PRELIMINARY SURVEY COORDINATE AND CURVE DATA - Killdeer Bypass - ND 200 to ND 22

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	81	1

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
SCL 22			
PI	90+00.00	624,123.59	1,398,380.27
POT	100+00.00	625,123.10	1,398,411.71
PC	105+35.29	625,658.12	1,398,428.76
PI SCL22-1	107+45.74	625,868.45	1,398,435.46
PT	109+55.78	626,078.31	1,398,419.78
PC	114+76.16	626,597.24	1,398,381.00
PI SCL22-2	116+86.59	626,807.08	1,398,365.31
PT	118+96.62	627,017.41	1,398,372.01
PC	140+39.66	629,159.36	1,398,440.25
PI SCL22-3	142+26.24	629,345.84	1,398,446.20
PT	144+12.54	629,530.94	1,398,469.69
PC	151+00.09	630,213.02	1,398,556.26
PI SCL22-4	152+86.85	630,398.29	1,398,579.78
PT	154+73.34	630,584.96	1,398,585.71
PC	187+27.25	633,837.23	1,398,689.02
PI SCL22-5	190+62.66	634,172.48	1,398,699.67
PT	193+96.47	634,504.72	1,398,653.64
PC	200+97.09	635,198.71	1,398,557.49
PI SCL22-6	205+00.24	635,598.04	1,398,502.16
PT	209+00.59	636,000.31	1,398,528.65
PC	280+22.71	643,107.03	1,398,996.58
PI SCL22-7	286+88.45	643,771.35	1,399,040.32
PT	292+88.99	644,221.33	1,399,530.94
PI	300+01.52	644,702.96	1,400,056.06

CURVE DATA

ARC DEFINITION

Curve SCL22-1		Curve SCL22-5	
PI	= 107+45.74	PI	= 190+62.66
Delta	= 6°05' 58" (LT)	Delta	= 9°42' 26" (LT)
Da	= 1°27' 02"	Da	= 1°27' 02"
T	= 210.44	T	= 335.42
L	= 420.49	L	= 669.23
R	= 3,950.00	R	= 3,950.00
Curve SCL22-2		**Curve SCL22-6**	
PI	= 116+86.59	PI	= 205+00.24
Delta	= 6°05' 57" (RT)	Delta	= 11°39' 18" (RT)
Da	= 1°27' 02"	Da	= 1°27' 02"
T	= 210.43	T	= 403.14
L	= 420.47	L	= 803.50
R	= 3,950.00	R	= 3,950.00
Curve SCL22-3		**Curve SCL22-7**	
PI	= 142+26.24	PI	= 286+88.45
Delta	= 5°24' 32" (RT)	Delta	= 43°42' 23" (RT)
Da	= 1°27' 02"	Da	= 3°27' 06"
T	= 186.58	T	= 665.74
L	= 372.88	L	= 1,266.28
R	= 3,950.00	R	= 1,660.00
Curve SCL22-4			
PI	= 152+86.85		
Delta	= 5°24' 51" (LT)		
Da	= 1°27' 02"		
T	= 186.76		
L	= 373.25		
R	= 3,950.00		

US PUBLIC LAND SURVEY DATA

DESC.	SEC-TWP-RGE		NORTHING	EASTING
SE Cor 29	T-145-N	R-95-W	619,846.27	1,398,245.71
SW Cor 20	T-145-N	R-95-W	625,292.14	1,393,148.10
SE Cor 20	T-145-N	R-95-W	625,123.10	1,398,411.71
NE Cor 20	T-145-N	R-95-W	630,398.29	1,398,579.78
NW Cor 20	T-145-N	R-95-W	630,555.81	1,393,300.52
E Qtr 20	T-145-N	R-95-W	627,760.72	1,398,495.76
W Qtr 20	T-145-N	R-95-W	627,923.98	1,393,224.33
SE Cor 21	T-145-N	R-95-W	624,949.03	1,403,700.61
N Qtr 21	T-145-N	R-95-W	630,321.24	1,401,221.95
S Qtr 17	T-145-N	R-95-W	630,474.22	1,395,938.60
E Qtr 17	T-145-N	R-95-W	633,036.53	1,398,663.76
NE Cor 17	T-145-N	R-95-W	635,675.79	1,398,747.18
N Qtr 16	T-145-N	R-95-W	635,600.90	1,401,390.28
SW Cor 8	T-145-N	R-95-W	635,828.87	1,393,464.23
S Qtr 8	T-145-N	R-95-W	635,752.41	1,396,105.69
W Qtr 8	T-145-N	R-95-W	638,470.25	1,393,543.49
E Qtr 8	T-145-N	R-95-W	638,316.43	1,398,829.50
N Qtr 9	T-145-N	R-95-W	640,883.16	1,401,557.92
SE Cor 5	T-145-N	R-95-W	640,957.07	1,398,911.82
S Qtr 5	T-145-N	R-95-W	641,034.37	1,396,267.38
E Qtr 5	T-145-N	R-95-W	643,599.67	1,398,995.81
W Qtr 5	T-145-N	R-95-W	643,754.06	1,393,705.18
N Qtr 5	T-145-N	R-95-W	646,325.59	1,396,424.96
SE Cor 4	T-145-N	R-95-W	640,809.03	1,404,203.63
NW Cor 4	T-145-N	R-95-W	646,243.66	1,399,077.17
NE Cor 4	T-145-N	R-95-W	646,083.47	1,404,360.60
E Qtr 4	T-145-N	R-95-W	643,446.94	1,404,282.50
N Qtr 4	T-145-N	R-95-W	646,163.59	1,401,718.89

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET	CONTROL POINT DESCRIPTION
GPS 4	625,603.73	1,384,872.17	2421.54	4788+68.67	39.41 Lt	#5 Rebar NDDOT
GPS 5	622,052.83	1,408,524.12	2357.36	5026+25.71	2,734.01 Rt	#5 Rebar NDDOT
GPS 6	641,055.23	1,397,934.63	2303.88	259+05.57	924.85 Lt	#5 Rebar HDR
GPS 8	631,115.79	1,401,236.49	2406.43	160+88.07	2632.60 Rt	#5 Rebar HDR

All coordinates and measurements on this document derived from the International Foot definition.

☐ Assumed Coordinates

☒ All coordinates on this sheet are Dunn County ground coordinates. They are derived from the "North Dakota Coordinate System of 1983", NAD83(2011).South Zone Combination Factor (cf) = 0.9998690

INITIALIZING BENCH MARK
NDGPS Stations (OPUS)

☒ NAVD-88
☐ NGVD-29
☐ GEOID 09 ☐ _____
☒ GEOID 12A

NOTES:

Date Survey Completed 06/06/14

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PRELIMINARY SURVEY COORDINATE AND CURVE DATA - Killdeer Bypass - ND 200 to ND 22

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	81	2

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
EXISTING ND22 (SLC22B)			
PI	5729+32.50	641,201.43	1,403,235.40
TS	5778+29.74	644,827.08	1,399,943.36
SC	5781+29.74	645,052.64	1,399,745.62
PI SCL22B-1	5791+39.58	645,818.05	1,399,120.50
CS	5800+32.99	646,806.09	1,399,100.25
ST	5803+32.95	647,105.98	1,399,104.58
PI	5845+39.33	651,310.23	1,399,238.58
EXISTING ND200			
PI	4871+50.33	625,292.14	1,393,148.10
PI	4924+16.64	625,123.10	1,398,411.71
PI	4977+08.34	624,949.03	1,403,700.61

CURVE DATA

ARC DEFINITION	
Curve SCL22B-1	
PI	= 5791+39.58
Delta	= 44° 03' 53" (RT)
Da	= 2° 00' 00"
R	= 2,864.79
L	= 1,903.24
Ls	= 300.00
Sc	= 3° 00' 00"
Ts	= 1,309.83

US PUBLIC LAND SURVEY DATA

DESC.	SEC-TWP-RGE	NORTHING	EASTING

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET	CONTROL POINT DESCRIPTION

NOTES:

Date Survey Completed 06/06/14

☐ Assumed Coordinates

☒ All coordinates on this sheet are Dunn County ground coordinates. They are derived from the "North Dakota Coordinate System of 1983", NAD83(2011).South Zone Combination Factor (cf) = 0.9998690

All coordinates and measurements on this document derived from the International Foot definition.

INITIALIZING BENCH MARK
NDGPS Stations (OPUS)

☒ NAVD-88
☐ NGVD-29

☐ GEOID 09 ☐ _____
☒ GEOID 12A

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	81	3

ND Highway 22 Monuments & Markers

Station	Offset		Northing	Easting	ALIGNMENT MONUMENTS	IRON PIN RW MONUMENTS	RESET RIGHT OF WAY MARKERS	IRON PIN REFERENCE MONUMENTS	RIGHT OF WAY MARKERS
1004+49.00	39.57'	LT	624573.63	1398354.61					1
1004+49.00	40.02'	RT	624571.10	1398434.16					1
1004+50.00	32.78'	LT	624574.42	1398361.44		1			
1004+50.00	59.78'	LT	624575.28	1398334.45		1			
1004+50.00	33.22'	RT	624572.32	1398427.40		1			
1004+50.00	60.22'	RT	624571.46	1398454.39		1			
1004+51.00	66.57'	LT	624576.49	1398327.69					1
1004+51.00	67.02'	RT	624572.24	1398461.21					1
1005+54.35	138.74'	LT	624682.03	1398259.03	1				
1006+08.23	137.01'	LT	624735.83	1398262.46	1				
1006+61.56	16.00'	LT	624785.34	1398384.94	1				
1006+66.30	135.14'	LT	624793.81	1398266.15	1				
1006+66.30	77.04'	LT	624791.99	1398324.22	1				
1006+66.30	0.00'		624789.56	1398401.22	1				
1007+00.00	59.88'	LT	624825.15	1398342.31		1			
1007+29.69	26.34'	LT	624853.74	1398376.89	1				
1007+33.36	31.94'	RT	624855.57	1398435.15	1				
1007+39.64	26.57'	LT	624863.72	1398376.86	1				
1007+40.20	10.68'	LT	624863.76	1398392.86	1				
1007+40.54	0.38'	LT	624863.78	1398403.07	1				
1007+59.99	10.41'	RT	624882.88	1398414.47	1				
1007+75.15	4.27'	LT	624898.49	1398400.28	1				
1007+94.20	12.03'	RT	624917.02	1398417.18	1				
1008+09.00	66.87'	RT	624930.07	1398472.47					1
1008+10.00	60.08'	RT	624931.28	1398465.71		1			
1008+22.45	13.40'	LT	624946.06	1398392.66	1				
1008+23.55	29.45'	LT	624947.67	1398376.66	1				
1008+42.22	11.23'	LT	624965.75	1398395.46	1				
1008+63.66	14.34'	LT	624987.28	1398393.04	1				
1008+66.11	136.22'	LT	624993.61	1398271.29					1
1008+69.66	130.34'	LT	624996.97	1398277.29				1	
1008+76.65	122.95'	RT	624995.89	1398530.67					1
1008+81.70	118.30'	RT	625001.09	1398526.18				1	
1008+93.07	134.03'	RT	625011.95	1398542.27			1		
1008+93.60	144.28'	LT	625021.35	1398264.11			1		
1008+99.86	133.04'	RT	625018.77	1398541.50		1			
1009+00.04	142.96'	LT	625027.74	1398265.64		1			
1009+00.41	101.19'	RT	625020.34	1398509.68			1		
1009+00.81	22.13'	RT	625023.25	1398430.67	1				
1009+01.42	98.23'	LT	625027.69	1398310.39			1		
1009+01.44	30.80'	LT	625025.57	1398377.79	1				
1009+56.66	19.73'	RT	625079.15	1398430.05	1				
1009+70.35	98.94'	RT	625090.31	1398509.65	1				
1009+72.60	181.58'	RT	625089.93	1398592.33	1				
1009+74.70	345.19'	LT	625108.80	1398065.90	1				
1009+76.66	379.95'	LT	625111.87	1398031.21	1				
1009+77.85	99.22'	LT	625104.11	1398311.84	1				
1009+78.53	310.58'	LT	625111.53	1398100.61	1				
1009+79.60	537.80'	LT	625119.83	1397873.54	1				
1009+80.10	444.64'	RT	625089.05	1398855.50	1				
1009+80.41	446.05'	LT	625117.72	1397965.27	1				
1009+81.51	470.11'	RT	625089.65	1398881.00	1				
1009+82.19	477.55'	LT	625120.51	1397933.83	1				
1009+86.85	235.63'	LT	625117.45	1398175.79	1				
1009+88.03	138.45'	RT	625106.72	1398549.71	1				

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Right Of Way Monuments & Markers

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	81	4

ND Highway 22 Monuments & Markers

Station	Offset		Northing	Easting	ALIGNMENT MONUMENTS	IRON PIN RW MONUMENTS	RESET RIGHT OF WAY MARKERS	IRON PIN REFERENCE MONUMENTS	RIGHT OF WAY MARKERS
1009+88.61	181.74'	RT	625105.92	1398593.00	1				
1009+89.72	158.26'	RT	625107.78	1398569.57	1				
1009+90.75	345.62'	LT	625124.85	1398065.97	1				
1009+92.64	379.05'	LT	625127.81	1398032.62	1				
1009+94.44	312.34'	LT	625127.48	1398099.35	1				
1009+96.21	448.18'	RT	625105.03	1398859.55	1				
1009+96.38	445.14'	LT	625133.66	1397966.68	1				
1009+97.44	225.66'	RT	625113.35	1398637.18	1				
1010+00.00	0.00'	CL	625123.10	1398411.71	1				
1010+04.23	445.39'	LT	625141.51	1397966.68	1				
1010+04.27	448.32'	RT	625113.09	1398859.94	1				
1010+04.36	222.88'	LT	625134.55	1398189.08	1				
1010+04.71	38.66'	RT	625126.57	1398450.50	1				
1010+06.92	315.69'	RT	625119.96	1398727.47	1				
1010+07.24	51.72'	LT	625131.98	1398360.25	1				
1010+08.36	382.28'	RT	625119.27	1398794.07	1				
1010+10.42	348.93'	RT	625122.40	1398760.80	1				
1010+10.62	156.87'	LT	625138.71	1398255.26	1				
1010+13.21	179.72'	LT	625142.02	1398232.50	1				
1010+13.25	223.01'	RT	625129.24	1398635.03	1				
1010+14.36	137.00'	LT	625141.81	1398275.24	1				
1010+17.49	493.64'	RT	625124.85	1398905.66	1				
1010+18.13	477.54'	LT	625156.42	1397934.99	1				
1010+20.25	449.18'	RT	625129.03	1398861.31	1				
1010+20.37	441.70'	LT	625157.52	1397970.89	1				
1010+21.18	530.96'	RT	625127.36	1398943.08	1				
1010+22.84	314.02'	RT	625135.92	1398726.30	1				
1010+22.87	99.07'	RT	625142.80	1398511.46	1				
1010+24.33	383.27'	RT	625135.20	1398795.57	1				
1010+26.48	348.58'	RT	625138.46	1398760.96	1				
1010+29.23	179.37'	LT	625158.02	1398233.37	1				
1010+32.28	98.20'	LT	625158.48	1398314.59	1				
1010+49.99	7.93'	RT	625172.80	1398421.23	1				
1010+98.06	27.06'	LT	625221.97	1398387.79	1				
1010+99.50	27.91'	RT	625221.65	1398442.78	1				
1010+99.82	171.03'	RT	625217.42	1398585.84		1			
1010+99.70	172.03'	RT	625217.27	1398586.83			1		
1011+00.01	200.00'	LT	625229.42	1398215.00		1			
1011+00.17	98.86'	LT	625226.36	1398316.09			1		
1011+05.85	0.00'	CL	625228.89	1398415.08	1				
1011+06.55	201.01'	RT	625223.22	1398616.01			1		
1011+06.90	201.00'	LT	625236.29	1398214.22			1		
1011+42.02	8.10'	RT	625264.86	1398424.17	1				
1011+33.92	134.98'	RT	625253.61	1398550.82				1	
1011+52.05	150.04'	LT	625278.10	1398266.28				1	
1011+34.50	134.16'	RT	625254.23	1398550.02					1
1011+54.45	2.94'	RT	625277.41	1398419.27	1				
1011+57.81	154.10'	LT	625283.72	1398262.33					1
1011+88.16	25.02'	RT	625310.91	1398441.87	1				
1011+88.96	8.95'	RT	625311.88	1398425.81	1				
1011+67.61	100.00'	RT	625289.02	1398516.56		1			
1011+68.59	99.85'	RT	625290.02	1398516.42					1
1012+02.48	100.00'	LT	625326.24	1398316.98		1			
1012+03.51	106.79'	LT	625327.29	1398310.20					1
1012+18.10	0.33'	LT	625341.12	1398416.73	1				

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Right Of Way Monuments & Markers

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	81	5

ND Highway 22 Monuments & Markers

Station	Offset		Northing	Easting	ALIGNMENT MONUMENTS	IRON PIN RW MONUMENTS	RESET RIGHT OF WAY MARKERS	IRON PIN REFERENCE MONUMENTS	RIGHT OF WAY MARKERS
1013+43.06	13.75'	LT	625465.68	1398401.77	1				
1013+76.13	11.18'	LT	625498.71	1398403.28	1				
1013+77.45	27.12'	LT	625499.43	1398387.29	1				
1013+88.09	10.10'	RT	625511.47	1398424.09	1				
1014+42.83	20.18'	RT	625566.83	1398431.59	1				
1014+46.06	4.22'	RT	625569.20	1398415.48	1				
1014+46.20	5.59'	LT	625568.81	1398405.68	1				
1014+64.46	20.00'	LT	625586.17	1398390.27	1				
1014+67.69	20.27'	RT	625591.78	1398430.27	1				
1014+92.54	20.20'	RT	625616.70	1398428.63	1				
1015+50.45	28.00'	LT	625670.87	1398376.32	1				
1016+70.33	0.00'	CL	625792.45	1398392.76	1				
1016+70.33	100.00'	LT	625781.36	1398293.37		1			
1016+70.33	100.00'	RT	625803.53	1398492.14		1			
1016+71.33	106.79'	LT	625781.60	1398286.51					1
1016+71.33	106.79'	RT	625805.27	1398498.78					1
1018+49.89	106.79'	RT	625982.73	1398478.99					1
1018+50.89	100.00'	RT	625982.98	1398472.13		1			
1024+14.24	0.00'	CL	626531.78	1398310.31	1				
1025+07.64	106.98'	LT	626613.39	1398193.76					1
1025+08.52	125.19'	LT	626612.36	1398175.55		1			
1025+08.67	100.19'	LT	626615.13	1398200.40		1			
1025+09.47	131.99'	LT	626612.60	1398168.69					1
1025+40.91	0.45'	LT	626657.67	1398296.28	1				
1026+04.24	0.00'	CL	626720.76	1398290.77	1				
1027+91.47	4.44'	LT	626907.43	1398274.49	1				
1029+78.70	0.00'	CL	627094.79	1398275.95	1				
1030+42.03	0.45'	LT	627158.12	1398276.45	1				
1030+74.41	125.19'	LT	627193.73	1398152.52		1			
1030+75.22	131.97'	LT	627194.72	1398145.76					1
1031+68.69	0.00'	CL	627284.72	1398280.48	1				
1036+51.13	0.00'	CL	627766.92	1398295.84	1				
1036+51.13	125.00'	LT	627770.90	1398170.91				1	
1036+51.91	131.79'	LT	627771.89	1398164.14					1
1042+98.82	131.79'	LT	628418.47	1398184.74					1
1042+99.79	145.00'	LT	628419.87	1398171.57		1			
1042+99.82	125.00'	LT	628419.26	1398191.56		1			
1043+00.79	151.79'	LT	628421.08	1398164.81					1
1044+77.84	151.79'	LT	628598.04	1398170.45					1
1044+78.84	145.00'	LT	628598.83	1398177.27		1			
1045+58.89	145.00'	LT	628678.84	1398179.82		1			
1045+59.89	151.79'	LT	628680.05	1398173.06					1
1050+79.28	0.00'	CL	629194.34	1398341.32	1				
1050+98.89	151.79'	LT	629218.81	1398190.23					1
1051+00.00	145.00'	LT	629219.71	1398197.05		1			
1052+05.94	0.45'	LT	629320.95	1398345.35	1				
1052+69.28	0.00'	CL	629384.18	1398348.89	1				
1054+74.58	5.34'	LT	629589.36	1398360.37	1				
1056+79.89	0.00'	CL	629792.23	1398393.08	1				
1056+99.04	151.79'	LT	629835.98	1398246.43					1
1057+00.00	145.00'	LT	629835.84	1398253.29		1			
1057+00.00	101.11'	LT	629828.65	1398296.59		1			
1057+01.11	107.88'	LT	629830.87	1398290.09					1
1057+43.22	0.45'	LT	629854.76	1398403.16	1				
1058+69.88	0.00'	CL	629979.28	1398426.32	1				

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Right Of Way Monuments & Markers

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	81	6

ND Highway 22 Monuments & Markers

Station	Offset		Northing	Easting	ALIGNMENT MONUMENTS	IRON PIN RW MONUMENTS	RESET RIGHT OF WAY MARKERS	IRON PIN REFERENCE MONUMENTS	RIGHT OF WAY MARKERS
1061+97.28	106.79'	LT	630320.69	1398381.20					1
1061+98.28	100.00'	LT	630320.43	1398388.06				1	
1062+46.96	106.68'	LT	630369.51	1398390.40					1
1062+49.23	100.00'	LT	630370.52	1398397.38		1			
1062+98.28	0.00'	CL	630400.45	1398504.66	1				
1063+16.04	100.00'	LT	630436.20	1398409.60		1			
1063+17.03	106.79'	LT	630438.42	1398403.10					1
1063+59.66	100.00'	RT	630442.51	1398614.20		1			
1063+60.65	106.79'	RT	630442.25	1398621.06					1
1063+97.28	106.79'	LT	630517.31	1398417.77					1
1063+97.28	106.79'	RT	630478.26	1398627.76					1
1063+98.28	100.00'	LT	630517.05	1398424.64				1	
1063+98.28	100.00'	RT	630480.48	1398621.26				1	
1065+96.22	0.00'	CL	630693.37	1398559.15	1				
1066+89.62	106.98'	RT	630766.28	1398681.33					1
1066+90.65	100.19'	RT	630768.51	1398674.84		1			
1066+93.17	105.40'	LT	630807.35	1398472.93					1
1066+99.07	106.55'	LT	630813.27	1398472.82					1
1067+00.03	99.75'	LT	630813.02	1398479.69		1			
1067+00.06	104.37'	LT	630813.85	1398475.14				1	
1067+00.11	114.75'	LT	630815.73	1398464.93		1			
1067+01.16	121.54'	LT	630817.94	1398458.43					1
1067+09.99	107.08'	RT	630786.61	1398685.07					1
1067+11.00	100.29'	RT	630788.80	1398678.56				1	
1067+22.89	0.45'	RT	630817.91	1398582.31	1				
1067+86.22	0.00'	CL	630880.44	1398592.39	1				
1068+08.09	0.00'	CL	630902.03	1398595.81	1				
1069+03.83	107.17'	RT	630982.91	1398715.65					1
1069+04.81	100.38'	RT	630984.78	1398709.05				1	
1069+26.93	121.40'	LT	631034.76	1398491.84					1
1069+27.96	114.61'	LT	631034.91	1398498.71				1	
1069+91.73	5.35'	RT	631083.51	1398625.13	1				
1071+97.23	0.00'	CL	631288.88	1398636.60	1				
1072+60.56	0.45'	RT	631352.11	1398640.14	1				
1072+92.80	100.19'	RT	631380.56	1398741.09		1			
1072+93.82	106.98'	RT	631381.35	1398747.91					1
1072+99.44	114.85'	LT	631395.21	1398526.45		1			
1073+00.41	121.65'	LT	631396.42	1398519.69					1
1073+87.22	0.00'	CL	631478.71	1398644.16	1				
1089+43.98	121.79'	LT	633038.55	1398571.84					1
1089+43.98	106.79'	RT	633031.29	1398800.31					1
1089+44.98	0.00'	CL	633035.68	1398693.61	1				
1089+44.98	115.00'	LT	633039.33	1398578.66				1	
1089+44.98	100.00'	RT	633032.51	1398793.56				1	
1089+99.00	121.79'	LT	633093.54	1398573.59					1
1090+00.00	115.00'	LT	633094.33	1398580.41		1			
1090+00.00	160.00'	LT	633095.76	1398535.43		1			
1090+01.00	166.79'	LT	633096.97	1398528.67					1
1091+98.84	106.79'	RT	633286.03	1398808.40					1
1091+99.84	150.00'	RT	633285.66	1398851.62		1			
1091+99.84	100.00'	RT	633287.24	1398801.65		1			
1092+00.84	156.79'	RT	633286.44	1398858.44					1
1094+75.20	0.00'	CL	633565.63	1398710.44	1				
1095+68.32	156.97'	RT	633654.63	1398870.14					1
1095+69.34	150.19'	RT	633655.85	1398863.38		1			

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Right Of Way Monuments & Markers

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	81	7

ND Highway 22 Monuments & Markers

Station	Offset		Northing	Easting	ALIGNMENT MONUMENTS	IRON PIN RW MONUMENTS	RESET RIGHT OF WAY MARKERS	IRON PIN REFERENCE MONUMENTS	RIGHT OF WAY MARKERS
1095+70.23	166.61'	LT	633664.91	1398546.71					1
1095+71.21	159.81'	LT	633665.69	1398553.53		1			
1096+01.86	0.45'	RT	633692.24	1398714.46	1				
1096+65.20	0.00'	CL	633755.57	1398714.94	1				
1098+83.32	166.41'	LT	633965.72	1398544.38					1
1098+84.36	159.62'	LT	633967.04	1398551.12				1	
1099+04.38	7.25'	RT	633995.04	1398716.79	1				
1099+11.11	157.18'	RT	634009.96	1398866.13					1
1099+12.08	150.38'	RT	634010.59	1398859.29				1	
1100+54.41	0.00'	CL	634144.30	1398698.78	1				
1101+43.56	0.00'	CL	634232.98	1398689.69	1				
1101+96.06	157.14'	RT	634304.67	1398839.35					1
1101+97.02	150.35'	RT	634304.81	1398832.49				1	
1102+06.89	0.45'	RT	634295.90	1398682.52	1				
1102+22.70	166.52'	LT	634290.06	1398514.92					1
1102+23.75	159.74'	LT	634291.96	1398521.52				1	
1102+37.54	159.81'	LT	634305.32	1398519.70		1			
1102+38.51	166.61'	LT	634305.38	1398512.83					1
1102+39.41	150.19'	RT	634347.80	1398826.77		1			
1102+40.43	156.97'	RT	634349.72	1398833.36					1
1102+98.64	166.78'	LT	634364.08	1398504.71					1
1102+98.90	156.80'	RT	634408.42	1398825.24					1
1102+99.66	159.99'	LT	634366.00	1398511.30		1			
1102+99.70	109.99'	LT	634372.85	1398560.83		1			
1102+99.86	100.01'	RT	634401.63	1398768.85		1			
1102+99.89	150.01'	RT	634408.48	1398818.38		1			
1103+00.69	116.79'	LT	634372.91	1398553.96					1
1103+00.85	106.80'	RT	634403.55	1398775.44					1
1103+33.55	0.00'	CL	634421.37	1398665.17	1				
1104+70.60	106.79'	RT	634571.77	1398752.17					1
1104+71.60	100.00'	RT	634571.83	1398745.31		1			
1110+61.72	0.00'	CL	635142.68	1398565.39	1				
1111+88.39	0.45'	LT	635268.16	1398548.03	1				
1111+98.81	117.37'	LT	635263.92	1398430.71					1
1111+99.88	110.59'	LT	635265.85	1398437.30		1			
1112+51.72	0.00'	CL	635331.09	1398540.86	1				
1114+96.17	118.20'	LT	635568.58	1398402.69					1
1114+97.15	111.41'	LT	635569.93	1398409.42				1	
1115+20.34	9.15'	LT	635598.39	1398510.42	1				
1115+76.15	118.19'	LT	635650.87	1398399.29					1
1115+77.11	111.40'	LT	635652.08	1398406.05		1			
1116+04.07	0.00'	CL	635682.48	1398516.65	1				
1116+41.56	111.32'	LT	635718.32	1398404.61		1			
1116+42.54	118.11'	LT	635719.24	1398397.80					1
1117+09.81	117.97'	LT	635788.52	1398397.54					1
1117+10.77	111.17'	LT	635789.49	1398404.34				1	
1117+88.96	0.00'	CL	635867.35	1398516.50	1				
1118+52.28	0.45'	LT	635930.67	1398517.93	1				
1118+99.14	116.92'	LT	635982.43	1398403.42					1
1119+00.04	110.11'	LT	635983.05	1398410.26		1			
1119+78.95	0.00'	CL	636057.20	1398523.84	1				
1122+99.00	116.79'	LT	636382.35	1398422.10					1
1123+00.00	110.00'	LT	636383.03	1398428.93		1			
1123+00.00	130.00'	LT	636383.96	1398408.95		1			
1123+01.00	136.79'	LT	636385.28	1398402.22					1

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Right Of Way Monuments & Markers

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	81	8

ND Highway 22 Monuments & Markers

Station	Offset		Northing	Easting	ALIGNMENT MONUMENTS	IRON PIN RW MONUMENTS	RESET RIGHT OF WAY MARKERS	IRON PIN REFERENCE MONUMENTS	RIGHT OF WAY MARKERS
1126+99.00	136.79'	LT	636782.84	1398420.78					1
1127+00.00	130.00'	LT	636783.53	1398427.61		1			
1127+00.00	170.00'	LT	636785.39	1398387.65		1			
1127+01.00	176.79'	LT	636786.71	1398380.92					1
1130+98.71	176.78'	LT	637183.99	1398399.47					1
1130+99.71	170.00'	LT	637184.67	1398406.29		1			
1130+99.71	120.00'	LT	637182.34	1398456.24		1			
1131+00.71	126.77'	LT	637183.65	1398449.52					1
1141+47.90	126.75'	LT	638229.70	1398498.38					1
1141+48.90	0.00'	CL	638224.78	1398625.04	1				
1141+48.90	120.00'	LT	638230.38	1398505.17		1			
1142+45.61	126.71'	LT	638326.35	1398502.57					1
1142+46.47	0.38'	RT	638322.25	1398629.59	1				
1142+46.62	0.00'	CL	638322.42	1398629.21	1				
1142+46.62	120.00'	LT	638327.08	1398509.31				1	
1143+43.03	126.62'	LT	638422.73	1398506.04					1
1143+44.04	0.00'	CL	638419.78	1398632.63	1				
1143+44.04	120.00'	LT	638423.52	1398512.69		1			
1156+98.71	126.75'	LT	639777.74	1398548.15					1
1156+99.71	120.00'	LT	639778.53	1398554.93		1			
1156+99.71	150.00'	LT	639779.47	1398524.94		1			
1157+00.71	156.77'	LT	639780.68	1398518.21					1
1167+37.41	156.75'	LT	640816.87	1398550.53					1
1167+38.41	150.00'	LT	640817.66	1398557.31				1	
1168+54.18	156.66'	LT	640933.58	1398554.26					1
1168+55.18	150.00'	LT	640934.37	1398560.95		1			
1168+88.41	0.00'	CL	640962.91	1398711.91	1				
1169+21.22	100.00'	LT	640998.82	1398612.98		1			
1169+22.21	106.79'	LT	641000.03	1398606.22					1
1169+87.41	106.79'	LT	641065.19	1398608.25					1
1169+88.41	100.00'	LT	641065.98	1398615.07				1	
1186+08.48	0.00'	CL	642682.15	1398765.50	1				
1187+98.81	108.98'	LT	642879.35	1398664.81					1
1188+00.00	102.23'	LT	642880.14	1398671.63		1			
1188+25.16	3.15'	LT	642898.82	1398772.26	1				
1189+33.48	0.00'	CL	643006.35	1398786.21	1				
1194+33.18	78.16'	LT	643517.43	1398852.54	1				
1194+43.61	105.60'	RT	643449.67	1399023.66		1			
1194+44.69	112.39'	RT	643447.72	1399030.24					1
1194+74.06	112.33'	RT	643472.44	1399042.00					1
1194+75.11	105.54'	RT	643476.31	1399036.33				1	
1194+95.23	111.56'	LT	643591.02	1398850.91					1
1194+96.19	104.77'	LT	643588.86	1398857.43				1	
1195+61.35	112.17'	RT	643544.66	1399079.51					1
1195+61.45	111.70'	LT	643653.51	1398883.89					1
1195+62.40	0.00'	CL	643600.08	1398981.98	1				
1195+62.40	104.91'	LT	643651.10	1398890.31				1	
1195+62.40	105.38'	RT	643548.82	1399074.05				1	
1195+92.03	0.00'	CL	643625.83	1398996.61	1				
1196+87.22	111.93'	LT	643768.39	1398953.29					1
1196+88.17	105.14'	LT	643765.49	1398959.52				1	
1197+01.46	111.96'	LT	643781.05	1398961.69					1
1197+02.41	105.16'	LT	643778.10	1398967.89		1			
1197+07.40	111.94'	RT	643660.76	1399150.62					1
1197+08.46	105.14'	RT	643665.39	1399145.55				1	

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Right Of Way Monuments & Markers

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	81	9

ND Highway 22 Monuments & Markers

Station	Offset		Northing	Easting	ALIGNMENT MONUMENTS	IRON PIN RW MONUMENTS	RESET RIGHT OF WAY MARKERS	IRON PIN REFERENCE MONUMENTS	RIGHT OF WAY MARKERS
1198+19.89	110.35'	LT	643882.39	1399037.15		1			
1198+20.82	117.15'	LT	643887.35	1399032.41					1
1199+32.89	0.00'	CL	643901.08	1399196.65	1				
1199+98.27	111.67'	RT	643871.49	1399321.63					1
1199+99.35	104.86'	RT	643876.94	1399317.44		1			
1200+00.29	110.49'	LT	644027.12	1399163.08		1			
1200+01.64	117.21'	LT	644032.81	1399159.24					1
1200+41.20	3.14'	RT	643981.80	1399269.05	1				
1202+57.87	0.00'	CL	644128.25	1399428.85	1				
1206+10.53	28.00'	RT	644345.87	1399707.77	1				
1206+10.53	20.00'	LT	644381.26	1399675.34	1				
1206+61.99	2.75'	RT	644399.25	1399728.66	1				
1206+61.99	2.75'	LT	644403.31	1399724.94	1				
1206+77.29	20.00'	RT	644396.87	1399751.58	1				
1206+87.22	20.00'	LT	644433.07	1399731.88	1				
1207+27.89	23.96'	RT	644428.14	1399791.57	1				
1207+28.96	8.00'	RT	644440.63	1399781.57	1				
1207+62.61	9.86'	RT	644462.00	1399807.64	1				
1207+63.11	25.92'	RT	644450.48	1399818.86	1				
1207+96.11	6.06'	RT	644487.42	1399829.77	1				
1207+98.15	21.93'	RT	644477.10	1399842.00	1				
1207+98.95	111.79'	LT	644576.23	1399752.24					1
1207+99.96	105.00'	LT	644571.90	1399757.57		1			
1208+57.78	2.18'	LT	644535.17	1399869.66	1				
1208+66.47	12.80'	RT	644529.99	1399886.19	1				
1209+03.41	116.79'	RT	644478.28	1399983.69					1
1209+04.41	110.00'	RT	644483.97	1399979.84		1			
1209+24.22	31.60'	LT	644601.74	1399898.78	1				
1209+34.04	176.39'	LT	644715.13	1399808.19					1
1209+37.87	170.69'	LT	644713.51	1399814.87				1	
1209+38.27	20.30'	LT	644602.91	1399916.76	1				
1209+40.33	16.37'	LT	644601.39	1399920.94	1				
1209+42.80	163.74'	RT	644470.28	1400044.45					1
1209+48.56	160.01'	RT	644476.92	1400046.17				1	
1209+77.00	18.16'	LT	644627.49	1399946.76	1				
1209+89.17	35.13'	LT	644648.23	1399944.27	1				
1209+96.77	223.29'	RT	644462.84	1400124.47					1
1209+98.89	204.02'	LT	644779.31	1399837.33			1		
1210+03.57	222.32'	RT	644468.15	1400128.82		1			
1210+05.67	202.99'	LT	644783.13	1399843.04		1			
1210+09.57	21.21'	RT	644620.47	1399997.38	1				
1210+10.23	169.61'	LT	644761.60	1399868.94			1		
1210+10.88	32.29'	LT	644660.80	1399962.20	1				
1210+38.32	77.73'	LT	644712.84	1399951.74	1				
1210+78.52	18.16'	LT	644696.08	1400021.62	1				
1210+79.76	99.07'	RT	644610.49	1400101.73	1				
1210+82.17	196.11'	RT	644540.58	1400169.07	1				
1210+87.03	99.27'	LT	644761.62	1399973.09	1				
1210+87.53	460.75'	LT	645028.47	1399729.23	1				
1210+88.06	346.14'	LT	644944.33	1399807.06	1				
1210+88.55	471.92'	RT	644341.55	1400360.12	1				
1210+89.67	311.58'	LT	644919.94	1399831.59	1				
1210+92.17	380.49'	LT	644972.43	1399786.88	1				
1210+97.03	231.16'	LT	644865.62	1399891.36	1				
1210+98.21	197.48'	RT	644550.40	1400181.82	1				

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Right Of Way Monuments & Markers

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	81	10

ND Highway 22 Monuments & Markers

Station	Offset		Northing	Easting	ALIGNMENT MONUMENTS	IRON PIN RW MONUMENTS	RESET RIGHT OF WAY MARKERS	IRON PIN REFERENCE MONUMENTS	RIGHT OF WAY MARKERS
1210+89.67	311.58'	LT	644919.94	1399831.59	1				
1210+92.17	380.49'	LT	644972.43	1399786.88	1				
1210+97.03	231.16'	LT	644865.62	1399891.36	1				
1210+98.21	197.48'	RT	644550.40	1400181.82	1				
1210+98.82	158.28'	RT	644579.72	1400155.78	1				
1211+01.06	146.01'	RT	644590.27	1400149.15	1				
1211+04.01	448.20'	RT	644369.48	1400355.49	1				
1211+04.10	346.12'	LT	644955.16	1399818.90	1				
1211+04.46	140.37'	LT	644803.70	1399958.17	1				
1211+05.64	312.68'	LT	644931.54	1399842.62	1				
1211+06.64	225.65'	RT	644535.33	1400207.06	1				
1211+08.15	379.35'	LT	644982.39	1399799.43	1				
1211+08.56	0.00'	CL	644702.99	1400056.03	1				
1211+09.71	448.39'	RT	644373.19	1400359.82	1				
1211+13.58	445.33'	LT	645034.70	1399758.86	1				
1211+13.88	222.70'	LT	644870.76	1399909.49	1				
1211+14.60	315.83'	RT	644474.22	1400273.86	1				
1211+14.91	382.44'	RT	644425.33	1400319.09	1				
1211+17.54	349.12'	RT	644451.66	1400298.52	1				
1211+18.42	141.49'	RT	644605.34	1400158.89	1				
1211+19.08	445.35'	LT	645038.43	1399762.90	1				
1211+19.91	156.75'	LT	644826.22	1399958.50	1				
1211+22.06	180.29'	LT	644845.03	1399944.18	1				
1211+22.54	137.70'	LT	644813.96	1399973.30	1				
1211+23.87	238.89'	RT	644537.21	1400228.71	1				
1211+29.44	401.67'	RT	644420.97	1400342.80	1				
1211+30.54	314.42'	RT	644486.03	1400284.66	1				
1211+30.86	383.69'	RT	644435.18	1400331.70	1				
1211+31.10	419.01'	RT	644409.30	1400355.74	1				
1211+31.89	99.06'	RT	644645.72	1400140.16	1				
1211+33.59	349.04'	RT	644462.57	1400310.30	1				
1211+34.21	451.69'	RT	644387.31	1400380.11	1				
1211+34.94	458.18'	LT	645058.61	1399765.92	1				
1211+37.87	197.75'	LT	644868.58	1399944.04	1				
1211+39.57	98.67'	LT	644796.69	1400012.23	1				
1211+43.28	121.97'	LT	644816.37	1399999.22	1				
1211+82.44	67.88'	RT	644702.86	1400156.35	1				
1211+88.37	60.83'	LT	644801.76	1400073.77	1				
1212+03.43	173.23'	RT	644639.37	1400243.01		1			
1212+05.20	201.13'	LT	644916.56	1399991.39		1			
1212+09.70	168.45'	LT	644895.51	1400016.79			1		
1212+10.22	174.27'	RT	644643.19	1400248.71					1
1212+12.00	202.09'	LT	644921.86	1399995.75			1		
1212+39.61	6.02'	RT	644787.09	1400156.71	1				
1212+82.08	173.51'	RT	644692.30	1400301.19				1	
1212+83.06	180.31'	RT	644687.95	1400306.50					1
1213+03.43	173.59'	RT	644706.67	1400316.98		1			
1213+05.18	196.61'	LT	644980.78	1400068.15				1	
1213+05.19	200.00'	LT	644983.29	1400065.87		1			
1213+10.23	172.62'	RT	644711.97	1400321.34					1
1213+11.96	195.58'	LT	644984.60	1400073.85					1
1213+11.98	198.97'	LT	644987.11	1400071.58					1
				Totals:	199	71	12	32	95

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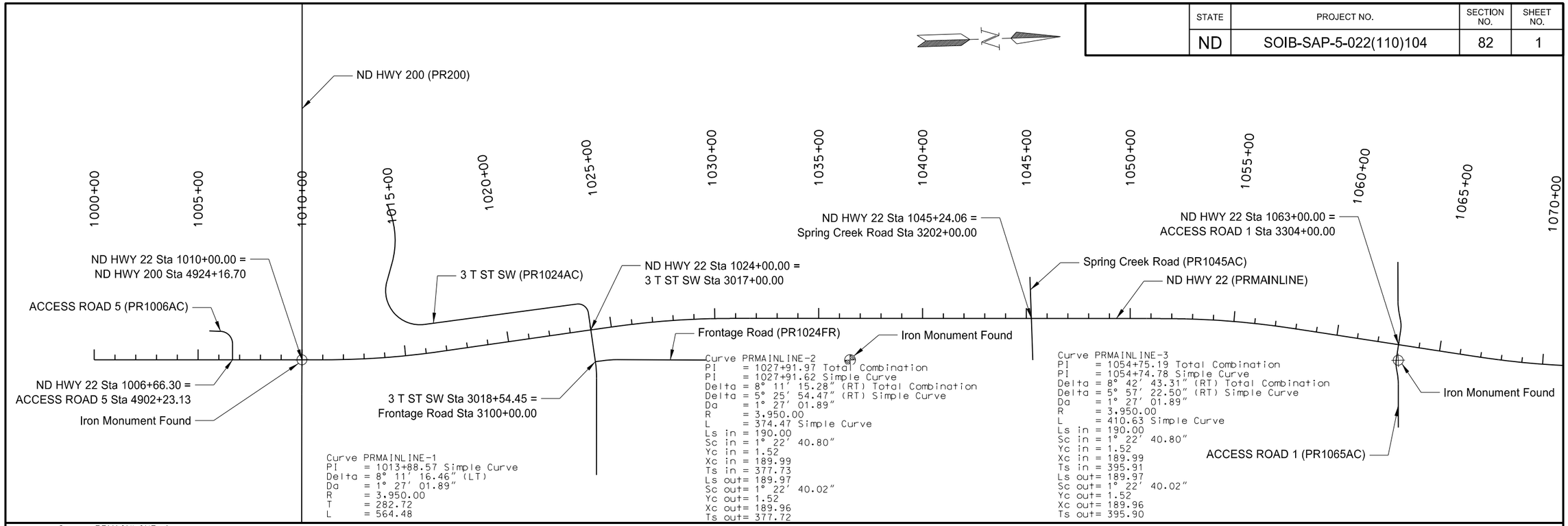
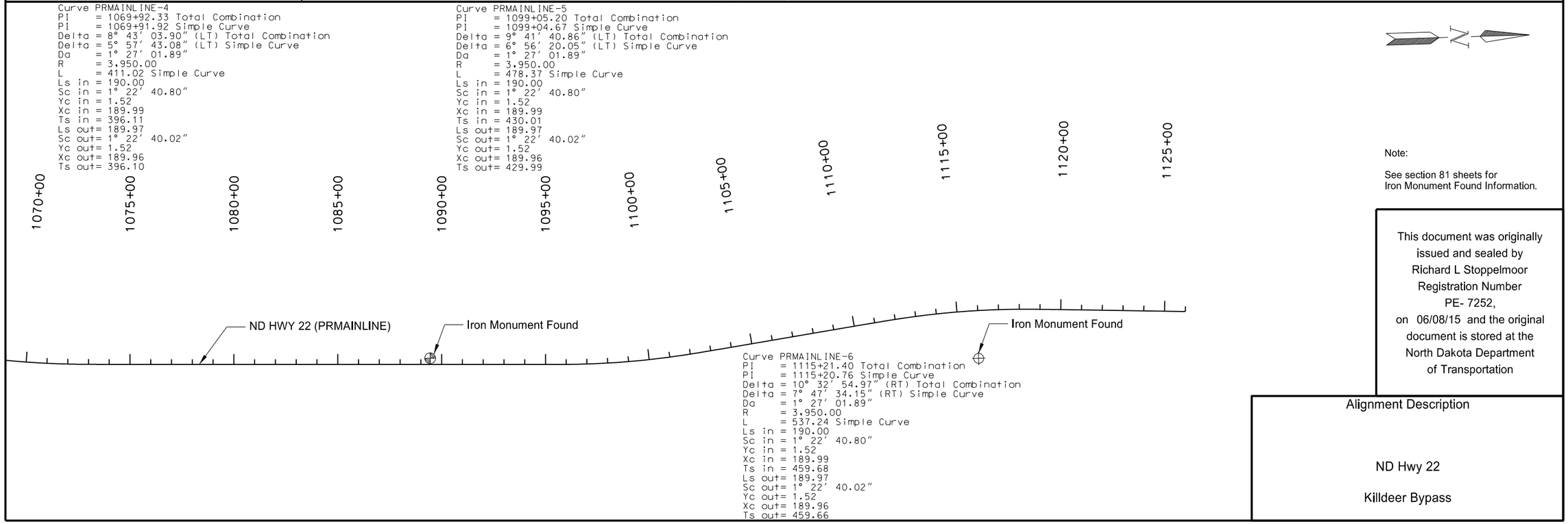
Right Of Way Monuments & Markers

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	82	1





Note:

See section 81 sheets for
Iron Monument Found Information.

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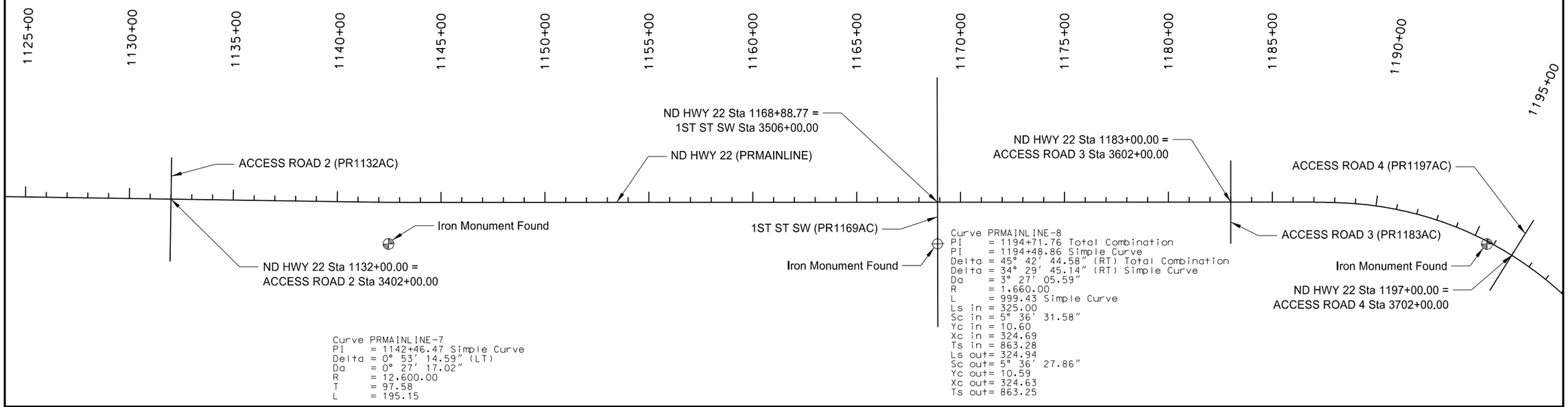
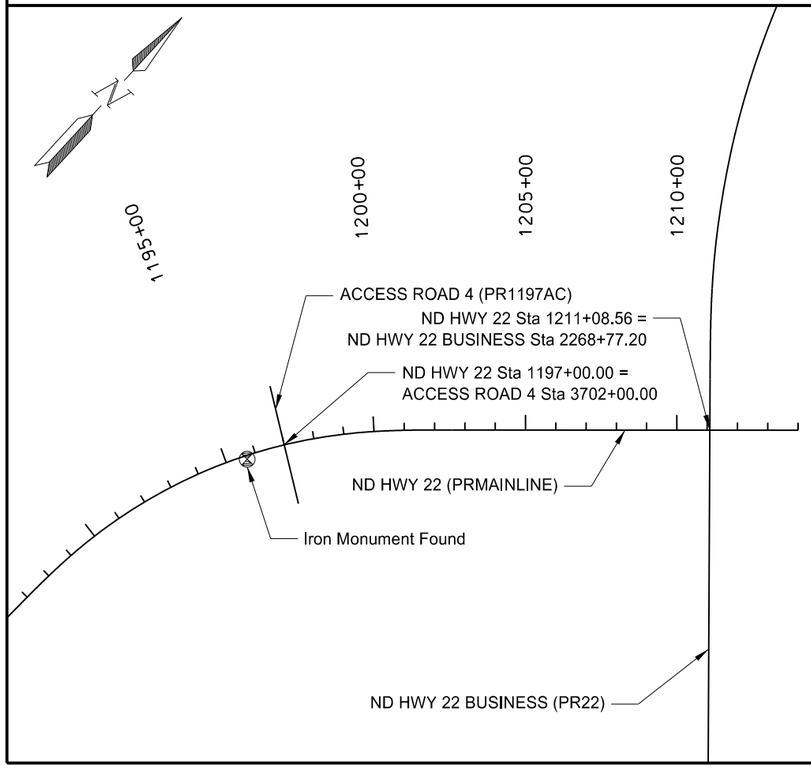
Alignment Description

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	82	2





Chain PRMAINLINE contains:
1 CUR PRMAINLINE-1 SCS PRMAINLINE-2 SCS PRMAINLINE-3 SCS PRMAINLINE-4 SCS PRMAINLINE-5 SCS PRMAINLINE-6 CUR PRMAINLINE-7 SCS PRMAINLINE-8 2

Beginning chain PRMAINLINE description
==========

Point 1 N 624,123.5895 E 1,398,380.2693 Sta 1000+00.00

Course from 1 to 2 N 1° 48' 06.80" E Dist 1,000.0001

Point 2 N 625,123.0951 E 1,398,411.7130 Sta 1010+00.00

Course from 2 to PC PRMAINLINE-1 N 1° 49' 30.40" E Dist 105.8484

Curve Data
———

Curve PRMAINLINE-1
P.I. Station 1013+88.57 N 625,511.4668 E 1,398,424.0884
Delta = 8° 11' 16.46" (LT)
Degree = 1° 27' 01.89"
Tangent = 282.7204
Length = 564.4783
Radius = 3,950.0000
External = 10.1049
Long Chord = 563.9981
Mid. Ord. = 10.0791
P.C. Station 1011+05.85 N 625,228.8898 E 1,398,415.0841
P.T. Station 1016+70.33 N 625,792.4457 E 1,398,392.7564
C.C. N 625,354.6926 E 1,394,467.0880
Back = N 1° 49' 30.40" E
Ahead = N 6° 21' 46.06" W
Chord Bear = N 2° 16' 07.83" W

Course from PT PRMAINLINE-1 to TS PRMAINLINE-2B N 6° 21' 46.06" W Dist 743.9141

SCS PRMAINLINE-2 found within chain PRMAINLINE, contains:
SPI PRMAINLINE-2B CUR PRMAINLINE-2 SPI PRMAINLINE-2A

PISCS PRMAINLINE-2 N 626,907.1843 E 1,398,268.4513 STA 1027+91.97
Total Back Tangent = 377.7343
Total Ahead Tangent = 377.7299
Total Length = 754.4508
Total Delta = 8° 11' 15.28" (RT)
Back Tangent = N 6° 21' 46.06" W
Ahead Tangent = N 1° 49' 29.23" E

Beginning SCS PRMAINLINE-2 description
———————————————————————————————

Spiral Back
Spiral PRMAINLINE-2B Type 1 Spiral Element

Angle	1° 22' 40.80" (RT)	P	0.3808	BK N	6° 21' 46.06" W
LS	190.0000	K	94.9982	AH N	4° 59' 05.26" W
R	3,950.0000	LT	126.6705	CB N	5° 54' 12.47" W
YS	1.5231	ST	63.3368	Defl	0° 27' 33.59"
XS	189.9890	LC	189.9951	Deg	1° 27' 01.89"

Spiral Coordinates
———

Point	North	East	Station
TS	626,531.7774	1,398,310.3131	1024+14.24
PI	626,657.6676	1,398,296.2750	1025+40.91
SC	626,720.7649	1,398,290.7716	1026+04.24
CC	627,063.9857	1,402,225.8319	

Circular Section
Curve Data
———

Curve PRMAINLINE-2
P.I. Station 1027+91.62 N 626,907.4320 E 1,398,274.4903
Delta = 5° 25' 54.47" (RT)
Degree = 1° 27' 01.89"
Tangent = 187.3758
Length = 374.4708
Radius = 3,950.0000
External = 4.4418
Long Chord = 374.3306
Mid. Ord. = 4.4368
P.C. Station 1026+04.24 N 626,720.7649 E 1,398,290.7716
P.T. Station 1029+78.71 N 627,094.8020 E 1,398,275.9521
C.C. N 627,063.9858 E 1,402,225.8319
Back = N 4° 59' 05.26" W
Ahead = N 0° 26' 49.21" E
Chord Bear = N 2° 16' 08.02" W

Spiral Ahead
Spiral PRMAINLINE-2A Type 2 Spiral Element

Angle	1° 22' 40.02" (RT)	P	0.3807	BK N	0° 26' 49.21" E
LS	189.9700	K	94.9832	AH N	1° 49' 29.23" E
R	3,950.0000	LT	126.6505	CB N	1° 21' 55.89" E
YS	1.5227	ST	63.3268	Defl	0° 27' 33.33"
XS	189.9590	LC	189.9651	Deg	1° 27' 01.89"

Spiral Coordinates
———

Point	North	East	Station
CS	627,094.8020	1,398,275.9521	1029+78.71
PI	627,158.1269	1,398,276.4462	1030+42.04
ST	627,284.7132	1,398,280.4791	1031+68.68
CC	627,063.9858	1,402,225.8319	

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Ending SCS PRMAINLINE-2 description

Note:

See section 81 sheets for
Iron Monument Found Information.

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Alignment Description

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	82	3

Course from ST PRMAINLINE-2A to TS PRMAINLINE-3B N 1° 49' 29.23" E Dist 1,910.5954

SCS PRMAINLINE-3 found within chain PRMAINLINE, contains:
SPI PRMAINLINE-3B CUR PRMAINLINE-3 SPI PRMAINLINE-3A

PISCS PRMAINLINE-3 N 629,590.0512 E 1,398,353.9255 STA 1054+75.19
Total Back Tangent = 395.9127
Total Ahead Tangent = 395.9083
Total Length = 790.6068
Total Delta = 8° 42' 43.31" (RT)
Back Tangent = N 1° 49' 29.23" E
Ahead Tangent = N 10° 32' 12.54" E

Beginning SCS PRMAINLINE-3 description

Spiral Back
Spiral PRMAINLINE-3B Type 1 Spiral Element

Angle 1° 22' 40.80" (RT) P 0.3808 BK N 1° 49' 29.23" E
LS 190.0000 K 94.9982 AH N 3° 12' 10.02" E
R 3,950.0000 LT 126.6705 CB N 2° 17' 02.82" E
YS 1.5231 ST 63.3368 Defl 0° 27' 33.59"
XS 189.9890 LC 189.9951 Deg 1° 27' 01.89"

Spiral Coordinates

Point	North	East	Station
TS	629,194.3397	1,398,341.3184	1050+79.28
PI	629,320.9460	1,398,345.3520	1052+05.95
SC	629,384.1839	1,398,348.8907	1052+69.28
CC	629,163.4973	1,402,292.7209	

Circular Section
Curve Data

Curve PRMAINLINE-3
P.I. Station 1054+74.78 N 629,589.3614 E 1,398,360.3719
Delta = 5° 57' 22.50" (RT)
Degree = 1° 27' 01.89"
Tangent = 205.4985
Length = 410.6268
Radius = 3,950.0000
External = 5.3419
Long Chord = 410.4419
Mid. Ord. = 5.3347
P.C. Station 1052+69.28 N 629,384.1839 E 1,398,348.8907
P.T. Station 1056+79.90 N 629,792.2399 E 1,398,393.0822
C.C. N 629,163.4973 E 1,402,292.7209
Back = N 3° 12' 10.02" E
Ahead = N 9° 09' 32.52" E
Chord Bear = N 6° 10' 51.27" E

Spiral Ahead
Spiral PRMAINLINE-3A Type 2 Spiral Element

Angle 1° 22' 40.02" (RT) P 0.3807 BK N 9° 09' 32.52" E
LS 189.9700 K 94.9832 AH N 10° 32' 12.54" E
R 3,950.0000 LT 126.6505 CB N 10° 04' 39.21" E
YS 1.5227 ST 63.3268 Defl 0° 27' 33.33"
XS 189.9590 LC 189.9651 Deg 1° 27' 01.89"

Spiral Coordinates

Point	North	East	Station
CS	629,792.2399	1,398,393.0822	1056+79.90
PI	629,854.7593	1,398,403.1622	1057+43.23
ST	629,979.2741	1,398,426.3225	1058+69.87
CC	629,163.4973	1,402,292.7209	

Ending SCS PRMAINLINE-3 description

Course from ST PRMAINLINE-3A to TS PRMAINLINE-4B N 10° 32' 12.54" E Dist 726.3488

SCS PRMAINLINE-4 found within chain PRMAINLINE, contains:
SPI PRMAINLINE-4B CUR PRMAINLINE-4 SPI PRMAINLINE-4A

PISCS PRMAINLINE-4 N 631,082.8061 E 1,398,631.5835 STA 1069+92.33
Total Back Tangent = 396.1110
Total Ahead Tangent = 396.1066
Total Length = 791.0011
Total Delta = 8° 43' 03.90" (LT)
Back Tangent = N 10° 32' 12.54" E
Ahead Tangent = N 1° 49' 08.64" E

Beginning SCS PRMAINLINE-4 description

Spiral Back
Spiral PRMAINLINE-4B Type 1 Spiral Element

Angle 1° 22' 40.80" (LT) P 0.3808 BK N 10° 32' 12.53" E
LS 190.0000 K 94.9982 AH N 9° 09' 31.74" E
R 3,950.0000 LT 126.6705 CB N 10° 04' 38.94" E
YS 1.5231 ST 63.3368 Defl 0° 27' 33.59"
XS 189.9890 LC 189.9951 Deg 1° 27' 01.89"

Spiral Coordinates

Point	North	East	Station
TS	630,693.3750	1,398,559.1479	1065+96.22
PI	630,817.9095	1,398,582.3118	1067+22.89
SC	630,880.4389	1,398,592.3932	1067+86.22
CC	631,509.1666	1,394,692.7520	

Circular Section
Curve Data

Curve PRMAINLINE-4
P.I. Station 1069+91.92 N 631,083.5126 E 1,398,625.1342
Delta = 5° 57' 43.08" (LT)
Degree = 1° 27' 01.89"
Tangent = 205.6962
Length = 411.0211
Radius = 3,950.0000
External = 5.3522
Long Chord = 410.8357
Mid. Ord. = 5.3449
P.C. Station 1067+86.22 N 630,880.4389 E 1,398,592.3932
P.T. Station 1071+97.24 N 631,288.8887 E 1,398,636.6052
C.C. N 631,509.1667 E 1,394,692.7520
Back = N 9° 09' 31.74" E
Ahead = N 3° 11' 48.65" E
Chord Bear = N 6° 10' 40.19" E

Spiral Ahead
Spiral PRMAINLINE-4A Type 2 Spiral Element

Angle 1° 22' 40.02" (LT) P 0.3807 BK N 3° 11' 48.65" E
LS 189.9700 K 94.9832 AH N 1° 49' 08.64" E
R 3,950.0000 LT 126.6505 CB N 2° 16' 41.97" E
YS 1.5227 ST 63.3268 Defl 0° 27' 33.33"
XS 189.9590 LC 189.9651 Deg 1° 27' 01.89"

Spiral Coordinates

Point	North	East	Station
CS	631,288.8887	1,398,636.6052	1071+97.24
PI	631,352.1169	1,398,640.1367	1072+60.57
ST	631,478.7036	1,398,644.1570	1073+87.21
CC	631,509.1666	1,394,692.7520	

Ending SCS PRMAINLINE-4 description

Course from ST PRMAINLINE-4A to TS PRMAINLINE-5B N 1° 49' 08.64" E Dist 2,087.9821

SCS PRMAINLINE-5 found within chain PRMAINLINE, contains:
SPI PRMAINLINE-5B CUR PRMAINLINE-5 SPI PRMAINLINE-5A

PISCS PRMAINLINE-5 N 633,995.4243 E 1,398,724.0864 STA 1099+05.20
Total Back Tangent = 430.0080
Total Ahead Tangent = 430.0035
Total Length = 858.3515
Total Delta = 9° 41' 40.86" (LT)
Back Tangent = N 1° 49' 08.64" E
Ahead Tangent = N 7° 52' 32.23" W

Beginning SCS PRMAINLINE-5 description

Spiral Back
Spiral PRMAINLINE-5B Type 1 Spiral Element

Angle 1° 22' 40.80" (LT) P 0.3808 BK N 1° 49' 08.64" E
LS 190.0000 K 94.9982 AH N 0° 26' 27.84" E
R 3,950.0000 LT 126.6705 CB N 1° 21' 35.05" E
YS 1.5231 ST 63.3368 Defl 0° 27' 33.59"
XS 189.9890 LC 189.9951 Deg 1° 27' 01.89"

Spiral Coordinates

Point	North	East	Station
TS	633,565.6335	1,398,710.4365	1094+75.20
PI	633,692.2401	1,398,714.4575	1096+01.87
SC	633,755.5751	1,398,714.9451	1096+65.20
CC	633,785.9821	1,394,765.0621	

Circular Section
Curve Data

Curve PRMAINLINE-5
P.I. Station 1099+04.67 N 633,995.0465 E 1,398,716.7886
Delta = 6° 56' 20.05" (LT)
Degree = 1° 27' 01.89"
Tangent = 239.4785
Length = 478.3715
Radius = 3,950.0000
External = 7.2528
Long Chord = 478.0792
Mid. Ord. = 7.2395
P.C. Station 1096+65.20 N 633,755.5751 E 1,398,714.9451
P.T. Station 1101+43.57 N 634,232.9866 E 1,398,689.6878
C.C. N 633,785.9821 E 1,394,765.0621
Back = N 0° 26' 27.84" E
Ahead = N 6° 29' 52.21" W
Chord Bear = N 3° 01' 42.19" W

Spiral Ahead
Spiral PRMAINLINE-5A Type 2 Spiral Element

Angle 1° 22' 40.02" (LT) P 0.3807 BK N 6° 29' 52.21" W
LS 189.9700 K 94.9832 AH N 7° 52' 32.23" W
R 3,950.0000 LT 126.6505 CB N 7° 24' 58.90" W
YS 1.5227 ST 63.3268 Defl 0° 27' 33.33"
XS 189.9590 LC 189.9651 Deg 1° 27' 01.89"

Spiral Coordinates

Point	North	East	Station
CS	634,232.9866	1,398,689.6878	1101+43.57
PI	634,295.9066	1,398,682.5214	1102+06.89
ST	634,421.3625	1,398,665.1673	1103+33.54
CC	633,785.9821	1,394,765.0621	

Ending SCS PRMAINLINE-5 description

Course from ST PRMAINLINE-5A to TS PRMAINLINE-6B N 7° 52' 32.23" W Dist 728.1874

SCS PRMAINLINE-6 found within chain PRMAINLINE, contains:
SPI PRMAINLINE-6B CUR PRMAINLINE-6 SPI PRMAINLINE-6A

PISCS PRMAINLINE-6 N 635,598.0221 E 1,398,502.4027 STA 1115+21.40
Total Back Tangent = 459.6767
Total Ahead Tangent = 459.6721
Total Length = 917.2210
Total Delta = 10° 32' 54.97" (RT)
Back Tangent = N 7° 52' 32.23" W
Ahead Tangent = N 2° 40' 22.74" E

Beginning SCS PRMAINLINE-6 description

Spiral Back
Spiral PRMAINLINE-6B Type 1 Spiral Element

Angle 1° 22' 40.80" (RT) P 0.3808 BK N 7° 52' 32.23" W
LS 190.0000 K 94.9982 AH N 6° 29' 51.43" W
R 3,950.0000 LT 126.6705 CB N 7° 24' 58.64" W
YS 1.5231 ST 63.3368 Defl 0° 27' 33.59"
XS 189.9890 LC 189.9951 Deg 1° 27' 01.89"

Spiral Coordinates

Point	North	East	Station
TS	635,142.6816	1,398,565.3889	1110+61.72
PI	635,268.1573	1,398,548.0321	1111+88.40
SC	635,331.0873	1,398,540.8648	1112+51.72
CC	635,778.0769	1,402,465.4922	

Circular Section
Curve Data

Curve PRMAINLINE-6
P.I. Station 1115+20.76 N 635,598.3945 E 1,398,510.4202
Delta = 7° 47' 34.15" (RT)
Degree = 1° 27' 01.89"
Tangent = 269.0353
Length = 537.2410
Radius = 3,950.0000
External = 9.1514
Long Chord = 536.8270
Mid. Ord. = 9.1303
P.C. Station 1112+51.72 N 635,331.0873 E 1,398,540.8648
P.T. Station 1117+88.97 N 635,867.3611 E 1,398,516.5014
C.C. N 635,778.0769 E 1,402,465.4922
Back = N 6° 29' 51.43" W
Ahead = N 1° 17' 42.72" E
Chord Bear = N 2° 36' 04.35" W

Spiral Ahead
Spiral PRMAINLINE-6A Type 2 Spiral Element

Angle 1° 22' 40.02" (RT) P 0.3807 BK N 1° 17' 42.72" E
LS 189.9700 K 94.9832 AH N 2° 40' 22.74" E
R 3,950.0000 LT 126.6505 CB N 2° 12' 49.41" E
YS 1.5227 ST 63.3268 Defl 0° 27' 33.33"
XS 189.9590 LC 189.9651 Deg 1° 27' 01.89"

Spiral Coordinates

Point	North	East	Station
CS	635,867.3611	1,398,516.5014	1117+88.97
PI	635,930.6717	1,398,517.9328	1118+52.29
ST	636,057.1844	1,398,523.8392	1119+78.94
CC	635,778.0769	1,402,465.4922	

Ending SCS PRMAINLINE-6 description

Course from ST PRMAINLINE-6A to PC PRMAINLINE-7 N 2° 40' 22.74" E Dist 2,169.9602

Curve Data

Curve PRMAINLINE-7
P.I. Station 1142+46.47 N 638,322.2526 E 1,398,629.5867
Delta = 0° 53' 14.59" (LT)
Degree = 0° 27' 17.02"
Tangent = 97.5751
Length = 195.1462
Radius = 12,600.0000
External = 0.3778
Long Chord = 195.1443
Mid. Ord. = 0.3778
P.C. Station 1141+48.90 N 638,224.7837 E 1,398,625.0363
P.T. Station 1143+44.04 N 638,419.7803 E 1,398,632.6271
C.C. N 638,812.3902 E 1,386,038.7454
Back = N 2° 40' 22.74" E
Ahead = N 1° 47' 08.15" E
Chord Bear = N 2° 13' 45.45" E

Course from PT PRMAINLINE-7 to TS PRMAINLINE-8B N 1° 47' 08.15" E Dist 4,264.4372

SCS PRMAINLINE-8 found within chain PRMAINLINE, contains:
SPI PRMAINLINE-8B CUR PRMAINLINE-8 SPI PRMAINLINE-8A

PISCS PRMAINLINE-8 N 643,545.0078 E 1,398,792.4043 STA 1194+71.76
Total Back Tangent = 863.2810
Total Ahead Tangent = 863.2718
Total Length = 1,649.3905
Total Delta = 45° 42' 44.58" (RT)
Back Tangent = N 1° 47' 08.15" E
Ahead Tangent = N 47° 29' 52.74" E

Beginning SCS PRMAINLINE-8 description

Spiral Back
Spiral PRMAINLINE-8B Type 1 Spiral Element

Angle 5° 36' 31.58" (RT) P 2.6503 BK N 1° 47' 08.15" E
LS 325.0000 K 162.4481 AH N 7° 23' 39.74" E
R 1,660.0000 LT 216.7755 CB N 3° 39' 18.14" E
YS 10.5977 ST 108.4323 Defl 1° 52' 09.98"
XS 324.6887 LC 324.8616 Deg 3° 27' 05.59"

Spiral Coordinates

Point	North	East	Station
TS	642,682.1468	1,398,765.5049	1186+08.48
PI	642,898.8171	1,398,772.2596	1188+25.25
SC	643,006.3476	1,398,786.2146	1189+33.48
CC	642,792.7086	1,400,432.4097	

Circular Section
Curve Data

Curve PRMAINLINE-8
P.I. Station 1194+48.86 N 643,517.4398 E 1,398,852.5428
Delta = 34° 29' 45.14" (RT)
Degree = 3° 27' 05.59"
Tangent = 515.3781
Length = 999.4305
Radius = 1,660.0000
External = 78.1642
Long Chord = 984.4038
Mid. Ord. = 74.6492
P.C. Station 1189+33.48 N 643,006.3476 E 1,398,786.2146
P.T. Station 1199+32.91 N 643,901.1003 E 1,399,196.6638
C.C. N 642,792.7086 E 1,400,432.4097
Back = N 7° 23' 39.74" E
Ahead = N 41° 53' 24.88" E
Chord Bear = N 24° 38' 32.31" E

Spiral Ahead
Spiral PRMAINLINE-8A Type 2 Spiral Element

Angle 5° 36' 27.86" (RT) P 2.6493 BK N 41° 53' 24.88" E
LS 324.9400 K 162.4181 AH N 47° 29' 52.74" E
R 1,660.0000 LT 216.7355 CB N 45° 37' 44.00" E
YS 10.5938 ST 108.4122 Defl 1° 52' 08.74"
XS 324.6289 LC 324.8017 Deg 3° 27' 05.59"

Spiral Coordinates

Point	North	East	Station
CS	643,901.1003	1,399,196.6638	1199+32.91
PI	643,981.8051	1,399,269.0513	1200+41.32
ST	644,128.2351	1,399,428.8403	1202+57.85
CC	642,792.7086	1,400,432.4097	

Ending SCS PRMAINLINE-8 description

Course from ST PRMAINLINE-8A to 3 N 47° 29' 52.74" E Dist 1,142.1530

Point 3 N 644,899.8921 E 1,400,270.8967 Sta 1214+00.00

Ending chain PRMAINLINE description

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Alignment Description

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	82	4

Chain PR22 contains:
1250 SCS PR22-1 1251

Beginning chain PR22 description
==========

Point 1250 N 651,310.2274 E 1,399,238.5765 Sta 2200+00.00

Course from 1250 to TS PR22-1B S 1° 49' 32.02" W Dist 4,206.3713

SCS PR22-1 found within chain PR22, contains:
SPI PR22-1B CUR PR22-1 SPI PR22-1A

PISCS PR22-1 N 645,796.8219 E 1,399,062.8487 STA 2255+16.21
Total Tangent = 1,309.8340
Total Length = 2,503.2086
Total Delta = 44° 03' 52.40" (LT)
Back Tangent = S 1° 49' 32.02" W
Ahead Tangent = S 42° 14' 20.38" E

Beginning SCS PR22-1 description
————————————————————————————

Spiral Back
Spiral PR22-1B Type 1 Spiral Element

Angle	2° 59' 59.28" (LT)	P	1.3087	BK S	1° 49' 32.02" W
LS	299.9800	K	149.9763	AH S	1° 10' 27.26" E
R	2,864.7900	LT	200.0154	CB S	0° 49' 32.34" W
YS	5.2343	ST	100.0194	Defl	0° 59' 59.68"
XS	299.8978	LC	299.9435	Deg	2° 00' 00.00"

Spiral Coordinates

Point	North	East	Station
TS	647,105.9911	1,399,104.5756	2242+06.37
PI	646,906.0772	1,399,098.2038	2244+06.39
SC	646,806.0787	1,399,100.2535	2245+06.35
CC	646,864.7866	1,401,964.4419	

Circular Section
Curve Data

Curve PR22-1
P.I. Station 2254+94.59 N 645,818.0431 E 1,399,120.5055
Delta = 38° 03' 53.85" (LT)
Degree = 2° 00' 00.00"
Tangent = 988.2431
Length = 1,903.2486
Radius = 2,864.7900
External = 165.6631
Long Chord = 1,868.4394
Mid. Ord. = 156.6070
P.C. Station 2245+06.35 N 646,806.0787 E 1,399,100.2535
P.T. Station 2264+09.60 N 645,052.6370 E 1,399,745.6278
C.C. N 646,864.7866 E 1,401,964.4419
Back = S 1° 10' 27.26" E
Ahead = S 39° 14' 21.11" E
Chord Bear = S 20° 12' 24.18" E

Spiral Ahead
Spiral PR22-1A Type 2 Spiral Element

Angle	2° 59' 59.28" (LT)	P	1.3087	BK S	39° 14' 21.11" E
LS	299.9800	K	149.9763	AH S	42° 14' 20.38" E
R	2,864.7900	LT	200.0154	CB S	41° 14' 20.71" E
YS	5.2343	ST	100.0194	Defl	0° 59' 59.68"
XS	299.8978	LC	299.9435	Deg	2° 00' 00.00"

Spiral Coordinates

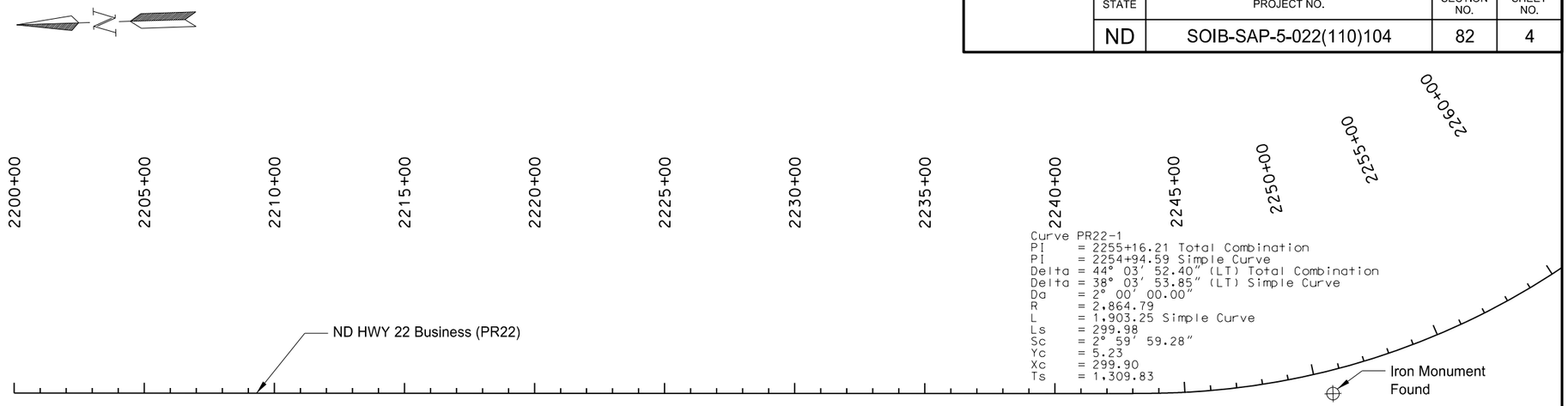
Point	North	East	Station
CS	645,052.6370	1,399,745.6278	2264+09.60
PI	644,975.1708	1,399,808.8961	2265+09.62
ST	644,827.0899	1,399,943.3514	2267+09.58
CC	646,864.7866	1,401,964.4419	

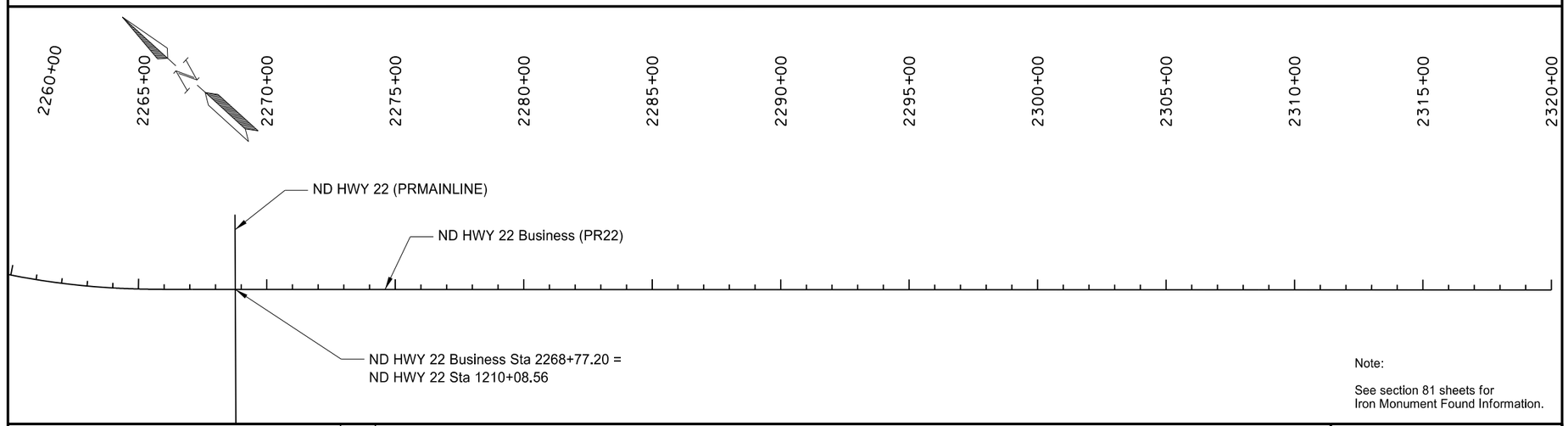
————————————————————————————
Ending SCS PR22-1 description

Course from ST PR22-1A to 1251 S 42° 14' 20.38" E Dist 5,290.4202

Point 1251 N 640,910.3419 E 1,403,499.7021 Sta 2320+00.00

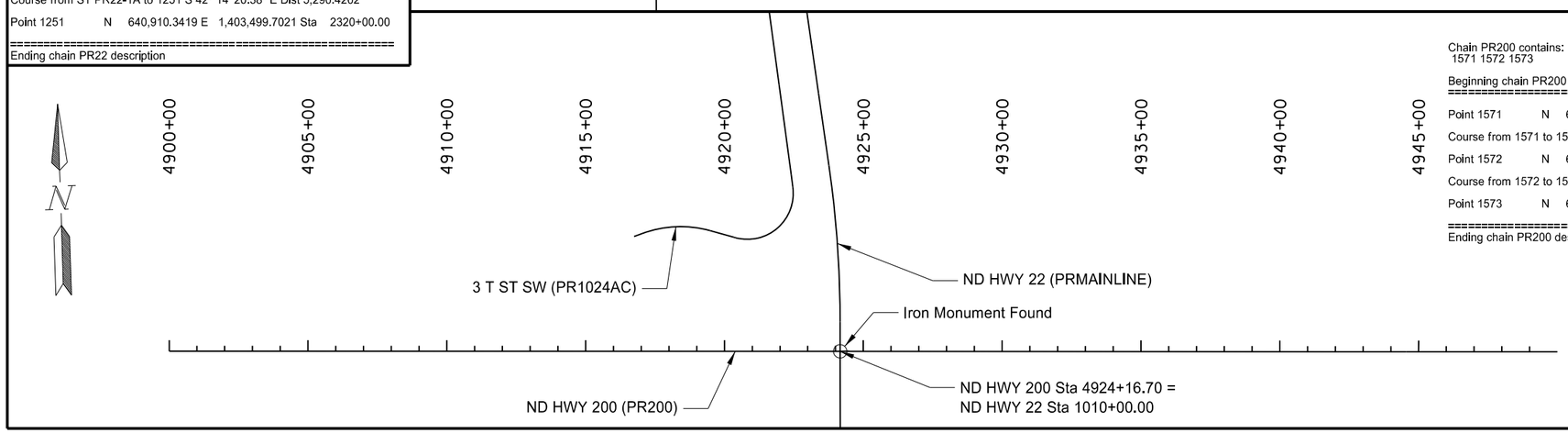
==========
Ending chain PR22 description





Note:

See section 81 sheets for
Iron Monument Found Information.



