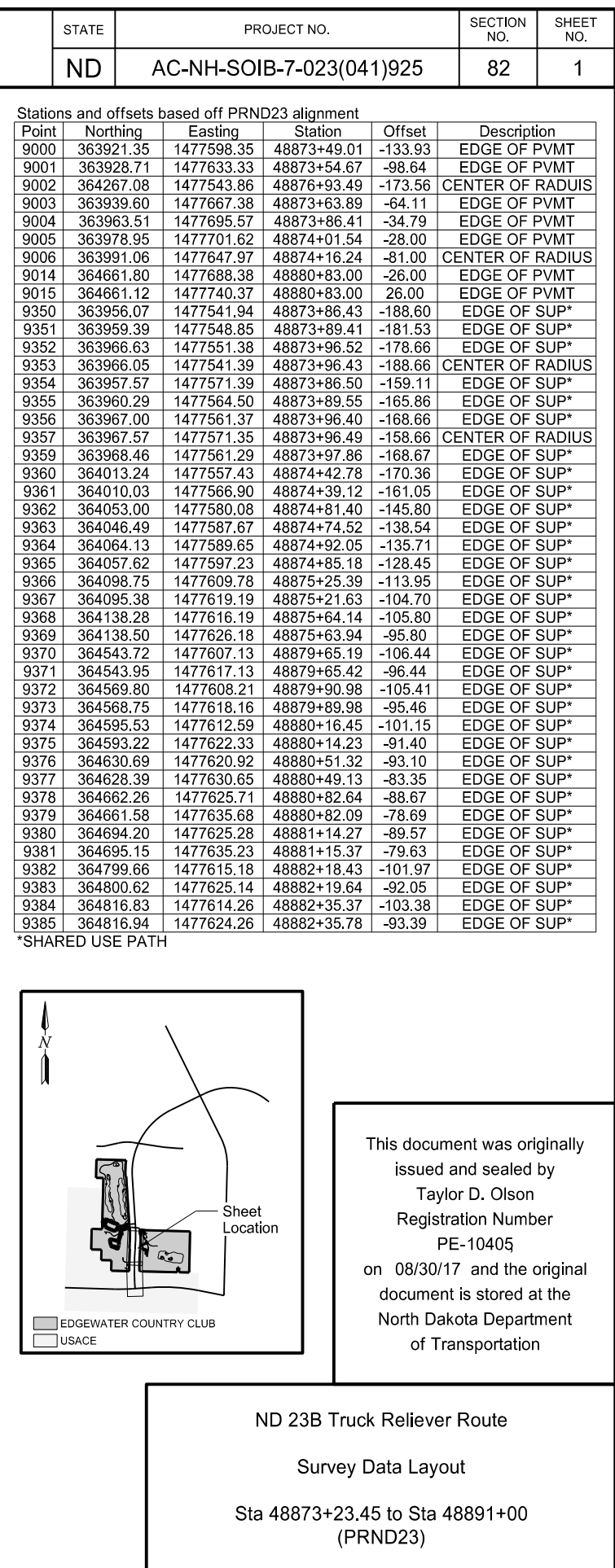
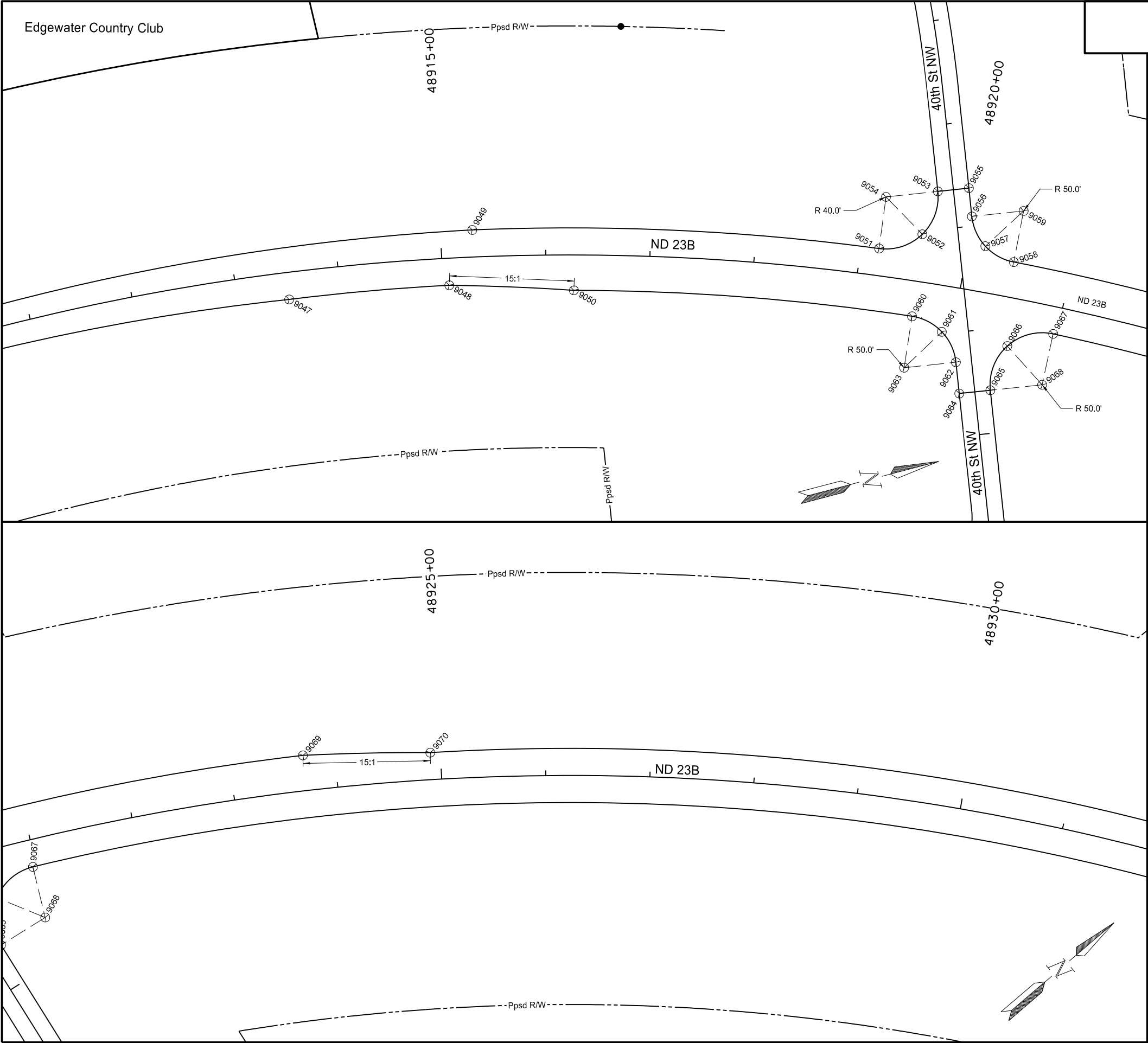
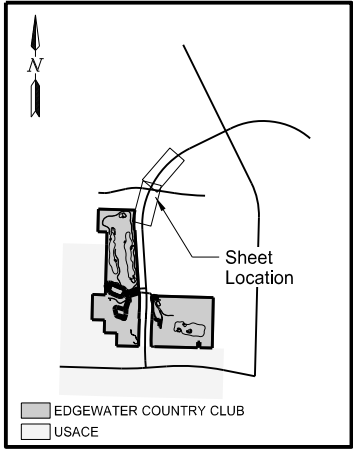






STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	82	3

Stations and offsets based off PRND23 alignment					
Point	Northing	Easting	Station	Offset	Description
9047	367919.57	1477688.94	48913+49.68	26.00	EDGE OF PVMT
9048	368071.75	1477714.68	48915+05.90	26.00	EDGE OF PVMT
9049	368106.56	1477668.89	48915+30.48	-26.00	EDGE OF PVMT
9050	368186.30	1477749.75	48916+27.09	34.00	EDGE OF PVMT
9051	368480.06	1477785.08	48919+17.58	-26.00	EDGE OF PVMT
9052	368523.68	1477782.32	48919+56.10	-45.45	EDGE OF PVMT
9053	368548.46	1477746.32	48919+64.30	-88.34	EDGE OF PVMT
9054	368499.03	1477738.82	48919+17.58	-76.00	CENTER OF RADIUS
9055	368578.13	1477750.81	48919+92.08	-96.23	HMA APPR
9056	368574.02	1477777.87	48919+99.22	-69.89	EDGE OF PVMT
9057	368579.26	1477808.74	48920+16.41	-44.00	EDGE OF PVMT
9058	368601.84	1477830.45	48920+45.57	-34.00	EDGE OF PVMT
9059	368623.46	1477785.36	48920+45.57	-84.00	CENTER OF RADIUS
9060	368494.11	1477856.09	48919+58.15	34.00	EDGE OF PVMT
9061	368518.02	1477877.74	48919+89.30	44.19	EDGE OF PVMT
9062	368523.73	1477909.49	48920+08.11	70.74	EDGE OF PVMT
9063	368474.29	1477902.00	48919+58.15	84.00	CENTER OF RADIUS
9064	368519.20	1477939.37	48920+16.84	99.77	HMA APPR
9065	368548.86	1477943.87	48920+46.88	91.18	EDGE OF PVMT
9066	368575.42	1477906.90	48920+55.00	46.34	EDGE OF PVMT
9067	368620.94	1477906.79	48920+96.40	26.00	EDGE OF PVMT
9068	368598.29	1477951.36	48920+96.40	76.00	CENTER OF RADIUS
9069	368887.51	1477994.21	48923+70.15	-34.00	EDGE OF PVMT
9070	368982.10	1478071.75	48924+90.58	-26.00	EDGE OF PVMT

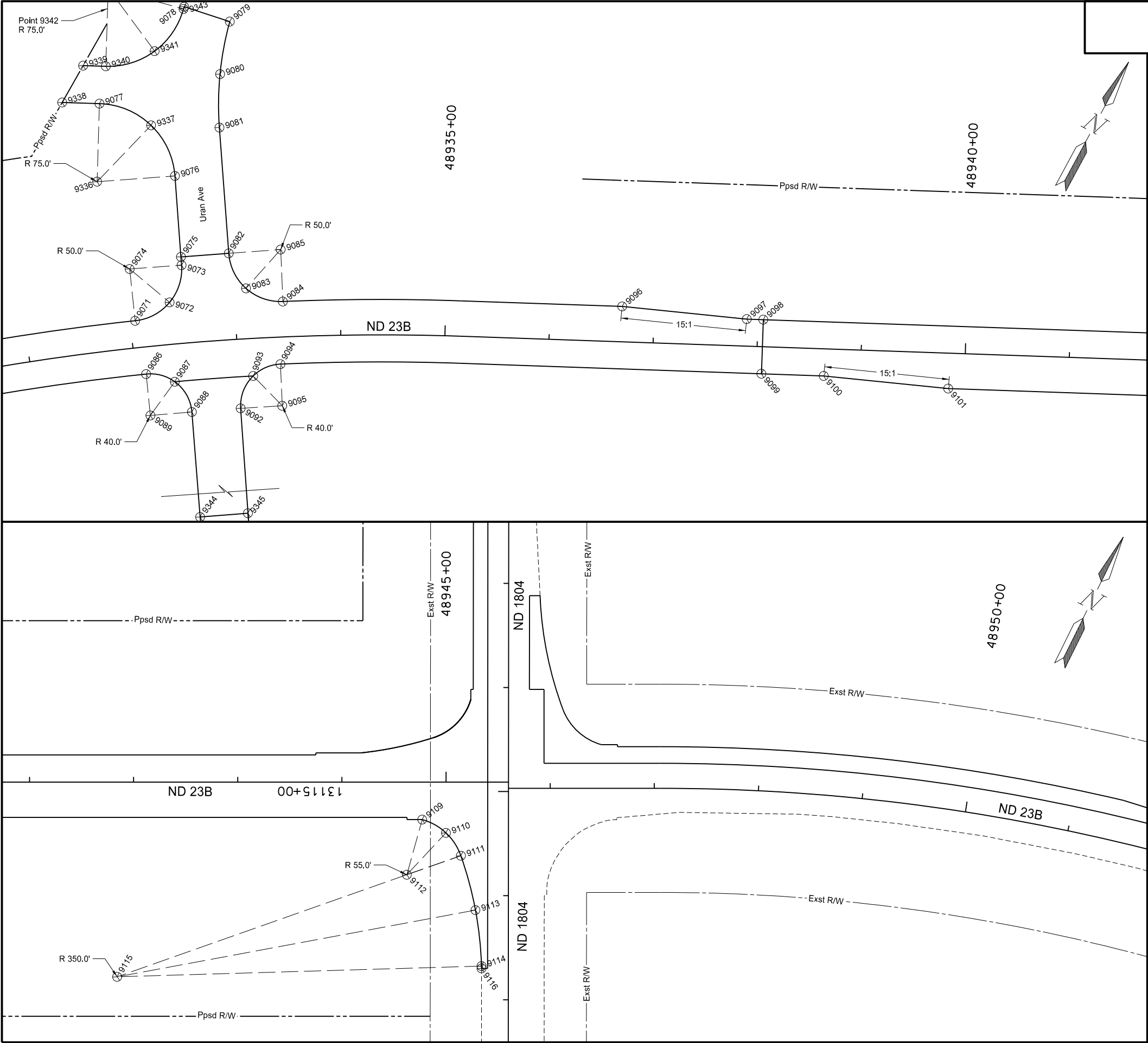


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ND 23B Truck Reliever Route

Survey Data Layout

Sta 48911+00 to Sta 48931+00
(PRND23)



STATE

ND

PROJECT NO.

AC-NH-SOIB-7-023(041)925

SECTION NO.

82

SHEET NO.

4

Stations and offsets based off PRND23 alignment

N

Sheet Location

EDGEWATER COUNTRY CLUB

USACE

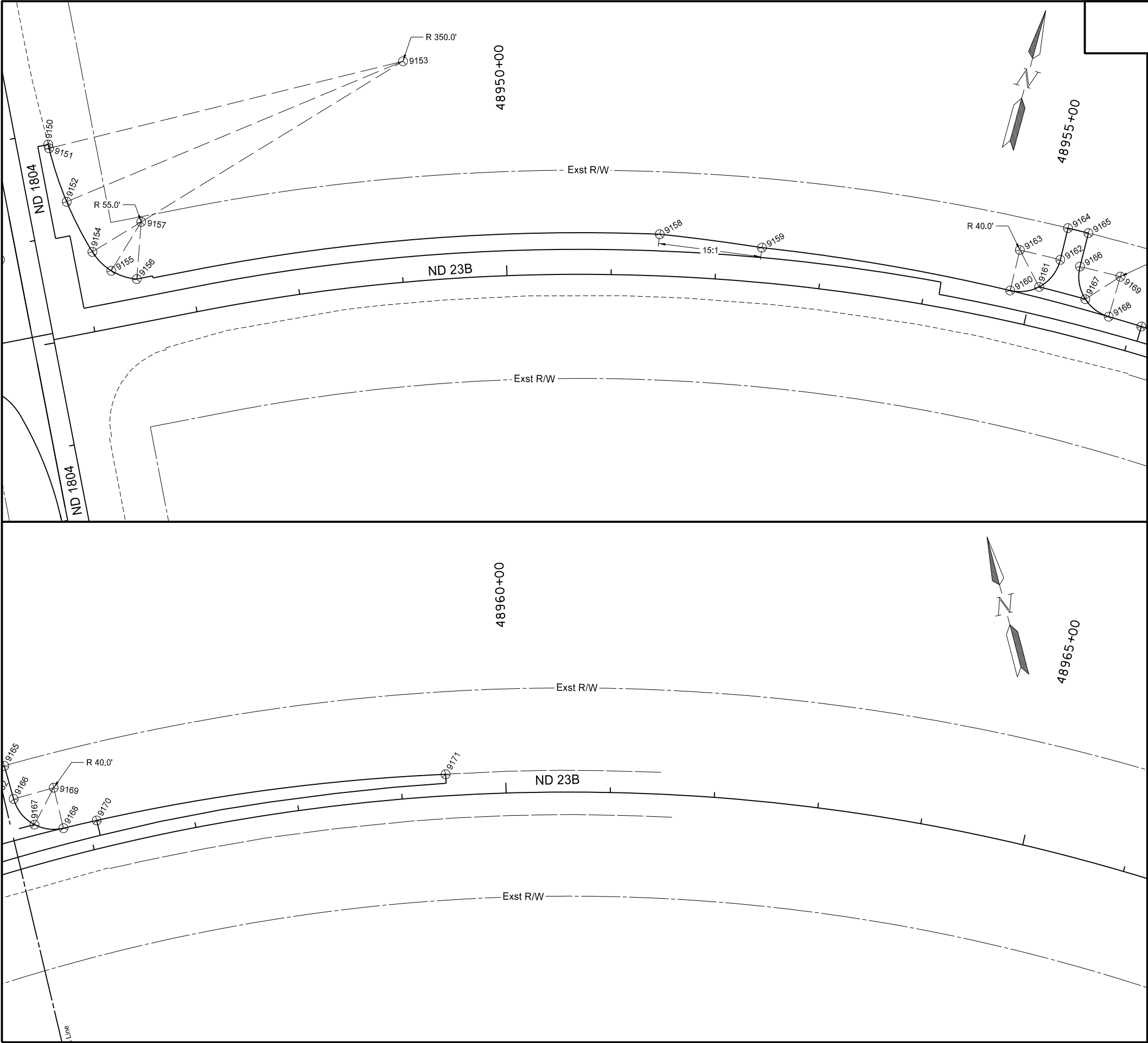
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ND 23B Truck Reliever Route

Survey Data Layout

Sta 48931+00 to Sta 48945+60 (PRND23)

9/29/2017 7:53:53 AM taylorolson P:\State\NDDOT\14214101\CADD\Design\Plans\Sections\082\082SD_004.dgn



STATE

ND

PROJECT NO.

AC-NH-SOIB-7-023(041)925

SECTION NO.

82

SHEET NO.

5

Stations and offsets based off EX23B alignment

N

Sheet Location

EDGEWATER COUNTRY CLUB

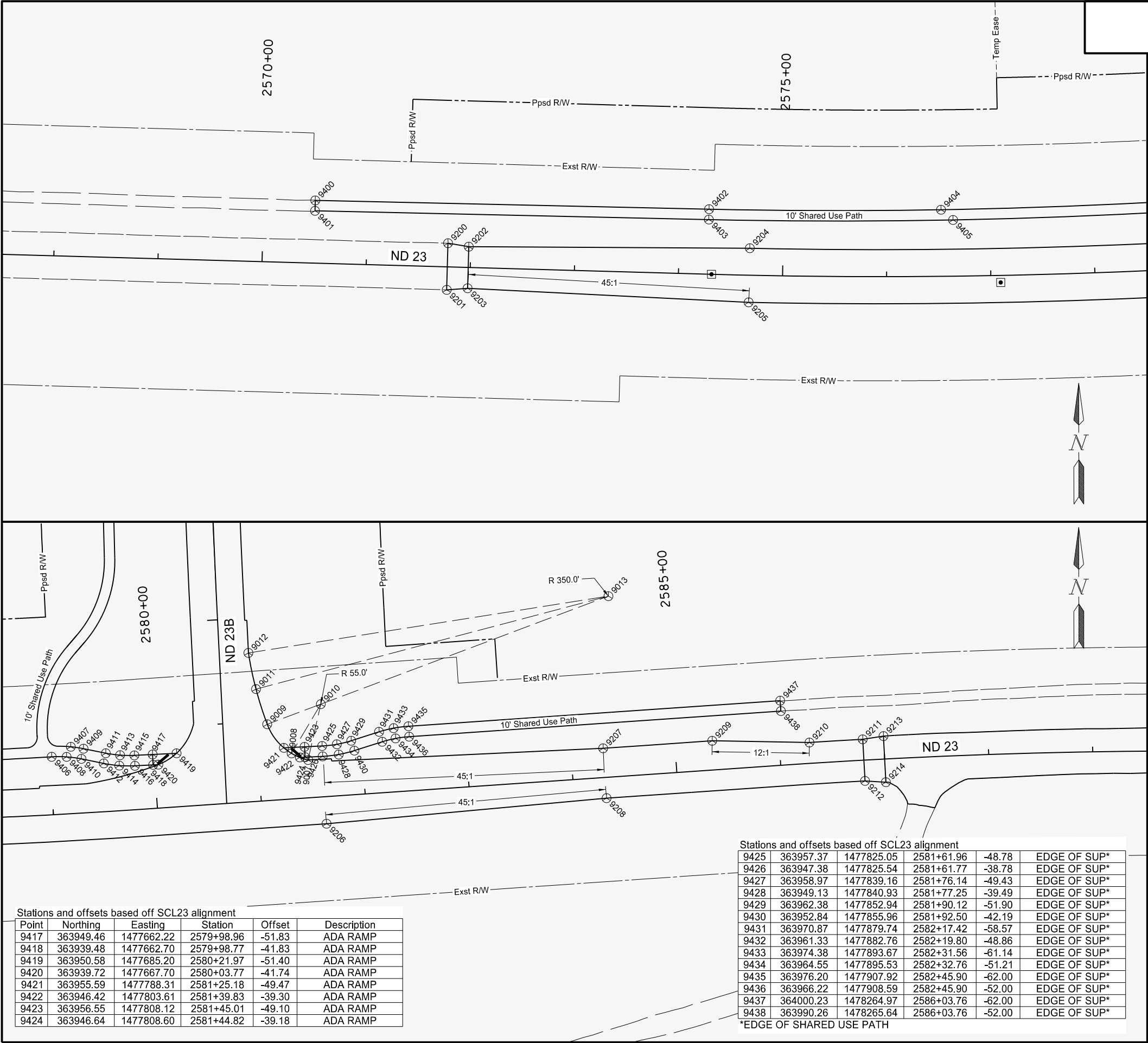
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ND 23B Truck Reliever Route

Survey Data Layout

Sta 48945+60 to Sta 48965+60
(EX23B)



STATE
ND

PROJECT NO.
AC-NH-SOIB-7-023(041)925

SECTION NO.
82

SHEET NO.
6

Stations and offsets based off PRND23 alignment

Point	Northing	Easting	Station	Offset	Description
9007	363943.95	1477811.55	48873+61.25	80.11	EDGE OF PVMT
9008	363950.31	1477795.70	48873+68.38	64.58	EDGE OF PVMT
9009	363978.30	1477772.34	48873+97.46	42.60	EDGE OF PVMT
9010	363997.56	1477823.85	48874+14.20	95.00	CENTER OF RADIUS
9011	364012.12	1477761.61	48874+31.77	33.53	EDGE OF PVMT
9012	364046.86	1477754.36	48874+66.81	27.98	EDGE OF PVMT
9013	364100.86	1478100.17	48875+04.01	376.00	CENTER OF RADIUS

Stations and offsets based off SCL23 alignment

9200	363916.81	1476845.87	2571+78.00	-22.75	EDGE OF PVMT
9201	363872.03	1476844.54	2571+78.00	22.06	EDGE OF PVMT
9202	363913.47	1476865.78	2571+98.00	-20.00	EDGE OF PVMT
9203	363873.49	1476864.59	2571+98.00	20.00	EDGE OF PVMT
9204	363911.57	1477135.67	2574+68.00	-26.00	EDGE OF PVMT
9205	363859.59	1477134.46	2574+68.00	26.00	EDGE OF PVMT
9206	363882.70	1477829.12	2581+61.00	26.00	EDGE OF PVMT
9207	363954.71	1478094.88	2584+31.00	-28.00	EDGE OF PVMT
9208	363906.82	1478098.11	2584+31.00	20.00	EDGE OF PVMT
9209	363961.76	1478199.64	2585+36.00	-28.00	EDGE OF PVMT
9210	363959.97	1478292.99	2586+28.92	-20.00	EDGE OF PVMT
9211	363962.96	1478344.15	2586+80.00	-20.00	EDGE OF PVMT
9212	363923.02	1478346.31	2586+80.00	20.00	EDGE OF PVMT
9213	363966.03	1478364.09	2587+00.00	-22.03	EDGE OF PVMT
9214	363921.72	1478366.33	2587+00.00	22.34	EDGE OF PVMT
9400	363958.11	1476718.44	2570+49.40	-60.25	EDGE OF SUP*
9401	363948.12	1476718.20	2570+49.46	-50.25	EDGE OF SUP*
9402	363949.14	1477096.59	2574+27.65	-62.50	EDGE OF SUP*
9403	363939.14	1477096.35	2574+27.71	-52.50	EDGE OF SUP*
9404	363948.23	1477319.33	2576+52.85	-63.99	EDGE OF SUP*
9405	363938.42	1477330.90	2576+64.44	-54.07	EDGE OF SUP*
9406	363947.38	1477565.29	2579+01.27	-55.63	EDGE OF SUP*
9407	363956.98	1477583.69	2579+20.36	-64.22	EDGE OF SUP*
9408	363947.29	1477579.64	2579+15.74	-54.77	EDGE OF SUP*
9409	363955.13	1477595.86	2579+32.55	-61.68	EDGE OF SUP*
9410	363945.33	1477593.85	2579+29.96	-52.01	EDGE OF SUP*
9411	363950.73	1477617.31	2579+53.91	-56.01	EDGE OF SUP*
9412	363940.93	1477615.30	2579+51.29	-46.36	EDGE OF SUP*
9413	363948.81	1477630.96	2579+67.55	-53.24	EDGE OF SUP*
9414	363938.84	1477630.19	2579+66.13	-43.34	EDGE OF SUP*
9415	363948.62	1477644.74	2579+81.41	-52.15	EDGE OF SUP*
9416	363938.63	1477645.22	2579+81.23	-42.15	EDGE OF SUP*

*EDGE OF SHARED USE PATH

EDGEWATER COUNTRY CLUB

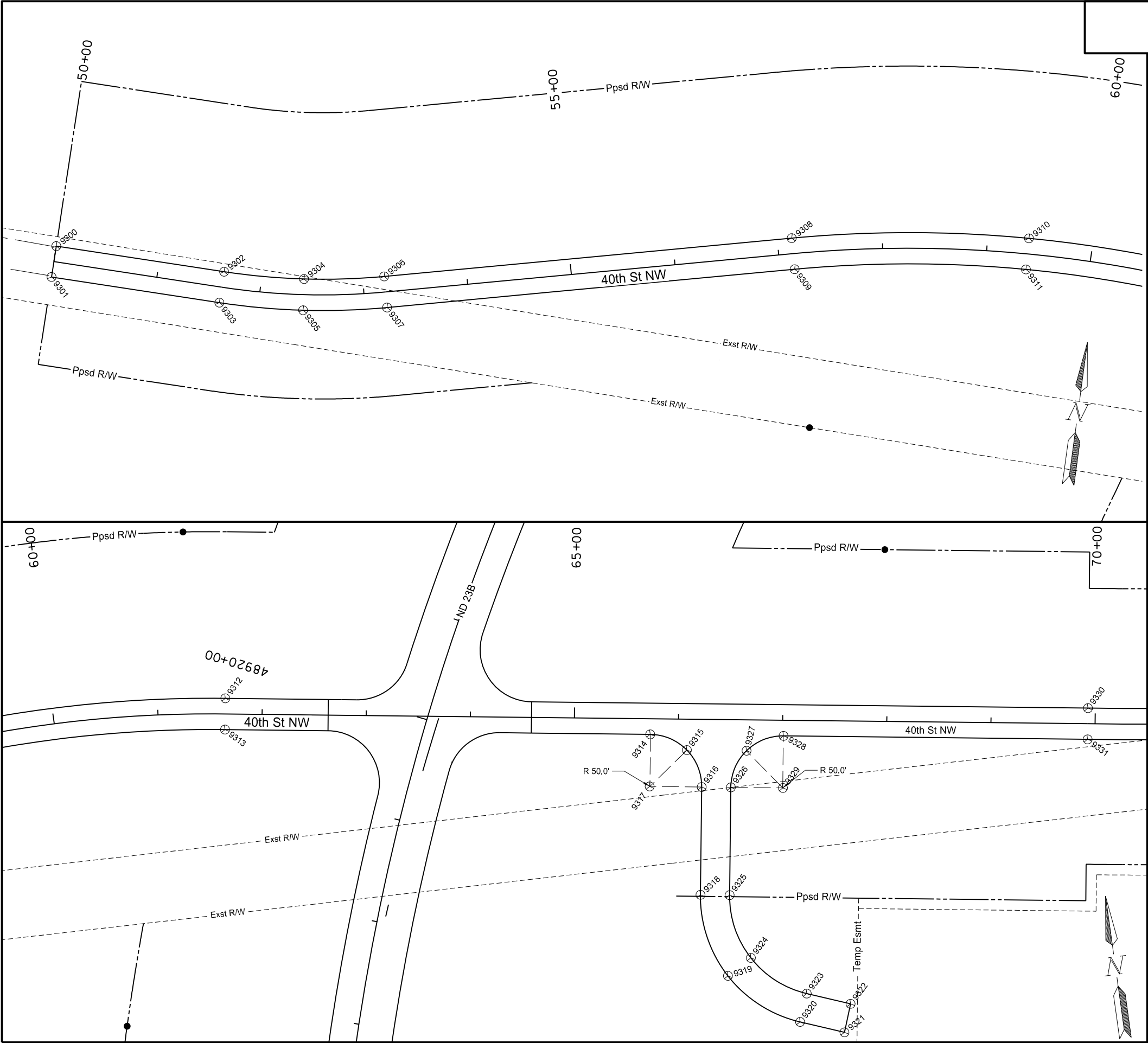
USACE

Sheet Location

ND 23B Truck Reliever Route

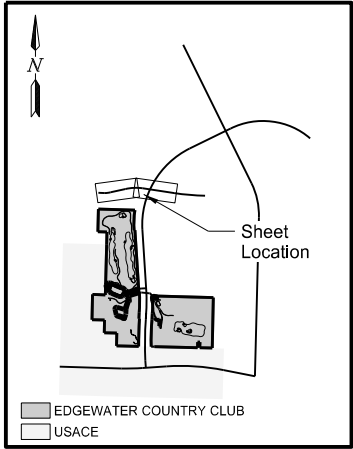
Survey Data Layout

Sta 2569+00 to Sta 2589+00 (SCL23)



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	82	8

Stations and offsets based off PR40ST alignment					
Point	Northing	Easting	Station	Offset	Description
9300	368473.06	1476500.97	50+00.00	-15.00	EDGE OF AGGR
9301	368443.07	1476500.45	50+00.00	15.00	EDGE OF AGGR
9302	368470.24	1476663.94	51+63.00	-15.00	EDGE OF AGGR
9303	368440.25	1476663.42	51+63.00	15.00	EDGE OF AGGR
9304	368473.63	1476740.90	52+41.92	-15.00	EDGE OF AGGR
9305	368443.80	1476744.06	52+41.92	15.00	EDGE OF AGGR
9306	368486.42	1476816.87	53+20.85	-15.00	EDGE OF AGGR
9307	368457.20	1476823.65	53+20.85	15.00	EDGE OF AGGR
9308	368575.34	1477199.80	57+13.96	-15.00	EDGE OF AGGR
9309	368546.12	1477206.58	57+13.96	15.00	EDGE OF AGGR
9310	368605.66	1477425.56	59+39.25	-15.00	EDGE OF AGGR
9311	368575.69	1477426.72	59+39.25	15.00	EDGE OF AGGR
9312	368592.96	1477652.99	61+64.54	-15.00	EDGE OF AGGR
9313	368563.30	1477648.49	61+64.54	15.00	EDGE OF AGGR
9314	368502.08	1478052.29	65+72.95	15.00	EDGE OF AGGR
9315	368482.30	1478085.05	66+08.31	29.64	AGGR APPR
9316	368445.15	1478094.23	66+22.95	65.00	AGGR APPR
9317	368452.64	1478044.80	65+72.95	65.00	CENTER OF RADIUS
9318	368342.78	1478078.71	66+22.96	168.53	AGGR APPR
9319	368262.02	1478094.03	66+50.21	246.09	AGGR APPR
9320	368208.58	1478156.50	67+19.98	289.56	AGGR APPR
9321	368192.76	1478197.31	67+62.70	299.08	AGGR APPR
9322	368219.07	1478206.92	67+68.26	271.63	AGGR APPR
9323	368234.69	1478166.62	67+26.07	262.23	AGGR APPR
9324	368276.06	1478118.26	66+72.05	228.58	AGGR APPR
9325	368338.59	1478106.40	66+50.96	168.53	AGGR APPR
9326	368440.95	1478121.91	66+50.95	65.00	AGGR APPR
9327	368473.71	1478141.69	66+65.60	29.65	AGGR APPR
9328	368482.89	1478178.84	67+00.95	15.00	EDGE OF AGGR
9329	368433.45	1478171.35	67+00.95	65.00	CENTER OF RADIUS
9330	368468.77	1478472.07	69+92.98	-15.00	EDGE OF AGGR
9331	368439.11	1478467.58	69+92.98	15.00	EDGE OF AGGR



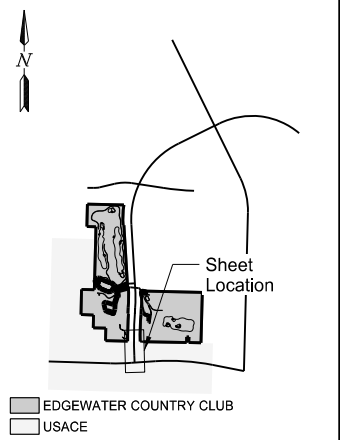
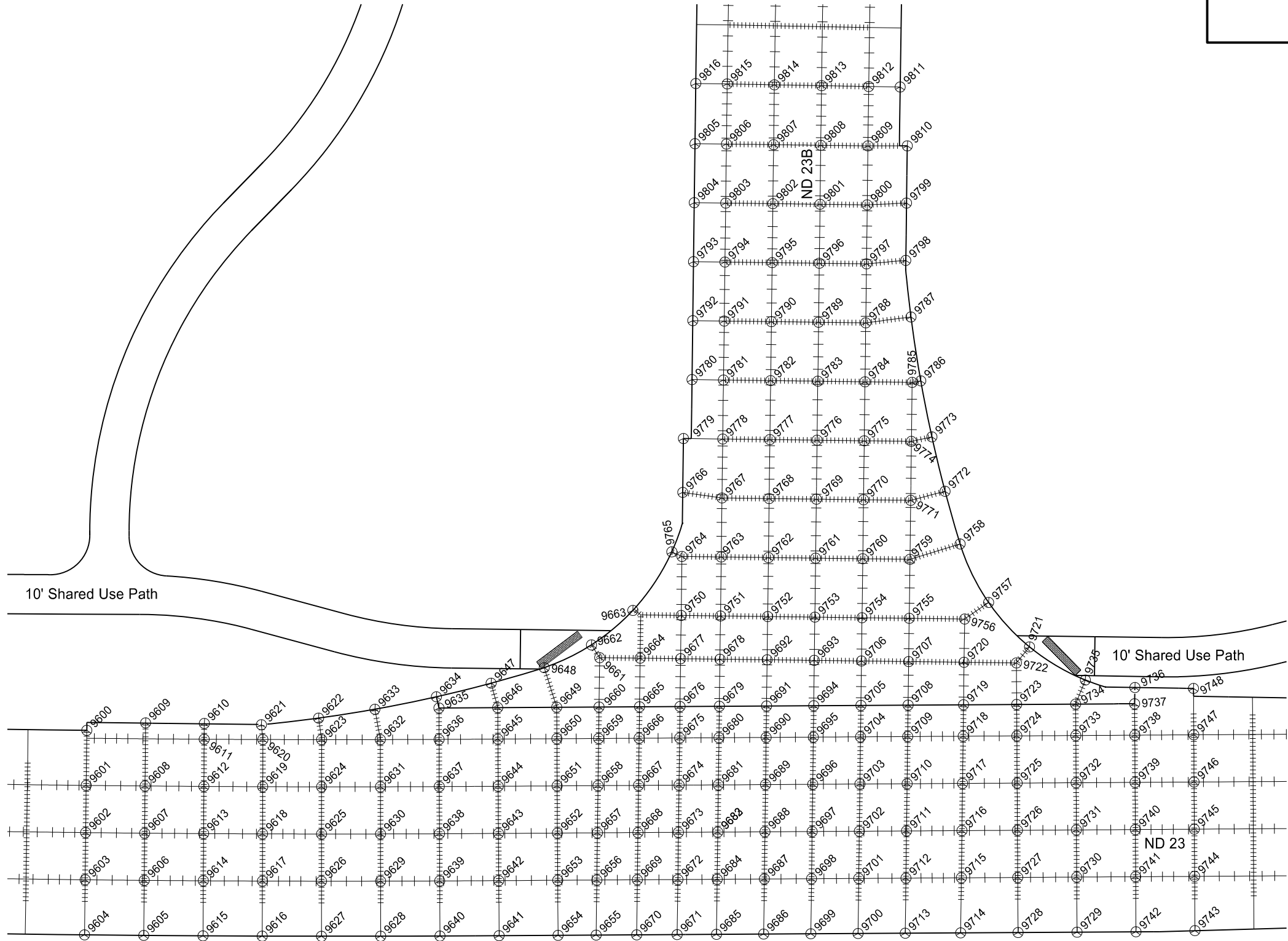
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ND 23B Truck Reliever Route

Survey Data Layout

Sta 50+00.00 to Sta 70+00.00
(PR40ST)

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	82	10

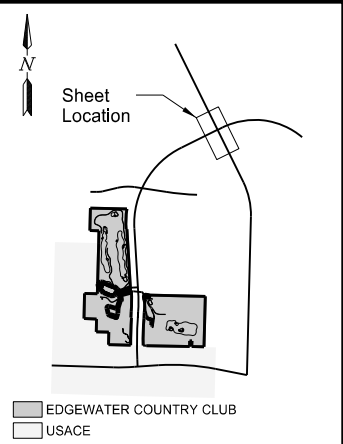
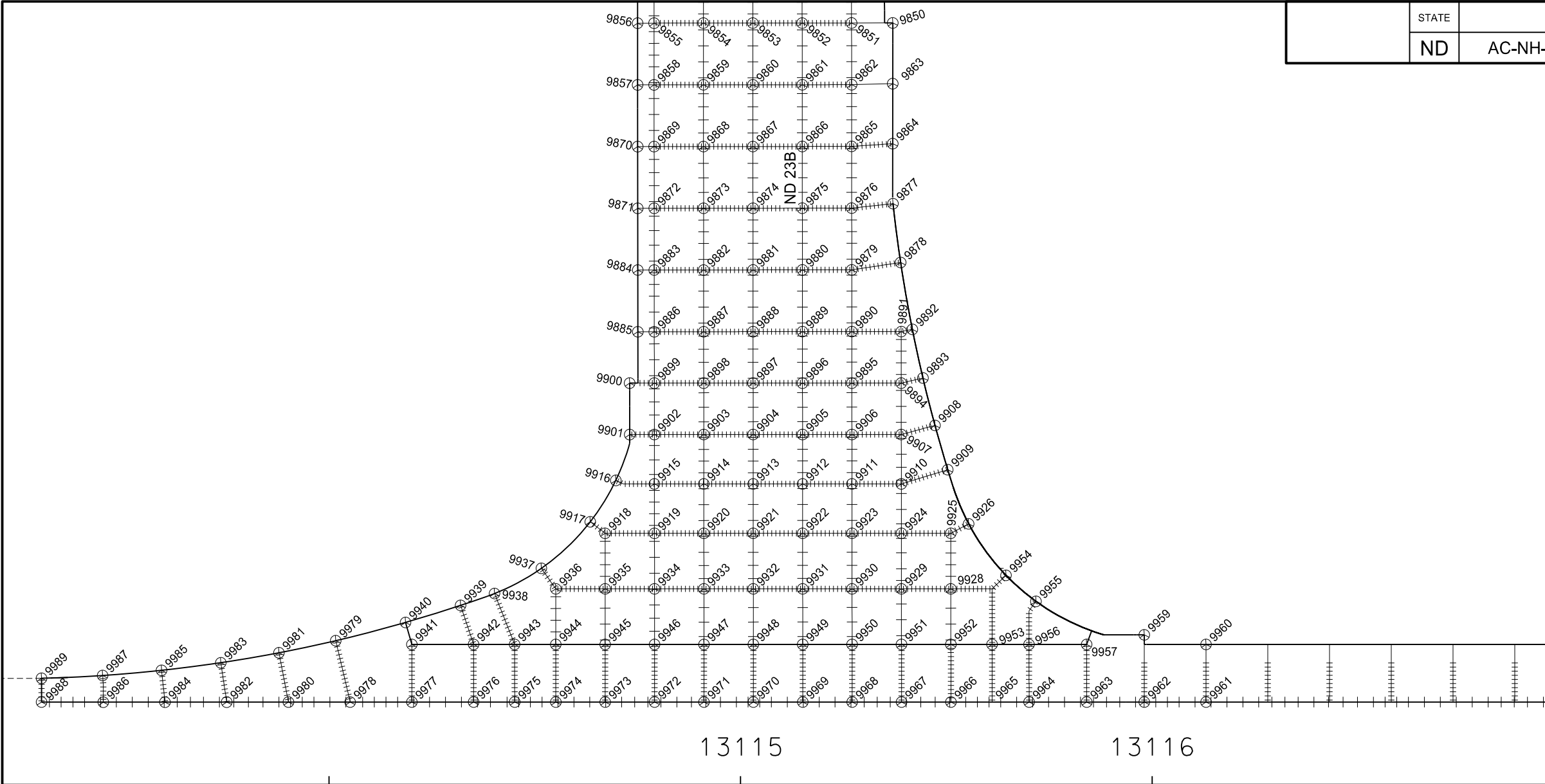


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ND 23B Truck Reliever Route
Elevation Data Points
South Intersection
(SCL23 & PRND23)

Notes:
1. Centerline omitted for clarity.
2. Refer to Sec 82 Sheet 12 for intersection point details.

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	82	11



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ND 23B Truck Reliever Route
Elevation Data Points
North Intersection
(PRND23, SCL1804, EX23B)

Notes:
1. PRND23 centerline omitted for clarity.
2. Refer to Sec 82 Sheet 12 for intersection point details.

Stations and offsets based off SCL23 alignment

Point	Northing	Easting	Elevation	Station	Offset
9600	363917.12	1477553.64	1883.05	2578+88.00	-26.00
9601	363903.14	1477554.34	1883.34	2578+88.00	-12.00
9602	363891.16	1477554.94	1883.59	2578+88.00	0.00
9603	363879.17	1477555.53	1883.34	2578+88.00	12.00
9604	363865.19	1477556.23	1883.05	2578+88.00	26.00
9605	363865.96	1477571.28	1883.10	2579+03.00	26.00
9606	363879.94	1477570.55	1883.39	2579+03.00	12.00
9607	363891.92	1477569.92	1883.64	2579+03.00	0.00
9608	363903.91	1477569.29	1883.39	2579+03.00	-12.00
9609	363919.95	1477568.45	1883.10	2579+03.01	-28.06
9610	363920.70	1477583.37	1883.13	2579+18.02	-28.01
9611	363916.28	1477583.59	1883.19	2579+18.00	-23.59
9612	363904.71	1477584.23	1883.44	2579+18.00	-12.00
9613	363892.73	1477584.89	1883.69	2579+18.00	0.00
9614	363880.75	1477585.56	1883.44	2579+18.00	12.00
9615	363866.77	1477586.33	1883.14	2579+18.00	26.00
9616	363867.62	1477601.37	1883.18	2579+33.00	26.00
9617	363881.60	1477600.56	1883.48	2579+33.00	12.00
9618	363893.58	1477599.87	1883.73	2579+33.00	0.00
9619	363905.56	1477599.18	1883.48	2579+33.00	-12.00
9620	363917.54	1477598.48	1883.23	2579+33.00	-24.00
9621	363921.27	1477597.88	1883.15	2579+32.61	-27.76
9622	363923.83	1477612.30	1883.15	2579+47.23	-29.47
9623	363918.42	1477613.40	1883.27	2579+48.00	-24.00
9624	363906.44	1477614.12	1883.51	2579+48.00	-12.00
9625	363894.46	1477614.84	1883.77	2579+48.00	0.00
9626	363882.49	1477615.57	1883.51	2579+48.00	12.00
9627	363868.51	1477616.41	1883.22	2579+48.00	26.00
9628	363869.44	1477631.45	1883.25	2579+63.00	26.00
9629	363883.41	1477630.57	1883.55	2579+63.00	12.00
9630	363895.39	1477629.82	1883.80	2579+63.00	0.00
9631	363907.37	1477629.06	1883.55	2579+63.00	-12.00
9632	363919.34	1477628.30	1883.29	2579+63.00	-24.00
9633	363926.96	1477626.45	1883.13	2579+61.62	-31.72
9634	363931.08	1477641.87	1882.91	2579+77.36	-34.84
9635	363928.28	1477642.69	1883.15	2579+78.00	-31.99
9636	363920.30	1477643.21	1883.21	2579+78.00	-24.00
9637	363908.33	1477644.00	1883.57	2579+78.00	-12.00
9638	363896.35	1477644.78	1883.82	2579+78.00	0.00
9639	363884.38	1477645.57	1883.57	2579+78.00	12.00
9640	363870.41	1477646.49	1883.28	2579+78.00	26.00
9641	363871.41	1477661.50	1883.30	2579+93.00	26.00
9642	363885.38	1477660.56	1883.59	2579+93.00	12.00
9643	363897.35	1477659.75	1883.84	2579+93.00	0.00
9644	363909.33	1477658.95	1883.52	2579+93.00	-12.00
9645	363921.30	1477658.14	1883.22	2579+93.00	-24.00
9646	363929.28	1477657.60	1883.03	2579+93.00	-32.00
9647	363935.38	1477655.55	1882.89	2579+91.36	-38.22
9648	363940.16	1477668.80	1882.98	2580+04.90	-42.10
9649	363930.29	1477672.57	1883.20	2580+08.00	-32.00
9650	363922.31	1477673.11	1883.35	2580+08.00	-24.00
9651	363910.33	1477673.91	1883.60	2580+08.00	-12.00
9652	363898.36	1477674.72	1883.86	2580+08.00	0.00
9653	363886.39	1477675.52	1883.61	2580+08.00	12.00
9654	363872.42	1477676.46	1883.31	2580+08.00	26.00
9655	363873.07	1477686.13	1883.32	2580+17.69	26.00
9656	363887.06	1477685.45	1883.62	2580+17.95	12.00
9657	363899.04	1477684.87	1883.87	2580+18.18	0.00
9658	363911.03	1477684.29	1883.65	2580+18.40	-12.00
9659	363923.02	1477683.71	1883.48	2580+18.62	-24.00
9660	363931.01	1477683.32	1883.36	2580+18.77	-32.00
9661	363943.54	1477682.71	1883.16	2580+19.01	-44.54
9662	363946.66	1477680.43	1883.08	2580+16.94	-47.81
9663	363951.34	1477686.01	1882.94	2580+22.82	-52.10
9664	363944.04	1477693.00	1883.22	2580+29.31	-44.35
9665	363931.70	1477693.60	1883.39	2580+29.08	-32.00
9666	363923.71	1477693.98	1883.49	2580+28.93	-24.00
9667	363911.72	1477694.57	1883.68	2580+28.70	-12.00
9668	363899.74	1477695.15	1883.87	2580+28.48	0.00
9669	363887.75	1477695.73	1883.62	2580+28.25	12.00
9670	363873.76	1477696.41	1883.33	2580+27.99	26.00
9671	363874.45	1477706.69	1883.33	2580+38.29	26.00
9672	363888.44	1477706.01	1883.62	2580+38.55	12.00
9673	363900.43	1477705.43	1883.88	2580+38.78	0.00
9674	363912.42	1477704.85	1883.61	2580+39.00	-12.00
9675	363924.40	1477704.26	1883.52	2580+39.23	-24.00
9676	363932.40	1477703.88	1883.43	2580+39.38	-32.00
9677	363944.54	1477703.29	1883.29	2580+39.61	-44.16
9678	363945.03	1477713.27	1883.35	2580+49.60	-43.97
9679	363933.07	1477713.85	1883.49	2580+49.38	-32.00
9680	363925.08	1477714.24	1883.58	2580+49.23	-24.00

Stations and offsets based off SCL23 alignment

Point	Northing	Easting	Elevation	Station	Offset
9681	363913.09	1477714.82	1883.74	2580+49.01	-12.00
9682	363901.10	1477715.41	1883.88	2580+48.78	0.00
9683	363901.10	1477715.41	1883.88	2580+48.78	0.00
9684	363889.11	1477715.99	1883.63	2580+48.56	12.00
9685	363875.13	1477716.67	1883.33	2580+48.29	26.00
9686	363875.93	1477728.64	1883.33	2580+60.30	26.00
9687	363889.92	1477727.96	1883.62	2580+60.56	12.00
9688	363901.91	1477727.38	1883.87	2580+60.78	0.00
9689	363913.89	1477726.80	1883.77	2580+61.01	-12.00
9690	363925.88	1477726.22	1883.66	2580+61.23	-24.00
9691	363933.87	1477725.83	1883.59	2580+61.38	-32.00
9694	363934.68	1477737.80	1883.57	2580+73.38	-32.00
9695	363926.69	1477738.19	1883.64	2580+73.23	-24.00
9696	363914.70	1477738.77	1883.75	2580+73.01	-12.00
9697	363902.71	1477739.36	1883.87	2580+72.79	0.00
9698	363890.72	1477739.94	1883.62	2580+72.56	12.00
9699	363876.74	1477740.62	1883.32	2580+72.30	26.00
9700	363877.54	1477752.59	1883.31	2580+84.30	26.00
9701	363891.53	1477751.91	1883.61	2580+84.56	12.00
9702	363903.52	1477751.33	1883.86	2580+84.79	0.00
9703	363915.51	1477750.75	1883.73	2580+85.01	-12.00
9704	363927.49	1477750.17	1883.64	2580+85.24	-24.00
9705	363935.49	1477749.78	1883.55	2580+85.39	-32.00
9708	363936.29	1477761.75	1883.47	2580+97.39	-32.00
9709	363928.30	1477762.14	1883.56	2580+97.24	-24.00
9710	363916.31	1477762.72	1883.70	2580+97.01	-12.00
9711	363904.32	1477763.31	1883.85	2580+96.79	0.00
9712	363892.34	1477763.89	1883.60	2580+96.56	12.00
9713	363878.35	1477764.57	1883.30	2580+96.30	26.00
9714	363879.30	1477778.64	1883.29	2581+10.41	26.00
9715	363893.28	1477777.96	1883.58	2581+10.67	12.00
9716	363905.27	1477777.38	1883.83	2581+10.89	0.00
9717	363917.26	1477776.79	1883.67	2581+11.12	-12.00
9718	363929.25	1477776.21	1883.50	2581+11.34	-24.00
9719	363937.24	1477775.82	1883.40	2581+11.49	-32.00
9720	363948.04	1477775.30	1883.26	2581+11.69	-42.81
9721	363952.95	1477791.68	1883.13	2581+28.36	-46.61
9722	363948.68	1477788.59	1883.20	2581+25.00	-42.56
9723	363938.15	1477789.30	1883.35	2581+25.00	-32.00
9724	363930.16	1477789.84	1883.46	2581+25.00	-24.00
9725	363918.19	1477790.65	1883.63	2581+25.00	-12.00
9726	363906.22	1477791.45	1883.81	2581+25.00	0.00
9727	363894.25	1477792.26	1883.56	2581+25.00	12.00
9728	363880.28	1477793.20	1883.26	2581+25.00	26.00
9729	363881.28	1477808.17	1883.24	2581+40.00	26.00
9730	363895.25	1477807.23	1883.53	2581+40.00	12.00
9731	363907.23	1477806.42	1883.79	2581+40.00	0.00
9732	363919.20	1477805.61	1883.61	2581+40.00	-12.00
9733	363931.17	1477804.81	1883.43	2581+40.00	-24.00
9734	363939.15	1477804.27	1883.31	2581+40.00	-32.00
9735	363945.41	1477806.37	1882.95	2581+42.51	-38.10
9737	363940.16	1477819.24	1883.32	2581+55.00	-32.00
9738	363932.18	1477819.77	1883.34	2581+55.00	-24.00
9739	363920.21	1477820.58	1883.51	2581+55.00	-12.00
9740	363908.23	1477821.39	1883.76	2581+55.00	0.00
9741	363896.26	1477822.19	1883.51	2581+55.00	12.00
9742	363882.29	1477823.13	1883.22	2581+55.00	26.00
9743	363883.50	1477838.08	1883.20	2581+70.00	25.80
9744	363897.27	1477837.16	1883.49	2581+70.00	12.00
9745	363909.24	1477836.35	1883.74	2581+70.00	0.00
9746	363921.21	1477835.55	1883.49	2581+70.00	-12.00
9747	363933.19	1477834.74	1883.23	2581+70.00	-24.00

Stations and offsets based off PRND23 alignment

Point	Northing	Easting	Elevation	Station	Offset
9692	363945.61	1477725.26	1883.47	48873+67.09	-6.00
9693	363946.19	1477737.25	1883.46	48873+67.09	6.00
9706	363946.77	1477749.23	1883.39	48873+67.09	30.00
9707	363947.35	1477761.22	1883.34	48873+67.09	18.00
9736	363944.29	1477819.05	1883.29	48873+61.23	87.62
9748	363944.96	1477833.95	1883.03	48873+61.17	-35.80
9750	363955.53	1477702.75	1882.63	48873+78.09	-28.00
9751	363956.01	1477712.74	1882.75	48873+78.09	-18.00
9752	363956.59	1477724.73	1882.92	48873+78.09	-6.00
9753	363957.18	1477736.71	1883.37	48873+78.09	6.00
9754	363957.76	1477748.70	1883.32	48873+78.09	18.00
9755	363958.34	1477760.68	1883.28	48873+78.09	30.00
9756	363959.02	1477774.77	1882.57	48873+78.09	44.10
9757	363963.60	1477780.59	1881.91	48873+82.38	50.14
9758	363978.00	1477772.45	1883.40	48873+97.16	42.70
9759	363973.32	1477759.96	1883.31	48873+93.09	30.00
9760	363972.74	1477747.97	1883.35	48873+93.09	18.00
9761	363972.16	1477735.99	1883.39	48873+93.09	6.00
9762	363971.58	1477724.00	1883.37	48873+93.09	-6.00
9763	363970.99	1477712.01	1883.18	48873+93.09	-18.00
9764	363970.51	1477702.03	1883.05	48873+93.09	-28.00
9765	363971.52	1477699.38	1883.06	48873+94.22	-30.60
9766	363986.78	1477701.24	1883.14	48874+09.38	-28.00
9767	363985.98	1477711.29	1883.31	48874+08.09	-18.00
9768	363986.56	1477723.27	1883.51	48874+08.09	-6.00
9769	363987.14	1477735.26	1883.61	48874+08.09	6.00
9770	363987.72	1477747.24	1883.58	48874+08.09	18.00
9771	363988.30	1477759.23	1883.55	48874+08.09	30.00
9772	363991.14	1477767.82	1883.56	48874+10.51	38.72
9773	364004.75	1477763.63	1883.71	48874+24.30	35.19
9774	364003.29	1477758.80	1883.72	48874+23.09	30.00
9775	364002.70	1477746.52	1883.75	48874+23.09	18.00
9776	364002.12	1477734.53	1883.79	48874+23.09	6.00
9777	364001.54	1477722.54	1883.69	48874+23.09	-6.00
9778	364000.96	1477710.56	1883.44	48874+23.09	-18.00
9779	364000.57	1477700.57	1883.22	48874+23.09	-28.00
9780	364015.55	1477701.84	1883.46	48874+38.09	-26.00
9781	364015.94	1477709.83	1883.63	48874+38.09	-18.00
9782	364016.52	1477721.82	1883.88	48874+38.09	-6.00
9783	364017.11	1477733.80	1883.98	48874+38.09	6.00
9784	364017.69	1477745.79	1883.93	48874+38.09	18.00
9785	364018.27	1477757.78	1883.88	48874+38.09	30.00
9786	364018.79	1477759.93	1883.87	48874+38.51	32.18
9787	364034.86	1477756.45	1884.05	48874+54.72	29.48
9788	364032.67	1477745.06	1884.10	48874+53.09	18.00
9789	364032.09	1477733.08	1884.18	48874+53.09	6.00
9790	364031.51	1477721.09	1884.10	48874+53.09	-6.00
9791	364030.92	1477709.10	1883.85	48874+53.09	-18.00
9792	364030.54	1477701.11	1883.68	48874+53.09	-26.00
9793	364045.52	1477700.39	1883.93	48874+68.09	-26.00
9794	364045.91	1477708.38	1884.09	48874+68.09	-18.00
9795	364046.49	1477720.36	1884.35	48874+68.09	-6.00
9796	364047.07	1477732.35	1884.39	48874+68.09	6.00
9797	364047.65	1477744.33	1884.29	48874+68.09	18.00
9798	364049.10	1477754.02	1884.21	48874+69.07	27.75
9799	364063.55	1477752.17	1884.35	48874+83.59	26.59
9800	364062.63	1477743.61	1884.44	48874+83.09	18.00
9801	364062.05	1477731.62	1884.62	48874+83.09	6.00
9802	364061.47	1477719.64	1884.61	48874+83.09	-6.00
9803	364060.89	1477707.65	1884.36	48874+83.09	-18.00
9804	364060.50	1477699.66	1884.19	48874+83.09	-26.00
9805	364075.48	1477698.93	1884.45	48874+98.09	-26.00
9806	364075.87	1477706.92	1884.62	48874+98.09	-18.00
9807	364076.45	1477718.91	1884.87	48874+98.09	-6.00
9808	364077.03	1477730.89	1884.89	48874+98.09	6.00
9809	364077.62	1477742.88	1884.67	48874+98.09	18.00
9810	364078.14	1477750.91	1884.49	48874+98.22	26.05
9811	364093.07	1477750.14	1884.75	48875+13.20	26.00
9812	364092.69	1477742.15	1884.92	48875+13.20	18.00
9813	364092.18	1477730.16	1885.17	48875+13.26	6.00
9814	364091.67	1477718.18	1885.17	48875+13.31	-6.00
9815	364091.15	1477706.19	1884.92	48875+13.37	-18.00
9816	364090.77	1477698.19	1884.75	48875+13.37	-26.00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	82	13

