PRELIMINARY SURVEY COORDINATE AND CURVE DATA - WILLISTON - US 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	81	1

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
WILLISTON - US 2 - (Chain: EX2)			
Begin	1130+09.41	447131.91	1206345.33
PC	1170+85.83	451204.81	1206514.75
PI C2	1178+71.63	451989.93	1206547.41
PT	1186+52.63	452766.93	1206430.10
PC	1203+98.59	454493.32	1206169.45
PI C3	1217+86.20	455865.39	1205962.30
PT	1231+21.39	457180.20	1206405.86
PC	1239+35.41	457951.50	1206666.07
PI C4	1248+08.36	458778.66	1206945.11
PT	1256+67.99	459651.38	1206965.17
End	1275+68.35	461551.23	1207008.83
Rec Sec Cor	1289+75.01	462957.53	1207041.03
Rec Qtr Cor	1316+15.36	465595.75	1207147.07
Rec Sec Cor	1342+55.77	468234.03	1207253.14
Rec Qtr Cor	1368+93.37	470869.75	1207352.45
Rec Sec Cor	1395+36.45	473510.90	1207454.58
Rec Qtr Cor	1421+76.88	476149.36	1207555.59
Rec Sec Cor	1448+17.39	478787.94	1207656.36
Rec Qtr Cor	1474+58.30	481426.78	1207761.23
Rec Sec Cor	1501+21.81	484088.19	1207866.80
Rec Qtr Cor	1527+58.72	486722.82	1207976.48
Rec Sec Cor	1553+96.16	489357.99	1208085.97
Rec Qtr Cor	1580+52.42	492012.12	1208192.33
Rec Sec Cor	1606+84.47	494642.05	1208297.82
Rec Qtr Cor	1633+37.50	497292.81	1208407.47
Rec Sec Cor	1659+73.35	499926.40	1208516.54
Rec Qtr Cor	1686+21.35	502572.32	1208621.69

CURVE DATA

ARC DEFINITION			
C2		C3	
PI STA=	1178+71.63	PI STA=	1217+86.20
Delta =	10° 58' 03" LT	Delta =	27° 13' 40" RT
D_a =	0° 42' 00"	D_a =	1° 00' 00"
R =	8,185.16'	R =	5,729.65'
T =	785.80'	T =	1,387.62'
L =	1,566.80'	L =	2,722.81'
C4			
PI STA=	1248+08.36		
Delta =	17° 19' 32" LT		
D_a =	1° 00' 00"		
R =	5,729.65'		
T =	872.95'		
L =	1,732.58'		

US PUBLIC LAND SURVEY DATA

DESC.	SEC-TWP-RGE	NORTHING	EASTING
W 1/4 Cor 1	T-155-N R-101-W	481426.78	1207761.23
NW Cor Sec 12	T-155-N R-101-W	478787.94	1207656.36
W 1/4 Cor 12	T-155-N R-101-W	476149.36	1207555.59
SW Cor Sec 12	T-155-N R-101-W	473510.90	1207454.58
W 1/4 Cor 13	T-155-N R-101-W	470869.75	1207352.45
SW Cor Sec 13	T-155-N R-101-W	468234.03	1207253.14
W 1/4 Cor 24	T-155-N R-101-W	465595.75	1207147.07
SW Cor Sec 24	T-155-N R-101-W	462957.53	1207041.03
W 1/4 Cor 25	T-155-N R-101-W	460325.37	1206930.21
SW Cor Sec 25	T-155-N R-101-W	457693.28	1206819.39
S 1/4 Cor 11	T-156-N R-101-W	505336.03	1206084.99
S 1/4 Cor 12	T-156-N R-101-W	505104.88	1211368.88
NW Cor Sec 13	T-156-N R-101-W	505217.90	1208726.63
SW Cor Sec 13	T-156-N R-101-W	499926.40	1208516.54
W 1/4 Cor 13	T-156-N R-101-W	502572.32	1208621.69
SW Cor Sec 14	T-156-N R-101-W	500167.27	1203221.81
W 1/4 Cor 24	T-156-N R-101-W	497292.81	1208407.47
SW Cor Sec 24	T-156-N R-101-W	494642.05	1208297.82
W 1/4 Cor 25	T-156-N R-101-W	492012.12	1208192.33
SW Cor Sec 25	T-156-N R-101-W	489357.99	1208085.97
W 1/4 Cor 36	T-156-N R-101-W	486722.82	1207976.48
SW Cor Sec 36	T-156-N R-101-W	484088.19	1207866.80

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION OFFSET
CONTROL POINT DESCRIPTION				
PRIMARY CONTROL - US 2				
GPS 2-1	450034.29	1206588.69	1899.54	1159+19.40 - 123' RT
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-1				
GPS 2-2	458307.37	1206934.80	2050.49	1243+47.64 - 156' RT
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-2				
GPS 2-3	469637.62	1207013.89	1976.98	1356+49.36 - 292' LT
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-3				
GPS 2-4	481385.96	1207913.32	2022.10	1474+23.56 -154' RT
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-4				
GPS 2-5	492046.30	1208343.34	2041.96	1580+92.63 - 150' RT
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-5				
GPS 2-6	505303.50	1209198.22	1941.03	1712+69.01 - 468' RT
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-6				

REFERENCE MARKERS

R Mkr#	NORTHING	EASTING	STATION	OFFSET
US 2				
22	450249.47	1206546.48	1161+33	- 71' RT
23	455505.04	1206198.03	1214+16	- 91' RT
24	460715.00	1207081.10	1267+34	- 91' RT
25	465975.06	1207252.19	1319+99	- 90' RT
26	471232.26	1207455.80	1372+60	- 89' RT
27	476498.40	1207656.83	1425+30	- 88' RT
28	481740.40	1207863.60	1477+76	- 90' RT
29	487036.27	1208078.01	1530+76	- 88' RT
30	492320.72	1208295.94	1583+65	- 91' RT
31	497601.01	1208509.79	1636+50	- 89' RT
32	502893.83	1208718.63	1689+46	- 84' RT

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

☐ Assumed Coordinates

☒ All coordinates on this sheet are Williams County ground coordinates. They are derived from the NAD83(2011) Reference frame; North Dakota North Zone Combination Factor (cf) = 0.9998445

INITIALIZING BENCH MARK
NDGPS Stations (OPUS)

☒ NAVD-88
☐ NGVD-29

☐ GEOID 09 ☐ _____
☒ GEOID 12A

This document was originally issued and sealed by Derek Anderson, Registration Number LS- 7107 , on 08/02/17 and the original document is stored at the North Dakota Department of Transportation

NOTES: Sheet 1 of 1

Date Survey Completed 09/01/16

PRELIMINARY SURVEY COORDINATE AND CURVE DATA -

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	81	2

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
WILLISTON - US 2 - (Chain: PR_US2)			
POB	10+00.00	447,130.47	1,206,380.05
PC	50+63.70	451,190.66	1,206,548.94
PI (PR_US2_3)	57+96.96	451,923.29	1,206,579.42
PT	65+26.34	452,649.70	1,206,479.42
Point 2	74+89.46	453,603.83	1,206,348.08
Point 3	78+92.35	454,002.87	1,206,292.57
PC	84+53.58	454,558.68	1,206,214.73
PI (PR_US2_10)	98+11.38	455,903.36	1,206,026.41
PT	111+19.50	457,188.52	1,206,464.54
PC	119+18.63	457,945.59	1,206,720.43
PI (PR_US2_13)	127+79.90	458,762.23	1,206,994.07
PT	136+28.68	459,623.15	1,207,018.61
PI	143+26.62	460,320.91	1,207,034.27
PI	155+55.90	461,549.88	1,207,062.23
PI	169+61.71	462,955.27	1,207,096.65
PI	196+01.95	465,593.43	1,207,201.27
PI	222+42.70	468,232.08	1,207,306.79
PI	248+79.95	470,867.45	1,207,406.38
PI	275+23.07	473,508.59	1,207,508.60
PI	301+63.45	476,147.06	1,207,609.08
PI	328+04.21	478,785.88	1,207,710.23
PI	354+44.89	481,424.51	1,207,814.17
PI	381+08.51	484,085.98	1,207,921.32
PI	407+45.31	486,720.55	1,208,029.56
PI	433+82.75	489,359.54	1,208,141.34
PI	460+39.01	492,009.72	1,208,248.50
PI	476+60.63	493,584.86	1,208,287.04
PI	486+71.18	494,639.85	1,208,352.07
PI	513+24.21	497,289.11	1,208,460.20
PI	539+59.92	499,924.10	1,208,569.89
PI	566+08.06	502,570.22	1,208,673.55
POT	567+22.02	502,684.09	1,208,678.07

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
TS	567+72.02	502,734.05	1,208,680.05
PC	569+72.02	502,933.74	1,208,690.89
PI (PR_US2_37)	590+78.57	505,032.98	1,208,866.20
PT	603+79.05	505,034.84	1,210,972.75
ST	605+79.03	505,029.20	1,211,172.63
Point 14	608+41.16	505,018.00	1,211,434.52

CURVE DATA

ARC DEFINITION

Curve PR_US2_3	
PI = 57+96.96	
Delta = 10° 13' 12" (Lt)	
D_c = 0° 41' 55"	
R = 8,200.00	
T = 733.26	
L = 1,462.64	
Curve PR_US2_10	
PI = 98+11.38	
Delta = 26° 47' 51" (Rt)	
D_c = 1° 00' 19"	
R = 5,700.00	
T = 1,357.80	
L = 2,665.91	
Curve PR_US2_13	
PI = 127+79.90	
Delta = 16° 53' 34" (Lt)	
D_c = 0° 59' 16"	
R = 5,800.00	
T = 861.27	
L = 1,710.04	
Curve PR_US2_37	
PI = 590+78.55	
Delta = 85° 10' 33" (Rt)	
D_c = 2° 30' 00"	
R = 2,291.83	
L = 3,407.03	
L_s in = 200.00	
S_c in = 2° 30' 00"	
T_s in = 2,399.58	

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET
CONTROL POINT DESCRIPTION					
PRIMARY CONTROL - US 2					
GPS 2-1	450034.29	1206588.69	1899.54	39+09.98 - 88' RT	
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-1					
GPS 2-2	458307.37	1206934.80	2050.49	123+22.96 - 103' RT	
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-2					
GPS 2-3	469637.62	1207013.89	1976.98	236+36.18 - 346' LT	
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-3					
GPS 2-4	481385.96	1207913.32	2022.10	354+10.26 - 93' RT	
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-4					
GPS 2-5	492046.30	1208343.34	2041.96	460+79.41 - 97' RT	
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-5					
GPS 2-6	505303.50	1209198.22	1941.03	589+90.89 - 825' LT	
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-6					

REFERENCE MARKERS

R Mkr#	NORTHING	EASTING	STATION	OFFSET
22	450249.47	1206546.48	41+23.23 -	36.65' RT
23	455505.04	1206198.03	94+03.51 -	36.25' RT
24	460715.00	1207081.10	147+21.67 -	37.85' RT
25	465975.06	1207252.19	199+85.31 -	35.64' RT
26	471232.26	1207455.80	252+46.43 -	35.05' RT
27	476498.40	1207656.83	305+16.39 -	29.08' RT
28	481740.40	1207863.60	357+62.47 -	29.79' RT
29	487036.27	1208078.01	410+62.73 -	35.56' RT
30	492320.72	1208295.94	463+51.67 -	38.28' RT
31	497601.01	1208509.79	516+36.28 -	37.66' RT
32	502893.83	1208718.63	569+34.08 -	30.67' RT

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

INITIALIZING BENCH MARK

- [x] NAVD-88
- [ ] NGVD-29
- [ ] GEOID 09
- [ ] _____
- [x] GEOID 12A

NOTES:

Date Survey Completed / /

- [ ] Assumed Coordinates
- [x] All coordinates on this sheet are Williams County ground coordinates. They are derived from the NAD83(2011) Reference frame; North Dakota North Zone Combination Factor (cf) = 0.9998445

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PRELIMINARY SURVEY COORDINATE AND CURVE DATA -

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	81	3

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
WILLISTON - FRONTAGE - (Chain: PR_FRONTAGE)			
POB	2000+00.00	451,973.70	1,206,581.77
PC	2005+89.53	451,997.89	1,205,992.73
PI	2006+69.50	452,001.17	1,205,912.83
PT	2007+15.16	452,448.52	1,205,931.03
POT	2010+82.91	452,448.52	1,205,931.03
OILFIELD REROUTE - (Chain: PR_OILFIELD)			
POB	10000+00.00	468,427.58	1,208,137.27
PC	10005+16.78	468,447.87	1,207,620.89
PI	10014+37.46	468,411.71	1,208,540.86
PT	10009+43.22	468,691.85	1,207,663.83
POT	10010+29.91	468,665.47	1,207,746.41
WILLISTON - US 2 WB - (Chain: PR_US2_WB)			
Point 763	2010+00.00	447,133.12	1,206,316.37
PC	2050+59.05	451,188.69	1,206,484.39
PI	2058+33.61	451,962.58	1,206,516.45
PT	2066+03.63	452,728.91	1,206,403.91
Point 764	2072+62.33	453,380.62	1,206,308.20
PC	2083+53.81	454,459.93	1,206,145.64
PI	2097+73.78	455,864.06	1,205,934.15
PT	2111+40.52	457,210.21	1,206,386.04
PC	2020+28.84	458,052.34	1,206,668.74
PI	2128+05.56	458,788.68	1,206,915.92
PT	2135+70.58	459,565.18	1,206,934.23
Point 765	2143+30.04	460,324.43	1,206,952.13
Point 766	2169+64.95	462,958.60	1,207,014.46
Point 767	2176+64.95	463,658.07	1,207,041.55
Point 768	2182+85.18	464,277.80	1,207,066.62
Point 769	2196+05.42	465,596.96	1,207,119.86
Point 770	2222+45.83	468,235.26	1,207,225.53
Point 771	2248+83.43	470,871.00	1,207,324.50

NOTES:

CURVE DATA

ARC DEFINITION

Curve PR_FRONTAGE_3	
PI = 2006+69.50	
Delta = 89° 58' 38" (Rt)	
D_c = 71° 37' 11"	
R = 80.00	
T = 79.97	
L = 125.63	
Curve PR_OILFIELD_3	
PI = 10014+37.46	
Delta = 195° 37' 48" (Rt)	
D_c = 45° 50' 12"	
R = 125.00	
T = 920.68	
L = 426.44	
Curve PR_US2_WB_3	**Curve PR_US2_WB_11**
PI = 2058+33.61	PI = 2128+05.56
Delta = 10° 43' 37" (Lt)	Delta = 17° 12' 21" (Lt)
D_c = 0° 41' 40"	D_c = 1° 06' 58"
R = 8,250.00	R = 5,134.00
T = 774.55	T = 776.72
L = 1,544.58	L = 1,541.74
Curve PR_US2_WB_8	
PI = 2097+73.78	
Delta = 27° 07' 19" (Rt)	
D_c = 0° 58' 24"	
R = 5,887.00	
T = 1,419.97	
L = 2,786.71	

Date Survey Completed / /

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
Gaurdrail (Chain : GRDRL)			
POB	415+00.00	487,474.650	1,208,059.50
POT	426+00.00	488,573.69	1,208,105.42

☐ Assumed Coordinates

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They are derived from the NAD83(2011) Reference frame; North Dakota North Zone
Combination Factor (cf) = 0.9998445

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET
CONTROL POINT DESCRIPTION					
PRIMARY CONTROL - US 2					
GPS 2-1	450034.29	1206588.69	1899.54	39+09.98 - 88' RT	
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-1					
GPS 2-2	458307.37	1206934.80	2050.49	123+22.96 - 103' RT	
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-2					
GPS 2-3	469637.62	1207013.89	1976.98	236+36.18 - 346' LT	
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-3					
GPS 2-4	481385.96	1207913.32	2022.10	354+10.26 - 93' RT	
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-4					
GPS 2-5	492046.30	1208343.34	2041.96	460+79.41 - 97' RT	
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-5					
GPS 2-6	505303.50	1209198.22	1941.03	589+90.89 - 825' LT	
5/8" Rebar w/ 2" Alum CAP Stamped GPS 2-6					

REFERENCE MARKERS

R Mkr#	NORTHING	EASTING	STATION	OFFSET
22	450249.47	1206546.48	41+23.23 -	36.65' RT
23	455505.04	1206198.03	94+03.51 -	36.25' RT
24	460715.00	1207081.10	147+21.67 -	37.85' RT
25	465975.06	1207252.19	199+85.31 -	35.64' RT
26	471232.26	1207455.80	252+46.43 -	35.05' RT
27	476498.40	1207656.83	305+16.39 -	29.08' RT
28	481740.40	1207863.60	357+62.47 -	29.79' RT
29	487036.27	1208078.01	410+62.73 -	35.56' RT
30	492320.72	1208295.94	463+51.67 -	38.28' RT
31	497601.01	1208509.79	516+36.28 -	37.66' RT
32	502893.83	1208718.63	569+34.08 -	30.67' RT

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

INITIALIZING BENCH MARK

☒ NAVD-88
☐ NGVD-29

☐ GEOID 09 ☐ _____
☒ GEOID 12A

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	81	4

SPEC CODE		BID ITEM	QTY	UNIT
720	125	ALIGNEMNT MONUMENTS		
		See tables	37	EA

ALIGNMENT MONUMENTS

WILLISTON - US 2 - (Chain: PR_US2)

STATION	OFFSET	DESCRIPTION	MONUMENT PER STANDARD D-720-1	POINT NUMBER
10+00.00	0	POB	X	866
50+63.70	0	PC	X	987
		PI (PR_US2_3)	X	893
65+26.34	0	PT	X	988
74+89.46	0	PI	X	867
78+92.35	0	PI	X	868
84+53.58	0	PC	X	989
		PI (PR_US2_10)	X	894
111+19.50	0	PT	X	990
119+18.63	0	PC	X	991
		PI (PR_US2_13)	X	895
136+28.68	0	PT	X	992
143+26.62	0	PI	X	869
155+55.90	0	PI	X	870
169+61.71	0	PI	X	871
196+01.95	0	PI	X	872
222+42.70	0	PI	X	873
248+79.95	0	PI	X	874
275+23.07	0	PI	X	881
301+63.45	0	PI	X	882
328+04.21	0	PI	X	883
354+44.89	0	PI	X	884
381+08.51	0	PI	X	885
407+45.31	0	PI	X	875
433+82.75	0	PI	X	887
460+39.01	0	PI	X	888
476+60.63	0	PI	X	889
486+71.18	0	PI	X	876
513+24.21	0	PI	X	891
539+59.92	0	PI	X	892
566+08.06	0	PI	X	877
567+22.02	0	POT	X	878

ALIGNMENT MONUMENTS

WILLISTON - FRONTAGE - (Chain: PR_FRONTAGE)

STATION	OFFSET	DESCRIPTION	MONUMENT PER STANDARD D-720-1	POINT NUMBER
2000+00.00	0	POB	X	1391
2005+89.53	0	PC	X	9863
2006+52.35	-33.11	PI	X	9864
2007+15.16	0	PT	X	9865
2010+82.91	0	POT	X	1392

R/W MONUMENTS

WILLISTON - FRONTAGE - (Chain: PR_FRONTAGE)

STATION	OFFSET	DESCRIPTION	MONUMENT PER STANDARD D-720-1	POINT NUMBER
2000+00.00	0	POB	X	1391
2005+89.53	0	PC	X	9863
2006+52.35	-33.11	PI	X	9864
2007+15.16	0	PT	X	9865
2010+82.91	0	POT	X	1392

NOTES:

1. The Contractor shall provide a licensed Professional Surveyor (PLS) to oversee the placement of monuments. The PLS shall record all section corners and quarter corner monuments placed on the project in accordange with the North Dakota Century Code. The Contractor shall submit a copy of the recordation to the Engineer.

2. Station and offsets given are perpendicular to the alignment.

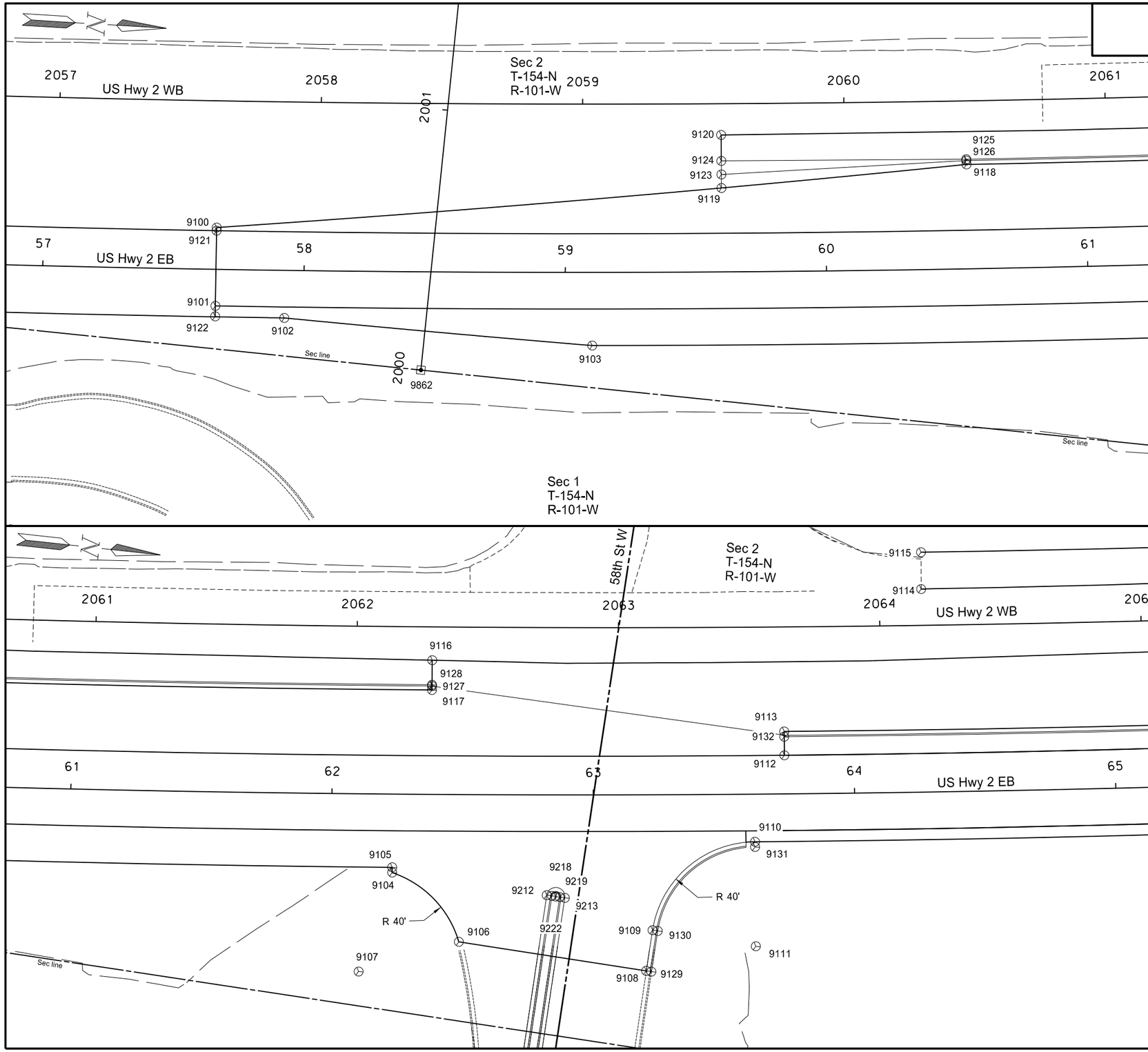
This document was originally issued and sealed by Derek Anderson, Registration Number PE- 7107, on 08/02/17 and the original document is stored at the North Dakota Department of Transportation

Survey Coordinate Data

US 2

R/W & Alignment Monumentation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	82	1



Point	North	East	Offset	Station	Feature	Description
9100	451892.34	1206532.07	-16.00	57+66.30	CON	
9101	451893.66	1206562.04	14.00	57+66.30	CON	
9102	451920.28	1206565.03	18.20	57+92.70	CON	
9103	452038.56	1206568.39	28.00	59+10.30	CON	
9104	452351.58	1206543.05	28.00	62+23.29	CON	
9105	452351.78	1206545.04	30.00	62+23.29	CON	
9106	452380.01	1206568.65	56.34	62+48.85	CON	
9107	452343.11	1206584.09	68.00	62+10.87	CON	RAD_40
9108	452452.52	1206571.93	67.37	63+20.06	CON	
9109	452453.26	1206556.17	51.79	63+22.53	CON	
9110	452488.55	1206518.31	18.20	63+61.75	CON	
9111	452493.21	1206558.03	58.20	63+61.75	CON	RAD_40
9112	452496.16	1206484.18	-14.80	63+73.30	CON	
9113	452495.09	1206475.12	-23.93	63+73.30	CON	
9114	452541.31	1206415.25	-77.76	64+26.77	CON	
9115	452539.70	1206401.25	-91.84	64+26.91	CON	
9116	452358.21	1206462.60	-51.38	62+38.00	CON	
9117	452359.37	1206473.92	-40.00	62+38.00	CON	
9118	452177.31	1206490.43	-40.00	60+54.30	CON	
9119	452084.26	1206505.16	-32.14	59+60.00	CON	
9120	452082.89	1206484.92	-52.43	59+60.00	CON	
9121	451892.39	1206533.27	-14.80	57+66.30	CON	
9122	451893.84	1206566.05	18.01	57+66.30	CON	
9123	452083.91	1206499.99	-37.32	59+60.00	CON	VG
9124	452083.56	1206494.82	-42.50	59+60.00	CON	GTR
9125	452177.10	1206488.44	-42.00	60+54.24	CON	CRB_BK
9126	452177.14	1206488.94	-41.50	60+54.24	CON	CRB_FC
9127	452359.21	1206472.43	-41.50	62+38.00	CON	CRB_FC
9128	452359.16	1206471.93	-42.00	62+38.00	CON	CRB_BK
9129	452454.52	1206572.03	67.69	63+22.01	CON	CRB_BK
9130	452455.25	1206556.27	52.11	63+24.49	CON	CRB_BK
9131	452488.79	1206520.29	20.20	63+61.75	CON	CRB_BK
9132	452495.32	1206477.10	-21.93	63+73.30	CON	CRB_BK

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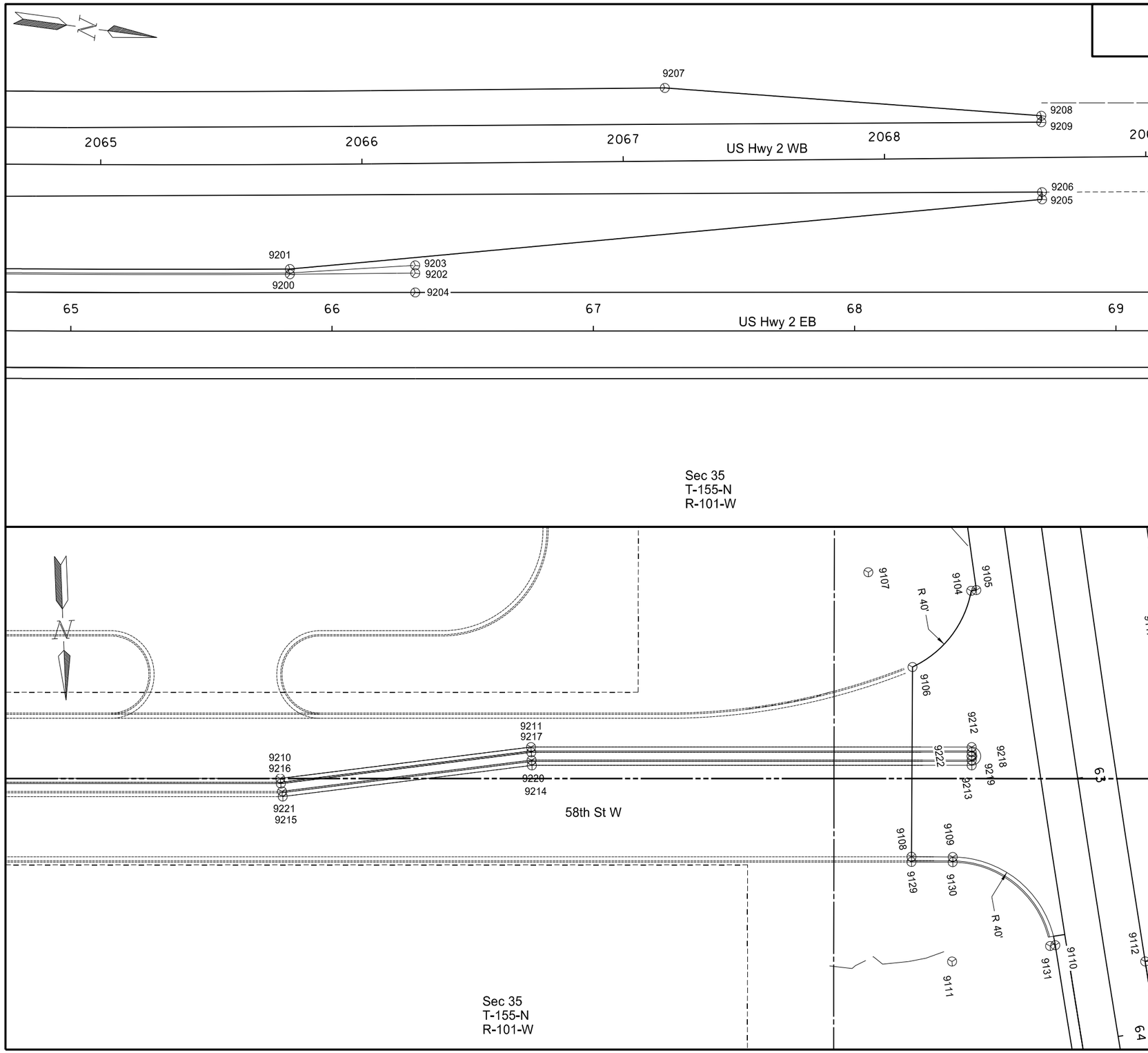
Survey Data Layout

US 2

58th St Intersection

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	82	2



Point	North	East	Offset	Station	Feature	Description
9200	452703.71	1206450.00	-21.78	65+83.86	CON	CRB_BK
9201	452703.43	1206448.02	-23.78	65+83.85	CON	
9202	452751.21	1206443.07	-22.17	66+31.85	CON	VG
9203	452750.78	1206440.12	-25.15	66+31.83	CON	VG
9204	452752.21	1206450.37	-14.80	66+31.85	CON	
9205	452985.05	1206382.47	-50.32	68+71.77	CON	
9206	452984.64	1206379.73	-53.09	68+71.74	CON	
9207	452836.19	1206359.86	-93.02	67+27.39	CON	
9208	452980.40	1206350.81	-82.32	68+71.48	CON	
9209	452980.75	1206353.25	-79.84	68+71.50	CON	
9210	452412.91	1206812.15	301.93	62+56.27	CON	GTR
9211	452404.76	1206715.78	205.25	62+58.12	CON	GTR
9212	452411.52	1206547.25	38.36	62+82.24	CON	GTR
9213	452418.51	1206547.53	39.39	62+89.13	CON	GTR
9214	452411.78	1206715.71	205.91	62+64.93	CON	GTR
9215	452419.87	1206811.49	302.00	62+63.02	CON	GTR
9216	452414.90	1206812.02	302.02	62+58.20	CON	CBR_BK
9217	452406.76	1206715.74	205.41	62+60.07	CON	CBR_BK
9218	452413.52	1206547.33	38.65	62+84.21	CON	CBR_BK
9219	452416.51	1206547.45	39.09	62+87.16	CON	CBR_BK
9220	452409.77	1206715.76	205.74	62+62.98	CON	CBR_BK
9221	452417.88	1206811.66	301.96	62+61.09	CON	CBR_BK
9222	452415.01	1206547.44	38.92	62+85.68	CON	RAD_1.5

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Survey Data Layout

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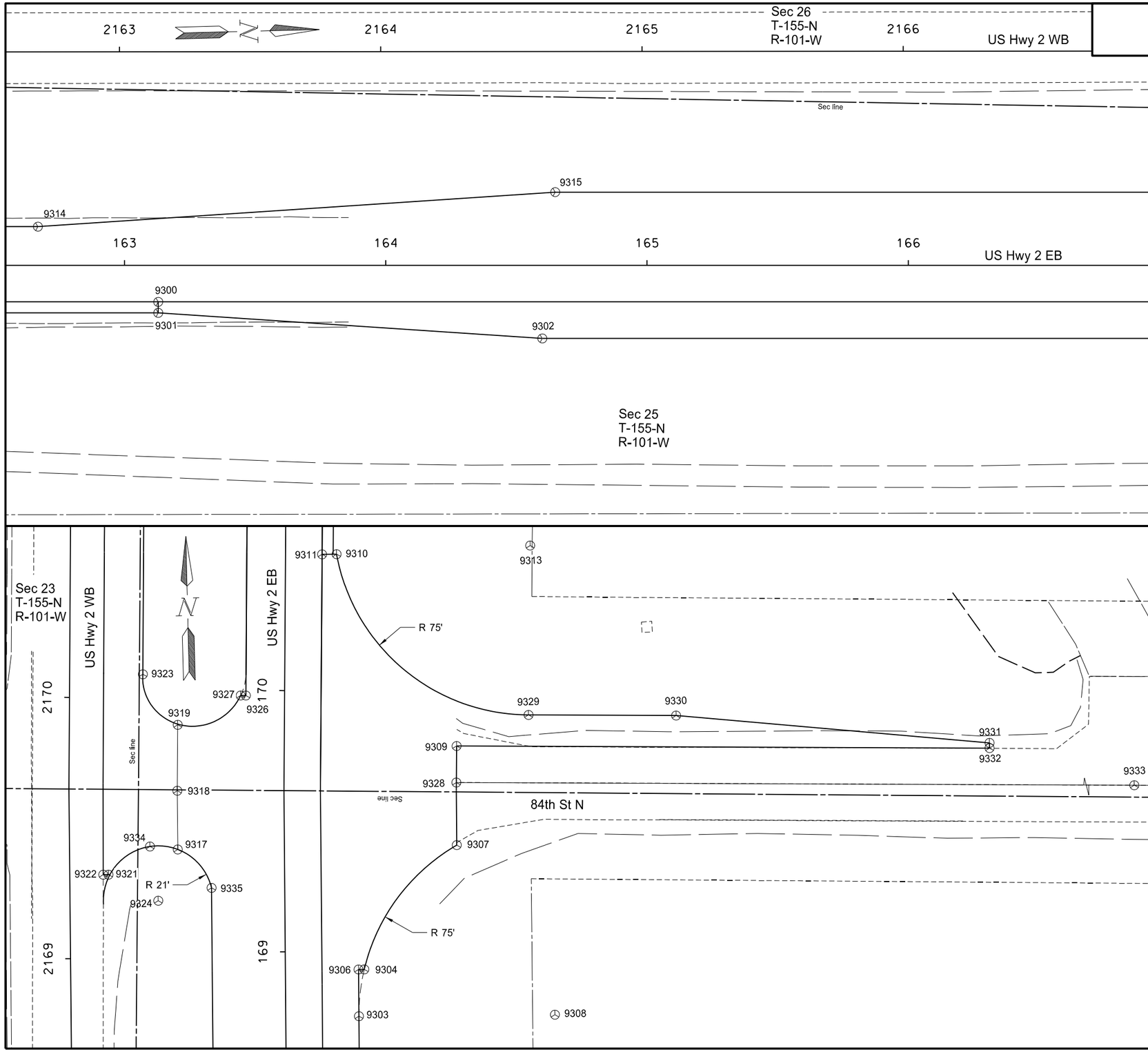
58th St Intersection

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	82	3



Point	North	East	Offset	Station	Feature	Description
9300	462306.34	1207094.76	14.00	163+12.93	CON	
9301	462306.24	1207098.96	18.20	163+12.93	CON	
9302	462452.95	1207112.35	28.00	164+59.93	CON	
9303	462868.03	1207122.52	28.00	168+75.13	CON	
9304	462885.92	1207122.96	28.00	168+93.03	CON	
9306	462885.87	1207125.13	30.18	168+93.03	CON	
9307	462932.26	1207162.08	65.98	169+40.31	CON	
9308	462866.14	1207197.49	103.00	168+75.08	CON	RAD_75
9309	462970.18	1207163.27	65.98	169+79.25	CON	
9310	463045.05	1207119.76	19.54	170+52.34	CON	
9311	463045.18	1207114.22	14.00	170+52.25	CON	
9313	463056.11	1207193.94	93.22	170+66.32	CON	RAD_75
9314	462261.00	1207064.84	-14.80	162+66.87	CON	
9315	462459.26	1207056.49	-28.00	164+64.87	CON	
9317	462934.09	1207055.32	-40.80	169+39.53	CON	VG
9318	462956.58	1207055.87	40.80	169+61.71	CON	VG
9319	462981.78	1207056.87	-40.80	169+86.63	CON	VG
9321	462925.33	1207028.47	-67.43	169+30.11	CON	
9322	462925.39	1207026.47	-69.43	169+30.13	CON	
9323	463001.54	1207044.14	-54.29	170+05.87	CON	
9324	462914.73	1207047.19	-48.45	169+19.98	CON	RAD_25
9326	462992.20	1207081.30	-16.80	169+98.00	CON	
9327	462992.12	1207083.30	-14.80	169+98.00	CON	
9328	462956.20	1207162.72	65.98	169+65.26	CON	
9329	462981.16	1207191.18	93.43	169+91.32	CON	
9330	462979.08	1207247.63	149.92	169+91.48	CON	
9331	462964.67	1207367.18	269.95	169+81.82	CON	
9332	462962.67	1207367.11	269.96	169+79.82	CON	
9333	462945.70	1207447.28	350.74	169+66.05	CON	
9334	462935.59	1207044.70	-51.44	169+40.76	CON	
9335	462918.99	1207067.75	-28.00	169+24.73	CON	

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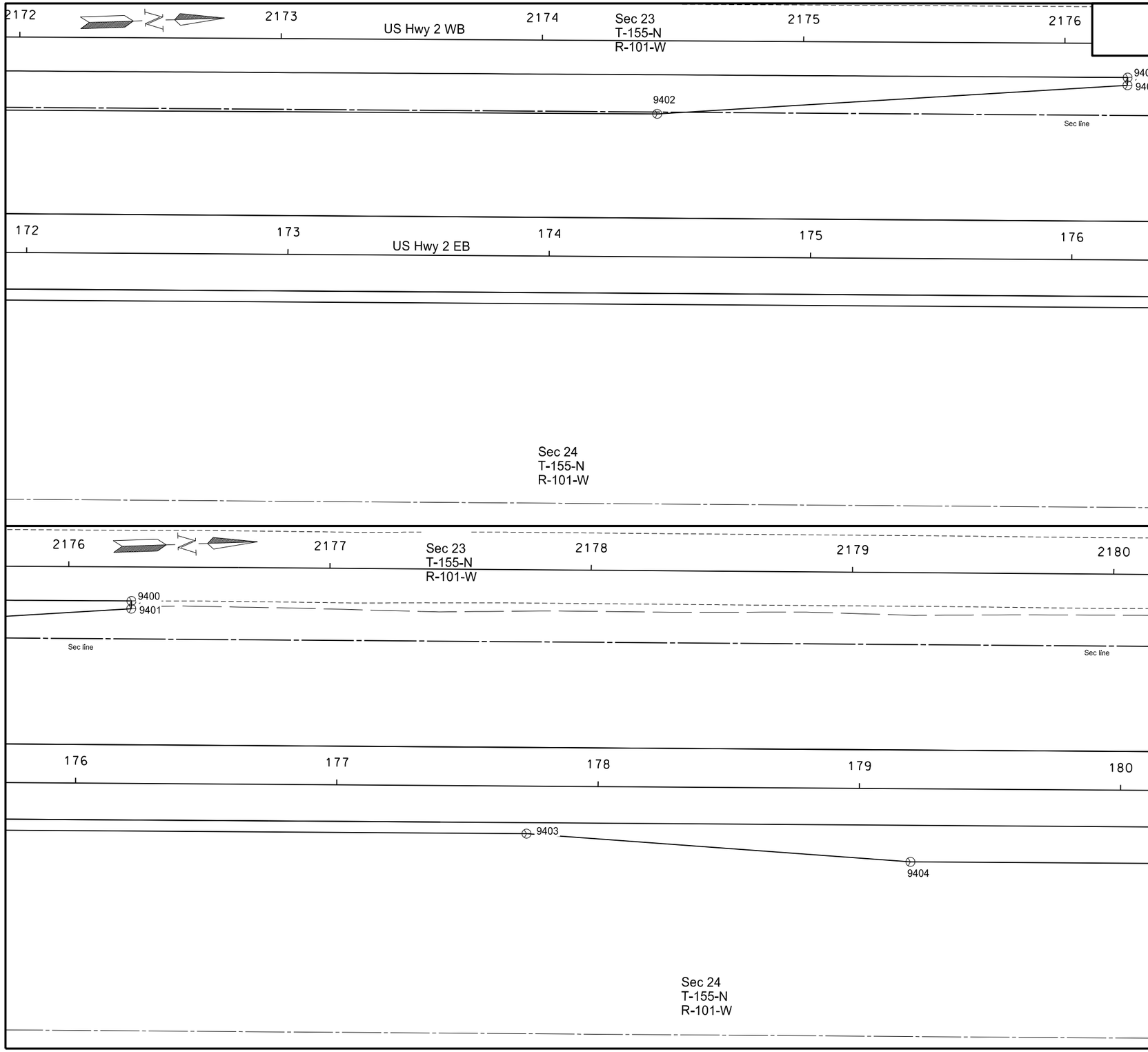
84th St W Intersection

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	82	4



Point	North	East	Offset	Station	Feature
9400	463616.75	1207052.99	-69.83	176+20.94	CON
9401	463616.56	1207055.95	-66.86	176+20.87	CON
9402	463436.31	1207060.98	-54.70	174+40.96	CON
9403	463764.93	1207146.97	18.20	177+72.73	CON
9404	463911.43	1207162.59	28.00	179+19.73	CON

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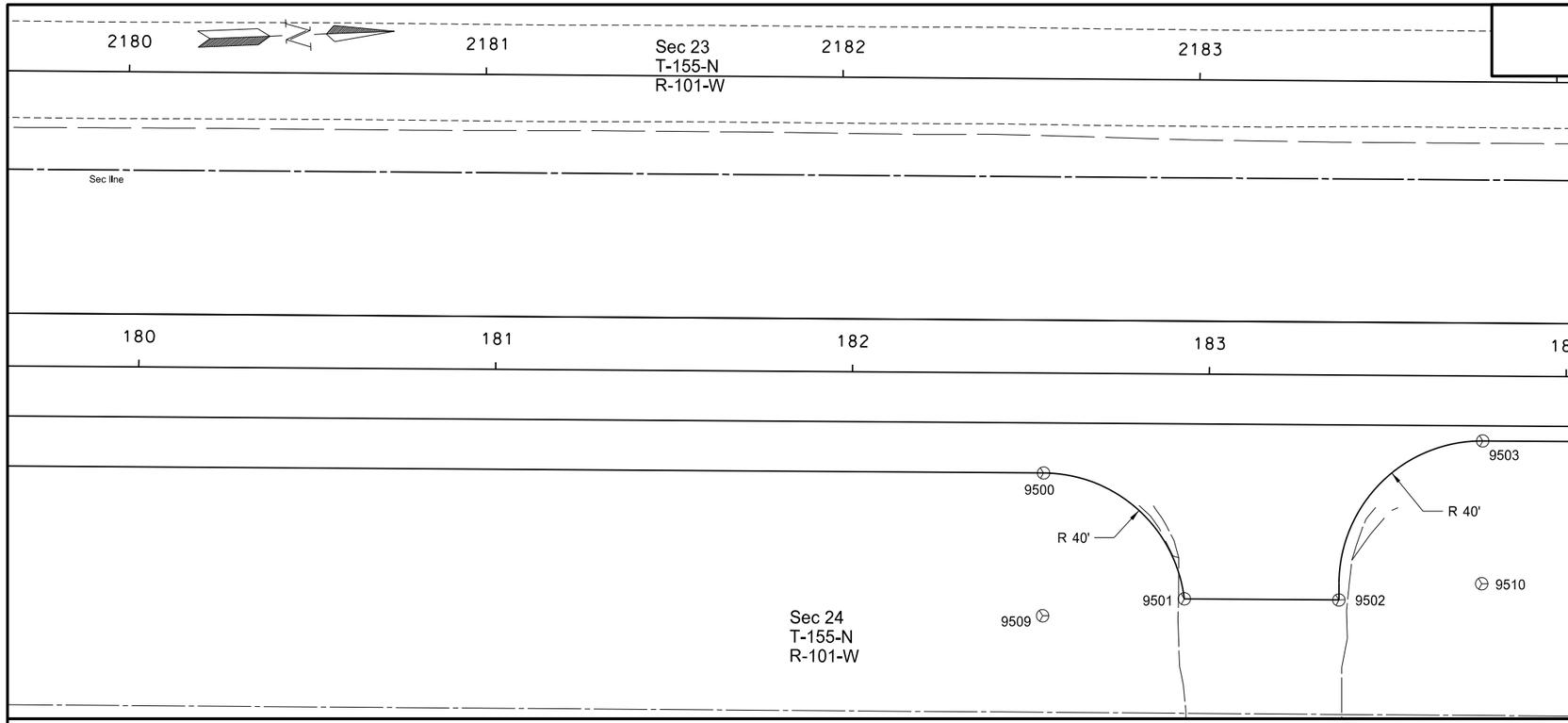
US 2

84th St W Intersection

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	82	5



Point	North	East	Offset	Station	Feature	Description
9500	464245.16	1207175.82	28.00	182+53.73	CON	
9501	464283.43	1207212.37	63.00	182+93.41	CON	
9502	464326.71	1207214.08	63.00	183+36.73	CON	
9503	464368.45	1207170.90	18.20	183+76.73	CON	
9509	464243.58	1207215.79	68.00	182+53.73	CON	RAD_40
9510	464366.87	1207210.87	58.20	183+76.73	CON	RAD_40

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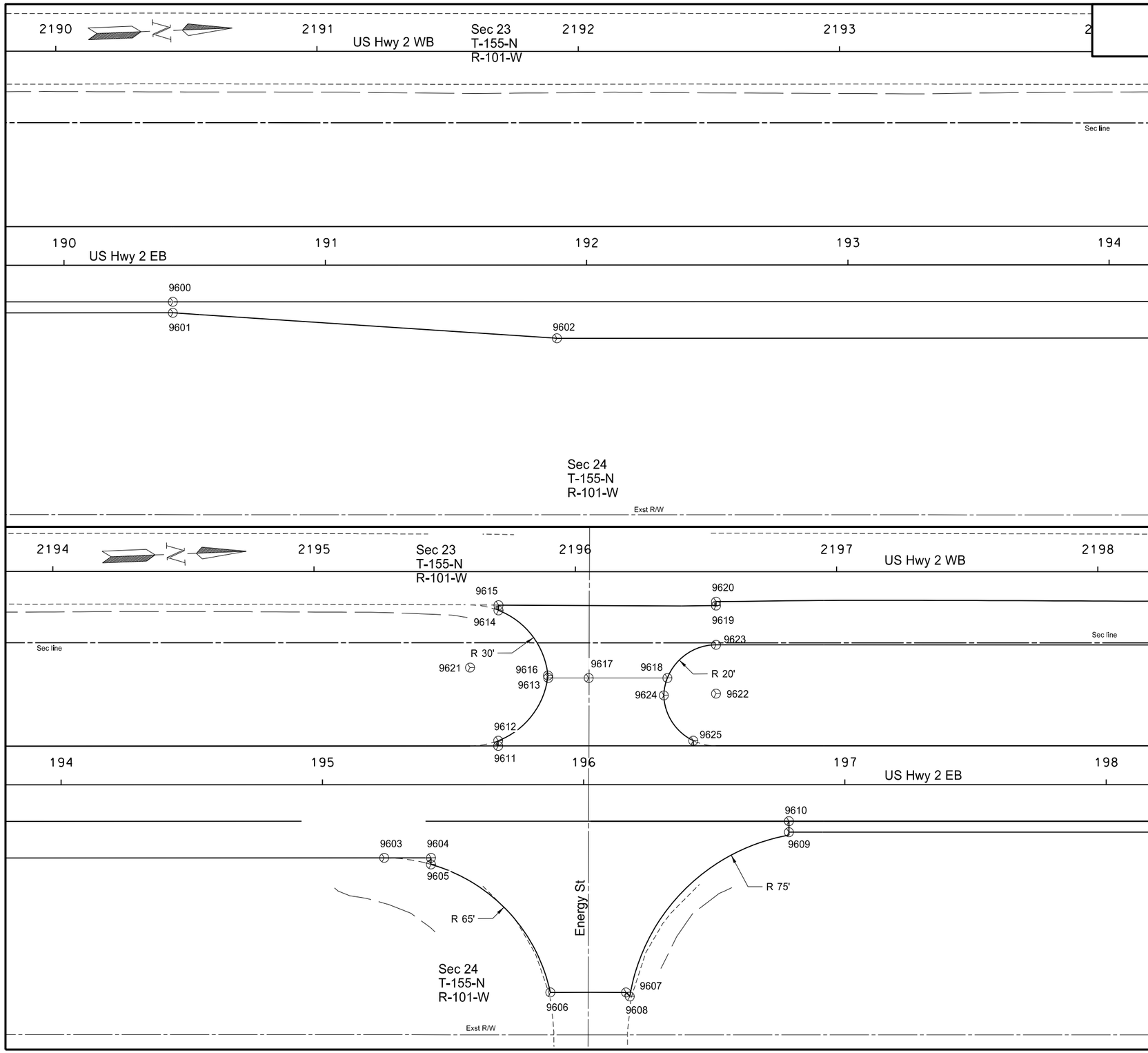
Survey Data Layout

US 2

Well St Intersection

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	82	6



Point	North	East	Offset	Station	Feature	Description
9600	465033.01	1207193.05	14.00	190+41.64	CON	
9601	465032.84	1207197.25	18.20	190+41.64	CON	
9602	465179.34	1207212.87	28.00	191+88.64	CON	
9603	465514.07	1207226.14	28.00	195+23.64	CON	
9604	465531.99	1207226.85	28.00	195+41.56	CON	
9605	465531.89	1207229.37	30.52	195+41.56	CON	
9606	465575.57	1207280.14	79.52	195+87.22	CON	
9607	465604.52	1207281.30	79.53	196+16.23	CON	
9608	465605.89	1207282.88	81.05	196+17.66	CON	
9609	465669.27	1207222.51	18.20	196+78.57	CON	
9610	465669.43	1207218.32	14.00	196+78.57	CON	
9611	465559.39	1207185.10	-14.80	195+67.29	CON	
9612	465559.47	1207183.11	-16.80	195+67.29	CON	
9613	465579.52	1207158.92	-41.76	195+86.37	CON	
9614	465561.58	1207133.28	-66.67	195+67.42	CON	
9615	465561.67	1207131.28	-68.67	195+67.43	CON	
9616	465579.56	1207159.88	-40.80	195+86.45	CON	VG
9617	465595.05	1207160.50	-40.80	196+01.95	CON	VG
9618	465625.15	1207161.70	-40.80	196+32.06	CON	VG
9619	465644.85	1207134.77	-68.50	196+50.67	CON	
9620	465644.91	1207133.27	-70.00	196+50.67	CON	
9621	465549.82	1207154.70	-44.80	195+56.52	CON	RAD_30
9622	465643.51	1207168.44	-34.80	196+50.67	CON	RAD_20
9623	465644.25	1207149.78	-53.48	196+50.67	CON	
9624	465623.51	1207168.30	-34.14	196+30.68	CON	
9625	465634.08	1207186.08	-16.80	196+41.95	CON	

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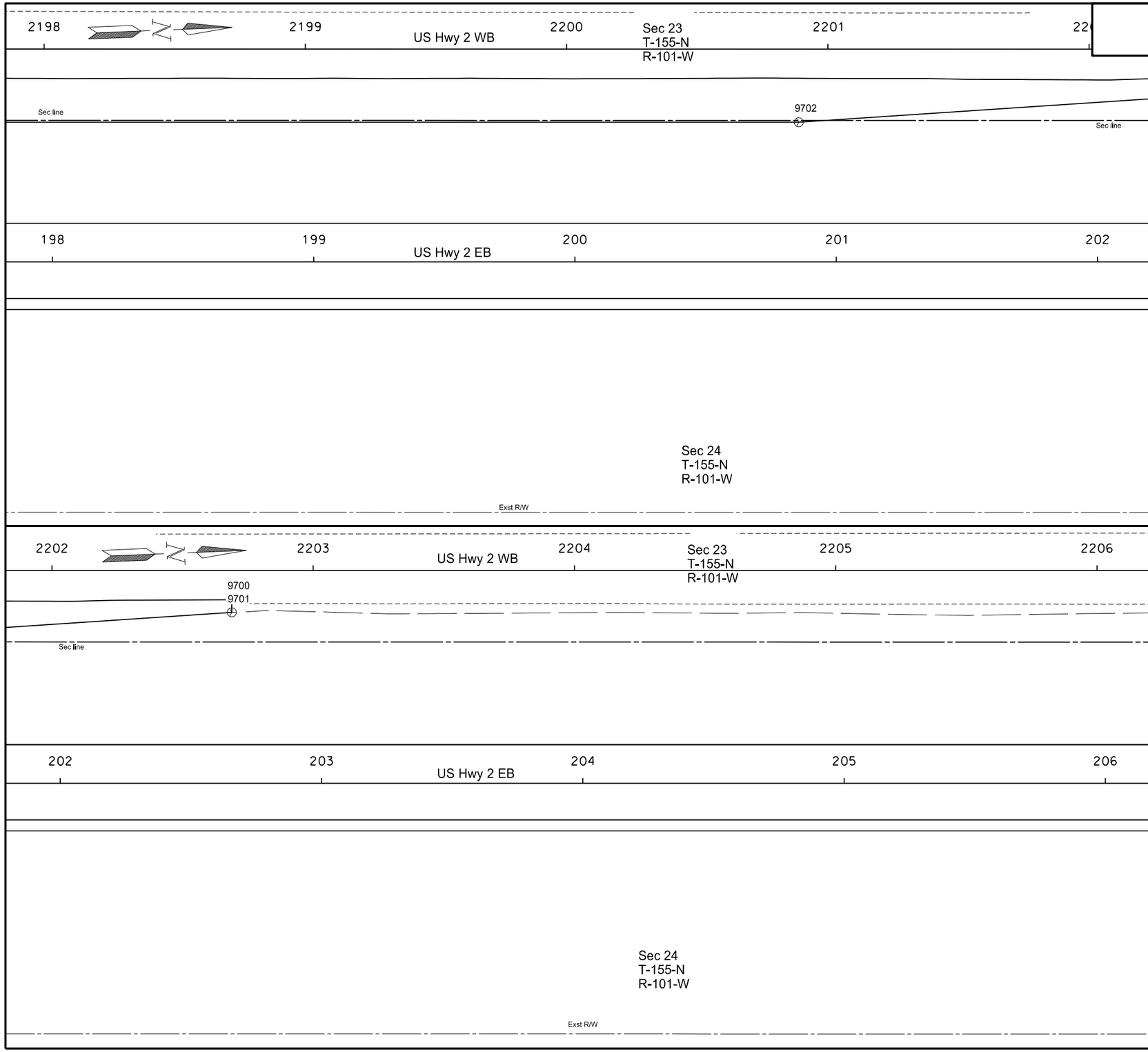
US 2

Energy St Intersection

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	82	7



Point	North	East	Offset	Station	Feature
9700	466259.38	1207157.59	-70.25	202+65.62	CON
9701	466259.24	1207162.40	-65.44	202+65.67	CON
9702	466078.91	1207167.19	-53.45	200+85.67	CON

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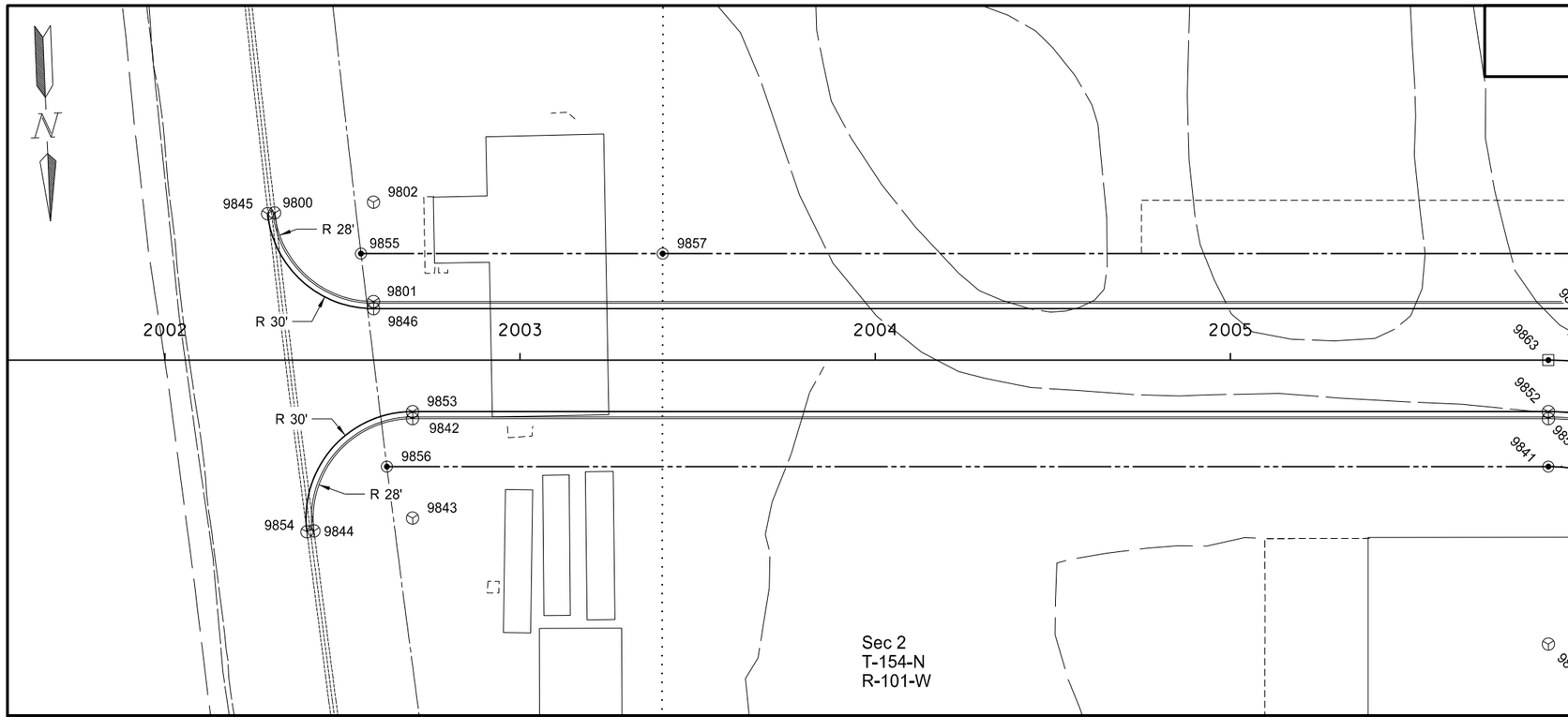
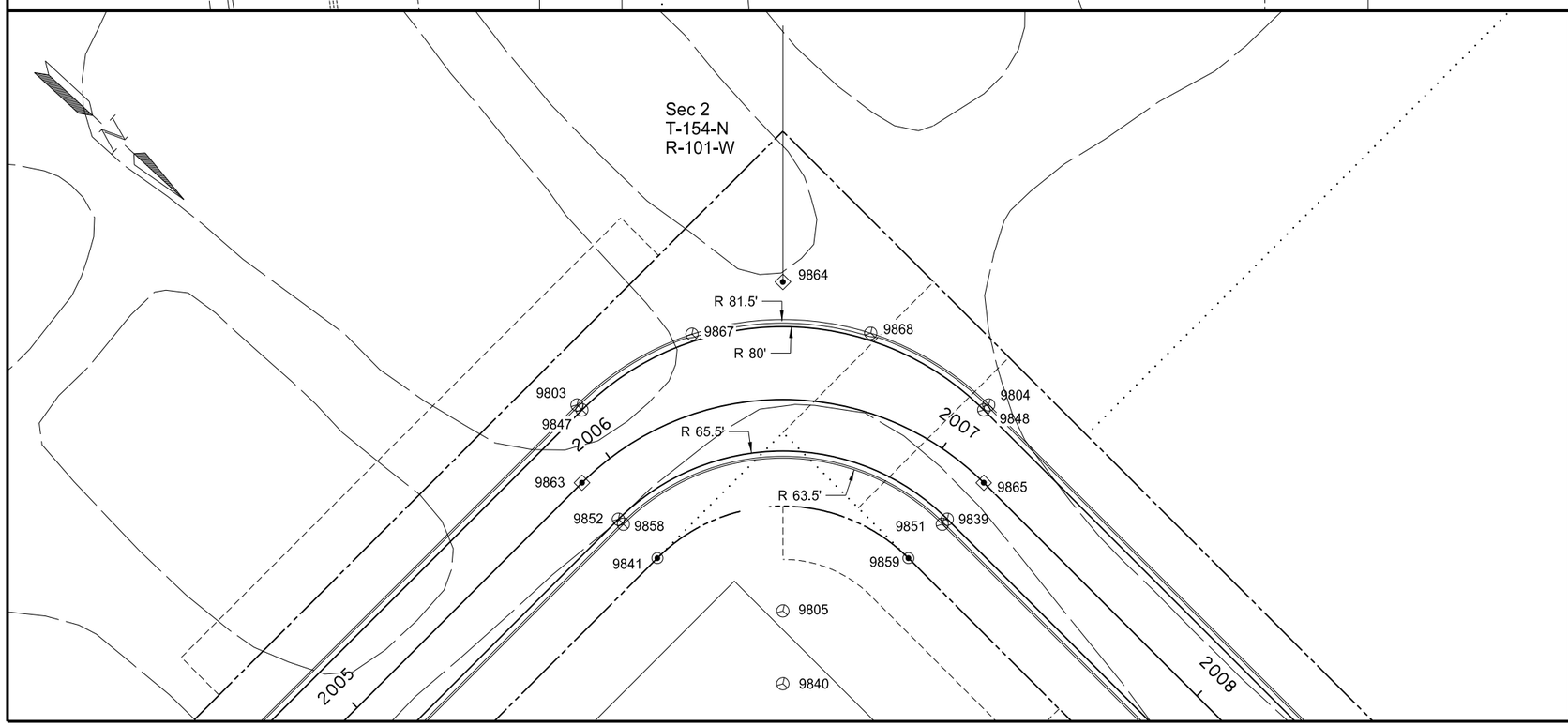
US 2

Energy St Intersection

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	82	8





See Sheet No. 9 For Table

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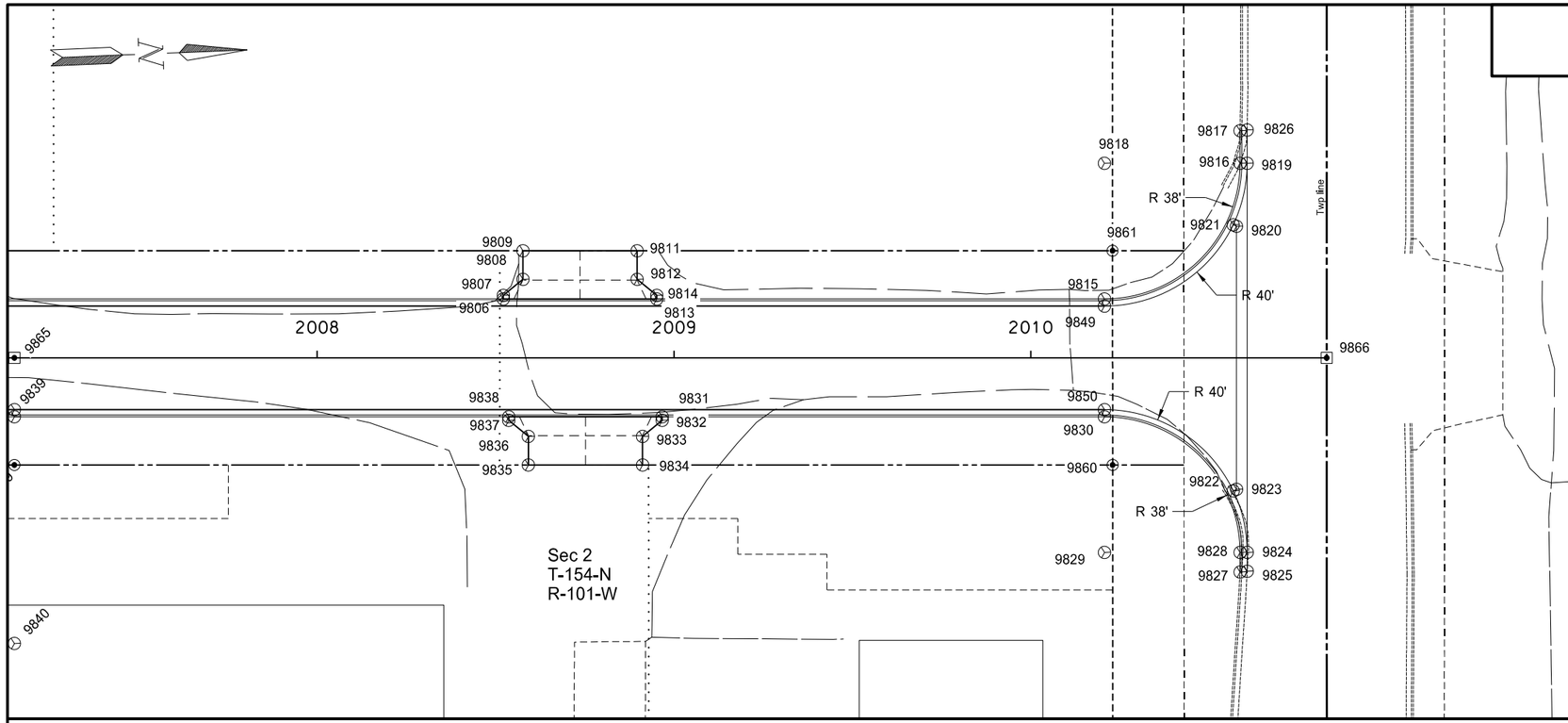
Survey Data Layout

US 2

Frontage Road

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	82	9



Point	North	East	Offset	Station	Feature	Description
9800	451941.75	1206349.37	-196.13	58+25.13	CON	CRB_BK
9801	451967.83	1206322.59	-221.50	58+53.31	CON	CRB_BK
9802	451939.85	1206321.44	-224.13	58+24.65	CON	RAD_28
9803	451982.00	1205977.57	-565.15	58+88.77	CON	CBR_BK
9804	452067.26	1205899.01	-638.02	59+86.10	CON	CBR_BK
9805	452063.93	1205980.94	-556.52	59+76.30	CON	RAD_82
9806	452218.65	1205905.16	-619.65	61+48.98	CON	DW
9807	452218.69	1205904.16	-620.65	61+49.12	CON	DW
9808	452224.36	1205899.89	-624.38	61+55.66	CON	DW
9809	452224.69	1205891.90	-632.31	61+56.81	CON	DW
9811	452256.66	1205893.20	-628.02	61+91.16	CON	DW
9812	452256.34	1205901.19	-620.10	61+89.98	CON	DW
9813	452261.65	1205905.91	-614.89	61+95.21	CON	DW
9814	452261.61	1205906.91	-613.90	61+95.06	CON	DW
9815	452386.95	1205912.01	-595.75	63+29.07	CON	
9816	452426.46	1205875.58	-627.38	63+76.02	CON	
9817	452426.83	1205866.47	-636.38	63+77.58	CON	
9818	452388.49	1205874.04	-633.30	63+35.36	CON	RAD_38
9819	452428.46	1205875.66	-627.06	63+78.16	CON	VG
9820	452423.86	1205892.72	-610.66	63+71.05	CON	VG
9821	452424.75	1205893.18	-610.09	63+71.93	CON	VG
9822	452421.77	1205966.80	-537.33	63+59.50	CON	VG
9823	452420.85	1205967.19	-537.05	63+58.47	CON	VG
9824	452424.05	1205984.57	-519.42	63+59.72	CON	VG
9825	452423.84	1205989.86	-514.19	63+58.83	CON	
9826	452428.84	1205866.33	-636.27	63+79.76	CON	
9827	452421.83	1205989.99	-514.29	63+56.69	CON	CRB_BK
9828	452422.05	1205984.49	-519.73	63+57.61	CON	CRB_BK
9829	452384.09	1205982.95	-525.57	63+17.50	CON	RAD_38
9830	452385.63	1205944.98	-563.13	63+23.68	CON	
9831	452261.79	1205939.95	-581.00	61+91.83	CON	DW
9832	452261.75	1205940.94	-580.01	61+91.69	CON	DW
9833	452256.07	1205945.22	-576.30	61+85.17	CON	DW

Point	North	East	Offset	Station	Feature	Description
9834	452255.75	1205953.21	-568.37	61+84.00	CON	DW
9835	452223.77	1205951.91	-572.63	61+49.92	CON	DW
9836	452224.10	1205943.92	-580.57	61+51.05	CON	DW
9837	452218.79	1205939.20	-585.75	61+45.81	CON	DW
9838	452218.83	1205938.20	-586.74	61+45.95	CON	DW
9839	452080.40	1205932.57	-603.60	59+97.68	CON	
9840	452077.82	1205996.01	-540.50	59+90.01	CON	RAD_63.5
9841	452014.37	1205993.41	-547.37	59+22.40	CON	
9842	452001.25	1206312.94	-229.23	58+88.18	CON	
9843	452029.23	1206314.09	-226.39	59+16.83	CON	RAD_28.5
9844	452031.68	1206341.98	-198.40	59+17.56	CON	
9845	451941.88	1206351.37	-194.13	58+25.16	CON	EOP
9846	451969.82	1206322.67	-221.31	58+55.35	CON	EOP
9847	451984.00	1205977.65	-564.95	58+90.91	CON	EOP
9848	452067.18	1205901.00	-636.03	59+85.85	CON	EOP
9849	452386.87	1205914.01	-593.77	63+28.74	CON	EOP
9850	452385.71	1205942.98	-565.10	63+24.01	CON	EOP
9851	452080.48	1205930.57	-605.59	59+97.92	CON	EOP
9852	452012.38	1205993.33	-547.58	59+20.27	CON	EOP
9853	451999.25	1206312.86	-229.43	58+86.13	CON	EOP
9854	452031.85	1206343.97	-196.40	59+17.61	CON	EOP
9855	451954.19	1206325.56	-219.27	58+39.15	SRWM	IP
9856	452014.44	1206320.73	-220.66	59+01.24	SRWM	IP
9857	451957.68	1206240.66	-303.85	58+47.44	SRWM	IP
9858	452027.86	1205993.96	-545.95	59+36.78	SRWM	IP
9859	452079.85	1205946.06	-590.19	59+96.04	SRWM	IP
9860	452387.36	1205958.56	-549.44	63+23.89	SRWM	IP
9861	452389.78	1205898.61	-608.74	63+33.74	SRWM	IP
9862	451973.70	1206581.77	37.62	58+45.03	SET	IP
9863	451997.89	1205992.73	-549.07	59+04.81	SET	IP
9864	452001.17	1205912.83	-628.61	59+13.64	SET	IP
9865	452081.07	1205916.08	-620.00	59+99.69	SET	IP
9866	452448.52	1205931.03	-569.69	63+92.52	SET	IP
9867	451992.32	1205940.98	-601.06	59+02.22	CON	DW
9868	452029.15	1205906.68	-632.97	59+44.31	CON	DW

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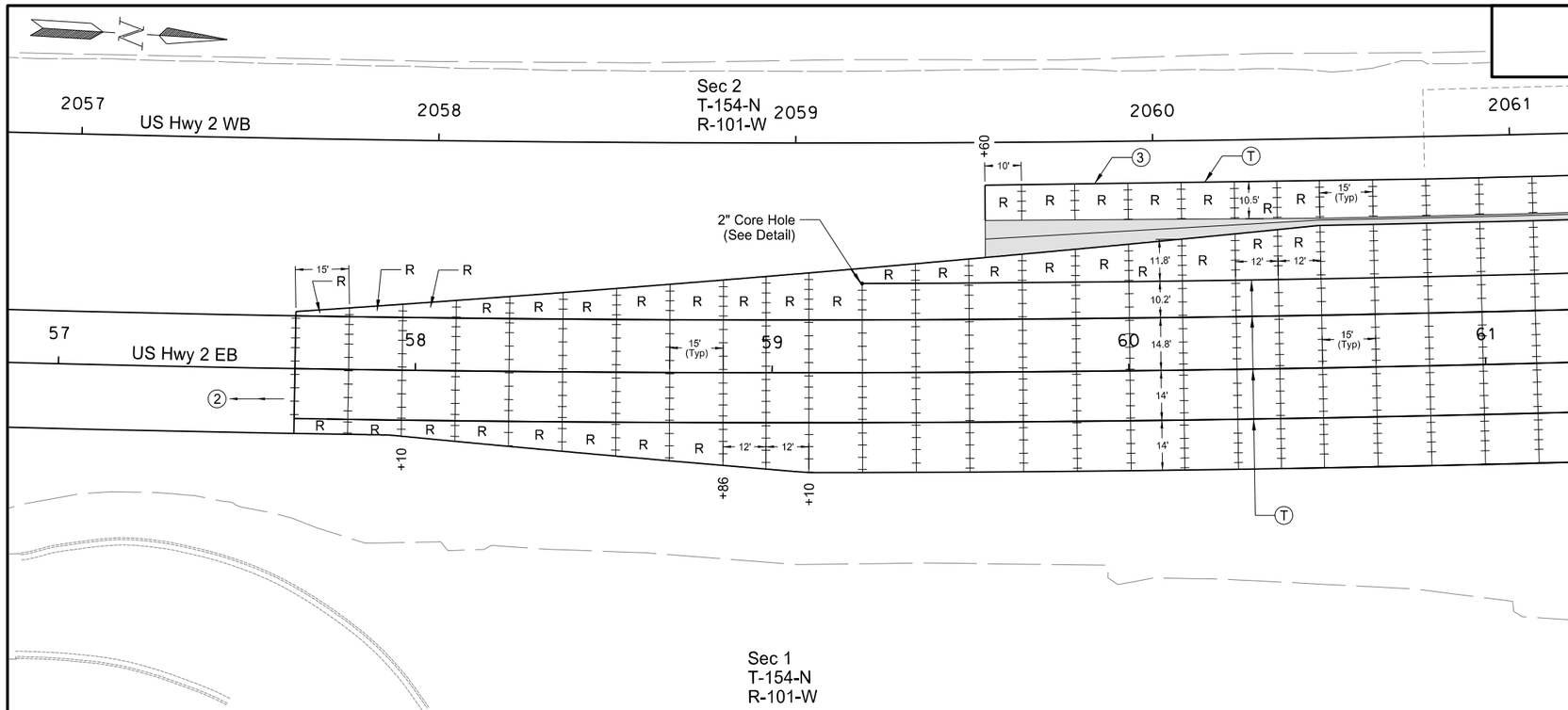
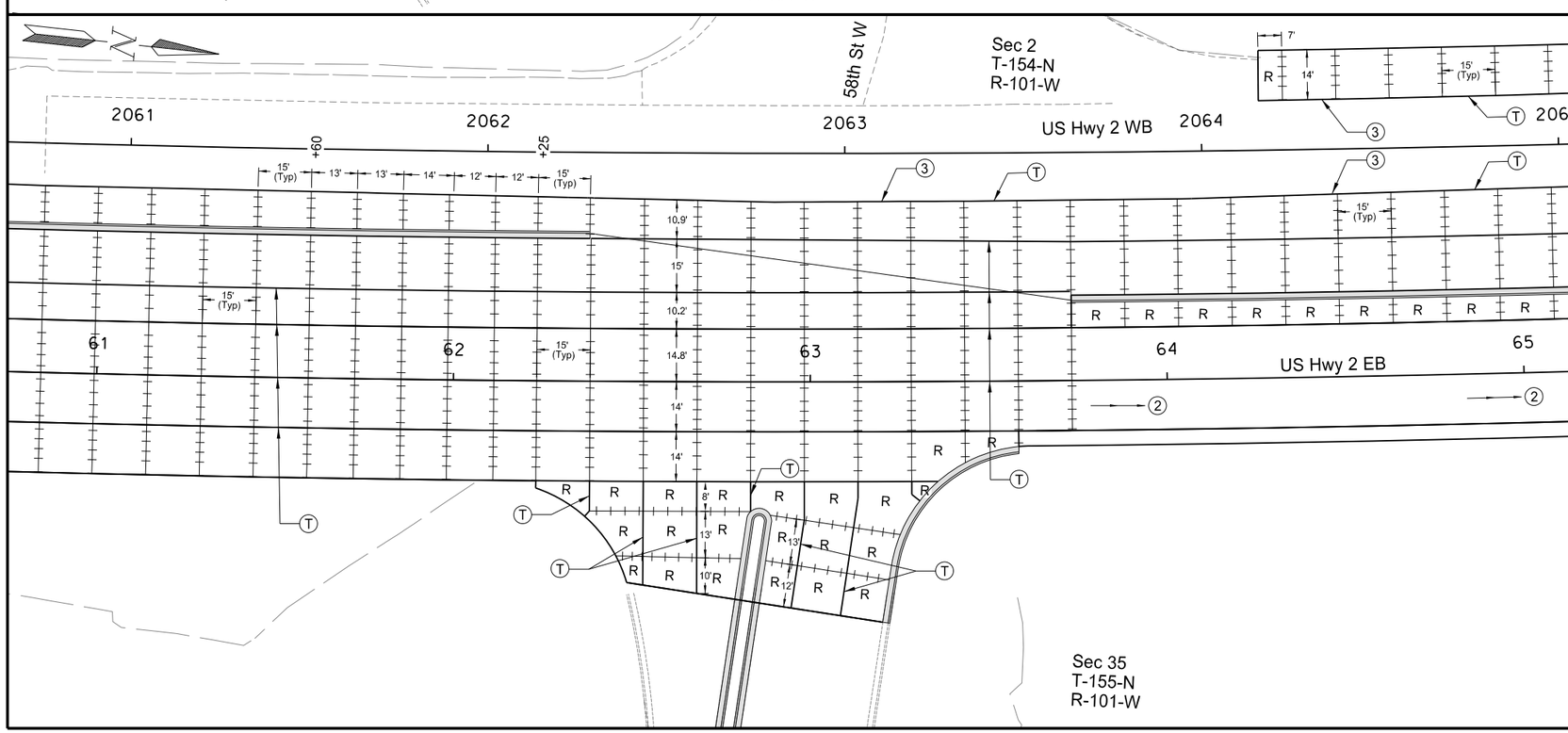
Survey Data Layout

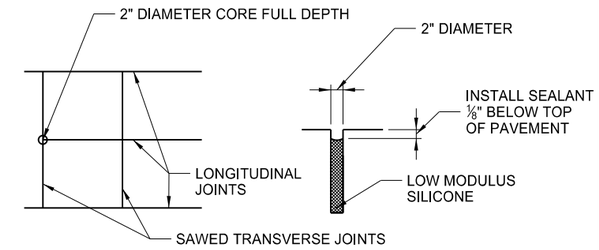
US 2

Frontage Road

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	90	1







CORE DETAIL

NOTES:

1. Stationing is based on Alignment "PR_US2" unless otherwise noted.
2. Continue 15' typical spacing on mainline.
3. Match existing joints.
4. Tie bars will be drilled and epoxied into place where existing pavement abuts new pavement or curb and gutter. All costs to be included in price bid for concrete pavement.