Chain PR200 contains:
1571 1572 1573

Beginning chain PR200 description
==========

Point 1571 N 625,200.7094 E 1,395,996.2633 Sta 4900+00.00

Course from 1571 to 1572 S 88° 09' 34.48" E Dist 2,416.6963

Point 1572 N 625,123.0951 E 1,398,411.7130 Sta 4924+16.70

Course from 1572 to 1573 S 88° 06' 55.99" E Dist 2,583.3037

Point 1573 N 625,038.1460 E 1,400,993.6196 Sta 4950+00.00

==========
Ending chain PR200 description

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Alignment Description

ND Hwy 22 Business/ND Hwy 200

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	82	5

Chain PR1024AC contains:
1486 CUR PR1024AC-1 CUR PR1024AC-2 CUR PR1024AC-3 CUR PR1024AC-4 1487 CUR PR1024AC-5 1488

Beginning chain PR1024AC description
==========

Point 1486 N 625,559.8927 E 1,397,683.0486 Sta 3001+00.00

Course from 1486 to PC PR1024AC-1 N 71° 33' 18.37" E Dist 30.5322

Curve Data
———

Curve PR1024AC-1
P.I. Station 3002+59.81 N 625,610.4565 E 1,397,834.6523
Delta = 35° 49' 19.31" (RT)
Degree = 14° 19' 26.20"
Tangent = 129.2814
Length = 250.0849
Radius = 400.0000
External = 20.3733
Long Chord = 246.0316
Mid. Ord. = 19.3859
P.C. Station 3001+30.53 N 625,569.5528 E 1,397,712.0123
P.T. Station 3003+80.62 N 625,571.8453 E 1,397,958.0333
C.C. N 625,190.1015 E 1,397,838.5693
Back = N 71° 33' 18.37" E
Ahead = S 72° 37' 22.32" E
Chord Bear = N 89° 27' 58.02" E

Course from PT PR1024AC-1 to PC PR1024AC-2 S 72° 37' 22.32" E Dist 88.5156

Curve Data
———

Curve PR1024AC-2
P.I. Station 3004+72.59 N 625,544.3764 E 1,398,045.8093
Delta = 0° 47' 33.15" (LT)
Degree = 11° 27' 32.96"
Tangent = 3.4582
Length = 6.9162
Radius = 500.0000
External = 0.0120
Long Chord = 6.9162
Mid. Ord. = 0.0120
P.C. Station 3004+69.13 N 625,545.4093 E 1,398,042.5090
P.T. Station 3004+76.05 N 625,543.3894 E 1,398,049.1236
C.C. N 626,022.5891 E 1,398,191.8390
Back = S 72° 37' 22.32" E
Ahead = S 73° 24' 55.47" E
Chord Bear = S 73° 01' 08.90" E

Curve Data
———

Curve PR1024AC-3
P.I. Station 3007+22.52 N 625,473.0402 E 1,398,285.3373
Delta = 112° 24' 53.92" (LT)
Degree = 34° 44' 08.01"
Tangent = 246.4668
Length = 323.6308
Radius = 164.9485
External = 131.6217
Long Chord = 274.1633
Mid. Ord. = 73.2063
P.C. Station 3004+76.05 N 625,543.3894 E 1,398,049.1236
P.T. Station 3007+99.68 N 625,718.2320 E 1,398,260.3002
C.C. N 625,701.4759 E 1,398,096.2050
Back = S 73° 24' 55.47" E
Ahead = N 5° 49' 49.39" W
Chord Bear = N 50° 22' 37.57" E

Course from PT PR1024AC-3 to PC PR1024AC-4 N 5° 49' 49.39" W Dist 739.2471

Curve Data
———

Curve PR1024AC-4
P.I. Station 3015+88.46 N 626,502.9363 E 1,398,180.1724
Delta = 89° 28' 03.33" (RT)
Degree = 114° 35' 29.61"
Tangent = 49.5375
Length = 78.0752
Radius = 50.0000
External = 20.3844
Long Chord = 70.3814
Mid. Ord. = 14.4808
P.C. Station 3015+38.93 N 626,453.6550 E 1,398,185.2046
P.T. Station 3016+17.00 N 626,508.4262 E 1,398,229.4048
C.C. N 626,458.7342 E 1,398,234.9459
Back = N 5° 49' 49.39" W
Ahead = N 83° 38' 13.94" E
Chord Bear = N 38° 54' 12.27" E

Course from PT PR1024AC-4 to 1487 N 83° 38' 13.94" E Dist 82.9978

Point 1487 N 626,517.6243 E 1,398,311.8913 Sta 3017+00.00

Course from 1487 to PC PR1024AC-5 N 83° 38' 13.94" E Dist 162.1734

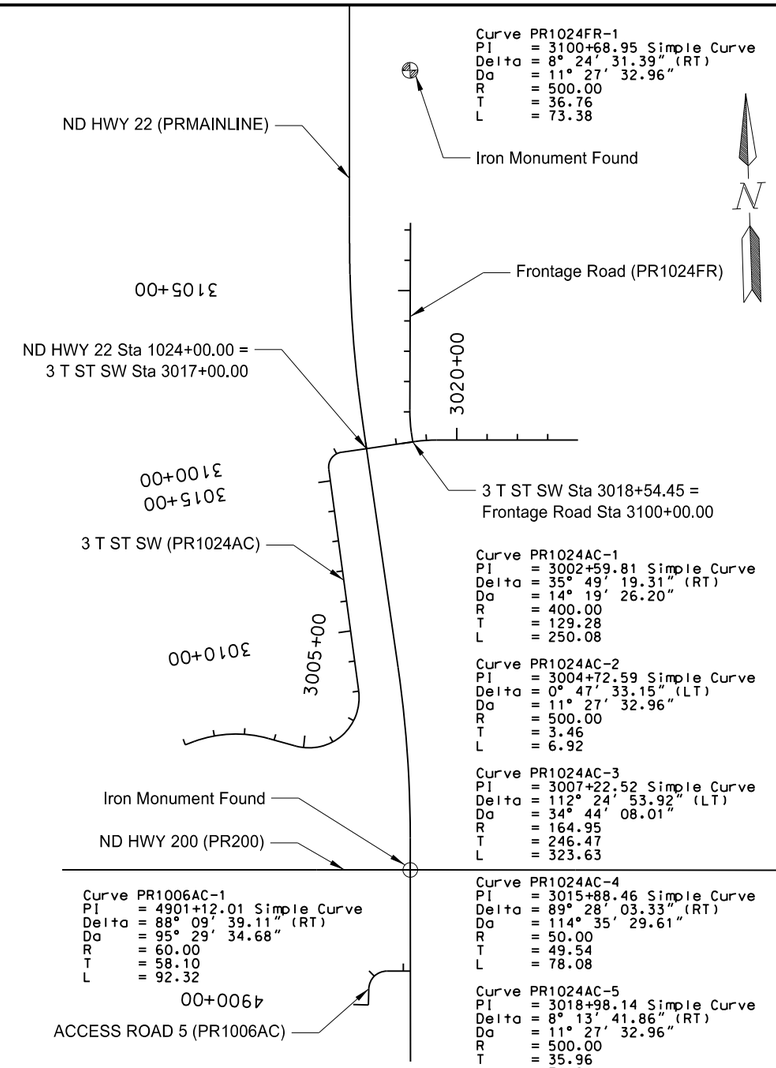
Curve Data
———

Curve PR1024AC-5
P.I. Station 3018+98.14 N 626,539.5827 E 1,398,508.8088
Delta = 8° 13' 41.86" (RT)
Degree = 11° 27' 32.96"
Tangent = 35.9645
Length = 71.8054
Radius = 500.0000
External = 1.2918
Long Chord = 71.7437
Mid. Ord. = 1.2885
P.C. Station 3018+62.17 N 626,535.5970 E 1,398,473.0658
P.T. Station 3019+33.98 N 626,538.4119 E 1,398,544.7542
C.C. N 626,038.6769 E 1,398,528.4775
Back = N 83° 38' 13.94" E
Ahead = S 88° 08' 04.20" E
Chord Bear = N 87° 45' 04.87" E

Course from PT PR1024AC-5 to 1488 S 88° 08' 04.20" E Dist 466.0212

Point 1488 N 626,523.2414 E 1,399,010.5284 Sta 3024+00.00

==========
Ending chain PR1024AC description



Curve PR1024FR-1
PI = 3100+68.95 Simple Curve
Delta = 8° 24' 31.39" (RT)
Da = 11° 27' 32.96"
R = 500.00
T = 36.76
L = 73.38

Curve PR1024AC-1
PI = 3002+59.81 Simple Curve
Delta = 35° 49' 19.31" (RT)
Da = 14° 19' 26.20"
R = 400.00
T = 129.28
L = 250.08

Curve PR1024AC-2
PI = 3004+72.59 Simple Curve
Delta = 0° 47' 33.15" (LT)
Da = 11° 27' 32.96"
R = 500.00
T = 3.46
L = 6.92

Curve PR1024AC-3
PI = 3007+22.52 Simple Curve
Delta = 112° 24' 53.92" (LT)
Da = 34° 44' 08.01"
R = 164.95
T = 246.47
L = 323.63

Curve PR1024AC-4
PI = 3015+88.46 Simple Curve
Delta = 89° 28' 03.33" (RT)
Da = 114° 35' 29.61"
R = 50.00
T = 49.54
L = 78.08

Curve PR1024AC-5
PI = 3018+98.14 Simple Curve
Delta = 8° 13' 41.86" (RT)
Da = 11° 27' 32.96"
R = 500.00
T = 35.96
L = 71.81

Curve PR1006AC-1
PI = 4901+12.01 Simple Curve
Delta = 88° 09' 39.11" (RT)
Da = 95° 29' 34.68"
R = 60.00
T = 58.10
L = 92.32

Chain PR1006AC contains:
2483 CUR PR1006AC-1 2484

Beginning chain PR1006AC description
==========

Point 2483 N 624,682.0299 E 1,398,259.0327 Sta 4900+00.00

Course from 2483 to PC PR1006AC-1 N 3° 38' 27.69" E Dist 53.9040

Curve Data
———

Curve PR1006AC-1
P.I. Station 4901+12.01 N 624,793.8121 E 1,398,266.1458
Delta = 88° 09' 39.11" (RT)
Degree = 95° 29' 34.68"
Tangent = 58.1043
Length = 92.3218
Radius = 60.0000
External = 23.5231
Long Chord = 83.4801
Mid. Ord. = 16.8982
P.C. Station 4900+53.90 N 624,735.8251 E 1,398,262.4559
P.T. Station 4901+46.23 N 624,791.9851 E 1,398,324.2214
C.C. N 624,732.0148 E 1,398,322.3347
Back = N 3° 38' 27.69" E
Ahead = S 88° 11' 53.20" E
Chord Bear = N 47° 43' 17.25" E

Course from PT PR1006AC-1 to 2484 S 88° 11' 53.20" E Dist 77.0370

Point 2484 N 624,789.5628 E 1,398,401.2203 Sta 4902+23.26

==========
Ending chain PR1006AC description

Chain PR1024FR contains:
821 CUR PR1024FR-1 822

Beginning chain PR1024FR description
==========

Point 821 N 626,534.7413 E 1,398,465.3920 Sta 3100+00.00

Course from 821 to PC PR1024FR-1 N 6° 21' 46.06" W Dist 32.1961

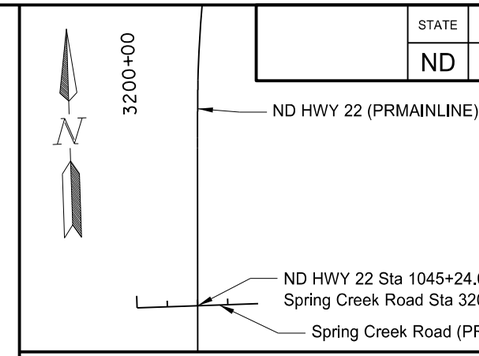
Curve Data
———

Curve PR1024FR-1
P.I. Station 3100+68.95 N 626,603.2686 E 1,398,457.7505
Delta = 8° 24' 31.39" (RT)
Degree = 11° 27' 32.96"
Tangent = 36.7560
Length = 73.3799
Radius = 500.0000
External = 1.3492
Long Chord = 73.3141
Mid. Ord. = 1.3455
P.C. Station 3100+32.20 N 626,566.7390 E 1,398,461.8239
P.T. Station 3101+05.58 N 626,640.0011 E 1,398,459.0627
C.C. N 626,622.1508 E 1,398,958.7440
Back = N 6° 21' 46.06" W
Ahead = N 2° 02' 45.33" E
Chord Bear = N 2° 09' 30.36" W

Course from PT PR1024FR-1 to 822 N 2° 02' 45.33" E Dist 617.8751

Point 822 N 627,257.4823 E 1,398,481.1212 Sta 3107+23.45

==========
Ending chain PR1024FR description



Chain PR1045AC contains:
823 824

Beginning chain PR1045AC description
==========

Point 823 N 628,638.6149 E 1,398,123.6402 Sta 3200+00.00

Course from 823 to 824 N 89° 46' 22.70" E Dist 400.0000

Point 824 N 628,640.1999 E 1,398,523.6371 Sta 3204+00.00

==========
Ending chain PR1045AC description

Chain PR1065AC contains:
827 CUR PR1065AC-1 CUR PR1065AC-2 CUR PR1065AC-3 CUR PR1065AC-4 828

Beginning chain PR1065AC description
==========

Point 827 N 630,411.8825 E 1,398,107.0677 Sta 3300+00.00

Course from 827 to PC PR1065AC-1 S 88° 21' 11.99" E Dist 191.1416

Curve Data
———

Curve PR1065AC-1
P.I. Station 3302+19.06 N 630,405.5877 E 1,398,326.0352
Delta = 10° 37' 57.53" (LT)
Degree = 19° 05' 54.94"
Tangent = 27.9164
Length = 55.6724
Radius = 300.0000
External = 1.2961
Long Chord = 55.5926
Mid. Ord. = 1.2905
P.C. Station 3301+91.14 N 630,406.3899 E 1,398,298.1303
P.T. Station 3302+46.81 N 630,409.9480 E 1,398,353.6089
C.C. N 630,706.2660 E 1,398,306.7511
Back = S 88° 21' 11.99" E
Ahead = N 81° 00' 50.48" E
Chord Bear = N 86° 19' 49.25" E

Course from PT PR1065AC-1 to PC PR1065AC-2 N 81° 00' 50.48" E Dist 34.0764

Curve Data
———

Curve PR1065AC-2
P.I. Station 3303+06.70 N 630,419.3011 E 1,398,412.7558
Delta = 19° 31' 22.05" (RT)
Degree = 38° 11' 49.87"
Tangent = 25.8054
Length = 51.1106
Radius = 150.0000
External = 2.2035
Long Chord = 50.8637
Mid. Ord. = 2.1716
P.C. Station 3302+80.89 N 630,415.2705 E 1,398,387.2671
P.T. Station 3303+32.00 N 630,414.5822 E 1,398,438.1261
C.C. N 630,267.1115 E 1,398,410.6960
Back = N 81° 00' 50.48" E
Ahead = S 79° 27' 47.46" E
Chord Bear = S 89° 13' 28.49" E

Course from PT PR1065AC-2 to PC PR1065AC-3 S 79° 27' 47.46" E Dist 135.9980

Curve Data
———

Curve PR1065AC-3
P.I. Station 3304+93.80 N 630,384.9936 E 1,398,597.2011
Delta = 19° 31' 22.05" (LT)
Degree = 38° 11' 49.87"
Tangent = 25.8054
Length = 51.1106
Radius = 150.0000
External = 2.2035
Long Chord = 50.8637
Mid. Ord. = 2.1716
P.C. Station 3304+68.00 N 630,389.7126 E 1,398,571.8308
P.T. Station 3305+19.11 N 630,389.0242 E 1,398,622.6898
C.C. N 630,537.1832 E 1,398,599.2609
Back = S 79° 27' 47.46" E
Ahead = N 81° 00' 50.48" E
Chord Bear = S 89° 13' 28.49" E

Course from PT PR1065AC-3 to PC PR1065AC-4 N 81° 00' 50.48" E Dist 15.7749

Curve Data
———

Curve PR1065AC-4
P.I. Station 3305+62.86 N 630,395.8583 E 1,398,665.9067
Delta = 10° 39' 22.92" (RT)
Degree = 19° 05' 54.94"
Tangent = 27.9790
Length = 55.7966
Radius = 300.0000
External = 1.3019
Long Chord = 55.7162
Mid. Ord. = 1.2963
P.C. Station 3305+34.88 N 630,391.4882 E 1,398,638.2711
P.T. Station 3305+90.68 N 630,395.0427 E 1,398,693.8738
C.C. N 630,095.1702 E 1,398,685.1289
Back = N 81° 00' 50.48" E
Ahead = S 88° 19' 46.60" E
Chord Bear = N 86° 20' 31.94" E

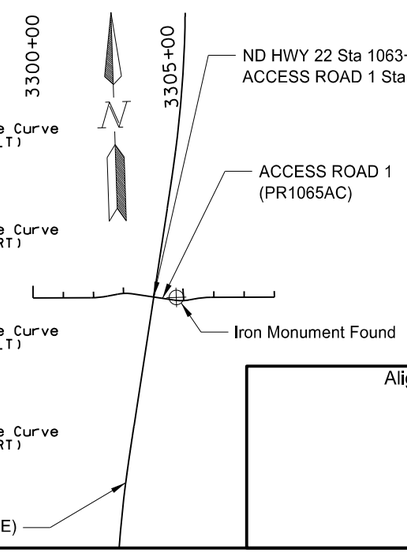
Course from PT PR1065AC-4 to 828 S 88° 19' 46.60" E Dist 209.3191

Point 828 N 630,388.9411 E 1,398,903.1039 Sta 3308+00.00

==========
Ending chain PR1065AC description

Note:

See section 81 sheets for Iron Monument Found Information.



Curve PR1065AC-1
PI = 3302+19.06 Simple Curve
Delta = 10° 37' 57.53" (LT)
Da = 19° 05' 54.94"
R = 300.00
T = 27.92
L = 55.67

Curve PR1065AC-2
PI = 3303+06.70 Simple Curve
Delta = 19° 31' 22.05" (RT)
Da = 38° 11' 49.87"
R = 150.00
T = 25.81
L = 51.11

Curve PR1065AC-3
PI = 3304+93.80 Simple Curve
Delta = 19° 31' 22.05" (LT)
Da = 38° 11' 49.87"
R = 150.00
T = 25.81
L = 51.11

Curve PR1065AC-4
PI = 3305+62.86 Simple Curve
Delta = 10° 39' 22.92" (RT)
Da = 19° 05' 54.94"
R = 300.00
T = 27.98
L = 55.80

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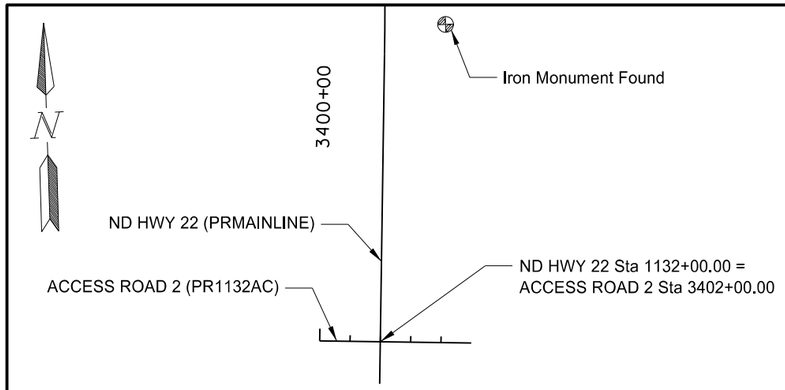
Alignment Description

Access Roads

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	82	6



Chain PR1132AC contains:
838 839

Beginning chain PR1132AC description

==========

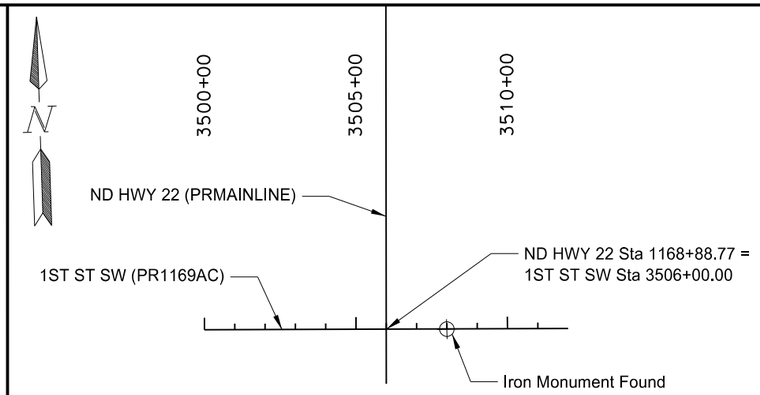
Point 838 N 637,286.2474 E 1,398,381.0017 Sta 3400+00.00

Course from 838 to 839 S 87° 19' 37.26" E Dist 500.0000

Point 839 N 637,262.9297 E 1,398,880.4577 Sta 3405+00.00

==========

Ending chain PR1132AC description



Chain PR1169AC contains:
840 841

Beginning chain PR1169AC description

==========

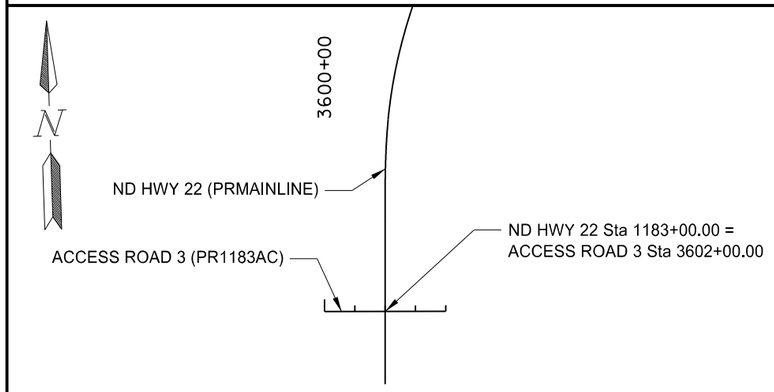
Point 840 N 640,980.4436 E 1,398,112.1646 Sta 3500+00.00

Course from 840 to 841 S 88° 21' 35.28" E Dist 1,200.0000

Point 841 N 640,946.0960 E 1,399,311.6729 Sta 3512+00.00

==========

Ending chain PR1169AC description



Chain PR1183AC contains:
842 843

Beginning chain PR1183AC description

==========

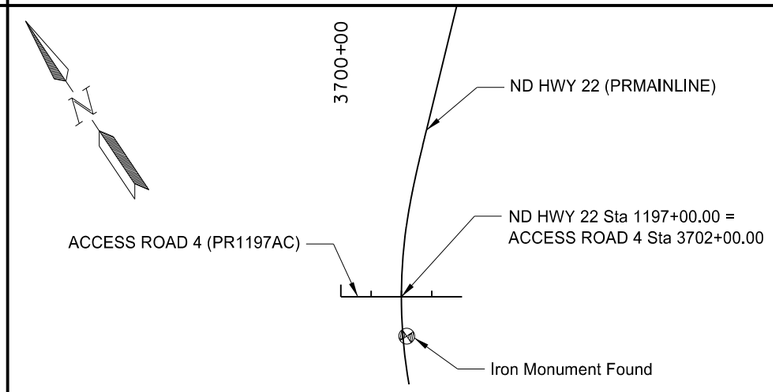
Point 842 N 642,380.0492 E 1,398,555.9900 Sta 3600+00.00

Course from 842 to 843 S 88° 12' 51.85" E Dist 400.0000

Point 843 N 642,367.5854 E 1,398,955.7958 Sta 3604+00.00

==========

Ending chain PR1183AC description



Chain PR1197AC contains:
844 845

Beginning chain PR1197AC description

==========

Point 844 N 643,828.8003 E 1,398,887.7052 Sta 3700+00.00

Course from 844 to 845 S 56° 08' 55.42" E Dist 400.0000

Point 845 N 643,605.9847 E 1,399,219.8997 Sta 3704+00.00

==========

Ending chain PR1197AC description

Note:

See section 81 sheets for
Iron Monument Found Information.

This document was originally issued and sealed by Richard L Stoppelmoor Registration Number PE- 7252, on 06/08/15 and the original document is stored at the North Dakota Department of Transportation

Alignment Description

Access Roads

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	82	7

Chain N_RAB_NE contains:
NRABNE1 CUR N_RAB_NE-1 CUR N_RAB_NE-2 CUR N_RAB_NE-3 CUR N_RAB_NE-4 CUR N_RAB_-NE-5 NRABNE2

Beginning chain N_RAB_NE description
==========

Point NRABNE1 N 644,387.3089 E 1,400,380.1124 Sta 10+00.00

Course from NRABNE1 to PC N_RAB_NE-1 N 47° 56' 58.52" W Dist 32.8290

Curve Data
———

Curve N_RAB_NE-1
P.I. Station 10+50.25 N 644,420.9651 E 1,400,342.7994
Delta = 9° 57' 21.57" (RT)
Degree = 28° 38' 52.40"
Tangent = 17.4203
Length = 34.7530
Radius = 200.0000
External = 0.7572
Long Chord = 34.7093
Mid. Ord. = 0.7544
P.C. Station 10+32.83 N 644,409.2973 E 1,400,355.7350
P.T. Station 10+67.58 N 644,434.6937 E 1,400,332.0759
C.C. N 644,557.8084 E 1,400,489.6918
Back = N 47° 56' 58.52" W
Ahead = N 37° 59' 36.95" W
Chord Bear = N 42° 58' 17.74" W

Course from PT N_RAB_NE-1 to PC N_RAB_NE-2 N 37° 59' 36.94" W Dist 0.6108

Curve Data
———

Curve N_RAB_NE-2
P.I. Station 11+02.95 N 644,462.5662 E 1,400,310.3046
Delta = 9° 33' 06.91" (LT)
Degree = 13° 46' 22.89"
Tangent = 34.7567
Length = 69.3524
Radius = 416.0000
External = 1.4494
Long Chord = 69.2721
Mid. Ord. = 1.4444
P.C. Station 10+68.19 N 644,435.1751 E 1,400,331.6999
P.T. Station 11+37.55 N 644,486.0271 E 1,400,284.6606
C.C. N 644,179.0966 E 1,400,003.8588
Back = N 37° 59' 36.95" W
Ahead = N 47° 32' 43.87" W
Chord Bear = N 42° 46' 10.41" W

Course from PT N_RAB_NE-2 to PC N_RAB_NE-3 N 47° 32' 43.87" W Dist 75.8263

Curve Data
———

Curve N_RAB_NE-3
P.I. Station 13+10.93 N 644,605.3372 E 1,400,158.8891
Delta = 44° 12' 57.24" (RT)
Degree = 23° 51' 29.03"
Tangent = 97.5547
Length = 185.3289
Radius = 240.1527
External = 19.0581
Long Chord = 180.7643
Mid. Ord. = 17.6569
P.C. Station 12+13.37 N 644,537.2102 E 1,400,228.7149
P.T. Station 13+98.70 N 644,702.8589 E 1,400,156.3531
C.C. N 644,709.1019 E 1,400,396.4246
Back = N 45° 42' 19.88" W
Ahead = N 1° 29' 22.64" W
Chord Bear = N 23° 35' 51.26" W

Curve Data
———

Curve N_RAB_NE-4
P.I. Station 14+82.93 N 644,787.0912 E 1,400,156.7130
Delta = 80° 13' 01.07" (LT)
Degree = 57° 17' 44.81"
Tangent = 84.2331
Length = 140.0050
Radius = 100.0000
External = 30.7487
Long Chord = 128.8474
Mid. Ord. = 23.5174
P.C. Station 13+98.70 N 644,702.8589 E 1,400,156.3531
P.T. Station 15+38.71 N 644,801.7585 E 1,400,073.7667
C.C. N 644,703.2861 E 1,400,056.3540
Back = N 0° 14' 41.27" E
Ahead = N 79° 58' 19.80" W
Chord Bear = N 39° 51' 49.26" W

Curve Data
———

Curve N_RAB_NE-5
P.I. Station 16+14.67 N 644,816.3709 E 1,399,999.2198
Delta = 32° 19' 21.90" (RT)
Degree = 21° 51' 26.60"
Tangent = 75.9656
Length = 147.8802
Radius = 262.1346
External = 10.7854
Long Chord = 145.9270
Mid. Ord. = 10.3592
P.C. Station 15+38.71 N 644,801.7585 E 1,400,073.7667
P.T. Station 16+86.59 N 644,868.5785 E 1,399,944.0370
C.C. N 645,058.9978 E 1,400,124.1899
Back = N 78° 54' 34.85" W
Ahead = N 46° 35' 12.95" W
Chord Bear = N 62° 44' 53.90" W

Course from PT N_RAB_NE-5 to NRABNE2 N 43° 08' 47.31" W Dist 260.4558

Point NRABNE2 N 645,058.6091 E 1,399,765.9202 Sta 19+47.04

==========
Ending chain N_RAB_NE description

Chain N_RAB_S contains:
NRABST NRABS2 CUR N_RAB_S-1 CUR N_RAB_S-2 NRABS3

Beginning chain N_RAB_S description
==========

Point NRABS1 N 644,345.8674 E 1,399,707.7712 Sta 30+00.00

Course from NRABS1 to NRABS2 N 40° 39' 52.09" E Dist 67.2355

Point NRABS2 N 644,396.8681 E 1,399,751.5837 Sta 30+67.24

Course from NRABS2 to PC N_RAB_S-1 N 51° 58' 27.85" E Dist 50.7614

Curve Data
———

Curve N_RAB_S-1
P.I. Station 31+53.27 N 644,450.4837 E 1,399,818.8588
Delta = 9° 41' 32.70" (LT)
Degree = 13° 46' 22.89"
Tangent = 35.2704
Length = 70.3725
Radius = 416.0000
External = 1.4925
Long Chord = 70.2886
Mid. Ord. = 1.4872
P.C. Station 31+18.00 N 644,428.1379 E 1,399,791.5703
P.T. Station 31+88.37 N 644,477.1048 E 1,399,841.9957
C.C. N 644,749.9950 E 1,399,528.0101
Back = N 50° 41' 12.72" E
Ahead = N 40° 59' 40.02" E
Chord Bear = N 45° 50' 26.37" E

Course from PT N_RAB_S-1 to PC N_RAB_S-2 N 39° 53' 04.51" E Dist 68.9232

Curve Data
———

Curve N_RAB_S-2
P.I. Station 34+71.59 N 644,696.0814 E 1,400,021.6166
Delta = 97° 19' 45.17" (RT)
Degree = 30° 23' 42.21"
Tangent = 214.3020
Length = 320.2139
Radius = 188.5036
External = 96.9066
Long Chord = 283.0782
Mid. Ord. = 64.0035
P.C. Station 32+57.29 N 644,529.9922 E 1,399,886.1923
P.T. Station 35+77.51 N 644,540.5754 E 1,400,169.0726
C.C. N 644,410.8707 E 1,400,032.2870
Back = N 39° 11' 34.17" E
Ahead = S 43° 28' 40.66" E
Chord Bear = N 87° 51' 26.75" E

Course from PT N_RAB_S-2 to NRABS3 S 43° 49' 39.30" E Dist 275.8790

Point NRABS3 N 644,341.5489 E 1,400,360.1162 Sta 38+53.39

==========
Ending chain N_RAB_S description

Chain N_RAB_W contains:
NRABW1 CUR N_RAB_W-1 CUR N_RAB_W-2 CUR N_RAB_W-3 NRABW2 NRABW3

Beginning chain N_RAB_W description
==========

Point NRABW1 N 645,028.4693 E 1,399,729.2307 Sta 20+00.00

Course from NRABW1 to PC N_RAB_W-1 S 45° 48' 50.81" E Dist 80.3990

Curve Data
———

Curve N_RAB_W-1
P.I. Station 21+14.99 N 644,944.3292 E 1,399,807.0559
Delta = 9° 30' 25.99" (LT)
Degree = 13° 46' 22.89"
Tangent = 34.5933
Length = 69.0278
Radius = 416.0000
External = 1.4359
Long Chord = 68.9487
Mid. Ord. = 1.4309
P.C. Station 20+80.40 N 644,972.4321 E 1,399,786.8834
P.T. Station 21+49.43 N 644,919.9443 E 1,399,831.5930
C.C. N 645,215.0145 E 1,400,124.8328
Back = S 35° 40' 15.79" E
Ahead = S 45° 10' 41.78" E
Chord Bear = S 40° 25' 28.79" E

Course from PT N_RAB_W-1 to PC N_RAB_W-2 S 47° 43' 56.52" E Dist 80.7649

Curve Data
———

Curve N_RAB_W-2
P.I. Station 23+21.28 N 644,803.7042 E 1,399,958.1721
Delta = 51° 13' 44.26" (RT)
Degree = 30° 09' 20.42"
Tangent = 91.0918
Length = 169.8817
Radius = 190.0000
External = 20.7077
Long Chord = 164.2792
Mid. Ord. = 18.6726
P.C. Station 22+30.19 N 644,865.6223 E 1,399,891.3600
P.T. Station 24+00.07 N 644,712.8400 E 1,399,951.7359
C.C. N 644,726.2649 E 1,399,762.2107
Back = S 47° 10' 38.05" E
Ahead = S 4° 03' 06.21" W
Chord Bear = S 21° 33' 45.92" E

Curve Data
———

Curve N_RAB_W-3
P.I. Station 24+65.11 N 644,648.2283 E 1,399,944.2727
Delta = 37° 47' 40.23" (RT)
Degree = 30° 09' 20.42"
Tangent = 65.0414
Length = 125.3313
Radius = 190.0000
External = 10.8242
Long Chord = 123.0714
Mid. Ord. = 10.2408
P.C. Station 24+00.07 N 644,712.8400 E 1,399,951.7359
P.T. Station 25+25.40 N 644,601.7448 E 1,399,898.7791
C.C. N 644,734.6415 E 1,399,762.9908
Back = S 6° 35' 20.04" W
Ahead = S 44° 23' 00.27" W
Chord Bear = S 25° 29' 10.15" W

Course from PT N_RAB_W-3 to NRABW2 S 44° 41' 46.59" W Dist 237.2870

Point NRABW2 N 644,433.0705 E 1,399,731.8837 Sta 27+62.69

Course from NRABW2 to NRABW3 S 47° 29' 52.74" W Dist 76.6929

Point NRABW3 N 644,381.2556 E 1,399,675.3416 Sta 28+39.38

==========
Ending chain N_RAB_W description

Chain N_RAB_CTR contains:
CUR N_RAB_CTR-1 CUR N_RAB_CTR-2 CUR N_RAB_CTR-3 CUR N_RAB_CTR-4

Beginning chain N_RAB_CTR description
==========

Curve Data
———

Curve N_RAB_CTR-1
P.I. Station 10+80.00 N 644,784.1589 E 1,399,977.2365
Delta = 90° 00' 00.00" (RT)
Degree = 71° 37' 11.01"
Tangent = 80.0000
Length = 125.6637
Radius = 80.0000
External = 33.1371
Long Chord = 113.1371
Mid. Ord. = 23.4315
P.C. Station 10+00.00 N 644,704.1637 E 1,399,976.3589
P.T. Station 11+25.66 N 644,783.2813 E 1,400,057.2316
C.C. N 644,703.2861 E 1,400,056.3540
Back = N 0° 37' 42.78" E
Ahead = S 89° 22' 17.22" E
Chord Bear = N 45° 37' 42.78" E

Curve Data
———

Curve N_RAB_CTR-2
P.I. Station 12+05.66 N 644,782.4037 E 1,400,137.2268
Delta = 90° 00' 00.00" (RT)
Degree = 71° 37' 11.01"
Tangent = 80.0000
Length = 125.6637
Radius = 80.0000
External = 33.1371
Long Chord = 113.1371
Mid. Ord. = 23.4315
P.C. Station 11+25.66 N 644,783.2813 E 1,400,057.2316
P.T. Station 12+51.33 N 644,702.4085 E 1,400,136.3492
C.C. N 644,703.2861 E 1,400,056.3540
Back = S 89° 22' 17.22" E
Ahead = S 0° 37' 42.78" W
Chord Bear = S 44° 22' 17.22" E

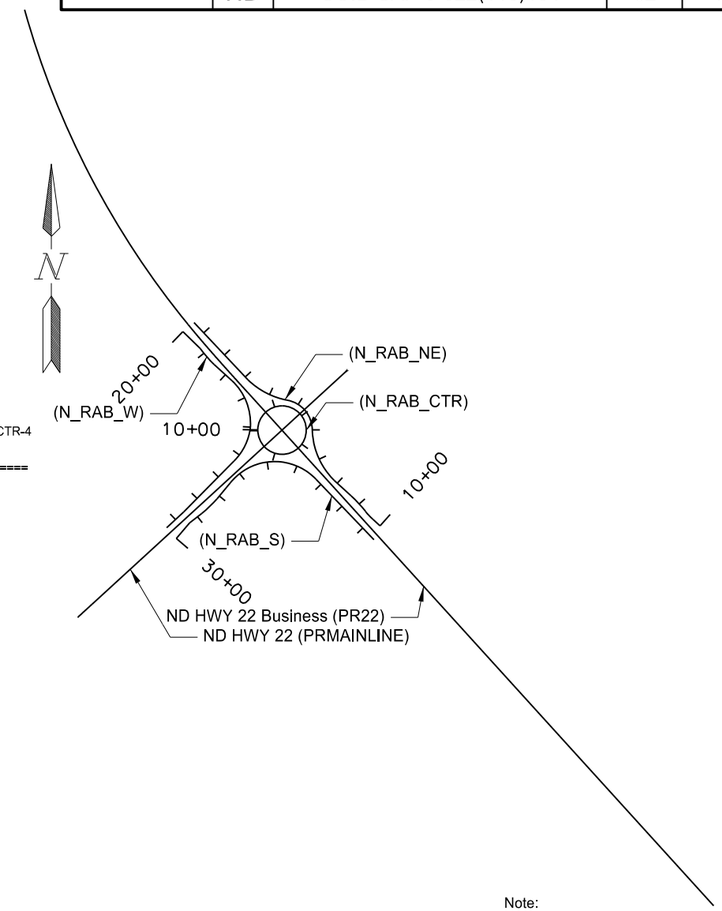
Curve Data
———

Curve N_RAB_CTR-3
P.I. Station 13+31.33 N 644,622.4134 E 1,400,135.4716
Delta = 90° 00' 00.00" (RT)
Degree = 71° 37' 11.01"
Tangent = 80.0000
Length = 125.6637
Radius = 80.0000
External = 33.1371
Long Chord = 113.1371
Mid. Ord. = 23.4315
P.C. Station 12+51.33 N 644,702.4085 E 1,400,136.3492
P.T. Station 13+76.99 N 644,623.2910 E 1,400,055.4764
C.C. N 644,703.2861 E 1,400,056.3540
Back = S 0° 37' 42.78" W
Ahead = N 89° 22' 17.22" W
Chord Bear = S 45° 37' 42.78" W

Curve Data
———

Curve N_RAB_CTR-4
P.I. Station 14+56.99 N 644,624.1686 E 1,399,975.4812
Delta = 90° 00' 00.00" (RT)
Degree = 71° 37' 11.01"
Tangent = 80.0000
Length = 125.6637
Radius = 80.0000
External = 33.1371
Long Chord = 113.1371
Mid. Ord. = 23.4315
P.C. Station 13+76.99 N 644,623.2910 E 1,400,055.4764
P.T. Station 15+02.65 N 644,704.1637 E 1,399,976.3589
C.C. N 644,703.2861 E 1,400,056.3540
Back = N 89° 22' 17.22" W
Ahead = N 0° 37' 42.78" E
Chord Bear = N 44° 22' 17.22" W

==========
Ending chain N_RAB_CTR description



Note:

See section 81 sheets for
Iron Monument Found Information.

This document was originally issued and sealed by Richard L Stoppelmoor Registration Number PE- 7252, on 06/08/15 and the original document is stored at the North Dakota Department of Transportation

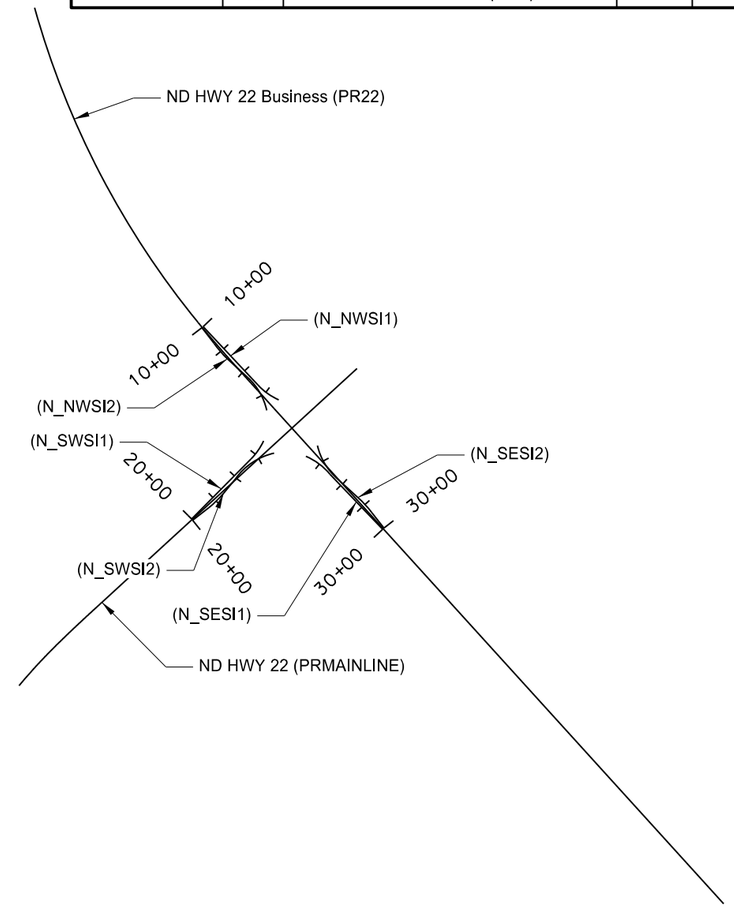
Alignment Description

North Roundabout

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	82	8



Chain N_SWSI1 contains:
NSWSIONE1 CUR N_SWSI1-1

Beginning chain N_SWSI1 description
==========

Point NSWSIONE1 N 644,403.3055 E 1,399,724.9410 Sta 20+00.00

Course from NSWSIONE1 to PC N_SWSI1-1 N 44° 41' 46.59" E Dist 278.6670

Curve Data
———

Curve N_SWSI1-1
P.I. Station 23+15.38 N 644,627.4913 E 1,399,946.7625
Delta = 19° 49' 56.94" (LT)
Degree = 27° 17' 01.34"
Tangent = 36.7122
Length = 72.6899
Radius = 210.0000
External = 3.1849
Long Chord = 72.3275
Mid. Ord. = 3.1373
P.C. Station 22+78.67 N 644,601.3946 E 1,399,920.9410
P.T. Station 23+51.36 N 644,660.8007 E 1,399,962.1986
C.C. N 644,749.0978 E 1,399,771.6635
Back = N 44° 41' 46.59" E
Ahead = N 24° 51' 49.65" E
Chord Bear = N 34° 46' 48.12" E

==========
Ending chain N_SWSI1 description

Chain N_SESI1 contains:
NSESIONE1 CUR N_SESI1-1

Beginning chain N_SESI1 description
==========

Point NSESIONE1 N 644,369.4776 E 1,400,355.4860 Sta 30+00.00

Course from NSESIONE1 to PC N_SESI1-1 N 43° 49' 39.30" W Dist 250.7862

Curve Data
———

Curve N_SESI1-1
P.I. Station 33+02.33 N 644,590.2747 E 1,400,149.1485
Delta = 27° 34' 59.45" (LT)
Degree = 27° 17' 01.34"
Tangent = 51.5483
Length = 101.0976
Radius = 210.0000
External = 6.2342
Long Chord = 100.1242
Mid. Ord. = 6.0545
P.C. Station 32+50.79 N 644,550.4015 E 1,400,181.8189
P.T. Station 33+51.88 N 644,610.4884 E 1,400,101.7288
C.C. N 644,417.3074 E 1,400,019.3814
Back = N 39° 19' 46.84" W
Ahead = N 66° 54' 46.29" W
Chord Bear = N 53° 07' 16.57" W

==========
Ending chain N_SESI1 description

Chain N_NWSI1 contains:
NNWSIONE1 CUR N_NWSI1-1

Beginning chain N_NWSI1 description
==========

Point NNWSIONE1 N 645,038.4334 E 1,399,762.9014 Sta 10+00.00

Course from NNWSIONE1 to PC N_NWSI1-1 S 43° 08' 47.31" E Dist 265.0784

Curve Data
———

Curve N_NWSI1-1
P.I. Station 13+07.67 N 644,813.9567 E 1,399,973.3047
Delta = 22° 55' 43.79" (LT)
Degree = 27° 17' 01.34"
Tangent = 42.5892
Length = 84.0386
Radius = 210.0000
External = 4.2751
Long Chord = 83.4789
Mid. Ord. = 4.1898
P.C. Station 12+65.08 N 644,845.0301 E 1,399,944.1795
P.T. Station 13+49.12 N 644,796.6853 E 1,400,012.2346
C.C. N 644,988.6420 E 1,400,097.3971
Back = S 43° 08' 47.31" E
Ahead = S 66° 04' 31.10" E
Chord Bear = S 54° 36' 39.21" E

==========
Ending chain N_NWSI1 description

Chain N_SWSI2 contains:
NSWSITWO1 CUR N_SWSI2-1 CUR N_SWSI2-2

Beginning chain N_SWSI2 description
==========

Point NSWSITWO1 N 644,399.2506 E 1,399,728.6569 Sta 20+00.00

Course from NSWSITWO1 to PC N_SWSI2-1 N 51° 58' 27.85" E Dist 67.1726

Curve Data
———

Curve N_SWSI2-1
P.I. Station 21+00.88 N 644,461.9960 E 1,399,807.6396
Delta = 9° 37' 59.69" (LT)
Degree = 14° 19' 26.20"
Tangent = 33.7058
Length = 67.2528
Radius = 400.0000
External = 1.4176
Long Chord = 67.1736
Mid. Ord. = 1.4126
P.C. Station 20+67.17 N 644,440.6298 E 1,399,781.5711
P.T. Station 21+34.43 N 644,487.4232 E 1,399,829.7651
C.C. N 644,749.9950 E 1,399,528.0101
Back = N 50° 39' 40.92" E
Ahead = N 41° 01' 41.23" E
Chord Bear = N 45° 50' 41.08" E

Course from PT N_SWSI2-1 to PC N_SWSI2-2 N 39° 53' 09.88" E Dist 62.2197

Curve Data
———

Curve N_SWSI2-2
P.I. Station 22+79.15 N 644,602.9059 E 1,399,916.7642
Delta = 42° 53' 52.83" (RT)
Degree = 27° 17' 01.34"
Tangent = 82.5054
Length = 157.2294
Radius = 210.0000
External = 15.6261
Long Chord = 153.5826
Mid. Ord. = 14.5439
P.C. Station 21+96.65 N 644,535.1657 E 1,399,869.6643
P.T. Station 23+53.87 N 644,620.4694 E 1,399,997.3785
C.C. N 644,415.2828 E 1,400,042.0826
Back = N 34° 48' 39.53" E
Ahead = N 77° 42' 32.36" E
Chord Bear = N 56° 15' 35.94" E

==========
Ending chain N_SWSI2 description

Chain N_SESI2 contains:
NSESITWO1 CUR N_SESI2-1 CUR N_SESI2-2

Beginning chain N_SESI2 description
==========

Point NSESITWO1 N 644,373.1870 E 1,400,359.8167 Sta 30+00.00

Course from NSESITWO1 to PC N_SESI2-1 N 37° 59' 36.95" W Dist 66.1595

Curve Data
———

Curve N_SESI2-1
P.I. Station 30+99.58 N 644,451.6635 E 1,400,298.5182
Delta = 9° 33' 06.91" (LT)
Degree = 14° 19' 26.20"
Tangent = 33.4199
Length = 66.6850
Radius = 400.0000
External = 1.3937
Long Chord = 66.6078
Mid. Ord. = 1.3888
P.C. Station 30+66.16 N 644,425.3259 E 1,400,319.0906
P.T. Station 31+32.84 N 644,474.2221 E 1,400,273.8605
C.C. N 644,179.0966 E 1,400,003.8588
Back = N 37° 59' 36.95" W
Ahead = N 47° 32' 43.87" W
Chord Bear = N 42° 46' 10.41" W

Course from PT N_SESI2-1 to PC N_SESI2-2 N 47° 32' 43.87" W Dist 90.5322

Curve Data
———

Curve N_SESI2-2
P.I. Station 32+91.20 N 644,579.7205 E 1,400,155.7838
Delta = 35° 47' 52.49" (RT)
Degree = 27° 17' 01.34"
Tangent = 67.8239
Length = 131.2062
Radius = 210.0000
External = 10.6810
Long Chord = 129.0825
Mid. Ord. = 10.1640
P.C. Station 32+23.38 N 644,535.3317 E 1,400,207.0646
P.T. Station 33+54.58 N 644,645.7191 E 1,400,140.1550
C.C. N 644,694.1100 E 1,400,344.5035
Back = N 49° 07' 13.63" W
Ahead = N 13° 19' 21.14" W
Chord Bear = N 31° 13' 17.39" W

==========
Ending chain N_SESI2 description

Chain N_NWSI2 contains:
NNWSITWO1 CUR N_NWSI2-1 CUR N_NWSI2-2

Beginning chain N_NWSI2 description
==========

Point NNWSITWO1 N 645,034.7002 E 1,399,758.8623 Sta 10+00.00

Course from NNWSITWO1 to PC N_NWSI2-1 S 37° 47' 43.68" E Dist 66.2016

Curve Data
———

Curve N_NWSI2-1
P.I. Station 10+99.67 N 644,955.1579 E 1,399,818.8999
Delta = 9° 34' 00.50" (LT)
Degree = 14° 19' 26.20"
Tangent = 33.4723
Length = 66.7889
Radius = 400.0000
External = 1.3980
Long Chord = 66.7114
Mid. Ord. = 1.3932
P.C. Station 10+66.20 N 644,982.3875 E 1,399,799.4336
P.T. Station 11+32.99 N 644,931.5422 E 1,399,842.6211
C.C. N 645,215.0145 E 1,400,124.8328
Back = S 35° 33' 39.16" E
Ahead = S 45° 07' 39.66" E
Chord Bear = S 40° 20' 39.41" E

Course from PT N_NWSI2-1 to PC N_NWSI2-2 S 47° 43' 56.52" E Dist 90.3630

Curve Data
———

Curve N_NWSI2-2
P.I. Station 12+89.58 N 644,826.2220 E 1,399,958.4979
Delta = 35° 00' 21.67" (RT)
Degree = 27° 17' 01.34"
Tangent = 66.2249
Length = 128.3038
Radius = 210.0000
External = 10.1948
Long Chord = 126.3175
Mid. Ord. = 9.7228
P.C. Station 12+23.35 N 644,870.7645 E 1,399,909.4907
P.T. Station 13+51.66 N 644,761.6241 E 1,399,973.0869
C.C. N 644,715.3622 E 1,399,768.2459
Back = S 47° 43' 56.52" E
Ahead = S 12° 43' 34.85" E
Chord Bear = S 30° 13' 45.69" E

==========
Ending chain N_NWSI2 description

Note:

See section 81 sheets for
Iron Monument Found Information.

This document was originally issued and sealed by Richard L Stoppelmoor Registration Number PE- 7252, on 06/08/15 and the original document is stored at the North Dakota Department of Transportation

Alignment Description

North Roundabout

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	82	9

Chain S_RAB_NW contains:
SRABNW1 SRABNW2 CUR S_RAB_NW-1 CUR S_RAB_NW-2 SRABNW3 SRABNW4

Beginning chain S_RAB_NW description
==========

Point SRABNW1 N 625,670.8687 E 1,398,376.3228 Sta 20+00.00

Course from SRABNW1 to SRABNW2 S 9° 20' 50.48" E Dist 85.8426

Point SRABNW2 N 625,586.1659 E 1,398,390.2653 Sta 20+85.84

Course from SRABNW2 to PC S_RAB_NW-1 S 1° 57' 45.28" W Dist 86.7826

Curve Data
———

Curve S_RAB_NW-1
P.I. Station 22+07.01 N 625,465.0819 E 1,398,385.7309
Delta = 9° 27' 03.54" (LT)
Degree = 13° 46' 22.89"
Tangent = 34.3878
Length = 68.6195
Radius = 416.0000
External = 1.4189
Long Chord = 68.5418
Mid. Ord. = 1.4141
P.C. Station 21+72.63 N 625,499.4342 E 1,398,387.2933
P.T. Station 22+41.24 N 625,430.9394 E 1,398,389.8305
C.C. N 625,480.5335 E 1,398,802.8637
Back = S 2° 36' 14.75" W
Ahead = S 6° 50' 48.79" E
Chord Bear = S 2° 07' 17.02" E

Course from PT S_RAB_NW-1 to PC S_RAB_NW-2 S 6° 50' 48.79" E Dist 71.5919

Curve Data
———

Curve S_RAB_NW-2
P.I. Station 25+01.29 N 625,172.8024 E 1,398,421.2343
Delta = 92° 28' 15.04" (RT)
Degree = 31° 44' 39.14"
Tangent = 188.4485
Length = 291.2999
Radius = 180.4921
External = 80.4490
Long Chord = 260.6984
Mid. Ord. = 55.6463
P.C. Station 23+12.84 N 625,359.8581 E 1,398,398.3654
P.T. Station 26+04.14 N 625,158.0189 E 1,398,233.3666
C.C. N 625,337.9547 E 1,398,219.2073
Back = S 6° 58' 12.84" E
Ahead = S 85° 30' 02.21" W
Chord Bear = S 39° 15' 54.68" W

Course from PT S_RAB_NW-2 to SRABNW3 S 89° 53' 26.93" W Dist 262.4792

Point SRABNW3 N 625,157.5187 E 1,397,970.8879 Sta 28+66.62

Course from SRABNW3 to SRABNW4 S 88° 15' 04.67" W Dist 35.9161

Point SRABNW4 N 625,156.4227 E 1,397,934.9885 Sta 29+02.53

==========
Ending chain S_RAB_NW description

Chain S_RAB_SE contains:
CUR S_RAB_SE-1 CUR S_RAB_SE-2 SRABSE2 SRABSE3

Beginning chain S_RAB_SE description
==========

Curve Data
———

Curve S_RAB_SE-1
P.I. Station 40+34.25 N 624,882.8776 E 1,398,414.4717
Delta = 41° 40' 08.75" (RT)
Degree = 63° 39' 43.12"
Tangent = 34.2499
Length = 65.4537
Radius = 90.0000
External = 6.2967
Long Chord = 64.0207
Mid. Ord. = 5.8850
P.C. Station 40+00.00 N 624,855.5712 E 1,398,435.1458
P.T. Station 40+65.45 N 624,917.0201 E 1,398,417.1823
C.C. N 624,909.8974 E 1,398,506.9000
Back = N 37° 07' 47.69" W
Ahead = N 4° 32' 21.06" E
Chord Bear = N 16° 17' 43.31" W

Curve Data
———

Curve S_RAB_SE-2
P.I. Station 42+28.09 N 625,079.1454 E 1,398,430.0534
Delta = 81° 39' 36.80" (RT)
Degree = 30° 26' 30.06"
Tangent = 162.6354
Length = 268.2513
Radius = 188.2149
External = 60.5322
Long Chord = 246.1167
Mid. Ord. = 45.8018
P.C. Station 40+65.45 N 624,917.0201 E 1,398,417.1823
P.T. Station 43+33.71 N 625,089.9256 E 1,398,592.3311
C.C. N 624,902.1246 E 1,398,604.8068
Back = N 4° 32' 21.06" E
Ahead = N 86° 11' 57.86" E
Chord Bear = N 45° 22' 09.46" E

Course from PT S_RAB_SE-2 to SRABSE2 S 89° 48' 30.09" E Dist 263.1656

Point SRABSE2 N 625,089.0453 E 1,398,855.4953 Sta 45+96.87

Course from SRABSE2 to SRABSE3 N 88° 39' 09.25" E Dist 25.5076

Point SRABSE3 N 625,089.6451 E 1,398,880.9959 Sta 46+22.38

==========
Ending chain S_RAB_SE description

Chain S_RAB_SW contains:
SRABSW1 SRABSW2 SRABSW3 CUR S_RAB_SW-1 CUR S_RAB_SW-2 SRABSW4 SRABSW5 SRABSW6

Beginning chain S_RAB_SW description
==========

Point SRABSW1 N 625,119.8341 E 1,397,873.5390 Sta 30+00.00

Course from SRABSW1 to SRABSW2 N 89° 21' 34.32" E Dist 60.2993

Point SRABSW2 N 625,120.5082 E 1,397,933.8344 Sta 30+60.30

Course from SRABSW2 to SRABSW3 S 84° 55' 47.54" E Dist 31.5562

Point SRABSW3 N 625,117.7194 E 1,397,965.2671 Sta 30+91.86

Course from SRABSW3 to PC S_RAB_SW-1 S 84° 56' 00.11" E Dist 66.2016

Curve Data
———

Curve S_RAB_SW-1
P.I. Station 31+92.88 N 625,108.7976 E 1,398,065.8959
Delta = 9° 34' 11.15" (LT)
Degree = 13° 46' 22.89"
Tangent = 34.8220
Length = 69.4819
Radius = 416.0000
External = 1.4549
Long Chord = 69.4012
Mid. Ord. = 1.4498
P.C. Station 31+58.06 N 625,111.8728 E 1,398,031.2100
P.T. Station 32+27.54 N 625,111.5316 E 1,398,100.6104
C.C. N 625,526.2474 E 1,398,067.9488
Back = S 84° 56' 00.11" E
Ahead = N 85° 29' 48.75" E
Chord Bear = S 89° 43' 05.68" E

Course from PT S_RAB_SW-1 to PC S_RAB_SW-2 N 85° 29' 48.75" E Dist 75.4082

Curve Data
———

Curve S_RAB_SW-2
P.I. Station 34+87.98 N 625,131.9798 E 1,398,360.2488
Delta = 89° 24' 53.35" (RT)
Degree = 30° 39' 01.12"
Tangent = 185.0342
Length = 291.7257
Radius = 186.9338
External = 76.0908
Long Chord = 263.0108
Mid. Ord. = 54.0783
P.C. Station 33+02.95 N 625,117.4521 E 1,398,175.7858
P.T. Station 35+94.67 N 624,947.6748 E 1,398,376.6597
C.C. N 624,931.0954 E 1,398,190.4626
Back = N 85° 29' 48.75" E
Ahead = S 5° 05' 17.90" E
Chord Bear = S 49° 47' 44.58" E

Course from PT S_RAB_SW-2 to SRABSW4 S 0° 08' 21.22" E Dist 83.9574

Point SRABSW4 N 624,863.7176 E 1,398,376.8637 Sta 36+78.63

Course from SRABSW4 to SRABSW5 S 7° 25' 48.48" E Dist 65.7251

Point SRABSW5 N 624,798.5444 E 1,398,385.3631 Sta 37+44.36

Course from SRABSW5 to SRABSW6 S 1° 49' 30.40" W Dist 13.2128

Point SRABSW6 N 624,785.3383 E 1,398,384.9423 Sta 37+57.57

==========
Ending chain S_RAB_SW description

Chain S_RAB_CTR contains:
CUR S_RAB_CTR-1 CUR S_RAB_CTR-2 CUR S_RAB_CTR-3 CUR S_RAB_CTR-4

Beginning chain S_RAB_CTR description
==========

Curve Data
———

Curve S_RAB_CTR-1
P.I. Station 40+80.00 N 625,119.5359 E 1,398,524.7941
Delta = 89° 59' 59.97" (RT)
Degree = 71° 37' 11.01"
Tangent = 80.0000
Length = 125.6637
Radius = 80.0000
External = 33.1371
Long Chord = 113.1371
Mid. Ord. = 23.4315
P.C. Station 40+00.00 N 625,177.8774 E 1,398,470.0559
P.T. Station 41+25.66 N 625,064.7977 E 1,398,466.4527
C.C. N 625,123.1392 E 1,398,411.7144
Back = S 43° 10' 29.64" E
Ahead = S 46° 49' 30.34" W
Chord Bear = S 1° 49' 30.35" W

Curve Data
———

Curve S_RAB_CTR-2
P.I. Station 42+05.66 N 625,010.0595 E 1,398,408.1112
Delta = 90° 00' 00.19" (RT)
Degree = 71° 37' 11.17"
Tangent = 80.0000
Length = 125.6637
Radius = 79.9999
External = 33.1371
Long Chord = 113.1371
Mid. Ord. = 23.4315
P.C. Station 41+25.66 N 625,064.7977 E 1,398,466.4527
P.T. Station 42+51.33 N 625,068.4010 E 1,398,353.3730
C.C. N 625,123.1391 E 1,398,411.7145
Back = S 46° 49' 30.34" W
Ahead = N 43° 10' 29.48" W
Chord Bear = N 88° 10' 29.57" W

Curve Data
———

Curve S_RAB_CTR-3
P.I. Station 43+31.33 N 625,126.7424 E 1,398,298.6349
Delta = 89° 59' 59.66" (RT)
Degree = 71° 37' 11.01"
Tangent = 79.9999
Length = 125.6636
Radius = 80.0000
External = 33.1370
Long Chord = 113.1370
Mid. Ord. = 23.4314
P.C. Station 42+51.33 N 625,068.4010 E 1,398,353.3730
P.T. Station 43+76.99 N 625,181.4806 E 1,398,356.9762
C.C. N 625,123.1392 E 1,398,411.7145
Back = N 43° 10' 29.48" W
Ahead = N 46° 49' 30.18" E
Chord Bear = N 1° 49' 30.35" E

Curve Data
———

Curve S_RAB_CTR-4
P.I. Station 44+56.99 N 625,236.2189 E 1,398,415.3177
Delta = 90° 00' 00.28" (RT)
Degree = 71° 37' 11.17"
Tangent = 80.0001
Length = 125.6637
Radius = 79.9999
External = 33.1371
Long Chord = 113.1371
Mid. Ord. = 23.4315
P.C. Station 43+76.99 N 625,181.4806 E 1,398,356.9762
P.T. Station 45+02.65 N 625,177.8774 E 1,398,470.0559
C.C. N 625,123.1392 E 1,398,411.7145
Back = N 46° 49' 30.18" E
Ahead = S 43° 10' 29.54" E
Chord Bear = S 88° 10' 29.68" E

==========
Ending chain S_RAB_CTR description

Chain S_RAB_NE contains:
SRABNE1 SRABNE2 SRABNE3 CUR S_RAB_NE-1 CUR S_RAB_NE-2 CUR S_RAB_NE-3

Beginning chain S_RAB_NE description
==========

Point SRABNE1 N 625,127.3559 E 1,398,943.0809 Sta 10+00.00

Course from SRABNE1 to SRABNE2 S 86° 10' 25.88" W Dist 37.5063

Point SRABNE2 N 625,124.8532 E 1,398,905.6582 Sta 10+37.51

Course from SRABNE2 to SRABNE3 N 84° 37' 14.91" W Dist 44.5453

Point SRABNE3 N 625,129.0292 E 1,398,861.3091 Sta 10+82.05

Course from SRABNE3 to PC S_RAB_NE-1 N 84° 38' 01.71" W Dist 66.0319

Curve Data
———

Curve S_RAB_NE-1
P.I. Station 11+82.84 N 625,138.4550 E 1,398,760.9622
Delta = 9° 33' 06.91" (LT)
Degree = 13° 46' 22.89"
Tangent = 34.7567
Length = 69.3524
Radius = 416.0000
External = 1.4494
Long Chord = 69.2721
Mid. Ord. = 1.4444
P.C. Station 11+48.08 N 625,135.2045 E 1,398,795.5666
P.T. Station 12+17.44 N 625,135.9181 E 1,398,726.2982
C.C. N 624,721.0277 E 1,398,756.6619
Back = N 84° 38' 01.71" W
Ahead = S 85° 48' 51.37" W
Chord Bear = N 89° 24' 35.17" W

Course from PT S_RAB_NE-1 to PC S_RAB_NE-2 S 85° 48' 51.37" W Dist 91.5132

Curve Data
———

Curve S_RAB_NE-2
P.I. Station 14+93.49 N 625,126.5673 E 1,398,450.5034
Delta = 88° 08' 51.00" (RT)
Degree = 30° 03' 32.85"
Tangent = 184.5449
Length = 293.2471
Radius = 190.6103
External = 74.6992
Long Chord = 265.1708
Mid. Ord. = 53.6673
P.C. Station 13+08.95 N 625,129.2386 E 1,398,635.0290
P.T. Station 16+02.20 N 625,310.9102 E 1,398,441.8685
C.C. N 625,319.8289 E 1,398,632.2700
Back = S 89° 10' 14.27" W
Ahead = N 2° 40' 54.73" W
Chord Bear = N 46° 45' 20.23" W

Course from PT S_RAB_NE-2 to PC S_RAB_NE-3 N 2° 17' 58.02" W Dist 256.1259

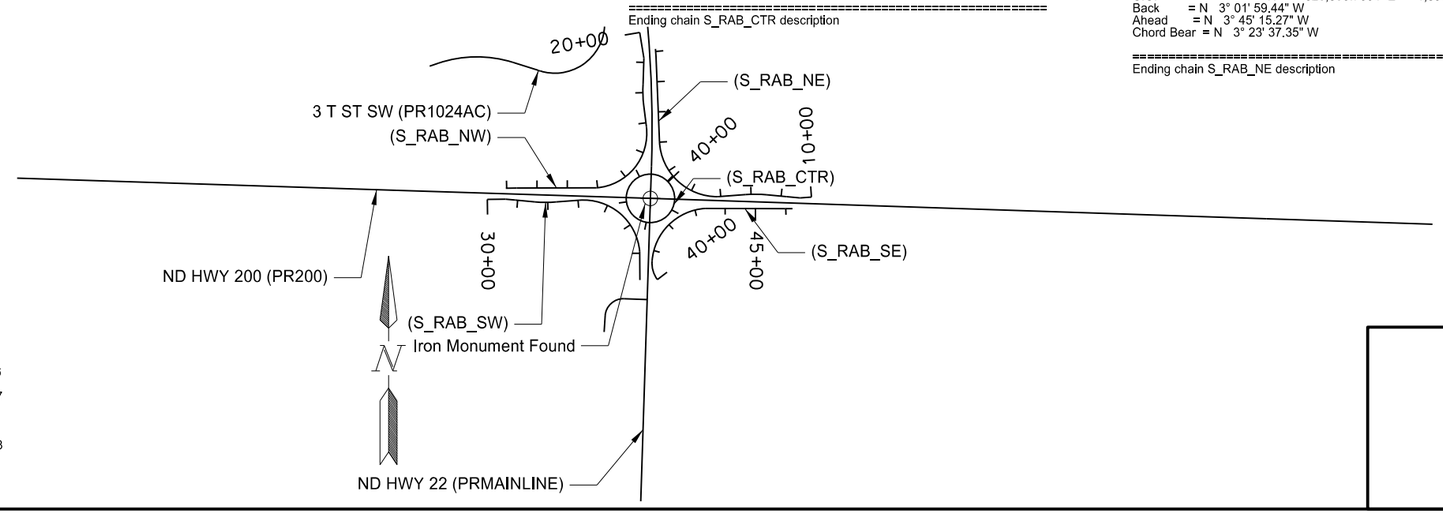
Curve Data
———

Curve S_RAB_NE-3
P.I. Station 18+83.30 N 625,591.7763 E 1,398,430.2703
Delta = 0° 43' 15.83" (LT)
Degree = 1° 26' 35.59"
Tangent = 24.9815
Length = 49.9623
Radius = 3,970.0000
External = 0.0786
Long Chord = 49.9619
Mid. Ord. = 0.0786
P.C. Station 18+58.32 N 625,566.8298 E 1,398,431.5922
P.T. Station 19+08.28 N 625,616.7041 E 1,398,428.6346
C.C. N 625,356.7604 E 1,394,467.1539
Back = N 3° 01' 59.44" W
Ahead = N 3° 45' 15.27" W
Chord Bear = N 3° 23' 37.35" W

==========
Ending chain S_RAB_NE description

Note:

See section 81 sheets for
Iron Monument Found Information.



This document was originally issued and sealed by Richard L Stoppelmoor Registration Number PE- 7252, on 06/08/15 and the original document is stored at the North Dakota Department of Transportation

Alignment Description

South Roundabout

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	82	10

Chain S_SOUTHSI1 contains:
SSOUTHSI1 CUR S_SOUTHSI1-1

Beginning chain S_SOUTHSI1 description
==========

Point SSOUTHSI1 N 624,863.7565 E 1,398,392.8637 Sta 40+00.00

Course from SSOUTHSI1 to PC S_SOUTHSI1-1 N 0° 08' 21.23" W Dist 82.3078

Curve Data
———

Curve S_SOUTHSI1-1
P.I. Station 41+23.52 N 624,987.2795 E 1,398,393.0414
Delta = 22° 14' 35.81" (LT)
Degree = 27° 19' 37.63"
Tangent = 41.2172
Length = 81.3964
Radius = 209.6664
External = 4.0129
Long Chord = 80.8862
Mid. Ord. = 3.9376
P.C. Station 40+82.31 N 624,946.0641 E 1,398,392.6636
P.T. Station 41+63.70 N 625,025.5709 E 1,398,377.7894
C.C. N 624,947.9858 E 1,398,183.0061
Back = N 0° 31' 30.59" E
Ahead = N 21° 43' 05.22" W
Chord Bear = N 10° 35' 47.32" W

==========
Ending chain S_SOUTHSI1 description

Chain S_SOUTHSI2 contains:
SSOUTHSI21 CUR S_SOUTHSI2-1

Beginning chain S_SOUTHSI2 description
==========

Point SSOUTHSI21 N 624,863.7801 E 1,398,403.0726 Sta 40+00.00

Course from SSOUTHSI21 to PC S_SOUTHSI2-1 N 4° 36' 01.55" W Dist 34.8265

Curve Data
———

Curve S_SOUTHSI2-1
P.I. Station 41+02.25 N 624,965.7504 E 1,398,395.4610
Delta = 35° 34' 48.15" (RT)
Degree = 27° 15' 55.68"
Tangent = 67.4283
Length = 130.4949
Radius = 210.1405
External = 10.5530
Long Chord = 128.4082
Mid. Ord. = 10.0484
P.C. Station 40+34.83 N 624,898.4944 E 1,398,400.2793
P.T. Station 41+65.32 N 625,023.2533 E 1,398,430.6745
C.C. N 624,913.5106 E 1,398,609.8826
Back = N 4° 05' 51.80" W
Ahead = N 31° 28' 56.34" E
Chord Bear = N 13° 41' 32.27" E

==========
Ending chain S_SOUTHSI2 description

Chain S_WESTSI1 contains:
SWESTSIONE1 CUR S_WESTSI1-1

Beginning chain S_WESTSI1 description
==========

Point SWESTSIONE1 N 625,141.5107 E 1,397,966.6802 Sta 30+00.00

Course from SWESTSIONE1 to PC S_WESTSI1-1 N 89° 53' 26.19" E Dist 265.8225

Curve Data
———

Curve S_WESTSI1-1
P.I. Station 33+08.56 N 625,141.8071 E 1,398,275.2411
Delta = 23° 14' 54.77" (LT)
Degree = 27° 34' 38.58"
Tangent = 42.7395
Length = 84.3029
Radius = 207.7636
External = 4.3505
Long Chord = 83.7258
Mid. Ord. = 4.2612
P.C. Station 32+65.82 N 625,142.0182 E 1,398,232.5021
P.T. Station 33+50.13 N 625,158.4831 E 1,398,314.5931
C.C. N 625,349.7793 E 1,398,233.5283
Back = S 89° 43' 01.22" E
Ahead = N 67° 02' 04.01" E
Chord Bear = N 78° 39' 31.40" E

==========
Ending chain S_WESTSI1 description

Chain S_WESTSI2 contains:
SWESTSI2 CUR S_WESTSI2-1 CUR S_WESTSI2-2

Beginning chain S_WESTSI2 description
==========

Point SWESTSI2 N 625,133.6569 E 1,397,966.6802 Sta 30+00.00

Course from SWESTSI2 to PC S_WESTSI2-1 S 84° 56' 00.11" E Dist 66.2016

Curve Data
———

Curve S_WESTSI2-1
P.I. Station 30+99.68 N 625,124.8533 E 1,398,065.9749
Delta = 9° 34' 11.15" (LT)
Degree = 14° 19' 26.20"
Tangent = 33.4826
Length = 66.8095
Radius = 400.0000
External = 1.3989
Long Chord = 66.7319
Mid. Ord. = 1.3940
P.C. Station 30+66.20 N 625,127.8103 E 1,398,032.6231
P.T. Station 31+33.01 N 625,127.4822 E 1,398,099.3542
C.C. N 625,526.2474 E 1,398,067.9488
Back = S 84° 56' 00.11" E
Ahead = N 85° 29' 48.75" E
Chord Bear = S 89° 43' 05.68" E

Course from PT S_WESTSI2-1 to PC S_WESTSI2-2 N 85° 29' 48.92" E Dist 90.0048

Curve Data
———

Curve S_WESTSI2-2
P.I. Station 32+89.33 N 625,138.7050 E 1,398,255.2642
Delta = 35° 02' 06.50" (RT)
Degree = 27° 16' 16.98"
Tangent = 66.3135
Length = 128.4685
Radius = 210.0949
External = 10.2170
Long Chord = 126.4764
Mid. Ord. = 9.7432
P.C. Station 32+23.02 N 625,134.5487 E 1,398,189.0811
P.T. Station 33+51.48 N 625,104.1139 E 1,398,311.8410
C.C. N 624,924.8669 E 1,398,202.2492
Back = N 86° 24' 23.51" E
Ahead = S 58° 33' 29.98" E
Chord Bear = S 76° 04' 33.24" E

==========
Ending chain S_WESTSI2 description

Chain S_EASTSI1 contains:
SEASTSIONE1 CUR S_EASTSI1-1

Beginning chain S_EASTSI1 description
==========

Point SEASTSIONE1 N 625,105.0319 E 1,398,859.5488 Sta 10+00.00

Course from SEASTSIONE1 to PC S_EASTSI1-1 N 89° 48' 30.08" W Dist 266.5500

Curve Data
———

Curve S_EASTSI1-1
P.I. Station 13+09.84 N 625,106.7211 E 1,398,549.7143
Delta = 23° 20' 13.53" (LT)
Degree = 27° 19' 52.24"
Tangent = 43.2934
Length = 85.3863
Radius = 209.6352
External = 4.4237
Long Chord = 84.7973
Mid. Ord. = 4.3323
P.C. Station 12+66.55 N 625,105.9234 E 1,398,593.0003
P.T. Station 13+51.94 N 625,090.3062 E 1,398,509.6535
C.C. N 624,896.3238 E 1,398,589.1376
Back = N 88° 56' 39.24" W
Ahead = S 67° 43' 07.23" W
Chord Bear = S 79° 23' 13.99" W

==========
Ending chain S_EASTSI1 description

Chain S_EASTSI2 contains:
SEASTSITWO1 CUR S_EASTSI2-1 CUR S_EASTSI2-2

Beginning chain S_EASTSI2 description
==========

Point SEASTSITWO1 N 625,113.0873 E 1,398,859.9398 Sta 10+00.00

Course from SEASTSITWO1 to PC S_EASTSI2-1 N 84° 38' 01.71" W Dist 66.1595

Curve Data
———

Curve S_EASTSI2-1
P.I. Station 10+99.58 N 625,122.4001 E 1,398,760.7968
Delta = 9° 33' 06.91" (LT)
Degree = 14° 19' 26.20"
Tangent = 33.4199
Length = 66.6850
Radius = 400.0000
External = 1.3937
Long Chord = 66.6078
Mid. Ord. = 1.3888
P.C. Station 10+66.16 N 625,119.2746 E 1,398,794.0702
P.T. Station 11+32.84 N 625,119.9608 E 1,398,727.4660
C.C. N 624,721.0277 E 1,398,756.6619
Back = N 84° 38' 01.71" W
Ahead = S 85° 48' 51.37" W
Chord Bear = N 89° 24' 35.17" W

Course from PT S_EASTSI2-1 to PC S_EASTSI2-2 S 85° 48' 51.37" W Dist 90.5322

Curve Data
———

Curve S_EASTSI2-2
P.I. Station 12+91.22 N 625,107.7827 E 1,398,569.5659
Delta = 35° 47' 15.23" (RT)
Degree = 27° 16' 09.96"
Tangent = 67.8385
Length = 131.2369
Radius = 210.1099
External = 10.6801
Long Chord = 129.1139
Mid. Ord. = 10.1635
P.C. Station 12+23.38 N 625,113.3529 E 1,398,637.1753
P.T. Station 13+54.61 N 625,142.8010 E 1,398,511.4645
C.C. N 625,322.7533 E 1,398,619.9234
Back = S 85° 17' 24.78" W
Ahead = N 58° 55' 19.99" W
Chord Bear = N 76° 48' 57.61" W

==========
Ending chain S_EASTSI2 description

Chain S_NORTHSI1 contains:
SNORTHSIONE1 CUR S_NORTHSI1-1

Beginning chain S_NORTHSI1 description
==========

Point SNORTHSIONE1 N 625,569.2025 E 1,398,415.4840 Sta 20+00.00

Course from SNORTHSIONE1 to PC S_NORTHSI1-1 S 2° 17' 50.65" E Dist 257.5299

Curve Data
———

Curve S_NORTHSI1-1
P.I. Station 23+04.58 N 625,264.8608 E 1,398,424.1664
Delta = 25° 18' 22.79" (LT)
Degree = 27° 20' 25.37"
Tangent = 47.0475
Length = 92.5603
Radius = 209.5647
External = 5.2162
Long Chord = 91.8097
Mid. Ord. = 5.0895
P.C. Station 22+57.53 N 625,311.8796 E 1,398,425.8075
P.T. Station 23+50.09 N 625,221.6526 E 1,398,442.7813
C.C. N 625,304.5695 E 1,398,635.2446
Back = S 1° 59' 56.45" W
Ahead = S 23° 18' 26.34" E
Chord Bear = S 10° 39' 14.94" E

==========
Ending chain S_NORTHSI1 description

Chain S_NORTHSI2 contains:
SNORTHSITWO1 CUR S_NORTHSI2-1 CUR S_NORTHSI2-2

Beginning chain S_NORTHSI2 description
==========

Point SNORTHSITWO1 N 625,568.8089 E 1,398,405.6799 Sta 20+00.00

Course from SNORTHSITWO1 to PC S_NORTHSI2-1 S 1° 57' 48.23" W Dist 70.1428

Curve Data
———

Curve S_NORTHSI2-1
P.I. Station 21+03.21 N 625,465.6762 E 1,398,401.7744
Delta = 9° 27' 03.54" (LT)
Degree = 14° 19' 26.20"
Tangent = 33.0652
Length = 65.9803
Radius = 400.0000
External = 1.3643
Long Chord = 65.9055
Mid. Ord. = 1.3597
P.C. Station 20+70.14 N 625,498.7072 E 1,398,403.2767
P.T. Station 21+36.12 N 625,432.8469 E 1,398,405.7164
C.C. N 625,480.5335 E 1,398,802.8637
Back = S 2° 36' 14.75" W
Ahead = S 6° 50' 48.79" E
Chord Bear = S 2° 07' 17.02" E

Course from PT S_NORTHSI2-1 to PC S_NORTHSI2-2 S 6° 50' 48.79" E Dist 92.3816

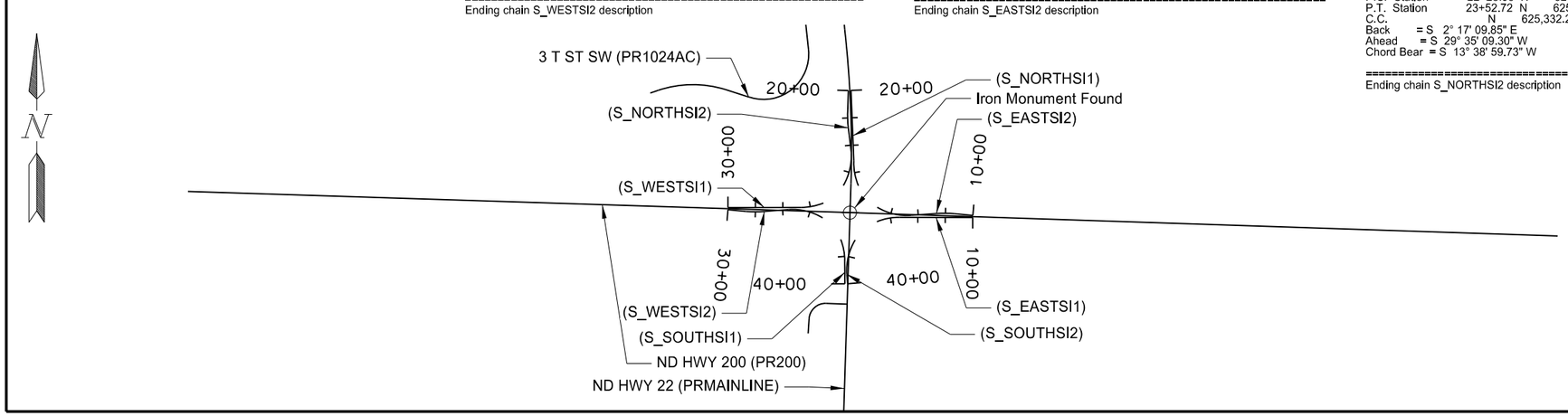
Curve Data
———

Curve S_NORTHSI2-2
P.I. Station 22+92.27 N 625,277.4143 E 1,398,419.2731
Delta = 31° 52' 19.16" (RT)
Degree = 25° 39' 30.86"
Tangent = 63.7606
Length = 124.2157
Radius = 223.3007
External = 8.9247
Long Chord = 122.6204
Mid. Ord. = 8.5817
P.C. Station 22+28.50 N 625,341.1241 E 1,398,416.7298
P.T. Station 23+52.72 N 625,221.9670 E 1,398,387.7927
C.C. N 625,332.2169 E 1,398,193.6068
Back = S 2° 17' 09.85" E
Ahead = S 29° 35' 09.30" W
Chord Bear = S 13° 38' 59.73" W

==========
Ending chain S_NORTHSI2 description

Note:

See section 81 sheets for
Iron Monument Found Information.