Stations and offsets based off PRND23 alignment

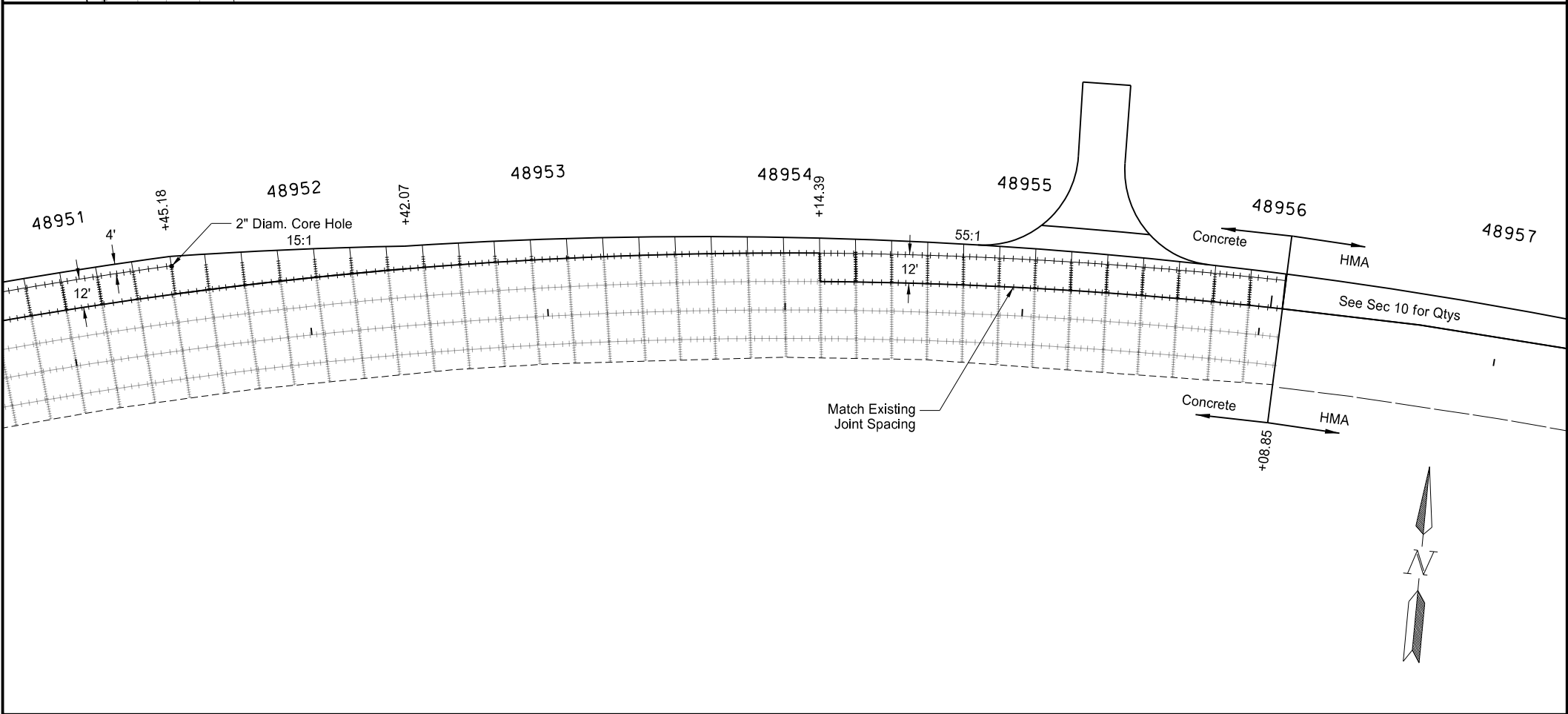
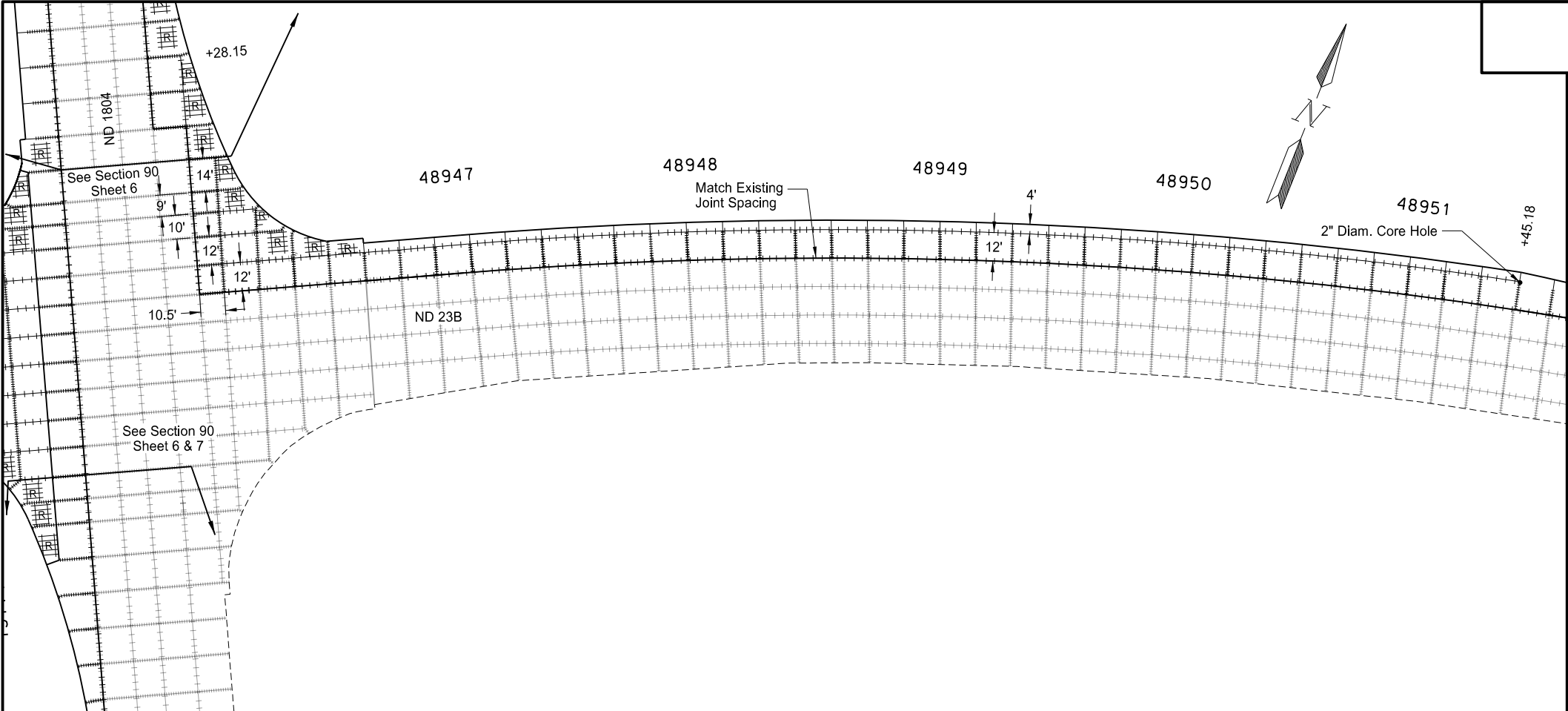
9850	370019.18	1479633.74	1960.37	48943+75.00	-28.00
9851	370010.20	1479638.17	1960.58	48943+75.00	-18.00
9852	369999.44	1479643.49	1960.83	48943+75.00	-6.00
9853	369988.69	1479648.80	1960.83	48943+75.00	6.00
9854	369977.93	1479654.12	1960.58	48943+75.00	18.00
9855	369967.17	1479659.44	1960.33	48943+75.00	30.00
9856	369963.58	1479661.21	1960.24	48943+75.00	34.00
9857	369970.23	1479674.65	1960.09	48943+90.00	34.00
9858	369973.81	1479672.88	1960.18	48943+90.00	30.00
9859	369984.57	1479667.57	1960.43	48943+90.00	18.00
9860	369995.33	1479662.25	1960.68	48943+90.00	6.00
9861	370006.09	1479656.94	1960.68	48943+90.00	-6.00
9862	370016.85	1479651.62	1960.43	48943+90.00	-18.00
9863	370024.03	1479647.85	1960.22	48943+89.80	-26.11
9864	370031.10	1479660.66	1960.08	48944+04.42	-26.77
9865	370023.49	1479665.07	1960.28	48944+05.00	-18.00
9866	370012.73	1479670.38	1960.53	48944+05.00	-6.00
9867	370001.98	1479675.70	1960.53	48944+05.00	6.00
9868	369991.22	1479681.02	1960.28	48944+05.00	18.00
9869	369980.46	1479686.33	1960.03	48944+05.00	30.00
9870	369976.87	1479688.10	1959.94	48944+05.00	34.00
9871	369983.52	1479701.55	1959.79	48944+20.00	34.00
9872	369987.10	1479699.78	1959.88	48944+20.00	30.00
9873	369997.86	1479694.46	1960.13	48944+20.00	18.00
9874	370008.62	1479689.15	1960.38	48944+20.00	6.00
9875	370019.38	1479683.83	1960.38	48944+20.00	-6.00
9876	370030.14	1479678.52	1960.13	48944+20.00	-18.00
9877	370038.65	1479673.10	1959.93	48944+18.92	-28.03
9878	370046.64	1479685.11	1959.75	48944+33.22	-29.88
9879	370036.78	1479691.96	1959.98	48944+35.00	-18.00
9880	370026.02	1479697.28	1960.23	48944+35.00	-6.00
9881	370015.26	1479702.60	1960.23	48944+35.00	6.00
9882	370004.51	1479707.91	1959.98	48944+35.00	18.00
9883	369993.75	1479713.23	1959.73	48944+35.00	30.00
9884	369990.16	1479715.00	1959.64	48944+35.00	34.00
9885	369996.81	1479728.45	1959.49	48944+50.00	34.00
9886	370000.39	1479726.67	1959.58	48944+50.00	30.00
9887	370011.15	1479721.36	1959.83	48944+50.00	18.00
9888	370021.91	1479716.04	1960.08	48944+50.00	6.00
9889	370032.67	1479710.73	1960.08	48944+50.00	-6.00
9890	370043.43	1479705.41	1959.83	48944+50.00	-18.00
9891	370054.18	1479700.10	1959.58	48944+50.00	-30.00
9892	370056.37	1479698.42	1959.53	48944+49.46	-32.71
9893	370063.91	1479707.89	1959.52	48944+61.30	-35.27
9894	370059.74	1479711.33	1959.60	48944+62.53	-30.00
9895	370048.97	1479716.64	1959.77	48944+62.52	-18.00
9896	370038.21	1479721.94	1959.96	48944+62.51	-6.00
9897	370027.45	1479727.25	1959.96	48944+62.50	6.00
9898	370016.68	1479732.56	1959.70	48944+62.49	18.00
9899	370005.92	1479737.86	1959.56	48944+62.48	30.00
9900	370002.33	1479739.63	1959.45	48944+62.47	34.00
9901	370006.08	1479751.73	1959.41	48944+74.98	36.00
9902	370011.46	1479749.07	1959.51	48944+74.98	30.00
9903	370022.22	1479743.76	1959.63	48944+74.99	18.00
9904	370032.98	1479738.46	1959.85	48944+75.00	6.00
9905	370043.75	1479733.15	1959.85	48944+75.01	-6.00
9906	370054.51	1479727.84	1959.64	48944+75.02	-18.00
9907	370065.27	1479722.54	1959.44	48944+75.03	-30.00
9908	370071.63	1479716.93	1959.33	48944+72.82	-38.18
9909	370079.18	1479725.21	1959.12	48944+83.58	-41.29
9910	370070.59	1479733.30	1959.28	48944+87.03	-30.00
9911	370059.83	1479738.60	1959.50	48944+87.02	-18.00
9912	370049.06	1479743.91	1959.73	48944+87.01	-6.00
9913	370038.30	1479749.22	1959.73	48944+87.00	6.00
9914	370027.54	1479754.52	1959.51	48944+86.99	18.00
9915	370016.77	1479759.83	1959.29	48944+86.98	30.00
9916	370007.98	1479763.20	1959.13	48944+86.11	39.38
9917	370006.86	1479774.98	1958.95	48944+96.17	45.60
9918	370011.33	1479775.89	1958.99	48944+98.97	42.00
9919	370022.09	1479770.59	1959.19	48944+98.98	30.00
9920	370032.85	1479765.28	1959.40	48944+98.99	18.00
9921	370043.62	1479759.97	1959.61	48944+99.00	6.00

Stations and offsets based off PRND23 alignment

Point	Northing	Easting	Elevation	Station	Offset
9922	370054.38	1479754.67	1959.60	48944+99.01	-6.00
9923	370065.14	1479749.36	1959.38	48944+99.02	-18.00
9924	370075.91	1479744.06	1959.15	48944+99.03	-30.00
9925	370086.67	1479738.75	1958.91	48944+99.04	-42.00
9926	370089.55	1479734.76	1958.85	48944+96.75	-46.35
9928	370092.64	1479750.86	1958.78	48945+12.54	-41.99
9929	370081.89	1479756.16	1959.01	48945+12.53	-30.00
9930	370071.12	1479761.46	1959.24	48945+12.52	-18.00
9931	370060.36	1479766.77	1959.40	48945+12.51	-6.00
9932	370049.60	1479772.08	1959.40	48945+12.50	6.00
9933	370038.83	1479777.38	1959.28	48945+12.49	18.00
9934	370028.07	1479782.69	1959.08	48945+12.48	30.00
9935	370017.31	1479788.00	1958.95	48945+12.47	42.00
9936	370006.54	1479793.30	1958.86	48945+12.46	54.00
9937	370001.20	1479790.37	1958.76	48945+07.47	57.49
9938	369993.71	1479800.89	1958.82	48945+13.57	68.87
9939	369987.58	1479807.12	1958.86	48945+16.45	77.12
9940	369977.41	1479816.76	1958.91	48945+20.58	90.51
9941	369981.15	1479820.87	1958.96	48945+25.93	88.98
9942	369994.60	1479814.24	1958.90	48945+25.94	73.98
9943	370003.55	1479809.83	1958.96	48945+25.95	64.00
9944	370012.52	1479805.41	1958.97	48945+25.96	54.00
9945	370023.29	1479800.10	1959.10	48945+25.97	42.00
9946	370034.05	1479794.79	1959.09	48945+25.98	30.00
9947	370044.81	1479789.49	1958.90	48945+25.99	18.00
9948	370055.58	1479784.18	1958.90	48945+26.00	6.00
9949	370066.34	1479778.87	1958.90	48945+26.01	-6.00
9950	370077.10	1479773.57	1958.87	48945+26.02	-18.00
9951	370087.87	1479768.26	1958.84	48945+26.03	-30.00
9952	370098.63	1479762.96	1958.81	48945+26.04	-42.00
9953	370107.61	1479758.53	1958.82	48945+26.05	-52.01
9954	370103.23	1479741.98	1958.78	48945+09.27	-55.42
9955	370112.54	1479744.42	1958.56	48945+15.59	-62.68
9956	370115.67	1479754.55	1958.78	48945+26.06	-61.00
9957	370128.23	1479748.36	1958.80	48945+26.07	-75.00
9959	370139.77	1479740.08	1957.80	48945+23.76	-89.01
9960	370154.25	1479735.53	1958.99	48945+26.09	-104.01
9961	370160.44	1479748.09	1959.19	48945+40.10	-104.00
9962	370146.99	1479754.72	1959.12	48945+40.08	-89.00
9963	370025.70	1479646.97	1959.00	48943+89.76	-28.00
9964	370032.15	1479660.06	1959.02	48944+04.34	-28.08
9965	370113.80	1479771.08	1959.03	48945+40.05	-52.00
9966	370104.83	1479775.51	1959.04	48945+40.04	-42.00
9967	370094.07	1479780.81	1959.00	48945+40.03	-30.00
9968	370083.30	1479786.12	1958.98	48945+40.02	-18.00
9969	370072.54	1479791.43	1958.97	48945+40.01	-6.00
9970	370061.78	1479796.73	1958.95	48945+40.00	6.00
9971	370051.02	1479802.04	1958.91	48945+39.99	18.00
9972	370040.25	1479807.34	1959.01	48945+39.98	30.00
9973	370029.49	1479812.65	1959.01	48945+39.97	42.00
9974	370018.73	1479817.96	1959.07	48945+39.96	54.00
9975	370009.76	1479822.38	1959.10	48945+39.95	64.00
9976	370000.81	1479826.79	1959.14	48945+39.94	73.98
9977	369987.35	1479833.42	1959.20	48945+39.93	88.98
9978	369973.90	1479840.06	1959.23	48945+39.91	103.98
9979	369964.16	1479828.23	1958.92	48945+24.99	107.47
9980	369960.45	1479846.70	1959.27	48945+39.91	118.98
9981	369953.08	1479836.97	1958.91	48945+27.93	121.27
9982	369947.00	1479853.35	1959.32	48945+39.91	133.98
9983	369941.48	1479845.39	1959.05	48945+30.34	135.41
9984	369933.55	1479859.99	1959.60	48945+39.91	148.98
9985	369929.39	1479853.43	1959.47	48945+32.18	149.81
9986	369920.11	1479866.64	1959.71	48945+39.91	163.98
9987	369917.09	1479860.88	1959.63	48945+33.42	164.13
9988	369906.63	1479873.22	1959.73	48945+39.85	178.98
9989	369904.08	1479868.05	1959.64	48945+34.08	178.98

Stations and offsets based off EX23B alignment

Point	Northing	Easting	Elevation	Station	Offset
9990	370245.43	1479750.79	1959.82	48945+80.16	-185.00
9991	370231.98	1479757.43	1959.71	48945+80.16	-170.00
9992	370218.53	1479764.08	1959.54	48945+80.16	-155.00
9993	370205.08	1479770.72	1959.41	48945+80.16	-140.00
9994	370191.61	1479777.32	1959.28	48945+80.11	-125.00
9995	370178.16	1479783.95	1959.14	48945+80.10	-110.00
9996	370164.71	1479790.59	1959.10	48945+80.08	-95.00
9997	370249.93	1479759.89	1959.75	48945+90.32	-185.00
9998	370236.89	1479767.37	1959.39	48945+91.24	-170.00
9999	370225.40	1479774.57	1959.21	48945+92.61	-156.51
10000	370213.59	1479782.64	1959.04	48945+94.62	-142.35
10001	370197.81	1479789.87	1958.94	48945+94.11	-125.00
10002	370200.10	1479792.77	1958.86	48945+97.73	-125.77
10003	370184.36	1479796.50	1958.87	48945+94.10	-110.00
10004	370189.00	1479801.91	1958.69	48946+01.00	-111.77
10005	370170.91	1479803.14	1958.69	48945+94.08	-95.00
10006	370178.51	1479811.30	1958.53	48946+04.77	-98.20
10007	370158.35	1479809.33	1958.69	48945+94.07	-81.00
10008	370145.79	1479815.52	1958.74	48945+94.06	-67.00
10009	370137.72	1479819.50	1958.78	48945+94.05	-58.00
10010	370128.56	1479823.53	1958.83	48945+93.60	-48.00
10011	370117.78	1479828.81	1958.85	48945+93.57	-36.00
10012	370107.23	1479834.53	1958.80	48945+94.02	-24.00
10013	370111.86	1479843.91	1958.74	48946+04.49	-24.00
10014	370122.68	1479838.73	1958.72	48946+04.63	-36.00
10015	370133.51	1479833.54	1958.69	48946+04.78	-48.00
10016	370142.52	1479829.22	1958.58	48946+04.90	-58.00
10017	370150.64	1479825.33	1958.47	48946+05.01	-67.00
10018	370163.26	1479819.29	1958.43	48946+05.17	-80.99
10019	370166.79	1479822.73	1958.39	48946+09.83	-82.62
10020	370158.62	1479831.63	1958.39	48946+14.18	-71.36
10021	370151.31	1479843.90	1958.40	48946+21.94	-59.37
10022	370149.36	1479843.05	1958.42	48946+20.33	-58.00
10023	370147.48	1479857.12	1958.40	48946+32.10	-50.08
10024	370140.28	1479847.26	1958.47	48946+20.08	-48.00
10025	370129.40	1479852.31	1958.53	48946+19.78	-36.00
10026	370118.51	1479857.36	1958.59	48946+19.49	-24.00
10027	370125.15	1479870.81	1958.49	48946+34.49	-24.00
10028	370135.97	1479865.63	1958.45	48946+34.63	-36.00
10029	370146.97	1479861.49	1958.40	48946+35.80	-47.69
10030	370148.00	1479876.42	1958.41	48946+49.63	-42.00
10031	370142.62	1479879.08	1958.39	48946+49.63	-36.00
10032	370131.80	1479884.26	1958.37	48946+49.49	-24.00
10033	370154.64	1479889.87	1958.39	48946+64.64	-42.00
10034	370149.26	1479892.52	1958.40	48946+64.64	-36.00
10035	370138.44	1479897.71	1958.31	48946+64.49	-24.00

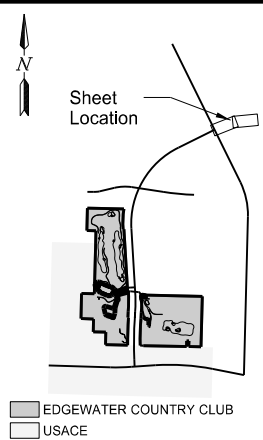


STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	90	3

SPEC	CODE	BID ITEM	QTY	UNIT
302	0120	AGGREGATE BASE COURSE CL 5		
		Sta 48945+74.36 to Sta 48956+05.00	856	TON
550	0302	8.5IN NON-REINF CONCRETE PVMT CL AE-DOWELED		
		Sta 48945+74.36 to Sta 48956+05.00	1,787	SY

Notes:

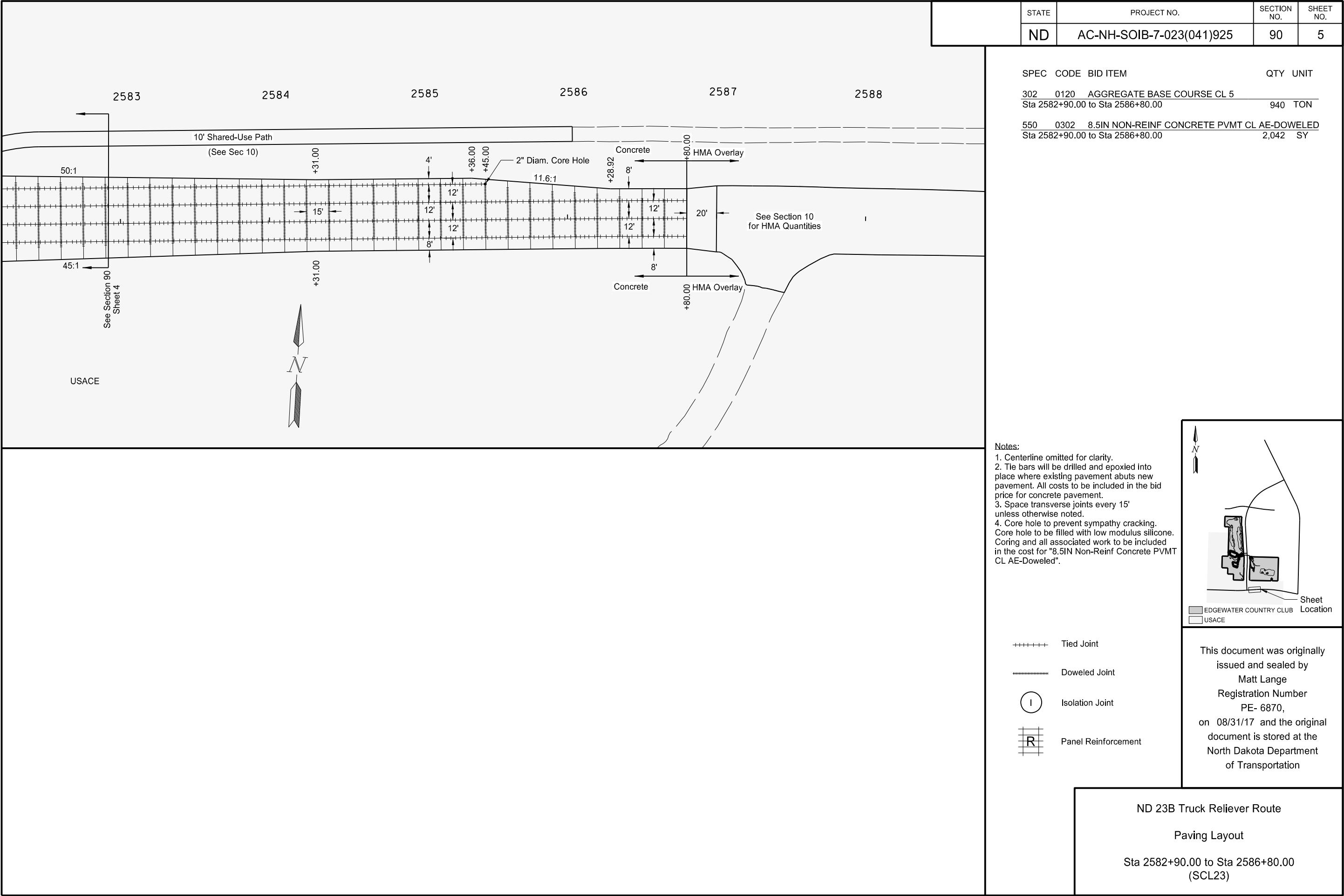
1. Centerline omitted for clarity.
2. Tie bars will be drilled and epoxied into place where existing pavement abuts new pavement. All costs to be included in the bid price for concrete pavement.
3. Space transverse joints every 15' unless otherwise noted.
4. Core hole to prevent sympathy cracking. Core hole to be filled with low modulus silicone. Coring and all associated work to be included in the cost for "8.5IN Non-Reinf Concrete PVMT CL AE-Doweled".



- +++++ Tied Joint
- Doweled Joint
- (I) Isolation Joint
- [R] Panel Reinforcement

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ND 23B Truck Reliever Route
Paving Layout
Sta 48945+74.36 to Sta 48956+08.85
(EX23B)



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED				TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
			BY PHASE NO.						
			1	2	3				
D3-36	36"x6"	STREET NAME SIGN (Sign and installation only)						6	
G20-1-60	60"x24"	ROAD WORK NEXT _____ MILES						34	
G20-1b-60	60"x24"	WORK IN PROGRESS/ NO WORK IN PROGRESS (Sign and installation only)						26	
G20-2-48	48"x24"	END ROAD WORK	2	8	2		8	19	152
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)	1	2	1		2	18	36
G20-10-108	108"x48"	CONTRACTOR SIGN						64	
G20-50a-72	72"x36"	ROAD WORK NEXT _____ MILES RT & LT ARROWS						37	
G20-52a-72	72"x24"	ROAD WORK NEXT _____ MILES RT or LT ARROW	2				2	30	60
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE \$80 WHEN WORKERS PRESENT	7				7	59	413
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)	10				10	7	70
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT						15	
M4-10-48	48"x18"	DETOUR ARROW RIGHT or LEFT						23	
M5-1-21	21"x15"	ARROW AHD AND RT or LT(Mounted on route marker post)						7	
M5-2-21	21"x15"	ARROW AHD UP & RT or LT (Mounted on route marker post)	4				4	7	28
M6-1-21	21"x15"	ARROW RT or LT (Mounted on route marker post)	3				3	7	21
M6-2-21	21"x15"	ARROW UP & RT or LT (Mounted on route marker post)						7	
M6-2a-21	21"x15"	ARROW DWN AND RT or LT (Drum Mounted)	4				4	7	28
M6-3-21	21"x15"	ARROW AHD (Mounted on route marker post)	2				2	7	14
R1-1-48	48"x48"	STOP	6	3			6	32	192
R1-1a-18	18"x18"	STOP and SLOW PADDLE Back to Back	5	8			8	5	40
R1-2-60	60"x60"	YIELD						29	
R2-1-48	48"x60"	SPEED LIMIT _____	7	20			20	39	780
R2-1a-24	24"x18"	MINIMUM FEE \$80 (Mounted on Speed Limit post)	2	9			9	10	90
R3-2-36	36"x36"	NO LEFT TURN						20	
R3-7-48	48"x48"	LEFT or RIGHT LANE MUST TURN LEFT or RIGHT	1				1	35	35
R4-1-48	48"x60"	DO NOT PASS						39	
R4-7-48	48"x60"	KEEP RIGHT SYMBOL						39	
R5-1-48	48"x48"	DO NOT ENTER						35	
R6-1-36	36"x12"	ONE WAY RIGHT or LEFT						13	
R7-1-12	12"x18"	NO PARKING						11	
R9-9-48	48"x24"	SIDEWALK CLOSED	4				4	10	40
R10-6-24	24"x36"	STOP HERE ON RED						16	
R11-2-48	48"x30"	ROAD CLOSED	4	3			4	28	112
R11-2a-48	48"x30"	STREET CLOSED						28	
R11-3a-60	60"x30"	ROAD CLOSED _____ MILES AHEAD LOCAL TRAFFIC ONLY	1	1			1	31	31
R11-3c-60	60"x30"	STREET CLOSED _____ MILES AHEAD LOCAL TRAFFIC ONLY						31	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC						31	
RS-128	30"x30"	GOLF COURSE SYMBOL						8	
W1-2-48	48"x48"	RIGHT or LEFT CURVE ARROW	2				2	35	70
W1-3-48	48"x48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW						35	
W1-4-48	48"x48"	RIGHT or LEFT REVERSE CURVE ARROW	5	13			13	35	455
W1-4b-48	48"x48"	DOUBLE RIGHT or LEFT REVERSE CURVE ARROW						35	
W1-6-48	48"x24"	LARGE ARROW	2	4			4	26	104
W1-7-60	60"x30"	LARGE ARROW (2 DIRECTIONS)	1				1	19	19
W3-1-48	48"x48"	STOP AHEAD SYMBOL						35	
W3-3-48	48"x48"	SIGNAL AHEAD SYMBOL						35	
W3-4-48	48"x48"	BE PREPARED TO STOP	4	8	2		8	35	280
W3-5-48	48"x48"	SPEED REDUCTION AHEAD	4	8			8	35	280
W4-2-48	48"x48"	RIGHT or LEFT LANE TRANSITION SYMBOL						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 SYMBOL						35	
W8-1-48	48"x48"	BUMP						35	
W8-3-48	48"x48"	PAVEMENT ENDS						35	
W8-7-48	48"x48"	LOOSE GRAVEL						35	
W8-9a-48	48"x48"	SHOULDER DROP-OFF						35	
W8-11-48	48"x48"	UNEVEN LANES						35	
W8-12-48	48"x48"	NO CENTER STRIPE						35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY						35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or ____ FT.	4				4	35	140
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or ____ FT.	4				4	35	140
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY						35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL						35	
W12-1-48	36"x36"	DOUBLE ARROW	1				1	35	35
W12-2-48	48"x48"	LOW CLEARANCE SYMBOL						35	
W13-1-24	24"x24"	____ MPH ADVISORY SPEED PLATE (Mounted on warning sign post)						11	
W13-4-48	48"x60"	RAMP ARROW						39	
W14-3-48	48"x36"	NO PASSING ZONE						23	
W20-1-48	48"x48"	ROAD WORK AHEAD or ____ FT or ____ MILE	5	10	2		10	35	350
W20-2-48	48"x48"	DETOUR AHEAD or ____ FT	2				2	35	70
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or ____ FT.						35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or ____ FT.						35	
W20-5-48	48"x48"	RIGHT or LEFT LANE CLOSED AHEAD or ____ FT.						35	
W20-7a-48	48"x48"	FLAGGING SYMBOL	4	8	2		8	35	280

[illegible][illegible]

SPEC & CODE			
704-1000	TRAFFIC CONTROL SIGNS	TOTAL UNITS	4735

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY				TOTAL QUANTITY
			BY PHASE NO.				
			1	2	3		
704-0100	FLAGGING	MHR	1670	1820	100		3590
704-1041	ATTENUATION DEVICE-TYPE B-55	EACH					
704-1043	ATTENUATION DEVICE-TYPE B-65	EACH					
704-1044	ATTENUATION DEVICE-TYPE B-70	EACH					
704-1050	TYPE I BARRICADES	EACH					
704-1051	TYPE II BARRICADES	EACH					
704-1052	TYPE III BARRICADES	EACH	35	37			37
704-1060	DELINEATOR DRUMS	EACH	34	328			328
704-1065	TRAFFIC CONES	EACH					
704-1067	TUBULAR MARKERS	EACH		153			153
704-1070	DELINEATOR	EACH					
704-1072	FLEXIBLE DELINEATORS	EACH					
704-1080	STACKABLE VERTICAL PANELS	EACH	106	56			106
704-1081	VERTICAL PANELS - BACK TO BACK	EACH					
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH	1				1
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH					
704-1087	SEQUENCING ARROW PANEL - TYPE C	EACH					
704-1088	SEQUENCING ARROW PANEL - TYPE C - CROSSOVER	EACH					
704-1095	TYPE B FLASHERS	EACH					
704-1185	PILOT CAR	HR		70	50		120
704-1500	OBLITERATION OF PVMT MK	SF		8941			8941
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF					
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH					
762-0200	RAISED PAVEMENT MARKERS	EACH					
762-0420	SHORT TERM 4IN LINE - TYPE R	LF		30480			30480
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF					
772-2110	FLASHING BEACON - POST MOUNTED	EACH					

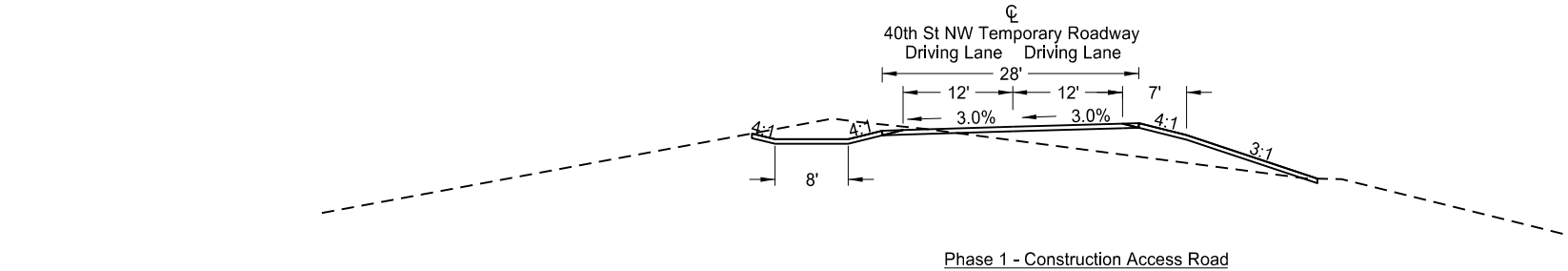
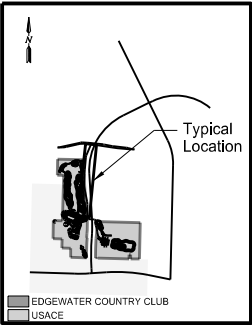
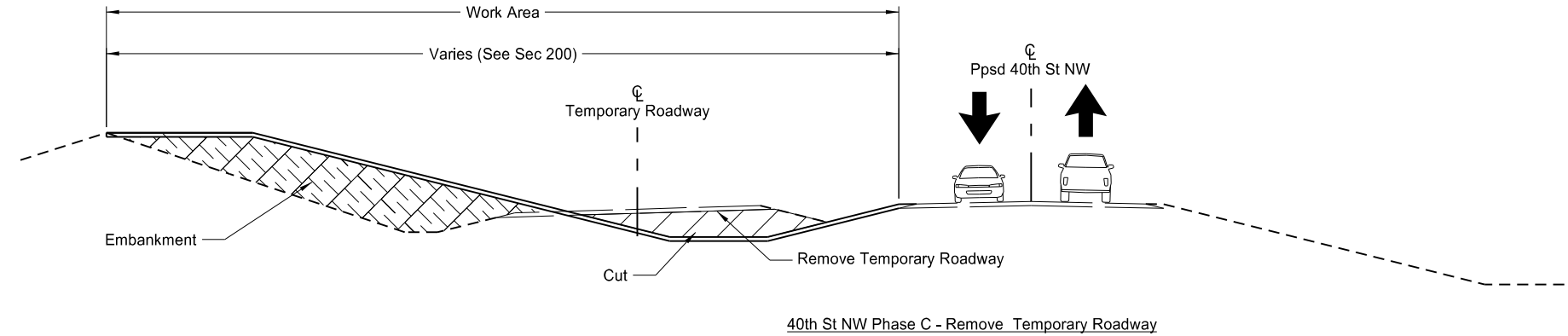
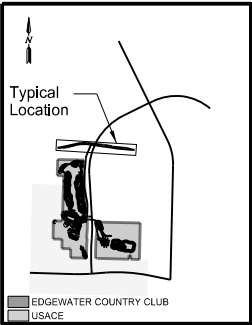
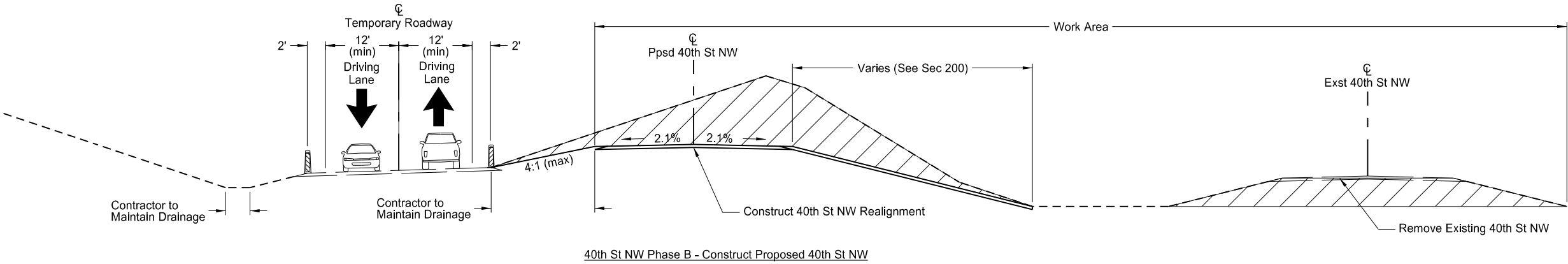
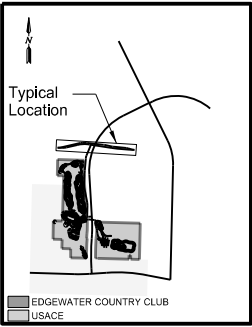
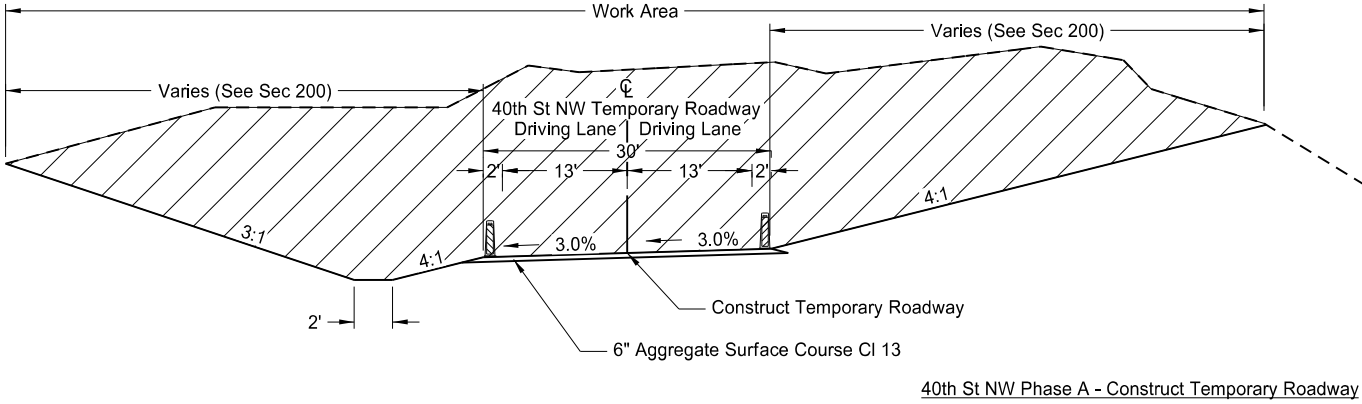
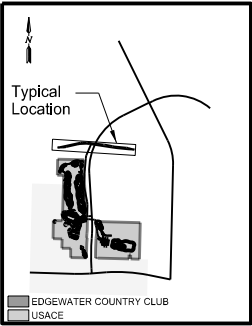
NOTE:
If additional signs are required, units will be calculated using the formula from Section III-19.06 of the Design Manual.
<http://www.dot.nd.gov/>

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Traffic Control Devices List

ND 23 Truck Reliever Route

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	100	2

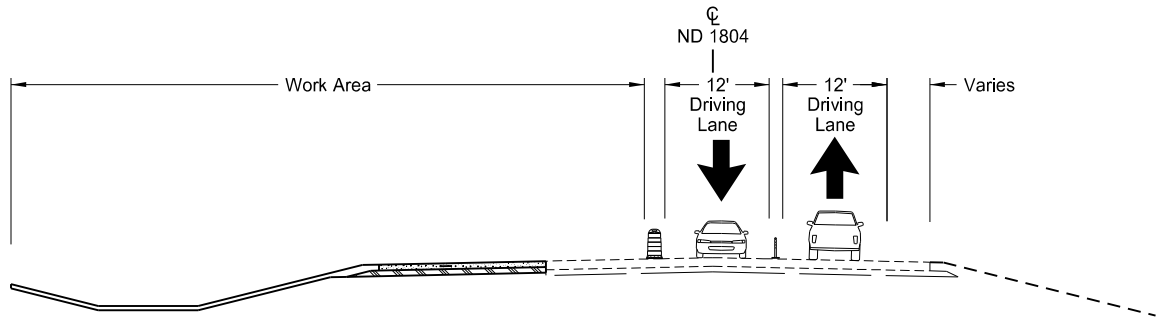
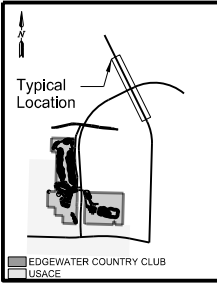


Notes:
1. Refer to Sec 30 Sheet 9 for 40th St NW Typical Sections

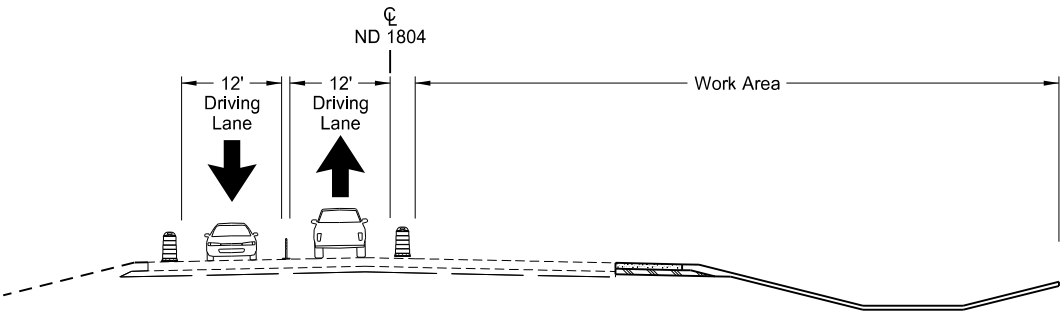
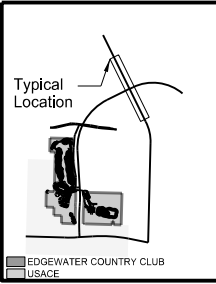
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ND 23B Truck Reliever Route
Temporary Work Zone Traffic Control
Phase 1
Typical Sections

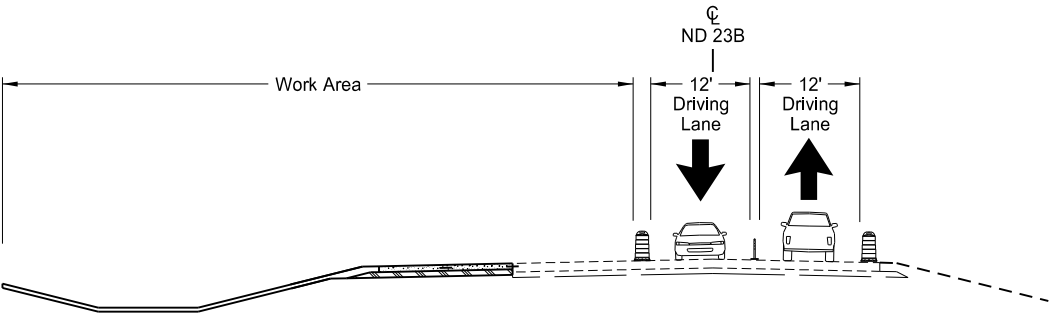
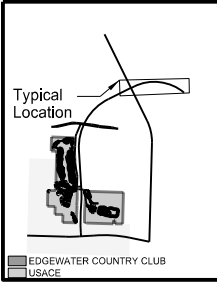
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	100	3



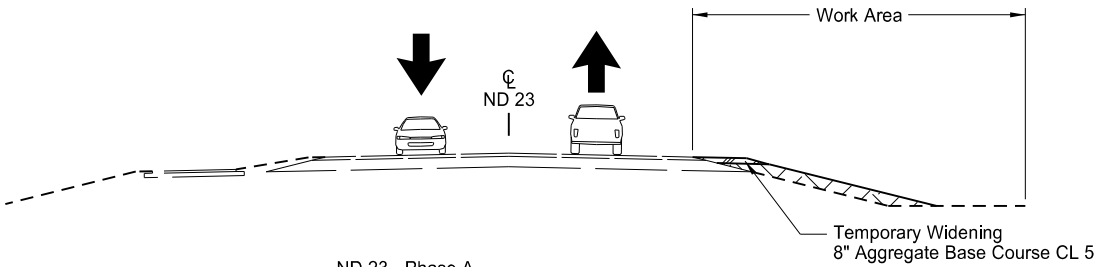
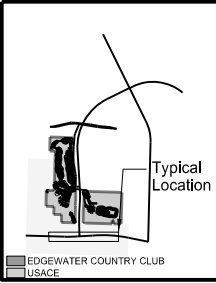
ND 1804 - Phase 2



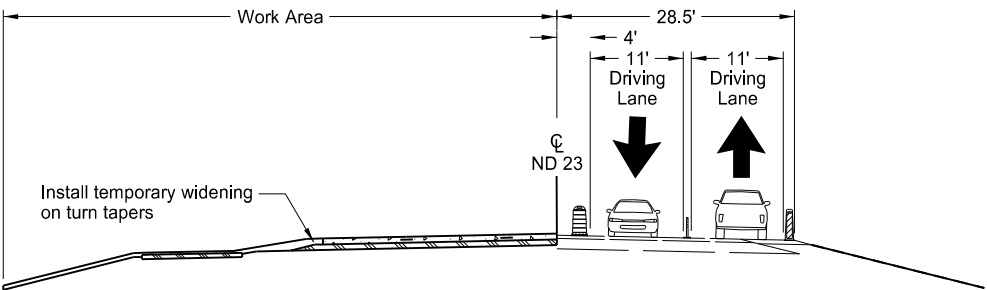
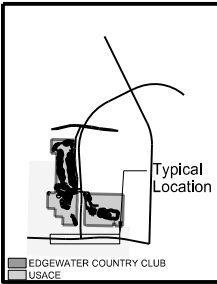
ND 1804 - Phase 2



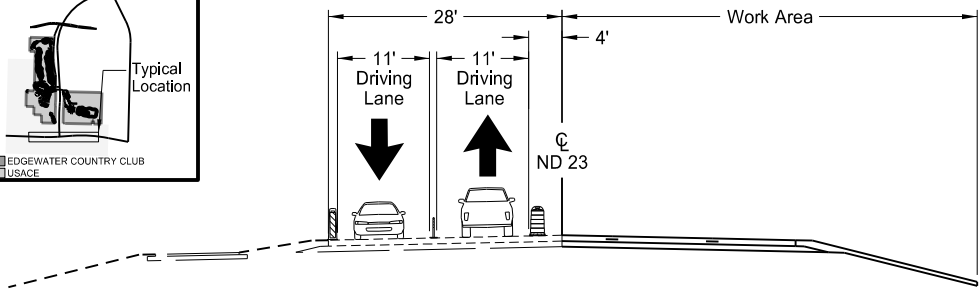
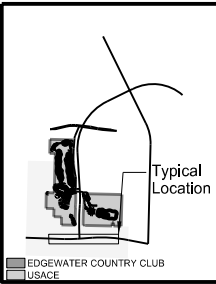
ND 23B - Phase 2



ND 23 - Phase A



ND 23 - Phase B



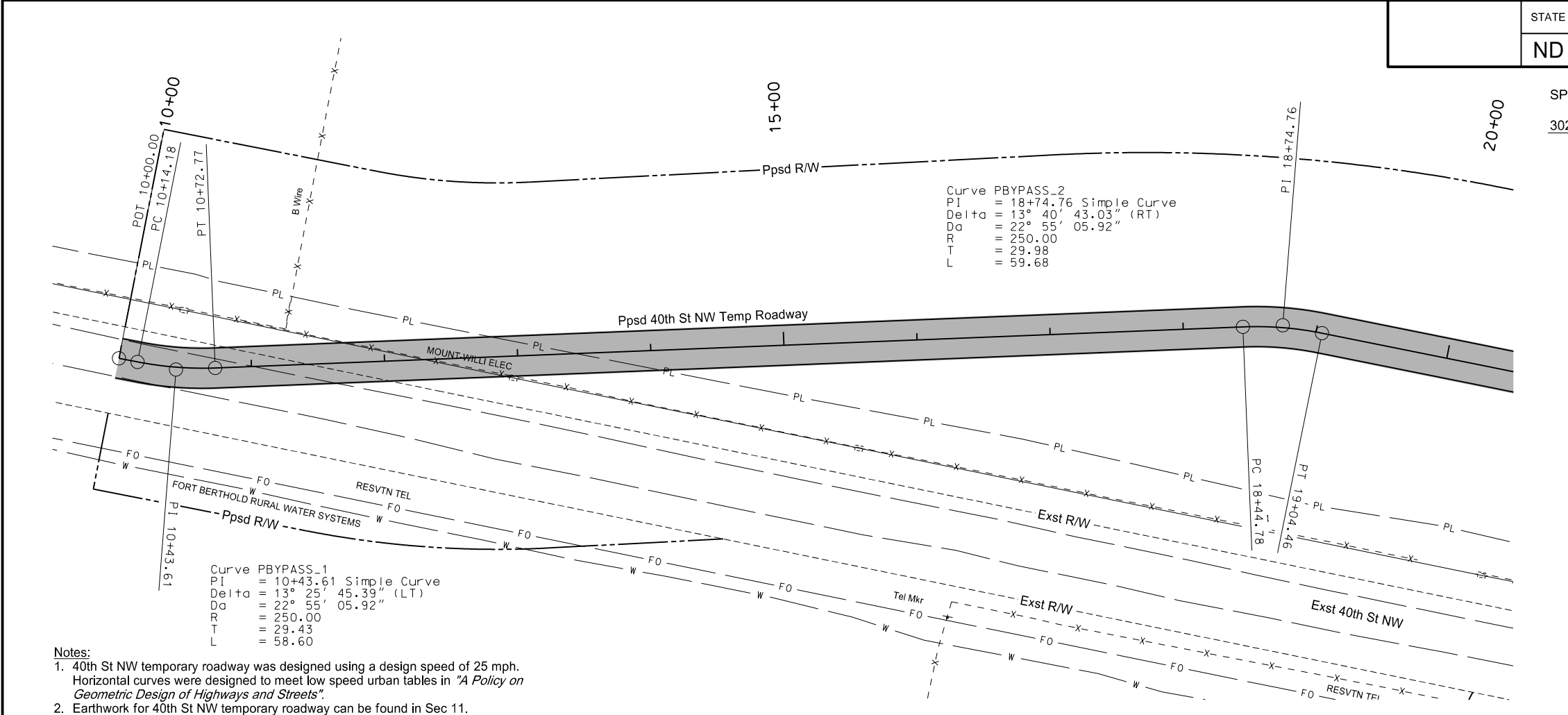
ND 23 - Phase C

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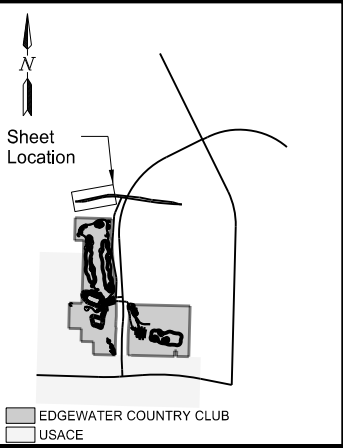
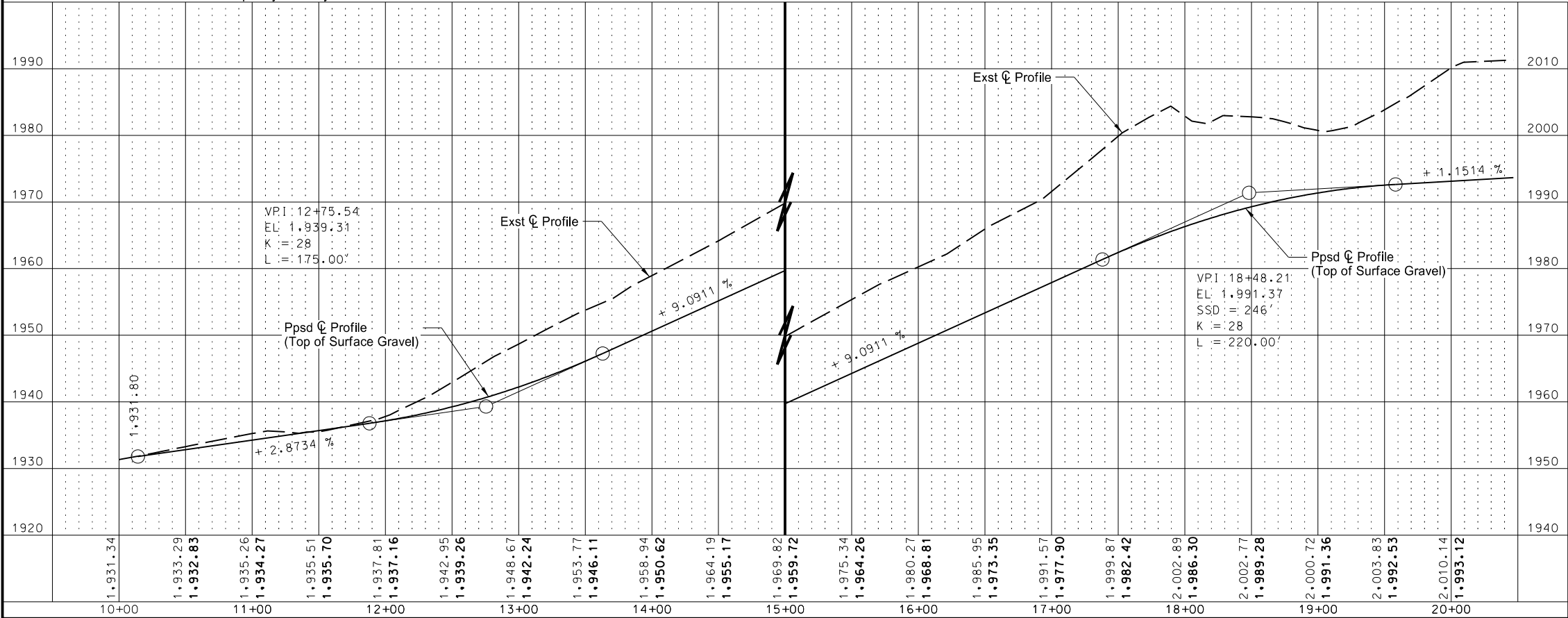
ND 23B Truck Reliever Route
Temporary Work Zone Traffic Control
Phase 2
Typical Sections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	100	4

SPEC CODE	BID ITEM	QTY	UNIT
302 0356	AGGREGATE SURFACE COURSE CL 13 Sta 10+00 to Sta 20+00	1,111	TON



- Notes:
- 40th St NW temporary roadway was designed using a design speed of 25 mph. Horizontal curves were designed to meet low speed urban tables in "A Policy on Geometric Design of Highways and Streets".
 - Earthwork for 40th St NW temporary roadway can be found in Sec 11.

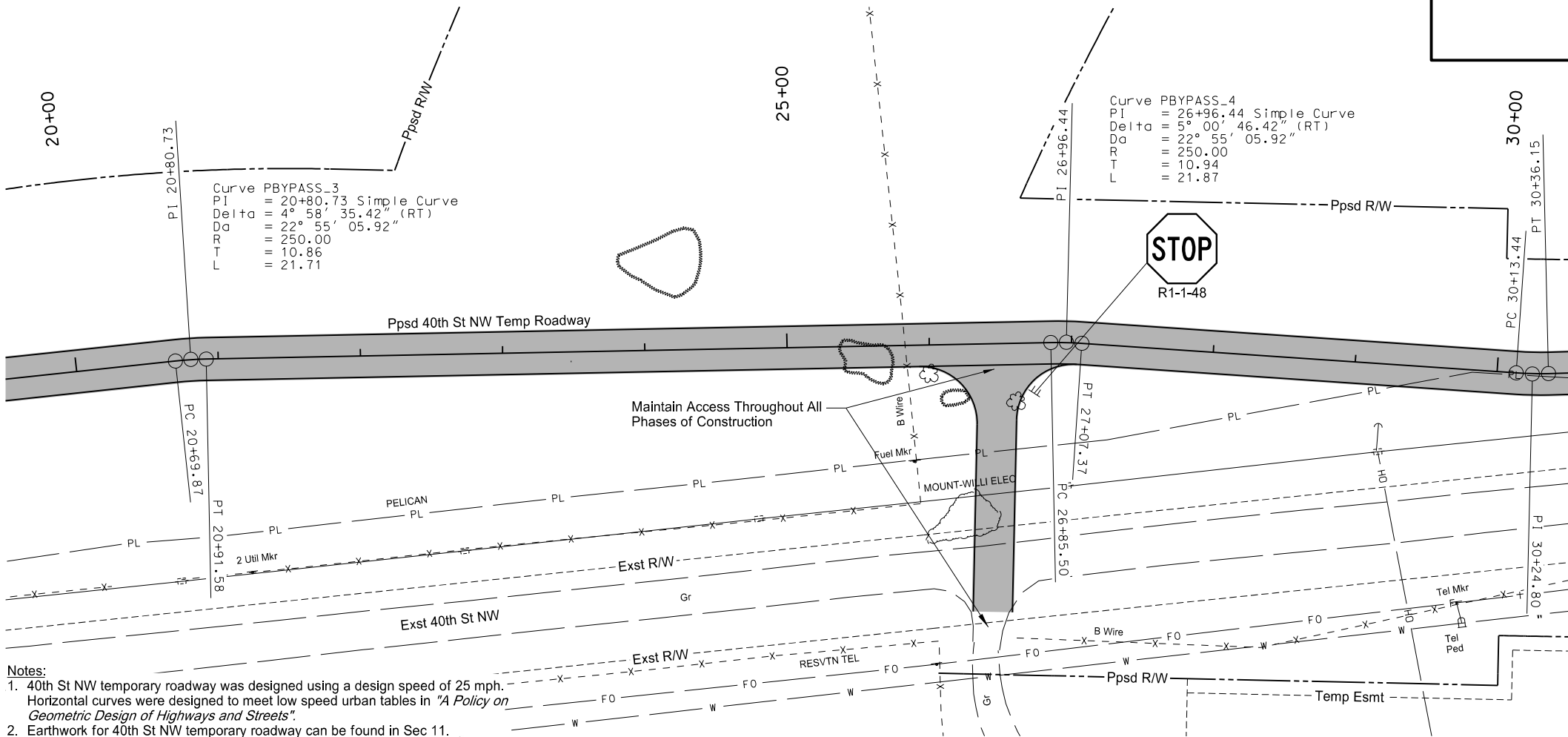


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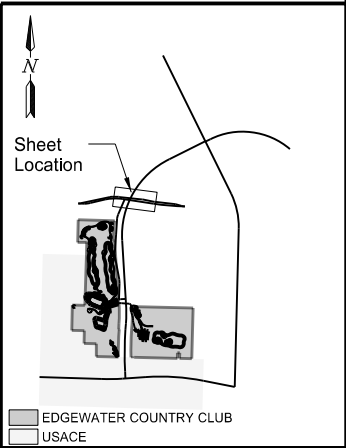
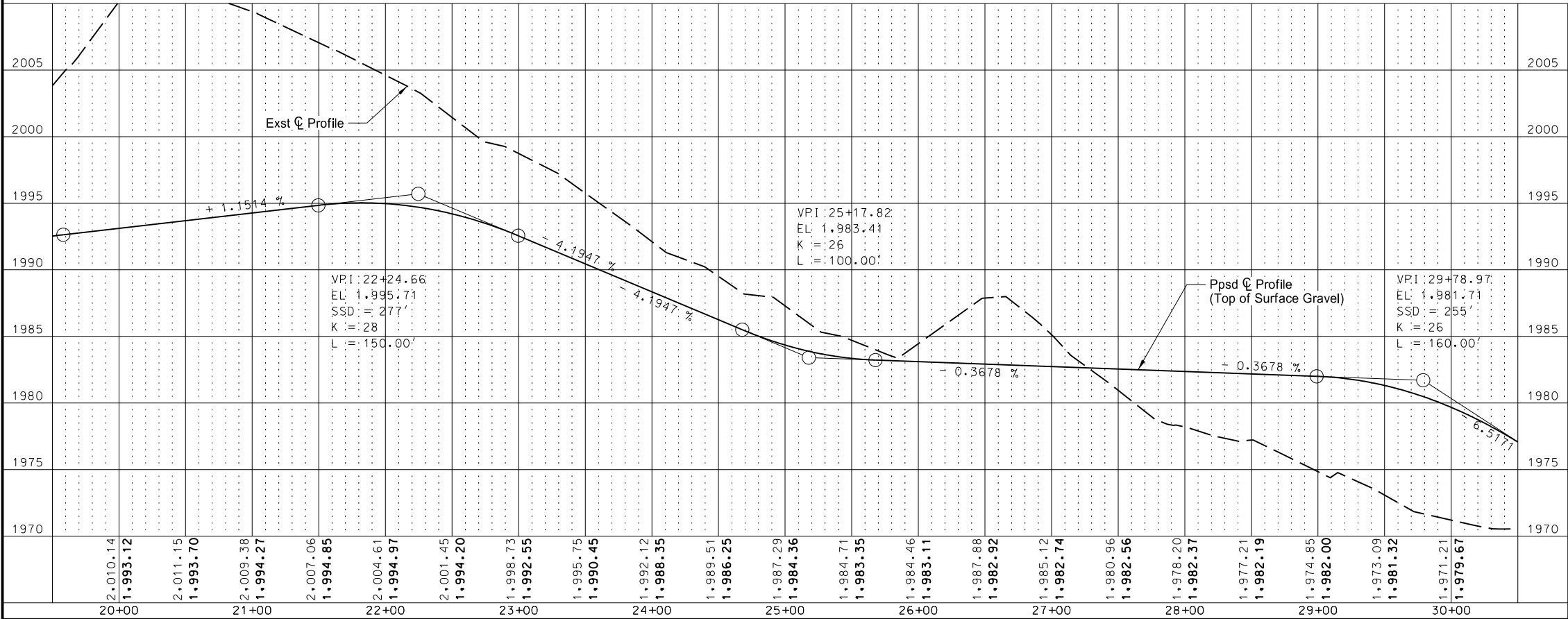
ND 23B Truck Reliever Route
Temporary Work Zone Traffic Control
40th St NW Phase A
Temporary Roadway
Sta 10+00.00 to Sta 20+00.00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	100	5

SPEC CODE	BID ITEM	QTY	UNIT
302	0356 AGGREGATE SURFACE COURSE CL 13 Sta 20+00 to Sta 30+00	1,311	TON



- Notes:
- 40th St NW temporary roadway was designed using a design speed of 25 mph. Horizontal curves were designed to meet low speed urban tables in "A Policy on Geometric Design of Highways and Streets".
 - Earthwork for 40th St NW temporary roadway can be found in Sec 11.



