STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2	3		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**	**2**	**2**	**2**		**2**	**34**	**68**
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**	**11**	**11**	**11**		**11**	**19**	**209**
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**		**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**	**9**	**9**	**9**		**9**	**30**	**270**
G20-55-96	**96"x48"**	**SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT**	**2**	**2**	**2**		**2**	**59**	**118**
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)**	**3**	**3**	**3**		**3**	**10**	**30**
M1-5-24	**24"x24"**	**STATE ROUTE MARKER (Post and installation only)**	**2**	**2**	**2**		**2**	**10**	**20**
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**	**7**	**7**	**7**		**7**	**32**	**224**
R1-1a-18	18"x18"	STOP and SLOW PADDLE Back to Back						5	
R1-2-60	**60"x60"**	**YIELD**	**2**	**2**	**2**		**2**	**29**	**58**
R2-1-48	**48"x60"**	**SPEED LIMIT __**	**14**	**14**	**14**		**14**	**39**	**546**
R2-1a-24	**24"x18"**	**MINIMUM FEE $80 (Mounted on Speed Limit post)**	**12**	**12**	**12**		**12**	**10**	**120**
R3-7-48	48"x48"	LEFT or RIGHT LANE MUST TURN LEFT or RIGHT						35	
R4-1-48	**48"x60"**	**DO NOT PASS**	**1**	**1**	**1**		**1**	**39**	**39**
R4-7-48	48"x60"	KEEP RIGHT SYMBOL						39	
R5-1-48	48"x48"	DO NOT ENTER						35	
R6-1-36	36"x12"	ONE WAY RIGHT or LEFT						13	
R7-1-12	12"x18"	NO PARKING						11	
R10-6-24	24"x36"	STOP HERE ON RED						16	
R11-2-48	48"x30"	ROAD CLOSED						28	
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**	**13**	**13**	**13**		**13**	**35**	**455**
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						35	
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**2**	**2**	**2**		**2**	**35**	**70**
W4-2-48	**48"x48"**	**RIGHT or LEFT LANE TRANSITION SYMBOL**	**1**	**1**	**1**		**1**	**35**	**35**
W5-1-48	48"x48"	ROAD NARROWS						35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE						35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW						35	
W6-3-48	48"x48"	TWO WAY TRAFFIC SYMBOL						35	
W8-1-48	48"x48"	BUMP						35	
W8-3-48	48"x48"	PAVEMENT ENDS						35	
W8-7-48	48"x48"	LOOSE GRAVEL						35	
W8-9a-48	48"x48"	SHOULDER DROP-OFF						35	
W8-11-48	48"x48"	UNEVEN LANES						35	
W8-12-48	**48"x48"**	**NO CENTER STRIPE**	**1**	**1**	**1**		**1**	**35**	**35**
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY						35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT.						35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT.						35	
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY						35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL						35	
W12-2-48	48"x48"	LOW CLEARANCE SYMBOL						35	
W13-1-24	24"x24"	__ MPH ADVISORY SPEED PLATE (Mounted on warning sign post)						11	
W13-4-48	48"x60"	RAMP ARROW						39	
W14-3-48	48"x36"	NO PASSING ZONE						23	
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**11**	**11**	**11**		**11**	**35**	**385**
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.**	**1**	**1**	**1**		**1**	**35**	**35**
W20-7a-48	48"x48"	FLAGGING SYMBOL						35	
W20-7k-24	24"x18"	__ FEET (Mounted on warning sign post)						10	
W20-8-48	48"x48"	STREET CLOSED						35	
W20-51-48	48"x48"	EQUIPMENT WORKING						35	
W20-52-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)						12	
W21-1a-48	48"x48"	WORKERS SYMBOL						35	
W21-2-48	48"x48"	FRESH OIL						35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT						35	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2	3		TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
W21-5-48	48"x48"	SHOULDER WORK						35	
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

W10-1	**36" dia.**	**Grade Crossing Advance Warning**	**2**	**2**	**2**		**2**	**18**	**36**

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS 2881**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY BY PHASE NO. 1	2	3		TOTAL QUANTITY
704-0100	**FLAGGING**	MHR	**1000**	**750**	**250**		**2000**
704-1041	**ATTENUATION DEVICE-TYPE B-55**	EACH	**2**	**6**	**2**		**6**
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	**20**	**19**	**17**		**20**
704-1060	**DELINEATOR DRUMS**	EACH	**405**	**405**	**370**		**405**
704-1065	TRAFFIC CONES	EACH					
704-1067	**TUBULAR MARKERS**	EACH	**330**	**350**	**310**		**350**
704-1070	DELINEATOR	EACH					
704-1072	FLEXIBLE DELINEATORS	EACH					
704-1080	**STACKABLE VERTICAL PANELS**	EACH	**350**	**300**	**260**		**350**
704-1081	**VERTICAL PANELS - BACK TO BACK**	EACH	**36**				**36**
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH					
704-1086	**SEQUENCING ARROW PANEL - TYPE B**	EACH	**1**	**1**	**1**		**1**
704-1087	**SEQUENCING ARROW PANEL - TYPE C**	EACH	**1**				**1**
704-1088	SEQUENCING ARROW PANEL - TYPE C - CROSSOVER	EACH					
704-1095	TYPE B FLASHERS	EACH					
704-1500	OBLITERATION OF PVMT MK	SF					
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF					
704-3510	**PRECAST CONCRETE MED BARRIER - STATE FURNISHED**	EACH	**11**	**40**	**11**		**40**
762-0200	RAISED PAVEMENT MARKERS	EACH					
762-0420	SHORT TERM 4IN LINE - TYPE R	LF					
762-0430	**SHORT TERM 4IN LINE - TYPE NR**	LF	**1700**		**68927**		**70627**
772-2110	FLASHING BEACON - POST MOUNTED	EACH					
772-2810	**TEMPORARY TRAFFIC SIGNALS**	EACH	**4**	**4**	**4**		**4**

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

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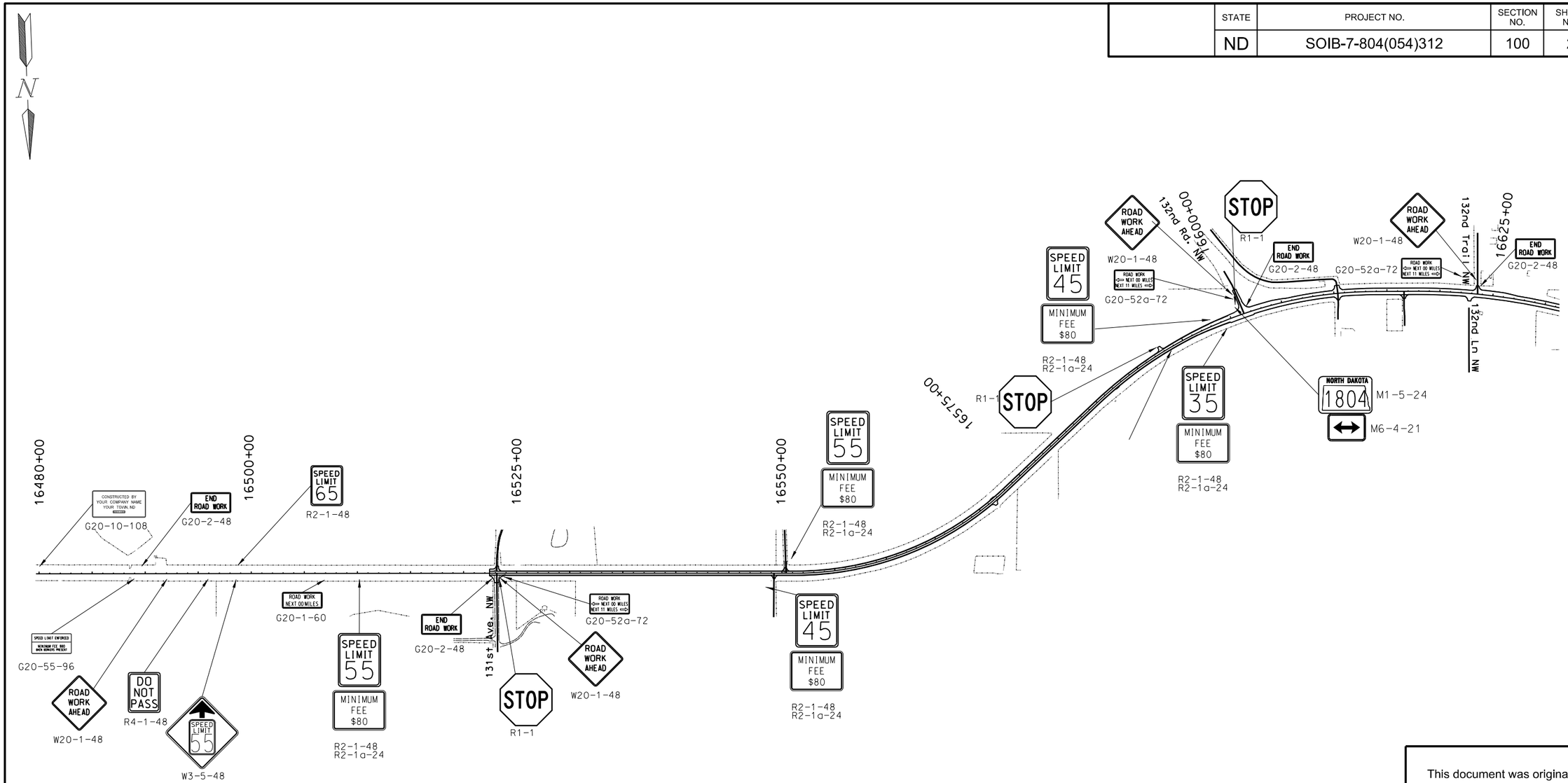
Traffic Control Devices List
ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	2



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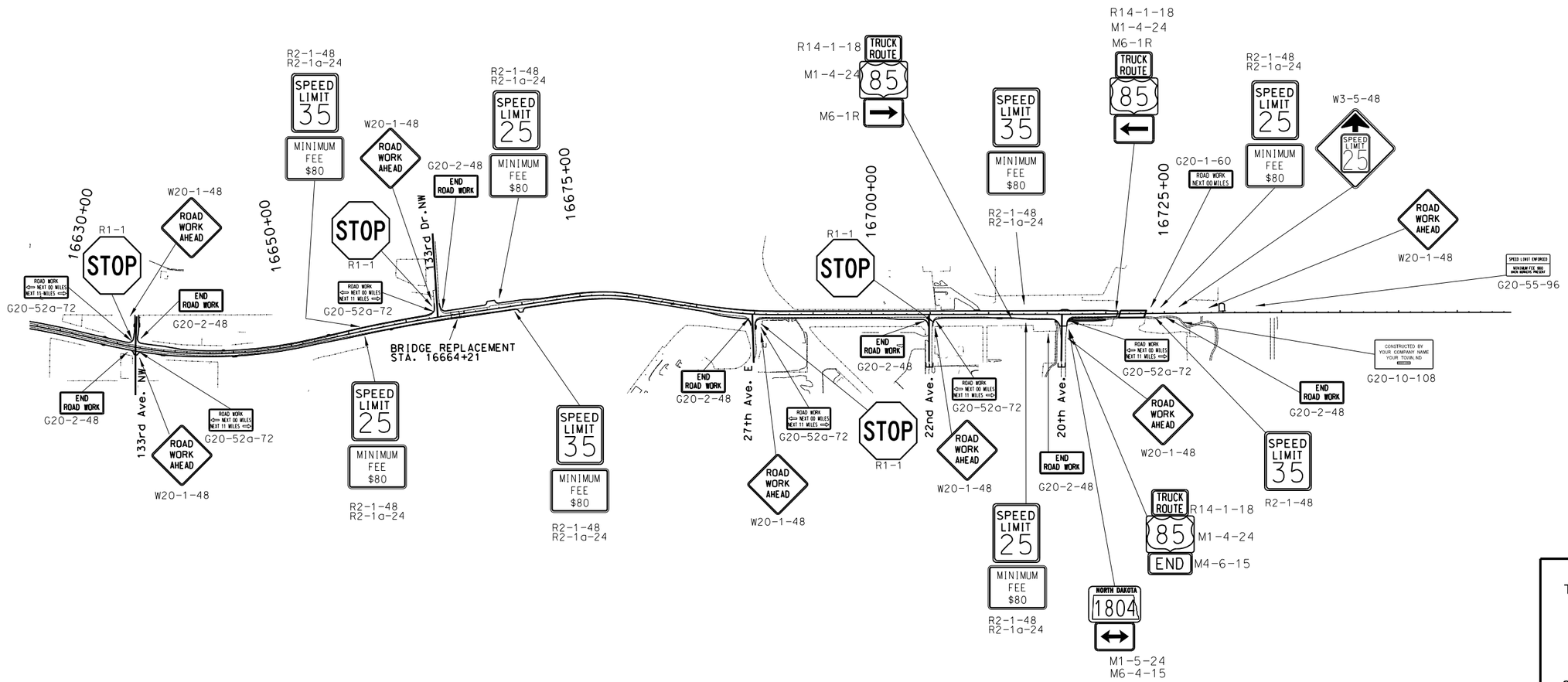
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND
Sta 16508+50 to Sta 16630+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	3



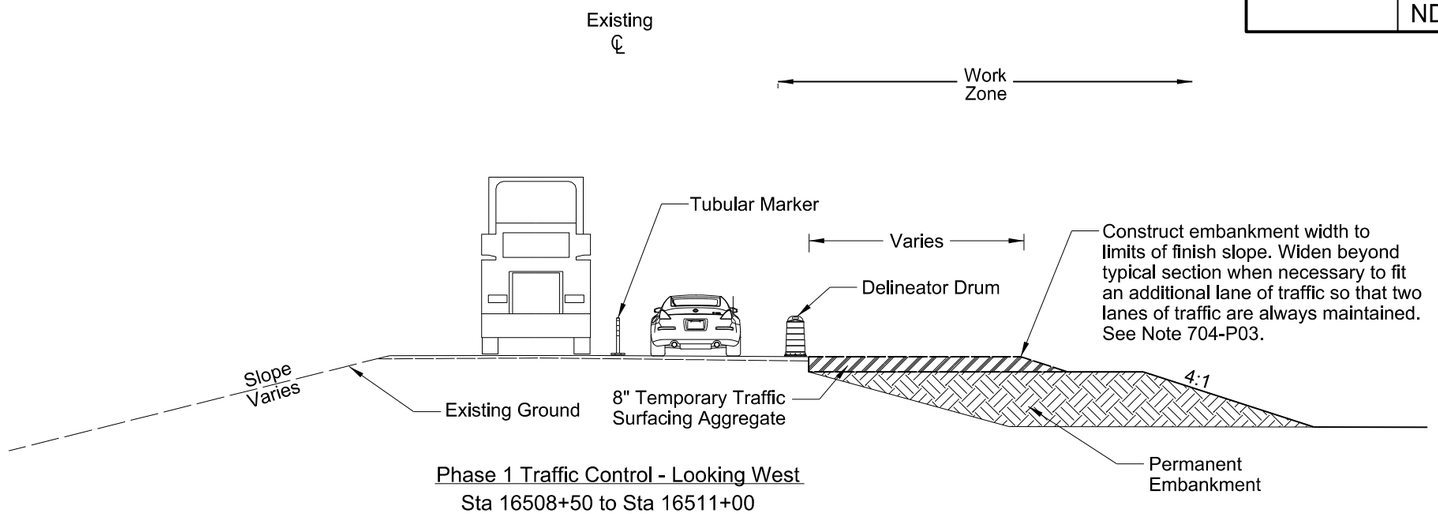
This document was originally issued and sealed by Adam McGill Registration Number PE- 7565, on 7/11/2016 and the original document is stored at the North Dakota Department of Transportation

Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16630+00 to Sta 16725+00

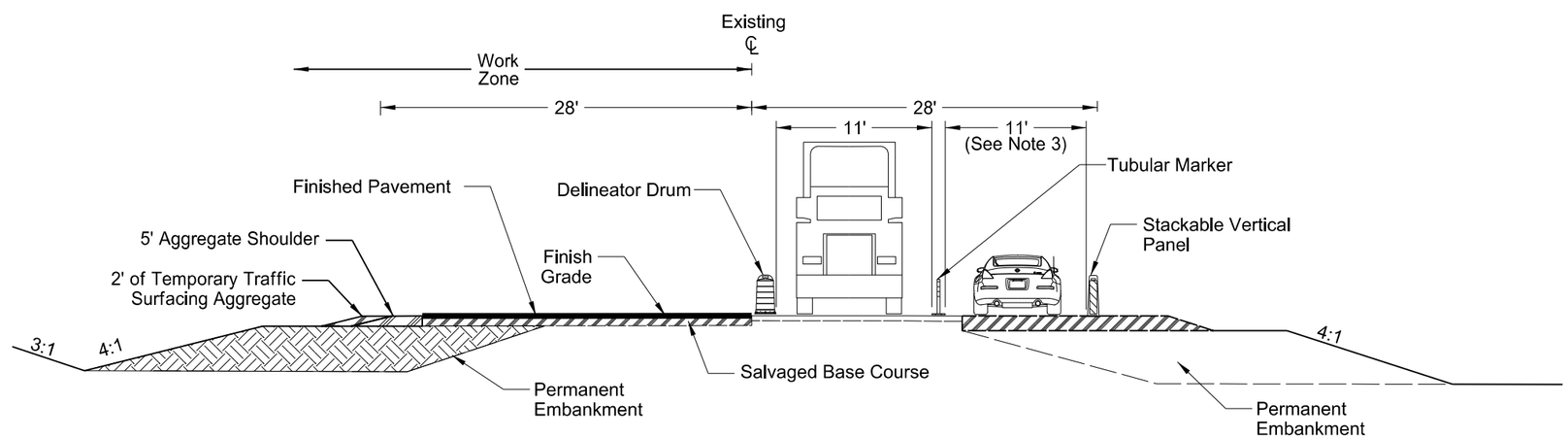
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	4



Phase 1 Traffic Control - Looking West
Sta 16508+50 to Sta 16511+00
Sta 16540+00 to Sta 16632+00

Work to be Performed in Phase 1

- Two-way traffic shall be maintained on the existing roadway.
- Construct embankment and place temporary traffic surface aggregate along existing shoulder to fit one lane of traffic or to reach finished grade foreslope, whichever is further.



Phase 2 Traffic Control - Looking West
Sta 16508+50 to Sta 16511+00
Sta 16540+00 to Sta 16632+00

Work to be Performed in Phase 2

- Two-way traffic shall be shifted over to the new embankment.
- Demolish existing AC pavement.
- Construct permanent embankment, base course and Finished Pavement.

Notes:

1. Stationing shown in the typical sections are approximate and actual station ranges the Engineer will determine in the field.
2. Conduct all work including temporary diversion roadway within ROW.
3. Lane widths shown are measured from the inside of traffic channelizing device.

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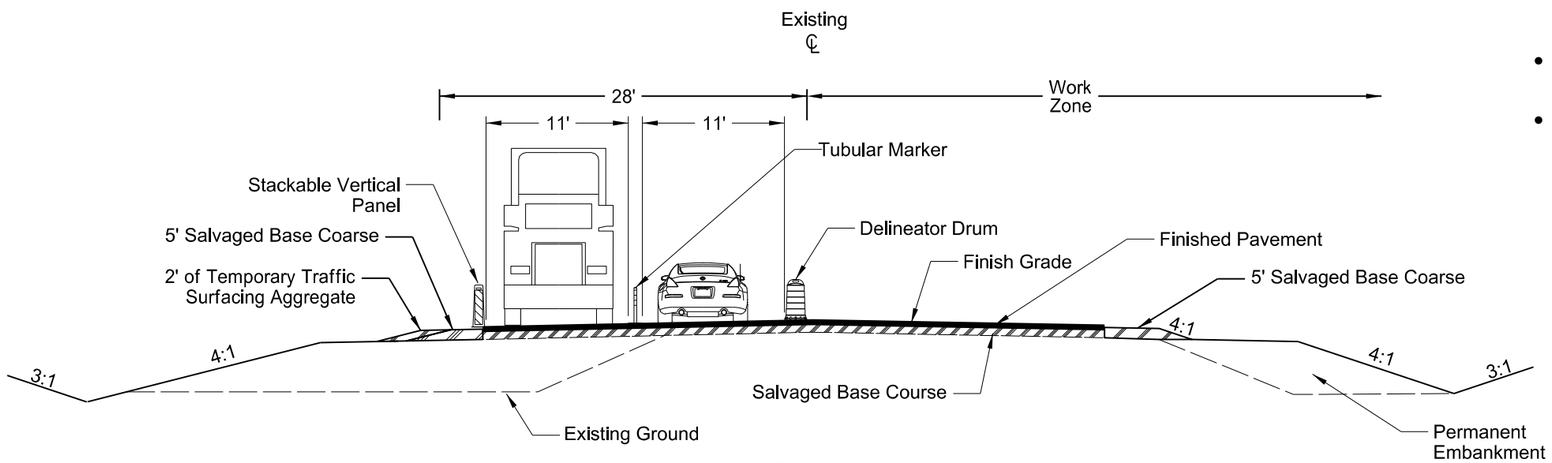
Work Zone Traffic Control
Rural Roadway Typical Sections

ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	5



Phase 3 Traffic Control - Looking West

Sta 16508+50 to Sta 16511+00
Sta 16540+00 to Sta 16632+00

Work to be Performed in Phase 3

- Two-way traffic shall be shifted over to the new roadway.
- Construct new roadway to finish grade including base course and Finished Pavement.

Notes:

1. Stationing shown in the typical sections are approximate and actual station ranges the Engineer will determine in the field.
2. Conduct all work including temporary diversion roadway within ROW.
3. Lane widths shown are measured from the inside of traffic channelizing device.

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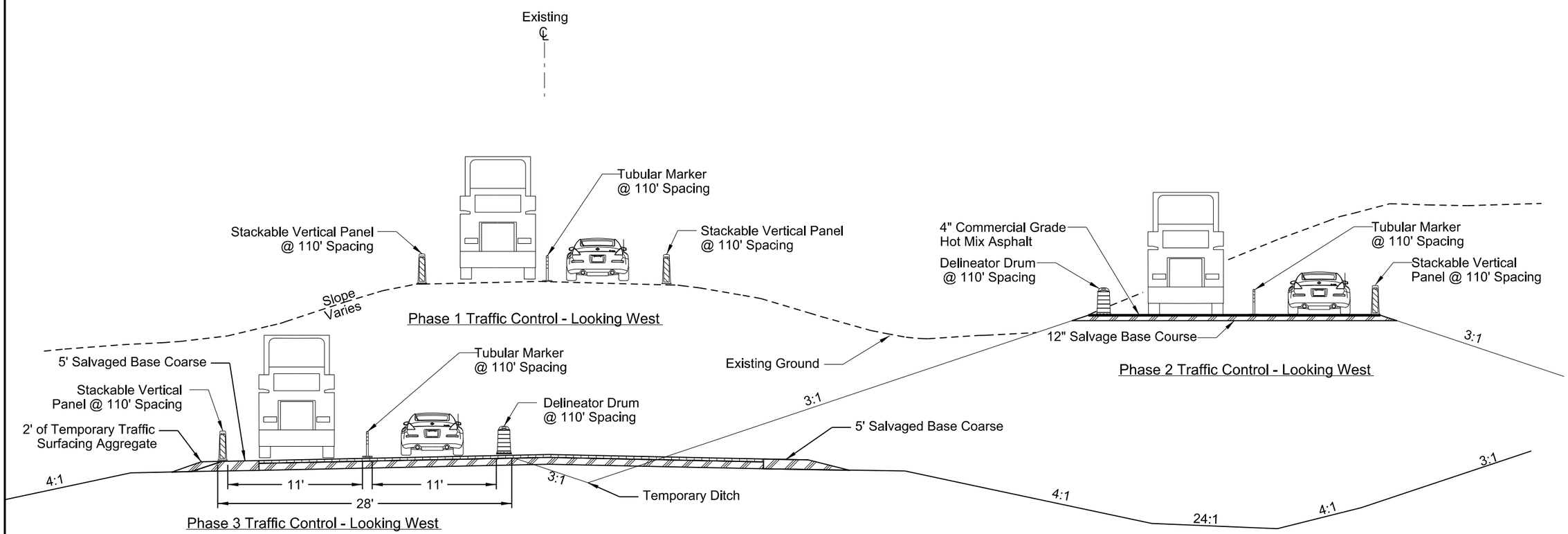
Work Zone Traffic Control
Rural Roadway Typical Sections

ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	6



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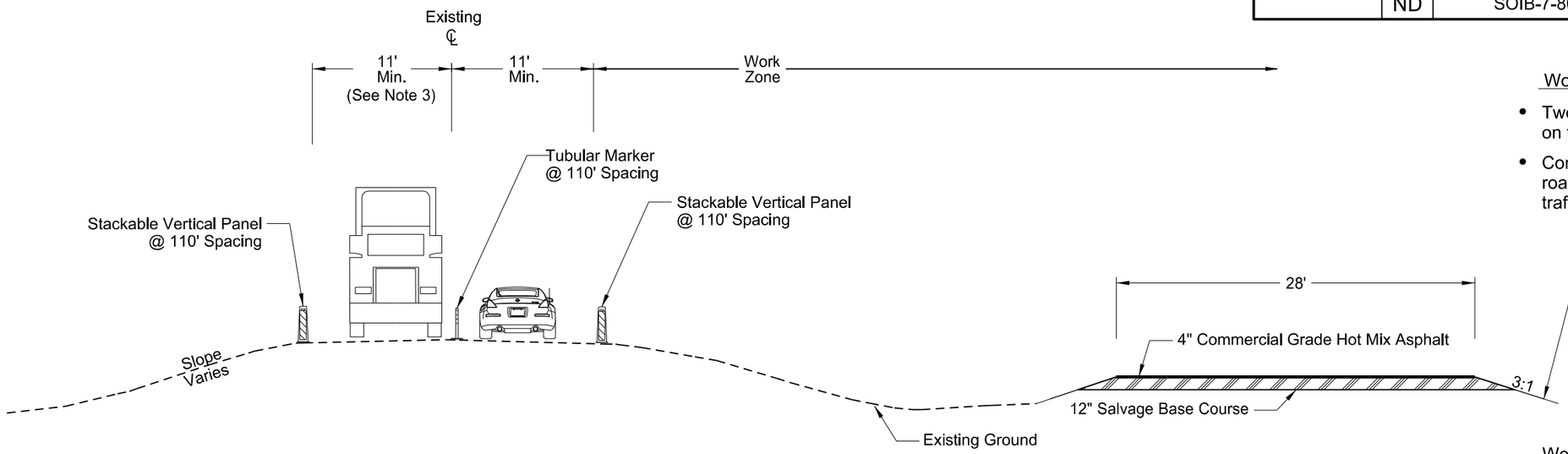
Work Zone Traffic Control
Deep Cut Typical Sections

ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	7



Phase 1 Traffic Control - Looking West

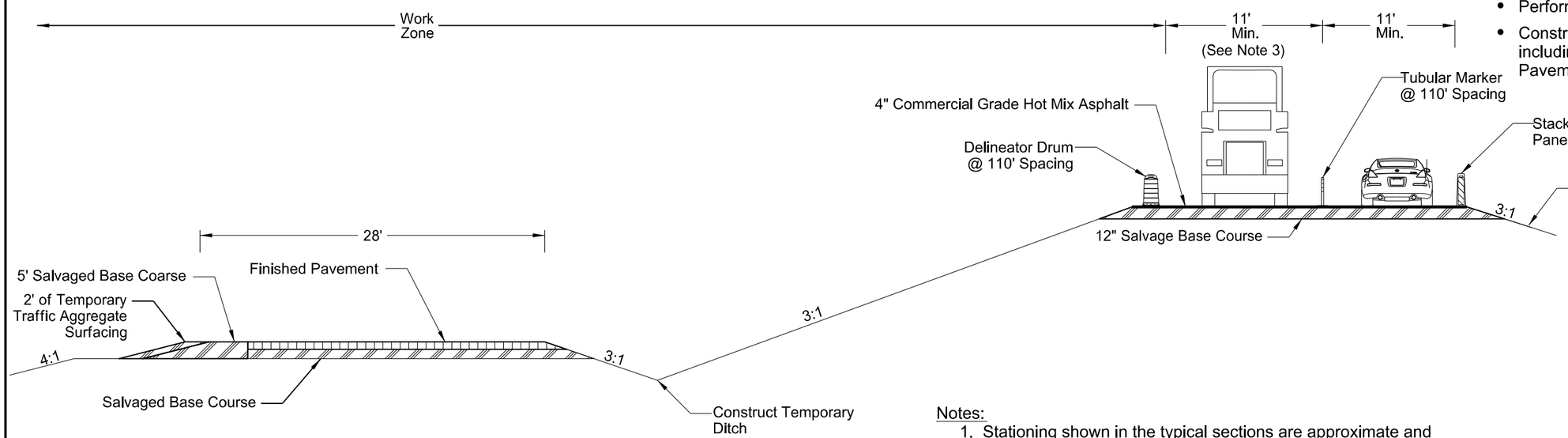
Sta 16511+00 to Sta 16519+50
Sta 16525+50 to Sta 16540+00

Work to be Performed in Phase 1

- Two-way traffic shall be maintained on the existing roadway.
- Construct temporary diversion roadway including temporary traffic surfacing aggregate.

Work to be Performed in Phase 2

- Two-way traffic shall be shifted over to the temporary diversion road.
- Demolish existing roadway.
- Perform deep cut excavation.
- Construct roadway to finish grade, including Base Coarse and Finished Pavement.



Phase 2 Traffic Control - Looking West

Sta 16511+00 to Sta 16519+50
Sta 16525+50 to Sta 16540+00

Notes:

1. Stationing shown in the typical sections are approximate and actual station ranges the Engineer will determine in the field.
2. Conduct all work including temporary diversion roadway within ROW.
3. Lane widths shown are measured from the inside of traffic channelizing device.

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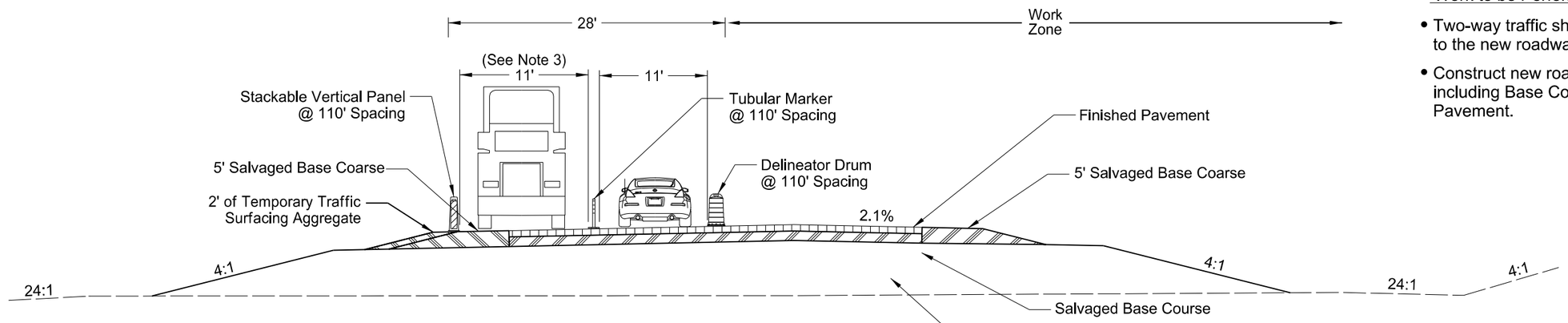
Work Zone Traffic Control
Deep Cut Typical Sections

ND 1804 Reconstruction
Williams County, ND

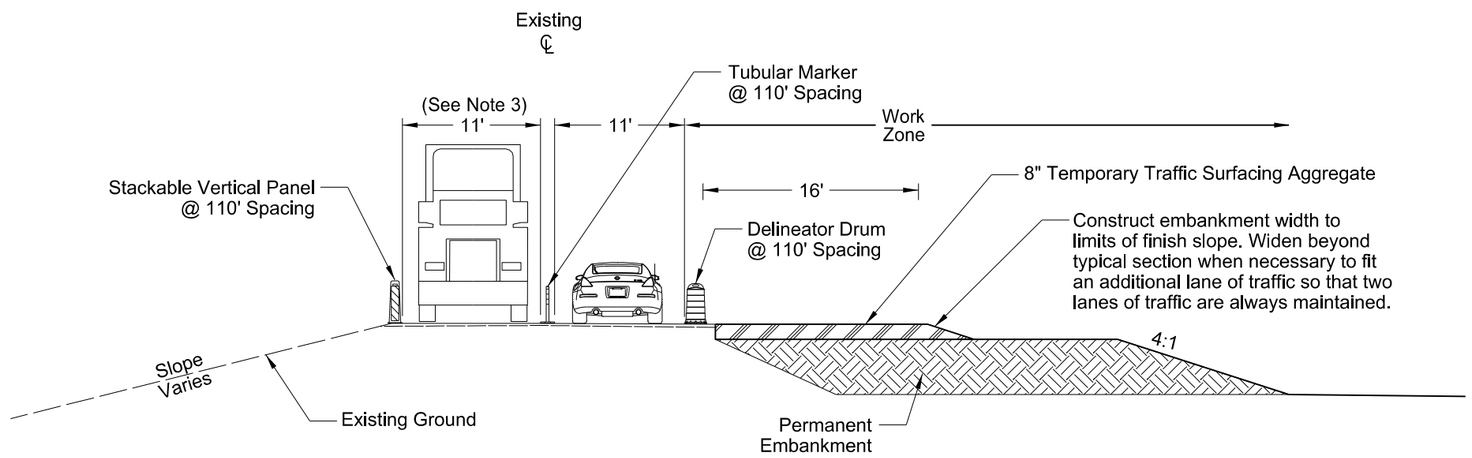
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	8



Phase 3 Traffic Control - Looking West
Sta 16511+00 to Sta 16519+50
Sta 16525+50 to Sta 16540+00

Work to be Performed in Phase 3

- Two-way traffic shall be shifted over to the new roadway.
- Construct new roadway to finish grade, including Base Coarse and Finished Pavement.



Phase 1 Traffic Control - Looking West
Sta 16519+50 to Sta 16525+50

Work to be Performed in Phase 1

- Two-way traffic shall be maintained on the existing roadway.
- Construct embankment and place temporary traffic surfacing aggregate along existing shoulder to fit one lane of traffic or to reach finished grade foreslope, whichever is further.

Notes:

1. Stationing shown in the typical sections are approximate and actual station ranges the Engineer will determine in the field.
2. Conduct all work including temporary diversion roadway within ROW.
3. Lane widths shown are measured from the inside of traffic channelizing device.

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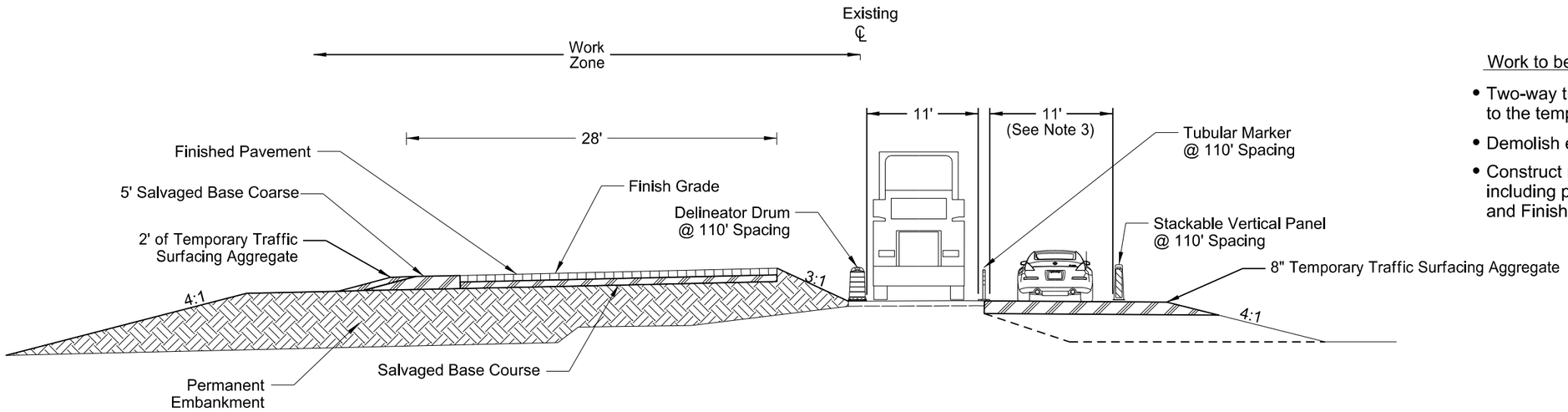
Work Zone Traffic Control
Deep Cut and Fill Typical Sections

ND 1804 Reconstruction
Williams County, ND

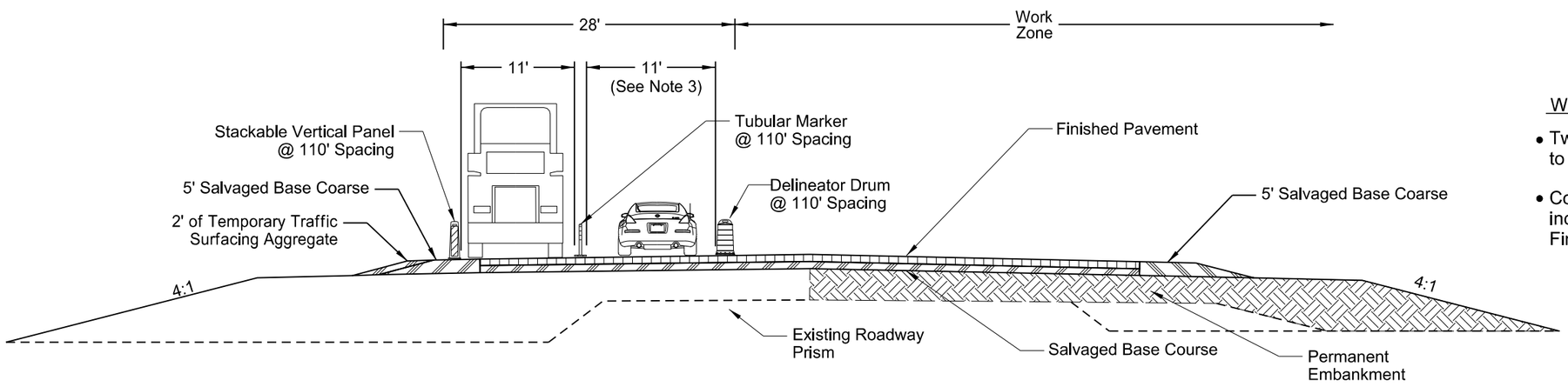
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	9



Phase 2 Traffic Control - Looking West
Sta 16519+50 to Sta 16525+50

Work to be Performed in Phase 2

- Two-way traffic shall be shifted over to the temporary diversion road.
- Demolish existing AC pavement.
- Construct new roadway to finish grade, including placement of base course and Finished Pavement.



Phase 3 Traffic Control - Looking West
Sta 16519+50 to Sta 16525+50

Work to be Performed in Phase 3

- Two-way traffic shall be shifted over to the new roadway.
- Construct new roadway to finish grade, including placement of base course and Finished Pavement.

Notes:

1. Stationing shown in the typical sections are approximate and actual station ranges the Engineer will determine in the field.
2. Conduct all work including temporary diversion roadway within ROW.
3. Lane widths shown are measured from the inside of traffic channelizing device.

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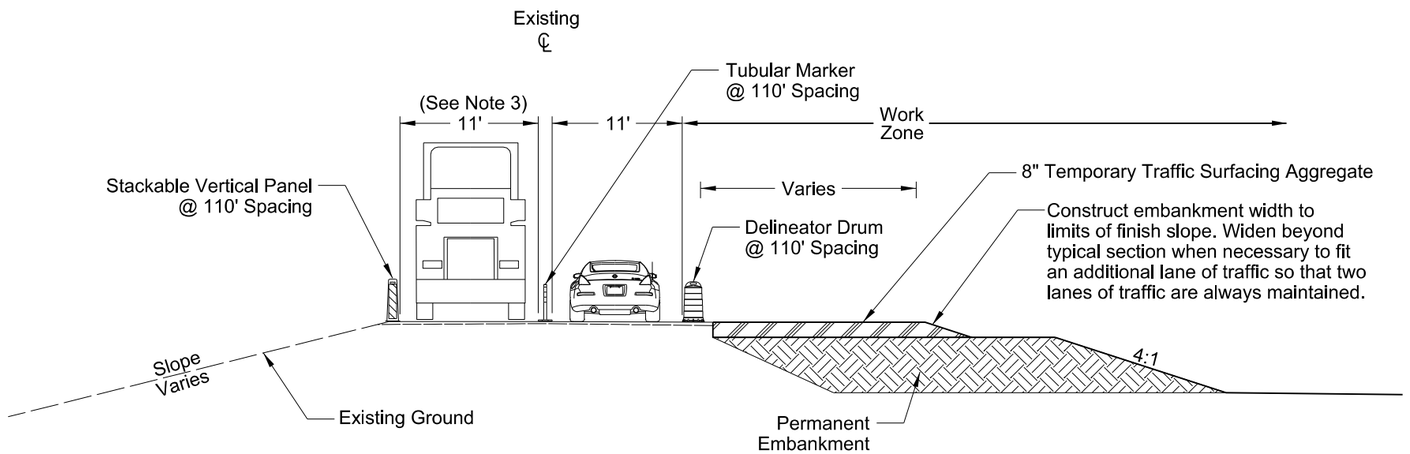
Work Zone Traffic Control
Deep Fill Typical Sections

ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	10

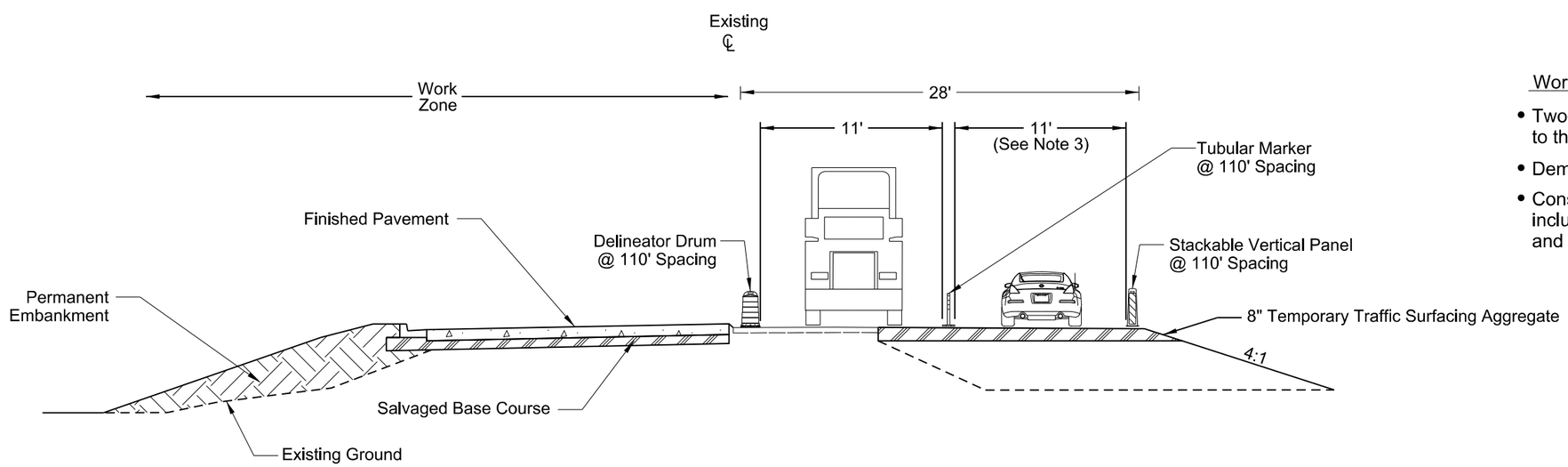


Phase 1 Traffic Control - Looking West

Sta 16632+00 to Sta 16655+00

Work to be Performed in Phase 1

- Two-way traffic shall be maintained on the existing roadway.
- Construct embankment and place temporary traffic surfacing aggregate along existing shoulder to fit one lane of traffic or to reach finished grade foreslope, whichever is further.



Phase 2 Traffic Control - Looking West

Sta 16632+00 to Sta 16655+00

Work to be Performed in Phase 2

- Two-way traffic shall be shifted over to the temporary diversion road.
- Demolish existing AC pavement.
- Construct new roadway to finish grade, including placement of base course and Finished Pavement.

Notes:

1. Stationing shown in the typical sections are approximate and actual station ranges the Engineer will determine in the field.
2. Conduct all work including temporary diversion roadway within ROW.
3. Lane widths shown are measured from the inside of traffic channelizing device.

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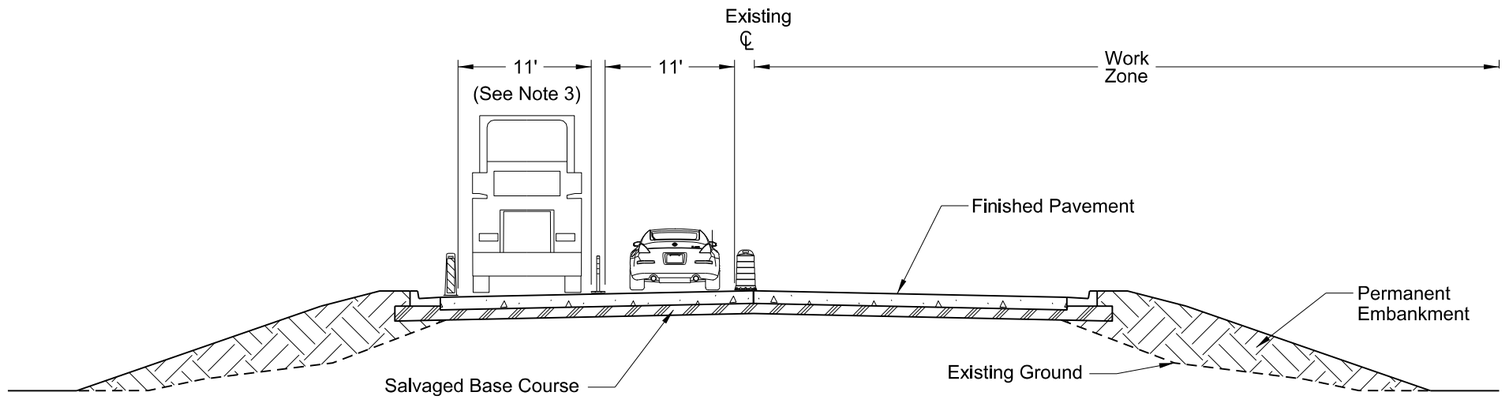
Work Zone Traffic Control

ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	11



Phase 3 Traffic Control - Looking West
Sta 16632+00 to Sta 16655+00

Work to be Performed in Phase 3

- Two-way traffic shall be shifted over to the new roadway.
- Construct new roadway to finish grade, including placement of base course and Finished Pavement.

Notes:

1. Stationing shown in the typical sections are approximate and actual station ranges the Engineer will determine in the field.
2. Conduct all work including temporary diversion roadway within ROW.
3. Lane widths shown are measured from the inside of traffic channelizing device.

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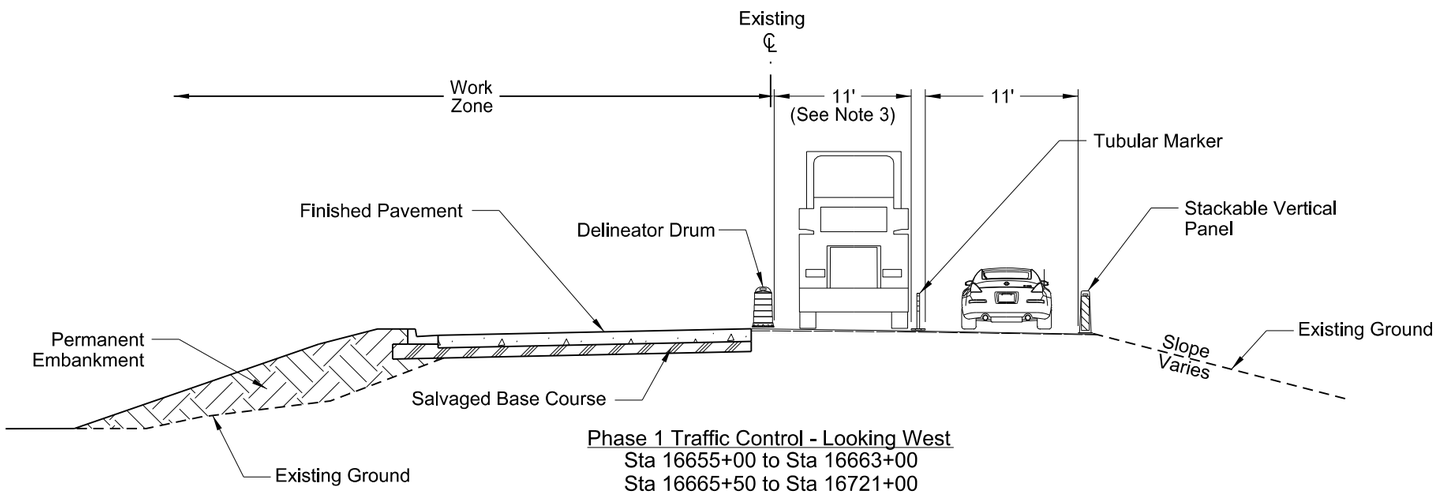
Work Zone Traffic Control

ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	12

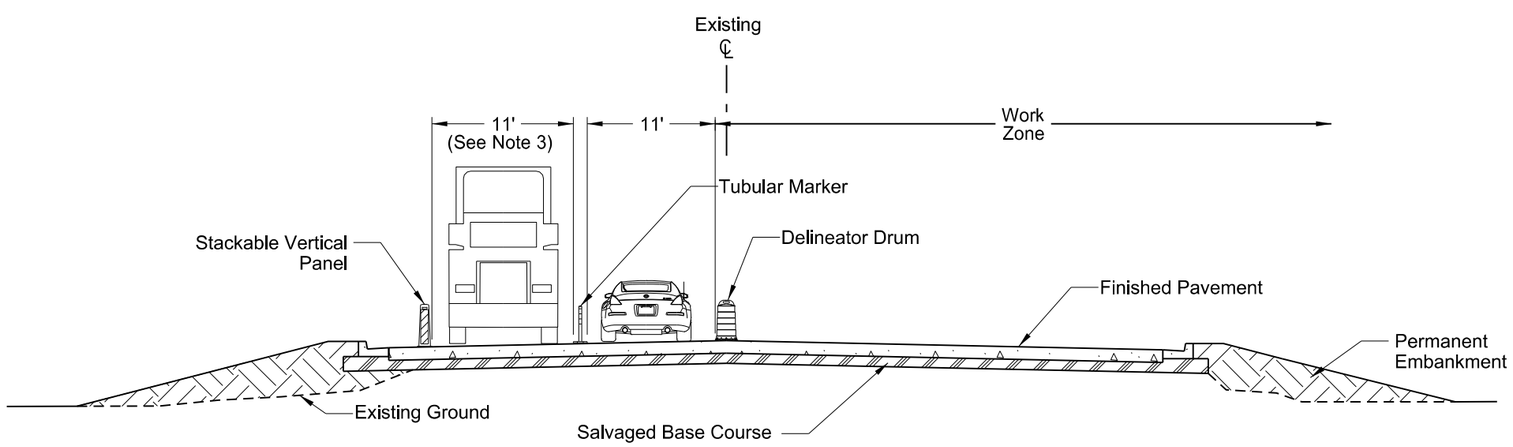


Phase 1 Traffic Control - Looking West
Sta 16655+00 to Sta 16663+00
Sta 16665+50 to Sta 16721+00

Phase 4 Traffic Control - Stony Creek - Looking West
Sta 16663+00 to Sta 16665+50 (See Note 4)

Work to be Performed in Phase 1

- Two-way traffic shall be shifted over to the westbound lanes of the existing roadway.
- Demolish AC pavement on existing eastbound and left turn lanes.
- Construct new roadway to finish grade including placement of Finished Pavement.



Phase 2 Traffic Control - Looking West
Sta 16655+00 to Sta 16663+00
Sta 16665+50 to Sta 16721+00

Work to be Performed in Phase 2

- Two-way traffic shall be shifted over to the new roadway.
- Demolish AC pavement on existing westbound lanes.
- Construct new roadway to finish grade, including placement of Finished Pavement.

Notes:

1. Stationing shown in the typical sections are approximate and actual station ranges the Engineer will determine in the field.
2. Conduct all work including temporary diversion roadway within ROW.
3. Lane widths shown are measured from the inside of traffic channelizing device.

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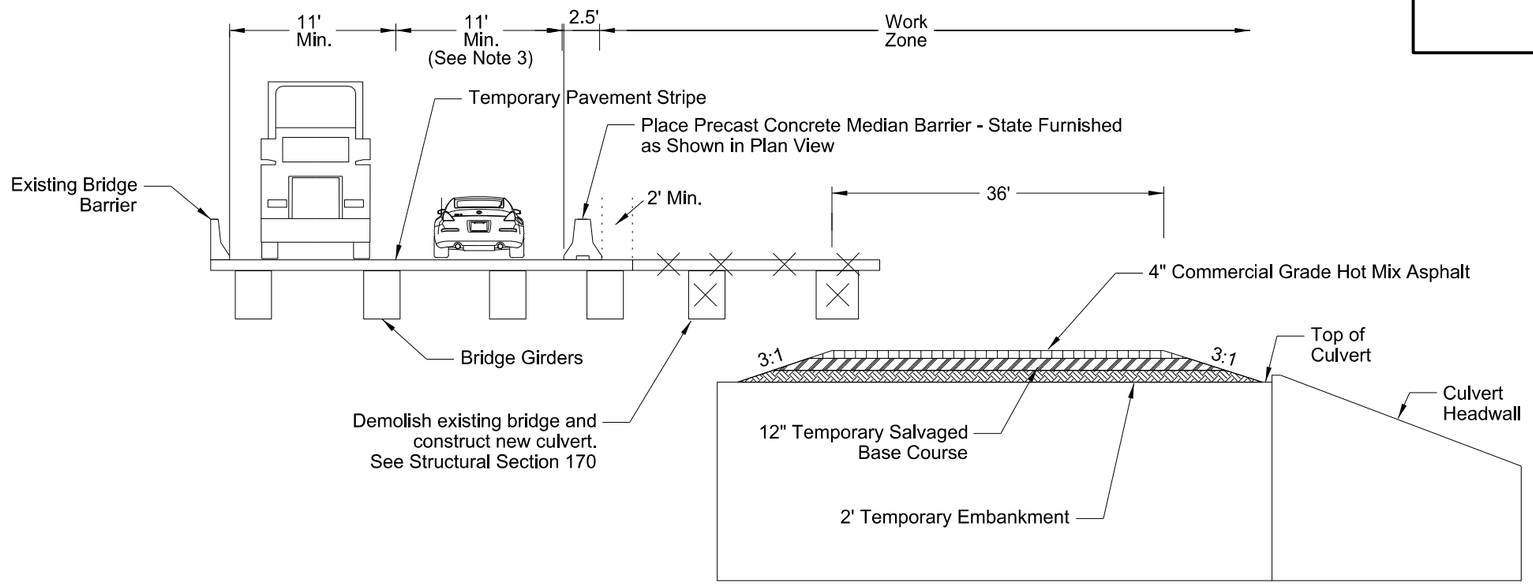
Work Zone Traffic Control
Urban Roadway Typical Sections

ND 1804 Reconstruction
Williams County, ND

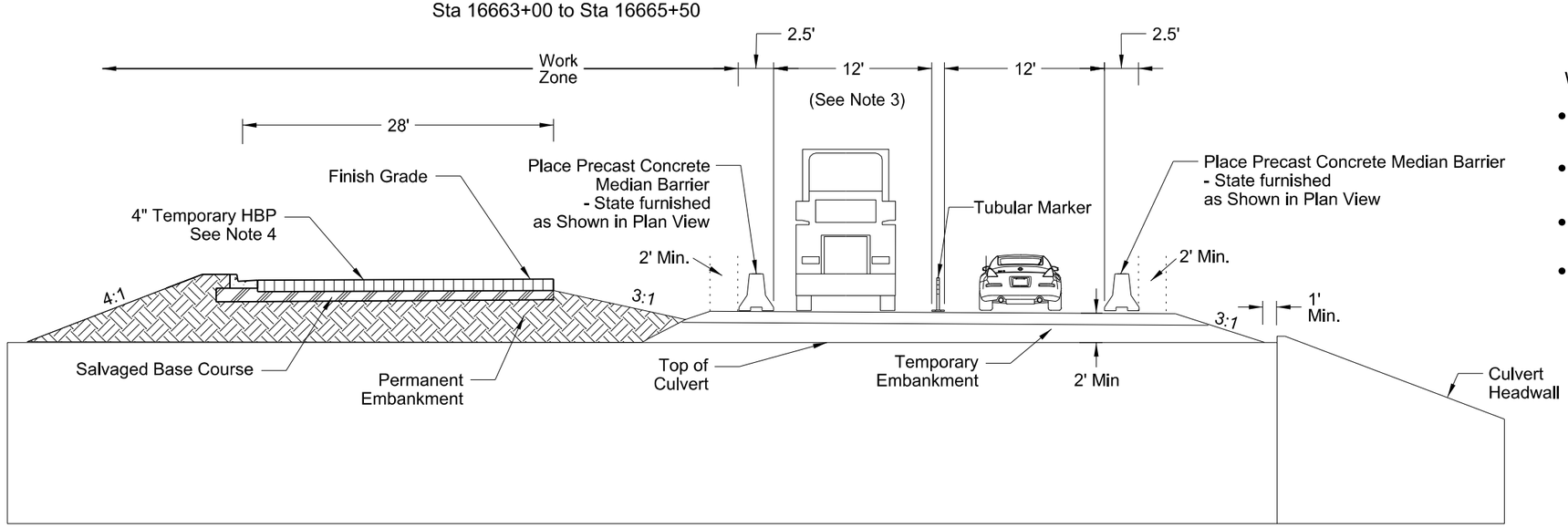
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	13



Phase 1 Traffic Control - Stony Creek - Looking West
Sta 16663+00 to Sta 16665+50

Work to be Performed in Stony Creek Phase 1

- Two-way traffic shall be shifted over to the westbound lanes of the existing roadway.
- Demolish the northern portion of the existing Stony Creek Bridge. See Section 170 for bridge demolition details.
- Build the northern portion of the box culvert.
- Construct temporary embankment to fit two lanes of traffic.



Phase 2 Traffic Control - Stony Creek - Looking West
Sta 16663+00 to Sta 16665+50

Work to be Performed in Stony Creek - Phase 2

- Two-way traffic shall be shifted over to the temporary embankment.
- Demolish the remaining portion of the Stony Creek Bridge.
- Construct the remaining portion of the box culvert.
- Construct the embankment of the new roadway to finish grade including placement of temporary asphalt to fit two lanes of traffic.

Notes:

1. Stationing shown in the typical sections are approximate and actual station ranges the Engineer will determine in the field.
2. Conduct all work including temporary diversion roadway within ROW.
3. Lane widths shown are measured from the inside of traffic channelizing device.
4. Use temporary ashpalt per Note 430-P01 from Sta 16663+50 to 16665+50.