LEGEND

R	PAVEMENT REINFORCEMENT - SEE DETAIL
T	TIED JOINT WITH HOT POUR SEAL - SEE DETAIL
	DOWELED JOINT AT TRANSVERSE JOINTS JOINT SPACING - 15' TYPICAL
	CURB & GUTTER / PIGMENTED CONCRETE

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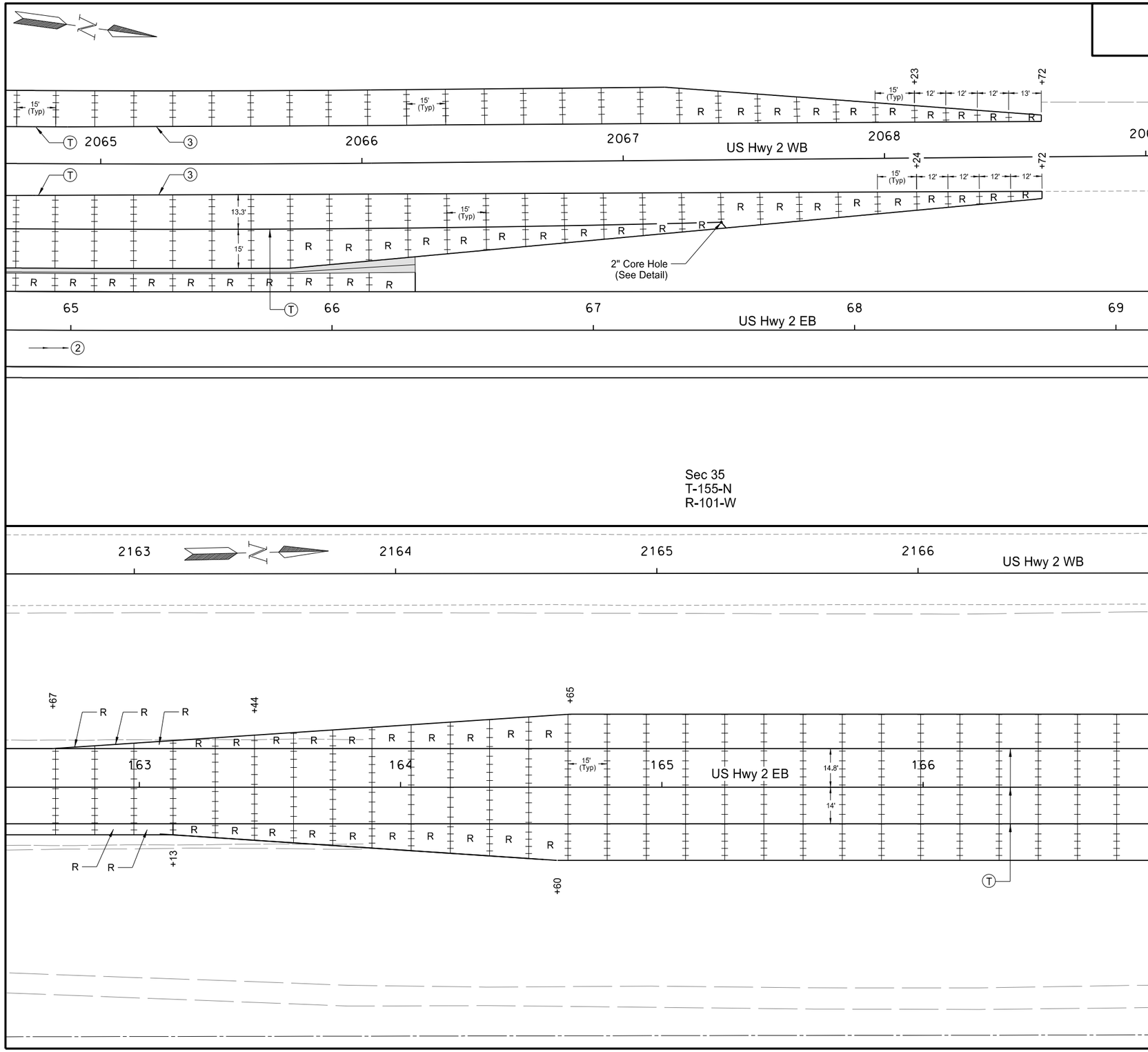
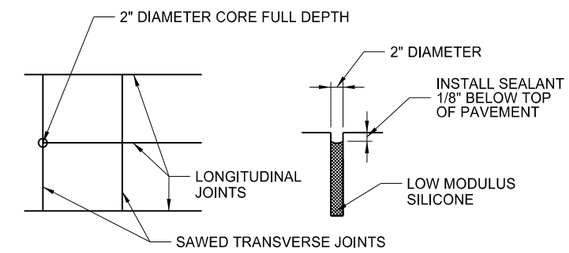
Paving Layout

US 2

58th St Intersection

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	90	2





CORE DETAIL

NOTES:

1. Stationing is based on Alignment "PR_US2" unless otherwise noted.
2. Continue 15' typical spacing on mainline.
3. Match existing joints.
4. Tie bars will be drilled and epoxied into place where existing pavement abuts new pavement or curb and gutter. All costs to be included in price bid for concrete pavement.

LEGEND

R	PAVEMENT REINFORCEMENT - SEE DETAIL
T	TIED JOINT WITH HOT POUR SEAL - SEE DETAIL
	DOWELED JOINT AT TRANSVERSE JOINTS JOINT SPACING - 15' TYPICAL
	CURB & GUTTER / PIGMENTED CONCRETE

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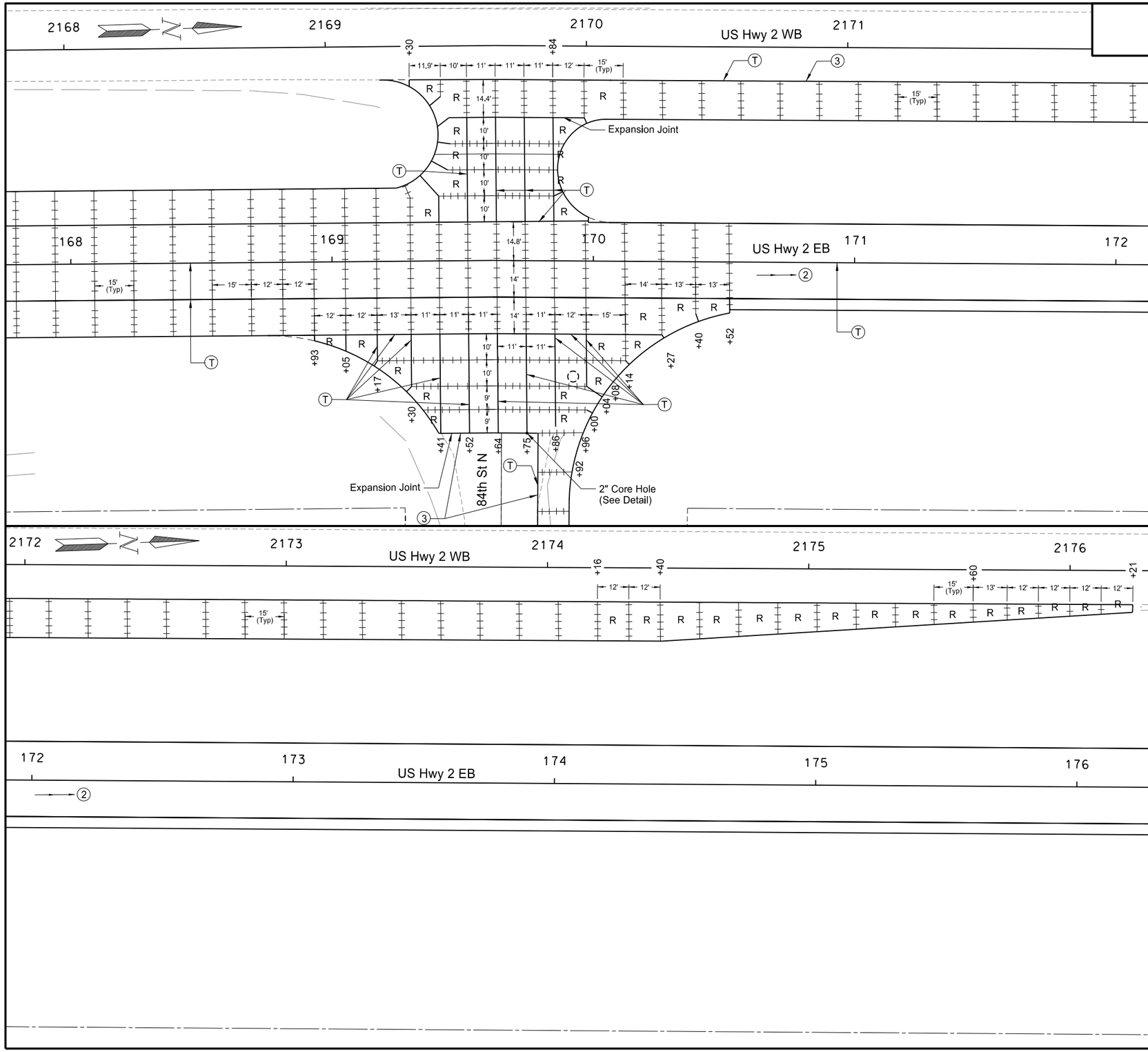
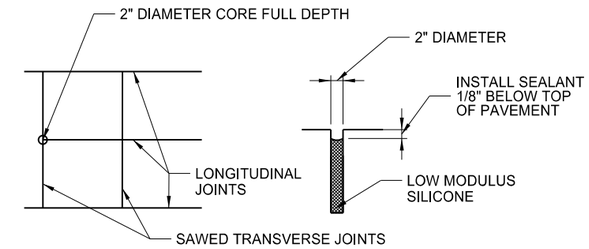
Paving Layout

US 2

58th St Intersection

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	90	3





CORE DETAIL

NOTES:

1. Stationing is based on Alignment "PR_US2" unless otherwise noted.
2. (2) Continue 15' typical spacing on mainline.
3. (3) Match existing joints.
4. Tie bars will be drilled and epoxied into place where existing pavement abuts new pavement or curb and gutter. All costs to be included in price bid for concrete pavement.

LEGEND

R	PAVEMENT REINFORCEMENT - SEE DETAIL
(T)	TIED JOINT WITH HOT POUR SEAL - SEE DETAIL
+++++++	DOWELED JOINT AT TRANSVERSE JOINTS JOINT SPACING - 15' TYPICAL
	CURB & GUTTER / PIGMENTED CONCRETE

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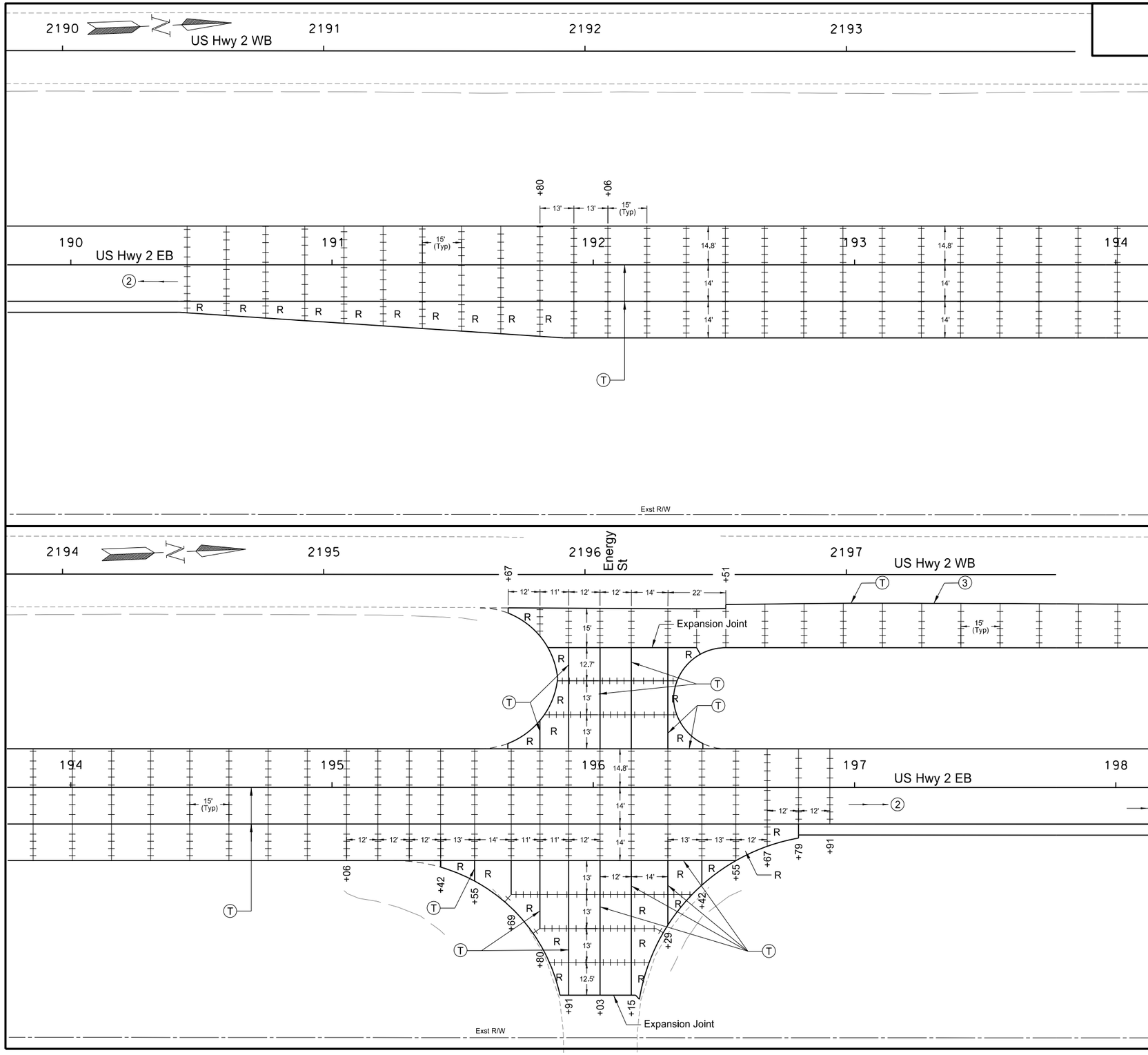
Paving Layout

US 2

84th St W Intersection

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	90	4



NOTES:

1. Stationing is based on Alignment "PR_US2" unless otherwise noted.
2. (2) Continue 15' typical spacing on mainline.
3. (3) Match existing joints.
4. Tie bars will be drilled and epoxied into place where existing pavement abuts new pavement or curb and gutter. All costs to be included in price bid for concrete pavement.

LEGEND

R	PAVEMENT REINFORCEMENT - SEE DETAIL
(T)	TIED JOINT WITH HOT POUR SEAL - SEE DETAIL
+++++++++	DOWELED JOINT AT TRANSVERSE JOINTS JOINT SPACING - 15' TYPICAL
	CURB & GUTTER / PIGMENTED CONCRETE

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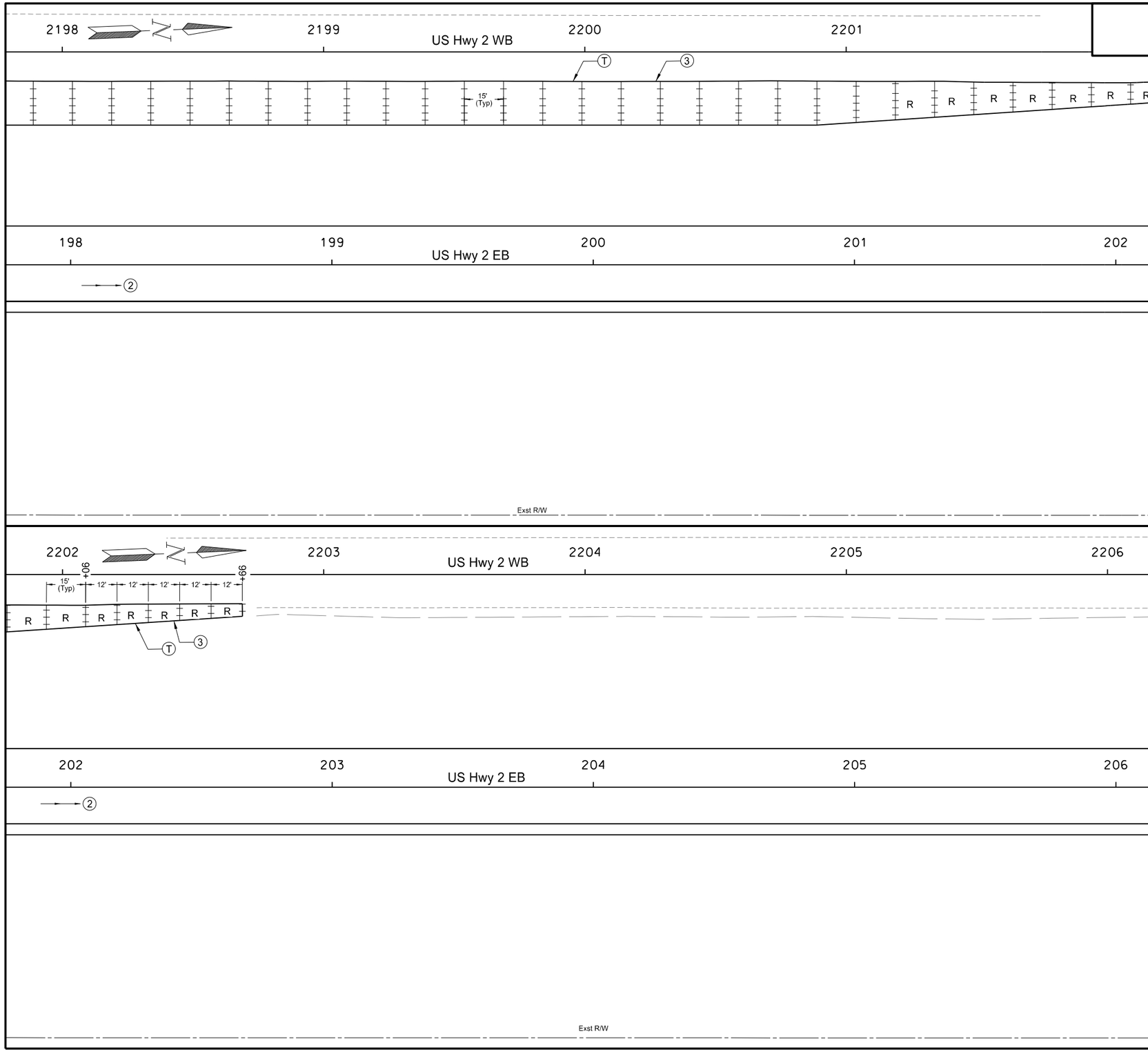
Paving Layout

US 2

Energy St Intersection

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	90	5



NOTES:

1. Stationing is based on Alignment "PR_US2" unless otherwise noted.
2. Continue 15' typical spacing on mainline.
3. Match existing joints.
4. Tie bars will be drilled and epoxied into place where existing pavement abuts new pavement or curb and gutter. All costs to be included in price bid for concrete pavement.

LEGEND

R	PAVEMENT REINFORCEMENT - SEE DETAIL
T	TIED JOINT WITH HOT POUR SEAL - SEE DETAIL
	DOWELED JOINT AT TRANSVERSE JOINTS JOINT SPACING - 15' TYPICAL
	CURB & GUTTER / PIGMENTED CONCRETE

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Paving Layout

US 2

Energy St Intersection

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	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**	**16**	**2**	**11**			**16**	**19**	**304**
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)							18	
G20-10-108	**108"x48"**	**CONTRACTOR SIGN**	**2**		**2**			**2**	**64**	**128**
G20-50a-72	**72"x36"**	**ROAD WORK NEXT __ MILES RT & LT ARROWS**		**17**				**17**	**37**	**629**
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**	**16**	**4**	**12**			**16**	**59**	**944**
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							32	
R1-1a-18	**18"x18"**	**STOP and SLOW PADDLE Back to Back**	**8**		**5**			**8**	**5**	**40**
R1-2-60	**60"x60"**	**YIELD**		**1**				**1**	**29**	**29**
R2-1-48	**48"x60"**	**SPEED LIMIT __**	**56**	**11**	**40**			**56**	**39**	**2184**
R2-1a-24	**24"x18"**	**MINIMUM FEE $80 (Mounted on Speed Limit post)**			**10**			**10**	**10**	**100**
R2-1aP-24	**24"x18"**	**MINIMUM FEE $80 (Mounted on Speed Limit post)**	**16**		**2**			**16**	**10**	**160**
R3-2-24	24"x24"	LEFT TURN PROHIBITION							10	
R3-6L-36	**30"x36"**	**MANDATORY MOVEMENT LANE CONTROL**		**1**				**1**	**16**	**16**
R3-7-48	**48"x48"**	**LEFT or RIGHT LANE MUST TURN LEFT or RIGHT**		**1**				**1**	**35**	**35**
R4-1-48	**48"x60"**	**DO NOT PASS**	**16**	**18**	**10**			**18**	**39**	**702**
R4-7-48	**48"x60"**	**KEEP RIGHT SYMBOL**		**2**				**2**	**39**	**78**
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**		**5**		**7**		**7**	**28**	**196**
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	
W1-3-48	48"x48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW							35	
W1-4-48	**48"x48"**	**RIGHT or LEFT REVERSE CURVE ARROW**		**3**				**3**	**35**	**105**
W1-4b-48	48"x48"	DOUBLE RIGHT or LEFT REVERSE CURVE ARROW							35	
W1-6-48	**48"x24"**	**LARGE ARROW**		**2**				**2**	**26**	**52**
W3-1-48	48"x48"	STOP AHEAD SYMBOL							35	
W3-3-48	48"x48"	SIGNAL AHEAD SYMBOL							35	
W3-4-48	48"x48"	BE PREPARED TO STOP							35	
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**16**	**2**	**12**			**16**	**35**	**560**
W4-1L-48	**48"x48"**	**MERGING TRAFFIC**		**1**				**1**	**35**	**35**
W4-2-48	**48"x48"**	**RIGHT or LEFT LANE TRANSITION SYMBOL**	**16**	**4**	**12**			**16**	**35**	**560**
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**		**19**				**19**	**35**	**665**
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)**		**2**				**2**	**11**	**22**
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**	**16**	**28**	**12**			**28**	**35**	**980**
W20-2-48	48"x48"	DETOUR AHEAD or __ FT							35	
W20-3-48	**48"x48"**	**ROAD or STREET CLOSED AHEAD or __ FT.**				**3**		**3**	**35**	**105**
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.**	**16**	**6**	**12**			**16**	**35**	**560**
W20-7a-48	**48"x48"**	**FLAGGING SYMBOL**	**8**		**5**			**8**	**35**	**280**
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	
W20-52P-54	**54"x12"**	**NEXT __ MILES (Mounted on warning sign post)**		**18**				**18**	**12**	**216**
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**				**3**		**3**	**35**	**105**
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	
W24-1L-48	**48"x48"**	**RIGHT or LEFT DOUBLE REVERSE CURVE**		**2**				**2**	**35**	**70**
	24"x24"	TAKE TURNS (6" D letters) (Mounted on stop sign post)							11	

SPECIAL SIGNS

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS 9860**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY BY PHASE NO. 1	2	3	4		TOTAL QUANTITY
704-0100	**FLAGGING**	MHR	**250**	**1750**	**250**	**100**		**2350**
704-1041	**ATTENUATION DEVICE-TYPE B-55**	EACH		**1**				**1**
704-1043	**ATTENUATION DEVICE-TYPE B-65**	EACH		**1**				**1**
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	**8**	**42**	**4**	**19**		**42**
704-1060	**DELINEATOR DRUMS**	EACH	**170**	**347**	**85**	**110**		**347**
704-1065	**TRAFFIC CONES**	EACH			**118**			**118**
704-1067	**TUBULAR MARKERS**	EACH	**130**		**74**			**130**
704-1070	DELINEATOR	EACH						
704-1072	**FLEXIBLE DELINEATORS**	EACH		**795**				**795**
704-1080	**STACKABLE VERTICAL PANELS**	EACH	**50**					**50**
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	**8**		**5**			**8**
704-1088	**SEQUENCING ARROW PANEL - TYPE C - CROSSOVER**	EACH		**2**				**2**
704-1095	TYPE B FLASHERS	EACH						
704-1500	**OBLITERATION OF PVMT MK**	SF		**16020**				**16020**
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF						
704-3510	**PRECAST CONCRETE MED BARRIER - STATE FURNISHED**	EACH		**69**				**69**
762-0200	**RAISED PAVEMENT MARKERS**	EACH		**21385**				**21385**
762-0420	**SHORT TERM 4IN LINE - TYPE R**	LF		**50037**				**50037**
762-0426	**SHORT TERM 24 IN LINE - TYPE R (LF)**	LF		**29**				**29**
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF						
772-2110	**FLASHING BEACON - POST MOUNTED**	EACH		**2**				**2**

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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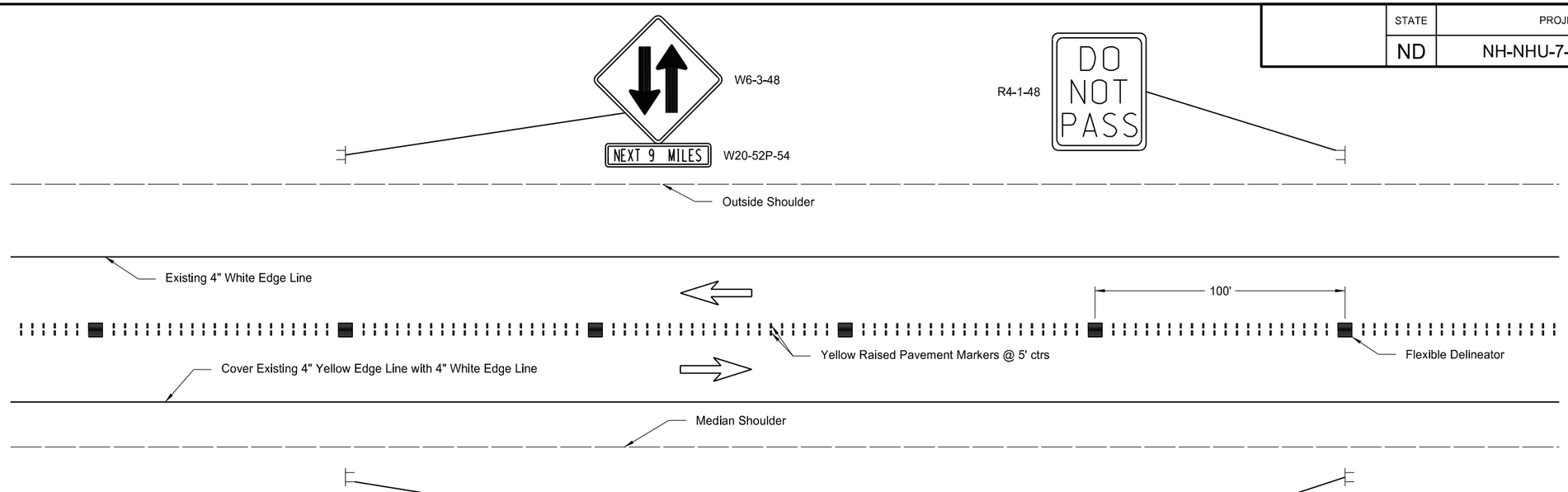
Traffic Control Devices List

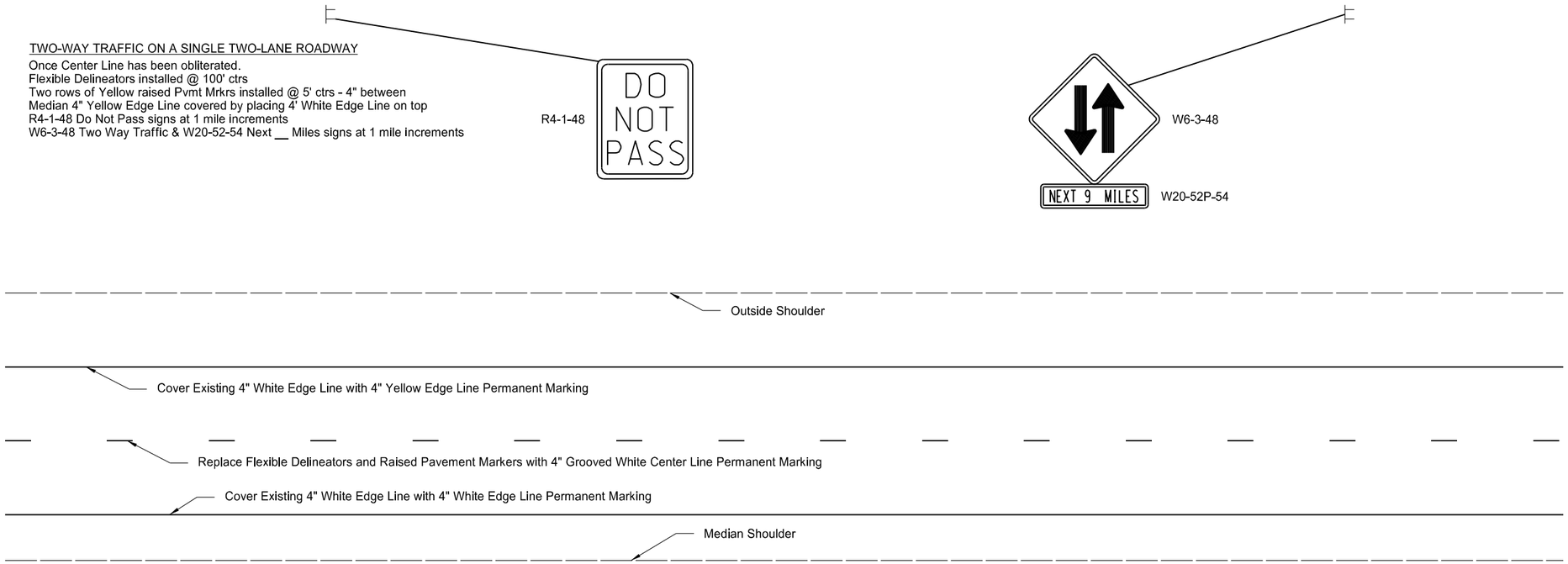
US 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	2



TWO-WAY TRAFFIC ON A SINGLE TWO-LANE ROADWAY

Once Center Line has been obliterated.
Flexible Delineators installed @ 100' ctrs
Two rows of Yellow raised Pvmt Mrkrs installed @ 5' ctrs - 4" between
Median 4" Yellow Edge Line covered by placing 4' White Edge Line on top
R4-1-48 Do Not Pass signs at 1 mile increments
W6-3-48 Two Way Traffic & W20-52-54 Next __ Miles signs at 1 mile increments



TO RETURN TRAFFIC TO NORMAL FOUR LANE DIVIDED OPERATION

Remove Flexible Delineators and Raised Pavement Markers.
Place 4" Grooved White Center Line Epoxy Pavement Marking.
Place 4" White Edge Line Preformed Patterned Pavement Marking.
Place 4" Yellow Edge Line Epoxy Pavement Marking over Median 4" White Edge Line.

*Note: Drawing not to scale.

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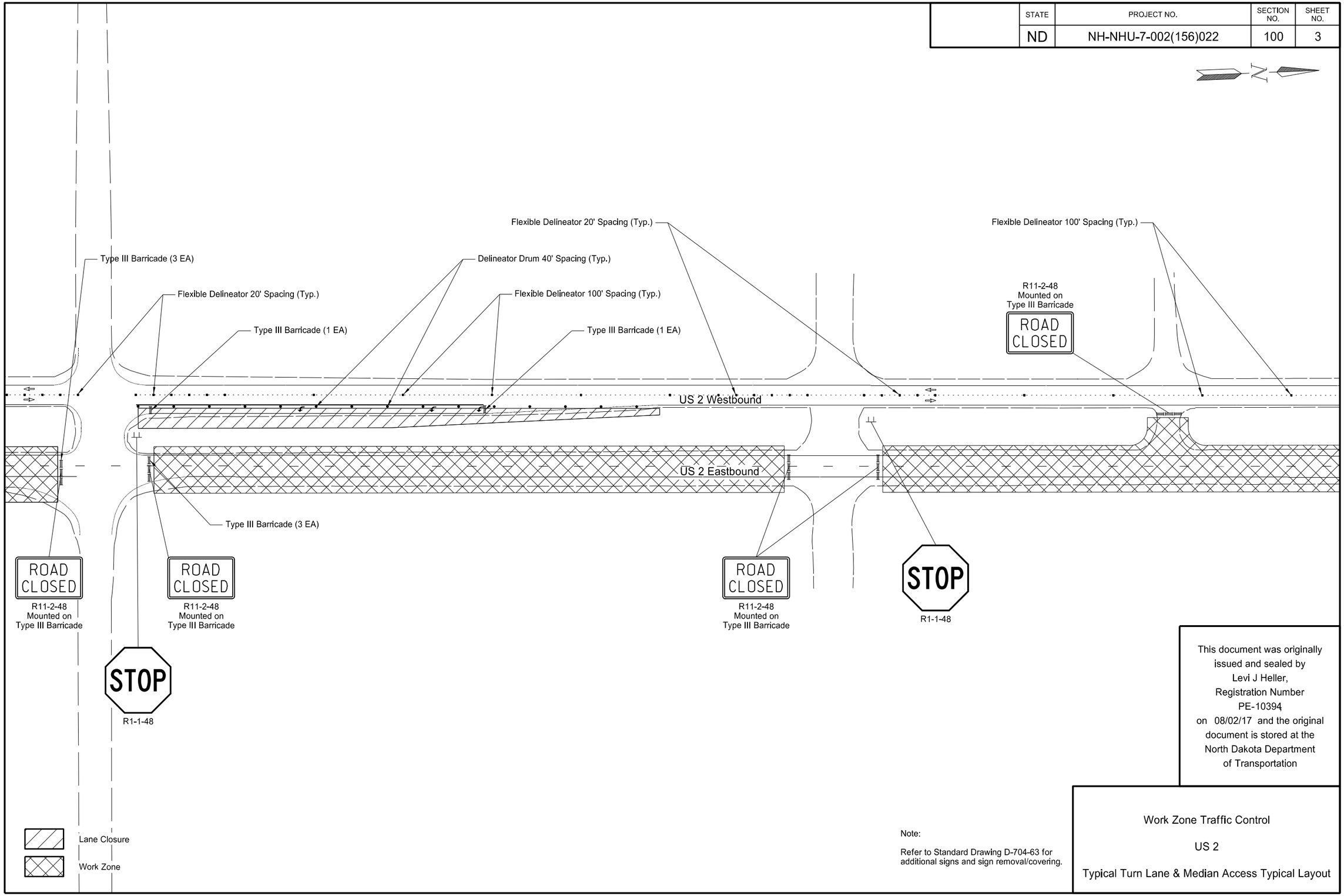
Two Way Traffic Control

US 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	3



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Note:

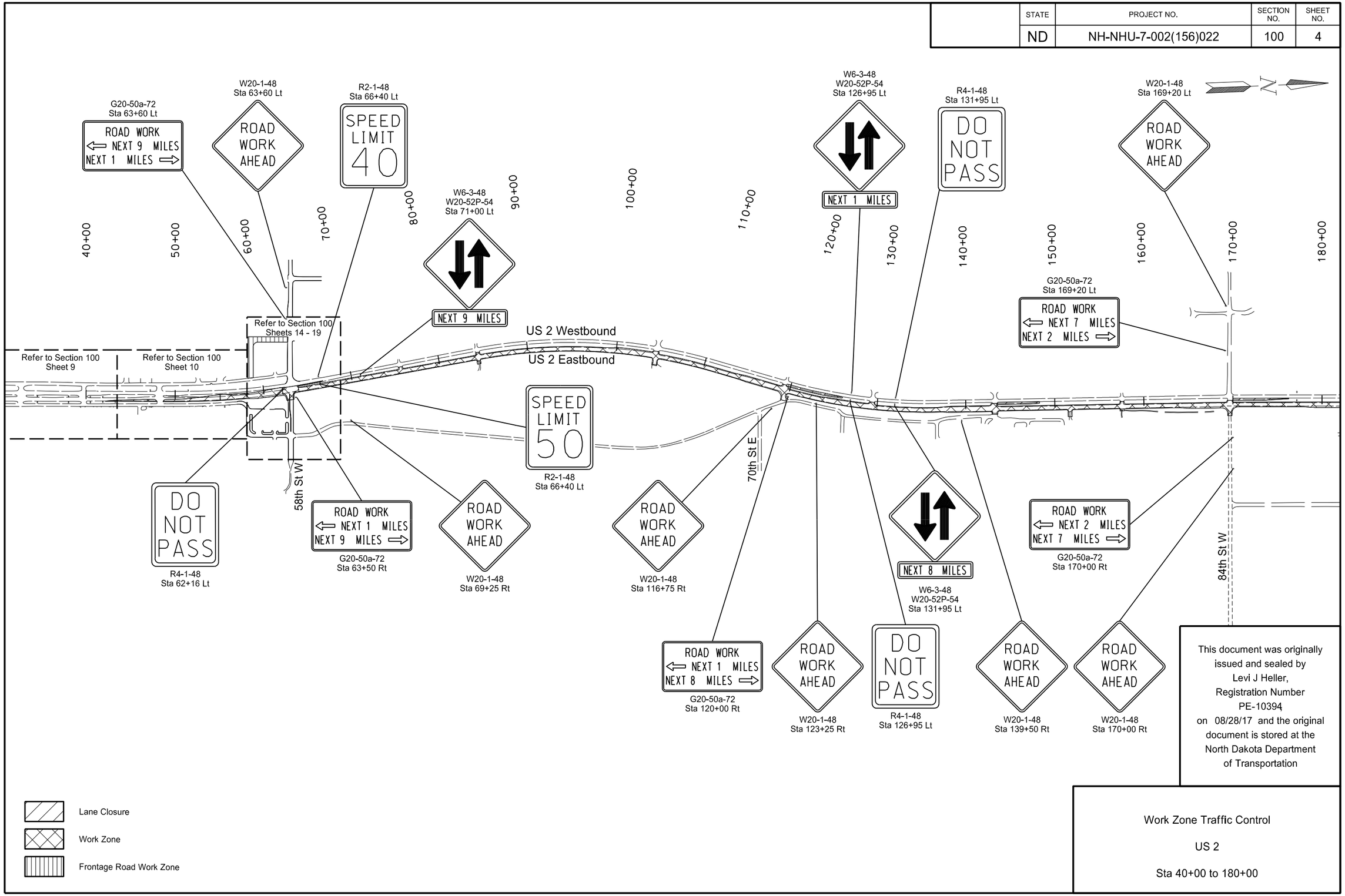
Refer to Standard Drawing D-704-63 for additional signs and sign removal/covering.

Work Zone Traffic Control

US 2

Typical Turn Lane & Median Access Typical Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	4



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Lane Closure

Work Zone

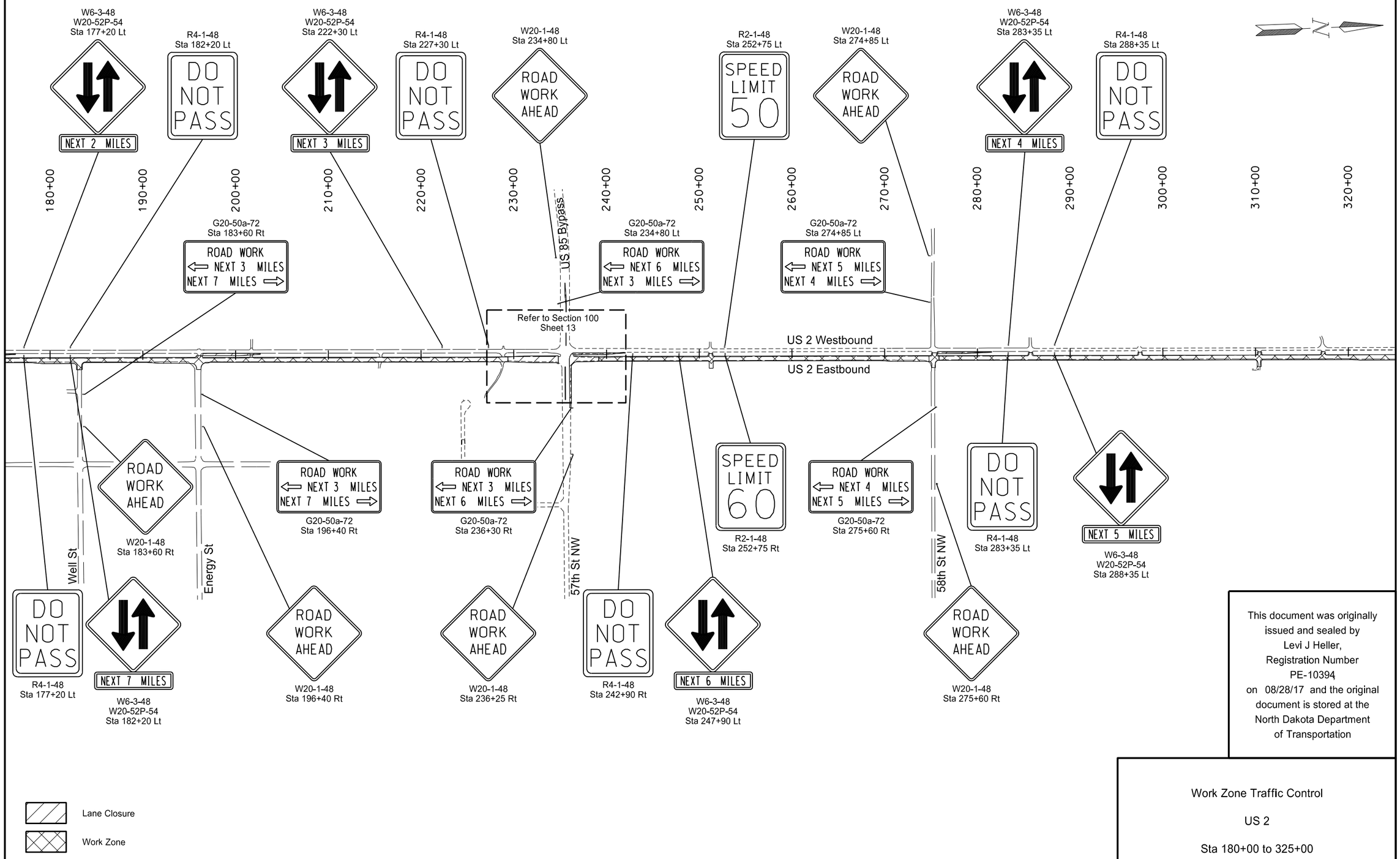
Frontage Road Work Zone

Work Zone Traffic Control

US 2

Sta 40+00 to 180+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	5



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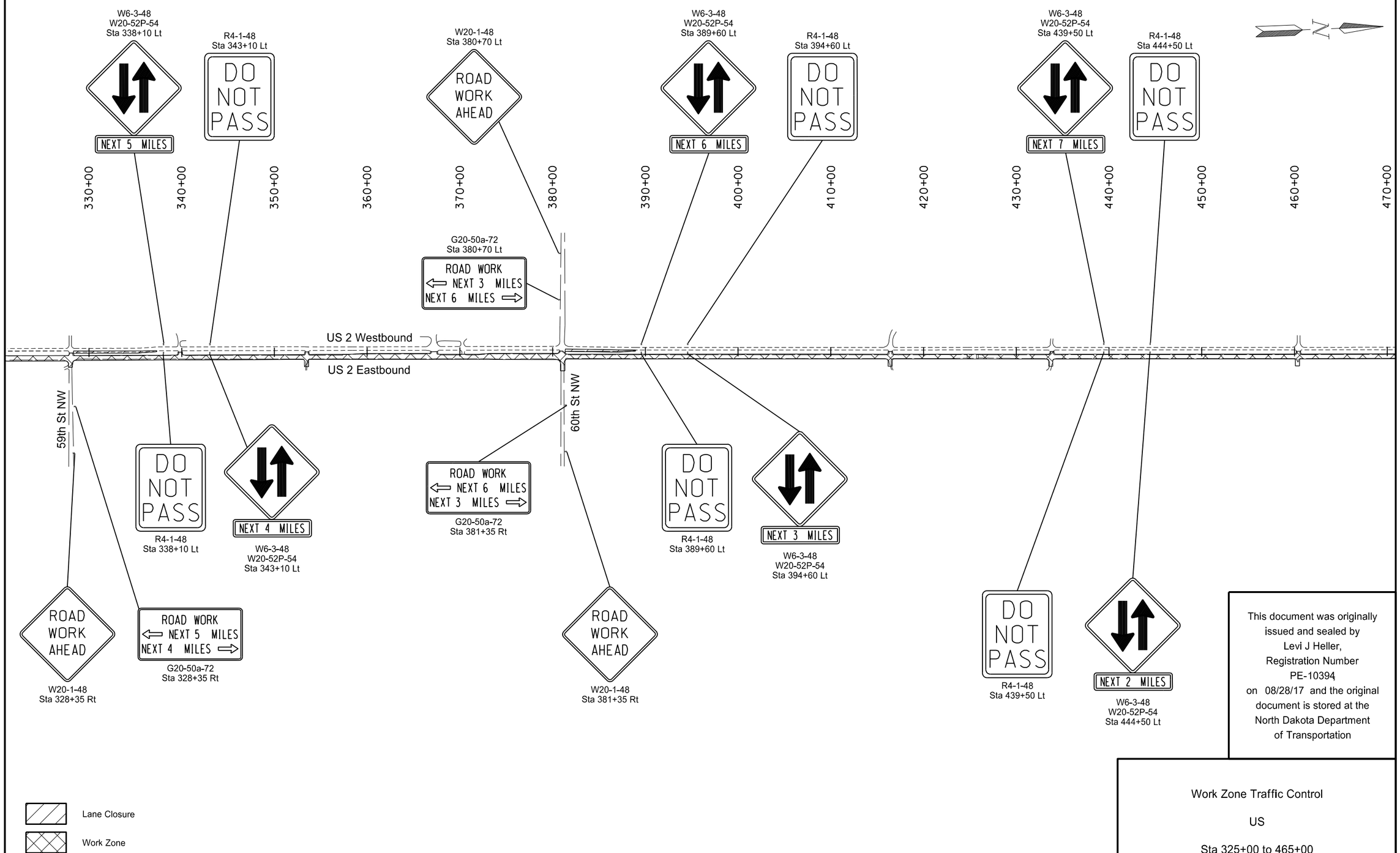
Work Zone Traffic Control

US 2

Sta 180+00 to 325+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	6



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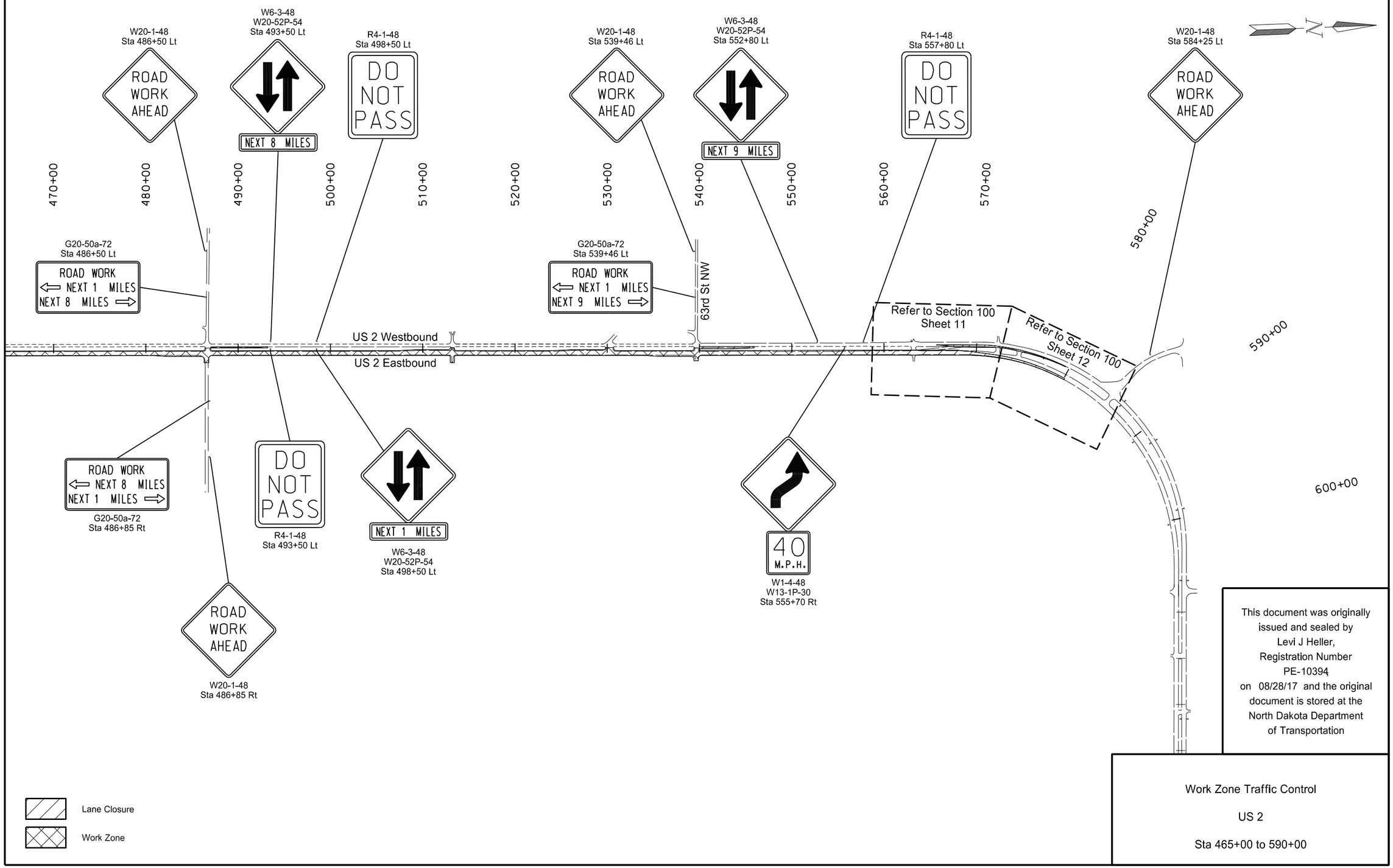
Work Zone Traffic Control

US

Sta 325+00 to 465+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	7



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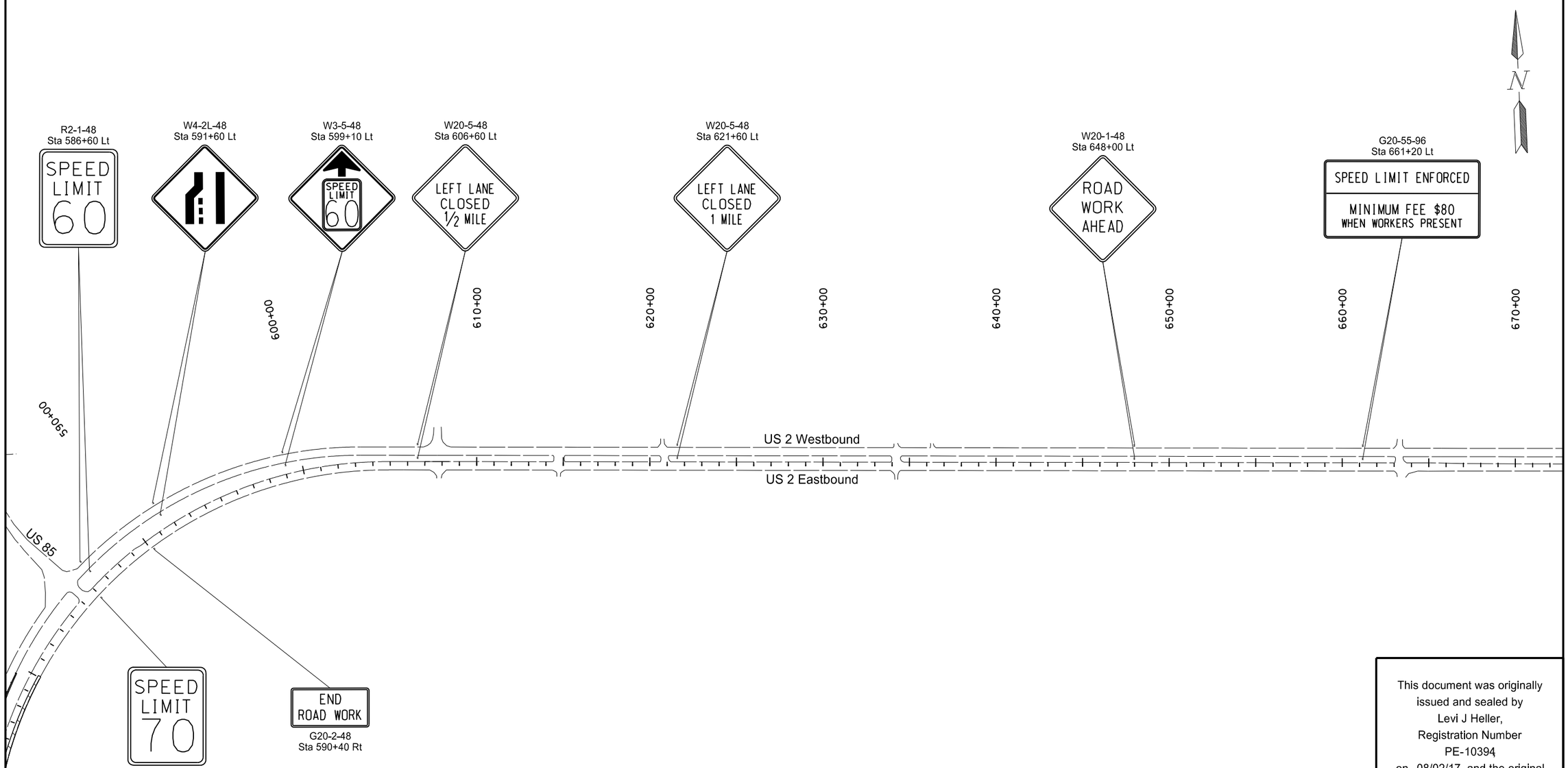
Work Zone Traffic Control

US 2

Sta 465+00 to 590+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	8



Lane Closure

Work Zone

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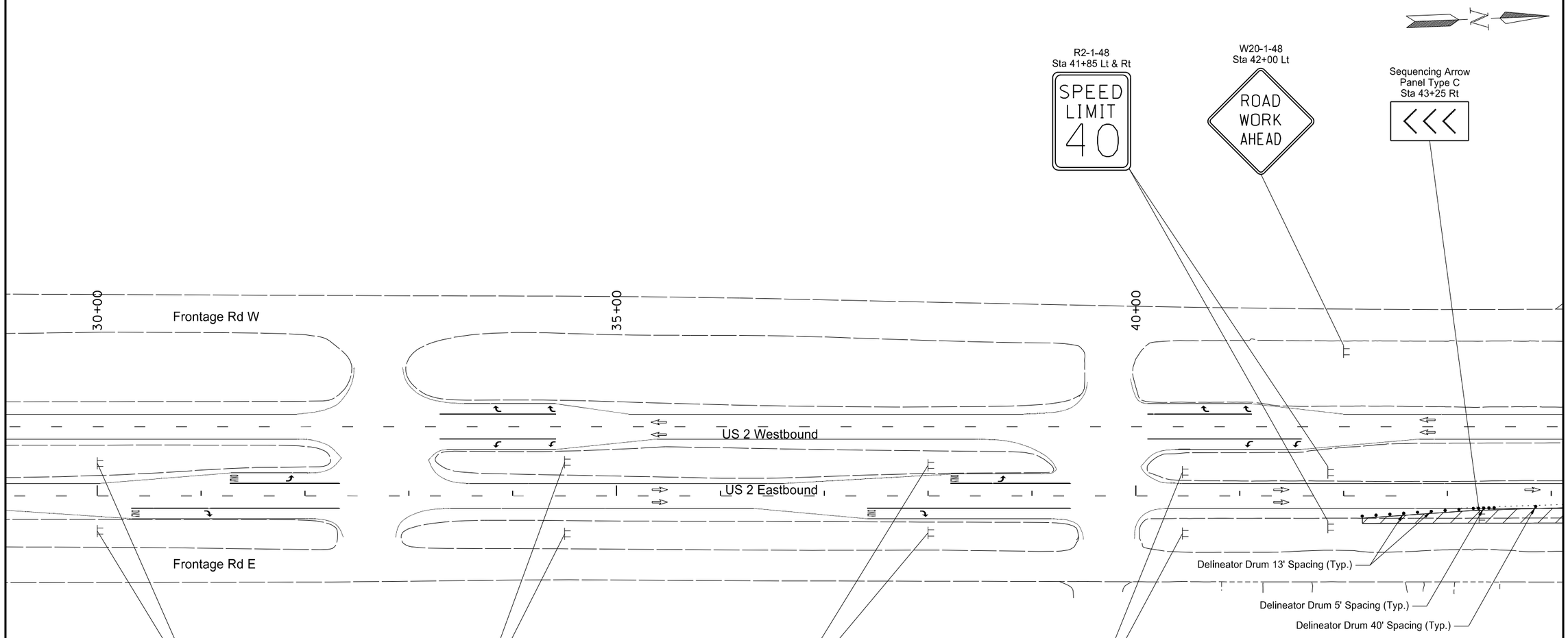
Work Zone Traffic Control

US 2

Sta 590+00 to 670+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	9



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Lane Closure

Work Zone

Note:

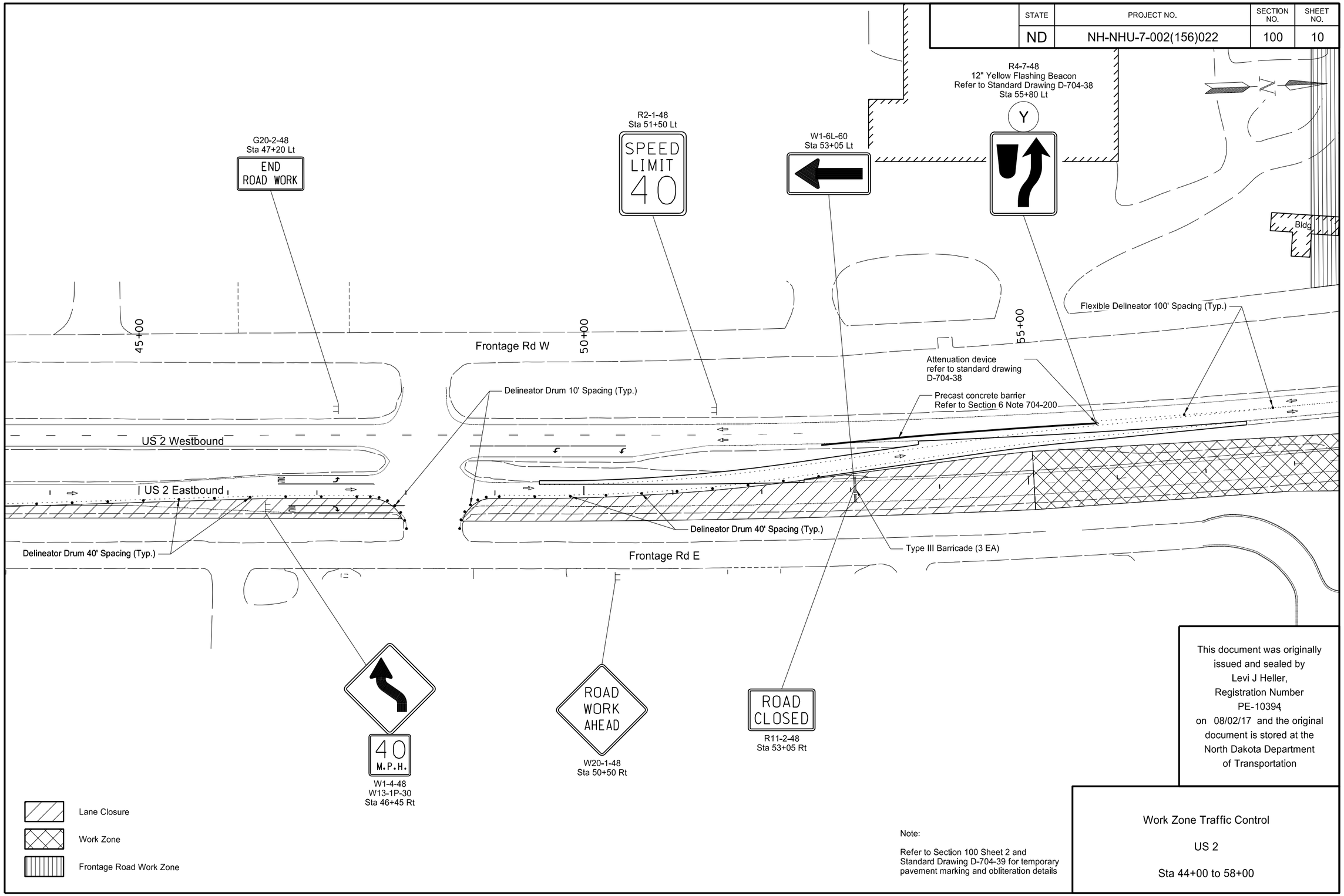
Refer to Section 100 Sheet 2 and Standard Drawing D-704-39 for temporary pavement marking and obliteration details

Work Zone Traffic Control

US 2

Sta 30+00 to 44+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	10



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Note:

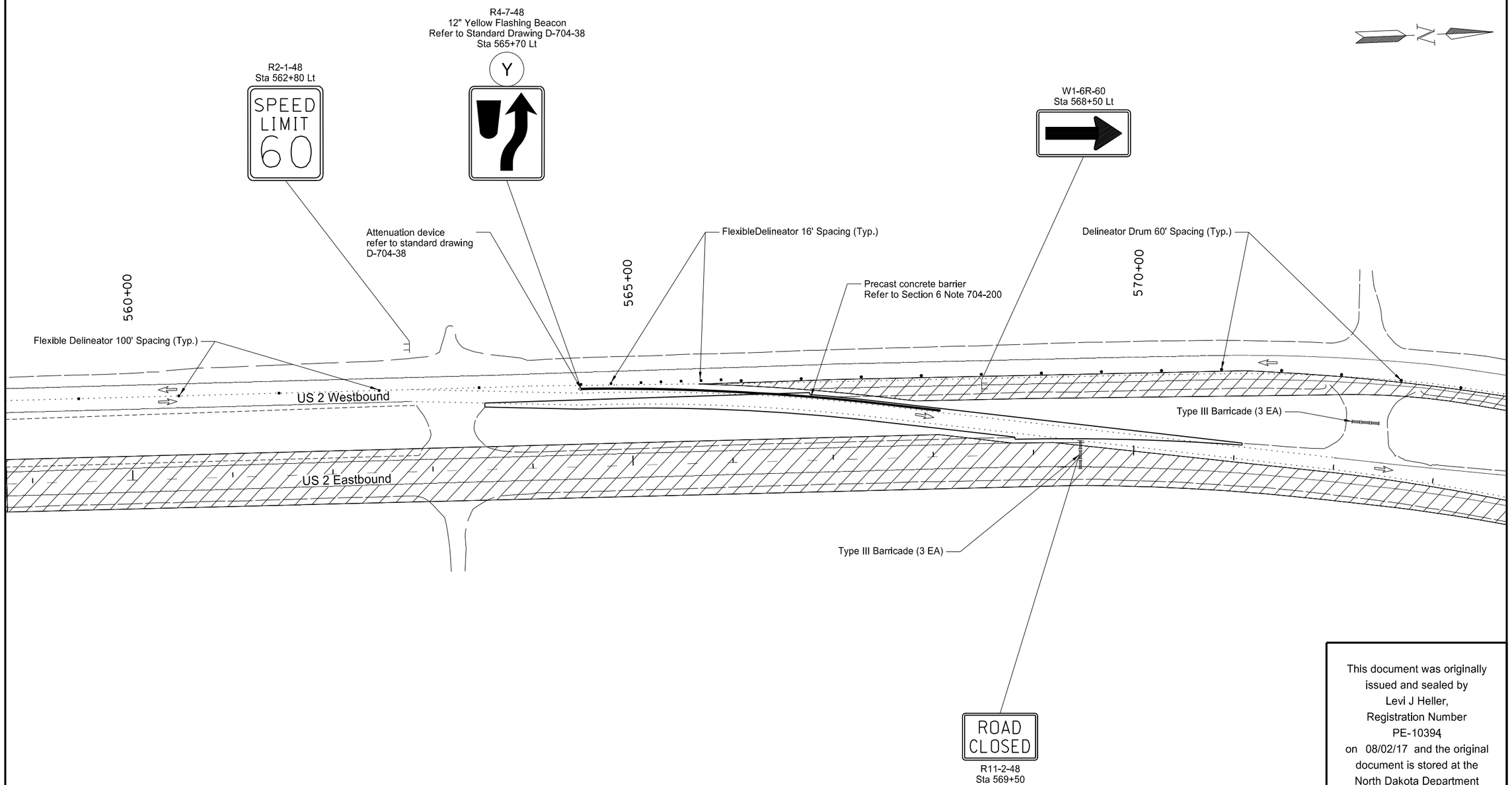
Refer to Section 100 Sheet 2 and Standard Drawing D-704-39 for temporary pavement marking and obliteration details

Work Zone Traffic Control

US 2

Sta 44+00 to 58+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7002(156)022	100	11



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Lane Closure

Work Zone

Note:

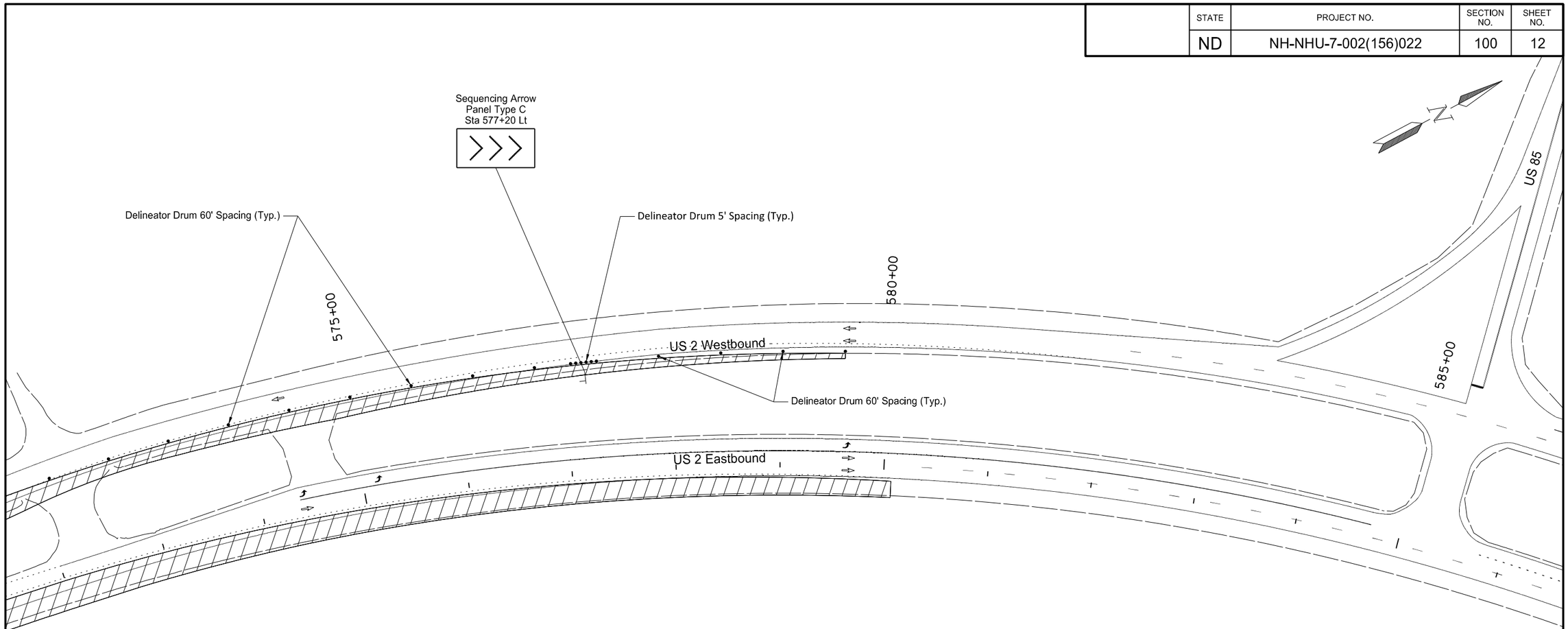
Refer to Section 100 Sheet 2 and Standard Drawing D-704-39 for temporary pavement marking and obliteration details

Work Zone Traffic Control

US 2

Sta 560+00 to 573+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	12



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Lane Closure

Work Zone

Note:

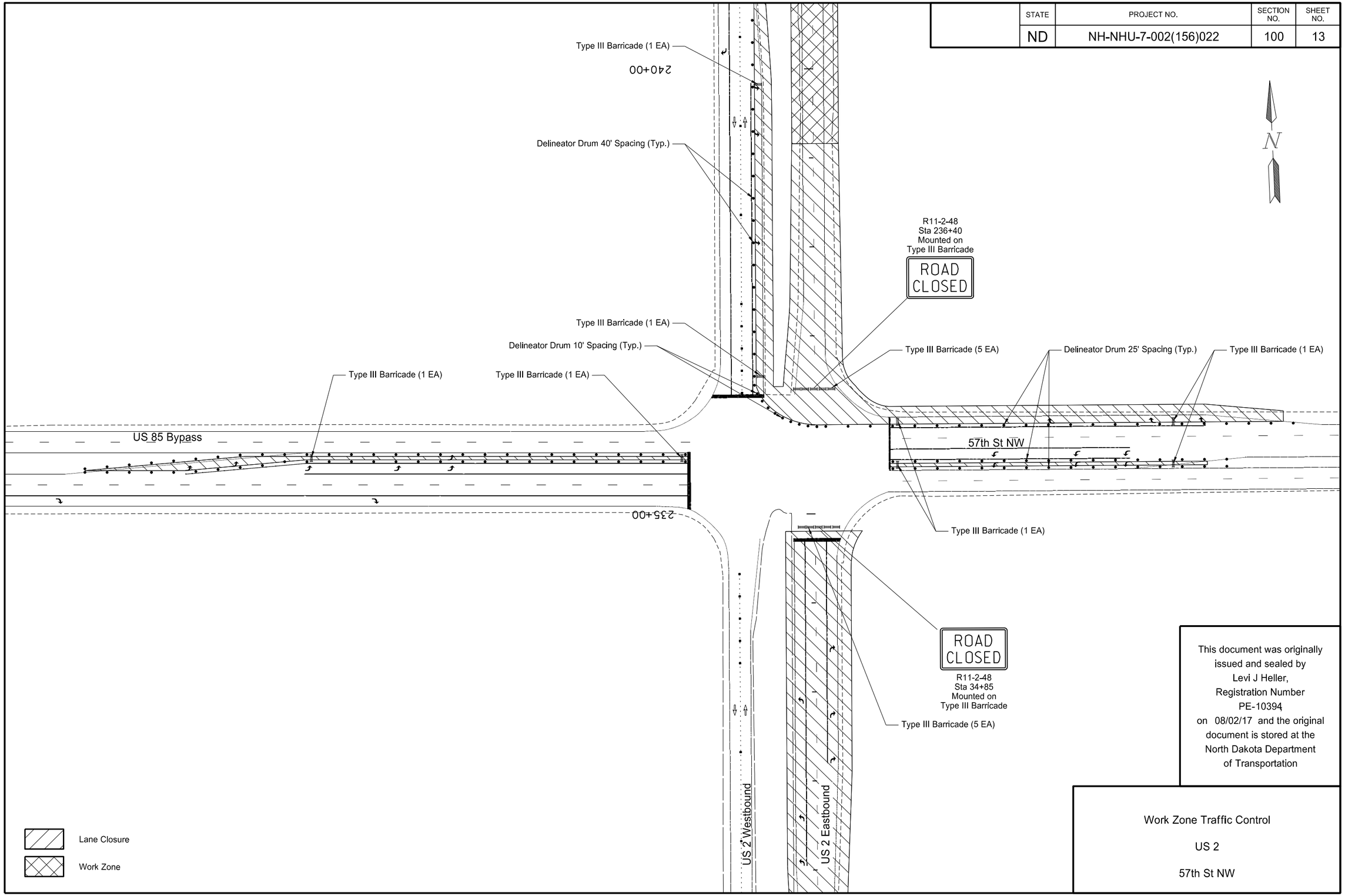
Refer to Section 100 Sheet 2 and Standard Drawing D-704-39 for temporary pavement marking and obliteration details

Work Zone Traffic Control

US 2

Sta 573+00 to 585+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	13



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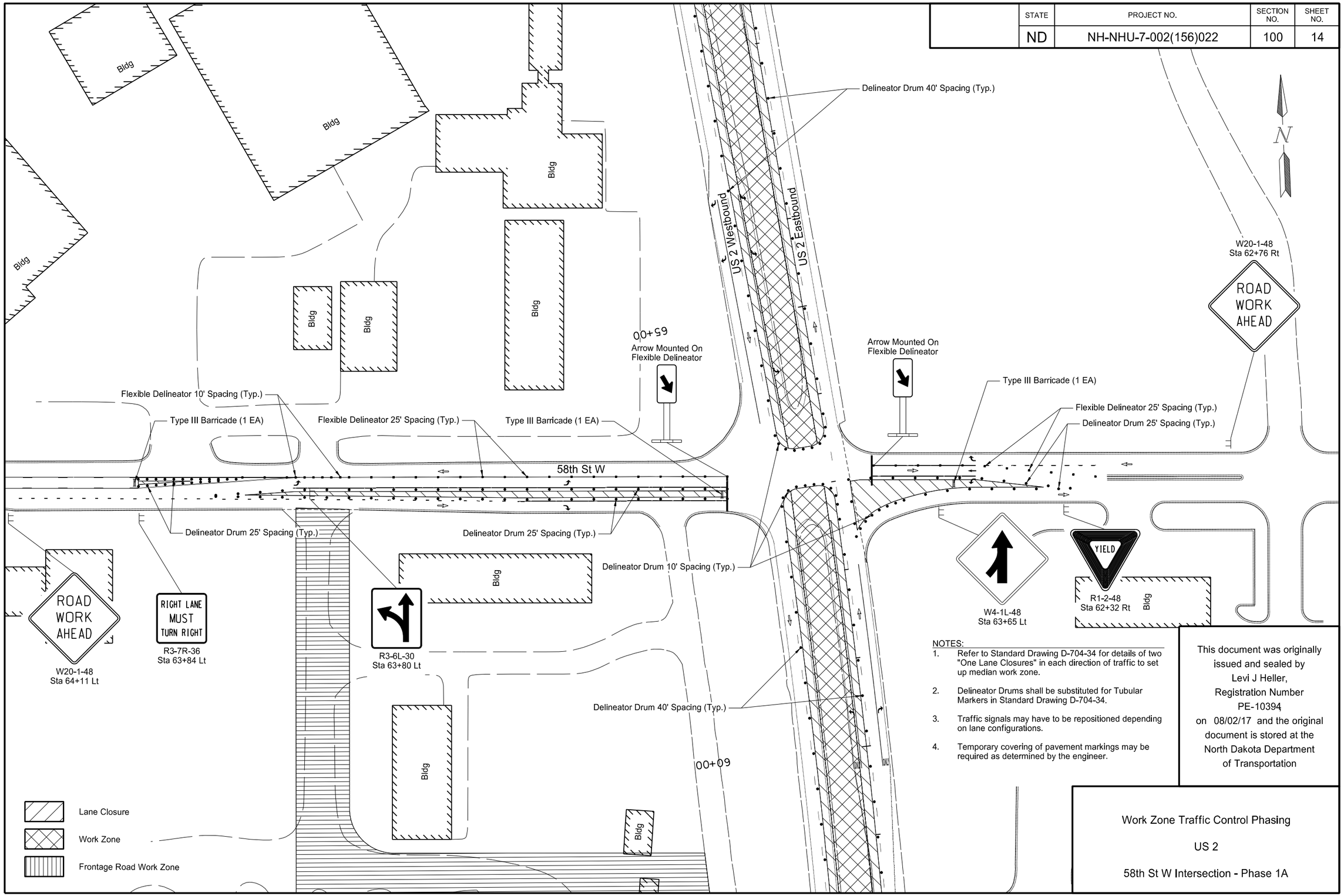
Work Zone Traffic Control

US 2

57th St NW

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	14



NOTES:

1. Refer to Standard Drawing D-704-34 for details of two "One Lane Closures" in each direction of traffic to set up median work zone.
2. Delineator Drums shall be substituted for Tubular Markers in Standard Drawing D-704-34.
3. Traffic signals may have to be repositioned depending on lane configurations.
4. Temporary covering of pavement markings may be required as determined by the engineer.

