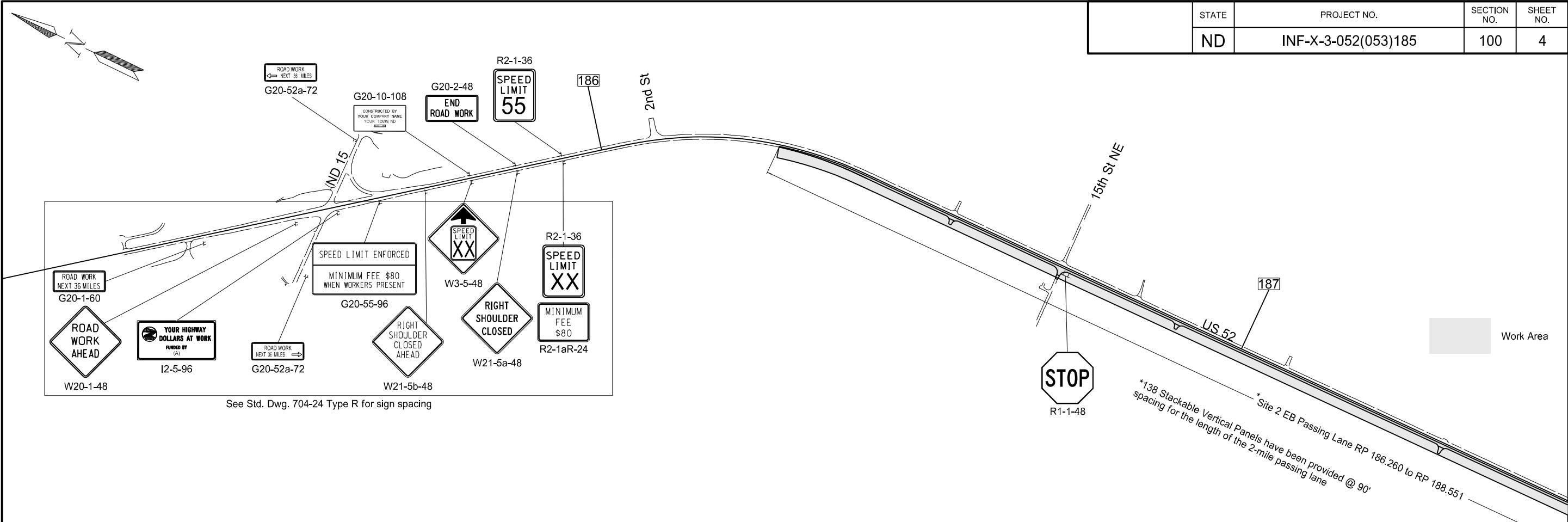
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	100	3



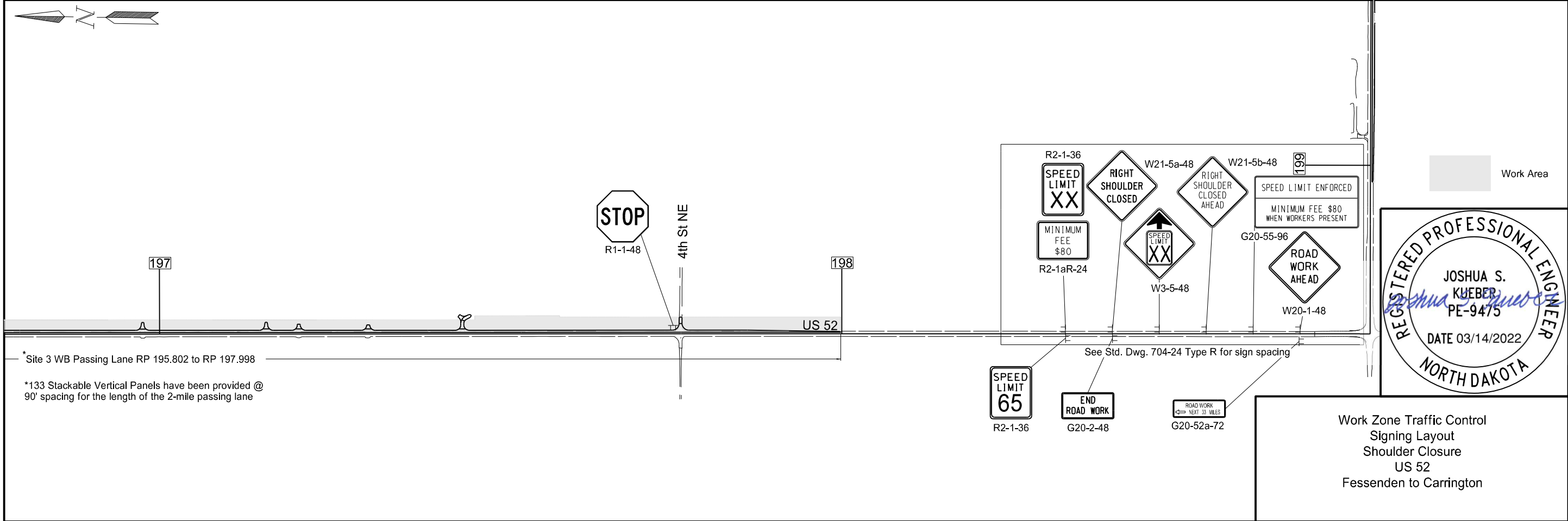
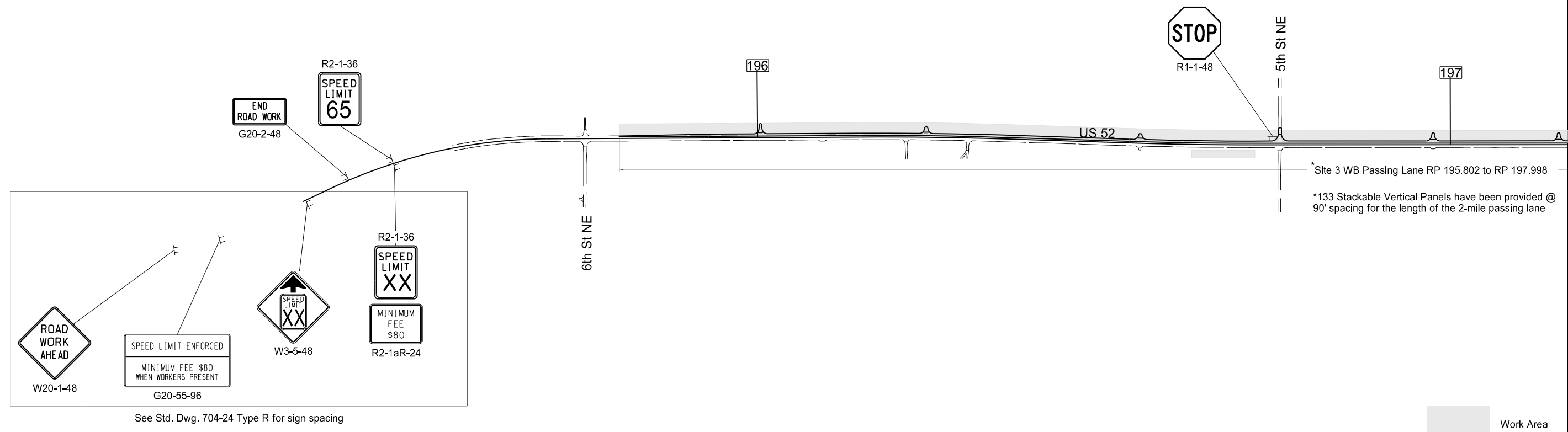
Work Zone Traffic Control
Typicals

US 52
Fessenden to Carrington

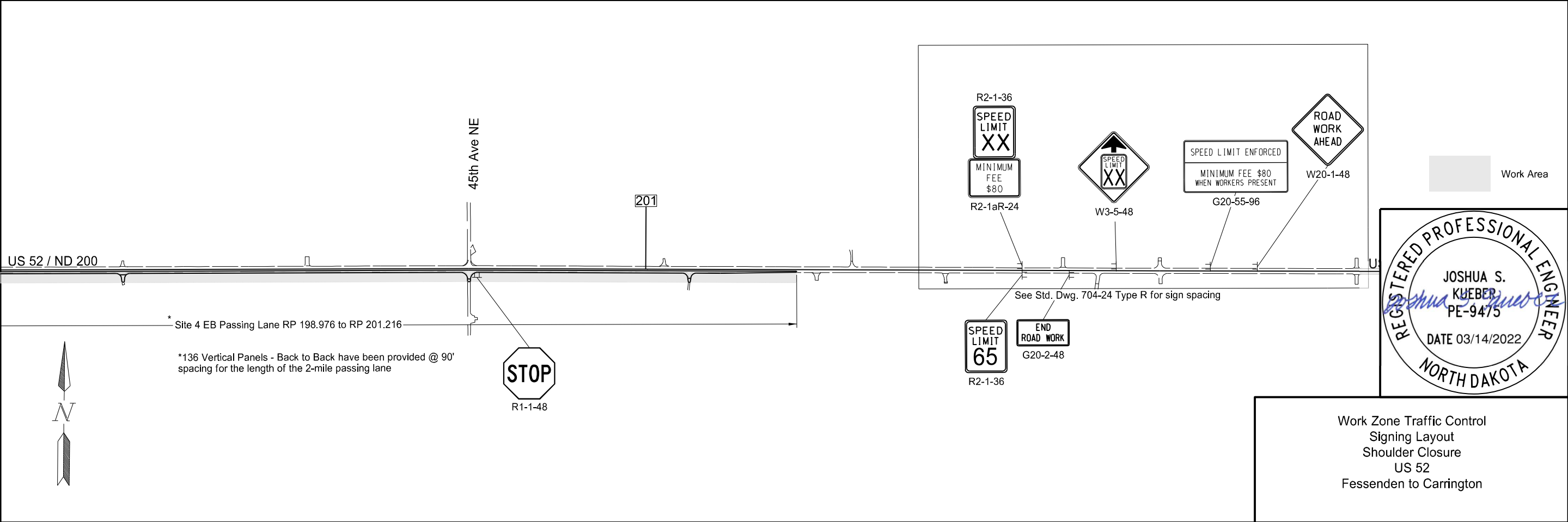
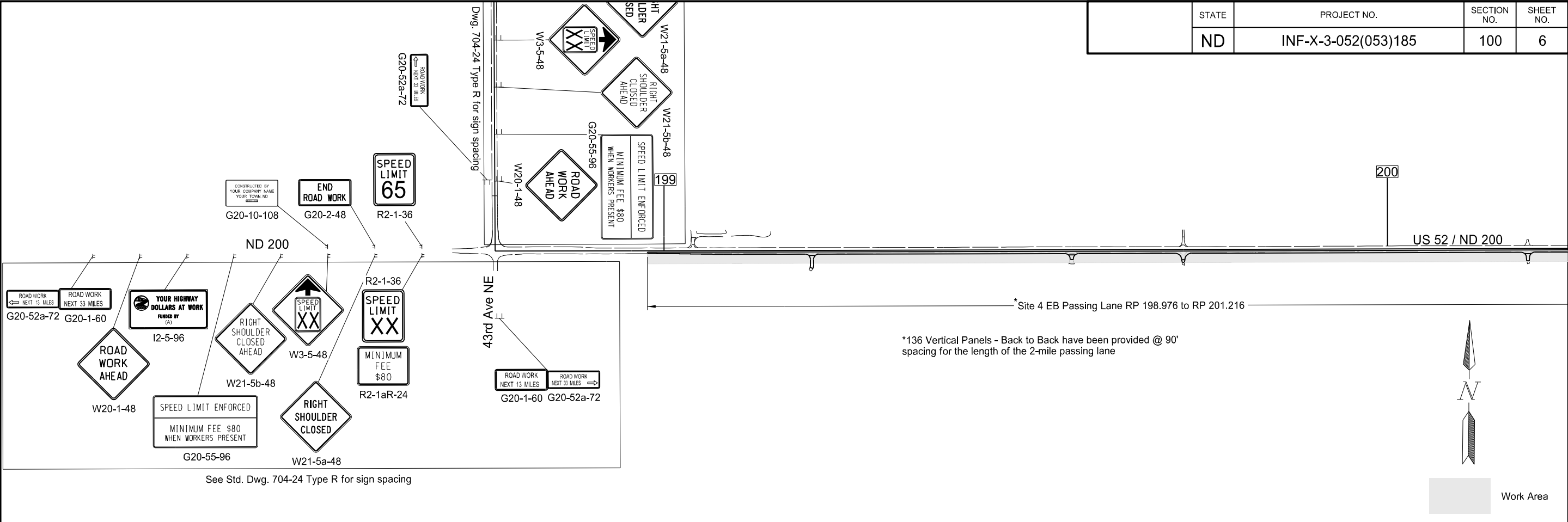
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	ND	INF-X-3-052(053)185	100	4



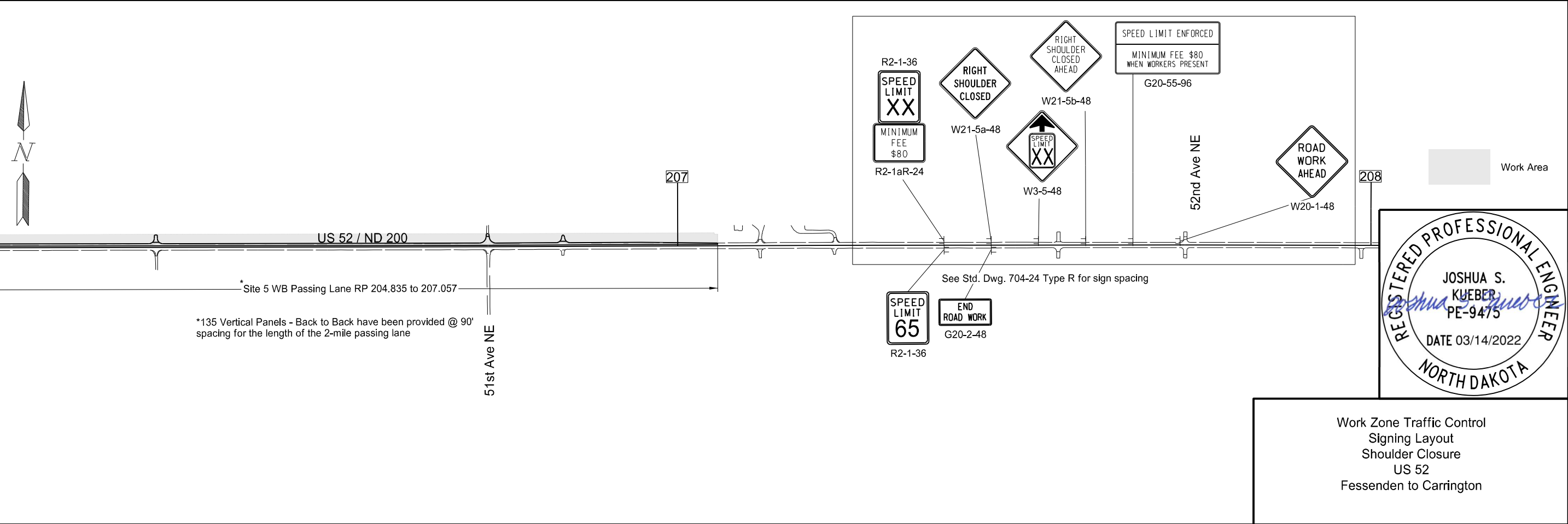
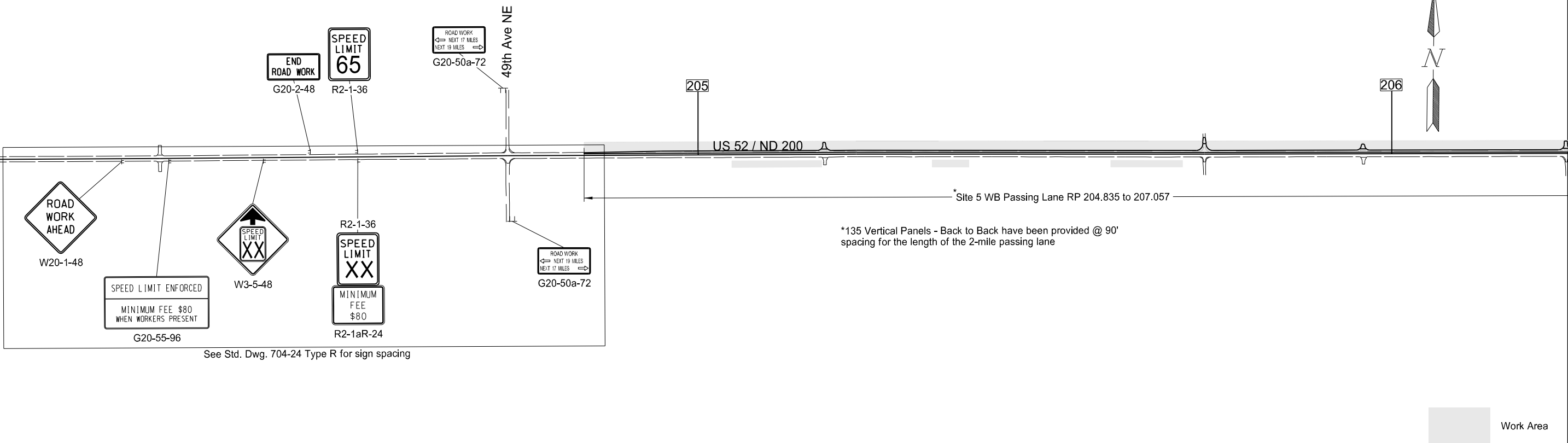
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	ND	INF-X-3-052(053)185	100	5



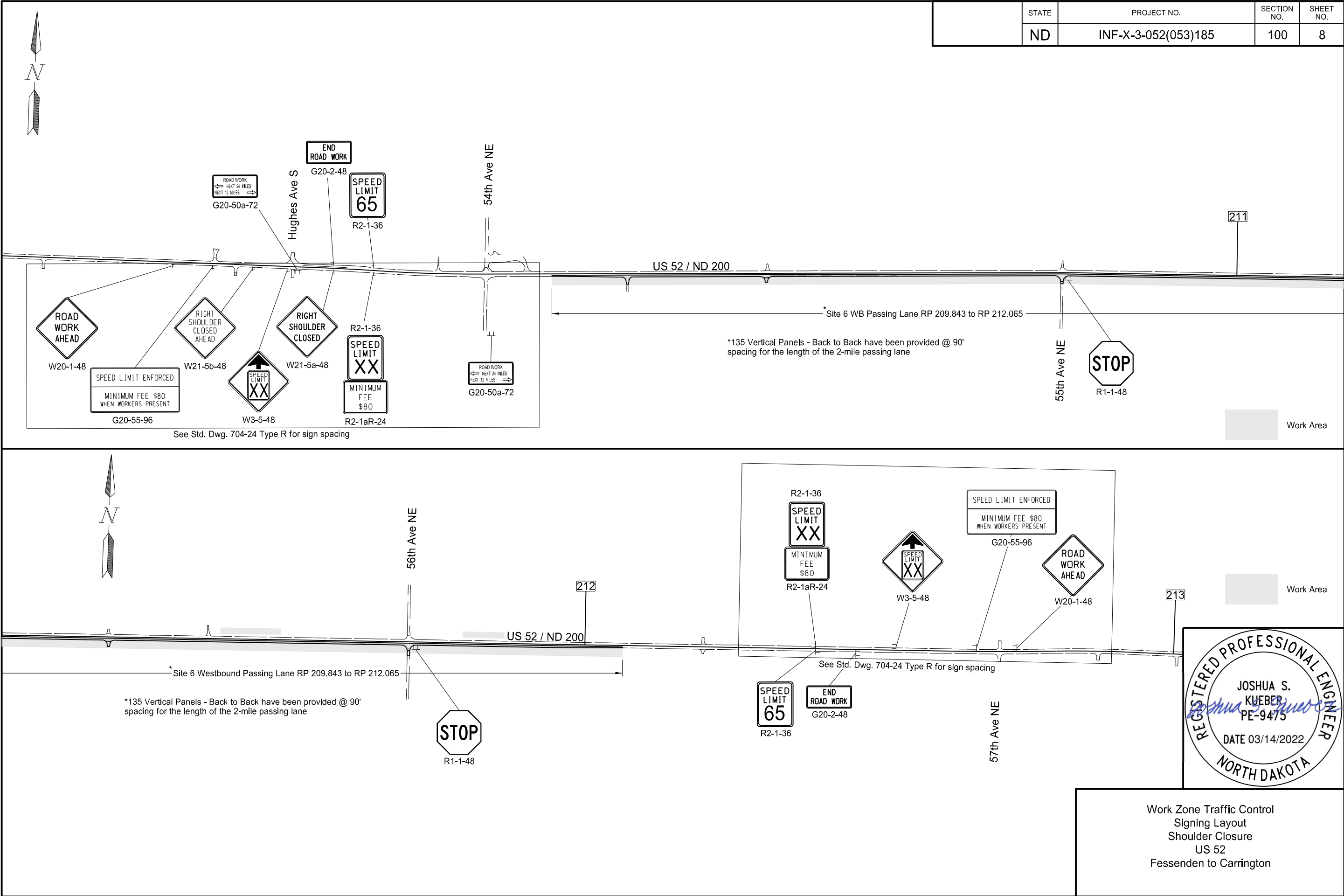
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	100	6



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	ND	INF-X-3-052(053)185	100	7

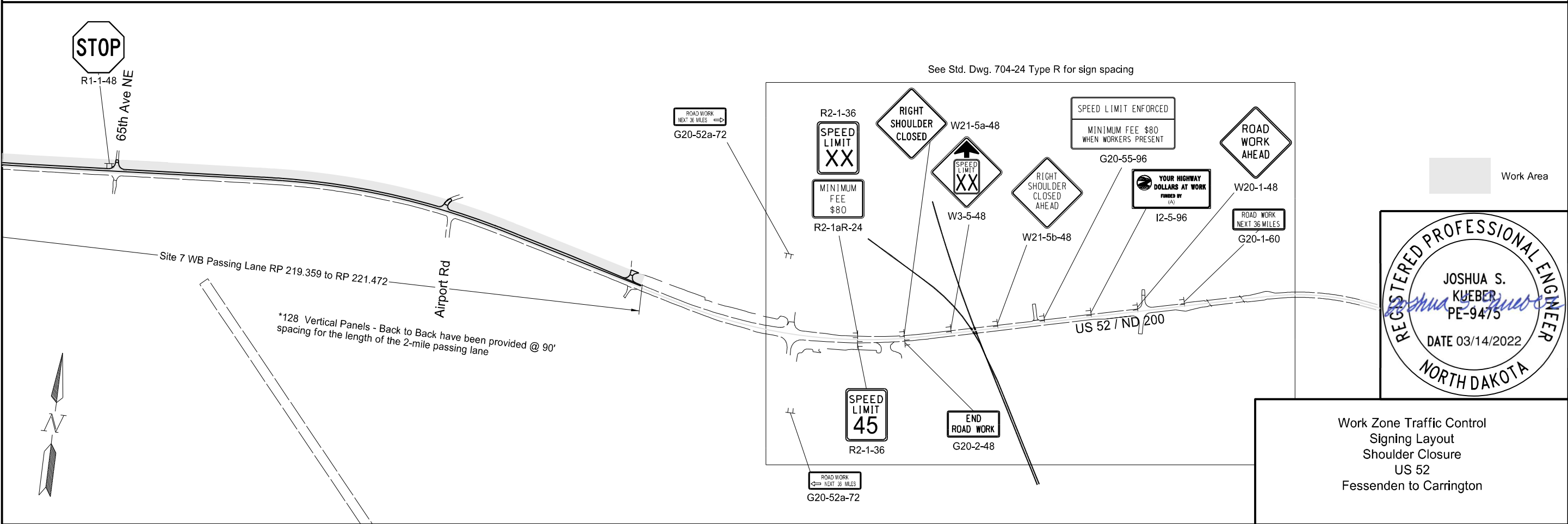
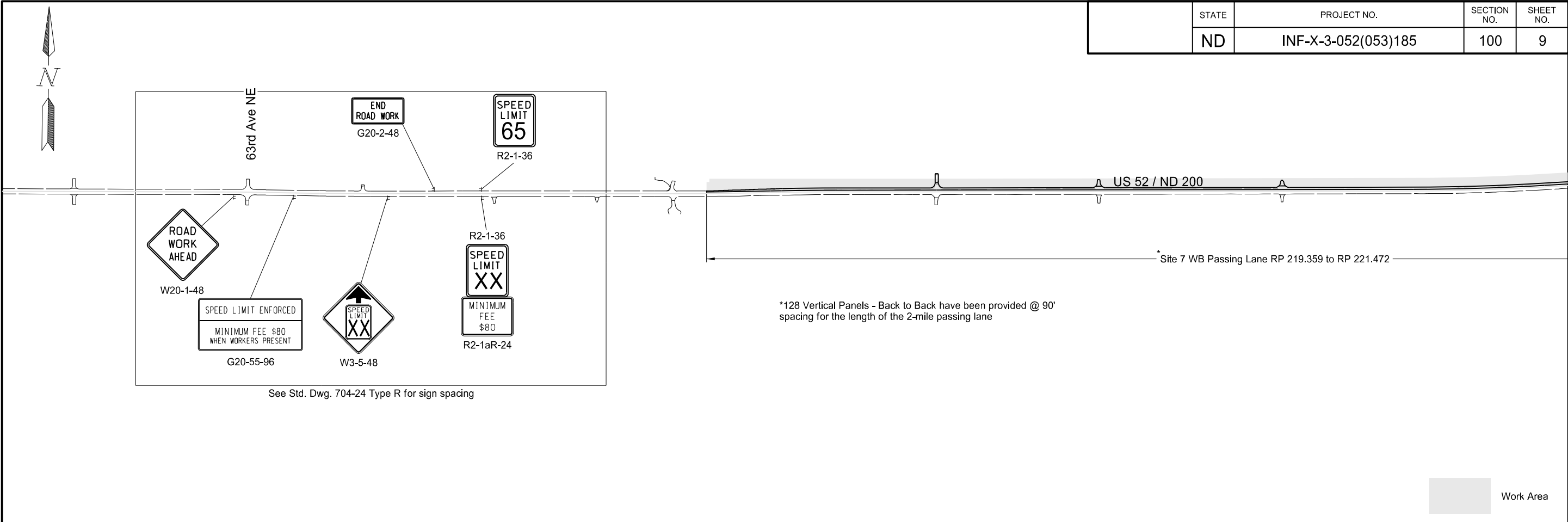


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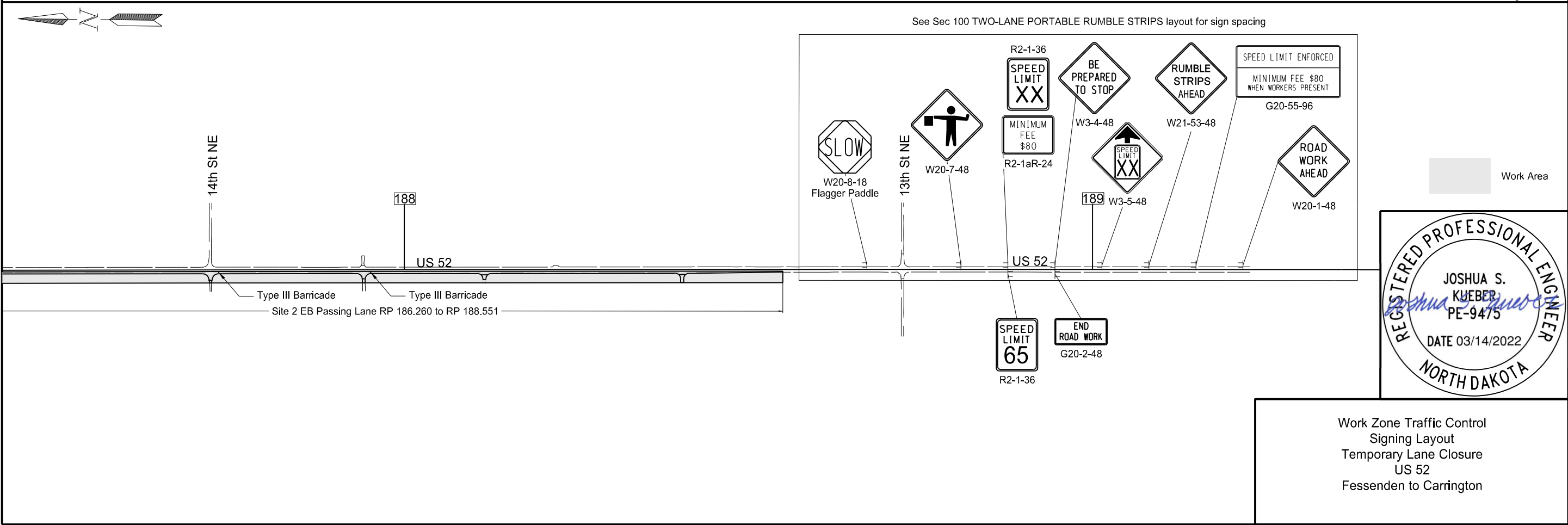
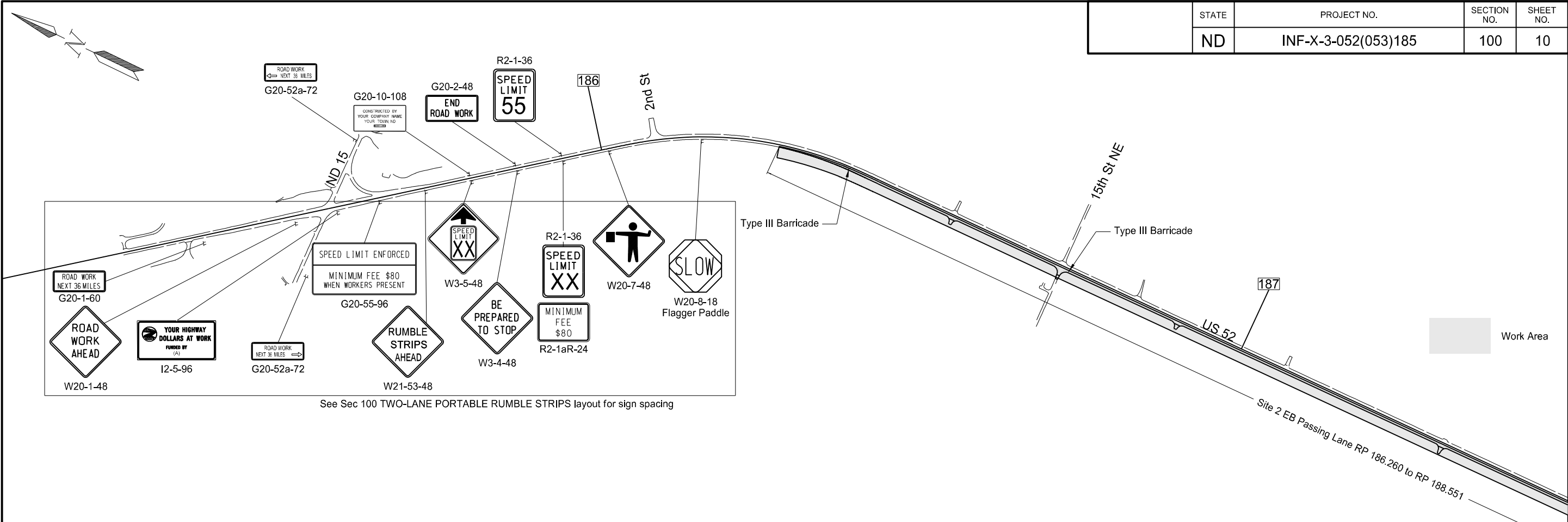


Work Zone Traffic Control
Signing Layout
Shoulder Closure
US 52
Fessenden to Carrington

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	100	9

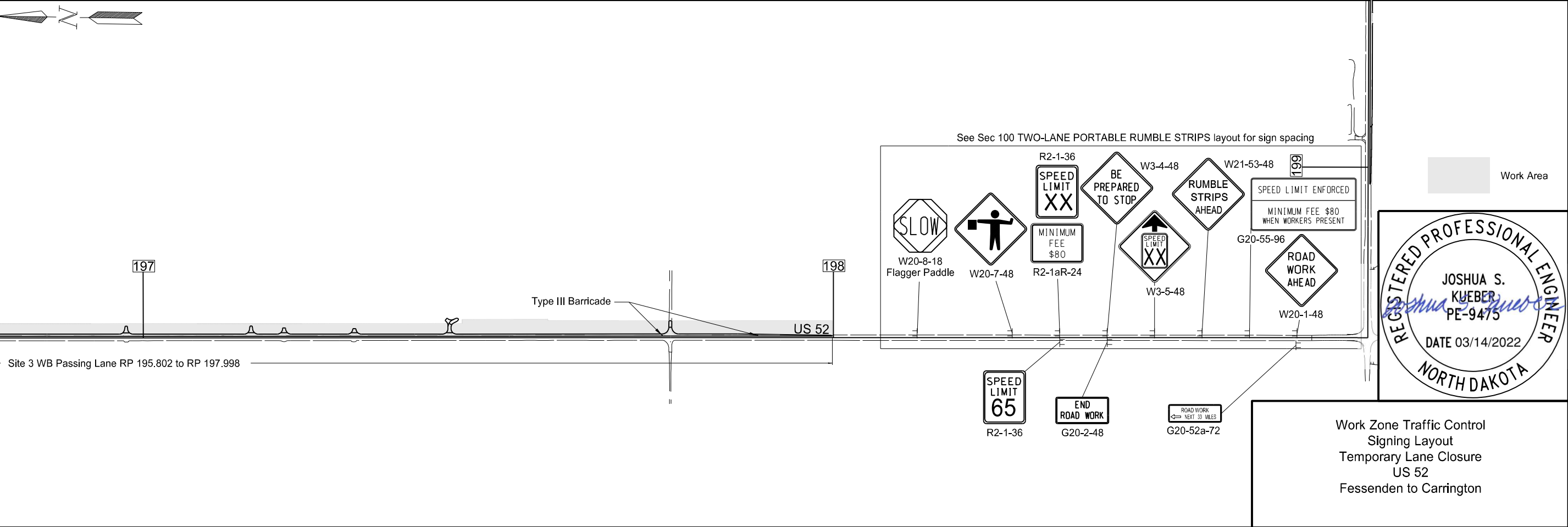
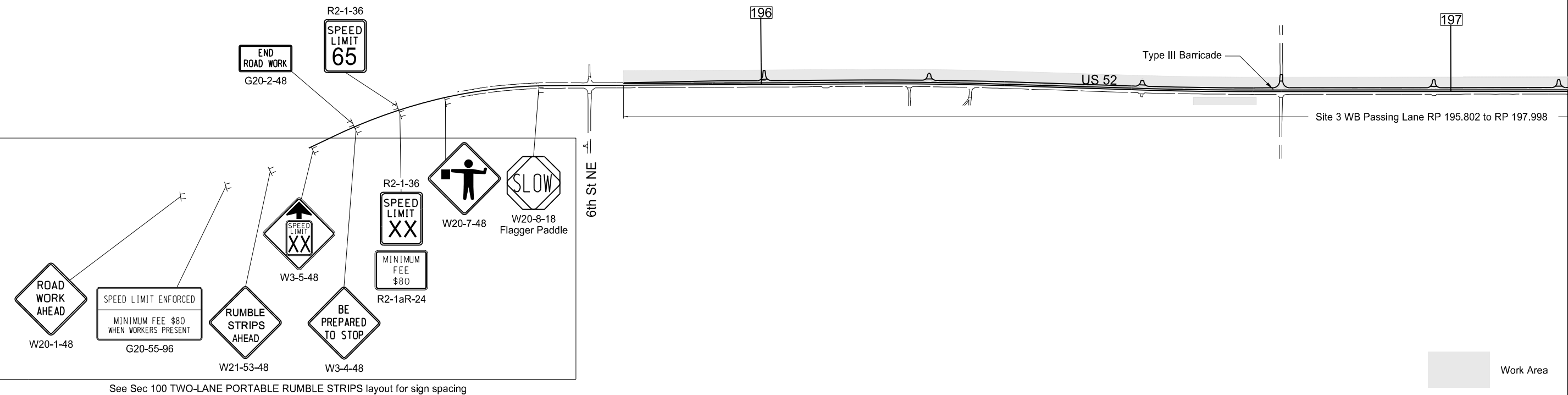


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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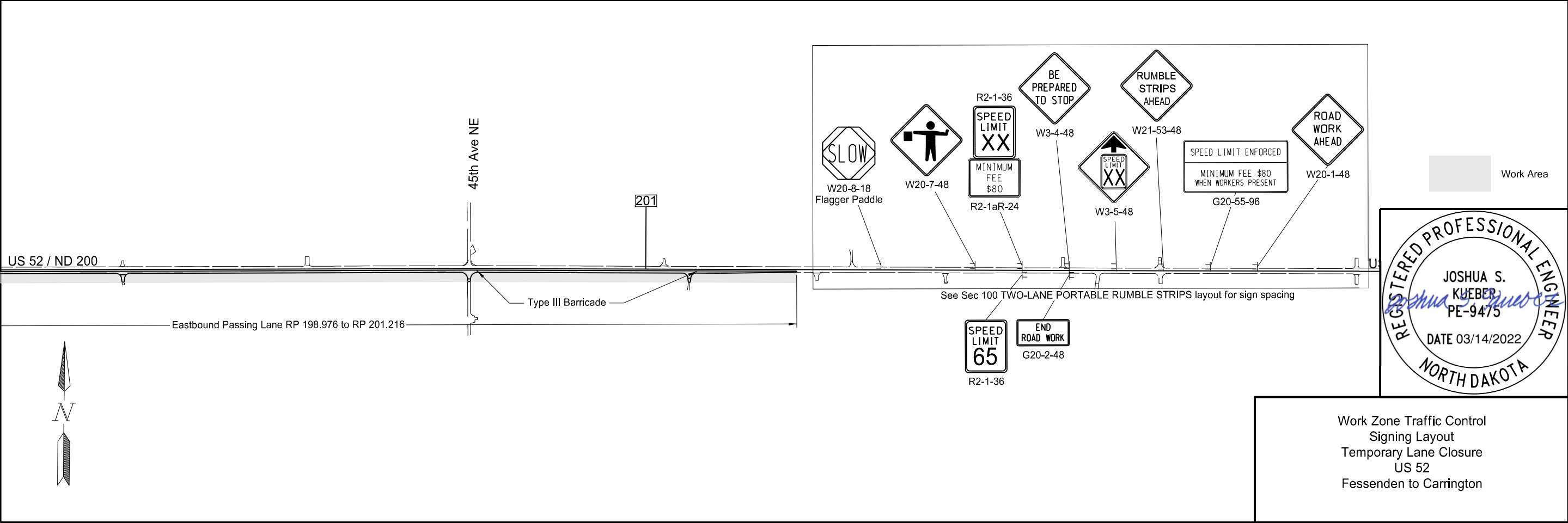
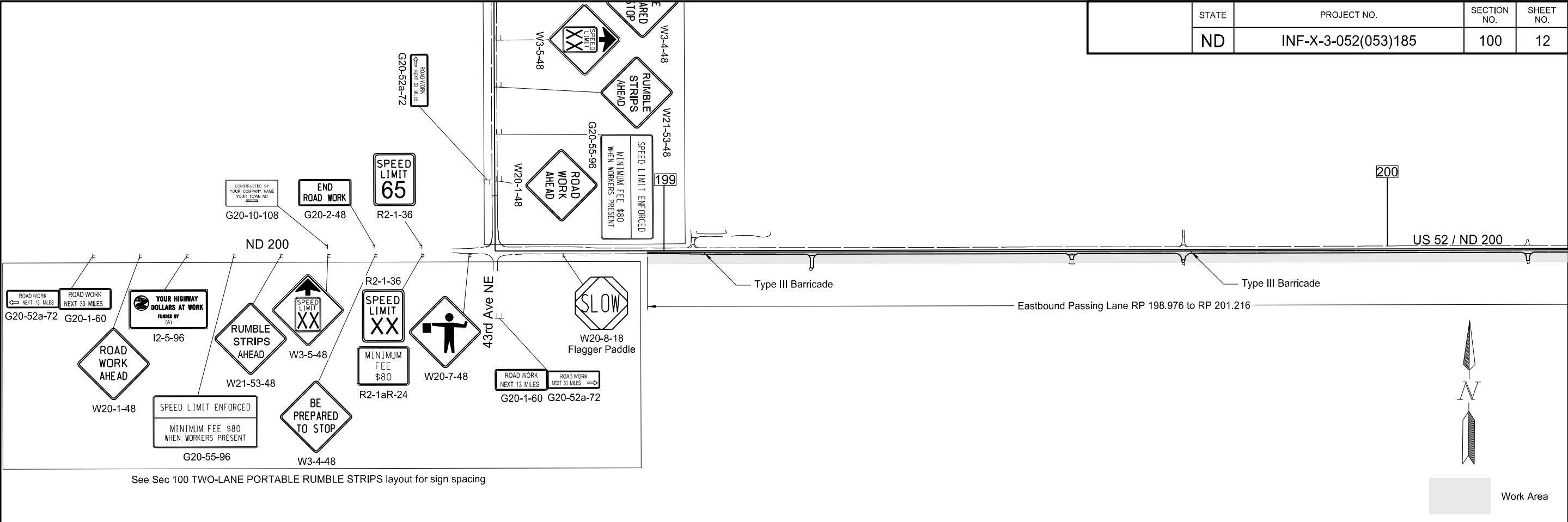


Work Zone Traffic Control
Signing Layout
Temporary Lane Closure
US 52
Fessenden to Carrington

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	100	11

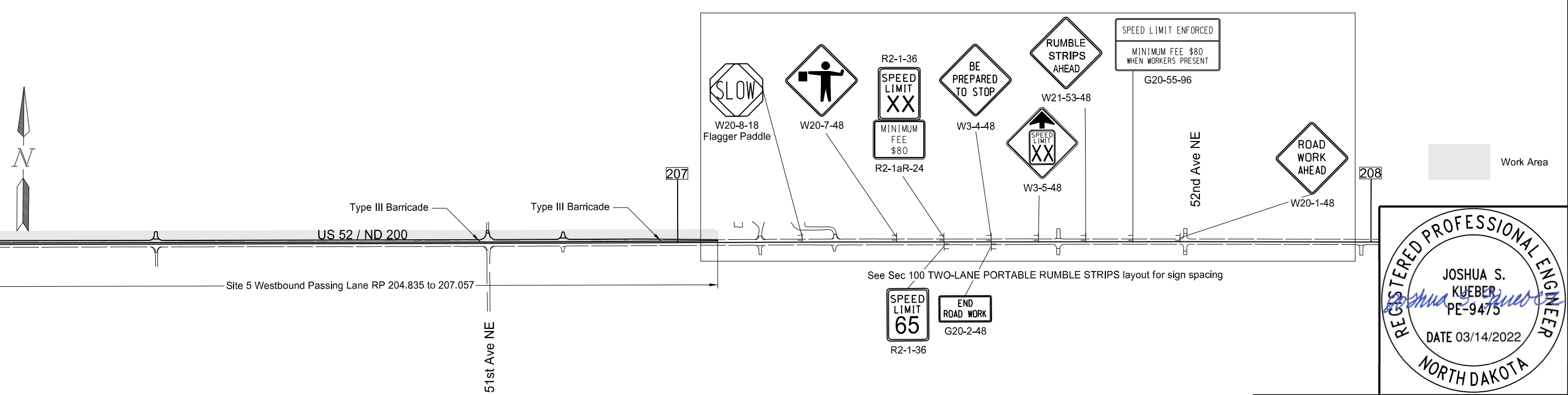
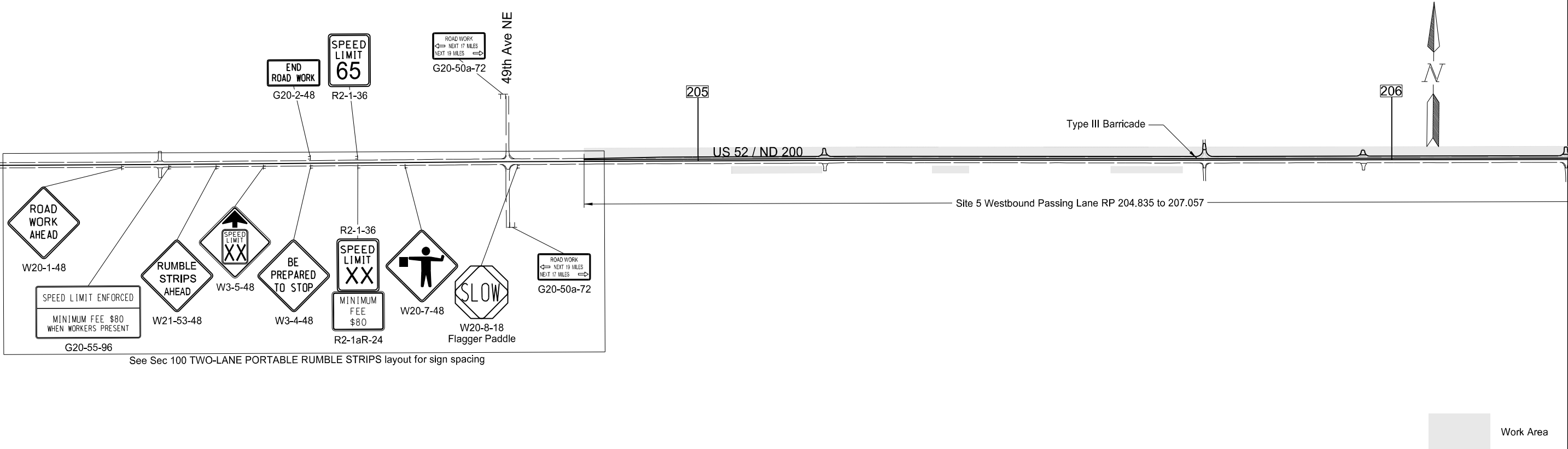


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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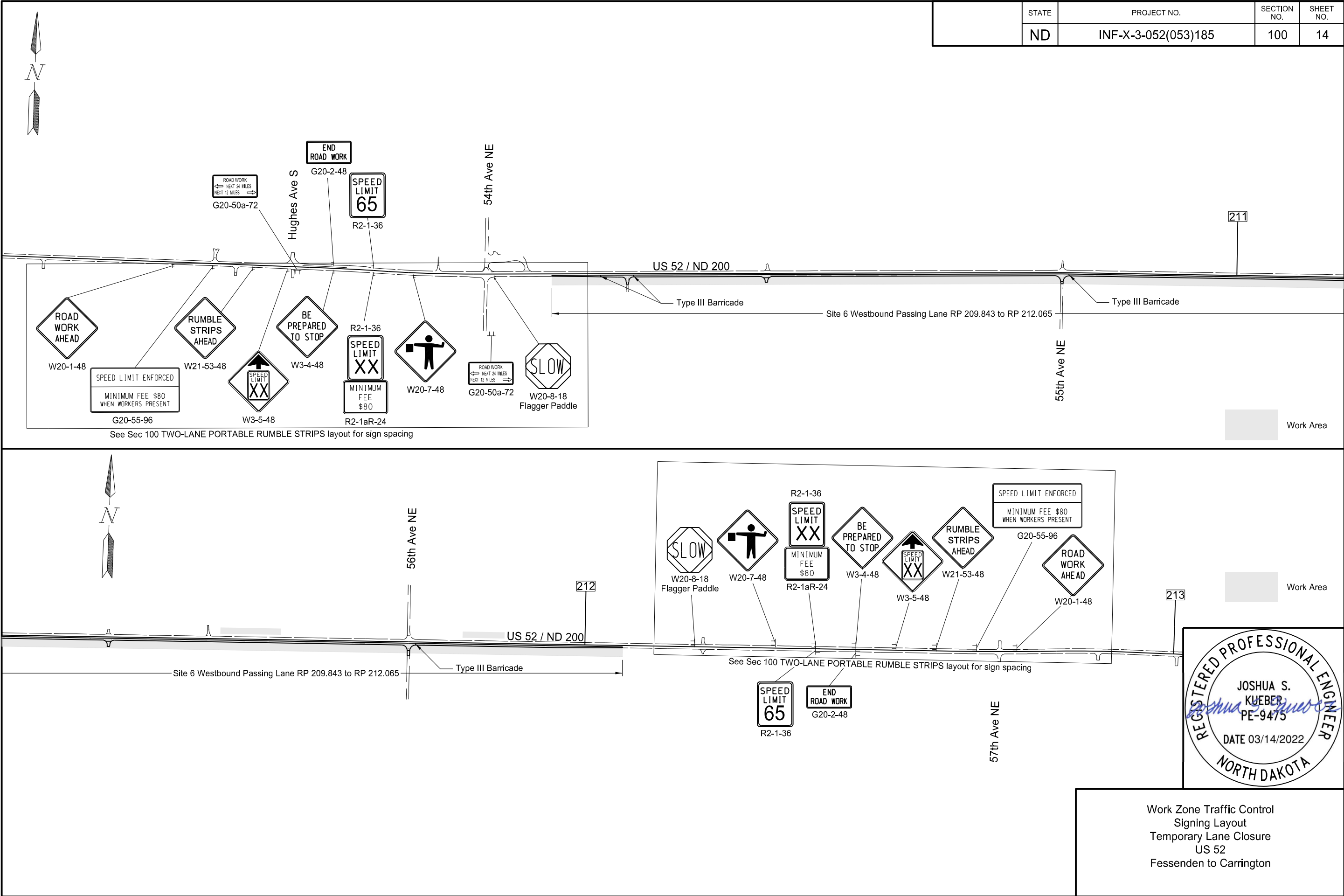
Work Zone Traffic Control
Signing Layout
Temporary Lane Closure
US 52
Fessenden to Carrington

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	100	13



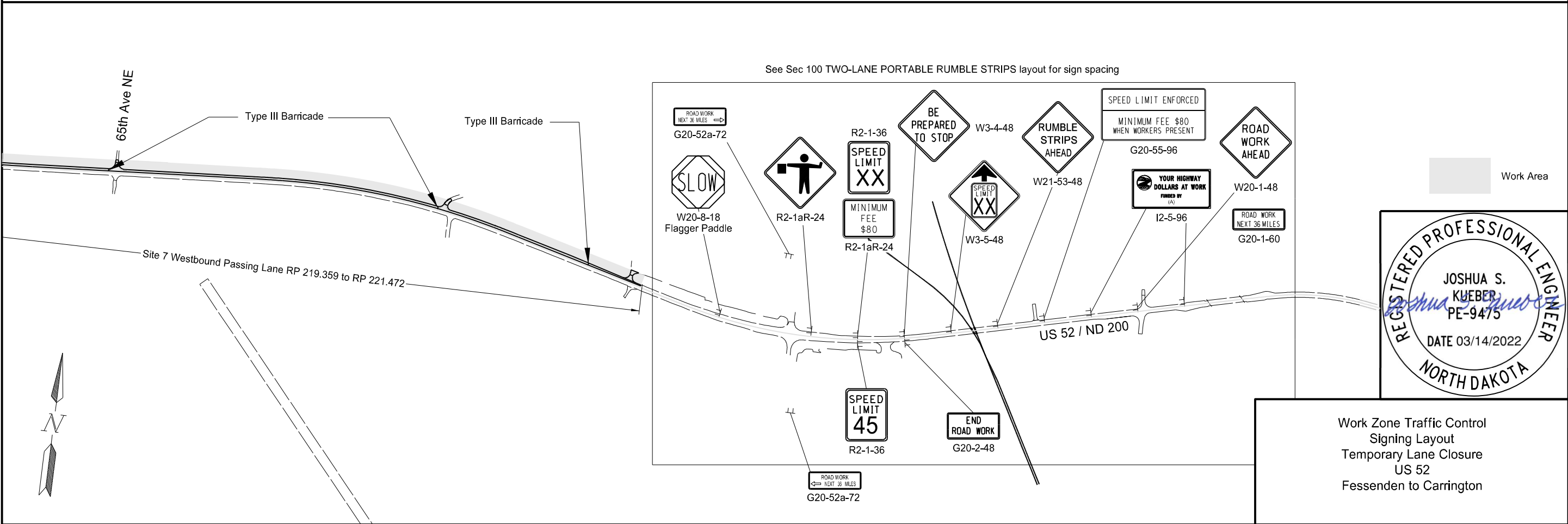
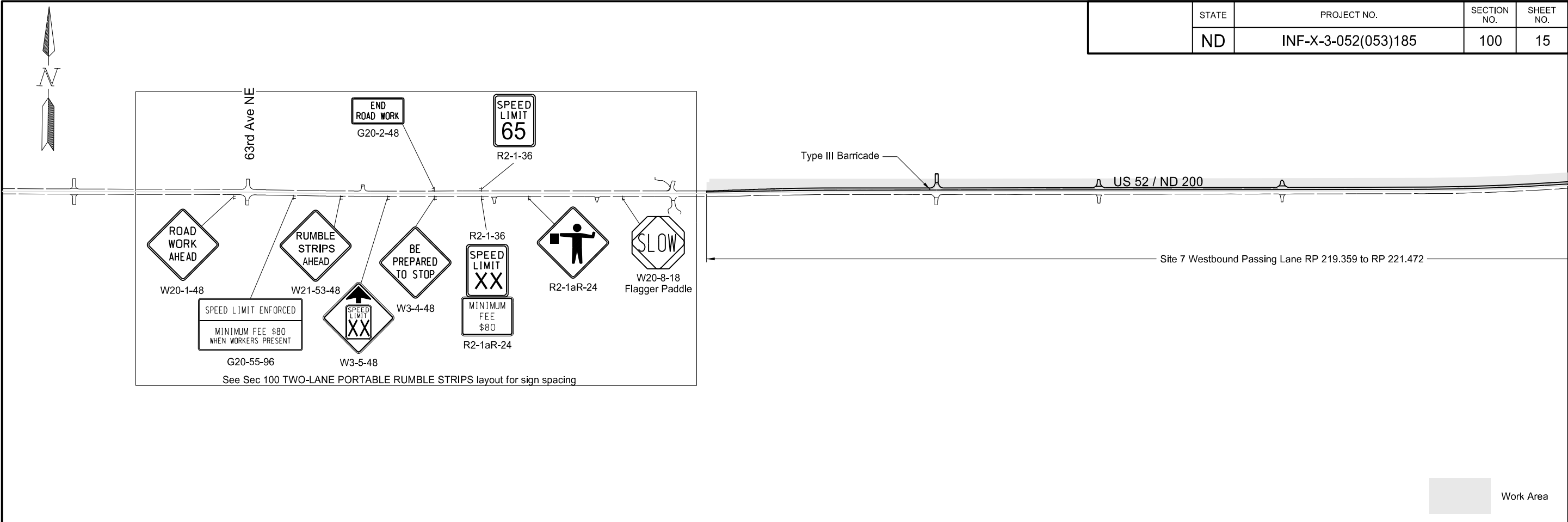
Work Zone Traffic Control
Signing Layout
Temporary Lane Closure
US 52
Fessenden to Carrington

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	100	14




Work Zone Traffic Control
Signing Layout
Temporary Lane Closure
US 52
Fessenden to Carrington

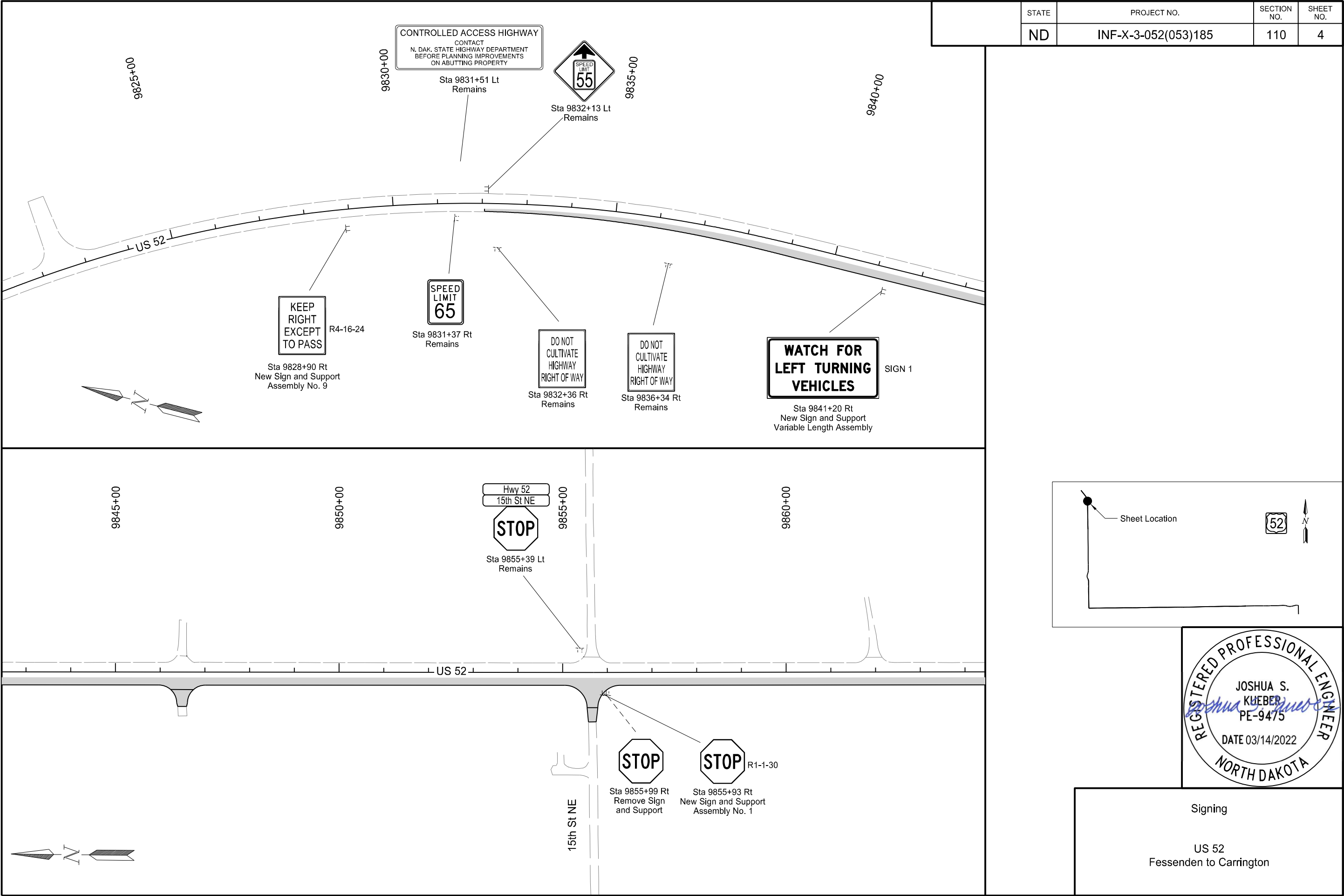
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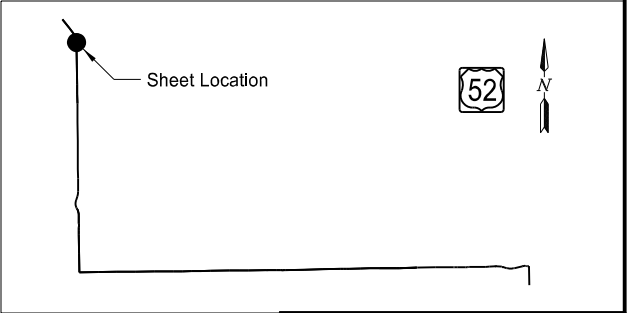
Work Zone Traffic Control
Signing Layout
Temporary Lane Closure
US 52
Fessenden to Carrington

																				STATE		PROJECT NO.		SECTION NO.	SHEET NO.		
																		N.D.		INF-X-3-052(053)185		110	1				
Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs		Sign Support Length				Vert Clearance FT	Support Size	Max Post Len LF	Sleeve Length				Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments				
			IV SF	XI SF	1st LF	2nd LF	3rd LF	4th LF				1st LF	2nd LF	3rd LF	4th LF												
RP186 Site 2 EB Passing Lane																											
9778+60 Rt	D17-2		12.3		11.0			5.0	2.5 x 2.5 12 ga	13.2	3.0				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1						
9828+90 Rt	R4-16	9		5.0	10.9			5.0	2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga									
9841+20 Rt	SIGN 1			16.5	10.7			5.0	2.5 x 2.5 10 ga	11.7	3.6				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga			1						
9855+93 Rt	R1-1	1		5.2	8.6			5.0	2 x 2 12 ga	10.5						1	4	2.25 x 2.25 12 ga									
9908+87 Rt	R1-1	1		5.2	8.7			5.0	2 x 2 12 ga	10.5						1	4	2.25 x 2.25 12 ga									
9927+30 Rt	W9-1	20			9.0	11.8		5.0	2.5 x 2.5 10 ga	12.9						1	4	3 x 3 7 ga			1						
9933+30 Rt	W4-2R	20			9.0	11.8		5.0	2.5 x 2.5 10 ga	12.9						1	4	3 x 3 7 ga			1						
9968+10 Rt	D17-1		14.0		11.3			5.0	2.5 x 2.5 12 ga	12.4	3.7				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1						
Sub Total			26.3	49.9		Total	84.8											Total	32.0			0	0	5			
RP195 Site 3 WB Passing Lane																											
10355+80 Lt	W4-2R	20		9.0	11.8			5.0	2.5 x 2.5 10 ga	12.9						1	4	3 x 3 7 ga			1						
10361+80 Lt	W9-1	20		9.0	11.8			5.0	2.5 x 2.5 10 ga	12.9						1	4	3 x 3 7 ga			1						
10386+25 Lt	Reset				10.4			5.0	2.25 x 2.25 12 ga	12.5						1	4	2.5 x 2.5 12 ga	1								
10439+08 Lt	R1-1			5.2	10.5			5.0	2.25 x 2.25 12 ga	12.5						1	4	2.5 x 2.5 12 ga	1								
10442+50 Lt	SIGN 1			16.5	10.7			5.0	2.5 x 2.5 10 ga	11.7	3.6				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga			1						
10454+80 Lt	R4-16	9		5.0	10.9			5.0	2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga									
10456+95 Rt	D17-2		12.3		11.0			5.0	2.5 x 2.5 12 ga	13.2	3.0				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1						
10484+10 Lt	D17-2		12.3		11.0			5.0	2.5 x 2.5 12 ga	13.2	3.0				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1						
Sub Total			24.6	44.7		Total	88.1											Total	32.0			2	0	5			
RP199 Site 4 EB Passing Lane																											
10499+45 Rt	R4-16	9		5.0	10.9			5.0	2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga									
10500+38 Lt	Reset				12.8	13.3		5.0	2.5 x 2.5 10 ga	13.9	3.8	4.4			2.19 x 2.19 10 ga	2	4	3 x 3 7 ga	1		2						
10504+38 Lt	Reset				11.3	11.7	12.0	5.0	2.5 x 2.5 12 ga	15.0	2.3	2.7	3.1		2.25 x 2.25 12 ga	3	4	3 x 3 7 ga	1		3						
10508+38 Lt	Reset				12.6	13.2		5.0	2.5 x 2.5 12 ga	13.7	3.9	4.4			2.25 x 2.25 12 ga	2	4	3 x 3 7 ga	1		2						
10511+75 Rt	SIGN 1			16.5	10.7			5.0	2.5 x 2.5 10 ga	11.7	3.6				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga			1						
10598+04 Rt	R1-1			5.2	10.2			5.0	2.25 x 2.25 12 ga	12.2						1	4	2.5 x 2.5 12 ga	1								
10599+00 Rt	W9-1	20		9.0	11.8			5.0	2.5 x 2.5 10 ga	12.9						1	4	3 x 3 7 ga			1						
10605+00 Rt	W4-2R	20		9.0	11.8			5.0	2.5 x 2.5 10 ga	12.9						1	4	3 x 3 7 ga			1						
10639+80 Rt	D17-1		14.0		11.3			5.0	2.5 x 2.5 12 ga	12.4	3.7				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1						
14145+55 Rt	D17-2		12.3		11.0			5.0	2.5 x 2.5 12 ga	13.2	3.0				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1	ND 200 Station					
Sub Total			26.3	44.7		Total	164.6											Total	56.0			4	0	12			
																							Sign Summary Perforated Tube US 52 Fessenden to Carrington				
3/14/22 10:38:19AM Page 1 of 2																											

																					STATE		PROJECT NO.		SECTION NO.	SHEET NO.
																					N.D.		INF-X-3-052(053)185		110	2
Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs		Sign Support Length				Vert Clear- ance FT	Support Size	Max Post Len LF	Sleeve Length				Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments			
			IV SF	XI SF	1st LF	2nd LF	3rd LF	4th LF				1st LF	2nd LF	3rd LF	4th LF											
RP205 Site 5 WB Passing Lane																										
10797+46 Lt	D17-1		14.0		11.3				5.0	2.5 x 2.5 12 ga	12.4	3.7			2.25 x 2.25 12 ga	1	4	3 x 3 7 ga				1				
10832+26 Lt	W4-2R	20		9.0	11.8				5.0	2.5 x 2.5 10 ga	12.9					1	4	3 x 3 7 ga				1				
10838+26 Lt	W9-1	20		9.0	11.8				5.0	2.5 x 2.5 10 ga	12.9					1	4	3 x 3 7 ga				1				
10924+20 Lt	SIGN 1		16.5	16.5	10.7				5.0	2.5 x 2.5 10 ga	11.7	3.6			2.19 x 2.19 10 ga	1	4	3 x 3 7 ga				1				
10936+50 Lt	R4-16	9		5.0	10.9				5.0	2 x 2 12 ga	11.5					1	4	2.25 x 2.25 12 ga								
10979+00 Lt	D17-2		12.3		11.0				5.0	2.5 x 2.5 12 ga	13.2	3.0			2.25 x 2.25 12 ga	1	4	3 x 3 7 ga				1				
Sub Total			42.8	39.5		Total	67.5								Total	24.0			0	0		5				
RP210 Site 6 EB Passing Lane																										
11032+20 Rt	D17-2				11.0				5.0	2.5 x 2.5 12 ga	13.2	3.0			2.25 x 2.25 12 ga	1	4	3 x 3 7 ga				1				
11074+70 Rt	R4-16	9		5.0	10.9				5.0	2 x 2 12 ga	11.5					1	4	2.25 x 2.25 12 ga								
11087+00 Rt	SIGN 1			16.5	10.7				5.0	2.5 x 2.5 10 ga	11.7	3.6			2.19 x 2.19 10 ga	1	4	3 x 3 7 ga				1				
11125+01 Rt	R1-1			5.2	10.1				5.0	2.25 x 2.25 12 ga	12.2					1	4	2.5 x 2.5 12 ga	1							
11140+42 Rt	Reset				12.0				5.0	2.5 x 2.5 10 ga	12.7					1	4	3 x 3 7 ga	1			1				
11173+00 Rt	W9-1	20		9.0	11.8				5.0	2.5 x 2.5 10 ga	12.9					1	4	3 x 3 7 ga				1				
11177+98 Rt	R1-1			5.2	10.2				5.0	2.25 x 2.25 12 ga	12.2					1	4	2.5 x 2.5 12 ga	1							
11179+00 Rt	W4-2R	20		9.0	11.8				5.0	2.5 x 2.5 10 ga	12.9					1	4	3 x 3 7 ga				1				
Sub Total			0.0	49.9		Total	88.5								Total	32.0			3	0		5				
RP219 Site 7 WB Passing Lane																										
11599+25 Lt	W4-2R	20		9.0	11.8				5.0	2.5 x 2.5 10 ga	12.9					1	4	3 x 3 7 ga				1				
11606+00 Lt	W9-1	20		9.0	11.8				5.0	2.5 x 2.5 10 ga	12.9					1	4	3 x 3 7 ga				1				
11652+54 Lt	R1-1			5.2	10.2				5.0	2.25 x 2.25 12 ga	12.2					1	4	2.5 x 2.5 12 ga	1							
11682+86 Lt	Reset	400			11.8				5.0	2.5 x 2.5 12 ga	13.9					1	4	3 x 3 7 ga	1							
11686+40 Lt	SIGN 1			16.5	10.7				5.0	2.5 x 2.5 10 ga	11.7	3.6			2.19 x 2.19 10 ga	1	4	3 x 3 7 ga				1				
11691+64 Lt	Reset	9			11.1				5.0	2 x 2 12 ga	11.5					1	4	2.25 x 2.25 12 ga	1							
11694+01 Lt	Reset	9			10.9				5.0	2 x 2 12 ga	11.5					1	4	2.25 x 2.25 12 ga	1							
11698+70 Lt	R4-16	9		5.0	10.9				5.0	2 x 2 12 ga	11.5					1	4	2.25 x 2.25 12 ga								
11745+00 Lt	D17-2		12.3		11.0				5.0	2.5 x 2.5 12 ga	13.2	3.0			2.25 x 2.25 12 ga	1	4	3 x 3 7 ga				1				
Sub Total			12.3	44.7		Total	100.2								Total	36.0			4	0		4				
Grand Total			132.3	273.4		Total	593.7								Total	212	0		13	0		36				

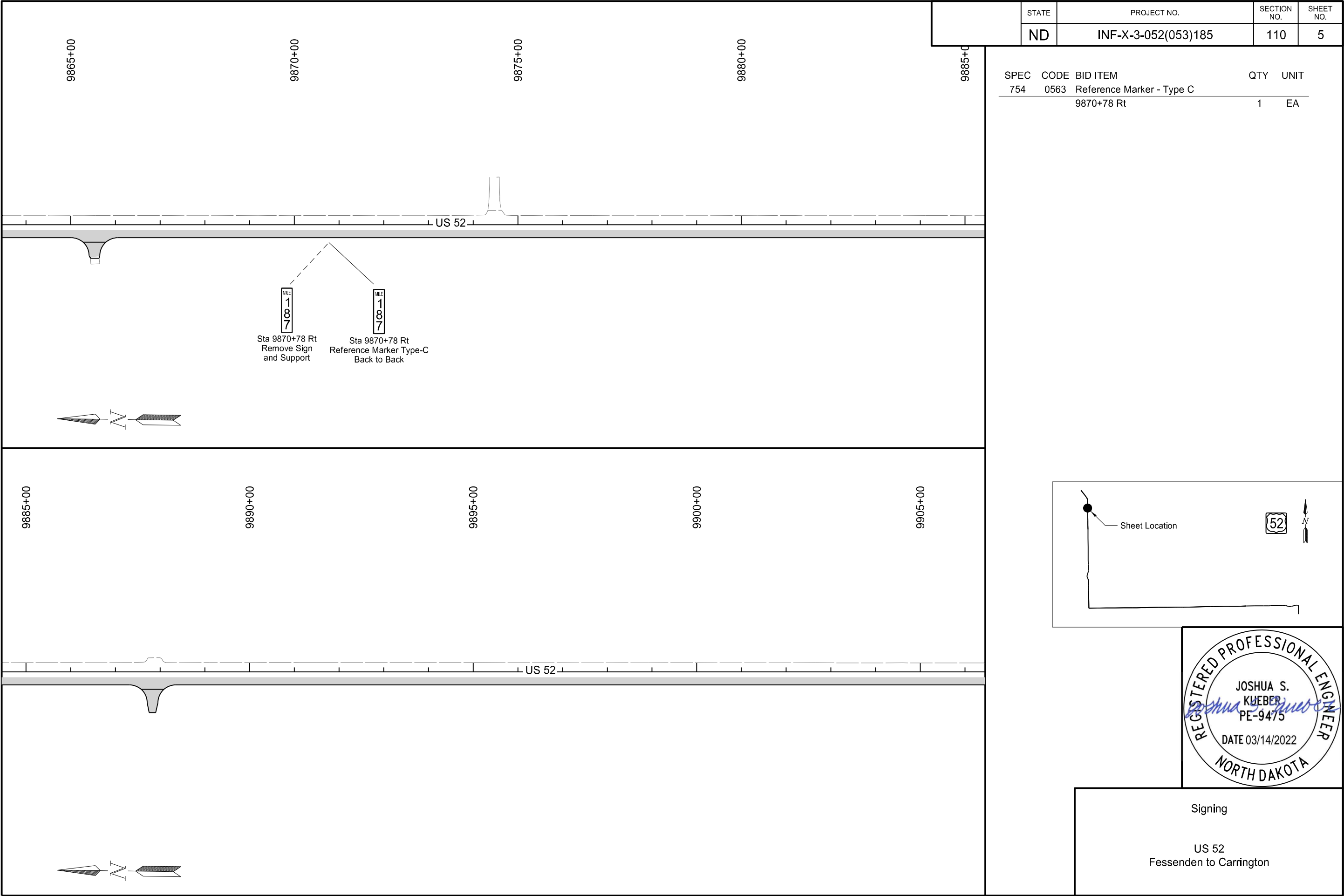


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ND	INF-X-3-052(053)185	110	4



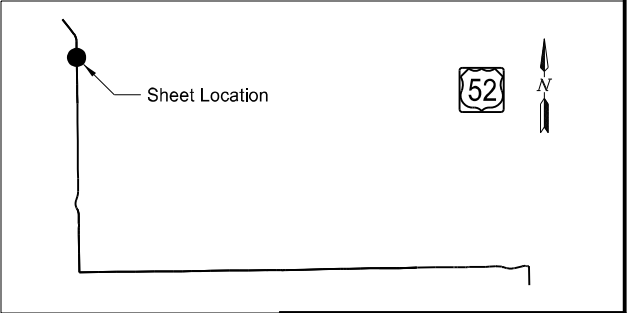
Signing

US 52
Fessenden to Carrington



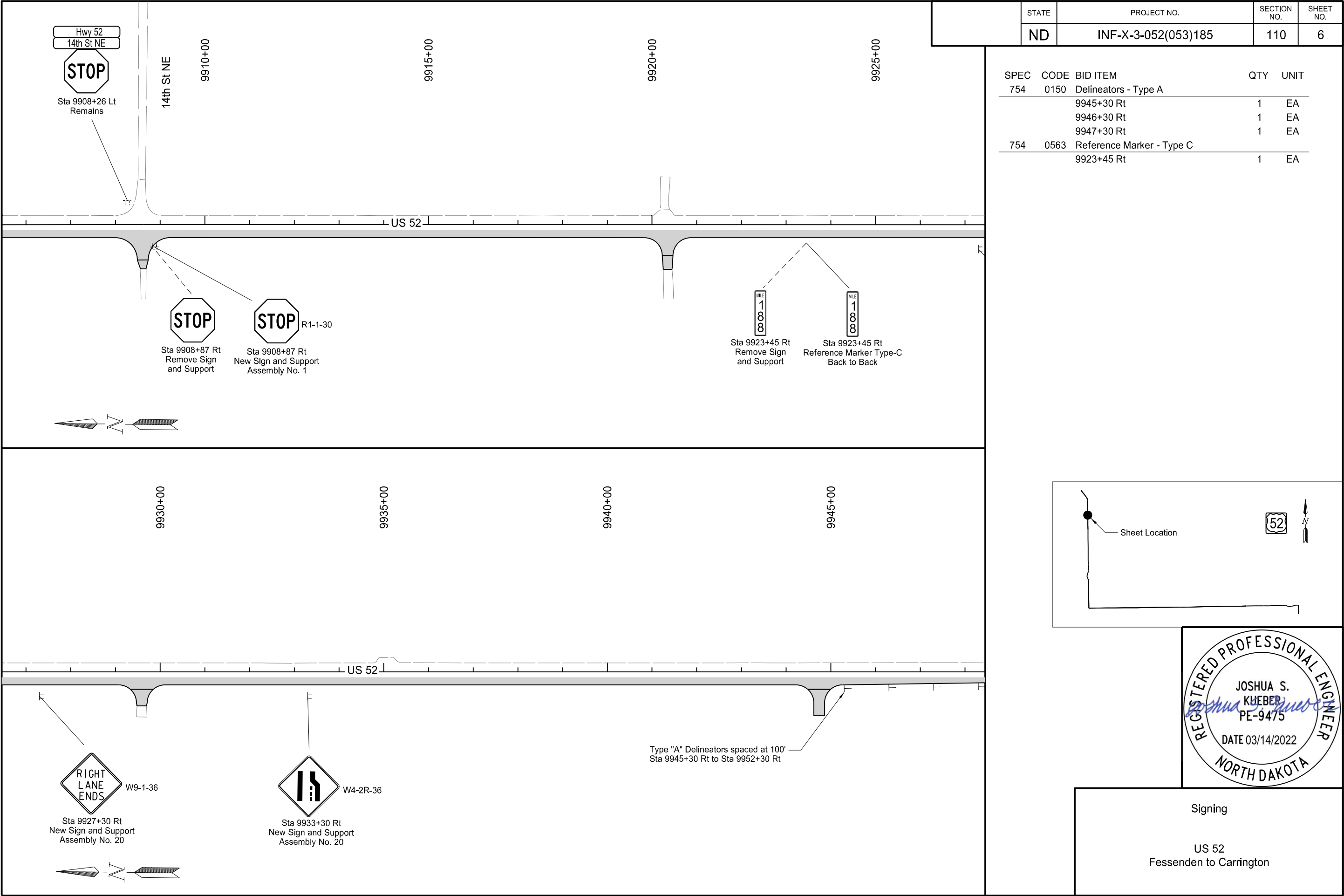
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ND	INF-X-3-052(053)185	110	5

SPEC	CODE	BID ITEM	QTY	UNIT
754	0563	Reference Marker - Type C		
		9870+78 Rt	1	EA



Signing

US 52
Fessenden to Carrington



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
		110	6

SPEC	CODE	BID ITEM	QTY	UNIT
754	0150	Delineators - Type A		
		9945+30 Rt	1	EA
		9946+30 Rt	1	EA
		9947+30 Rt	1	EA
754	0563	Reference Marker - Type C		
		9923+45 Rt	1	EA