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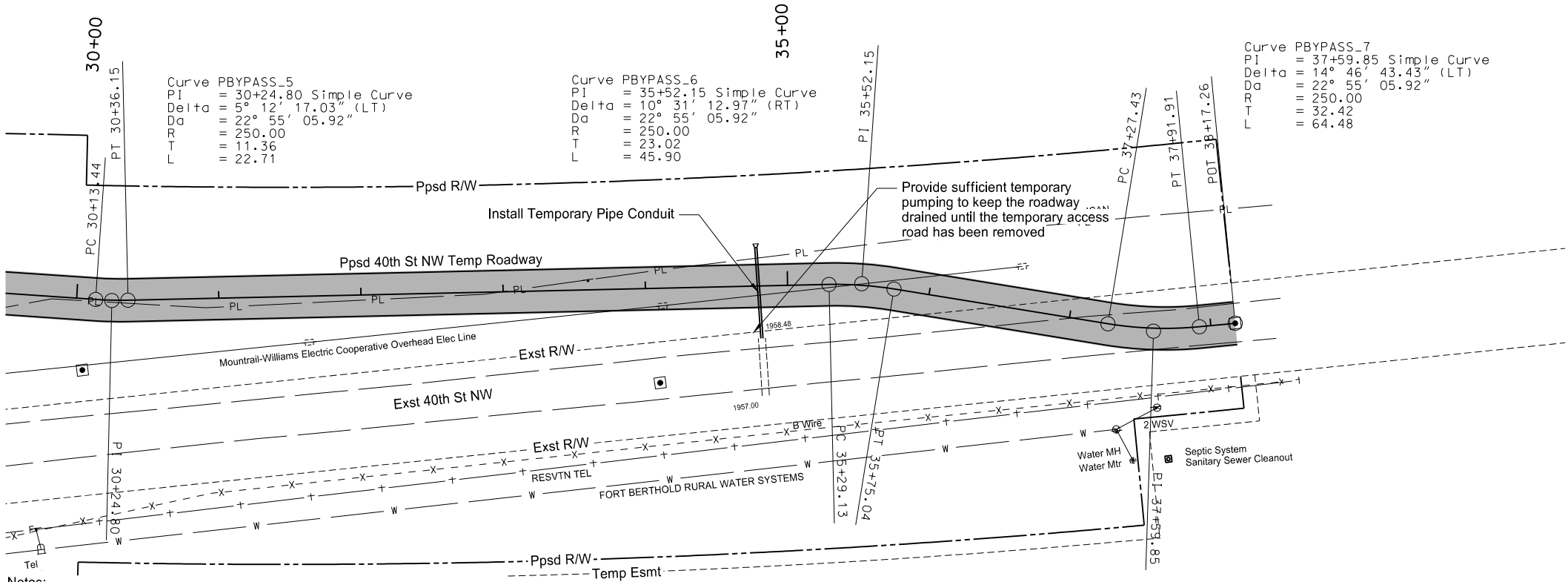
ND 23B Truck Reliever Route
Temporary Work Zone Traffic Control
40th St NW Phase A
Temporary Roadway
Sta 20+00.00 to Sta 30+00.00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	100	6

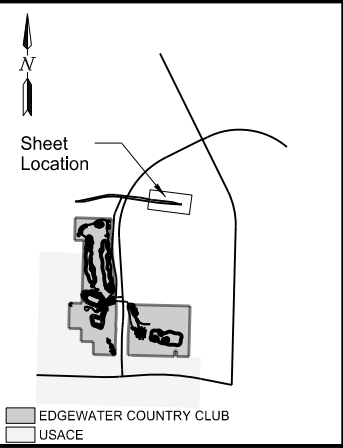
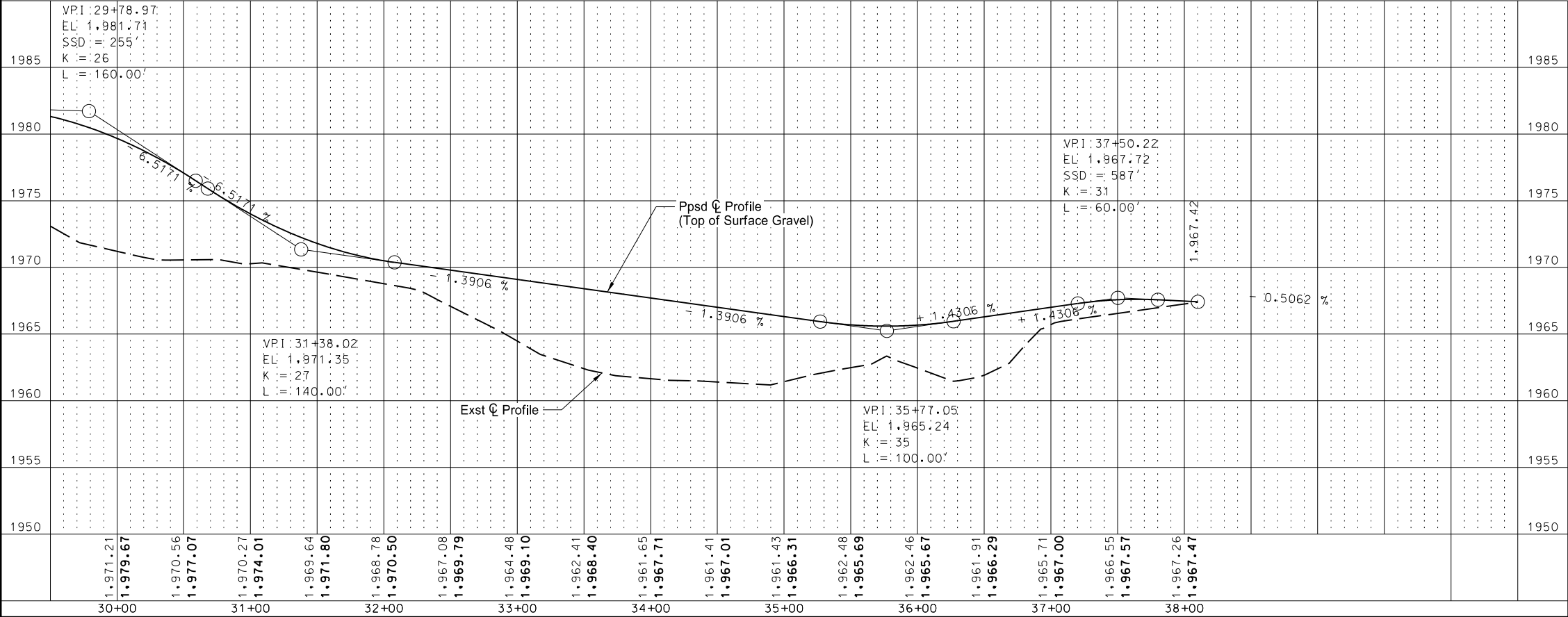
SPEC CODE BID ITEM QTY UNIT

302 0356 AGGREGATE SURFACE COURSE CL 13
Sta 30+00 to 38+17.26 908 TON

714 5015 PIPE CORR STEEL .064IN 18IN
Sta 34+78.3~27.11' Lt to 34+81.2~36.8' Rt 64 LF



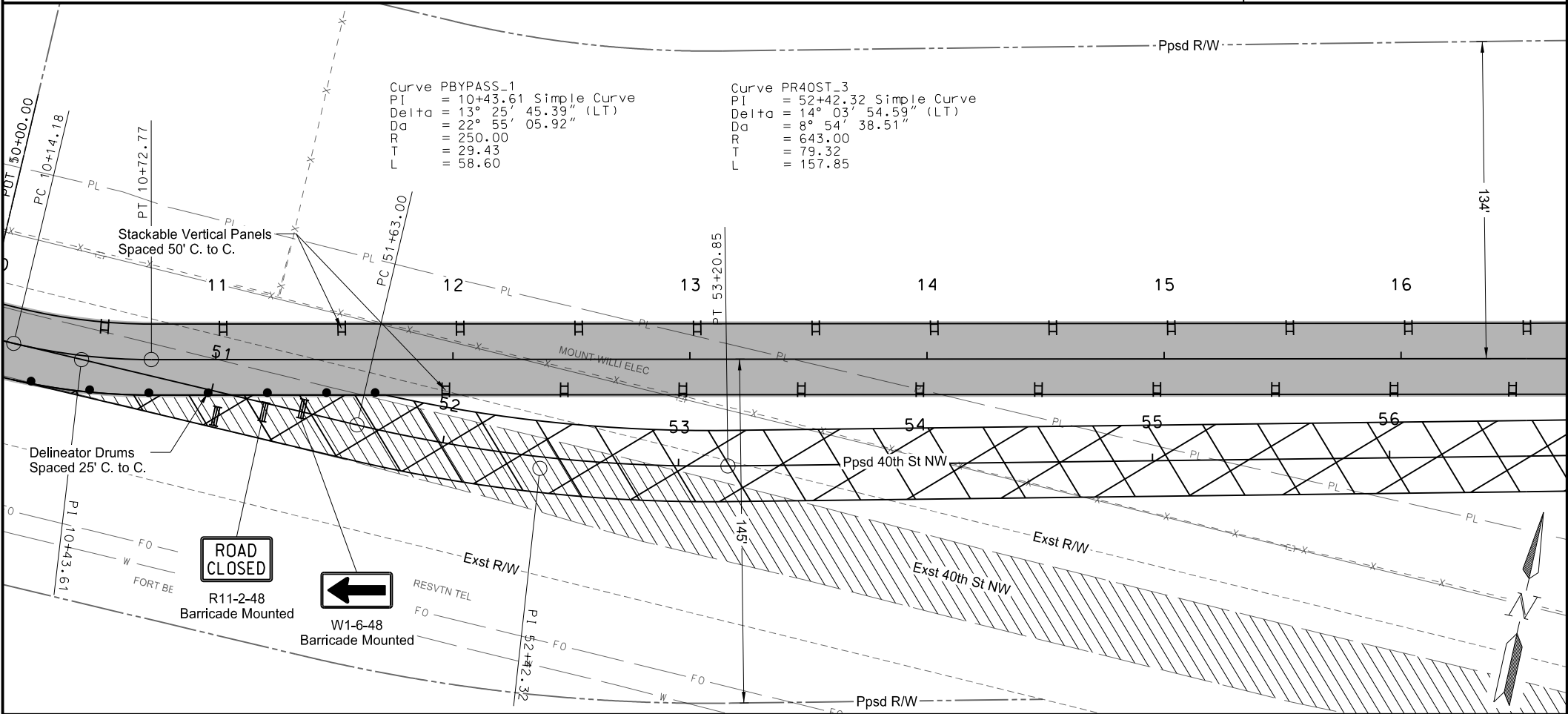
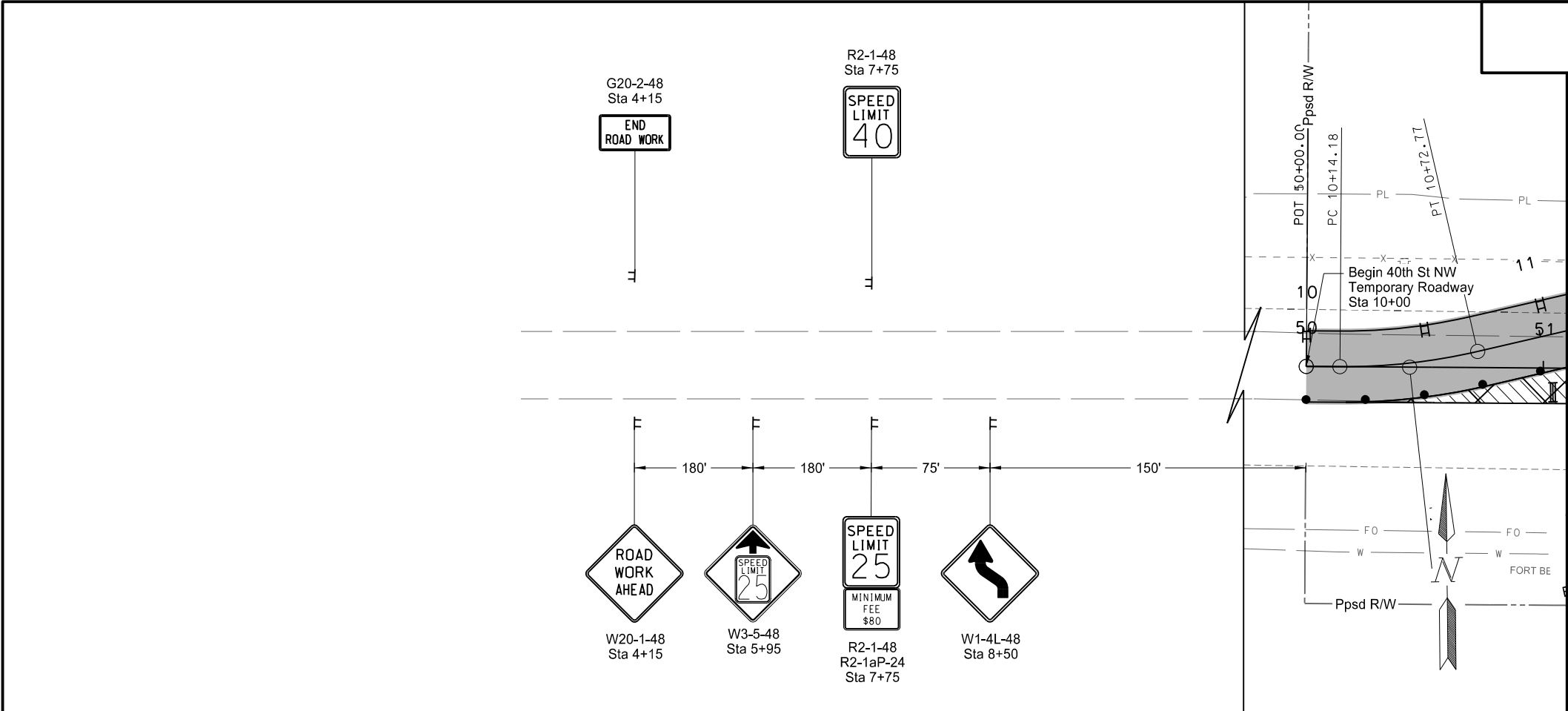
- Notes:
- 40th St NW temporary roadway was designed using a design speed of 25 mph. Horizontal curves were designed to meet low speed urban tables in "A Policy on Geometric Design of Highways and Streets".
 - Earthwork for 40th St NW temporary roadway can be found in Sec 11.
 - All costs of the labor and equipment to remove temporary pipe conduit shall be included in the price bid for "Pipe Corr Steel .064IN 18IN".



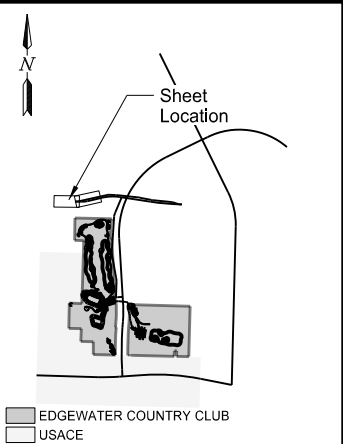
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ND 23B Truck Reliever Route
Temporary Work Zone Traffic Control
40th St NW Phase A
Temporary Roadway
Sta 30+00.00 to Sta 38+17.26

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	100	7

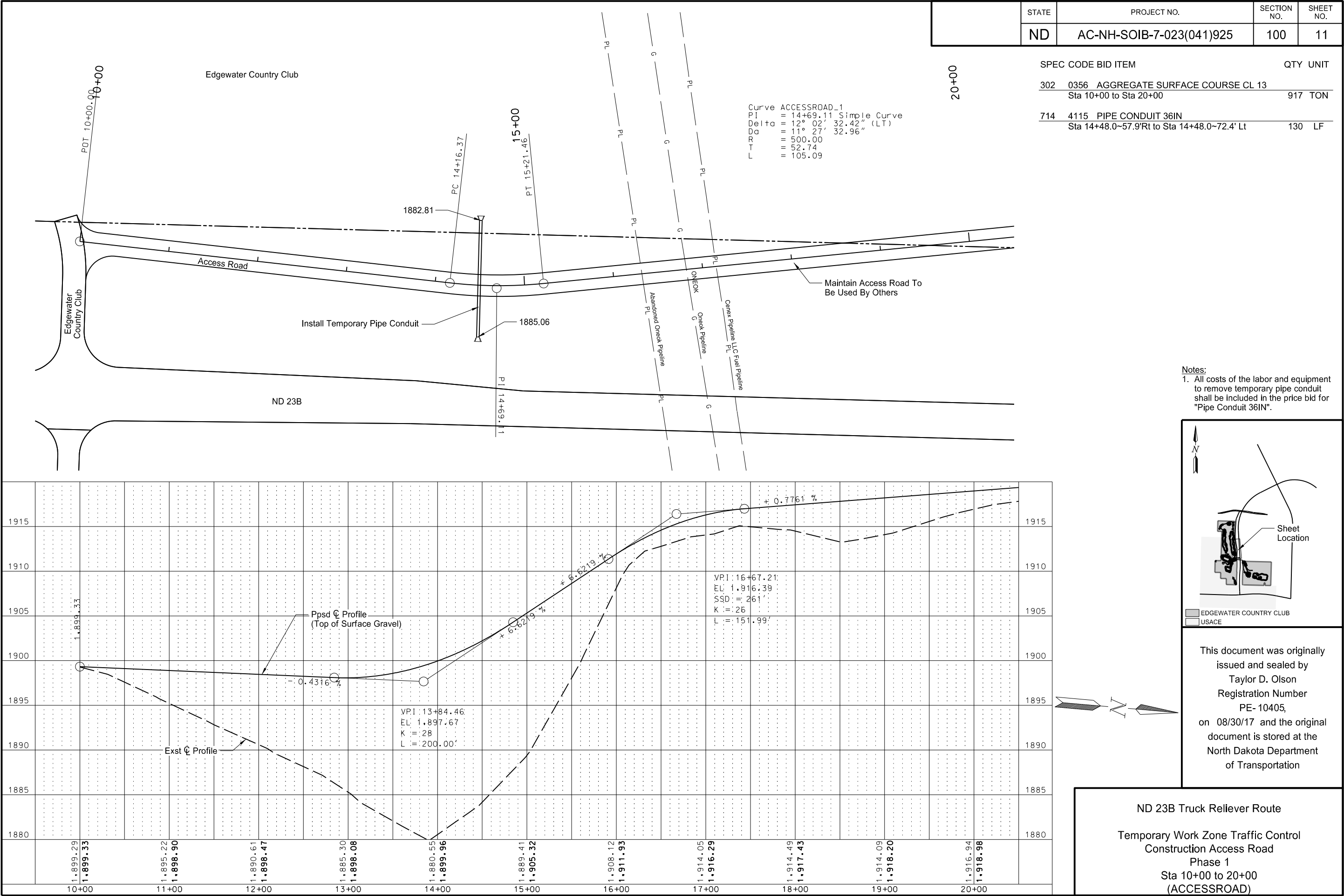


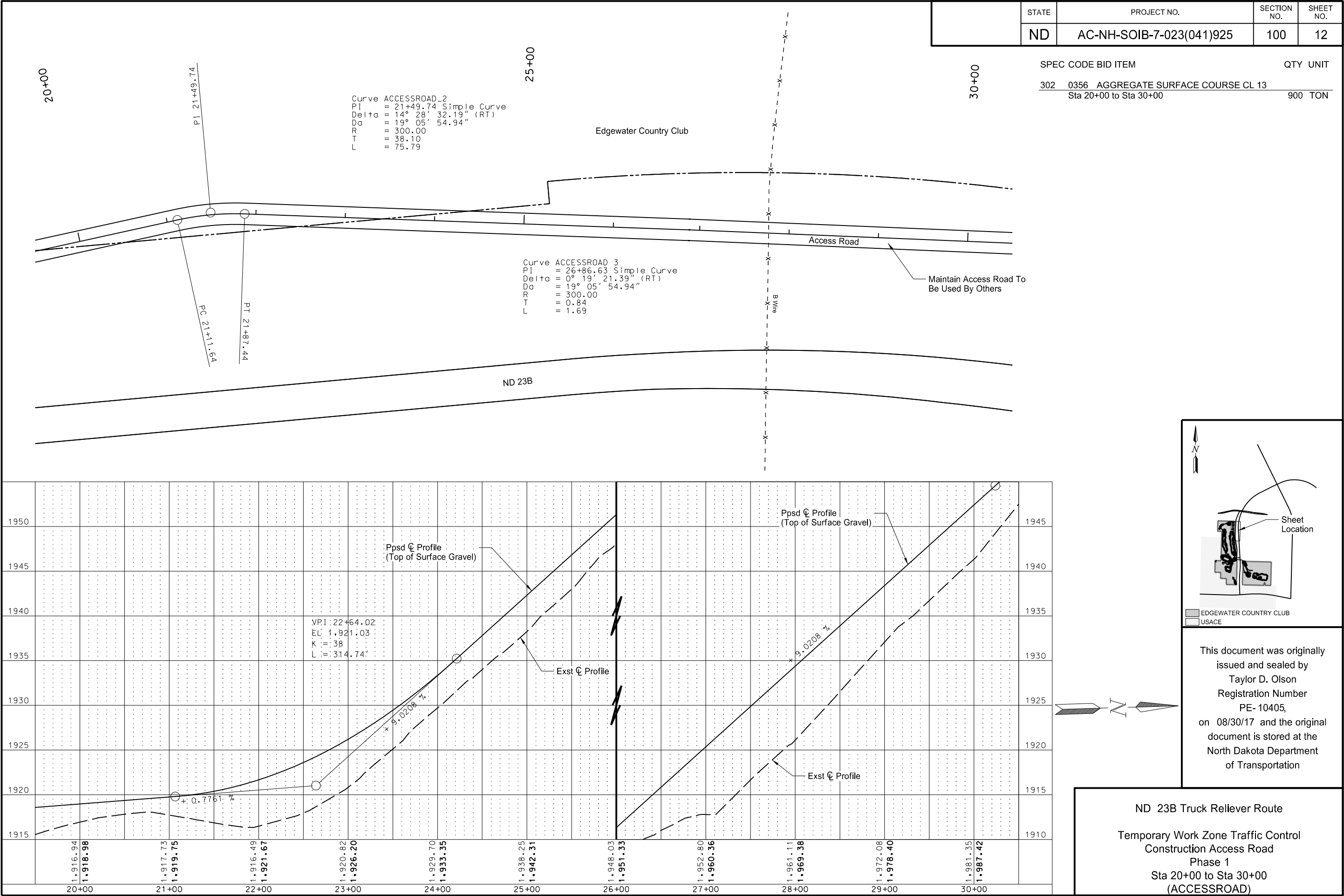
- Type III Barricade
- Sign
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Zone
- Exst 40th St NW
- 40th St NW Temporary Roadway



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ND 23B Truck Reliever Route
Temporary Work Zone Traffic Control
40th St NW Phase B





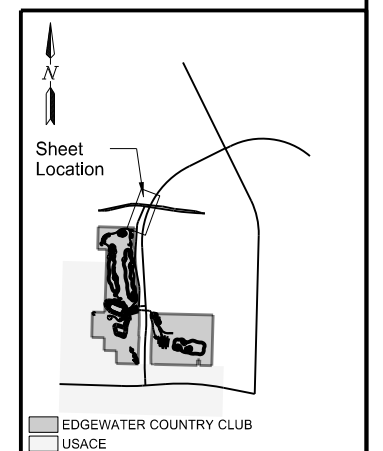
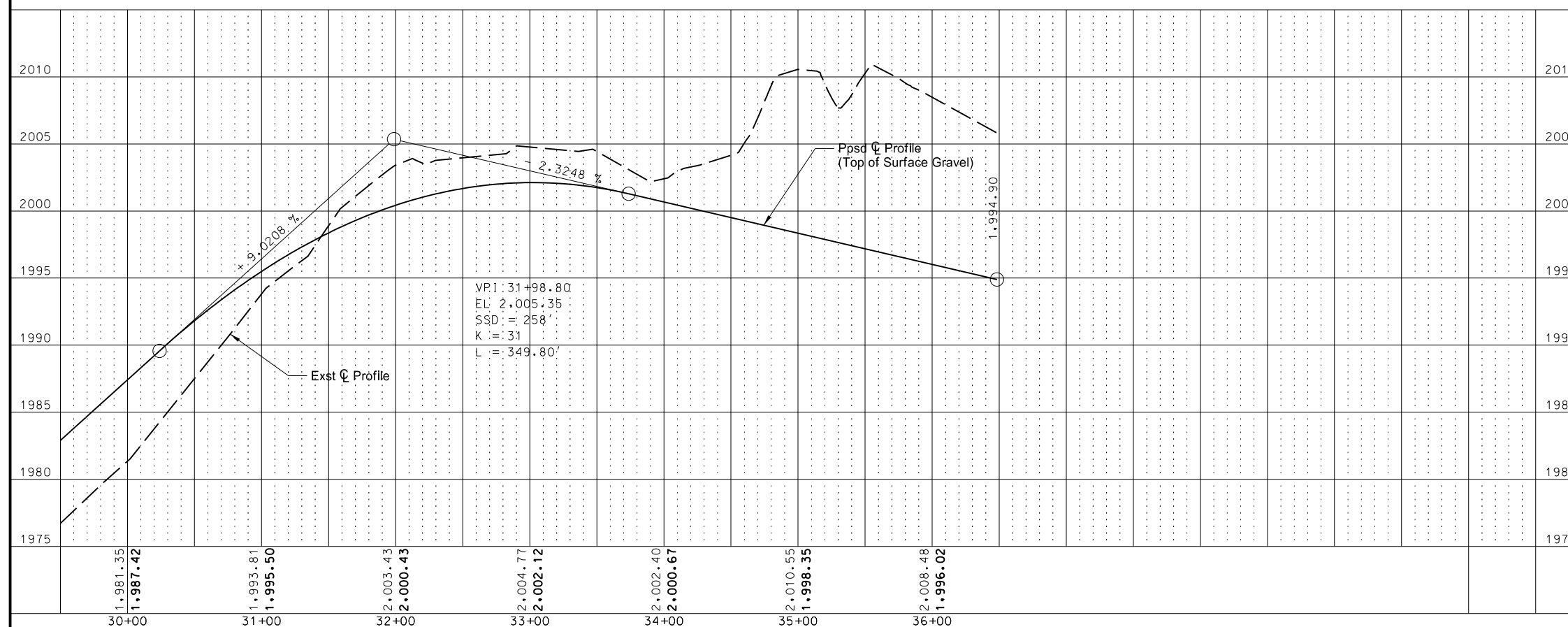
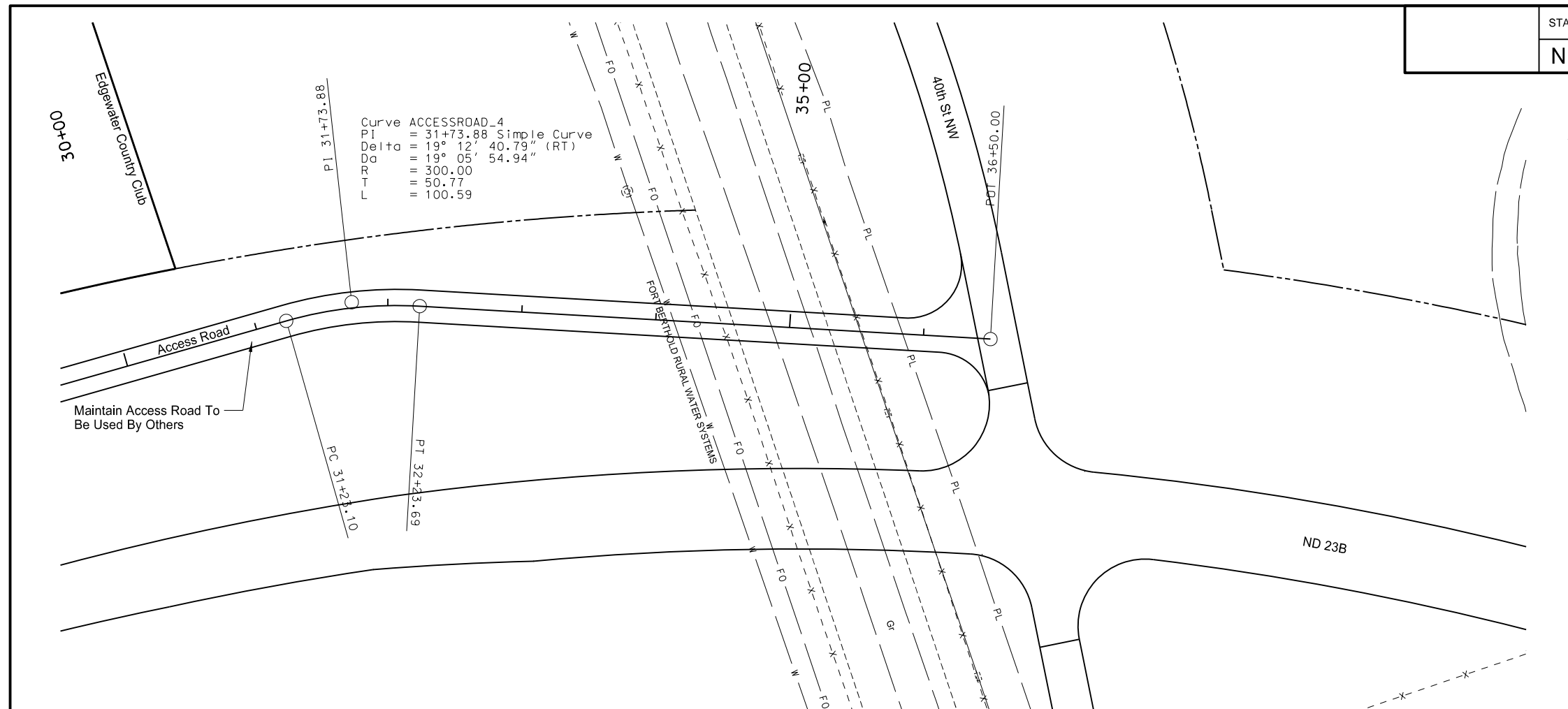
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	100	13

SPEC	CODE	BID	ITEM
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QTY	UNIT
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302	0356	AGGREGATE SURFACE COURSE CL 13
		Sta 30+00 to Sta 36+50

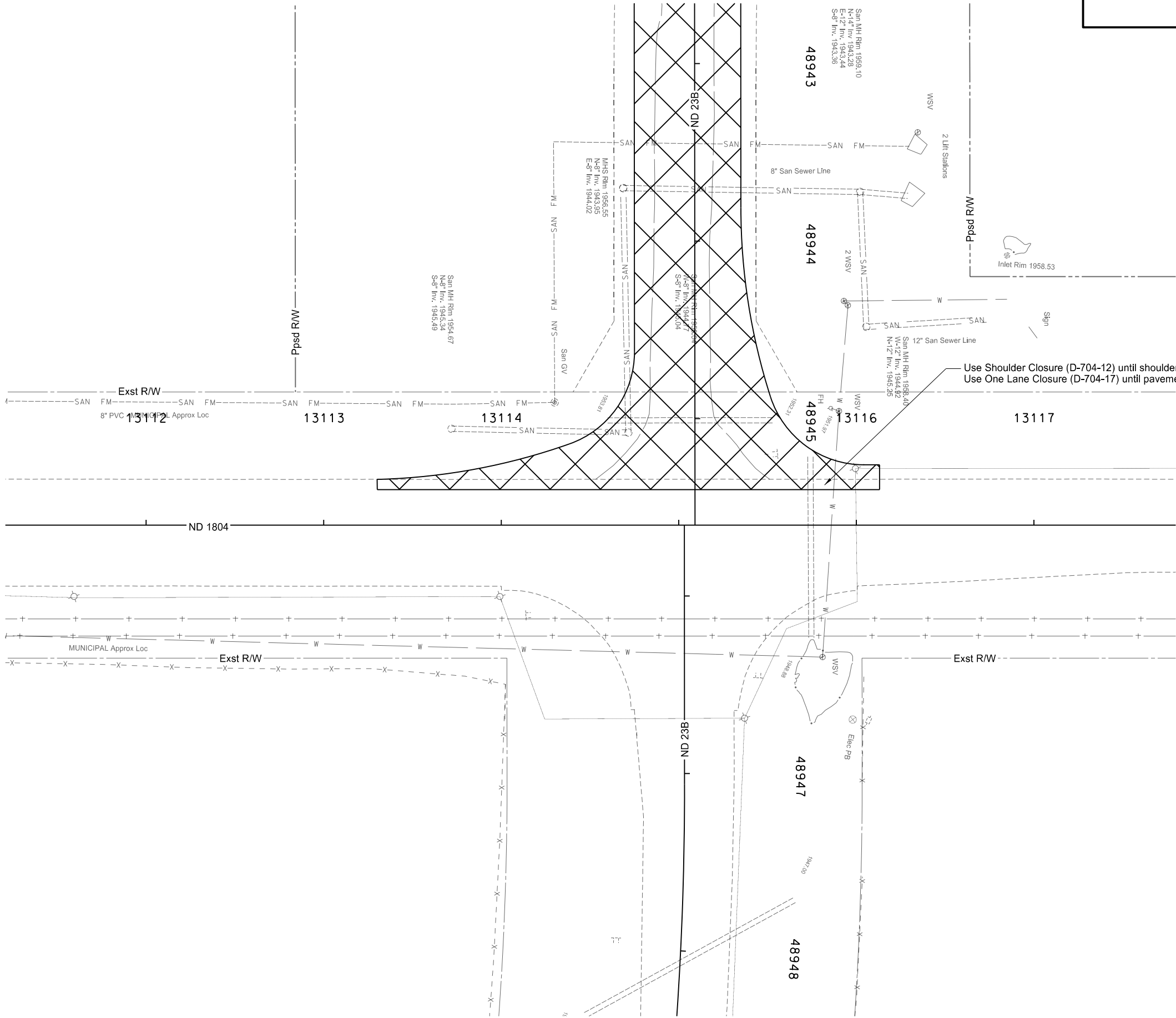
607 TON



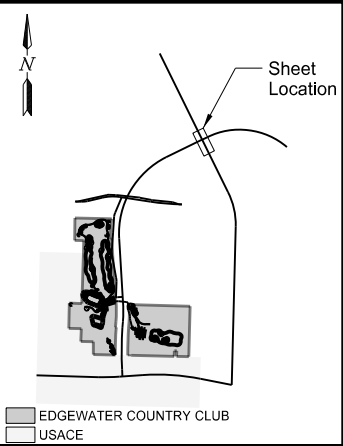
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ND 23B Truck Reliever Route
Temporary Work Zone Traffic Control
Construction Access Road
Phase 1
Sta 30+00 to Sta 36+50
(ACCESSROAD)

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	100	14



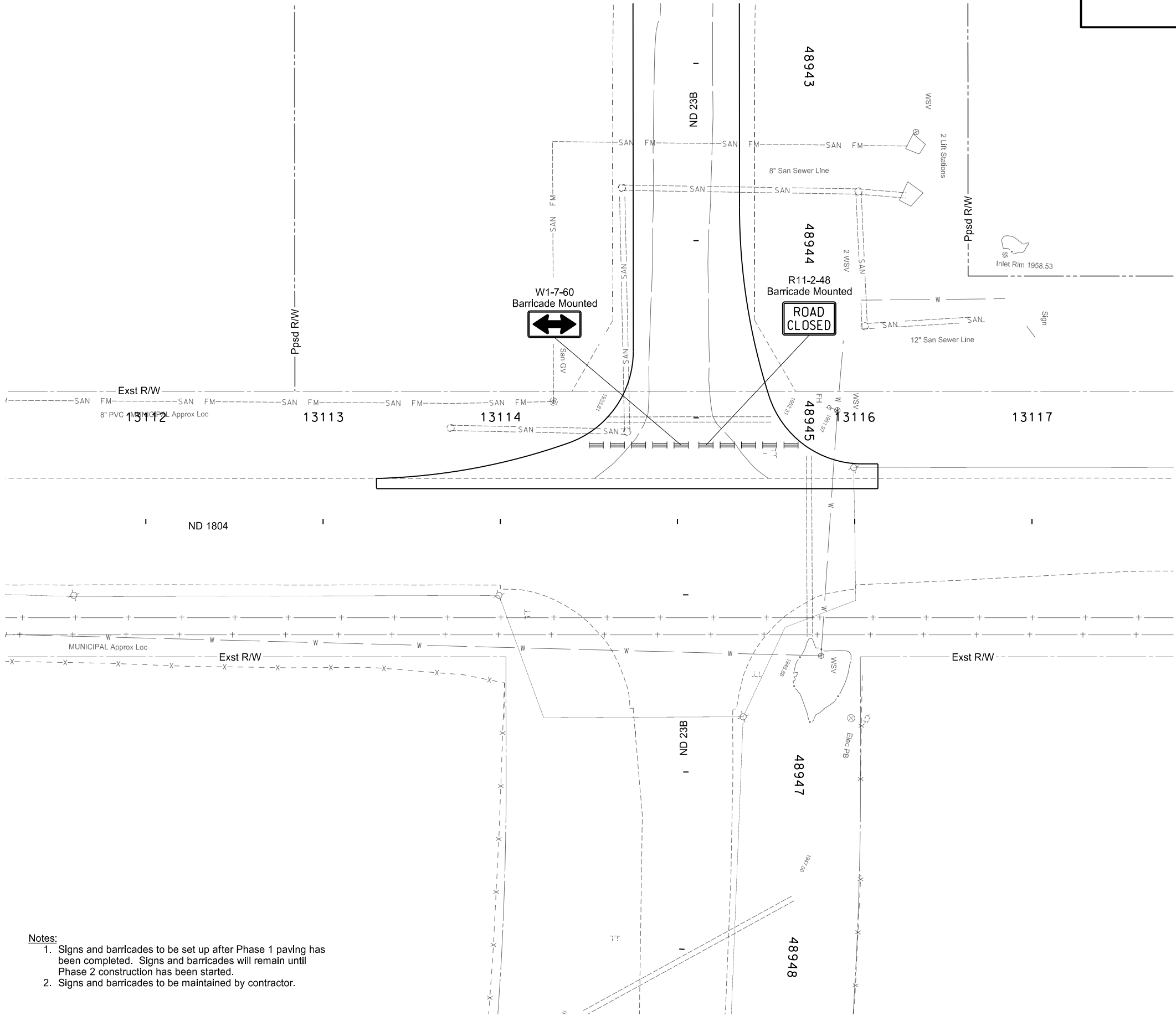
- Type III Barricade
- Sign
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Zone
- Newly Constructed Roadway
- Aggregate Base Course CI 5



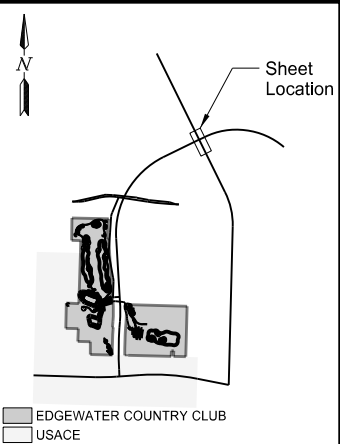
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ND 23B Truck Reliever Route
Temporary Work Zone Traffic Control
Phase 1

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	100	15



- Type III Barricade
- Sign
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Zone
- Newly Constructed Roadway
- Aggregate Base Course CI 5

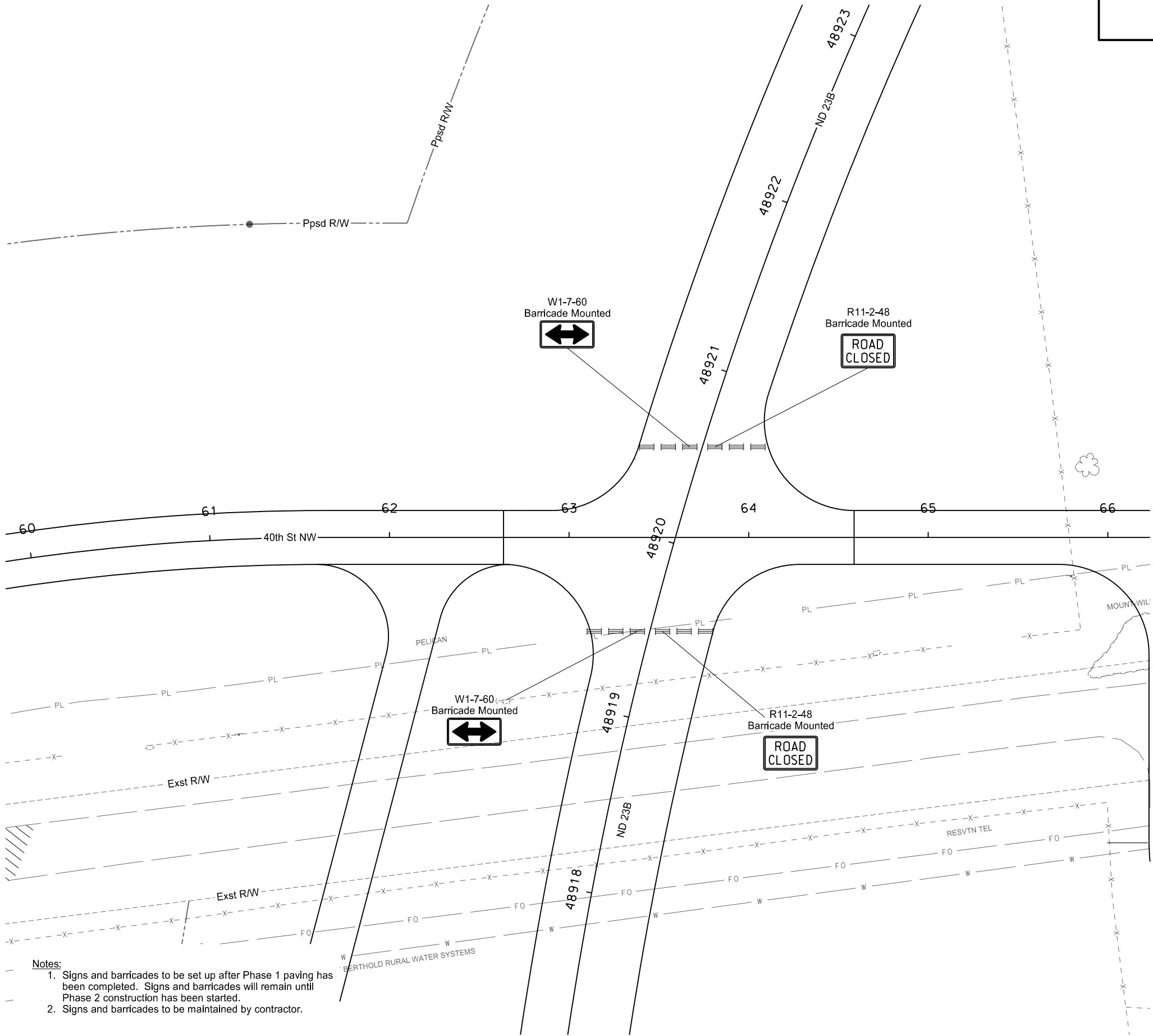


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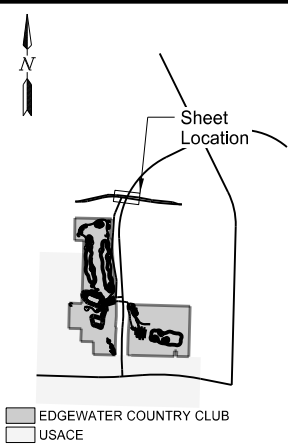
ND 23B Truck Reliever Route
Temporary Work Zone Traffic Control
Phase 1

- Notes:
- Signs and barricades to be set up after Phase 1 paving has been completed. Signs and barricades will remain until Phase 2 construction has been started.
 - Signs and barricades to be maintained by contractor.

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	100	16



- Type III Barricade
- Sign
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Zone
- Newly Constructed Roadway
- Aggregate Base Course CI 5



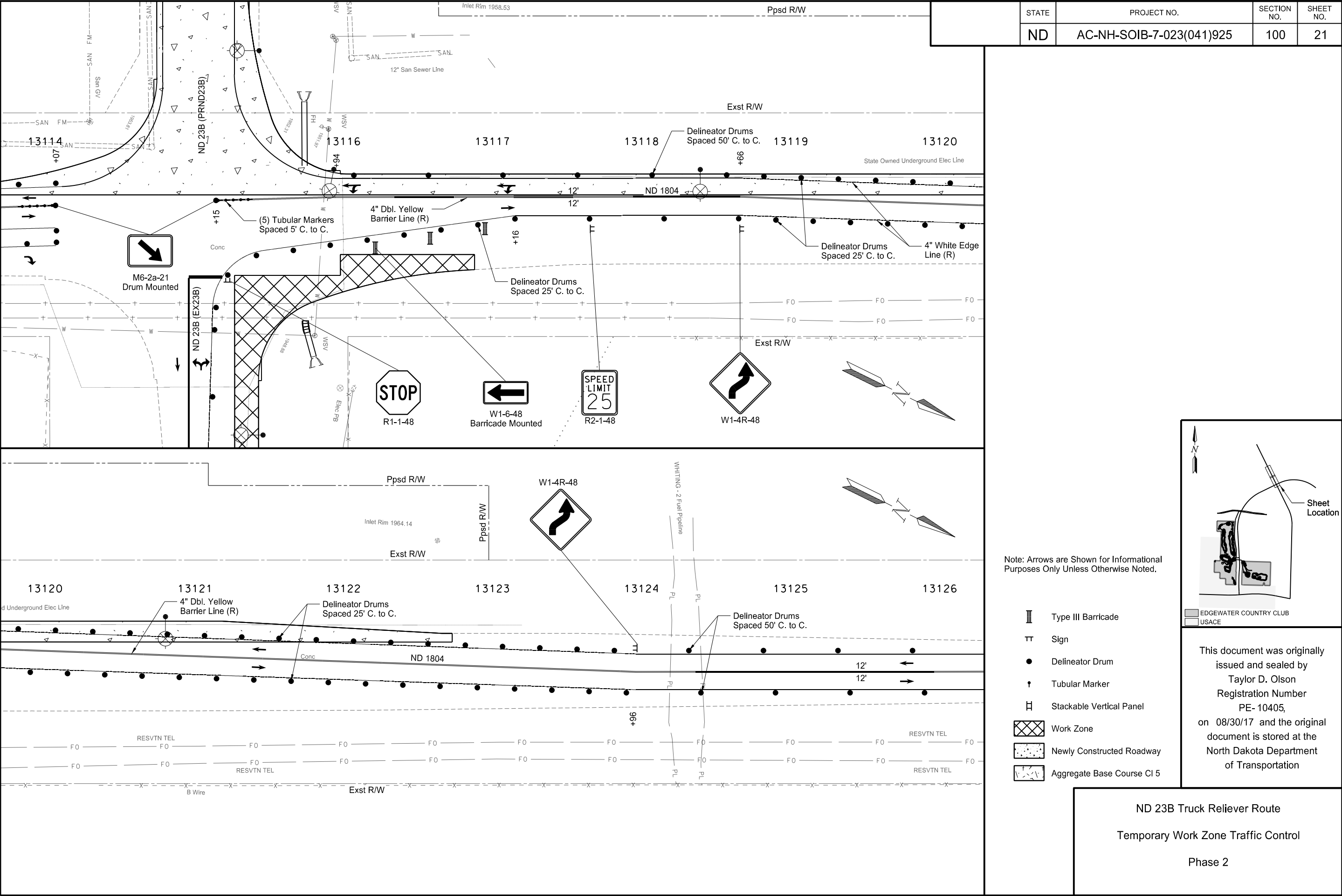
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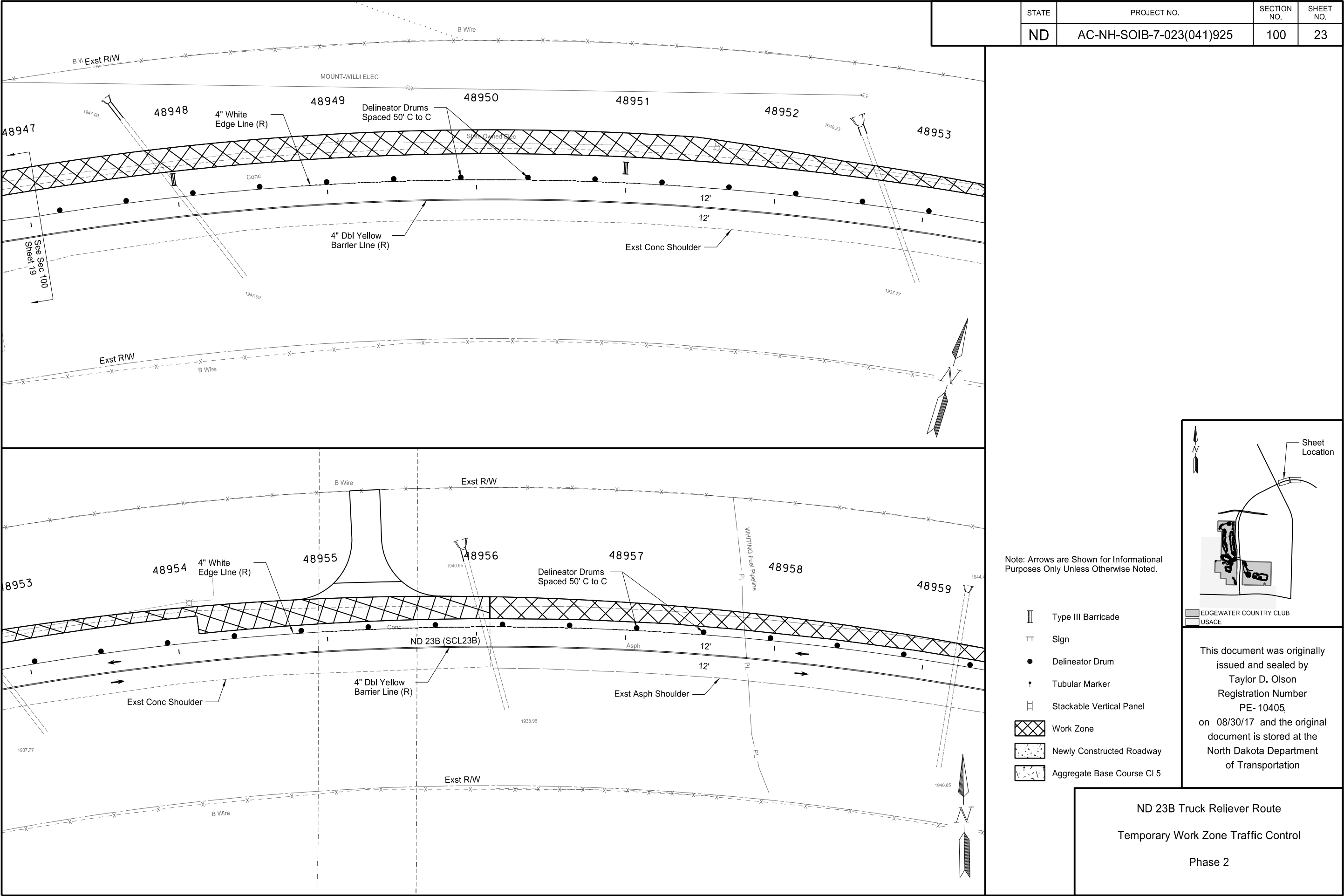


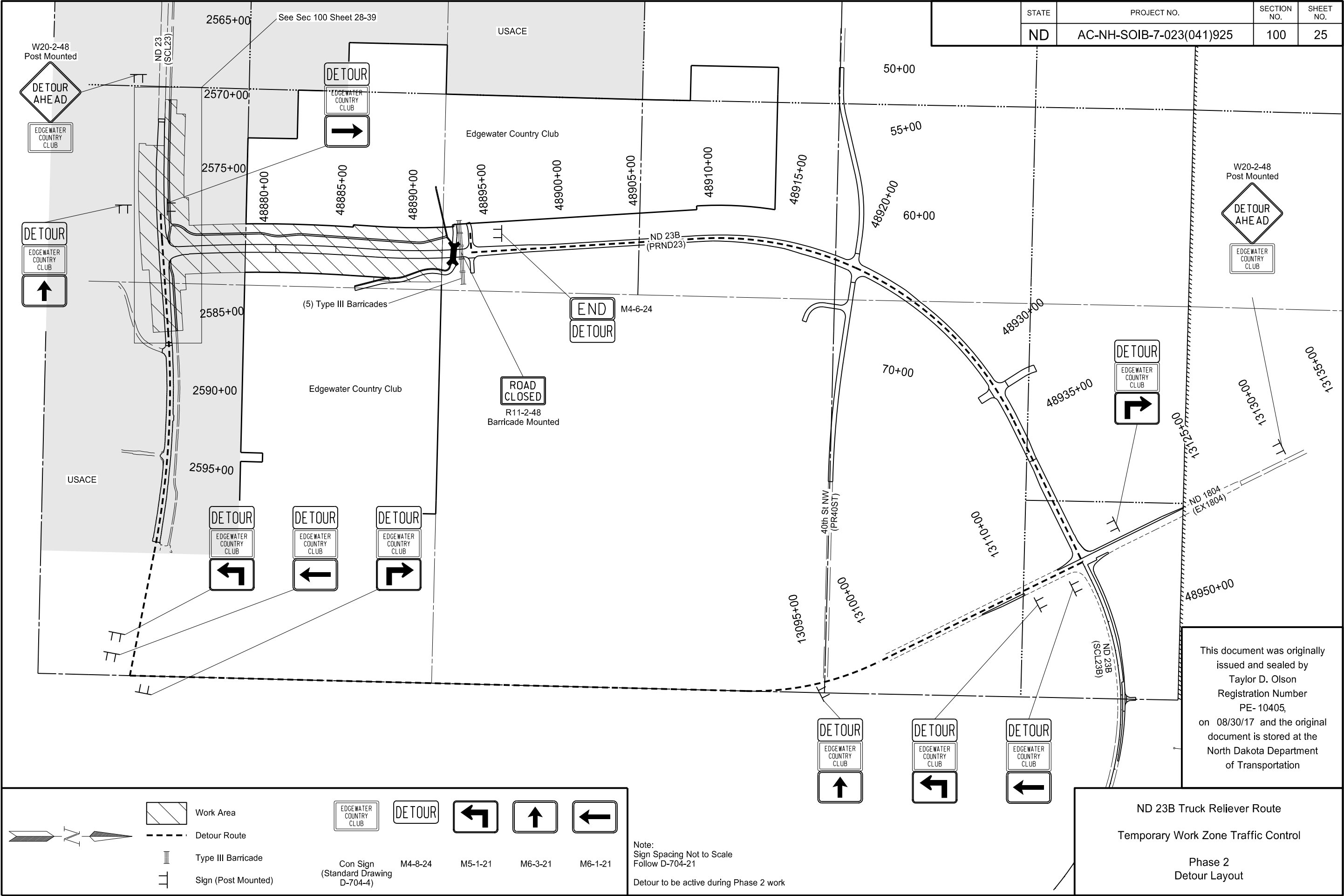
ND 23B Truck Reliever Route
Temporary Work Zone Traffic Control
Phase 1

- Notes:
1. Signs and barricades to be set up after Phase 1 paving has been completed. Signs and barricades will remain until Phase 2 construction has been started.
 2. Signs and barricades to be maintained by contractor.

8/30/2017	11:04:23 AM	bradyhaussler	\\frgo-files01\PI\State\NDDOT\14214101\CADD\Design\Plans\Sections\100\100WZ_018_Phase2a.dgn
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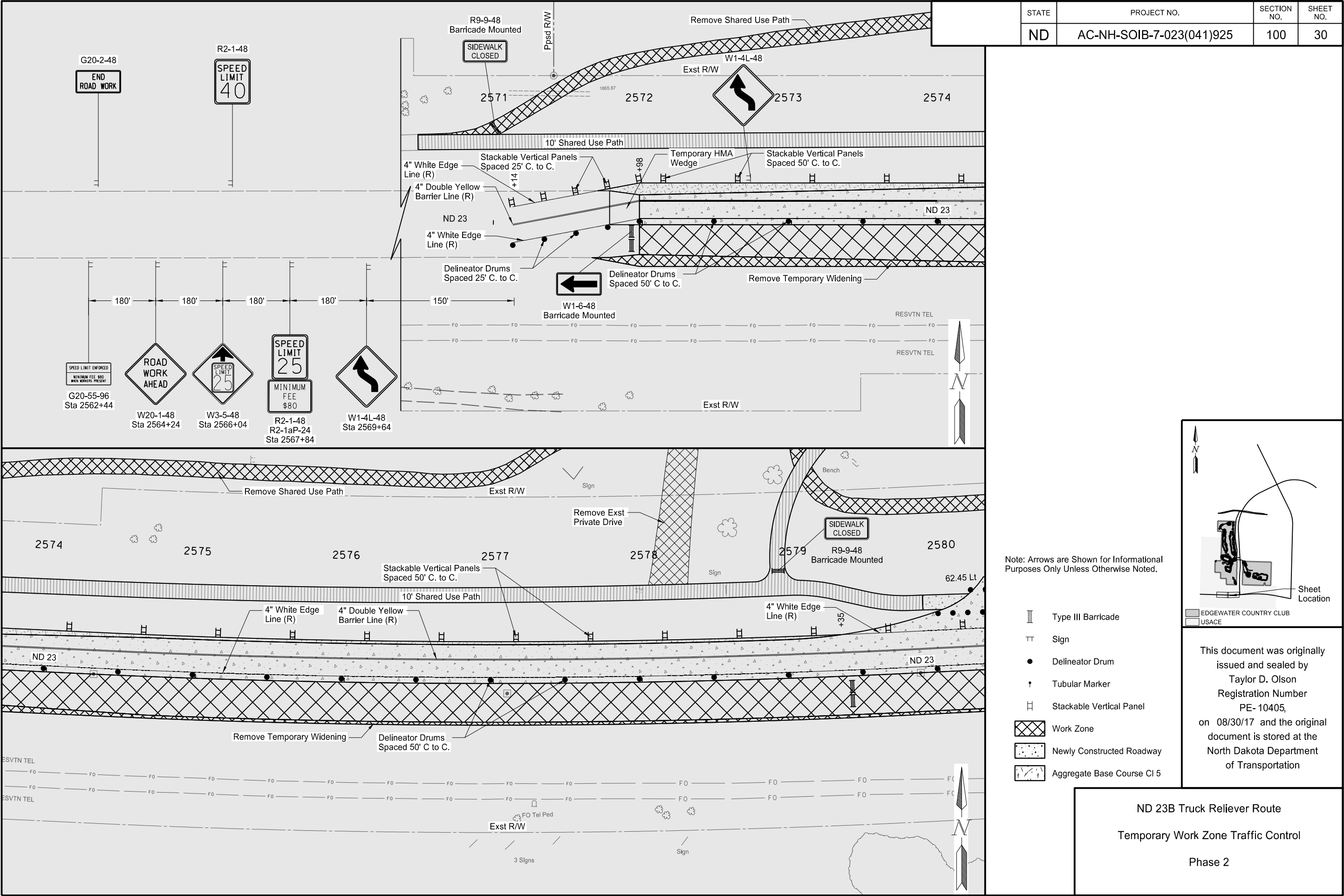


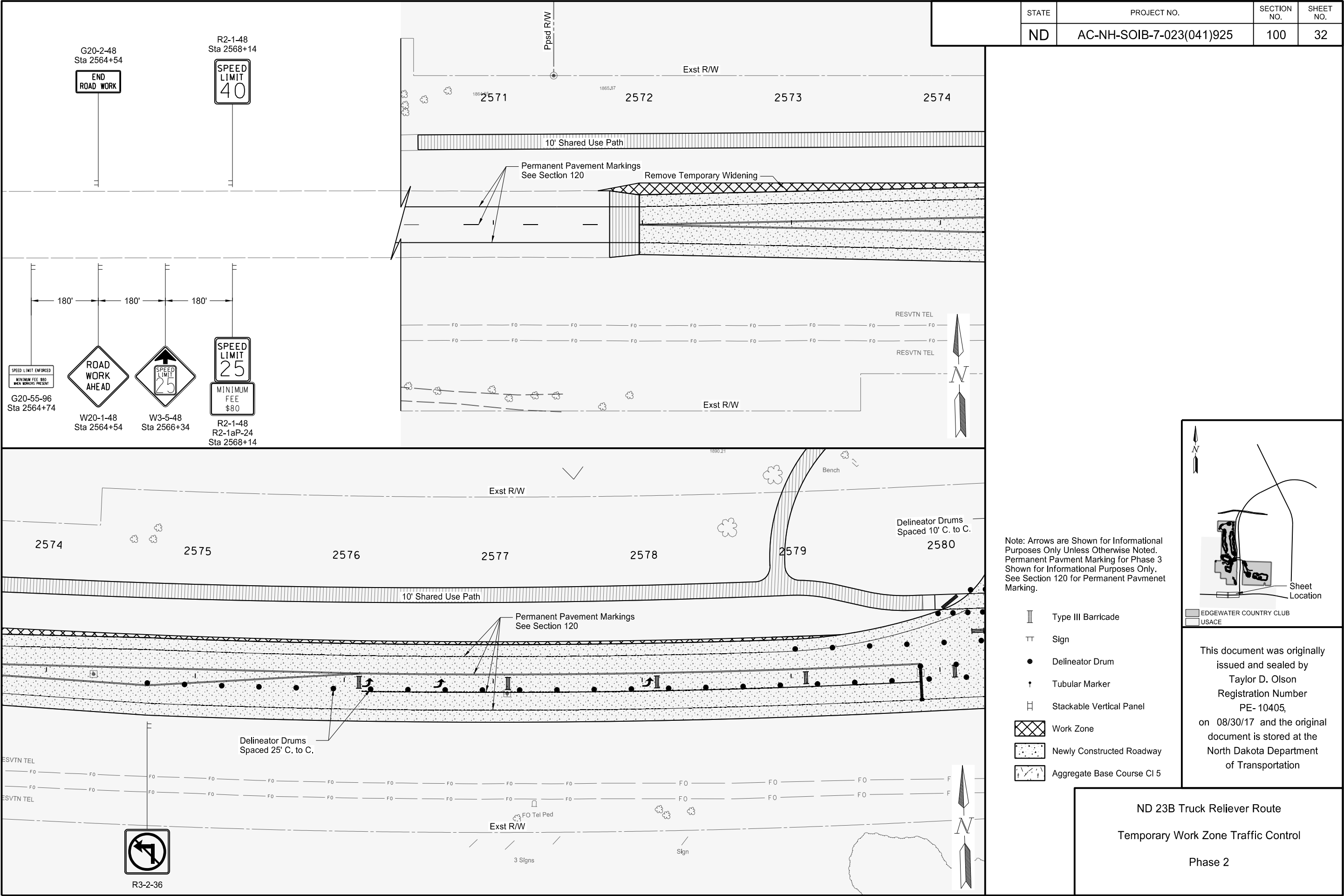


STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	100	25

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ND 23B Truck Reliever Route
Temporary Work Zone Traffic Control
Phase 2
Detour Layout





SIGN NUMBER		NPDES Permit				
WIDTH x HEIGHT		3'-0" x 2'-0"				
BORDER WIDTH		0.63" (inset 0.38")				
CORNER RADIUS		1.5"				
MOUNTING		Ground				
BACKGROUND		TYPE: Diamond Grade				
		COLOR: Fluorescent Orange				
LEGEND/BORDER		TYPE: Non-reflective				
		COLOR: Black				

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
48962+00 Rt
2571+00 Rt
2589+00 Lt
13109+00 Rt
13127+00 Lt

AREA: 6.0 Sq.Ft.

Diagram of NPDES Permit sign with dimensions and stationing. The sign is 3'-0" wide and 2'-0" high. It contains the text: NPDES Permit, 1234567890, Contact NDDOT, (701) 123-4567. Dimensions are in inches.tenths. Letter locations are panel edge to lower left corner.

LETTER POSITION (X)																LENGTH	SIZE	SERIES	
N	P	D	E	S		P	e	r	m	i	t					26.7	3/2.3	D 2000	
4.7	7.4	9.9	12.6	14.8	16.8	19.8	22.1	24.3	25.8	29.3	30.2								
1	2	3	4	5	6	7	8	9	0		See Note						3	D 2000	
C	o	n	t	a	c	t		N	D	D	O	T					29	3/2.3	D 2000
3.5	6	8.3	10.4	11.8	13.9	15.8	17	20	22.8	25.5	28.1	30.6							
(	7	0	1	)			1	2	3	-	4	5	6	7		See Note		3	D 2000

Note: Obtain permit number from the NPDES permit and phone number from the NDDOT District Office.

Note: Place one sign at each end of the project, 60' from roadway centerline, on the right hand side, visible to traffic entering the project.

Diagram showing the installation of NPDES Permit Sign and EPA Permit Notification Sign on a sign support with dimensions and labels. The NPDES Permit Sign is 36" wide and 24" high. The EPA Permit Notification Sign is 36" wide and 24" high. The sign support is 5' vertical clearance. The ground line is indicated. Labels include: NPDES Permit Sign, Stringers, EPA Permit Notification Sign, Sign support, Ground line, and 5' vertical clearance.

NPDES Permit Sign at construction site

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ND 23B Truck Reliver Route
Temporary Work Zone Traffic Control
Sign Details

8/30/2017 11:06:03 AM bradyhaussler \\frgo-files01\PI\State\NDDOT\14214101\CADD\Design\Plans\Sections\100\110SN_034-035_DSignDet_NPDES_Permit_Sign.dgn

SIGN NUMBER

EPA Permit Notification

WIDTH X HEIGHT

3'-0" x 2'-0"

BORDER WIDTH

0.63" (inset 0.38")

CORNER RADIUS

1.5"

MOUNTING

Ground

BACKGROUND

TYPE: XI Reflective

COLOR: Fluorescent Orange

LEGEND/BORDER

TYPE: Non-reflective

COLOR: Black

STATION(S):

48962+00 Rt

2571+00 Rt

2589+00 Lt

13109+00 Rt

13127+00 Lt

AREA: 6.0 Sq.Ft.