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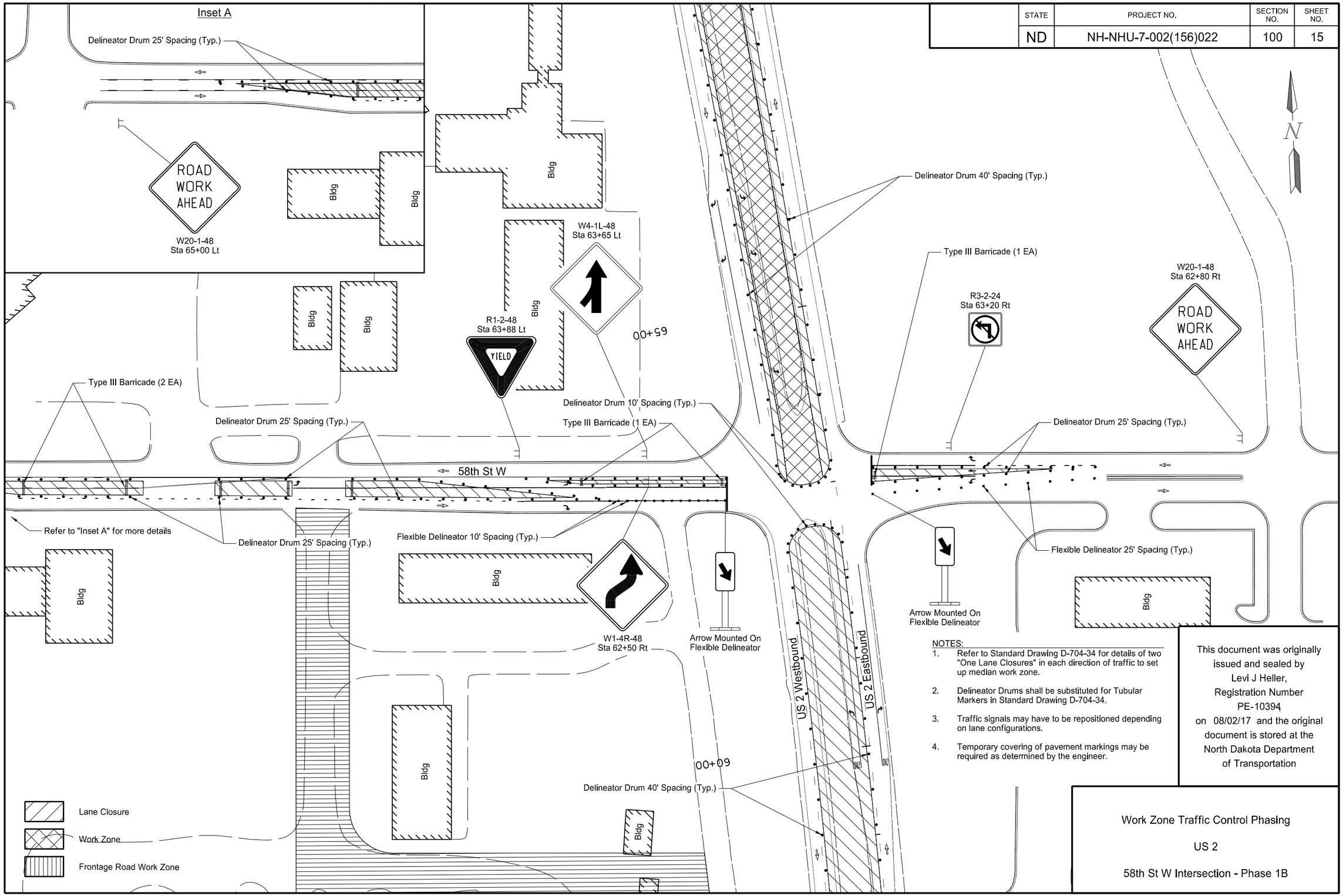
Work Zone Traffic Control Phasing

US 2

58th St W Intersection - Phase 1A

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	15



NOTES:

1. Refer to Standard Drawing D-704-34 for details of two "One Lane Closures" in each direction of traffic to set up median work zone.
2. Delineator Drums shall be substituted for Tubular Markers in Standard Drawing D-704-34.
3. Traffic signals may have to be repositioned depending on lane configurations.
4. Temporary covering of pavement markings may be required as determined by the engineer.

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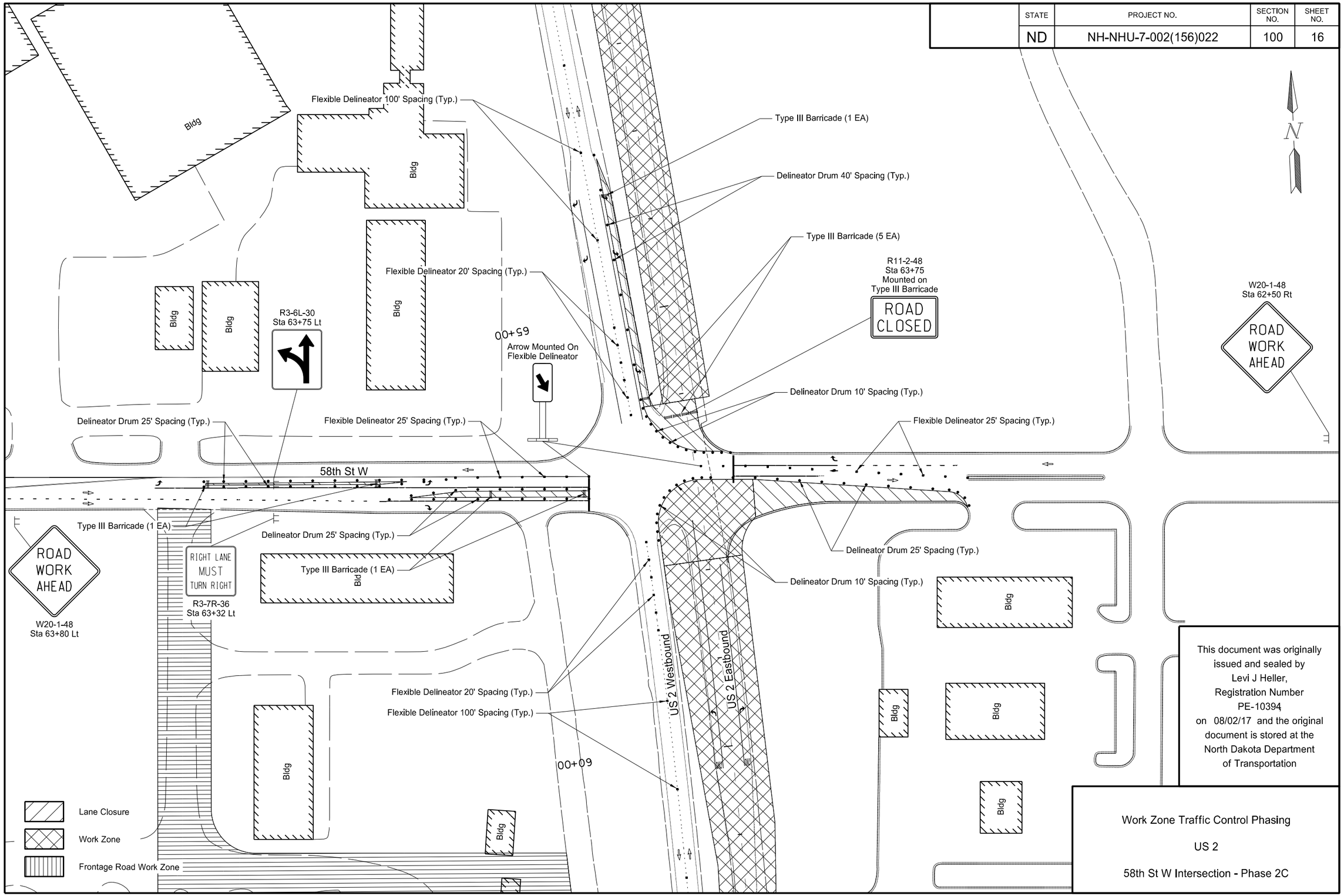
Work Zone Traffic Control Phasing

US 2

58th St W Intersection - Phase 1B

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	16



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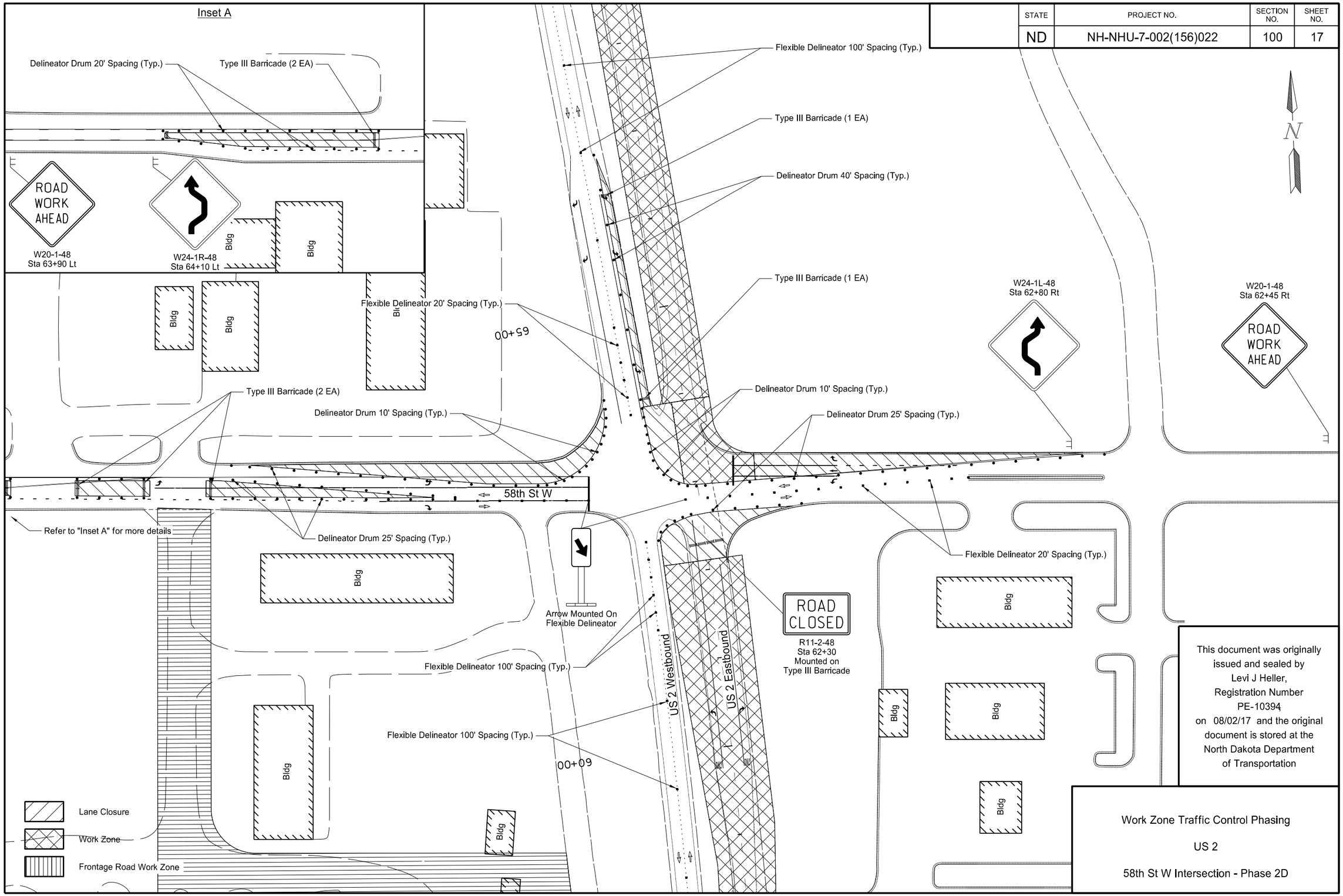
Work Zone Traffic Control Phasing

US 2

58th St W Intersection - Phase 2C

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	17



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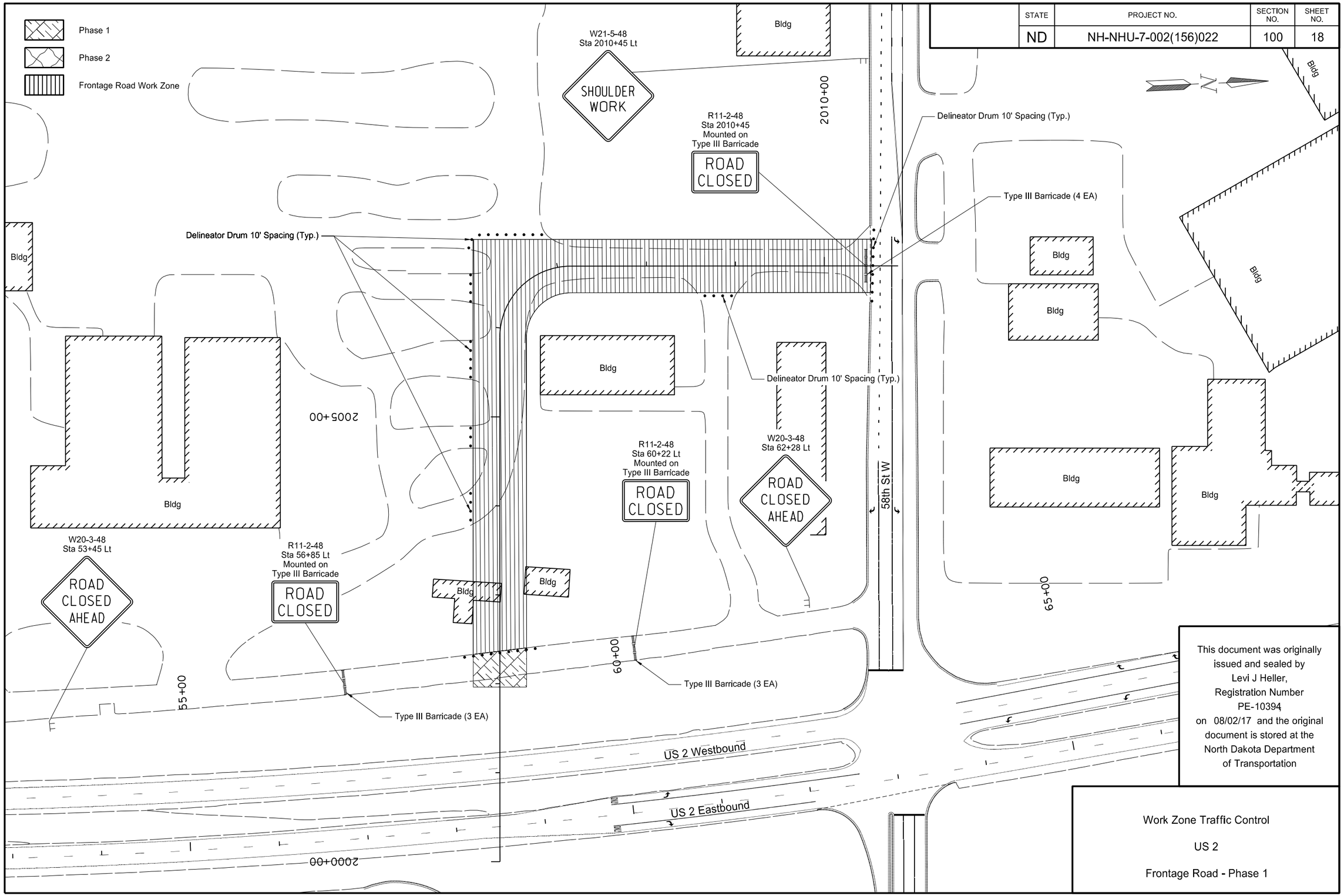
Work Zone Traffic Control Phasing

US 2

58th St W Intersection - Phase 2D

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	18



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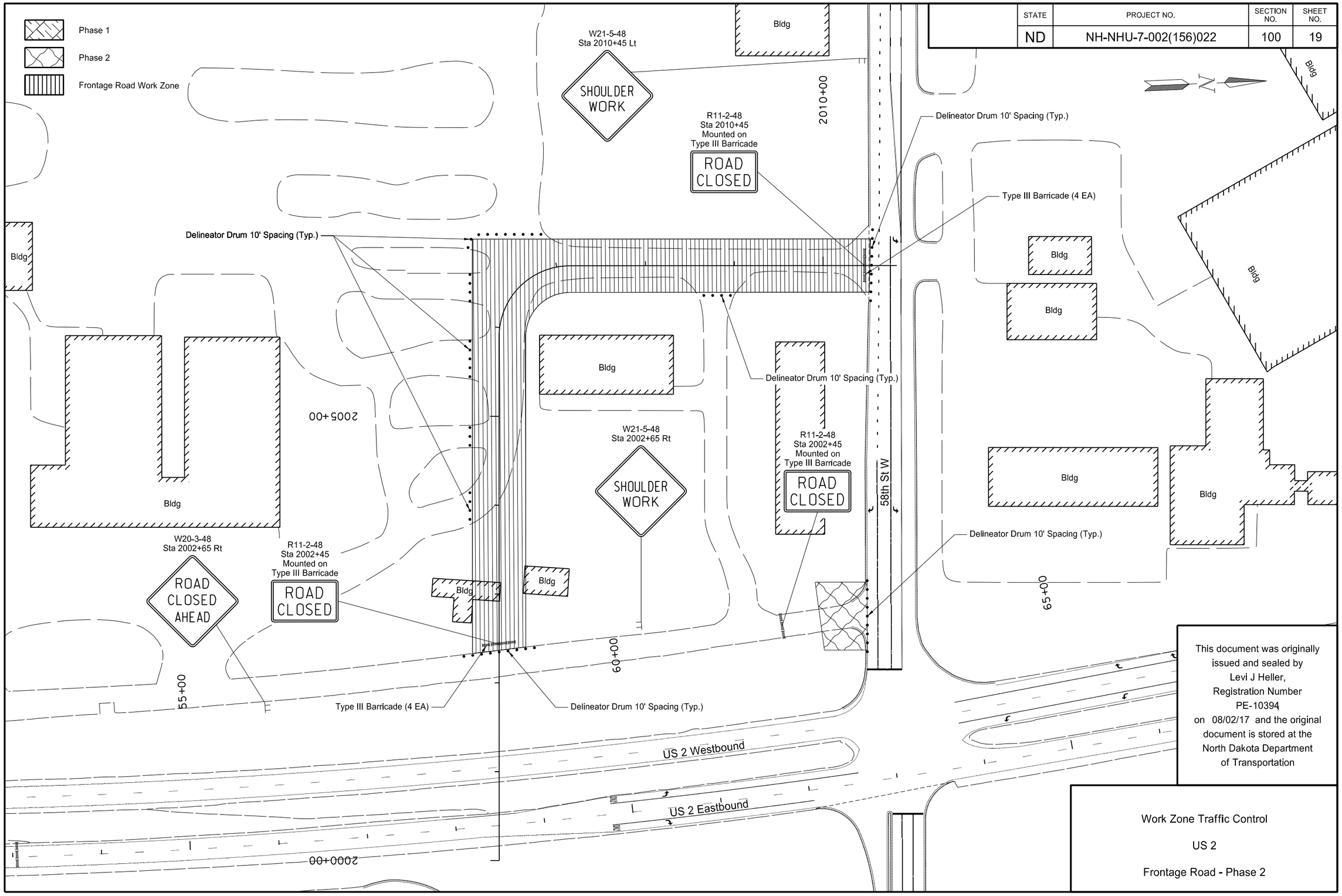
Work Zone Traffic Control

US 2

Frontage Road - Phase 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	100	19



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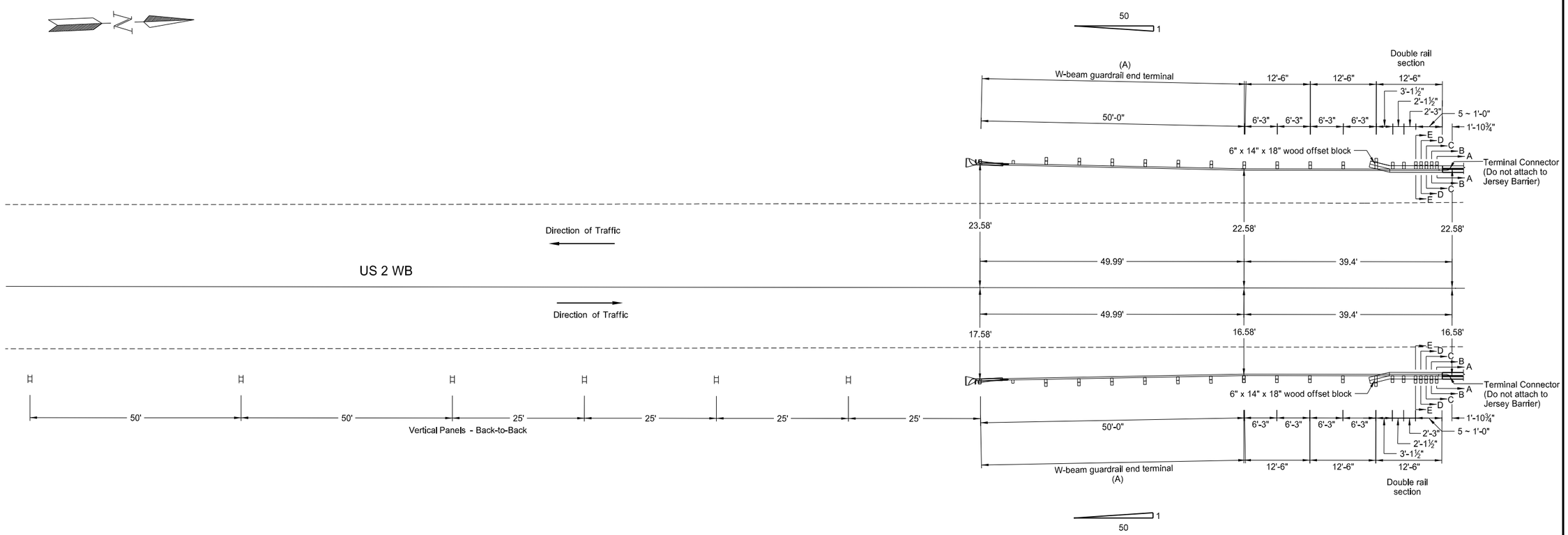
Work Zone Traffic Control

US 2

Frontage Road - Phase 2

23 U.S.C. 409 NDDOT Reserves All Objections	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-NHU-7-002(156)022	100	20

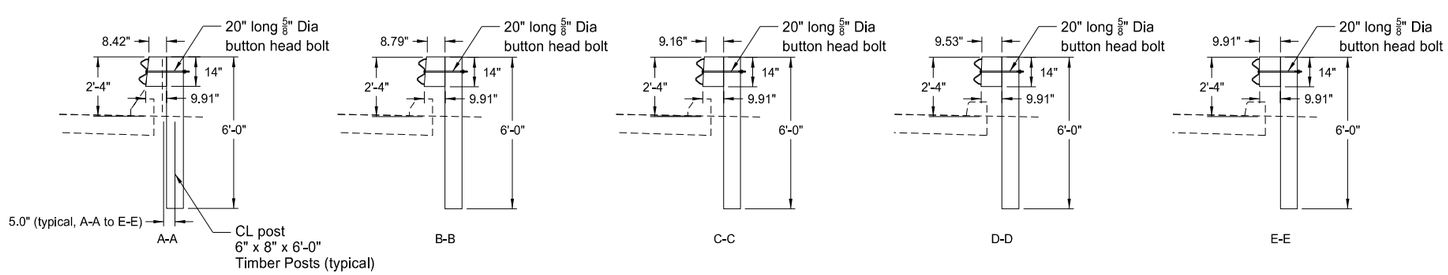
1" = 20'



SPEC	CODE	BID ITEM	QTY	UNIT
704	1081	VERTICAL PANELS-BACK TO BACK		
		Cow Creek WB Bridge	6	EA
764	0145	W-BEAM GUARDRAIL END TERMINALS		
		Cow Creek WB Bridge	2	EA

Notes

(A) Install a Sequential Kinking Terminal at this location



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Vertical Panel and W-Beam Guardrail Layout
For Two-Way Traffic

Cow Creek Crossing - RP 29.262

US 2 Westbound

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	NH-NHU-7-002(156)022	110	1

Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	Sign Support Length 2nd LF	Sign Support Length 3rd LF	Sign Support Length 4th LF	Vert Clear-ance FT	Support Size	Max Post Len LF	Sleeve Length 1st LF	Sleeve Length 2nd LF	Sleeve Length 3rd LF	Sleeve Length 4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
60+29 Rt	Spring Lake Park				13.70	14.20	14.70		7.0	2.5 x 2.5 10 ga	15.4						3	12	3 x 3 7 ga	1		3	
62+27 Lt	Sign 1		15.0																				Mount on Mast Arm
62+27 Lt	Sign 4	17		16.0																			Mount on Mast Arm
62+32 Rt	Sign 3		15.0																				Mount on Mast Arm
62+32 Rt	Sign 4	17		16.0																			Mount on Mast Arm
63+36 Rt	R6-1R	27	3.0		9.90				5.0	2 x 2 12 ga	13.2						1	4	2.25 x 2.25 12 ga				
63+72 Rt	Sign 1		15.0																				Mount on Mast Arm
63+72 Rt	Sign 4	17		16.0																			Mount on Mast Arm
63+75 Lt	Sign 3		15.0																				Mount on Mast Arm
63+75 Lt	Sign 4	17		16.0																			Mount on Mast Arm
66+44 Lt mdn	R2-1 & R2-1			24.0	14.70	14.70			7.0	2.5 x 2.5 12 ga	16.2						2	8	3 x 3 7 ga			2	
66+68 Lt	R2-1	11		12.0					7.0														Mount on Light Standard
68+56 Lt	W3-4	58		19.0	17.00	17.20	17.50		7.0	2.5 x 2.5 10 ga	19.4						3	12	3 x 3 7 ga			3	
68+56 Lt mdn	W3-4	58		19.0	17.00	17.20	17.50		7.0	2.5 x 2.5 10 ga	19.4						3	12	3 x 3 7 ga			3	
70+56 Lt	R2-1	10		7.5	14.40				7.0	2.5 x 2.5 10 ga	15.9						1	4	3 x 3 7 ga			1	
70+56 Rt	R2-1	10		7.5	14.40				7.0	2.5 x 2.5 10 ga	15.9						1	4	3 x 3 7 ga			1	
70+56 Lt mdn	R2-1			15.0	14.40				7.0	2.5 x 2.5 10 ga	15.9						1	4	3 x 3 7 ga			1	
72+79 Lt	Spring Lake Park				12.90	13.90			7.0	2.5 x 2.5 12 ga	15.0	4.0	5.0			2.25 x 2.25 12 ga	2	8	3 x 3 7 ga	1		2	
129+47 Rt	R6-1L	27		3.0	10.90				5.0	2 x 2 12 ga	13.2						1	4	2.25 x 2.25 12 ga				
158+62 Lt mdn	W3-3	21		16.0	15.50	16.00			7.0	2.5 x 2.5 12 ga	20.0	3.5	4.0			2.25 x 2.25 12 ga	2	8	3 x 3 7 ga			2	
158+62 Rt	W3-3	21		16.0	15.50	16.00			7.0	2.5 x 2.5 12 ga	20.0	3.5	4.0			2.25 x 2.25 12 ga	2	8	3 x 3 7 ga			2	
162+62 Lt mdn	W3-4	58		19.0	17.00	17.20	17.50		7.0	2.5 x 2.5 10 ga	19.4						3	12	3 x 3 7 ga			3	
162+62 Rt	W3-4	58		19.0	17.00	17.20	17.50		7.0	2.5 x 2.5 10 ga	19.4						3	12	3 x 3 7 ga			3	
164+57 Rt	W12-2	58			17.40	17.70	17.90		7.0	2.5 x 2.5 10 ga	19.4						3	12	3 x 3 7 ga	1		3	
169+15 Lt	Sign 4	17		16.0																			Mount on Mast Arm
169+15 Lt	Sign 2		15.0																				Mount on Mast Arm
169+15 Rt	Sign 3		15.0																				Mount on Mast Arm
169+25 Lt mdn	R6-1	27			12.50				7.0	2 x 2 12 ga	13.2						1	4	2.25 x 2.25 12 ga	1			
169+80 Lt	Sign 3		15.0																				Mount on Mast Arm
169+80 Lt	Sign 4	17		16.0																			Mount on Mast Arm
170+13 Lt mdn	R6-1	27			12.50				7.0	2 x 2 12 ga	13.2						1	4	2.25 x 2.25 12 ga	1			
170+15 Rt	Sign 2		15.0																				Mount on Mast Arm
176+48 Lt	W3-4	58		19.0	17.00	17.20	17.50		7.0	2.5 x 2.5 10 ga	19.4						3	12	3 x 3 7 ga			3	
176+48 Lt mdn	W3-4	58		19.0	17.00	17.20	17.50		7.0	2.5 x 2.5 10 ga	19.4						3	12	3 x 3 7 ga			3	
180+48 Lt mdn	W3-3	21		16.0	15.50	16.00			7.0	2.5 x 2.5 12 ga	20.0	3.5	4.0			2.25 x 2.25 12 ga	2	8	3 x 3 7 ga			2	
180+48 Lt	W3-3	21		16.0	15.50	16.00			7.0	2.5 x 2.5 12 ga	20.0	3.5	4.0			2.25 x 2.25 12 ga	2	8	3 x 3 7 ga			2	
181+19 Rt	R5-1	16		9.0	13.90				7.0	2.5 x 2.5 12 ga	14.4	5.3				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1	
181+19 Lt mdn	R5-1	16		9.0	14.00				7.0	2.5 x 2.5 12 ga	14.4	5.3				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1	
183+43 Rt					11.50				5.0	2.5 x 2.5 12 ga	13.3	3.1				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga	1		1	
183+79 Rt	Street		14.0		10.90				5.0	2.5 x 2.5 12 ga	11.3						1	4	3 x 3 7 ga				Special Assembly 1E

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Sign Summary
Perforated Tube

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	NH-NHU-7-002(156)022	110	2

Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	Sign Support Length 2nd LF	Sign Support Length 3rd LF	Sign Support Length 4th LF	Vert Clear-ance FT	Support Size	Max Post Len LF	Sleeve Length 1st LF	Sleeve Length 2nd LF	Sleeve Length 3rd LF	Sleeve Length 4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
195+51 Lt mdn	R1-2			17.4	13.20	13.50			5.0	2.5 x 2.5 10 ga	14.7						2	8	3 x 3 7 ga			2	Special Assembly 2
196+59 Lt mdn	R1-2			17.4	13.20	13.50			5.0	2.5 x 2.5 10 ga	14.7						2	8	3 x 3 7 ga			2	Special Assembly 2
196+61 Rt	Street		14.0		10.90				5.0	2.5 x 2.5 12 ga	11.3						1	4	3 x 3 7 ga				
367+19 Rt	R6-1L	27		3.0	10.90				5.0	2 x 2 12 ga	13.2						1	4	2.25 x 2.25 12 ga				
486+88 Rt	SA 1			28.5	13.90	14.10	14.30		5.0	2.5 x 2.5 10 ga	14.9						3	12	3 x 3 7 ga			3	
530+26 Rt	R6-1L	27		3.0	10.90				5.0	2 x 2 12 ga	13.2						1	4	2.25 x 2.25 12 ga				
540+10 Rt	R6-1L & R6-1R			13.5	9.40				5.0	2.25 x 2.25 12 ga	10.1						1	4	2.5 x 2.5 12 ga				
Sub Total			151.00	443.80		**Total**	865.10										**Total**	232		6	0	49	
2001+90 Lt	W1-1L	18		4.0	7.50				5.0	2 x 2 12 ga	12.9						1	4	2.25 x 2.25 12 ga				
2002+01 Lt	W1-6L	34		8.0	7.20				5.0	2.25 x 2.25 12 ga	8.9						1	4	2.5 x 2.5 12 ga				
2002+40 Rt	W14-1	18		4.0	2.50					2 x 2 12 ga	12.9						1	4	2.25 x 2.25 12 ga				
2002+60 Lt	R1-1	1		5.2	7.70				5.0	2 x 2 12 ga	10.5						1	4	2.25 x 2.25 12 ga				
2004+90 Rt	W1-1R	18		4.0	7.50				5.0	2 x 2 12 ga	12.9						1	4	2.25 x 2.25 12 ga				
2008+01 Lt	W1-1L	18		4.0	7.50				5.0	2 x 2 12 ga	12.9						1	4	2.25 x 2.25 12 ga				
2010+22 Rt	R1-1	1		5.2	7.70				5.0	2 x 2 12 ga	10.5						1	4	2.25 x 2.25 12 ga				
Sub Total			0.00	34.40		**Total**	47.60										**Total**	28		0	0	0	
Grand Total			**151.0**	**478.2**		**Total**	**912.70**										**Total**	**260**	**0**	**6**	**0**	**49**	

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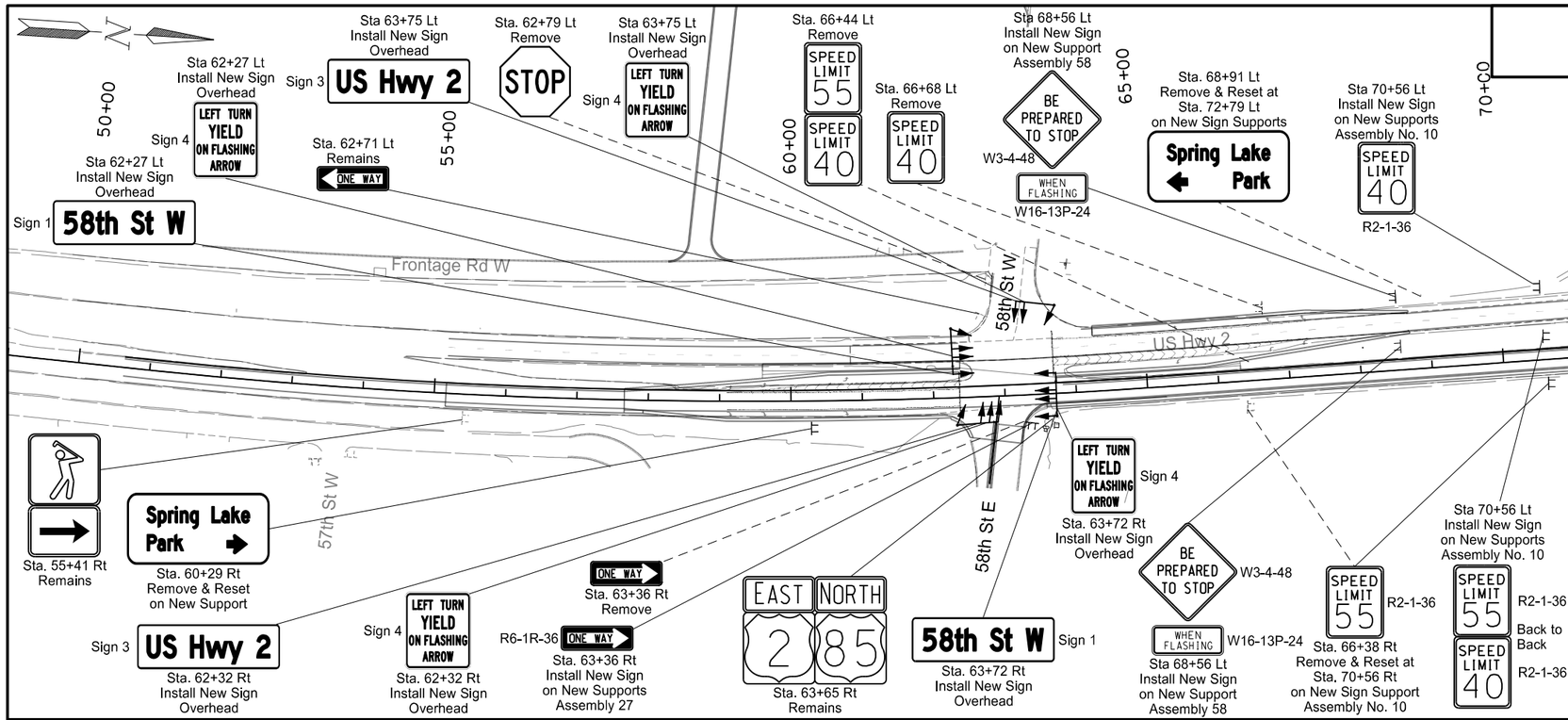
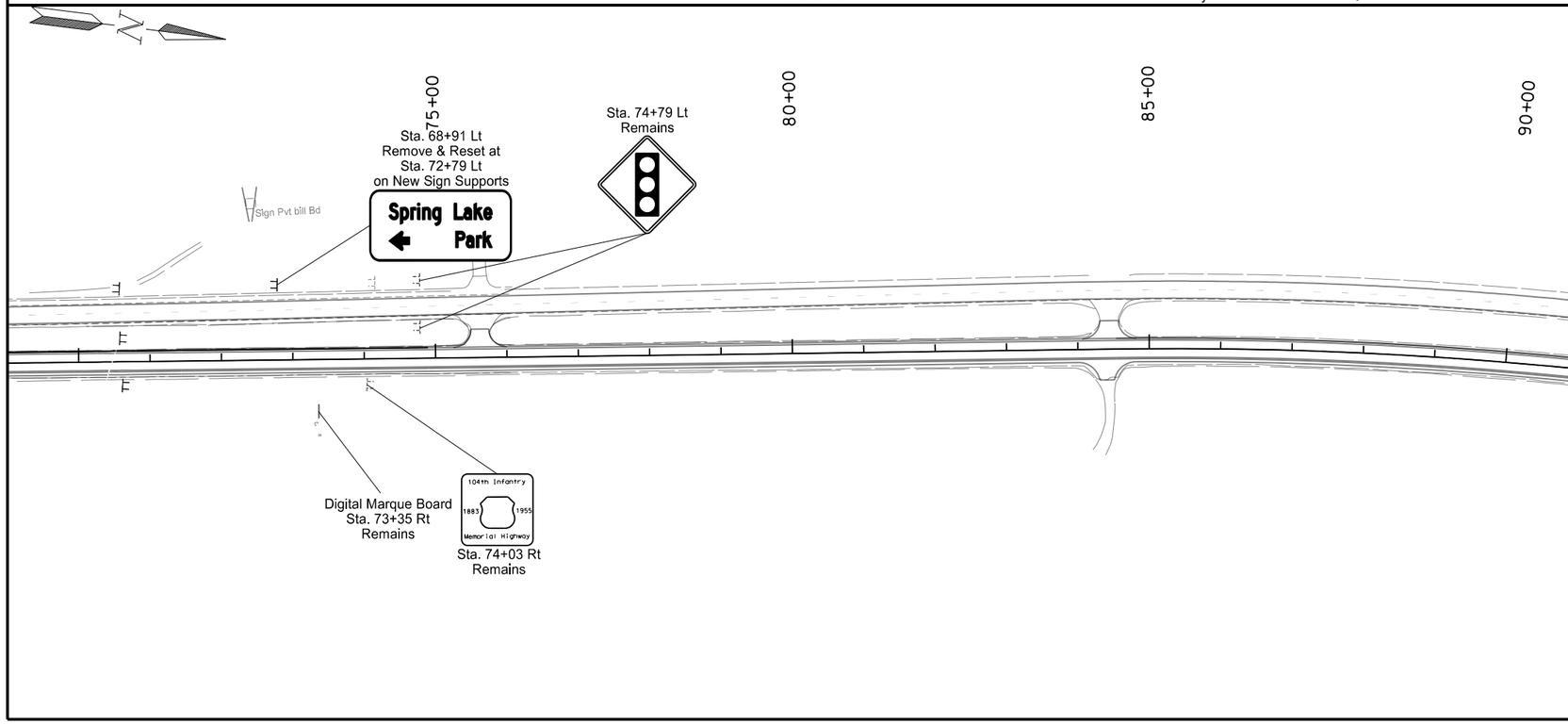
Sign Summary
Perforated Tube

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	3





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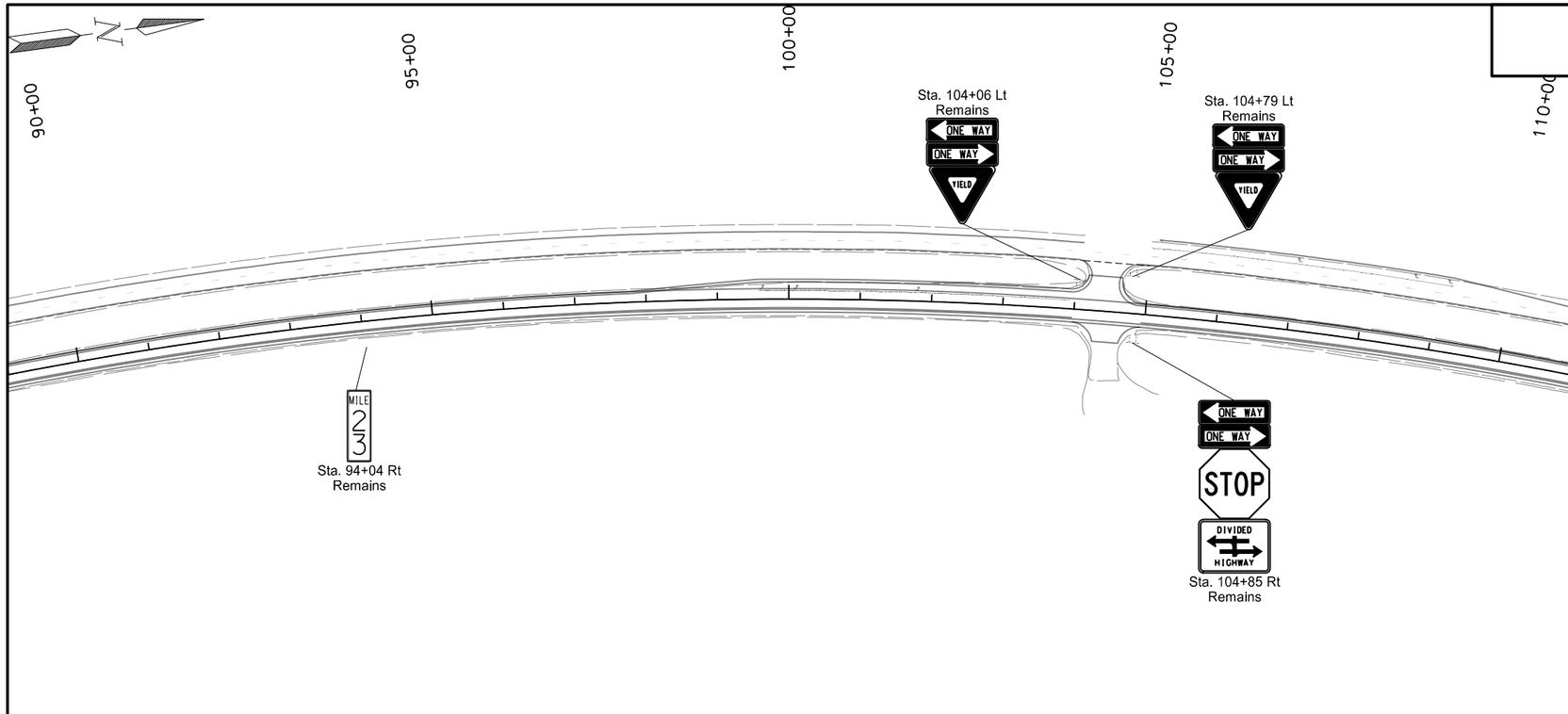
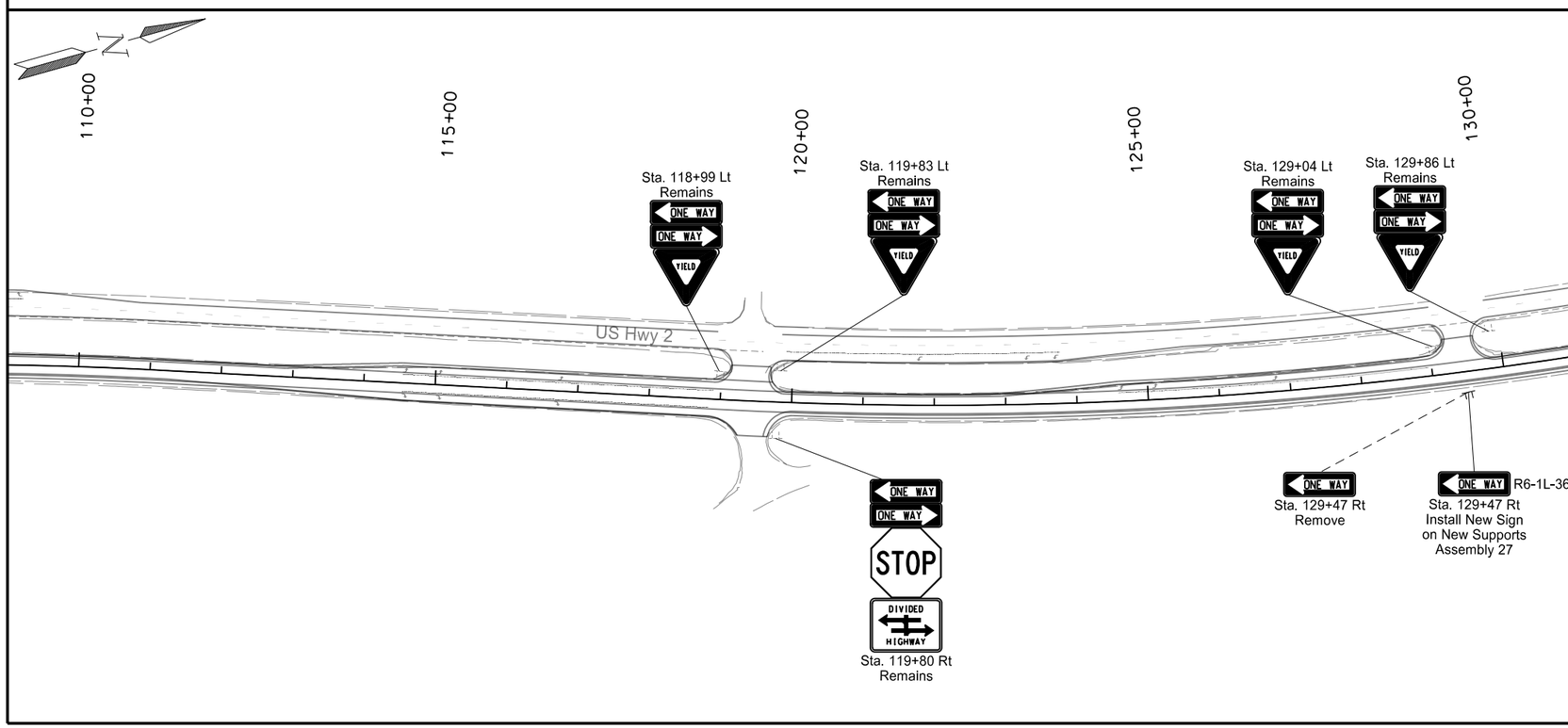
Signing

US 2

Sta 50+00 to Sta 90+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	4





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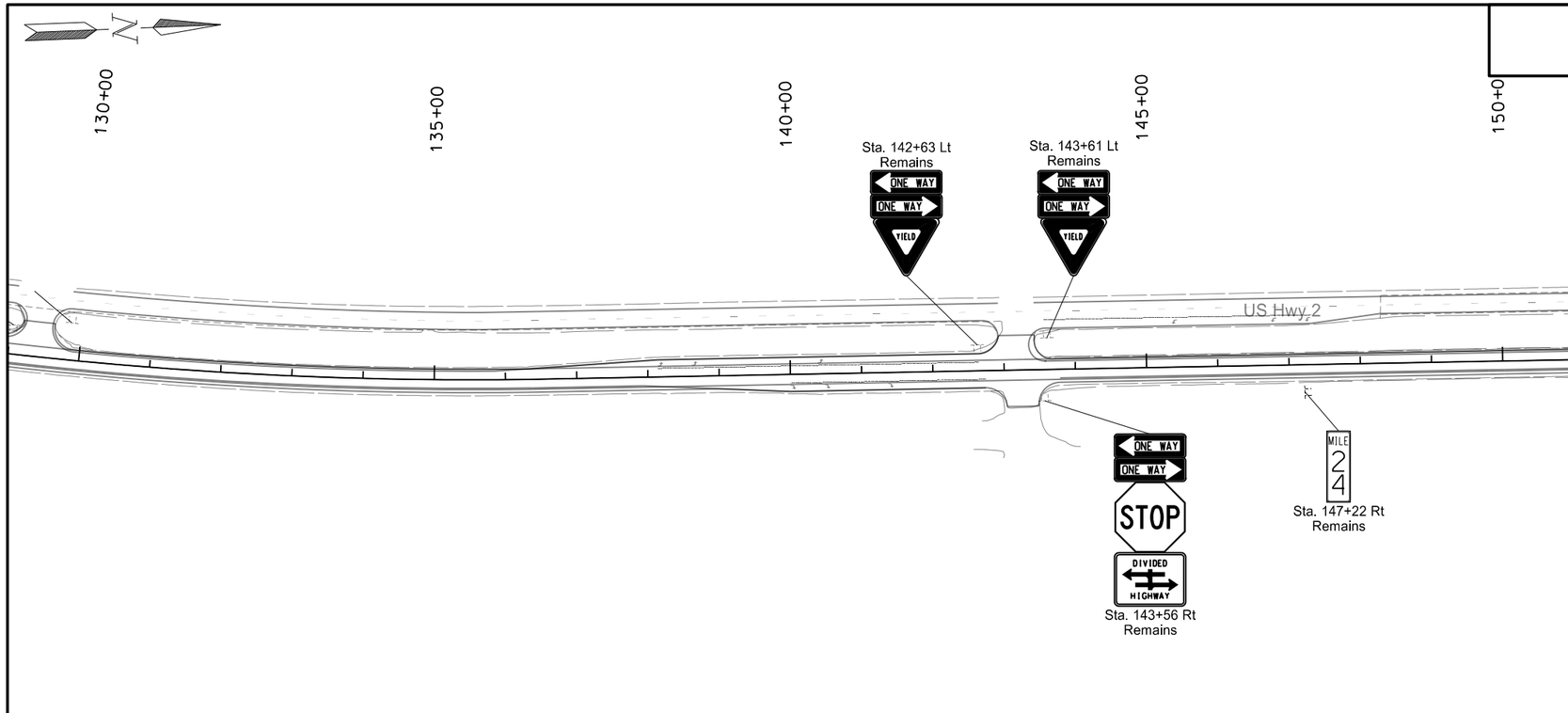
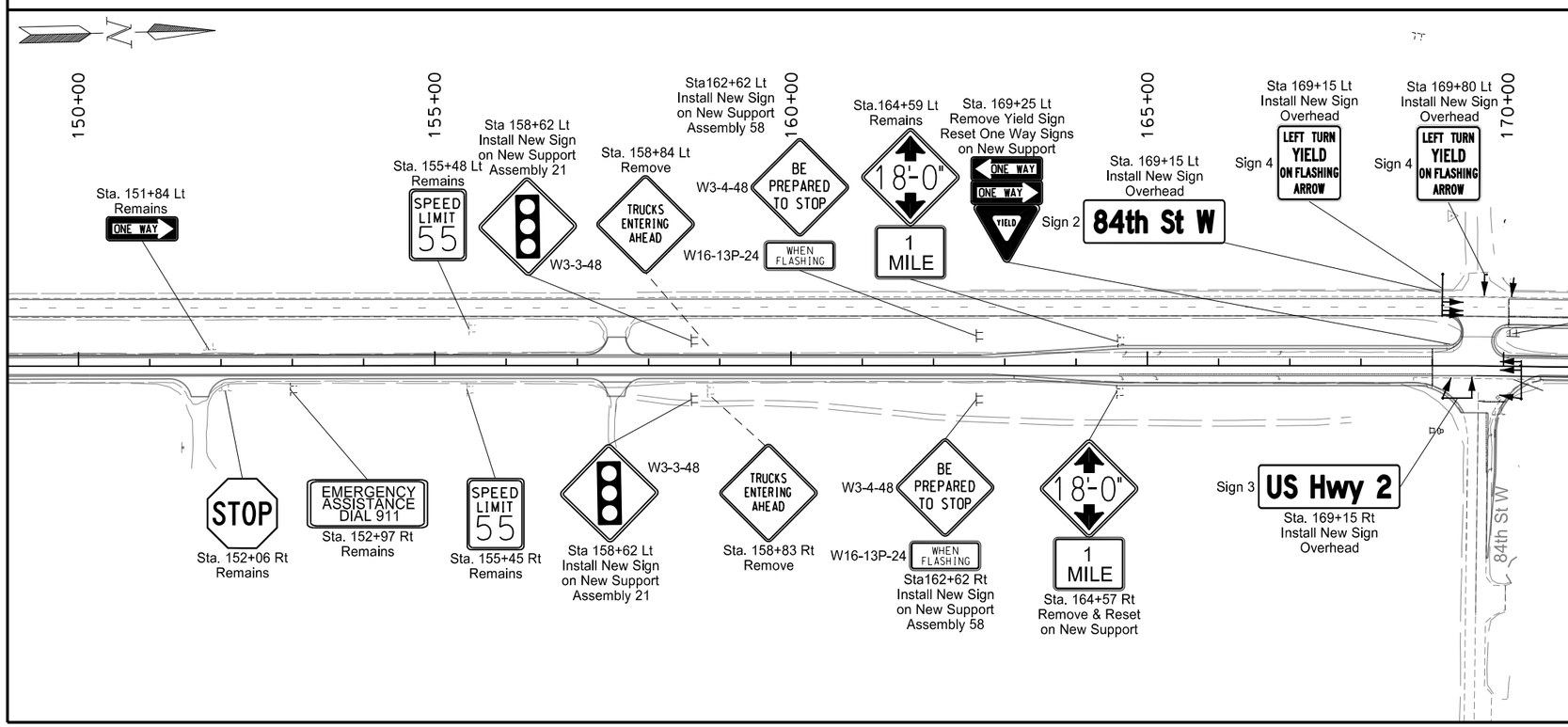
US 2

Sta 90+00 to Sta 130+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	5





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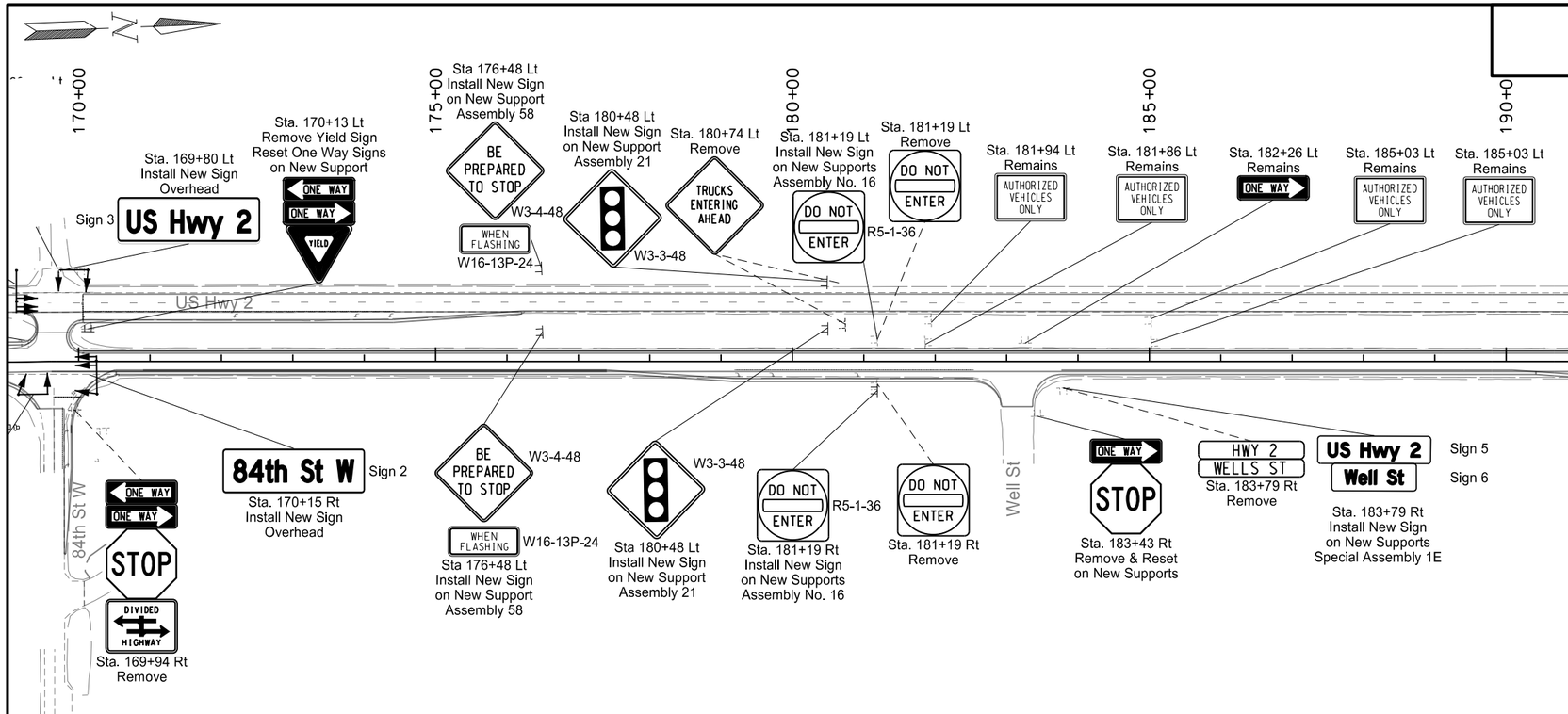
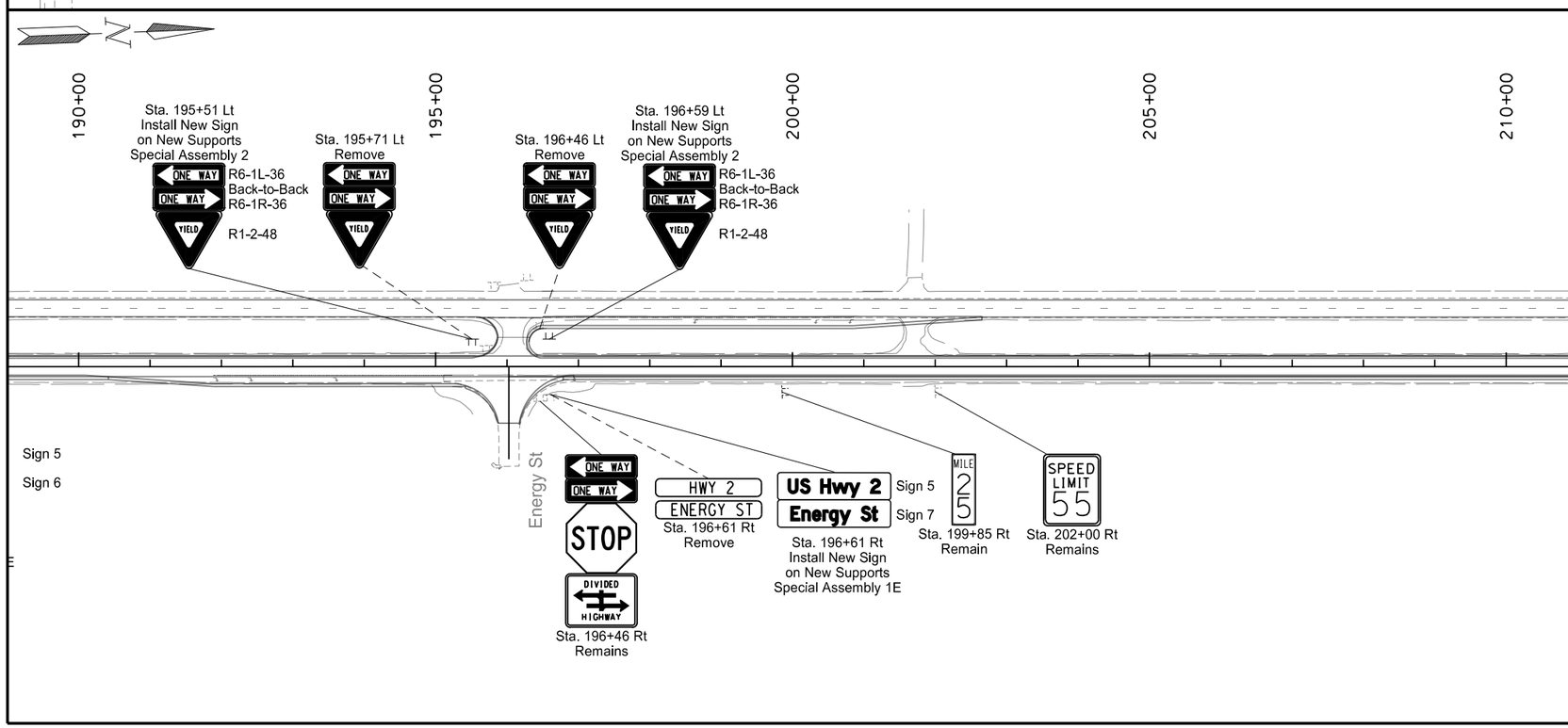
US 2