Sheet Location

REGISTERED PROFESSIONAL ENGINEER

JOSHUA S. KUEBER

PE-9475

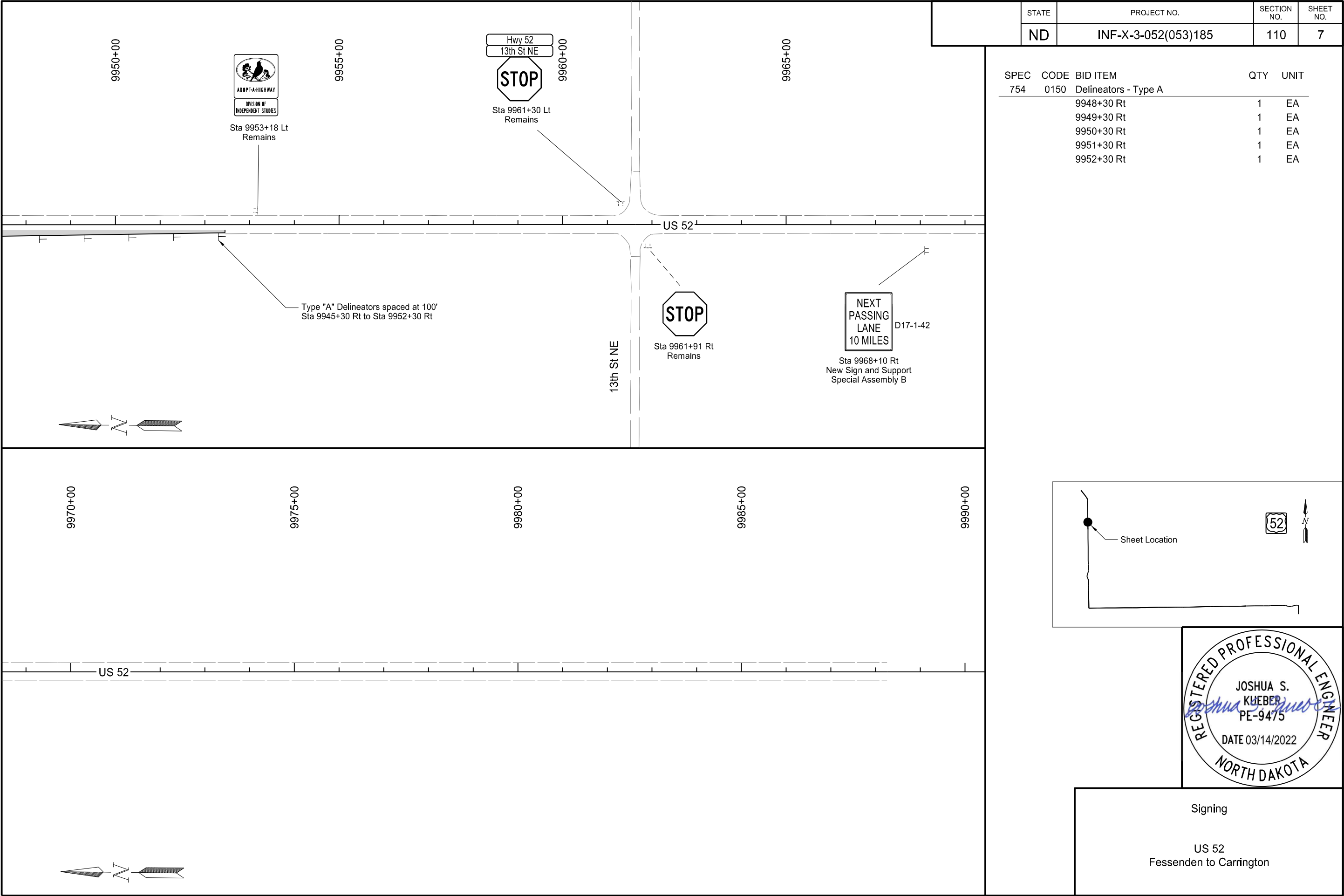
DATE 03/14/2022

NORTH DAKOTA

Signing

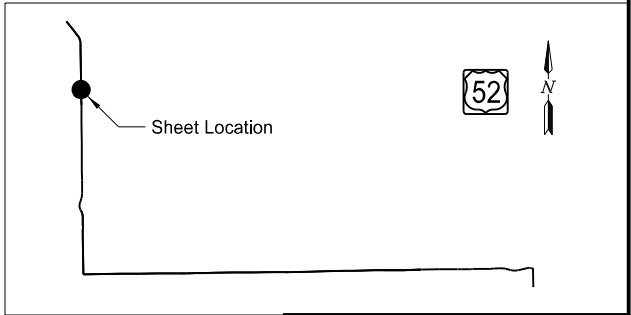
US 52

Fessenden to Carrington



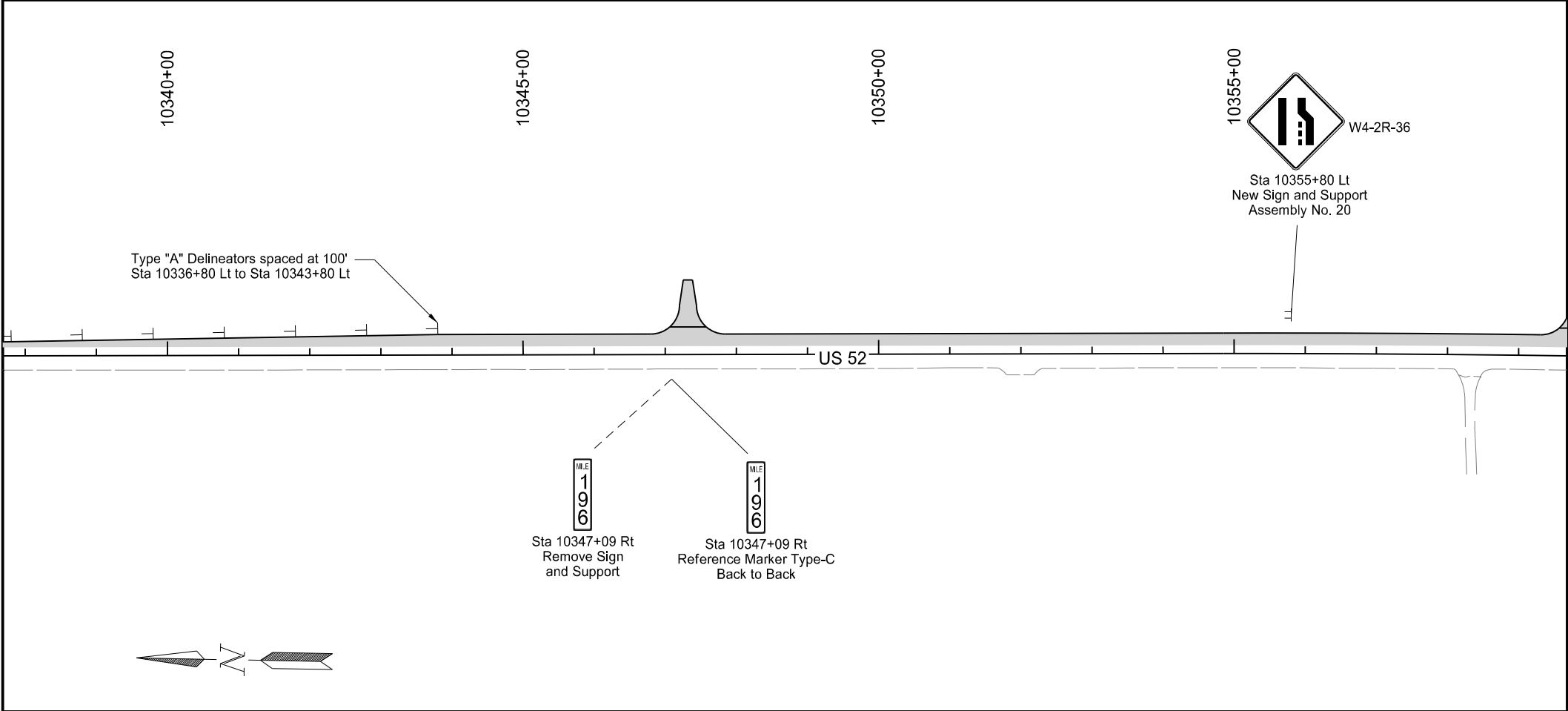
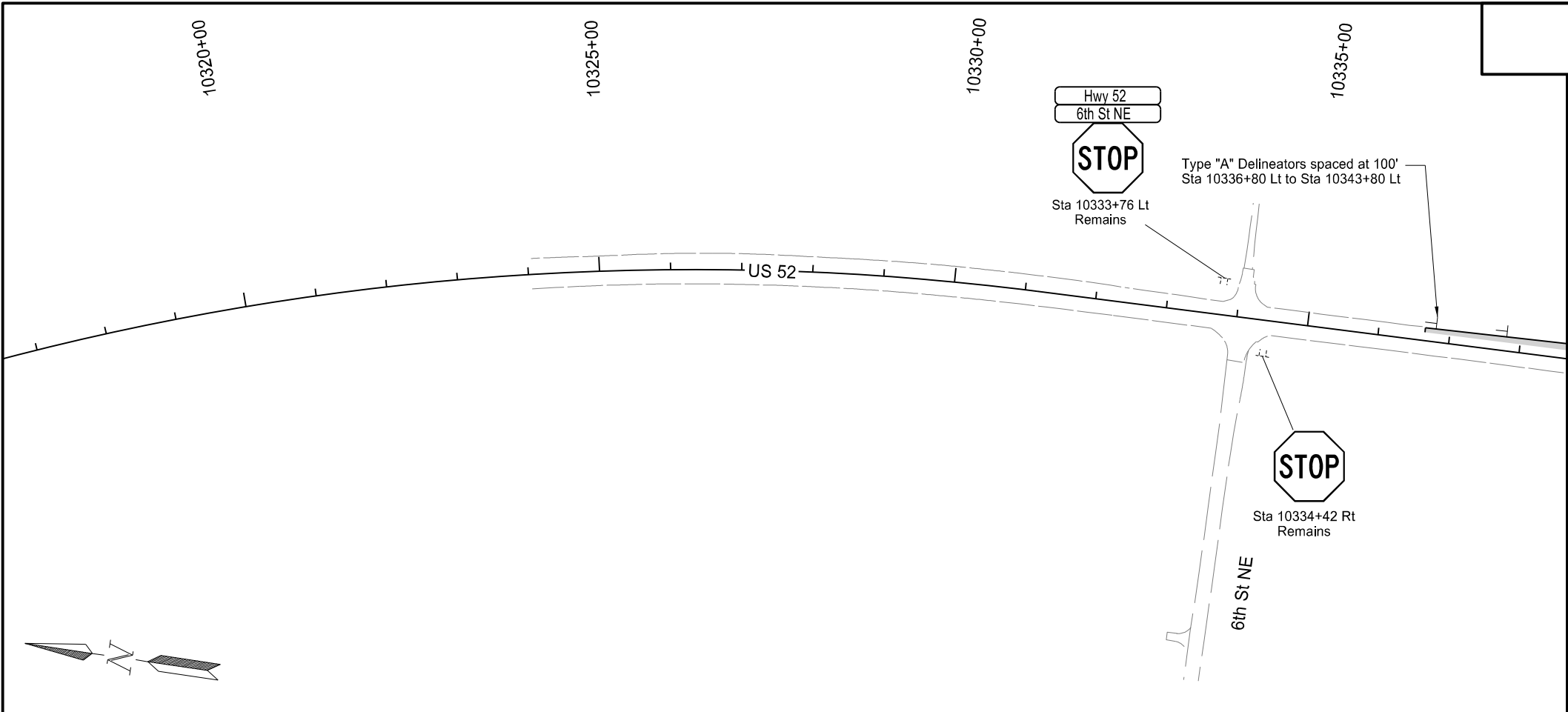
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	INF-X-3-052(053)185	110	7

SPEC	CODE	BID ITEM	QTY	UNIT
754	0150	Delineators - Type A		
		9948+30 Rt	1	EA
		9949+30 Rt	1	EA
		9950+30 Rt	1	EA
		9951+30 Rt	1	EA
		9952+30 Rt	1	EA



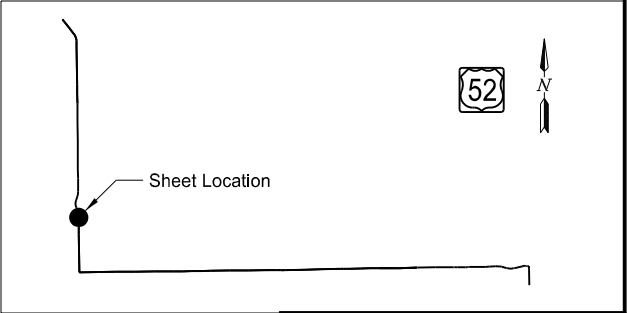
Signing

US 52
Fessenden to Carrington



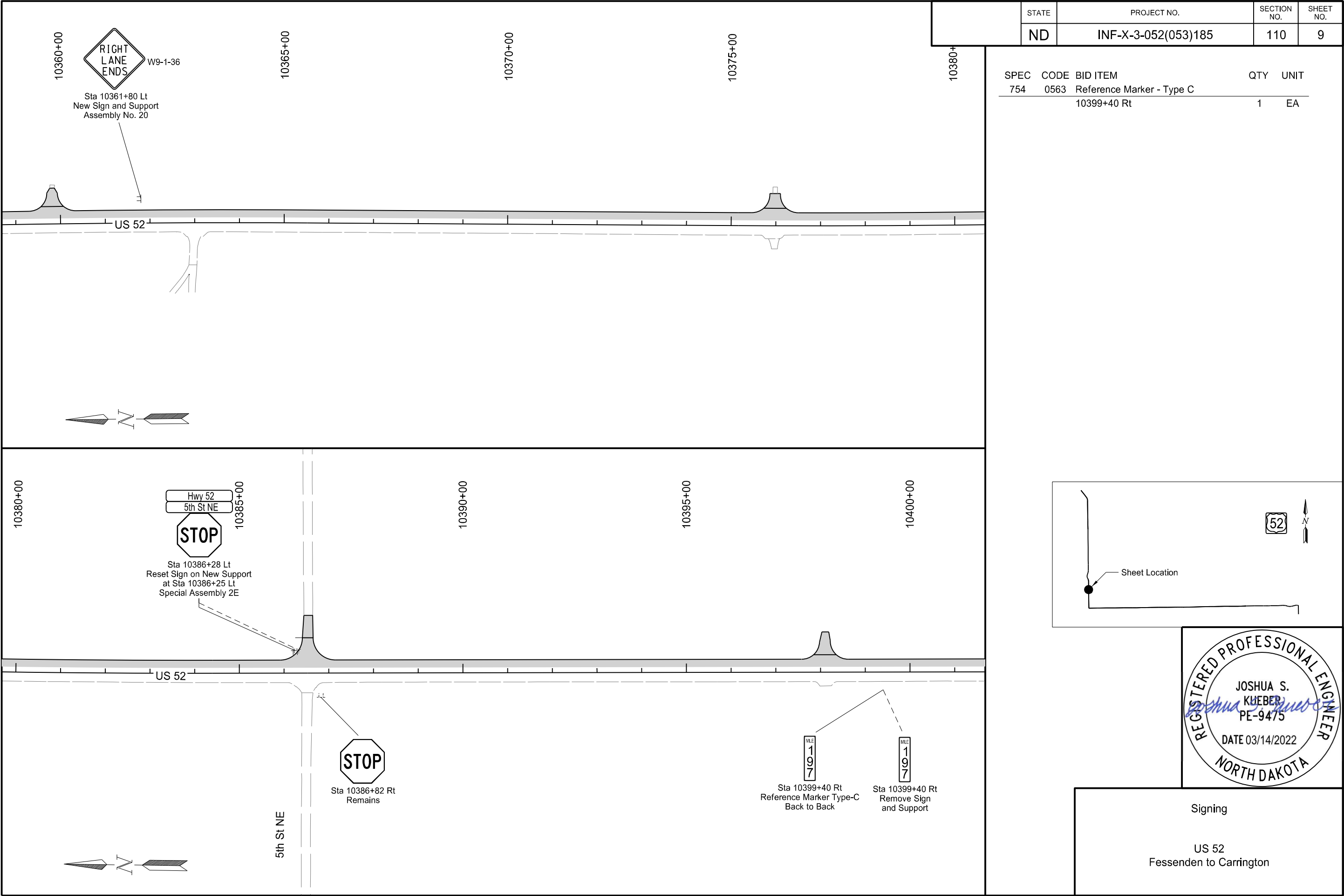
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	INF-X-3-052(053)185	110	8

SPEC	CODE	BID ITEM	QTY	UNIT
754	0150	Delineators - Type A		
		10336+80 Lt	1	EA
		10337+80 Lt	1	EA
		10338+80 Lt	1	EA
		10339+80 Lt	1	EA
		10340+80 Lt	1	EA
		10341+80 Lt	1	EA
		10342+80 Lt	1	EA
		10343+80 Lt	1	EA
754	0563	Reference Marker - Type C		
		10347+09 Rt	1	EA



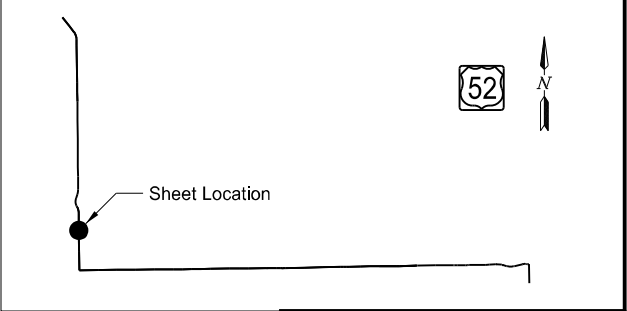
Signing

US 52
Fessenden to Carrington



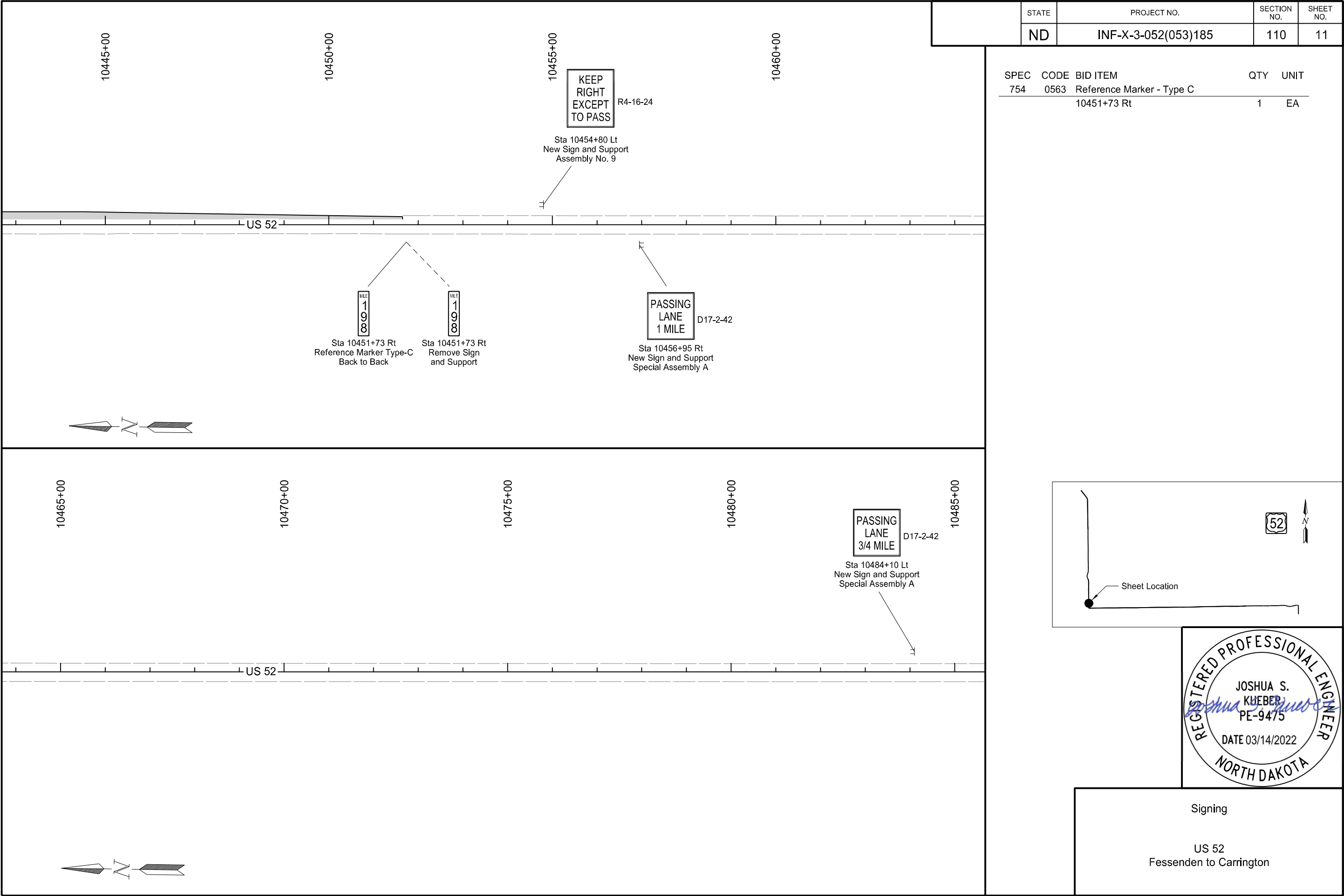
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ND	INF-X-3-052(053)185	110	9

SPEC	CODE	BID ITEM	QTY	UNIT
754	0563	Reference Marker - Type C		
		10399+40 Rt	1	EA



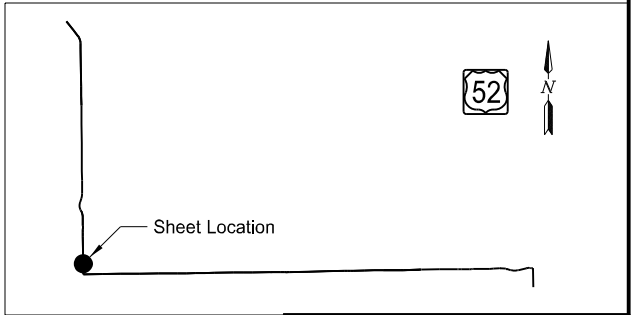
Signing

US 52
Fessenden to Carrington



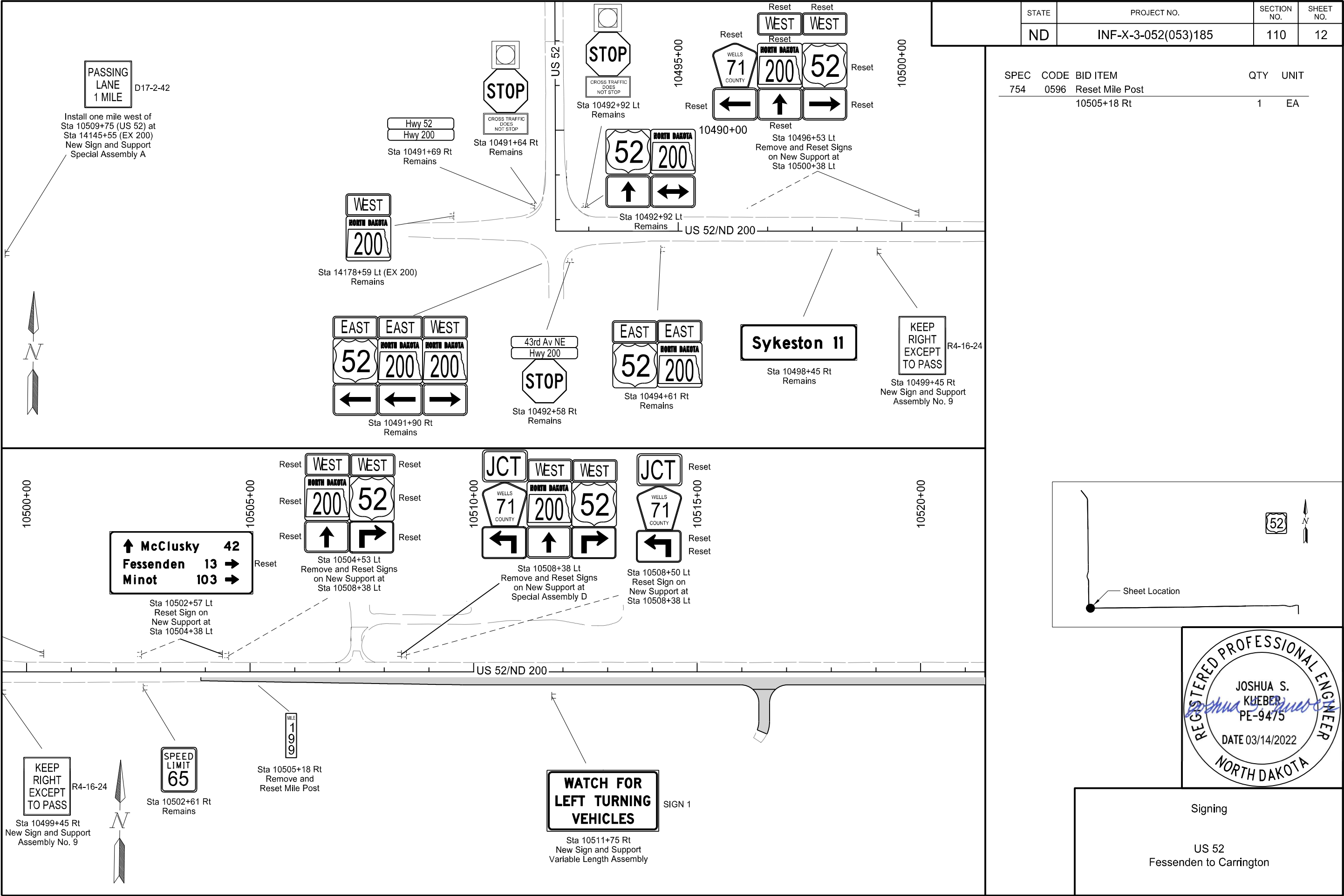
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	INF-X-3-052(053)185	110	11

SPEC	CODE	BID ITEM	QTY	UNIT
754	0563	Reference Marker - Type C		
		10451+73 Rt	1	EA



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US 52
Fessenden to Carrington



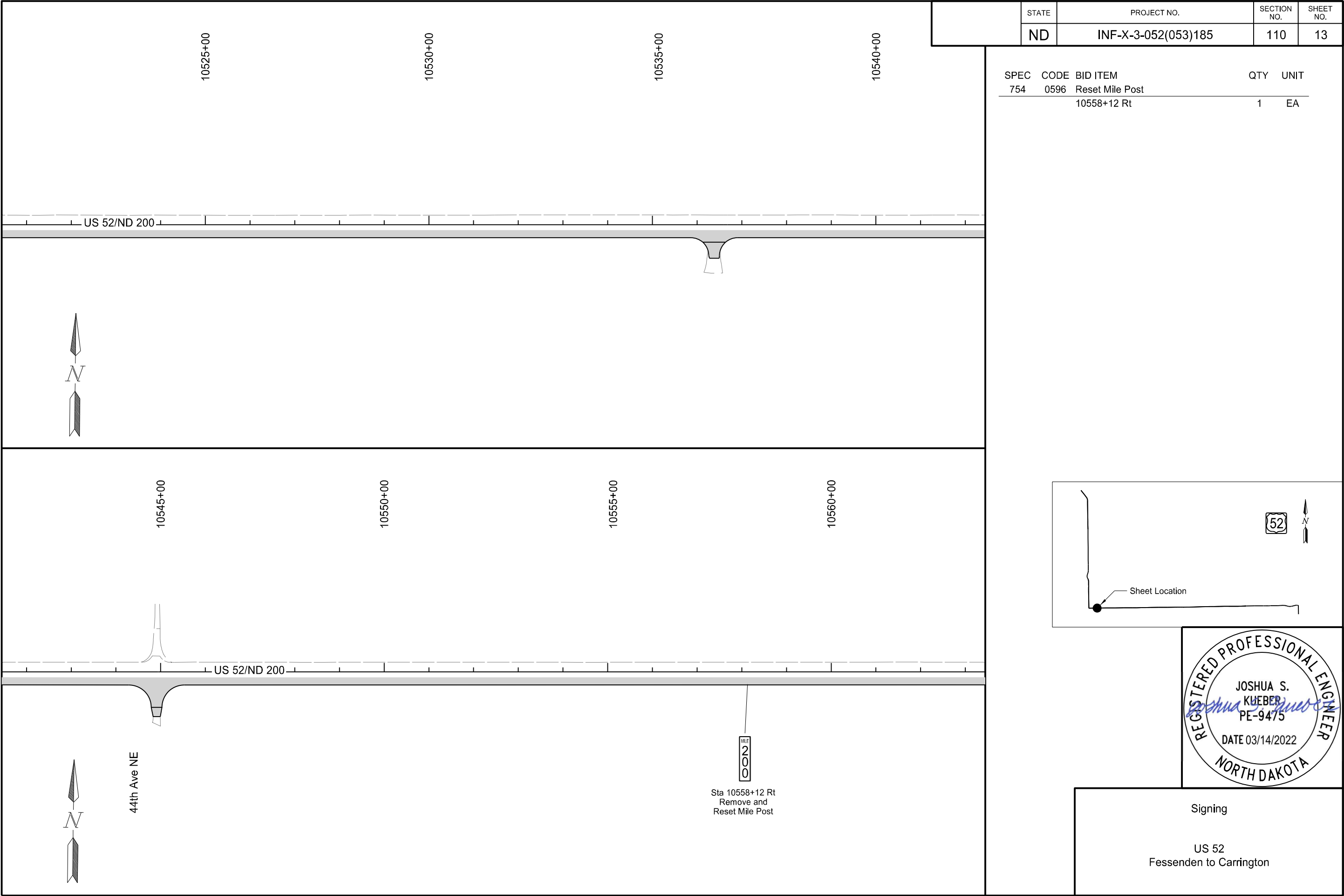
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ND	INF-X-3-052(053)185	110	12

SPEC	CODE	BID ITEM	QTY	UNIT
754	0596	Reset Mile Post		
		10505+18 Rt	1	EA



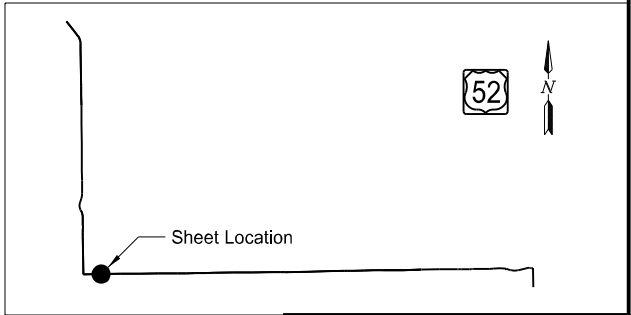
Signing

US 52
Fessenden to Carrington



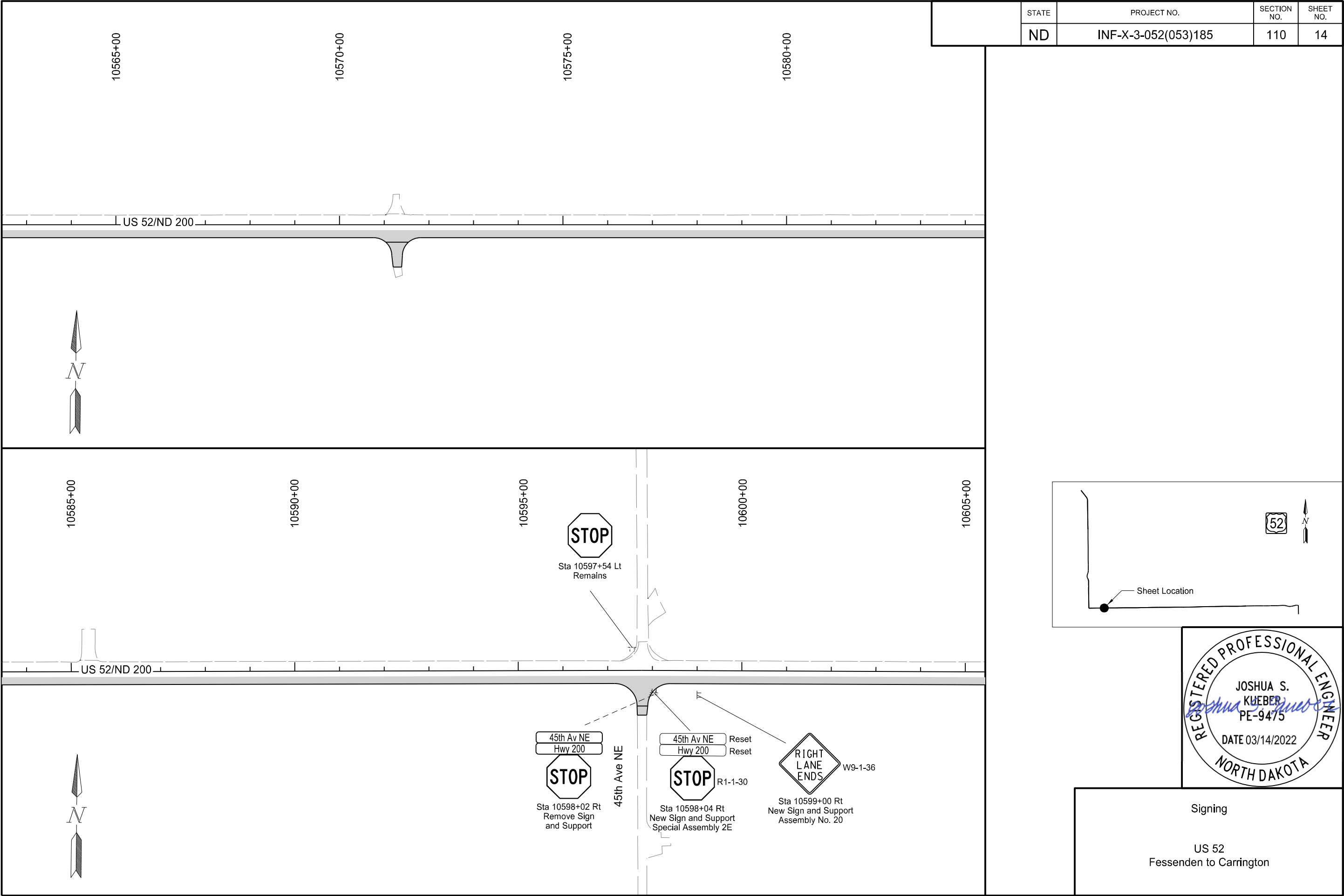
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	INF-X-3-052(053)185	110	13

SPEC	CODE	BID ITEM	QTY	UNIT
754	0596	Reset Mile Post		
		10558+12 Rt	1	EA



Signing

US 52
Fessenden to Carrington

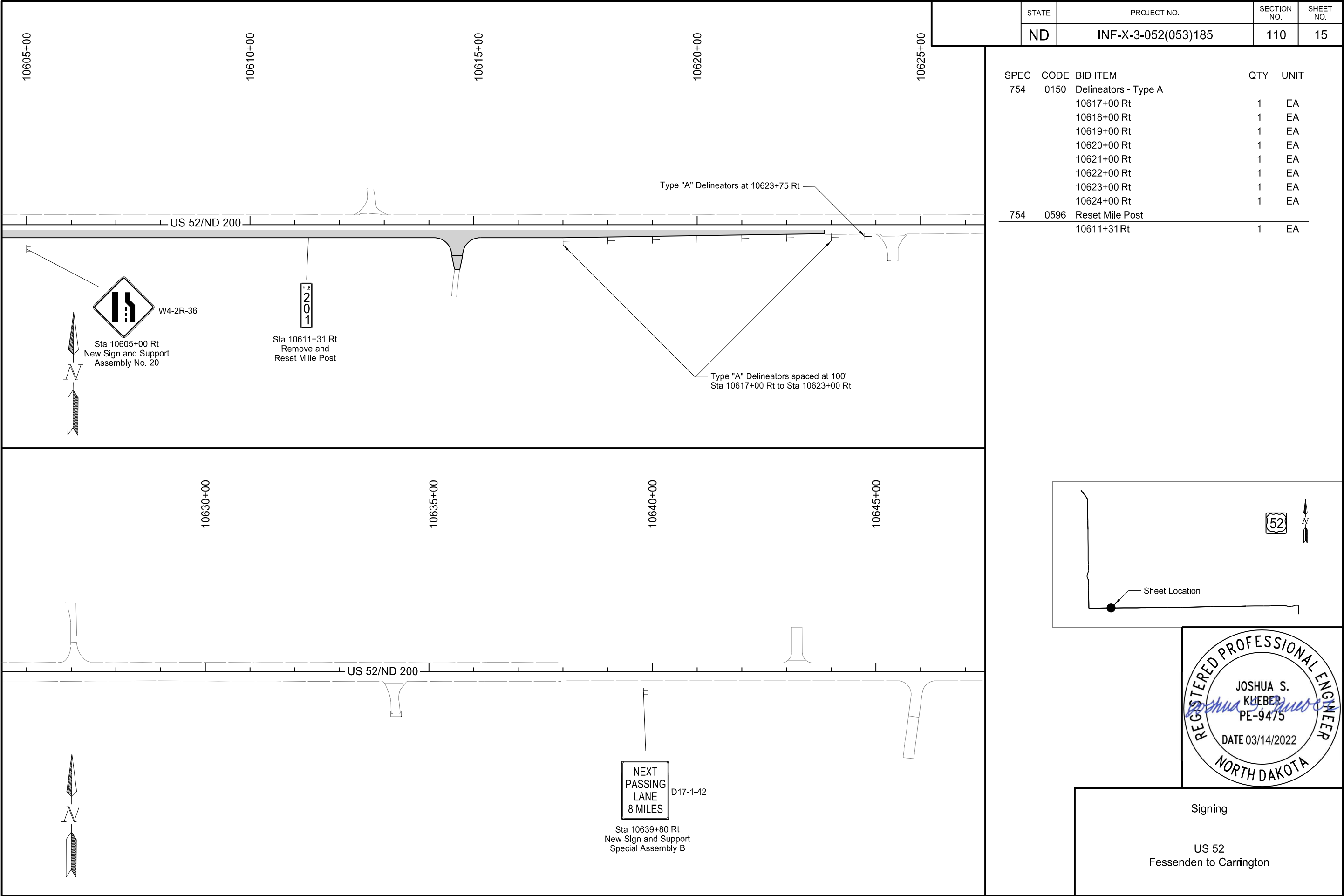


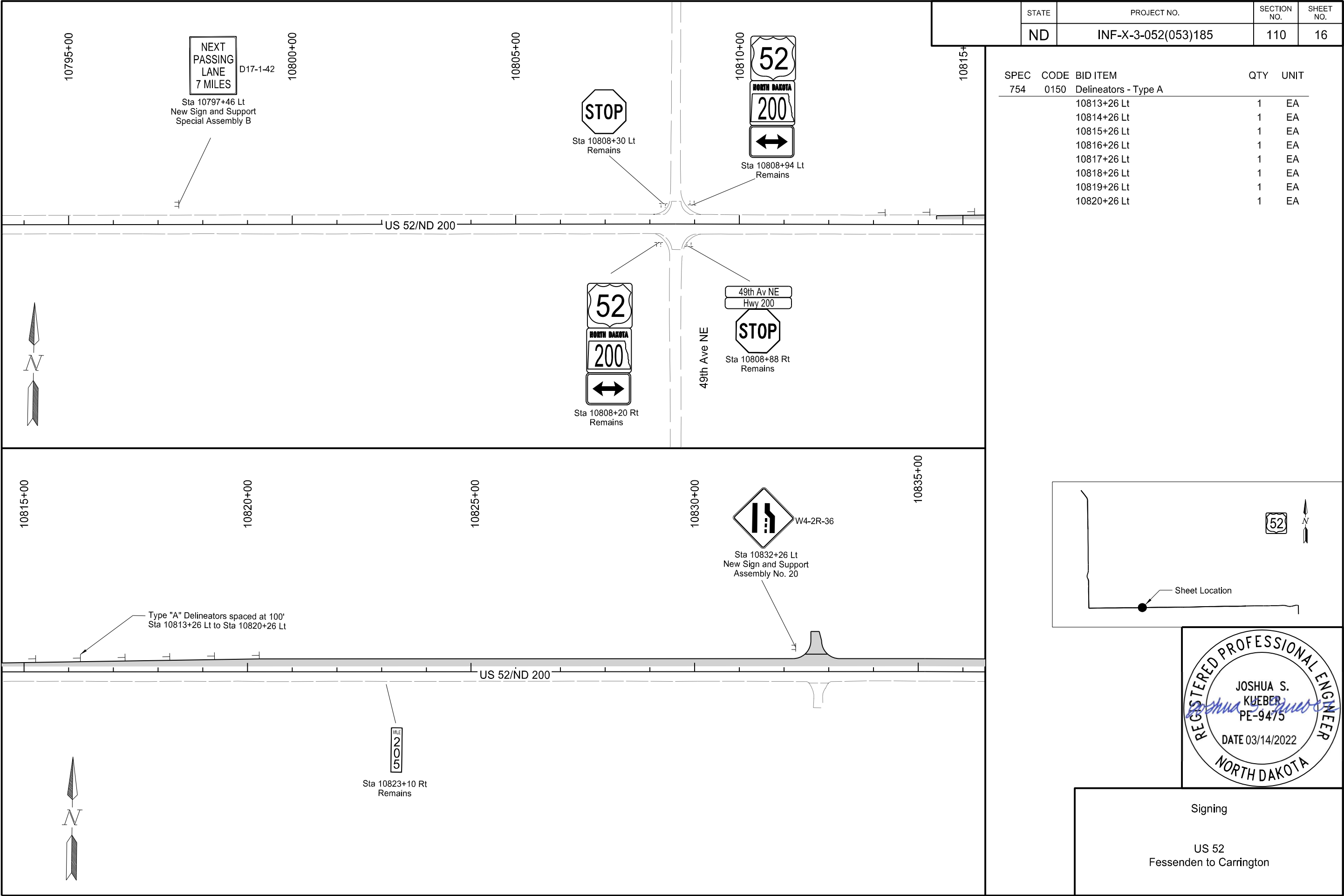
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ND	INF-X-3-052(053)185	110	14

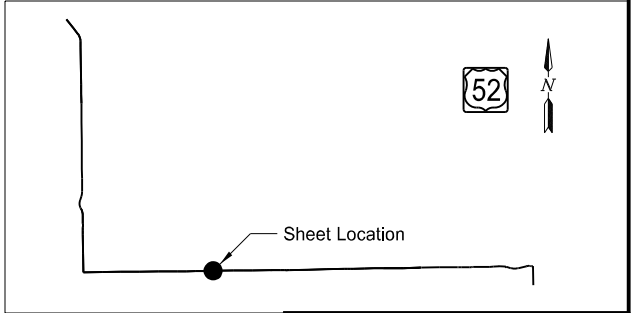
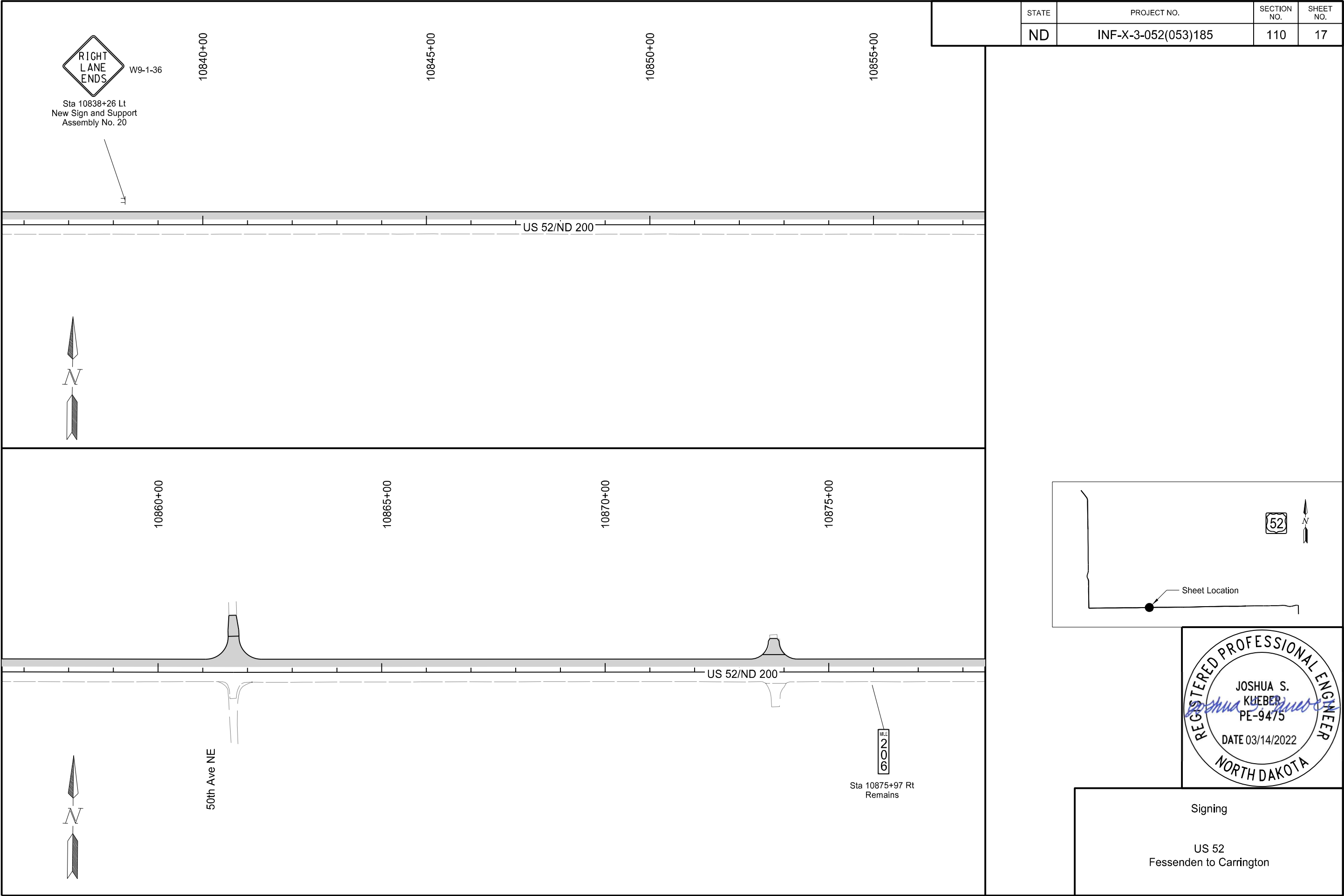


Signing

US 52
Fessenden to Carrington

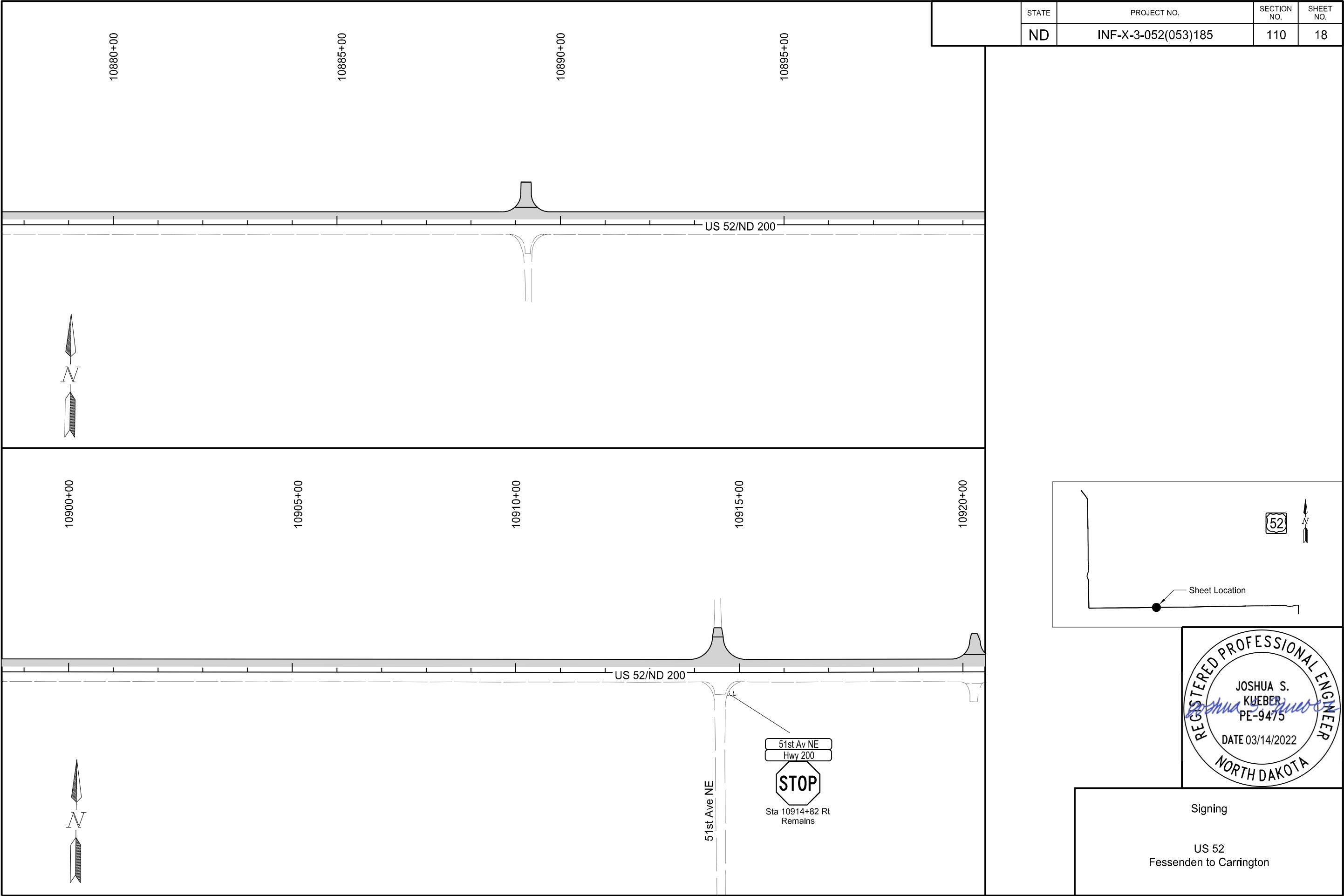




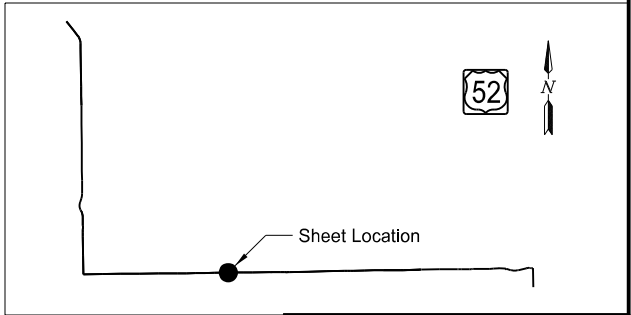


Signing

US 52
Fessenden to Carrington

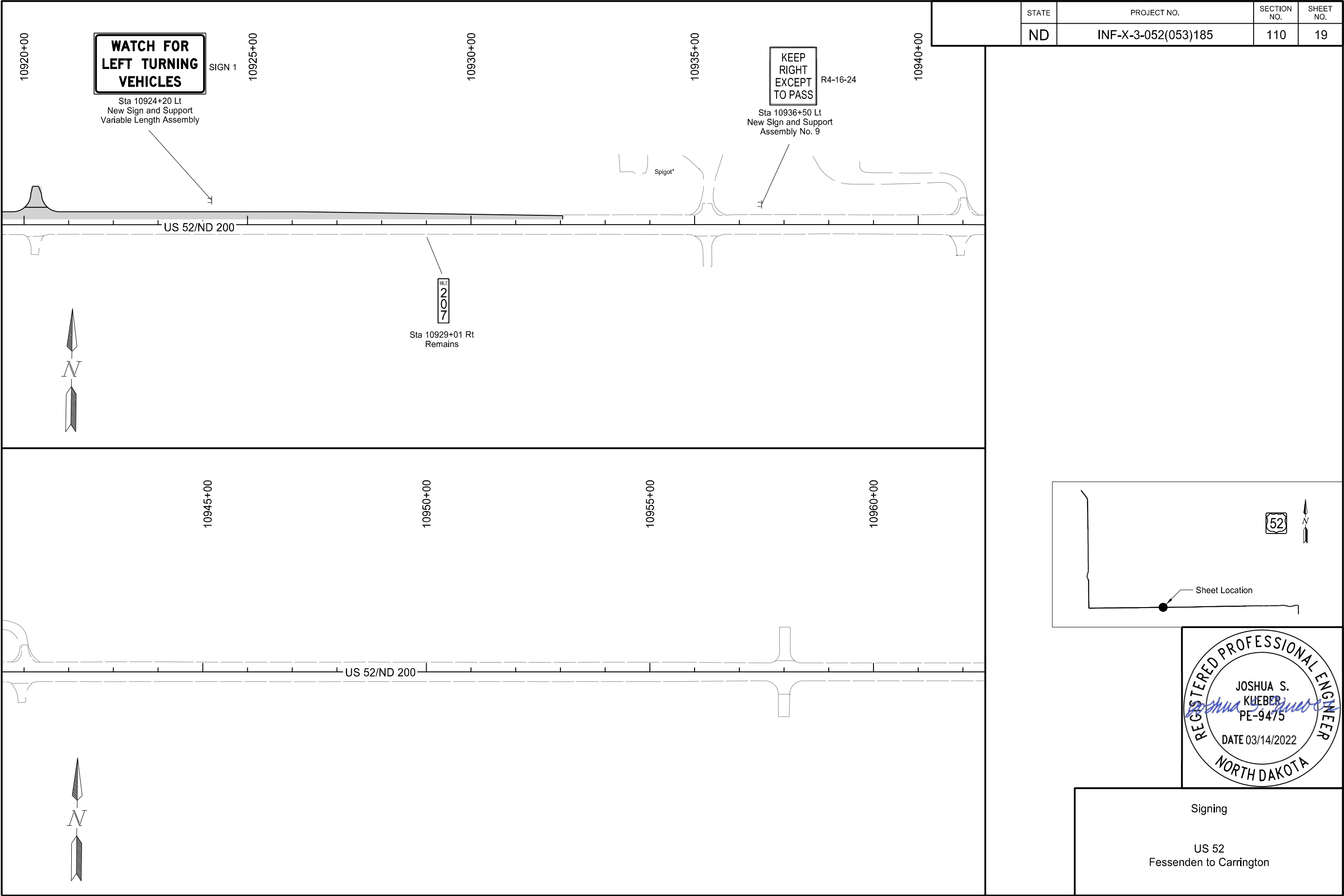


STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	INF-X-3-052(053)185	110	18



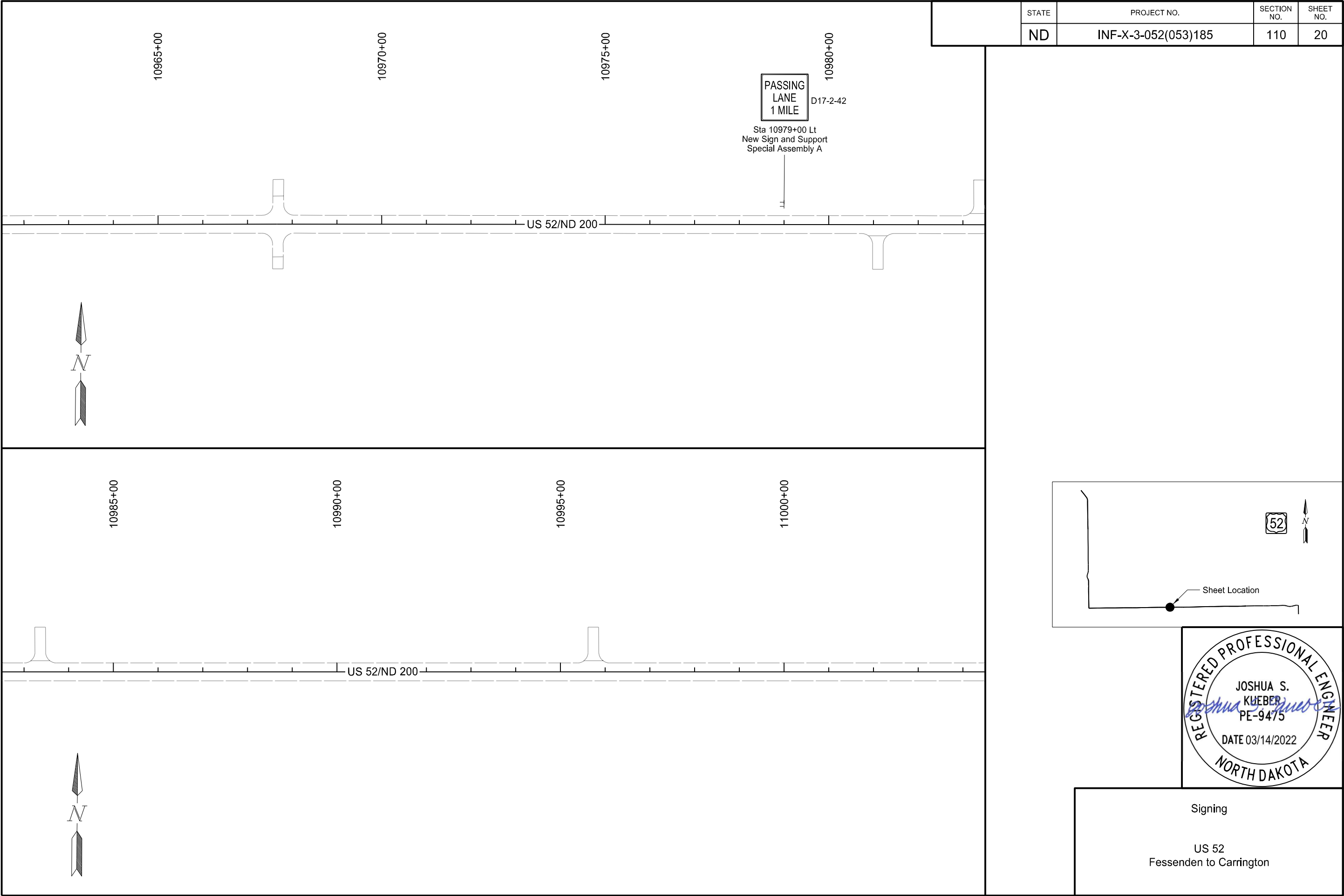
Signing

US 52
Fessenden to Carrington

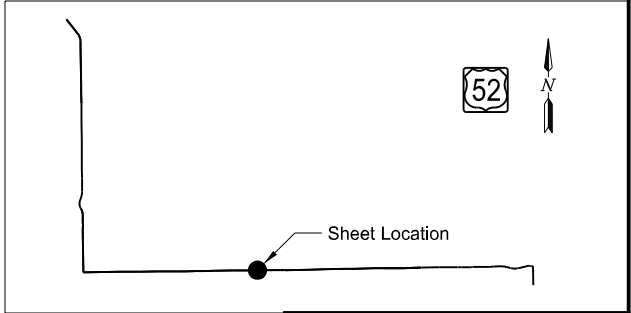


Signing

US 52
Fessenden to Carrington

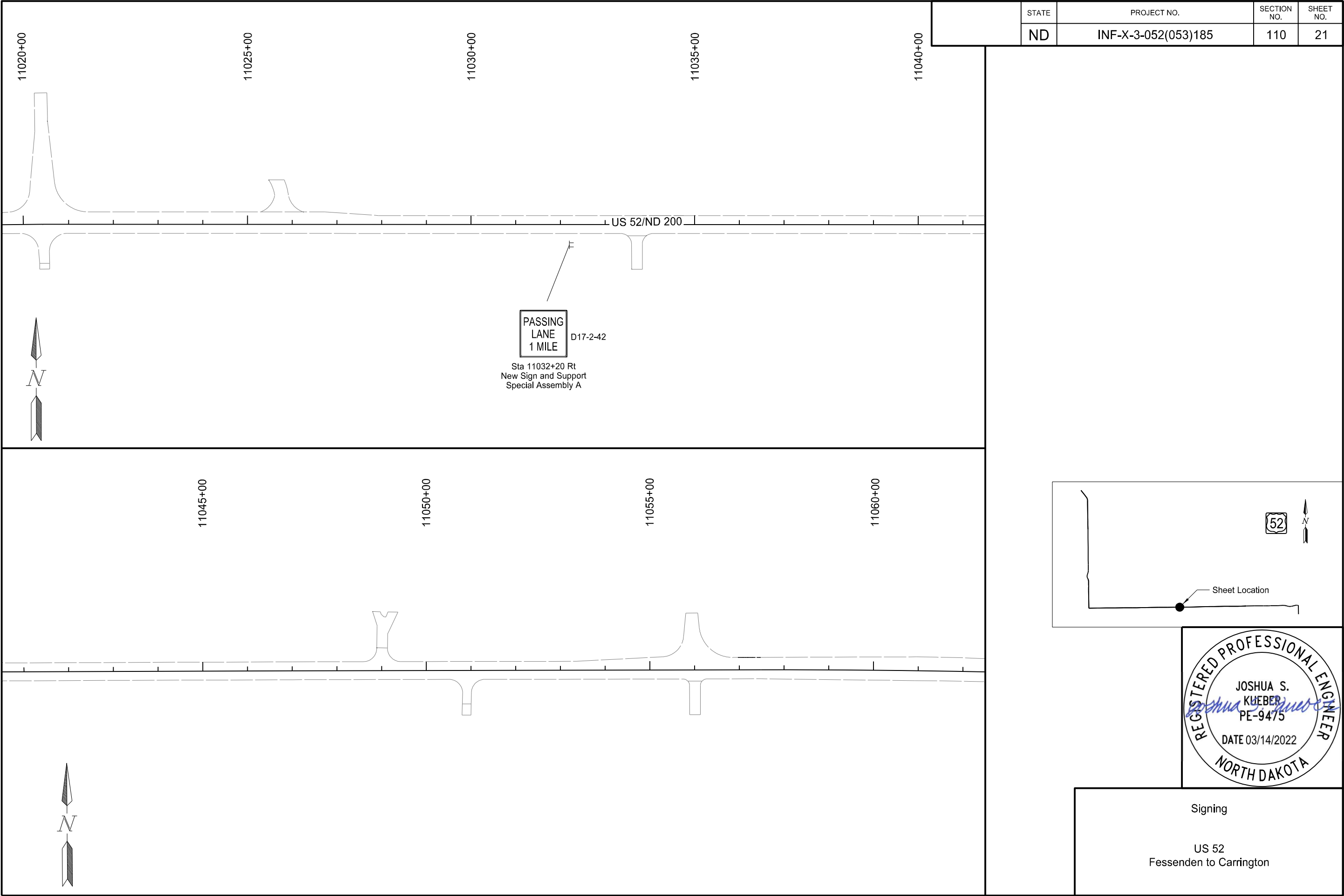


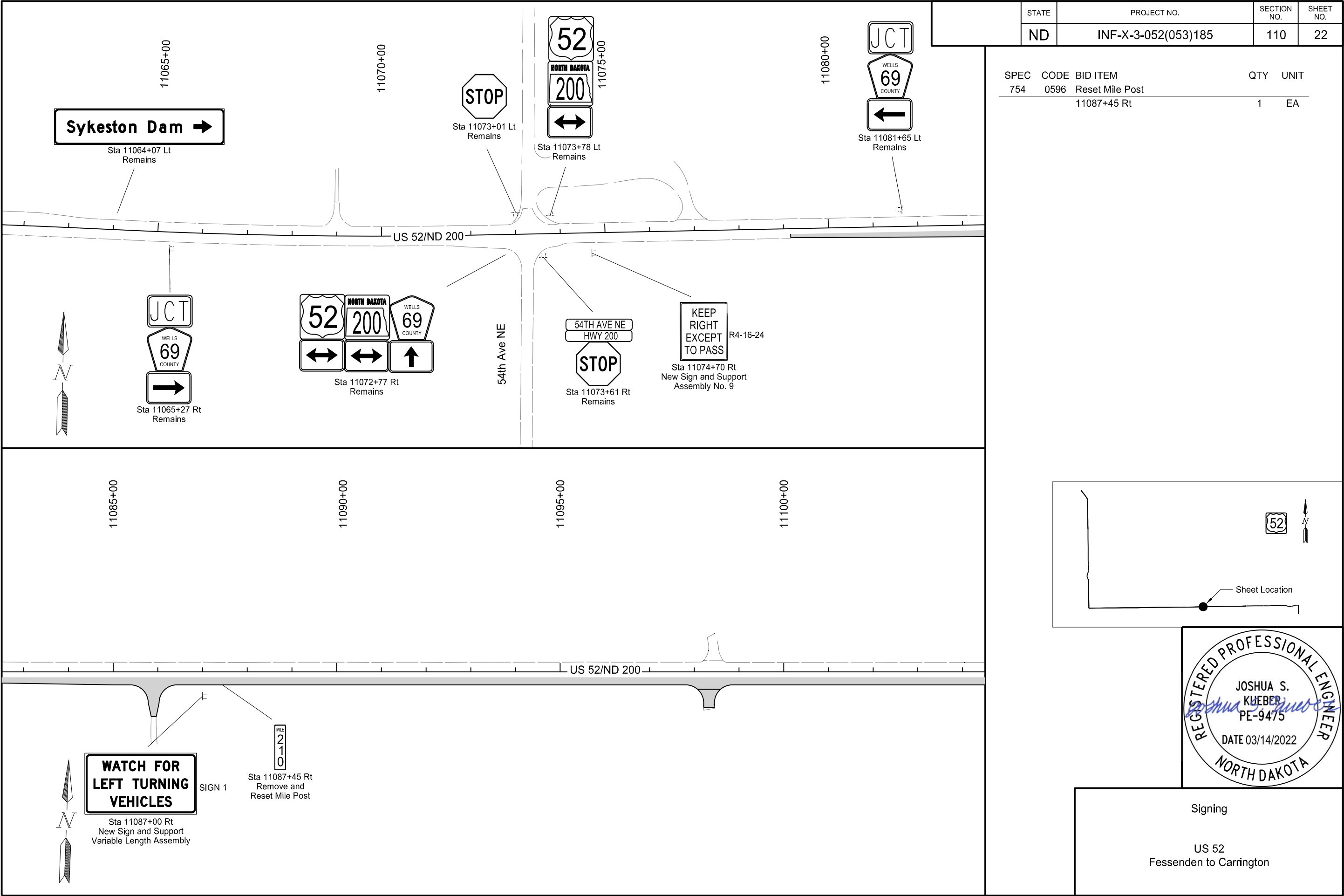
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ND	INF-X-3-052(053)185	110	20



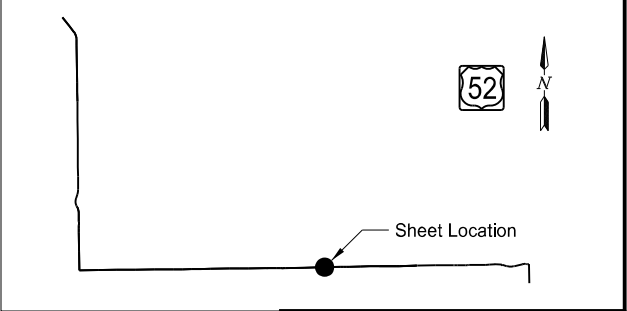
Signing

US 52
Fessenden to Carrington



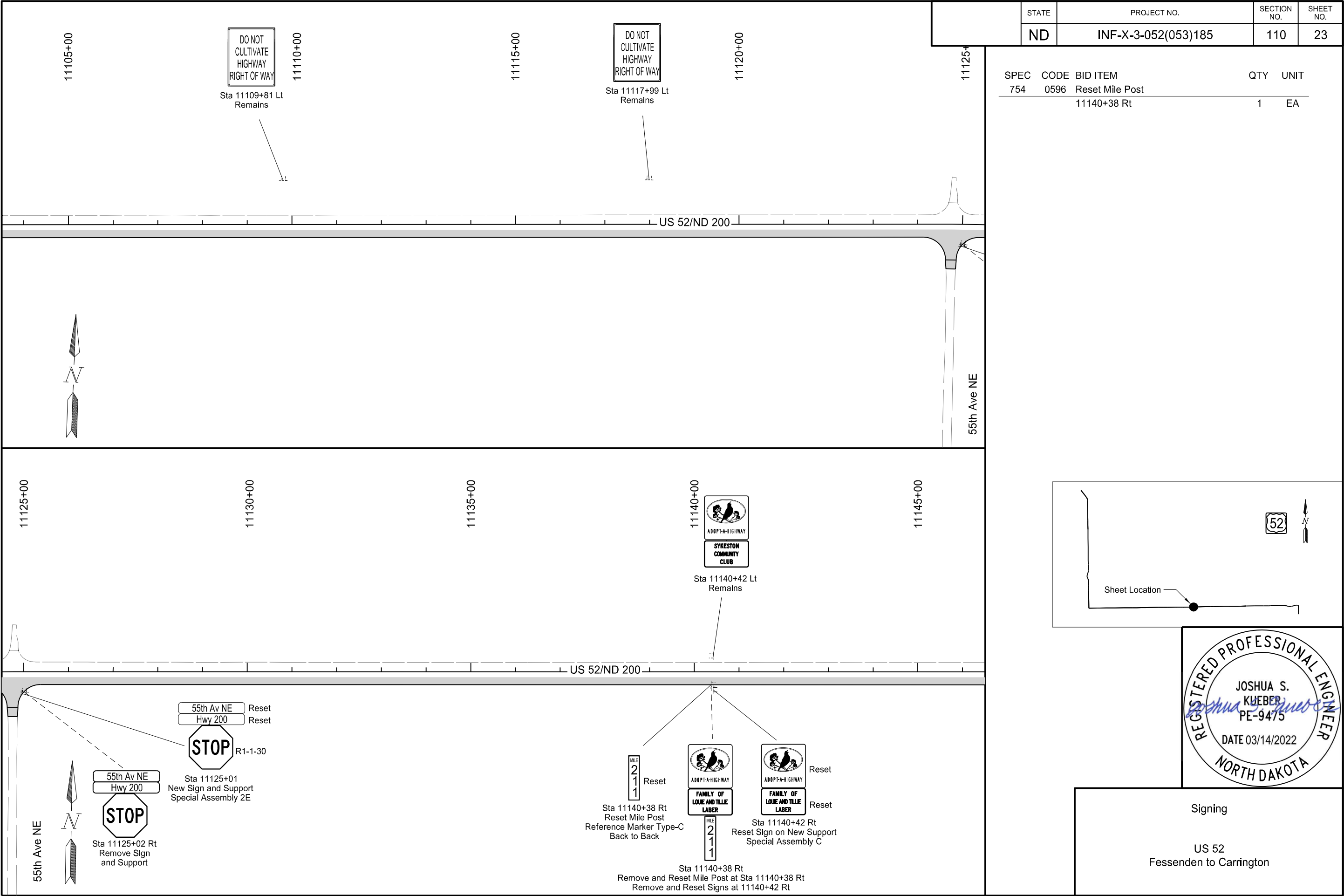


STATE	PROJECT NO.		SECTION NO.	SHEET NO.
	ND INF-X-3-052(053)185		110	22
SPEC	CODE	BID ITEM	QTY	UNIT
754	0596	Reset Mile Post		
		11087+45 Rt	1	EA



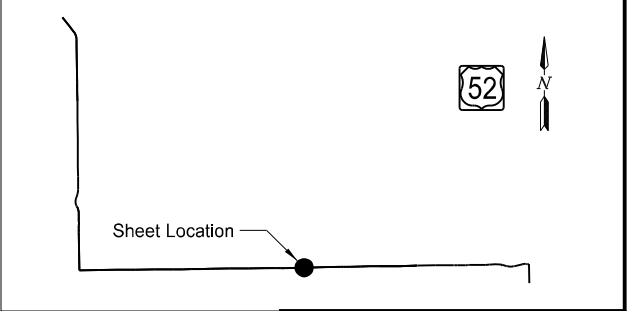
Signing

US 52
Fessenden to Carrington



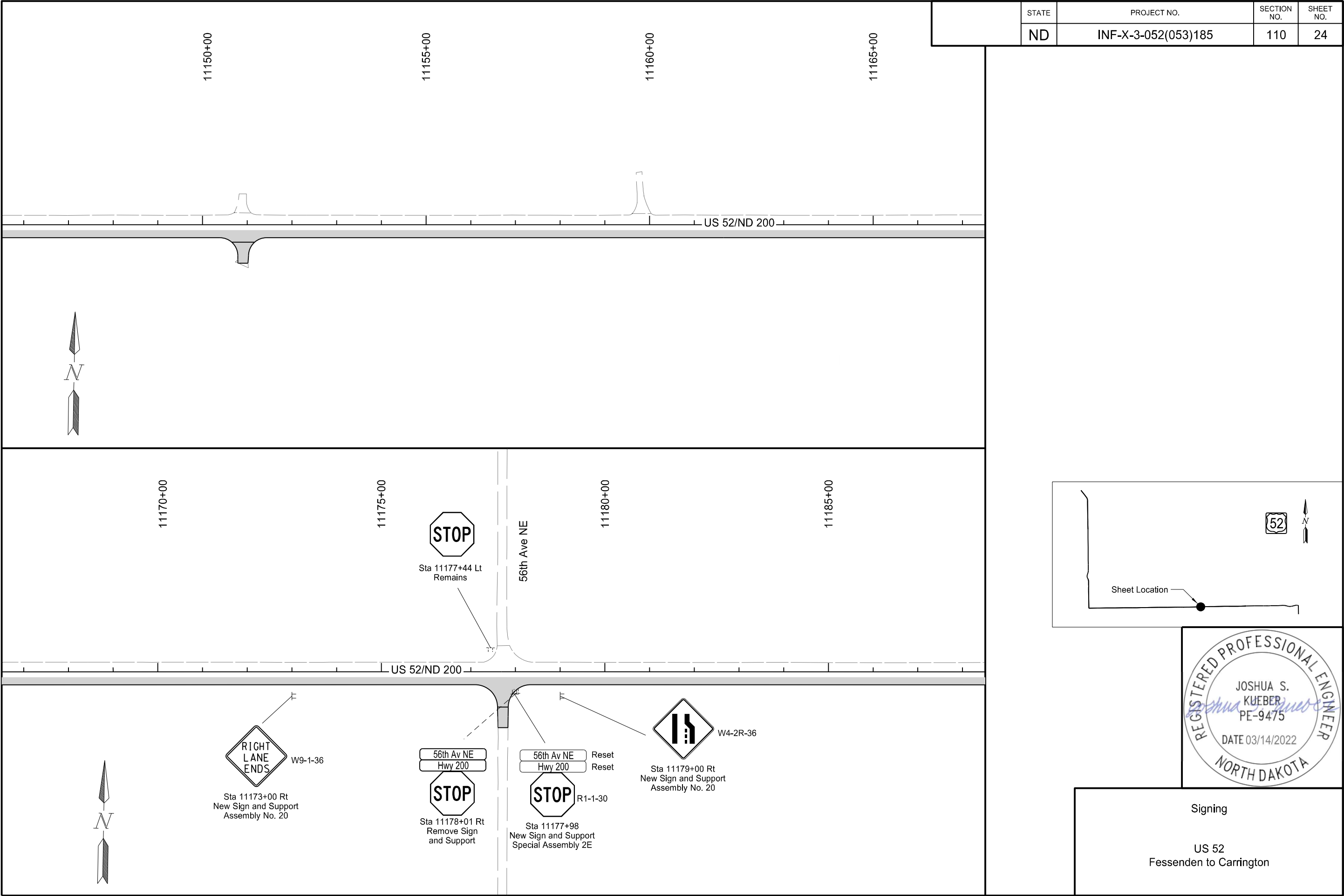
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	INF-X-3-052(053)185	110	23

SPEC	CODE	BID ITEM	QTY	UNIT
754	0596	Reset Mile Post		
		11140+38 Rt	1	EA

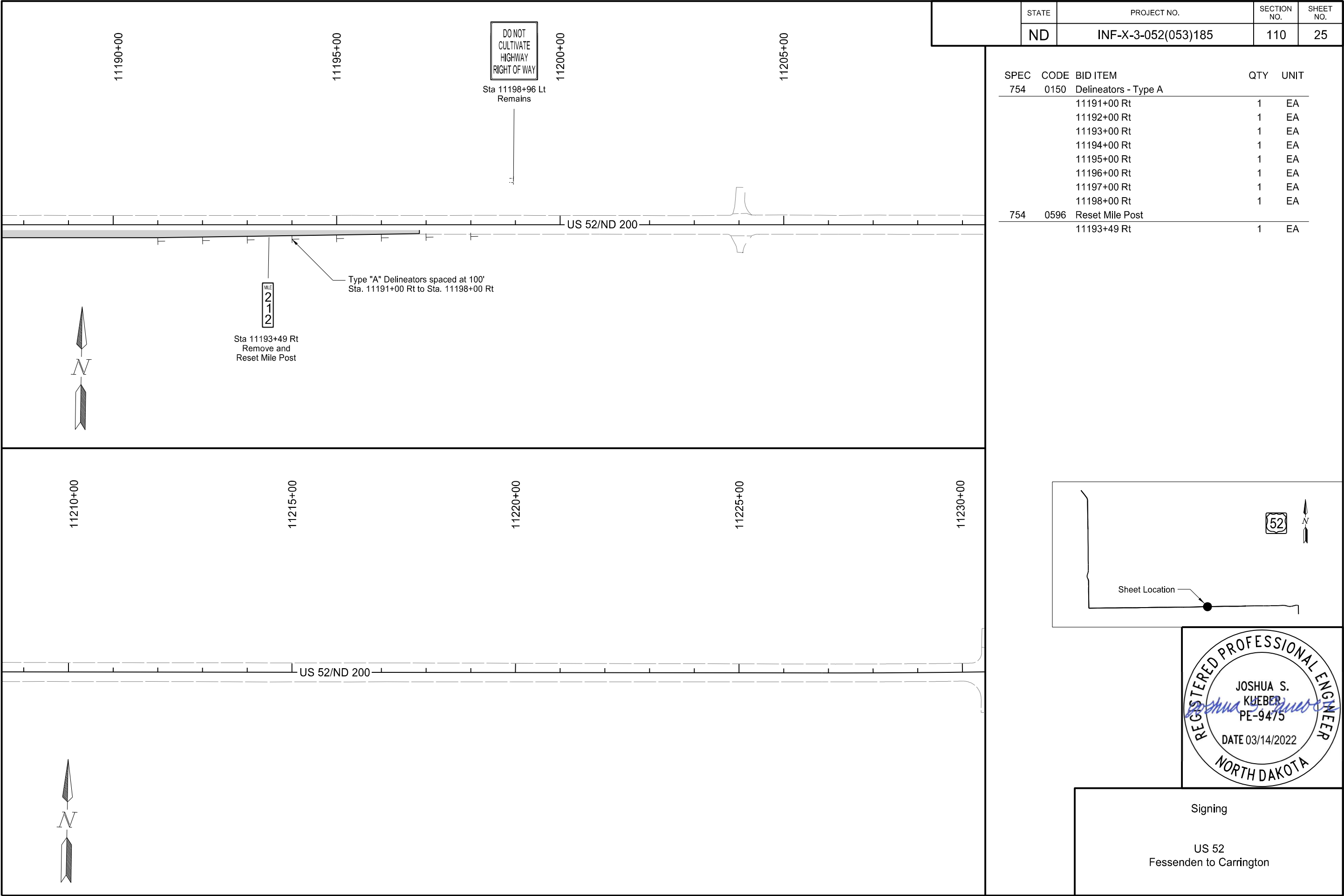


Signing

US 52
Fessenden to Carrington

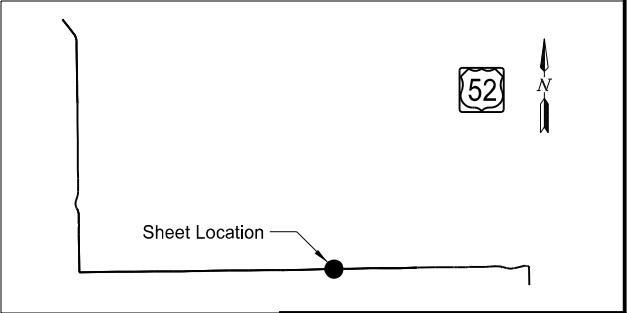


STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	INF-X-3-052(053)185	110	24



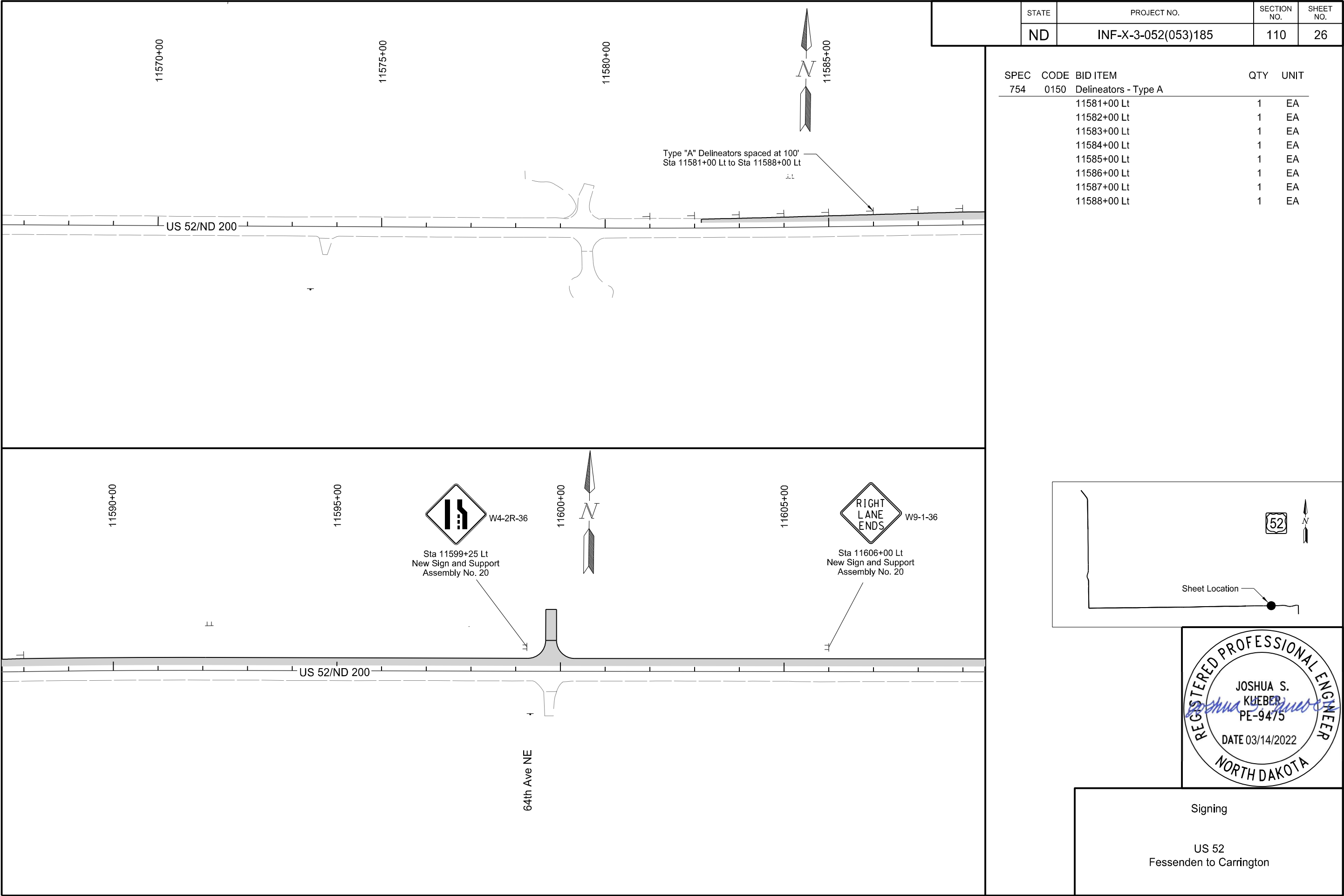
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	INF-X-3-052(053)185	110	25

SPEC	CODE	BID ITEM	QTY	UNIT
754	0150	Delineators - Type A		
		11191+00 Rt	1	EA
		11192+00 Rt	1	EA
		11193+00 Rt	1	EA
		11194+00 Rt	1	EA
		11195+00 Rt	1	EA
		11196+00 Rt	1	EA
		11197+00 Rt	1	EA
		11198+00 Rt	1	EA
754	0596	Reset Mile Post		
		11193+49 Rt	1	EA



Signing

US 52
Fessenden to Carrington



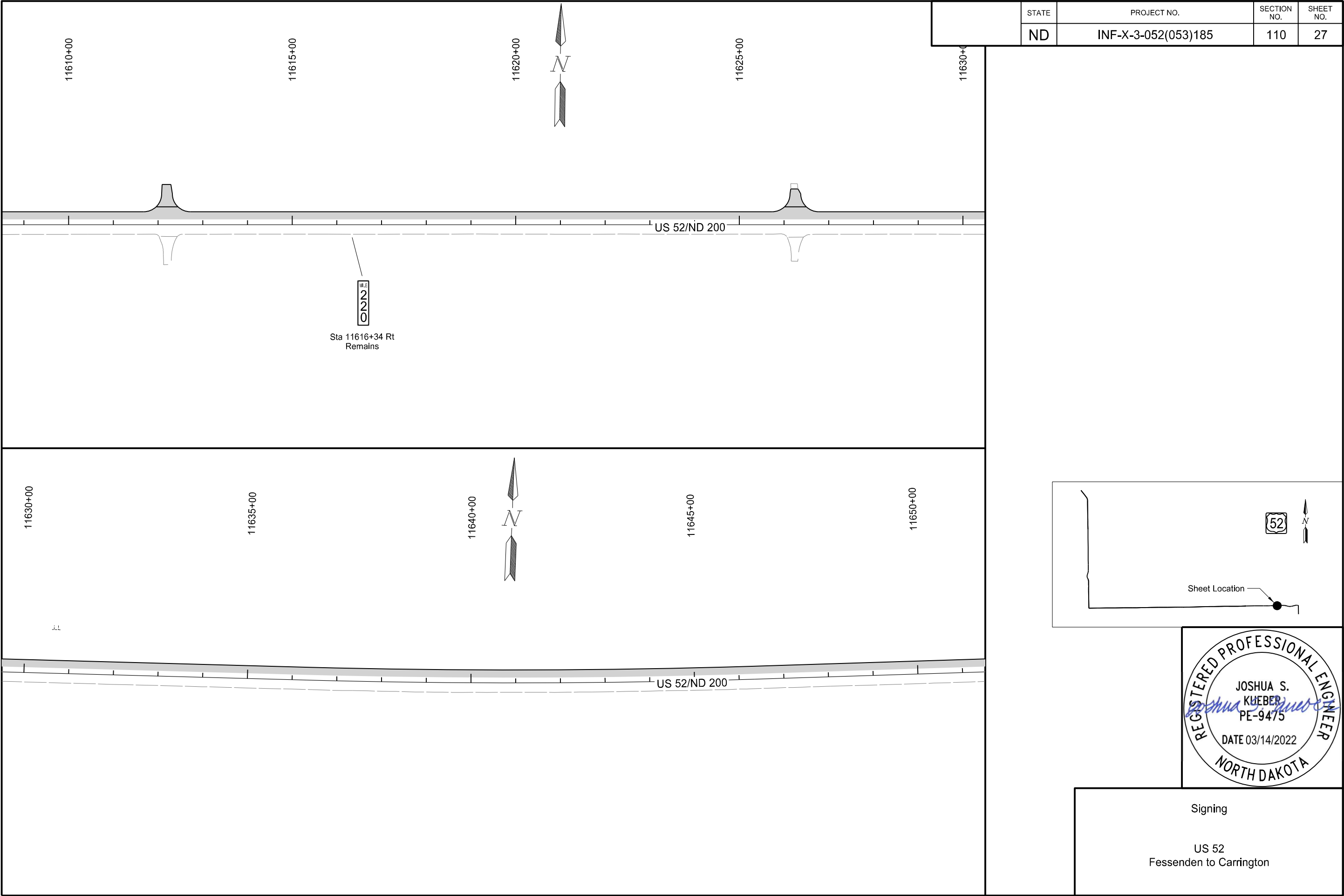
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ND	INF-X-3-052(053)185	110	26