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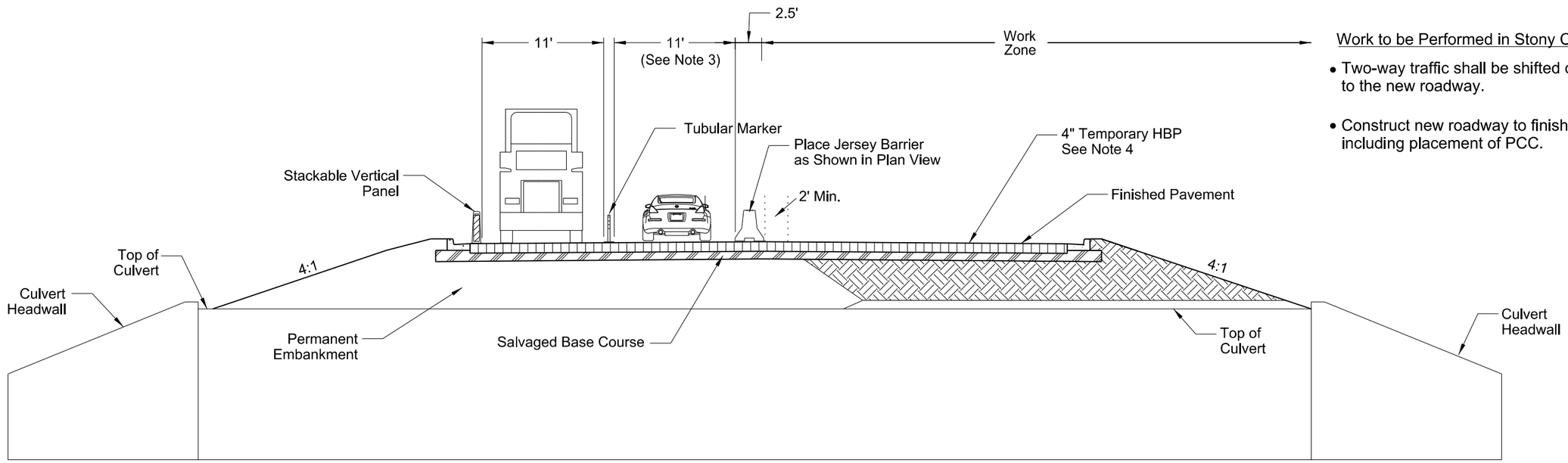
Work Zone Traffic Control
Stony Creek Bridge Typical Sections

ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	14



Phase 3 Traffic Control - Stony Creek - Looking West (See Note 5)
Sta 16663+00 to Sta 16665+50

Work to be Performed in Stony Creek Phase 3

- Two-way traffic shall be shifted over to the new roadway.
- Construct new roadway to finish grade including placement of PCC.

Notes:

1. Stationing shown in the typical sections are approximate and actual station ranges the Engineer will determine in the field.
2. Conduct all work including temporary diversion roadway within ROW.
3. Lane widths shown are measured from the inside of traffic channelizing device.
4. Use temporary asphalt per Note 430-P01 from Sta 16663+50 to Sta 16665+50.

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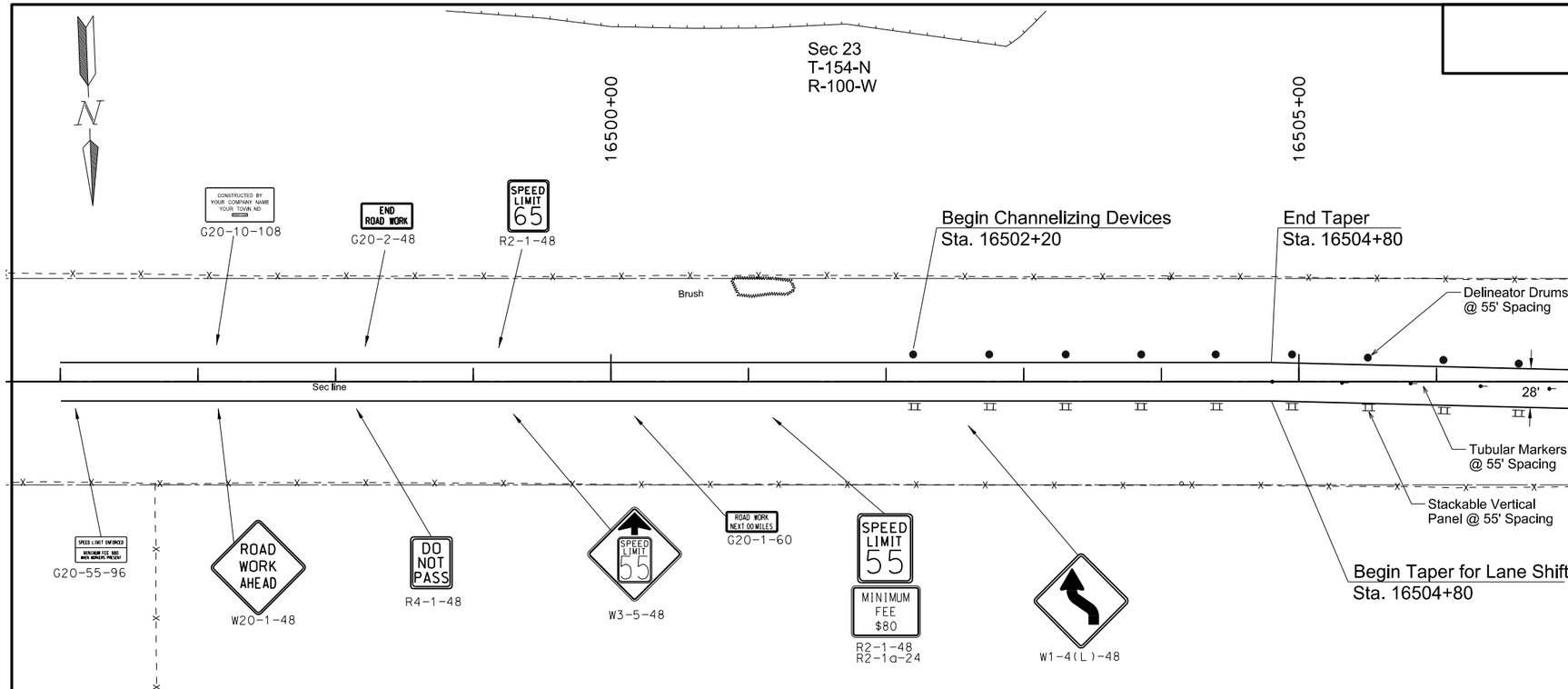
Work Zone Traffic Control
Stony Creek Bridge Typical Sections

ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	15



Notes:

1. Use Standard Drawing D-704-15 Type B for sign spacing.
2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area

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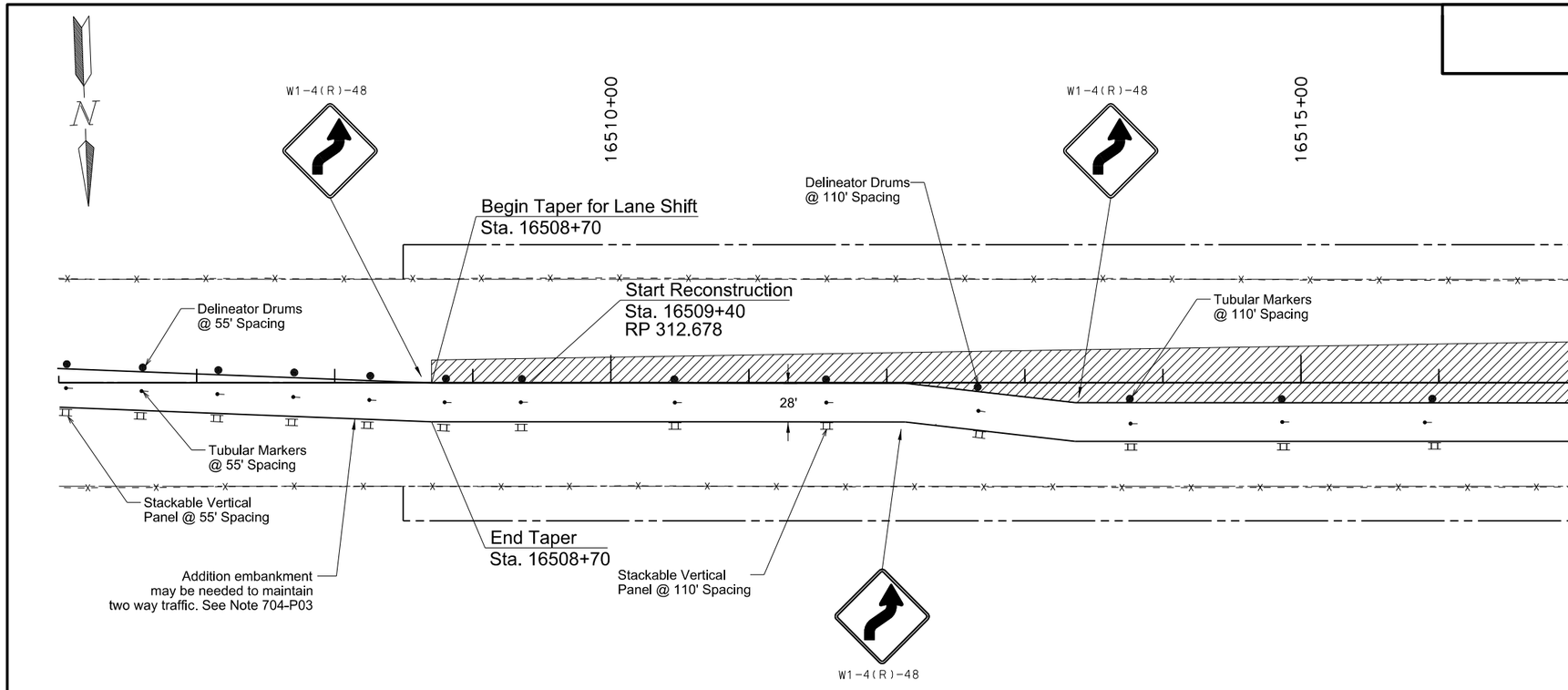
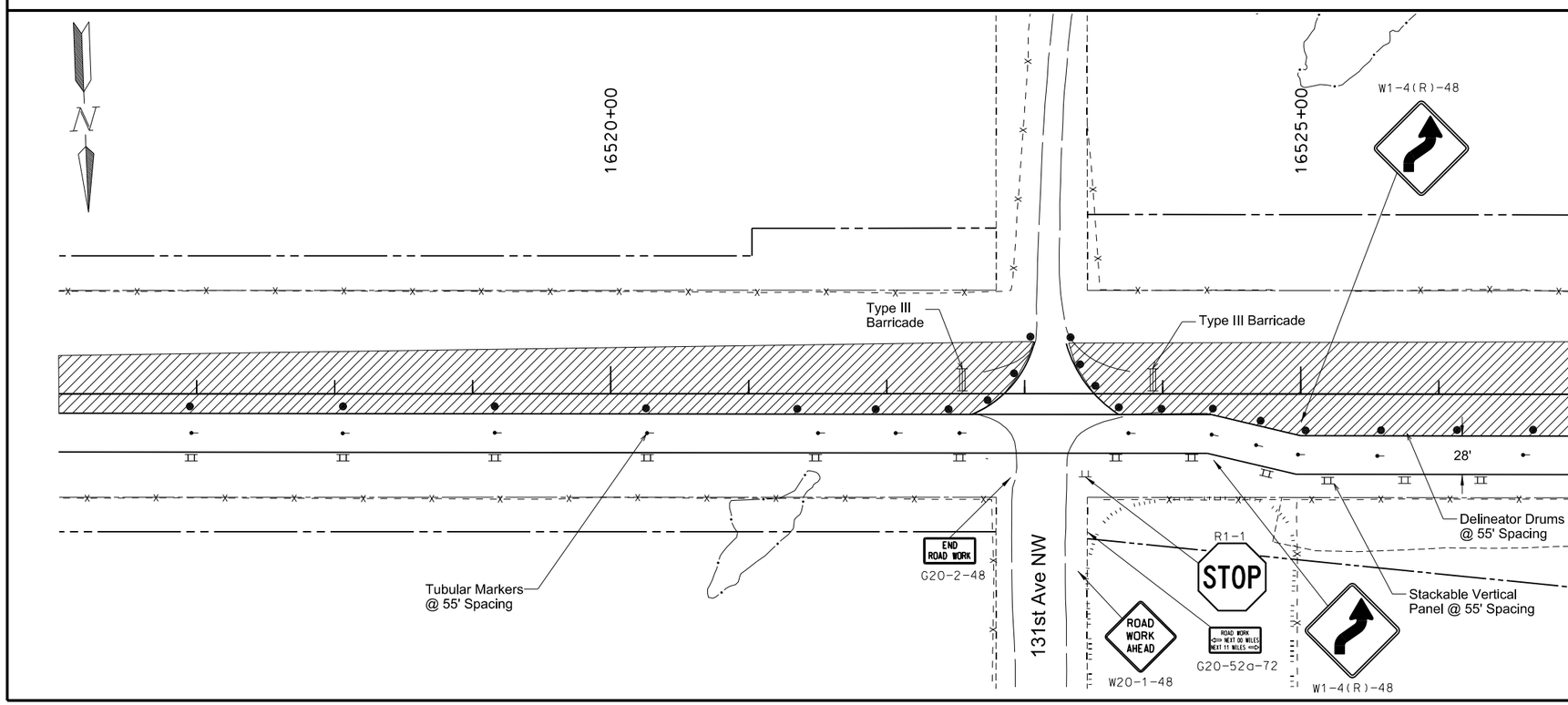
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND
Sta 16509+40 to Sta 16527+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	16





Notes:

1. Use Standard Drawing D-704-15 for sign spacing.
2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area

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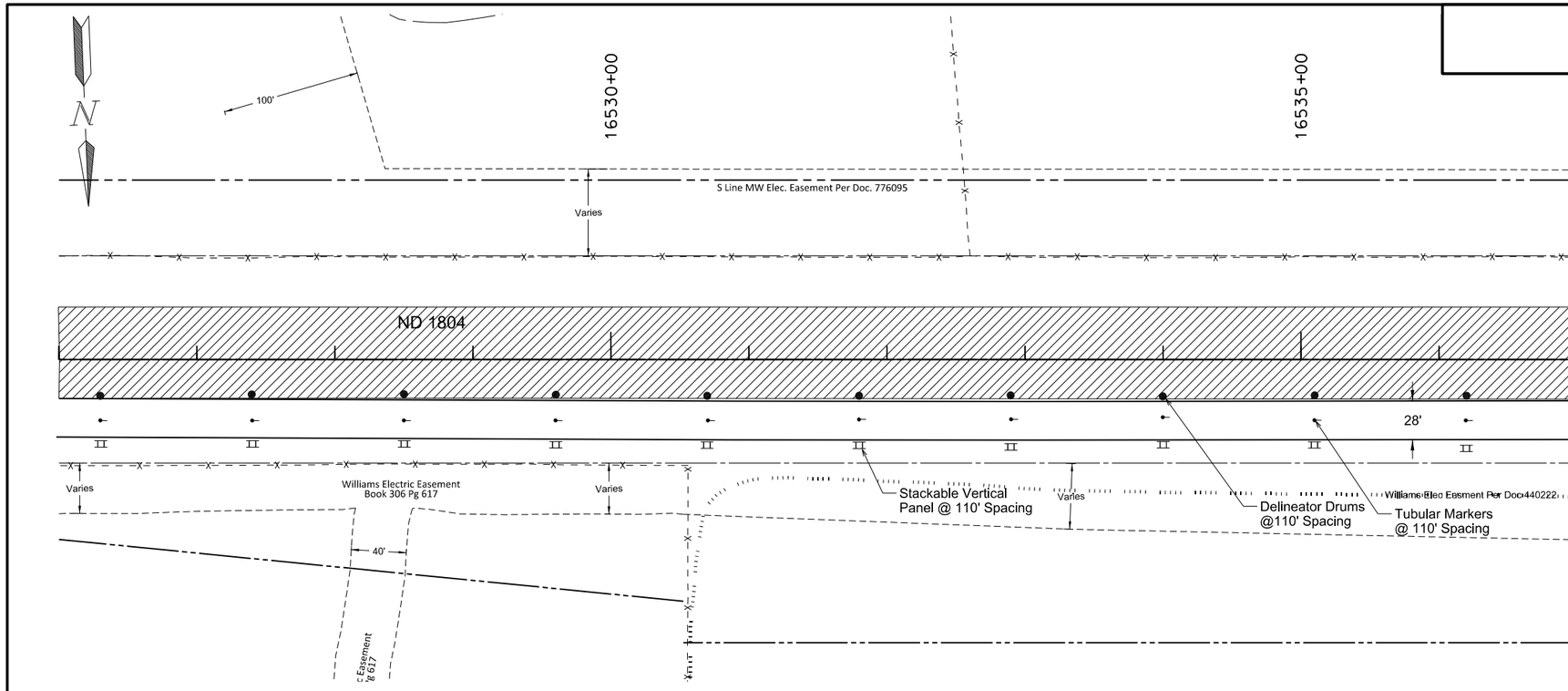
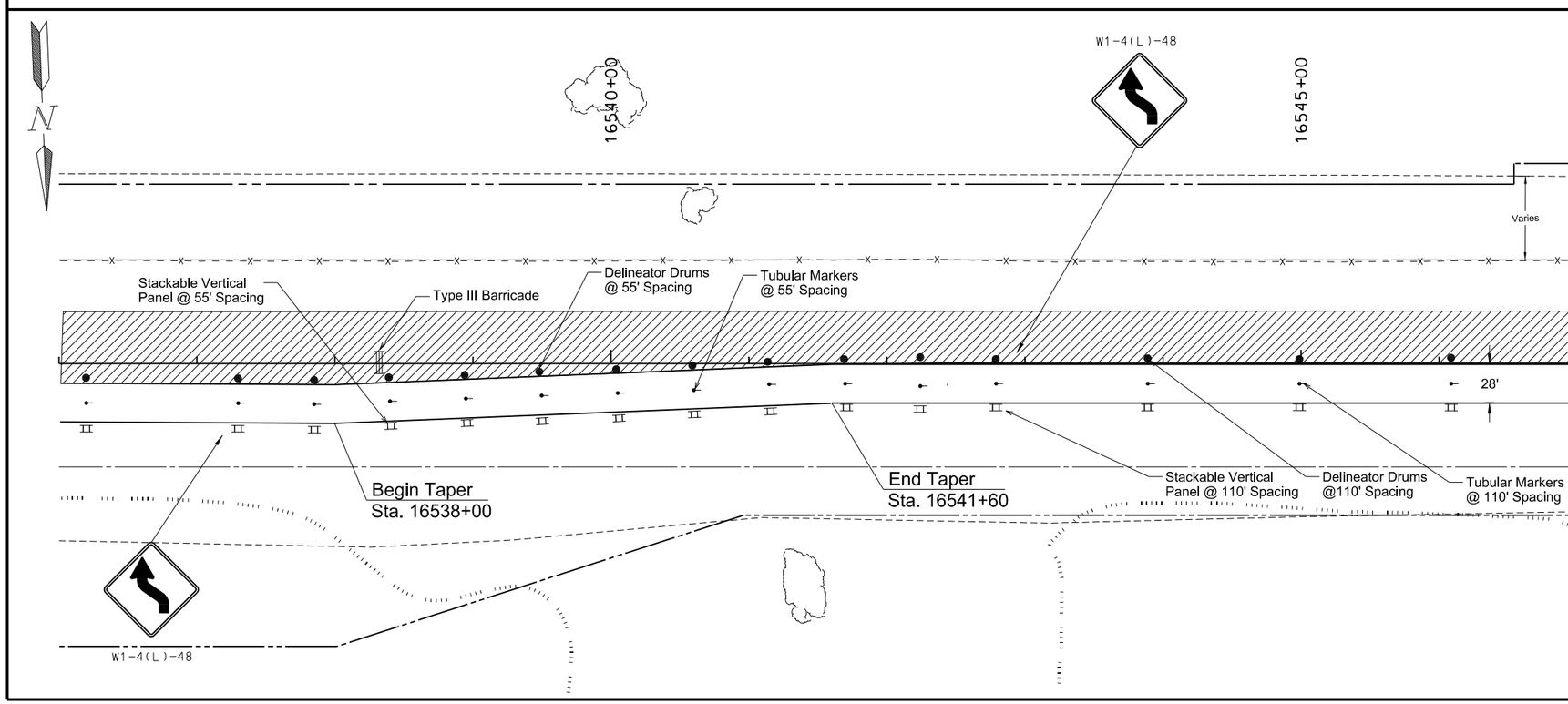
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND
Sta 16509+40 to Sta 16527+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	17





Notes:

1. Use Standard Drawing D-704-15 for sign spacing.
2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area

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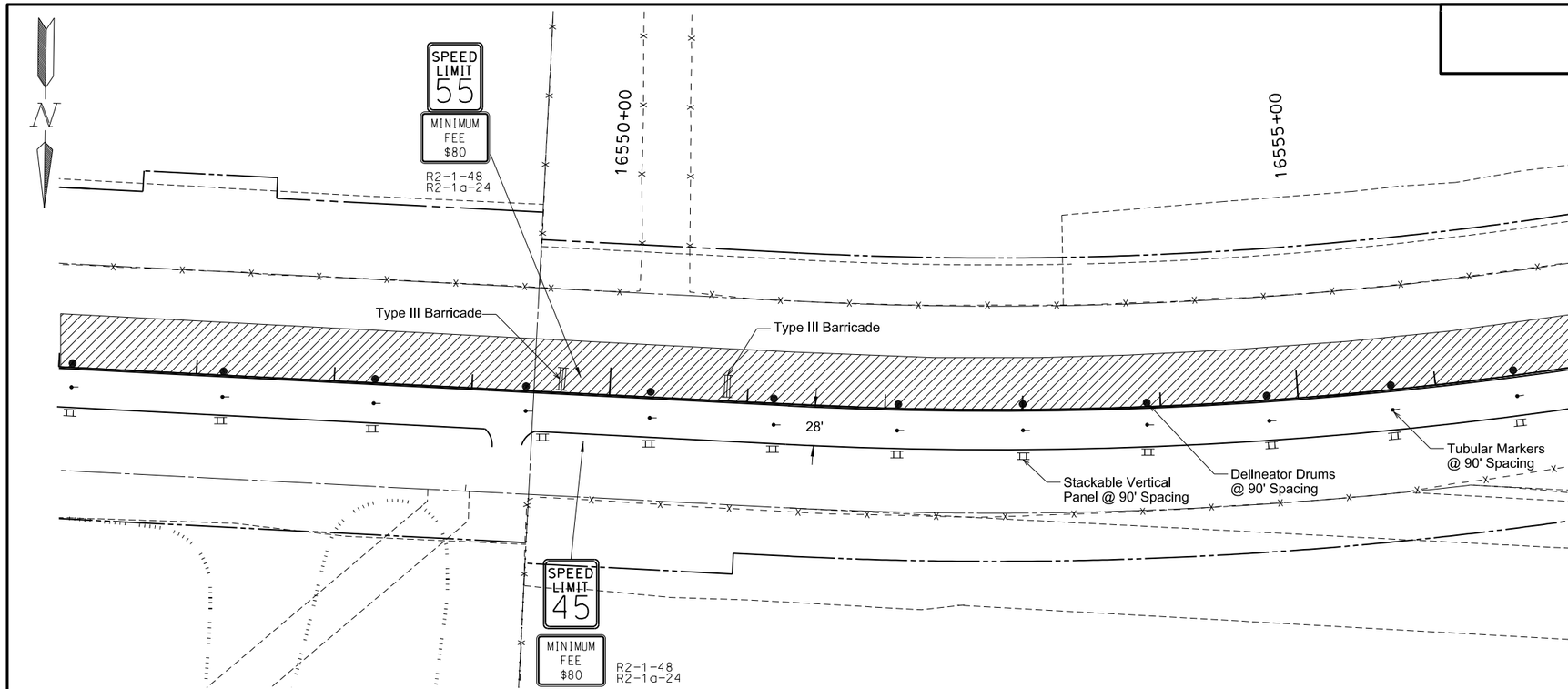
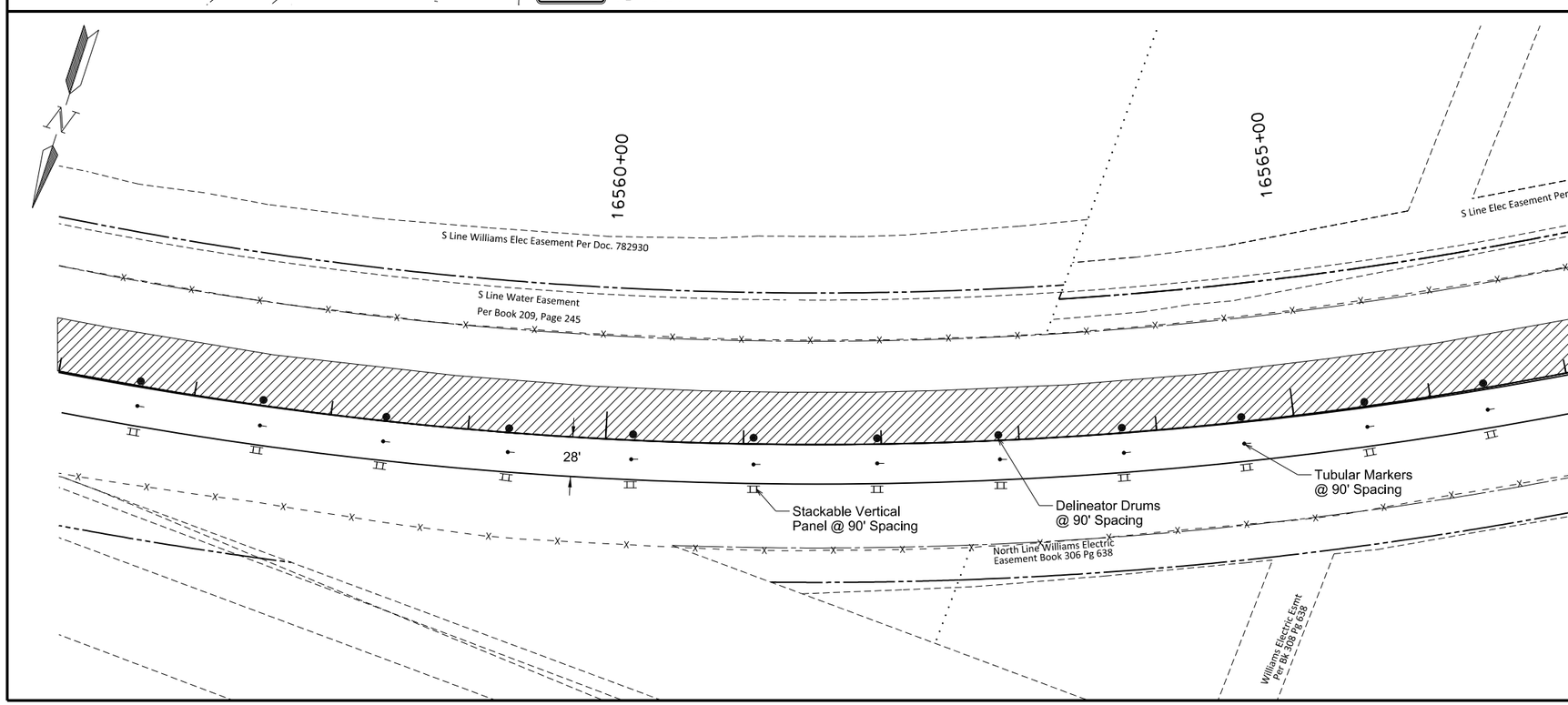
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16527+00 to Sta 16547+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	18





Notes:

1. Use Standard Drawing D-704-15 for sign spacing.
2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area

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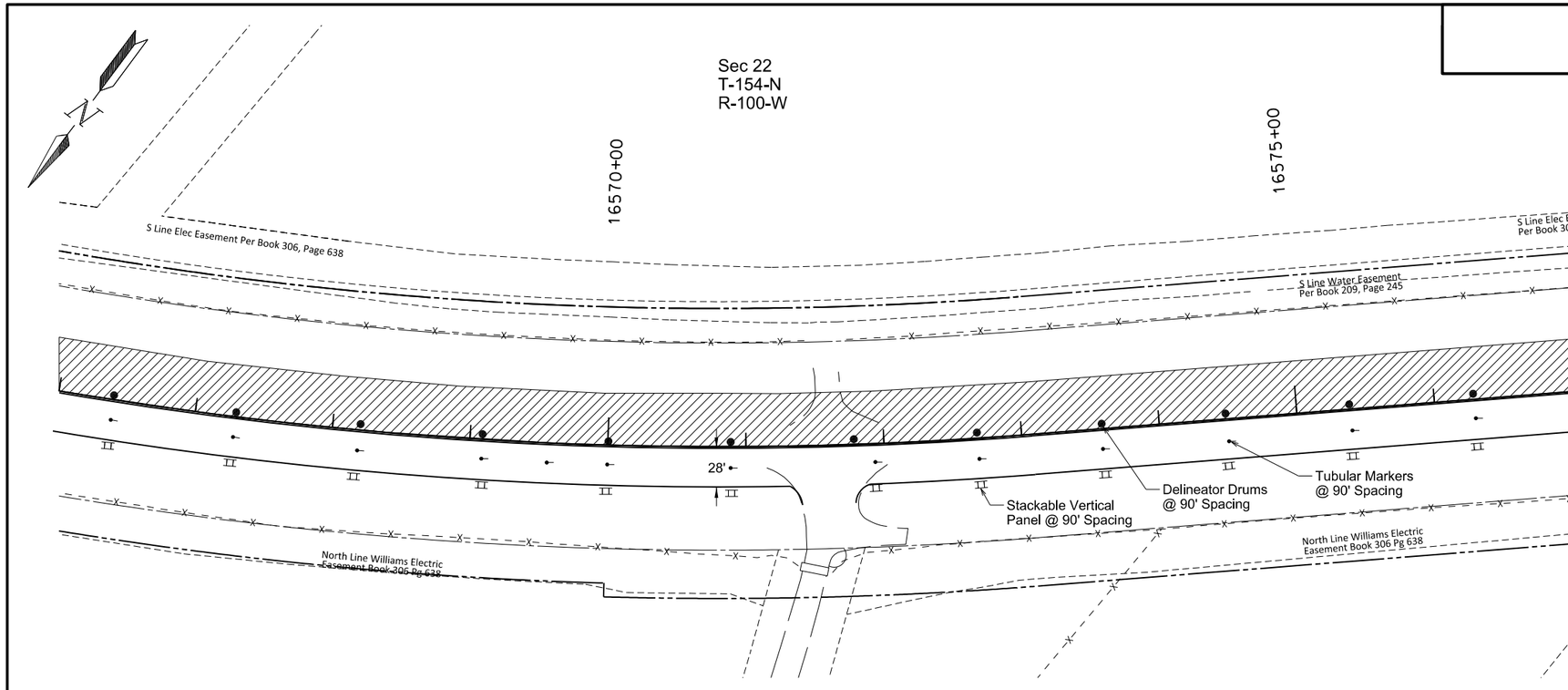
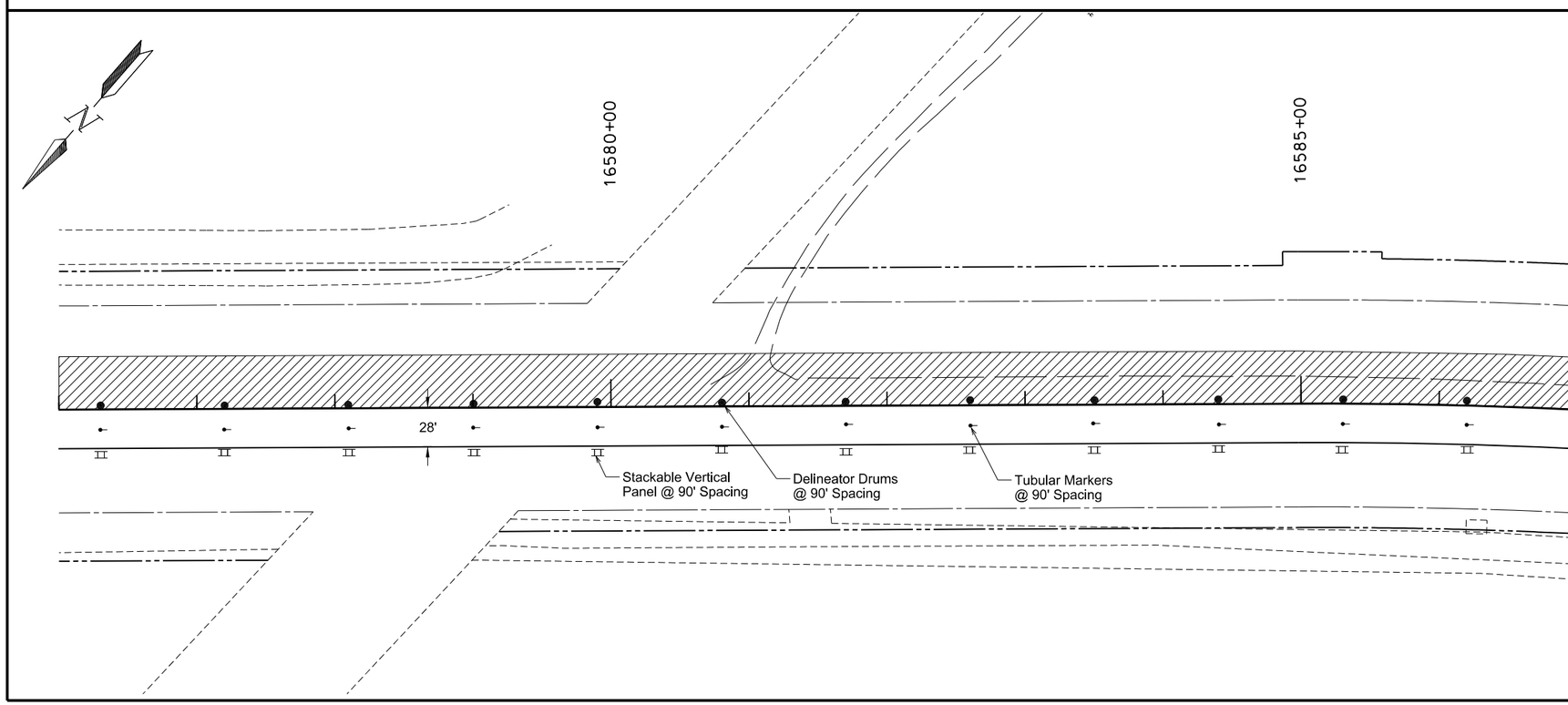
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16547+00 to Sta 16567+07

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	19





Notes:

1. Use Standard Drawing D-704-15 for sign spacing.
2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device Frequency may be adjusted by Engineer.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area

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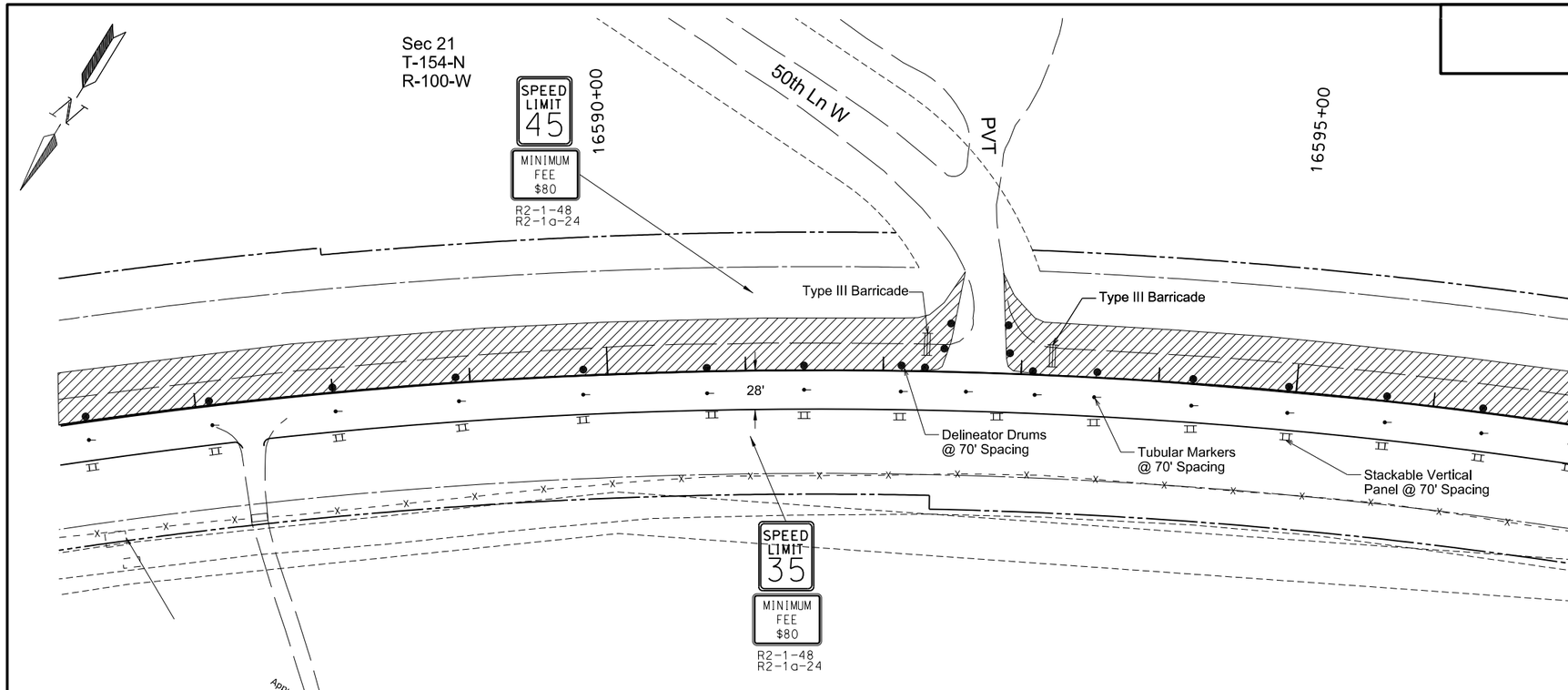
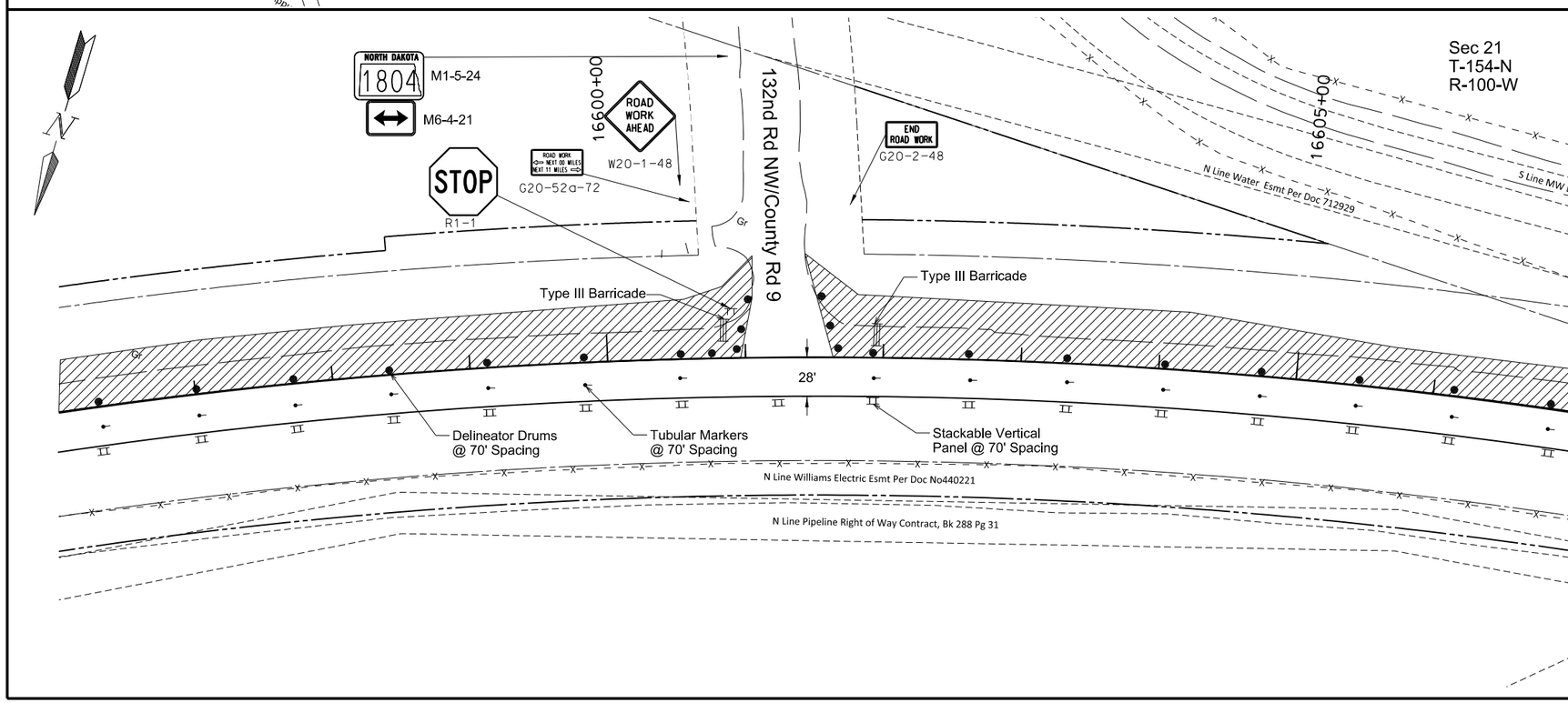
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16567+07 to Sta16587+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	20





Notes:

1. Use Standard Drawing D-704-15 for sign spacing.
2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area

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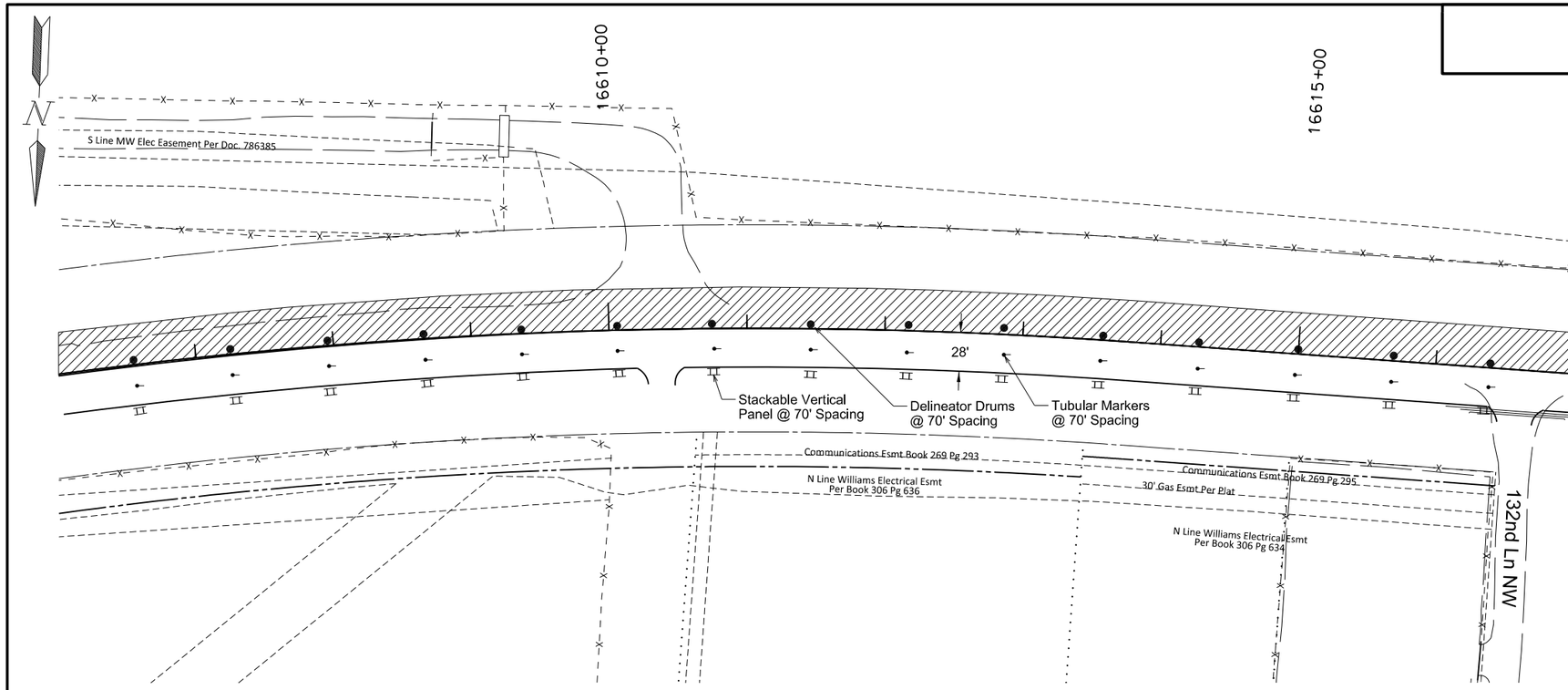
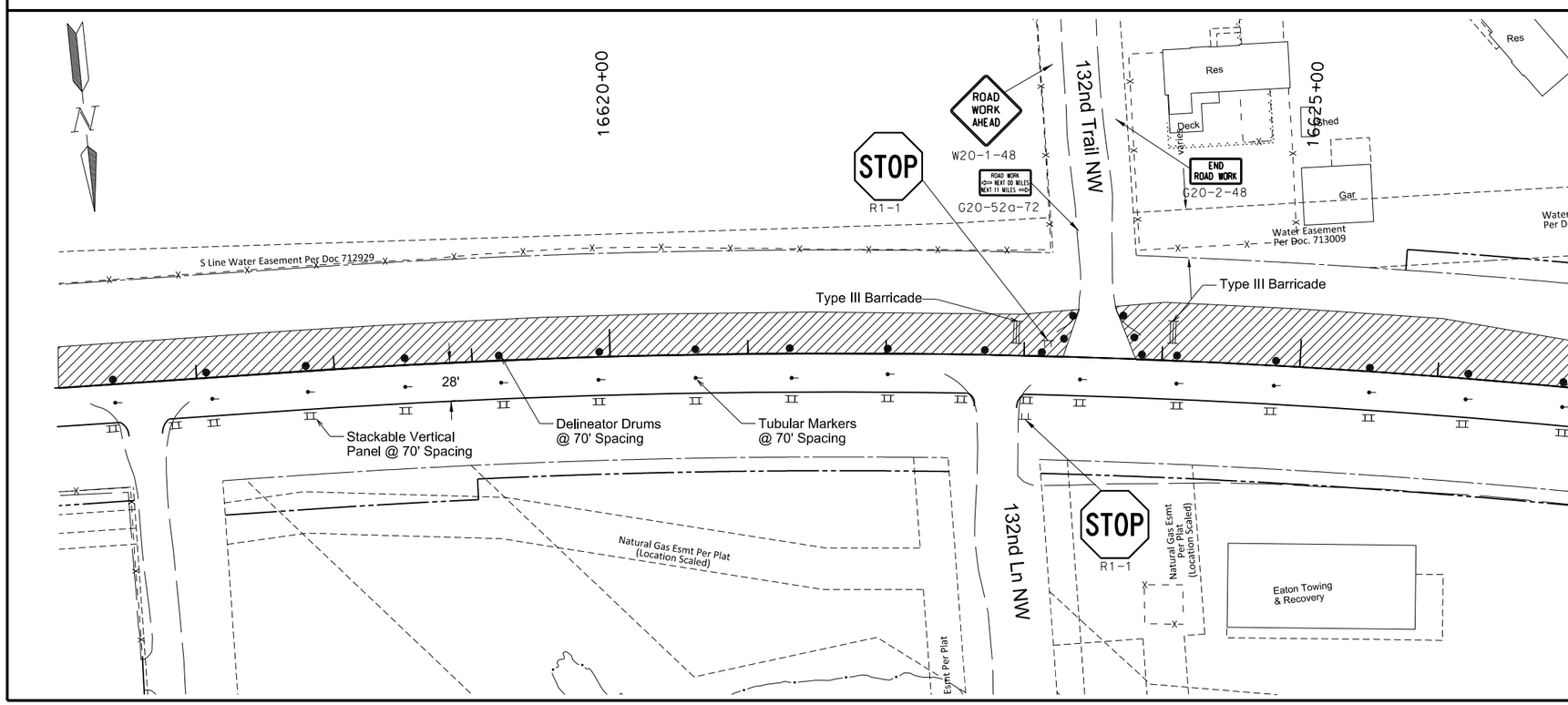
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16587+00 to Sta 16607+04

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	21





Notes:

1. Use Standard Drawing D-704-15 for sign spacing.
2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area

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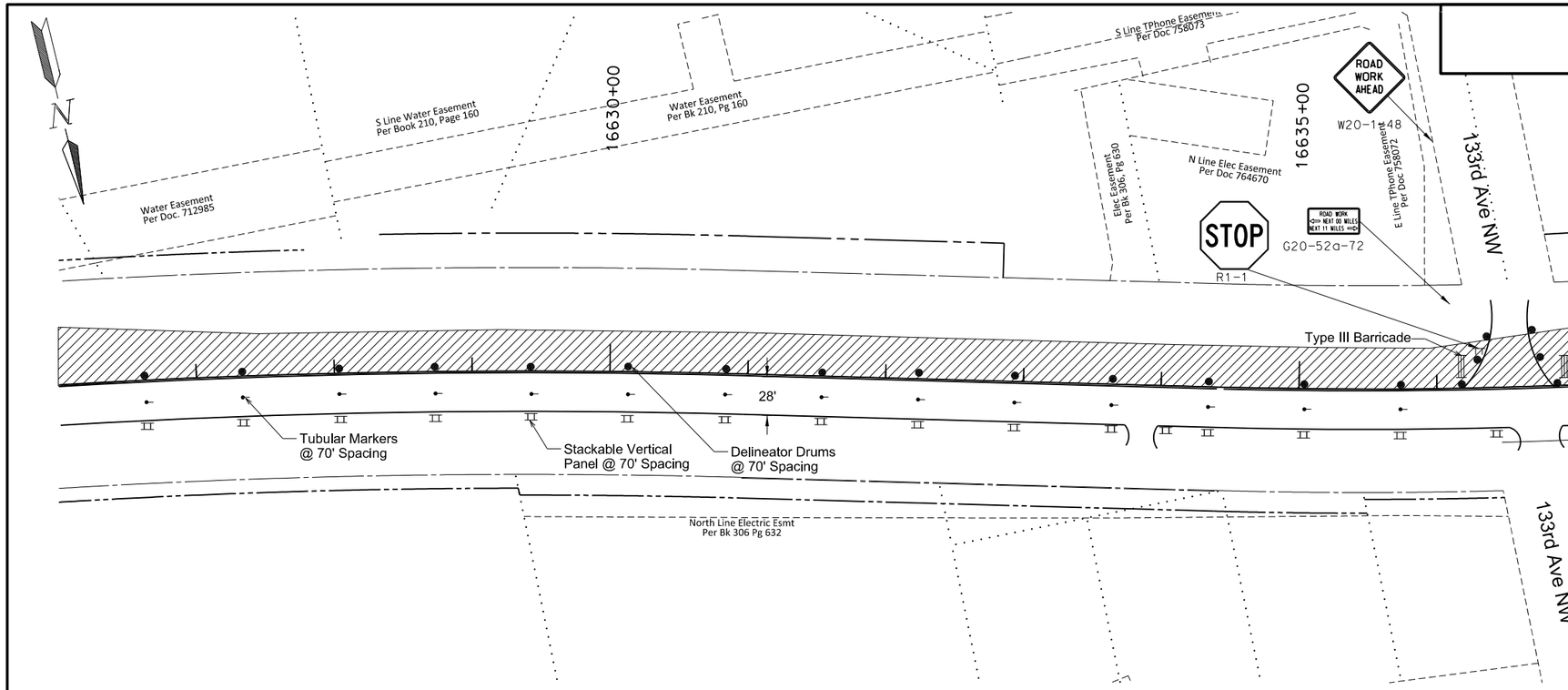
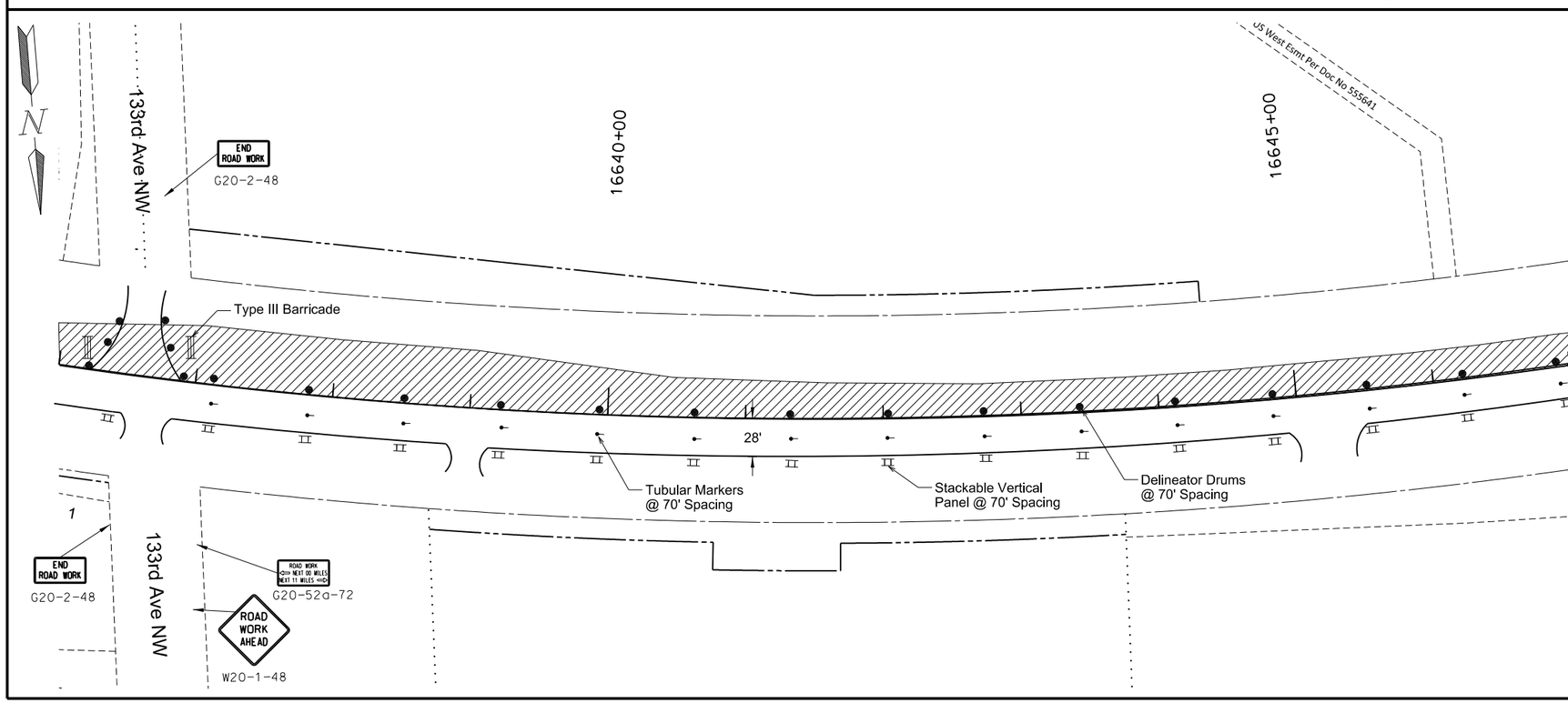
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16607+04 to Sta 16627+01

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	22





Notes:

1. Use Standard Drawing D-704-15 for sign spacing.
2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area

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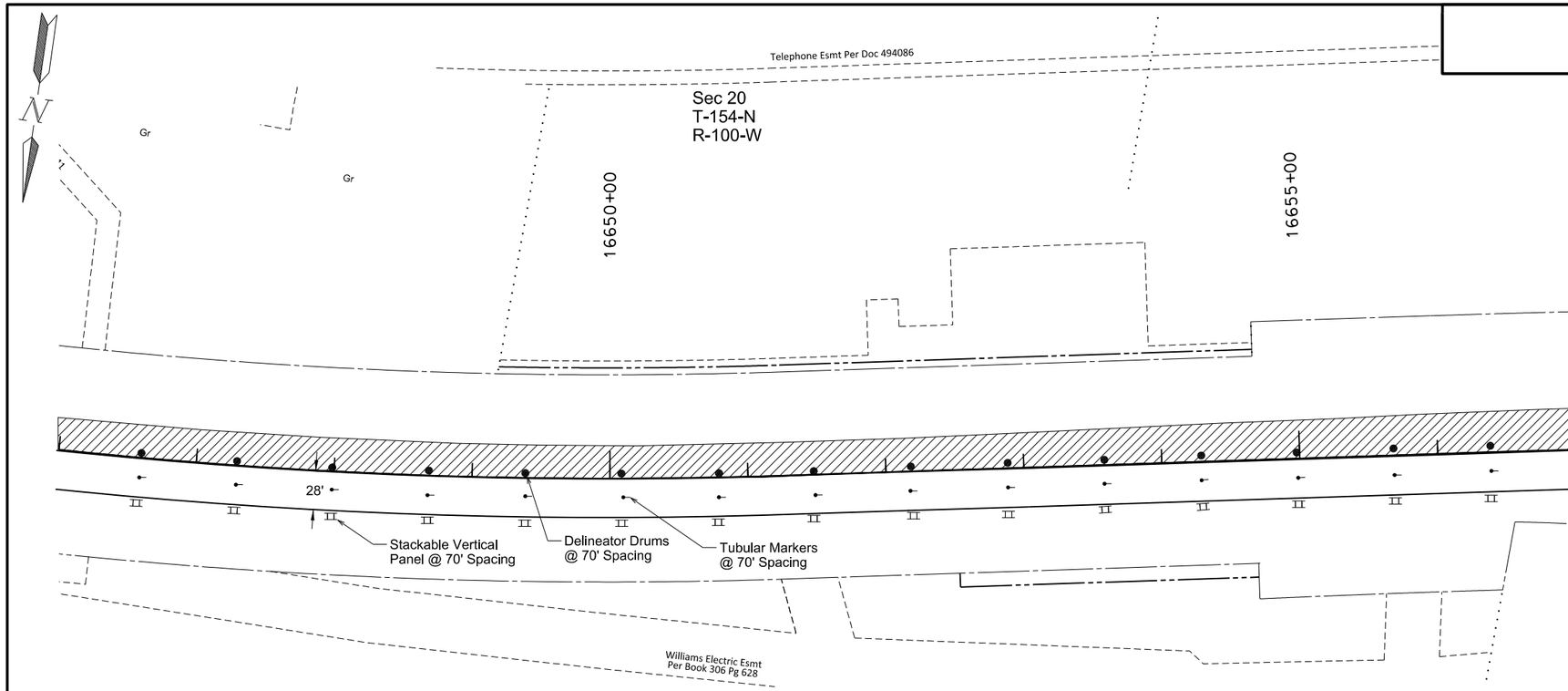
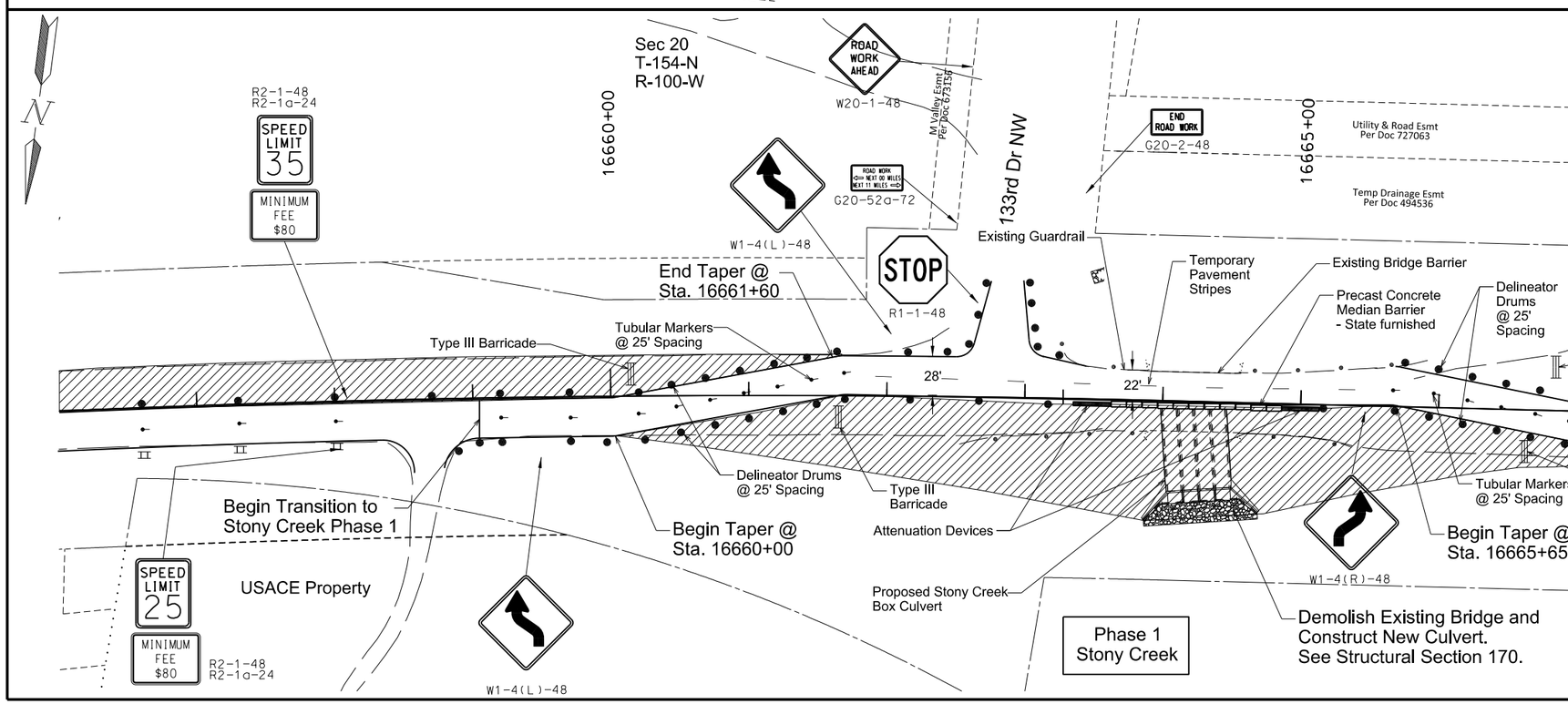
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16627+01 to Sta 16647+04