Sta 130+00 to Sta 170+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	6





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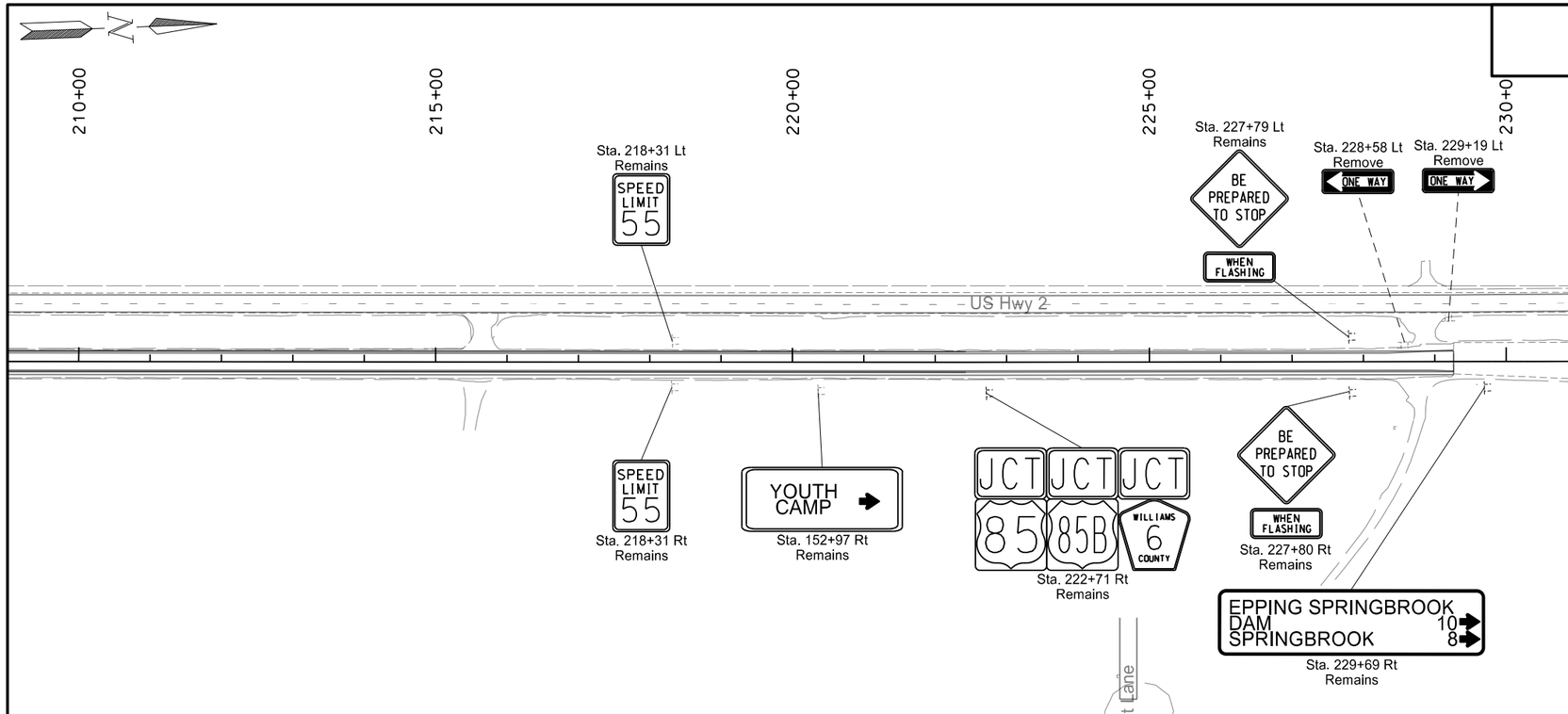
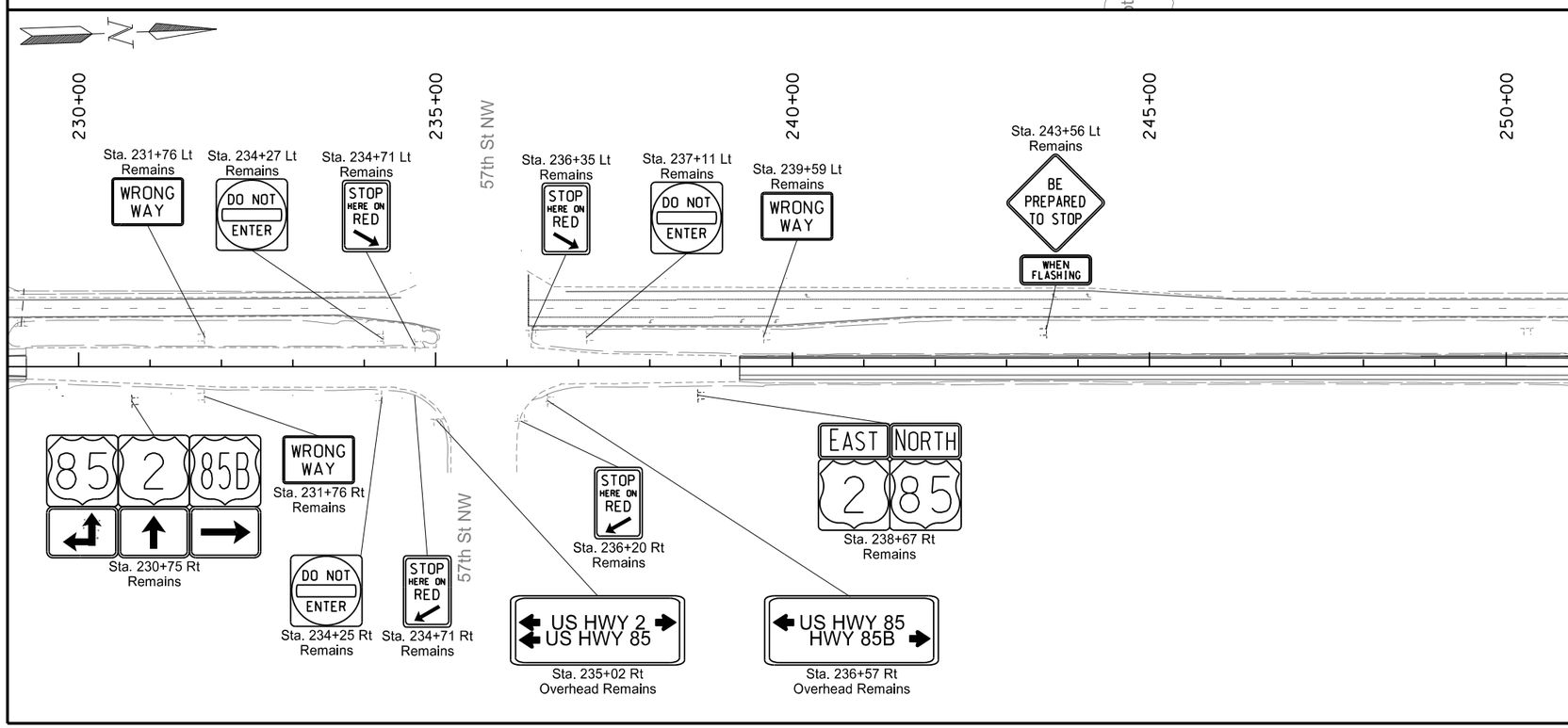
US 2

Sta 170+00 to Sta 210+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	7





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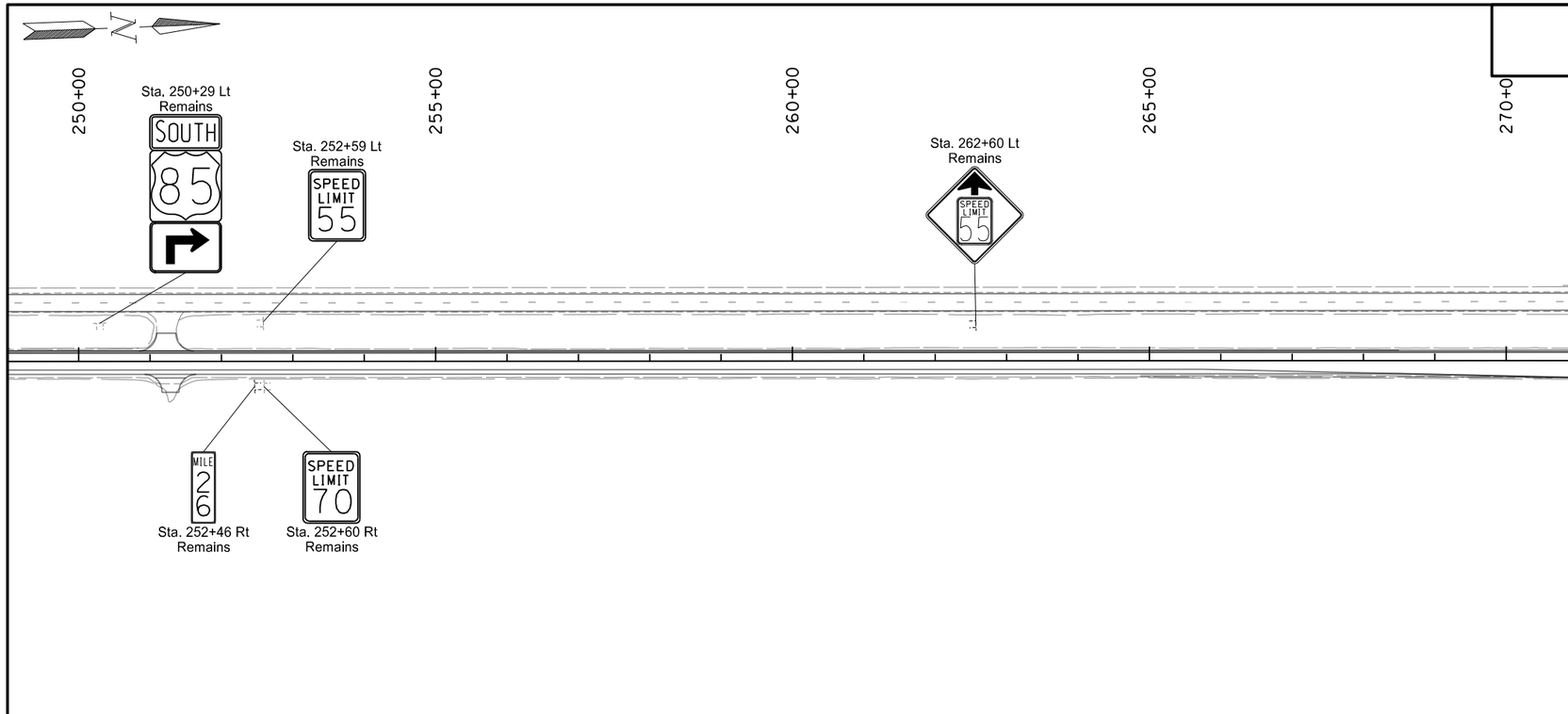
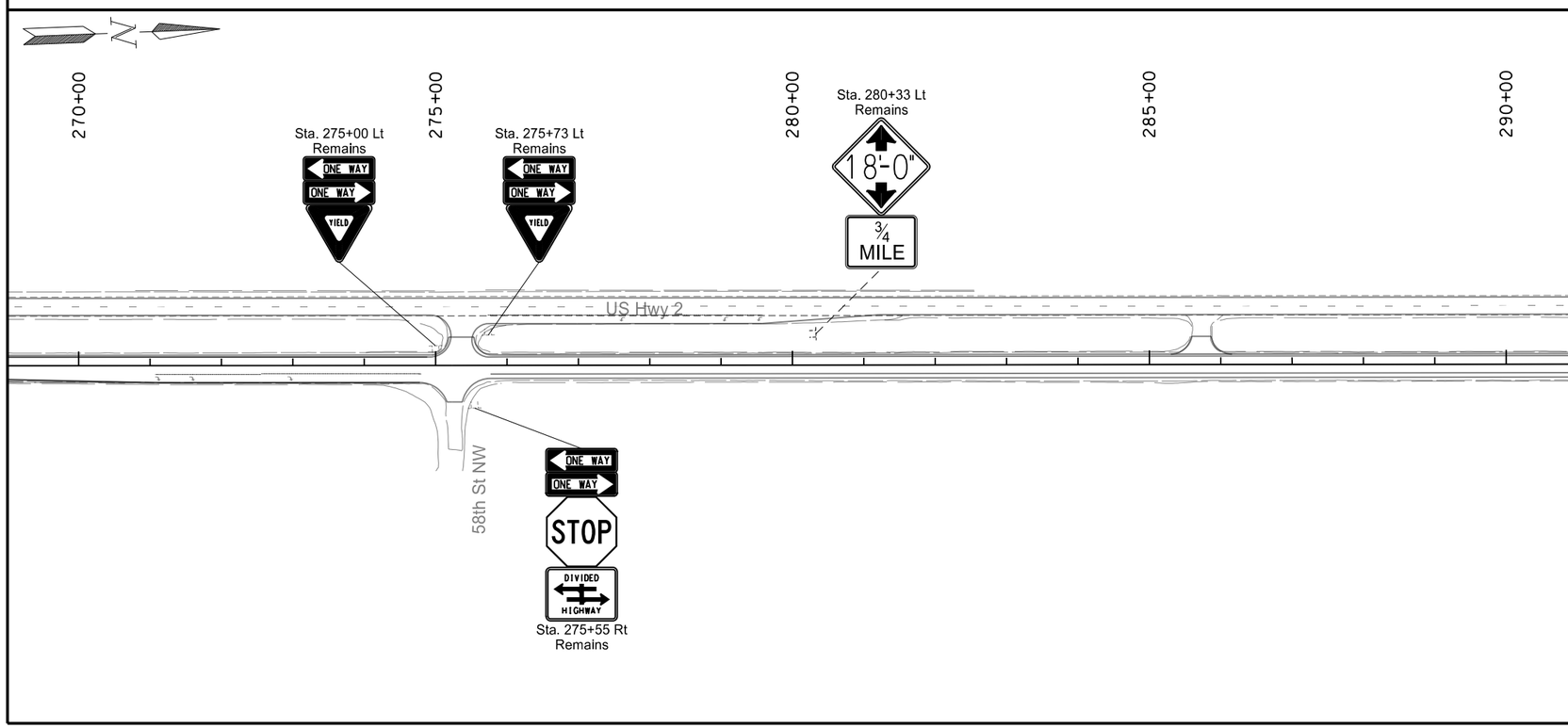
US 2

Sta 210+00 to Sta 250+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	8





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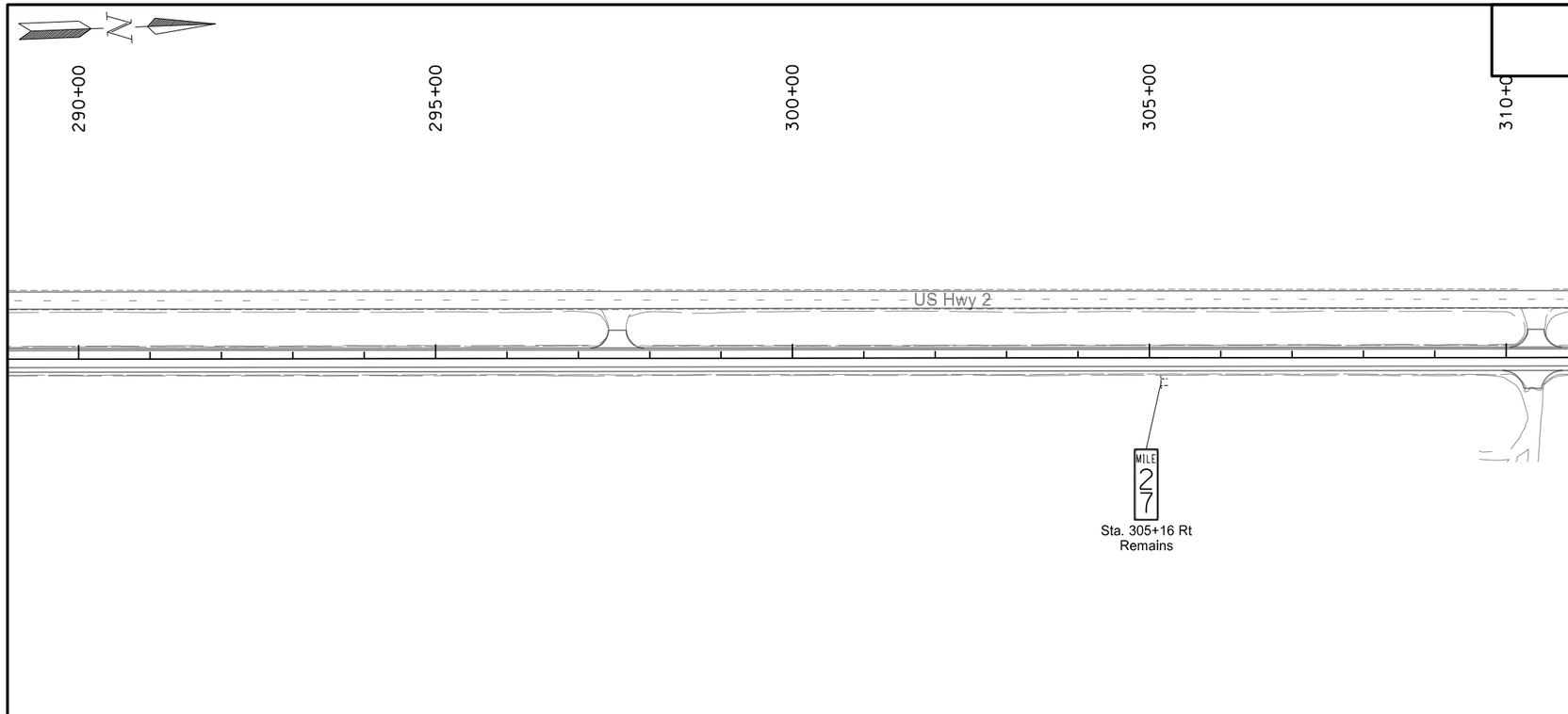
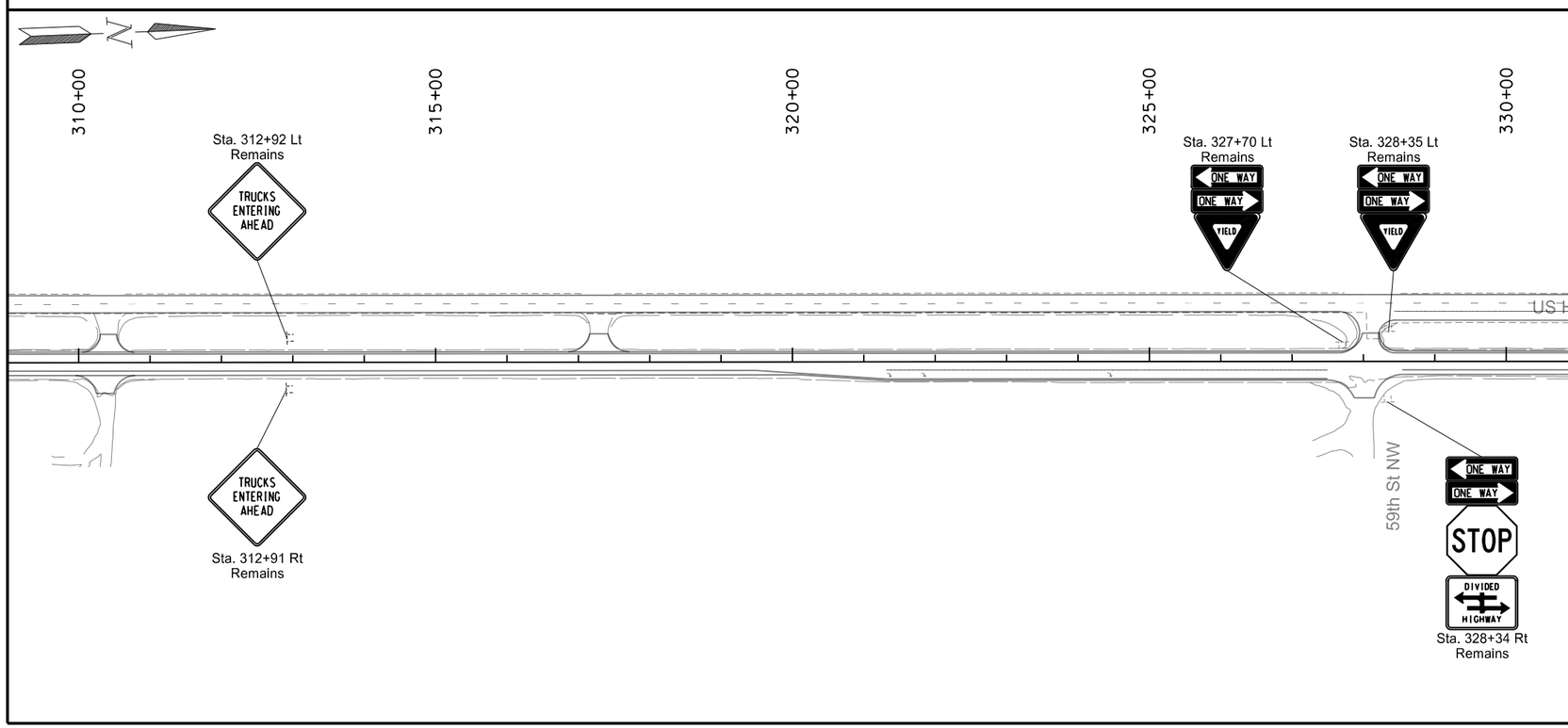
US 2

Sta 250+00 to Sta 290+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	9





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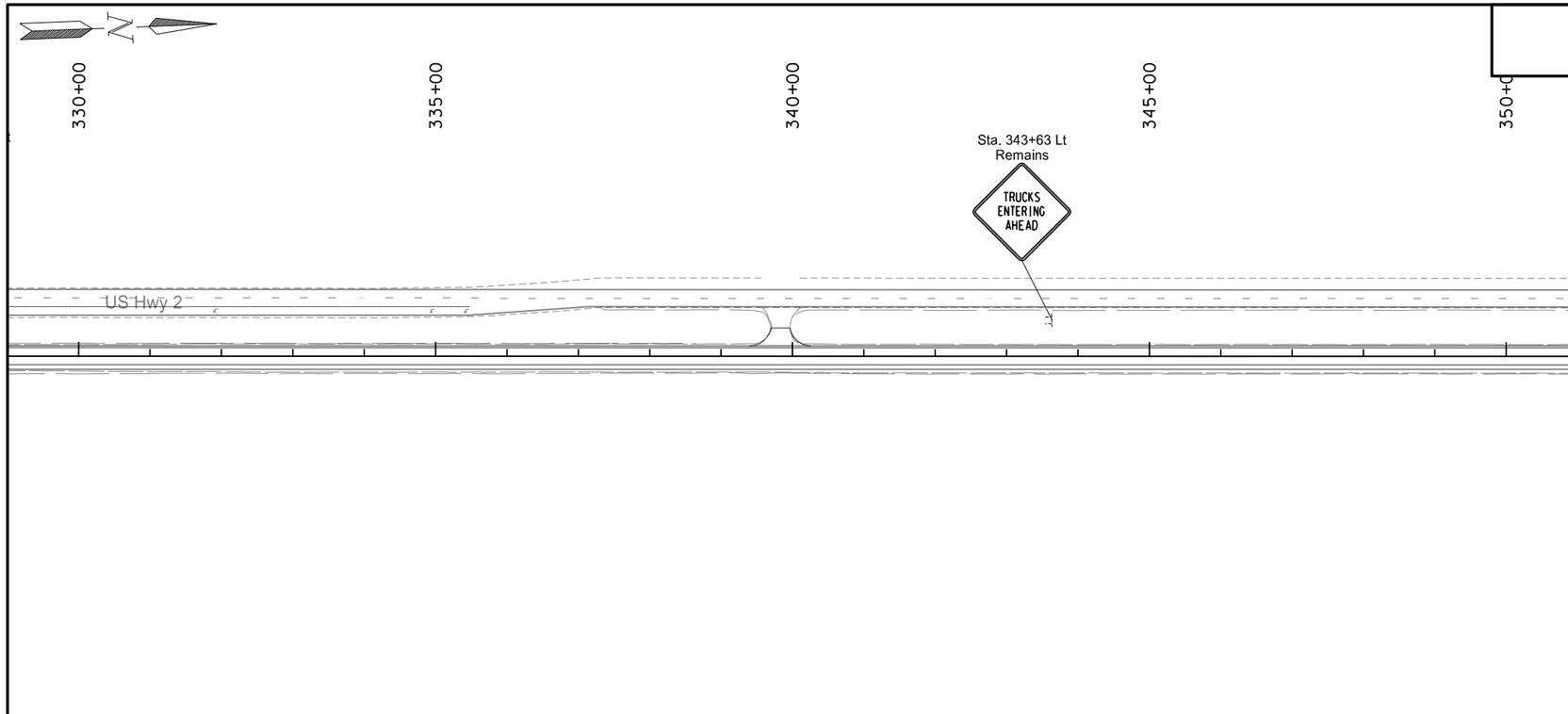
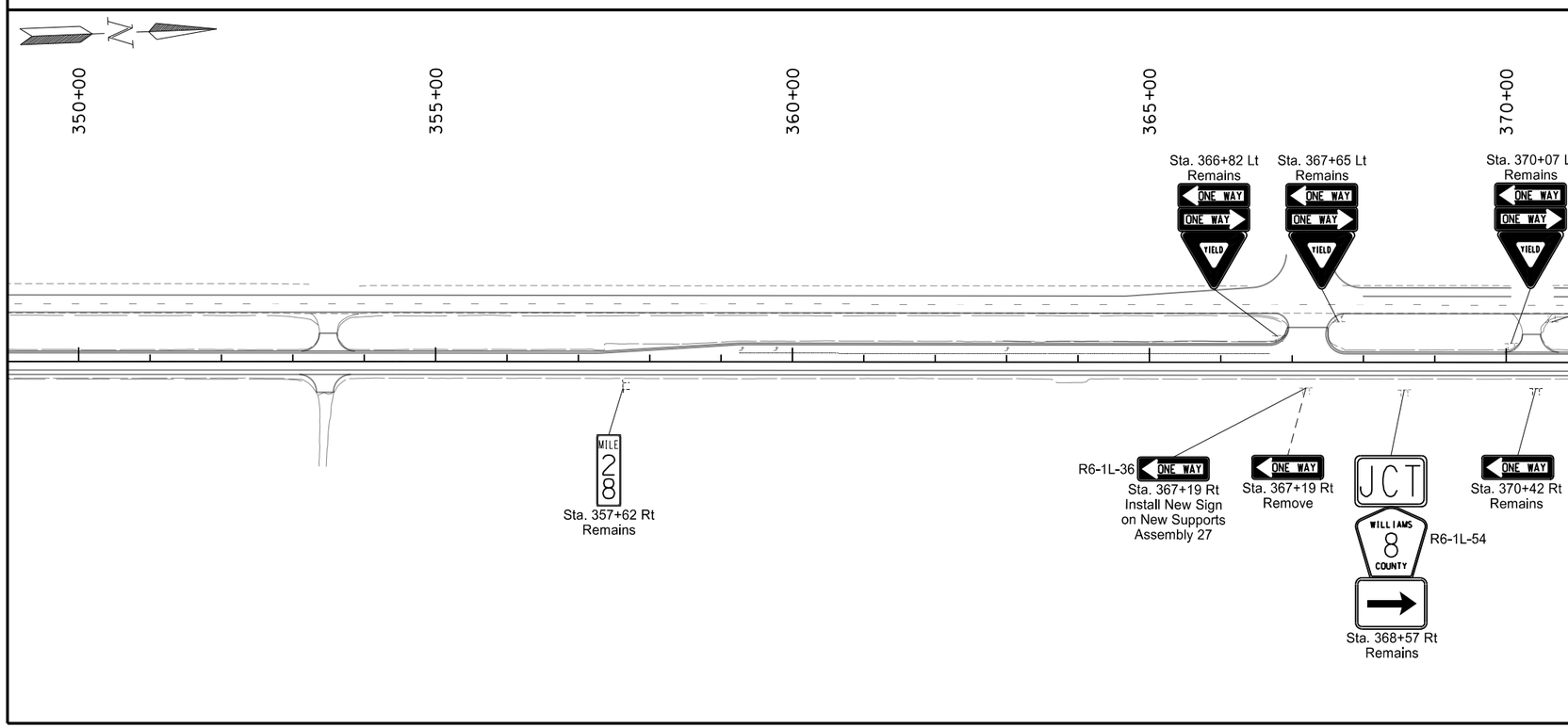
US 2

Sta 290+00 to Sta 330+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	10





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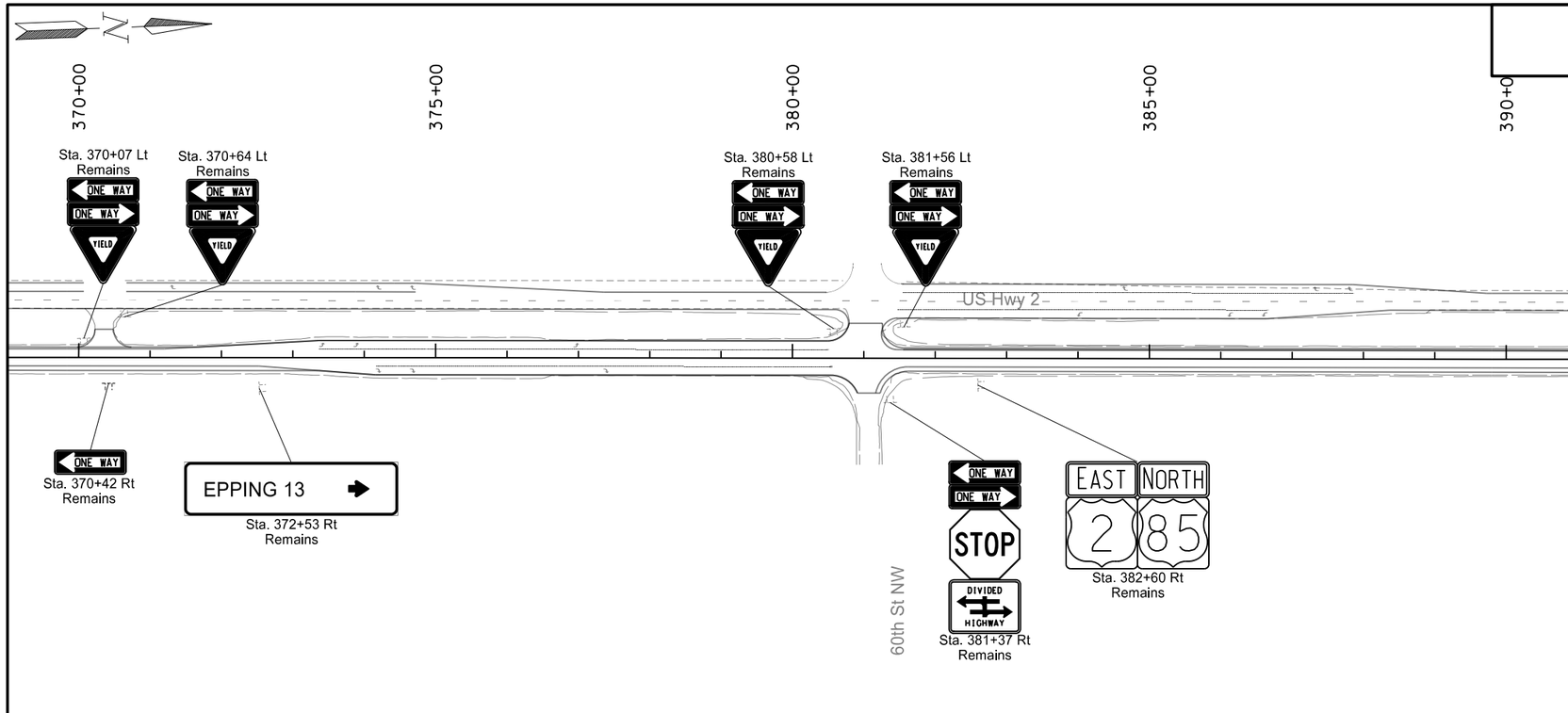
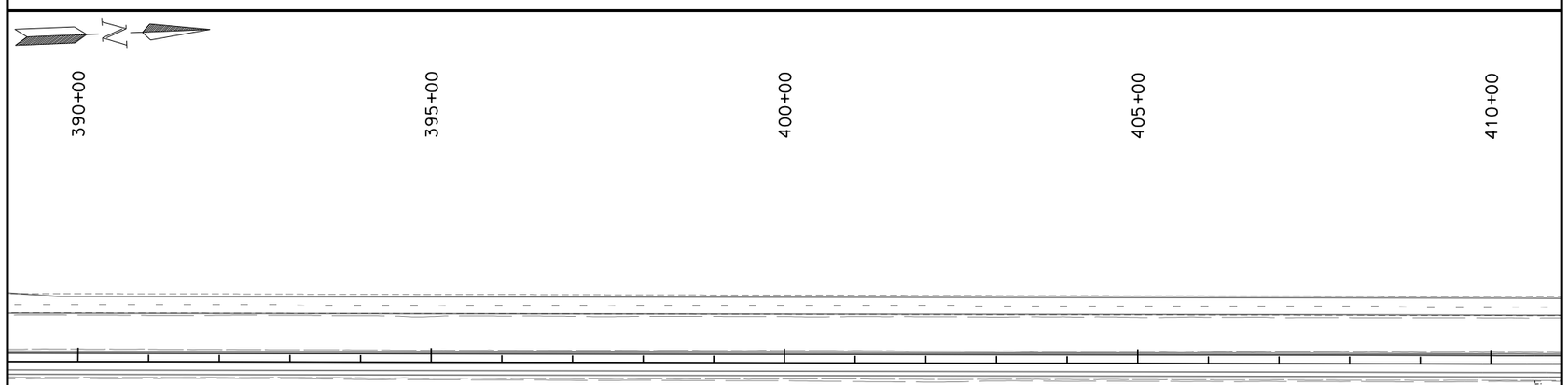
US 2

Sta 330+00 to Sta 370+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	11





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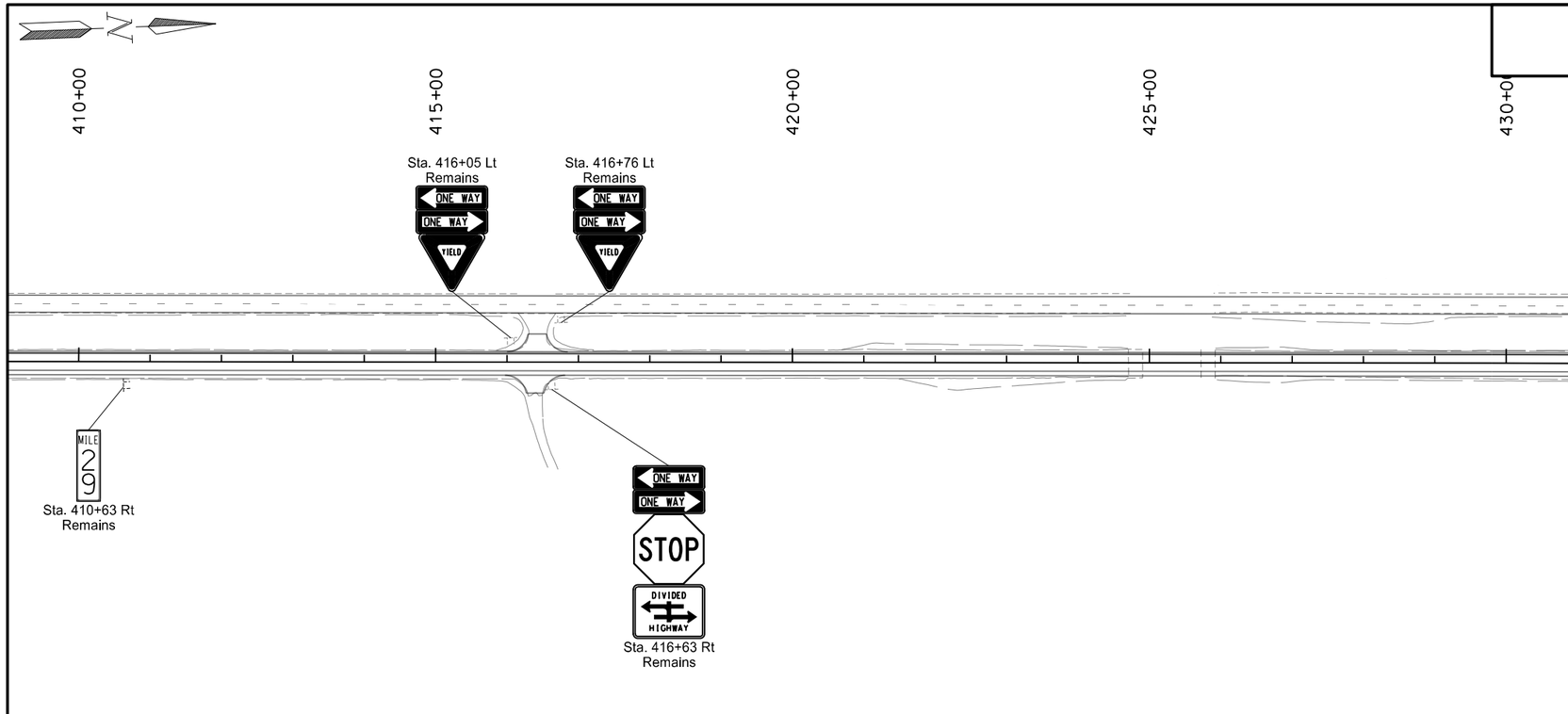
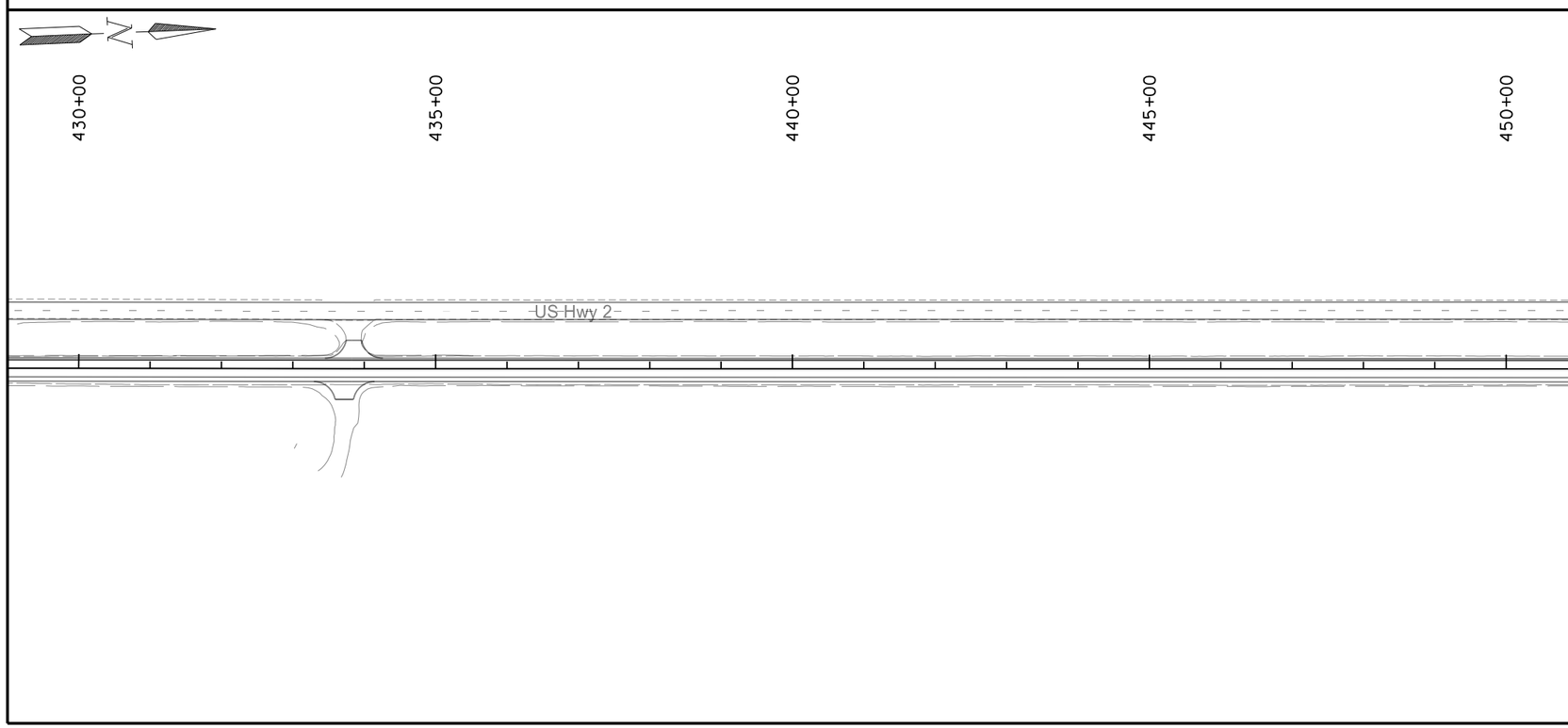
US 2

Sta 370+00 to Sta 410+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	12





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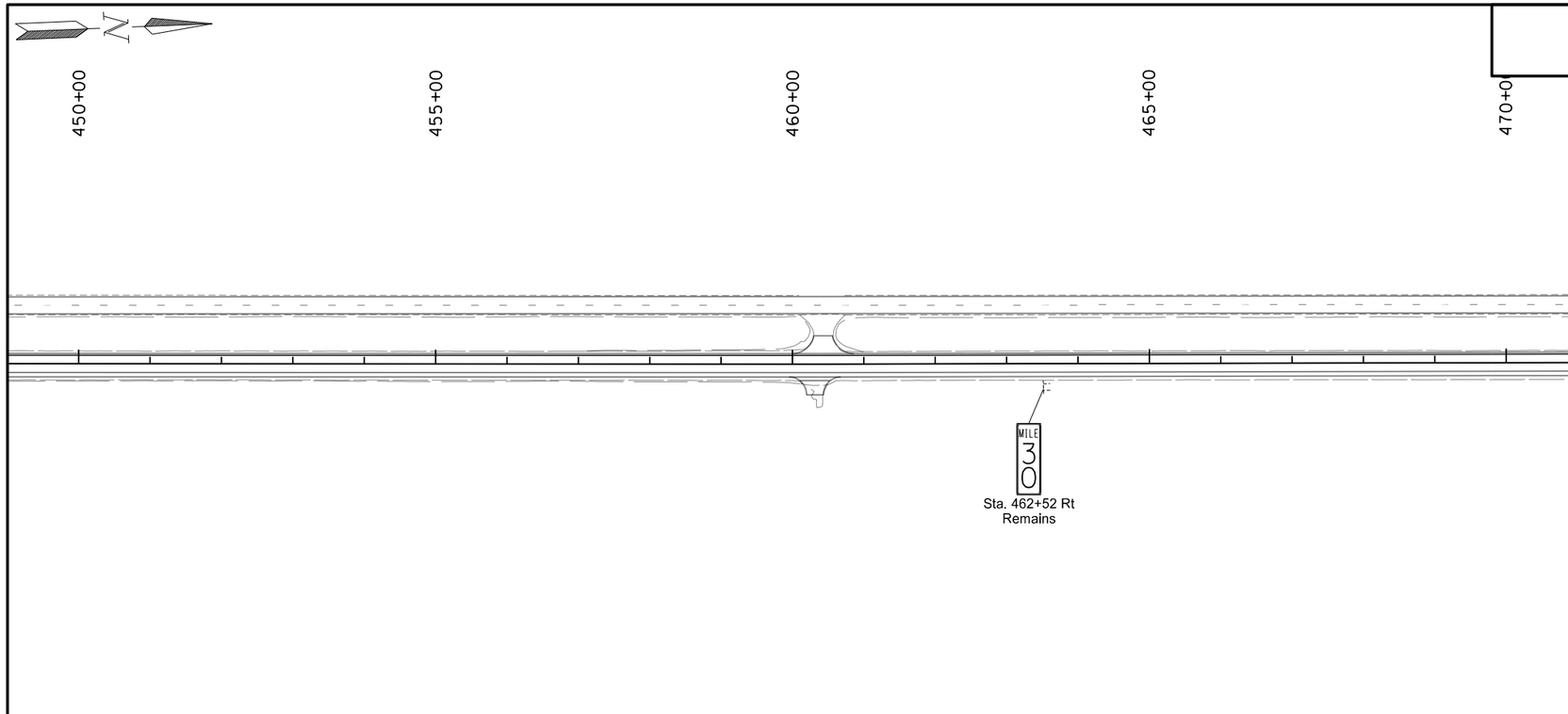
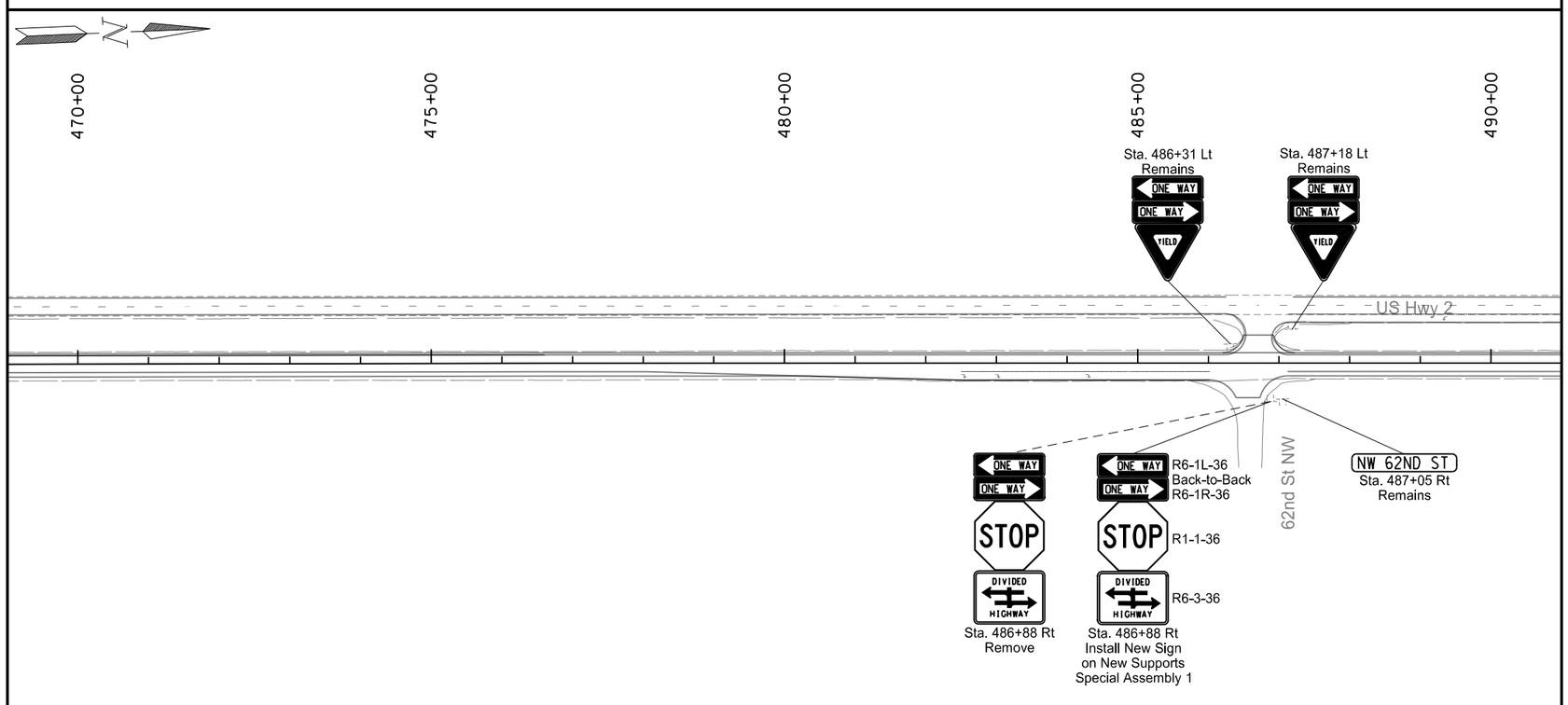
US 2

Sta 410+00 to Sta 450+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	13





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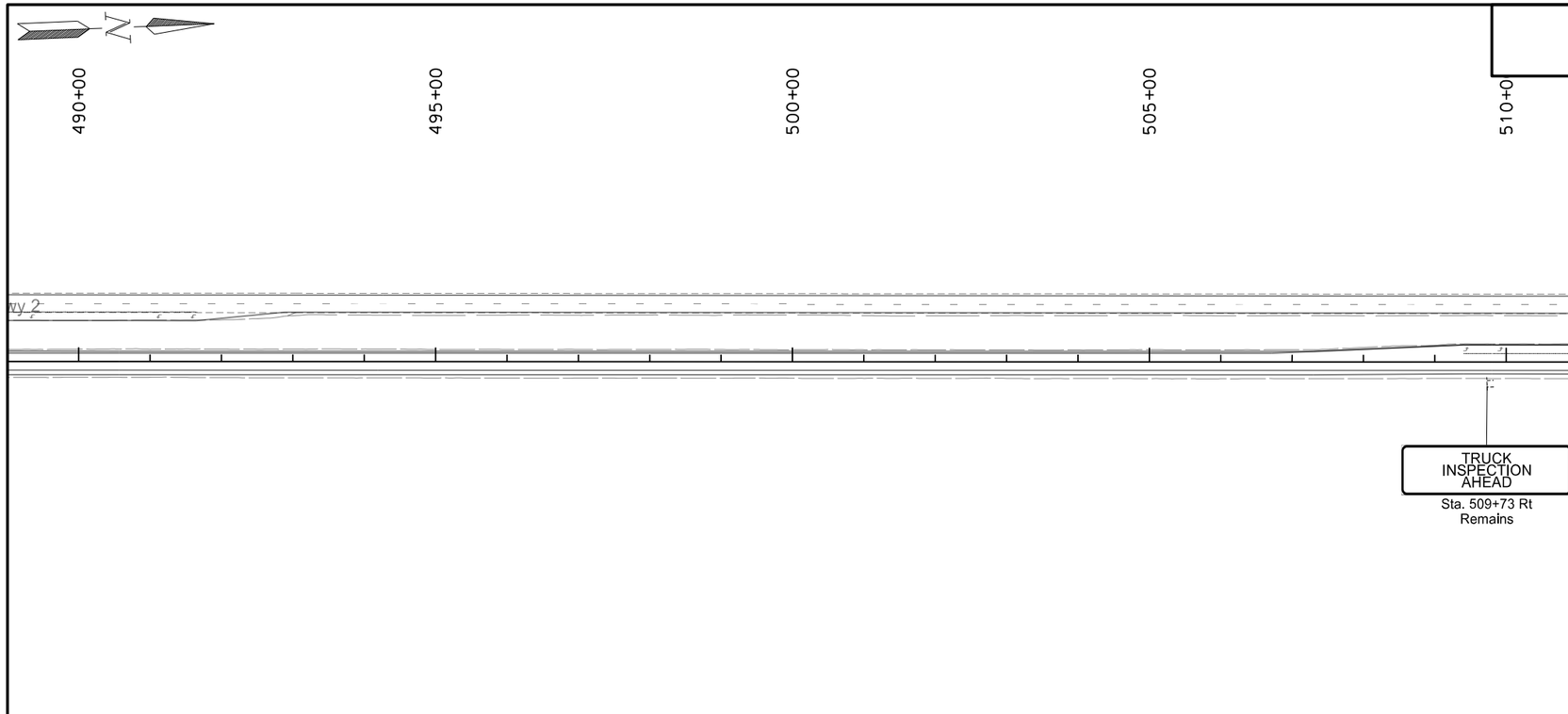
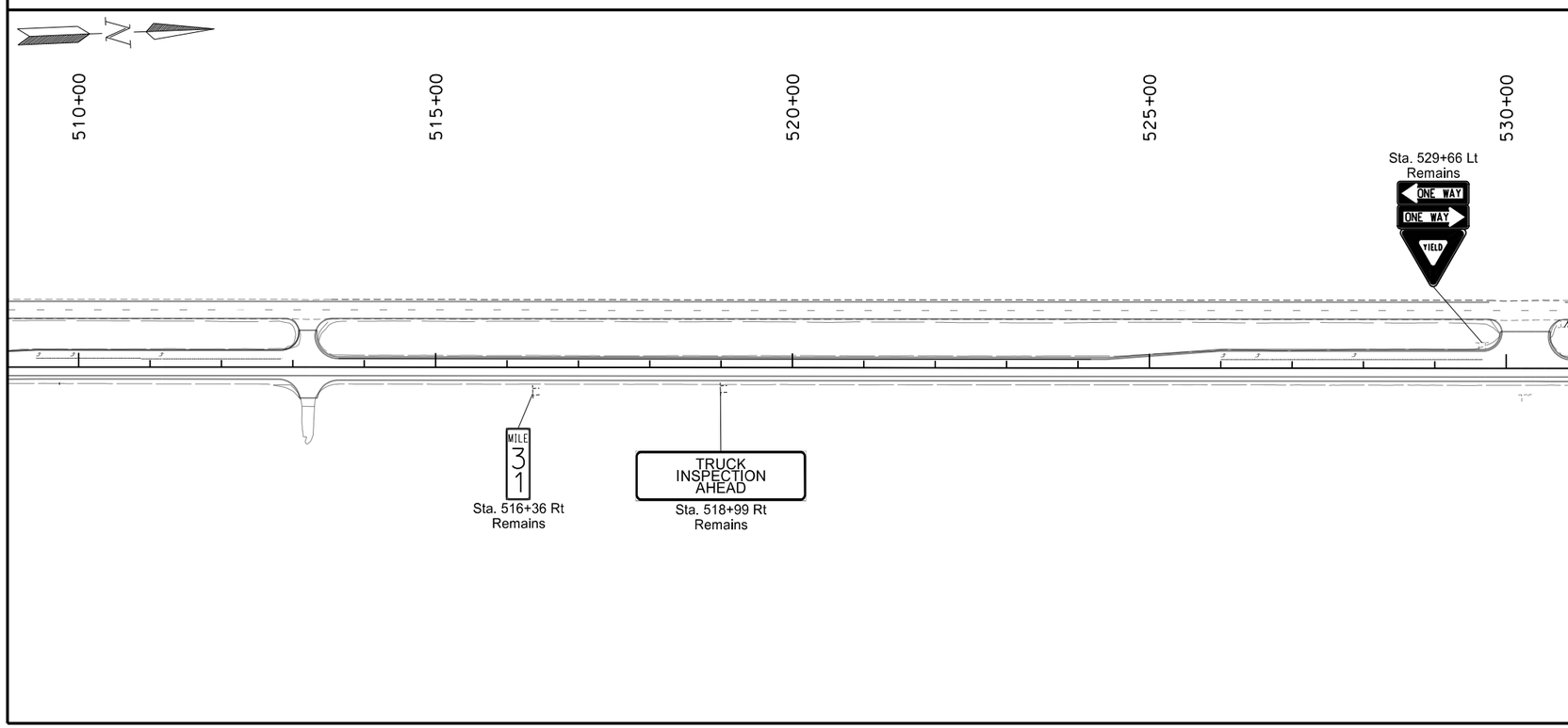
US 2

Sta 450+00 to Sta 490+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	14





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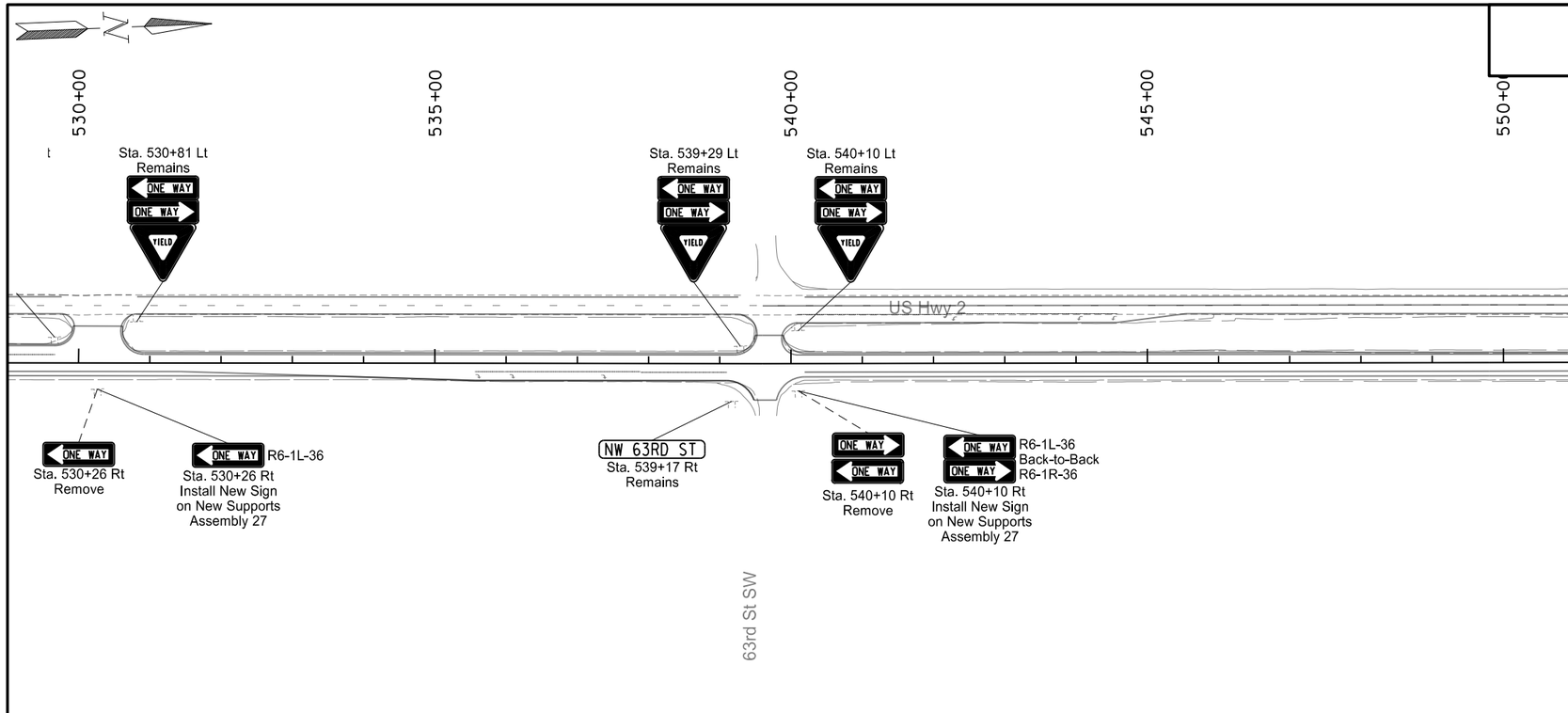
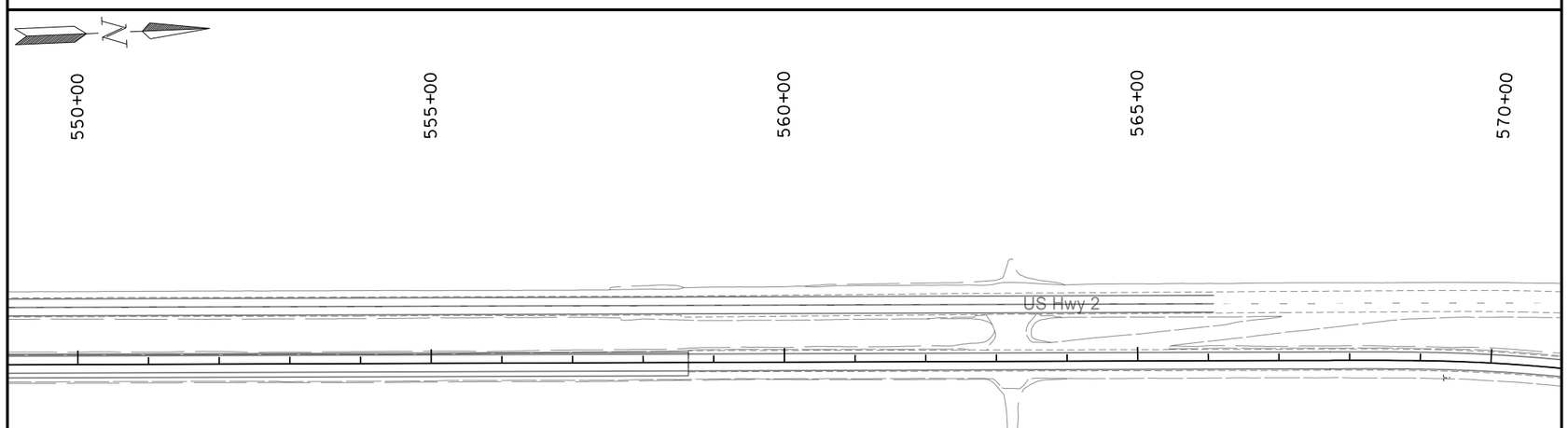
US 2

Sta 490+00 to Sta 530+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	15





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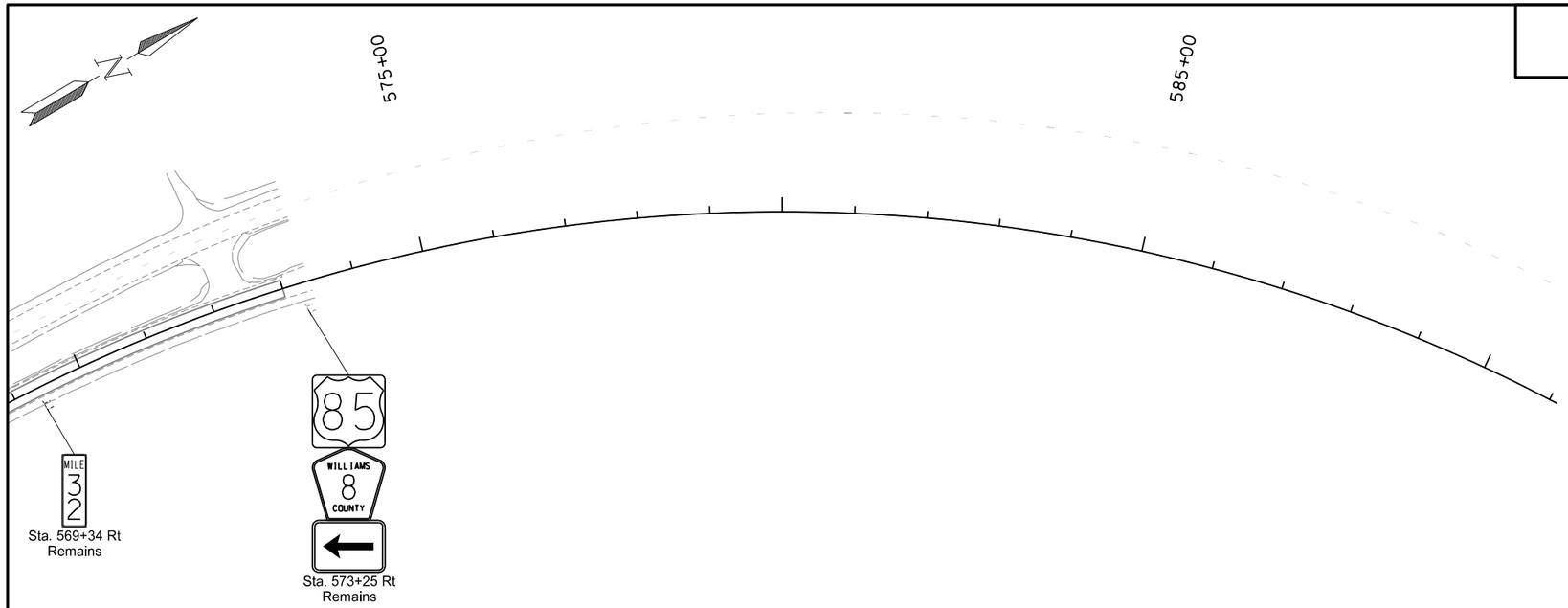
US 2

Sta 530+00 to Sta 570+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	16



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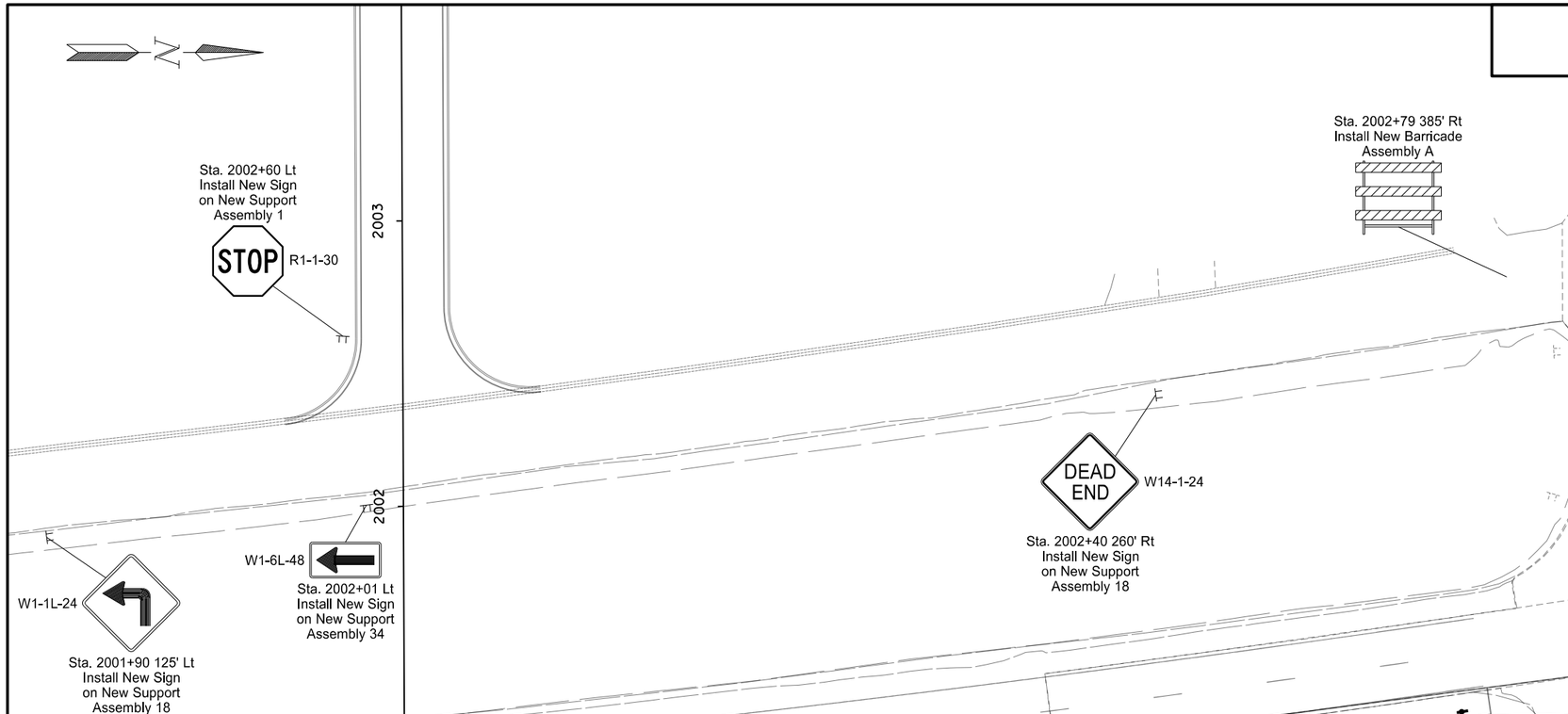
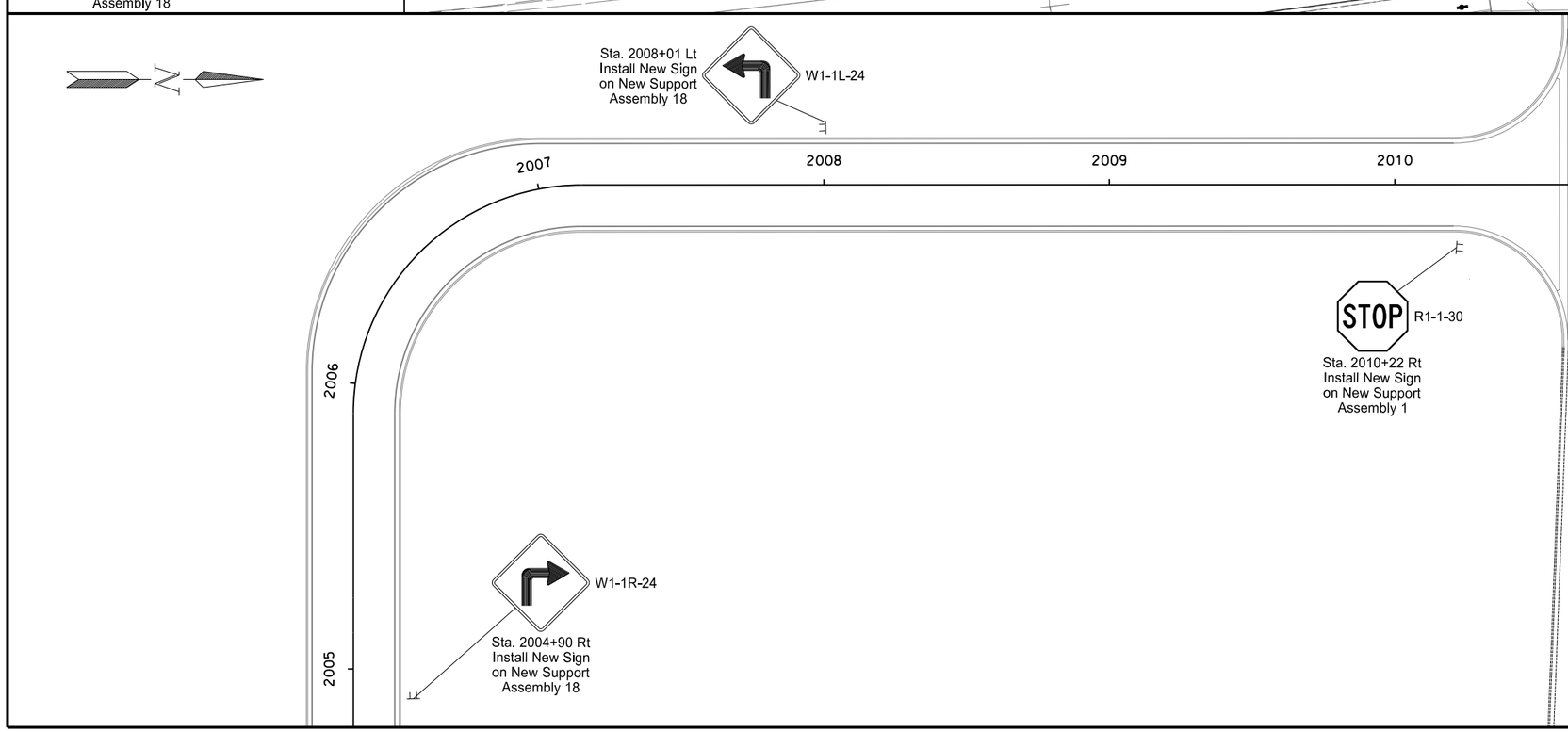
US 2

Sta 570+00 to Sta 574+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	17





SPEC CODE		BID ITEM	QTY	UNIT
754	141	BARRICADE ASSEMBLY A		
		Sta 2002+79 385' Rt	1	EA

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US 2

Frontage Road

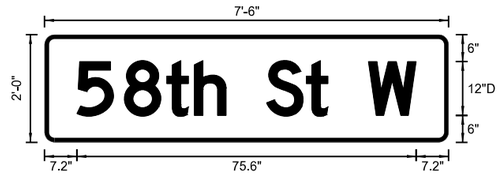
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	18

SIGN NUMBER	Sign 1
WIDTH x HEIGHT	7'-6" x 2'-0"
BORDER WIDTH	1" (inset 0")
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
62+27 Lt
63+72 Rt

AREA: 15.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Street_Name_Overhead_Border.ssl

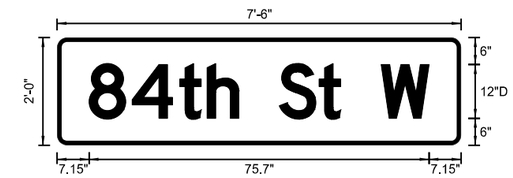
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
5	8	t	h		S	t		W											75.6	12/9	D 2000
7.2	17.8	27.2	33.4	40.4	49.4	58.3	63.1	72.1													

SIGN NUMBER	Sign 2
WIDTH x HEIGHT	7'-6" x 2'-0"
BORDER WIDTH	1" (inset 0")
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
169+15 Lt
170+15 Rt

AREA: 15.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Street_Name_Overhead_Border.ssl

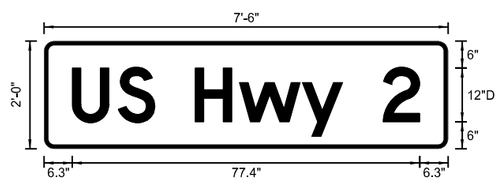
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
8	4	t	h		S	t		W											75.7	12/9	D 2000
7.1	16.7	27.3	33.4	40.5	49.5	58.4	63.2	72.2													

SIGN NUMBER	Sign 3
WIDTH x HEIGHT	7'-6" x 2'-0"
BORDER WIDTH	1" (inset 0")
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
62+32 Rt
63+75 Lt
169+15 Rt
169+80 Lt

AREA: 15.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Street_Name_Overhead_Border.ssl

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
U	S		H	w	y		2												77.4	12/9	D 2000
6.3	16.5	24.7	33.7	43.5	57.5	66.5	75.5														

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Sign Details

US 2

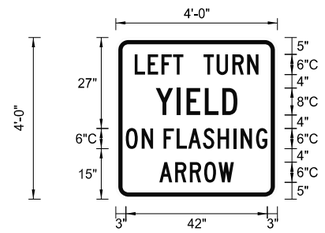
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	19

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

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
62+27 Lt
62+32 Rt
63+72 Rt
63+75 Lt
169+15 Lt
169+80 Lt

AREA: 16.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Misc_Regulatory.ssl

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
L	E	F	T		T	U	R	N											36.8	6	C 2000
5.6	9.5	13.6	17	20.1	26.1	30	34.7	39													
Y	I	E	L	D															24.2	8	C 2000
11.9	18.1	21	26.4	31.6																	
O	N	F	L	A	S	H	I	N	G										42	6	C 2000
3	7.7	14.2	18.1	21.5	25.9	30.3	34.9	37.1	41.7												
A	R	R	O	W															22.1	6	C 2000
12.9	17.6	22	26.3	30.5																	

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Sign Details

US 2

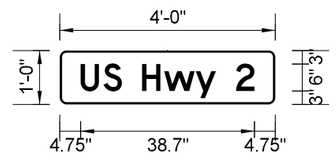
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	20

SIGN NUMBER	Sign 5
WIDTH x HEIGHT	4'-0" x 1'-0"
BORDER WIDTH	0.5" (inset 0")
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
183+79 Rt
196+61 Rt

AREA: 4.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Street_Name_Conv_Border.ssl

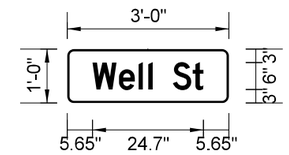
LETTER POSITION (X)								LENGTH	SIZE	SERIES
U	S		H	w	y		2	38.7	6/4.5	D 2000
4.7	9.8	13.8	18.3	23.3	30.3	34.8	39.3			

SIGN NUMBER	Sign 6
WIDTH x HEIGHT	3'-0" x 1'-0"
BORDER WIDTH	0.5" (inset 0")
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
183+79 Rt

AREA: 3.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Street_Name_Conv_Border.ssl

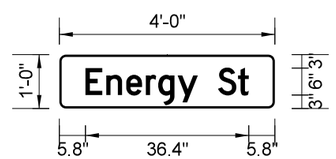
LETTER POSITION (X)								LENGTH	SIZE	SERIES
W	e	l	l		S	t		24.7	6/4.5	D 2000
5.6	11.5	15.9	18.1	19	23.5	28				