36"

24"

2.5"

1"

3"

1"

5"

1"

1"

2.5"

IF YOU WOULD LIKE TO OBTAIN A COPY OF THE
STORMWATER POLLUTION PREVENTION PLAN FOR THIS SITE
CONTACT THE EPA REGIONAL OFFICE AT
<https://www.epa.gov/npdes/contact-us-stormwater#regional>

IF YOU OBSERVE INDICATORS OF STORMWATER POLLUTANTS
IN THE DISCHARGE OR IN THE RECEIVING WATERBODY
CONTACT THE EPA THROUGH THE FOLLOWING WEBSITE
<https://www.epa.gov/enforcement/report-environmental-violations>

2.5"

1"

1"

2.2"

0.6"

2.2"

1"

1"

2.5"

8.5"

1"

14.5"

3.25"

29.5"

3.25"

Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

LETTER POSITION (X)																																LENGTH	SIZE	SERIES						
I	F		Y	O	U		W	O	U	L	D		L	I	K	E		T	O															12.3	1	B 2000				
5.2	5.5	5.9	6.9	7.5	8.2	8.6	9.6	10.4	11	11.7	12.2	12.6	13.6	14.1	14.5	15.1	15.5	16.5	17																					
O	B	T	A	I	N		A		C	O	P	Y		O	F		T	H	E																	12.5	1	B 2000		
18.4	19.1	19.6	20	20.7	21	21.5	22.5	23	24	24.6	25.3	25.7	26.3	27.3	27.9	28.3	29.3	29.8	30.5																					
S	T	O	R	M	W	A	T	E	R		P	O	L	L	U	T	I	O	N		P	R	E	V	E	N	T	I	O	N						17.6	1	B 2000		
3.4	3.9	4.4	5.1	5.7	6.3	7	7.6	8.1	8.7	9.1	10.1	10.6	11.3	11.8	12.3	12.9	13.4	13.7	14.4	14.8	15.8	16.4	17	17.4	18	18.6	19.1	19.7	20	20.6										
P	L	A	N		F	O	R		T	H	I	S		S	I	T	E																			10.3	1	B 2000		
22.1	22.6	23.1	23.8	24.2	25.2	25.7	26.3	26.8	27.8	28.3	28.9	29.2	29.6	30.6	31.2	31.5	32																							
C	O	N	T	A	C	T		T	H	E		E	P	A		R	E	G	I	O	N	A	L		O	F	F	I	C	E		A	T			20.3	1	B 2000		
7.3	7.9	8.5	9.1	9.5	10.2	10.7	11.1	12.1	12.6	13.3	13.6	14.6	15.2	15.7	16.2	17.2	17.8	18.3	18.9	19.3	19.9	20.5	21.2	21.5	22.5	23.2	23.7	24.2	24.5	25.2	25.5	26.5	27.1							
h	t	t	p	s	:	/	/	w	w	w	.	e	p	a	.	g	o	v	/	n	p	d	e	s	/	c	o	n	t	a	c	t			16.6	1/0.8	B 2000			
4.7	5.1	5.4	5.8	6.3	6.6	6.9	7.9	8.9	9.5	10.1	10.7	11	11.4	11.9	12.4	12.6	13.1	13.6	14	15.1	15.6	16.1	16.6	17	17.3	18.4	18.8	19.3	19.8	20.1	20.6	21								
-	u	s	-	s	t	o	r	m	w	a	t	e	r		r	e	g	i	o	n	a	l														10.2	1/0.8	B 2000		
21.3	21.7	22.2	22.5	22.9	23.3	23.6	24.1	24.5	25.1	25.8	26.2	26.5	27	27.3	28.3	28.6	29.1	29.6	29.9	30.4	30.8	31.3																		
I	F		Y	O	U		O	B	S	E	R	V	E		I	N	D	I	C	A	T	O	R	S													14.5	1	B 2000	
3.2	3.6	4	5	5.6	6.3	6.7	7.7	8.4	8.9	9.5	10	10.5	11.1	11.5	12.5	12.9	13.5	14.1	14.5	15	15.6	16.1	16.7	17.3																
O	F		S	T	O	R	M	W	A	T	E	R		P	O	L	L	U	T	A	N	T	S														14.1	1	B 2000	
18.7	19.3	19.7	20.7	21.2	21.7	22.4	23	23.6	24.3	24.9	25.4	25.9	26.4	27.4	27.9	28.6	29.1	29.6	30.2	30.6	31.3	31.9	32.3																	
I	N		T	H	E		D	I	S	C	H	A	R	G	E		O	R		I	N																14.1	1	B 2000	
4.3	4.6	5.1	6.1	6.6	7.2	7.6	8.6	9.2	9.5	10.1	10.7	11.3	12	12.5	13.1	13.5	14.5	15.2	15.6	16.6	16.9	17.4																		
T	H	E		R	E	C	E	I	V	I	N	G		W	A	T	E	R	B	O	D	Y															13.3	1	B 2000	
18.4	18.9	19.5	19.9	20.9	21.5	22	22.6	23.2	23.5	24.1	24.4	25	25.5	26.5	27.2	27.8	28.3	28.8	29.4	30	30.6	31.2																		
C	O	N	T	A	C	T		T	H	E		E	P	A		T	H	R	O	U	G	H															15	1	B 2000	
4.4	4.9	5.6	6.2	6.6	7.3	7.8	8.2	9.2	9.7	10.3	10.7	11.7	12.3	12.8	13.3	14.3	14.8	15.5	16	16.7	17.3	17.9	18.3																	
T	H	E		F	O	L	L	O	W	I	N	G		W	E	B	S	I	T	E																		12.1	1	B 2000
19.3	19.9	20.5	20.9	21.9	22.4	23	23.6	24	24.6	25.4	25.7	26.4	26.8	27.8	28.6	29.1	29.6	30.2	30.5	31																				
h	t	t	p	s	:	/	/	w	w	w	.	e	p	a	.	g	o	v	/	e	n	f	o	r	c	e	m	e	n	t	/						16.3	1/0.8	B 2000	
3.3	3.7	4	4.4	4.9	5.2	5.5	6.5	7.5	8.1	8.7	9.3	9.6	10	10.5	11	11.2	11.7	12.2	12.6	13.7	14.1	14.6	14.9	15.4	15.7	16.2	16.7	17.4	17.8	18.3	18.6									
r	e	p	o	r	t	-	e	n	v	i	r	o	n	m	e	n	t	a	l	-	v	i	o	l	a	t	i	o	n	s								12.8	1/0.8	B 2000
19.6	20	20.5	20.9	21.4	21.7	22	22.4	22.9	23.4	23.9	24.2	24.5	25	25.5	26.2	26.7	27.1	27.5	28	28.2	28.6	29.1	29.4	29.9	30.1	30.6	30.9	31.2	31.7	32.2										

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ND 23B Truck Reliver Route
Temporary Work Zone Traffic Control
Sign Details

8/30/2017

11:06:01 AM

bradyhaussler

\\frgo-files01\PI\State\NDDOT\14214101\CADD\Design\Plans\Sections\100\110SN_034-035_DSignDet_NPDES_Permit_Sign.dgn

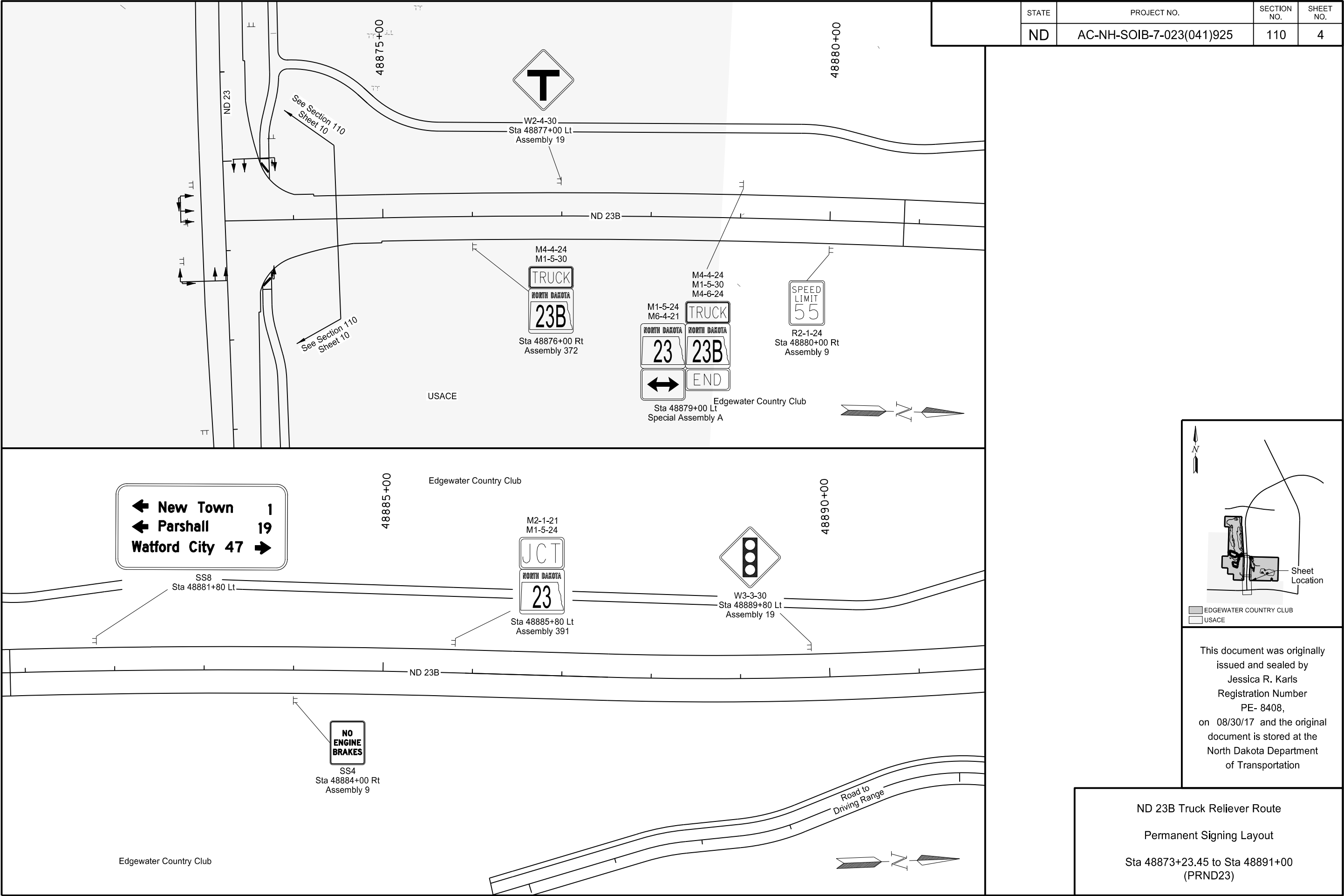
																				STATE	PROJECT NO.			SECTION NO.	SHEET NO.					
																				N.D.	AC-NH-SOIB-7-023(041)925			110	1					
	Sign	Assembly	Flat Sheet For Signs		Sign Support Length				Vert Clear-ance	Support	Max Post Len	Sleeve Length				Sleeve	Anchor	Anchor	Anchor	Reset Sign Panel	Reset Sign Support	Break-Away								
Station / RP	No.	No.	IV SF	XI SF	1st LF	2nd LF	3rd LF	4th LF	FT	Size	LF	1st LF	2nd LF	3rd LF	4th LF	Size	EA	LF	Size	EA	EA	EA	Comments							
ND 23 B (Proposed)																														
48876+00 Rt	M1-5	372	7.0		12.20				5.0	2.5 x 2.5 12 ga	14.1						1	4	3 x 3 7 ga											
48877+00 Lt	W2-4	19		6.3	12.35				5.0	2.5 x 2.5 12 ga	14.6						1	4	3 x 3 7 ga											
48879+00 Lt	SA-A		15.2		13.23				5.0	2.5 x 2.5 10 ga	14.4	4.1				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga			1								
48880+00 Rt	R2-1	9		5.0	11.63				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga											
48881+80 Lt	SS8		28.0		11.88	12.88			5.0	2.5 x 2.5 10 ga	13.9	3.4	4.4			2.19 x 2.19 10 ga	2	8	3 x 3 7 ga			2								
48884+00 Rt	SS4	9		5.0	11.63				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga											
48885+80 Lt	M1-5	391	6.2		12.42				5.0	2.25 x 2.25 12 ga	12.7						1	4	2.5 x 2.5 12 ga											
48889+80 Lt	W3-3	19		6.3	12.35				5.0	2.5 x 2.5 12 ga	14.6						1	4	3 x 3 7 ga											
48891+76 Rt	SA-F			6.3					5.0																					
48892+00 Lt	R2-1	9		5.0	10.55				5.0	2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga											
48892+66 Lt	SA-E		4.0	4.0	12.93				5.0	2.5 x 2.5 10 ga	15.4						1	4	3 x 3 7 ga			1								
48892+86 Rt	SA-E		4.0	4.0	12.93				5.0	2.5 x 2.5 10 ga	15.4						1	4	3 x 3 7 ga			1								
48893+67 Lt	R1-1	1		5.2	10.59				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga											
48894+25 Rt	W1-7	34		8.0	10.21				5.0	2.5 x 2.5 12 ga	11.3						1	4	3 x 3 7 ga											
48896+00 Rt	R2-1	9		5.0	11.63				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga											
48909+23 Rt	W1-2R	19		6.3	12.27				5.0	2.5 x 2.5 12 ga	14.6						1	4	3 x 3 7 ga											
48919+58 Lt	SA-2E		19.0	5.2	11.50				5.0	2.5 x 2.5 12 ga	12.6	3.3				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1								
48920+53 Rt	SA-2E		19.0	5.2	11.50				5.0	2.5 x 2.5 12 ga	12.6	3.3				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1								
48928+91 Rt	W3-1	20		9.0	12.64				5.0	2.25 x 2.25 12 ga	14.1	3.9				2 x 2 12 ga	1	4	3 x 3 7 ga			1								
48932+34 Lt	SA-2E		17.0	5.2	13.52				5.0	2.5 x 2.5 10 ga	15.5	3.6				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga			1								
48933+12 Rt	W1-7	34		8.0	10.88				5.0	2.5 x 2.5 10 ga	13.6						1	4	3 x 3 7 ga			1								
48933+41 Rt	M1-5	392	7.2		12.48				5.0	2.5 x 2.5 12 ga	13.9						1	4	3 x 3 7 ga											
48935+15 Lt	W1-2L	19		6.3	12.27				5.0	2.5 x 2.5 12 ga	14.6						1	4	3 x 3 7 ga											
48937+97 Lt	SS4	9		5.0					5.0													Mount on Light Standard								
48938+65 Rt	SS11		18.8		11.42	12.42			5.0	2.25 x 2.25 12 ga	12.9	3.6	4.6			2 x 2 12 ga	2	8	3 x 3 7 ga			2								
48939+49 Lt	R2-1	9		5.0					5.0													Mount on Light Standard								
48942+79 Lt	M1-5	372	7.0						5.0													Mount on Light Standard								
48944+91 Rt	R1-1	3		13.3	10.13				5.0	2.5 x 2.5 12 ga	12.4	2.6				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1								
48945+04 Lt	SA-D		15.4						5.0													Cannot find a post for this scenerio.								
Sub Total			167.80	128.60	Total		310.44												Total	104			0	0	13					
ND 23 B (Existing)																														
48946+38 Lt	R1-1	3		13.3	10.13				5.0	2.5 x 2.5 12 ga	12.4	2.6				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1								
48946+48 Rt	SA-D		15.4		12.92				5.0	2.5 x 2.5 10 ga	13.7	4.2				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga			1								
48948+38 Rt	M1-5	372	7.0		12.69				5.0	2.5 x 2.5 12 ga	14.1						1	4	3 x 3 7 ga											
48951+45 Lt	SS12		17.5		12.35	13.35			5.0	2.25 x 2.25 12 ga	13.8	4.0	5.0			2 x 2 12 ga	2	8	3 x 3 7 ga			2								
48952+38 Rt	R2-1	9		5.0	12.09				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga											
48956+38 Rt	SS4	9		5.0	11.63				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga											
48958+38 Lt	M1-5	392	7.2		12.73				5.0	2.5 x 2.5 12 ga	13.9						1	4	3 x 3 7 ga											
48962+38 Lt	W3-1	20		9.0	12.89				5.0	2.25 x 2.25 12 ga	14.1	4.1				2 x 2 12 ga	1	4	3 x 3 7 ga			1								
49108+60 Rt	SS15		28.0		12.69	13.25	13.81		5.0	2.5 x 2.5 10 ga	16.4	2.8	3.4	3.9		2.19 x 2.19 10 ga	3	12	3 x 3 7 ga			3								
																			This document was originally issued and sealed by Jessica R. Karls, Registration Number 8408, on 8/30/2017 and is stored at the North Dakota Department of Transportation.						Sign Summary Perforated Tube					
8/30/2017 11:36:17AM																														
Page 1 of 3																														

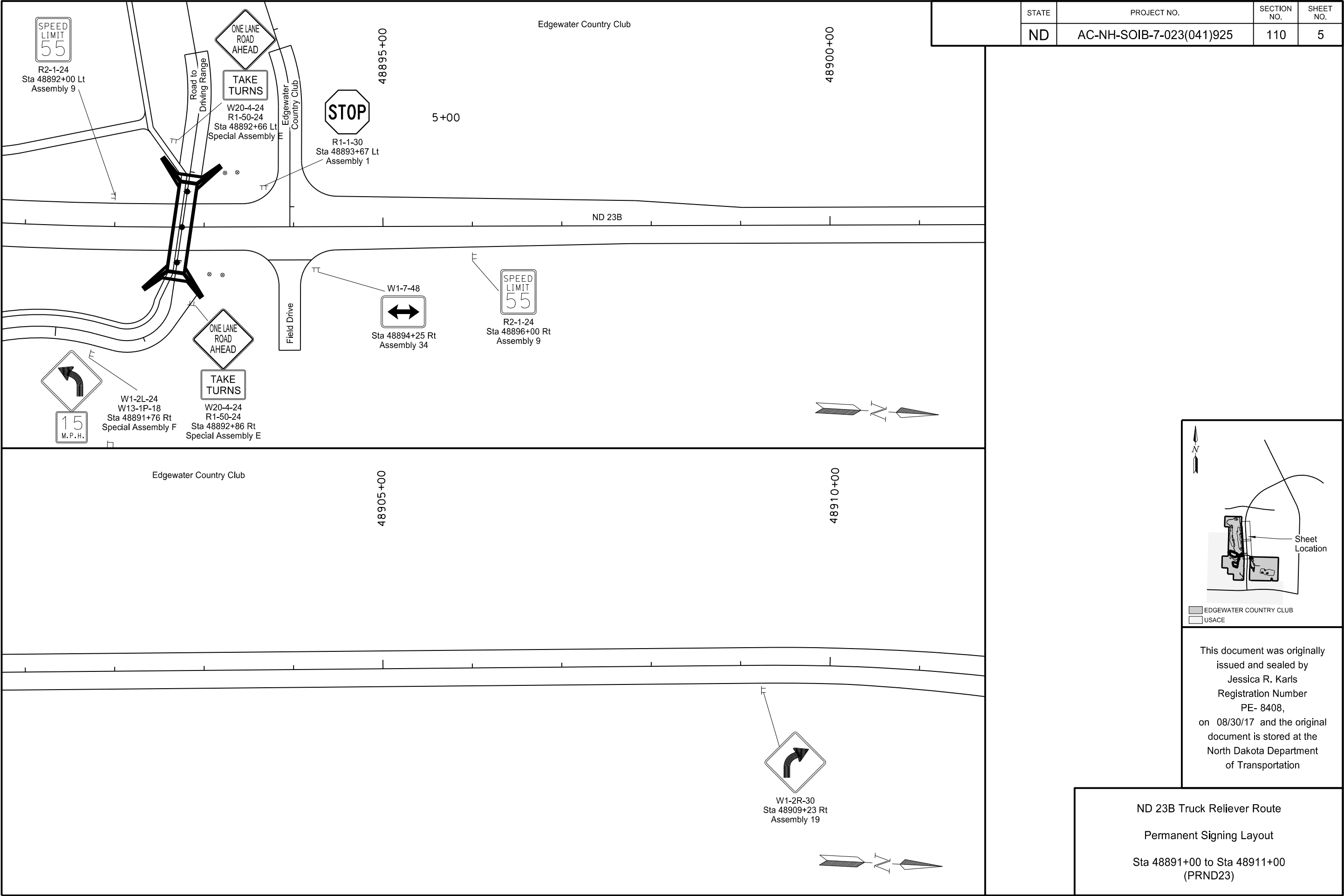
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																			N.D.	AC-NH-SOIB-7-023(041)925			110	2				
	Sign	Assembly	Flat Sheet For Signs		Sign Support Length				Vert Clear-ance	Support	Max Post Len	Sleeve Length				Sleeve	Anchor	Anchor	Anchor	Reset Sign Panel	Reset Sign Support	Break-Away						
Station / RP	No.	No.	IV SF	XI SF	1st LF	2nd LF	3rd LF	4th LF	FT	Size	LF	1st LF	2nd LF	3rd LF	4th LF	Size	EA	LF	Size	EA	EA	EA	Comments					
Sub Total			75.10	32.30	Total		150.53														Total	48			0	0	8	
ND 23																												
2559+00 Rt	SS5			34.0	13.23	13.94	14.65		5.0	2.5 x 2.5 12 ga	15.0	3.9	4.6	5.3		2.25 x 2.25 12 ga	3	12	3 x 3 7 ga				3					
2563+00 Rt	W3-3	19		6.3	12.85				5.0	2.5 x 2.5 12 ga	14.6						1	4	3 x 3 7 ga									
2567+00 Rt	M1-5	394	9.2		13.48				5.0	2.5 x 2.5 10 ga	13.9						1	4	3 x 3 7 ga				1					
2571+00 Rt	SS9		17.5		10.21	10.88			5.0	2.5 x 2.5 10 ga	12.5						2	8	3 x 3 7 ga				2					
2574+50 Lt	R2-1	9		5.0	10.88				5.0	2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga									
2575+00 Rt	SA-C		15.4		13.23				5.0	2.5 x 2.5 10 ga	13.7	4.5				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga				1					
2577+29 Rt	SS18		13.5						5.0														Mount on Light Standard					
2578+50 Lt	M1-5	371	6.0		11.42				5.0	2.25 x 2.25 12 ga	12.9						1	4	2.5 x 2.5 12 ga									
2579+77 Lt	R5-3	42		7.0	10.25				5.0	2.25 x 2.25 12 ga	11.6						1	4	2.5 x 2.5 12 ga									
2579+98 Lt	SS6		20.0																				Mount on Mast Arm					
2580+27 Rt	M1-5	399	6.2		11.05				5.0	2.25 x 2.25 12 ga	12.7						1	4	2.5 x 2.5 12 ga									
2580+54 Rt	SS7		18.0																				Mount on Mast Arm					
2580+54 Rt	R3-5R	11		12.0																			Mount on Mast Arm					
2580+54 Rt	R3-5L	11		12.0																			Mount on Mast Arm					
2580+67 Rt	W1-7	34		8.0	9.88				5.0	2.5 x 2.5 12 ga	11.3						1	4	3 x 3 7 ga									
2581+10 Rt	W1-7	34		8.0	9.88				5.0	2.5 x 2.5 12 ga	11.3						1	4	3 x 3 7 ga									
2581+33 Rt	SS3			16.0																			Mount on Mast Arm					
2581+33 Rt	SS6		20.0																				Mount on Mast Arm					
2581+58 Lt	R5-3	42		7.0																			Mount on Light Standard					
2583+00 Rt	M1-5	371	6.0		12.67				5.0	2.25 x 2.25 12 ga	12.9						1	4	2.5 x 2.5 12 ga									
2584+08 Lt	SS19		13.5						5.0														Mount on Light Standard					
2586+60 Lt	SA-D		15.4		12.98				5.0	2.5 x 2.5 10 ga	13.7	4.3				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga				1					
2589+00 Rt	R2-1	9		5.0	12.13				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga									
2589+60 Lt	SS10		12.0		10.38	11.38			5.0	2.5 x 2.5 12 ga	13.7						2	8	3 x 3 7 ga				2					
2593+60 Lt	M1-5	394	9.2		12.21				5.0	2.5 x 2.5 10 ga	13.9						1	4	3 x 3 7 ga				1					
2597+44 Rt	R2-1	9							5.0	2 x 2 12 ga										1								
2597+60 Lt	W3-3	19		6.3	11.54				5.0	2.5 x 2.5 12 ga	14.6						1	4	3 x 3 7 ga									
2706+45 Rt	M1-5	391	6.2		11.67				5.0	2.25 x 2.25 12 ga	12.7						1	4	2.5 x 2.5 12 ga	1								
2708+45 Rt	SS16		9.0		10.57				5.0	2.5 x 2.5 10 ga	11.4						1	4	3 x 3 7 ga				1					
2723+17 Lt	SS17		20.0		11.51	12.07	12.64		5.0	2.5 x 2.5 12 ga	13.4						3	12	3 x 3 7 ga				3					
Sub Total			217.10	126.60	Total		307.58														Total	104			2	0	15	
ND 1804																												
13102+75 Rt	M1-5	394	9.2		12.98				5.0	2.5 x 2.5 10 ga	13.9						1	4	3 x 3 7 ga				1					
13106+75 Rt	SS13		9.8		10.94	11.94			5.0	2.25 x 2.25 12 ga	13.3						2	8	2.5 x 2.5 12 ga									
13108+75 Lt	R2-1	9		5.0	11.17				5.0	2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga									
13110+75 Rt	SA-B		16.4		13.11	13.73			5.0	2.5 x 2.5 10 ga	14.7						2	8	3 x 3 7 ga				2					
13112+75 Lt	M1-5	372	7.0		12.23				5.0	2.5 x 2.5 12 ga	14.1						1	4	3 x 3 7 ga									
13117+50 Rt	M1-5	372	7.0		12.23				5.0	2.5 x 2.5 12 ga	14.1						1	4	3 x 3 7 ga									
13119+50 Lt	SA-B		16.4		13.11	13.73			5.0	2.5 x 2.5 10 ga	14.7						2	8	3 x 3 7 ga				2					
13121+50 Rt	R2-1	9		5.0	11.63				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga									
																		This document was originally issued and sealed by Jessica R. Karls, Registration Number 8408, on 8/30/2017 and is stored at the North Dakota Department of Transportation.					Sign Summary Perforated Tube					
8/30/2017 11:36:17AM																												
Page 2 of 3																												

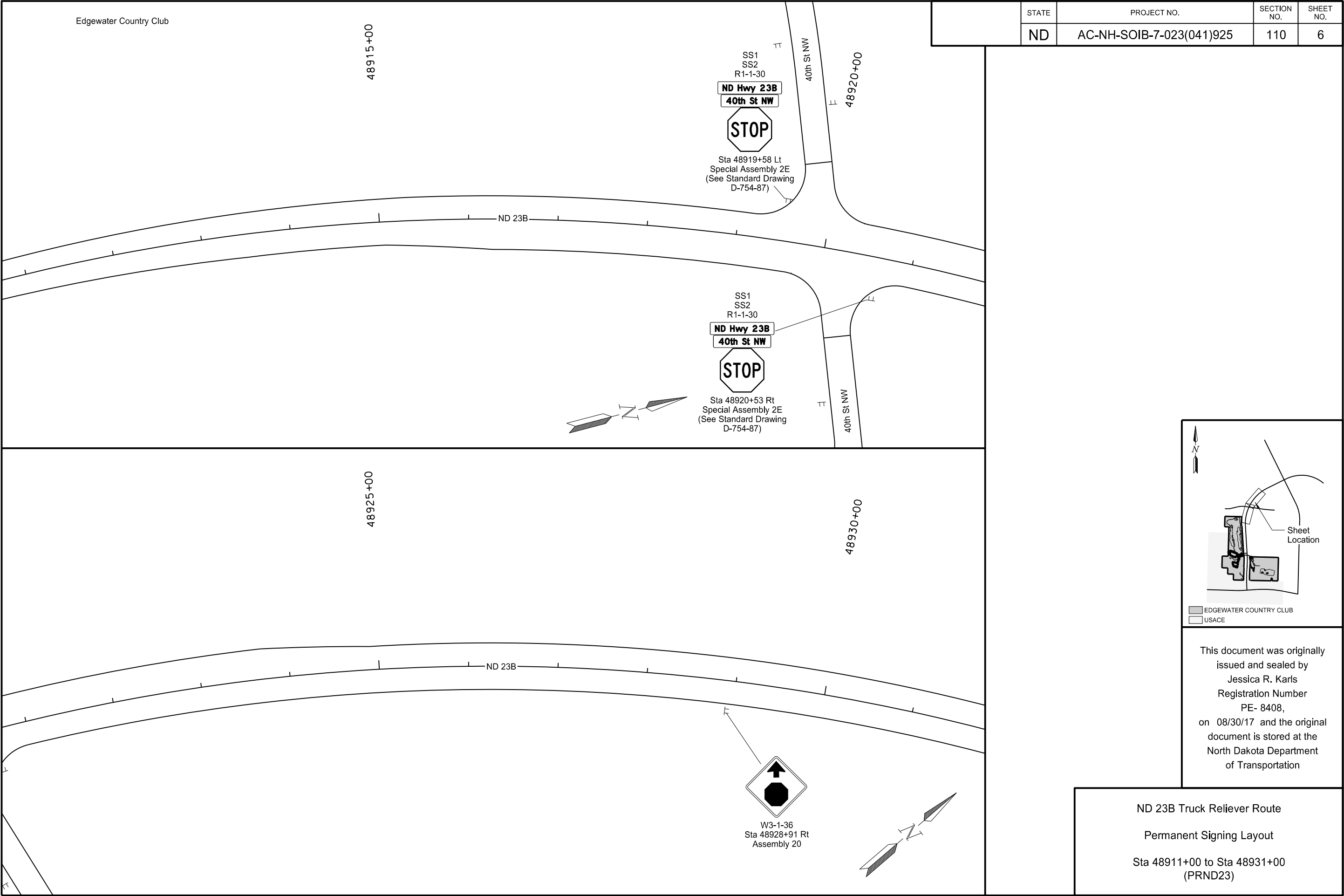
																		STATE	PROJECT NO.			SECTION NO.	SHEET NO.					
																		N.D.	AC-NH-SOIB-7-023(041)925			110	3					
	Sign No.	Assembly No.	Flat Sheet For Signs		Sign Support Length				Vert Clear-ance	Support	Max Post Len	Sleeve Length					Anchor	Anchor	Anchor	Reset Sign Panel	Reset Sign Support	Break-Away	Comments					
Station / RP			IV SF	XI SF	1st LF	2nd LF	3rd LF	4th LF	FT	Size	LF	1st LF	2nd LF	3rd LF	4th LF	Size	EA	LF	Size	EA	EA	EA						
13121+50 Lt	R2-1	9		5.0	11.63				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga									
13124+50 Lt	SS14		10.5		11.00	12.00			5.0	2.25 x 2.25 12 ga	12.4						2	8	2.5 x 2.5 12 ga									
13127+50 Lt	M1-5	394	9.2		13.31				5.0	2.5 x 2.5 10 ga	13.9						1	4	3 x 3 7 ga			1						
13135+43 Lt	SS5			34.0	13.23	13.94	14.65		5.0	2.5 x 2.5 12 ga	15.0	3.9	4.6	5.3		2.25 x 2.25 12 ga	3	12	3 x 3 7 ga			3						
Sub Total			85.50	49.00	Total		226.56												Total	72			0	0	9			
40th St NW																												
50+60 Rt	R2-1	9		5.0	11.71				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga									
59+00 Rt	M1-5	394		9.2	13.31				5.0	2.5 x 2.5 10 ga	13.9						1	4	3 x 3 7 ga			1						
61+25 Rt	W3-1	20		9.0	12.97				5.0	2.25 x 2.25 12 ga	14.1	4.2				2 x 2 12 ga	1	4	3 x 3 7 ga			1						
62+00 Lt	R2-1	9		5.0	11.71				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga									
65+30 Rt	R2-1	9		5.0	11.96				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga									
65+95 Lt	W3-1	20		9.0	12.52				5.0	2.5 x 2.5 10 ga	12.9						1	4	3 x 3 7 ga			1						
68+20 Lt	M1-5	394		9.2	12.86				5.0	2.5 x 2.5 10 ga	13.9						1	4	3 x 3 7 ga			1						
Sub Total			0.00	51.40	Total		87.04												Total	28			0	0	4			
Grand Total			545.5	387.9	Total		1,082.15												Total	356	0		2	0	49			
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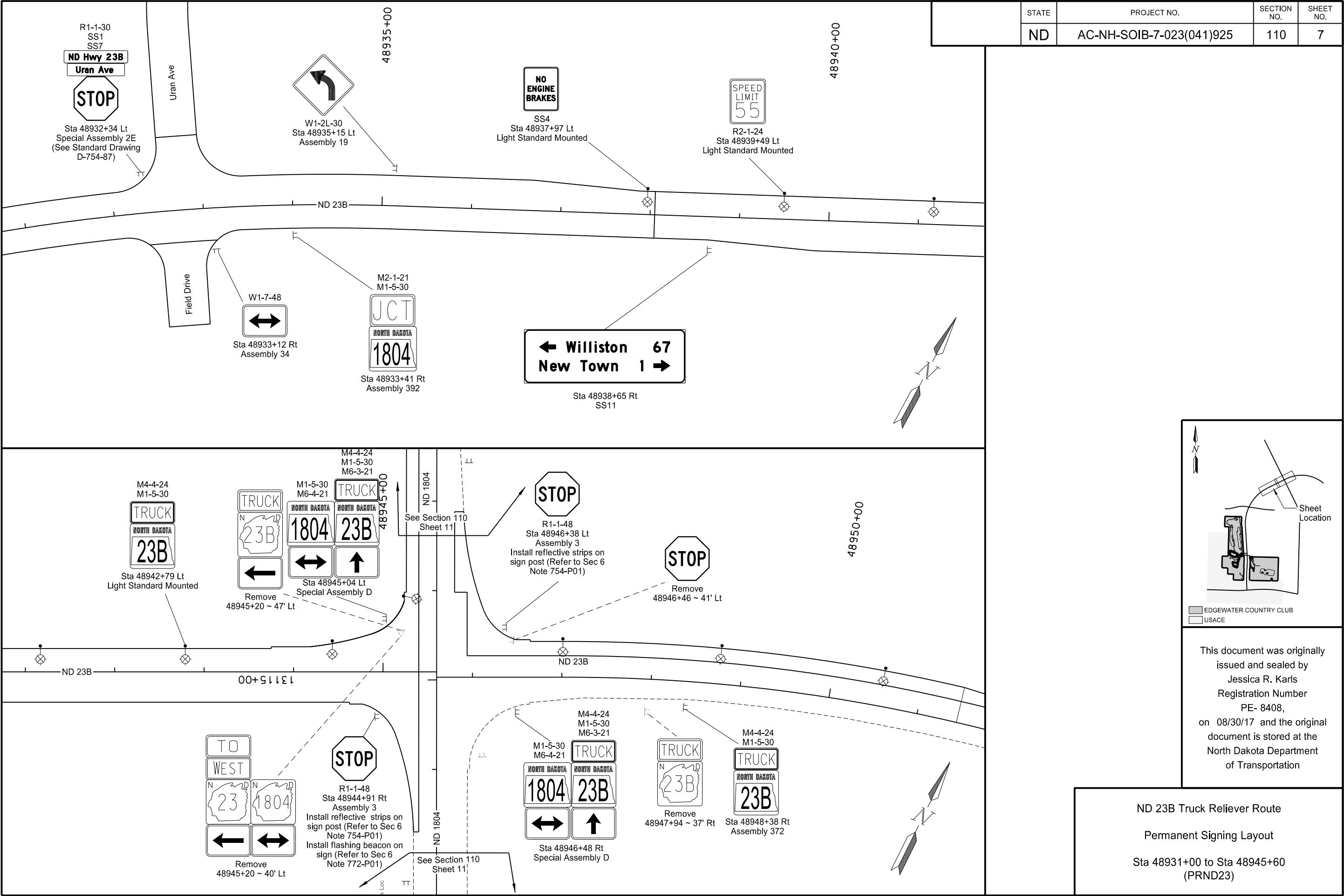
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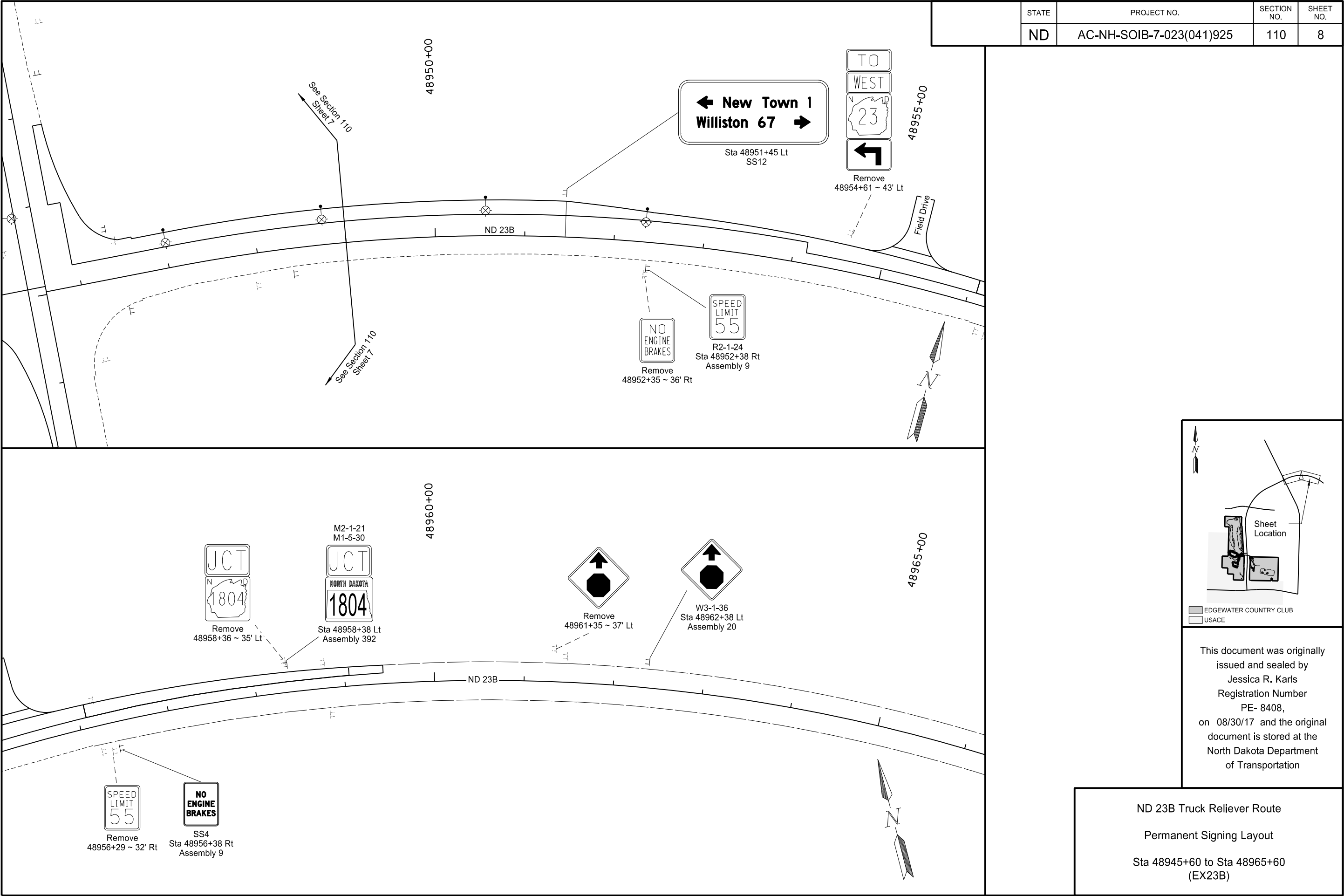


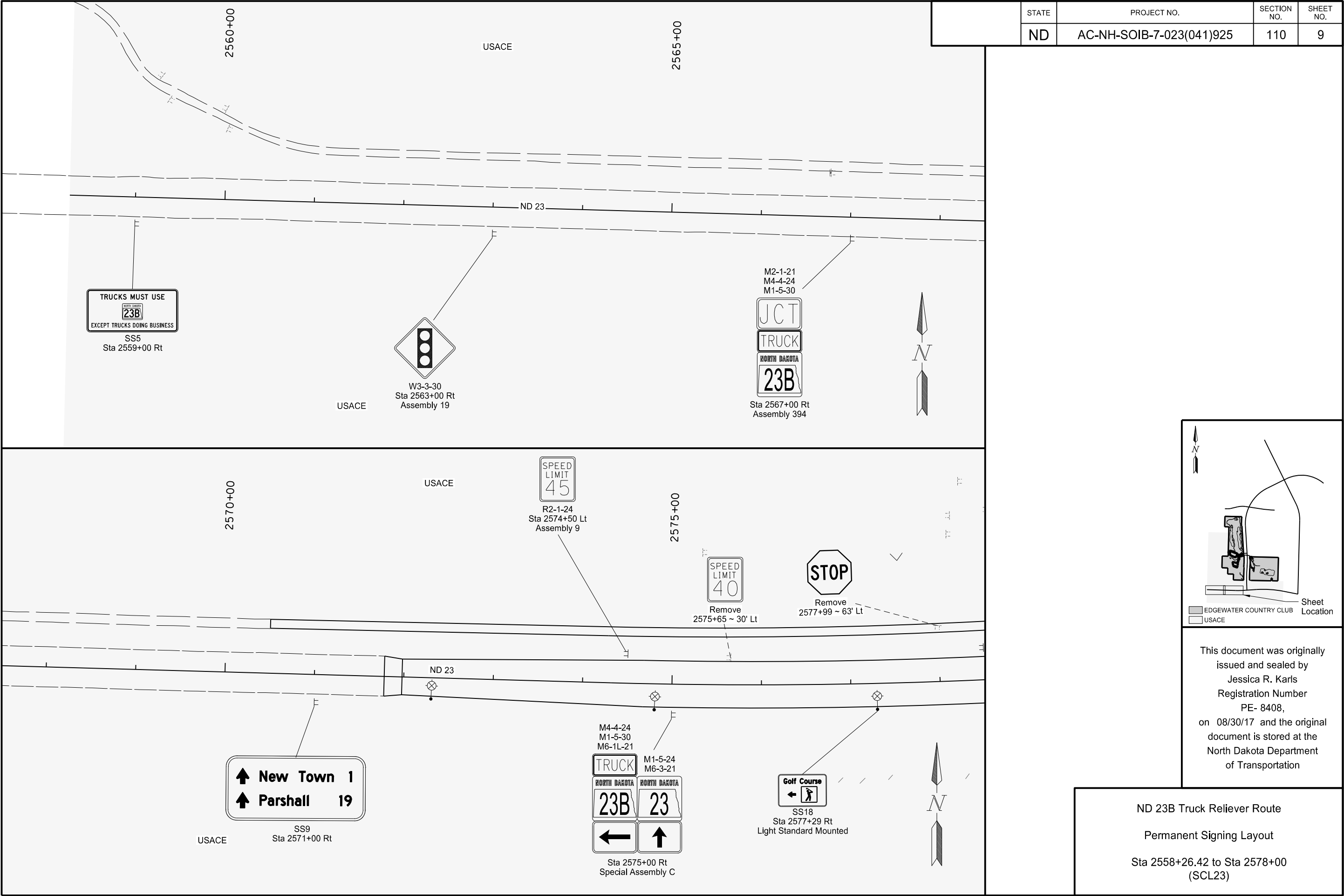


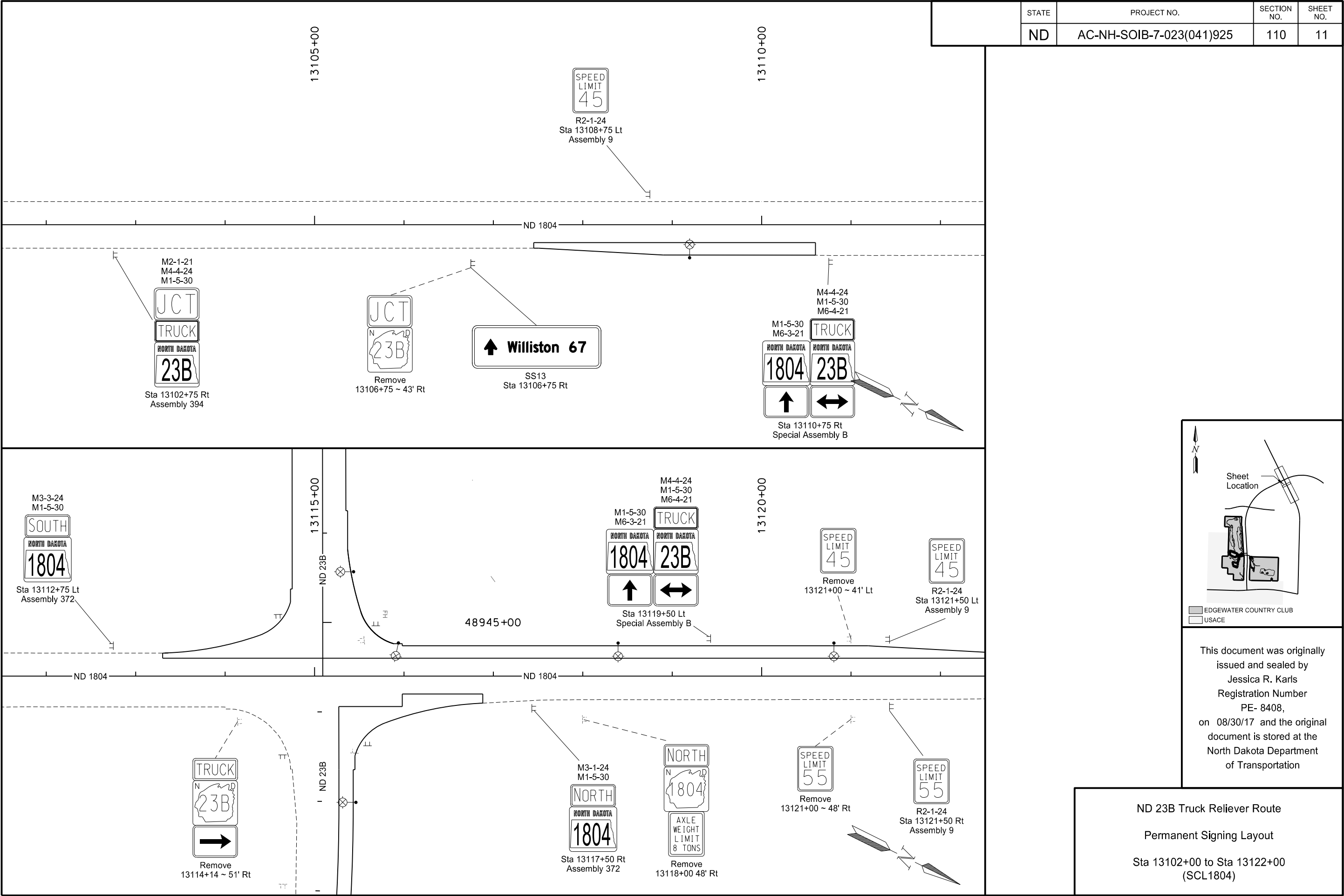


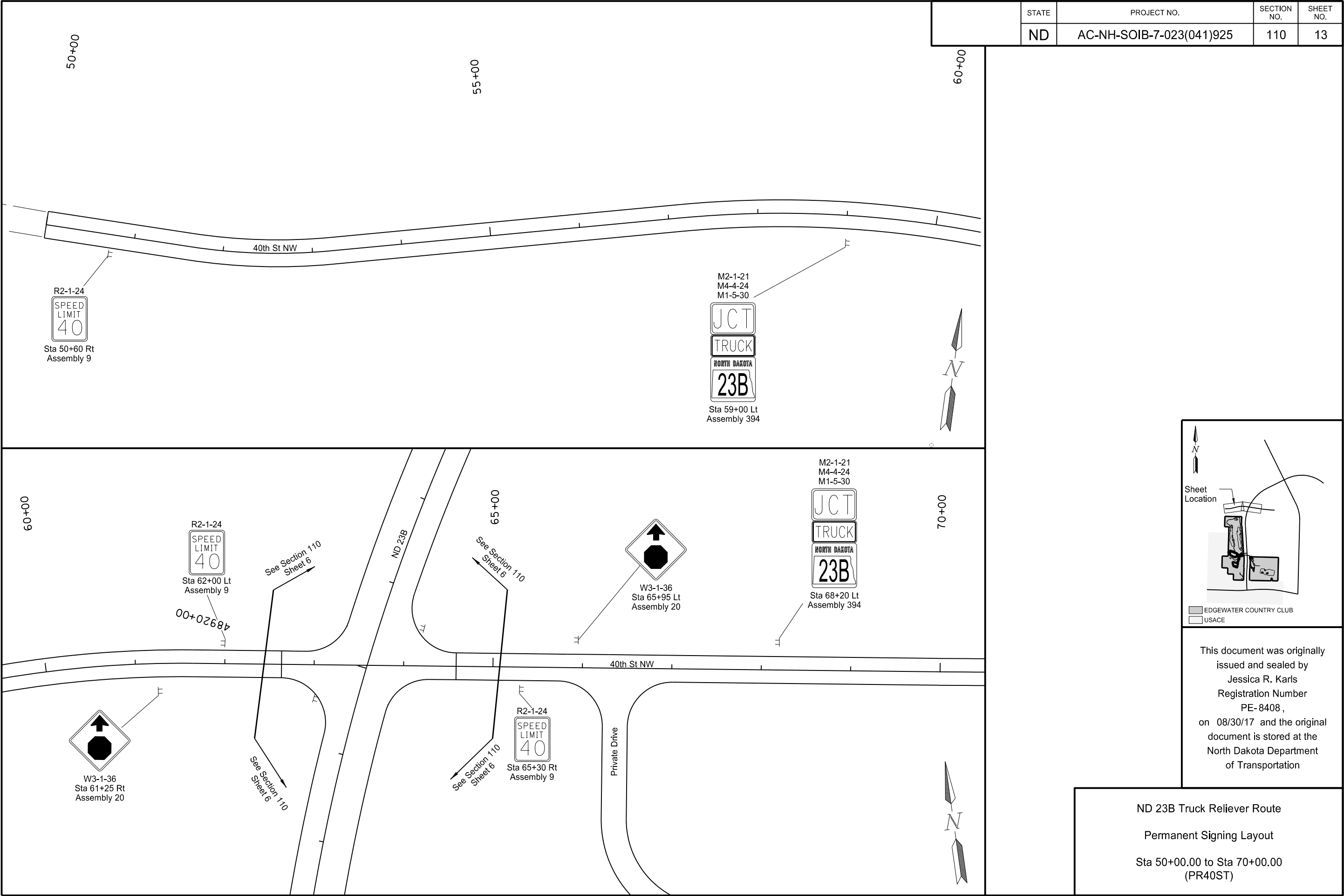
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ND 23B Truck Reliever Route
Permanent Signing Layout
Sta 48931+00 to Sta 48945+60 (PRND23)

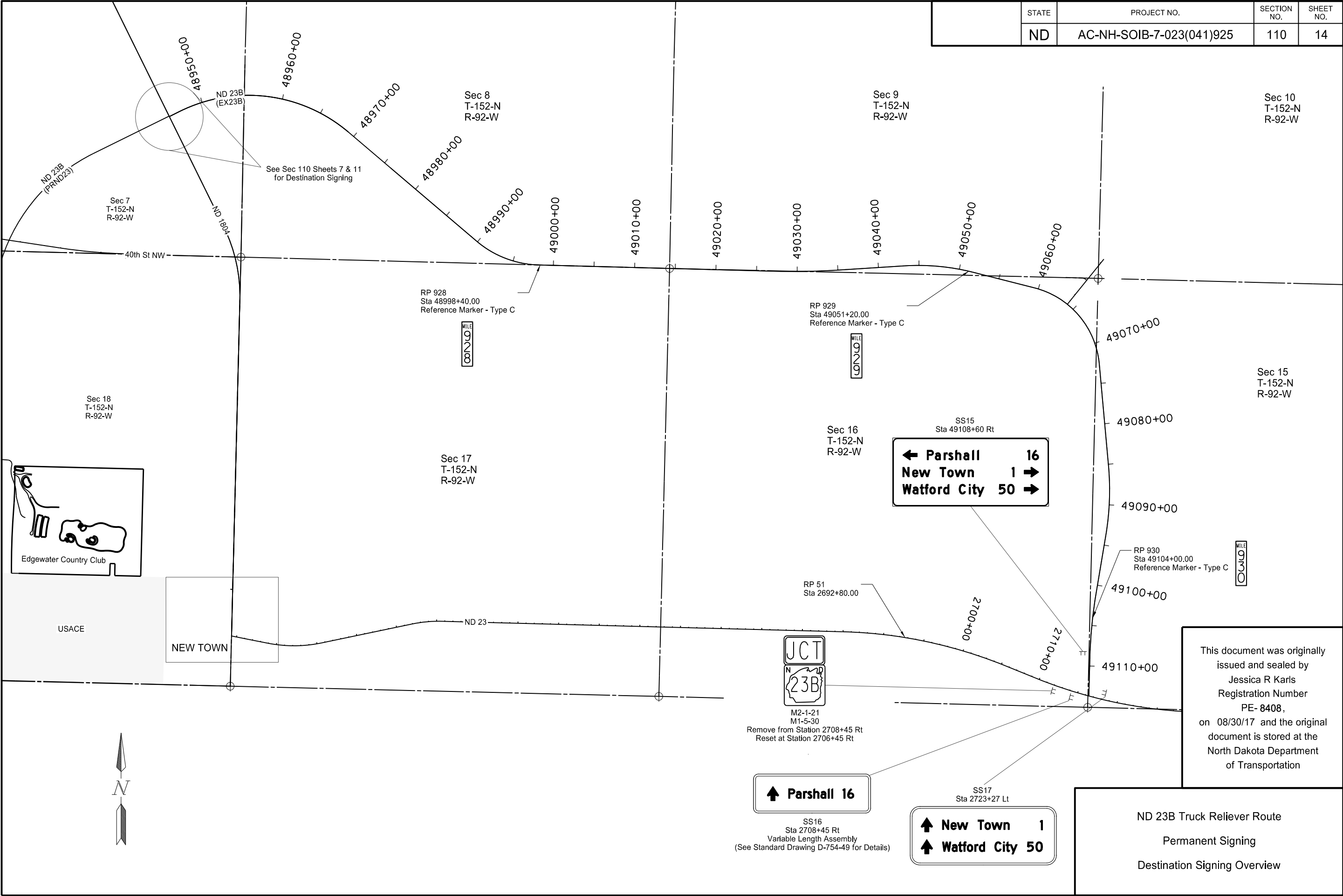








	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	110	14



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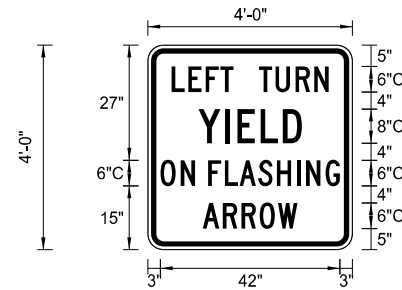
ND 23B Truck Reliever Route
Permanent Signing
Destination Signing Overview

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	110	16

SIGN NUMBER	SS3
WIDTH x HEIGHT	4'-0" x 4'-0"
BORDER WIDTH	1.25" (inset 0.75")
CORNER RADIUS	3"
MOUNTING	Mast Arm Mounted
BACKGROUND	TYPE: XI Reflective COLOR: White
LEGEND/BORDER	TYPE: Non-reflective COLOR: Black

[illegible]

STATION(S): 2581+33 Rt	AREA: 16.0 Sq.Ft.
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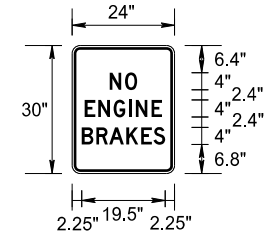
Dimensions are in inches.tenths Letter locations are panel edge to lower left corner

[illegible]

SIGN NUMBER	SS4
WIDTH x HEIGHT	2'-0" x 2'-6"
BORDER WIDTH	0.63" (inset 0.38")
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: XI Reflective
	COLOR: White
LEGEND/BORDER	TYPE: Non-reflective
	COLOR: Black

[illegible]

STATION(S): 48884+00 Rt 48937+97 Lt 48956+38 Rt	AREA: 5.0 Sq.Ft.
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Dimensions are in inches.tenths Letter locations are panel edge to lower left corner

[illegible]

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Registration Number
PE- 8408,
on 08/30/17 and the original
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North Dakota Department
of Transportation

ND 23B Truck Reliever Route

Permanent Signing

Sign Details

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	110	18

SIGN NUMBER	SS6				
WIDTH x HEIGHT	10'-0" x 2'-0"				
BORDER WIDTH	1" (inset 0")				
CORNER RADIUS	2.25"				
MOUNTING	Mast Arm Mounted				
BACKGROUND	TYPE: IV Reflective				
	COLOR: Green				
LEGEND/BORDER	TYPE: IV Reflective				
	COLOR: White				

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):

2579+98 Lt

2581+33 Rt

AREA: 20.0 Sq.Ft.

120"

24"

ND Hwy 23B

6"

12"D

6"

9.7"

100.6"

9.7"

Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

[illegible][illegible][illegible]

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ND 23B Truck Reliever Route

Permanent Signing

Sign Details

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	110	19

SIGN NUMBER	SS8
WIDTH X HEIGHT	8'-0" x 3'-6"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_6IN_TYPE D	6.1	28.5	6	9	90
ND_6IN_TYPE D	6.1	18	6	9	90
ND_6IN_TYPE D	80.9	7.5	6	9	270

Diagram of a rectangular traffic sign with dimensions and text. The sign is 96" wide and 42" high. The text on the sign is as follows:

- Top line: ← New Town 1
- Second line: ← Parshall 19
- Third line: Watford City 47 →

Dimensions and offsets are provided in inches and tenths:

- Overall width: 96"
- Overall height: 42"
- Left side offsets (from left edge to text): 7.5", 6"D, 4.5", 6"D, 18"
- Right side offsets (from right edge to text): 7.5", 6"D, 4.5", 6"D, 4.5", 6"D, 7.5"
- Bottom offsets (from bottom edge to text): 6.05", 83.9", 6.05"
- Text area height: 28.5"
- Text area width: 83.9"

STATION(S):
48881+80 Lt

AREA: 28.0 Sq.Ft.

Dimensions are in inches, tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: NU-LowV_Casination.ss																		LENGTH	SIZE	SERIES
LETTER POSITION (X)																				
N	e	w		T	o	w	n											43.7	6/4.5	D 2000
21.1	27	31.2	38	44	48.7	53.2	61.2													
1																		1.5	6	D 2000
88.4																				
P	a	r	s	h	a	l	l											31.9	6/4.5	D 2000
21.1	26	31.4	34.3	38.5	43.5	48.9	52													
1	9																	6.9	6	D 2000
83	85.9																			
W	a	t	f	o	r	d		C	i	t	y							50.1	6/4.5	D 2000
6.1	12.2	16.7	19.6	22.6	28	31.1	34.7	40.7	46.9	49	51.7									
4	7																	9.7	6	D 2000
65.2	70.9																			

SIGN NUMBER	SS9
WIDTH X HEIGHT	7'-0" x 2'-6"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGL
ND_6IN_TYPE D	6.2	17.3	6	9	0
ND_6IN_TYPE D	6.2	3.8	6	9	0

STATION(S):
2575+00 Rt

AREA: 17.5 Sq.Ft.

84"

30"

5.25" 3.8" 6"D 9" 7.5" 4.5" 6"D 9" 5.25" 3.7"

↑ New Town 1

↑ Parshall 19

5.25" 6"D 7.5" 6"D 5.25"

BORDER
R=3"
TH=0.75"

6.2" 71.6" 6.2"

Panel Style: ND_Conv_Destination.ssi
M.U.T.C.D.: 2009 Edition

Dimensions are in inches, tenths Letter locations are panel edge to lower left corner

PANEL STYLE: ND Conv. Destination,ss																		LENGTH	SIZE	SERIES
LETTER POSITION (X)																				
N	e	w		T	o	w	n													
18.2	24.2	28.4	35.1	41.1	45.8	50.3	58.3											43.7	6/4.5	D 2000
1																		1.5	6	D 2000
76.3																				
P	a	r	s	h	a	l	l													
18.2	23.1	28.6	31.5	35.7	40.7	46.1	49.1											31.9	6/4.5	D 2000
1	9																			
70.9	73.7																	6.9	6	D 2000

SIGN NUMBER	SS10
WIDTH X HEIGHT	8'-0" x 1'-6"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGL
ND_6IN_TYPE D	7.6	4.5	6	9	0

STATION(S):
2589+60 Lt

AREA: 12.0 Sq.Ft.

Diagram of a rectangular traffic sign for "Watford City 47". The sign is white with a black border and contains a black arrow pointing up, the text "Watford City", and the number "47". Dimensions are provided in inches: overall width is 96 inches, overall height is 18 inches. The sign is 80.9 inches wide and 14.5 inches high. Margins are 6 inches on the top and bottom, and 4.5 inches on the left and right. The text "Watford City" is 6 inches high and 60 inches wide. The number "47" is 9 inches high and 14.5 inches wide. The arrow is 7.55 inches wide and 7.55 inches high. The sign is mounted on a post with a 6-inch diameter. The sign is located 2589 feet 60 inches from the station.

[illegible]

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ND 23B Truck Reliever Route

Permanent Signing

Sign Details

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	110	20

SIGN NUMBER	SS11
WIDTH X HEIGHT	7'-6" x 2'-6"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_6IN_TYPE D	8.6	17.3	6	9	90
ND_6IN_TYPE D	72.4	6.7	6	9	270

Diagram of a rectangular traffic sign with dimensions and text layout. The sign is 90" wide and 30" high. The text "Williston 67" is on the top line, and "New Town 1" is on the bottom line. Arrows point left and right. Dimensions are given in inches, tenths.

Dimension	Value
Overall Width	90"
Overall Height	30"
Top Margin	6.7"
Text Line Spacing	6"
Bottom Margin	6.75"
Left Margin	8.6"
Text Width	72.8"
Right Margin	8.6"
Top Text Line Height	6.75"
Text Line Spacing	4.5"
Bottom Text Line Height	6.75"
Text Line Spacing	6"
Bottom Margin	6.8"

Dimensions are in inches, tenths

Letter locations are panel edge to lower left corner

[illegible]

SIGN NUMBER	SS12
WIDTH X HEIGHT	7'-0" x 2'-6"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGL
ND_6IN_TYPE D	6.9	17.3	6	9	90
ND_6IN_TYPE D	68.1	6.7	6	9	270

STATION(S):
48951+45 Lt

AREA: 17.5 Sq.Ft.

Diagram illustrating the dimensions and layout of a rectangular traffic sign. The sign is 84" wide and 30" high. The text "New Town 1" is positioned above "Williston 67". The sign includes a left-pointing arrow and a right-pointing arrow. Dimensions for the sign and its components are provided in inches and tenths.