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	23





Notes:

1. Use Standard Drawing D-704-15 & D-704-21 for sign spacing.

2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area
- Temporary Pavement Stripe

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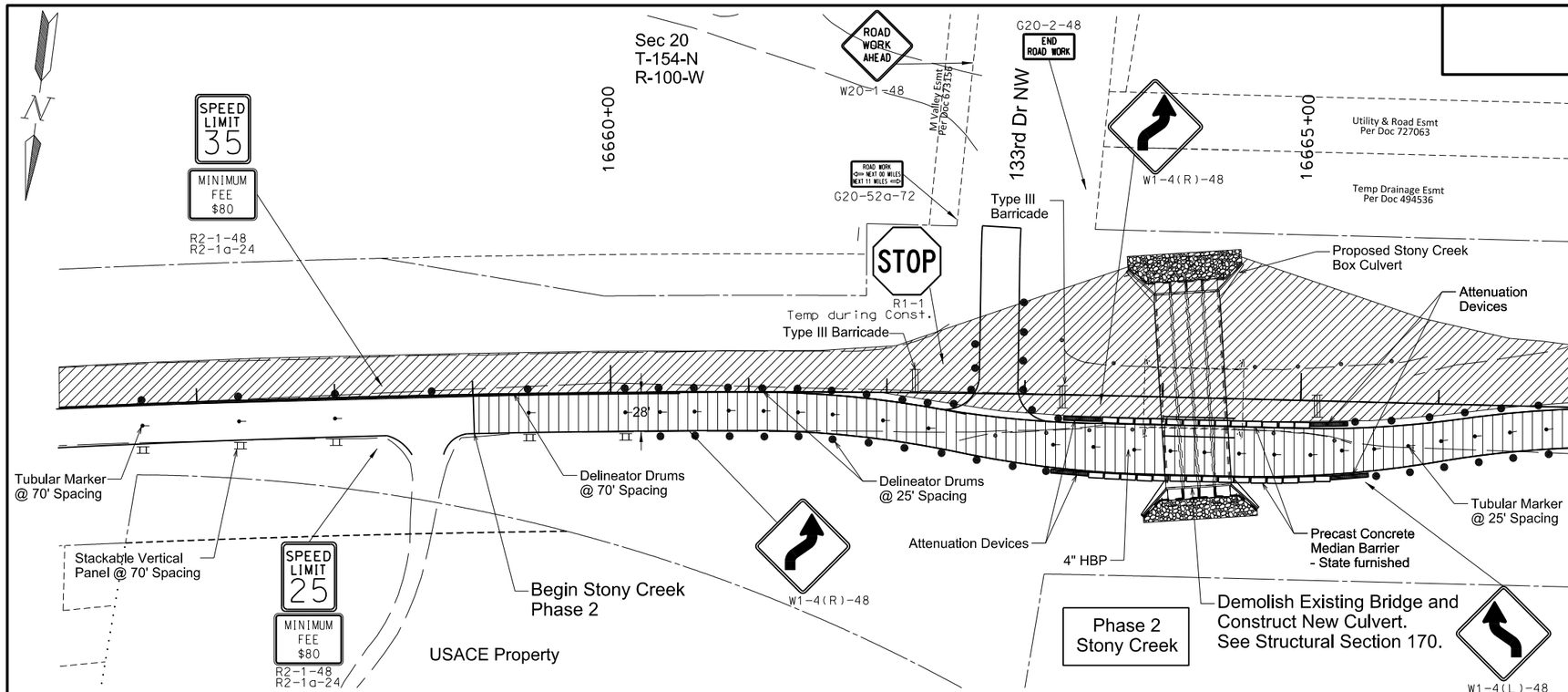
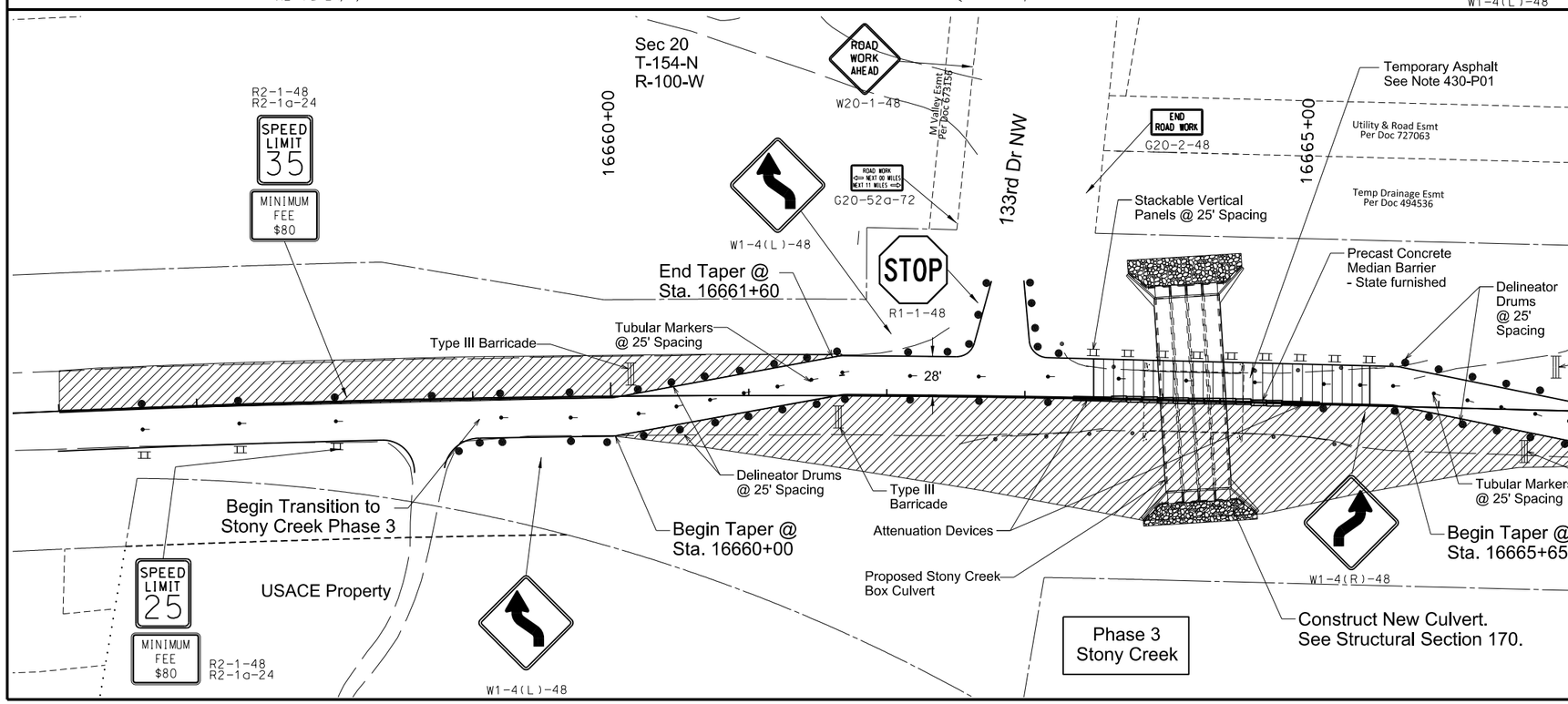
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16647+04 to Sta 16667+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	24





Notes:

1. Use Standard Drawing D-704-15 & D-704-21 for sign spacing.
2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area
- Temporary Asphalt

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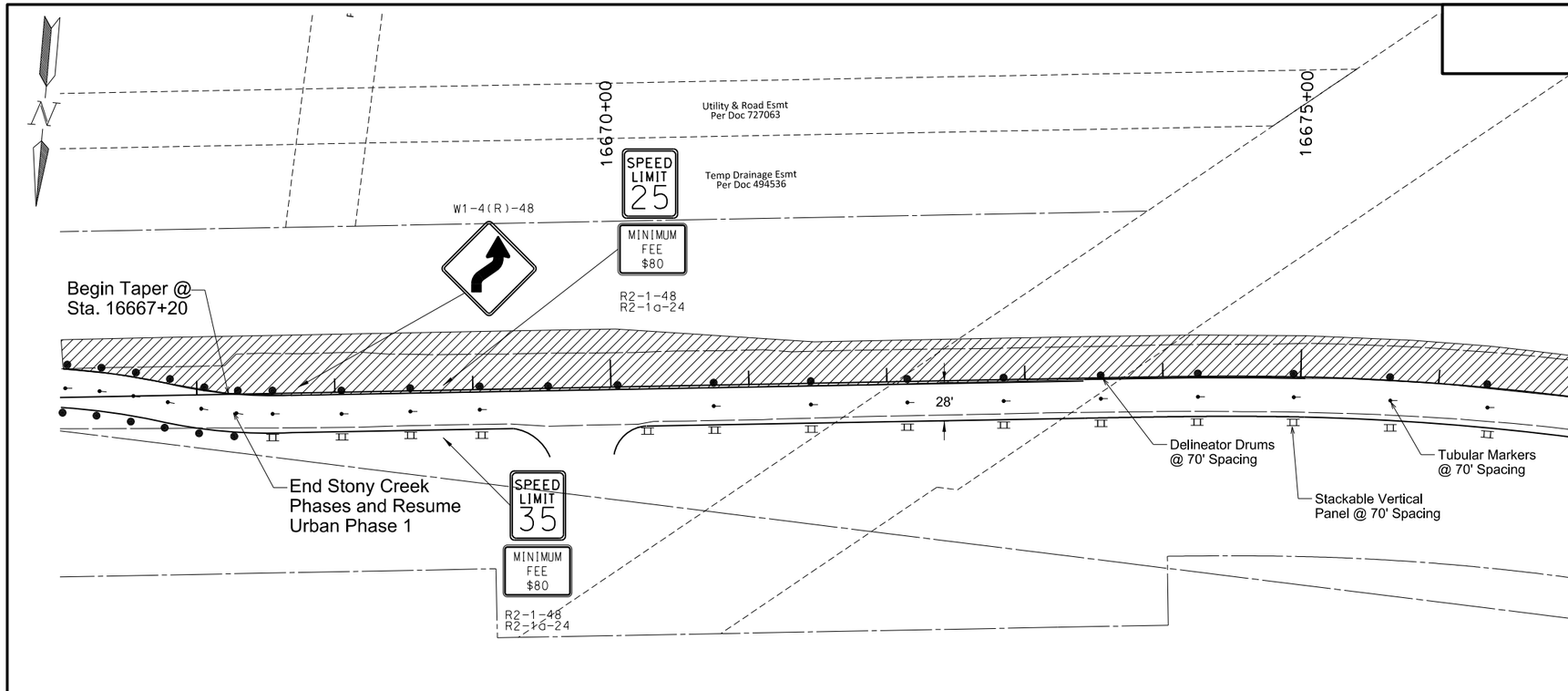
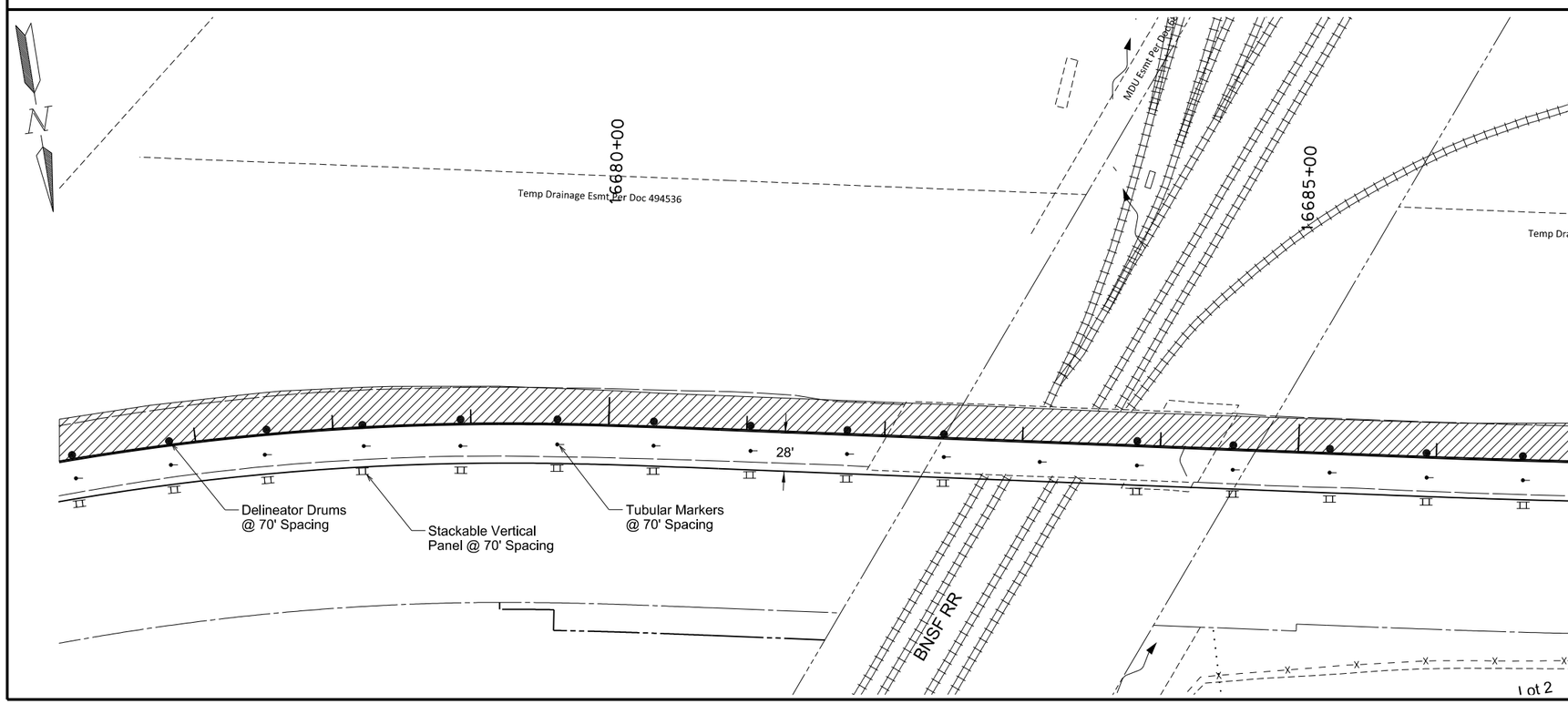
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16647+04 to Sta 16667+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	25





Notes:

1. Use Standard Drawing D-704-15 for sign spacing.
2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area

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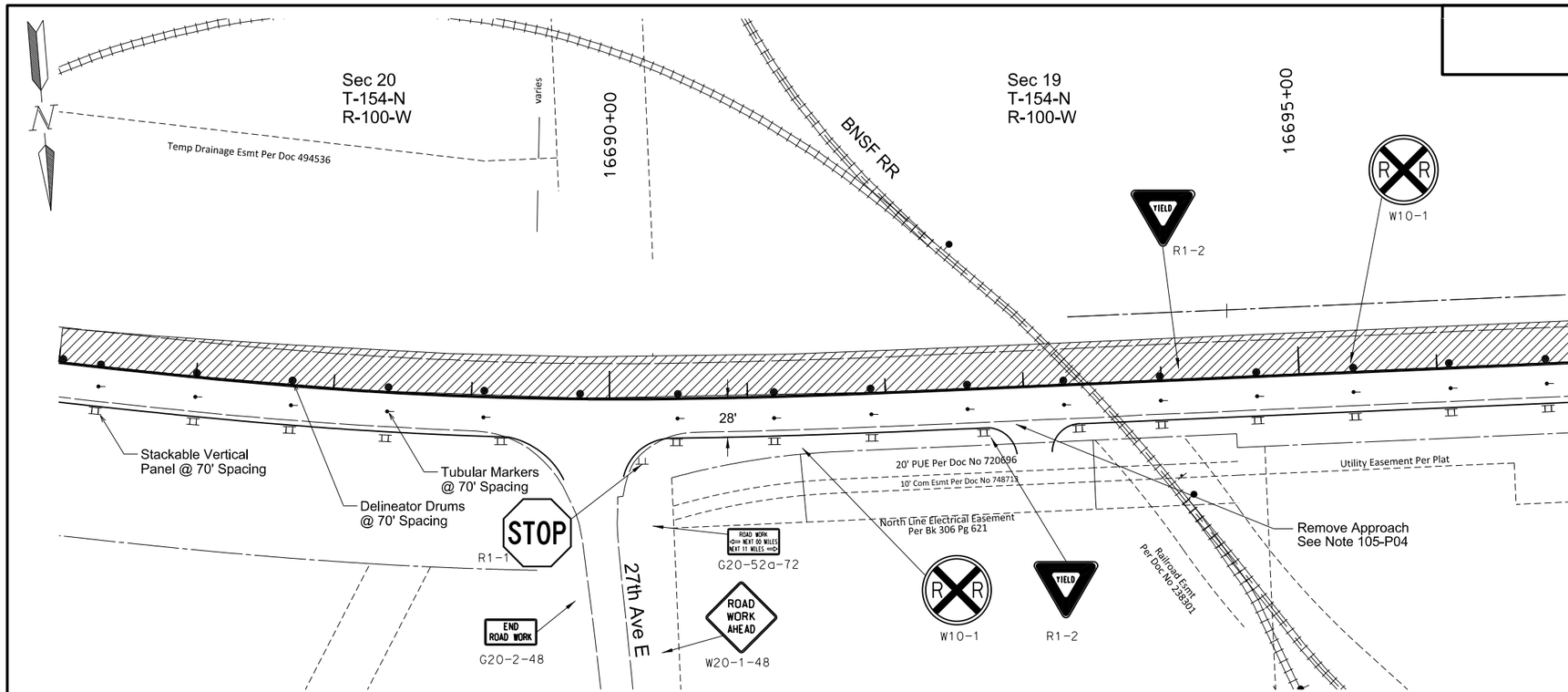
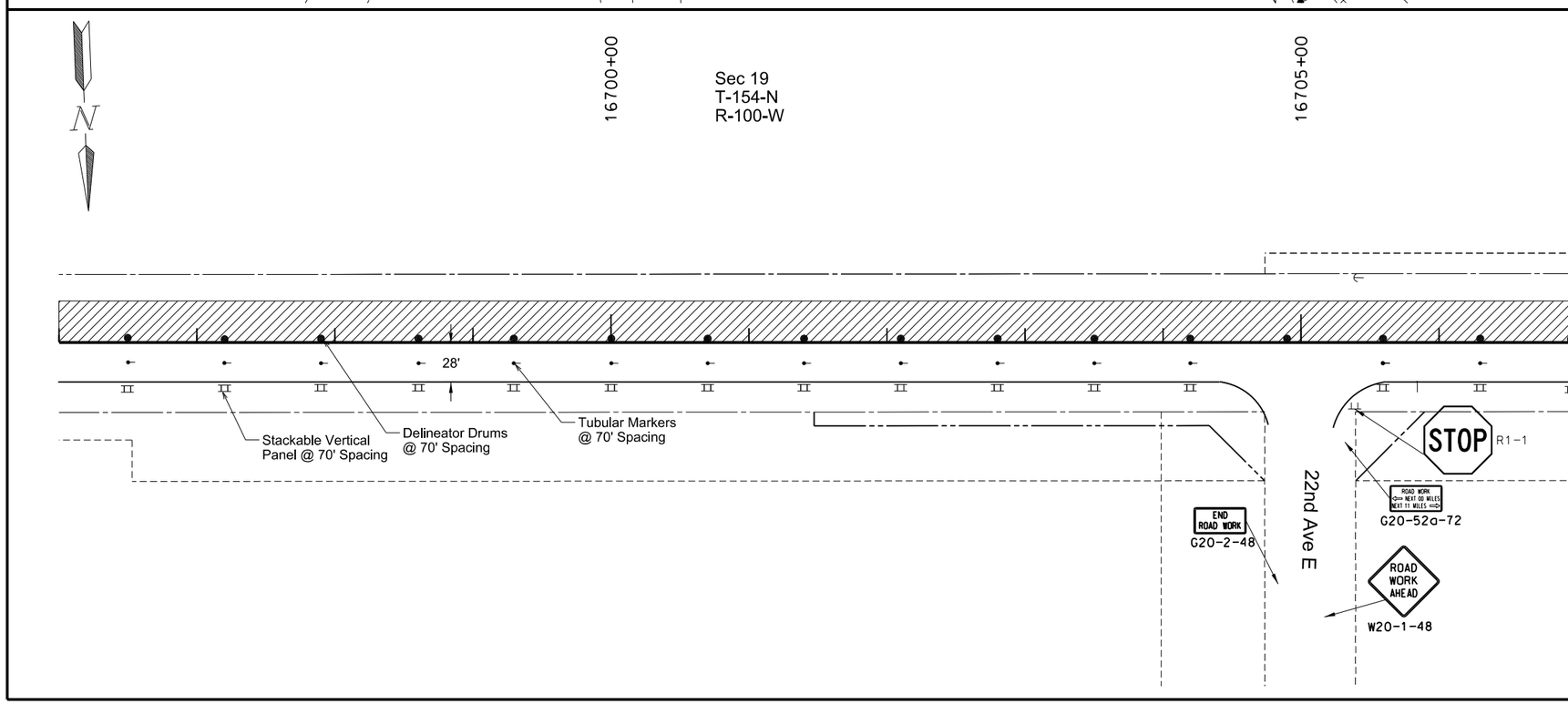
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16667+00 to 16687+02

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	26





Notes:

1. Use Standard Drawing D-704-15 for sign spacing
2. Railroad crossing signs and cross bucks will remain in place until roadway widening conflicts with signs, at which time, temporary replacement signs should be installed.
3. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.
4. Contractor shall coordinate construction adjacent to the railroad with BNSF. See note 107-P01, section 6.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area

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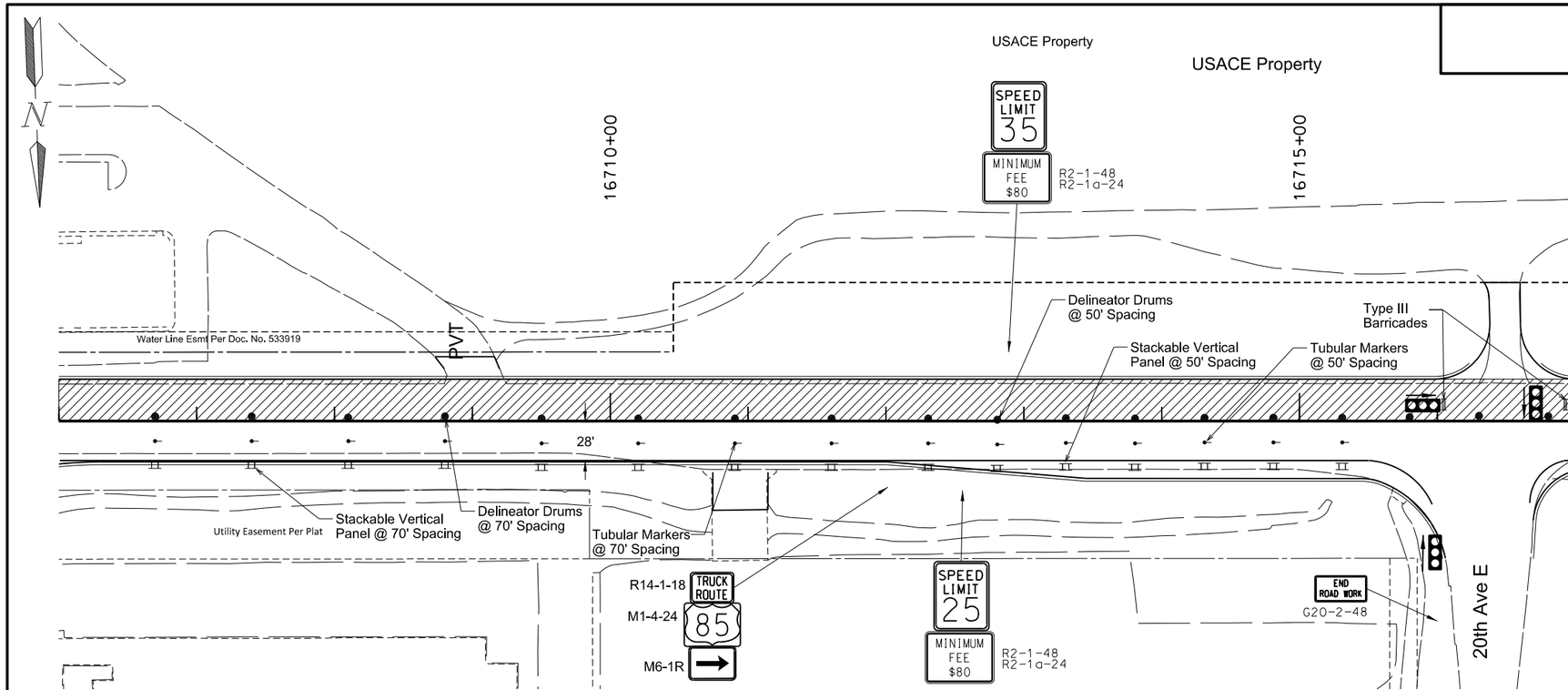
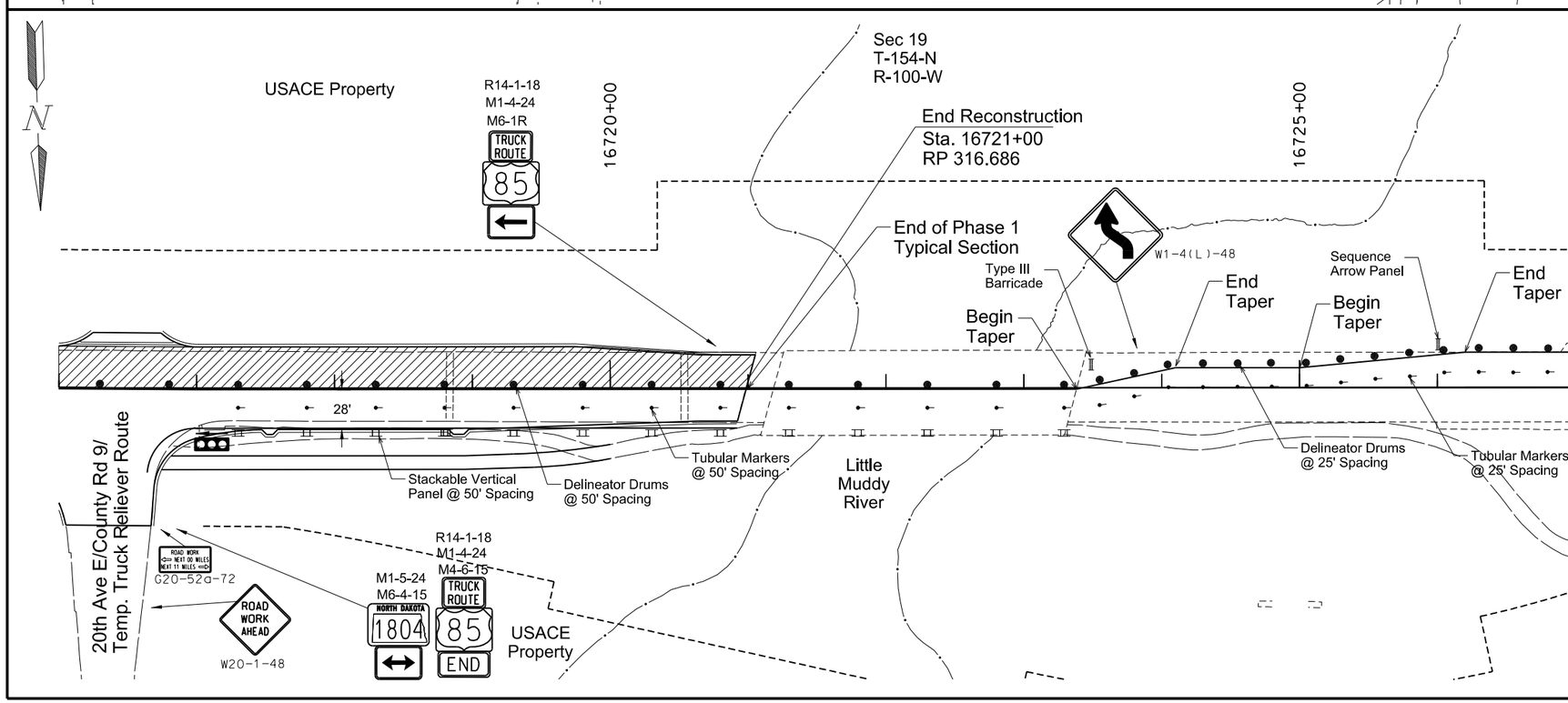
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16687+02 to 16707+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	27





Notes:

1. Use Standard Drawing D-704-15 Type C for sign spacing.
2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.
3. Use portable trailer mounted traffic signals during signal replacement when the existing controller is not in operation. Orient the traffic signal to face the direction indicated by the arrow. See Note 772-P03.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area
- Portable Trailer Mounted Traffic Signal

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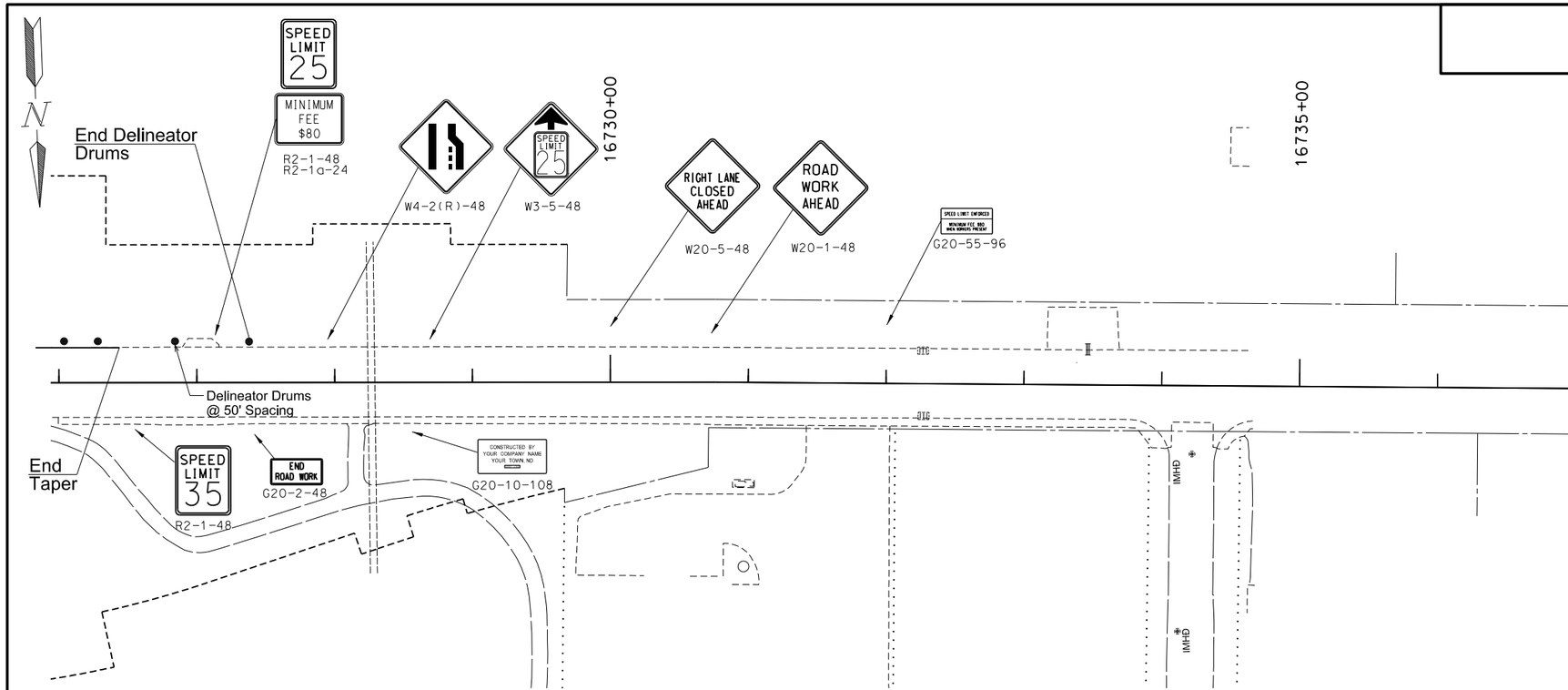
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16707+00 to Sta 16721+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	28



Notes:

1. Use Standard Drawing D-704-15 Type C for sign spacing.
2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area

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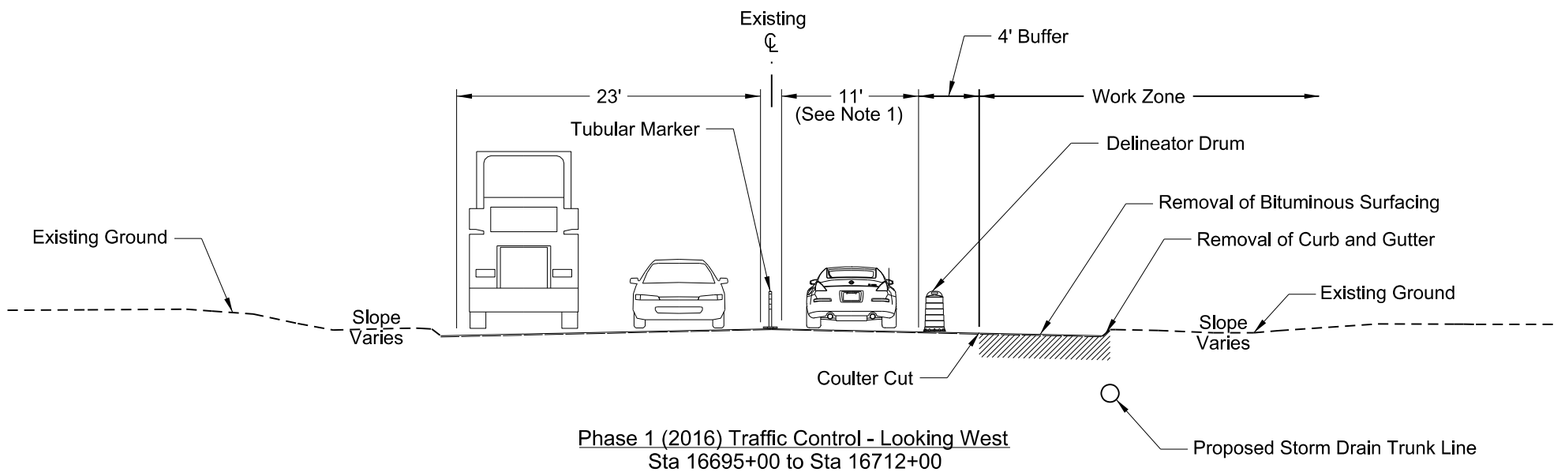
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16707+00 to Sta 16721+00

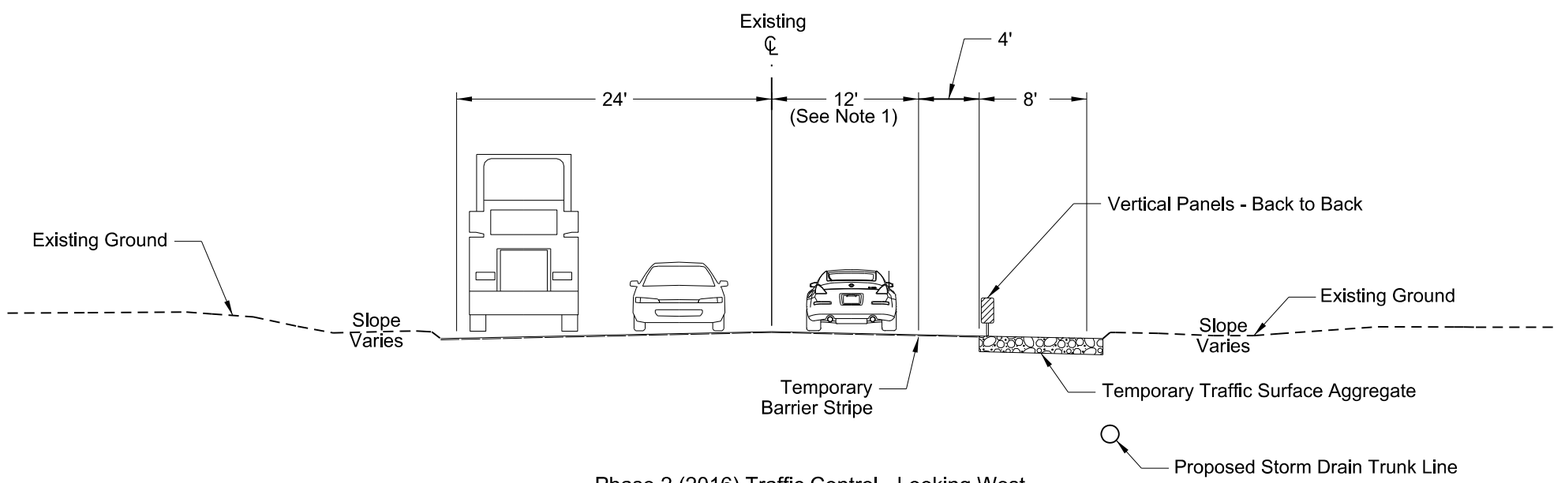
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	29



Phase 1 (2016) Traffic Control - Looking West
Sta 16695+00 to Sta 16712+00

Work to be Performed in Phase 1 (2016)

- Maintain two lanes of eastbound traffic and reduce westbound traffic to one lane.
- Demolish 8' of pavement on existing northermost westbound lane.
- Construct new storm drain trunk line.



Phase 2 (2016) Traffic Control - Looking West
Sta 16695+00 to Sta 16712+00

Work to be Performed in Phase 2 (2016)

- Maintain two lanes of eastbound traffic and reduce westbound traffic to one lane.
- Place temporary barrier stripe on north edge of westbound lane.
- Install vertical panels in the gravel along the coulter cut every 100 feet.

Notes:

1. Lane widths shown are measured from the inside of traffic channelizing device.
2. Work is to be completed for Phase 1 (2016) and Phase 2 (2016) according to note 105-P05.

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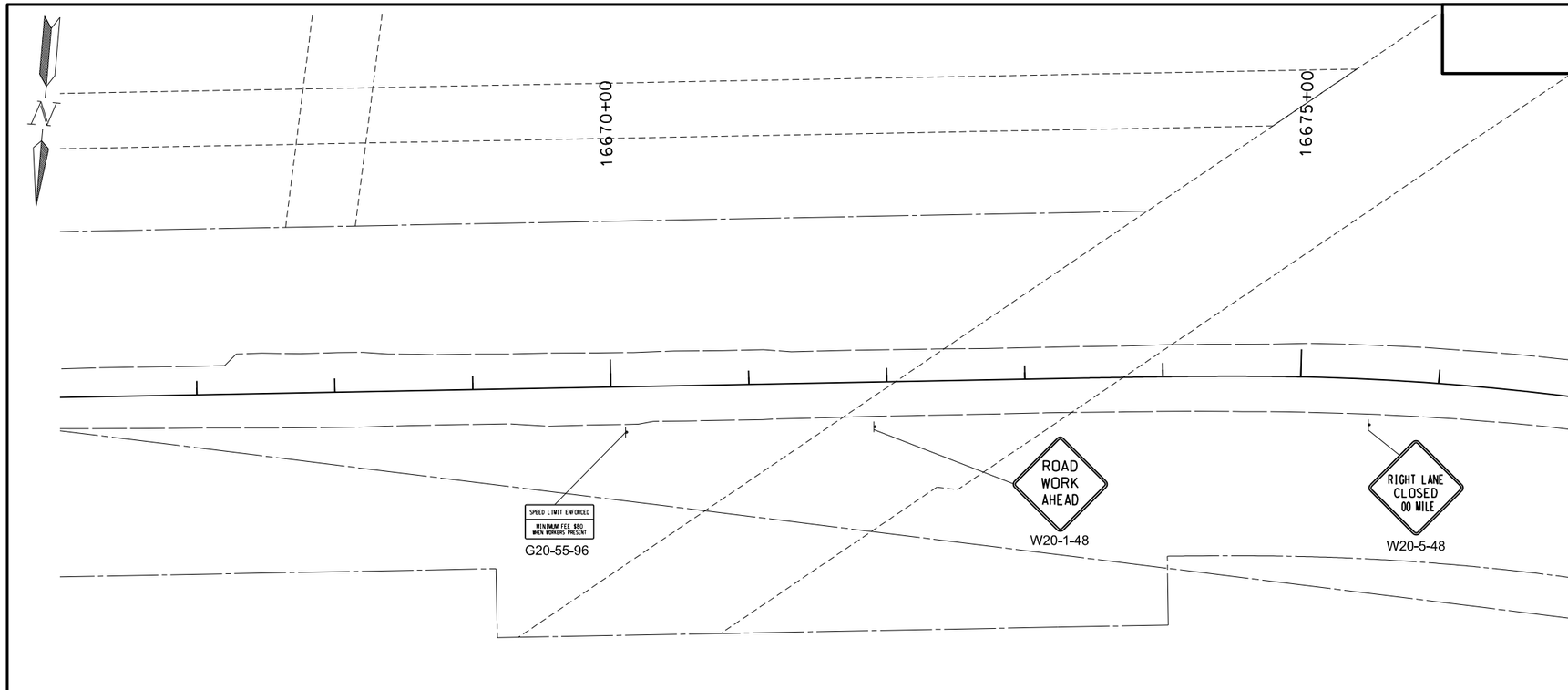
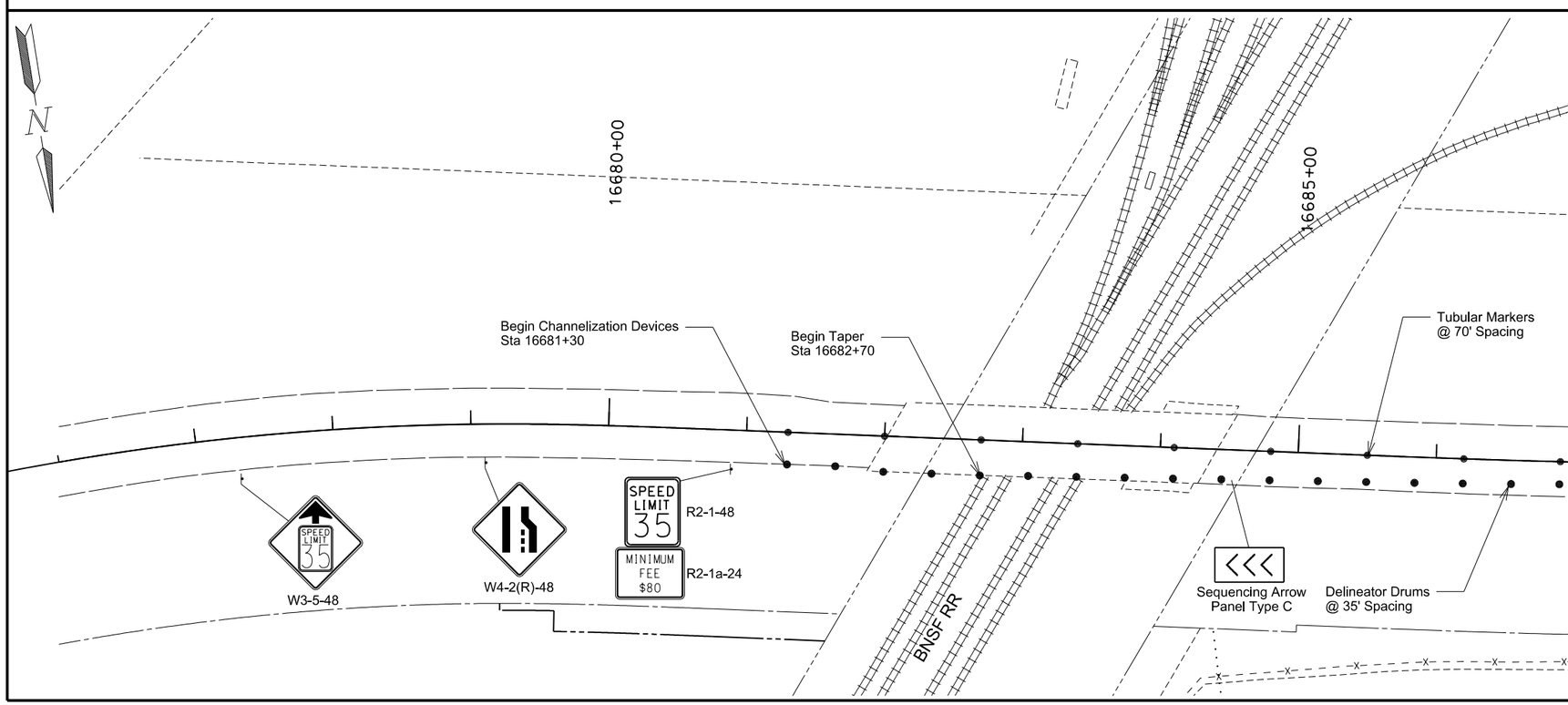
Work Zone Traffic Control
Urban Roadway Typical Sections

ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	30





Notes:

1. Use Standard Drawing D-704-34 for sign spacing.
2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area

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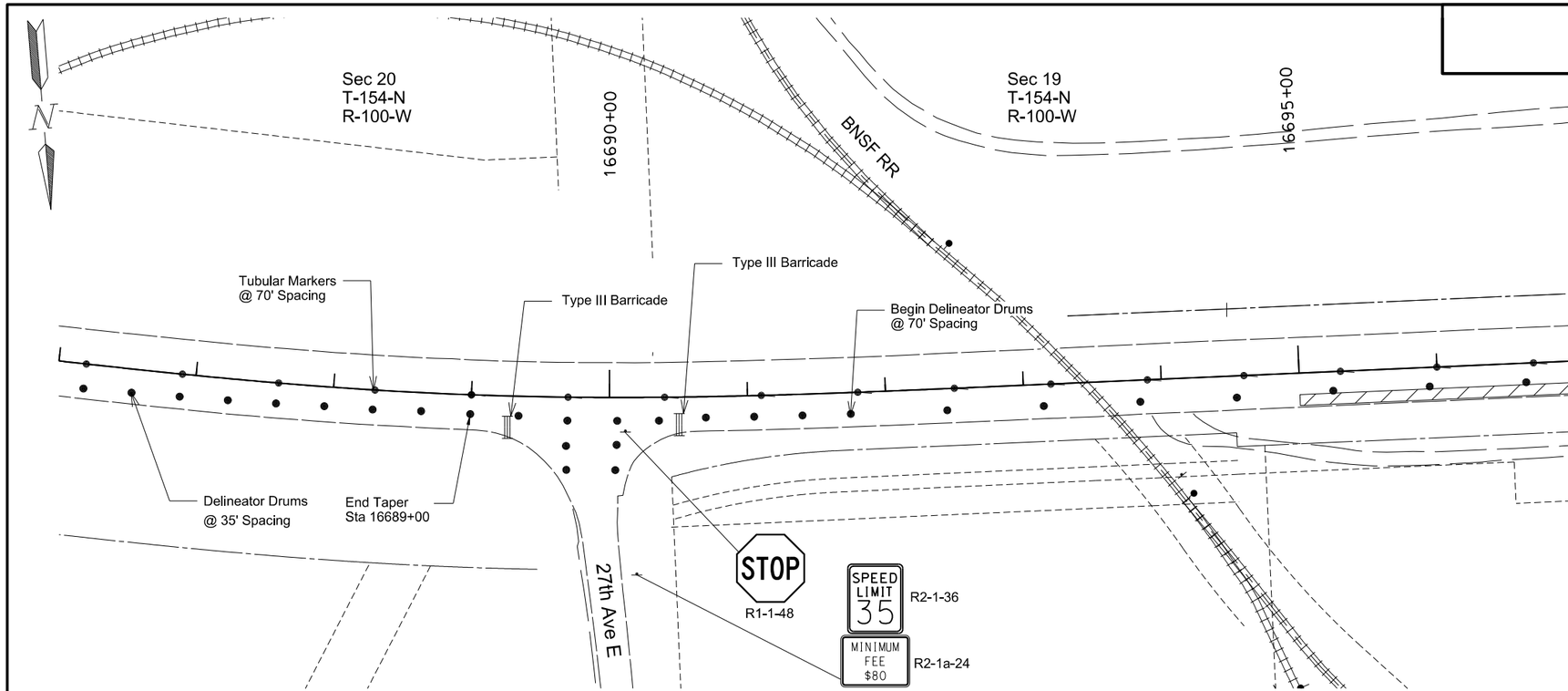
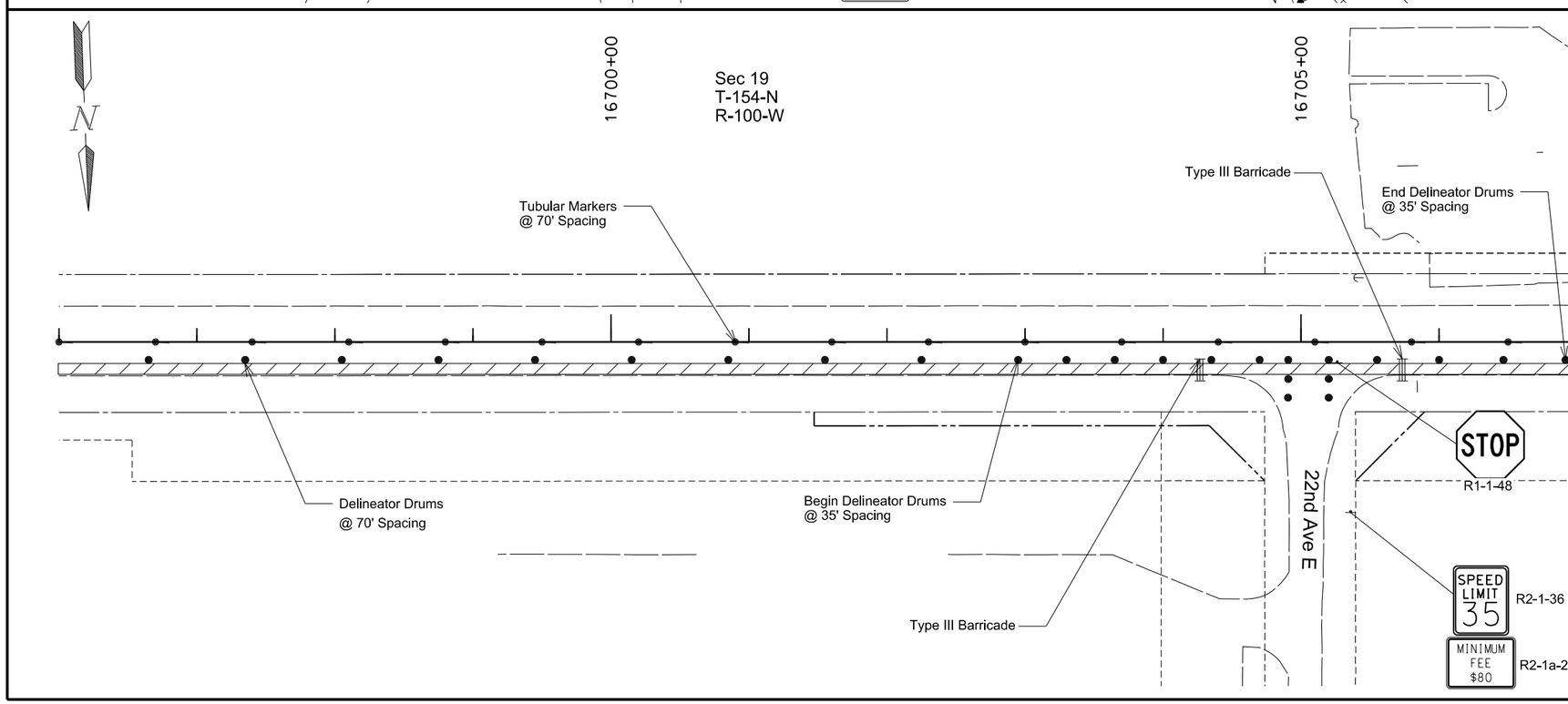
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16667+00 to 16687+02

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	31





Notes:

1. Use Standard Drawing D-704-34 for sign spacing.
2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area

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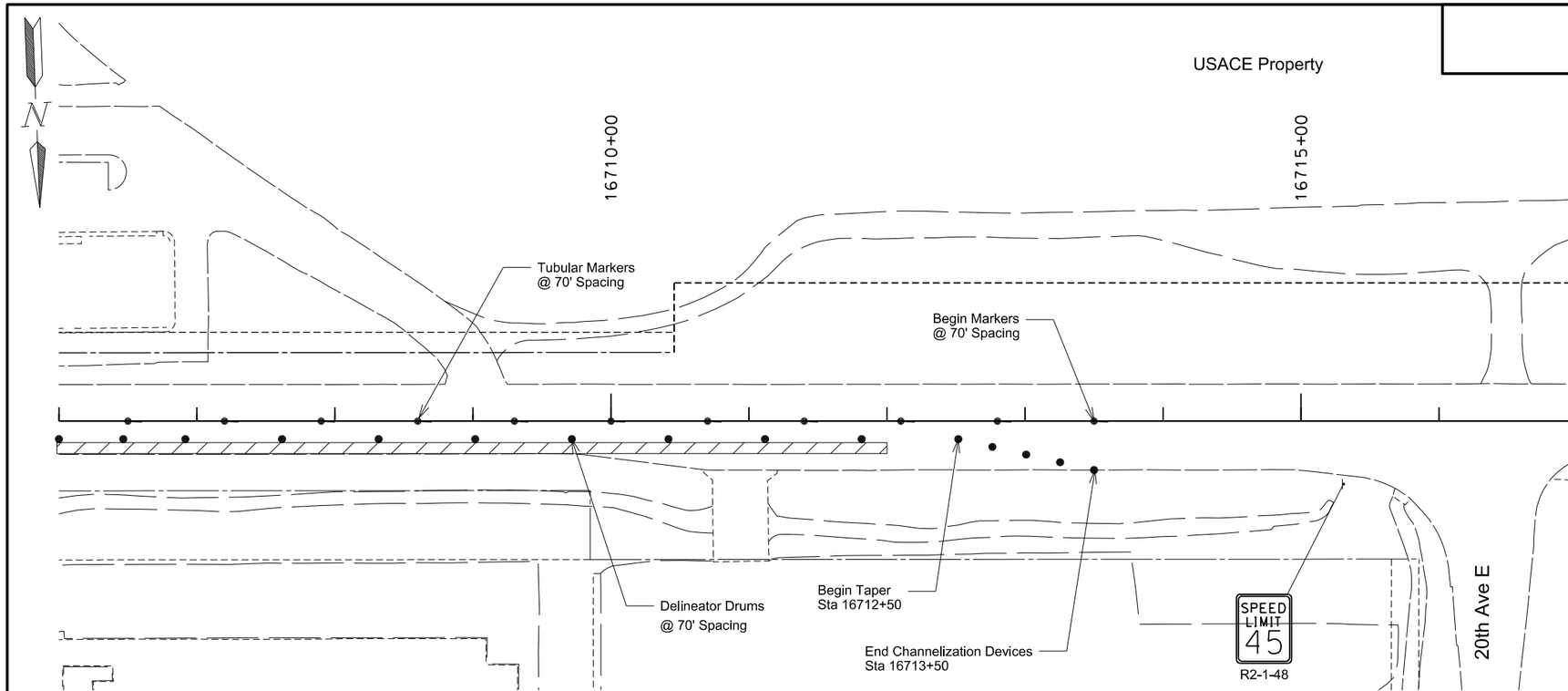
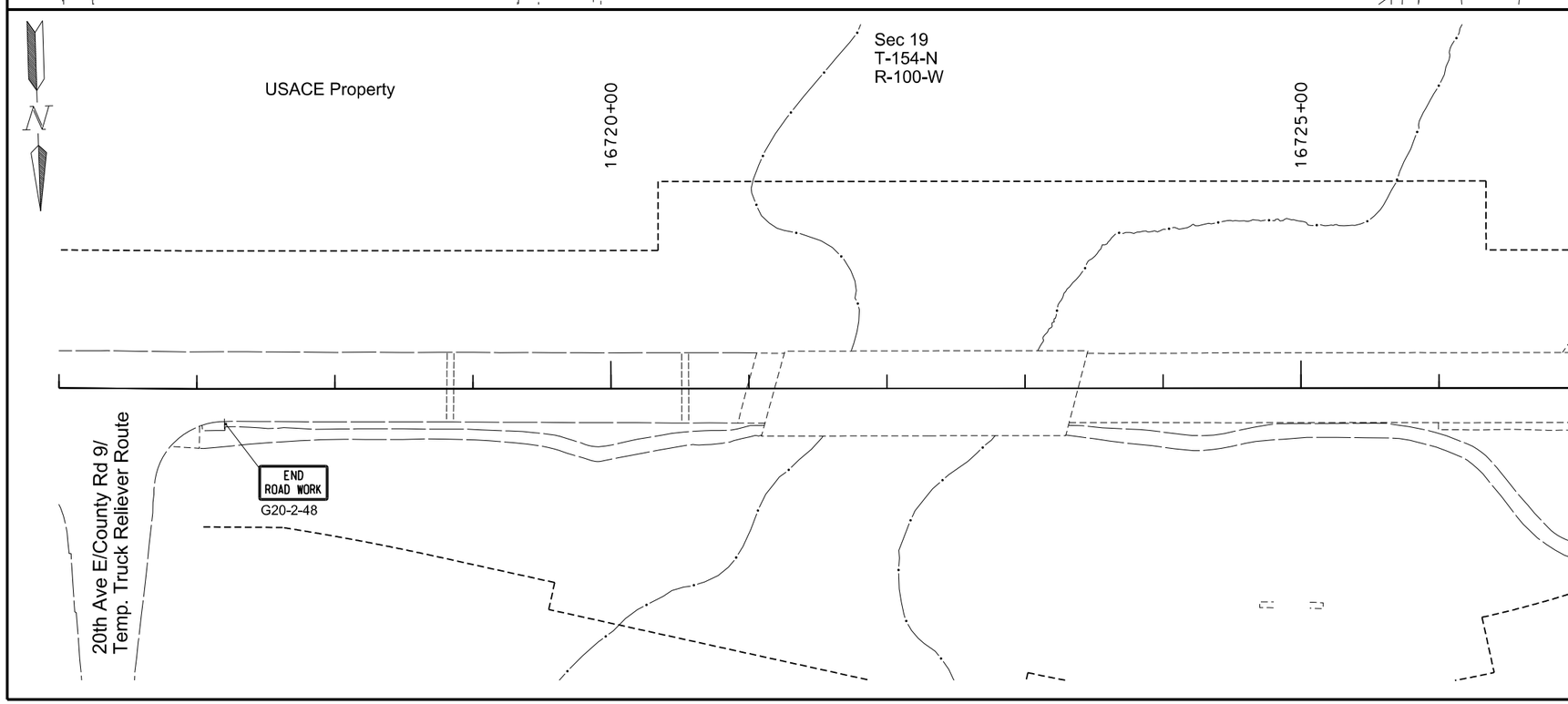
Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16687+02 to 16707+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	100	32





Notes:

1. Use Standard Drawing D-704-34 for sign spacing.
2. Per MUTCD, channelizing device spacing should not exceed a distance in feet equal to 1.0 times the posted speed limit in mph when used for taper channelization, and a distance in feet equal to 2.0 times the posted speed limit in mph when used for tangent channelization. Device frequency may be adjusted by Engineer.