SIGN NUMBER	Sign 7
WIDTH x HEIGHT	4'-0" x 1'-0"
BORDER WIDTH	0.5" (inset 0")
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
196+61 Rt

AREA: 4.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Street_Name_Conv_Border.ssl

LETTER POSITION (X)									LENGTH	SIZE	SERIES
E	n	e	r	g	y		S	t	36.4	6/4.5	D 2000
5.8	10.4	14.9	19.3	22	26.3	30.8	35.3	39.8			

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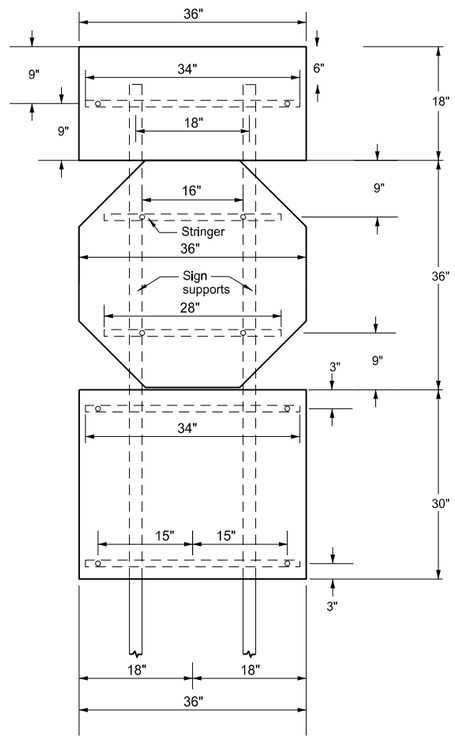
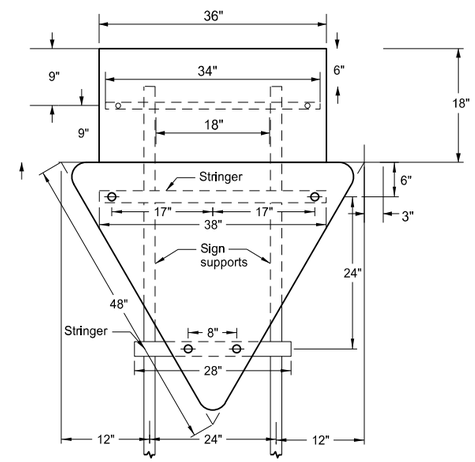
US 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	110	21



Special Assembly 1
(Perforated Tube)
Area: 28.46 SF



Special Assembly 2
(Perforated Tube)
Area: 20.43 SF

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Sign Details

US 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	120	1

(Table 1) Permanent Pavement Marking Summary

Sheet No.	Begin Station	End Station	Lane	Obliteration of Pavement Marking (SF) 704 1500	EPOXY PAVEMENT MARKING						PREFORMED PATTERNED PAVEMENT MARKING		
					MESSAGE (SF) 762 0112		4IN LINE (LF) 762 0113			8IN LINE (LF) 762 0115	4IN LINE (LF) 762 1305	8IN LINE (LF) 762 1309	24IN LINE (LF) 762 1325
					Lt Arrow	Rt Arrow	White CL Skips	Yellow Edge Line	White Edge Line	White Channel Line	White CL Skips	White Channel Line	Stop Bar
-	50+64	55+16	EB	-	-	-	-	452	452	-	113	-	-
	-		WB	-	-	-	-	-	-	-	-	-	-
3	55+16	69+00	EB	-	48	48	-	1,237	1,370	-	315	1,266	95
			WB	-	48	48	-	1,248	1,202	-	311	1,396	60
-	69+00	97+79	EB	-	-	-	-	2,881	2,876	-	720	-	-
			WB	-	-	-	-	2,895	2,901	-	725	-	-
3	97+79	105+00	EB	-	48	-	-	724	624	-	180	436	-
			WB	-	-	-	-	711	640	-	182	-	-
4	105+00	130+00	EB	-	96	48	-	2,489	2,494	-	625	1,297	-
			WB	-	48	48	-	2,443	2,320	-	623	806	-
-	130+00	135+00	EB	-	-	-	-	499	501	-	125	-	-
			WB	-	-	-	-	494	492	-	123	-	-
5	135+00	148+50	EB	-	48	48	-	1,247	1,351	-	338	723	-
			WB	-	48	-	-	1,297	1,316	-	337	374	-
-	148+50	162+80	EB	-	-	-	-	1,430	1,430	-	358	-	-
			WB	-	-	-	-	1,430	1,430	-	358	-	-
6	162+80	183+77	EB	226	48	128	-	2,086	2,192	-	524	1,309	88
			WB	-	48	-	-	2,085	2,020	-	524	435	36
-	183+77	190+00	EB	-	-	-	-	623	623	-	156	-	-
			WB	-	-	-	-	623	623	-	156	-	-
7	190+00	203+00	EB	-	-	48	-	1,293	1,334	-	325	335	-
			WB	-	48	-	-	1,283	1,300	-	325	435	-
-	203+00	228+00	EB	-	-	-	-	2,500	2,500	-	625	-	-
			WB	-	-	-	-	2,500	2,500	-	625	-	-
8	228+00	247+00	EB	-	-	-	194	901	901	-	32	-	-
			WB	-	48	48	-	1,778	1,669	-	376	1,139	72
-	247+00	269+00	EB	-	-	-	550	2,200	2,200	-	-	-	-
			WB	-	-	-	-	2,200	2,200	-	550	-	-
Part 1 Total				**226**	**576**	**464**	**744**	**41,549**	**41,461**	**-**	**9,651**	**9,951**	**351**

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Permanent Pavement Marking Summary

Sta 50+64 to Sta 269+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	120	2

(Table 1) Permanent Pavement Marking Summary

Sheet No.	Begin Station	End Station	Lane	Obliteration of Pavement Marking (SF) 704 1500	EPOXY PAVEMENT MARKING						PREFORMED PATTERNED PAVEMENT MARKING		
					MESSAGE (SF) 762 0112		4IN LINE (LF) 762 0113			8IN LINE (LF) 762 0115	4IN LINE (LF) 762 1305	8IN LINE (LF) 762 1309	24IN LINE (LF) 762 1325
					Lt Arrow	Rt Arrow	White CL Skips	Yellow Edge Line	White Edge Line	White Channel Line	White CL Skips	White Channel Line	Stop Bar
9	269+00	281+50	EB	-	-	48	313	1,253	1,151	371	-	-	-
			WB	-	48	-	-	1,248	1,250	-	313	385	-
-	281+50	319+00	EB	-	-	-	938	3,750	3,750	-	-	-	-
			WB	-	-	-	-	3,750	3,750	-	938	-	-
9	319+00	331+00	EB	-	-	48	300	1,207	1,096	618	-	-	-
			WB	-	-	-	-	1,200	1,200	-	300	256	-
10	331+00	338+00	EB	-	-	-	175	700	700	-	-	-	-
			WB	-	48	-	-	700	700	-	175	447	-
-	338+00	357+00	EB	-	-	-	475	1,900	1,900	-	-	-	-
			WB	-	-	-	-	1,900	1,900	-	475	-	-
11	357+00	382+00	EB	-	96	48	625	2,483	2,503	2,093	-	-	-
			WB	-	-	48	-	2,428	2,431	-	625	712	-
12	382+00	390+00	EB	-	-	-	200	800	800	-	-	-	-
			WB	-	48	48	-	800	800	-	200	1,050	-
-	390+00	478+00	EB	-	-	-	2,200	8,800	8,800	-	-	-	-
			WB	-	-	-	-	8,800	8,800	-	2,200	-	-
13	478+00	494+00	EB	-	-	48	400	1,596	1,490	352	-	-	-
			WB	-	48	-	-	1,589	1,506	-	400	451	-
-	494+00	507+00	EB	-	-	-	325	1,300	1,300	-	-	-	-
			WB	-	-	-	-	1,300	1,300	-	325	-	-
14	507+00	513+64	EB	-	48	-	166	684	664	344	-	-	-
			WB	-	-	-	-	655	664	-	166	-	-
-	513+64	524+00	EB	-	-	-	259	1,036	1,036	-	-	-	-
			WB	-	-	-	-	1,036	1,036	-	259	-	-
15	524+00	546+00	EB	-	48	48	550	2,173	2,141	720	-	-	-
			WB	-	48	-	-	2,144	2,001	-	550	449	-
-	546+00	573+00	EB	-	-	-	675	2,702	2,698	-	-	-	-
		566+08	WB	-	-	-	-	2,008	2,008	-	502	-	-
Part 2 Total				-	432	336	7,601	59,942	59,375	4,498	7,428	3,750	-
Overall Total				226	1,008	800	8,345	101,491	100,836	4,498	17,079	13,701	351

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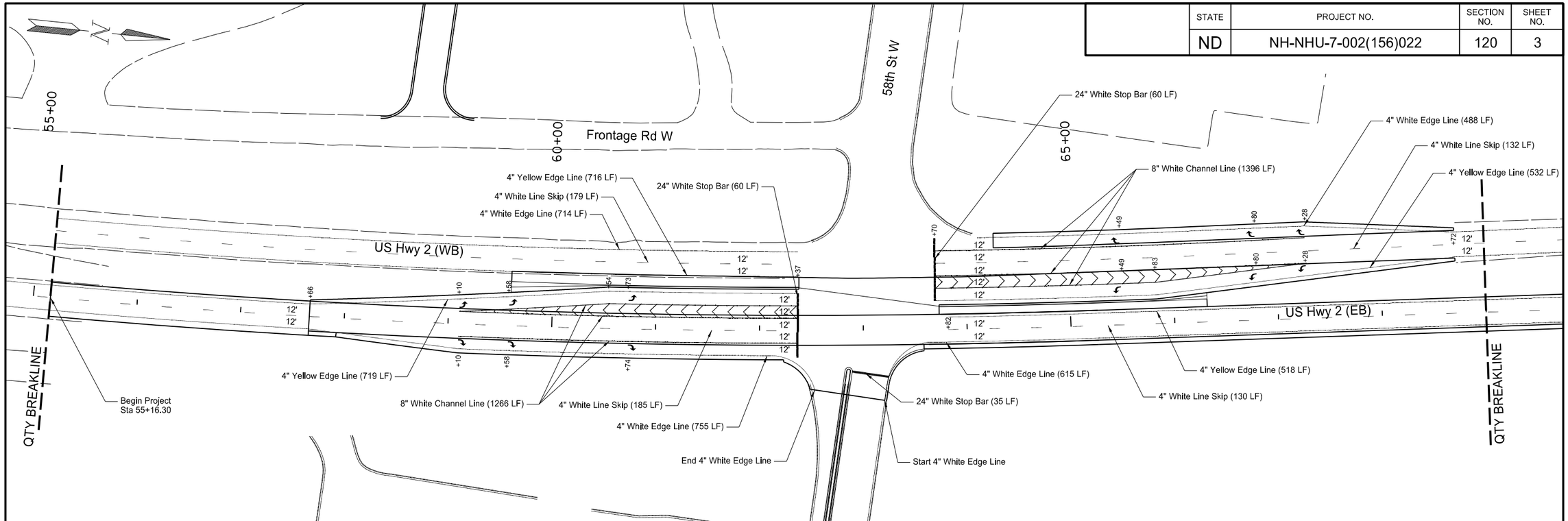
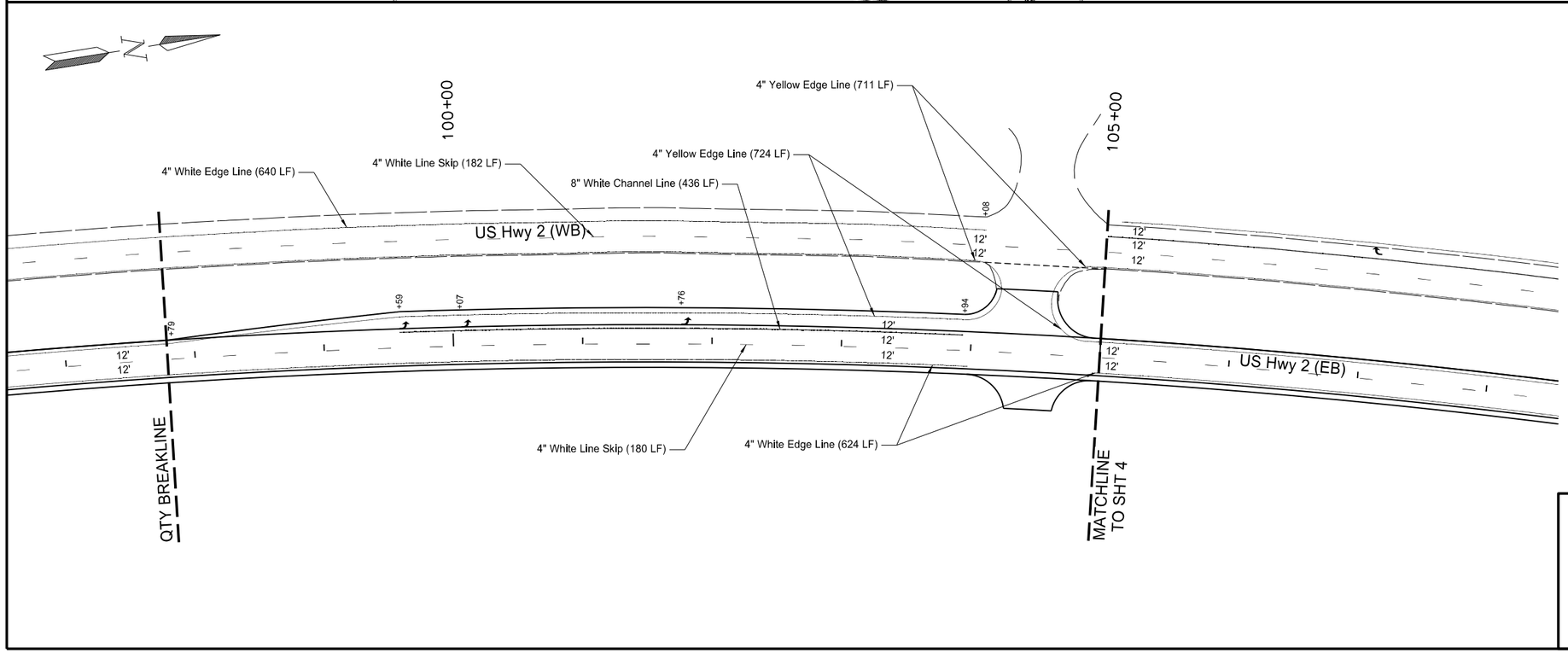
Permanent Pavement Marking Summary

Sta 269+00 to Sta 573+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	120	3





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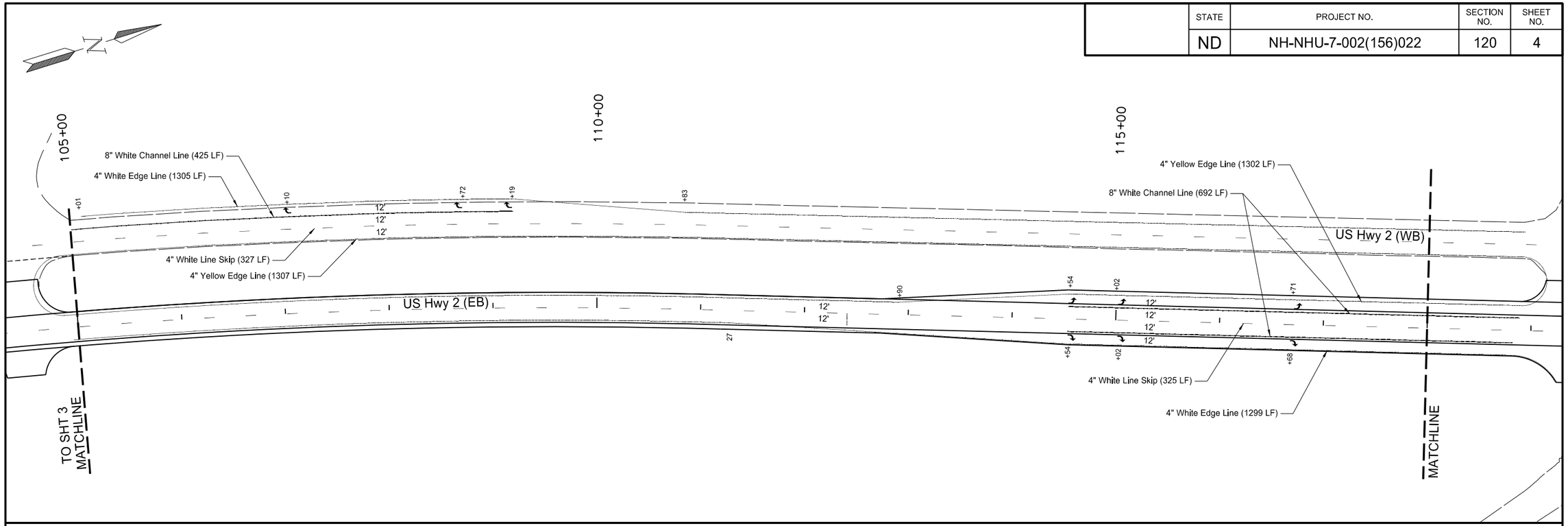
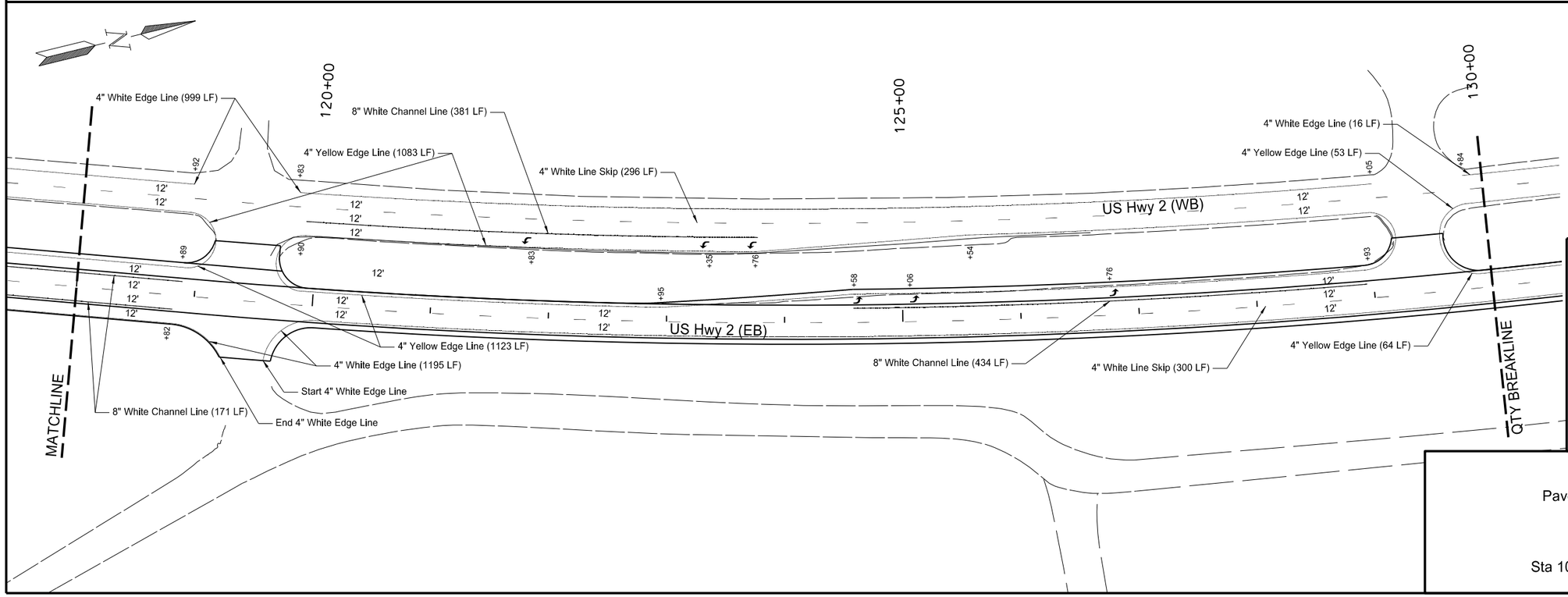
Pavement Marking

US 2

Sta 55+16 to 69+00 (58th St SW)
Sta 97+79 to 105+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	120	4





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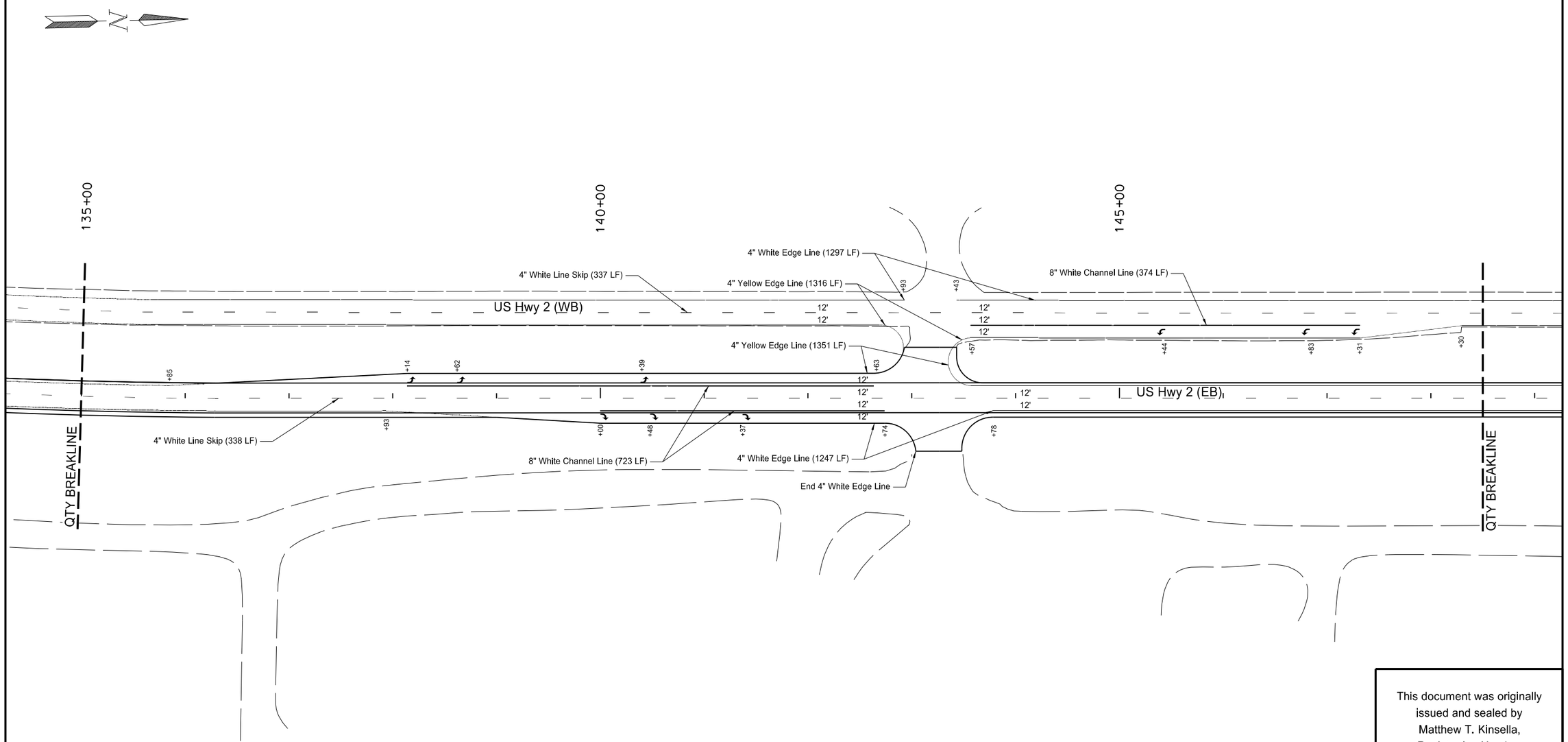
Pavement Marking

US 2

Sta 105+00 to 130+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	120	5



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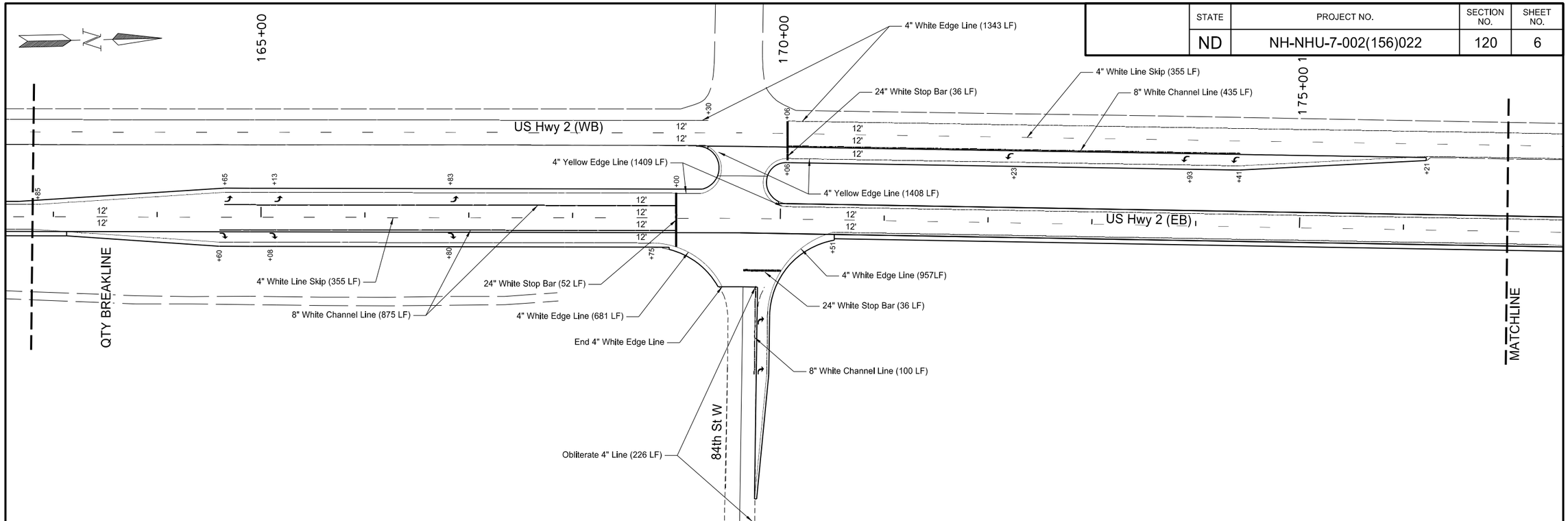
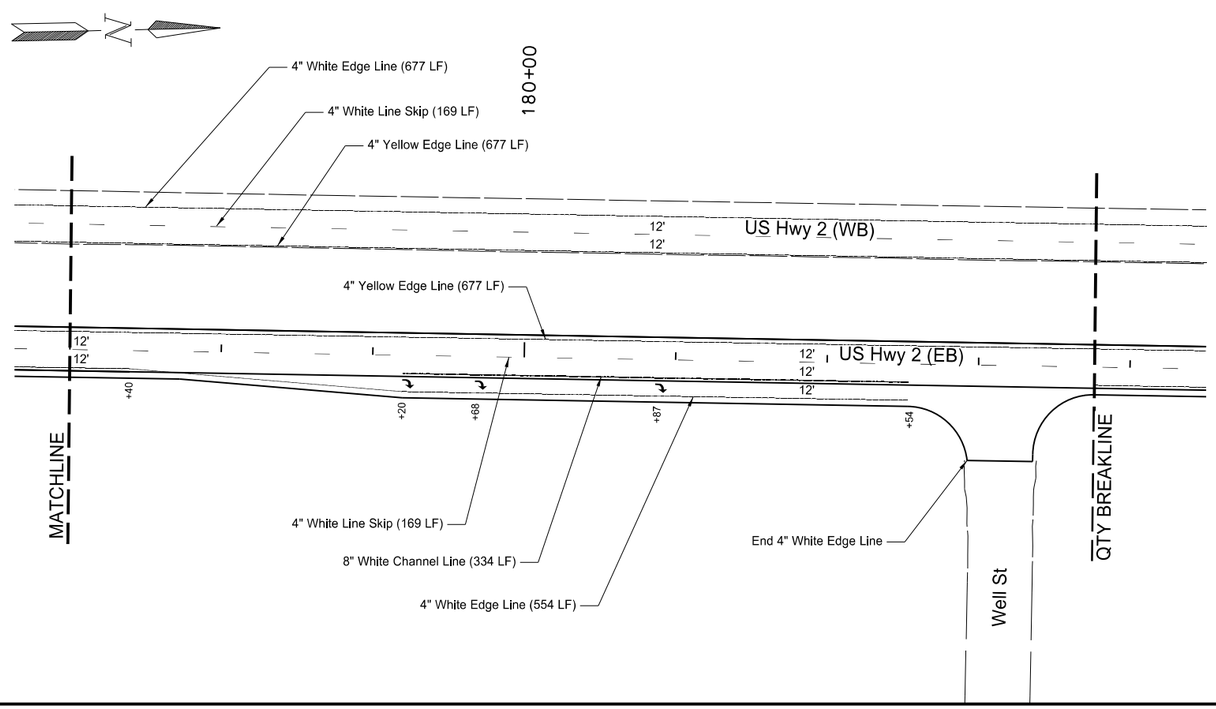
Pavement Marking

US 2

Sta 135+00 to 148+50

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	120	6





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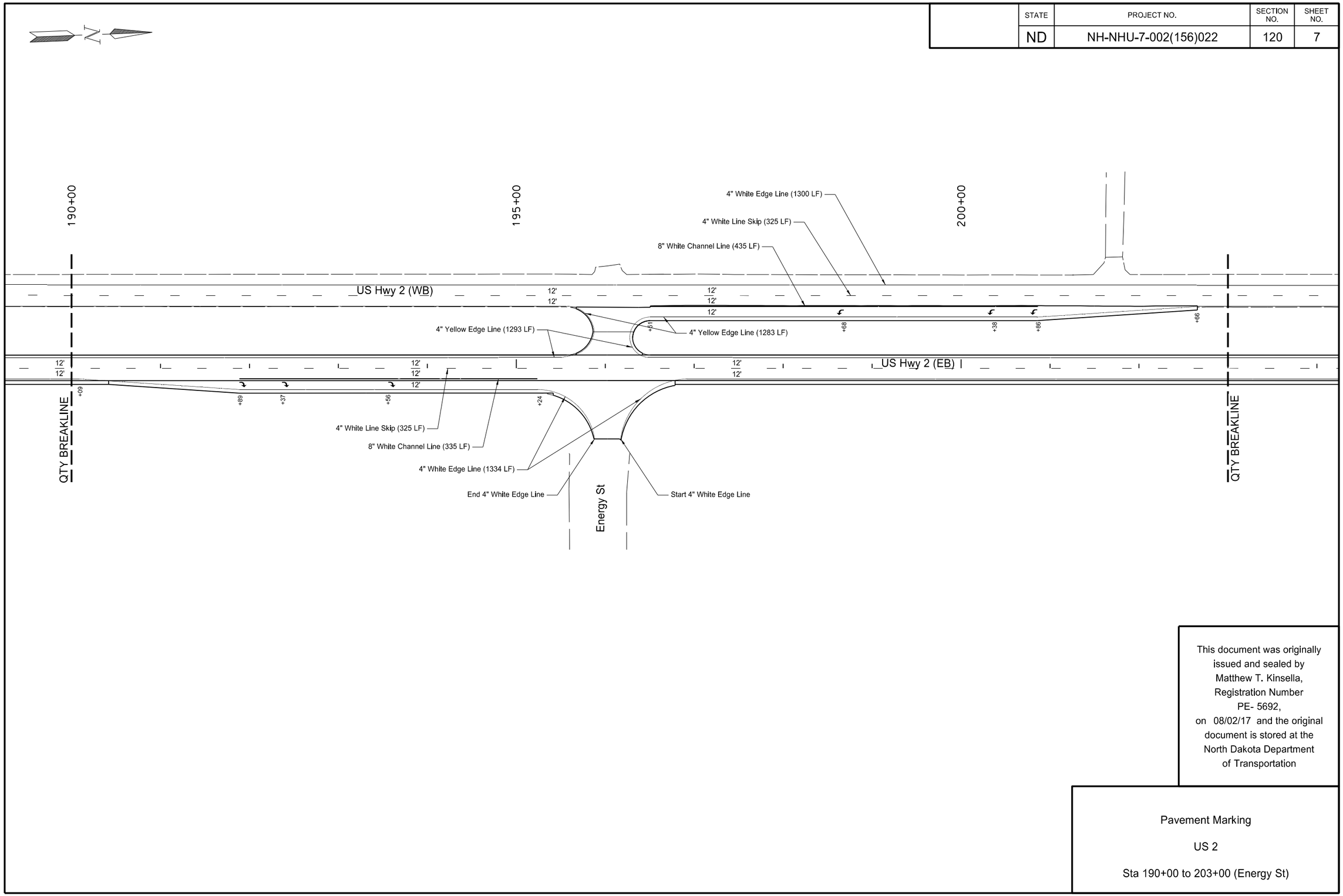
Pavement Marking

US 2

Sta 162+80 to 183+77 (84th St W)

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	120	7



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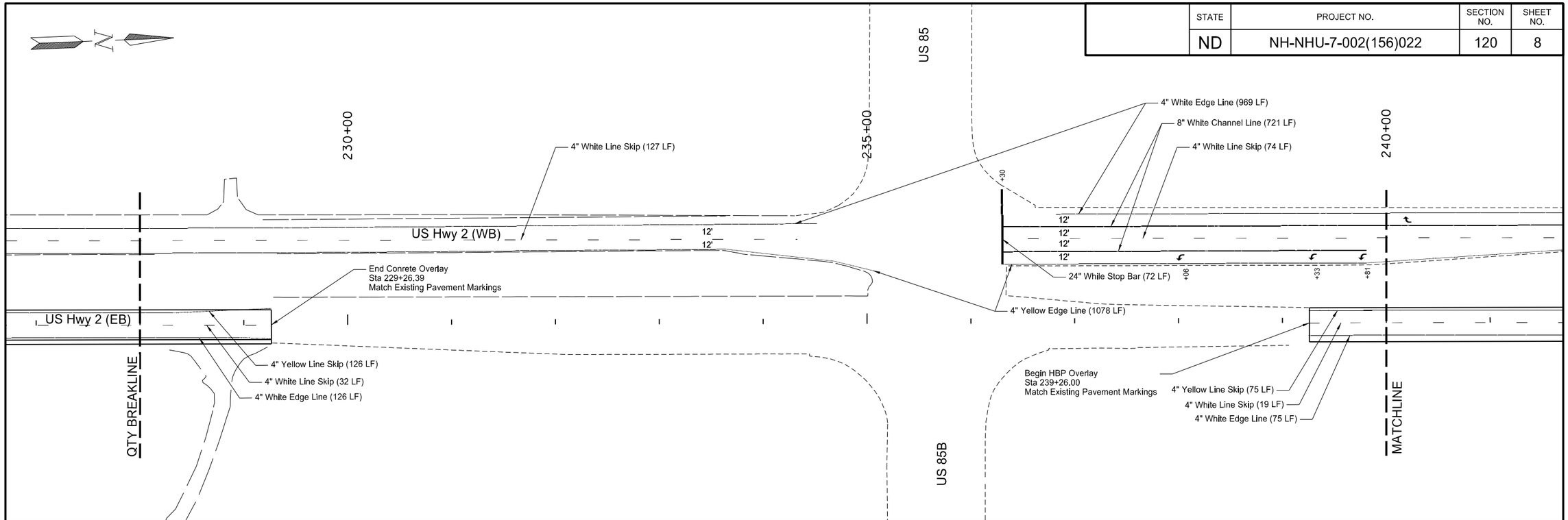
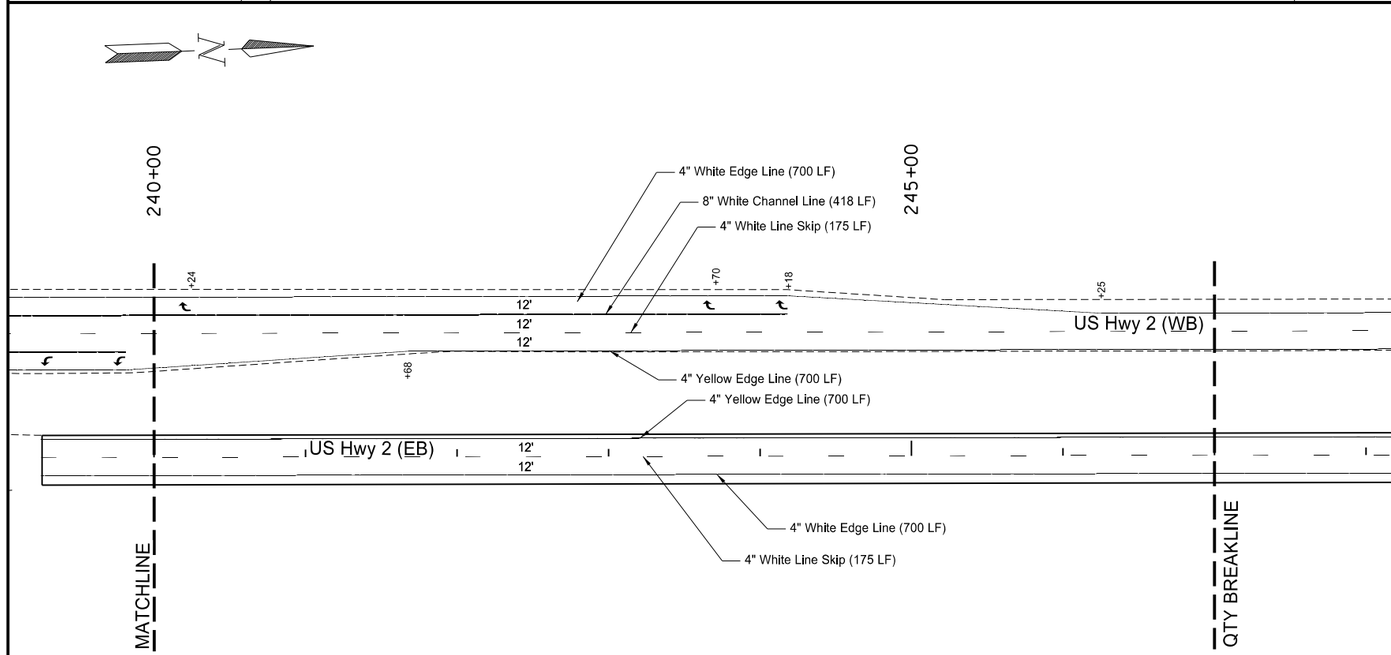
Pavement Marking

US 2

Sta 190+00 to 203+00 (Energy St)

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	120	8





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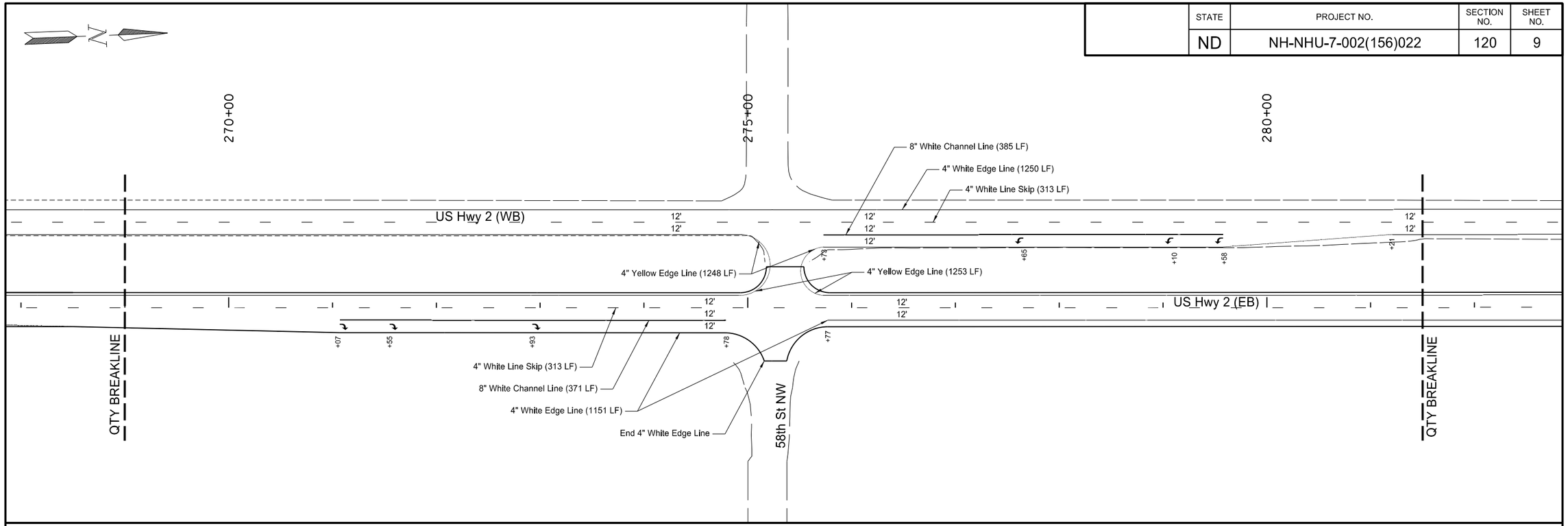
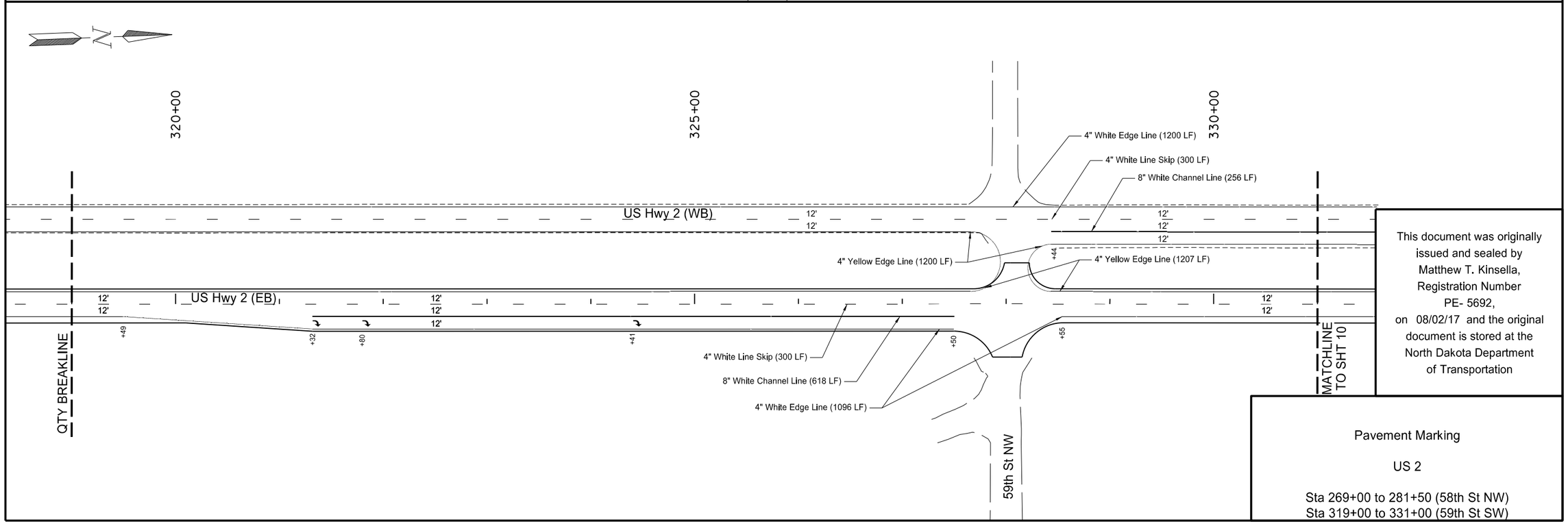
Pavement Marking

US 2

Sta 228+00 to 247+00 (US 85)

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	120	9





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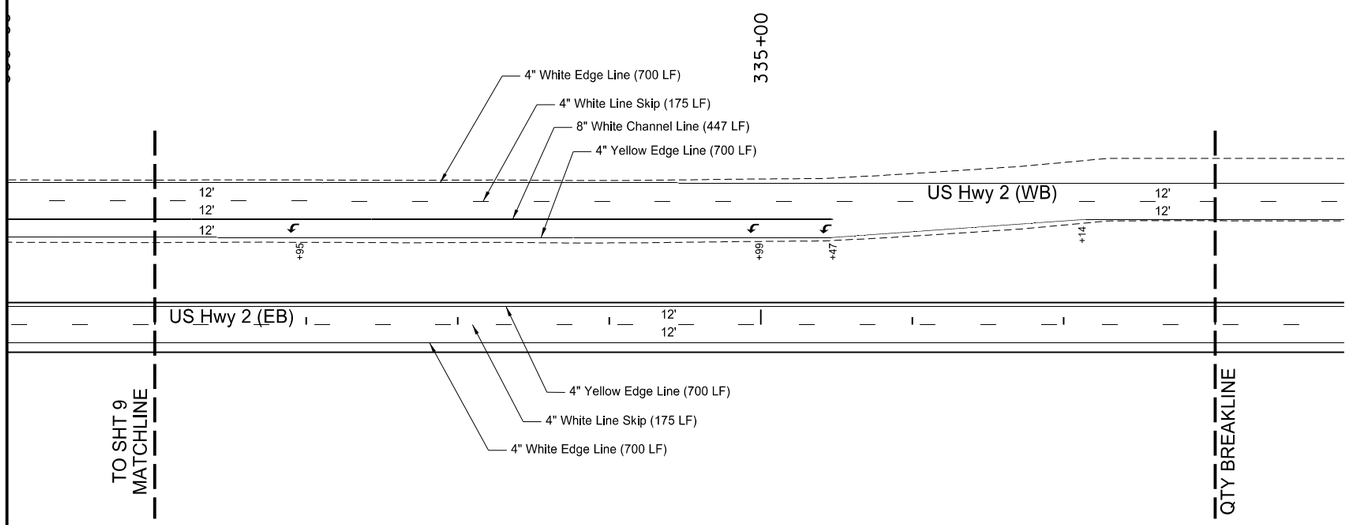
Pavement Marking

US 2

Sta 269+00 to 281+50 (58th St NW)
Sta 319+00 to 331+00 (59th St SW)

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	120	10



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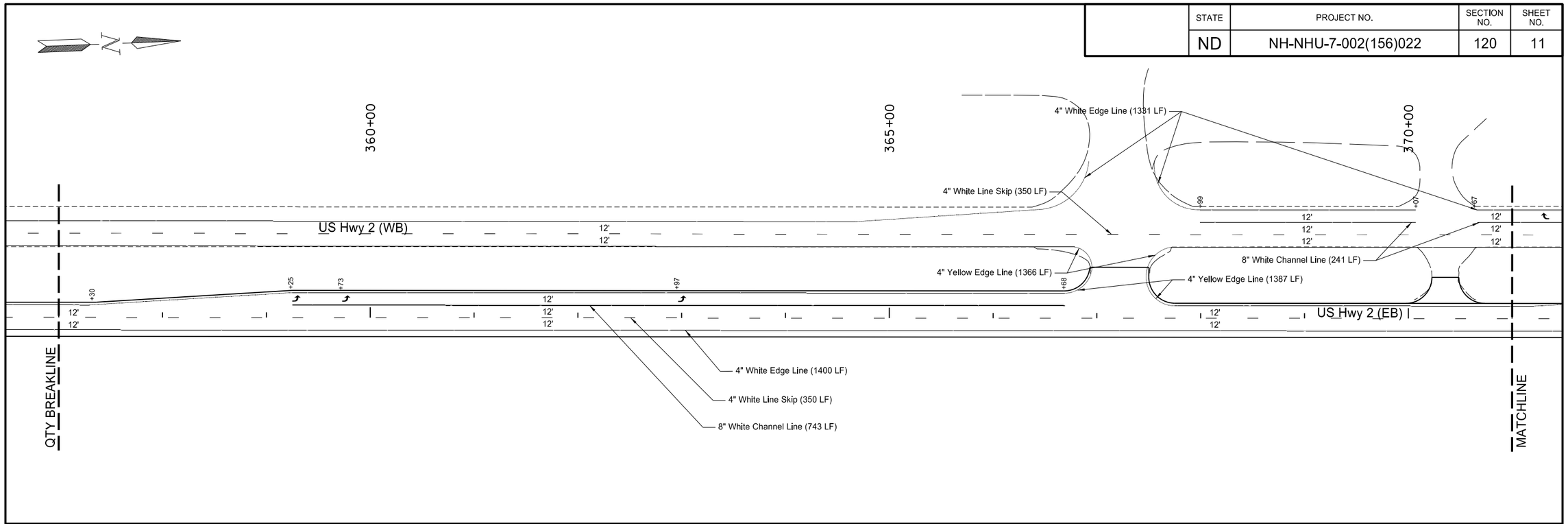
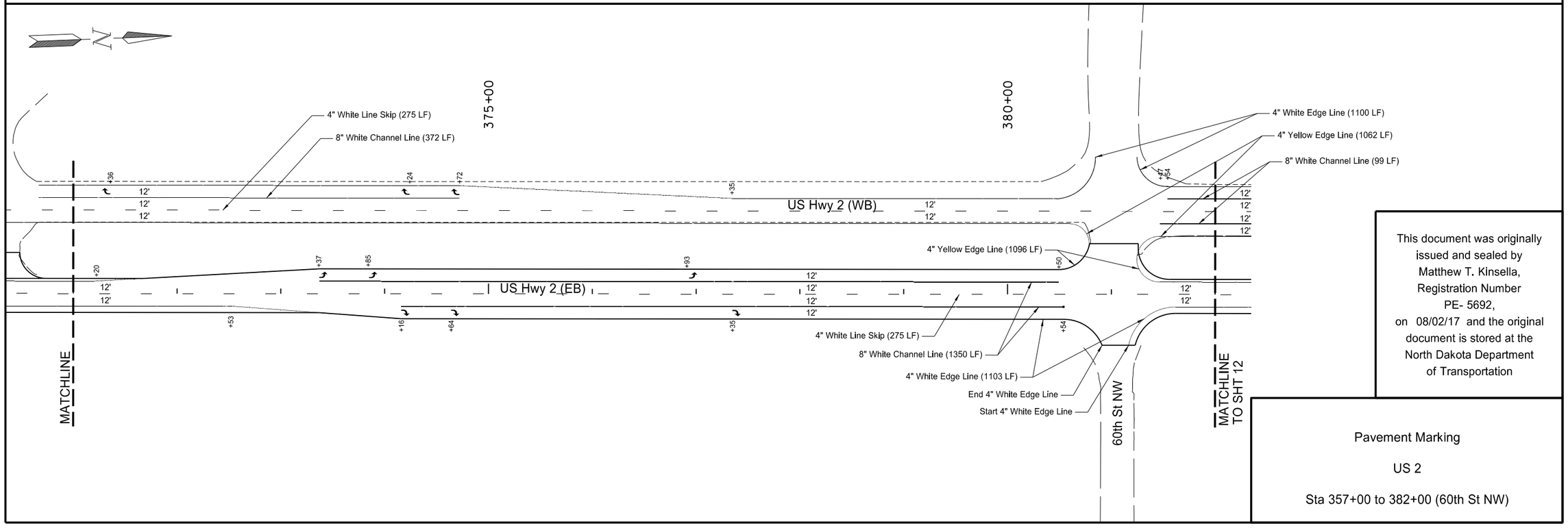
Pavement Marking

US 2

Sta 331+00 to 338+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	120	11





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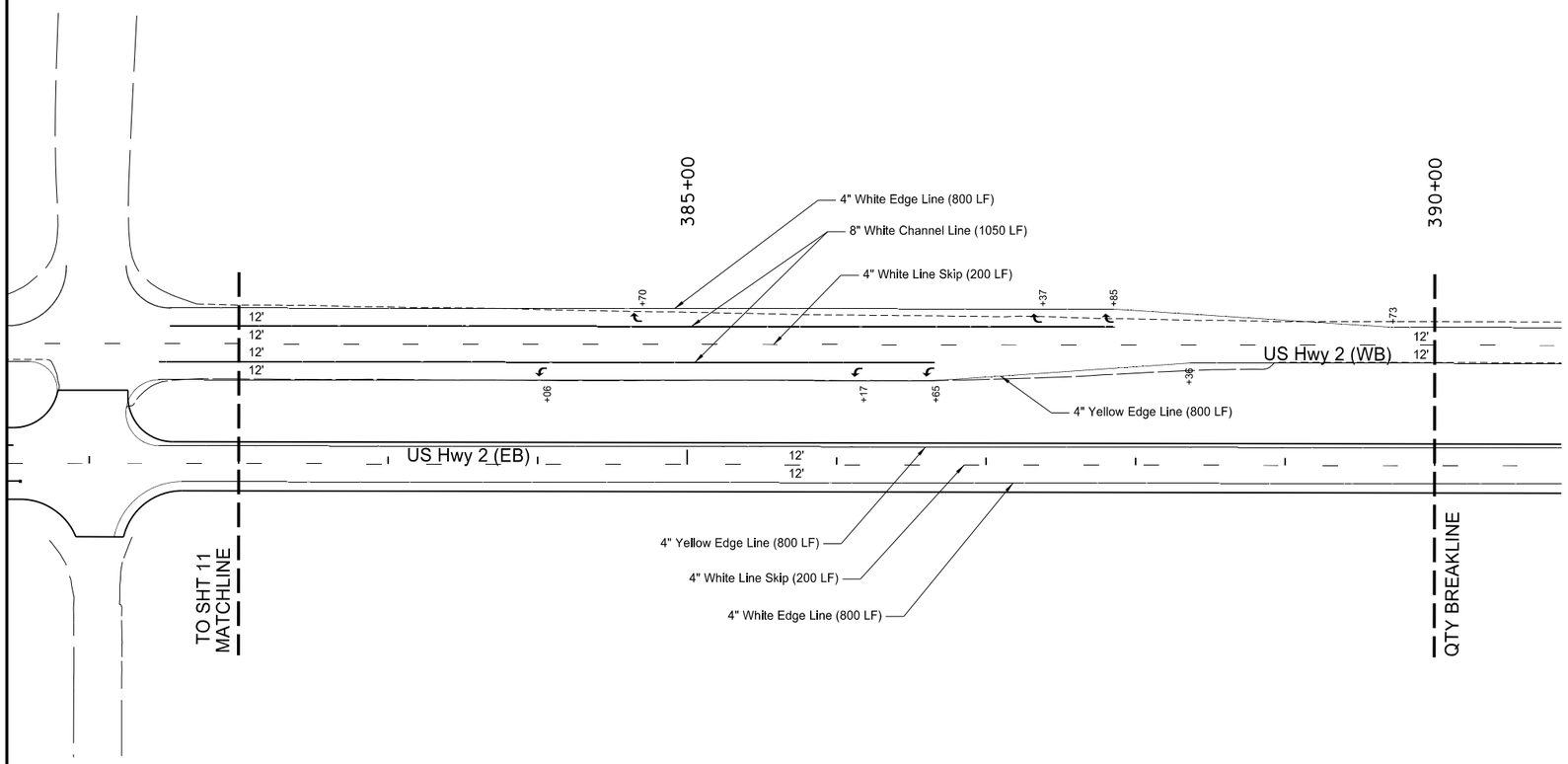
Pavement Marking

US 2

Sta 357+00 to 382+00 (60th St NW)

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	120	12



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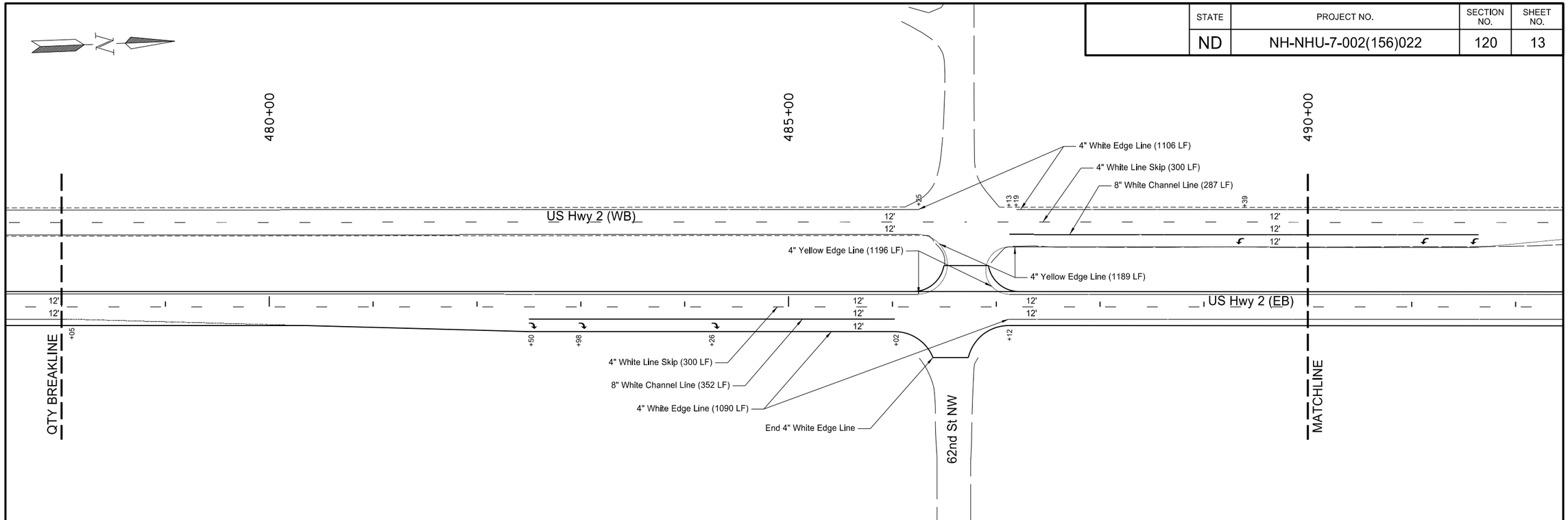
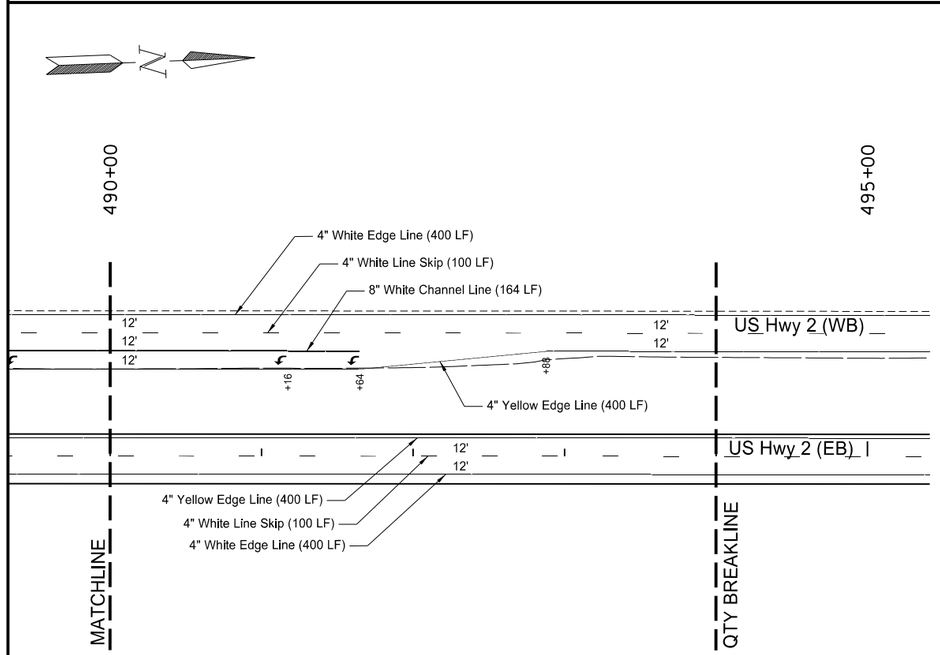
Pavement Marking

US 2

Sta 382+00 to 390+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	120	13





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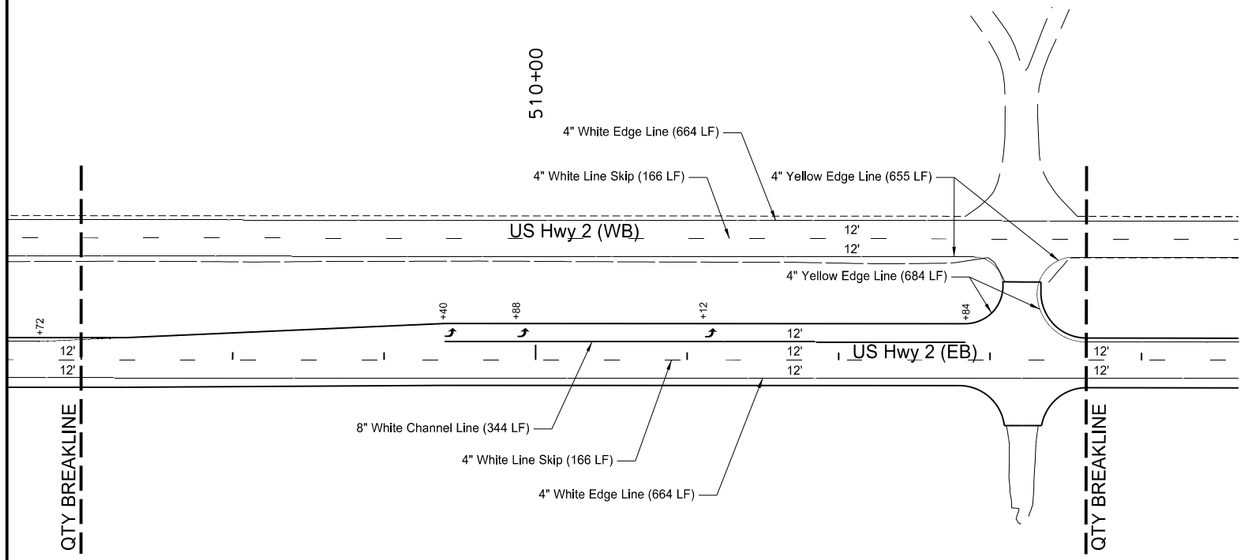
Pavement Marking

US 2

Sta 478+00 to 494+00 (62nd St NW)

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	120	14



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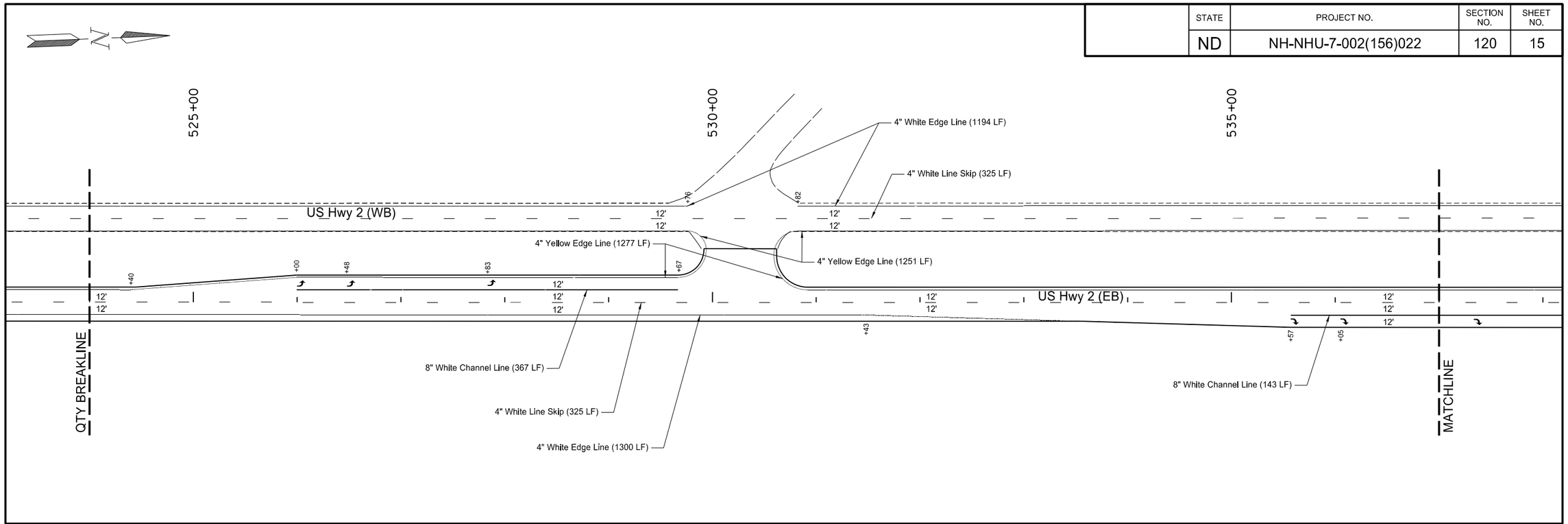
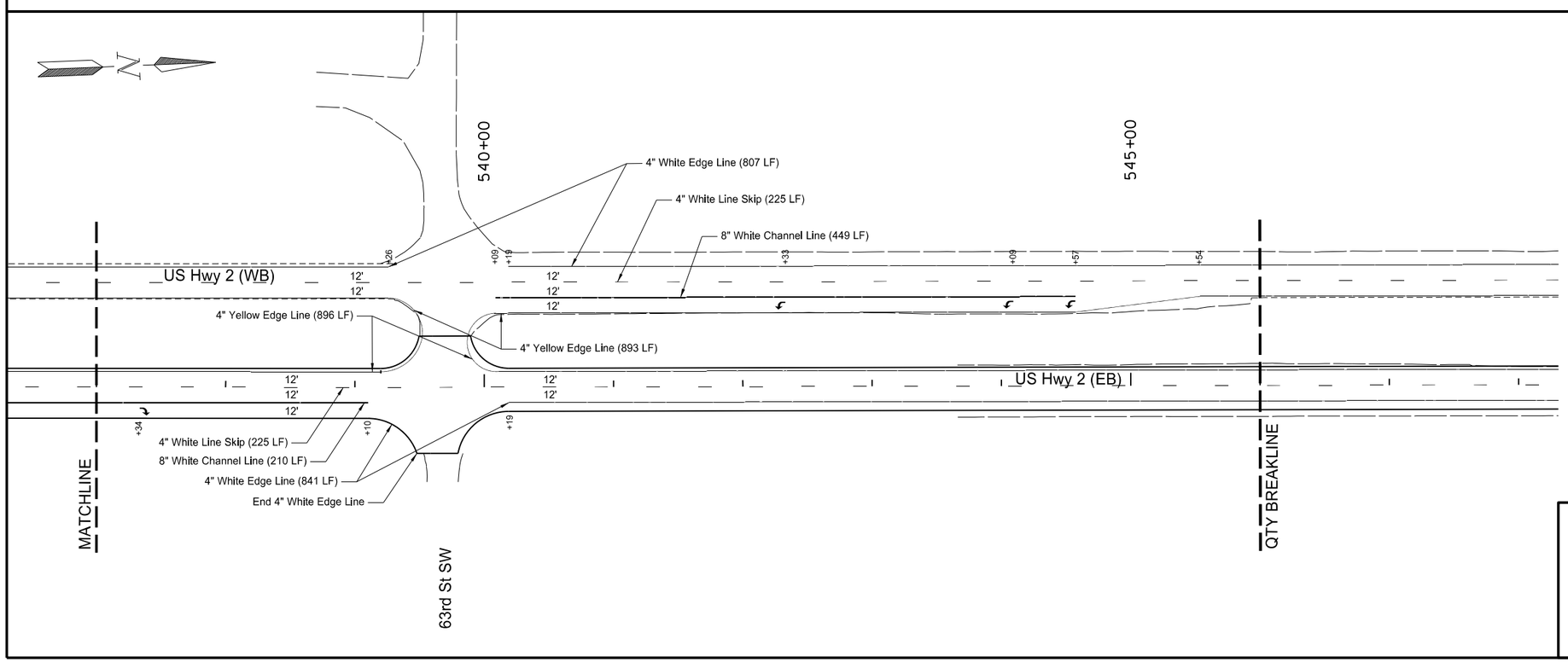
Pavement Marking

US 2

Sta 507+00 to 513+64

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	120	15





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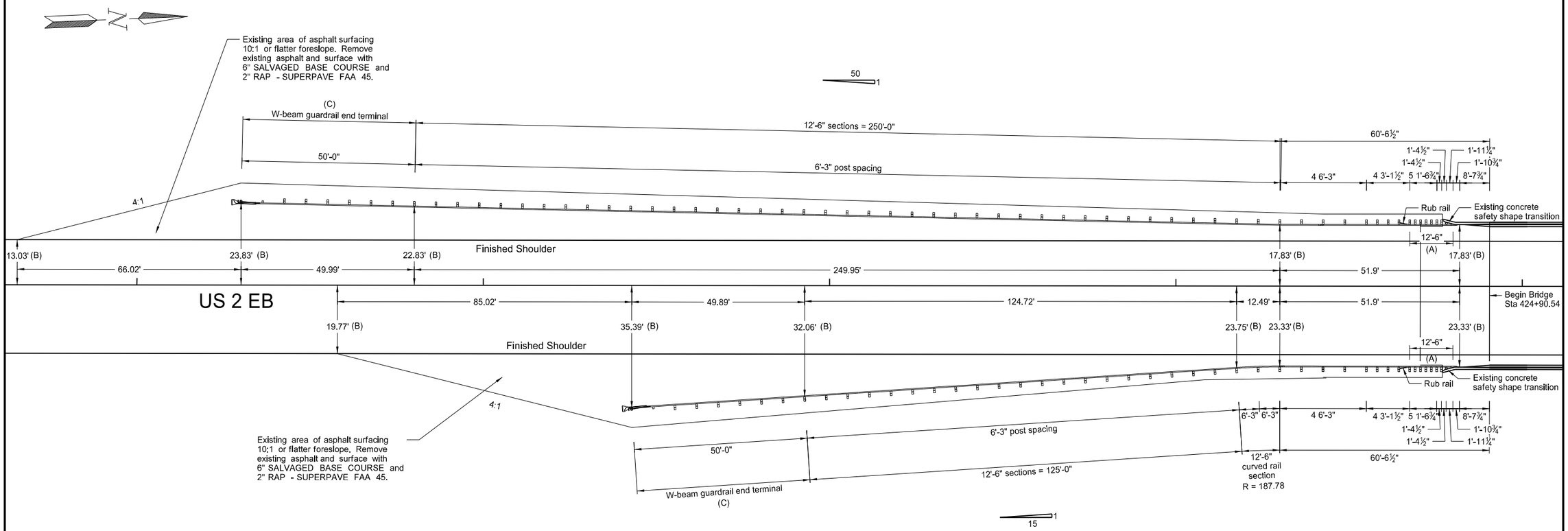
Pavement Marking

US 2

Sta 524+00 to 546+00 (63rd St SW)

23 U.S.C. 409 NDDOT Reserves All Objections	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-NHU-7-002(156)022	130	1

1" = 30'



Notes

(A) 12'-6" Double rail section

(B) Stationing and offsets shown from centerline are based on alignment GRDRL.

(C) Reset existing FLEAT end terminal.

