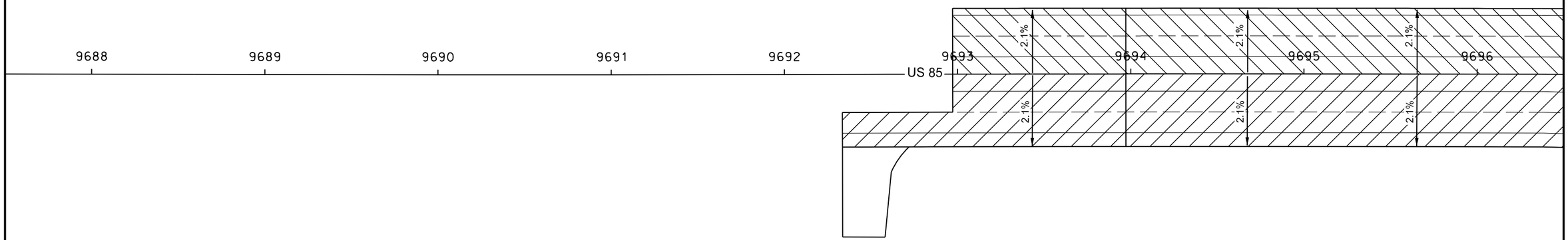
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	80	1



Legend

Normal Crown (2.1% or 3.0%)

Transition (Varies)

Superelevation (Varies)

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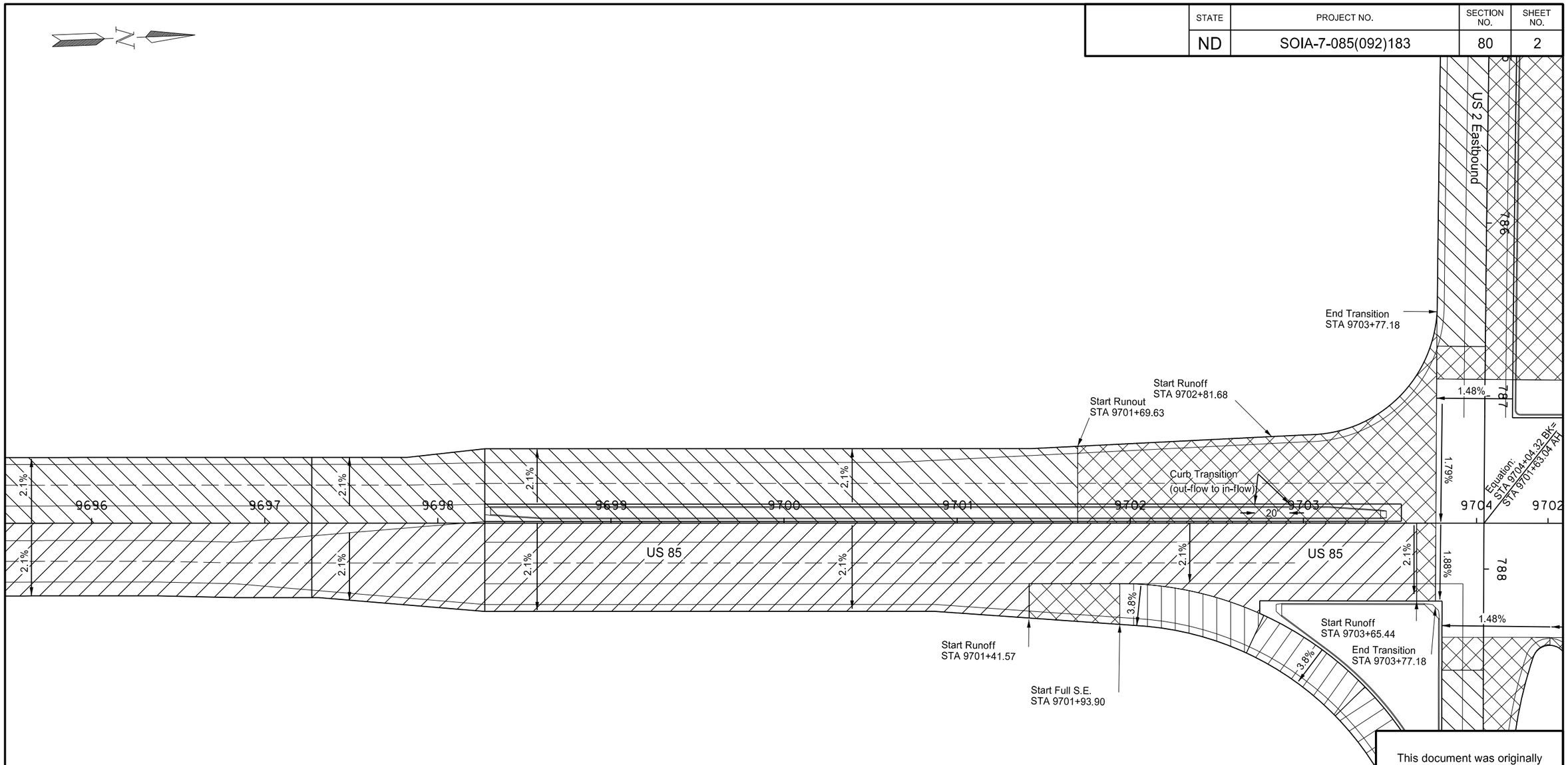
Superelevation and Transition Layout

US 85 Intersection Improvements

US 85
9688+00 to 9696+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	80	2



Legend

Normal Crown (2.1% or 3.0%)

Transition (Varies)

Superelevation (Varies)

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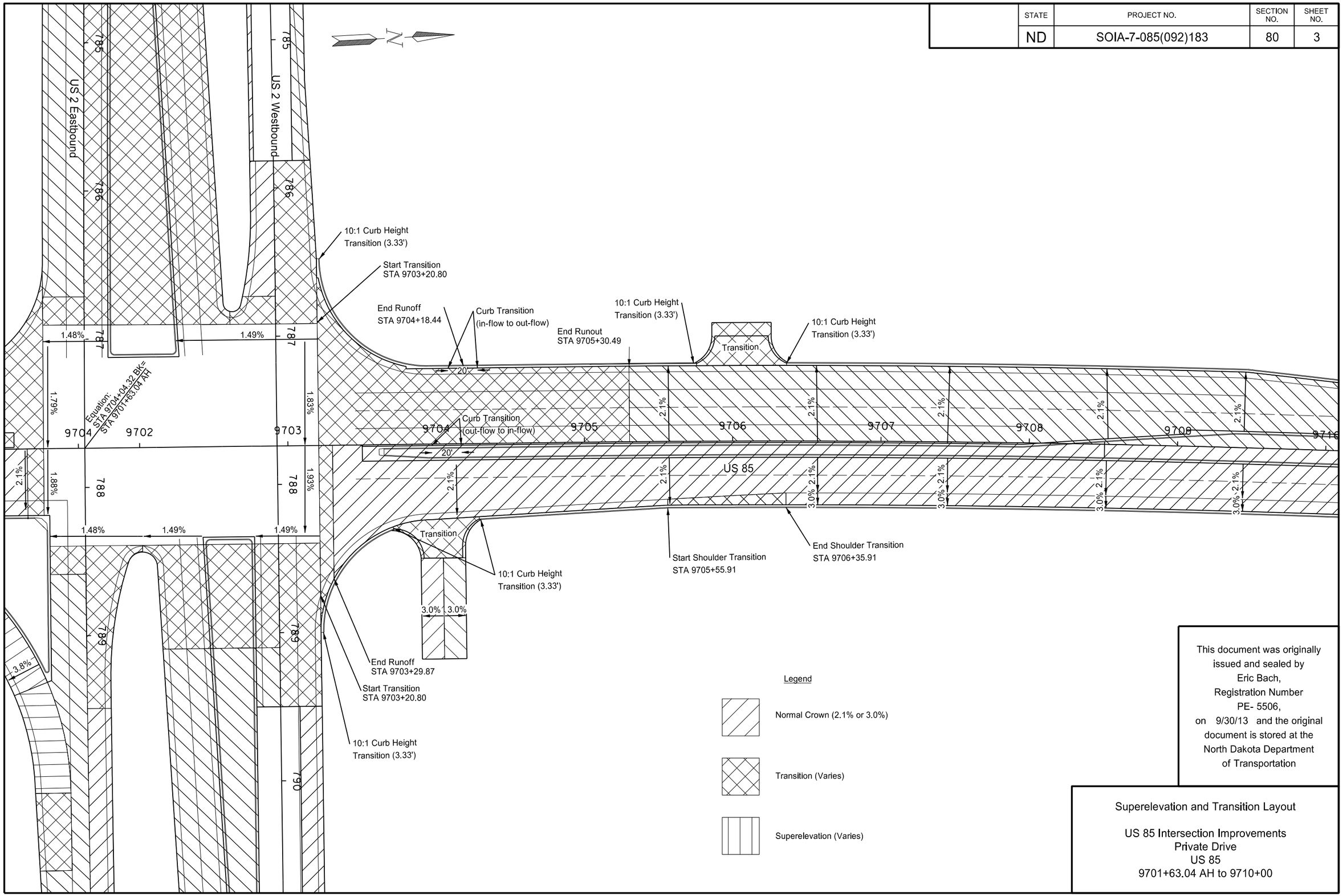
Superelevation and Transition Layout

US 85 Intersection Improvements

US 85
9696+00 to 9704+04.32 BK

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	80	3



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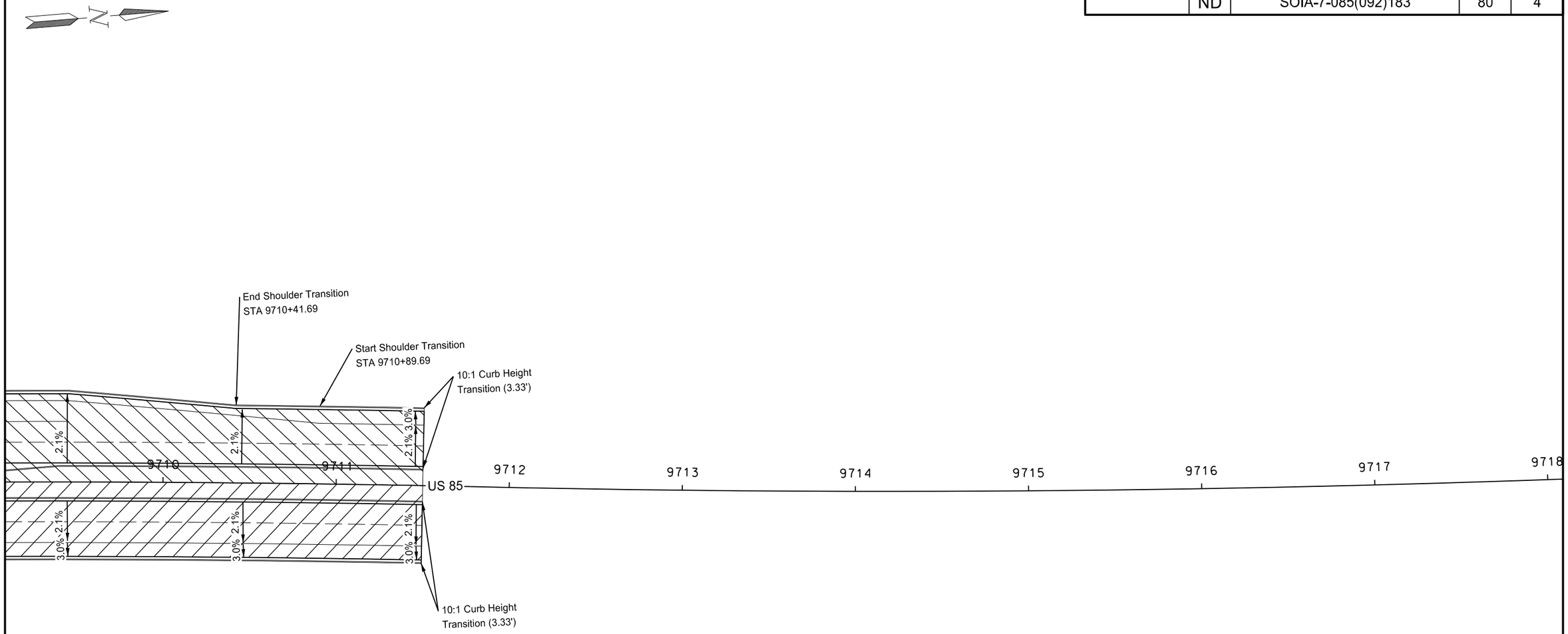
Superelevation and Transition Layout

US 85 Intersection Improvements
Private Drive
US 85
9701+63.04 AH to 9710+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	80	4



Legend

Normal Crown (2.1% or 3.0%)

Transition (Varies)

Superelevation (Varies)

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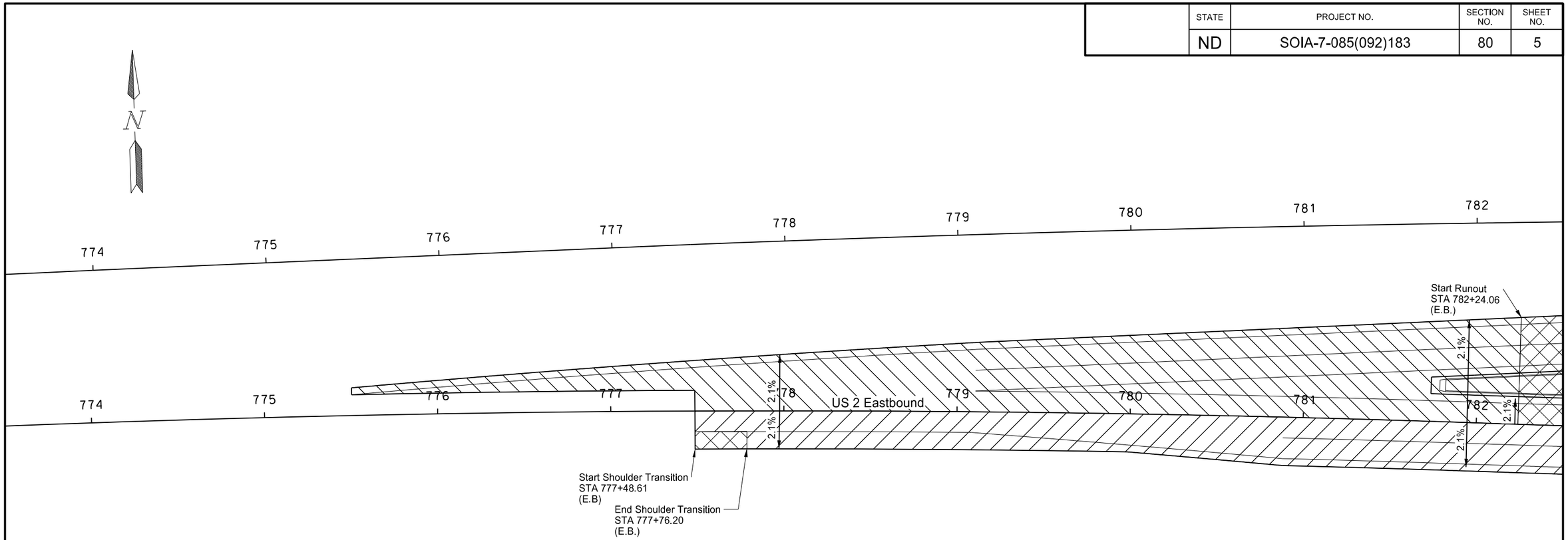
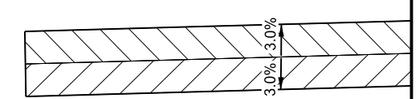
Superelevation and Transition Layout

US 85 Intersection Improvements

US 85
9710+00 to 9718+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	80	5





Legend

Normal Crown (2.1% or 3.0%)

Transition (Varies)

Superelevation (Varies)

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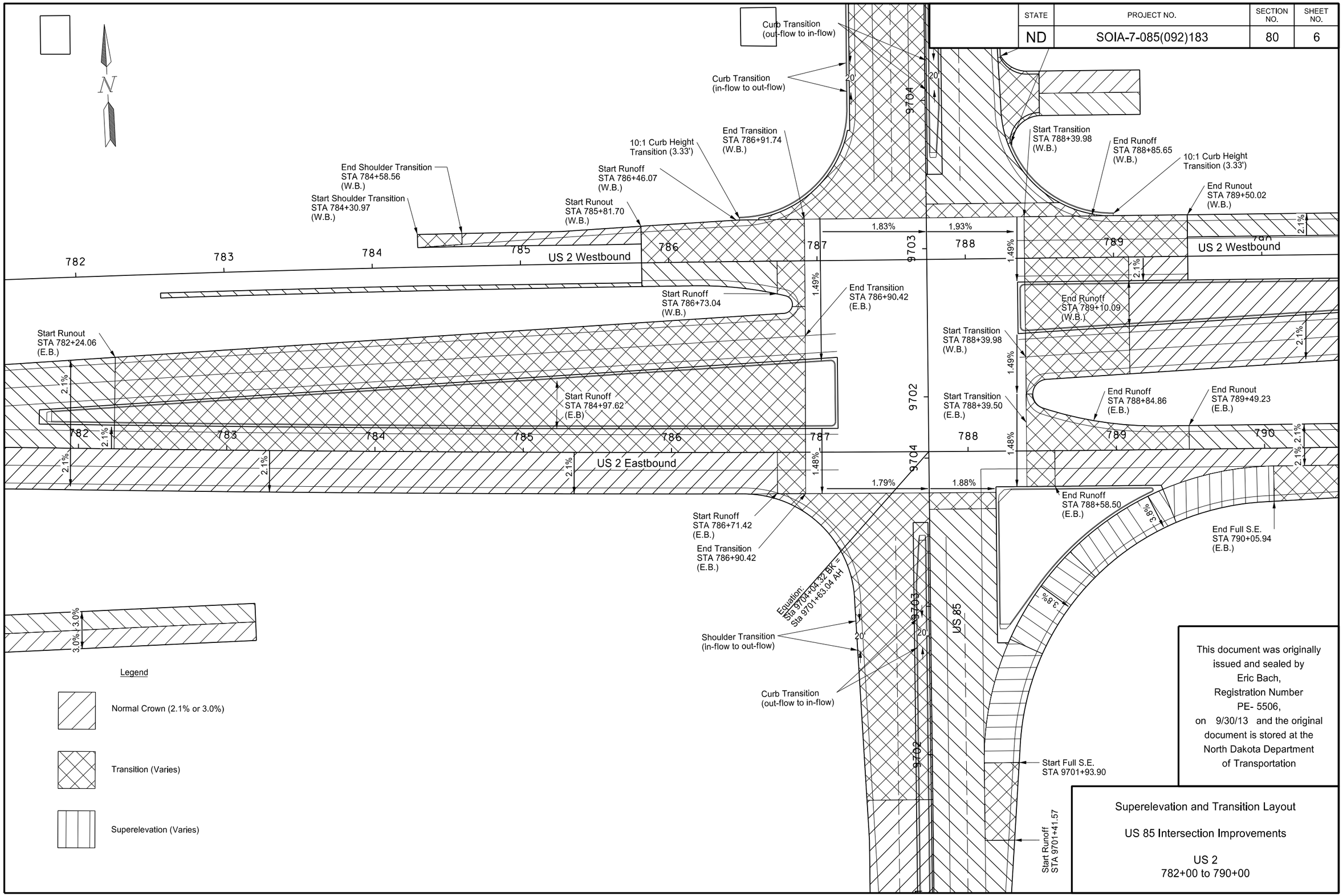
Superelevation and Transition Layout

US 85 Intersection Improvements

US 2
777+00 to 782+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	80	6



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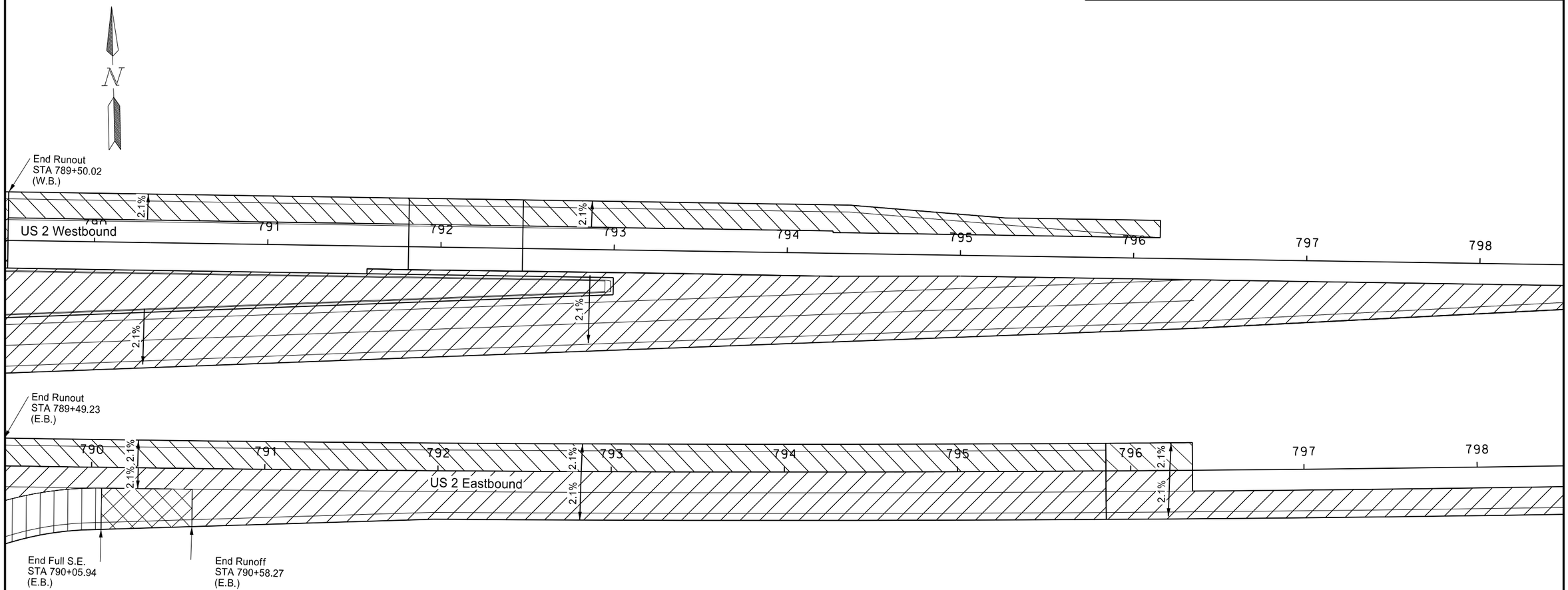
Superelevation and Transition Layout

US 85 Intersection Improvements

US 2
782+00 to 790+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	80	7



Legend

Normal Crown (2.1% or 3.0%)

Transition (Varies)

Superelevation (Varies)

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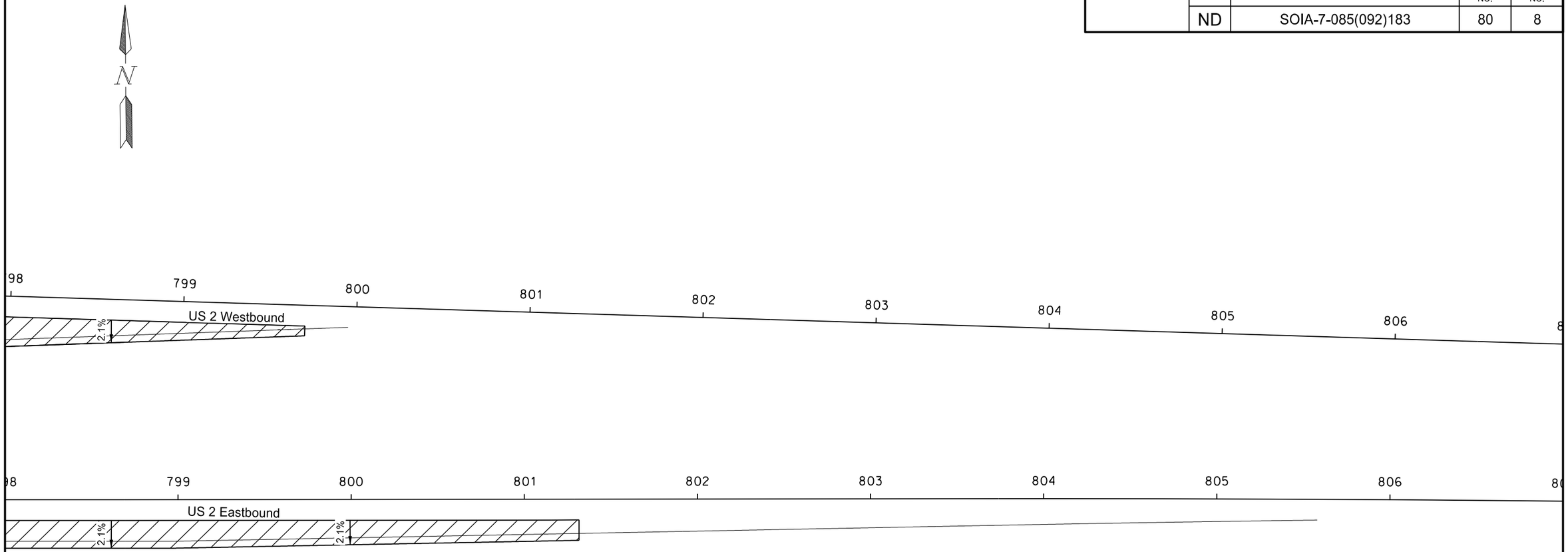
Superelevation and Transition Layout

US 85 Intersection Improvements

US 2
790+00 to 798+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	80	8



Legend

Normal Crown (2.1% or 3.0%)

Transition (Varies)

Superelevation (Varies)

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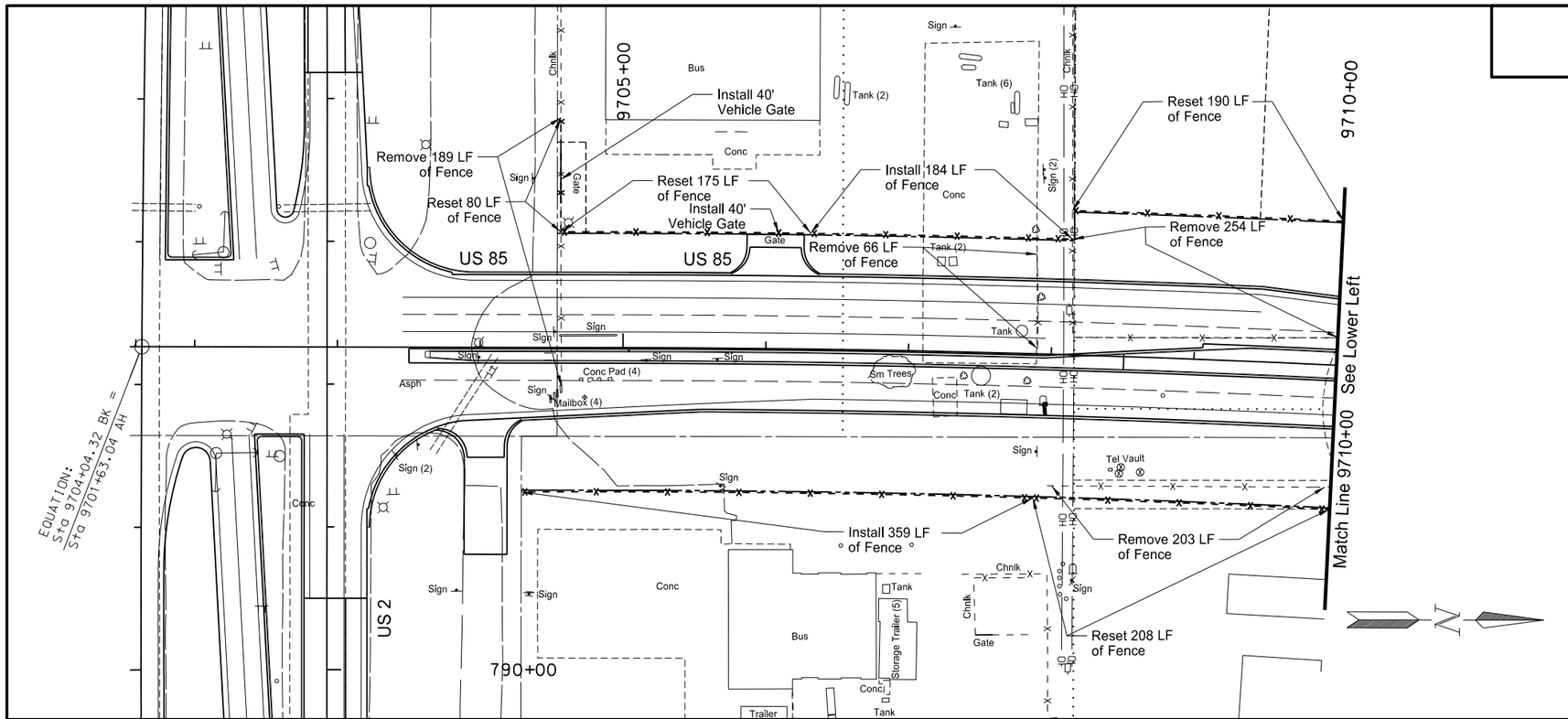
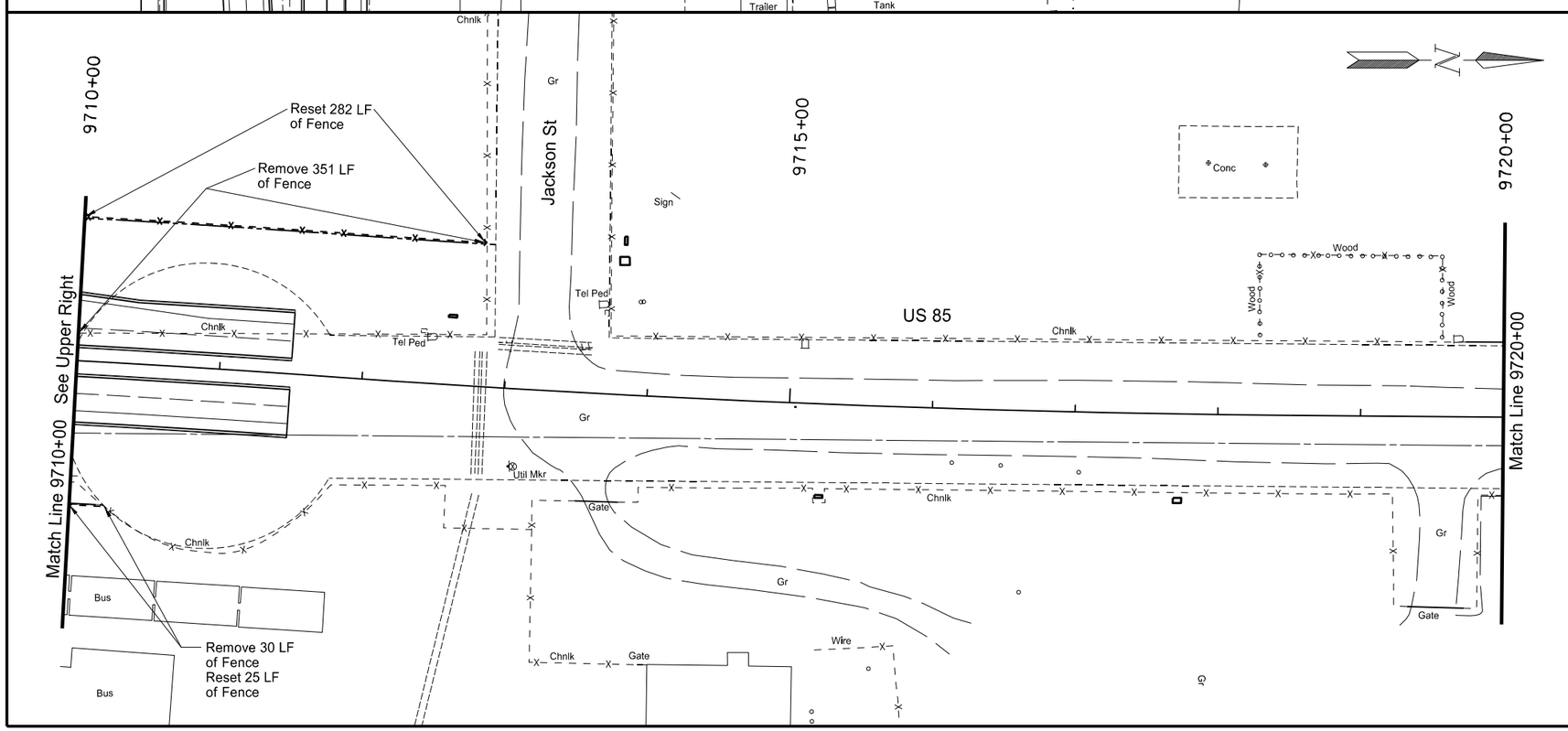
Superelevation and Transition Layout

US 85 Intersection Improvements

US 2
798+00 to 806+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	80	9





202	0312	Remove Existing Fence		
		9704+56 - 161' LT to 9704+57 - 27' RT	189	LF
		9707+88 - 70' LT to 9707+90 - 4' LT	66	LF
		9708+12 - 81' LT to 9712+82 - 101' LT	605	LF
		9707+96 - 92' RT to 9710+25 - 101' RT	233	LF
		Total =	1093	LF
752	0650	Fence Chain Link With Barbed Wire		
		9706+30 - 81' LT to 9708+13 - 81' LT	184	LF
		9704+29 - 101' RT to 9707+90 - 101' RT	359	LF
			543	LF
752	0930	Fence Reset Existing		
		9704+56 - 161' LT to 9704+56 - 81' LT	80	LF
		9704+56 - 81' LT to 9706+30 - 81' LT	175	LF
		9708+12 - 101' LT to 9712+82 - 101' LT	472	LF
		9707+90 - 101' RT to 9710+25 - 101' RT	233	LF
		Total =	960	LF
752	2100	Vehicle Gate		
		9704+56 - 121' LT	1	EA
		9706+06 - 81' LT	1	EA
752	3100	Corner Assembly Chain Link		
		9704+56 - 81' LT	1	EA
		9708+13 - 81' LT	1	EA
		9708+12 - 101' LT	1	EA
		9710+25 - 101' RT	1	EA
		9712+82 - 101' LT	1	EA
		Total =	5	EA
752	4160	Double Brace Assembly Chain Link		
		9704+29 - 101' RT	1	EA
		9704+56 - 161' LT	1	EA
			2	EA

Note: Stations & Offsets from US 85 Chain: PR85

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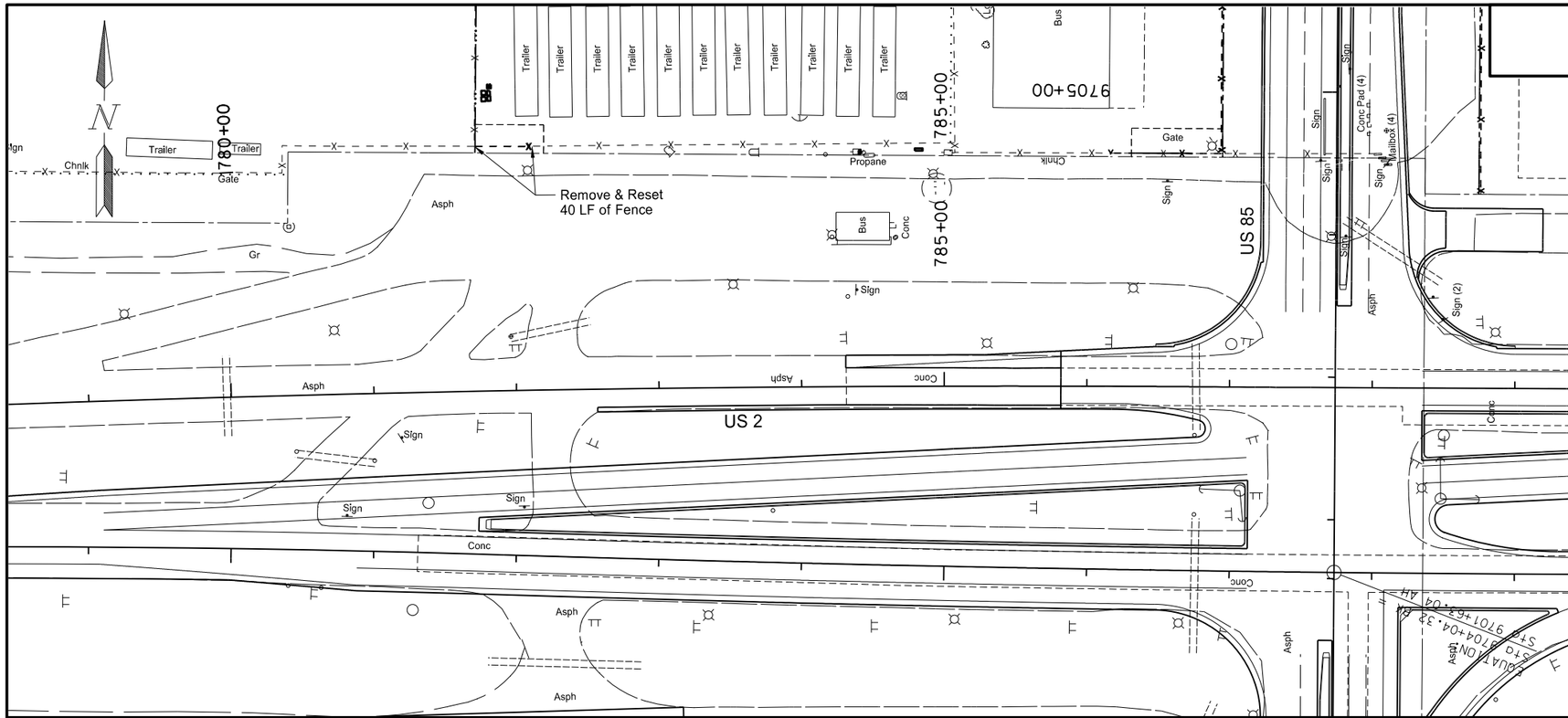
Fencing Details Layout

US 85 Intersection Improvements

US 85
9704+00 to 9710+00
9710+00 to 9720+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	80	10



202	0312	Remove Existing Fence		
		781+74 - 172' LT to 782+14 171' LT	40	LF
752	0930	Fence Reset Existing		
		781+74 - 172' LT to 782+14 171' LT	40	LF

Note: Stations & Offsets from US 2 WB Chain: PR2WB

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Fencing Details Layout

US 85 Intersection Improvements

US 2
779+00 to 789+00

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - US 85 Intersection Improvements

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	81	1

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
EX-US2			
PI	657+39.18	432,974.81	1,168,882.06
PI	710+18.44	432,750.70	1,174,156.56
PC	762+91.29	432,532.31	1,179,424.89
PI	768+99.72	432,507.11	1,180,032.79
PT	775+07.96	432,456.12	1,180,639.08
PC	776+91.90	432,440.71	1,180,822.37
PI	787+81.10	432,349.43	1,181,907.74
PT	798+69.26	432,340.83	1,182,996.91
PC	803+73.96	432,336.85	1,183,501.60
PI	808+34.97	432,333.21	1,183,962.60
PT	812+95.91	432,314.74	1,184,423.24
PI	814+77.00	432,307.48	1,184,604.19
EX-US2_EB			
PI	657+39.18	432,890.88	1,168,878.50
PI	710+18.48	432,666.77	1,174,153.04
PC	765+96.05	432,435.76	1,179,725.82
PI	768+96.12	432,423.33	1,180,025.63
PT	771+96.05	432,426.61	1,180,325.68
PC	773+04.62	432,427.80	1,180,434.25
PI	777+48.26	432,432.65	1,180,877.86
PT	781+91.46	432,403.19	1,181,320.52

CURVE DATA

ARC DEFINITION	
C4	C5
PI STA = 768+99.72	PI STA = 787+81.10
Delta = 2° 26' 00" (RT)	Delta = 4° 21' 17" (LT)
Degree = 0° 12' 00"	Degree = 0° 12' 00"
Tangent = 608.43'	Tangent = 1,089.21'
Length = 1,216.67'	Length = 2,177.36'
Radius = 28,647.90'	Radius = 28,647.90'
C6	
PI STA = 808+34.97	
Delta = 1° 50' 38" (RT)	
Degree = 0° 12' 00"	
Tangent = 461.01'	
Length = 921.94'	
Radius = 28,647.90'	
CT103	CT104
PI STA = 768+96.12	PI STA = 777+48.26
Delta = 3° 00' 00" (LT)	Delta = 4° 26' 03" (RT)
Degree = 0° 30' 00"	Degree = 0° 30' 00"
Tangent = 300.07'	Tangent = 443.64'
Length = 600.00'	Length = 886.84'
Radius = 11,459.16'	Radius = 11,459.16'

US PUBLIC LAND SURVEY DATA

DESC.	SEC	TWP	RGE	NORTHING	EASTING
SW Cor	Sec 31	T-154-N	R-101-W	421801.44	1178972.44
W¼ Cor	Sec 31	T-154-N	R-101-W	424442.12	1179084.71
C¼ Cor	Sec 31	T-154-N	R-101-W	424334.09	1181641.93
SW Cor	Sec 30	T-154-N	R-101-W	427082.66	1179197.09
S¼ Cor	Sec 30	T-154-N	R-101-W	426980.25	1181746.62
W¼ Cor	Sec 30	T-154-N	R-101-W	429723.59	1179308.75
E¼ Cor	Sec 30	T-154-N	R-101-W	429512.59	1184491.50
SW Cor	Sec 19	T-154-N	R-101-W	432362.33	1179421.68
S¼ Cor	Sec 19	T-154-N	R-101-W	432258.85	1181959.30
SE Cor	Sec 19	T-154-N	R-101-W	432149.47	1184597.58
W¼ Cor	Sec 19	T-154-N	R-101-W	435007.53	1179532.87
C¼ Cor	Sec 19	T-154-N	R-101-W	434899.66	1182068.86
E¼ Cor	Sec 19	T-154-N	R-101-W	434787.64	1184703.48
NW Cor	Sec 19	T-154-N	R-101-W	437651.70	1179644.04
N¼ Cor	Sec 19	T-154-N	R-101-W	437543.35	1182178.56
NE Cor	Sec 19	T-154-N	R-101-W	437430.61	1184818.81
N¼ Cor	Sec 36	T-154-N	R-102-W	427367.33	1176569.68
NE Cor	Sec 25	T-154-N	R-102-W	432532.19	1179427.79

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET
CONTROL POINT DESCRIPTION (Chain PR_85)					
GPS 3	451335.06	1169703.42	2252.48	9925+18	5180' LT
#6 Rebar					
GPS 4	469766.32	1202817.07	2019.41	10343+01	267' LT
#6 Rebar					
GPS 5	443186.12	1178827.44	2132.50	9817+09	985' LT
#6 Rebar					
GPS 6	431273.68	1181662.58	2050.14	9693+00	195' LT
#6 Rebar					
GPS 9	469170.63	1186092.74	2274.25	10171+47	63' RT
#6 Rebar					

Reference Markers (Chain US-EX2)

R Mkr #	Northing	Easting	Station	Offset
13	432730.58	1171764.69	686+30	122' RT
14	432666.98	1177048.62	739+11	36' LT
15	432304.75	1182355.80	792+29	48' RT

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

NOTES:

Date Survey Completed 4/23/13

☐ Assumed Coordinates

☒ All coordinates on this sheet are Williams County ground coordinates. They are derived from the "North Dakota Coordinate System of 1983", NAD83(CORS96), North Zone Combination factor (cf) = .9998445

INITIALIZING BENCH MARK

☒ NAVD-88
☐ NGVD-29

☒ ENGLISH UNITS
☐ METRIC UNITS

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PRELIMINARY SURVEY COORDINATE AND CURVE DATA - US 85 Intersection Improvements

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	81	2

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
EX-US2_WB			
PC	791+49.57	432,527.82	1,179,533.11
PI	796+49.68	432,507.11	1,180,032.79
PT	801+49.57	432,512.58	1,180,532.88
PC	804+95.68	432,516.36	1,180,878.96
PI	809+81.89	432,521.67	1,181,365.15
PT	814+67.90	432,502.24	1,181,850.98
EX_US85			
PI	9650+12.26	426,982.65	1,181,686.67
PI	9702+95.18	432,261.29	1,181,899.34
PI	9704+04.32	432,370.33	1,181,903.87

CURVE DATA

ARC DEFINITION	
CT201	CT202
PI STA = 796+49.68	PI STA = 809+81.89
Delta = 3° 00' 00" (LT)	Delta = 2° 55' 00" (RT)
Degree = 0° 18' 00"	Degree = 0° 18' 00"
Tangent = 500.11'	Tangent = 486.22'
Length = 1,000.00'	Length = 972.22'
Radius = 19,098.59'	Radius = 19,098.59'

US PUBLIC LAND SURVEY DATA

DESC.	SEC-TWP-RGE	NORTHING	EASTING

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET	CONTROL POINT DESCRIPTION

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

INITIALIZING BENCH MARK

- [x] NAVD-88
- [ ] NGVD-29

- [x] ENGLISH UNITS
- [ ] METRIC UNITS

- [ ] Assumed Coordinates
- [x] All coordinates on this sheet are Williams County ground coordinates. They are derived from the "North Dakota Coordinate System of 1983", NAD83(CORS96), North Zone Combination factor (cf) = .9998445

NOTES:

Date Survey Completed 4/23/13

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Iron R/W Pins/Concrete Monuments

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	81	3

720	0100	Monuments	
		Total = 5	EA
720	0110	Right of Way Markers	
		Total = 21	EA

Right of Way Markers and Iron Pins		
PR85		
Station	Offset	Description
9696+37.10	-197.8	PT
9696+37.10	95.2	PT
9699+93.30	95.2	R/W
9701+55.58	-197.8	R/W
9702+30.31	-272.41	R/W
9702+44.90	269.9	R/W
9704+28.94	100	R/W
9704+53.82	-80	R/W
9705+04.06	-80	PC
9705+04.06	100	PC
9708+13.96	-80	R/W
9708+13.41	-100	R/W
9710+24.16	100	R/W
9711+77.51	78.76	PRC
9711+77.51	-100	PRC
9711+81.79	70.97	R/W
9712+87.78	-100	R/W

PR2WB		
780+42.59	-120.97	R/W
780+44.23	-170.94	R/W

PR2EB		
781+91.46	-281.9	PRC
781+91.46	183.26	PRC
Total ROW	Markers =	21

Iron Pins	
PR85	
Centerline Locations	
Station	Description
9696+37.10	PT
9705+04.06	PC
9711+77.51	PRC

PR2WB	
787+17.94	PT

PR2EB	
781+91.46	PRC
Total Iron Pins =	26

	Concrete Monuments		
	PR85		
	Station	Offset	Description
*	9694+42.65	-0.28	PI
	9702+95.22	62.2	SEC. COR.
*	9708+40.78	-5.28	PI

	PR2EB		
	778+35.76	7.25	QTR. CROSSING
*	790+30.35	12.29	PI
	Total Concrete Monuments =		5

Note:

*Station and offsets given are perpendicular to alignment.

Iron pins will be set by the Engineer and are not a pay item.

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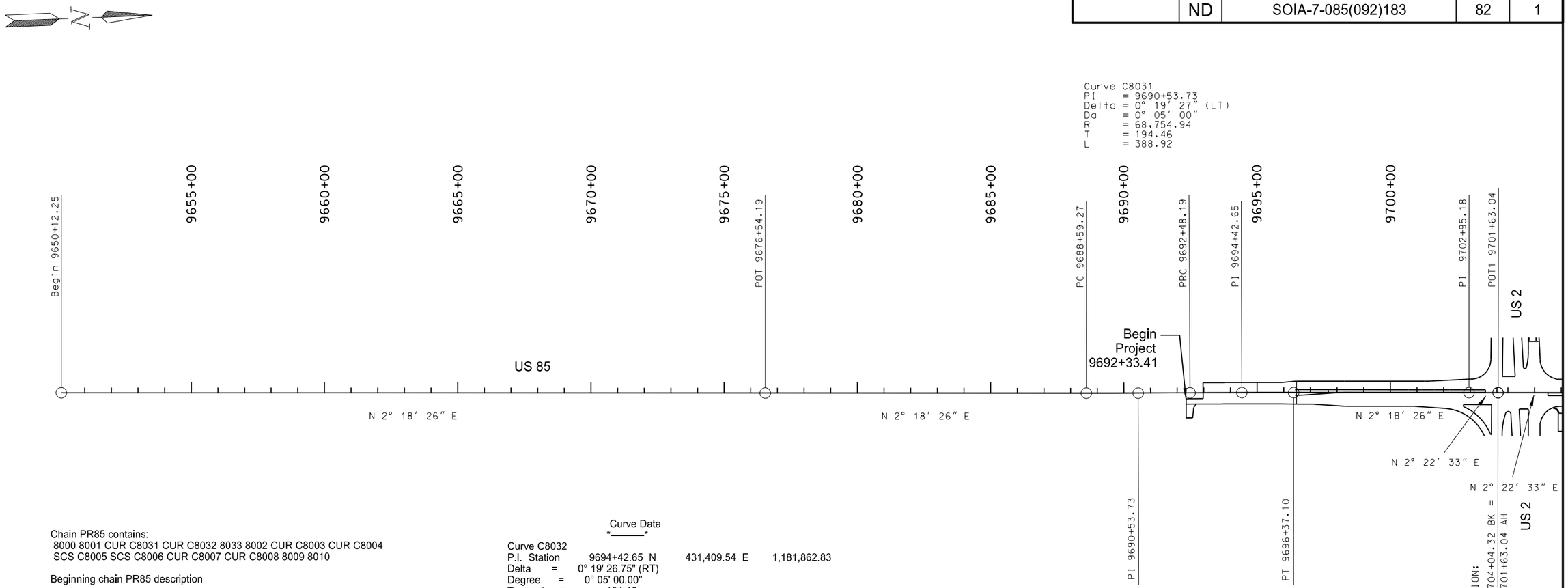
R/W Monuments

US 85 Intersection Improvements

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	82	1



Chain PR85 contains:
8000 8001 CUR C8031 CUR C8032 8033 8002 CUR C8003 CUR C8004
SCS C8005 SCS C8006 CUR C8007 CUR C8008 8009 8010

Beginning chain PR85 description
==========

Point 8000 N 426,982.65 E 1,181,686.67 Sta 9650+12.25

Course from 8000 to 8001 N 2° 18' 25.85" E Dist 2,641.94

Point 8001 N 429,622.45 E 1,181,793.03 Sta 9676+54.19

Course from 8001 to PC C8031 N 2° 18' 25.85" E Dist 1,205.08

Curve Data
———

Curve C8031
P.I. Station 9690+53.73 N 431,020.86 E 1,181,849.37
Delta = 0° 19' 26.75" (LT)
Degree = 0° 05' 00.00"
Tangent = 194.46
Length = 388.92
Radius = 68,754.94
External = 0.27
Long Chord = 388.92
Mid. Ord. = 0.27
P.C. Station 9688+59.27 N 430,826.56 E 1,181,841.54
P.T. Station 9692+48.19 N 431,215.20 E 1,181,856.10
C.C. N 433,594.42 E 1,113,142.34
Back = N 2° 18' 25.85" E
Ahead = N 1° 58' 59.10" E
Chord Bear = N 2° 08' 42.47" E

Curve Data
———

Curve C8032
P.I. Station 9694+42.65 N 431,409.54 E 1,181,862.83
Delta = 0° 19' 26.75" (RT)
Degree = 0° 05' 00.00"
Tangent = 194.46
Length = 388.92
Radius = 68,754.94
External = 0.27
Long Chord = 388.92
Mid. Ord. = 0.27
P.C. Station 9692+48.19 N 431,215.20 E 1,181,856.10
P.T. Station 9696+37.10 N 431,603.84 E 1,181,870.65
C.C. N 428,835.98 E 1,250,569.85
Back = N 1° 58' 59.10" E
Ahead = N 2° 18' 25.85" E
Chord Bear = N 2° 08' 42.47" E

Course from PT C8032 to 8033 N 2° 18' 25.85" E Dist 658.08

Point 8033 N 432,261.39 E 1,181,897.15 Sta 9702+95.18

Course from 8033 to 8002 N 2° 22' 33.19" E Dist 109.14

End Region 1
Equation: Sta 9704+04.32 (BK) = Sta 9701+63.04 (AH) ————
Begin Region 2

Point 8002 N 432,370.43 E 1,181,901.67 Sta 9701+63.04

Course from 8002 to PC C8003 N 2° 22' 33.19" E Dist 341.02

Continued on next page

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Survey Data Layout

US 85 Intersection Improvements

US 85
9650+12.25 to 9704+04.32 BK

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	82	2

Continued from previous page

Curve Data

Curve C8003
P.I. Station 9708+40.89 N 433,047.70 E 1,181,929.77
Delta = 3° 35' 30.26" (RT)
Degree = 0° 32' 00.00"
Tangent = 336.84
Length = 673.45
Radius = 10,742.96
External = 5.28
Long Chord = 673.34
Mid. Ord. = 5.28
P.C. Station 9705+04.06 N 432,711.16 E 1,181,915.81
P.T. Station 9711+77.51 N 433,382.71 E 1,181,964.79
C.C. N 432,265.81 E 1,192,649.53
Back = N 2° 22' 33.19" E
Ahead = N 5° 58' 03.44" E
Chord Bear = N 4° 10' 18.32" E

Curve Data

Curve C8004
P.I. Station 9715+14.33 N 433,717.72 E 1,181,999.81
Delta = 3° 35' 29.87" (LT)
Degree = 0° 32' 00.00"
Tangent = 336.83
Length = 673.43
Radius = 10,742.96
External = 5.28
Long Chord = 673.32
Mid. Ord. = 5.28
P.C. Station 9711+77.51 N 433,382.71 E 1,181,964.79
P.T. Station 9718+50.94 N 434,054.25 E 1,182,013.77
C.C. N 434,499.62 E 1,171,280.05
Back = N 5° 58' 03.44" E
Ahead = N 2° 22' 33.57" E
Chord Bear = N 4° 10' 18.51" E

Course from PT C8004 to TS C8005B N 2° 22' 33.57" E Dist 334.69

SCS C8005 found within chain PR85, contains:
SPI C8005B CUR C8005 SPI C8005A

PISCS C8005 N 435,312.45 E 1,182,065.98 STA 9731+10.22
Total Tangent = 924.59
Total Length = 1,763.54
Total Delta = 45° 24' 22.47" (LT)
Back Tangent = N 2° 22' 33.57" E
Ahead Tangent = N 43° 01' 48.89" W

Beginning SCS C8005 description

Spiral Back
Spiral C8005B Type 1 Spiral Element

Angle	3° 45' 00.00" (LT)	P	1.36	BK N	2° 22' 33.57" E
LS	250.00	K	124.98	AH N	1° 22' 26.43" W
R	1,909.86	LT	166.70	CB N	1° 07' 33.73" E
YS	5.45	ST	83.37	Defl	1° 14' 59.84"
XS	249.89	LC	249.95	Deg	3° 00' 00.00"

Spiral Coordinates

Point	North	East	Station
TS	434,388.66	1,182,027.65	9721+85.63
PI	434,555.22	1,182,034.56	9723+52.34
SC	434,638.56	1,182,032.56	9724+35.63
CC	434,592.77	1,180,123.25	

Circular Section

Curve Data

Curve C8005
P.I. Station 9730+91.50 N 435,294.24 E 1,182,016.83
Delta = 37° 54' 22.47" (LT)
Degree = 3° 00' 00.00"
Tangent = 655.87
Length = 1,263.54
Radius = 1,909.86
External = 109.48
Long Chord = 1,240.62
Mid. Ord. = 103.54
P.C. Station 9724+35.63 N 434,638.56 E 1,182,032.56
P.T. Station 9736+99.18 N 435,801.93 E 1,181,601.59
C.C. N 434,592.77 E 1,180,123.25
Back = N 1° 22' 26.43" W
Ahead = N 39° 16' 48.89" W
Chord Bear = N 20° 19' 37.66" W

Spiral Ahead
Spiral C8005A Type 2 Spiral Element

Angle	3° 45' 00.00" (LT)	P	1.36	BK N	39° 16' 48.89" W
LS	250.00	K	124.98	AH N	43° 01' 48.89" W
R	1,909.86	LT	166.70	CB N	41° 46' 49.06" W
YS	5.45	ST	83.37	Defl	1° 14' 59.84"
XS	249.89	LC	249.95	Deg	3° 00' 00.00"

Spiral Coordinates

Point	North	East	Station
CS	435,801.93	1,181,601.59	9736+99.18
PI	435,866.46	1,181,548.81	9737+82.54
ST	435,988.32	1,181,435.06	9739+49.18
CC	434,592.77	1,180,123.25	

Ending SCS C8005 description

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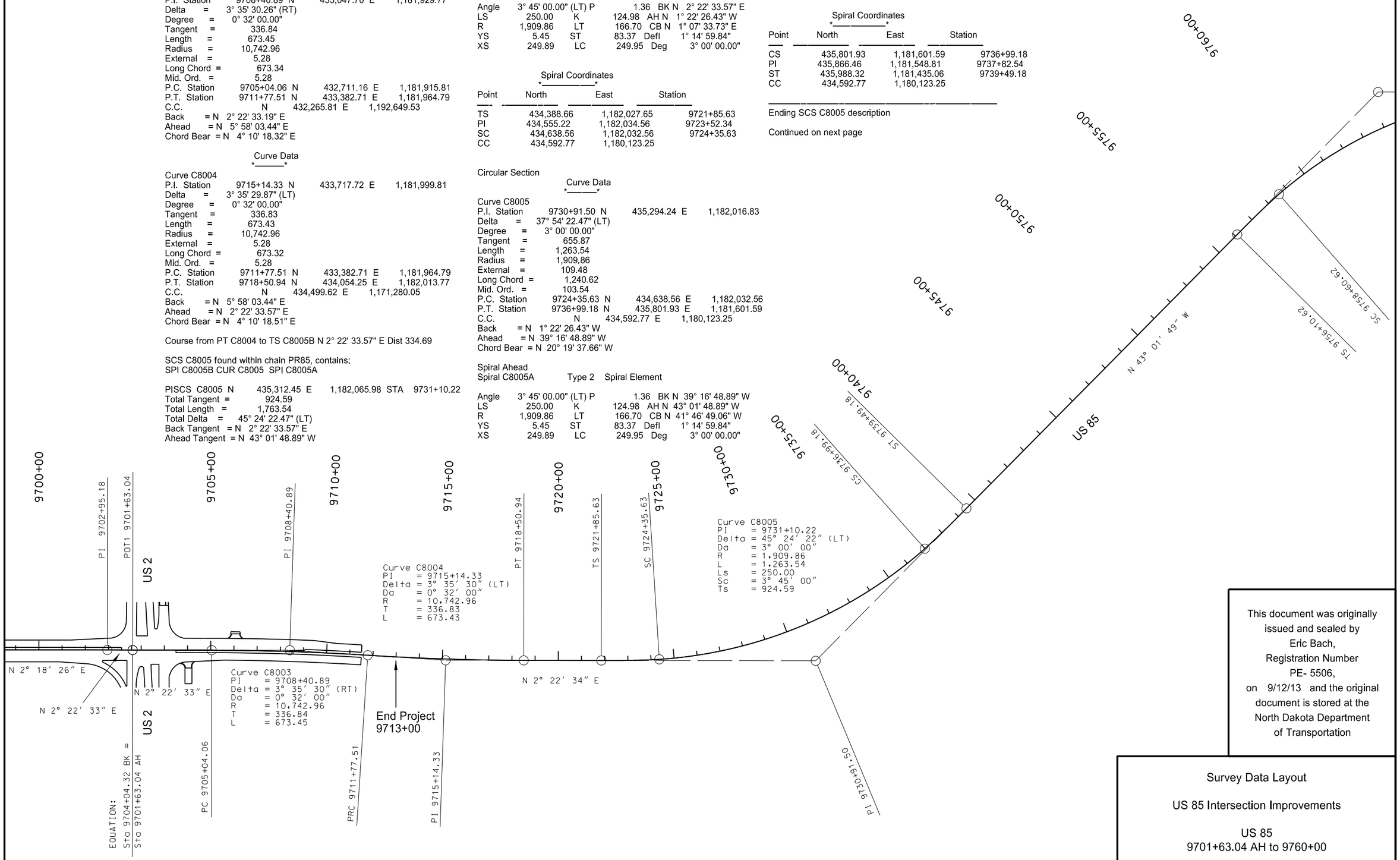

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Survey Data Layout

US 85 Intersection Improvements

US 85
9701+63.04 AH to 9760+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	82	3