LEGEND

- Type III Barricade
- Jersey Barrier
- Delineator Drum
- Tubular Marker
- Stackable Vertical Panel
- Work Area

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Work Zone Traffic Control
Construction Sign Layout

ND 1804 Reconstruction
Williams County, ND

Sta 16707+00 to Sta 16721+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	SOIB-7-804(054)312	110	1

Sta/RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	Sign Support Length 2nd LF	Sign Support Length 3rd LF	Sign Support Length 4th LF	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
16522+99 Lt	SA-2B			5.2	9.4				2.25 x 2.25 12 ga	9.7						1	4	2.5 x 2.5 12 ga	1			
16523+56 Rt		1			12.8				2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga	1			
16534+73 Lt		19		6.3	13.1				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
16535+00 Rt		22		6.0	12.9				2.5 x 2.5 12 ga	16.2						1	4	3 x 3 7 ga				
16548+00 Rt		20		9.0	13.7				2.25 x 2.25 12 ga	14.1	5.0				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
16558+00 Lt		9			12.8				2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga	1			
16558+00 Rt		9			12.8				2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga	1			
16591+50 Rt		20		9.0	13.7				2.25 x 2.25 12 ga	14.1	5.0				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
16592+56 Lt	SA-2B			5.2	8.8				2.25 x 2.25 12 ga	9.7						1	4	2.5 x 2.5 12 ga	1			
16593+74 Rt		437		8.4	14.3				2.5 x 2.5 10 ga	15.2						1	4	3 x 3 7 ga	1		1	
16599+00 Lt		9			12.8				2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga	1			
16599+00 Rt		9			12.7				2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga	1			
16600+87 Lt	SA-2B				8.8				2.25 x 2.25 12 ga	9.7						1	4	2.5 x 2.5 12 ga	1			
16600+92 Lt		430		14.4	14.4				2.5 x 2.5 10 ga	15.3	4.8				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga			1	
16601+72 Rt		400																	1			Mount on Light Standard
16604+34 Lt		437			14.4				2.5 x 2.5 10 ga	15.2						1	4	3 x 3 7 ga	1		1	
16607+77 Lt		22		6.0																		Mount on Light Standard
16609+00 Lt		20		9.0	13.7				2.25 x 2.25 12 ga	14.1	5.0				2 x 2 12 ga	1	4	3 x 3 7 ga			1	
16610+04 Lt		1		5.2	12.6				2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
16610+59 Rt		1		5.2	12.6				2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
16616+99 Rt		1		5.2																		Mount on Light Standard
16618+77 Lt		19																	1			Mount on Light Standard
16623+07 Rt	SA-2B			5.2	8.8				2.25 x 2.25 12 ga	9.7						1	4	2.5 x 2.5 12 ga	1			
16623+24 Lt	SA-2B				8.8				2.5 x 2.5 12 ga	10.7						1	4	3 x 3 7 ga	1			
16628+77 Rt		19		6.3																		Mount on Light Standard
16636+14 Lt	SA-2B				7.7				2.25 x 2.25 12 ga	9.7						1	4	2.5 x 2.5 12 ga	1			
16637+09 Rt		1																	1			Mount on Light Standard
16645+57 Lt		19		6.3	12.0				2.5 x 2.5 12 ga	14.5						1	4	3 x 3 7 ga				
16660+77 Rt	SN-9		9.0																			Mount on Light Standard
16662+40 Lt	SN-3		8.3	5.2															1			Mount on Light Standard
16662+76 Rt		34			12.7				2.5 x 2.5 10 ga	13.6						1	4	3 x 3 7 ga	1		1	
16664+77 Rt	SN-11		4.5																			Mount on Light Standard
16666+77 Lt	SN-8		9.0																1			Mount on Light Standard
16666+92 Lt	SA-2B			5.2	7.4				2.25 x 2.25 12 ga	8.2						1	4	2.5 x 2.5 12 ga	1			

Basis of Estimate
Sign Support Lengths

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

Rural Roadway - 60"

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Sign Summary
Perforated Tube

ND 1804 Reconstrction

Between 20th Avenue and 131st Avenue

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	SOIB-7-804(054)312	110	2

Sta/RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	Sign Support Length 2nd LF	Sign Support Length 3rd LF	Sign Support Length 4th LF	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
16679+21 Rt		63		7.1	12.2				2.5 x 2.5 10 ga	15.3						1	4	3 x 3 7 ga			1	
16684+81 Lt		9		5.0	9.7				2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga				
16684+91 Rt		54																	1			Mount on Light Standard
16685+82 Rt		9		5.0	12.6				2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
16688+80 Lt		9		5.0	12.8				2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
16690+22 Rt	SN-1		7.5		11.4				2.5 x 2.5 10 ga	14.1						1	4	3 x 3 7 ga	1		1	
16690+31 Lt	SN-10		21.3		12.4	13.4			2.5 x 2.5 12 ga	15.1	3.3	4.3			2.25 x 2.25 12 ga	2	4	3 x 3 7 ga			2	
16691+13 Rt		63		7.1	12.4				2.5 x 2.5 10 ga	15.3						1	4	3 x 3 7 ga			1	
16695+56 Lt		63		7.1	12.4				2.5 x 2.5 10 ga	15.3						1	4	3 x 3 7 ga			1	
16699+03 Lt		9		5.0	9.7				2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga				
16700+59 Rt		9		5.0																		Mount on Light Standard
16702+09 Lt		9		5.0	9.7				2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga				
16703+81 Lt		9			9.7				2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga	1			
16704+04 Rt		9																	1			Mount on Light Standard
16705+37 Rt	SN-6		8.0	5.2	4.2				2 x 2 12 ga	5.0						1	4	2.25 x 2.25 12 ga				
16705+81 Lt		9		5.0	9.7				2 x 2 12 ga	11.5						1	4	2.25 x 2.25 12 ga				
16707+49 Rt		20																	1			Mount on Light Standard
16712+09 Rt			15.6																			
16715+76 Lt		17		16.0																		Mount on Mast Arm
16715+77 Lt	SN-5		17.0																			Mount on Mast Arm
16716+12 Rt	SN-4		19.0																			Mount on Mast Arm
16716+22 Lt		22		6.0	12.7				2.25 x 2.25 12 ga	12.9						1	4	2.5 x 2.5 12 ga				
16716+79 Lt		17		16.0																		Mount on Mast Arm
16716+80 Lt	SN-4		17.0																			Mount on Mast Arm
16716+83 Rt		405	12.4		11.1				2.5 x 2.5 12 ga	13.5	2.7				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1	
16716+91 Rt		379	8.2		12.6				2.5 x 2.5 12 ga	12.9						1	4	3 x 3 7 ga				
16716+94 Lt		17		16.0																		Mount on Mast Arm
16716+95 Rt	SN-5		17.0																			Mount on Mast Arm
16717+42 Rt		9		5.0	12.5				2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
16718+38 Rt		9		5.0																		Mount on Light Standard
16719+53 Rt		9		5.0																		Mount on Light Standard
16720+81 Lt		431	14.4		11.0				2.5 x 2.5 12 ga	13.0	2.7				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1	
Sub Total			188.2	252.8		**Total**	495.8									**Total**	172		25	0	15	
Grand Total			188.2	252.8		**Total**	495.8									**Total**	172		25	0	15	

Basis of Estimate
Sign Support Lengths

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

Rural Roadway - 60"

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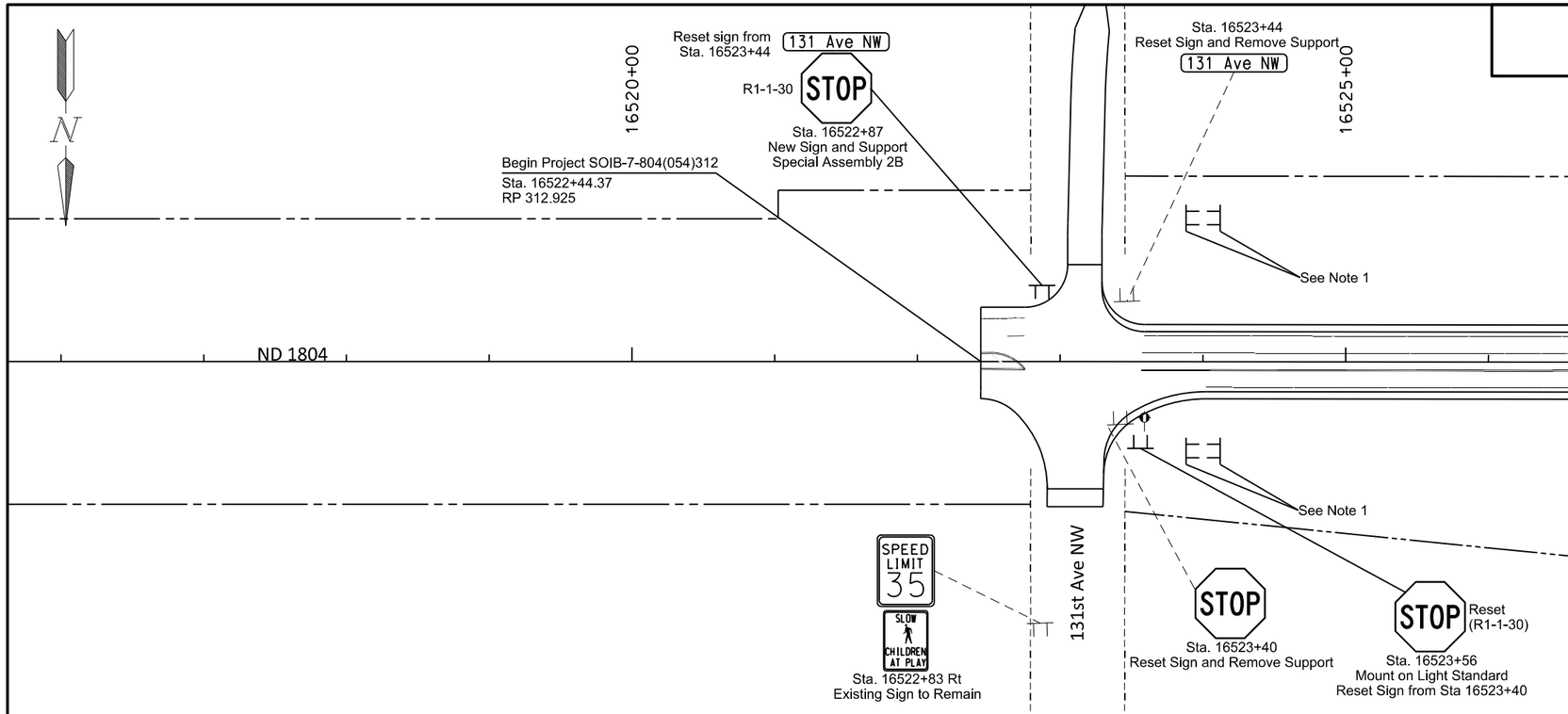
Sign Summary
Perforated Tube

ND 1804 Reconstrction

Between 20th Avenue and 131st Avenue

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	3



Spec	Code	Bid Item	Unit	Quantity
754	805	OBJECT MARKERS - CULVERTS	EA	4

Notes:

1. Culvert Object Markers, Refer to Std Drawing D754-83

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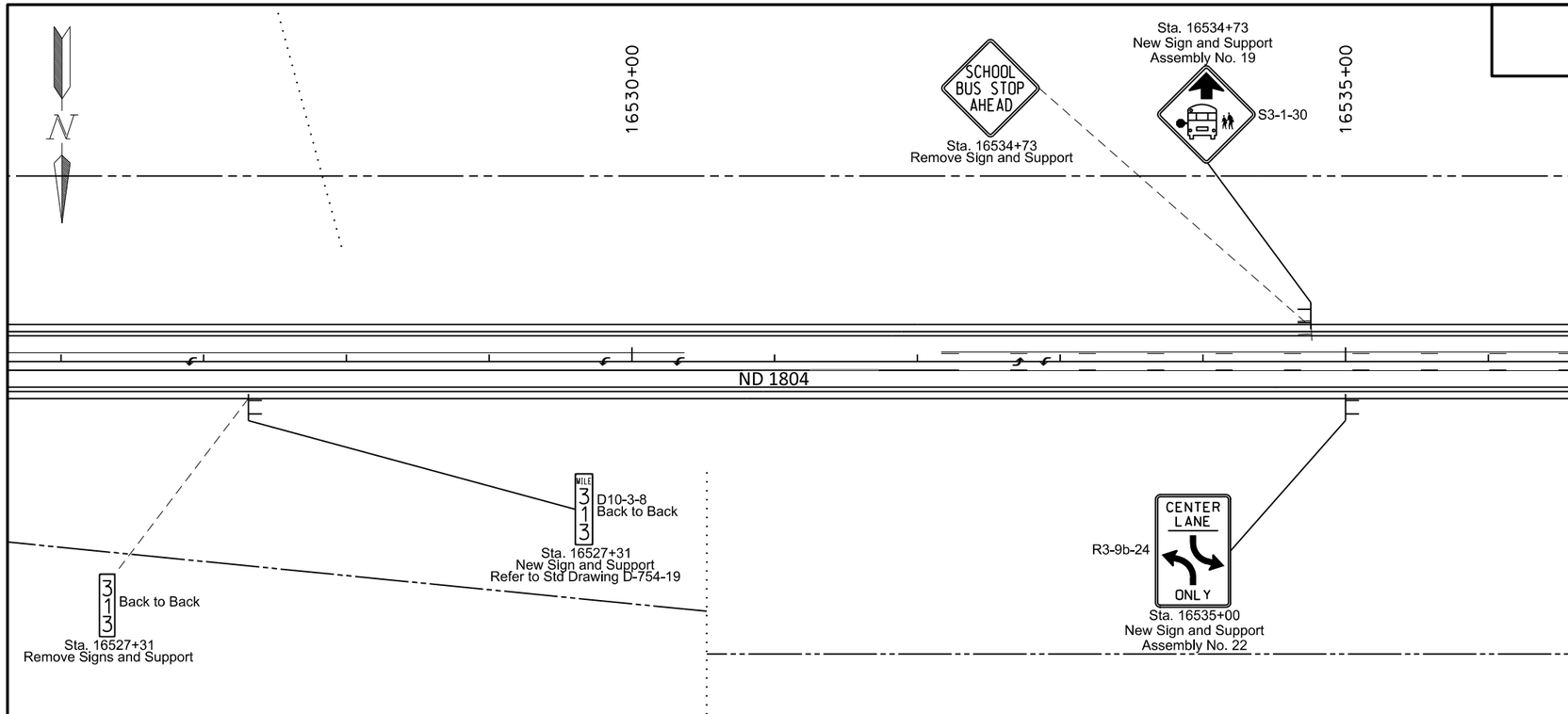
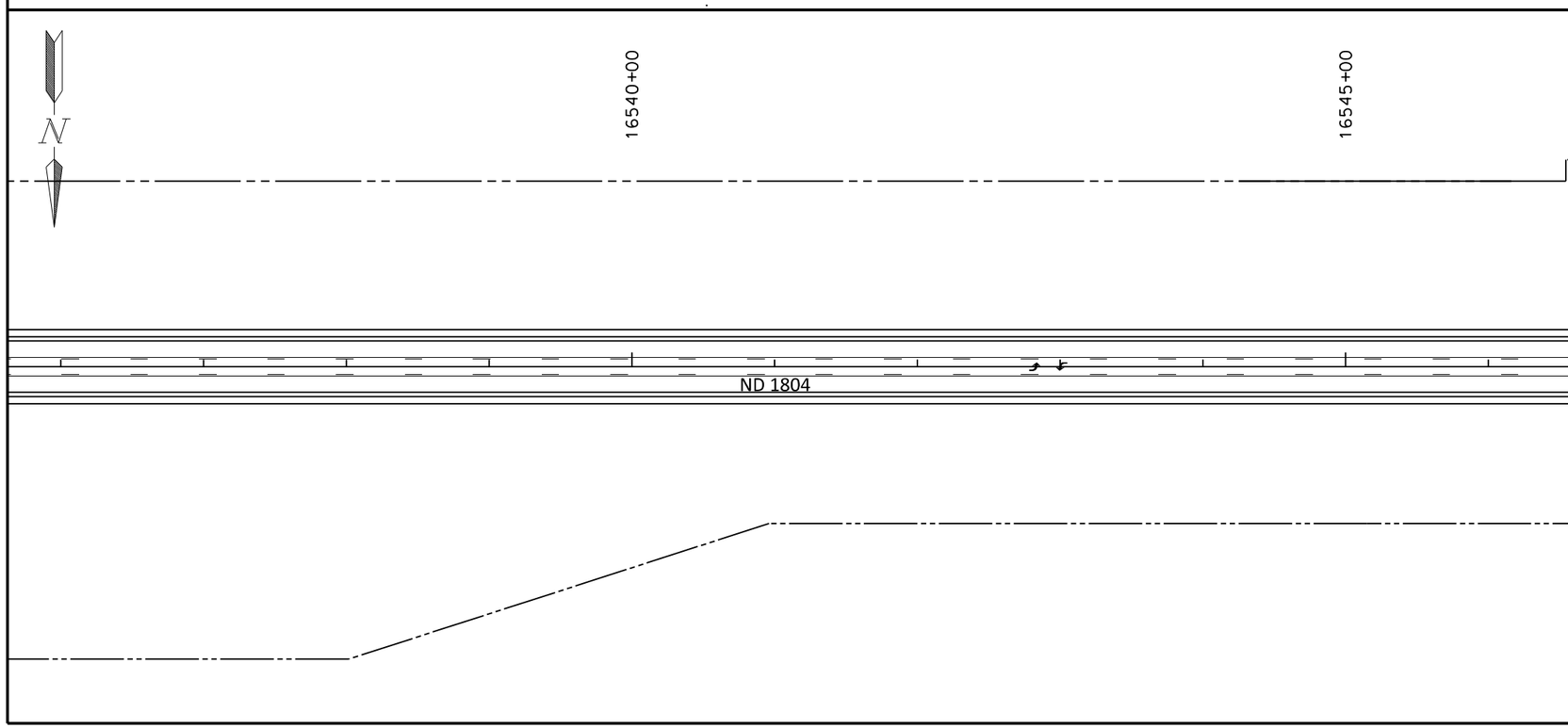
Signing

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	4





Spec	Code	Bid Item	Unit	Quantity
754	563	REFERENCE MARKER-TYPE C	EA	1

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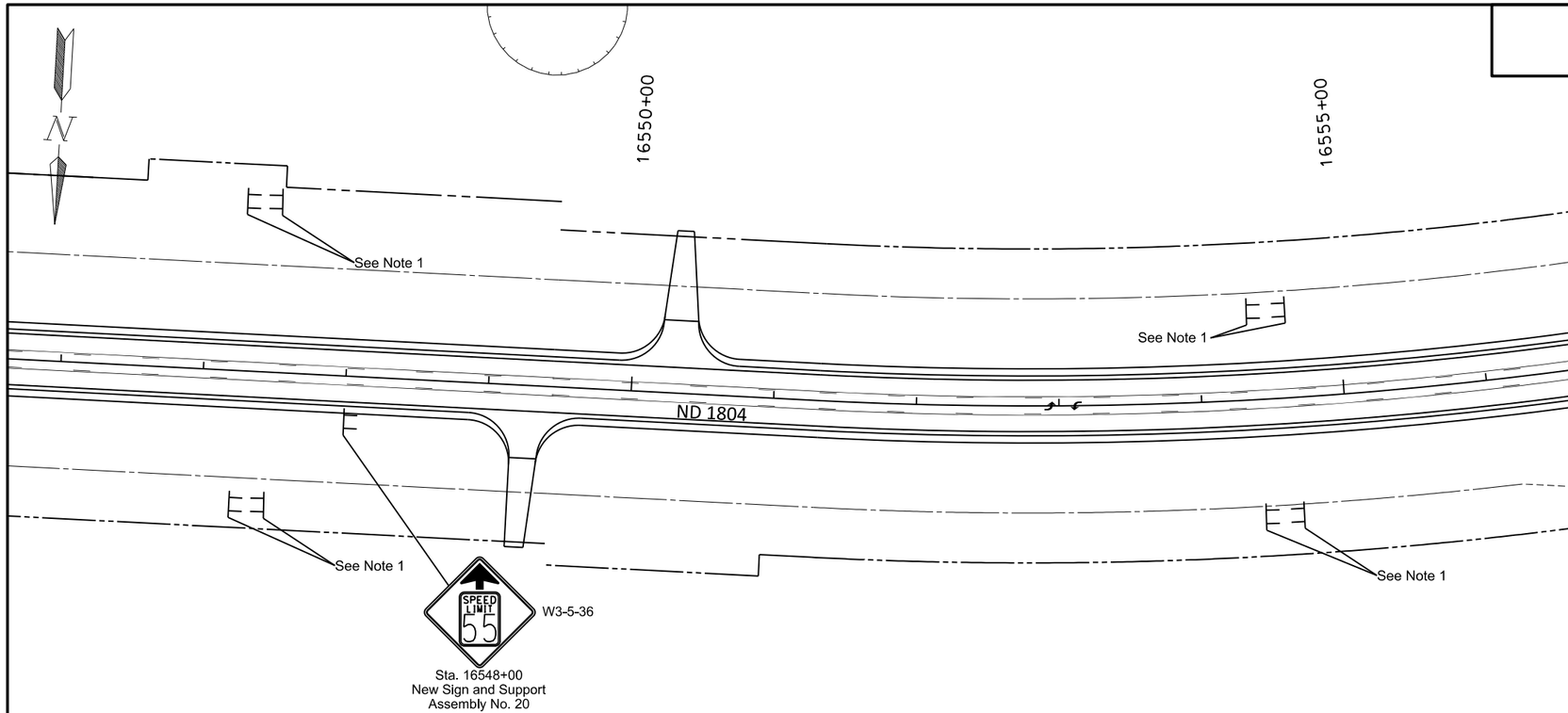
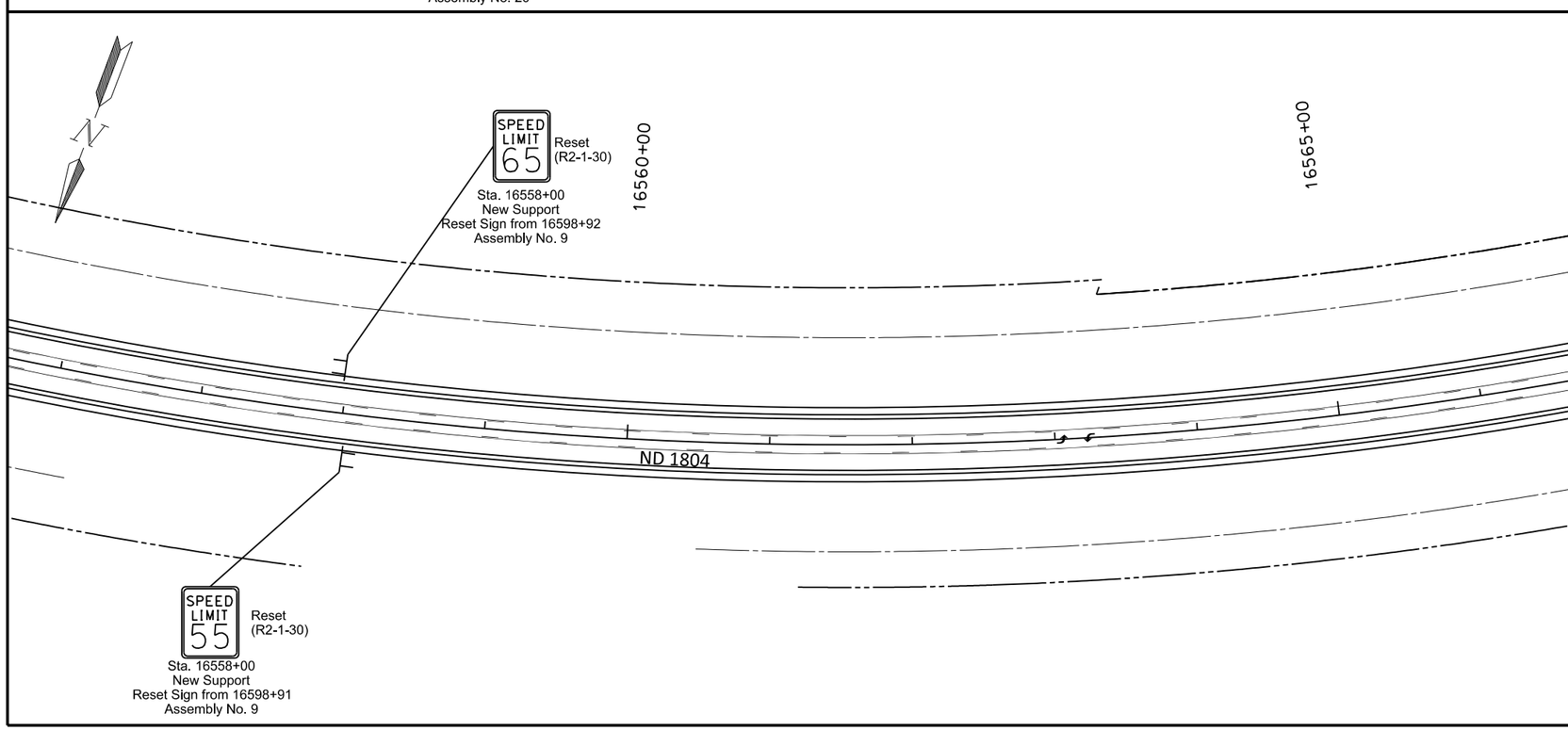
Signing

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	5





Spec	Code	Bid Item	Unit	Quantity
754	805	OBJECT MARKERS - CULVERTS	EA	8

Notes:
1. Culvert Object Markers, Refer to Std Drawing D754-83

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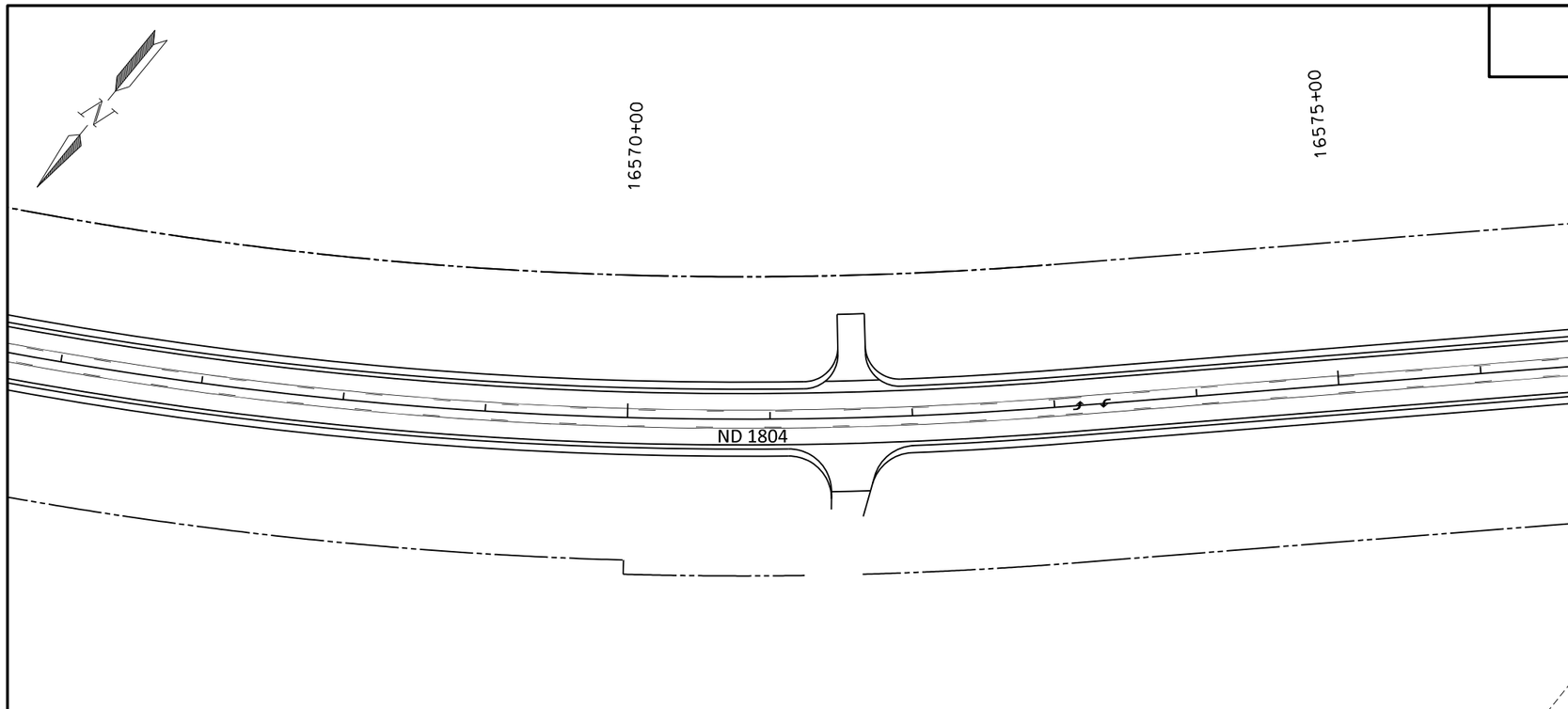
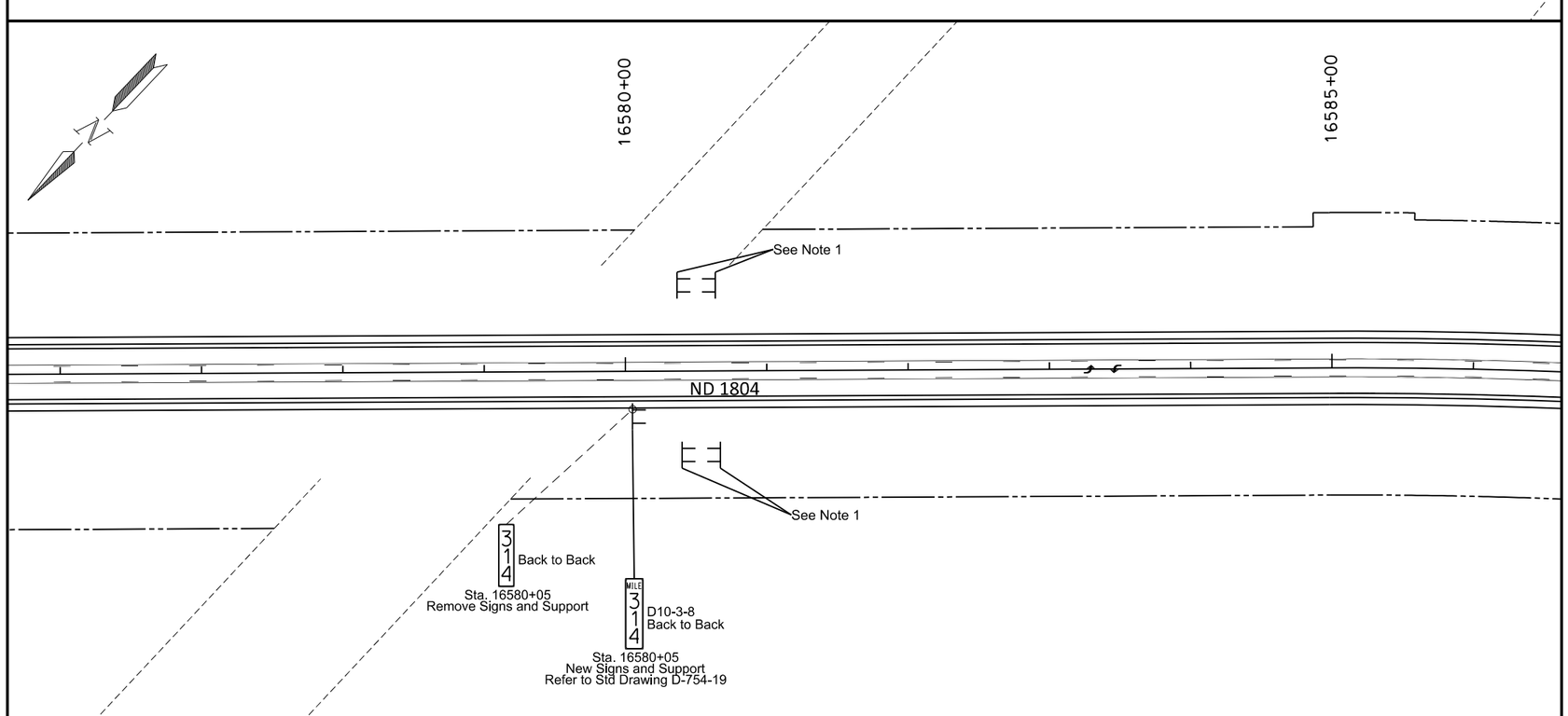
Signing

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	6





Spec	Code	Bid Item	Unit	Quantity
754	563	REFERENCE MARKER-TYPE C	EA	1
754	805	OBJECT MARKERS - CULVERTS	EA	4

Notes:
1. Culvert Object Markers, Refer to Std Drawing D754-83

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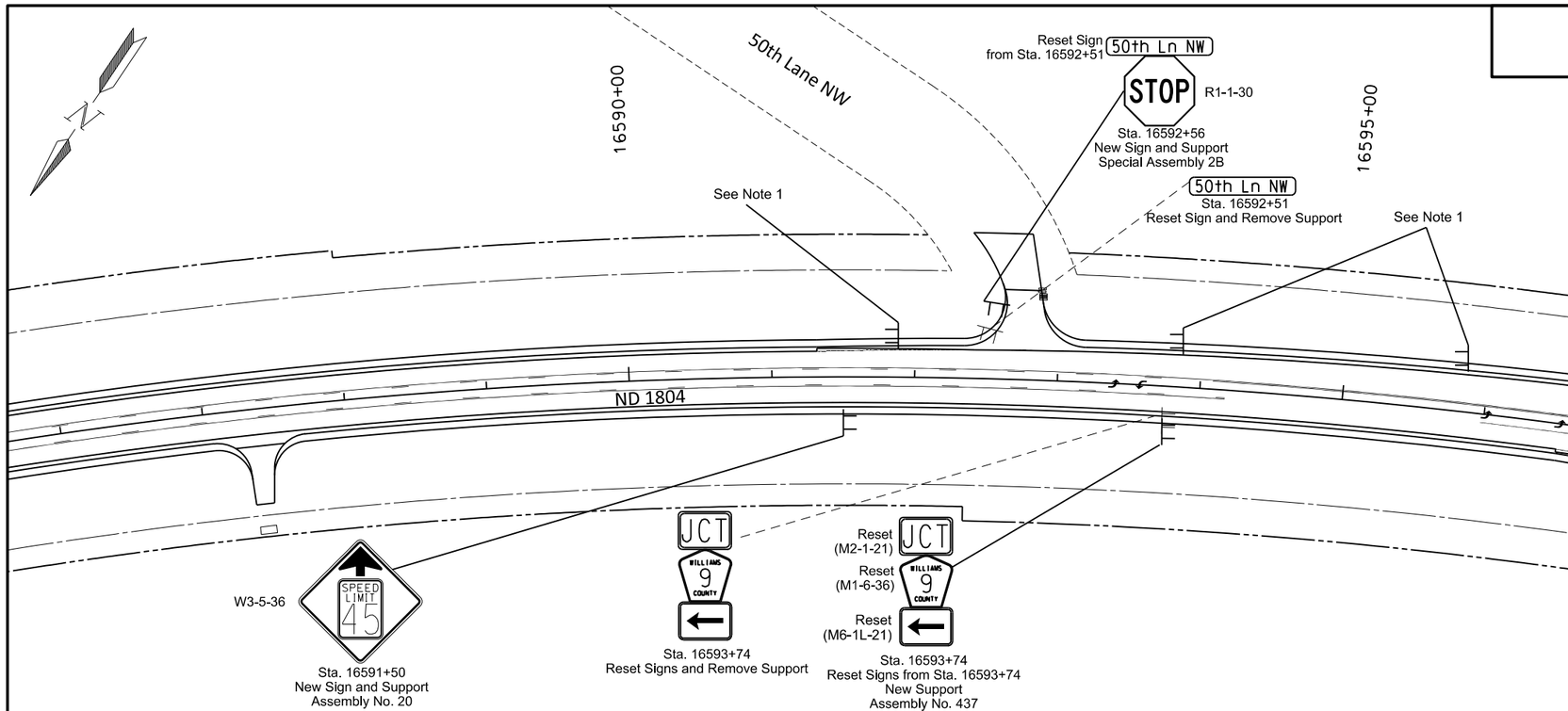
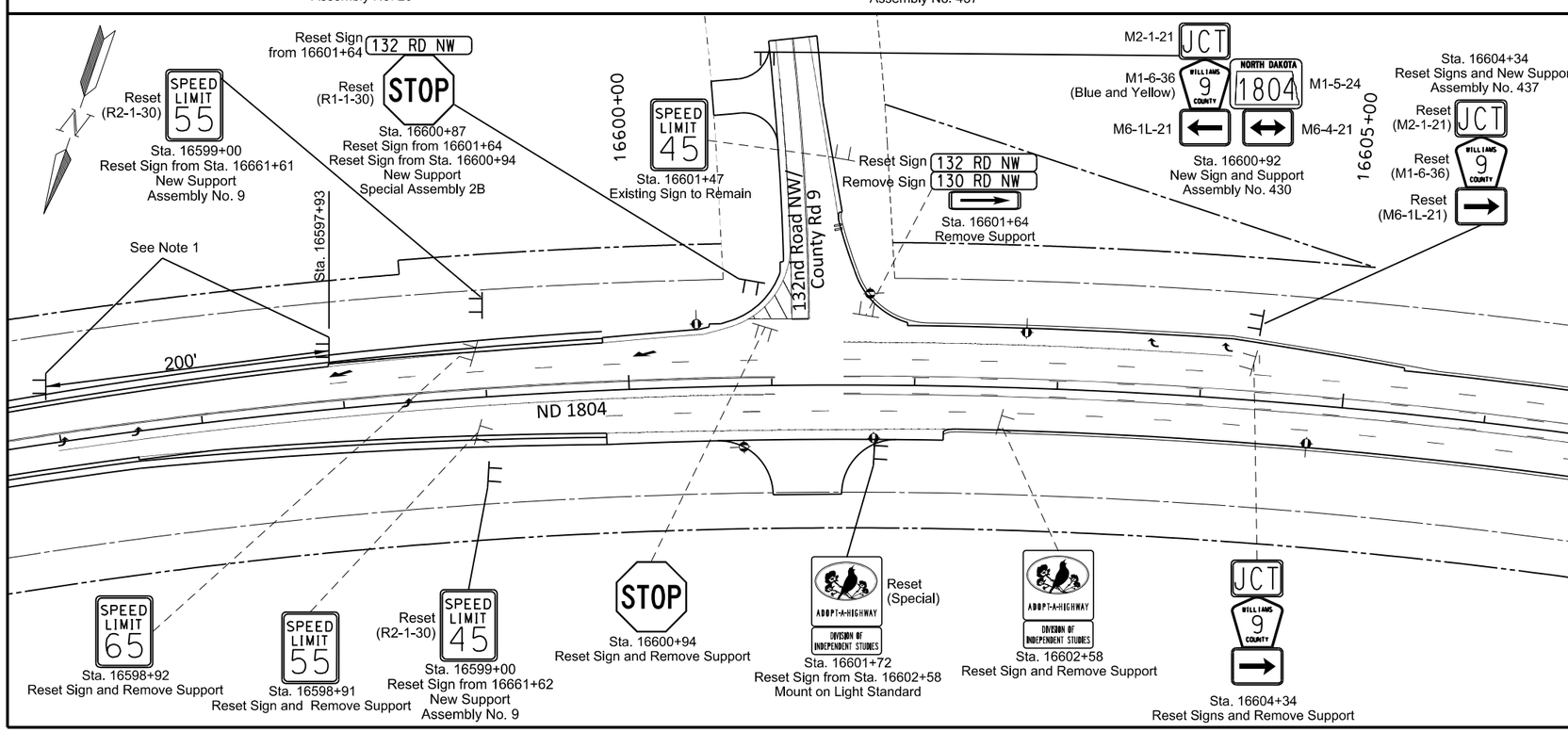
Signing

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	7





Spec	Code	Bid Item	Unit	Quantity
754	150	DELINEATORS-TYPE A	EA	4

Notes:

1. Type A White Delineators, Refer to Std Drawing D754-21

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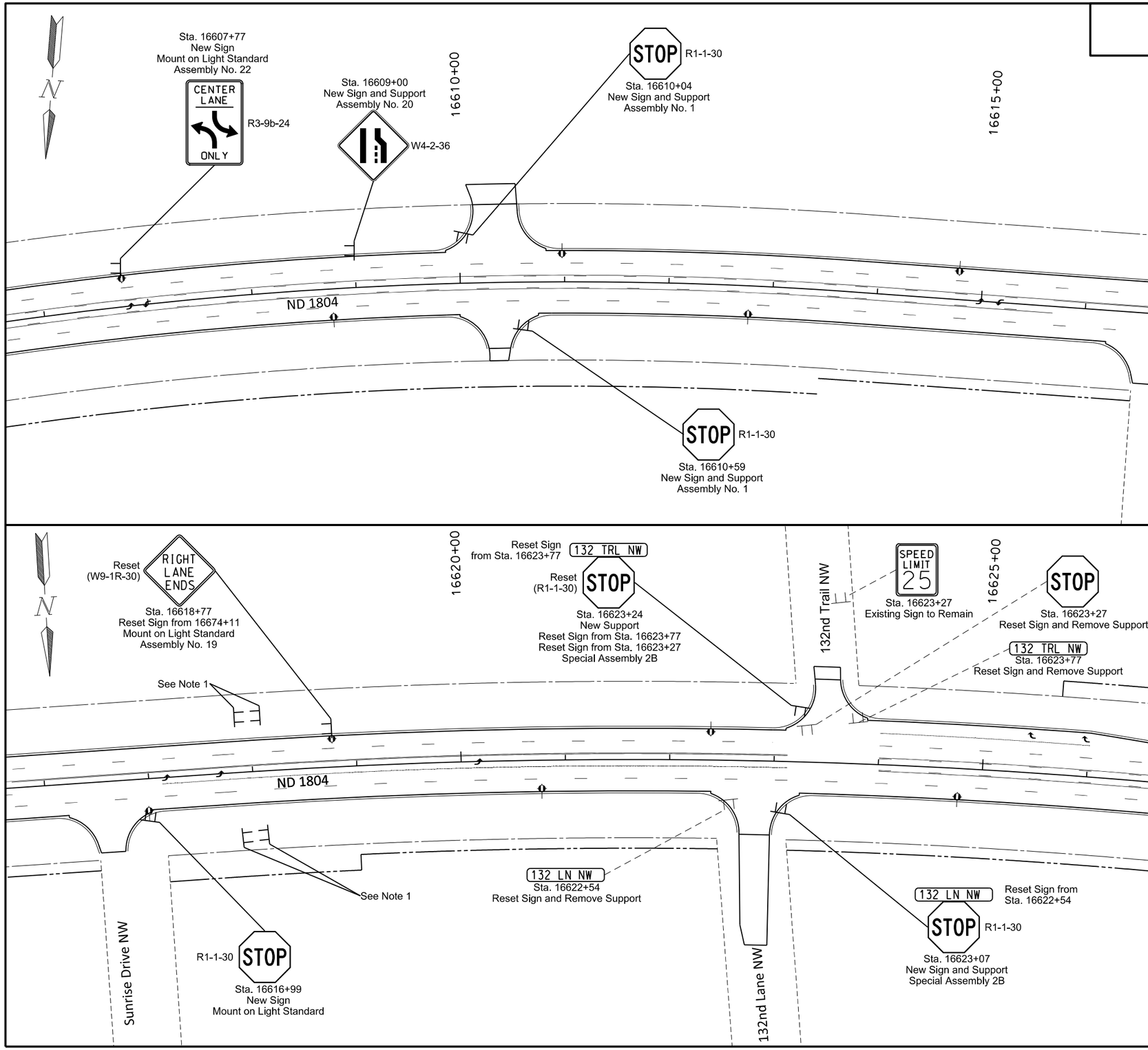
Signing

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	8



Spec	Code	Bid Item	Unit	Quantity
754	805	OBJECT MARKERS - CULVERTS	EA	4

Notes:

1. Culvert Object Markers, Refer to Std Drawing D754-83

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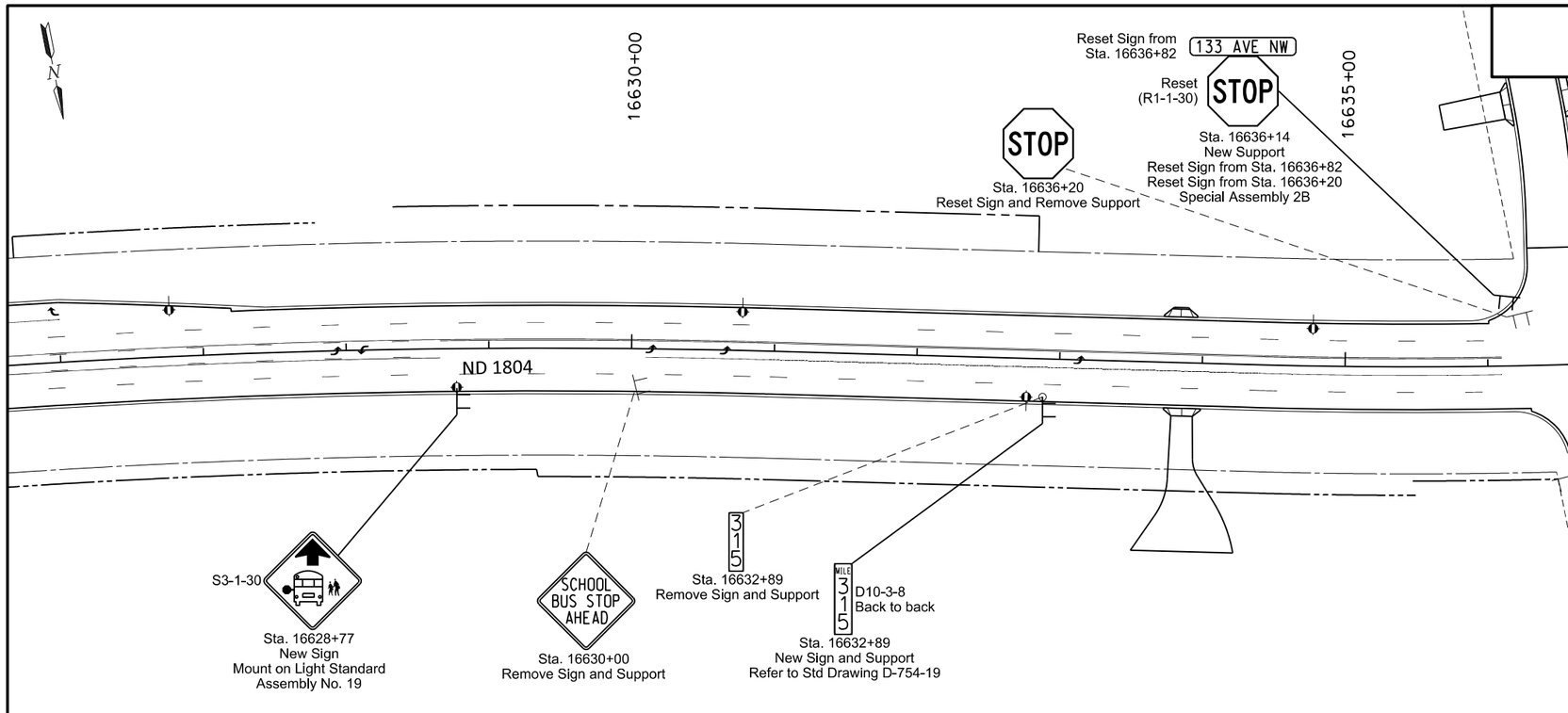
Signing

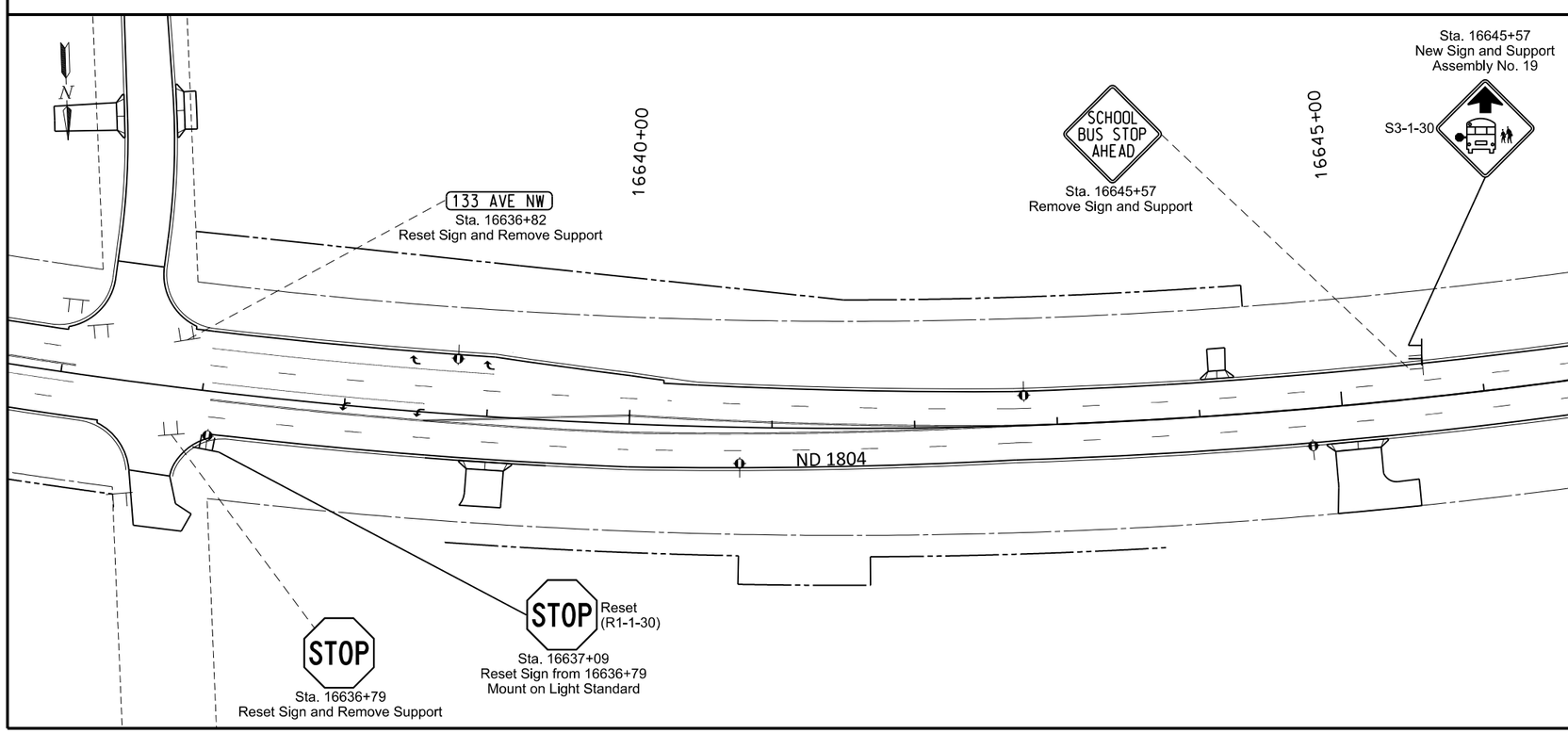
1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	9

Spec	Code	Bid Item	Unit	Quantity
754	563	REFERENCE MARKER-TYPE C	EA	1





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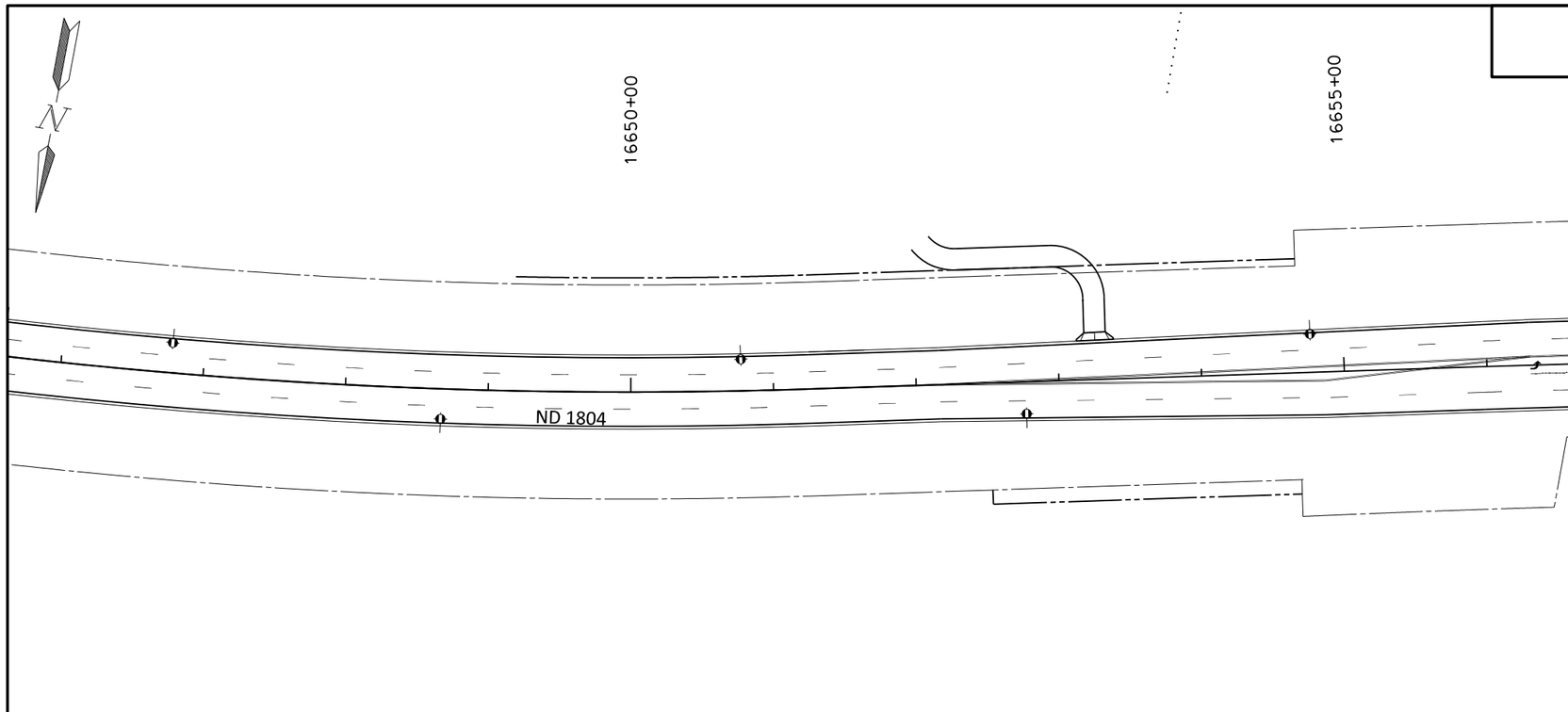
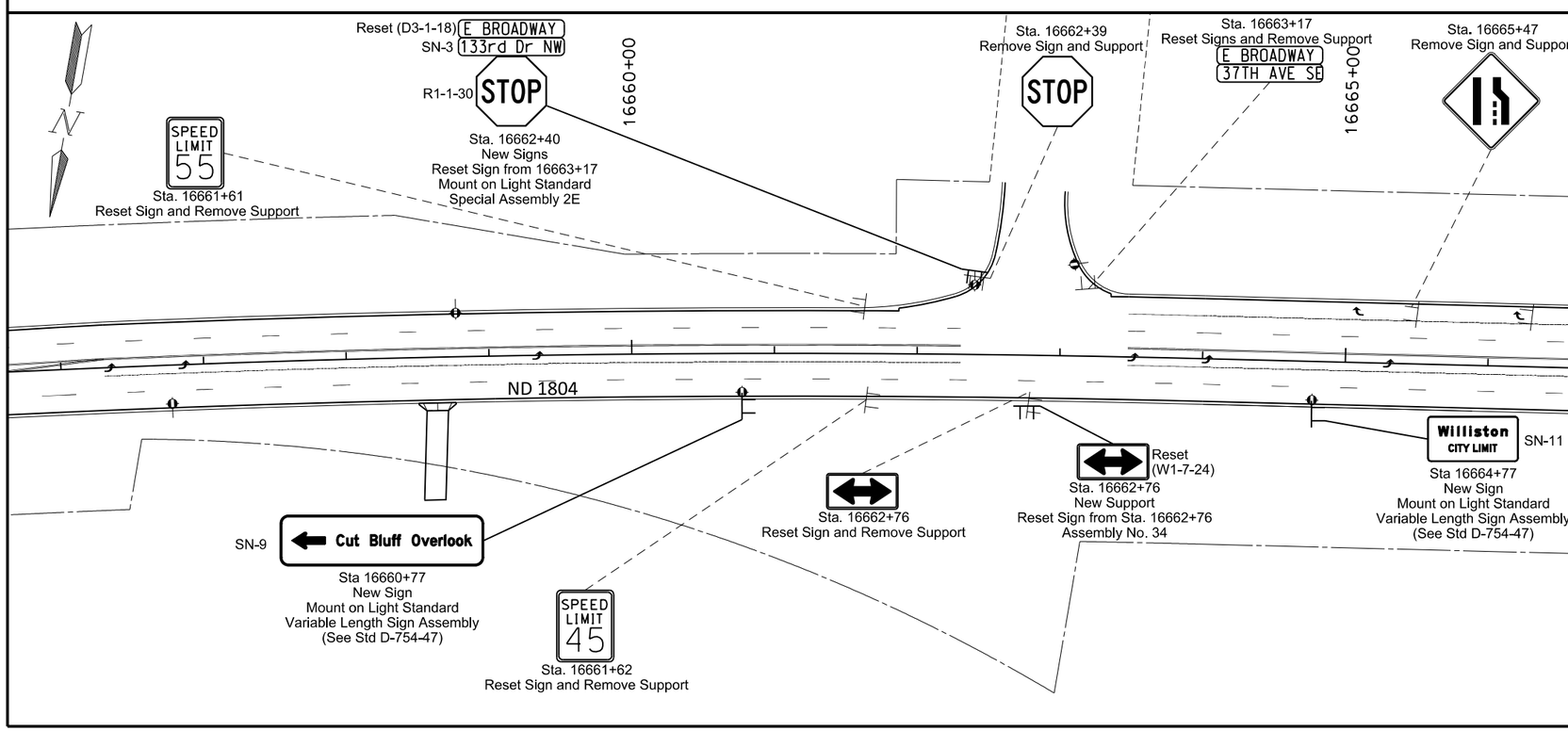
1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	10