SPEC	CODE	BID ITEM	QTY	UNIT
764	0150	REMOVE AND RESET GUARDRAIL		
		Sta 421+80.05 Lt to 424+81.90 Lt	301.9	LF
		Sta 422+92.79 Rt to 424+81.90 Rt	189.4	LF
764	1059	RESET W-BEAM GUARDRAIL END TERMINAL		
		Sta 421+30.06 Lt to 421+80.05 Lt	1	EA
		Sta 422+42.90 Rt to 422+92.79 Rt	1	EA
764	2081	REMOVE END TREATMENT AND TRANSITION		
		Sta 421+30.06 Lt to 421+80.05 Lt	1	EA
		Sta 422+42.90 Rt to 422+92.79 Rt	1	EA

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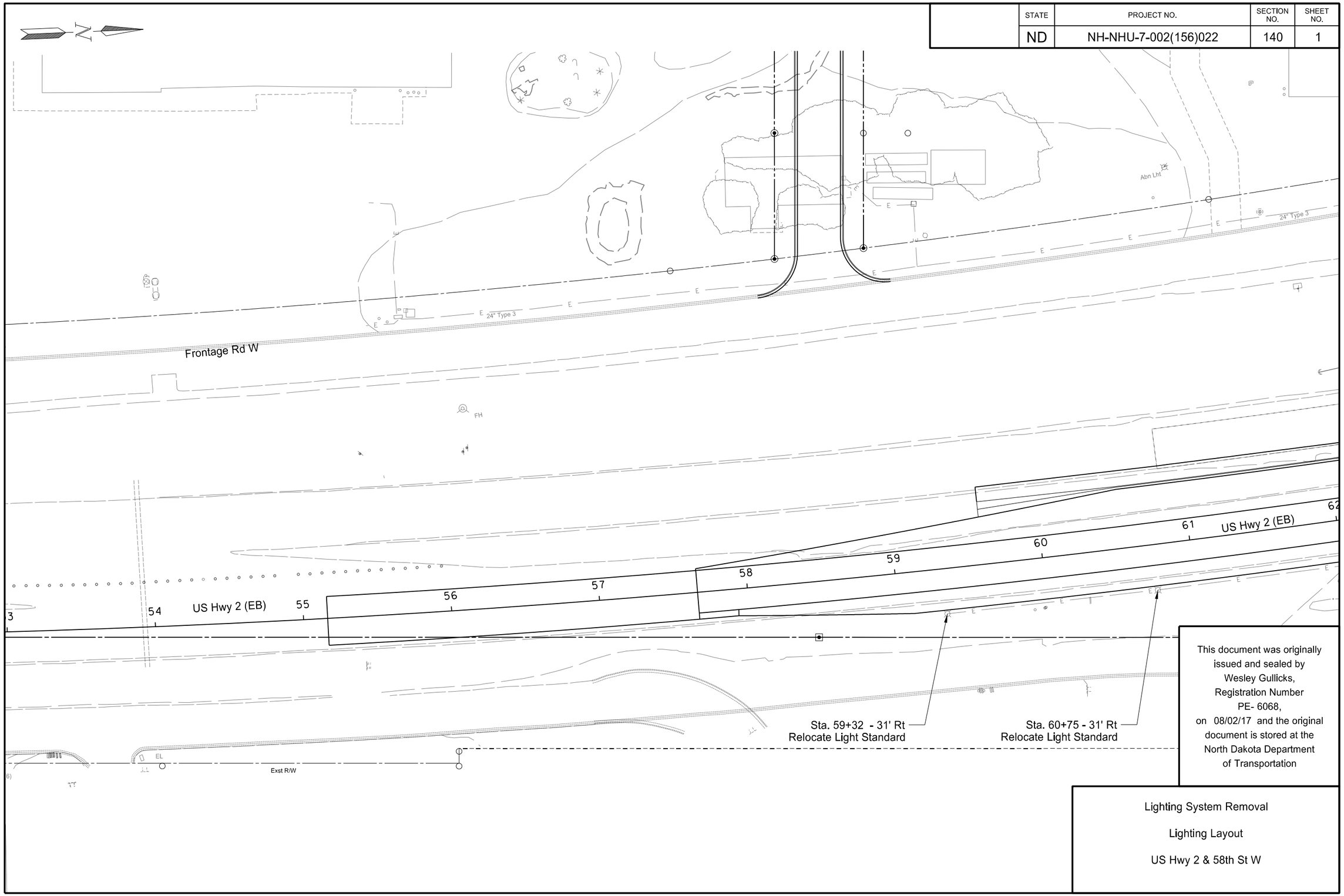
W-Beam Guardrail Layout

US 2

Cow Creek Structure No. 0002-029.275R

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	1



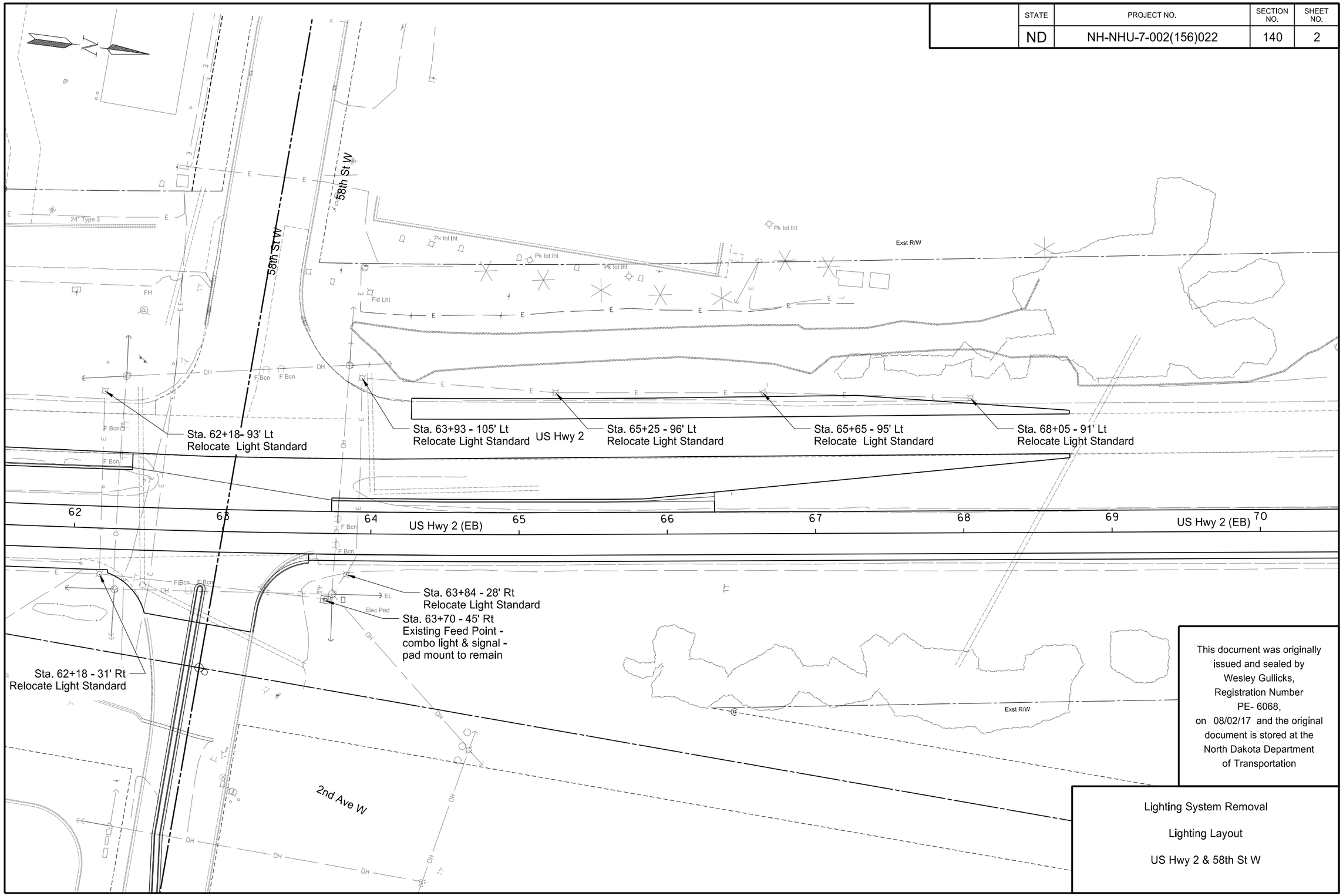
This document was originally issued and sealed by Wesley Gullicks, Registration Number PE- 6068, on 08/02/17 and the original document is stored at the North Dakota Department of Transportation

Lighting System Removal

Lighting Layout

US Hwy 2 & 58th St W

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	2



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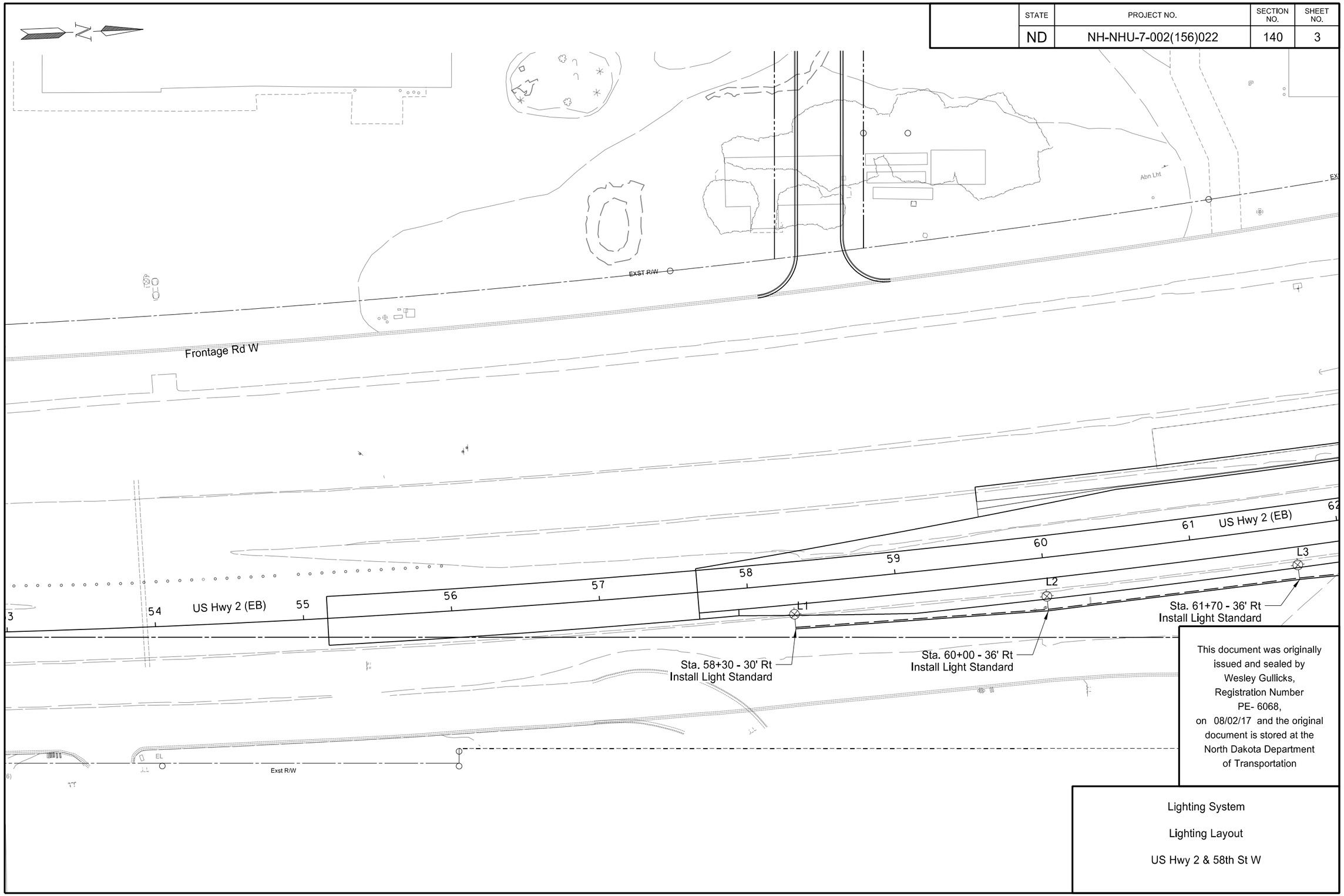
Lighting System Removal

Lighting Layout

US Hwy 2 & 58th St W

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	3



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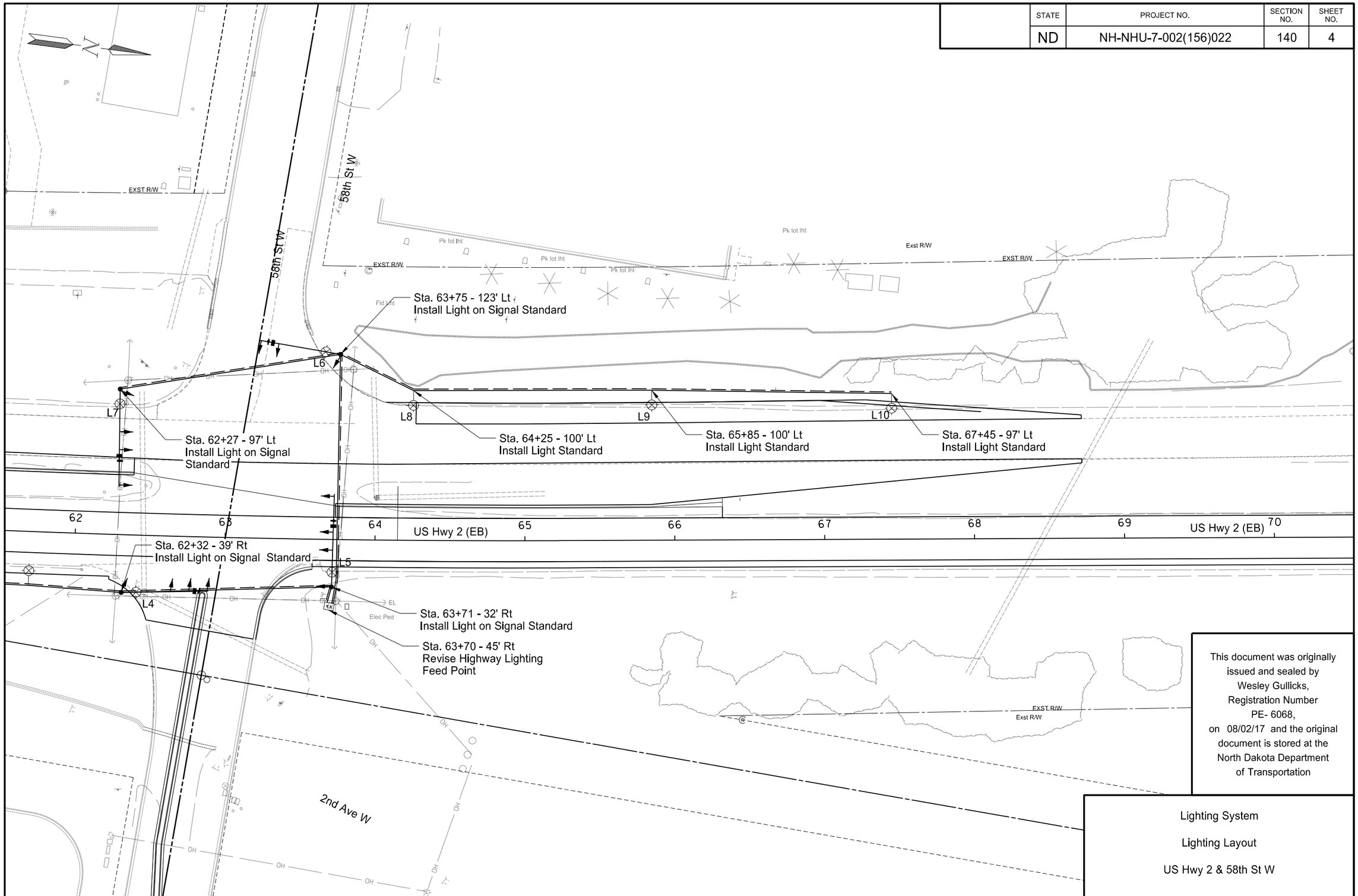
Lighting System

Lighting Layout

US Hwy 2 & 58th St W

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	4



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Lighting System

Lighting Layout

US Hwy 2 & 58th St W

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	5

Conduit / Conductor Run Tabulation								
Sta to Sta		Conduit Runs		Cable Trench	Cable Runs			
		Length	Size	LF	LF	Conductor Size, Type & Quantity	LF	Conductor Size, Type & Quantity
58+30 - 30' Rt	60+00 - 36' Rt	170'	2"	--	356'	(2) #6 RHW	178'	(1) #6 THW
60+00 - 36' Rt	61+70 - 36' Rt	170'	2"	--	356'	(2) #6 RHW	178'	(1) #6 THW
61+70 - 36' Rt	62+32 - 39' Rt	62'	2"	--	140'	(2) #6 RHW	70'	(1) #6 THW
62+32 - 39' Rt	63+71 - 32' Rt	140'	2"	--	296'	(2) #6 RHW	148'	(1) #6 THW
63+71 - 32' Rt	63+70 - 45' Rt	13'	2"	--	54'	(2) #6 RHW	27'	(1) #6 THW
63+70 - 45' Rt	63+75 - 123' Lt	169'	2"	--	366'	(2) #6 RHW	183'	(1) #6 THW
63+75 - 123' Lt	62+27 - 97' Lt	150'	2"	--	316'	(2) #6 RHW	158'	(1) #6 THW
63+75 - 123' Lt	64+25 - 100' Lt	54'	2"	--	124'	(2) #6 RHW	62'	(1) #6 THW
64+25 - 100' Lt	65+85 - 100' Lt	160'	2"	--	336'	(2) #6 RHW	168'	(1) #6 THW
65+85 - 100' Lt	67+45 - 97' Lt	160'	2"	--	336'	(2) #6 RHW	168'	(1) #6 THW

Light Standard Foundation Table		
Description	Footing Depth "D" 24" & 30" Diameter	Footing Depth "D" 36" & 42" Diameter
42' Pole	6'-0"	5'-0"

Light Standards							
No.	Station	Luminaire	Circuit	IES - Type	Pole Height	Mast Arm	Remarks
L1	58+30 - 30' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	Install new LED Luminaire on Relocated Light Standard. Provide new anchor bolts.
L2	60+00 - 36' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	Install new LED Luminaire on Relocated Light Standard. Provide new anchor bolts.
L3	61+70 - 36' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	Install new LED Luminaire on Relocated Light Standard. Provide new anchor bolts.
L4	62+32 - 39' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	Install new LED Luminaire on Signal Standard
L5	63+71 - 32' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	Install new LED Luminaire on Signal Standard
L6	63+75 - 123' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	Install new LED Luminaire on Signal Standard
L7	62+27 - 97' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	Install new LED Luminaire on Signal Standard
L8	64+25 - 100' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	Install new LED Luminaire on Relocated Light Standard. Provide new anchor bolts.
L9	65+85 - 100' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	Install new LED Luminaire on Relocated Light Standard. Provide new anchor bolts.
L10	67+45 - 97' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	Install new LED Luminaire on Relocated Light Standard. Provide new anchor bolts.

Lighting Quantities							
Description	Concrete Foundation - Highway Lighting	2" Diameter Rigid Conduit	Underground Conductor No6 - Type RHW	Underground Conductor No6 - Type THW	Relocate Light Standard	Revise Highway Lighting Feedpoint	LED Luminaire
Unit	EA	LF	LF	LF	EA	EA	EA
Quantity	6	1248	2680	1340	9	1	10

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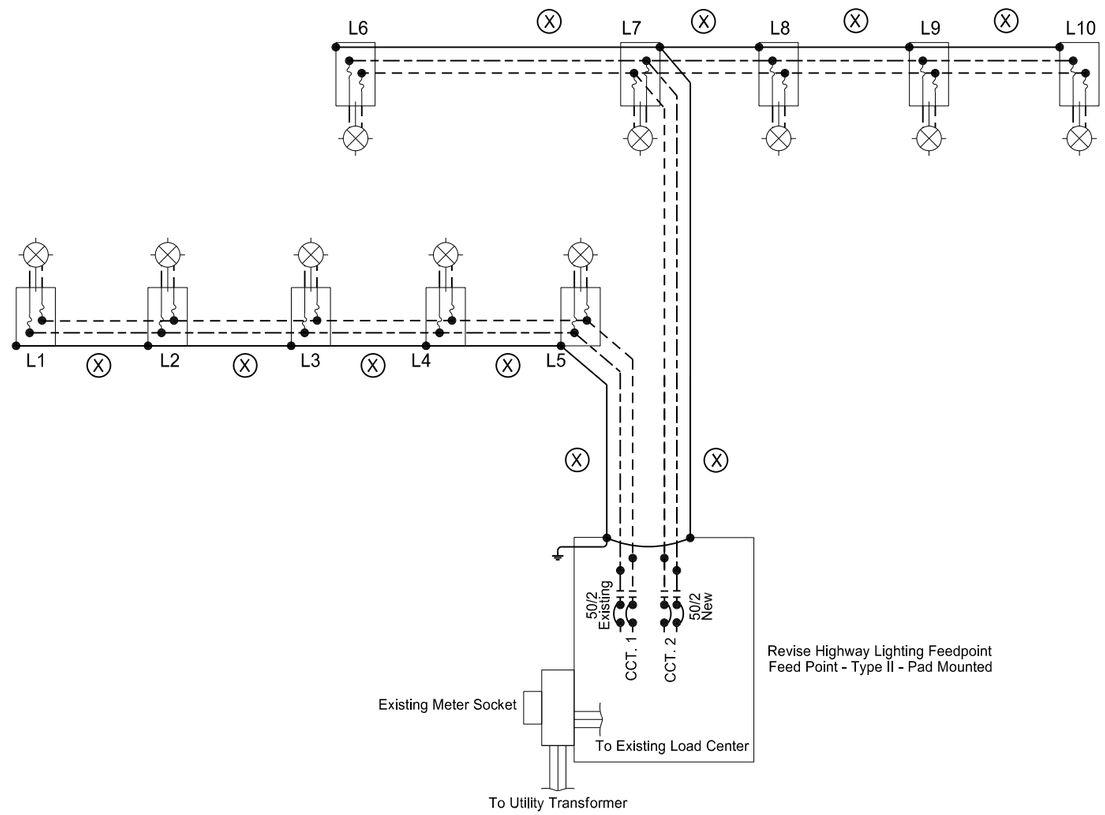
Lighting System

US Hwy 2 and 58th St W Intersection

Lighting Quantities

ND Hwy 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	6



LEGEND

- Phase Conductor
- Phase Conductor
- Ground Conductor
- 2 - #6 RHW & 1 - #6 THW
- LED Luminaire 208 Watt Operating on 240 Volts
- Light Standard with Inline Fuses

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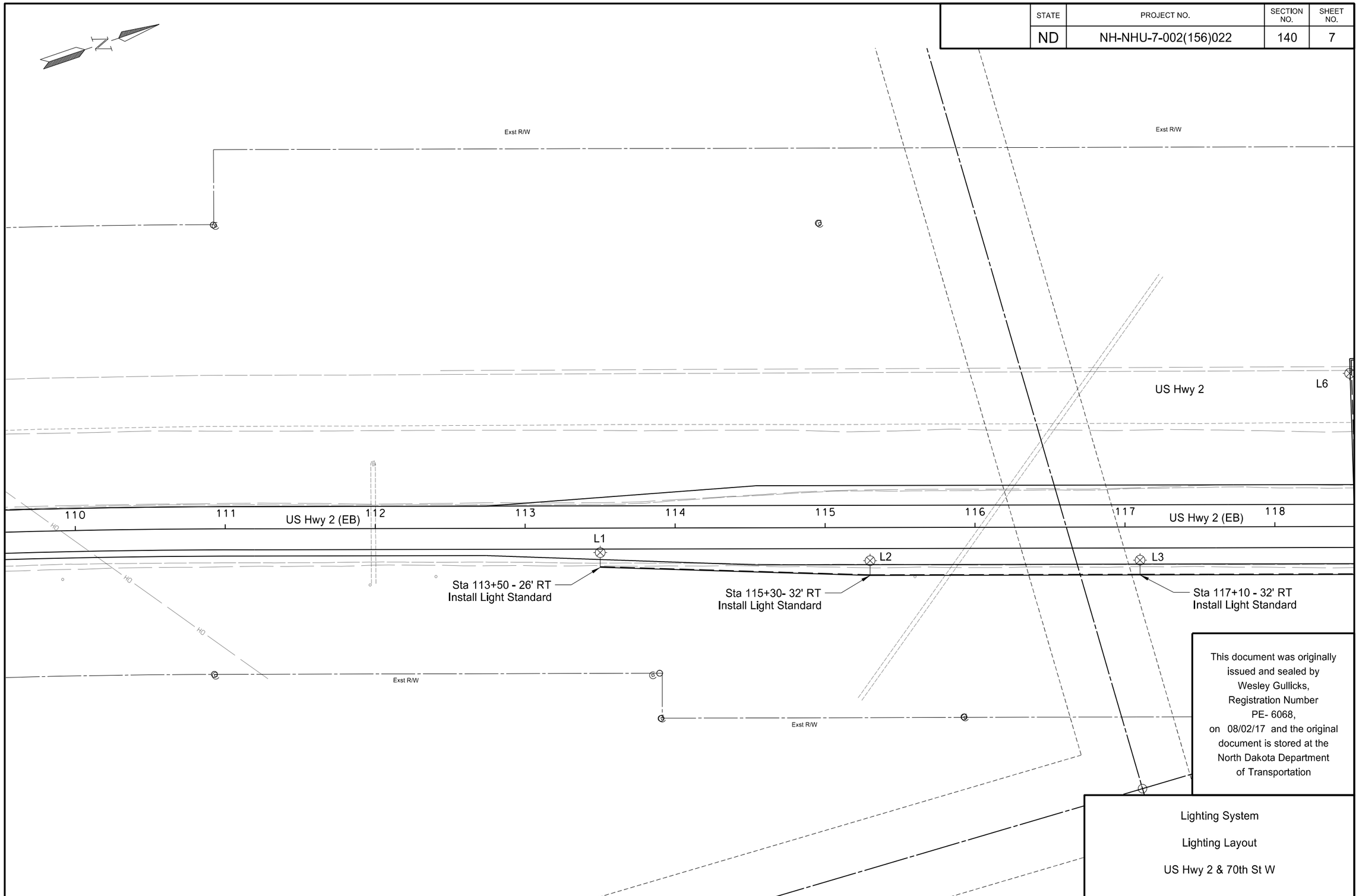
Lighting System

US Hwy 2 and 58th St W Intersection

Lighting Schematic

US Hwy 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	7



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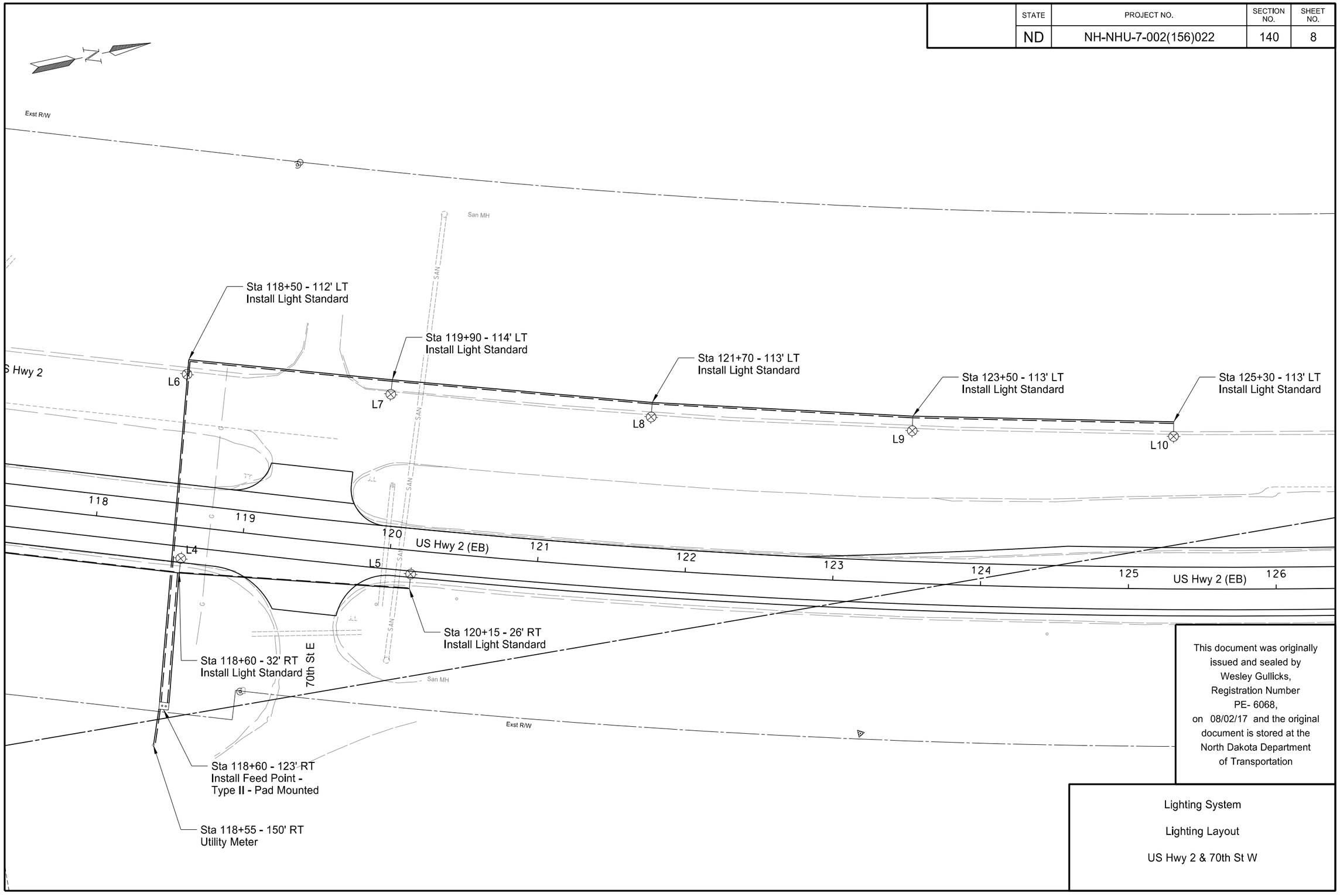
Lighting System

Lighting Layout

US Hwy 2 & 70th St W

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	8



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Lighting System

Lighting Layout

US Hwy 2 & 70th St W

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	9

Conduit / Conductor Run Tabulation								
Sta to Sta		Conduit Runs		Cable Trench	Cable Runs			
		Length	Size	LF	LF	Conductor Size, Type & Quantity	LF	Conductor Size, Type & Quantity
113+50 - 26' Rt	115+30 - 32' Rt	180'	2"	--	376'	(2) #6 RHW	188'	(1) #6 THW
115+30 - 32' Rt	117+10 - 32' Rt	180'	2"	--	376'	(2) #6 RHW	188'	(1) #6 THW
117+10 - 32' Rt	118+60 - 32' Rt	150'	2"	--	316'	(2) #6 RHW	158'	(1) #6 THW
118+60 - 32' Rt	120+15 - 26' Rt	156'	2"	--	328'	(2) #6 RHW	164'	(1) #6 THW
118+60 - 32' Rt	118+60 - 123' Rt	91'	2"	--	210'	(2) #6 RHW	105'	(1) #6 THW
118+60 - 123' Rt	118+50 - 112' Lt	235'	2"	--	498'	(2) #6 RHW	249'	(1) #6 THW
118+50 - 112' Lt	119+90 - 114' Lt	140'	2"	--	296'	(2) #6 RHW	148'	(1) #6 THW
119+90 - 114' Lt	121+70 - 113' Lt	180'	2"	--	376'	(2) #6 RHW	188'	(1) #6 THW
121+70 - 113' Lt	123+50 - 113' Lt	180'	2"	--	376'	(2) #6 RHW	188'	(1) #6 THW
123+50 - 113' Lt	125+30 - 113' Lt	180'	2"	--	376'	(2) #6 RHW	188'	(1) #6 THW
118+60-123' Rt	118+55 - 150' Rt	28'	2"	--	144'	(3) #2 RHW	--	--

Light Standard Foundation Table		
Description	Footing Depth "D" 24" & 30" Diameter	Footing Depth "D" 36" & 42" Diameter
42' Pole	6'-0"	5'-0"

Light Standards							
No.	Station	Luminaire	Circuit	IES - Type	Pole Height	Mast Arm	Remarks
L1	113+50 - 26' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	
L2	115+30 - 32' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	
L3	117+10 - 32' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	
L4	118+60 - 32' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	
L5	120+15 - 26' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	
L6	118+50 - 112' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	
L7	119+90 - 114' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	
L8	121+70 - 113' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	
L9	123+50 - 113' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	
L10	125+30 - 113' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	

Lighting Quantities									
Description	Concrete Foundation - Highway Lighting	Concrete Foundation - Feed Point - Type B	2" Diameter Rigid Conduit	Underground Conductor No6 - Type RHW	Underground Conductor No6 - Type THW	Underground Conductor No2 - Type RHW	Feed Point - Type II - Pad Mounted	Lt Std 10FT MA 42FT MT HT Breakaway	LED Luminaire
Unit	EA	EA	LF	LF	LF	LF	LF	LF	EA
Quantity	10	1	1700	3528	1764	144	1	10	10

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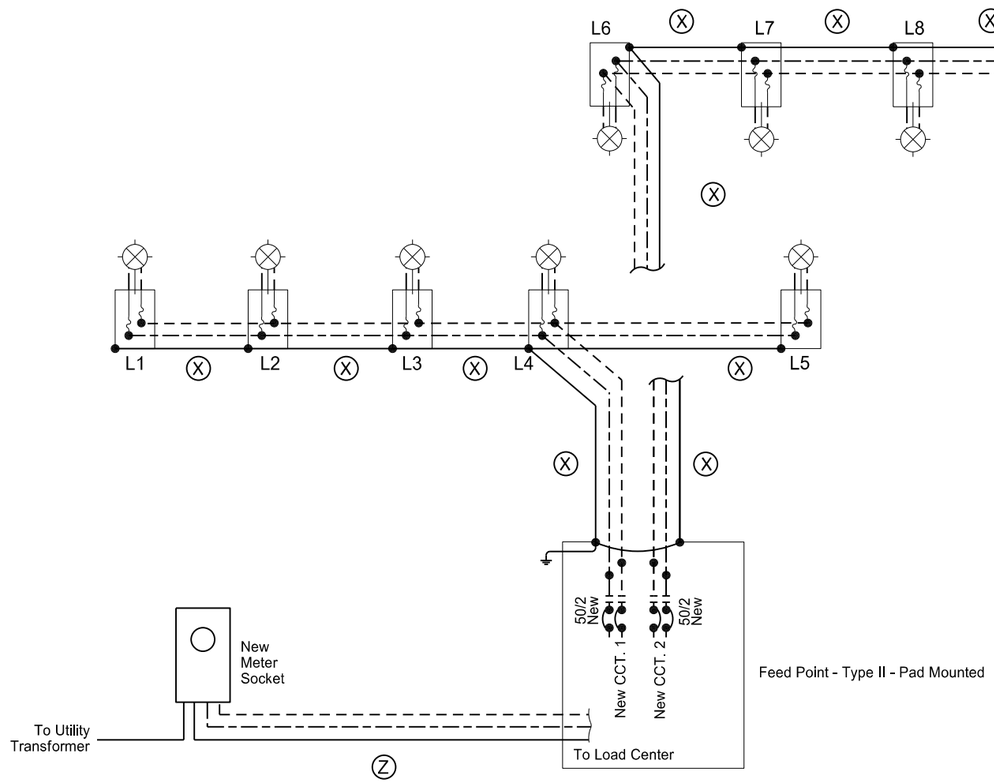
Lighting System
US Hwy 2 & 70th St W
Lighting Quantities
ND Hwy 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	10



LEGEND

- Phase Conductor
- Phase Conductor
- Ground Conductor
- X — 2 - #6 RHW & 1 - #6 THW
- Z — 3 - #2 RHW
- LED Luminaire 208 Watt Operating on 240 Volts
- Light Standard with Inline Fuses

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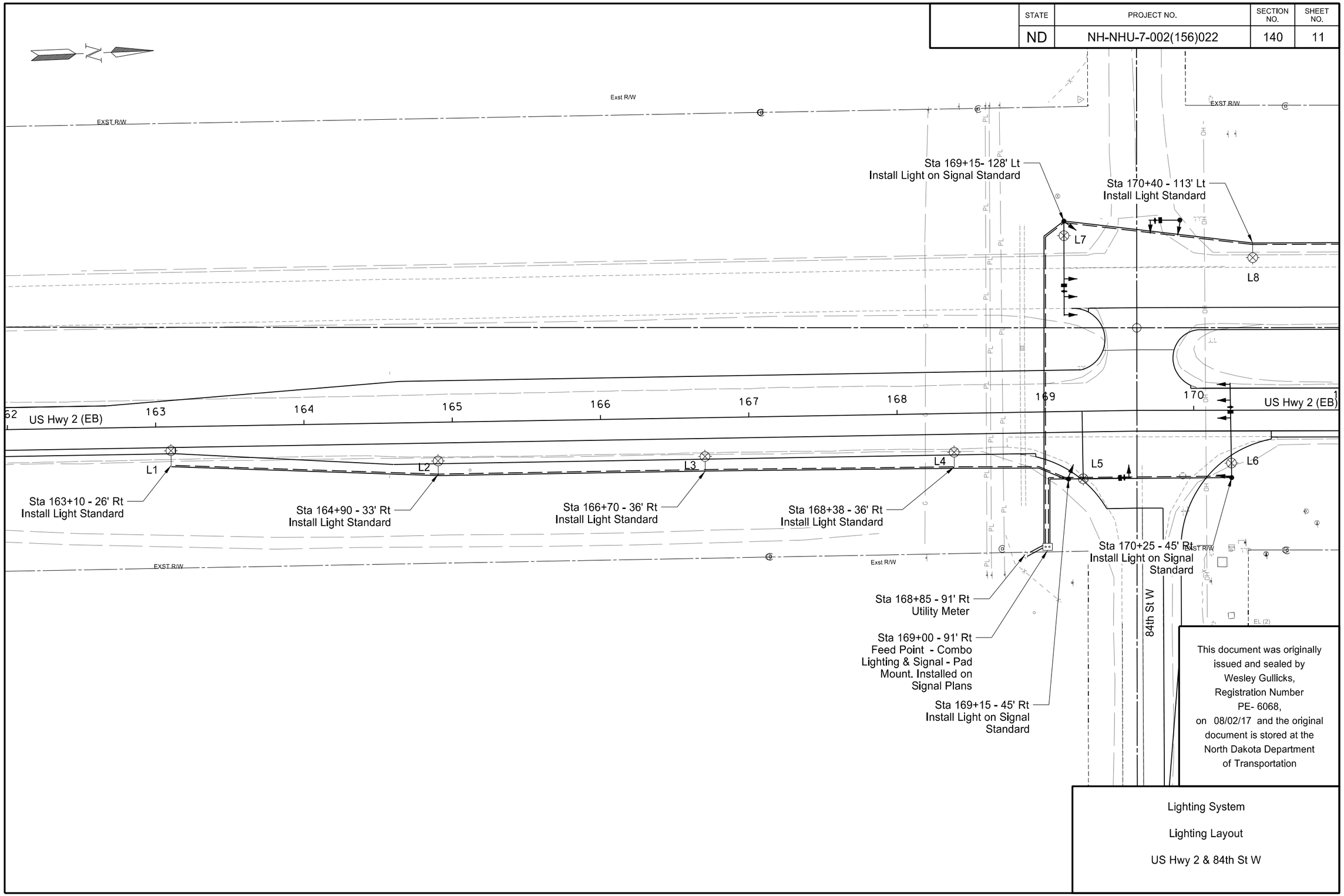
Lighting System

US Hwy 2 & 70th St W

Lighting Schematic

US Hwy 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	11



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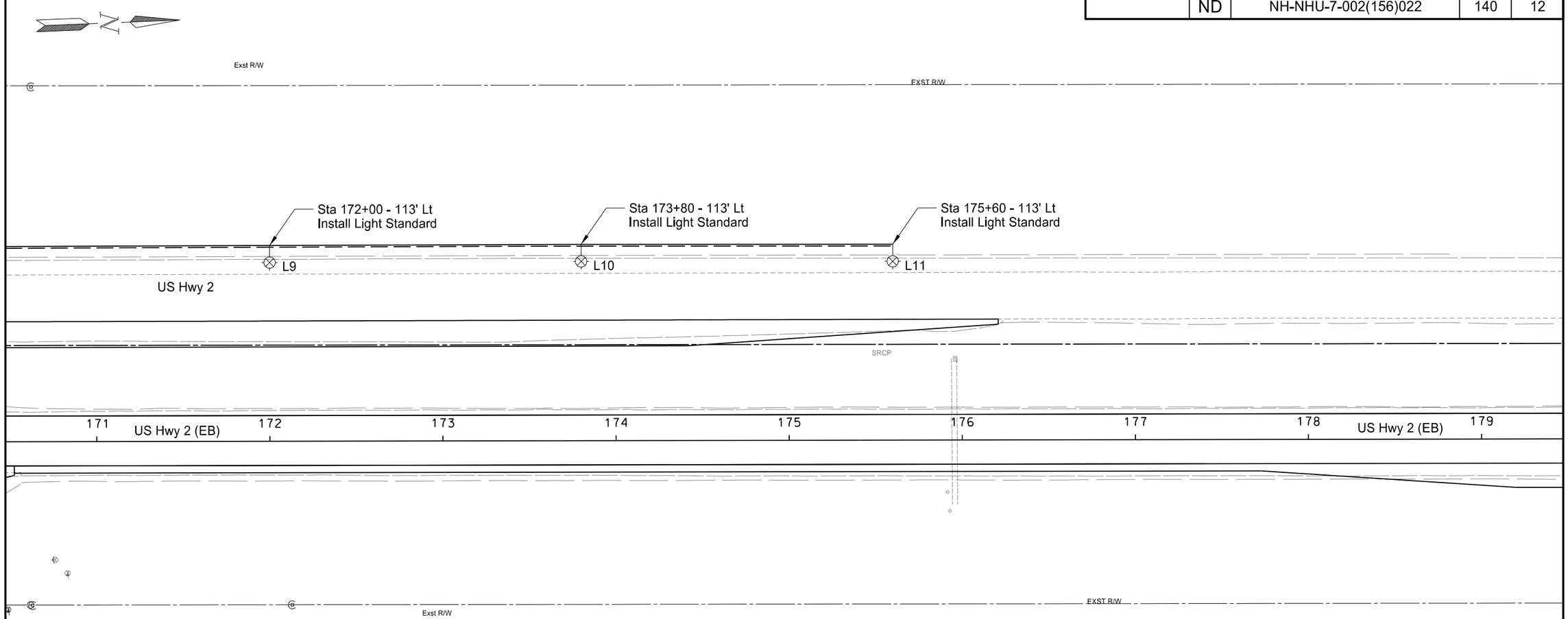
Lighting System

Lighting Layout

US Hwy 2 & 84th St W

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	12



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Lighting System

Lighting Layout

US Hwy 2 & 84th St W

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	13

Conduit / Conductor Run Tabulation

Sta to Sta		Conduit Runs		Cable Trench	Cable Runs			
		Length	Size	LF	LF	Conductor Size, Type & Quantity	LF	Conductor Size, Type & Quantity
163+10 - 26' Rt	164+90 - 33' Rt	180'	2"	--	376'	(2) #6 RHW	188'	(1) #6 THW
164+90 - 33' Rt	166+70 - 36' Rt	180'	2"	--	376'	(2) #6 RHW	188'	(1) #6 THW
166+70 - 36' Rt	168+38 - 36' Rt	168'	2"	--	352'	(2) #6 RHW	176'	(1) #6 THW
168+38 - 36' Rt	169+25 - 45' Rt	78'	2"	--	172'	(2) #6 RHW	86'	(1) #6 THW
169+25 - 45' Rt	169+00 - 45' Rt	15'	2"	--	38'	(2) #6 RHW	19'	(1) #6 THW
169+00 - 45' Rt	169+00 - 91' Rt	46'	2"	--	112'	(2) #6 RHW	56'	(1) #6 THW
169+25 - 45' Rt	170+25 - 45' Rt	100'	2"	--	216'	(2) #6 RHW	108'	(1) #6 THW
169+00 - 91' Rt	169+15 - 128' Lt	229'	2"	--	486'	(2) #6 RHW	243'	(1) #6 THW
169+15 - 128' Lt	170+40 - 113' Lt	130'	2"	--	276'	(2) #6 RHW	138'	(1) #6 THW
170+40 - 113' Lt	172+00 - 113' Lt	160'	2"	--	336'	(2) #6 RHW	168'	(1) #6 THW
172+00 - 113' Lt	173+80 - 113' Lt	180'	2"	--	376'	(2) #6 RHW	188'	(1) #6 THW
173+80 - 113' Lt	175+60 - 113' Lt	180'	2"	--	376'	(2) #6 RHW	188'	(1) #6 THW
168+85 - 91' Rt	169+00 - 91' Rt	15'	2"	--	105'	(3) #2 RHW	--	--

Light Standards

No.	Station	Luminaire	Circuit	IES - Type	Pole Height	Mast Arm	Remarks
L1	163+10 - 26' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	
L2	164+90 - 33' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	
L3	166+70 - 36' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	
L4	168+38 - 36' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	
L5	169+15 - 45' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	Install LED Luminaire on Signal Standard
L6	170+25 - 45' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	Install LED Luminaire on Signal Standard
L7	169+15 - 128' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	Install LED Luminaire on Signal Standard
L8	170+40 - 113' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	
L9	172+00 - 113' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	
L10	173+80 - 113' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	
L11	175+60 - 113' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	

Light Standard Foundation Table

Description	Footing Depth "D" 24" & 30" Diameter	Footing Depth "D" 36" & 42" Diameter
42' Pole	6'-0"	5'-0"

Lighting Quantities (*)

Description	Concrete Foundation - Highway Lighting	2" Diameter Rigid Conduit	Underground Conductor No6 - Type RHW	Underground Conductor No6 - Type THW	Underground Conductor No2 - Type RHW	Lt Std 10FT MA 42FT MT HT Breakaway	LED Luminaire
Unit	EA	LF	LF	LF	LF	EA	EA
Quantity	8	1661	3492	1746	105	8	11

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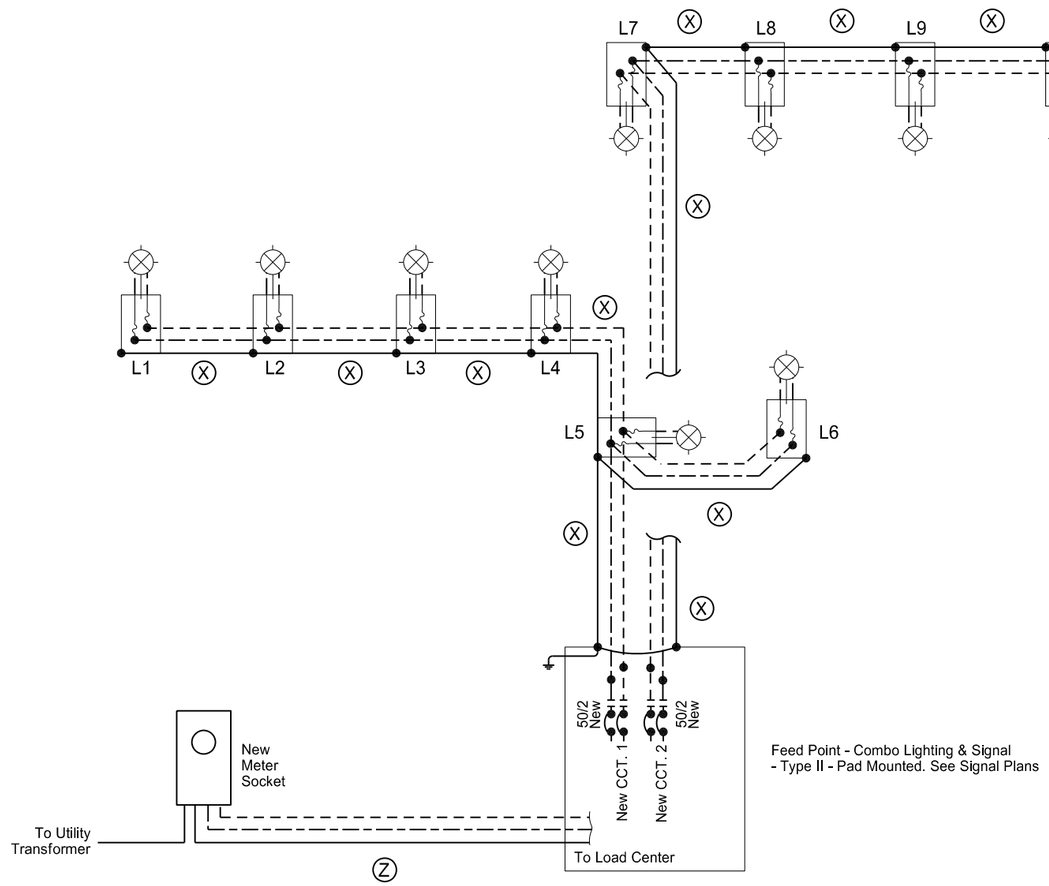
Lighting System
US Hwy 2 & 84th St W
Lighting Quantities
US Hwy 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	14



LEGEND

- Phase Conductor
- Phase Conductor
- Ground Conductor
- (X) 2 - #6 RHW & 1 - #6 THW
- (Z) 3 - #2 RHW
- LED Luminaire 208 Watt Operating on 240 Volts
- Light Standard with Inline Fuses

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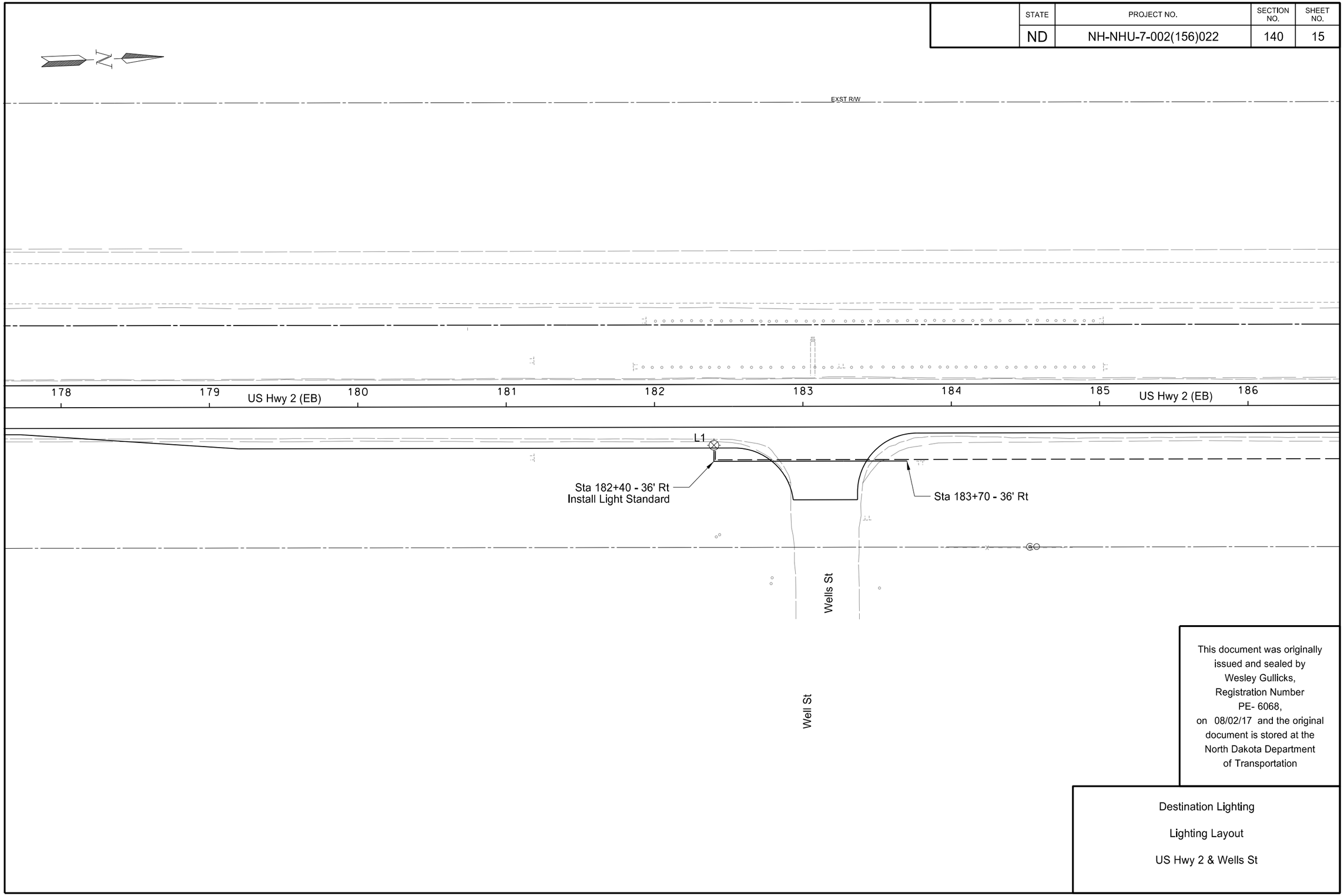
Lighting System

US Hwy 2 / 84th St W

Lighting Schematic

US Hwy 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	15



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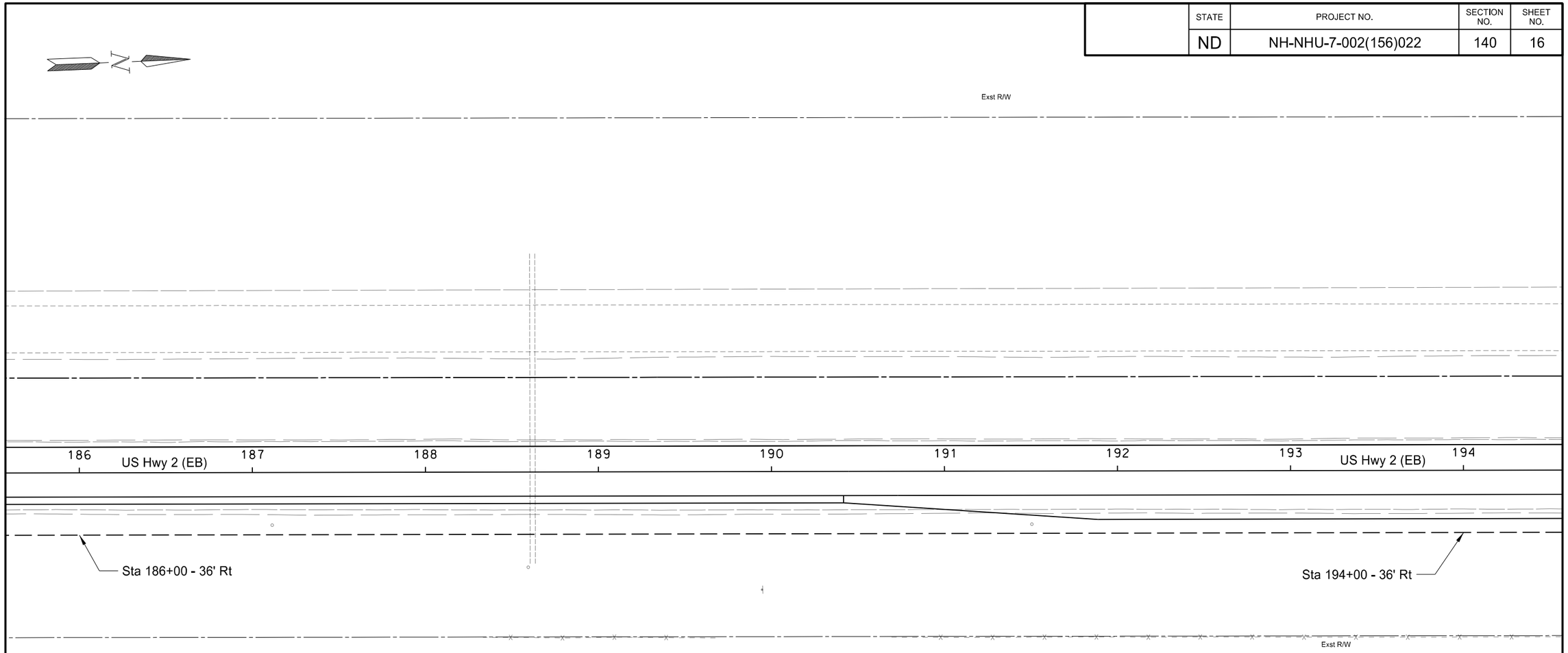
Destination Lighting

Lighting Layout

US Hwy 2 & Wells St

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	16



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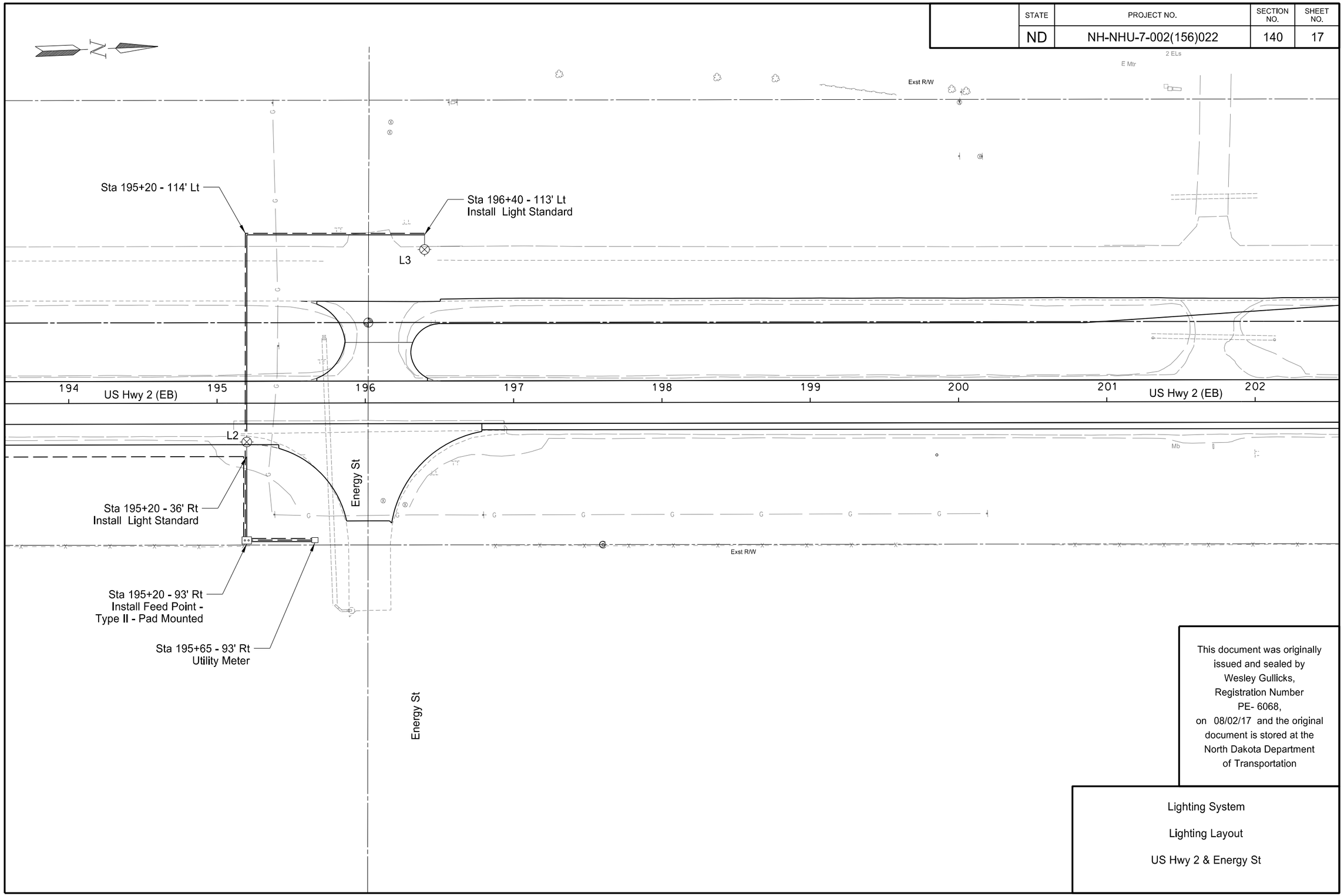
Destination Lighting

Lighting Layout

US Hwy 2 & Wells St & Energy St

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	17



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Lighting System

Lighting Layout

US Hwy 2 & Energy St

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	18

Conduit / Conductor Run Tabulation

Sta to Sta		Conduit Runs		Cable Trench	Cable Runs			
		Length	Size	LF	LF	Conductor Size, Type & Quantity	LF	Conductor Size, Type & Quantity
182+40 - 36' Rt	183+70 - 36' Rt	130'	2"	--	134'	3 NO. #6 USE	--	--
182+40 - 36' Rt	195+20 - 36' Rt	--	2"	1150'	1150'	3 NO. #6 USE	--	--
195+20 - 36' Rt	195+20 - 93' Rt	--	2"	57'	67'	3 NO. #6 USE	--	--
195+20 - 93' Rt	195+20 - 114' Lt	207'	2"		217'	3 NO. #6 USE	--	--
195+20 - 114' Lt	196+40 - 113' Lt	120'	2"		124'	3 NO. #6 USE	--	--
195+20 - 93' Rt	195+65 - 93' Rt	45'	2"		195'	(3) #2 RHW	--	--

Light Standard Foundation Table

Description	Footing Depth "D" 24" & 30" Diameter	Footing Depth "D" 36" & 42" Diameter
42' Pole	6'-0"	5'-0"

Light Standards

No.	Station	Luminaire	Circuit	IES - Type	Pole Height	Mast Arm	Remarks
L1	182+40 - 36' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	Wells Street - Install new LED Luminaire on Relocated Light Standard. Provide new anchor bolts.
L2	195+20 - 36' Rt	22,000 lumen, 3000K LED	2	III	42'	10'	Energy Drive - Install new LED Luminaire on Relocated Light Standard. Provide new anchor bolts.
L3	196+40 - 113' Lt	22,000 lumen, 3000K LED	2	III	42'	10'	Energy Drive - Install new LED Luminaire on Relocated Light Standard. Provide new anchor bolts.

Lighting Quantities (*)

Description	Concrete Foundation - Highway Lighting	Concrete Foundation - Feed Point - Type B	Cable Trench - Type II	2" Diameter Rigid Conduit	Multiple Underground Cable 3 NO 6 USE	Underground Conductor No2 - Type RHW	Feed Point - Type II - Pad Mounted	LED Luminaire	Destination Lighting
Unit	EA	EA	LF	LF	LF	LF	EA	EA	EA
Quantity	3	1	1207	502	1692	195	1	3	1

(*) These Items shall not be bid seperatly but shall be included in the item "Destination Lighting"

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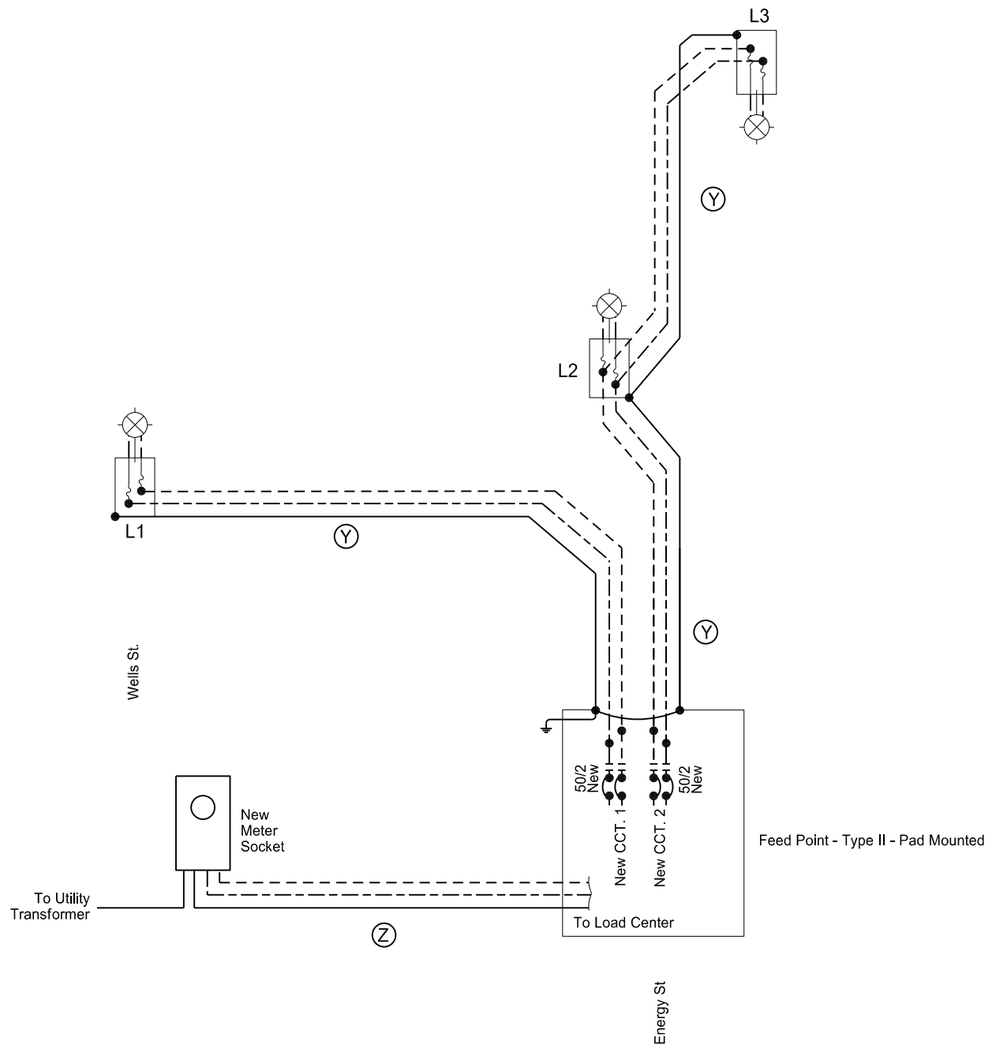
Lighting System

US Hwy 2 / Wells St. & Energy St

Lighting Quantities

US Hwy 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	19



LEGEND

- Phase Conductor
- Phase Conductor
- Ground Conductor
- Y — 3 - #6 USE
- Z — 3 - #2 RHW
- LED Luminaire 208 Watt Operating on 240 Volts
- Light Standard with Inline Fuses

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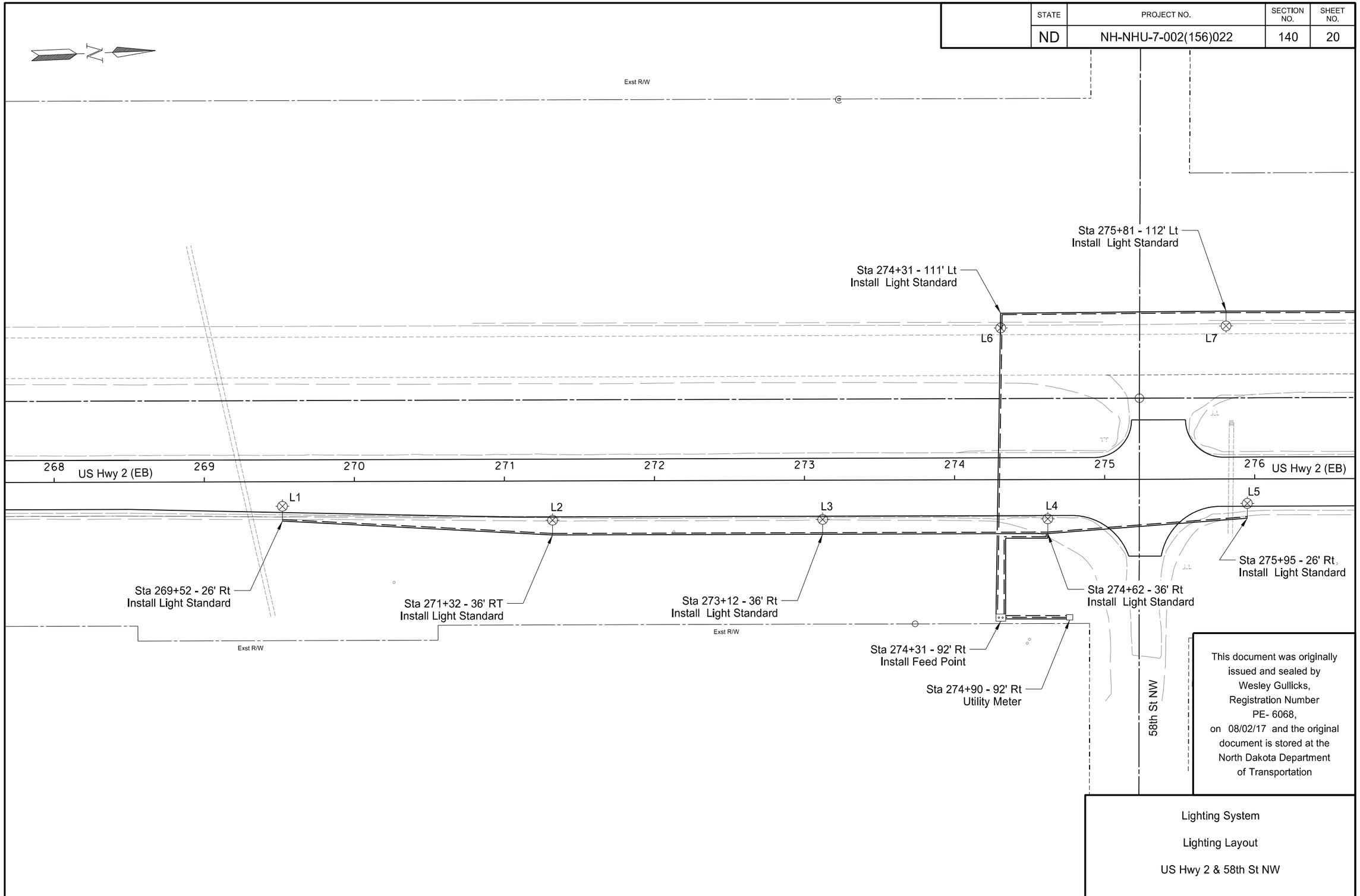
Destination Lighting

US Hwy 2 / Wells St & Energy St

Lighting Schematic

US Hwy 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	20



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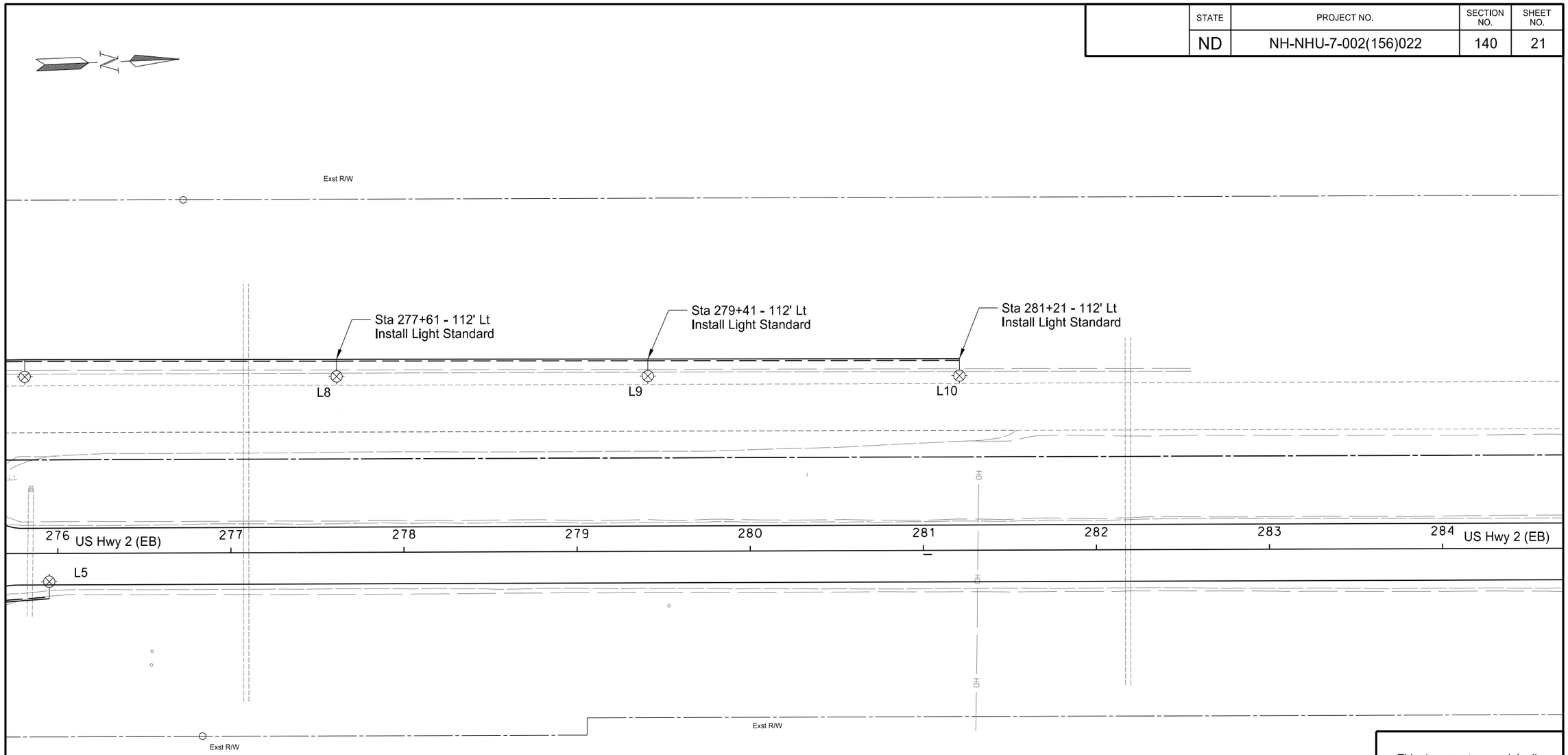
Lighting System

Lighting Layout

US Hwy 2 & 58th St NW

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	21



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Lighting System

Lighting Layout

US Hwy 2 & 58th St NW

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	22

Conduit / Conductor Run Tabulation

Sta to Sta		Conduit Runs		Cable Trench	Cable Runs			
		Length	Size	LF	LF	Conductor Size, Type & Quantity	LF	Conductor Size, Type & Quantity
269+52 - 26' Rt	271+32 - 36' Rt	180'	2"	--	376'	(2) #6 RHW	188'	(1) #6 THW
271+32 - 36' Rt	273+12 - 36' Rt	180'	2"	--	376'	(2) #6 RHW	188'	(1) #6 THW
273+12 - 36' Rt	274+31 - 36' Rt	119'	2"	--	246'	(2) #6 RHW	123'	(1) #6 THW
274+31 - 36' Rt	274+62 - 36' Rt	62'	(2)2"	--	140'	(2) #6 RHW	70'	(1) #6 THW
274+62 - 36' Rt	275+95 - 26' Rt	135'	2"	--	286'	(2) #6 RHW	143'	(1) #6 THW
274+31 - 36' Rt	274+31 - 92' Rt	56'	2"	--	132'	(2) #6 RHW	66'	(1) #6 THW
274+31 - 92' Rt	274+31 - 111' Lt	203'	2"	--	434'	(2) #6 RHW	217'	(1) #6 THW
274+31 - 111' Lt	275+81 - 112' Lt	150'	2"	--	316'	(2) #6 RHW	158'	(1) #6 THW
275+81 - 112' Lt	277+62 - 112' Lt	180'	2"	--	376'	(2) #6 RHW	188'	(1) #6 THW
277+62 - 112' Lt	279+41 - 112' Lt	180'	2"	--	376'	(2) #6 RHW	188'	(1) #6 THW
279+41 - 112' Lt	281+21 - 112' Lt	180'	2"	--	376'	(2) #6 RHW	188'	(1) #6 THW
274+31 - 92' Rt	274+90 - 92' Rt	59'	2"	--	237'	(3) #2 RHW	--	--

Light Standard Foundation Table

Description	Footing Depth "D" 24" & 30" Diameter	Footing Depth "D" 36" & 42" Diameter
42' Pole	6'-0"	5'-0"

Light Standards

No.	Station	Luminaire	Circuit	IES - Type	Pole Height	Mast Arm	Remarks
L1	269+52 - 26' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	
L2	271+32 - 36' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	
L3	273+12 - 36' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	
L4	274+62 - 36' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	
L5	275+95 - 26' Rt	22,000 lumen, 3000K LED	1	III	42'	10'	
L6	274+31 - 111' Lt	22,000 lumen, 3000K LED	1	III	42'	10'	
L7	275+81 - 112' Lt	22,000 lumen, 3000K LED	1	III	42'	10'	
L8	277+61 - 112' Lt	22,000 lumen, 3000K LED	1	III	42'	10'	
L9	279+41 - 112' Lt	22,000 lumen, 3000K LED	1	III	42'	10'	
L10	281+21 - 112' Lt	22,000 lumen, 3000K LED	1	III	42'	10'	

Lighting Quantities

Description	Concrete Foundation - Highway Lighting	Concrete Foundation - Feed Point - Type B	2" Diameter Rigid Conduit	Underground Conductor No6 - Type RHW	Underground Conductor No6 - Type THW	Underground Conductor No2 - Type RHW	Feed Point - Type II - Pad Mounted	Lt Std 10FT MA 42FT MT HT Breakaway	LED Luminaire
Unit	EA	EA	LF	LF	LF	LF	LF	LF	EA
Quantity	10	1	1684	3434	1717	237	1	10	10

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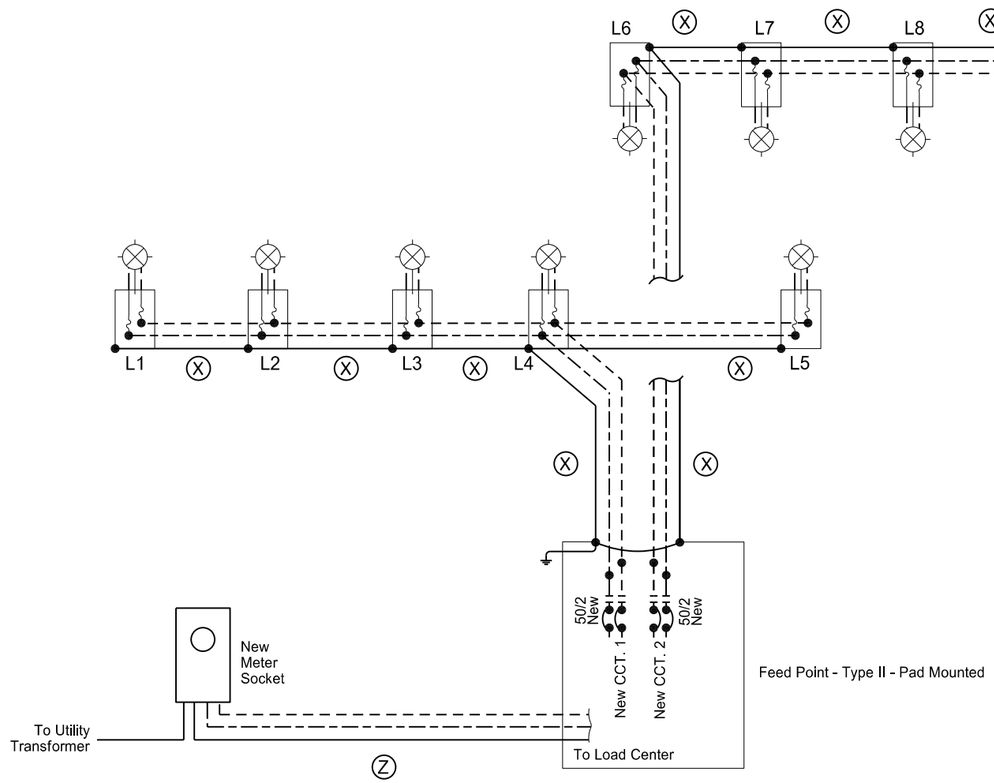
Lighting System

US Hwy 2 & 58th St NW

Lighting Quantities

US Hwy 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	140	23



LEGEND

- Phase Conductor
- Phase Conductor
- Ground Conductor
- X — 2 - #6 RHW & 1 - #6 THW
- Z — 3 - #2 RHW
- LED Luminaire 208 Watt Operating on 240 Volts
- Light Standard with Inline Fuses

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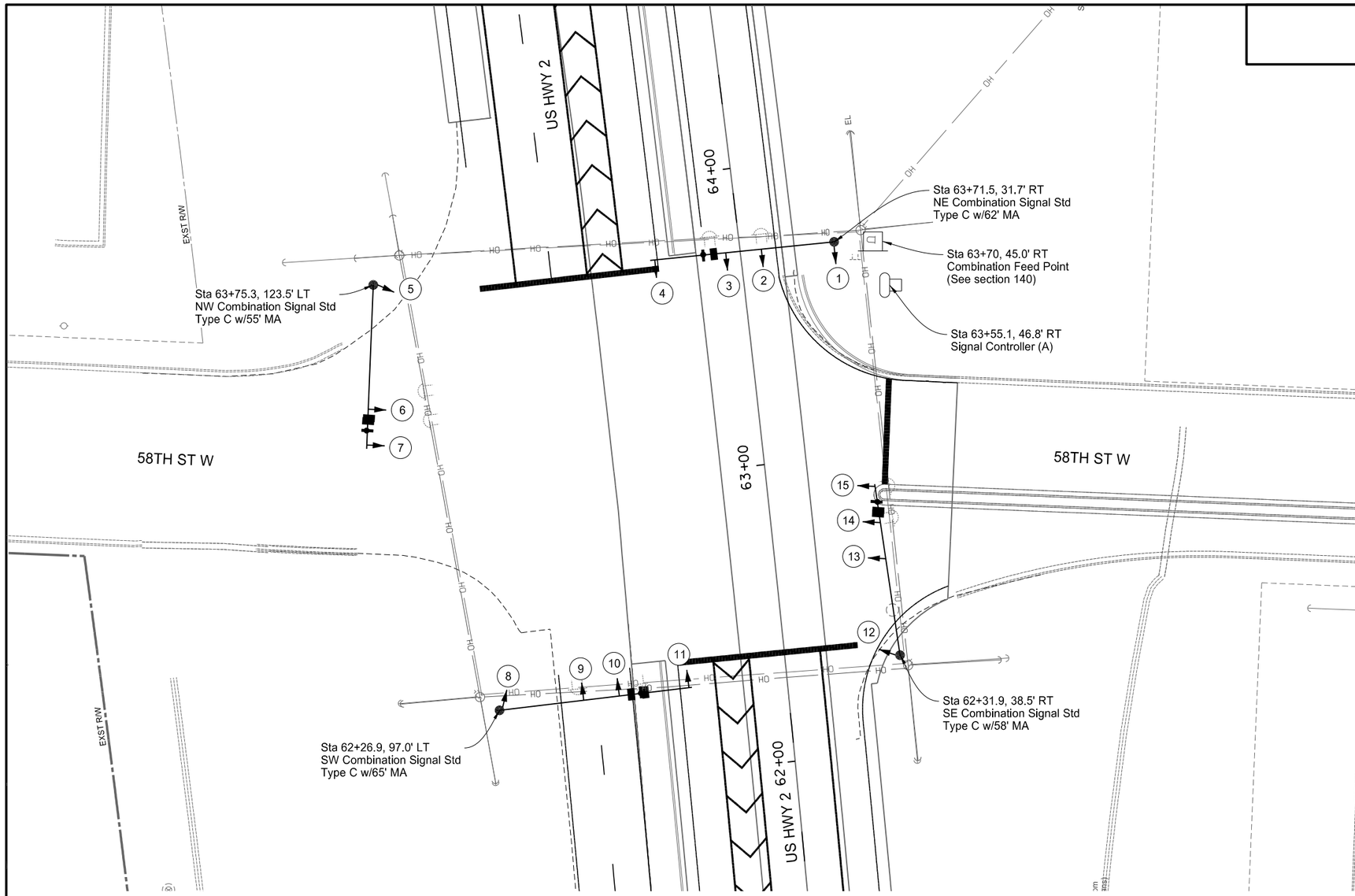
Lighting System

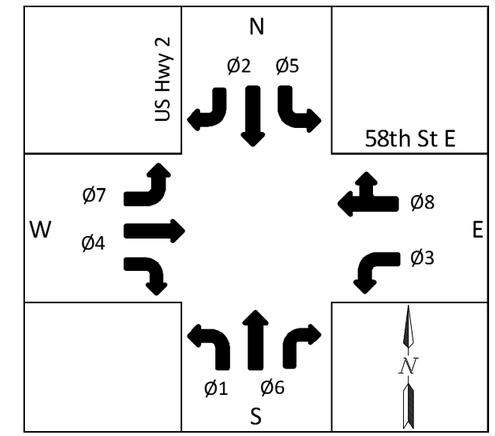
US Hwy 2 & 58th St NW

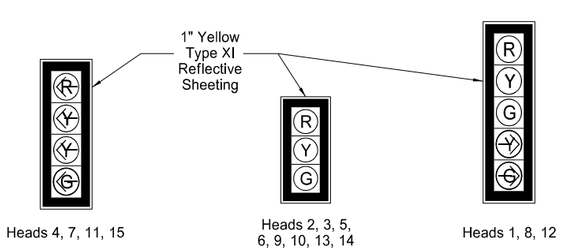
Lighting Schematic

US Hwy 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	1







All Signal Heads:
12" LED Lenses & 5" Louvered Backplates

LEGEND

- Signal controller
- Signal head
- EVP Detector
- Video Detection Unit
- Feed Point
- Signal Foundation

(A): Face cabinet door east with hinges on the right side.