Component	Width (inches)	Height (inches)
Sign Panel	84"	30"
Left Arrow	6.9"	6.75"
Text "New Town 1"	70.2"	6"
Text "Williston 67"	70.2"	4.5"
Right Arrow	6.9"	6.75"

Dimensions are in inches, tenths

Letter locations are panel edge to lower left corner

[illegible]

SIGN NUMBER	SS13
WIDTH X HEIGHT	6'-6" x 1'-6"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGL
ND_6IN_TYPE D	7.1	4.5	6	9	0

[illegible]

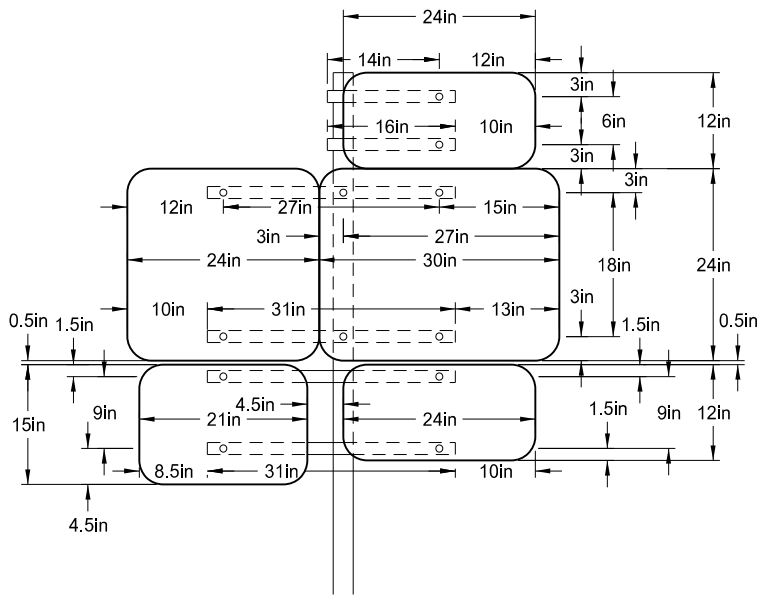
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ND 23B Truck Reliever Route

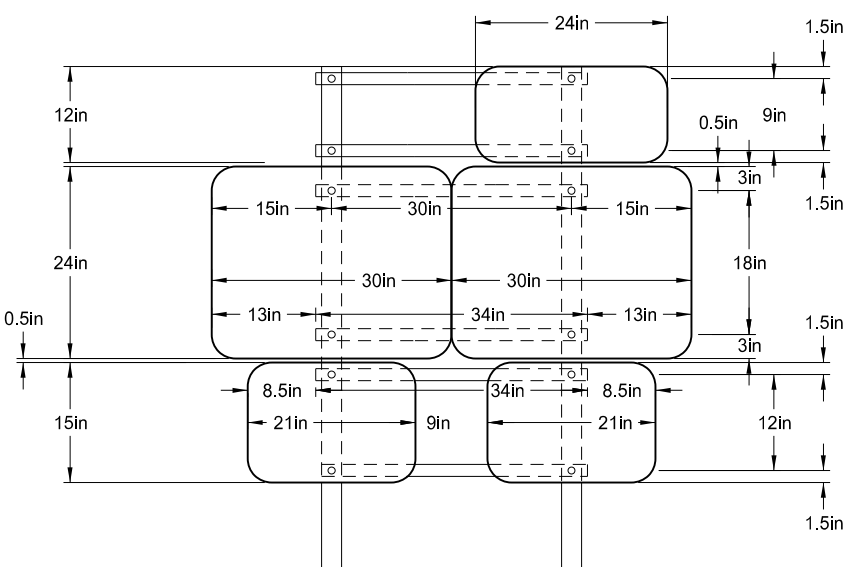
Permanent Signing

Sign Details

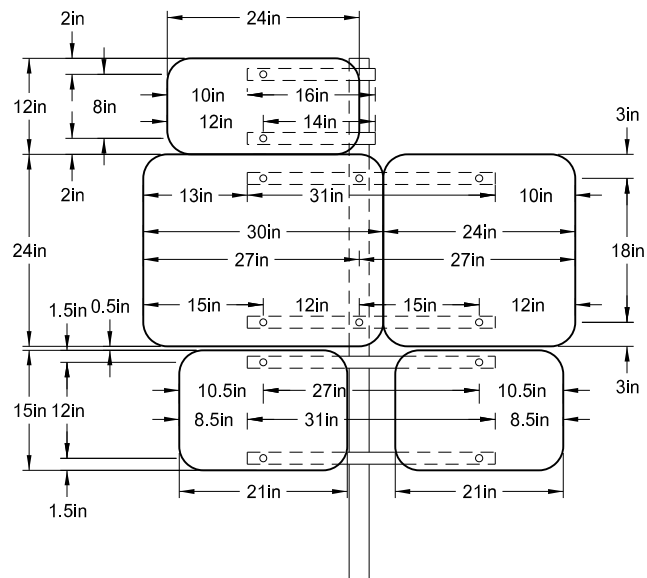
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	110	24



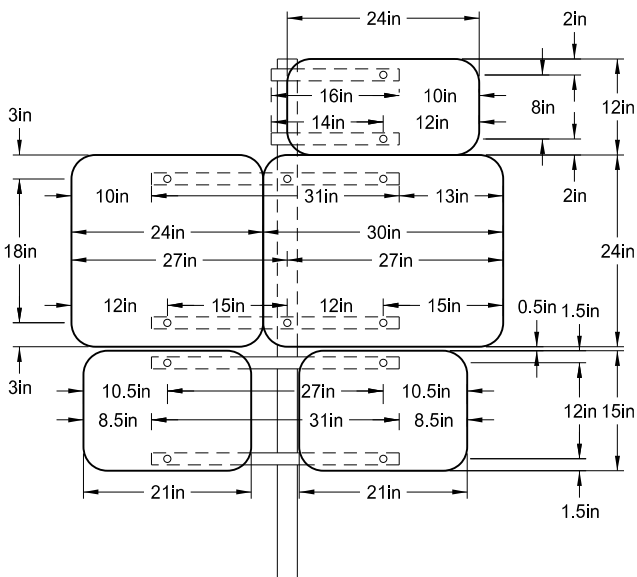
SPECIAL ASSEMBLY A
AREA = 15.2 SF (PAY AREA)
AREA = 15.2 SF (DESIGN AREA)
(PERFORATED STEEL TUBE)



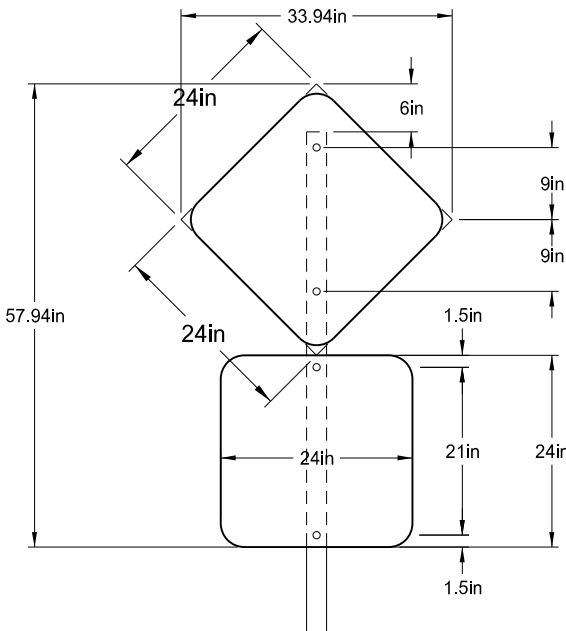
SPECIAL ASSEMBLY B
AREA = 16.4 SF (PAY AREA)
AREA = 16.4 SF (DESIGN AREA)
(PERFORATED STEEL TUBE)



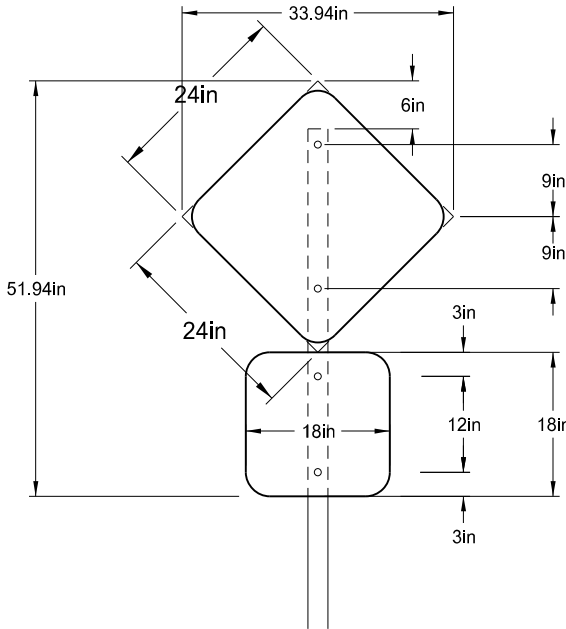
SPECIAL ASSEMBLY C
AREA = 15.4 SF (PAY AREA)
AREA = 15.4 SF (DESIGN AREA)
(PERFORATED STEEL TUBE)



SPECIAL ASSEMBLY D
AREA = 15.4 SF (PAY AREA)
AREA = 15.4 SF (DESIGN AREA)
(PERFORATED STEEL TUBE)



SPECIAL ASSEMBLY E
AREA = 8.0 SF (PAY AREA)
AREA = 8.0 SF (DESIGN AREA)
(PERFORATED STEEL TUBE)



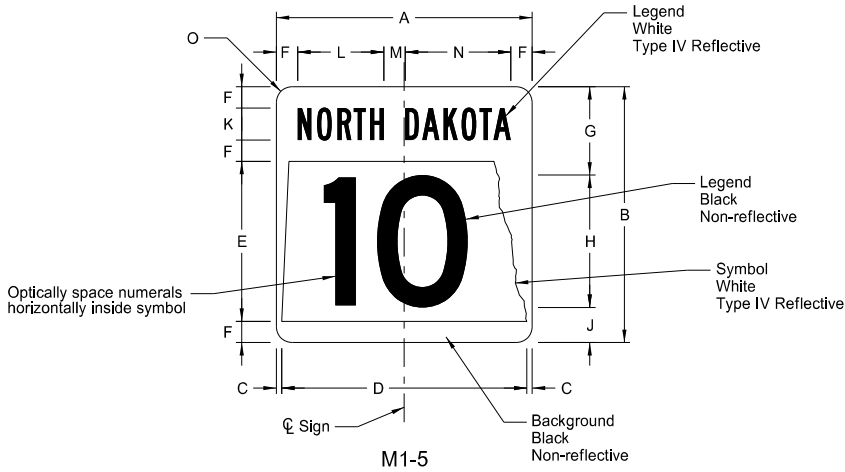
SPECIAL ASSEMBLY F
AREA = 6.3 SF (PAY AREA)
AREA = 6.3 SF (DESIGN AREA)
(PERFORATED STEEL TUBE)

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ND 23B Truck Reliever Route

Permanent Signing

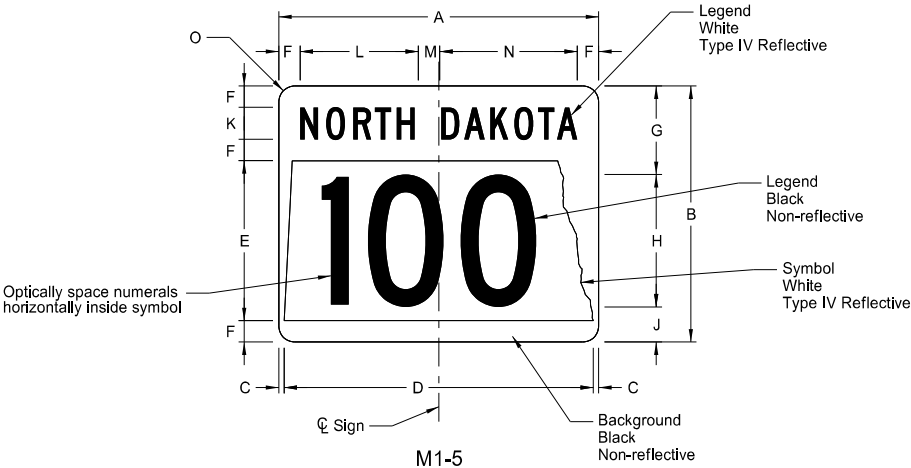
Sign Assemblies



STATE ROUTE MARKER

SIGN	DIMENSION (INCHES)													
	A	B	C	D	E	F	G	H	J	K	L	M	N	O
1, 2 digits	18*	18*	0.38	17.25	11.25	1.5	6.38	9 D**	2.63	2.25 B	6.1	1.5	7.4	1.5
1, 2 digits	24	24	0.5	23	15	2	8.5	12 D**	3.5	3 B	8.1	2	9.9	1.5
1, 2 digits	36	36	0.75	34.5	22.5	3	12.75	18 D**	5.25	4.5 B	12.1	3	14.9	2.25
1, 2 digits	48*	48*	1	46	30	4	17	24 D**	7	6 B	16.2	4	19.8	3

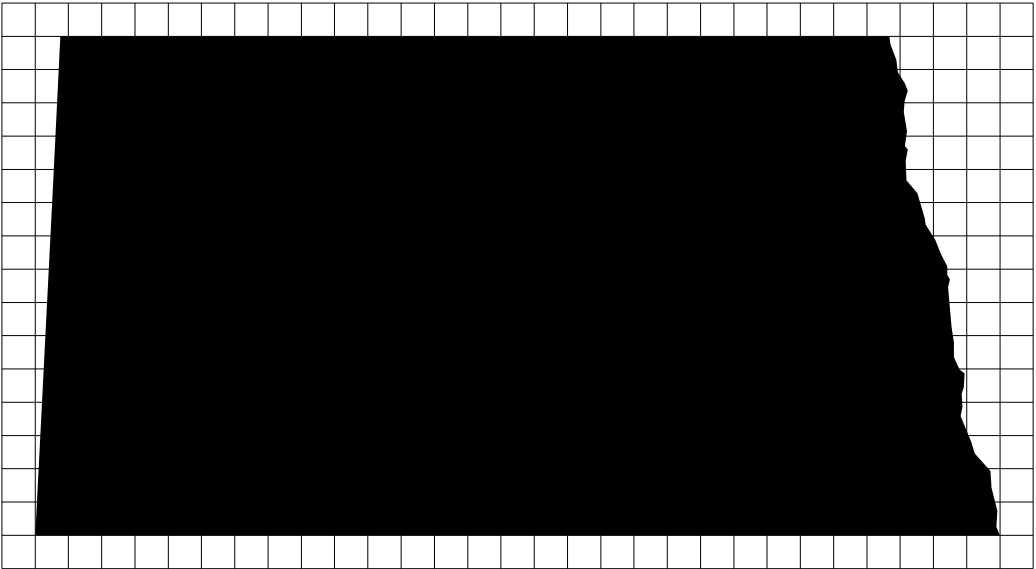
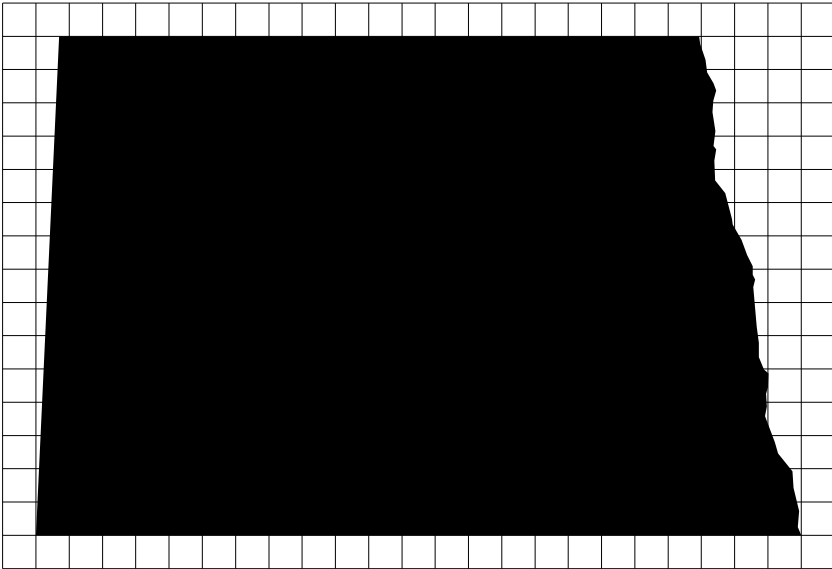
* Size not for independent use (only for use within a guide sign)
** Reduce numeral spacing by 25%



STATE ROUTE MARKER

SIGN	DIMENSION (INCHES)													
	A	B	C	D	E	F	G	H	J	K	L	M	N	O
3 digits	24*	18*	1.13	21.75	11.25	1.5	6.38	9 C**	2.63	2.25 C	8.8	2	10.2	1.5
3 digits	30	24	0.5	29	15	2	8.5	12 C**	3.5	3 C	10.7	2.5	12.8	1.5
3 digits	45	36	0.75	43.5	22.5	3	12.75	18 C**	5.25	4.5 C	16.1	3.8	19.1	2.25
3 digits	60*	48*	1	58	30	4	17	24 C**	7	6 C	21.5	5	25.5	3
4 digits	24*	18*	1.13	21.75	11.25	1.5	6.38	9 B***	2.63	2.25 C	8.8	2	10.2	1.5
4 digits	30	24	0.5	29	15	2	8.5	12 B***	3.5	3 C	10.7	2.5	12.8	1.5
4 digits	45	36	0.75	43.5	22.5	3	12.75	18 B***	5.25	4.5 C	16.1	3.8	19.1	2.25
4 digits	60*	48*	1	58	30	4	17	24 B***	7	6 C	21.5	5	25.5	3

* Size not for independent use (only for use within a guide sign)
** Reduce numeral spacing by 25%
*** Reduce numeral spacing by 50%

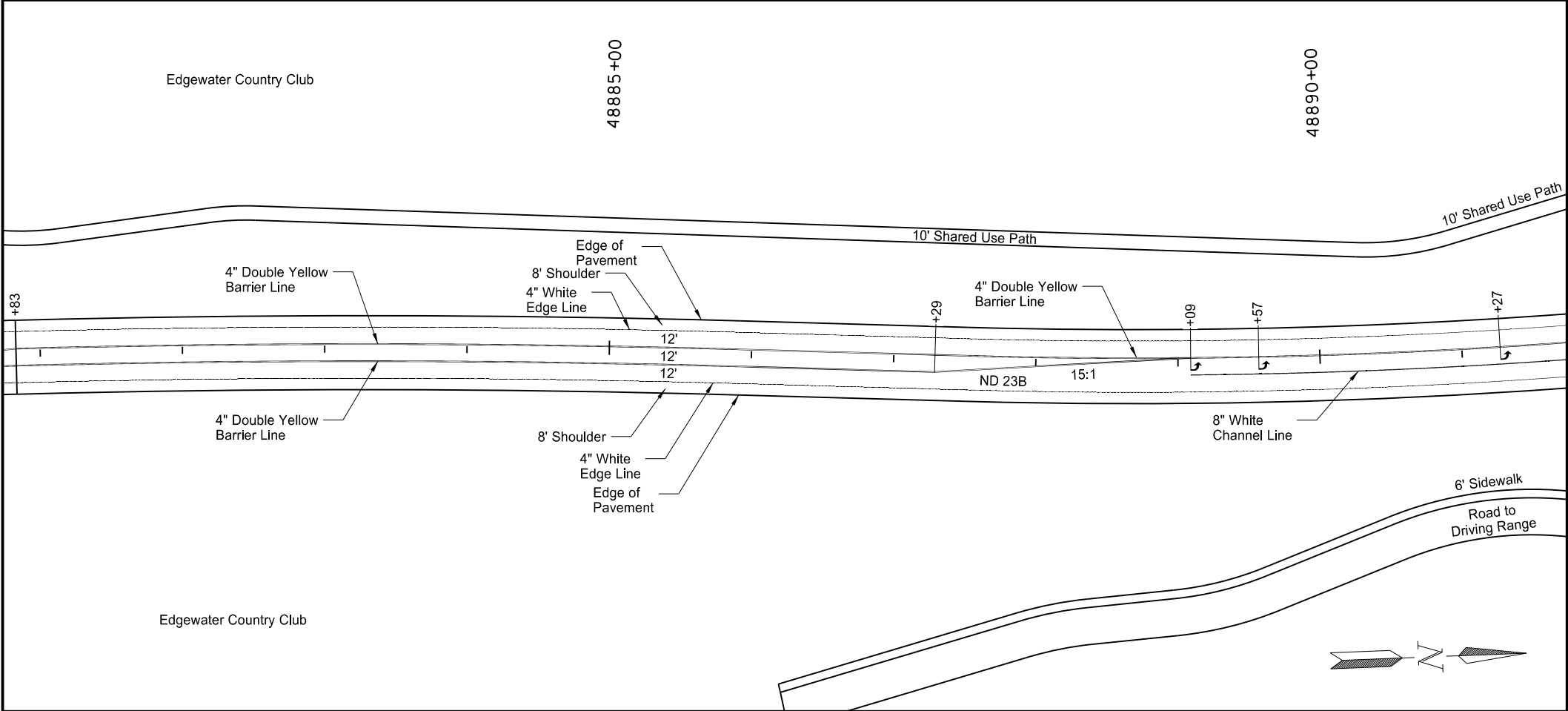
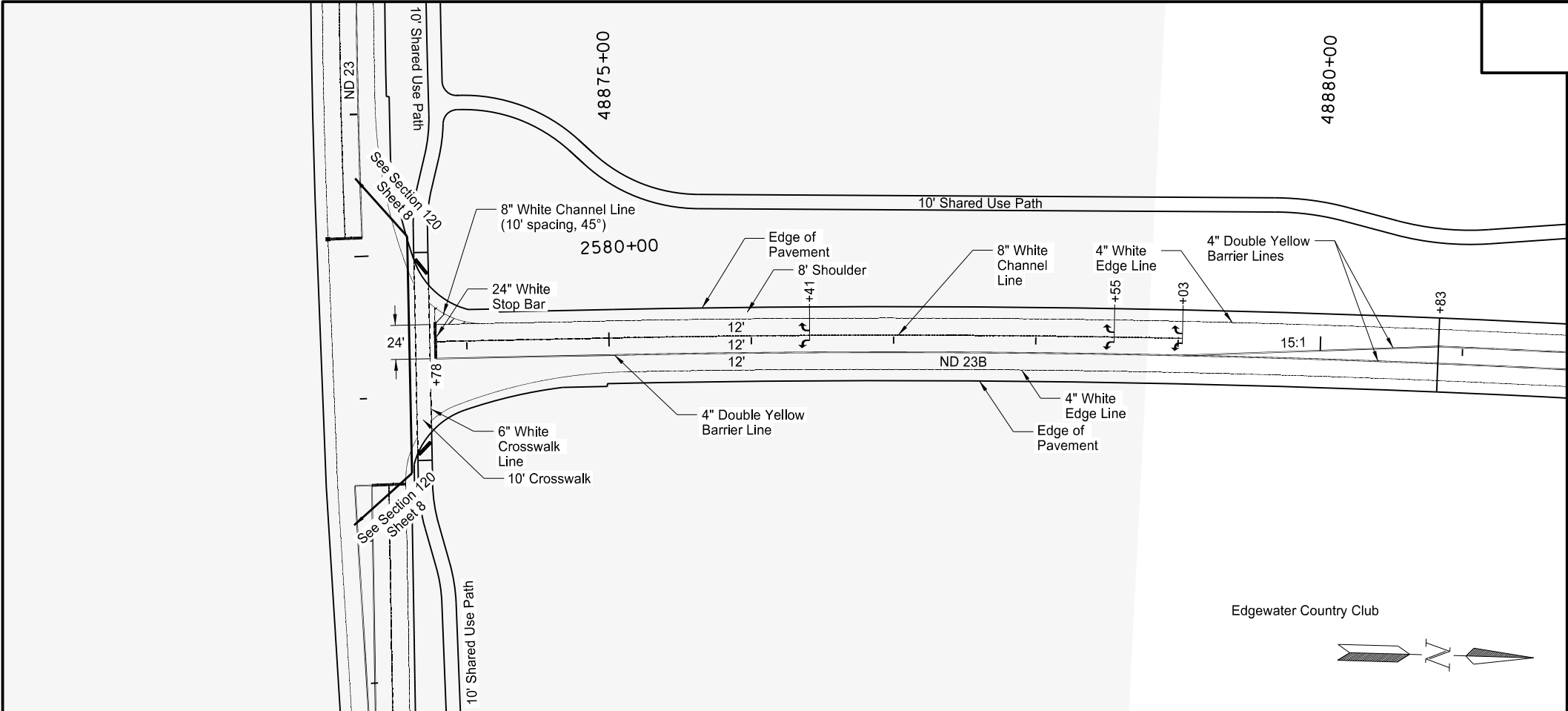


Note: North Dakota symbol graphics file can be obtained from the Design Division of North Dakota Department of Transportation.

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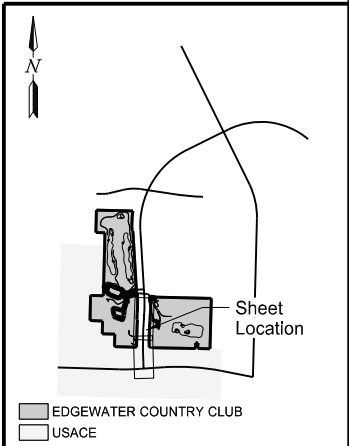
ND 23B Truck Reliever Route
Permanent Signing

ND Highway Shield Details for
Route Markers and Guide Signs



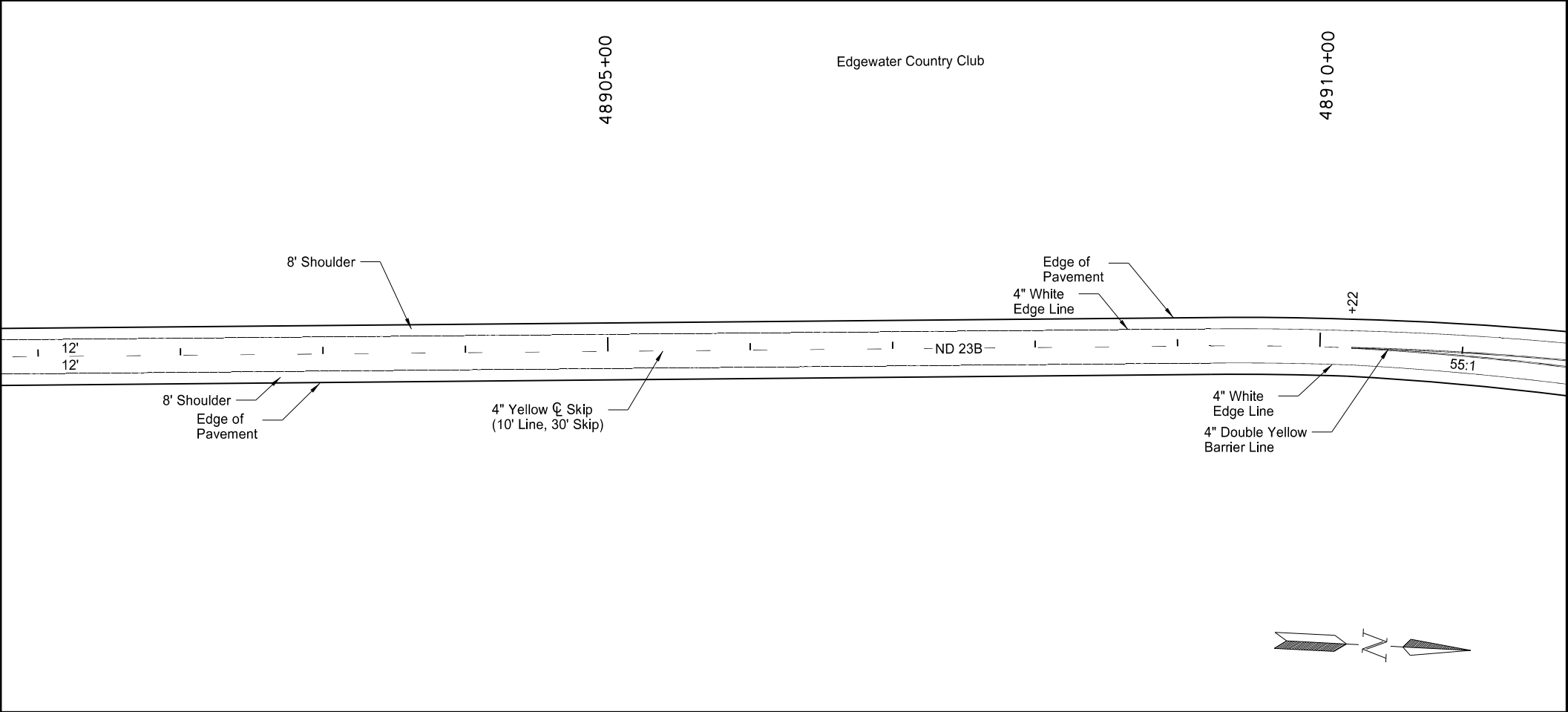
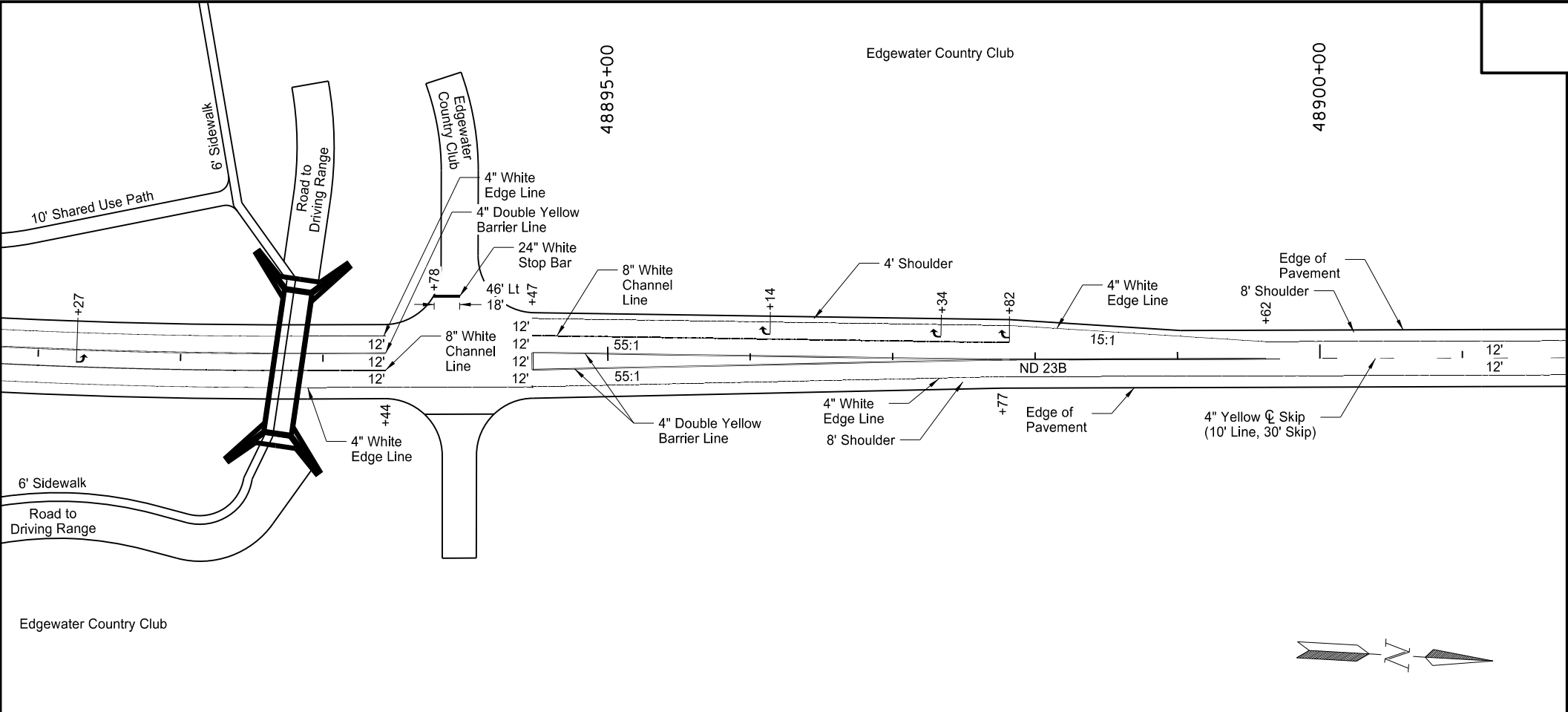
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	120	1

SPEC	CODE	BID ITEM	QTY	UNIT
762	0112	EPOXY PVMT MK MESSAGE		
		Left Turn Arrows (5)	80	SF
		Right Turn Arrows (3)	48	SF
762	0113	EPOXY PVMT MK 4IN LINE		
		4" White Edge Line	3,508	LF
		4" Dbl Yellow Barrier Line	5,456	LF
762	0114	EPOXY PVMT MK 6IN LINE		
		6" White Crosswalk Line	240	LF
762	0115	EPOXY PVMT MK 8IN LINE		
		8" White Channel Line	736	LF
762	0117	EPOXY PVMT MK 24IN LINE		
		24" White Stop Line	24	LF



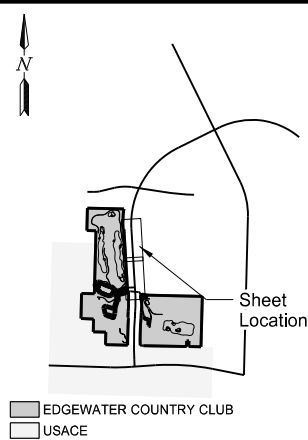
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ND 23B Truck Reliever Route
Permanent Pavement Markings
Sta 48873+23.45 to Sta 48891+00 (PRND23)



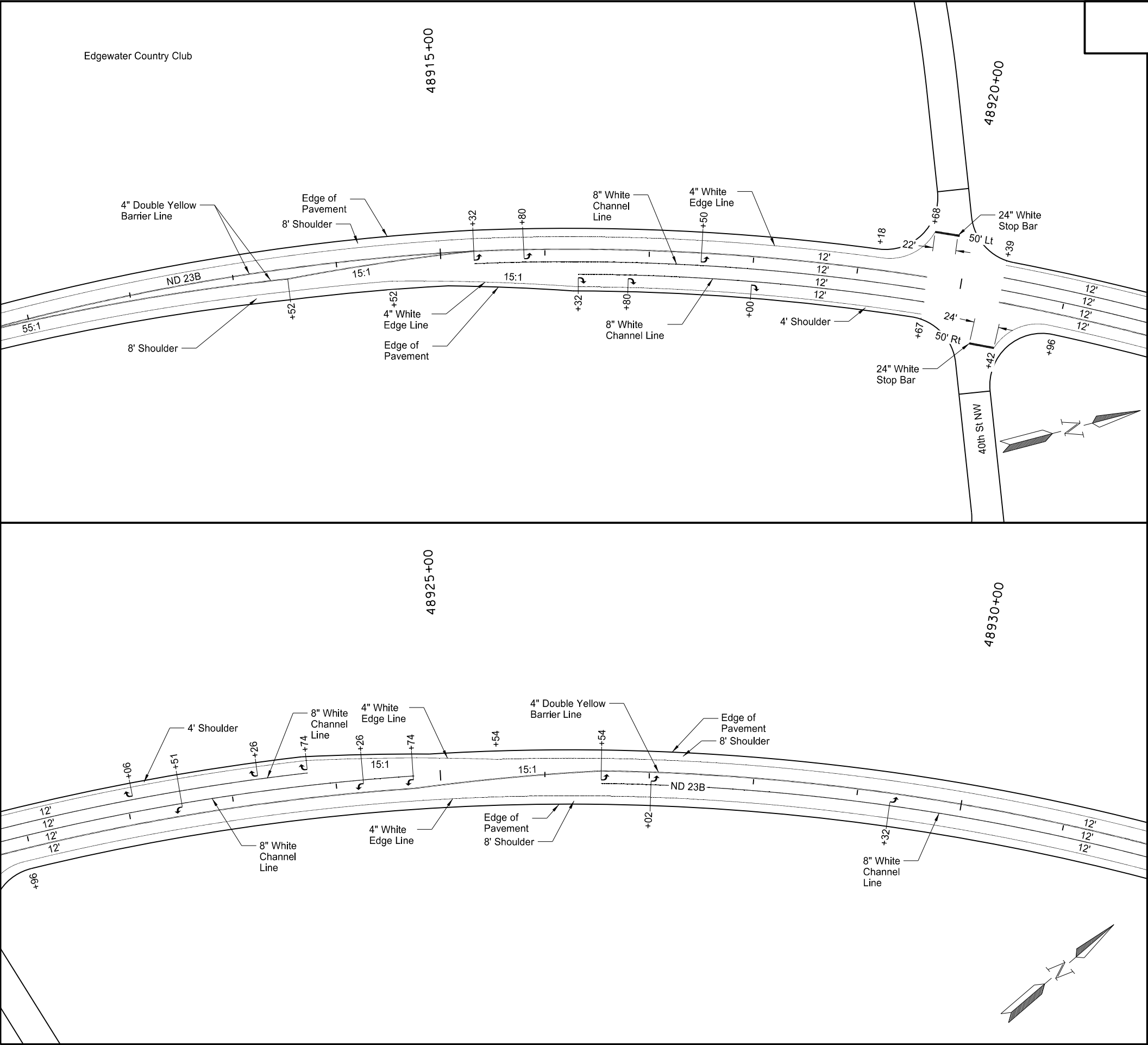
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	120	2

SPEC	CODE	BID ITEM	QTY	UNIT
762	0112	EPOXY PVMT MK MESSAGE		
		Left Turn Arrows (1)	16	SF
		Right Turn Arrows (3)	48	SF
762	0113	EPOXY PVMT MK 4IN LINE		
		4" Yellow Skips	265	LF
		4" White Edge Line	4,078	LF
		4" Dbl Yellow Barrier Line	2,514	LF
762	0115	EPOXY PVMT MK 8IN LINE		
		8" White Channel Line	580	LF
762	0017	EPOXY PVMT MK 24IN LINE		
		24" White Stop Line	19	LF



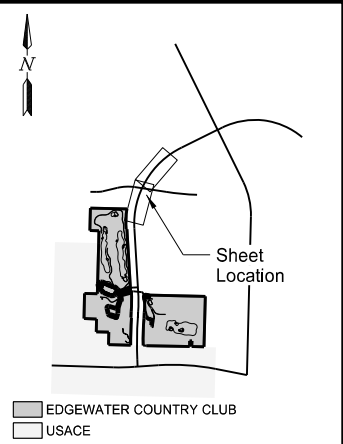
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ND 23B Truck Reliever Route
Permanent Pavement Markings
Sta 48891+00 to Sta 48911+00
(PRND23)



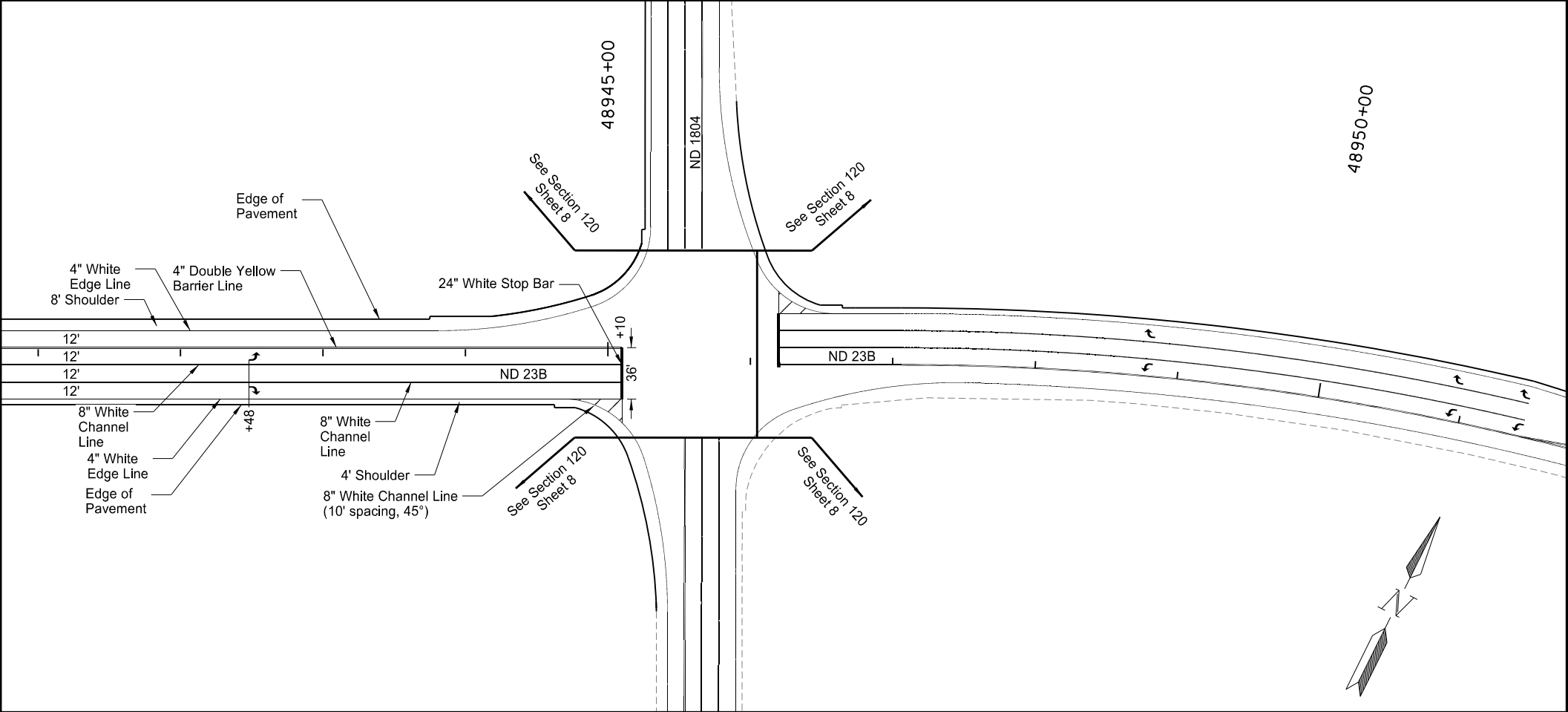
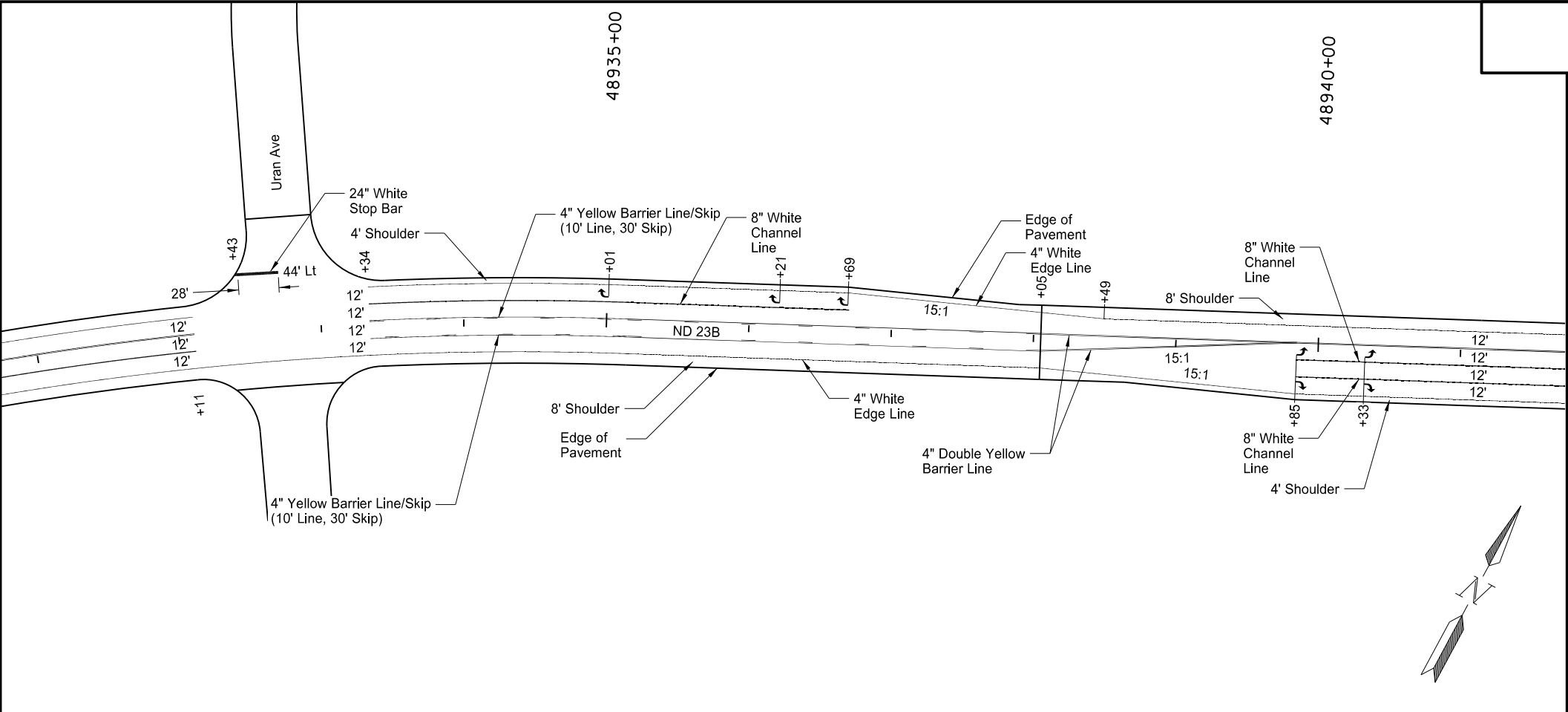
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	120	3

SPEC	CODE	BID ITEM	QTY	UNIT
762	0112	EPOXY PVMT MK MESSAGE		
		Left Turn Arrows (9)	144	SF
		Right Turn Arrows (6)	96	SF
762	0113	EPOXY PVMT MK 4IN LINE		
		4" White Edge Line	3,882	LF
		4" Dbl Yellow Barrier Line	4,726	LF
762	0115	EPOXY PVMT MK 8IN LINE		
		8" White Channel Line	1,985	LF
762	0117	EPOXY PVMT MK 24IN LINE		
		24" White Stop Line	46	LF



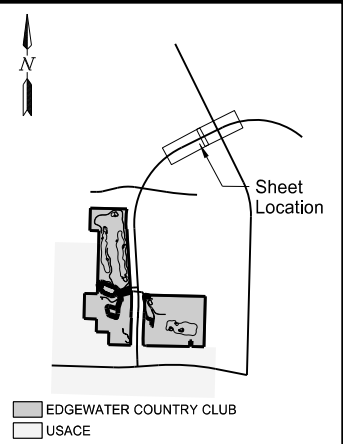
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ND 23B Truck Reliever Route
Permanent Pavement Markings
Sta 48911+00 to Sta 48931+00
(PRND23)



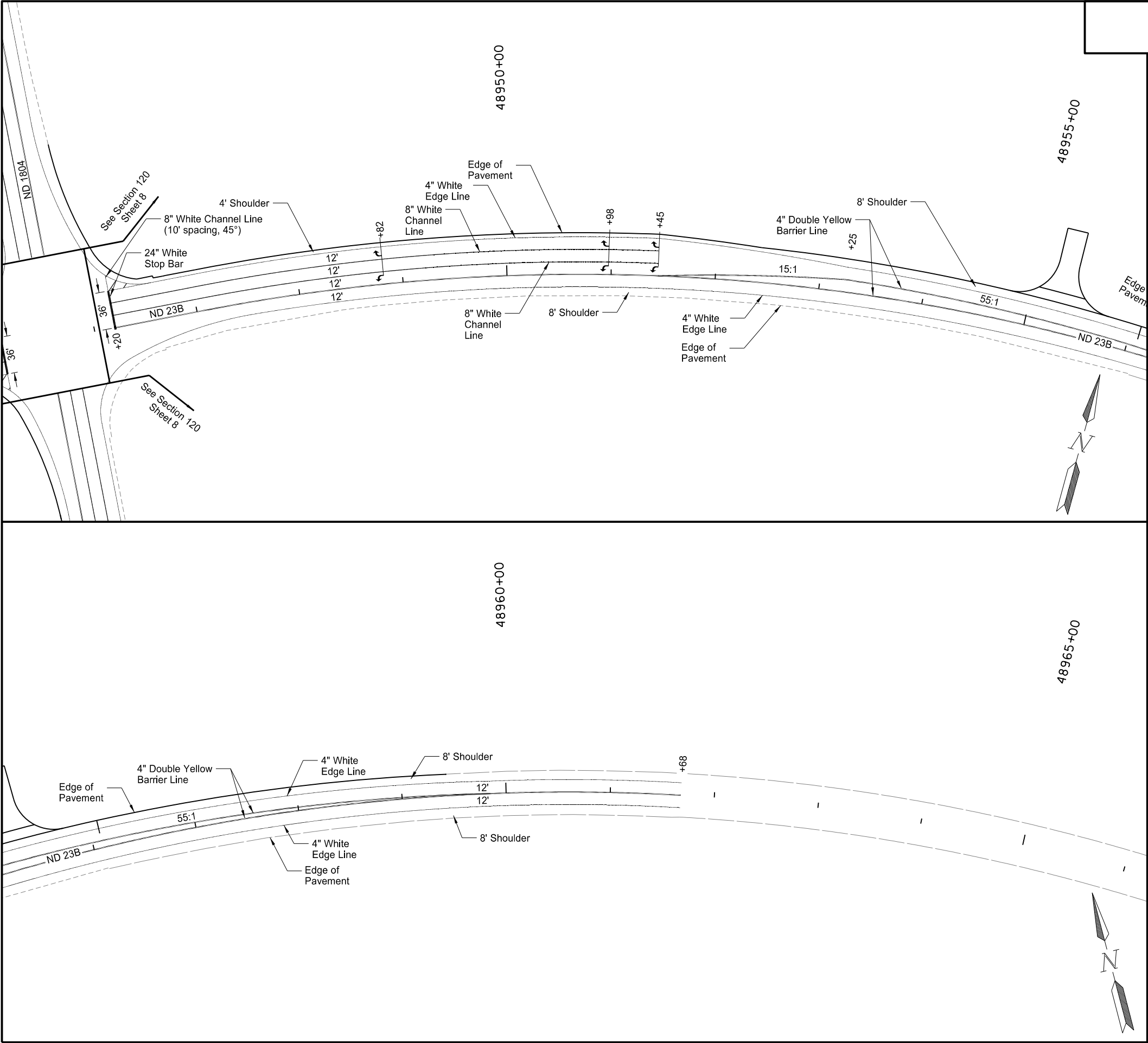
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	120	4

SPEC	CODE	BID ITEM	QTY	UNIT
762	0112	EPOXY PVMT MK MESSAGE		
		Left Turn Arrows (3)	48	SF
		Right Turn Arrows (6)	96	SF
762	0113	EPOXY PVMT MK 4IN LINE		
		4" White Edge Line	2,815	LF
		4" Yellow Barrier/ Skip Line	1,178	LF
		4" Dbl Yellow Barrier Line	1,994	LF
762	0115	EPOXY PVMT MK 8IN LINE		
		8" White Channel Line	1,520	LF
762	0117	EPOXY PVMT MK 24IN LINE		
		24" White Stop Line	67	LF



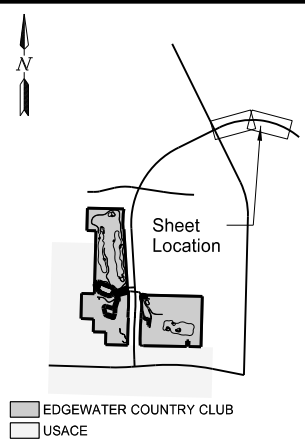
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ND 23B Truck Reliever Route
Permanent Pavement Markings
Sta 48931+00 to Sta 48945+60
(PRND23)



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	120	5

SPEC	CODE	BID ITEM	QTY	UNIT
762	0112	EPOXY PVMT MK MESSAGE		
		Left Turn Arrows (3)	48	SF
		Right Turn Arrows (3)	48	SF
762	0113	EPOXY PVMT MK 4IN LINE		
		4" White Edge Line	3,217	LF
		4" Dbl Yellow Barrier Line	4,782	LF
762	0115	EPOXY PVMT MK 8IN LINE		
		8" White Channel Line	1,078	LF
762	0117	EPOXY PVMT MK 24IN LINE		
		24" White Stop Line	36	LF

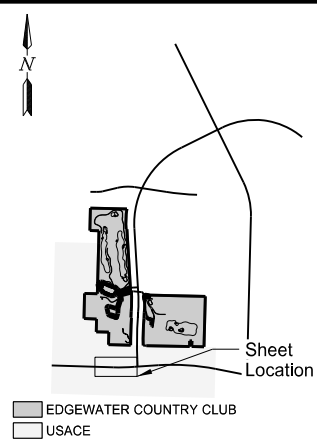
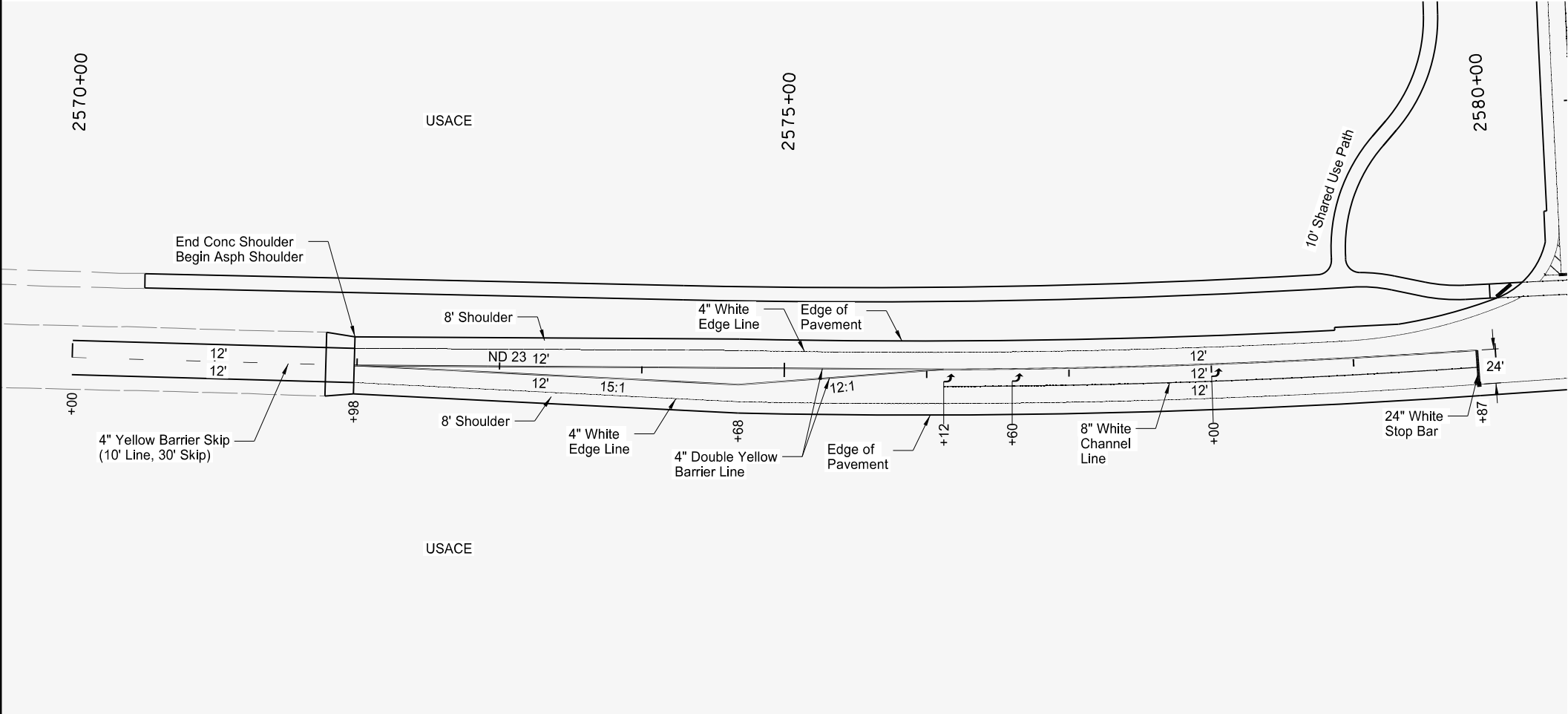


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ND 23B Truck Reliever Route
Permanent Pavement Markings
Sta 48945+60 to Sta 48965+00
(EX23B)

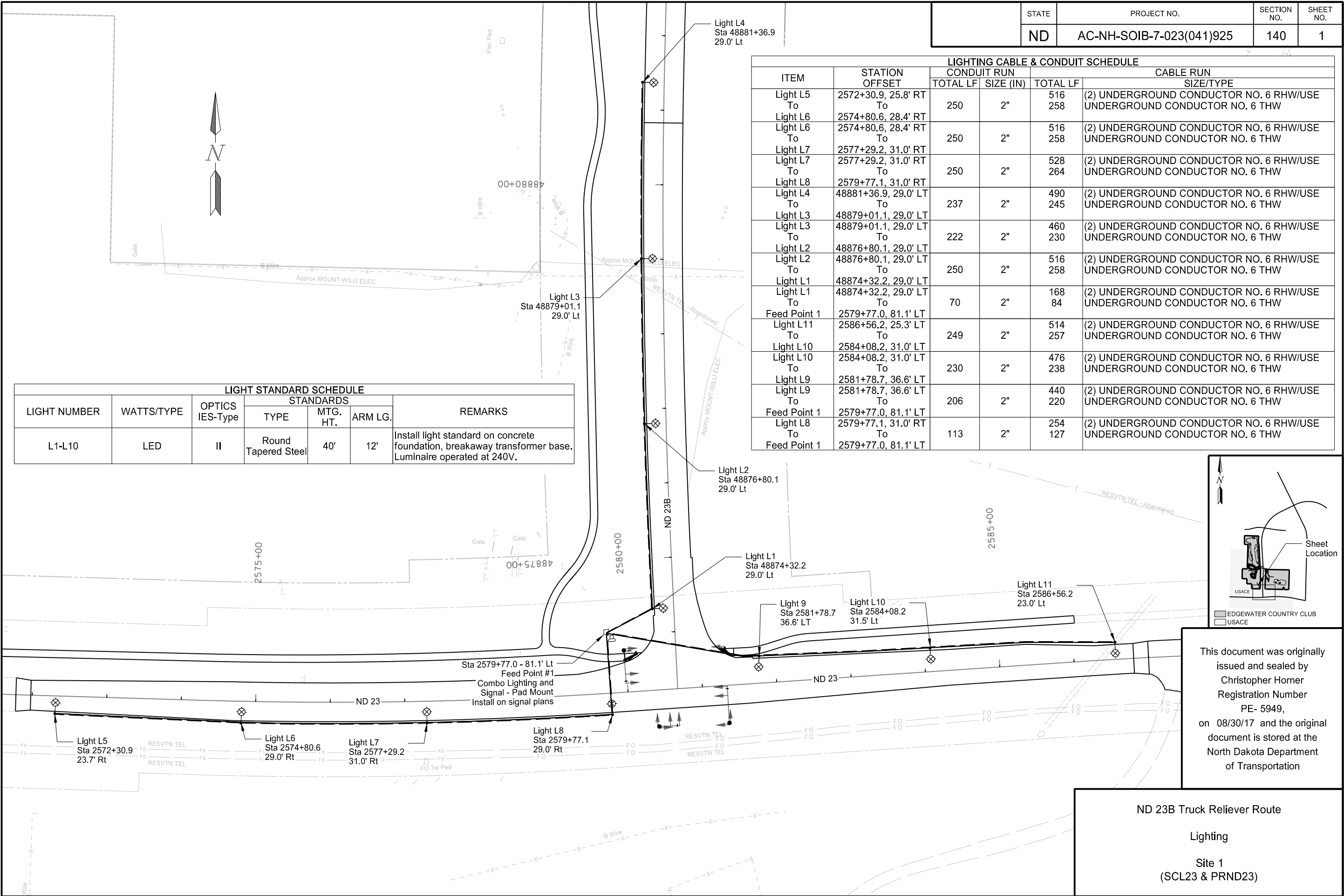
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	120	6

SPEC	CODE	BID ITEM	QTY	UNIT
762	0112	EPOXY PVMT MK MESSAGE		
Left Turn Arrows (3)			48	SF
762	0113	EPOXY PVMT MK 4IN LINE		
4" White Edge Line			2,002	LF
4" Dbl Yellow Barrier Line			2,406	LF
4" Yellow Skips			50	LF
762	0115	EPOXY PVMT MK 8IN LINE		
8" White Channel Line			375	LF
762	0117	EPOXY PVMT MK 24IN LINE		
24" White Stop Line			24	LF



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ND 23B Truck Reliever Route
Permanent Pavement Markings
Sta 2560+00 to Sta 2580+00
(SCL23)



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	140	1

LIGHTING CABLE & CONDUIT SCHEDULE					
ITEM	STATION OFFSET	CONDUIT RUN		CABLE RUN	
		TOTAL LF	SIZE (IN)	TOTAL LF	SIZE/TYPE
Light L5 To Light L6	2572+30.9, 25.8' RT To 2574+80.6, 28.4' RT	250	2"	516 258	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light L6 To Light L7	2574+80.6, 28.4' RT To 2577+29.2, 31.0' RT	250	2"	516 258	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light L7 To Light L8	2577+29.2, 31.0' RT To 2579+77.1, 31.0' RT	250	2"	528 264	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light L4 To Light L3	48881+36.9, 29.0' LT To 48879+01.1, 29.0' LT	237	2"	490 245	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light L3 To Light L2	48879+01.1, 29.0' LT To 48876+80.1, 29.0' LT	222	2"	460 230	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light L2 To Light L1	48876+80.1, 29.0' LT To 48874+32.2, 29.0' LT	250	2"	516 258	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light L1 To Feed Point 1	48874+32.2, 29.0' LT To 2579+77.0, 81.1' LT	70	2"	168 84	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light L11 To Light L10	2586+56.2, 25.3' LT To 2584+08.2, 31.0' LT	249	2"	514 257	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light L10 To Light L9	2584+08.2, 31.0' LT To 2581+78.7, 36.6' LT	230	2"	476 238	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light L9 To Feed Point 1	2581+78.7, 36.6' LT To 2579+77.0, 81.1' LT	206	2"	440 220	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light L8 To Feed Point 1	2579+77.1, 31.0' RT To 2579+77.0, 81.1' LT	113	2"	254 127	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW

LIGHT STANDARD SCHEDULE						
LIGHT NUMBER	WATTS/TYPE	OPTICS IES-Type	STANDARDS			REMARKS
			TYPE	MTG. HT.	ARM LG.	
L1-L10	LED	II	Round Tapered Steel	40'	12'	Install light standard on concrete foundation, breakaway transformer base. Luminaire operated at 240V.

Sheet Location

EDGEWATER COUNTRY CLUB

USACE

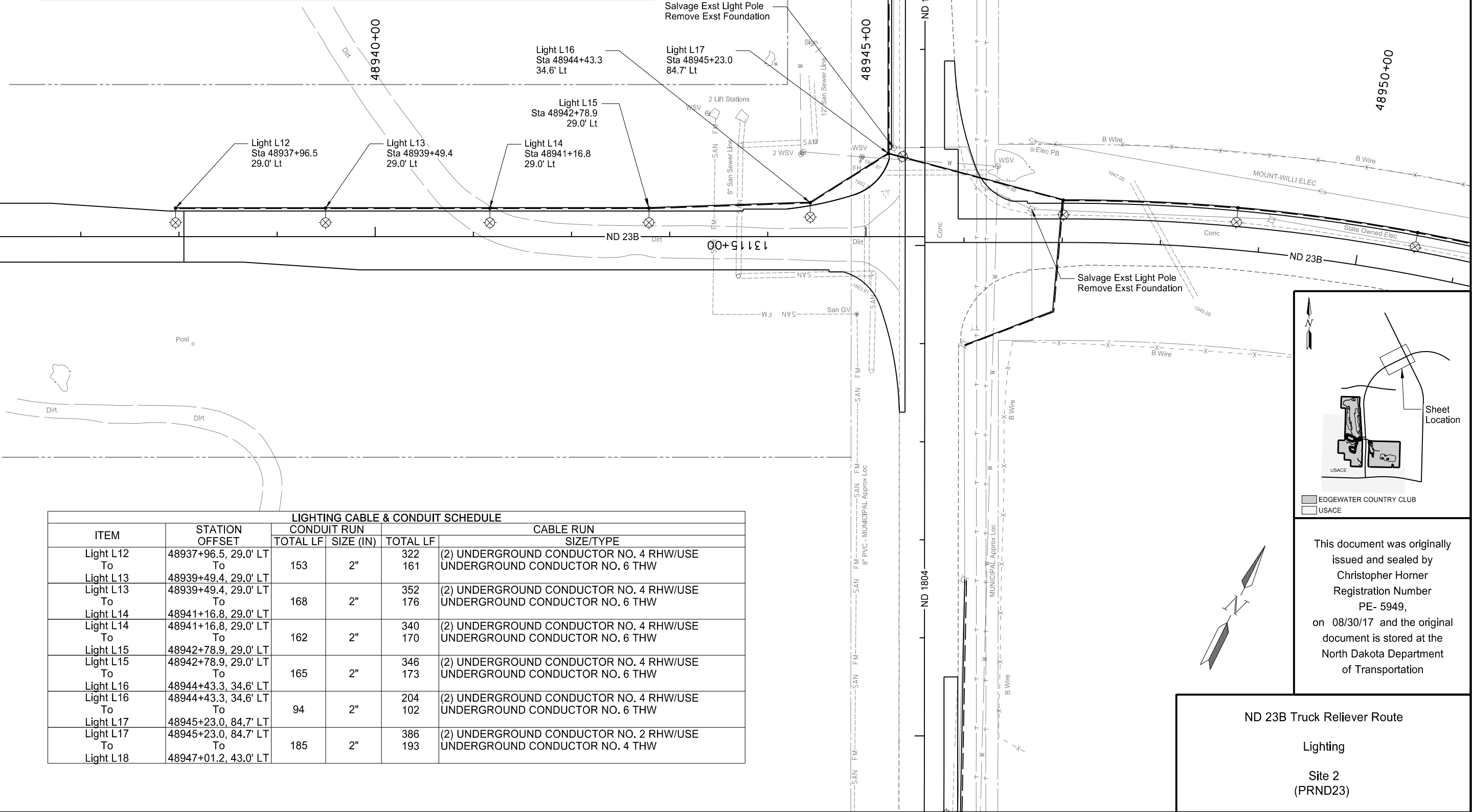
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ND 23B Truck Reliever Route

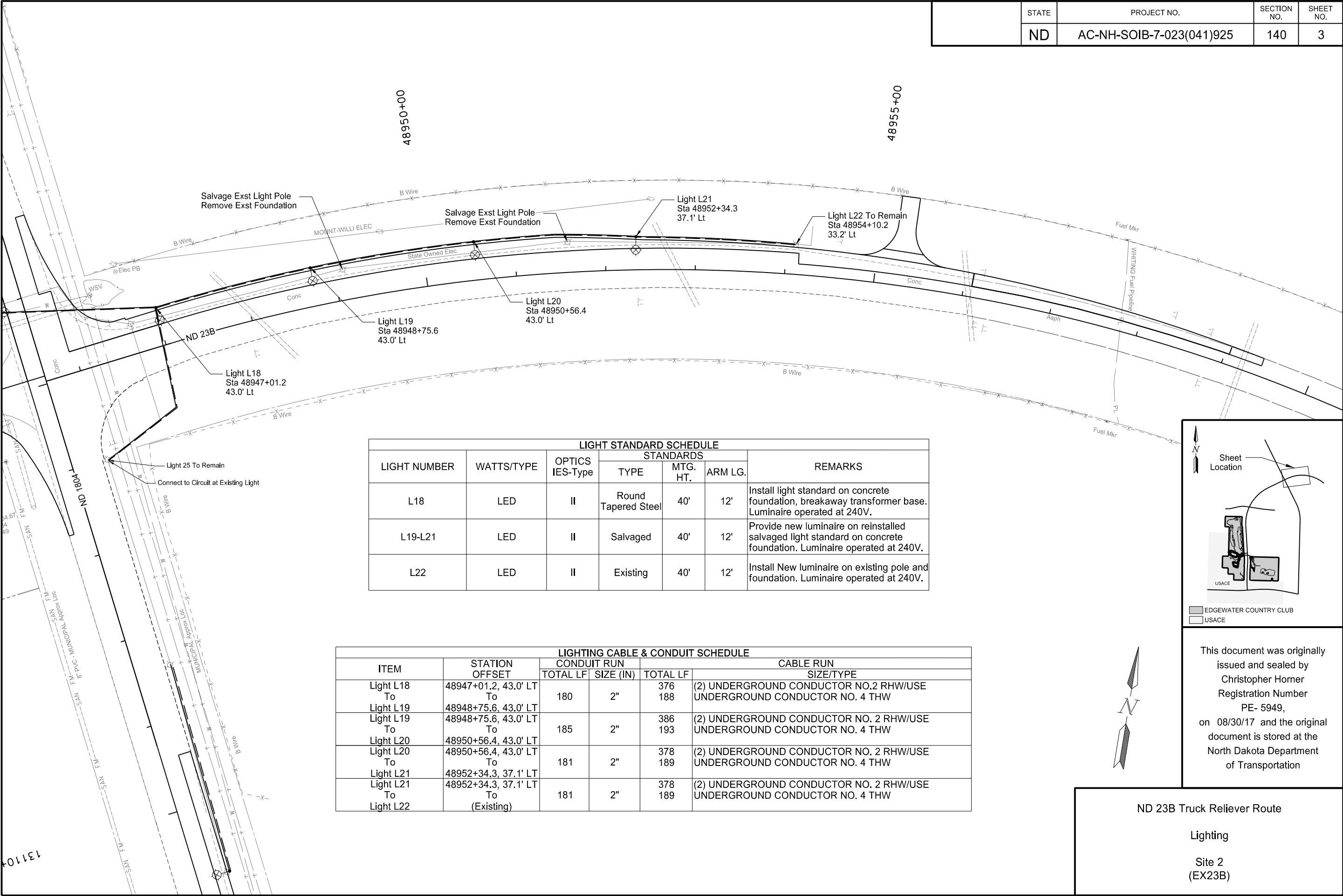
Lighting

Site 1 (SCL23 & PRND23)

LIGHT STANDARD SCHEDULE						
LIGHT NUMBER	WATTS/TYPE	OPTICS IES-Type	STANDARDS			REMARKS
			TYPE	MTG. HT.	ARM LG.	
L12-L16	LED	II	Round Tapered Steel	40'	12'	Install light standard on concrete foundation, breakaway transformer base. Luminaire operated at 240V.
L17	LED	II	Salvaged	40'	12'	Provide new luminaire on reinstalled salvaged light standard on concrete foundation. Luminaire operated at 240V.