SPEC	CODE	BID ITEM	QTY	UNIT
754	0150	Delineators - Type A		
		11581+00 Lt	1	EA
		11582+00 Lt	1	EA
		11583+00 Lt	1	EA
		11584+00 Lt	1	EA
		11585+00 Lt	1	EA
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		11587+00 Lt	1	EA
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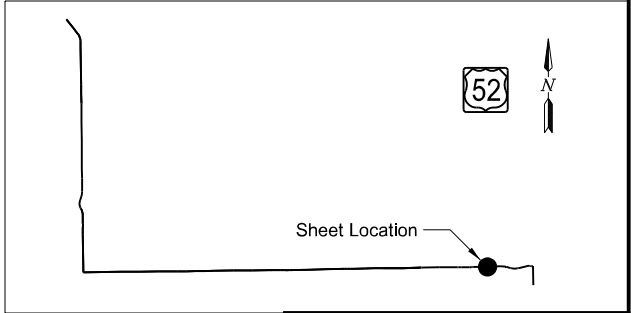


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US 52
Fessenden to Carrington

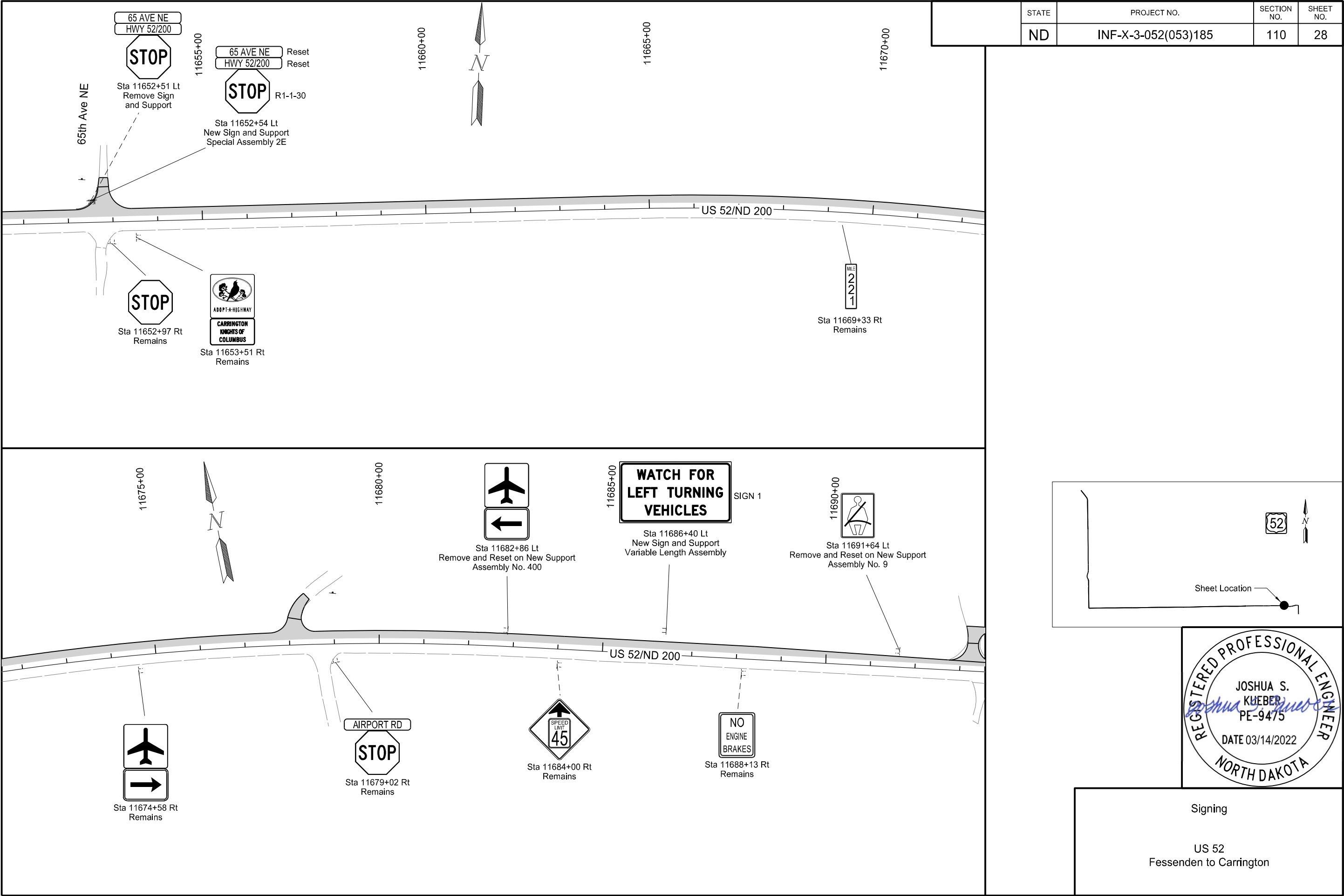


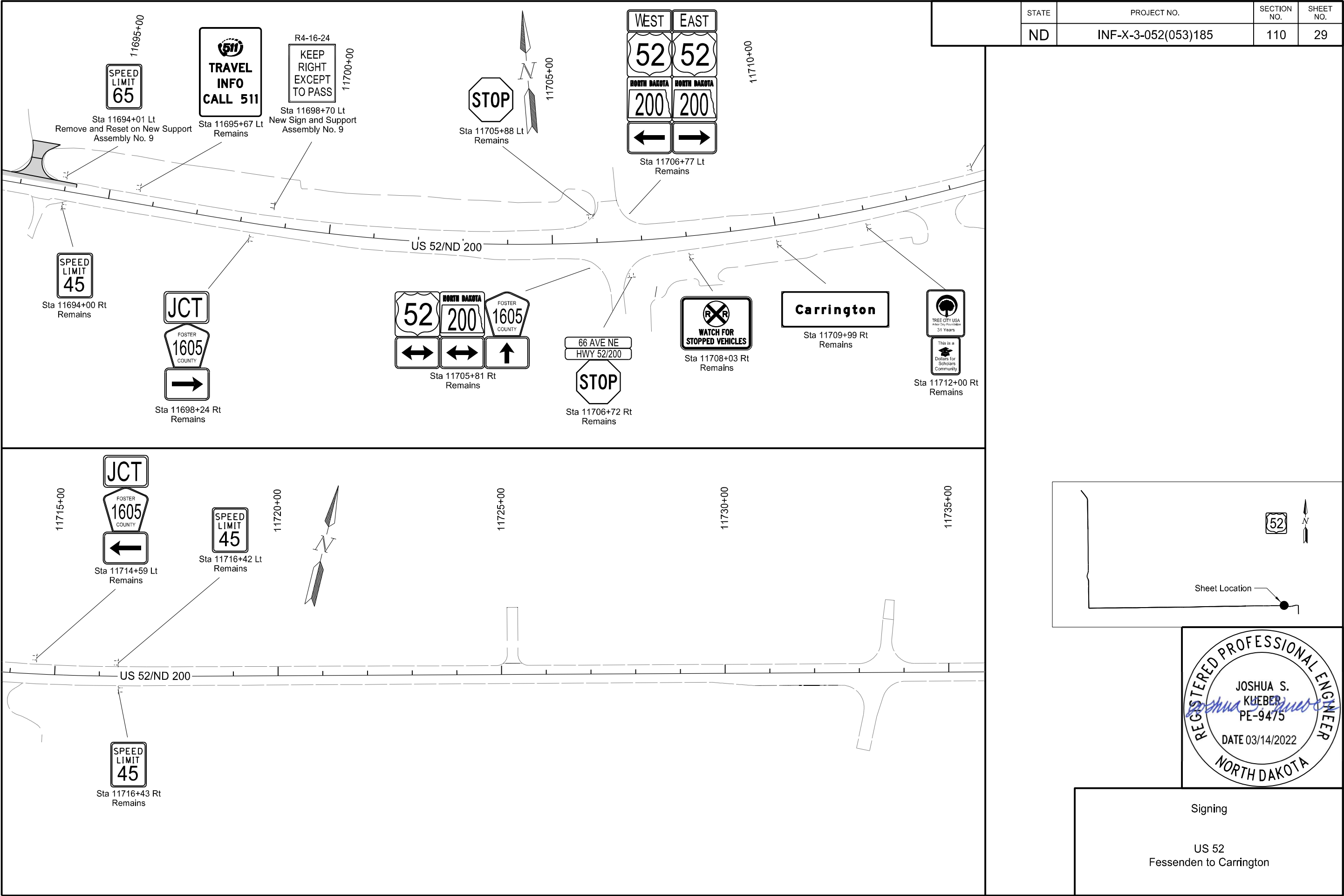
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ND	INF-X-3-052(053)185	110	27

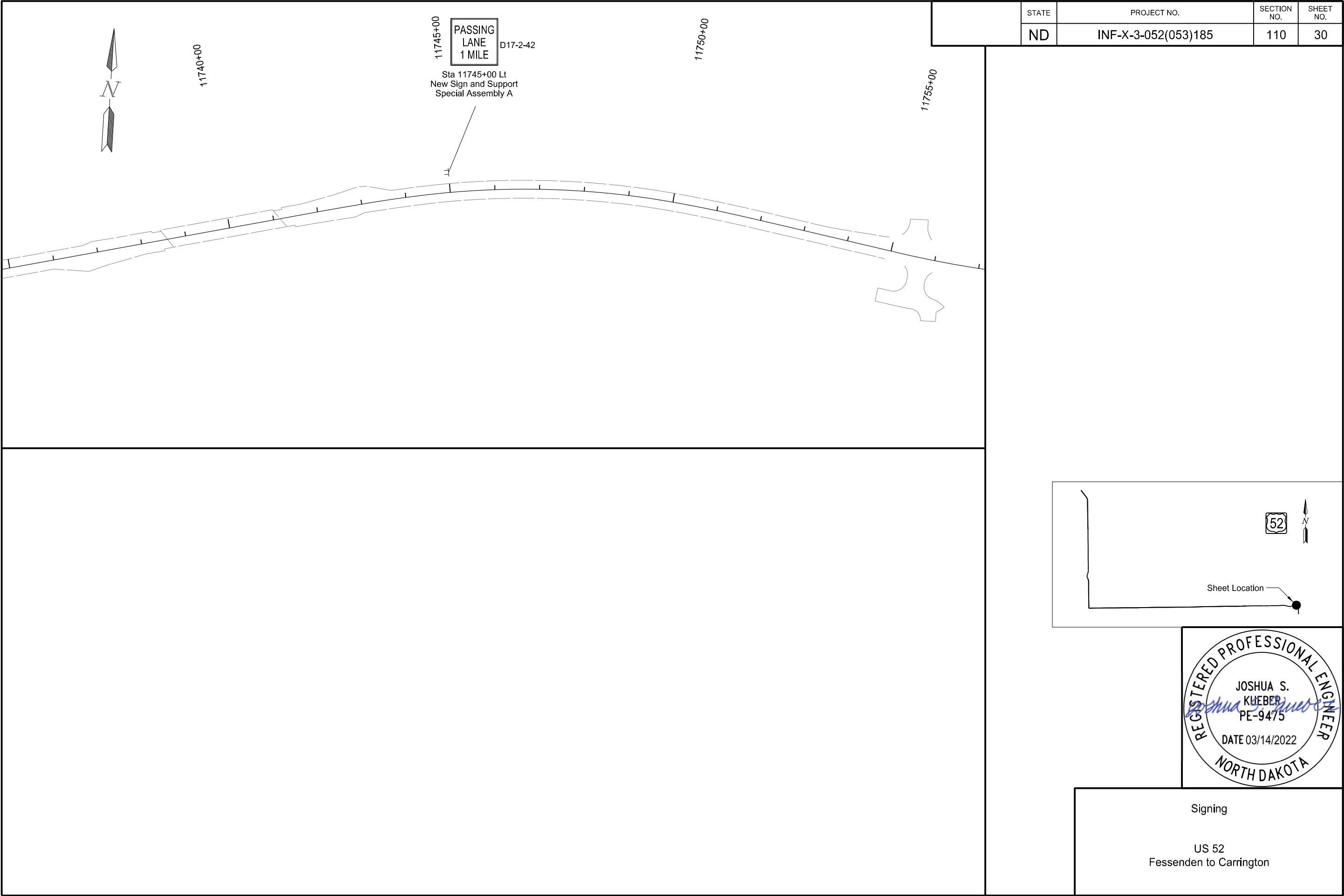


Signing

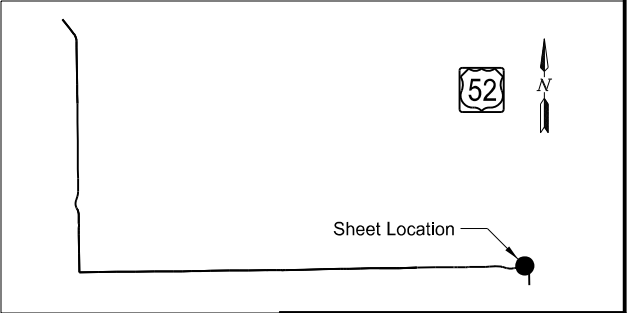
US 52
Fessenden to Carrington







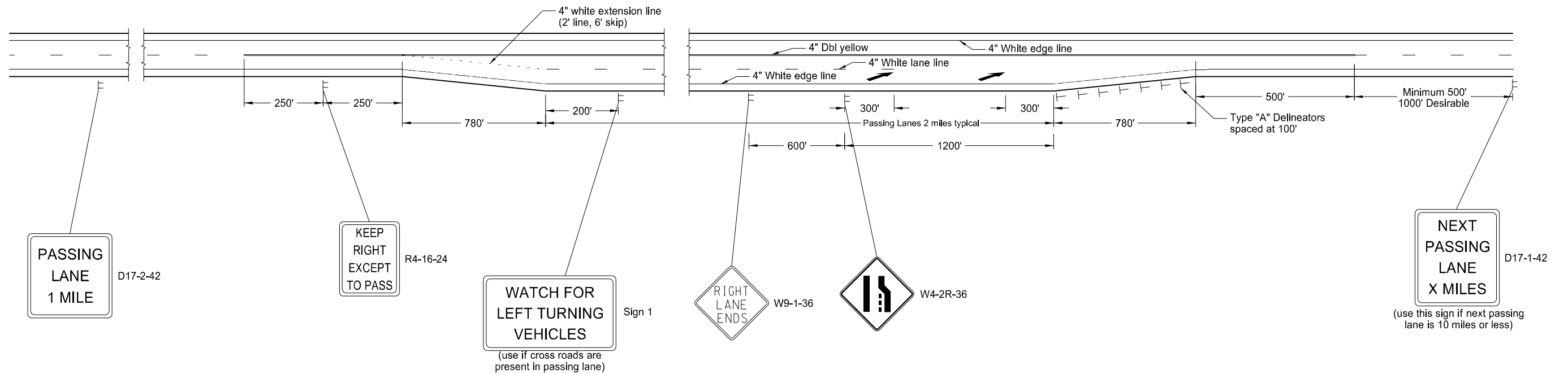
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Signing

US 52
Fessenden to Carrington

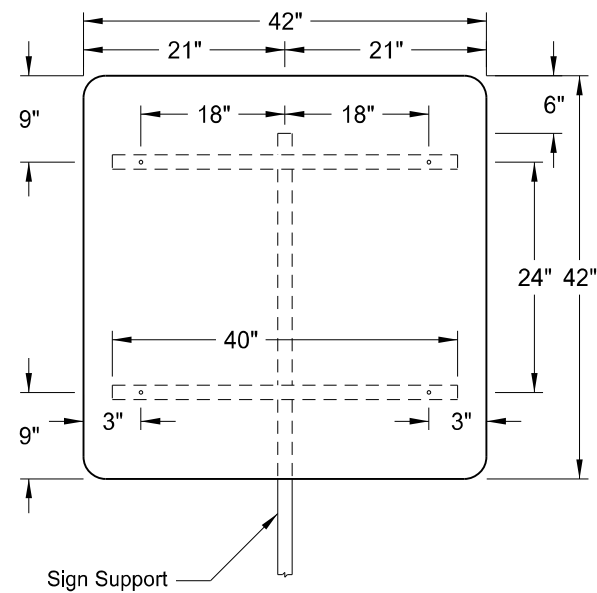
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	ND	INF-X-3-052(053)185	110	31



Passing Lane Detail

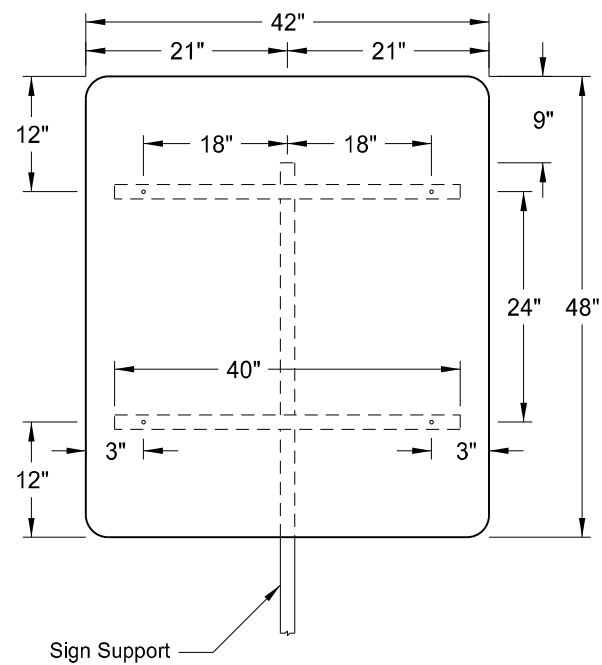
US 52
Fessenden to Carrington

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	110	33



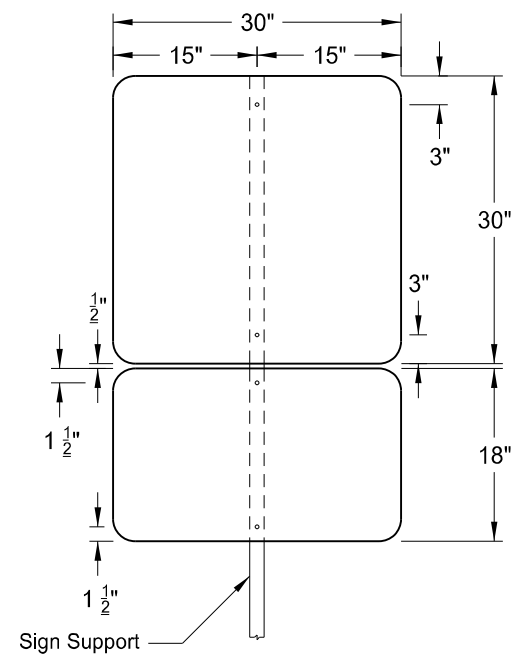
Special Assembly A
Sta 9778+60 Rt
Sta 10456+95 Rt
Sta 10484+10 Lt
Sta 10979+00 Lt
Sta 11032+20 Rt
Sta 11741+20 Lt
Sta 10509+75 Rt (EX 200)

Pay Area: 12.3 Sq Ft



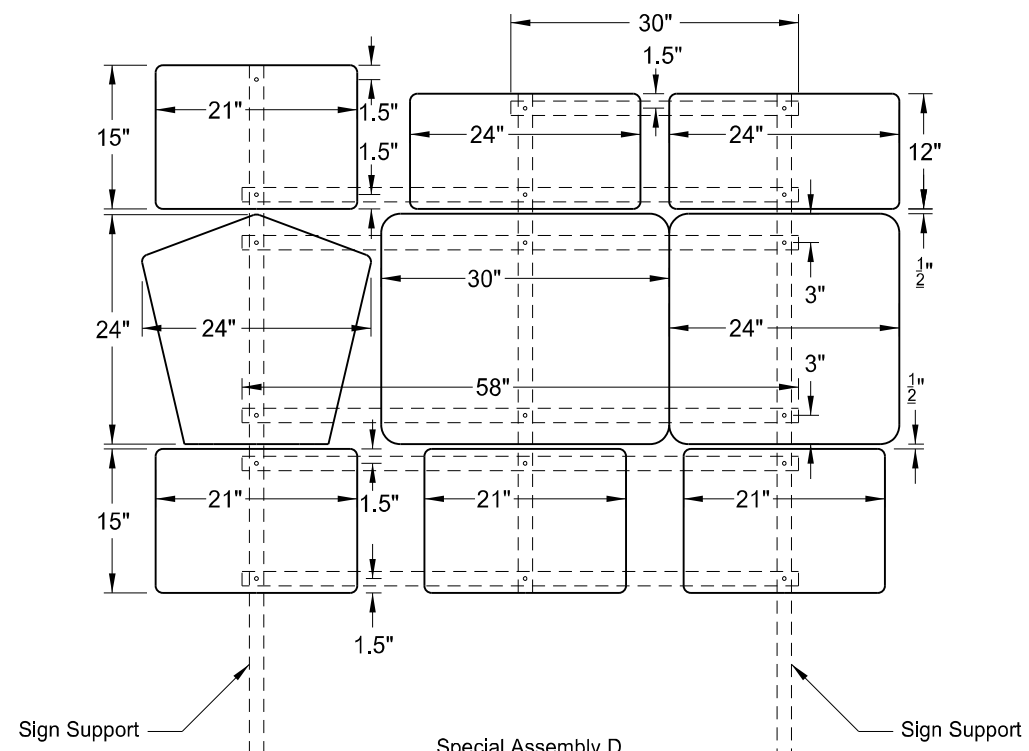
Special Assembly B
Sta 9968+10 Rt
Sta 10639+80 Rt
Sta 10797+46 Lt

Pay Area: 14.0 Sq Ft



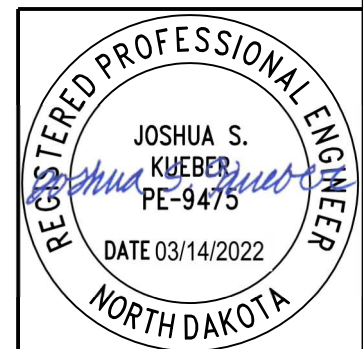
Special Assembly C
Sta 11140+42 Rt

Pay Area: 10 Sq Ft



Special Assembly D
Sta 10508+38 Lt

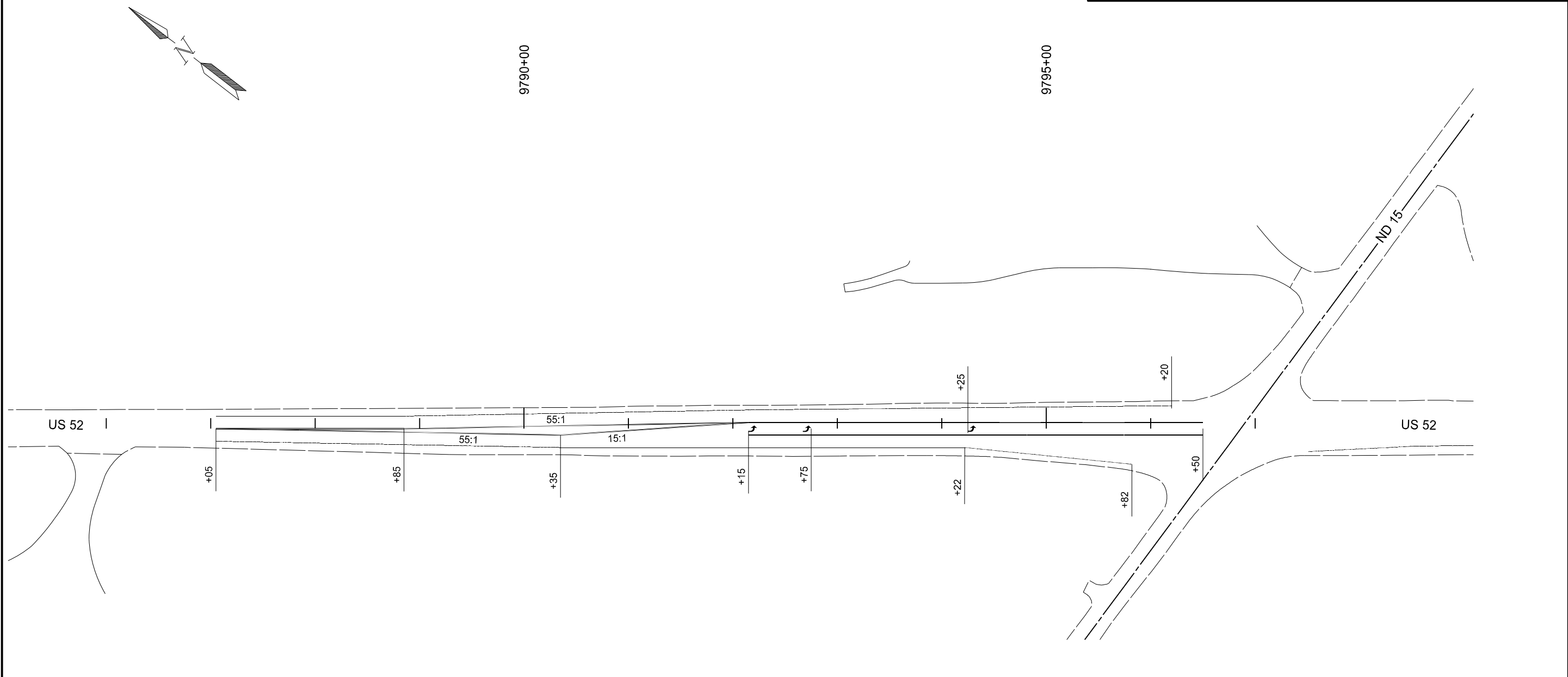
Design Area: 25.75 Sq Ft



Signing Details
Special Assemblies

US 52
Fessenden to Carrington

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	120	1



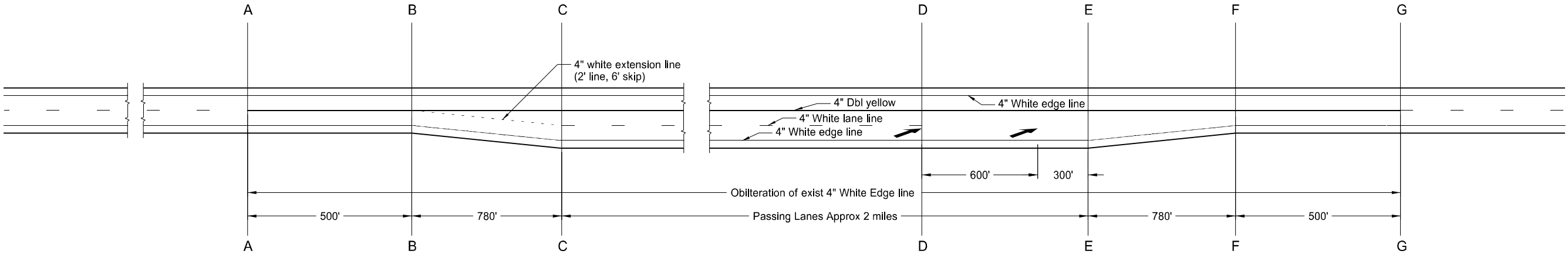
Pavement Marking Transitions																
Work Area 1 - EB Left Turn Lane Sta 9787+05 to Sta 9796+50 RP 185.418 to RP 185.587	Location															
	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset
	4" White Edge Line	12.0' Lt		12.0' Lt		-		18.0' Lt		-		-		22.0' Lt		-
	4" Dbl Yellow	0.0'		0.0'		-		6.0' Lt		6.0' Lt		6.0' Lt		6.0' Lt		6.0' Lt
	4" Dbl Yellow	0.0'	9788+85	-	9790+35	6.0' Rt	9792+15	6.0' Lt	9794+22	-	9795+82	-	9796+20	-	9796+50	-
	8" White Lane Line	-		-		-		6.0' Rt		6.0' Rt		6.0' Rt		6.0' Rt		6.0' Rt
	4" White Edge Line	12.0' Rt		-		18.0' Rt		18.0' Rt		18.0' Rt		34.0' Rt		-		-

*See Section 10, Sheet 2 for PVMT MK and Obliteration Quantities



Pavement Markings

US 52
Fessenden to Carrington



Work Area 2 - EB Passing Lane Sta 9832+05 to Sta 9952+45 RP 186.260 to RP 188.551	Pavement Marking Transitions at Passing Lanes													
	Location													
	A		B		C		D		E		F		G	
4" Dbl Yellow	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset
4" White Lane Line (10' Line, 30' Skip)		-		-		12.0' Rt		12.0' Rt		-		-		-
4" White Extension Line (2' line, 6' Skip)	9826+40	-	9831+40	0.0'	9839+20	12.0' Rt	9936+30	-	9945+30	-	9953+10	-	9958+10	-
4" White Edge Line		12.0' Rt		12.0' Rt		12.0' Rt		24.0' Rt		24.0' Rt		12.0' Rt		12.0' Rt
Obliteration of Exst 4" White Edge Line		12.0' Rt		12.0' Rt		12.0' Rt		12.0' Rt		12.0' Rt		12.0' Rt		12.0' Rt

Work Area 3 - WB Passing Lane Sta 10336+65 to Sta 10451+65 RP 195.802 to RP 1987.998	Location													
	Location													
	A		B		C		D		E		F		G	
4" Dbl Yellow	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset
4" White Lane Line (10' Line, 30' Skip)		0.0'		0.0'		0.0'		0.0'		0.0'		0.0'		0.0'
4" White Extension Line (2' line, 6' Skip)	10457+30	-	10452+30	-	10444+50	12.0' Lt	10352+80	12.0' Lt	10343+80	-	10336+00	-	10331+00	-
4" White Edge Line		12.0' Lt		12.0' Lt		24.0' Lt		24.0' Lt		24.0' Lt		12.0' Lt		12.0' Lt
Obliteration of Exst 4" White Edge Line		12.0' Lt		12.0' Lt		12.0' Lt		12.0' Lt		12.0' Lt		12.0' Lt		12.0' Lt

Work Area 4 - EB Passing Lane Sta 10503+90 to Sta 10622+85 RP 198.976 to RP 201.216	Location													
	Location													
	A		B		C		D		E		F		G	
4" Dbl Yellow	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset
4" White Lane Line (10' Line, 30' Skip)		0.0'		0.0'		0.0'		0.0'		0.0'		0.0'		0.0'
4" White Extension Line (2' line, 6' Skip)	10496+95	-	10501+95	-	10509+75	12.0' Rt	10608+00	12.0' Rt	10617+00	-	10624+80	-	10629+80	-
4" White Edge Line		12.0' Rt		12.0' Rt		24.0' Rt		24.0' Rt		24.0' Rt		12.0' Rt		12.0' Rt
Obliteration of Exst 4" White Edge Line		12.0' Rt		12.0' Rt		12.0' Rt		12.0' Rt		12.0' Rt		12.0' Rt		12.0' Rt

Work Area 5 - WB Passing Lane Sta 10814+41 to Sta 10932+05 RP 204.835 to RP 207.057	Location													
	Location													
	A		B		C		D		E		F		G	
4" Dbl Yellow	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset
4" White Lane Line (10' Line, 30' Skip)		0.0'		0.0'		0.0'		0.0'		0.0'		0.0'		0.0'
4" White Extension Line (2' line, 6' Skip)	10939+00	-	10934+00	-	10926+20	12.0' Lt	10829+26	12.0' Lt	10820+26	-	10812+46	-	10807+46	-
4" White Edge Line		12.0' Lt		12.0' Lt		24.0' Lt		24.0' Lt		24.0' Lt		12.0' Lt		12.0' Lt
Obliteration of Exst 4" White Edge Line		12.0' Lt		12.0' Lt		24.0' Lt		24.0' Lt		24.0' Lt		12.0' Lt		12.0' Lt

Work Area 6 - EB Passing Lane Sta 11079+15 to Sta 11196+85 RP 209.843 to RP 212.065	Location													
	Location													
	A		B		C		D		E		F		G	
4" Dbl Yellow	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset
4" White Lane Line (10' Line, 30' Skip)		0.0'		0.0'		0.0'		0.0'		0.0'		0.0'		0.0'
4" White Extension Line (2' line, 6' Skip)	11072+20	-	11077+20	-	11085+00	12.0' Rt	11182+00	12.0' Rt	11191+00	-	11198+80	-	11203+80	-
4" White Edge Line		12.0' Rt		12.0' Rt		24.0' Rt		24.0' Rt		24.0' Rt		12.0' Rt		12.0' Rt
Obliteration of Exst 4" White Edge Line		12.0' Rt		12.0' Rt		12.0' Rt		12.0' Rt		12.0' Rt		12.0' Rt		12.0' Rt

Work Area 7 - WB Passing Lane Sta 11582+15 to Sta 11694+25 RP 219.359 to RP 221.472	Location													
	Location													
	A		B		C		D		E		F		G	
4" Dbl Yellow	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset	Station	Offset
4" White Lane Line (10' Line, 30' Skip)		0.0'		0.0'		0.0'		0.0'		0.0'		0.0'		0.0'
4" White Extension Line (2' line, 6' Skip)	11701+20	-	11696+20	-	11688+40	12.0' Lt	11597+00	-	11588+00	-	11580+20	-	11575+20	-
4" White Edge Line		12.0' Lt		12.0' Lt		24.0' Lt		24.0' Lt		24.0' Lt		12.0' Lt		12.0' Lt
Obliteration of Exst 4" White Edge Line		12.0' Lt		12.0' Lt		12.0' Lt		12.0' Lt		12.0' Lt		12.0' Lt		12.0' Lt

*See Section 10, Sheet 2 for Quantities



Pavement Markings

US 52
Fessenden to Carrington

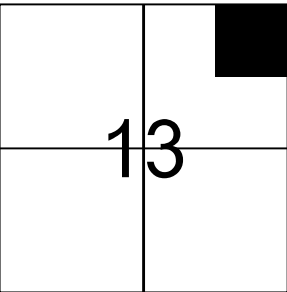
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	180	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

TEST HOLE PLAT

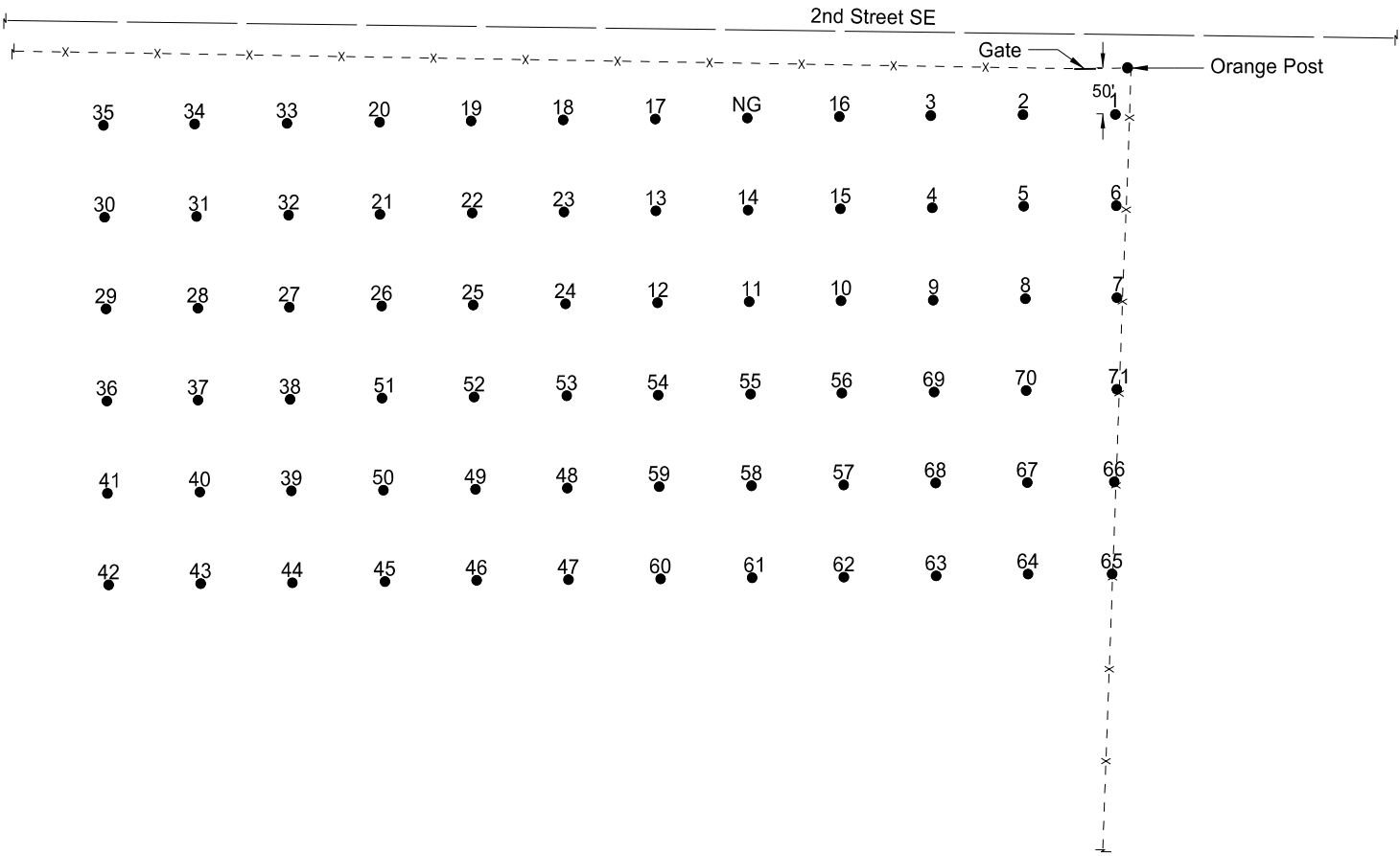
Location: NE1/4NE1/4 13-145-74 County: Sheridan
Ownership: Betty Mertz, John Mertz and Terry Mertz

LOCATION OF PIT IN SECTION



Area "A" consists of Test Holes 1 - 9
Area "B" consists of Test Holes 10 - 17
Area "C" consists of Test Holes 18 - 26
Area "D" consists of Test Holes 27 - 35
Area "E" consists of Test Holes 36 - 44
Area "F" consists of Test Holes 45 - 53
Area "G" consists of Test Holes 54 - 62
Area "H" consists of Test Holes 63 - 71

Legend:
gr = gravel
sd = sand
FS = fine sand
Fgr = fine gravel
CS = coarse sand
sh = shale
SiCl = silt clay
rk = rock
FeO = Iron oxide
CoS = Coal Slack
WL = water line
NG = no gravel
DM = disturbed material
CGr = course gravel



Scale 1"=200'

																									STATE	PROJECT NO.		SECTION NO.	SHEET NO.		
																									ND	INF-X-3-052(053)185		180	2		
PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES							
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	
1	2.0	2.0 gr SiCl	0	8	19	30	SiCl	11	2.0	5.0 gr	0	10	20	30	+gr	25	0.5	5.5 Fgr	2	12	23	34	+gr	37	1.0	5.0 gr	1	15	25	36	rk
		1.0 sd SiCl								1.0 Fgr								2.0 gr								4.0 Fgr					
2	1.0	11.0 Fgr	2	9	20	31	+gr			4.0 gr								1.0 Fgr								1.0 gr					
		1.0 FgrSiCl								1.0 Fgr								2.0 gr								2.0 Fgr					
		1.0 Fgr								1.0 gr								3.0 Fgr								4.0 gr					
		2.0 FgrSiCl								1.0 Fgr								3.0 gr						38	1.0	7.0 gr	0	9	19	28	SiCl
		1.0 gr SiCl								2.0 FgrSiCl								3.0 Fgr								4.0 Fgr					
		2.0 gr								3.0 Fgr						26	0.5	7.5 gr	0	11	19	30	+gr			1.0 gr					
		1.0 gr SiCl						12	2.0	1.0 gr	0	3	15	28	+gr			2.0 Fgr								4.0 Fgr					
3	0.5	10.5 Fgr	0	3	8	14	+gr			10.0 Fgr								2.0 gr								1.5 sd sh					
		2.0 gr SiCl								1.0 gr								2.0 Fgr						39	0.5	9.5 gr	1	8	18	27	+gr
		7.0 gr								1.0 FgrSiCl								1.0 gr								3.0 Fgr					
4	1.0	5.0 FgrSiCl	0	0	6	11	+gr			5.0 Fgr								5.0 Fgr								2.0 gr					
		1.0 Fgr						13	0.5	5.5 Fgr	1	6	14	24	SiCl	27	0.5	6.5 gr	4	17	29	40	+gr			5.0 Fgr					
		1.0 FgrSiCl								9.0 gr								5.0 Fgr						40	1.5	3.5 Fgr	0	5	13	22	+gr
		10.0 Fgr								3.0 Fgr								1.0 gr								2.0 gr					
		2.0 FgrSiCl						14	2.0	3.0 Fgr	0	8	22	36	SiCl			2.0 Fgr								10.0 Fgr					
5	1.0	3.0 gr	0	2	8	18	SiCl			2.0 gr								1.5 Fgr sh								3.0 sd					
		2.0 Fgr						15	1.0	3.0 Fgr	0	1	4	7	SiCl			3.5 CGr						41	1.5	2.5 gr	0	4	13	21	+gr
		3.0 gr								3.0 sd sh						28	0.5	4.5 Fgr	4	14	25	34	rk			1.0 Fgr					
		2.0 Fgr								2.0 gr								1.0 gr								2.0 gr					
		2.0 gr SiCl						16	0.5	9.5 Fgr	0	4	11	19	SiCl			6.0 Fgr								6.0 Fgr					
		1.0 Fgr								2.0 gr								3.5 gr								2.0 Fgr sh					
6	1.0	1.0 FgrSiCl	0	3	10	20	SiCl	17	1.0	3.0 Fgr	2	23	36	48	rk	29	2.0	11.0 Fgr	1	11	18	27	rk			1.0 gr					
		6.0 Fgr								5.0 gr								2.0 Fgr sh						42	0.5	2.5 Fgr	0	3	10	16	+gr
		3.0 FgrSiCl						18	1.0	11.0 Fgr	0	3	8	17	SiCl			2.5 CGr								1.0 gr					
		2.5 Fgr								1.0 gr						30	2.0	9.0 Fgr	0	3	10	18	SiCl			6.0 Fgr					
		1.5 FgrSiCl						19	1.5	11.5 Fgr	0	5	9	17	SiCl			1.0 sd sh								2.0 Fgr sh					
7	0.5	1.5 gr	0	0	5	11	SiCl	20	0.5	19.5 Fgr	0	1	7	15	+gr	31	2.0	14.0 Fgr	0	2	9	17	SiCl			1.0 Fgr					
8	0.5	2.5 gr	0	5	13	22	+gr	21	2.0	2.0 gr	0	10	19	27	+gr	32	2.0	11.0 Fgr	0	4	12	21	SiCl			1.0 Fgr sh					
		1.0 Fgr								2.0 Fgr								1.0 sd								1.0 FS					
		1.0 gr								3.0 gr								4.5 Fgr								1.0 Fgr sh					
		2.0 FgrSiCl								1.0 Fgr						33	0.5	11.5 Fgr	0	0	3	10	SiCl			0.5 Fgr					
		2.0 Fgr								2.0 gr								1.0 Fgr sh								1.5 Fgr sh					
		2.0 FgrSiCl								5.0 Fgr								6.0 Fgr								2.0 sd					
		5.0 Fgr								1.0 sd sh						34	3.0	5.0 Fgr	0	2	6	12	+gr	43	1.0	4.0 Fgr	2	6	14	23	+gr
		1.0 gr CoS								1.0 Fgr								1.0 sd								3.0 gr					
		3.0 Fgr								1.0 sd								3.0 Fgr								12.0 Fgr					
9	0.5	2.5 gr	0	13	24	34	+cave	22	1.5	12.5 Fgr	0	3	9	18	SiCl			1.0 CS													
		2.0 FS						23	2.0	8.5 Fgr	0	2	8	15	SiCl			3.0 Fgr													
		2.0 Fgr								0.5 sd								1.0 sd													
		2.0 gr								2.5 Fgr								3.0 Fgr													
		1.0 gr CoS						24	1.0	6.0 gr	3	11	22	34	+gr	35	2.0	10.0 Fgr	0	1	4	9	SiCl								
		1.0 gr								1.0 Fgr						36	2.0	12.0 Fgr	1	11	19	27	+gr								
		4.0 CGr								6.0 gr								1.0 FgrSiCl													
10	0.5	2.5 gr	0	6	15	27	SiCl			2.0 CGr								2.0 sd sh													
		2.0 Fgr								4.0 gr								1.0 sd													
		1.0 gr																2.0 gr													
		5.0 Fgr																													

																								STATE	PROJECT NO.		SECTION NO.	SHEET NO.							
																								ND	INF-X-3-052(053)185		180	3							
PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES											
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)		% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)		% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)		% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)		% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
44	1.0	6.0	gr	0	8	19	29	+gr	52	0.5	10.5	gr	1	9	22	34	+gr	64	0.5	4.5	gr	2	16	26	38	+gr									
		2.0	Fgr								2.0	Fgr									1.0	Fgr													
		2.0	gr								1.0	gr									8.0	gr													
		2.0	Fgr								1.0	Fgr									2.0	Fgr													
		2.0	gr								2.5	gr									1.0	gr													
		5.0	Fgr								2.5	Fgr									2.0	Fgr													
45	0.5	4.5	Fgr	0	10	20	31	+gr	53	1.0	6.0	gr	2	11	25	37	+gr				1.0	gr													
		1.0	gr								1.0	Fgr						65	0.5	9.5	gr	0	10	21	34	+gr									
		8.0	Fgr								5.0	gr									1.0	Fgr													
		1.0	gr								3.0	Fgr									2.0	gr													
		5.0	Fgr								4.0	gr									2.0	Fgr													
46	1.0	8.0	gr	1	11	22	33	+gr	54	1.0	2.0	Fgr	3	15	26	37	+gr				2.0	gr													
		1.0	Fgr								4.0	gr									1.0	FgrSiCl													
		5.0	gr								1.0	Fgr									2.0	Fgr													
		5.0	Fgr								9.0	gr						66	0.5	3.5	gr	0	3	12	23	+gr									
47	0.5	2.5	Fgr	1	16	25	36	+gr			1.0	Fgr									2.0	Fgr													
		5.0	gr								2.0	gr									2.0	gr													
		1.0	Fgr						55	0.5	19.5	gr	2	14	27	39	+gr				1.0	Fgr													
		1.0	gr						56	0.5	8.5	gr	3	14	27	39	+gr				9.5	FgrSiCl													
		7.0	Fgr								1.0	Fgr									1.5	sd sh													
		1.0	gr								3.0	gr						67	0.5	5.5	gr	0	13	23	35	+gr									
		1.0	Fgr								1.5	Fgr									1.0	Fgr													
		1.0	gr								0.5	gr									13.0	gr													
48	0.5	13.5	gr	1	12	23	35	+gr			2.0	Fgr						68	1.0	13.0	gr	3	13	30	39	+gr									
		2.0	Fgr								3.0	gr									1.0	Fgr													
		1.0	gr						57	0.5	19.5	gr	2	13	25	37	+gr				5.0	gr													
		2.0	Fgr						58	0.5	2.5	gr	2	12	25	36	+gr	69	1.0	7.0	gr	3	14	28	42	+gr									
		1.0	gr								1.0	Fgr									1.0	Fgr													
49	0.5	2.5	gr	1	13	23	34	+gr			3.0	gr									11.0	gr													
		1.0	Fgr								2.0	Fgr						70	0.5	2.5	CGr	2	11	22	33	SiCl									
		2.0	gr								5.0	gr									5.0	gr													
		5.0	Fgr								2.5	Fgr									2.0	Fgr													
		1.0	gr								3.5	gr									2.0	FgrSiCl													
		4.0	Fgr						59	0.5	13.5	gr	0	14	27	39	+cave				1.0	Fgr													
		2.0	gr						60	0.5	5.5	gr	2	10	25	39	rk				1.0	FgrSiCl													
		2.0	Fgr								2.0	Fgr									1.0	Fgr													
50	0.5	7.5	gr	1	8	20	31	+gr			3.0	gr						71	0.5	3.5	gr	0	5	13	23	SiCl									
		1.0	Fgr						61	2.0	18.0	gr	1	12	26	38	+gr				1.0	Fgr													
		4.0	gr						62	0.5	5.5	gr	2	14	26	37	+gr				1.0	FgrSiCl													
		7.0	Fgr								2.0	Fgr									1.0	Fgr													
51	0.5	5.5	gr	3	16	26	36	+gr			3.5	gr															RANGE 74 TWP 145 SEC NE 1/4 13								
		2.0	Fgr								0.5	Fgr														COUNTY Sheridan May-17									
		3.0	gr								3.0	gr														PROSPECTED BY Rogstad/Usher									
		2.0	Fgr								1.0	Fgr														INSPECTED & APPROVED Jeffrey Swank Jun-17									
		2.0	gr								4.0	gr																							
		5.0	Fgr						63	3.0	17.0	gr	2	10	22	35	+gr																		

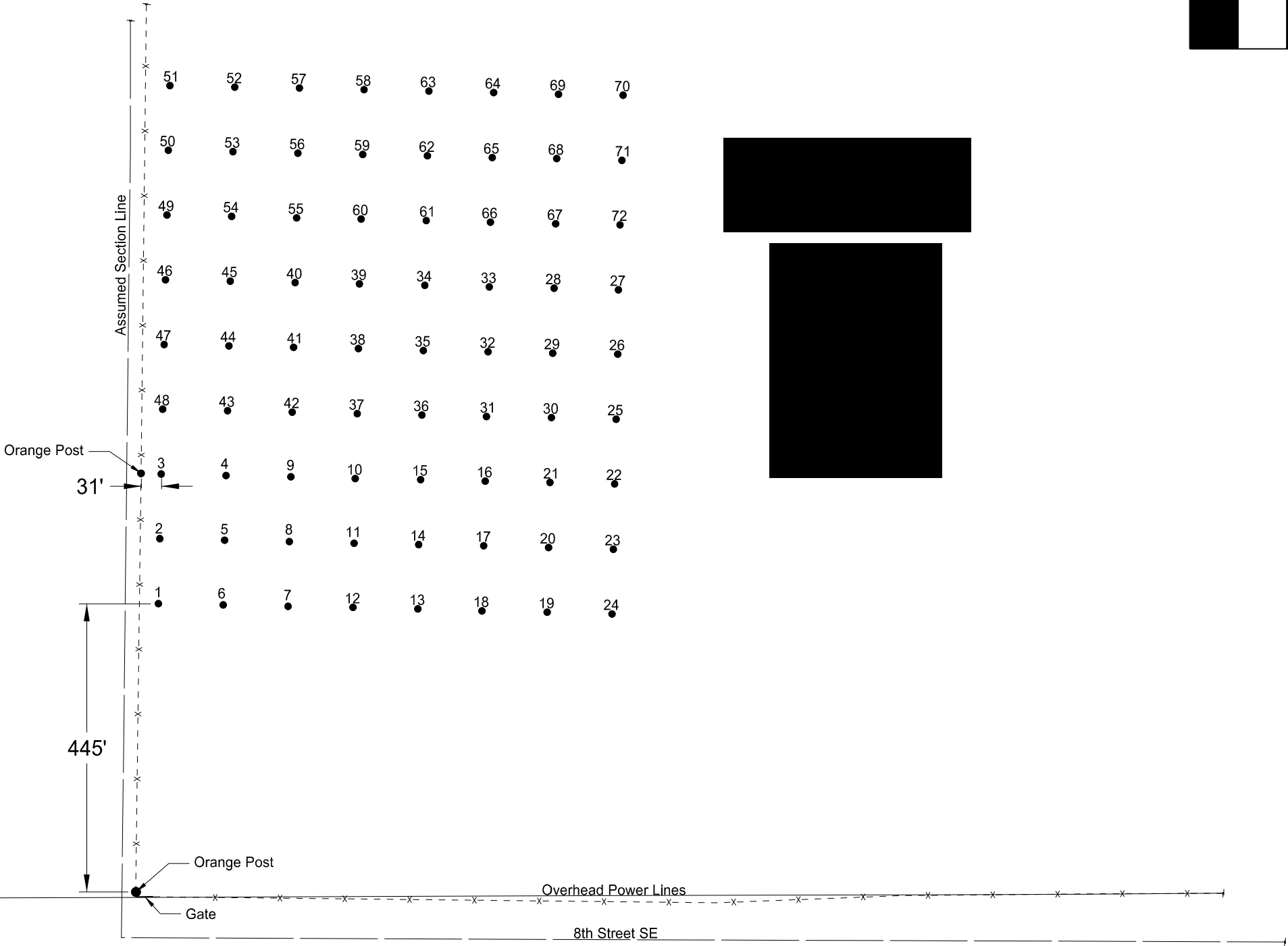
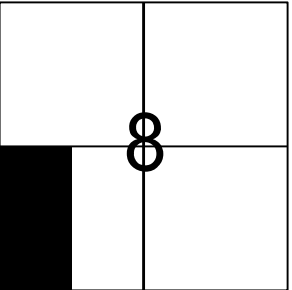
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	INF-X-3-052(053)185	180	4

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

LOCATION OF PIT IN SECTION

TEST HOLE PLAT

Location: W1/2SW1/4 8-144-71 County: Kidder
Ownership: Karen Hirschert



Scale 1" = 200"

[illegible]

																									STATE	PROJECT NO.		SECTION NO.	SHEET NO.		
																									ND	INF-X-3-052(053)185		180	6		
PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES							
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
27	2.0	2.0 Fgr	2	13	22	31	+gr	33	1.0	1.0 gr	1	13	26	37	+gr	39	2.0	7.0 Fgr	3	17	27	36	+gr	45	1.0	2.0 gr	0	6	18	31	+gr
		1.0 gr								2.0 Fgr								2.0 gr								3.0 Fgr					
		2.0 sd								1.0 sd								1.0 sd								7.0 gr					
		4.5 Fgr								6.0 Fgr								1.0 gr								4.0 Fgr					
		2.5 gr								1.0 gr								2.0 Fgr								3.0 gr					
		4.0 Fgr								3.0 Fgr								1.0 gr						46	1.0	2.0 gr	2	17	26	34	+gr
		1.0 CGr								1.0 gr								1.0 CGr								2.5 Fgr					
		1.0 Fgr								2.0 Fgr								2.0 gr								0.5 sd					
28	1.0	2.0 gr	1	13	23	34	+gr			1.0 CGr								1.0 Fgr								4.0 gr					
		5.0 Fgr								1.0 gr						40	2.0	2.0 Fgr	1	9	21	33	+gr			2.0 Fgr					
		1.0 sd						34	1.5	2.5 gr	4	18	29	40	+gr			1.0 sd								4.0 gr					
		1.0 gr								1.5 FS								1.0 Fgr								3.0 Fgr					
		2.0 Fgr								3.5 Fgr								1.0 gr								4.0 gr					
		4.0 gr								7.0 gr								1.0 Fgr								1.0 Fgr					
		1.0 CS								2.0 CGr								3.0 gr								1.0 gr					
		3.0 gr								2.0 gr								2.0 Fgr								2.0 Fgr					
29	0.5	2.5 gr	0	14	26	38	+gr	35	1.0	3.0 Fgr	2	16	25	35	+gr			1.0 gr						47	0.5	2.5 gr	2	12	23	34	+gr
		4.0 Fgr								1.0 sd								1.0 CS								3.0 Fgr					
		1.0 gr								5.0 Fgr								5.0 gr								1.0 CS					
		2.0 Fgr								1.0 gr						41	1.5	3.5 Fgr	1	12	23	34	+gr			1.0 Fgr					
		3.0 gr								3.0 Fgr								1.0 CS								5.0 gr					
		2.0 Fgr								3.0 CGr								1.0 Fgr								1.0 CGr					
		5.0 gr								2.0 gr								1.0 gr								1.0 Fgr					
30	1.0	2.0 gr	4	13	25	37	+gr			1.0 Fgr								2.0 Fgr								1.0 gr					
		5.0 Fgr						36	1.0	1.0 gr	0	9	20	29	+gr			2.0 gr								2.0 Fgr					
		12.0 gr								2.0 Fgr								1.0 Fgr								2.0 gr					
31	1.0	8.5 Fgr	0	13	22	32	+gr			1.0 sd								2.0 gr						48	1.0	1.0 gr	0	8	16	25	+gr
		0.5 sd								3.0 Fgr								2.0 Fgr								2.0 Fgr					
		2.0 gr								2.0 gr								2.0 gr								1.0 sd					
		1.0 Fgr								1.0 CS								1.0 Fgr								9.0 Fgr					
		2.0 gr								5.5 gr						42	1.0	3.0 gr	0	11	22	33	+gr			1.0 gr					
		1.0 CGr								1.5 FS								4.0 Fgr								5.0 Fgr					
		2.0 Fgr								2.0 Fgr								5.0 gr													
		2.0 gr						37	1.0	5.0 Fgr	1	15	27	37	+gr			1.0 FS													
32	1.0	2.0 gr	2	10	21	31	+gr			1.0 sd								1.0 gr													
		2.0 Fgr								4.0 gr								2.0 Fgr													
		1.0 sd								2.0 Fgr								1.0 CGr													
		1.0 Fgr								3.0 gr								2.0 gr													
		1.0 gr								2.0 Fgr						43	1.0	2.0 Fgr	0	13	24	33	+gr								
		1.0 sd						38	0.5	1.5 gr	1	11	22	33	+gr			2.0 sd													
		4.0 gr								5.0 Fgr								8.0 Fgr							RANGE 71 TWP 144 SEC 8						
		1.0 Fgr								1.0 gr								5.0 gr							COUNTY Kidder Aug-15						
		6.0 gr								1.0 Fgr								2.0 Fgr							PROSPECTED BY Rogstad/Usher						
										2.0 gr								6.0 gr							INSPECTED & APPROVED Jeffrey Swank Aug-15						
										1.0 sd								2.0 Fgr													
										4.0 gr								1.0 gr													
																		3.0 Fgr													
																		3.0 gr													

																									STATE	PROJECT NO.		SECTION NO.	SHEET NO.					
																									ND	INF-X-3-052(053)185		180	7					
PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES										
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole			
49	1.0	1.0 gr	0	9	20	32	+gr	56	1.0	2.0 gr	2	14	25	35	+gr	63	1.0	9.0 Fgr	0	11	22	32	+gr	70	0.5	2.5 gr	0	10	18	28	+gr			
		1.0 Fgr								3.0 Fgr								2.0 gr								3.5 Fgr								
		2.0 FS								2.0 gr								1.0 Fgr								0.5 FS								
		2.0 gr								1.0 Fgr								2.0 gr								4.0 gr								
		2.0 Fgr								3.0 gr								4.0 Fgr								2.0 FS								
		2.0 gr								1.0 Fgr								1.0 gr								7.0 gr								
		1.0 Fgr								7.0 gr						64	1.0	3.0 Fgr	0	12	20	30	+gr	71	1.5	0.5 Fgr	0	10	21	31	+gr			
		5.0 gr						57	2.0	6.0 Fgr	0	9	21	30	+gr			1.0 FS								1.0 gr								
		2.0 Fgr								3.0 gr								3.0 Fgr								7.0 Fgr								
		1.0 gr								1.0 sd								7.0 gr								2.0 gr								
50	1.0	7.0 Fgr	0	13	26	36	+gr			1.0 Fgr								3.0 Fgr								6.0 Fgr								
		2.0 gr								3.0 gr								2.0 gr								2.0 gr								
		1.0 Fgr								2.0 sd						65	1.0	7.0 Fgr	0	11	22	31	+gr	72	0.5	2.5 gr	1	12	22	32	+gr			
		4.0 gr								2.0 Fgr								2.0 gr								6.0 Fgr								
		2.0 Fgr						58	1.0	1.0 gr	0	10	20	31	+gr			1.0 Fgr								6.0 gr								
		1.0 gr								4.0 Fgr								4.0 gr								1.0 Fgr								
		2.0 Fgr								3.0 gr								4.0 Fgr								4.0 gr								
51	1.0	4.0 Fgr	0	11	23	31	+gr			1.0 Fgr								1.0 gr																
		2.0 gr								2.0 gr						66	3.0	2.0 gr	0	8	19	30	+gr											
		1.0 sd								2.0 CGr								4.0 Fgr																
		2.0 Fgr								6.0 gr								2.0 gr																
		10.0 gr						59	1.0	4.0 Fgr	0	13	24	33	+gr			1.0 Fgr																
52	2.0	1.0 Fgr	1	16	26	35	+gr			1.0 sd								5.0 gr																
		1.0 sd								1.0 Fgr								1.0 Fgr																
		15.0 Fgr								1.0 FS								1.0 FS																
		1.0 gr								2.0 gr								1.0 gr																
53	1.0	1.0 gr	1	13	23	33	+gr			5.0 Fgr						67	0.5	9.5 Fgr	1	13	25	37	+gr											
		6.0 Fgr								1.0 gr								5.0 gr																
		4.0 gr								4.0 Fgr								2.0 Fgr																
		1.0 Fgr						60	2.0	3.0 Fgr	1	9	20	30	+gr			1.0 gr																
		7.0 gr								1.0 gr								2.0 Fgr																
54	2.0	5.0 Fgr	1	13	23	32	+gr			2.0 Fgr						68	0.5	2.5 gr	0	8	17	28	+gr											
		2.0 gr								1.0 sd								1.0 sd																
		1.0 Fgr								8.0 gr								2.0 Fgr																
		1.0 gr								2.0 Fgr								1.0 sd																
		2.0 Fgr								1.0 gr								2.5 Fgr																
		1.0 gr						61	3.0	1.0 gr	0	15	27	37	+gr			0.5 CS																
		2.0 Fgr								7.0 Fgr								2.0 gr																
		4.0 gr								2.0 gr								1.0 Fgr																
55	4.0	9.0 Fgr	0	11	22	31	+gr			2.0 Fgr								7.0 gr																
		1.0 gr								1.0 gr						69	3.0	5.0 Fgr	1	16	28	38	+gr											
		3.0 Fgr								2.0 Fgr								3.0 gr							RANGE					71	TWP	144	SEC	8
		1.0 sd								2.0 gr								1.0 sd							COUNTY					Kidder		Aug-15		
		1.0 gr								2.0 Fgr								3.0 Fgr							PROSPECTED BY					Rogstad/Usher				
		1.0 Fgr								1.0 sd								4.0 gr							INSPECTED & APPROVED					Jeffrey Swank		Aug-15		

NDDOT ABBREVIATIONS

D-101-1

?	This is a special text character used in the labeling of existing features. It indicates a feature that has an unknown characteristic, potentially based on: lack of description, location accuracy or purpose.		C Gdrl	cable guardrail	Culv	culvert	FOS	factor of safety
			Calc	calculate	C&G	curb & gutter	Fed	Federal
Abn	abandoned		CIP	cast iron pipe	CI	curb inlet	FP	feed point
Abut	abutment		CB	catch basin	CR	curb ramp	Fn	fence
Adj	adjusted		CRS	cationic rapid setting	C	cut	Fn P	fence post
Aggr	aggregate		C Gd	cattle guard	Dd Ld	dead load	FO	fiber optic
Ahd	ahead		C To C	center to center	Defl	deflection	FD	field drive
ARV	air release valve		CL or C	centerline	Defm	deformed	F	fill
Align	alignment		Ch	chain	DInt	delineate	FAA	fine aggregate angularity
Al	alley		Chnlk	chain-link	DIntr	delineator	FH	fire hydrant
Alt	alternate		Ch Blk	channel block	Depr	depression	Fl	flange
Alum	aluminum		Ch Ch	channel change	Desc	description	Flrd	flared
ADA	Americans with Disabilities Act		Chk	check	Det	detail	FES	flared end section
&	and		Chsld	chiseled	DWP	detectable warning panel	F Bcn	flashing beacon
Appr	approach		Cir	circle	Dtr	detour	FA	flight auger sample
Approx	approximate		Cl	class	Dia or \varnothing	diameter	FL	flow line
ACP	asbestos cement pipe		Clnt	clean-out	Dir	direction	Ftg	footing
Asph	asphalt		Clr	clear	Dist	distance	FM	force main
AC	asphalt cement		Cl&gr	clearing & grubbing	DM	disturbed material	Fnd	found
Assmd	assumed		Comb.	combination	DB	ditch block	Fdn	foundation
@	at		Coml	commercial	DG	ditch grade	Frac	fractional
Atten	attenuation		Compr	compression	Dbl	double	Frwy	freeway
ATR	automatic traffic recorder		CADD	computer aided drafting & design	Dn	down	Frt	front
Ave	Avenue		Conc	concrete	Dwg	drawing	FF	front face
Avg	average		CECB	concrete erosion control blanket	Dr	drive	F Disp	fuel dispenser
ADT	average daily traffic		Cond	conductor	Drwy	driveway	FFP	fuel filler pipes
			Const	construction	DI	drop inlet	FLS	fuel leak sensor
			Cont	continuous	D	dry density	Furn	furnish/ed
			CSB	continuous split barrel sample	DSDS	dynamic speed display sign		
			Contr	contraction				
			Contr	contractor				
Bk	back		CP	control point				
BF	back face		Coord	coordinate	Ea	each		
Balc	balcony		Cor	corner	Esmt	easement		
B Wire	barbed wire		Corr	corrected	E	East		
Barr	barricade		CAES	corrugated aluminum end section	EB	Eastbound		
Btry	battery		CAP	corrugated aluminum pipe	Elast	elastomeric		
BI	beehive inlet		CMES	corrugated metal end section	EL	electric locker		
Beg	begin		CMP	corrugated metal pipe	E Mtr	electric meter		
BG	below grade		CPVCP	corrugated poly-vinyl chloride pipe	Elec	electric/al		
BM	bench mark		CSES	corrugated steel end section	EDM	electronic distance meter		
Bkwy	bikeway		CSFES	corrugated steel flared end section	Elev or El	elevation		
Bit	bituminous		CSP	corrugated steel pipe	Ellipt	elliptical		
Blk	block		CSTES	corrugated steel traversable end section	Emb	embankment		
BH	bore hole		Co	County	Emuls	emulsion/emulsified		
Bot	bottom		Crse	course	ES	end section		
Blvd	Boulevard		Ct	Court	Engr	engineer		
Bndry	boundary		Xarm	cross arm	ESS	environmental sensor station		
Brkwy	breakaway		Xbuck	cross buck	Eq	equal		
Br	bridge		Xsec	cross sections	Evgr	evergreen		
Bldg	building		Xing	crossing	Exc	excavation		
Bus.	business		Xrd	crossroad	Exst	existing		
BV	butterfly valve		Crn	crown	Exp	expansion		
By	bypass				Expy	Expressway		
					E	external of curve		
					Extru	extruded		

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PE-4683

ENGINEER

NORTH DAKOTA

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NDDOT ABBREVIATIONS

D-101-2

Galv	galvanized	Ln	lane	Obsc	obscure(d)	Qty	quantity
Gar	garage	Lg	large	Ocpd	occupied	Qtr	quarter
Gs L	gas line	Lat	latitude	Ocpy	occupy		
G Reg	gas line regulator	Lt	left	O/s	offset		
GMV	gas main valve	Lens	lenses	OC	on center	Rad or R	radius
G Mtr	gas meter	Lvl	level	C	one dimensional consolidation	RR	railroad
GSV	gas service valve	LvIng	leveling	OC	organic content	Rlwy	railway
GVP	gas vent pipe	Lht	light	Orig	original	Rsd	raised
GV	gate valve	LP	light pole	O To O	out to out	RC	rapid curing
Ga	gauge	Ltg	lighting	OD	outside diameter	Rec	record
Gov	government	Liq	liquid	OH	overhead	Rcy	recycle
Grd	graded/grade	LL	liquid limit			RAP	recycled asphalt pavement
Grnd	ground	Loc	location			RPCC	recycled portland cement concrete
GWM	ground water monitor	Long.	longitude	PMT	pad mounted transformer	Ref	reference
Gdrl	guardrail	Lp	loop	Pg	pages	R Mkr	reference marker
Gtr	gutter	LD	loop detector	Pntd	painted	RM	reference monument
		Lum	luminaire	Pr	pair	RP	reference point
				Pnl	panel	Refl	reflectorized
H Plg	H piling			Pk	park	RCB	reinforced concrete box
Hdwl	headwall	Mb	mailbox	PSD	passing sight distance	RCES	reinforced concrete end section
Ht	height	ML	main line	Pvmt	pavement	RCFES	reinforced concrete flared end section
Hel	helical	MH	manhole	Ped	pedestal	RCP	reinforced concrete pipe
HDPE	high density polyethylene	Mkd	marked	Ped	pedestrian	RCPS	reinforced concrete pipe sewer
HM	high mast	Mkr	marker	PPP	pedestrian pushbutton post	RCTES	reinforced concrete traversable end section
HP	high pressure	Mkg	marking	Pen.	penetration	Reinf	reinforcement
HPS	high pressure sodium	MA	mast arm	Perf	perforated	Res	reservation
Hwy	highway	Matl	material	Per.	perimeter	Res	residence
Hor	horizontal	Max	maximum	Perm	permanent	Ret	retaining
HBP	hot bituminous pavement	MC	meander corner	PL	pipeline	Rev	reverse
HMA	hot mix asphalt	Meas	measure	Pl	place	Rt	right
Hyd	hydrant	Mdn	median	P&P	plan & profile	R/W	right of way
Ph	hydrogen ion content	MD	median drain	PL	plastic limit	Riv	river
		MC	medium curing	Pl or \overline{P}	plate	Rd	road
		MGS	Midwest Guardrail System	Pt	point	Rdbd	road bed
Id	identification	MM	mile marker	PE	polyethylene	Rdwy	roadway
Incl	inclinometer tube	MP	mile post	PVC	polyvinyl chloride	RWIS	roadway weather information system
IMH	inlet manhole	Min	minimum	PCC	Portland Cement concrete	Rk	rock
ID	inside diameter	Misc	miscellaneous	PP	power pole	Rt	route
Inst	instrument	Mon	monument	Preempt	preemption		
Intchg	interchange	Mnd	mound	Prefab	prefabricated		
Intmdt	intermediate	Mtbl	mountable	Prfmd or Pref	preformed		
Intscn	intersection	Mtd	mounted	Prep	preperation		
Inv	invert	Mtg	mounting	Press.	pressure		
IP	iron pipe	Mk	muck	PRV	pressure relief valve		
				Prestr	prestressed		
				Pvt	private		
				PD	private drive		
				Prod.	production/produce		
				Prog	programmed		
				Prop.	property		
				Prop Ln	property line		
				Ppsd	proposed		
				PB	pull box		
Jt	joint	Neop	neoprene				
Jct	junction	Ntwk	network				
		N	North				
		NE	North East				
		NW	North West				
		NB	Northbound				
		No. or #	number				

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NDDOT ABBREVIATIONS

D-101-3

Salv	salvage(d)	Tel	telephone
San	sanitary sewer line	Tel B	Telephone Booth
Sec	section	Tel P	telephone pole
SL	section line	Tv	television
Sep	separation	Temp	temperature
Seq	sequence	Temp	temporary
Serv	service	TBM	temporary bench mark
Sht	sheet	T	thinwall tube sample
Shtng	sheeting	Ts	topsoil
Shldr	shoulder	Traf	traffic
Sw or Sdwk	sidewalk	TSCB	traffic signal control box
SD	sight distance	Tr	trail
SN	sign number	Transf	transformer
Sig	signal	Trans	transition
Sgl	single	TT	transmission tower
SRCP	slotted reinforced concrete pipe	TES	traversable end section
SC	slow curing	Trans	transverse
SS	slow setting	Trtd	treated
Sm	small	Trmt	treatment
S	South	Qc	triaxial compression
SE	South East	TERO	tribal employment rights ordinance
SW	South West	Tpl	triple
SB	Southbound	Typ	typical
Sp	spaces		
Spcl	special	Qu	unconfined compressive strength
SA	special assembly	Ugrnd	underground
SP	special provisions	Util	utility
G	specific gravity		
Spk	spike		
SB	split barrel sample	VG	valley gutter
SH	sprinkler head	Vap	vapor
SV	sprinkler valve	Vert	vertical
Sq	square	VCP	vitrified clay pipe
Stk	stake	Vol	volume
Std	standard		
N	standard penetration test		
Std Specs	standard specifications	Wkwy	walkway
Stm L	steam line	W	water content
SEC	steel encased concrete	WGV	water gate valve
SMA	stone matrix asphalt	WL	water line
SSD	stopping sight distance	WM	water main
SD	storm drain	WMV	water main valve
St	street	W Mtr	water meter
SPP	structural plate pipe	WSV	water service valve
SPPA	structural plate pipe arch	WW	water well
Str	structure	Wrng	wearing
Subd	subdivision	WIM	weigh in motion
Sub	subgrade	W	west
Sub Prep	subgrade preparation	WB	westbound
Ss	subsoil	Wrng	wiring
SS	supplement specification	W/	with
Supp	supplemental	W/o	without
Surf	surfacing	WC	witness corner
Surv	survey		
Sym	symmetrical		

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MEASUREMENTS

ac	acres
A	ampere
Bd Ft	board feet
Cd	candela
cm	centimeter
C	coulomb
CF	cubic feet
m3	cubic meter
m3/s	cubic meters per second
CY	cubic yard
CY/mi	cubic yards per mile
D or Deg	degree
F	Fahrenheit
F	farad
ft	feet/foot
Gal	gallon
G	giga
Ha	hectare
H	henry
Hz	hertz
hr	hour(s)
in	inch
J	joule
K	kelvin
kN	kilo newton
kPa	kilo pascal
kg	kilogram
kg/m3	kilogram per cubic meter
km	kilometer
K	Kip(s)
LF	linear foot
L	litre
Lm	lumen
L sum	lump sum
Lx	lux
M Hr	man hour
M	mega
m	meter
m/s	meters per second
mi	mile
mL	milliliter
mm	millimeter
mm/hr	millimeters per hour
n	nano
N	newton
Pa	pascal
lb	pounds
sec	seconds
S	siemens
SF	square feet
km2	square kilometer
m2	square meter
SY	square yard
Sta Yd	station yards
SI	Systems International

T	tesla
T/mi	tons per mile
V	volt
W	watt
Wb	weber

SURVEY DESCRIPTIONS

Az	azimuth
Bs	backsight
Brg	bearing
BP Cap	blue plastic cap
BS	both sides
BC	brass cap
CS	curve to spiral
Eq	equation
E	external of curve
FS	far side
FB	field book
Fs	foresight
Geod	geodetic
GIS	Geographical Information System
GPS	Global Positioning System
HI	height of instrument
IM	iron monument
I Pn	iron pin
LS	Land Surveyor (licensed)
LSIT	Land Surveyor In Training
L	length of curve
LC	long chord
LB	level book
Mer	meridian
M	mid ordinate of curve
NGS	National Geodetic Survey
NS	near side
Obsn	observation
Off Loc	office location
OP Cap	orange plastic cap
PK	Parker-Kalon nail
P Cap	plastic cap
PP Cap	pink plastic cap
PCC	point of compound curve
PC	point of curve
PI	point of intersection
PRC	point of reverse curvature
PT	point of tangent
POC	point on curve
POT	point on tangent
RTP	random traverse point
Rge	range
RP Cap	red plastic cap
SC	spiral to curve
ST	spiral to tangent
Sta	station
SE	superelevation
Tan	tangent
T	tangent (semi)
TS	tangent to spiral
Twp	township
TB	transit book
TP	traverse point
TP	turning point
USC&G	US Coast & Geodetic Survey
USGS	US Geologic Survey
VC	vertical curve
WGS	World Geodetic System
YP Cap	yellow plastic cap
Z	zenith

SOIL TYPES

Cl	clay
Cl F	clay fill
Cl Hvy	clay heavy
Cl Lm	clay loam
Co S	coal slack
C Gr	coarse gravel
CS	coarse sand
FS	fine sand
Gr	gravel
Lig Co	lignite coal
Lig Sl	lignite slack
Lm	loam
Rk	rock
Sd	sand
Sdy Cl	sandy clay
Sdy Cl Lm	sandy clay loam
Sdy Fl	sandy fill
Sdy Lm	sandy loam
Sc	scoria
Sh	shale
Si Cl	silt clay
Si Cl Lm	silty clay loam
Si Lm	silty loam

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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12-18-20	Sheet Added - Continued from D-101-3



12 18 2020

NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

702COM	702 Communications	GT PLNS NAT GAS	Great Plains Natural Gas Company	RED RIV COMM	Red River Rural Communications
ACCENT	Accent Communications	HALS TEL	Halstad Telephone Company	RESVTN TEL	Reservation Telephone
AGASSIZ WU	Agassiz Water Users Incorporated	IDEA1	Idea1	ROBRTS TEL	Roberts Company Telephone
AGC	Associated General Contractors of America	INT-COMM TEL	Inter-Community Telephone Company	R-RIDER ELEC	Roughrider Electric Cooperative
ALL PL	Alliance Pipeline	KANEB PL	Kaneb Pipeline Company	RRVW	Red River Valley & Western Railroad
ALL SEAS WU	All Seasons Water Users Association	KEM ELEC	Kem Electric Cooperative Incorporated	S CENT REG WD	South Central Regional Water District
AMOCO PI	Amoco Pipeline Company	KOCH GATH SYS	Koch Gathering Systems Incorporated	S E W U	South East Water Users Incorporated
AMRDA HESS	Amerada Hess Corporation	LKHD PL	Lakehead Pipeline Company	SCOTT CABLE	Scott Cable Television Dickinson
AT&T	AT&T Corporation	LNGDN RWU	Langdon Rural Water Users Incorporated	SHERDN ELEC	Sheridan Electric Cooperative
B PAW	Bear Paw Energy Incorporated	LWR YELL R ELEC	Lower Yellowstone Rural Electric	SHEYN VLY ELEC	Sheyenne Valley Electric Cooperative
BAKER ELEC	Baker Electric	MCKNZ CON	McKenzie Consolidated Telcom	SKYTECH	Skyland Technologies Incorporated
BASIN ELEC	Basin Electric Cooperative Incorporated	MCKNZ ELEC	McKenzie Electric Cooperative	SLOPE ELEC	Slope Electric Cooperative Incorporated
BEK TEL	Bek Communications Cooperative	MCKNZ WRD	McKenzie County Water Resource District	SOURIS RIV TELCOM	Souris River Telecommunications
BELLE PL	Belle Fourche Pipeline Company	MCLEOD	McLeod USA	ST WAT COMM	State Water Commission
BLM	Bureau of Land Management	MCLN ELEC	McLean Electric Cooperative	STATE LN WATER	State Line Water Cooperative
BNSF	Burlington Northern Santa Fe Railway	MCLN-SHRDN R WAT	McLean-Sheridan Rural Water	STER ENG	Sterling Energy
BOEING	Boeing	MDU	Montana-dakota Utilities	STUT RWU	Stutsman Rural Water Users
BRNS RWD	Barnes Rural Water District	MIDCO	MidContinent Communications	SW PL PRJ	Southwest Pipeline Project
BURK-DIV ELEC	Burke-Divide Electric Cooperative	MIDSTATE TEL	Midstate Telephone Company	T M C	Turtle Mountain Communications
BURL WU	Burleigh Water Users	MINOT CABLE	Minot Cable Television	TCI	TCI of North Dakota
CABLE ONE	Cable One	MINOT TEL	Minot Telephone Company	TESORO HGH PLNS PL	Tesoro High Plains Pipeline
CABLE SERV	Cable Services	MISS VALL COMM	Missouri Valley Communications	TRI-CNTY WU	Tri-County Water Users Incorporated
CAP ELEC	Capital Electric Cooperative Incorporat	MISS W W S	Missouri West Water System	TRL CO RWU	Traill County Rural Water Users
CASS CO ELEC	Cass County Electric Cooperative	MNKOTA PWR	Minnkota Power	UNTD TEL	United Telephone
CASS RWU	Cass Rural Water Users Incorporated	MOR-GRAN-SOU ELEC	Mor-gran-sou Electric Cooperative	UPPR SOUR WUA	Upper Souris Water Users Association
CAV ELEC	Cavalier Rural Electric Cooperative	MOUNT-WILLI ELEC	Mountrail-williams Electric Cooperative	US SPRINT	U.S. Sprint
CBLCOM	Cablecom Of Fargo	MRE LBTY TEL	Moore & Liberty Telephone	USAF MSL CABLE	U.S.A.F. Missile Cable
CENEX PL	Cenex Pipeline	MUNICIPAL	City Water And Sewer	USFWS	US Fish and Wildlife Service
CENT PL WATER DIST	Central Pipe Line Water District	MUNICIPAL	City Of '.....'	USW COMM	U.S. West Communications
CENT PWR ELEC	Central Power Electric Cooperative	N CENT ELEC	North Central Electric Cooperative	VRNDRY ELEC	Verendrye Electric Cooperative
CENTURYLINK	CenturyLink	N VALL W DIST	North Valley Water District	W RIV TEL	West River Telephone Incorporated
COE	Corps of Engineers	ND PKS & REC	North Dakota Parks And Recreation	WAPA	Western Area Power Administration
CONS TEL	Consolidated Telephone	ND TEL	North Dakota Telephone Company	WEB	W. E. B. Water Development Association
CONT RES	Continental Resource Inc	NDDOT	North Dakota Department of Transportation	WILLI RWA	Williams Rural Water Association
CPR	Canadian Pacific Railway	NDSU SOIL SCI DEPT	NDSU Soil Science Department	WILSTN BAS PL	Williston Basin Interstate Pipeline Company
D O E	Department Of Energy	NEMONT TEL	Nemont Telephone	WLSH RWD	Walsh Water Rural Water District
DAK CARR	Dakota Carrier Network	NODAK R ELEC	Nodak Rural Electric Cooperative	WOLVRTN TEL	Wolverton Telephone
DAK CENT TEL	Dakota Central Telephone	NOON FRMS TEL	Noonan Farmers Telephone Company	XLENER	Xcel Energy
DAK RWD	Dakota Rural Water District	NPR	Northern Plains Railroad	YSVR	Yellowstone Valley Railroad
DGC	Dakota Gasification Company	NSP	Northern States Power		
DICKEY R NET	Dickey Rural Networks	NTH PRAIR RW	Northern Prairie Rural Water Association		
DICKEY RWU	Dickey Rural Water Users Association	NTHN BRDR PL	Northern Border Pipeline		
DICKEY TEL	Dickey Telephone	NTHN PLNS ELEC	Northern Plains Electric Cooperative Incorporated		
DNRR	Dakota Northern Railroad	NTHWSTRN REF	Northwestern Refinery Company		
DOME PL	Dome Pipeline Company	NW COMM	Northwest Communication Cooperation		
DVELEC	Dakota Valley Electric Cooperative	NWRWD	Northwest Rural Water District		
DVMW	Dakota, Missouri Valley & Western	ONEOK	Oneok gas		
ENBRDG	Enbridge Pipelines Incorporated	OSHA	Occupational Safety and Health Administration		
ENVENTIS	Enventis Telephone	OTTR TL PWR	Otter Tail Power Company		
FALK MNG	Falkirk Mining Company	P L E M	Prairielands Energy Marketing		
FHWA	Federal Highway Administration	POLAR COM	Polar Communications		
G FKS-TRL WD	Grand Forks-traill Water District	PVT ELEC	Private Electric		
GETTY TRD & TRAN	Getty Trading & Transportation	QWEST	Qwest Communications		
GLDN W ELEC	Golden West Electric Cooperative	R&T W SUPPLY	R & T Water Supply Association		
GRGS CO TEL	Griggs County Telephone				
GTR RAMSEY WD	Greater Ramsey Water District				

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PE-4683

ENGINEER

NORTH DAKOTA

12 18 2020

LINE STYLES

D-101-20

Existing Topography

	Existing Ground Void
	Existing Cemetary Boundary
	Existing Box Culvert Bridge
	Existing Concrete Surface
	Existing Drainage Structure
	Existing Gravel Surface
	Existing Riprap
	Existing Dirt Surface
	Existing Asphalt Surface
	Existing Tie Point Line
	Existing Railroad Centerline
	Existing Guardrail Cable
	Existing Guardrail Metal
	Existing Edge of Water
	Existing Fence
	Existing Railroad
	Existing Field Line
	Exst Flow
	Existing Curb
	Existing Valley Gutter
	Existing Driveway Gutter
	Existing Curb and Gutter
	Existing Mountable Curb and Gutter