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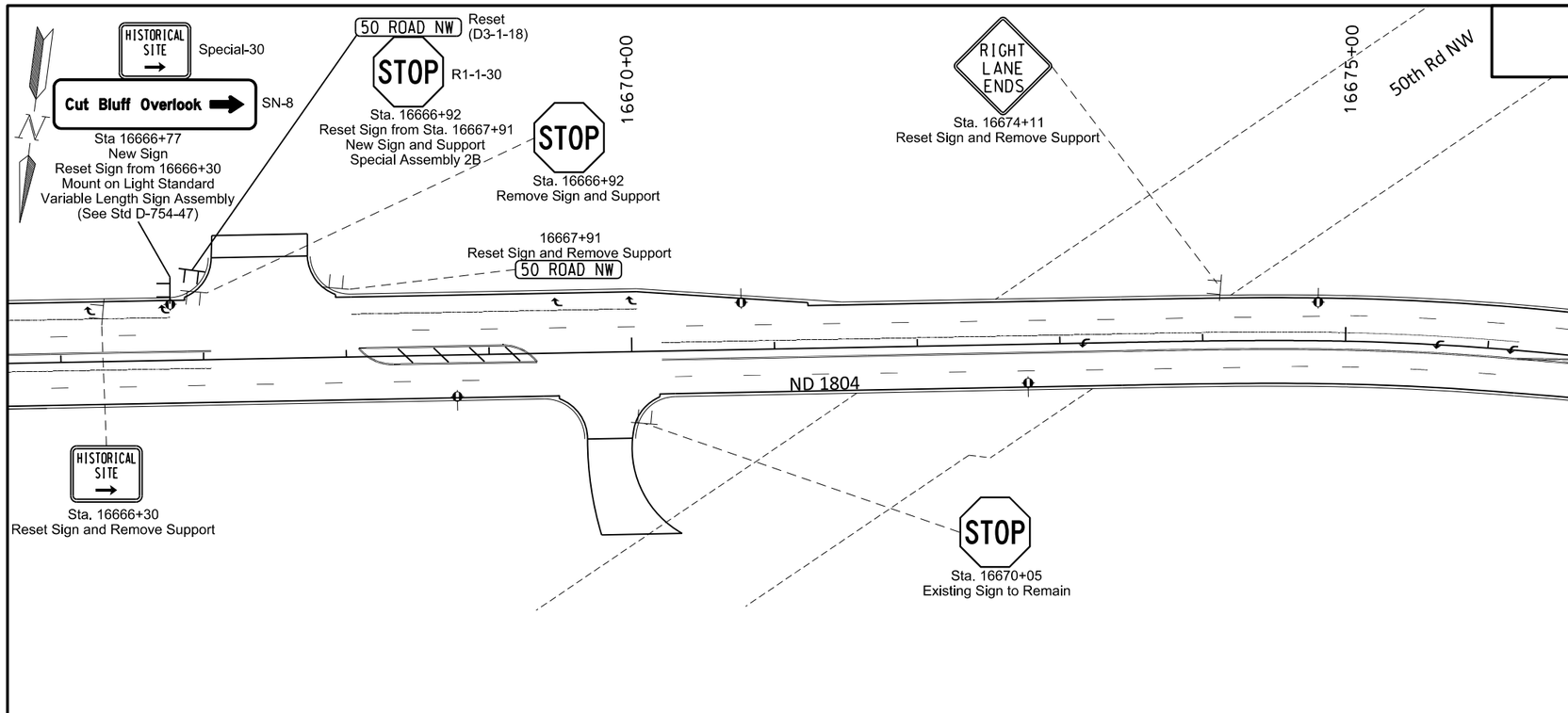
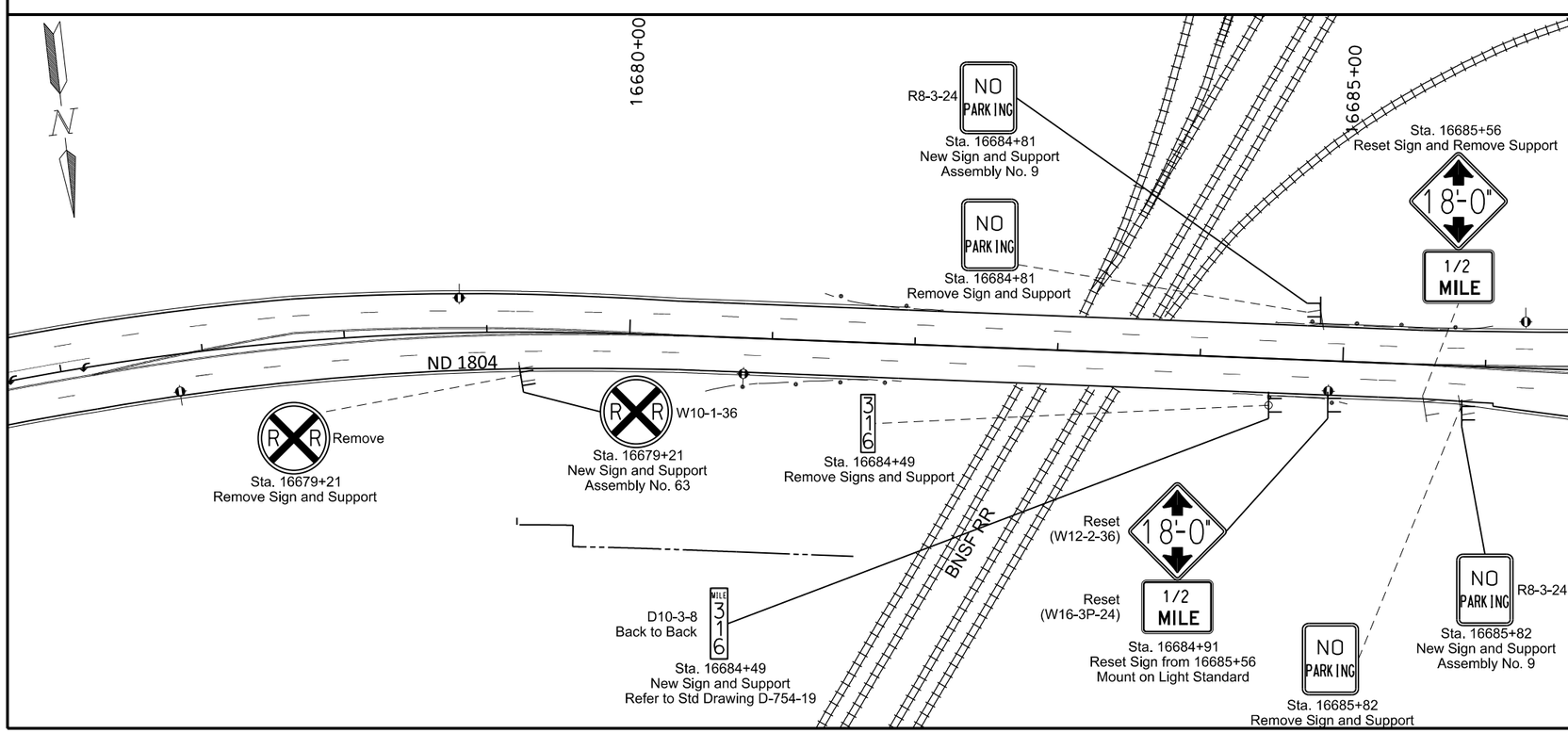
Signing

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	11





Spec	Code	Bid Item	Unit	Quantity
754	563	REFERENCE MARKER-TYPE C	EA	1

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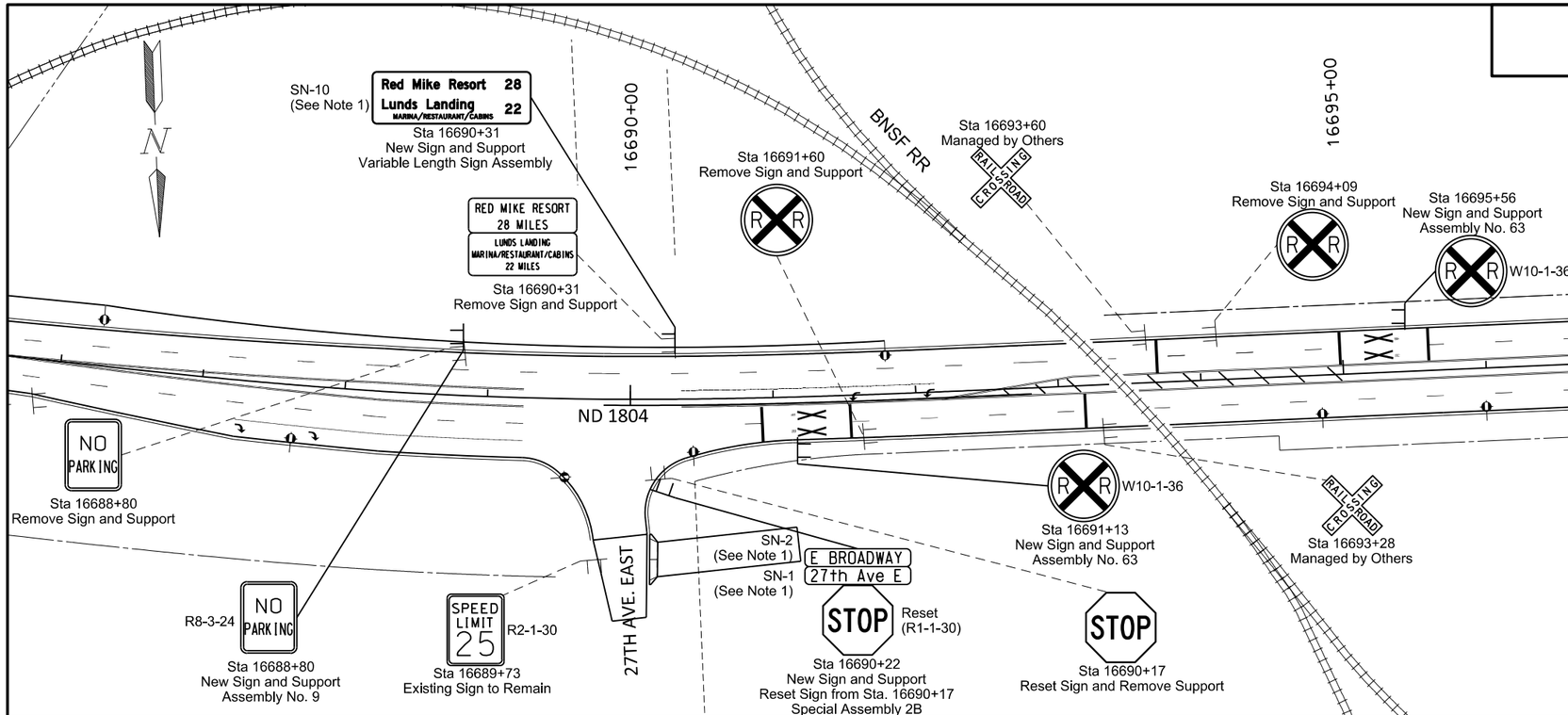
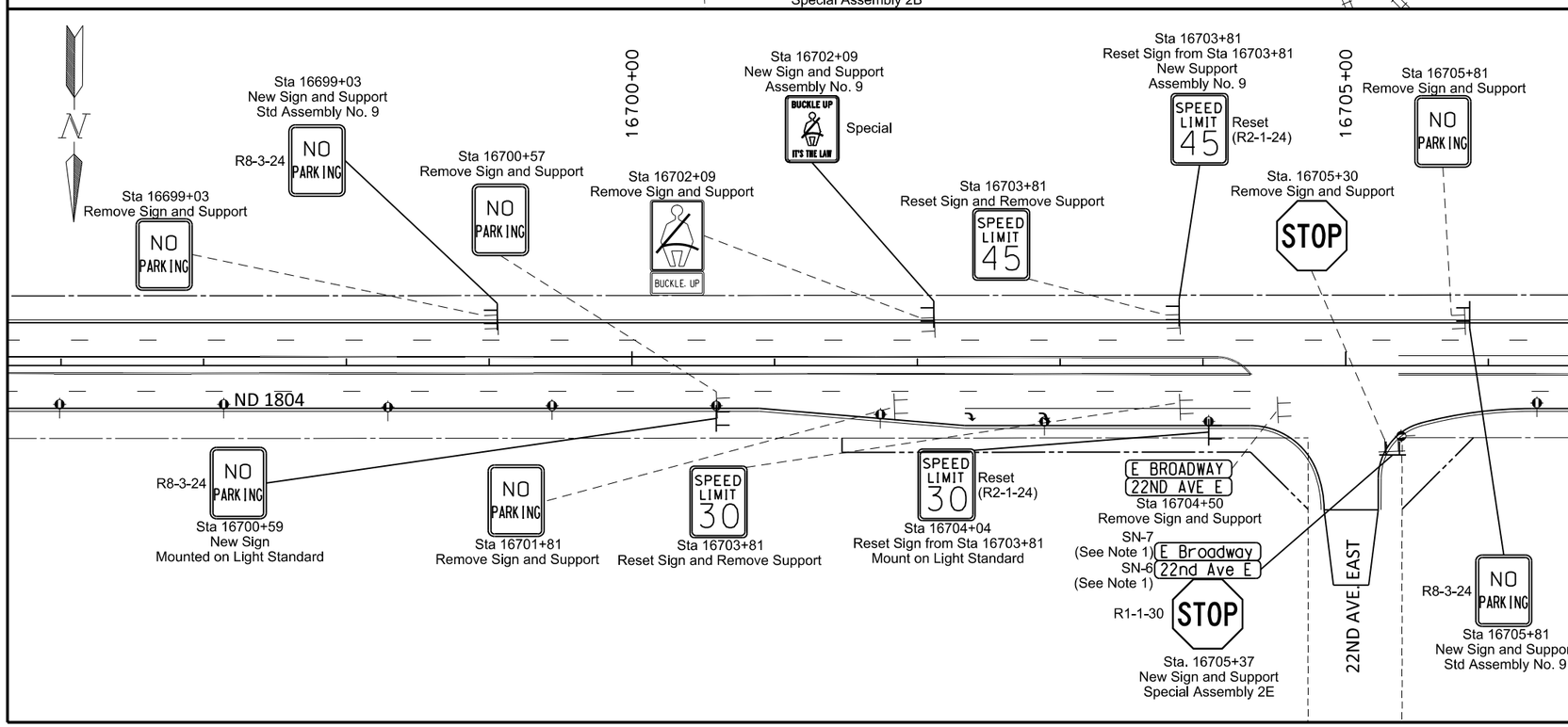
Signing

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	12





Notes

1. Refer to NDDOT standard D-754-47 for variable length sign assembly.

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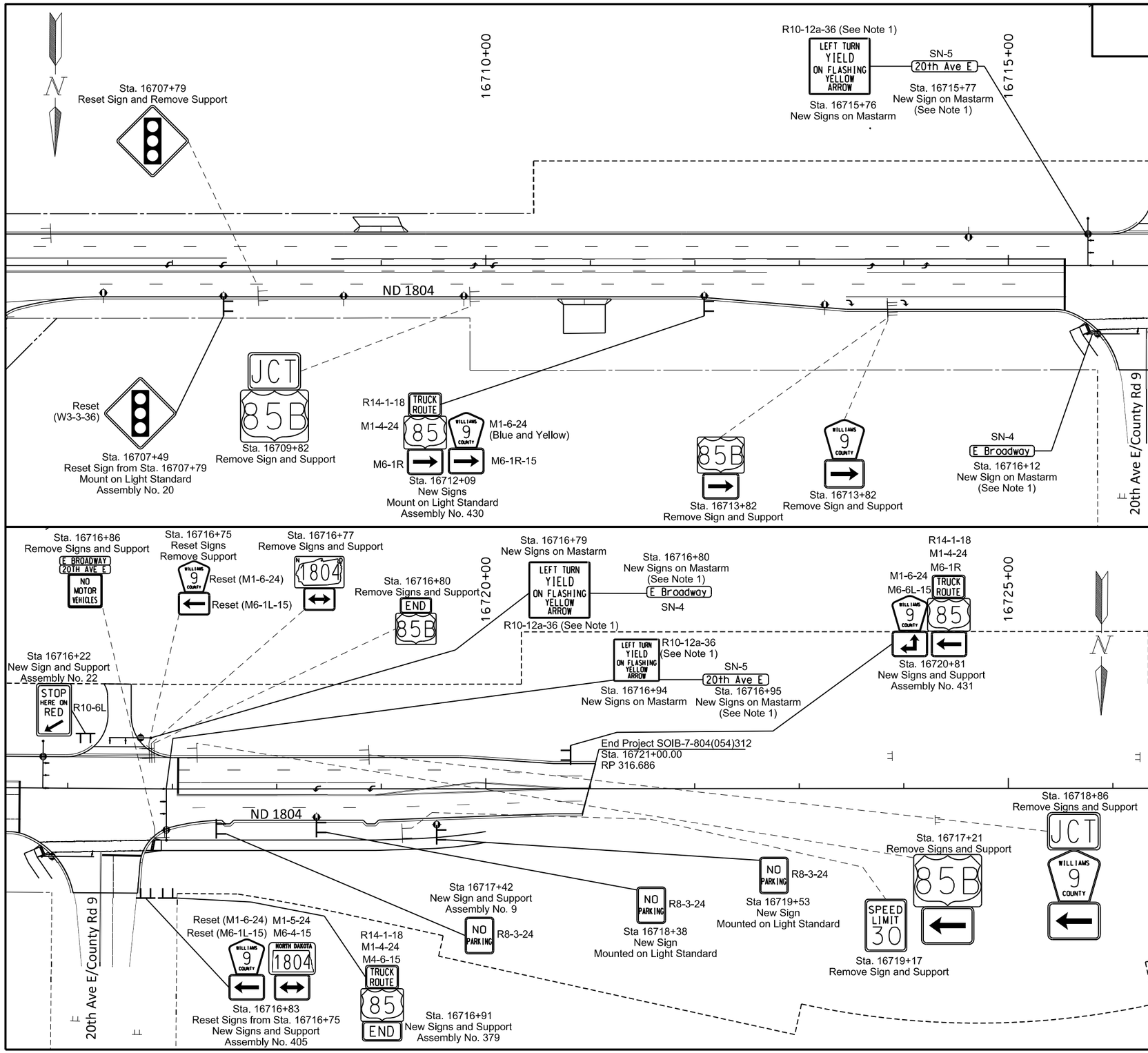
Signing

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	13



NOTES

1. Refer to NDDOT standard D-754-47 for variable length sign assembly.

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Signing

1804 Reconstruction

Williams County, ND

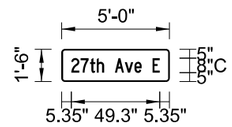
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	14

SIGN NUMBER	SN-1
WIDTH x HEIGHT	5'-0" x 1'-6"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	1.88"
MOUNTING	Ground
BACKGROUND	**TYPE:** IV Reflective
	COLOR: Green
LEGEND/BORDER	**TYPE:** IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
16690+22

AREA: 7.5 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Street_Name_Expwy_Border.ssl

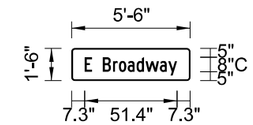
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
2	7	t	h		A	v	e		E										49.3	8/6	C 2000
5.4	10.6	15.8	19.5	23.6	29.6	35.1	40.5	44.6	50.6												

SIGN NUMBER	SN-2
WIDTH x HEIGHT	5'-6" x 1'-6"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	1.88"
MOUNTING	Ground
BACKGROUND	**TYPE:** IV Reflective
	COLOR: Green
LEGEND/BORDER	**TYPE:** IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
16690+22

AREA: 8.3 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Street_Name_Expwy_Border.ssl

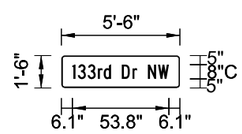
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
E		B	r	o	a	d	w	a	y										51.4	8/6	C 2000
7.3	11.4	17.4	23	26.3	31.2	36.2	41.1	49.1	53.8												

SIGN NUMBER	SN-3
WIDTH x HEIGHT	5'-6" x 1'-6"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	1.88"
MOUNTING	Ground
BACKGROUND	**TYPE:** IV Reflective
	COLOR: Green
LEGEND/BORDER	**TYPE:** IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
16662+40

AREA: 8.3 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Street_Name_Expwy_Border.ssl

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
1	3	3	r	d		D	r		N	W									53.8	8/6	C 2000
6.1	9.2	14.6	20.3	23.6	27.6	33.6	39.6	42.2	48.2	53.8											

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Sign Details

ND 1804 Reconstruction

Williams County, ND

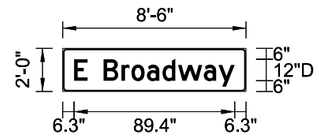
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	15

SIGN NUMBER	SN-4
WIDTH x HEIGHT	8'-6" x 2'-0"
BORDER WIDTH	1" (inset 0")
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	**TYPE:** IV Reflective
	COLOR: Green
LEGEND/BORDER	**TYPE:** IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
16716+12
16716+80

AREA: 17.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Street_Name_Overhead_Border.ssl

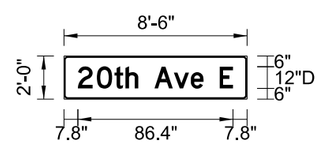
LETTER POSITION (X)										LENGTH	SIZE	SERIES
E		B	r	o	a	d	w	a	y	89.4	12/9	D 2000
6.3	13.7	22.7	32.7	38.2	46.9	55.5	64.1	78.5	86.7			

SIGN NUMBER	SN-5
WIDTH x HEIGHT	8'-6" x 2'-0"
BORDER WIDTH	1" (inset 0")
CORNER RADIUS	2.25"
MOUNTING	Overhead
BACKGROUND	**TYPE:** IV Reflective
	COLOR: Green
LEGEND/BORDER	**TYPE:** IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
16715+77
16716+95

AREA: 17.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Street_Name_Overhead_Border.ssl

LETTER POSITION (X)										LENGTH	SIZE	SERIES
2	0	t	h		A	v	e		E	86.4	12/9	D 2000
7.8	18.4	28.2	34.3	41.4	50.4	61.2	70.7	77.8	86.8			

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Sign Details

ND 1804 Reconstruction

Williams County, ND

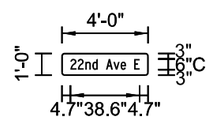
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	16

SIGN NUMBER	SN-6
WIDTH x HEIGHT	4'-0" x 1'-0"
BORDER WIDTH	0.5" (inset 0")
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	**TYPE:** IV Reflective
	COLOR: Green
LEGEND/BORDER	**TYPE:** IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
16705+37

AREA: 4.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Street_Name_Conv_Border.ssl

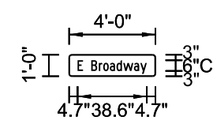
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
2	2	n	d		A	v	e		E										38.6	6/4.5	C 2000
4.7	8.8	13.1	17	20	24.5	28.7	32.7	35.7	40.2												

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

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
16705+37

AREA: 4.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Street_Name_Conv_Border.ssl

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
E		B	r	o	a	d	w	a	y										38.6	6/4.5	C 2000
4.7	7.8	12.3	16.5	19	22.6	26.4	30.1	36.1	39.6												

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Sign Details

ND 1804 Reconstruction

Williams County, ND

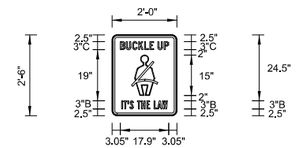
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	17

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

SYMBOL	X	Y	WID	HT	ANGLE
Seat Belt	7.2	7.5	9.7	15	0

STATION(S):
1) Along Exit Ramps at Rest Areas
2) Other locations (B)

AREA: 5.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Misc_Regulatory.ssi

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
B	U	C	K	L	E	U	P												17.9	3	C 2000
3	5.2	7.5	9.8	12	13.9	17	19.3														
I	T	'	S	T	H	E	L	A	W										17.1	3	B 2000
3.4	4.3	5.7	6.6	9.4	10.9	12.9	15.5	16.8	18.6												

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Sign Details

ND 1804 Reconstruction

Williams County, ND

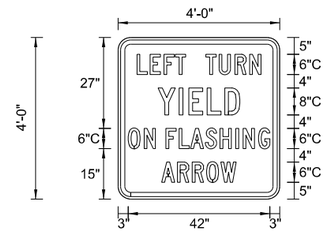
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	18

SIGN NUMBER	R10-12a-36
WIDTH x HEIGHT	4'-0" x 4'-0"
BORDER WIDTH	1.25" (inset 0.75")
CORNER RADIUS	3"
MOUNTING	Mast Arm Mounted
BACKGROUND	**TYPE:** XI Reflective
	COLOR: White
LEGEND/BORDER	**TYPE:** Non-reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
16715+76
16716+79
16716+94

AREA: 16.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Misc_Regulatory.ssl

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

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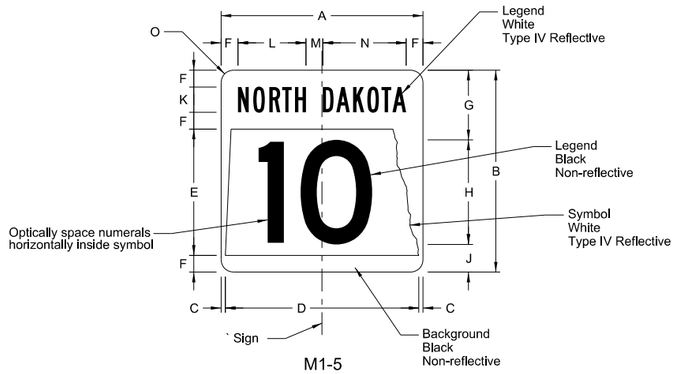
Sign Details

ND 1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	19

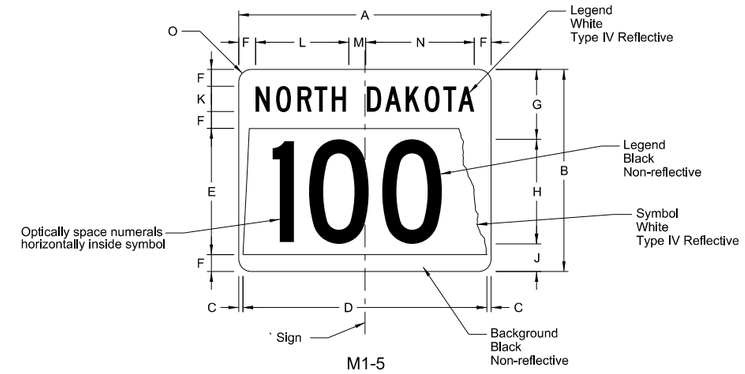


M1-5

STATE ROUTE MARKER

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

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

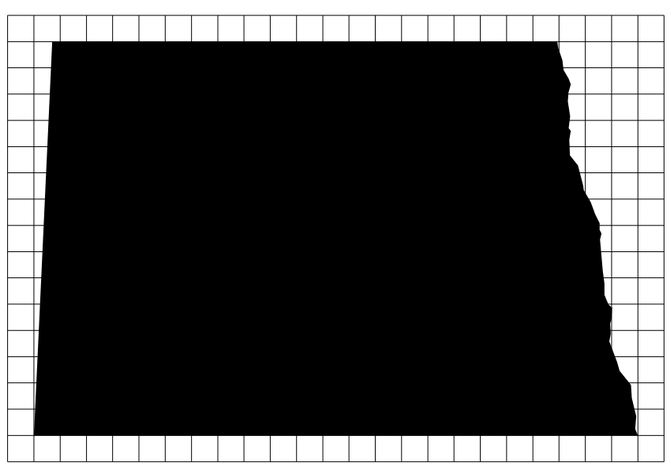


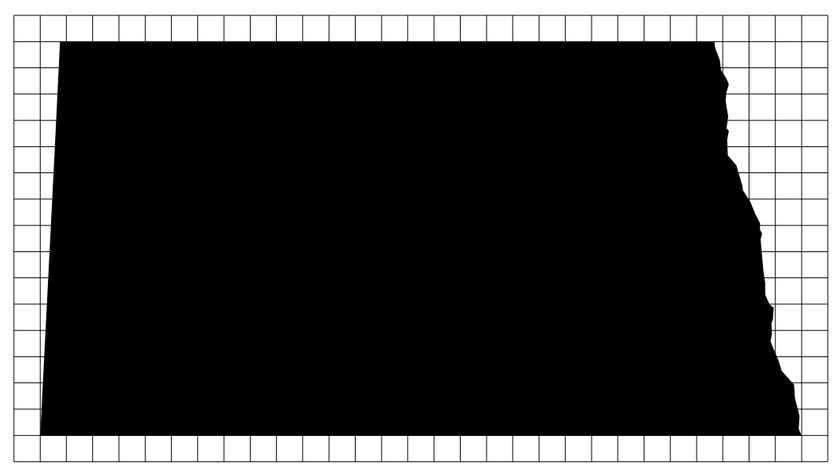
M1-5

STATE ROUTE MARKER

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

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





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

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Sign Details

ND 1804 Reconstruction

Williams County, ND

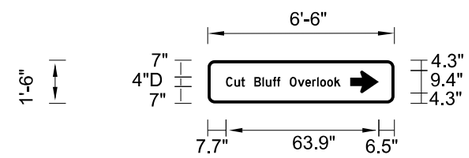
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	110	20

SIGN NUMBER	SN-8
WIDTH x HEIGHT	6'-6" x 1'-6"
BORDER WIDTH	1.25" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Brown
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ARDD	59.6	4.3	9.4	12	0

STATION(S): 16666+77

AREA: 9.8 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Expwy_Recreation.ssl

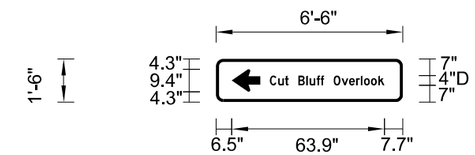
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
C	u	t		B	l	u	f	f		O	v	e	r	l	o	o	k		47.9	4/3	D 2000
7.7	11.2	14	15.6	19.6	22.9	24.3	27.2	28.9	30.3	34.3	37.6	40.8	43.7	45.7	47	49.9	53				

SIGN NUMBER	SN-9
WIDTH x HEIGHT	6'-6" x 1'-6"
BORDER WIDTH	1.25" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Brown
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ARDD	6.5	4.3	9.4	12	180

STATION(S): 16660+77

AREA: 9.8 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Expwy_Recreation.ssl

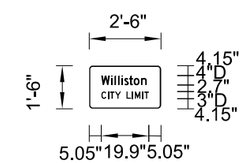
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
C	u	t		B	l	u	f	f		O	v	e	r	l	o	o	k		47.9	4/3	D 2000
22.4	25.9	28.7	30.3	34.3	37.6	39	42	43.6	45.1	49.1	52.4	55.6	58.5	60.5	61.8	64.7	67.8				

SIGN NUMBER	SN-11
WIDTH x HEIGHT	2'-6" x 1'-6"
BORDER WIDTH	0.5" (inset 0")
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S): 16664+77

AREA: 3.8 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Street_Name_Conv_Border.ssl

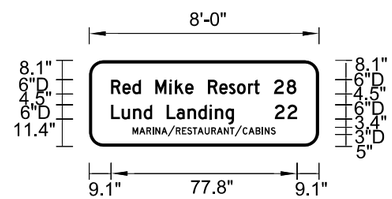
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
W	i	l	l	i	s	t	o	n											19	4/3	D 2000
5.1	9.2	10.6	12	13.5	14.7	16.7	18.6	21.7													
C	I	T	Y		L	I	M	I	T										19.9	3	D 2000
5.1	7.8	8.7	10.7	13.3	15.6	17.9	19.1	22.1	23.1												

SIGN NUMBER	SN-10
WIDTH x HEIGHT	8'-0" x 3'-0"
BORDER WIDTH	1.25" (inset 0")
CORNER RADIUS	6"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S): 16690+31

AREA: 24.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Destination.ssl

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
R	e	d		M	i	k	e		R	e	s	o	r	t	2	8			77.5	6/4.5	D 2000
9.1	13.8	18	21.6	27.6	33.6	35.7	40.1	43.6	49.6	54.3	58.4	61.7	66.3	68.8	77.2	82.5					
L	u	n	d		L	a	n	d	i	n	g	2	2						77.8	6/4.5	D 2000
9.1	13.5	18.3	22.7	26.3	32.3	36.5	41.1	45.5	50.3	52.5	56.9	77.5	82.8								
M	A	R	I	N	A	/	R	E	S	T	A	U	R	A	N	T	/	C	59.8	3	D 2000
18.1	20.9	23.9	26.4	27.6	30.1	32.8	36.2	38.8	40.9	43.2	45.3	48.3	51	53.3	56.3	58.8	60.7	64.1			
A	B	I	N	S																	
66.6	69.6	72.1	73.3	75.9																	

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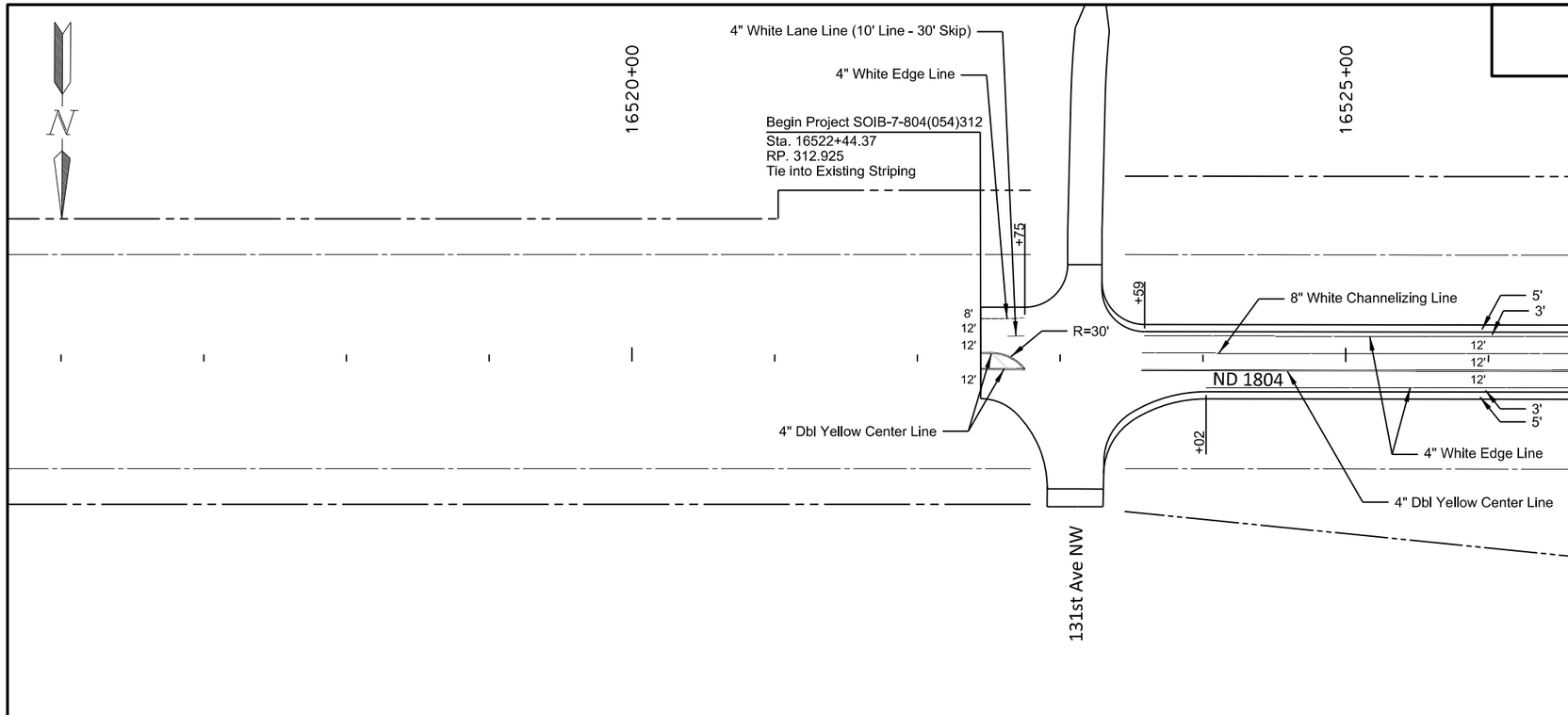
Sign Details

ND 1804 Reconstruction

Williams County, ND



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	120	1

Spec	Code	Bid Item	Unit	Quantity
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED		
		4" White Lane Line (10' line, 30' skip)	LF	31
		4" White Edge Line	LF	470
		4" Dbl Yellow Line (4" between)	LF	553
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED		
		8" White Channelizing Line	LF	243

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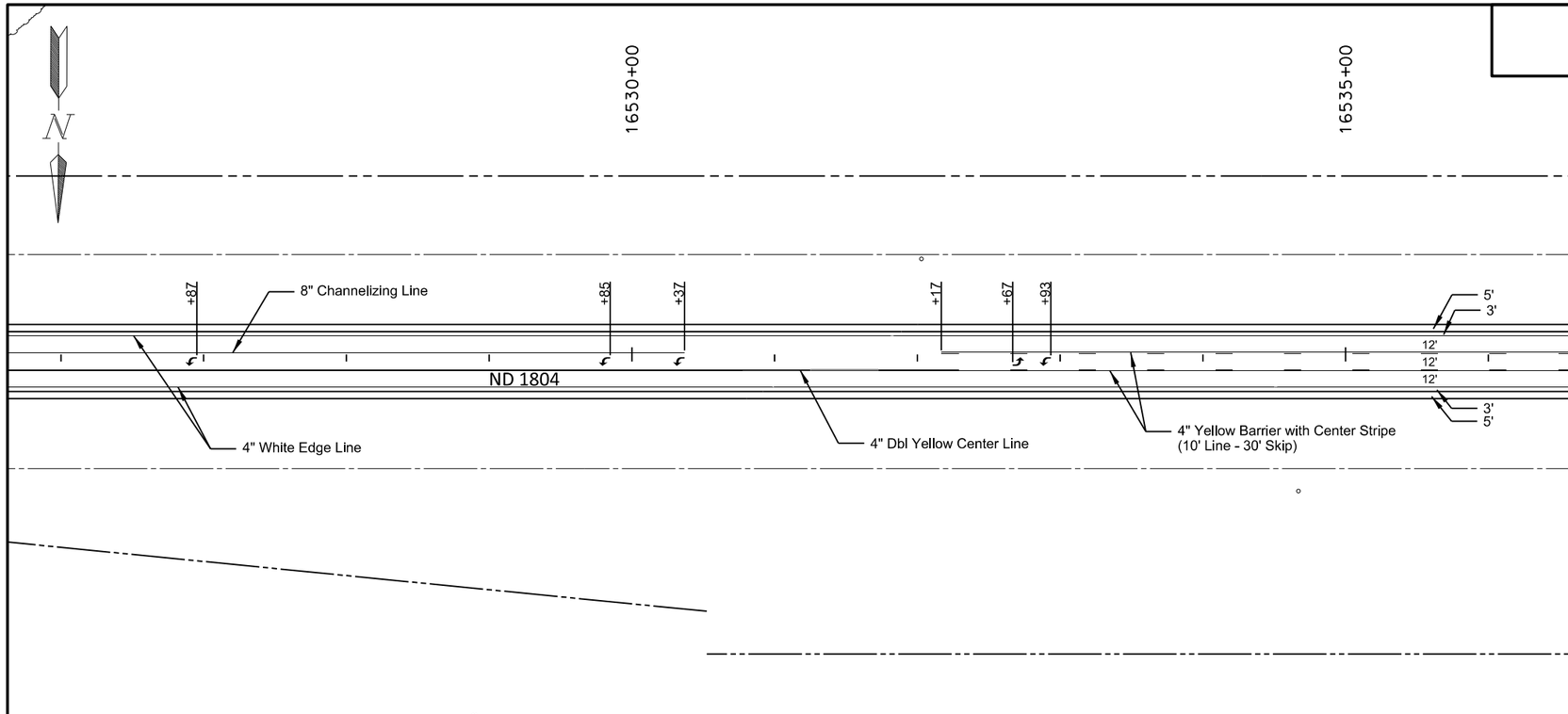
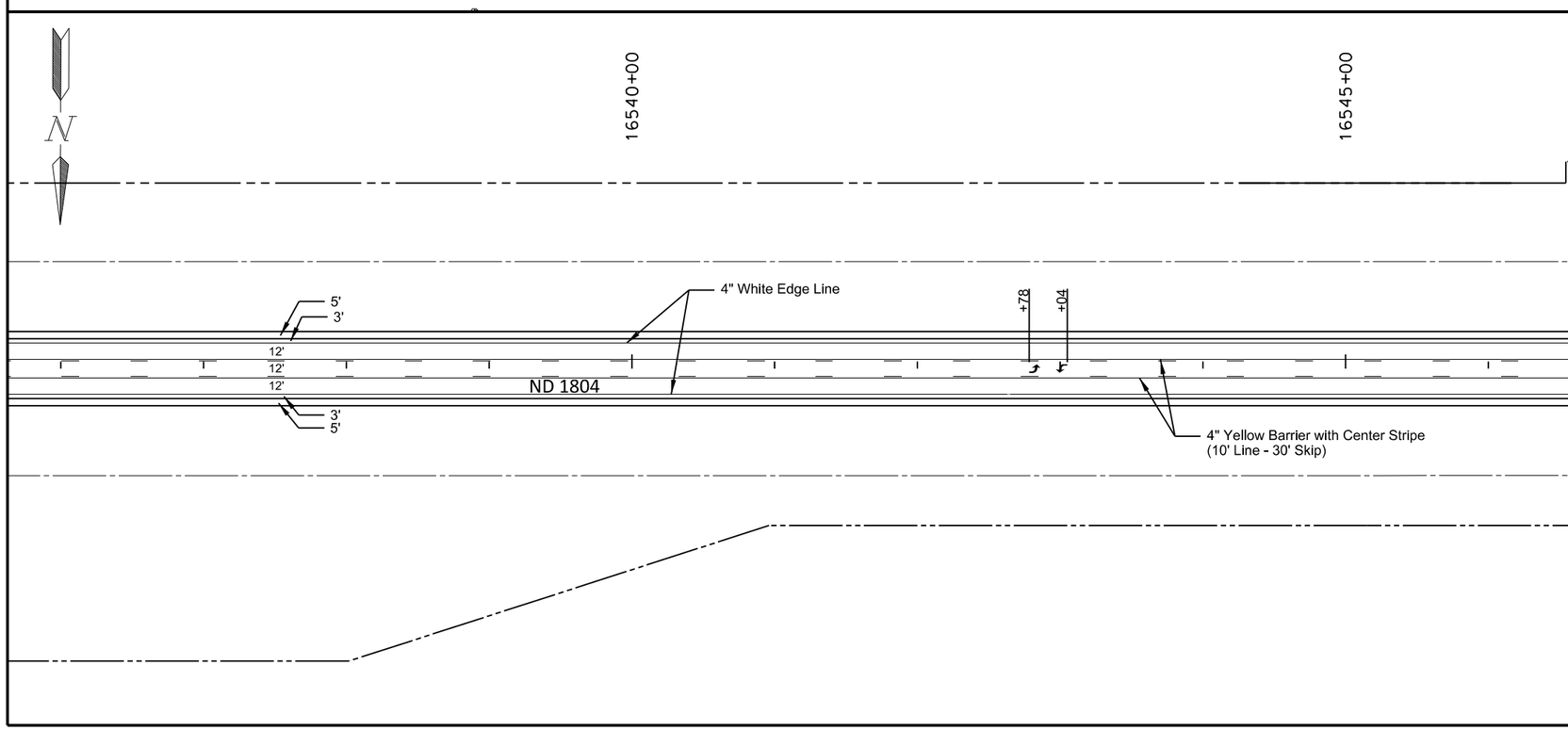
Pavement Marking

1804 Reconstruction

Williams County, ND
Sta 16522+44 to Sta 16526+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	120	2





Spec	Code	Bid Item	Unit	Quantity
762	1280	PREFORMED THERMO PLASTIC PVMT MK MESSAGE		
		Left Arrow (7)	SF	112
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED		
		4" White Edge Line	LF	4000
		4" Dbl Yellow Line (4" between)	LF	1234
		4" Yellow Barrier with Center Stripe (10' line, 30' skip)	LF	3456
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED		
		8" White Channelizing Line	LF	436

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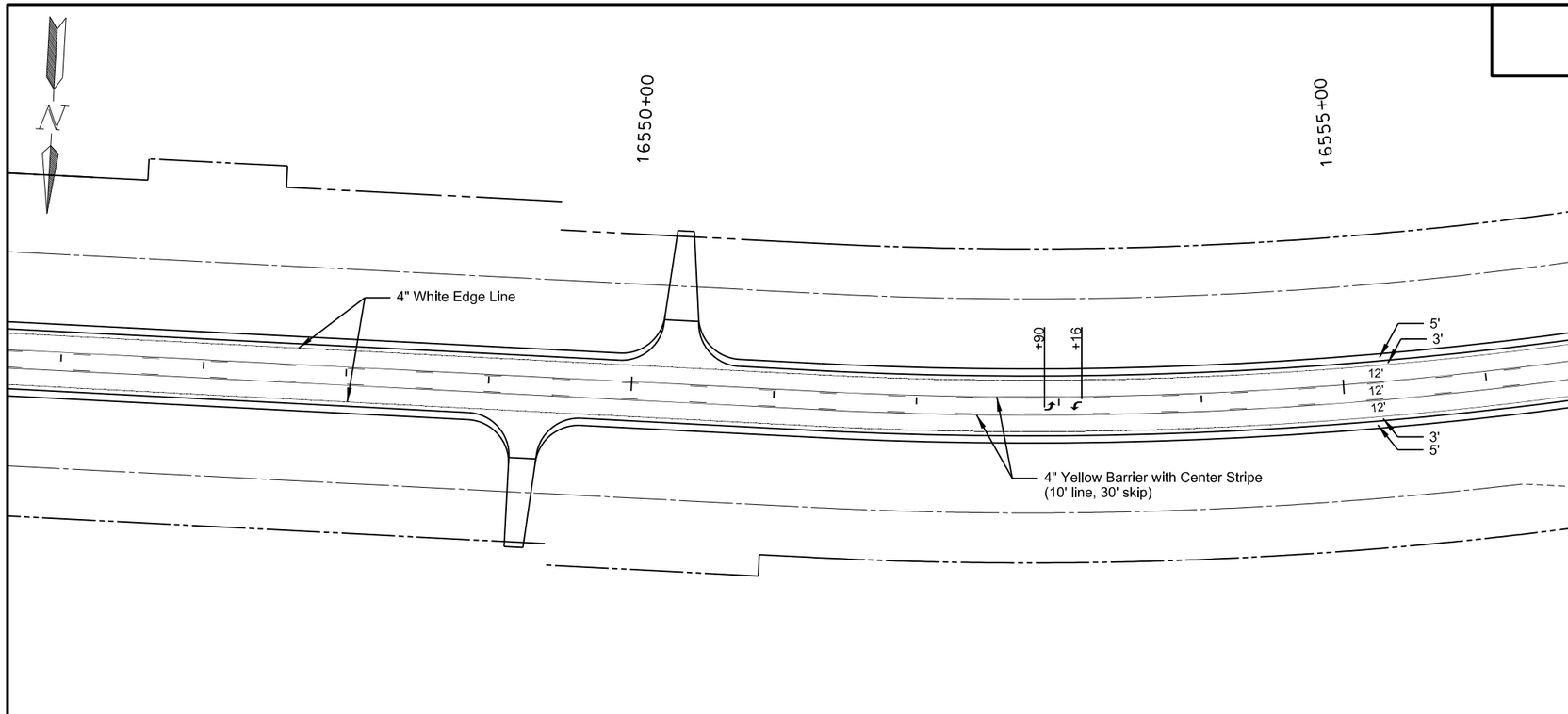
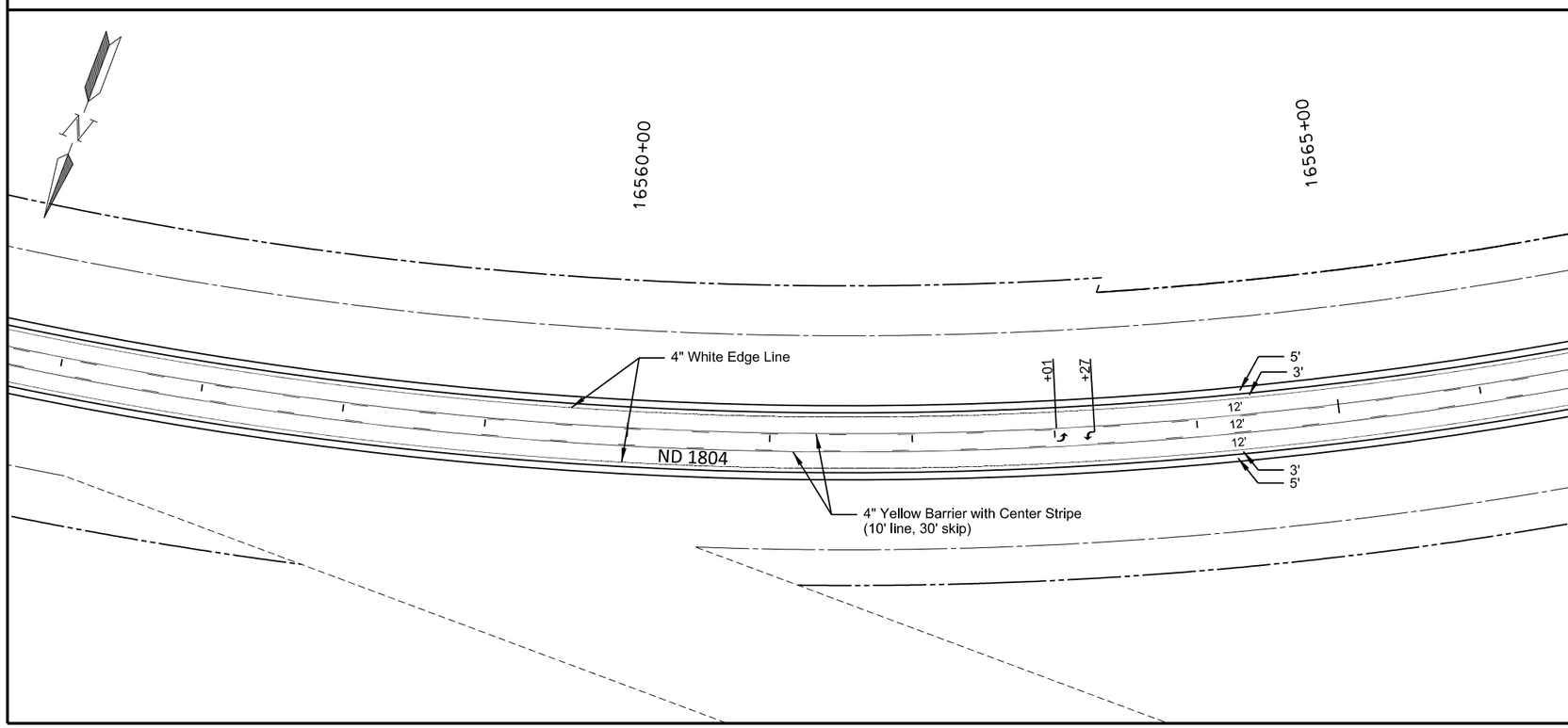
Pavement Marking

1804 Reconstruction

Williams County, ND
Sta 16526+00 to Sta 16546+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	120	3





Spec	Code	Bid Item	Unit	Quantity
762	1280	PREFORMED THERMO PLASTIC PVMT MK MESSAGE		
		Left Arrow (4)	SF	64
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED		
		4" White Edge Line	LF	4000
		4" Yellow Barrier with Center Stripe (10' line, 30' skip)	LF	6000

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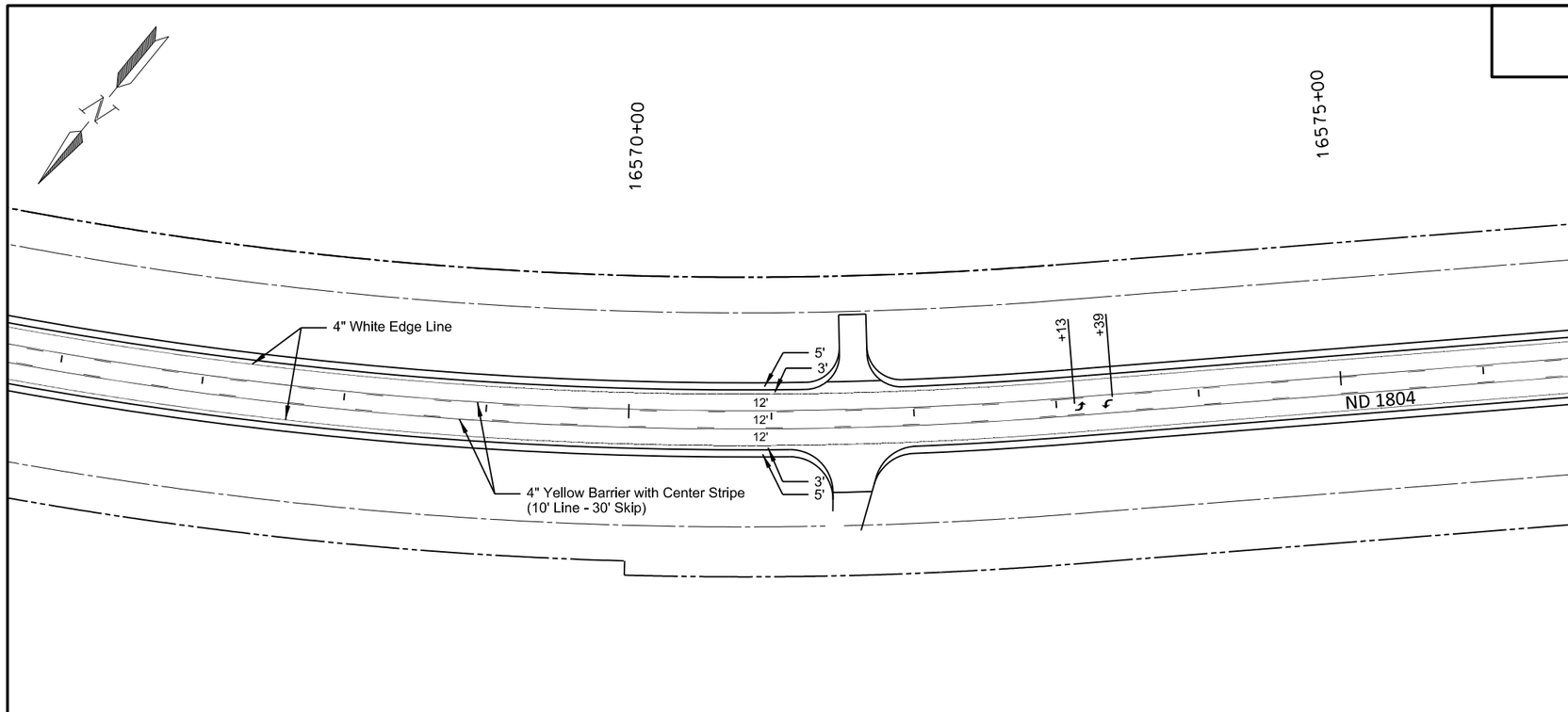
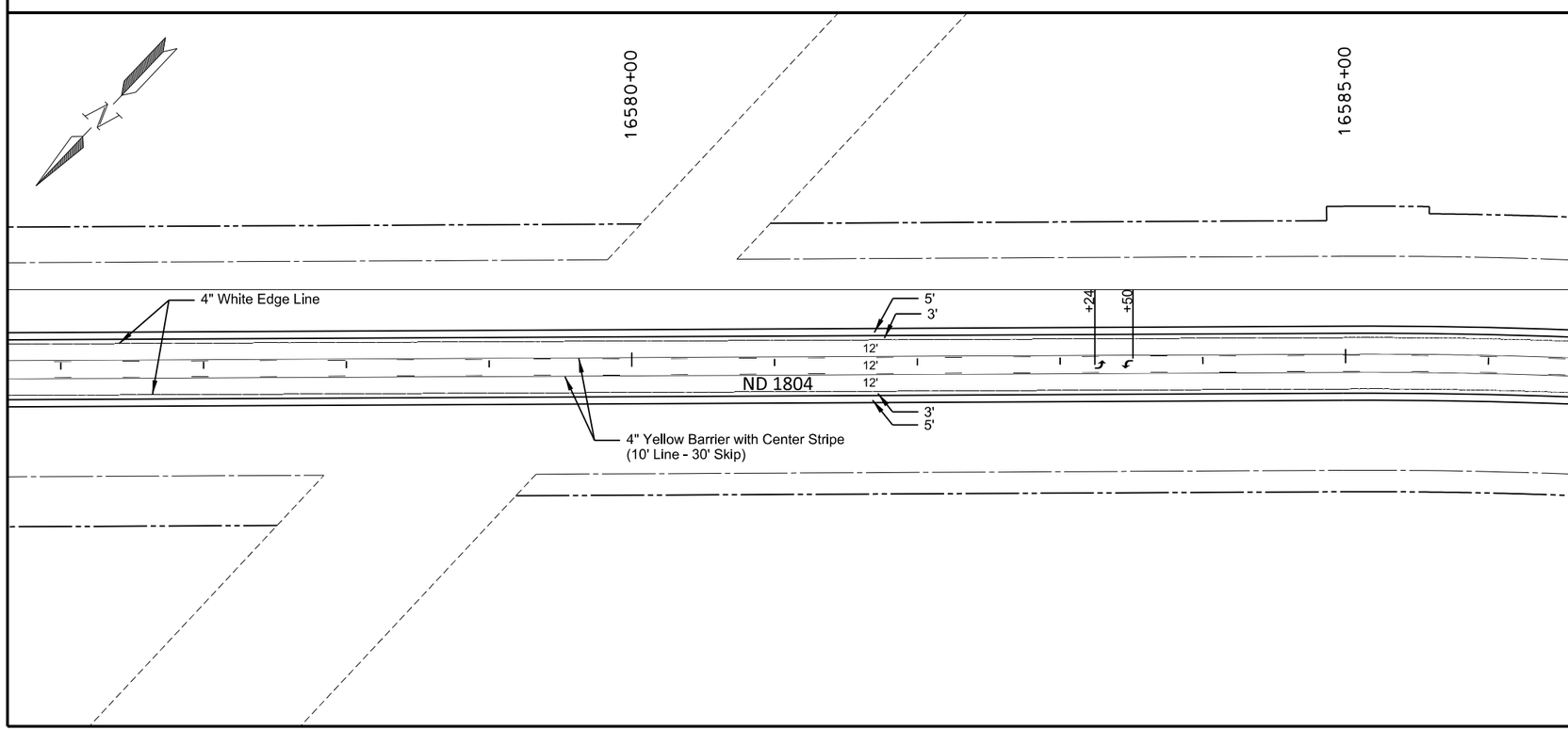
Pavement Marking

1804 Reconstruction

Williams County, ND
Sta 16546+00 to Sta 16566+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	120	4





Spec	Code	Bid Item	Unit	Quantity
762	1280	PREFORMED THERMO PLASTIC PVMT MK MESSAGE		
		Left Arrow (4)	SF	64
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED		
		4" White Edge Line	LF	4000
		4" Yellow Barrier with Center Stripe (10' line, 30' skip)	LF	5000