LIGHTING CABLE & CONDUIT SCHEDULE					
ITEM	STATION OFFSET	CONDUIT RUN		CABLE RUN	
		TOTAL LF	SIZE (IN)	TOTAL LF	SIZE/TYPE
Light L12 To Light L13	48937+96.5, 29.0' LT To 48939+49.4, 29.0' LT	153	2"	322 161	(2) UNDERGROUND CONDUCTOR NO. 4 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light L13 To Light L14	48939+49.4, 29.0' LT To 48941+16.8, 29.0' LT	168	2"	352 176	(2) UNDERGROUND CONDUCTOR NO. 4 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light L14 To Light L15	48941+16.8, 29.0' LT To 48942+78.9, 29.0' LT	162	2"	340 170	(2) UNDERGROUND CONDUCTOR NO. 4 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light L15 To Light L16	48942+78.9, 29.0' LT To 48944+43.3, 34.6' LT	165	2"	346 173	(2) UNDERGROUND CONDUCTOR NO. 4 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light L16 To Light L17	48944+43.3, 34.6' LT To 48945+23.0, 84.7' LT	94	2"	204 102	(2) UNDERGROUND CONDUCTOR NO. 4 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light L17 To Light L18	48945+23.0, 84.7' LT To 48947+01.2, 43.0' LT	185	2"	386 193	(2) UNDERGROUND CONDUCTOR NO. 2 RHW/USE UNDERGROUND CONDUCTOR NO. 4 THW



LIGHT STANDARD SCHEDULE						
LIGHT NUMBER	WATTS/TYPE	OPTICS IES-Type	STANDARDS			REMARKS
			TYPE	MTG. HT.	ARM LG.	
L18	LED	II	Round Tapered Steel	40'	12'	Install light standard on concrete foundation, breakaway transformer base. Luminaire operated at 240V.
L19-L21	LED	II	Salvaged	40'	12'	Provide new luminaire on reinstalled salvaged light standard on concrete foundation. Luminaire operated at 240V.
L22	LED	II	Existing	40'	12'	Install New luminaire on existing pole and foundation. Luminaire operated at 240V.

LIGHTING CABLE & CONDUIT SCHEDULE					
ITEM	STATION OFFSET	CONDUIT RUN		CABLE RUN	
		TOTAL LF	SIZE (IN)	TOTAL LF	SIZE/TYPE
Light L18 To Light L19	48947+01.2, 43.0' LT To 48948+75.6, 43.0' LT	180	2"	376 188	(2) UNDERGROUND CONDUCTOR NO.2 RHW/USE UNDERGROUND CONDUCTOR NO. 4 THW
Light L19 To Light L20	48948+75.6, 43.0' LT To 48950+56.4, 43.0' LT	185	2"	386 193	(2) UNDERGROUND CONDUCTOR NO. 2 RHW/USE UNDERGROUND CONDUCTOR NO. 4 THW
Light L20 To Light L21	48950+56.4, 43.0' LT To 48952+34.3, 37.1' LT	181	2"	378 189	(2) UNDERGROUND CONDUCTOR NO. 2 RHW/USE UNDERGROUND CONDUCTOR NO. 4 THW
Light L21 To Light L22	48952+34.3, 37.1' LT To (Existing)	181	2"	378 189	(2) UNDERGROUND CONDUCTOR NO. 2 RHW/USE UNDERGROUND CONDUCTOR NO. 4 THW

Sheet Location

EDGEWATER COUNTRY CLUB
USACE

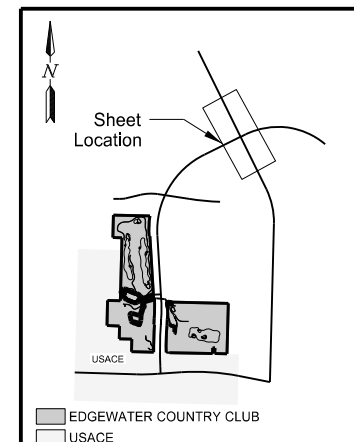
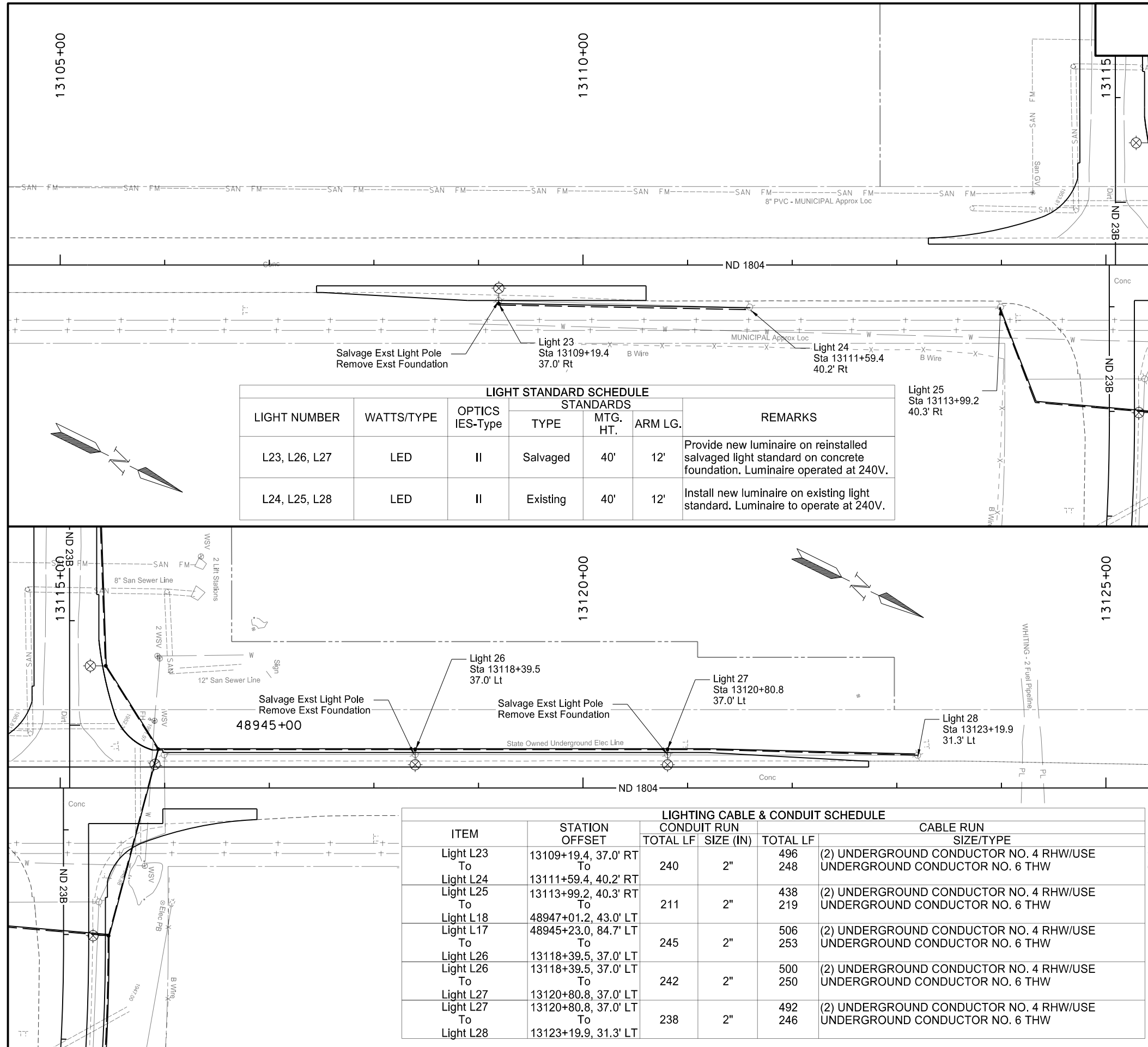
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ND 23B Truck Reliever Route

Lighting

Site 2
(EX23B)

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	140	4



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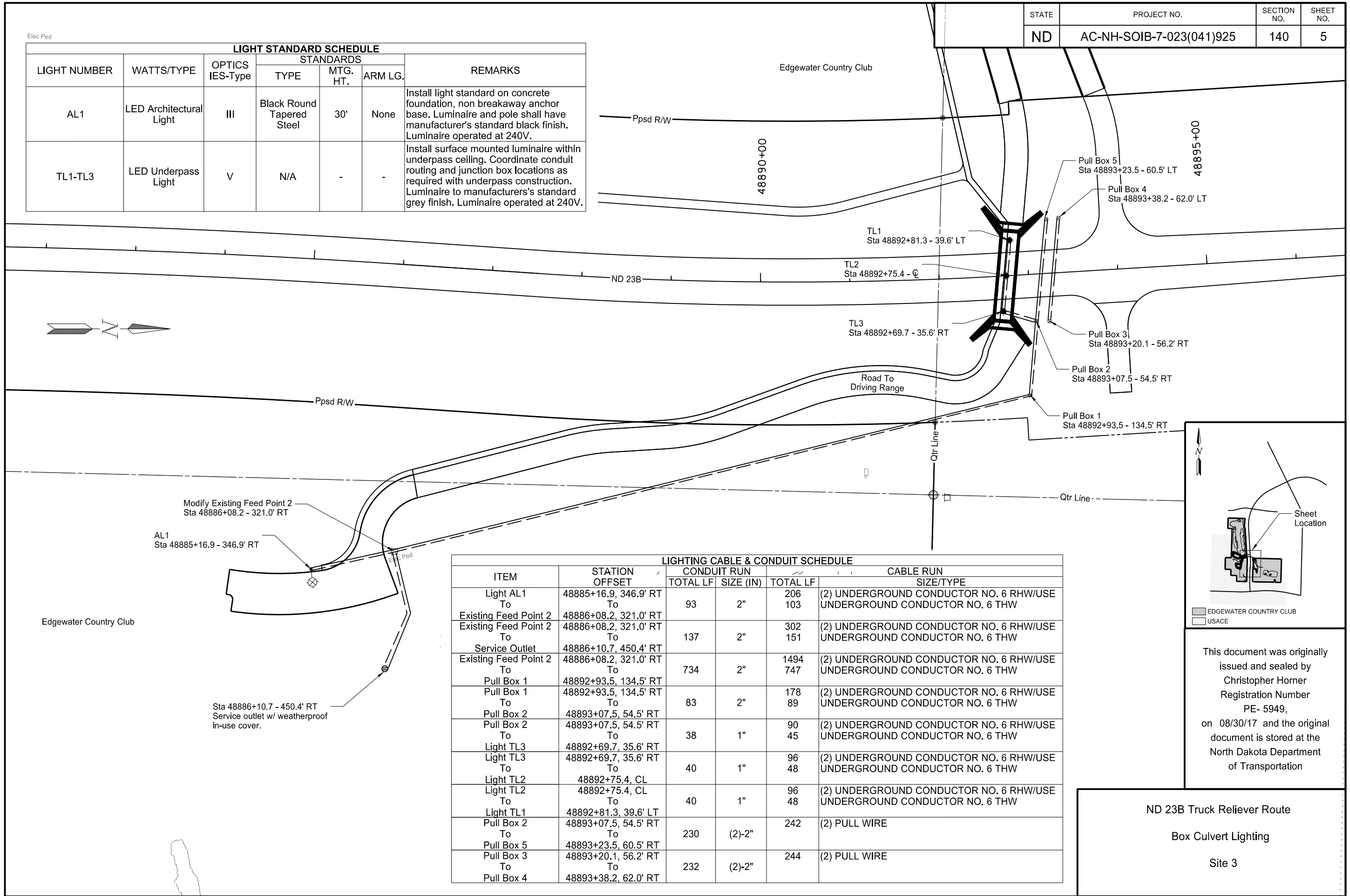
ND 23B Truck Reliever Route

Lighting

Site 2
(SCL1804)

Elec Ped

LIGHT STANDARD SCHEDULE						
LIGHT NUMBER	WATTS/TYPE	OPTICS IES-Type	STANDARDS			REMARKS
			TYPE	MTG. HT.	ARM LG.	
AL1	LED Architectural Light	III	Black Round Tapered Steel	30'	None	Install light standard on concrete foundation, non breakaway anchor base. Luminaire and pole shall have manufacturer's standard black finish. Luminaire operated at 240V.
TL1-TL3	LED Underpass Light	V	N/A	-	-	Install surface mounted luminaire within underpass ceiling. Coordinate conduit routing and junction box locations as required with underpass construction. Luminaire to manufacturers's standard grey finish. Luminaire operated at 240V.

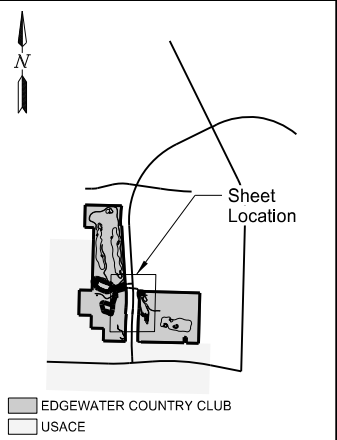


Modify Existing Feed Point 2
Sta 48886+08.2 - 321.0' RT

AL1
Sta 48885+16.9 - 346.9' RT

Sta 48886+10.7 - 450.4' RT
Service outlet w/ weatherproof
in-use cover.

LIGHTING CABLE & CONDUIT SCHEDULE					
ITEM	STATION OFFSET	CONDUIT RUN		CABLE RUN	
		TOTAL LF	SIZE (IN)	TOTAL LF	SIZE/TYPE
Light AL1 To Existing Feed Point 2	48885+16.9, 346.9' RT To 48886+08.2, 321.0' RT	93	2"	206 103	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Existing Feed Point 2 To Service Outlet	48886+08.2, 321.0' RT To 48886+10.7, 450.4' RT	137	2"	302 151	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Existing Feed Point 2 To Pull Box 1	48886+08.2, 321.0' RT To 48892+93.5, 134.5' RT	734	2"	1494 747	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Pull Box 1 To Pull Box 2	48892+93.5, 134.5' RT To 48893+07.5, 54.5' RT	83	2"	178 89	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Pull Box 2 To Light TL3	48893+07.5, 54.5' RT To 48892+69.7, 35.6' RT	38	1"	90 45	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light TL3 To Light TL2	48892+69.7, 35.6' RT To 48892+75.4, CL	40	1"	96 48	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light TL2 To Light TL1	48892+75.4, CL To 48892+81.3, 39.6' LT	40	1"	96 48	(2) UNDERGROUND CONDUCTOR NO. 6 RHW/USE UNDERGROUND CONDUCTOR NO. 6 THW
Light TL1 To Pull Box 2	48892+81.3, 39.6' LT To 48893+07.5, 54.5' RT	230	(2)-2"	242	(2) PULL WIRE
Pull Box 2 To Pull Box 5	48893+07.5, 54.5' RT To 48893+23.5, 60.5' RT	232	(2)-2"	244	(2) PULL WIRE
Pull Box 5 To Pull Box 3	48893+23.5, 60.5' RT To 48893+20.1, 56.2' RT				
Pull Box 3 To Pull Box 4	48893+20.1, 56.2' RT To 48893+38.2, 62.0' RT				



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ND 23B Truck Reliever Route

Box Culvert Lighting

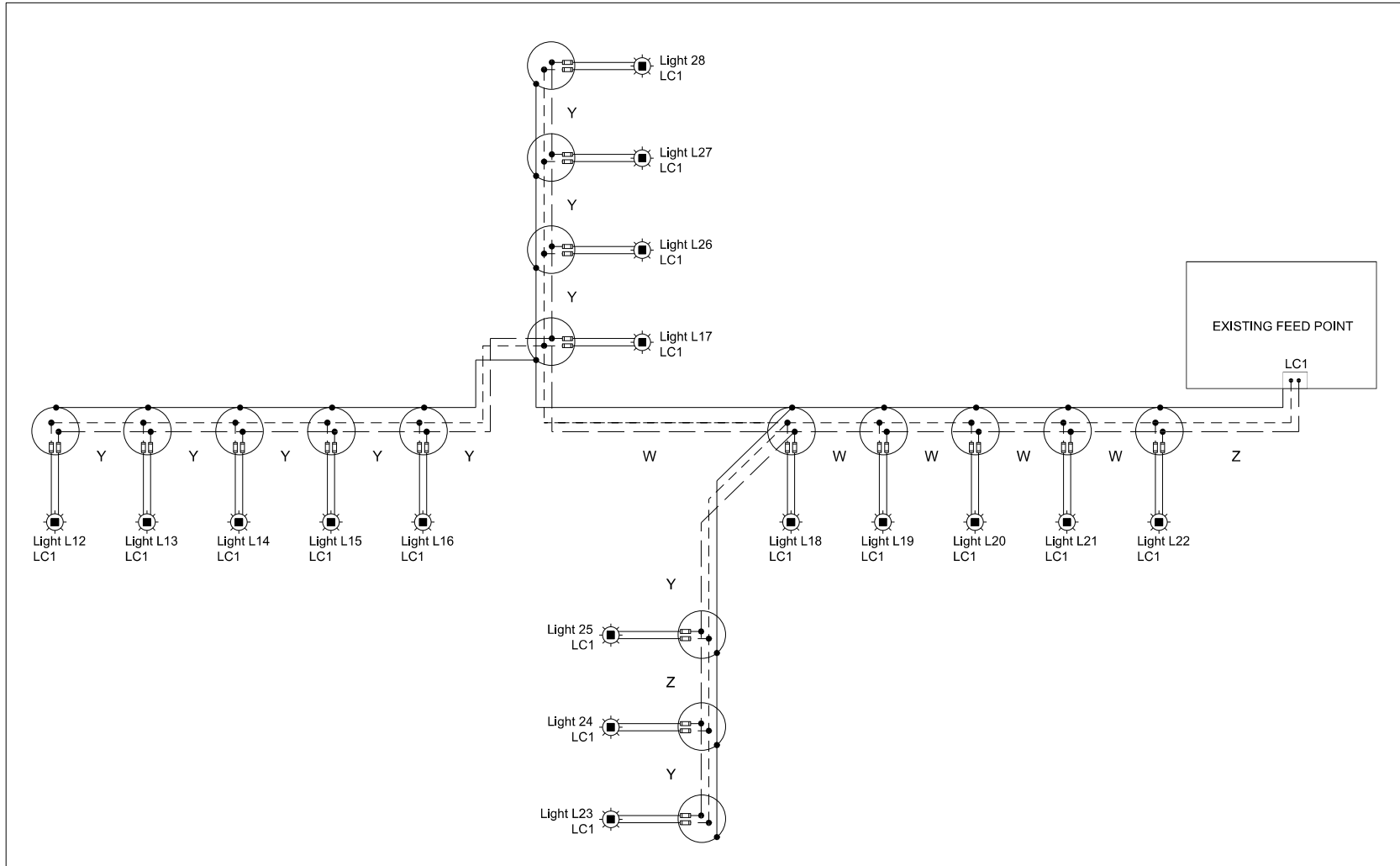
Site 3

FEED POINT 1 PANEL SCHEDULE

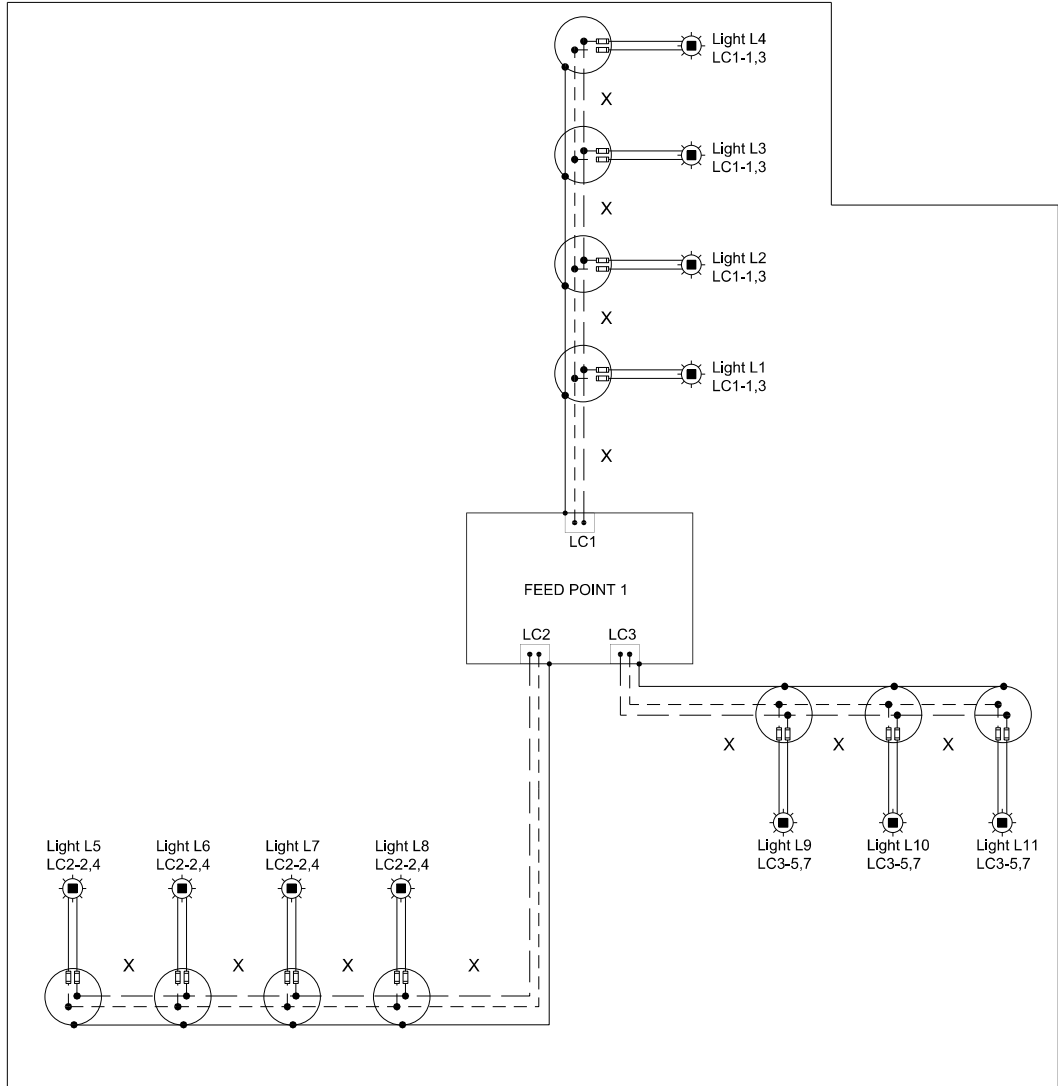
100 Amp Main Breaker, 120/240 Volt, 1Ø, All breakers 22 kAIC minimum.
NEMA 1 enclosure (inside cabinet). 12 space minimum loadcenter. Fed from Utility Metersocket. UL SUSE Rated.
(3) - #2 AWG Cu RHW/USE feeder conductors in Conduit from Utility Metersocket.
Install loadcenter main service conductors in conduit inside feed point cabinet. Provide Typed Identifications according to NEC 408 & 110.
Per NEC provide and bond #6 AWG ground electrodes to 2 ground rods minimum 6' apart along with cabinet.

CKT	DESCRIPTION	BRK	V-A	AMPS	Φ	AMPS	V-A	BRK	DESCRIPTION	CKT
1	LC1 - ND 23 TRR North	50	1,094	4.6	A	3.4	821	50	LC2 - ND 23 West	2
3				4.6	B	3.4				4
5	LC3 - ND 23 East	50	816	3.4	A	10.0	1200	50	Traffic Signal Controller	6
7				3.4	B					8
9	Photoeye	15	12	0.1	A				(Space)	10
11	GFCI Receptacle (Feedpoint Internal)	20	180	1.5	B				(Space)	12
Total Connected VA and Amps			4,123	21.5						
				12.9						

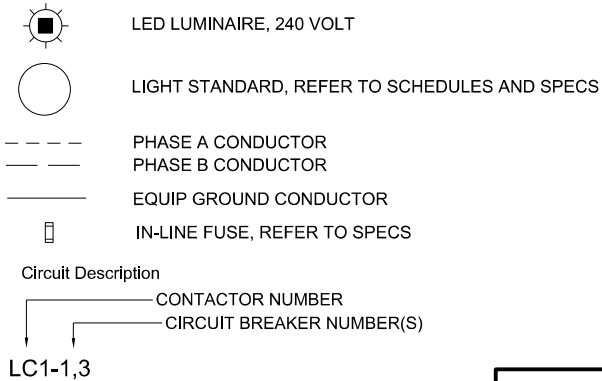
LIGHTING SYSTEM B



LIGHTING SYSTEM A



LEGEND



- W (2) #2 RHW/USE, (1) #4 THW GROUND
X (2) #6 RHW/USE, (1) #6 THW GROUND
Y (2) #4 RHW/USE, (1) #6 THW GROUND
Z EXISTING RUN (NOT TO BE DISTURBED)

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ND 23B Truck Reliever Route
Lighting Schematic
Existing Feed Point & FP1

LIGHT STANDARD FOUNDATION SELECTION TABLE		
Description	Footing Depth "D" 24" & 30" Diameter	Footing Depth "D" 36" & 42" Diameter
<u>Light Standard</u> 30' - 40' Mounting Height	8', 8'	7', 7'

NOTES FOR LIGHT STANDARD FOUNDATIONS:

1. For Light Standard foundations, choose a diameter that is at a minimum the largest of the following scenarios:

- Anchor bolt cage circle diameter plus 12"

- Base plus 6"

- 24"

It is the Contractor's responsibility to determine the foundation diameter and include the corresponding costs for the actual diameter in the corresponding unit price bid "CONCRETE FOUNDATION-HIGHWAY LIGHTING".
2. Provide Class AAE-3 Portland Cement Concrete mixed and proportioned as specified in Section 802.
3. Provide Grade 60 reinforcing steel.
4. The Contractor may use temporary casing to maintain the opening prior to placement of concrete. The casing will be removed prior to curing of the concrete. If casing is used, it will be of sufficient strength to withstand handling and installation procedures. The Contractor will submit a casing material proposal to the Engineer for review two weeks prior to ordering casing material. Include all costs associated with the temporary casing in the corresponding unit price bid "CONCRETE FOUNDATION-HIGHWAY LIGHTING". Permanent casing of the foundation will not be used.
5. Include all costs associated with the construction of the foundation in the corresponding unit price bid "CONCRETE FOUNDATION-HIGHWAY LIGHTING". This includes but is not limited to excavation, concrete, reinforcing steel, anchor bolts and ground rod.
6. See Standard Drawing D-770-1 for additional foundation information.
7. Light Standards will have a minimum of 4 anchor bolts.

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ND 23B Truck Reliever Route

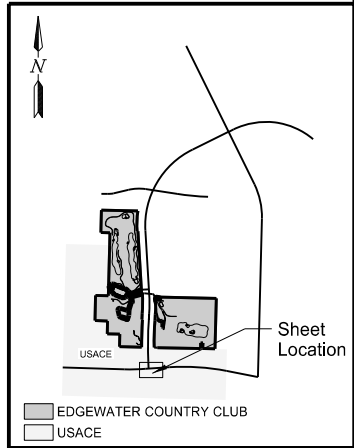
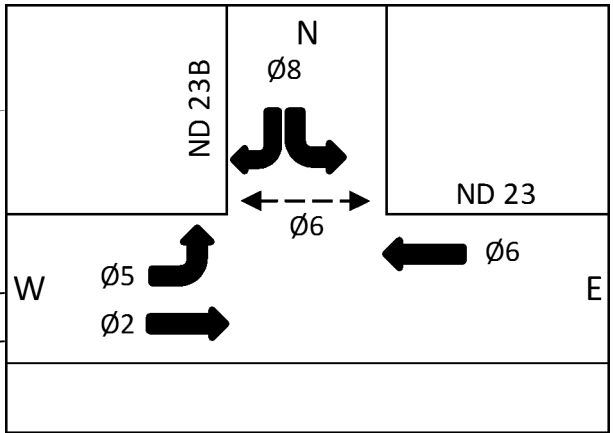
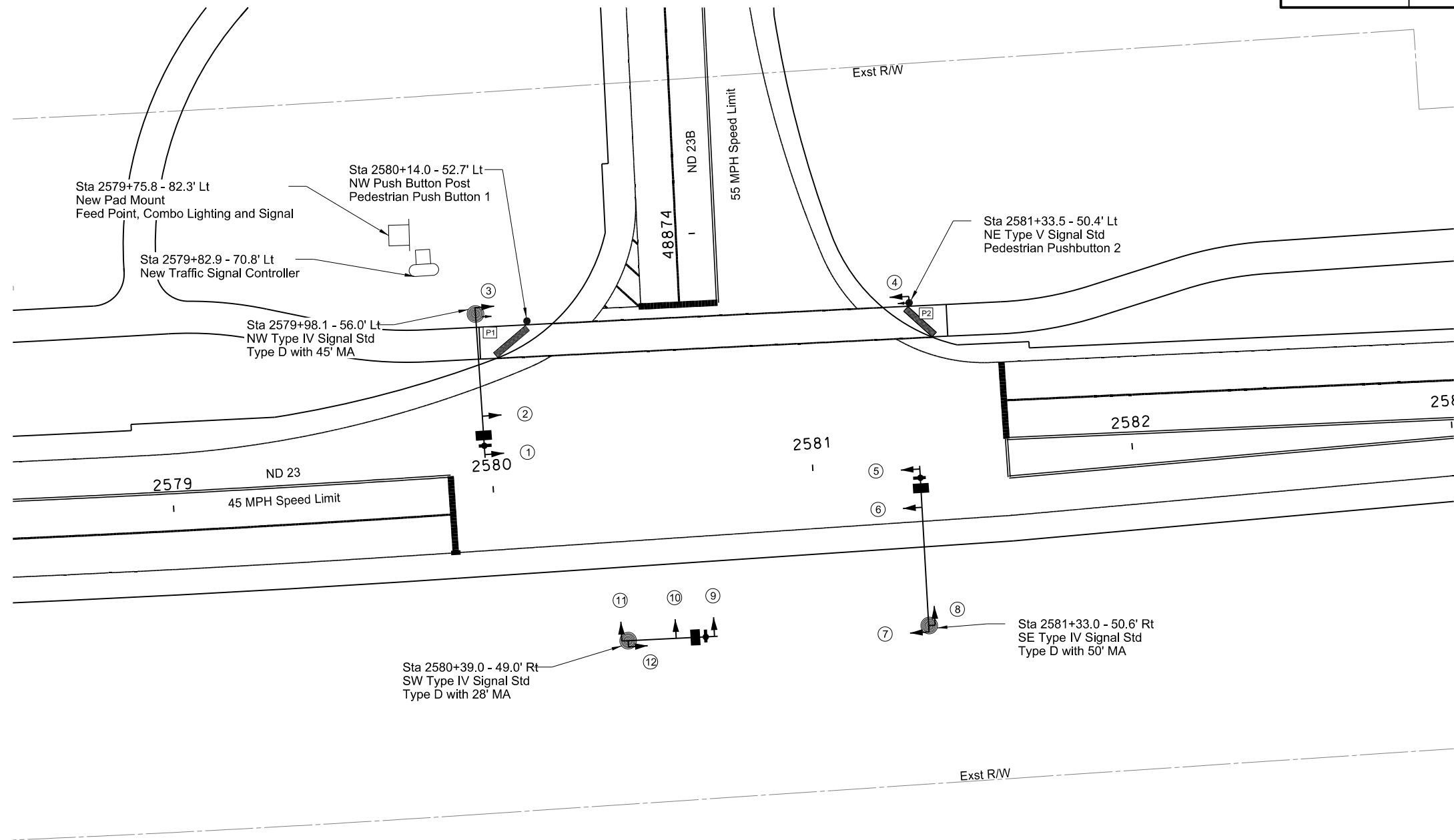
Light Concrete Foundations

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	140	8

Spec	Code	Item Description	Unit	Site 1	Site 2	Site 3
770	0020	CONCRETE FOUNDATION-HIGHWAY LIGHTING	EA	11	13	1
770	0100	PULL BOX	EA	-	-	5
770	0150	PULL WIRE	LF	-	-	486
770	0300	1IN DIAMETER RIGID CONDUIT	LF	-	-	118
770	0330	2IN DIAMETER RIGID CONDUIT	LF	2327	2830	1509
770	0503	UNDERGROUND CONDUCTOR NO2-TYPE RHW	LF	-	1904	-
770	0504	UNDERGROUND CONDUCTOR NO4-TYPE RHW	LF	-	3996	-
770	0505	UNDERGROUND CONDUCTOR NO6-TYPE RHW	LF	4878	-	2462
770	0604	UNDERGROUND CONDUCTOR NO4-TYPE THW	LF	-	952	-
770	0605	UNDERGROUND CONDUCTOR NO6-TYPE THW	LF	2439	1998	1231
770	1826	LT STD 12FT MA 40FT MT HT BREAKAWAY	EA	11	6	-
770	4070	ARCHITECTURAL LT STD 30FT MT HT	EA	-	-	1
770	4210	LED LUMINAIRE	EA	11	17	-
770	4300	UNDERPASS LIGHT UNIT CEILING MD-50 WATT	EA	-	-	3
770	-	ARCHITECTURAL LED LUMINAIRE	EA	-	-	1
770	4540	RELOCATE LIGHT STANDARD	EA	-	7	-
770	4582	REMOVE CONCRETE FOUNDATION	EA	-	7	-
770	9270	MODIFY EXISTING FEED POINT	EA	-	-	1
770	0003	LIGHTING SYSTEM A	EA	1		
770	0004	LIGHTING SYSTEM B	EA		1	
770	0005	LIGHTING SYSTEM C	EA			1
Items shown are for informational purposes, contractor shall provide all labor and equipment required for each lighting system to be fully operational as shown in the plans. Items shall be included in the corresponding price bld "LIGHTING SYSTEM _".						

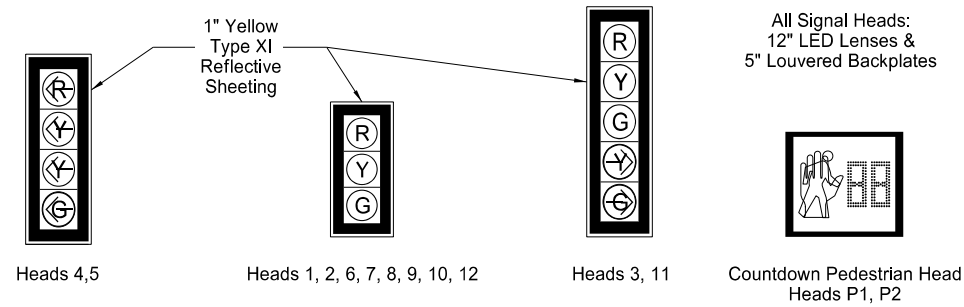
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ND 23B Truck Reliever Route
Lighting Quantities

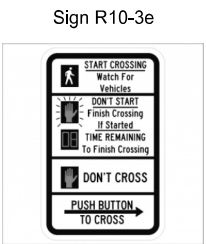


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ND 23B Truck Reliever Route
Signal Layout
ND 23 / ND 23B (SCL23)



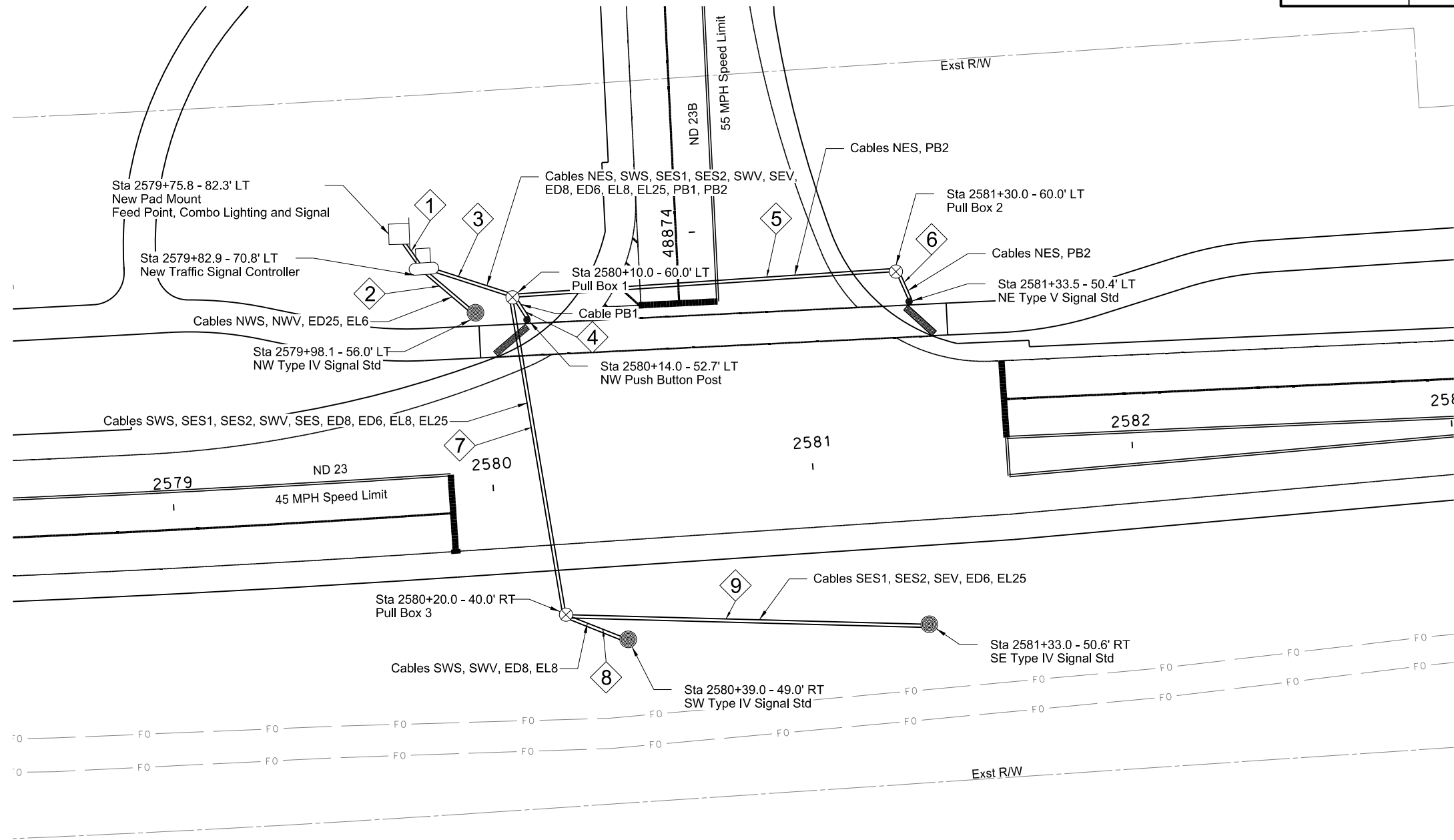
- Legend**
- Signal Controller
 - Signal Head
 - EVP Detector
 - Feed Point
 - Video Detection Unit



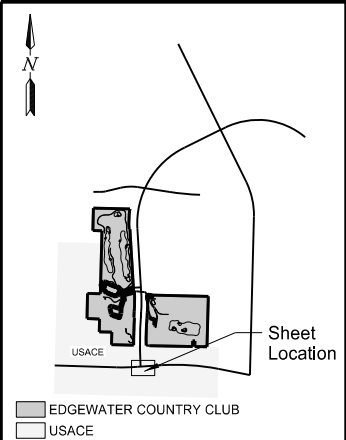
Pedestrian Pushbutton Schedule		
Location	Pushbutton & Sign Location on Pole	Direction of Arrow on Sign
Pushbutton 1	South	Right
Pushbutton 2	South	Left

Note:
1. Stationing based on Chain SCL23

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	150	2



NWS = Northwest Type IV Signal Standard
NES = Northeast Type V Signal Standard
SWS = Southwest Type IV Signal Standard
SES1 = Southeast Type IV Signal Standard 1
SES2 = Southeast Type IV Signal Standard 2
NWV = Northwest Video Detection Unit
SWV = Southwest Video Detection Unit
SEV = Northeast Video Detection Unit
ED25 = Ø2 + Ø5 EVP Detector
ED6 = Ø6 EVP Detector
ED8 = Ø8 EVP Detector
EL25 = Ø2 + Ø5 EVP Light
EL6 = Ø6 EVP Light
EL8 = Ø8 EVP Light
PB1 = Pedestrian Pushbutton 1
PB2 = Pedestrian Pushbutton 2



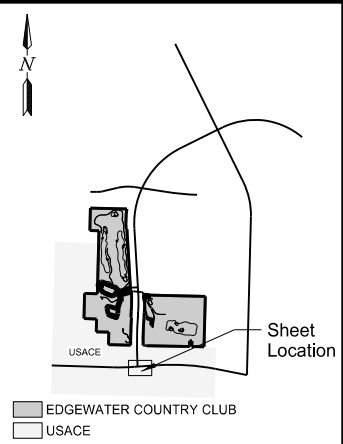
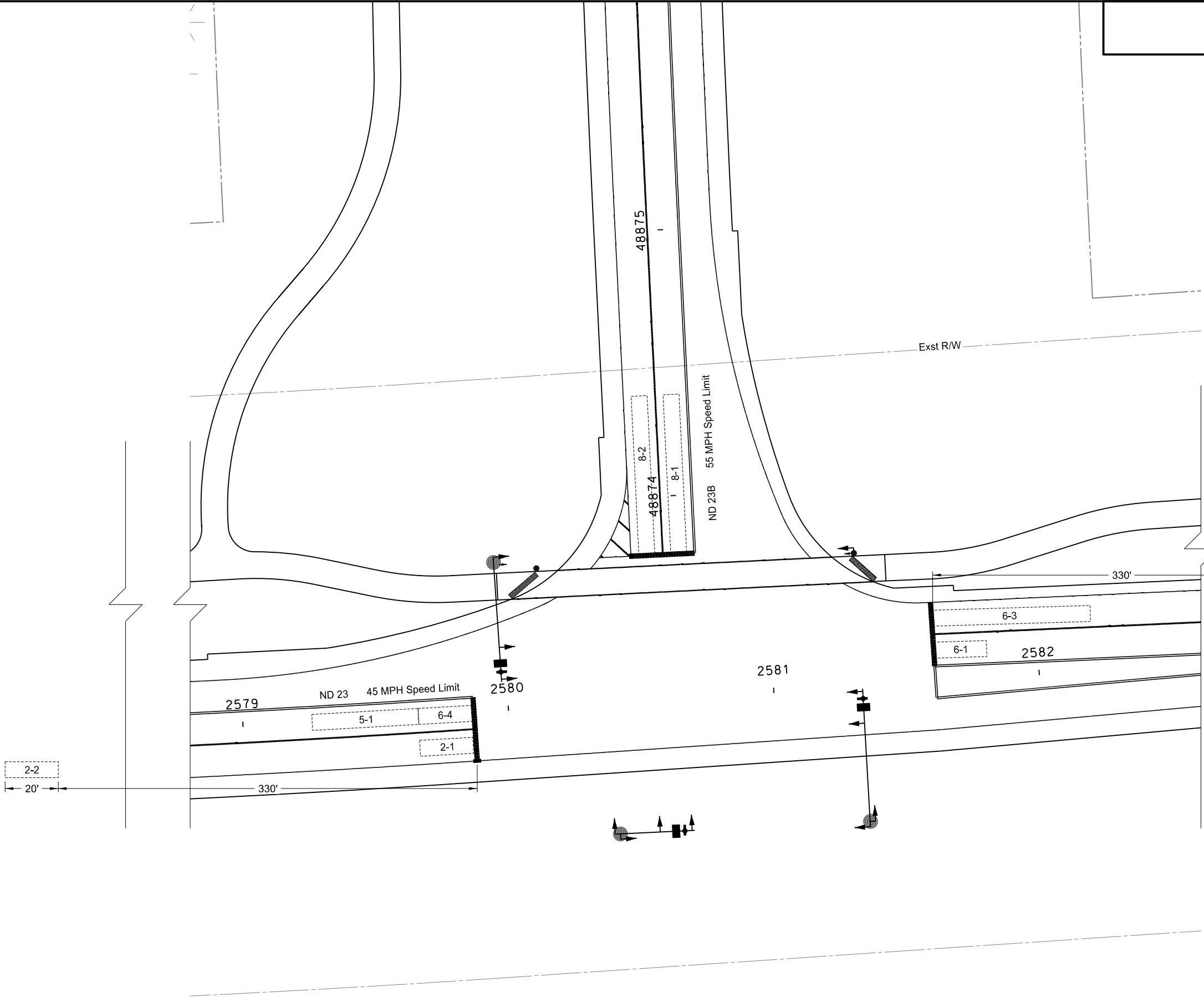
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ND 23B Truck Reliever Route
Conduit and Conductor Layout
ND 23/ ND 23B

- Legend
- New Signal Controller
 - Cable & Conduit Run
 - Pull Box
 - Feed Point
 - Signal Pole

Note:
1. Stationing based on Chain SCL23

DETECTION ZONE SCHEDULE						
Phase-Number	Distance From Stop Bar (feet)	Length (feet)	Presence/Counting	Passage/Counting	Queue/Counting	Locking Memory
2-1	0	20			X	
2-2	330	20		X		X
5-1	20	40	X			X
6-1	0	20			X	
6-2	330	20		X		X
6-3	0	60	X			X
6-4	0	20	X			X
8-1	0	60	X			X
8-2	0	60	X			X



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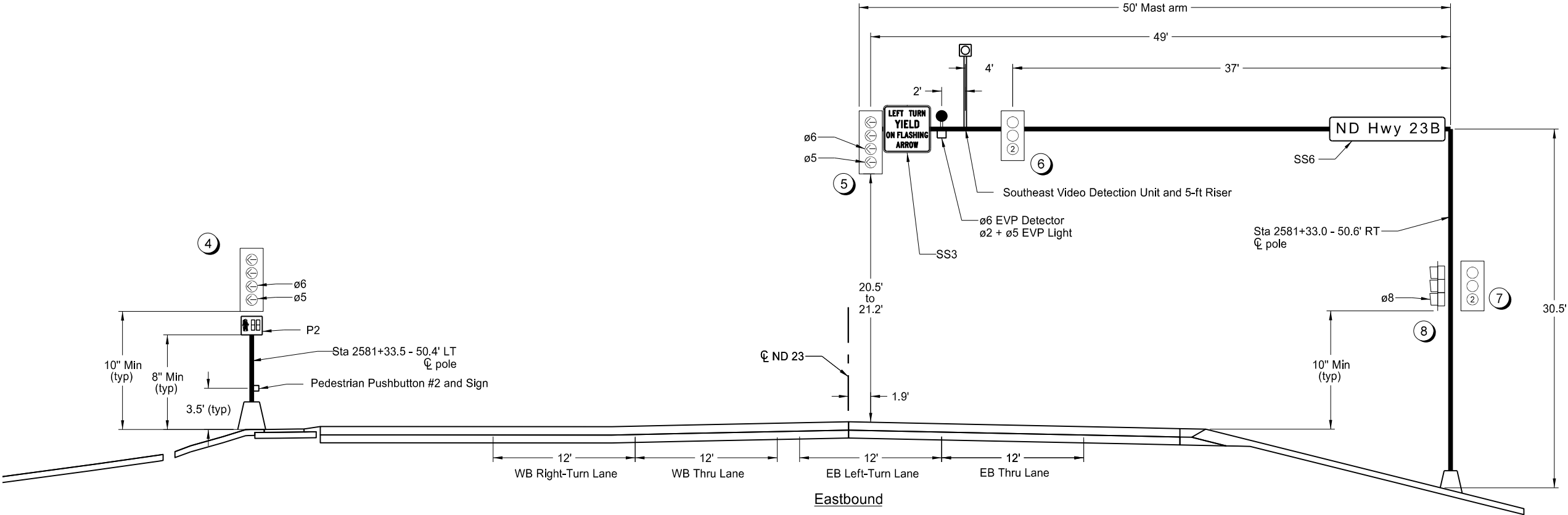
ND 23B Truck Reliever Route
Video Detection Zone Layout
ND 23 / ND 23B

Notes:
1. Stationing based on Chain SCL23.
2. The final size of all detection zones shall be as recommended by the video detection manufacturer.

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	150	4

Northeast Type V Signal Standard

Southeast Type IV Signal Standard



Eastbound

LEGEND

- Video Detection Camera
- Traffic Signal Head w/ associated phase
- Signal Head Number
- EVP Light
- EVP Detector

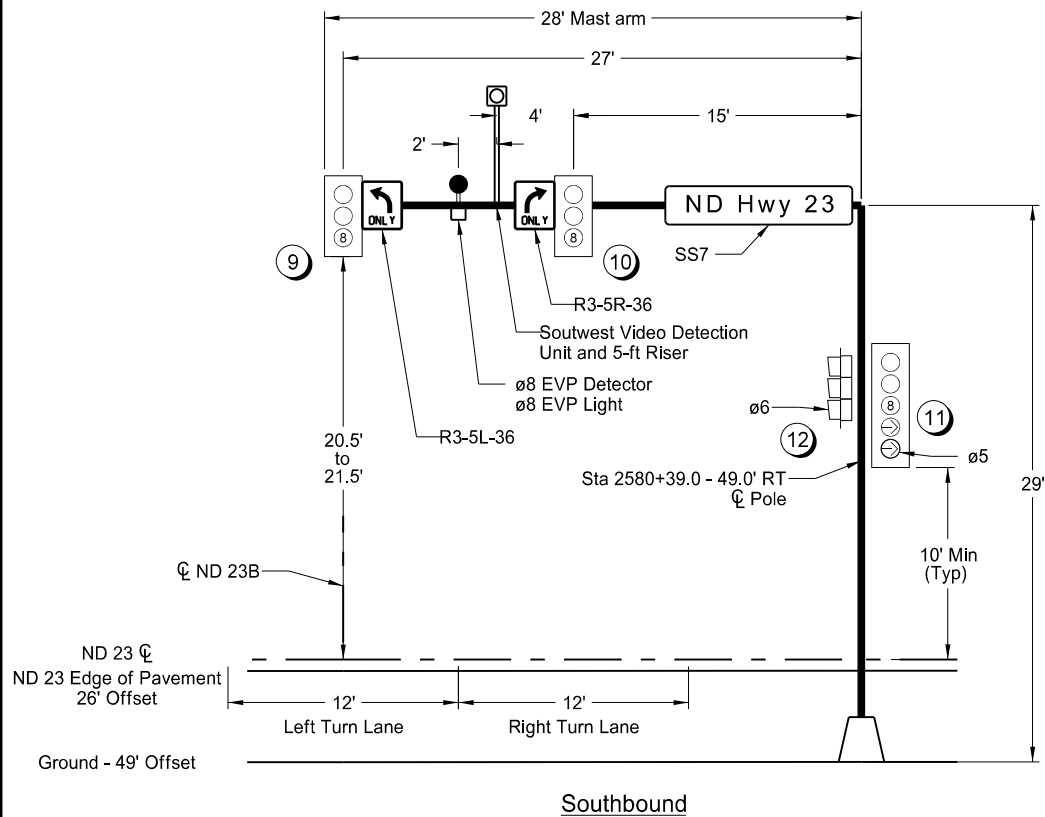
Notes:
1. Face the EVP Detector the opposite direction of signal heads on corresponding mast arm.

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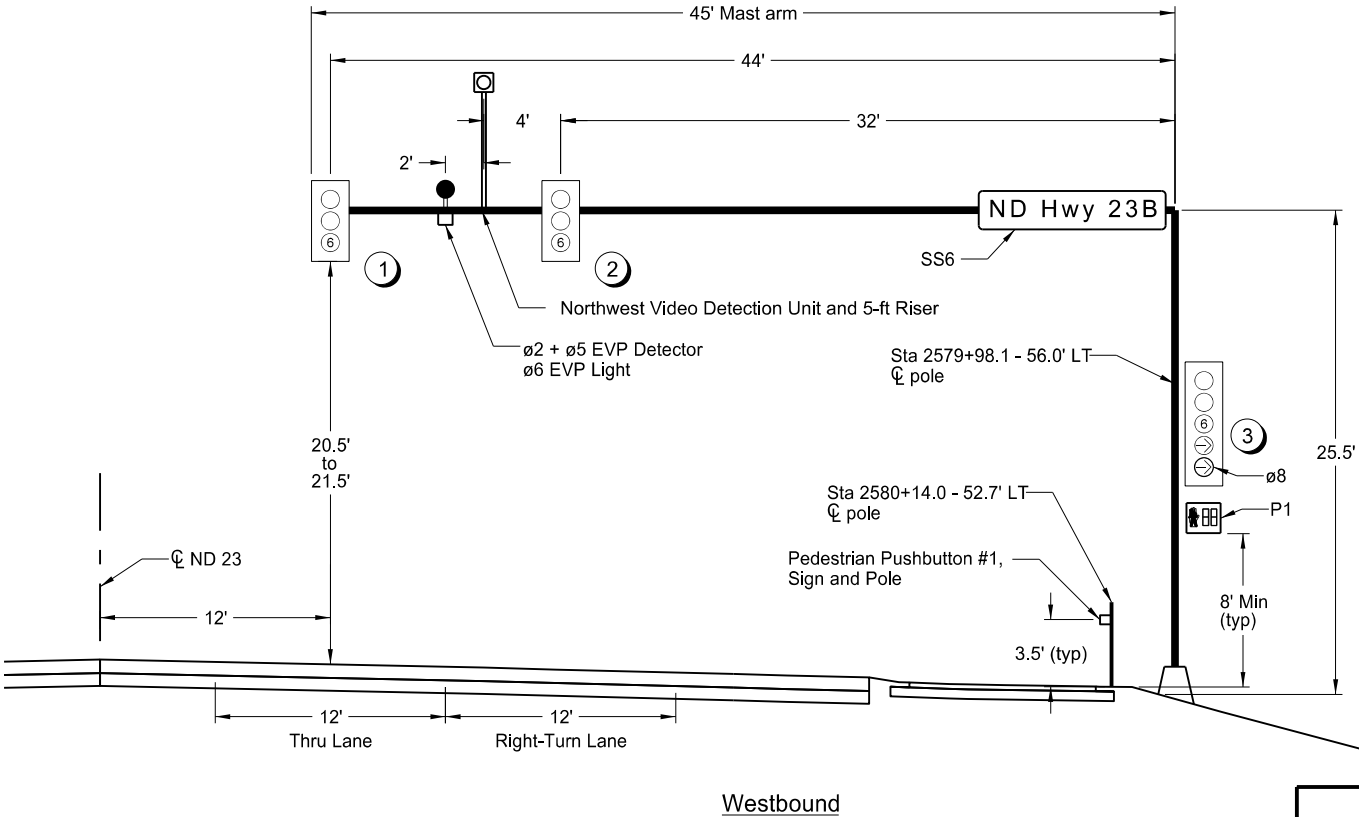
ND 23B Truck Reliever Route
Signal Standards and Head Locations
ND 23 / ND 23B

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	150	5

Southwest Type IV Signal Standard



Northwest Type IV Signal Standard



Legend

- Video Detection Camera
- Traffic Signal Head w/ Associated Phase
- Signal Head Number
- EVP Light
- EVP Detector

Notes:
1. For the Northwest Signal Standard, face the EVP Detector the opposite direction of signal heads on corresponding mast arm.
2. For the Southwest Signal Standard, face the EVP Detector the same direction of signal heads on corresponding mast arm.

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ND 23B Truck Reliever Route
Signal Standards and Head Locations
ND 23 / ND 23B

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
Future	EB Thru	Future	Future	EB Left	WB Thru	Future	SB Thru

BASIC INTERVALS (OR FUNCTIONS)

Minimum Green/Initial		15.0			5.0	15.0		10.0
Minimum Initial with Pedestrian Actuation*						51.4		
Passage Time		5.0			3.0	5.0		3.0
Maximum Green		60.0			30.0	60.0		30.0
Yellow Change		4.3			3.0	4.3		3.0
Red Clearance		2.1			3.4	2.1		2.0
Walk						7.0		
Pedestrian Clearance						38.0		

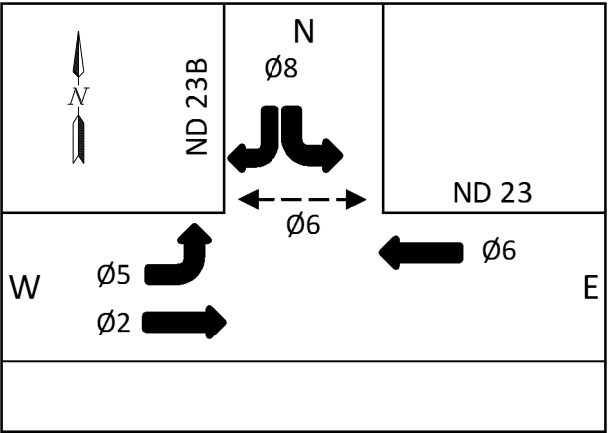
EB = Eastbound (ND 23)
WB = Westbound (ND 23)
SB = Southbound (ND 23B)

VOLUME DENSITY TIMING FUNCTIONS - ONLY APPLICABLE DURING "FREE" (UNCOORDINATED) TIMING PLAN

Minimum Initial		15.0				15.0		
Minimum Gap		2.0				2.0		
Time to Reduce to Minimum Gap		18.0				18.0		
Time Before Reduction		30.0				30.0		

OTHER CONTROLLER FUNCTIONS

Recall		Minimum			No	Minimum		No
Flashing-Normal & Conflict Monitor		Y			R	Y		R
Start Up Phasing		G			R	G		R
Emergency Vehicle Pre-emption		x			x	x		x
Type of Detector	Presence	Refer to Detector Zone Table						
	Calling							
	Passage							
Locking Memory								
Non-Locking Memory								



Intersection	Time Period	Timing Plan
ND 23 and ND 23B	12:00 AM to 11:59 PM	Uncoordinated

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ND 23B Truck Reliever Route
Controller Settings
ND 23 / ND 23B

RUN					CONDUIT		CABLE				
#	ITEM		STATION, OFFSET	SIZE (IN)	LF	Origin	Destination	# of Cables	SIZE/TYPE	Total LF	TITLE
1	<i>Origin</i> <i>Destination</i>	Feed Point Traffic Signal Controller	2579+75.8, 82.3' LT 2579+82.9, 70.8' LT	2	14	Feed Point Feed Point	Traffic Signal Controller Traffic Signal Controller	2 1	UNDERGROUND CONDUCTOR NO6-TYPE RHW UNDERGROUND CONDUCTOR NO6-TYPE THW	66 33	
2	<i>Origin</i> <i>Destination</i>	Traffic Signal Controller Northwest Type IV Signal Std	2579+82.9, 70.8' LT 2579+98.1, 56.0' LT	3	22	Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller	Northwest Type IV Signal Std Transformer Base Northwest Video Detection Unit Northwest Emergency Preemption Detector Northwest Emergency Preemption Lamp	1 1 1 1	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE	36 95 92 92	NWS NWV ED25 EL6
3	<i>Origin</i> <i>Destination</i>	Traffic Signal Controller Pull Box 1	2579+82.9, 70.8' LT 2580+10.0, 60.0' LT	3	29	Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller Traffic Signal Controller	Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1	3 1 2 2 2 2	14 AWG 12 CONDUCTOR CABLE 14 AWG 7 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	132 44 88 88 88 88	SWS, SES1, NES SES2 SWV, SEV ED8, ED6 EL8, EL25 PB1, PB2
4	<i>Origin</i> <i>Destination</i>	Pull Box 1 Northwest Pedestrian Pole	2580+10.0, 60.0' LT 2580+14.0, 52.7' LT	2	9	Pull Box 1	Pushbutton 1	1	16 AWG 2 CONDUCTOR CABLE	23	PB1
5	<i>Origin</i> <i>Destination</i>	Pull Box 1 Pull Box 2	2580+10.0, 60.0' LT 2581+30.0, 60.0' LT	3	120	Pull Box 1 Pull Box 1	Pull Box 2 Pull Box 2	1 1	14 AWG 12 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	132 132	NES PB2
6	<i>Origin</i> <i>Destination</i>	Pull Box 2 Northeast Type V Signal Std	2581+30.0, 60.0' LT 2581+33.5, 50.4' LT	2	11	Pull Box 2 Pull Box 2	Northeast Type V Signal Std Transformer Base Pushbutton 2	1 1	14 AWG 12 CONDUCTOR CABLE 16 AWG 2 CONDUCTOR CABLE	22 25	NES PB2
7	<i>Origin</i> <i>Destination</i>	Pull Box 1 Pull Box 3	2580+10.0, 60.0' LT 2580+20.0, 40.0' RT	3	101	Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1 Pull Box 1	Pull Box 3 Pull Box 3 Pull Box 3 Pull Box 3 Pull Box 3 Pull Box 3	2 1 2 2 2 2	14 AWG 12 CONDUCTOR CABLE 14 AWG 7 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE	226 113 226 226 226 226	SWS, SES1 SES2 SWV, SEV ED8, ED6 EL8, EL25
8	<i>Origin</i> <i>Destination</i>	Pull Box 3 Southwest Type IV Signal Std	2580+20.0, 40.0' RT 2580+39.0, 49.0' RT	2	21	Pull Box 3 Pull Box 3 Pull Box 3 Pull Box 3	Southwest Type IV Signal Std Transformer Base Southwest Video Detection Unit Southwest Emergency Preemption Detector Southwest Emergency Preemption Lamp	1 1 1 1	14 AWG 12 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE	32 86 83 83	SWS SWV ED8 EL8
9	<i>Origin</i> <i>Destination</i>	Pull Box 3 Southeast Type IV Signal Std	2580+20.0, 40.0' RT 2581+33.0, 50.6' RT	2	114	Pull Box 3 Pull Box 3 Pull Box 3 Pull Box 3 Pull Box 3 Pull Box 3	Southeast Type IV Signal Std Transformer Base Southeast Type IV Signal Std Transformer Base Southeast Video Detection Unit Southeast Emergency Preemption Detector Southeast Emergency Preemption Lamp	1 1 1 1 1 1	14 AWG 12 CONDUCTOR CABLE 14 AWG 7 CONDUCTOR CABLE VIDEO DETECTION CABLE EMERGENCY VEHICLE DETECTOR CABLE 14 AWG 2 CONDUCTOR CABLE	125 125 179 176 176	SES1 SES2 SEV ED6 EL25

INTERNAL MAST ARM/STANDARD SIGNAL HEAD CABLE				
Origin	Destination	# of Cabl	SIZE/TYPE	Total LF
Northwest Type IV Signal Std Transformer Base	Vehicle Head 1	1	14 AWG 5 CONDUCTOR CABLE	72
	Vehicle Head 2	1	14 AWG 5 CONDUCTOR CABLE	60
	Vehicle Head 3	1	14 AWG 7 CONDUCTOR CABLE	20
	Pedestrian Head 1	1	14 AWG 3 CONDUCTOR CABLE	15
Northeast Type V Signal Std Transformer Base	Vehicle Head 4	1	14 AWG 7 CONDUCTOR CABLE	77
	Pedestrian Head 2	1	14 AWG 3 CONDUCTOR CABLE	15
Southeast Type IV Signal Std Transformer Base	Vehicle Head 5	1	14 AWG 7 CONDUCTOR CABLE	77
	Vehicle Head 6	1	14 AWG 5 CONDUCTOR CABLE	65
	Vehicle Head 7	1	14 AWG 5 CONDUCTOR CABLE	25
	Vehicle Head 8	1	14 AWG 5 CONDUCTOR CABLE	25
	Vehicle Head 9	1	14 AWG 5 CONDUCTOR CABLE	55
Southwest Type IV Signal Std Transformer Base	Vehicle Head 10	1	14 AWG 5 CONDUCTOR CABLE	43
	Vehicle Head 11	1	14 AWG 7 CONDUCTOR CABLE	29
	Vehicle Head 12	1	14 AWG 5 CONDUCTOR CABLE	29

NWS = Northwest Type IV Signal Standard
NES = Northeast Type V Signal Standard
SWS = Southwest Type IV Signal Standard
SES1 = Southeast Type IV Signal Standard 1
SES2 = Southeast Type IV Signal Standard 2
NWV = Northwest Video Detection Unit
SWV = Southwest Video Detection Unit
SEV = Northeast Video Detection Unit
ED25 = Ø2 + Ø5 EVP Detector
ED6 = Ø6 EVP Detector
ED8 = Ø8 EVP Detector
EL25 = Ø2 + Ø5 EVP Light
EL6 = Ø6 EVP Light
EL8 = Ø8 EVP Light
PB1 = Pedestrian Pushbutton 1
PB2 = Pedestrian Pushbutton 2

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ND 23B Truck Reliever Route
Cable and Conduit Schedule
ND 23 / ND 23B

SIGNAL STANDARD FOUNDATION SELECTION TABLE		
Description	Footing Depth "D" 24" & 30" Diameter	Footing Depth "D" 36" & 42" Diameter
<u>Signal Standard</u>		
Type IV		
26'-30' Signal Mast Arm	N/A, 15'	14', 14'
40'-45' Signal Mast Arm	N/A, N/A	15', 15'
46'-50' Signal Mast Arm	N/A, N/A	17', 17'
Type V		
15' Mounting Height	6', 6'	5', 5'

NOTES FOR SIGNAL STANDARD FOUNDATIONS:

1. For Signal Standard foundations, choose a diameter that is at a minimum the largest of the following scenarios:

- Anchor bolt cage circle diameter plus 12"

- Base plus 6"

- 24"

It is the Contractor's responsibility to determine the foundation diameter and include the corresponding costs for the actual diameter in the corresponding unit price bid "CONCRETE FOUNDATION-TRAFFIC SIGNALS".
2. Provide Class AAE-3 Portland Cement Concrete mixed and proportioned as specified in Section 802.
3. Provide Grade 60 reinforcing steel.
4. The Contractor may use temporary casing to maintain the opening prior to placement of concrete. The casing will be removed prior to curing of the concrete. If casing is used, it will be of sufficient strength to withstand handling and installation procedures. The Contractor will submit a casing material proposal to the Engineer for review two weeks prior to ordering casing material. Include all costs associated with the temporary casing in the corresponding unit price bid "CONCRETE FOUNDATION-TRAFFIC SIGNALS". Permanent casing of the foundation will not be used.
5. Include all costs associated with the construction of the foundation in the corresponding unit price bid "CONCRETE FOUNDATION-TRAFFIC SIGNALS". This includes but is not limited to excavation, concrete, reinforcing steel, anchor bolts and ground rod.
6. See Standard Drawing D-770-1 for additional foundation information.
7. Signal Standards will have a minimum of 6 anchor bolts.