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Alignment Description

South Roundabout

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	82	11

Chain PR_TMPNRAB contains:
8101 CUR PR_TMPNRAB-1 CUR PR_TMPNRAB-2 CUR PR_TMPNRAB-3
CUR PR_TMPNRAB-4 CUR PR_TMPNRAB-5 8102

Beginning chain PR_TMPNRAB description
==========

Point 8101 N 645,302.5314 E 1,399,563.1131 Sta 300+00.00

Course from 8101 to PC PR_TMPNRAB-1 S 33° 09' 01.80" E Dist 10.3294

Curve Data
———

Curve PR_TMPNRAB-1
P.I. Station 301+33.30 N 645,191.0532 E 1,399,636.1898
Delta = 18° 37' 19.57" (RT)
Degree = 7° 38' 21.97"
Tangent = 122.9658
Length = 243.7628
Radius = 750.0000
External = 10.0135
Long Chord = 242.6913
Mid. Ord. = 9.8816
P.C. Station 300+10.33 N 645,293.8833 E 1,399,568.7617
P.T. Station 302+54.09 N 645,072.0752 E 1,399,667.2515
C.C. N 644,882.6218 E 1,398,941.5743
Back = S 33° 15' 13.66" E
Ahead = S 14° 37' 54.08" E
Chord Bear = S 23° 56' 33.87" E

Curve Data
———

Curve PR_TMPNRAB-2
P.I. Station 303+84.13 N 644,946.2530 E 1,399,700.1000
Delta = 19° 40' 22.75" (LT)
Degree = 7° 38' 21.97"
Tangent = 130.0395
Length = 257.5188
Radius = 750.0000
External = 11.1900
Long Chord = 256.2556
Mid. Ord. = 11.0255
P.C. Station 302+54.09 N 645,072.0752 E 1,399,667.2515
P.T. Station 305+11.61 N 644,838.8336 E 1,399,773.3894
C.C. N 645,261.5286 E 1,400,392.9287
Back = S 14° 37' 54.08" E
Ahead = S 34° 18' 16.83" E
Chord Bear = S 24° 28' 05.45" E

Course from PT PR_TMPNRAB-2 to PC PR_TMPNRAB-3 S 34° 18' 16.83" E Dist 242.2929

Curve Data
———

Curve PR_TMPNRAB-3
P.I. Station 309+12.32 N 644,507.8255 E 1,399,999.2274
Delta = 29° 34' 50.01" (LT)
Degree = 9° 32' 57.47"
Tangent = 158.4179
Length = 309.7669
Radius = 600.0000
External = 20.5612
Long Chord = 306.3381
Mid. Ord. = 19.8800
P.C. Station 307+53.90 N 644,638.6870 E 1,399,909.9441
P.T. Station 310+63.67 N 644,438.0946 E 1,400,141.4731
C.C. N 644,976.8431 E 1,400,405.5755
Back = S 34° 18' 16.83" E
Ahead = S 63° 53' 06.84" E
Chord Bear = S 49° 05' 41.83" E

Curve Data
———

Curve PR_TMPNRAB-4
P.I. Station 311+14.00 N 644,415.9419 E 1,400,186.6627
Delta = 7° 40' 40.58" (RT)
Degree = 7° 38' 21.97"
Tangent = 50.3273
Length = 100.5040
Radius = 750.0000
External = 1.6867
Long Chord = 100.4288
Mid. Ord. = 1.6829
P.C. Station 310+63.67 N 644,438.0946 E 1,400,141.4731
P.T. Station 311+64.17 N 644,387.9504 E 1,400,228.4875
C.C. N 643,764.6589 E 1,399,811.3452
Back = S 63° 53' 06.84" E
Ahead = S 56° 12' 26.26" E
Chord Bear = S 60° 02' 46.55" E

Course from PT PR_TMPNRAB-4 to PC PR_TMPNRAB-5 S 56° 12' 26.26" E Dist 256.5308

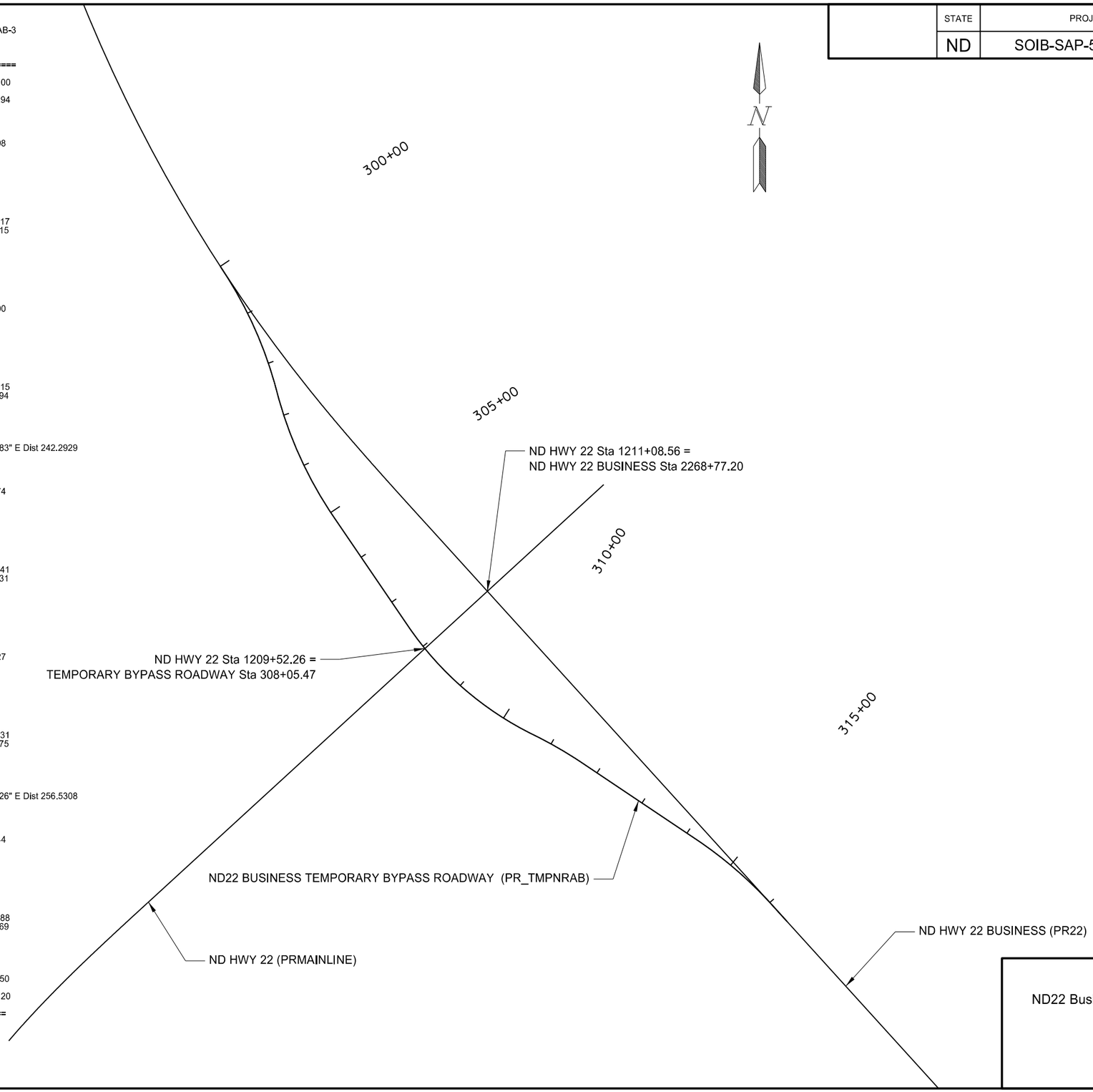
Curve Data
———

Curve PR_TMPNRAB-5
P.I. Station 315+12.58 N 644,194.1691 E 1,400,518.0344
Delta = 13° 58' 05.87" (RT)
Degree = 7° 38' 21.97"
Tangent = 91.8778
Length = 182.8446
Radius = 750.0000
External = 5.6067
Long Chord = 182.3921
Mid. Ord. = 5.5651
P.C. Station 314+20.71 N 644,245.2706 E 1,400,441.6788
P.T. Station 316+03.55 N 644,126.1476 E 1,400,579.7969
C.C. N 643,621.9791 E 1,400,024.5365
Back = S 56° 12' 26.26" E
Ahead = S 42° 14' 20.38" E
Chord Bear = S 49° 13' 23.32" E

Course from PT PR_TMPNRAB-5 to 8102 S 42° 14' 20.38" E Dist 43.6450

Point 8102 N 644,093.8351 E 1,400,609.1361 Sta 316+47.20

==========
Ending chain PR_TMPNRAB description



Note:

See section 81 sheets for
Iron Monument Found Information.

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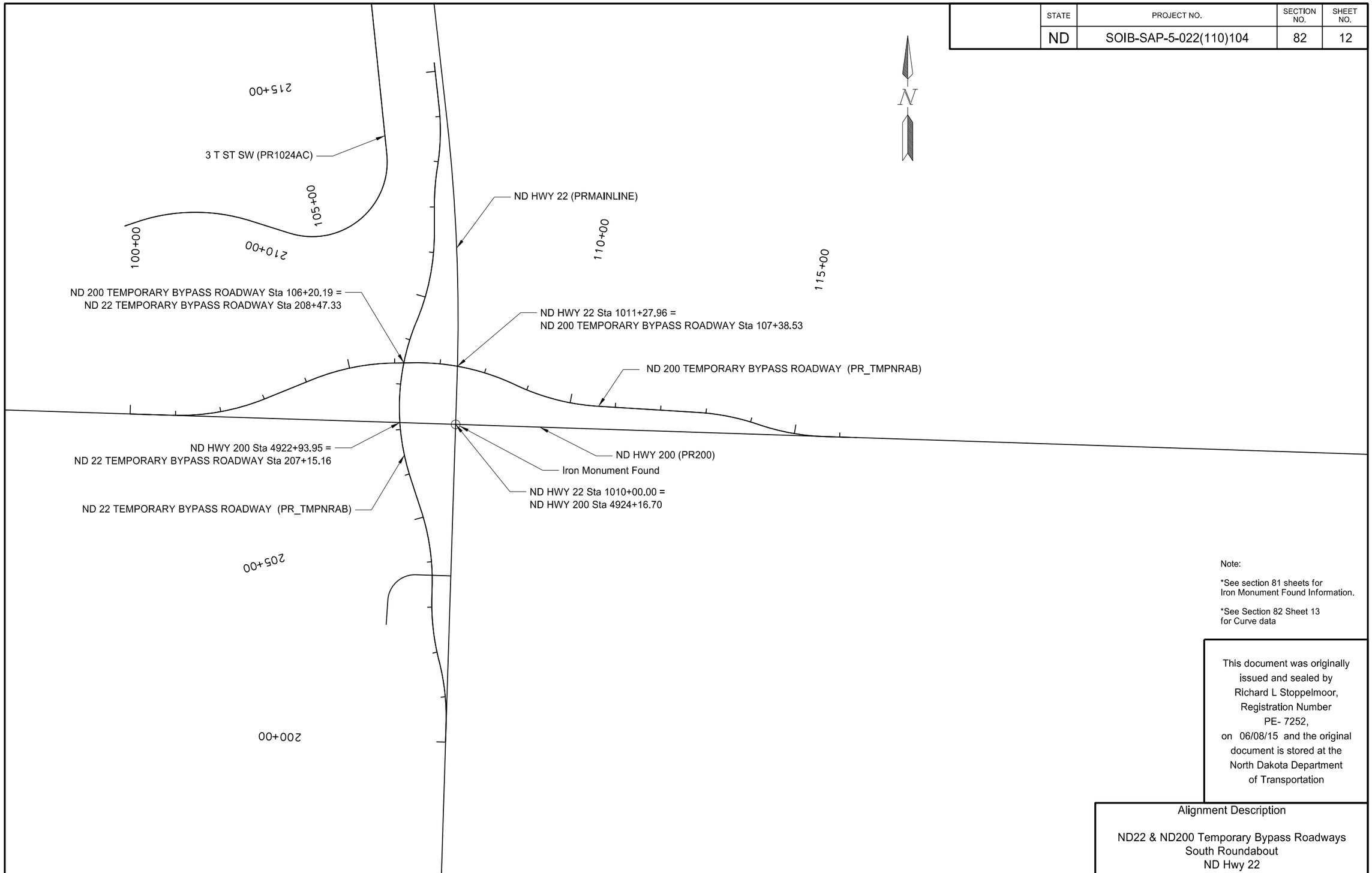
Alignment Description

ND22 Business Temporary Bypass Roadway
North Roundabout
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	82	12



Note:

*See section 81 sheets for Iron Monument Found Information.

*See Section 82 Sheet 13 for Curve data

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Alignment Description

ND22 & ND200 Temporary Bypass Roadways
South Roundabout
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	82	13

Chain PR_TMPSRABSN contains:
8051 CUR PR_TMPSRABSN-1 CUR PR_TMPSRABSN-2 CUR PR_TMPSRABSN-3 CUR PR_TMPSRABSN-4 CUR PR_TMPSRABSN-5 CUR PR_TMPSRABSN-6 CUR PR_TMPSRABSN-7 8052

Beginning chain PR_TMPSRABSN description
==========

Point 8051 N 624,423.4502 E 1,398,389.4188 Sta 200+00.00

Course from 8051 to PC PR_TMPSRABSN-1 N 1° 49' 30.40" E Dist 38.9705

Curve Data

Curve PR_TMPSRABSN-1
P.I. Station 201+10.59 N 624,533.9876 E 1,398,392.9411
Delta = 16° 18' 13.96" (LT)
Degree = 11° 27' 32.96"
Tangent = 71.6230
Length = 142.2782
Radius = 500.0000
External = 5.1038
Long Chord = 141.7986
Mid. Ord. = 5.0522
P.C. Station 200+38.97 N 624,462.4009 E 1,398,390.6600
P.T. Station 201+81.25 N 624,603.3359 E 1,398,375.0338
C.C. N 624,478.3253 E 1,397,890.9137
Back = N 1° 49' 30.40" E
Ahead = N 14° 28' 43.56" W
Chord Bear = N 6° 19' 36.58" W

Curve Data

Curve PR_TMPSRABSN-2
P.I. Station 202+52.35 N 624,672.1836 E 1,398,357.2558
Delta = 16° 11' 15.88" (RT)
Degree = 11° 27' 32.96"
Tangent = 71.1060
Length = 141.2647
Radius = 500.0000
External = 5.0308
Long Chord = 140.7953
Mid. Ord. = 4.9806
P.C. Station 201+81.25 N 624,603.3359 E 1,398,375.0338
P.T. Station 203+22.51 N 624,743.2580 E 1,398,359.3764
C.C. N 624,728.3466 E 1,398,859.1540
Back = N 14° 28' 43.56" W
Ahead = N 1° 42' 32.31" E
Chord Bear = N 6° 23' 05.63" W

Course from PT PR_TMPSRABSN-2 to PC PR_TMPSRABSN-3 N 1° 42' 32.31" E Dist 21.5312

Curve Data

Curve PR_TMPSRABSN-3
P.I. Station 204+31.89 N 624,852.5887 E 1,398,362.6384
Delta = 19° 55' 47.64" (LT)
Degree = 11° 27' 32.96"
Tangent = 87.8481
Length = 173.9212
Radius = 500.0000
External = 7.6586
Long Chord = 173.0457
Mid. Ord. = 7.5431
P.C. Station 203+44.04 N 624,764.7796 E 1,398,360.0185
P.T. Station 205+17.97 N 624,936.0320 E 1,398,335.1699
C.C. N 624,779.6911 E 1,397,860.2409
Back = N 1° 42' 32.31" E
Ahead = N 18° 13' 15.32" W
Chord Bear = N 8° 15' 21.50" W

Course from PT PR_TMPSRABSN-3 to PC PR_TMPSRABSN-4 N 18° 13' 15.32" W Dist 70.7974

Curve Data

Curve PR_TMPSRABSN-4
P.I. Station 207+69.40 N 625,174.8613 E 1,398,256.5502
Delta = 39° 43' 38.77" (RT)
Degree = 11° 27' 32.96"
Tangent = 180.6394
Length = 346.6873
Radius = 500.0000
External = 31.6301
Long Chord = 339.7841
Mid. Ord. = 29.7483
P.C. Station 205+88.76 N 625,003.2795 E 1,398,313.0328
P.T. Station 209+35.45 N 625,342.9239 E 1,398,322.7739
C.C. N 625,159.6204 E 1,398,787.9618
Back = N 18° 13' 15.32" W
Ahead = N 21° 30' 23.45" E
Chord Bear = N 1° 38' 34.07" E

Curve Data

Curve PR_TMPSRABSN-5
P.I. Station 210+42.34 N 625,440.8029 E 1,398,365.7356
Delta = 24° 08' 04.77" (LT)
Degree = 11° 27' 32.96"
Tangent = 106.8925
Length = 210.6146
Radius = 500.0000
External = 11.2984
Long Chord = 209.0610
Mid. Ord. = 11.0487
P.C. Station 209+35.45 N 625,342.9239 E 1,398,322.7739
P.T. Station 211+46.07 N 625,547.6923 E 1,398,364.9209
C.C. N 625,543.8814 E 1,397,864.9354
Back = N 23° 41' 52.63" E
Ahead = N 0° 26' 12.14" W
Chord Bear = N 11° 37' 50.24" E

Course from PT PR_TMPSRABSN-5 to PC PR_TMPSRABSN-6 N 0° 02' 56.15" E Dist 59.9559

Curve Data

Curve PR_TMPSRABSN-6
P.I. Station 212+46.56 N 625,648.1834 E 1,398,365.0067
Delta = 9° 16' 10.88" (RT)
Degree = 11° 27' 32.96"
Tangent = 40.5351
Length = 80.8933
Radius = 500.0000
External = 1.6404
Long Chord = 80.8051
Mid. Ord. = 1.6350
P.C. Station 212+06.02 N 625,607.6483 E 1,398,364.9721
P.T. Station 212+86.91 N 625,688.1835 E 1,398,371.5703
C.C. N 625,607.2213 E 1,398,864.9719
Back = N 0° 02' 56.15" E
Ahead = N 9° 19' 07.03" E
Chord Bear = N 4° 41' 01.59" E

Curve Data

Curve PR_TMPSRABSN-7
P.I. Station 213+55.77 N 625,756.1283 E 1,398,382.7194
Delta = 15° 40' 53.09" (LT)
Degree = 11° 27' 32.96"
Tangent = 68.8534
Length = 136.8461
Radius = 500.0000
External = 4.7185
Long Chord = 136.4194
Mid. Ord. = 4.6744
P.C. Station 212+86.91 N 625,688.1835 E 1,398,371.5703
P.T. Station 214+23.76 N 625,824.5576 E 1,398,375.0888
C.C. N 625,769.1458 E 1,397,878.1687
Back = N 9° 19' 07.03" E
Ahead = N 6° 21' 46.06" W
Chord Bear = N 1° 28' 40.49" E

Course from PT PR_TMPSRABSN-7 to 8052 N 6° 21' 46.06" W Dist 95.8013

Point 8052 N 625,919.7687 E 1,398,364.4717 Sta 215+19.56

==========
Ending chain PR_TMPSRABSN description

Chain PR_TMPSRABEW contains:
8001 CUR PR_TMPSRABEW-1 CUR PR_TMPSRABEW-2 CUR PR_TMPSRABEW-3 CUR PR_TMPSRABEW-4 CUR PR_TMPSRABEW-5 CUR PR_TMPSRABEW-6 8002

Beginning chain PR_TMPSRABEW description
==========

Point 8001 N 625,146.1124 E 1,397,695.3864 Sta 100+00.00

Course from 8001 to PC PR_TMPSRABEW-1 S 88° 09' 34.48" E Dist 92.8187

Curve Data

Curve PR_TMPSRABEW-1
P.I. Station 101+98.58 N 625,139.7349 E 1,397,893.8627
Delta = 23° 53' 10.83" (LT)
Degree = 11° 27' 32.96"
Tangent = 105.7601
Length = 208.4477
Radius = 500.0000
External = 11.0628
Long Chord = 206.9414
Mid. Ord. = 10.8233
P.C. Station 100+92.82 N 625,143.1315 E 1,397,788.1572
P.T. Station 103+01.27 N 625,179.4319 E 1,397,991.8899
C.C. N 625,642.8735 E 1,397,804.2152
Back = S 88° 09' 34.48" E
Ahead = N 67° 57' 14.68" E
Chord Bear = N 79° 53' 50.10" E

Course from PT PR_TMPSRABEW-1 to PC PR_TMPSRABEW-2 N 67° 57' 14.68" E Dist 113.0210

Curve Data

Curve PR_TMPSRABEW-2
P.I. Station 105+09.85 N 625,257.7223 E 1,398,185.2192
Delta = 21° 38' 22.36" (RT)
Degree = 11° 27' 32.96"
Tangent = 95.5589
Length = 188.8406
Radius = 500.0000
External = 9.0496
Long Chord = 187.7203
Mid. Ord. = 8.8887
P.C. Station 104+14.29 N 625,221.8542 E 1,398,096.6472
P.T. Station 106+03.13 N 625,258.4000 E 1,398,280.7757
C.C. N 624,758.4126 E 1,398,284.3220
Back = N 67° 57' 14.68" E
Ahead = N 89° 35' 37.04" E
Chord Bear = N 78° 46' 25.86" E

Course from PT PR_TMPSRABEW-2 to PC PR_TMPSRABEW-3 N 89° 35' 37.04" E Dist 43.8208

Curve Data

Curve PR_TMPSRABEW-3
P.I. Station 107+61.54 N 625,259.5235 E 1,398,439.1809
Delta = 25° 48' 57.28" (RT)
Degree = 11° 27' 32.96"
Tangent = 114.5884
Length = 225.2863
Radius = 500.0000
External = 12.9625
Long Chord = 223.3855
Mid. Ord. = 12.6349
P.C. Station 106+46.95 N 625,258.7108 E 1,398,324.5954
P.T. Station 108+72.24 N 625,210.3553 E 1,398,542.6844
C.C. N 624,758.7234 E 1,398,328.1417
Back = N 89° 35' 37.04" E
Ahead = S 64° 35' 25.67" E
Chord Bear = S 77° 29' 54.32" E

Curve Data

Curve PR_TMPSRABEW-4
P.I. Station 109+68.77 N 625,168.9339 E 1,398,629.8804
Delta = 21° 51' 18.43" (LT)
Degree = 11° 27' 32.96"
Tangent = 96.5343
Length = 190.7219
Radius = 500.0000
External = 9.2336
Long Chord = 189.5678
Mid. Ord. = 9.0662
P.C. Station 108+72.24 N 625,210.3553 E 1,398,542.6844
P.T. Station 110+62.96 N 625,162.9491 E 1,398,726.2289
C.C. N 625,661.9873 E 1,398,757.2272
Back = S 64° 35' 25.67" E
Ahead = S 86° 26' 44.11" E
Chord Bear = S 75° 31' 04.89" E

Course from PT PR_TMPSRABEW-4 to PC PR_TMPSRABEW-5 S 86° 26' 44.11" E Dist 220.1317

Curve Data

Curve PR_TMPSRABEW-5
P.I. Station 113+50.62 N 625,145.1149 E 1,399,013.3399
Delta = 15° 23' 03.21" (RT)
Degree = 11° 27' 32.96"
Tangent = 67.5326
Length = 134.2527
Radius = 500.0000
External = 4.5400
Long Chord = 133.8498
Mid. Ord. = 4.4992
P.C. Station 112+83.09 N 625,149.3017 E 1,398,945.9372
P.T. Station 114+17.34 N 625,123.1969 E 1,399,077.2167
C.C. N 624,650.2635 E 1,398,914.9390
Back = S 86° 26' 44.11" E
Ahead = S 71° 03' 40.89" E
Chord Bear = S 78° 45' 12.50" E

Curve Data

Curve PR_TMPSRABEW-6
P.I. Station 114+92.31 N 625,098.8659 E 1,399,148.1257
Delta = 17° 03' 15.09" (LT)
Degree = 11° 27' 32.96"
Tangent = 74.9673
Length = 148.8259
Radius = 500.0000
External = 5.5889
Long Chord = 148.2771
Mid. Ord. = 5.5271
P.C. Station 114+17.34 N 625,123.1969 E 1,399,077.2167
P.T. Station 115+66.17 N 625,096.4006 E 1,399,223.0524
C.C. N 625,596.1302 E 1,399,239.4944
Back = S 71° 03' 40.89" E
Ahead = S 88° 06' 55.99" E
Chord Bear = S 79° 35' 18.44" E

Course from PT PR_TMPSRABEW-6 to 8002 S 88° 06' 55.99" E Dist 71.5252

Point 8002 N 625,094.0486 E 1,399,294.5390 Sta 116+37.69

==========
Ending chain PR_TMPSRABEW description

Note:

See section 81 sheets for
Iron Monument Found Information.

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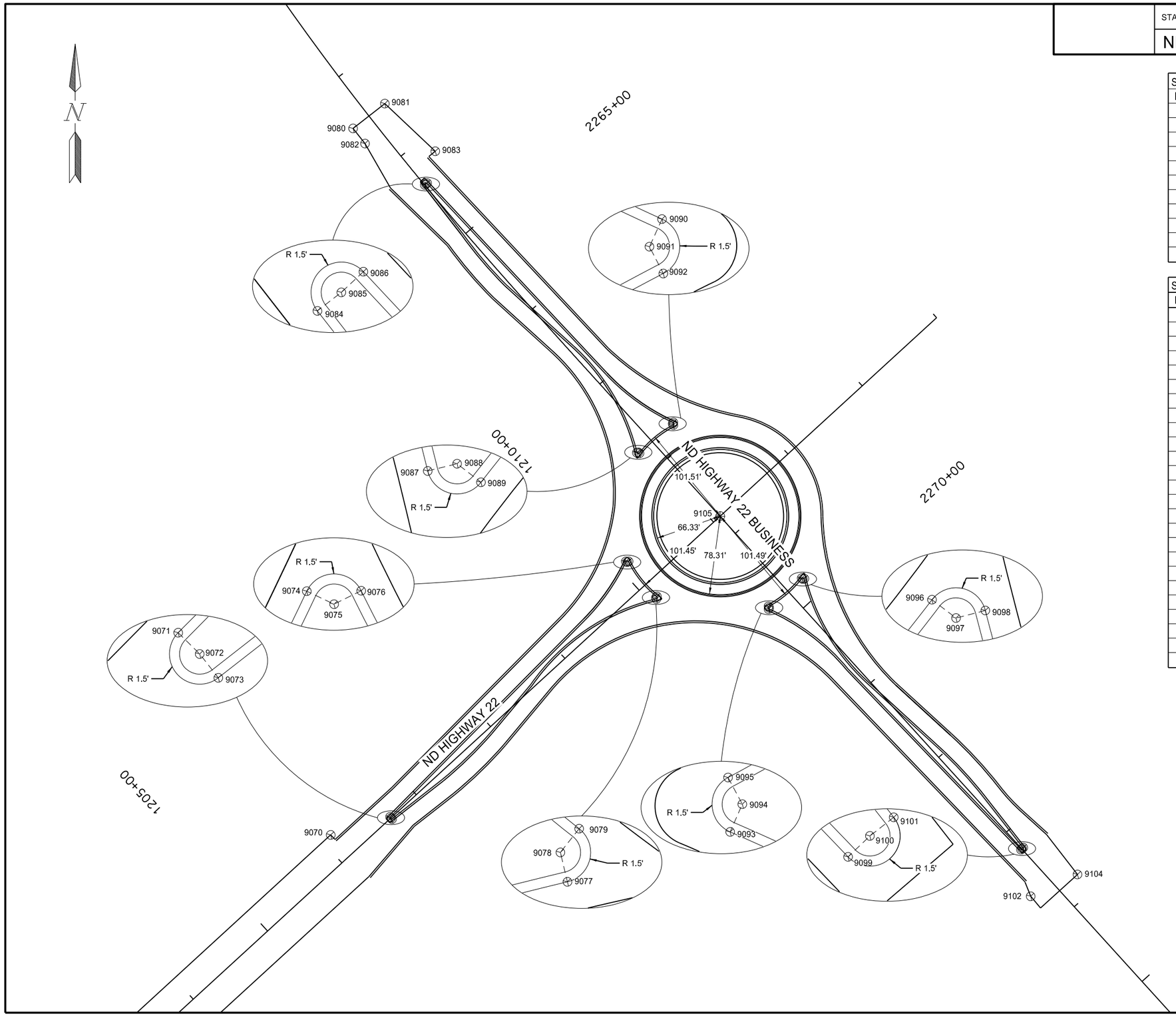
Alignment Description

ND22 & ND200 Temporary Bypass Roadways
South Roundabout
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	82	14



Stations and Offsets from ND HWY 22 Centerline Chain: PRMAINLINE				
POINT	NORTH	EAST	STATION	OFFSET
9070	644387.1536	1399669.9367	1206+10.53	-28.0000
9071	644405.0145	1399728.7421	1206+65.95	-1.4400
9072	644403.9595	1399729.8084	1206+66.02	0.0600
9073	644402.7779	1399730.7324	1206+65.91	1.5600
9074	644658.2757	1399962.6703	1210+09.52	-30.1100
9075	644657.6315	1399964.0250	1210+10.09	-28.7200
9076	644658.2964	1399965.3696	1210+11.53	-28.3000
9077	644620.9810	1399992.8839	1210+06.60	17.8000
9078	644622.4398	1399992.5349	1210+07.33	16.4900
9079	644623.6172	1399993.4644	1210+08.81	16.2500
9105	644703.2445	1400056.3261	1211+08.95	0.0119

Stations and Offsets from ND HWY 22 Business Centerline Chain: PR222				
POINT	NORTH	EAST	STATION	OFFSET
9080	645087.5681	1399692.1068	2263+49.11	20.0000
9081	645112.2107	1399723.6146	2263+49.11	-20.0000
9082	645072.5316	1399703.9476	2263+68.11	20.0000
9083	645064.9594	1399773.6506	2264+17.87	-29.4900
9084	645031.4935	1399763.2475	2264+37.12	-0.1400
9085	645032.4128	1399764.4328	2264+37.17	-1.6400
9086	645033.4386	1399765.5272	2264+37.09	-3.1400
9087	644766.1229	1399973.5642	2267+75.03	18.6200
9088	644766.4829	1399975.0203	2267+75.74	17.3000
9089	644765.5625	1399976.2048	2267+77.22	17.0400
9090	644796.1711	1400009.7202	2267+77.09	-28.3500
9091	644794.8061	1400009.0984	2267+77.68	-26.9700
9092	644793.4733	1400009.7866	2267+79.13	-26.5900
9093	644611.0380	1400104.2382	2269+77.69	26.1200
9094	644612.4120	1400104.8400	2269+77.07	24.7500
9095	644613.7354	1400104.1339	2269+75.62	24.3900
9096	644641.7561	1400137.0776	2269+77.02	-18.8400
9097	644640.8468	1400138.2706	2269+78.49	-19.1100
9098	644641.2219	1400139.7229	2269+79.19	-20.4400
9099	644372.5613	1400354.6052	2273+22.54	1.0700
9100	644373.6001	1400355.6873	2273+22.50	-0.4200
9101	644374.5234	1400356.8694	2273+22.61	-1.9200
9102	644326.3002	1400364.2235	2273+63.26	25.0500
9103	644314.6318	1400373.9780	2273+78.45	25.6700
9104	644347.9385	1400410.6600	2273+78.45	-23.8700

NOTE:
RADIUS POINTS GIVEN AT CURB & GUTTER - TYPE 1
ARE MEASURED FROM THE FACE OF THE CURB.

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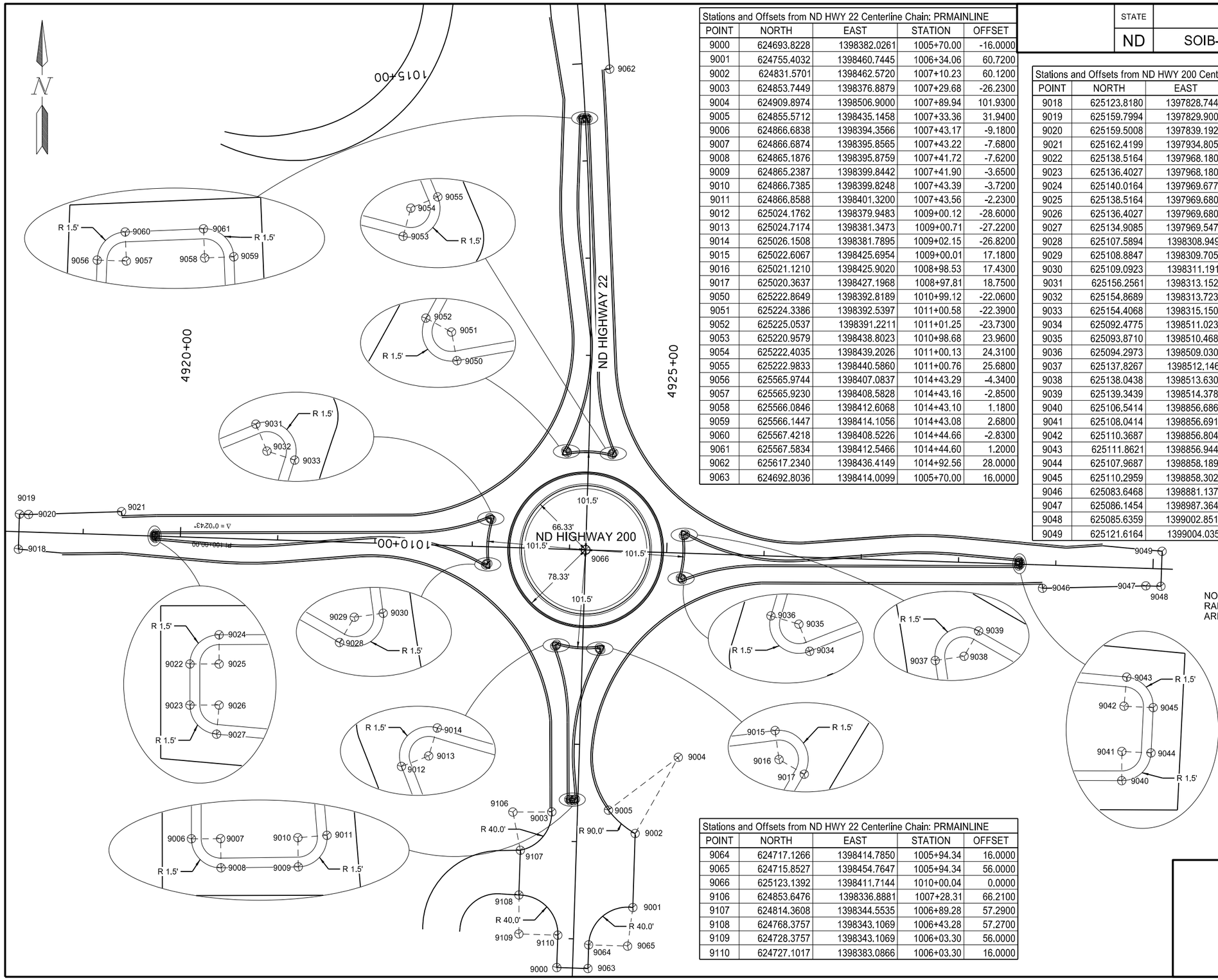
Survey Data Points

North Roundabout

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	82	15



Stations and Offsets from ND HWY 22 Centerline Chain: PRMAINLINE				
POINT	NORTH	EAST	STATION	OFFSET
9000	624693.8228	1398382.0261	1005+70.00	-16.0000
9001	624755.4032	1398460.7445	1006+34.06	60.7200
9002	624831.5701	1398462.5720	1007+10.23	60.1200
9003	624853.7449	1398376.8879	1007+29.68	-26.2300
9004	624909.8974	1398506.9000	1007+89.94	101.9300
9005	624855.5712	1398435.1458	1007+33.36	31.9400
9006	624866.6838	1398394.3566	1007+43.17	-9.1800
9007	624866.6874	1398395.8565	1007+43.22	-7.6800
9008	624865.1876	1398395.8759	1007+41.72	-7.6200
9009	624865.2387	1398399.8442	1007+41.90	-3.6500
9010	624866.7385	1398399.8248	1007+43.39	-3.7200
9011	624866.8588	1398401.3200	1007+43.56	-2.2300
9012	625024.1762	1398379.9483	1009+00.12	-28.6000
9013	625024.7174	1398381.3473	1009+00.71	-27.2200
9014	625026.1508	1398381.7895	1009+02.15	-26.8200
9015	625022.6067	1398425.6954	1009+00.01	17.1800
9016	625021.1210	1398425.9020	1008+98.53	17.4300
9017	625020.3637	1398427.1968	1008+97.81	18.7500
9050	625222.8649	1398392.8189	1010+99.12	-22.0600
9051	625224.3386	1398392.5397	1011+00.58	-22.3900
9052	625225.0537	1398391.2211	1011+01.25	-23.7300
9053	625220.9579	1398438.8023	1010+98.68	23.9600
9054	625222.4035	1398439.2026	1011+00.13	24.3100
9055	625222.9833	1398440.5860	1011+00.76	25.6800
9056	625565.9744	1398407.0837	1014+43.29	-4.3400
9057	625565.9230	1398408.5828	1014+43.16	-2.8500
9058	625566.0846	1398412.6068	1014+43.10	1.1800
9059	625566.1447	1398414.1056	1014+43.08	2.6800
9060	625567.4218	1398408.5226	1014+44.66	-2.8300
9061	625567.5834	1398412.5466	1014+44.60	1.2000
9062	625617.2340	1398436.4149	1014+92.56	28.0000
9063	624692.8036	1398414.0099	1005+70.00	16.0000

Stations and Offsets from ND HWY 200 Centerline Chain: PR200				
POINT	NORTH	EAST	STATION	OFFSET
9018	625123.8180	1397828.7440	4918+34.00	18.0000
9019	625159.7994	1397829.9002	4918+34.00	-18.0000
9020	625159.5008	1397839.1929	4918+43.30	-18.0000
9021	625162.4199	1397934.8054	4919+38.77	-23.9900
9022	625138.5164	1397968.1802	4919+72.90	-1.1700
9023	625136.4027	1397968.1802	4919+72.96	0.9400
9024	625140.0164	1397969.6773	4919+74.35	-2.7200
9025	625138.5164	1397969.6802	4919+74.40	-1.2200
9026	625136.4027	1397969.6802	4919+74.46	0.9000
9027	625134.9085	1397969.5477	4919+74.38	2.3900
9028	625107.5894	1398308.9491	4923+14.48	18.8000
9029	625108.8847	1398309.7055	4923+15.20	17.4800
9030	625109.0923	1398311.1911	4923+16.68	17.2200
9031	625156.2561	1398313.1527	4923+17.12	-29.9800
9032	625154.8689	1398313.7235	4923+17.74	-28.6100
9033	625154.4068	1398315.1505	4923+19.18	-28.1900
9034	625092.4775	1398511.0235	4925+16.96	27.3400
9035	625093.8710	1398510.4685	4925+16.36	25.9600
9036	625094.2973	1398509.0303	4925+14.91	25.5800
9037	625137.8267	1398512.1461	4925+16.59	-18.0300
9038	625138.0438	1398513.6303	4925+18.07	-18.2900
9039	625139.3439	1398514.3785	4925+18.77	-19.6200
9040	625106.5414	1398856.6863	4928+61.97	1.9100
9041	625108.0414	1398856.6914	4928+61.93	0.4100
9042	625110.3687	1398856.8043	4928+61.97	-1.9200
9043	625111.8621	1398856.9446	4928+62.06	-3.4100
9044	625107.9687	1398858.1896	4928+63.43	0.4400
9045	625110.2959	1398858.3025	4928+63.47	-1.8900
9046	625083.6468	1398881.1370	4928+87.16	23.9900
9047	625086.1454	1398987.3647	4929+93.25	18.0000
9048	625085.6359	1399002.8513	4930+08.75	18.0000
9049	625121.6164	1399004.0351	4930+08.75	-18.0000

NOTE:
RADIUS POINTS GIVEN AT CURB & GUTTER - TYPE 1 ARE MEASURED FROM THE FACE OF THE CURB.

Stations and Offsets from ND HWY 22 Centerline Chain: PRMAINLINE				
POINT	NORTH	EAST	STATION	OFFSET
9064	624717.1266	1398414.7850	1005+94.34	16.0000
9065	624715.8527	1398454.7647	1005+94.34	56.0000
9066	625123.1392	1398411.7144	1010+00.04	0.0000
9106	624853.6476	1398336.8881	1007+28.31	66.2100
9107	624814.3608	1398344.5535	1006+89.28	57.2900
9108	624768.3757	1398343.1069	1006+43.28	57.2700
9109	624728.3757	1398343.1069	1006+03.30	56.0000
9110	624727.1017	1398383.0866	1006+03.30	16.0000

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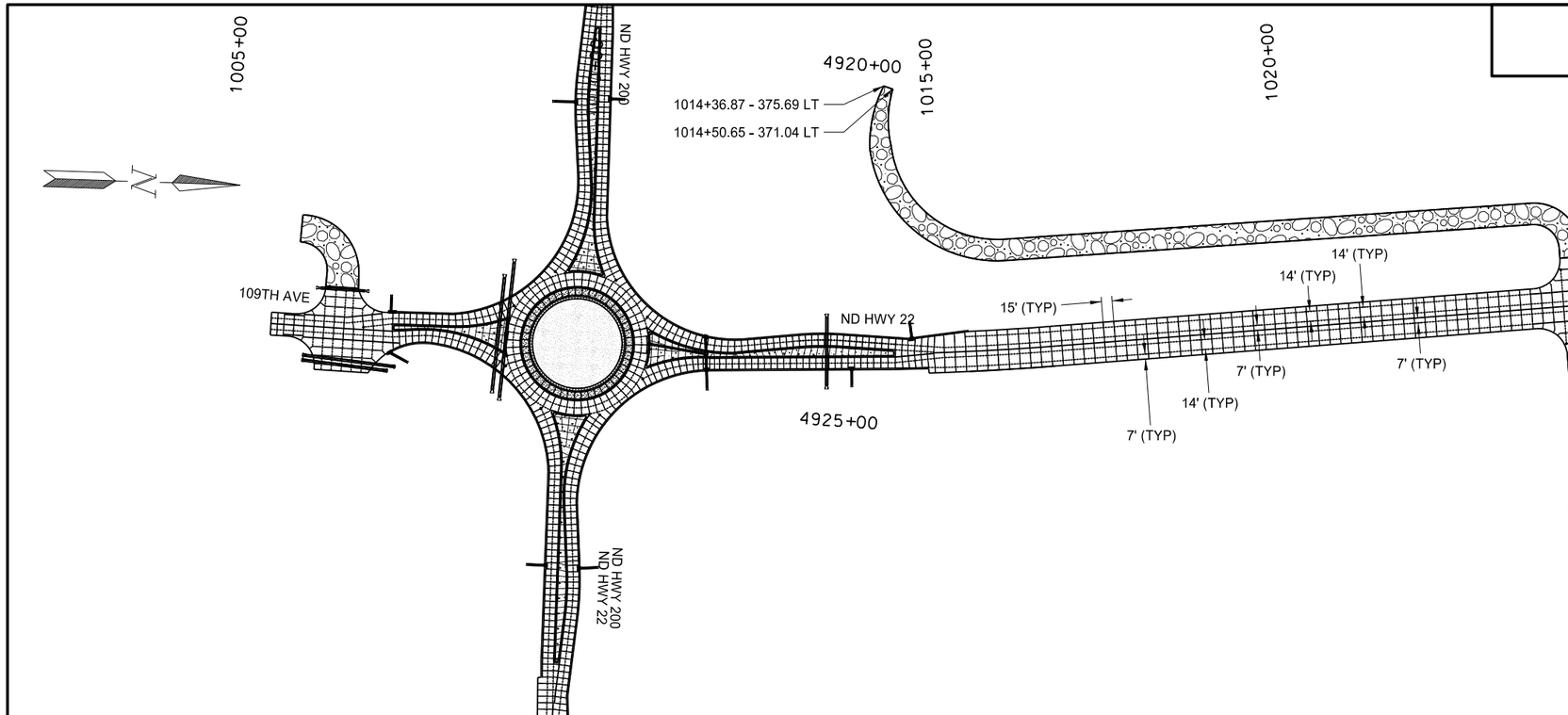
Survey Data Points

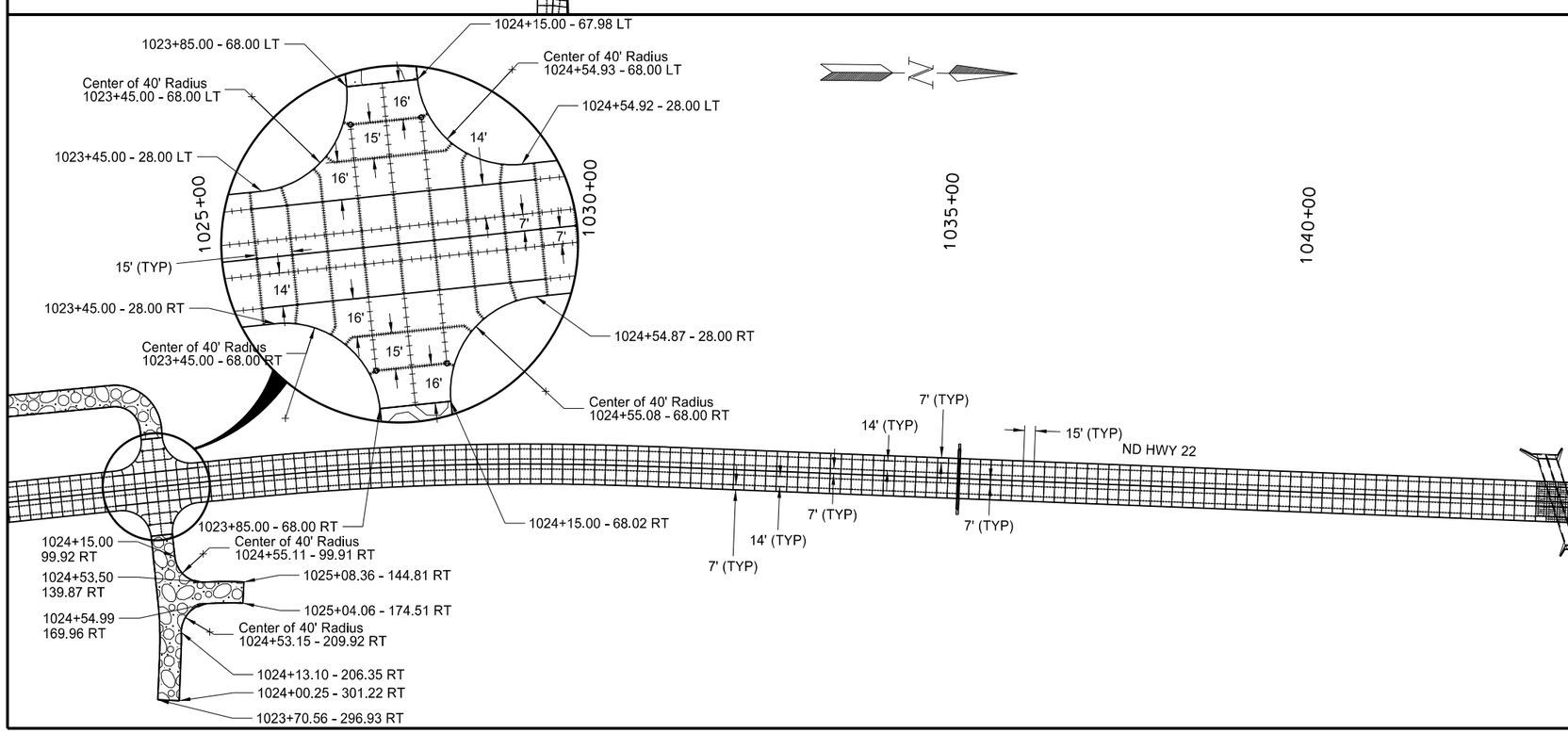
South Roundabout

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	90	1





302-0120	AGGREGATE BASE COURSE CL 5		
	ND Hwy 22 1015+50.00 - 1043+00.00	8,216	TON
	Total=	8,216	TON
302-0356	AGGREGATE SURFACE COURSE CL 13		
	ND Hwy 22 1024+00	3,504	TON
	Total=	3,504	TON
550-0305	9IN NON REINF CONCRETE PVMT CL AE-DOWELED		
	ND Hwy 22 1015+50.00 - 1043+00.00	17,531	SY
	Total=	17,531	SY

LEGEND

- Keyway Joint
- Doweled Joint
- Tied Joint
- Gravel Road
- Pavement Reinforcement
- 4" Diam. Core Hole*

*Core hole to be placed to prevent sympathy cracking. Core hole to be filled with low modulus silicone. Coring and all associated work to be included in the "9IN NON-REINF CONCRETE PVMT CL AE-DOWELED" bid item.

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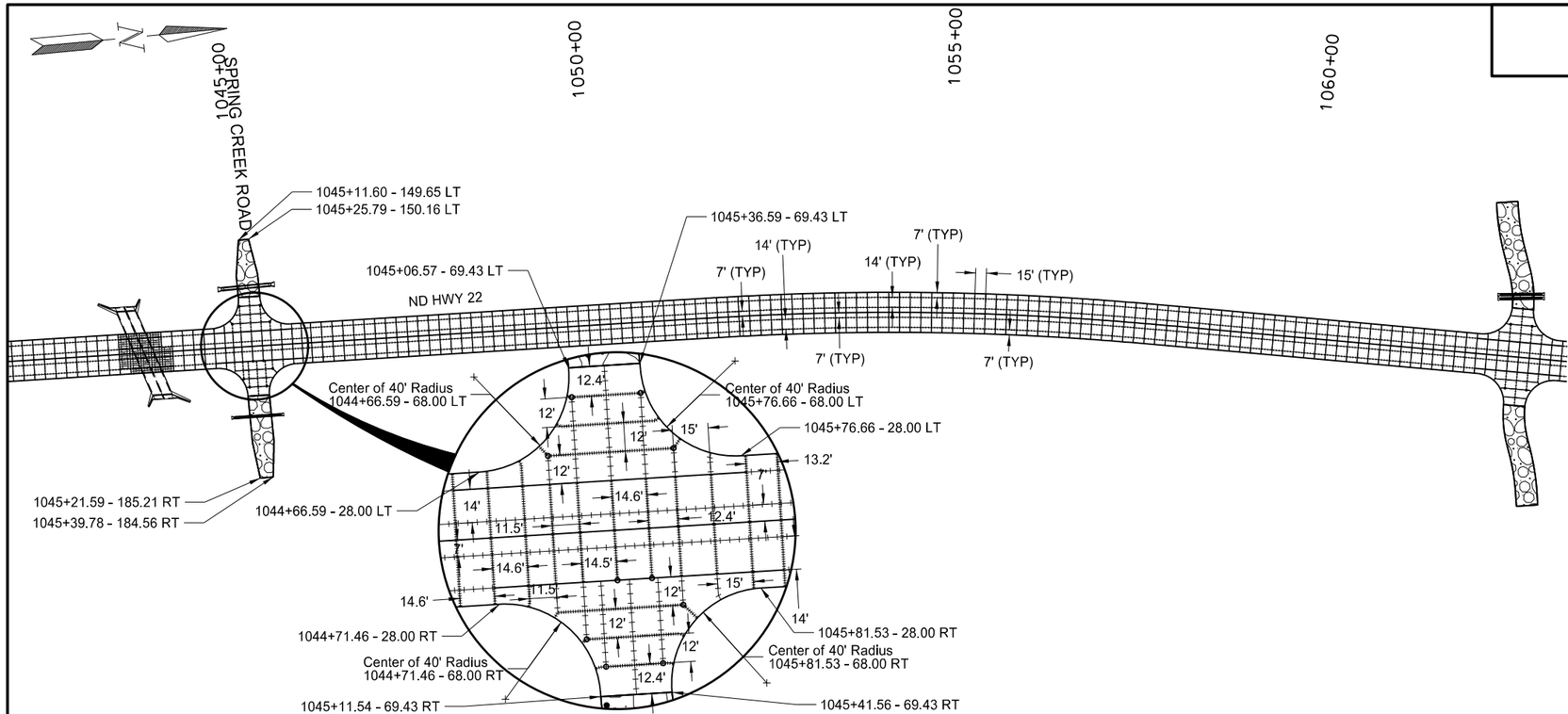
Paving Layout

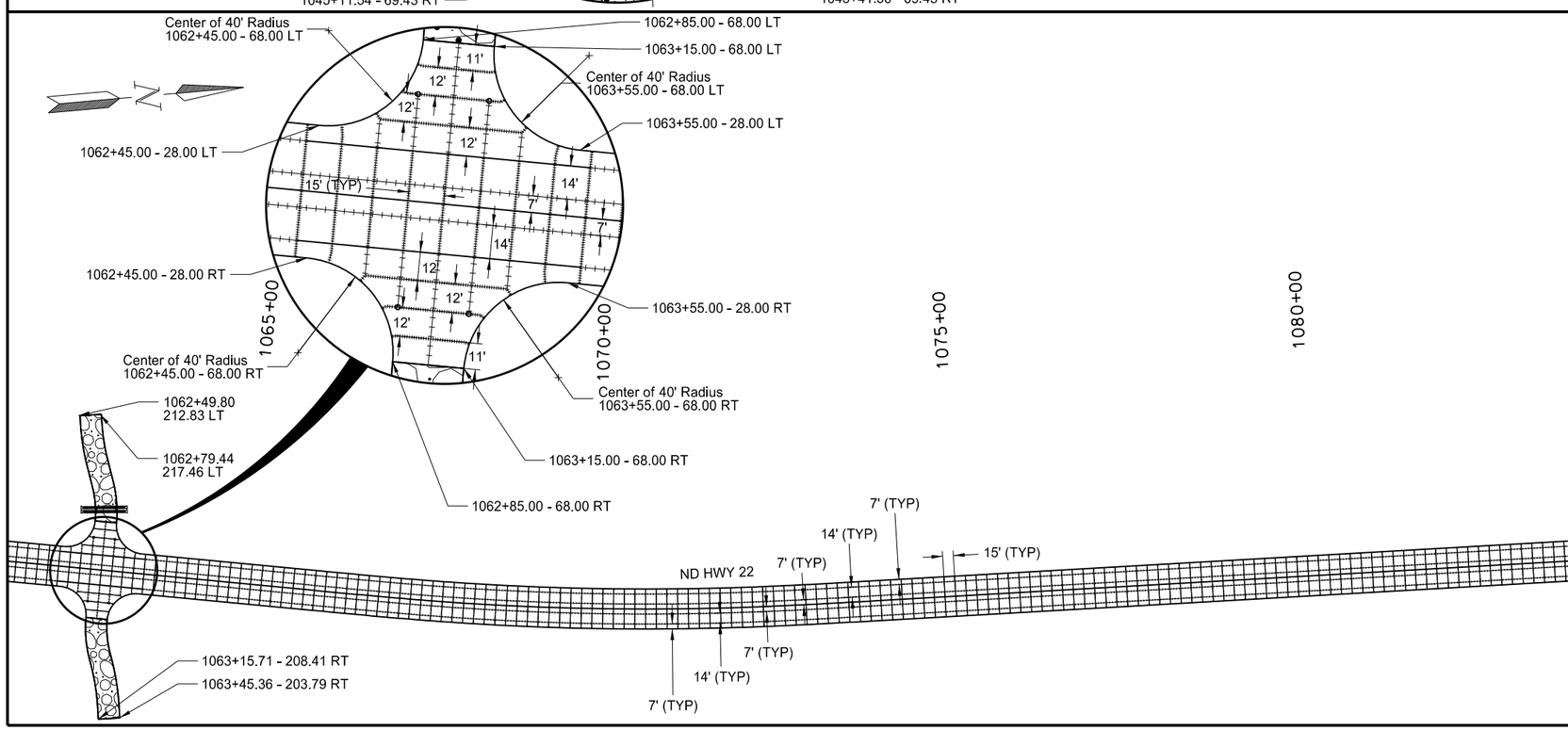
Sta 1015+50 to 1043+00

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	90	2





302-0120	AGGREGATE BASE COURSE CL 5		
	ND Hwy 22 1043+00.00 - 1082+50.00	13,035	TON
	Total=	13,035	TON
550-0305	9IN NON REINF CONCRETE PVMT CL AE-DOWELED		
	ND Hwy 22 1043+00.00 - 1082+50.00	25,428	SY
	Total=	25,428	SY

LEGEND

- Keyway Joint
- Doweled Joint
- Tied Joint
- Gravel Road
- Pavement Reinforcement
- 4" Diam. Core Hole*

*Core hole to be placed to prevent sympathy cracking. Core hole to be filled with low modulus silicone. Coring and all associated work to be included in the "9IN NON-REINF CONCRETE PVMT CL AE-DOWELED" bid item.

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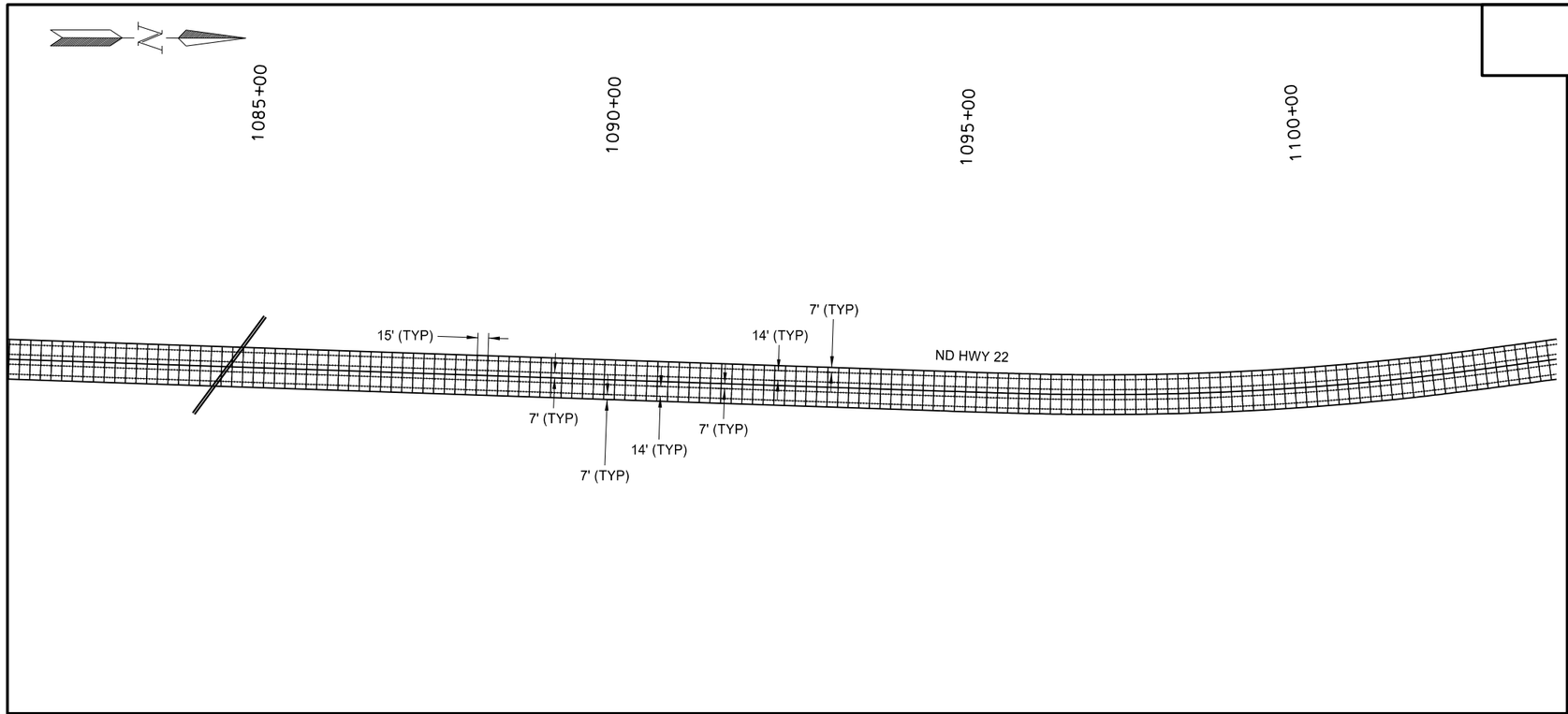
Paving Layout

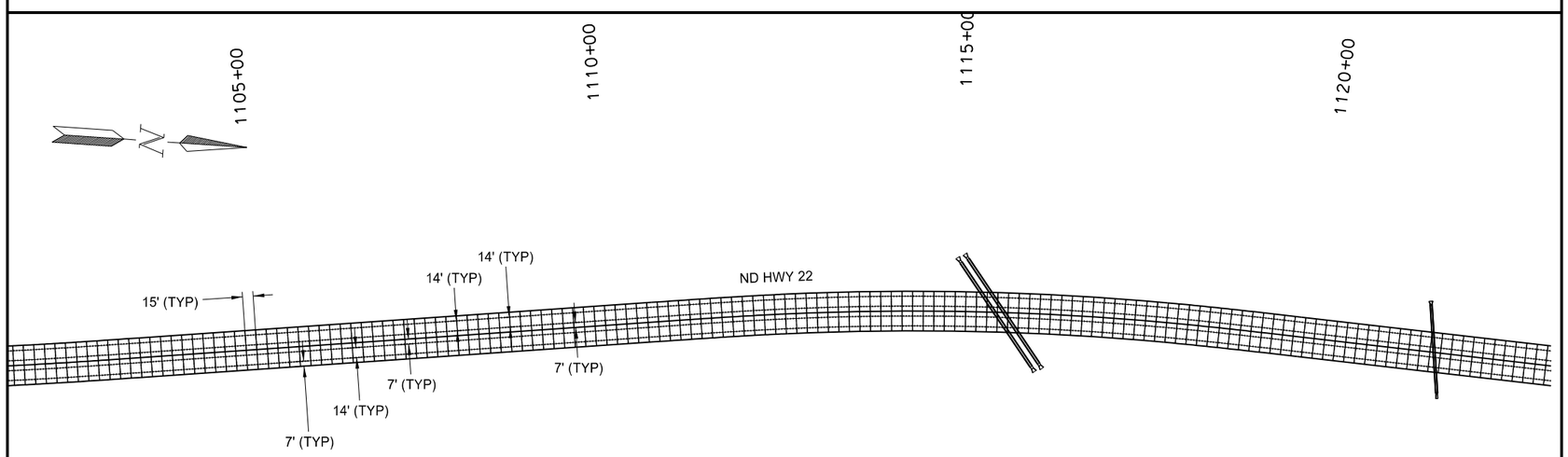
Sta 1043+00 to 1082+50

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	90	3





302-0120	AGGREGATE BASE COURSE CL 5		
	ND Hwy 22 1082+50.00 - 1122+50.00	11,639	TON
	Total=	11,639	TON
550-0305	9IN NON REINF CONCRETE PVMT CL AE-DOWELED		
	ND Hwy 22 1082+50.00 - 1122+50.00	24,889	SY
	Total=	24,889	SY

LEGEND

- Keyway Joint
- Doweled Joint
- Tied Joint
- Gravel Road
- Pavement Reinforcement
- 4" Diam. Core Hole*

*Core hole to be placed to prevent sympathy cracking. Core hole to be filled with low modulus silicone. Coring and all associated work to be included in the "9IN NON-REINF CONCRETE PVMT CL AE-DOWELED" bid item.

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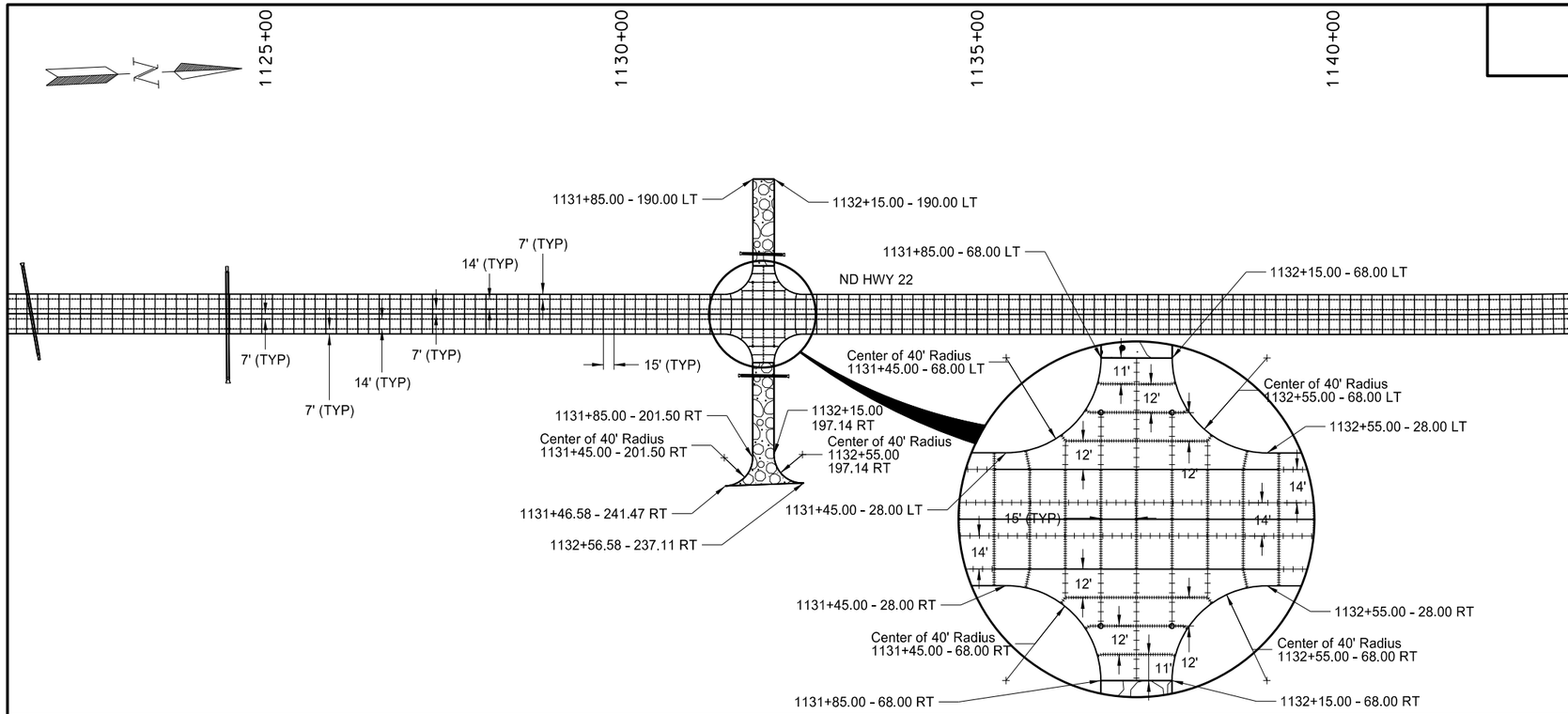
Paving Layout

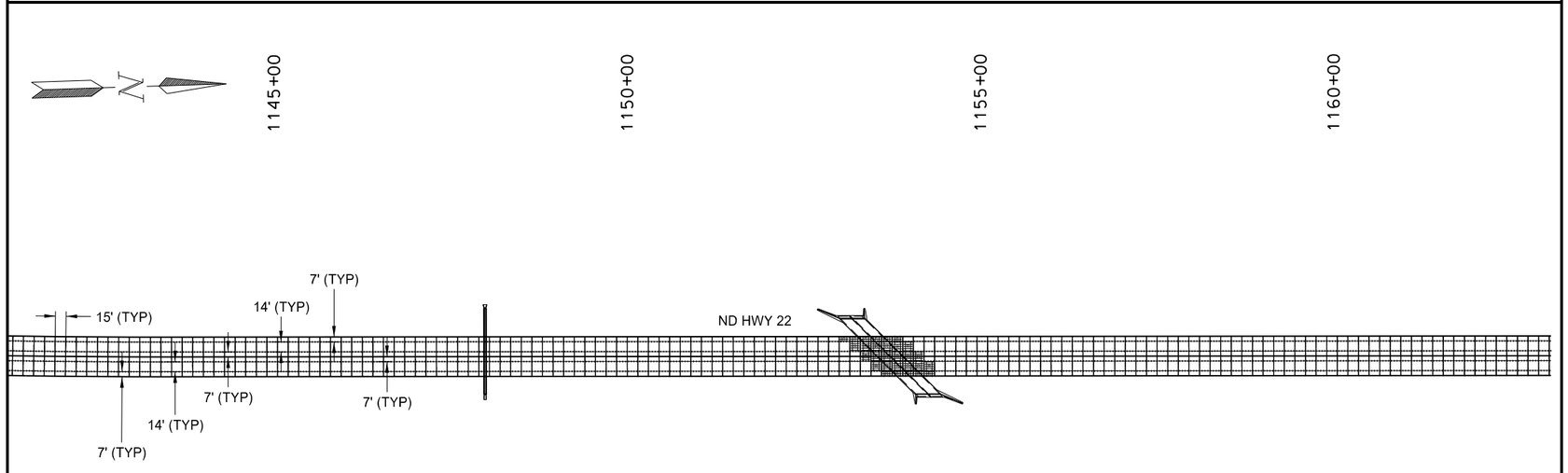
Sta 1082+50 to 1122+50

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	90	4





302-0120	AGGREGATE BASE COURSE CL 5		
	ND Hwy 22 1122+50.00 - 1162+00.00	12,465	TON
	Total=	12,465	TON
550-0305	9IN NON REINF CONCRETE PVMT CL AE-DOWELED		
	ND Hwy 22 1122+50.00 - 1162+00.00	24,998	SY
	Total=	24,998	SY

LEGEND

- Keyway Joint
- Doweled Joint
- Tied Joint
- Gravel Road
- Pavement Reinforcement
- 4" Diam. Core Hole*

*Core hole to be placed to prevent sympathy cracking. Core hole to be filled with low modulus silicone. Coring and all associated work to be included in the "9IN NON-REINF CONCRETE PVMT CL AE-DOWELED" bid item.

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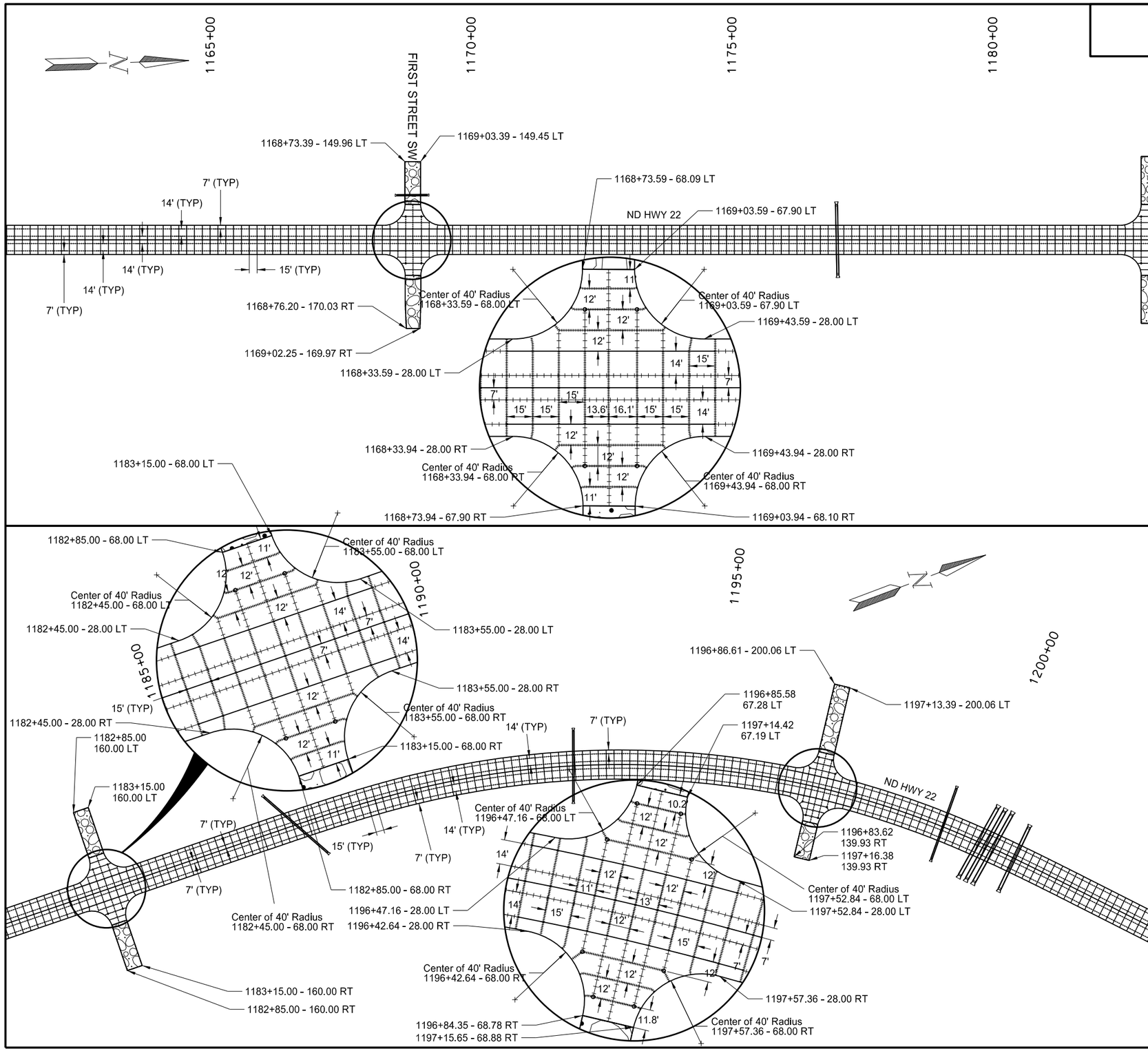
Paving Layout

Sta 1122+50 to 1162+00

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	90	5



LEGEND

- Keyway Joint
- Doweled Joint
- Tied Joint
- Gravel Road
- Pavement Reinforcement
- 4" Diam. Core Hole*

*Core hole to be placed to prevent sympathy cracking. Core hole to be filled with low modulus silicone. Coring and all associated work to be included in the "9IN NON-REINF CONCRETE PVMT CL AE-DOWELED" bid item.

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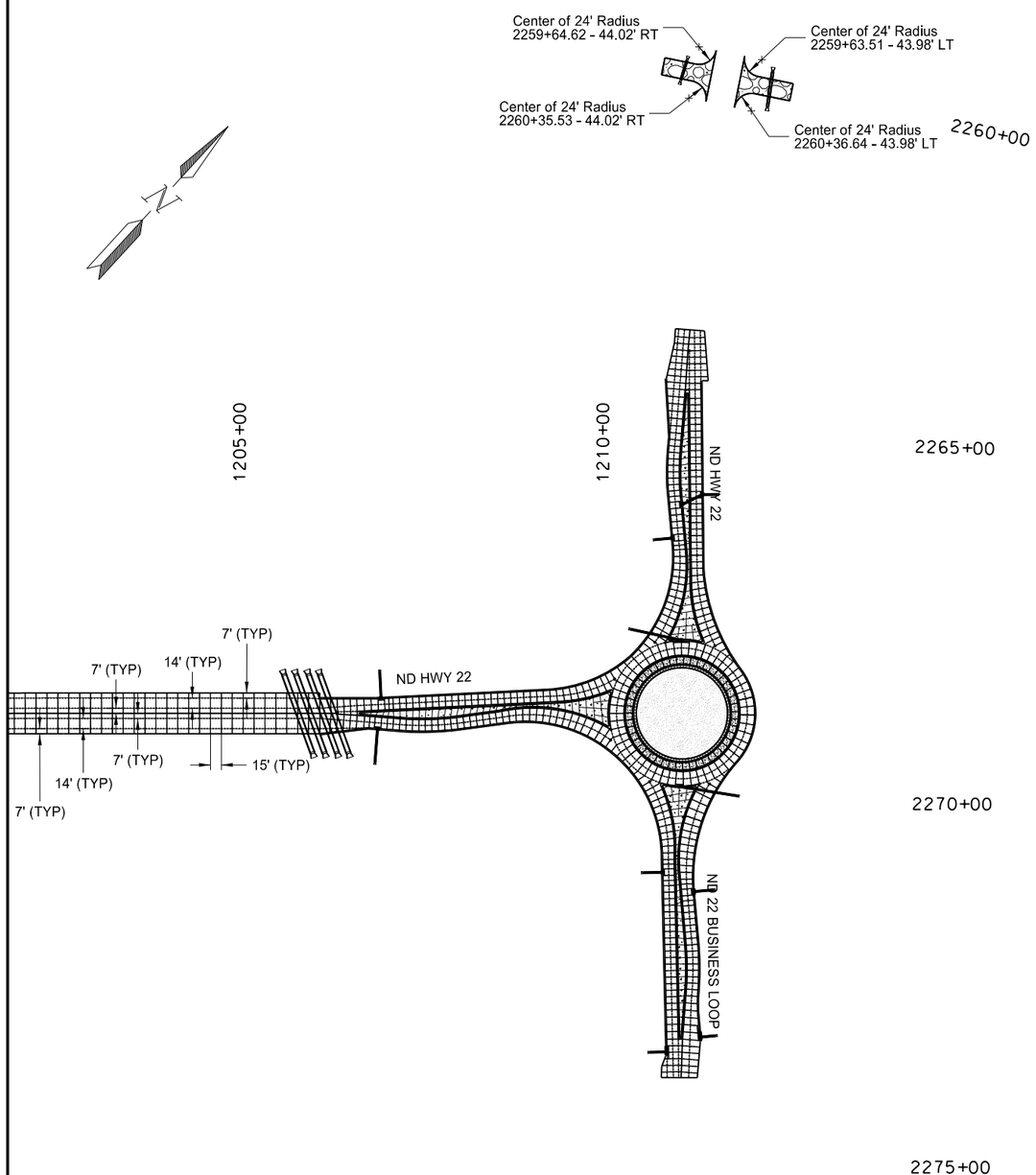
Paving Layout

Sta 1162+00 to 1202+50

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	90	6



302-0120	AGGREGATE BASE COURSE CL 5		
	ND Hwy 22 1202+50.00 - 1206+10.53	1,362	TON
	Total=	1,362	TON
550-0305	9IN NON REINF CONCRETE PVMT CL AE-DOWELED		
	ND Hwy 22 1202+50.00 - 1206+10.53	2,246	SY
	Total=	2,246	SY

LEGEND

- Keyway Joint
- Doweled Joint
- Tied Joint
- Gravel Road
- Pavement Reinforcement
- 4" Diam. Core Hole*

*Core hole to be placed to prevent sympathy cracking. Core hole to be filled with low modulus silicone. Coring and all associated work to be included in the "9IN NON-REINF CONCRETE PVMT CL AE-DOWELED" bid item.

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Paving Layout

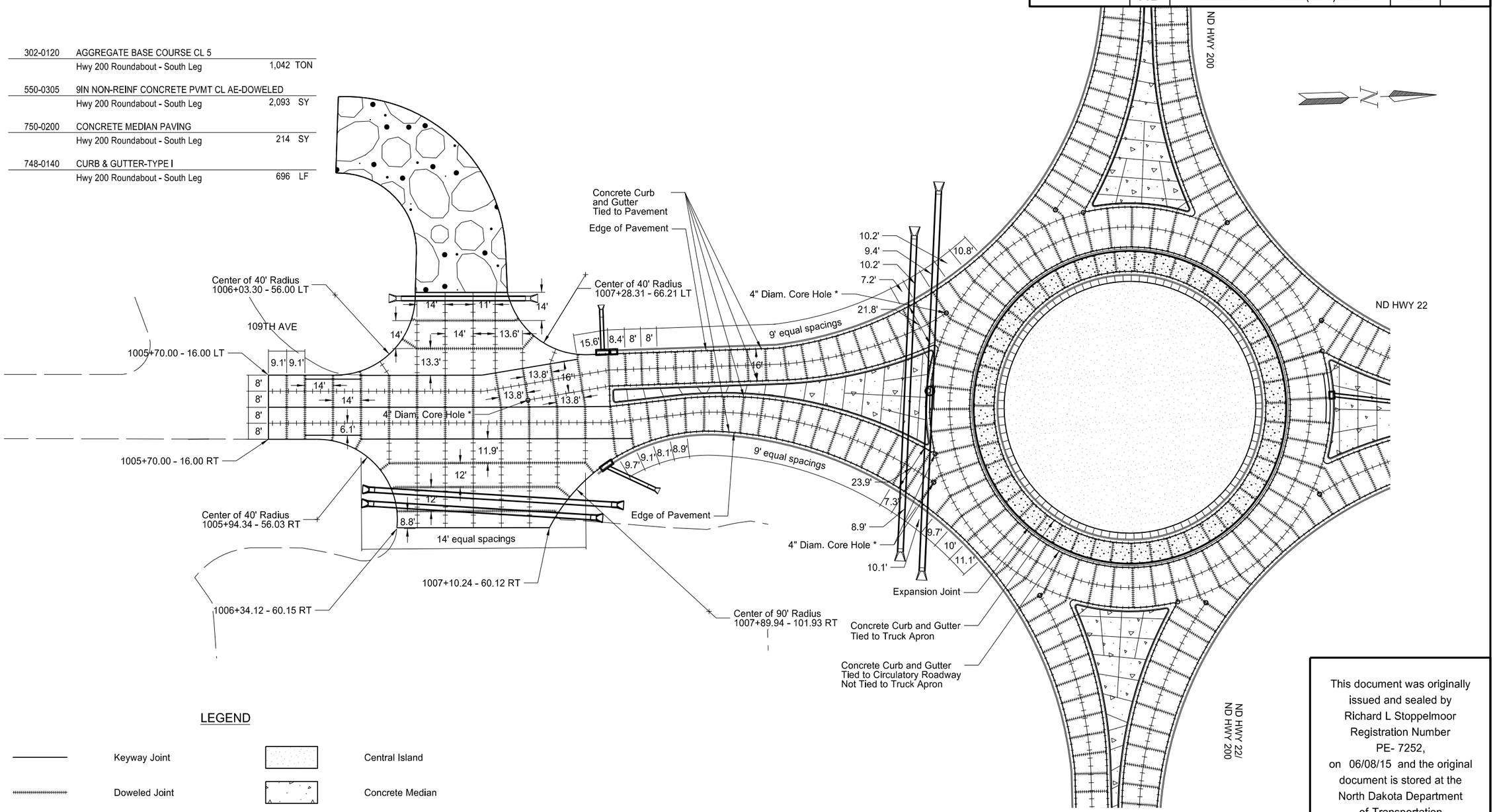
Sta 1202+50 to 1214+00

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	90	7

302-0120	AGGREGATE BASE COURSE CL 5		
	Hwy 200 Roundabout - South Leg	1,042	TON
550-0305	9IN NON-REINF CONCRETE PVMT CL AE-DOWELED		
	Hwy 200 Roundabout - South Leg	2,093	SY
750-0200	CONCRETE MEDIAN PAVING		
	Hwy 200 Roundabout - South Leg	214	SY
748-0140	CURB & GUTTER-TYPE I		
	Hwy 200 Roundabout - South Leg	696	LF



LEGEND

Keyway Joint	Central Island
Doweled Joint	Concrete Median
Tied Joint	Colored Concrete Truck Apron
Tied Curb And Gutter Joint	Tooled/Saw Cut Joint
Expansion Joint	

*Core hole to be placed to prevent sympathy cracking. Core hole to be filled with low modulus silicone. Coring and all associated work to be included in the "9IN NON-REINF CONCRETE PVMT CL AE-DOWELED" bid item.