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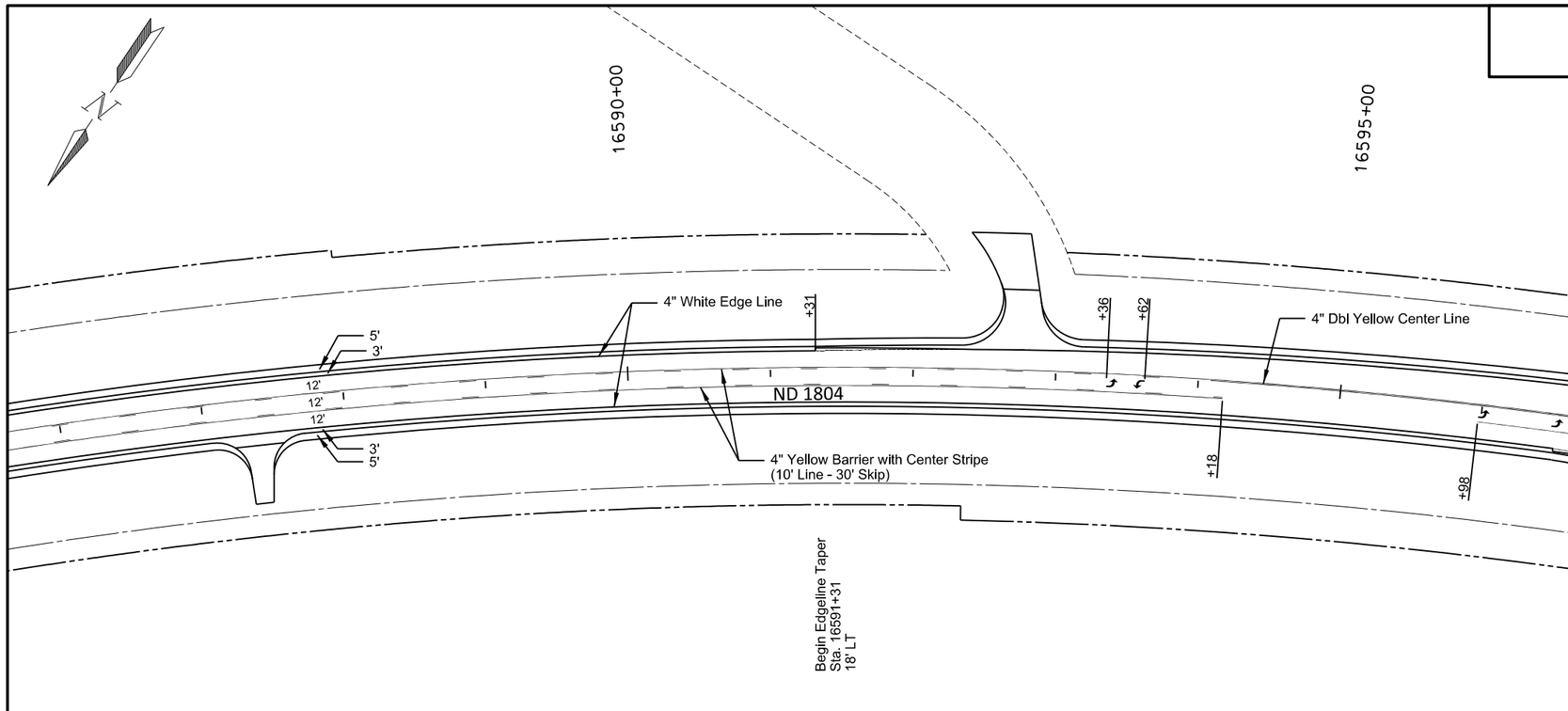
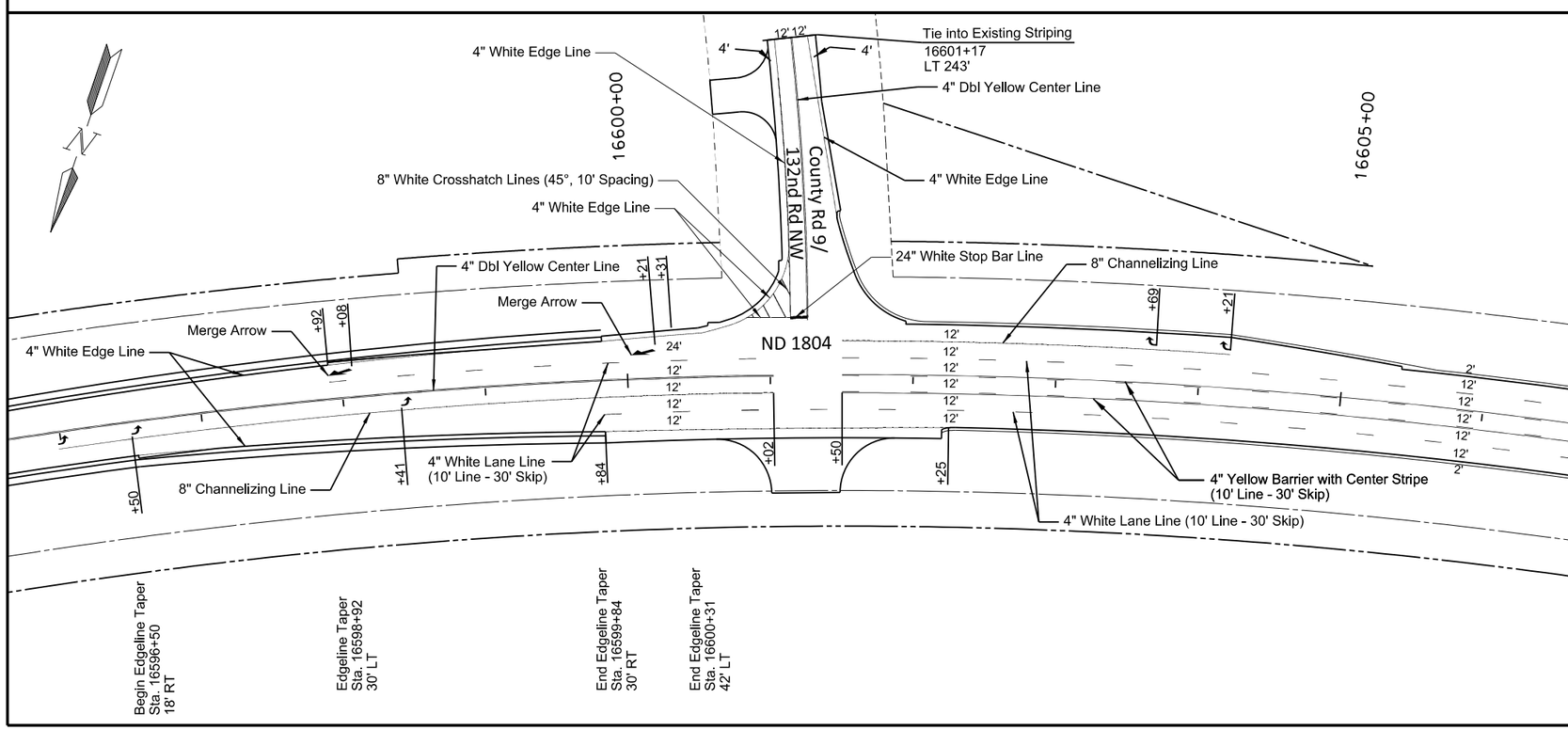
Pavement Marking

1804 Reconstruction

Williams County, ND
Sta 16566+00 to Sta 16586+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	120	5





Spec	Code	Bid Item	Unit	Quantity
762	1280	PREFORMED THERMO PLASTIC PVMT MK MESSAGE		
		Left/Right Arrow (7)	SF	112
		Merging Arrow (2)	SF	82
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED		
		4" White Edge Line	LF	3807
		4" White Lane Line (10' line, 30' skip)	LF	378
		4" Dbl Yellow Line (4" between)	LF	1762
		4" Yellow Barrier with Center Stripe (10' line, 30' skip)	LF	3418
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED		
		8" White Channelizing Line	LF	776
		8" White Crosshatch Line	LF	47
762	1325	PREFORMED PATTERNED PVMT MK 24IN LINE-GROOVED		
		24" Stopping Bar Bands	LF	12

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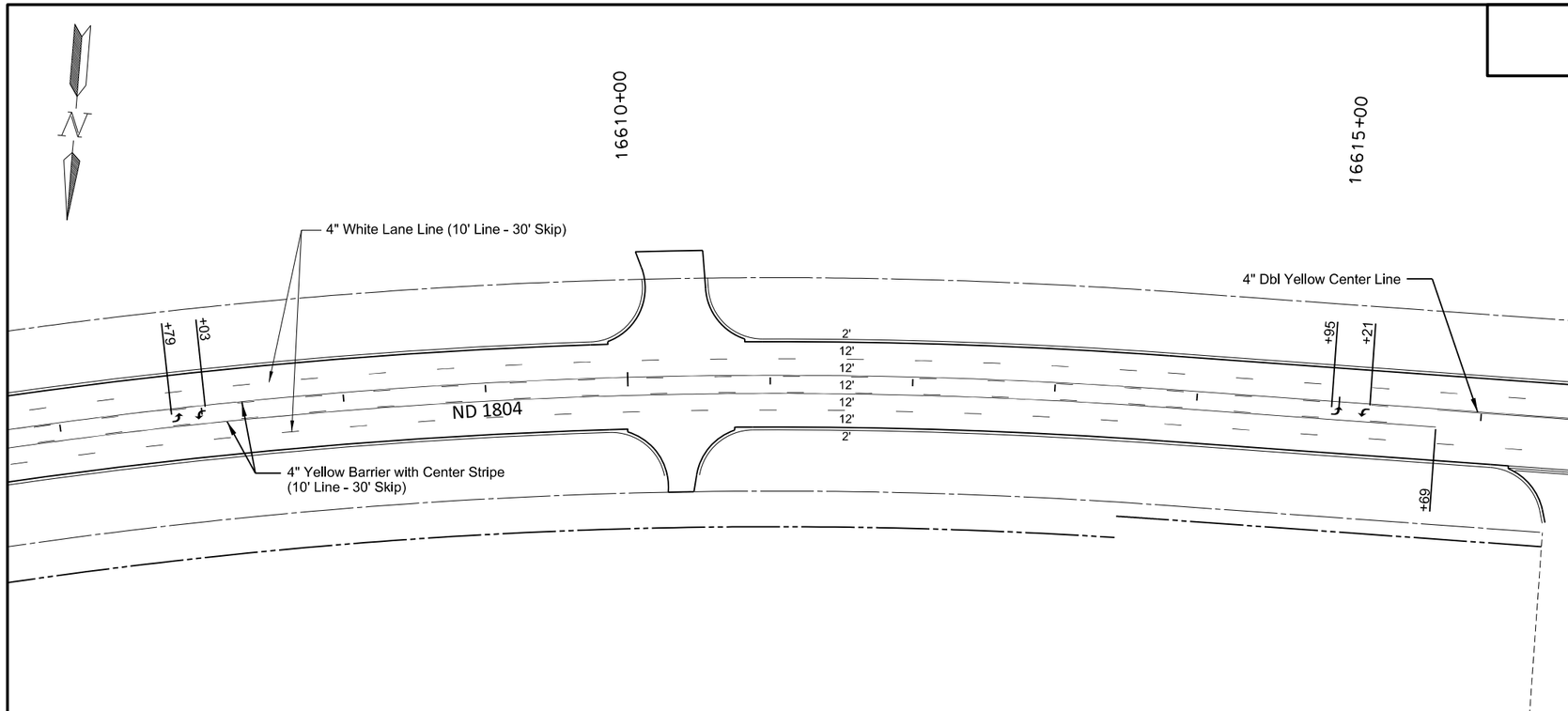
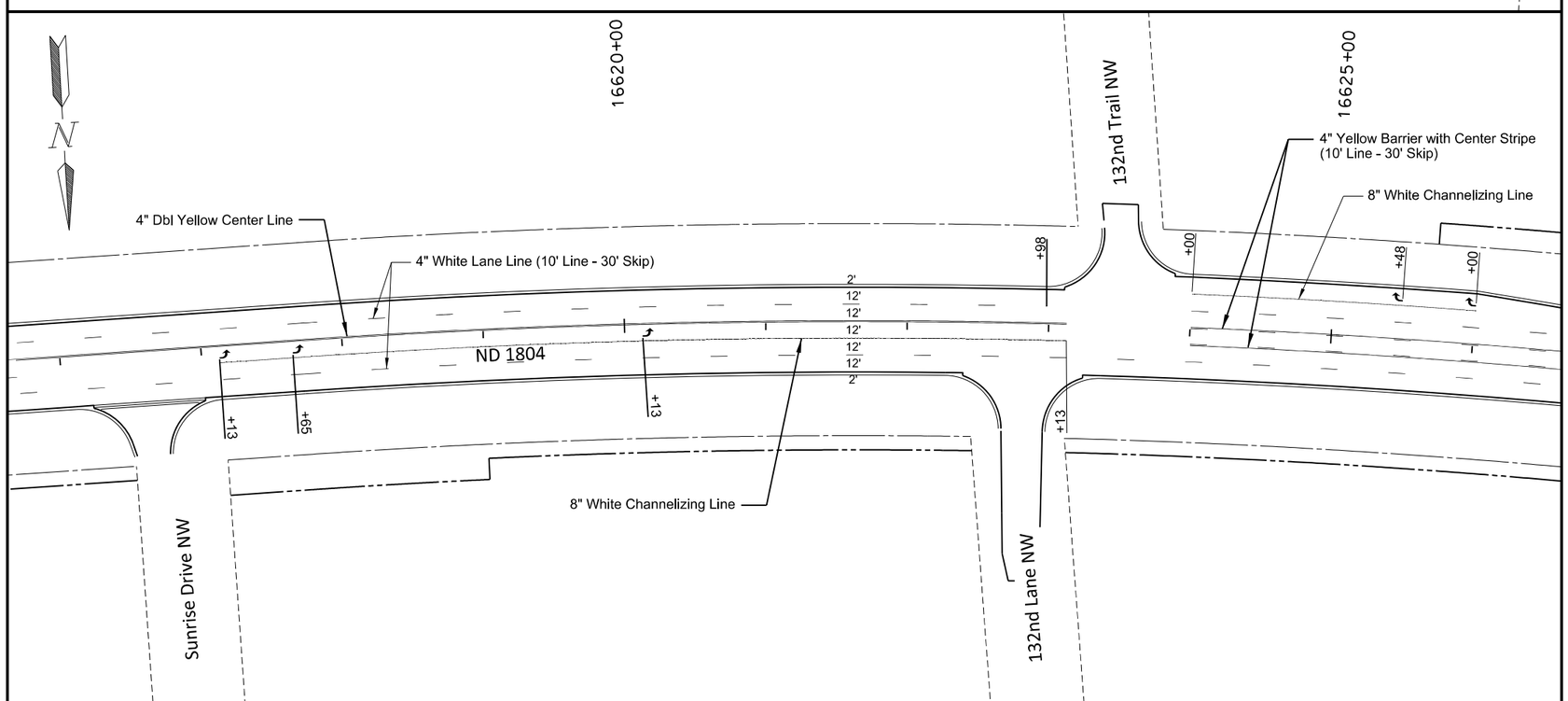
Pavement Marking

1804 Reconstruction

Williams County, ND
Sta 16586+00 to Sta 16606+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	120	6





Spec	Code	Bid Item	Unit	Quantity
762	1280	PREFORMED THERMO PLASTIC PVMT MK MESSAGE		
		Left/Right Arrow (9)	SF	144
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED		
		4" White Lane Line (10' line, 30' skip)	LF	976
		4" Dbl Yellow Line (4" between)	LF	1490
		4" Yellow Barrier with Center Stripe (10' line, 30' skip)	LF	2923
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED		
		8" White Channelizing Line	LF	802

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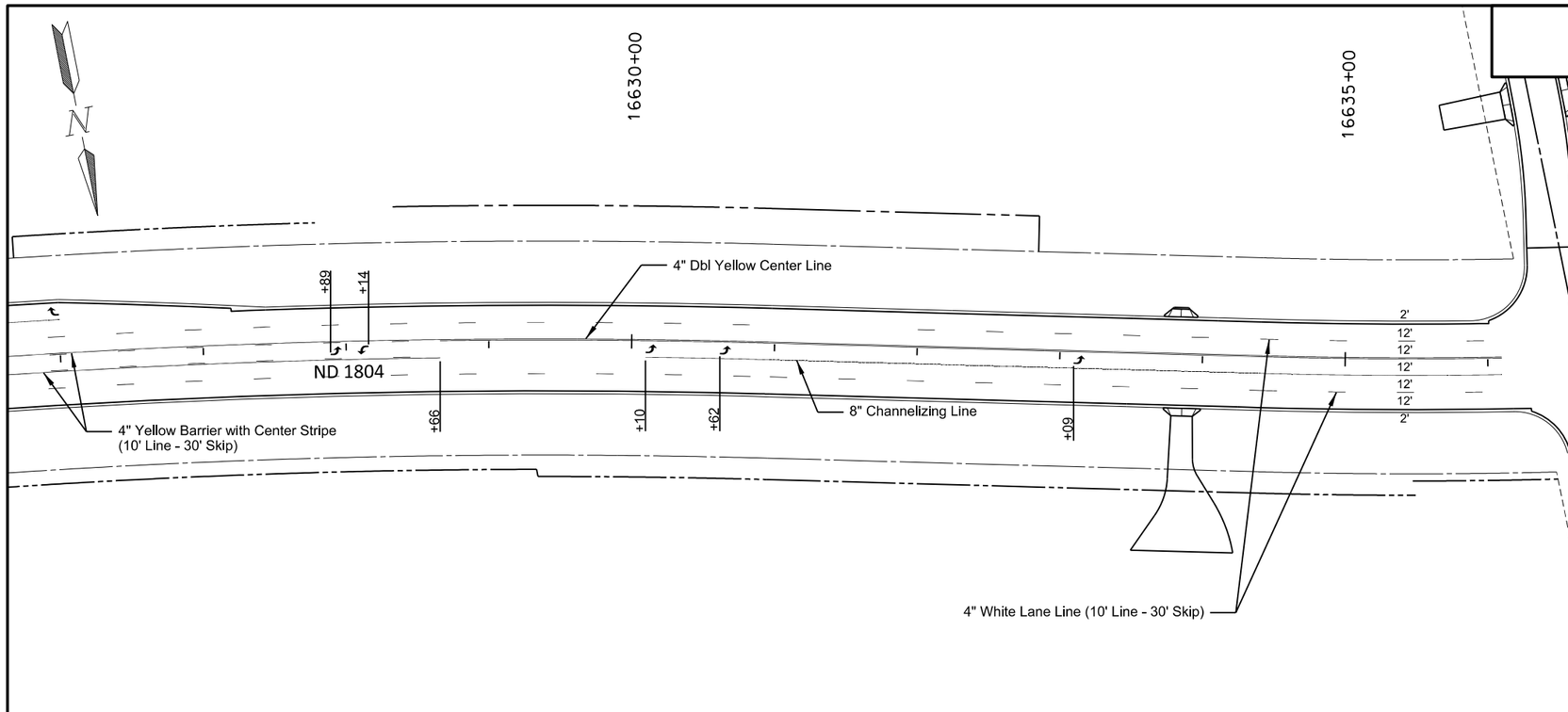
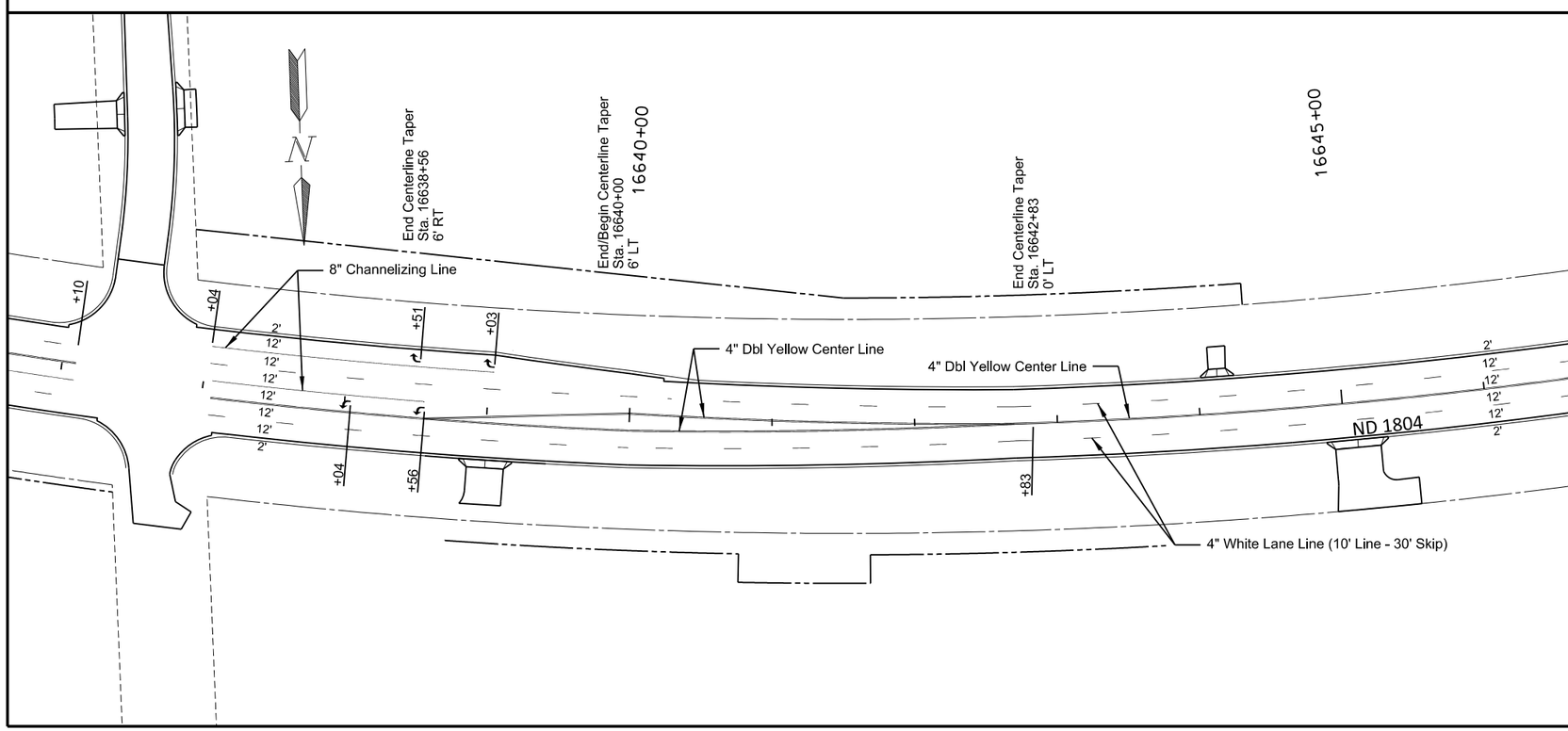
Pavement Marking

1804 Reconstruction

Williams County, ND
Sta 16606+00 to Sta 16626+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	120	7





Spec	Code	Bid Item	Unit	Quantity
762	1280	PREFORMED THERMO PLASTIC PVMT MK MESSAGE		
		Left/Right Arrow (9)	SF	176
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED		
		4" White Lane Line (10' line, 30' skip)	LF	949
		4" Dbl Yellow Line (4" between)	LF	4112
		4" Yellow Barrier with Center Stripe (10' line, 30' skip)	LF	664
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED		
		8" White Channelizing Line	LF	952

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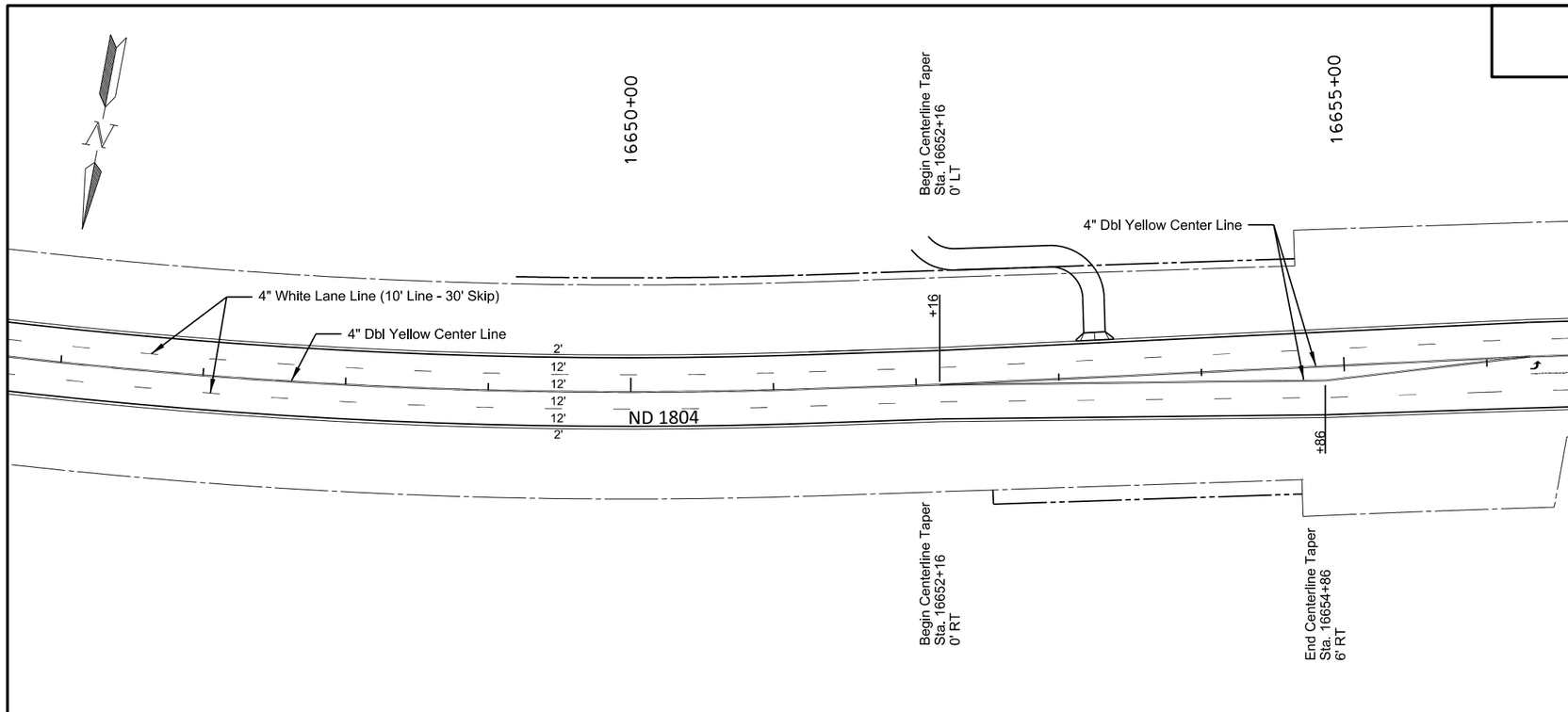
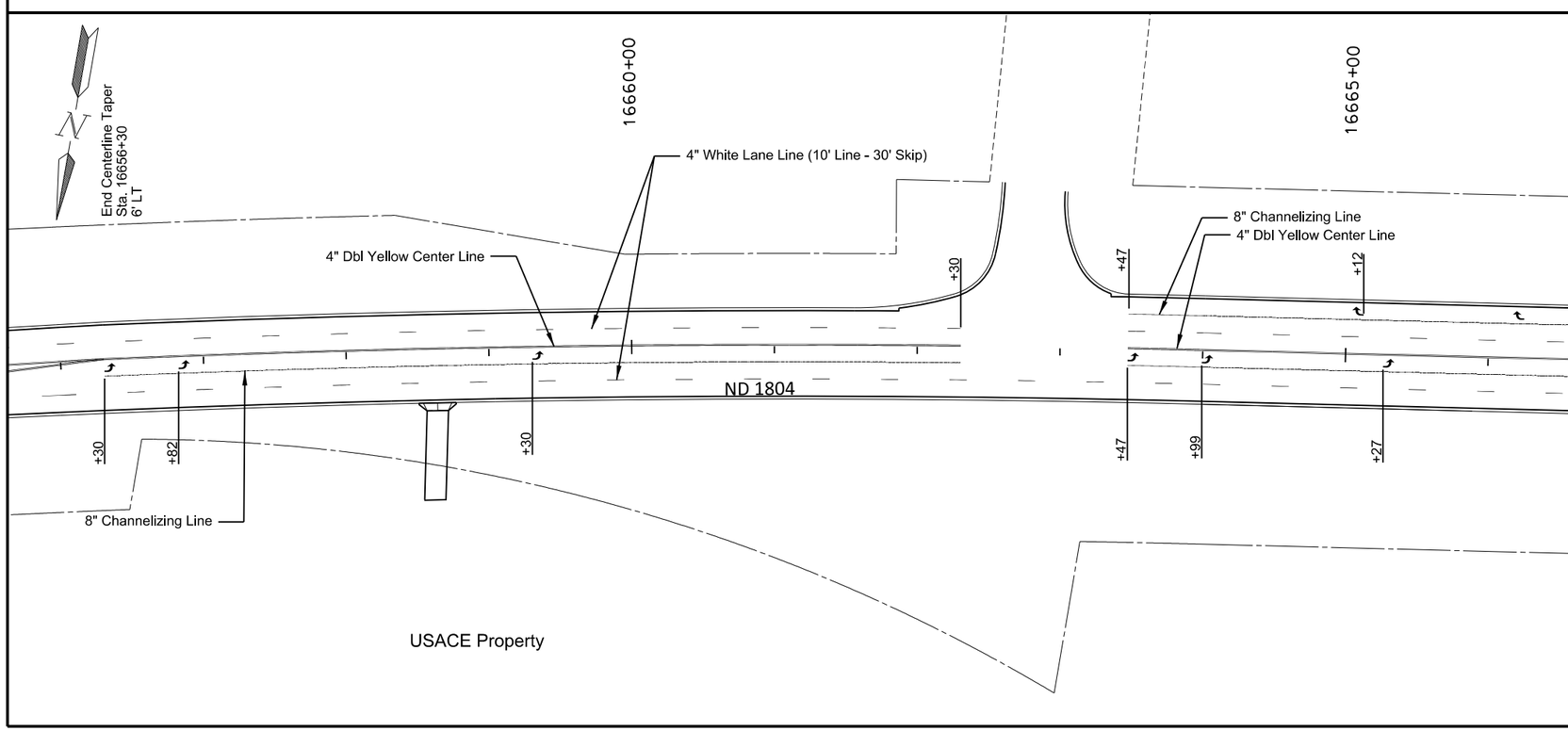
Pavement Marking

1804 Reconstruction

Williams County, ND
Sta 16626+00 to Sta 16646+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	120	8





Spec	Code	Bid Item	Unit	Quantity
762	1280	PREFORMED THERMO PLASTIC PVMT MK MESSAGE		
		Left/Right Arrow (7)	SF	112
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED		
		4" White Lane Line (10' line, 30' skip)	LF	971
		4" Dbl Yellow Line (4" between)	LF	4608
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED		
		8" White Channelizing Line	LF	1108

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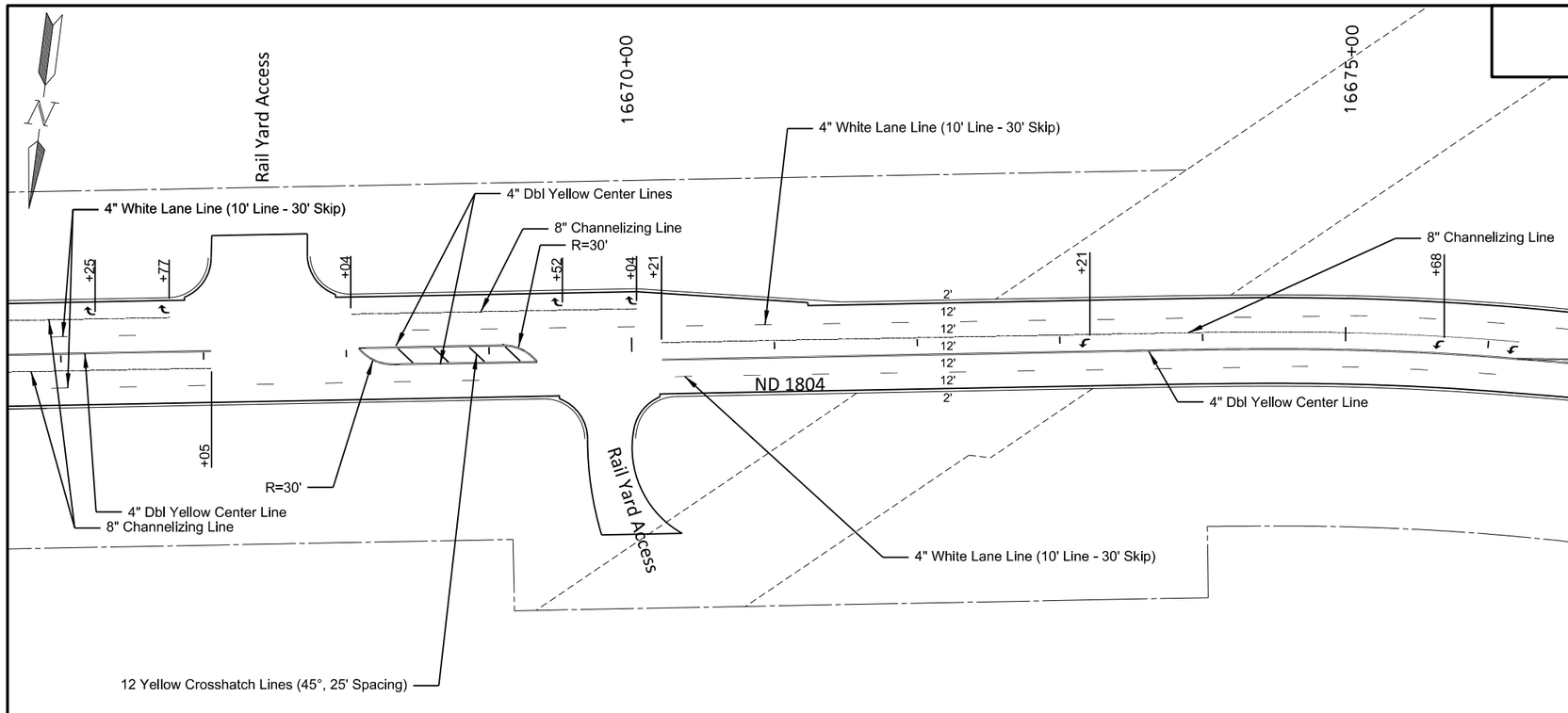
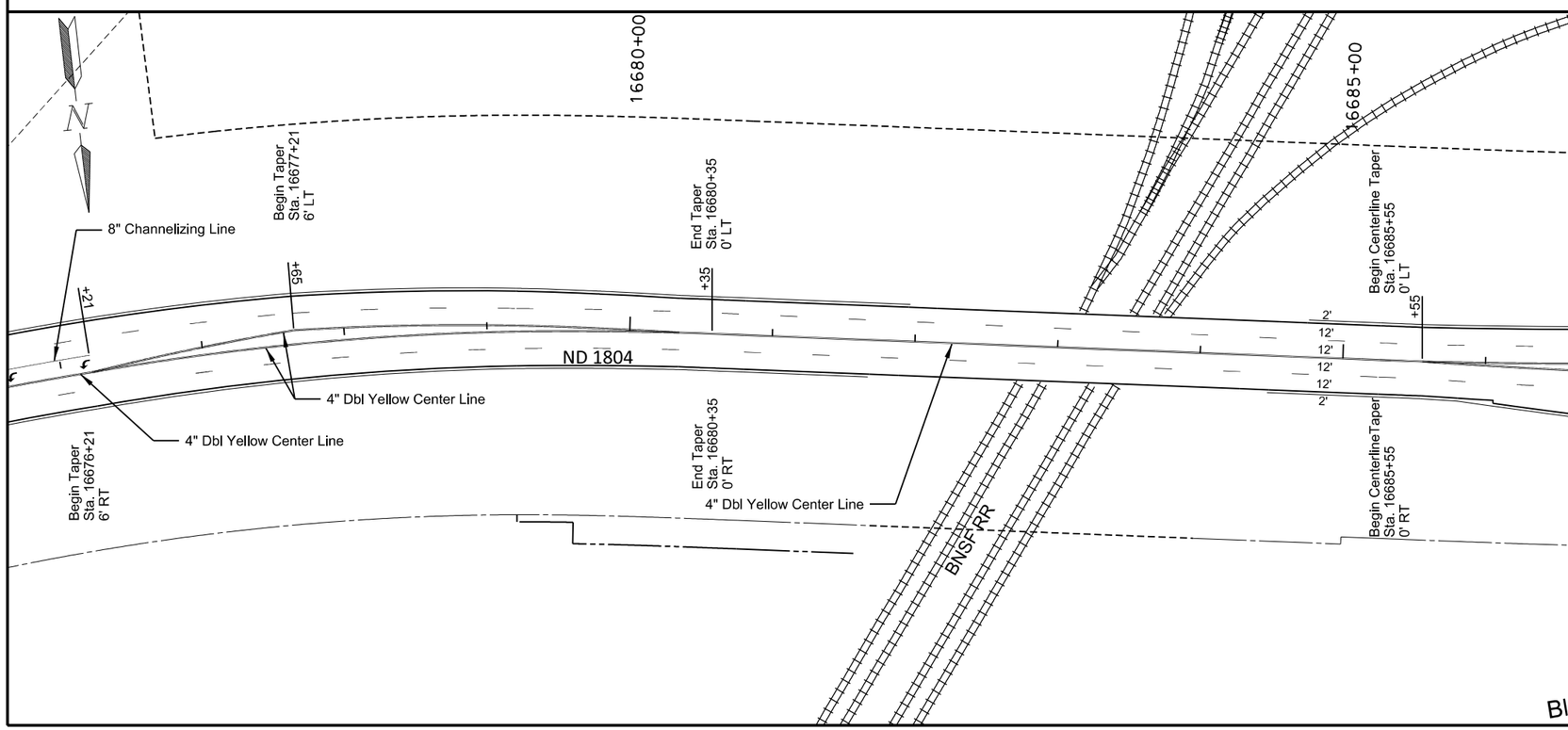
Pavement Marking

1804 Reconstruction

Williams County, ND
Sta 16646+00 to Sta 16666+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	120	9





Spec	Code	Bid Item	Unit	Quantity
762	1280	PREFORMED THERMO PLASTIC PVMT MK MESSAGE		
		Left/Right Arrow (9)	SF	112
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED		
		4" White Lane Line (10' line, 30' skip)	LF	946
		4" Dbl Yellow Line (4" between)	LF	4820
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED		
		8" White Channelizing Line	LF	987
762	1315	PREFORMED PATTERNED PVMT MK 12IN LINE-GROOVED		
		12" Yellow Crosshatch Line	LF	64

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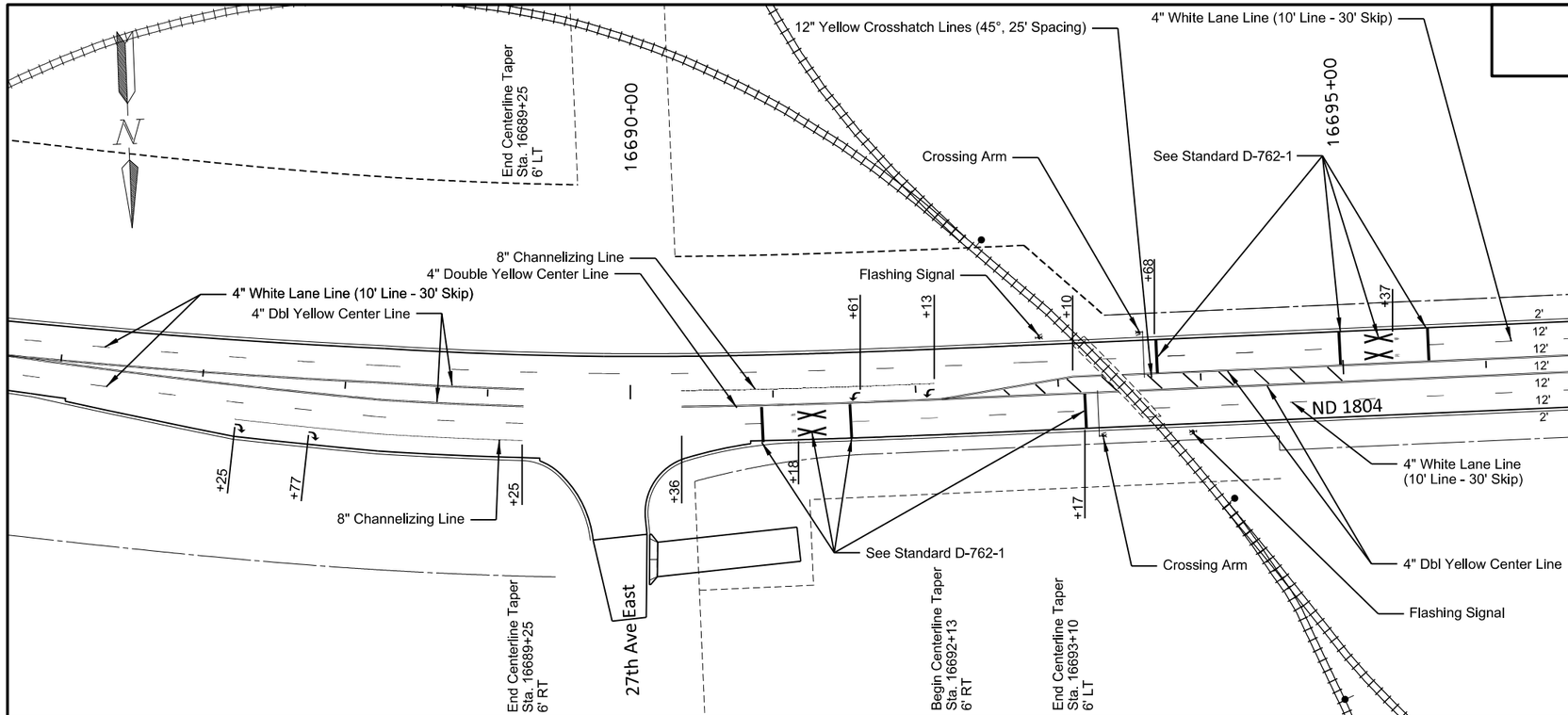
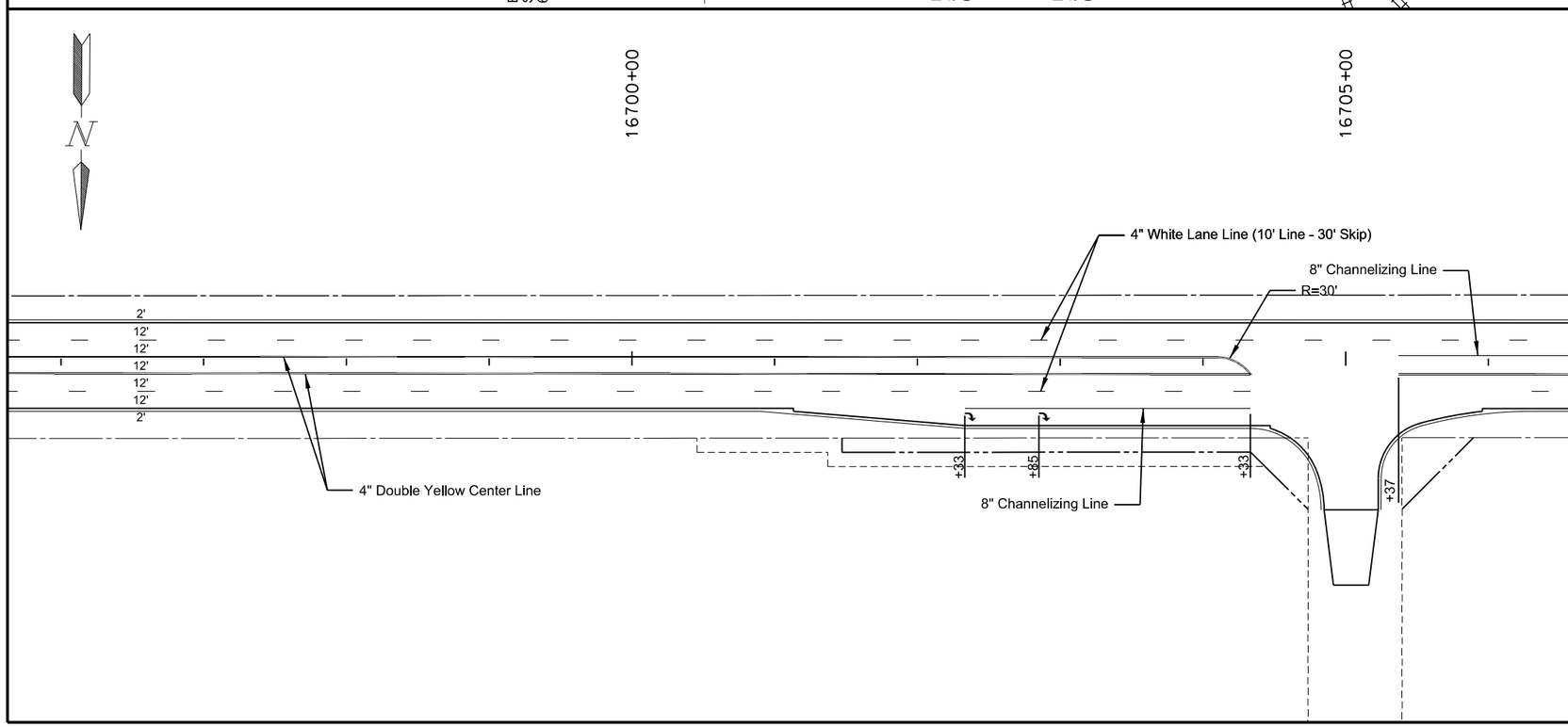
Pavement Marking

1804 Reconstruction

Williams County, ND
Sta 16666+00 to Sta 16686+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	120	10





Spec	Code	Bid Item	Unit	Quantity
762	1280	PREFORMED THERMO PLASTIC PVMT MK MESSAGE		
		Left/Right Arrow (6)	SF	96
		Railroad Cross & 2 R's	SF	242
		Railroad Crossing 2' x 24' Bands (6 @ 48 SF EA)	SF	288
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED		
		4" White Lane Line (10' line, 30' skip)	LF	947
		4" Dbl Yellow Line (4" between)	LF	6422
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED		
		8" White Channelizing Line	LF	644
762	1315	PREFORMED PATTERNED PVMT MK 12IN LINE-GROOVED		
		12" Yellow Crosshatch Line	LF	146

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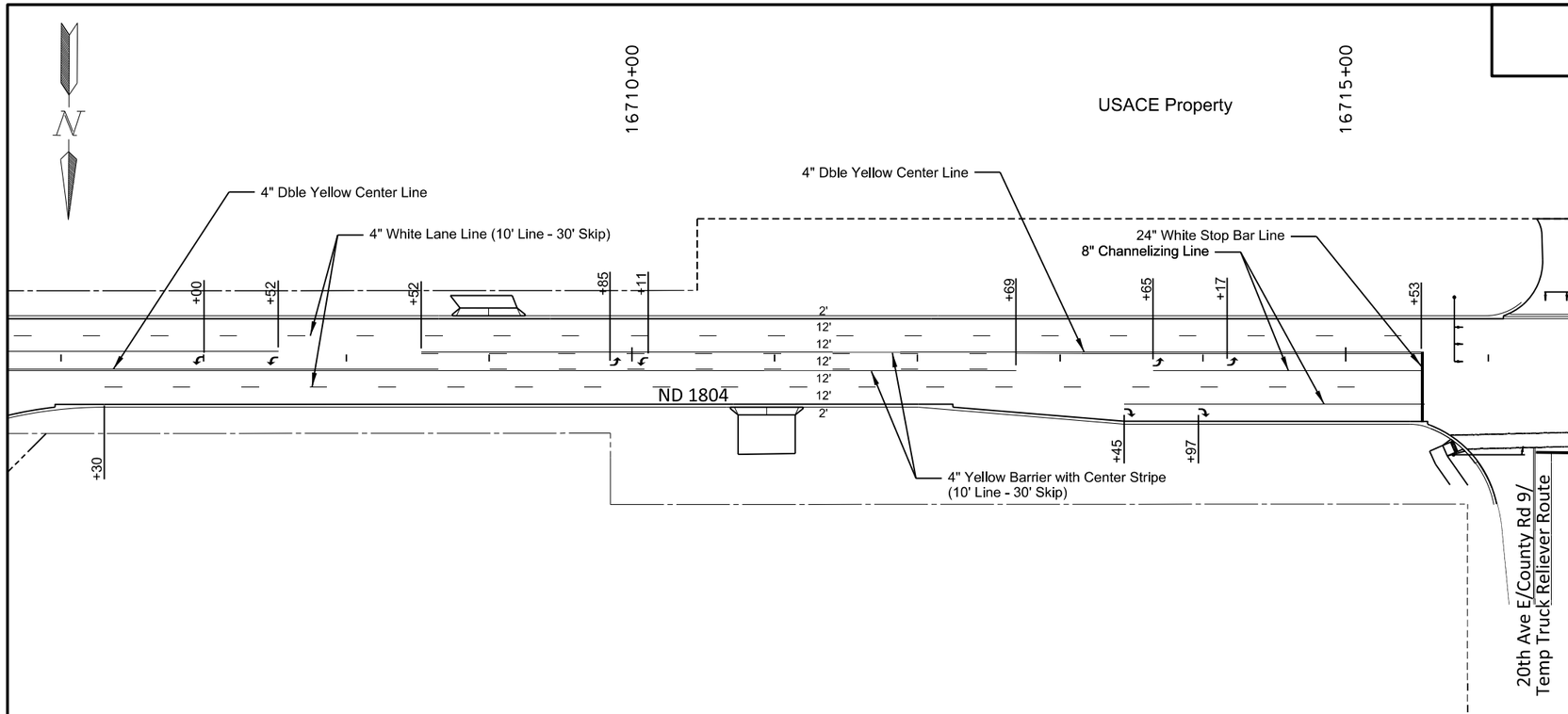
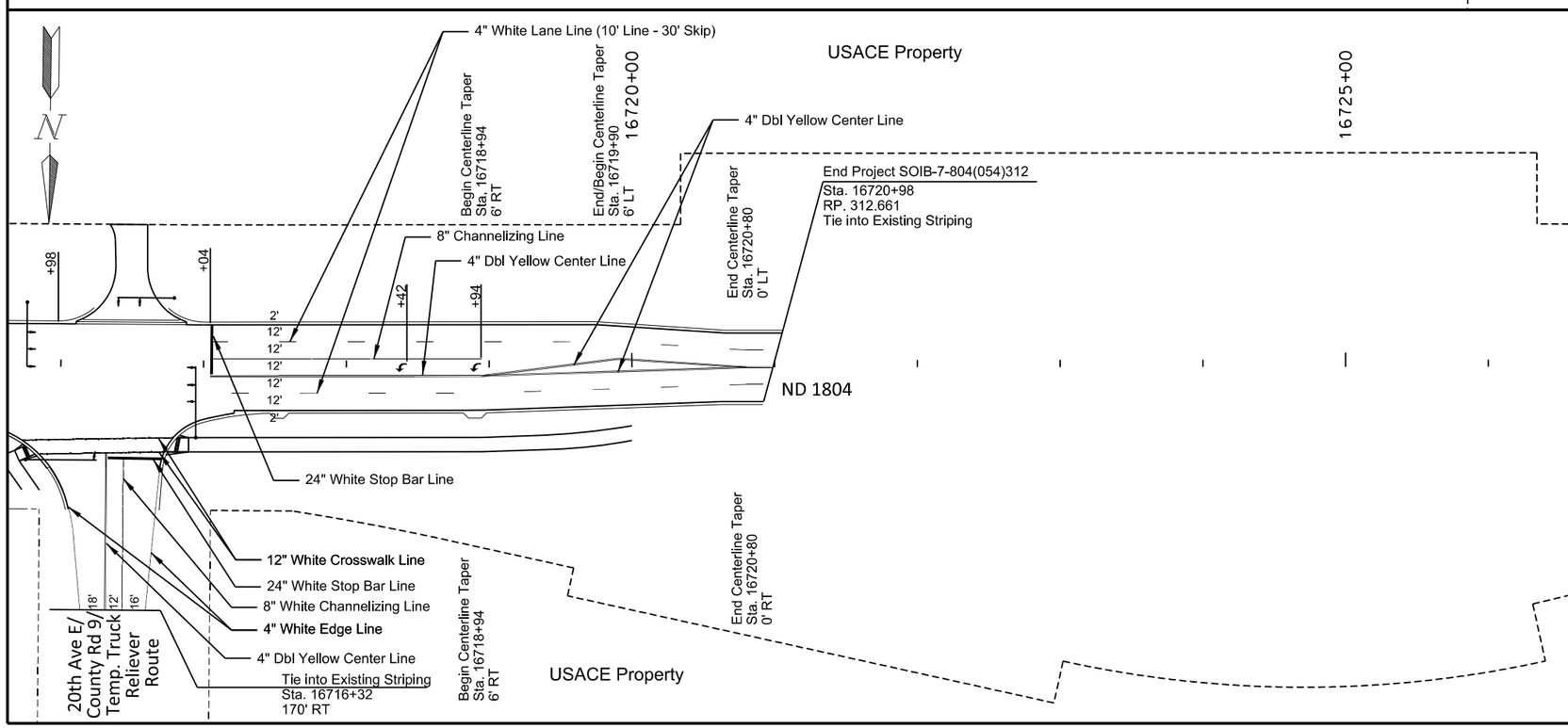
Pavement Marking

1804 Reconstruction

Williams County, ND
Sta 16686+00 to Sta 16706+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	120	11





Spec	Code	Bid Item	Unit	Quantity
762	1280	PREFORMED THERMO PLASTIC PVMT MK MESSAGE		
		Left/Right Arrow (10)	SF	160
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED		
		4" White Edge Line	LF	206
		4" White Lane Line (10' line, 30' skip)	LF	660
		4" Dbl Yellow Line (4" between)	LF	2466
		4" Yellow Barrier with Center Stripe (10' line, 30' skip)	LF	1043
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED		
		8" White Channelizing Line	LF	592
762	1315	PREFORMED PATTERNED PVMT MK 12IN LINE-GROOVED		
		12" White Crosswalk Line	LF	210
762	1325	PREFORMED PATTERNED PVMT MK 24IN LINE-GROOVED		
		24" Stopping Bar Bands	LF	122

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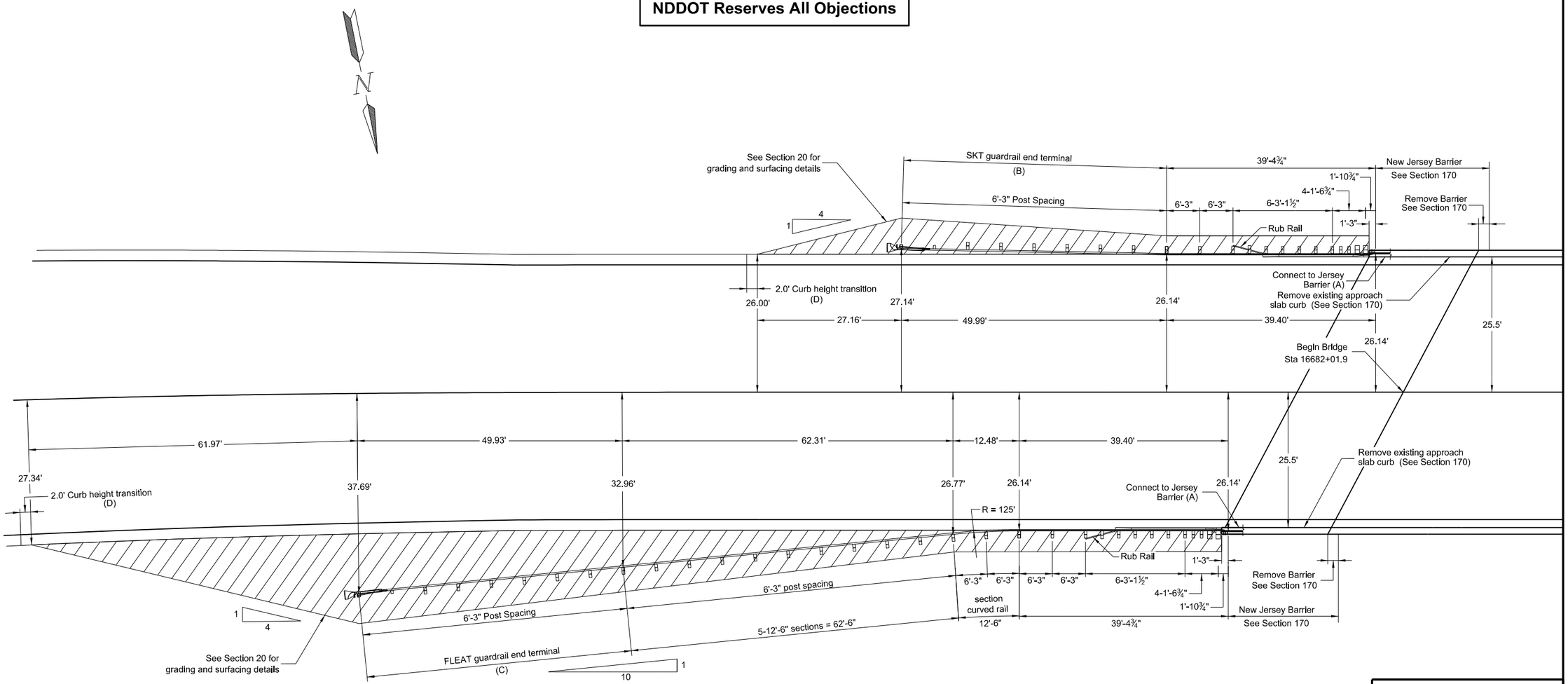
Pavement Marking

1804 Reconstruction

Williams County, ND
Sta 16706+00 to Sta 16720+98

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	130	1

23 U.S.C. 409
NDDOT Reserves All Objections



Notes: (A) See Standard Drawing D-764-9 for connection to concrete Jersey barrier.

(B) Install Sequential Kinking Terminal (SKT) per Standard Drawing D-764-5.

(C) Install Flared Energy Absorbing Terminal (FLEAT) per Standard Drawing D-764-6.

(D) Install Type I Curb with maximum curb height of 3"
Sta 16679+42.54 to Sta 16681+47.65 Rt.
Sta 16680+80.15 to Sta 16681+75.43 Lt.

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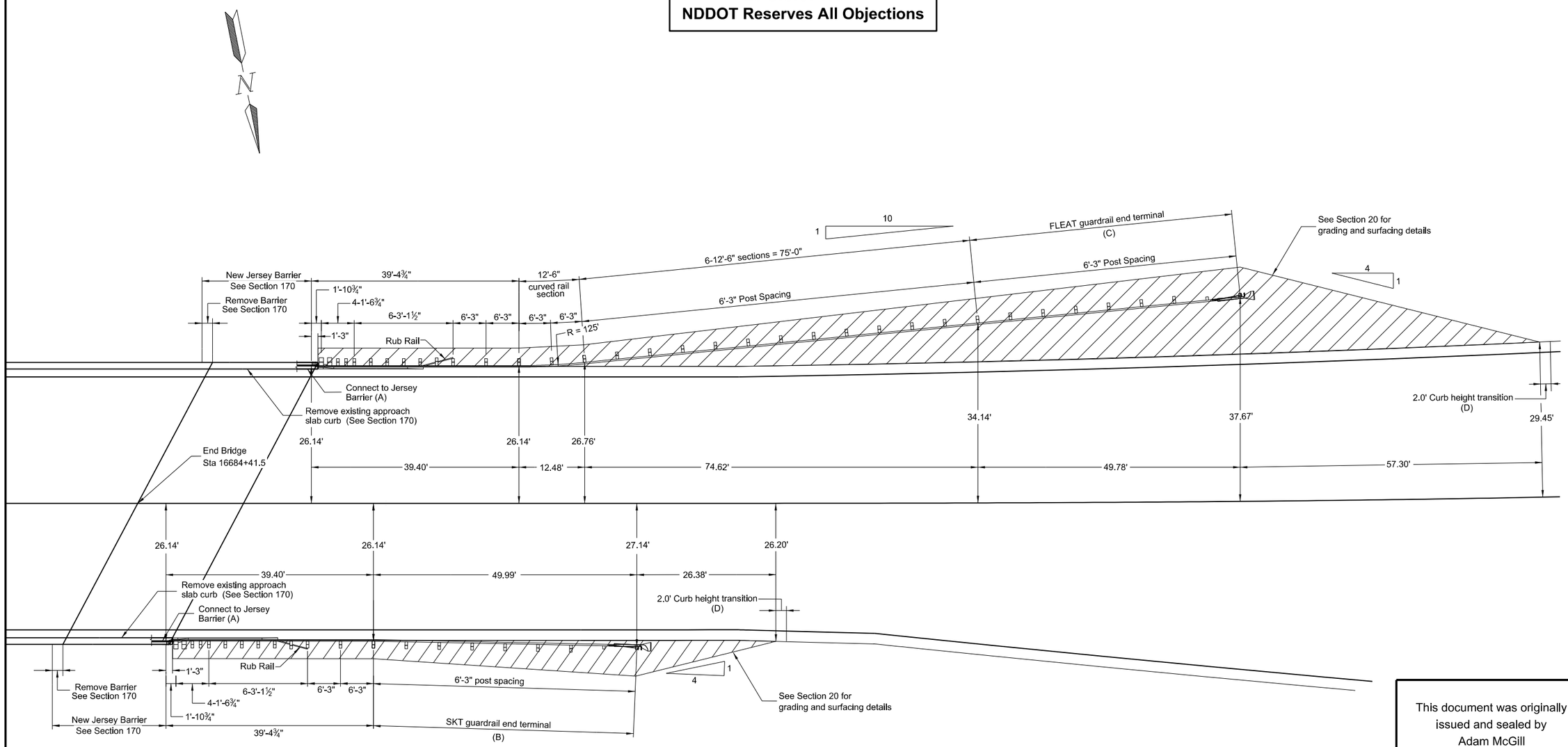
Guardrail

B.N.R.R. Overhead Bridge
RP 315.883
ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	130	2

23 U.S.C. 409
NDDOT Reserves All Objections



Notes: (A) See Standard Drawing D-764-9 for connection to concrete Jersey barrier.