N

Chain PR2WB contains:
CUR PR2WB-1 CUR PR2WB-2 8601

Beginning chain PR2WB description
==========

Curve Data
———-

Curve PR2WB-1
P.I. Station 768+45.55 N 432,508.37 E 1,179,978.63
Delta = 3° 19' 28.68" (LT)
Degree = 0° 18' 00.00"
Tangent = 554.26
Length = 1,108.21
Radius = 19,098.59
External = 8.04
Long Chord = 1,108.06
Mid. Ord. = 8.04
P.C. Station 762+91.29 N 432,532.31 E 1,179,424.89
P.T. Station 773+99.50 N 432,516.58 E 1,180,532.83
C.C. N 451,613.07 E 1,180,249.93
Back = S 87° 31' 26.82" E
Ahead = N 89° 09' 04.50" E
Chord Bear = S 89° 11' 11.16" E

Course from PT PR2WB-1 to PC PR2WB-2 N 89° 22' 25.40" E Dist 346.11

Curve Data
———-

Curve PR2WB-2
P.I. Station 782+31.88 N 432,523.68 E 1,181,365.18
Delta = 2° 55' 01.19" (RT)
Degree = 0° 18' 00.00"
Tangent = 486.27
Length = 972.33
Radius = 19,098.59
External = 6.19
Long Chord = 972.23
Mid. Ord. = 6.19
P.C. Station 777+45.61 N 432,520.36 E 1,180,878.92
P.T. Station 787+17.94 N 432,502.24 E 1,181,850.98
C.C. N 413,422.21 E 1,181,009.18
Back = N 89° 36' 33.16" E
Ahead = S 87° 28' 25.65" E
Chord Bear = S 88° 55' 56.24" E

Continued on next page

Chain PR2EB contains:
8620 CUR PR2EB-1 CUR PR2EB-2 CUR PR2EB-3 CUR PR2EB-4 8621

Beginning chain PR2EB description
==========

Point 8620 N 432,448.26 E 1,179,424.24 Sta 762+94.21

Course from 8620 to PC PR2EB-1 S 87° 37' 34.60" E Dist 301.84

Curve Data
———-

Curve PR2EB-1
P.I. Station 768+96.12 N 432,423.33 E 1,180,025.63
Delta = 3° 00' 00.00" (LT)
Degree = 0° 30' 00.00"
Tangent = 300.07
Length = 600.00
Radius = 11,459.16
External = 3.93
Long Chord = 599.93
Mid. Ord. = 3.93
P.C. Station 765+96.05 N 432,435.76 E 1,179,725.82
P.T. Station 771+96.05 N 432,426.61 E 1,180,325.68
C.C. N 443,885.09 E 1,180,200.43
Back = S 87° 37' 34.60" E
Ahead = N 89° 22' 25.40" E
Chord Bear = S 89° 07' 34.60" E

Course from PT PR2EB-1 to PC PR2EB-2 N 89° 22' 25.40" E Dist 108.57

Curve Data
———-

Curve PR2EB-2
P.I. Station 777+48.26 N 432,432.65 E 1,180,877.86
Delta = 4° 26' 03.08" (RT)
Degree = 0° 30' 00.00"
Tangent = 443.64
Length = 886.84
Radius = 11,459.16
External = 8.58
Long Chord = 886.62
Mid. Ord. = 8.58
P.C. Station 773+04.62 N 432,427.80 E 1,180,434.25
P.T. Station 781+91.46 N 432,403.19 E 1,181,320.52
C.C. N 420,969.33 E 1,180,559.50
Back = N 89° 22' 25.40" E
Ahead = S 86° 11' 31.51" E
Chord Bear = S 88° 24' 33.05" E

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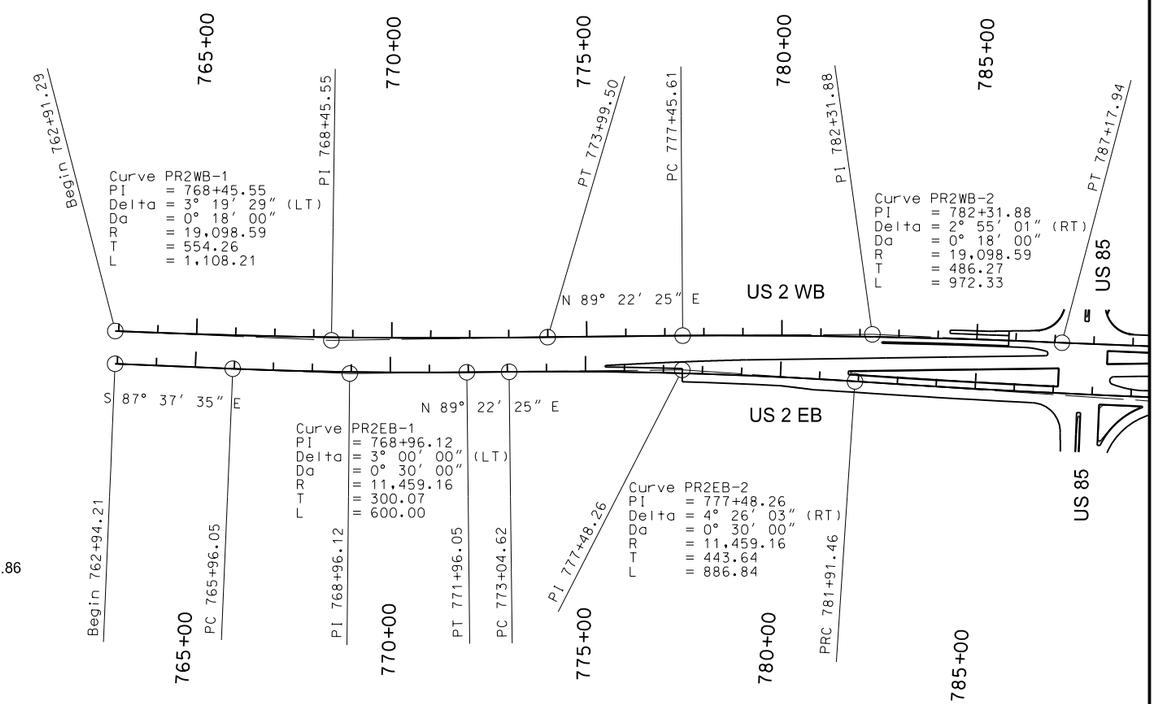

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Survey Data Layout

US 85 Intersection Improvements
US 2 EB
762+94.21 to 785+00
US 2 WB
762+91.29 to 785+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	82	4

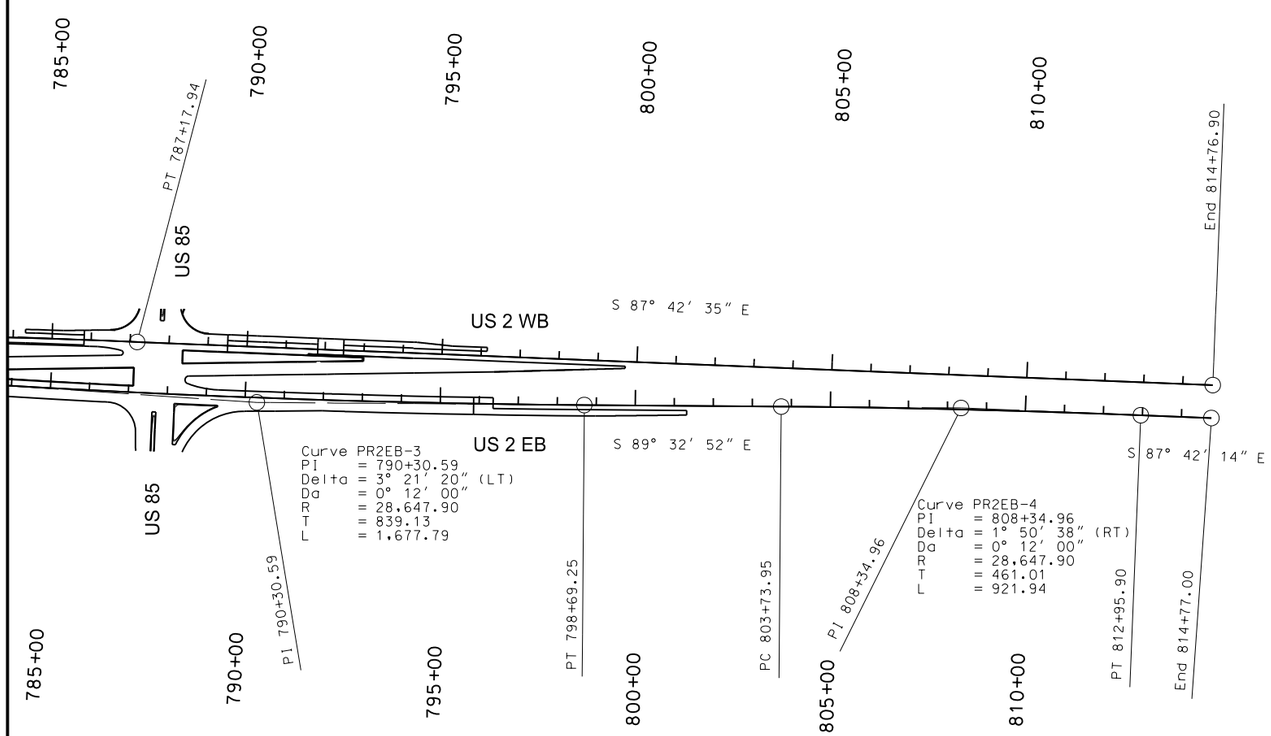
PR2WB Continued from previous page

Course from PT PR2WB-2 to 8601 S 87° 42' 34.60" E Dist 2,758.96

Point 8601 N 432,391.98 E 1,184,607.73 Sta 814+76.90

==========

Ending chain PR2WB description



PR2EB Continued from previous page

Curve Data

Curve PR2EB-3

P.I. Station	790+30.59 N	432,347.46 E	1,182,157.81
Delta =	3° 21' 20.08" (LT)		
Degree =	0° 12' 00.00"		
Tangent =	839.13		
Length =	1,677.79		
Radius =	28,647.90		
External =	12.29		
Long Chord =	1,677.55		
Mid. Ord. =	12.28		
P.C. Station	781+91.46 N	432,403.19 E	1,181,320.52
P.T. Station	798+69.25 N	432,340.83 E	1,182,996.91
C.C.	N	460,987.84 E	1,183,223.08

Back = S 86° 11' 31.51" E

Ahead = S 89° 32' 51.60" E

Chord Bear = S 87° 52' 11.55" E

Course from PT PR2EB-3 to PC PR2EB-4 S 89° 32' 51.60" E Dist 504.70

Curve Data

Curve PR2EB-4

P.I. Station	808+34.96 N	432,333.21 E	1,183,962.60
Delta =	1° 50' 38.00" (RT)		
Degree =	0° 12' 00.00"		
Tangent =	461.01		
Length =	921.94		
Radius =	28,647.90		
External =	3.71		
Long Chord =	921.90		
Mid. Ord. =	3.71		
P.C. Station	803+73.95 N	432,336.85 E	1,183,501.60
P.T. Station	812+95.90 N	432,314.74 E	1,184,423.24
C.C.	N	403,689.84 E	1,183,275.44

Back = S 89° 32' 51.60" E

Ahead = S 87° 42' 13.60" E

Chord Bear = S 88° 37' 32.60" E

Course from PT PR2EB-4 to 8621 S 87° 42' 13.60" E Dist 181.10

Point 8621 N 432,307.48 E 1,184,604.19 Sta 814+77.00

==========

Ending chain PR2EB description

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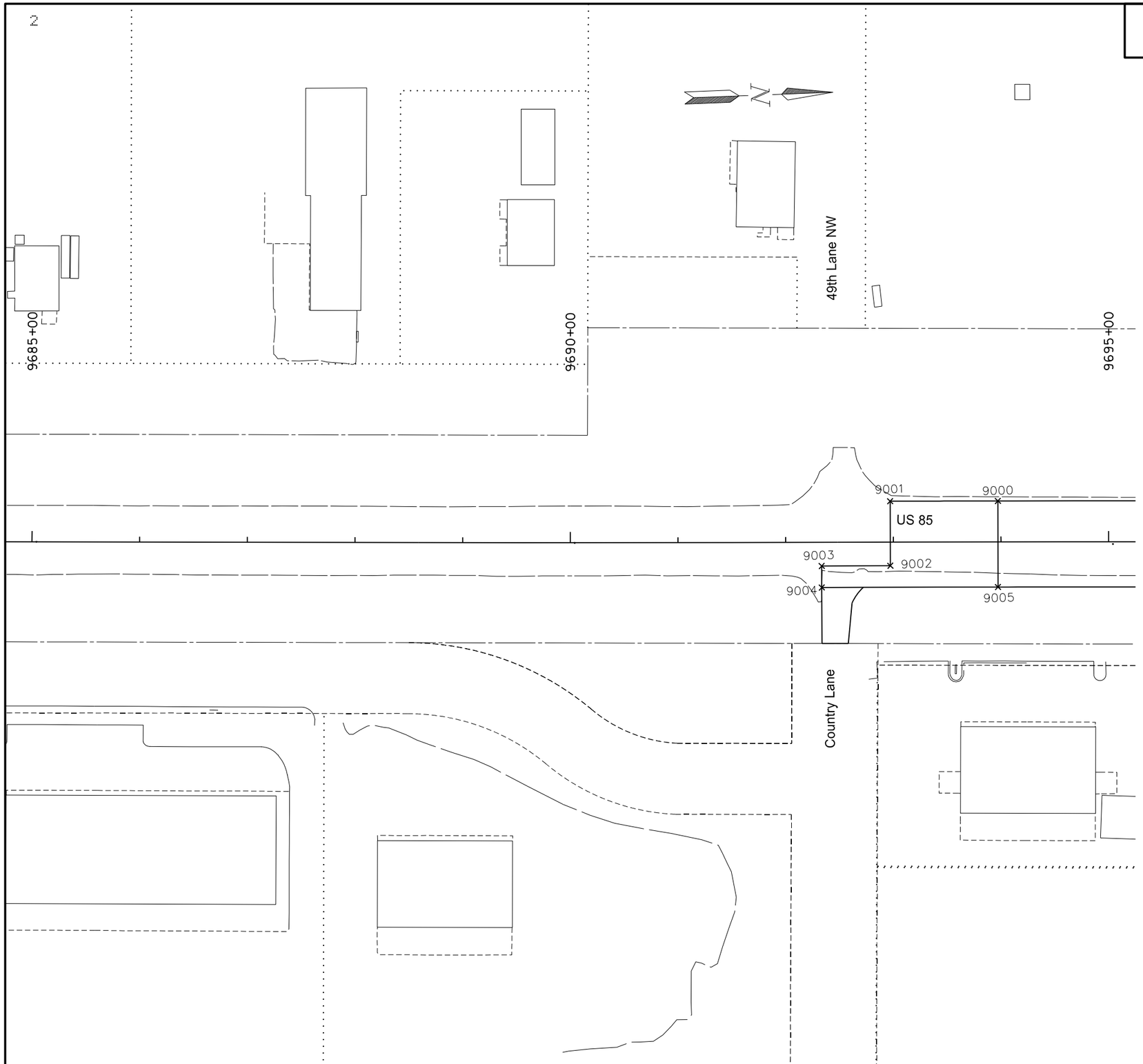
Survey Data Layout

US 85 Intersection Improvements
US 2 EB
785+00 to 814+77.00
US 2 WB
785+00 to 814+76.90

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	82	5



Alignment: PR85					
Point	North	East	Station	Offset	Region
9000	431365.50	1181823.44	9693+97.18	-38.00	1
9001	431265.51	1181819.83	9692+97.18	-38.00	1
9002	431263.39	1181879.80	9692+97.18	22.00	1
9003	431199.67	1181877.57	9692+33.41	22.00	1
9004	431198.97	1181897.56	9692+33.41	42.00	1
9005	431362.55	1181903.39	9693+97.18	42.00	1

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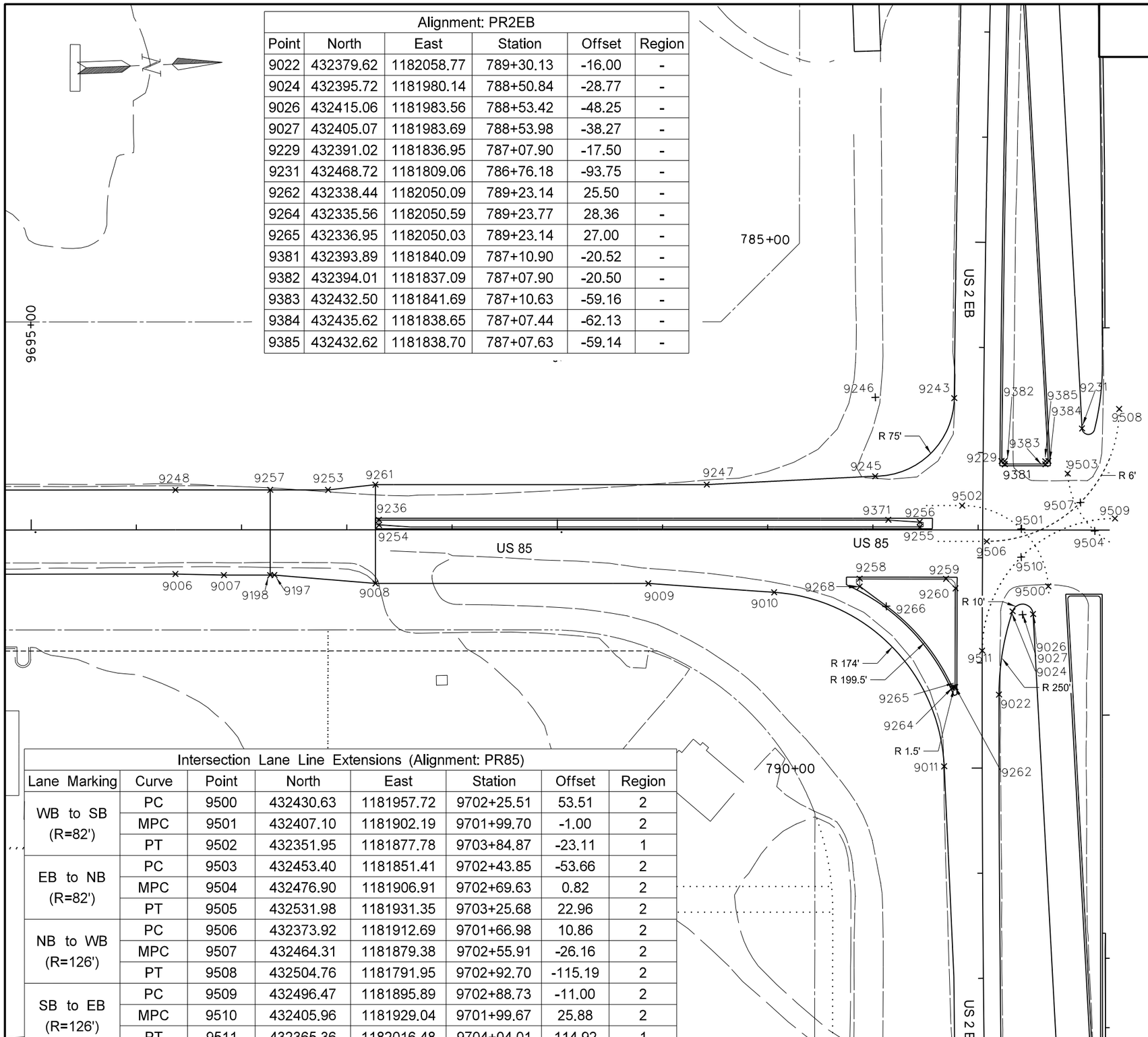
Survey Data Points

US 85 Intersection Improvements

US 85
9685+00 to 9695+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	82	6



Alignment: PR2EB					
Point	North	East	Station	Offset	Region
9022	432379.62	1182058.77	789+30.13	-16.00	-
9024	432395.72	1181980.14	788+50.84	-28.77	-
9026	432415.06	1181983.56	788+53.42	-48.25	-
9027	432405.07	1181983.69	788+53.98	-38.27	-
9229	432391.02	1181836.95	787+07.90	-17.50	-
9231	432468.72	1181809.06	786+76.18	-93.75	-
9262	432338.44	1182050.09	789+23.14	25.50	-
9264	432335.56	1182050.59	789+23.77	28.36	-
9265	432336.95	1182050.03	789+23.14	27.00	-
9381	432393.89	1181840.09	787+10.90	-20.52	-
9382	432394.01	1181837.09	787+07.90	-20.50	-
9383	432432.50	1181841.69	787+10.63	-59.16	-
9384	432435.62	1181838.65	787+07.44	-62.13	-
9385	432432.62	1181838.70	787+07.63	-59.14	-

Alignment: PR85					
Point	North	East	Station	Offset	Region
9006	431602.15	1181912.62	9696+37.10	42.0000	1
9007	431648.15	1181915.47	9696+83.18	43.0000	1
9008	431791.71	1181929.27	9698+27.18	51.0000	1
9009	432050.90	1181939.71	9700+86.57	51.0000	1
9010	432170.02	1181952.95	9702+06.14	59.4300	1
9011	432324.80	1182124.83	9703+67.98	224.8500	1
9197	431696.11	1181917.41	9697+31.18	43.0000	1
9198	431692.12	1181917.25	9697+27.18	43.0000	1
9236	431797.48	1181868.95	9698+30.51	-9.5000	1
9243	432348.51	1181775.33	9703+77.18	-125.3200	1
9245	432270.50	1181846.48	9703+02.18	-51.0000	1
9246	432273.61	1181771.55	9703+02.18	-126.0000	1
9247	432110.17	1181848.02	9701+42.11	-43.0000	1
9248	431605.37	1181832.69	9696+37.10	-38.0000	1
9253	431750.33	1181838.53	9697+82.18	-38.0000	1
9254	431797.28	1181873.94	9698+30.51	-4.5000	1
9255	432310.85	1181896.64	9703+44.58	-2.5600	1
9256	432311.05	1181891.64	9703+44.58	-7.5600	1
9257	431695.38	1181836.31	9697+27.18	-38.0000	1
9258	432251.81	1181943.29	9702+87.46	46.4900	1
9259	432333.77	1181946.69	9703+69.55	46.5000	1
9260	432342.44	1181956.15	9703+78.61	55.59	1
9261	431795.50	1181835.34	9698+27.18	-43.00	1
9266	432275.98	1181970.54	9703+12.80	72.72	1
9268	432251.49	1181950.81	9702+87.45	54.02	1
9371	432281.24	1181888.44	9703+14.66	-9.52	1

Intersection Lane Line Extensions (Alignment: PR85)							
Lane Marking	Curve	Point	North	East	Station	Offset	Region
WB to SB (R=82')	PC	9500	432430.63	1181957.72	9702+25.51	53.51	2
	MPC	9501	432407.10	1181902.19	9701+99.70	-1.00	2
	PT	9502	432351.95	1181877.78	9703+84.87	-23.11	1
EB to NB (R=82')	PC	9503	432453.40	1181851.41	9702+43.85	-53.66	2
	MPC	9504	432476.90	1181906.91	9702+69.63	0.82	2
	PT	9505	432531.98	1181931.35	9703+25.68	22.96	2
NB to WB (R=126')	PC	9506	432373.92	1181912.69	9701+66.98	10.86	2
	MPC	9507	432464.31	1181879.38	9702+55.91	-26.16	2
	PT	9508	432504.76	1181791.95	9702+92.70	-115.19	2
SB to EB (R=126')	PC	9509	432496.47	1181895.89	9702+88.73	-11.00	2
	MPC	9510	432405.96	1181929.04	9701+99.67	25.88	2
	PT	9511	432365.36	1182016.48	9704+04.01	114.92	1

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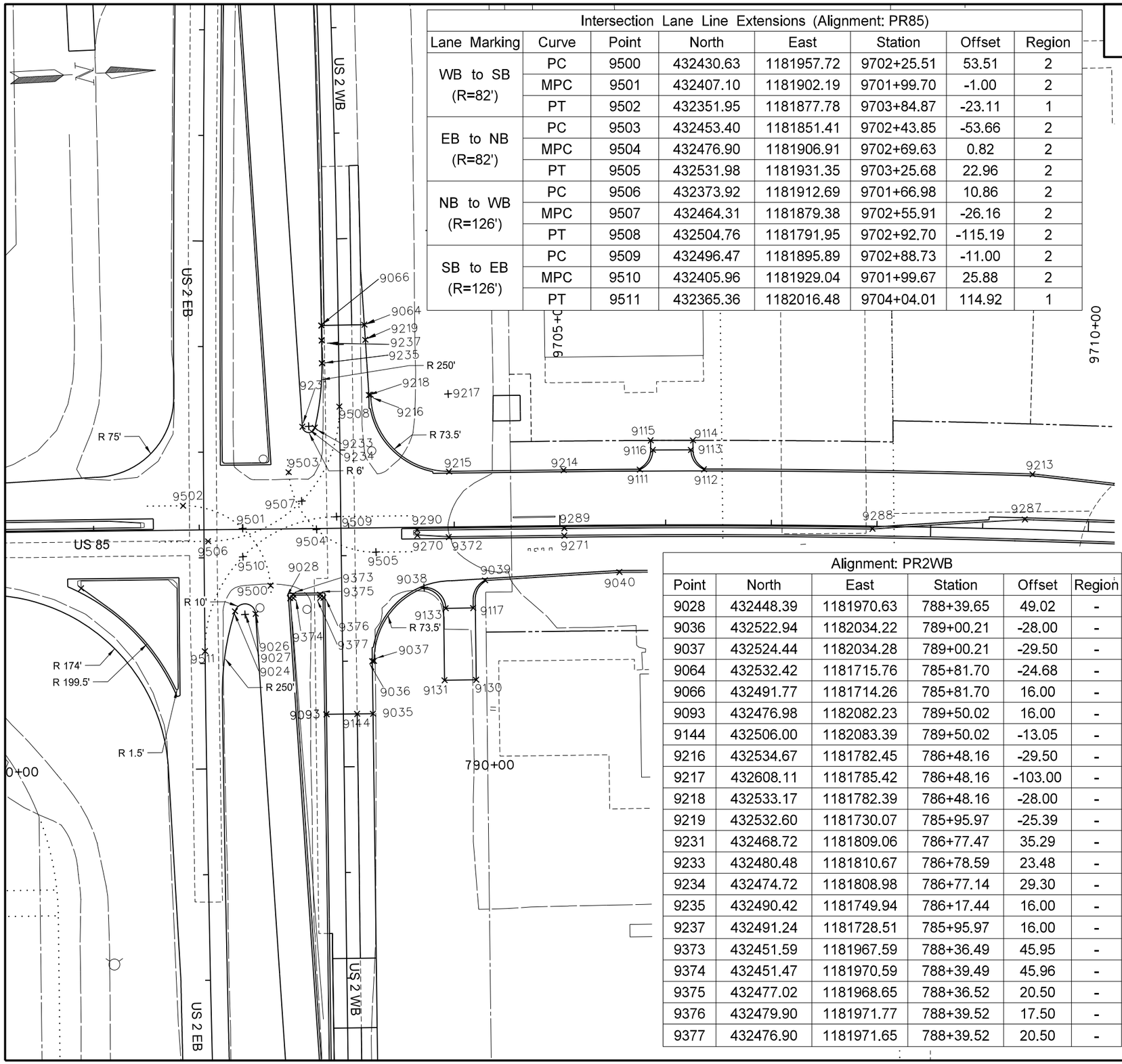
Survey Data Points

US 85 Intersection Improvements

US 85
9695+00 to 9704+04.32 BK
785+00 to 814+76.90

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	82	7



Intersection Lane Line Extensions (Alignment: PR85)							
Lane Marking	Curve	Point	North	East	Station	Offset	Region
WB to SB (R=82')	PC	9500	432430.63	1181957.72	9702+25.51	53.51	2
	MPC	9501	432407.10	1181902.19	9701+99.70	-1.00	2
	PT	9502	432351.95	1181877.78	9703+84.87	-23.11	1
EB to NB (R=82')	PC	9503	432453.40	1181851.41	9702+43.85	-53.66	2
	MPC	9504	432476.90	1181906.91	9702+69.63	0.82	2
	PT	9505	432531.98	1181931.35	9703+25.68	22.96	2
NB to WB (R=126')	PC	9506	432373.92	1181912.69	9701+66.98	10.86	2
	MPC	9507	432464.31	1181879.38	9702+55.91	-26.16	2
	PT	9508	432504.76	1181791.95	9702+92.70	-115.19	2
SB to EB (R=126')	PC	9509	432496.47	1181895.89	9702+88.73	-11.00	2
	MPC	9510	432405.96	1181929.04	9701+99.67	25.88	2
	PT	9511	432365.36	1182016.48	9704+04.01	114.92	1

Alignment: PR85					
Point	North	East	Station	Offset	Region
9038	432575.53	1181967.20	9703+70.68	56.97	2
9039	432633.59	1181963.50	9704+28.53	50.87	2
9040	432760.90	1181962.54	9705+55.91	44.50	2
9111	432785.44	1181866.59	9705+75.89	-52.50	2
9112	432846.05	1181869.68	9706+36.28	-52.50	2
9113	432834.66	1181850.60	9706+23.96	-70.95	2
9114	432837.12	1181841.66	9706+25.94	-80.00	2
9115	432797.18	1181839.63	9705+86.23	-80.00	2
9116	432798.71	1181848.77	9705+88.20	-70.94	2
9117	432620.98	1181989.10	9704+17.00	76.96	2
9130	432620.16	1182057.16	9704+19.00	145.00	2
9131	432590.19	1182055.91	9703+89.00	145.00	2
9133	432595.01	1181988.02	9703+91.00	76.96	2
9213	433156.24	1181890.86	9709+45.69	-52.50	2
9214	432713.33	1181863.35	9705+04.06	-52.50	2
9215	432605.06	1181858.86	9703+95.69	-52.50	2
9270	432571.72	1181917.53	9703+64.81	7.51	2
9271	432710.76	1181925.30	9705+04.06	9.50	2
9287	433146.71	1181933.22	9709+39.69	-9.50	2
9288	433002.17	1181934.35	9707+95.69	2.50	2
9289	432711.05	1181918.31	9705+04.06	2.50	2
9290	432571.93	1181912.53	9703+64.81	2.50	2
9372	432601.53	1181920.77	9703+94.73	9.50	2

Alignment: PR2WB					
Point	North	East	Station	Offset	Region
9028	432448.39	1181970.63	788+39.65	49.02	-
9036	432522.94	1182034.22	789+00.21	-28.00	-
9037	432524.44	1182034.28	789+00.21	-29.50	-
9064	432532.42	1181715.76	785+81.70	-24.68	-
9066	432491.77	1181714.26	785+81.70	16.00	-
9093	432476.98	1182082.23	789+50.02	16.00	-
9144	432506.00	1182083.39	789+50.02	-13.05	-
9216	432534.67	1181782.45	786+48.16	-29.50	-
9217	432608.11	1181785.42	786+48.16	-103.00	-
9218	432533.17	1181782.39	786+48.16	-28.00	-
9219	432532.60	1181730.07	785+95.97	-25.39	-
9231	432468.72	1181809.06	786+77.47	35.29	-
9233	432480.48	1181810.67	786+78.59	23.48	-
9234	432474.72	1181808.98	786+77.14	29.30	-
9235	432490.42	1181749.94	786+17.44	16.00	-
9237	432491.24	1181728.51	785+95.97	16.00	-
9373	432451.59	1181967.59	788+36.49	45.95	-
9374	432451.47	1181970.59	788+39.49	45.96	-
9375	432477.02	1181968.65	788+36.52	20.50	-
9376	432479.90	1181971.77	788+39.52	17.50	-
9377	432476.90	1181971.65	788+39.52	20.50	-

Alignment: PR2WB					
Point	North	East	Station	Offset	Region
9024	432395.72	1181980.14	788+51.26	101.28	-
9026	432415.06	1181983.56	788+53.90	81.81	-
9027	432405.07	1181983.69	788+54.43	91.80	-
9035	432520.95	1182083.99	789+50.02	-28.00	-

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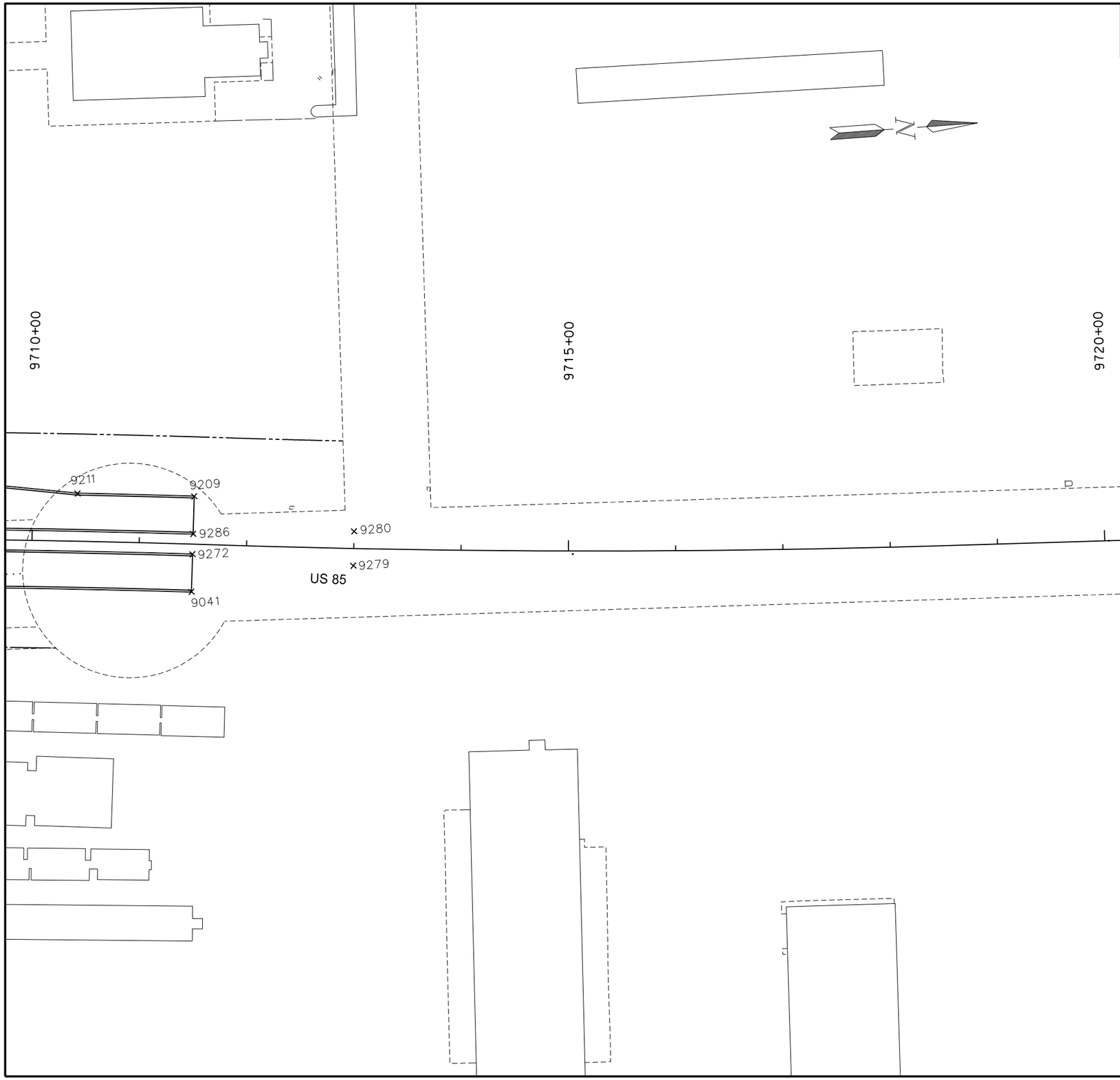
Survey Data Points

US 85 Intersection Improvements

US 85
9701+63.04 AH to 9710+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	82	8



Alignment: PR85					
Point	North	East	Station	Offset	Region
9041	433350.84	1182006.24	9711+50.00	44.50	2
9209	433359.86	1181917.70	9711+50.00	-44.50	2
9211	433251.61	1181907.21	9710+41.69	-44.50	2
9272	433354.39	1181971.42	9711+50.00	9.50	2
9279	433503.13	1181992.76	9713+00.00	16.00	2
9280	433506.09	1181960.90	9713+00.00	-16.00	2
9286	433356.31	1181952.52	9711+50.00	-9.50	2

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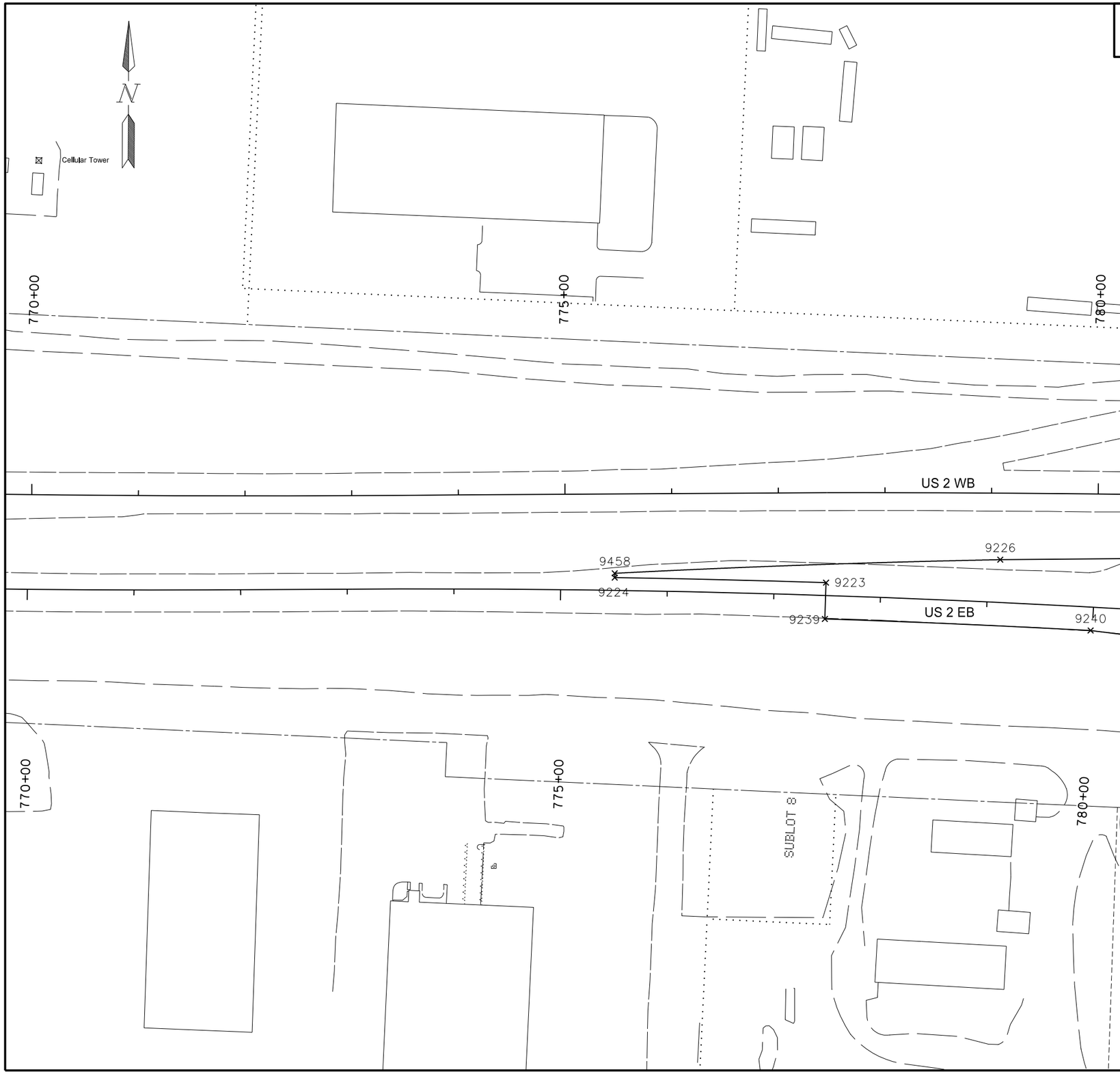
Survey Data Points

US 85 Intersection Improvements

US 85
9710+00 to 9713+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	82	9



Alignment:PR2EB					
Point	North	East	Station	Offset	Region
9223	432436.05	1180878.53	777+48.61	-12.00	-
9224	432439.85	1180680.30	775+50.55	-12.00	-
9226	432458.41	1181041.71	779+10.55	-40.04	-
9239	432402.06	1180877.58	777+48.61	22.00	-
9240	432392.41	1181126.77	779+98.47	22.00	-
9458	432443.85	1180680.34	775+50.55	-16.00	-

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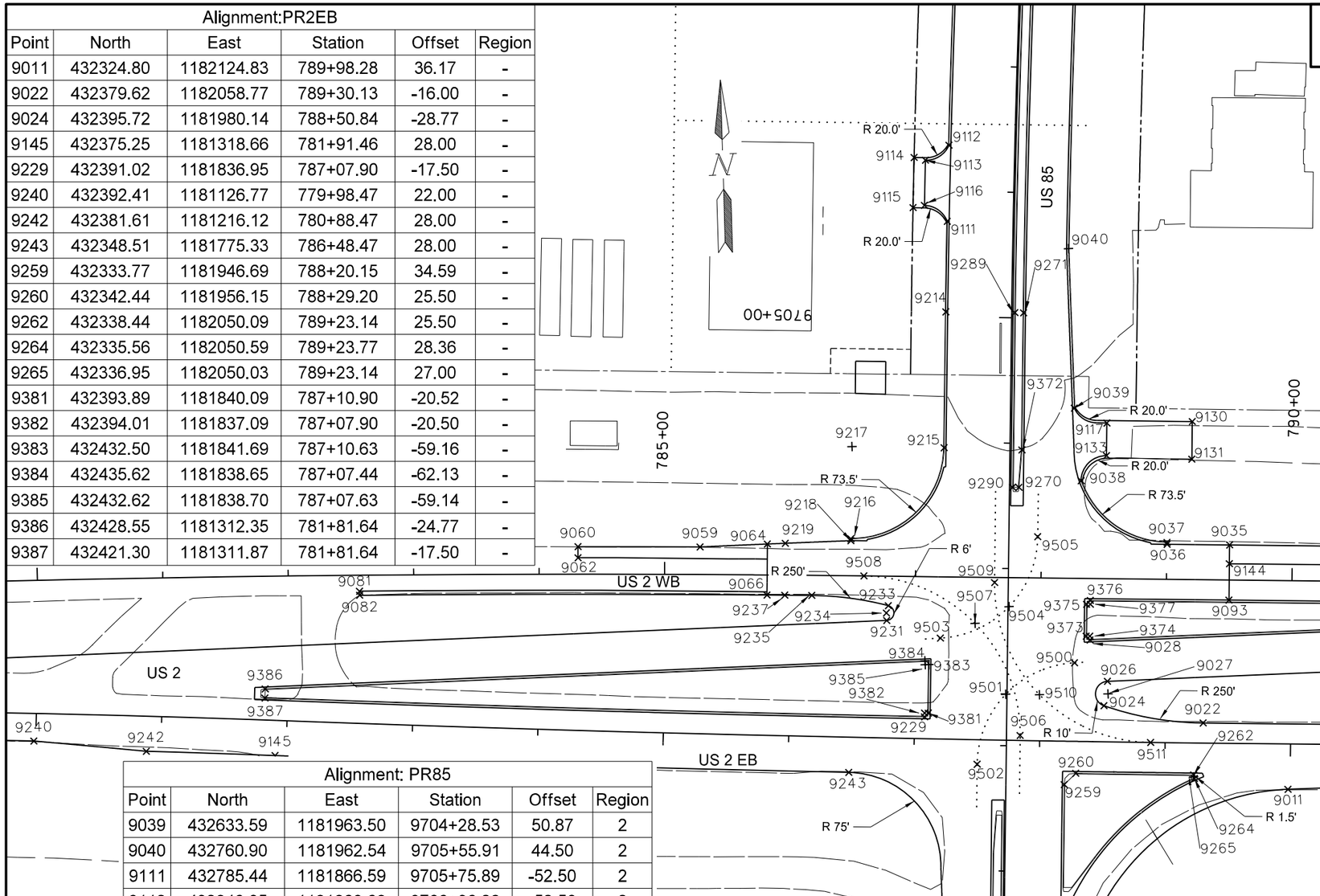
Survey Data Points

US 85 Intersection Improvements

US 2
777+48.61 to 780+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	82	10



Alignment:PR2EB

Point	North	East	Station	Offset	Region
9011	432324.80	1182124.83	789+98.28	36.17	-
9022	432379.62	1182058.77	789+30.13	-16.00	-
9024	432395.72	1181980.14	788+50.84	-28.77	-
9145	432375.25	1181318.66	781+91.46	28.00	-
9229	432391.02	1181836.95	787+07.90	-17.50	-
9240	432392.41	1181126.77	779+98.47	22.00	-
9242	432381.61	1181216.12	780+88.47	28.00	-
9243	432348.51	1181775.33	786+48.47	28.00	-
9259	432333.77	1181946.69	788+20.15	34.59	-
9260	432342.44	1181956.15	788+29.20	25.50	-
9262	432338.44	1182050.09	789+23.14	25.50	-
9264	432335.56	1182050.59	789+23.77	28.36	-
9265	432336.95	1182050.03	789+23.14	27.00	-
9381	432393.89	1181840.09	787+10.90	-20.52	-
9382	432394.01	1181837.09	787+07.90	-20.50	-
9383	432432.50	1181841.69	787+10.63	-59.16	-
9384	432435.62	1181838.65	787+07.44	-62.13	-
9385	432432.62	1181838.70	787+07.63	-59.14	-
9386	432428.55	1181312.35	781+81.64	-24.77	-
9387	432421.30	1181311.87	781+81.64	-17.50	-

Alignment: PR2WB

Point	North	East	Station	Offset	Region
9026	432415.06	1181983.56	788+53.90	81.81	-
9027	432405.07	1181983.69	788+56.43	91.80	-
9028	432448.39	1181970.63	788+39.65	49.02	-
9035	432520.95	1182083.99	789+50.02	-28.00	-
9036	432522.94	1182034.22	789+00.21	-28.00	-
9037	432524.44	1182034.28	789+00.21	-29.50	-
9038	432575.53	1181967.20	788+31.14	-77.88	-
9059	432531.65	1181662.09	785+28.16	-22.00	-
9060	432534.73	1181564.85	784+30.97	-22.00	-
9062	432525.87	1181564.59	784+30.97	-13.14	-
9064	432532.42	1181715.76	785+81.70	-24.68	-
9066	432491.77	1181714.26	785+81.70	16.00	-
9081	432504.28	1181389.78	782+56.75	12.73	-
9082	432501.01	1181389.71	782+56.75	16.00	-
9093	432476.98	1182082.23	789+50.02	16.00	-
9144	432506.00	1182083.39	789+50.02	-13.05	-
9216	432534.67	1181782.45	786+48.16	-29.50	-
9218	432533.17	1181782.39	786+48.16	-28.00	-
9219	432532.60	1181730.07	785+95.97	-25.39	-
9231	432468.72	1181809.06	786+77.47	35.29	-
9233	432480.48	1181810.67	786+78.59	23.48	-
9234	432474.72	1181808.98	786+77.14	29.30	-
9235	432490.42	1181749.94	786+17.44	16.00	-
9237	432491.24	1181728.51	785+95.97	16.00	-
9270	432571.72	1181917.53	787+81.67	-72.08	-
9290	432571.93	1181912.53	787+76.66	-72.09	-
9373	432451.59	1181967.59	788+36.49	45.95	-
9374	432451.47	1181970.59	788+39.49	45.96	-
9375	432477.02	1181968.65	788+36.52	20.50	-
9376	432479.90	1181971.77	788+39.52	17.50	-
9377	432476.90	1181971.65	788+39.52	20.50	-

Alignment: PR85

Point	North	East	Station	Offset	Region
9039	432633.59	1181963.50	9704+28.53	50.87	2
9040	432760.90	1181962.54	9705+55.91	44.50	2
9111	432785.44	1181866.59	9705+75.89	-52.50	2
9112	432846.05	1181869.68	9706+36.28	-52.50	2
9113	432834.66	1181850.60	9706+23.96	-70.95	2
9114	432837.12	1181841.66	9706+25.94	-80.00	2
9115	432797.18	1181839.63	9705+86.23	-80.00	2
9116	432798.71	1181848.77	9705+88.20	-70.94	2
9117	432620.98	1181989.10	9704+17.00	76.96	2
9130	432620.16	1182057.16	9704+19.00	145.00	2
9131	432590.19	1182055.91	9703+89.00	145.00	2
9133	432595.01	1181988.02	9703+91.00	76.96	2
9214	432713.33	1181863.35	9705+04.06	-52.50	2
9215	432605.06	1181858.86	9703+95.69	-52.50	2
9217	432608.11	1181785.42	9703+95.69	-126.00	2
9271	432710.76	1181925.30	9705+04.06	9.50	2
9289	432711.05	1181918.31	9705+04.06	2.50	2
9372	432601.53	1181920.77	9703+94.73	9.50	2

Intersection Lane Line Extensions (Alignment: PR85)

Lane Marking	Curve	Point	North	East	Station	Offset	Region
WB to SB (R=82')	PC	9500	432430.63	1181957.72	9702+25.51	53.51	2
	MPC	9501	432407.10	1181902.19	9701+99.70	-1.00	2
	PT	9502	432351.95	1181877.78	9703+84.87	-23.11	1
EB to NB (R=82')	PC	9503	432453.40	1181851.41	9702+43.85	-53.66	2
	MPC	9504	432476.90	1181906.91	9702+69.63	0.82	2
	PT	9505	432531.98	1181931.35	9703+25.68	22.96	2
NB to WB (R=126')	PC	9506	432373.92	1181912.69	9701+66.98	10.86	2
	MPC	9507	432464.31	1181879.38	9702+55.91	-26.16	2
	PT	9508	432504.76	1181791.95	9702+92.70	-115.19	2
SB to EB (R=126')	PC	9509	432496.47	1181895.89	9702+88.73	-11.00	2
	MPC	9510	432405.96	1181929.04	9701+99.67	25.88	2
	PT	9511	432365.36	1182016.48	9704+04.01	114.92	1

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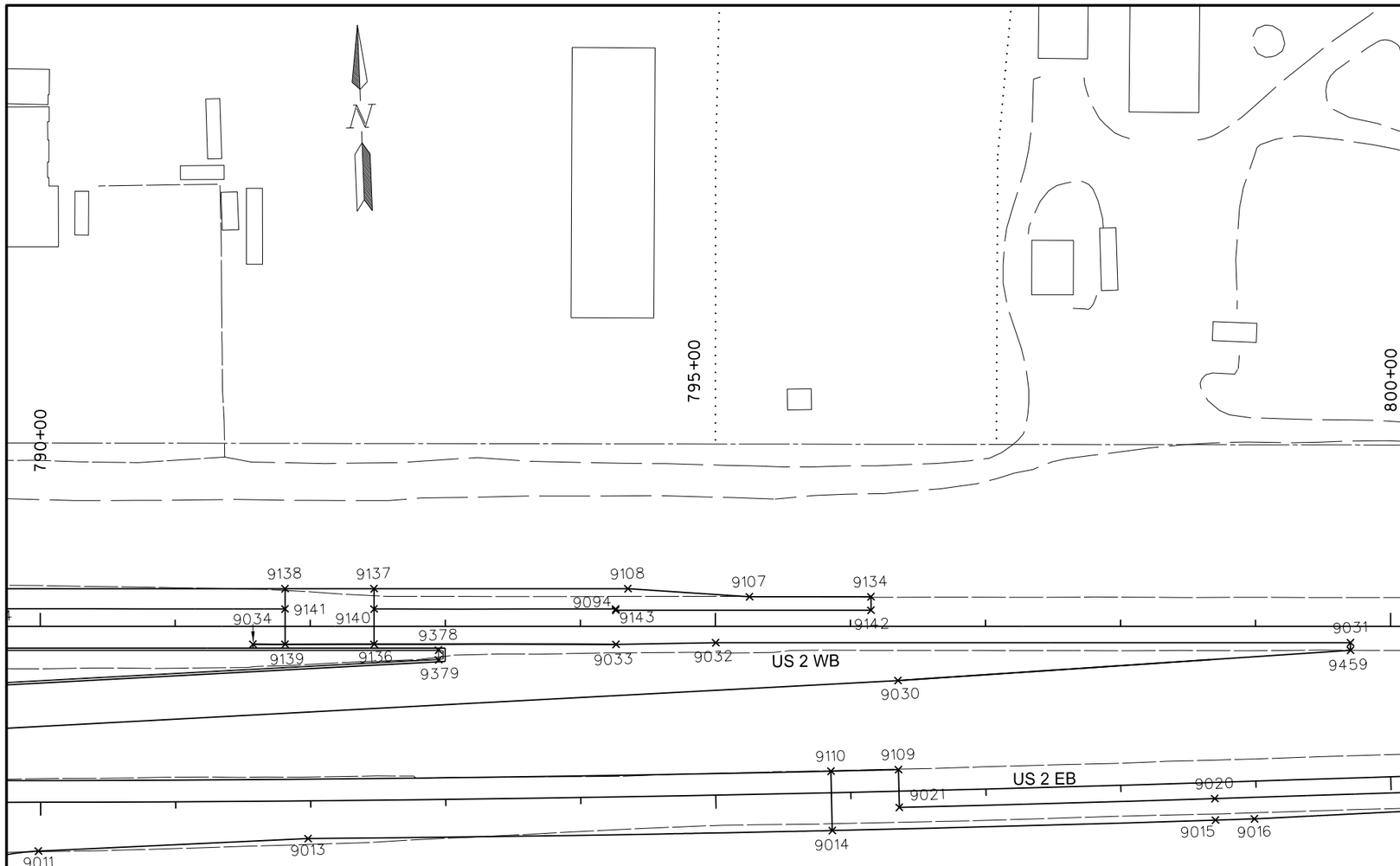
Survey Data Points

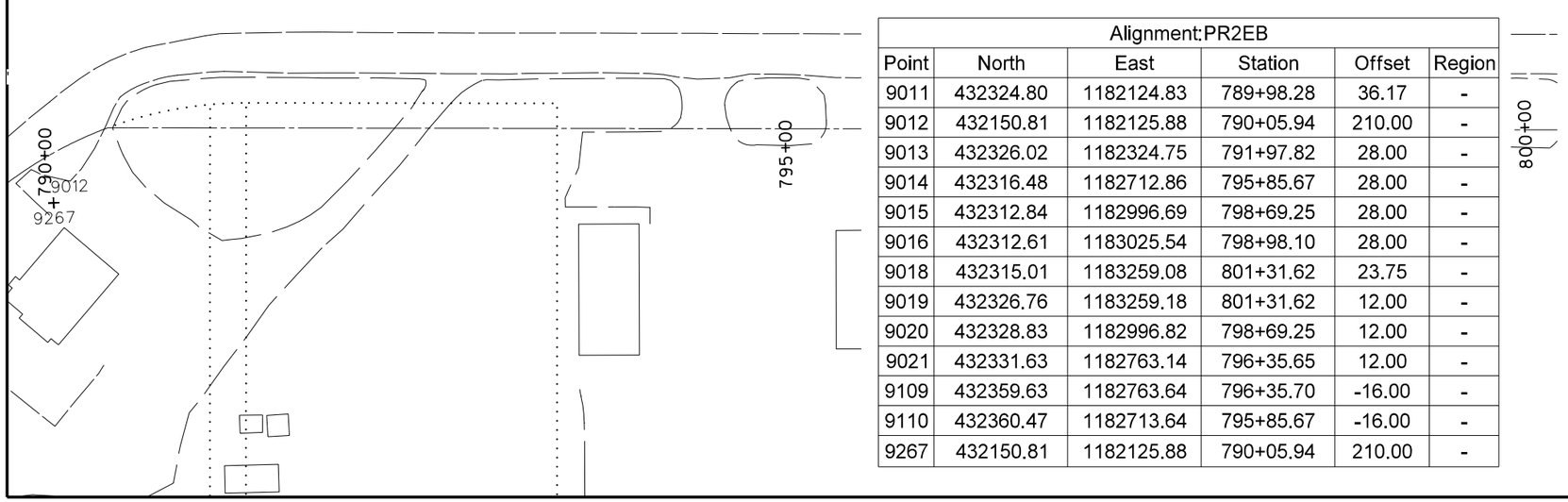
US 85 Intersection Improvements

US 2 / US 85
780+00 to 790+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	82	11



Alignment: PR2WB					
Point	North	East	Station	Offset	Region
9030	432425.58	1182765.91	796+35.21	40.04	-
9031	432440.20	1183101.84	799+70.28	12.00	-
9032	432458.99	1182632.14	795+00.21	12.00	-
9033	432460.67	1182558.32	794+26.38	13.27	-
9034	432471.52	1182289.70	791+57.54	13.16	-
9094	432486.85	1182559.17	794+26.18	-12.92	-
9107	432491.96	1182658.48	795+25.21	-22.00	-
9108	432501.56	1182568.79	794+35.21	-28.00	-
9134	432488.37	1182748.41	796+15.21	-22.00	-
9136	432467.95	1182379.29	792+47.20	13.15	-
9137	432509.07	1182380.93	792+47.20	-28.00	-
9138	432511.70	1182315.09	791+81.30	-28.00	-
9139	432470.47	1182313.44	791+81.30	13.26	-
9140	432494.07	1182380.33	792+47.20	-12.99	-
9141	432496.70	1182314.49	791+81.30	-12.98	-
9142	432478.37	1182748.01	796+15.21	-12.00	-
9143	432485.93	1182559.14	794+26.18	-12.00	-
9378	432461.69	1182426.90	792+95.03	17.50	-
9379	432454.52	1182426.62	792+95.03	24.68	-
9459	432434.54	1183101.61	799+70.28	17.66	-



Alignment:PR2EB					
Point	North	East	Station	Offset	Region
9011	432324.80	1182124.83	789+98.28	36.17	-
9012	432150.81	1182125.88	790+05.94	210.00	-
9013	432326.02	1182324.75	791+97.82	28.00	-
9014	432316.48	1182712.86	795+85.67	28.00	-
9015	432312.84	1182996.69	798+69.25	28.00	-
9016	432312.61	1183025.54	798+98.10	28.00	-
9018	432315.01	1183259.08	801+31.62	23.75	-
9019	432326.76	1183259.18	801+31.62	12.00	-
9020	432328.83	1182996.82	798+69.25	12.00	-
9021	432331.63	1182763.14	796+35.65	12.00	-
9109	432359.63	1182763.64	796+35.70	-16.00	-
9110	432360.47	1182713.64	795+85.67	-16.00	-
9267	432150.81	1182125.88	790+05.94	210.00	-