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Paving Layout

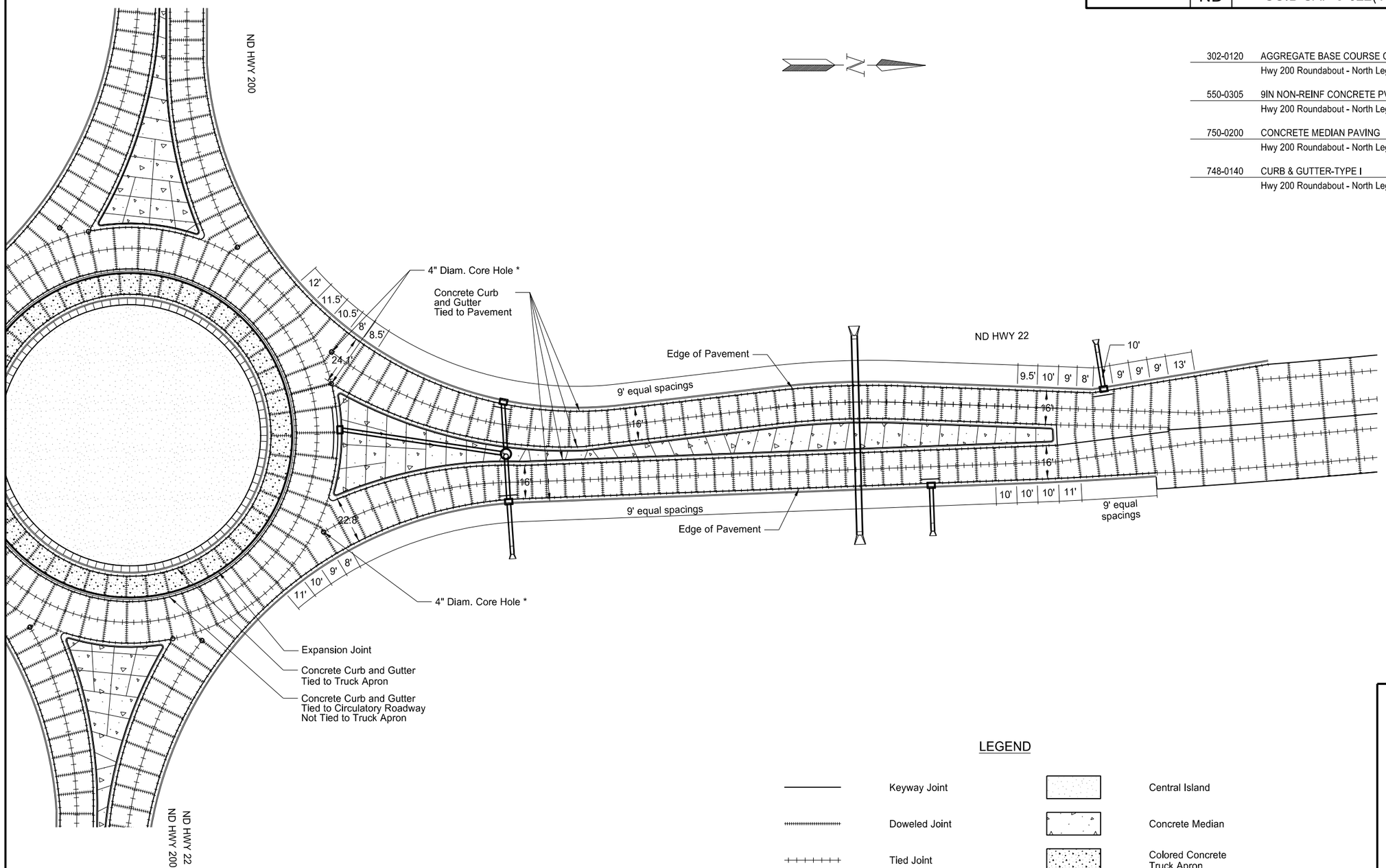
South Roundabout - South Leg

109th Avenue

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	90	8

302-0120	AGGREGATE BASE COURSE CL 5		
	Hwy 200 Roundabout - North Leg	1,080	TON
550-0305	9IN NON-REINF CONCRETE PVMT CL AE-DOWELED		
	Hwy 200 Roundabout - North Leg	1,853	SY
750-0200	CONCRETE MEDIAN PAVING		
	Hwy 200 Roundabout - North Leg	362	SY
748-0140	CURB & GUTTER-TYPE I		
	Hwy 200 Roundabout - North Leg	1,378	LF



LEGEND

	Keyway Joint		Central Island
	Doweled Joint		Concrete Median
	Tied Joint		Colored Concrete Truck Apron
	Tied Curb And Gutter Joint		Tooled/Saw Cut Joint
	Expansion Joint		

*Core hole to be placed to prevent sympathy cracking. Core hole to be filled with low modulus silicone. Coring and all associated work to be included in the "9IN NON-REINF CONCRETE PVMT CL AE-DOWELED" bid item.

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Paving Layout

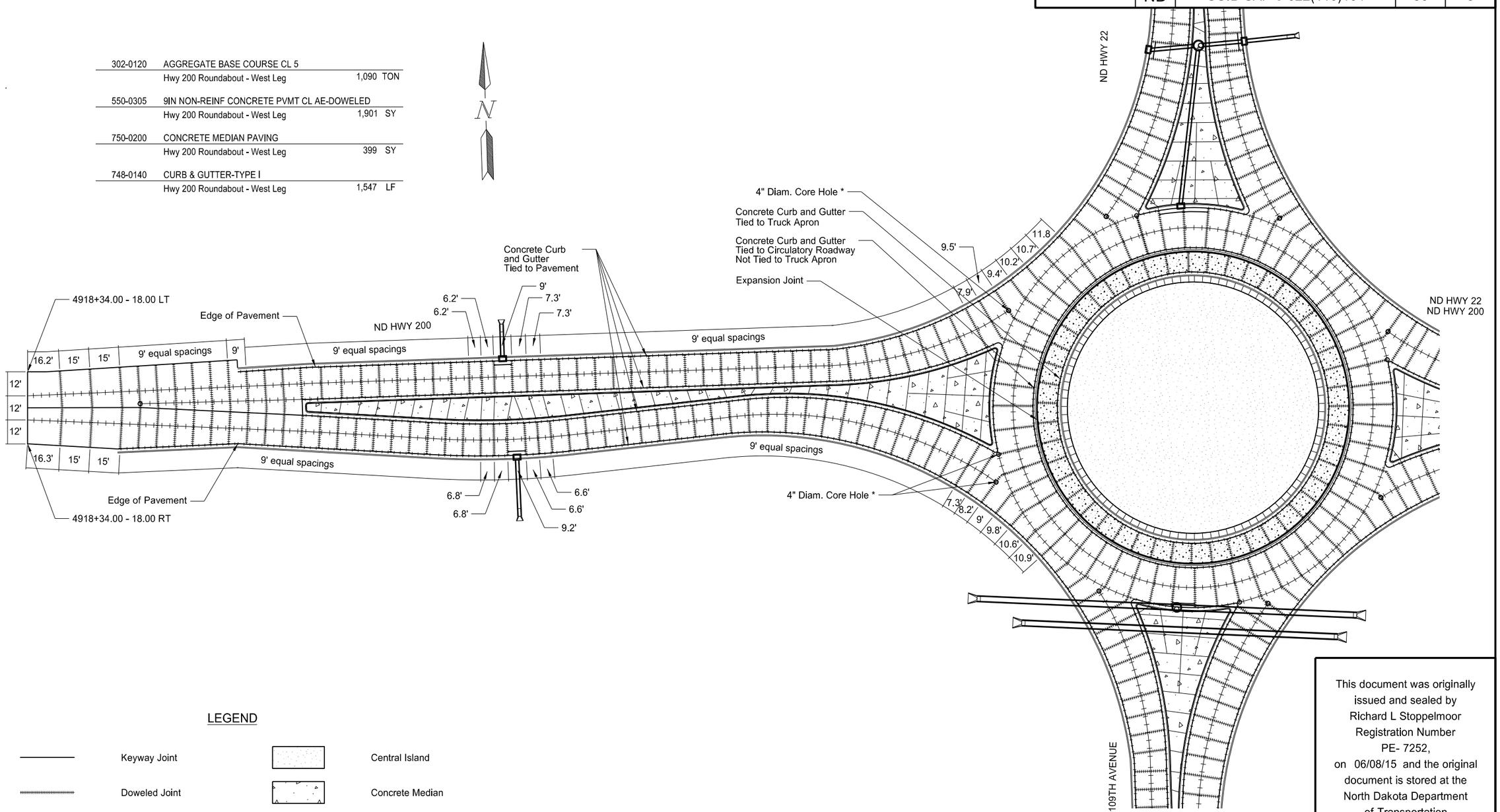
South Roundabout - North Leg

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	90	9

302-0120	AGGREGATE BASE COURSE CL 5		
	Hwy 200 Roundabout - West Leg	1,090	TON
550-0305	9IN NON-REINF CONCRETE PVMT CL AE-DOWELED		
	Hwy 200 Roundabout - West Leg	1,901	SY
750-0200	CONCRETE MEDIAN PAVING		
	Hwy 200 Roundabout - West Leg	399	SY
748-0140	CURB & GUTTER-TYPE I		
	Hwy 200 Roundabout - West Leg	1,547	LF



LEGEND

	Keyway Joint		Central Island
	Doweled Joint		Concrete Median
	Tied Joint		Colored Concrete Truck Apron
	Tied Curb And Gutter Joint		Tooled/Saw Cut Joint
	Expansion Joint		

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Paving Layout

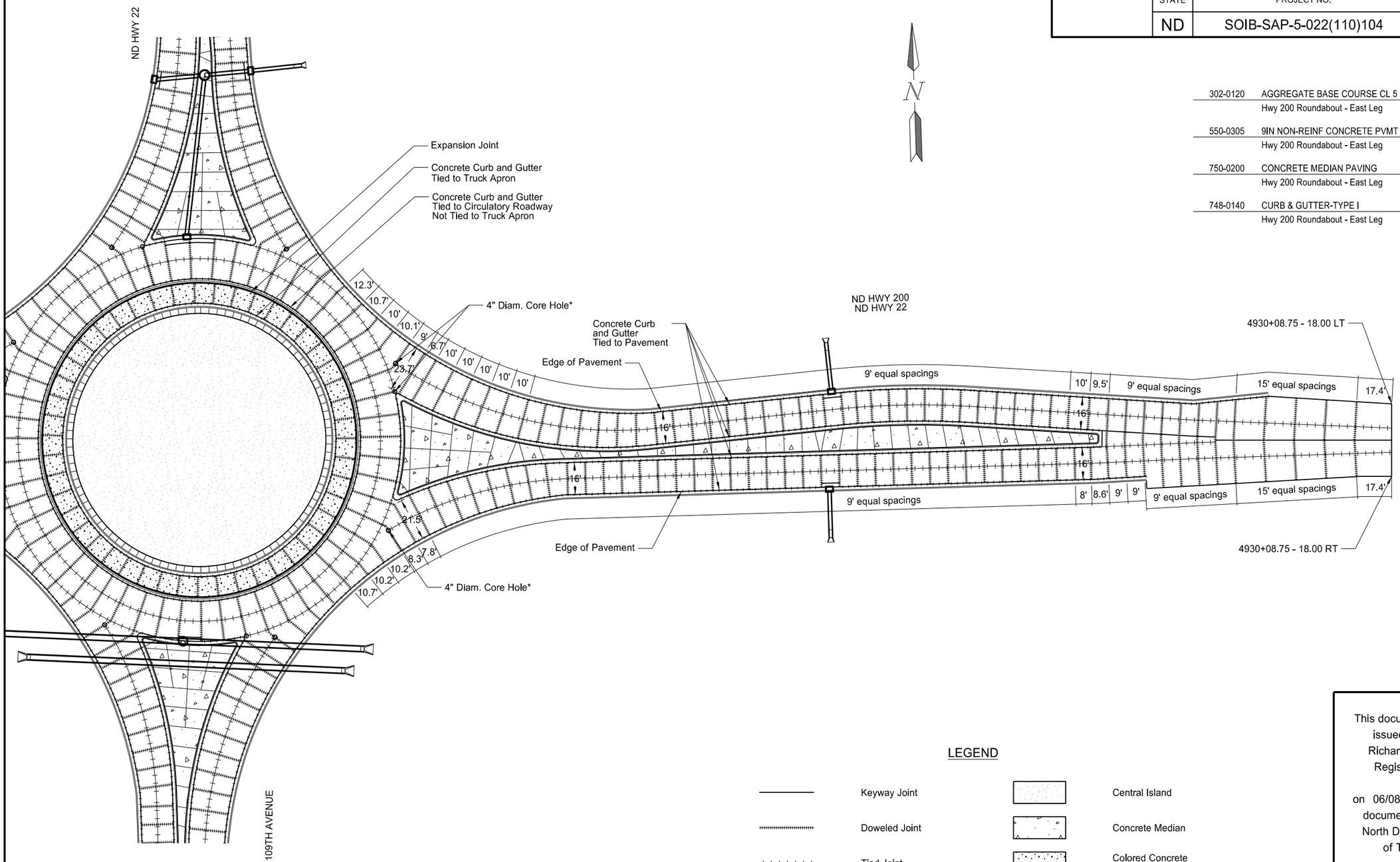
South Roundabout - West Leg

ND Hwy 200

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	90	10

302-0120	AGGREGATE BASE COURSE CL 5		
	Hwy 200 Roundabout - East Leg	1,110	TON
550-0305	9IN NON-REINF CONCRETE PVMT CL AE-DOWELED		
	Hwy 200 Roundabout - East Leg	1,942	SY
750-0200	CONCRETE MEDIAN PAVING		
	Hwy 200 Roundabout - East Leg	394	SY
748-0140	CURB & GUTTER-TYPE I		
	Hwy 200 Roundabout - East Leg	1,537	LF



LEGEND

	Keyway Joint		Central Island
	Doweled Joint		Concrete Median
	Tied Joint		Colored Concrete Truck Apron
	Tied Curb And Gutter Joint		Tooled/Saw Cut Joint
	Expansion Joint		

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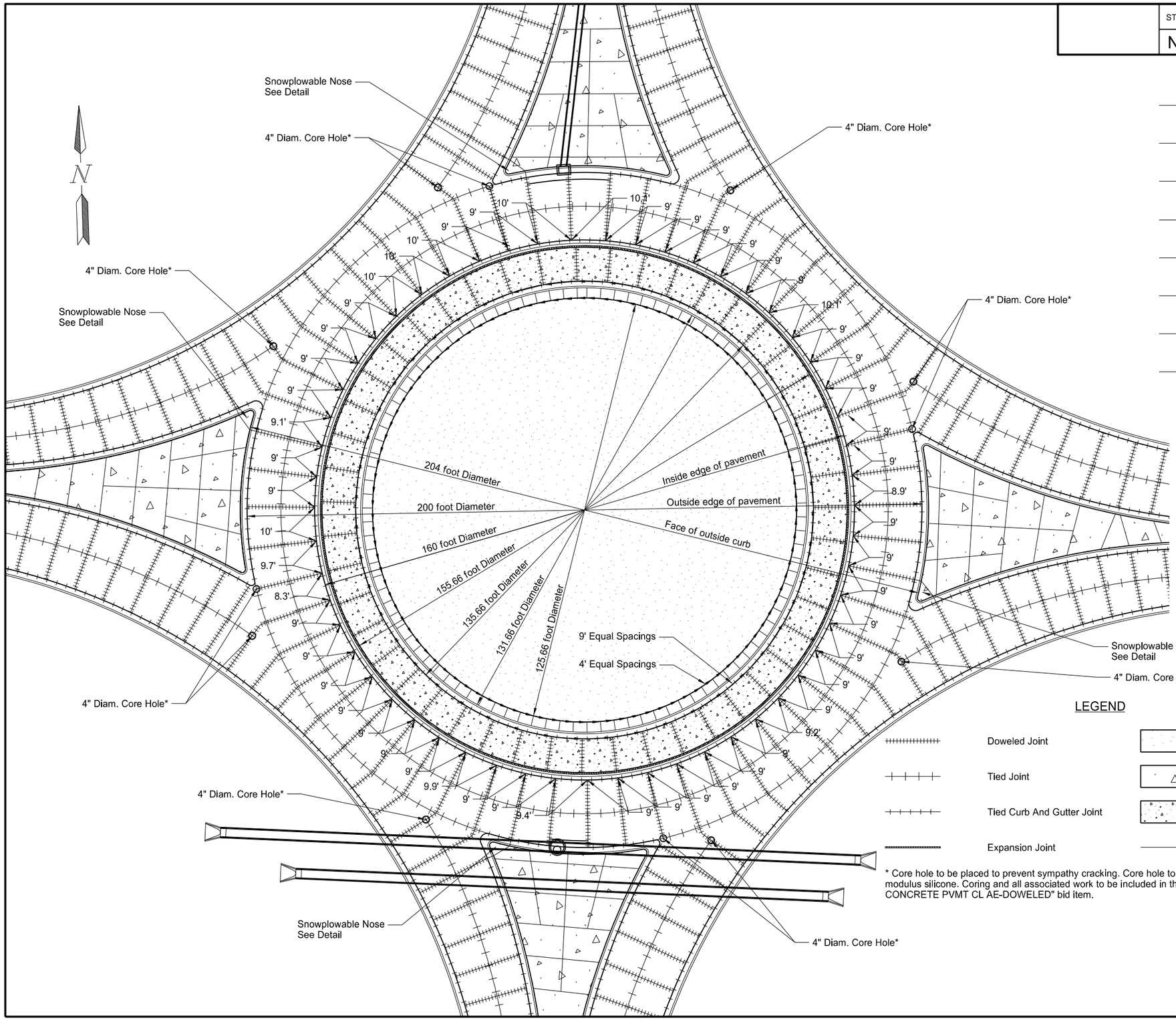
Paving Layout

South Roundabout - East Leg

ND Hwy 200

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	90	11



302-0120	AGGREGATE BASE COURSE CL 5		
	Hwy 200 Roundabout - Center	1,294	TON
550-0305	9IN NON-REINF CONCRETE PVMT CL AE-DOWELED		
	Hwy 200 Roundabout - Center	1,843	SY
550-0330	NON-REINF CONCRETE PVMT CL AE-DOWELED-COLORED		
	Hwy 200 Roundabout - Center	508	SY
750-0140	SIDEWALK CONCRETE 6IN		
	Hwy 200 Roundabout - Center	135	SY
748-0120	CURB & GUTTER MOUNTABLE-TYPE I		
	Hwy 200 Roundabout - Center	496	LF
748-0140	CURB & GUTTER-TYPE I		
	Hwy 200 Roundabout - Center	798	LF
708-1200	SMALL ROCK COVER		
	Hwy 200 Roundabout - Center	250	TON
709-0155	GEOSYNTHETIC MATERIAL TYPE RR		
	Hwy 200 Roundabout - Center	1,378	SY

LEGEND

	Doweled Joint		Central Island
	Tied Joint		Concrete Median
	Tied Curb And Gutter Joint		Colored Concrete Truck Apron
	Expansion Joint		Tooled/Saw Cut Joint

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Paving Layout

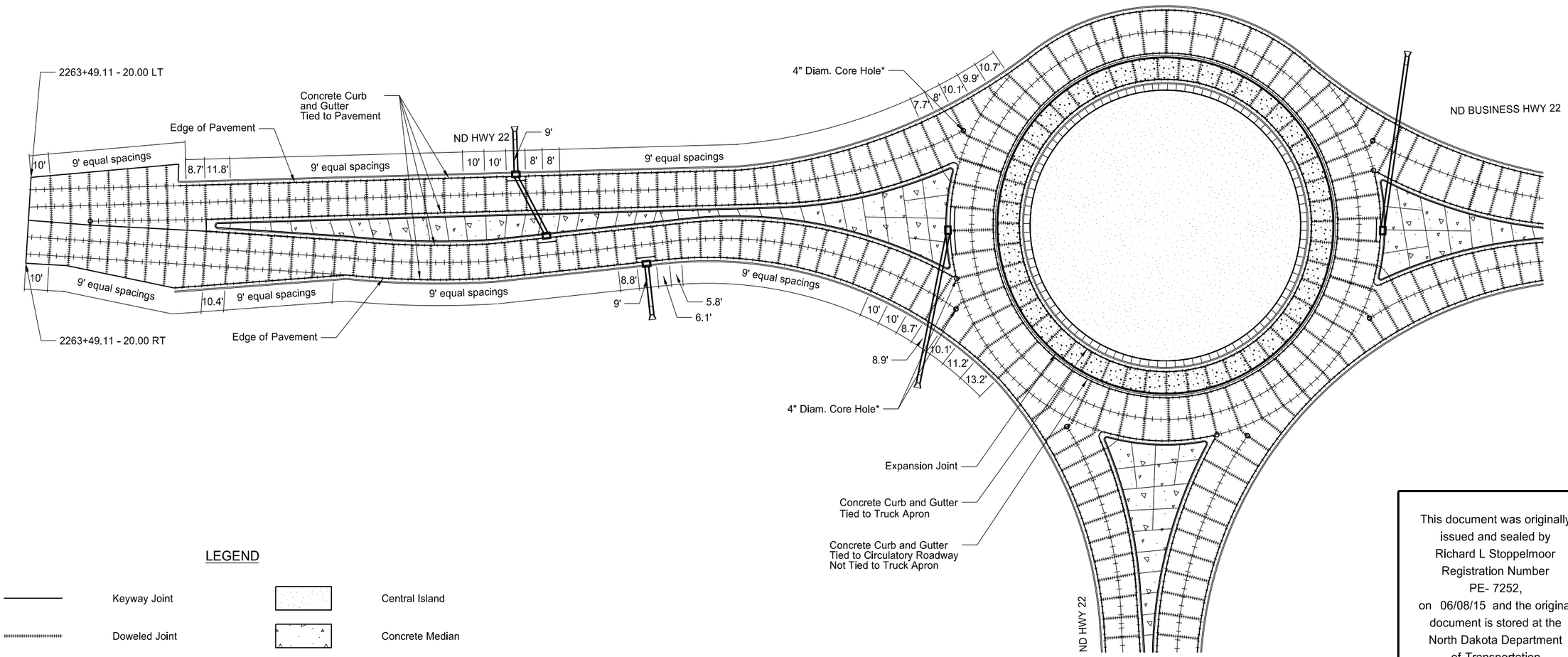
South Roundabout - Center

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	90	12

302-0120	AGGREGATE BASE COURSE CL 5		
	Hwy 22-B Roundabout - Northwest Leg	1,020	Ton
550-0305	9IN NON-REINF CONCRETE PVMT CL AE-DOWELED		
	Hwy 22-B Roundabout - Northwest Leg	1,784	SY
750-0200	CONCRETE MEDIAN PAVING		
	Hwy 22-B Roundabout - Northwest Leg	372	SY
748-0140	CURB & GUTTER-TYPE I		
	Hwy 22-B Roundabout - Northwest Leg	1,442	LF



LEGEND

Keyway Joint	Central Island
Doweled Joint	Concrete Median
Tied Joint	Colored Concrete Truck Apron
Tied Curb And Gutter Joint	Tooled/Saw Cut Joint
Expansion Joint	

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Paving Layout

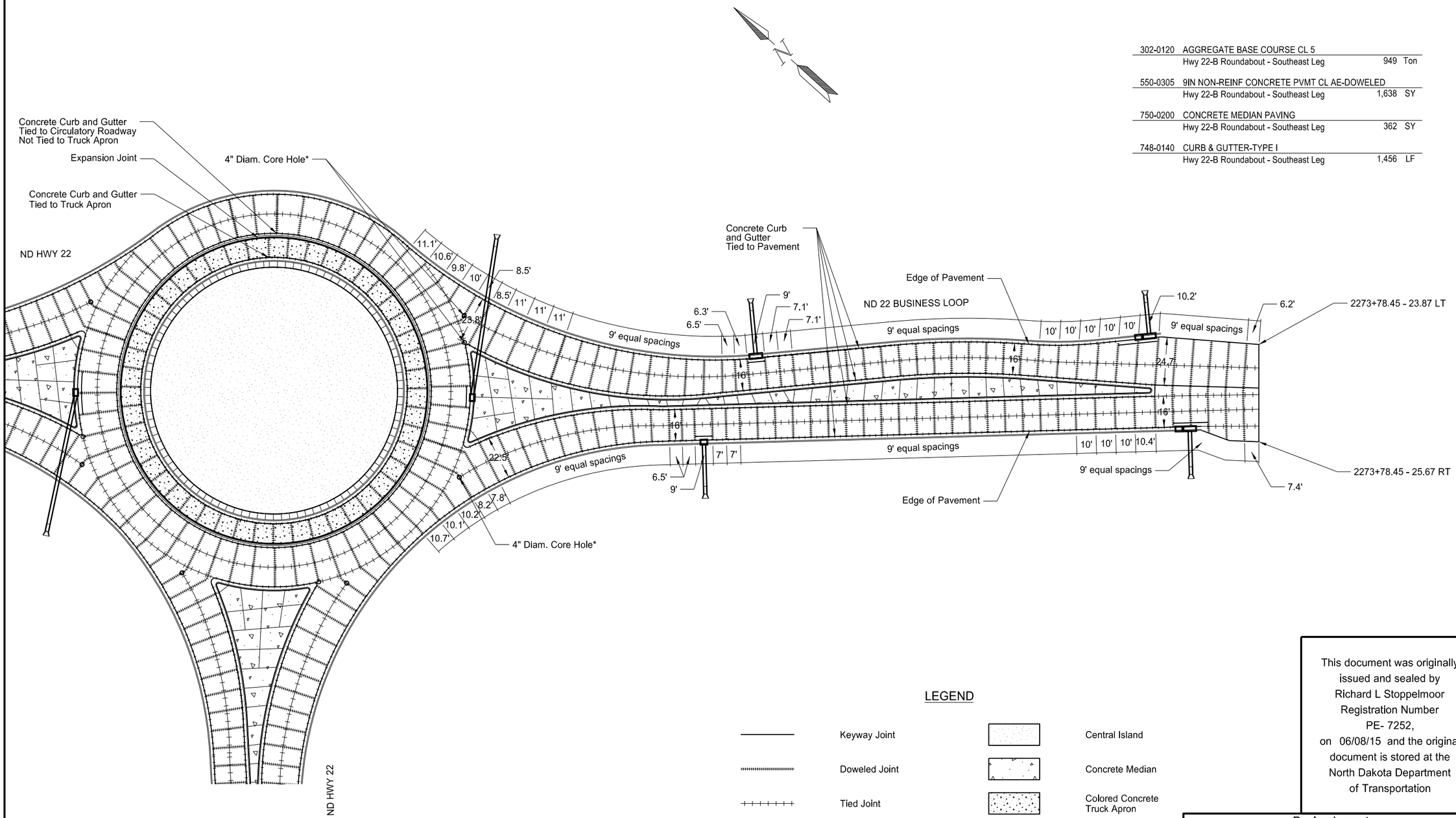
North Roundabout - Northwest Leg

ND Business Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	90	13

302-0120	AGGREGATE BASE COURSE CL 5		
	Hwy 22-B Roundabout - Southeast Leg	949	Ton
550-0305	9IN NON-REINF CONCRETE PVMT CL AE-DOWELED		
	Hwy 22-B Roundabout - Southeast Leg	1,638	SY
750-0200	CONCRETE MEDIAN PAVING		
	Hwy 22-B Roundabout - Southeast Leg	362	SY
748-0140	CURB & GUTTER-TYPE I		
	Hwy 22-B Roundabout - Southeast Leg	1,456	LF



LEGEND

	Keyway Joint		Central Island
	Doweled Joint		Concrete Median
	Tied Joint		Colored Concrete Truck Apron
	Tied Curb And Gutter Joint		Tooled/Saw Cut Joint
	Expansion Joint		

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Paving Layout

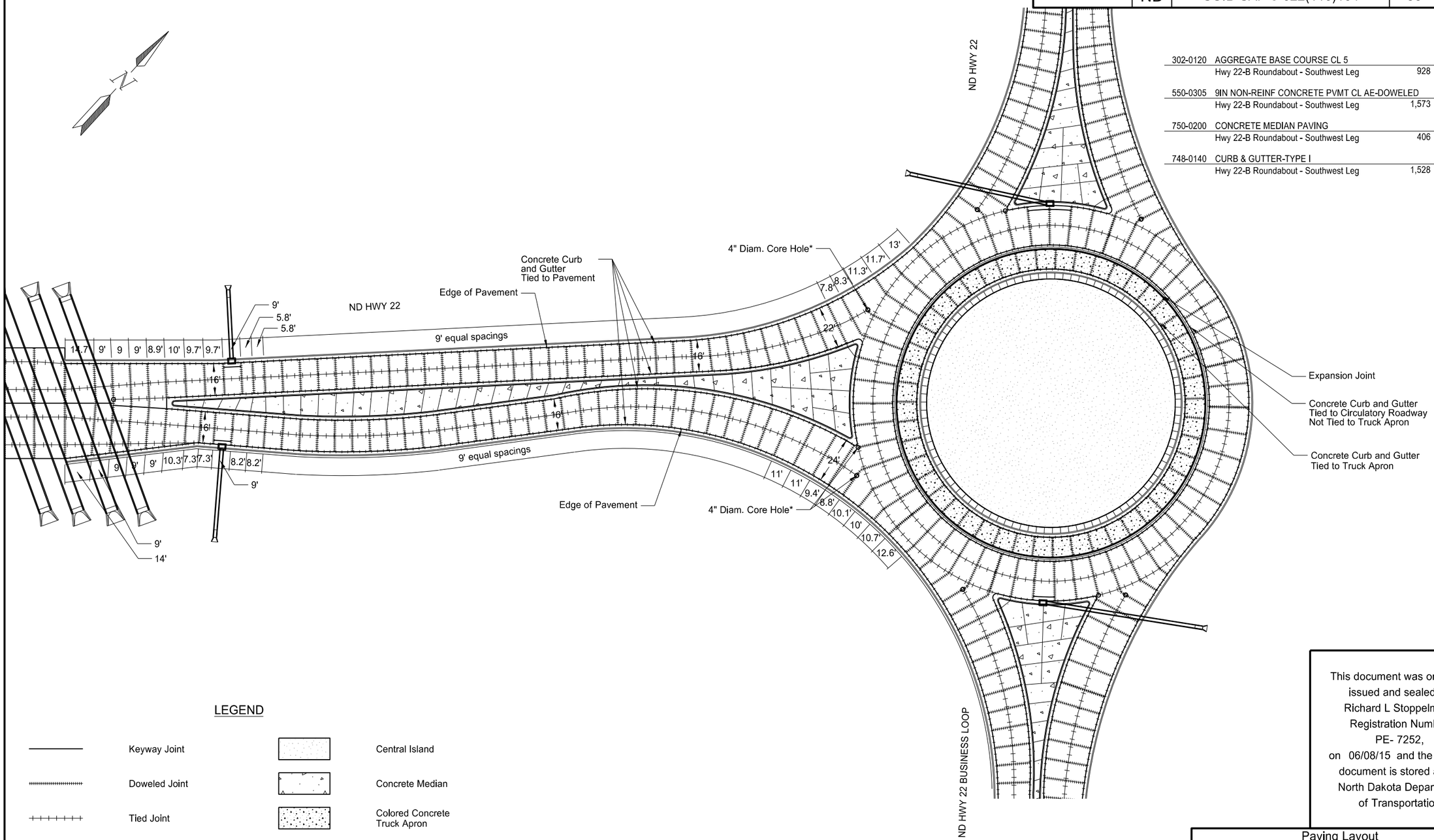
North Roundabout - Southeast Leg

ND Business Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	90	14

302-0120	AGGREGATE BASE COURSE CL 5		
	Hwy 22-B Roundabout - Southwest Leg	928	Ton
550-0305	9IN NON-REINF CONCRETE PVMT CL AE-DOWELED		
	Hwy 22-B Roundabout - Southwest Leg	1,573	SY
750-0200	CONCRETE MEDIAN PAVING		
	Hwy 22-B Roundabout - Southwest Leg	406	SY
748-0140	CURB & GUTTER-TYPE I		
	Hwy 22-B Roundabout - Southwest Leg	1,528	LF



LEGEND

Keyway Joint	Central Island
Doweled Joint	Concrete Median
Tied Joint	Colored Concrete Truck Apron
Tied Curb And Gutter Joint	Tooled/Saw Cut Joint
Expansion Joint	

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Paving Layout

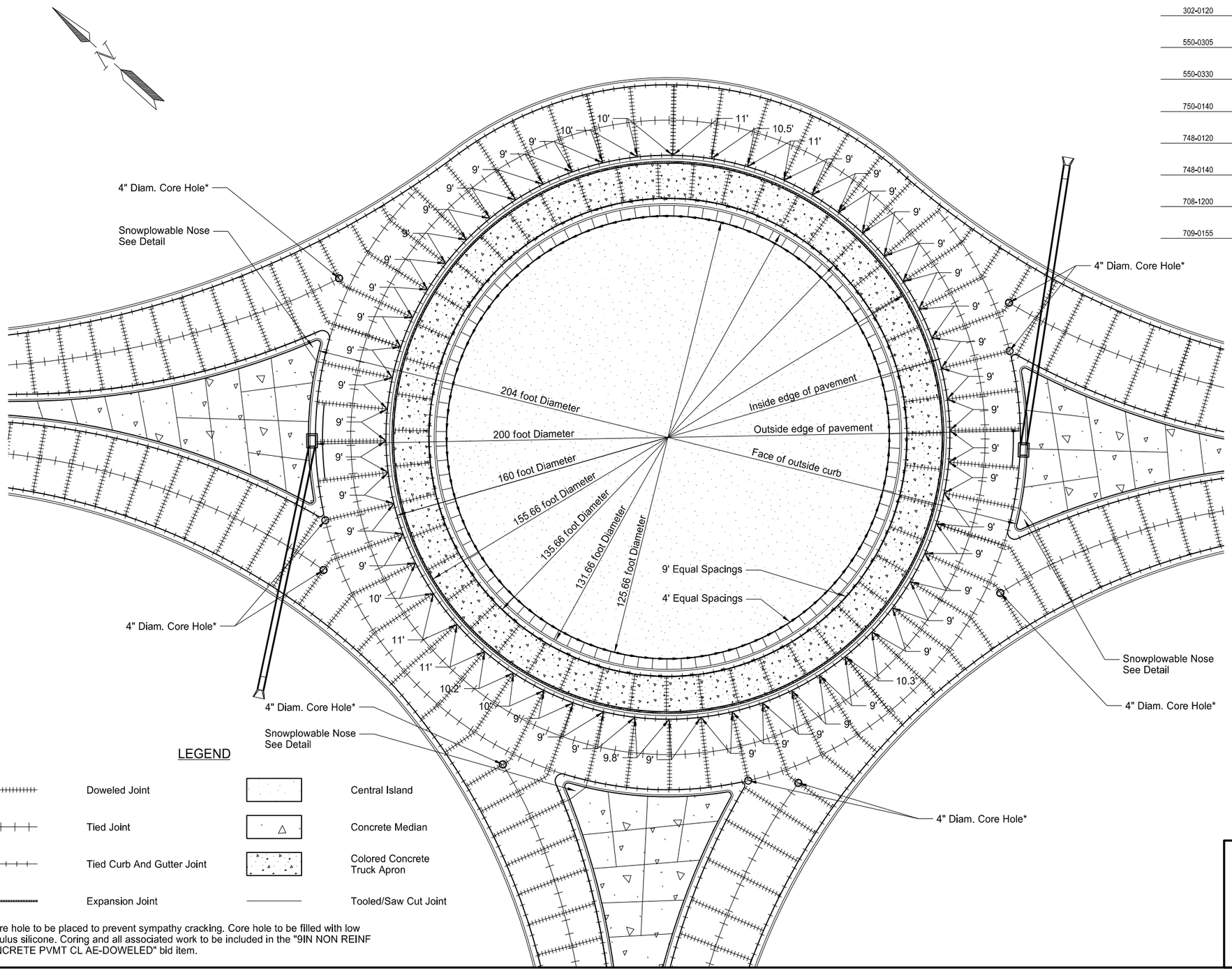
North Roundabout - Southwest Leg

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	90	15

302-0120	AGGREGATE BASE COURSE CL 5		
	Hwy 22-B Roundabout - Center	1,216	Ton
550-0305	9IN NON-REINF CONCRETE PVMT CL AE-DOWELED		
	Hwy 22-B Roundabout - Center	1,655	SY
550-0330	NON-REINF CONCRETE PVMT CL AE-DOWELED-COLORED		
	Hwy 22-B Roundabout - Center	508	SY
750-0140	SIDEWALK CONCRETE 6IN		
	Hwy 22-B Roundabout - Center	135	SY
748-0120	CURB & GUTTER MOUNTABLE-TYPE I		
	Hwy 22-B Roundabout - Center	497	LF
748-0140	CURB & GUTTER-TYPE I		
	Hwy 22-B Roundabout - Center	864	LF
708-1200	SMALL ROCK COVER		
	Hwy 22-B Roundabout - Center	250	Ton
709-0155	GEOSYNTHETIC MATERIAL TYPE RR		
	Hwy 22-B Roundabout - Center	1,378	SY



LEGEND

	Doweled Joint		Central Island
	Tied Joint		Concrete Median
	Tied Curb And Gutter Joint		Colored Concrete Truck Apron
	Expansion Joint		Tooled/Saw Cut Joint

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Paving Layout

North Roundabout - Center

ND Hwy 22

Killdeer Bypass

Revised

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2	3	4		TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
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**	**4**	**6**	**4**	**8**		**8**	**19**	**152**
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)							18	
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							30	
G20-55-96	**96"x48"**	**SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT**	**4**	**6**	**4**	**8**		**8**	**59**	**472**
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)							10	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)							10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)							10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)							7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)							7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)							7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)							7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)							7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT							15	
M4-10-48	48"x18"	DETOUR 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)							7	
M6-1-21	21"x15"	ARROW RT or LT (Mounted on route marker post)							7	
M6-2-21	21"x15"	ARROW UP & RT or LT (Mounted on route marker post)							7	
M6-3-21	21"x15"	ARROW AHD (Mounted on route marker post)							7	
R1-1-48	**48"x48"**	**STOP**	**2**	**2**	**4**			**4**	**32**	**128**
R1-1a-18	18"x18"	STOP and SLOW PADDLE Back to Back							5	
R1-2-60	60"x60"	YIELD							29	
R2-1-48	**48"x60"**	**SPEED LIMIT __**	**4**	**6**	**4**	**8**		**8**	**39**	**312**
R2-1a-24	**24"x18"**	**MINIMUM FEE $80 (Mounted on Speed Limit post)**	**4**	**6**	**4**	**8**		**8**	**10**	**80**
R3-2-48	**48"x48"**	**NO LEFT TURN SYMBOL**		**1**				**1**	**35**	**35**
R3-7-48	48"x48"	LEFT or RIGHT LANE MUST TURN LEFT or RIGHT							35	
R4-1-48	48"x60"	DO NOT PASS							39	
R4-7-48	**48"x60"**	**KEEP RIGHT SYMBOL**	**4**	**10**	**7**	**4**		**10**	**39**	**390**
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	
R10-6-24	24"x36"	STOP HERE ON RED							16	
R11-2-48	48"x30"	ROAD CLOSED							28	
R11-2-48	**48"x30"**	**ROAD CLOSED (Mounted on Barricade)**	**2**	**11**	**3**			**11**	**16**	**176**
R11-2a-48	48"x30"	STREET CLOSED							28	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY							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	
R11-4a-60	**60"x30"**	**STREET CLOSED TO THRU TRAFFIC (Mounted on Barricade)**	**2**	**2**				**2**	**19**	**38**
W1-3-48	**48"x48"**	**RIGHT or LEFT SHARP REVERSE CURVE ARROW**		**4**				**4**	**35**	**140**
W1-4-48	48"x48"	RIGHT or LEFT REVERSE CURVE ARROW							35	
W1-4b-48	48"x48"	DOUBLE RIGHT or LEFT REVERSE CURVE ARROW							35	
W1-6-48	48"x24"	LARGE ARROW							26	
W1-6-48	**48"x24"**	**LARGE ARROW (Mounted on Barricade)**		**5**	**7**			**7**	**14**	**98**
W3-1-48	**48"x48"**	**STOP AHEAD SYMBOL**			**2**			**2**	**35**	**70**
W3-3-48	48"x48"	SIGNAL AHEAD SYMBOL							35	
W3-4-48	48"x48"	BE PREPARED TO STOP							35	
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**2**	**4**	**2**	**4**		**4**	**35**	**140**
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.							35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT.							35	
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY							35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL							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**	**4**	**6**	**4**	**8**		**8**	**35**	**280**
W20-2-48	48"x48"	DETOUR AHEAD or __ FT							35	
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							35	
W20-7k-24	24"x18"	__ FEET (Mounted on warning sign post)							10	
W20-8-48	48"x48"	STREET CLOSED							35	
W20-51-48	48"x48"	EQUIPMENT WORKING							35	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2	3	4		TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
W20-52-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)							12	
W21-1a-48	48"x48"	WORKERS SYMBOL							35	
W21-2-48	48"x48"	FRESH OIL							35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT							35	
W21-5-48	**48"x48"**	**SHOULDER WORK**	**4**			**4**		**4**	**35**	**140**
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED							35	
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT.							35	
W21-6a-48	48"x48"	SURVEY CREW AHEAD							35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT.							35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY							35	
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK							35	
	24"x24"	TAKE TURNS (6" D letters) (Mounted on stop sign post)							11	

SPECIAL SIGNS

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS 2651**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY BY PHASE NO. 1	2	3	4		TOTAL QUANTITY
704-0100	**FLAGGING**	MHR	**150**	**300**	**225**	**300**		**975**
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	**4**	**42**	**24**			**42**
704-1060	**DELINEATOR DRUMS**	EACH	**195**	**24**	**131**	**133**		**195**
704-1065	TRAFFIC CONES	EACH						
704-1067	**TUBULAR MARKERS**	EACH	**52**	**189**	**28**			**189**
704-1070	DELINEATOR	EACH						
704-1072	FLEXIBLE DELINEATORS	EACH						
704-1080	**STACKABLE VERTICAL PANELS**	EACH		**374**	**17**			**374**
704-1081	VERTICAL PANELS - BACK TO BACK	EACH						
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH						
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						
704-1500	OBLITERATION OF PVMT MK	SF						
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						
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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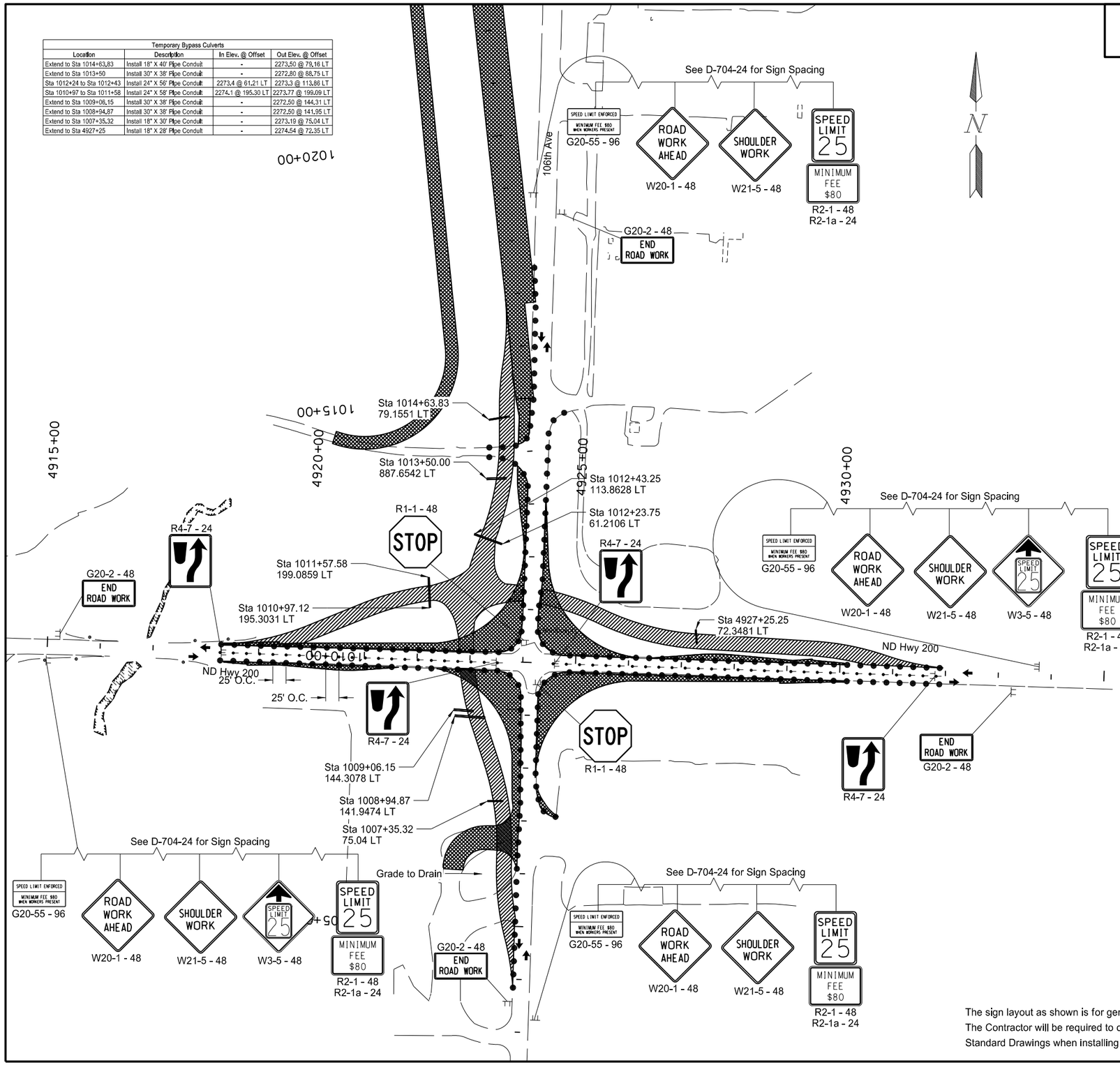
Traffic Control Devices List

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	100	2

Temporary Bypass Culverts			
Location	Description	In Elev. @ Offset	Out Elev. @ Offset
Extend to Sta 1014+63.83	Install 18" X 40' Pipe Conduit	-	2273.50 @ 79.16 LT
Extend to Sta 1013+50	Install 30" X 38' Pipe Conduit	-	2272.80 @ 88.75 LT
Sta 1012+24 to Sta 1012+43	Install 24" X 56' Pipe Conduit	2273.4 @ 61.21 LT	2273.3 @ 113.86 LT
Sta 1010+97 to Sta 1011+58	Install 24" X 58' Pipe Conduit	2274.1 @ 195.30 LT	2273.77 @ 199.09 LT
Extend to Sta 1009+06.15	Install 30" X 38' Pipe Conduit	-	2272.50 @ 144.31 LT
Extend to Sta 1008+94.87	Install 30" X 38' Pipe Conduit	-	2272.50 @ 141.95 LT
Extend to Sta 1007+35.32	Install 18" X 30' Pipe Conduit	-	2273.19 @ 75.04 LT
Extend to Sta 4927+25	Install 18" X 28' Pipe Conduit	-	2274.54 @ 72.35 LT



Phase 1 ND 200 Roundabout Summary:

- Construct proposed mainline ND 22 from Sta 1015+00 to Sta 1045+24.
- Construct proposed access roads connecting to proposed ND 22 mainline at Sta 1024+00 simultanerously with temporary bypass construction.
- Grading of embankment for temporary roadway and proposed roundabout on all four quadrants up to the edge of the existing roadway of ND 200 and 106th Avenue.
- Construct final grade to ensure drainage flows throughout construction.
- Construct embankment and aggregate base of ND 200 Roundabout Phase 2 temporary roadways and ND 200 Roundabout Phase 3 temporary widening areas.
- Maintain traffic on existing ND 200 and 106th Avenue to maintain access to all parcels.
- Traffic for west property on south 106th Avenue will be maintained using the southern-most access while north access is constructed at Sta 1006+70.

Temporary drainage items are incidental to pipe conduits.

LEGEND

- Work Zone
- Temporary Roadway Construction
- Temporary Roadway
- Tubular Marker
- Vertical Stackable Panel
- Delineator Drum
- Type III Barricade
- Traffic Direction

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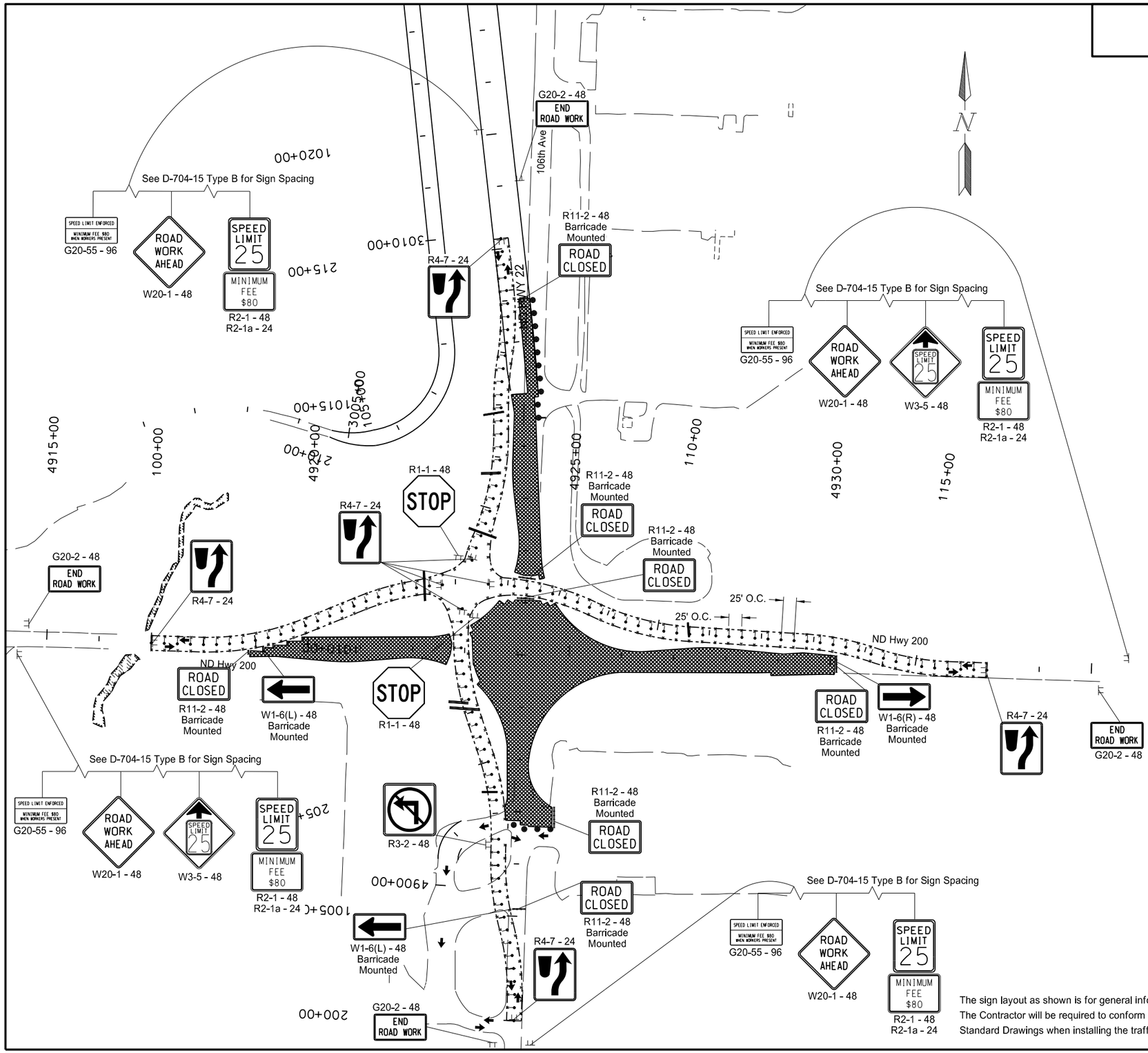
Work Zone Traffic Control
Overview
ND 200 Roundabout (Phase 1)

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	100	3



Phase 2 ND 200 Roundabout Summary:

Remove existing ND 200 pavement. Construct embankment and aggregate base for the following:
- Center island of roundabout.
- East leg of roundabout.
- North leg of roundabout.
- West leg of roundabout.
- South leg of roundabout from Sta 1006+72 to center of roundabout.

Construct pavement for the following:
- East leg of roundabout excluding area where temporary roadway crosses.
- North leg of roundabout excluding area where temporary roadway crosses.
- West leg of roundabout excluding areas where temporary roadways cross.
- South leg of roundabout from Sta 1006+72 to center of roundabout.

Construct drainage infrastructure for roundabout.

Maintain traffic on temporary roadway constructed in Phase 1.

LEGEND

- Work Zone
- Temporary Roadway Construction
- Temporary Roadway
- Tubular Marker
- Vertical Stackable Panel
- Delineator Drum
- Type III Barricade
- Traffic Direction

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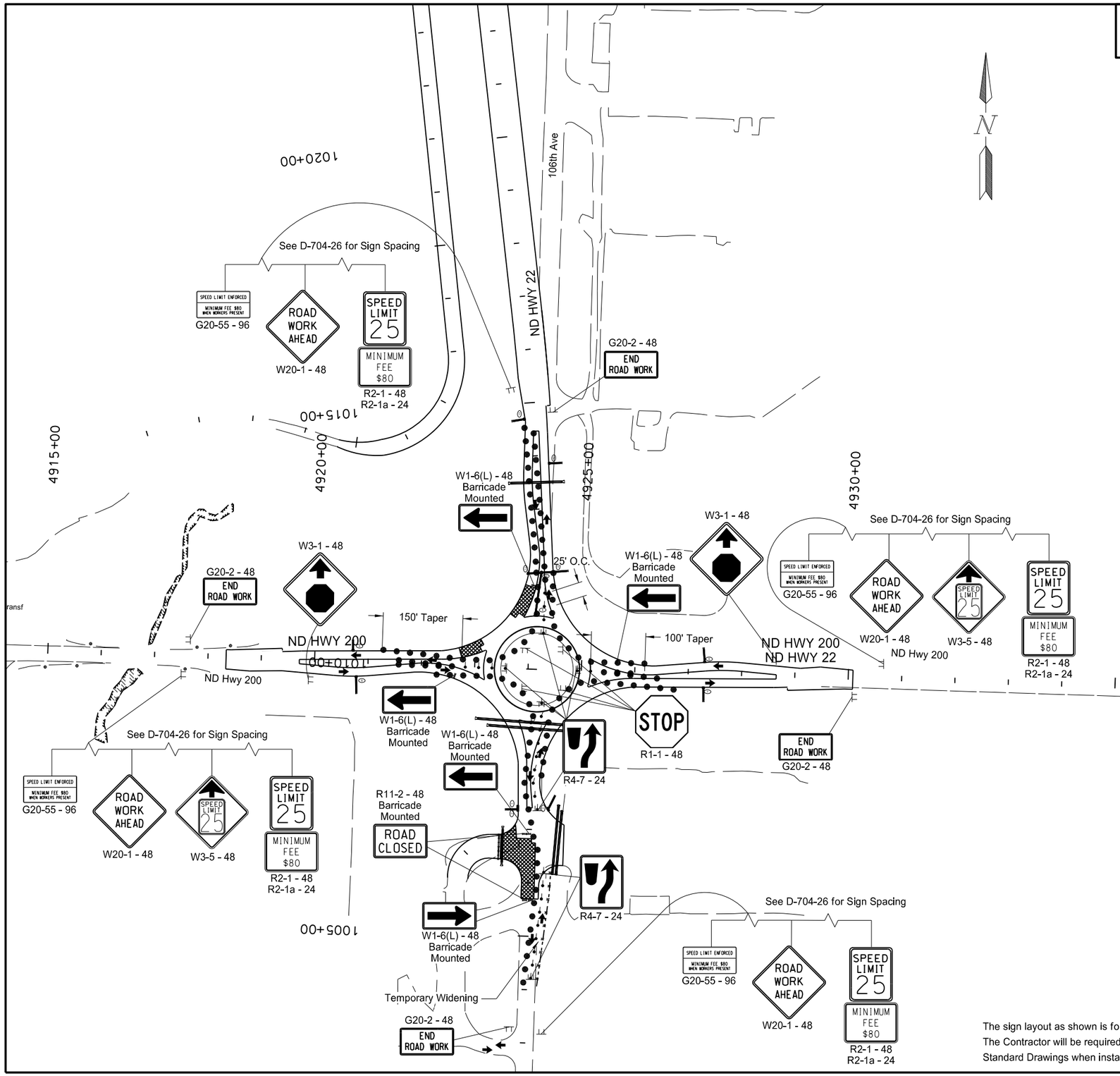
Work Zone Traffic Control
Overview
ND 200 Roundabout (Phase 2)

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	100	4



Phase 3A ND 200 Roundabout Summary:

- Construct remaining southbound lane of north leg of roundabout.
- Construct remaining westbound lane of west leg of roundabout.
- Southbound lane of south leg of roundabout from Sta 1005+70 to Sta 1006+88.
- Construct drainage infrastructure.
- Phase construction of west leg of roundabout by bridge so as to maintain traffic.
- Remove ND 200 Roundabout Phase 1 and 2 temporary roadway.

LEGEND

- Work Zone
- Temporary Roadway Construction
- Temporary Roadway
- Tubular Marker
- Vertical Stackable Panel
- Delineator Drum
- Type III Barricade
- Traffic Direction

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Work Zone Traffic Control
Overview
ND 200 Roundabout (Phase 3A)

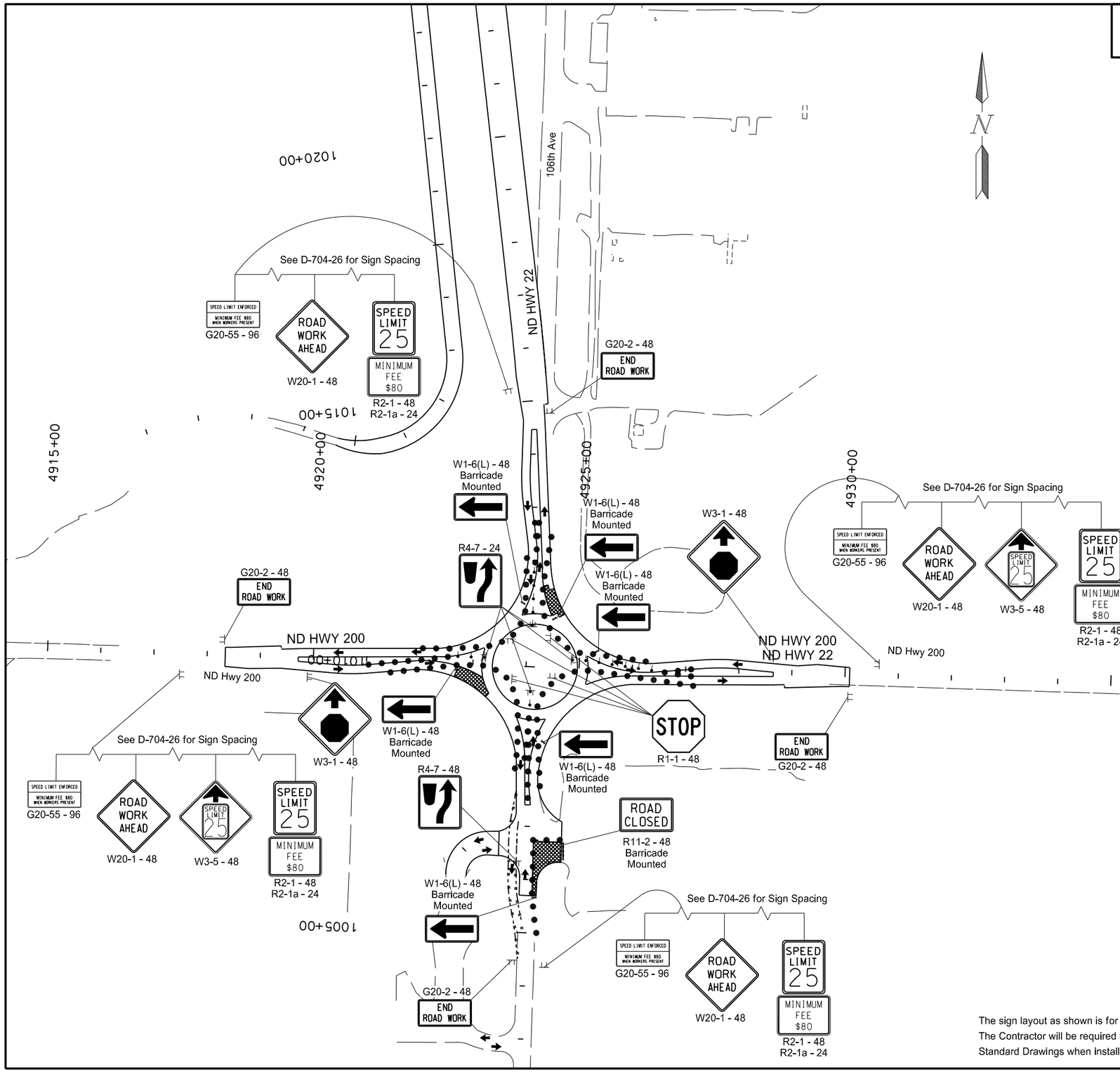
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	100	5

Phase 3B ND 200 Roundabout Summary:

- Construct remaining northbound lane of north leg of roundabout.
- Construct remaining eastbound lane of west leg of roundabout.
- Construct remaining portion of northbound lane and driveway on the south leg of the roundabout.
- Phase construction on west leg of roundabout by bridge so as to maintain traffic.



LEGEND

- Work Zone
- Temporary Roadway Construction
- Temporary Roadway
- Tubular Marker
- Vertical Stackable Panel
- Delineator Drum
- Type III Barricade
- Traffic Direction

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Work Zone Traffic Control
Overview
ND 200 Roundabout (Phase 3B)

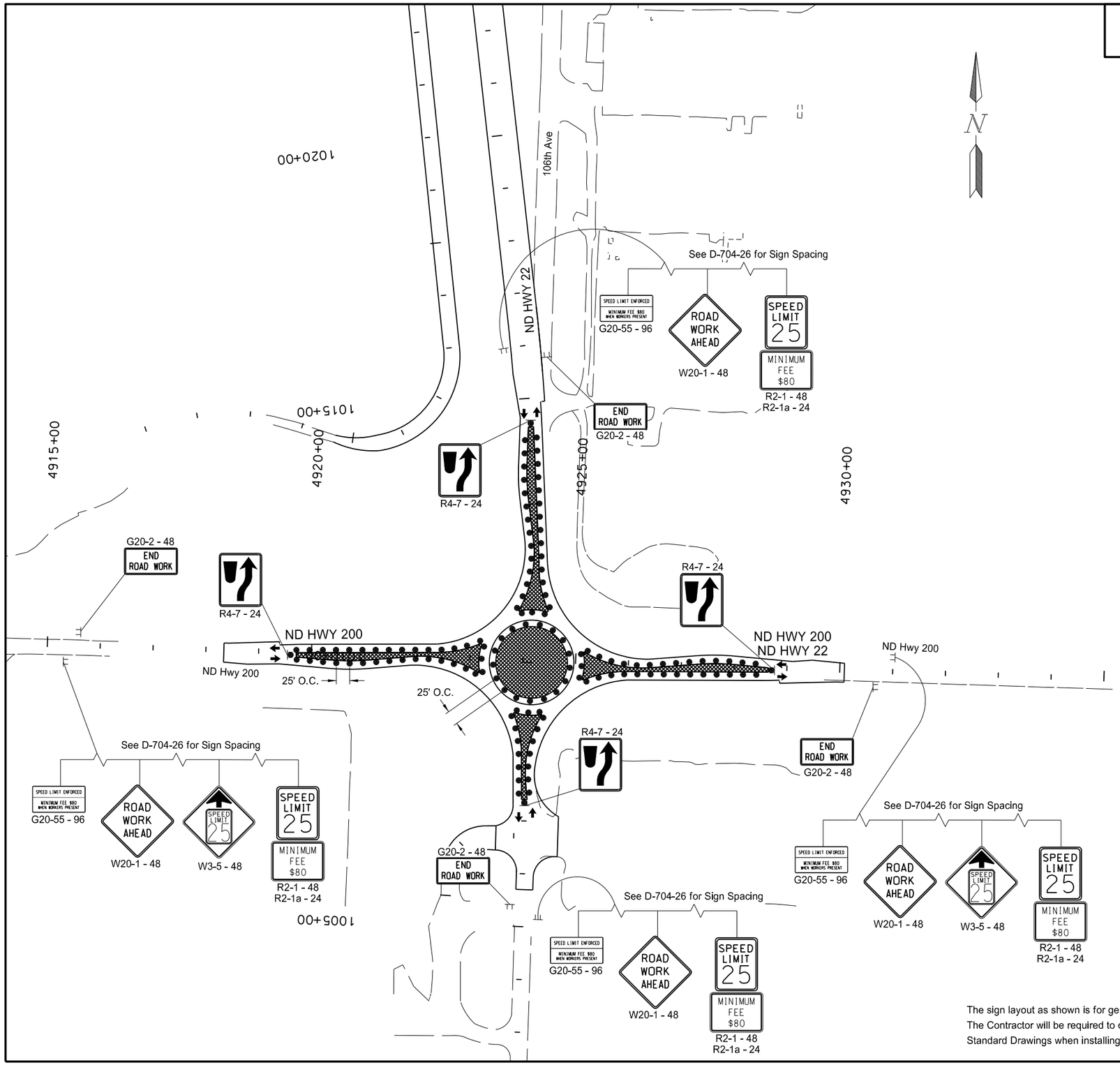
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	100	6

Phase 4A ND 200 Roundabout Summary:

- Construct splitter island curb and gutter.
- Construct center island curb, gutter and fill.



LEGEND

- Work Zone
- Temporary Roadway Construction
- Temporary Roadway
- Tubular Marker
- Vertical Stackable Panel
- Delineator Drum
- Type III Barricade
- Traffic Direction

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Work Zone Traffic Control
Overview
ND 200 Roundabout (Phase 4A)

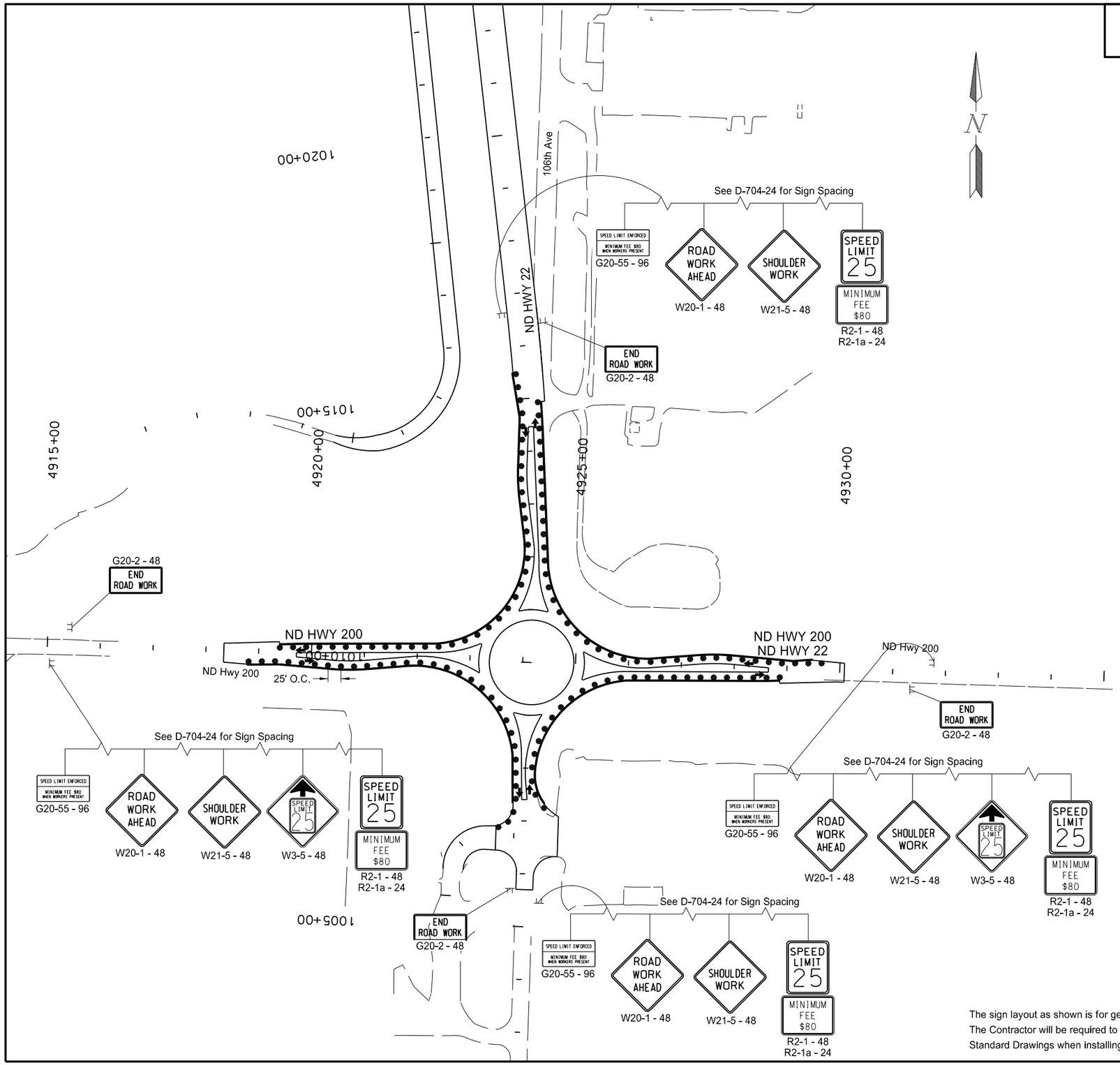
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	100	7

Phase 4B ND 200 Roundabout Summary:

- Construct curb and gutter along outside edges of roundabout lanes.



LEGEND

- Work Zone
- Temporary Roadway Construction
- Temporary Roadway
- Tubular Marker
- Vertical Stackable Panel
- Delineator Drum
- Type III Barricade
- Traffic Direction

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Work Zone Traffic Control Overview
ND 200 Roundabout (Phase 4B)

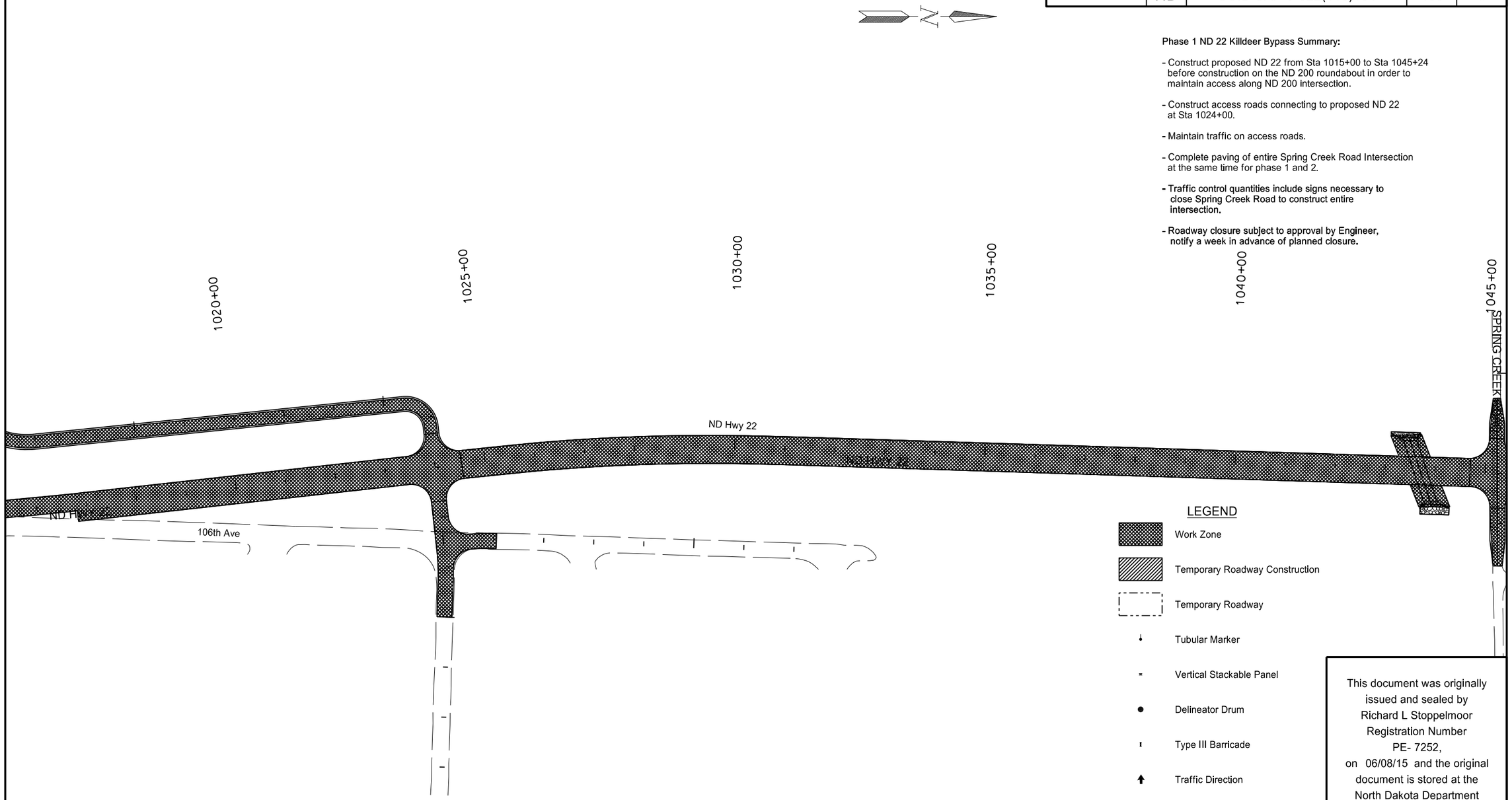
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	100	8

Phase 1 ND 22 Killdeer Bypass Summary:

- Construct proposed ND 22 from Sta 1015+00 to Sta 1045+24 before construction on the ND 200 roundabout in order to maintain access along ND 200 intersection.
- Construct access roads connecting to proposed ND 22 at Sta 1024+00.
- Maintain traffic on access roads.
- Complete paving of entire Spring Creek Road Intersection at the same time for phase 1 and 2.
- Traffic control quantities include signs necessary to close Spring Creek Road to construct entire intersection.
- Roadway closure subject to approval by Engineer, notify a week in advance of planned closure.



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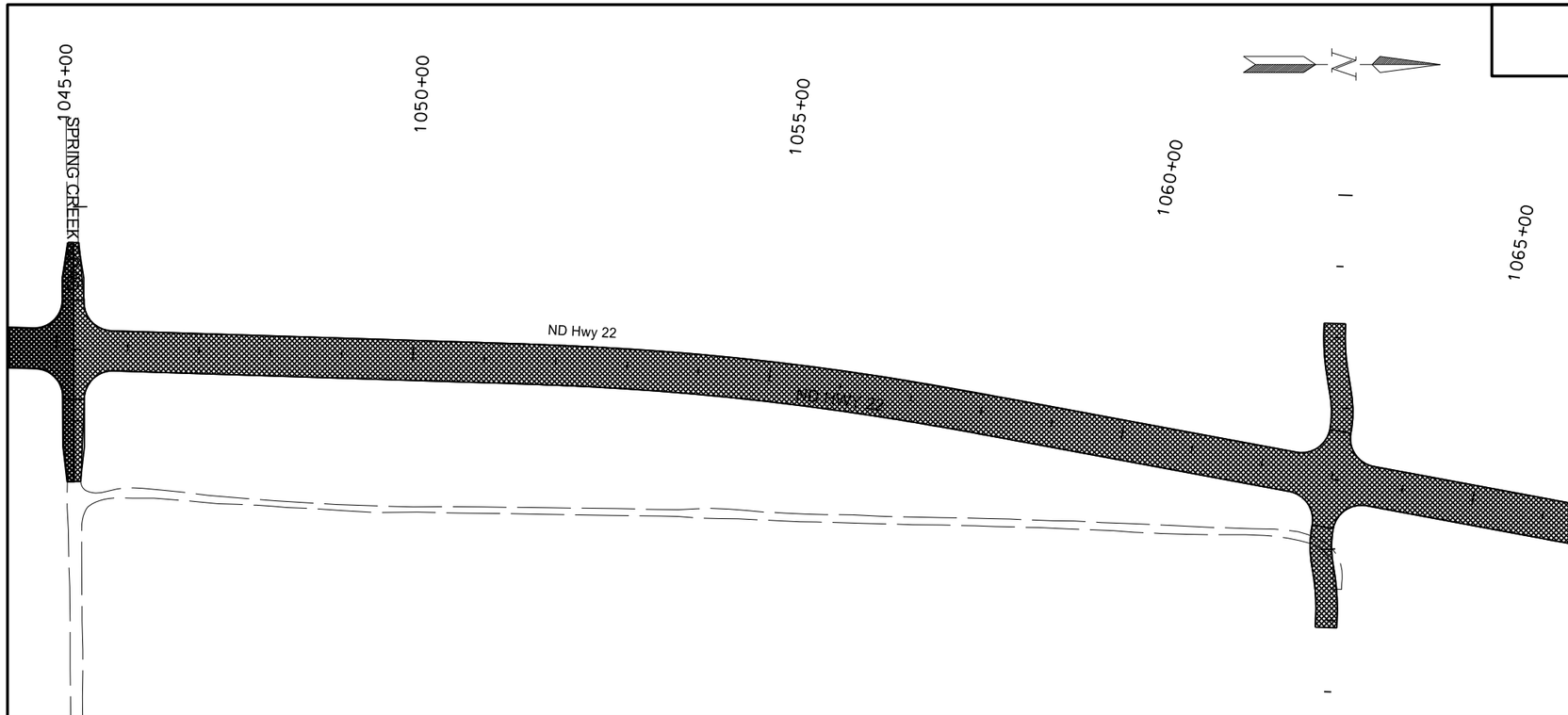
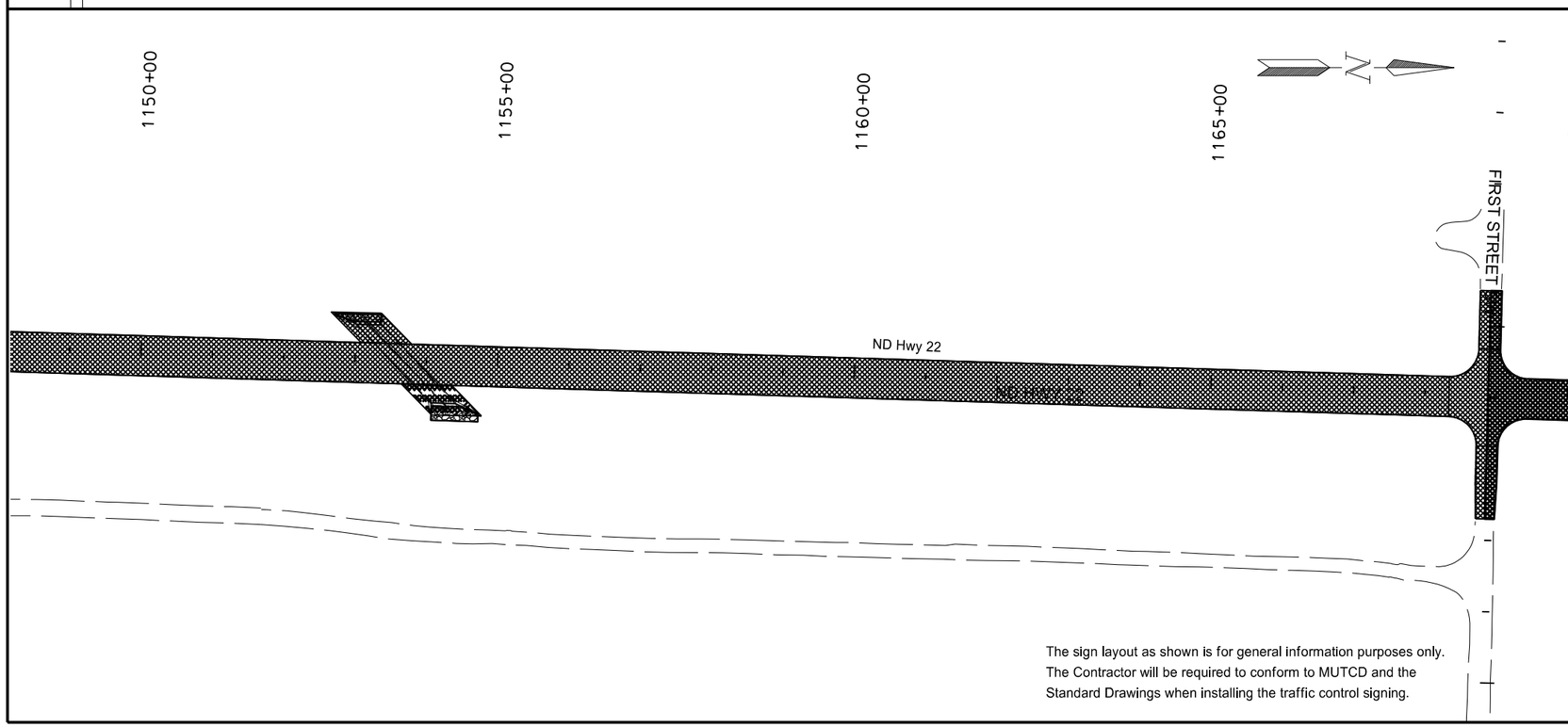
Work Zone Traffic Control
Overview
Sta 1020+00 to Sta 1045+00
Phase 1
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	100	9





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Phase 2 ND 22 Killdeer Bypass Summary:

- Construct proposed ND 22 from Sta 1045+24 to Sta 1168+89.
- Complete paving of entire Spring Creek Road intersection at the same time for phase 1 and phase 2.
- Complete paving of entire First Street SW intersection at the same time for phase 2 and phase 3.