(B) Install Sequential Kinking Terminal (SKT) per Standard Drawing D-764-5.

(C) Install Flared Energy Absorbing Terminal (FLEAT) per Standard Drawing D-764-6.

(D) Install Type I Curb with maximum curb height of 3"
Sta 16684+68.08 to Sta 16685+62.58 Rt
Sta 16684+95.69 to Sta 16687+08.15 Lt.

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Guardrail

B.N.R.R. Overhead Bridge
RP 315.883
ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	130	3

23 U.S.C. 409
NDDOT Reserves All Objections

W-BEAM GUARDRAIL SUMMARY OF QUANTITIES

W-BEAM GUARDRAIL AT BRIDGE ENDS

LOCATION	(A) TERM-INAL CON-NECTOR	(A) 5/8" Ø x 22" LONG GUARD-RAIL BOLT	(A) 5/8" Ø x 20" LONG GUARD-RAIL BOLT	(A) 7/8" Ø x 10" LONG H.S. HEX HEAD BOLT	(A) 5/8" Ø x 18" LONG GUARD-RAIL BOLT	(A) 6"x 8" x 14" WOOD OFF-SET BLOCK	(A) 6"x 8" x 6' TIMBER POST	(A) 5/8" Ø x 1 1/4" LONG GUARD-RAIL BOLT	(A) 12'-6" DOUBLE RAIL SECTION	(A) 12'-6" STRAIGHT RAIL SECTION	(A) 12'-6" CURVED RAIL SECTION	(A) 5/8" Ø x 11" LONG HEX HEAD BOLT	(A) 1/2" Ø x 4" LONG LAG SCREW	(A) 6" x 8" x 7'-0" TIMBER POSTS	(A) RUB RAIL END SHOE	(A) C 6 x 8.2 x 14'-6 1/4" RUB RAIL SECTION	(A) C 6 x 8.2 x 12'-7" BENT RUB RAIL SECTION	(A) 5/8" Ø x 1 1/2" LONG GUARD-RAIL BOLT	(A) 7 3/4" x 4 ½" x 3/8" RUB RAIL SPLICE PLATE	(A) 10"x 10" x 8'-0" TIMBER POST	(A) 10"x 8" x 21" TAPERED TIMBER BLOCK	(A) 6"x 8" x 21" TIMBER BLOCK	(A) 6"x 9 3/4" x 14" TIMBER BLOCK	(A) REFL-ECTOR-IZED PLATES
	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
Sta 16680+54.80 to Sta 16681+68.90 Rt	1	2	10	4	22	15	20	80	1	7	1	2	1	3	1	1	1	4	1	2	2	7	1	6
Sta 16681+57.29 to Sta 16681+96.68 Lt	1	2	10	4	10	3	8	32	1	2		2	1	3	1	1	1	4	1	2	2	7	1	3
Sta 16684+74.44 to Sta 16686+01.05 Lt.	1	2	10	4	24	17	22	88	1	8	1	2	1	3	1	1	1	4	1	2	2	7	1	7
Sta 16684+46.83 to Sta 16684+86.22 Rt.	1	2	10	4	10	3	8	32	1	2		2	1	3	1	1	1	4	1	2	2	7	1	3
TOTAL	4	8	40	16	66	38	58	232	4	19	2	8	4	12	4	4	4	16	4	8	8	28	4	19

Remove box beam guardrail

Sta 16680+91.3 to Sta 16681+91.5 Rt	100.2	LF
Sta 16681+72.4 to Sta 16682+19.1 Lt.	46.7	LF
Sta 16684+51.6 to Sta 16685+66.8 Lt.	115.2	LF
Sta 16684+23.8 to Sta 16684+67.0 Rt.	43.2	LF
Total	305.3	LF

W-beam guardrail

Sta 16680+54.80 to Sta 16681+68.90 Rt.	114.4	LF
Sta 16681+57.29 to Sta 16681+96.68 Lt.	39.4	LF
Sta 16684+74.44 to Sta 16686+01.05 Lt	126.9	LF
Sta 16684+46.83 to Sta 16684+86.22 Rt	39.4	LF
Total	320.1	LF

Remove end treatment and transition

Sta 16684+54.4 to Sta 16680+91.3 Rt.	1	ea
Sta 16681+35.6 to Sta 16681+72.4 Lt.	1	ea
Sta 16685+66.8 to Sta 16686+04.2 Lt	1	ea
Sta 16684+67.0 to Sta 16685+04.3 Rt	1	ea
Total	4	ea

W-beam guardrail end terminal

Sta 16680+04.59 to Sta 16680+54.80 Rt.	1	ea
Sta 16680+02.00 to Sta 16681+57.29 Lt.	1	ea
Sta 16686+01.05 to Sta 16686+53.77 Lt.	1	ea
Sta 16684+86.22 to Sta 16685+38.92 Rt.	1	ea
Total	4	ea

(A) These items are not to be bid separately. Include in these items in the bid price for "W-Beam Guardrail".

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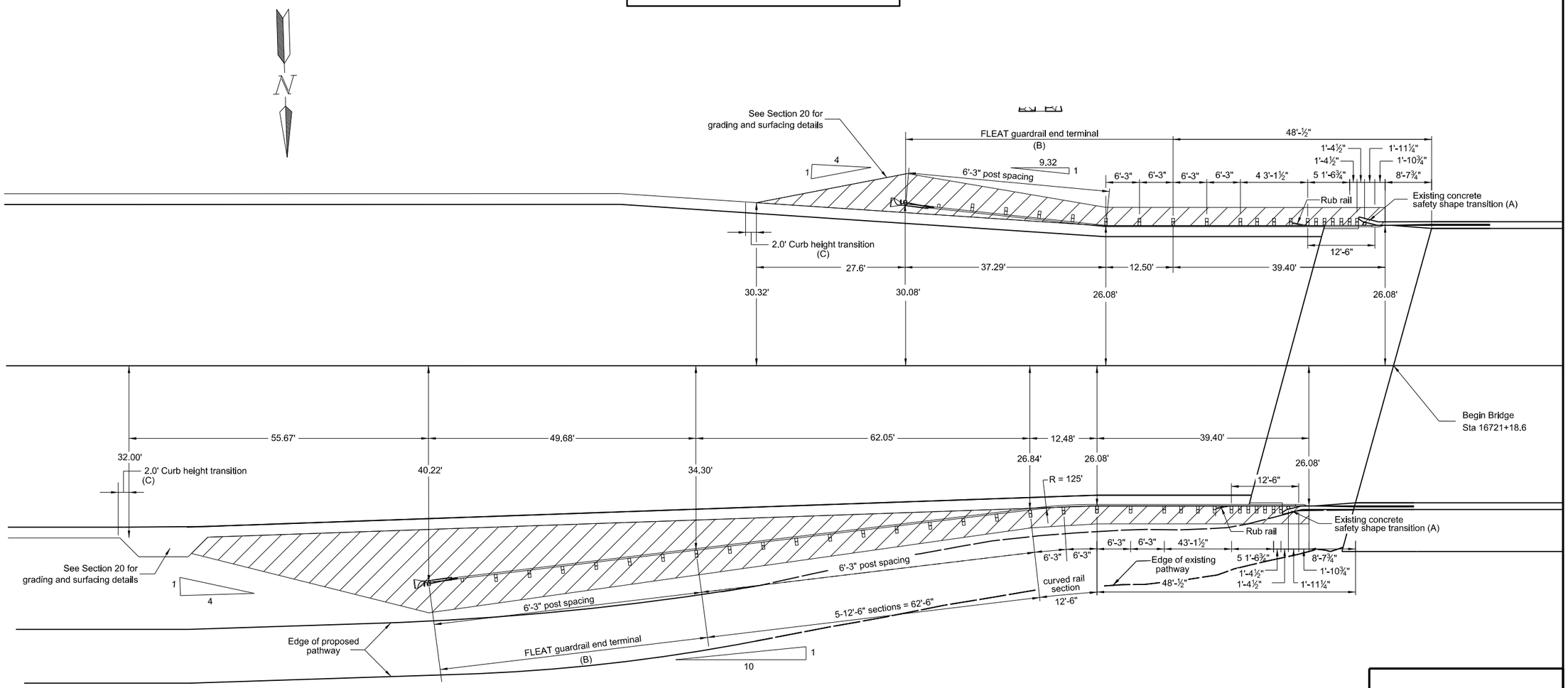
Guardrail

B.N.R.R. Overhead Bridge
RP 315.883
ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	130	4

23 U.S.C. 409
NDDOT Reserves All Objections



Notes: (A) See Standard Drawing D-764-11 for connection to concrete safety shape transition.

(B) Install Flared Energy Absorbing Terminal (FLEAT) per Standard Drawing D-764-6.

(C) Install Type I Curb with maximum curb height of 3"
Sta 16718+83.62 to Sta 16720+92.87 Rt.
Sta 16720+00.22 to Sta 16721+05.74 Lt.

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Guardrail

Little Muddy River Bridge
RP 316.686
ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	130	5

23 U.S.C. 409
NDDOT Reserves All Objections

W-BEAM GUARDRAIL SUMMARY OF QUANTITIES

W-BEAM GUARDRAIL AT BRIDGE ENDS WITH EXISTING SAFETY SHAPE TRANSITION

LOCATION	(A) TERM-INAL CONNEC-TOR	(A) 6" ID STD PIPE 12" LONG	(A) 5/8" Ø x 2" LONG GUARD-RAIL BOLT	(A) 7/8"Ø x 10" LONG HEX HEAD BOLT	(A) 5/8" Ø x 18" LONG GUARD-RAIL BOLT	(A) 6"x 8" x 14" WOOD OFF-SET BLOCK	(A) 6"x 8" x 6' TIMBER POST	(A) 5/8" Ø x 1 1/4" LONG GUARD-RAIL BOLT	(A) 12'-6" DOUBLE RAIL SECTION	(A) 12'-6" STRAIGHT RAIL SECTION	(A) 12'-6" CURVED RAIL SECTION	(A) 5/8" Ø x 12" LONG GUARD-RAIL BOLT	(A) 6" x 8" x 7'-0" TIMBER POSTS	(A) 6" x 8" x 23" WOOD OFFSET BLOCK	(A) 5'- 2 1/16" RUBRAIL SECTION	(A) 12'-6 5/16" RUBRAIL SECTION	(A) 5/8" Ø x 1 ½" LONG HEX HEAD BOLT	(A) 5/8" Ø x 20" LONG GUARD-RAIL BOLT	(A) REFL-ECTOR-IZED PLATES	(A) 7" x 7" x ½" RUBRAIL ANCHOR PLATE	(A) 7 3/4" x 4 1/2" x x 3/8" RUBRAIL SPLICE PLATE	(A) 12" x 12 1/2" x 5/8" PLATE
	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
Sta 16720+77.65 to Sta 16721+17.05 Lt.	1	1	1	7	13	6	9	32	1	2		1	4	7	1	1	4	7	6	1	1	1
Sta 16719+88.97 to Sta 1672+02.89 Rt.	1	1	1	7	25	18	21	80	1	7	1	1	4	7	1	1	4	7	3	1	1	1
TOTAL	2	2	2	14	38	24	30	112	2	9	1	2	8	14	2	2	8	14	9	2	2	2

Remove W-beam guardrail & posts

Sta 16720+78.2 to 16721+17.5 Lt.	39.3	LF
Sta 16720+26.2 to 16721+02.8 Rt.	76.6	LF
Total	115.9	LF

W-beam guardrail

Sta 16720+77.65 to Sta 16721+17.05 Lt.	39.4	LF
Sta 16719+88.97 to Sta 16721+02.89 Rt.	114.4	LF
Total	153.8	LF

Remove end treatment and transition

Sta 16720+41.0 to Sta 16720+78.2 Lt.	1	ea
Sta 16719+89.8 to Sta 16721+26.2 Rt.	1	ea
Total	2	ea

W-beam guardrail end terminal

Sta 16719+36.63 to 16719+88.97 Rt.	1	ea
Sta 16720+25.16 to 16720+77.65 Lt.	1	ea
Total	2	ea

These items are not to be bid separately. Include these items in the bid price for "W-Beam Guardrail".

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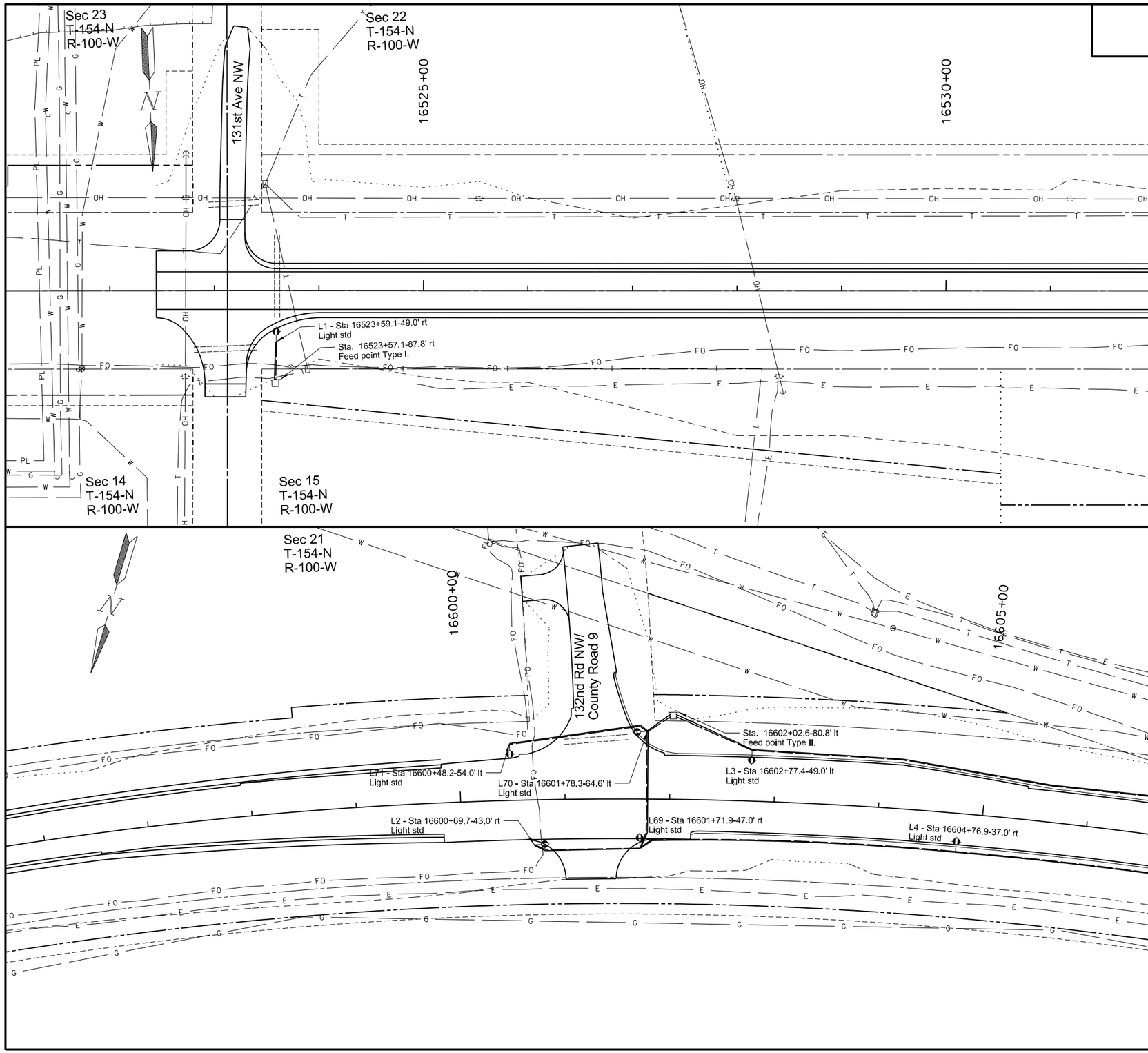
Guardrail

Little Muddy River Bridge
RP 316.686
ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	140	1



New Luminaire

New Conduit/Conductor

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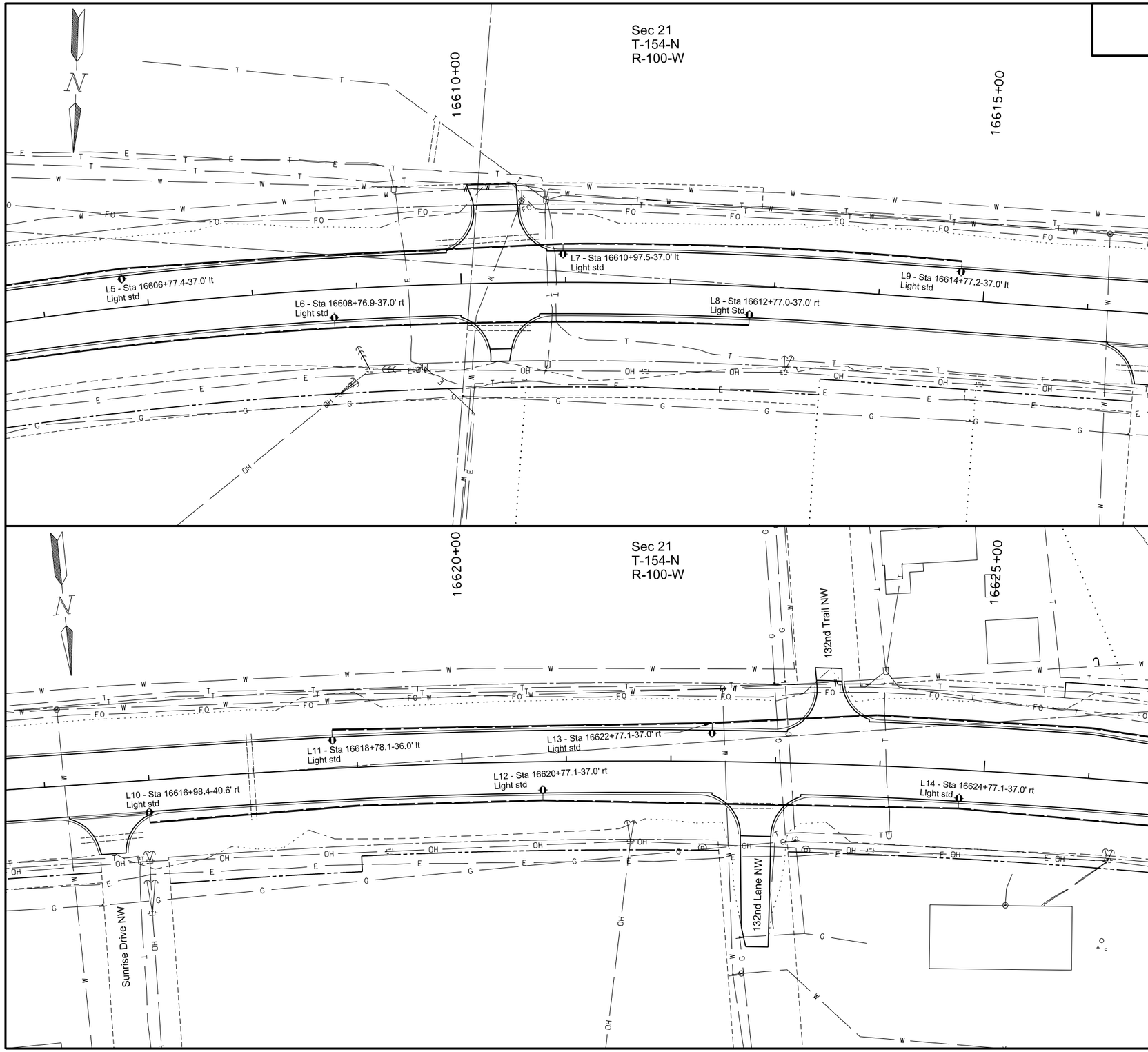
Lighting

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	140	2



New Luminaire

New Conduit/Conductor

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Lighting

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	140	3

New Luminaire

New Conduit/Conductor

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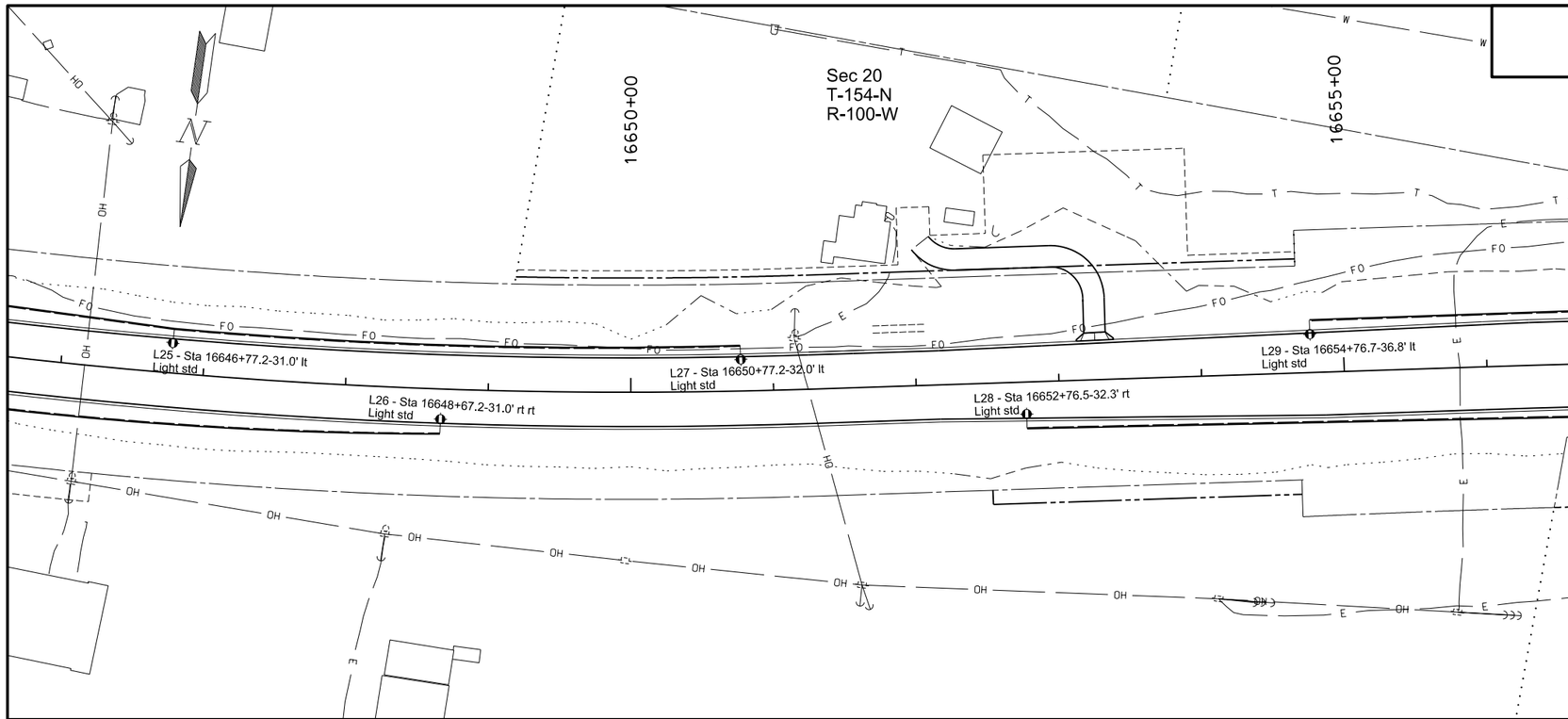
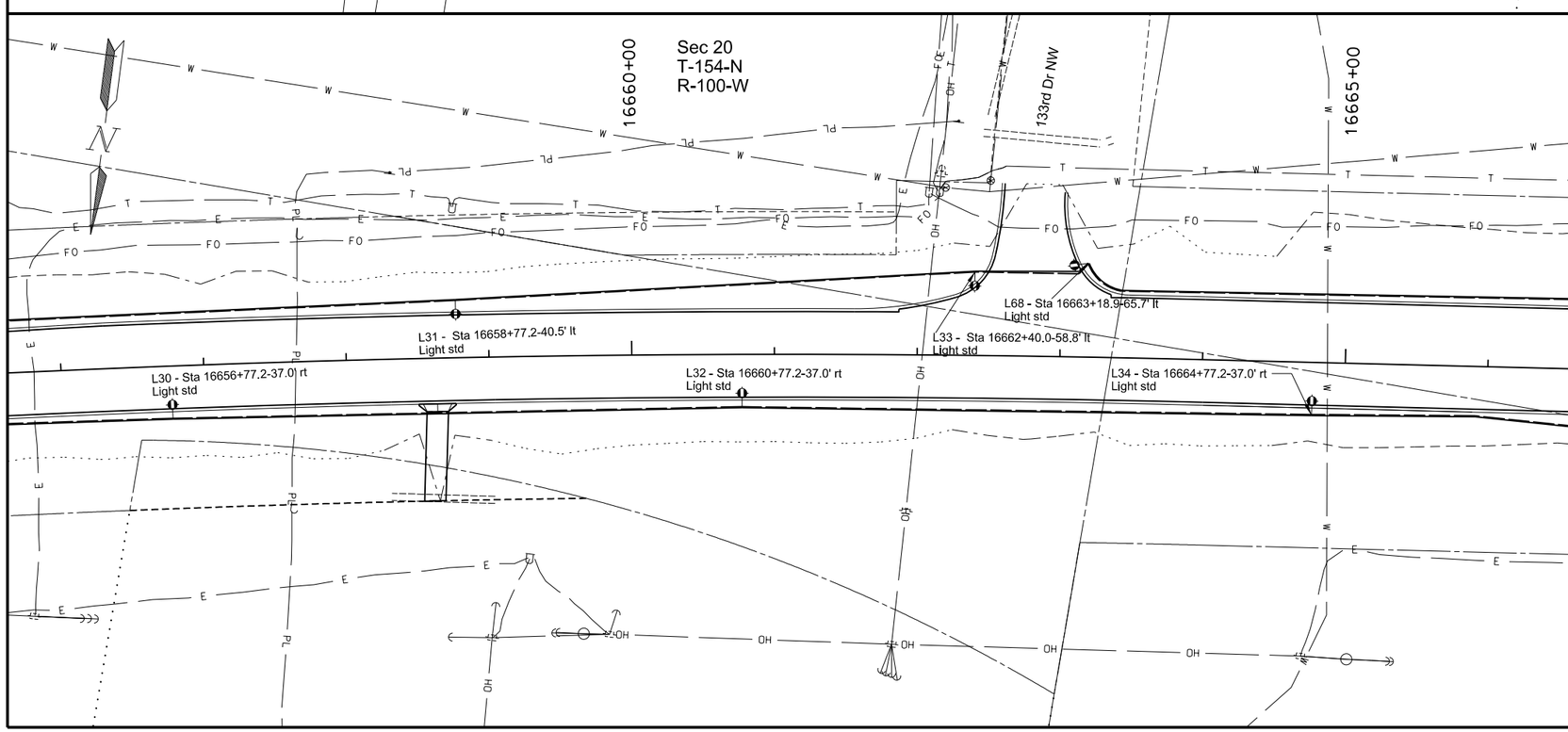
Lighting

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	140	4





New Luminaire

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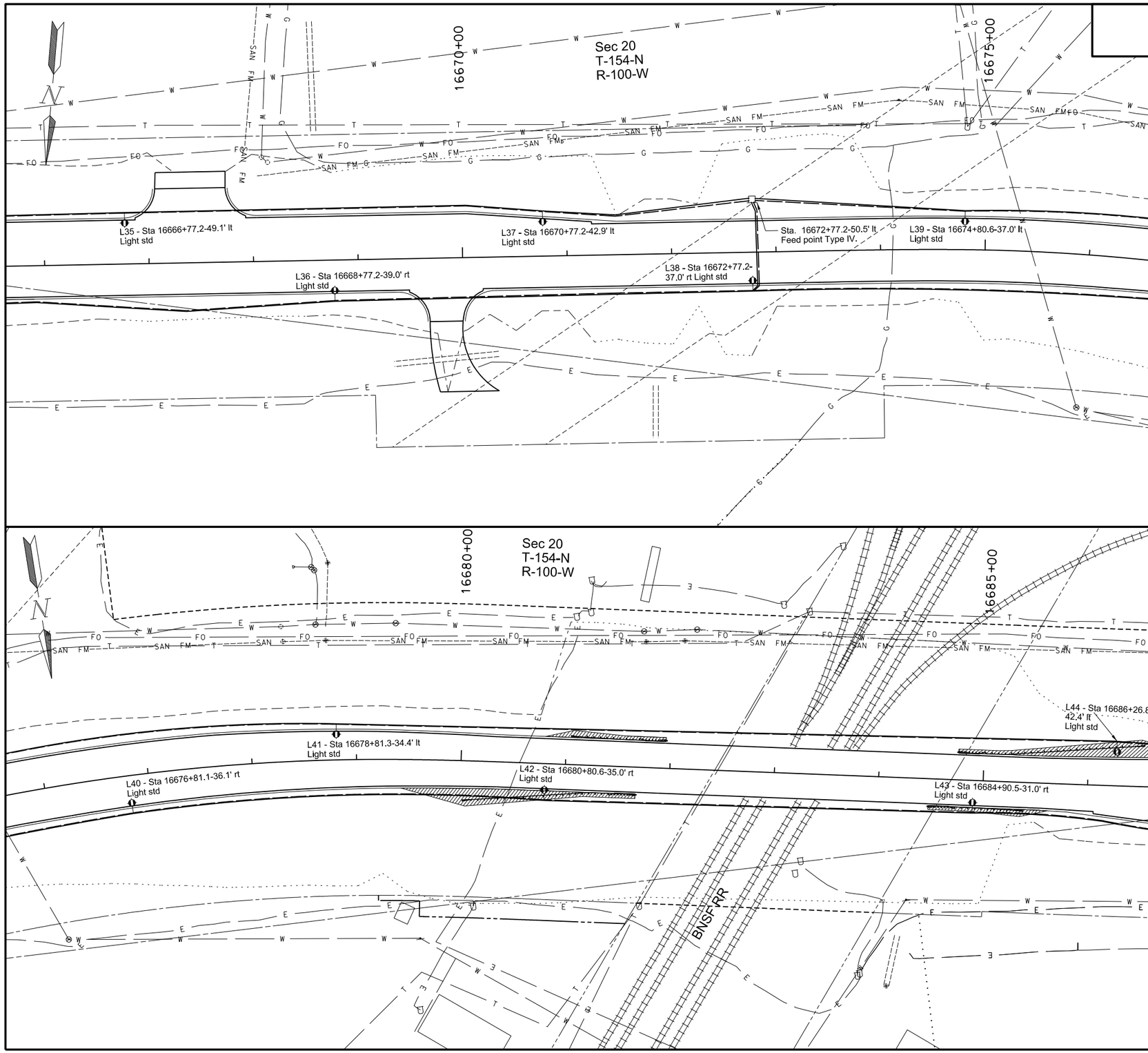
Lighting

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	140	5



New Luminaire

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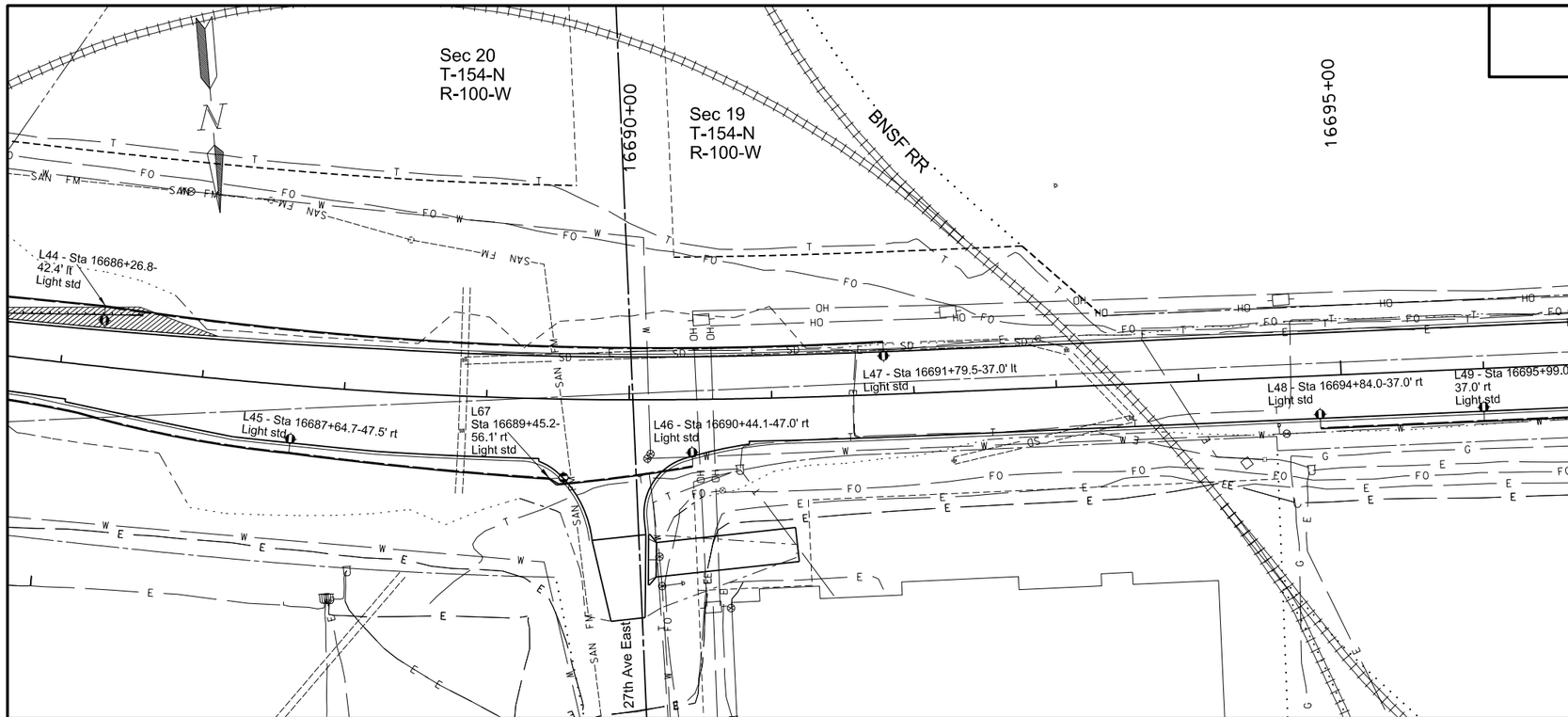
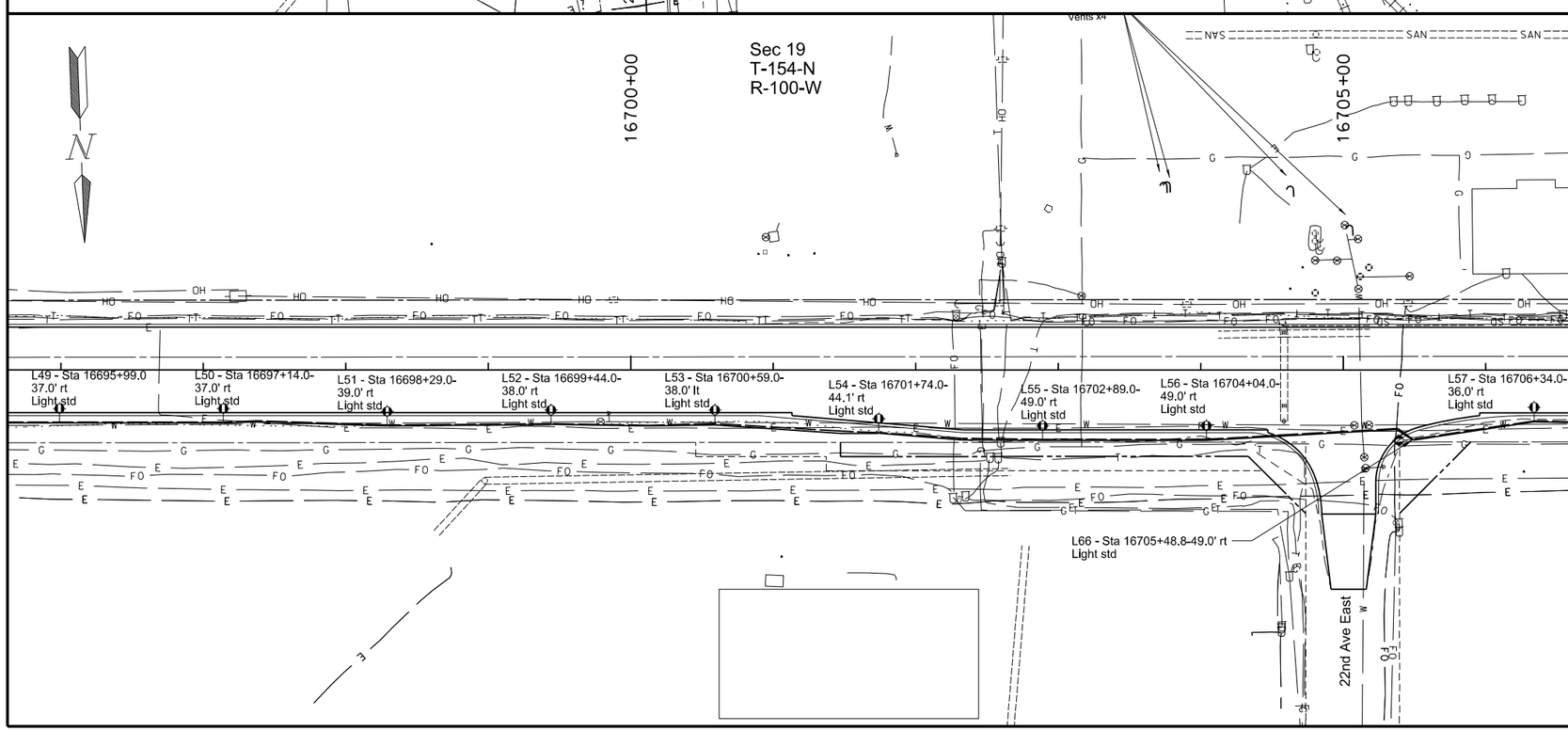
Lighting

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	140	6





New Luminaire

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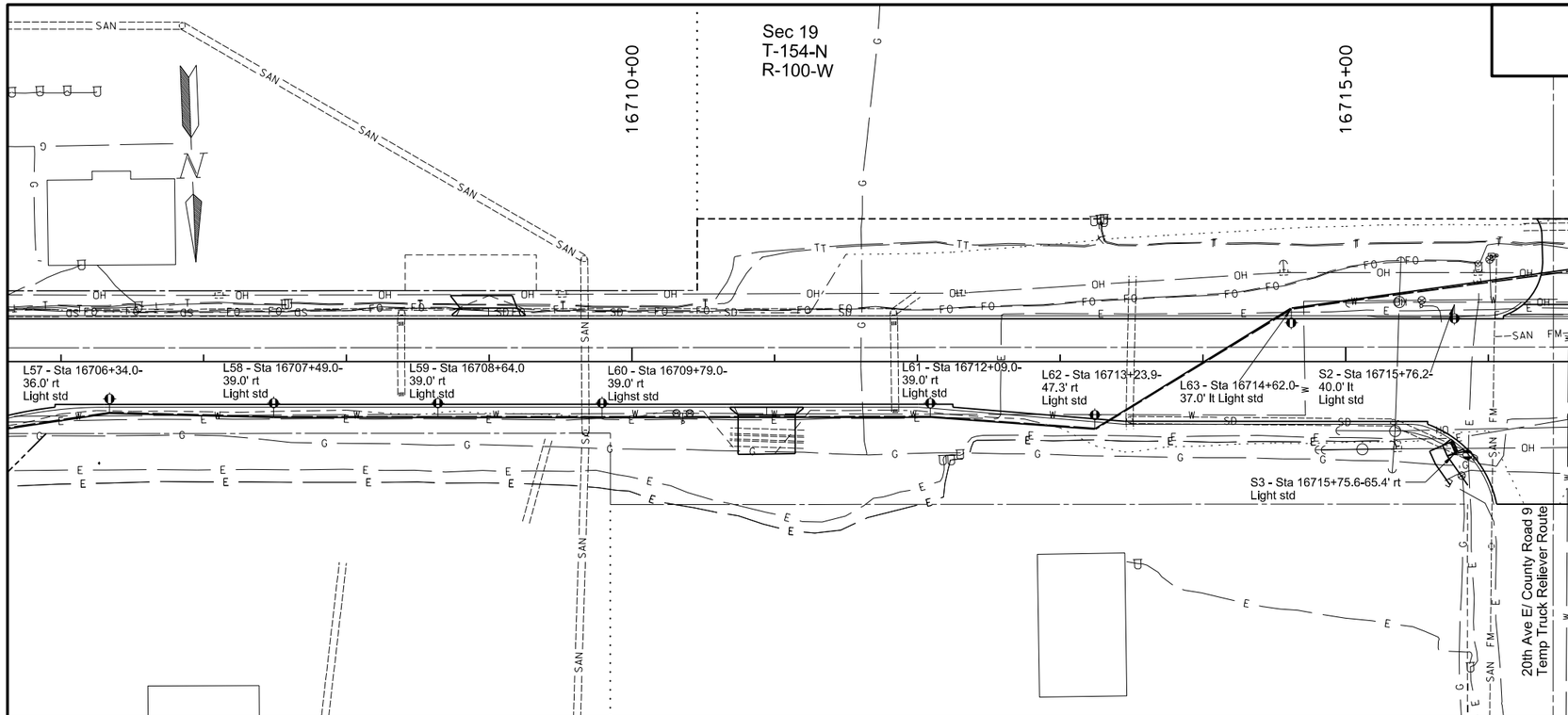
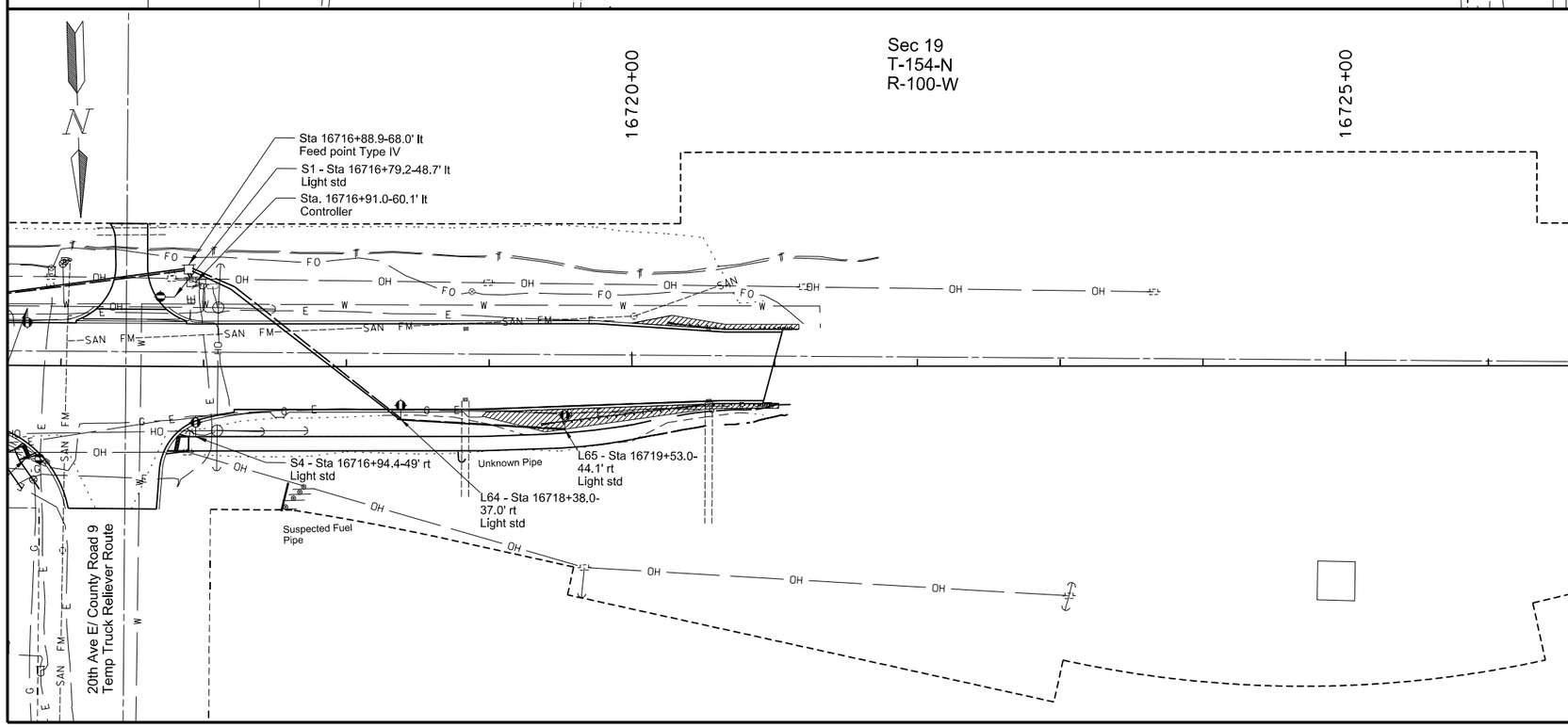
Lighting

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	140	7





New Luminaire

New Conduit/Conductor

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Lighting

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	140	8

Light Standards				
Station	Conduit Runs		Cable Runs	
	LF	DIA	LF	TYPE
16523+57.1-87.8' rt to 16523+59.1-49.0' rt	45	2"	118 59	(2) #6 RHW (1) #6 THW
16602+02.6-80.8' lt to 16602+77.4-49.0' lt	85	2"	198 99	(2) #6 RHW (1) #6 THW
16602+77.4-49.0' lt to 16606+77.4-37.0' lt	420	2"	856 428	(2) #6 RHW (1) #6 THW
16606+77.4-37.0' lt to 16610+97.5-37.0' lt	435	2"	886 443	(2) #6 RHW (1) #6 THW
16610+97.5-37.0' lt to 16614+77.2-37.0' lt	395	2"	806 403	(2) #6 RHW (1) #6 THW
16602+02.6-80.8' lt to 16601+78.3-64.6' lt	35	2"	98 49	(2) #6 RHW (1) #6 THW
16601+78.3-64.6' lt to 16600+77.1-72.3' lt	114	2"	244 122	(2) #6 RHW (1) #6 THW
16601+78.3-64.6' lt to 16601+71.9-47.0' rt	122	2"	260 130	(2) #6 RHW (1) #6 THW
16601+71.9-47.0' rt to 16600+69.7-43.0' rt	115	2"	246 123	(2) #6 RHW (1) #6 THW
16601+71.9-47.0' rt to 16604+76.9-37.0' rt	312	2"	620 320	(2) #6 RHW (1) #6 THW
16604+76.9-37.0' rt to 16608+76.9-37.0' rt	410	2"	836 418	(2) #6 RHW (1) #6 THW
16608+76.9-37.0' rt to 16612+77.0-37.0' rt	410	2"	836 418	(2) #6 RHW (1) #6 THW

Light Standards				
Station	Conduit Runs		Cable Runs	
	LF	DIA	LF	TYPE
16616+98.4-40.6' rt to 16620+77.1-37.0' rt	396	2"	808 404	(2) #6 RHW (1) #6 THW
16620+77.1-37.0' rt to 16624+77.1-37.0' rt	436	2"	888 444	(2) #6 RHW (1) #6 THW
16624+77.1-37.0' rt to 16628+77.2-37.0' rt	420	2"	856 428	(2) #6 RHW (1) #6 THW
16628+77.2-37.0' rt to 16630+58.8-60.6' rt	185	2"	390 195	(2) #6 RHW (1) #6 THW
16630+58.8-60.6' rt to 16630+77.2-37.0' lt	105	2"	238 238 119	(2) #4 RHW (2) #6 RHW (1) #4 THW
16618+78.1-36.0' lt to 16622+77.1-37.0' lt	390	2"	796 398	(2) #6 RHW (1) #6 THW
16622+77.1-37.0' lt to 16626+77.4-42.6' lt	470	2"	956 478	(2) #6 RHW (1) #6 THW
16626+77.4-42.6' lt to 16630+77.2-37.0' lt	405	2"	818 413	(2) #6 RHW (1) #6 THW
16630+58.8-60.6' rt to 16632+77.2-37.0' rt	220	2"	468 234	(2) #6 RHW (1) #6 THW
16632+77.2-37.0' rt to 16637+06.9-41.0' rt	444	2"	904 452	(2) #6 RHW (1) #6 THW
16637+06.9-41.0' rt to 16640+78.0-35.3' rt	395	2"	806 403	(2) #6 RHW (1) #6 THW
16640+78.0-35.3' rt to 16644+77.4-36.1' rt	423	2"	862 431	(2) #6 RHW (1) #6 THW

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Lighting

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	140	9

Light Standards				
Station	Conduit Runs		Cable Runs	
	LF	DIA	LF	TYPE
16644+77.4-36.1' rt to 16648+67.2-31.0' rt	414	2"	844 422	(2) #6 RHW (1) #6 THW
16630+77.2-37.0' lt to 16634+77.2-36.0' lt	420	2"	856 428	(2) #4 RHW (1) #4 THW
16634+77.2-36.0' lt to 16638+77.2-49.0' lt	420	2"	856 428	(2) #6 RHW (1) #6 THW
16638+77.2-49.0' lt to 16642+77.0-31.0' lt	420	2"	856 428	(2) #6 RHW (1) #6 THW
16642+77.0-31.0' lt to 16646+77.2-31.0' lt	420	2"	856 428	(2) #6 RHW (1) #6 THW
16646+77.2-31.0' lt to 16650+77.2-32.0' lt	420	2"	856 428	(2) #6 RHW (1) #6 THW
16652+76.5-32.3' rt to 16656+77.2-37.0' rt	410	2"	836 418	(2) #6 RHW (1) #6 THW
16656+77.2-37.0' rt to 16660+77.2-37.0' rt	410	2"	836 418	(2) #6 RHW (1) #6 THW
16660+77.2-37.0' rt to 16664+77.2-37.0' rt	410	2"	836 418	(2) #6 RHW (1) #6 THW
16664+77.2-37.0' rt to 16668+77.2-39.0' rt	411	2"	838 419	(2) #6 RHW (1) #6 THW
16668+77.2-39.0' rt to 16672+77.2-37.0' rt	400	2"	816 408	(2) #6 RHW (1) #6 THW

Light Standards				
Station	Conduit Runs		Cable Runs	
	LF	DIA	LF	TYPE
16672+77.2-37.0' rt to 16672+77.2-50.6' lt	90	2"	208 208 104	(2) #4 RHW (2) #6 RHW (1) #4 THW
16654+76.7-36.8' lt to 16658+77.2-40.5' lt	411	2"	838 419	(2) #6 RHW (1) #6 THW
16658+77.2-40.5' lt to 16662+40.0-58.8' lt	365	2"	746 373	(2) #6 RHW (1) #6 THW
16662+40.0-58.8' lt to 16663+18.9-65.7' lt	110	2"	236 118	(2) #6 RHW (1) #6 THW
16663+18.9-65.7' lt to 16666+77.2-49.1' lt	372	2"	760 380	(2) #6 RHW (1) #6 THW
16666+77.2-49.1' lt to 16670+77.2-42.9' lt	411	2"	838 419	(2) #6 RHW (1) #6 THW
16670+77.2-42.9' lt to 16672+77.2-50.6' lt	205	2"	438 219	(2) #6 RHW (1) #6 THW
16672+77.2-37.0' rt to 16676+81.1-36.1' rt	410	2"	836 418	(2) #4 RHW (1) #4 THW
16676+81.1-36.1' rt to 16680+80.6-35.0' rt	405	2"	826 413	(2) #4 RHW (1) #4 THW
16680+80.6-35.0' rt to 16684+90.5-31.0' rt	421	2"	858 429	(2) #4 RHW (1) #4 THW
16684+90.5-31.0' rt to 16687+64.7-47.5' rt	285	2"	586 295	(2) #6 RHW (1) #6 THW

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Lighting

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	140	10

Light Standards				
Station	Conduit Runs		Cable Runs	
	LF	DIA	LF	TYPE
16687+64.7-47.5' rt to 16689+45.2-56.1' rt	194	2"	404 202	(2) #6 RHW (1) #6 THW
16689+45.2-56.1' rt 16690+44.1-47.0' rt	111	2"	238 119	(2) #6 RHW (1) #6 THW
16672+77.2-50.6' lt to 16674+80.6-37.0' lt	205	2"	438 219	(2) #6 RHW (1) #6 THW
16674+80.6-37.0' lt to 16678+81.3-34.4' lt	420	2"	856 428	(2) #6 RHW (1) #6 THW
16678+81.3-34.4' lt to 16686+26.8-42.4' lt	760	2"	1536 768	(2) #6 RHW (1) #6 THW
16686+26.8-42.4' lt to 16691+79.5-37.0' lt	560	2"	1136 568	(2) #6 RHW (1) #6 THW
16694+84.0-37.0' rt to 16695+99.0-37.0' rt	125	2"	532 133	(4) #4 RHW (1) #4 THW
16695+99.0-37.0' rt to 16697+14.0-37.0' rt	125	2"	532 133	(4) #4 RHW (1) #4 THW
16697+14.0-37.0' rt to 16698+29.0-39.0' rt	125	2"	532 133	(4) #4 RHW (1) #4 THW
16698+29.0-39.0' rt to 16699+44.0-38.0' rt	125	2"	532 133	(4) #4 RHW (1) #4 THW
16699+44.0-38.0' rt to 16700+59.0-38.0' lt	125	2"	532 133	(4) #4 RHW (1) #4 THW
16700+59.0-38.0' lt to 16701+74.0-44.1' rt	125	2"	532 133	(4) #4 RHW (1) #4 THW

Light Standards				
Station	Conduit Runs		Cable Runs	
	LF	DIA	LF	TYPE
16701+74.0-44.1' rt to 16702+89.0-49.0' rt	125	2"	532 133	(4) #4 RHW (1) #4 THW
16702+89.0-49.0' rt to 16704+04.0-49.0' rt	125	2"	532 133	(4) #4 RHW (1) #4 THW
16704+04.0-49.0' rt to 16705+48.8-49.0' rt	155	2"	652 163	(4) #4 RHW (1) #4 THW
16705+48.8-49.0' rt to 16706+34.0-36.0' rt	96	2"	416 104	(4) #4 RHW (1) #4 THW
16706+34.0-36.0' rt to 16707+49.0-39.0' rt	125	2"	532 133	(4) #4 RHW (1) #4 THW
16707+49.0-39.0' rt to 16708+64.0-39.0' rt	125	2"	532 532 133	(2) #3 RHW (2) #4 RHW (1) #3 THW
16708+64.0-39.0' rt to 16709+79.0-39.0' rt	125	2"	532 133	(4) #3 RHW (1) #3 THW
16709+79.0-39.0' rt to 16712+09.0-39.0' rt	240	2"	992 248	(4) #3 RHW (1) #3 THW
16712+09.0-39.0' rt to 16713+23.9-47.3' rt	125	2"	532 133	(4) #3 RHW (1) #3 THW
16713+23.9-47.3' rt to 16714+62.0-37.0' lt	160	2"	672 168	(4) #3 RHW (1) #3 THW
16714+62.0-37.0' lt to 16716+88.9-68.0' lt	245	2"	1036 259	(4) #3 RHW (1) #3 THW

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Lighting

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	140	11

Light Standards				
Station	Conduit Runs		Cable Runs	
	LF	DIA	LF	TYPE
16716+88.9-68.0' lt to 16718+38.0-37.0' rt	185	2"	398 199	(2) #6 RHW (1) #6 THW
16718+38.0-37.0' rt to 16719+53.0-44.1' rt	125	2"	266 133	(2) #6 RHW (1) #6 THW
16716+88.9-68.0' lt to 16716+91.0-60.1' lt	25	2"	90 45	(2) #6 RHW (1) #6 THW

Light Standards						
No.	Station	Wattage	IES-Type	Mounting	Pole Ht.	Mast Arm
L1	16523+59.1-49.0' rt	274	III	SINGLE	42	6
L2	16600+69.7-43.0' rt	274	III	SINGLE	42	6
L3	16602+77.4-49.0' lt	274	III	SINGLE	42	6
L4	16604+76.9-37.0' rt	274	III	SINGLE	42	6
L5	16606+77.4-37.0' lt	274	III	SINGLE	42	6
L6	16608+76.9-37.0' rt	274	III	SINGLE	42	6
L7	16610+97.5-37.0' lt	274	III	SINGLE	42	6
L8	16612+77.0-37.0' rt	274	III	SINGLE	42	6
L9	16614+77.2-37.0' lt	274	III	SINGLE	42	6
L10	16616+98.4-40.6' rt	274	III	SINGLE	42	6
L11	16618+78.1-36.0' lt	274	III	SINGLE	42	6
L12	16620+77.1-37.0' rt	274	III	SINGLE	42	6
L13	16622+77.1-37.0' lt	274	III	SINGLE	42	6
L14	16624+77.1-37.0' rt	274	III	SINGLE	42	6
L15	16626+77.4-42.6' lt	274	III	SINGLE	42	6
L16	16628+77.2-37.0' rt	274	III	SINGLE	42	6
L17	16630+77.2-37.0' lt	274	III	SINGLE	42	6
L18	16632+77.2-37.0' rt	274	III	SINGLE	42	6
L19	16634+77.2-36.0' lt	274	III	SINGLE	42	6
L20	16637+06.9-41.0' rt	274	III	SINGLE	42	6
L21	16638+77.2-49.0' lt	274	III	SINGLE	42	6
L22	16640+78.0-35.3' rt	274	III	SINGLE	42	6
L23	16642+77.0-31.0' lt	274	III	SINGLE	42	6
L24	16644+77.4-36.1' rt	274	III	SINGLE	42	6
L25	16646+77.2-31.0' lt	274	III	SINGLE	42	6
L26	16648+67.2-31.0' rt	274	III	SINGLE	42	6
L27	16650+77.2-32.0' lt	274	III	SINGLE	42	6
L28	16652+76.5-32.3' rt	274	III	SINGLE	42	6
L29	16654+76.7-36.8' lt	274	III	SINGLE	42	6
L30	16656+77.2-37.0' rt	274	III	SINGLE	42	6
L31	16658+77.2-40.5' lt	274	III	SINGLE	42	6
L32	16660+77.2-37.0' rt	274	III	SINGLE	42	6
L33	16662+40.0-58.8' lt	274	III	SINGLE	42	6
L34	16664+77.2-37.0' rt	274	III	SINGLE	42	6
L35	16666+77.2-49.1' lt	274	III	SINGLE	42	6
L36	16668+77.2-39.0' rt	274	III	SINGLE	42	6
L37	16670+77.2-42.9' lt	274	III	SINGLE	42	6

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Lighting

1804 Reconstruction

Williams County, ND

Light Standards						
No.	Station	Wattage	IES-Type	Mounting	Pole Ht.	Mast Arm
L38	16672+77.2-37.0' rt	274	III	SINGLE	42	6
L39	16674+80.6-37.0' lt	274	III	SINGLE	42	6
L40	16676+81.1-36.1' rt	274	III	SINGLE	42	6
L41	16678+81.3-34.4' lt	274	III	SINGLE	42	6
L42	16680+80.6-35.0' rt	274	III	SINGLE	42	6
L43	16684+90.5-31.0' rt	274	III	SINGLE	42	6
L44	16686+26.8-42.4' lt	274	III	SINGLE	42	6
L45	16687+64.7-47.5' rt	274	III	SINGLE	42	6
L46	16690+44.1-47.0' rt	274	III	SINGLE	42	6
L47	16691+79.5-37.0' lt	274	III	SINGLE	42	6
L48	16694+84.0-37.0' rt	274	III	SINGLE	42	6
L49	16695+99.0-37.0' rt	274	III	SINGLE	42	6
L50	16697+14.0-37.0' rt	274	III	SINGLE	42	6
L51	16698+29.0-39.0' rt	274	III	SINGLE	42	6
L52	16699+44.0-38.0' rt	274	III	SINGLE	42	6
L53	16700+59.0-38.0' lt	274	III	SINGLE	42	6
L54	16701+74.0-44.1' rt	274	III	SINGLE	42	6
L55	16702+89.0-49.0' rt	274	III	SINGLE	42	6
L56	16704+04.0-49.0' rt	274	III	SINGLE	42	6
L57	16706+34.0-36.0' rt	274	III	SINGLE	42	6
L58	16707+49.0-39.0' rt	274	III	SINGLE	42	6
L59	16708+64.0-39.0' rt	274	III	SINGLE	42	6
L60	16709+79.0-39.0' rt	274	III	SINGLE	42	6
L61	16712+09.0-39.0' rt	274	III	SINGLE	42	6
L62	16713+23.9-47.3' rt	274	III	SINGLE	42	6
L63	16714+62.0-37.0' lt	274	III	SINGLE	42	6
L64	16718+38.0-37.0' rt	274	III	SINGLE	42	6
L65	16719+53.0-44.1' rt	274	III	SINGLE	42	6
L66	16705+48.8-49.0' rt	274	III	SINGLE	42	6
L67	16689+45.2-56.1' rt	274	III	SINGLE	42	6
L68	16663+18.9-65.7' lt	274	III	SINGLE	42	6
L69	16601+71.9-47.0' rt	274	III	SINGLE	42	6
L70	16601+78.3-64.6' lt	274	III	SINGLE	42	6
L71	16600+48.2-54.0' lt	274	III	SINGLE	42	6
S1	16716+79.2-48.7' lt	274	III	Signal Standard Extension	42	6
S2	16715+76.2-40.0' lt	274	III	Signal Standard Extension	42	6
S3	16715+75.6-65.4' rt	274	III	Signal Standard Extension	42	6
S4	16716+94.4-49.0' rt	274	III	Signal Standard Extension	42	6

1804 RECONSTRUCTION QUANTITIES (A)													
CONCRETE FOUNDATION - HIGHWAY LIGHTING	2IN DIAMETER RIGID CONDUIT	UNDERGROUND CONDUCTOR NO3 - TYPE RHW	UNDERGROUND CONDUCTOR NO4 - TYPE RHW	UNDERGROUND CONDUCTOR NO6 - TYPE RHW	UNDERGROUND CONDUCTOR NO3 - TYPE THW	UNDERGROUND CONDUCTOR NO4 - TYPE THW	UNDERGROUND CONDUCTOR NO6 - TYPE THW	FEED POINT - TYPE I - PAD MOUNTED	FEED POINT - TYPE II - PAD MOUNTED	FEED POINT - TYPE IV - PAD MOUNTED	LT STD 6FT MA 42FT MT HT BREAKAWAY	LED LUMINAIRE - 274 WATT	LIGHTING SYSTEM
EA	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA
71	20208	4296	10210	34006	1074	3375	17224	1	1	3	71	75	1

(A) These items shall not be bid separately but shall be included in the price bid for the “LIGHTING SYSTEM”.