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ND 23B Truck Reliever Route

Signal Concrete Foundations

ND 23 / ND 23B

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	150	9

SPEC	CODE	BID ITEM	QTY	UNIT
772	9811	TRAFFIC SIGNAL SYSTEM - SITE 1		
ND 23 & ND 23B			1	EA

SPEC	CODE	ITEM DESCRIPTION	UNIT	SITE 1
770	0060	CONCRETE FOUNDATION-FEED POINT-TYPE B	EA	1
770	0740	FEED POINT-TYPE III-PAD MOUNTED	EA	1
772	0020	CONCRETE FOUNDATION-TRAFFIC SIGNALS	EA	4
772	0100	PULLBOX	EA	3
772	0240	2IN DIAMETER RIGID CONDUIT	LF	169
772	0270	3IN DIAMETER RIGID CONDUIT	LF	272
772	0375	EMERGENCY VEHICLE DETECTOR CABLE	LF	665
772	0420	NO16 AWG 2 CONDUCTOR CABLE	LF	268
772	0432	NO14 AWG 2 CONDUCTOR CABLE	LF	665
772	0435	NO14 AWG 5 CONDUCTOR CABLE	LF	374
772	0437	NO14 AWG 7 CONDUCTOR CABLE	LF	485
772	0442	NO14 AWG 12 CONDUCTOR CABLE	LF	705
772	0695	TYPE V SIGNAL STANDARD	EA	1
772	0628	TYPE IV SIGNAL STD 28FT MA	EA	1
772	0645	TYPE IV SIGNAL STD 45FT MA	EA	1
772	0650	TYPE IV SIGNAL STD 50FT MA	EA	1
772	1810	1-WAY 3 SEC HEAD W/12IN LENS-POST MTD	EA	3
772	1812	1-WAY 3 SEC HEAD W/12IN LENS-MA MTD	EA	5
772	1820	1-WAY 4 SEC HEAD W/12IN LENS-POST MTD	EA	1
772	1822	1-WAY 4 SEC HEAD W/12IN LENS-MA MTD	EA	1
772	1830	1-WAY 5 SEC HEAD W/12IN LENS-POST MTD	EA	2
772	2060	PEDESTRIAN COUNTDOWN SIGNAL HEAD-POST MTD	EA	2
772	2200	PEDESTRIAN PUSHBUTTON POST	EA	1
772	2215	PEDESTRIAN PUSHBUTTON & SIGN	EA	2
772	2260	VIDEO DETECTION CABLE	LF	674
772	2265	VIDEO DETECTION SYSTEM (A)	EA	1
772	2350	CONTROLLER TYPE 1 (B)	EA	1
772	2553	BATTERY BACKUP SYSTEM	EA	1
772	2610	EMERGENCY VEHICLE PRE-EMPTION UNIT (C)	EA	3
(A) Includes cameras, video monitor, access point and all other equipment required for a fully operational video detection system.				
(B) Includes cabinet, working slab, conflict monitor, load switches, flashers, bus interface units and all other equipment required for a fully operational traffic signal controller.				
(C) Includes detectors, lights and all other equipment required for a fully operation preemption system.				

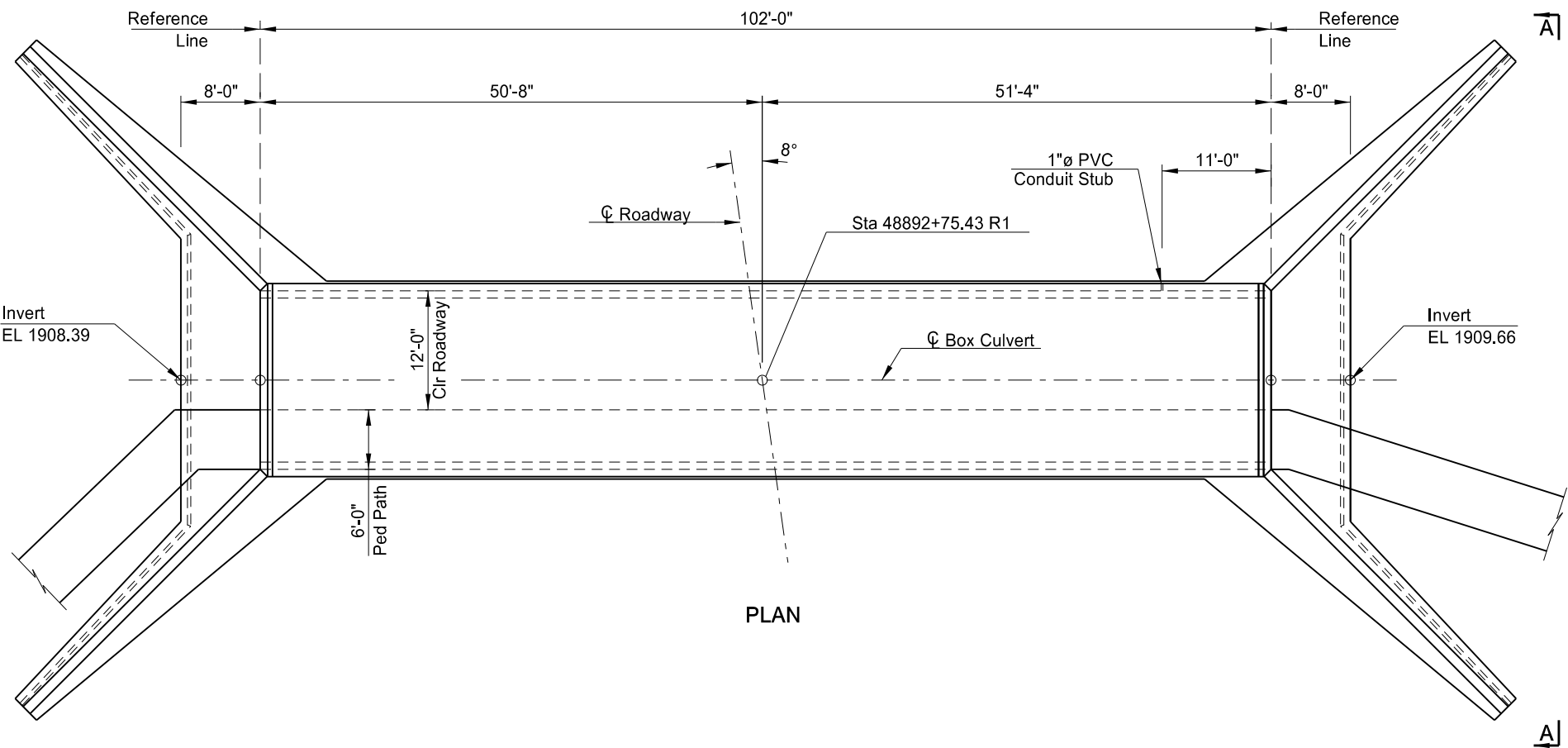
Items shown above are for informational purposes, contractor shall provide all labor and equipment necessary for the signal system to be fully operational as shown in the plans.

Items shall be included in the corresponding price bid "TRAFFIC SIGNAL SYSTEM - SITE 1"

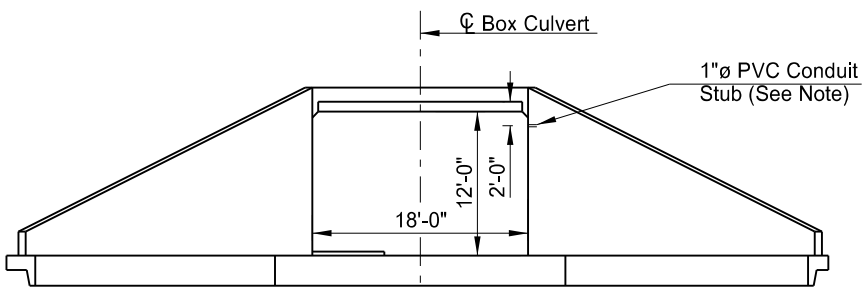
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ND 23B Truck Reliever Route
Signal Quantities
ND 23 / ND 23B

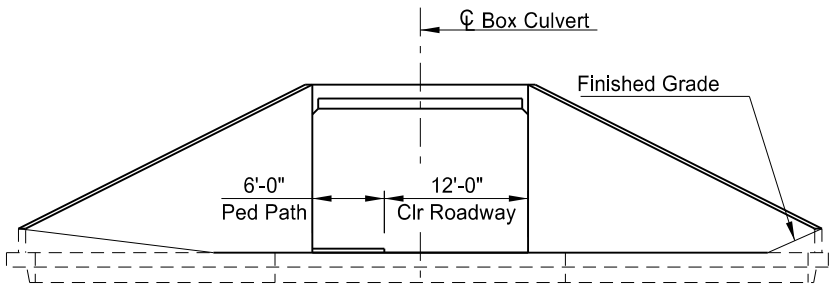
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	170	1



PLAN



A-A
(Showing Dimensions)



A-A
(Showing Finished Section)

NOTE:
See Section 140, Sheet 5 for information on 1" ø PVC Stub.

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HL-93 DESIGN LOADING

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
ND 23B TRUCK RELIEVER ROUTE
NEW TOWN

**REINFORCED CONCRETE
SINGLE BOX CULVERT LAYOUT**
CLEAR SPAN 1 x 18' CLEAR HEIGHT 12'
MAXIMUM FILL 5'

PROJECT: AC-NH-SIOB-7-023(041)925
STATION: 48892+75.43 R1
MOUNTRAIL COUNTY

09/20/2017 Jon Ketterling /s/
DATE BRIDGE ENGINEER

ELEVATION

BOX CULVERT BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
210	0050	BOX CULVERT EXCAVATION	EA	1
210	0210	FOUNDATION FILL	CY	2,441
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1
602	1131	CLASS AE-3 CONCRETE-BOX CULVERT	CY	296.7
612	0114	REINFORCING STEEL-GRADE 60-BOX CULVERT	LBS	63,116
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	321

DESIGN STRENGTHS:

f'c = 3,000 psi ~ Class AE-3 Concrete
fy = 60,000 psi ~ Reinforcing Steel

Load & Resistance Factor Design

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	170	2

STRUCTURAL NOTES

100 SCOPE OF WORK: Work at this site consists of building a new single barrel 18' x 12' x 102'-0" reinforced concrete box culvert.

602 CONCRETE: Cast the following elements of each section in one continuous run:

- 1. Floor slab and wing footings
- 2. Each sidewall up to the bottom of fillets with its adjacent wings complete to the top
- 3. Roof slab and parapets
- 4. Concrete Pedestrian Path

Allow the concrete in the walls to set at least two hours before the roof slab is poured.

602 CURING CONCRETE: Wet cure all concrete surfaces not covered by forms. Cover the concrete with a double thickness of burlap. Maintain surface moisture between the final finish and placement of burlap by periodic applications of a light fog spray of water. Keep the burlap continuously moist until the end of the curing period.

612 REINFORCING STEEL: When the distance between end bars is not evenly divisible by bar spacing, adjust the odd distance by a few irregular spaces near the center, not at the ends of the culvert.

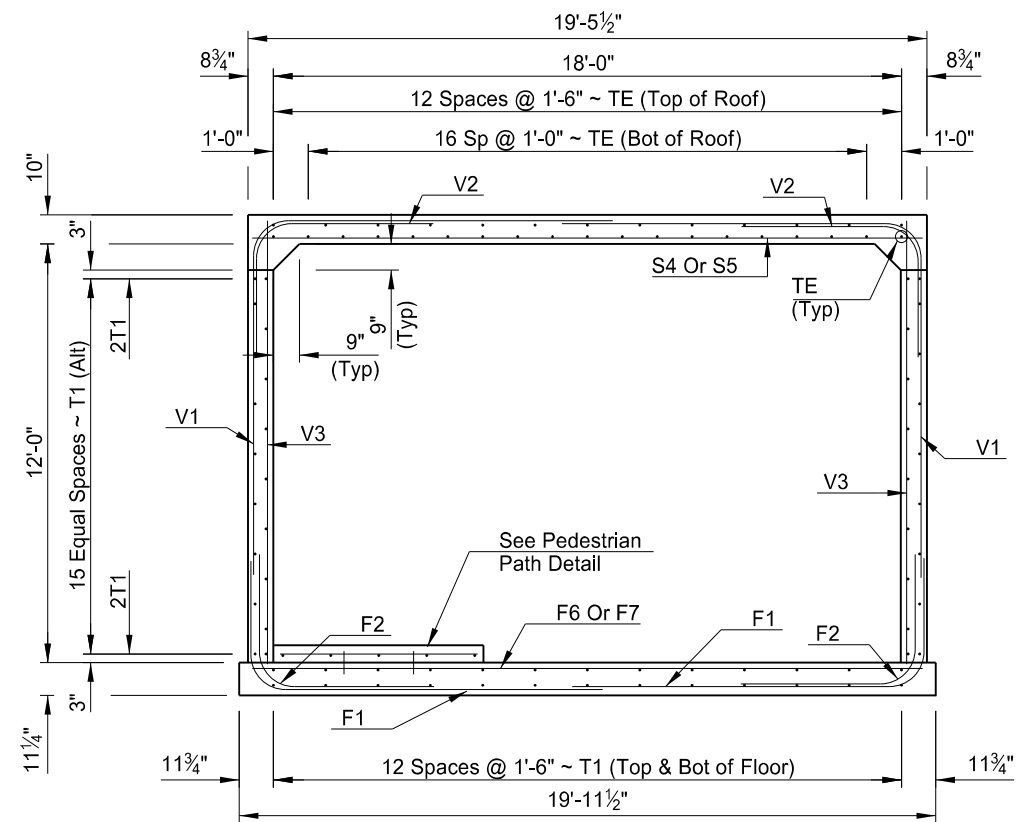
Dimensions of bent bars are given out to out. Place bolsters and bar supports for the roof steel at a maximum of 4 foot spacing.

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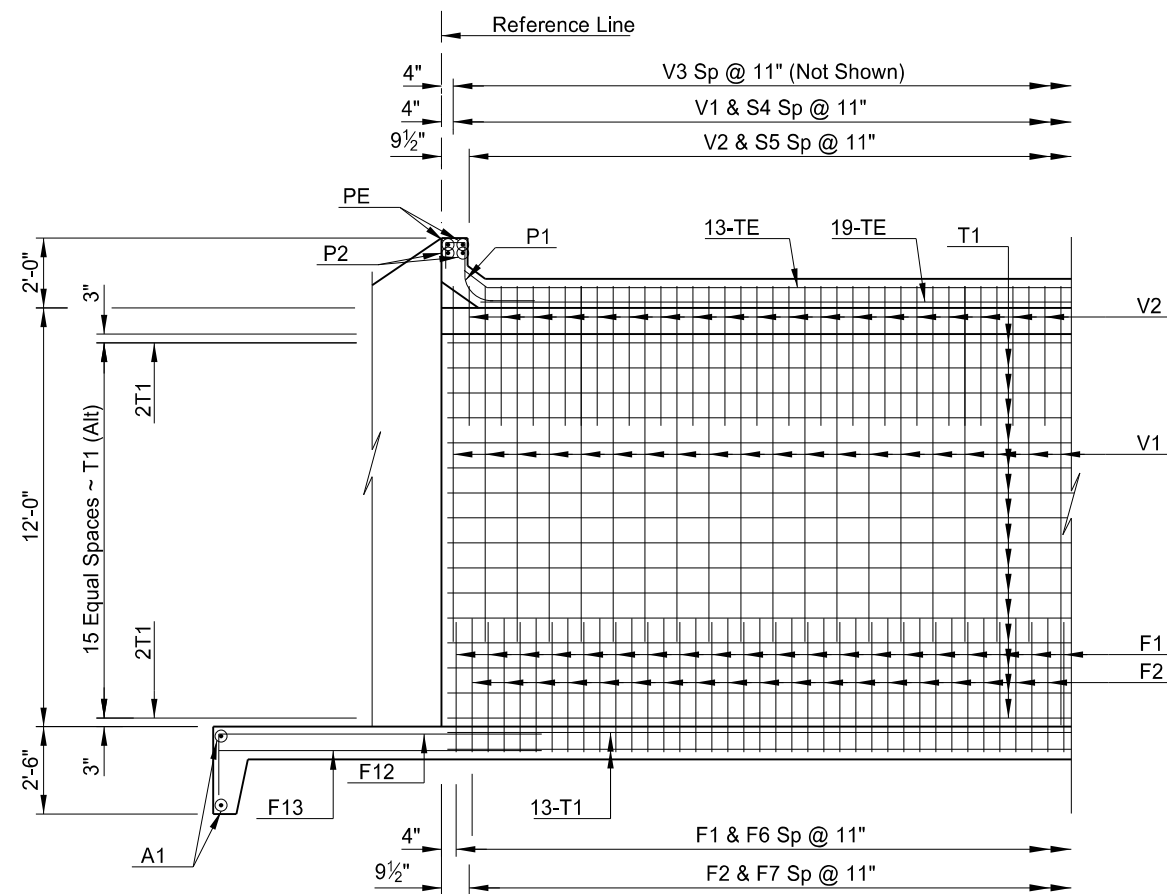
ND 23B TRUCK RELIEVER ROUTE

STRUCTURAL NOTES

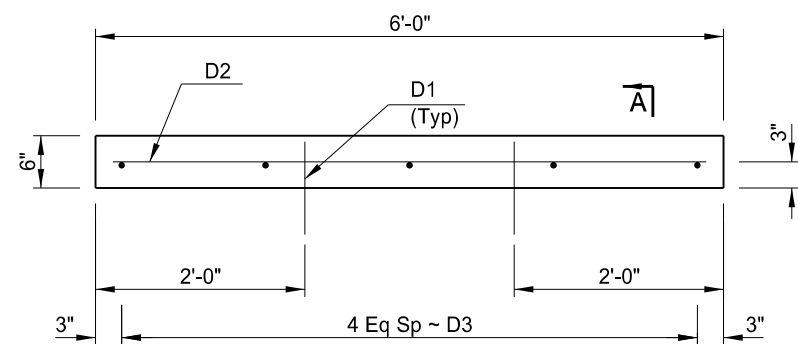
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	170	4



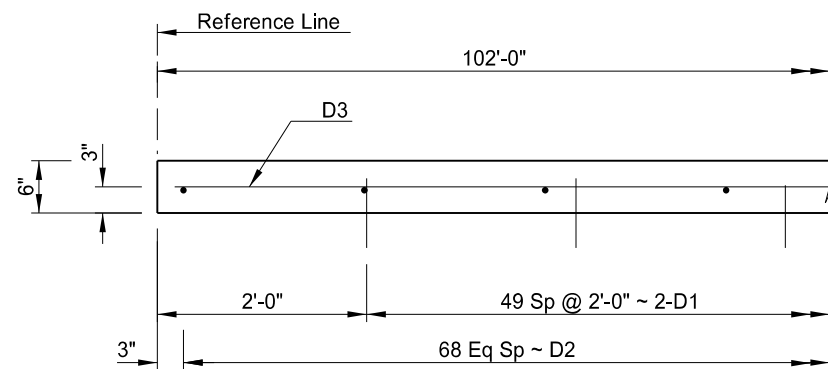
BARREL SECTION



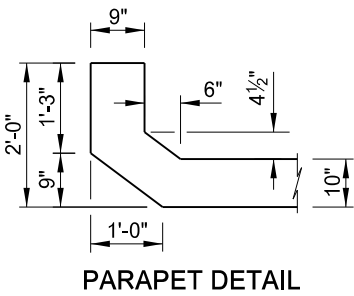
LONGITUDINAL SECTION



PEDESTRIAN PATH DETAIL



A-A



PARAPET DETAIL

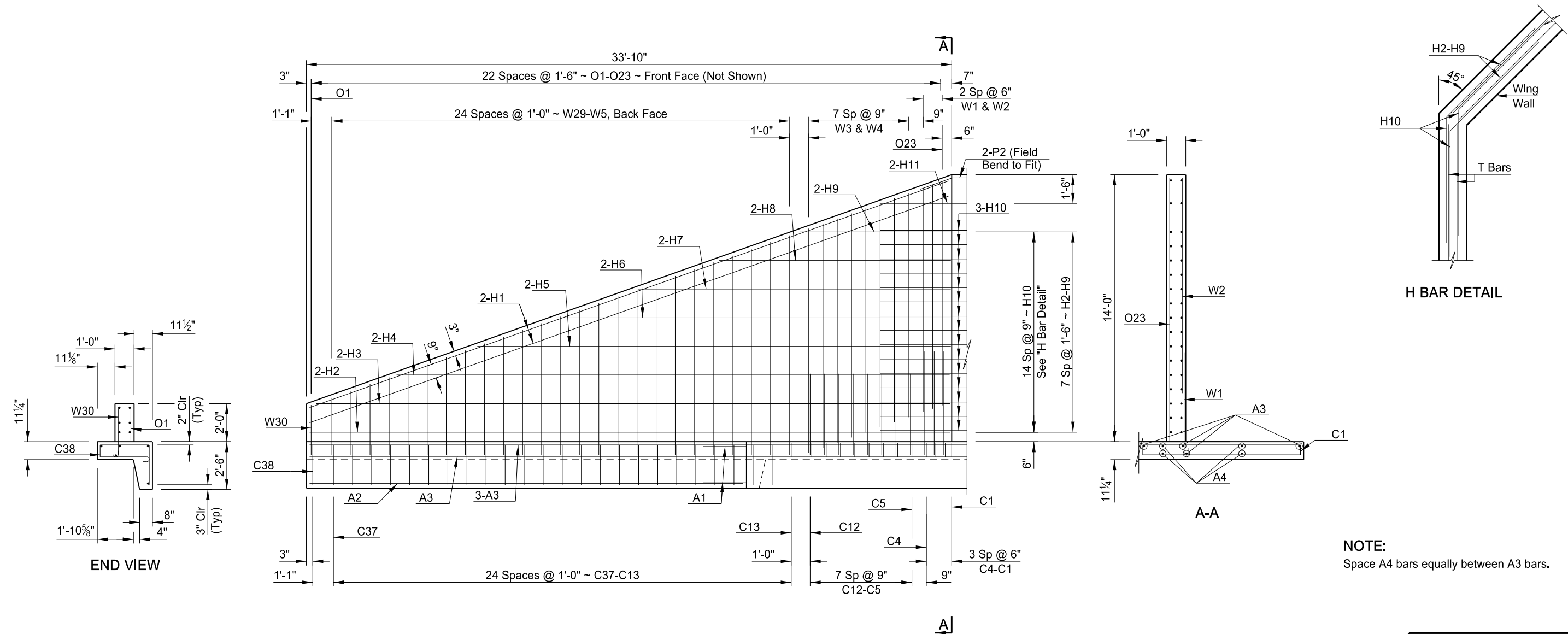
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ND 23B TRUCK RELIEVER ROUTE

BARREL & PARAPET DETAILS

NOTE:
Epoxy D1 dowel bar 4 inches into bottom slab of culvert.

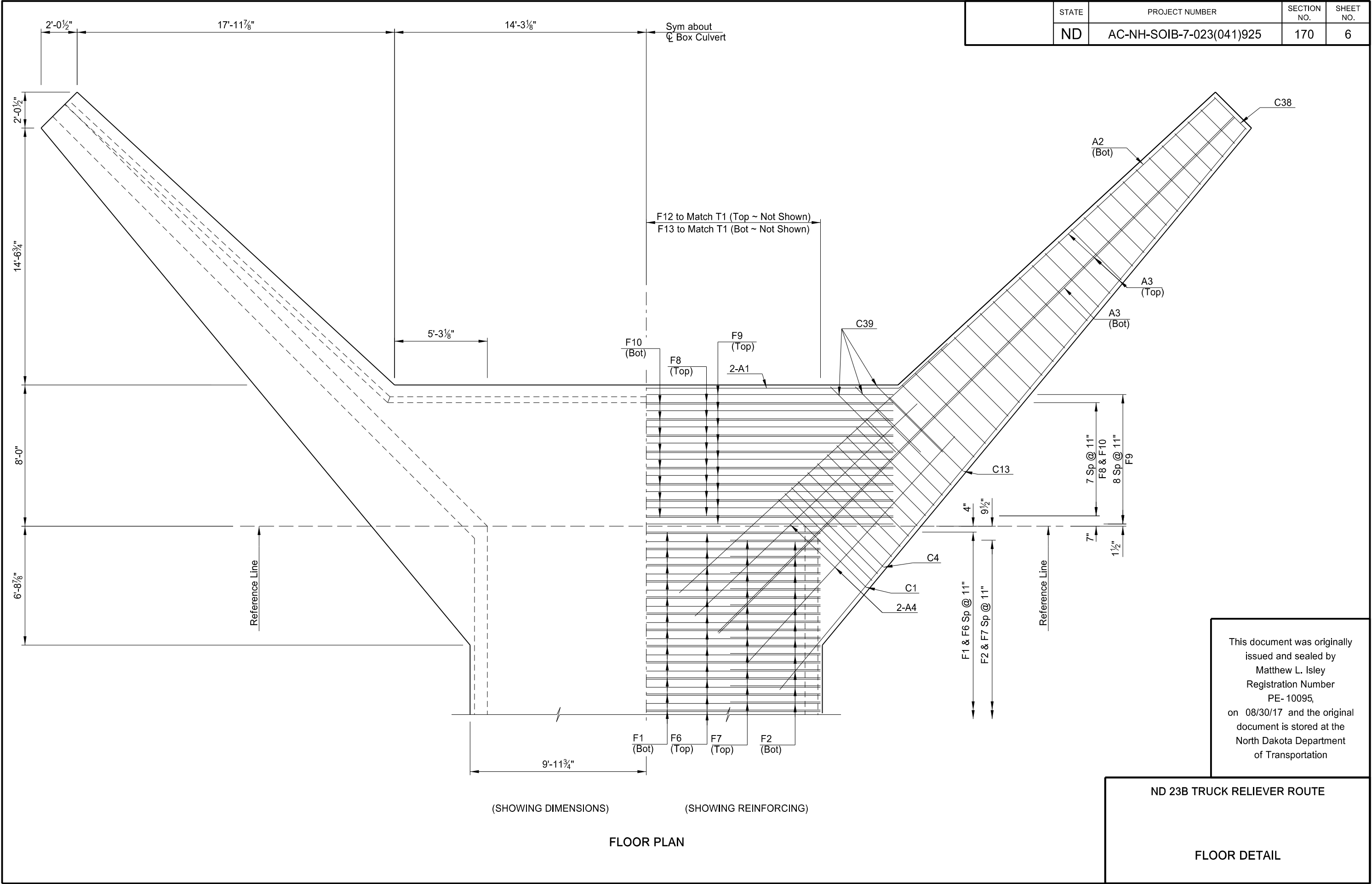
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	170	5



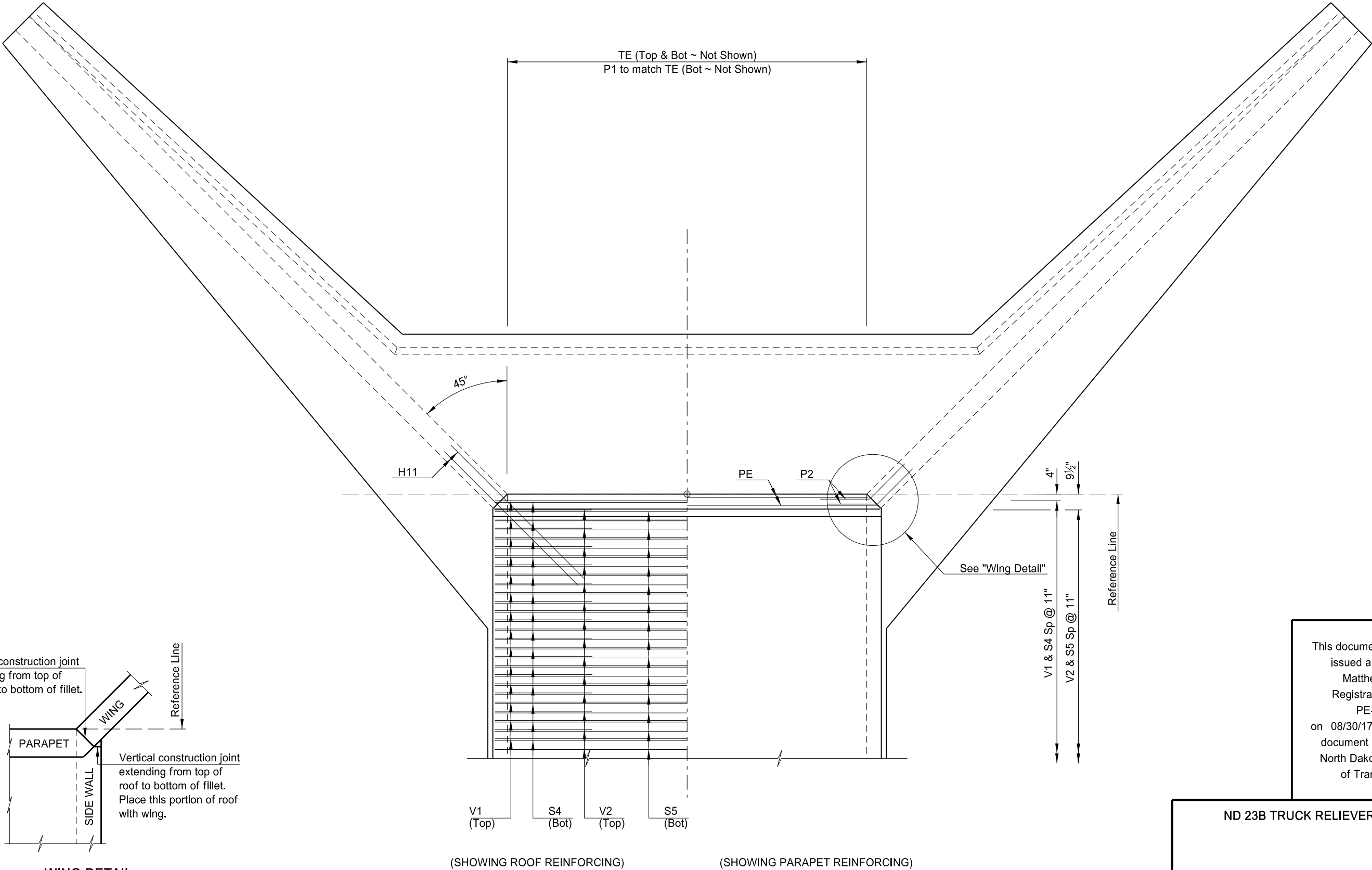
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ND 23B TRUCK RELIEVER ROUTE

WING DETAILS



STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	AC-NH-SOIB-7-023(041)925	170	7



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ND 23B TRUCK RELIEVER ROUTE

ROOF DETAILS

															STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
BAR LIST (CONSTANT)															ND	AC-NH-SOIB-7-023(041)925	170	8
MARK	SIZE	NO.	LENGTH	SHAPE	MARK	SIZE	NO.	LENGTH	SHAPE	BAR LIST (VARIABLE)								
										MARK	SIZE	NO.	LENGTH	SHAPE				
W1	7	12	6'-3"	BENT	C35	4	4	9'-1"	BENT	V1	7	224	20'-0"	BENT				
W2	6	12	11'-9"	STR.	C36	4	4	8'-9"	BENT	V2	7	220	8'-3"	BENT				
W3	7	32	5'-1"	BENT	C37	4	4	8'-7"	BENT	V3	4	224	12'-4"	STR.				
W4	6	32	11'-9"	STR.	C38	4	4	8'-3"	BENT									
W5	7	4	12'-4"	BENT	C39	4	12	7'-1"	BENT	F1	5	224	13'-4"	BENT				
W6	7	4	12'-0"	BENT						F2	7	220	8'-3"	BENT				
W7	7	4	11'-7"	BENT	D1	6	100	0'-8"	STR.	F6	8	112	19'-6"	STR.				
W8	7	4	11'-1"	BENT	D2	4	69	5'-6"	STR.	F7	7	110	19'-6"	STR.				
W9	7	4	10'-11"	BENT	D3	4	5	102'-9"	STR.									
W10	7	4	10'-7"	BENT						S4	8	112	18'-8"	STR.				
W11	6	4	10'-0"	BENT	H1	7	16	35'-4"	STR.	S5	8	110	18'-8"	STR.				
W12	6	4	9'-7"	BENT	H2	4	8	33'-5"	STR.									
W13	6	4	9'-3"	BENT	H3	4	8	33'-1"	STR.	T1	4	62	102'-9"	STR.				
W14	5	4	8'-11"	BENT	H4	4	8	28'-11"	STR.	TE	4	34	103'-2"	BENT				
W15	5	4	8'-6"	BENT	H5	4	8	24'-8"	STR.									
W16	4	4	8'-1"	BENT	H6	4	8	20'-5"	STR.	P1	4	38	4'-7"	BENT				
W17	4	4	7'-9"	BENT	H7	4	8	16'-2"	STR.	P2	6	8	5'-0"	BENT				
W18	4	4	7'-5"	BENT	H8	4	8	11'-11"	STR.	PE	6	4	18'-0"	STR.				
W19	4	4	7'-0"	BENT	H9	4	8	7'-9"	STR.									
W20	4	4	6'-8"	BENT	H10	4	180	6'-0"	BENT									
W21	4	4	6'-4"	BENT	H11	6	8	9'-6"	STR.									
W22	4	4	6'-0"	BENT														
W23	4	4	5'-7"	BENT	O1-O23	4	4 SET	178'-3"	STR.									
W24	4	4	5'-3"	BENT														
W25	4	4	4'-11"	BENT	A1	6	8	17'-9"	BENT									
W26	4	4	4'-7"	BENT	A2	6	4	24'-5"	STR.									
W27	4	4	4'-2"	BENT	A3	6	16	41'-4"	STR.									
W28	4	4	3'-10"	BENT	A4	6	16	17'-5"	STR.									
W29	4	4	3'-5"	BENT														
W30	4	4	3'-1"	BENT	F8	8	16	28'-0"	STR.									
					F9	7	18	28'-0"	STR.									
C1	6	4	15'-8"	BENT	F10	5	16	28'-0"	STR.									
C2	6	4	15'-8"	BENT	F12	4	26	11'-0"	BENT									
C3	6	4	15'-6"	BENT	F13	4	26	9'-3"	STR.									
C4	6	4	15'-4"	BENT														
C5	6	4	15'-2"	BENT														
C6	6	4	15'-0"	BENT														
C7	6	4	14'-10"	BENT														
C8	6	4	14'-6"	BENT														
C9	6	4	14'-4"	BENT														
C10	6	4	14'-2"	BENT														
C11	6	4	14'-0"	BENT														
C12	6	4	13'-10"	BENT														
C13	5	4	13'-6"	BENT														
C14	5	4	14'-8"	BENT														
C15	5	4	14'-4"	BENT														
C16	5	4	14'-2"	BENT														
C17	5	4	13'-10"	BENT														
C18	5	4	13'-8"	BENT														
C19	5	4	13'-4"	BENT														
C20	5	4	13'-2"	BENT														
C21	5	4	12'-10"	BENT														
C22	4	4	12'-7"	BENT														
C23	4	4	12'-3"	BENT														
C24	4	4	11'-11"	BENT														
C25	4	4	11'-9"	BENT														
C26	4	4	11'-5"	BENT														
C27	4	4	11'-3"	BENT														
C28	4	4	10'-11"	BENT														
C29	4	4	10'-7"	BENT														
C30	4	4	10'-5"	BENT														
C31	4	4	10'-1"	BENT														
C32	4	4	9'-11"	BENT														
C33	4	4	9'-7"	BENT														
C34	4	4	9'-3"	BENT														

CONCRETE QUANTITY FORMULAS	
ENTIRE FLOOR	"L" X 0.69300 + 44.25610 = 114.9 CY
TWO OUTSIDE WALLS & FOUR WINGS	"L" X 0.60764 + 40.09880 = 102.1 CY
PEDESTRIAN PATH	"L" X 0.11111 + 0.0 = 11.3 CY
ENTIRE ROOF	"L" X 0.66191 + 0.825940 = 68.4 CY
TOTAL	"L" X 2.07366 + 85.18080 = 296.7 CY

NOTE:

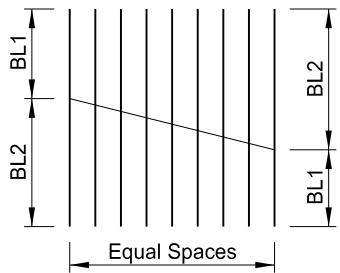
Unless construction requirements dictate otherwise, the Contractor has the option to construct the box culvert using construction joints or as one continuous unit. If construction joints are used, the longitudinal bar lengths may be adjusted, but a minimum lap length of 1'-3" must be maintained.

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ND 23B TRUCK RELIEVER ROUTE

REINFORCING BAR LIST

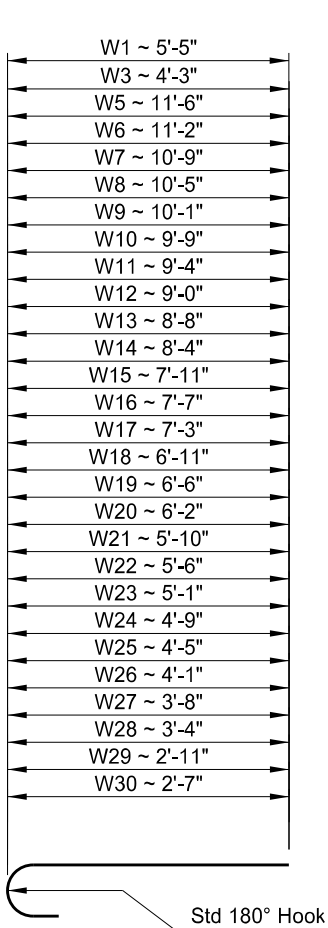
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	170	9



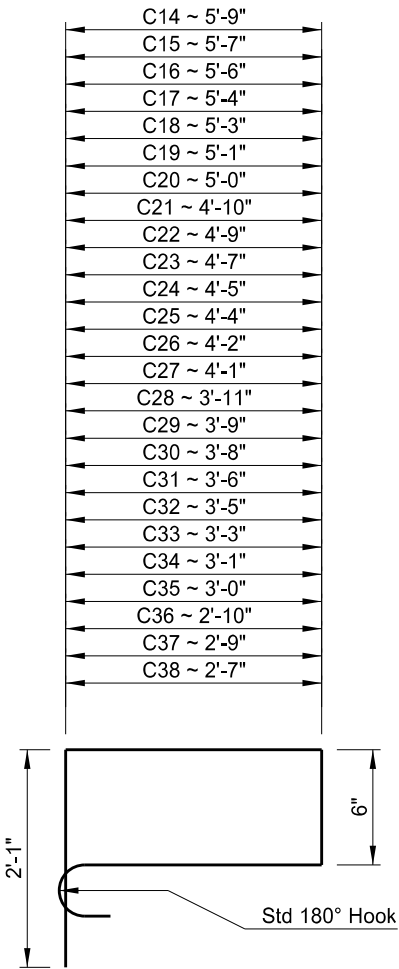
2 SETS SHOWN

MARK	LENGTH 1 SET	BL1	BL2	SPACES
O1-O23	178'-3"	1'-11"	13'-7"	22

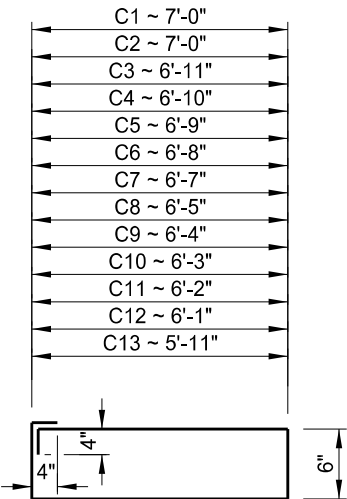
BAR CUTTING DETAILS



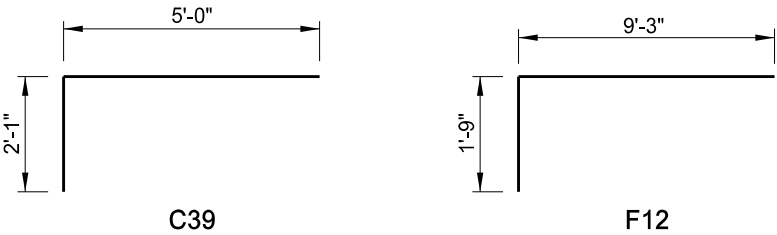
W1, W3, & W5-W30



C16-C38

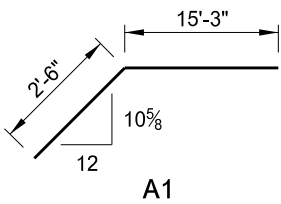


C1-C15

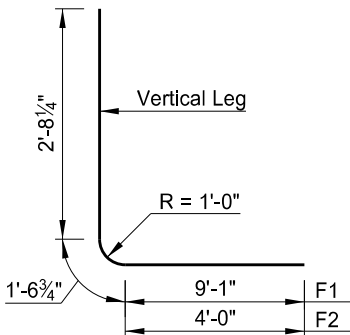


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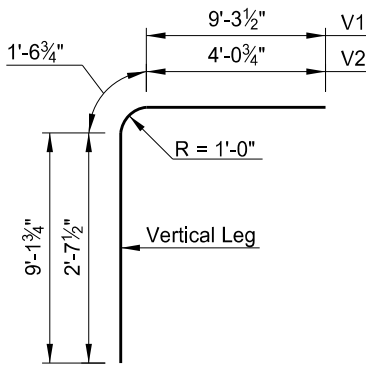
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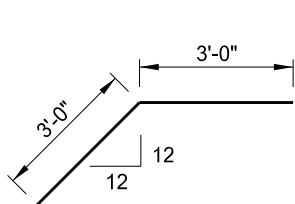
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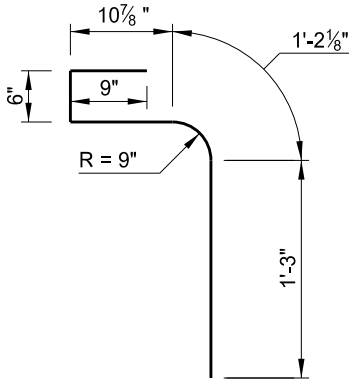
F1 & F2



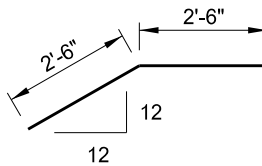
V1 & V2



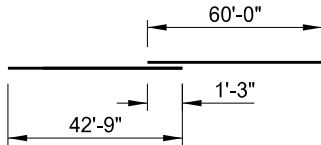
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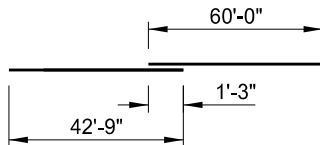
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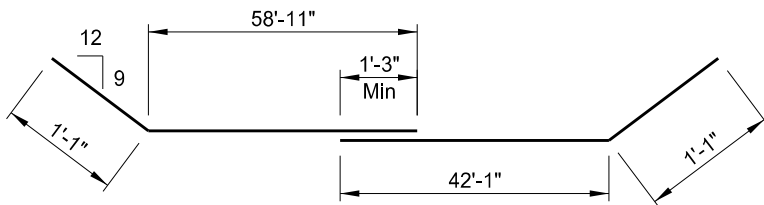
P2



D3



T1



TE

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ND 23B TRUCK RELIEVER ROUTE

BAR DETAILS

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	AC-NH-SOIB-7-023(041)925	195	1

The following sheets in Section 195:

Sheet Title	Page Number
Cover Sheet	G001
General Sheet	G002
Plan And Profile Layout	C201
Pipe Trench, Allowable Bend, & Thrust Restraint Details	C501
Pipeline Crossing Details	C502
Pipeline Connection Details	C503
Appurtancence Details	C504

ND 23B Truck Reliever Route

Waterline Table of Contents

FORT BERTHOLD RESERVATION

THREE AFFILIATED TRIBES



NEW TOWN BYPASS FBRW CONFLICT

**BID SET
AUGUST 2017**

Bartlett & West

Driving Community and Industry Forward, Together.

#	DATE	DESCRIPTION	BY

PROJECT:
NEW TOWN BYPASS
FBRW CONFLICT

CLIENT:
FT. BERTHOLD RESERVATION

PROJECT MANAGER:
ZACH GLUEKERT
PE# 7872

PROJECT ENGINEER:
CHRIS MAUS
PE# ----

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DRAWING NO: G001

SHEET NUMBER 1 of 7

DESIGN NUMBER
12483.013

CONST. NUMBER
12483.013

Bartlett & West

3456 E CENTURY AVENUE — BISMARCK ND 58503
PHONE 701.258.1110 — FAX 701.258.1111
WWW.BARTWEST.COM

LOCATION MAP



PRIOR TO CONSTRUCTION, THE FOLLOWING AGENCIES AND UTILITIES SHALL BE NOTIFIED

MUNICIPALS, REGULATORY AND OTHER GOVERNMENTAL AGENCIES OR DEPARTMENTS

USDA
MR. MARK WAX
P.O. BOX 1737
BISMARCK, ND 58502.1737
PHONE 701.250.4791

USBR
MR. DENISE FISCHER
P.O. BOX 1017 BISMARCK, ND 58501
PHONE 701.250.4242

NRCS
MS, MARY PODOLL
P.O. BOX 1458
BISMARCK ND 58502

FORT BERTHOLD RURAL WATER
MR. PEM HALL
FBRW DIRECTOR
308 4 BEARS COMPLEX
NEW TOWN, ND 58763.9102

NORTH DAKOTA DOT
WILLISTON DISTRICT OFFICE
605 DAKOTA PARKWAY WEST
WILLISTON, ND 58802-0698
PHONE 701-774-2700

BUREAU OF INDIAN AFFAIRS
MRS. KAYLA DANKS
P.O. BOX 370
NEW TOWN, ND 58763
PHONE 701.627.4707

FORT BERTHOLD TERO
MR. DEWEY HOSIE
P.O. BOX 488
NEW TOWN, ND 58763
PHONE 701.627.3634

MOUNTRAIL COUNTY HIGHWAY DEPARTMENT
MR. JOHN SAUBER OR MR. SCOTT STAMMEN
P.O. BOX 275
STANLEY ND 58784.0275
PHONE 701.628.2390

UTILITIES

NORTH DAKOTA ONE CALL
PHONE 1.800.795.0555

MOUNTRAIL-WILLIAMS ELECTRIC COOP, INC.
MR. DALE HAUGEN
MANAGER
218 58th STREET WEST
WILLISTON, ND 58802
PHONE 701.577.3765

RESERVATION TELEPHONE COOPERATIVE
MR. KEN LITTLEFIELD - NEW TOWN 701.627.4958
MR. TERRY WILBER - NEW TOWN 701.627.3508
P.O. BOX 68 PARSHALL, ND 58770

UTILITY NOTES

- BEFORE MAKING ANY OF THE SPECIFIED UTILITY CROSSINGS, THE CONTRACTOR SHALL NOTIFY THE PROPER AGENT FOR THE UTILITY SO THAT HE MAY BE PRESENT TO MARK THE LOCATION OF THE UTILITY TO BE CROSSED. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE TO ANY UTILITY IN THE AREA THAT IS CAUSED BY HIS CONSTRUCTION PROCEDURE. THE EXACT LOCATIONS OF THE UTILITIES ARE UNKNOWN. ONLY APPROXIMATE LOCATIONS ARE SHOWN ON THE DETAILED PLAN SHEETS. FOR FIELD LOCATION AND STAKING, THE CONTRACTOR SHALL CONTACT THE RESPECTIVE UTILITIES.
- UTILITY DISTURBANCE:
ALL MATERIALS, LABOR, TOOLS AND EQUIPMENT REQUIRED FOR THE REPAIR OF BURIED UTILITY FACILITIES AND SERVICE LINES DISTURBED DURING CONSTRUCTION SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT. COSTS ASSOCIATED WITH SUCH CROSSINGS SHALL BE INCLUDED AS PART OF THE BID AMOUNTS FOR OTHER ITEMS STATED IN THE BID FORM AND NO ADDITIONAL PAYMENT WILL BE MADE THEREFORE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TIMELY REMOVAL, RELOCATION, PROTECTION AND TEMPORARY MAINTENANCE OF EXISTING SERVICE AND UTILITY LINES ENCOUNTERED DURING CONSTRUCTION.

GENERAL NOTES

- PIPELINE ROUTE AND APPURTENANCES:** THE PIPELINE ROUTE AND APPURTENANCE LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE PIPELINE ROUTE AND APPURTENANCE LOCATIONS WILL BE STAKED IN THE FIELD BY THE OWNER'S REPRESENTATIVE AT THE TIME OF CONSTRUCTION. THE PIPELINE SHALL HAVE A MINIMUM DEPTH OF COVER OF 7½ FEET AND A MAXIMUM DEPTH OF COVER OF 9 FEET, EXCEPT AS OTHERWISE NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS. SERVICE LINES SHALL HAVE A MINIMUM DEPTH OF COVER OF 8 FEET. SERVICE LINES ARE DEFINED AS 1" OR LARGER PIPE WHICH SERVE ONE USER. HOWEVER, ONE SERVICE LINE MAY SERVE 2 USERS.
- PIPELINE EASEMENTS:** PIPELINE EASEMENTS ARE GENERALLY 50 FEET IN WIDTH ON PRIVATE LAND, THE CENTERLINE OF WHICH IS THE PIPELINE AS CONSTRUCTED AND ARE AS SHOWN ON THE DRAWINGS. THE EASEMENT WIDTH MAY BE LESS IN PUBLIC R.O.W. OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
- PIPE CLASS:** ALL 2" AND LARGER PIPE SHOWN ON THE DETAILED LAYOUT SHEETS SHALL BE CLASS 160 PVC UNLESS OTHERWISE NOTED. ALL SERVICE LINES SHALL BE 1½" CLASS 200 UNLESS SHOWN OTHERWISE ON DRAWINGS. ALL 1" SERVICE LINES SHALL BE HDPE 4710 SDR 7. SERVICE LINES MAY BE LARGER FOR SPECIAL USERS AND ARE SHOWN ON THE DRAWINGS.
- VALVES:** VALVES SHOWN ON THE DRAWINGS SHALL BE THE SAME SIZE AS THE LINE SIZE. IN THE EVENT PIPE SIZE CHANGE OCCURS AT A VALVE, THE VALVE SHALL BE THE SAME SIZE AS THE SMALLER LINE SIZE. LOCATIONS WILL BE FLAGGED IN THE FIELD BY THE OWNER'S REPRESENTATIVE.
- TREES IN RIGHT OF WAY:** CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING TREES TEN (10) FEET EACH SIDE OF PIPELINE CENTERLINE. REMAINING TREES IN THE PIPELINE RIGHT-OF-WAY SHALL BE PRESERVED BY THE CONTRACTOR. SHEETING OR SHORING AS NECESSARY SHALL BE PROVIDED BY THE CONTRACTOR. THIS NOTE IS APPLICABLE ONLY WHEN SHELTER BELTS ARE ENCOUNTERED OR AS DETERMINED BY THE OWNER'S REPRESENTATIVE.
- UTILITY DISTURBANCE:** ALL MATERIALS, LABOR, TOOLS AND EQUIPMENT REQUIRED FOR THE REPAIR OF BURIED UTILITY FACILITIES AND SERVICE LINES DISTURBED DURING CONSTRUCTION SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT. COSTS ASSOCIATED WITH UTILITY CROSSINGS SHALL BE INCLUDED AS PART OF THE BID AMOUNTS FOR OTHER ITEMS STATED IN THE BID FORM AND NO ADDITIONAL PAYMENT WILL BE MADE THEREFORE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TIMELY REMOVAL, RELOCATION, PROTECTION AND TEMPORARY MAINTENANCE OF EXISTING SERVICE AND UTILITY LINES ENCOUNTERED DURING CONSTRUCTION. ALL FIBER OPTIC CABLES SHALL BE HAND EXPOSED BEFORE EXCAVATING EQUIPMENT IS USED IN THEIR VICINITY. CALL THE LOCATOR AT LEAST TWO (2) DAYS PRIOR TO REQUIRING THE LOCATE.
- EXISTING PIPELINE CROSSINGS:** EXISTING NATURAL GAS, OIL AND WATER MAIN TRANSMISSION PIPELINES MAY BE ENCOUNTERED. THE CONTRACTOR SHALL EXPOSE THE EXISTING PIPELINES 200 FEET (MINIMUM) IN ADVANCE OF THE CROSSING TO VERIFY THE HORIZONTAL AND VERTICAL ALIGNMENT. MAINTAIN A MINIMUM COVER DEPTH OF 7 FEET AND A 12 INCH VERTICAL SEPARATION BETWEEN THE CONTRACT PIPELINE AND THE EXISTING PIPELINES. COMPACT TRENCH MATERIAL WITHIN 5 FEET EACH SIDE OF THE EXISTING MAIN TRANSMISSION PIPELINES TO 90% RELATIVE COMPACTION OR IN ACCORDANCE WITH THE PERMIT REQUIREMENTS, WHICHEVER IS GREATER. ANY ADDITIONAL CONSTRUCTION REQUIREMENTS MAY BE STIPULATED IN THE PERMIT REQUIREMENTS PROVIDED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR MAY HAVE THE OPTION TO BORE UNDERNEATH THE EXISTING MAIN TRANSMISSION PIPELINES. CROSSING THESE PIPELINES SHALL BE CONSIDERED INCIDENTAL TO THE PIPELINE.
- OVERHEAD ELECTRIC MAIN TRANSMISSION LINE:** IF OPERATING CONSTRUCTION EQUIPMENT UNDER EXISTING ELECTRIC TRANSMISSION LINES AND THE EQUIPMENT IS CAPABLE OF CONTACTING OR APPROACHING TRANSMISSION LINE CONDUCTORS WITHIN 12 FEET, THE CONTRACTOR SHALL OBTAIN A "SPECIAL WORK PERMIT" AS REQUIRED FROM THE APPROPRIATE ENTITY.
- TRENCH COMPACTION:** COMPACTION OF THE TRENCH BACKFILL PER SPECIFICATION SECTION 02223 IS REQUIRED AND SHALL BE ACCOMPLISHED USING A PACKER-WHEEL ATTACHMENT (OR OTHER SUITABLE METHODS). THE PACKER WHEEL SHALL BE OF SUFFICIENT WIDTH AND SIZE TO ADEQUATELY COMPACT THE BACKFILL. SMALL, NARROW, PACKER WHEELS WILL NOT BE ACCEPTABLE. COMPACTION OF THE TRENCH BACKFILL BY RUNNING EQUIPMENT TIRES OVER THE BACKFILL MATERIAL IS NOT ACCEPTABLE. THE TRENCH BACKFILL SHALL BE COMPACTED UPON BACKFILLING TO A LEVEL OF APPROXIMATELY HALF WAY DOWN FROM THE ORIGINAL GROUND LINE. COMPACT THE TRENCH MATERIAL AGAIN IN TWO ADDITIONAL AND EQUAL LIFTS UPON BACKFILLING TO THE ORIGINAL GROUND LINE. FOR THOSE AREAS WHERE THE PIPELINE CENTERLINE IS WITHIN THE INSLOPE OF A TOWNSHIP OR COUNTY ROAD OR WITHIN THE "CLEAR ZONE" OF A STATE HIGHWAY, THE FOLLOWING REQUIREMENTS SHALL BE MET:
 - IF CONSTRUCTION EXCAVATION IS WITHIN THE INSLOPE OF THE STRUCTURAL ROAD BED CONTRACTOR SHALL COMPACT TO 95% RELATIVE COMPACTION. OTHERWISE, COMPACT BACKFILL AS NOTED ABOVE.
 - THE CONTRACTOR SHALL MEET ALL TRAFFIC CONTROL SIGNING AND SAFETY REQUIREMENTS IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
 - MAXIMUM LENGTH OF OPEN TRENCH SHALL BE 300 FEET.TRENCH BACKFILL COMPACTION IN CITY LIMITS, SUBDIVISIONS, RECREATIONAL AREAS, AND YARD AREAS SHALL BE IN THE SAME FASHION AS THAT REQUIRED FOR COMPACTION OF BACKFILL IN COUNTY AND STATE RIGHT-OF-WAY ENCROACHMENTS. PIPELINE MARKER TAPE SHALL BE INSTALLED ABOVE ALL PIPING IN CITY LIMITS, SUBDIVISIONS AND AT UTILITY CROSSINGS IF REQUIRED BY THE UTILITY AGENCY.
- AIR VALVES:** PRIOR TO AND DURING FILLING OF THE PIPELINE, ALL AIR VALVE OUTLETS SHALL BE IN AN OPEN POSITION.
- METER PITS:** EACH USER (STANDARD, HIGH CONSUMPTION OR LIVESTOCK) WILL RECEIVE AN EXTERIOR METER PIT. THE TYPES OF METER PITS THAT SHALL BE PROVIDED BY THE CONTRACTOR ARE DETAILED ON THE DRAWINGS AND IN THE SPECIFICATIONS. THOSE USERS WHICH RECEIVE AN 18" DIAMETER MODIFIED MUELLER/MCULLOUGH BOX (DUE TO PRESSURES IN EXCESS OF 140 PSI) ARE DESIGNATED BY THE SYMBOL .
- 1½" SERVICE LINE VALVES:** 1½" SERVICE LINE VALVES SHALL BE PROVIDED IN ADDITION TO CURB STOPS OR METER BOXES FOR ALL USERS LOCATED 500 FEET OR GREATER FROM THE MAINLINES, AND USERS CONNECTING TO MAINLINES GREATER THAN OR EQUAL TO 3". THE LOCATIONS OF THE 1½" SERVICE LINE VALVES ARE DEPICTED ON THE DRAWINGS. SERVICE LINE VALVES MAY BE ADDED OR DELETED FROM THE CONTRACT AT THE UNIT PRICE 1½" VALVES STATED ON THE BID SCHEDULE.
- EXPOSED TRENCH:** MAXIMUM LENGTH OF OPEN TRENCH IMMEDIATELY BEHIND PIPE LAYING OPERATIONS SHALL BE 1,000 FEET, EXCEPT AS OTHERWISE NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS. NO OTHER TRENCH AREAS OR PIPELINE SEGMENTS SHALL BE LEFT OPEN AFTER PIPE LAYING OPERATIONS HAVE CEASED ON A GIVEN PIPELINE SEGMENT.