LEGEND

- Work Zone
- Temporary Roadway Construction
- Temporary Roadway
- Tubular Marker
- Vertical Stackable Panel
- Delineator Drum
- Type III Barricade
- Traffic Direction

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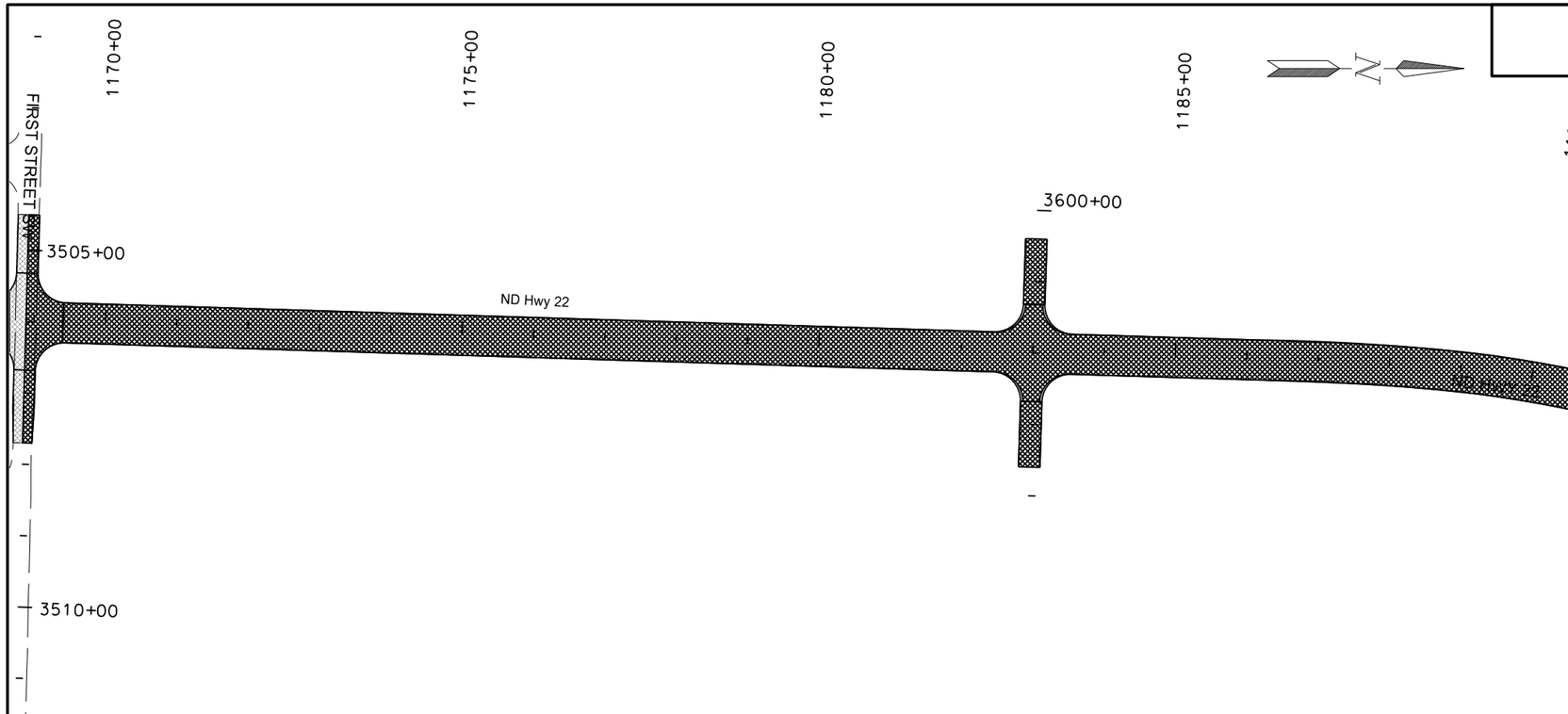
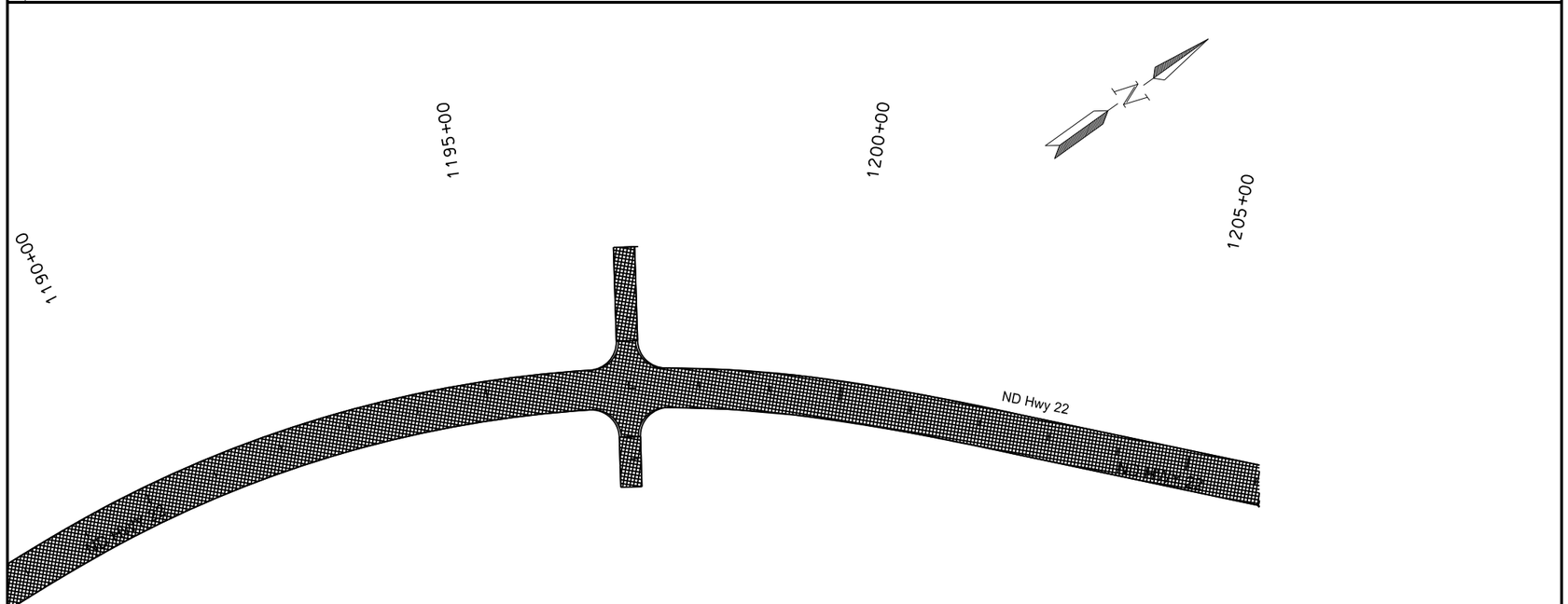
Work Zone Traffic Control
Overview
Sta 1045+00 to Sta 1069+00
Phase 2
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	100	10





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Phase 3 ND 22 Killdeer Bypass Summary:

- Construct proposed ND 22 from Sta 1168+89 to south leg of ND 22 roundabout.
- Complete paving of entire First Street SW intersection at the same time for phase 2 and phase 3.

LEGEND

- Work Zone
- Temporary Roadway Construction
- Temporary Roadway
- Tubular Marker
- Vertical Stackable Panel
- Delineator Drum
- Type III Barricade
- Traffic Direction

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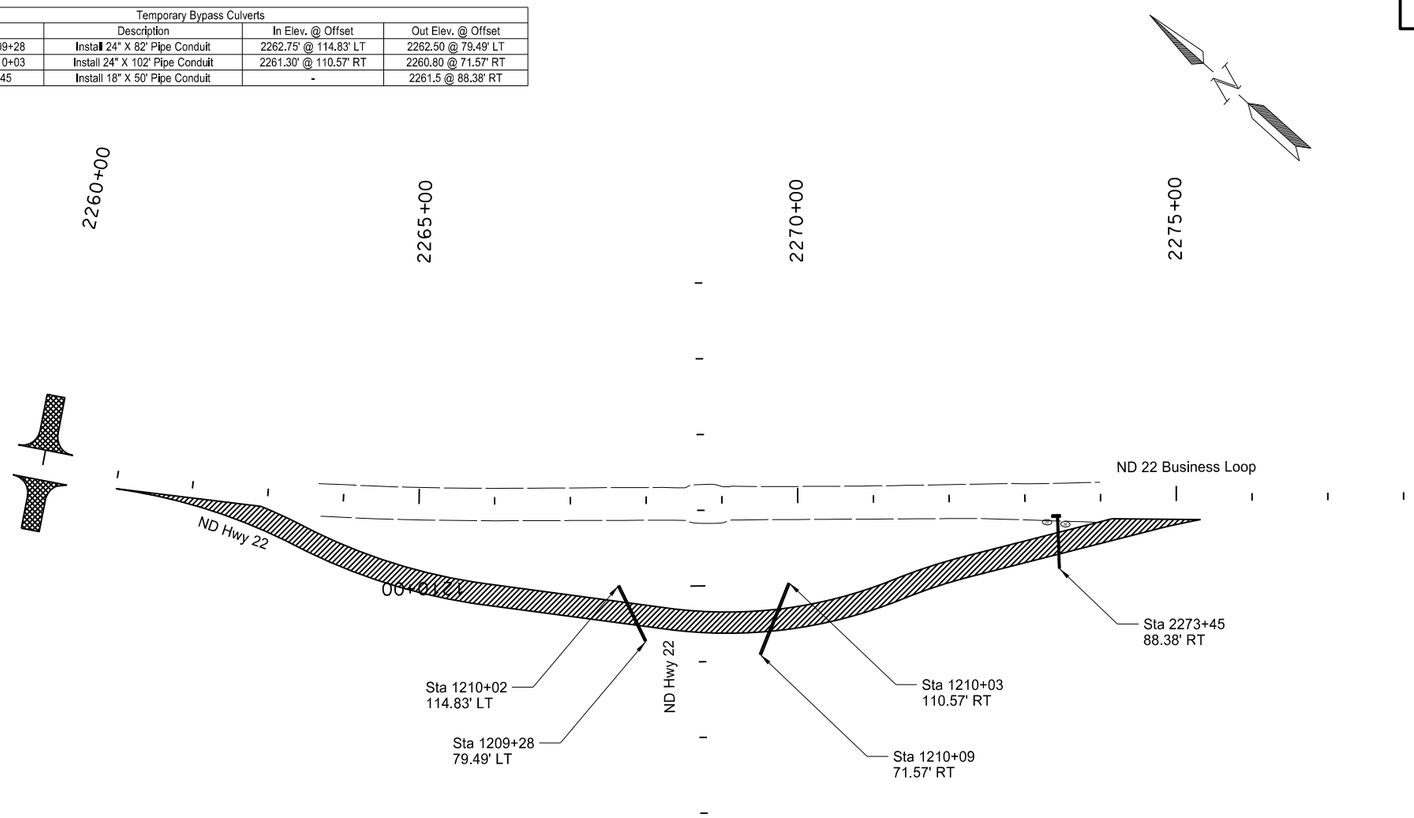
Work Zone Traffic Control
Overview
Sta 1169+00 to Sta 1205+00
Phase 3
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	100	11

Temporary Bypass Culverts			
Location	Description	In Elev. @ Offset	Out Elev. @ Offset
Sta 1210+02 to Sta 1209+28	Install 24" X 82' Pipe Conduit	2262.75' @ 114.83' LT	2262.50 @ 79.49' LT
Sta 1209+09 to Sta 1210+03	Install 24" X 102' Pipe Conduit	2261.30' @ 110.57' RT	2260.80 @ 71.57' RT
Extend to Sta 2273+45	Install 18" X 50' Pipe Conduit	-	2261.5 @ 88.38' RT



Phase 1 ND 22 Roundabout Summary:

- Construct final grade to ensure drainage flows throughout construction.
- Construct temporary roadway on SW side of existing ND 22 from Sta 2261+10 to Sta 2275+14.
- Maintain traffic on ND 22 / ND 22 Business.

Temporary drainage items are incidental to pipe conduits.

LEGEND

- Work Zone
- Temporary Roadway Construction
- Temporary Roadway
- Tubular Marker
- Vertical Stackable Panel
- Delineator Drum
- Type III Barricade
- Traffic Direction

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Work Zone Traffic Control
Overview
ND 22 Roundabout (Phase 1)

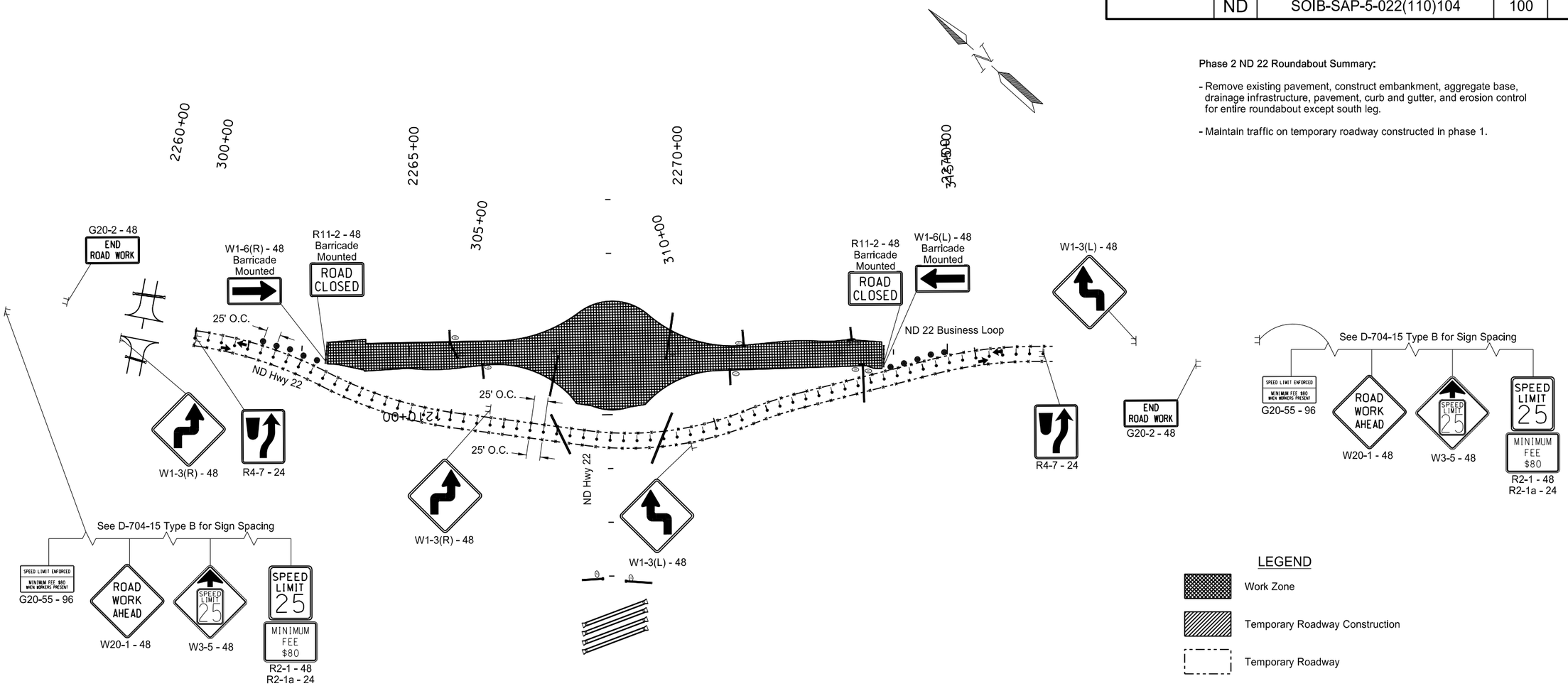
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	100	12

Phase 2 ND 22 Roundabout Summary:

- Remove existing pavement, construct embankment, aggregate base, drainage infrastructure, pavement, curb and gutter, and erosion control for entire roundabout except south leg.
- Maintain traffic on temporary roadway constructed in phase 1.



LEGEND

- Work Zone
- Temporary Roadway Construction
- Temporary Roadway
- Tubular Marker
- Vertical Stackable Panel
- Delineator Drum
- Type III Barricade
- Traffic Direction

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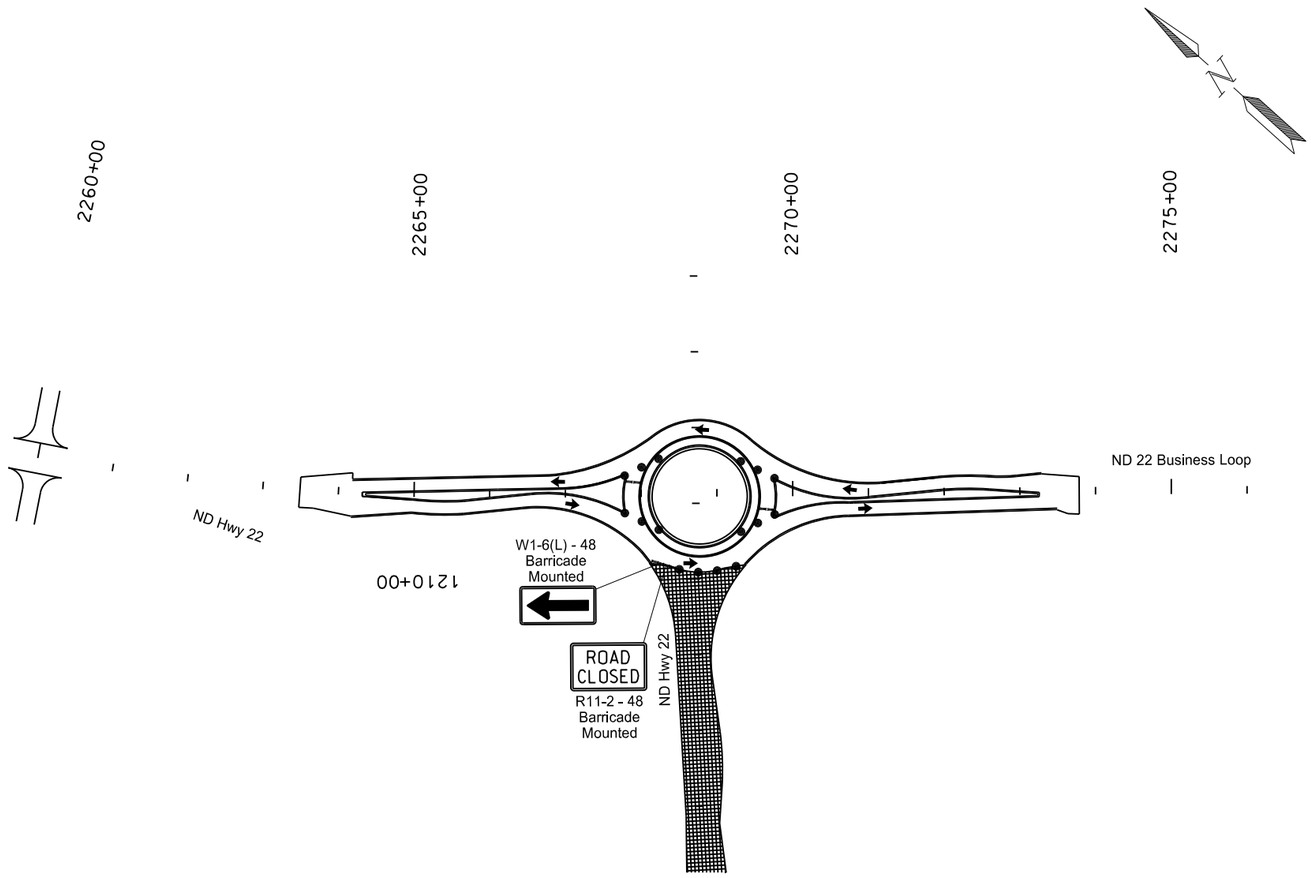
Work Zone Traffic Control Overview
ND22 Roundabout (Phase 2)

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	100	13



Phase 3 ND 22 Roundabout Summary:

- Remove temporary roadway when traffic is open on proposed ND 22.
- Construct embankment, aggregate base, drainage, pavement, curb and gutter, and erosion control for SW leg of proposed ND 22 roundabout.
- Maintain traffic on NW and SE legs of roundabout constructed in phase 2.

LEGEND

- Work Zone
- Temporary Roadway Construction
- Temporary Roadway
- Tubular Marker
- Vertical Stackable Panel
- Delineator Drum
- Type III Barricade
- Traffic Direction

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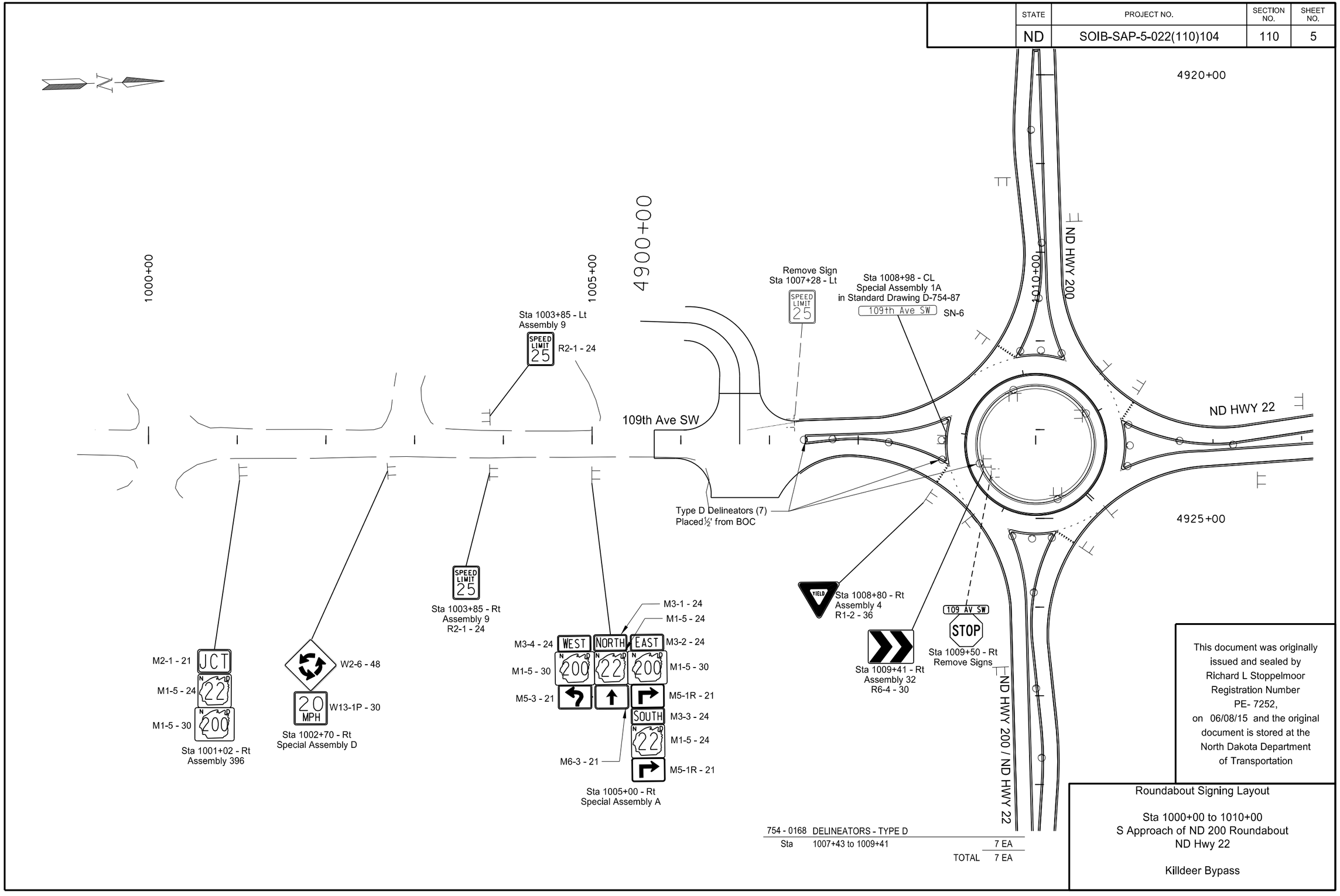
Work Zone Traffic Control
Overview
ND 22 Roundabout (Phase 3)

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	5



754 - 0168 DELINEATORS - TYPE D

Sta	1007+43 to 1009+41	7 EA
TOTAL		7 EA

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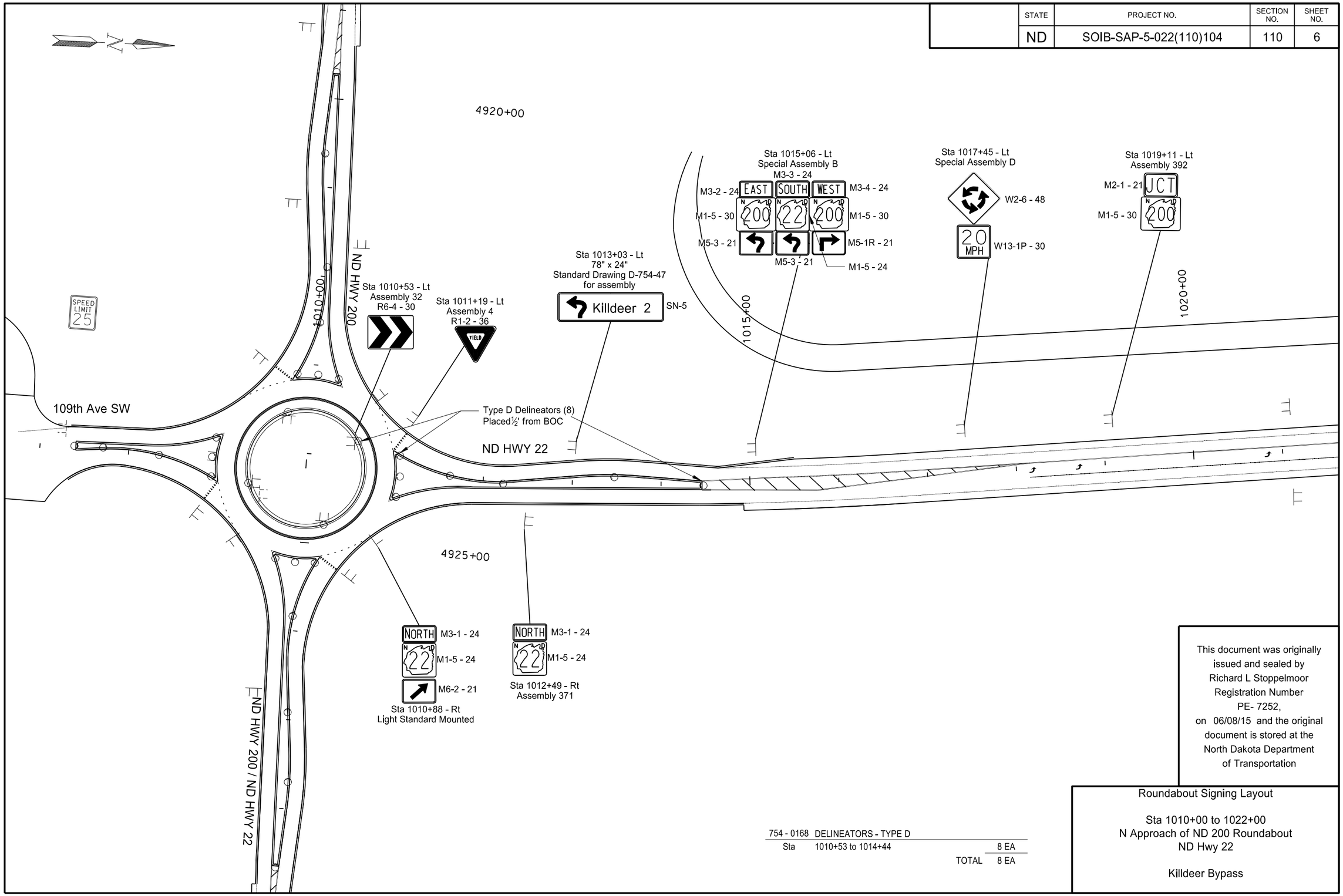
Roundabout Signing Layout

Sta 1000+00 to 1010+00
S Approach of ND 200 Roundabout
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	6



754 - 0168	DELINEATORS - TYPE D	
Sta	1010+53 to 1014+44	8 EA
	TOTAL	8 EA

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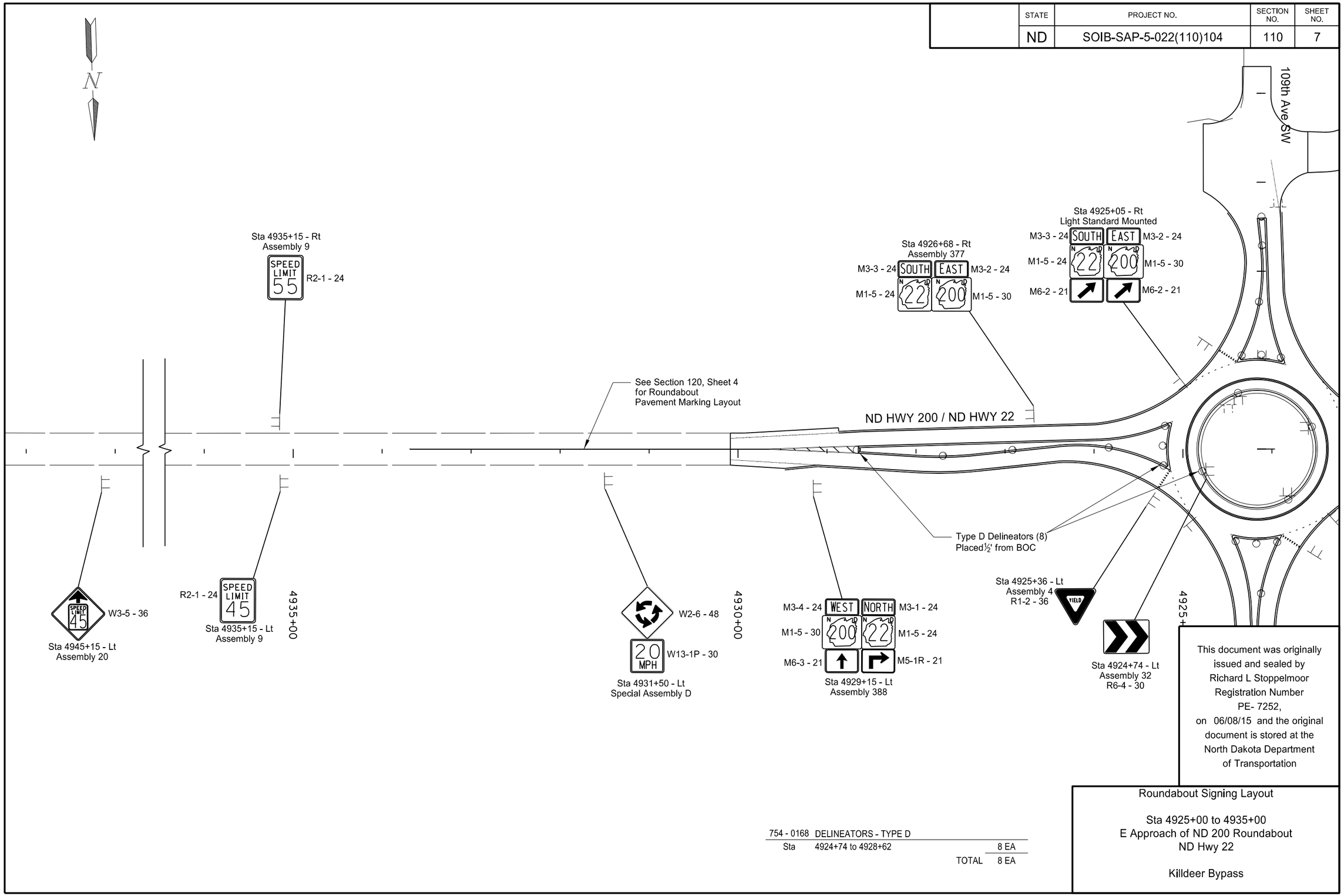
Roundabout Signing Layout

Sta 1010+00 to 1022+00
N Approach of ND 200 Roundabout
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	7



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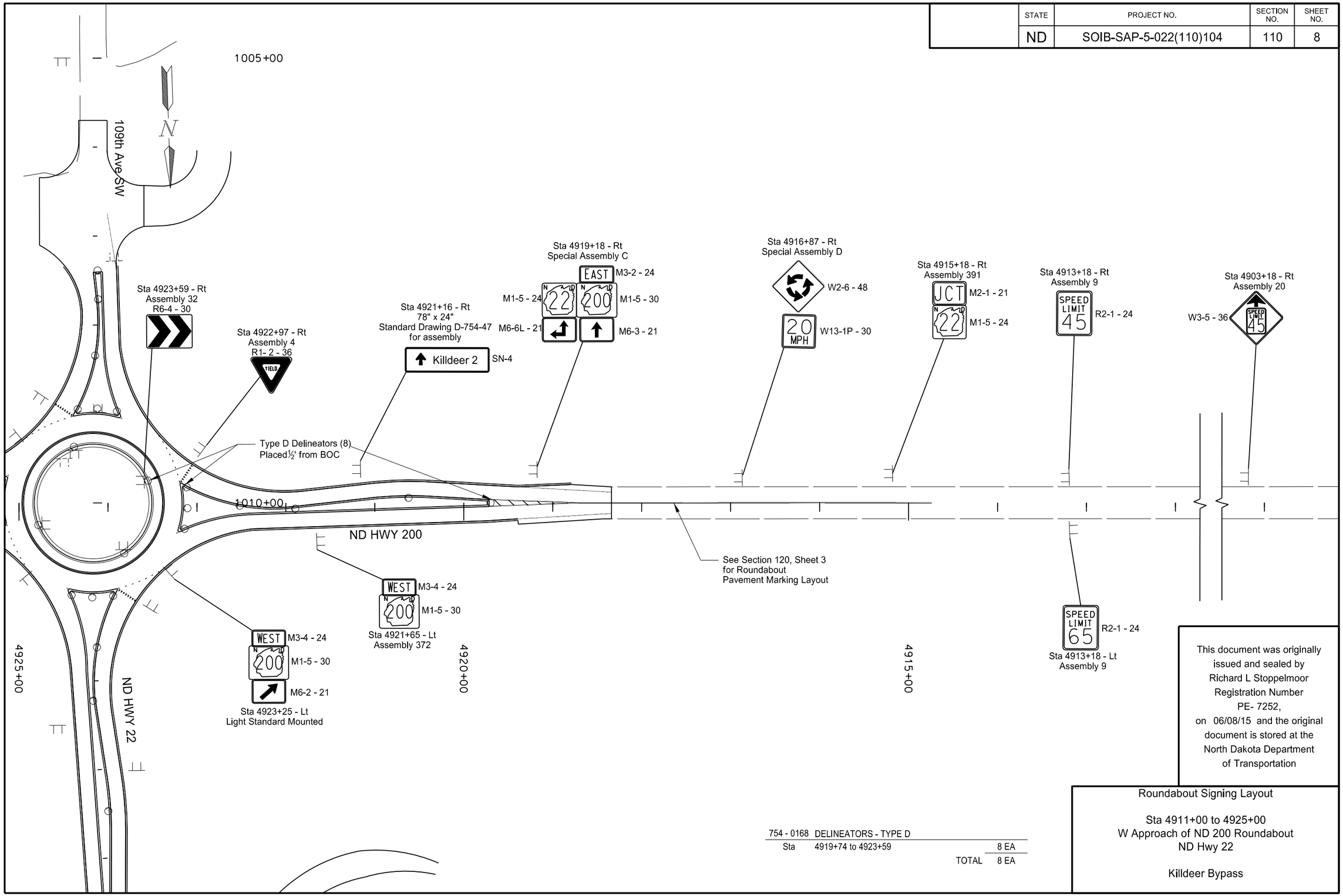
754 - 0168	DELINEATORS - TYPE D	
Sta	4924+74 to 4928+62	8 EA
	TOTAL	8 EA

Roundabout Signing Layout

Sta 4925+00 to 4935+00
E Approach of ND 200 Roundabout
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	8



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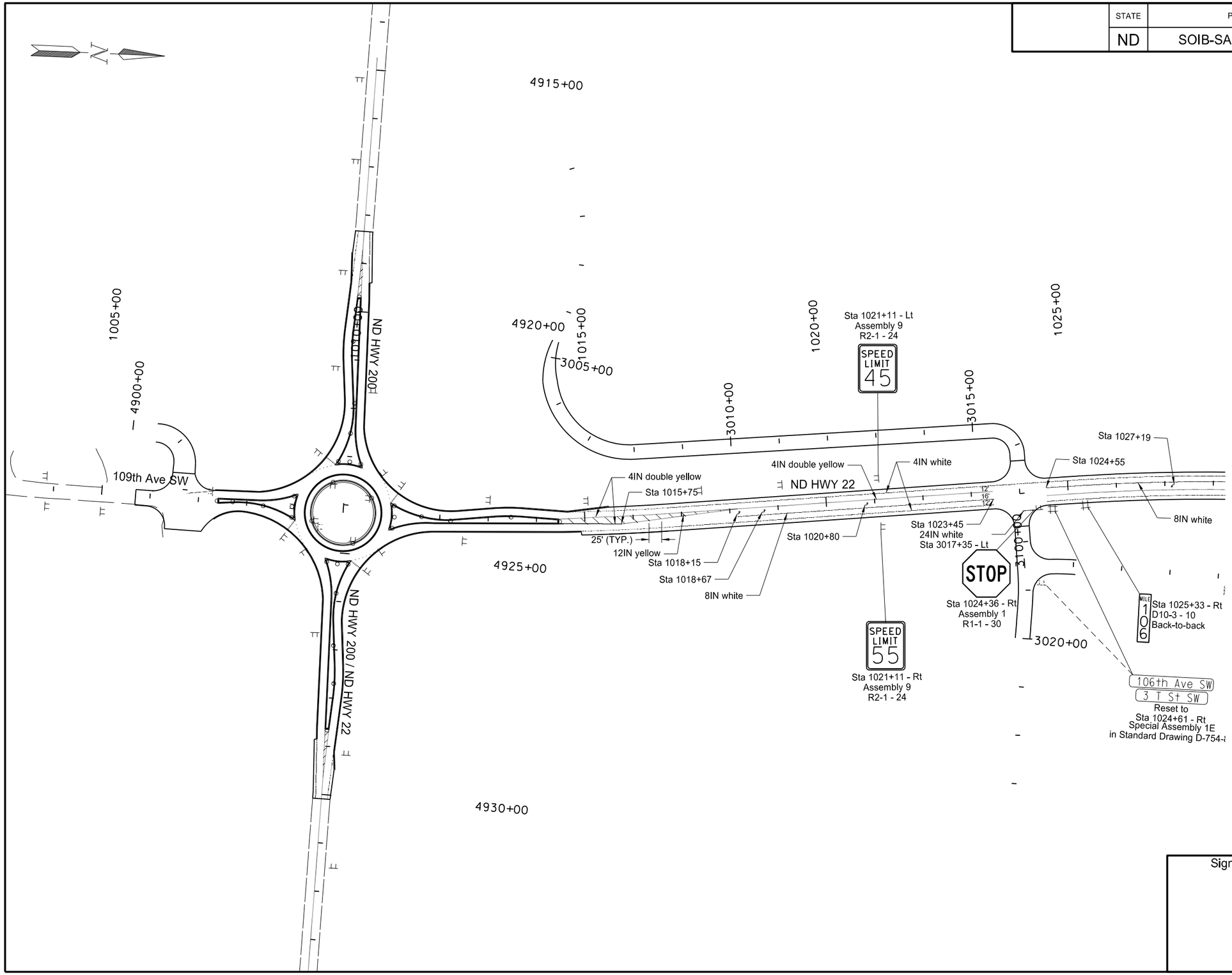
754 - 0168	DELINEATORS - TYPE D	
Sta	4919+74 to 4923+59	8 EA
	TOTAL	8 EA

Roundabout Signing Layout

Sta 4911+00 to 4925+00
W Approach of ND 200 Roundabout
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	9



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Signing and Pavement Marking Layout

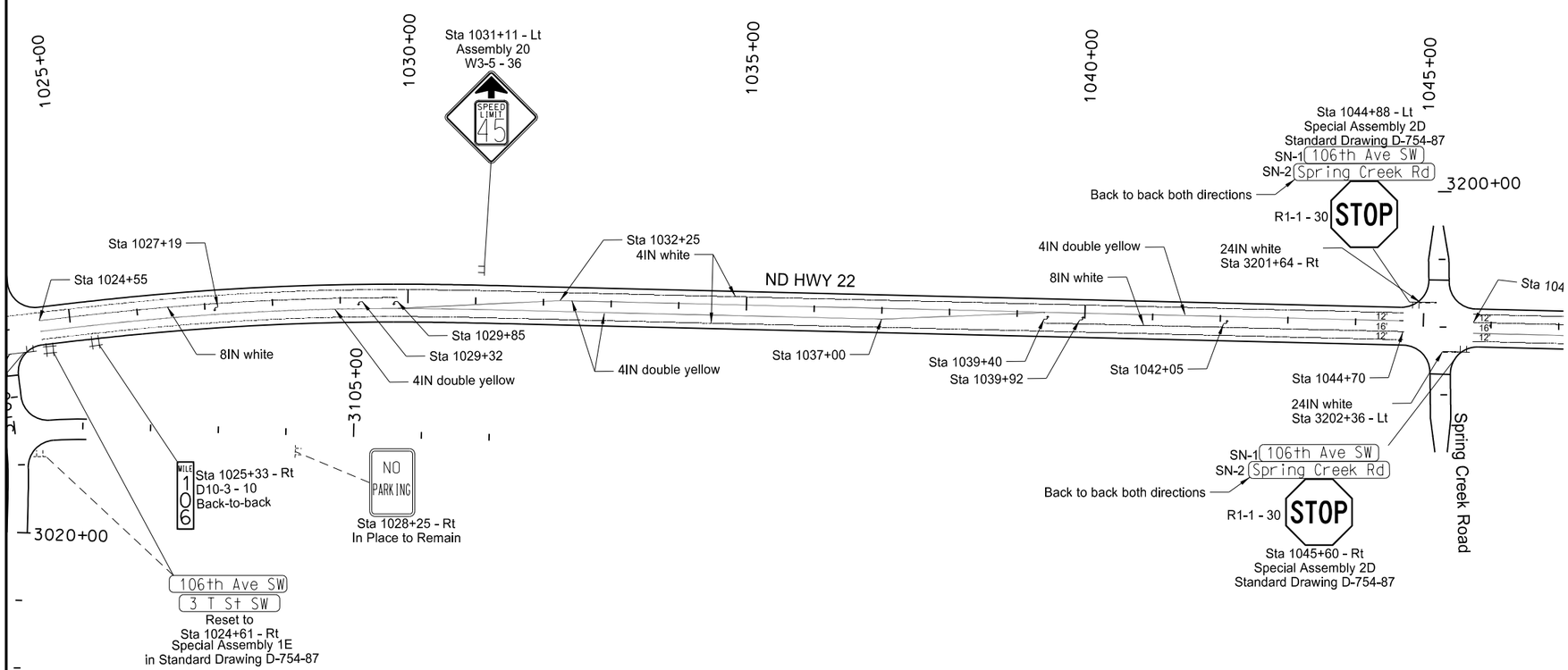
Sta 1005+00 to 1028+00

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	10

754 - 0563	REFERENCE MARKER - TYPE C	
Sta	1025+33 - Rt	1 EA
	TOTAL	1 EA



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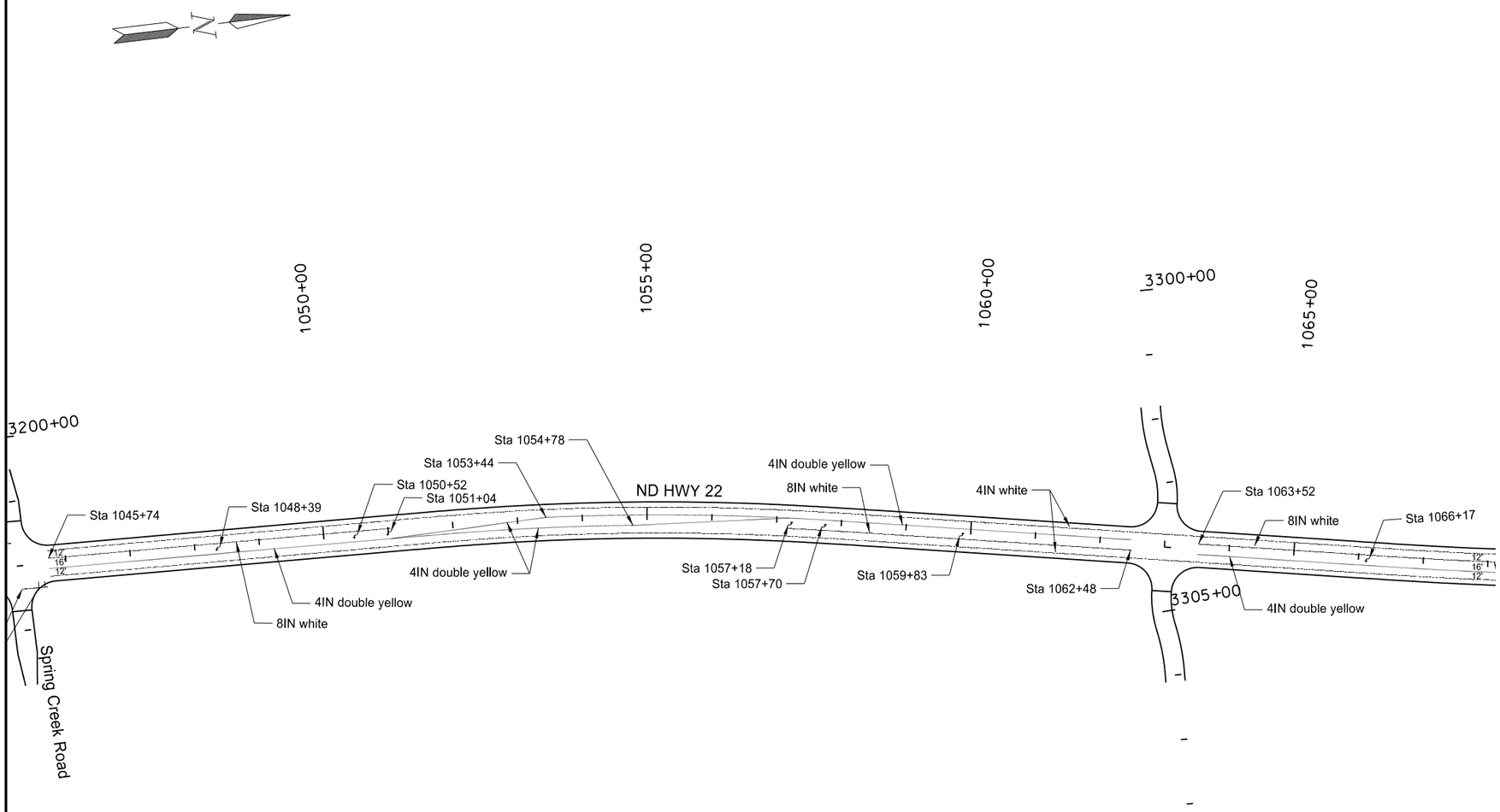
Signing and Pavement Marking Layout

Sta 1028+00 to 1046+00

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	11



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Signing and Pavement Marking Layout

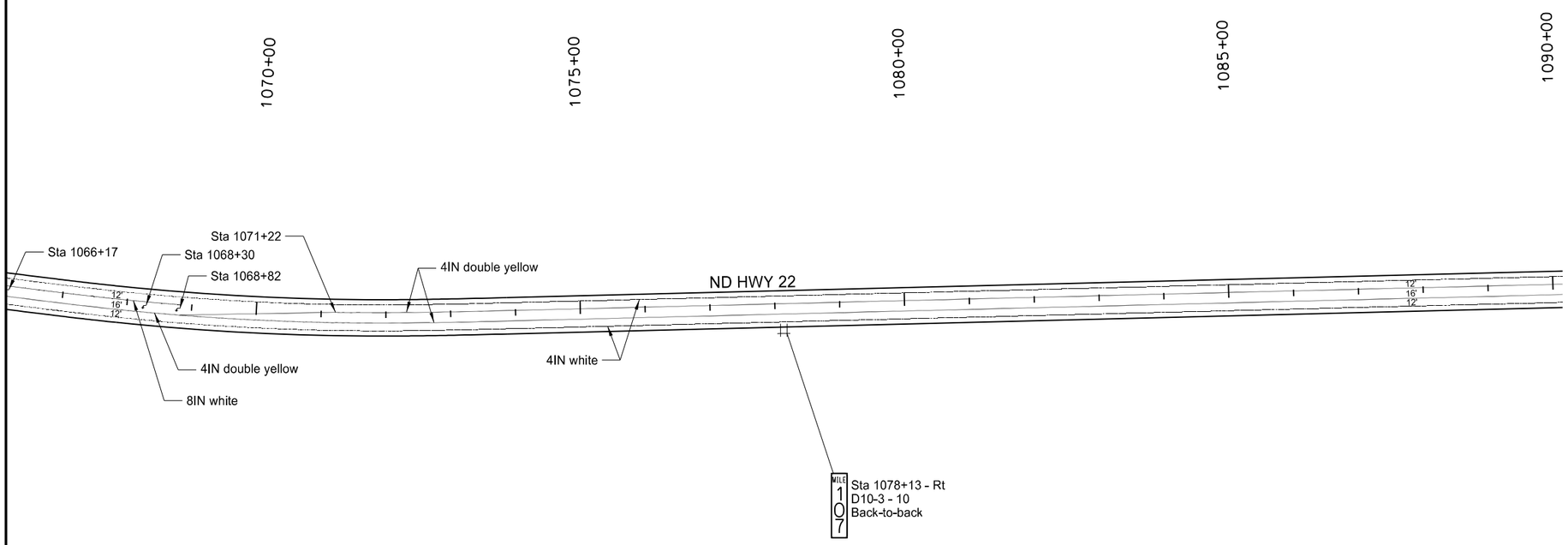
Sta 1046+00 to 1067+00

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	12

754 - 0563	REFERENCE MARKER - TYPE C	
Sta	1078+13 - Rt	1 EA
	TOTAL	1 EA



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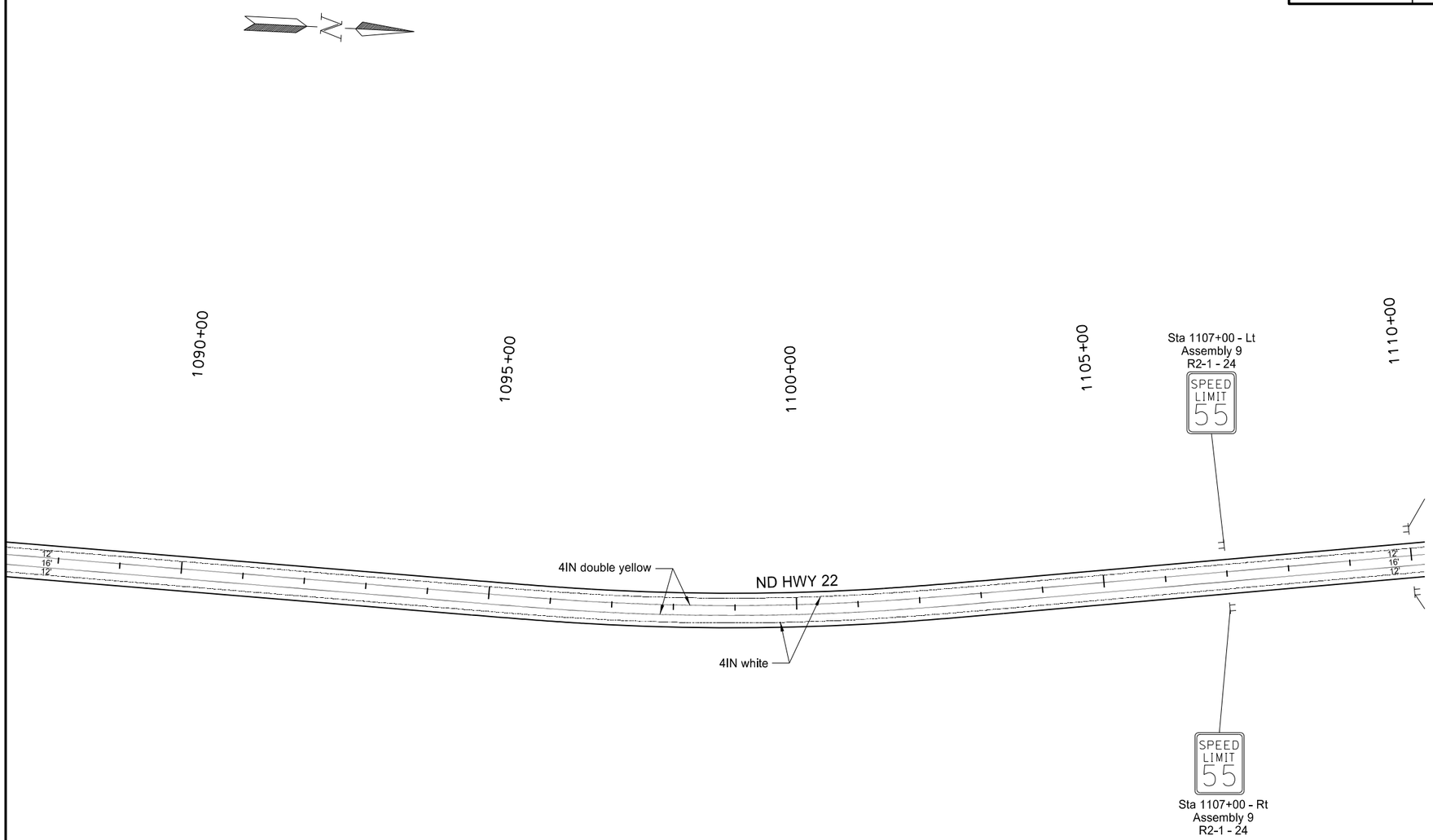
Signing and Pavement Marking Layout

Sta 1067+00 to 1089+00

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	13



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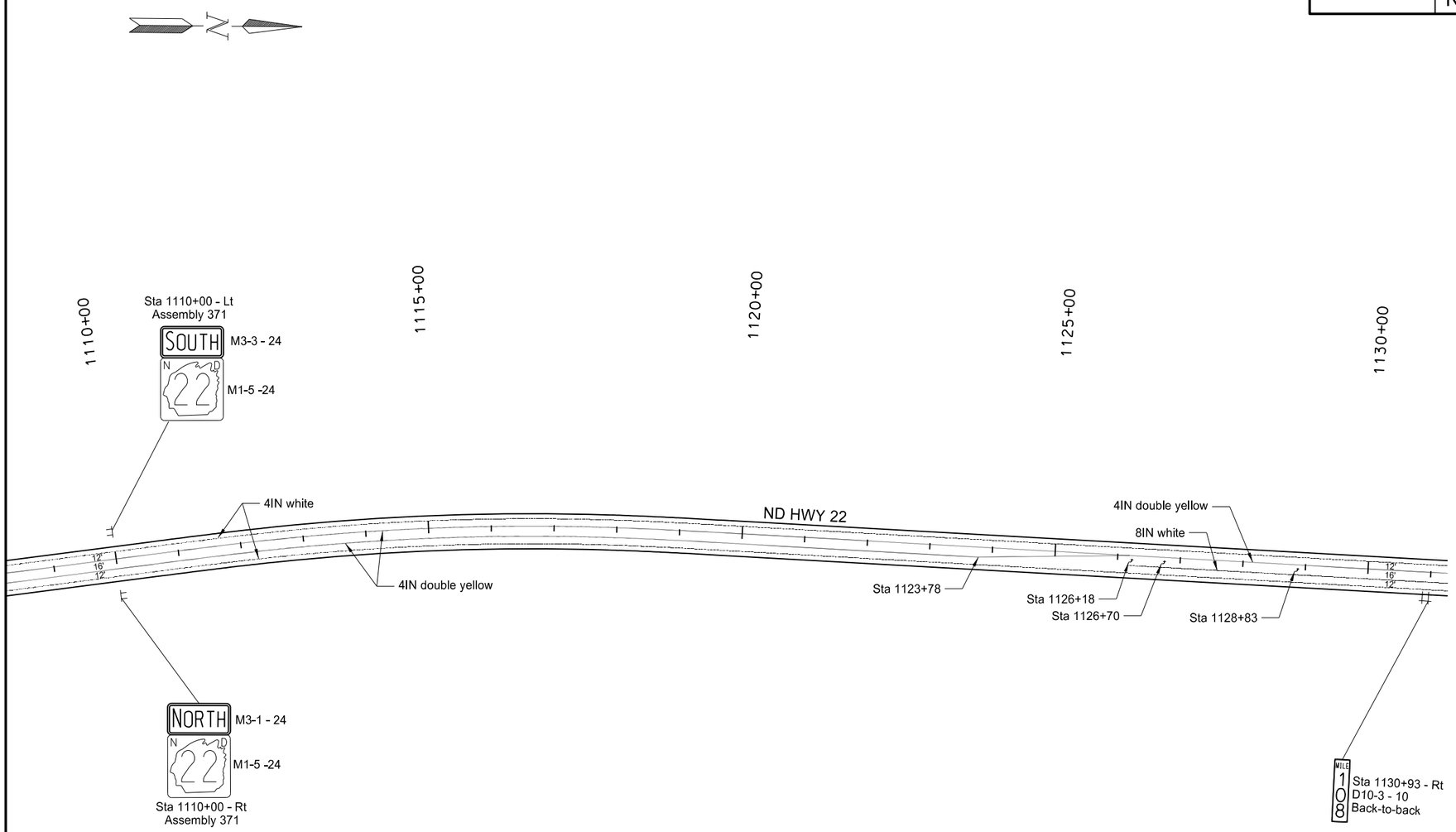
Signing and Pavement Marking Layout

Sta 1089+00 to 1109+00

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	14



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Signing and Pavement Marking Layout

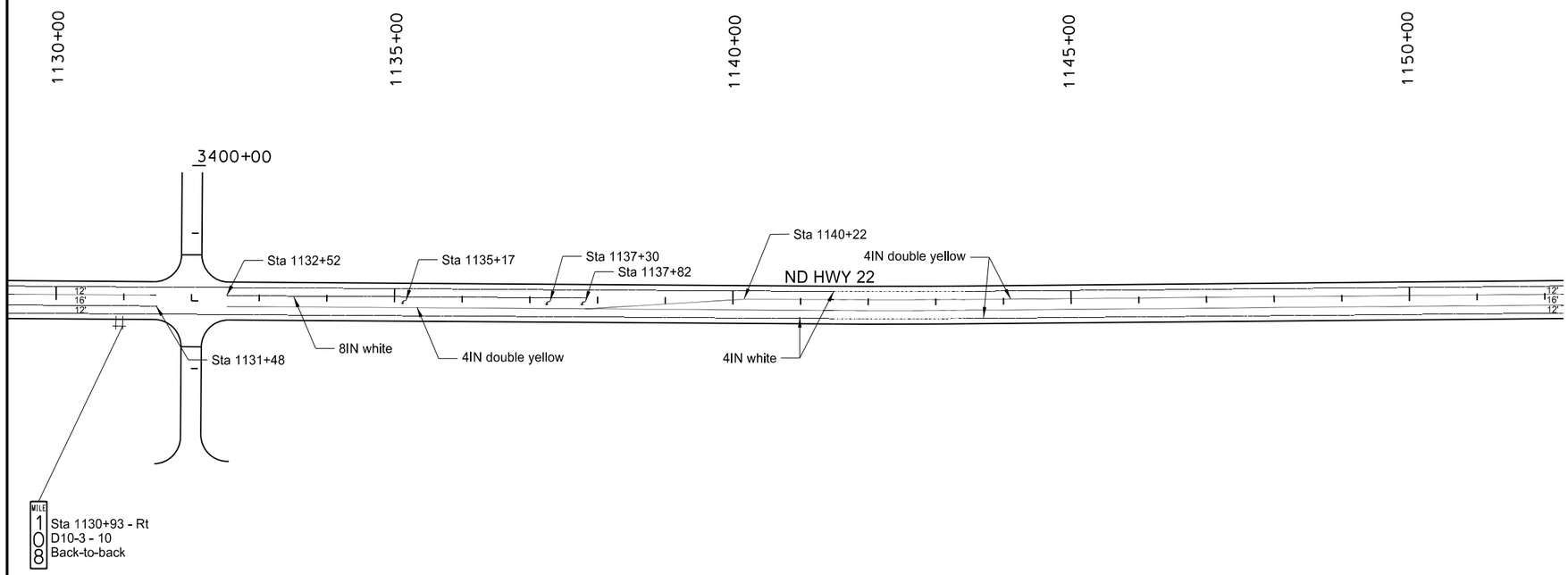
Sta 1109+00 to 1130+00

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	15

754 - 0563	REFERENCE MARKER - TYPE C	
Sta	1130+93 - Rt	1 EA
	TOTAL	1 EA



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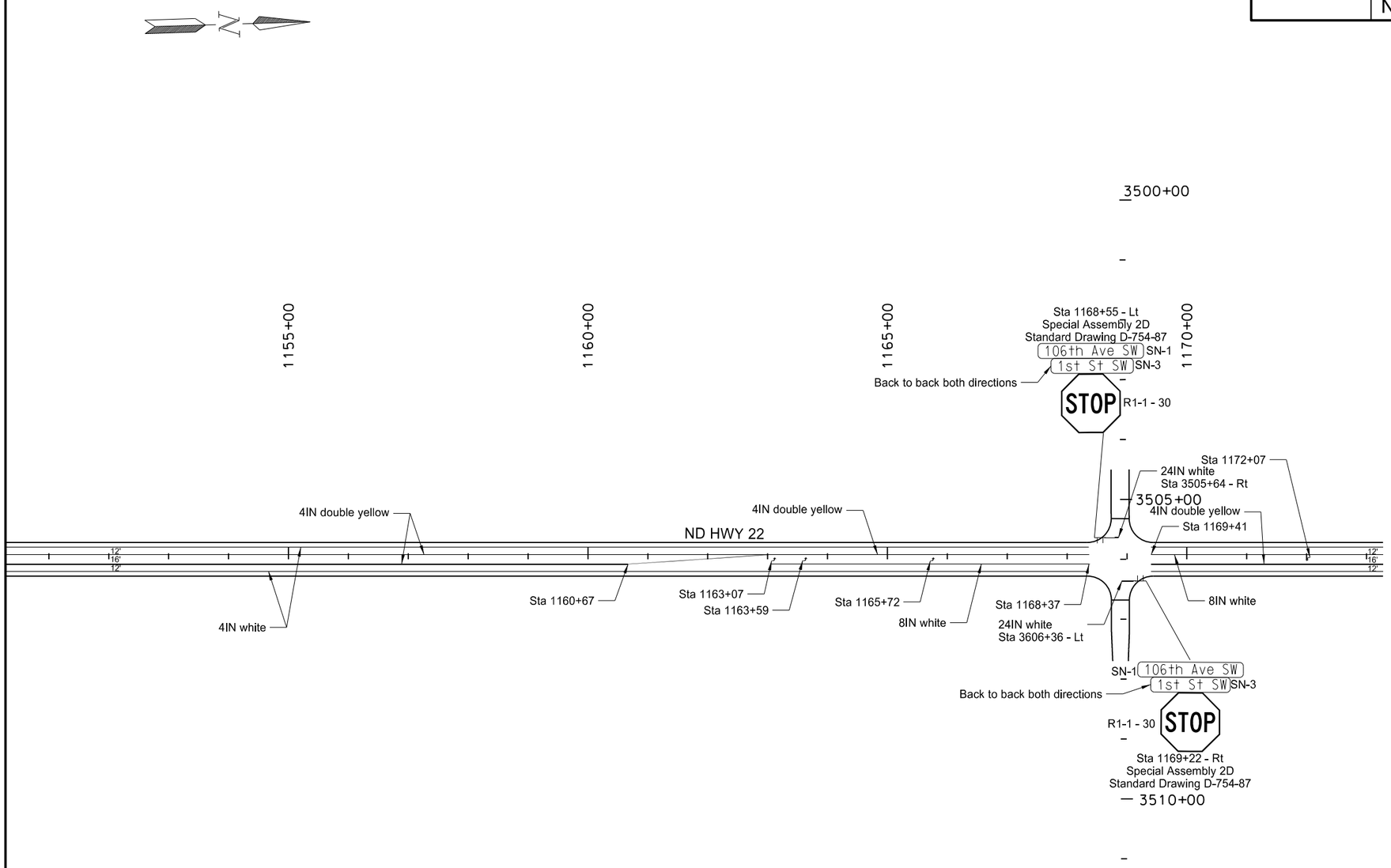
Signing and Pavement Marking Layout

Sta 1130+00 to 1151+00

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	16



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Signing and Pavement Marking Layout

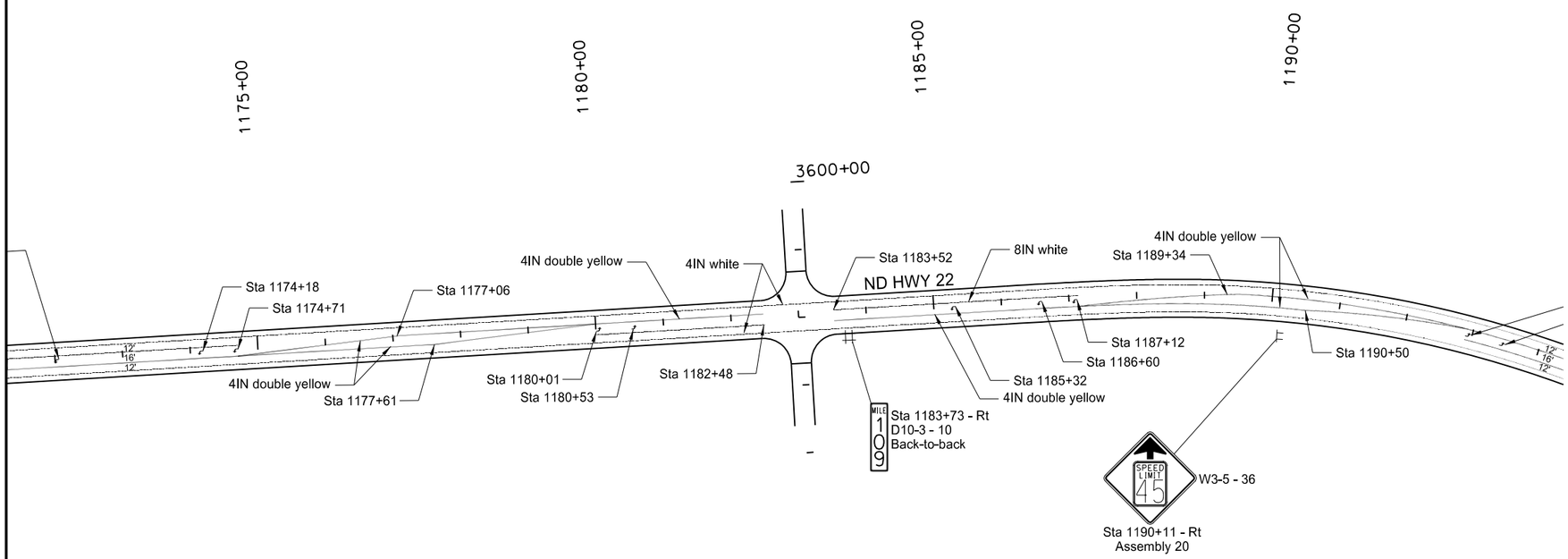
Sta 1151+00 to 1172+00

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	17

754 - 0563	REFERENCE MARKER - TYPE C	
Sta	1183+73 - Rt	1 EA
	TOTAL	1 EA



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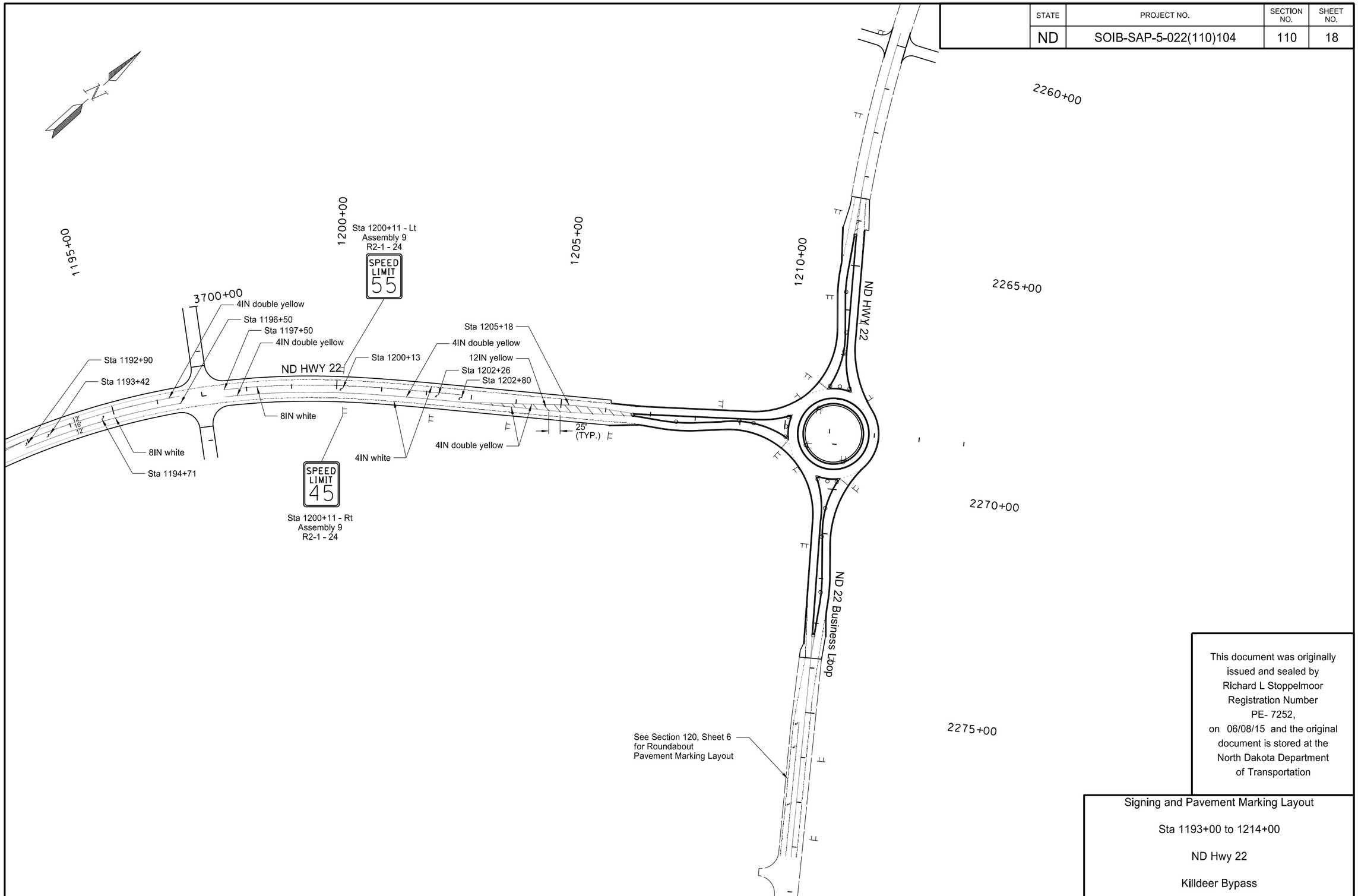
Signing and Pavement Marking Layout

Sta 1172+00 to 1193+00

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	18



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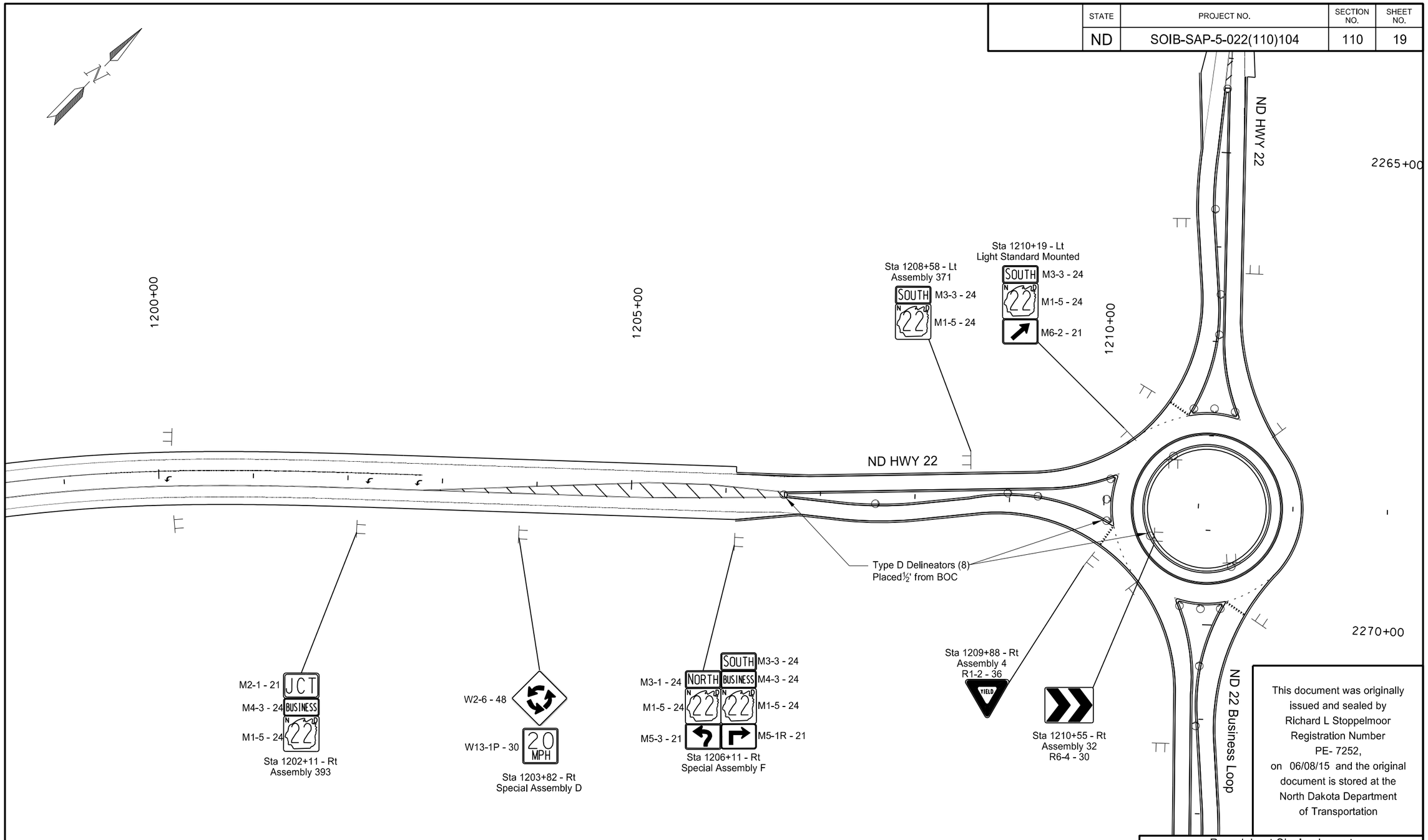
Signing and Pavement Marking Layout

Sta 1193+00 to 1214+00

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	19



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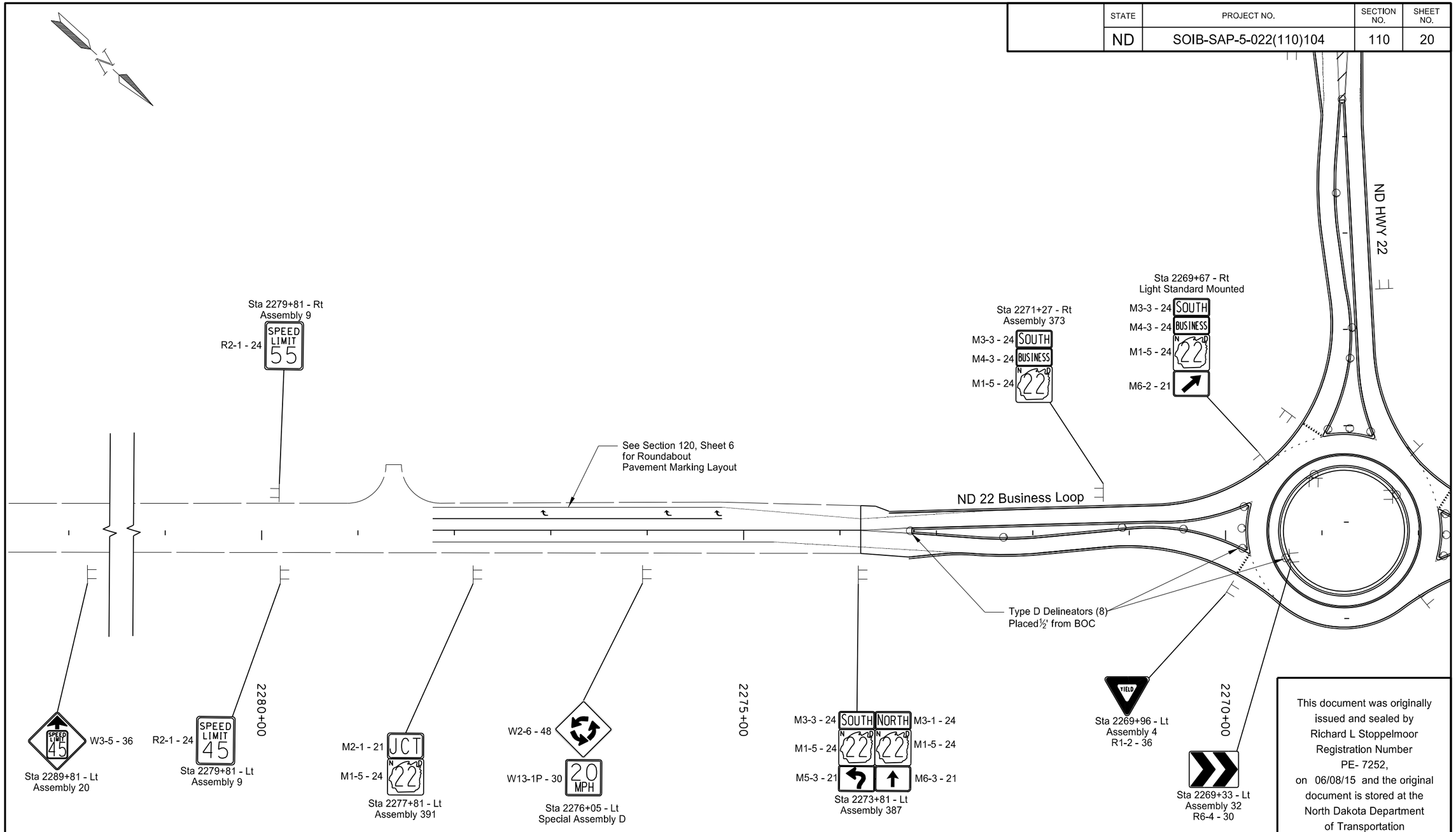
754 - 0168	DELINEATORS - TYPE D	
Sta	1206+65 to 1210+54	8 EA
	TOTAL	8 EA

Roundabout Signing Layout

Sta 1200+00 to 1212+00
S Approach of ND 22 Roundabout
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	20