N

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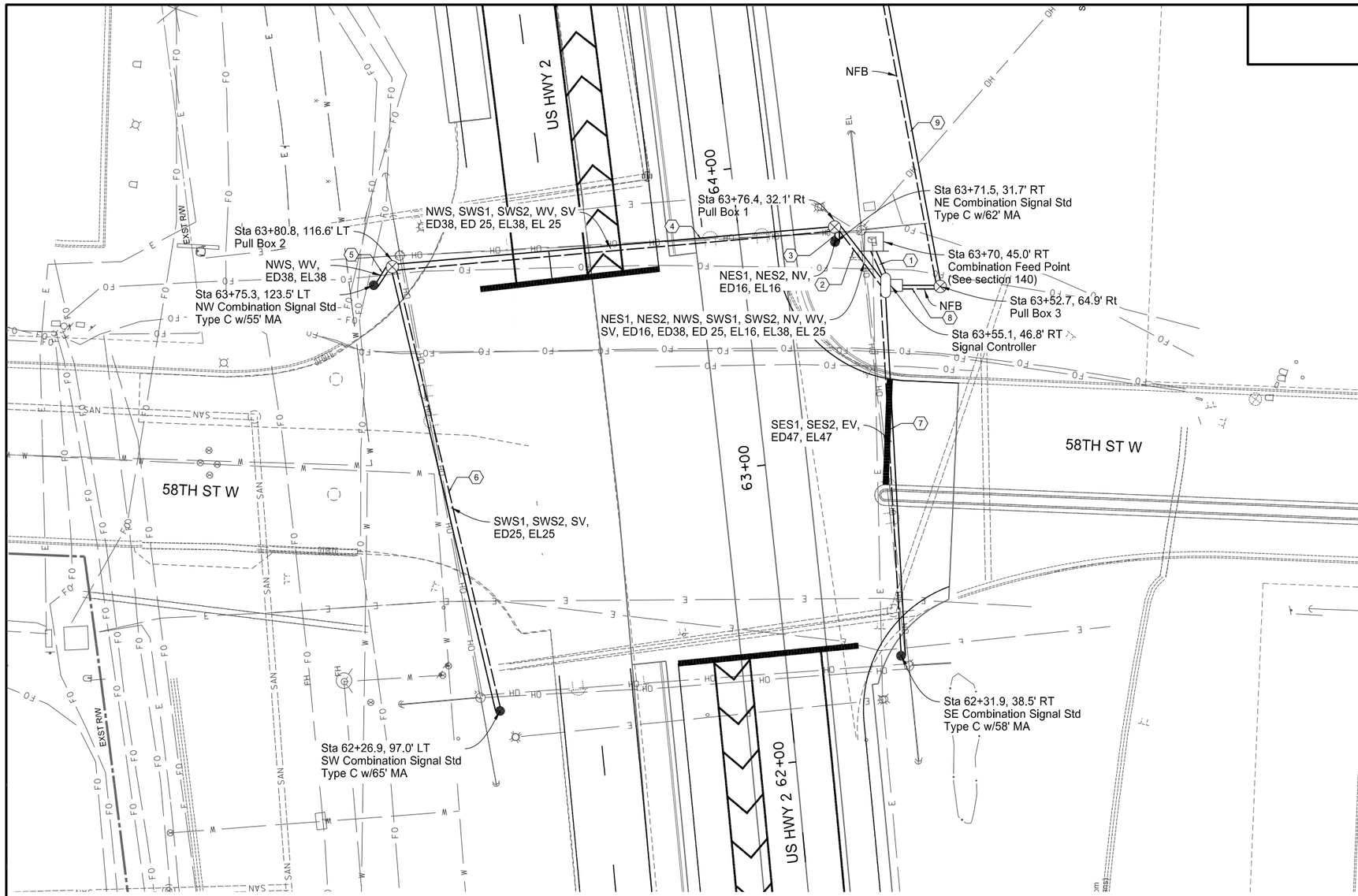
US Hwy 2

Signal Layout
Intersection of 58th St W
Site 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	2



Cable Titles

NES1 = Northeast Combo Signal Standard
NES2 = Northeast Combo Signal Standard
NWS = Northwest Combo Signal Standard
SES1 = Southeast Combo Signal Standard
SES2 = Southeast Combo Signal Standard
SWS1= Southwest Combo Signal Standard
SWS2= Southwest Combo Signal Standard
NFB=North Flashing Beacon
NV = North Video Detection Unit
SV = South Video Detection Unit
EV = East Video Detection Unit
WV = West Video Detection Unit
ED16 = Ø1 + Ø6 EVP Detector
ED25 = Ø2 + Ø5 EVP Detector
ED38 = Ø3 + Ø8 EVP Detector
ED47 = Ø4 + Ø7 EVP Detector
EL16 = Ø1 + Ø6 EVP Light
EL25 = Ø2 + Ø5 EVP Light
EL38 = Ø3 + Ø8 EVP Light
EL47 = Ø4 + Ø7 EVP Light

N

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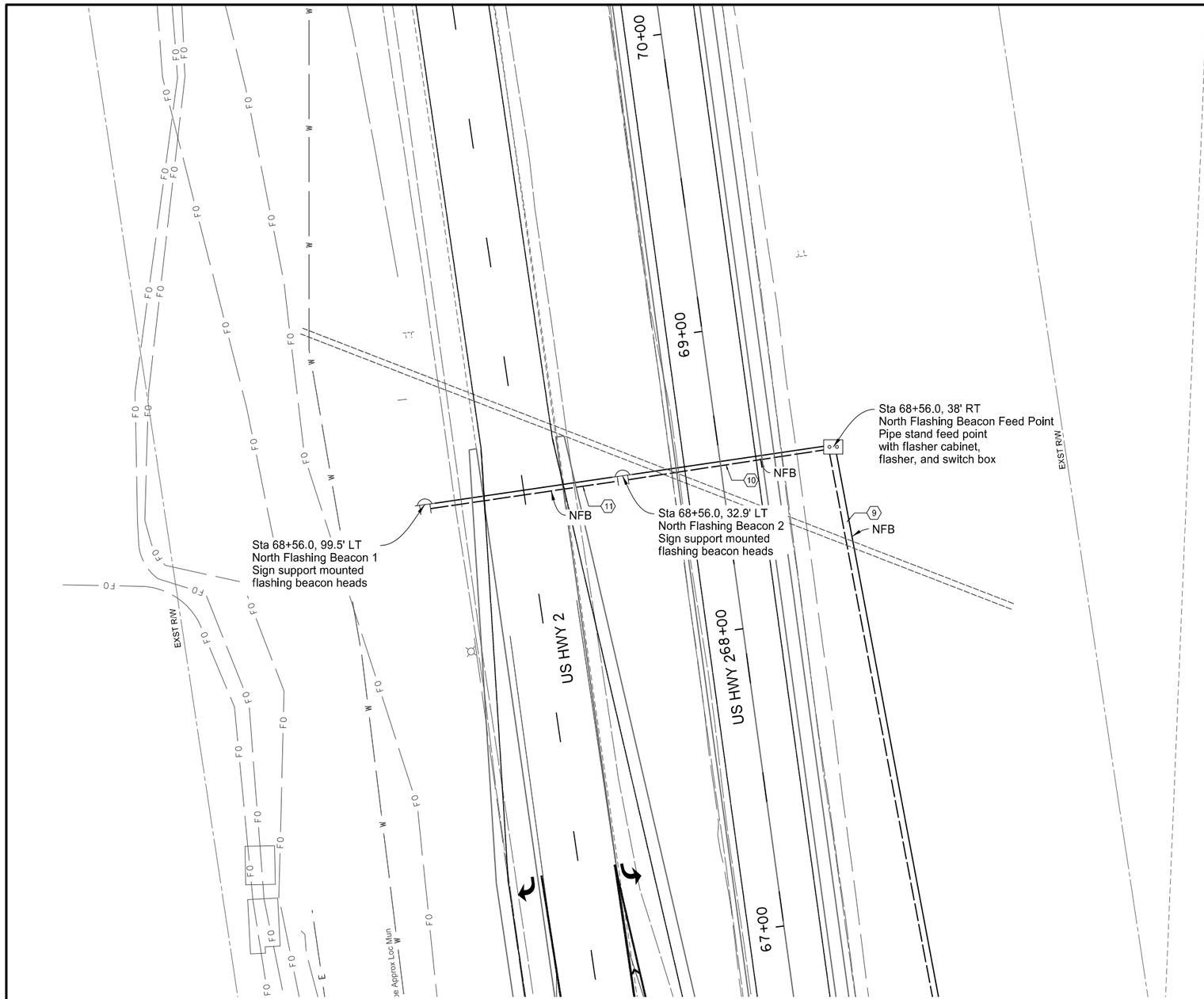
LEGEND

- Signal controller
- Cable & Conduit Run
- Pull Box
- Feed Point
- Signal Pole

US Hwy 2

Conduit and Conductor Layout
Intersection of 58th St W
Site 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	3



LEGEND

Pipe Stand Feed Point

Flashing Beacon

N

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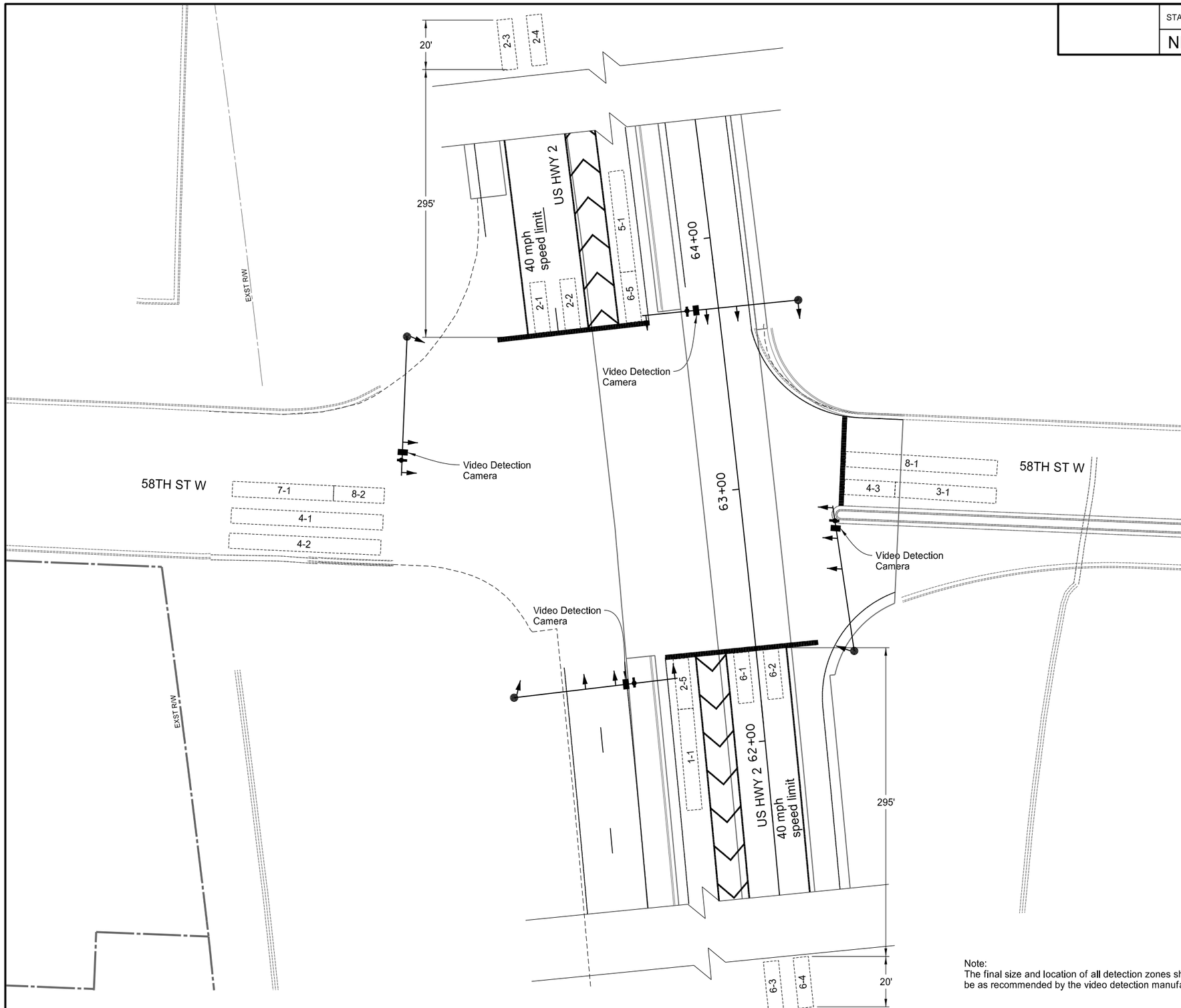
US Hwy 2

North Flashing Beacon Layout
Intersection of 58th St W
Site 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	4



DETECTION ZONE SCHEDULE

Phase-Number	Distance From Stop Bar (feet)	Length (feet)	Presence/Counting	Passage/Counting	Locking Memory	Non-Locking Memory
1-1	20	40	X			X
2-1	0	20		X		X
2-2	0	20		X		X
2-3	295	20		X	X	
2-4	295	20		X	X	
2-5	0	20	X			X
3-1	20	40	X			X
4-1	0	60	X		X	
4-2	0	60	X			X
4-3	0	20	X			X
5-1	20	40	X			X
6-1	0	20		X		X
6-2	0	20		X		X
6-3	295	20		X	X	
6-4	295	20		X	X	
6-5	0	20	X			X
7-1	20	40	X			X
8-1	0	60	X			X
8-2	0	20	X			X

N

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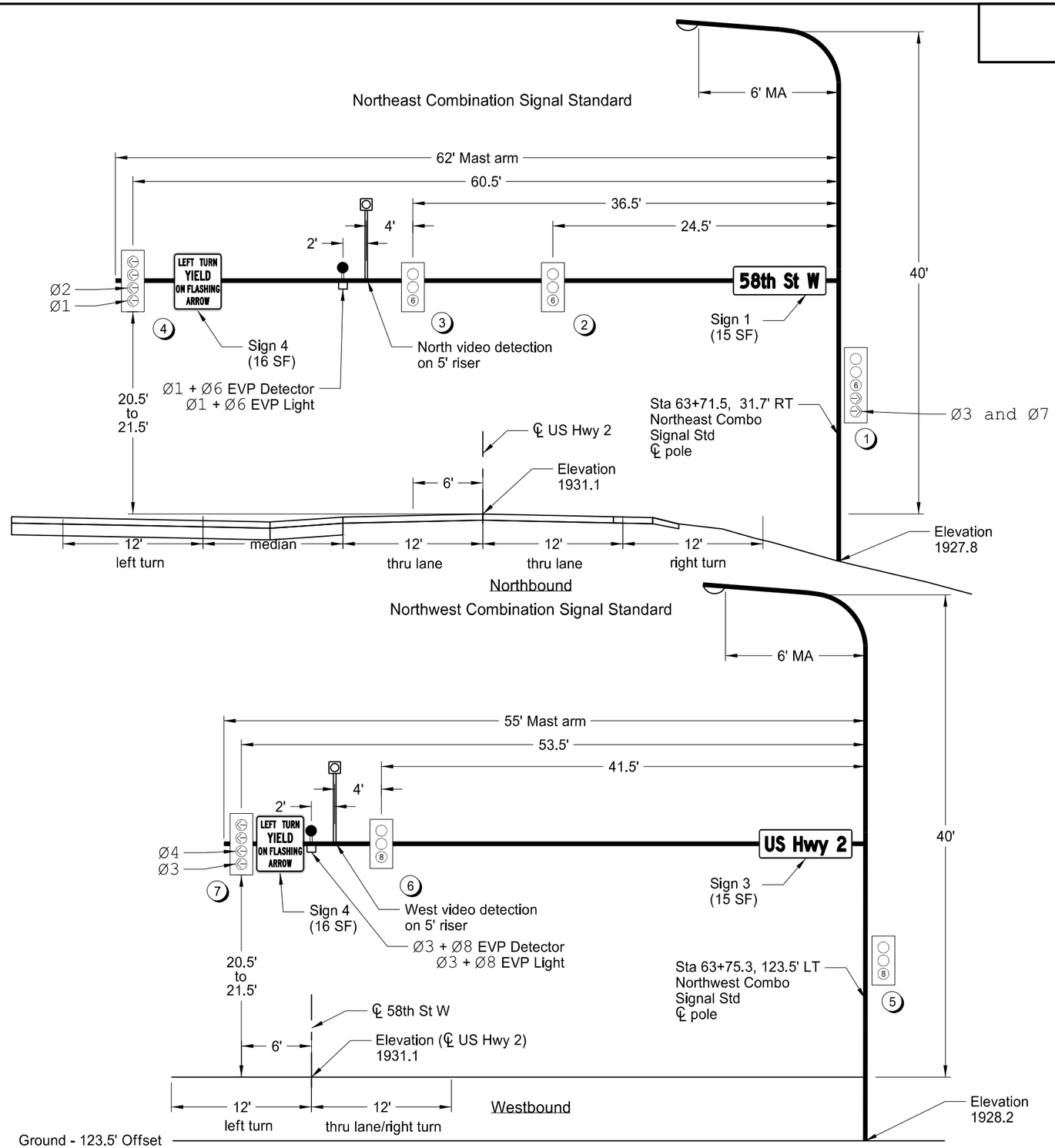
Note:
The final size and location of all detection zones shall be as recommended by the video detection manufacture.

US Hwy 2

Video Detection Zone Layout
Intersection of 58th St W
Site 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	5



LEGEND

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

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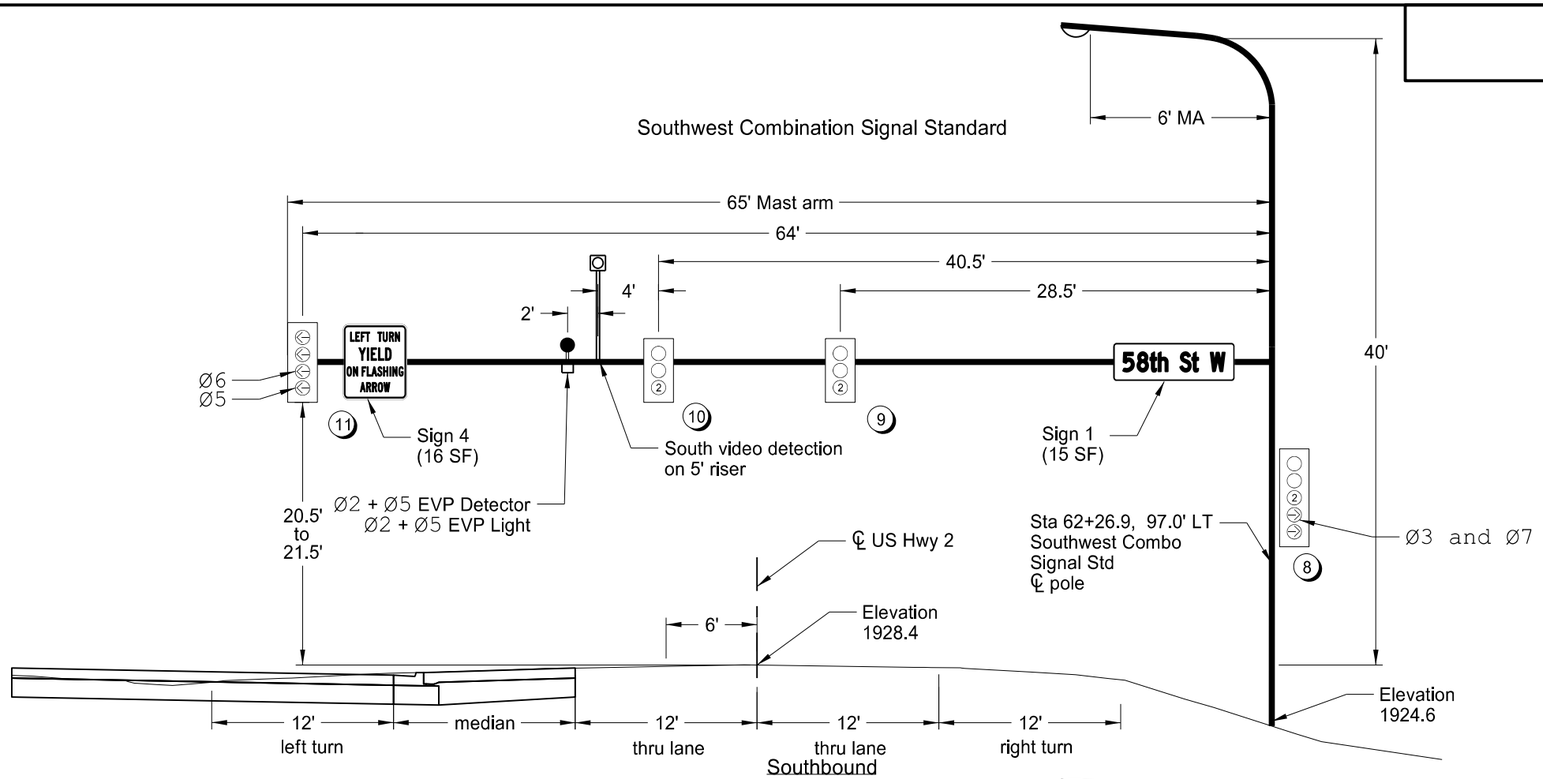
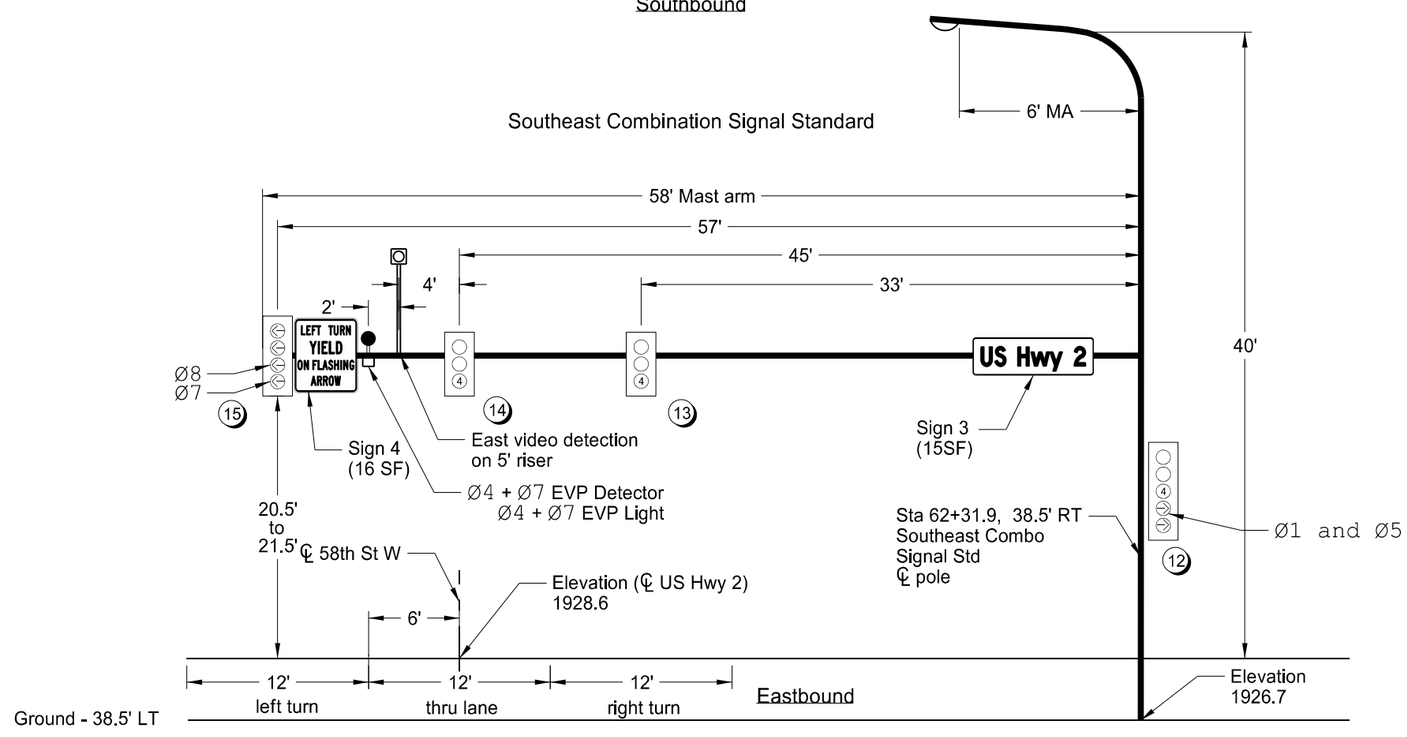
US Hwy 2

Signal Standards and Head Locations
Intersection of 58th St W
Site 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	6





LEGEND

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

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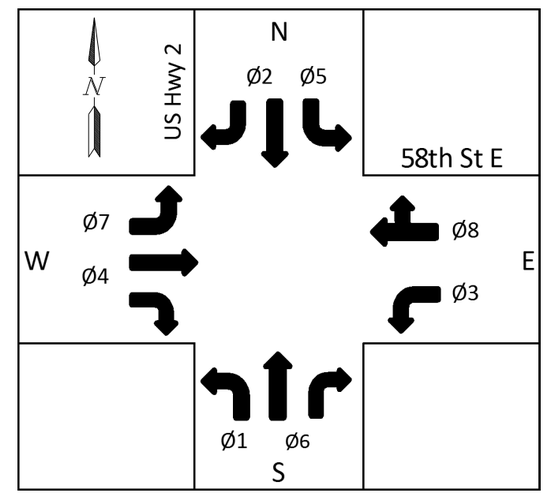
US Hwy 2

Signal Standards and Head Locations
Intersection of 58th St W
Site 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	7

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
	NB Left	SB Thru	WB Left	EB Thru	SB Left	NB Thru	EB Left	WB Thru
BASIC INTERVALS (OR FUNCTIONS)								
Minimum Green/Initial	5.0	15.0	5.0	10.0	5.0	15.0	5.0	10.0
Minimum Initial with Pedestrian Actuation*								
Passage Time	2.0	5.0	2.0	2.0	2.0	5.0	2.0	2.0
Maximum Green	30.0	60.0	30.0	30.0	30.0	60.0	30.0	30.0
Yellow Change	3.0	3.9	3.0	3.2	3.0	3.9	3.0	3.2
Red Clearance	2.7	1.9	3.0	3.5	2.8	1.9	3.3	3.2
Walk								
Pedestrian Clearance								
VOLUME DENSITY TIMING FUNCTIONS - ONLY APPLICABLE DURING "FREE" (UNCOORDINATED) TIMING PLAN								
Minimum Initial		15.0				15.0		
Added Initial per Actuation		1.5				1.5		
Minimum Gap		2.0				2.0		
Time to Reduce to Minimum Gap		18.0				18.0		
Time Before Reduction		30.0				30.0		
OTHER CONTROLLER FUNCTIONS								
Recall	No	Minimum	No	No	No	Minimum	No	No
Flashing-Normal & Conflict Monitor	R	Y	R	R	R	Y	R	R
Start Up Phasing	R	G	R	R	R	G	R	R
Emergency Vehicle Pre-emption	x	x	x	x	x	x	x	x
Type of Detector – Presence	Refer to Detector Zone Table							
Type of Detector – Calling								
Type of Detector – Passage								
Locking Memory								
Non-Locking Memory								

EB = Eastbound (58th St W)
WB = Westbound (58th St W)
NB = Northbound (US Hwy 2)
SB = Southbound (US Hwy 2)



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US Hwy 2

Controller Settings

Intersection of 58th St W

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	8

Head Number	Phase 1 Northbound Left								Phase 2 Southbound							
	RW	Clear to Phase 2	3	4	5	6	7	8	RW	Clear to Phase 3	4	5	6	7	8	1
1																
2																
3																
4	GL	YL	YL	YL	N	N	YL	YL	FYA	YL	YL	N	N	YL	YL	YL
5																
6																
7																
8									G	Y	Y	N	N	Y	Y	Y
9									G	Y	Y	N	N	Y	Y	Y
10									G	Y	Y	N	N	Y	Y	Y
11																
12	GR	YR	YR	YR	N	N	YR	YR								
13																
14																
15																

Head Number	Phase 3 Westbound Left								Phase 4 Eastbound							
	RW	Clear to Phase 4	5	6	7	8	1	2	RW	Clear to Phase 5	6	7	8	1	2	3
1	GR	YR	YR	YR	N	N	YR	YR								
2																
3																
4																
5																
6																
7	GL	YL	YL	YL	N	N	YL	YL	FYA	YL	YL	N	N	YL	YL	YL
8																
9																
10																
11																
12									G	Y	Y	N	N	Y	Y	Y
13									G	Y	Y	N	N	Y	Y	Y
14									G	Y	Y	N	N	Y	Y	Y
15																

Head Number	Phase 5 Southbound Left								Phase 6 Northbound							
	RW	Clear to Phase 6	7	8	1	2	3	4	RW	Clear to Phase 7	8	1	2	3	4	5
1									G	Y	Y	N	N	Y	Y	Y
2									G	Y	Y	N	N	Y	Y	Y
3									G	Y	Y	N	N	Y	Y	Y
4																
5																
6																
7																
8																
9																
10																
11	GL	YL	YL	YL	N	N	YL	YL	FYA	YL	YL	N	N	YL	YL	YL
12																
13																
14																
15																

Head Number	Phase 7 Eastbound Left								Phase 8 Westbound							
	RW	Clear to Phase 8	1	2	3	4	5	6	RW	Clear to Phase 1	2	3	4	5	6	7
1																
2																
3																
4																
5									G	Y	Y	N	N	Y	Y	Y
6									G	Y	Y	N	N	Y	Y	Y
7																
8	GR	YR	YR	YR	N	N	YR	YR								
9																
10																
11																
12																
13																
14																
15	GL	YL	YL	YL	N	N	YL	YL	FYA	YL	YL	N	N	YL	YL	YL

Blank spaces denote a "Red" indication
G= Green Ball Indication
Y= Yellow Ball Indication
GL= Green Left Arrow Indication
YL= Yellow Left Arrow Indication
FYA = Flashing Yellow Arrow Indication
GR=Green Right Arrow Indication
YR=Yellow Right Arrow Indication

N= Continue to display right of way indication. When any phase is on alone, any non-conflicting phase may start timing without a clearance interval. See Chart A.

Note: Do not allow Flashing Yellow Arrow during preemption for Phases 2, 4, 6 and 8.

Preemption Controller Settings

Head Number	Phases 2 and 5 Southbound								Phases 4 and 7 Eastbound							
	RW	Clear to Phase 3	4	5	6	7	8	1	RW	Clear to Phase 5	6	7	8	1	2	3
1																
2																
3																
4																
5																
6																
7																
8	G	Y	Y	N	Y	Y	Y	Y								
9	G	Y	Y	N	Y	Y	Y	Y								
10	G	Y	Y	N	Y	Y	Y	Y								
11	GL	YL	YL	N	YL	YL	YL	YL								
12									G	Y	Y	N	Y	Y	Y	Y
13									G	Y	Y	N	Y	Y	Y	Y
14									G	Y	Y	N	Y	Y	Y	Y
15									GL	YL	YL	N	YL	YL	YL	YL

Head Number	Phases 6 and 1 Northbound								Phases 8 and 3 Westbound							
	RW	Clear to Phase 7	8	1	2	3	4	5	RW	Clear to Phase 1	2	3	4	5	6	7
1	G	Y	Y	N	Y	Y	Y	Y								
2	G	Y	Y	N	Y	Y	Y	Y								
3	G	Y	Y	N	Y	Y	Y	Y								
4	GL	YL	YL	N	YL	YL	YL	YL								
5									G	Y	Y	N	Y	Y	Y	Y
6									G	Y	Y	N	Y	Y	Y	Y
7									GL	YL	YL	N	YL	YL	YL	YL
8																
9																
10																
11																
12																
13																
14																
15																

Chart A

Phase	Non-conflicting Phase allowed to time concurrently
1	5, 6
2	5, 6
3	7, 8
4	7, 8
5	1, 2
6	1, 2
7	3, 4
8	3, 4

Conductor			Cable NWS (Northwest Signal Std) (12 No. 12 AWG)		Cable NES1 (Northeast Signal Std) (12 No. 12 AWG)		Cable NES2 (Northeast Signal Std) (12 No. 7 AWG)		Cable SWS1 (Southwest Signal Std) (12 No. 12 AWG)		Cable SWS2 (Southwest Signal Std) (12 No. 7 AWG)		Cable SES1 (Southeast Signal Std) (12 No. 12 AWG)		Cable SES2 (Southeast Signal Std) (12 No. 7 AWG)	
	Base	Tracer	Head	Indication	Head	Indication	Head	Indication	Head	Indication	Head	Indication	Head	Indication	Head	Indication
1	Black			Spare		Spare		Spare		Spare		Spare		Spare		Spare
2	White			Neutral		Neutral		Neutral		Neutral		Neutral		Neutral		Neutral
3	Red		5, 6	Ø8 Red	1, 2, 3	Ø6 Red	4	Ø1 Red ←	8, 9, 10	Ø2 Red	11	Ø5 Red ←	12, 13, 14	Ø4 Red	15	Ø7 Red ←
4	Green			Ground		Ground		Ground		Ground		Ground		Ground		Ground
5	Orange		5, 6	Ø8 Yellow	1, 2, 3	Ø6 Yellow	4	Ø1 Yellow ←	8, 9, 10	Ø2 Yellow	11	Ø5 Yellow ←	12, 13, 14	Ø4 Yellow	15	Ø7 Yellow ←
6	Blue		5, 6	Ø8 Green	1, 2, 3	Ø6 Green	4	Ø1 Green ←	8, 9, 10	Ø2 Green	11	Ø5 Green ←	12, 13, 14	Ø4 Green	15	Ø7 Green ←
7	White	Black	7	Ø4 FYA ←		Spare	4	Ø2 FYA ←		Spare	11	Ø6 FYA ←		Spare	15	Ø8 FYA ←
8	Red	Black	7	Ø3 Red ←		Spare				Spare				Spare		
9	Green	Black		Spare	1	Ø3 Yellow →			8	Ø1 Yellow →			12	Ø1 Yellow →		
10	Orange	Black	7	Ø3 Yellow ←		Spare				Spare				Spare		
11	Blue	Black	7	Ø3 Green ←		Spare				Spare				Spare		
12	Black	White		Spare	1	Ø3 Green →			8	Ø1 Green →			12	Ø1 Green →		

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US Hwy 2

Controller Phasing & Signal Heads and Conductors
Intersection of 58th St W
Site 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	9

SIGNAL CABLE & CONDUIT SCHEDULE

RUN				CONDUIT			CABLE					
#	ITEM		STATION, OFFSET	SIZE (IN)	LF	NOTES	Origin	Destination	# of Cables	SIZE/TYPE	Total LF	TITLE
1	*Origin*	Combination Feed Point	63+70.0, 45.0' RT	2	15		Combination Feed Point	Traffic Signal Controller	2	UNDERGROUND CONDUCTOR NO 6-TYPE RHW	68	
	Destination	Traffic Signal Controller	63+55.1, 46.8' RT				Combination Feed Point	Traffic Signal Controller	1	UNDERGROUND CONDUCTOR NO 6-TYPE THW	34	
2	*Origin*	Traffic Signal Controller	63+55.1, 46.8' RT	4	30		Traffic Signal Controller	Pull Box 1	3	12 AWG 12 CONDUCTOR CABLE	135	NES1, NWS, SWS1
	Destination	Pull Box 1	63+76.4, 32.1' RT				Traffic Signal Controller	Pull Box 1	2	12 AWG 7 CONDUCTOR CABLE	90	NES2, SWS2
							Traffic Signal Controller	Pull Box 1	3	VIDEO DETECTION CABLE	135	NV, WV, SV
							Traffic Signal Controller	Pull Box 1	3	EMERGENCY VEHICLE DETECTOR CABLE	135	ED16, ED38, ED25
							Traffic Signal Controller	Pull Box 1	3	12 AWG 2 CONDUCTOR CABLE	135	EL16, EL38, EL25
3	*Origin*	Pull Box 1	63+76.4, 32.1' RT	2	5		Pull Box 1	Northeast Combo Signal Std Transformer Base	1	12 AWG 12 CONDUCTOR CABLE	16	NES1
	Destination	Northeast Combo Signal Std	63+71.5, 31.7' RT				Pull Box 1	Northeast Combo Signal Std Transformer Base	1	12 AWG 7 CONDUCTOR CABLE	16	NES2
							Pull Box 1	North Video Detection Unit	1	VIDEO DETECTION CABLE	83	NV
							Pull Box 1	Northeast Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	80	ED16
							Pull Box 1	Northeast Emergency Preemption Lamp	1	12 AWG 2 CONDUCTOR CABLE	80	EL16
4	*Origin*	Pull Box 1	63+76.4, 32.1' RT	4	150		Pull Box 1	Pull Box 2	2	12 AWG 12 CONDUCTOR CABLE	324	NWS, SWS1
	Destination	Pull Box 2	63+80.8, 116.6' LT				Pull Box 1	Pull Box 2	1	12 AWG 7 CONDUCTOR CABLE	162	SWS2
							Pull Box 1	Pull Box 2	2	VIDEO DETECTION CABLE	324	WV, SV
							Pull Box 1	Pull Box 2	2	EMERGENCY VEHICLE DETECTOR CABLE	324	ED38, ED25
							Pull Box 1	Pull Box 2	2	12 AWG 2 CONDUCTOR CABLE	324	EL38, EL25
5	*Origin*	Pull Box 2	63+80.8, 116.6' LT	2	10		Pull Box 2	Northwest Combo Signal Std Transformer Base	1	12 AWG 12 CONDUCTOR CABLE	21	NWS
	Destination	Northwest Combo Signal Std	63+75.3, 123.5' LT				Pull Box 2	West Video Detection Unit	1	VIDEO DETECTION CABLE	93	WV
							Pull Box 2	Northwest Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	90	ED38
							Pull Box 2	Northwest Emergency Preemption Lamp	1	12 AWG 2 CONDUCTOR CABLE	90	EL38
6	*Origin*	Pull Box 2	63+80.8, 116.6' LT	4	155		Pull Box 2	Southwest Combo Signal Std Transformer Base	1	12 AWG 12 CONDUCTOR CABLE	166	SWS1
	Destination	Southwest Combo Signal Std	62+26.9, 97.0' LT				Pull Box 2	Southwest Combo Signal Std Transformer Base	1	12 AWG 7 CONDUCTOR CABLE	166	SWS2
							Pull Box 2	South Video Detection Unit	1	VIDEO DETECTION CABLE	237	SV
							Pull Box 2	Southwest Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	234	ED25
							Pull Box 2	Southwest Emergency Preemption Lamp	1	12 AWG 2 CONDUCTOR CABLE	234	EL25
7	*Origin*	Traffic Signal Controller	63+55.1, 46.8' RT	4	125		Traffic Signal Controller	Southeast Combo Signal Std Transformer Base	1	12 AWG 12 CONDUCTOR CABLE	139	SES1
	Destination	Southeast Combo Signal Std	62+31.9, 38.5' RT				Traffic Signal Controller	Southeast Combo Signal Std Transformer Base	1	12 AWG 7 CONDUCTOR CABLE	139	SES2
							Traffic Signal Controller	East Video Detection Unit	1	VIDEO DETECTION CABLE	214	EV
							Traffic Signal Controller	Southeast Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	211	ED47
							Traffic Signal Controller	Southeast Emergency Preemption Lamp	1	12 AWG 2 CONDUCTOR CABLE	211	EL47
8	*Origin*	Traffic Signal Controller	63+55.1, 46.8' RT	2	20		Traffic Signal Controller	Pull Box 3	2	12 AWG 7 CONDUCTOR CABLE	70	NFB
	Destination	Pull Box 3	63+52.7, 64.9' RT									
9	*Origin*	Pull Box 3	63+52.7, 64.9' RT	2	505		Pull Box 3	North Flashing Beacon Feed Point	1	12 AWG 7 CONDUCTOR CABLE	521	NFB
	Destination	North Flashing Beacon Feed Point	68+56.0, 38.0' RT									
10	*Origin*	North Flashing Beacon Feed Point	68+56.0, 38.0' RT	2	75		North Flashing Beacon Feed Point	North Flashing Beacon 2	1	12 AWG 7 CONDUCTOR CABLE	100	NFB
	Destination	North Flashing Beacon 2	68+56.0, 32.9' LT									
11	*Origin*	North Flashing Beacon 2	68+56.0, 32.9' LT	2	70		North Flashing Beacon 2	North Flashing Beacon 1	1	12 AWG 7 CONDUCTOR CABLE	100	NFB
	Destination	North Flashing Beacon 1	68+56.0, 99.5' LT									

Origin	Destination	# of Cables	SIZE/TYPE	Total LF
Northeast Combo Signal Std Transformer Base	Vehicle Head 1	1	12 AWG 7 CONDUCTOR CABLE	20
	Vehicle Head 2	1	12 AWG 5 CONDUCTOR CABLE	53
	Vehicle Head 3	1	12 AWG 5 CONDUCTOR CABLE	65
	Vehicle Head 4	1	12 AWG 7 CONDUCTOR CABLE	89
Northwest Combo Signal Std Transformer Base	Vehicle Head 5	1	12 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 6	1	12 AWG 5 CONDUCTOR CABLE	70
	Vehicle Head 7	1	12 AWG 7 CONDUCTOR CABLE	82
Southwest Combo Signal Std Transformer Base	Vehicle Head 8	1	12 AWG 7 CONDUCTOR CABLE	20
	Vehicle Head 9	1	12 AWG 5 CONDUCTOR CABLE	57
	Vehicle Head 10	1	12 AWG 5 CONDUCTOR CABLE	69
	Vehicle Head 11	1	12 AWG 7 CONDUCTOR CABLE	92
Southeast Combo Signal Std Transformer Base	Vehicle Head 12	1	12 AWG 7 CONDUCTOR CABLE	20
	Vehicle Head 13	1	12 AWG 5 CONDUCTOR CABLE	61
	Vehicle Head 14	1	12 AWG 5 CONDUCTOR CABLE	73
	Vehicle Head 15	1	12 AWG 7 CONDUCTOR CABLE	85

Cable Titles
NES1 = Northeast Combo Signal Standard
NES2 = Northeast Combo Signal Standard
NWS = Northwest Combo Signal Standard
SES1 = Southeast Combo Signal Standard
SES2 = Southeast Combo Signal Standard
SWS1= Southwest Combo Signal Standard
SWS2= Southwest Combo Signal Standard
NFB=North Flashing Beacon
NV = North Video Detection Unit
SV = South Video Detection Unit
EV = East Video Detection Unit
WV = West Video Detection Unit
ED16 = Ø1 + Ø6 EVP Detector
ED25 = Ø2 + Ø5 EVP Detector
ED38 = Ø3 + Ø8 EVP Detector
ED47 = Ø4 + Ø7 EVP Detector
EL16 = Ø1 + Ø6 EVP Light
EL25 = Ø2 + Ø5 EVP Light
EL38 = Ø3 + Ø8 EVP Light
EL47 = Ø4 + Ø7 EVP Light

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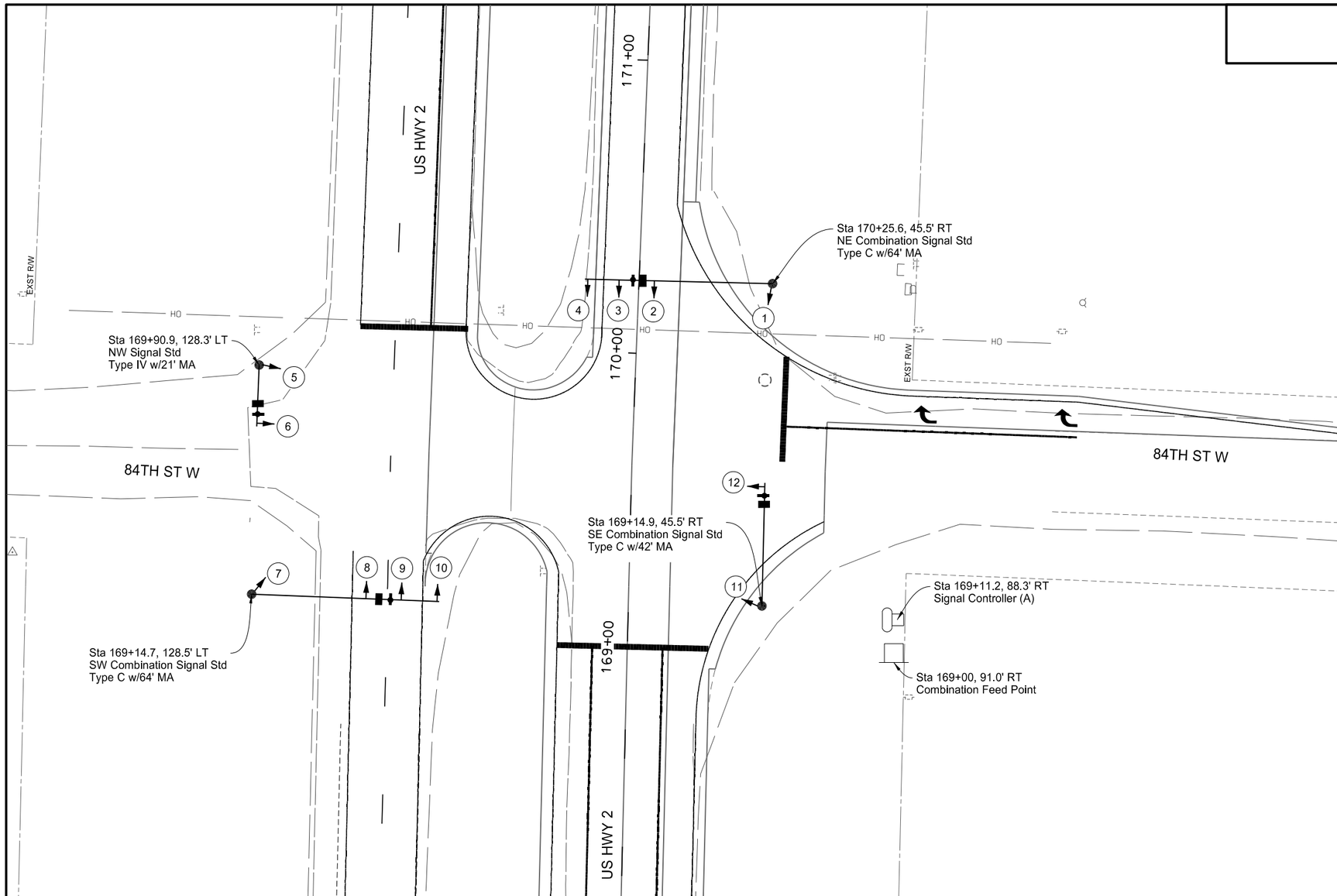
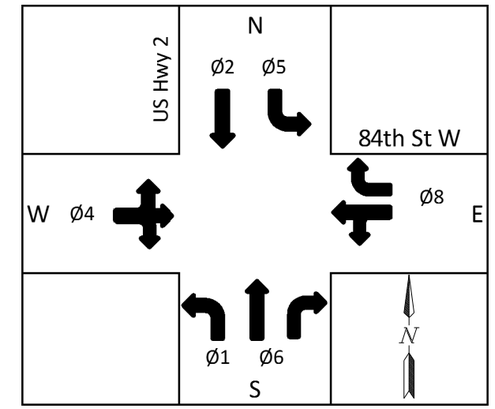
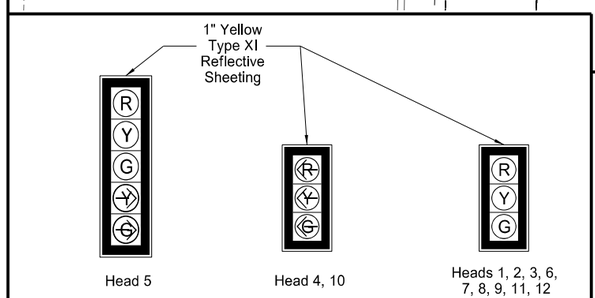
US Hwy 2

Cable and Conduit Schedule
Intersection of 58th St W
Site 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	10







All Signal Heads:
12" LED Lenses & 5" Louvered Backplates

LEGEND

- Signal controller
- Signal head
- EVP Detector
- Video Detection Unit
- Feed Point
- Signal Foundation

(A): Face cabinet door east with hinges on the right side.

N

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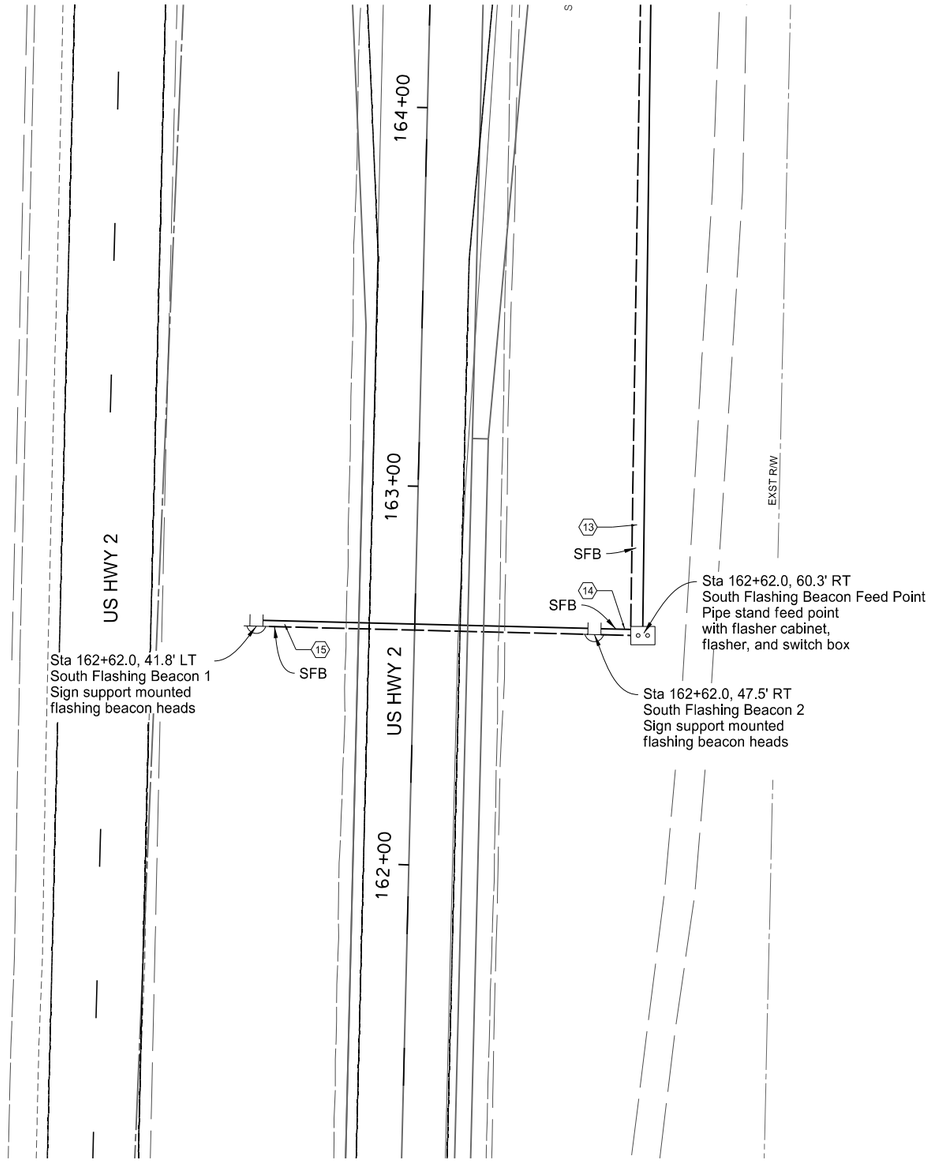
US Hwy 2

Signal Layout
Intersection of 84th St W
Site 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	11



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LEGEND

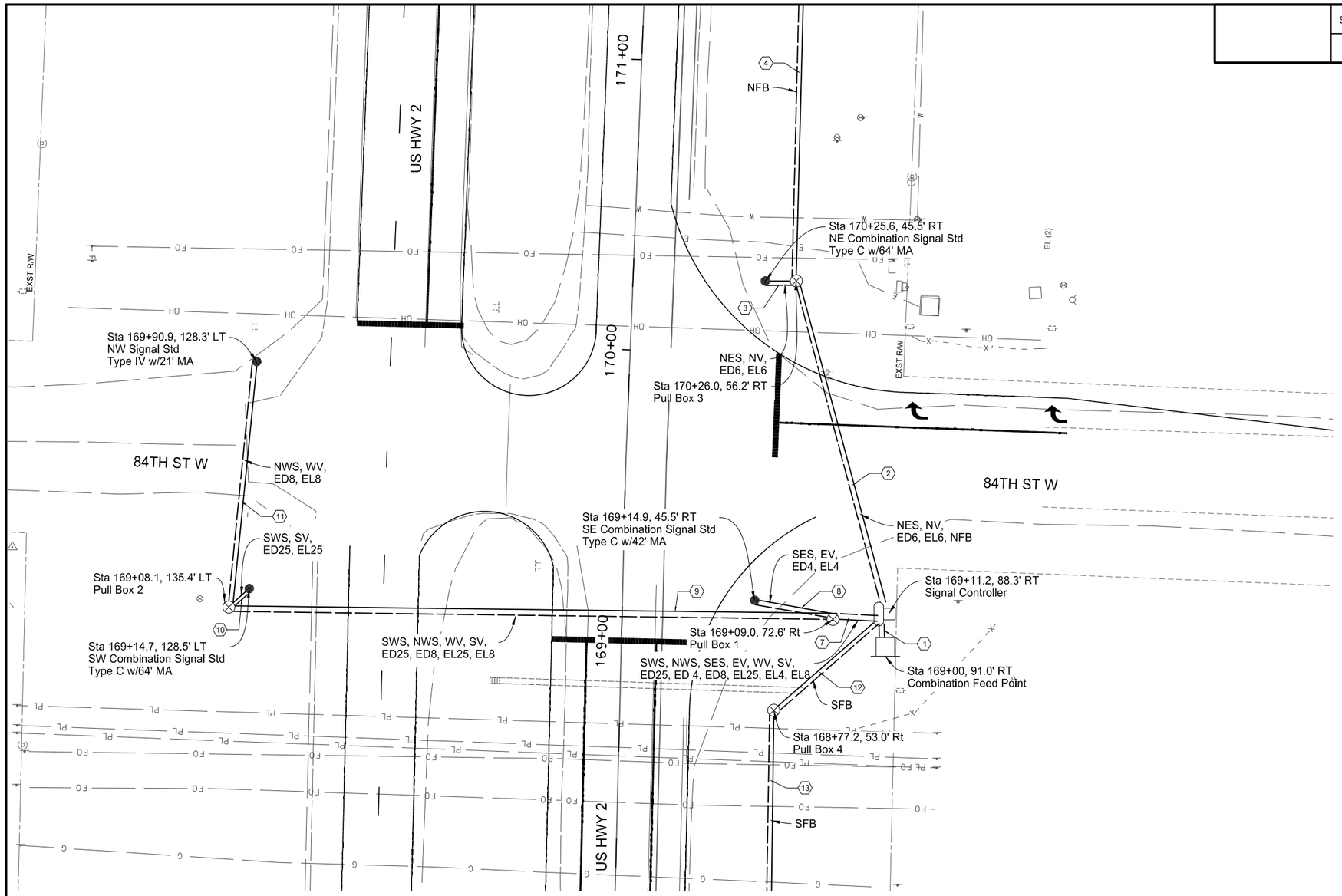
Pipe Stand Feed Point

Flashing Beacon

US Hwy 2

South Flashing Beacon Layout
Intersection of 84th St W
Site 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	12



Cable Titles

NES = Northeast Signal Standard
NWS = Northwest Signal Standard
SES = Southeast Signal Standard
SWS = Southwest Signal Standard
NFB=North Flashing Beacon
SFB=South Flashing Beacon
NV = North Video Detection Unit
SV = South Video Detection Unit
EV = East Video Detection Unit
WV = West Video Detection Unit
ED25 = Ø2 + Ø5 EVP Detector
ED4 = Ø4 EVP Detector
ED6 = Ø6 EVP Detector
ED8 = Ø8 EVP Detector
EL25 = Ø2 + Ø5 EVP Light
EL4 = Ø4 EVP Light
EL6 = Ø6 EVP Light
EL8 = Ø8 EVP Light

LEGEND

- Signal controller
- Cable & Conduit Run
- Pull Box
- Feed Point
- Signal Pole

N

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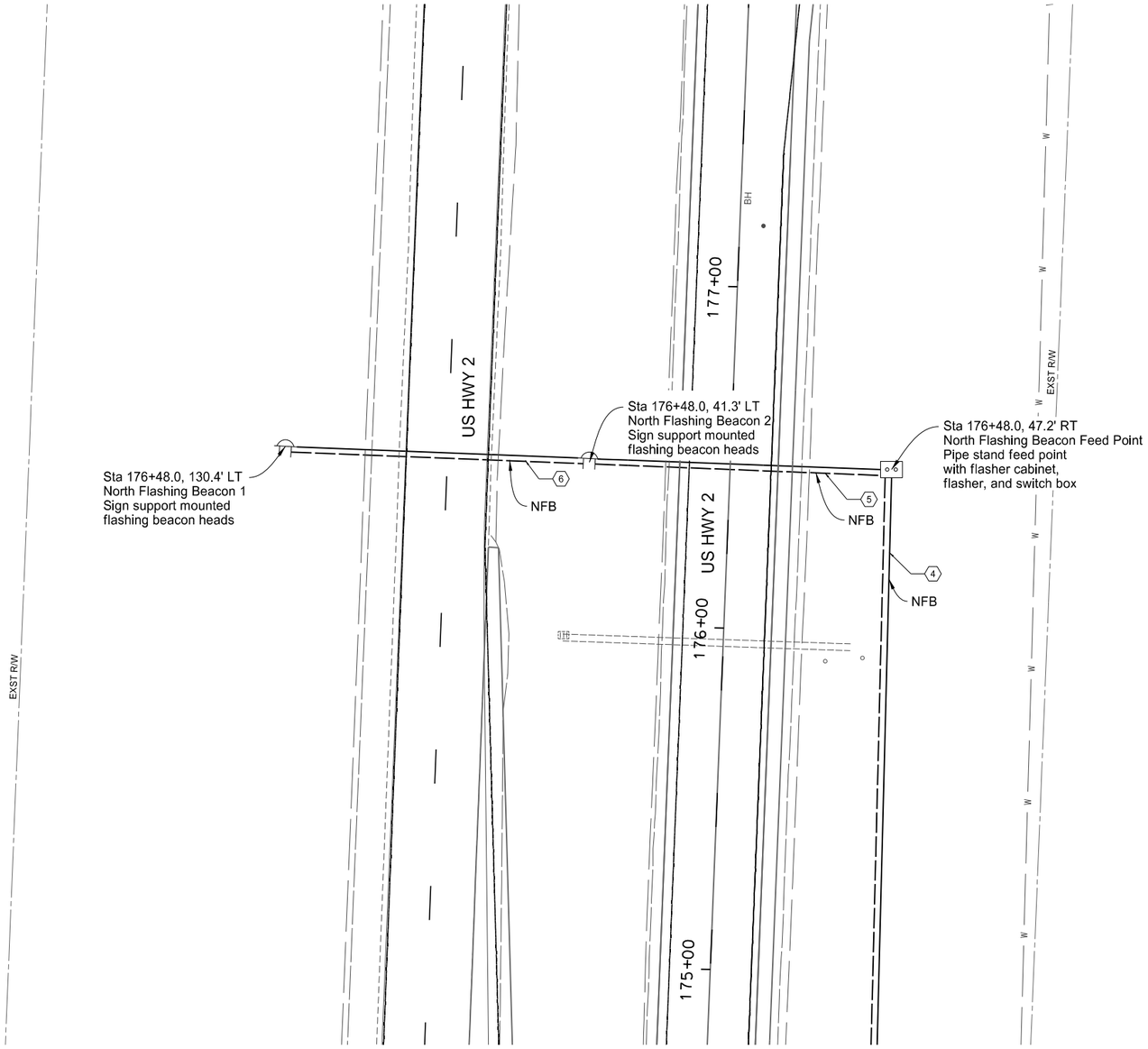
US Hwy 2

Conduit and Conductor Layout
Intersection of 84th St W
Site 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	13



LEGEND

Pipe Stand Feed Point

Flashing Beacon

N

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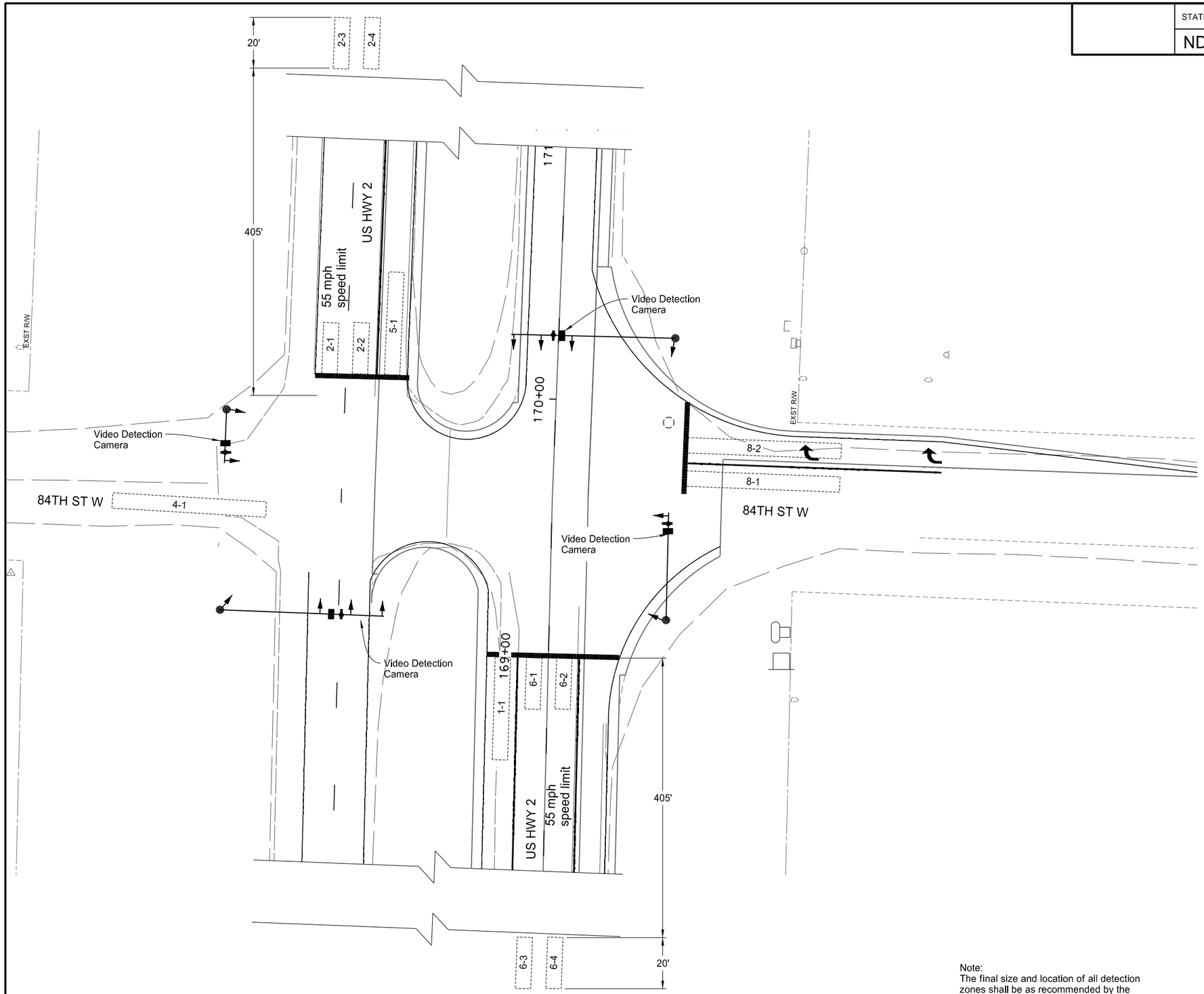
US Hwy 2

North Flashing Beacon Layout
Intersection of 84th St W
Site 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	14



DETECTION ZONE SCHEDULE

Phase-Number	Distance From Stop Bar (feet)	Length (feet)	Presence/Counting	Passage/Counting	Locking Memory	Non-Locking Memory
1-1	0	40	X		X	
2-1	0	20		X		X
2-2	0	20		X		X
2-3	405	20		X	X	
2-4	405	20		X	X	
4-1	0	60	X			X
5-1	0	40	X		X	
6-1	0	20		X		X
6-2	0	20		X		X
6-3	405	20		X	X	
6-4	405	20		X	X	
8-1	0	60	X		X	
8-2	0	60	X			X

N

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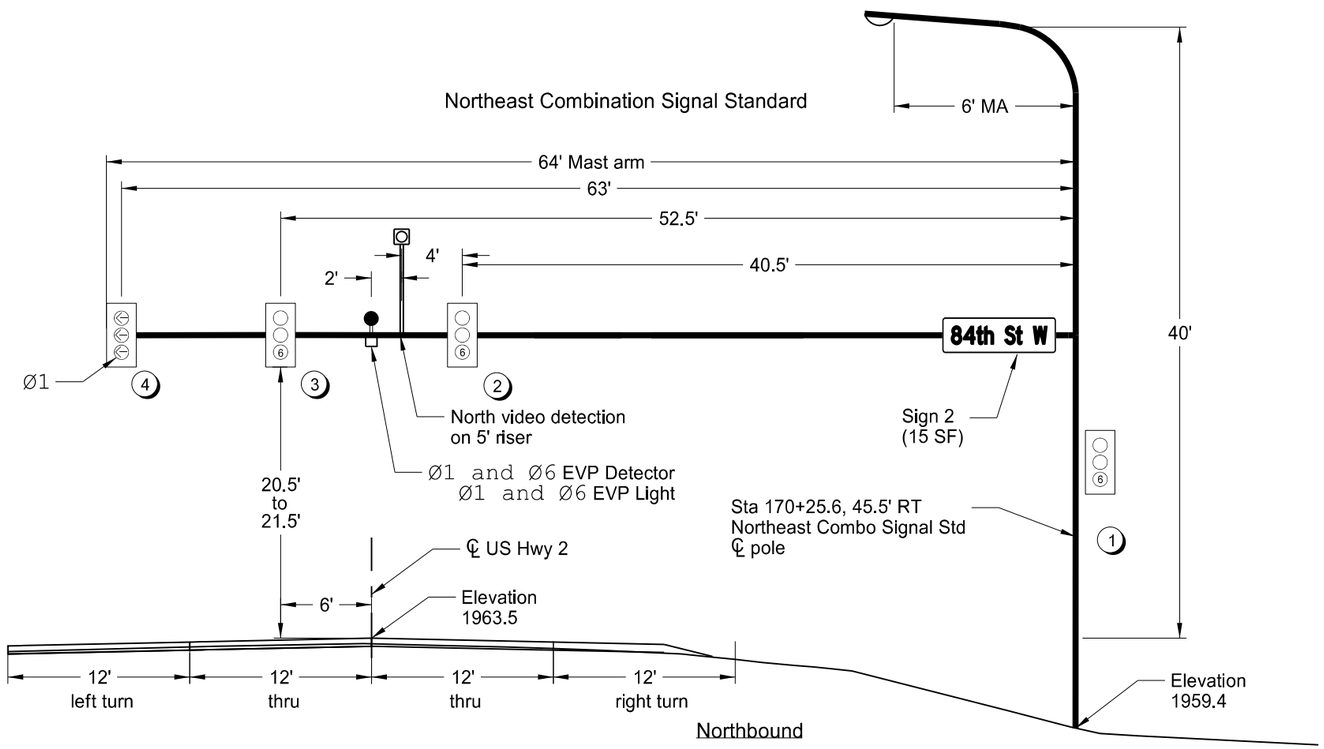
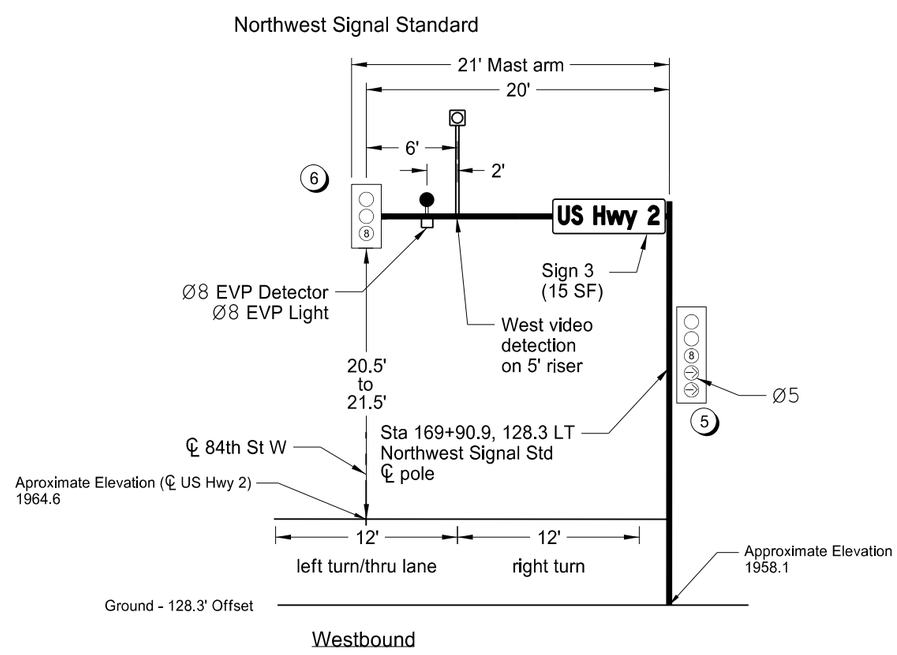
Note:
The final size and location of all detection zones shall be as recommended by the video detection manufacture.