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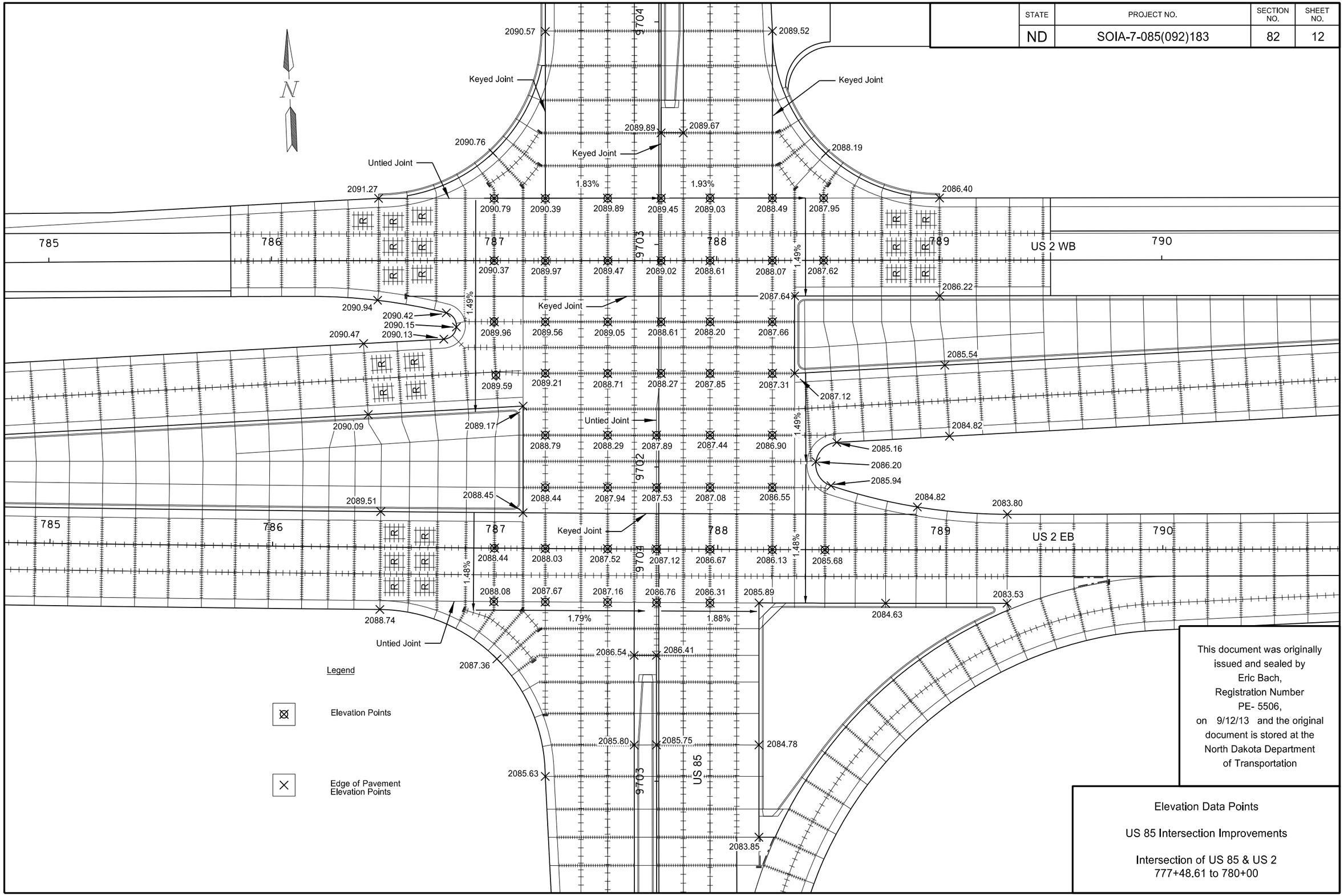
Survey Data Points

US 85 Intersection Improvements

US 2
790+00 to 800+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	82	12



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Elevation Data Points

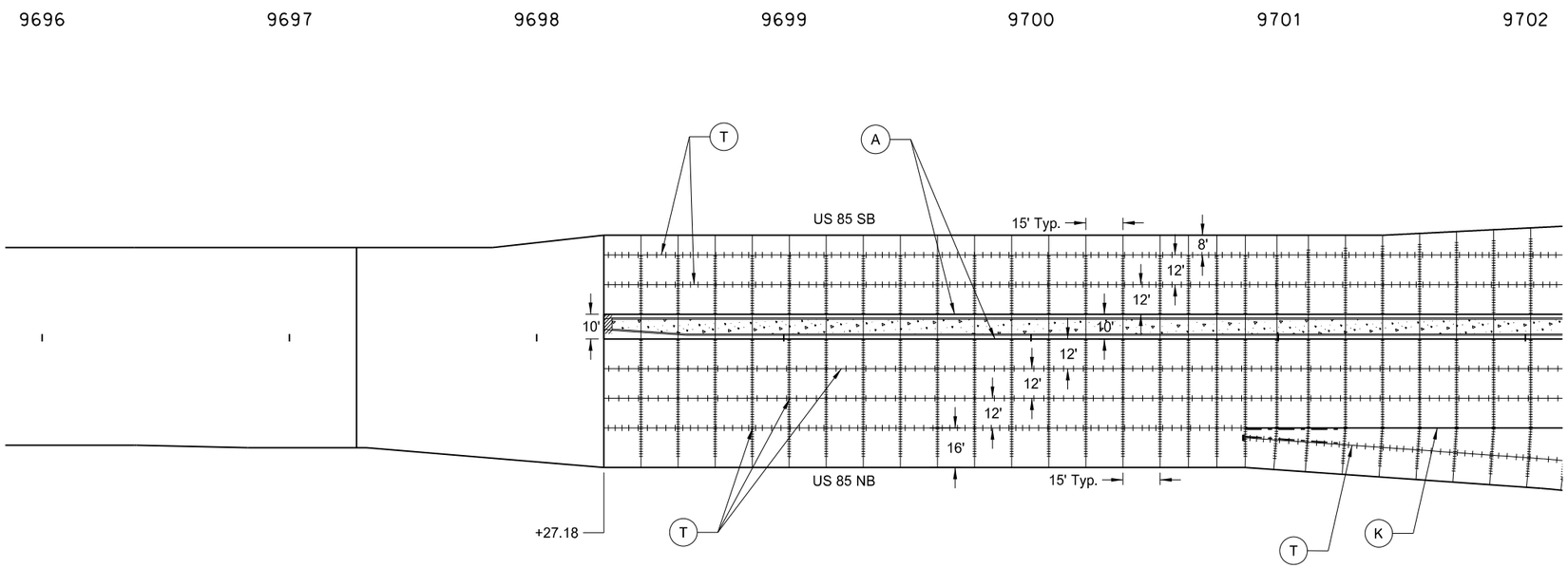
US 85 Intersection Improvements

Intersection of US 85 & US 2
777+48.61 to 780+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	90	1

302	0100	Salvaged Base Course		
		9698+27.18 to 9702+00	2094	TON
		9698+27.18 to 9702+00 Median	280	TON
550	0328	14IN Non Reinf Concrete Pvmt CL AE-Doweled		
		9698+27.18 to 9702+00	3544	SY
748	0140	Curb & Gutter-Type I		
		9698+30.51 to 9702+00 Median LT	369	LF
		9698+30.51 to 9702+00 Median RT	370	LF
750	0200	Concrete Median Paving		
		9698+30.51 to 9702+00	243	SY
750	0210	Concrete Median Nose Paving		
		9698+27.18 to 9698+30.51	3	SY

Note: Stations & Offsets from US 85 Chain: PR85



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(A) — Curb and Gutter (All): No. 3 tie bars, 1'-6" @ 4' c to c (continuous)

(T) — Tied Joint - See Detail

(K) — Non-Tied Keyed Joint - See Detail

(S) — Sawed Longitudinal Joint

Doweled Joint - Placed in driving lanes only @ 15' Average transverse joint spacing (Continuous)

Concrete Median Paving

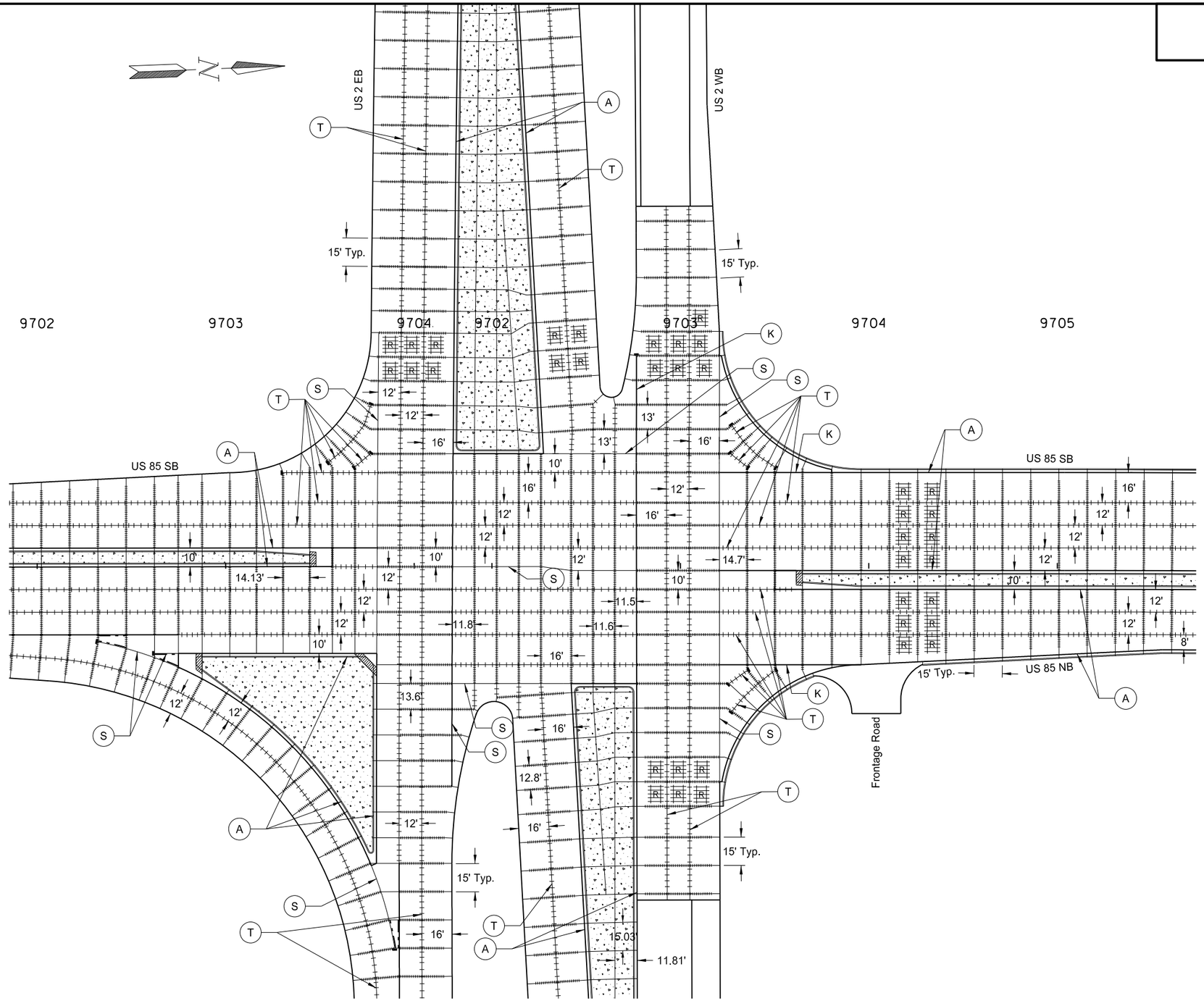
Concrete Median Nose Paving

Paving Joint Layouts

US 85 Intersection Improvements

US 85
9698+27.18 to 9702+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	90	2



302	0100	Salvaged Base Course		
		9702+00 to 9705+00	4452	TON
		9702+00 to 9705+00 Median	1311	TON
550	0328	14IN Non Reinf Concrete Pvmt CL AE-Doweled		
		9702+00 to 9705+00	9432	SY
748	0140	Curb & Gutter-Type I		
		9702+00 to 9703+44.58 Median LT BK	145	LF
		9702+00 to 9703+44.58 Median RT BK	145	LF
		9702+87.46 - 47' RT to 9703+69.55 - 47' RT BK	82	LF
		9702+87.45 - 54' RT to 9703+77.33 - 151' RT BK	134	LF
		9703+77.33 - 151' RT to 9703+78.61 - 56' RT BK	96	LF
		9701+81.40 - 125' LT to 9701+81.79 - 63' LT AH	62	LF
		9701+81.79 - 63' LT to 9702+24.74 - 63' LT AH	44	LF
		9702+22.32 - 125' LT to 9702+24.74 - 63' LT AH	61	LF
		9702+44.61 - 63' RT to 9702+47.12 - 126' RT AH	63	LF
		9702+44.61 - 63' RT to 9702+74.44 - 63' RT AH	30	LF
		9702+74.44 - 63' RT to 9702+75.41 - 126' RT AH	63	LF
		9703+22.19 to 9705+00 South Bound LT AH	220	LF
		9703+22.41 to 9703+70.68 North Bound RT AH	90	LF
		9703+64.81 to 9705+00 Median LT AH	135	LF
		9703+64.81 to 9705+00 Median RT AH	135	LF
		9704+28.54 to 9705+00 North Bound RT AH	72	LF
750	0200	Concrete Median Paving		
		9702+00 to 9703+44.58 BK	94	SY
		Right Turn Island RT BK	466	SY
		9702+01.86 -125' LT to 9702+03.24 - 63' LT AH	287	SY
		9702+59.55 - 63' RT to 9702+62.36 - 126' RT AH	204	SY
		9703+64.81 to 9705+00 AH	87	SY
750	0210	Concrete Median Nose Paving		
		9702+84.21 - 45' RT BK (Island)	4	SY
		9703+44.58 to 9703+47.91 BK	3	SY
		9703+68.06 - 45' RT BK (Island)	5	SY
		9703+61.48 to 9703+64.81 AH	3	SY

Note: Stations & Offsets from US 85 Chain: PR85

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(A) — Curb and Gutter (All): No. 3 tie bars, 1'-6" @ 4' c to c (continuous)

(T) — Tied Joint - See Detail

(K) — Non-Tied Keyed Joint - See Detail

(S) — Sawed Longitudinal Joint

Doweled Joint - Placed in driving lanes only @ 15' Average transverse joint spacing (Continuous)

Concrete Median Paving

Concrete Median Nose Paving

Paving Joint Layouts

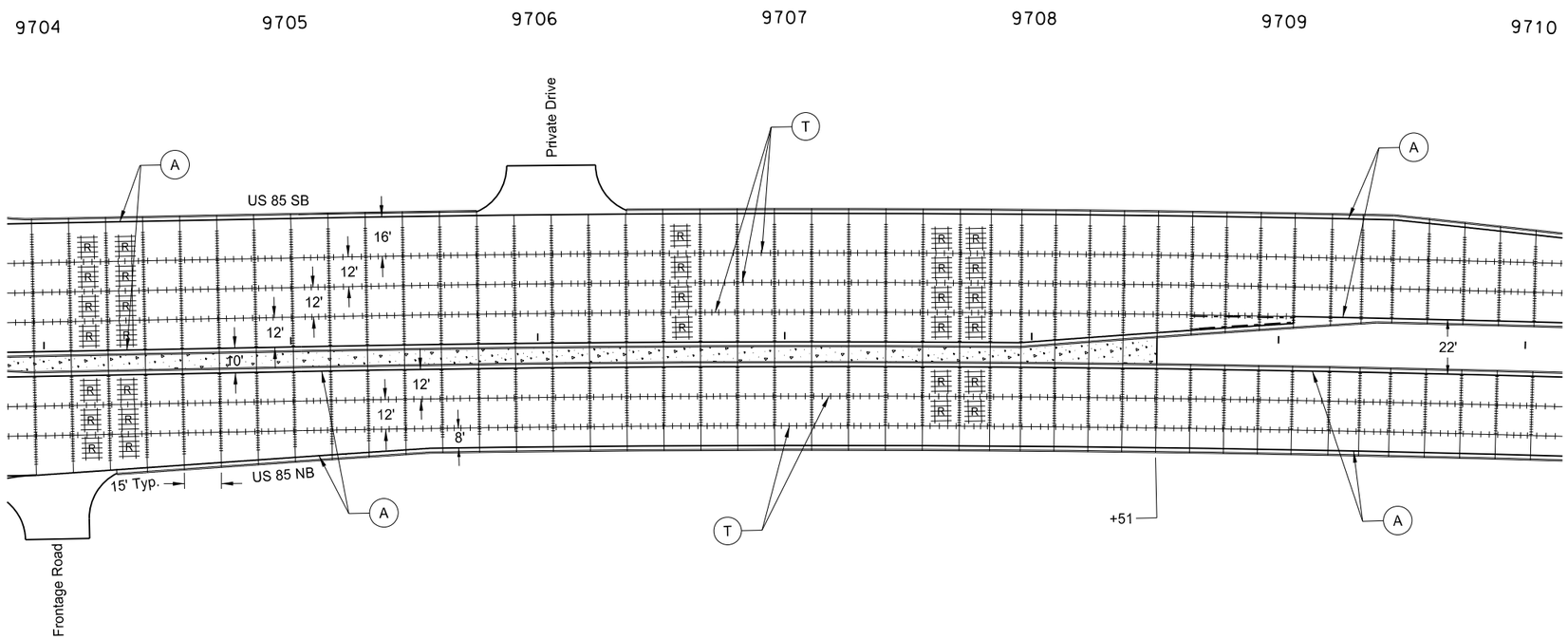
US 85 Intersection Improvements

US 85
9702+00 to 9705+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	90	3

302	0100	Salvaged Base Course		
		9705+00 to 9710+00	2146	TON
		9705+00 to 9708+50.81 Median	285	TON
550	0328	14IN Non Reinf Concrete Pvmt CL AE-Doweled		
		9705+00 to 9710+00	4488	SY
748	0140	Curb & Gutter-Type I		
		9705+00 to 9710+00 South Bound LT	442	LF
		9705+00 to 9710+00 Median LT	501	LF
		9705+00 to 9710+00 Median RT	500	LF
		9705+00 to 9710+00 North Bound RT	498	LF
750	0200	Concrete Median Paving		
		9705+00 to 9708+50.81	248	SY

Note: Stations & Offsets from US 85 Chain: PR85



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(A) — Curb and Gutter (All): No. 3 tie bars, 1'-6" @ 4' c to c (continuous)

(T) — Tied Joint - See Detail

(K) — Non-Tied Keyed Joint - See Detail

(S) — Sawed Longitudinal Joint

Doweled Joint - Placed in driving lanes only @ 15' Average transverse joint spacing (Continuous)

Concrete Median Paving

Concrete Median Nose Paving

Paving Joint Layouts

US 85 Intersection Improvements

US 85
9705+00 to 9710+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	90	4

302	0100	Salvaged Base Course		
		9710+00 to 9711+50	550	TON
550	0328	14IN Non Reinf Concrete Pvmt CL AE-Doweled		
		9710+00 to 9711+50	1075	SY
748	0140	Curb & Gutter-Type I		
		9710+00 to 9711+50 South Bound LT	151	LF
		9710+00 to 9711+50 Median LT	150	LF
		9710+00 to 9711+50 Median RT	150	LF
		9710+00 to 9711+50 North Bound RT	149	LF

Note: Stations & Offsets from US 85 Chain: PR85

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(A) — Curb and Gutter (All): No. 3 tie bars, 1'-6" @ 4' c to c (continuous)

(T) — Tied Joint - See Detail

(K) — Non-Tied Keyed Joint - See Detail

(S) — Sawed Longitudinal Joint

Doweled Joint - Placed in driving lanes only @ 15' Average transverse joint spacing (Continuous)

Concrete Median Paving

Concrete Median Nose Paving

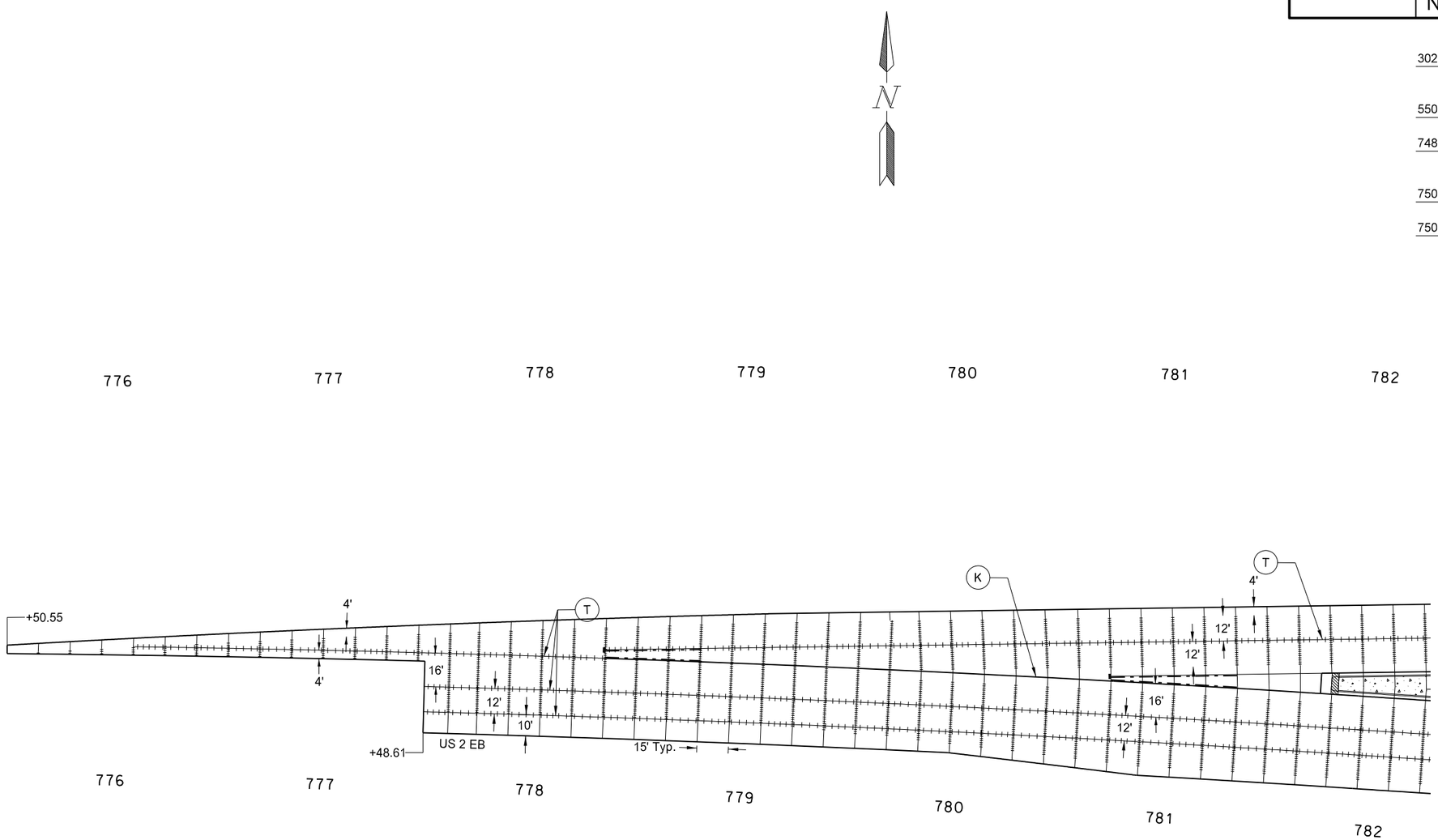
Paving Joint Layouts

US 85 Intersection Improvements

US 85
9710+00 to 9711+50

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	90	5

302	0100	Salvaged Base Course		
		775+50.55 to 782+00 (PR2EB)	1955	TON
		781+78.31 to 782+00 Median (PR2EB)	19	TON
550	0328	14IN Non Reinf Concrete Pvmt CL AE-Doweled		
		775+50.55 to 782+00 (PR2EB)	3629	SY
748	0140	Curb & Gutter-Type I		
		781+81.64 to 782+00 Median LT (PR2EB)	18	LF
		781+81.64 to 782+00 Median RT (PR2EB)	18	LF
750	0200	Concrete Median Paving		
		781+81.64 to 782+00 (PR2EB)	15	SY
750	0210	Concrete Median Nose Paving		
		781+78.31 to 781+81.64 (PR2EB)	4	SY



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(A) — Curb and Gutter (All): No. 3 tie bars, 1'-6" @ 4' c to c (continuous)

(T) — Tied Joint - See Detail

(K) — Non-Tied Keyed Joint - See Detail

(S) — Sawed Longitudinal Joint

Doweled Joint - Placed in driving lanes only @ 15' Average transverse joint spacing (Continuous)

Concrete Median Paving

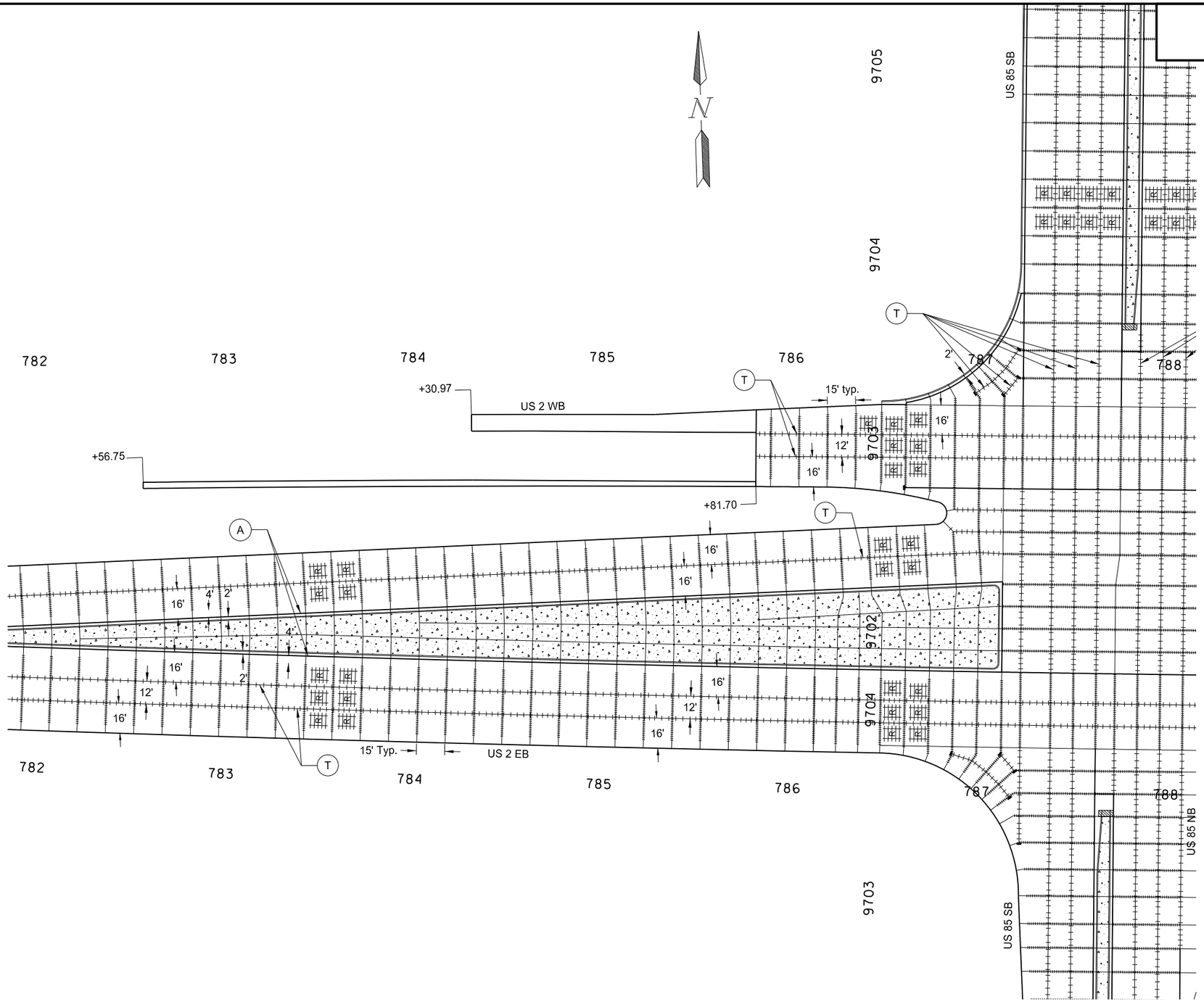
Concrete Median Nose Paving

Paving Joint Layouts

US 85 Intersection Improvements

US 2 EB
775+50.55 to 782+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	90	6



302	0100	Salvaged Base Course		
		782+00 to 786+48.47 (PR2EB)	2019	TON
		782+00 to 786+48.47 Median (PR2EB)	1394	TON
		785+81.70 to 786+48.16 (PR2WB)	185	TON
550	0328	14IN Non Reinf Concrete Pvmt CL AE-Doweled		
		782+00 to 786+48.47 (PR2EB)	3789	SY
		785+81.70 to 786+48.16 (PR2WB)	315	SY
748	0140	Curb & Gutter-Type I		
		782+00 to 786+48.47 Median LT (PR2EB)	449	LF
		782+00 to 786+48.47 Median RT (PR2EB)	448	LF
750	0200	Concrete Median Paving		
		782+00 to 786+48.47 (PR2EB)	1216	SY

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Concrete Median Paving

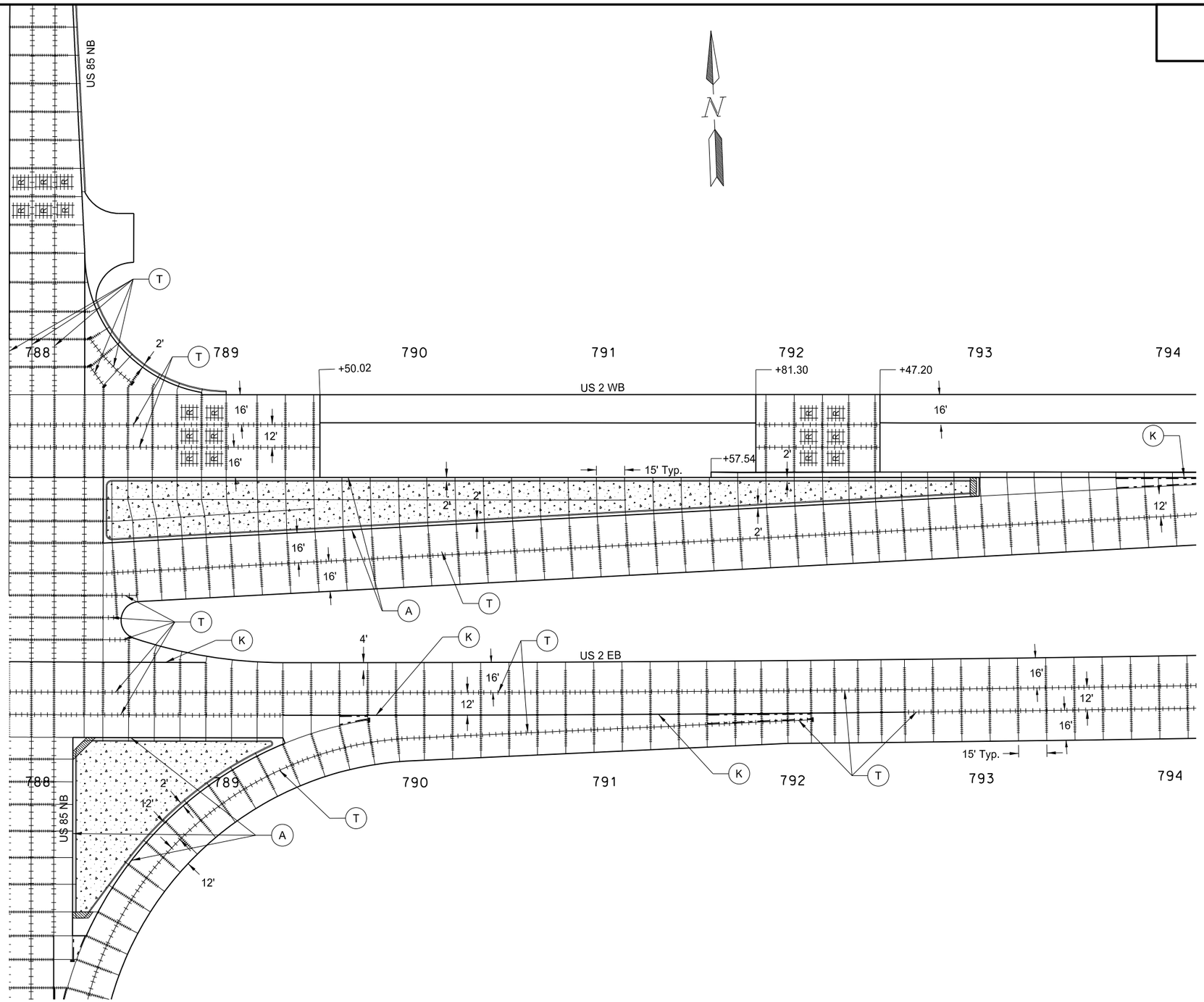
Concrete Median Nose Paving

Paving Joint Layouts

US 85 Intersection Improvements
US 2 EB
782+00 to 786+48.47
US 2 WB
785+81.70 to 786+48.16

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	90	7

302	0100	Salvaged Base Course		
		789+00.21 to 794+00 (PR2WB)	1354	TON
		789+00.21 to 792+98.36 Median (PR2WB)	844	TON
		789+98.28 to 794+00 (PR2EB)	1176	TON
550	0328	14IN Non Reinf Concrete Pvmt CL AE-Doweled		
		789+00.21 to 794+00 (PR2WB)	2484	SY
		789+98.28 to 794+00 (PR2EB)	2053	SY
748	0140	Curb & Gutter-Type I		
		789+00.21 to 792+95.03 Median LT (PR2WB)	395	LF
		789+00.21 to 792+95.03 Median RT (PR2WB)	395	LF
750	0200	Concrete Median Paving		
		789+00.21 to 792+95.03 (PR2WB)	735	SY
750	0210	Concrete Median Nose Paving		
		792+95.03 to 792+98.36 (PR2WB)	4	SY



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K — Non-Tied Keyed Joint - See Detail

S — Sawed Longitudinal Joint

Doweled Joint - Placed in driving lanes only @ 15' Average transverse joint spacing (Continuous)

Concrete Median Paving

Concrete Median Nose Paving

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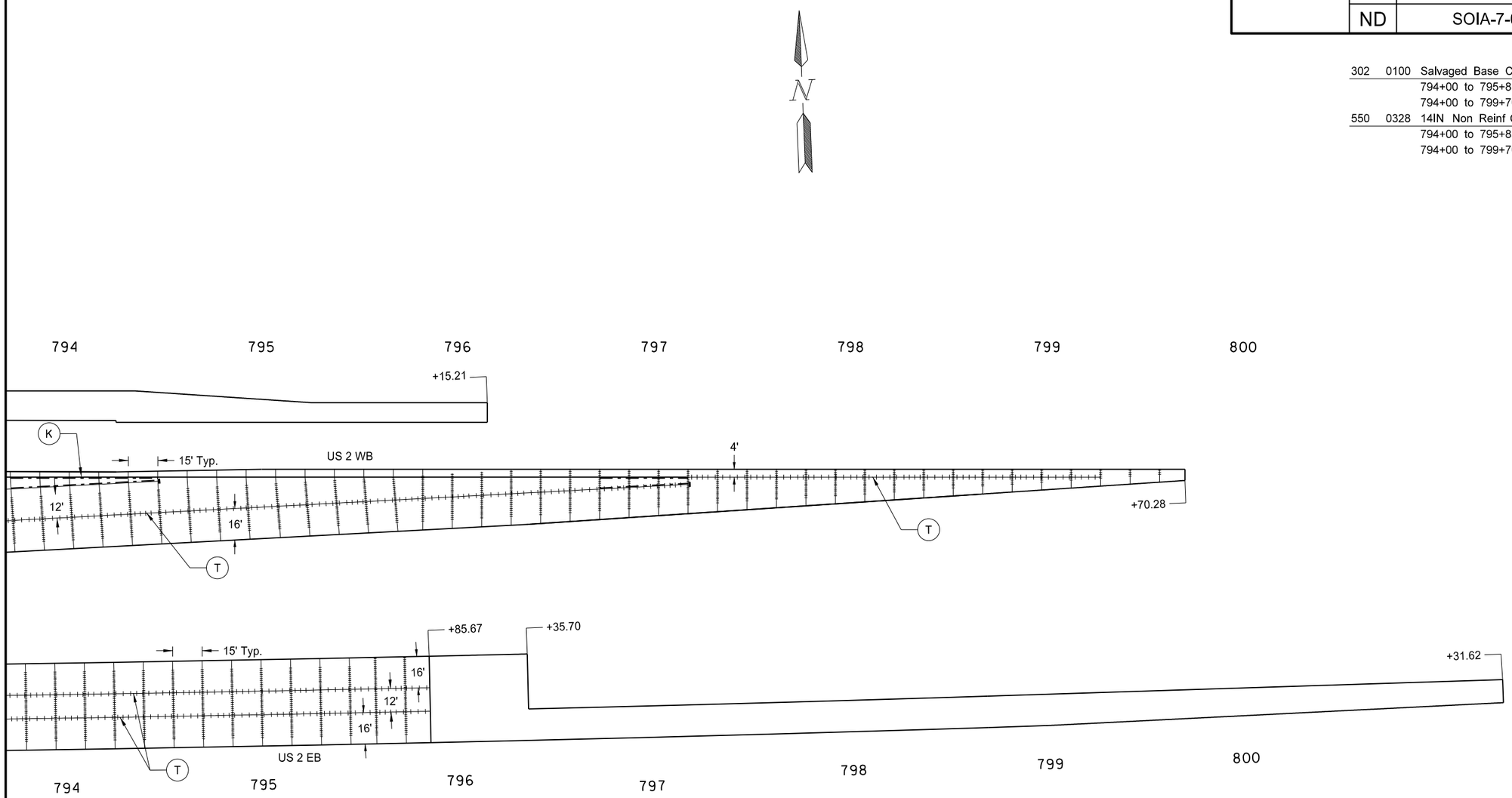
Paving Joint Layouts

US 85 Intersection Improvements
US 2 EB
789+98.28 to 794+00
US 2 WB
789+00.21 to 794+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	90	8

302	0100	Salvaged Base Course		
		794+00 to 795+85.67 (PR2EB)	527	TON
		794+00 to 799+70.28 (PR2WB)	886	TON
550	0328	14IN Non Reinf Concrete Pvmt CL AE-Doweled		
		794+00 to 795+85.67 (PR2EB)	908	SY
		794+00 to 799+70.28 (PR2WB)	1516	SY



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Concrete Median Paving

Concrete Median Nose Paving

Paving Joint Layouts

US 85 Intersection Improvements
US 2 EB
794+00 to 795+85.67
US 2 WB
794+00 to 799+70.28

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2		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**	**7**	**7**		**7**	**19**	**133**
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					37	
G20-52a-72	72"x24"	ROAD WORK NEXT __ MILES RT or LT ARROW					30	
G20-55-96	**96"x48"**	**SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT**	**5**	**5**		**5**	**59**	**295**
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**	**4**	**4**		**4**	**5**	**20**
R1-2-60	60"x60"	YIELD					29	
R2-1-48	**48"x60"**	**SPEED LIMIT __**	**18**	**18**		**18**	**39**	**702**
R2-1a-24	**24"x18"**	**MINIMUM FEE $80 (Mounted on Speed Limit post)**	**5**	**5**		**5**	**10**	**50**
R3-7-48	48"x48"	LEFT or RIGHT LANE MUST TURN LEFT or RIGHT					35	
R4-1-48	**48"x60"**	**DO NOT PASS**	**4**	**4**		**4**	**39**	**156**
R4-7-48	48"x60"	KEEP RIGHT SYMBOL					39	
R5-1-48	48"x48"	DO NOT ENTER					35	
R6-1-36	36"x12"	ONE WAY RIGHT or LEFT					13	
R7-1-12	12"x18"	NO PARKING					11	
R10-6-24	24"x36"	STOP HERE ON RED					16	
R11-2-48	**48"x30"**	**ROAD CLOSED**	**4**	**3**		**4**	**28**	**112**
R11-2a-48	48"x30"	STREET CLOSED					28	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY					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**	**1**	**1**		**1**	**35**	**35**
W1-4b-48	48"x48"	DOUBLE RIGHT or LEFT REVERSE CURVE ARROW					35	
W1-6-48	48"x24"	LARGE ARROW					26	
W3-1-48	48"x48"	STOP AHEAD SYMBOL					35	
W3-3-48	48"x48"	SIGNAL AHEAD SYMBOL					35	
W3-4-48	**48"x48"**	**BE PREPARED TO STOP**	**4**	**4**		**4**	**35**	**140**
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**4**	**4**		**4**	**35**	**140**
W4-2-48	**48"x48"**	**RIGHT or LEFT LANE TRANSITION SYMBOL**	**4**	**4**		**4**	**35**	**140**
W5-1-48	48"x48"	ROAD NARROWS					35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE					35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW					35	
W6-3-48	48"x48"	TWO WAY TRAFFIC SYMBOL					35	
W8-1-48	**48"x48"**	**BUMP**	**4**	**4**		**4**	**35**	**140**
W8-3-48	**48"x48"**	**PAVEMENT ENDS**	**1**	**1**		**1**	**35**	**35**
W8-7-48	**48"x48"**	**LOOSE GRAVEL**	**2**	**2**		**2**	**35**	**70**
W8-9a-48	48"x48"	SHOULDER DROP-OFF					35	
W8-11-48	**48"x48"**	**UNEVEN LANES**	**2**	**2**		**2**	**35**	**70**
W8-12-48	**48"x48"**	**NO CENTER STRIPE**	**2**	**2**		**2**	**35**	**70**
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY					35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT.					35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT.					35	
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY					35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL					35	
W12-2-48	48"x48"	LOW CLEARANCE SYMBOL					35	
W13-1-24	24"x24"	__ MPH ADVISORY SPEED PLATE (Mounted on warning sign post)					11	
W13-4-48	48"x60"	RAMP ARROW					39	
W14-3-48	48"x36"	NO PASSING ZONE					23	
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**5**	**5**		**5**	**35**	**175**
W20-2-48	48"x48"	DETOUR AHEAD or __ FT					35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT.					35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT.					35	
W20-5-48	**48"x48"**	**RIGHT or LEFT LANE CLOSED AHEAD or __ FT.**	**4**	**4**		**4**	**35**	**140**
W20-7a-48	**48"x48"**	**FLAGGING SYMBOL**	**4**	**4**		**4**	**35**	**140**
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	
W20-52-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)					12	
W21-1a-48	48"x48"	WORKERS SYMBOL					35	
W21-2-48	**48"x48"**	**FRESH OIL**	**2**	**2**		**2**	**35**	**70**
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT					35	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2		TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
W21-5-48	**48"x48"**	**SHOULDER WORK**		**2**		**2**	**35**	**70**
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED					35	
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT.					35	
W21-6a-48	48"x48"	SURVEY CREW AHEAD					35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT.					35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY					35	
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK					35	
	24"x24"	TAKE TURNS (6" D letters) (Mounted on stop sign post)					11	

SPECIAL SIGNS

R3-8b	**54"X30"**	**LEFT TURN ONLY, THRU, RIGHT TURN ONLY**	**1**	**1**		**1**	**29**	**29**
R3-8 (Mod)	**36"X30"**	**LEFT TURN ONLY, THRU AND RIGHT TURN**	**1**	**1**		**1**	**25**	**25**
R3-8 (Mod)	**36"X30"**	**LEFT TURN AND THRU, RIGHT TURN ONLY**	**1**	**1**		**1**	**25**	**25**

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS 3110**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY BY PHASE NO. 1	2		TOTAL QUANTITY
704-0100	**FLAGGING**	MHR	**500**	**500**		**1000**
704-1041	ATTENUATION DEVICE-TYPE B-55	EACH				
704-1043	ATTENUATION DEVICE-TYPE B-65	EACH				
704-1044	ATTENUATION DEVICE-TYPE B-70	EACH				
704-1050	TYPE I BARRICADES	EACH				
704-1051	TYPE II BARRICADES	EACH				
704-1052	**TYPE III BARRICADES**	EACH	**21**	**6**		**21**
704-1060	**DELINEATOR DRUMS**	EACH	**216**	**229**		**229**
704-1065	TRAFFIC CONES	EACH				
704-1067	**TUBULAR MARKERS**	EACH	**176**	**150**		**176**
704-1070	DELINEATOR	EACH				
704-1072	**FLEXIBLE DELINEATORS**	EACH	**134**	**162**		**162**
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	**2**	**2**		**2**
704-1088	SEQUENCING ARROW PANEL - TYPE C - CROSSOVER	EACH				
704-1095	TYPE B FLASHERS	EACH				
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF				
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH				
762-0200	RAISED PAVEMENT MARKERS	EACH				
762-0420	**SHORT TERM 4IN LINE - TYPE R**	LF	**32626**	**40947**		**73573**
762-0424	**SHORT TERM 8IN LINE - TYPE R**	LF	**3631**	**5558**		**9189**
762-0426	**SHORT TERM 24IN LINE TYPE-R**	LF		**84**		**84**
762-0430	**SHORT TERM 4IN LINE - TYPE NR**	LF	**8519**	**3628**		**12147**
762-0434	**SHORT TERM 8IN LINE TYPE-NR**	LF	**451**			**451**
762-0436	**SHORT TERM 24IN LINE - TYPE NR**	LF	**110**			**110**
762-1500	**OBLITERATION OF PVMT MK**	SF	**2585**	**2585**		**5170**
772-2110	FLASHING BEACON - POST MOUNTED	EACH				

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

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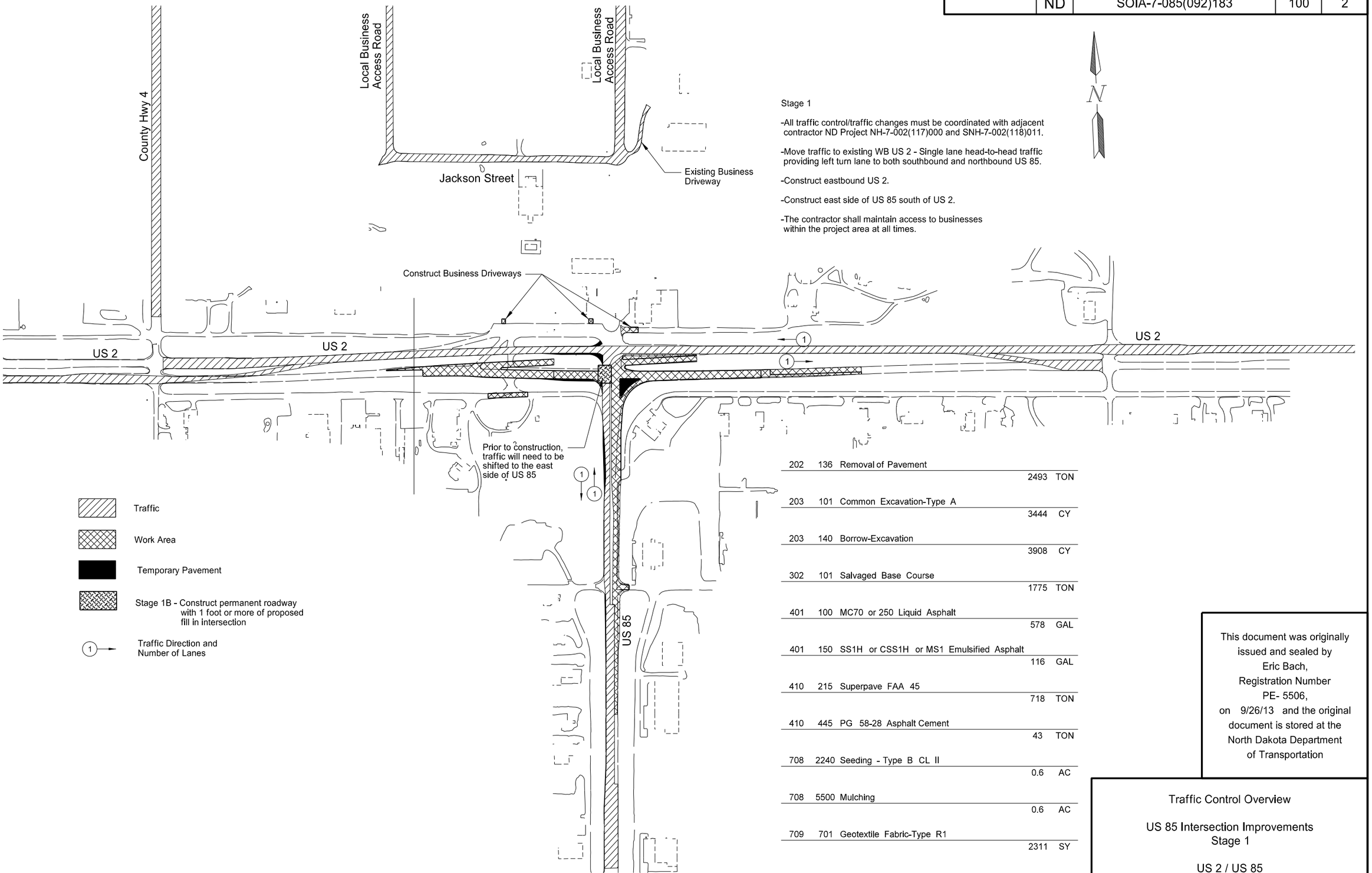
Traffic Control Devices List

US 85 Intersection Improvements

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	2



Stage 1

-All traffic control/traffic changes must be coordinated with adjacent contractor ND Project NH-7-002(117)000 and SNH-7-002(118)011.

-Move traffic to existing WB US 2 - Single lane head-to-head traffic providing left turn lane to both southbound and northbound US 85.

-Construct eastbound US 2.

-Construct east side of US 85 south of US 2.

-The contractor shall maintain access to businesses within the project area at all times.

202	136	Removal of Pavement	2493	TON
203	101	Common Excavation-Type A	3444	CY
203	140	Borrow-Excavation	3908	CY
302	101	Salvaged Base Course	1775	TON
401	100	MC70 or 250 Liquid Asphalt	578	GAL
401	150	SS1H or CSS1H or MS1 Emulsified Asphalt	116	GAL
410	215	Superpave FAA 45	718	TON
410	445	PG 58-28 Asphalt Cement	43	TON
708	2240	Seeding - Type B CL II	0.6	AC
708	5500	Mulching	0.6	AC
709	701	Geotextile Fabric-Type R1	2311	SY

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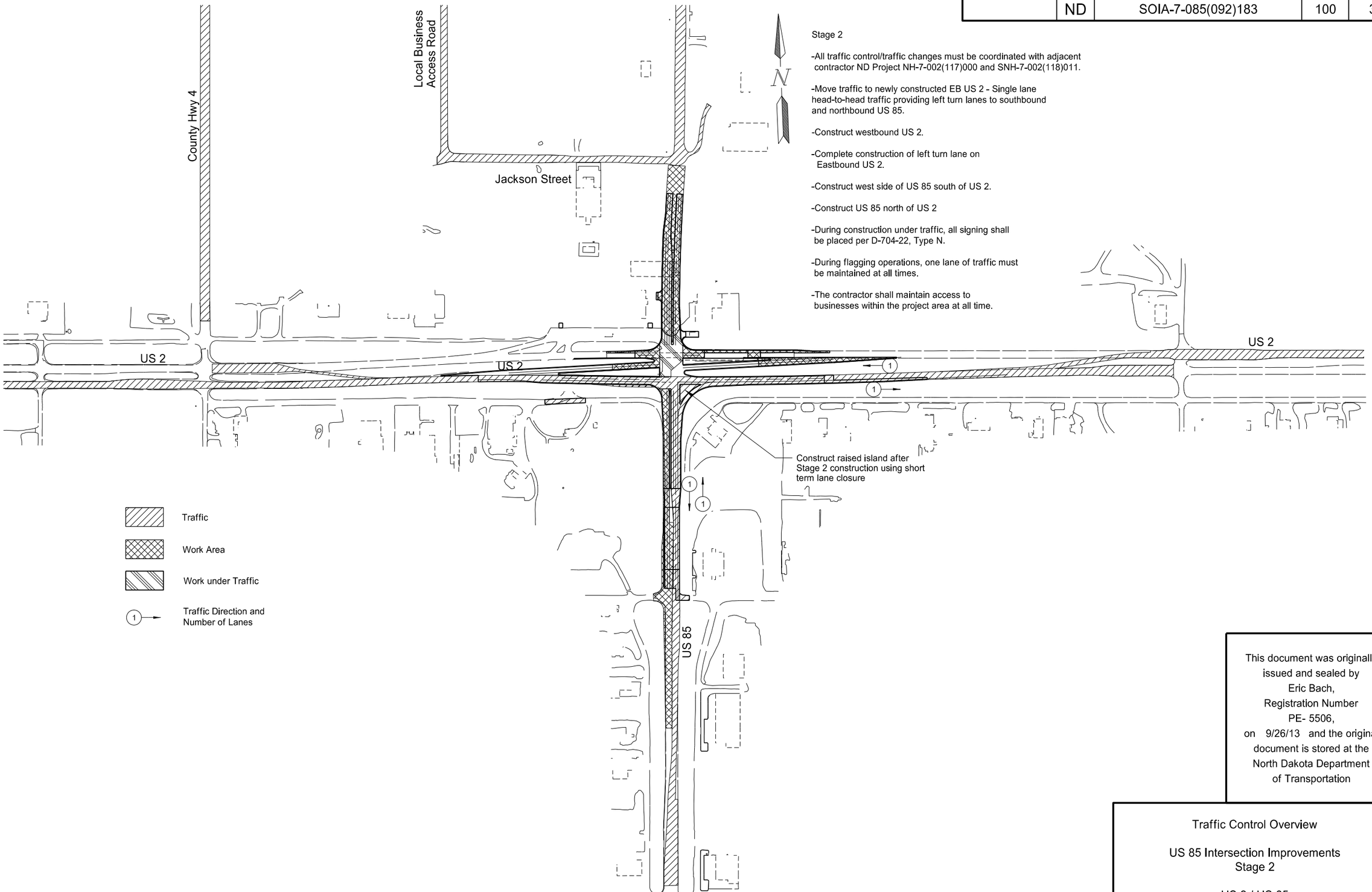
Traffic Control Overview

US 85 Intersection Improvements
Stage 1

US 2 / US 85

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	3



Stage 2

-All traffic control/traffic changes must be coordinated with adjacent contractor ND Project NH-7-002(117)000 and SNH-7-002(118)011.

-Move traffic to newly constructed EB US 2 - Single lane head-to-head traffic providing left turn lanes to southbound and northbound US 85.

-Construct westbound US 2.

-Complete construction of left turn lane on Eastbound US 2.

-Construct west side of US 85 south of US 2.

-Construct US 85 north of US 2

-During construction under traffic, all signing shall be placed per D-704-22, Type N.

-During flagging operations, one lane of traffic must be maintained at all times.

-The contractor shall maintain access to businesses within the project area at all time.