754 - 0168	DELINEATORS - TYPE D	
Sta	2269+33 to 2273+23	8 EA
	TOTAL	8 EA

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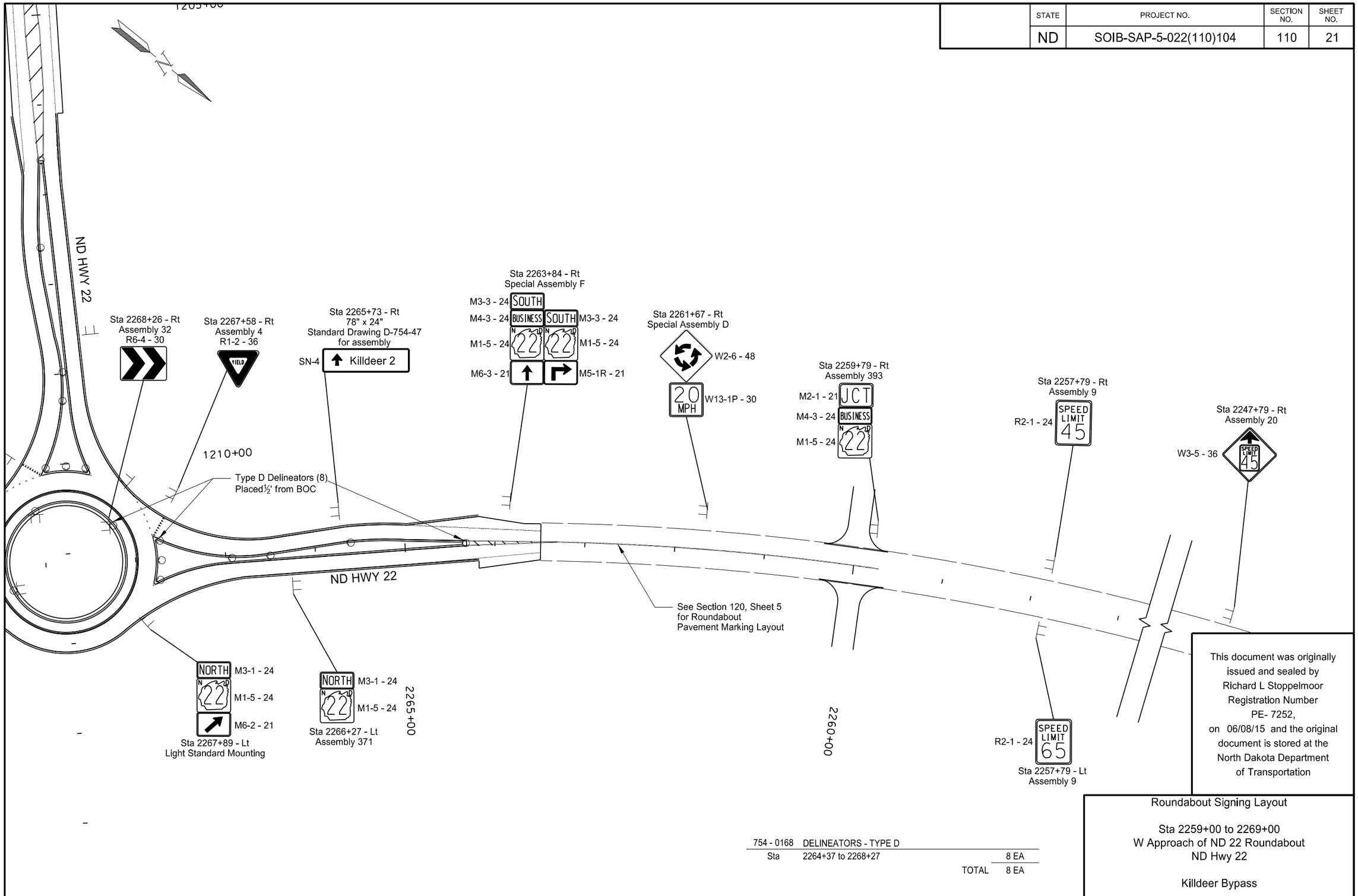
Roundabout Signing Layout

Sta 2269+00 to 2281+00
NE Approach of ND 22 Roundabout
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	21



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754 - 0168	DELINEATORS - TYPE D	
Sta	2264+37 to 2268+27	8 EA
	TOTAL	8 EA

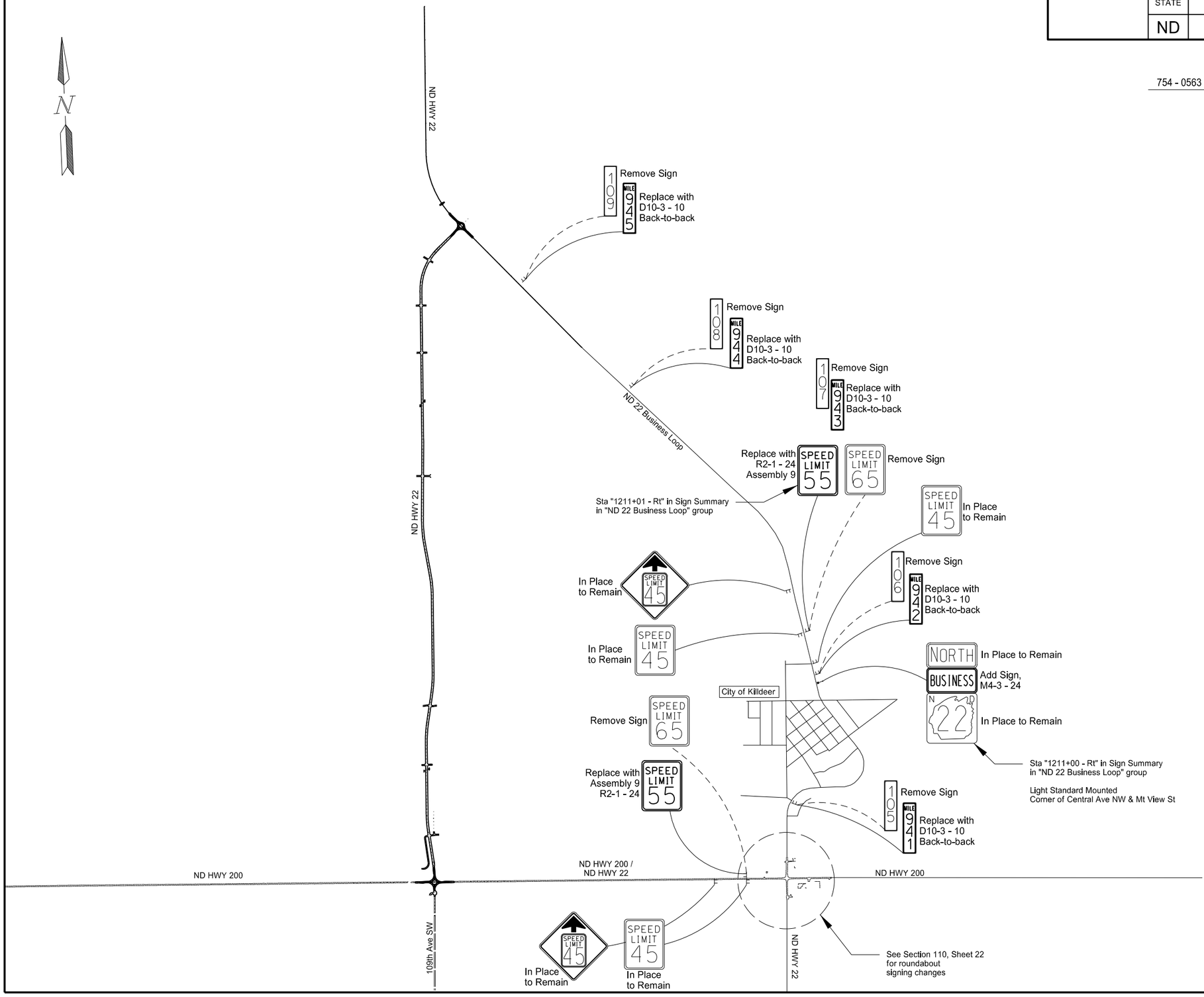
Roundabout Signing Layout

Sta 2259+00 to 2269+00
W Approach of ND 22 Roundabout
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	22

754 - 0563	REFERENCE MARKER - TYPE C	
	ND 22 Business Loop	5 EA
	TOTAL	5 EA



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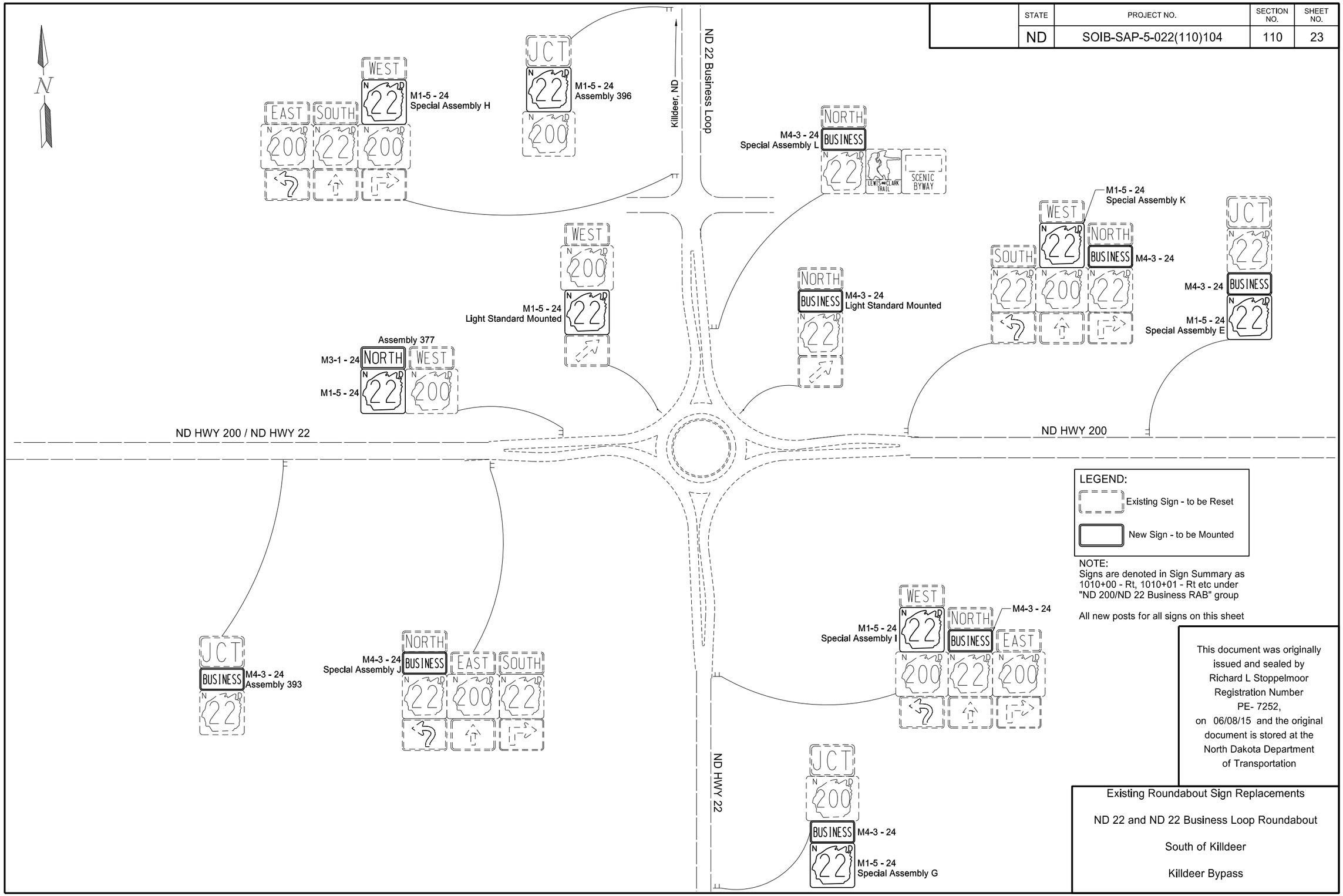
Signing Overview

ND 200, ND 22, & ND 22 Business Loop

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	23



LEGEND:

Existing Sign - to be Reset

New Sign - to be Mounted

NOTE:
Signs are denoted in Sign Summary as 1010+00 - Rt, 1010+01 - Rt etc under "ND 200/ND 22 Business RAB" group

All new posts for all signs on this sheet

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Existing Roundabout Sign Replacements

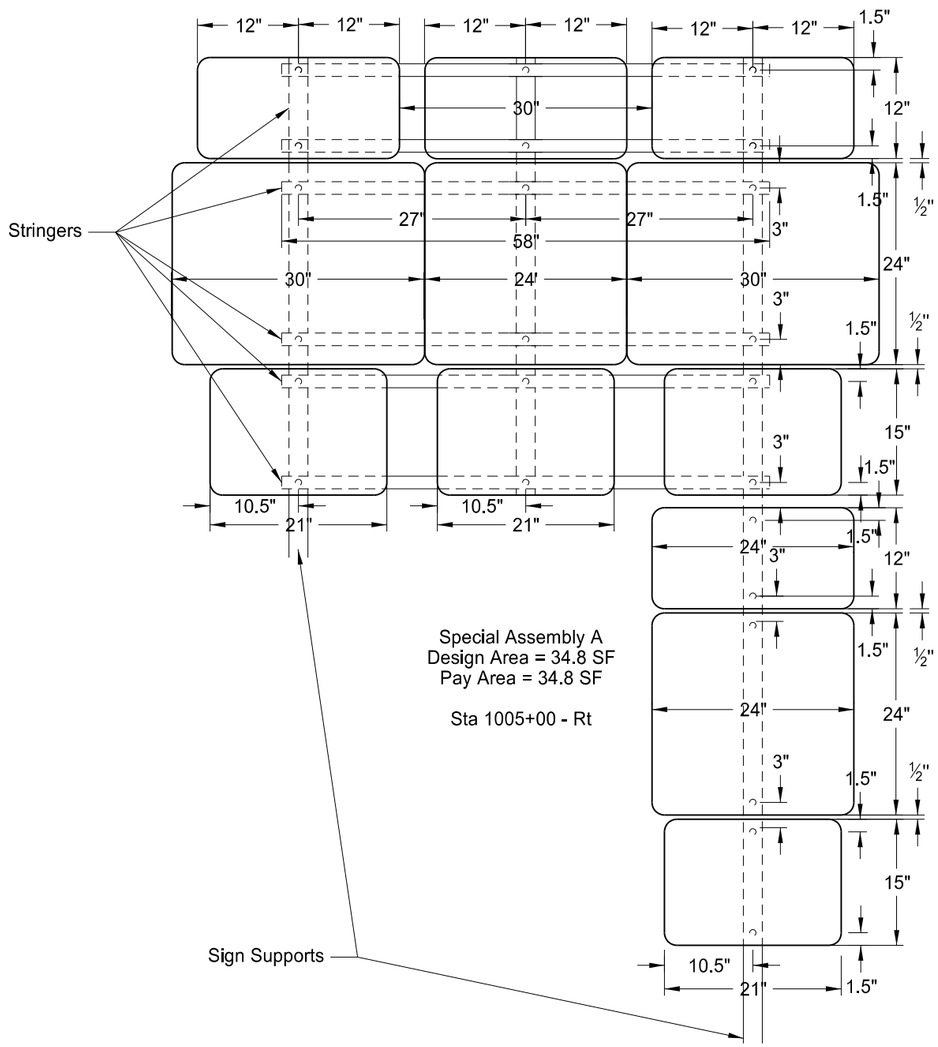
ND 22 and ND 22 Business Loop Roundabout

South of Killdeer

Killdeer Bypass

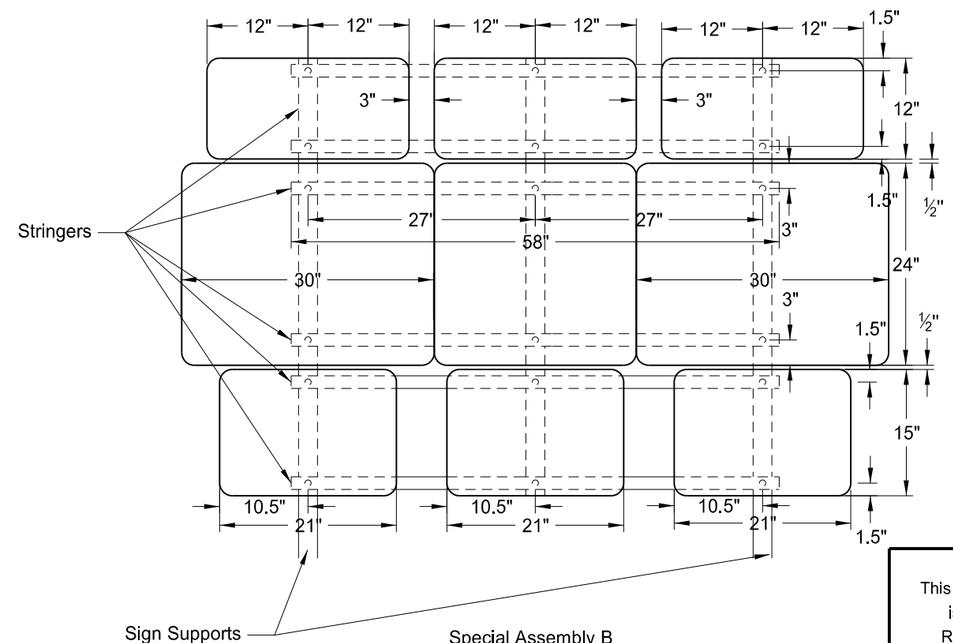
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	26

Notes:
1. See Standard D-754-25 for mounting details.
2. The minimum sign backing material thicness shall be 0.100 inch.
3. Perforated square tube stringer shall be 1½" x 1½".
4. All holes shall be punched round for ⅜" bolt.
5. Special Assembly 1E and Special Assembly 4D correspond to Standard Drawing D-754-87 for mounting details



Special Assembly A
Design Area = 34.8 SF
Pay Area = 34.8 SF

Sta 1005+00 - Rt



Special Assembly B
Design Area = 27.0 SF
Pay Area = 27.0 SF

Sta 1015+06 - Lt

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Sign Details

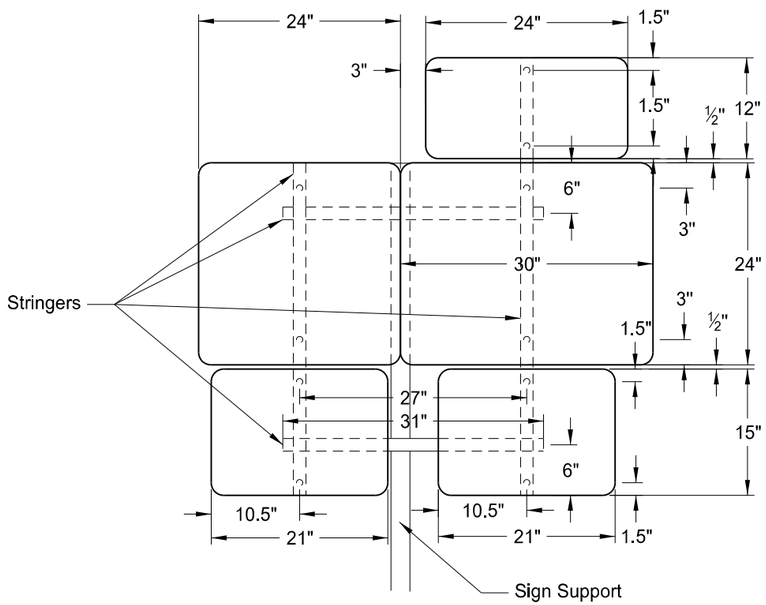
Special Assemblies A & B Detail

ND Hwy 22

Killdeer Bypass

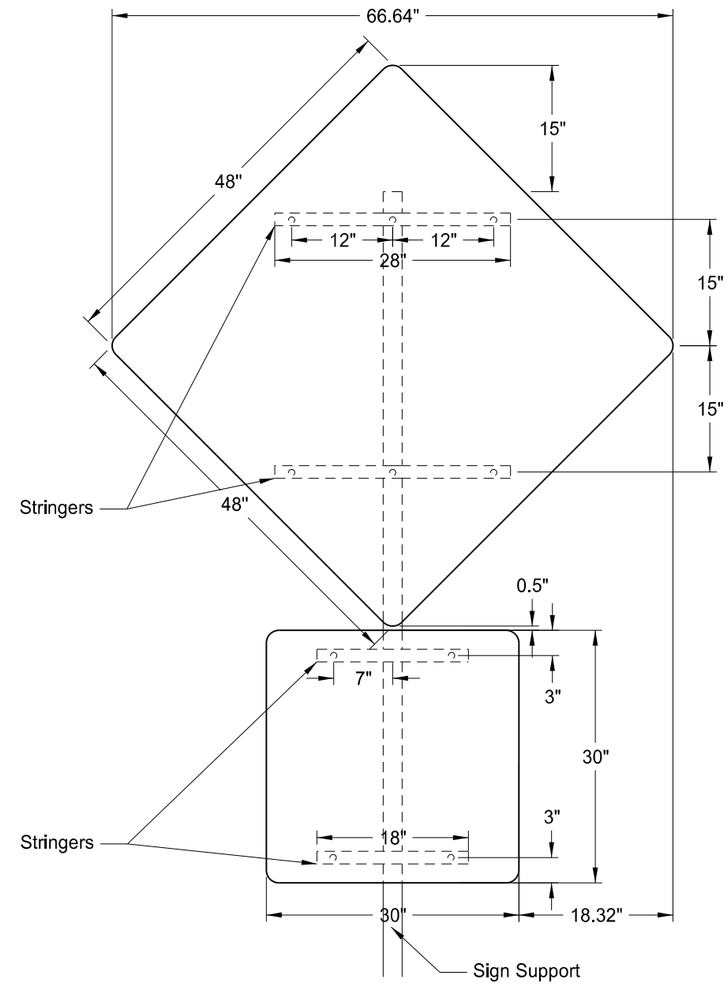
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	27

Notes:
1. See Standard D-754-25 for mounting details.
2. The minimum sign backing material thicness shall be 0.100 inch.
3. Perforated square tube stringer shall be 1½" x 1½".
4. All holes shall be punched round for ⅜" bolt.



Special Assembly C
Design Area = 15.4 SF
Pay Area = 15.4 SF

Sta 4919+18 - Rt



Special Assembly D
Design Area = 22.25 SF
Pay Area = 22.25 SF

Sta 1002+70 - Rt
Sta 1017+45 - Lt
Sta 1203+82 - Rt

Sta 4916+87 - Rt
Sta 4931+50 - Lt

Sta 2261+67 - Rt
Sta 2276+05 - Lt

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Sign Details

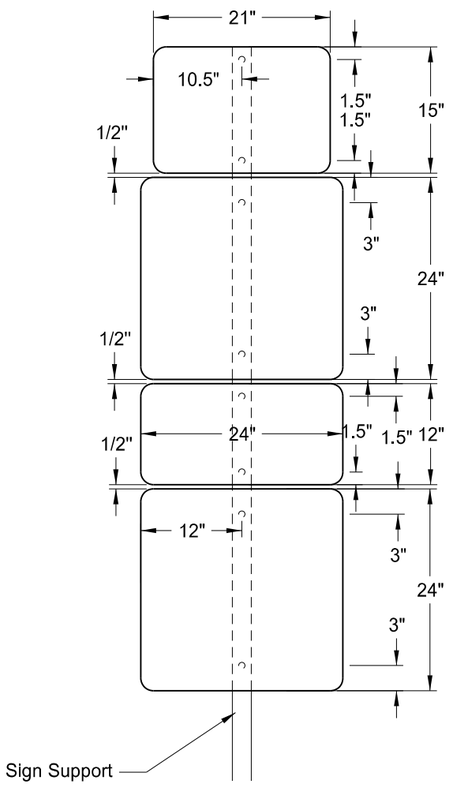
Special Assemblies C & D Detail

ND Hwy 22

Killdeer Bypass

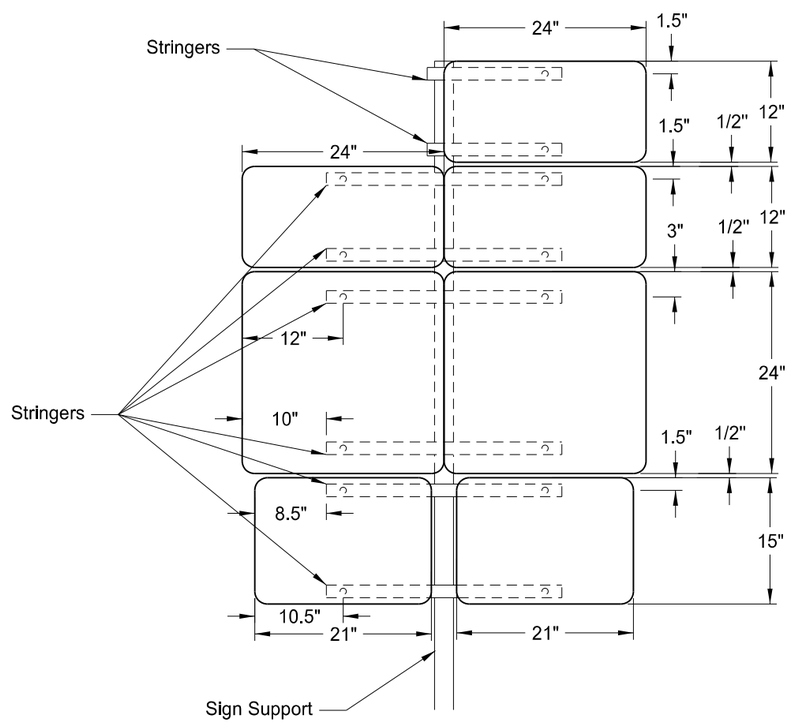
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	28

Notes:
1. See Standard D-754-25 for mounting details.
2. The minimum sign backing material thicness shall be 0.100 inch.
3. Perforated square tube stringer shall be 1½" x 1½".
4. All holes shall be punched round for ⅜" bolt.



Special Assembly E
Design Area = 12.2 SF
Pay Area = 6 SF

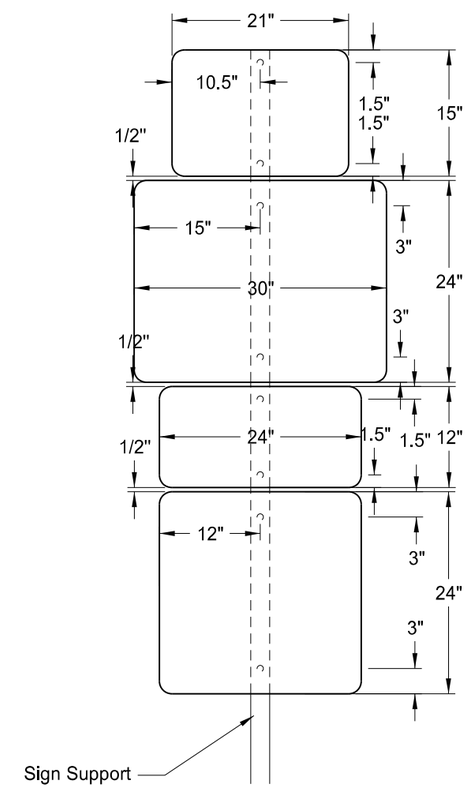
East Approach of ND 22/ ND 22 Business Loop RAB



Special Assembly F
Design Area = 18.4 SF
Pay Area = 18.4 SF

Sta 1206+11 - Rt

Sta 2263+84 - Rt



Special Assembly G
Design Area = 13.2 SF
Pay Area = 6 SF

South Approach of ND 22/ ND 22 Business Loop RAB

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Sign Details

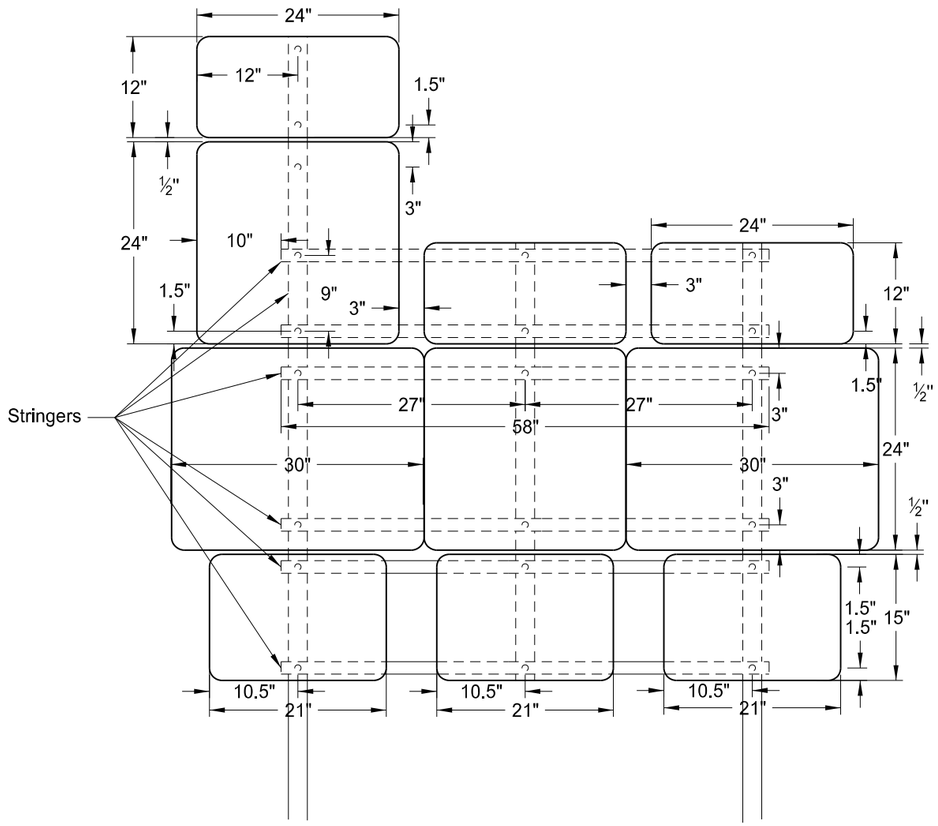
Special Assemblies E, F & G Detail

ND Hwy 22

Killdeer Bypass

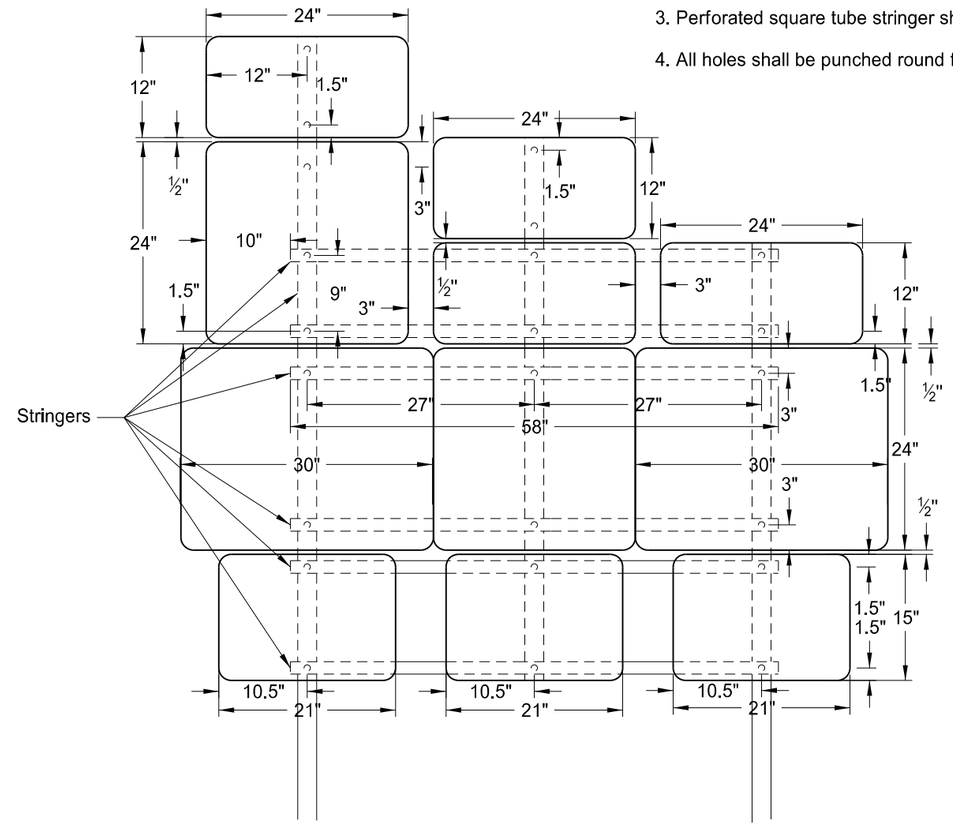
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	29

Notes:
1. See Standard D-754-25 for mounting details.
2. The minimum sign backing material thicness shall be 0.100 inch.
3. Perforated square tube stringer shall be 1½" x 1½".
4. All holes shall be punched round for ⅜" bolt.



Special Assembly H
Design Area = 30.6 SF
Pay Area = 4 SF

North Approach of ND 22/ ND 22 Business Loop RAB



Special Assembly I
Design Area = 32.6 SF
Pay Area = 6 SF

South Approach of ND 22/ ND 22 Business Loop RAB

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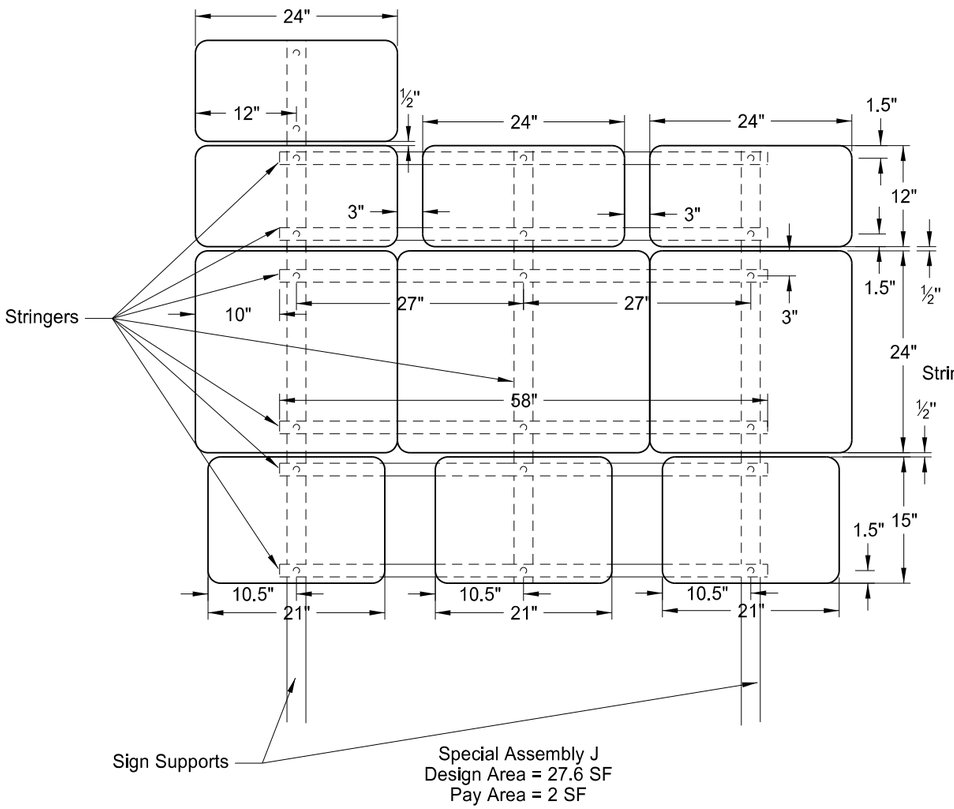
Sign Details

Special Assemblies H & I Detail

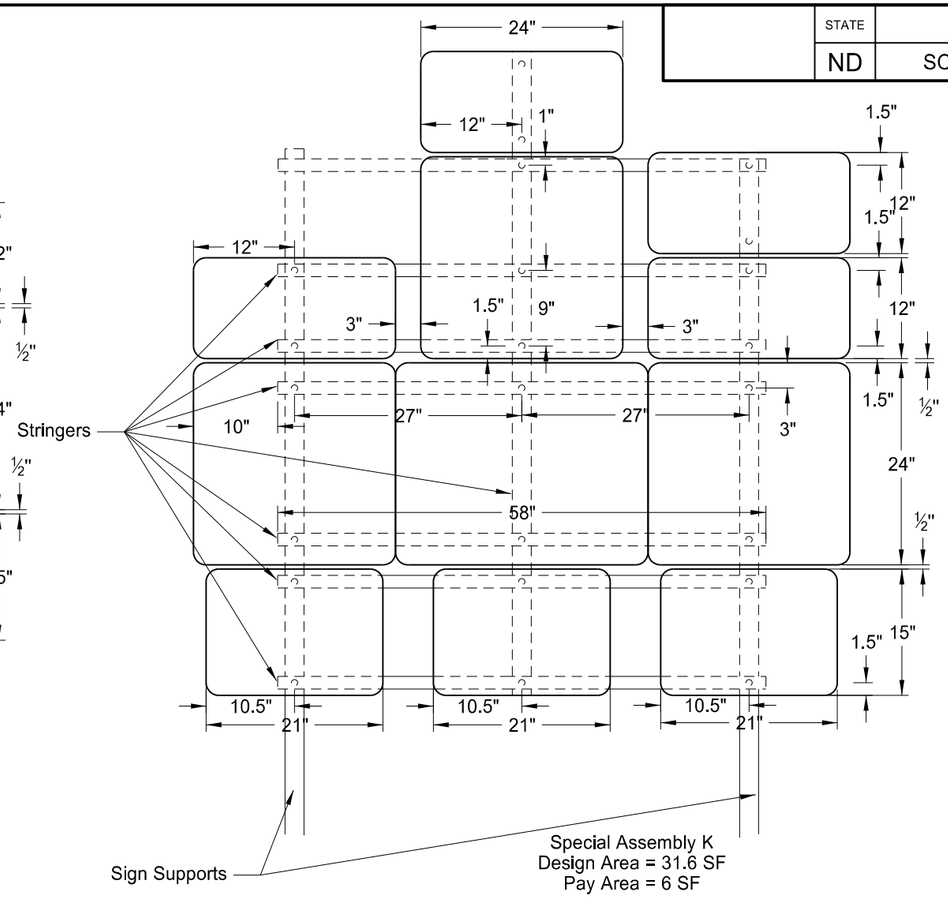
ND Hwy 22

Killdeer Bypass

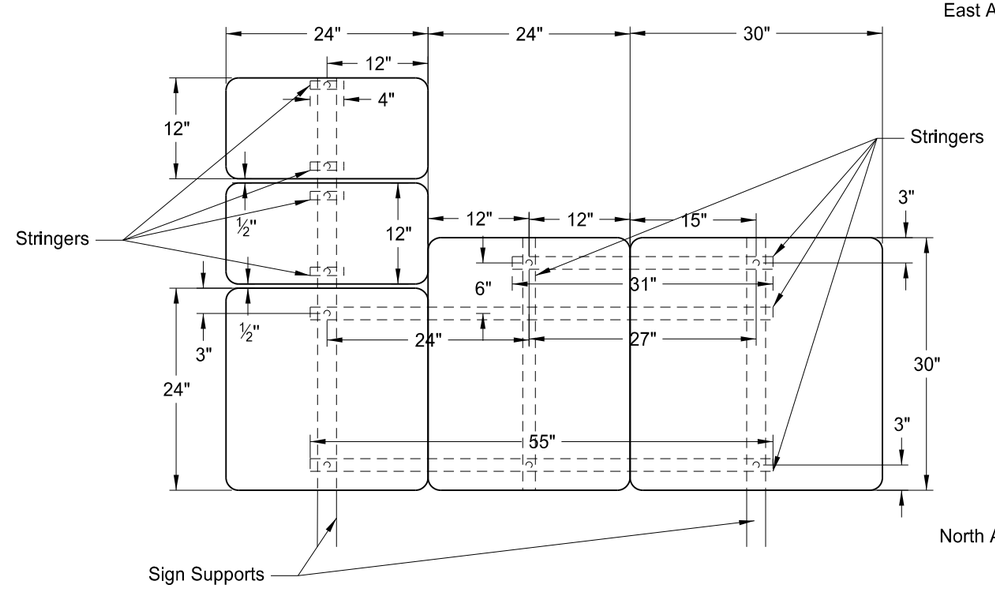
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	110	30



West Approach of ND 22/ ND 22 Business Loop RAB



East Approach of ND 22/ ND 22 Business Loop RAB



Special Assembly L
Design Area = 19.25 SF
Pay Area = 2 SF

North Approach of ND 22/ ND 22 Business Loop RAB

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Sign Details

Special Assemblies J, K,& L Detail

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	120	1

PREFORMED PATTERNED - GROOVED
4IN DOUBLE YELLOW

Station to		Station		Quantity	
MAINLINE					
1014+46	Rt	1015+75	Rt	260	LF
1014+46	Lt	1015+30	Lt	166	LF
1015+30	Lt	1016+70	Lt	280	LF
1015+75	Rt	1018+15	Lt	482	LF
1016+70	Lt	1023+45	Lt	1350	LF
1024+55	Rt	1026+04	Rt	298	LF
1026+04	Rt	1029+79	Rt	748	LF
1029+79	Rt	1031+69	Rt	380	LF
1029+85	Rt	1032+25	Lt	480	LF
1031+69	Rt	1037+00	Rt	1062	LF
1032+25	Lt	1044+70	Lt	2490	LF
1037+00	Rt	1039+48	Lt	480	LF
1045+74	Rt	1050+79	Rt	1012	LF
1050+79	Rt	1052+69	Rt	380	LF
1051+04	Rt	1053+44	Lt	482	LF
1052+69	Rt	1054+78	Rt	416	LF
1053+44	Lt	1056+80	Lt	674	LF
1054+78	Rt	1057+18	Lt	482	LF
1056+80	Lt	1058+70	Lt	380	LF
1058+70	Lt	1062+48	Lt	756	LF
1063+52	Rt	1065+96	Rt	488	LF
1065+96	Rt	1067+86	Rt	380	LF
1067+86	Rt	1071+97	Rt	824	LF
1068+82	Rt	1071+22	Lt	480	LF
1071+22	Lt	1071+97	Lt	150	LF
1071+97	Rt	1073+87	Rt	380	LF
1071+97	Lt	1073+87	Lt	380	LF
1073+87	Rt	1094+75	Rt	4176	LF
1073+87	Lt	1094+75	Lt	4176	LF
1094+75	Rt	1096+65	Rt	380	LF
1094+75	Lt	1096+65	Lt	380	LF
1096+65	Rt	1101+44	Rt	958	LF
1096+65	Lt	1101+44	Lt	954	LF
1101+44	Lt	1103+34	Lt	380	LF
1101+44	Rt	1103+34	Rt	380	LF
1103+34	Rt	1110+62	Rt	1456	LF
1103+34	Lt	1110+62	Lt	1456	LF
1110+62	Lt	1112+52	Lt	380	LF
1110+62	Rt	1112+52	Rt	380	LF
1112+52	Lt	1117+89	Lt	1076	LF
1112+52	Rt	1117+89	Rt	1072	LF
1117+89	Rt	1119+79	Rt	380	LF
1117+89	Lt	1119+79	Lt	380	LF
1119+79	Lt	1131+48	Lt	2338	LF
1119+79	Rt	1123+78	Rt	798	LF
1123+78	Rt	1126+18	Lt	482	LF
1132+52	Rt	1141+49	Rt	1794	LF
1137+82	Rt	1140+22	Lt	482	LF
1140+22	Lt	1141+49	Lt	254	LF
1141+49	Rt	1143+44	Rt	390	LF
1141+49	Lt	1143+44	Lt	390	LF
1143+44	Lt	1168+37	Lt	4986	LF
1143+44	Rt	1160+67	Rt	3446	LF
1160+67	Rt	1163+07	Lt	482	LF
1169+41	Rt	1177+61	Rt	1640	LF
1174+70	Rt	1177+11	Lt	482	LF
1177+11	Lt	1182+48	Lt	1074	LF
1177+61	Rt	1180+01	Lt	482	LF
1183+52	Rt	1186+08	Rt	512	LF
1186+08	Rt	1189+33	Rt	648	LF
1187+12	Rt	1189+33	Lt	444	LF
1189+33	Rt	1190+50	Rt	232	LF
1189+34	Lt	1189+52	Lt	38	LF
1189+52	Lt	1196+50	Lt	1402	LF
1190+50	Rt	1192+89	Lt	478	LF
1197+50	Rt	1199+33	Rt	364	LF
1199+33	Rt	1202+58	Rt	648	LF
1202+58	Rt	1206+62	Rt	808	LF
1202+80	Rt	1205+20	Lt	482	LF
1205+20	Lt	1206+62	Lt	284	LF
ND 200					
4928+64.88	Rt	4929+64.83	CL	200	LF
4918+34.00	CL	4918+71.12	CL	74	LF
4918+71.09	CL	4919+71.55	Rt	202	LF
4918+71.38	CL	4919+71.31	Lt	200	LF
4928+65.01	Lt	4929+65.12	CL	200	LF
4929+65.12	CL	4930+08.75	CL	88	LF
ND 22					
2263+31.12	CL	2264+31.85	CL	202	LF
2263+31.41	CL	2264+31.40	Lt	200	LF
2273+25.42	Rt	2273+78.45	CL	106	LF
2273+25.58	Lt	2273+78.45	Lt	106	LF
			TOTAL	**61942**	**LF**

PREFORMED PATTERNED - GROOVED
8IN WHITE

Station to		Station		Quantity	
MAINLINE					
1018+15	Rt	1023+45	Rt	530	LF
1024+55	Lt	1026+04	Lt	149	LF
1026+04	Lt	1029+79	Lt	375	LF
1029+79	Lt	1029+85	Lt	6	LF
1039+40	Rt	1044+70	Rt	530	LF
1045+74	Lt	1050+79	Lt	506	LF
1050+79	Lt	1051+04	Lt	25	LF
1057+18	Rt	1058+70	Rt	152	LF
1058+70	Rt	1062+48	Rt	378	LF
1063+52	Lt	1065+96	Lt	244	LF
1065+96	Lt	1067+86	Lt	190	LF
1067+86	Lt	1068+82	Lt	96	LF
1126+18	Rt	1131+48	Rt	530	LF
1132+52	Lt	1137+82	Lt	530	LF
1163+07	Rt	1168+37	Rt	530	LF
1169+41	Lt	1174+71	Lt	530	LF
1180+01	Rt	1182+48	Rt	247	LF
1183+52	Lt	1186+08	Lt	256	LF
1186+08	Lt	1187+12	Lt	104	LF
1192+90	Rt	1196+50	Rt	358	LF
1197+50	Lt	1199+33	Lt	184	LF
1199+33	Lt	1202+58	Lt	326	LF
1202+58	Lt	1202+79	Lt	21	LF
			TOTAL	**6797**	**LF**

PREFORMED PATTERNED - GROOVED
8IN DOTTED LANE EXTENSION

Station to		Station		Quantity	
MAINLINE					
1009+00	Rt	1009+73	Rt	15	LF
1010+74	Lt	1010+96	Lt	15	LF
1210+11	Rt	1210+36	Rt	15	LF
ND 200					
4923+49	Rt	4923+43	Rt	15	LF
4924+88	Lt	4925+14	Lt	15	LF
ND 22					
2267+80	Rt	2268+00	Rt	15	LF
2269+42	Lt	2269+75	Lt	16	LF
			TOTAL	**106**	**LF**

PREFORMED PATTERNED - GROOVED
12IN WHITE

Station to		Station		Quantity	
1044+94.74	Lt	1045+18.74	Lt	24	LF
1024+05.92	Rt	1024+29.93	Rt	24	LF
1045+29.19	Rt	1045+53.19	Rt	24	LF
1168+61.99	Lt	1168+85.99	Lt	24	LF
1168+91.57	Rt	1169+15.57	Rt	24	LF
			TOTAL	**120**	**LF**

PREFORMED PATTERNED - GROOVED
4IN WHITE

Station to		Station		Quantity	
MAINLINE					
1006+75	Lt	1007+30	Lt	56	LF
1007+34	Rt	1007+94	Rt	65	LF
1007+30	Lt	1007+45	Lt	15	LF
1007+45	Lt	1008+24	Lt	78	LF
1007+94	Rt	1008+89	Rt	101	LF
1008+24	Lt	1009+21	Lt	108	LF
1008+89	Rt	1009+27	Rt	50	LF
1009+03	Rt	1009+06	Lt	57	LF
1009+68	Rt	1010+24	Rt	56	LF
1009+77	Lt	1010+34	Lt	59	LF
1010+76	Rt	1011+88	Rt	125	LF
1010+77	Lt	1012+36	Lt	174	LF
1010+95	Rt	1010+96	Lt	59	LF
1011+88	Rt	1014+43	Rt	256	LF
1012+36	Lt	1013+08	Lt	72	LF
1013+08	Lt	1013+77	Lt	69	LF
1013+77	Lt	1014+66	Lt	89	LF
1014+43	Rt	1015+00	Rt	58	LF
1014+66	Lt	1015+00	Lt	34	LF
1015+00	Rt	1016+70	Rt	171	LF
1015+00	Lt	1016+70	Lt	169	LF
1016+70	Rt	1023+45	Rt	675	LF
1016+70	Lt	1024+55	Lt	785	LF
1024+55	Rt	1026+04	Rt	149	LF
1024+55	Lt	1026+04	Lt	150	LF
1026+04	Rt	1029+79	Rt	373	LF
1026+04	Lt	1029+79	Lt	376	LF
1029+79	Rt	1031+69	Rt	190	LF
1029+79	Lt	1031+69	Lt	190	LF
1031+69	Rt	1044+70	Rt	1301	LF
1031+69	Lt	1044+70	Lt	1301	LF
1045+74	Lt	1050+79	Lt	506	LF
1045+74	Rt	1050+79	Rt	505	LF
1050+79	Rt	1052+69	Rt	190	LF
1050+79	Lt	1052+69	Lt	190	LF
1052+69	Rt	1056+80	Rt	409	LF
1052+69	Lt	1056+80	Lt	413	LF
1056+80	Rt	1058+70	Rt	190	LF
1056+80	Lt	1058+70	Lt	190	LF
1058+70	Lt	1063+52	Lt	482	LF
1058+70	Rt	1063+52	Rt	482	LF
1063+52	Lt	1065+96	Lt	244	LF
1063+52	Rt	1065+96	Rt	244	LF
1065+96	Lt	1067+86	Lt	190	LF
1065+96	Rt	1067+86	Rt	190	LF
1067+86	Lt	1071+97	Lt	409	LF
1067+86	Rt	1071+97	Rt	413	LF
1071+97	Lt	1073+87	Lt	190	LF
1071+97	Rt	1073+87	Rt	190	LF
1073+87	Lt	1094+75	Lt	2088	LF
1073+87	Rt	1094+75	Rt	2088	LF
1094+75	Lt	1096+65	Lt	190	LF
1094+75	Rt	1096+65	Rt	190	LF
1096+65	Lt	1101+44	Lt	476	LF
1096+65	Rt	1101+44	Rt	481	LF
1101+44	Lt	1103+34	Lt	190	LF
1101+44	Rt	1103+34	Rt	190	LF
1103+34	Lt	1110+62	Lt	728	LF
1103+34	Rt	1110+62	Rt	728	LF
1110+62	Rt	1112+52	Rt	190	LF
1110+62	Lt	1112+52	Lt	190	LF

PREFORMED PATTERNED - GROOVED
4IN WHITE

Station to		Station		Quantity	
MAINLINE					
1112+52	Rt	1117+89	Rt	535	LF
1112+52	Lt	1117+89	Lt	540	LF
1117+89	Rt	1119+79	Rt	190	LF
1117+89	Lt	1119+79	Lt	190	LF
1119+79	Rt	1132+52	Rt	1273	LF
1119+79	Lt	1132+52	Lt	1273	LF
1132+52	Lt	1141+49	Lt	897	LF
1132+52	Rt	1141+49	Rt	897	LF
1141+49	Lt	1143+44	Lt	195	LF
1141+49	Rt	1143+44	Rt	195	LF
1143+44	Rt	1168+37	Rt	2493	LF
1143+44	Lt	1168+37	Lt	2493	LF
1169+41	Rt	1183+52	Rt	1411	LF
1169+41	Lt	1183+52	Lt	1411	LF
1183+52	Lt	1186+08	Lt	256	LF
1183+52	Rt	1186+08	Rt	256	LF
1186+08	Rt	1189+34	Rt	323	LF
1186+08	Lt	1189+33	Lt	327	LF
1189+33	Rt	1197+54	Rt	811	LF
1189+33	Lt	1197+50	Lt	826	LF
1197+50	Rt	1199+33	Rt	181	LF
1197+50	Lt	1199+33	Lt	185	LF
1199+33	Rt	1202+58	Rt	323	LF
1199+33	Lt	1202+58	Lt	327	LF
1202+58	Lt	1206+14	Lt	357	LF
1202+58	Rt	1206+14	Rt	357	LF
1206+14	Rt	1206+62	Rt	48	LF
1206+14	Lt	1206+61	Lt	47	LF
1206+61	Lt	1209+24	Lt	263	LF
1206+62	Rt	1207+28	Rt	66	LF
1207+28	Rt	1207+98	Rt	70	LF
1207+98	Rt	1208+66	Rt	69	LF
1208+66	Rt	1210+37	Rt	189	LF
1209+22	Lt	1210+38	Lt	127	LF
1210+12	Rt	1210+15	Lt	57	LF
1210+78	Rt	1211+33	Rt	56	LF
1210+86	Lt	1211+41	Lt	56	LF
1211+82	Rt	1211+88	Lt	140	LF
ND 200					
4918+34	Lt	4919+27	Lt	93	LF
4918+34	Rt	4919+71	Rt	137	LF
4919+27	Lt	4919+75	Lt	48	LF
4919+71	Rt	4920+37	Rt	66	LF
4919+75	Lt	4922+37	Lt	262	LF
4920+37	Rt	4921+06	Rt	69	LF
4921+06	Rt	4921+81	Rt	75	LF
4921+81	Rt	4923+45	Rt	184	LF
4922+37	Lt	4923+41	Lt	117	LF
4923+19	Rt	4923+23	Lt	59	LF
4924+89	Lt	4926+40	Lt	169	LF
4924+93	Rt	4925+98	Rt	117	LF
4925+12	Rt	4925+14	Lt	56	LF
4925+98	Rt	4928+61	Rt	263	LF
4926+40	Lt	4927+31	Lt	92	LF
4927+31	Lt	4928+00	Lt	69	LF
4928+00	Lt	4928+66	Lt	66	LF
4928+61	Rt	4929+66	Rt	105	LF
4928+66	Lt	4929+10	Lt	45	LF
4929+10	Lt	4930+09	Lt	99	LF
4929+66	Rt	4930+09	Rt	43	LF

PREFORMED PATTERNED - GROOVED
4IN WHITE

Station to		Station		Quantity	
ND 22					
2263+49	Rt	2264+31	Rt	83	LF
2263+49	Lt	2264+19	Lt	70	LF
2264+19	Lt	2264+30	Lt	11	LF
2264+30	Lt	2266+84	Lt	253	LF
2264+31	Rt	2264+97	Rt	66	LF
2264+97	Rt	2265+66	Rt	70	LF
2265+66	Rt	2266+42	Rt	77	LF
2266+42	Rt	2268+00	Rt	174	LF
2266+79	Lt	2268+18	Lt	151	LF
2267+80	Rt	2267+82	Lt	56	LF
2269+42	Lt	2271+16	Lt	190	LF
2269+54	Rt	2270+73	Rt	131	LF
2269+72	Rt	2269+74	Lt	56	LF
2270+73	Rt	2273+26	Rt	253	LF
2271+16	Lt	2271+92	Lt	76	LF
2271+92	Lt	2272+61	Lt	69	LF
2272+61	Lt	2273+27	Lt	66	LF
2273+26	Rt	2273+49	Rt	23	LF
2273+27	Lt	2273+78	Lt	52	LF
2273+49	Rt	2273+78	Rt	30	LF
			TOTAL	**44668**	**LF**

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Pavement Marking Quantities

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	120	2

PREFORMED PATTERNED - GROOVED 12IN YELLOW

Station to		Station		Quantity	
MAINLINE					
1014+66	CL	1014+78	CL	18	LF
1014+91	CL	1015+06	CL	20	LF
1015+16	CL	1015+31	CL	21	LF
1015+41	CL	1015+57	CL	23	LF
1015+67	CL	1015+82	CL	22	LF
1015+94	CL	1016+07	CL	19	LF
1016+21	CL	1016+32	CL	16	LF
1016+47	CL	1016+57	CL	14	LF
1016+74	CL	1016+82	CL	12	LF
1017+01	CL	1017+07	CL	9	LF
1017+27	CL	1017+32	CL	7	LF
1017+54	CL	1017+57	CL	5	LF
1203+21	CL	1203+24	CL	4	LF
1203+44	CL	1203+49	CL	6	LF
1203+68	CL	1203+74	CL	8	LF
1203+91	CL	1203+99	CL	10	LF
1204+15	CL	1204+24	CL	13	LF
1204+38	CL	1204+49	CL	15	LF
1204+62	CL	1204+74	CL	17	LF
1204+85	CL	1204+99	CL	19	LF
1205+08	CL	1205+24	CL	22	LF
1205+33	CL	1205+49	CL	23	LF
1205+58	CL	1205+74	CL	23	LF
1205+83	CL	1205+98	CL	21	LF
1206+08	CL	1206+20	CL	17	LF
1206+33	CL	1206+42	CL	13	LF
1206+55	CL	1206+61	CL	9	LF
ND 200					
4918+98	CL	4919+01	CL	3	LF
4919+13	CL	4919+17	CL	5	LF
4919+28	CL	4919+34	CL	7	LF
4919+43	CL	4919+50	CL	9	LF
4919+58	CL	4919+66	CL	11	LF
4928+70	CL	4928+78	CL	11	LF
4928+86	CL	4928+93	CL	9	LF
4929+03	CL	4929+08	CL	7	LF
4929+19	CL	4929+23	CL	5	LF
4929+35	CL	4929+38	CL	3	LF
ND 22					
2264+18	CL	2264+24	CL	7	LF
2264+03	CL	2264+08	CL	6	LF
2263+88	CL	2263+92	CL	5	LF
2263+73	CL	2263+76	CL	4	LF
			TOTAL	**498**	**LF**

PREFORMED PATTERNED - GROOVED 4IN YELLOW

Station to		Station		Quantity	
MAINLINE					
1007+40	Lt	1007+41	Lt	10	LF
1007+40	Lt	1008+22	Lt	82	LF
1007+41	Lt	1007+75	Lt	35	LF
1007+75	Lt	1009+03	Rt	133	LF
1008+22	Lt	1009+06	Lt	86	LF
1010+95	Rt	1011+89	Rt	97	LF
1010+96	Lt	1012+18	Lt	127	LF
1011+89	Rt	1014+46	Rt	257	LF
1012+18	Lt	1013+10	Lt	92	LF
1013+10	Lt	1013+76	Lt	66	LF
1013+76	Lt	1014+46	Lt	70	LF
1206+62	Rt	1207+29	Rt	67	LF
1206+62	Lt	1209+40	Lt	279	LF
1207+29	Rt	1207+96	Rt	67	LF
1207+96	Rt	1208+58	Lt	62	LF
1208+58	Lt	1210+12	Rt	160	LF
1209+40	Lt	1210+15	Lt	77	LF
ND 200					
4919+71	Lt	4922+37	Lt	266	LF
4919+72	Rt	4920+38	Rt	66	LF
4920+38	Rt	4921+04	Rt	67	LF
4921+04	Rt	4921+94	Lt	90	LF
4921+94	Lt	4923+19	Rt	131	LF
4922+37	Lt	4923+23	Lt	89	LF
4925+12	Rt	4925+98	Rt	90	LF
4925+14	Lt	4926+42	Rt	134	LF
4925+98	Rt	4928+65	Rt	267	LF
4926+42	Rt	4927+32	Lt	91	LF
4927+32	Lt	4927+99	Lt	67	LF
4927+99	Lt	4928+65	Lt	66	LF
ND 22					
2264+32	Lt	2266+97	Lt	265	LF
2264+32	Rt	2264+98	Rt	66	LF
2264+98	Rt	2265+65	Rt	67	LF
2265+65	Rt	2266+54	Lt	90	LF
2266+54	Lt	2267+80	Rt	131	LF
2266+97	Lt	2267+82	Lt	88	LF
2269+72	Rt	2270+75	Rt	106	LF
2269+74	Lt	2271+03	Rt	133	LF
2270+75	Rt	2273+25	Rt	251	LF
2271+03	Rt	2271+93	Lt	91	LF
2271+93	Lt	2272+60	Lt	67	LF
2272+60	Lt	2273+26	Lt	66	LF
			TOTAL	**4612**	**LF**

PREFORMED PATTERNED - GROOVED LEFT TURN ARROW

Station		Quantity	
1018+15	Rt	16	SF
1018+67	Rt	16	SF
1020+80	Rt	16	SF
1027+19	Lt	16	SF
1029+32	Lt	16	SF
1029+84	Lt	16	SF
1039+40	Rt	16	SF
1039+92	Rt	16	SF
1042+05	Rt	16	SF
1048+39	Lt	16	SF
1050+52	Lt	16	SF
1051+04	Lt	16	SF
1057+18	Rt	16	SF
1057+70	Rt	16	SF
1059+83	Rt	16	SF
1066+17	Lt	16	SF
1068+30	Lt	16	SF
1068+82	Lt	16	SF
1126+18	Rt	16	SF
1126+70	Rt	16	SF
1128+83	Rt	16	SF
1135+17	Lt	16	SF
1137+30	Lt	16	SF
1137+82	Lt	16	SF
1163+07	Rt	16	SF
1163+59	Rt	16	SF
1165+72	Rt	16	SF
1172+06	Lt	16	SF
1174+19	Lt	16	SF
1174+71	Lt	16	SF
1180+01	Rt	16	SF
1180+53	Rt	16	SF
1185+32	Lt	16	SF
1186+60	Lt	16	SF
1187+12	Lt	16	SF
1192+90	Rt	16	SF
1193+42	Rt	16	SF
1194+71	Rt	16	SF
1200+14	Lt	16	SF
1202+26	Lt	16	SF
1202+78	Lt	16	SF
TOTAL		656	SF

PREFORMED PATTERNED - GROOVED YIELD LINE

Station		Quantity	
MAINLINE			
1011+04	Lt	24	SF
1008+95	Rt	24	SF
1210+04	Rt	24	SF
ND 200			
4923+12	Rt	24	SF
4925+21	Lt	24	SF
ND 22			
2267+72	Rt	24	SF
2269+82	Lt	24	SF
TOTAL		168	SF

SUMMARY PERMANENT PREFORMED PATTERNED - GROOVED PAVMENT MARKING

SPEC-CODE	ITEM	Quantity	
762-0122	PREFORMED PATTERNED PVMT MK-MESSAGE (GROOVED)	824	SF
762-1305	PREFORMED PATTERNED PVMT MK 4IN LINE (GROOVED) (WHITE)	44668	LF
762-1305	PREFORMED PATTERNED PVMT MK 4IN LINE (GROOVED) (YELLOW)	66554	LF
762-1309	PREFORMED PATTERNED PVMT MK 8IN LINE (GROOVED) (WHITE)	6903	LF
762-1315	PREFORMED PATTERNED PVMT MK 12IN LINE (GROOVED) (WHITE)	120	LF
762-1315	PREFORMED PATTERNED PVMT MK 12IN LINE (GROOVED) (YELLOW)	498	LF

PAINT 4IN DOUBLE YELLOW

Station to		Station		Quantity	
ND 200					
4914+74	CL	4918+34	CL	720	LF
4930+09	CL	4933+69	CL	720	LF
ND 22					
2259+72	CL	2263+32	CL	720	LF
2273+78	CL	2278+22	CL	888	LF
			TOTAL	**3048**	**LF**

PAINT 4IN WHITE

Station to		Station		Quantity	
ND 22					
2273+7	Rt	2275+22	Rt	145	LF
2273+7	Lt	2274+69	Lt	91	LF
2274+6	Lt	2278+22	Lt	353	LF
2275+2	Rt	2278+22	Rt	300	LF
			TOTAL	**889**	**LF**

PAINT 8IN WHITE

Station to		Station		Quantity	
ND 22					
2275+2	Rt	2278+22	Rt	300	LF
			TOTAL	**300**	**LF**

PAINT RIGHT TURN ARROW

Station		Quantity	
2275+2	Rt	16	SF
2275+7	Rt	16	SF
2277+0	Rt	16	SF
TOTAL		47	SF

SUMMARY PERMANENT PREFORMED PATTERNED - GROOVED PAVMENT MARKING

SPEC-CODE	ITEM	Quantity	
762-0103	PVMT MK PAINTED - MESSAGE	47	SF
762-1104	PVMT MK PAINTED 4IN LINE	3937	LF
762-1108	PVMT MK PAINTED 8IN LINE	300	LF

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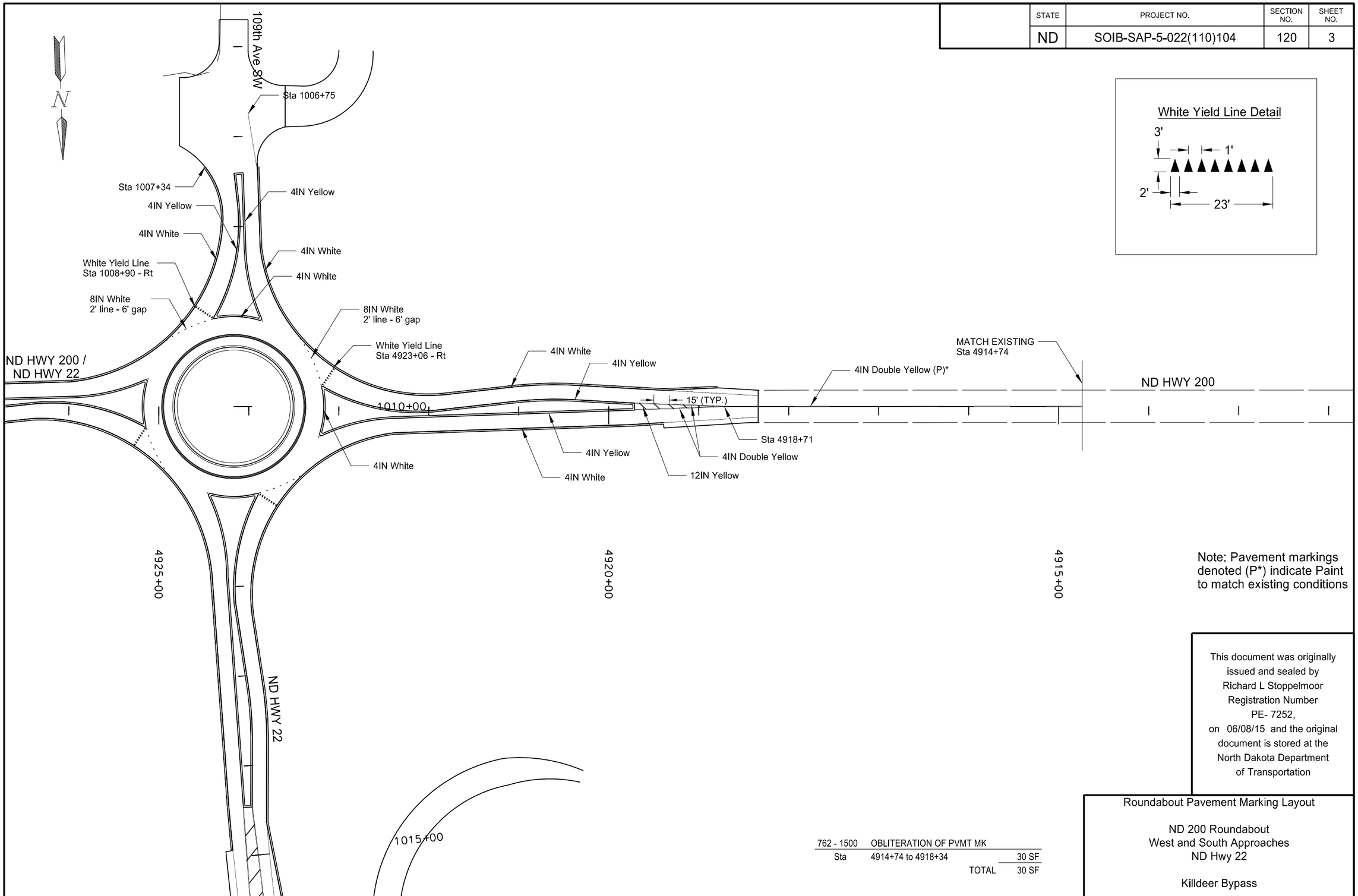
Pavement Marking Quantities

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	120	3



White Yield Line Detail

Note: Pavement markings denoted (P*) indicate Paint to match existing conditions

762 - 1500	OBLITERATION OF PVMT MK	
Sta	4914+74 to 4918+34	30 SF
	TOTAL	30 SF

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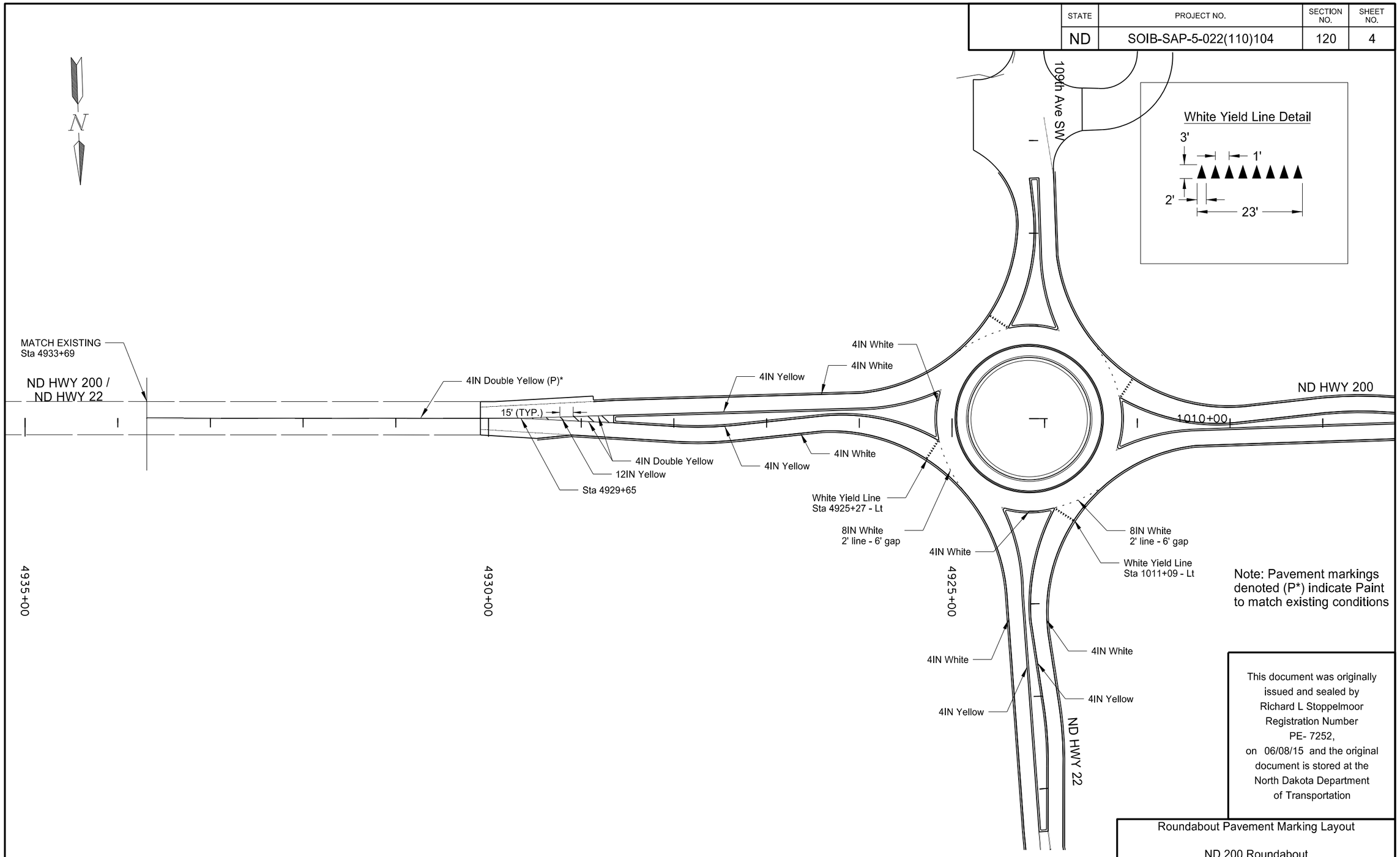
Roundabout Pavement Marking Layout

ND 200 Roundabout
West and South Approaches
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	120	4



Note: Pavement markings denoted (P*) indicate Paint to match existing conditions

762 - 1500 OBLITERATION OF PVMT MK

Sta	4930+09 to 4933+69	30 SF
	TOTAL	30 SF

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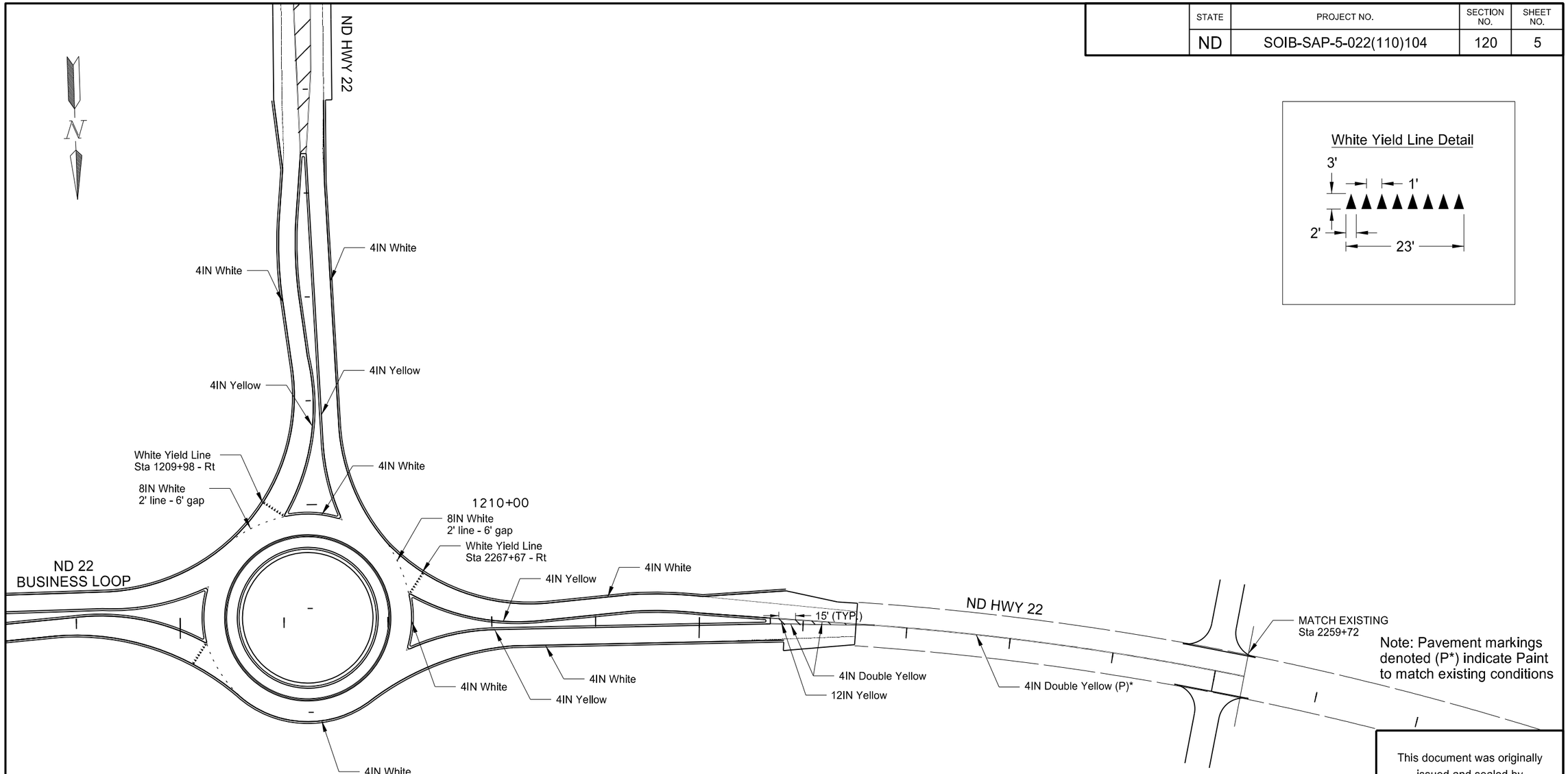
Roundabout Pavement Marking Layout

ND 200 Roundabout
North and East Approaches
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	120	5



Note: Pavement markings denoted (P*) indicate Paint to match existing conditions

762 - 1500	OBLITERATION OF PVMT MK	
Sta	2259+72 to 2263+49	30 SF
	TOTAL	30 SF

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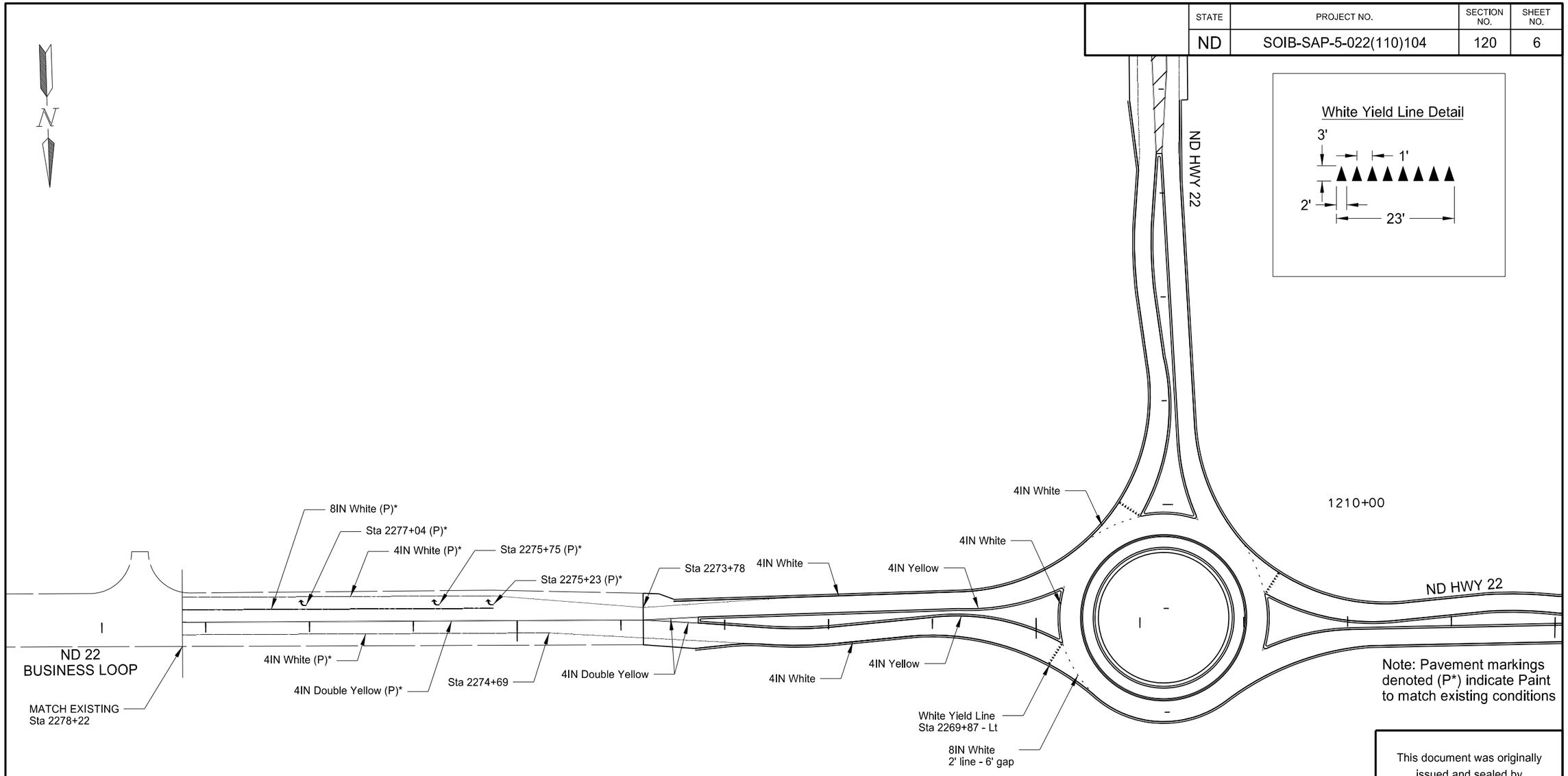
Roundabout Pavement Marking Layout

ND 22 Roundabout
South and West Approach
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	120	6



Note: Pavement markings denoted (P*) indicate Paint to match existing conditions

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762 - 1500 OBLITERATION OF PVMT MK

Sta	2273+78 to 2278+22 - Lt/Rt	1141 SF
Sta	2273+78 to 2278+22 - Rt	48 SF
	TOTAL	1189 SF

Roundabout Pavement Marking Layout

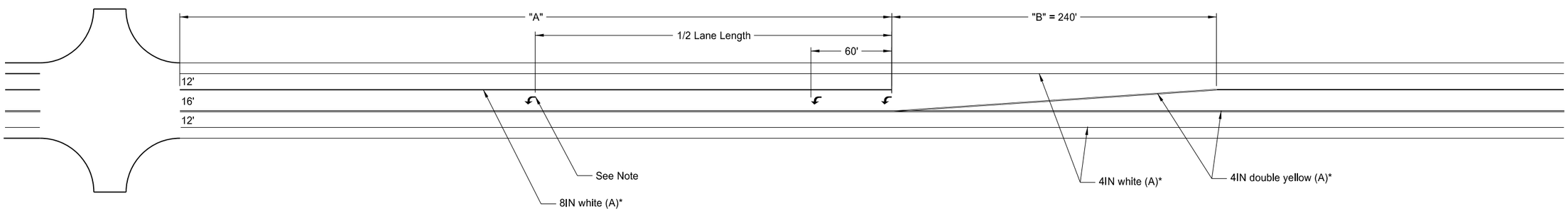
ND 22 Roundabout
East Approach
ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	120	7

Left Turn Lanes			
Station	to Station	Direction	"A"
1018+15	1023+45	NB	530
1024+55	1029+85	SB	530
1039+40	1044+70	NB	530
1045+74	1051+04	SB	530
1057+18	1062+48	NB	530
1063+52	1068+82	SB	530
1126+18	1131+48	NB	530
1132+52	1137+82	SB	530
1163+07	1168+37	NB	530
1169+41	1174+71	SB	530
1180+01	1182+48	NB	247
1183+52	1187+12	SB	360
1192+90	1196+50	NB	360
1197+50	1202+80	SB	530

Right Turn Lanes				
Station	to Station	Direction	"A"	"B"
2275+23	2278+22	SB	300	144



NOTE:

Pavement marking quanties indicated (A)* are shown in section 120, Sheet 1

If turning lane length is greater than 300' an additional arrow shall be placed at ½ "A".