US Hwy 2

Video Detection Zone Layout
Intersection of 84th St W
Site 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	15





LEGEND

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

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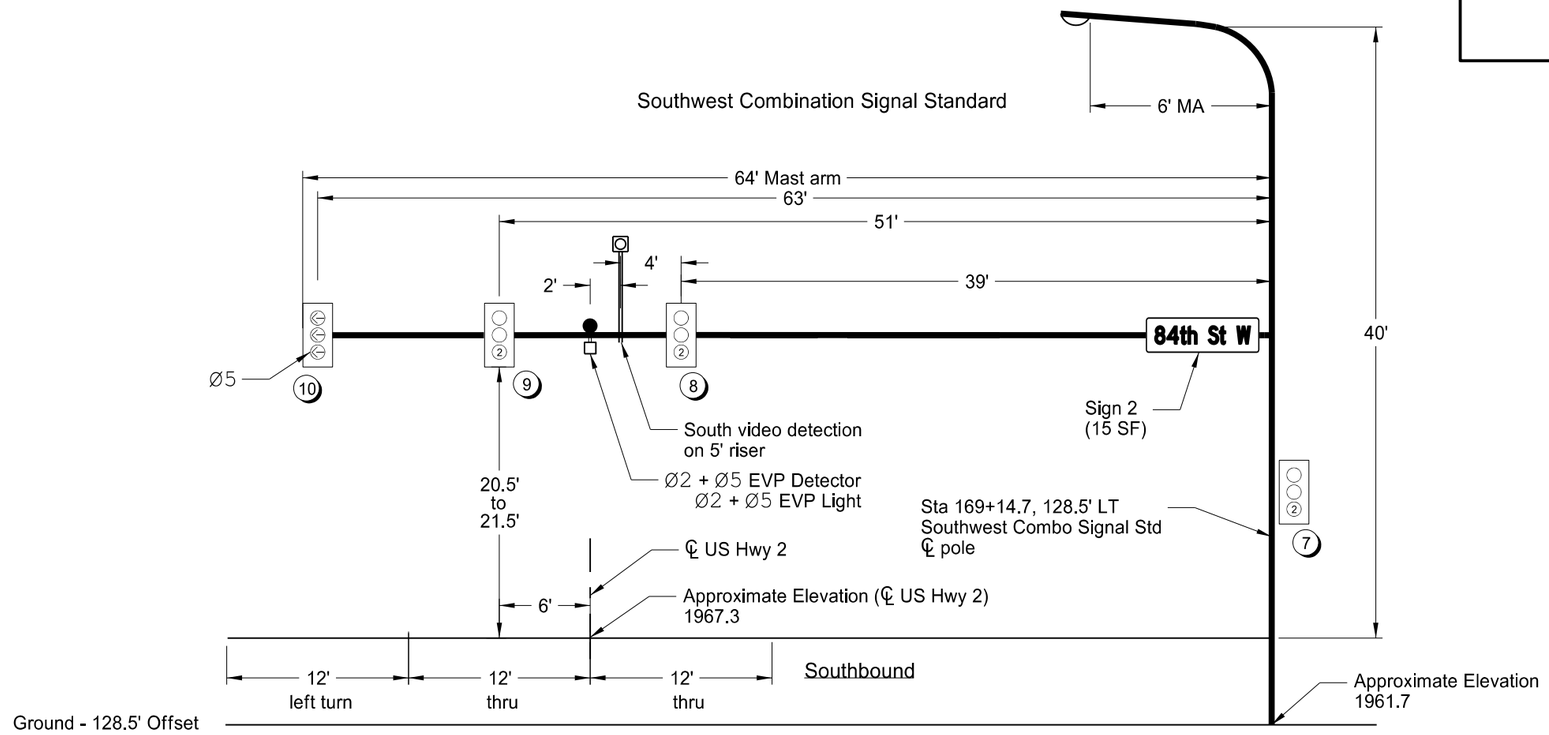
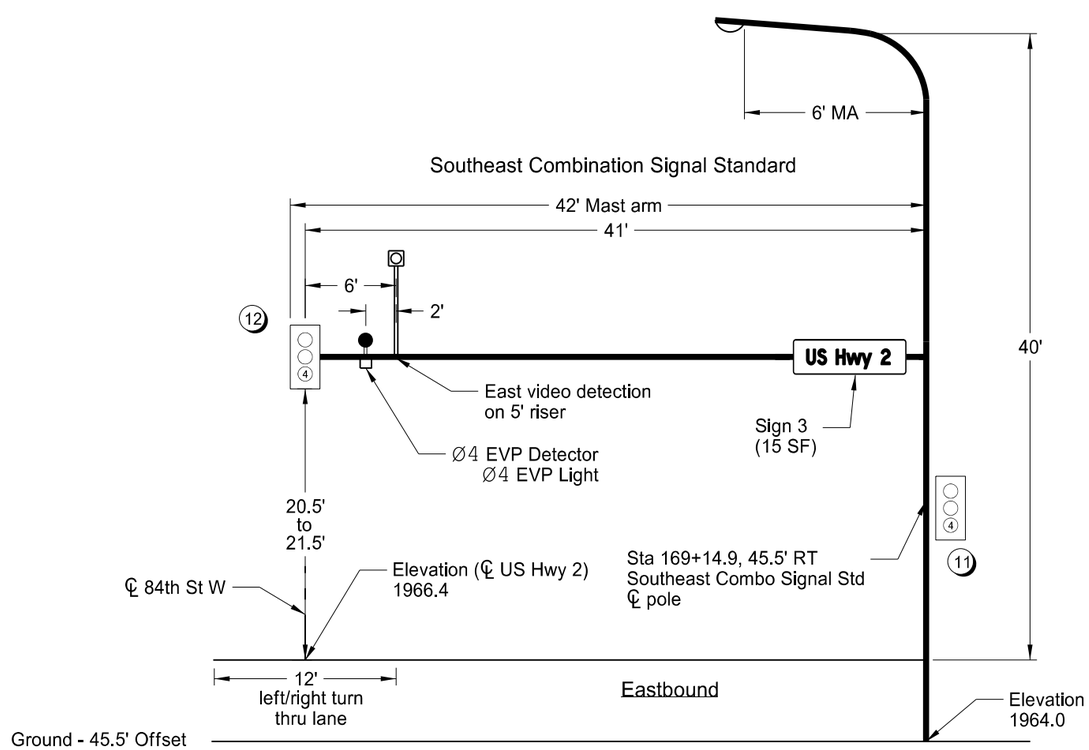
US Hwy 2

Signal Standards and Head Locations
Intersection of 84th St W
Site 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	16





LEGEND

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

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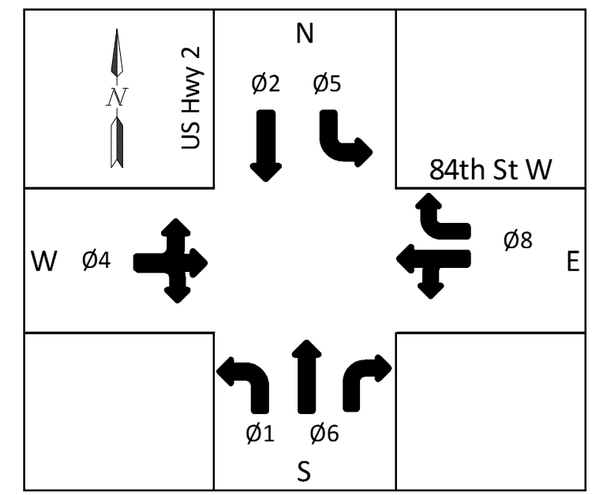
US Hwy 2

Signal Standards and Head Locations
Intersection of 84th St W
Site 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	17

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
	NB Left	SB Thru	Future	EB Thru	SB Left	NB Thru	Future	WB Thru
BASIC INTERVALS (OR FUNCTIONS)								
Minimum Green/Initial	5.0	15.0		10.0	5.0	15.0		10.0
Minimum Initial with Pedestrian Actuation*								
Passage Time	2.0	5.0		2.0	2.0	5.0		2.0
Maximum Green	30.0	60.0		30.0	30.0	60.0		30.0
Yellow Change	3.0	5.0		3.2	3.0	5.0		3.2
Red Clearance	3.3	1.0		3.5	3.3	1.0		3.8
Walk								
Pedestrian Clearance								
VOLUME DENSITY TIMING FUNCTIONS - ONLY APPLICABLE DURING "FREE" (UNCOORDINATED) TIMING PLAN								
Minimum Initial		15.0				15.0		
Added Initial per Actuation		1.5				1.5		
Minimum Gap		2.0				2.0		
Time to Reduce to Minimum Gap		18.0				18.0		
Time Before Reduction		30.0				30.0		
OTHER CONTROLLER FUNCTIONS								
Recall	No	Minimum	No	No	No	Minimum	No	No
Flashing-Normal & Conflict Monitor	R	Y	R	R	R	Y	R	R
Start Up Phasing	R	G	R	R	R	G	R	R
Emergency Vehicle Pre-emption	x	x	x	x	x	x	x	x
Type of Detector – Presence	Refer to Detector Zone Table							
Type of Detector – Calling								
Type of Detector – Passage								
Locking Memory								
Non-Locking Memory								

EB = Eastbound (84th St W)
WB = Westbound (84th St W)
NB = Northbound (US Hwy 2)
SB = Southbound (US Hwy 2)



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US Hwy 2

Controller Settings
Intersection of 84th St W
Site 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	18

	Phase 1								Phase 2								Phase 3								Phase 4							
	Northbound Left								Southbound								Future								Eastbound							
Head Number	RW	Clear to Phase 2	3	4	5	6	7	8	RW	Clear to Phase 3	4	5	6	7	8	1	RW	Clear to Phase 4	5	6	7	8	1	2	RW	Clear to Phase 5	6	7	8	1	2	3
1																																
2																																
3																																
4	GL	YL		YL	YL	N		YL																								
5																																
6																																
7									G		Y	N	N		Y	Y																
8									G		Y	N	N		Y	Y																
9									G		Y	N	N		Y	Y																
10																																
11																									G	Y	Y		N	Y	Y	
12																									G	Y	Y		N	Y	Y	

	Phase 5								Phase 6								Phase 7								Phase 8							
	Southbound Left								Northbound								Future								Westbound							
Head Number	RW	Clear to Phase 6	7	8	1	2	3	4	RW	Clear to Phase 7	8	1	2	3	4	5	RW	Clear to Phase 8	1	2	3	4	5	6	RW	Clear to Phase 1	2	3	4	5	6	7
1									G		Y	N	N		Y	Y																
2									G		Y	N	N		Y	Y																
3									G		Y	N	N		Y	Y																
4																																
5	GR	YR		YR	YR	N		YR																	G	Y	Y		N	Y	Y	
6																									G	Y	Y		N	Y	Y	
7																																
8																																
9																																
10	GL	YL		YL	YL	N		YL																								
11																																
12																																

Blank spaces denote a "Red" indication
G= Green Ball Indication
Y= Yellow Ball Indication
GL= Green Left Arrow Indication
YL= Yellow Left Arrow Indication
GR=Green Right Arrow Indication
YR=Yellow Right Arrow Indication

N= Continue to display right of way indication. When any phase is on alone, any non-conflicting phase may start timing without a clearance interval. See Chart A.

Preemption Controller Settings

	Phases 2 and 5								Phase 4								Phases 1 and 6								Phase 8							
	Southbound								Eastbound								Northbound								Westbound							
Head Number	RW	Clear to Phase 3	4	5	6	7	8	1	RW	Clear to Phase 5	6	7	8	1	2	3	RW	Clear to Phase 7	8	1	2	3	4	5	RW	Clear to Phase 1	2	3	4	5	6	7
1																	G		Y	N	Y		Y	Y								
2																	G		Y	N	Y		Y	Y								
3																	G		Y	N	Y		Y	Y								
4																	GL		YL	N	YL		YL	YL								
5																									G	Y	Y		N	Y	Y	
6																									G	Y	Y		N	Y	Y	
7	G		Y	N	Y		Y	Y																								
8	G		Y	N	Y		Y	Y																								
9	G		Y	N	Y		Y	Y																								
10	GL		YL	N	YL		YL	YL																								
11									G	Y	Y		N	Y	Y																	
12									G	Y	Y		N	Y	Y																	

Chart A

Phase	Non-conflicting Phase allowed to time concurrently
1	6
2	5, 6
3	N/A
4	8
5	2
6	1, 2
7	N/A
8	4

Conductor			Cable NWS (Northwest Signal Std) (12 No. 12 AWG)		Cable NES (Northeast Signal Std) (12 No. 12 AWG)		Cable SWS (Southwest Signal Std) (12 No. 12 AWG)		Cable SES (Southeast Signal Std) (12 No. 12 AWG)	
Base		Tracer	Head	Indication	Head	Indication	Head	Indication	Head	Indication
1	Black			Spare		Spare		Spare		Spare
2	White			Neutral		Neutral		Neutral		Neutral
3	Red		5, 6	Ø8 Red	1, 2, 3	Ø6 Red	7, 8, 9	Ø2 Red	11, 12	Ø4 Red
4	Green			Ground		Ground		Ground		Ground
5	Orange		5, 6	Ø8 Yellow	1, 2, 3	Ø6 Yellow	7, 8, 9	Ø2 Yellow	11, 12	Ø4 Yellow
6	Blue		5, 6	Ø8 Green	1, 2, 3	Ø6 Green	7, 8, 9	Ø2 Green	11, 12	Ø4 Green
7	White	Black		Spare		Spare		Spare		Spare
8	Red	Black		Spare	4	Ø1 Red ←	10	Ø5 Red ←		Spare
9	Green	Black		Spare		Spare		Spare		Spare
10	Orange	Black	5	Ø5 Yellow ←	4	Ø1 Yellow ←	10	Ø5 Yellow ←		Spare
11	Blue	Black	5	Ø5 Green ←	4	Ø1 Green ←	10	Ø5 Green ←		Spare
12	Black	White		Spare		Spare		Spare		Spare

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US Hwy 2

Controller Phasing & Signal Heads and Conductors
Intersection of 84th St W
Site 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	19

SIGNAL CABLE & CONDUIT SCHEDULE

RUN				CONDUIT			CABLE					
#		ITEM	STATION, OFFSET	SIZE (IN)	LF	NOTES	Origin	Destination	# of Cables	SIZE/TYPE	Total LF	TITLE
1	*Origin*	Combination Feed Point	169+00.0, 91.0' RT	2	15		Combination Feed Point	Traffic Signal Controller	2	UNDERGROUND CONDUCTOR NO 6-TYPE RHW	68	
	Destination	Traffic Signal Controller	169+11.2, 88.3' RT				Combination Feed Point	Traffic Signal Controller	1	UNDERGROUND CONDUCTOR NO 6-TYPE THW	34	
2	*Origin*	Traffic Signal Controller	169+11.2, 88.3' RT	4	120		Traffic Signal Controller	Pull Box 3	1	12 AWG 12 CONDUCTOR CABLE	135	NES
	Destination	Pull Box 3	170+26.0, 56.2' RT				Traffic Signal Controller	Pull Box 3	1	VIDEO DETECTION CABLE	135	NV
							Traffic Signal Controller	Pull Box 3	1	EMERGENCY VEHICLE DETECTOR CABLE	135	ED6
							Traffic Signal Controller	Pull Box 3	1	12 AWG 2 CONDUCTOR CABLE	135	EL6
							Traffic Signal Controller	Pull Box 3	1	12 AWG 7 CONDUCTOR CABLE	135	NFB
3	*Origin*	Pull Box 3	170+26.0, 56.2' RT	2	15		Pull Box 3	Northeast Combo Signal Std Transformer Base	1	12 AWG 12 CONDUCTOR CABLE	26	NES
	Destination	Northeast Combo Signal Std	170+25.6, 45.5' RT				Pull Box 3	North Video Detection Unit	1	VIDEO DETECTION CABLE	97	NV
							Pull Box 3	Northeast Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	94	ED6
							Pull Box 3	Northeast Emergency Preemption Lamp	1	12 AWG 2 CONDUCTOR CABLE	94	EL6
4	*Origin*	Pull Box 3	170+26.0, 56.2' RT	2	625		Pull Box 3	North Flashing Beacon Feed Point	1	12 AWG 7 CONDUCTOR CABLE	641	NFB
	Destination	North Flashing Beacon Feed Point	176+48.0, 47.2' RT									
5	*Origin*	North Flashing Beacon Feed Point	176+48.0, 47.2' RT	2	90		North Flashing Beacon Feed Point	North Flashing Beacon 2	1	12 AWG 7 CONDUCTOR CABLE	115	NFB
	Destination	North Flashing Beacon 2	176+48.0, 41.3' LT									
6	*Origin*	North Flashing Beacon 2	176+48.0, 41.3' LT	2	90		North Flashing Beacon 2	North Flashing Beacon 1	1	12 AWG 7 CONDUCTOR CABLE	120	NFB
		North Flashing Beacon 1	176+48.0, 130.4' LT									
7	*Origin*	Traffic Signal Controller	169+11.2, 88.3' RT	4	20		Traffic Signal Controller	Pull Box 1	3	12 AWG 12 CONDUCTOR CABLE	105	SWS, NWS, SES
	Destination	Pull Box 1	169+09.0, 72.6' RT				Traffic Signal Controller	Pull Box 1	3	VIDEO DETECTION CABLE	105	EV, WV, SV
							Traffic Signal Controller	Pull Box 1	3	EMERGENCY VEHICLE DETECTOR CABLE	105	ED25, ED4, ED8
							Traffic Signal Controller	Pull Box 1	3	12 AWG 2 CONDUCTOR CABLE	105	EL25, EL4, EL8
8	*Origin*	Pull Box 1	169+09.0, 72.6' RT	2	30		Pull Box 1	Southeast Signal Std Transformer Base	1	12 AWG 12 CONDUCTOR CABLE	41	SES
	Destination	Southeast Combo Signal Std	169+14.9, 45.5' RT				Pull Box 1	East Video Detection Unit	1	VIDEO DETECTION CABLE	102	EV
							Pull Box 1	Southeast Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	99	ED4
							Pull Box 1	Southeast Emergency Preemption Lamp	1	12 AWG 2 CONDUCTOR CABLE	99	EL4
9	*Origin*	Pull Box 1	169+09.0, 72.6' RT	4	210		Pull Box 1	Pull Box 2	2	12 AWG 12 CONDUCTOR CABLE	444	SWS, NWS
	Destination	Pull Box 2	169+08.1, 135.4' LT				Pull Box 1	Pull Box 2	2	VIDEO DETECTION CABLE	444	WV, SV
							Pull Box 1	Pull Box 2	2	EMERGENCY VEHICLE DETECTOR CABLE	444	ED25, ED8
							Pull Box 1	Pull Box 2	2	12 AWG 2 CONDUCTOR CABLE	444	EL25, EL8
10	*Origin*	Pull Box 2	169+08.1, 135.4' LT	2	10		Pull Box 2	Southwest Combo Signal Std Transformer Base	1	12 AWG 12 CONDUCTOR CABLE	21	SWS
	Destination	Southwest Combo Signal Std	169+14.7, 128.5' LT				Pull Box 2	South Video Detection Unit	1	VIDEO DETECTION CABLE	102	SV
							Pull Box 2	Southwest Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	99	ED25
							Pull Box 2	Southwest Emergency Preemption Lamp	1	12 AWG 2 CONDUCTOR CABLE	99	EL25
11	*Origin*	Pull Box 2	169+08.1, 135.4' LT	4	85		Pull Box 2	Northwest Signal Std Transformer Base	1	12 AWG 12 CONDUCTOR CABLE	96	NES
	Destination	Northwest Signal Std	169+90.9, 128.3' LT				Pull Box 2	West Video Detection Unit	1	VIDEO DETECTION CABLE	157	WV
							Pull Box 2	Northwest Emergency Preemption Detector	1	EMERGENCY VEHICLE DETECTOR CABLE	154	ED8
							Pull Box 2	Northwest Emergency Preemption Lamp	1	12 AWG 2 CONDUCTOR CABLE	154	EL8
12	*Origin*	Traffic Signal Controller	169+11.2, 88.3' RT	2	50		Traffic Signal Controller	Pull Box 4	1	12 AWG 7 CONDUCTOR CABLE	65	SFB
	Destination	Pull Box 4	168+77.2, 53.0' RT									
13	*Origin*	Pull Box 4	168+77.2, 53.0' RT	2	615		Pull Box 4	South Flashing Beacon Feed Point	1	12 AWG 7 CONDUCTOR CABLE	631	SFB
	Destination	South Flashing Beacon Feed Point	162+62.0, 60.3' RT									
14	*Origin*	South Flashing Beacon Feed Point	162+62.0, 60.3' RT	2	15		South Flashing Beacon Feed Point	South Flashing Beacon 2	1	12 AWG 7 CONDUCTOR CABLE	40	SFB
	Destination	South Flashing Beacon 2	162+62.0, 47.5' RT									
15	*Origin*	South Flashing Beacon 2	162+62.0, 47.5' RT	2	90		South Flashing Beacon 2	South Flashing Beacon 1	1	12 AWG 7 CONDUCTOR CABLE	120	SFB
	Destination	South Flashing Beacon 1	162+62.0, 41.8' LT									

INTERNAL MAST ARM/STANDARD SIGNAL HEAD CABLE

Origin	Destination	# of Cables	SIZE/TYPE	Total LF
Northeast Combo Signal Std Transformer Base	Vehicle Head 1	1	12 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 2	1	12 AWG 5 CONDUCTOR CABLE	69
	Vehicle Head 3	1	12 AWG 5 CONDUCTOR CABLE	81
	Vehicle Head 4	1	12 AWG 5 CONDUCTOR CABLE	91
Northwest Signal Std Transformer Base	Vehicle Head 5	1	12 AWG 7 CONDUCTOR CABLE	20
	Vehicle Head 6	1	12 AWG 5 CONDUCTOR CABLE	48
Southwest Combo Signal Std Transformer Base	Vehicle Head 7	1	12 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 8	1	12 AWG 5 CONDUCTOR CABLE	67
	Vehicle Head 9	1	12 AWG 5 CONDUCTOR CABLE	79
	Vehicle Head 10	1	12 AWG 5 CONDUCTOR CABLE	91
Southeast Signal Std Transformer Base	Vehicle Head 11	1	12 AWG 5 CONDUCTOR CABLE	20
	Vehicle Head 12	1	12 AWG 5 CONDUCTOR CABLE	69

Cable Titles
NES = Northeast Signal Standard
NWS = Northwest Signal Standard
SES = Southeast Signal Standard
SWS = Southwest Signal Standard
NFB=North Flashing Beacon
SFB=South Flashing Beacon
NV = North Video Detection Unit
SV = South Video Detection Unit
EV = East Video Detection Unit
WV = West Video Detection Unit
ED25 = Ø2 + Ø5 EVP Detector
ED4 = Ø4 EVP Detector
ED6 = Ø6 EVP Detector
ED8 = Ø8 EVP Detector
EL25 = Ø2 + Ø5 EVP Light
EL4 = Ø4 EVP Light
EL6 = Ø6 EVP Light
EL8 = Ø8 EVP Light

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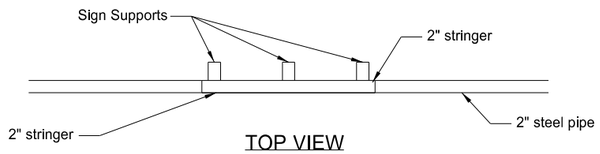
US Hwy 2

Cable and Conduit Schedule
Intersection of 84th St W
Site 2

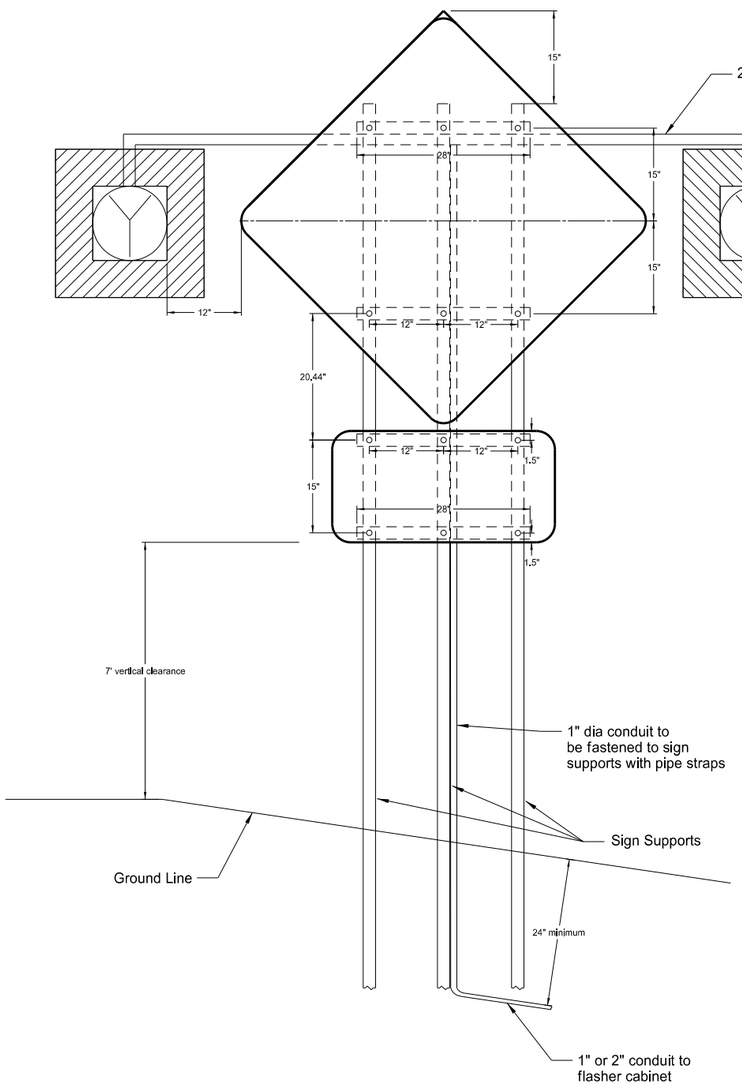
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	20



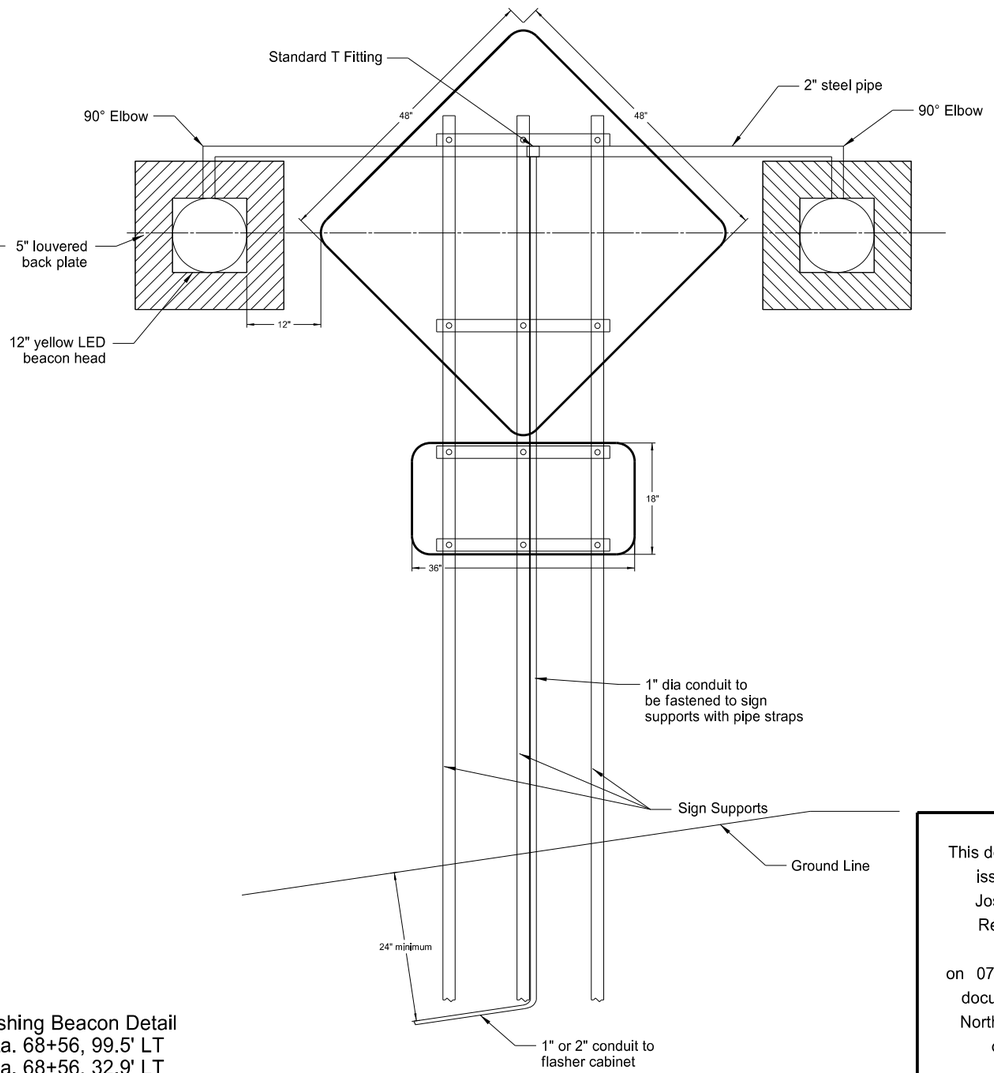
TOP VIEW

Note: Conduit straps as required to securely attach the steel pipe to the stringer.

Note: Heads mounted to same sign shall flash alternately.



FRONT VIEW



BACK VIEW

Flashing Beacon Detail
Sta. 68+56, 99.5' LT
Sta. 68+56, 32.9' LT
Sta. 162+62, 41.8' LT
Sta. 162+62, 47.5' RT
Sta. 176+48, 130.4' LT
Sta. 176+48, 41.3' LT

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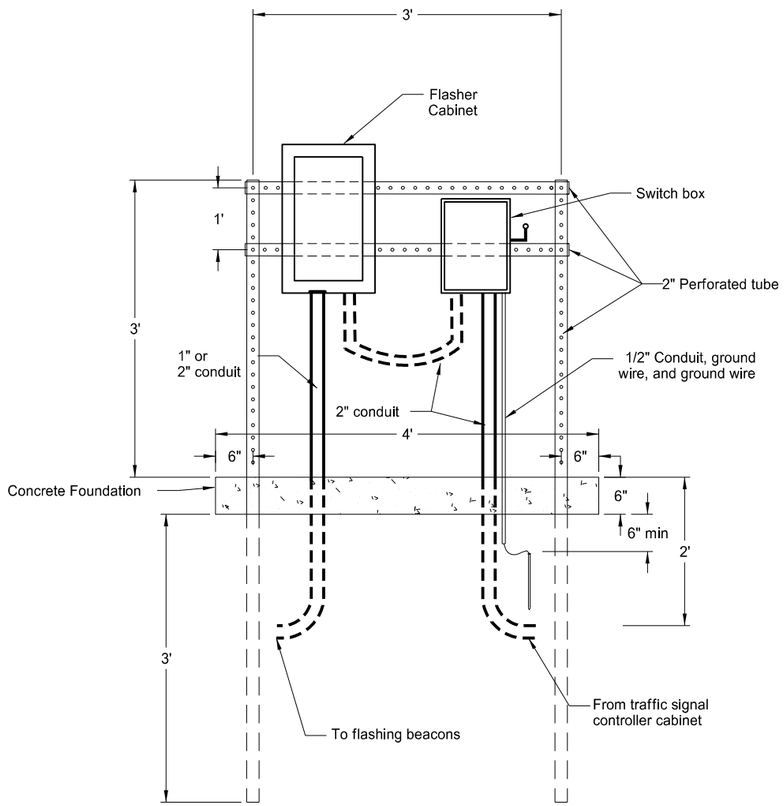
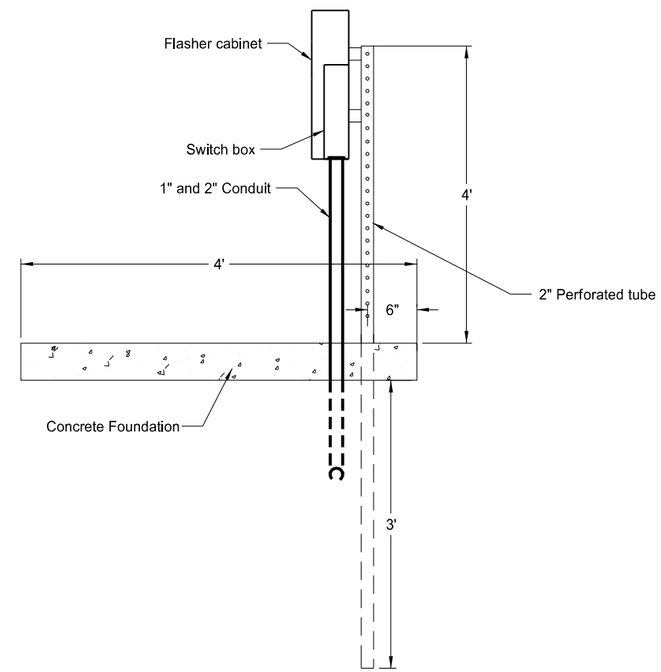
US Hwy 2

Flashing Beacon Detail
Site 1 & Site 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	21



FRONT VIEW



SIDE VIEW

Pipe Stand Feed Point Detail
Sta. 68+56, 38.0' RT
Sta. 162+62, 60.3' RT
Sta. 176+48, 47.2' RT

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US Hwy 2

Flashing Beacon Pipe Stand Feed Point Detail
Site 1 & Site 2

SIGNAL STANDARD FOUNDATION SELECTION TABLE		
Description	Footing Depth "D" 24" & 30" Diameter	Footing Depth "D" 36" & 42" Diameter
Signal Standard Type IV 20' - 25' Signal Mast Arm	12', 12'	11', 11'
Combination 40' Mounting Height 40' - 45' Signal Mast Arm 51' - 55' Signal Mast Arm 56' - 60' Signal Mast Arm 61' - 65' Signal Mast Arm	 N/A, N/A N/A, N/A N/A, N/A N/A, N/A	 15', 15' 17', 17' 18', 18' 19', 19'

NOTES FOR SIGNAL STANDARD FOUNDATIONS:

1. For Signal Standards, use at minimum the largest of the following scenarios:

   - Anchor bolt cage circle diameter plus 12"
   - Base plus 6"
   - 24"

   It is the Contractor's responsibility to determine the foundation diameter and include the corresponding costs for the actual diameter in the corresponding unit price bid "CONCRETE FOUNDATION-TRAFFIC SIGNALS".

2. Provide Class AAE-3 Portland Cement Concrete mixed and proportioned as specified in Section 802.

3. Provide Grade 60 reinforcing steel.

4. The Contractor may use temporary casing to maintain the opening prior to placement of concrete. The casing will be removed prior to curing of the concrete. If casing is used, it will be of sufficient strength to withstand handling and installation procedures. The Contractor will submit a casing material proposal to the Engineer for review two weeks prior to ordering casing material. Include all costs associated with the temporary casing in the corresponding unit price bid "CONCRETE FOUNDATION-TRAFFIC SIGNALS". Permanent casing of the foundation will not be used.

5. Include all costs associated with the construction of the foundation in the corresponding unit price bid "CONCRETE FOUNDATION-TRAFFIC SIGNALS". This includes but is not limited to excavation, concrete, reinforcing steel, anchor bolts and ground rod.

6. See Standard Drawing D-770-1 for additional foundation information.

7. Signal Standards will have a minimum of 6 anchor bolts.

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US Hwy 2

Signal Concrete Foundations

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	23

SPEC	CODE	ITEM DESCRIPTION	UNIT	TRAFFIC SIGNAL SYSTEM - SITE 1	TRAFFIC SIGNAL SYSTEM - SITE 2	TOTAL
772	0020	CONCRETE FOUNDATION-TRAFFIC SIGNALS	EA	4	4	8
772	0100	PULLBOX	EA	3	4	7
772	0240	2IN DIAMETER RIGID CONDUIT	LF	700	1,645	2,345
772	0290	4IN DIAMETER RIGID CONDUIT	LF	460	435	895
772	0300	UNDERGROUND CONDUCTOR NO6-TYPE RHW	LF	68	68	136
772	0310	UNDERGROUND CONDUCTOR NO6-TYPE THW	LF	34	34	68
772	0375	EMERGENCY VEHICLE DETECTOR CABLE	LF	1,074	1,130	2,204
772	0400	NO12 AWG 2 CONDUCTOR CABLE	LF	1,074	1,130	2,204
772	0403	NO12 AWG 5 CONDUCTOR CABLE	LF	468	574	1,042
772	0405	NO12 AWG 7 CONDUCTOR CABLE	LF	1,772	1,887	3,659
772	0410	NO12 AWG 12 CONDUCTOR CABLE	LF	801	868	1,669
772	0520	FEED POINT-FLASHING BEACON	EA	1	2	3
772	0621	TYPE IV SIGNAL STD 21FT MA	EA	-	1	1
772	1122	COMBO 42FT MA SIG & LT STD-TYPE C	EA	-	1	1
772	1252	COMBO 55FT MA SIG & LT STD-TYPE C	EA	1	-	1
772	1282	COMBO 58FT MA SIG & LT STD-TYPE C	EA	1	-	1
772	1297	COMBO 62FT MA SIG & LT STD-TYPE C	EA	1	-	1
772	1299	COMBO 64FT MA SIG & LT STD-TYPE C	EA	-	2	1
772	1399	COMBO 65FT MA SIG & LT STD-TYPE C	EA	1	-	1
772	1810	1-WAY 3 SEC HEAD W/12IN LENS-POST MTD	EA	1	3	4
772	1812	1-WAY 3 SEC HEAD W/12IN LENS-MA MTD	EA	7	8	15
772	1822	1-WAY 4 SEC HEAD W/12IN LENS-MA MTD	EA	4	-	4
772	1830	1-WAY 5 SEC HEAD W/12IN LENS-POST MTD	EA	3	1	3
772	1900	12IN SIGNAL HEAD	EA	4	8	12
772	2110	FLASHING BEACON-POST MOUNTED	EA	2	4	6
772	2260	VIDEO DETECTION CABLE	LF	1,086	1,142	2,228
772	2265	VIDEO DETECTION SYSTEM[1]	EA	1	1	2
772	2350	CONTROLLER TYPE 1[2]	EA	1	1	2
772	2556	BATTERY BACKUP SYSTEM	EA	1	1	2
772	2610	EMERGENCY VEHICLE PRE-EMPTION UNIT[3]	EA	4	4	8

[1]Includes resetting cameras, video monitor, access point and all other equipment required for a fully operational video detection system.

[2]Includes cabinet, working slab, conflict monitor, load switches, flashers, bus interface units and all other equipment required as reset or new for a fully operational traffic signal and flashing beacon controller.

[3]Includes resetting detectors, lights and all other equipment required for a fully operation preemption system.

772	9811	TRAFFIC SIGNAL SYSTEM - SITE 1	EA	1
772	9812	TRAFFIC SIGNAL SYSTEM - SITE 2	EA	1

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

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

SPEC	CODE	BID ITEM	QTY	UNIT
772	9811	TRAFFIC SIGNAL SYSTEM - SITE 1		
Intersection of US Hwy 2 & 58th St W			1	EA
772	9812	TRAFFIC SIGNAL SYSTEM - SITE 2		
Intersection of US Hwy 2 & 84th St W			1	EA

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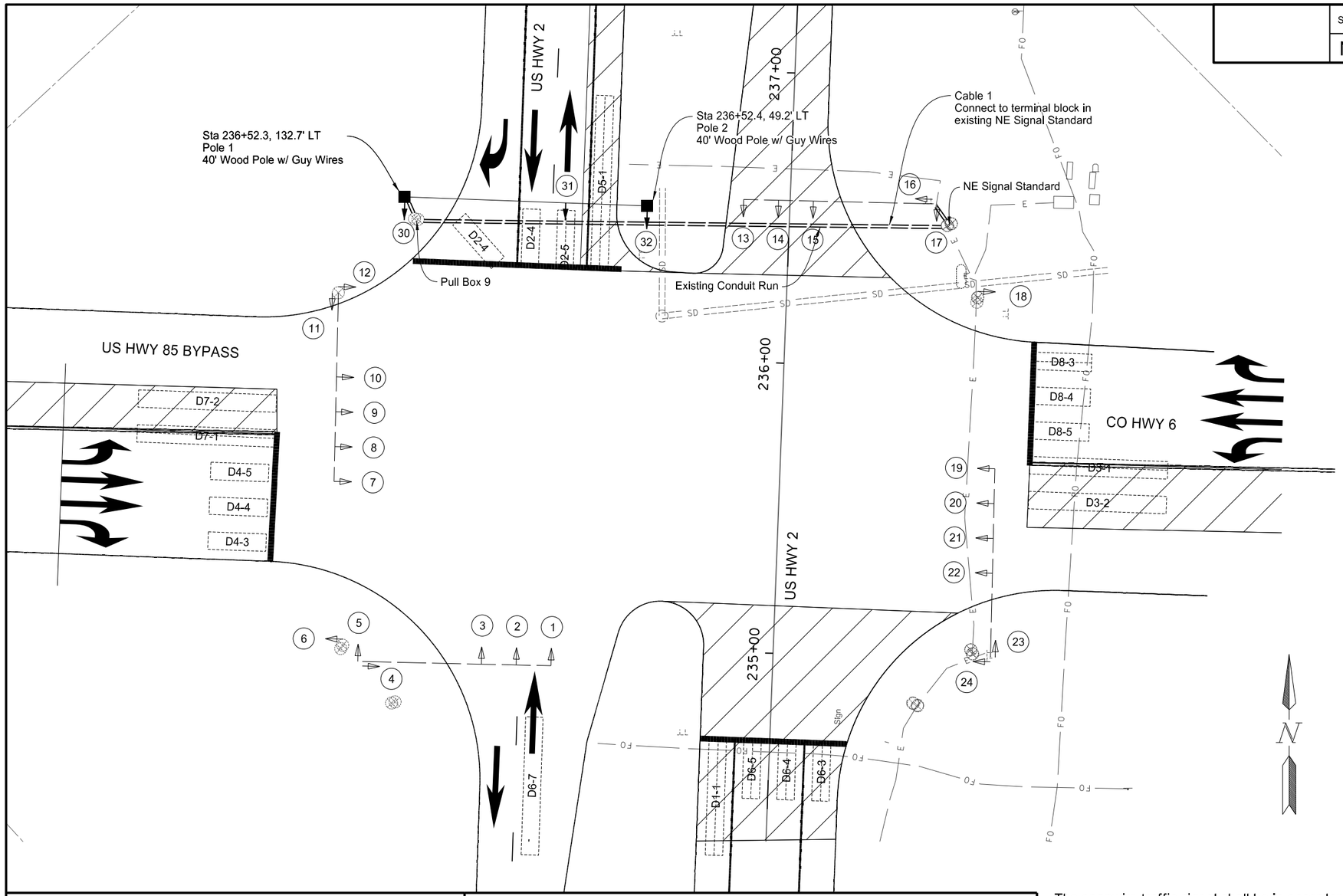
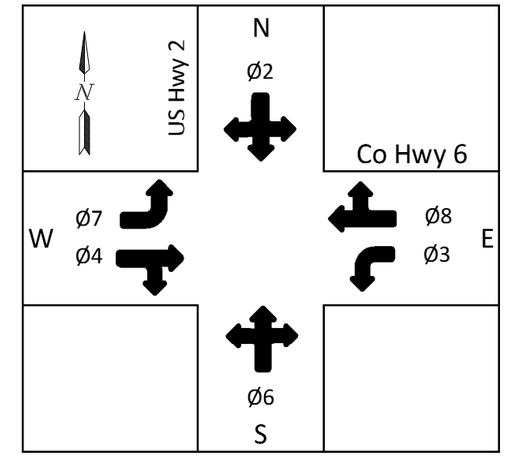
US Hwy 2

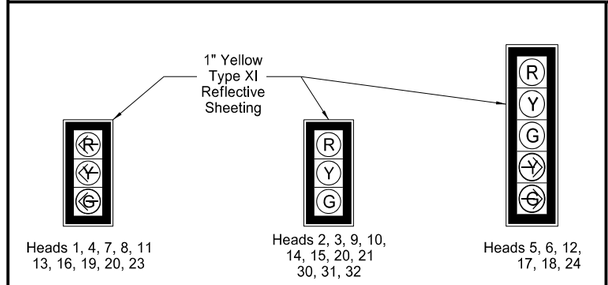
Traffic Signal Estimate of Quantities
Site 1 & Site 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	24





Temporary Signal Phasing



All Signal Heads:
12" LED Lenses & 5" Louvered Backplates

LEGEND

- Existing Signal Controller
- Signal Head
- EVP Detector
- Video Detection Unit
- Existing Hand Hole
- Wood Pole
- Existing Signal Head
- New Signal Head
- Lane Closed
- Open Lanes

The spanwire traffic signal shall be in accordance with the NDDOT specifications and standard detail D-772-6.

Modify the existing signal timing per the field engineer. Existing Northbound Left-Turn and Southbound Left-Turn phases are to be omitted.

Re-aim existing video detection units and emergency vehicle preemption detection units to accomodate new detection zones as needed.

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US Hwy 2

Spanwire Signal Layout
Intersection of Co Hwy 6
Site 3

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	150	25

RUN	ITEM	STATION OFFSET	CONDUIT RUN		CABLE RUN		
			TOTAL LF	SIZE (IN)	TOTAL LF	SIZE / TYPE	CABLE #
1	NE Signal to Pull Box 9	236+56.8, 49.0' RT 236+49.5, 54.5' RT	9	Existing	9	12 AWG 5 Conductor Cable	1
2	Pull Box 9 to Pull Box 8	236+49.5, 54.5' RT 236+44.9, 129.1' LT	184	Existing	184	12 AWG 5 Conductor Cable	1
3	Pull Box 8 to Wood Pole 1	236+44.9, 129.1' LT 236+52.3, 135.7' LT	8	2"	8	12 AWG 5 Conductor Cable	1
4	Wood Pole 1 to Wood Pole 2	236+52.3, 135.7' LT 236+57.4, 49.2' LT			88	12 AWG 5 Conductor Cable	1

5 No. 12 AWG	
HEAD	CABLE
30, 31, 32	1

Bag Heads	
Phase	Head Number
1	11, 13
2	2
3	8
5	1, 23
6	14, 15, 17
7	20

SPEC	CODE	BID ITEM	QTY	UNIT
772	2810	TEMPORARY TRAFFIC SIGNALS Intersection of US Hwy 2 & Co Hwy 6 Modification of US Hwy 2 & 58th St W (See plan note 772-P16)	1	EA

DETECTION ZONE SCHEDULE

Phase-Number	Distance From Stop Bar (feet)	Length (feet)	Presence/Counting	Passage/Counting	Counting	Locking Memory	Non-Locking Memory
~~1-1~~	~~0~~	~~60~~	~~X~~				~~X~~
~~2-1~~	~~0~~	~~10~~		~~X~~		~~X~~	
2-2	0	10		X		X	
2-3	0	20			X		
2-4	0	10			X		
~~2-5~~	~~0~~	~~10~~			~~X~~		
3-1	0	60	X				X
~~3-2~~	~~0~~	~~60~~					
4-1	0	60		X		X	
4-2	0	60		X		X	
4-3	0	20			X		
4-4	0	20	X				X
4-5	0	20	X				X
~~5-1~~	~~0~~	~~40~~	~~X~~				~~X~~
~~6-1~~	~~0~~	~~20~~		~~X~~		~~X~~	
~~6-2~~	~~0~~	~~20~~		~~X~~		~~X~~	
~~6-3~~	~~0~~	~~20~~			~~X~~		
~~6-4~~	~~0~~	~~20~~			~~X~~		
~~6-5~~	~~0~~	~~20~~			~~X~~		
6-6	0	20		X		X	
6-7	0	20	X				X
7-1	0	60	X				X
~~7-2~~	~~0~~	~~60~~	~~X~~				~~X~~
8-1	0	60		X		X	
8-2	0	20		X		X	
8-3	0	20			X		
8-4	0	20	X				X
8-5	0	20	X				X

Phase	Non-Conflicting Phase Allowed to Time Concurrently
1	N/A
2	N/A
3	7 or 8
4	7 or 8
5	N/A
6	N/A
7	3 or 4
8	3 or 4

Note: Program Phases 2 and 6 as split phases

ITEM DESCRIPTION	UNIT	TOTAL
40' Wood Pole with Guy Wires	EA	2
12 AWG 5 Conductor Cable	LF	329
Underground 2" Dia Rigid Conduit	LF	8
Pole Mtd. 2.5" Dia Rigid Conduit	LF	40
1/2" Span Wire - 7 Strand Steel	LF	88
1/2" Stability Wire - 7 Strand Steel	LF	88
Cable Hangers	LS	1
Mounting Hardware	EA	2
3 Section Head with 12" Lenses	EA	3

Items shown above are for informational purposes. Contractor shall provide all labor and equipment necessary for the temporary signal system to be fully operational as shown in the plans. Items shall be included in the corresponding price bid for "Temporary Traffic Signals."

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US Hwy 2

Construction Signal Phasing
Cable & Conduit Schedule
Intersection of Co Hwy 6
Site 3

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	180	1

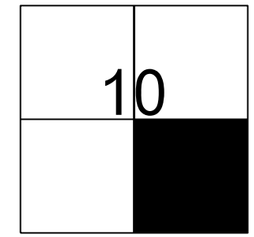
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

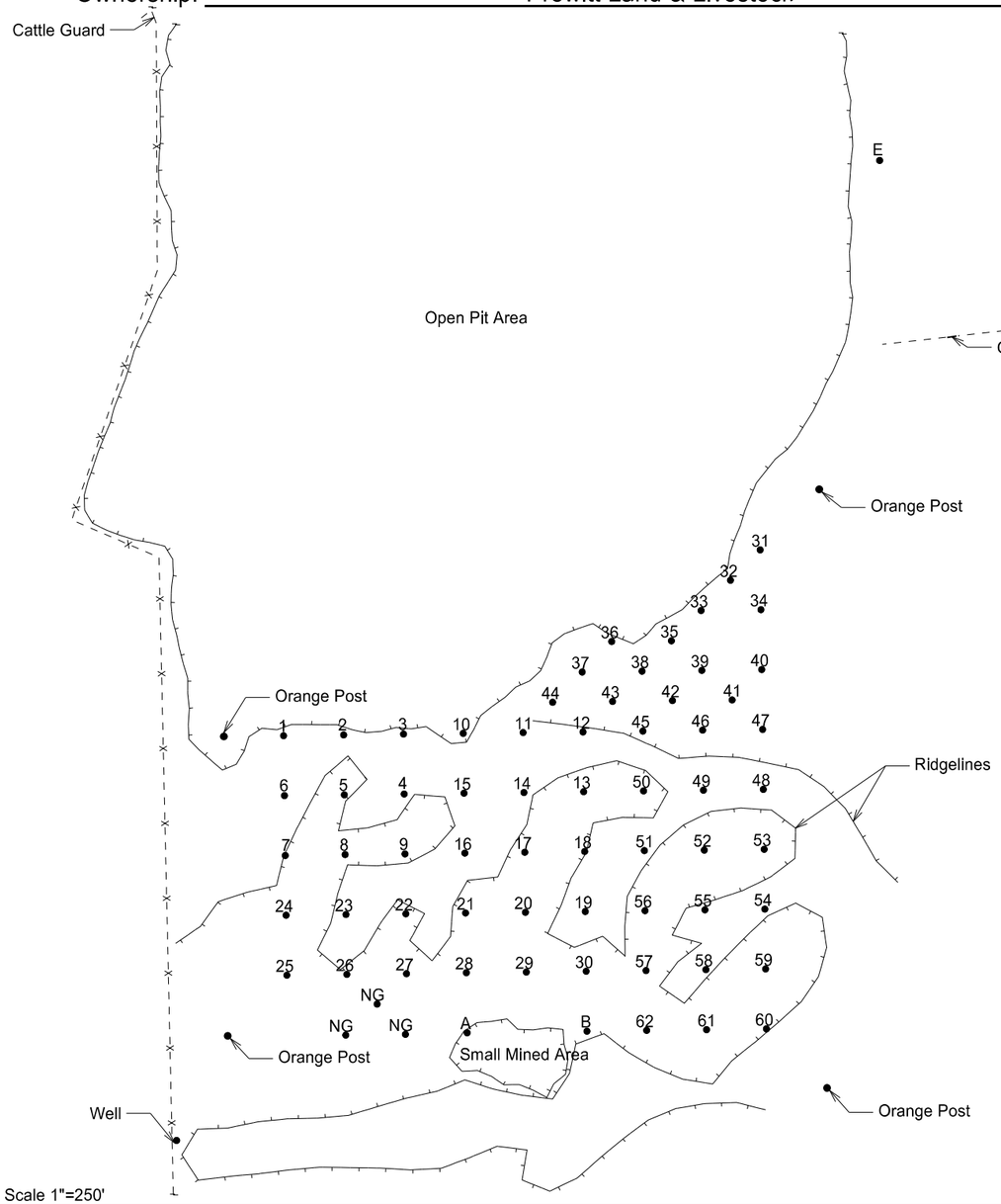
TEST HOLE PLAT

Location: SE1/4 10-24-59 County: Richland, MT

Ownership: Prewitt Land & Livestock

LOCATION OF PIT IN SECTION





Area "A" consists of test holes 1-9
Area "B" consists of test holes 10-18
Area "C" consists of test holes 19-30
Area "D" consists of test holes 31-44
Area "E" consists of test holes 45-53
Area "F" consists of test holes 54-62
Test Holes A-E are for Information only

Legend
gr = gravel
Fgr = fine gravel
CGr = coarse gravel
sd = sand
FS = fine sand
CS = coarse sand
sh = shale
SiCl = silt clay
rk = rock
FeO = iron oxide
CoS = coal slack
NG = no gravel
DM = disturbed material
WL = water line

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	180	2

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
1	0.5	6.0 gr	0	15	38	55	+
		0.5 sd					
		4.0 gr					
		1.0 Fgr					
		6.0 gr					
		2.0 gr Si Cl					
2	2.0	3.0 gr	1	16	37	53	+
		1.0 FS					
		1.0 sd					
		13.0 gr					
3	1.0	4.0 gr	1	16	35	51	+
		2.0 sd					
		1.0 FS					
		12.0 gr					
4	2.0	1.0 Fgr Si Cl	0	13	37	53	+
		2.0 gr					
		1.0 Fgr Si Cl					
		11.0 gr					
		1.0 gr Co S					
		2.0 gr					
5	0.5	2.5 gr	1	17	40	55	Si Cl
		1.0 FS					
		8.0 gr					
		2.0 FS					
		5.0 gr					
6	0.5	0.5 Fgr Si Cl	0	11	33	48	Si Cl
		9.0 gr					
		1.0 sd Si Cl					
		0.5 sd					
		0.5 Fgr					
		3.0 gr					
		3.0 gr Si Cl					
7	0.5	4.0 gr	1	15	36	50	Si Cl
		0.5 FS					
		1.5 gr					
		2.5 FS					
		4.5 gr					
8	1.0	1.0 gr Si Cl	0	10	31	45	Si Cl
		2.0 gr					
		1.0 gr Co S					
		1.0 gr					
		1.0 sd					
		4.0 gr					
		1.0 gr Si Cl					
9	0.5	1.5 gr Si Cl	2	24	44	55	+
		13.0 gr					
		1.0 FS					
		4.0 gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
10	0.5	1.0 FS	1	19	36	47	+
		3.5 gr					
		1.0 FS					
		4.0 gr					
		1.0 Si Cl					
		2.0 gr					
		3.0 FS					
		4.0 gr					
11	2.0	11.5 gr	0	13	31	46	+
		0.5 sd					
		1.0 sd					
		2.0 gr					
12	1.0	2.0 sd	0	14	30	41	+
		1.5 Fgr					
		3.0 gr					
		1.0 FS					
		3.0 gr					
		1.0 FS					
		4.5 gr					
		3.0 FS					
13	0.5	2.5 gr	0	10	29	42	+
		2.0 sd					
		1.0 gr					
		0.5 Fgr					
		1.0 gr					
		1.5 sd					
		1.0 Fgr					
		6.5 gr					
		0.5 sd					
		1.0 Fgr					
		2.0 gr					
14	2.0	2.0 sd	1	16	35	47	+
		14.0 gr					
		1.0 sd					
		1.0 Fgr					
15	2.0	0.5 sd Si Cl	0	16	39	55	+
		0.5 Fgr					
		17.0 gr					
16	0.5	2.5 gr Si Cl	1	15	30	39	+
		4.0 gr					
		6.0 FS					
		4.0 gr					
		1.5 gr Si Cl					
		1.5 gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
17	0.5	0.5 gr Si Cl	0	12	34	48	+
		1.0 sd					
		1.0 sd Si Cl					
		1.0 gr					
		1.0 Fgr					
		1.0 gr					
		1.0 sd					
		6.0 gr					
		2.0 gr Si Cl					
		1.0 Fgr					
		2.0 gr					
		1.0 gr Co S					
		1.0 gr					
18	0.5	1.5 gr Si Cl	0	15	28	37	+
		4.0 gr					
		0.5 Si Cl					
		2.5 FS					
		1.0 gr					
		2.0 sd					
		1.0 FS Co S					
		2.0 gr					
		3.0 FS					
		2.0 gr					
19	4.0	3.0 sd	0	17	35	44	+
		13.0 gr					
20	2.0	1.0 sd Si Cl	0	16	36	48	Si Cl
		8.0 gr					
21	1.5	0.5 Fgr Si Cl	0	12	30	45	Si Cl
		2.5 gr					
		0.5 sd					
		1.0 gr					
		2.0 sd					
		1.0 sd					
		2.0 gr					
		1.0 gr					
		2.0 gr Si Cl					
22	1.5	0.5 Fgr Si Cl	0	17	38	52	Si Cl
		9.0 gr					
		1.0 Fgr					
		3.0 gr					
		1.0 gr Si Cl					
23	0.5	1.5 gr Si Cl	1	19	41	53	Si Cl
		8.0 gr					
		0.5 FS					
		0.5 gr					
		2.0 sd					
		3.0 gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	
24	1.0	1.0 Fgr Si Cl	0	4	19	30	Si Cl
		1.5 Fgr					
		0.5 sd					
		1.0 gr Si Cl					
25	0.5	2.5 gr	1	19	40	52	Si Cl
26	1.0	1.0 gr Si Cl	0	13	35	48	Si Cl
		2.0 gr					
		1.0 sd					
		3.0 gr					
		0.5 gr Si Cl					
27	5.0	1.0 sd	0	9	24	35	Si Cl
		2.0 gr					
		1.0 FS					
		2.0 sd					
28	3.0	1.0 Fgr Si Cl	0	8	24	42	Si Cl
		1.0 gr Si Cl					
29	2.5	1.5 gr Si Cl	1	24	43	54	Si Cl
		1.5 gr					
		3.5 gr Si Cl					
30	0.5	12.5 gr	1	13	39	56	Si Cl
31	2.0	8.0 gr	1	17	38	51	Si Cl
		1.0 FS					
		1.0 gr Si Cl					
		4.5 gr					
32	0.5	0.5 gr Si Cl	0	12	32	47	Si Cl
		8.0 gr					
		1.0 Fgr					
		2.0 FS					
		5.0 gr					
		1.0 gr Si Cl					
33	3.0	5.0 gr	0	12	26	36	+
		1.0 sd					
		1.0 gr					
		1.5 sd					
		2.5 gr					
		1.0 gr Si Cl					
		1.0 gr					
		4.0 sd					

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PROSPECTED BY Volk/Nelson

INSPECTED & APPROVED Jeffrey Swank Oct-15

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	180	3

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
34	3.0	1.0 gr	0	12	28	38	+
		1.0 FS					
		3.0 gr					
		2.0 FS					
		2.0 gr					
		1.0 FS					
		1.0 gr Si Cl					
		2.0 gr					
		1.0 FS					
		1.5 gr					
		1.5 FS					
35	2.5	1.5 sd Si Cl	0	14	35	46	+
		1.0 Fgr					
		3.0 gr					
		1.0 Fgr					
		4.0 gr					
		2.0 gr Si Cl					
		4.0 gr					
		1.0 sd					
36	4.0	7.0 gr	0	13	31	47	+
		1.0 FS					
		4.0 gr					
		2.0 gr Si Cl					
		2.0 FS					
37	4.0	2.0 sd Si Cl	0	10	23	34	+
		1.0 gr					
		1.0 Fgr					
		3.0 gr					
		3.0 sd					
		1.0 sd Si Cl					
		1.0 gr					
		1.0 Fgr					
		1.5 gr					
		1.5 sd					
38	4.0	2.5 FS	0	8	23	34	+
		5.5 gr					
		3.0 FS					
		5.0 gr					
39	2.0	3.0 sd	0	9	25	38	+
		1.0 gr Si Cl					
		6.0 gr					
		2.0 sd					
		2.0 gr					
		1.0 Fgr					
		3.0 gr					
40	3.0	3.0 gr	1	14	32	47	+
		1.0 FS					
		13.0 gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
41	1.0	2.0 sd	0	15	30	41	+
		1.0 Fgr					
		1.0 sd					
		2.0 gr					
		1.0 Fgr					
		4.0 gr					
		1.0 Fgr					
		3.5 gr					
		1.5 sd					
		1.0 gr					
		1.0 sd					
42	1.0	1.5 sd	1	8	32	47	+
		1.5 Fgr					
		6.0 gr					
		1.0 FS Co S					
		2.0 gr					
		1.0 sd					
		2.0 gr					
		1.0 FS					
		3.0 gr					
43	1.0	1.0 sd	1	13	36	52	+Cave
		6.0 gr					
		1.0 gr Si Cl					
		8.0 gr					
44	1.0	0.5 sd	1	12	32	44	+
		2.0 gr					
		1.5 sd					
		6.5 gr					
		1.5 FS					
		3.0 gr					
		1.0 FS					
		2.0 Si Cl					
		2.0 gr					
45	1.0	3.0 sd	0	13	31	42	+
		1.0 Fgr					
		2.0 gr					
		2.0 sd					
		3.0 gr					
		1.0 gr Co S					
		5.0 gr					
		1.0 Fgr					
		1.0 gr					
46	4.0	2.0 sd	0	12	28	39	+
		2.0 Fgr					
		7.5 gr					
		0.5 FS					
		4.0 gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
47	1.0	1.0 sd Si Cl	0	9	24	35	+
		3.0 sd					
		1.0 Fgr					
		2.0 sd					
		1.0 Fgr					
		1.0 sd					
		1.0 Fgr					
		1.5 gr					
		0.5 sd					
		5.5 gr					
		0.5 sd					
		1.0 gr					
48	4.0	2.0 FS	0	5	11	16	+
		10.0 sd					
		2.0 gr					
		1.0 gr Si Cl					
		1.0 gr					
49	3.0	8.0 sd	0	8	20	31	+
		1.0 Fgr					
		7.0 gr					
		1.0 Fgr Si Cl					
50	2.0	1.0 sd	1	14	28	39	+
		2.0 gr					
		2.0 FS					
		5.0 gr					
		0.5 Si Cl					
		2.5 gr					
		3.0 FS					
		2.0 gr					
51	3.0	2.0 gr	0	12	32	44	+
		1.0 sd					
		5.0 gr					
		1.0 Fgr					
		1.0 gr					
		3.0 sd					
		1.0 Fgr					
		3.0 gr					
52	1.0	1.0 Fgr	1	12	28	38	+
		1.0 FS					
		7.5 gr					
		5.5 FS					
		4.0 gr					
53	2.0	1.0 sd	0	13	31	41	+
		2.0 FS					
		1.0 sd					
		9.0 gr					
		1.0 FS					
		1.0 Fgr Si Cl					
		2.0 gr Si Cl					
		1.0 sd					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
54	4.0	7.5 FS	0	8	19	26	+
		2.5 gr					
		2.0 FS					
		4.0 gr					
55	2.0	9.0 gr	0	15	36	51	+
		1.0 sd					
		1.0 FS					
		5.5 gr					
		0.5 sd					
		1.0 gr					
56	3.5	2.5 FS	1	16	35	47	+
		10.0 gr					
		1.0 FS					
		3.0 gr					
57	1.0	2.0 gr Si Cl	0	13	40	53	Si Cl
		6.0 gr					
		1.0 gr Si Cl					
		3.0 gr					
		1.0 gr Si Cl					
58	0.5	0.5 gr	1	14	33	44	+
		5.0 FS					
		1.0 gr					
		1.5 FS					
		11.5 gr					
59	0.5	0.5 gr	0	15	35	47	+
		1.0 Fgr					
		2.5 gr					
		1.5 sd					
		2.0 FS					
		0.5 sd					
		10.5 gr					
		1.0 sd					
60	5.0	1.0 sd	0	16	32	42	+
		2.0 gr					
		1.0 gr Si Cl					
		4.0 FS					
		7.0 gr					

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PROSPECTED BY Volk/Nelson

INSPECTED & APPROVED Jeffrey Swank Oct-15

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-NHU-7-002(156)022	180	4

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
61	0.5	0.5 Fgr	2	18	38	51	+
		12.0 gr					
		1.0 Fgr					
		3.0 gr					
		2.0 sd Si Cl					
		1.0 gr					
62	1.5	1.5 gr Si Cl	1	17	39	54	Si Cl
		9.0 gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
A	0.5	1.5 gr Si Cl	1	24	46	57	Si Cl
		4.0 gr					
B	0.5	1.5 gr	0	14	36	50	+
		1.0 sd					
		1.0 FS					
		3.0 gr					
		3.0 Fgr					
		7.0 gr					
		3.0 gr Si Cl					
C	2.5	0.5 gr Si Cl	0	12	30	41	+
		2.0 sd					
		2.0 gr					
		2.5 Fgr					
		4.5 gr					
		2.0 sd					
		4.0 gr					
D	1.5	5.5 sd	0	11	24	34	+
		9.0 gr					
		2.0 Fgr					
		2.0 FS					
E	5.0	3.5 gr	2	23	40	52	+
		1.5 sd					
		1.0 gr					
		1.0 Si Cl					
		5.0 gr					
		3.0 gr Si Cl					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole

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