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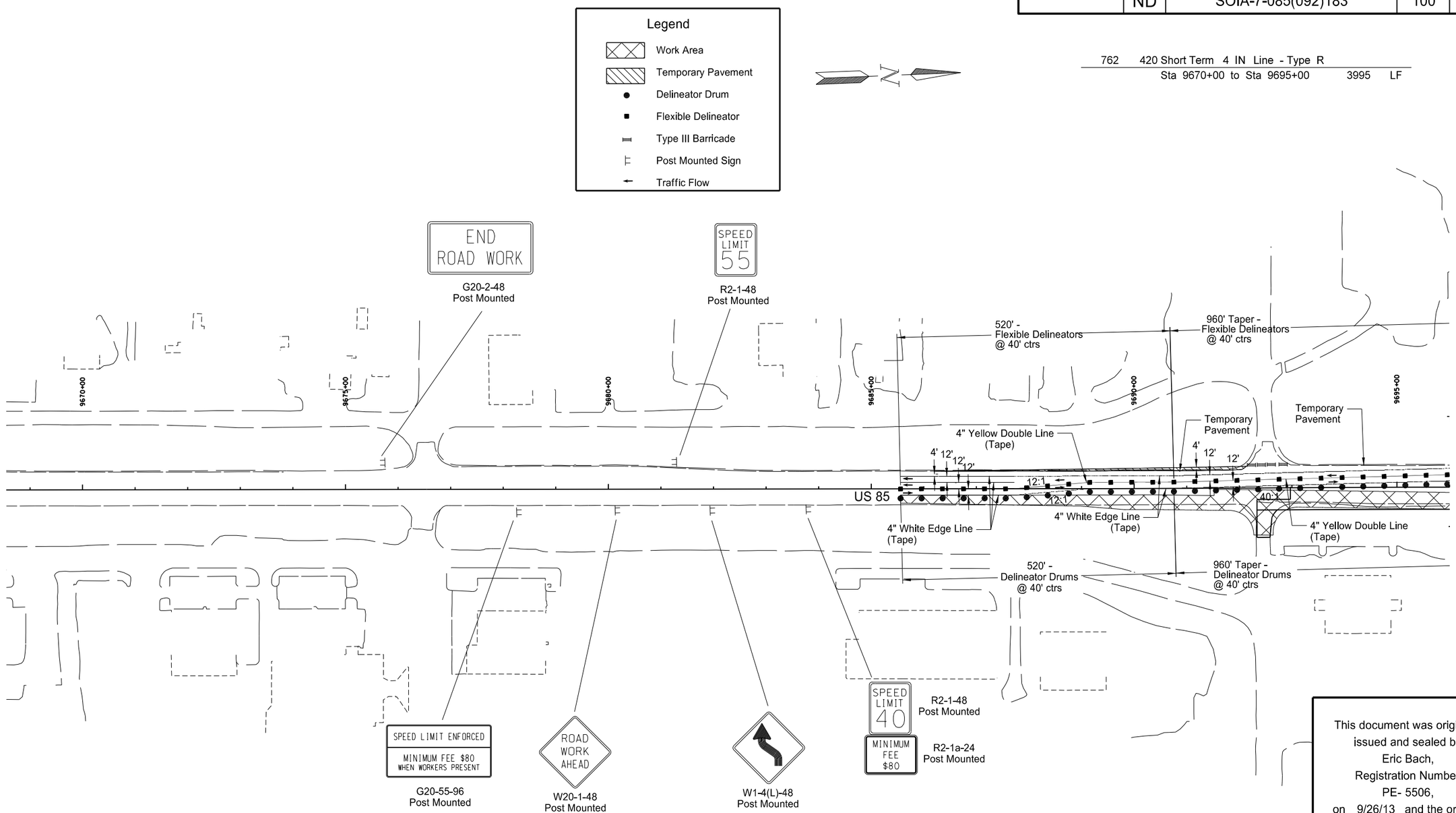
Traffic Control Overview

US 85 Intersection Improvements
Stage 2

US 2 / US 85

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	4

762	420 Short Term 4 IN Line - Type R		
	Sta 9670+00 to Sta 9695+00	3995	LF



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Traffic Control Layout

US 85 Intersection Improvements
Stage 1

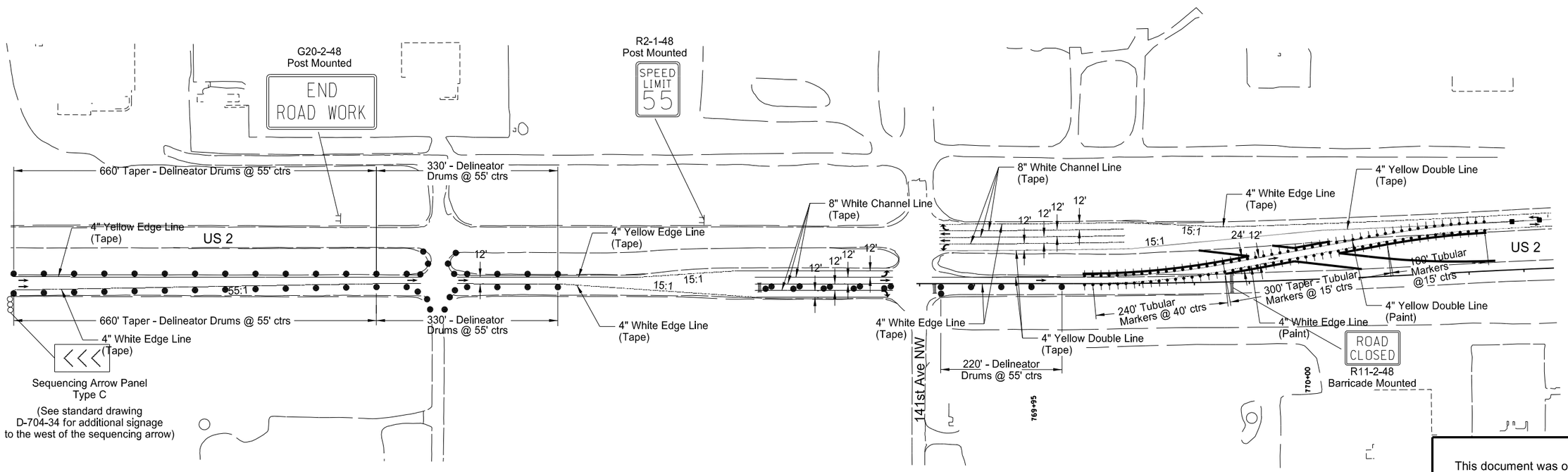
US 85
9670+00 to 9695+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	4A

Legend

- Delineator Drum
- Flexible Delineator
- Type III Barricade
- Post Mounted Sign
- Tubular Marker
- Traffic Flow

762	420	Short Term 4 IN Line - Type R		
		West End to Sta 774+00	7419	LF
762	424	Short Term 8 IN Line - Type R		
		West End to Sta 774+00	1756	LF
762	430	Short Term 4 IN Line - Type NR		
		West End to Sta 774+00	2225	LF



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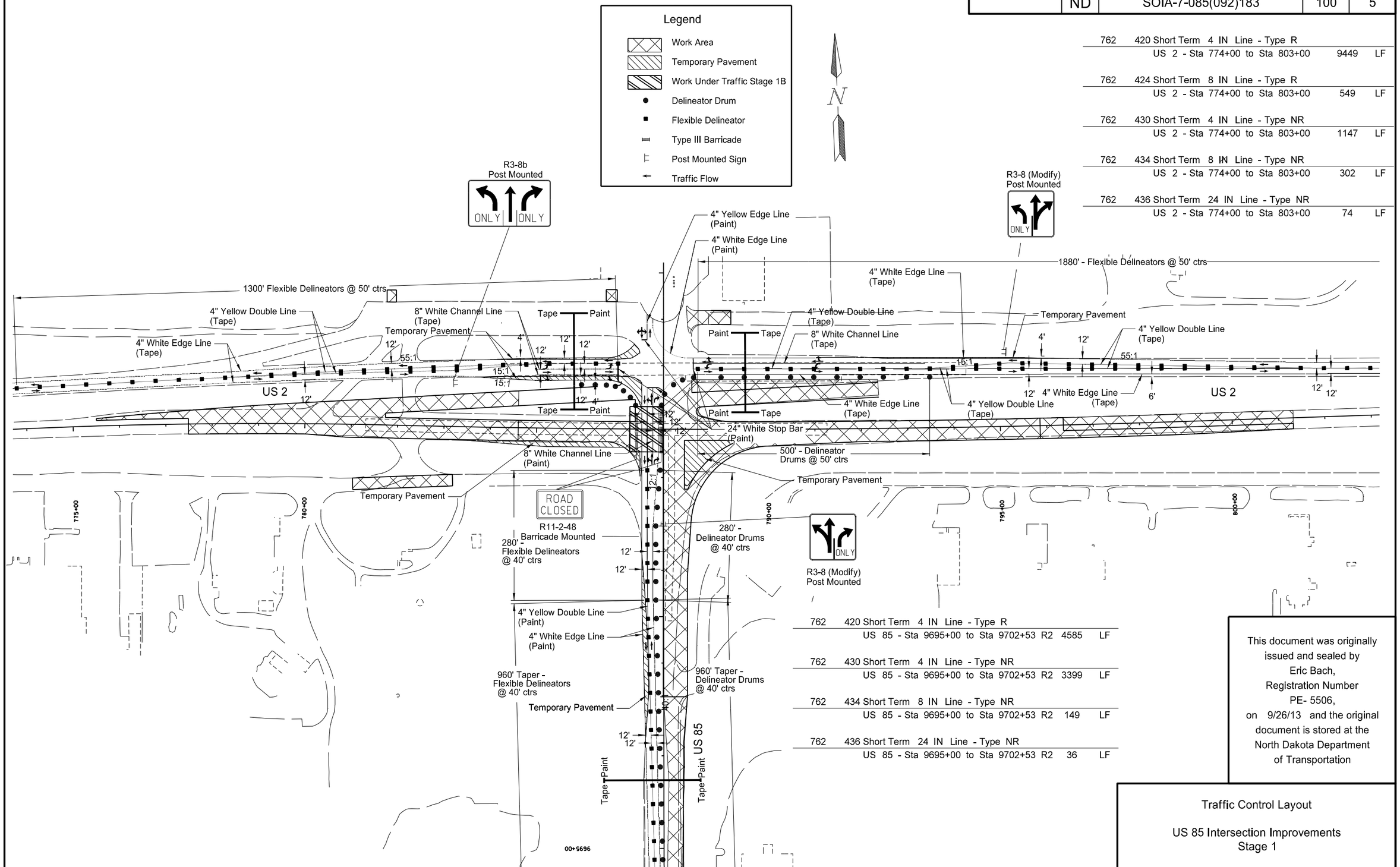
Traffic Control Layout

US 85 Intersection Improvements
Stage 1

US 2
West End of Project to 774+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	5



762	420 Short Term 4 IN Line - Type R			
	US 2 - Sta 774+00 to Sta 803+00	9449	LF	
762	424 Short Term 8 IN Line - Type R			
	US 2 - Sta 774+00 to Sta 803+00	549	LF	
762	430 Short Term 4 IN Line - Type NR			
	US 2 - Sta 774+00 to Sta 803+00	1147	LF	
762	434 Short Term 8 IN Line - Type NR			
	US 2 - Sta 774+00 to Sta 803+00	302	LF	
762	436 Short Term 24 IN Line - Type NR			
	US 2 - Sta 774+00 to Sta 803+00	74	LF	

762	420 Short Term 4 IN Line - Type R			
	US 85 - Sta 9695+00 to Sta 9702+53 R2	4585	LF	
762	430 Short Term 4 IN Line - Type NR			
	US 85 - Sta 9695+00 to Sta 9702+53 R2	3399	LF	
762	434 Short Term 8 IN Line - Type NR			
	US 85 - Sta 9695+00 to Sta 9702+53 R2	149	LF	
762	436 Short Term 24 IN Line - Type NR			
	US 85 - Sta 9695+00 to Sta 9702+53 R2	36	LF	

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Traffic Control Layout

US 85 Intersection Improvements
Stage 1

US 2 - 774+00 to 803+00
US 85 - 9695+00 to US 2

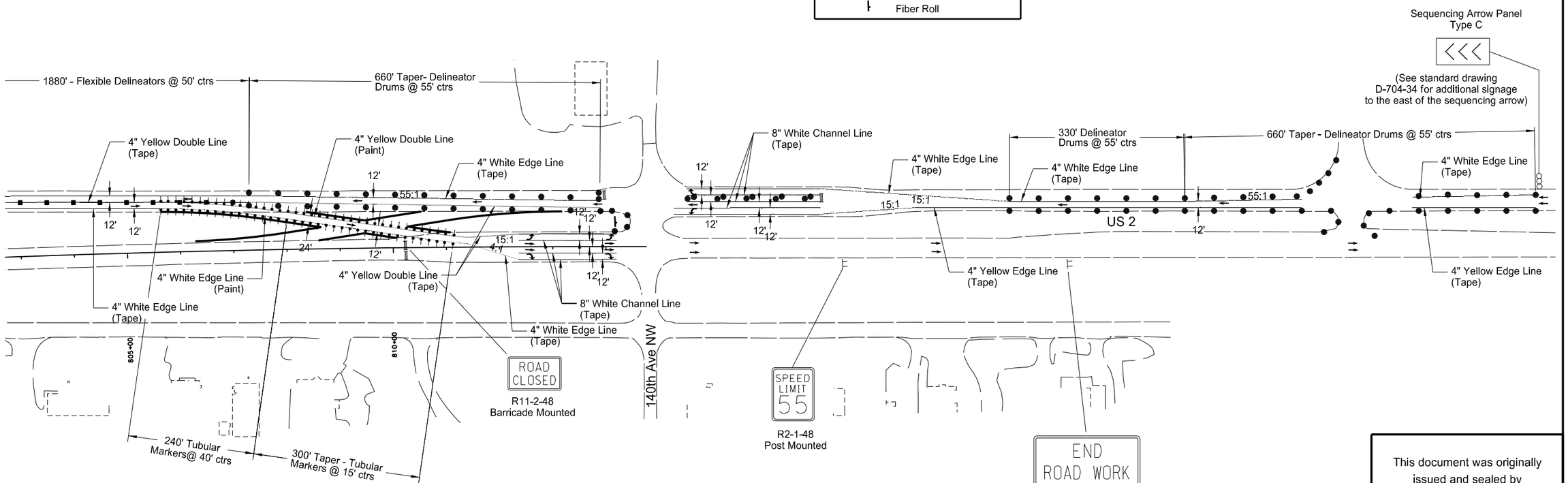
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	6

762	420 Short Term 4 IN Line - Type R			
	Sta 803+00 to East End	7178	LF	
762	424 Short Term 8 IN Line - Type R			
	Sta 803+00 to East End	1326	LF	
762	430 Short Term 4 IN Line - Type NR			
	Sta 803+00 to East End	1748	LF	

Legend

- Delineator Drum
- Flexible Delineator
- Type III Barricade
- Post Mounted Sign
- Tubular Marker
- Traffic Flow
- Fiber Roll

N



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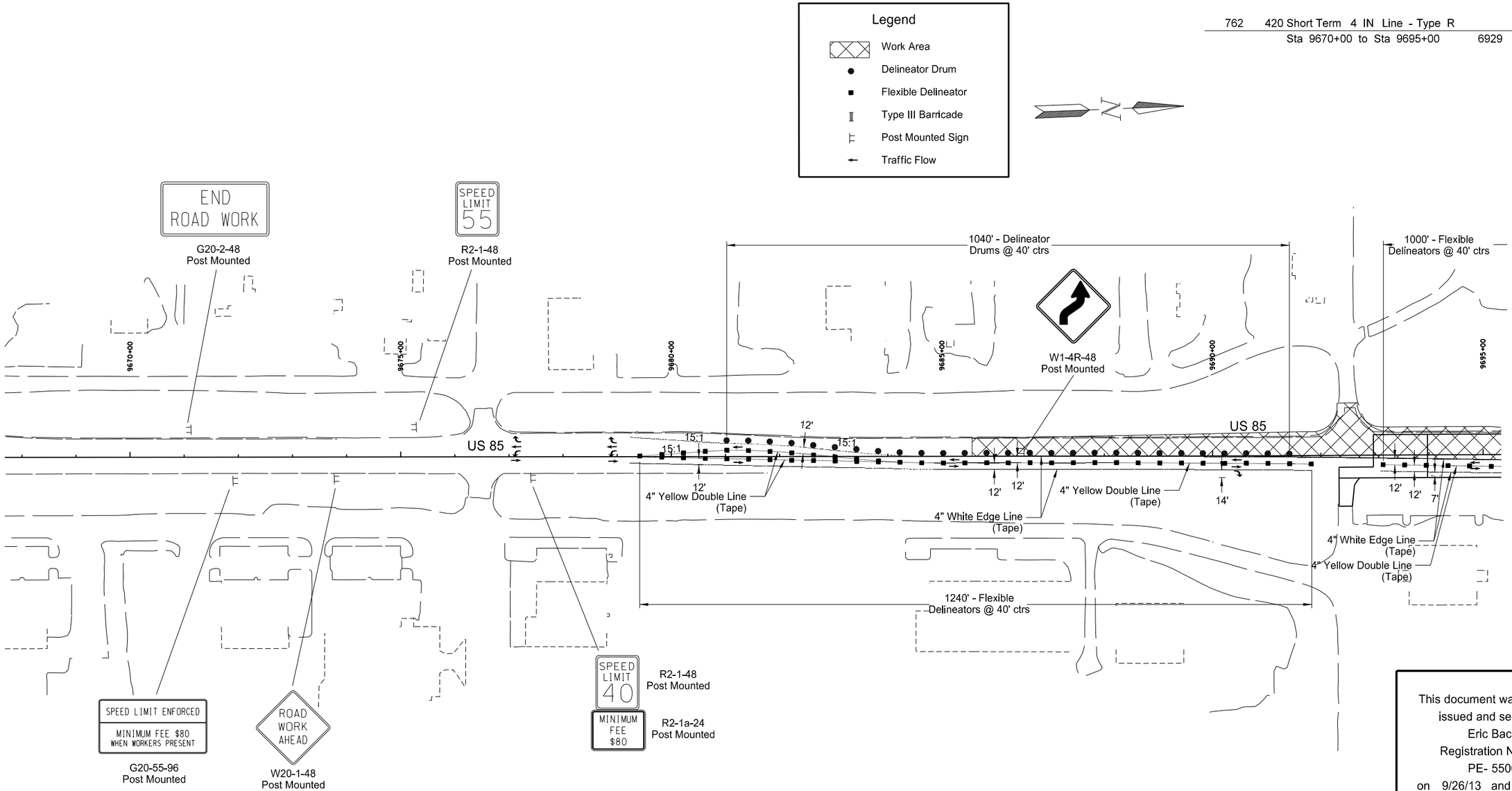
Traffic Control Layout

US 85 Intersection Improvements
Stage 1

US 2
803+00 to East End of Project

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	7

762 420 Short Term 4 IN Line - Type R
Sta 9670+00 to Sta 9695+00 6929 LF



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Traffic Control Layout

US 85 Intersection Improvements
Stage 2

US 85
9670+00 to 9695+00

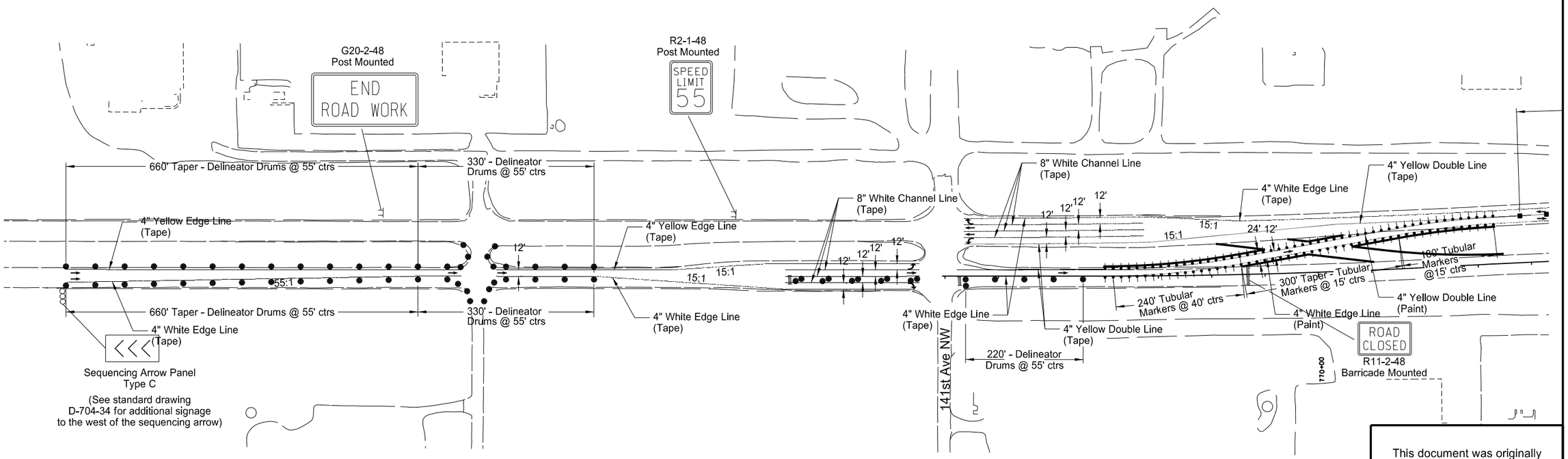
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	7A

Legend

- Delineator Drum
- Flexible Delineator
- Type III Barricade
- Post Mounted Sign
- Tubular Marker
- Traffic Flow

N

762	420 Short Term 4 IN Line - Type R		
	West End to Sta 774+00	8777	LF
762	424 Short Term 8 IN Line - Type R		
	West End to Sta 774+00	1756	LF
762	430 Short Term 4 IN Line - Type NR		
	West End to Sta 774+00	1544	LF



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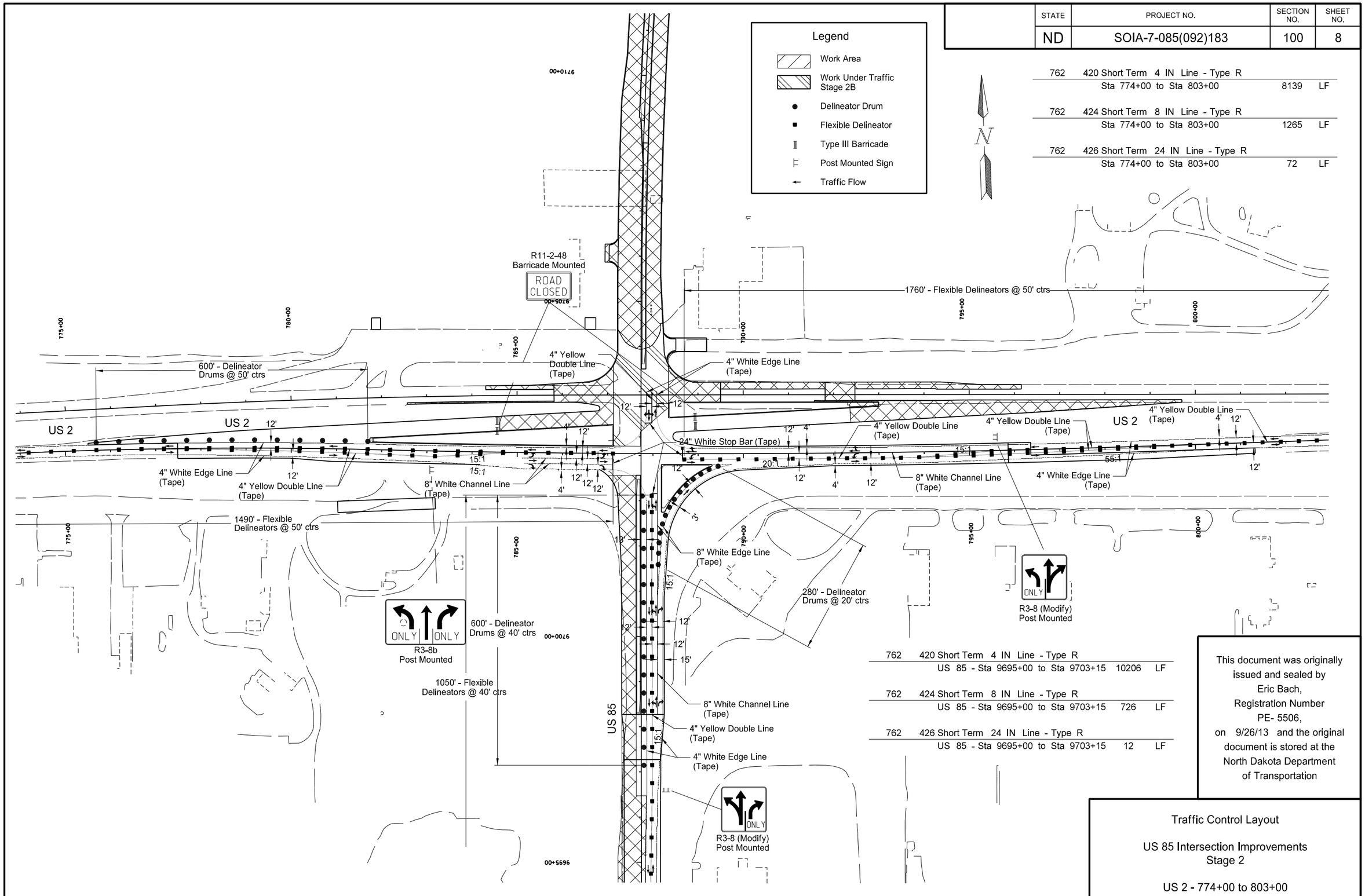
Traffic Control Layout

US 85 Intersection Improvements
Stage 2

US 2- West End of Project to 774+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	8



762	420 Short Term 4 IN Line - Type R		
	Sta 774+00 to Sta 803+00	8139	LF
762	424 Short Term 8 IN Line - Type R		
	Sta 774+00 to Sta 803+00	1265	LF
762	426 Short Term 24 IN Line - Type R		
	Sta 774+00 to Sta 803+00	72	LF

762	420 Short Term 4 IN Line - Type R		
	US 85 - Sta 9695+00 to Sta 9703+15	10206	LF
762	424 Short Term 8 IN Line - Type R		
	US 85 - Sta 9695+00 to Sta 9703+15	726	LF
762	426 Short Term 24 IN Line - Type R		
	US 85 - Sta 9695+00 to Sta 9703+15	12	LF

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Traffic Control Layout

US 85 Intersection Improvements
Stage 2

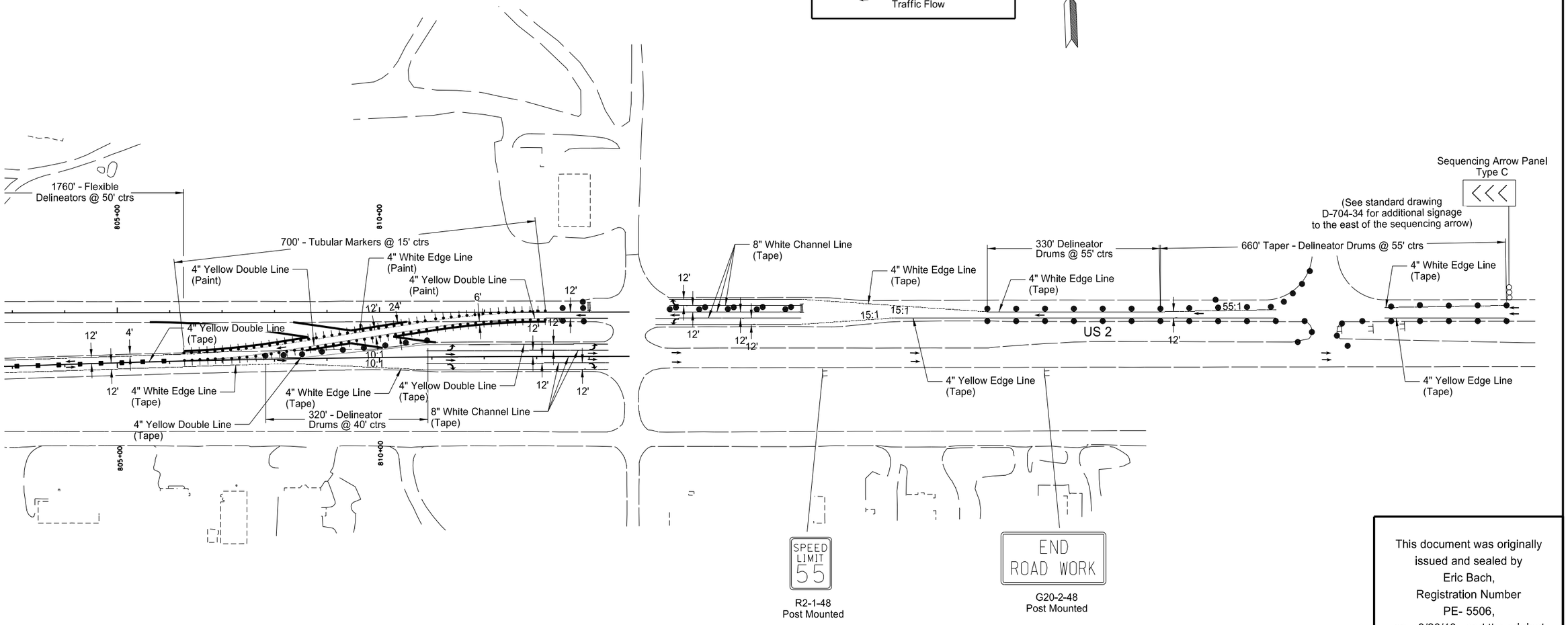
US 2 - 774+00 to 803+00
US 85 - 9695+00 to US 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	9

762	420 Short Term 4 IN Line - Type R		
	Sta 803+00 to East End	6896	LF
762	424 Short Term 8 IN Line - Type R		
	Sta 803+00 to East End	1811	LF
762	430 Short Term 4 IN Line - Type NR		
	Sta 803+00 to East End	2084	LF

Legend

- Delineator Drum
- Flexible Delineator
- Tubular Markers
- Type III Barricade
- Post Mounted Sign
- Traffic Flow



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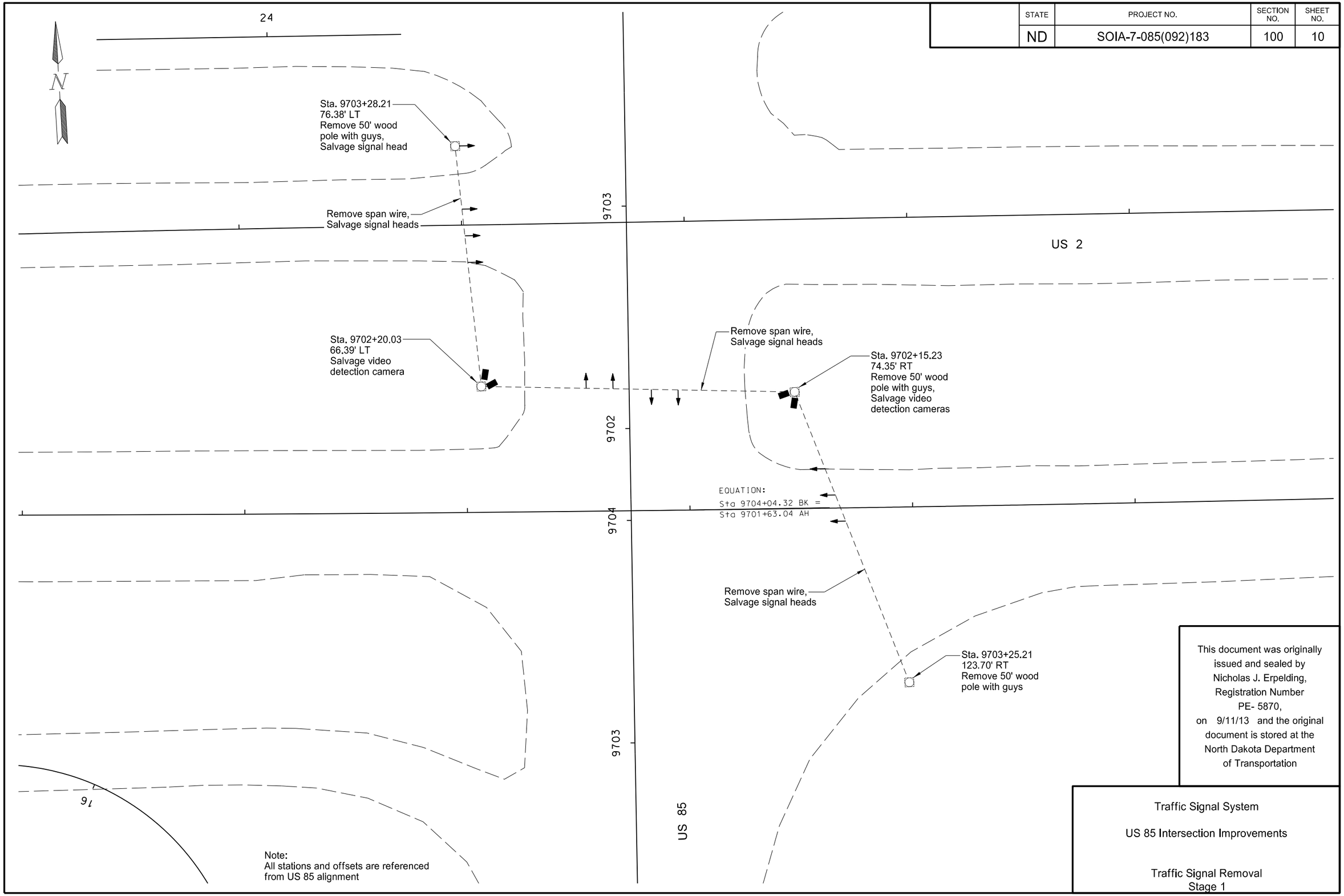
Traffic Control Layout

US 85 Intersection Improvements
Stage 2

US 2
803+00 to East End of Project

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	10



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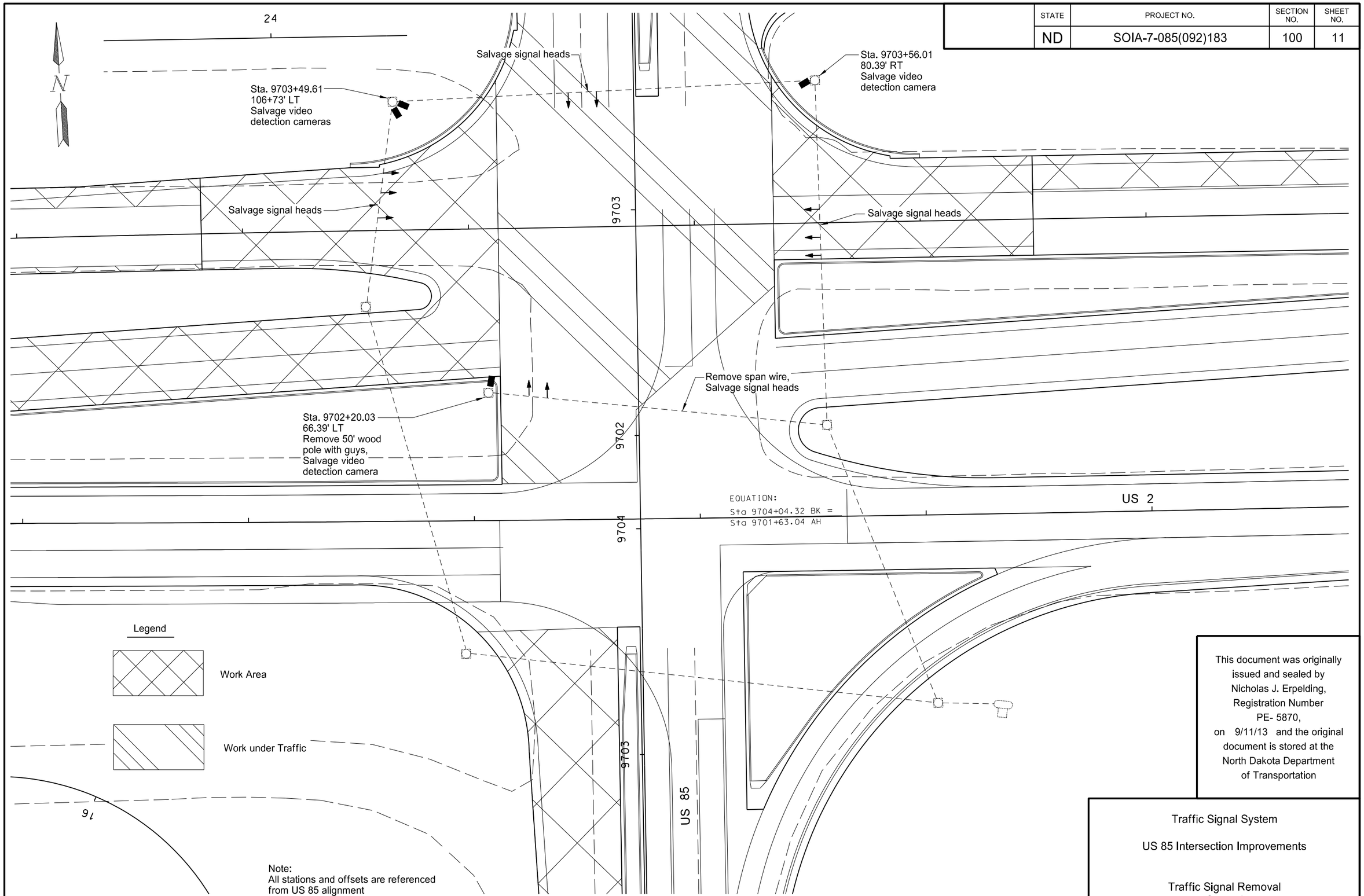
Traffic Signal System

US 85 Intersection Improvements

Traffic Signal Removal
Stage 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	11



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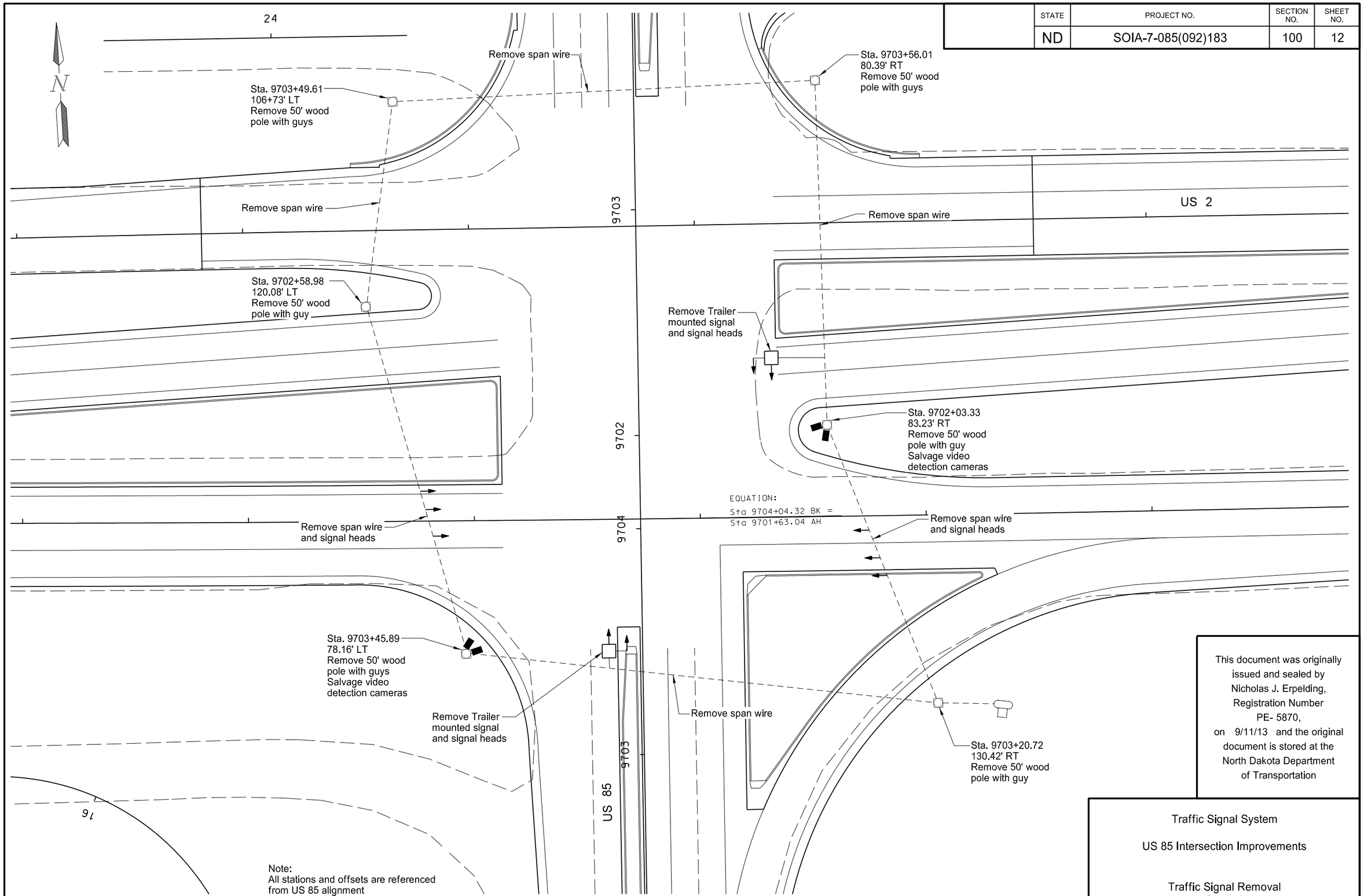
Traffic Signal System

US 85 Intersection Improvements

Traffic Signal Removal
Stage 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	12



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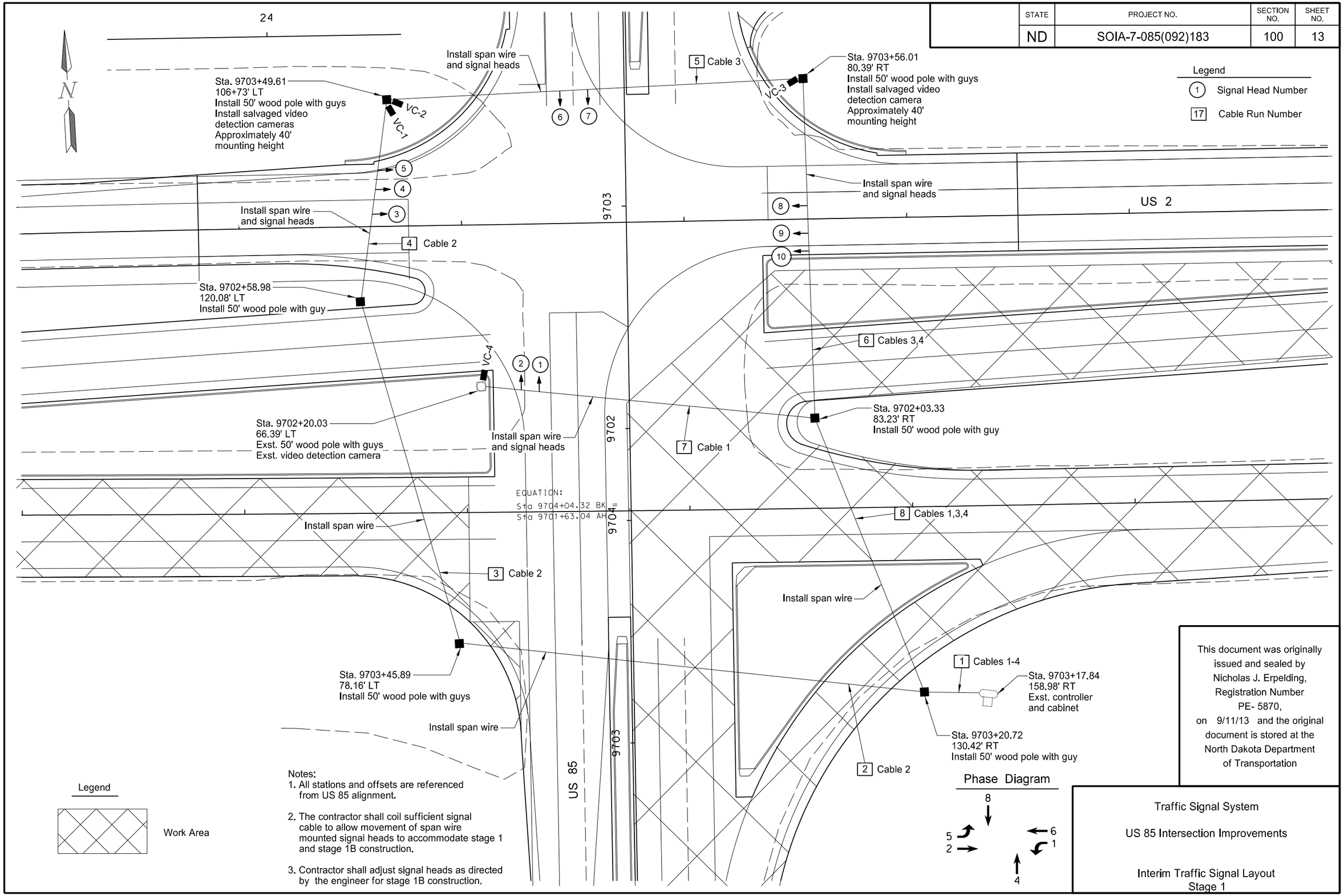
Traffic Signal System

US 85 Intersection Improvements

Traffic Signal Removal
Stage 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	13



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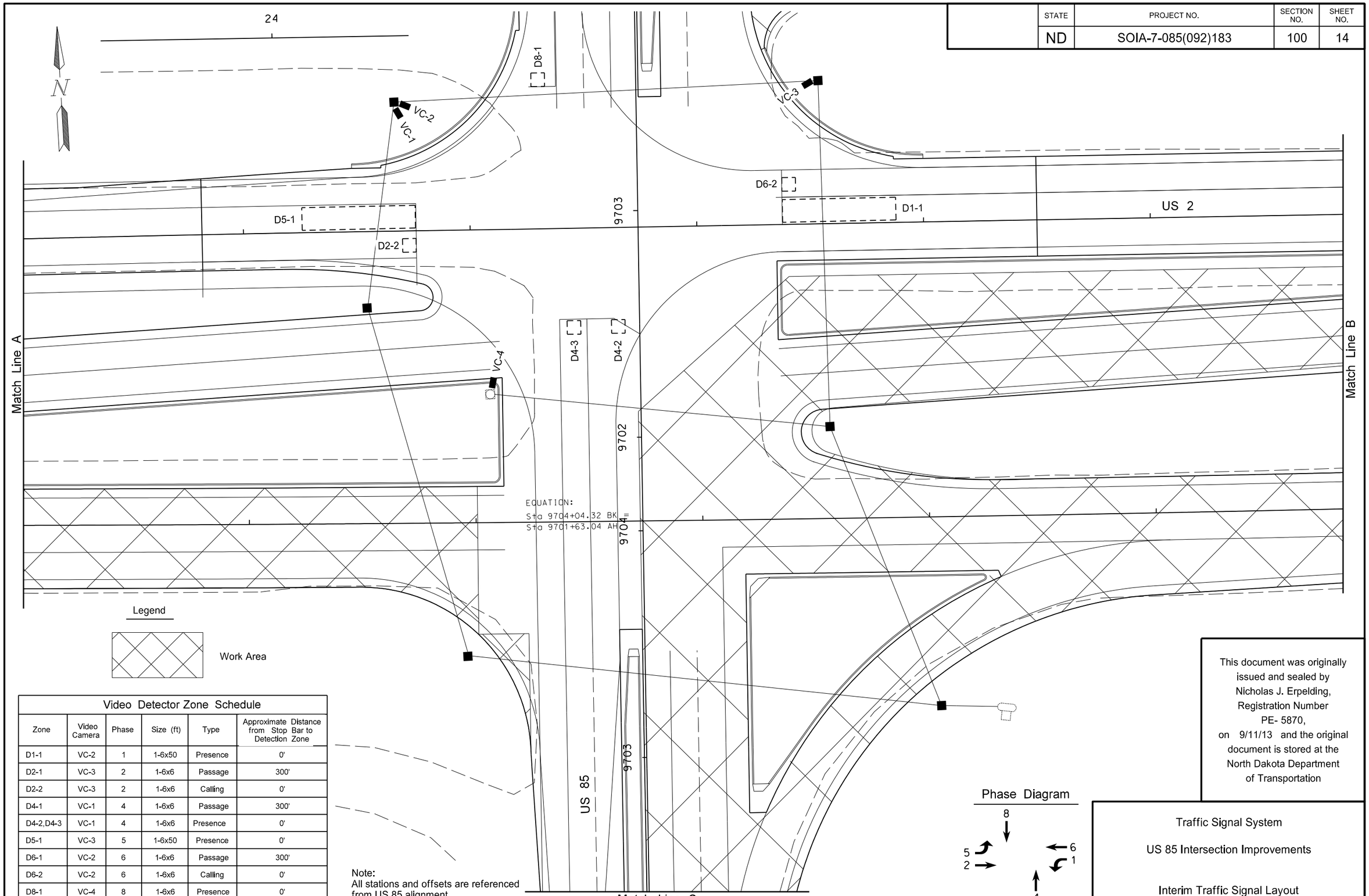
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	14



Video Detector Zone Schedule

Zone	Video Camera	Phase	Size (ft)	Type	Approximate Distance from Stop Bar to Detection Zone
D1-1	VC-2	1	1-6x50	Presence	0'
D2-1	VC-3	2	1-6x6	Passage	300'
D2-2	VC-3	2	1-6x6	Calling	0'
D4-1	VC-1	4	1-6x6	Passage	300'
D4-2,D4-3	VC-1	4	1-6x6	Presence	0'
D5-1	VC-3	5	1-6x50	Presence	0'
D6-1	VC-2	6	1-6x6	Passage	300'
D6-2	VC-2	6	1-6x6	Calling	0'
D8-1	VC-4	8	1-6x6	Presence	0'

Note:
All stations and offsets are referenced from US 85 alignment

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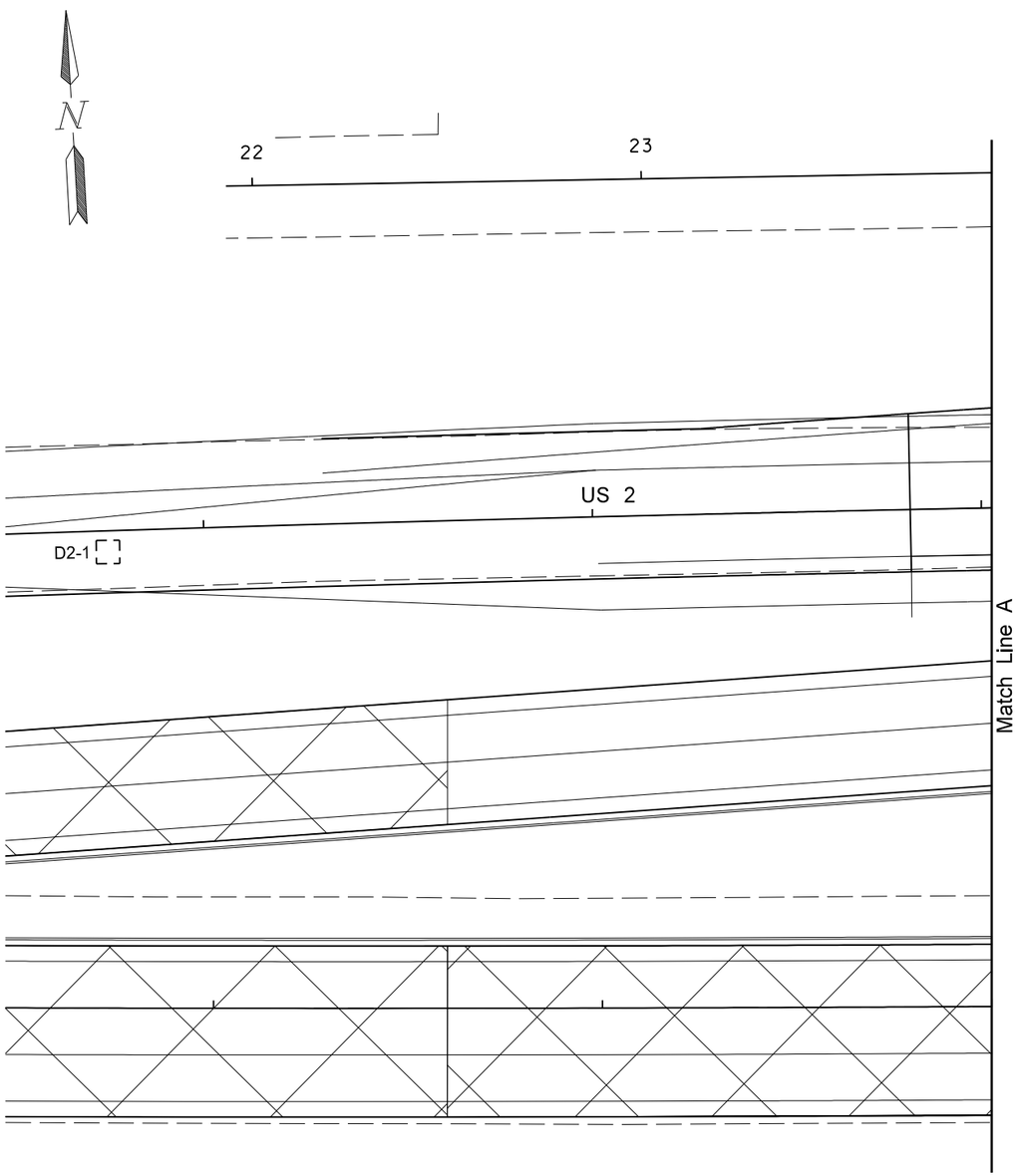
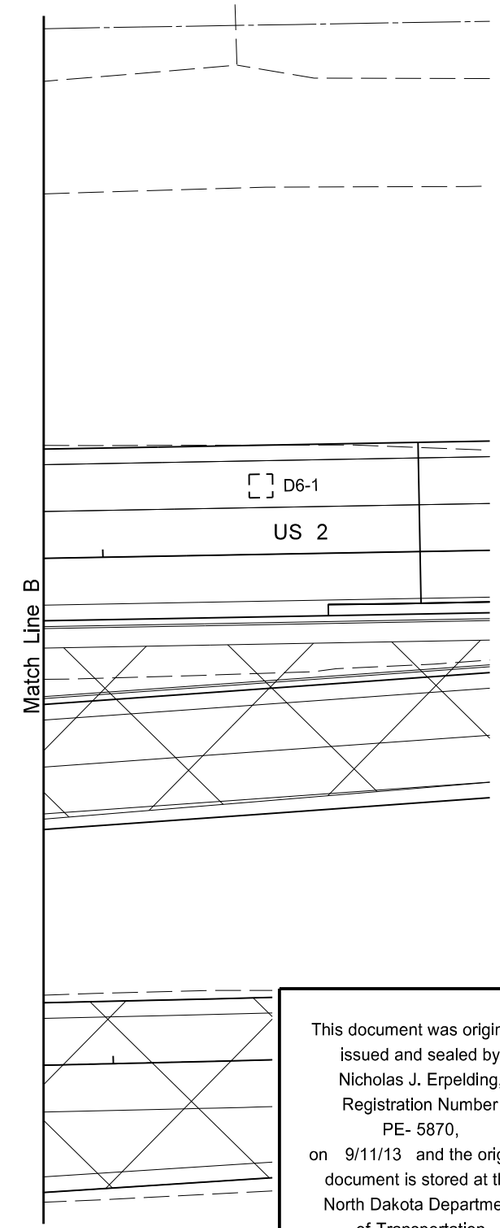
Traffic Signal System

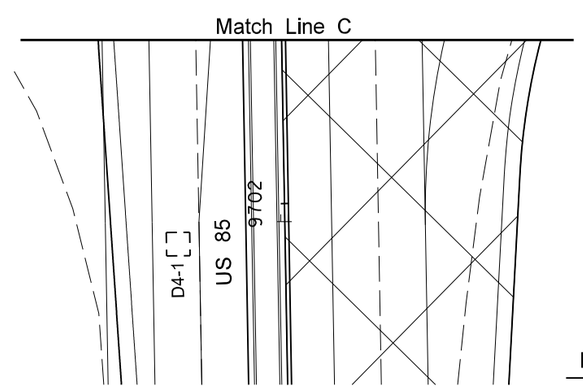
US 85 Intersection Improvements

Interim Traffic Signal Layout
Stage 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	15



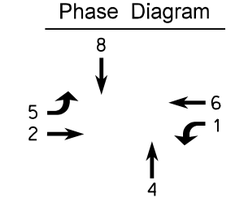




Legend

Work Area

Phase Diagram



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Traffic Signal System

US 85 Intersection Improvements

Interim Traffic Signal Layout
Stage 1

Run	Station	Location	Conduit Run		Cable Run			
			Length	Size	Length	Code	QTY	Type
1	9703+17.84 to 9703+20.72	Existing Controller to Wood Pole	54	2"	128 128 256	A A B	2 2 4	No. 12 AWG 5 Conductor Cable No. 12 AWG 12 Conductor Cable Video Detector Cable
2	9703+20.72 to 9703+45.89	Wood Pole to Wood Pole	208	Span Wire	219 428	A B	1 2	No. 12 AWG 12 Conductor Cable Video Detector Cable
3	9703+45.89 to 9702+58.98	Wood Pole to Wood Pole	164	Span Wire	174 348	A B	1 2	No. 12 AWG 12 Conductor Cable Video Detector Cable
4	9702+58.98 to 9703+49.61	Wood Pole to Wood Pole	88	Span Wire	66 186	A B	1 2	No. 12 AWG 12 Conductor Cable Video Detector Cable
5	9703+56.01 to 9703+49.61	Wood Pole to Wood Pole	187	Span Wire	108	A	1	No.12 AWG 5 Conductor Cable
6	9702+03.33 to 9703+56.01	Wood Pole to Wood Pole	153	Span Wire	163 105 163	A A B	1 1 1	No. 12 AWG 5 Conductor Cable No. 12 AWG 12 Conductor Cable Video Detector Cable
7	9702+03.33 to 9702+20.03	Wood Pole to Existing Wood Pole	150	Span Wire	140 160	A B	1 1	No. 12 AWG 5 Conductor Cable Video Detector Cable
8	9703+20.72 to 9702+03.33	Wood Pole to Wood Pole	132	Span Wire	320 160 320	A A B	2 1 2	No. 12 AWG 5 Conductor Cable No. 12 AWG 12 Conductor Cable Video Detector Cable

Cable Code

A = Signal Control Cable
B = Video Detection Cable

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Traffic Signal System

US 85 Intersection Improvements

Conduit and Conductors
Stage 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	17

N

Head #	Phase 1 R/W	Phase 1 Clear to Phase 2	3	4	5	6	7	8	Phase 2 R/W	Phase 2 Clear to Phase 3	4	5	6	7	8	1	Phase 3 (Not Used) R/W	Phase 3 Clear to Phase 4	5	6	7	8	1	2
1																								
2																								
3	~~G~~	~~Y~~		~~Y~~	(A)	(A)		~~Y~~																
4																								
5																								
6																								
7																								
8																								
9									G		Y	(A)	(A)		Y	Y								
10									G		Y	(A)	(A)		Y	Y								

Head #	Phase 4 R/W	Phase 4 Clear to Phase 5	6	7	8	1	2	3	Phase 5 R/W	Phase 5 Clear to Phase 6	7	8	1	2	3	4	Phase 6 R/W	Phase 6 Clear to Phase 7	8	1	2	3	4	5
1																								
2																								
3																								
4																	G		Y	(A)	(A)		Y	Y
5																	G		Y	(A)	(A)		Y	Y
6	G	Y	Y		(A)	Y	Y																	
7	G	Y	Y		(A)	Y	Y																	
8									~~G~~	~~Y~~		~~Y~~	(A)	(A)		~~Y~~								
9																								
10																								

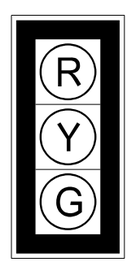
Head #	Phase 7 (Not Used) R/W	Phase 7 Clear to Phase 8	1	2	3	4	5	6	Phase 8 R/W	Phase 8 Clear to Phase 1	2	3	4	5	6	7
1									G	Y	Y		(A)	Y	Y	
2									G	Y	Y		(A)	Y	Y	
3																
4																
5																
6																
7																
8																
9																
10																

Blank squares denote a red indication

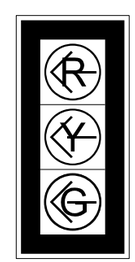
(A) When one phase is on alone any nonconflicting phase may start timing concurrently without a clearance interval (See Chart A)

Chart A

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



(12" Lenses)
Heads 1,2,4,5,6,7,9,10



(12" Lenses)
Heads 3,8

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Notes:

All Heads Shall use LED

5" Louvered Back Plate with Type XI Yellow Reflective Border (typ.) on all heads

Traffic Signal System

US 85 Intersection Improvements

Phasing
Stage 1

US 85 & US 2 Stage 1 Interim Signal

Conductor			Cable 1 (5 No.12 AWG)			Cable 2 (12 No.12 AWG)			Cable 3 (5 No.12 AWG)			Cable 4 (12 No.12 AWG)		
Run	Base	Tracer	Head	Phase	Indication	Head	Phase	Indication	Head	Phase	Indication	Head	Phase	Indication
1	Black		1,2	Ø8	Green	4,5	Ø6	Green	6,7	Ø4	Green	9,10	Ø2	Green
2	White				Neutral			Neutral			Neutral			Neutral
3	Red		1,2	Ø8	Red	4,5	Ø6	Red	6,7	Ø4	Red	9,10	Ø2	Red
4	Green				Ground			Ground			Ground			Ground
5	Orange		1,2	Ø8	Yellow	4,5	Ø6	Yellow	6,7	Ø4	Yellow	9,10	Ø2	Yellow
6	Blue					3	Ø1	Green Left Arrow				8	Ø5	Green Left Arrow
7	White	Black				3	Ø1	Yellow Left Arrow				8	Ø5	Yellow Left Arrow
8	Red	Black				3	Ø1	Red Left Arrow				8	Ø5	Red Left Arrow
9	Green	Black						Spare						Spare
10	Orange	Black						Spare						Spare
11	Blue	Black						Spare						Spare
12	Black	White						Spare						Spare

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Traffic Signal System

US 85 Intersection Improvements

Conductors
Stage 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	19

			Not Used				Not Used	
	01	02	03	04	05	06	07	08
BASIC INTERVALS (OR FUNCTIONS)								
Minimum Initial	7.0	20.0		10.0	7.0	20.0		10.0
Passage Time	1.0	4.5		4.5	1.0	4.5		4.5
Maximum (Maximum Green or Ext.Limit)	20.0	60.0		60.0	20.0	60.0		60.0
Yellow Change	3.0	5.0		4.0	3.0	5.0		4.0
Red Clearance	3.3	1.4		1.5	2.3	1.7		1.7
VOLUME DENSITY TIMING FUNCTIONS VARIABLE INITIAL TIMING OPTIONS								
Actuations Before Added Initial	-	-		-	-	-		-
Added Initial per Actuation	-	-		-	-	-		-
Maximum Initial	-	-		-	-	-		-
TIME WAITING GAP REDUCTION OPTIONS								
Time Before Reduction	-	20.0		-	-	20.0		-
Time to Reduce to Minimum Gap	-	20.0		-	-	20.0		-
Minimum Gap	-	2.0		-	-	2.0		-
Locking Memory	X	X		X	X	X		X
Non-Locking Memory								
Phase recall (Y/N)	N	Y		N	N	Y		N
Flashing-Normal & Conflict Monitor	R	R		R	R	R		R
Start Up Phasing	R	G		R	R	G		R
Type of Detector – Presence	X				X			
Type of Detector – Calling		X		X		X		X
Type of Detector – Passage		X		X		X		X
Emergency Vehicle Pre-emption								

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Traffic Signal System

US 85 Intersection Improvements

Controller Settings
Stage 1

SPEC	CODE	ITEM DESCRIPTION	UNIT	TOTAL
		SPAN WIRE	LF	1082
		INSTALL SALVAGED VIDEO DETECTION CAMERA	EA	3
		50FT WOOD POLE WITH GUYS	EA	6
		1-WAY 3 SEC HEAD W/12IN LENS-SPAN WIRE MTD	EA	10
772	0240	2IN DIAMETER RIGID CONDUIT	LF	74
772	0403	NO12 AWG 5 CONDUCTOR CABLE	LF	988
772	0410	NO12 AWG 12 CONDUCTOR CABLE	LF	971
772	2260	VIDEO DETECTION CABLE	LF	1591
		REVISE VIDEO DETECTION SYSTEM	EA	1
772	2800	INTERIM TRAFFIC SIGNAL - SITE 1	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 for "INTERIM TRAFFIC SIGNAL - SITE 1"		

NOTE:
THESE QUANTITIES COVER STAGE 1 OF TWO INTERIM STAGES.