PLAN SHEET INDEX

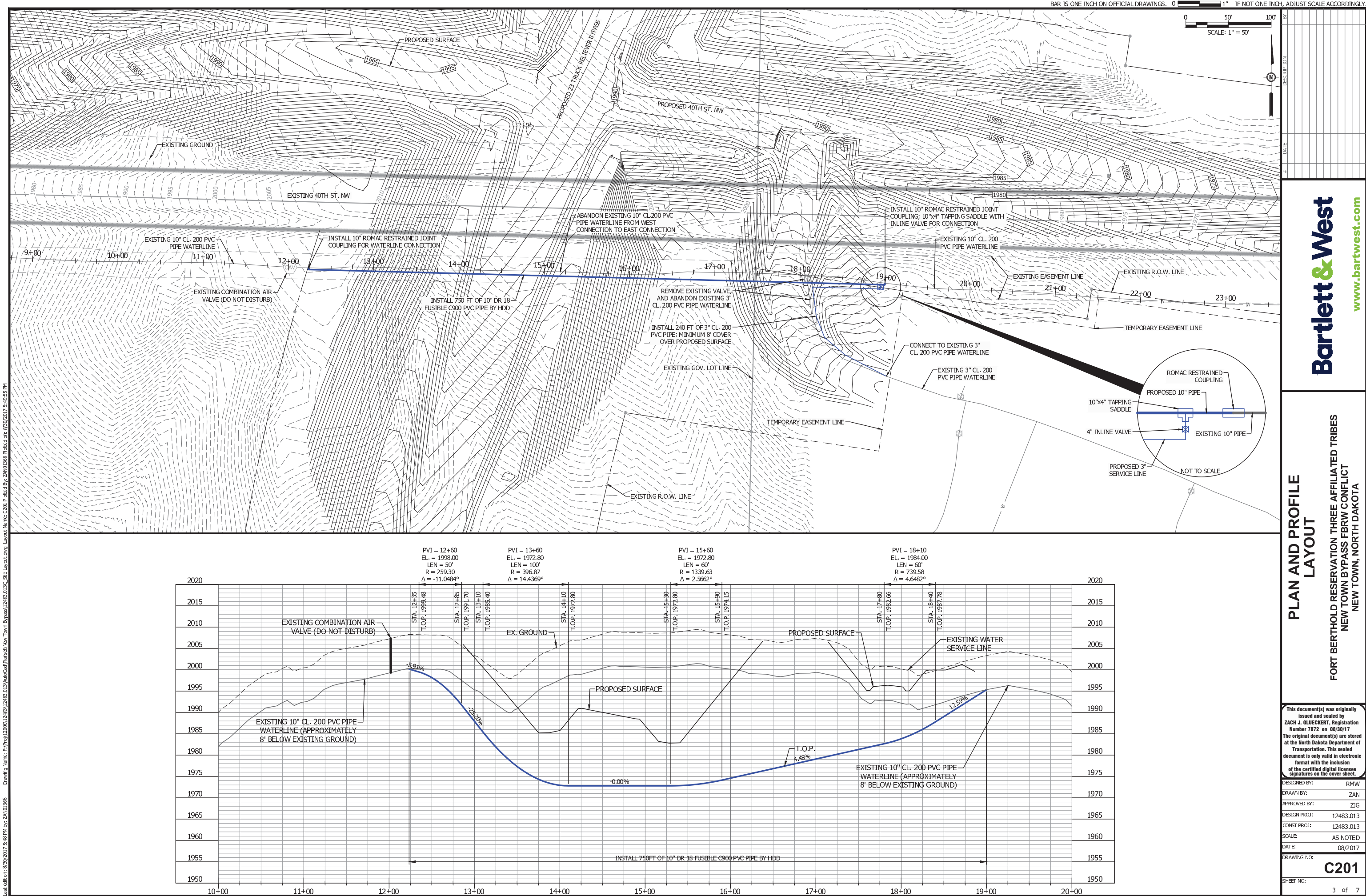
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GENERAL		
1	G001	COVER
2	G002	GENERAL SHEET
CIVIL		
3	C201	PLAN AND PROFILE LAYOUT
4	C501	PIPE TRENCH, ALLOWABLE BEND, & THRUST RESTRAINT DETAILS
5	C502	PIPELINE CROSSING DETAILS
6	C503	PIPELINE CONNECTION DETAILS
7	C504	APPURTENANCE DETAILS

GENERAL SHEET

FORT BERTHOLD RESERVATION THREE AFFILIATED TRIBES
NEW TOWN BYPASS FBRW CONFLICT
NEW TOWN, NORTH DAKOTA

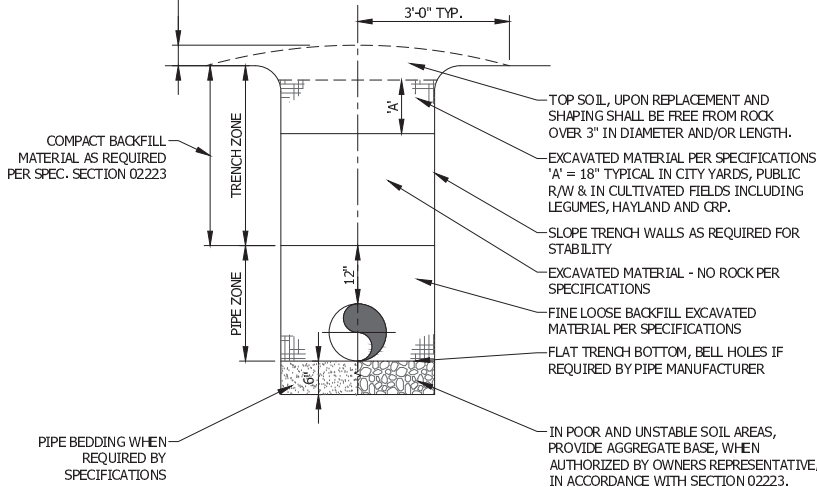
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DRAWN BY:	ZAN
APPROVED BY:	ZIG
DESIGN PROJ:	12483.013
CONST PROJ:	12483.013
SCALE:	AS NOTED
DATE:	08/2017
DRAWING NO:	G002
SHEET NO:	2 of 7



Drawing Name: F:\proj\12000\12483\12483.013\AutoCad\PlanSet\New Town Bypass\12483.013_C_Site Layout.dwg Layout Name: C201 Plotted By: ZAN\1368 Plotted on: 8/30/2017 5:49:55 PM
Last edit on: 8/30/2017 5:48 PM by: ZAN\1368

- UNIFORMLY MOUND EXCESS MATERIAL - NOT TO EXCEED 3' EACH SIDE FROM CENTER OF TRENCH. PERMISSIBLE MOUND IN SPECIFIC AREAS AS FOLLOWS:
- 18" IN CULTIVATED FIELDS, PASTURES, HAYLANDS, AND LEGUMES.
 - 6" MAXIMUM MOUND IN CITY LIMITS, SUBDIVISIONS, YARDS, AND PUBLIC RIGHT-OF-WAY. COMPACTION IS REQUIRED. SEE GENERAL NOTES.
 - NO MOUNDING IN STREETS, ROADS, DRAINAGE WAYS, FLOOD IRRIGATION AREAS, DRIVEWAYS, GRASS AND DIRT TRAILS AND AS REQUIRED BY PERMITS.



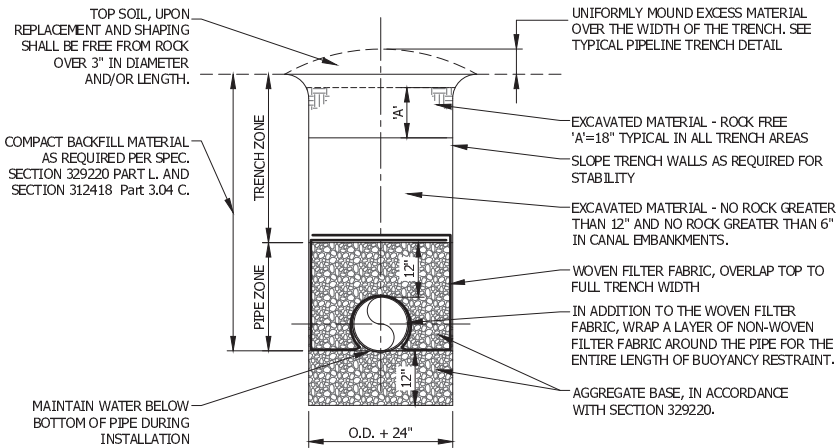
TYPICAL PIPELINE TRENCH DETAIL PVC OR DUCTILE IRON PIPE

NOT TO SCALE

1
C501

TRENCH NOTES:

- 90" MINIMUM COVER OVER MAINLINE PIPE. 96" MINIMUM COVER OVER SERVICE LINE PIPE. 108" MAXIMUM COVER OVER PIPE, ALL LINES EXCEPT AS NOTED IN THE SPECIFICATIONS AND ON THE PLANS.
- PAYMENT FOR CLASS A MATERIAL EXCAVATION WHEN AUTHORIZED BY THE OWNER'S REPRESENTATIVE SHALL BE BASED ON A UNIFORM TRENCH WIDTH OF 36" FOR PIPE SIZES 1" THROUGH 12". RATES OF PAYMENT SHALL BE PER SPECIAL CONDITION SECTION 01150.
- REFER TO SPECIFICATION SECTION 02223 FOR ADDITIONAL REQUIREMENTS.
- TOPSOIL SHALL BE REMOVED AND REPLACED FOR ALL EXCAVATIONS COMPLETED BY BACKHOES AND FOR ALL EXCAVATIONS WHICH ARE 18" OR MORE IN WIDTH WHEN A TRENCHING MACHINE IS USED.
- PAYMENT FOR AGGREGATE BASE, WHEN AUTHORIZED BY THE OWNER'S REPRESENTATIVE, SHALL BE BASED ON A UNIFORM TRENCH WIDTH OF 36" AND BASE THICKNESS OF 6". RATES OF PAYMENT SHALL BE PER SPECIAL CONDITION SECTION 01150.
- EXCAVATION OF THE TRENCH BOTTOM FOR BELLS (BELL HOLES) SHALL BE REQUIRED ON LARGER DIAMETER PVC PIPE (ESPECIALLY 14" AND LARGER) SO THAT THE PIPE IS UNIFORMLY SUPPORTED ALONG THE ENTIRE PIPE LENGTH. THE CONTRACTOR SHALL REFER TO THE PIPE MANUFACTURERS INSTALLATION REQUIREMENTS.
- TRENCH BACKFILL SHALL BE COMPACTED TO 85% MINIMUM RELATIVE COMPACTION OR AS REQUIRED BY THE SPECIFICATIONS. TRENCH BACKFILL SHALL BE 95% MINIMUM RELATIVE COMPACTION FOR CANAL EMBANKMENTS AND FOR THE PIPELINE TRENCH 25 FEET IN EACH DIRECTION OF AN OPEN CUT CANAL.



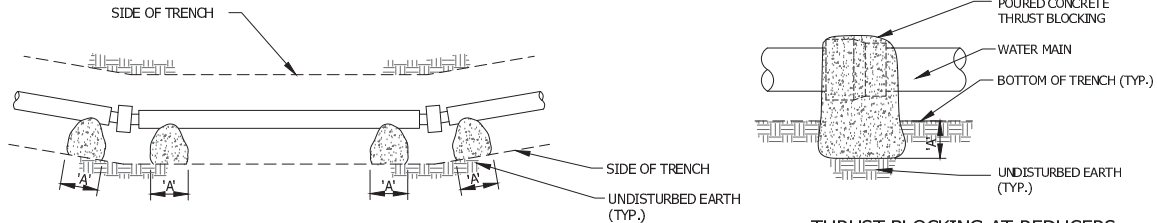
NOTE:

- SEE TYPICAL PIPELINE TRENCH DETAIL FOR ADDITIONAL TRENCH NOTES AND INSTALLATION REQUIREMENTS.

TYPICAL BUOYANCY RESTRAINT TRENCH DETAIL

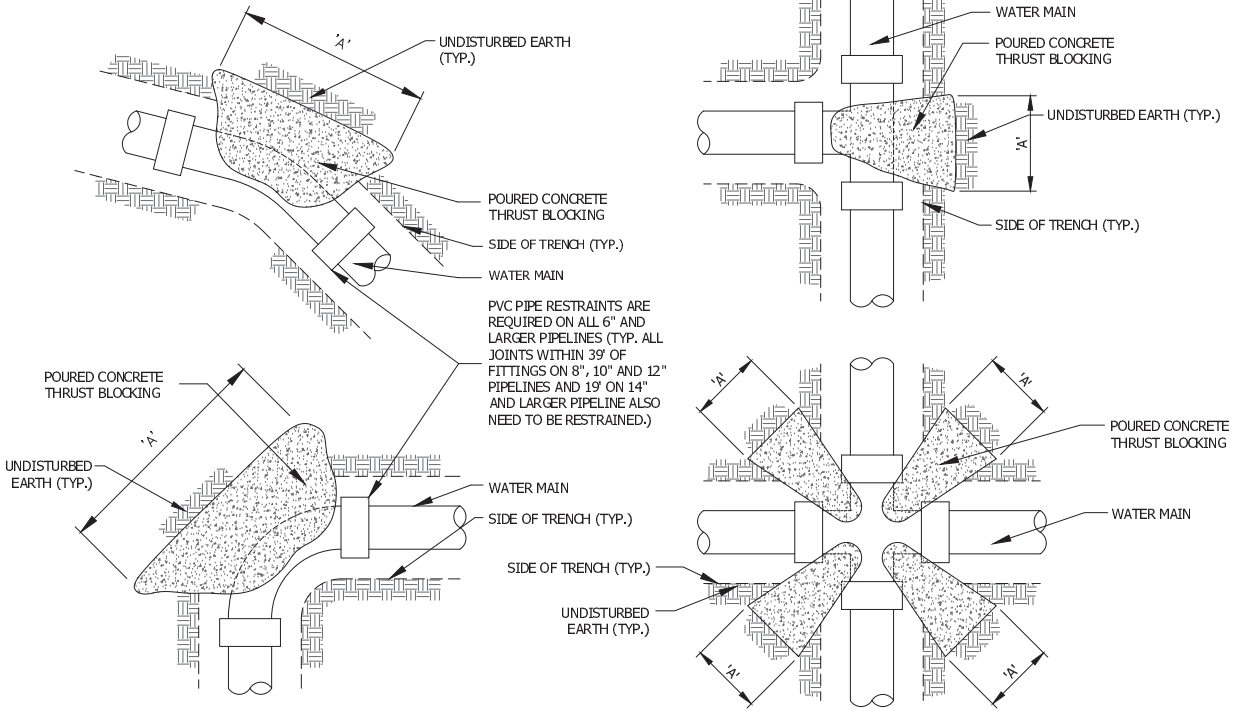
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C501



THRUST BLOCKING AT DEFLECTED COUPLINGS

THRUST BLOCKING AT REDUCERS



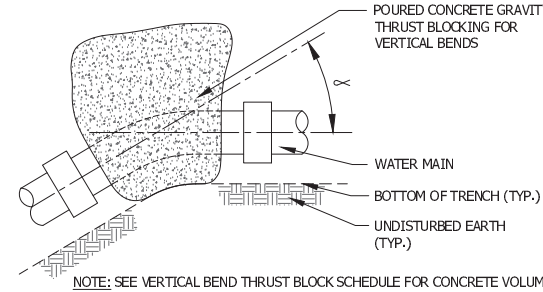
THRUST BLOCK DETAILS

NOT TO SCALE

2
C501

VERTICAL THRUST BLOCKING AT BENDS & COUPLINGS

PIPE SIZE	CU. FT. OF CONCRETE REQUIRED					
	< 3°	< 4°	< 5°	< 11 1/4°	< 22 1/2°	< 45°
1 1/2"	----	----	----	1/2	1	2
2"	----	----	----	1	1 1/2	3
2 1/2"	----	----	1/2	1	1 1/2	4 1/2
3"	----	1/2	1	1 1/2	3 1/2	6 1/2
4"	1	1	1	3	5 1/2	11
6"	1 1/2	2	3	6	12	24
8"	3	4	4	10	19	38
10"	4	6	7	16	32	62
12"	6	8	10	23	46	90
14"	8	11	13	31	62	122
16"	11	14	18	41	81	159
18"	13	18	22	52	103	201
20"	16	22	28	64	127	249
24"	24	32	40	92	183	358



NOTES:

- BEARING SURFACE SHALL BE AGAINST UNDISTURBED SOIL.
- THE MINIMUM TOTAL DISTANCE FROM THE FITTING TO THE BEARING SURFACE (DEPTH OF BLOCK) SHALL BE TWICE THE PIPE DIAMETER BUT NOT LESS THAN 12".
- BLOCK HEIGHT SHALL BE EQUAL TO OR LESS THAN THE TOTAL DISTANCE FROM THE FITTING TO THE BEARING SURFACE (DEPTH OF BLOCK). THE MINIMUM HEIGHT SHALL NOT BE LESS THAN THE PIPE OUTSIDE DIAMETER.
- BLOCK MINIMUM WIDTH SHALL BE ONE TO TWO TIMES THE HEIGHT.
- CONCRETE SHALL NOT BE PLACED ON OR AROUND JOINTS, EXCEPT IN THE CASE OF REDUCING FITTINGS.
- FOR ANGLES REQUIRING MORE THAN ONE FITTING, EACH FITTING SHALL HAVE A THRUST BLOCK AS SPECIFIED ABOVE.
- PVC PIPE RESTRAINTS ARE REQUIRED ON ALL 8" AND LARGER PIPELINES (TYPICAL: ALL JOINTS WITHIN 39 FEET OF FITTINGS ON 8", 10" AND 12" PIPELINES AND 19 FEET ON 14" AND LARGER PIPELINE ALSO NEED TO BE RESTRAINED.)
- WRAP ALL METAL FITTINGS WITH (2) TWO WRAPS OF 8 MIL. POLYETHYLENE ENCASEMENT AND INSTALL SACRIFICIAL ANODES PER SPECIFICATION SECTION 16640 FOR ALL 8" AND LARGER FITTINGS.

HORIZONTAL THRUST BLOCKING AT BENDS & COUPLINGS

PIPE SIZE	MINIMUM SQUARE FEET REQUIRED 'A'											
	TEE, CROSS, REDUCER OR DEAD END				90°				45°			
	CL. 160 PVC	CL. 200 PVC NOTE NO. 1	CL. 250 PVC NOTE NO. 1	CL. 200 DUCTILE IRON	CL. 160 PVC	CL. 200 PVC NOTE NO. 1	CL. 250 PVC NOTE NO. 1	CL. 200 DUCTILE IRON	CL. 160 PVC	CL. 200 PVC NOTE NO. 1	CL. 250 PVC NOTE NO. 1	CL. 200 DUCTILE IRON
2", 2 1/2" & 3"	C.B.	C.B.	C.B.	---	C.B.	1 1/4	1 1/2	---	C.B.	C.B.	C.B.	---
4"	C.B.	1 1/2	2	2 1/2	1 1/2	2	2 1/2	4	C.B.	C.B.	1 1/2	2
6"	2 1/2	3	4	6	3 1/2	4 1/2	5	8	2	2 1/2	3	5
8"	4	5	6	10	5 1/2	7	9	14	3	4	5	8
10"	6	8	10	16	9	11	13	22	5	6	7	12
12"	9	11	14	23	12	15	19	32	7	8	10	17
14"	---	15	18	32	---	22	27	43	---	12	15	24
16"	---	19	24	41	---	28	36	56	---	16	20	31
18"	---	26	32	51	---	36	45	71	---	20	25	40
20"	---	31	39	63	---	45	56	88	---	24	30	48
24"	---	45	57	90	---	64	80	127	---	35	44	69

NOTE NO. 1 - CL. 200 PVC, CL. 150 C-900 OR CL. 165 C-905
NOTE NO. 2 - CL. 250 PVC, CL. 200 C-900, CL. 235 C-905 OR DUCTILE IRON PIPE.

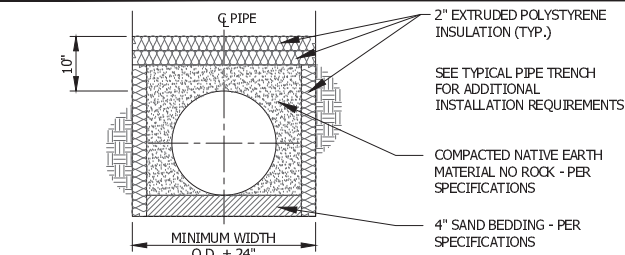
NOTES:

- REQUIRED THRUST BLOCK AREAS ARE BASED ON A SOIL BEARING PRESSURE OF 1500 LBS./SQ. FT. AND DESIGN PRESSURES OF 120 PSI FOR CL. 160 PVC PIPE, 150 PSI FOR CL. 200 PVC PIPE AND CL. 150 C-900 PVC PIPE, 200 PSI FOR CL. 250 PVC PIPE AND CL. 200 C-900 PVC PIPE, AND 300 PSI FOR CL. 200 DUCTILE IRON PIPE.
- C.B. = 8"x16" CONCRETE BLOCKS MAY BE USED AND WILL PROVIDE THE REQUIRED AREA WHEN WEDGED FIRMLY BETWEEN THE LINE AND THE UNDISTURBED SIDE OF THE TRENCH.

ALLOWABLE BEND FOR PVC PIPE

NOT TO SCALE

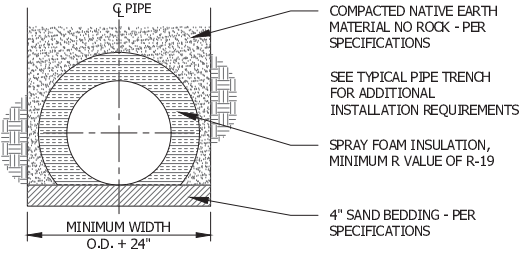
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NOTE:

- POLYSTYRENE SHEETS TO BE INSTALLED AS A SINGLE SHEET AS MUCH AS POSSIBLE, SHEET SEAMS SHALL BE OFFSET A MINIMUM OF 12".

POLYSTYRENE INSULATED



SPRAY FOAM INSULATED

TYPICAL INSULATED VERTICAL TRENCH

NOT TO SCALE

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C501

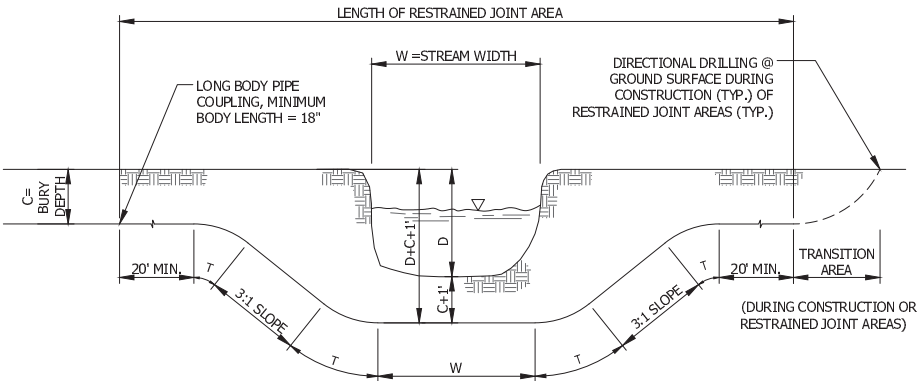
PIPE TRENCH, ALLOWABLE BEND, & THRUST RESTRAINT DETAILS

FORT BERTHOLD RESERVATION THREE AFFILIATED TRIBES
NEW TOWN BYPASS FBRW CONFLICT
NEW TOWN, NORTH DAKOTA

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APPROVED BY: ZIG
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CONST PROJ: 12483.013
SCALE: AS NOTED
DATE: 08/2017
DRAWING NO: C501
SHEET NO: 4 of 7

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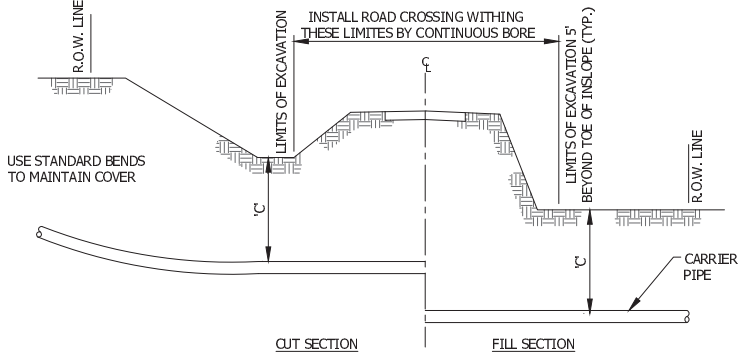


- NOTES:
- DIMENSION 'C' SHALL BE 90" MINIMUM TO 120" MAXIMUM.
 - T = TRANSITION FROM HORIZONTAL TO SLOPED PIPE. DO NOT EXCEED BENDING LIMITS OF PIPE MATERIAL BASED ON PIPE MANUFACRURER RECOMMENDATIONS.
- GENERAL NOTES FOR RESTRAINED JOINT CONSTRUCTION:
- CANALS, CREEK, RIVER, STREAM, WETLAND AND OTHER WATERWAY CROSSINGS MAY COINCIDE WITH PIPELINES DESIGNED AS "RESTRAINED JOINT AREAS". IN SUCH CASES, THE PROVISIONS STIPULATED FOR SUCH CROSSINGS SHALL ALSO APPLY TO THE RESTRAINED JOINT AREA.
 - FOR CREEK, RIVER, STREAM, WETLAND AND OTHER WATER CROSSINGS AUTHORIZED BY THE CORPS OF ENGINEERS SECTION 404 PERMIT (SEE APPENDIX 'A' OF THE CONTRACT DOCUMENTS), CONSTRUCTION ACTIVITIES SHALL NOT OCCUR FROM APRIL 15 TO JUNE 1 UNLESS SPECIFIC WRITTEN APPROVAL HAS BEEN OBTAINED FROM THE NORTH DAKOTA GAME & FISH OR THE 'DIRECTIONAL DRILLING' METHOD IS UTILIZED. CONTACT GREG LINK AT 701-221-6331.
 - DURING CONSTRUCTION, IF THE DIRECTIONAL DRILLING METHOD OF INSTALLATION IS USED BY THE CONTRACTOR FOR RESTRAINED JOINT AREAS WHICH COINCIDE WITH STREAM CROSSINGS OR FOR STREAM CROSSINGS COVERED UNDER NOTE 1 ABOVE, PROVIDE ADDITIONAL RESTRAINED JOINT PIPE AS MAY BE REQUIRED AT EACH SIDE OF THE CROSSING WITHIN THE TRANSITION AREA TO THE GROUND SURFACE. THE CONTRACTOR SHALL PROVIDE THE REQUIRED DEPTH OF COVER OVER THE PIPE UPON TYING IN THE RESTRAINED JOINT AREA PIPE WITH THE ADJOINING PIPELINE.
 - THE CROSSING OF CANALS, STREAMS, CREEKS, WETLANDS AND OTHER WATERWAYS SHALL BE SUBSIDIARY TO PIPELINE INSTALLATION AND INCLUDED IN THE UNIT PRICE THEREOF.
 - INSTALLATION OF DESIGNATED RESTRAINED JOINT AREAS SHALL BE COMPENSATED FOR UNDER THE PROVISIONS OF SPECIFICATION 330520.
 - TRANSITION AREA IS NOT TO BE INCLUDED AS PAYMENT IN THE RESTRAINED JOINT FOOTAGE, BUT WILL BE PAID THE SAME AS ADJOINING PIPELINE.

TYPICAL CANAL/STREAM CROSSING CONSTRUCTION

NOT TO SCALE

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TYPE 3 & 4 ROAD CROSSINGS

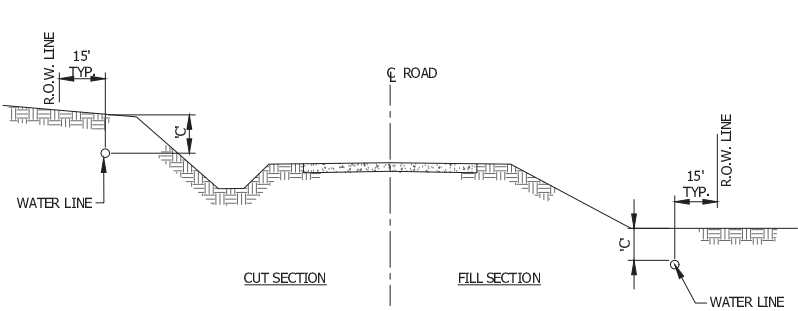
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ENCASEMENT SCHEDULE

MAIN SIZE	TYPE 1 ROAD CROSSING ENCASEMENT & MINIMUM WALL THICKNESS	TYPE 1 ROAD CROSSING MINIMUM ENCASEMENT USING HDPE 3408	RAILROAD CROSSING ENCASEMENT & MINIMUM WALL THICKNESS
1½" PVC	3" PVC - CL. 160	3" POLY DR17	----
2" PVC	4" PVC - CL. 160	5" POLY DR17	4" STEEL - 0.250
2½" PVC	6" PVC - CL. 160	5" POLY DR17	6" STEEL - 0.250
3" PVC	6" PVC - CL. 160	6" POLY DR17	6" STEEL - 0.250
4" PVC	8" PVC - CL. 160	8" POLY DR17	8" STEEL - 0.250
6" PVC	12" PVC - CL. 160	12" POLY DR17	12" STEEL - 0.250
8" PVC	16" STEEL - 0.250"	18" POLY DR17	16" STEEL - 0.282
10" PVC	18" STEEL - 0.250"	20" POLY DR17	18" STEEL - 0.282
12" PVC	20" STEEL - 0.250"	24" POLY DR17	20" STEEL - 0.344
14" PVC	22" STEEL - 0.250"	24" POLY DR17	22" STEEL - 0.344
16" PVC	24" STEEL - 0.250"	26" POLY DR17	24" STEEL - 0.375"
18" PVC	26" STEEL - 0.375"	28" POLY DR17	26" STEEL - 0.406"
20" PVC	34" STEEL - 0.500"	30" POLY DR17	34" STEEL - 0.531"
24" PVC	36" STEEL - 0.625"	34" POLY DR17	36" STEEL - 0.625"

CASING SIZES SHOWN ABOVE ARE MINIMUM SIZES. LARGER SIZES MAY BE REQUIRED DEPENDING UPON ACTUAL DIMENSIONS OF CARRIER PIPING AND SKIDS.

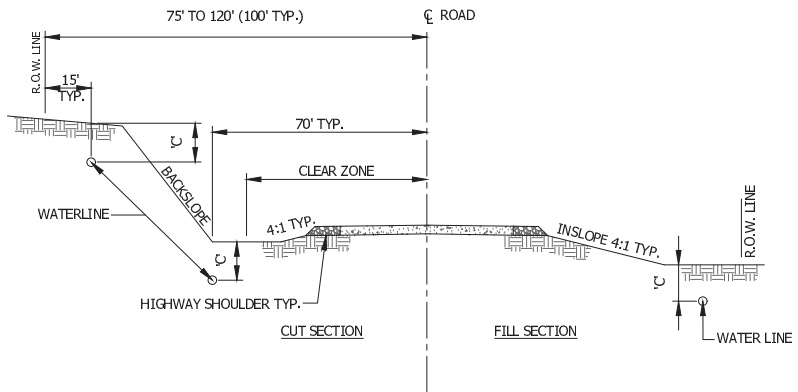


- NOTES:
- DIMENSION 'C' SHALL BE 90" MINIMUM TO 120" MAXIMUM.
 - FOR COUNTY AND HIGHWAY RIGHT-OF-WAY ENCROACHMENT, THE CONTRACTOR IS REQUIRED TO COMPLY WITH THE ABOVE REQUIREMENT. SUBMIT THE TRAFFIC CONTROL PLAN TO THE COUNTY'S REPRESENTATIVE FOR REVIEW. OTHER REQUIREMENTS SUCH AS CLEAR ZONE LIMITS, SHALL BE OBTAINED FROM THE COUNTY OR THEIR REPRESENTATIVE.

TYPICAL PIPELINE INSTALLATION IN COUNTY ROAD RIGHT-OF-WAY

NOT TO SCALE

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C502

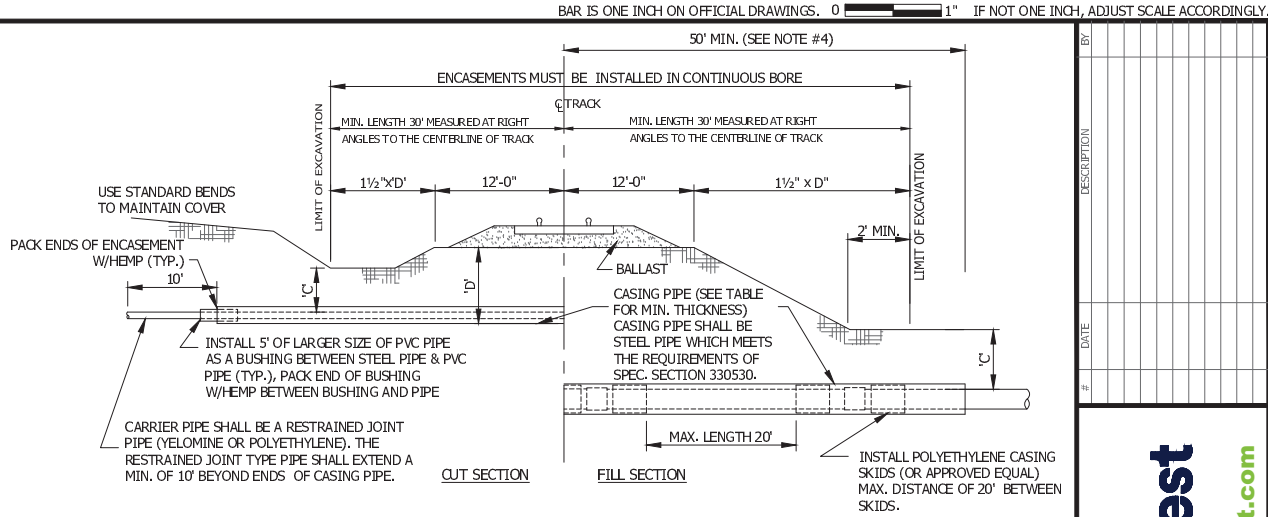


- NOTES:
- DIMENSION 'C' SHALL BE 90" MINIMUM TO 120" MAXIMUM.
 - FOR COUNTY AND HIGHWAY RIGHT-OF-WAY ENCROACHMENT, THE CONTRACTOR IS REQUIRED TO COMPLY WITH THE ABOVE REQUIREMENT. SUBMIT THE TRAFFIC CONTROL PLAN TO THE COUNTY'S REPRESENTATIVE FOR REVIEW. OTHER REQUIREMENTS SUCH AS CLEAR ZONE LIMITS, SHALL BE OBTAINED FROM THE COUNTY OR THEIR REPRESENTATIVE.
 - WHEN IN THE HIGHWAY RIGHT-OF-WAY, THE PIPELINE WILL BE INSTALLED 15 FEET FROM HIGHWAY RIGHT-OF-WAY. HOWEVER, IN SOME INSTANCES, IT MAY BE REQUIRED THAT THE PIPELINE CENTERLINE DEVIATE FROM THIS LOCATION. THE DEVIATIONS IN PIPELINE ALIGNMENT WILL BE FLAGGED IN THE FIELD AND ARE AS FOLLOWS:
 - IN HIGHWAY CUT SECTIONS, INSTALL THE PIPELINE AT TOE OF BACKSLOPE OR 70 FEET FROM CENTERLINE OF HIGHWAY, WHICHEVER IS LESS. HOWEVER, IN NO EVENT SHALL THE PIPELINE BE INSTALLED CLOSER THAN 55 FEET FROM CENTERLINE OF HIGHWAY. IN SOME EXISTING HIGHWAY CUT SECTIONS AND WHERE SHOWN ON THE PLANS OR AS STAKED IN THE FIELD, INSTALL THE PIPELINE ON TOP OF THE HIGHWAY BACKSLOPE 10 FEET FROM THE HIGHWAY RIGHT-OF-WAY LINE.
 - IN DEEP HIGHWAY FILL SECTIONS, INSTALL THE PIPELINE 10 FEET FROM THE HIGHWAY RIGHT-OF-WAY LINE.
 - FOR THAT PORTION OF THE PIPELINE LOCATED WITHIN THE HIGHWAY RIGHT-OF-WAY AND PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO NORTH DAKOTA DEPARTMENT OF TRANSPORTATION (NDDOT) DISTRICT OFFICE FOR REVIEW. THE TRAFFIC CONTROL PLAN SHALL CONFORM TO THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND SHALL BE BASED ON THE SIGNING REQUIREMENTS FOR WORK CONDUCTED WITHIN THE HIGHWAY CLEAR ZONE. PROVIDE A COPY OF THE TRAFFIC CONTROL PLAN TO THE OWNER AND OWNER'S REPRESENTATIVE.
 - WHEN WORKING WITHIN THE HIGHWAY RIGHT-OF-WAY, THE CONTRACTOR SHALL PROVIDE SIGNING ALONG THE HIGHWAY IN ACCORDANCE WITH THE APPROVED TRAFFIC CONTROL PLAN AS IF WORKING IN THE HIGHWAY CLEAR ZONE. THE CLEAR ZONE VARIES FOR EACH HIGHWAY AND SPECIFIC INFORMATION ON THE CLEAR ZONE LIMITS SHALL BE OBTAINED FROM THE NDDOT. THE NDDOT REQUIRES THAT THE CONTRACTOR NOT OPERATE EQUIPMENT, STORE MATERIAL OR PARK VEHICLES IN THE HIGHWAY CLEAR ZONE. HOWEVER, IT IS UNDERSTOOD THAT THERE MAY BE LOCATIONS WHERE IT MAY BE NECESSARY TO OPERATE EQUIPMENT IN THE CLEAR ZONE SUCH AS IN HIGHWAY CUT SECTIONS AND WHEN THE PIPELINE IS LOCATED WITHIN 14 FEET OF THE HIGHWAY CLEAR ZONE.
 - LIMIT INGRESS AND EGRESS TO THE WORK SITE TO ESTABLISHED APPROACHES AND TRAILS. VEHICLES SHALL NOT BE PARKED IN THE HIGHWAY CLEAR ZONE. THE CONTRACTOR SHALL NOT OPERATE HEAVY EQUIPMENT ON THE SHOULDER OF THE STATE HIGHWAY UNLESS WRITTEN APPROVAL HAS BEEN OBTAINED FROM NDDOT. CONTRACTOR'S EQUIPMENT SHALL BE PARKED A MINIMUM OF 60 FEET FROM THE HIGHWAY SHOULDER DURING NON-WORKING HOURS.
 - MAXIMUM LENGTH OF OPEN TRENCH SHALL BE 1000 FEET, 300 FEET MAXIMUM WHEN IN THE CLEAR ZONE. BARRICADES AND APPROPRIATE WARNING LIGHTS SHALL BE PROVIDED AT NIGHT AROUND OPEN TRENCHES.
 - REFER TO APPLICABLE GENERAL NOTES ON PLAN SHEET RW02, SPECIFICATION SECTION 13210 AND 15100, FOR ADDITIONAL HIGHWAY REQUIREMENTS. WHEN PARALLELING MT STATE HIGHWAY RIGHT-OF-WAY, THE PIPELINE SHALL BE INSTALLED A MINIMUM OF 100 FEET FROM THE HIGHWAY CENTERLINE UNLESS NOTED OTHERWISE.

TYPICAL LINE INSTALLATION IN STATE HIGHWAY RIGHT-OF-WAY

NOT TO SCALE

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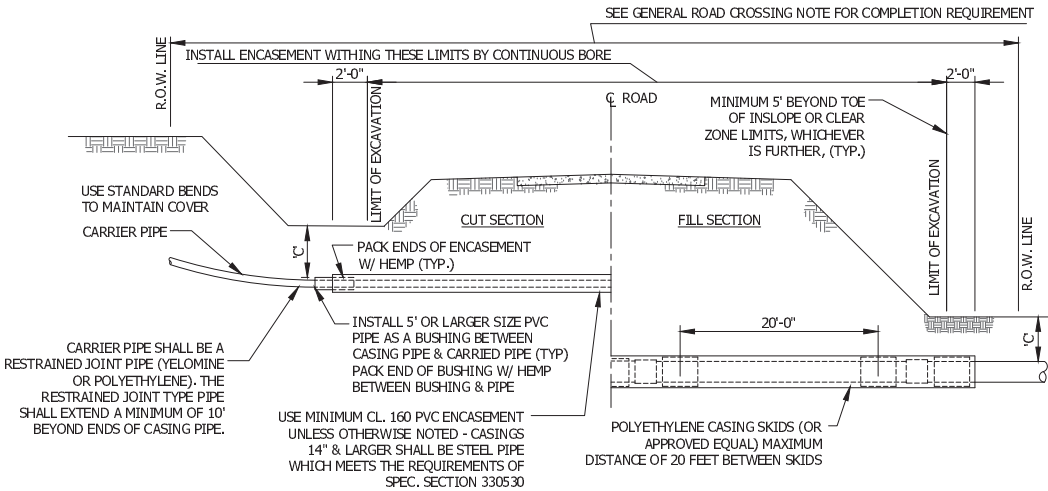


- NOTES:
- DIMENSION 'C' SHALL BE 90" MINIMUM TO 120" MAXIMUM HOWEVER, IN CUT SECTIONS, DIMENSION 'C' SHALL BE 96" MINIMUM.
 - ALL CONSTRUCTION IN RAILROAD R.O.W. MUST BE COORDINATED WITH THE APPROPRIATE RAILROAD REPRESENTATIVE. THE RAILROAD MAY HAVE A REPRESENTATIVE PRESENT DURING CONSTRUCTION.
 - DIMENSION 'D' SHALL BE 8'-0" (MINIMUM) + O.D. CASING PIPE.
 - ENCASEMENT SHALL EXTEND A MINIMUM OF 50 FEET ON EACH SIDE OF CENTERLINE OF RAILROAD TRACKS OR 5 FEET BEYOND TOE OF INSLOPE, WHICHEVER IS GREATER. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE CASING AS REQUIRED BY THE RAILROAD CROSSING PERMIT.

TYPICAL RAILROAD CROSSING

NOT TO SCALE

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C502



- NOTES:
- TYPE 1 ROAD CROSSINGS ARE TYPICALLY LOCATED AT STATE AND FEDERAL HIGHWAY CROSSINGS.
 - DIMENSION 'C' SHALL BE 90" MINIMUM TO 120" MAXIMUM HOWEVER, IN CUT SECTIONS, DIMENSION 'C' SHALL BE 96" MINIMUM.
 - THE CLEAR ZONE FOR STATE HIGHWAYS GENERALLY EXTENDS 50 FEET EACH SIDE FROM THE CENTERLINE. HOWEVER ACTUAL WIDTH OF THE CLEAR ZONE MAY VARY AT SPECIFIC CROSSINGS. THE CONTRACTOR SHALL VERIFY THE CLEAR ZONE LIMITS WITH NDDOT.
 - NO WORK SHALL BE PERFORMED IN THE HIGHWAY INSLOPES.

TYPE 1 ROAD CROSSING

NOT TO SCALE

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C502

- GENERAL NOTES FOR ALL ROAD CROSSINGS:
- ROAD CROSSINGS SHALL BE CONSTRUCTED IN THE SAME MANNER AS TYPE 1 ROAD CROSSINGS EXCEPT THAT NO CASING PIPE IS REQUIRED FOR TYPES 3 & 4 ROAD CROSSINGS.
 - ALL ROAD CROSSINGS SHALL BE COMPLETE AND CONTINUOUS TO THE RIGHT-OF-WAY LIMITS PER SPECIFICATION SECTION 330530. HOWEVER, THE CONTRACTOR SHALL MAKE EVERY ATTEMPT TO ELIMINATE INSTALLATION OF PIPE JOINTS BENEATH THE ROAD BED WITHIN THE LIMITS OF THE ROAD CROSSING. FOR TYPE 2, 3 AND 4 ROAD CROSSINGS, RESTRAINED JOINT PIPE IS REQUIRED IF MORE THAN ONE LENGTH OF PIPE IS TO BE INSTALLED WITHIN THE BORE AREA. THIS APPLIES TO ALL BORING METHODS. NO ADDITIONAL PAYMENT WILL BE MADE FOR THE USE OF RESTRAINED JOINT PIPE AT ROAD CROSSINGS.
 - ALL OTHER ROAD CROSSINGS NOT DESIGNATED ON THE DRAWINGS OR FLAGGED AS TYPE OF ROAD CROSSING IN THE FIELD BY THE OWNER'S REPRESENTATIVE SHALL BE SUBSIDIARY TO THE PIPELINE. THE CONTRACTOR SHALL COMPACT THE NON-DESIGNATED OR NON-FLAGGED ROAD CROSSINGS IN ACCORDANCE WITH THE SPECIFICATIONS.
 - TYPE 4 ROAD CROSSINGS ARE NOT SHOWN ON THE PLANS, BUT WILL BE DETERMINED BY THE OWNER'S REPRESENTATIVE IN THE FIELD.
 - DIMENSION 'C' SHALL BE 90" MINIMUM TO 120" MAXIMUM HOWEVER, IN CUT SECTIONS, DIMENSION 'C' SHALL BE 96" MINIMUM.
 - ALL ROAD CROSSINGS SHALL USE PVC LONG BODY COUPLERS ON EACH SIDE.
 - FLEXIBLE UTILITY MARKERS SHALL BE PROVIDED AT BOTH RIGHT OF WAY LINES FOR ALL RAILROAD, TYPE 1, AND TYPE 3 ROAD CROSSINGS.

ROAD TYPE	DESCRIPTION
1	STATE AND FEDERAL HIGHWAYS
3	PAVED OR UNPAVED PUBLIC ROADWAYS
4	FARM ACCESS APPROACHES, PAVED OR UNPAVED SUBDIVISION STREETS/ROADS, PAVED DRIVEWAYS AND AT PRIVATE OR PUBLIC ROADS NOT DESIGNATED AS TYPE 3 CROSSINGS, WHICH ARE AUTHORIZED AND FLAGGED AS TYPE 4 ROAD CROSSINGS BY THE OWNER'S REPRESENTATIVE. IN GENERAL, SECONDARY DRIVEWAYS, TRAILS, NON BUILT-UP ROADWAYS, PARKING AREAS OR OTHER SIMILAR TRAVELED WAYS WILL NOT BE FLAGGED OR AUTHORIZED AS A TYPE 4 ROAD CROSSING (SEE NOTE 3).

Bartlett & West
 www.bartwest.com

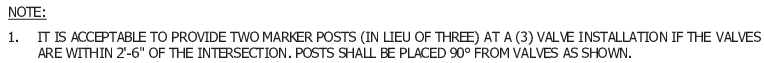
PIPELINE CROSSING
 DETAILS
 FORT BERTHOLD RESERVATION THREE AFFILIATED TRIBES
 NEW TOWN BYPASS FBRW CONFLICT
 NEW TOWN, NORTH DAKOTA

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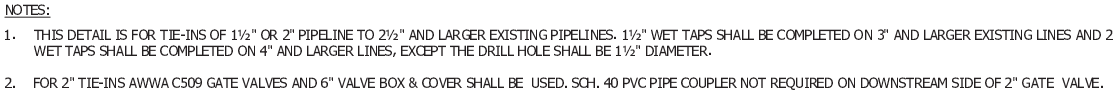


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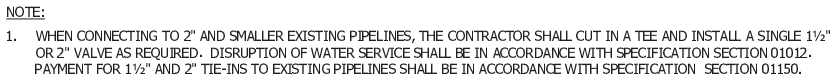


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1. WRAP ALL METAL FITTINGS/VALVES WITH (2) TWO WRAPS OF 8 MIL. POLYETHYLENE ENCASEMENT AND INSTALL 3 LB. MAGNESIUM ANODE AT EACH FITTING/VALVE.
2. FOR 8" AND SMALLER VALVES, PLACE A 4"x8"x16" CONCRETE PARTITION BLOCK UNDER EACH VALVE. FOR 10" AND LARGER VALVES, PLACE A 24"x24"x4" PRECAST CONCRETE PAD UNDER EACH VALVE.
3. WHEN VALVE IS TO BE INSTALLED MORE THAN 5 FEET FROM A TEE, CROSS, OR ELBOW: (2) TWO 4"x8"x16" OR 24"x24"x4" CONCRETE PARTITION BLOCKS BASED ON PIPE SIZE ARE TO BE INSTALLED ON THE UPSTREAM AND DOWNSTREAM SIDE OF VALVE. (TYP.)
4. FOR 8" AND LARGER VALVES, A FORD UNIFLANGE SERIES 1300 PVC PIPE RESTRAINT, STARGRIP SERIES 4000 OR EQUAL IS REQUIRED ON BOTH SIDES OF VALVE. ADDITIONALLY, ALL JOINTS WITHIN 39 FEET ON EITHER SIDE OF THE VALVE SHALL ALSO BE RESTRAINED WITH THE FORD UNIFLANGE PVC PIPE RESTRAINT SERIES 1350, STARGRIP SERIES 4000P OR EQUAL. WRAP EACH RESTRAINED COUPLING WITH (2) TWO WRAPS OF 8 MIL. POLYETHYLENE ENCASEMENT.
5. AS A GENERAL GUIDELINE, LOCATE APPURTENANCES ADJACENT TO EXISTING OBSTRUCTIONS SUCH AS, BUT NOT LIMITED TO: FENCE LINES, EXISTING PIPELINES, SHELTER BELTS, ETC. THE PIPELINE CENTERLINE MAY DEVIATE FROM THAT SHOWN ON THE PLANS TO PLACE AIR VALVES AND INLINE VALVES ADJACENT TO EXISTING SIMILAR APPURTENANCES. LOCATE BLOWOFFS TO PLACE ONE SIDE (PREFERABLY THE LOWER SIDE) OF A STREAM CHANNEL. DO NOT PLACE BLOWOFFS IN THE MIDDLE OF THE STREAM UNLESS AUTHORIZED BY THE OWNER'S REPRESENTATIVE.
6. ALL APPURTENANCES SHALL HAVE A MARKER POST LOCATED ADJACENT TO THE APPURTENANCE AS SHOWN ON THE DRAWINGS AND AS FOLLOWS:
 - A. FOR APPURTENANCES IN CULTIVATED FIELDS AND WHICH ARE OFFSET TO THE ADJACENT FENCE LINE OR R.O.W. LINE, LOCATE THE POST ALONG THE R.O.W. OR FENCE LINE. ALL MARKER POSTS SHALL BE A 6"x6"x8" PRESSURE TREATED WOODEN POST W/3'-0" BURY AND REFLECTIVE TAPE (APPROX. 6" WIDE, PLACED NEAR TOP).
 - B. APPURTENANCE LOCATED IN STATE OR COUNTY HIGHWAY R.O.W. SHALL HAVE A MARKER POST AS DESCRIBED ABOVE. HOWEVER, PLACE POST AT R.O.W. LINE OR FENCE LINE. RECORD THE OFFSET DISTANCE TO APPURTENANCE ON THE RECORD DRAWINGS.



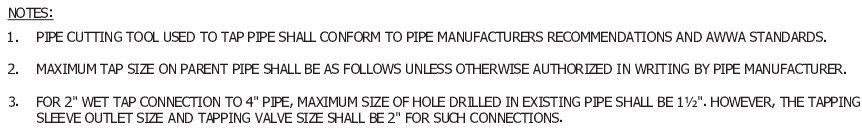
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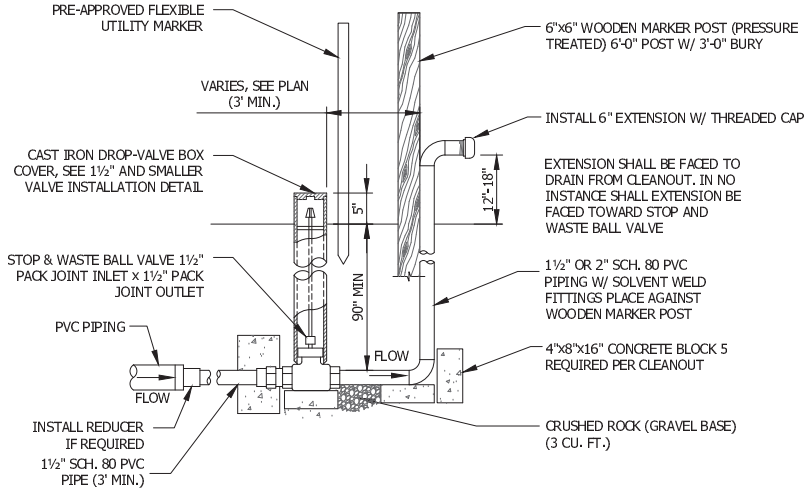
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TYPICAL WET TAP CONNECTION

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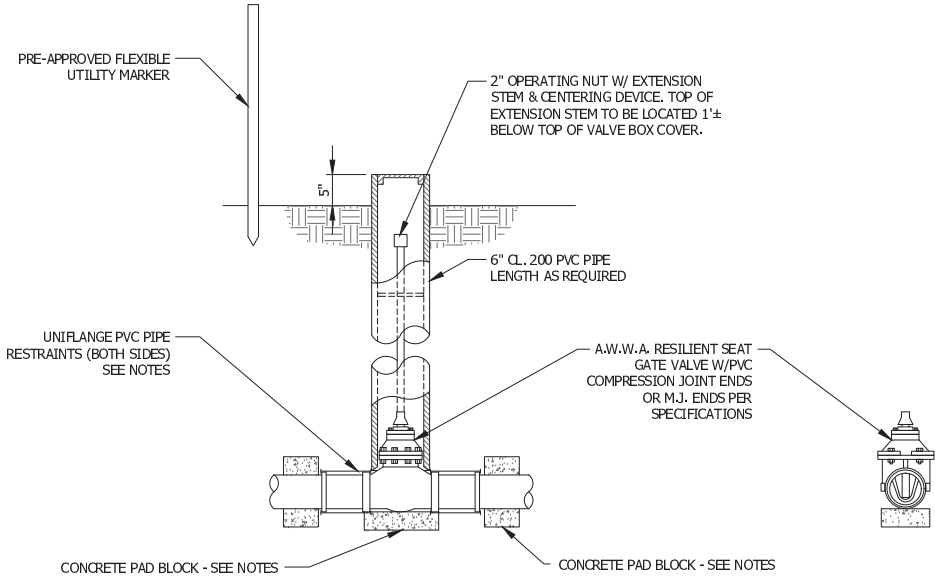
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Last edit on: 8/30/2017 5:48 PM by: ZAN01368



- NOTES:
- CLEANOUTS WHICH ARE PLACED AT INTERMEDIATE HIGH POINTS TO BE USED FOR MANUAL AIR RELEASE VALVE, SHALL EXIT THE TOP OF THE PIPELINE. MINIMUM SIZE OF SADDLE OR TEE SHALL BE THE SAME SIZE AS THE CLEANOUT. EXTEND THE SCHEDULE 80 PVC TO A POINT DETERMINED BY THE OWNER'S REPRESENTATIVE, (FENCE LINE, R.O.W. LINE, ETC.) PROVIDE ADEQUATE DEPTH OF BURY FOR THE MAIN PIPELINE, SUCH THAT 7'-6" MINIMUM COVER IS MAINTAINED OVER CLEANOUT PIPING.
 - 2" CLEANOUT IS THE SAME AS 1 1/2" CLEANOUT ABOVE EXCEPT PIPING AND VALVE ARE 2".

2" OR 1 1/2" CLEANOUT

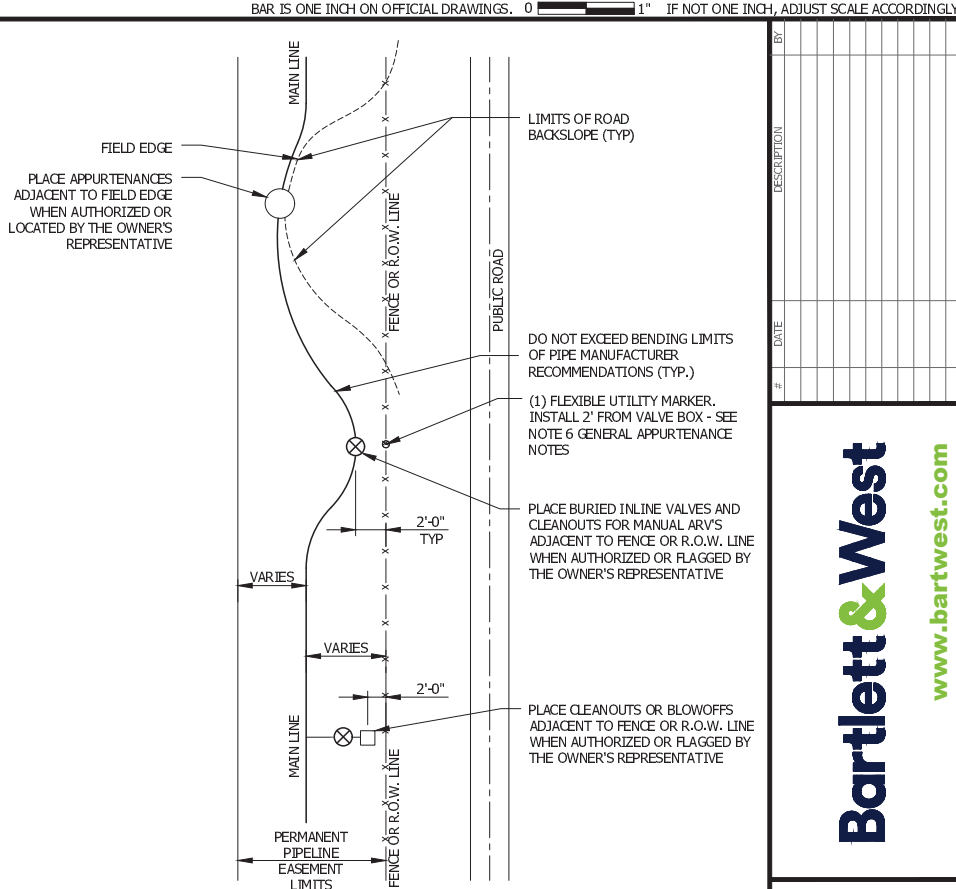
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- NOTES:
- WRAP ALL METAL FITTINGS/VALVES WITH (2) TWO WRAPS OF 8 MIL POLYETHYLENE ENCASEMENT. SACRIFICIAL ANODES SHALL BE PROVIDED FOR ALL 10" AND LARGER VALVES/FITTINGS PER SPECIFICATION SECTION 16640.
 - FOR 8" AND SMALLER VALVES, PLACE 8"x16"x4" PRECAST CONCRETE BLOCK UNDER EACH VALVE. FOR 10" AND LARGER VALVES, PLACE 20"x20"x4" PRECAST CONCRETE PAD UNDER EACH VALVE.
 - WHEN 8" AND SMALLER VALVE IS TO BE INSTALLED MORE THAN 5' FROM A TEE, CROSS, OR ELBOW: (2) TWO 8"x16"x4" CONCRETE PARTITION BLOCKS ARE TO BE INSTALLED ON THE UPSTREAM AND DOWNSTREAM SIDE OF VALVE. (TYP.)
 - WHEN 10" AND LARGER VALVE IS TO BE INSTALLED MORE THAN 5' FROM A TEE, CROSS, OR ELBOW: (2) TWO 20"x20"x4" CONCRETE PARTITION BLOCKS ARE TO BE INSTALLED ON THE UPSTREAM AND DOWNSTREAM SIDE OF VALVE. (TYP.)
 - FOR 10" AND LARGER VALVES, A FORD UNIFLANGE SERIES 1300 PVC PIPE RESTRAINT OR EQUAL IS REQUIRED ON BOTH SIDES OF VALVE. ADDITIONALLY, ALL JOINTS WITHIN 39' FOR 10" AND 12" PIPE AND 19' FOR 14" AND LARGER PIPE ON EITHER SIDE OF THE VALVE SHALL ALSO BE RESTRAINED WITH THE FORD UNIFLANGE PVC PIPE RESTRAINT SERIES 1350 OR EQUAL. WRAP EACH RESTRAINED COUPLING WITH (2) TWO WRAPS OF 8 MIL. POLYETHYLENE PER AWWA C105.

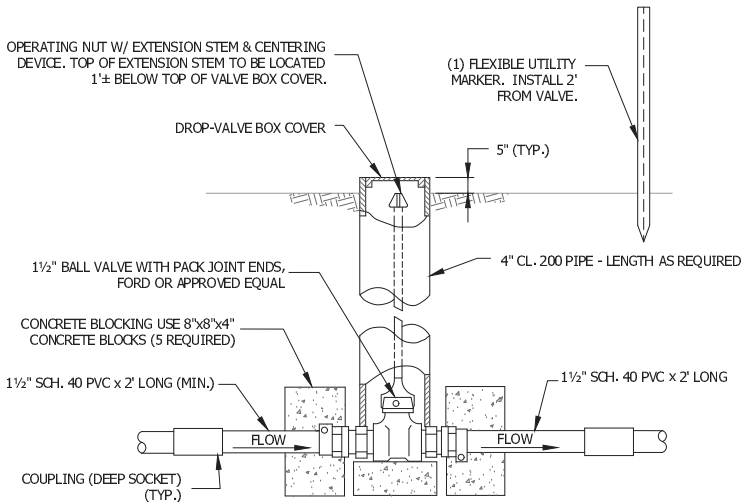
TYPICAL GATE VALVE INSTALLATION

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C504



TYPICAL PLAN VIEW OF APPURTENANCE LAYOUT
IN CULTIVATED LAND AND LEGUMES

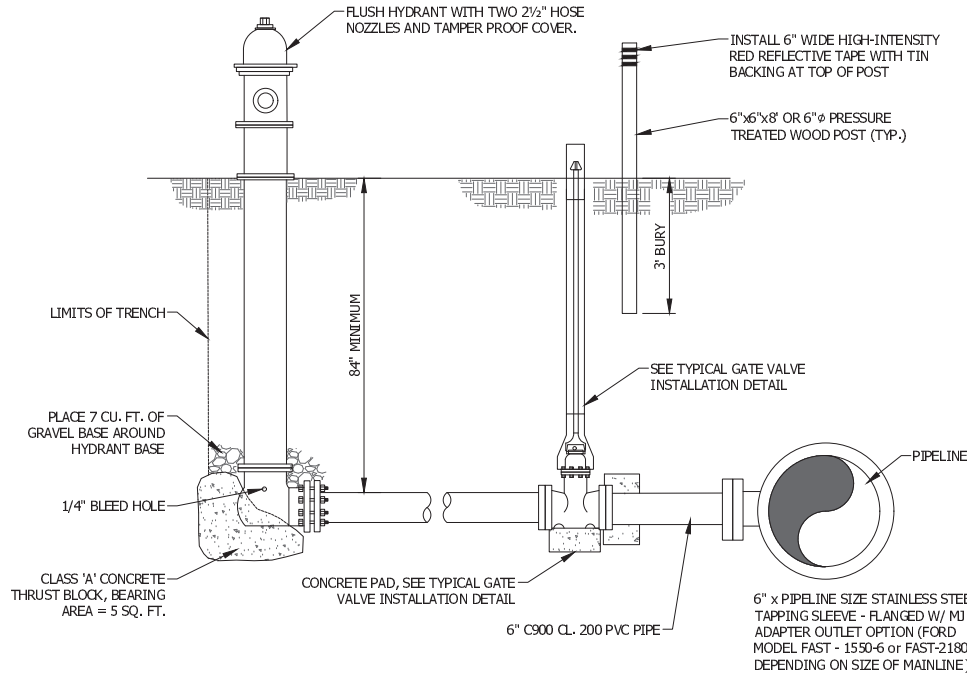
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- NOTES:
- PLACE POST AS FOLLOWS:
 - WHEN IN PRIVATE LAND, PLACE POST ADJACENT TO BOX.
 - WHEN IN PUBLIC R.O.W., PLACE POST AT R.O.W. LINE OR FENCE LINE. RECORD OFFSET DISTANCE ON RECORD DRAWINGS.
 - UPON COMPLETION OF DISINFECTION AND FLUSHING OPERATIONS, THE CONTRACTOR SHALL CLOSE ALL 1 1/2" SERVICE LINE VALVES, OWNER WILL OPEN VALVES UPON USER CONNECTING TO SYSTEM.
 - 2" VALVE IS THE SAME AS 1 1/2" VALVE EXCEPT VALVE IS 2" AWWA C509 GATE VALVE FOR APPROPRIATE PIPE MATERIAL AND SIZE.
 - 1" VALVE IS THE SAME AS 1 1/2" VALVE EXCEPT VALVE IS 1" BALL VALVE WITH PACK JOINT ENDS SIZED FOR APPROPRIATE PIPE MATERIAL AND SIZE.

1 1/2" AND SMALLER BALL VALVE INSTALLATION

4
C504



6" FLUSH HYDRANT ASSEMBLY

NOT TO SCALE

5
C504

GENERAL APPURTENANCE NOTES:

- FOR 8" AND SMALLER VALVES, PLACE A 8"x16"x4" CONCRETE PARTITION BLOCK UNDER EACH VALVE. FOR 10" AND LARGER VALVES, PLACE A 20"x20"x4" PRECAST CONCRETE PAD UNDER EACH VALVE.
- AS A GENERAL GUIDELINE, LOCATE APPURTENANCES ADJACENT TO EXISTING OBSTRUCTIONS SUCH AS, BUT NOT LIMITED TO: FENCE LINES, EXISTING PIPELINES, SHELTER BELTS, ETC. THE PIPELINE CENTERLINE MAY DEVIATE FROM THAT SHOWN ON THE PLANS TO PLACE AIR VALVES AND INLINE VALVES ADJACENT TO EXISTING SIMILAR APPURTENANCES. LOCATE BLOWOFFS TOWARD ONE SIDE (PREFERABLY THE LOWER SIDE) OF A STREAM CHANNEL. DO NOT PLACE BLOWOFFS IN THE MIDDLE OF THE STREAM UNLESS AUTHORIZED BY THE OWNER'S REPRESENTATIVE.
- ALL APPURTENANCES SHALL HAVE A PRE-APPROVED FLEXIBLE UTILITY MARKER LOCATED ADJACENT TO THE APPURTENANCE AS SHOWN ON THE DRAWINGS AND AS FOLLOWS:
 - FOR APPURTENANCES IN CULTIVATED FIELDS AND WHICH ARE OFFSET TO THE ADJACENT FENCE LINE OR R.O.W. LINE, LOCATE THE UTILITY MARKER ALONG THE R.O.W. OR FENCE LINE.
 - APPURTENANCE LOCATED IN STATE OR COUNTY HIGHWAY R.O.W. SHALL HAVE A UTILITY MARKER AS DESCRIBED ABOVE. HOWEVER, PLACE POST AT R.O.W. LINE OR FENCE LINE. RECORD THE OFFSET DISTANCE TO APPURTENANCE ON THE RECORD DRAWINGS.

APPURTENANCE DETAILS

FORT BERTHOLD RESERVATION THREE AFFILIATED TRIBES
NEW TOWN BYPASS FBRW CONFLICT
NEW TOWN, NORTH DAKOTA

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