	Existing 3-Cable w Posts
	Site Boundary
	Existing Berm, Dike, Pit, or Earth Dam
	Existing Ditch Block
	Existing Tree Boundary
	Existing Brush or Shrub Boundary
	Existing Retaining Wall
	Existing Planter or Wall
	Existing W-Beam Guardrail with Posts
	Existing Railroad Switch
	Gravel Pit - Borrow Area
	Existing Wet Area-Vegetation Break
	Existing High Tension Cable Guardrail
	Existing High Tension Cable Guardrail with Posts

Proposed Topography

	3-Cable w Posts
	Flow
	Fence
	Remove Line
	Wall
	Retaining Wall (Plan View)
	W-Beam w Posts
	High Tension Cable Guardrail with Posts

Existing Utilities

	Existing Electrical
	Existing Fiber Optic Line
	Existing TV Fiber Optic
	Existing Gas Pipe
	Existing Overhead Utility Line
	Existing Power
	Existing Fuel Pipeline
	Existing Undefined Above Ground Pipe Line
	Existing Sanitary Sewer
	Existing Sanitary Force Main
	Existing Storm Drain
	Existing Storm Drain Force Main
	Existing Culvert
	Existing Telephone Line
	Existing TV Line
	Existing Water or Steam Line
	Existing Under Drain
	Existing Slotted Drain
	Existing Conduit
	Existing Conductor
	Existing Down Guy Wire Down Guy
	Existing Underground Vault or Lift Station

Proposed Utilities

	24 Inch Pipe
	Reinforced Concrete Pipe
	Under Drain
	Edge Drain

Traffic Utilities

	Conductor
	Fiber Optic
	Existing Loop Detector
	Existing Double Micro Loop Detector
	Micro Loop Detector Double
	Existing Micro Loop Detector
	Micro Loop Detector
	Signal Head with Mast Arm
	Existing Signal Head with Mast Arm

Sign Structures






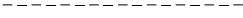







	Existing Overhead Sign Structure
	Existing Overhead Sign Structure Cantilever
	Overhead Sign Structure Cantilever

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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09-23-16	Added and Revised Items, Organized by Functional Groups
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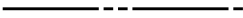
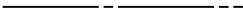
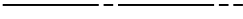




LINE STYLES

D-101-21


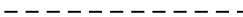
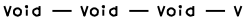





Right Of Way

	Easement
	Existing Easement
	Right of Way
	Existing Right of Way
	Existing Right of Way Railroad
	Existing Right of Way Not State Owned
	Existing Government Lot Line
	Existing Adjacent Block Lines
	Existing Adjacent Lot Lines
	Existing Adjacent Property Line
	Existing Adjacent Subdivision Lines
	Sight Distance Triangle Line
	Dimension Leader







Boundary Control


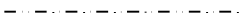
	Existing City Corporate Limits or Reservation Boundary
	Existing State or International Line
	Existing Township
	Existing County
	Existing Section Line
	Existing Quarter Section Line
	Existing Sixteenth Section Line
	Existing Centerline
	Tangent Line

Cross Sections and Typicals



	Existing Ground
	Existing Topsoil (Cross Section View)
	Existing Ground Void (Not Surveyed)
	Existing Concrete
	Existing Aggregate (Cross Section View)
	Existing Curb and Gutter (Cross Section View)
	Existing Asphalt (Cross Section View)
	Existing Reinforcement Rebar

Geotechnical



	Geotextile Fabric Type D
	Geogrid
	Geotextile Fabric Type R
	Geotextile Fabric Type R1
	Geotextile Fabric Type RR
	Geotextile Fabric Type S

	Subgrade Reinforcement
	Failure Line







Countours

	Depression Contours
	Supplemental Contour


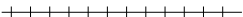

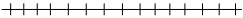
Profile

	Subgrade, Subcut or Ditch Grade
	Topsoil Profile




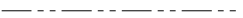





Striping

	Centerline Pavement Marking
	Barrier with Centerline Pavement Marking
	Barrier Pavement Marking
	Stripe 4 IN Dotted Extension White
	Stripe 8 IN Dotted Extension White
	Stripe 8 IN Lane Drop








Pavement Joints

	Doweled Joint
	Tie Bar 30 Inch 4 Foot Center to Center
	Tie Bar 18 Inch 3 Foot Center to Center
	Tie Bar at Random Spacing




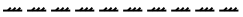
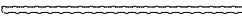
Bridge Details

	Small Hidden Object
	Large Hidden Object
	Phantom Object
	Existing Conditions Object
	Centerline Main
	Centerline Secondary
	Excavation Limits
	Proposed Ground
	Sheet Piling

Erosion Control

	Limits of Const Transition Line
	Bale Check
	Rock Check
	Floating Silt Curtain
	Silt Fence
	Excavation Limits
	Fiber Rolls

Environmental

	Wetland Mitigation
	Existing Wetland Easement USFWS
	Existing Wetland Jurisdictional
	Existing Wetland
	Tree Row

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SYMBOLS

D-101-30


 North Arrow (Half Scale)


 Alignment Data Point

 Alignment Monument


 Spot Elevation


 Existing Miscellaneous Spot

 Existing Access Control Arrow

 Existing Benchmark

 Reset USGS Marker

 Iron Monument Found





 Iron Pin R/W Monument

 Property Corner

 Iron Pin Reference Monument


   Right of Way Marker (Exst, Ppsd, Reset)

 Existing Federal Reference Corner


    Existing Section Corner (Full, Quarter, Sixteenth, Meander)


 Existing Witness Corner


   Existing Control Point (CP, GPS-RTK, TRI)


 Existing Traverse PI Aerial Panel


 Existing Reference Marker Point NGS

 Existing EFB Misc

 Existing Bush or Shrub


 Existing Large Evergreen Tree


 Existing Small Evergreen Tree

 Existing Large Tree

 Existing Small Tree

 Existing Tree Trunk

 Cairn or Stone Circle


 Existing Artifact


 Existing Satellite Dish

 Existing Weather Station

 Existing Windmill or Tower


 Reinforced Pavement


 Continuous Split Barrel Sample

 Flight Auger Sample

 Split Barrel Sample

 Thinwall Tube Sample

 Standard Penetration Test

 Inclinometer Tube

 Excavation Unit

 Existing Ground Water Well Bore Hole

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






























ENGINEER

NORTH DAKOTA


12 18 2020

SYMBOLS

D-101-31

	Flexible Delineator		Highway Sign (Exst, Ppsd)
	Flexible Delineator Type A (Exst, Ppsd)		Mile Post Type A (Exst-Ppsd-Reset)
	Flexible Delineator Type B (Exst, Ppsd)		Mile Post Type B (Exst, Ppsd)
	Flexible Delineator Type C (Exst, Ppsd)		Mile Post Type C (Exst, Ppsd)
	Flexible Delineator Type D (Exst, Ppsd)		Object Marker Type I (Exst, Ppsd)
	Flexible Delineator Type E (Exst, Ppsd)		Object Marker Type II (Exst, Ppsd)
	Delineator Type A (Exst, Ppsd, Diamond Grade-Reset)		Object Marker Type III (Exst, Ppsd)
	Delineator Type B (Exst, Ppsd, Diamond Grade-Reset)		Existing Reference Marker
	Delineator Type C (Exst, Ppsd, Diamond Grade)		Road Closure Gate 18 Ft (Exst, Ppsd)
	Delineator Type D (Exst, Ppsd, Diamond Grade)		Road Closure Gate 28 Ft (Exst, Ppsd)
	Delineator Type E (Exst, Ppsd, Diamond Grade)		Road Closure Gate 40 Ft (Exst, Ppsd)
	Barricade (Type I, Type II, Type III)		Existing Railroad Battery Box
	Arrow Panel (Caution Mode, Double Direction, Left Directional, Right Directional, Sequencing, Truck Mounted)		Existing RR Profile Spot
	Attenuation Device		Existing Railroad Crossbuck
	Truck Mounted Attenuator		Existing Railroad Frog
	Delineator Drums		Existing Mailbox (Private, Federal)
	Flagger		
	Tubular Marker		
	Traffic Cone		
	Back to Back Vertical Panel Sign		

















































































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SYMBOLS


D-101-32

	Existing Luminaire			High Mast Light Standard 3 Luminaire (Exst, Ppsd)		Existing Traffic Signal Standard			
	Luminaire LED			High Mast Light Standard 4 Luminaire (Exst, Ppsd)				Pull Box (Exst-Ppsd-Undefined)	
	Existing Light Standard Luminaire			High Mast Light Standard 5 Luminaire (Exst, Ppsd)				Intelligent Transportation Pull Box (Exst, Ppsd)	
	Relocate Light Standard			High Mast Light Standard 6 Luminaire (Exst, Ppsd)				Transformer (Exst, Ppsd)	
	Light Standard Light LED Luminaire			High Mast Light Standard 7 Luminaire (Exst, Ppsd)				Power Pole (Exst-Ppsd-with Transformer)	
	Light Standard 35 Watt High Pressure Sodium Vapor Luminaire			High Mast Light Standard 8 Luminaire (Exst, Ppsd)				Wood Pole (Exst, Ppsd)	
	Light Standard 50 Watt High Pressure Sodium Vapor Luminaire			High Mast Light Standard 9 Luminaire (Exst, Ppsd)				Pedestrian Push Button Post (Exst, Ppsd)	
	Light Standard 70 Watt High Pressure Sodium Vapor Luminaire			High Mast Light Standard 10 Luminaire (Exst, Ppsd)				Existing Pole	
	Light Standard 100 Watt High Pressure Sodium Vapor Luminaire			Overhead Sign Structure Load Center (Exst, Ppsd)				Existing Telephone Pole	
	Light Standard 150 Watt High Pressure Sodium Vapor Luminaire			Traffic Signal Controller (Exst, Ppsd)				Existing Post	
	Light Standard 200 Watt High Pressure Sodium Vapor Luminaire			Pad Mounted Traffic Signal Controller (Exst, Ppsd)					Connection Conductor (Ground, Neutral, Phase 1, Phase 2)
	Light Standard 250 Watt High Pressure Sodium Vapor Luminaire			Flashing Beacon (Exst, Ppsd)					
	Light Standard 310 Watt High Pressure Sodium Vapor Luminaire			Concrete Foundation (Exst, Ppsd)					
	Light Standard 400 Watt High Pressure Sodium Vapor Luminaire			Pipe Mounted Flasher (Exst, Ppsd)					
	Light Standard 700 Watt High Pressure Sodium Vapor Luminaire			Pad Mounted Feed Point (Exst, Ppsd)					
	Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire			Pipe Mounted Feed Point with Pad (Exst, Ppsd)					
	Emergency Vehicle Detector			Pole Mounted Feed Point (Exst, Ppsd)					
	Video Detection Camera			Junction Box (Exst, Ppsd)					
				Existing Pedestrian Head with Number					
				Existing Signal Head					
				Pole Mounted Head					
				Existing Lighting Standard Pole					

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions



12 18 2020

SYMBOLS

D-101-33

			Existing Manhole (Electrical, Gas, Telephone)		Cap or Stub Exst Gas, Exst Sanitary, Exst Storm Drain, Ppsd Storm Drain, Exst Water
			Water Manhole (Exst, Exst with Valve)		Existing Pedestal Electrical, Telephone, Fiber Optic Telephone, TV, Fiber Optic TV, Undefined
			Sanitary Sewer Manhole (Exst, Ppsd, Exst with Valve)		Existing Pipe Vent Gas, Fuel, Sanitary, Storm Drain, Water, Undefined
			Sanitary Force Main Manhole (Exst, Ppsd, Exst with Valve)		Valve Exst Gas, Exst Water, Ppsd Water, Exst Undefined
			Storm Drain Manhole (Exst, Ppsd, Exst with Inlet, Ppsd with Inlet)		Pump Sanitary, Storm Drain, Exst Water
			Force Main Storm Drain Manhole (Exst, Exst with Valve)		Corrugated Metal End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)
			Manhole (Ppsd, Ppsd 48 Inch, Exst Undefined)		Reinforced Concrete End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)
			Existing Water Appurtenance		Existing Utility Marker
			Sprinkler Head (Exst, Ppsd)		Existing Meter
			Fire Hydrant (Exst, Ppsd)		Existing Fuel Dispensers
			Cleanout (Exst Sanitary, Underdrain)		Existing Fuel Filler Pipes
			Existing Catch Basin Inlet (Round, Square)		Existing Fuel Leak Sensors
			Existing Curb Inlet (Round, Square)		
			Existing Slotted Reinforced Concrete Pipe		
			Catch Basin (Riser 30 Inch, Beehive, Type A)		
			Inlet Mountable Curb (Type A, Type B)		
			Inlet Saddle Base (Type 1, Type 2)		
			Inlet Special (Catch Basin, Type 1, Type A)		
			Inlet (Tee, Type 1, Type 2, Type 2 Double)		
			Median Drain		
			Headwall (Exst, Ppsd, Ppsd Single with Vegetation Barrier, Ppsd Double with Vegetation Barrier)		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions Sheet added - Continued from D-101-32

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
12 18 2020

Cross Section Legend

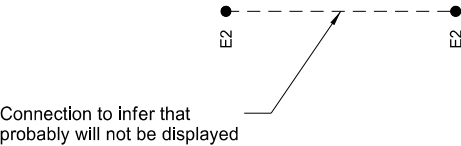
Description	Longitudinal Parallel to Roadway	Transverse Perpendicular to Roadway*
Cable Line	● CBL1	● CBL2
Conduit Line	● CDU1	● CDU2
Electric Line	● E1	● E2
Fiber Optic Line	● F1	● F2
Gas Main Line	● GM1	● GM2
Gas Service Line	● GS1	● GS2
Gas Transmission Line	● GT1	● GT2
Fuel Pipeline	● PL1	● PL2
Sanitary Sewer Force Main	● SSF1	● SSF2
Sanitary Sewer	● SS1	● SS2
Steam Line	● STE1	● STE2
Storm Drain (Assumed Depth)	● SD1	● SD2
Telephone Line	● T1	● T2
TV Line	● TV1	● TV2
Water Main Line	● WM1	● WM2
Water Service Line	● WS1	● WS2

Description	Longitudinal Parallel to Roadway	Transverse Perpendicular to Roadway*
Overhead Power Transmission Line	OHT1 ↑	OHT2 ↑
Overhead Line	OH1 ↑	OH2 ↑



When storm drain invert elevations are NOT used to draw pipe, they will appear as shown to the left. When invert elevations are used to draw pipe, they will be a cross section similar to the graphics shown below.

* Usually the transverse utilities are shown on a cross section with 2 or more symbols. The utility runs from one symbol to the other, but the connection may not be shown.

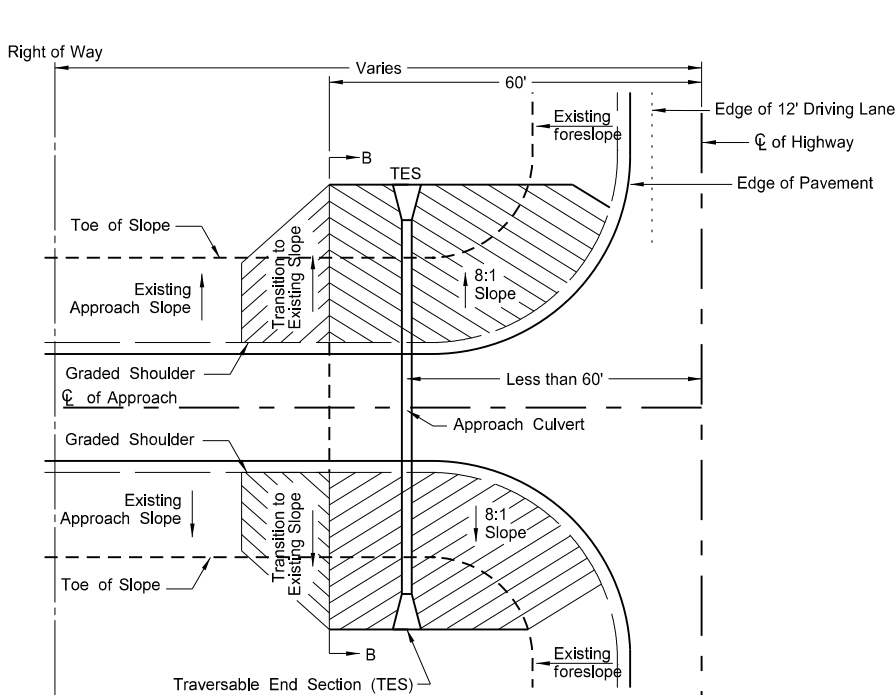
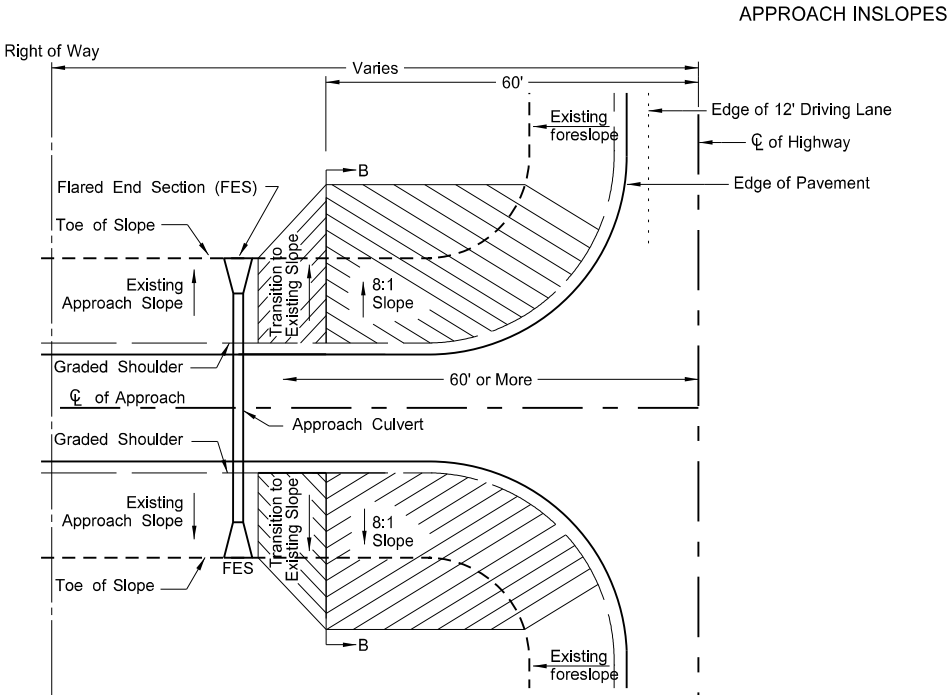
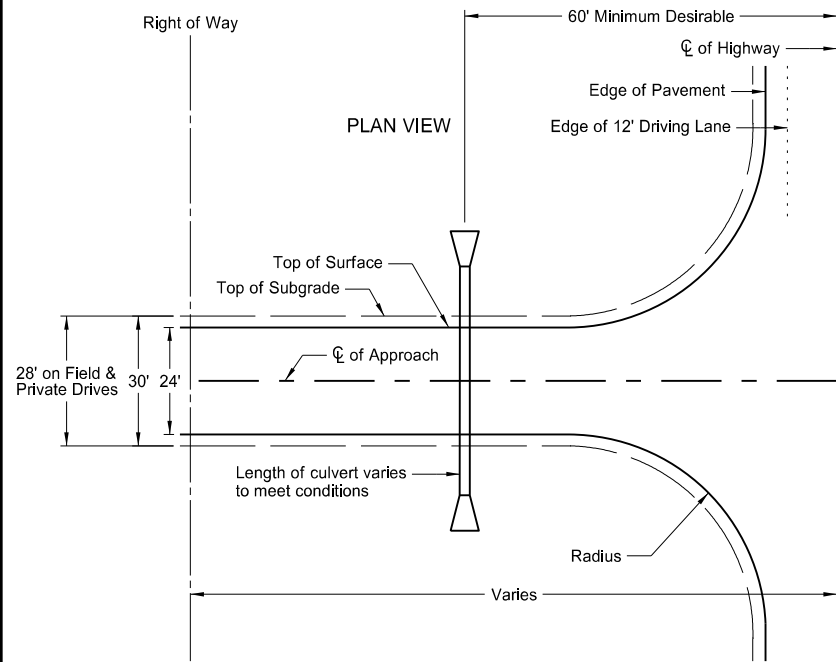


On the right side of most cross sections there is a earthwork table. The following example (values not related to project) details the earthwork table layout.

Cut Area	CA: 34.34 SF
Fill Area	FA: 0.017 SF
Cut Volume	CV: 64.44 CY
Fill Volume	FV: 0.031 CY
Mass Ordinate	MO: 65.13 CY

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-20-18	
REVISIONS	
DATE	CHANGE

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Roger Weigel,
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PEPE-2930
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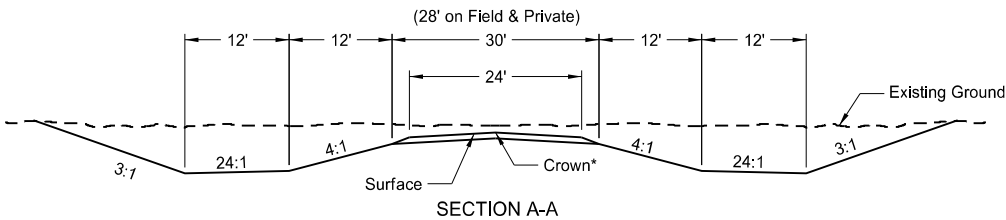


CASE 1
APPROACH PIPE LOCATED
60' OR MORE FROM C

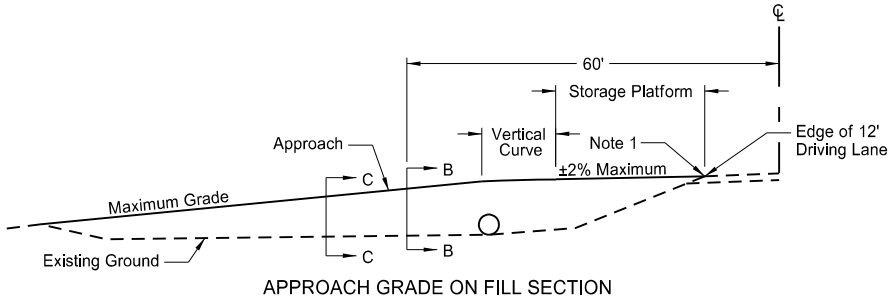
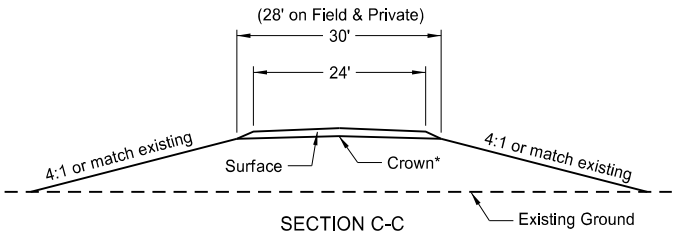
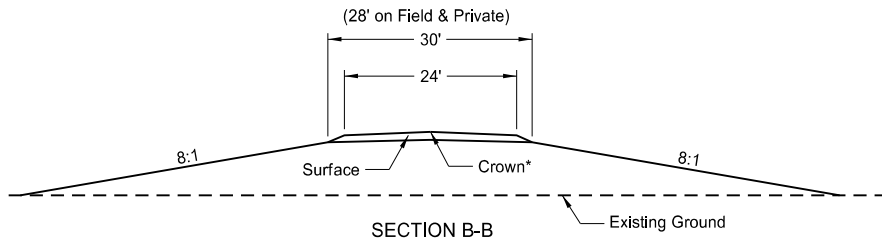
CASE 2
APPROACH PIPE LOCATED
LESS THAN 60' FROM C

CRITERIA FOR RURAL APPROACH TYPES

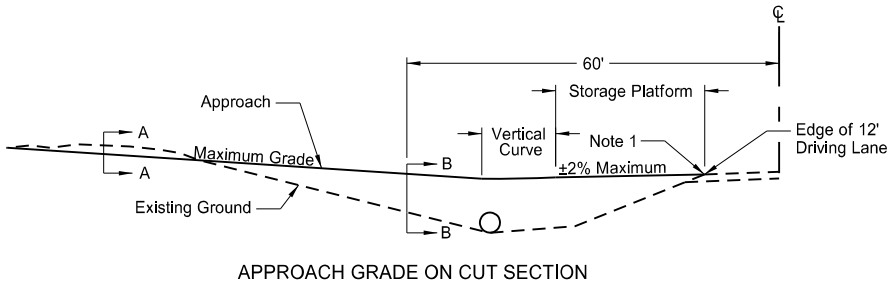
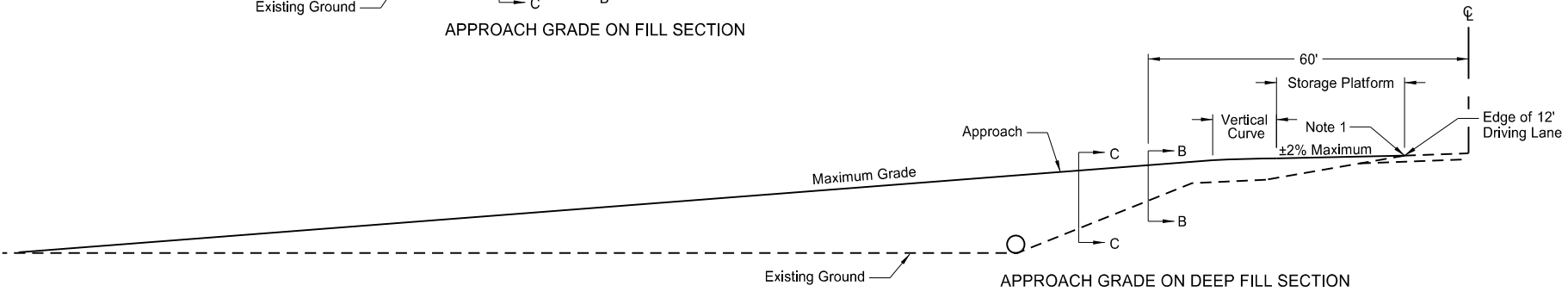
	Field Drives	Private Drives	Low Volume Public Roads
Radius	R=40 ft	R=40 ft	R=50 ft
Maximum Grade	10%	7%	7%
Storage Platform	24 ft	24 ft	50 ft
Vertical Curve Length	10 ft	10 ft	Varies (Min. 20 mph)



*2.1% crown for paved surface
*3.0% crown for gravel surface



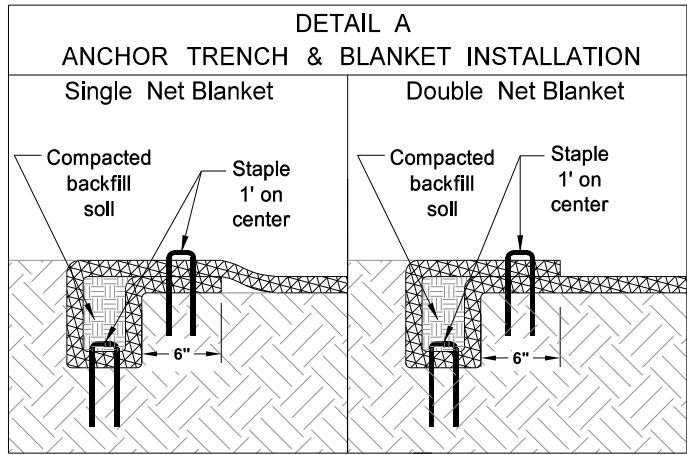
NOTES:
1. 5% Max Rollover between approach storage platform and highway.



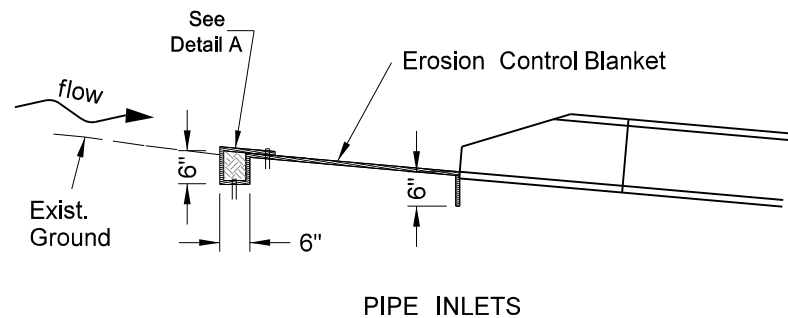
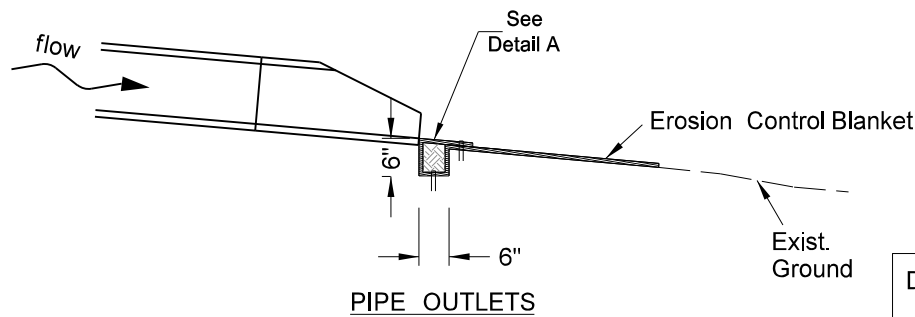
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-25-14	
REVISIONS	
DATE	CHANGE
6-30-2017	Revised Radius, Storage Platform, Inslope dimensions, and Note 1.
10-25-2019	Changed "Inslope" to "Foreslope".

This document was originally issued and sealed by
Kirk J Hoff,
Registration Number
PE- 4683,
on 10/25/19 and the original document is stored at the North Dakota Department of Transportation

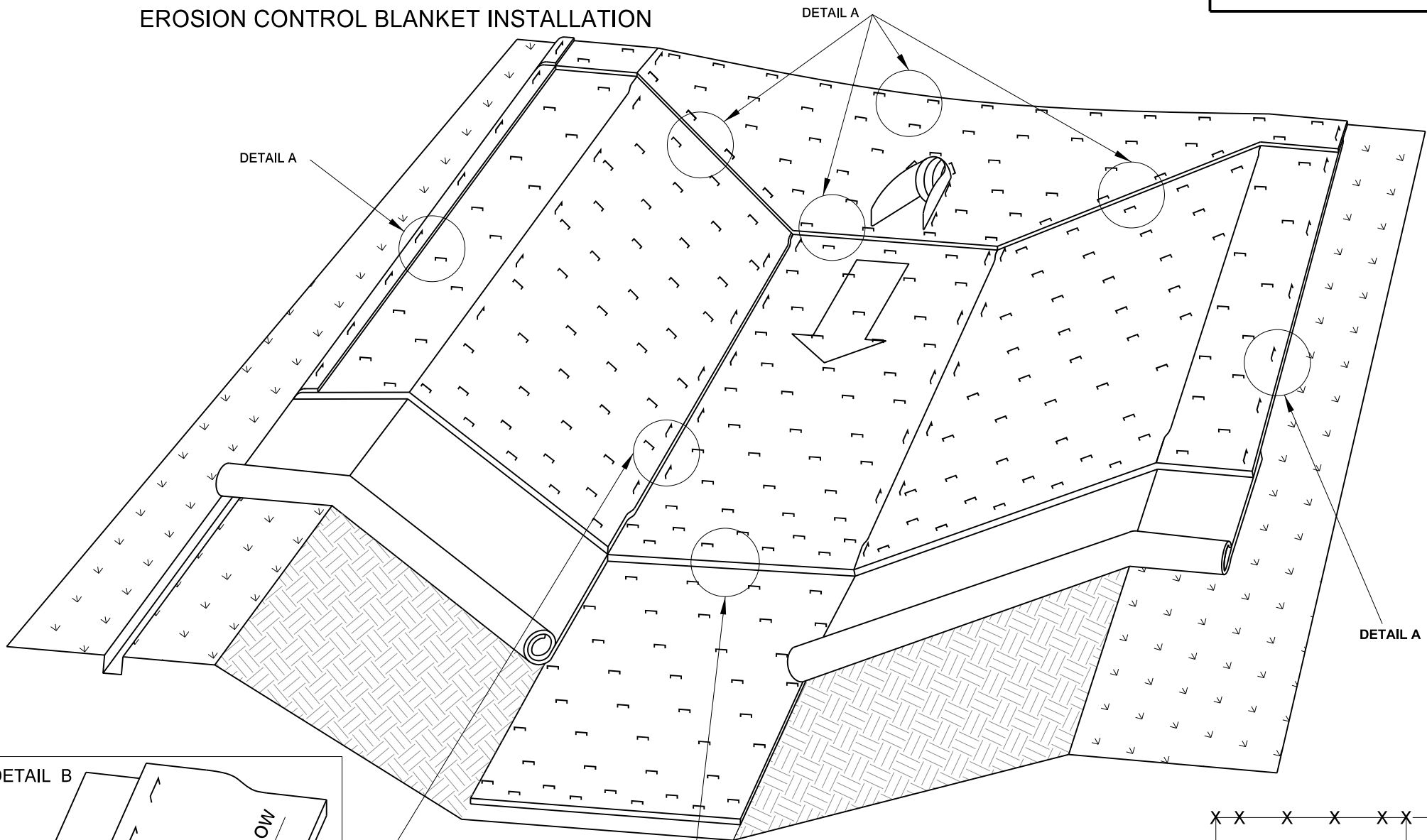
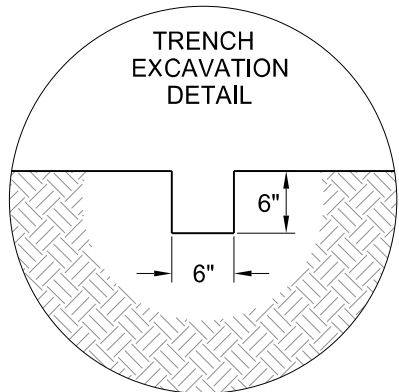
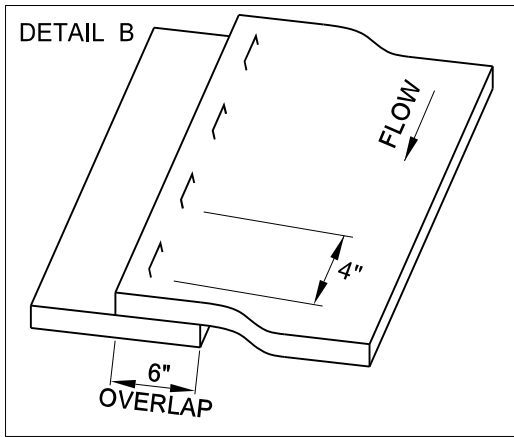
EROSION AND SILTATION CONTROL
EROSION CONTROL BLANKET INSTALLATION



NOTE:
If a Single Net Blanket is used the side with the netting should be on the top once the blanket is installed.

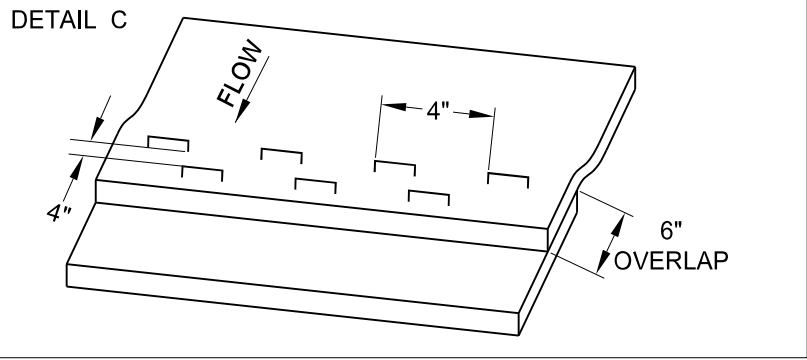
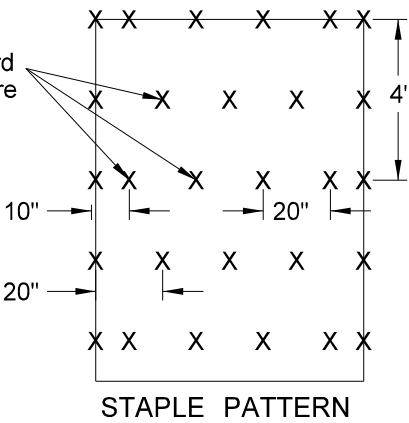


INSTALLATION AT PIPE ENDS



BLANKET LAYOUT
CHANNEL OR SLOPE INSTALLATION

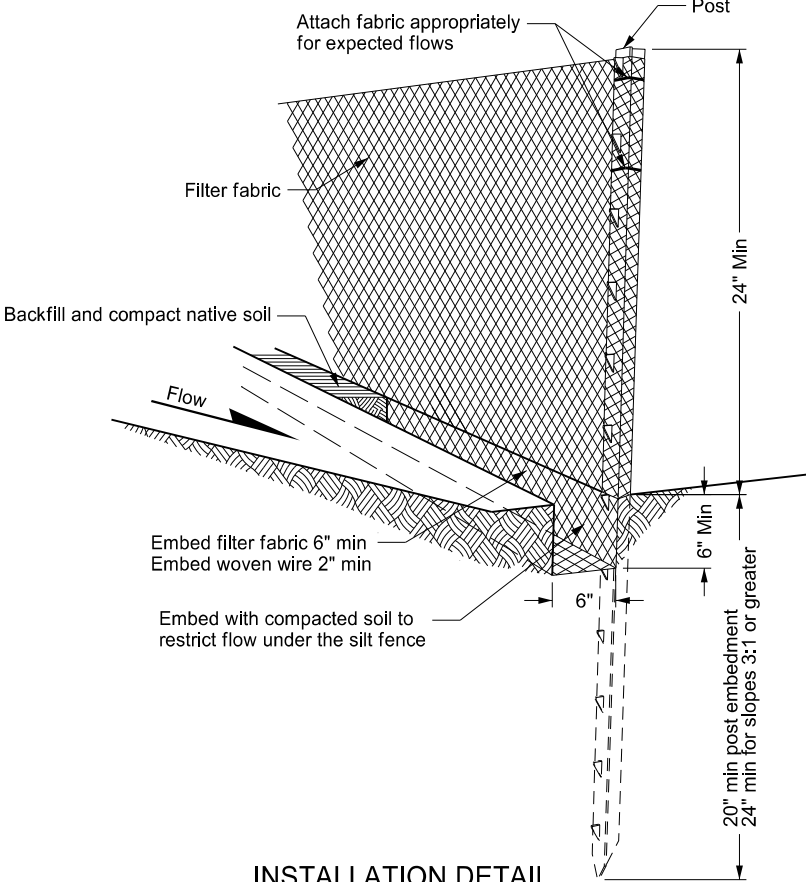
3.8 staples per square yard
using 8-inch 11 gauge wire
"u" staples.



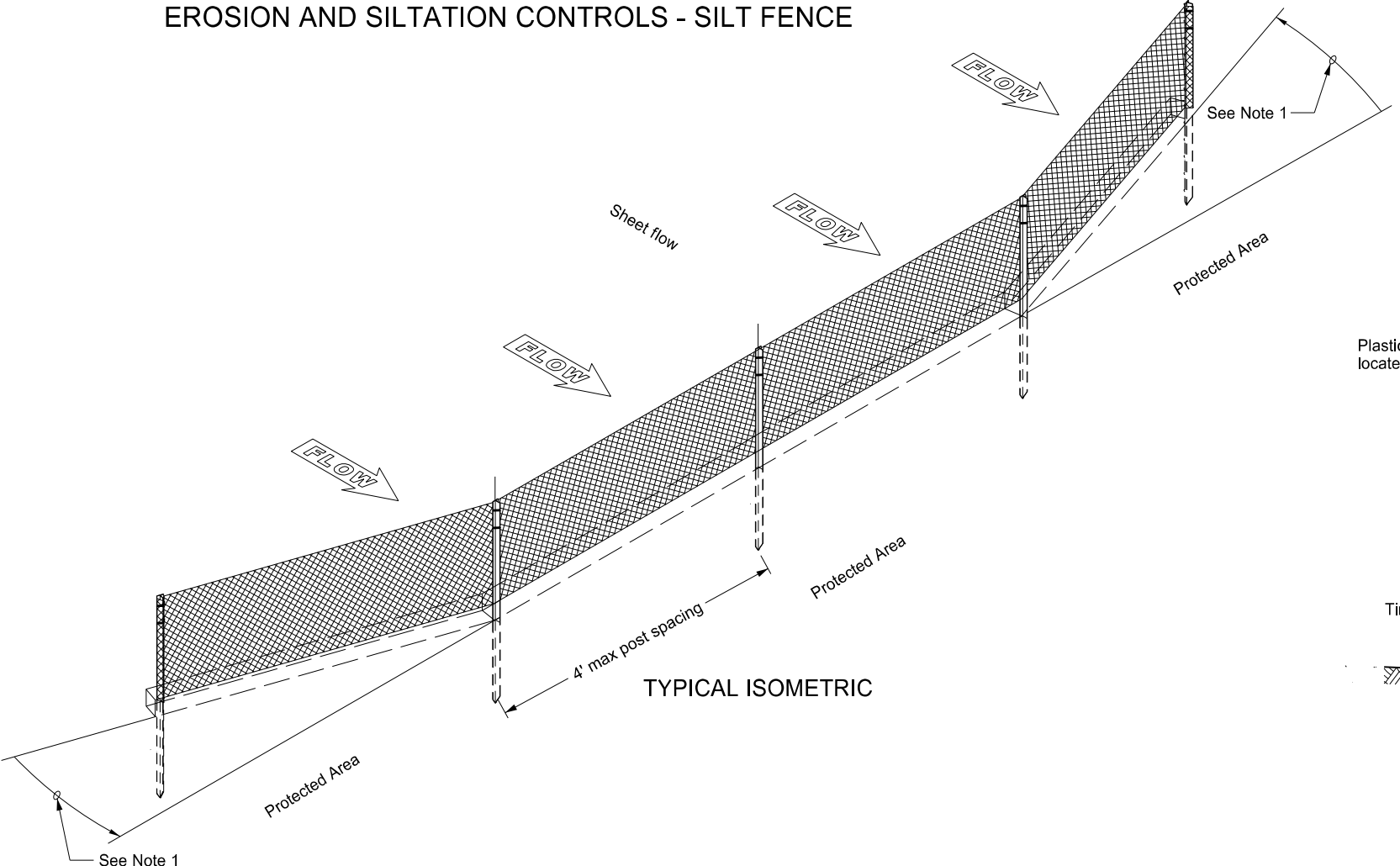
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Changed standard drawing number from D-708-S to D-255-2.
07-27-15	Changed installation details such as trench depth and overlap dimensions.
08-27-19	New Design Engineer PE Stamp.

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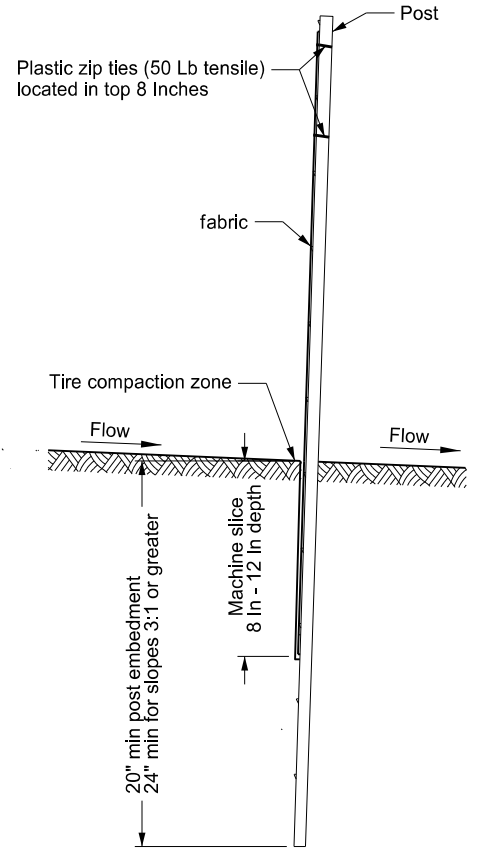
EROSION AND SILTATION CONTROLS - SILT FENCE



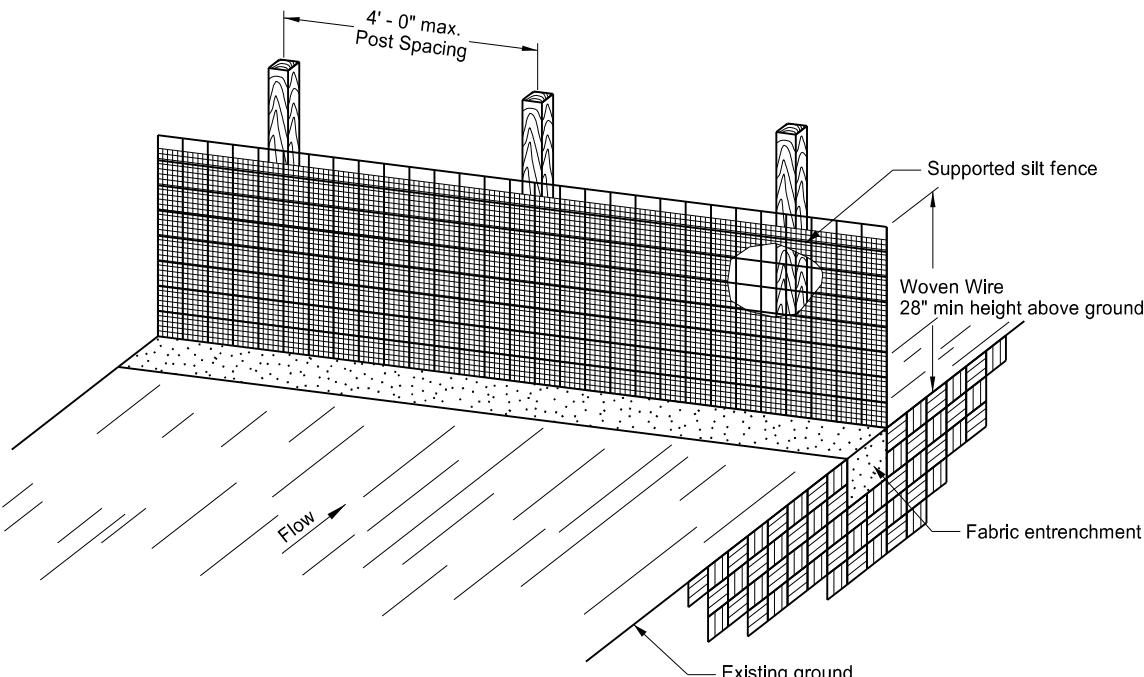
INSTALLATION DETAIL



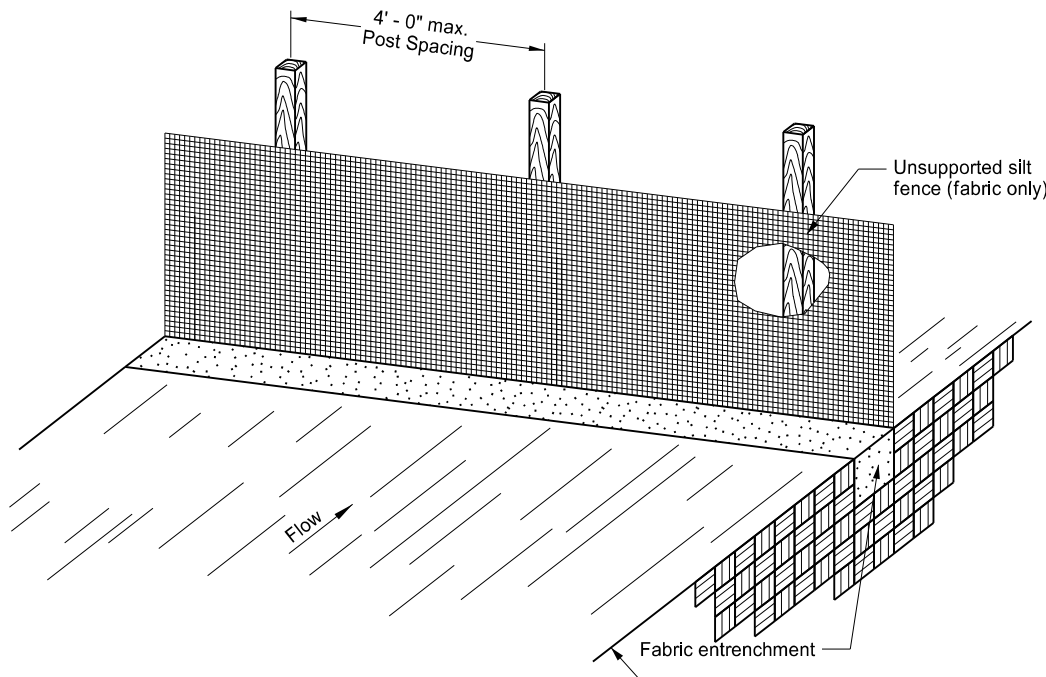
TYPICAL ISOMETRIC



MACHINE SLICED SILT FENCE



SILT FENCE SUPPORTED



SILT FENCE UNSUPPORTED

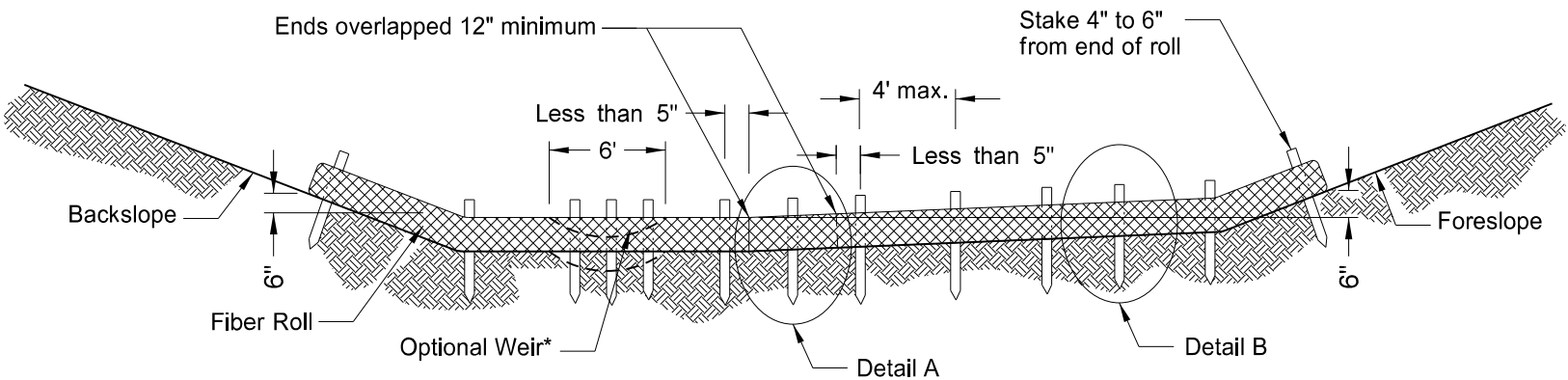
- NOTES:
- 1. Install the ends of the silt fence to point slightly upslope to prevent sediment from flowing around the ends of the fence.
 - 2. Place splices outside low spots.
 - 3. Install silt fencing parallel to contour lines.
 - 4. Do not embed silt fence when placed in standing water.
 - 5. Silt fence material does not need to reach the top of woven wire support.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Standard drawing resulted from splitting standard D-708-2.
06-27-16 08-27-19	Revised details & added new ones. New Design Engineer PE Stamp.

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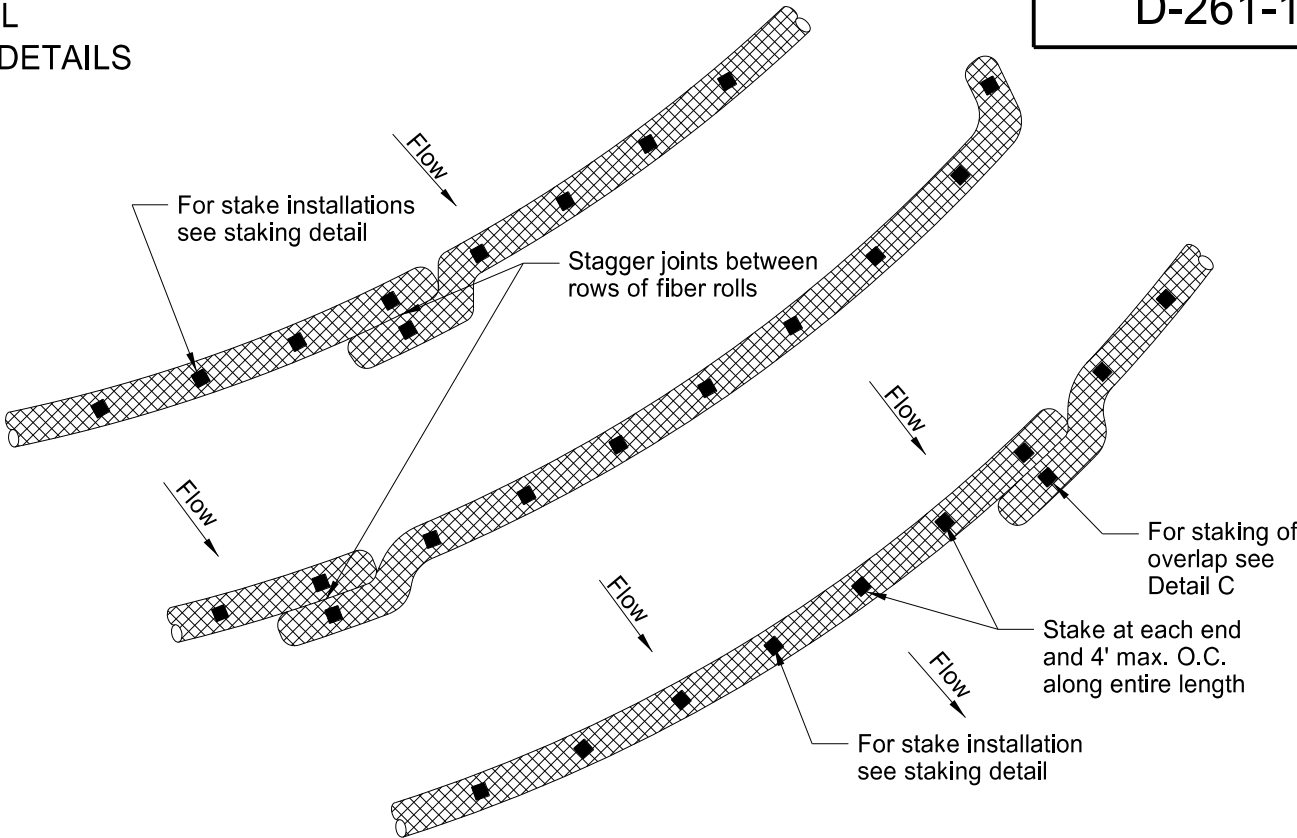
EROSION CONTROL
FIBER ROLL PLACEMENT DETAILS

D-261-1

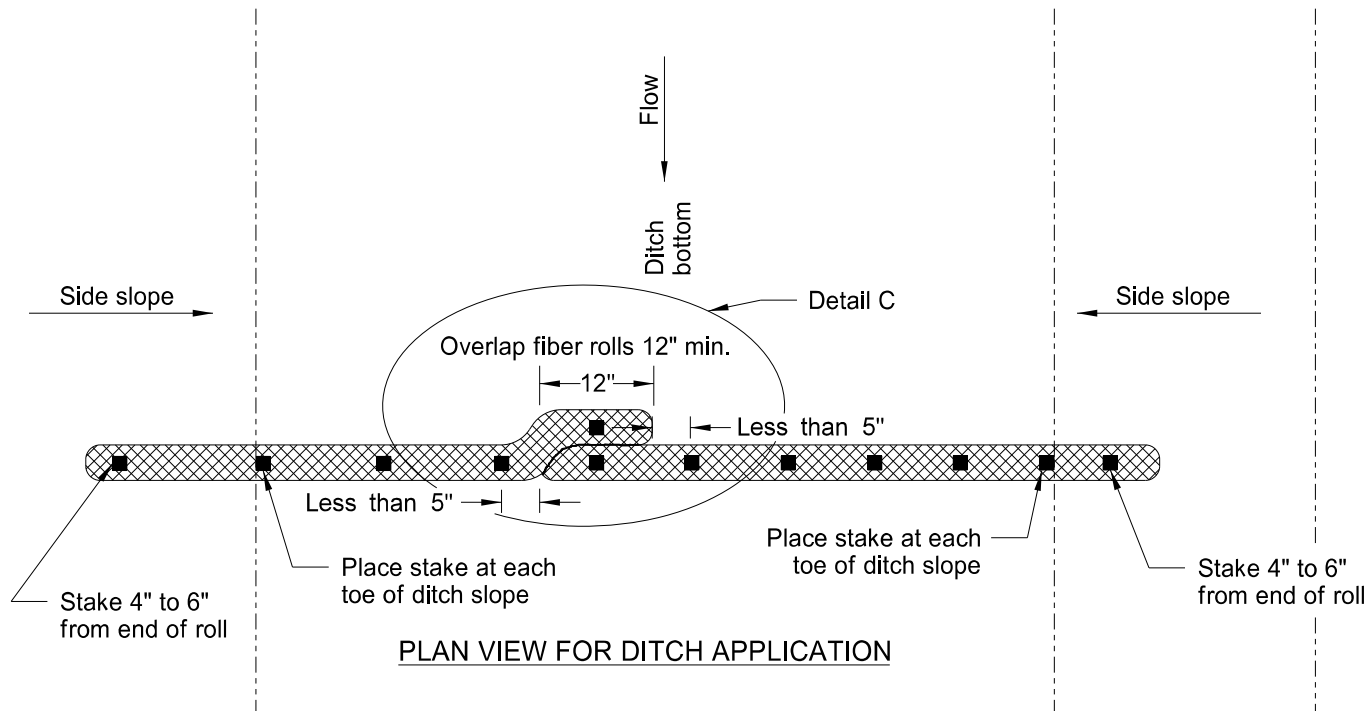


*Optional Weir. Use in flat areas, such as the Red River Valley, where there is potential for water to back up on adjacent property. Lower fiber roll enough to prevent water from backing up on adjacent property. Do not use 20-inch fiber rolls in flat areas where there is potential for water to back up on adjacent property.

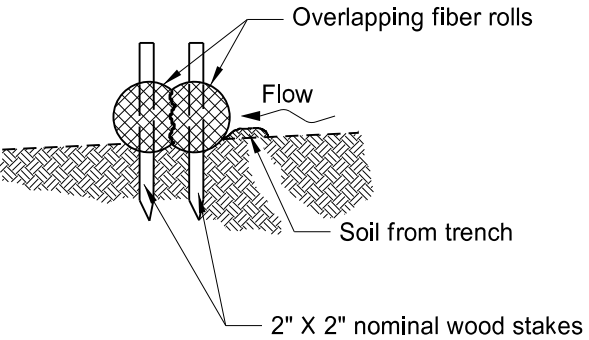
12 OR 20 INCH FIBER ROLL - DITCH BOTTOM



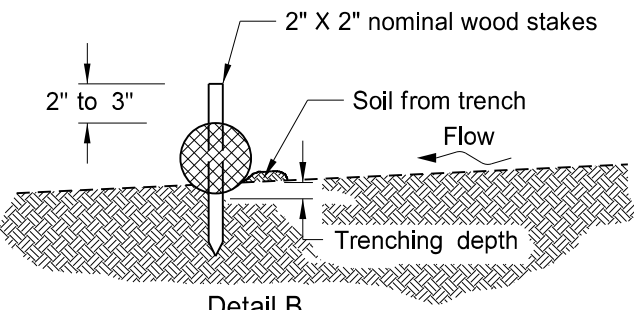
PLAN VIEW FOR SLOPE APPLICATION



PLAN VIEW FOR DITCH APPLICATION



Detail A
Fiber Roll Overlapping Staking Detail



Detail B
Fiber Roll Staking Detail

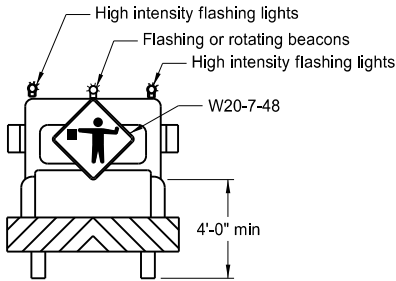
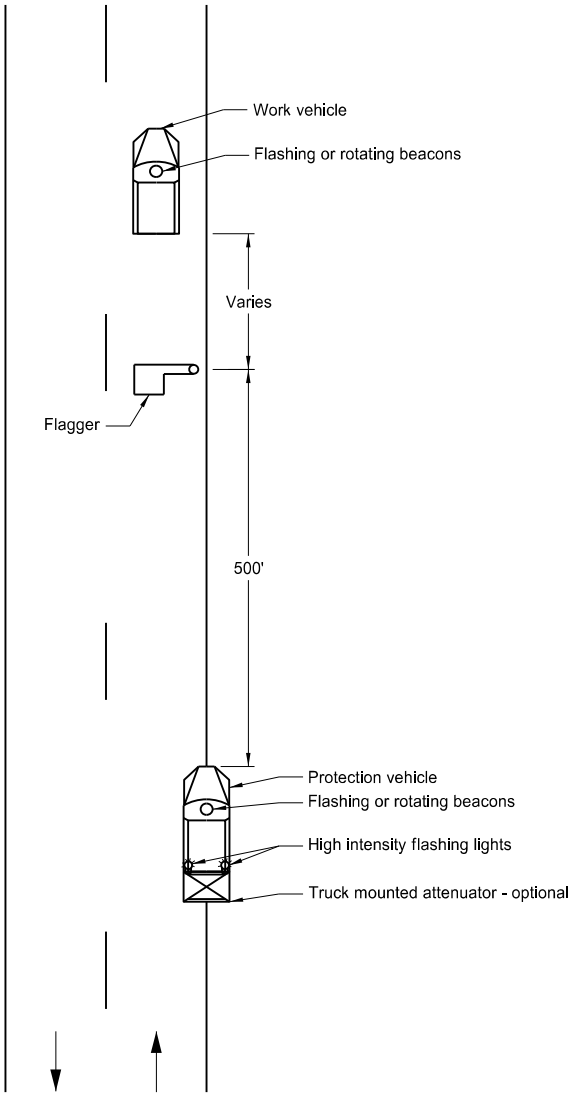
FIBER ROLL DIAMETER	NOMINAL STAKE SIZE	MINIMUM STAKE LENGTH	MINIMUM TRENCH DEPTH	MAXIMUM TRENCH DEPTH
6"	2" x 2"	18"	2"	2"
12"	2" x 2"	24"	2"	3"
20"	2" x 2"	36"	3"	5"

NOTE: Runoff must not be allowed to run under or around roll.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-18-10	
REVISIONS	
DATE	CHANGE
06-10-13	Added plan view for ditch and slope application. Added table with values for stake and trench dimensions.
10-04-13	Revised fiber roll overlap detail.
06-26-14	Changed standard drawing number from D-708-7 to D-261-1.
08-27-19	New Design Engineer PE Stamp

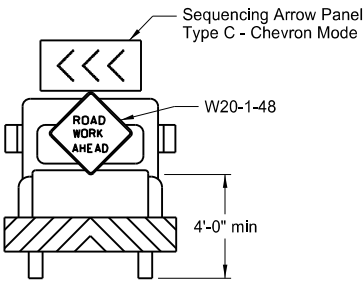
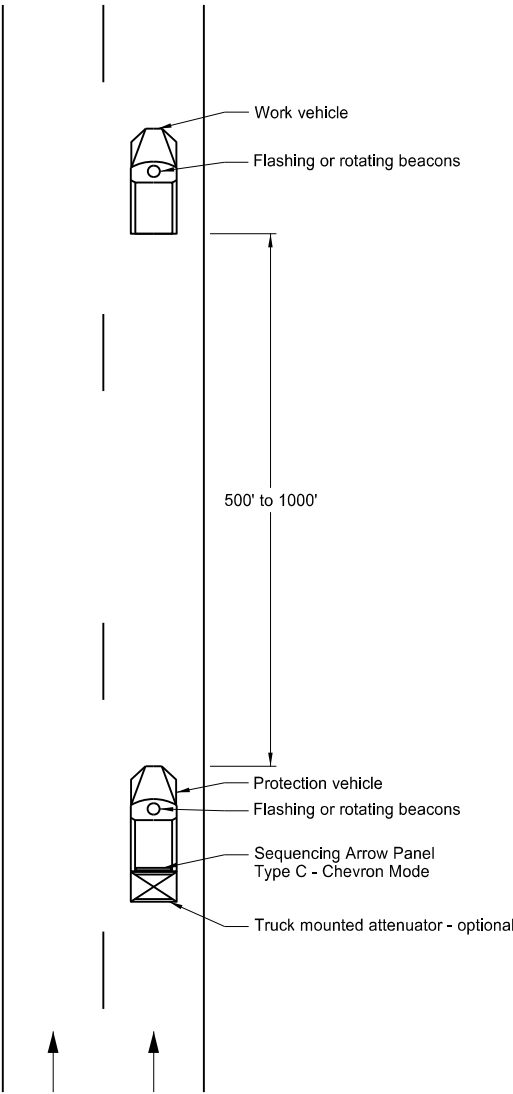
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Two Lane, Two Way Roadways



Typical Protection Vehicle

Multilane Roadways



Typical Protection Vehicle

- Notes:
1. Display a 360 degree rotating, flashing, oscillating or strobe light on the working vehicle.
 2. Display a 360 degree rotating, flashing, oscillating or strobe light on the shadow vehicle. Operate a sequencing arrow panel Type C in chevron mode on the shadow vehicle for Multilane Roadway.
 3. Use these layouts during daylight hours and in areas of good visibility only.
 4. Use flagger to protect the work area and warn oncoming traffic for two lane, two way roadway.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-25-12	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp

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PE- 4683,
on 10/03/19 and the original document is stored at the
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SIGN NUMBER	G20-10-108
WIDTH x HEIGHT	9'-0" x 4'-0"
BORDER WIDTH	1.25" (inset 0.75")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Fluorescent Orange
LEGEND/BORDER	TYPE: Non-Refl
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE
	42.1	6.2	24	4	0

STATION(S):

AREA: 36.0 Sq.Ft.

9'-0"

4'-0"

8.25"

91.5"

8.25"

6.2"

6"D

4.5"

6"D

4.5"

6"D

4.5"

4"

6.3"

24"

NDDOT LOGO

Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

LETTER POSITION (X)																		LENGTH	SIZE	SERIES
C	O	N	S	T	R	U	C	T	E	D		B	Y					69.7	6	D 2000
19.2	24.5	30	35.1	39.7	44.3	49.4	54.8	59.7	64.3	69	73.1	79.1	83.7							
Y	O	U	R		C	O	M	P	A	N	Y		N	A	M	E		91.5	6	D 2000
8.3	14.2	19.8	25.3	29.4	35.4	40.7	46.2	52.4	56.8	62.8	67.8	72.9	78.9	83.9	89.9	96				
Y	O	U	R		T	O	W	N	,		N	D						64.6	6	D 2000
21.7	27.6	33.2	38.7	42.8	48.8	53.3	58.4	64.6	69.6	70.7	76.7	82.2								

- Notes:
- 1. Post mount sign a distance of ½A following the End Road Work (G20-2-48) sign (maximum 2 signs per project.)
 - 2. Use sign on rural projects with a 30 day or longer duration (not required on seal coats or other short duration projects.)
 - 3. Do not place sign in urban areas or within city limits.

Advance Warning Sign Spacing (A)			
Road Type	Distance between signs min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE
7-18-14 9-27-17 8-30-18 10-03-19	Revise sheeting to type IV. Updated to active voice. Updated sign number in note 1. New Design Engineer PE Stamp.

This document was originally issued and sealed by

Kirk J Hoff,

Registration Number

PE- 4683 ,

on 10/03/19 and the original document is stored at the

North Dakota Department of Transportation

D-704-6

Diagram of a rectangular highway sign with dimensions and text. The sign is 8'-0" wide and 4'-0" high. The text on the sign reads: "YOUR HIGHWAY DOLLARS AT WORK" and "FUNDED BY (A)". The sign features a logo on the left side, which is a circular emblem containing a stylized road and the text "NDDOT". The dimensions are given in feet and inches, with the text indicating that dimensions are in inches, tenths.

STATION(S):

AREA: 32.0 Sq.Ft.

8'-0"

4'-0"

8"

6"C

4.5"

6"C

23.5"

7.3"

18"

5.3"

4"C

3"

4"C

6.4"

6"

84"

6"

8"

6"C

4.5"

6"C

6"

4"C

3"

4"C

6.5"

18.5"

23.5"

YOUR HIGHWAY
DOLLARS AT WORK

FUNDED BY
(A)

NDDOT

Dimensions are in inches,tenths

Letter locations are panel edge to lower left corner

POSITION (X)										LENGTH	SIZE	SERIES
A	Y									50.3	6	C 2000
75.8	80											
W	O	R	K							62.6	6	C 2000
72.2	77.5	82.3	86.6									
										25	4	C 2000

Use a horizontal spacing of 3" between words and hyphens. Center message horizontally in sign panel.

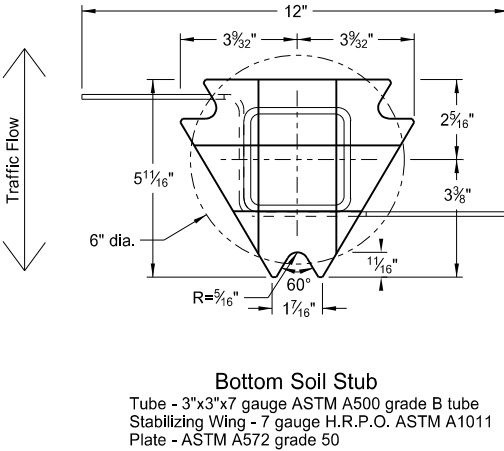
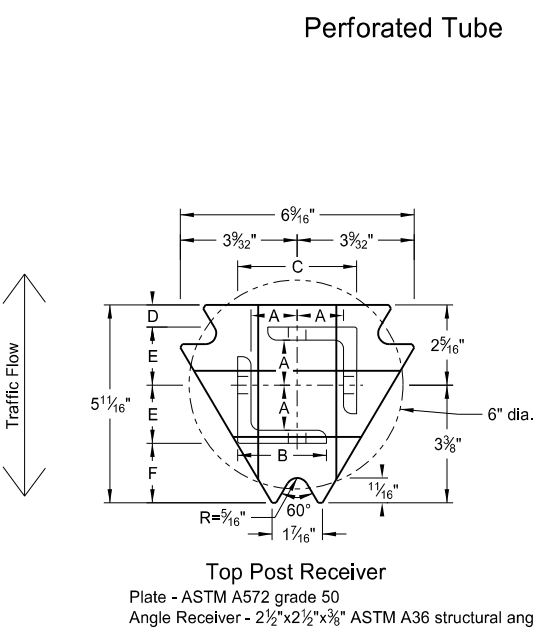
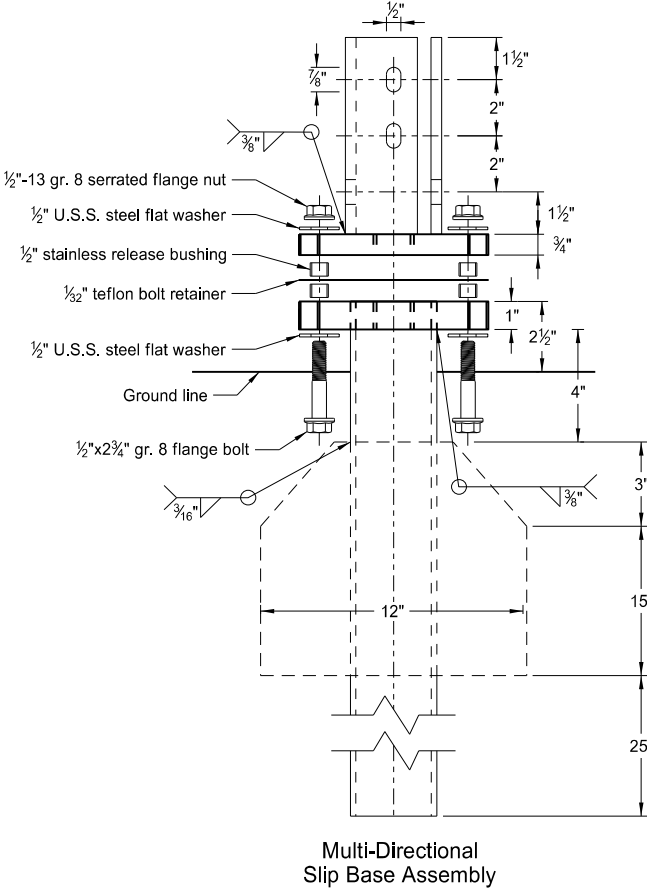
- | | |
|------------------------------|--------|
| NORTH DAKOTA | |
| DEPARTMENT OF TRANSPORTATION | |
| 12-08-21 | |
| REVISIONS | |
| DATE | CHANGE |
| | |



12/08/21

Perforated Tube

- Notes:
1. Torque slip base bolts as specified by manufacturer.
 2. Use anchor with 43.9 KSI yield strength and 59.3 KSI tensile strength.
 3. Provide 4" vertical clearance for anchor or breakaway base. Measure the 4"x60" measurement above and below post location and back and ahead of post.
 4. In concrete sidewalk, use same anchor without wings.
 5. Provide more than 7' between the first and fourth posts of a four post sign.

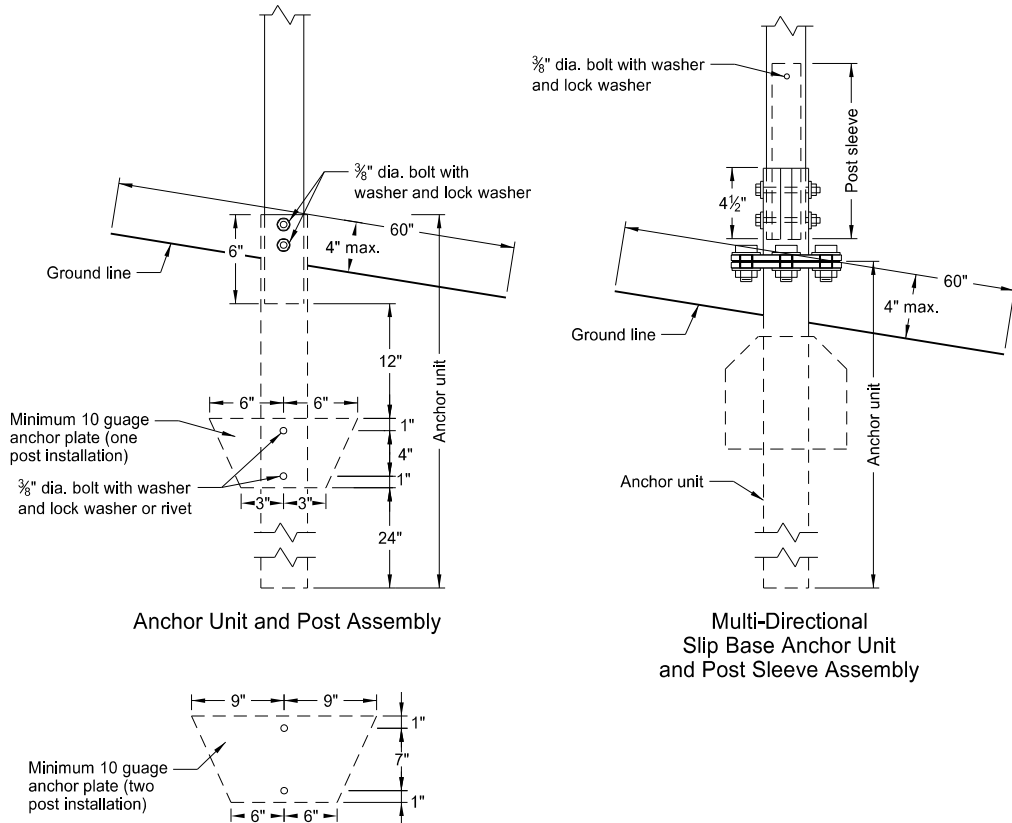


Telescoping Perforated Tube						
Number of Posts	Post Size in.	Wall Thick-ness Gauge	Sleeve Size in.	Wall Thick-ness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			(A)	3
1	2 1/2	10			Yes	
1	2 1/4	12	2	12	Yes	
1	2 1/2	12	2 1/4	12	Yes	
2	2	12			No	2 1/4
2	2 1/4	12			No	2 1/2
2	2 1/2	12			Yes	
2	2 1/2	12			Yes	
2	2 1/4	10	2	12	Yes	
2	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/2	12			Yes	
3 & 4	2 1/2	10			Yes	
3 & 4	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/4	12	2	12	Yes	
3 & 4	2 1/2	10	2 3/16	10	Yes	

Properties of Telescoping Perforated Tube						
Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in. ⁴	Cross Sec. Area in. ²	Section Modulus in. ³
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/8 x 2 3/8	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.785

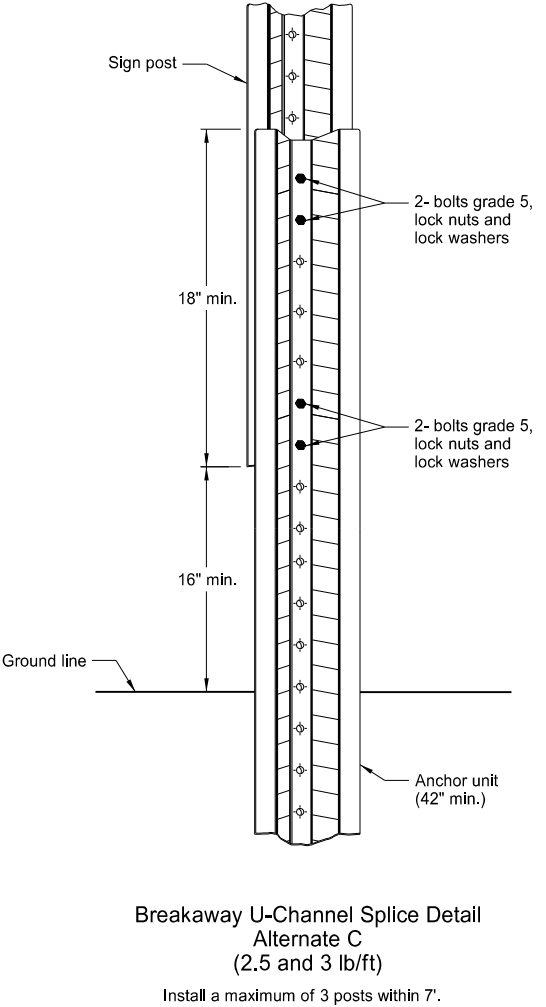
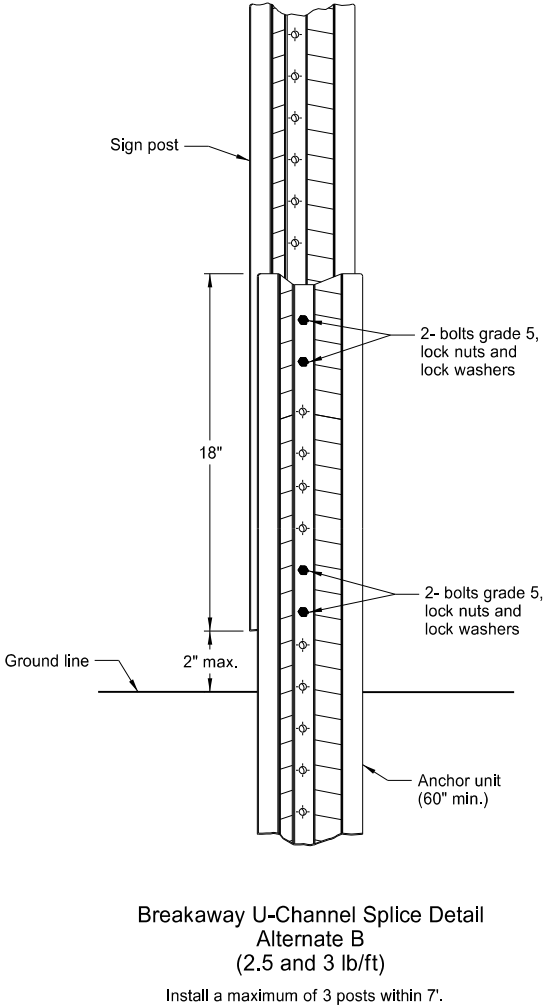
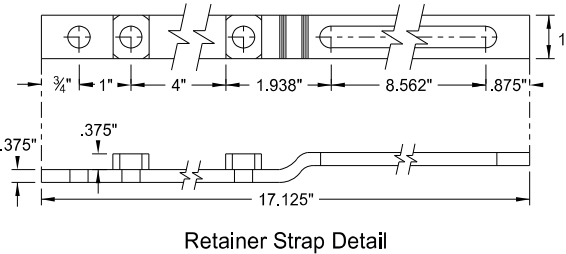
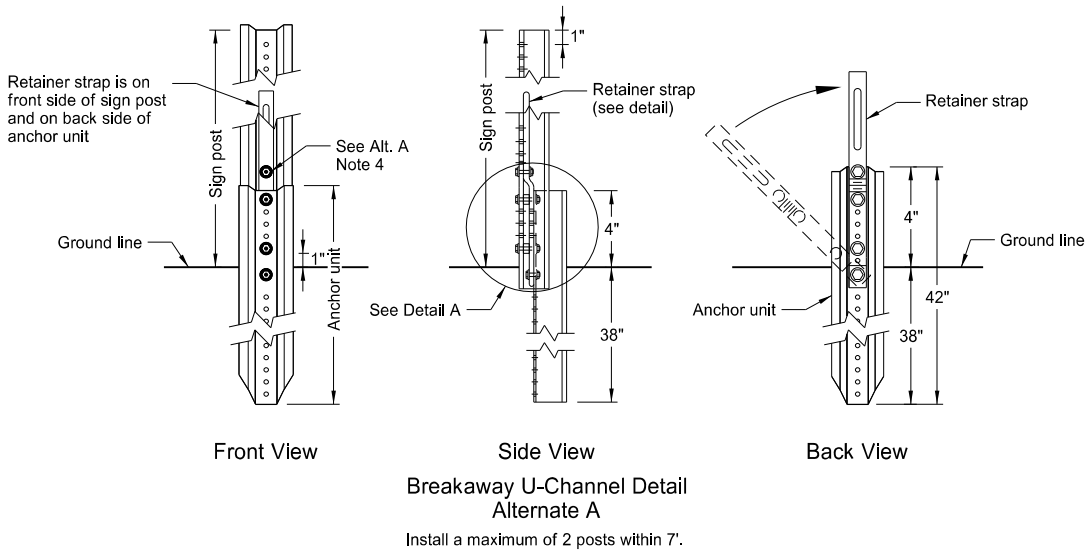
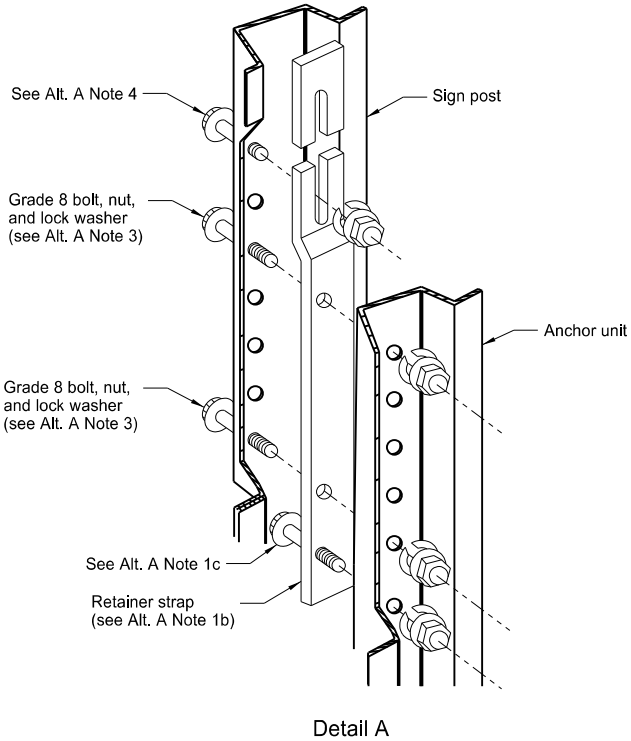
Top Post Receiver Data Table						
Square Post Sizes (B)	A	B	C	D	E	F
2 3/16"x10 ga.	1 5/16"	2 1/2"	3 1/2"	2 5/32"	1 33/64"	1 7/8"
2 1/2"x10 ga.	1 5/32"	2 1/2"	3 5/16"	5/8"	1 21/32"	1 3/4"

- (A) Use breakaway base when support is placed in weak soils. Engineer determines if soils are weak.
- (B) For additional wind load, insert the 2 3/8"x10 ga. into 2 1/2"x10 ga.