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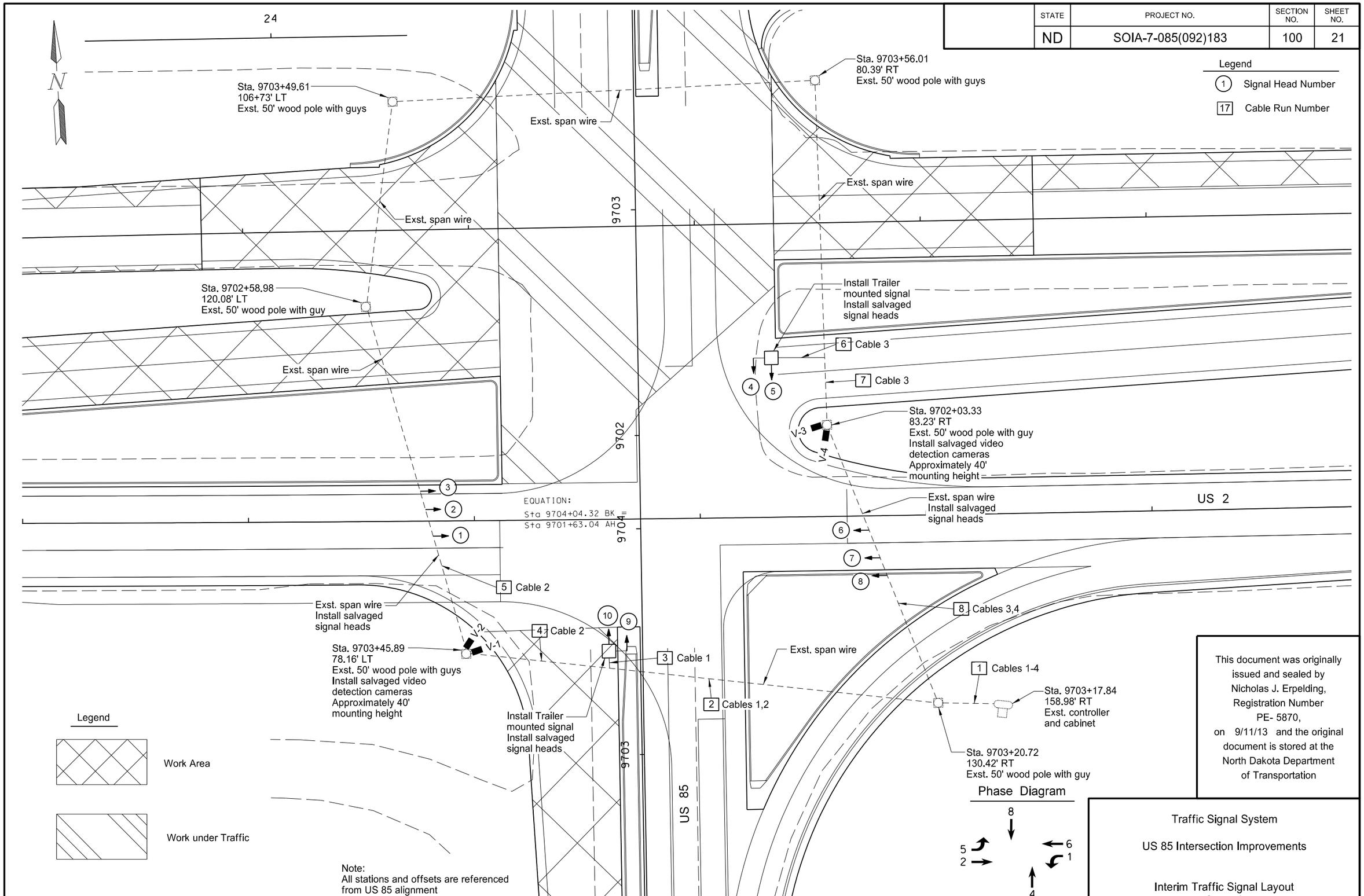
Traffic Signal System

US 85 Intersection Improvements

Estimated Signal Quantities
Stage 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	21



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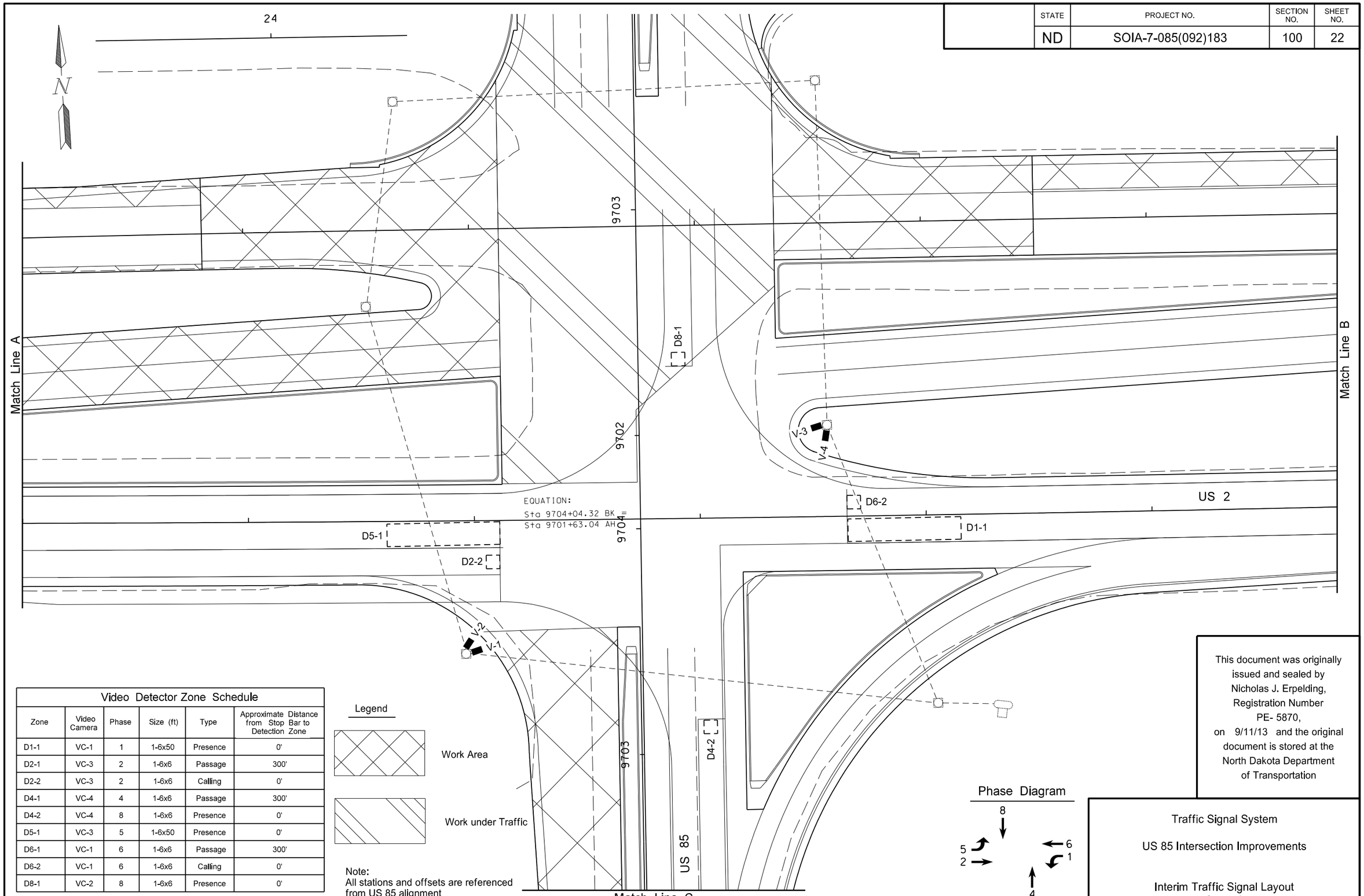
Traffic Signal System

US 85 Intersection Improvements

Interim Traffic Signal Layout
Stage 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	22



Video Detector Zone Schedule

Zone	Video Camera	Phase	Size (ft)	Type	Approximate Distance from Stop Bar to Detection Zone
D1-1	VC-1	1	1-6x50	Presence	0'
D2-1	VC-3	2	1-6x6	Passage	300'
D2-2	VC-3	2	1-6x6	Calling	0'
D4-1	VC-4	4	1-6x6	Passage	300'
D4-2	VC-4	8	1-6x6	Presence	0'
D5-1	VC-3	5	1-6x50	Presence	0'
D6-1	VC-1	6	1-6x6	Passage	300'
D6-2	VC-1	6	1-6x6	Calling	0'
D8-1	VC-2	8	1-6x6	Presence	0'

Legend

Work Area

Work under Traffic

Note:
All stations and offsets are referenced from US 85 alignment

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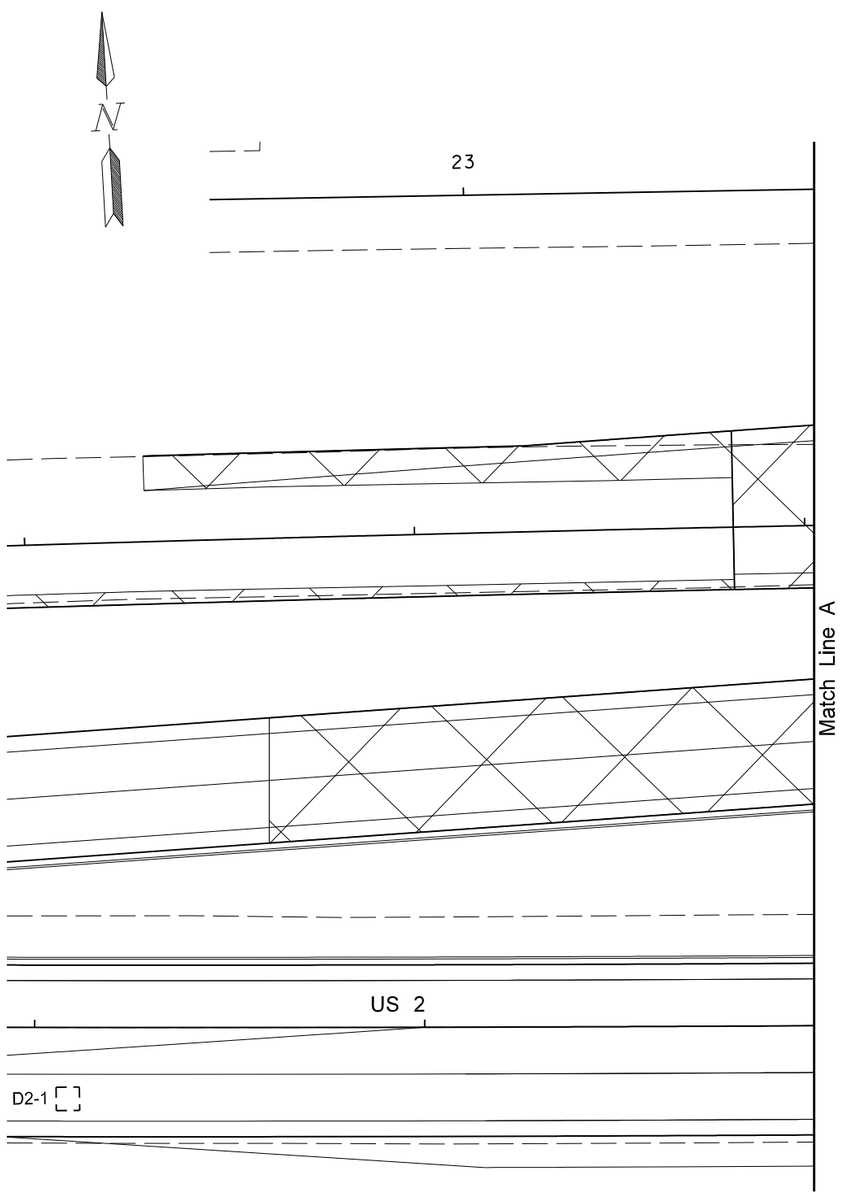
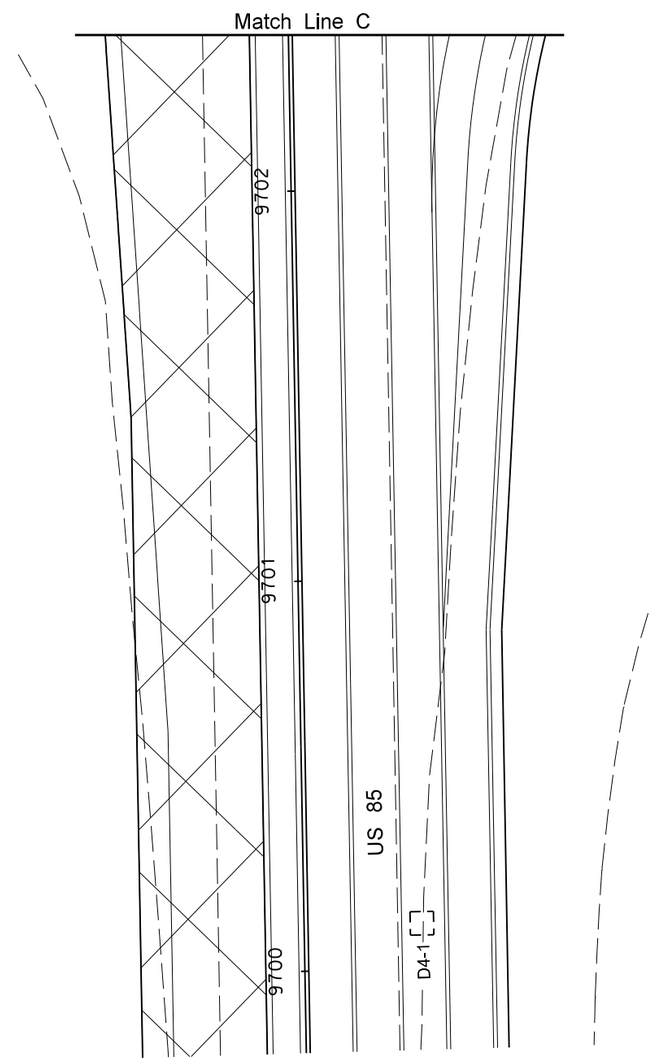
Traffic Signal System

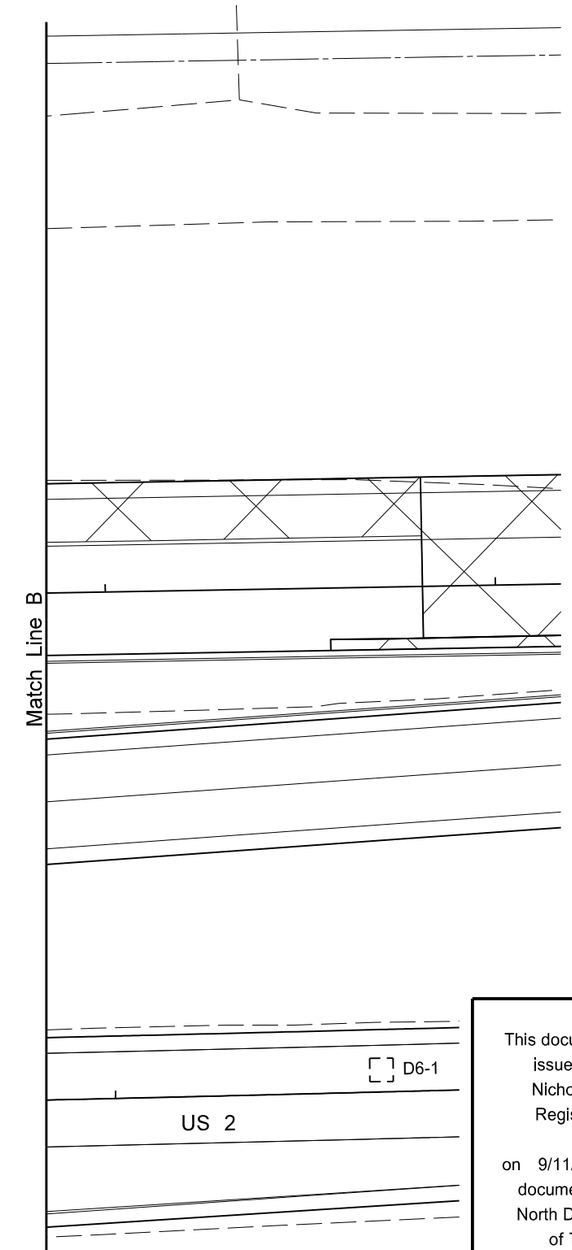
US 85 Intersection Improvements

Interim Traffic Signal Layout
Stage 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	23



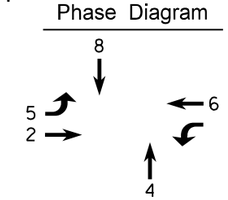




Legend

Work Area

Phase Diagram



Note:
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Traffic Signal System

US 85 Intersection Improvements

Interim Traffic Signal Layout
Stage 2

Run	Station	Location	Conduit Run		Cable Run			
			Length	Size	Length	Code	QTY	Type
1	9703+17.84 to 9703+20.72	Existing Controller to Existing Wood Pole	54	2"	64 192 256	A A B	1 3 4	No. 12 AWG 5 Conductor Cable No. 12 AWG 12 Conductor Cable Video Detector Cable
2	9703+20.72 to Begin - Run 3	Existing Wood Pole to Beginning of Run 3	145	Span Wire	310 310	A B	2 2	No. 12 AWG 12 Conductor Cable Video Detector Cable
3	End - Run 2 to Trailer	End of Run 2 to Trailer Mtd. Signal	10	Span Wire	20	A	1	No. 12 AWG 12 Conductor Cable
4	9703+45.89 to Begin - Run 3	Existing Wood Pole to Beginning of Run 3	63	Span Wire	73 146	A B	1 2	No. 12 AWG 12 Conductor Cable Video Detector Cable
5	9703+45.89 to 9702+58.98	Existing Wood Pole to Existing Wood Pole	164	Span Wire	85	A	1	No.12 AWG 12 Conductor Cable
6	End - Run 7 to Trailer	End of Run 7 to Trailer Mtd. Signal	21	Span Wire	31	A	1	No. 12 AWG 5 Conductor Cable
7	9702+03.33 to Begin - Run 6	Existing Wood Pole to Beginning of Run 6	30	Span Wire	40	A	1	No. 12 AWG 5 Conductor Cable
8	9703+20.72 to 9702+03.33	Existing Wood Pole to Existing Wood Pole	132	Span Wire	142 90 284	A A B	1 1 2	No. 12 AWG 5 Conductor Cable No. 12 AWG 12 Conductor Cable Video Detector Cable

Cable Code

A = Signal Control Cable
B = Video Detection Cable

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Traffic Signal System

US 85 Intersection Improvements

Conduit and Conductors
Stage 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	25

N

Head #	Phase 1 R/W	Phase 1 Clear to Phase 2	3	4	5	6	7	8
1	~~G~~	~~Y~~		~~Y~~	(A)	(A)		~~Y~~
2								
3								
4								
5								
6								
7								
8								
9								
10								

Head #	Phase 2 R/W	Phase 2 Clear to Phase 3	4	5	6	7	8	1
1								
2								
3								
4								
5								
6								
7	G		Y	(A)	(A)		Y	Y
8	G		Y	(A)	(A)		Y	Y
9								
10								

Head #	Phase 3 R/W	Phase 3 Clear to Phase 4	5	6	7	8	1	2
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Head #	Phase 4 R/W	Phase 4 Clear to Phase 5	6	7	8	1	2	3
1								
2								
3								
4	G	Y	Y		(A)	Y	Y	
5	G	Y	Y		(A)	Y	Y	
6								
7								
8								
9								
10								

Head #	Phase 5 R/W	Phase 5 Clear to Phase 6	7	8	1	2	3	4
1								
2								
3								
4								
5								
6	~~G~~	~~Y~~		~~Y~~	(A)	(A)		~~Y~~
7								
8								
9								
10								

Head #	Phase 6 R/W	Phase 6 Clear to Phase 7	8	1	2	3	4	5
1								
2	G		Y	(A)	(A)		Y	Y
3	G		Y	(A)	(A)		Y	Y
4								
5								
6								
7								
8								
9								
10								

Head #	Phase 7 R/W	Phase 7 Clear to Phase 8	1	2	3	4	5	6
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

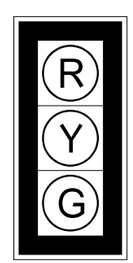
Head #	Phase 8 R/W	Phase 8 Clear to Phase 1	2	3	4	5	6	7
1								
2								
3								
4								
5								
6								
7								
8								
9	G	Y	Y		(A)	Y	Y	
10	G	Y	Y		(A)	Y	Y	

Blank squares denote a red indication

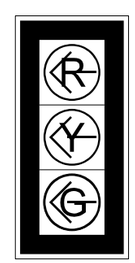
(A) When one phase is on alone any nonconflicting phase may start timing concurrently without a clearance interval (See Chart A)

Chart A

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



(12" Lenses)
Heads 2,3,4,5,7,8,9,10



(12" Lenses)
Heads 1,6

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Notes:

All Heads Shall use LED

5" Louvered Back Plate with Type XI Yellow Reflective Border (typ.) on all heads

Traffic Signal System

US 85 Intersection Improvements

Phasing
Stage 2

US 85 & US 2 Stage 2 Interim Signal

Conductor			Cable 1 (12 No.12 AWG)			Cable 2 (12 No.12 AWG)			Cable 3 (5 No.12 AWG)			Cable 4 (12 No.12 AWG)		
Run	Base	Tracer	Head	Phase	Indication	Head	Phase	Indication	Head	Phase	Indication	Head	Phase	Indication
1	Black		9,10	Ø8	Green	2,3	Ø6	Green	4,5	Ø4	Green	7,8	Ø2	Green
2	White				Neutral			Neutral			Neutral			Neutral
3	Red		9,10	Ø8	Red	2,3	Ø6	Red	4,5	Ø4	Red	7,8	Ø2	Red
4	Green				Ground			Ground			Ground			Ground
5	Orange		9,10	Ø8	Yellow	2,3	Ø6	Yellow	4,5	Ø4	Yellow	7,8	Ø2	Yellow
6	Blue				Spare	1	Ø1	Green Left Arrow				6	Ø5	Green Left Arrow
7	White	Black			Spare	1	Ø1	Yellow Left Arrow				6	Ø5	Yellow Left Arrow
8	Red	Black			Spare	1	Ø1	Red Left Arrow				6	Ø5	Red Left Arrow
9	Green	Black			Spare			Spare						Spare
10	Orange	Black			Spare			Spare						Spare
11	Blue	Black			Spare			Spare						Spare
12	Black	White			Spare			Spare						Spare

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Traffic Signal System

US 85 Intersection Improvements

Conductors
Stage 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	27

N

			Not Used				Not Used	
	01	02	03	04	05	06	07	08
BASIC INTERVALS (OR FUNCTIONS)								
Minimum Initial	7.0	20.0		10.0	7.0	20.0		10.0
Passage Time	1.0	4.5		4.5	1.0	4.5		4.5
Maximum (Maximum Green or Ext.Limit)	20.0	60.0		60.0	20.0	60.0		60.0
Yellow Change	3.0	5.0		4.0	3.0	5.0		4.0
Red Clearance	3.5	1.5		2.0	3.5	1.2		1.9
VOLUME DENSITY TIMING FUNCTIONS VARIABLE INITIAL TIMING OPTIONS								
Actuations Before Added Initial	-	-		-	-	-		-
Added Initial per Actuation	-	-		-	-	-		-
Maximum Initial	-	-		-	-	-		-
TIME WAITING GAP REDUCTION OPTIONS								
Time Before Reduction	-	20.0		-	-	20.0		-
Time to Reduce to Minimum Gap	-	20.0		-	-	20.0		-
Minimum Gap	-	2.0		-	-	2.0		-
Locking Memory	X	X		X	X	X		X
Non-Locking Memory								
Phase recall (Y/N)	N	Y		N	N	Y		N
Flashing-Normal & Conflict Monitor	R	R		R	R	R		R
Start Up Phasing	R	G		R	R	G		R
Type of Detector — Presence	X				X			
Type of Detector — Calling		X		X		X		X
Type of Detector — Passage		X		X		X		X
Emergency Vehicle Pre-emption								

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Traffic Signal System

US 85 Intersection Improvements

Controller Settings
Stage 2

SPEC	CODE	ITEM DESCRIPTION	UNIT	TOTAL
		SPAN WIRE	LF	0
		INSTALL SALVAGED VIDEO DETECTION CAMERA	EA	4
		INSTALL TRAILER MOUNTED SIGNAL	EA	2
		1-WAY 3 SEC HEAD W/12IN LENS-TRAILER MTD	EA	2
		RELOCATE 1-WAY 3 SEC HEAD W/12IN LENS-SPAN WIRE MTD	EA	6
		RELOCATE 1-WAY 5 SEC HEAD W/12IN LENS-SPAN WIRE MTD	EA	2
772	0240	2IN DIAMETER RIGID CONDUIT	LF	54
772	0403	NO12 AWG 5 CONDUCTOR CABLE	LF	277
772	0410	NO12 AWG 12 CONDUCTOR CABLE	LF	770
772	2260	VIDEO DETECTION CABLE	LF	686
		REVISE VIDEO DETECTION SYSTEM	EA	1
772	2800	INTERIM TRAFFIC SIGNAL–SITE 1	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 for "INTERIM TRAFFIC SIGNAL – SITE 1"		

NOTE:
THESE QUANTITIES COVER STAGE 2 OF TWO INTERIM STAGES.

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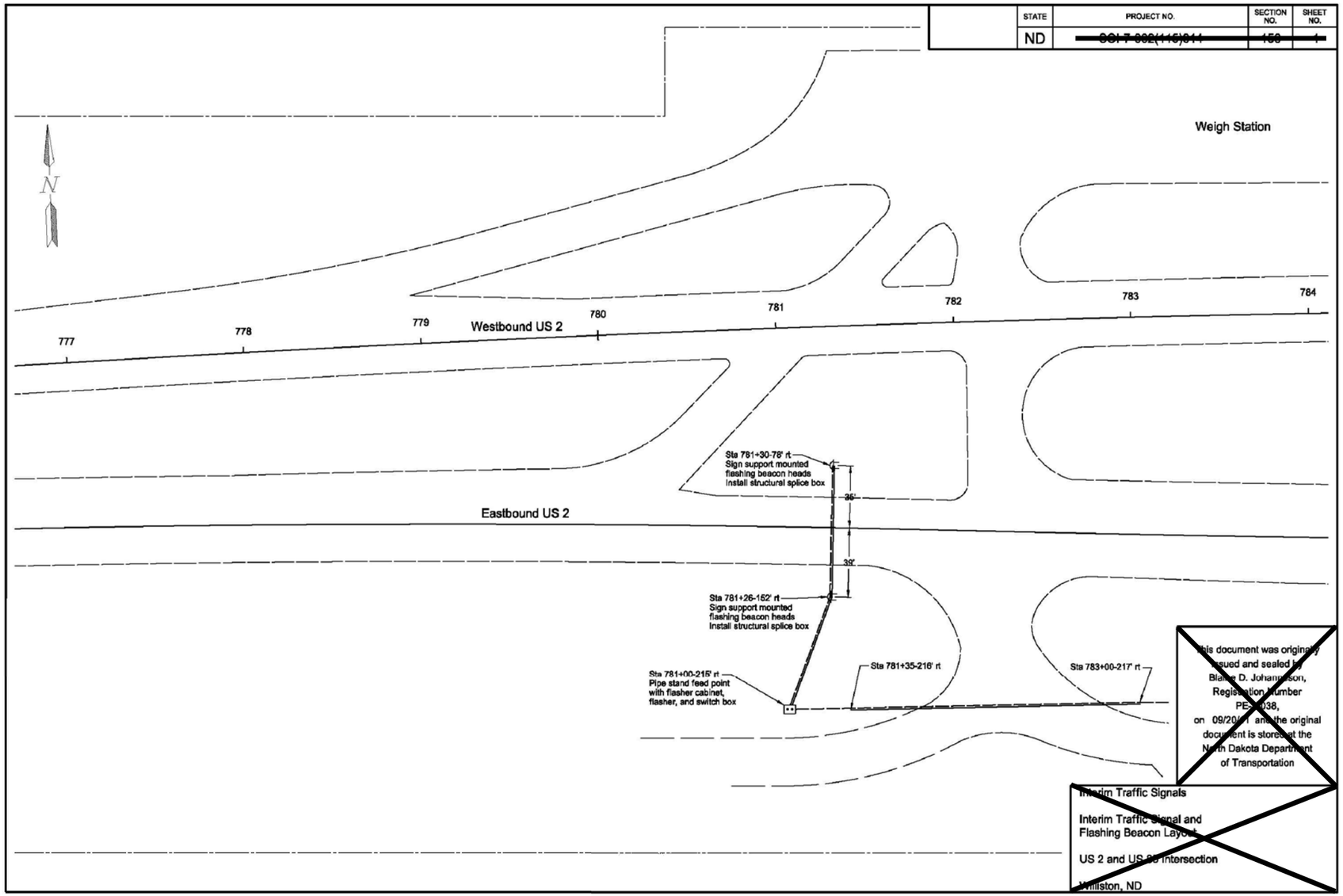
Traffic Signal System

US 85 Intersection Improvements

Estimated Signal Quantities
Stage 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	29



This document was originally issued and sealed by Blaine D. Johanneson, Registration Number PE-[illegible]038, on 09/20/[illegible] and the original document is stored at the North Dakota Department of Transportation

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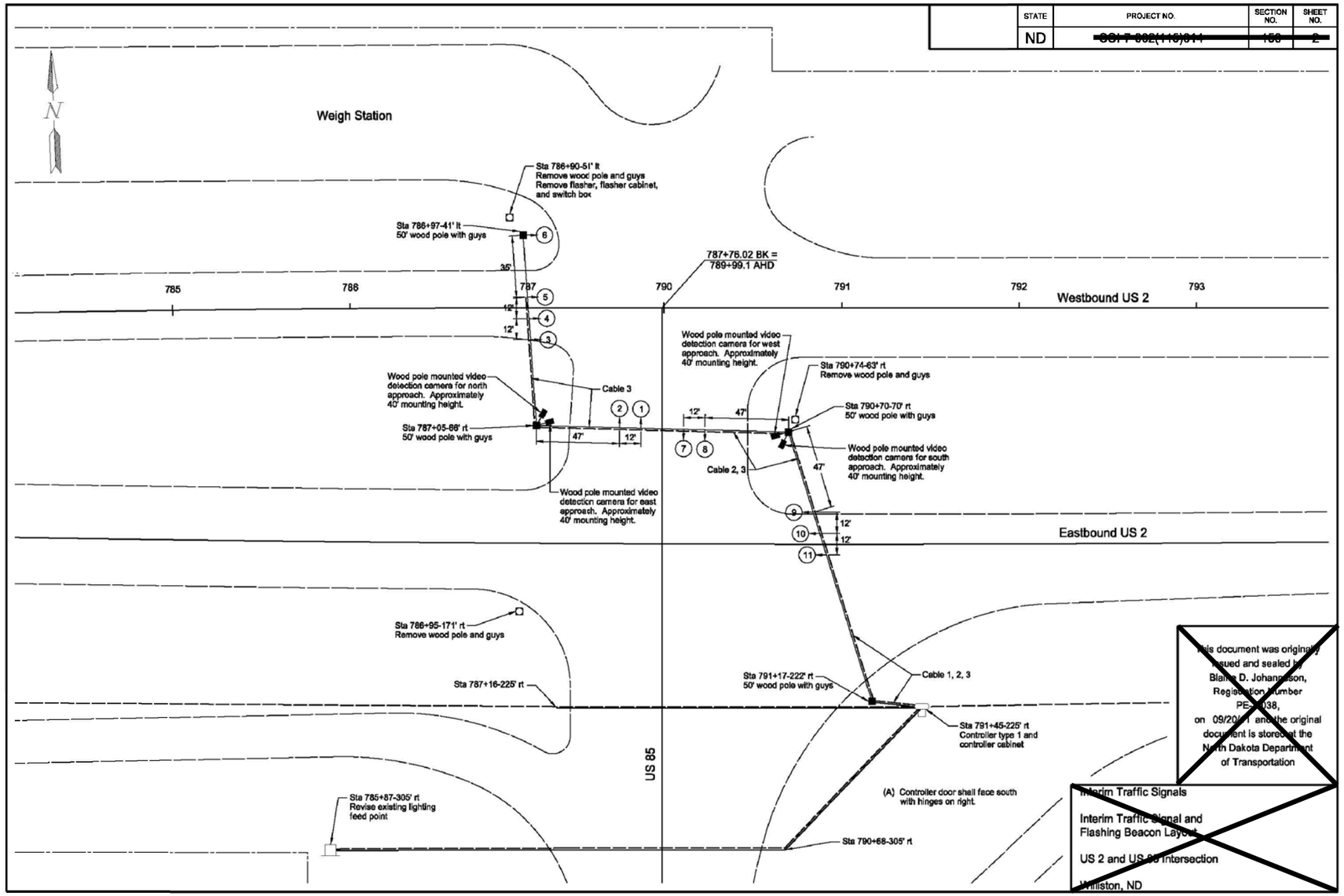
Traffic Signal System

US 85 Intersection Improvements

For Information Only

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	30



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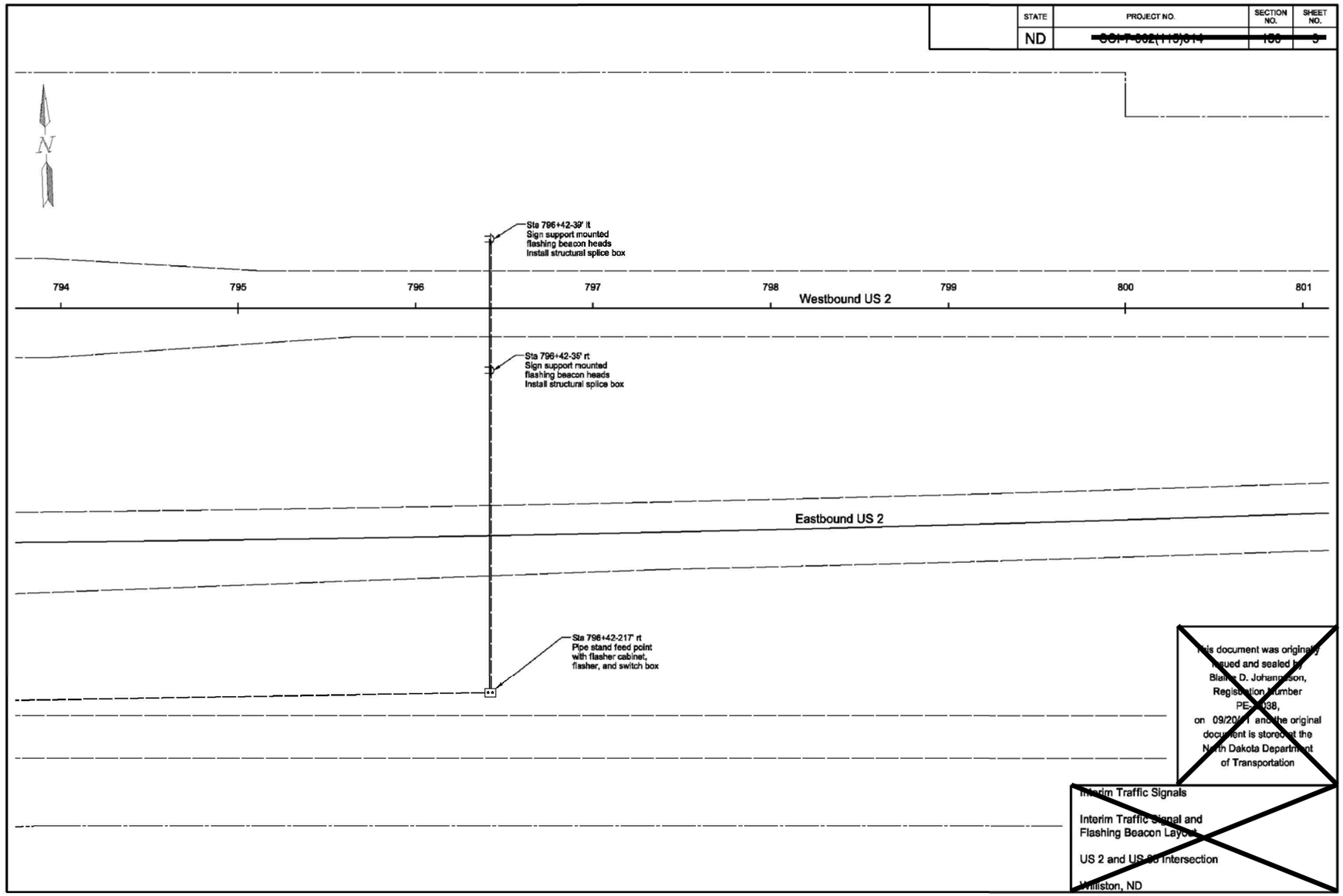
Traffic Signal System

US 85 Intersection Improvements

For Information Only

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	100	31



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Traffic Signal System

US 85 Intersection Improvements

For Information Only

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	110	1

Sta/RP	Sign No.	Assembly No.	Flat Sheet For Signs XI SF	Flat Sheet For Signs IV SF	Sign Support Length 1st LF	Sign Support Length 2nd LF	Sign Support Length 3rd LF	Sign Support Length 4th LF	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
US Highway 85																						
9686+00 Rt		21	16.0		11.6				2.5 x 2.5 10 ga	12.6	3.7				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga			1	
9688+00 Rt		11	12.0		12.1	12.4			2.25 x 2.25 12 ga	12.7						2	4	2.5 x 2.5 12 ga				
9690+00 Rt	SA C			13.4	14.0	14.0			2.5 x 2.5 12 ga	15.6						2	4	3 x 3 7 ga			2	
9691+00 Rt	SA B				13.4	12.4			2.5 x 2.5 12 ga	14.1	3.4				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga	1			
9692+88 Rt		448	8.2		12.8	13.1			2 x 2 12 ga	14.3						2	4	2.25 x 2.25 12 ga				
9693+00 Rt					12.3	12.6	12.9		2.25 x 2.25 12 ga	14.0	3.6	4.0	4.2		2 x 2 12 ga	3	4	3 x 3 7 ga	1			
9694+00 Lt	SA D				11.7				2.5 x 2.5 12 ga	14.4						1	4	3 x 3 7 ga	1			
9695+00 Rt					9.8	10.1	10.7		2.5 x 2.5 12 ga	11.3						3	4	3 x 3 7 ga	1		3	
9696+65 Lt					10.1	11.1			2.25 x 2.25 12 ga	11.5	3.1	4.0			2 x 2 12 ga	2	4	3 x 3 7 ga	1		2	
9697+00 Rt	SA C			13.4	14.6	14.8			2.5 x 2.5 12 ga	15.6						2	4	3 x 3 7 ga			2	
9697+65 Lt		11	12.0		11.4	11.7			2.25 x 2.25 12 ga	12.7						2	4	2.5 x 2.5 12 ga				
9699+00 Lt		21	16.0		13.1	13.4			2.5 x 2.5 10 ga	14.3	2					2	4	3 x 3 7 ga			2	
9701+00 Rt	SA A				14.0				2.5 x 2.5 12 ga	14.1						1	4	3 x 3 7 ga	1			
9701+01 Lt		371			12.3				2.25 x 2.25 12 ga	12.9						1	4	2.5 x 2.5 12 ga	1			
9703+40 Lt mdn		11	12.0		10.2				2.25 x 2.25 12 ga	11.2	3.2				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
9703+69 Rt mdn		11		12.0	10.2				2.25 x 2.25 12 ga	11.2	3.2				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
9707+25 Lt	SA E			31.3	13.2	13.2	13.2		2.25 x 2.25 12 ga	14.6	3.5	3.5	3.5		2 x 2 12 ga	3	4	3 x 3 7 ga			2	
9708+44 Rt		11	12.0		10.2				2.25 x 2.25 12 ga	11.2	3.2				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
9708+44 Lt		11	12.0		10.2				2.25 x 2.25 12 ga	11.2	3.2				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
9711+25 Lt	SN 1			47.5	10.9	10.9	10.9		2.5 x 2.5 10 ga	12.7	3.0	3.0	3.0		2.19 x 2.19 10 ga	3	4	3 x 3 7 ga			3	
Sub Total			100.2	117.6		**Total**	435.5									**Total**	136		7	0	21	

Basis of Estimate
Sign Support Lengths

The sign support lengths have been calculated
using the following vertical clearances:

Rural Roadway – 63”
Urban/rural expressway and freeway - 87" (Offset - 60")

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Signing Summary

US 85 Intersection Improvements

Perforated Tube and W-Shape

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	110	2

Sta/RP	Sign No.	Assembly No.	Flat Sheet For Signs XI SF	Flat Sheet For Signs IV SF	Sign Support Length 1st LF	Sign Support Length 2nd LF	Sign Support Length 3rd LF	Sign Support Length 4th LF	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
US Highway 2 – Eastbound																						
0772+10 Rt		21	16.0		12.2	12.5			2.5 x 2.5 10 ga	14.3						2	4	3 x 3 7 ga			2	
0774+10 Rt	SA B			8.4	12.2	12.2			2.25 x 2.25 12 ga	12.6						2	4	2.5 x 2.5 12 ga				
0776+10 Rt	SA H			15.8	16.2	16.2			2.5 x 2.5 12 ga	16.6	4.8	4.8			2.25 x 2.25 12 ga	2	4	3 x 3 7 ga	1		2	
0778+10 Rt	SA C			13.4	11.8	12.0			2.25 x 2.25 12 ga	12.6						2	4	2.5 x 2.5 12 ga				
0780+10 Lt		58			15.3	15.6	15.8		2.5 x 2.5 12 ga	16.3						3	4	3 x 3 7 ga	1		3	
0780+10 Rt		58			14.9	15.2	15.4		2.5 x 2.5 12 ga	16.3						3	4	3 x 3 7 ga	1		3	
0782+48 Rt					12.2	13.4			2.5 x 2.5 10 ga	14.1	3.7	5.0			2.19 x 2.19 10 ga	2	4	3 x 3 7 ga	1		2	
0784+48 Rt	SA F			53.6	14.0	14.6	15.2	15.8	2.5 x 2.5 10 ga	17.1	3.0	3.6	4.3	4.9	2.19 x 2.19 10 ga	4	4	3 x 3 7 ga			4	
0784+60 Lt mdn		33	6.0		10.8				2.25 x 2.25 12 ga	11.7						1	4	2.5 x 2.5 12 ga				
0784+60 Rt		33	6.0		12.1				2.5 x 2.5 12 ga	14.8						1	4	3 x 3 7 ga				
0786+10 Rt		16	9.0		12.3				2.25 x 2.25 12 ga	13.8	3.9				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
0786+12 Lt		16	9.0		9.5				2.5 x 2.5 12 ga	10.5						1	4	3 x 3 7 ga				
0788+57 Lt mdn		11	12.0		13.1				2.5 x 2.5 12 ga	14.3	4.5				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1	
0789+47 Rt		5	6.9		13.5	14.0			2 x 2 12 ga	15.4						2	4	2.25 x 2.25 12 ga				
0789+99 Rt	SA D				13.6	14.0			2.25 x 2.25 12 ga	14.8						2	4	2.5 x 2.5 12 ga	1			
0790+91 Rt		375			12.9				2.5 x 2.5 12 ga	13.8	4.5				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga	1		1	
0792+10 Rt		21	16.0		14.0	14.5			2.25 x 2.25 12 ga	15.7	4.4	4.9			2 x 2 12 ga	2	4	3 x 3 7 ga			2	
0793+93 Rt					12.6	13.2	13.7		2.5 x 2.5 10 ga	16.4	2.7	3.3	3.9		2.19 x 2.19 10 ga	3	4	3 x 3 7 ga	1		3	
0797+84 Rt		9			11.9				2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga	1			
Sub Total			80.9	91.2		**Total**	488.4									**Total**	144		8	0	24	

Basis of Estimate
Sign Support Lengths

The sign support lengths have been calculated
using the following vertical clearances:

Rural Roadway – 63”

Urban/rural expressway and freeway – 87" (Offset - 60")

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Signing Summary

US 85 Intersection Improvements

Perforated Tube and W-Shape

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	110	3

Sta/RP	Sign No.	Assembly No.	Flat Sheet For Signs XI SF	Flat Sheet For Signs IV SF	Sign Support Length 1st LF	Sign Support Length 2nd LF	Sign Support Length 3rd LF	Sign Support Length 4th LF	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
US Highway 2 - Westbound																						
0784+32 Lt					12.3	13.3			2.5 x 2.5 10 ga	13.9	3.8	4.8			2.19 x 2.19 10 ga	2	4	3 x 3 7 ga	1		2	
0786+18 Lt		377			12.4	13.0			2.5 x 2.5 12 ga	14.3						2	4	3 x 3 7 ga	1		2	
0786+82 Rt mdn		11	12.0		13.3				2.5 x 2.5 12 ga	14.3	4.7				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1	
0789+14 Lt		16	9.0		12.3				2.25 x 2.25 12 ga	13.8	3.9				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
0789+14 Rt mdn		16	9.0		12.6				2.25 x 2.25 12 ga	13.8	4.2				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
0791+64 Lt		33	6.0		11.4				2.25 x 2.25 12 ga	11.7						1	4	2.5 x 2.5 12 ga				
0791+64 Rt		33	6.0		12.1				2.5 x 2.5 12 ga	14.8						1	4	3 x 3 7 ga				
0792+00 Lt	SA A				11.7				2.5 x 2.5 10 ga	12.8						1	4	3 x 3 7 ga1	1		1	
0795+35 Lt		58			14.9	15.2	15.4		2.5 x 2.5 12 ga	16.3						3	4	3 x 3 7 ga	1		3	
0795+35 Rt		58			14.9	15.2	15.4		2.5 x 2.5 12 ga	16.3						3	4	3 x 3 7 ga	1		3	
0797+00 Lt	SA G			55.9	14.0	14.6	15.2	15.8	2.5 x 2.5 10 ga	17.1	3.0	3.6	4.3	4.9	2.19 x 2.19 10 ga	4	4	3 x 3 7 ga			4	
0799+00 Lt					11.8	12.5	13.1	13.8	2.5 x 2.5 12 ga	18.0	1.1	1.8	2.4	3.1	2.25 x 2.25 12 ga	4	4	3 x 3 7 ga	1		4	
0803+35 Lt		21	16.0		12.2	12.5			2.5 x 2.5 10 ga	14.3						2	4	3 x 3 7 ga			2	
Sub Total			58.0	55.9		**Total**	350.9									**Total**	104		6	0	24	
Grand Total			239.1	264.7		**Total**	1274.8									**Total**	388		21	0	69	

Basis of Estimate
Sign Support Lengths

The sign support lengths have been calculated using the following vertical clearances:

Rural Roadway – 63”
Urban/rural expressway and freeway – 87" (Offset - 60")

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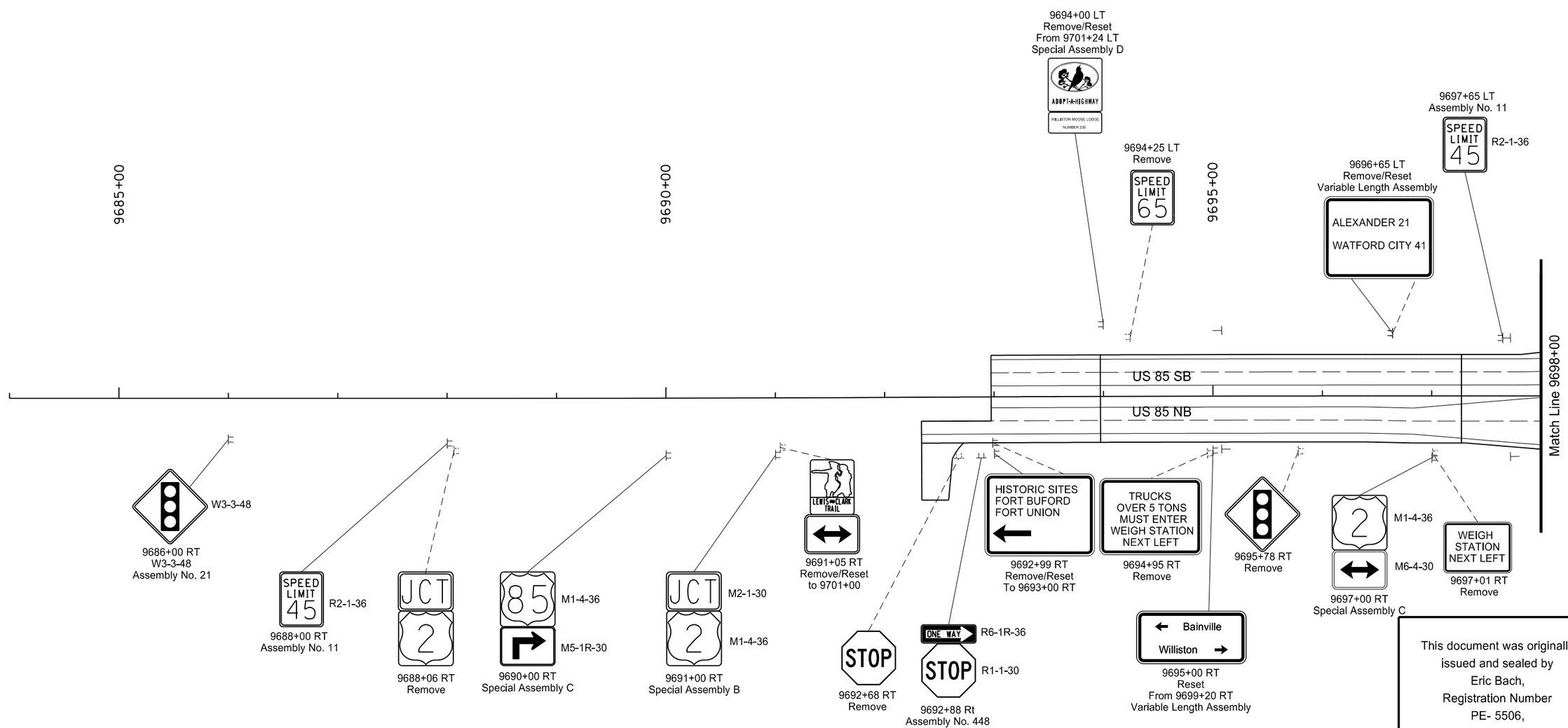
Signing Summary

US 85 Intersection Improvements

Perforated Tube and W-Shape

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	110	4

754	0195	Diamond Grade Delineators-Type A		
		9695+08 LT and RT	2	EA
		9697+72 LT and RT	2	EA



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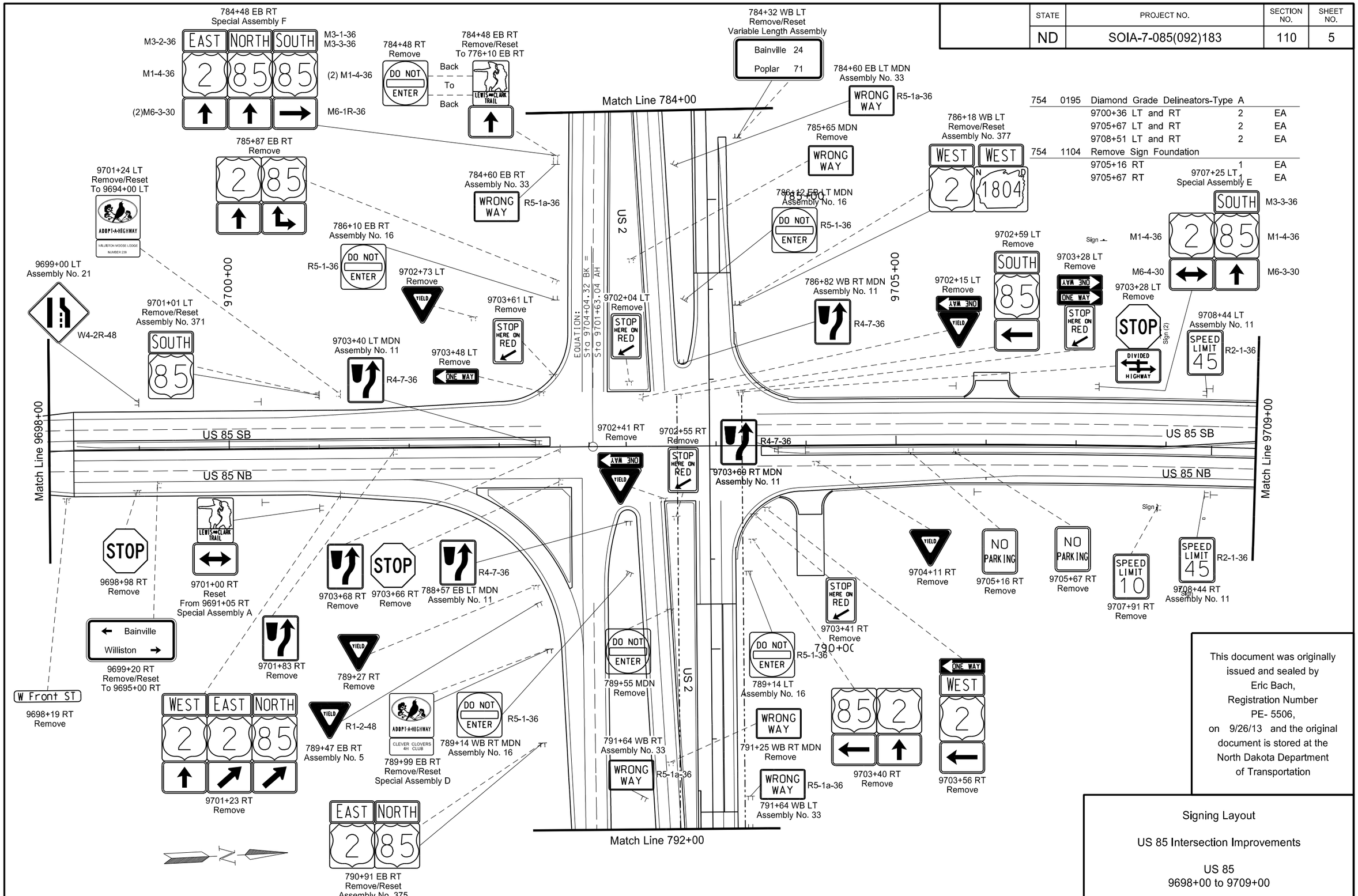
Signing Layout

US 85 Intersection Improvements

US 85
9692+33.41 to 9698+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	110	5



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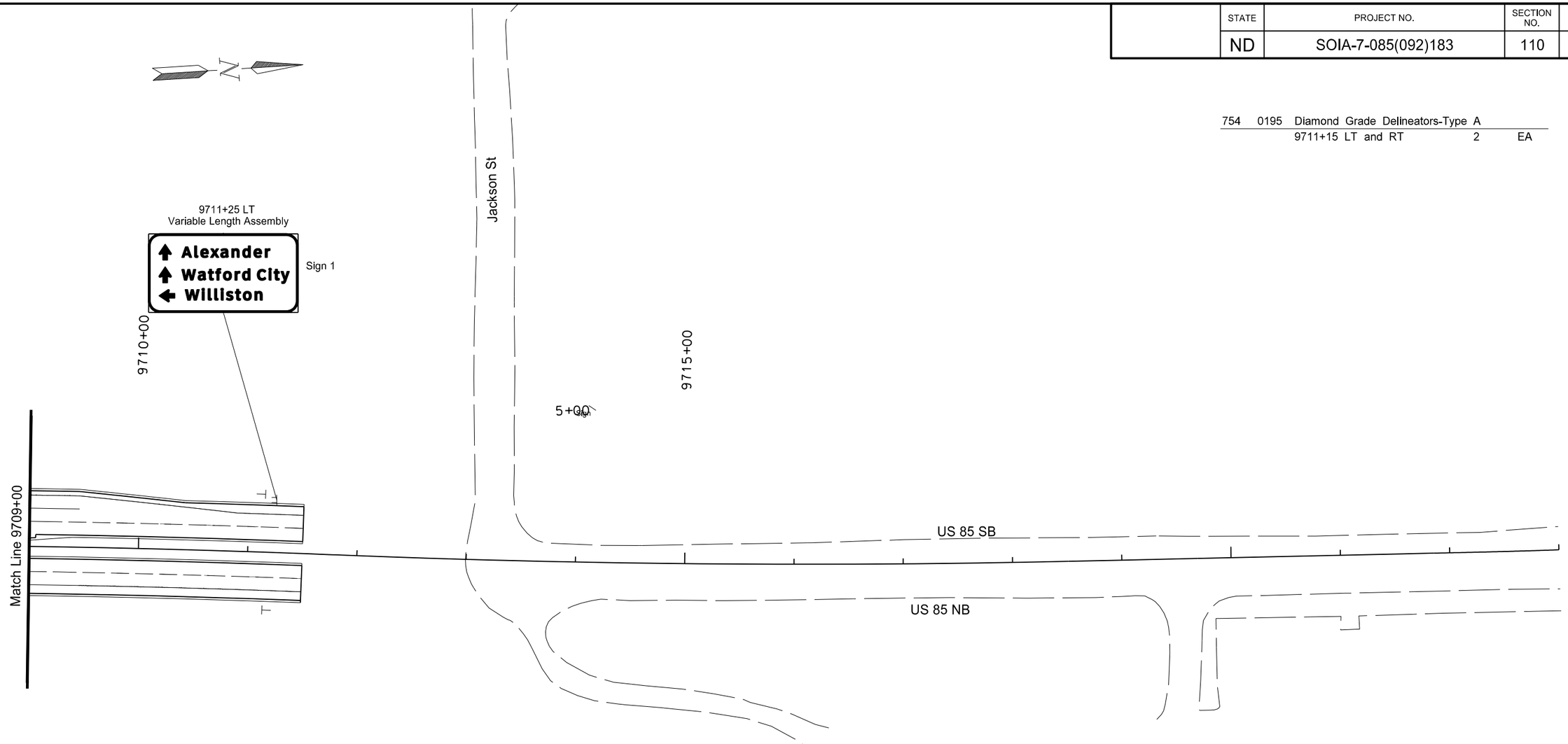
Signing Layout

US 85 Intersection Improvements

US 85
9698+00 to 9709+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	110	6

754	0195	Diamond Grade Delineators-Type A		
		9711+15 LT and RT	2	EA



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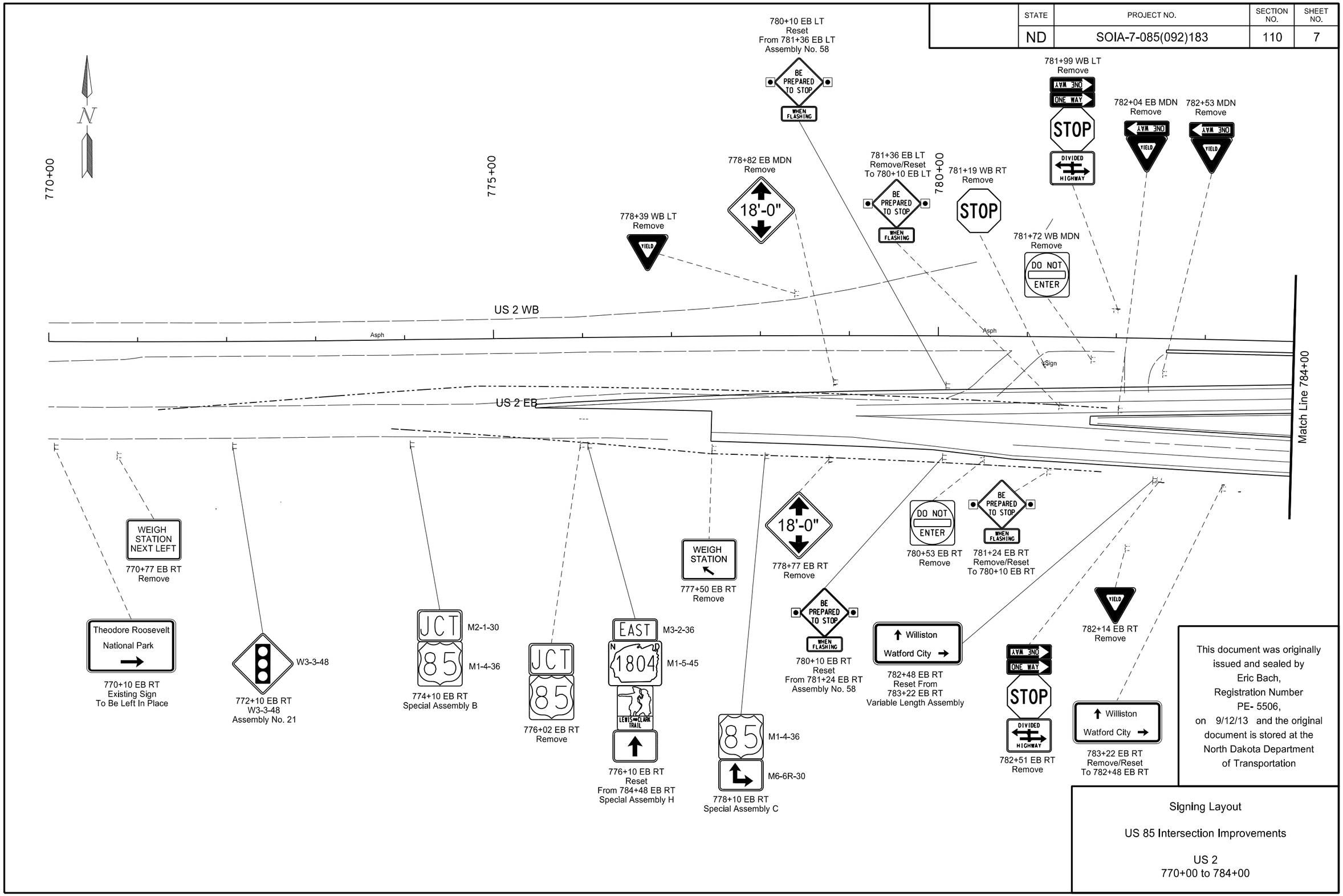
Signing Layout

US 85 Intersection Improvements

US 85
9709+00 to 9723+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	110	7



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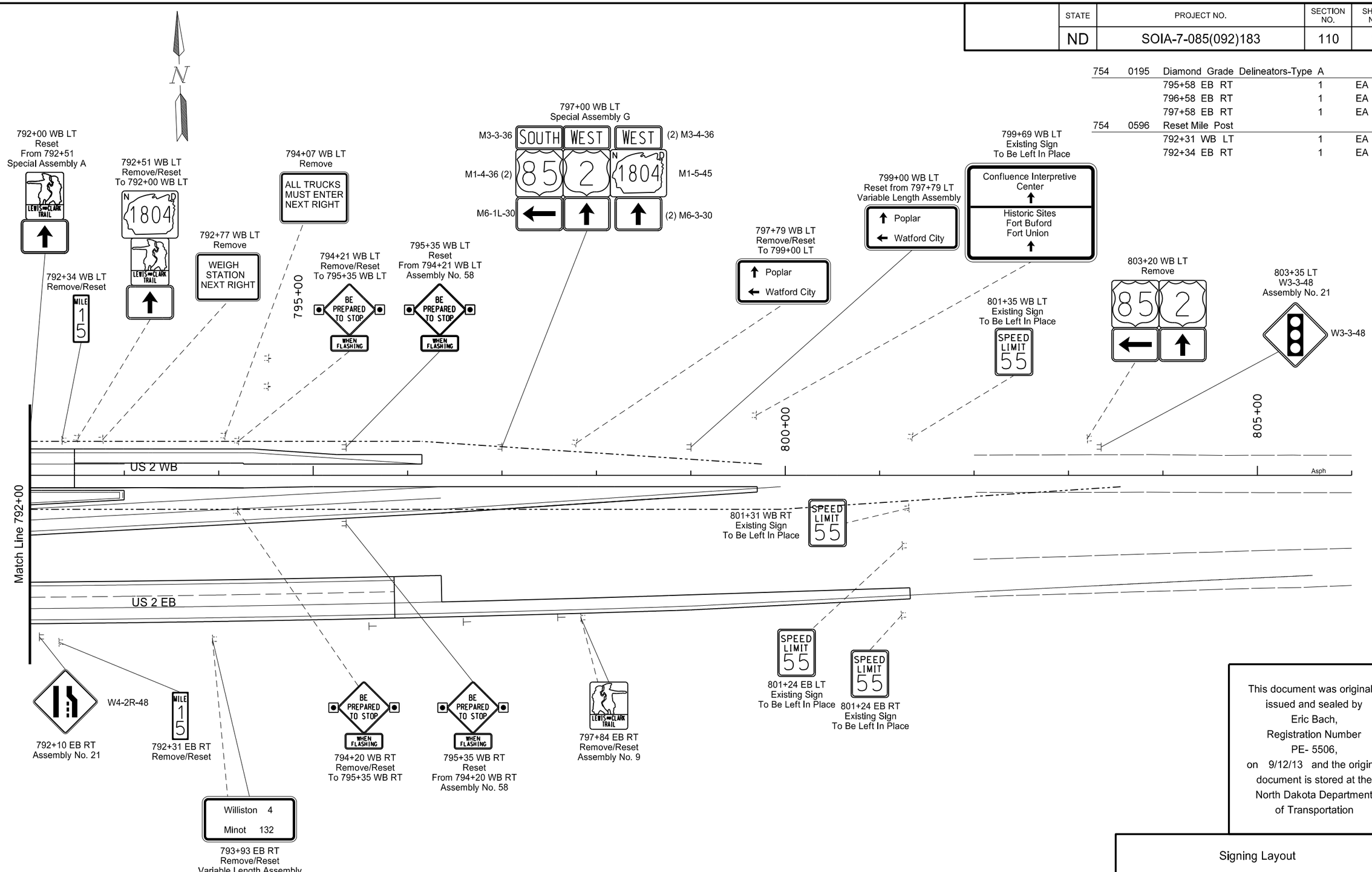
Signing Layout

US 85 Intersection Improvements

US 2
770+00 to 784+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	110	8

754	0195	Diamond Grade Delineators-Type A		
		795+58 EB RT	1	EA
		796+58 EB RT	1	EA
		797+58 EB RT	1	EA
754	0596	Reset Mile Post		
		792+31 WB LT	1	EA
		792+34 EB RT	1	EA



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Signing Layout

US 85 Intersection Improvements

US 2
792+00 to 806+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	110	9

SIGN NUMBER	Sign 1
WIDTH x HEIGHT	10'-0" x 4'-6"
BORDER WIDTH	1.25" (inset 0")
CORNER RADIUS	9"
MOUNTING	Ground
BACKGROUND	TYPE: 3A Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: 3A Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
AREXIT	8	37	8	9	90
AREXIT	8	22	8	9	90
AREXIT	8	8.1	8	9	180

STATION(S):
9711+25 LT

AREA: 45.0 Sq.Ft.

Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Expwy_DestInation,ssl

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
A	l	e	x	a	n	d	e	r											67.3	8/6.5	ClearviewHwy-5-W
26.4	36.1	40.8	48.3	56.1	64.5	72.8	81.3	90													
W	a	t	f	o	r	d		C	i	t	y								85.6	8/6.5	ClearviewHwy-5-W
26.4	38.8	46.5	52.2	58.1	67	72.7	78.5	87.7	96.4	100.4	105.7										
W	i	l	l	i	s	t	o	n											58.7	8/6.5	ClearviewHwy-5-W
26.4	39.2	43.9	48.8	53.6	57.7	64.6	70.6	79.5													

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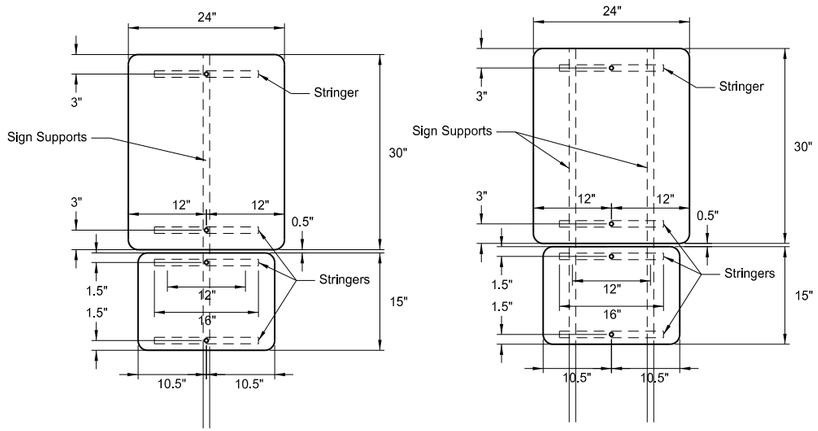
Signing Details

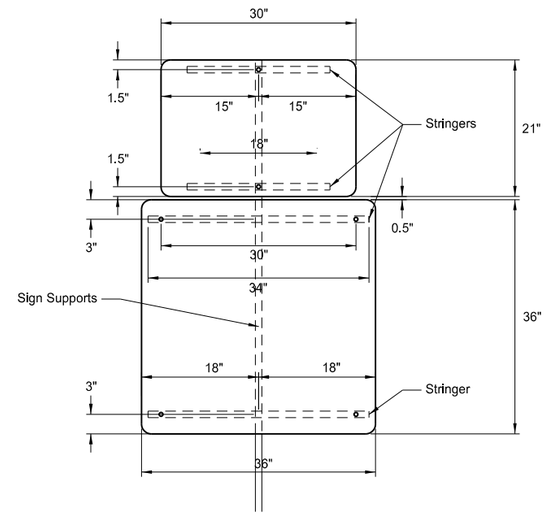
US 85 Intersection Improvements

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	110	10



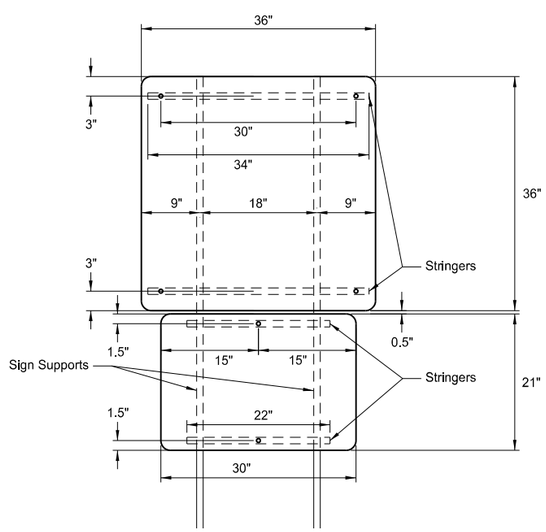
Special Assembly A
US 85: 9701+00 RT
US 2: 792+00 LT

Design Area: 7.2 Sf



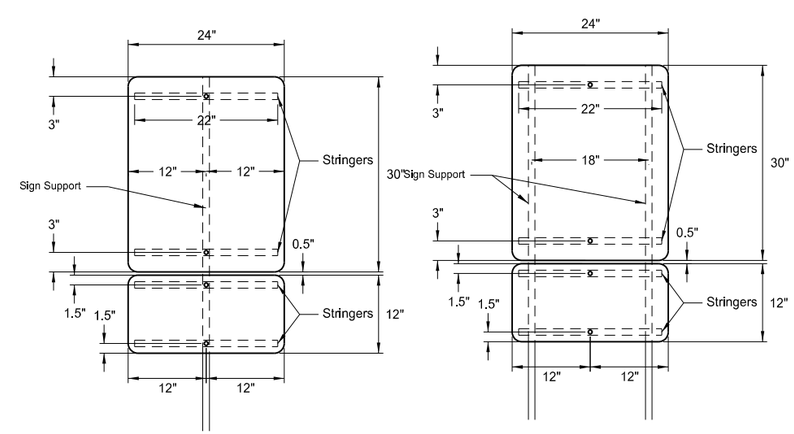
Special Assembly B
US 85: 9691+00 RT
US 2: 774+10 EB RT

Design Area: 13.4 Sf



Special Assembly C
US 85: 9690+00 RT
US 85: 9697+00 RT
US 2: 778+10 EB RT

Design Area: 13.4 Sf



Special Assembly D
US 85: 9694+00 LT
US 2: 789+99 RT

Design Area: 7.0 Sf

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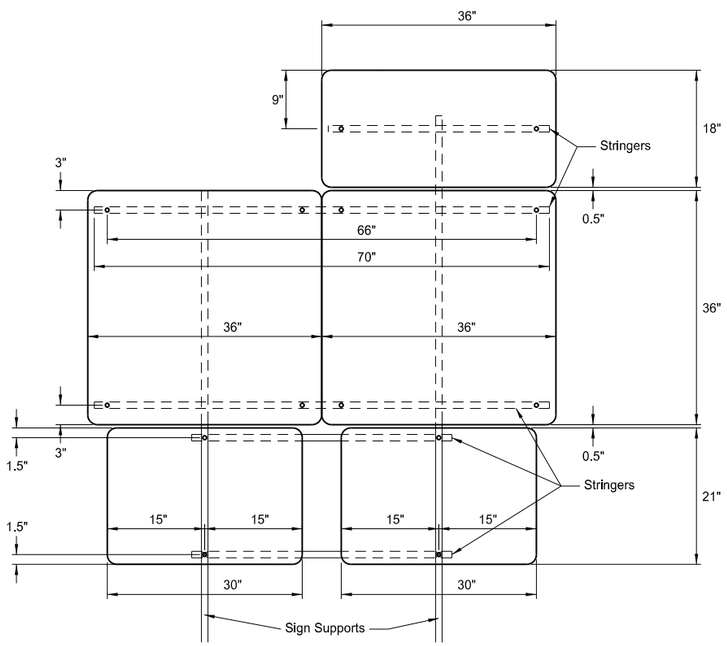
Signing Details

US 85 Intersection Improvements

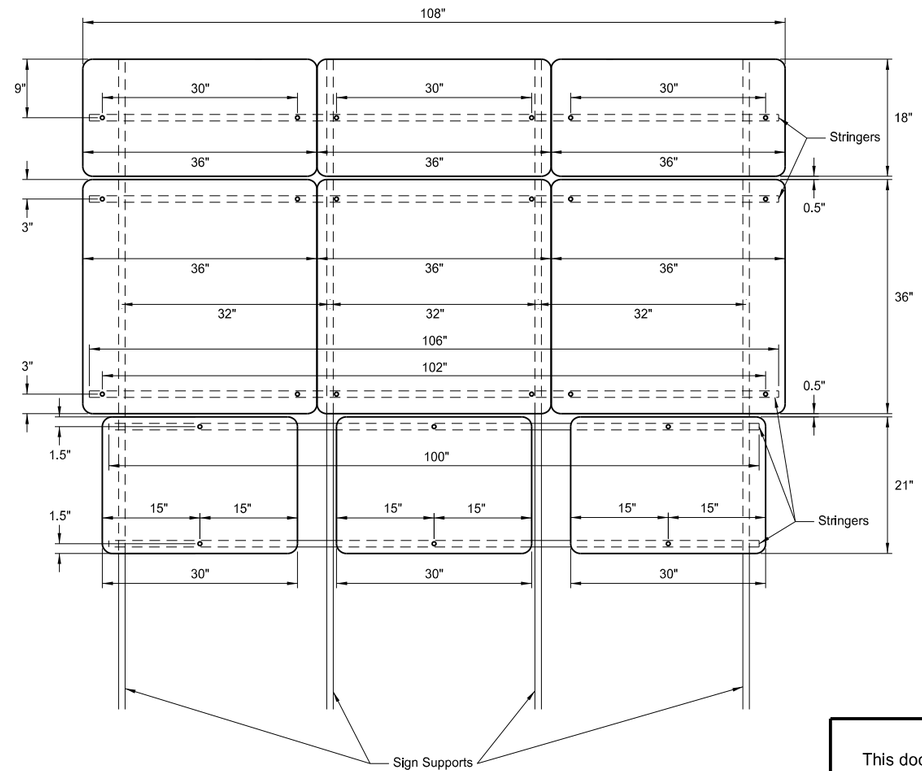
Special Assemblies

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	110	11



Special Assembly E
US 85: 9707+25 LT

Design Area: 31.3 Sf



Special Assembly F
US 2: 784+48 EB RT

Design Area: 53.6 Sf

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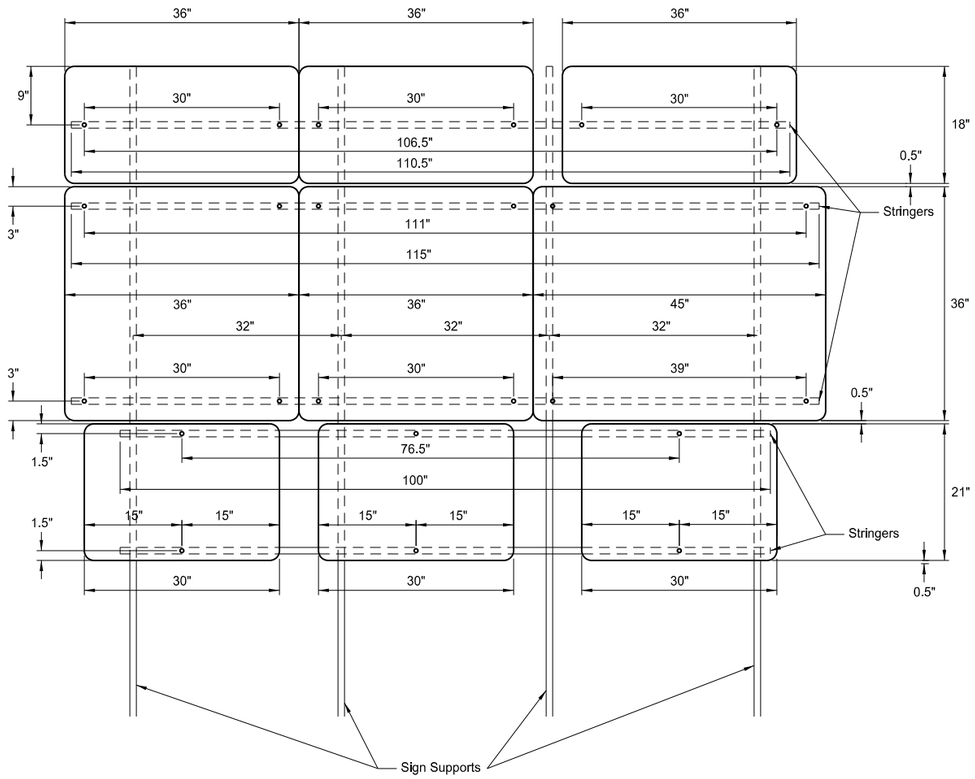
Signing Details

US 85 Intersection Improvements

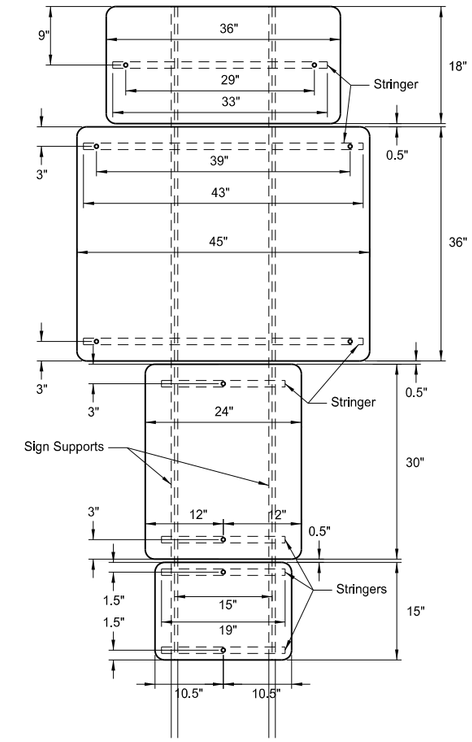
Special Assemblies

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	110	12



Special Assembly G
US 2: 797+00 WB LT

Design Area: 55.9 Sf



Special Assembly H
US 2: 776+10 EB RT

Design Area: 22.9 Sf

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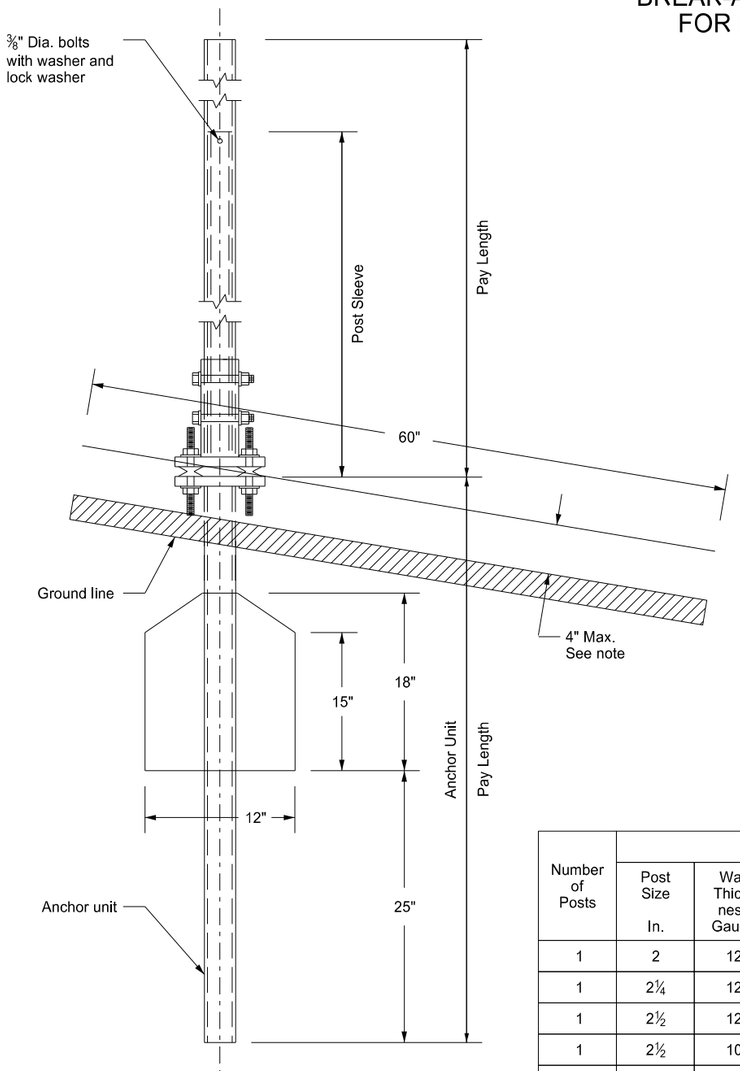
Signing Details

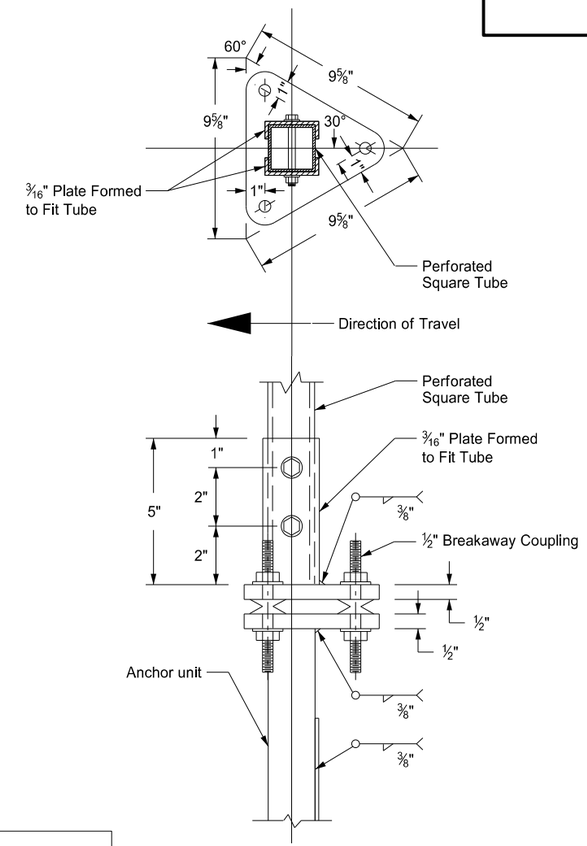
US 85 Intersection Improvements

Special Assemblies

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	110	13

BREAK-AWAY COUPLER SYSTEM FOR PERFORATED TUBES





BASE PLATE WITH BREAKAWAY COUPLER

NOTES:

1. 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.
2. Anchor unit shall be the same size as the post and shall have the same specification as the post.
3. When used in concrete sidewalk, anchor shall be the same except the anchor plate shall be omitted.
4. Four post signs shall have over 8' between the first and fourth post.
5. In lieu of the breakaway base system on standard D-754-24 the breakaway coupling system may be used. The breakaway coupler system shall be manufactured from material meeting the requirements of ASTM A325 fasteners with the special requirements as specified by DENT BREAKAWAY IND., INC. which meets the test requirements of NCHRP Report 350.
6. Base plates and formed plates shall be fabricated from steel meeting the requirements of AASHTO M-183 and M232.

Number of Posts	Telescoping Perforated Tube					
	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size In.
1	2	12			No	2¼
1	2¼	12			No	2½
1	2½	12			B	2½
1	2½	10			Yes	2½
1	2¼	12	2	12	Yes	2¼ & 2 Sleeve
1	2½	12	2¼	12	Yes	2½ & 2¼ Sleeve
2	2	12			No	2¼
2	2¼	12			No	2½
2	2½	12			Yes	2½
2	2½	10			Yes	2½
2	2¼	12	2	12	Yes	2¼ & 2 Sleeve
2	2½	12	2¼	12	Yes	2½ & 2¼ Sleeve
3 & 4	2½	12			Yes	2½
3 & 4	2½	10			Yes	2½
3 & 4	2½	12	2¼	12	Yes	2½ & 2¼ Sleeve
3 & 4	2¼	12	2	12	Yes	2¼ & 2 Sleeve
3 & 4	2½	10	2 3/16	10	Yes	2½ & 2 3/16 Sleeve

B - The 2½" 12 gauge posts do not need breakaway bases when placed in standard soils. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.

Telescoping Perforated Tubes						
Tube Size In.	Wall Thickness In.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In.^4	Cross Sect. area In.^2	Section Modules In.^3
1½ x 1½	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.785

The 2 3/16" size 10 gauge is shown as 2.19" size on the plans. The 2½" size 10 gauge is shown as 2.51" size on the plans.

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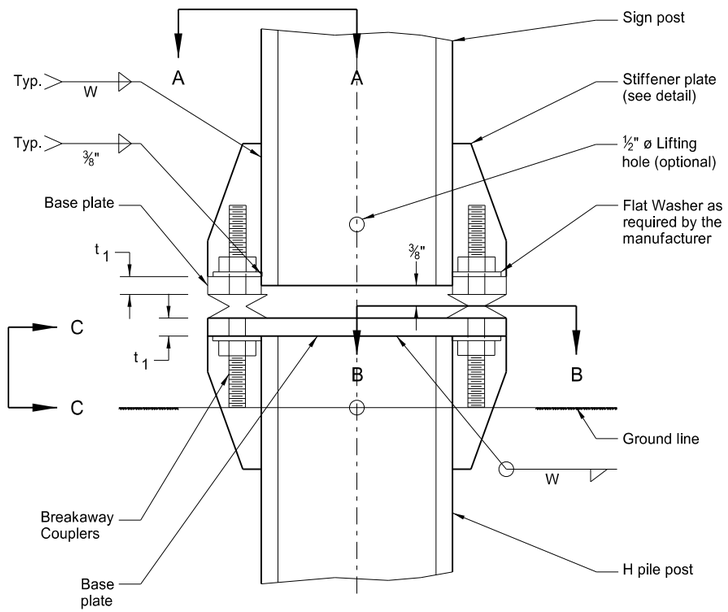
Signing Details

US 85 Intersection Improvements

Break-Away Coupler System

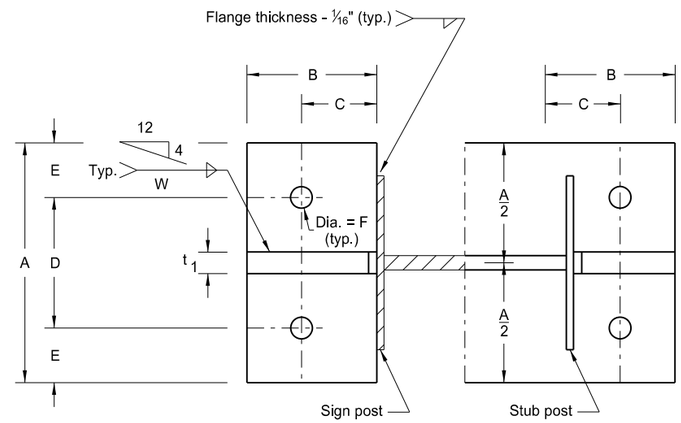
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	110	14

BREAK-AWAY COUPLER SYSTEM STRUCTURAL DETAILS FOR W-SHAPE SUPPORTS



SIGN POST AND STUB POST

ELEVATION



SECTION A-A

SECTION B-B

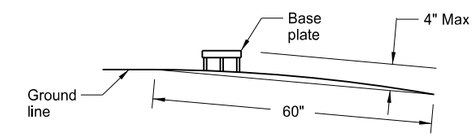
(See Table For Dimensions)

Sections shown are for installations on right shoulder and in gore. Plate slot bevels are opposite hand from that shown for installations on left shoulder.

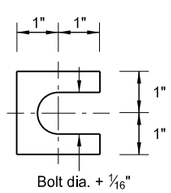
NOTES:
Structural steel shall conform to Sec. 894.06B.6. Reinforcing bars shall conform to Section 612. High strength bolts shall conform to ASTM - A325. Refer to "Sign Summary" sheet for specific data on each individual sign installation.

ASSEMBLY PROCEDURE

1. Assemble post to stub with breakaway coupling bolts with one flat washer as shown.
2. Shim as required to plumb post.
3. Tighten all bolts the maximum possible with 12" to 15" wrench.
4. In lieu of the breakaway base system shown on standard D-754-13 the breakaway coupling system may be used. The breakaway coupling system shall be manufactured from material meeting the requirements of ASTM A325 fasteners with the special requirements as specified by DENT BREAKAWAY IND., INC. which meets the requirements of NCHRP Report 350.

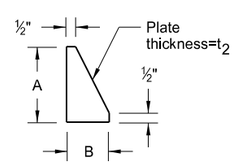


SECTION C-C



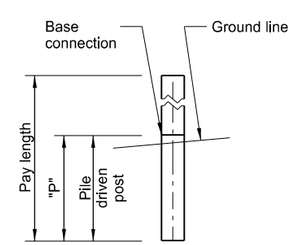
SHIM DETAIL

Furnish 2 - .012"± thick and 2 - .032"± thick shims per post. Shims shall be fabricated from brass shim stock or strip conforming to ASTM B36.



STIFFENER PLATE DETAIL

(See Table For Dimensions)



H-PILE FOOTING

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

DIMENSION / POST SIZE	BASE CONNECTION DATA										FOOTING DATA
	BOLT SIZE	A	B	C	D	E	t_1	t_2	W	F	H PILE POST P
W4X13	3/4" ø x 5 1/4"	6"	2-1/2"	1-1/2"	3-1/2"	1-1/4"	1"	1/2"	1/4"	13/16"	14'
W5X16											14'
W6X20	7/8" ø x 5 1/4"	8"	3"	1-3/4"	4"	2"	1-1/4"	1/2"	1/4"	15/16"	14'
W8X24											14'
W8X31	1 1/4" ø x 7"	9"	3-1/2"	2"	5"	2"	1-1/2"	3/4"	5/16"	1 5/16"	14'
W10X39											14'
W8X28	1" ø x 5 1/4"	8"	3"	2"	4"	2"	1-1/2"	3/4"	5/16"	1 1/16"	14'

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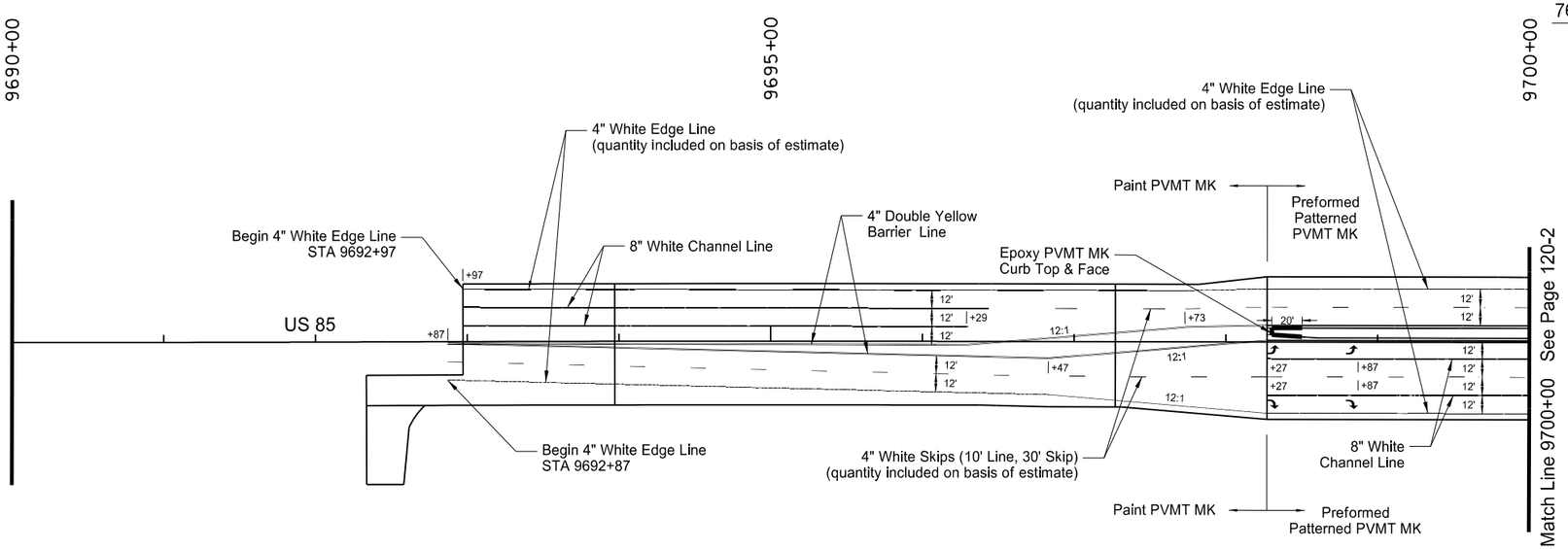
Signing Details

US 85 Intersection Improvements

W-Shape Support Details
Break-Away Coupler System

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	120	1

762	1104	Pvmt Mk Painted 4in Line		
		Double Yellow Barrier	2162	LF
762	1108	Pvmt Mk Painted 8in Line		
		8" White Channel Line	664	LF
762	0118	Epoxy PVMT MK Curb Top & Face		
		Yellow	45	LF
762	0122	Preformed Patterned Pvmt Mk - Message (Grooved)		
		Arrow (RT) 16 SF x 2 EA =	32	SF
		Arrow (LT) 16 SF x 2 EA =	32	SF
		Total =	64	SF
762	1309	Preformed Patterned Pvmt Mk 8in Line - Grooved		
		8" White Channel Line	346	LF



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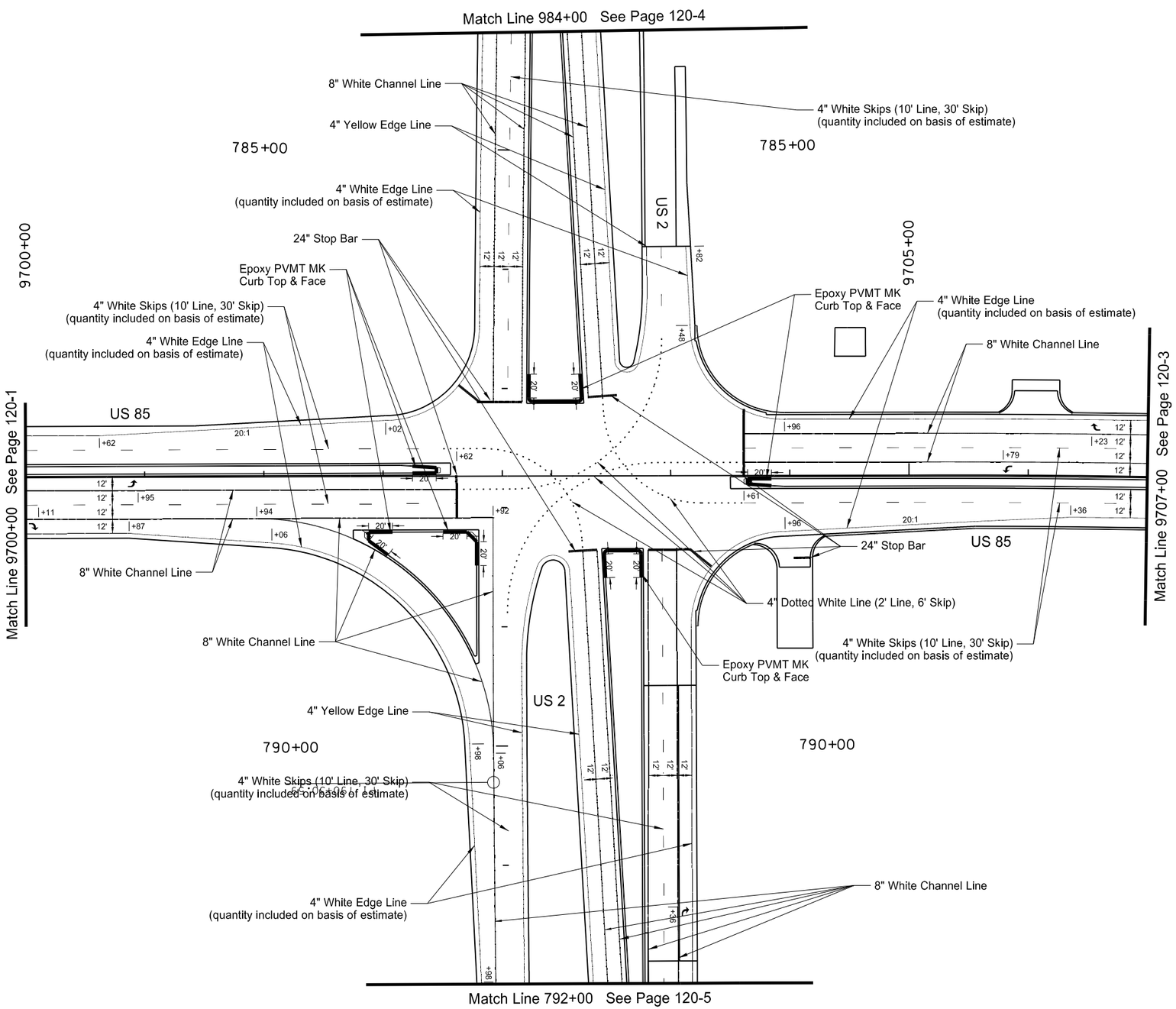
Pavement Marking Layout

US 85 Intersection Improvements

US 85
9692+33.41 to 9700+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	120	2



762	0118	Epoxy PVMT MK Curb Top & Face		
		Yellow	350	LF
762	0122	Preformed Patterned Pvmt Mk - Message (Grooved)		
		Arrow (RT) 16 SF x 3 EA =	48	SF
		Arrow (LT) 16 SF x 2 EA =	32	SF
		Total =	80	SF
762	1305	Preformed Patterned Pvmt Mk 4in Line - Grooved		
		Yellow Edge Line	1142	LF
		Dotted White Line	215	LF
		Total =	1357	LF
762	1309	Preformed Patterned Pvmt Mk 8in Line - Grooved		
		8" White Channel Line	4938	LF
762	1325	Preformed Patterned Pvmt MK 24in Line - Grooved		
		White Stop Bar	269	LF

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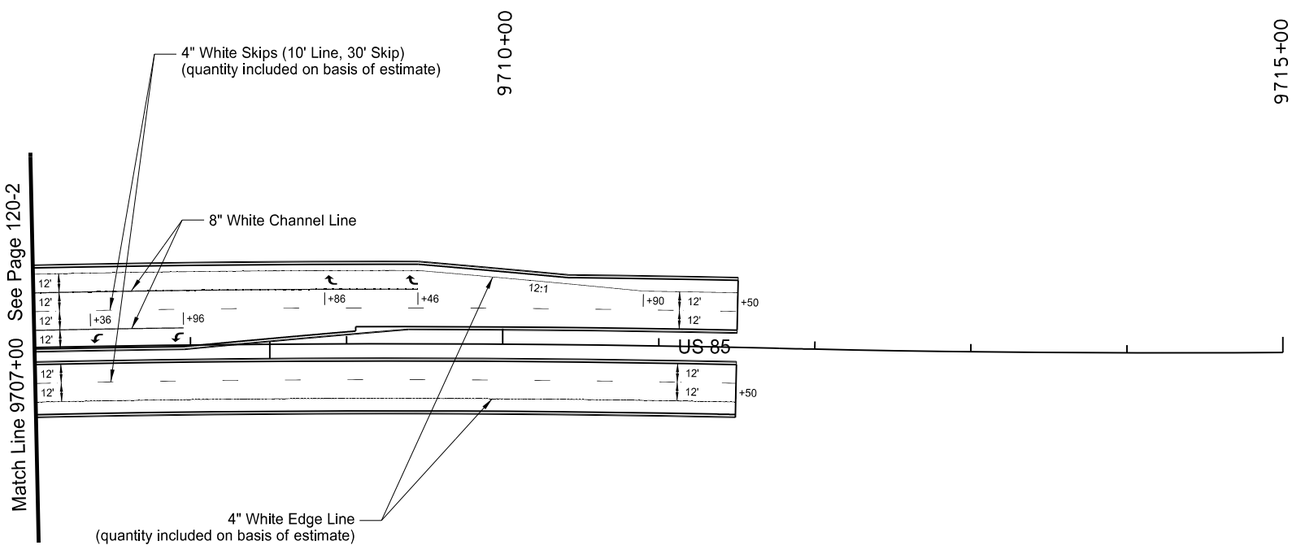
Pavement Marking Layout

US 85 Intersection Improvements

US 85
9700+00 to 9707+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	120	3

762	0122	Preformed Patterned Pvmt Mk - Message (Grooved)			
		Arrow (RT)	16 SF x 2 EA =	32	SF
		Arrow (LT)	16 SF x 2 EA =	32	SF
			Total =	64	SF
762	1309	Preformed Patterned Pvmt Mk 8in Line - Grooved			
		8" White Channel Line		343	LF



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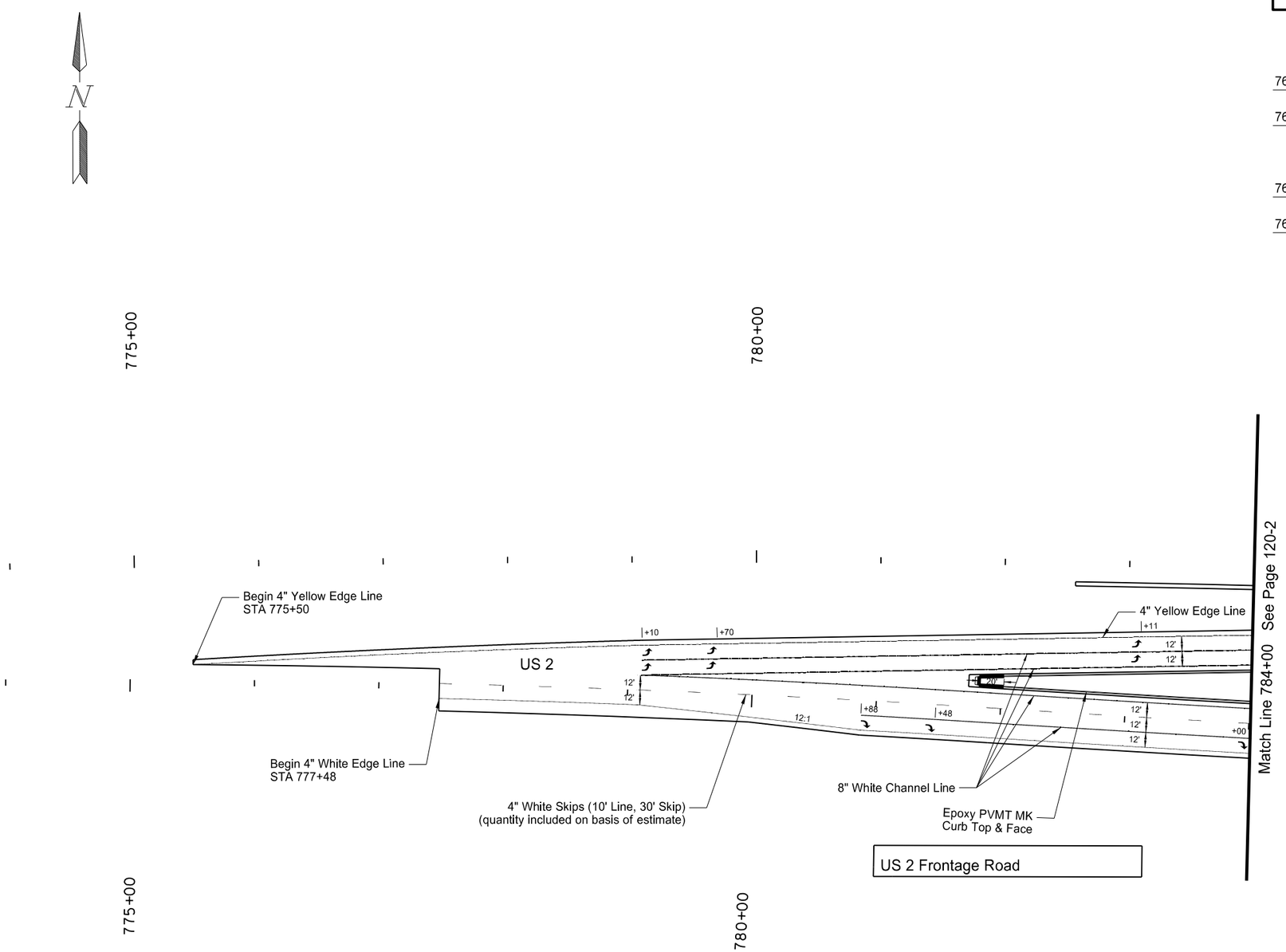
Pavement Marking Layout

US 85 Intersection Improvements

US 85
9707+00 to 9711+50

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	120	4

762	0118	Epoxy PVMT MK Curb Top & Face			
		Yellow		47	LF
762	0122	Preformed Patterned Pvmt Mk - Message (Grooved)			
		Arrow (RT)	16 SF x 3 EA =	48	SF
		Arrow (LT)	16 SF x 6 EA =	96	SF
			Total =	144	SF
762	1305	Preformed Patterned Pvmt Mk 4in Line - Grooved			
		Yellow Edge Line		852	LF
762	1309	Preformed Patterned Pvmt Mk 8in Line - Grooved			
		8" White Channel Line		1785	LF



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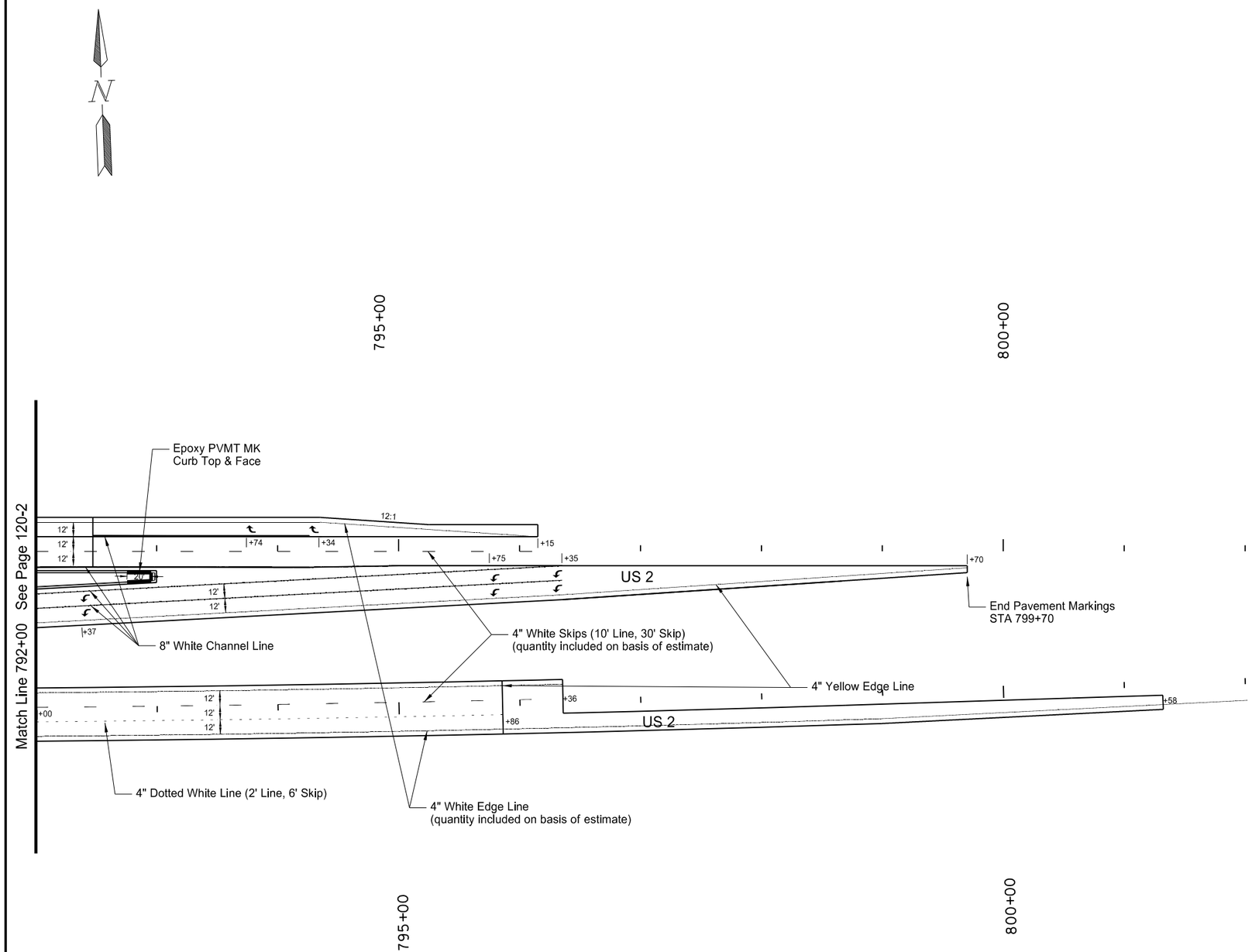
Pavement Marking Layout

US 85 Intersection Improvements

US 2
775+50 to 784+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	120	5

762	0118	Epoxy PVMT MK Curb Top & Face			
		Yellow		47	LF
762	0122	Preformed Patterned Pvmt Mk - Message (Grooved)			
		Arrow (RT)	16 SF x 2 EA =	32	SF
		Arrow (LT)	16 SF x 6 EA =	96	SF
			Total =	128	SF
762	1305	Preformed Patterned Pvmt Mk 4in Line - Grooved			
		Yellow Edge Line		1157	LF
		Dotted White Line		96	LF
			Total =	1253	LF
762	1309	Preformed Patterned Pvmt Mk 8in Line - Grooved			
		8" White Channel Line		1542	LF



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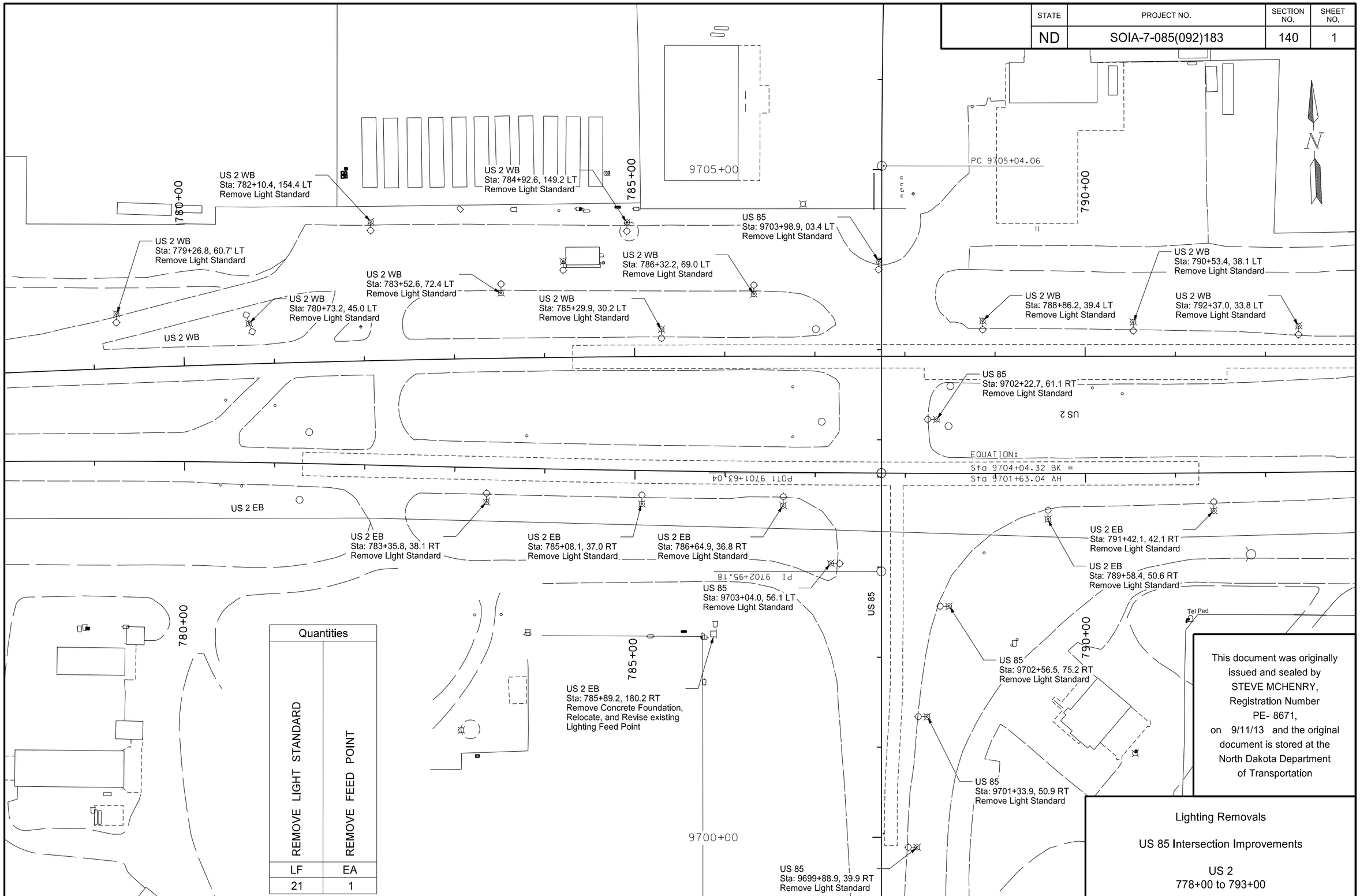
Pavement Marking Layout

US 85 Intersection Improvements

US 2
792+00 to 802+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	140	1



Quantities	
REMOVE LIGHT STANDARD	REMOVE FEED POINT
LF	EA
21	1

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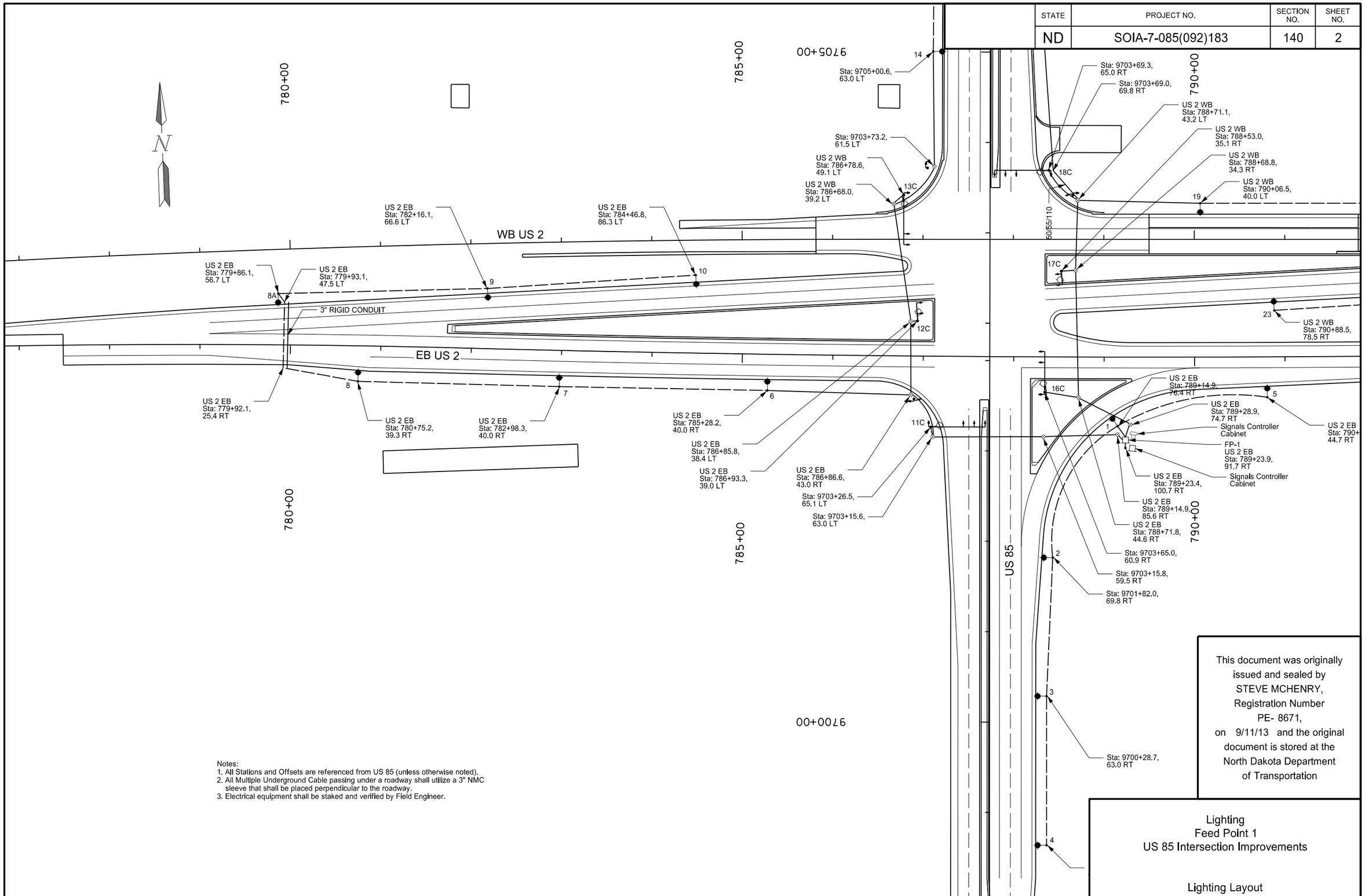
Lighting Removals

US 85 Intersection Improvements

US 2
778+00 to 793+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	140	2



Notes:
1. All Stations and Offsets are referenced from US 85 (unless otherwise noted).
2. All Multiple Underground Cable passing under a roadway shall utilize a 3" NMC sleeve that shall be placed perpendicular to the roadway.
3. Electrical equipment shall be staked and verified by Field Engineer.

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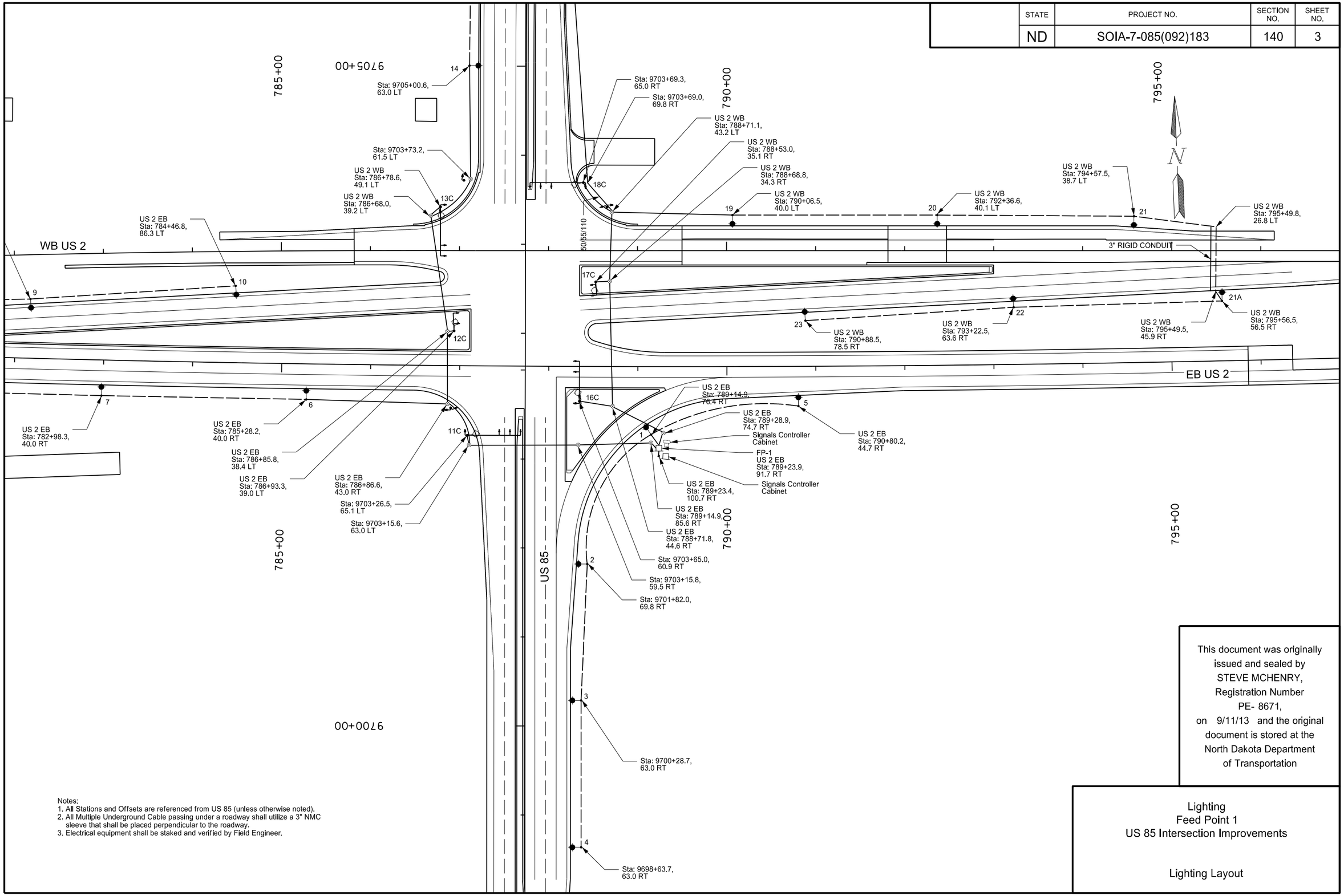
Lighting
Feed Point 1
US 85 Intersection Improvements

Lighting Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	140	3



Notes:
1. All Stations and Offsets are referenced from US 85 (unless otherwise noted).
2. All Multiple Underground Cable passing under a roadway shall utilize a 3" NMC sleeve that shall be placed perpendicular to the roadway.
3. Electrical equipment shall be staked and verified by Field Engineer.