Right turn lane has taper length B = 144', because 12:1 for 12' lane is 144' for 45 mph.

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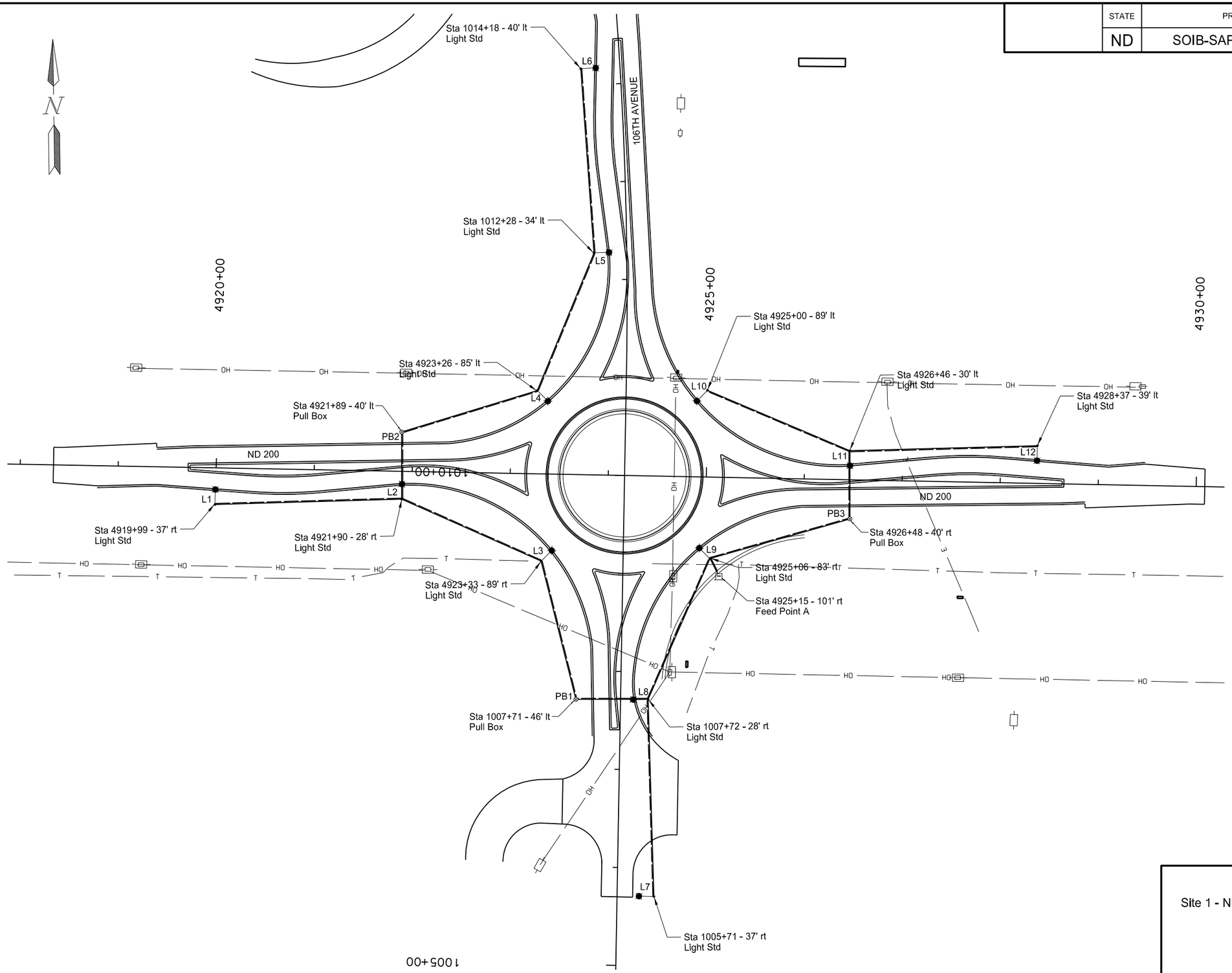
Pavement Marking Details

Turning Lane Detail

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	140	1



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Lighting Layout

Site 1 - ND 200 and ND 22 Bypass Roundabout

ND Hwy 22

Killdeer Bypass

Light Std Number	Station	Conduit Runs		Cable Runs	
		LF	Dia	LF	Type
L1	Sta 4919+99 - 37' rt to	185	2	394	(2) No 6 RHW
L2	Sta 4921+90 - 28' rt			197	(1) No 6 THW
L6	1014+18 - 40' lt to	187	2	195	(1) No 6 THW
L5	1012+28 - 34' lt			390	(2) No 6 RHW
L5	1012+28 - 34' lt to	150	2	158	(1) No 6 THW
L4	4923+26 - 85' lt			316	(2) No 6 RHW
L4	4923+26 - 85' lt to	142	2	150	(1) No 6 THW
PB2	4921+98 - 40' lt			300	(2) No 6 RHW
PB2	Sta 4921+89 - 40' lt to	66	2	74	(1) No 6 THW
L2	Sta 4921+90 - 28' rt			148	(2) No 6 RHW
L2	Sta 4921+90 - 28' rt to	154	2	324	(2) No 6 RHW
L3	Sta 4923+33 - 89' rt			162	(1) No 6 THW
L3	Sta 4923+33 - 89' rt to	142	2	302	(2) No 6 RHW
PB1	Sta 1007+71 - 46' lt			151	(1) No 6 THW
PB1	Sta 1007+71 - 46' lt to	71	2	158	(2) No 6 RHW
L8	Sta 1007+72 - 28' rt			79	(1) No 6 THW
L7	Sta 1005+71 - 37' rt to	199	2	414	(2) No 6 RHW
L8	Sta 1007+72 - 28' rt			207	(1) No 6 THW
L8	Sta 1007+72 - 28' rt to	155	2	326	(2) No 6 RHW
L9	Sta 4925+06 - 83' rt			163	(1) No 6 THW
L10	4925+00 - 88' lt to	156	2	328	(2) No 8 RHW
L11	4926+46 - 30' lt			164	(1) No 8 THW
L12	4928+37 - 39' lt to	189	2	197	(1) No 8 THW
L11	4926+46 - 30' lt			394	(2) No 8 RHW
L11	4926+46 - 30' lt to	67	2	75	(1) No 6 THW
PB3	4926+48 - 40' rt			150	(2) No 6 RHW
PB3	Sta 4926+48 - 40' rt to	145	2	153	(1) No 6 THW
L9	Sta 4925+06 - 83' rt			306	(2) No 6 RHW
L9	Sta 4925+06 - 83' rt to	16	2	60	(2) No 6 RHW
Feed Point A	Sta 4925+15 - 101' rt			30	(1) No 6 THW

Lighting Foundation Table		
Description	Footing Depth "D" 24" and 30" Dia	Footing Depth "D" 36" and 42" Dia
Light Standard 40' Pole	6'	5'

Lighting Quantities (A)											
Concrete Foundation - Lighting	Concrete Foundatoin - Feed Point - Type B	2" Diameter Rigid Conduit	Underground Conductor No. 6 - Type RHW	Underground Conductor No. 6 - Type THW	Underground Conductor No. 8 - Type RHW	Underground Conductor No. 8 - Type THW	Feed Point - Type I - Pad Mounted	Lt Std 12 ft MA 40 ft Pole - Breakaway	LED Luminaire - 245 Watt		Lighting System - Site 1
EA	EA	LF	LF	LF	LF	LF	EA	EA	EA		EA
12	1	2024	3588	1794	722	361	1	12	12		1

(A) These items shall not be bid separately, but shall be included in the item "Lighting System - Site 1".

Light Standards								
No.	Station	Wattage	Circuit	IES-TYPE	Mounting	Mounting Ht	Mast Arm	Breakaway
1	4919+99 - 37' Rt	245	A1	III	Single	40'	12'	Bkwy
2	4921+90 - 28' Rt	245	A1	III	Single	40'	12'	Bkwy
3	4923+33 - 89' Rt	245	A1	III	Single	40'	12'	Bkwy
4	4923+26 - 85' Lt	245	A1	III	Single	40'	12'	Bkwy
5	1012+28 - 34' Lt	245	A1	III	Single	40'	12'	Bkwy
6	1014+18 - 40' Lt	245	A1	III	Single	40'	12'	Bkwy
7	1005+71 - 37' Rt	245	A1	III	Single	40'	12'	Bkwy
8	1007+72 - 28' Rt	245	A1	III	Single	40'	12'	Bkwy
9	4925+06 - 83' Rt	245	A1	III	Single	40'	12'	Bkwy
10	4925+00 - 89' Lt	245	A1	III	Single	40'	12'	Bkwy
11	4926+46 - 30' Lt	245	A1	III	Single	40'	12'	Bkwy
12	4928+37 - 39' Lt	245	A1	III	Single	40'	12'	Bkwy

LED LIGHTING POLES SHALL BE PLACED IN THE LOCATIONS SPECIFIED ON THE PLANS.

THE ILLUMINATION PERFORMANCE CRITERIA OF THE LED LIGHT FIXTURES SHALL MEET THE FOLLOWING:
DESCRIPTION: MONGOOSE LED WITH 6 COBs
DRIVE CURRENT: 1050 mA
LENS: TYPE M (MEDIUM), LOW TILT
ILLUMINACE AVG: 1.3FC
UNIFORMITY RATIO (AVG/MIN): 3.3:1 MAX
COLOR RENDERING INDEX (CRI): 60 MIN
NOMINAL CORRELATED COLOR TEMPERATURE (CCT): 4000 K

ANY OTHER MAKER OR MODEL SHALL MEET THE ILLUMINANCE CRITERIA AND ATTRIBUTES AND BE APPROVED BY THE ENGINEER PRIOR TO ORDERING.

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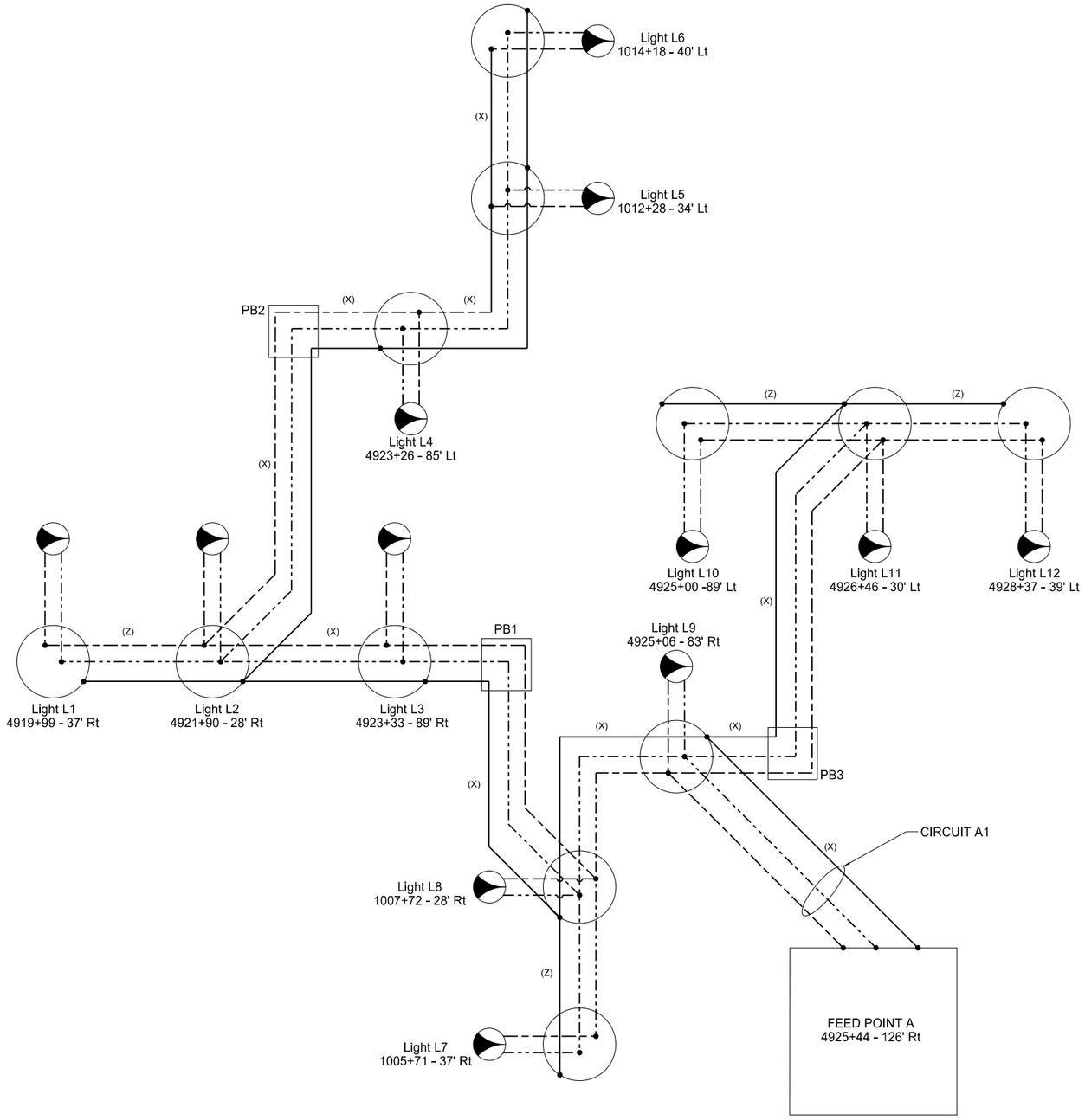
Cable Runs, Light Standards, and Quantities

Site 1 - ND 200 and ND 22 Bypass Roundabout

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	140	3



LEGEND

- Feed Point
- 245 W LED Luminaire
- Light Standard
- Light Standard Number
- Phase Conductor
- Phase Conductor
- Ground
- (X) 3 NO. 6 USE
- (Z) 3 NO. 8 USE
- Pull Box

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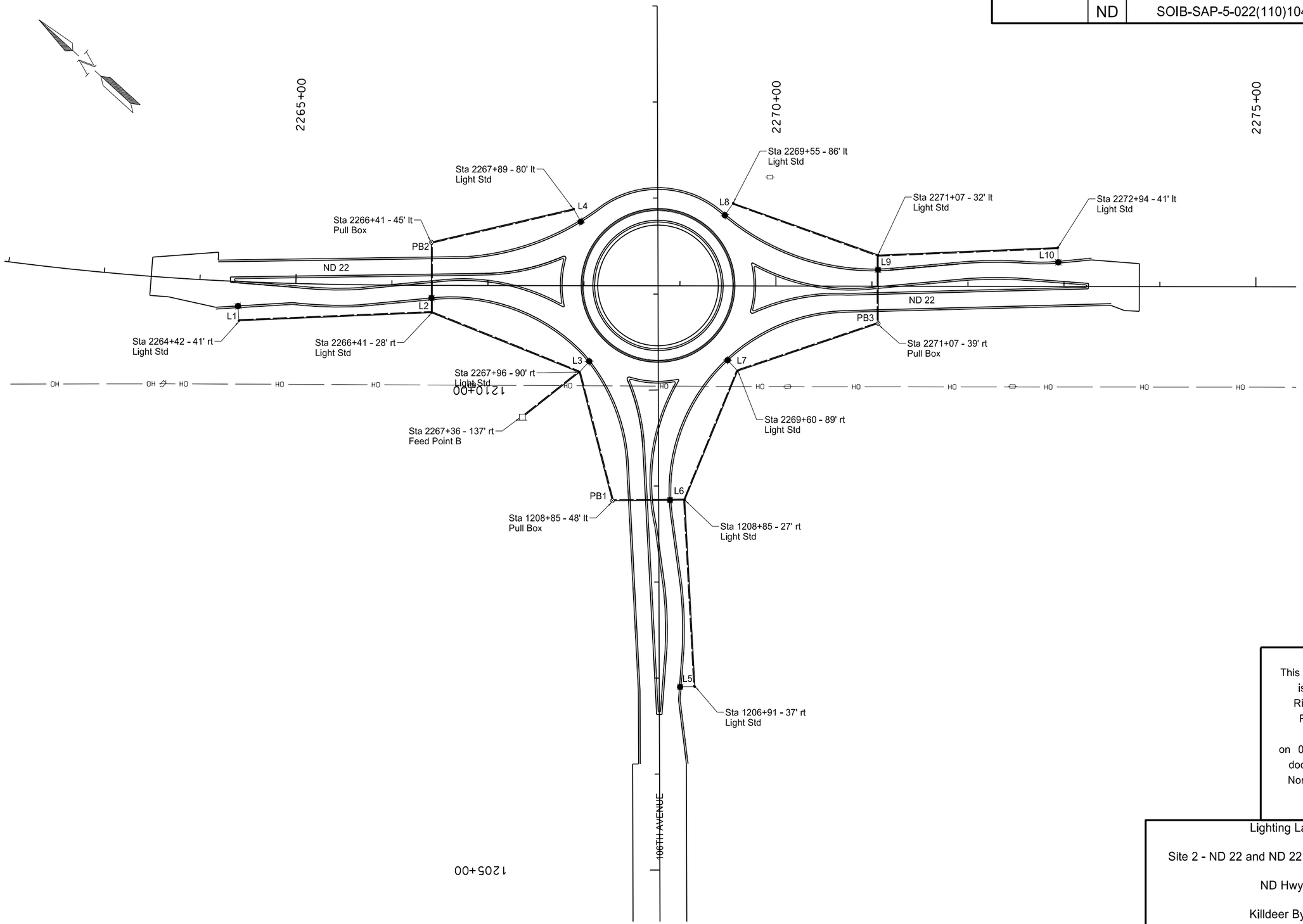
Lighting Schematic

Site 1 - ND 200 and ND 22 Bypass Roundabout

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	140	4



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Lighting Layout

Site 2 - ND 22 and ND 22 Bypass Roundabout

ND Hwy 22

Killdeer Bypass

Light Std Number	Station	Conduit Runs		Cable Runs	
		LF	Dia	LF	Type
L1	Sta 2264+42 - 41' rt to	199	2"	414	(2) No 8 RHW
L2	Sta 2266+41 - 28' rt			207	(1) No 8 THW
L4	Sta 2267+89 - 80' lt to	149	2"	157	(1) No 8 THW
PB2	Sta 2266+41 - 45' lt			314	(2) No 8 RHW
PB2	Sta 2266+41 - 45' lt to	70	2"	78	(1) No 8 THW
L2	Sta 2266+41 - 28' rt			156	(2) No 8 RHW
L2	Sta 2266+96 - 90' rt to	164	2"	344	(2) No 8 RHW
L3	Sta 2267+96 - 90' rt			172	(1) No 8 THW
L8	Sta 2269+55 - 86' lt to	158	2"	332	(2) No 8 RHW
L9	Sta 2271+07 - 32' lt			166	(1) No 8 THW
L10	Sta 2272+94 - 41' lt to	185	2"	193	(1) No 8 THW
L9	Sta 2271+07 - 32' lt			386	(2) No 8 RHW
L9	Sta 2271+07 - 32' lt to	68	2"	76	(1) No 8 THW
PB3	Sta 2271+07 - 39' rt			152	(2) No 8 RHW
PB3	Sta 2271+07 - 39' rt to	151	2"	159	(1) No 8 THW
L7	Sta 2269+60 - 89' rt			318	(2) No 8 RHW
L7	Sta 2269+60 - 89' rt to	143	2"	151	(1) No 8 THW
L6	Sta 1208+85 - 27' rt			302	(2) No 8 RHW
L5	Sta 1206+91 - 37' rt to	193	2"	402	(2) No 8 RHW
L6	Sta 1208+85 - 27' rt			201	(1) No 8 THW
L6	Sta 1208+85 - 27' rt to	73	2"	81	(1) No 8 THW
PB1	Sta 1208+85 - 48' lt			162	(2) No 8 RHW
PB1	Sta 1208+85 - 48' lt to	135	2"	143	(1) No 8 THW
L3	Sta 2267+96 - 90' rt			286	(2) No 8 RHW
L3	Sta 2267+96 - 90' rt to	71	2"	170	(2) No 8 RHW
Feed Point B	Sta 2267+36 - 137' rt			85	(1) No 8 THW

Lighting Foundation Table

Description	Footing Depth "D" 24" and 30" Dia	Footing Depth "D" 36" and 42" Dia
Light Standard 40' Pole	6'	5'

Lighting Quantities (A)

Concrete Foundation - Lighting	Concrete Foundatoin - Feed Point - Type B	2" Diameter Rigid Conduit	Underground Conductor No. 8 - Type RHW	Underground Conductor No. 8 - Type THW	Feed Point - Type I - Pad Mounted	Lt Std 12 ft MA 40 ft Pole - Breakaway	LED Luminaire - 245 Watt		Lighting System - Site 2
EA	EA	LF	LF	LF	EA	EA	EA		EA
10	1	1759	3738	1869	1	10	10		1

(A) These items shall not be bid separately, but shall be included in the item "Lighting System - Site 2".

Light Standards

No.	Station	Wattage	Circuit	IES-TYPE	Mounting	Mounting Ht	Mast Arm	Breakaway
1	2264+42 - 41' Rt	245	A2	III	Single	40'	12'	Bkwy
2	2266+41 - 28' Rt	245	A2	III	Single	40'	12'	Bkwy
3	2267+96 - 90' Rt	245	A2	III	Single	40'	12'	Bkwy
4	2267+89 - 80' Lt	245	A2	III	Single	40'	12'	Bkwy
5	1206+91 - 37' Rt	245	A2	III	Single	40'	12'	Bkwy
6	1208+85 - 27' Rt	245	A2	III	Single	40'	12'	Bkwy
7	2269+60 - 89' Rt	245	A2	III	Single	40'	12'	Bkwy
8	2269+55 - 86' Lt	245	A2	III	Single	40'	12'	Bkwy
9	2271+07 - 32' Lt	245	A2	III	Single	40'	12'	Bkwy
10	2272+94 - 41' Lt	245	A2	III	Single	40'	12'	Bkwy

LED LIGHTING POLES SHALL BE PLACED IN THE LOCATIONS SPECIFIED ON THE PLANS.

THE ILLUMINATION PERFORMANCE CRITERIA OF THE LED LIGHT FIXTURES SHALL MEET THE FOLLOWING:
DESCRIPTION: MONGOOSE LED WITH 6 COBs
DRIVE CURRENT: 1050 mA
LENS: TYPE M (MEDIUM), LOW TILT
ILLUMINACE AVG: 1.3FC
UNIFORMITY RATIO (AVG/MIN): 3.3:1 MAX
COLOR RENDERING INDEX (CRI): 60 MIN
NOMINAL CORRELATED COLOR TEMPERATURE (CCT): 4000 K

ANY OTHER MAKER OR MODEL SHALL MEET THE ILLUMINANCE CRITERIA AND ATTRIBUTES AND BE APPROVED BY THE ENGINEER PRIOR TO ORDERING.

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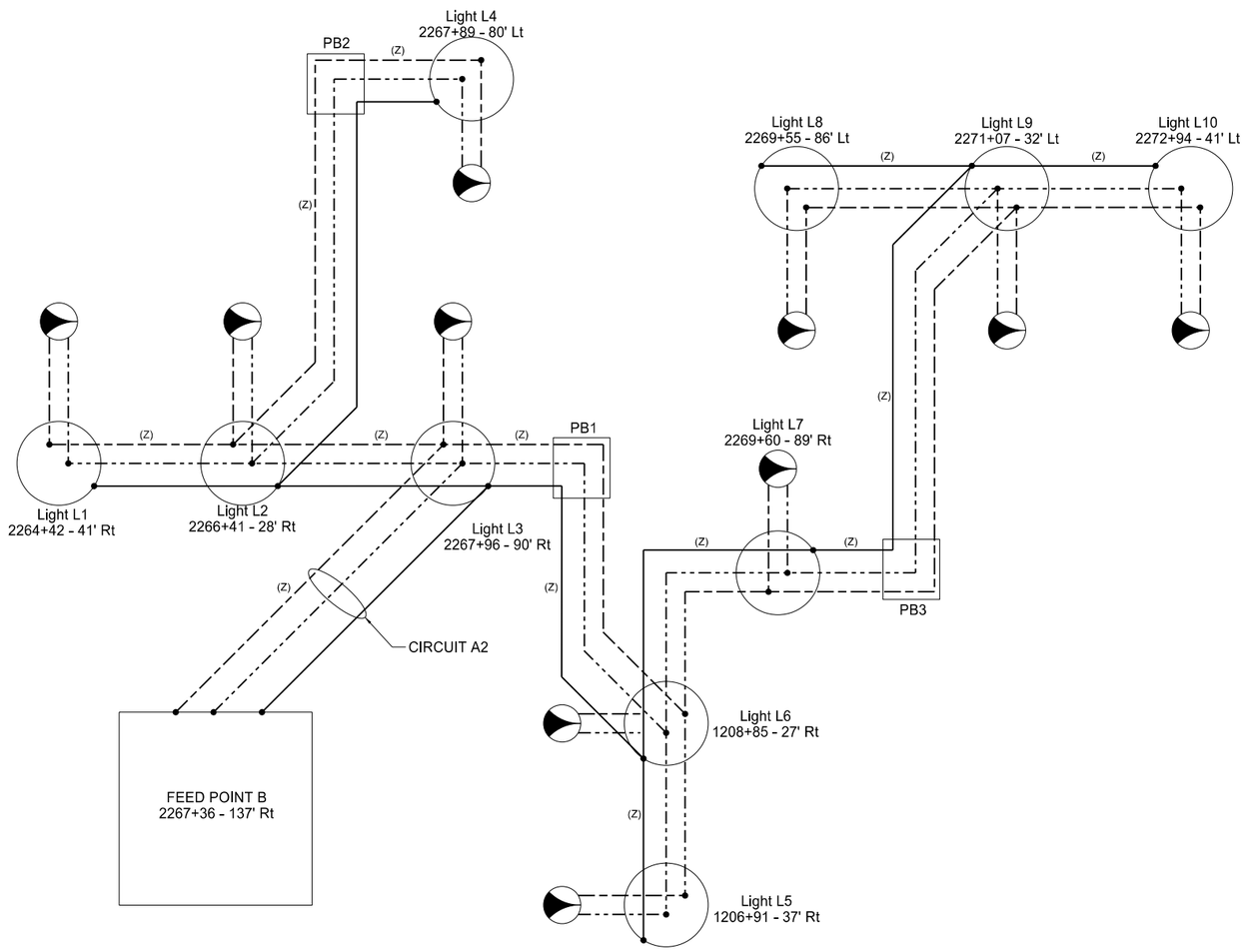
Cable Runs, Light Standards, and Quantities

Site 2 - ND 22 and ND 22 Bypass Roundabout

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	140	6



LEGEND

- Feed Point
- 245 W LED Luminaire
- Light Standard
- Light Standard Number
- Phase Conductor
- Phase Conductor
- Ground
- (Z) 3 NO. 8 USE
- Pull Box

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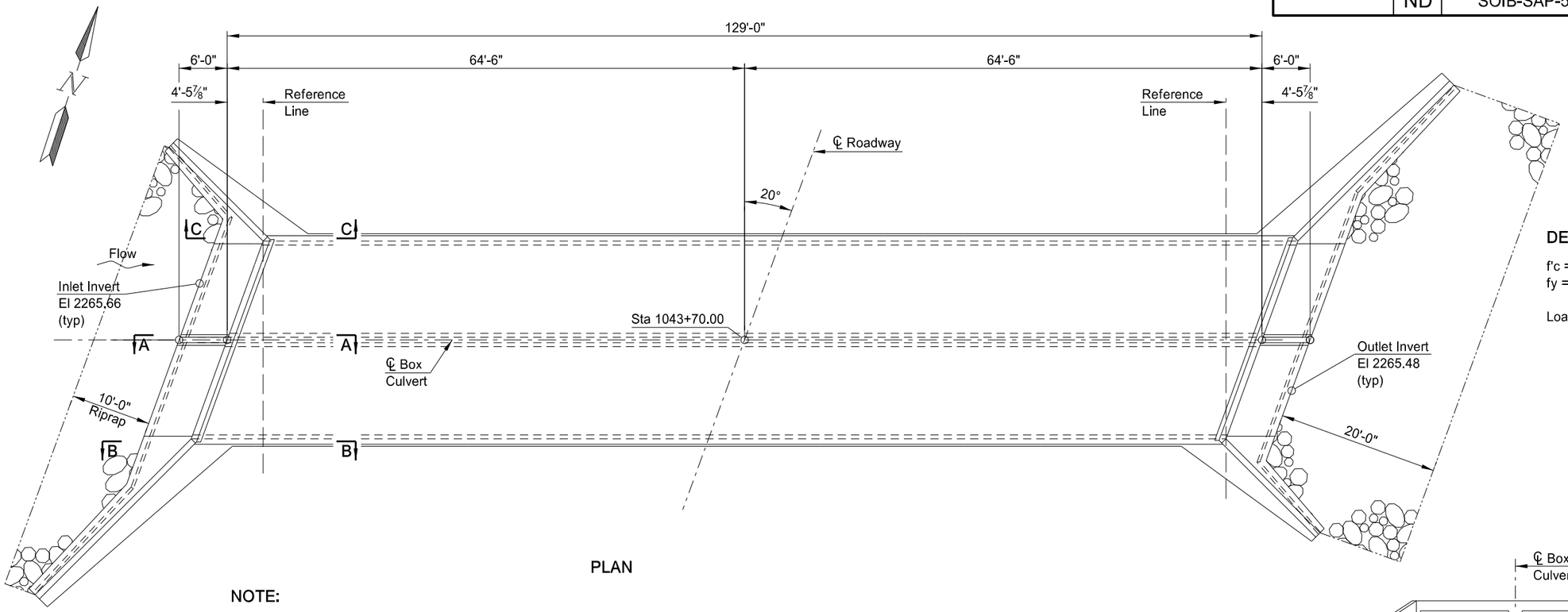
Lighting Schematic

Site 2 - ND 22 and ND 22 Bypass Roundabout

ND Hwy 22

Killdeer Bypass

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	1



PLAN

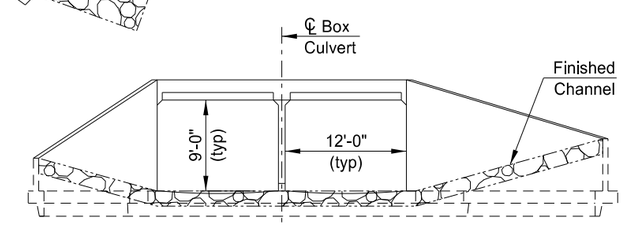
DESIGN STRENGTHS:

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

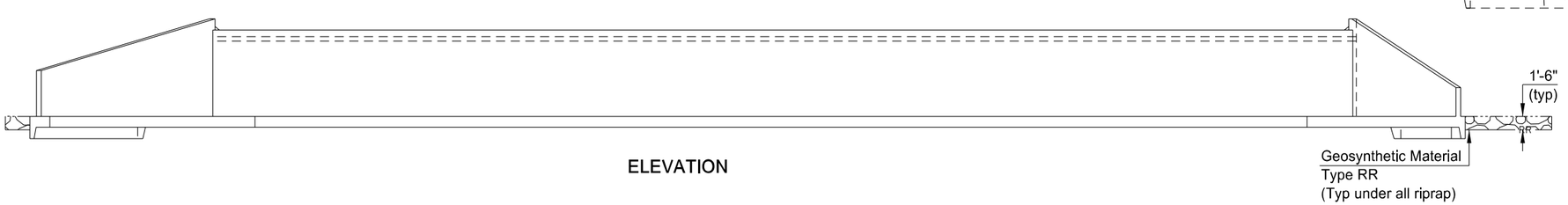
Load & Resistance Factor Design

NOTE:

See Dwg 22-106.348-10 for Sections A-A.
See Dwg 22-106.348-11 for Sections B-B and C-C.



END VIEW



ELEVATION

HYDRAULIC DATA:

Drainage Area	30.6	sq mi
Stream Gradient	0.0132	ft/ft
Design Frequency	50	yr
Design Discharge	1,590	cfs
Design Headwater Stage	2276.26	ft
Design Tailwater Stage	2274.22	ft
Velocity Through Bridge	8.5	fps
100-Year Frequency Discharge	1,870	cfs
100-Year Frequency Headwater	2277.49	ft
Overtopping Stage	2279.22	ft
Overtopping Discharge	2,185 ±	cfs

BOX CULVERT BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
210	0050	BOX CULVERT EXCAVATION	EA	1
210	0210	FOUNDATION FILL	CY	416
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1
256	0200	RIPRAP GRADE II	CY	87
602	1131	CLASS AE-3 CONCRETE-BOX CULVERT	CY	387.6
612	0114	REINFORCING STEEL-GRADE 60-BOX CULVERT	LBS	53,312
709	0151	GEOSYNTHETIC MATERIAL TYPE R1	SY	623
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	173

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HL-93 DESIGN LOADING

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

SPRING CREEK
20° SKEW
REINFORCED CONCRETE
DOUBLE BOX CULVERT LAYOUT

CLEAR SPAN 2 x 12' CLEAR HEIGHT 9'
MAXIMUM FILL 8'

PROJECT: SOIB-SAP-5-022(110)104
STATION: 1043+70.00
DUNN COUNTY

3/31/2015 — DATE
Terrence R. Udland — BRIDGE ENGINEER

NOTES

100 SCOPE OF WORK: Work at this site consists of building a new double barrel 12' x 9' x 129'-0" reinforced concrete box culvert.

602 CONCRETE: The following elements of each section shall be cast in one continuous run:

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

The concrete in the walls shall be allowed to set at least two hours before the roof slab is poured.

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

Dimensions of bent bars are given out to out. All bends conform to CRSI Standards unless indicated otherwise.

709 GEOSYNTHETIC MATERIAL TYPE R1: The contractor shall install one continuous piece of fabric to meet the required longitudinal length indicated in the plans. If transverse seaming is necessary the seam shall be sewn.

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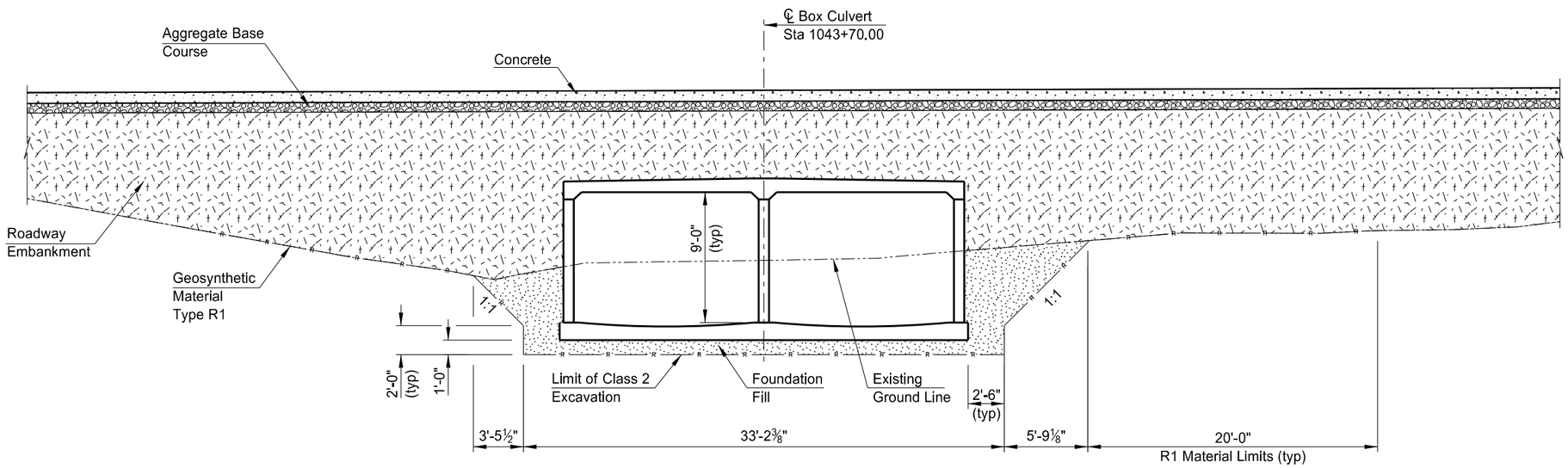
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	3



(SHOWING SECTION ALONG ℄ ROADWAY)

R1 MATERIAL PLACEMENT AND FOUNDATION FILL THROUGH EXISTING EMBANKMENT

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NOTES:

The R1 Fabric shall extend 31'-8" Lt & Rt of ℄ Roadway.

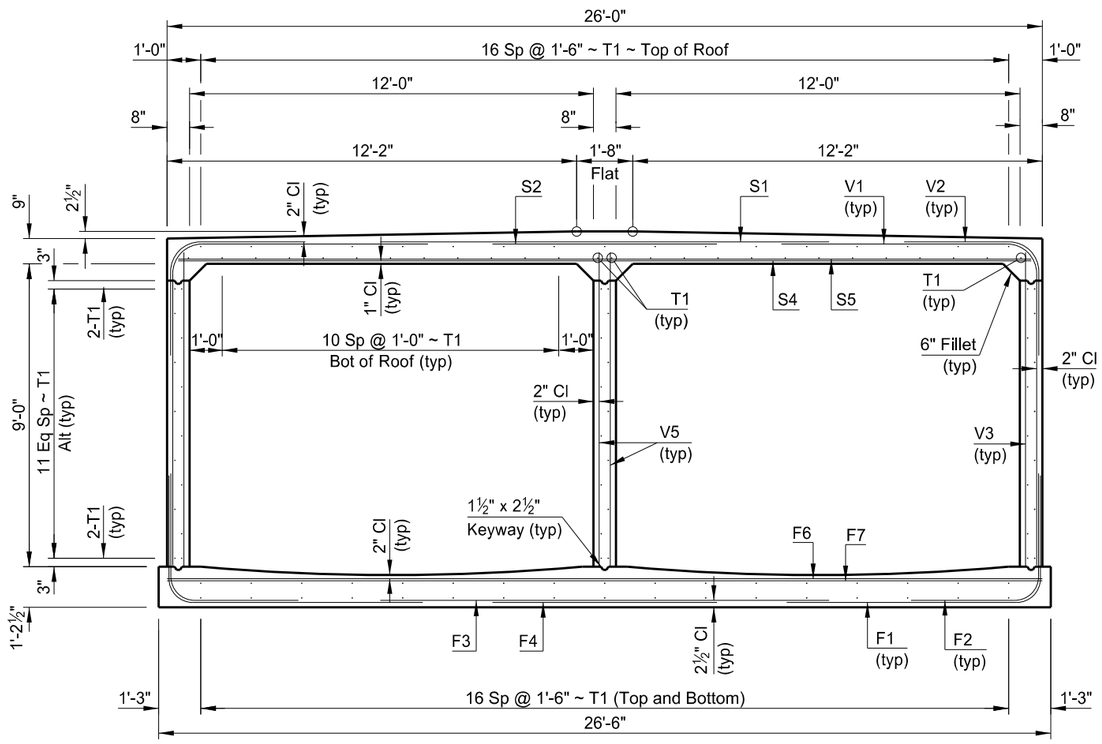
The minimum depth of foundation fill under the box shall be 1'-0". All unsound material under the box shall be removed. The depth required shall be determined by the Engineer.

The foundation fill shall run to the end of the apron.

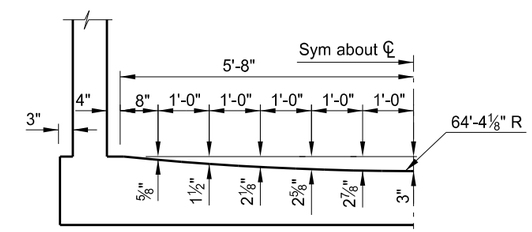
SPRING CREEK

EXCAVATION & FOUNDATION FILL DETAIL

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	4



SECTION OF BARREL



CURVED FLOOR OFF-SETS

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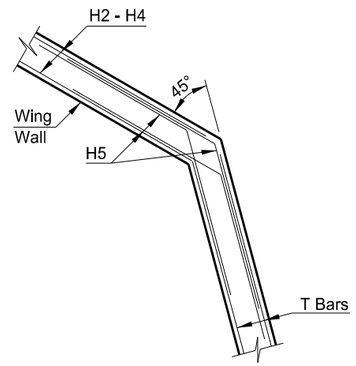
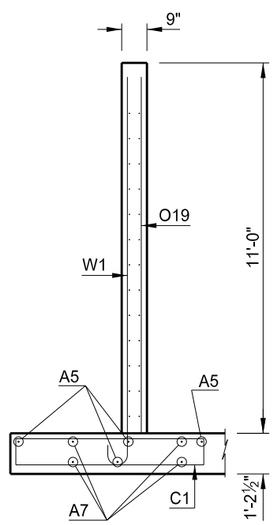
SPRING CREEK

BARREL SECTION

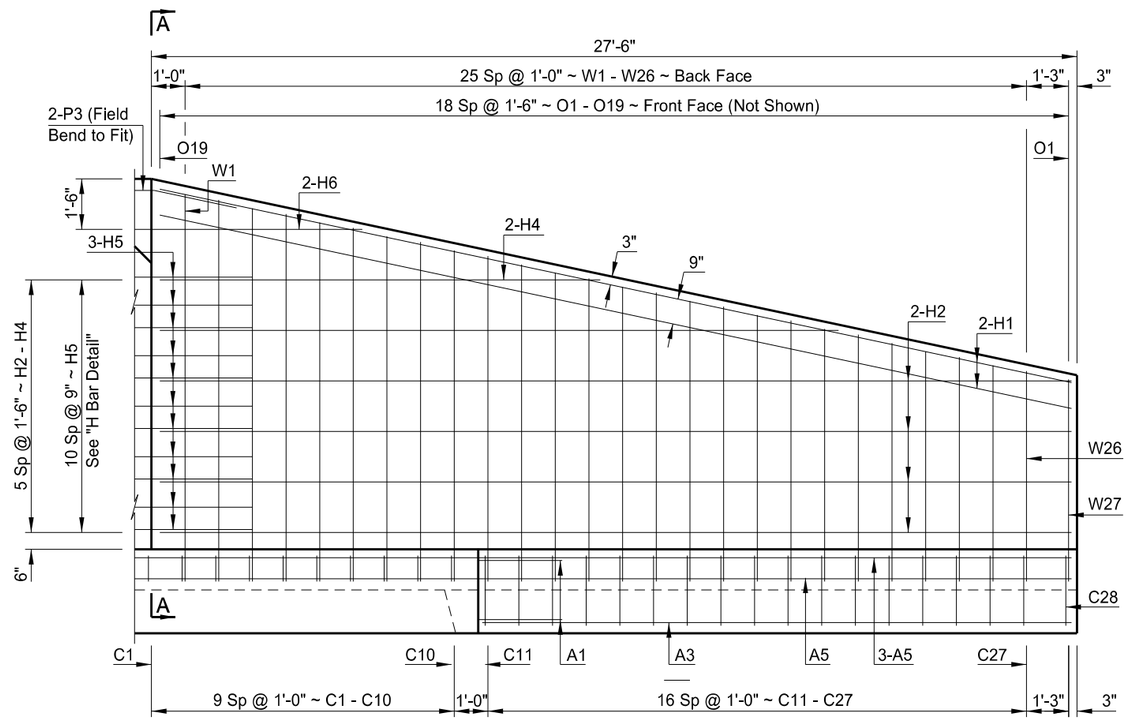
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	5



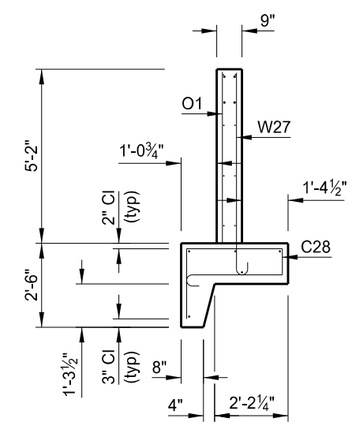
H BAR DETAIL



A-A



LONG WING ELEVATION



END VIEW

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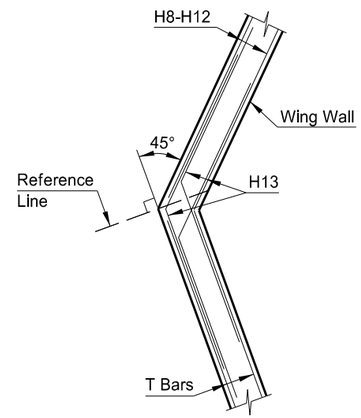
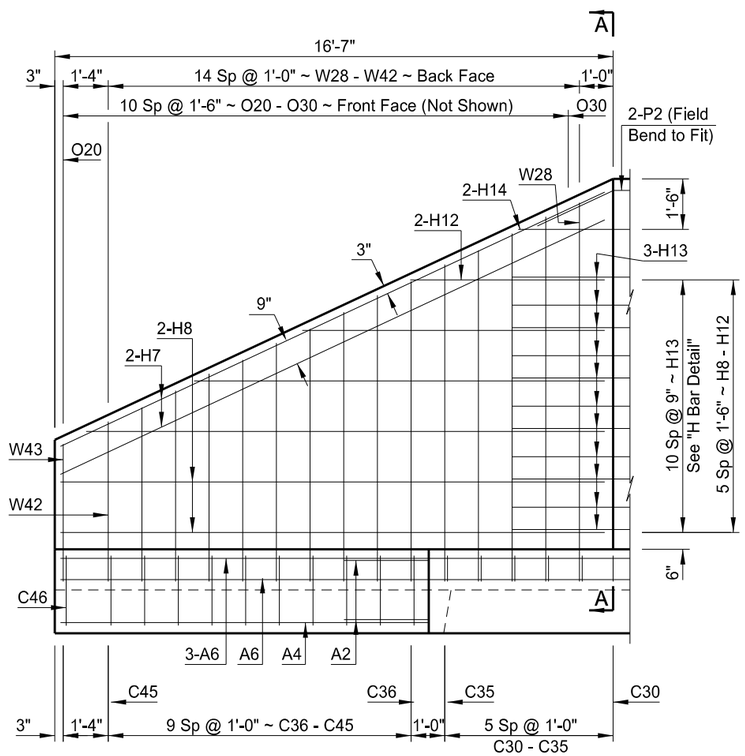
SPRING CREEK

LONG WING DETAILS

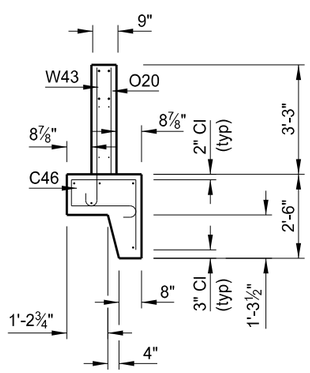
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	6



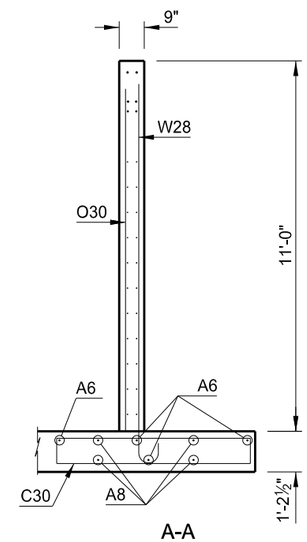
H BAR DETAIL



SHORT WING ELEVATION



END VIEW



A-A

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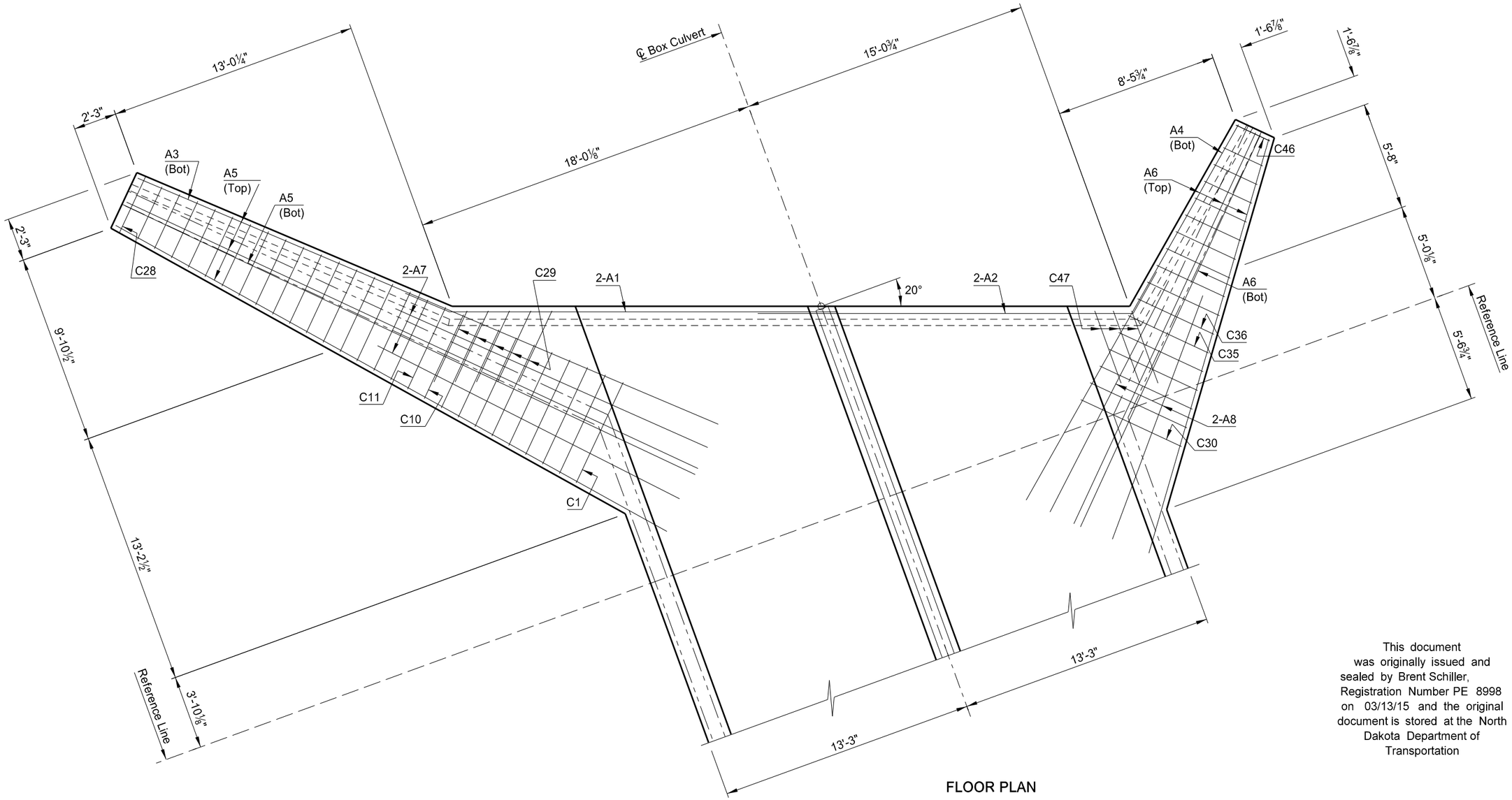
SPRING CREEK

SHORT WING DETAILS

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	7



FLOOR PLAN

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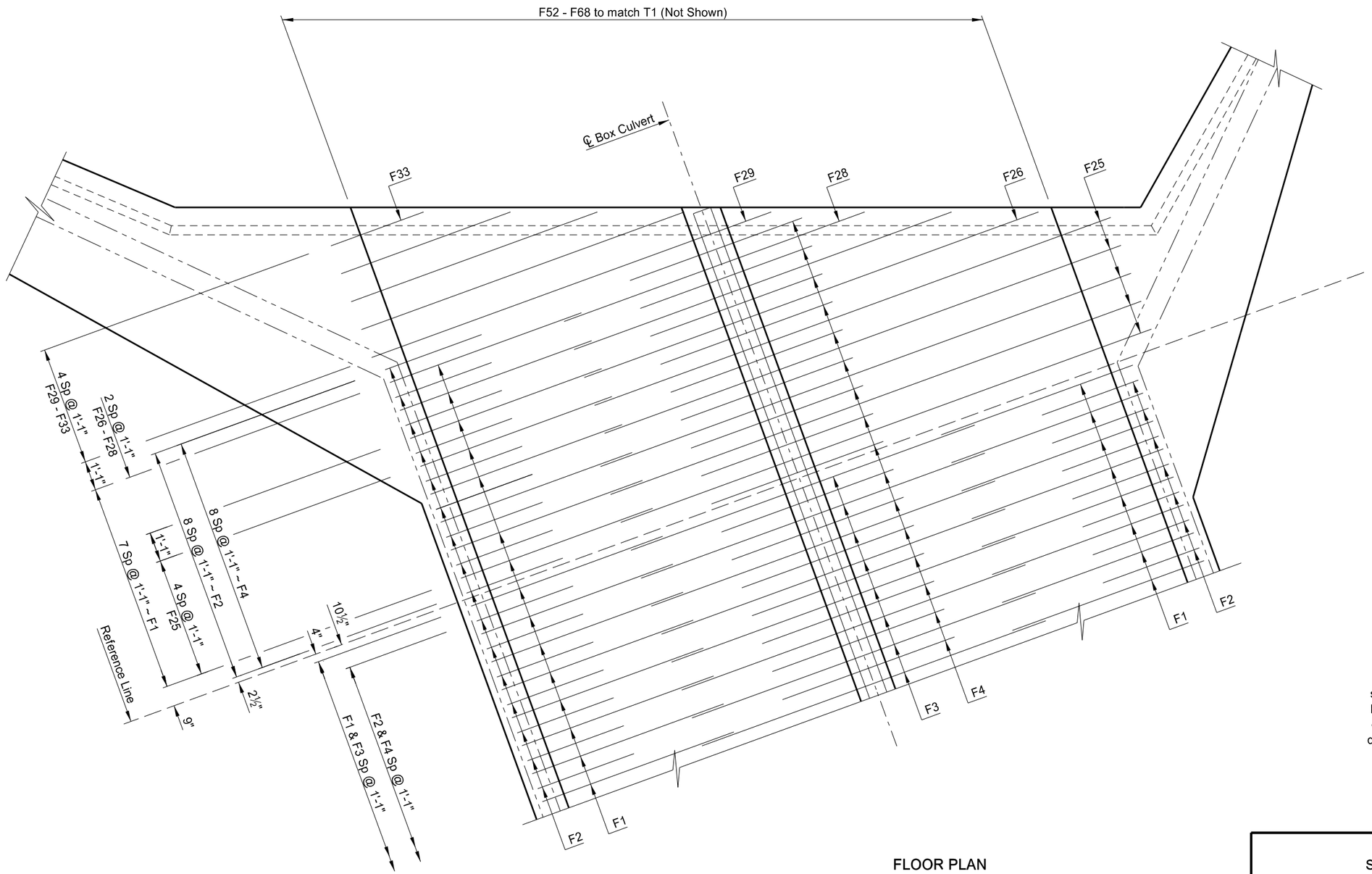
SPRING CREEK

(SHOWING DIMENSIONS & WING FOOTING REINFORCING)

FLOOR DETAIL

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	8



FLOOR PLAN

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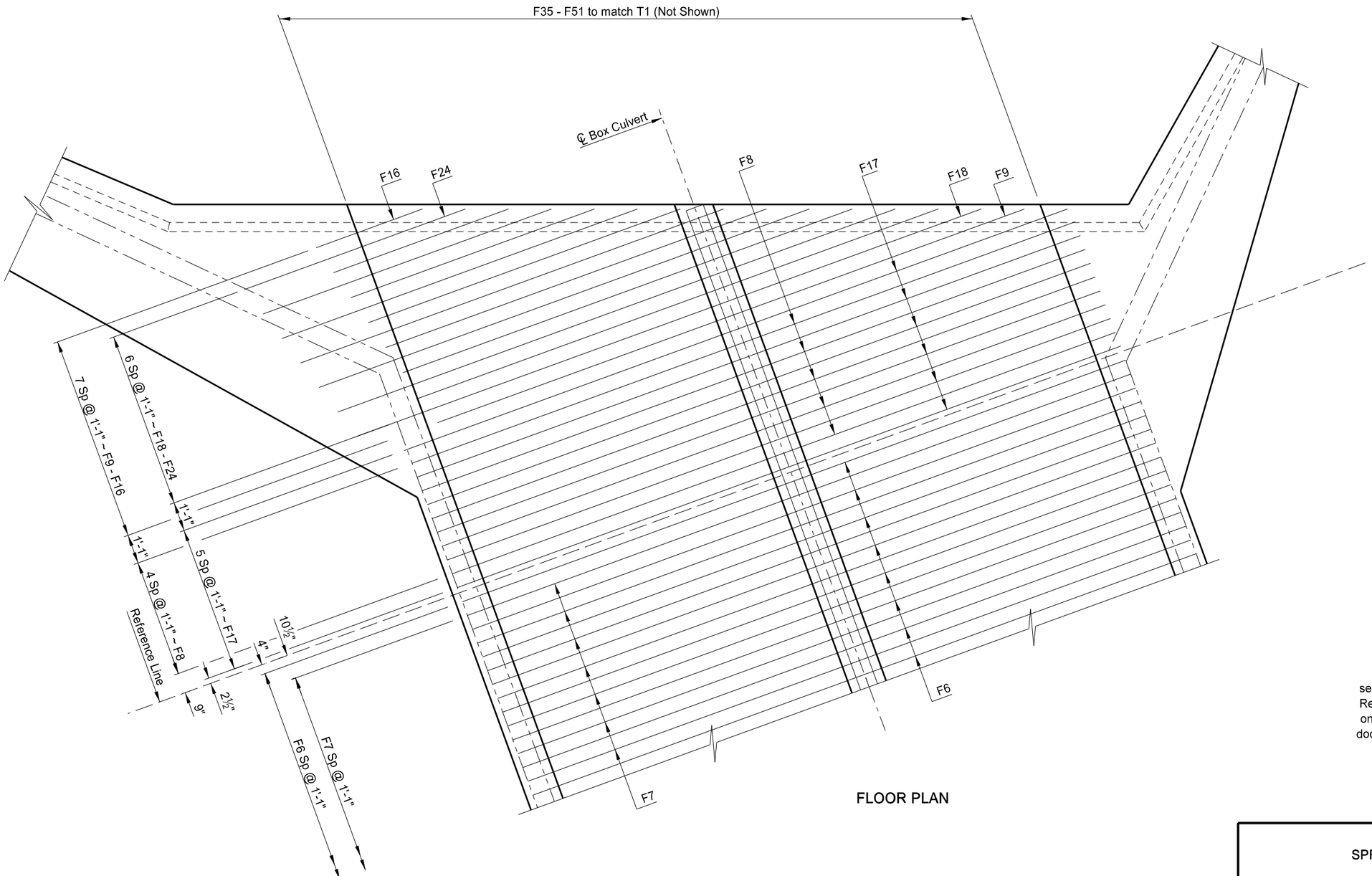
SPRING CREEK

(SHOWING BOTTOM MAT REINFORCING)

FLOOR DETAIL

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	9



FLOOR PLAN

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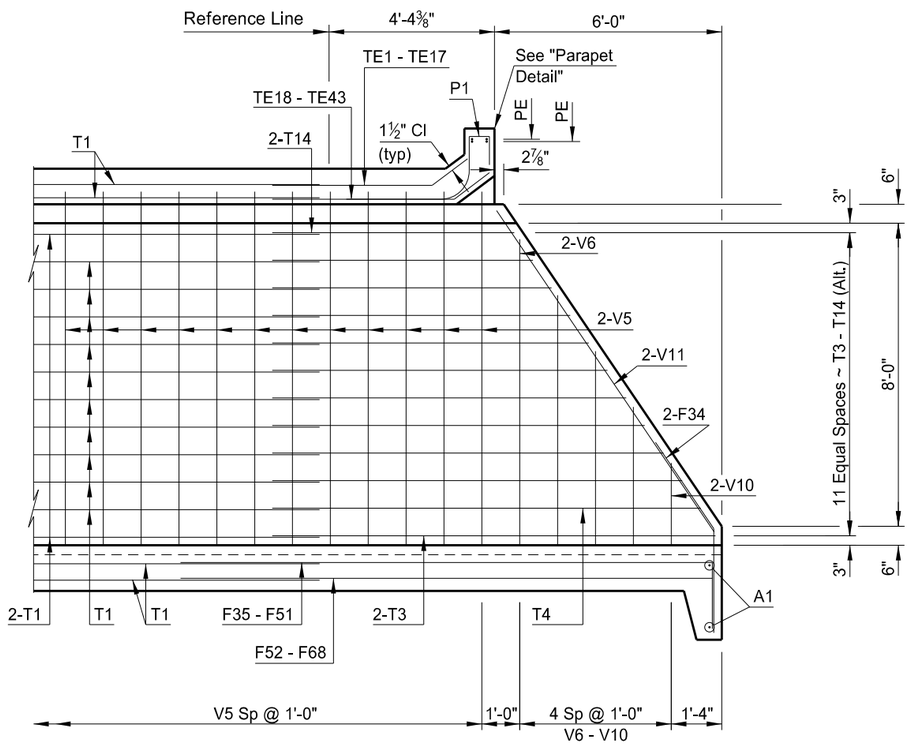
SPRING CREEK

(SHOWING TOP MAT REINFORCING)

FLOOR DETAIL

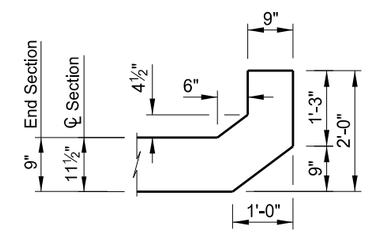
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	10



(INNER WALL)

A-A

LONGITUDINAL SECTION



PARAPET DETAIL

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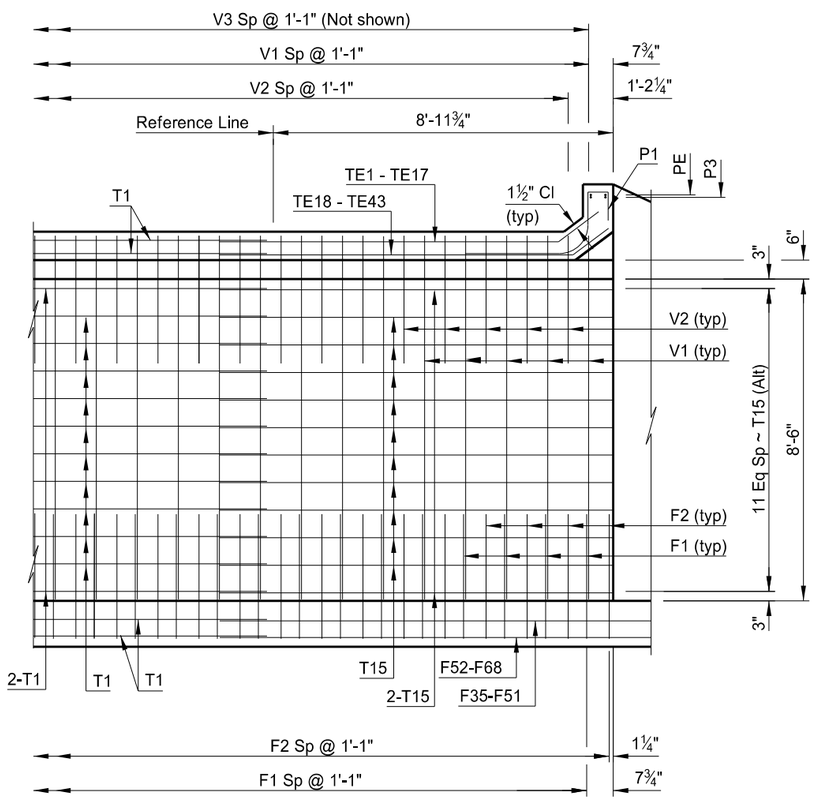
NOTE:

See Dwg 22-106.348-1 for location of Section A-A.

SPRING CREEK

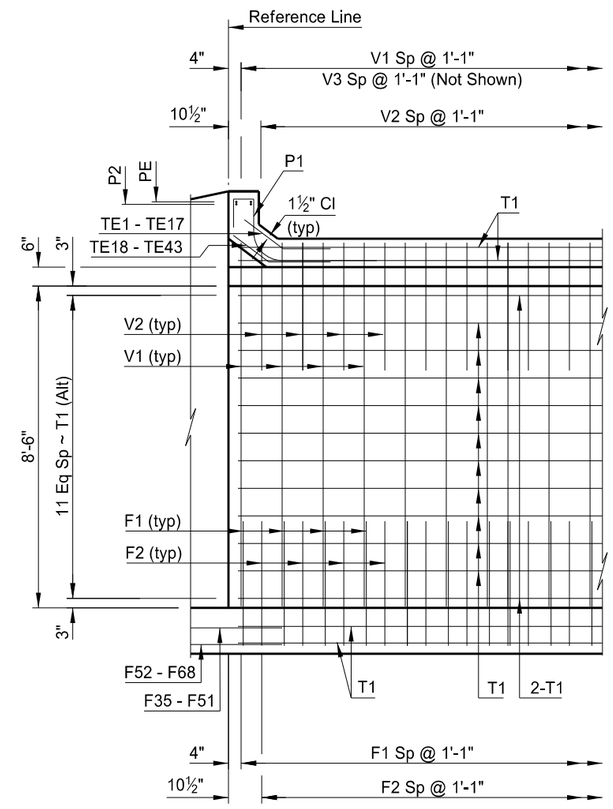
INNER WALL DETAIL & PARAPET DETAIL

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SIOB-SAP-5-022(110)104	170	11



(OUTER WALL)

B-B



(OUTER WALL)

C-C

LONGITUDINAL SECTIONS

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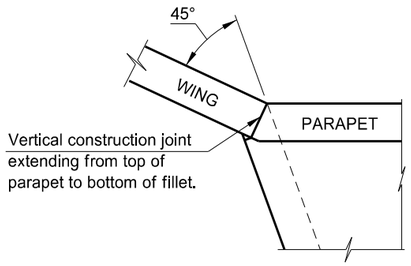
NOTE:

See Dwg 22-106.348-1 for location of Sections B-B and C-C.

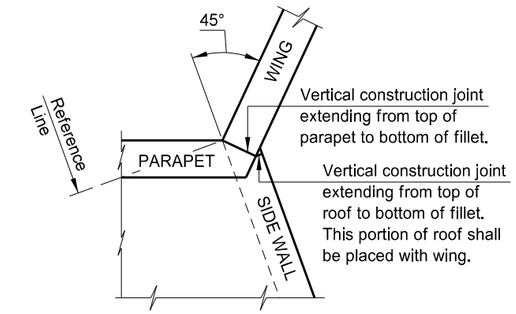
SPRING CREEK

OUTER WALL DETAILS

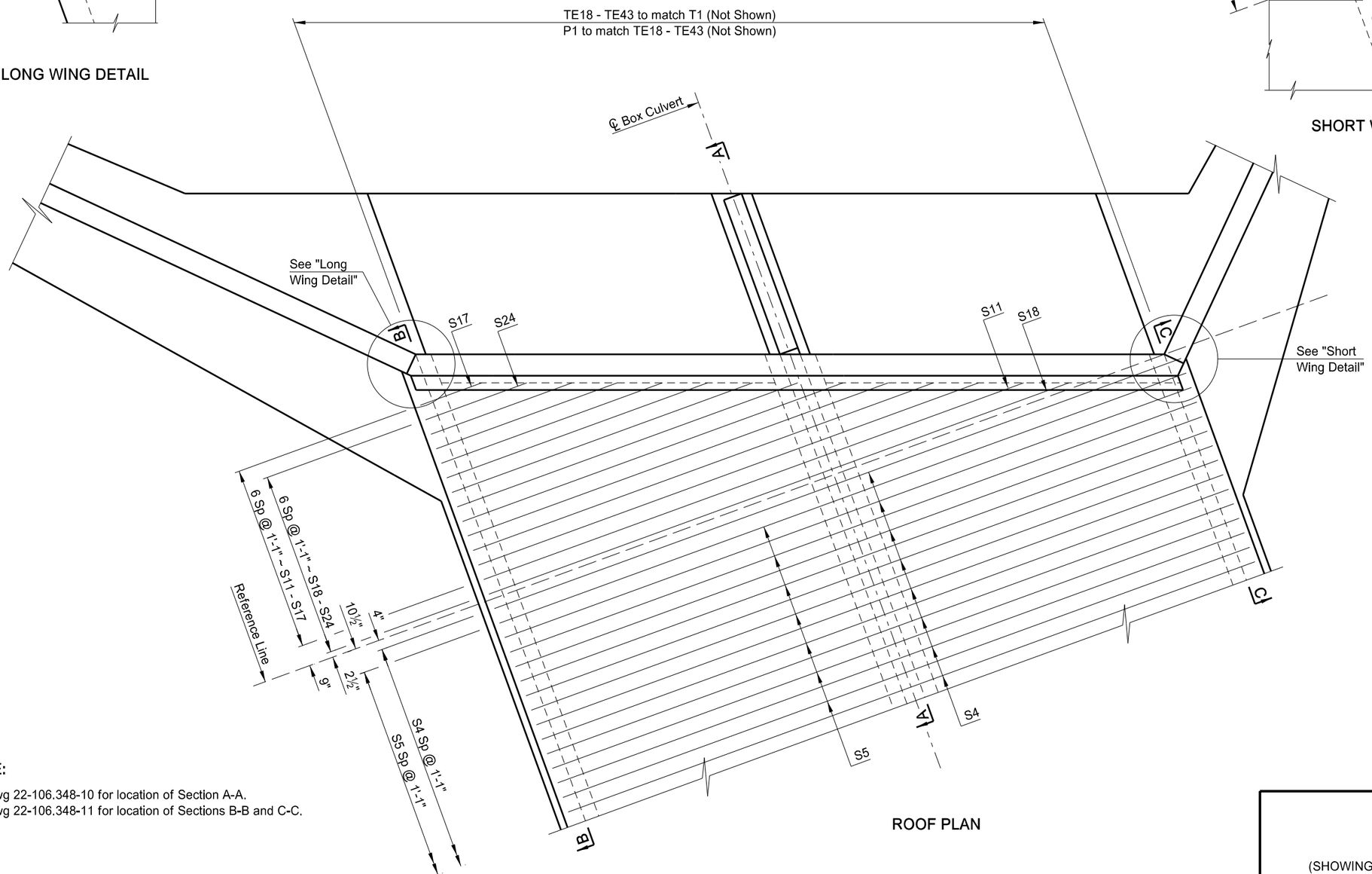
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	12



LONG WING DETAIL



SHORT WING DETAIL



ROOF PLAN

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NOTE:

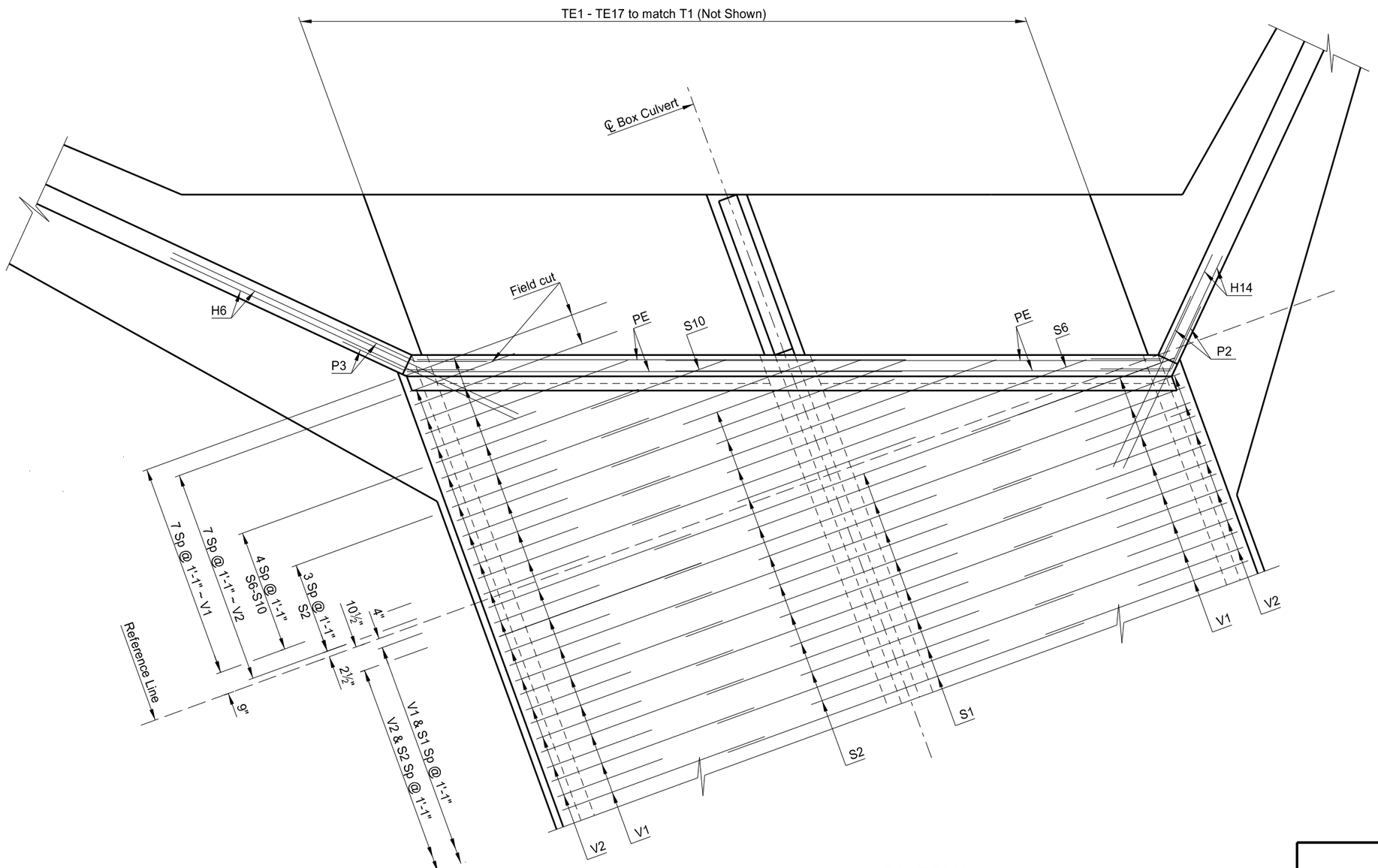
See Dwg 22-106.348-10 for location of Section A-A.
See Dwg 22-106.348-11 for location of Sections B-B and C-C.

SPRING CREEK

(SHOWING BOTTOM MAT REINFORCING)

ROOF DETAILS

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	13



ROOF PLAN

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SPRING CREEK

(SHOWING TOP MAT & PARAPET REINFORCING)

ROOF DETAIL

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	14

BAR LIST (CONSTANT)

MARK	SIZE	NO.	LENGTH	SHAPE
W1	7	2	12'-5"	BENT
W2	7	2	12'-2"	BENT
W3	7	2	11'-11"	BENT
W4	7	2	11'-9"	BENT
W5	7	2	11'-6"	BENT
W6	7	2	11'-4"	BENT
W7	7	2	11'-1"	BENT
W8	7	2	10'-11"	BENT
W9	6	2	10'-6"	BENT
W10	6	2	10'-4"	BENT
W11	6	2	10'-1"	BENT
W12	6	2	9'-11"	BENT
W13	5	2	9'-7"	BENT
W14	5	2	9'-4"	BENT
W15	5	2	9'-2"	BENT
W16	5	2	8'-11"	BENT
W17	5	2	8'-9"	BENT
W18	4	2	8'-5"	BENT
W19	4	2	8'-3"	BENT
W20	4	2	8'-0"	BENT
W21	4	2	7'-10"	BENT
W22	4	2	7'-7"	BENT
W23	4	2	7'-4"	BENT
W24	4	2	7'-2"	BENT
W25	4	2	6'-11"	BENT
W26	4	2	6'-9"	BENT
W27	4	2	6'-6"	BENT
C1	5	2	13'-8"	BENT
C2	5	2	13'-4"	BENT
C3	5	2	13'-2"	BENT
C4	5	2	13'-0"	BENT
C5	5	2	12'-10"	BENT
C6	5	2	12'-6"	BENT
C7	5	2	12'-4"	BENT
C8	5	2	12'-2"	BENT
C9	5	2	12'-0"	BENT
C10	5	2	11'-8"	BENT
C11	5	2	12'-9"	BENT
C12	5	2	12'-7"	BENT
C13	5	2	12'-5"	BENT
C14	4	2	12'-0"	BENT
C15	4	2	11'-10"	BENT
C16	4	2	11'-8"	BENT
C17	4	2	11'-6"	BENT
C18	4	2	11'-2"	BENT
C19	4	2	11'-0"	BENT
C20	4	2	10'-10"	BENT
C21	4	2	10'-8"	BENT
C22	4	2	10'-4"	BENT
C23	4	2	10'-2"	BENT
C24	4	2	10'-0"	BENT
C25	4	2	9'-8"	BENT
C26	4	2	9'-6"	BENT
C27	4	2	9'-4"	BENT
C28	4	2	9'-0"	BENT
C29	4	10	6'-2"	BENT
H1	7	8	27'-8"	STR.
H2	4	16	27'-1"	STR.
H3	4	4	20'-1"	STR.
H4	4	4	13'-1"	STR.
H5	4	66	6'-0"	BENT
H6	6	4	13'-5"	STR.
O1-O19	4	2 SETS	149'-8"	STR.

BAR LIST (CONSTANT)

MARK	SIZE	NO.	LENGTH	SHAPE
W28	7	2	12'-1"	BENT
W29	7	2	11'-8"	BENT
W30	7	2	11'-2"	BENT
W31	7	2	10'-9"	BENT
W32	6	2	10'-1"	BENT
W33	6	2	9'-7"	BENT
W34	5	2	9'-1"	BENT
W35	5	2	8'-7"	BENT
W36	4	2	8'-1"	BENT
W37	4	2	7'-7"	BENT
W38	4	2	7'-1"	BENT
W39	4	2	6'-8"	BENT
W40	4	2	6'-2"	BENT
W41	4	2	5'-9"	BENT
W42	4	2	5'-3"	BENT
W43	4	2	4'-7"	BENT
C30	5	2	13'-8"	BENT
C31	5	2	13'-2"	BENT
C32	5	2	12'-8"	BENT
C33	5	2	12'-2"	BENT
C34	5	2	11'-10"	BENT
C35	5	2	11'-4"	BENT
C36	5	2	12'-1"	BENT
C37	4	2	11'-6"	BENT
C38	4	2	11'-0"	BENT
C39	4	2	10'-8"	BENT
C40	4	2	10'-2"	BENT
C41	4	2	9'-8"	BENT
C42	4	2	9'-2"	BENT
C43	4	2	8'-8"	BENT
C44	4	2	8'-4"	BENT
C45	4	2	7'-10"	BENT
C46	4	2	7'-2"	BENT
C47	4	6	6'-2"	BENT
H7	7	8	17'-10"	STR.
H8	4	8	16'-2"	STR.
H9	4	4	15'-4"	STR.
H10	4	4	12'-2"	STR.
H11	4	4	8'-11"	STR.
H12	4	4	5'-9"	STR.
H13	4	66	6'-0"	BENT
H14	6	4	8'-3"	STR.
O20-O30	4	2 SETS	73'-4"	STR.
A1	6	4	22'-8"	BENT
A2	6	4	19'-6"	BENT
A3	6	2	17'-9"	STR.
A4	6	2	11'-1"	STR.
A5	6	8	32'-9"	STR.
A6	6	8	22'-5"	STR.
A7	6	8	17'-9"	STR.
A8	6	8	13'-6"	STR.
P1	4	52	4'-7"	BENT
P2	6	4	5'-0"	BENT
P3	6	4	5'-0"	BENT
PE	6	8	17'-5"	STR.
V6	4	4	7'-11"	STR.
V7	4	4	6'-6"	STR.
V8	4	4	5'-1"	STR.
V9	4	4	3'-7"	STR.
V10	4	4	2'-2"	STR.
V11	6	4	10'-3"	STR.

BAR LIST (CONSTANT)

MARK	SIZE	NO.	LENGTH	SHAPE
F8	5	10	26'-0"	STR.
F9-F16	5	2 SETS	108'-8"	STR.
F17	5	12	26'-0"	STR.
F18-F24	5	2 SETS	116'-1"	STR.
F25	6	10	20'-6"	STR.
F26-F28	6	2 SETS	43'-8"	STR.
F29-F33	6	2 SETS	47'-4"	STR.
F34	6	4	5'-6"	BENT
F35-F51	4	2 SETS	230'-3"	BENT
F52-F68	4	2 SETS	200'-6"	STR.
S6-S10	7	2 SETS	55'-2"	STR.
S11-S17	5	2 SETS	78'-6"	STR.
S18-S24	5	2 SETS	88'-8"	STR.
T3	4	4	11'-9"	STR.
T4-T13	4	2 SETS	90'-0"	STR.
T14	4	4	6'-5"	STR.
T15	4	28	10'-3"	STR.
TE1-TE17	4	2 SETS	107'-0"	BENT
TE18-TE43	4	2 SETS	171'-2"	BENT

BAR LIST (VARIABLE)

MARK	SIZE	NO.	LENGTH	SHAPE
V1	5	238	16'-9"	BENT
V2	6	236	7'-0"	BENT
V3	4	240	9'-4"	STR.
V5	4	260	9'-4"	STR.
F1	4	240	11'-0"	BENT
F2	5	238	7'-3"	BENT
F3	6	112	13'-4"	STR.
F4	7	128	6'-8"	STR.
F6	5	112	26'-0"	STR.
F7	5	110	26'-0"	STR.
S1	7	112	13'-4"	STR.
S2	7	118	6'-8"	STR.
S4	5	112	25'-4"	STR.
S5	5	110	25'-4"	STR.
T1	4	119	122'-1"	STR.