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION		This document was originally issued and sealed by Kirk J Hoff, Registration Number PE- 4683, on 10/03/19 and the original document is stored at the North Dakota Department of Transportation
2-28-14		
REVISIONS		
DATE	CHANGE	
9-27-17 10-03-19	Updated to active voice New Design Engr PE Stamp	

U-Channel Post



Alternate A Steps of Installation:

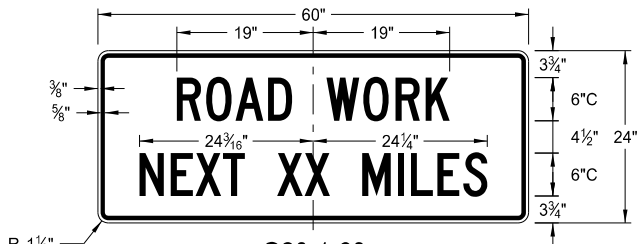
- a) Drive anchor unit to within 12" of ground level.
b) Establish proper assembly by lining up bottom hole of retainer strap with 6th hole from the top of the anchor unit.
c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
d) Rotate strap 90° to left.
- a) Drive anchor unit to 4" above ground.
b) Rotate strap to vertical position.
- a) Place 5/16"x2" bolt, lock washer and nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit.
b) Alternately tighten two connector bolts.
- Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
- Properly nest base post, strap, and sign post. Proper nesting occurs when all flat surfaces of the base post, strap, and sign post at the bolts have full contact across the entire width.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17 10-03-19	Updated to active voice New Design Engr PE Stamp

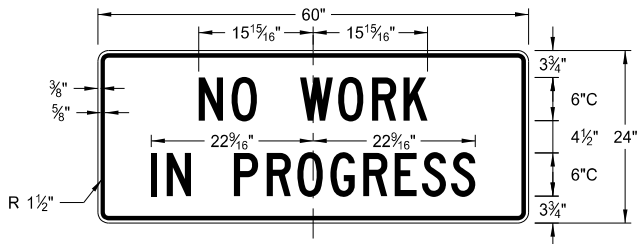
This document was originally issued and sealed by
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of Transportation

CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS

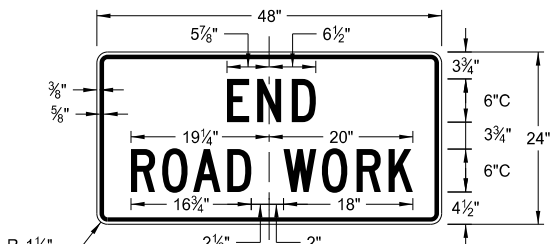
D-704-9



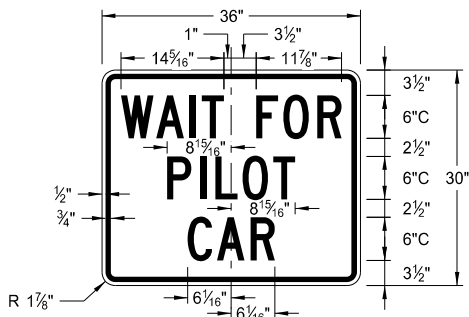
G20-1-60
Legend: black (non-refl)
Background: orange



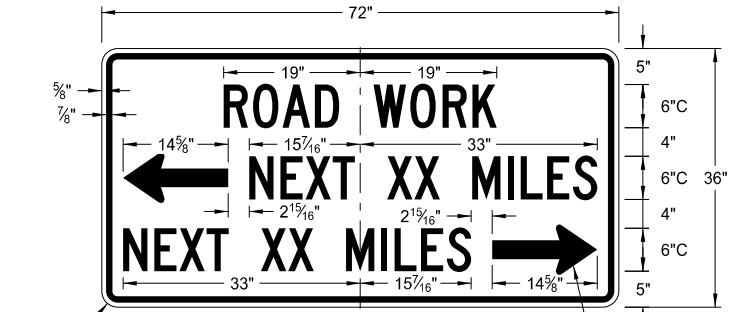
G20-1b-60
Legend: black (non-refl)
Background: orange



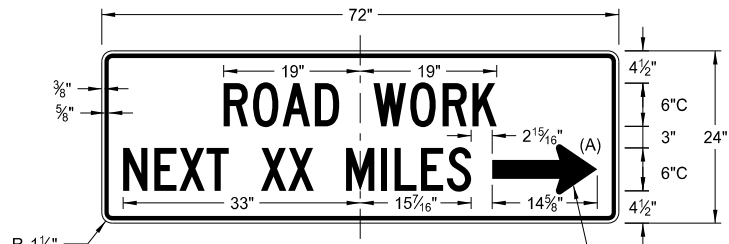
G20-2-48
Legend: black (non-refl)
Background: orange



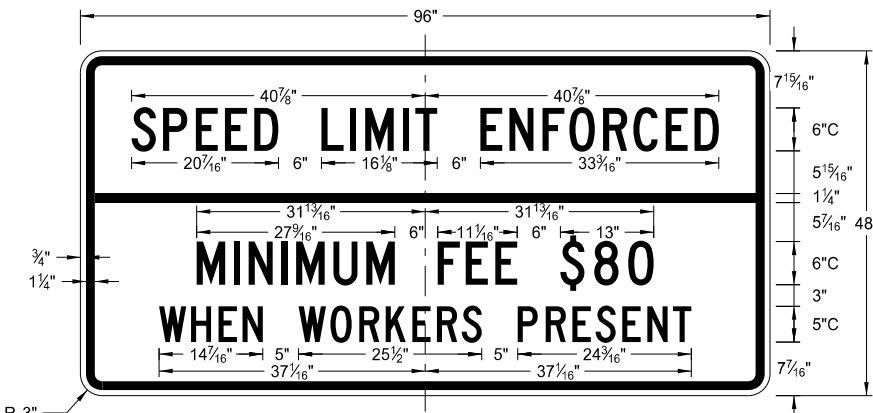
G20-4b-36
Legend: black (non-refl)
Background: orange



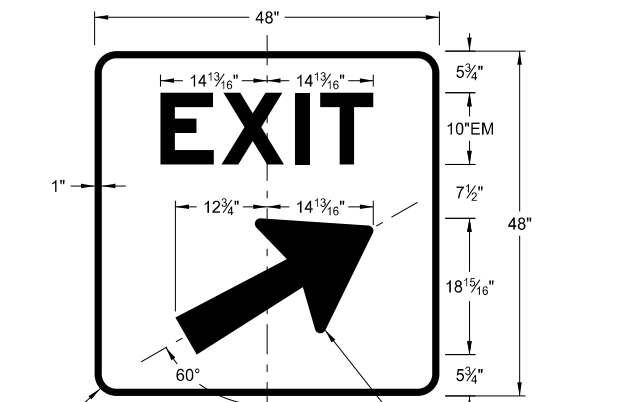
G20-50a-72
Legend: black (non-refl)
Background: orange



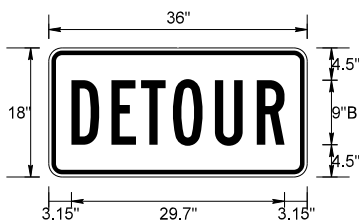
G20-52a-72
Legend: black (non-refl)
Background: orange



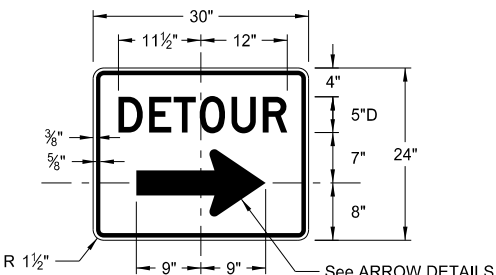
G20-55-96
Legend: black (non-refl)
Background: orange



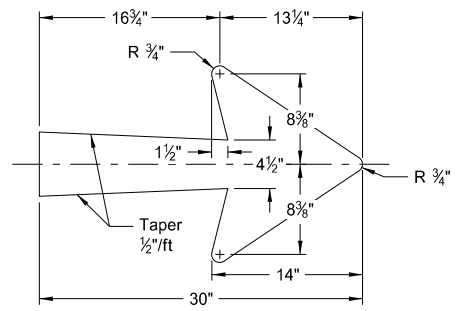
E5-1(L or R)-48
Legend: white
Background: green (orange optional)



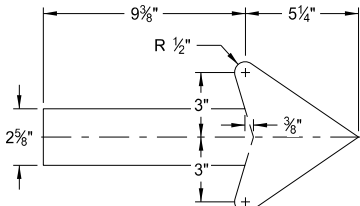
M4-8-36
Legend: black (non-refl)
Background: orange



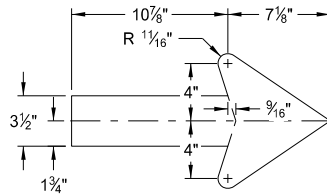
M4-9(L or R)-30 & M4-9-30
Legend: black (non-refl)
Background: orange



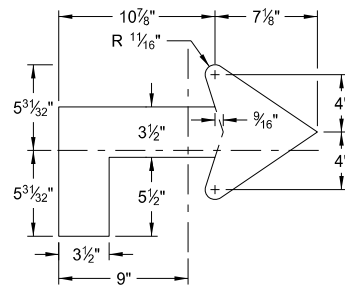
E5-1-48



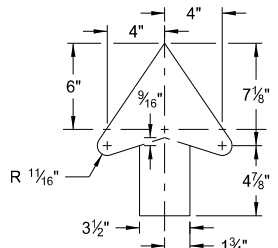
G20-50a-72
G20-52a-72



M4-9(L or R)-30
Right or Left



M4-9(L or R)-30
Advanced Right or Left



M4-9-30
Straight

ARROW DETAILS

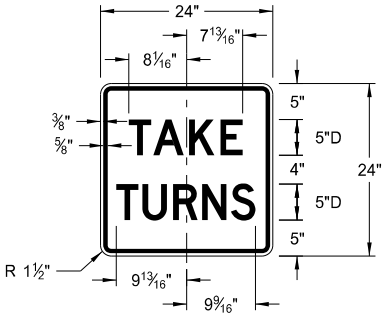
NOTES:
(A) Arrow may be right or left of the legend to indicate construction to the right or left.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17 10-03-19	Added sign & background color New Design Engineer PE Stamp

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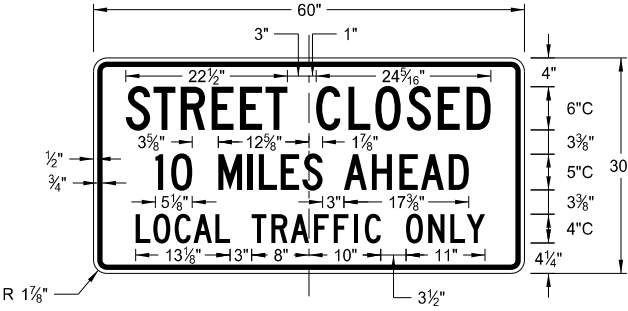
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS

D-704-10



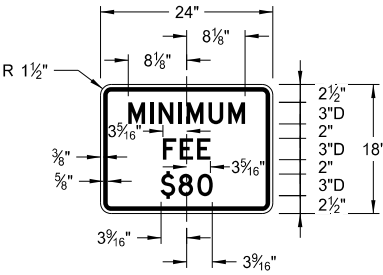
R1-50P-24

Legend: black (non-refl)
Background: white



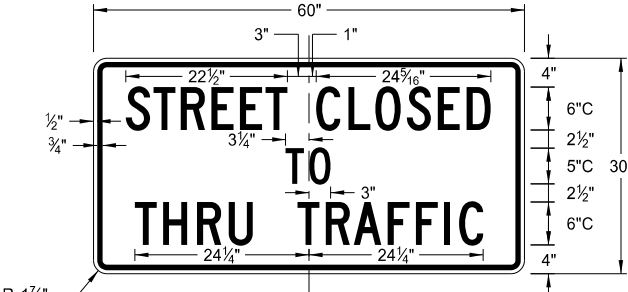
R11-3c-60

Legend: black (non-refl)
Background: white



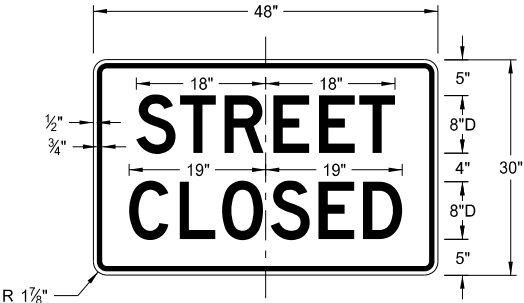
R2-1aP-24

Legend: black (non-refl)
Background: white



R11-4a-60

Legend: black (non-refl)
Background: white



R11-2a-48

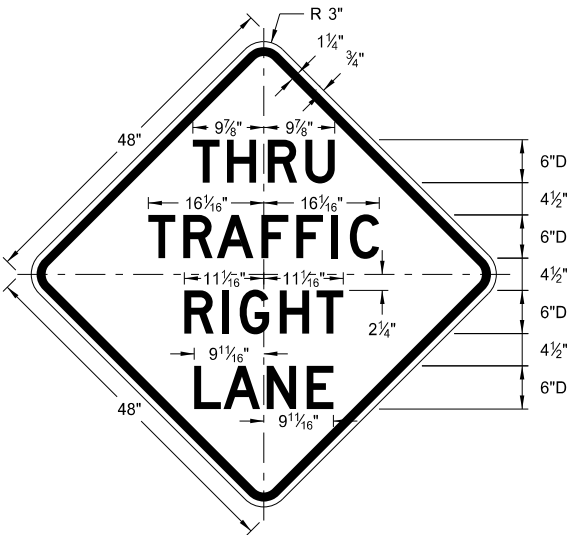
Legend: black (non-refl)
Background: white

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17 10-03-19	Revised sign number New Design Engineer PE Stamp

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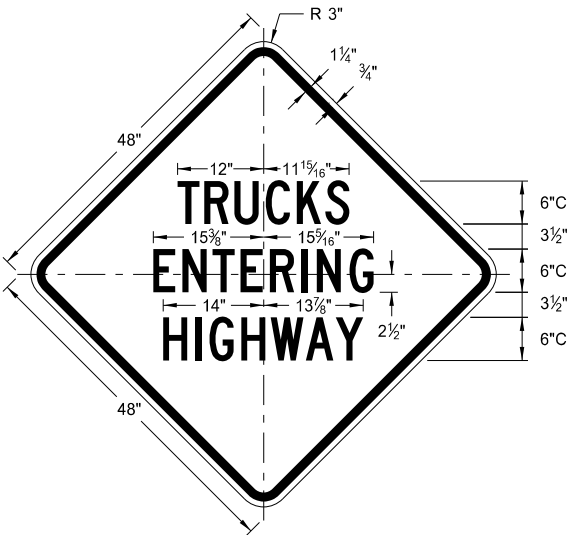
CONSTRUCTION SIGN DETAILS
WARNING SIGNS

D-704-11



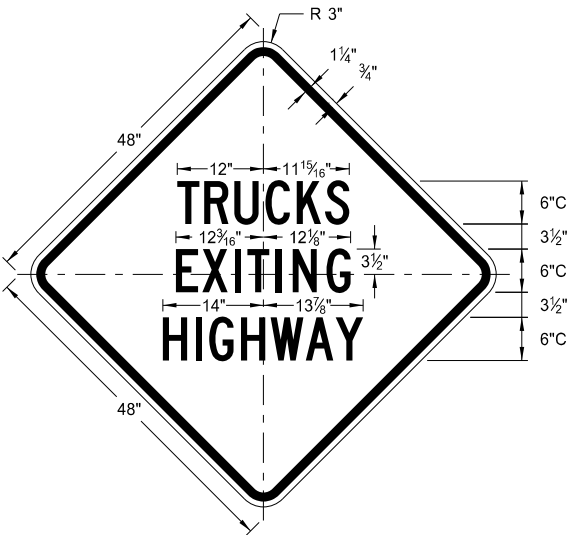
W5-8-48

Legend: black (non-refl)
Background: orange



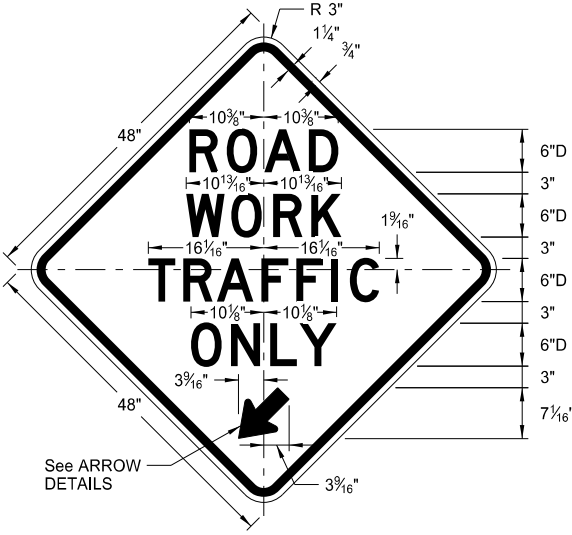
W8-53-48

Legend: black (non-refl)
Background: orange



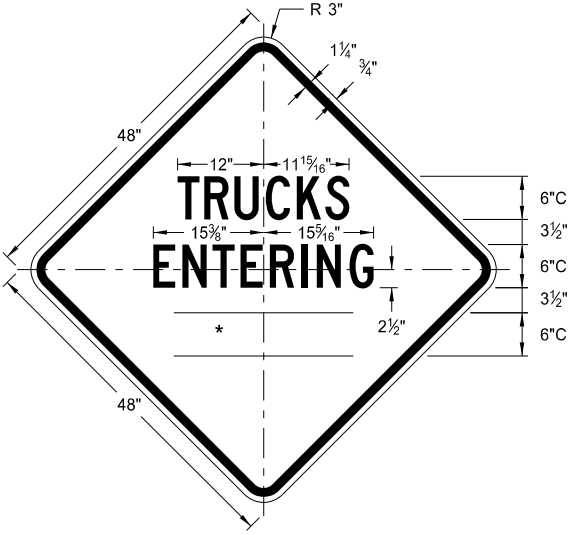
W8-56-48

Legend: black (non-refl)
Background: orange



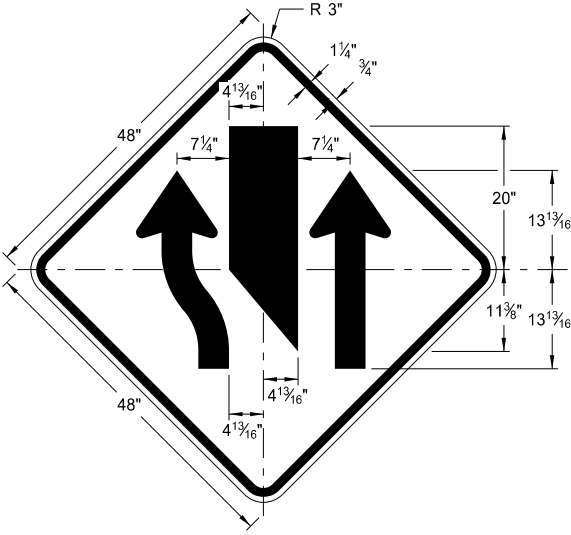
W5-9-48

Legend: black (non-refl)
Background: orange



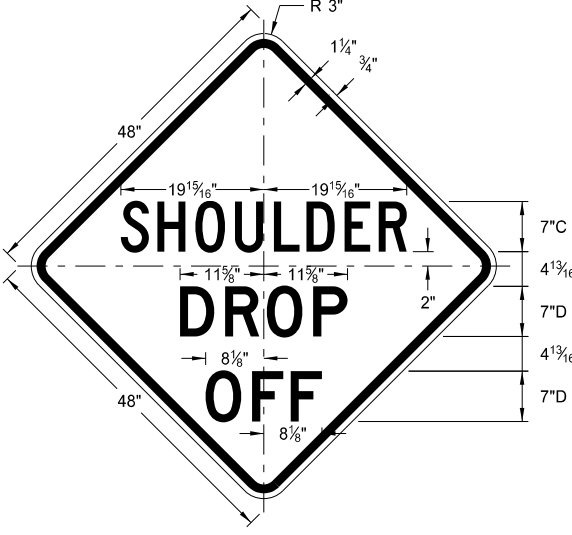
W8-54-48

Legend: black (non-refl)
Background: orange



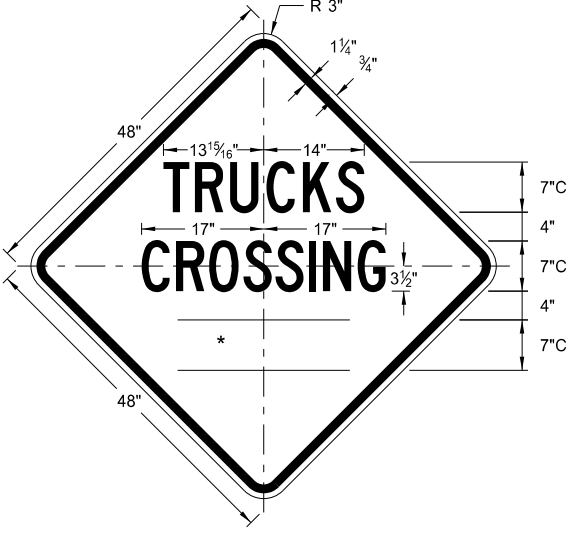
W9-3a-48

Legend: black (non-refl)
Background: orange



W8-9a-48

Legend: black (non-refl)
Background: orange

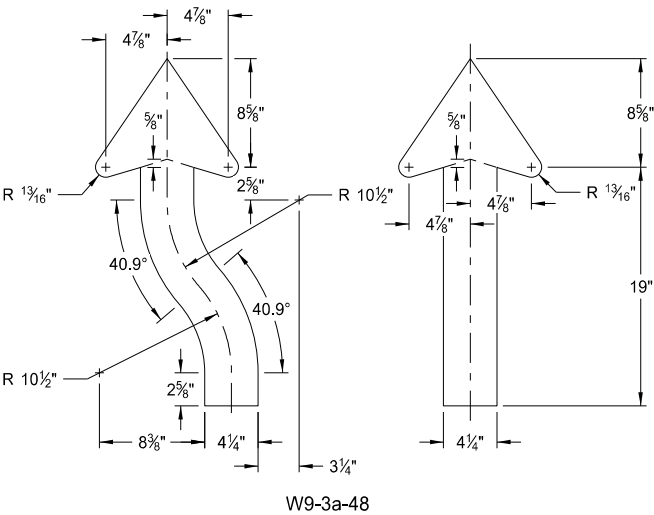
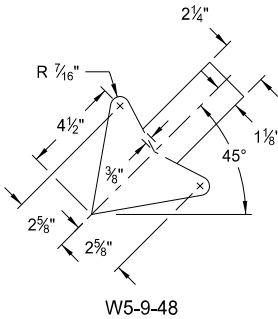


W8-55-48

Legend: black (non-refl)
Background: orange

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

* DISTANCE MESSAGES



ARROW DETAILS

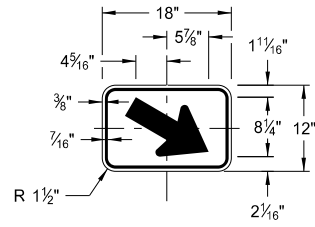
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated sign number
5-31-18	Revised sign and arrow details
10-03-19	New Design Engineer PE Stamp

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CONSTRUCTION SIGN DETAILS
WARNING SIGNS

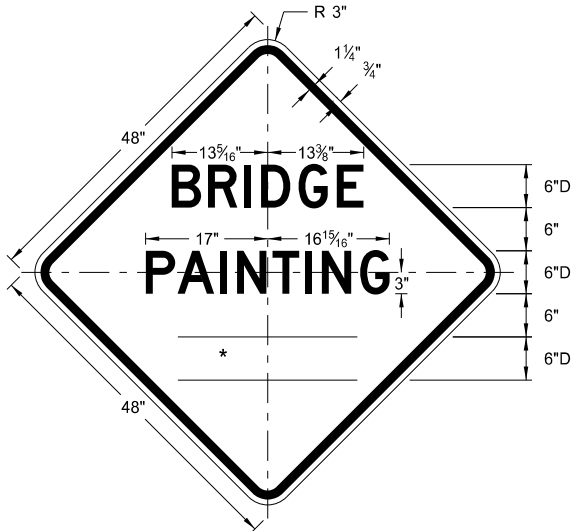
WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

* DISTANCE MESSAGES



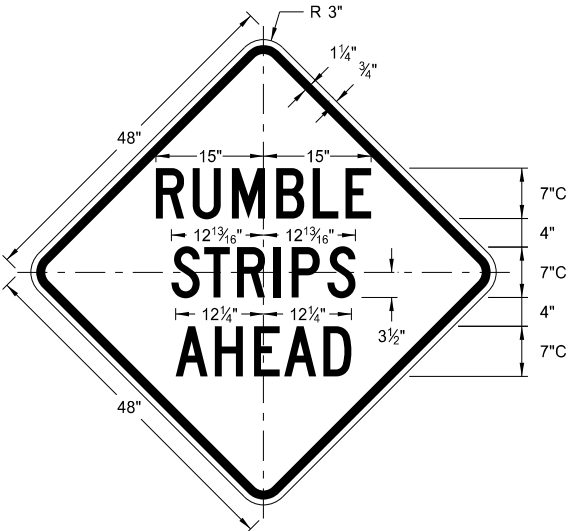
W16-7aP-18

Legend: black (non-refl)
Background: orange



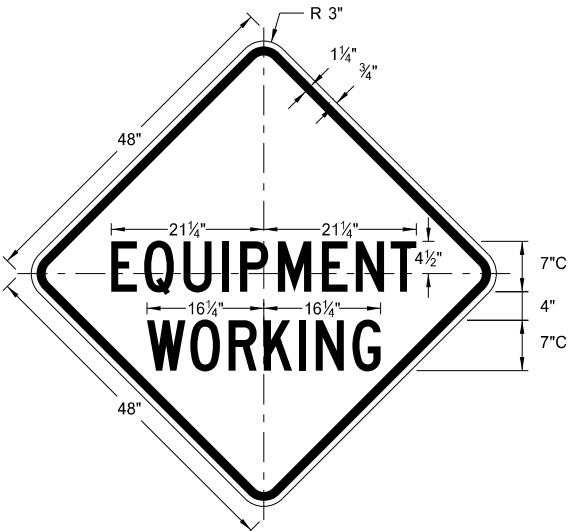
W21-50-48

Legend: black (non-refl)
Background: orange



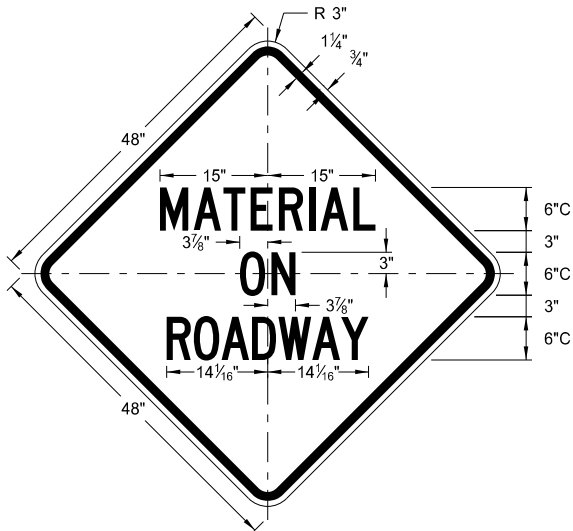
W21-53-48

Legend: black (non-refl)
Background: orange



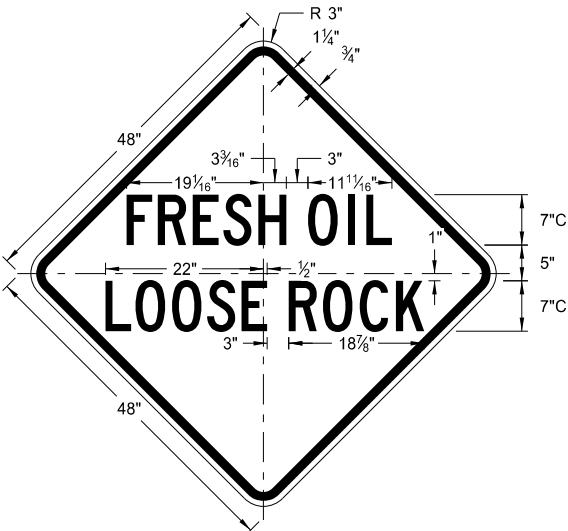
W20-51-48

Legend: black (non-refl)
Background: orange



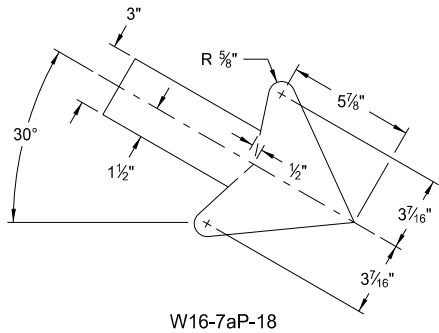
W21-51-48

Legend: black (non-refl)
Background: orange

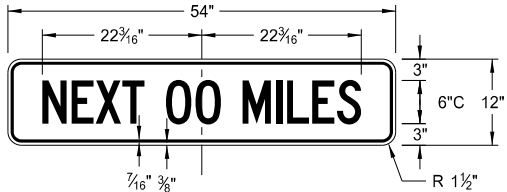


W22-8-48

Legend: black (non-refl)
Background: orange

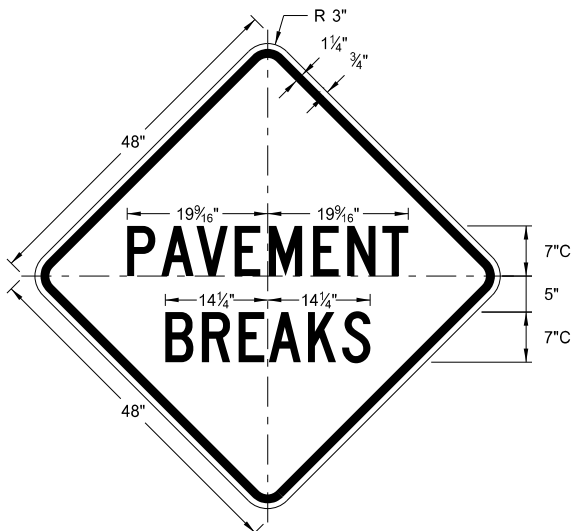


W16-7aP-18



W20-52P-54

Legend: black (non-refl)
Background: orange

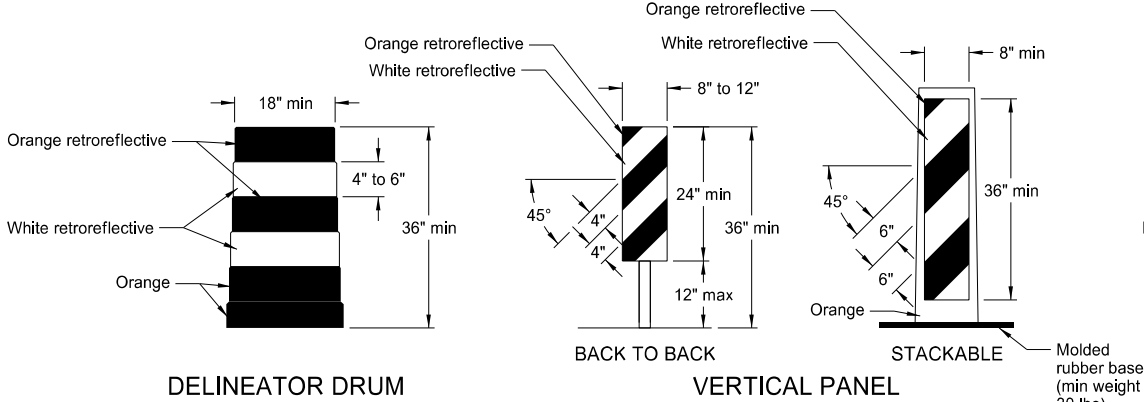


W21-52-48

Legend: black (non-refl)
Background: orange

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION		This document was originally issued and sealed by Kirk J Hoff, Registration Number PE- 4683, on 11/1/19 and the original document is stored at the North Dakota Department of Transportation
5-31-18		
REVISIONS		
DATE	CHANGE	
11-01-19	Added details for sign W16-7aP-18.	

BARRICADE AND CHANNELIZING DEVICE DETAILS



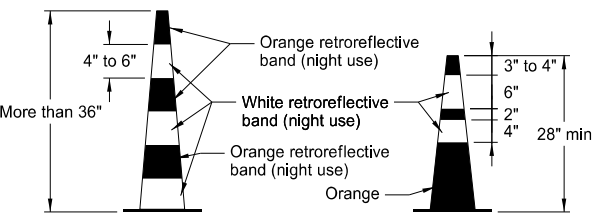
DELINEATOR DRUM

VERTICAL PANEL

STACKABLE
Molded rubber base (min weight 30 lbs)

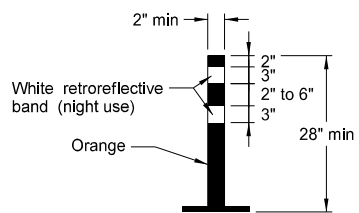
Provide horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide for drum markings. Use a minimum of two orange and two white stripes with the top stripe being orange for each drum. Do not exceed 3" nonretroreflectORIZED spaces between the horizontal orange and white stripes. Avoid placement of stripes on drum ribs or indentations. Use closed top drums that will not allow collection of debris. Do not place ballast on the top of drum.

Provide alternating orange and white retroreflective stripes, sloping downward in direction vehicular traffic is to pass. Place retroreflective sheeting on both sides of panel with a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective material on the vertical panel is 36 inches or more, use a stripe width of 6 inches.



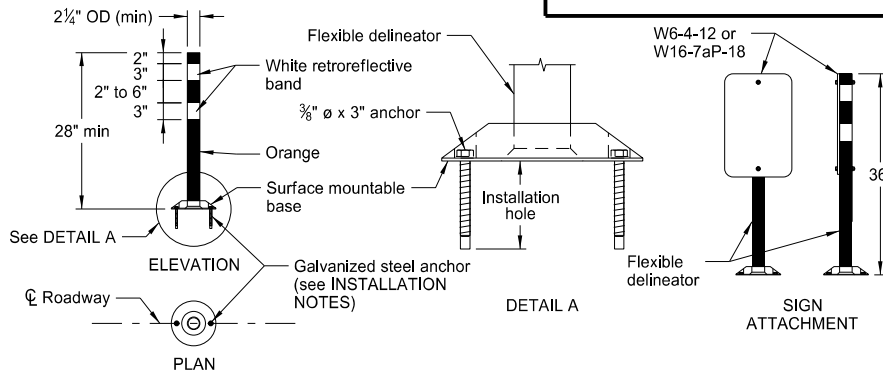
TRAFFIC CONE

Provide retroreflectORIZATION of cones more than 36" in height by alternating orange and white retroreflective stripes. Use a minimum of two orange and two white stripes for each cone with the top stripe being orange. Use maximum 3" nonretroreflectORIZED space between the orange and white stripes.



TUBULAR MARKER

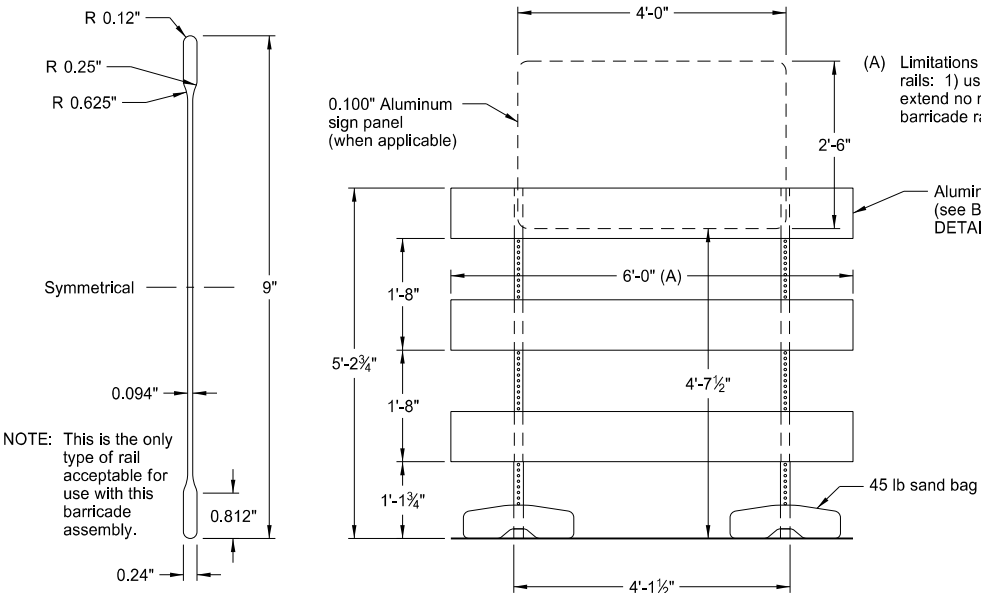
Provide retroreflectORIZATION of tubular markers more than 42" in height by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



FLEXIBLE DELINEATOR

INSTALLATION NOTES:

1. Drill installation holes to diameter and depth required by manufacturer's specifications.
2. For removal, remove anchors and fill installation hole with an epoxy designed to bond to pavement surface.
3. In lieu of bolted down base, use an 8" x 8" butyl pad or hot melt butyl. Remove butyl as close as possible to pavement surface.

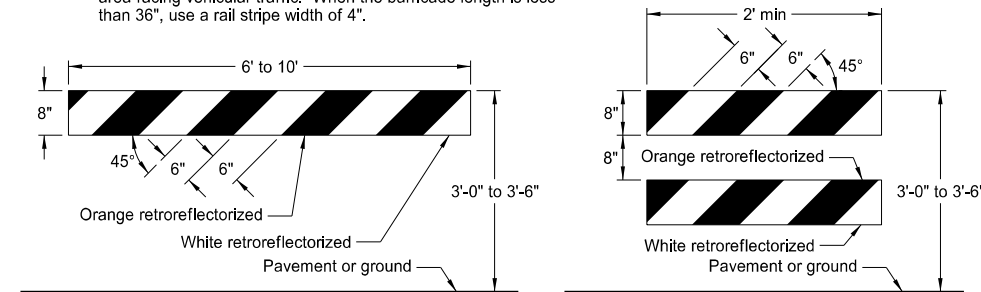


BARRICADE BLADE DETAIL

ELEVATION VIEW

BARRICADE ASSEMBLY DETAIL
(Aluminum Barricade Rails)

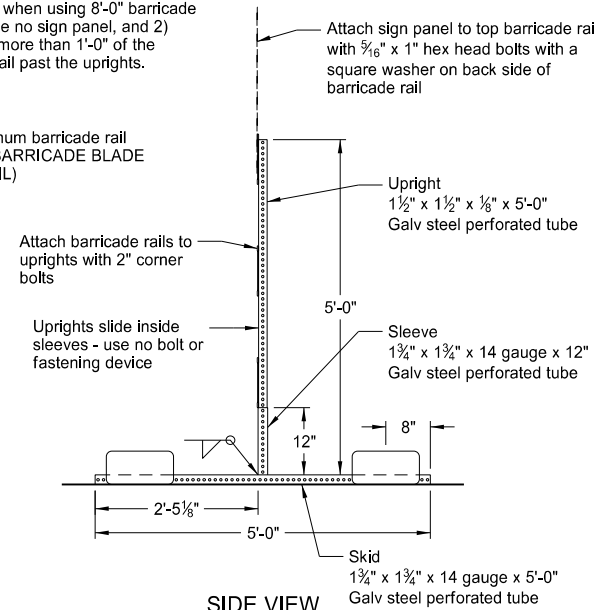
NOTE: For barricade markings use alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Place retroreflective sheeting on both sides of the rails with a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the barricade length is less than 36", use a rail stripe width of 4".



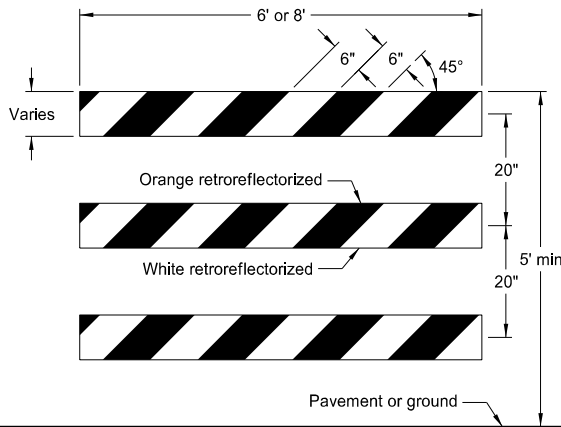
TYPE I BARRICADE

TYPE II BARRICADE

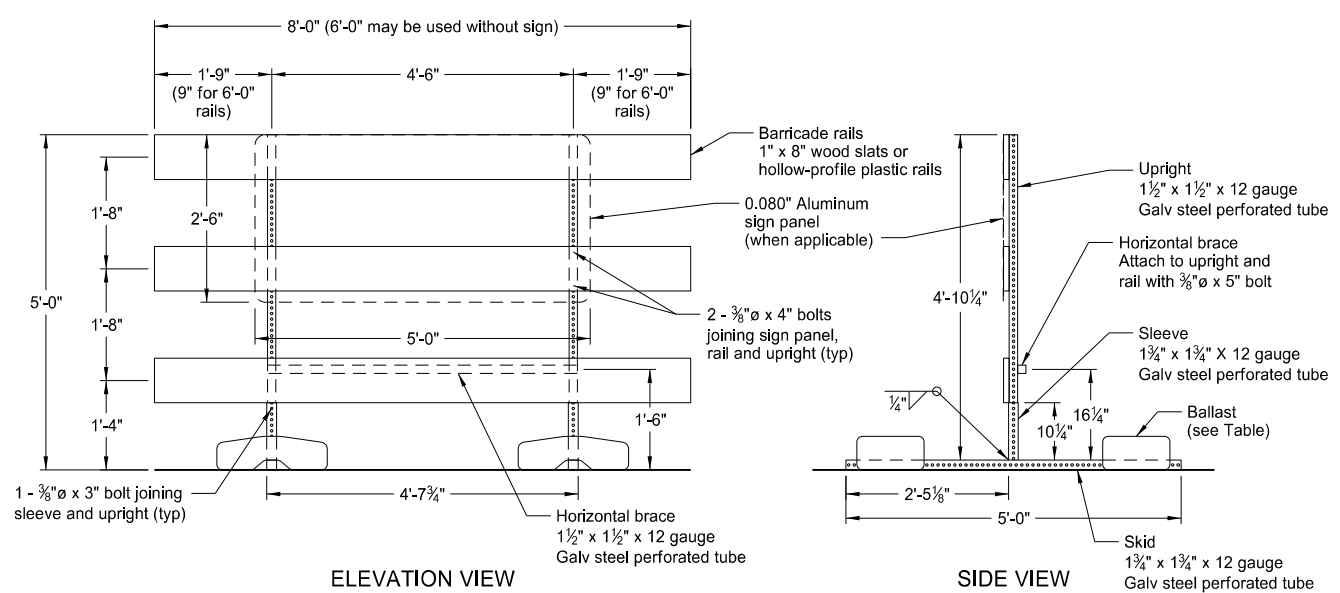
BARRICADE RAIL DETAILS



SIDE VIEW



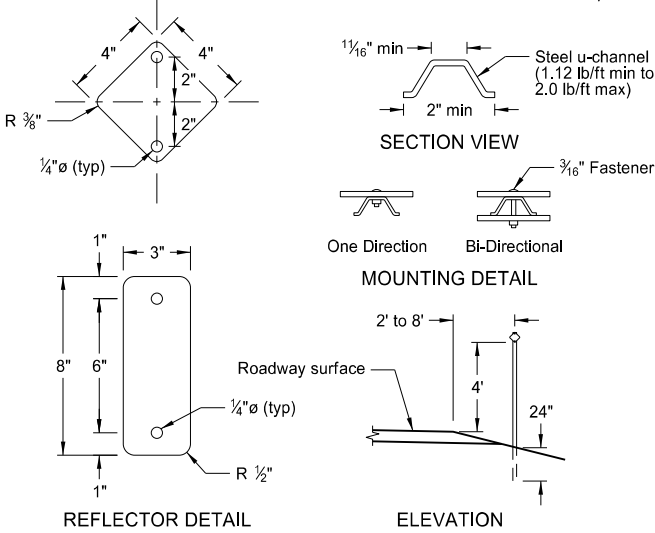
TYPE III BARRICADE



ELEVATION VIEW

SIDE VIEW

BARRICADE ASSEMBLY DETAIL
(Wood or Plastic Rails)



REFLECTOR DETAIL

ELEVATION

DELINEATORS

MINIMUM BALLAST
(For each side of barricade support)

Without Sign	4 - 25 lb sandbags
With Sign	6 - 25 lb sandbags

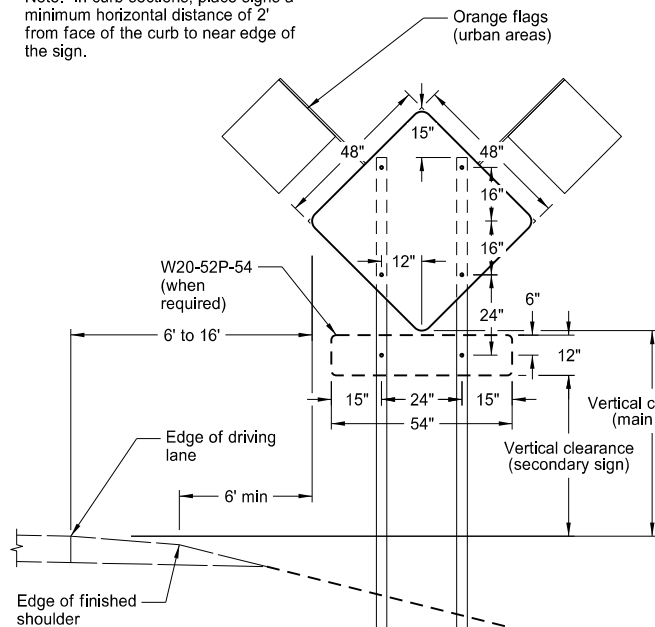
Note: Number of sandbags based on a wind speed of 55 MPH. Sandbags assumed to be placed at or near the ends of the skids.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17 11-01-19	Updated to active voice Revised details for Flexible Delineator

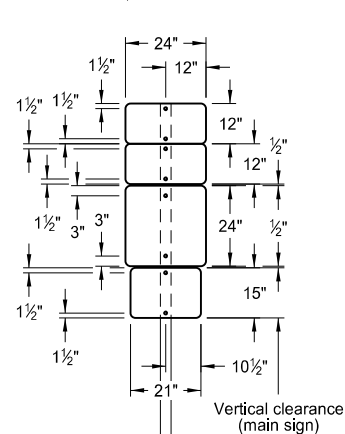
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CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

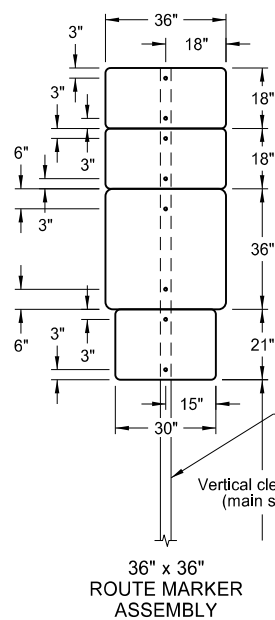
Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



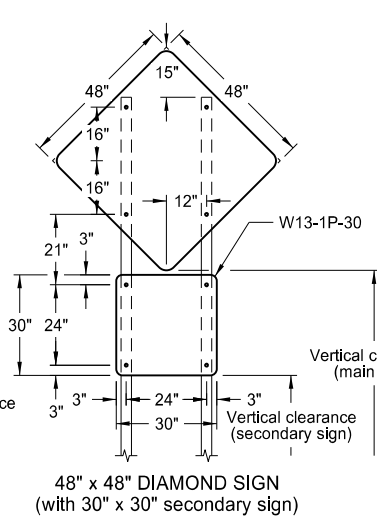
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



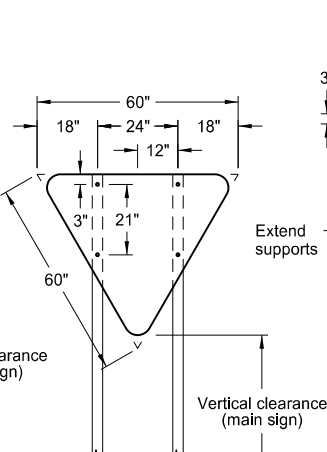
24" x 24"
ROUTE MARKER
ASSEMBLY



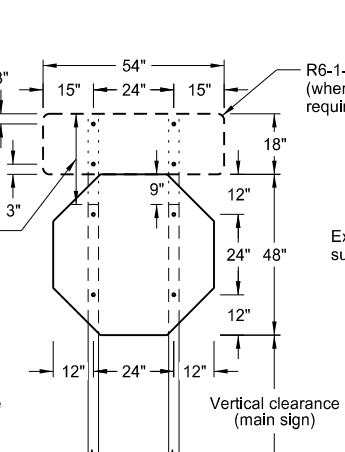
36" x 36"
ROUTE MARKER
ASSEMBLY



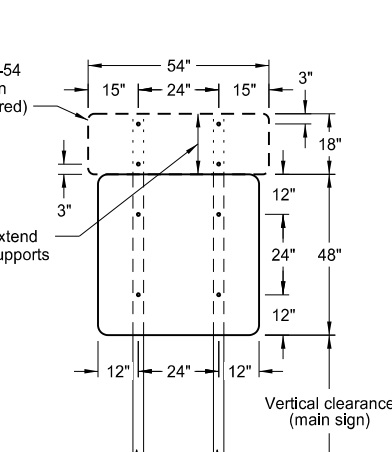
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



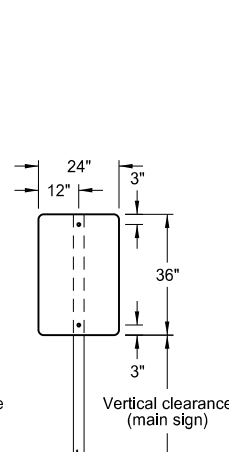
R1-2-60 - YIELD SIGN



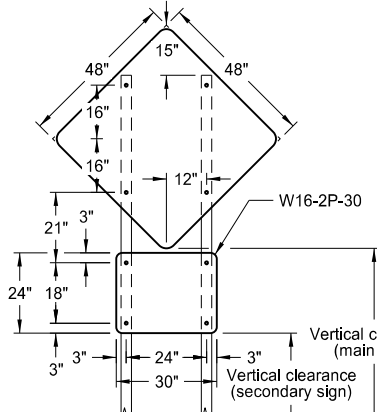
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



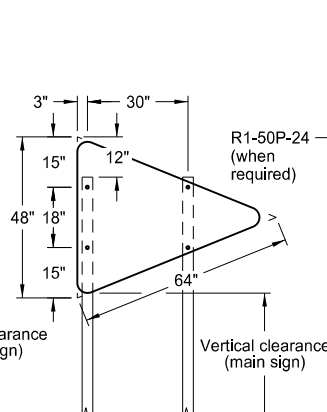
48" x 48" SIGN
(with R6-1-54 sign as required)



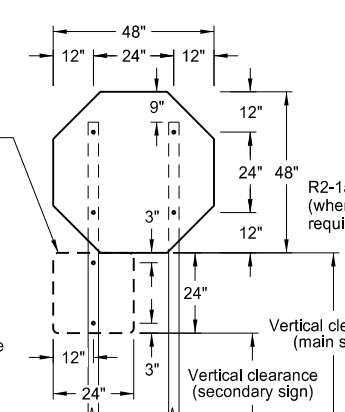
24" x 36" SIGN



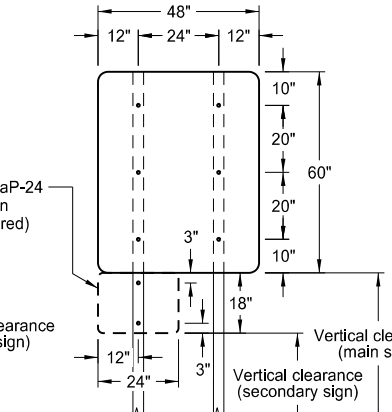
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



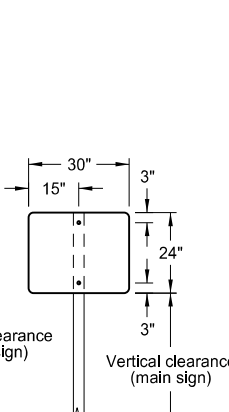
W14-3-64 - PENNANT SIGN



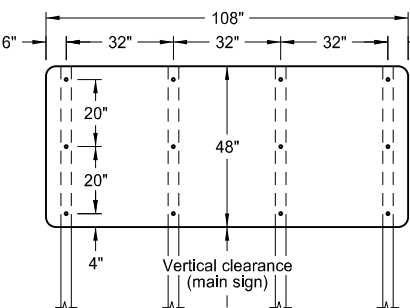
R1-1-48 - STOP SIGN
(with R1-50P-24 sign as required)



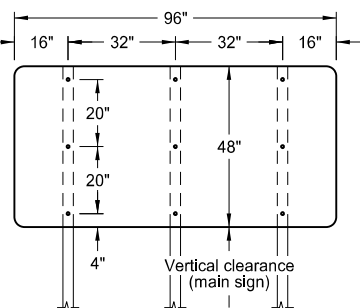
48" x 48" SIGN
(with R2-1aP-24 sign as required)



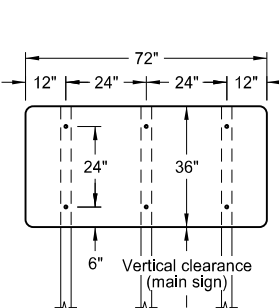
30" x 24" SIGN



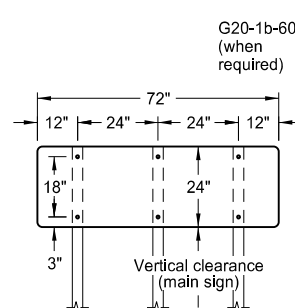
108" x 48" SIGN



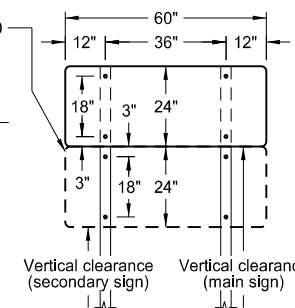
96" x 48" SIGN



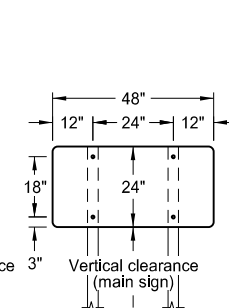
72" x 36" SIGN



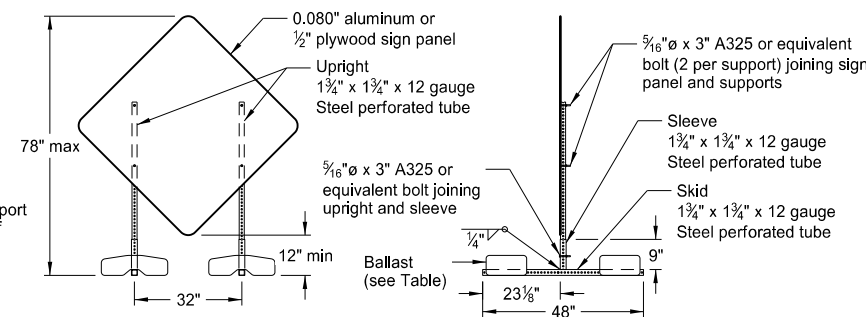
72" x 24" SIGN



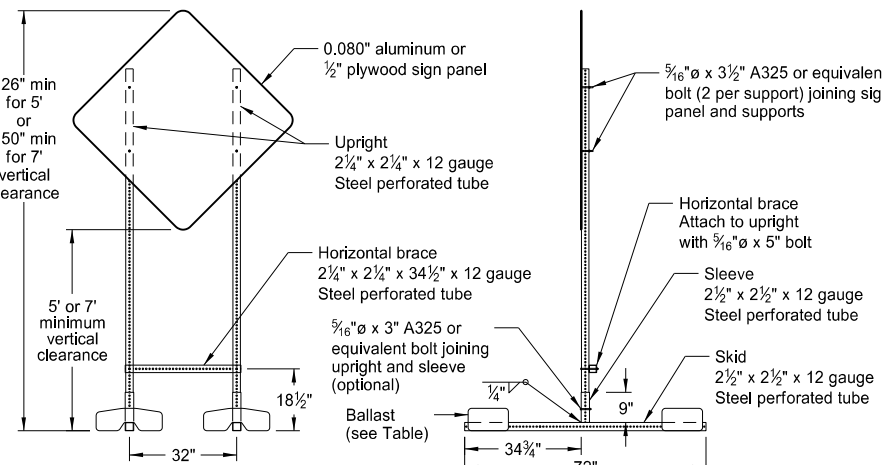
60" x 24" SIGN



48" x 24" SIGN



PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

1. Sign Supports: Galvanize or paint supports. Minimum post sizes are 2.5 lb/ft u-channel or 2" x 2" x 12 gauge steel perforated tube, except where noted. When installing signs on u-channel, minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes based on a wind speed of 55 MPH.

Place signs over 50 square feet on 2½" x 2½" perforated tube supports as a minimum.

Do not attach guy wires to sign supports. Attach wind beams behind sign panels when used with u-posts.
2. Sign Panels: Provide sign panels made of 0.100" aluminum, ½" plywood, or other approved material, except where noted. Punch all holes round for ⅝" bolts.
3. Alternate Messages: Install and remove alternate message signs on reflectorized plate (without borders) as required. (i.e. "Left" and "Right" message on lane closure sign)
4. Route Marker Auxiliary Signs: Provide route marker auxiliary signs, such as the cardinal direction and directional arrows, with a background and legend that match the route marker they are used with:

Interstate - white legend on blue background
Interstate Business Loop - white legend on green background
US and State - black legend on white background
County - yellow legend on blue background

5. Vertical Clearance: Install signs with a vertical clearance of 5'-0" (see TYPICAL SECTION.). In areas where parking or pedestrian movements are likely or the view of the sign may be obstructed, install signs with a vertical clearance of 7'-0" from the top of the curb or from the near edge of the driving lane in absence of a curb.

The vertical clearance to secondary signs is 1'-0" less than the vertical clearance stated above.

Provide a minimum clearance of 7'-0" from the ground at the post for signs with an area exceeding 50 square feet.

6. Portable Signs: Provide portable signs that meet the vertical clearance stated above when it is necessary to place signs within the pavement surface.

Use of low-mounting height (minimum 12" vertical clearance) portable signs for 5 days or less, is allowed as long as the view of the sign is not obstructed. Time delays caused by unforeseen circumstances, such as equipment breakdown, rain, subgrade failures, etc., will not accrue towards the 5 day period. Use of R9-8 through R9-11a series, W1-6 through W1-8 series, M4-10, and E5-1 is allowed for longer than 5 days.

Restrict signs mounted on portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT details to a maximum surface area of 16 square feet.

MINIMUM BALLAST
(For each side of sign support base)

Sign Panel Mounting Height (ft)	Number of 25 lb sandbags for 4' x 4' sign panel
1'	6
5'	8
7'	10

Note: The number of sandbags are based on a wind speed of 55 MPH. Place sandbags at or near the ends of skids.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-4-13	
REVISIONS	
DATE	CHANGE
11-14-13	Revised Note 6
9-27-17	Updated to active voice
11-01-19	Revised 60"x24" sign detail

This document was originally issued and sealed by

Kirk J Hoff,
Registration Number
PE-4683,
on 11/1/19 and the original document is stored at the North Dakota Department of Transportation

ROAD CLOSURE LAYOUTS

Notes:

1. Variables

- S = Numerical value of speed limit or 85th percentile.
- W = The width of taper in feet.
- L = Minimum length of taper, $S \times W$ for freeways, expressways, and other roads with speeds of 45 mph or greater, or $W \times S^2/60$ for urban, residential, and other streets with speeds of 40 mph or less.
- 2. Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
- 3. Place delineator drums, barricades or cones for tapering traffic at dimension "S" and for tangents space at 2 times dimension "S".
- 4. Place Sequencing Arrow Panels at the beginning of the taper when possible. Where shoulder width does not provide sufficient room, move the panel closer to the work area and place on roadway surface. See Shoulder Closure Standard Drawing.
- Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
- Use Type B on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
- Use Type C on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
- 5. Re-establish speed. Determine exact speed limit in the field, dependent on location and conditions.
- 6. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at $\frac{1}{2}$ B.
- 7. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
- 8. Cover existing speed limit signs within reduced speed zones.
- 9. Where necessary, engineer will determine safe speed.
- 10. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
- 11. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.
- 12. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
- 13. Sign I2-5-96 is not required if this layout is part of other traffic control that contains this sign.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

KEY

- Type III barricade
- Sign
- Delineator drum
- Tubular markers
- Work area
- Flagger
- Sequencing arrow panel
- Vertical panels back to back

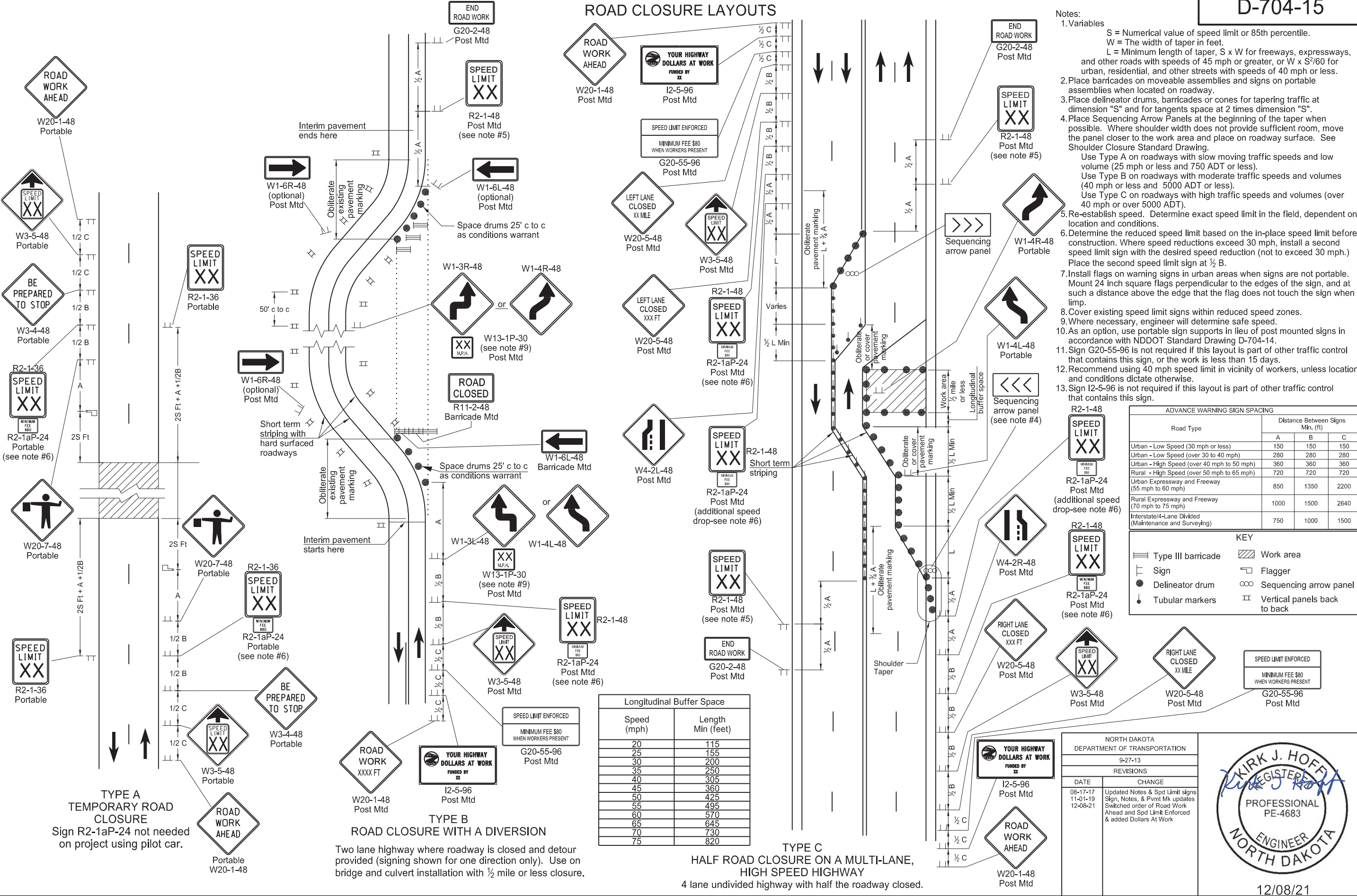
Longitudinal Buffer Space	
Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

TYPE C
HALF ROAD CLOSURE ON A MULTI-LANE, HIGH SPEED HIGHWAY
4 lane undivided highway with half the roadway closed.

TYPE B
ROAD CLOSURE WITH A DIVERSION

Two lane highway where roadway is closed and detour provided (signing shown for one direction only). Use on bridge and culvert installation with $\frac{1}{2}$ mile or less closure.

TYPE A
TEMPORARY ROAD CLOSURE
Sign R2-1aP-24 not needed on project using pilot car.



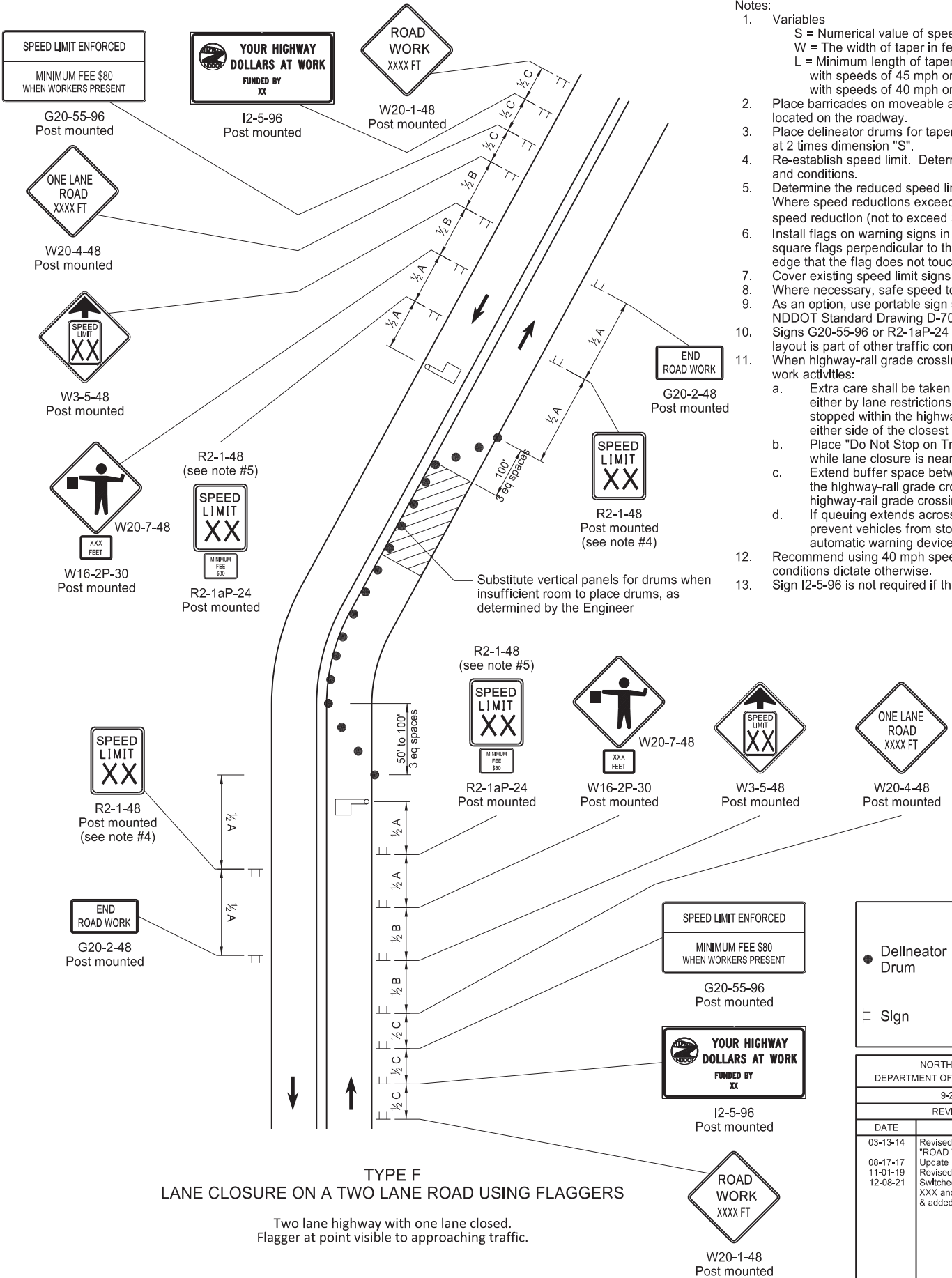
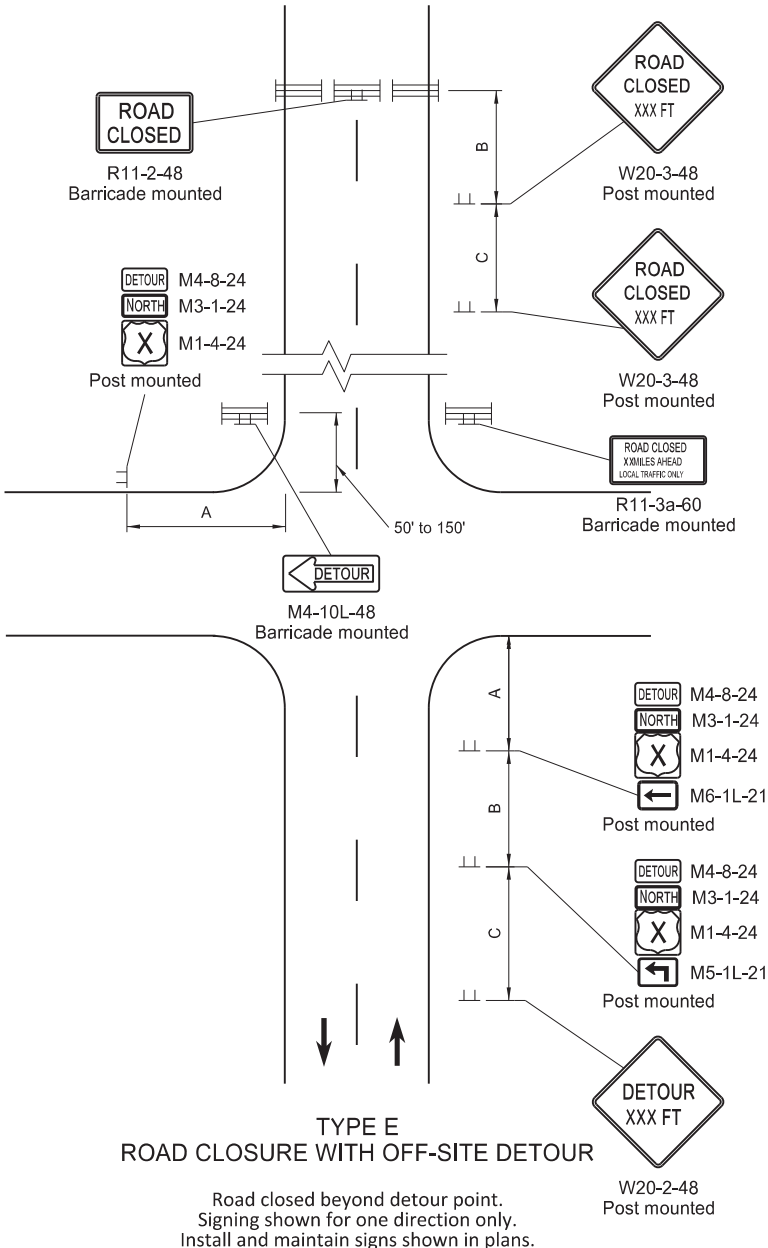
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Updated Notes & Spd Limit signs
11-01-19	Sign, Notes, & Pymt Mkt updates
12-08-21	Switched order of Road Work Ahead and Spd Limit Enforced & added Dollars At Work



12/08/21

ROAD CLOSURE AND LANE CLOSURE ON A TWO WAY ROAD LAYOUTS

- Notes:
- Variables
 - S = Numerical value of speed limit or 85th percentile.
 - W = The width of taper in feet
 - L = Minimum length of taper in feet. S x W for freeways, expressways, and roads with speeds of 45 mph or greater, or W x S²/60 for urban, residential, and streets with speeds of 40 mph or less.
 - Place barricades on moveable assemblies and signs on portable assemblies when located on the roadway.
 - Place delineator drums for tapering traffic at 3 equal spaces and for tangents space them at 2 times dimension "S".
 - Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
 - Determine the reduced speed limit based on the in place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place second speed limit sign at 1/2B.
 - Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
 - Cover existing speed limit signs within a reduced speed zone.
 - Where necessary, safe speed to be determined by the Engineer.
 - As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
 - Signs G20-55-96 or R2-1aP-24 are not required when pilot car operation is used, if this layout is part of other traffic control that contains this sign, or if work is less than 15 days.
 - When highway-rail grade crossings exist either within or in the vicinity of the roadway work activities:
 - Extra care shall be taken to minimize the probability of conditions being created, either by lane restrictions, flagging or other operations, where vehicles might be stopped within the highway-rail grade crossing (considered as being 15 feet on either side of the closest and farthest rail.) Place "Do Not Stop on Tracks" sign (R8-8-24) near cross buck in each direction while lane closure is near tracks.
 - Extend buffer space between work zone and lane closure transition upstream of the highway-rail grade crossing to prevent flagging queue from extending across highway-rail grade crossing.
 - If queuing extends across highway-rail crossing, provide flagger at crossing to prevent vehicles from stopping within the crossing (even when automatic warning devices are in place.)
 - Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
 - Sign I2-5-96 is not required if this layout is part of other traffic control that contains this sign.



ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

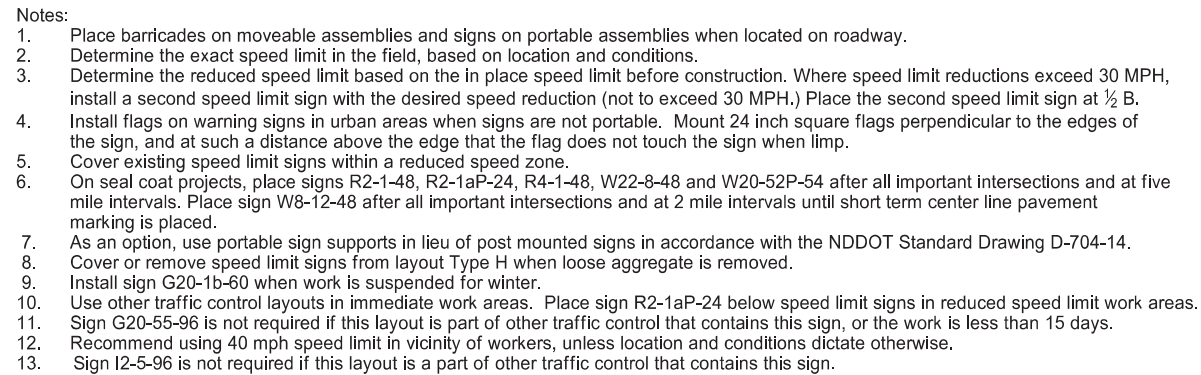
KEY		
● Delineator Drum	Type III Barricade	⏏ Flagger
⏏ Sign	▨ Work/Hazard Area	

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
03-13-14	Revised Sign Call "ROAD WORK XXX FT"
08-17-17	Update notes & sign numbers
11-01-19	Revised signs, sign #s, & notes
12-08-21	Switched order of Road Work XXX and Spd Limit Enforced & added Dollars At Work

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

12/08/21

D-704-20



ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

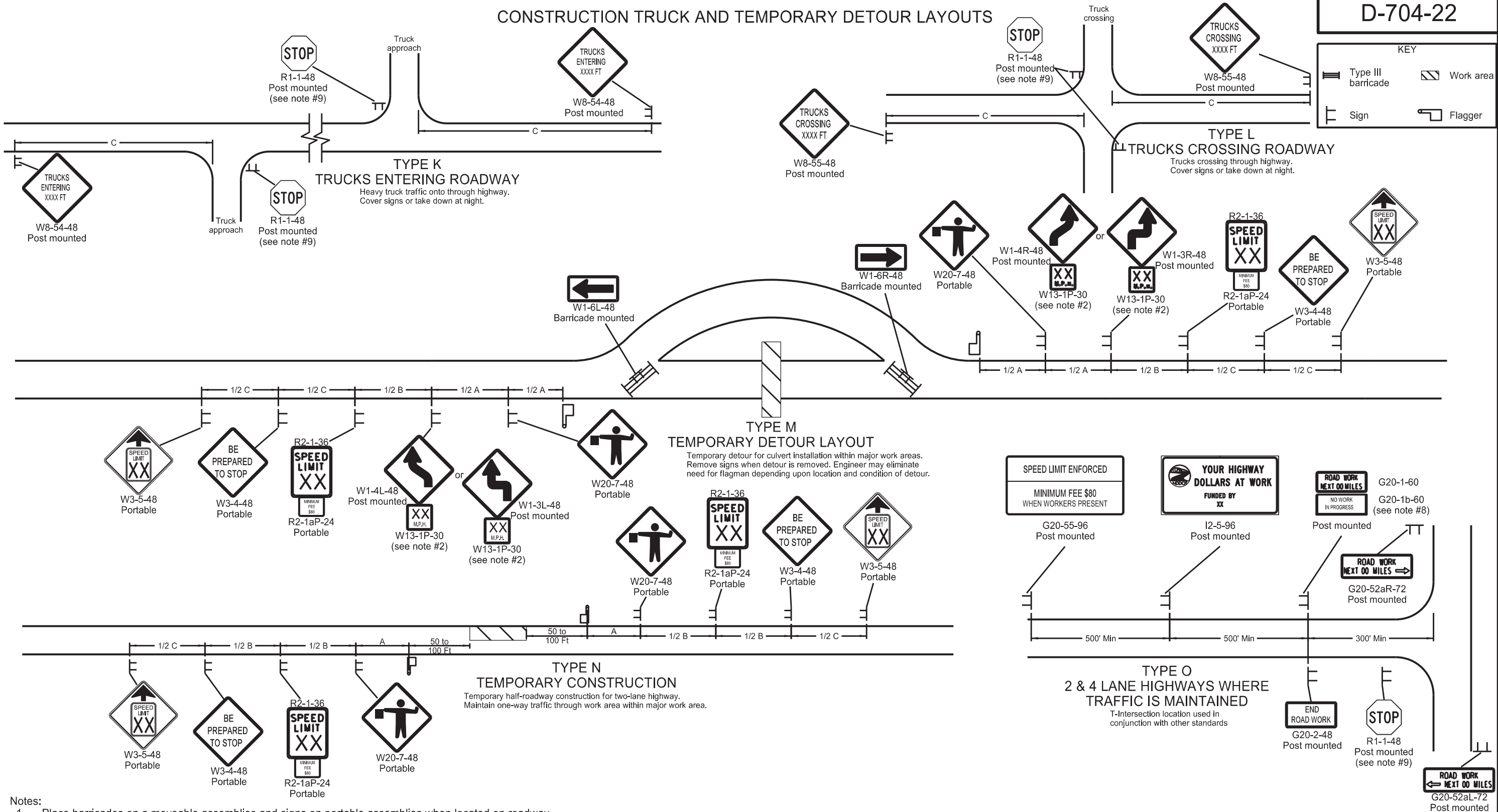
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Updated notes & sign numbers
11-01-19	Updated note & sign
12-08-21	Switched order of Road Work and Spd Limit Enforced & added Dollars At Work



12/08/21

CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

D-704-22



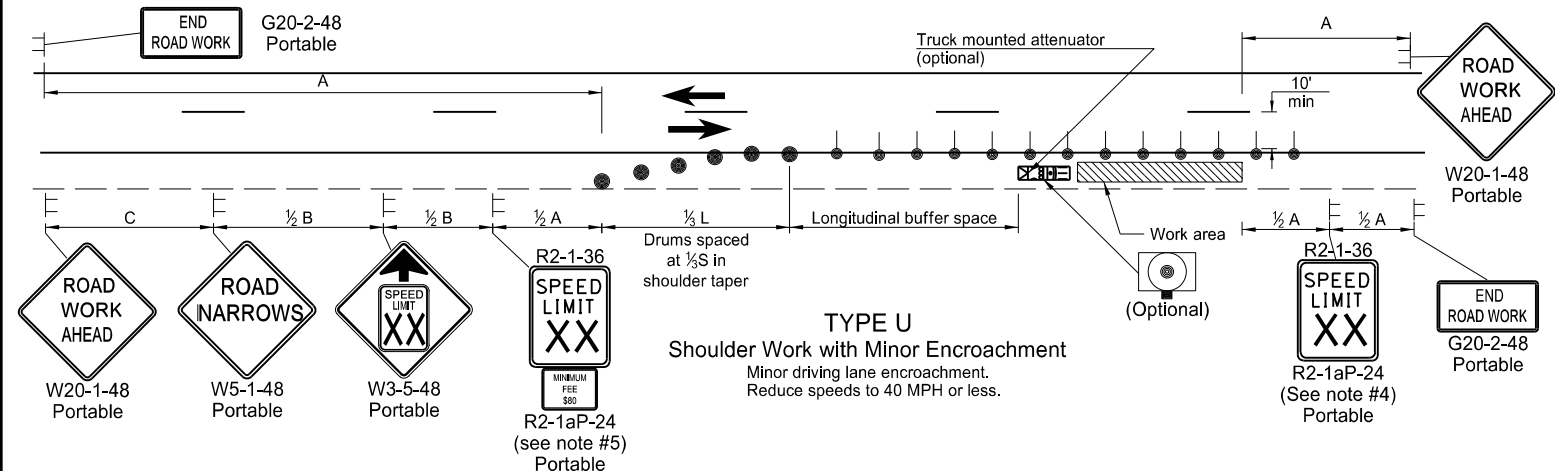
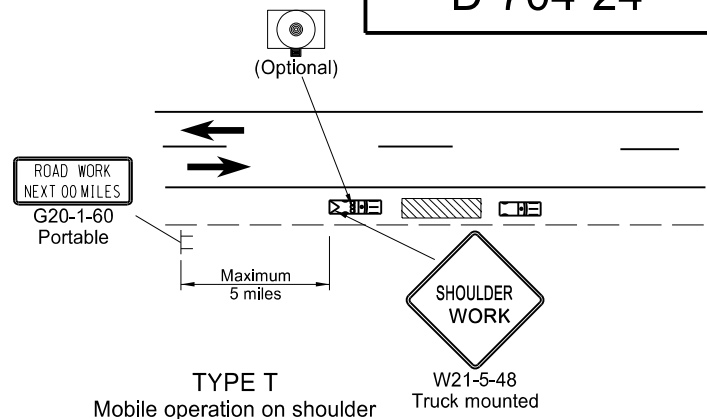
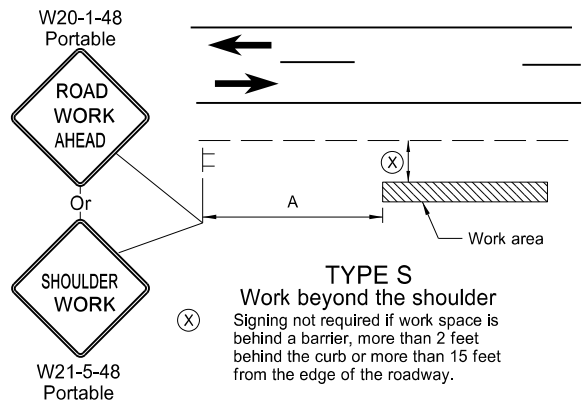
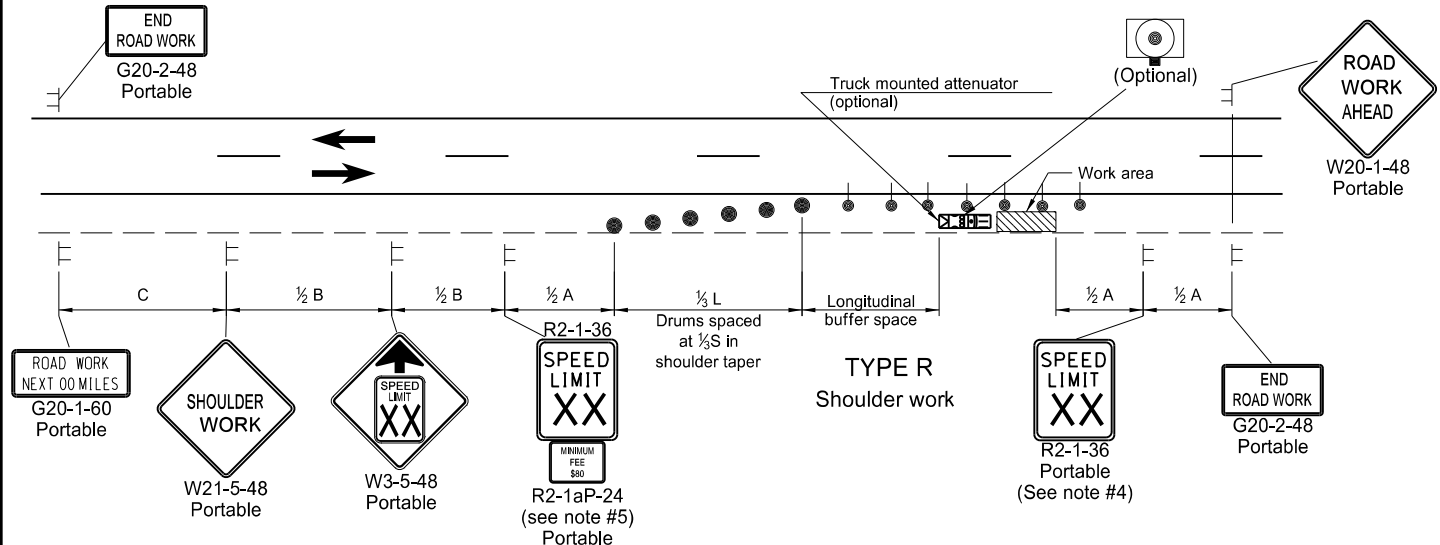
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs		
	Min. (ft)	A	B
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Update notes & sign numbers
11-01-19	Revised sign numbers & note 7
12-09-21	Added Speed Limit Enforced and Dollars At Work signs

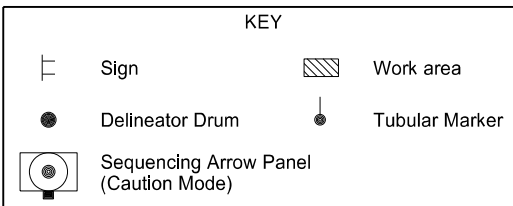
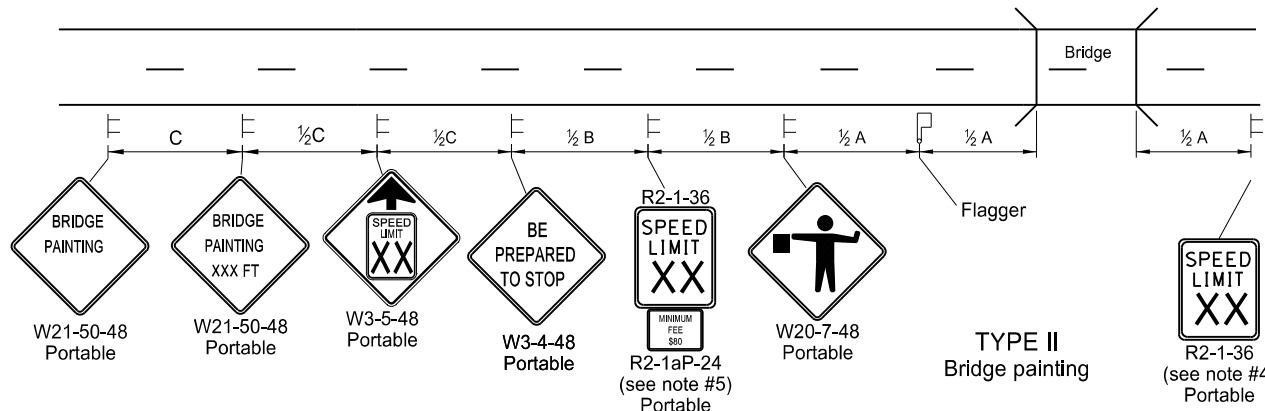
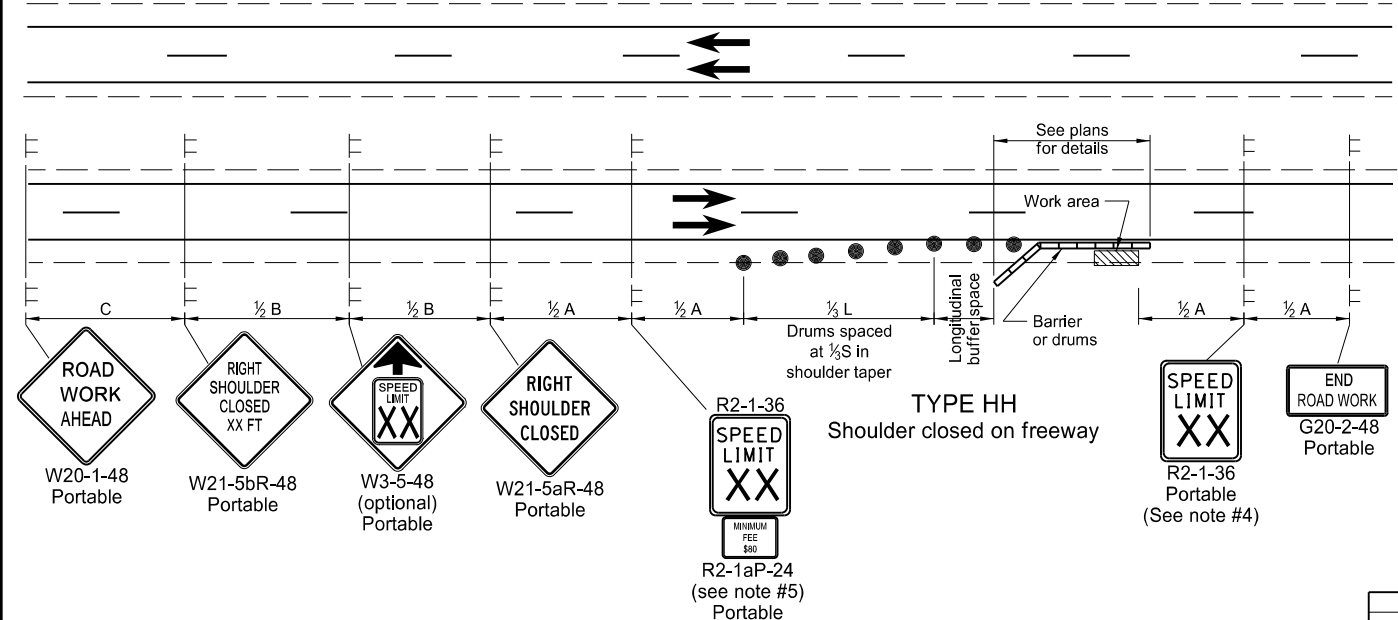


12/09/21

SHOULDER CLOSURES AND BRIDGE PAINTING LAYOUTS



- Notes
- Variables
 - S = Numerical value of speed limit or 85th percentile.
 - W = The width of the taper in feet.
 - L = Minimum length of taper, $S \times W$ for freeways, expressways, and all other roads with speeds of 45 mph or greater, or $W \times S^2 / 60$ for urban, residential, and other streets with speeds of 40 mph or less.
 - Space delineator drums for tapering traffic at dimension "S". Space delineator drums or tubular markers for tangents at 2 times "S".
 - Sequencing Arrow Panels
 - Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
 - Use Type B on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
 - Use Type C on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
 - Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
 - Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at 1/2 B.
 - Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
 - Cover existing speed limit signs within a reduced speed zone.
 - As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
 - Recommend 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.



ADVANCE WARNING SIGN SPACING				
Road Type	Distance Between Signs			
	A	B	C	
Urban - Low Speed (30 mph or less)	150	150	150	
Urban - Low Speed (over 30 to 40 mph)	280	280	280	
Urban - High Speed (over 40 mph to 50 mph)	360	360	360	
Rural - High Speed (over 50 mph to 65 mph)	720	720	720	
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200	
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640	
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500	

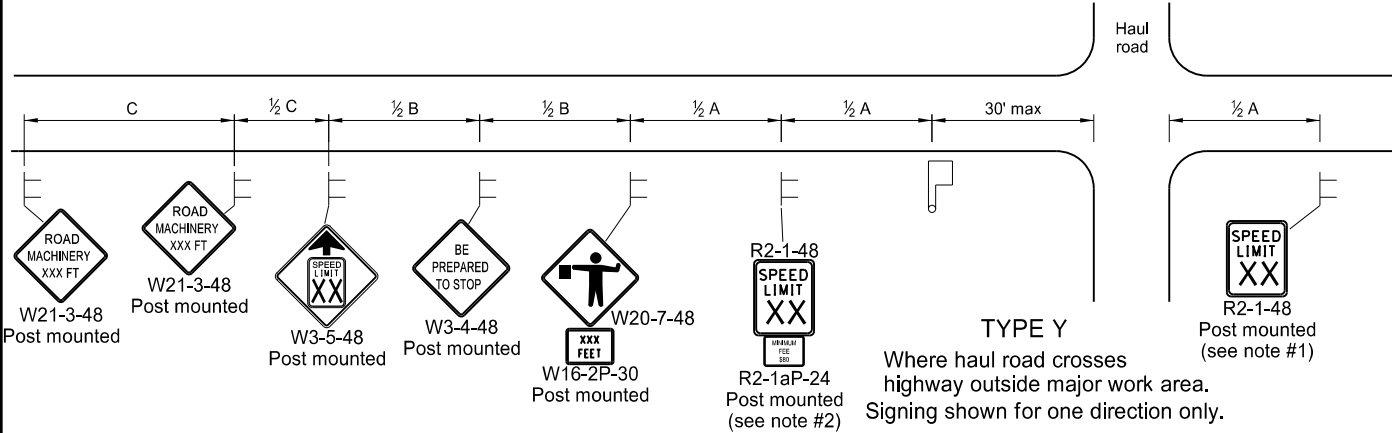
Longitudinal Buffer Space	
Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
8-17-17 11-01-19	Updated notes & revised signs Revised drum spacing & signs nos.

This document was originally issued and sealed by
Kirk J Hoff,
Registration Number
PE- 4683,
on 11/1/19 and the original document is stored at the
North Dakota Department
of Transportation

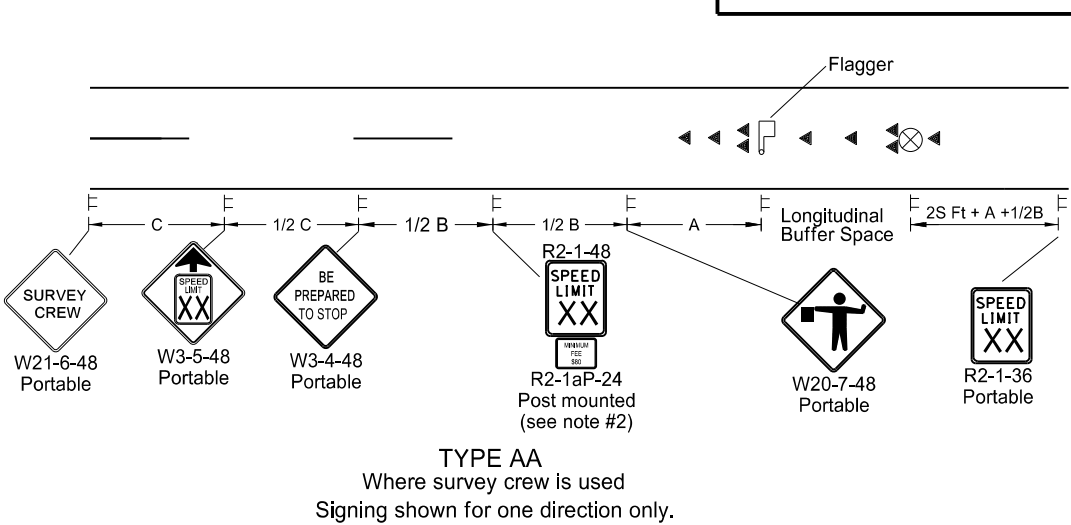
MISCELLANEOUS SIGN LAYOUTS

D-704-26

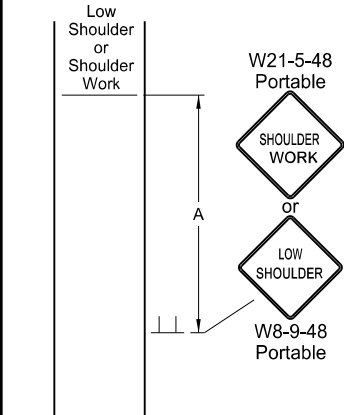


TYPE Y
Where haul road crosses
highway outside major work area.
Signing shown for one direction only.

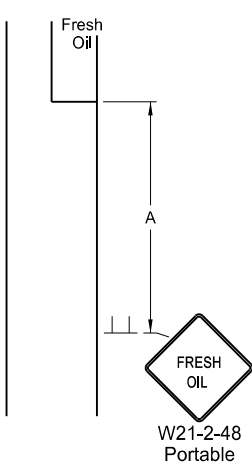
TYPE Z
Where speed zone is needed
Signing shown for one direction only.



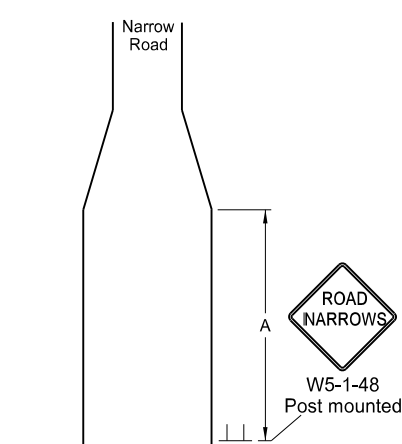
TYPE AA
Where survey crew is used
Signing shown for one direction only.



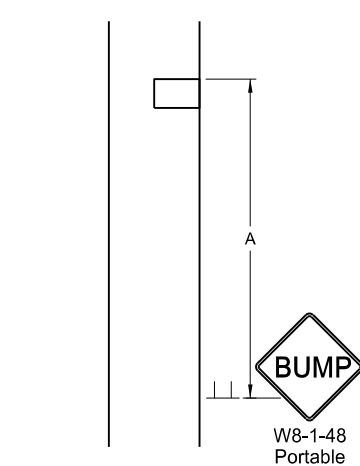
TYPE BB
Within major work area
where sign conditions exist



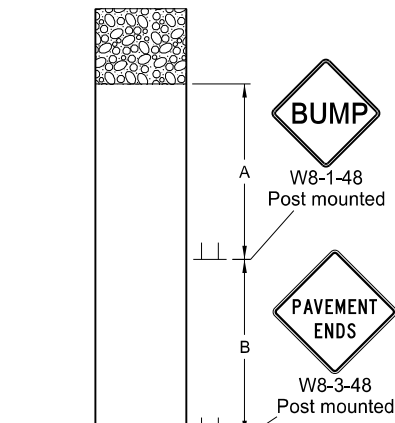
TYPE CC
Where sign conditions exist



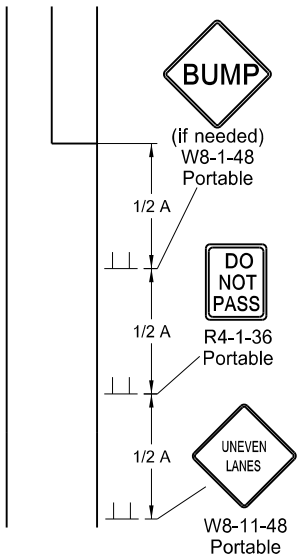
TYPE DD
Where sign conditions exist



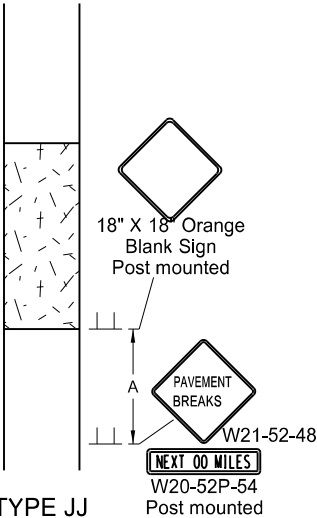
TYPE EE
Where sign conditions exist



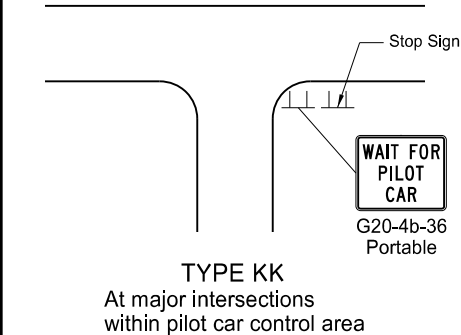
TYPE FF
Where sign conditions exist
Signing shown for one direction only.



TYPE GG
Where elevation difference
exists between lanes



TYPE JJ
For break in pavement.
Install signs when conditions exist
and remove when not applicable.
Signing shown for one direction only.



TYPE KK
At major intersections
within pilot car control area

- Notes
1. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
 2. Determine reduced speed limit based on in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at 1/2B.
 3. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
 4. Cover existing speed limit signs within reduced speed zones.
 5. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
 6. Sign G20-55-96 is not required if this standard is part of other traffic control layouts, or work is less than 15 days.
 7. When pilot car operation is used, place sign G20-4b-36 "Wait For Pilot Car" at major intersections within pilot car control area.
 8. Recommend 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
 9. Layouts shown for one direction only.

ADVANCE WARNING SIGN SPACING				
Road Type	Distance Between Signs Min. (ft)			
	A	B	C	
Urban - Low Speed (30 mph or less)	150	150	150	
Urban - Low Speed (over 30 to 40 mph)	280	280	280	
Urban - High Speed (over 40 mph to 50 mph)	360	360	360	
Rural - High Speed (over 50 mph to 65 mph)	720	720	720	
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200	
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640	
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500	

Longitudinal Buffer Space	
*Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

* Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
8-17-17	Added speed limit signs. Updated notes & sign numbers
11-01-19	Revised note 5 & sign numbers

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Registration Number
PE- 4683,
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KEY

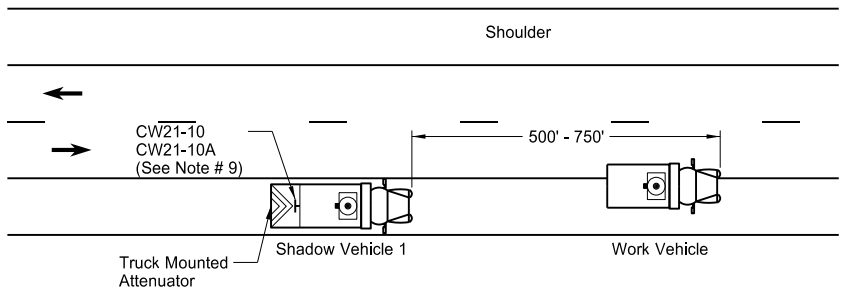
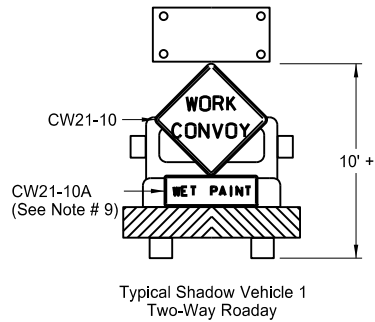
Flagger Sign

Cones Survey Equipment

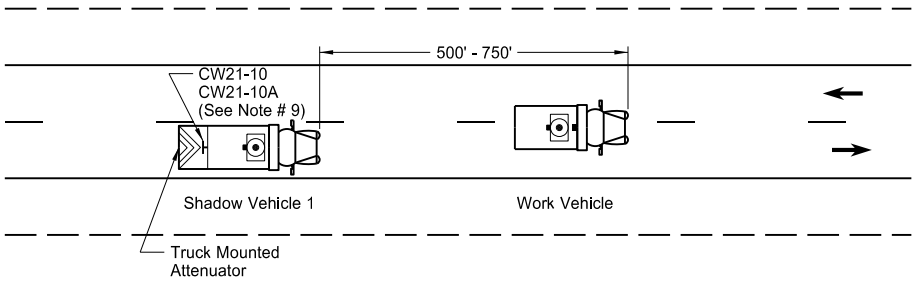
S = Numerical value of speed limit or 85th percentile.

MOBILE OPERATION
(PAVEMENT MARKING)

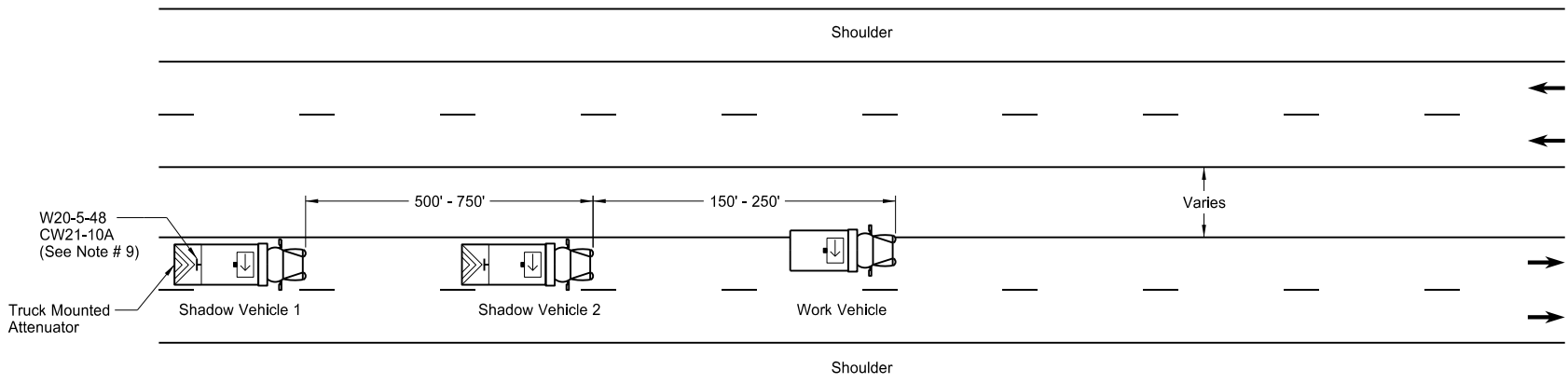
D-704-27



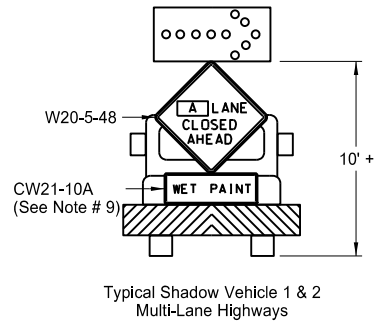
Two-Way Roadway with Paved Shoulders



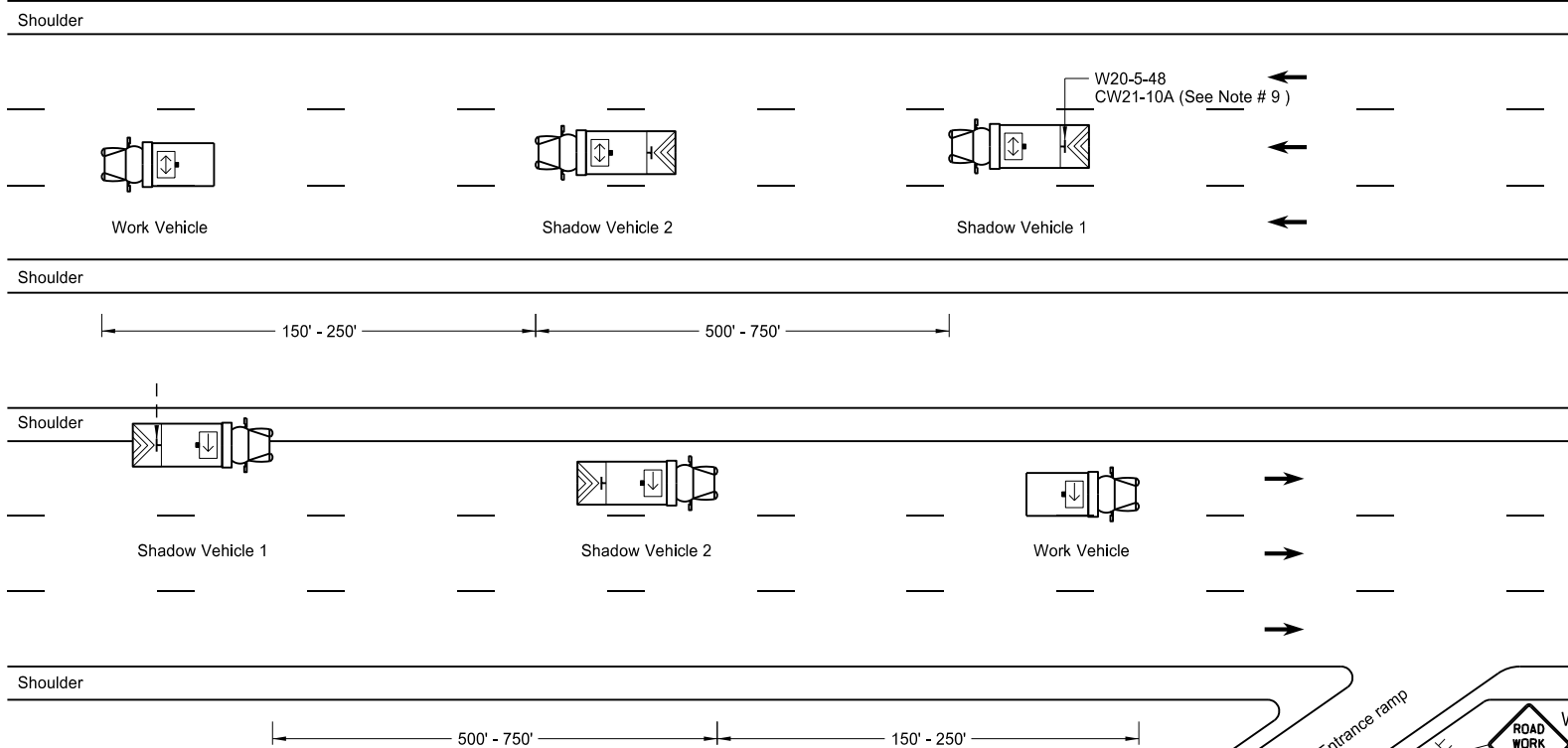
Two-Way Roadway without Paved Shoulders



Undivided Multi-Lane Roadway

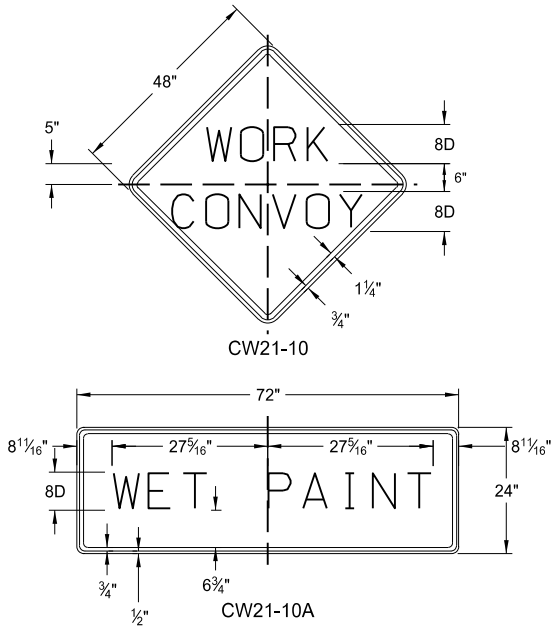


A = ☐ Left ☐ Right ☐ Center



Divided Multi-Lane Highway

Sign Details

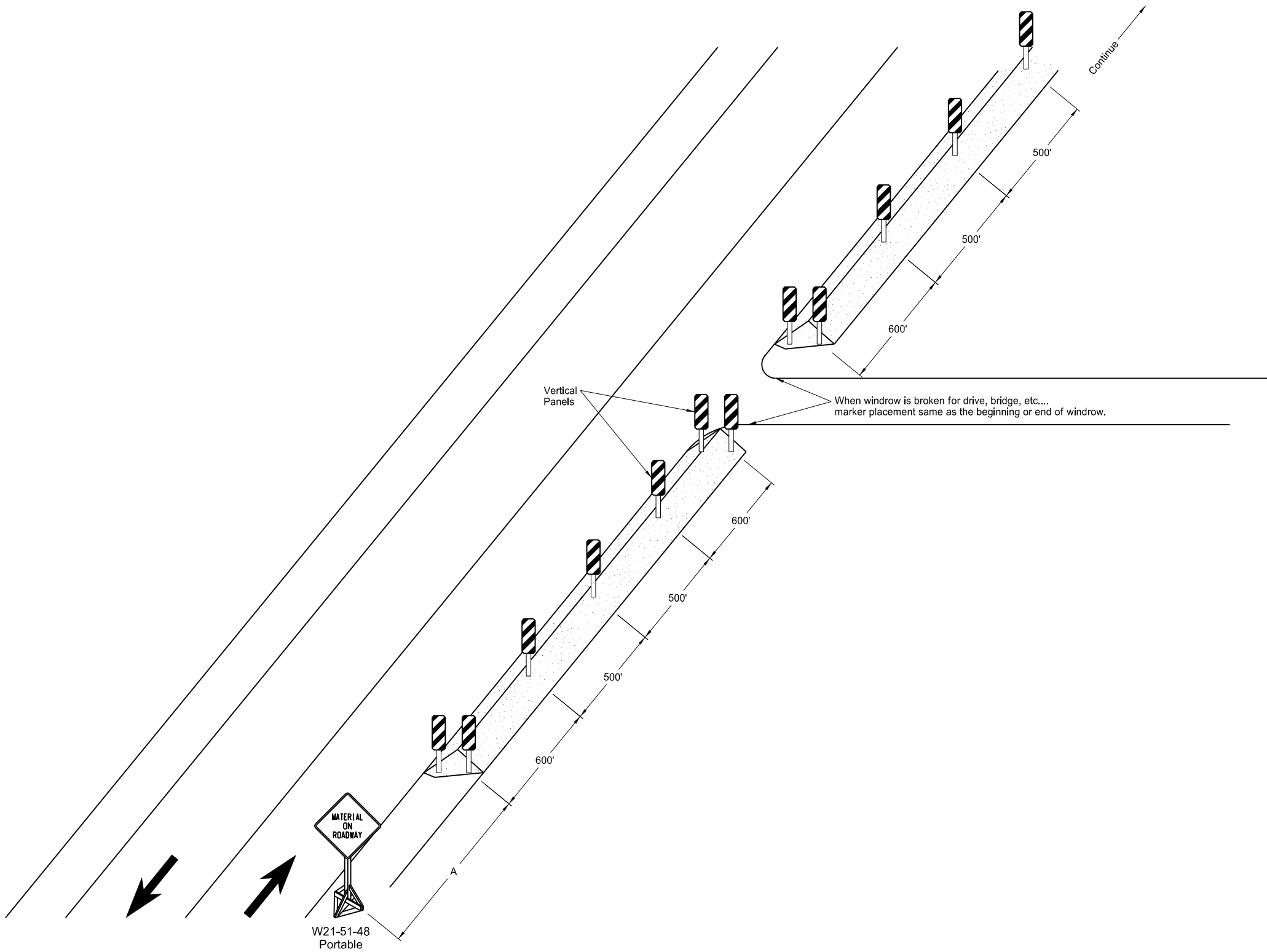


- Notes
1. Use additional vehicles you choose to be in the convoy with truck mounted attenuators, at your own expense.
 2. Display yellow rotating beacons or strobe lights on shadow and work vehicles, unless otherwise stated in the plans.
 3. Use Type B or Type C flashing arrow panels controlled from inside the vehicle.
 4. Provide each vehicle with two-way electronic communication capability.
 5. Move shadow vehicle 1 first to shadow other convoy vehicles when convoy changes lane.
 6. Vary vehicle spacing between shadow vehicle 1 and shadow vehicle 2 based on sight distance restrictions. Motorists approaching the work convoy need to see trail vehicle in time to slow down and/or change lanes as they approach shadow vehicle.
 7. Sign Colors
 - Letters = Black
 - Border = Black
 - Background = Orange
 8. As an option, use shadow vehicle 2 the paint tender vehicle.
 9. Use sign CW21-10A only during painting operation.
 10. Pull over work and shadow vehicles periodically to allow motor vehicle traffic to pass on two lane - two way roadways.

KEY	
	Sign
	Truck mounted attenuator
	Flashing arrow panels:
	Right directional
	Left directional
	Double arrow directional
	Caution Mode

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
6-18-14	Removed shadow vehicle 2 on two lane roadways
9-27-17	Updated to active voice
11-08-19	Changed Standard Heading

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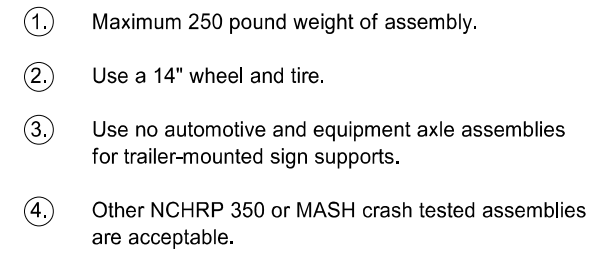
Notes:
As an option, use portable sign supports in lieu of post mounted sign in accordance with NDDOT Standard Drawing D-704-14.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (55 mph to 60 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
6-24-14 8-17-17 11-01-19	Revised Note Updated notes & sign support Revised note

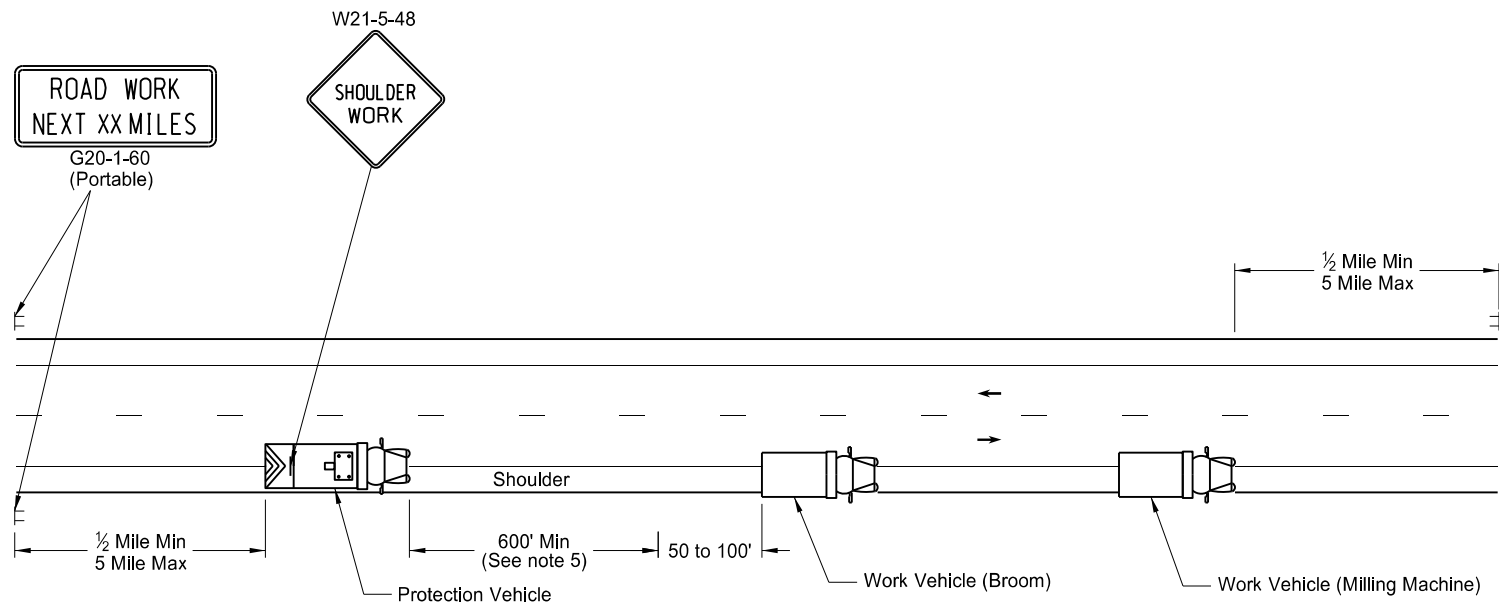
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D-704-50

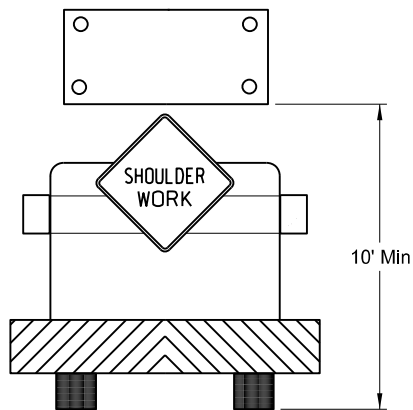


MOBILE OPERATION
Grinding Shoulder Rumble Strips

D-704-56



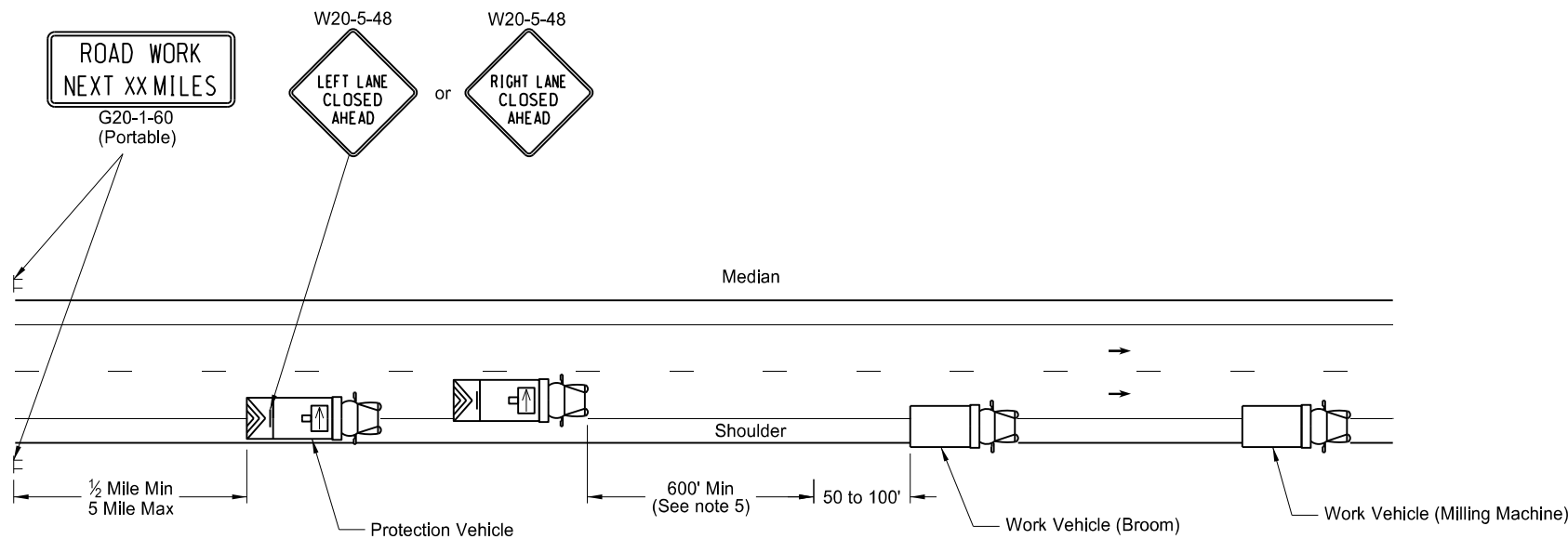
TWO LANE - TWO WAY ROADWAY



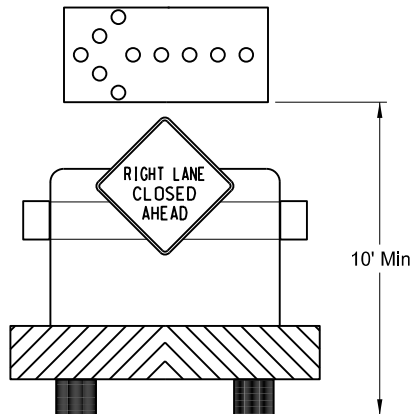
TWO LANE - TWO WAY ROADWAY

Typical Protection Vehicle with
Flashing Arrow Panel In Caution Mode

- Notes:
1. Provide truck mounted attenuators on additional vehicles in the convoy, at no additional cost.
 2. Provide rotating, flashing, oscillating, or strobe lights on vehicles.
 3. Provide Type B or Type C flashing arrow panels that are controlled from inside the vehicle.
 4. Provide two - way electronic communication capability in each vehicle.
 5. Vary vehicle spacing between the protection vehicle and work vehicle depending on sight distance restrictions. Keep the spacing of the convoy vehicles such that motorists approaching the work convoy can see the protection vehicle in time to slow down and safely pass the work vehicles.
 6. Move advance Road Work Ahead signs as the work area moves through the construction zone.

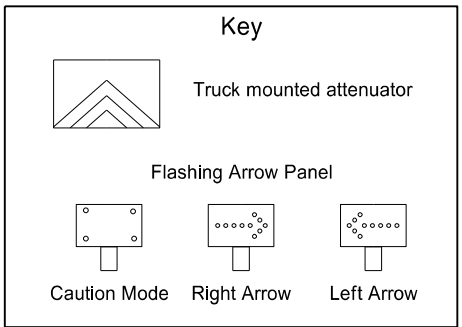


INTERSTATE & 4 LANE DIVIDED HIGHWAY



INTERSTATE & 4 LANE DIVIDED HIGHWAY

Typical Protection Vehicle with Flashing Arrow
Panel In Flashing Arrow Mode

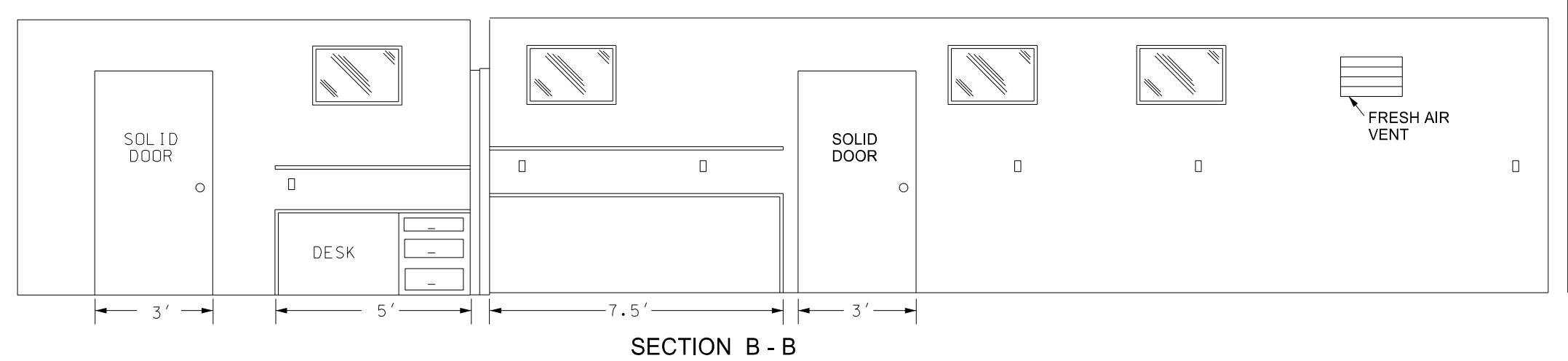
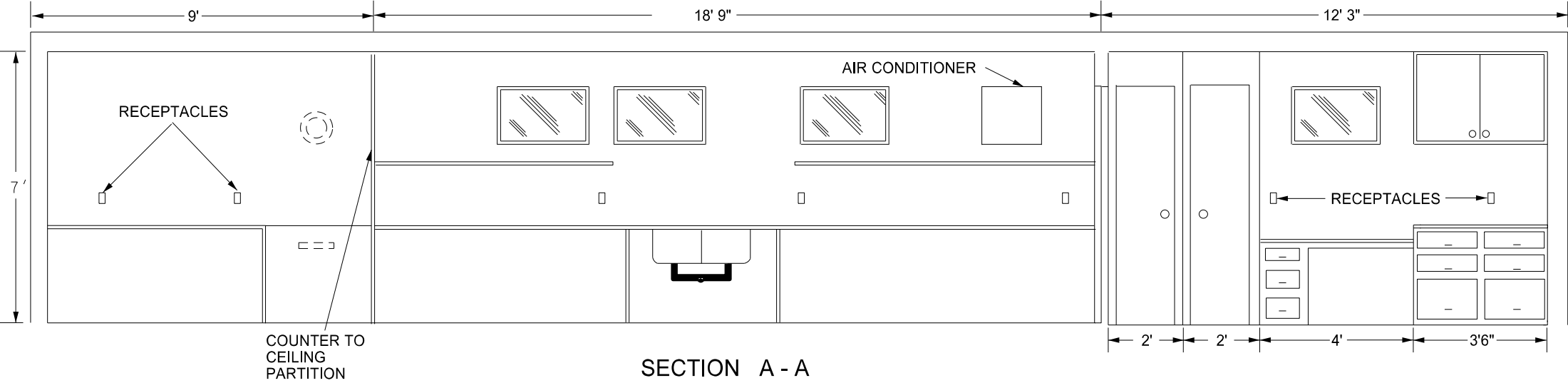
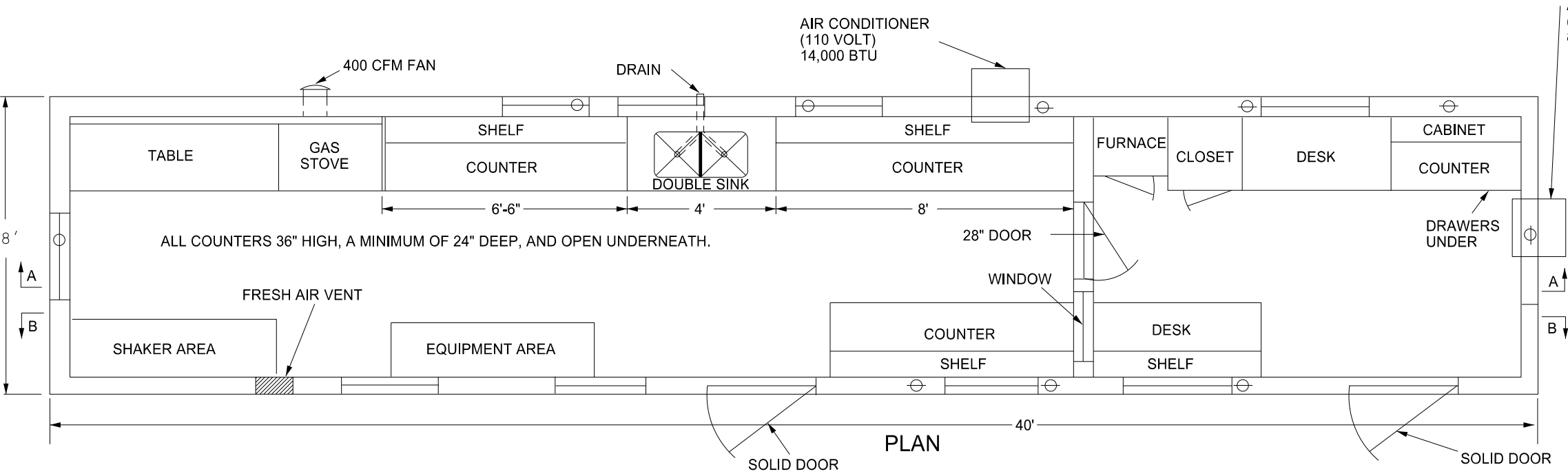


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-15-12	
REVISIONS	
DATE	CHANGE
8-17-17 10-03-19	Updated notes & signs New Design Engineer PE Stamp

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BITUMINOUS LABORATORY

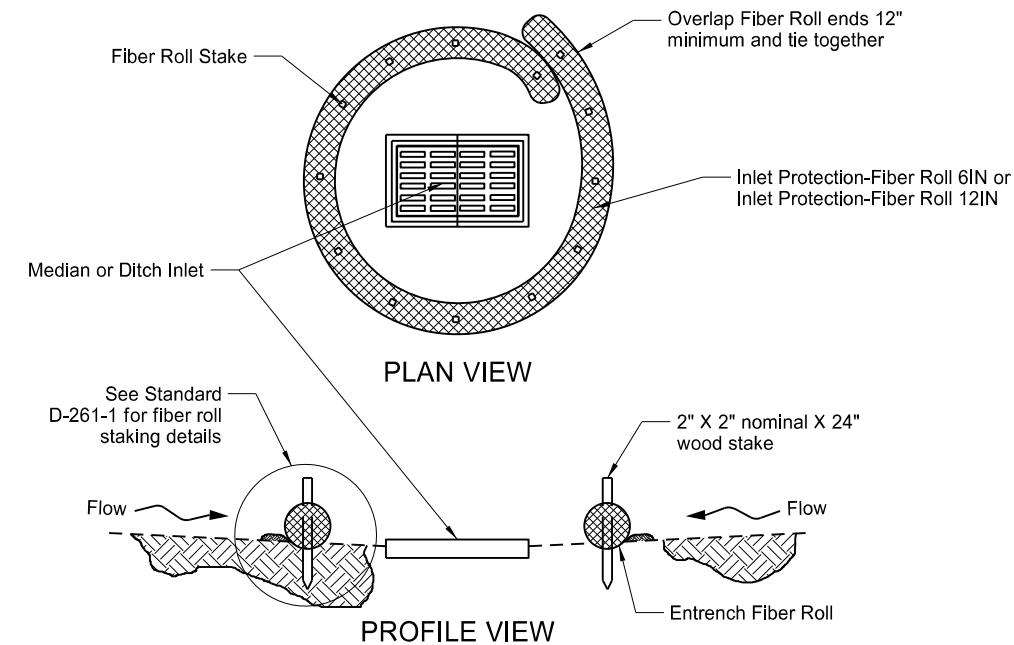
D-706-1



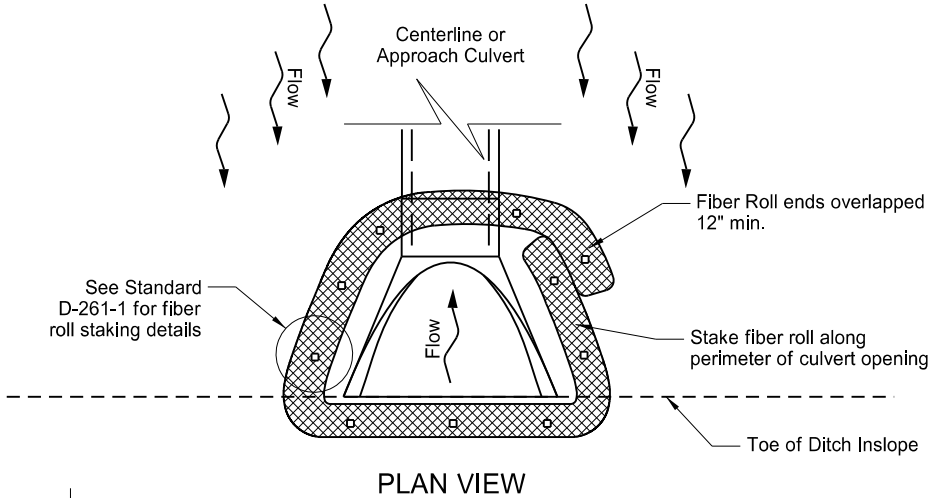
- Provide a laboratory with the following:
1. A 1'x1' shelf at 36" above the regular countertop.
 2. Double compartment stainless steel sink, with each compartment a minimum of 16"x14"x10" deep. Provide water service lines made of copper or plastic and a diameter of ½ inch.
 3. An exhaust fan capable of removing inside air at a rate of 400 CFM.
 4. Fresh air vent hinged to open or close manually.
 5. 24" x 48" table capable of holding a 200 lb masonry saw with a minimum clearance of 36" above the table.
 6. A water supply tank with a capacity of 500 gallons and a 20 gallon capacity pressure tank on the pump.
 7. Heavy duty type locks, latches, and hinges for doors made to withstand the intense use in service.
 8. A wall between the office and the work area properly insulated to prevent the transmission of heat and noise.
 9. The steel cable tie downs and ground anchors at each corner of the lab.
 10. Electrical service entrance wired for 100 amps and separate circuits for air conditioners. Space convenience outlets in counter areas a minimum of four feet apart.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION		This document was originally issued and sealed by Kirk J Hoff, Registration Number PE- 4683, on 08/27/19 and the original document is stored at the North Dakota Department of Transportation
10-03-13		
REVISIONS		
DATE	CHANGE	
07-30-14	Changed standard's title and revised notes.	
01-11-16	Revised notes.	
08-27-19	New Design Engineer PE Stamp	

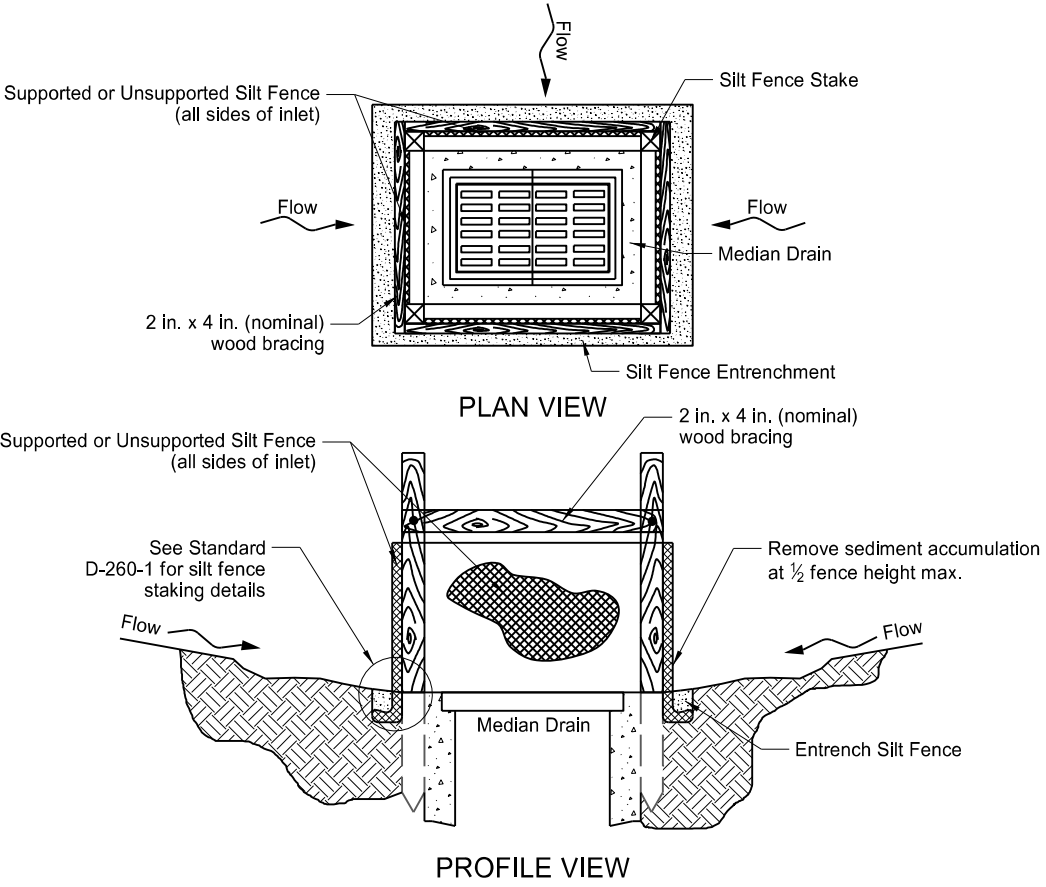
EROSION AND SILTATION CONTROLS
MEDIAN OR DITCH INLET PROTECTION



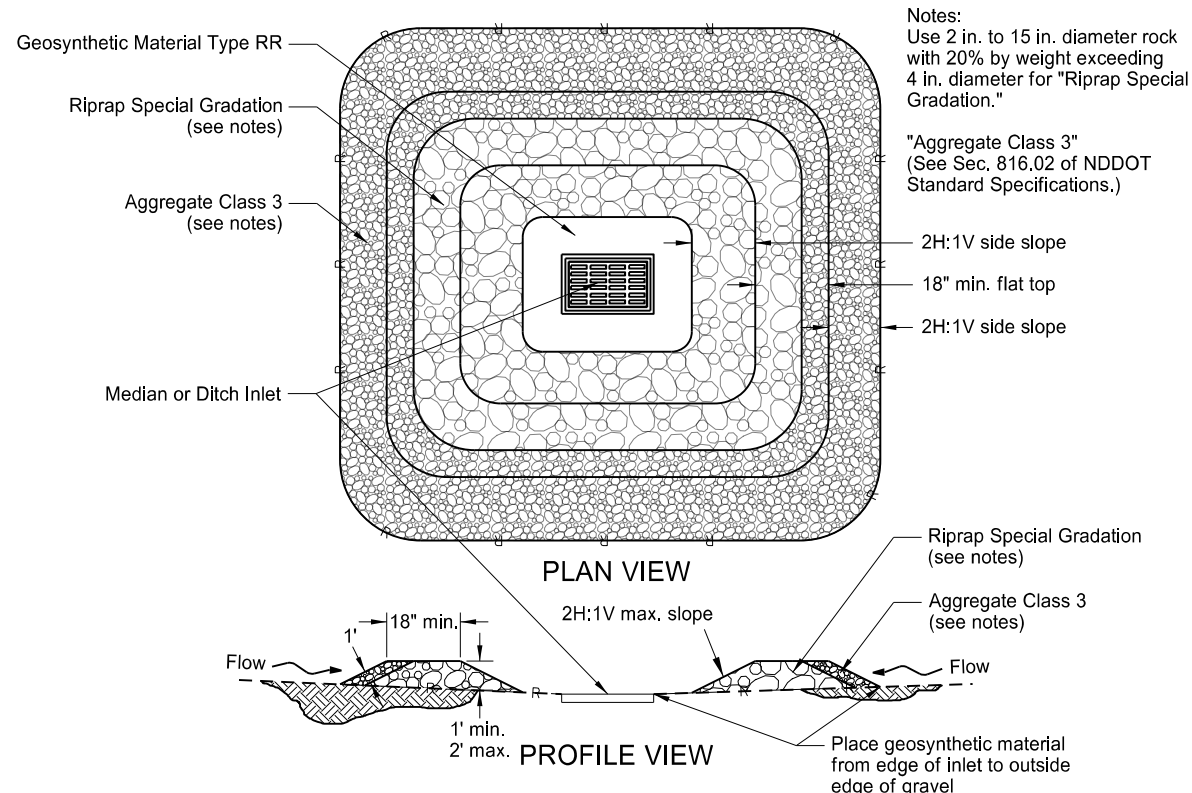
FIBER ROLL PROTECTION
(MEDIAN OR DITCH INLET)



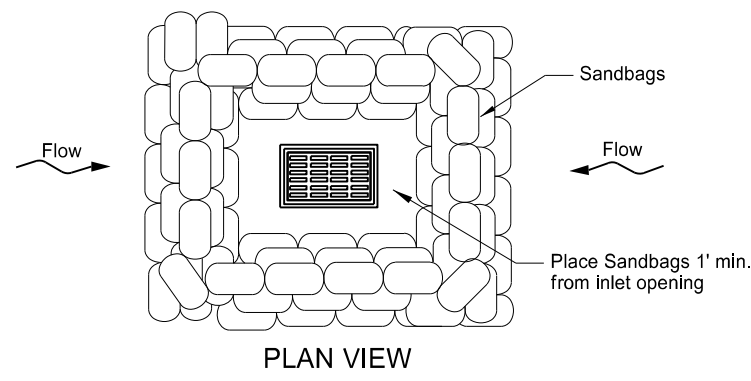
FIBER ROLL PROTECTION
(INLET OF CULVERT)



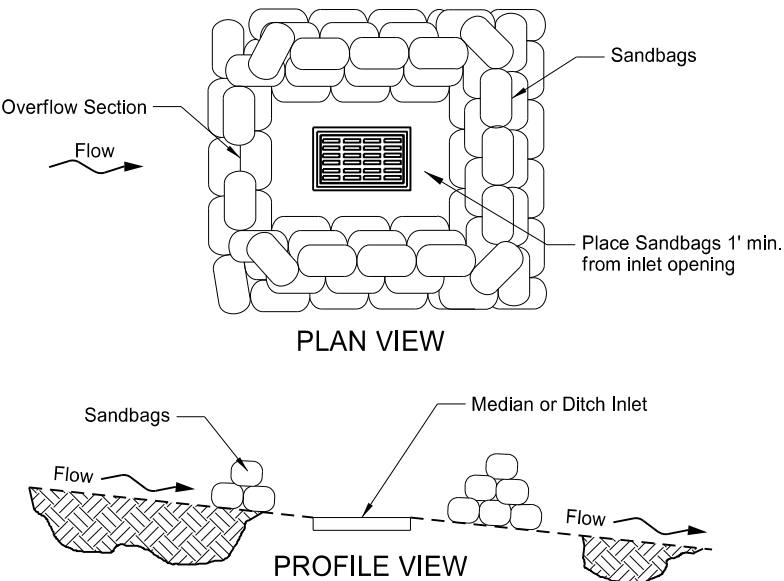
SILT FENCE PROTECTION
(MEDIAN OR DITCH INLET)



GRAVEL INLET PROTECTION
(MEDIAN OR DITCH INLET)



SANDBAG PROTECTION
(LOW POINT)

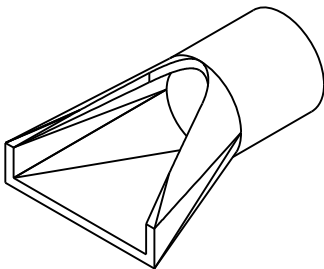


SANDBAG PROTECTION
(ON SLOPE)

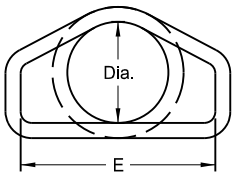
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Updated reference to standard drawing number for fiber roll staking details.
10-01-14	Updated reference to standard drawing number for silt fence.
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.

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FLARED END SECTION						
TERMINAL DIMENSIONS						
DIA	A	B	C	D	E	U
12	0'-4"	2'-0"	4'-0 ⁷ / ₈ "	6'-0 ⁷ / ₈ "	2'-0"	2"
15	0'-6"	2'-3"	3'-10"	6'-1"	2'-6"	2 ¹ / ₄ "
18	0'-9"	2'-3"	3'-10"	6'-1"	3'-0"	2 ¹ / ₂ "
21	0'-9"	3'-0"	3'-1"	6'-1"	3'-6"	2 ³ / ₄ "
24	0'-9 ¹ / ₂ "	3'-7 ¹ / ₂ "	2'-6"	6'-1 ¹ / ₂ "	4'-0"	3"
27	0'-10 ¹ / ₂ "	4'-0"	2'-1 ¹ / ₂ "	6'-1 ¹ / ₂ "	4'-6"	3 ¹ / ₂ "
30	1'-0"	4'-6"	1'-7 ³ / ₄ "	6'-1 ³ / ₄ "	5'-0"	3 ¹ / ₂ "
36	1'-3"	5'-3"	2'-9"	8'-0"	6'-0"	4"
42	1'-9"	5'-3"	2'-9"	8'-0"	6'-6"	4 ¹ / ₂ "
48	2'-0"	6'-0"	2'-0"	8'-0"	7'-0"	5"
54	2'-3"	5'-5"	2'-9 ¹ / ₂ "	8'-2 ¹ / ₄ "	7'-6"	5 ¹ / ₂ "
60	2'-11"	5'-0"	3'-3"	8'-3"	8'-0"	5"
66	2'-6"	6'-0"	2'-3"	8'-3"	8'-6"	5 ¹ / ₂ "
72	3'-0"	6'-6"	1'-9"	8'-3"	9'-0"	6"
78	3'-0"	7'-6"	1'-9"	9'-3"	9'-6"	6 ¹ / ₂ "
84	3'-0"	7'-6 ¹ / ₂ "	1'-9"	9'-3 ¹ / ₂ "	10'-0"	6 ¹ / ₂ "
90	3'-5"	7'-3 ¹ / ₂ "	2'-0"	9'-3 ¹ / ₄ "	11'-0"	6 ¹ / ₂ "

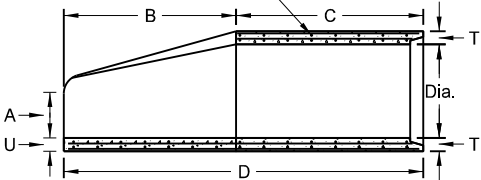


PERSPECTIVE

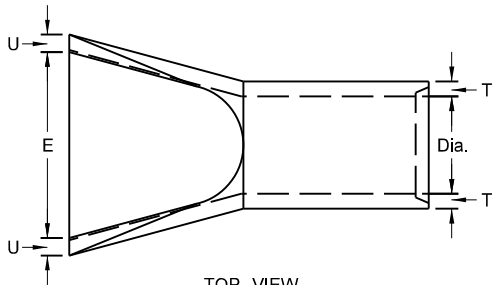


END VIEW

Standard Reinforcement for Class III pipe reinforced as per AASHTO M170



SIDE VIEW



TOP VIEW

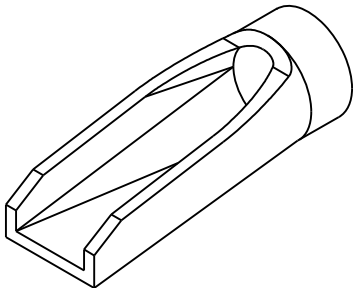
NOTES:

- All reinforcing steel shall meet AASHTO M170 requirements.
- All circular, longitudinal, and elliptical reinforcement shall be assembled and securely fastened in cage fashion so as to maintain reinforcement in exact shape and correct positions within the forms.
- Laying length of pipe: 12" to 66" (incl.) = not less than 4 feet
66" to 108" (incl.) = not less than 6 feet
- Joints shall be sealed with rubber gaskets or with sealer approved by the engineer whenever pipe are specified for storm drain or sanitary sewers.
- For Class IV and Class V reinforced concrete pipe and end section sizes which do not have reinforcement specified by AASHTO M170, shop drawings and design calculations shall be prepared and sealed by a Professional Engineer and submitted for the Engineer's review.

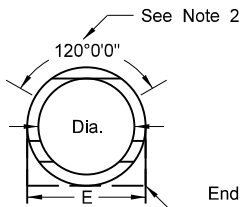
REINFORCED CONCRETE PIPE - FLARED END SECTION

Reinforcement to be equivalent to Class III RCP

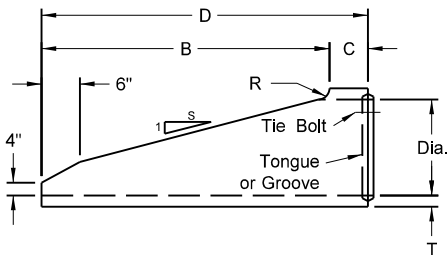
TRAVERSABLE END SECTION						
DIA	B	C	D	E	R	S
15"	4'	9"	4'-9"	1'-7 ¹ / ₂ "	3"	6
18"	5'-9"	9"	6'-6"	1'-11"	3"	6
24"	6'	1'	7'	2'-6"	3"	4
30"	7'-6"	1'	8'-6"	3'-1"	3 ¹ / ₂ "	4
36"	7'-3"	15"	8'-6"	3'-8"	3"	4



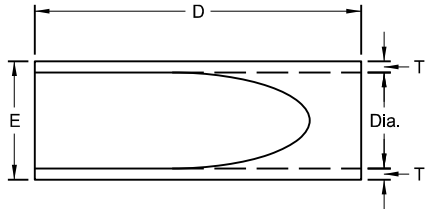
PERSPECTIVE



END VIEW



SIDE VIEW



TOP VIEW

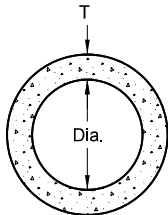
NOTES (Traversable End Section):

- Manufactured in accordance with applicable portions of ASTM C76/AASHTO M170.
- Reinforcement per Class III RCP with double reinforcement in the upper 120° of the full barrel portion.

REINFORCED CONCRETE PIPE - TRAVERSABLE END SECTION

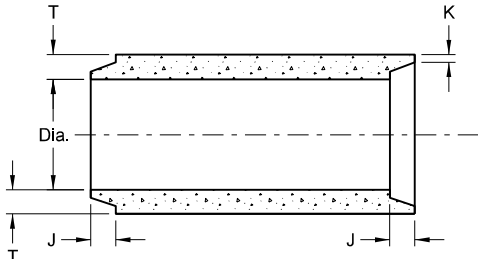
Reinforcement to be equivalent to Class III RCP

All Classifications of Round Concrete Pipe						
Internal Dia. of pipe in Inches	Cross-Sectional Water Area	Weight per Lin. Foot of pipe Std. Wall	Joint J Groove End Min./Max.	Joint K Tongue Min.	Minimum Wall Thickness (T)	
Dia	Sq. ft.	Lbs.	In.	In.	In.	
12	0.79	92	1 ⁵ / ₈ -2 ³ / ₈	³ / ₄	2	
15	1.23	127	1 ³ / ₄ -2 ¹ / ₄	⁷ / ₈	2 ¹ / ₄	
18	1.77	168	1 ¹ / ₂ -2 ¹ / ₂	1	2 ¹ / ₂	
21	2.40	214	1 ¹ / ₂ -3 ¹ / ₈	1 ¹ / ₈	2 ³ / ₄	
24	3.14	265	2 ³ / ₄ -3 ¹ / ₄	1 ¹ / ₈	3	
27	3.98	322	2 ³ / ₄ -4	1 ¹ / ₄	3 ¹ / ₄	
30	4.91	384	3 ¹ / ₄ -4 ¹ / ₄	1 ¹ / ₄	3 ¹ / ₂	
33	5.94	452	3 ¹ / ₄ -4 ¹ / ₄	1 ¹ / ₂	3 ³ / ₄	
36	7.07	524	3 ¹ / ₄ -4 ¹ / ₄	1 ¹ / ₂	4	
42	9.62	685	3 ³ / ₄ -4 ³ / ₄	1 ³ / ₄	4 ¹ / ₂	
48	12.57	685	3 ³ / ₄ -4 ³ / ₄	1 ³ / ₄	5	
54	15.90	1070	4 ¹ / ₂ -5 ¹ / ₄	2	5 ¹ / ₂	
60	19.63	1296	4 ¹ / ₂ -5 ¹ / ₂	2 ¹ / ₄	6	
66	23.76	1542	5-6	2 ³ / ₈	6 ¹ / ₂	
72	28.27	1810	5 ⁵ / ₈ -6 ³ / ₄	2 ³ / ₈	7	
78	33.18	2098	6 ¹ / ₄ -7 ¹ / ₄	2 ³ / ₈	7 ¹ / ₂	
84	38.48	2410	5 ⁵ / ₈ -7 ³ / ₄	3 ³ / ₈	8	
90	44.18	2793	6 ³ / ₄ -8 ¹ / ₂	3 ³ / ₈	8 ¹ / ₂	
96	50.27	3092	7-8 ¹ / ₄	3 ¹ / ₂	9	
102	56.75	3466	7-8 ¹ / ₄	3 ¹ / ₂	9 ¹ / ₂	
108	63.62	3864	7 ¹ / ₄ -8 ¹ / ₂	3 ³ / ₄	10	

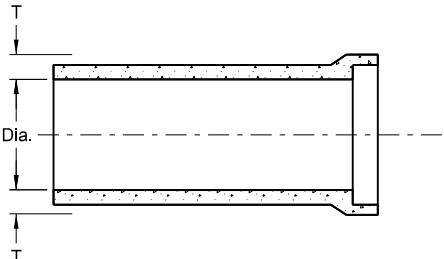


END VIEW

CIRCULAR PIPE

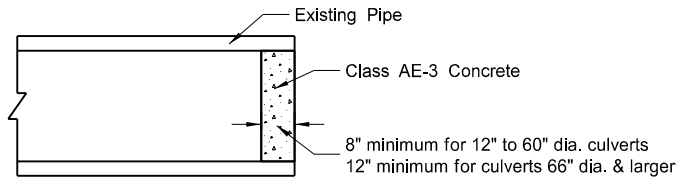


TONGUE & GROOVE JOINT



BELL & SPIGOT JOINT

JOINTS FOR REINFORCED CONCRETE PIPE



CONCRETE PIPE PLUG

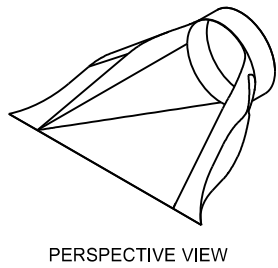
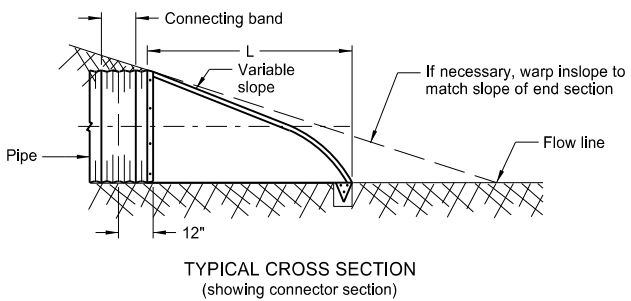
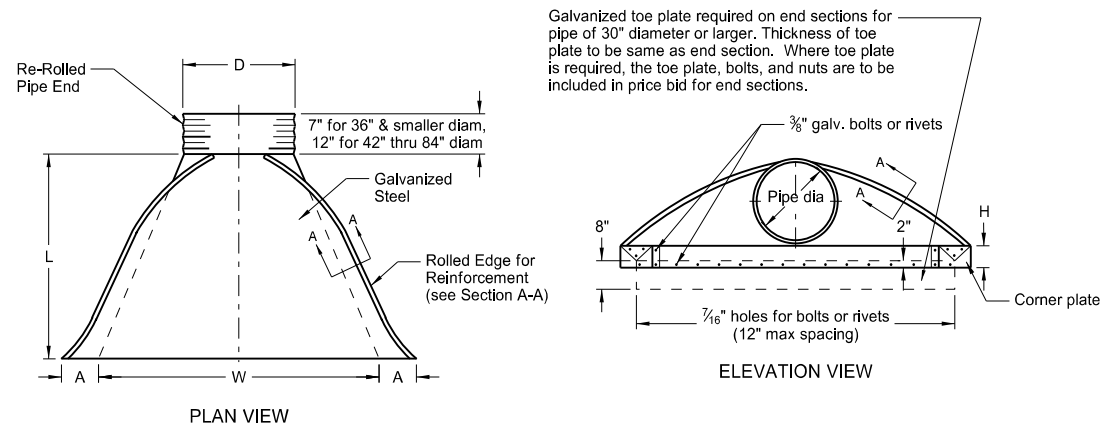
SEE STANDARD DRAWING D-714-22 FOR DETAILS OF CONCRETE PIPE TIES (TIE BOLTS).

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-12-14	
REVISIONS	
DATE	CHANGE
01-21-15	Revised Note 5
11-21-16	Revised End Section Dimensions
09-18-19	Updated Perspective View Details

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Jon Ketterling
Registration Number
PE- 4684,
on 9/18/19 and the original document is stored at the
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ROUND CORRUGATED STEEL PIPE CULVERTS AND END SECTIONS

D-714-4



PIPE DIA. IN	GALV. THICK.	END SECTION DIMENSIONS					APPROX. SLOPE RATE	BODY PIECE
		A IN	B IN	H IN	L IN	W IN		
15	0.064	7	8	6	26	30	2½:1	1
18	0.064	8	10	6	31	36	2½:1	1
24	0.064	10	13	6	41	48	2½:1	1
30	0.079	12	16	8	51	60	2½:1	1 or 2
36	0.079	14	19	9	60	72	2½:1	2
42	0.109	16	22	11	69	84	2½:1	2
48	0.109	18	27	12	78	90	2½:1	2
54	0.109	18	30	12	84	102	2:1	2
* 60	0.109	18	33	12	87	114	1½:1	3
* 66	0.109	18	36	12	87	120	1½:1	3
* 72	0.109	18	39	12	87	126	1 1/3 :1	3
* 78	0.109	18	42	12	87	132	1¼:1	3
* 84	0.109	18	45	12	87	138	1 1/6 :1	3

* These sizes have 0.109" sides and 0.138" center panels.

* * Pipe diameter is equal to dimension "D" of end section.

Manufacturers tolerances of above dimensions will be allowed.

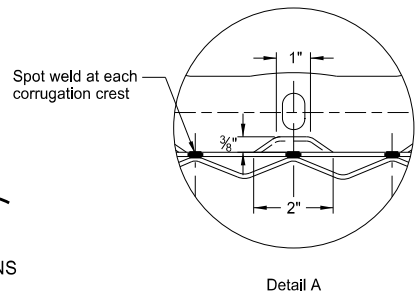
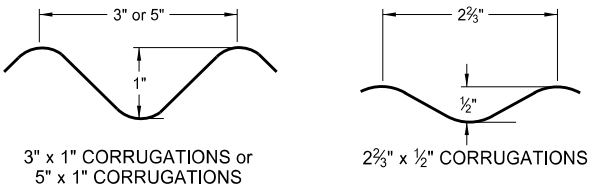
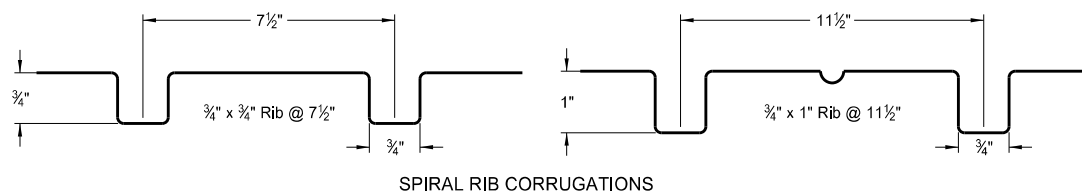
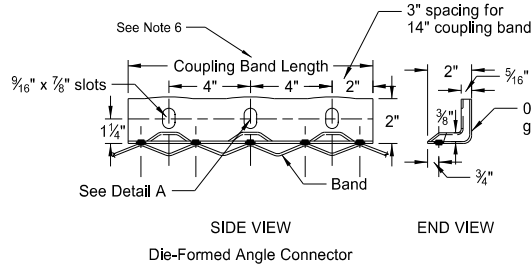
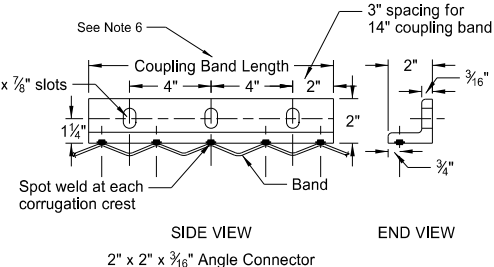
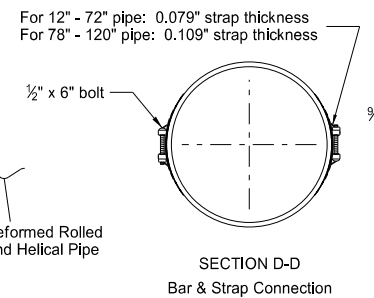
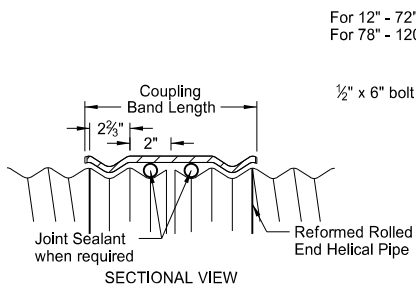
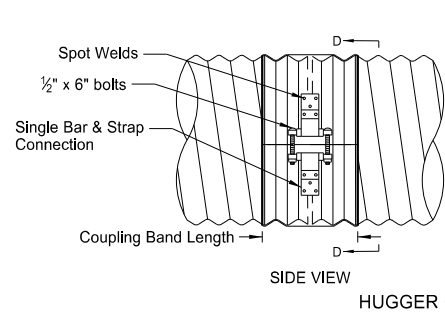
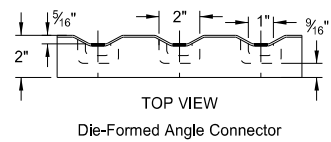
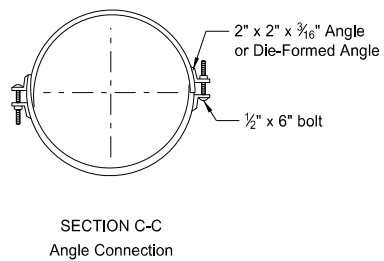
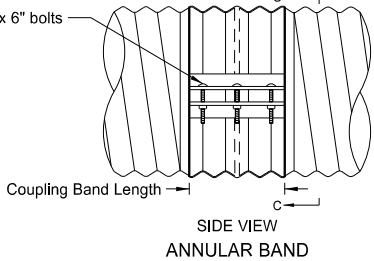
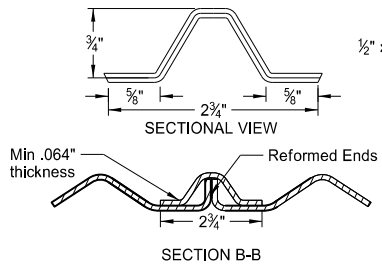
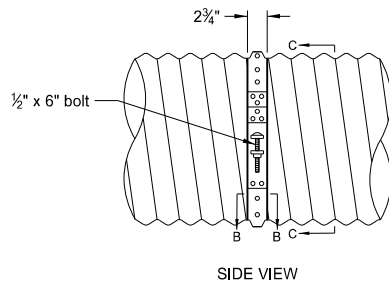
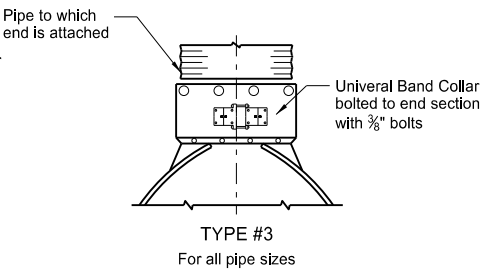
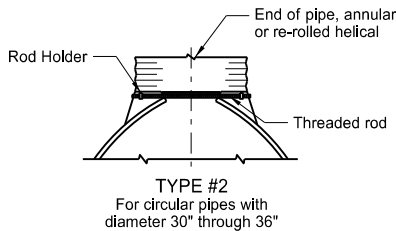
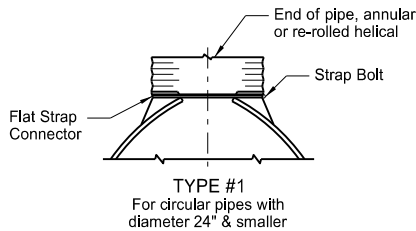
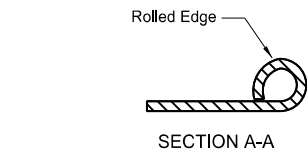
Splices to be the lap riveted type.