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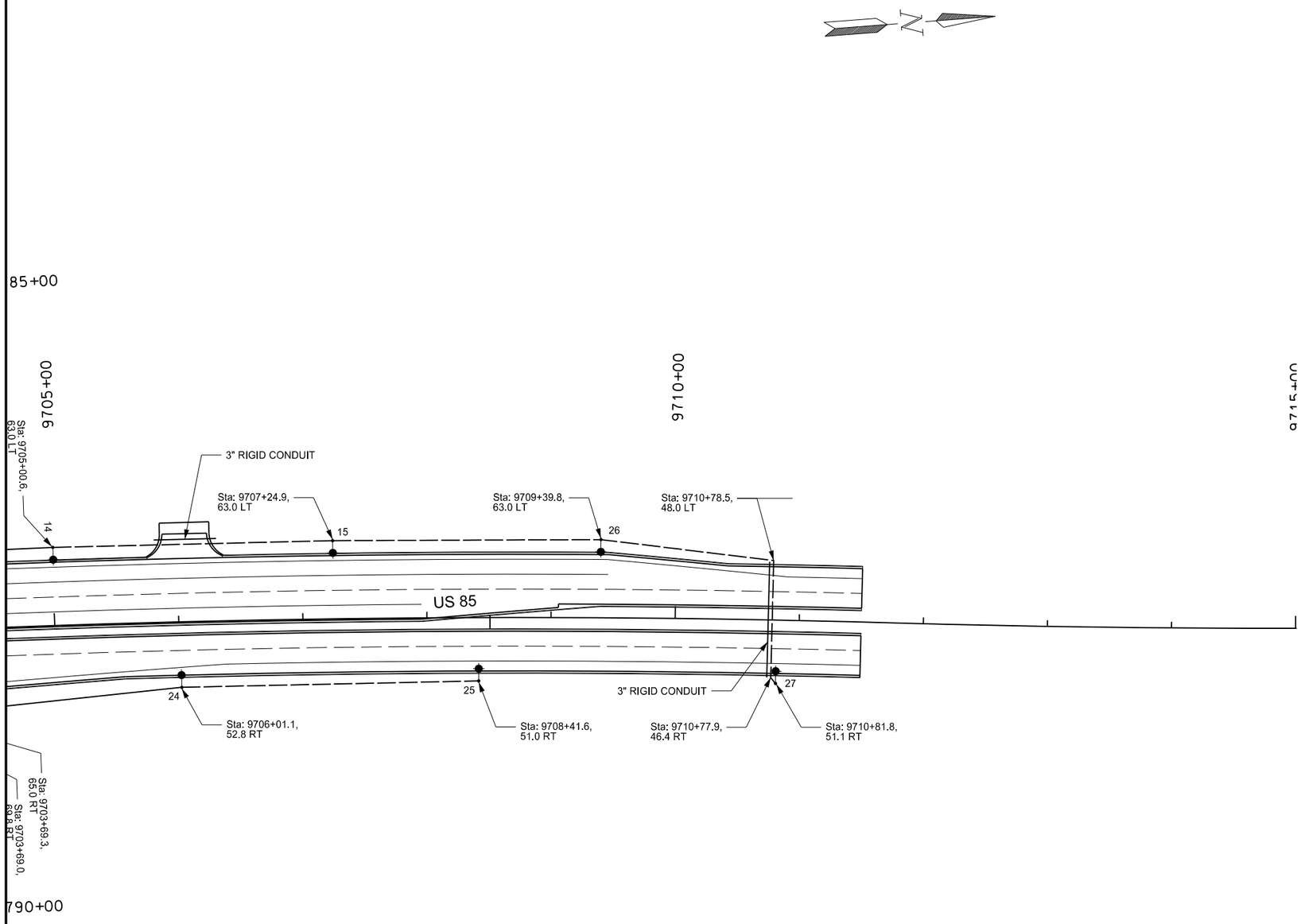
Lighting
Feed Point 1
US 85 Intersection Improvements

Lighting Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	140	4



Notes:
1. All Stations and Offsets are referenced from US 85 (unless otherwise noted).
2. All Multiple Underground Cable passing under a roadway shall utilize a 3" NMC sleeve that shall be placed perpendicular to the roadway.
3. Electrical equipment shall be staked and verified by Field Engineer.

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Lighting
Feed Point 1
US 85 Intersection Improvements

Lighting Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	140	5

Station	Conduit Runs		Cable Trench	Cable Runs	
	Length (ft)	Size	Length (ft)	Length (ft)	Type
789+23.4 - 100.7 RT TO	9	2		58	2-1/C #2 RHW
789+23.9 - 91.7 RT				29	1-1/C #2 THW
789+23.9 - 91.7 RT TO			18	32	3 No 4 Style USE
789+14.9 - 76.4 RT TO					
789+14.9 - 76.4 RT TO			172	180	3 No 4 Style USE
9701+82.0 - 69.8 RT					
9701+82.0 - 69.8 RT TO			154	162	3 No 4 Style USE
9700+28.7 - 63.0 RT					
9700+28.7 - 63.0 RT TO			166	174	3 No 4 Style USE
9698+63.7 - 63.0 RT					
789+14.9 - 76.4 RT TO			172	180	3 No 4 Style USE
790+80.2 - 44.7 RT					
789+23.9 - 91.7 RT TO	10	2		886	2-1/C #4 RHW
789+14.9 - 85.6 RT TO	80	2		443	1-1/C #4 THW
9703.15.8 - 59.5 RT TO	121	2			
9703+15.6 - 63.0 LT TO	52	2			
786+86.6 - 43.0 RT TO	158	2			
785+28.2 - 40.0 RT					
785+28.2 - 40.0 RT TO			231	239	3 No 4 Style USE
782+98.3 - 40.0 RT					
782+98.3 - 40.0 RT TO			223	231	3 No 4 Style USE
780+75.2 - 39.3 RT					
780+73.4 - 27.9 RT TO			169	177	3 No 4 Style USE
779+92.1 - 25.4 RT TO	73	3			
779+93.1 - 47.5 LT TO					
779+86.1 - 56.7 LT					
779+86.1 - 56.7 LT			232	240	3 No 4 Style USE
782+16.1 - 66.6 LT					
782+16.1 - 66.6 LT TO			231	239	3 No 4 Style USE
784+46.8 - 86.3 LT					
789+23.9 - 91.7 RT TO	NOTE 1	2		482	2-1/C #4 RHW
789+14.9 - 85.6 RT TO	NOTE 1	2		241	1-1/C #4 THW
9703.15.8 - 59.5 RT TO	NOTE 1	2			
9703+15.6 - 63.0 LT TO	10	2			
9703+26.5 - 65.1' LT					
9703+26.5 - 65.1' LT TO	NOTE 1	2		326	2-1/C #4 RHW
9703+15.6 - 63.0 LT TO	NOTE 1	2		163	1-1/C #4 THW
786+86.6 - 43.0' RT TO	80	2			
786+85.8 - 38.4' LT TO	7	2			
786+93.3 - 39.0' LT					

Station	Conduit Runs		Cable Trench	Cable Runs	
	Length (ft)	Size	Length (ft)	Length (ft)	Type
786+93 - 39.0 LT TO	NOTE 1	2		324	2-1/C #4 RHW
786+85.8 - 38.4 - LT TO	130	2		162	1-1/C #4 THW
786+68.0 - 39.2 LT TO	13	2			
786+78.6 - 49.1 LT					
786+78.6 - 49.1 LT	NOTE 1	2		430	2-1/C #4 RHW
786+68.0 - 39.2 LT TO	61	2		215	1-1/C #4 THW
9703+73.2 - 61.5' LT TO	128	2			
9705+00.6 - 63.0' LT					
9705+00.6 - 63.0' LT	51	3	226	234	3 No 4 Style USE
9707+24.9 - 63.0' LT					
9707+24.9 - 63.0' LT TO			217	225	3 No 4 Style USE
9709+39.8 - 63.0' LT					
9709+39.8 - 63.0' LT TO	94	3	241	249	3 No 4 Style USE
9710+78.5 - 48.0' LT TO					
9710+77.9' - 46.4' RT TO					
9710+81.8 - 51.1' RT					
789+23.9 - 91.7 RT TO	17	2		270	2-1/C #4 RHW
789+28.9 - 74.7 RT TO	63	2		135	1-1/C #4 THW
788+71.8 - 44.6 RT TO	37	2			
9703+65.0 - 60.9 RT					
9703+65.0 - 60.9 RT TO	NOTE 1			406	2-1/C #4 RHW
788+71.8 - 44.6 RT TO	139	2		203	1-1/C #4 THW
788+68.8 - 34.3 RT TO	15	2			
788+53.0 - 35.1 RT					
788+53.0 - 35.1 RT TO	NOTE 1	2		306	2-1/C #4 RHW
788+68.8 - 34.3 RT TO	76	2		153	1-1/C #4 THW
788+71.1 - 43.2 LT TO	50	2			
9703+69.3 - 65.0 RT					
9703+69.35 - 65.0 RT TO	NOTE 1	2		390	2-1/C #4 RHW
788+71.1 - 43.2 LT TO	135	2		195	1-1/C #4 THW
790+06.5 - 40.0 LT					
790+06.5 - 40.0 LT TO			230	238	3 No 4 Style USE
792+36.6 - 40.1 LT					

NOTE 1: CONDUIT LENGTH INCLUDED IN A PREVIOUS TOTAL

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Lighting
Feed Point 1
US 85 Intersection Improvements

Lighting Quantities

Station	Conduit Runs		Cable Trench	Cable Runs	
	Length (ft)	Size	Length (ft)	Length (ft)	Type
792+36.6 - 40.1 LT TO			222	230	3 No 4 Style USE
794+57.5 - 38.7 LT					
794+57.5 - 38.7 LT TO			179	187	3 No 4 Style USE
795+49.8 - 26.8 LT TO					
795+49.5 - 45.9 RT TO	73	3			
795+56.5 - 56.5 RT					
795+56.5 - 56.5 RT TO			235	243	3 No 4 Style USE
793+22.5 - 63.6 RT					
793+22.5 - 63.6 RT TO			235	243	3 No 4 Style USE
790+88.5 - 78.5 RT					
9703+69.35 - 65.0 RT TO	NOTE 1	2		668	2-1/C #4 RHW
788+71.1 - 43.2 LT TO	274	2		334	1-1/C #4 THW
9703+69.0 - 69.8 RT TO					
9706+01.1 - 52.8 RT					
9706+01.1 - 52.8 RT TO			240	248	3 No 4 Style USE
9708+41.6 - 51.0 RT					

NOTES:
1. Conduit length included in a previous total

No.	Station	Offset	Wattage	Circuit	IES-Type	Pole Ht.	Mast Arm	Note
1	789+14.9	76.4' RT	250	1	3	40	8'	
2	9701+82.0	69.8' RT	250	1	3	40	8'	
3	9700+28.7	63.0' RT	250	1	3	40	8'	
4	9698+63.7	63.0' RT	250	1	3	40	8'	
5	790+80.2	44.7' RT	250	1	3	40	8'	
6	785+28.2	40.0' RT	250	2	3	40	8'	
7	782+98.3	40.0' RT	250	2	3	40	8'	
8	780+75.2	39.3' RT	250	2	3	40	8'	
8A	779+86.1	56.7' LT	250	2	3	40	8'	
9	782+16.1	66.6' LT	250	2	3	40	8'	
10	784+46.8	86.3' LT	250	2	3	40	8'	
11C	9703+26.5	65.1' LT	400	3	3	40	8'	
12C	786+93.3	39.0' LT	400	3	3	40	8'	
13C	786+78.6	49.1' LT	400	3	3	40	8'	
14	9705+00.6	63.0' LT	250	3	3	40	8'	
15	9707+24.9	63.0' LT	250	3	3	40	8'	
16C	9703+65.0	60.9' RT	400	4	3	40	8'	
17C	788+53.0	35.1' RT	400	4	3	40	8'	
18C	9703+69.3	65.0' RT	400	4	3	40	8'	
19	790+06.5	40.0' LT	250	4	3	40	8'	
20	792+36.6	40.1' LT	250	4	3	40	8'	
21	794+57.5	38.7' LT	250	4	3	40	8'	
21A	795+56.5	56.5' RT	250	4	3	40	8'	
22	793+22.5	63.6' RT	250	4	3	40	8'	
23	790+88.5	78.5' RT	250	4	3	40	8'	
24	9706+01.1	52.8' RT	250	4	3	40	8'	
25	9708+41.6	51.0' RT	250	4	3	40	8'	
26	9709+39.8	63.0' RT	250	4	3	40	8'	
27	9710+81.8	51.1' RT	250	4	3	40	8'	

Quantities

CONCRETE FOUNDATION-HIGHWAY LIGHTING	CONCRETE FOUNDATION-FEED POINT- TYPE B	CABLE TRENCH II	2IN DIAMETER RIGID CONDUIT	2IN DIAMETER RIGID STEEL CONDUIT	3IN DIAMETER RIGID CONDUIT	MULTIPLE UNDERGRUOND CABLE 3NO4 STYLE USE	UNDERGROUND CONDUCTOR NO2-TYPE RHW	UNDERGROUND CONDUCTOR NO4-TYPE RHW	UNDERGROUND CONDUCTOR NO2-TYPE THW	UNDERGROUND CONDUCTOR NO4-TYPE THW	LT STD 8FT MA 40FT MT HT BREAKAWAY	HP SODIUM VAPOR LUMINAIRE-250 WATT	HP SODIUM VAPOR LUMINAIRE-400 WATT	RELOCATED HIGHWAY LIGHTING FEED POINT	MODIFY EXISTING FEED POINT
EA	EA	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA
23	1	3793	1656	9	291	3951	58	4488	29	2244	23	23	6	1	1

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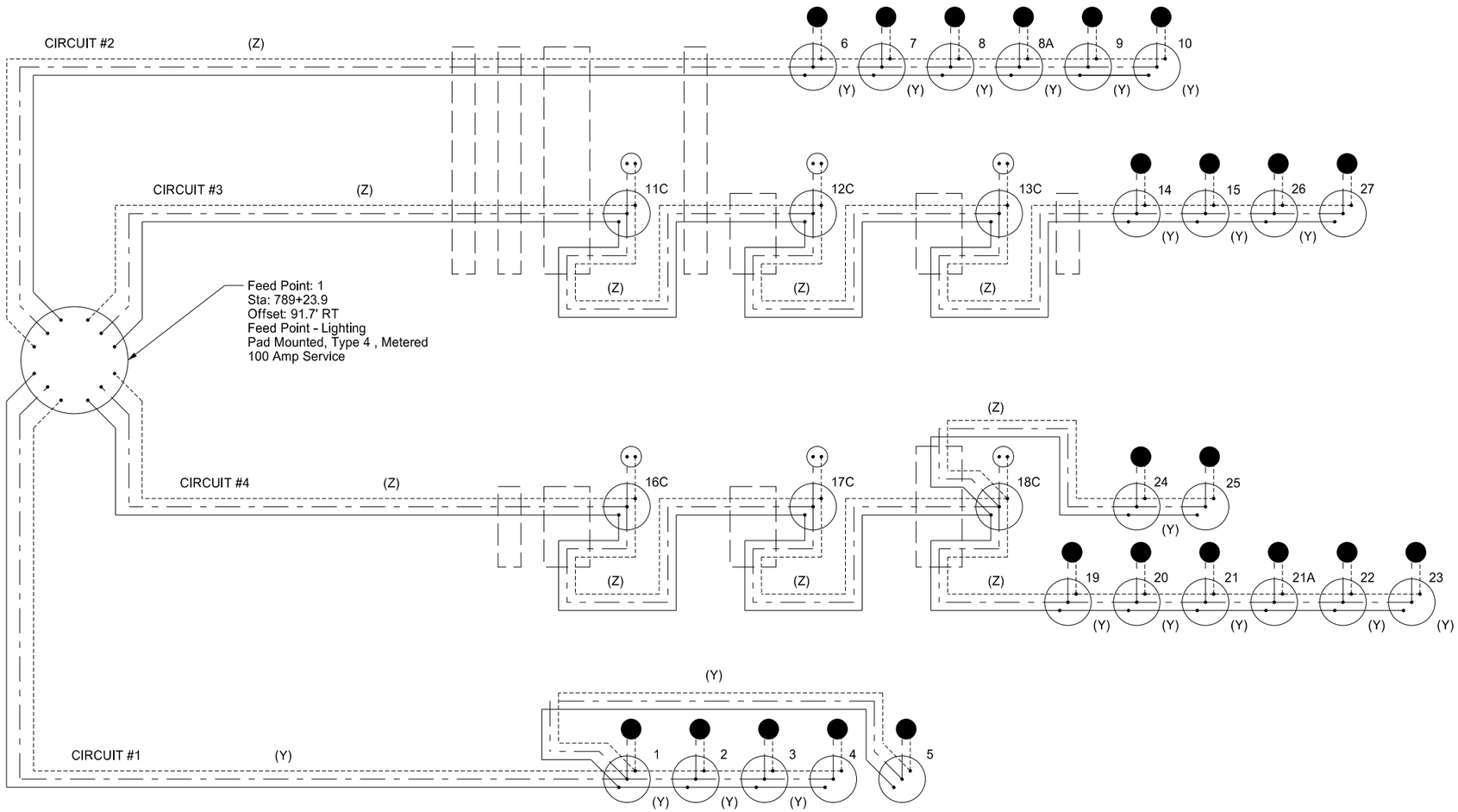
Lighting
Feed Point 1
US 85 Intersection Improvements

Lighting Quantities

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	140	7



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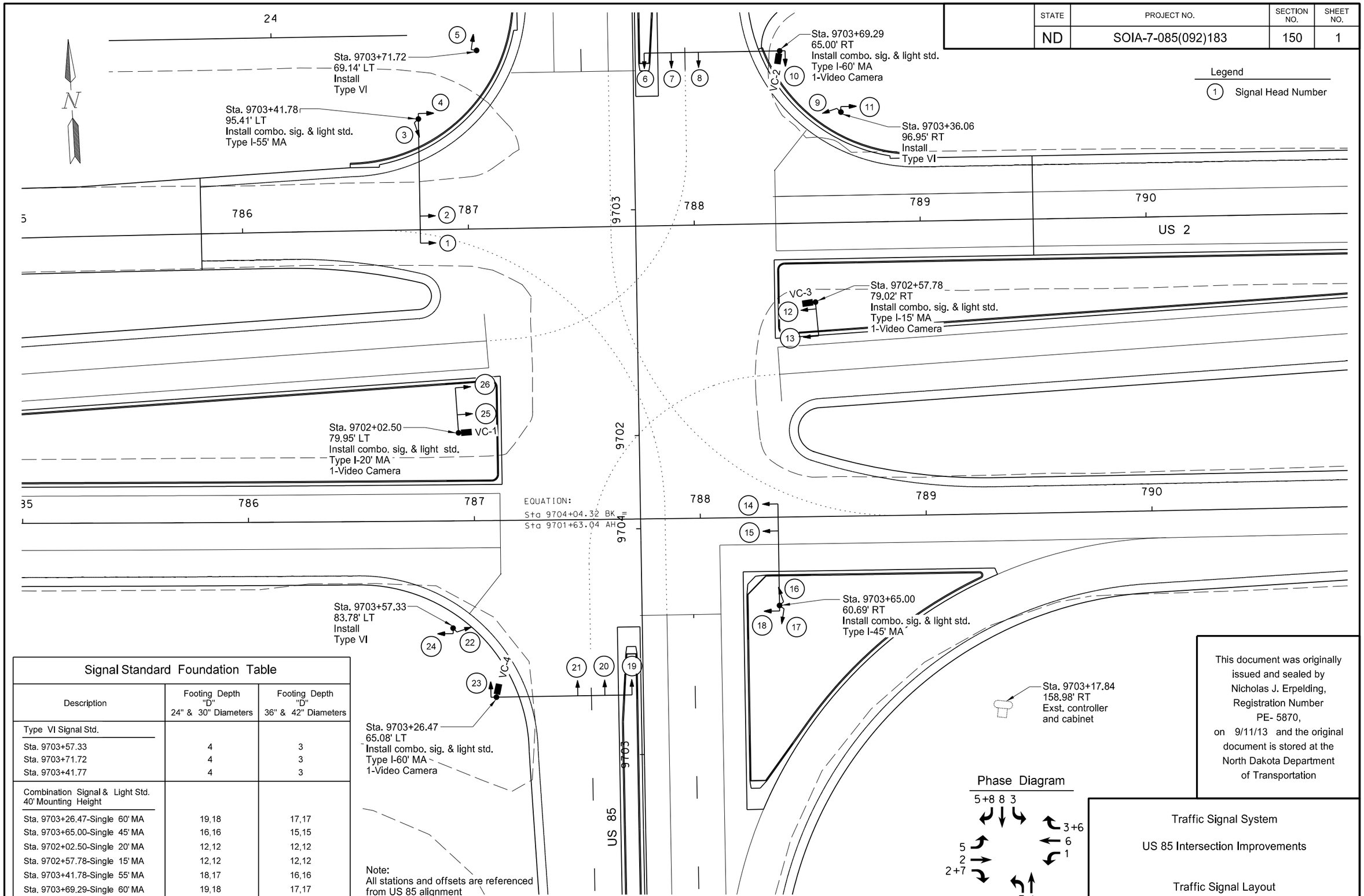
Legend

Phase Conductor		1	Light Standard Number	●	250 Watt HP Sodium Vapor Luminaire, operated on 240 volts
Phase Conductor		1C	Combination Lighting and Signal Standard	○	400 Watt HP Sodium Vapor Luminaire, operated on 240 volts
Ground Conductor		(Y)	3 No. 4 Style USE		Existing Pull Box (provided in Signals plans)
		(Z)	2 No. 4 RHW, 1 No. 4 THW		Light Standard

Lighting Schematic
Feed Point 1
US 85 Intersection Improvements

Lighting Quantities

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	1



Signal Standard Foundation Table

Description	Footing Depth "D" 24" & 30" Diameters	Footing Depth "D" 36" & 42" Diameters
Type VI Signal Std.		
Sta. 9703+57.33	4	3
Sta. 9703+71.72	4	3
Sta. 9703+41.77	4	3
Combination Signal & Light Std. 40' Mounting Height		
Sta. 9703+26.47-Single 60' MA	19,18	17,17
Sta. 9703+65.00-Single 45' MA	16,16	15,15
Sta. 9702+02.50-Single 20' MA	12,12	12,12
Sta. 9702+57.78-Single 15' MA	12,12	12,12
Sta. 9703+41.78-Single 55' MA	18,17	16,16
Sta. 9703+69.29-Single 60' MA	19,18	17,17

Note:
All stations and offsets are referenced from US 85 alignment

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Traffic Signal System

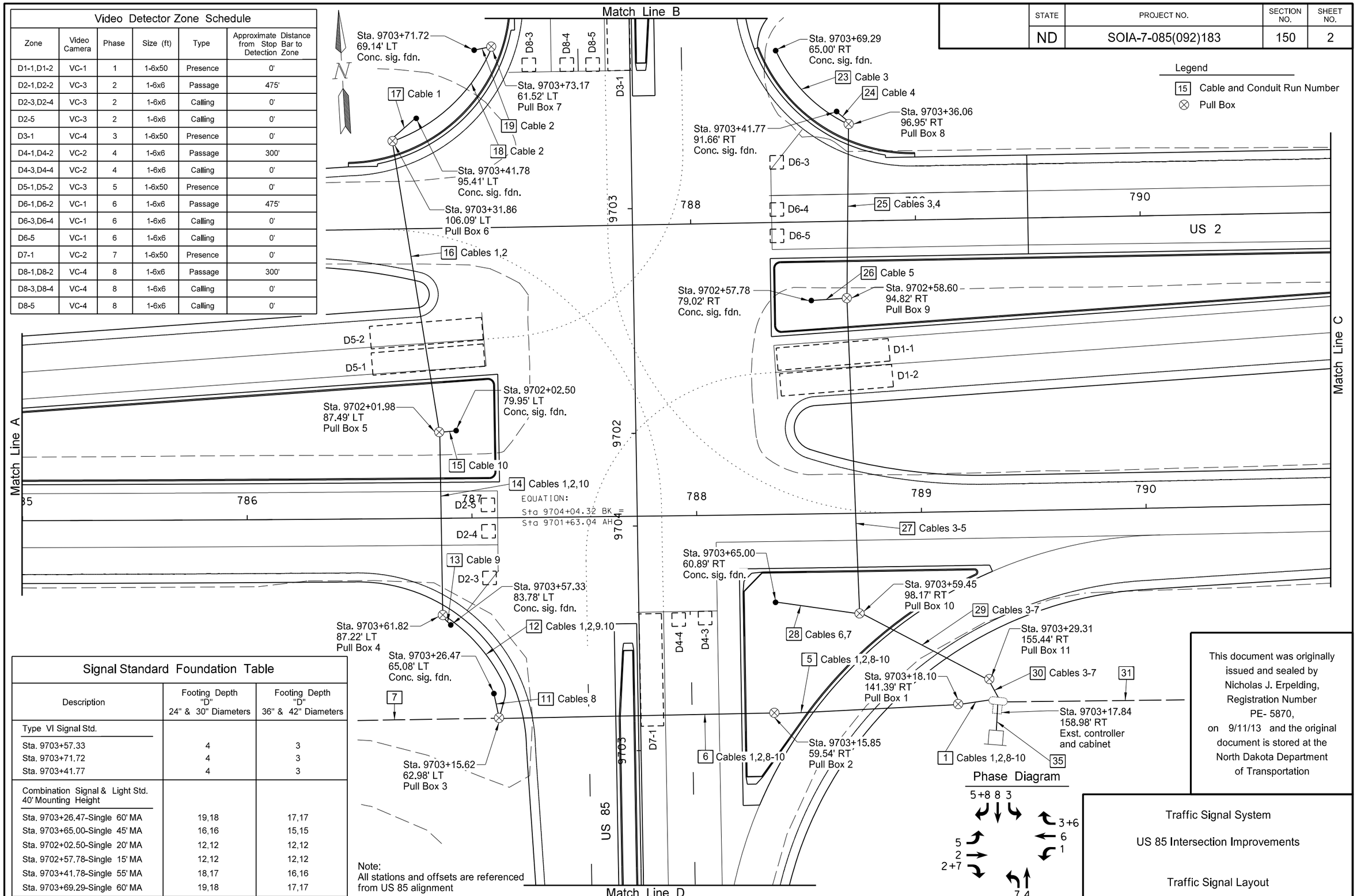
US 85 Intersection Improvements

Traffic Signal Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	2

Video Detector Zone Schedule

Zone	Video Camera	Phase	Size (ft)	Type	Approximate Distance from Stop Bar to Detection Zone
D1-1,D1-2	VC-1	1	1-6x50	Presence	0'
D2-1,D2-2	VC-3	2	1-6x6	Passage	475'
D2-3,D2-4	VC-3	2	1-6x6	Calling	0'
D2-5	VC-3	2	1-6x6	Calling	0'
D3-1	VC-4	3	1-6x50	Presence	0'
D4-1,D4-2	VC-2	4	1-6x6	Passage	300'
D4-3,D4-4	VC-2	4	1-6x6	Calling	0'
D5-1,D5-2	VC-3	5	1-6x50	Presence	0'
D6-1,D6-2	VC-1	6	1-6x6	Passage	475'
D6-3,D6-4	VC-1	6	1-6x6	Calling	0'
D6-5	VC-1	6	1-6x6	Calling	0'
D7-1	VC-2	7	1-6x50	Presence	0'
D8-1,D8-2	VC-4	8	1-6x6	Passage	300'
D8-3,D8-4	VC-4	8	1-6x6	Calling	0'
D8-5	VC-4	8	1-6x6	Calling	0'



Signal Standard Foundation Table

Description	Footing Depth "D" 24" & 30" Diameters	Footing Depth "D" 36" & 42" Diameters
Type VI Signal Std.		
Sta. 9703+57.33	4	3
Sta. 9703+71.72	4	3
Sta. 9703+41.77	4	3
Combination Signal & Light Std. 40' Mounting Height		
Sta. 9703+26.47-Single 60' MA	19,18	17,17
Sta. 9703+65.00-Single 45' MA	16,16	15,15
Sta. 9702+02.50-Single 20' MA	12,12	12,12
Sta. 9702+57.78-Single 15' MA	12,12	12,12
Sta. 9703+41.78-Single 55' MA	18,17	16,16
Sta. 9703+69.29-Single 60' MA	19,18	17,17

Note:
All stations and offsets are referenced from US 85 alignment

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Traffic Signal System

US 85 Intersection Improvements

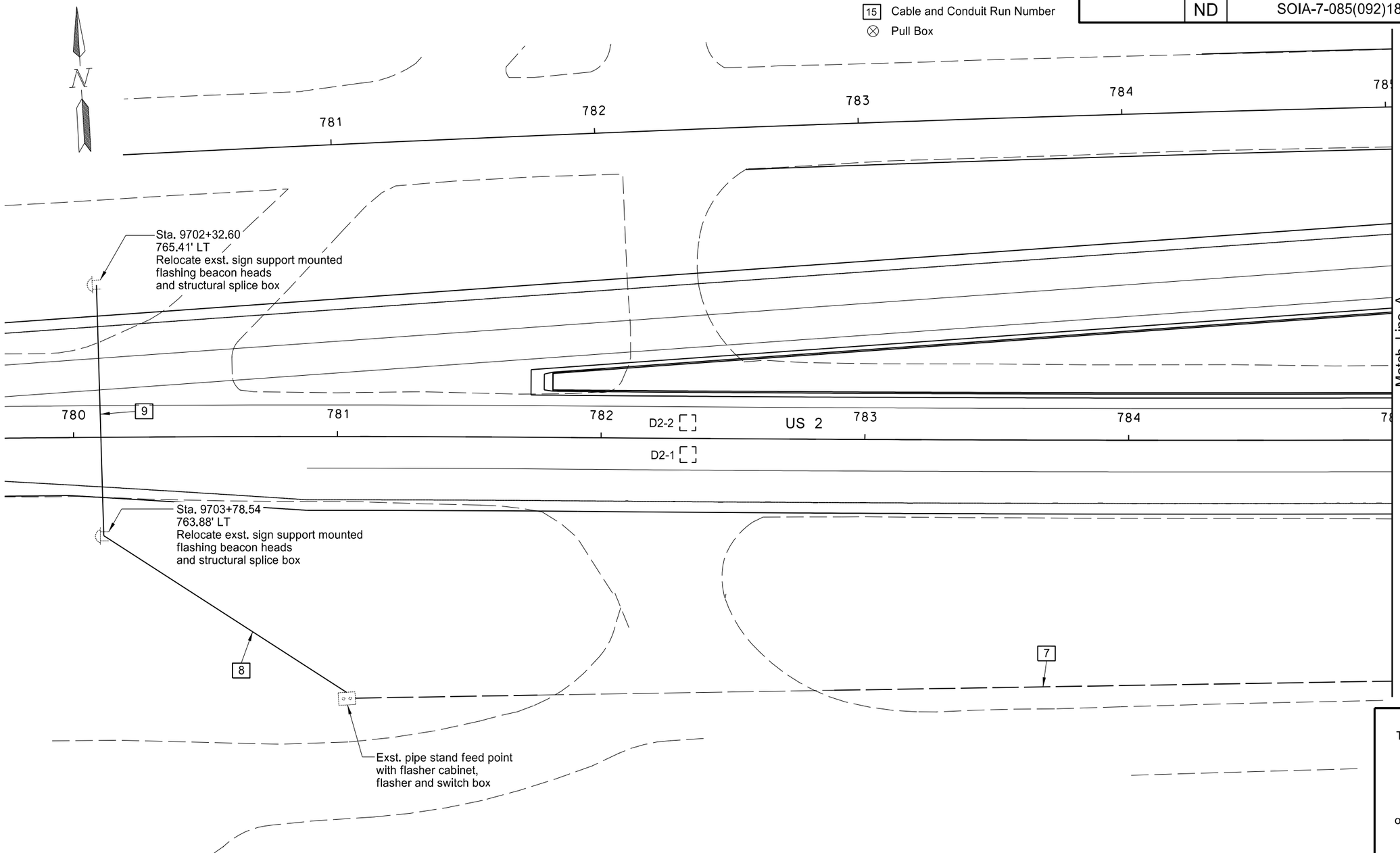
Traffic Signal Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	3

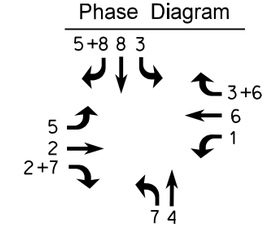
Legend

15 Cable and Conduit Run Number

⊗ Pull Box



Phase Diagram



Note:
All stations and offsets are referenced from US 85 alignment

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Traffic Signal System

US 85 Intersection Improvements

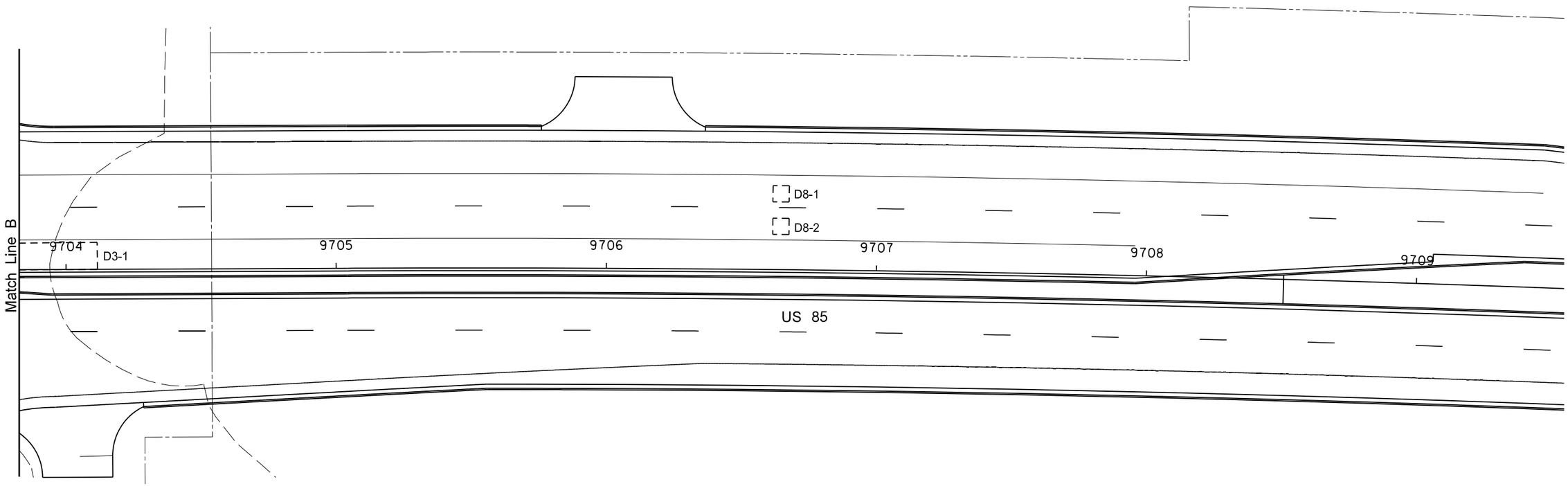
Traffic Signal Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	4

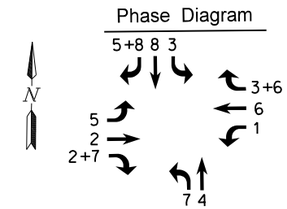
Legend

15 Cable and Conduit Run Number

⊗ Pull Box



Phase Diagram



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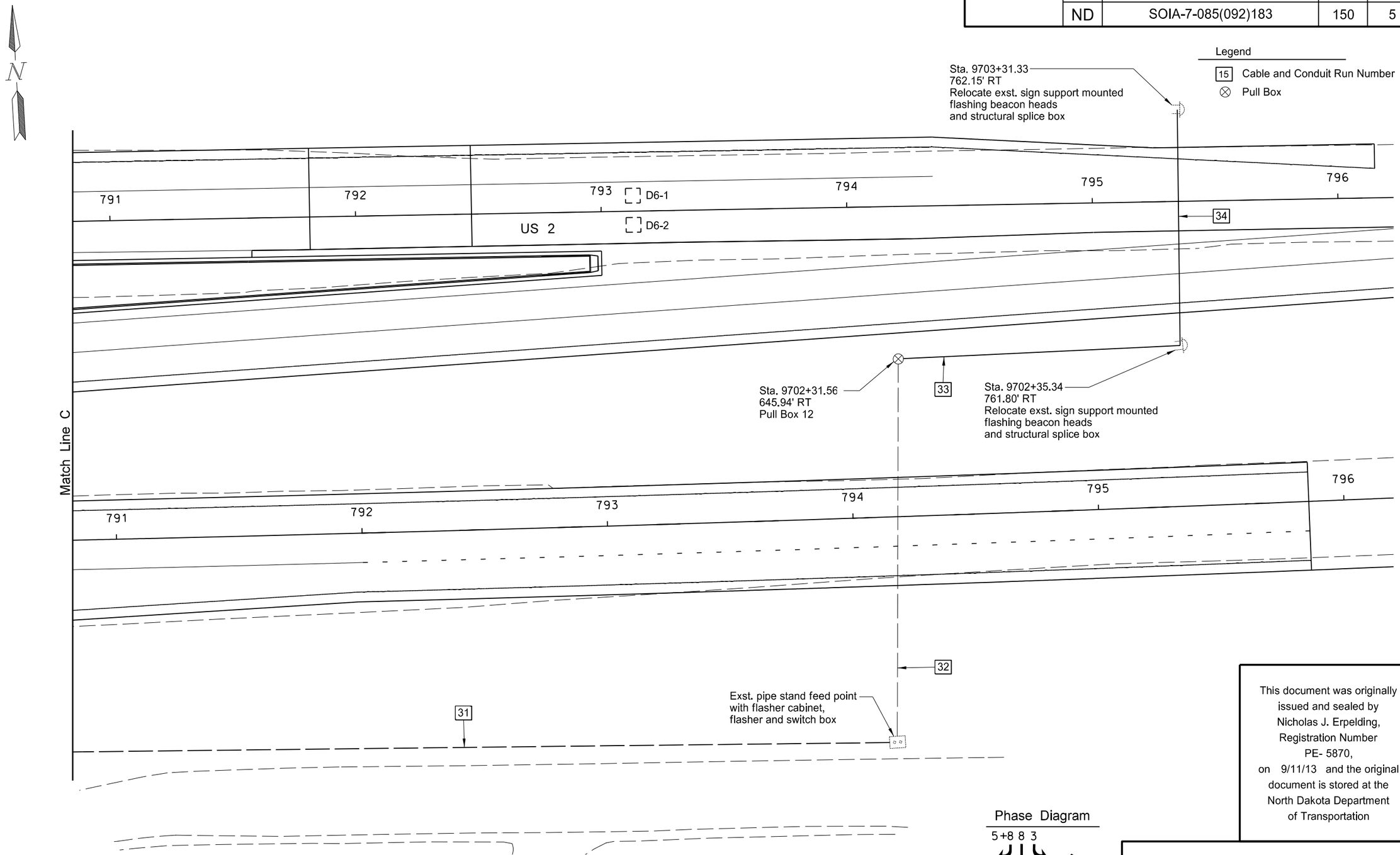
Traffic Signal System

US 85 Intersection Improvements

Traffic Signal Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	5



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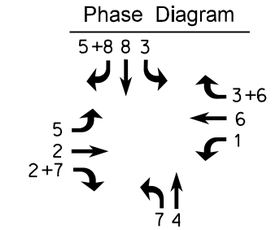
Phase Diagram



Note:
All stations and offsets are referenced from US 85 alignment

Traffic Signal System

US 85 Intersection Improvements

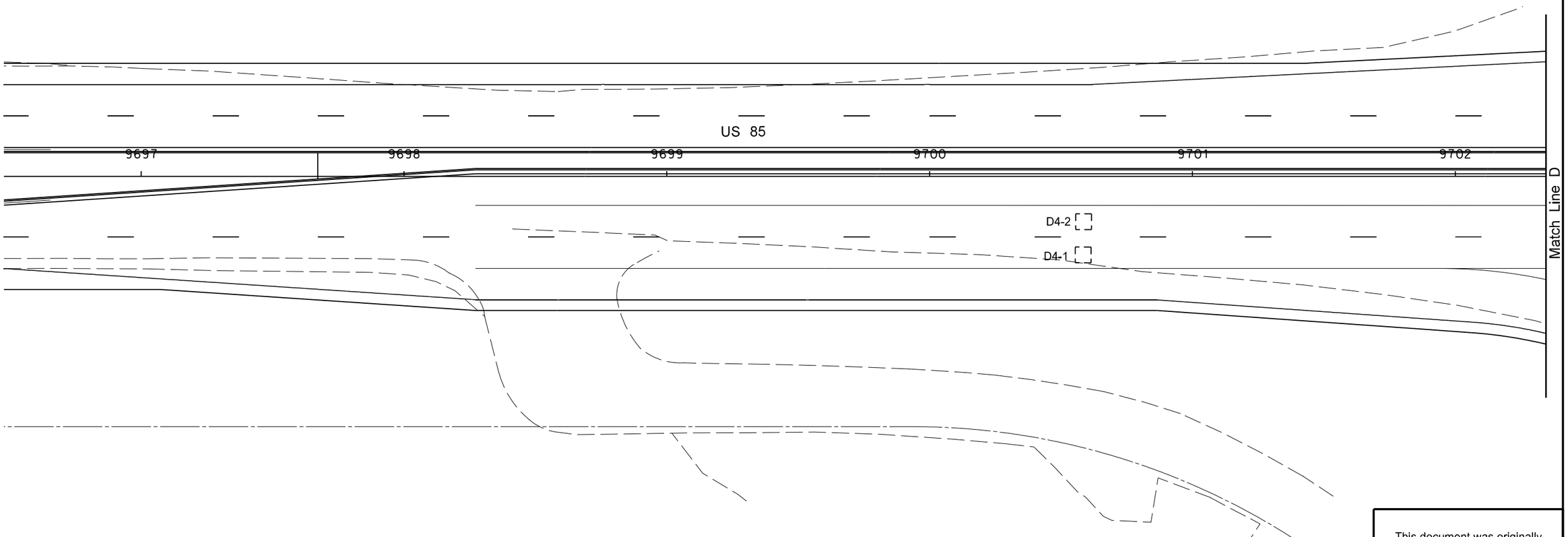
Traffic Signal Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	6

Legend

15 Cable and Conduit Run Number

⊗ Pull Box



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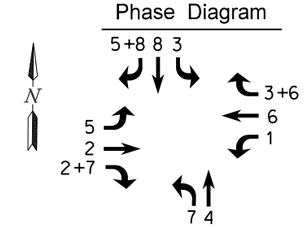
Phase Diagram



Note:
All stations and offsets are referenced from US 85 alignment

Traffic Signal System

US 85 Intersection Improvements

Traffic Signal Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	7

Run	Station	Location	Conduit Run		Cable Trench	Cable Run			
			Length	Size	Length	Length	Code	QTY	Type
1	9703+17.84 to 9703+18.10	Controller to Pull Box 1	14	4"		48 48 24 96 72 48	A B C C C D	2 2 1 4 3 2	No. 12 AWG 2 Conductor Cable Emergency Detector Cable No. 12 AWG 5 Conductor Cable No. 12 AWG 12 Conductor Cable Mult 3 No 6 USE Video Detector Cable
2									Not Used
3									Not Used
4									Not Used
5	9703+18.10 to 9703+15.85	Pull Box 1 to Pull Box 2	82	4"		184 184 92 368 184 184	A B C C C D	2 2 1 4 2 2	No. 12 AWG 2 Conductor Cable Emergency Detector Cable No. 12 AWG 5 Conductor Cable No. 12 AWG 12 Conductor Cable Mult 3 No 6 USE Video Detector Cable
6	9703+15.85 to 9703+15.62	Pull Box 2 to Pull Box 3	122	4"		264 264 132 528 264 264	A B C C C D	2 2 1 4 2 2	No. 12 AWG 2 Conductor Cable Emergency Detector Cable No. 12 AWG 5 Conductor Cable No. 12 AWG 12 Conductor Cable Mult 3 No 6 USE Video Detector Cable
7	9703+15.62 to —	Pull Box 3 to Existing Flasher Cabinet	10	2"	605	625	C	1	Mult 3 No 6 USE
8	— to 9703+78.54	Existing Flasher Cabinet to Existing Flasher	110 10	2" 1"		130	C	1	No. 12 AWG 5 Conductor Cable
9	9703+78.54 to 9702+32.60	Existing Flasher to Existing Flasher	95 10	2" 1"		115	C	1	No. 12 AWG 5 Conductor Cable
10									Not Used
11	9703+15.62 to 9703+26.47	Pull Box 3 to Signal	11	3"		26 26 26 26	A B C D	1 1 1 1	No. 12 AWG 2 Conductor Cable Emergency Detector Cable No. 12 AWG 12 Conductor Cable Video Detector Cable
12	9703+15.62 to 9703+61.82	Pull Box 3 to Pull Box 4	70	4"		80 80 80 240 80 80	A B C C C D	1 1 1 3 1 1	No. 12 AWG 2 Conductor Cable Emergency Detector Cable No. 12 AWG 5 Conductor Cable No. 12 AWG 12 Conductor Cable Mult 3 No 6 USE Video Detector Cable
13	9703+61.82 to 9703+57.33	Pull Box 4 to Type VI Signal	5	2"		20	C	1	No. 12 AWG 12 Conductor Cable

Run	Station	Location	Conduit Run		Cable Trench	Cable Run			
			Length	Size	Length	Length	Code	QTY	Type
14	9703+61.82 to 9702+01.98	Pull Box 4 to Pull Box 5	81	4"		91 91 91 182 91 91	A B C C C D	1 1 1 2 1 1	No. 12 AWG 2 Conductor Cable Emergency Detector Cable No. 12 AWG 5 Conductor Cable No. 12 AWG 12 Conductor Cable Mult 3 No 6 USE Video Detector Cable
15	9702+01.98 to 9702+02.50	Pull Box 5 to Signal	7	2"		22 22	C D	1 1	No. 12 AWG 5 Conductor Cable Video Detector Cable
16	9702+01.98 to 9703+31.86	Pull Box 5 to Pull Box 6	131	4"		141 141 282 141	A B C C	1 1 2 1	No. 12 AWG 2 Conductor Cable Emergency Detector Cable No. 12 AWG 12 Conductor Cable Mult 3 No 6 USE
17	9703+31.86 to 9703+41.78	Pull Box 6 to Signal	14	3"		29 29 29	A B C	1 1 1	No. 12 AWG 2 Conductor Cable Emergency Detector Cable No. 12 AWG 12 Conductor Cable
18	9703+31.86 to 9703+73.17	Pull Box 6 to Pull Box 7	57	2"		67 67	C C	1 1	No. 12 AWG 12 Conductor Cable Mult 3 No 6 USE
19	9703+73.17 to 9703+71.72	Pull Box 7 to Type VI Signal	8	2"		23	B	1	No. 12 AWG 12 Conductor Cable
20									Not Used
21									Not Used

Cable Code

A = Emergency Vehicle Indicator Lamp
B = Emergency Vehicle Detector Cable
C = Signal Control Cable
D = Video Detection Cable
E = Power Cable

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Traffic Signal System

US 85 Intersection Improvements

Conduit and Conductors

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	8

Run	Station	Location	Conduit Run		Cable Trench	Cable Run			
			Length	Size	Length	Length	Code	QTY	Type
22									Not Used
23	9703+36.06 to 9703+69.29	Pull Box 8 to Signal	50	3"		65 65 65 65	A B C D	1 1 1 1	No. 12 AWG 2 Conductor Cable Emergency Detector Cable No. 12 AWG 12 Conductor Cable Video Detector Cable
24	9703+36.06 to 9703+41.77	Pull Box 8 to Type VI Signal	7	2"		22	C	1	No. 12 AWG 12 Conductor Cable
25	9703+36.06 to 9702+58.60	Pull Box 8 to Pull Box 9	78	4"		88 88 176 88	A B C D	1 1 2 1	No. 12 AWG 2 Conductor Cable Emergency Detector Cable No. 12 AWG 12 Conductor Cable Video Detector Cable
26	9702+58.60 to 9702+57.78	Pull Box 9 to Signal	15	2"		30 30	C D	1 1	No. 12 AWG 5 Conductor Cable Video Detector Cable
27	9702+58.60 to 9703+59.45	Pull Box 9 to Pull Box 10	141	4"		151 151 151 302 302	A B C C D	1 1 1 2 2	No. 12 AWG 2 Conductor Cable Emergency Detector Cable No. 12 AWG 5 Conductor Cable No. 12 AWG 12 Conductor Cable Video Detector Cable
28	9703+59.45 to 9703+65.00	Pull Box 10 to Signal	37	3"		52 52 52 52 52	A B C C D	1 1 1 1 1	No. 12 AWG 2 Conductor Cable Emergency Detector Cable No. 12 AWG 5 Conductor Cable No. 12 AWG 12 Conductor Cable Video Detector Cable
29	9703+59.45 to 9703+29.31	Pull Box 10 to Pull Box 11	63	4"		146 146 146 219 146	A B C C D	2 2 2 3 2	No. 12 AWG 2 Conductor Cable Emergency Detector Cable No. 12 AWG 5 Conductor Cable No. 12 AWG 12 Conductor Cable Video Detector Cable
30	9703+29.31 to 9703+17.84	Pull Box 11 to Controller	7	4"		34 34 34 51 34	A B C C D	2 2 2 3 2	No. 12 AWG 2 Conductor Cable Emergency Detector Cable No. 12 AWG 5 Conductor Cable No. 12 AWG 12 Conductor Cable Video Detector Cable
31	9703+17.84 to —	Controller to Existing Flasher Cabinet	10	2"	475	495	C	1	Mult 3 No 6 USE
32	— to 9702+31.56	Existing Flasher Cabinet to Pull Box 12	156	1"		166	C	1	No. 12 AWG 5 Conductor Cable
33	9702+31.56 to 9702+35.34	Pull Box 12 to Existing Flasher	115 10	2" 1"		135	C	1	No. 12 AWG 5 Conductor Cable
34	9702+35.34 to 9703+31.33	Existing Flasher to Existing Flasher	105 10	2" 1"		125	C	1	No. 12 AWG 5 Conductor Cable

Run	Station	Location	Conduit Run		Cable Trench	Cable Run			
			Length	Size	Length	Length	Code	QTY	Type
35	— to 9703+17.84	Feedpoint to Controller	10	2"		20	E	1	#6 U.S.E.

Cable Code

A = Emergency Vehicle Indicator Lamp
B = Emergency Vehicle Detector Cable
C = Signal Control Cable
D = Video Detection Cable
E = Power Cable

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Traffic Signal System

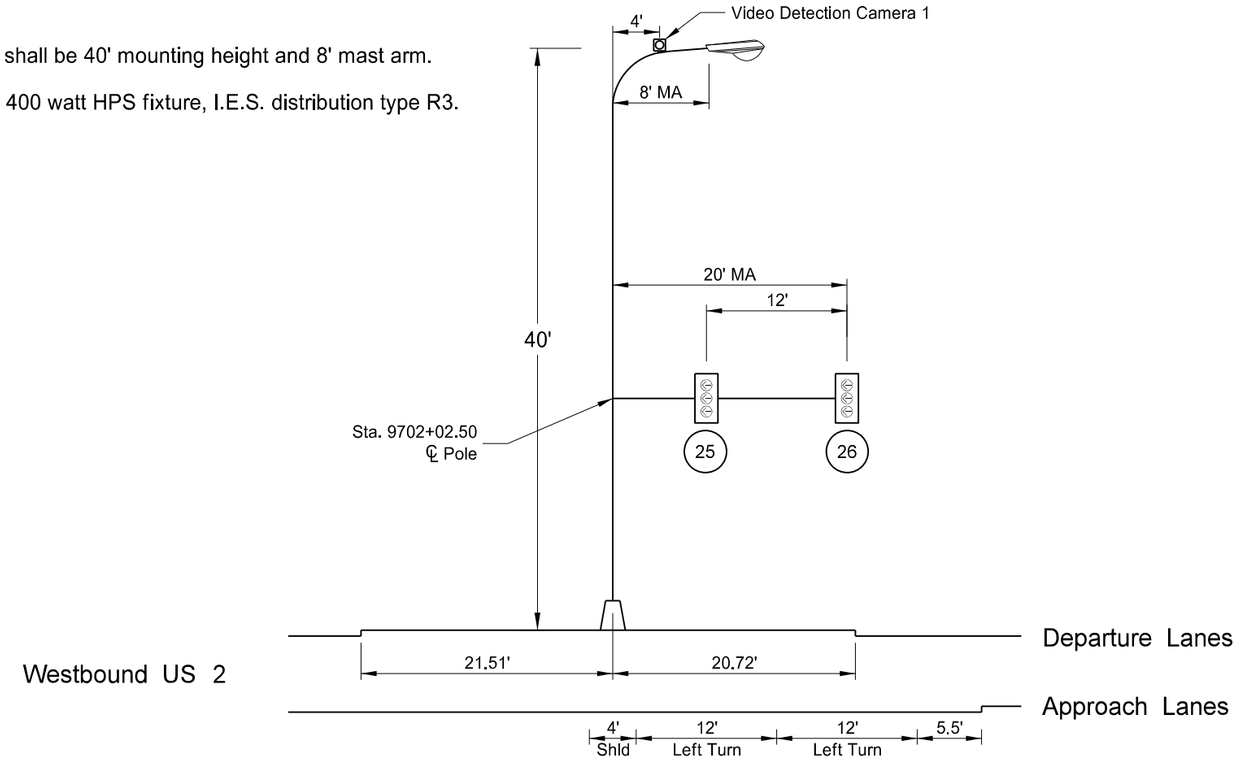
US 85 Intersection Improvements

Conduit and Conductors

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	9

Notes:
1. Luminaire extension shall be 40' mounting height and 8' mast arm.

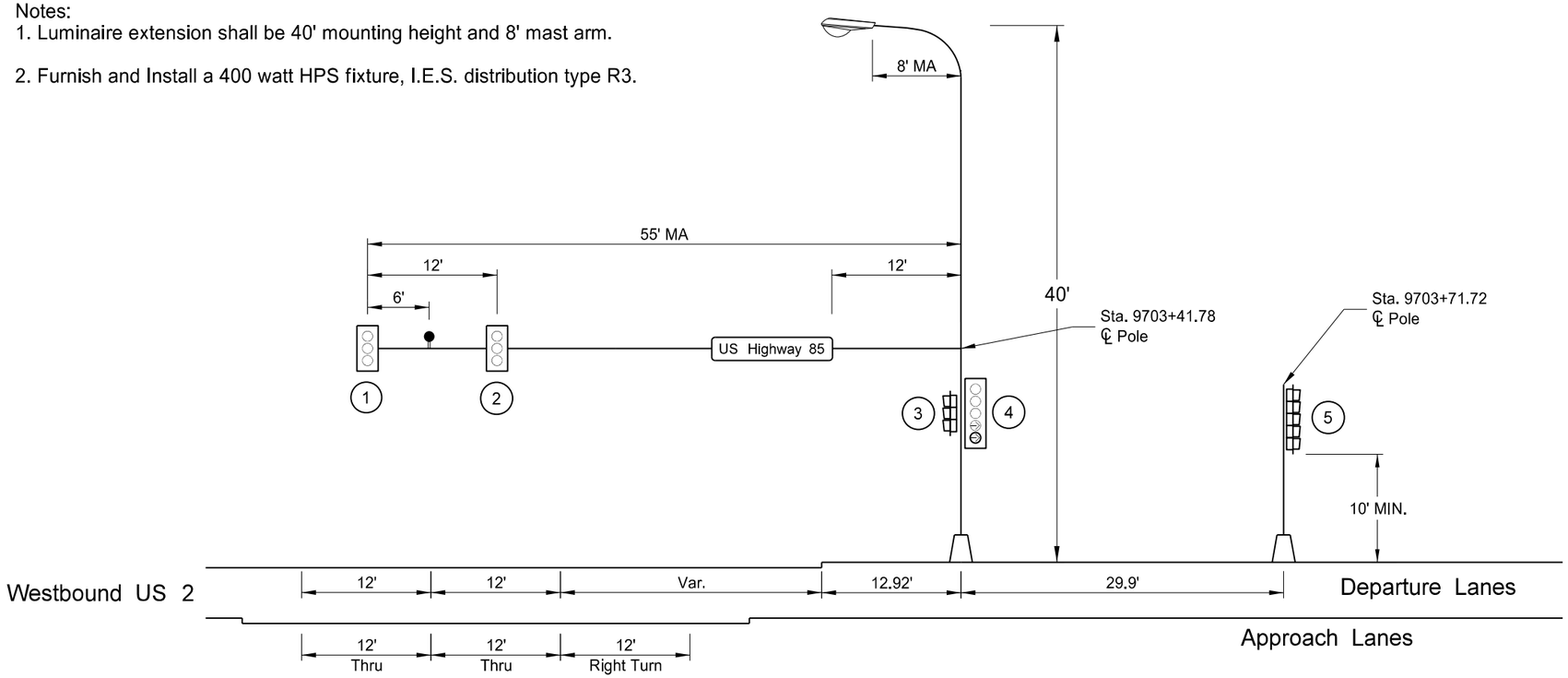
2. Furnish and Install a 400 watt HPS fixture, I.E.S. distribution type R3.



*The final location of the video detection cameras shall be determined by the contractor to provide a functional system.

Notes:
1. Luminaire extension shall be 40' mounting height and 8' mast arm.

2. Furnish and Install a 400 watt HPS fixture, I.E.S. distribution type R3.



LEGEND

- Transformer Base
- Video Detection Camera
- Traffic Signal Head
- (X) Signal Head Number
- Emergency Vehicle Detection Unit

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Traffic Signal System

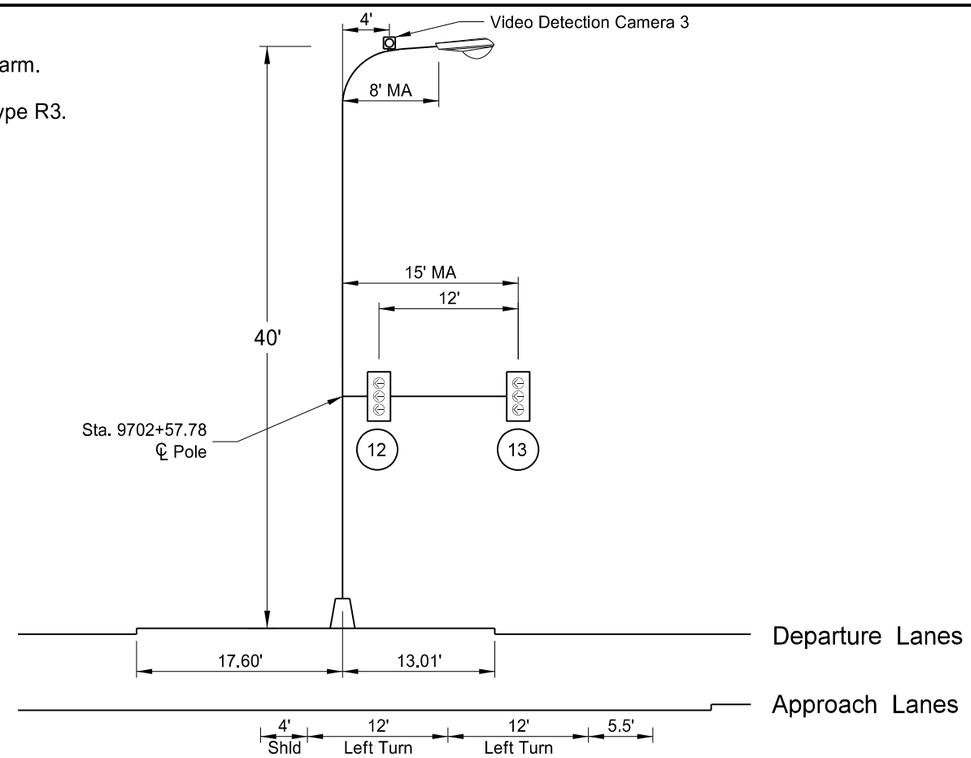
US 85 Intersection Improvements

Signal Standards and Head Locations

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	10

Notes:
1. Luminaire extension shall be 40' mounting height and 8' mast arm.