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.

CONCRETE FORMULAS

ENTIRE FLOOR	"L" x	1.04598	+	36.09791	=	171.0 CY
TWO OUTSIDE WALLS & FOUR WINGS	"L" x	0.41975	+	18.65734	=	72.8 CY
INSIDE WALL	"L" x	0.20988	+	1.40441	=	28.5 CY
ENTIRE ROOF	"L" x	0.88452	+	1.21934	=	115.3 CY
TOTAL	"L" x	2.56013	+	57.37901	=	387.6 CY

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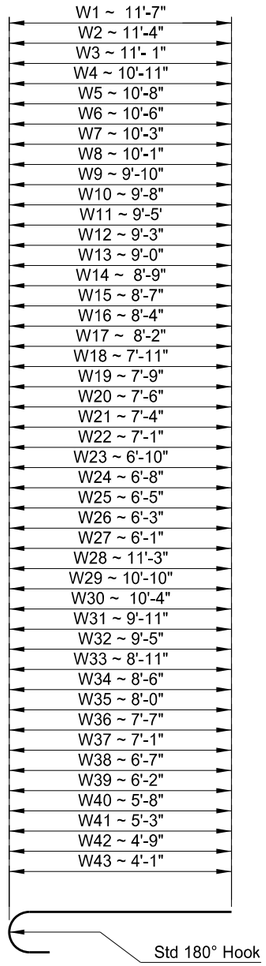
QUANTITIES

CLASS AE-3 CONCRETE	387.6 CY
REINFORCING STEEL	53,312 LBS

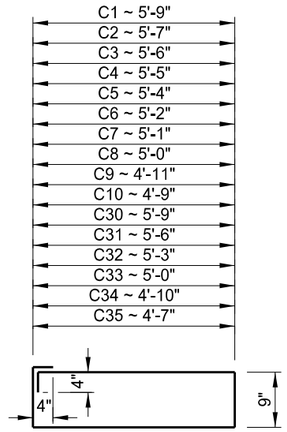
SPRING CREEK

REINFORCING BAR LIST

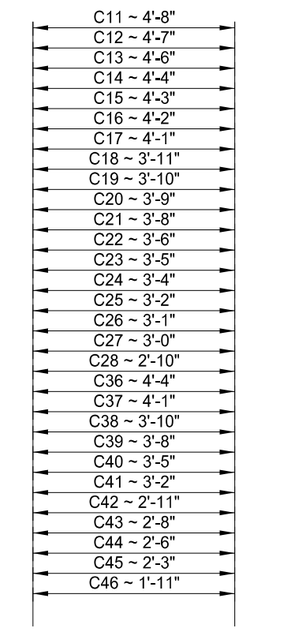
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	15



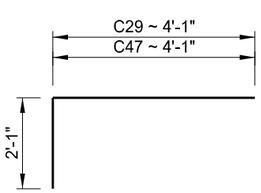
W1 - W43



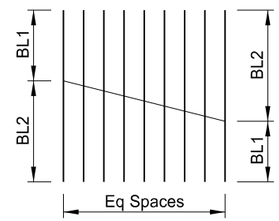
C1 - C10 & C30 - C35



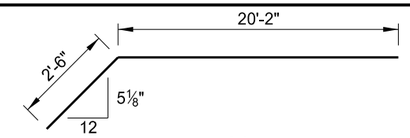
C11 - C28 & C36 - C46



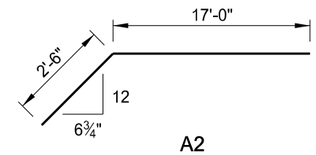
C29 & C47



2 SETS SHOWN



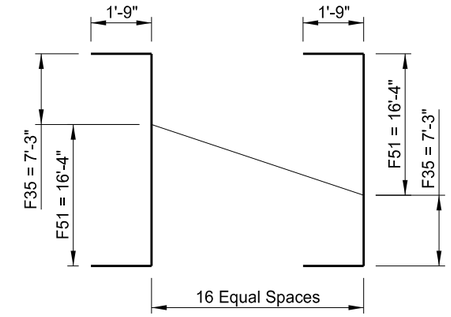
A1



A2

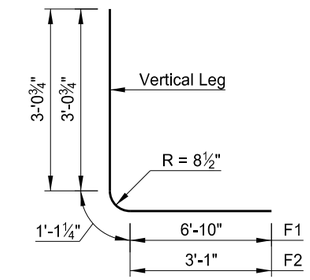
MARK	LENGTH 1 SET	BL1	BL2	SPACES
O1-O19	149'-8"	5'-0"	10'-9"	18
O20-O30	73'-4"	3'-2"	10'-2"	10
F9-F16	108'-8"	4'-2"	23'-0"	7
F18-F24	116'-1"	8'-8"	24'-6"	6
F26-F28	43'-8"	11'-7"	17'-6"	2
F29-F33	47'-4"	3'-6"	15'-5"	4
F52-F68	200'-6'	7'-3"	16'-4"	16
S6-S10	55'-2"	5'-1"	17'-0"	4
S11-S17	78'-6"	2'-3"	20'-2"	6
S18-S24	88'-8'	3'-9"	21'-7"	6
T4-T13	90'-0"	6'-9"	11'-3"	9

BAR CUTTING DETAILS

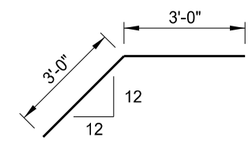


F35 - F51

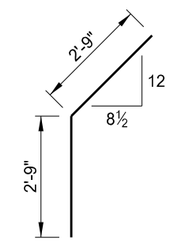
2 SETS SHOWN
2 SETS REQUIRED
LENGTH 1 SET = 230'-3"



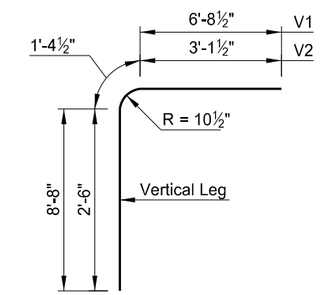
F1 & F2



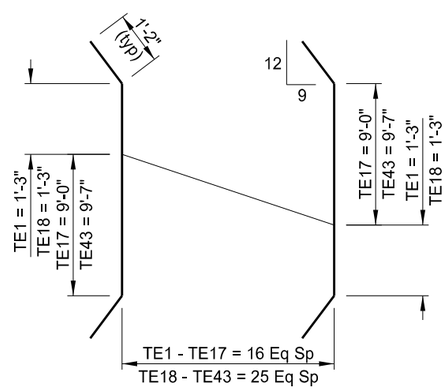
H5 & H13



F34

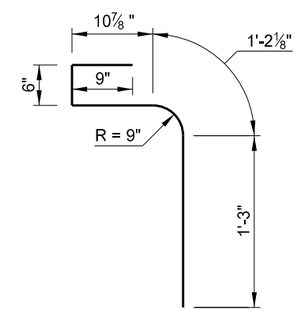


V1 & V2



TE1-TE17
TE18-TE43

2 SETS SHOWN
2 SETS REQUIRED
LENGTH 1 SET TE1-TE17 = 107'-0"
LENGTH 1 SET TE18-TE43 = 178'-9"



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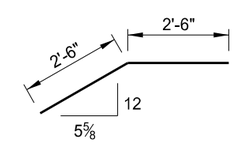

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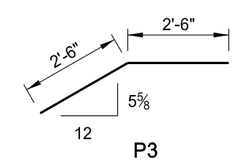

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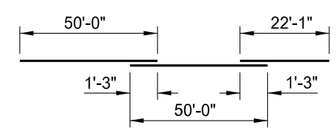

T1

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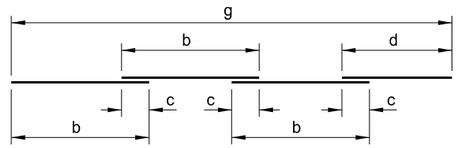
SPRING CREEK

BAR DETAILS



c = Lap Splice (typ)
e = # of "b" Length Pieces in a Set
Total Length per Set = e x b + d

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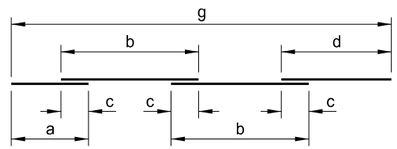
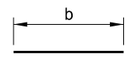


c = Lap Splice (typ)
e = # of "b" Length Pieces in a Set
Total Length per Set = e x b + a + d

AA



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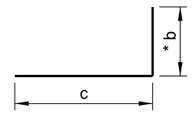
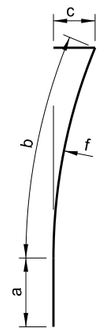


B

* b = Vertical Leg for
XB500 and XB501.



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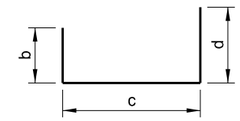

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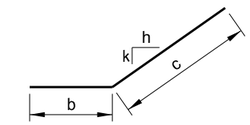

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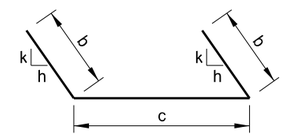

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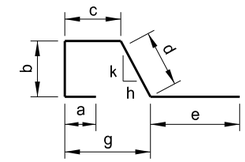

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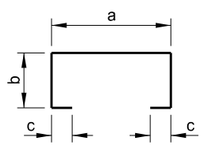

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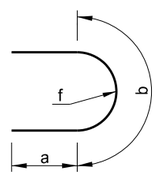

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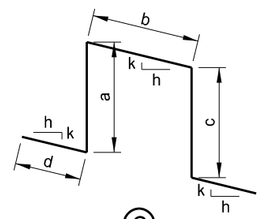

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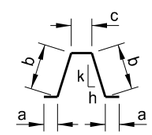

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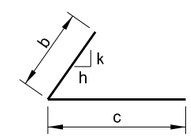

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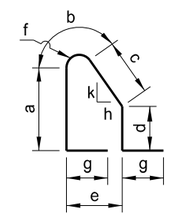

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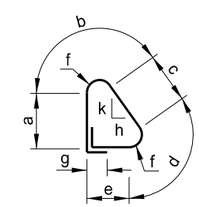

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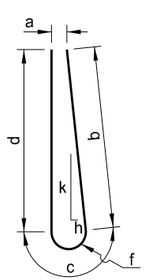

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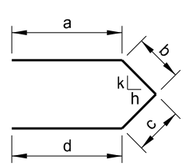

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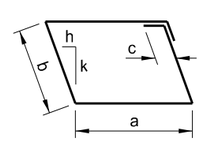

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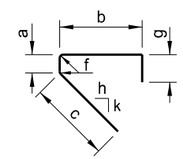

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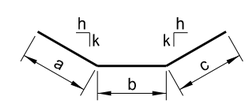

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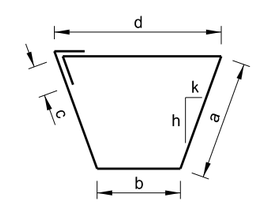

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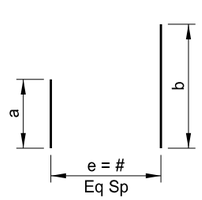

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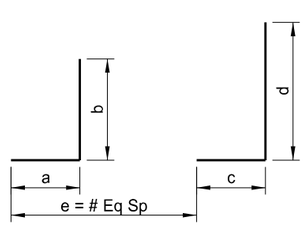

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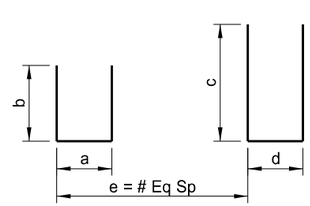

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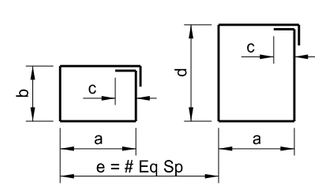

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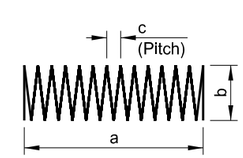
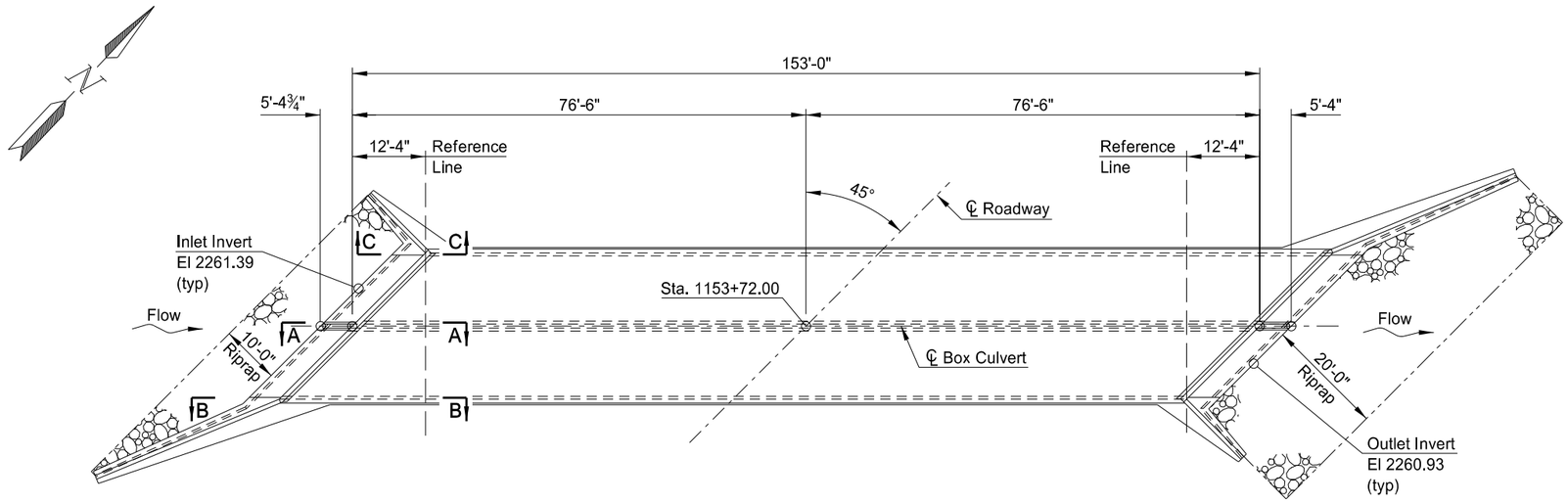


SPL

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	16



PLAN

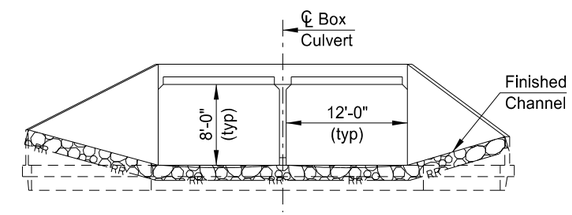
NOTE:

See Dwg 22-108.432-10 for Section A-A.
See Dwg 22-108.432-11 for Sections B-B and C-C.

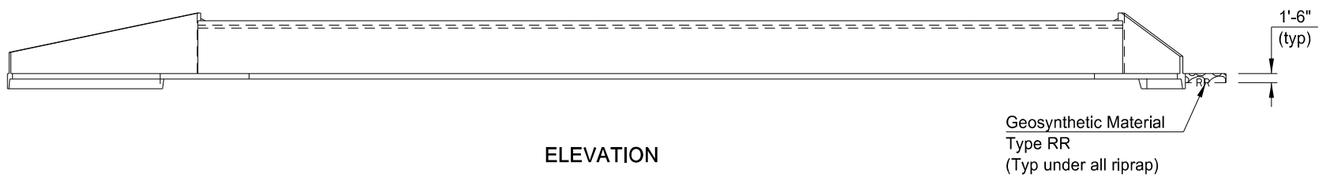
DESIGN STRENGTHS:

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

Load & Resistance Factor Design



END VIEW



ELEVATION

HYDRAULIC DATA:

Drainage Area	9.6	sq mi
Stream Gradient	0.0091	ft/ft
Design Frequency	50	yr
Design Discharge	1063	cfs
Design Headwater Stage	2269.69	ft
Design Tailwater Stage	2267.92	ft
Velocity Through Bridge	7.5	fps
100-Year Frequency Discharge	1331	cfs
100-Year Frequency Headwater	2270.64	ft
Overtopping Stage	2272.22	ft
Overtopping Discharge	1819	cfs

BOX CULVERT BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
210	0050	BOX CULVERT EXCAVATION	EA	1
210	0210	FOUNDATION FILL	CY	298
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1
256	0200	RIPRAP GRADE II	CY	94
602	1131	CLASS AE-3 CONCRETE-BOX CULVERT	CY	410.6
612	0114	REINFORCING STEEL-GRADE 60-BOX CULVERT	LBS	60,530
709	0151	GEOSYNTHETIC MATERIAL TYPE R1	SY	665
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	189

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HL-93 DESIGN LOADING

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

GUMBO CREEK
45° SKEW
REINFORCED CONCRETE
DOUBLE BOX CULVERT LAYOUT

CLEAR SPAN 2 x 12' CLEAR HEIGHT 8'
MAXIMUM FILL 5'

PROJECT: SOIB-SAP-5-022(110)104
STATION: 1153+72.00
DUNN COUNTY

3/31/2015 — Terrence R. Udland
DATE — BRIDGE ENGINEER

NOTES

100 SCOPE OF WORK: Work at this site consists of building a new double barrel 12' x 8' x 153'-0" reinforced concrete box culvert.

602 CONCRETE: The following elements of each section shall be cast in one continuous run:

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

The concrete in the walls shall be allowed to set at least two hours before the roof slab is poured.

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

Dimensions of bent bars are given out to out. All bends conform to CRSI Standards unless indicated otherwise.

709 GEOSYNTHETIC MATERIAL TYPE R1: The contractor shall install one continuous piece of fabric to meet the required longitudinal length indicated in the plans. If transverse seaming is necessary the seam shall be sewn.

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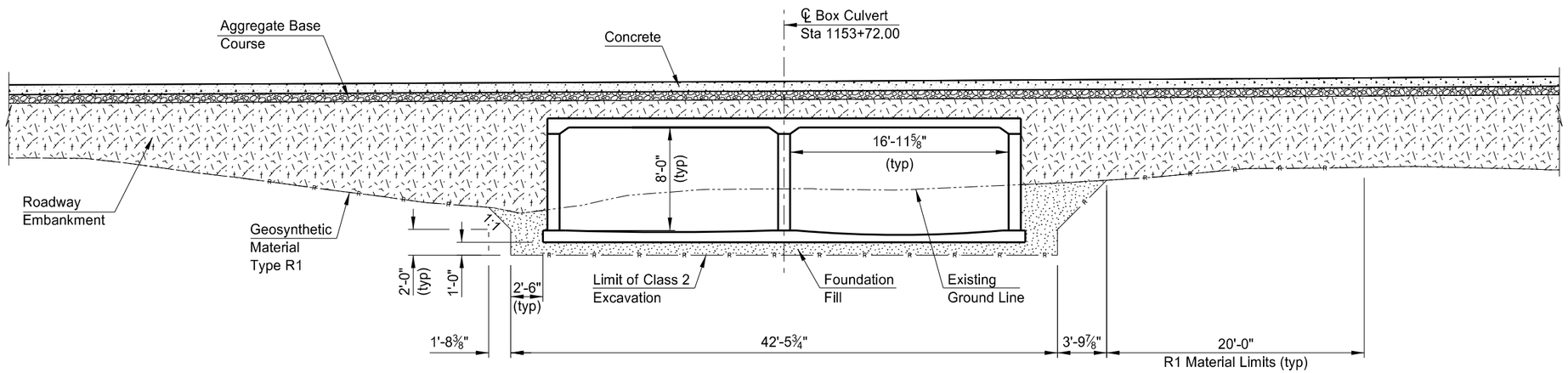
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	18



(SHOWING SECTION ALONG ℄ ROADWAY)

R1 MATERIAL PLACEMENT AND FOUNDATION FILL THROUGH EXISTING EMBANKMENT

NOTES:

The R1 Fabric shall extend 31'-8" Lt & Rt of ℄ Roadway.

The minimum depth of foundation fill under the box shall be 1'-0". All unsound material under the box shall be removed. The depth required shall be determined by the Engineer.

The foundation fill shall run to the end of the apron.

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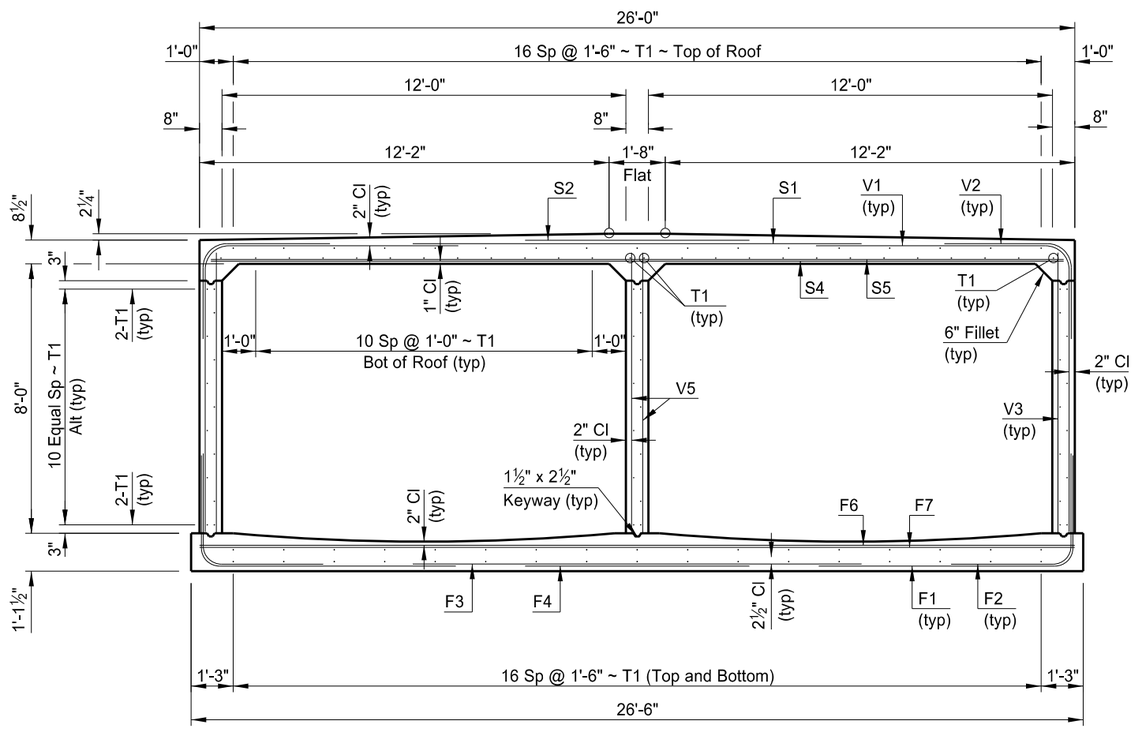
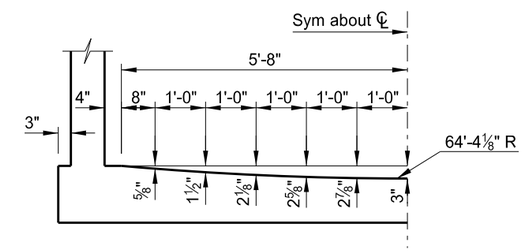
GUMBO CREEK

EXCAVATION & FOUNDATION FILL DETAIL

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	19



SECTION OF BARREL



CURVED FLOOR OFF-SETS

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GUMBO CREEK

BARREL SECTION

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
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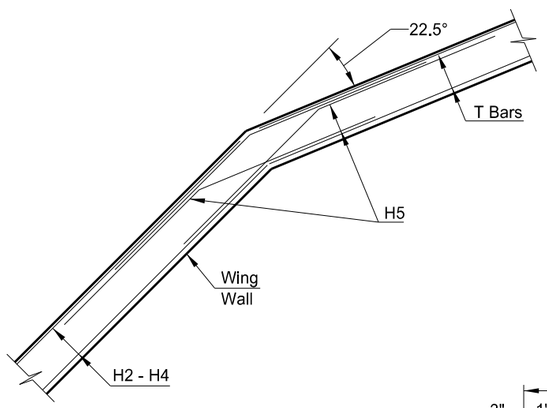
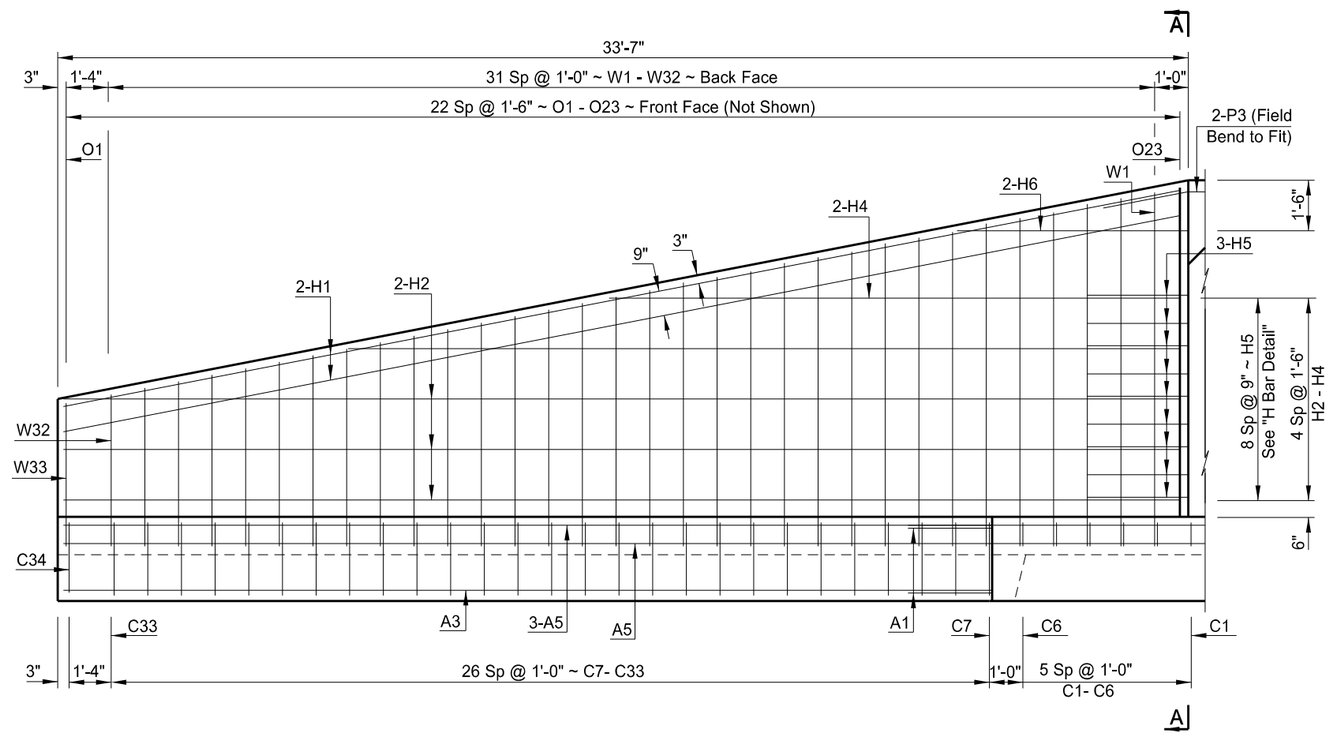
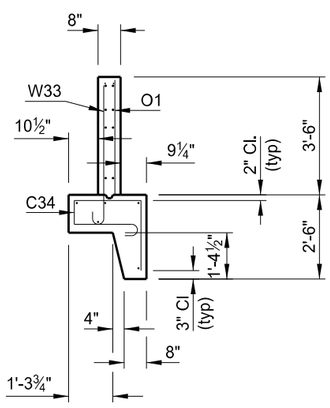


H BAR DETAIL



LONG WING ELEVATION



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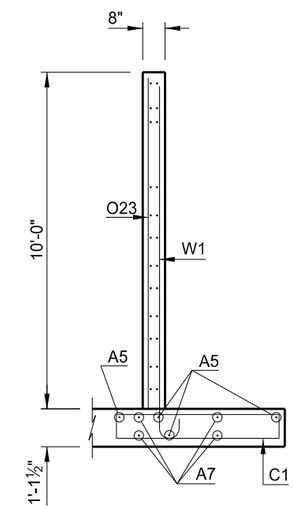

A-A

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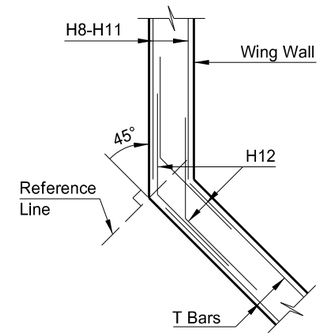
GUMBO CREEK

LONG WING DETAILS

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	21



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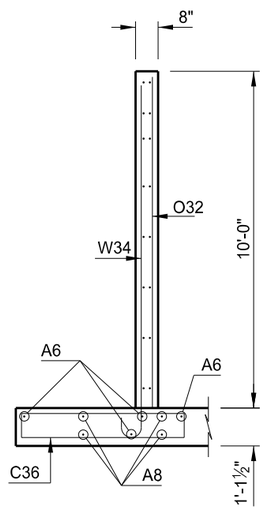
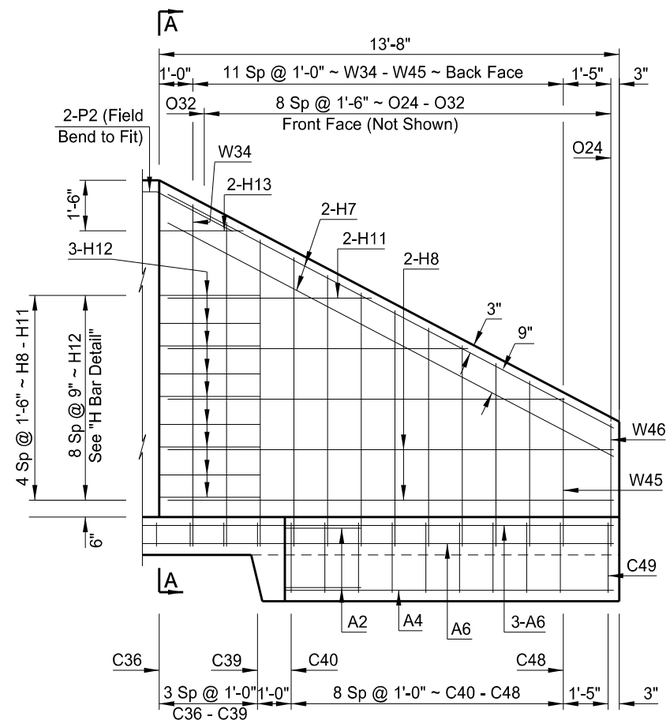


A-A



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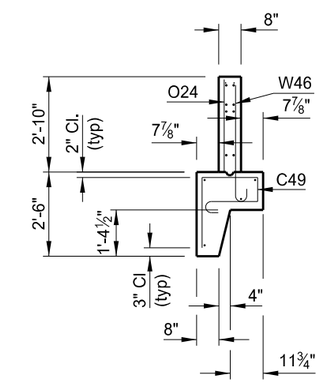

END VIEW

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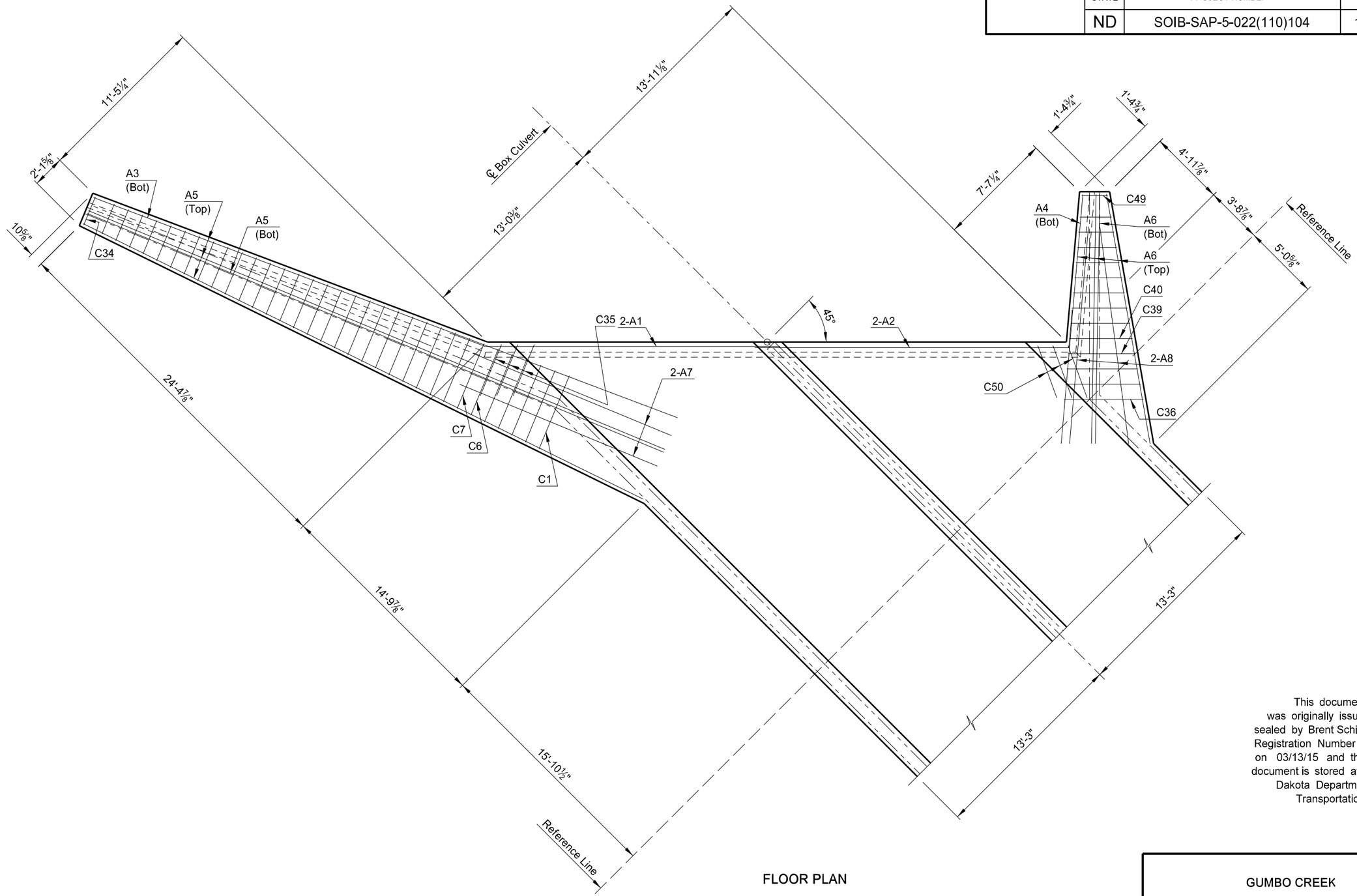
GUMBO CREEK

SHORT WING DETAILS

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	22



FLOOR PLAN

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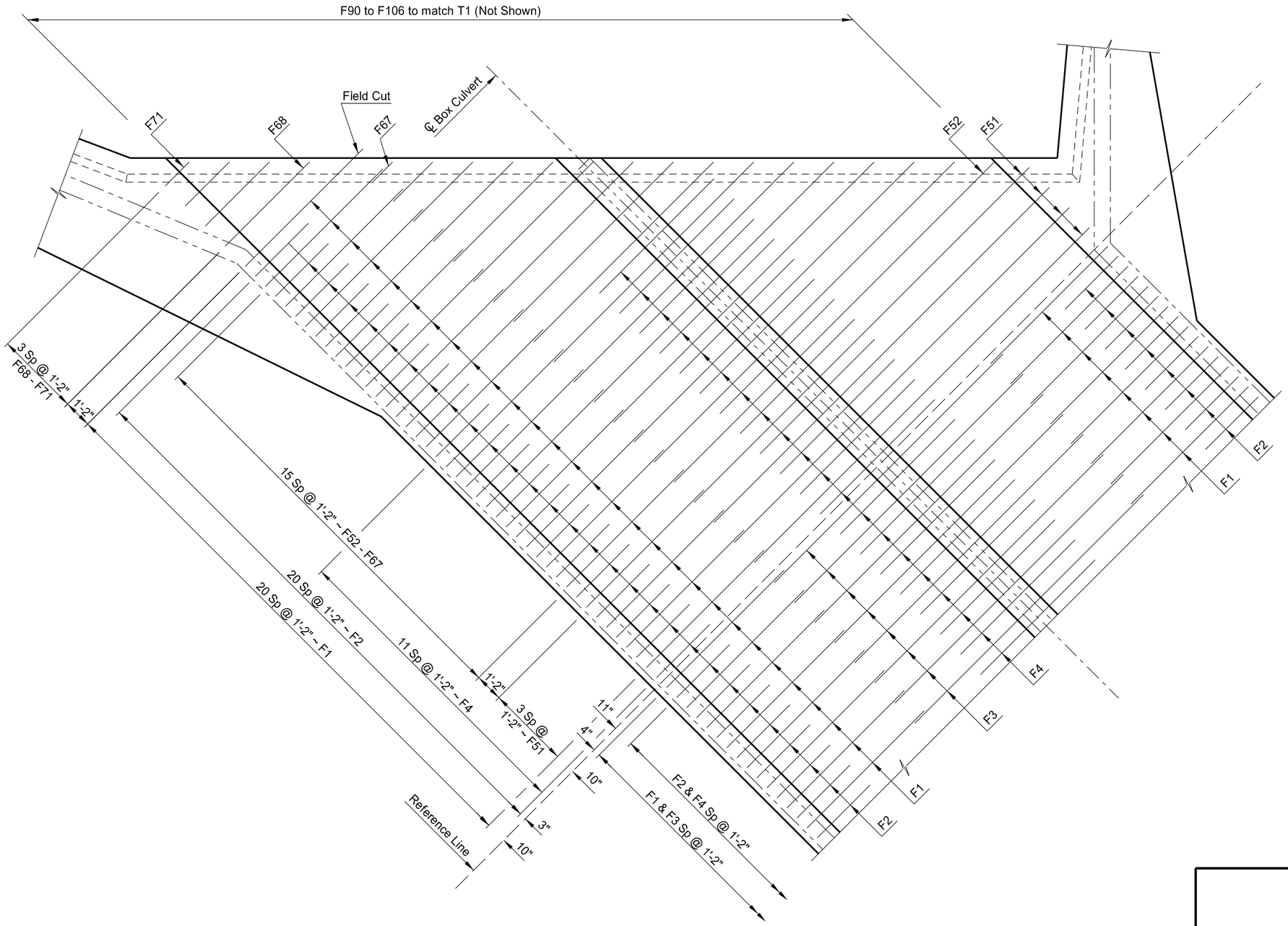
GUMBO CREEK

(SHOWING DIMENSIONS & WING FOOTING REINFORCING)

FLOOR DETAIL

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	23



FLOOR PLAN

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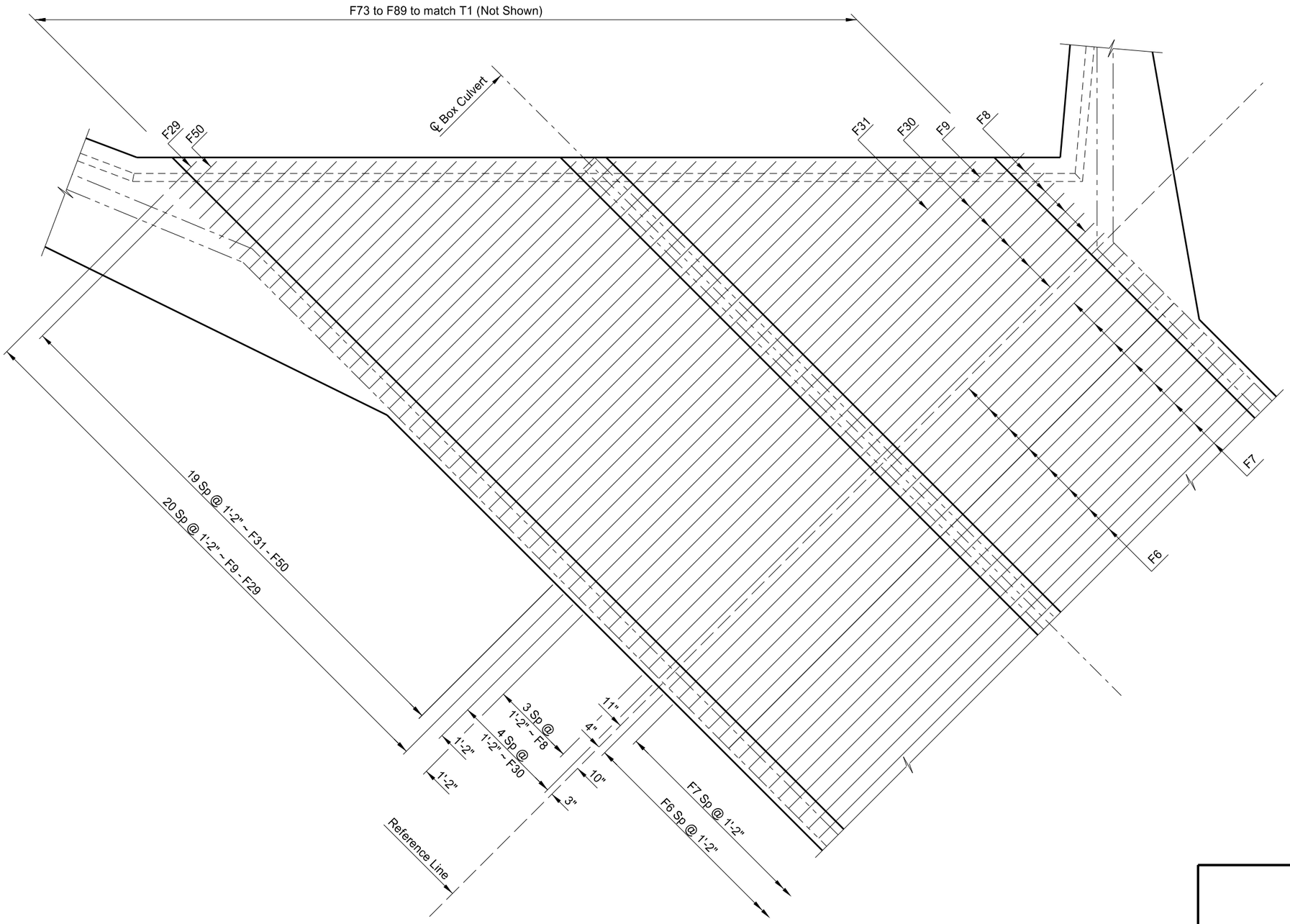
GUMBO CREEK

(SHOWING BOTTOM MAT REINFORCING)

FLOOR DETAIL

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	24



FLOOR PLAN

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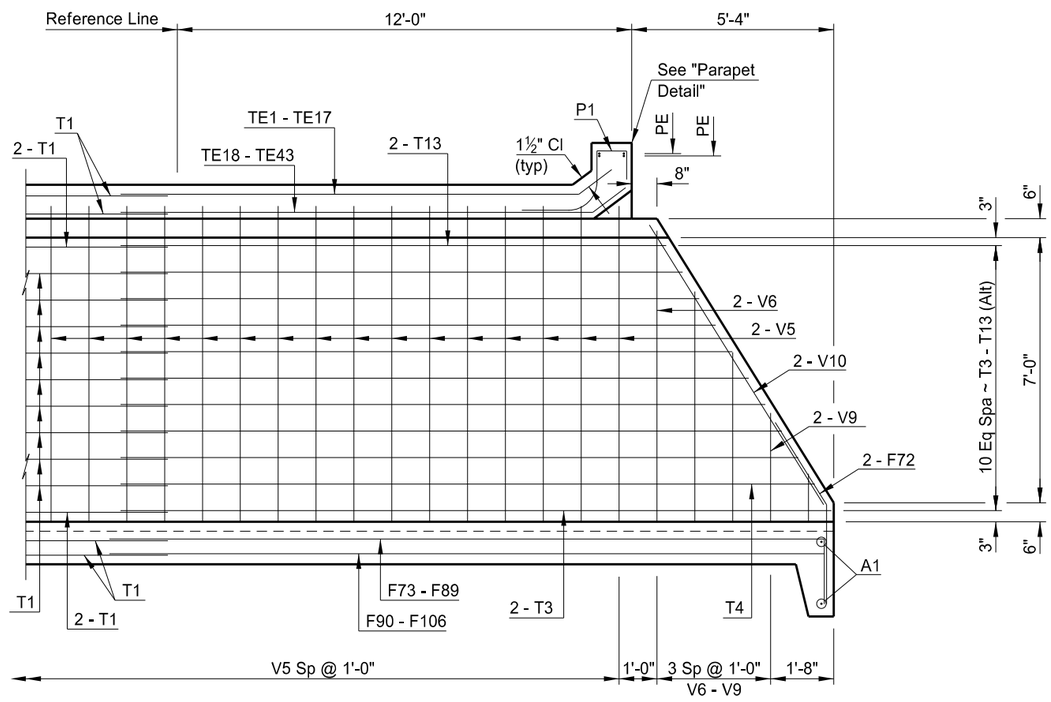
GUMBO CREEK

(SHOWING TOP MAT REINFORCING)

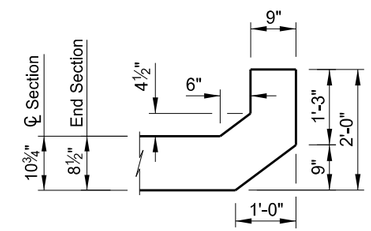
FLOOR DETAIL

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	25



(INNER WALL)
A-A

LONGITUDINAL SECTION



PARAPET DETAIL

NOTE:

See Dwg 22-108.432-1 for location of Section A-A.

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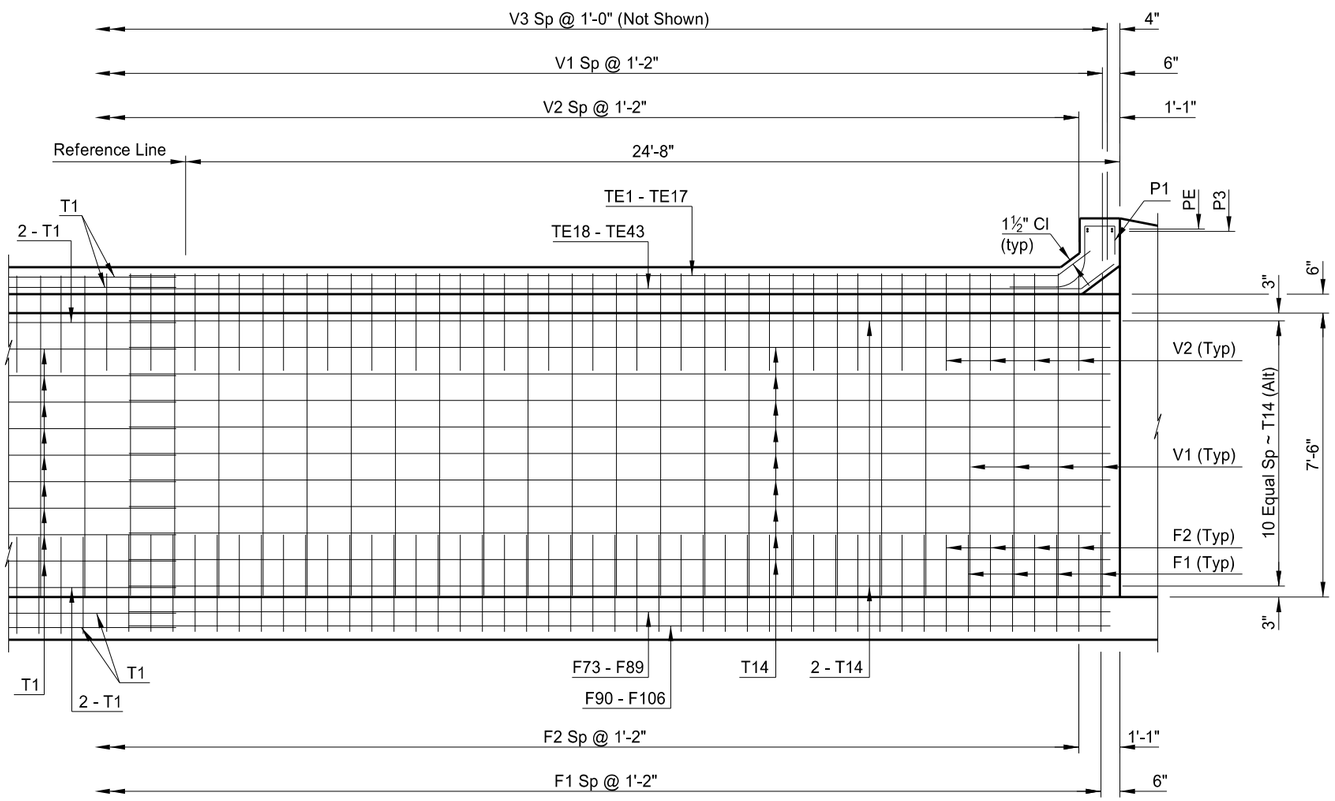
GUMBO CREEK

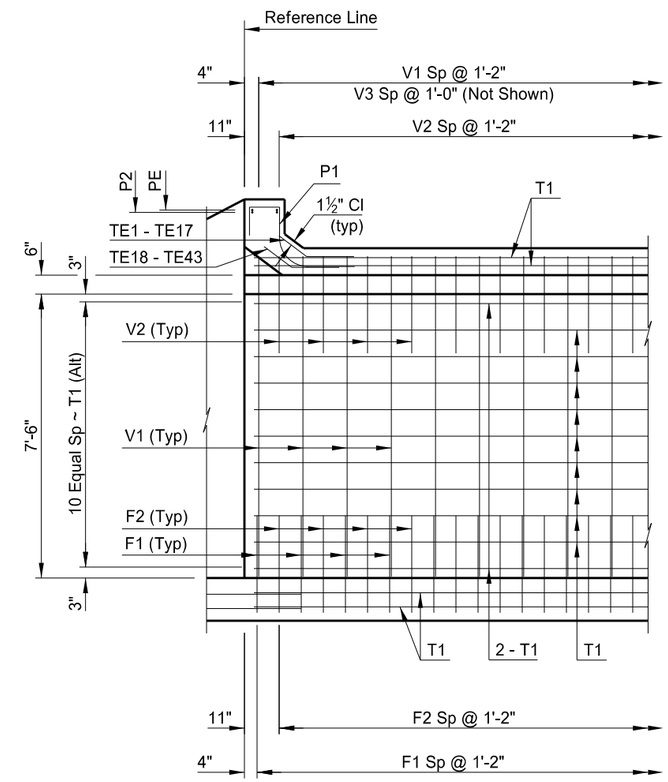
INNER WALL DETAIL & PARAPET DETAIL

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	26



(OUTER WALL)

B-B



(OUTER WALL)

C-C

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LONGITUDINAL SECTIONS

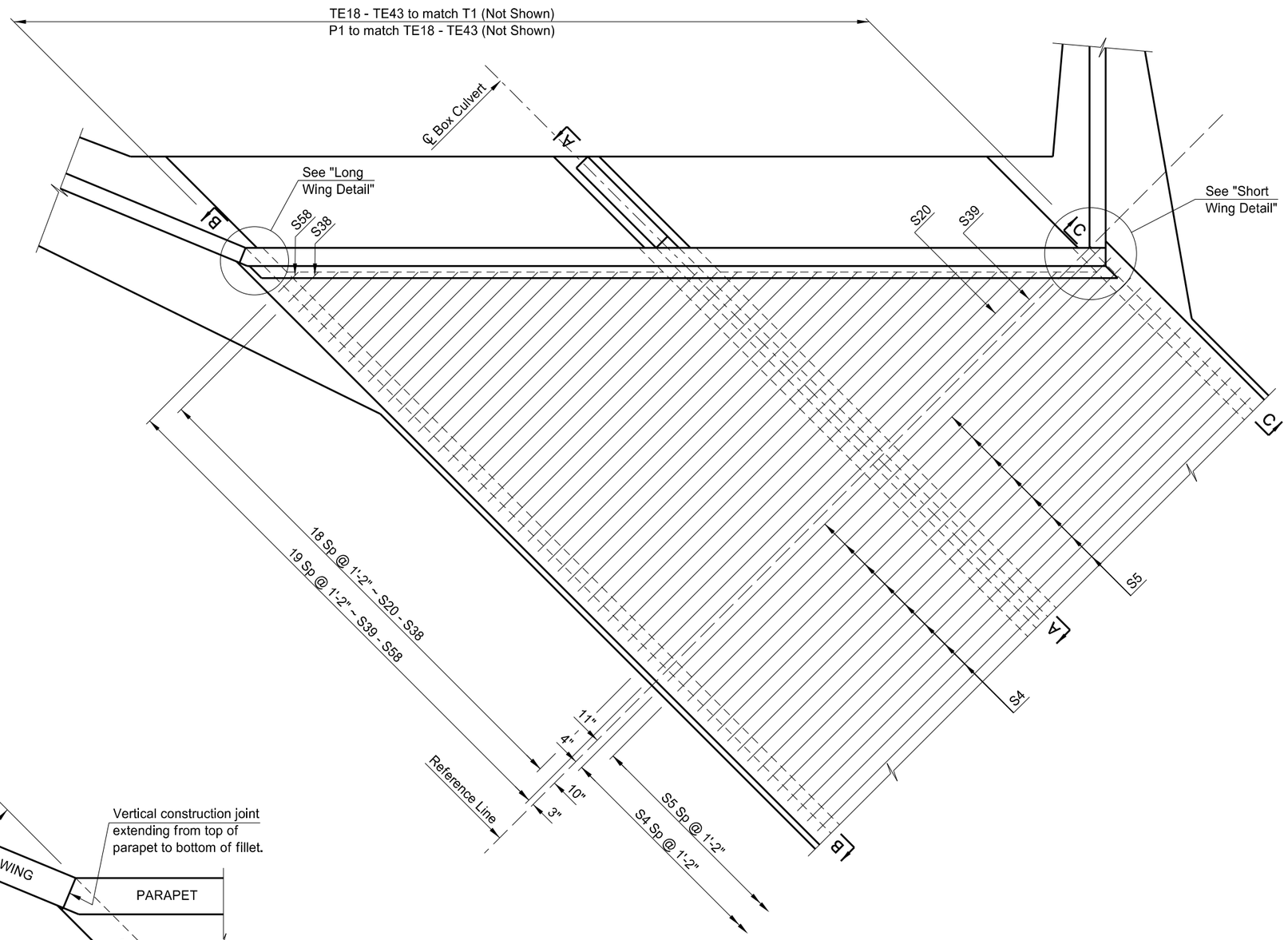
NOTE:

See Dwg 22-108.432-1 for location of Sections B-B and C-C.

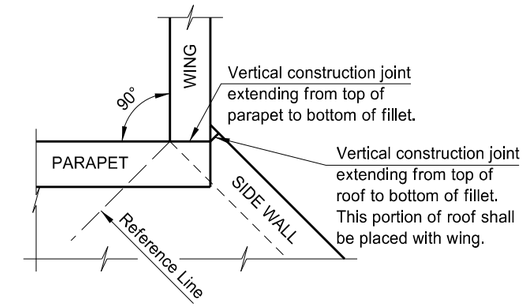
GUMBO CREEK

OUTER WALL DETAILS

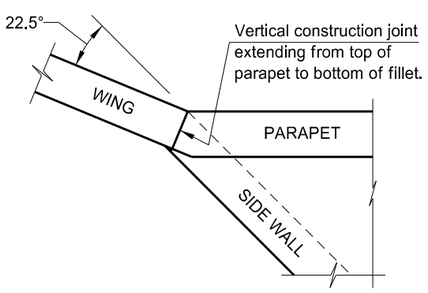
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	27



ROOF PLAN



SHORT WING DETAIL



LONG WING DETAIL

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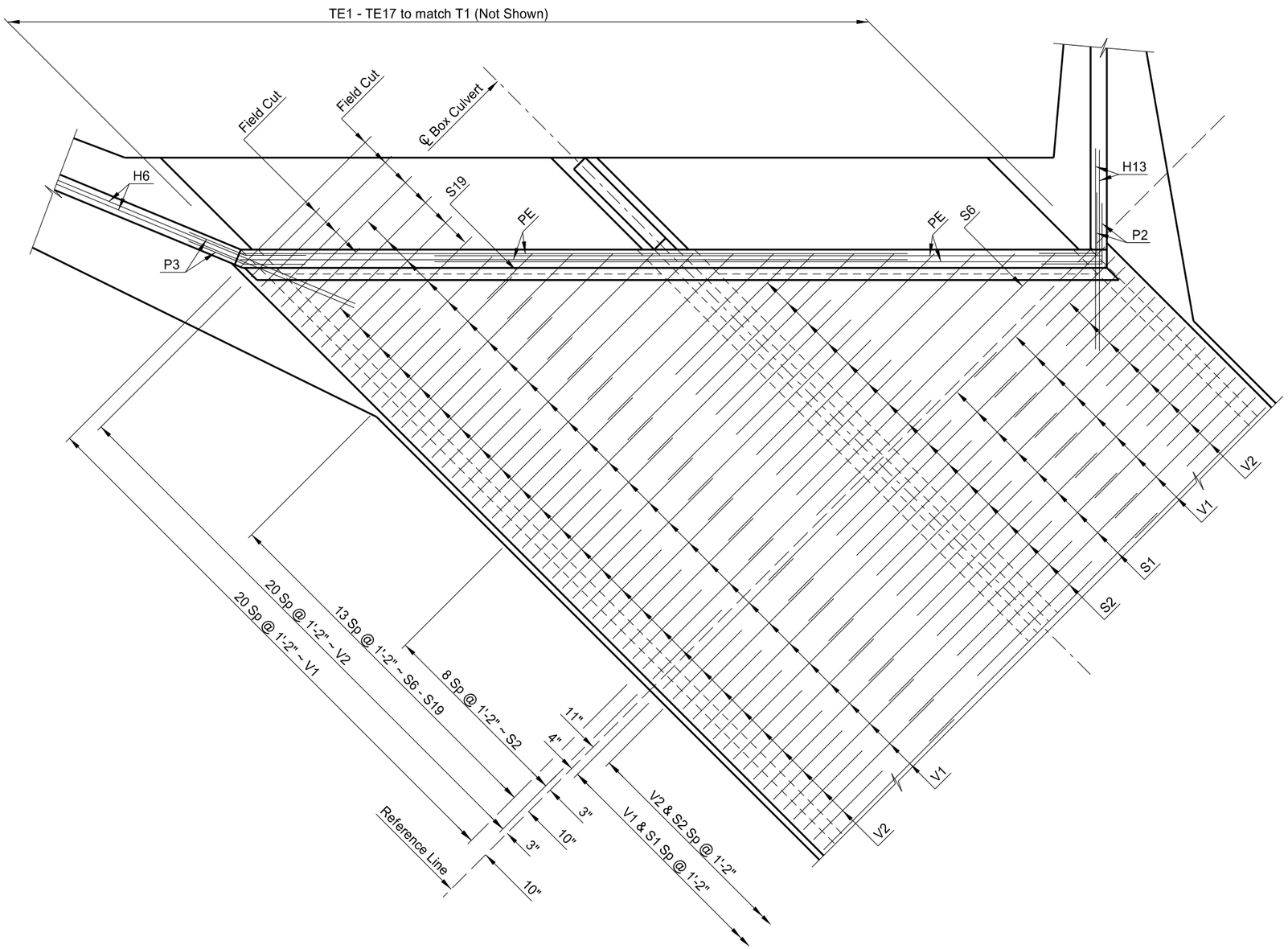
NOTE:
See Dwg 22-108.432-10 for location of Section A-A.
See Dwg 22-108.432-11 for location of Sections B-B and C-C.

GUMBO CREEK

(SHOWING BOTTOM MAT REINFORCING)

ROOF DETAILS

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	28



ROOF PLAN

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GUMBO CREEK

(SHOWING TOP MAT & PARAPET REINFORCING)

ROOF DETAIL

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	29

BAR LIST (CONSTANT)

MARK	SIZE	NO.	LENGTH	SHAPE
W 1	7	2	11'- 4"	BENT
W 2	7	2	11'- 2"	BENT
W 3	7	2	11'-0"	BENT
W 4	6	2	10'- 7"	BENT
W 5	6	2	10'- 5"	BENT
W 6	6	2	10'- 3"	BENT
W 7	6	2	10'- 0"	BENT
W 8	6	2	9'-10"	BENT
W 9	5	2	9'- 7"	BENT
W10	5	2	9'- 4"	BENT
W11	5	2	9'- 2"	BENT
W12	5	2	9'- 0"	BENT
W13	5	2	8'- 9"	BENT
W14	4	2	8'- 6"	BENT
W15	4	2	8'- 4"	BENT
W16	4	2	8'- 1"	BENT
W17	4	2	7'-10"	BENT
W18	4	2	7'- 8"	BENT
W19	4	2	7'- 6"	BENT
W20	4	2	7'- 4"	BENT
W21	4	2	7'- 1"	BENT
W22	4	2	6'-11"	BENT
W23	4	2	6'- 9"	BENT
W24	4	2	6'- 6"	BENT
W25	4	2	6'- 4"	BENT
W26	4	2	6'- 2"	BENT
W27	4	2	5'-11"	BENT
W28	4	2	5'- 9"	BENT
W29	4	2	5'- 7"	BENT
W30	4	2	5'- 4"	BENT
W31	4	2	5'- 2"	BENT
W32	4	2	5'- 0"	BENT
W33	4	2	4'- 9"	BENT
C 1	5	2	12'-4"	BENT
C 2	5	2	12'-2"	BENT
C 3	5	2	12'- 0"	BENT
C 4	5	2	11'- 10"	BENT
C 5	5	2	11'-8"	BENT
C 6	5	2	11'- 4"	BENT
C 7	5	2	12'- 6"	BENT
C 8	5	2	12'- 4"	BENT
C 9	4	2	12'- 1"	BENT
C10	4	2	11'-11"	BENT
C11	4	2	11'- 9"	BENT
C12	4	2	11'- 5"	BENT
C13	4	2	11'- 3"	BENT
C14	4	2	11'- 1"	BENT
C15	4	2	10'- 11"	BENT
C16	4	2	10'-9"	BENT
C17	4	2	10'- 7"	BENT
C18	4	2	10'- 3"	BENT
C19	4	2	10'- 1"	BENT
C20	4	2	9'- 11"	BENT
C21	4	2	9'-9"	BENT
C22	4	2	9'- 7"	BENT
C23	4	2	9'- 5"	BENT
C24	4	2	9'- 3"	BENT
C25	4	2	8'- 11"	BENT
C26	4	2	8'-9"	BENT
C27	4	2	8'- 7"	BENT
C28	4	2	8'- 5"	BENT
C29	4	2	8'- 3"	BENT
C30	4	2	8'- 1"	BENT
C31	4	2	7'- 9"	BENT
C32	4	2	7'- 7"	BENT
C33	4	2	7'- 5"	BENT
C34	4	2	7'- 3"	BENT
C35	4	6	5'- 9"	BENT

BAR LIST (CONSTANT)

MARK	SIZE	NO.	LENGTH	SHAPE
H 1	7	8	33'- 9"	STR.
H 2	4	12	33'- 2"	STR.
H 3	4	4	24'- 8"	STR.
H 4	4	4	16'- 11"	STR.
H 5	4	54	6'- 0"	BENT
H 6	6	4	14'- 4"	STR.
O 1-O23	4	2 SETS	150'- 6"	STR.
W34	7	2	10'-11"	BENT
W35	6	2	10'- 3"	BENT
W36	6	2	9'-9"	BENT
W37	5	2	9'- 2"	BENT
W38	5	2	8'- 7"	BENT
W39	4	2	8'- 0"	BENT
W40	4	2	7'- 6"	BENT
W41	4	2	6'- 11"	BENT
W42	4	2	6'- 5"	BENT
W43	4	2	5'- 11"	BENT
W44	4	2	5'- 5"	BENT
W45	4	2	4'-11"	BENT
W46	4	2	4'- 1"	BENT
C36	5	2	12'- 4"	BENT
C37	5	2	11'-10"	BENT
C38	5	2	11'- 4"	BENT
C39	5	2	10'- 10"	BENT
C40	4	2	11'- 7"	BENT
C41	4	2	10'- 11"	BENT
C42	4	2	10'- 5"	BENT
C43	4	2	9'-11"	BENT
C44	4	2	9'- 5"	BENT
C45	4	2	8'-11"	BENT
C46	4	2	8'- 5"	BENT
C47	4	2	7'- 11"	BENT
C48	4	2	7'- 5"	BENT
C49	4	2	6'- 7"	BENT
C50	4	6	5'- 9"	BENT
H 7	7	8	14'-11"	STR.
H 8	4	8	13'- 3"	STR.
H 9	4	4	11'-9"	STR.
H10	4	4	8'- 11"	STR.
H11	4	4	6'- 0"	STR.
H12	4	54	6'- 0"	BENT
H13	6	4	7'-10"	STR.
O24-O32	4	2 SETS	53'- 3"	STR.
A 1	6	4	21'-11"	BENT
A 2	6	4	23'- 2"	BENT
A 3	6	2	27'- 6"	STR.
A 4	6	2	9'-11"	STR.
A 5	6	8	41'- 1"	STR.
A 6	6	8	16'-6"	STR.
A 7	6	8	14'- 1"	STR.
A 8	6	8	14'- 5"	STR.
P1	4	52	4'- 7"	BENT
P2	6	4	5'- 0"	BENT
P3	6	4	5'- 0"	BENT
PE	6	8	23'- 1"	STR.
V 6	4	4	7'-8"	STR.
V 7	4	4	6'- 0"	STR.
V 8	4	4	4'- 5"	STR.
V 9	4	4	2'- 10"	STR.
V10	6	4	8'- 8"	STR.

BAR LIST (CONSTANT)

MARK	SIZE	NO.	LENGTH	SHAPE
F 8	6	8	26'- 0"	STR.
F 9-F 29	6	2 SETS	278'- 3"	STR.
F30	5	10	26'- 0"	STR.
F 31-F 50	5	2 SETS	265'- 0"	STR.
F51	7	8	19'- 6"	STR.
F 52-F 67	7	2 SETS	158'- 0"	STR.
F 68-F 71	7	2 SETS	12'- 4"	STR.
F72	6	4	5'- 6"	BENT
F73-F89	4	2 SETS	352'- 9"	BENT
F90-F106	4	2 SETS	323'- 0"	STR.
S 6-S19	7	2 SETS	142'- 4"	STR.
S20-S38	6	2 SETS	232'-9"	STR.
S39-S58	5	2 SETS	245'- 0"	STR.
T 3	4	4	18'-11"	STR.
T 4-T 12	4	2 SETS	150'- 0"	STR.
T 13	4	4	14'-5"	STR.
T 14	4	26	26'-0"	STR.
TE1-TE17	4	2 SETS	239'- 5"	BENT
TE18-TE43	4	2 SETS	359'-8"	BENT

BAR LIST (VARIABLE)

MARK	SIZE	NO.	LENGTH	SHAPE
V 1	5	260	15'- 9"	BENT
V 2	6	258	7'- 0"	BENT
V 3	4	308	8'- 4"	STR.
V 5	4	308	8'- 4"	STR.
F 1	4	264	10'- 3"	BENT
F 2	4	262	6'- 6"	BENT
F 3	7	111	13'- 4"	STR.
F 4	7	134	6'- 8"	STR.
F 6	6	111	26'- 0"	STR.
F 7	5	110	26'- 0"	STR.
S 1	7	111	13'- 4"	STR.
S 2	7	128	6'- 8"	STR.
S 4	6	111	25'- 4"	STR.
S 5	5	110	25'- 4"	STR.
T 1	4	116	130'- 4"	STR.

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.

CONCRETE FORMULAS

ENTIRE FLOOR	"L" x 0.96419 + 32.09893 = 179.6 CY
TWO OUTSIDE WALLS & FOUR WINGS	"L" x 0.37037 + 15.37365 = 72.0 CY
INSIDE WALL	"L" x 0.18519 + 1.11111 = 29.5 CY
ENTIRE ROOF	"L" x 0.83372 + 1.94779 = 129.5 CY
TOTAL	"L" x 2.35347 + 50.53147 = 410.6 CY

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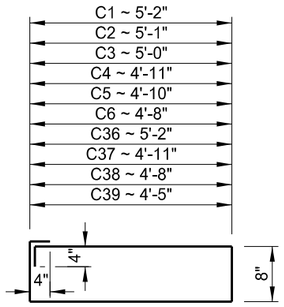
QUANTITIES

CLASS AE-3 CONCRETE	410.6 CY
REINFORCING STEEL	60,530 LBS

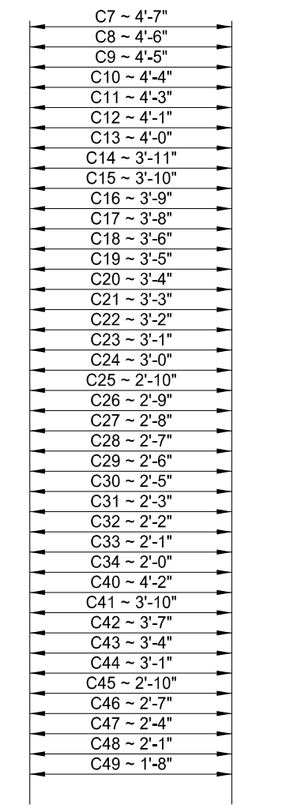
GUMBO CREEK

REINFORCING BAR LIST

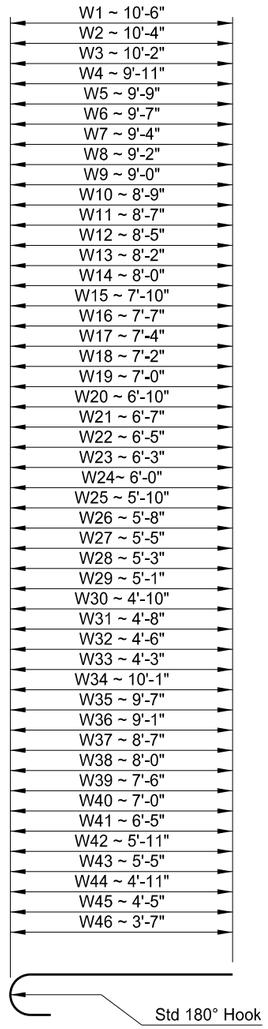
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	170	30



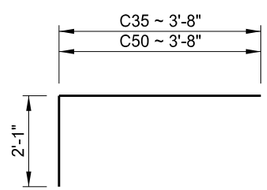
C1 - C6 & C36 - C39



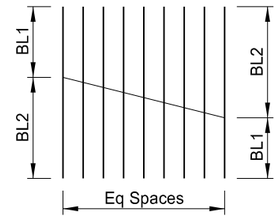
C7 - C34 & C40 - C49



W1 - W46



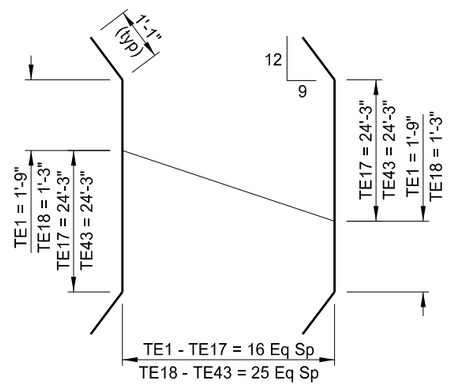
C35 & C50



2 SETS SHOWN

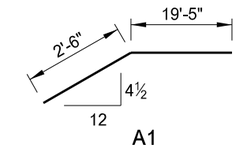
MARK	LENGTH 1 SET	BL1	BL2	SPACES
O 1-O23	150'- 6"	3'- 4"	9'-9"	22
O24-O32	53'- 3"	2'-9"	9'-1"	8
F 9-F 29	278'- 3"	24'-11"	1'- 7"	20
F 31-F 50	265'- 0"	24'- 4"	2'- 2"	19
F 52-F 67	158'- 0"	18'- 7"	1'- 2"	15
F 68-F 71	12'- 4"	4'- 10"	1'-4"	3
F90-F106	323'- 0"	7'- 0"	31'- 0"	16
S 6-S19	142'- 4"	17'- 9"	2'- 7"	13
S20-S38	232'-9"	22'- 9"	1'- 9"	18
S39-S58	245'- 0"	23'- 4"	1'- 2"	19
T 4-T 12	150'- 0"	18'- 5"	14'- 11"	8

BAR CUTTING DETAILS

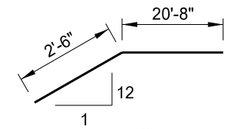


TE1-TE17
TE18-TE43

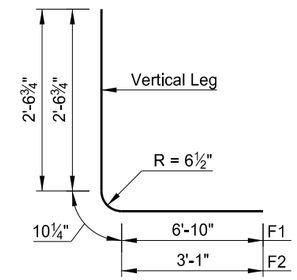
2 SETS SHOWN
2 SETS REQUIRED
LENGTH 1 SET TE1-TE17 = 239'-5"
LENGTH 1 SET TE18-TE43 = 359'-8"



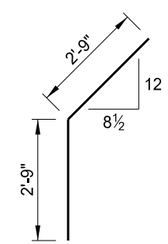
A1



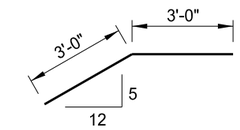
A2



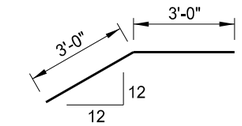
F1 & F2



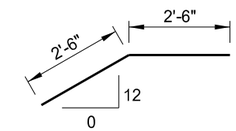
F72



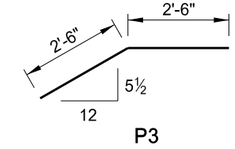
H5



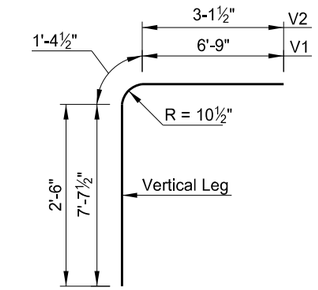
H12



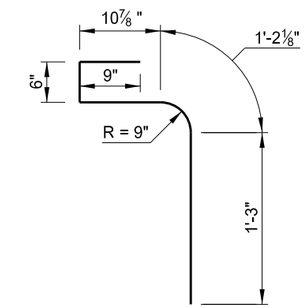
P2



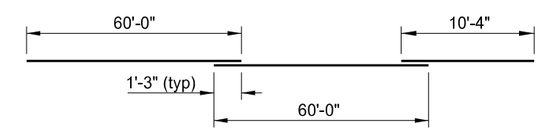
P3



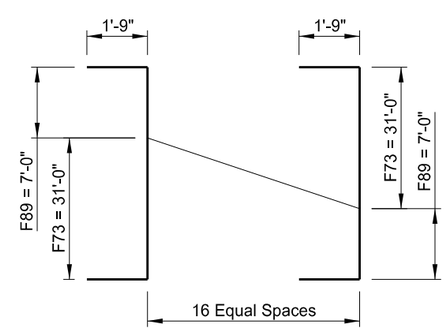
V1 & V2



P1



T1



F73 - F89

2 SETS SHOWN
2 SETS REQUIRED
LENGTH 1 SET = 352'-9"

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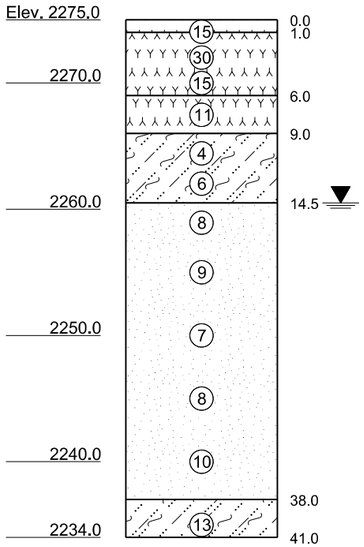
GUMBO CREEK

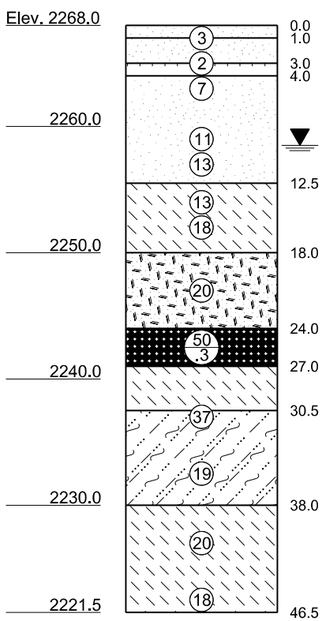
BAR DETAILS

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-SAP-5-022(110)104	175	1



LEAN CLAY with sand and organics, dark brown (CL, A-6)	TOPSOIL	MC=M	wc=16%
LEAN CLAY with sand and trace organics,brown with white inclusions, very stiff (CL,A-6)	SENTINEL BUTTE FORMATION	MC=M	wc=7%
LEAN CLAY with sand and trace organics,brown with white inclusions, very stiff (CL,A-6)	SENTINEL BUTTE FORMATION	MC=M	wc=15%
LEAN CLAY, brown, stiff (CL, A-6)	SENTINEL BUTTE FORMATION	MC=M	wc=27%
CLAYEY SAND with a little gravel, brown, very loose to loose (SC, A-6)	SENTINEL BUTTE FORMATION	MC=M	
CLAYEY SAND with a little gravel, brown, very loose to loose (SC, A-6)	SENTINEL BUTTE FORMATION	MC=M	wc=18%
WATER LEVEL			
SAND WITH SILT, fine grained, brown, loose (SP-SM, A-2-4)	SENTINEL BUTTE FORMATION	MC=W	
SAND WITH SILT, fine grained, brown, loose (SP-SM, A-2-4)	SENTINEL BUTTE FORMATION	MC=W	
SAND WITH SILT, fine grained, brown, loose (SP-SM, A-2-4)	SENTINEL BUTTE FORMATION	MC=W	
SAND WITH SILT, fine grained, brown, loose (SP-SM, A-2-4)	SENTINEL BUTTE FORMATION	MC=W	
SAND WITH SILT, fine grained, brown, loose (SP-SM, A-2-4)	SENTINEL BUTTE FORMATION	MC=W	
CLAYEY SAND, brown, medium dense (SC, A-6)	SENTINEL BUTTE FORMATION	MC=W	

BORING NUMBER B-18
North Dakota Highway 22 (Killdeer Bypass) Approx. Sta. 1044+00
Drilled on 10/21/14



SILTY SAND with organics, dark brown (SM, A-2-4)	TOPSOIL	MC=M	wc=12%
SILTY SAND with trace organics, brown, very loose (SM, A-2-4)	COARSE ALLUVIUM	MC=M	wc=17%
LEAN CLAY with sand and trace organics, light brown, soft (CL, A-6)	SENTINEL BUTTE FORMATION	MC=M	wc=11%
SILTY SAND with laminations of lean clay, gray with iron oxide stains and brown mottling, medium dense (SM, A-2-4)	SENTINEL BUTTE FORMATION	MC=M	wc=22%
SILTY SAND with laminations of lean clay, gray with iron oxide stains and brown mottling, medium dense (SM, A-2-4)	SENTINEL BUTTE FORMATION	MC=M	
FAT CLAY with trace lignite and laminations of silt, gray with iron oxide stains, stiff to very stiff (CH, A-7-6)	SENTINEL BUTTE FORMATION	MC=M	
FAT CLAY with trace lignite and laminations of silt, gray with iron oxide stains, stiff to very stiff (CH, A-7-6)	SENTINEL BUTTE FORMATION	MC=M	
SANDY LEAN CLAY, gray, very stiff (CL, A-6)	SENTINEL BUTTE FORMATION	MC=M	wc=26%
LIGNITE	SENTINEL BUTTE FORMATION	MC=W	
FAT CLAY with trace lignite and laminations of silt, gray, hard (CH, A-7-6)	SENTINEL BUTTE FORMATION	MC=W	
CLAYEY SAND with lenses and laminations of lean clay, gray, dense to medium dense (SC, A-6)	SENTINEL BUTTE FORMATION	MC=W	
CLAYEY SAND with lenses and laminations of lean clay, gray, dense to medium dense (SC, A-6)	SENTINEL BUTTE FORMATION	MC=W	
FAT CLAY with trace lignite and laminations of silt, gray, hard (CH, A-7-6)	SENTINEL BUTTE FORMATION	MC=W	
FAT CLAY with trace lignite and laminations of silt, gray, hard (CH, A-7-6)	SENTINEL BUTTE FORMATION	MC=W	

BORING NUMBER B-29
North Dakota Highway 22 (Killdeer Bypass) Approx. Sta. 1154+00
Drilled on 10/21/14

NOTE:

The standard penetration test consists of driving the sampler with a 140 pound hammer and counting the number of blows applied in each of three 6" increments of penetration. If the sampler is driven less than 18" (usually in highly resistant material), permitted in ASTM:D1586, the blows for each complete 6" increment and for each partial increment is on the boring log. For partial increments, the number of blows is show to the nearest 0.1' below the slash.

MC= Describes moisture condition
wc= Water content, as percent of dry weight

This document was originally issued and sealed by Richard L Stoppelmoor Registration Number PE- 7252, on 06/08/15 and the original document is stored at the North Dakota Department of Transportation

Boring Logs

ND Hwy 22

Killdeer Bypass