Multiple panel bodies shall have lap seams which are to be tightly joined with ¾" dia. galv. bolts or rivets. Nuts to be torqued to 25 foot-lbs ±.

NOTES:

- Pipes and connecting bands shall conform to applicable sections of NDDOT Standard Specifications and to AASHTO M-36.
- Top edge of all end sections to have rolled edges for reinforcement (see Section A-A). The reinforced edges are to be supplemented with 2" x 2" x ¼" galv. angle for 60" through 72" dia. and 2½" x 2½" x ¼" galv. angle for 78" and 84" dia.. Angles to be attached by galv. ¾" dia. bolts and nuts. Angles are to extend from pipe to the corner wing bend.
- Elongated pipes shall be factory preformed so that the vertical diameter shall be 5% greater and the horizontal diameter 5% less than a circular pipe.
- Coupling bands shall be two-piece for pipes larger than 36" as shown in Section C-C & D-D details. For pipes 36" and smaller, a one-piece band is acceptable.
- ½" x 8" bolts may be used as a substitute for the ½" x 6" bolts shown in the details.
- Coupling bands wider than 14" may be used if a minimum of four ½" bolts with maximum spacing of 5½" are used for the connection.
- Length of spot welds shall be minimum ½".

COUPLING BAND DIMENSIONS				
COUPLING TYPE	CORRUGATION PITCH x DEPTH	PIPE SIZE	COUPLING BAND LENGTH	MIN. BAND THICKNESS
Hat Band	2⅝" x ½"	12" - 48"	2¾"	.064"
Annular Band	2⅝" x ½"	12" - 72"	12"	.052"
		78" - 84"	12"	.079"
Hugger Band	2⅝" x ½"	48" - 120"	14"	.052"
		12" - 72"	10½"	.052"
	3" x 1"	78" - 84"	10½"	.079"
		48" - 120"	10½"	.052"
Hugger Band	5" x 1"	48" - 120"	12"	.064"
	Re-rolled End			

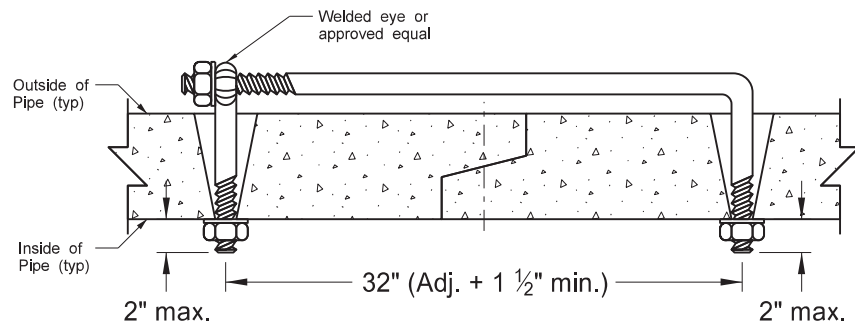


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
08-16-13	
REVISIONS	
DATE	CHANGE
01-07-14	End Section Plan View
02-27-14	3" x 1" Corrugation Detail
09-18-19	Added Perspective View Detail

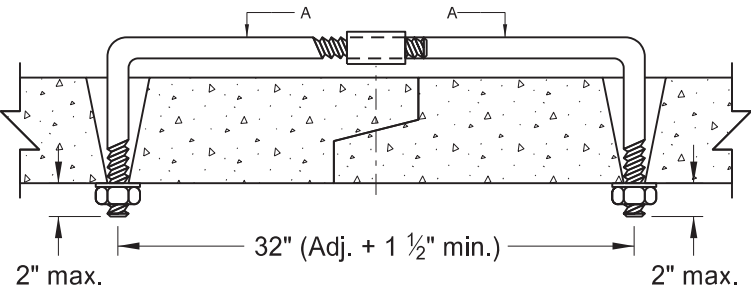
This document was originally issued and sealed by
Jon Ketterling
Registration Number PE-4684,
on 9/18/19 and the original document is stored at the North Dakota Department of Transportation

CONCRETE PIPE, CATTLE PASS, OR
PRECAST CONCRETE BOX CULVERT TIES

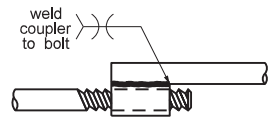
D-714-22



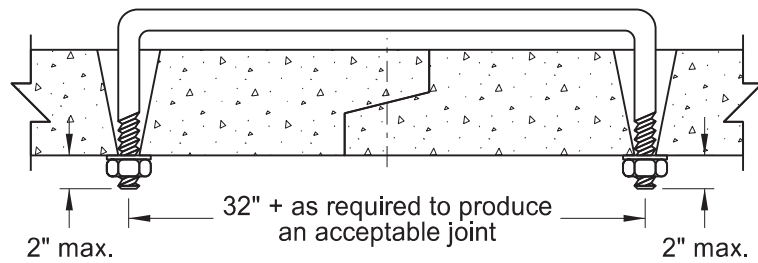
EYE BOLT TIE (PIPES ONLY)



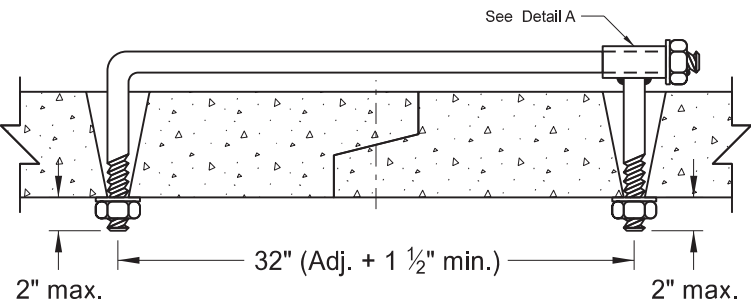
ADJUSTABLE TIE (RCB AND PIPES ONLY)



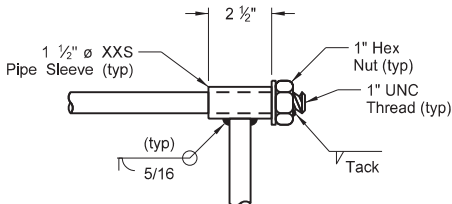
SECTION A-A



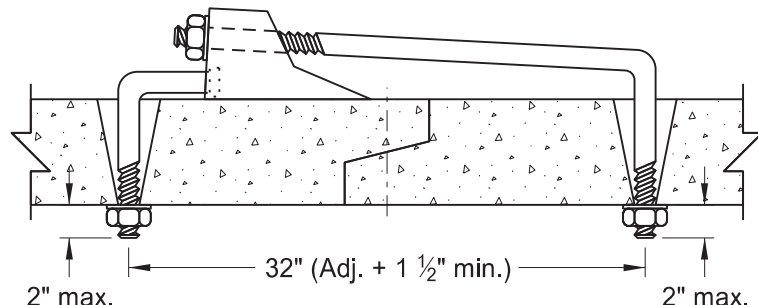
U BOLT TIE (RCB, PIPES, OR CATTLE PASSES)



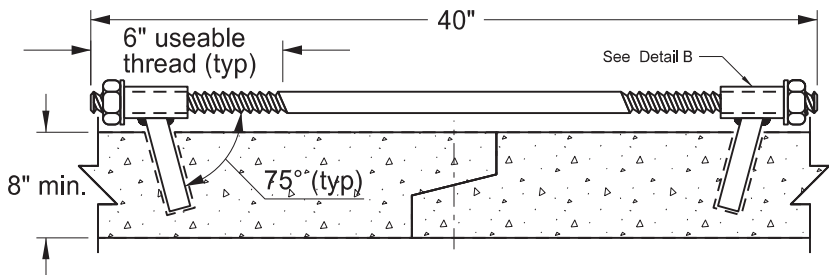
WELDED TIE (RCB AND PIPES ONLY)



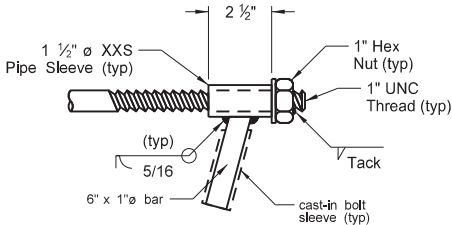
DETAIL A



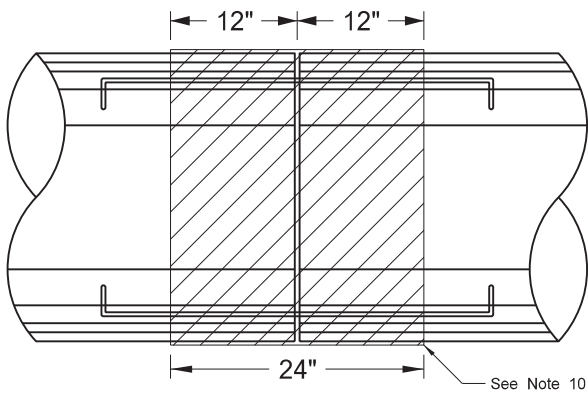
CANOPY TIE (PIPES ONLY)



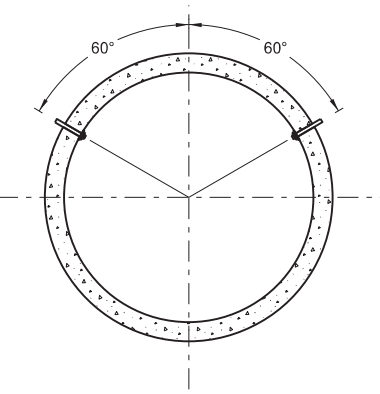
HIDDEN TIE (RCB ONLY)



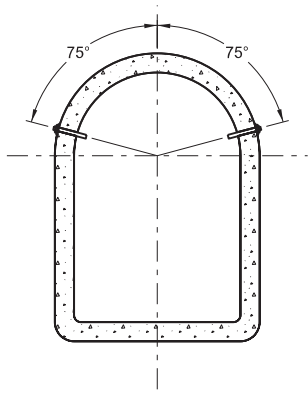
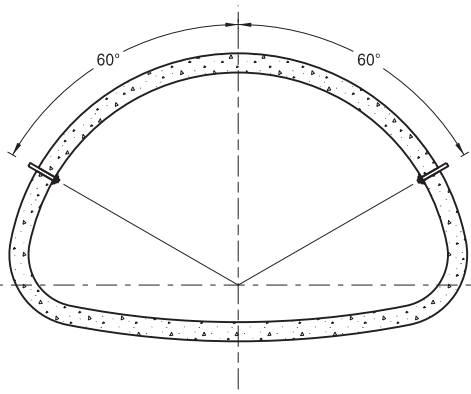
DETAIL B



PLAN VIEW (PIPES ONLY)



END VIEW

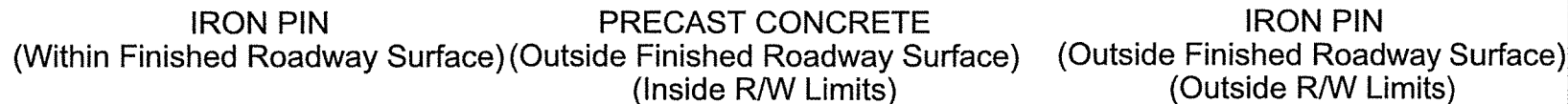
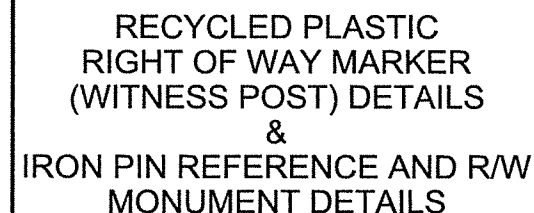


REQUIRED SIZE OF TIE BOLTS		
Pipe Size	Thread ϕ	XXS Pipe Sleeve Inner ϕ
18" - 24"	$\frac{5}{8}$ " See note 3	$\frac{3}{4}$ "
30" - 66"	$\frac{3}{4}$ "	1"
72" - 120"	1"	1 $\frac{1}{4}$ "
RCB/Cattle Pass		

- NOTES:
- The pipe size listed is the inside diameter of round pipe or the equivalent diameter of pipe arch.
 - Insert pipe ties from the inside of the pipes and grout in place for Cattle Pass and Jacked and Bored pipes. Jacked and bored pipes with a diameter of 24" or less do not require pipe ties.
 - Nuts and washers are not required on Jacked and Bored pipes or pipes with a 24" diameter or less. Insert and grout tie bars into place where nuts and washers are not used.
 - Do not use pipe ties to pull the pipe or RCB sections tight. The ties are only for holding sections together.
 - Use only tie bolt assemblies that have been hot dip galvanized in accordance with ASTM A 153.
 - Holes in pipes to accommodate tie bolts can be precast or drilled. Tapered holes are permitted when precast. Use holes that have a diameter $\frac{1}{4}$ " larger than the diameter of the thread. In precast RCB's, use holes that contain cast-in bolt sleeves with an inside diameter of 1 $\frac{1}{4}$ ".
 - Select the type of tie bolt used from those shown.
 - Include the cost of precasting or drilling the required holes and furnishing and installing the tie bolts in the price bid for the appropriate conduit or RCB pay item.
 - Tie all centerline and approach RCP culvert joints. Tie the first three joints including the end section of all free ends of storm drain systems. Free ends are defined as any storm drain end which does not terminate at an inlet or manhole. Outfall culverts with end sections which drain adjacent ditches are examples of free ends.
 - Place joint wrap prior to installing ties. Firmly secure the wrap around the full perimeter. For concrete pipes, overlap the joint by 12" in both directions. For box culverts, use a waterproof membrane that meets ASTM C877 (Type III). Provide a membrane that is a minimum of 12" wide and center it at the joint. Provide a minimum overlap of 2.5" at the seams.
 - Use tie bolts that conform to ASTM A 36. Use heavy hex nuts that conform to ASTM A 563. Use washers that conform to ASTM F 436, Type 1. Use welded pipe sleeves and cast-in bolt sleeves that conform to ASTM A 53, Grade B.
 - Tie RCB's at locations shown on the plans.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
3-18-14	
REVISIONS	
DATE	CHANGE
7-21-15	Note 8
6-8-17	Notes 2-11, Table, Title, Labels
8-11-21	Notes 2-12, Table, Label





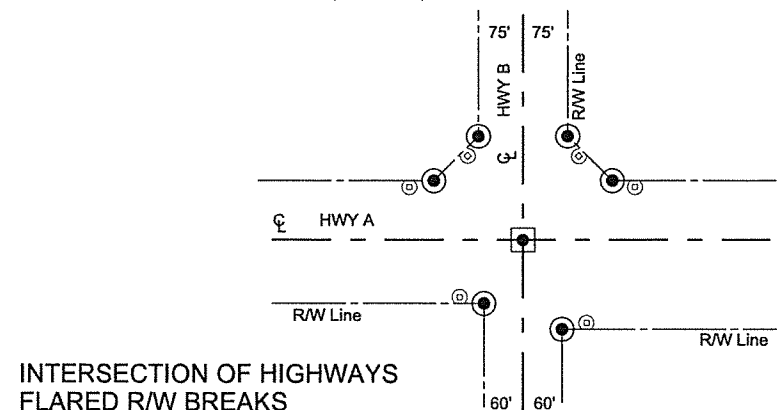
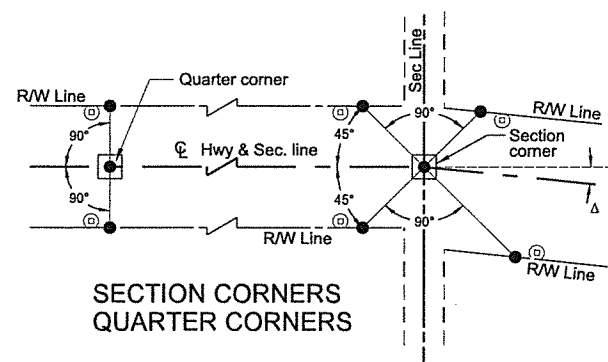
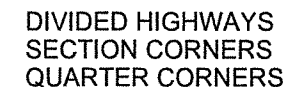
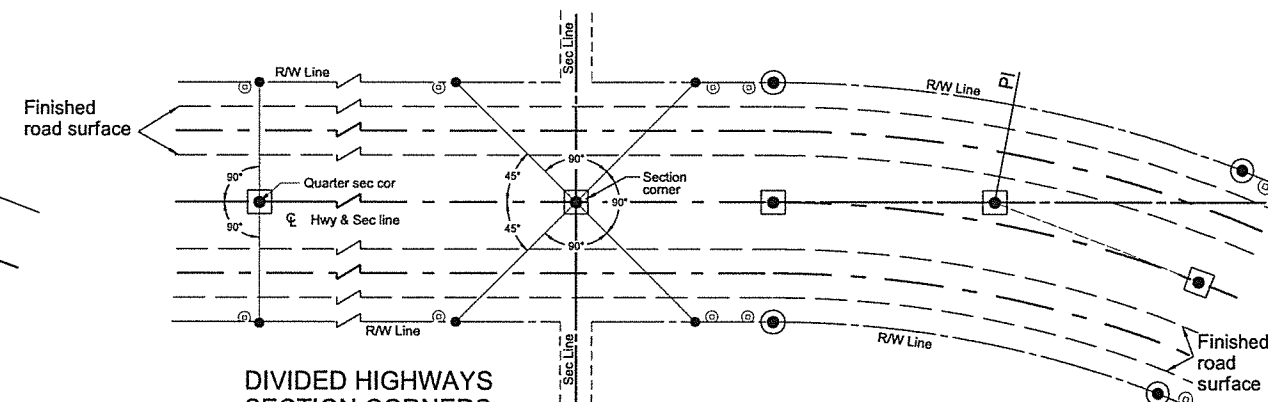
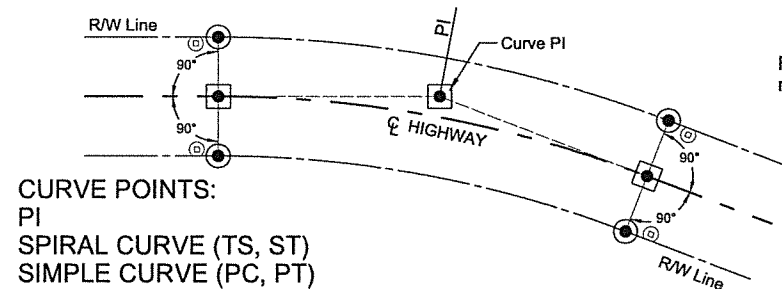
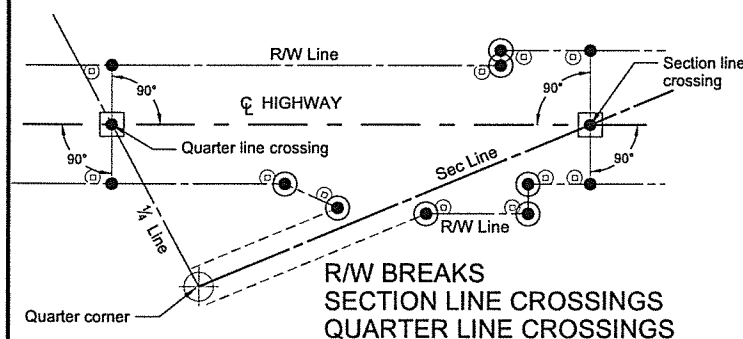
Construct and install Alignment Monuments, Iron Pin Reference Monuments, Iron Pin R/W Monuments, and Right of Way Markers (witness posts) according to Section 720 of the Standard Specifications.

ALIGNMENT MONUMENTS: Place Iron Pin or Precast Concrete Alignment Monuments with aluminum caps on the centerline alignment PI's, section corners, quarter corners, section line crossings, quarter line crossings, and at curve points (PC's, PT's, TS's, and ST's) on the centerline.

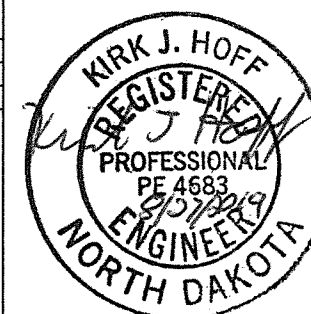
IRON PIN R/W MONUMENT: Place Iron Pns with aluminum caps (No. 5 X 18") at breaks on the Right of Way line, and at curve points (PC's, PT's, TS's and ST's) on the Right of Way line.

IRON PIN REFERENCE MONUMENT: Place Iron Pins without aluminum caps (No. 5 X 18") as reference monuments on the Right of Way line at section corners, quarter corners, section line crossings, and quarter line crossings.

R/W MARKERS (WITNESS POST) WITHIN DRIVEWAYS: If a single iron Pin R/W or Reference Monument is within a driveway, place right of way marker (witness post) 50 feet back, in stationing, from the Iron Pin Monument along the R/W line. If R/W break is within a driveway, place right of way markers (witness posts) 50 feet back, or ahead from respective Iron Pin R/W Monuments along the R/W lines. Maintain Iron Pin R/W or Reference Monument original position within driveway.



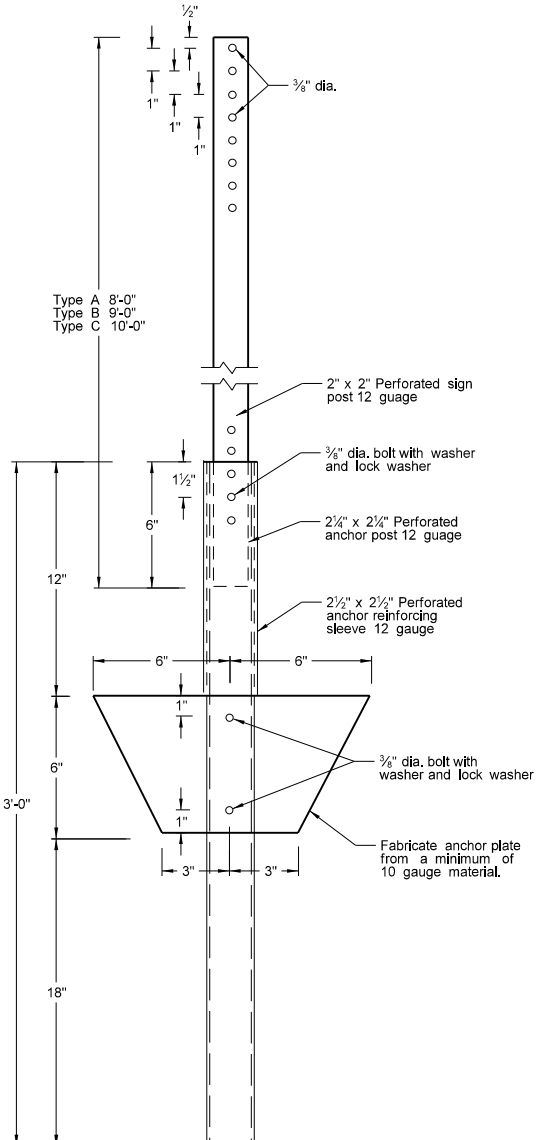
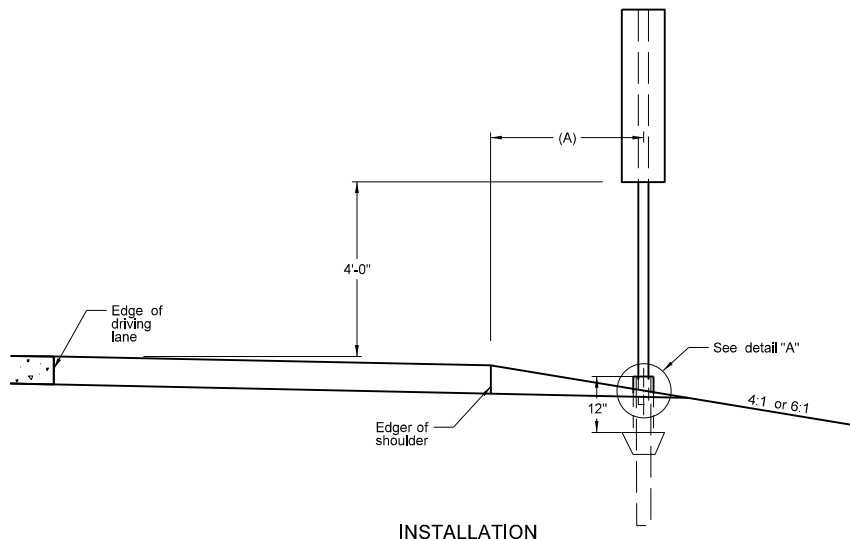
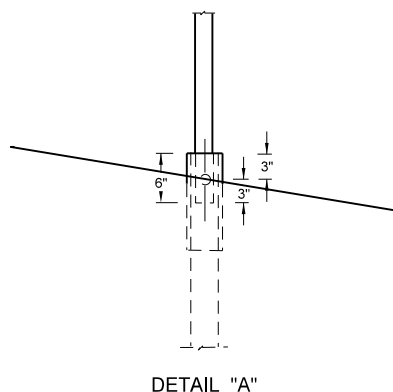
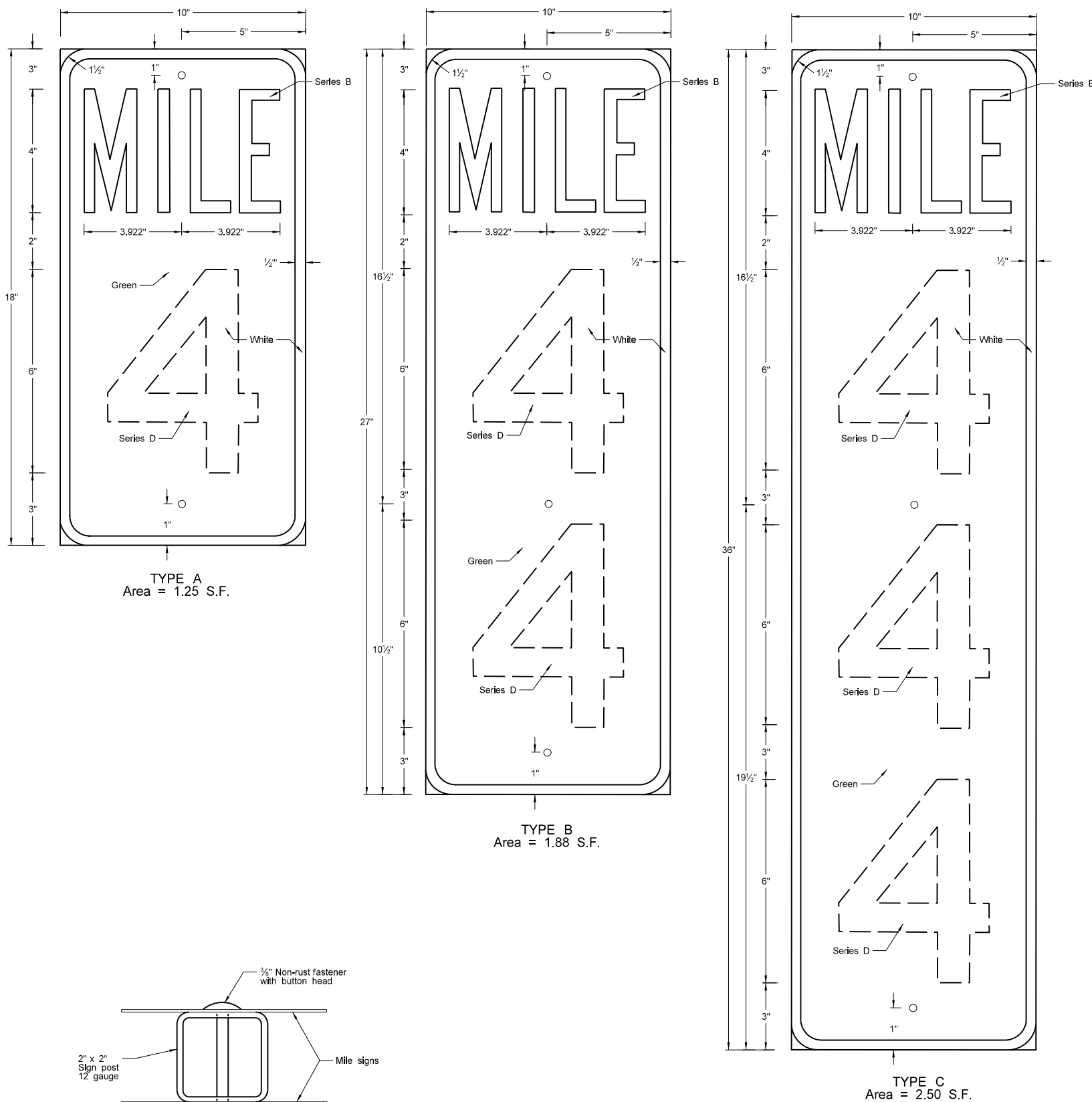
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-2013	
REVISIONS	
DATE	CHANGE
11/12/13	Note for SIGN DETAIL modified to meet ASTM D-4956 Type III or higher on 80 gauge 5052-H38
10/17/17	Updated to active voice.
08/27/19	New Design Engr PE Stamp



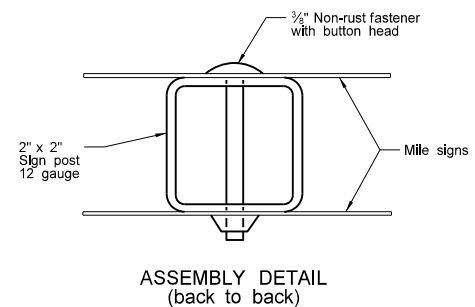
- LEGEND**
- Iron Pin Reference Monument
 - Ⓟ R/W Marker (witness post)
 - Alignment Monument
 - ⦿ Iron Pin R/W Monument

(CONVENTIONAL USE) REFERENCE MARKERS

D-754-19



NOTES:
Installation: Install posts along right shoulder.
Sign: Fabricate backing of 0.080 aluminum.
Fasteners: Attach signs to post with tension pin type fastener or other suitable vandal resistant non-rust fastener.
Reflective Sheeting: Use Type IV sheeting.
Numbers: Use screened or applied copy numbers of the series shown.

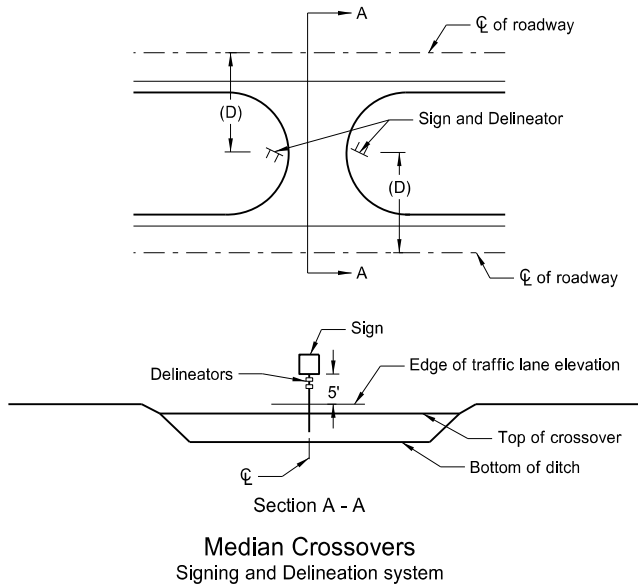
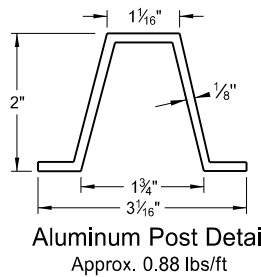
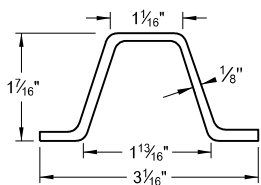
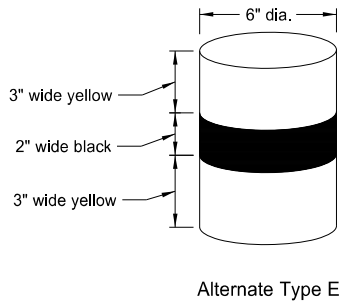
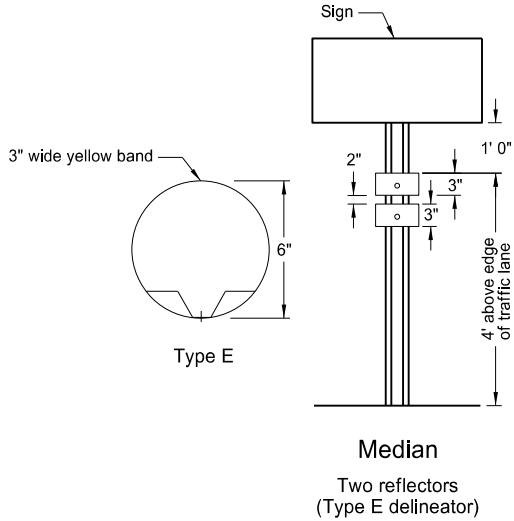
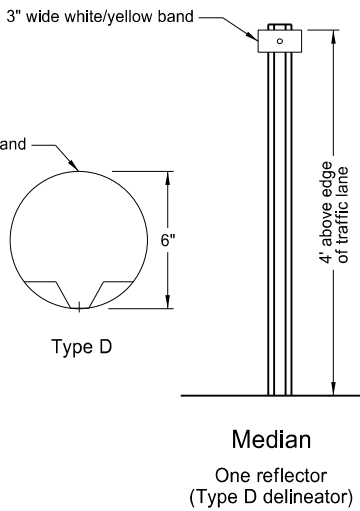
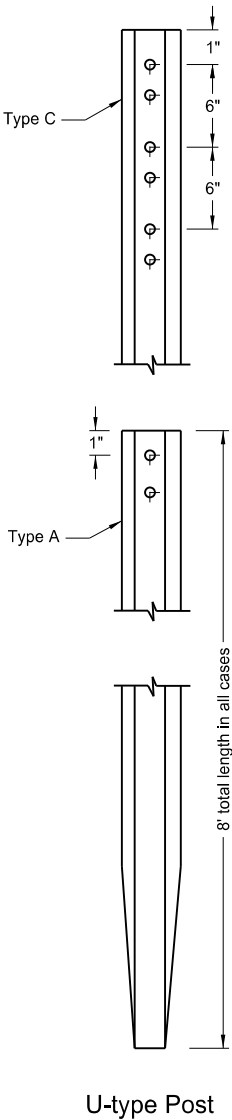
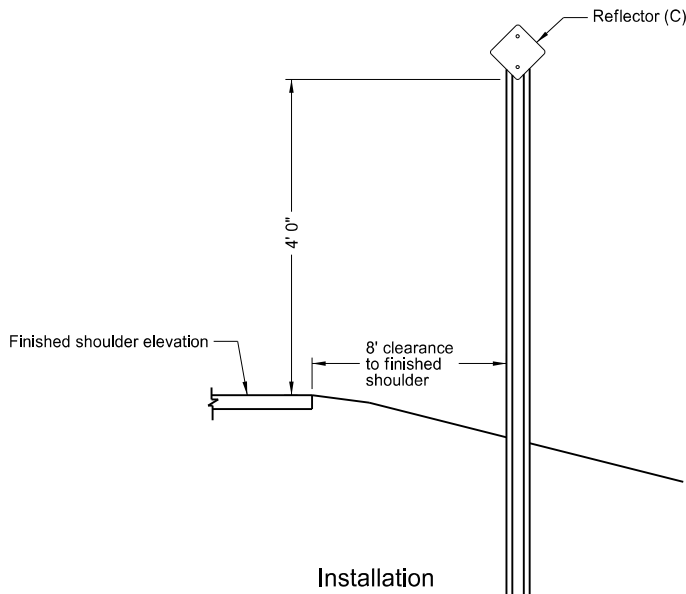
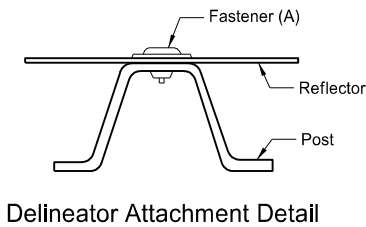
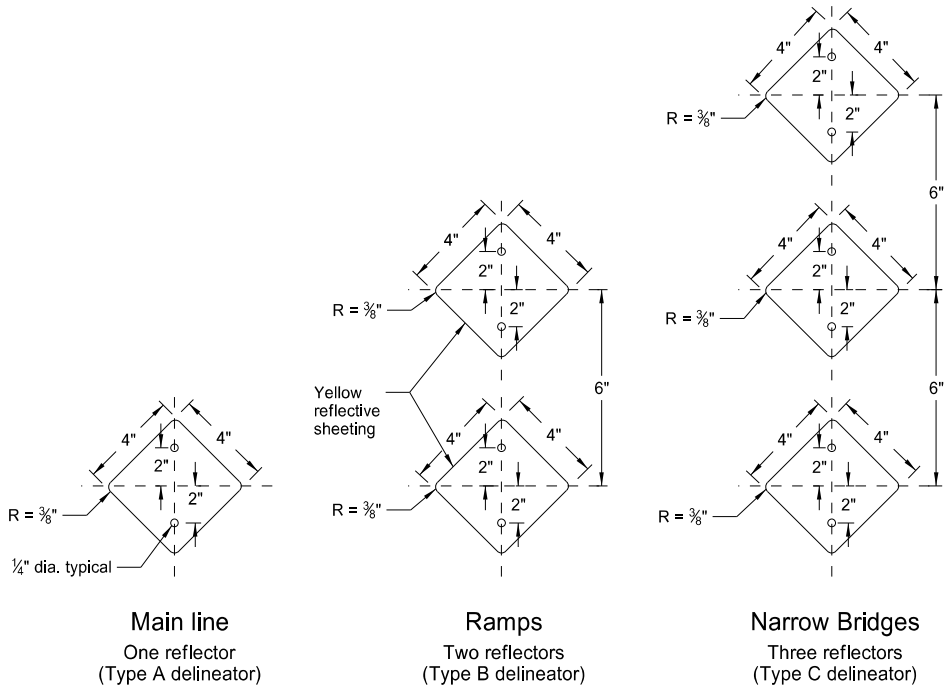


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
7-8-14	Revised post and reflective sheeting notes
8-30-18	Updated to active voice.
8-29-19	New Design Engineer PE Stamp.

This document was originally issued and sealed by
Kirk J Hoff,
Registration Number
PE- 4683,
on 8/29/19 and the original document is stored at the
North Dakota Department
of Transportation

REFLECTORIZED DELINEATORS

D-754-21



Delineator Details
Type A, B, and C

Installation: Install posts along the right shoulder line unless shown otherwise on the plans.

Reflectors: Use reflector of the same color as the adjacent pavement marking.

Spacing: For delineator spacing along main line tangents and curves with radius greater than 11500' (less than 0° 30') use 528' centers. For curves with a radius less than 11500', but greater than 1200', use 264' centers. With curves less than 1200' use spacing (S) = 3*(Square Root(R))-50

Type E

Alternate: As an alternate, use one unit band consisting of two yellow stripes separated by a 2" black stripe in place of two 3" yellow bands.

(A) Use a 3/8" dia tension pin type or other non-rust vandal resistant fastener with min 1 3/16" outside dia flat washer.

(B) Drill only those holes required to attach the number of reflectors on that post, or drill all the posts the same so that any number of reflectors may be added.

(C) Mount reflector facing traffic at an angle of 93° away from oncoming traffic.

(D) The median width may vary. Place sign and delineator assembly in the median crossover an equal distance from each roadway.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-25-12	
REVISIONS	
DATE	CHANGE
7-18-14 10-25-19	Revised reflective sheeting. Updated notes to active voice and revised Median detail.

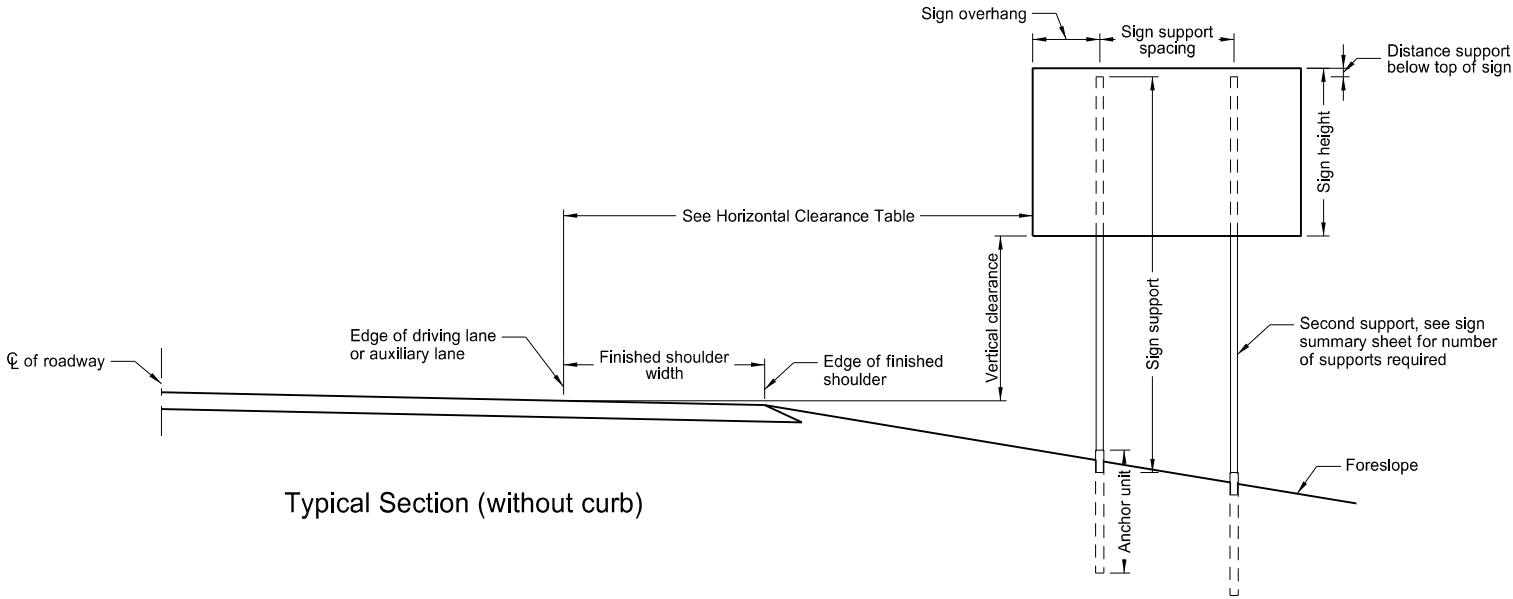
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of Transportation

PERFORATED TUBE ASSEMBLY DETAILS

D-754-23

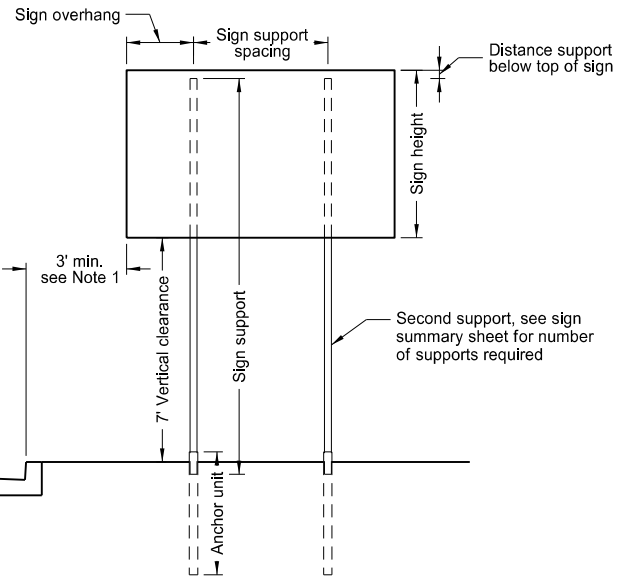
Notes:

1. Curbed Roadways: Use a 3' clearance from face of the curb except where right of way or sidewalk width is limited; Use a minimum 2' clearance. Increase the horizontal clearance if required to maintain a minimum sidewalk clear width of 4' from the sign support, not including any attached curb.
2. Minimum vertical clearance: Provide at least 5' measured from the bottom of the sign to the edge of the driving lane or auxiliary lane at the side of the road in rural districts. Provide at least 7' clearance to the bottom of the sign, where parking or pedestrian movements occur.
- Install signs on expressways a minimum height of 7'.
- Install adopt-a-highway signs on Freeways at least 7' above the edge of the driving lane.
- Maximum vertical clearance is 6" greater than the minimum vertical clearance.
3. Offset signs: Use a vertical clearance of 5' above the edge of the driving lane for signs placed 30 feet or more from the edge of the traveled way.
4. Provide a horizontal clearance from edge of shared use path to edge of sign of 3', except where width is limited. Provide a minimum clearance of 2'.

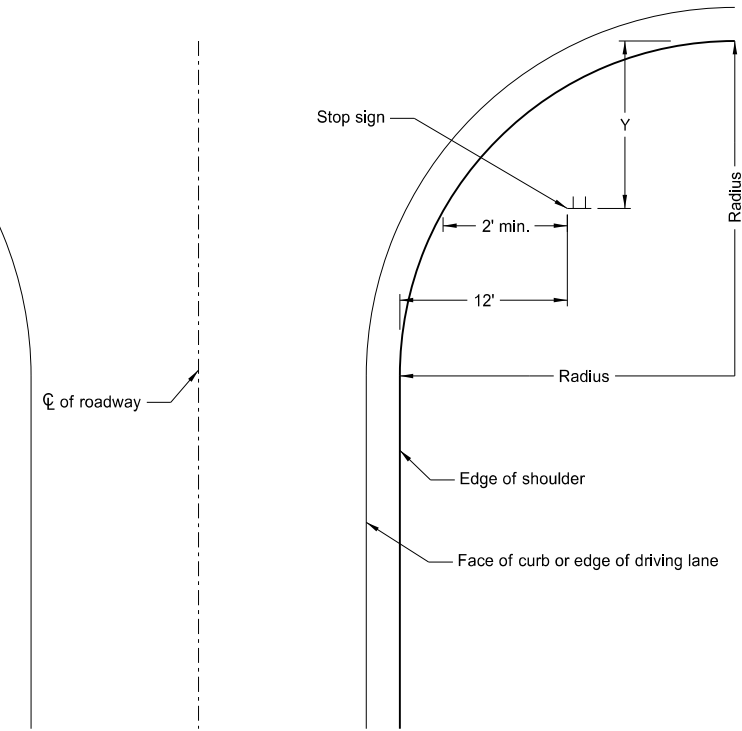


Typical Section (without curb)

Horizontal Clearance Table	
Shoulder Width ft	Offset ft
0 to 2	16
>2 to 4	18
>4 to 6	20
>6 to 8	22
>8 to 10	24

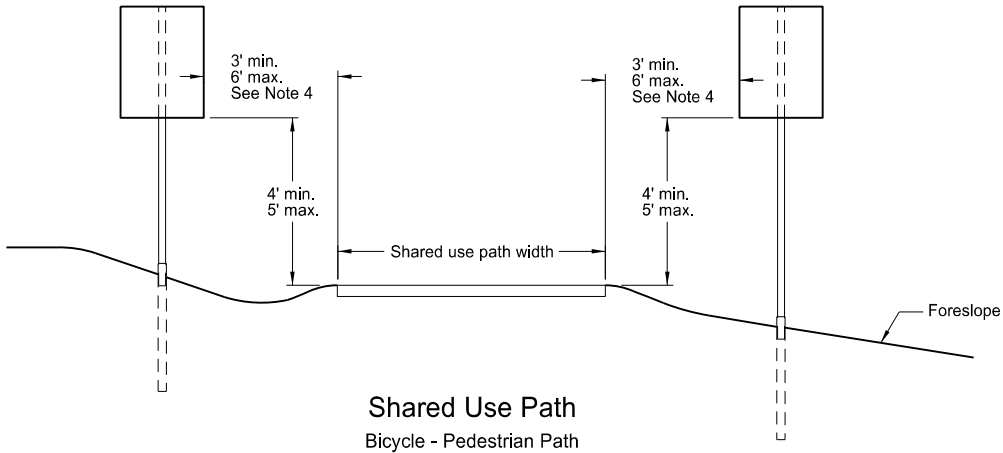


Typical Section (with curb)
Residential or Business District



Stop Sign Location
Wide Throat Intersection
Use layout for the placement of "Stop" signs.

Radius ft.	Y-max. ft.	Y-min. ft.
40	50	15
45	50	18
50	50	21
55	50	25
60	50	28
65	50	32
70	50	35
75	50	39
80	50	43



Shared Use Path
Bicycle - Pedestrian Path

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
7-8-14	Revised note 2, added note 4.
8-30-18	Updated notes to active voice.
8-29-19	New Design Engineer PE Stamp.

This document was originally issued and sealed by
Kirk J Hoff,
Registration Number
PE- 4683,
on 8/29/19 and the original document is stored at the North Dakota Department of Transportation

Breakaway Coupler System
for Perforated Tubes

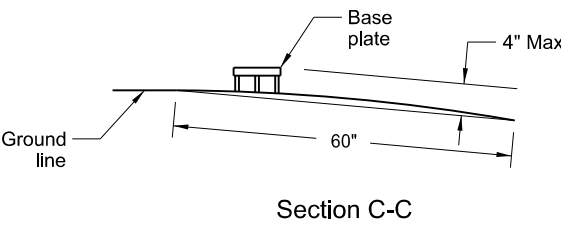
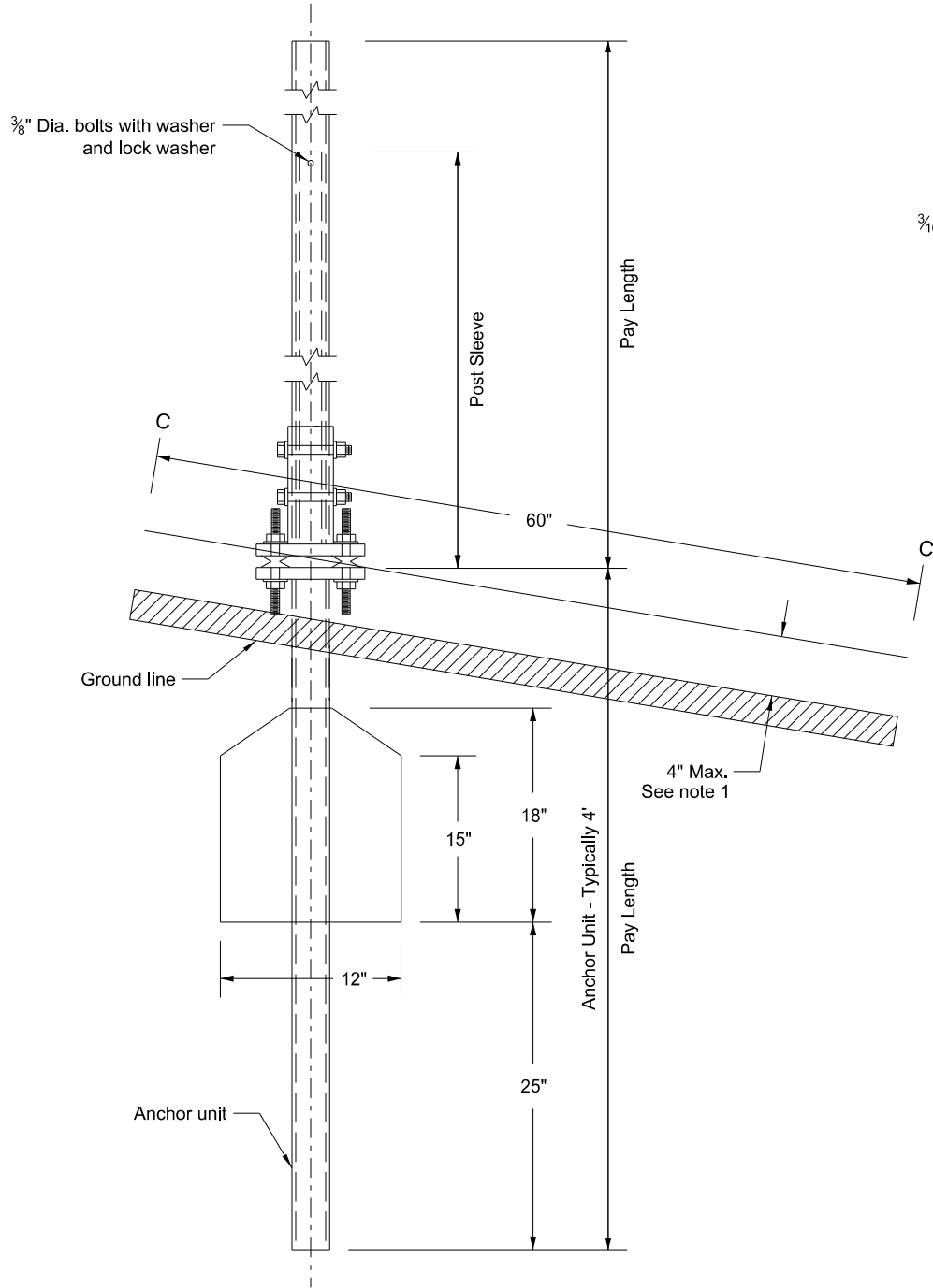
Notes:

1. 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement is above and below post location and also back and ahead of post.
2. Use anchor unit of the same size and specification as the post.
3. Provide a minimum 8' distance between the first and fourth post on four post signs.
4. Use the breakaway base system on standard D-754-24 or the breakaway coupling system manufactured from material meeting the requirements of ASTM A325 fasteners with the special requirements specified by DENT BREAKAWAY IND., INC. which meets the test requirements of NCHRP Report 350.

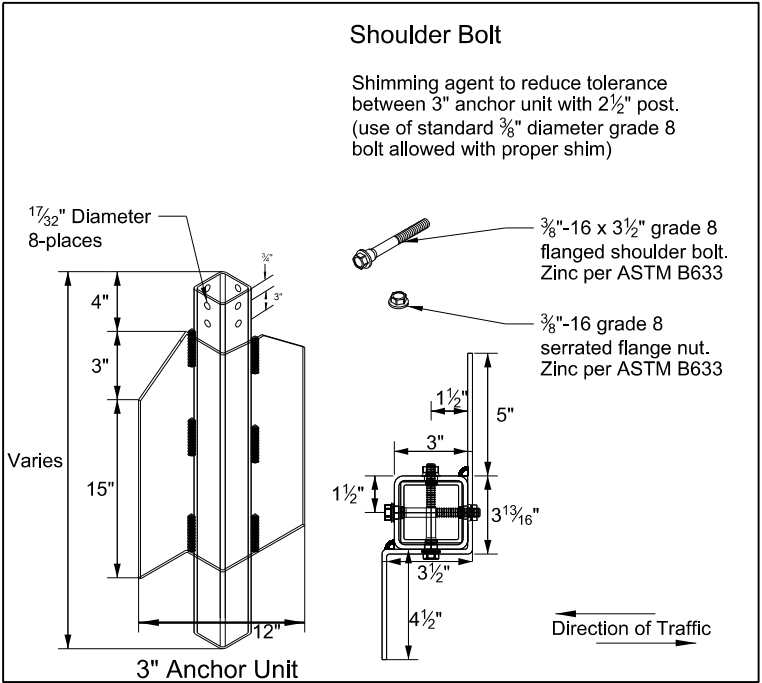
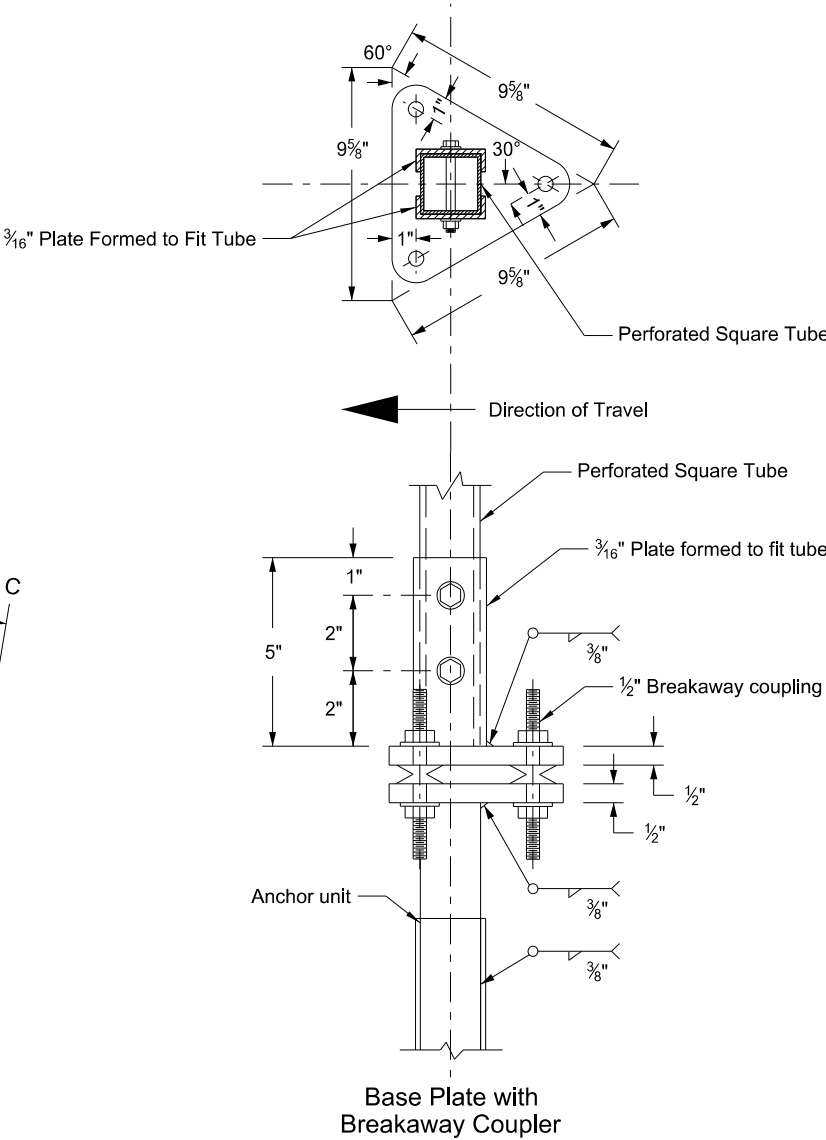
Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thickness Guage
1	2	12			No	2¼	12
1	2¼	12			No	2½	12
1	2½	12			(B)	3(C)	7
1	2½	10			Yes		7
1	2¼	12	2	12	Yes		7
1	2½	12	2¼	12	Yes		7
2	2½	10			Yes		7
2	2¼	12	2	12	Yes		7
2	2½	12	2¼	12	Yes		7
3 & 4	2½	12			Yes		7
3 & 4	2½	10			Yes		7
3 & 4	2½	12	2¼	12	Yes		7
3 & 4	2¼	12	2	12	Yes		7
3 & 4	2½	10	2¾	10	Yes		7

(B) - 2½" 12 gauge posts do not need breakaway bases unless support is placed in boggy, wet, or loose soil areas.

(C) - 3" anchor unit

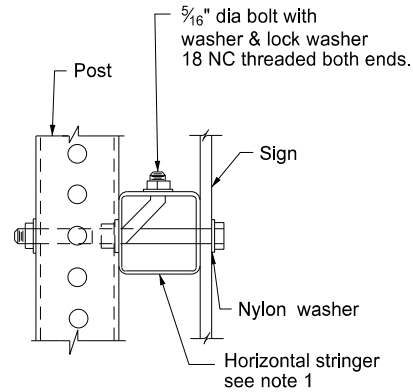


Max protection of the stub post is 4" above a 60" chord aligned radially to the center line of the highway and connecting any point, within the length of the chord, on the ground surface on one side of the support to a point in the ground surface on the other side.

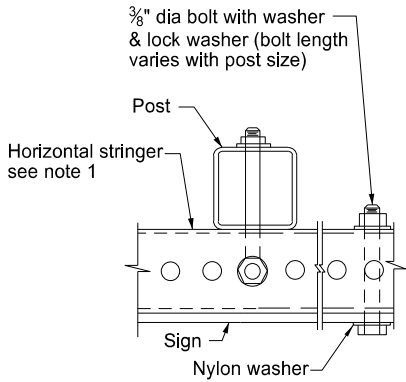


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10-3-2013		
REVISIONS		
DATE	CHANGE	
8-30-18 8-30-19	Updated notes to active voice. New Design Engr PE Stamp.	

Mounting Details Perforated Tube

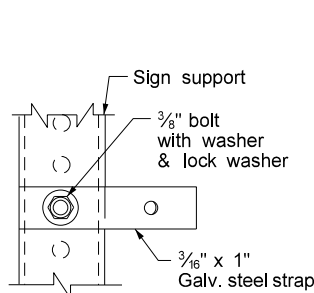


Side View

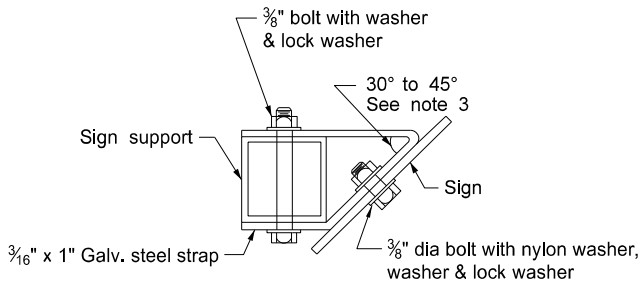


Top View

STRINGER MOUNTING
(WITH STRINGER IN FRONT OF POST)

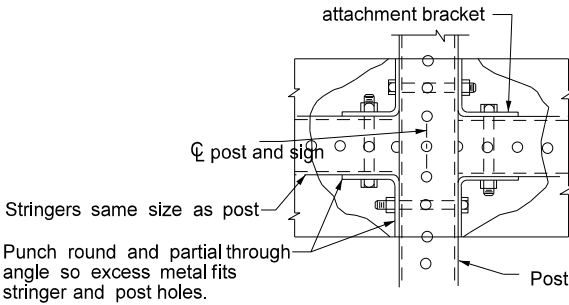


Side View

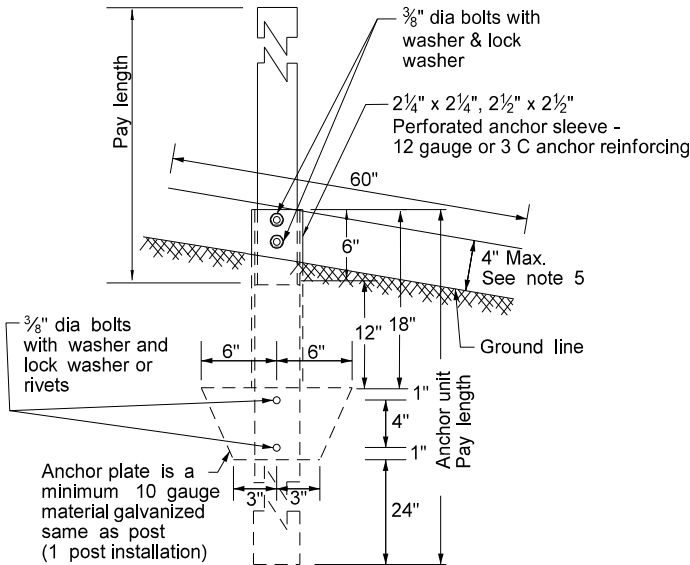


Top View

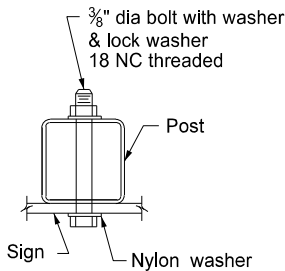
STRAP DETAIL



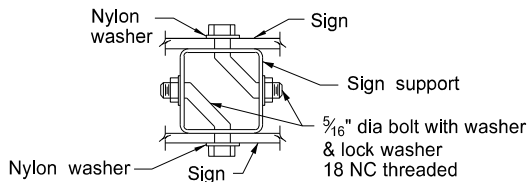
STREET NAME SIGNS AND ONE WAY SIGNS
SINGLE POST ASSEMBLY
ONE STRINGER OR BACK TO BACK MOUNTING



ANCHOR UNIT AND POST ASSEMBLY

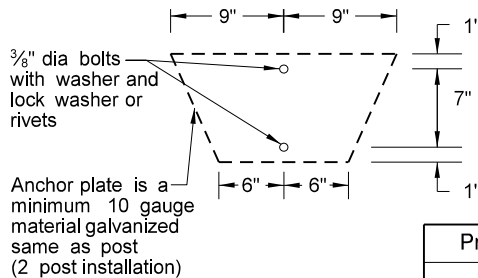


BOLT MOUNTING



Top View

BACK TO BACK MOUNTING



Properties of Telescoping Perforated Tubes						
Tube Size In.	Wall Thickness In.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In. ⁴	Cross Sect. area In. ²	Section Modulus In. ³
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.783

The 2 3/16" size 10 gauge is shown as 2.19" size on the plans.
The 2 1/2" size is shown as 2.51" size on the plans.

Note:

1. Horizontal stringers - Use perforated tubes or 1 3/4" x 3/16" thick, 1.08 lbs./ft aluminum or 3.16 lbs./ft steel z bar stringers.
2. Use minimum outside diameter 1 5/16" ± 1/16" and 10 gauge thick metal washers on sign face.
3. Place No Parking signs with directional arrows at a 30 to 45 degree angle with the line of traffic flow. Turning the support to the correct angle for No Parking signs requiring the above angles is allowed. If the No Parking sign is placed with another sign that requires placement at a 90 degree angle with the line of traffic flow, use the detailed angle strap to mount the No Parking sign. Use flat washers and lock washers with all nylon washers.
4. Punching the sign backing and placing the bolt through the sign, the stringer and the post is allowed in lieu of using the bent bolt to attach the post to the stringer.
5. 4" vertical clearance of anchor or breakaway base. The 4" x 60" measurement is above and below post location and also back and ahead of post.

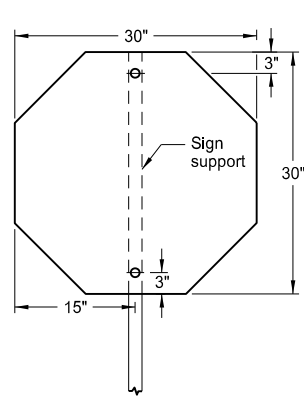
Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thickness Gauge	Sleeve Size In.	Wall Thickness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thickness Gauge
1	2	12			No	2 1/4	12
1	2 1/4	12			No	2 1/2	12
1	2 1/2	12			(B)	3(C)	7
1	2 1/2	10			Yes		7
1	2 1/4	12	2 1/2(D)	12	Yes		7
1	2 1/2	12	2 1/4	12	Yes		7
2	2 1/2	10			Yes		7
2	2 1/4	12	2 1/2(D)	12	Yes		7
2	2 1/2	12	2 1/4	12	Yes		7
3 & 4	2 1/2	12			Yes		7
3 & 4	2 1/2	10			Yes		7
3 & 4	2 1/2	12	2 1/4	12	Yes		7
3 & 4	2 1/4	12	2 1/2(D)	12	Yes		7
3 & 4	2 1/2	10	2 3/16	10	Yes		7

(B) - When placing 2 1/2", 12 gauge posts in standard soils without breakaway bases, provide a shim as specified by the manufacturer. Provide breakaway base when placing the support in weak soils. Engineer will determine if soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.
(C) - 3" anchor unit
(D) - 2 1/2" x 12 ga. x 18" minimum length external sleeve required.

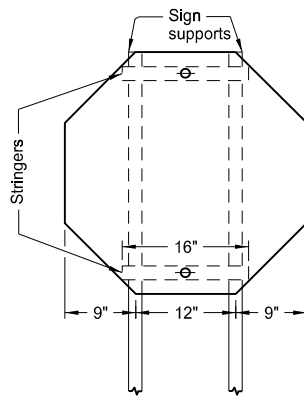
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8-6-09		
REVISIONS		
DATE	CHANGE	
7-8-14 8-30-18 8-30-19	Revised Note 3. Updated notes to active voice. New Design Engr PE Stamp.	

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION
DETAILS REGULATORY, WARNING AND GUIDE SIGNS

D-754-26

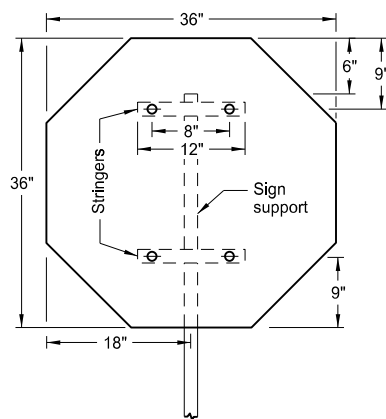


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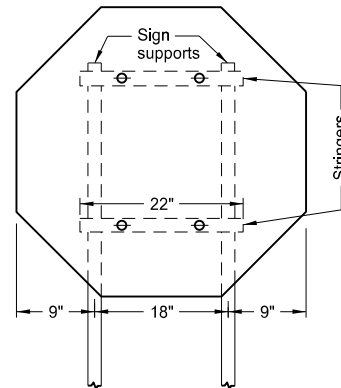


2 Posts

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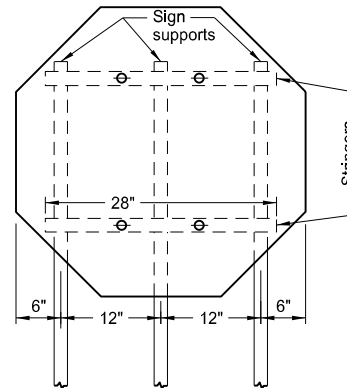


1 Post



2 Posts

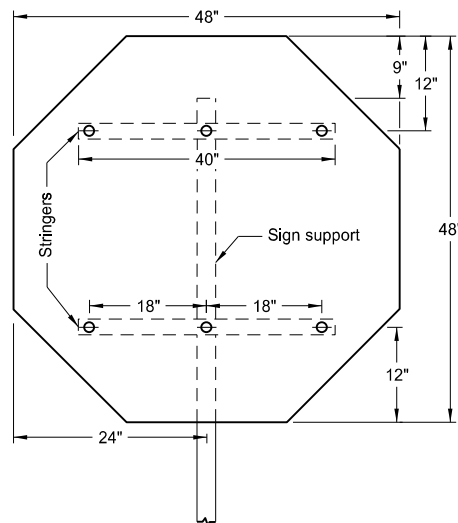
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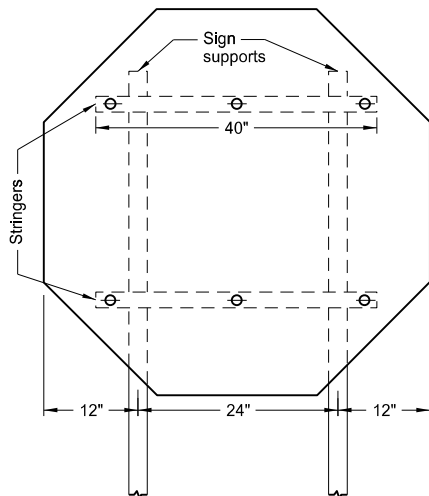
3 Posts

Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½" x 1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.

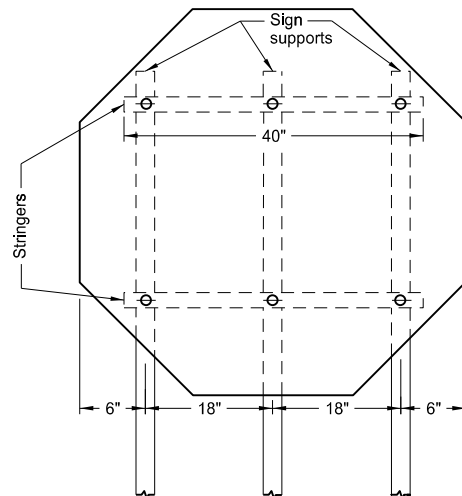


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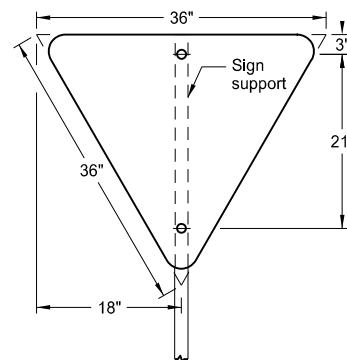


2 Posts

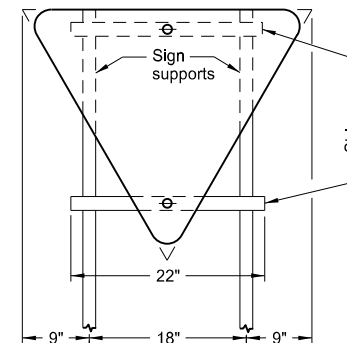
Assembly No. 3



3 Posts

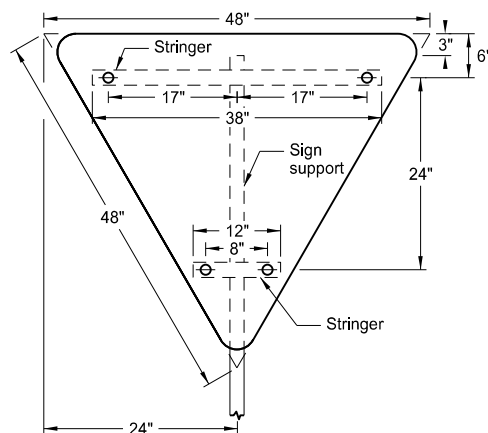


1 Post

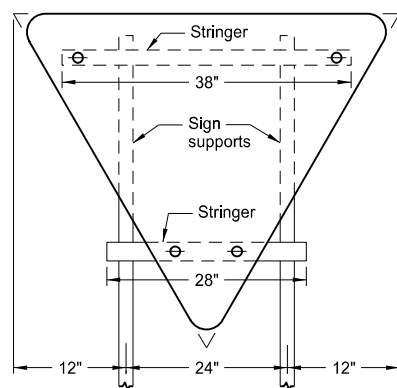


2 Posts

Assembly No. 4

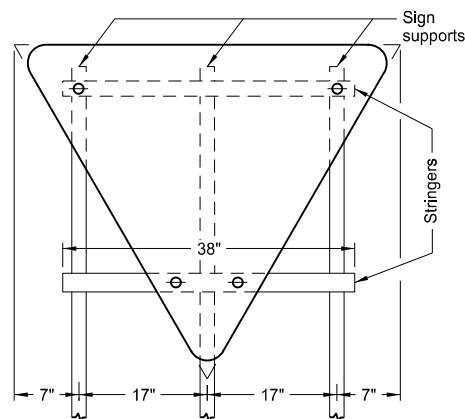


1 Post



2 Posts

Assembly No. 5

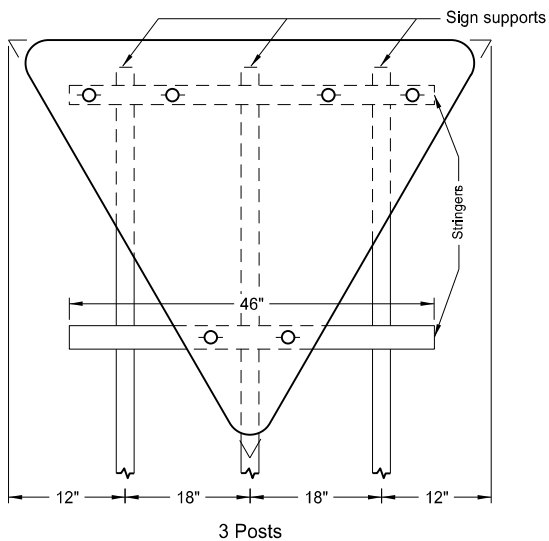
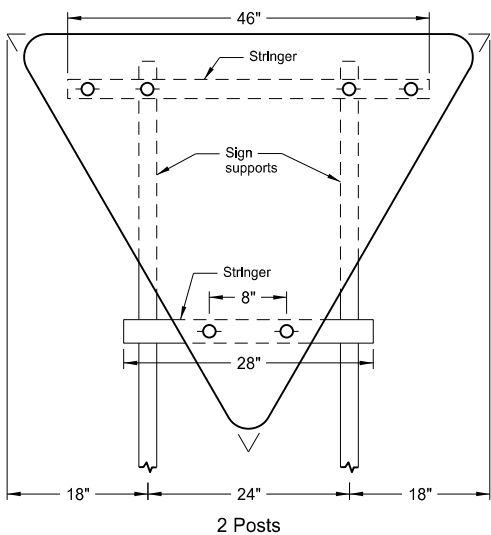
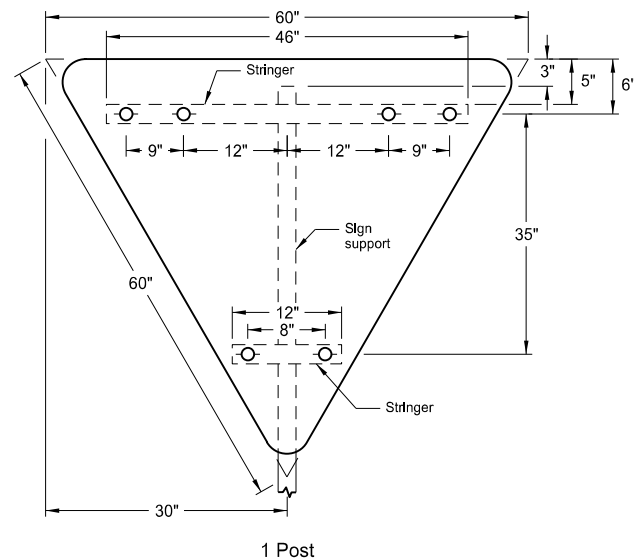


3 Posts

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
8-30-19	New Design Engineer PE Stamp.

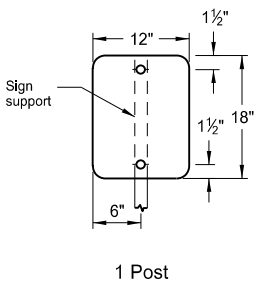
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION
DETAILS REGULATORY, WARNING AND GUIDE SIGNS

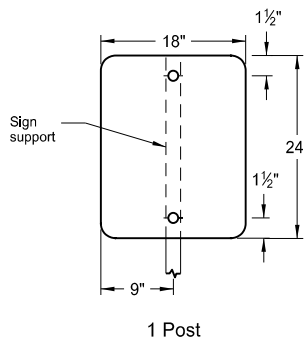


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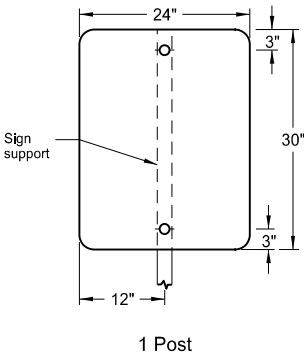
- Notes:
1. Use 0.100 inch minimum thickness sign backing material.
 2. Use 1½" x 1½" perforated square tube stringers.
 3. Punch holes round for ⅝" bolt.