2. Furnish and Install a 400 watt HPS fixture, I.E.S. distribution type R3.



Eastbound US 2

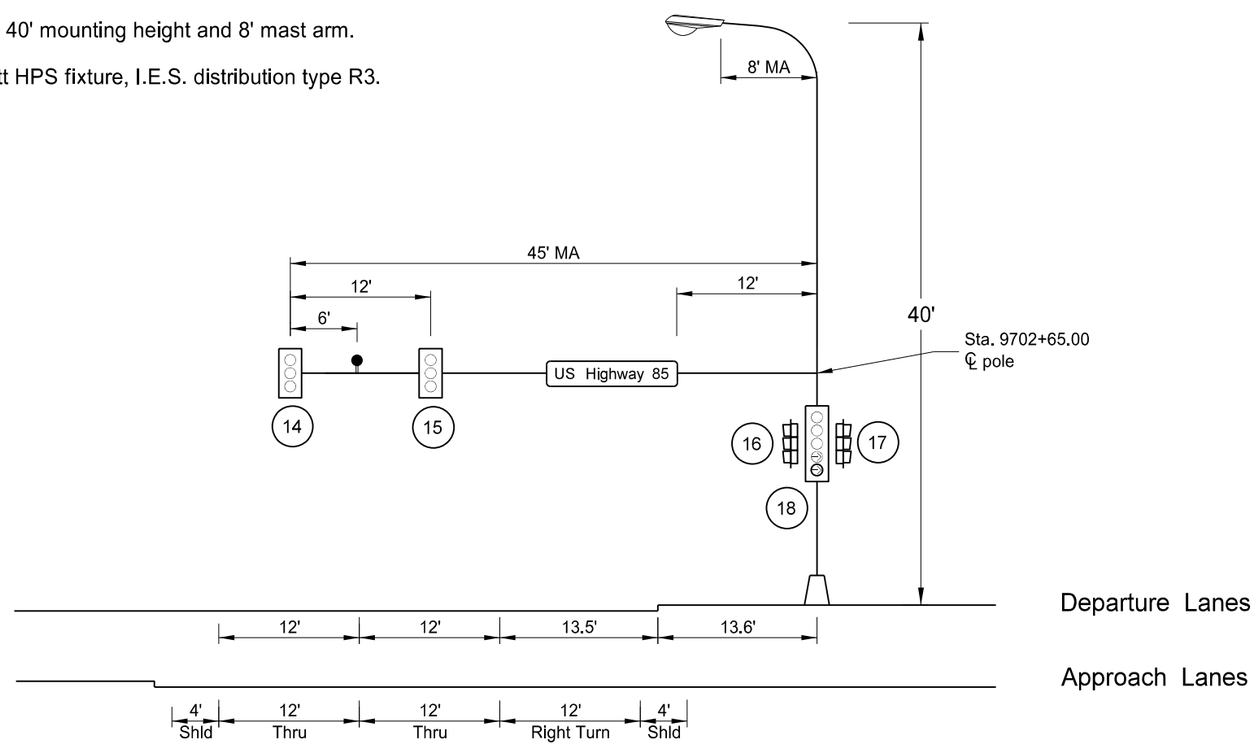
*The final location of the video detection cameras shall be determined by the contractor to provide a functional system.

LEGEND

- Transformer Base
- Video Detection Camera
- Traffic Signal Head
- (X) Signal Head Number
- Emergency Vehicle Detection Unit

Notes:
1. Luminaire extension shall be 40' mounting height and 8' mast arm.

2. Furnish and Install a 400 watt HPS fixture, I.E.S. distribution type R3.



Eastbound US 2

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Traffic Signal System

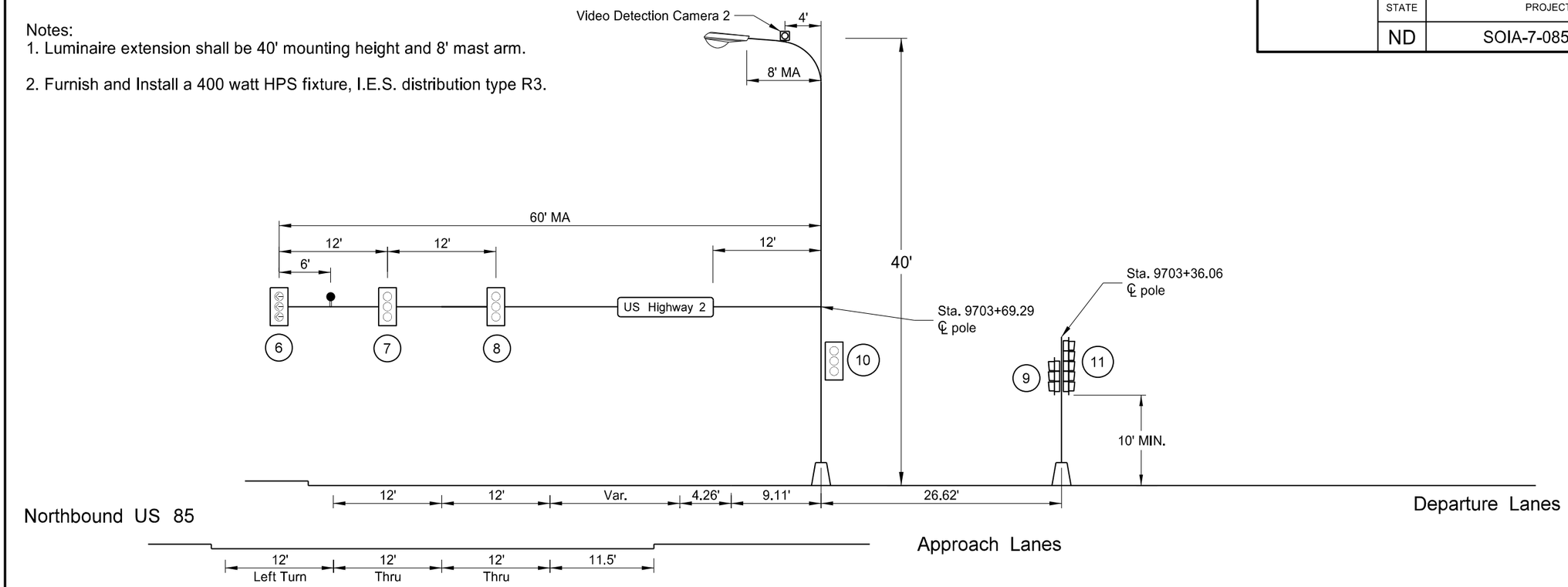
US 85 Intersection Improvements

Signal Standards and Head Locations

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	11

Notes:
1. Luminaire extension shall be 40' mounting height and 8' mast arm.

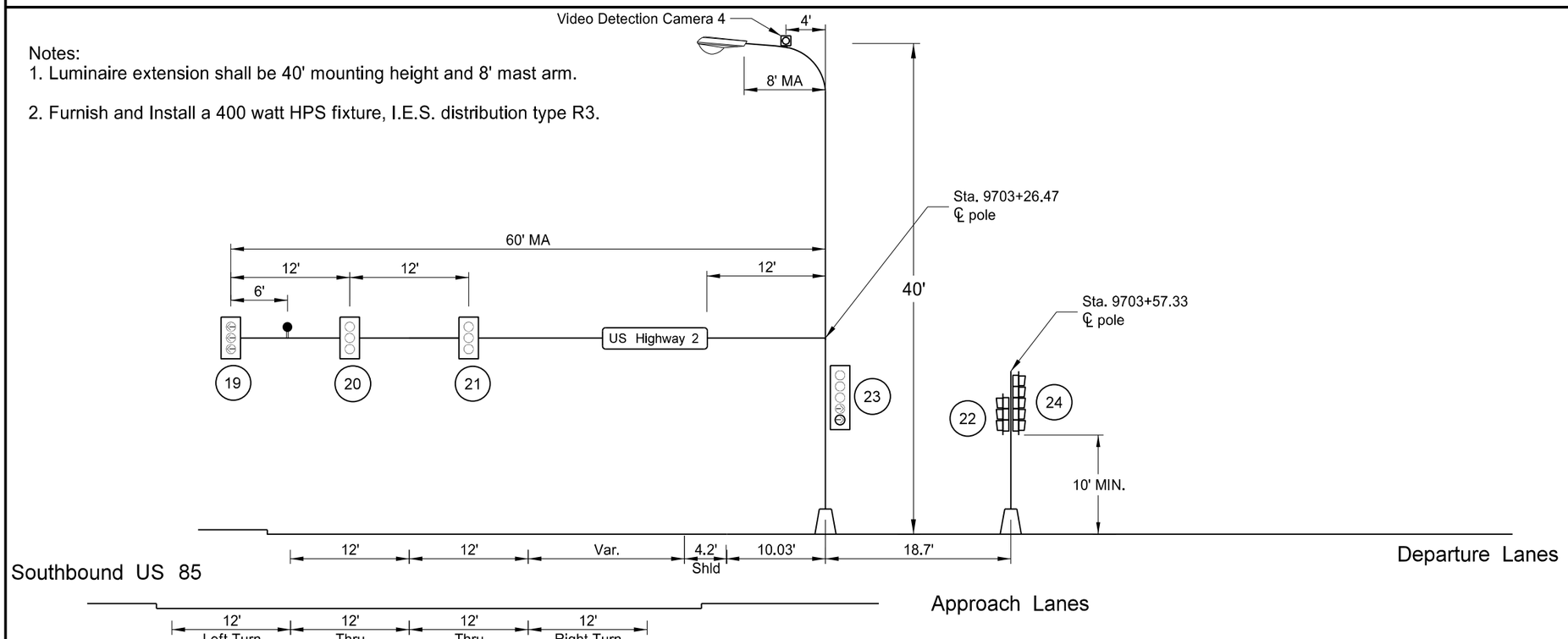
2. Furnish and Install a 400 watt HPS fixture, I.E.S. distribution type R3.



*The final location of the video detection cameras shall be determined by the contractor to provide a functional system.

Notes:
1. Luminaire extension shall be 40' mounting height and 8' mast arm.

2. Furnish and Install a 400 watt HPS fixture, I.E.S. distribution type R3.



LEGEND

- Transformer Base
- Video Detection Camera
- Traffic Signal Head
- (X) Signal Head Number
- Emergency Vehicle Detection Unit

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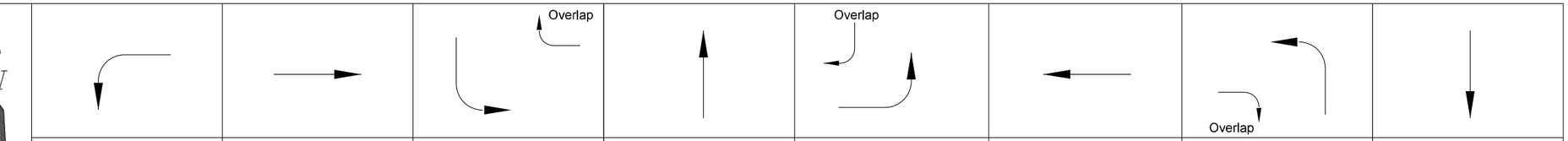
Traffic Signal System

US 85 Intersection Improvements

Signal Standards and Head Locations

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	12



Phase 1

Head #	R/W	Clear to Phase 2	3	4	5	6	7	8
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~
23								
24								
25	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~
26	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~

Phase 2

Head #	R/W	Clear to Phase 3	4	5	6	7	8	1
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14	G	Y	Y	(A)	(A)	Y	Y	Y
15	G	Y	Y	(A)	(A)	Y	Y	Y
16								
17								
18	G	Y	Y	(A)	(A)	Y	Y	Y
19								
20								
21								
22								
23								
24	G	Y	Y	(A)	(A)	Y	Y	Y
25								
26								

Phase 3

Head #	R/W	Clear to Phase 4	5	6	7	8	1	2
1								
2								
3								
4	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~
5								
6								
7								
8								
9								
10								
11	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~
12								
13								
14								
15								
16	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~
17								
18								
19	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~
20								
21								
22								
23								
24								
25								
26								

Phase 4

Head #	R/W	Clear to Phase 5	6	7	8	1	2	3
1								
2								
3								
4								
5								
6								
7	G	Y	Y	(A)	(A)	Y	Y	Y
8	G	Y	Y	(A)	(A)	Y	Y	Y
9								
10	G	Y	Y	(A)	(A)	Y	Y	Y
11								
12								
13								
14								
15								
16								
17	G	Y	Y	(A)	(A)	Y	Y	Y
18								
19								
20								
21								
22								
23								
24								
25								
26								

Phase 5

Head #	R/W	Clear to Phase 6	7	8	1	2	3	4
1								
2								
3								
4								
5	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~
6								
7								
8								
9	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~
10								
11								
12	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~
13	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~
14								
15								
16								
17								
18								
19								
20								
21								
22								
23	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~
24								
25								
26								

Phase 6

Head #	R/W	Clear to Phase 7	8	1	2	3	4	5
1	G	Y	Y	(A)	(A)	Y	Y	Y
2	G	Y	Y	(A)	(A)	Y	Y	Y
3								
4	G	Y	Y	(A)	(A)	Y	Y	Y
5								
6								
7								
8								
9								
10								
11	G	Y	Y	(A)	(A)	Y	Y	Y
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

Phase 7

Head #	R/W	Clear to Phase 8	1	2	3	4	5	6
1								
2								
3	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~
4								
5								
6	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~
19								
20								
21								
22								
23								
24	~~G~~	~~Y~~	~~Y~~	~~Y~~	(A)	(A)	~~Y~~	~~Y~~
25								
26								

Phase 8

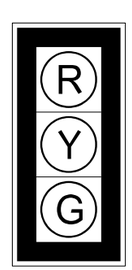
Head #	R/W	Clear to Phase 1	2	3	4	5	6	7
1								
2								
3								
4								
5	G	Y	Y	(A)	(A)	Y	Y	Y
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20	G	Y	Y	(A)	(A)	Y	Y	Y
21	G	Y	Y	(A)	(A)	Y	Y	Y
22								
23	G	Y	Y	(A)	(A)	Y	Y	Y
24								
25								
26								

Blank squares denote a red indication

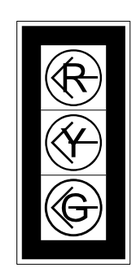
(A) When one phase is on alone any nonconflicting phase may start timing concurrently without a clearance interval (See Chart A)

Chart A

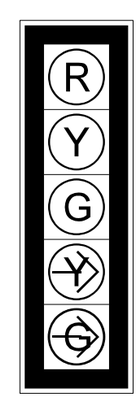
On Phase	Non-Conflicting Phase Allowed to Time Concurrently
1	5 or 6
2	5 or 6
3	7 or 8
4	7 or 8
5	1 or 2
6	1 or 2
7	3 or 4
8	3 or 4



(12" Lenses)
Heads 1,2,7,8,10,14,15,17,20,21



(12" Lenses)
Heads 3,6,9,12,13,16,19,22,25,26



(12" Lenses)
Heads 4,5,11,18,23,24

Notes:

All Heads Shall use LED

5" Louvered Back Plate with Type XI Yellow Reflective Border (typ.) on all heads

Leading/Lagging of turn phases may vary to best handle traffic demand

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Traffic Signal System

US 85 Intersection Improvements

Phasing

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	13

US 85 & US 2

Conductor			Cable 1 (12 No.12 AWG)		Cable 2 (12 No.12 AWG)		Cable 3 (12 No.12 AWG)		Cable 4 (12 No.12 AWG)		Cable 5 (5 No. 12 AWG)	
Run	Base	Tracer	Head	Indication	Head	Indication	Head	Indication	Head	Indication	Head	Indication
1	Black		1,2,4	Ø6 Green	5	Ø8 Green	7,8,10	Ø4 Green	11	Ø6 Green	12,13	Ø5 Green Left Arrow
2	White			Neutral		Neutral		Neutral		Neutral		Neutral
3	Red		1,2,4	Ø6 Red	5	Ø8 Red	7,8,10	Ø4 Red	11	Ø6 Red	12,13	Ø5 Red Left Arrow
4	Green			Ground		Ground		Ground		Ground		Ground
5	Orange		1,2,4	Ø6 Yellow	5	Ø8 Yellow	7,8,10	Ø4 Yellow	11	Ø6 Yellow	12,13	Ø5 Yellow Left Arrow
6	Blue		3	Ø7 Green Left Arrow		Spare	6	Ø7 Green Left Arrow	9	Ø5 Green Left Arrow		
7	White	Black	3	Ø7 Yellow Left Arrow	5	Ø5 Green Right Arrow	6	Ø7 Yellow Left Arrow	9	Ø5 Yellow Left Arrow		
8	Red	Black	3	Ø7 Red Left Arrow	5	Ø5 Yellow Right Arrow	6	Ø7 Red Left Arrow	9	Ø5 Red Left Arrow		
9	Green	Black	4	Ø3 Green Right Arrow		Spare		Spare	11	Ø3 Green Right Arrow		
10	Orange	Black	4	Ø3 Yellow Right Arrow		Spare		Spare	11	Ø3 Yellow Right Arrow		
11	Blue	Black		Spare		Spare		Spare		Spare		
12	Black	White		Spare		Spare		Spare		Spare		

Conductor			Cable 6 (12 No.12 AWG)		Cable 7 (5 No. 12 AWG)		Cable 8 (12 No. 12 AWG)		Cable 9 (12 No.12 AWG)		Cable 10 (5 No. 12 AWG)	
Run	Base	Tracer	Head	Indication	Head	Indication	Head	Indication	Head	Indication	Head	Indication
1	Black		14,15,18	Ø2 Green	17	Ø4 Green	20,21,23	Ø8 Green	24	Ø2 Green	25,26	Ø1 Green Left Arrow
2	White			Neutral		Neutral		Neutral		Neutral		Neutral
3	Red		14,15,18	Ø2 Red	17	Ø4 Red	20,21,23	Ø8 Red	24	Ø2 Red	25,26	Ø1 Red Left Arrow
4	Green			Ground		Ground		Ground		Ground		Ground
5	Orange		14,15,18	Ø2 Yellow	17	Ø4 Yellow	20,21,23	Ø8 Yellow	24	Ø2 Yellow	25,26	Ø1 Yellow Left Arrow
6	Blue		16	Ø3 Green Left Arrow			19	Ø3 Green Left Arrow	22	Ø1 Green Left Arrow		
7	White	Black	16	Ø3 Yellow Left Arrow			19	Ø3 Yellow Left Arrow	22	Ø1 Yellow Left Arrow		
8	Red	Black	16	Ø3 Red Left Arrow			19	Ø3 Red Left Arrow	22	Ø1 Red Left Arrow		
9	Green	Black	18	Ø7 Green Right Arrow			23	Ø5 Green Right Arrow	24	Ø7 Green Right Arrow		
10	Orange	Black	18	Ø7 Yellow Right Arrow			23	Ø5 Yellow Right Arrow	24	Ø7 Yellow Right Arrow		
11	Blue	Black		Spare				Spare		Spare		
12	Black	White		Spare				Spare		Spare		

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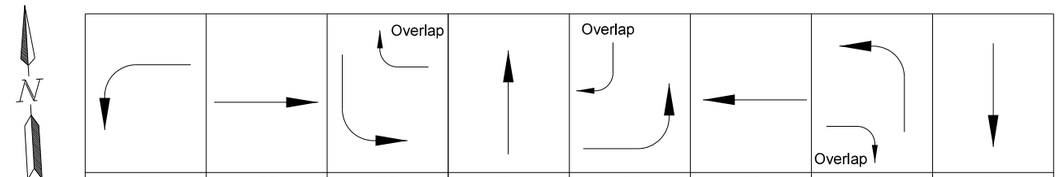
Traffic Signal System

US 85 Intersection Improvements

Conductors

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	14



	01	02	03	04	05	06	07	08
BASIC INTERVALS (OR FUNCTIONS)								
Minimum Initial	7.0	20.0	7.0	10.0	7.0	20.0	7.0	10.0
Passage Time	1.0	4.5	1.0	4.5	1.0	4.5	1.0	4.5
Maximum (Maximum Green or Ext.Limit)	30.0	60.0	30.0	60.0	30.0	60.0	30.0	60.0
Yellow Change	3.0	5.0	3.0	4.5	3.0	5.0	3.0	4.5
Red Clearance	4.1	1.5	5.0	3.0	3.5	1.5	5.0	3.5
VOLUME DENSITY TIMING FUNCTIONS VARIABLE INITIAL TIMING OPTIONS								
Actuations Before Added Initial	-	-	-	-	-	-	-	-
Added Initial per Actuation	-	-	-	-	-	-	-	-
Maximum Initial	-	-	-	-	-	-	-	-
TIME WAITING GAP REDUCTION OPTIONS								
Time Before Reduction	-	20.0	-	-	-	20.0	-	-
Time to Reduce to Minimum Gap	-	20.0	-	-	-	20.0	-	-
Minimum Gap	-	2.0	-	-	-	2.0	-	-
Locking Memory	X	X	X	X	X	X	X	X
Non-Locking Memory								
Phase recall (Y/N)	N	Y	N	N	N	Y	N	N
Flashing-Normal & Conflict Monitor	R	R	R	R	R	R	R	R
Start Up Phasing	R	G	R	R	R	G	R	R
Type of Detector – Presence	X		X		X		X	
Type of Detector – Calling		X		X		X		X
Type of Detector – Passage		X		X		X		X
Emergency Vehicle Pre-emption	X	X	X	X	X	X	X	X

Note:

Leading/Lagging of turn phases may vary to best handle traffic demand

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Traffic Signal System

US 85 Intersection Improvements

Controller Settings

SPEC	CODE	ITEM DESCRIPTION	UNIT	TOTAL
772	0100	PULL BOX	EA	12
772	0020	CONCRETE FOUNDATION-TRAFFIC SIGNALS	EA	9
772	0200	1IN DIAMETER RIGID CONDUIT	LF	176
772	0240	2IN DIAMETER RIGID CONDUIT	LF	364
772	0270	3IN DIAMETER RIGID CONDUIT	LF	112
772	0290	4IN DIAMETER RIGID CONDUIT	LF	789
772	0310	UNDERGROUND CONDUCTOR NO6-TYPE THW	LF	20
772	0375	EMERGENCY VEHICLE DETECTOR CABLE	LF	1399
772	0400	NO12 AWG 2 CONDUCTOR CABLE	LF	1399
772	0403	NO12 AWG 5 CONDUCTOR CABLE	LF	1525
772	0410	NO12 AWG 12 CONDUCTOR CABLE	LF	2748
772	0700	TYPE VI SIGNAL STANDARD	EA	3
772	0852	COMBO 15FT MA SIG & LT STD-TYPE C	EA	1
772	0902	COMBO 20FT MA SIG & LT STD-TYPE C	EA	1
772	1152	COMBO 45FT MA SIG & LT STD-TYPE C	EA	1
772	1252	COMBO 55FT MA SIG & LT STD-TYPE C	EA	1
772	1295	COMBO 60FT MA SIG & LT STD-TYPE C	EA	2
772	1810	1-WAY 3 SEC HEAD W/12IN LENS-POST MTD	EA	5
772	1812	1-WAY 3 SEC HEAD W/12IN LENS-MA MTD	EA	14
772	1830	1-WAY 5 SEC HEAD W/12IN LENS-POST MTD	EA	7
772	2260	VIDEO DETECTION CABLE	LF	1432
772	2265	VIDEO DETECTION SYSTEM	EA	1
772	2610	EMERGENCY VEHICLE PRE-EMPTION UNIT	EA	4
772	3072	RELOCATE FLASHING BEACON	EA	4
772	9811	TRAFFIC SIGNAL SYSTEM--SITE 1	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 for "TRAFFIC SIGNAL SYSTEM – SITE 1"		

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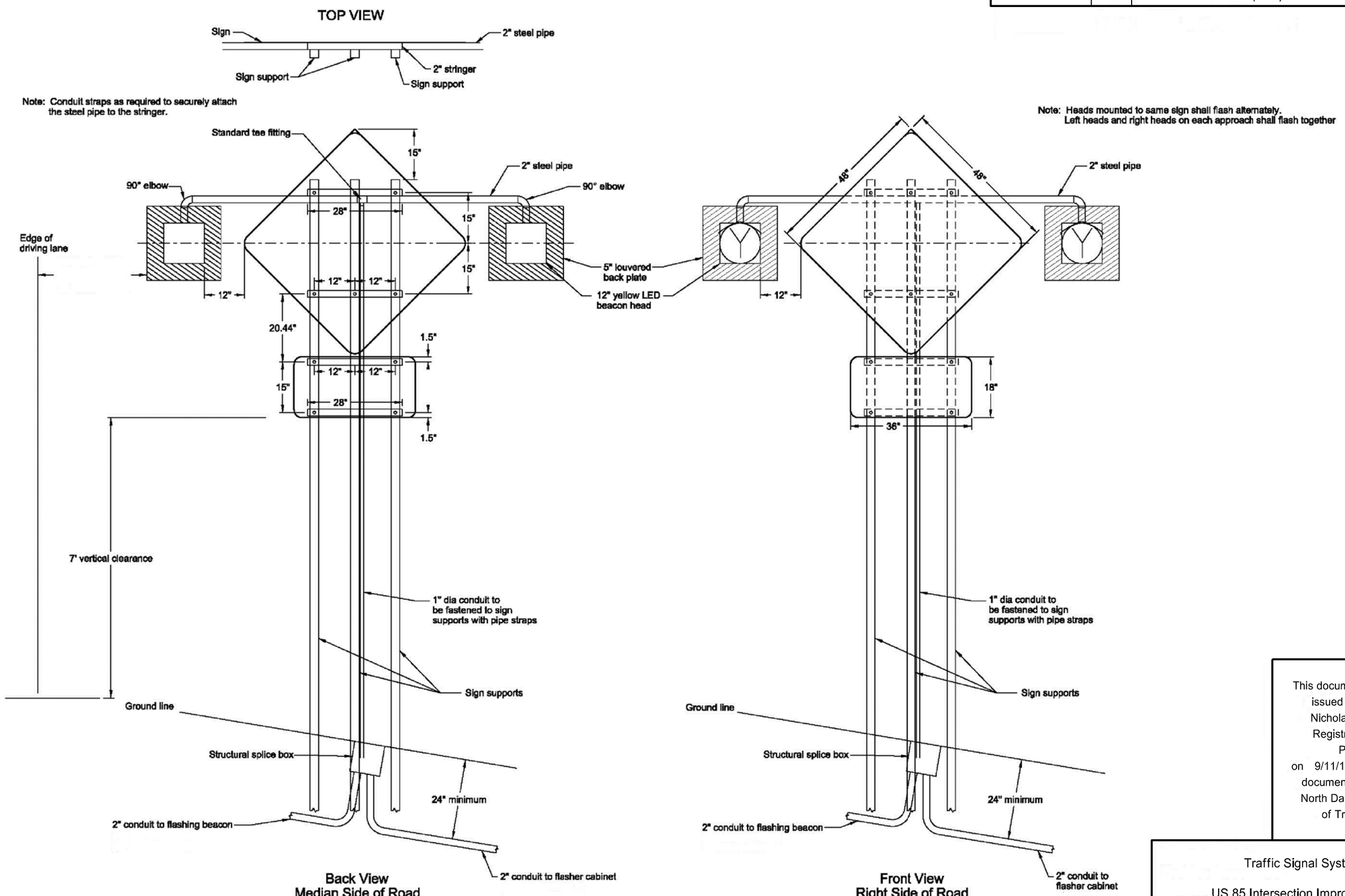
Traffic Signal System

US 85 Intersection Improvements

Estimated Signal Quantities

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	16



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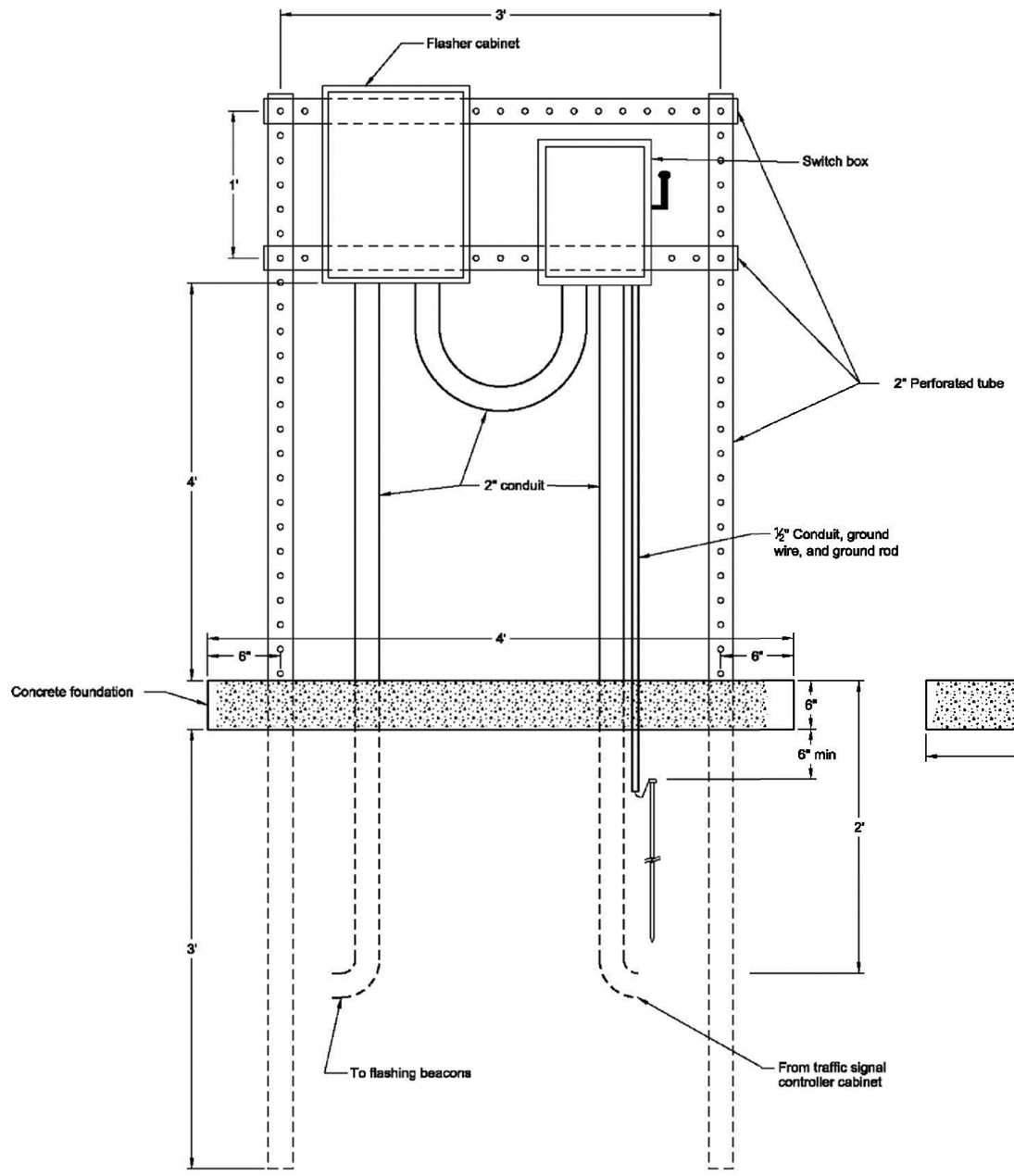
Traffic Signal System

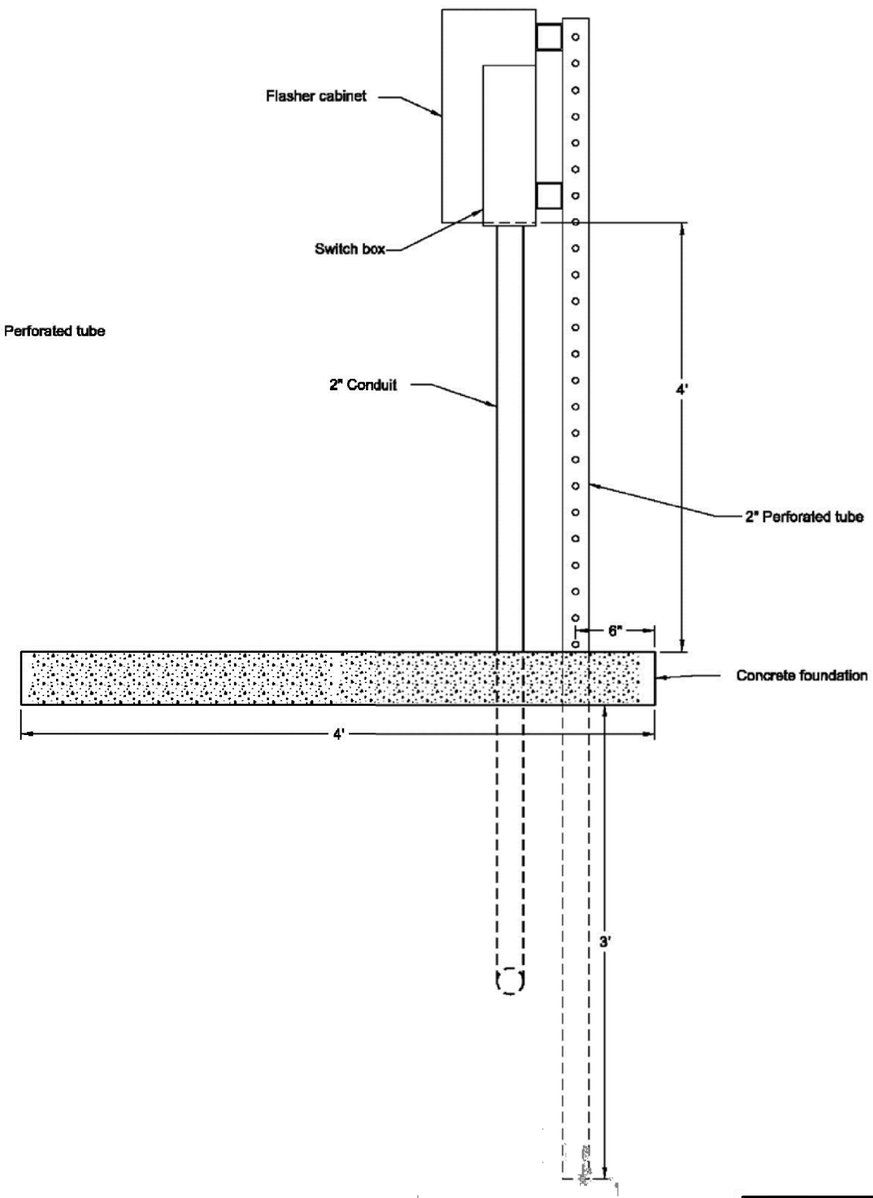
US 85 Intersection Improvements

Flashing Beacon Detail

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	150	17



Front View



Side View

Pipe Stand Feed Point Detail

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Traffic Signal System

US 85 Intersection Improvements

Pipe Stand Feed Detail

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	175	1

Boring Number	LSS-001	LSS-002	LSS-003	LSS-004	LSS-005	LSS-006	LSS-008
Northing	429505.60	429905.18	430404.71	430904.24	431403.73	431903.26	432643.84
Easting	1181607.08	1181623.21	1181643.38	1181663.52	1181683.69	1181703.85	1181734.24
Station	9676+04.07	9680+04.07	9685+04.07	9690+04.07	9695+04.07	9700+04.07	9705+04.12
Offset	0.16 Lt	0.14 Lt	0.10 Lt	0.09 Rt	2.05 Rt	2.21 Rt	2.21 Rt
Elevation	0.0	0.0	0.0	0.0	0.0	0.0	2087.7
Sample Depth	2.1' - 5'	2' - 5'	2' - 5'	2' - 5'	2.5' - 5'	2.2' - 5'	1' - 10'
% Passing 3/8" Sieve	100	91	89	94	86	77	100
% Passing No. 4 Sieve	94	70	69	81	70	62	98
% Passing No. 10 Sieve	87	53	53	68	57	50	95
% Coarse Sand (-No. 10, +No. 40)	12	9	13	12	11	12	12
% Fine Sand (-No. 40, +No. 200)	27	23	23	23	29	24	26
% Silt (0.075 - 0.002 mm)	40	17	13	30	13	11	36
% Clay (<0.002 mm)	7	5	5	5	5	4	21
% Finer than 0.02 mm	16	10	10	11	11	9	39
Frost Group	F3	F2	F2	F2	F2	F2	F3
Liquid Limit (-No. 40)	28	24	23	28	NP	22	31
Plastic Limit (-No. 40)	13	13	14	13	NP	14	13
Plasticity Index (-No. 40)	15	11	9	15	NP	8	18
Soil Color	Brown	Brown	Brown	Brown	Brown	Brown	Brown
USCS Classification	SC	SC	SC	SC	SM	SC	CL
Soil Classification (AASHTO M-15)	A-6 (3)	A-2-6 (0)	A-2-4 (0)	A-2-6 (1)	A-1-b (0)	A-2-4 (0)	A-6 (7)
Optimum Moisture (%)	7.0	6.0	6.0	7.0	5.0	6.0	7.0
Maximum Dry Density (pcf)	135.0	136.0	134.0	133.0	138.0	137.0	135.0

Depth (ft) (top 8 samples)	Moisture (%) (top 8 samples)														
		2.0	12	2.0	13	2.0	16	2.0	15	2.0	7	2.0	13	1.0	12
		3.0	14	3.0	17	3.0	16	3.0	13	3.0	5	3.0	18	2.0	9
		4.0	10	4.0	19	4.0	16	4.0	12	4.0	9	4.0	18	3.0	9
														4.0	8
														5.0	13
														6.0	15
														7.0	15
														8.0	15
Avg. Moisture of Sample Depth (all)		12		16		16		13		7		16		12	

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Soil Boring Logs

US 85 Intersection Improvements

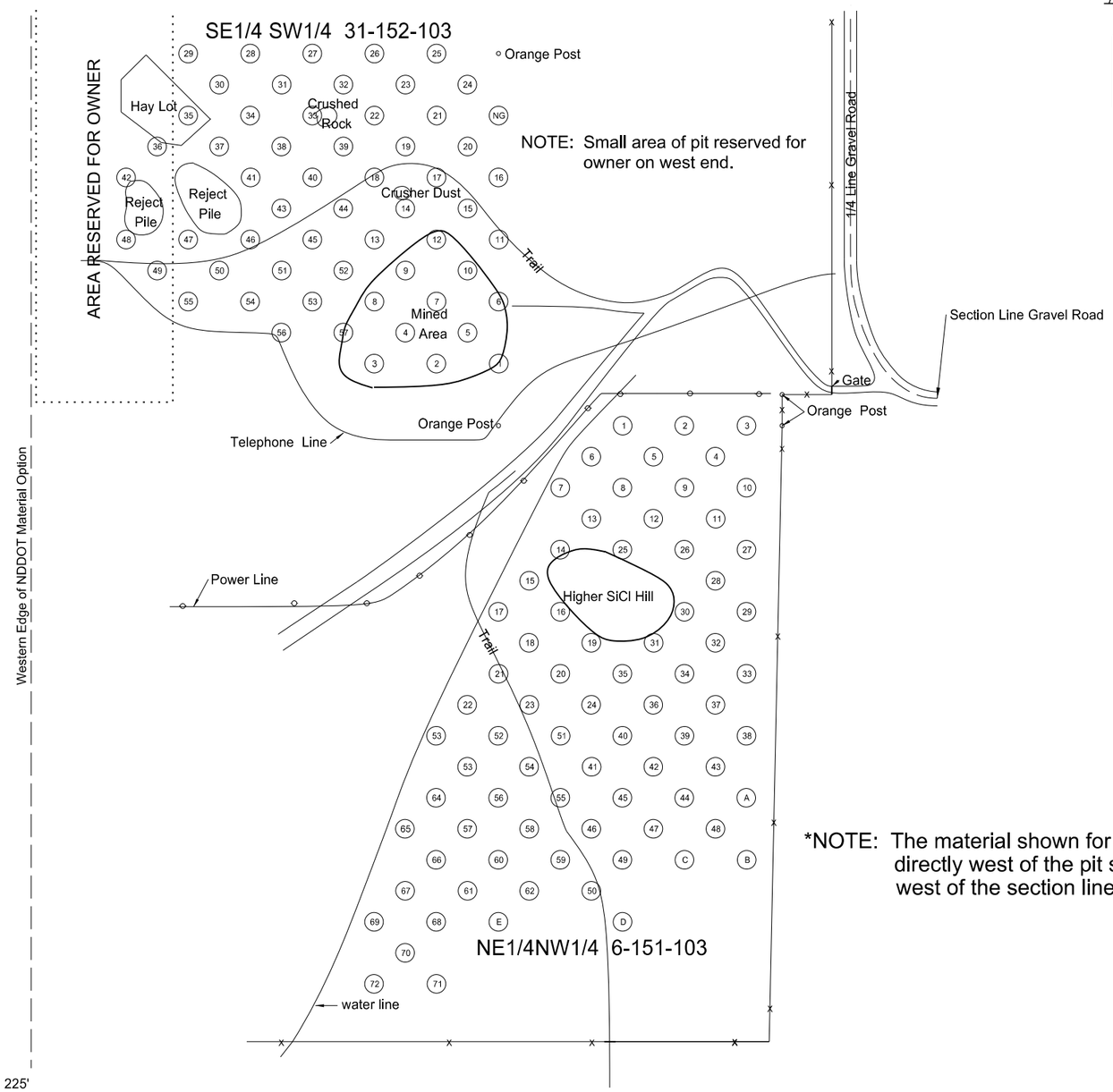
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	180	1

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

TEST HOLE PLAT

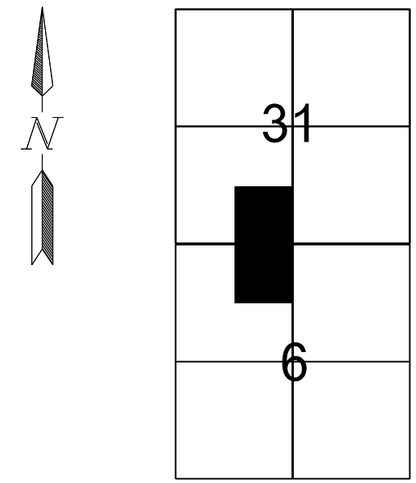
Location: SE1/4SW1/4 31-152-103 & NE1/4NW1/4 6-151-103 County: McKenzie

Ownership: James & Diana Gullikson, Cartwright, ND



Scale 1" = 225'

LOCATION OF PIT IN SECTION



SE1/4SW1/4 31-152-103

Area "A" consists of Test Holes 1 - 13
Area "B consists of Test Holes 14 - 26
Area "C" consists of Test Holes 27 - 39
Area "D" consists of Test Holes 40 - 48
Area "E" consists of Test Holes 49 - 57

NE1/4NW1/4 6-151-103

Area "A" consists of Test Holes 1 - 13
Area "B consists of Test Holes 14 - 24
Area "C" consists of Test Holes 25 - 37
Area "D" consists of Test Holes 38 - 50
Area "E" consists of Test Holes 51 - 62
Area "F" consists of Test Holes 63 - 72

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

*NOTE: The material shown for Section 6 may now be depleted. More material may be available directly west of the pit shown in Section 6. The NDDOT Material Option includes 1,320 feet west of the section line and 1,320 feet south of the section line in Section 6.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	**SOIA-7-085(092)183**	**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	1.5	9.0 gr	0	18	45	62	+WL16.5
		1.5 FS					
		4.5 gr					
2	0.5	0.5 gr	0	16	33	42	+WL 7.0
		1.0 Fgr					
		1.0 Fgr SiCl					
		1.0 Fgr					
		1.0 Fgr SiCl					
		2.0 gr					
3	0.5	4.5 gr	2	17	32	51	+WL 5.0
4	0.5	3.5 gr	1	24	48	62	+WL 4.0
5	5.0	1.0 gr	3	18	28	35	+WL 8.0
		1.0 FS					
		1.0 gr					
6	0.5	5.5 gr SiCl	1	12	27	33	+WL14.0
		1.0 gr					
		0.5 FS					
		0.5 Fgr					
		4.0 gr					
		2.0 FS					
7	0.5	3.5 gr	0	12	24	37	+WL 4.0
8	0.5	4.5 gr	1	26	48	58	+WL 5.0
9	0.5	1.5 gr	1	22	33	37	+WL 2.0
10	2.0	1.0 sd	2	21	40	50	+WL 8.0
		4.0 gr					
		1.0 FS					
11	1.0	1.0 Fgr	2	21	41	54	+WL17.0
		8.0 gr					
		1.0 Fgr					
		2.0 gr					
		1.0 Fgr					
		3.0 gr					
12	0.5	0.5 FS	1	21	44	55	+WL 3.0
		2.0 gr					
13	0.5	5.5 Fgr	0	9	22	29	+WL 9.0
		1.0 sd					
		1.0 Fgr					
		1.0 gr					
14	0.5	2.5 FS	0	7	19	29	+WL 8.0
		3.0 gr					
		2.0 FS					
15	2.0	1.0 gr	1	17	35	43	+WL13.0
		1.0 sd					
		6.0 gr					
		2.0 FS					
		1.0 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
16	0.5	0.5 Fgr	1	13	29	37	+WL 9.5
		1.0 FS					
		1.0 Fgr					
		2.0 FgrSiCl					
		1.0 FS					
		3.0 gr					
17	1.0	2.0 FS	0	15	33	40	+WL 7.0
		3.0 gr					
		1.0 FS					
18	0.5	6.5 gr	0	16	36	48	+WL 8.0
		1.0 sd					
19	0.5	3.5 gr	0	10	27	35	+WL 6.0
		1.0 FS					
		1.0 gr					
20	0.5	2.5 Fgr	0	14	32	43	+WL10.0
		3.0 gr					
		0.5 FS					
		3.5 gr					
21	0.5	5.5 gr	0	14	33	44	+WL 6.0
22	0.5	0.5 sd	0	12	29	42	+WL 6.0
		4.5 gr					
		0.5 Fgr					
23	0.5	1.5 sd	0	9	19	25	+WL 9.0
		1.0 sd SiCl					
		1.0 FS					
		3.0 gr					
		1.0 FS					
		1.0 gr					
24	0.5	2.5 sd	0	4	12	17	+WL10.0
		1.0 Fgr SiCl					
		3.0 gr					
		3.0 FS					
25	0.5	2.5 sd SiCl	0	11	25	31	+WL 9.0
		5.0 gr					
		1.0 FS					
26	0.5	3.5 FS	0	6	15	20	+WL12.0
		1.0 sd					
		1.0 FS					
		1.0 Fgr					
27	0.5	2.5 gr	0	9	19	26	+WL 7.0
		4.0 FS					
28	0.5	3.5 gr	2	28	44	50	+WL 8.0
		1.0 FS					
		3.0 gr					
29	0.5	4.5 gr	1	21	44	50	+WL 9.0
		2.0 FS					
		2.0 gr					
30	0.5	7.5 gr	4	29	51	60	+WL 8.0

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
31	0.5	6.0 gr	3	23	55	75	+WL 6.5
32	0.5	5.5 gr	0	16	37	49	+WL 6.0
33	0.5	1.5 gr	0	11	32	47	+WL 5.0
		1.0 FS					
		2.0 gr					
34	0.5	5.5 gr	3	19	45	63	+WL 6.0
35	0.5	7.5 gr	2	31	53	69	+WL 8.0
36	0.5	4.5 FS SiCl	0	20	35	45	+WL 8.5
		3.5 gr					
37	0.5	1.5 gr	0	10	28	37	+WL 5.0
		1.0 FS					
		1.0 gr					
		1.0 FS					
38	0.5	5.5 gr	0	17	38	48	+WL 6.0
39	1.0	4.0 gr	0	13	31	44	+WL 5.0
40	0.5	1.5 gr	0	9	24	33	+WL 6.0
		4.0 FS SiCl					
41	0.5	5.5 gr	0	13	36	48	+WL 6.0
42	0.5	2.5 sd	0	7	17	28	+WL 7.0
		4.0 gr					
43	0.5	4.5 gr	0	21	46	60	+WL 8.0
		1.0 FS					
		2.0 gr					
44	0.5	3.5 gr	0	6	19	27	+WL 7.0
		3.0 sd SiCl					
45	0.5	3.0 gr	0	15	36	52	+WL 9.0
		0.5 FS					
		1.5 gr					
		0.5 Fgr					
		3.0 gr					
46	0.5	0.5 gr	2	22	42	54	+WL 8.5
		1.0 sd					
		4.0 gr					
		1.0 FS					
		1.5 gr					
47	1.0	1.0 Fgr	0	16	39	53	+WL 8.0
		6.0 gr					
48	0.5	2.5 FS	0	11	24	31	+WL 8.0
		2.0 gr					
		2.0 FS					
		1.0 gr					
49	1.5	7.5 gr	2	22	43	58	+WL 12.0
		1.0 gr Si Cl					
		2.0 gr					
50	0.5	6.0 FS	0	9	21	31	+WL 10.5
		1.5 Fgr					
		2.5 gr					
51	0.5	5.5 gr	3	25	41	51	+WL 9.5
		2.0 FS					
		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
52	0.5	1.5 gr	0	13	25	30	+WL 10.0
		2.0 FS					
		3.0 gr					
		5.0 Fgr					
		2.5 FS					
53	0.5	1.5 gr	0	15	29	37	+WL 9.5
		5.0 FS					
		2.5 gr					
54	0.5	0.5 Fgr	0	23	46	59	+WL 11.0
		10.0 gr					
55	5.0	6.0 gr	2	20	38	52	+Cave
		2.0 FS					
56	0.5	2.0 gr	0	11	24	34	+WL 10.0
		4.5 FS					
		2.0 gr					
		1.0 FS					
57	0.5	6.0 gr	0	21	42	54	+WL 6.5

RANGE 103 **TWP** 152 **SEC** SE¼SW¼ 31

COUNTY McKenzie Sep-08

PROSPECTED BY Volk/Swenson

INSPECTED & APPROVED Carter Jun-09

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	**SOIA-7-085(092)183**	**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
1	1.0	2.0 sd	2	25	46	58	+
		2.0 gr					
		1.5 sd					
		13.5 gr					
2	4.0	2.0 FS	2	14	33	45	+
		10.5 gr					
		0.5 gr SiCl					
		1.5 gr					
		0.5 gr CoS					
		1.0 gr					
3	2.0	2.0 gr	1	15	36	51	+
		1.0 FS					
		2.0 Fgr					
		1.0 FS SiCl					
		6.0 gr					
		1.0 FS					
		2.0 gr					
		1.0 FS					
		2.0 gr					
4	2.0	2.0 FS SiCl	1	20	41	54	+
		14.5 gr					
		0.5 gr CoS					
		1.0 Fgr					
5	0.5	1.0 sd	1	23	48	60	+
		2.5 Fgr					
		14.0 gr					
		1.0 FS					
		1.0 gr					
6	0.5	1.5 sd	2	18	44	58	+
		15.5 gr					
		1.5 Fgr					
7	0.5	0.5 sd	2	25	49	63	+
		2.0 Fgr					
		17.0 gr					
8	1.0	1.0 Fgr	3	22	49	62	+
		1.0 sd					
		8.0 gr					
		2.0 FS					
		2.0 gr					
		2.0 gr SiCl					
		3.0 gr					
9	1.0	2.0 sd	0	21	43	55	+
		15.5 gr					
		1.5 FS					
10	0.5	1.5 FS	3	22	49	62	+
		18.0 gr					
11	0.5	2.5 sd	1	20	42	56	+
		2.0 Fgr					
		15.0 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
12	1.0	2.0 sd SiCl	3	28	54	65	+
		14.0 gr					
		2.0 gr SiCl					
		1.0 gr					
13	2.0	16.0 gr	0	16	44	61	+
		2.0 FS					
14	8.0	1.0 sd Si Cl	0	11	31	43	+
		1.0 Fgr					
		2.0 gr					
		2.0 FS					
		6.0 gr					
15	4.0	0.5 FS	0	21	44	59	+
		4.0 gr					
		0.5 FS					
		11.0 gr					
16	9.0	4.0 Fgr	0	7	26	43	+
		1.0 gr					
		1.0 FS					
		4.0 Fgr					
		1.0 FS					
17	3.0	2.0 Fgr	1	14	34	44	+
		8.0 gr					
		5.0 FS					
		1.0 gr					
		1.0 FS					
18	5.0	1.5 FS	2	16	34	46	+
		4.5 gr					
		1.0 FS					
		8.0 gr					
19	6.0	9.0 FS	0	0	1	3	+ Cave
20	4.0	1.5 FS	0	16	27	34	+
		1.5 gr					
		1.0 FS					
		2.0 gr					
		1.0 FS					
		1.0 Fgr					
		3.0 gr					
		2.0 FS Si Cl					
		0.5 Fgr					
		0.5 FS					
		2.0 gr					
21	1.0	1.0 FS	2	22	47	60	+
		18.0 gr					
22	1.0	1.0 FS	1	17	36	47	+
		2.0 gr					
		0.5 FS					
		1.5 Fgr					
		12.0 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
23	2.0	1.5 sd	1	20	38	49	+
		3.5 gr					
		1.0 FS					
		4.5 gr					
		3.5 FS					
		4.0 gr					
24	2.0	1.5 FS	3	17	37	47	+
		6.5 gr					
		1.0 sd					
		3.5 gr					
		0.5 sd					
		1.5 gr					
		0.5 FS					
		3.0 gr					
25	5.0	7.0 gr	1	21	45	57	+
		2.0 FS					
		6.0 gr					
26	1.0	2.0 FS	3	19	37	50	+
		4.5 gr					
		1.5 FS					
27	1.0	3.0 FS	1	18	41	54	+
		13.0 gr					
		1.5 FS					
		1.5 gr					
28	2.0	2.0 sd	0	13	38	52	+
		8.5 gr					
		1.5 Fgr					
		4.5 gr					
		1.5 gr Co S					
29	4.0	2.0 sd	1	13	32	46	+
		2.5 FS					
		4.5 gr					
		4.0 Fgr					
		3.0 gr					
30	7.0	5.0 gr	0	16	37	50	+
		1.0 gr Si Cl					
		1.0 gr					
		1.0 gr Si Cl					
		2.0 gr					
		2.0 FS					
		1.0 Fgr					
31	8.0	2.0 FS Si Cl	0	15	33	46	+
		1.0 FS					
		9.0 gr					
32	7.0	6.0 gr	2	21	44	61	+
		1.0 gr Si Cl					
		6.0 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
33	4.0	8.0 FS	0	14	30	39	+
		8.0 gr					
34	2.5	1.0 FS	0	14	37	49	+
		0.5 Fgr					
		6.5 gr					
		0.5 FS					
		9.0 gr					
35	2.0	7.0 FS	0	18	35	42	+
		9.0 gr					
		1.0 FS					
		1.0 gr					
36	2.0	2.0 FS	1	14	31	42	+
		1.0 sd					
		1.0 Fgr					
		1.0 gr					
		1.0 FS					
37	5.0	1.0 FS	0	15	41	54	+
		4.0 gr Si Cl					
		6.0 gr					
		1.0 FS					
		1.0 gr					
		1.5 gr Si Cl					
		0.5 gr					
38	6.0	10.0 FS	0	4	13	17	+
		4.0 gr					
39	3.0	2.0 FS	1	19	44	57	+
		6.5 gr					
		1.5 Fgr					
		7.0 gr					
40	1.0	19.0 gr	2	17	39	56	+
41	2.0	3.0 gr	1	17	36	48	+
		1.0 FS					
		1.0 Fgr					
		1.0 FS					
		5.0 gr					
		1.0 FS					
		6.0 gr					

RANGE 103 **TWP** 152 **SEC** NE¼ NW¼ 6

COUNTY McKenzie Sep-08

PROSPECTED BY Volk/Swenson

INSPECTED & APPROVED Carter Jun-09

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIA-7-085(092)183	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
42	2.0	2.0 FS	3	20	44	57	+
		16.0 gr					
43	3.5	4.5 FS	0	9	23	30	+
		2.0 sd					
		2.0 gr					
		1.0 FS					
		1.5 gr					
		3.5 FS					
		2.0 gr					
44	6.0	2.0 FS	0	11	33	47	+
		1.0 gr					
		1.0 FS					
		4.0 gr					
		1.0 Fgr					
		5.0 gr					
45	3.0	1.0 sd	1	22	46	57	+
		4.0 gr					
		1.0 FS					
		1.0 gr					
		1.0 FS					
		9.0 gr					
46	6.0	1.0 Fgr	1	23	46	56	+
		4.0 gr					
		2.0 FS					
		7.0 gr					
47	6.0	1.0 sd	1	18	39	51	+
		1.0 Fgr					
		5.0 gr					
		1.0 FS					
		1.0 Fgr					
		5.0 gr					
48	7.0	6.0 FS	0	9	27	40	+
		7.0 gr					
49	8.0	1.0 FS	1	14	36	50	+
		8.5 gr					
		0.5 FS					
		2.0 gr					
50	6.0	1.0 FS	0	12	27	38	+
		1.0 Fgr					
		1.0 FS					
		1.0 Fgr Co S					
		1.0 Fgr Si Cl					
		2.0 FS					
		7.0 gr					
51	2.0	1.0 FS	0	20	40	50	+
		9.0 gr					
		0.5 FS					
		1.5 Fgr					
		6.0 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
52	2.5	1.5 gr	1	21	41	54	+
		2.0 FS					
		11.0 gr					
		2.0 FS					
		1.0 gr					
53	2.0	0.5 gr	3	28	54	65	+
		1.5 FS					
		16.0 gr					
54	3.0	2.5 gr	1	14	34	46	+
		3.5 FS					
		3.0 gr					
		1.0 FS					
		1.0 gr					
		1.0 FS					
		5.0 gr					
55	4.0	0.5 FS	1	18	37	48	+
		2.5 gr					
		3.0 FS					
		10.0 gr					
56	2.0	1.0 FS	0	10	24	35	+
		4.0 gr					
		1.0 FS					
		1.0 Fgr					
		1.0 FS					
		1.0 Fgr					
		1.0 FS					
		4.0 gr					
		1.0 Fgr					
		1.0 FS					
		1.0 Fgr					
57	2.0	2.5 FS	1	18	35	45	+
		4.5 gr					
		5.0 FS					
		5.0 gr					
		1.0 FS					
58	2.0	3.0 FS	2	17	38	49	+
		1.0 Fgr					
		6.0 gr					
		0.5 FS					
		0.5 Fgr					
		7.0 gr					
59	4.0	1.5 gr	1	14	32	42	+
		2.5 FS					
		8.0 gr					
		1.0 FS					
		2.0 gr					
		1.0 FS					

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
60	5.0	3.0 FS	0	18	38	46	+
		7.0 gr					
		1.0 sd					
		4.0 gr					
61	2.0	2.0 FS	0	7	19	29	+
		2.0 FS Co S					
		1.0 Fgr					
		2.0 FS					
		1.0 sd Si Cl					
		1.0 FS					
		9.0 gr					
62	8.5	1.5 FS	0	14	33	45	+
		1.0 Fgr					
		1.0 FS					
		2.0 Fgr					
		6.0 gr					
63	1.0	1.0 FS	2	20	45	58	+
		1.0 Fgr					
		17.0 gr					
64	2.0	7.0 gr	2	26	46	57	+
		3.0 FS					
		4.0 gr					
		1.0 FS					
		3.0 gr					
65	1.0	1.0 Fgr	0	19	44	56	+
		8.0 gr					
		1.0 FS					
		9.0 gr					
66	3.5	1.5 FS	1	18	38	49	+
		6.0 gr					
		3.0 FS					
		6.0 gr					
67	5.5	1.5 FS	0	16	42	55	+
		9.0 gr					
		1.0 FS					
		3.0 gr					
68	6.0	1.0 sd	0	12	27	38	+
		1.0 gr					
		3.0 FS					
		2.0 gr					
		1.0 FS					
		6.0 gr					
69	5.5	0.5 FS	0	14	36	50	+
		2.0 Fgr					
		7.0 gr					
		1.0 sd					
		4.0 gr					
70	4.0	1.0 gr	0	6	19	27	+
		10.0 FS					
		5.0 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
71	3.5	4.5 sd	0	0	4	3	+
		12.0 FS					
72	6.0	4.0 sd	1	12	29	42	+
		4.0 gr					
		1.5 FS					
		3.0 gr					
		1.5 FS					
A	1.0	3.0 FS	0	0	0	0	+
		1.0 sd Si Cl					
		16.0 FS					
B	6.0	14.0 FS	0	0	0	0	+
C	1.0	14.0 FS	0	0	2	3	+
		0.5 Fgr					
		3.5 FS					
		1.0 Fgr					
D	8.0	2.0 FS Si Cl	0	2	7	10	+
		1.0 gr Si Cl					
		1.0 FS Si Cl					
		8.0 FS					
E	2.0	1.0 FS	0	0	5	8	+
		1.0 Fgr					
		1.0 sd Co S					
		2.0 Fgr					
		3.0 sd					
		2.0 Fgr					
		1.0 FS					
		1.5 Fgr					
		0.5 gr					

***NOTE: THE MATERIAL IN SECTION 6 MIGHT BE DEPLETED**

RANGE 103 **TWP** 151 **SEC** NE¼ NW¼ 6

COUNTY McKenzie Sep-08

PROSPECTED BY Volk/Swenson

INSPECTED & APPROVED Carter Jun-09