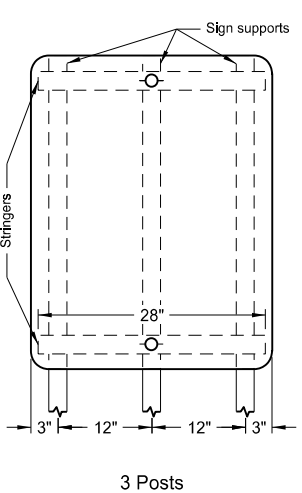
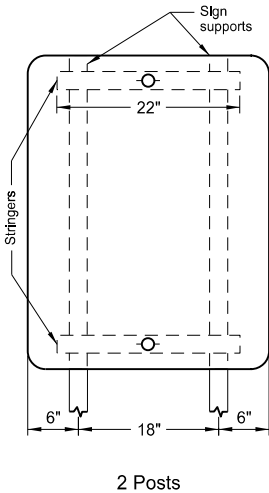
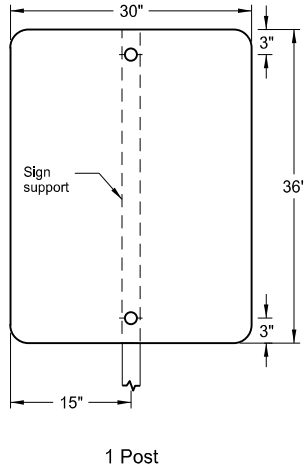
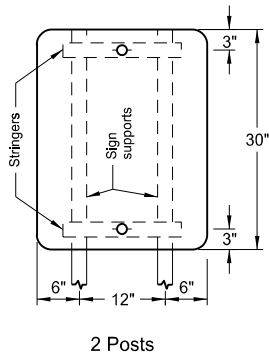
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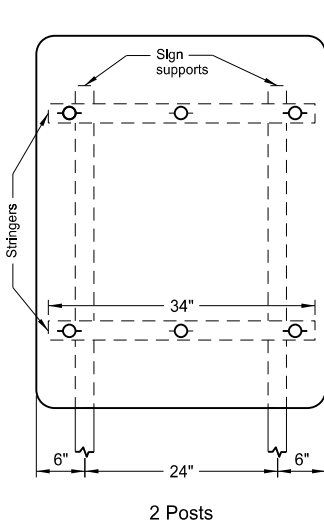
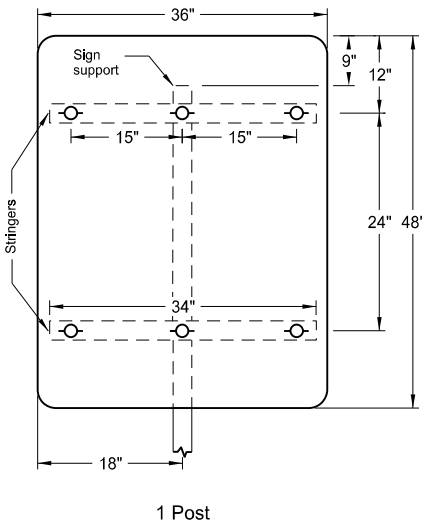
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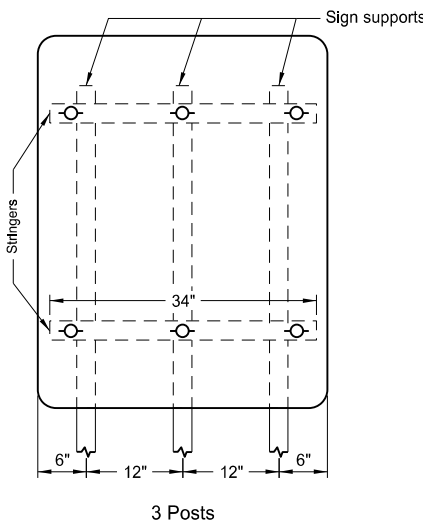
Assembly No. 9



Assembly No. 10



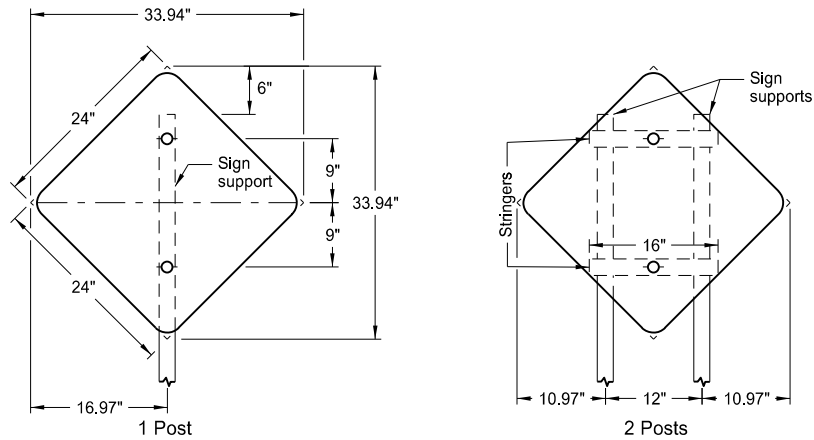
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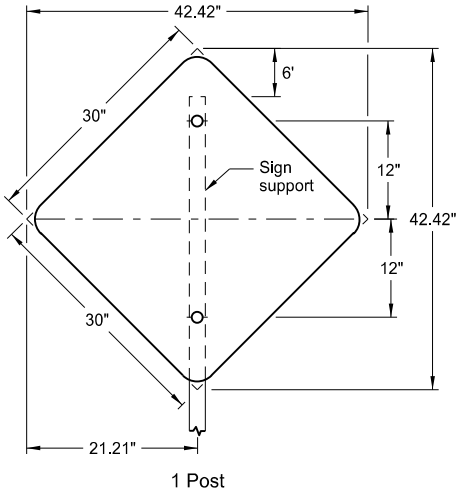
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
8-30-19	New Design Engineer PE Stamp.

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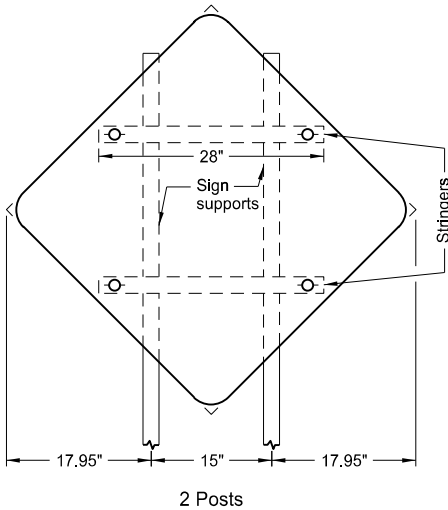
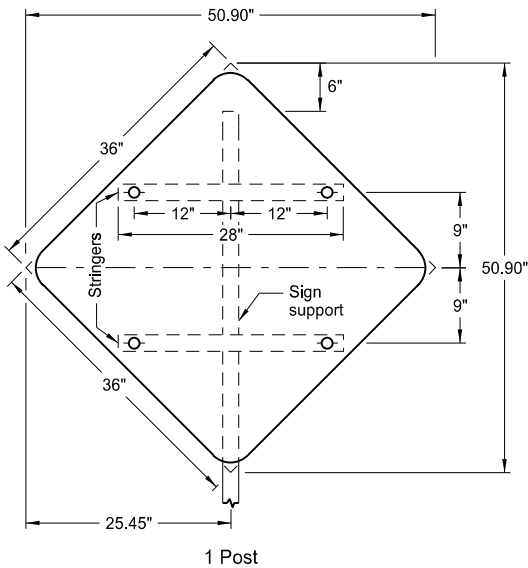
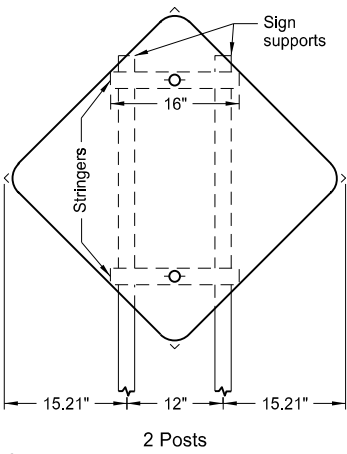
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION
DETAILS REGULATORY, WARNING AND GUIDE SIGNS



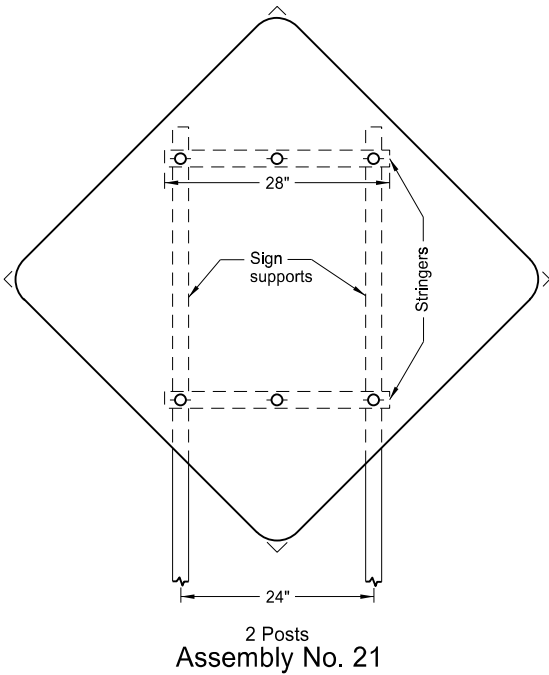
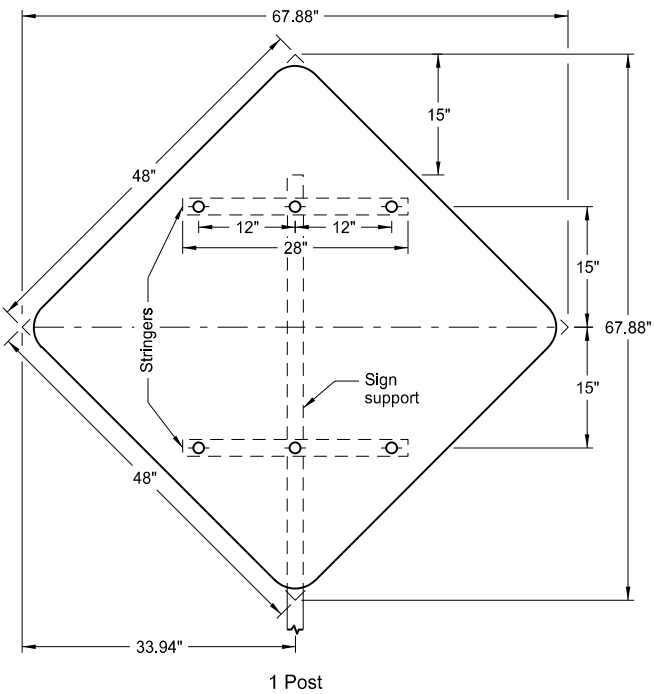
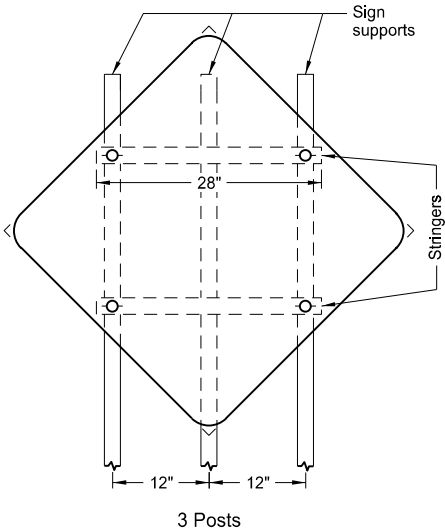
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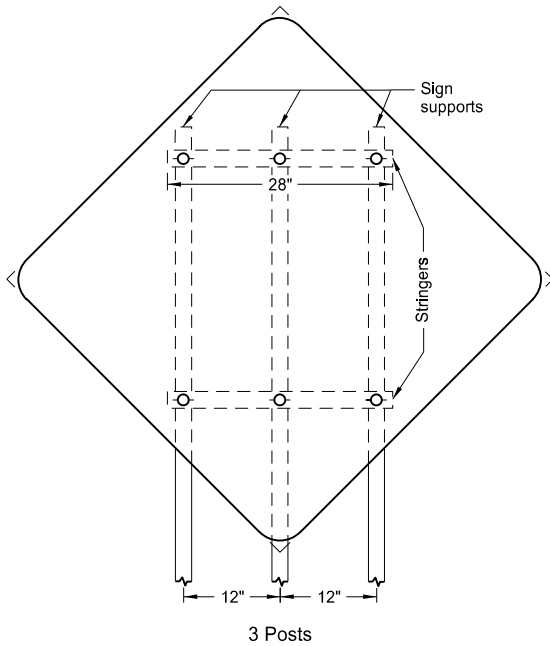
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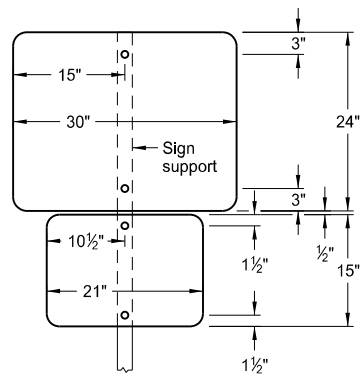
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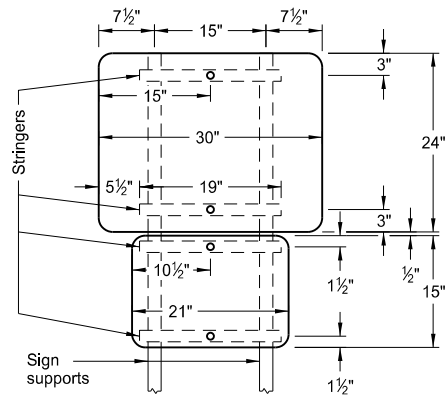
- Notes:
1. Use 0.100 inch minimum thickness sign backing material.
 2. Use 1½" x 1½" perforated square tube stringers.
 3. Punch holes round for ⅜" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
8-30-19	New Design Engineer PE Stamp.

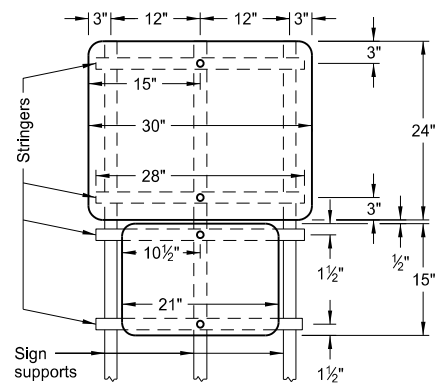
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1 Post



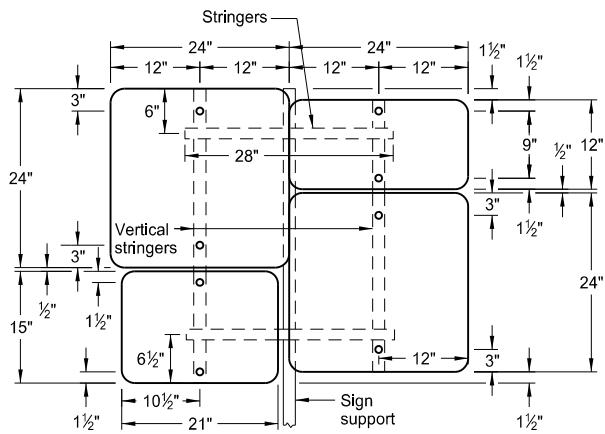
2 Posts



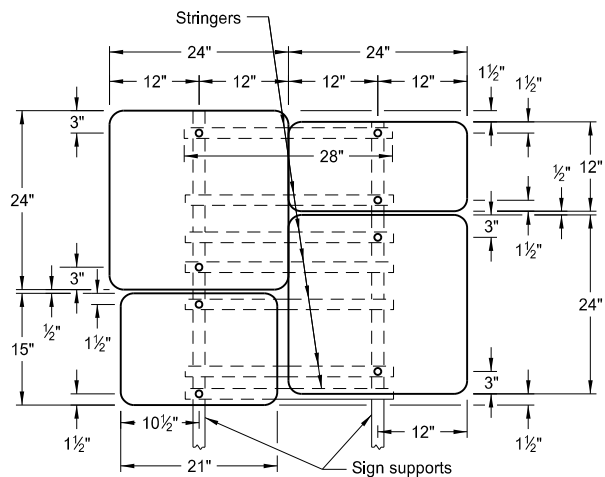
3 Posts

ASSEMBLY NO. 400

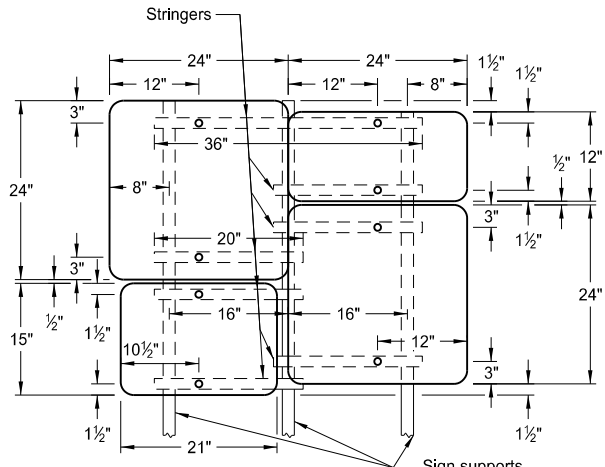
- Notes:
1. Use 0.100 inch minimum thickness sign backing material.
 2. Use 1 1/2"x1 1/2" perforated square tube stringers.
 3. Punch holes round for 3/8" bolt.



1 Post

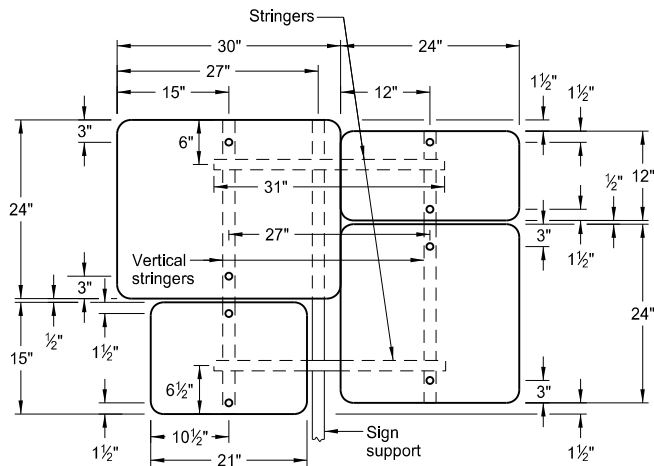


2 Posts

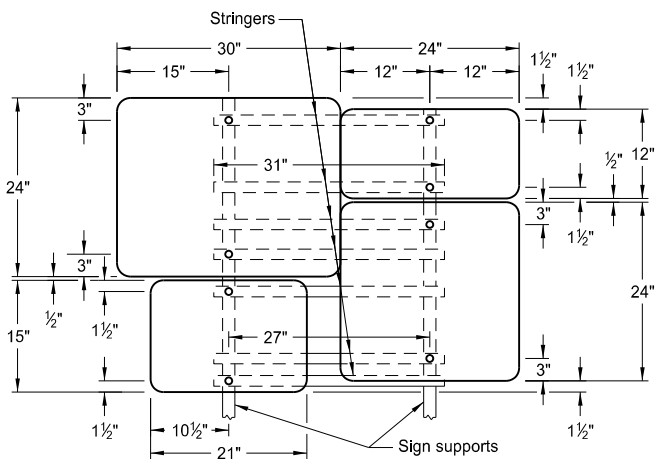


3 Posts

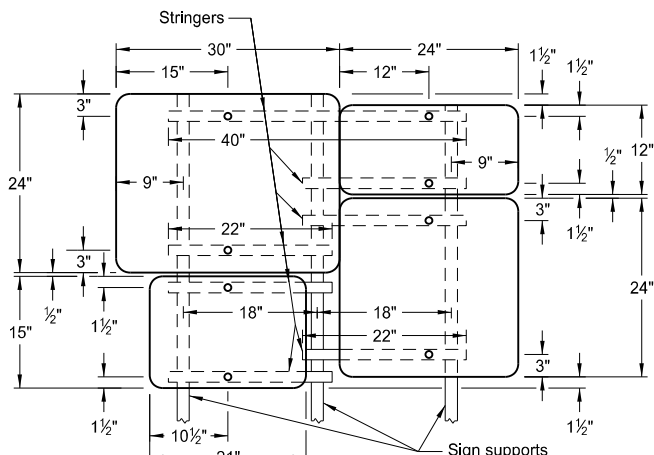
ASSEMBLY NO. 401



1 Post



2 Post



3 Posts

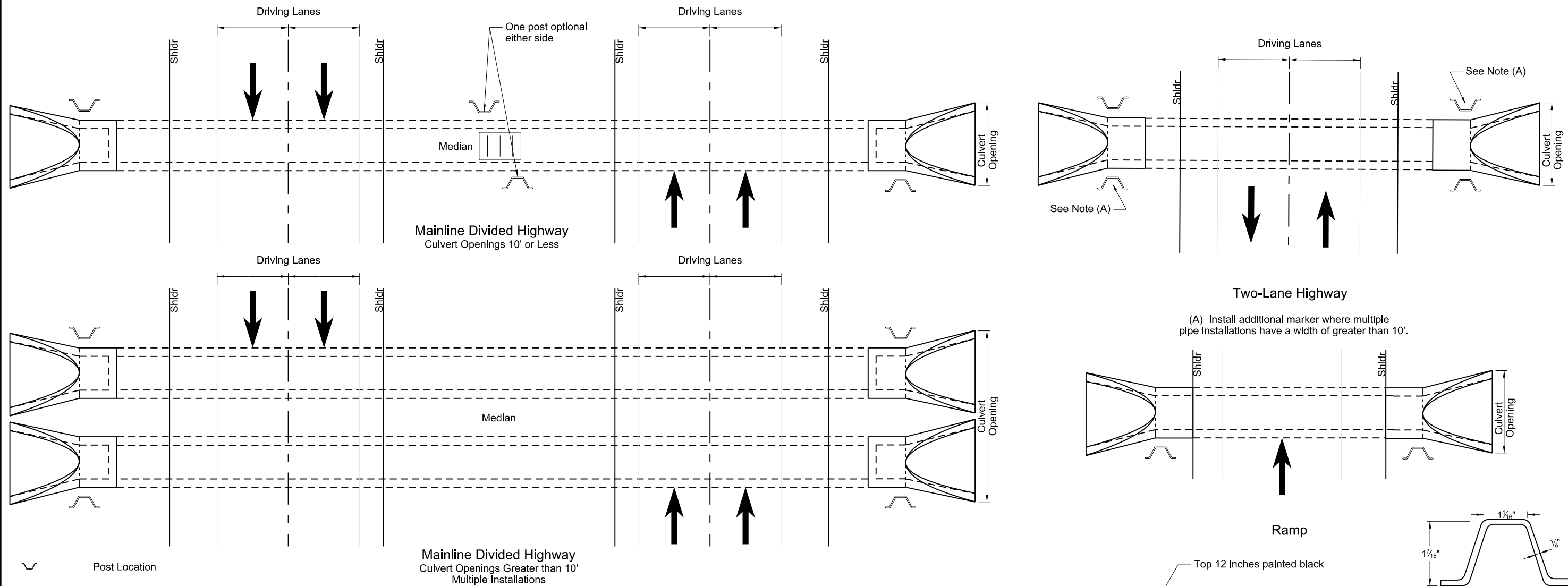
ASSEMBLY NO. 402

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
9-04-19	New Design Engineer PE Stamp.

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Registration Number
PE- 4683,
on 9/04/19 and the original document is stored at the
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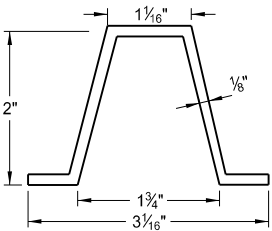
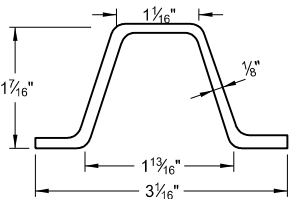
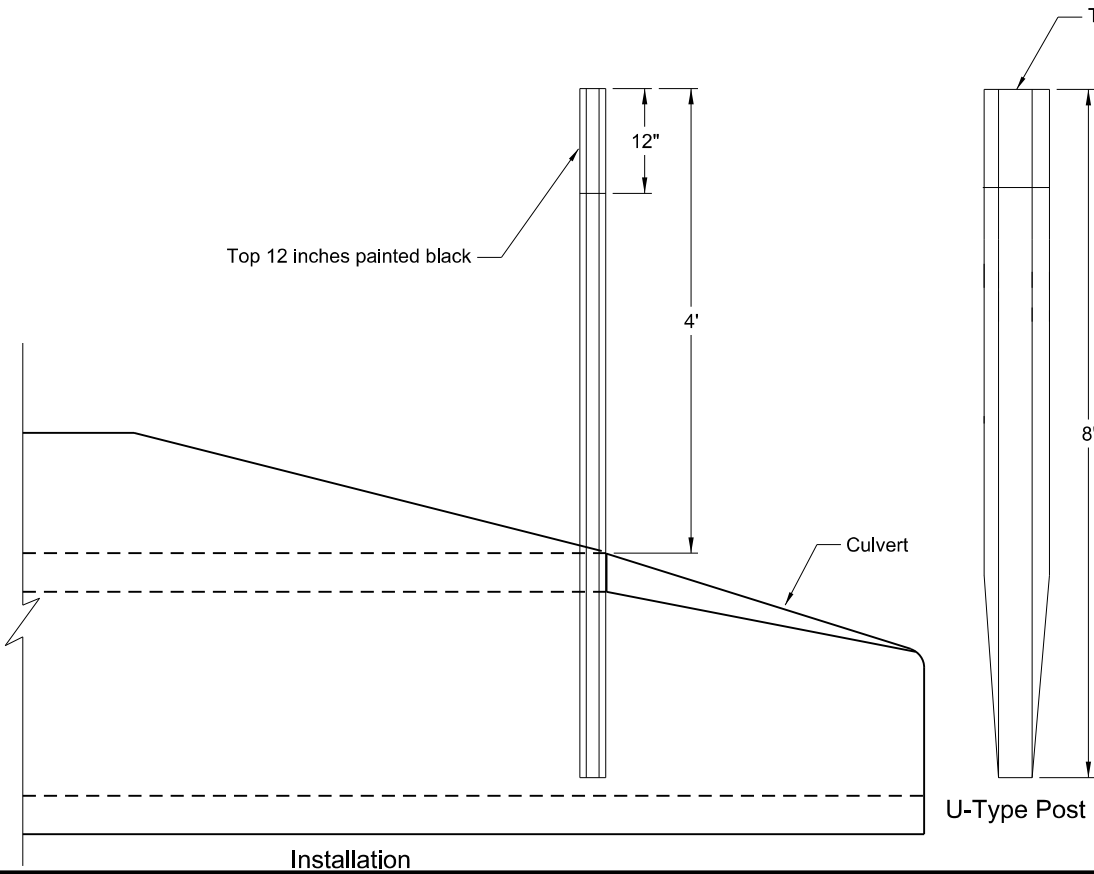
OBJECT MARKERS - CULVERTS

D-754-83



Notes:

Mark each end of culverts crossing the roadway within the right-of-way with a post. Install posts in front of culvert in direction of travel along the side of culvert and one foot from culvert opening unless shown otherwise in plans.



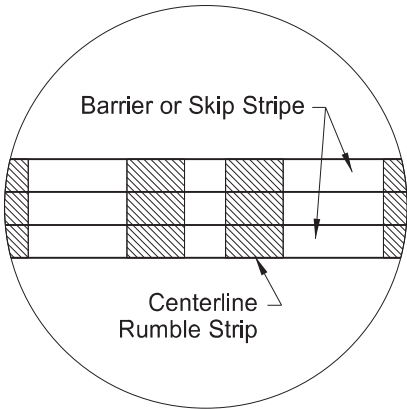
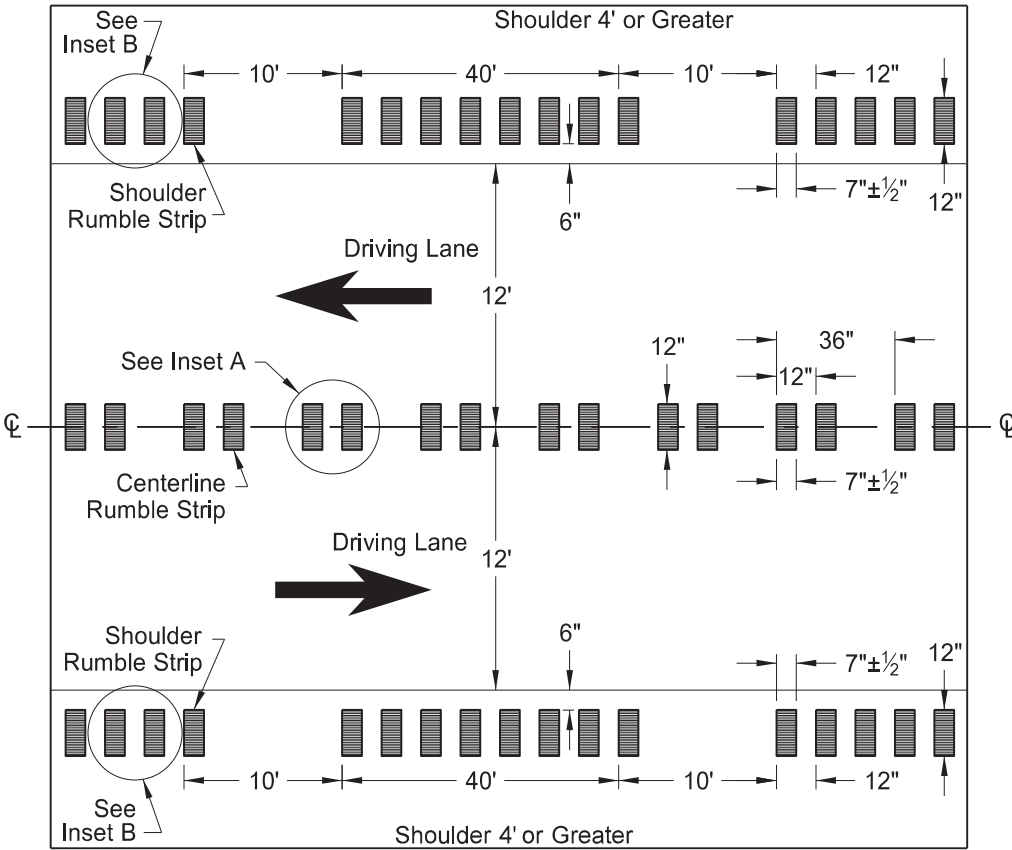
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-05-13	
REVISIONS	
DATE	CHANGE
7-7-14	Revised Notes
8-30-18	Updated notes to active voice.
9-05-19	New Design Engineer PE Stamp.

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Registration Number
PE- 4683,
on 9/05/19 and the original document is stored at the
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of Transportation

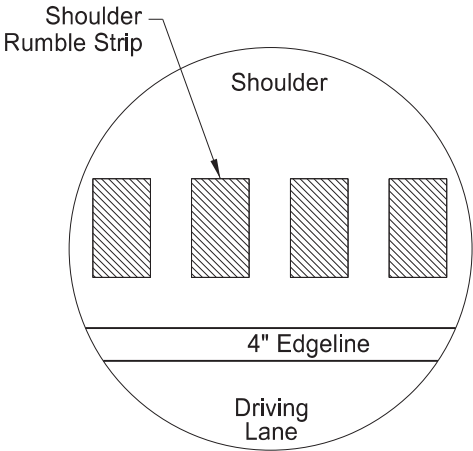
RUMBLE STRIPS UNDIVIDED HIGHWAYS (SHOULDERS 4' OR GREATER)

D-760-3

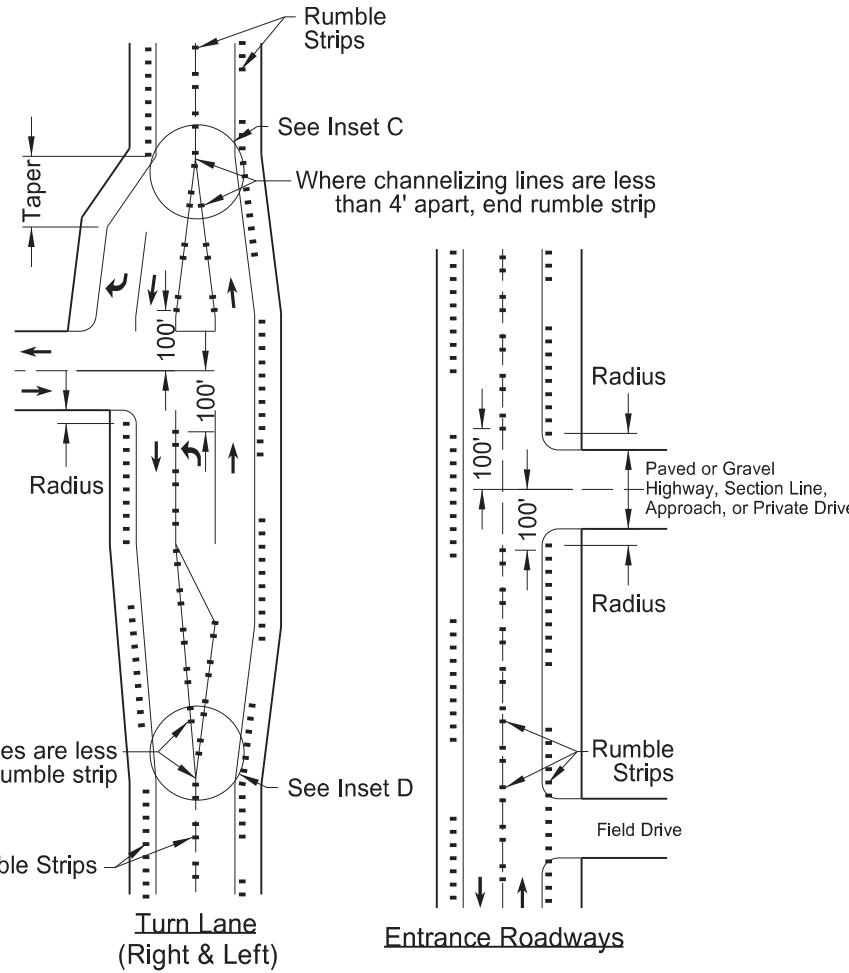
- NOTES:
- 1) Discontinue shoulder rumble strips through the entire length of right turn lanes and tapers, and at the radius of a paved or gravel highway, section line, approach, or private drive.
 - 2) Discontinue centerline rumble strips 100' before and after a paved or gravel highway, section line, approach, or private drive. Place rumble strips at left turn lanes as shown below.



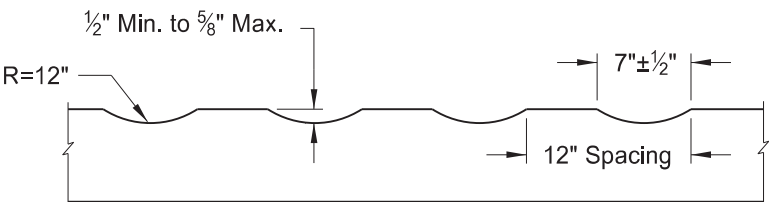
Inset A - Centerline Rumble Strip



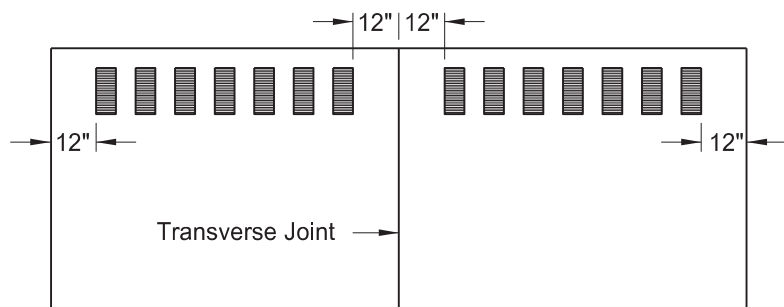
Inset B - Shoulder Rumble Strip



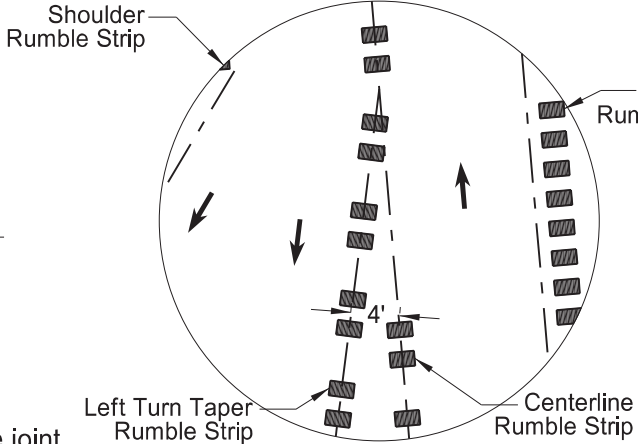
Undivided Highways (Shoulders 4' or Greater)



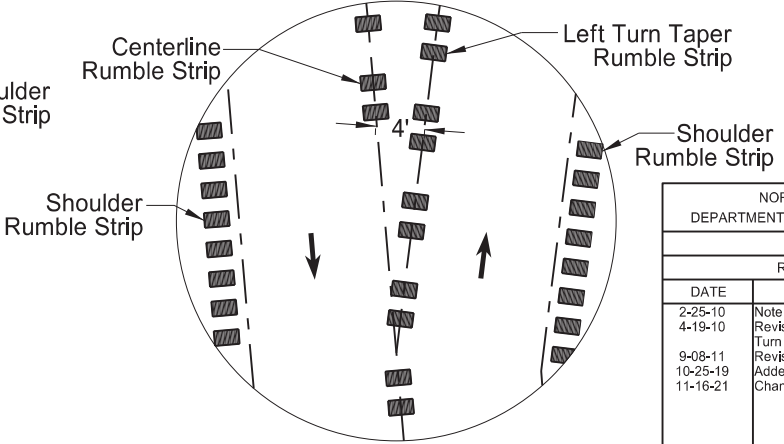
Profile of Rumble Strips - Bituminous and PCC Pavements



Discontinue rumble strip approx. 12" on both sides of PCC transverse joint



Inset C



Inset D

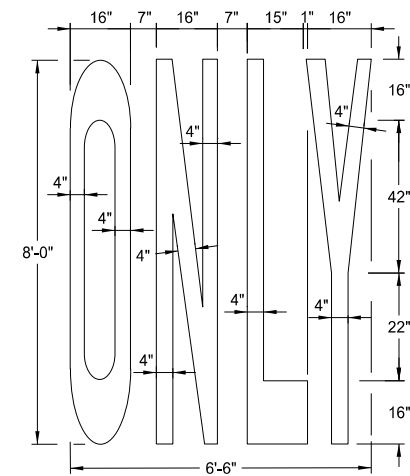
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-29-09	
REVISIONS	
DATE	CHANGE
2-25-10	Note 4 was added.
4-19-10	Revised Note 5, Note 6, and Turn Lane (Right & Left).
9-08-11	Revised Notes and D-760-3.
10-25-19	Added missing dimensions.
11-16-21	Changed turn lane rumble layouts.



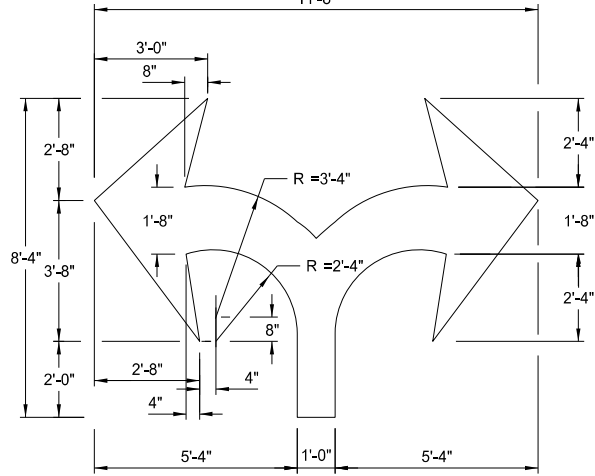
11/16/21

Pavement Marking Message Details

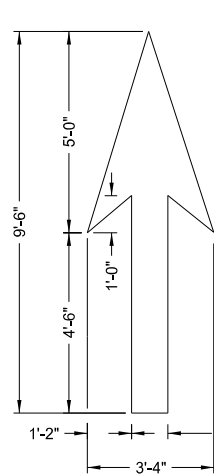
D-762-1



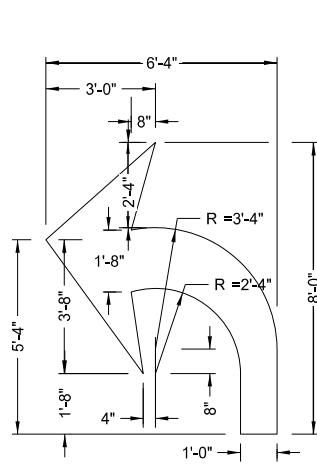
22 S. F.



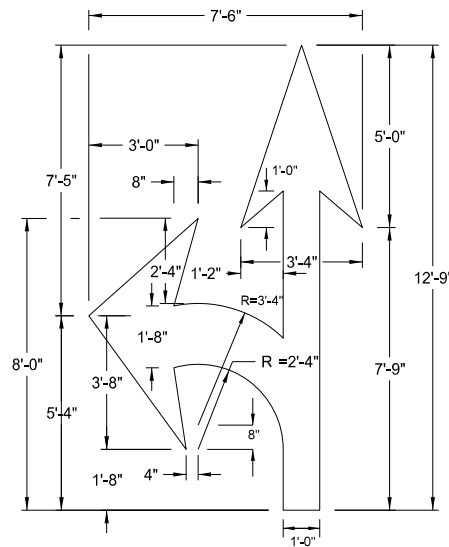
29 S. F.



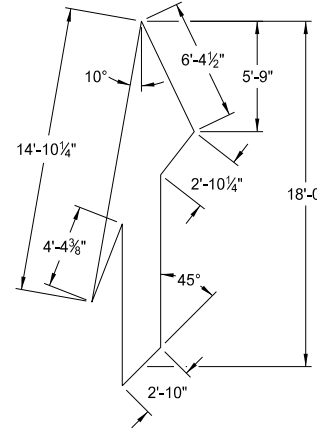
12 S. F.



16 S. F.

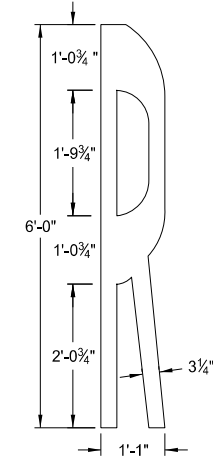


27 S. F.

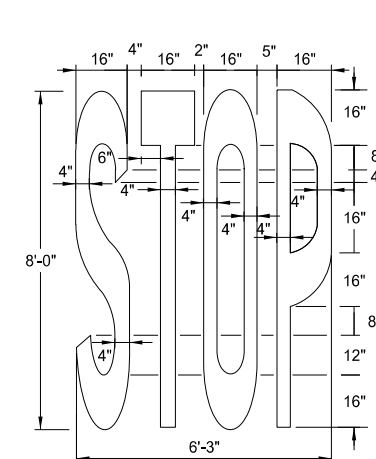


41 S. F.

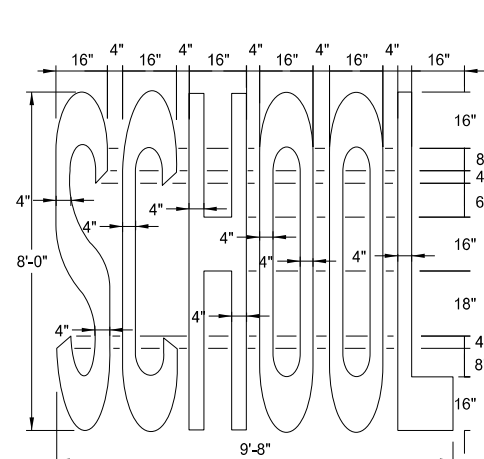
Note: Rotate merge arrow 20° from edge of roadway.



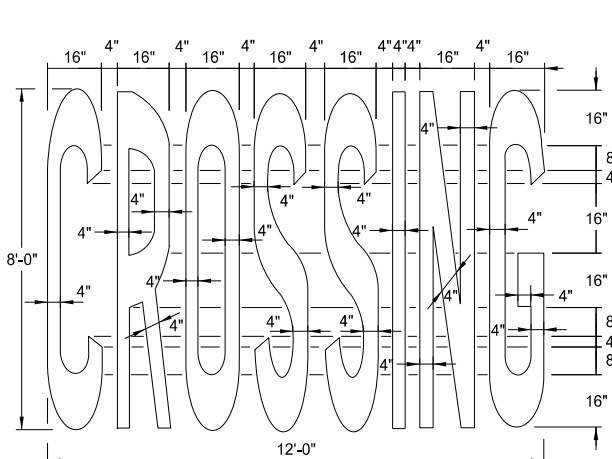
4 S. F.



22 S. F.



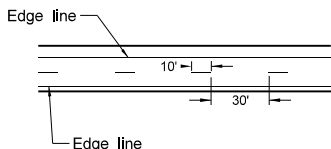
34.5 S. F.



46 S. F.

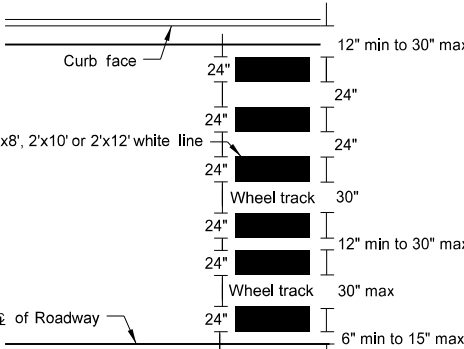
Speed Limit	Chevron Width	Chevron Spacing 45° to Traffic
0-25 mph	8"	5'
30-40 mph	8"	15'
45 mph and above	12"	25'

Chevron Crosshatching Table

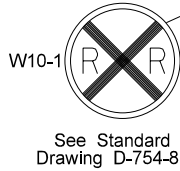
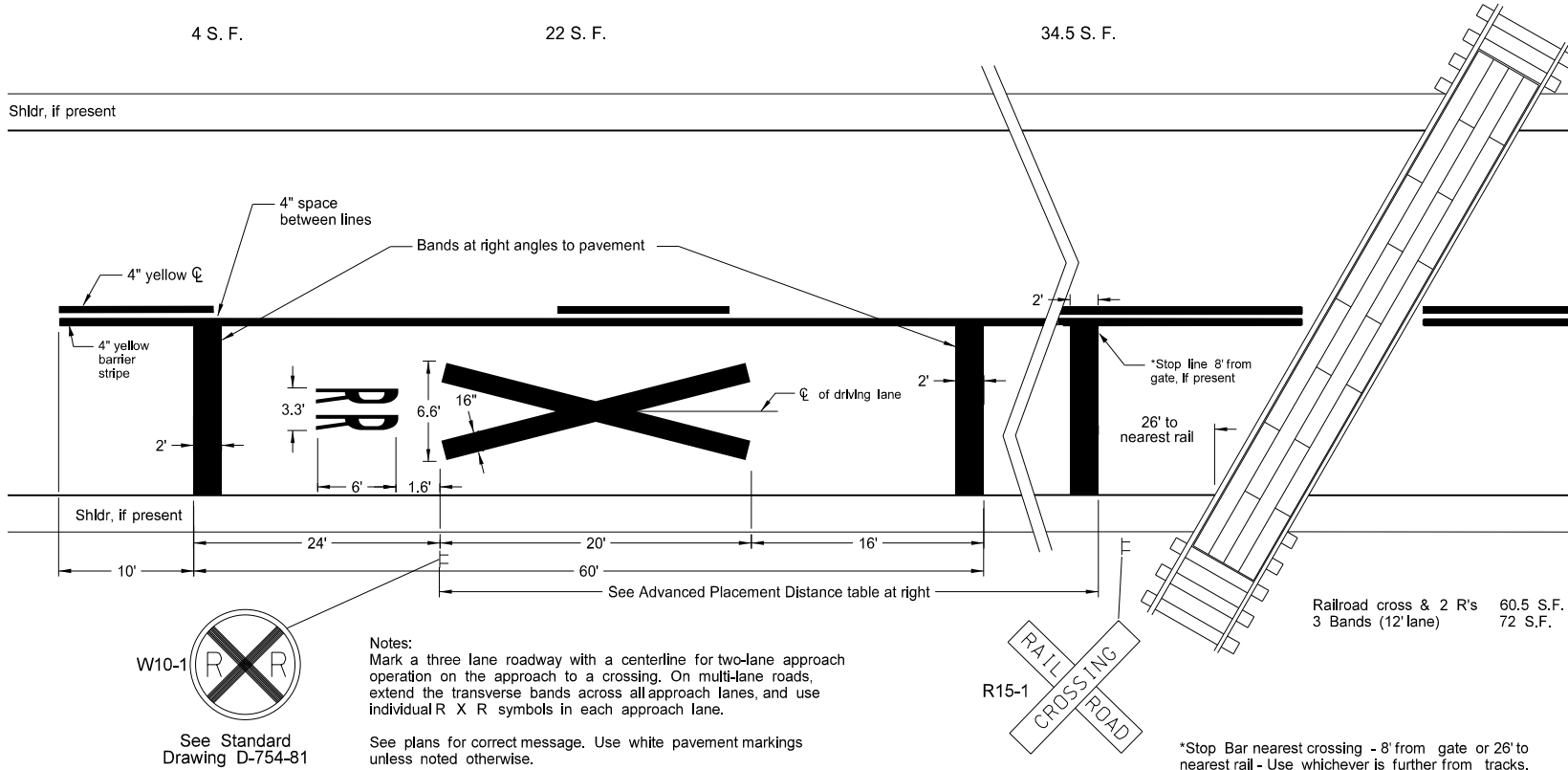


Centerline Pavement Marking Skip Spacing Detail

Advance Placement Distance for Railroad Warning Signs	
Posted or 85th Percentile Speed	Advance Distance
20 mph	min. 100 ft
25 mph	min. 100 ft
30 mph	min. 100 ft
35 mph	min. 100 ft
40 mph	125 ft
45 mph	175 ft
50 mph	250 ft
55 mph	325 ft
60 mph	400 ft
65 mph	475 ft
70 mph	550 ft



Continental Crosswalk Detail



Notes:
Mark a three lane roadway with a centerline for two-lane approach operation on the approach to a crossing. On multi-lane roads, extend the transverse bands across all approach lanes, and use individual R X R symbols in each approach lane.

See plans for correct message. Use white pavement markings unless noted otherwise.

*Stop Bar nearest crossing - 8' from gate or 26' to nearest rail - Use whichever is further from tracks.

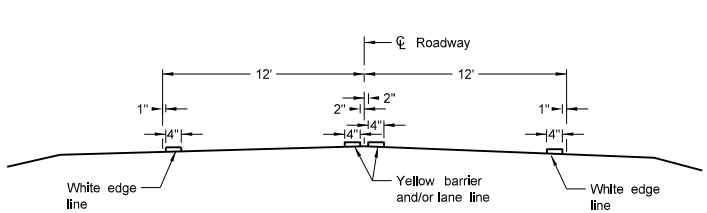
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-6-11	
REVISIONS	
DATE	CHANGE
10-17-17 08-27-19 01-28-2020	Updated to active voice. New Design Engineer PE Stamp. Revised min Stop Bar distance to rail.

This document was originally issued and sealed by
Kirk J Hoff,
Registration Number
PE-4683,
on 1/28/2020 and the original document is stored at the North Dakota Department of Transportation

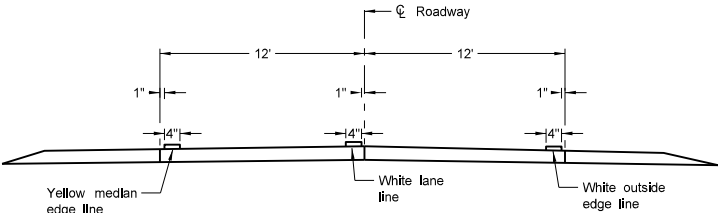
PAVEMENT MARKING

D-762-4

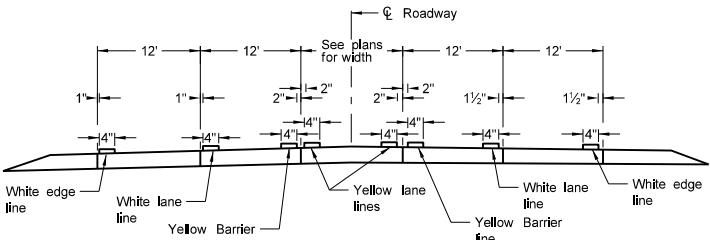
- NOTES:
1. Continue edge lines through private drives and field drives. Break edge lines for intersections.



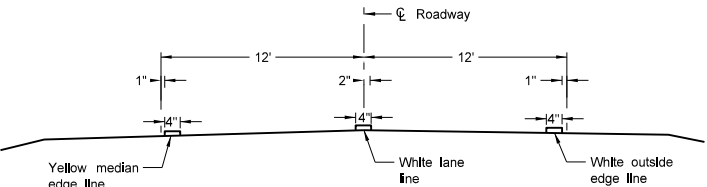
Two Lane Two Way
RURAL ROADWAY



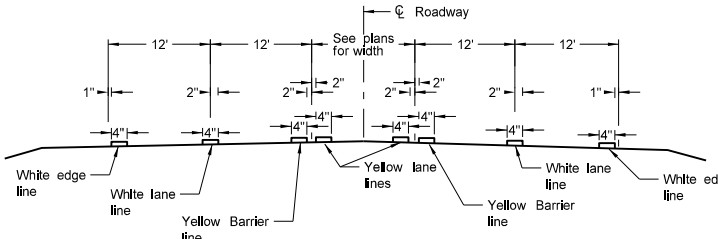
Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



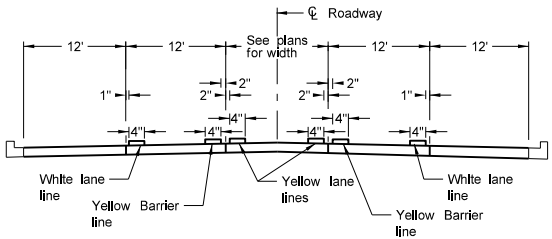
RURAL FIVE LANE ROADWAY
Concrete Section



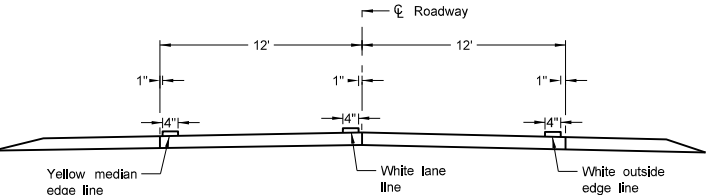
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



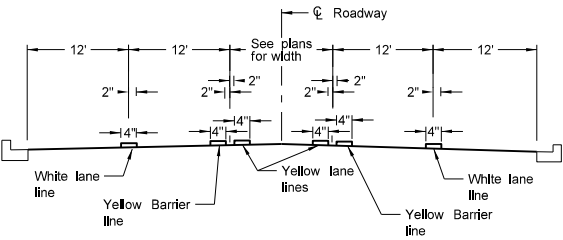
RURAL FIVE LANE ROADWAY
Asphalt Section



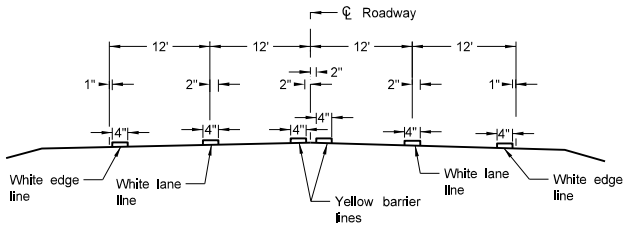
URBAN FIVE LANE SECTION
Concrete Section



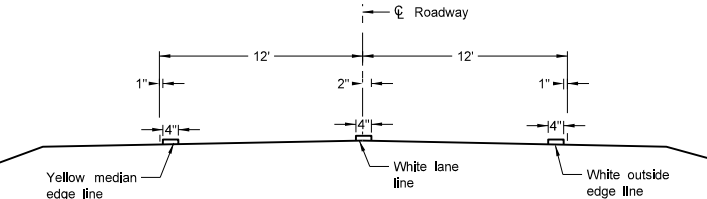
Two Lane Roadway
PRIMARY HIGHWAY
Concrete Section



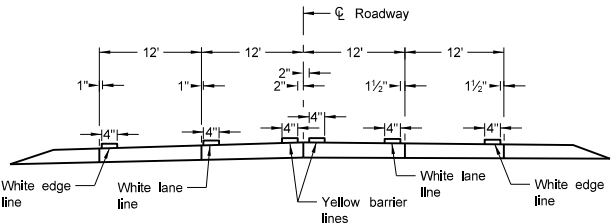
URBAN FIVE LANE SECTION
Asphalt Section



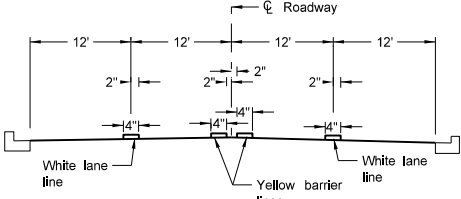
RURAL FOUR LANE ROADWAY
Asphalt Section



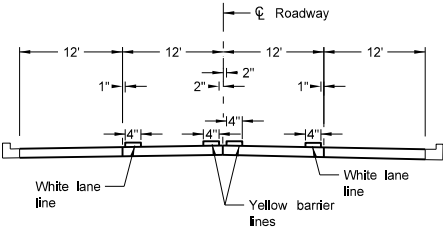
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



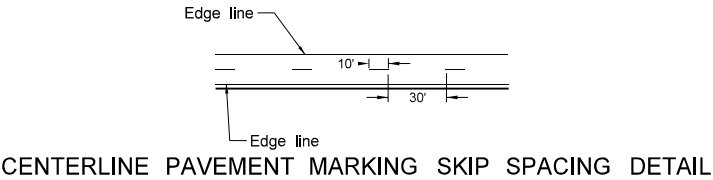
RURAL FOUR LANE ROADWAY
Concrete Section



URBAN FOUR LANE SECTION
Asphalt Section



URBAN FOUR LANE SECTION
Concrete Section



CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
10-17-17 08-27-19	Updated to active voice. New Design Engineer PE Stamp.

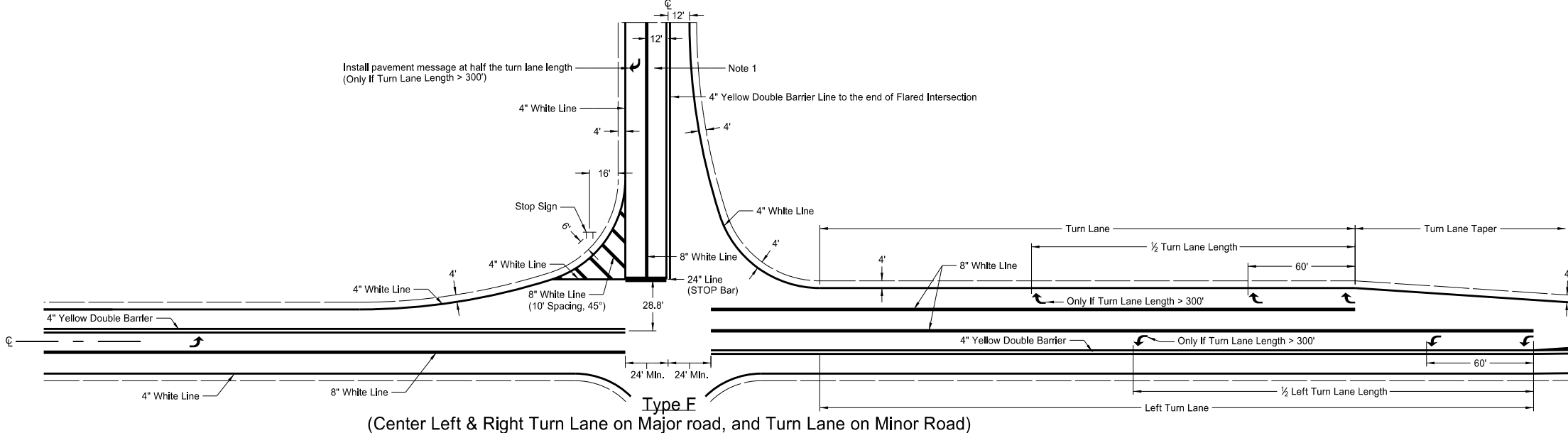
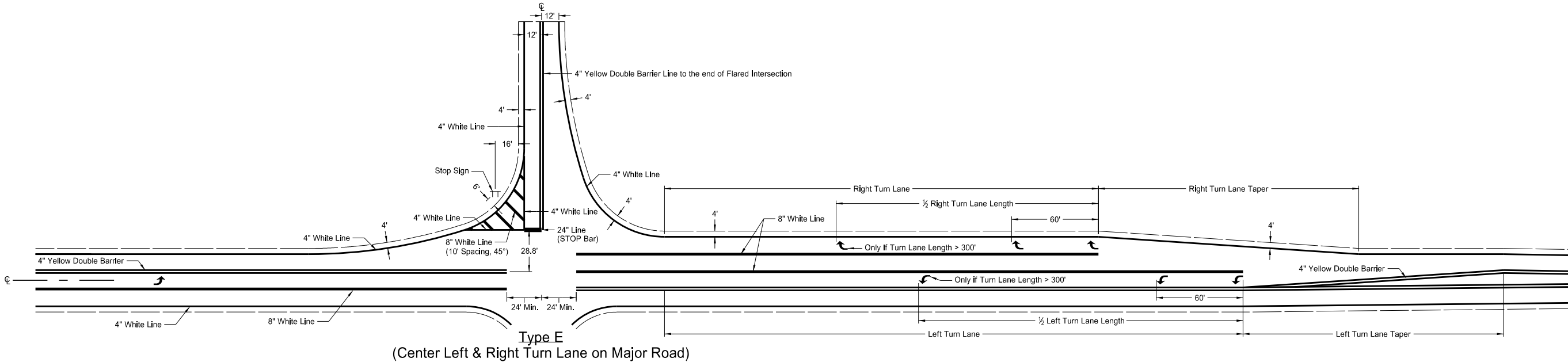
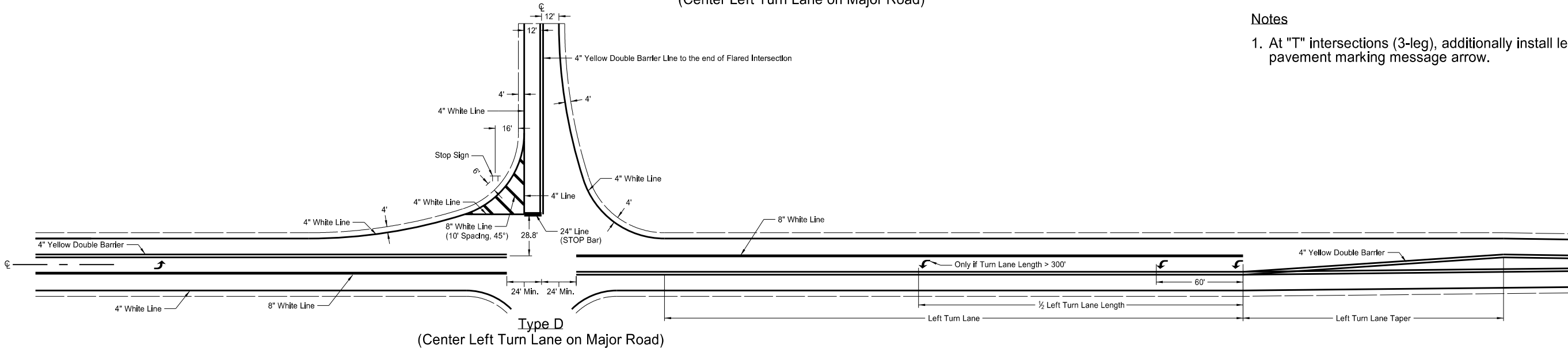
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Registration Number
PE-4683,
on 8/27/19 and the original
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North Dakota Department
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PAVEMENT MARKING FOR STANDARD 90 DEGREE FLARED INTERSECTION
(Center Left Turn Lane on Major Road)

D-762-6

Notes

1. At "T" intersections (3-leg), additionally install left turn pavement marking message arrow.



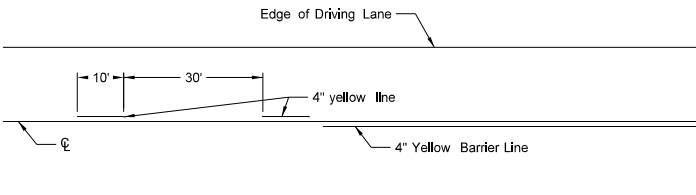
4" Marking
8" Marking
24" Marking

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
3-29-16	
REVISIONS	
DATE	CHANGE
8-17-17 8-27-19	Updated dimensioning, New Design Engineer PE Stamp.

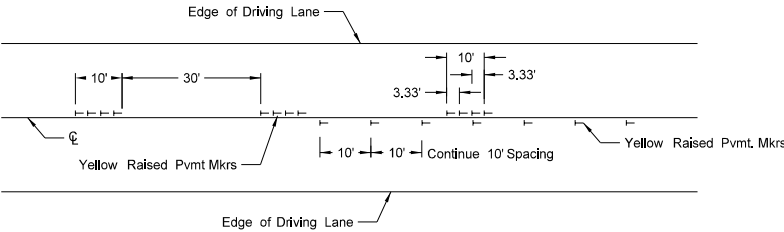
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PE- 4683,
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SHORT-TERM PAVEMENT MARKING

D-762-11

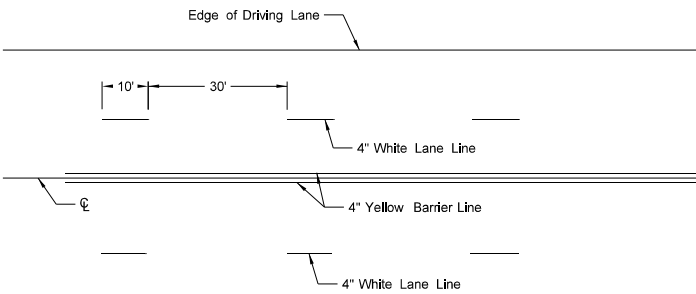


Painted or Tape Lines

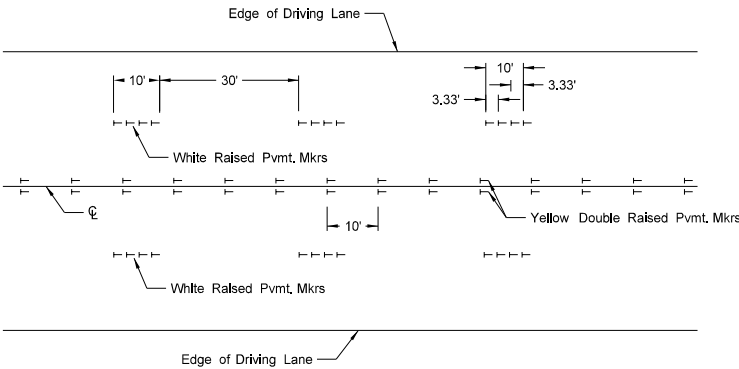


Raised Pavement Markers

TWO-LANE TWO-WAY ROADWAY

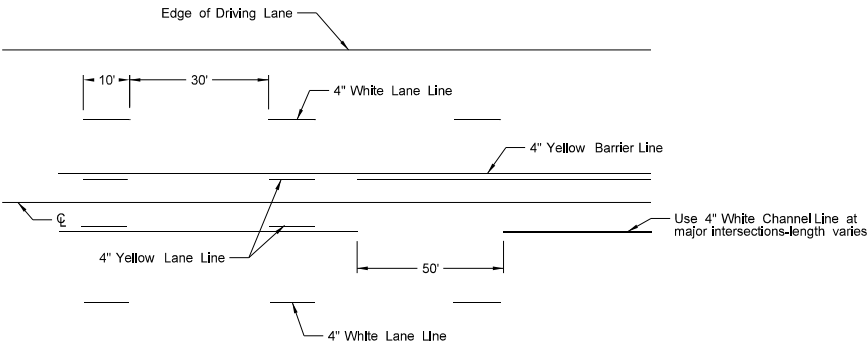


Painted or Tape Lines

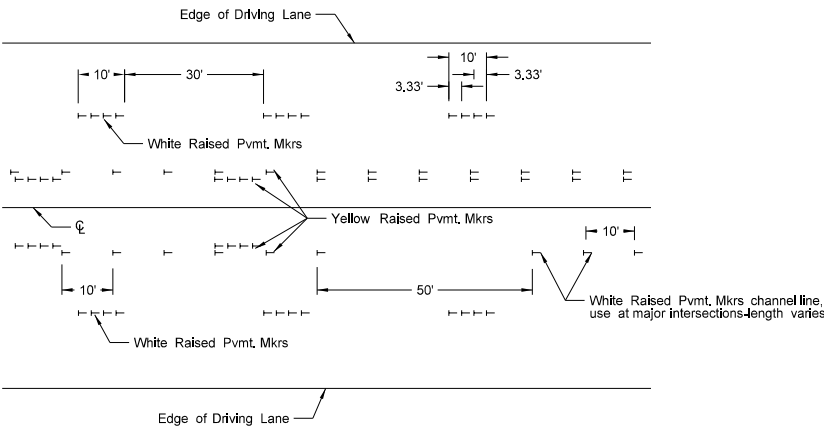


Raised Pavement Markers

FOUR LANE ROADWAY

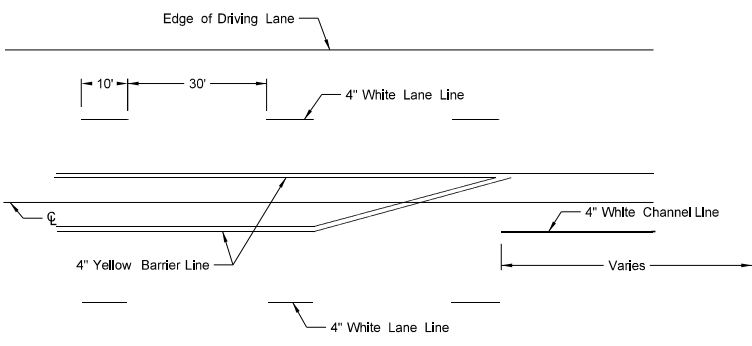


Painted or Tape Lines

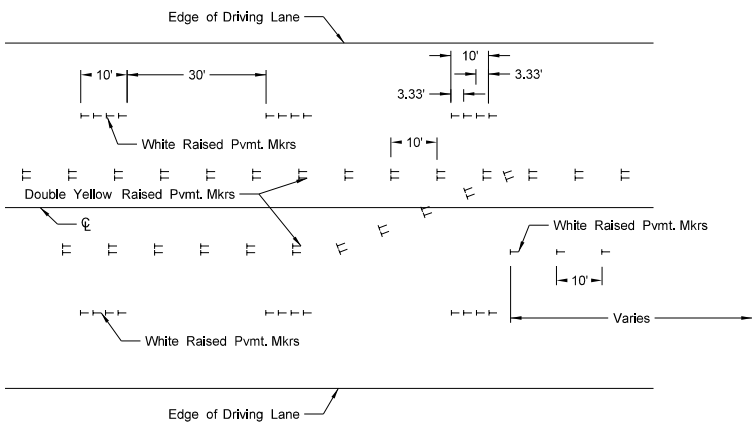


Raised Pavement Markers

FIVE LANE ROADWAY TWO WAY LEFT TURN



Painted or Tape Lines



Raised Pavement Markers

FIVE LANE ROADWAY WITH MARKED ISLANDS

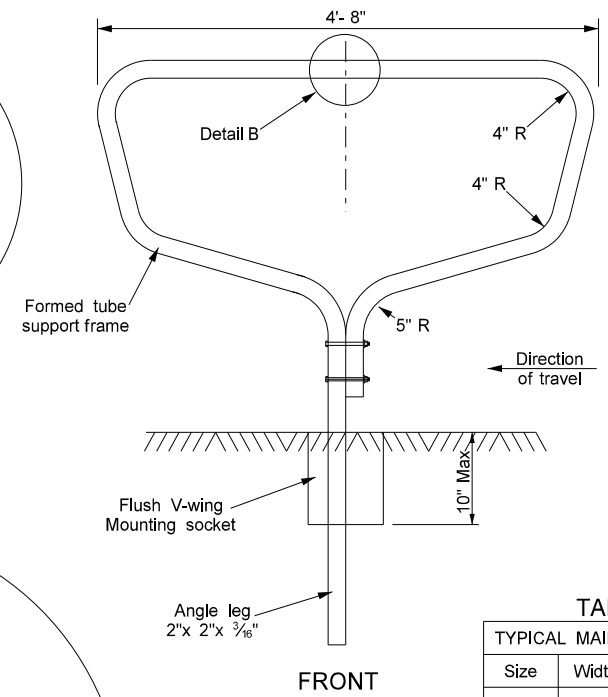
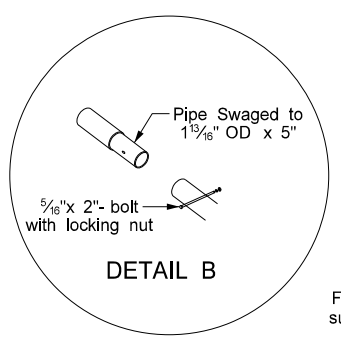
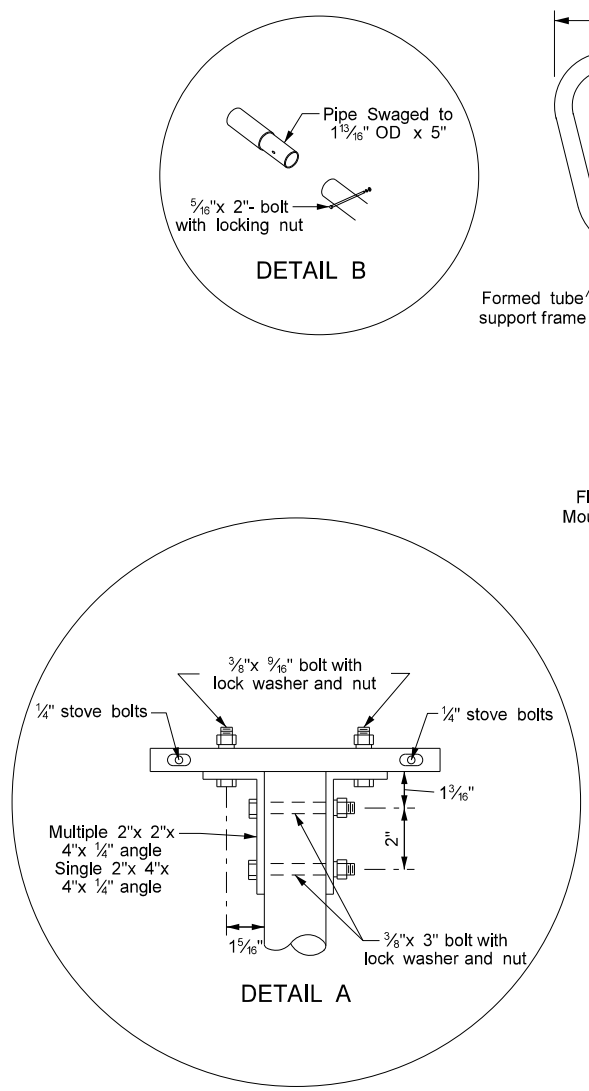
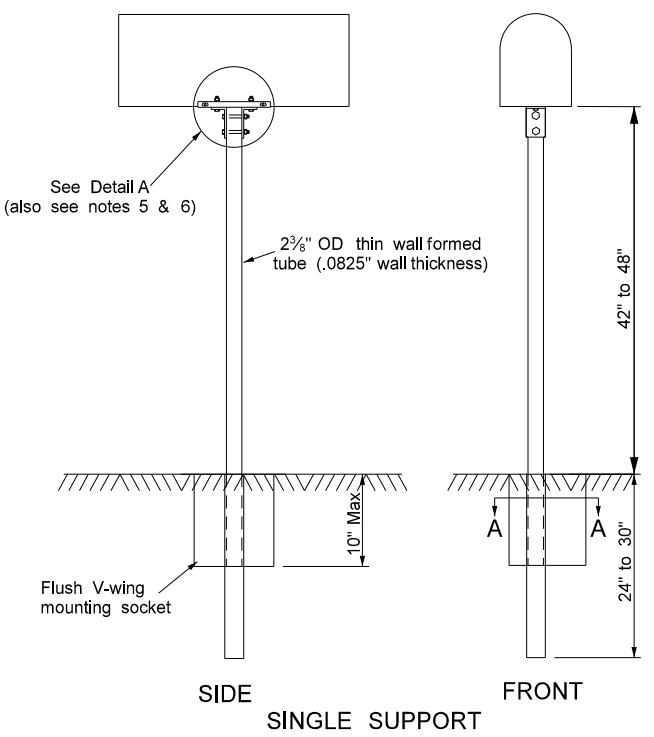
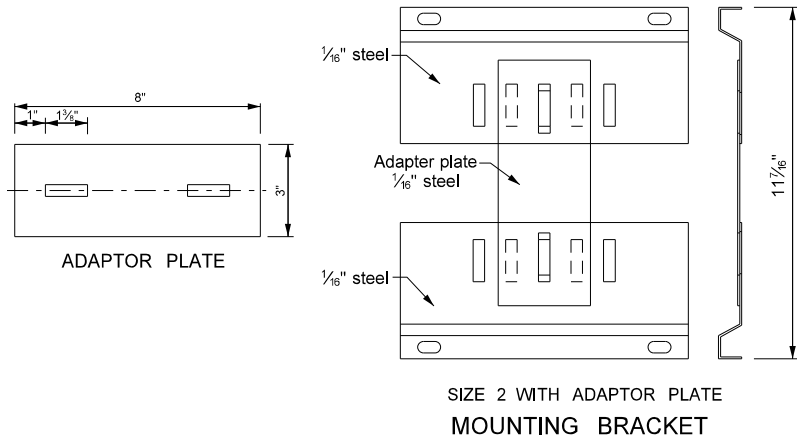
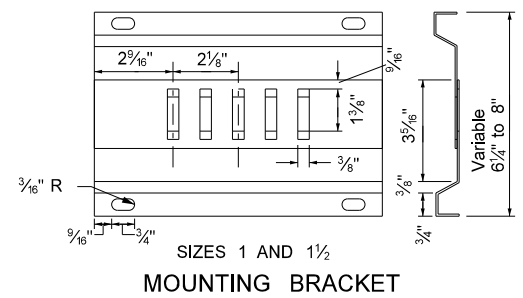
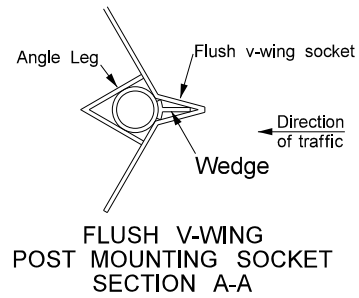
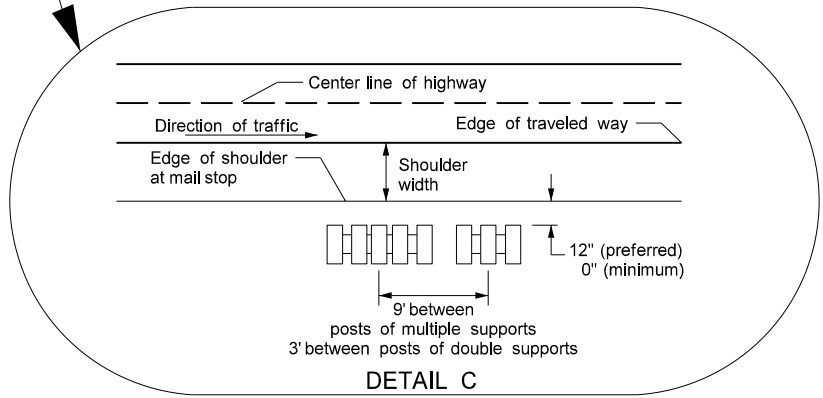
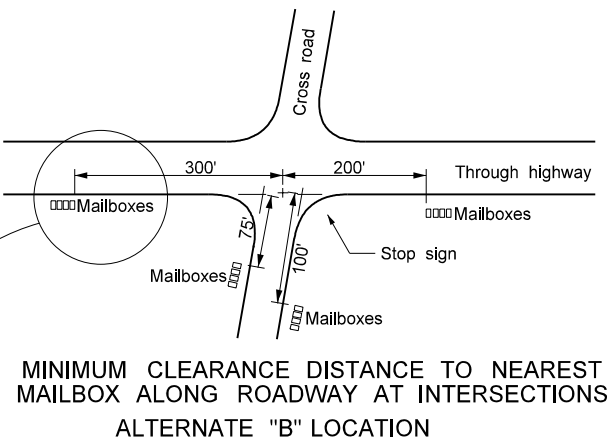
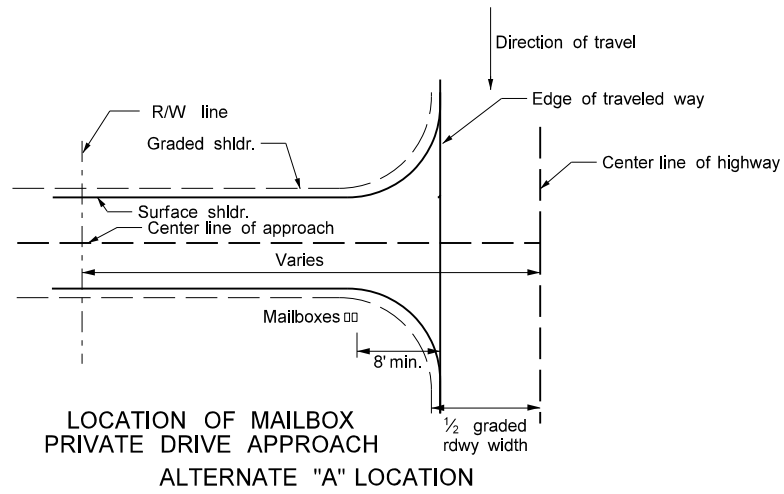
- NOTES:
1. Place no passing zones on two-lane two-way roadways as shown. In lieu of short term no passing zone pavement markings, place no passing zone signs. Replace no passing zone signs with short term no passing zone pavement marking within three days.
 2. Place short term center line stripe (paint) on top lift to match exact placement of permanent stripe.
 3. Remove raised markers and tape markings after permanent pavement marking is installed.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
3-29-16	Re-numbered to be D-762-11 (previously was D-762-6)
10-17-17	Updated to active voice.
8-27-19	New Design Engineer PE Stamp.

This document was originally issued and sealed by
Kirk J Hoff,
Registration Number
PE- 4683,
on 8/27/19 and the original document is stored at the North Dakota Department of Transportation

MAILBOX LOCATION DETAILS

D-766-1



- Notes:
- The mailbox support and hardware details shall consist of the "V-Loc Mailbox Support System" manufactured by:

Tapco
Traffic & Parking Control Co. Inc.
 - Any other equal support system meeting the requirements of NCHRP Report 350, which has been crash tested, and approved by the Federal Highway Administration may be used. Approved alternate mailbox assemblies shall be installed in the manner and arrangement crash tested.
 - The preferred location for all mailboxes is the Alternate "A" location. However, the Engineer may approve the Alternate "B" location if warranted by existing field conditions.
 - Postal regulations require that mailboxes must be located on the right-hand side of the road in the direction traveled by the carrier. Therefore, the Engineer shall contact the local carrier or postmaster before installing new mailboxes to verify the direction of travel.
 - Mailboxes installed on private drive approaches must always be located on the downstream side of the approach.
 - Install angle connection parallel to traffic flow for size 2 mailbox mounted on single posts.
 - Size 2 mailbox mounted on multiple support requires 2 each, 3/8" by 5/16" bolts with lock washers and nuts to attach the adapter plate to mounting bracket. The unit will then require 4 angle connections to attach to the formed tube support frame. See Detail A.
 - Space multiple support frames a minimum of 4 feet apart. Space single support frames a minimum of 3 ft apart. Do not place more than five No. 1 mailboxes, three No. 2 mailboxes, or any combination of four No. 1-A and No. 2 mailboxes on multiple support frames.

TABLE A TYPICAL MAILBOX DIMENSIONS			
Size	Width	Height	Length
1	6.5"	8.5"	19"
1A	8"	10.5"	21"
2	11.5"	13.5"	23.5"

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-15-2010	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by
Roger Weigel,
Registration Number
PE- 2930 ,
on 9/15/2010 and the original document is stored at the
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of Transportation