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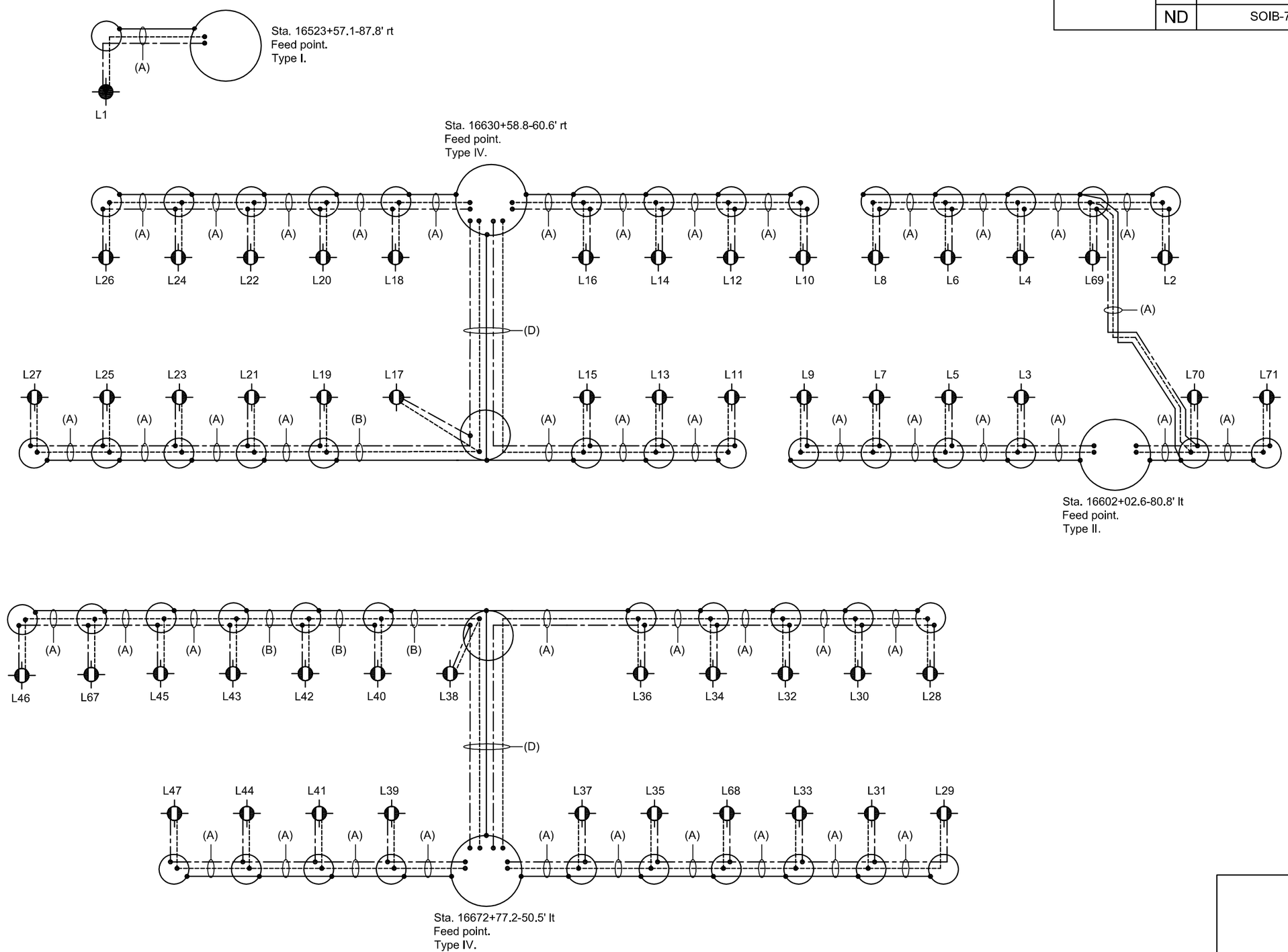
Lighting

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	140	13



LEGEND

	LED Roadway Luminaire 274 Watt
	Light Standard
	Feed Point
##	Light Standard number
	Pull Box
	Phase Conductor
	Phase Conductor
	Ground Conductor

WIRE LEGEND

(A)	2 - #6 AWG CU 1 - #6 AWG CU GND
(B)	2 - #4 AWG CU 1 - #4 AWG CU GND
(C)	4 - #6 AWG CU 1 - #6 AWG CU GND
(D)	2 - #4 AWG CU 2 - #6 AWG CU 1 - #4 AWG CU GND
(E)	4 - #4 AWG CU 1 - #4 AWG CU GND
(F)	4 - #3 AWG CU 1 - #3 AWG CU GND
(G)	2 - #3 AWG CU 2 - #4 AWG CU 1 - #3 AWG CU GND

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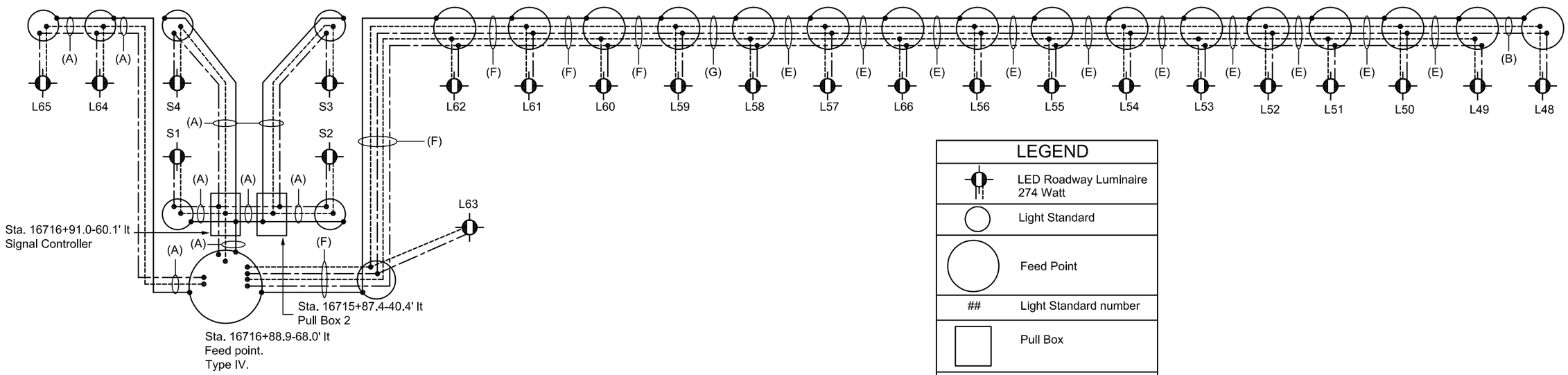
Lighting

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	140	14



LEGEND

	LED Roadway Luminaire 274 Watt
	Light Standard
	Feed Point
##	Light Standard number
	Pull Box
—— - ——	Phase Conductor
----------	Phase Conductor
————	Ground Conductor

WIRE LEGEND

(A)	2 - #6 AWG CU 1 - #6 AWG CU GND
(B)	2 - #4 AWG CU 1 - #4 AWG CU GND
(C)	4 - #6 AWG CU 1 - #6 AWG CU GND
(D)	2 - #4 AWG CU 2 - #6 AWG CU 1 - #4 AWG CU GND
(E)	4 - #4 AWG CU 1 - #4 AWG CU GND
(F)	4 - #3 AWG CU 1 - #3 AWG CU GND
(G)	2 - #3 AWG CU 2 - #4 AWG CU 1 - #3 AWG CU GND

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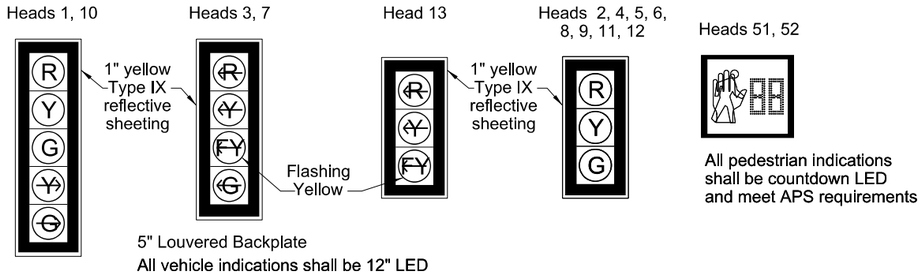
Lighting

1804 Reconstruction

Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	150	1



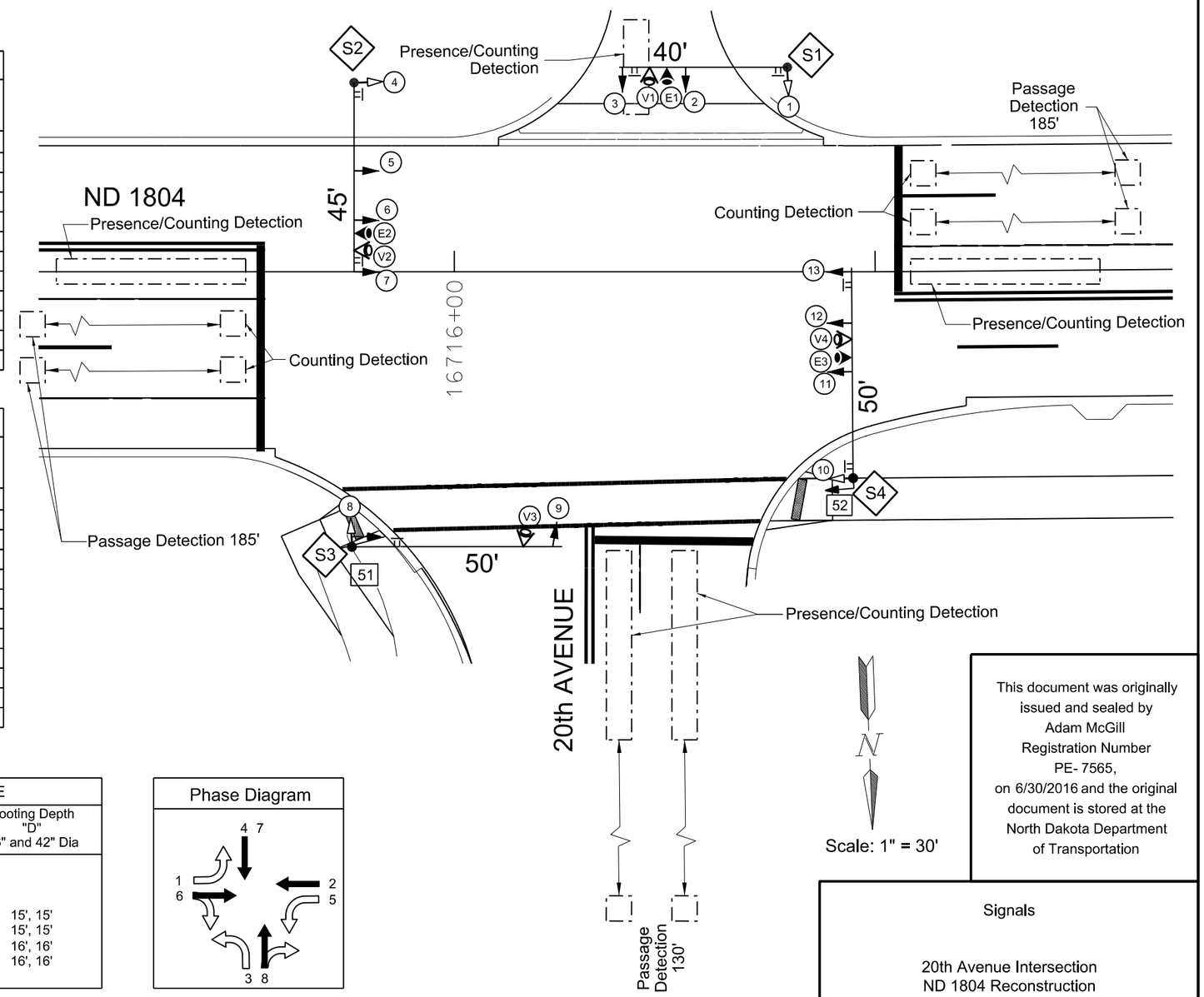
Legend

- S# Vehicle Signal Standard Number
- # Signal Head Number
- P# Pedestrian Head Number
- V# Video Detector Number
- E# EVD Detector Number
- Pedestrian Signal
- Mast Mounted Signal
- Pole Mounted Signal
- EVD Detector
- Video Detector
- Traffic Sign

Notes:
1. Install the pedestrian push buttons so that the face of it is parallel to the crosswalk

CONDUCTORS			CABLE 1 and 2 (NO.14 AWG 12 Conductors)				
	BASE	TRACER	Cable 1		Cable 2		INDICATION
			Phase	Head	Phase	Head	
1	Black		3	3			Green Arrow
2	White						Neutral
3	Red		8	1, 2	2	4, 5, 6	Red
4	Green						Ground
5	Orange		8	1, 2	2	4, 5, 6	Yellow
6	Blue		8	1, 2	2	4, 5, 6	Green
7	White	Black	3	3	5	7	Flashing Yellow Arrow
8	Red	Black	3	3	5	7	Red Arrow
9	Green	Black	3	3			Yellow Arrow
10	Orange	Black	5	1	5	7	Yellow Arrow
11	Blue	Black	5	1	5	7	Green Arrow
12	Black	White					Spare

CONDUCTORS			CABLE 3 and 4 (NO.14 AWG 12 Conductors)				
	BASE	TRACER	Cable 3		Cable 4		INDICATION
			Phase	Head	Phase	Head	
1	Black		6	51	6	52	Walk
2	White						Neutral
3	Red		4	8, 9	6	10, 11, 12	Red
4	Green						Ground
5	Orange		4	8, 9	6	10, 11, 12	Yellow
6	Blue		4	8, 9	6	10, 11, 12	Green
7	White	Black	7		1	13	Flashing Yellow Arrow
8	Red	Black	7		1	13	Red Arrow
9	Green	Black	6	51	6	52	Don't Walk
10	Orange	Black	7		1	13	Yellow Arrow
11	Blue	Black	7		3	10	Yellow Arrow
12	Black	White			3	10	Green Arrow



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Video Detector Schedule		
Detector	Phase	Type
V1	8/3	Video
V2	2/5	Video
V3	4/7	Video
V4	6/1	Video

SIGNAL STANDARD FOUNDATION TABLE		
Description	Footing Depth "D" 24" and 30" Dia	Footing Depth "D" 36" and 42" Dia
Combination Signal and Light Stds 30' Mounting Height		
S1 - Combo 40' Mast Arm	16', 16'	15', 15'
S2 - Combo 45' Mast Arm	16', 16'	15', 15'
S3 - Combo 50' Mast Arm	17', 16'	16', 16'
S4 - Combo 50' Mast Arm	17', 16'	16', 16'

Phase Diagram

Signals

20th Avenue Intersection
ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	150	2

STATION	CONDUIT RUNS			CABLE RUNS	
	Run	LF	(Qty) Dia	LF	Type
16716+91-60.1' LT to 16716+86 - 53.4' LT	A	28	(1) 2"	56 28	(2) No. 6 RHW-USE Power Supply (1) No. 6 THW Power Supply
16716+86 - 53.4 LT to 16716+79.2 - 48.7' LT	B	22	(2) 3"	22 22 22 44 22	(1) Cable 1, 12 Conductor (a) (1) Video Coaxial & Video Power(c) (1) EVD Cable (d) (2) No. 6 RHW (e) (1) No. 6 THW (e)
16716+86 - 49.4 LT to 16716+79 - 48.6' LT to 16715+87.4 - 40.4' LT	C	119	(2) 3"	119 119 119 238 119 238 119	(1) Cable 2-12 Conductor (a) (1) Cable 3-12 Conductor (a) (1) No. 14 AWG - 5 Conductor (b) (2) Video Coaxial & Video Power (c) (1) EVD Cable (d) (2) No. 6 RHW (e) (1) No. 6 THW (e)
16715+76.2 - 45.0 LT to 16715+87.4 - 40.4' LT	D	23	(2) 3"	23 23 23 46 23	(1) Cable 2-12 Conductor (a) (1) Video Coaxial & Video Power (c) (1) EVD Cable (d) (2) No. 6 RHW (e) (1) No. 6 THW (e)
16715+87.4 - 40.4' LT to 16715+75.6 - 65.4' RT	E	117	(2) 3"	117 117 117 234 117	(1) Cable 3-12 Conductor (a) (1) No. 14 AWG - 5 Conductor (b) (1) Video Coaxial & Video Power (c) (2) No. 6 RHW (e) (1) No. 6 THW (e)
16716+86 - 49.4 LT to 16716+92.1 - 50.7' RT	F	117	(2) 3"	117 117 117 117 234 117	(1) Cable 4-12 Conductor (a) (1) No. 14 AWG - 5 Conductor (b) (1) Video Coaxial & Video Power (c) (1) EVD Cable (d) (2) No. 6 RHW (e) (1) No. 6 THW (e)

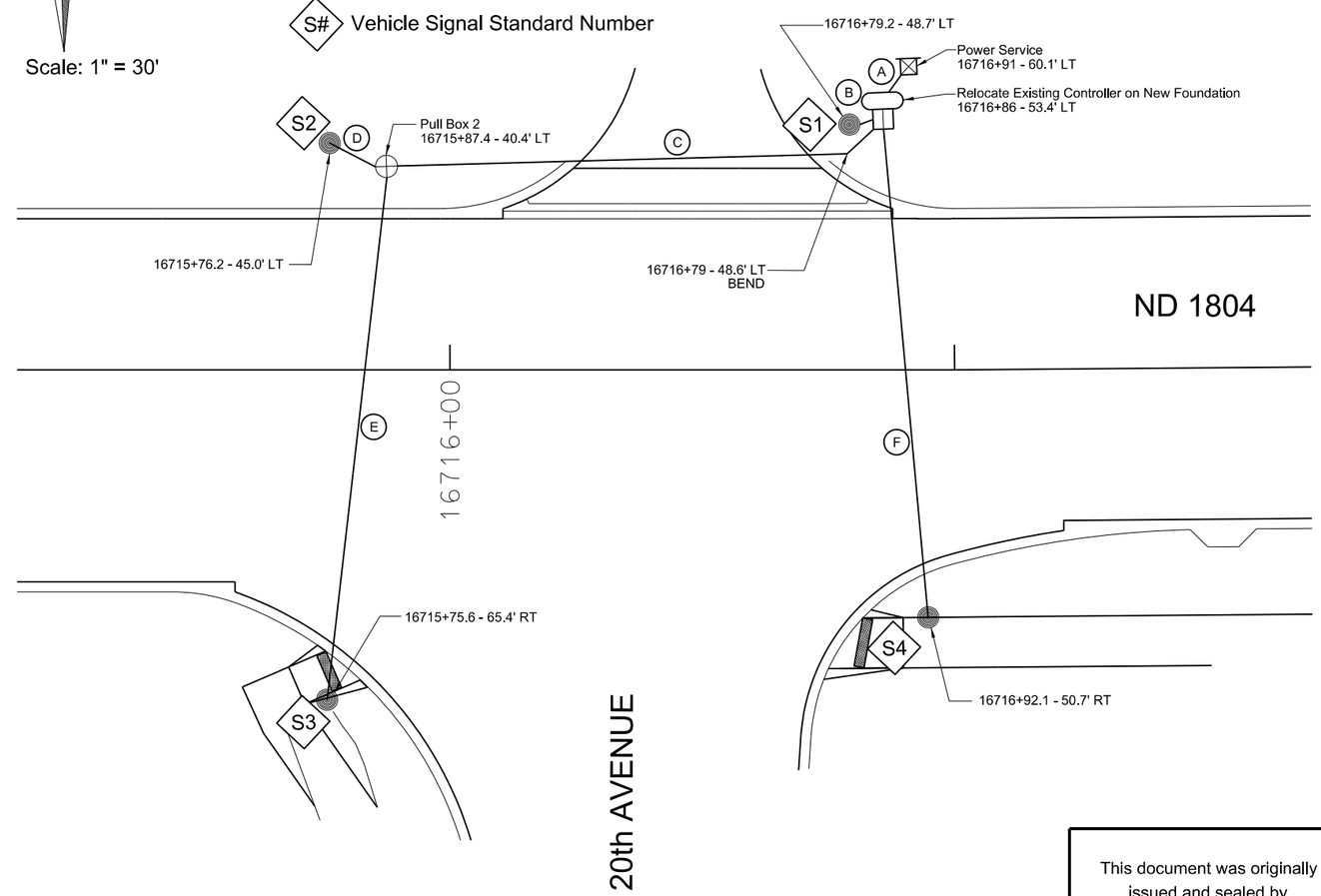
(a) Indicator Cable (No. 14 AWG 12 Conductor, see sheet 1)
(b) Pedestrian Pushbutton Cable
(c) Video Detection - (As Required by Manufacturer)
(d) Emergency Vehicle Detector Cable
(e) Intersection Lighting Cable

Legend

- Overhead Cable Number
- Conduit Run
- Vehicle Signal Standard
- Pull Box
- S# Vehicle Signal Standard Number

N

Scale: 1" = 30'



Note:
1. Install an additional 2-inch conduit in each traffic signal standard foundation and traffic signal cabinet foundation. Place a label on the additional conduits indicating the cardinal direction the conduit runs. Cap both ends of additional conduit.

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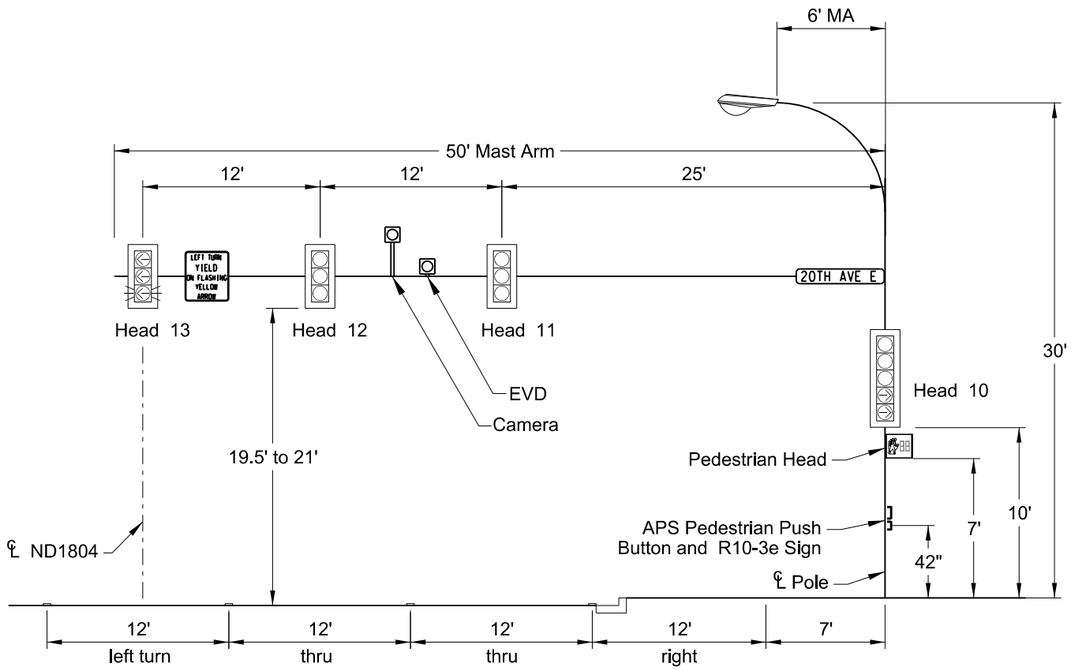
Signals

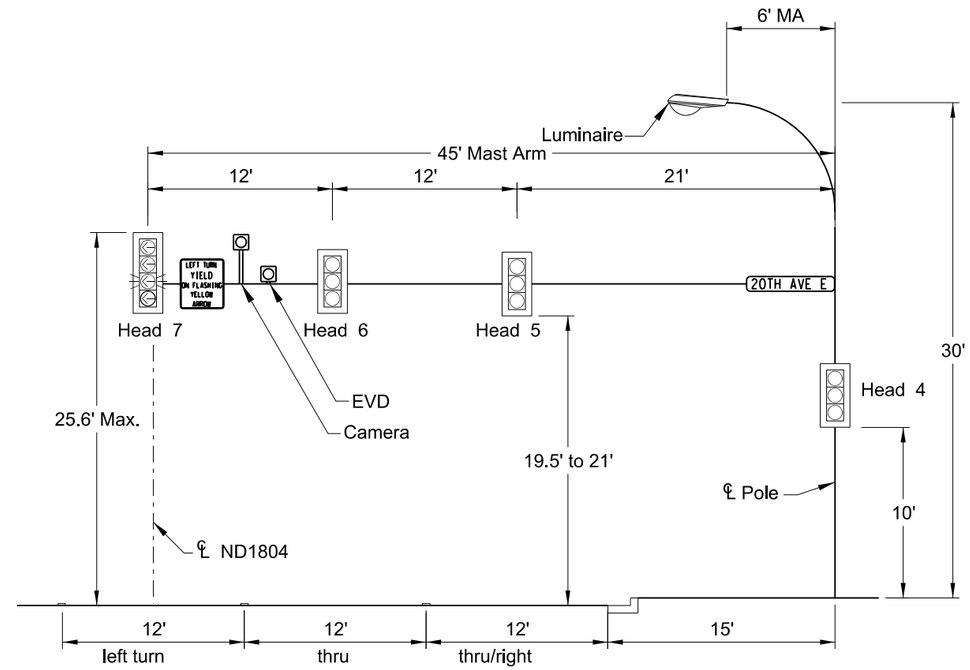
20th Avenue Intersection
ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	150	3

Traffic Signal Pole and Luminaire Profiles



Signal Standard: S4 WB View



Signal Standard: S2 EB View

Notes:
1. Position the heads to provide the best possible view for the traffic to be controlled.

TRAFFIC SIGNAL POLE & LUMINAIRE SCHEDULE

POLE	MAST ARM LENGTH (FT)	COORDINATES FOR CENTER OF DRILLED SHAFT FOUNDATION		LUMINAIRE (POLE MOUNT)					
		STATION	OFFSET	MODEL	ARM LENGTH	TYPE	VOLTS	OPTICS	TILT
S2	45	16715+76.2	45.0' LT	COBRA HEAD	6'	LED	240 VAC	ROADWAY TYPE III DISTRIBUTION	0 degree
S4	50	16716+92.1	50.7' RT	COBRA HEAD	6'	LED	240 VAC	ROADWAY TYPE III DISTRIBUTION	0 degree

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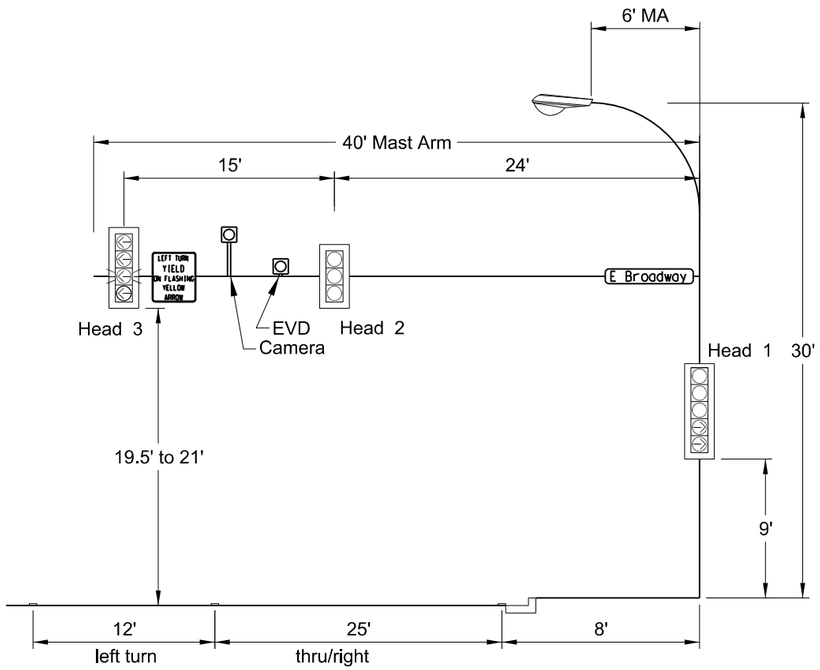
Signals

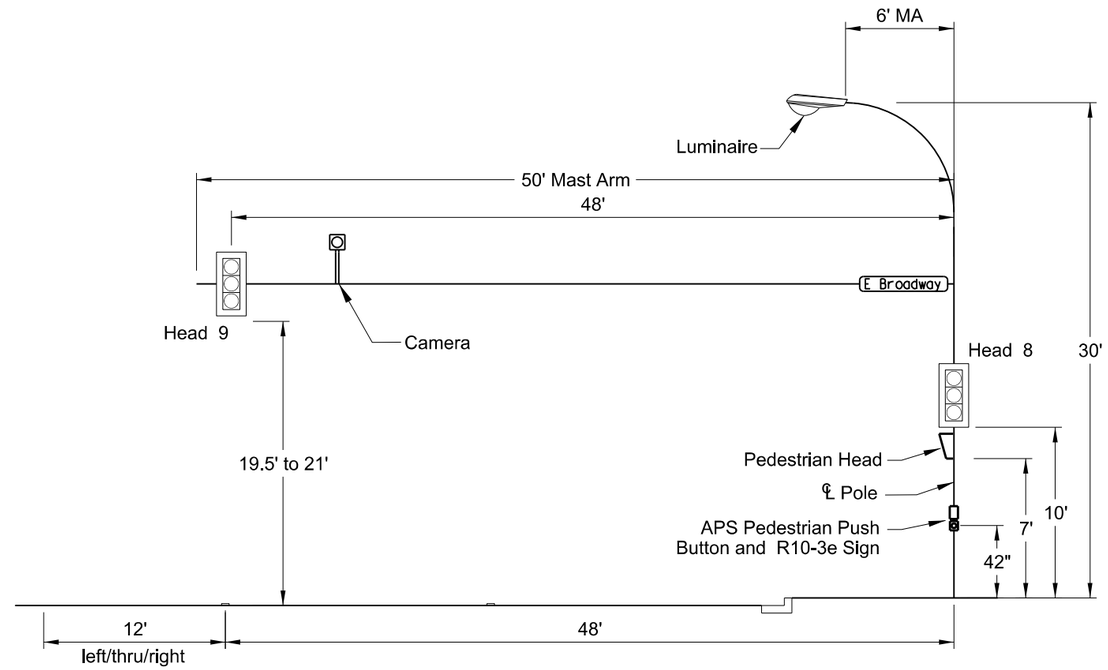
20th Avenue Intersection
ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	150	4

Traffic Signal Pole and Luminaire Profiles



Signal Standard: S1 SB View



Signal Standard: S3 NB View

Notes:
1. Position the heads to provide the best possible view for the traffic to be controlled.

TRAFFIC SIGNAL POLE & LUMINAIRE SCHEDULE

POLE	MAST ARM LENGTH (FT)	COORDINATES FOR CENTER OF DRILLED SHAFT FOUNDATION		LUMINAIRE (POLE MOUNT)					
		STATION	OFFSET	MODEL	ARM LENGTH	TYPE	VOLTS	OPTICS	TILT
S1	40	16716+79.2	48.7' LT	COBRA HEAD	6'	LED	240 VAC	ROADWAY TYPE III DISTRIBUTION	0 degree
S3	50	16715+75.6	65.4' RT	COBRA HEAD	6'	LED	240 VAC	ROADWAY TYPE III DISTRIBUTION	0 degree

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Signals

ND 1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	150	5

N

Head #	Phase 1								Phase 2								Phase 3							
	Future																OLA							
	R/W	Clear To Ø							R/W	Clear To Ø							R/W	Clear To Ø						
		2	3	4	5	6	7	8		3	4	5	6	7	8	1		4	5	6	7	8	1	2
1																								
2																								
3																	←G	←Y	←Y	←Y		(A)		←Y
4, 5, 6									G	Y	Y	(A)	(A)		Y									
7																								
8, 9																								
10																								
																	→G	→Y	→Y	→Y		(A)		→Y
11, 12																								
13									←FY	←Y	←Y	(A)	(A)		←Y									

Head #	Phase 4								Phase 5								Phase 6							
									OLB								(B)							
	R/W	Clear To Ø							R/W	Clear To Ø							R/W	Clear To Ø						
		5	6	7	8	1	2	3		6	7	8	1	2	3	4		7	8	1	2	3	4	5
1																								
									→G	→Y		→Y		(A)	→Y	→Y								
2																								
3	←FY	←Y	←Y		(A)		←Y	←Y																
4, 5, 6																								
7									←G	←Y		←Y		(A)	←Y	←Y	←FY		←Y		(A)	←Y	←Y	←Y
8, 9	G	Y	Y		(A)		Y	Y																
10																	G		Y		(A)	Y	Y	Y
11, 12																	G		Y		(A)	Y	Y	Y
13																								

Head #	Phase 7								Phase 8							
	Future															
	R/W	Clear To Ø							R/W	Clear To Ø						
		8	1	2	3	4	5	6		1	2	3	4	5	6	7
1									G		Y	(A)	(A)	Y	Y	
2									G		Y	(A)	(A)	Y	Y	
3																
4, 5, 6																
7																
8, 9																
10																
11, 12																
13																

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).
(B) Upon pedestrian actuation only.

Chart A	
On Phase	Non-Conflicting Phase Allowed to Time Concurrently
2	5 or 6 (not both)
3	8
4	8
5	2
6	2
8	3 or 4 (not both)

20th Avenue and ND 1804	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
BASIC INTERVALS (OR FUNCTIONS)								
Minimum Initial	Future	8.0	8.0	8.0	8.0	8.0	Future	8.0
Maximum (Maximum Green or Ext Limit)		55.0	23.0	23.0	14.0	41.0		45.0
Yellow Change		3.2	3.2	3.2	3.2	3.2		3.2
Red Clearance		2.7	2.7	2.2	2.7	3.0		2.5
Walk						7.0		
Pedestrian Clearance						27.0		
Added Initial Per Actuation								
Vehicle Extension		3.0	3.0	3.0	3.0	3.0		3.0
Detector Type		Locking	Non-Locking	Non-Locking	Non-Locking	Locking		Non-Locking
Start-Up Phase Color		Green	Red	Red	Red	Green		Red
Color During Flashing Operations		Yellow	Red*	Red	Yellow**	Yellow		Red

* Signal head controlling OLA flash yellow
** Signal head controlling OLB flash red

Emergency Vehicle Preemption Phasing (B)		
Eastbound	Westbound	Southbound
Phase 2	Phase 6	Phase 8

(B) No pedestrian signal during EVP phasing

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Signals

20th Avenue Intersection
ND1804 Reconstruction
Williams County, ND

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	150	6

Spec	Code	Description	Unit	Quantity
772	20	CONCRETE FOUNDATION - TRAFFIC SIGNAL	EA	4
772	100	PULL BOX	EA	1
772	240	2IN DIAMETER RIGID CONDUIT	LF	72
772	270	3IN DIAMETER RIGID CONDUIT	LF	836
772	300	UNDERGROUND CONDUCTOR NO6-TYPE RHW	LF	66
772	310	UNDERGROUND CONDUCTOR NO6-TYPE THW	LF	36
772	375	EMERGENCY VEHICLE DETECTOR CABLE	LF	476
772	433	NO14 AWG 3 CONDUCTOR CABLE (SIGNAL)	LF	26
772	435	NO14 AWG 5 CONDUCTOR CABLE (SIGNAL)	LF	440
772	437	NO14 AWG 7 CONDUCTOR CABLE (SIGNAL)	LF	163
772	442	NO14 AWG 12 CONDUCTOR CABLE (SIGNAL)	LF	559
772	433	NO14 AWG 3 CONDUCTOR CABLE (PED BUTTON)	LF	17
772	435	NO14 AWG 5 CONDUCTOR CABLE (PED BUTTON)	LF	381
772	1102	COMBO 40FT MA SIG & LT STD-TYPE C	EA	1
772	1152	COMBO 45FT MA SIG & LT STD-TYPE C	EA	1
772	1202	COMBO 50FT MA SIG & LT STD-TYPE C	EA	2
772	1810	1-WAY 3 SEC HEAD W/12IN LENS-POST MTD	EA	2
772	1812	1-WAY 3 SEC HEAD W/12IN LENS-MA MTD	EA	7
772	1822	1-WAY 4 SEC HEAD W/12IN LENS-MA MTD	EA	2
772	1830	1-WAY 5 SEC HEAD W/12IN LENS-POST MTD	EA	2
772	2060	PEDESTRIAN COUNTDOWN SIGNAL HEAD-POST MTD	EA	2
772	2215	PEDESTRIAN PUSHBUTTON & SIGN	EA	2
772	2260	VIDEO DETECTION CABLE	LF	856
772	2264	VIDEO DETECTION-SINGLE CAMERA	EA	4
772	2300	CONTROLLER CABINET PROTECTION	EA	1
772	2610	EMERGENCY VEHICLE PRE-EMPTION UNIT	EA	1
772	3002	RELOCATE CONTROLLER CABINET	EA	1

Note:
These items shall not be bid separately but shall be included in the item "Traffic Signals System" 772-0001.

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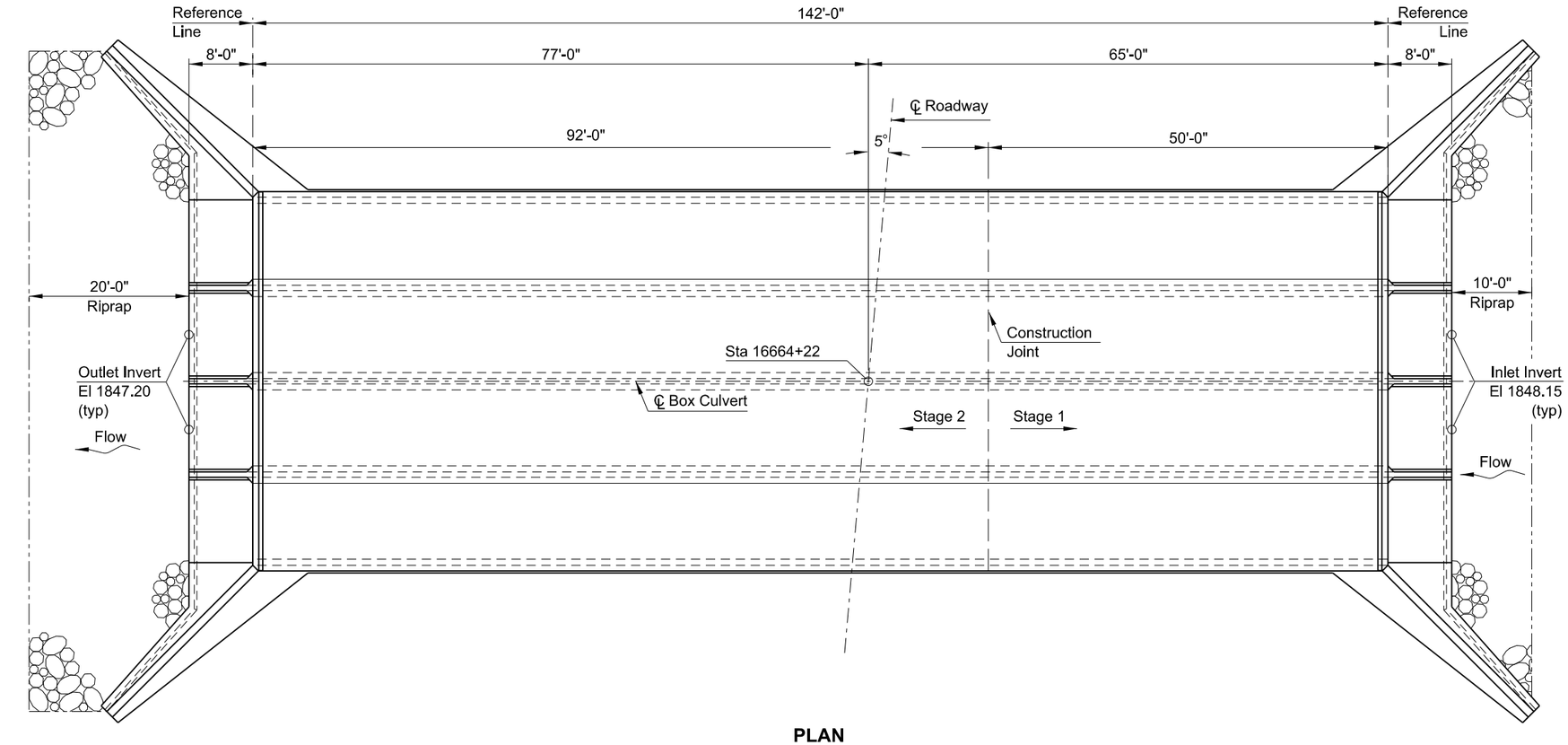
Signals

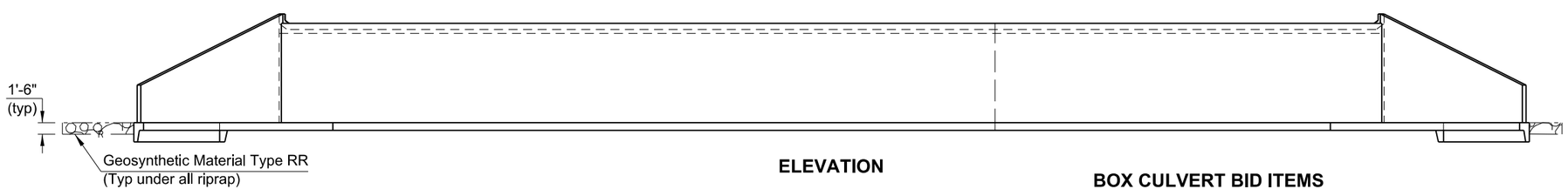
20th Avenue Intersection
ND 1804 Reconstruction
Williams County, ND

23 U.S.C. 409
NDDOT Reserves All Objections

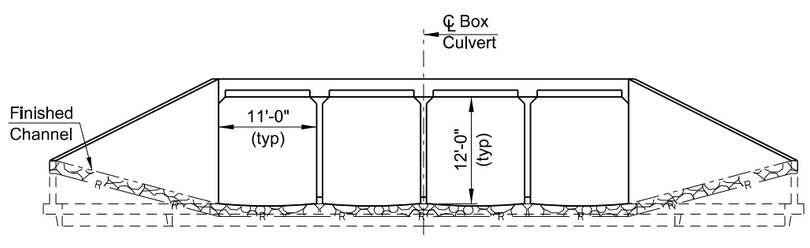
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	170	1



PLAN



ELEVATION



END VIEW

DESIGN STRENGTHS:

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

Load & Resistance Factor Design

HYDRAULIC DATA:

Drainage Area	146	sq mi
Stream Gradient	0.004	ft/ft
Design Frequency	50	yr
Design Discharge	4,208	cfs
Design Headwater Stage	1,862.0	ft
Design Tailwater Stage	1859.9	ft
Velocity Through Culvert	9.4	fps
100-Year Frequency Discharge	5,212	cfs
100-Year Frequency Headwater	1863.1	ft
Overtopping Stage	1867.6	ft
Overtopping Discharge	7,100	cfs

BOX CULVERT BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0105	REMOVAL OF STRUCTURE	L SUM	1
210	0050	BOX CULVERT EXCAVATION	EA	1
210	0210	FOUNDATION FILL	CY	966.3
210	0225	FOUNDATION FILL - TYPE 1	CY	874.5
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1
256	0200	RIPRAP GRADE II	CY	132
602	1131	CLASS AE-3 CONCRETE-BOX CULVERT	CY	810.4
612	0114	REINFORCING STEEL-GRADE 60-BOX CULVERT	LBS	108,494
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	2,923
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	554
709	0162	GEOSYNTHETIC SEPARATION MATERIAL TYPE S1	SY	1,361
930	8230	SHORING	EA	4

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SPECIAL PROVISION

SP 4(14)	FED. MIGRATORY BIRD TREATY ACT

HL-93 DESIGN LOADING

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
STONY CREEK
WILLISTON, ND

REINFORCED CONCRETE
QUADRUPLE BOX CULVERT LAYOUT

CLEAR SPAN 4 x 11' CLEAR HEIGHT 12'
MAXIMUM FILL 10'

PROJECT: SOIB-7-804(054)312
STATION: 16664+22
WILLIAMS COUNTY

7/12/2016 — Terrence R. Udland /s/
DATE — BRIDGE ENGINEER

NOTES

100 SCOPE OF WORK: Work at this site consists of removing an existing structure and building a new quadruple barrel 11' x 12' x 142'-0" reinforced concrete box culvert.

202 REMOVAL OF STRUCTURE: The existing structure is a 3-span concrete box girder bridge, 72'-0" long with a clear roadway width of 44'-0". Include the cost for all of the work required to remove the bridge in the contract unit price for "Removal of Structure".

Complete and submit SFN 17987 Asbestos Notification of Demolition and Renovation to the North Dakota Department of Health 10 days prior to beginning the removal of concrete.

210 ORDINARY BACKFILL: Compact material as specified in Section 203.04 E.2.a.

210 FOUNDATION FILL-TYPE 1: Meet the gradation requirements of Aggregate Class 7 in table 816-01 in the standard specifications for road and bridge construction.

602 CONCRETE: Provide aggregate for the concrete that meets the requirements of Section 802.01 c.2, "Coarse Aggregate" and Section 802.01 C.3, "Fine Aggregate."

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

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

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

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

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

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

930 SHORING: Temporary shoring is required as shown on the plans for construction of both segments of the box culvert. The contractor is responsible to design, construct, maintain, and remove temporary shoring. Include all labor, equipment and material needed for this work in the bid item, "Shoring", with a quantity of 2 EA per segment of box culvert construction.

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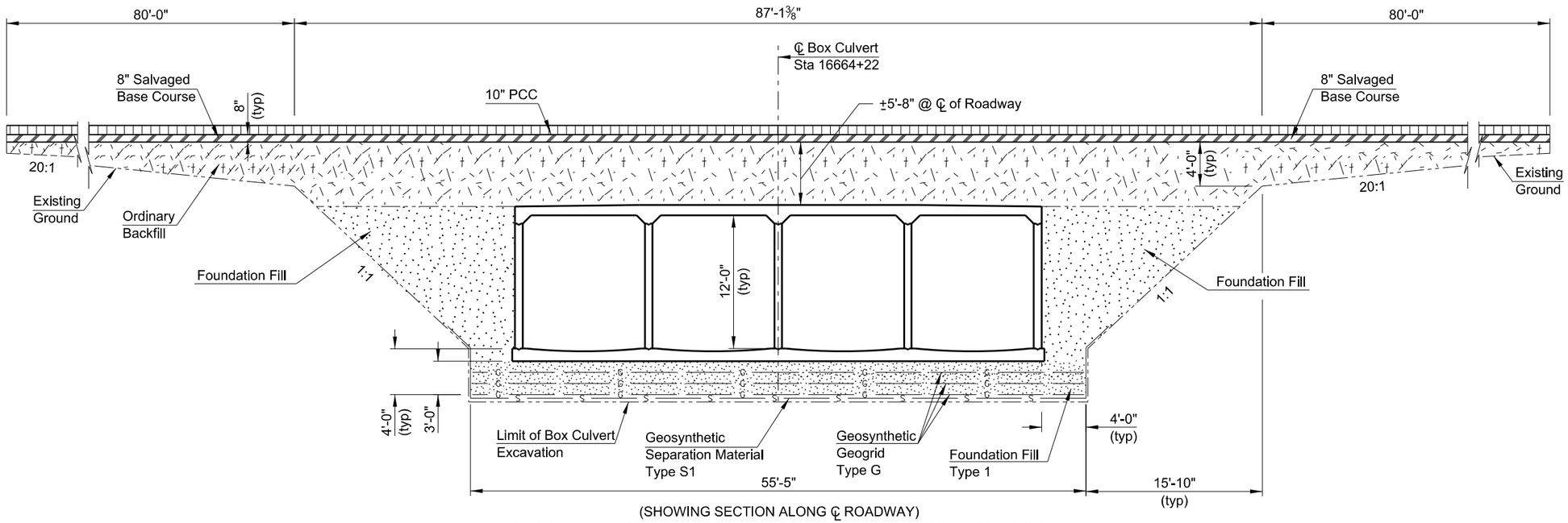
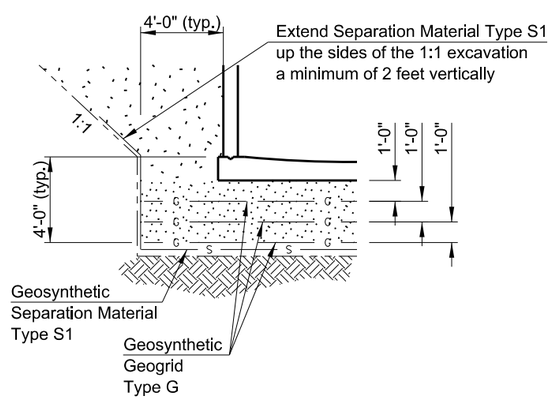
23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	170	3



(SHOWING SECTION ALONG ℄ ROADWAY)

GEOSYNTHETIC MATERIAL PLACEMENT AND FOUNDATION FILL THROUGH EXISTING EMBANKMENT



GEOSYNTHETIC UNDER BOX CULVERT

NOTES:

Provide a 3'-0" minimum depth of foundation fill with geosynthetic materials as shown under the box culvert. Remove and replace all unsound material under the box with foundation fill. The engineer will determine the depth required.

Extend the geosynthetic materials and foundation fill to the end of the apron.

High ground water may require dewatering of the foundation soils. Payment for dewatering is included in foundation preparation.

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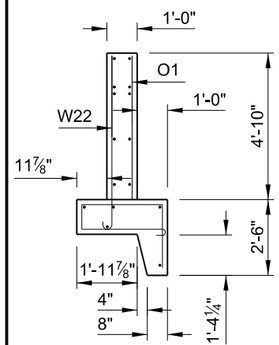
STONY CREEK
WILLIAMS COUNTY

STATION: 16664+22

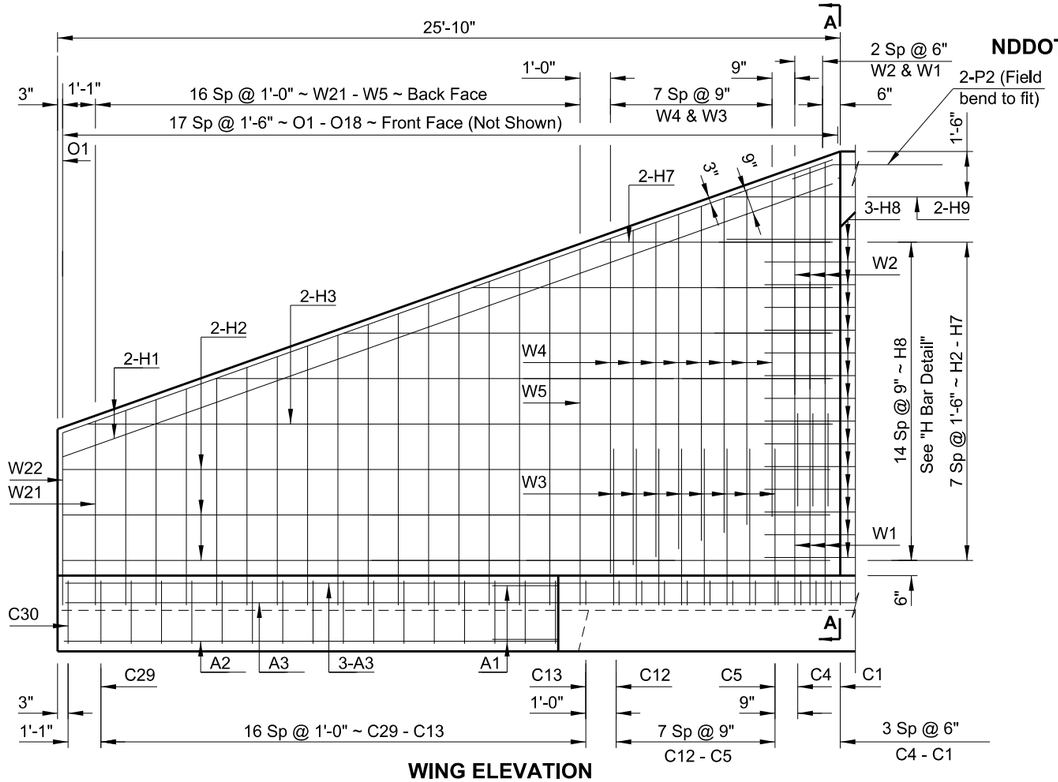
EXCAVATION & FOUNDATION FILL DETAIL

23 U.S.C. 409
NDDOT Reserves All Objections

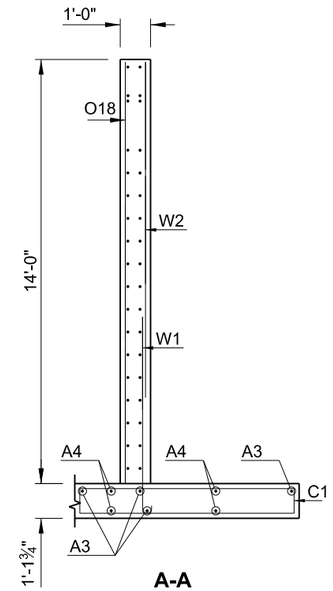
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	170	4



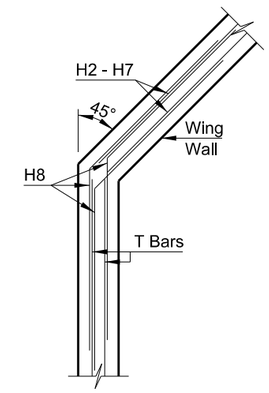
END VIEW



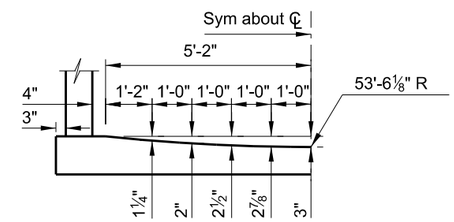
WING ELEVATION



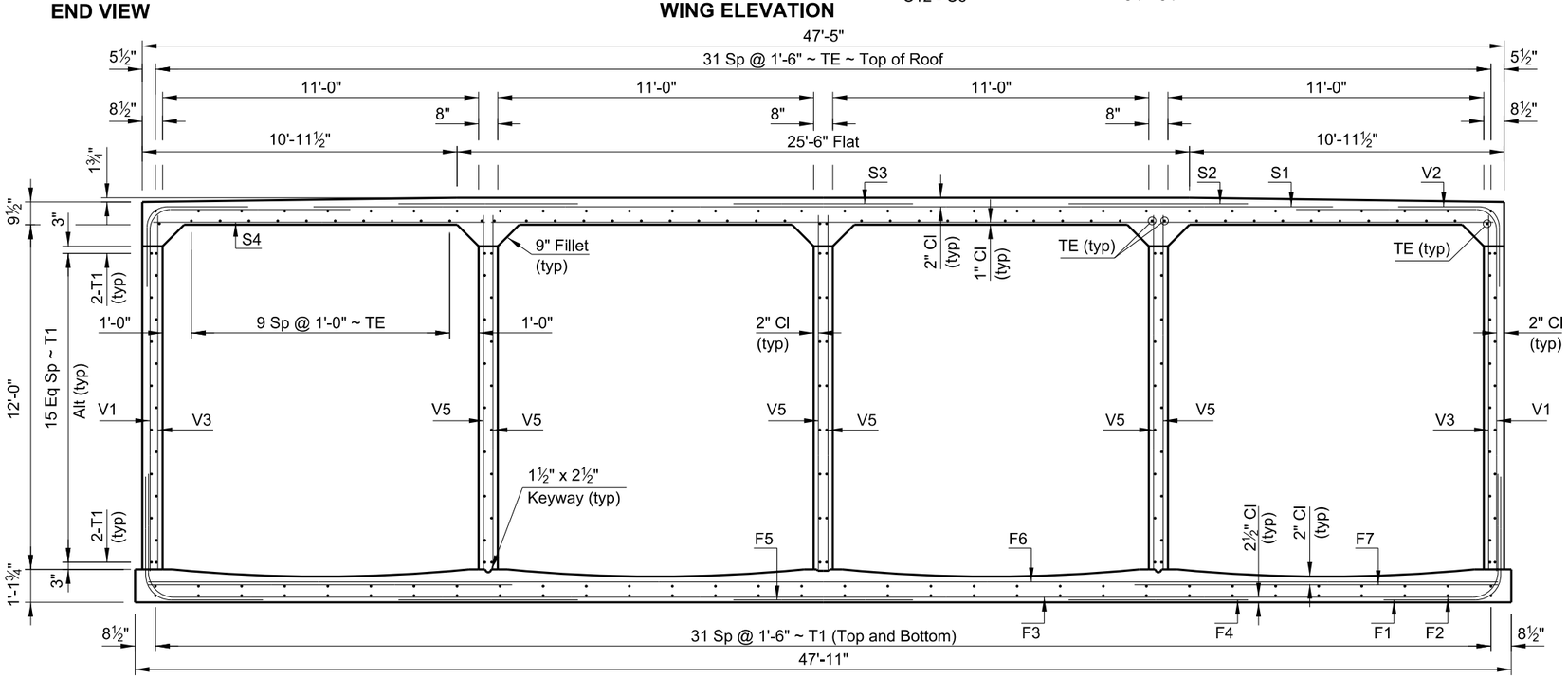
A-A



H BAR DETAIL



CURVED FLOOR OFF-SETS



SECTION OF BARREL

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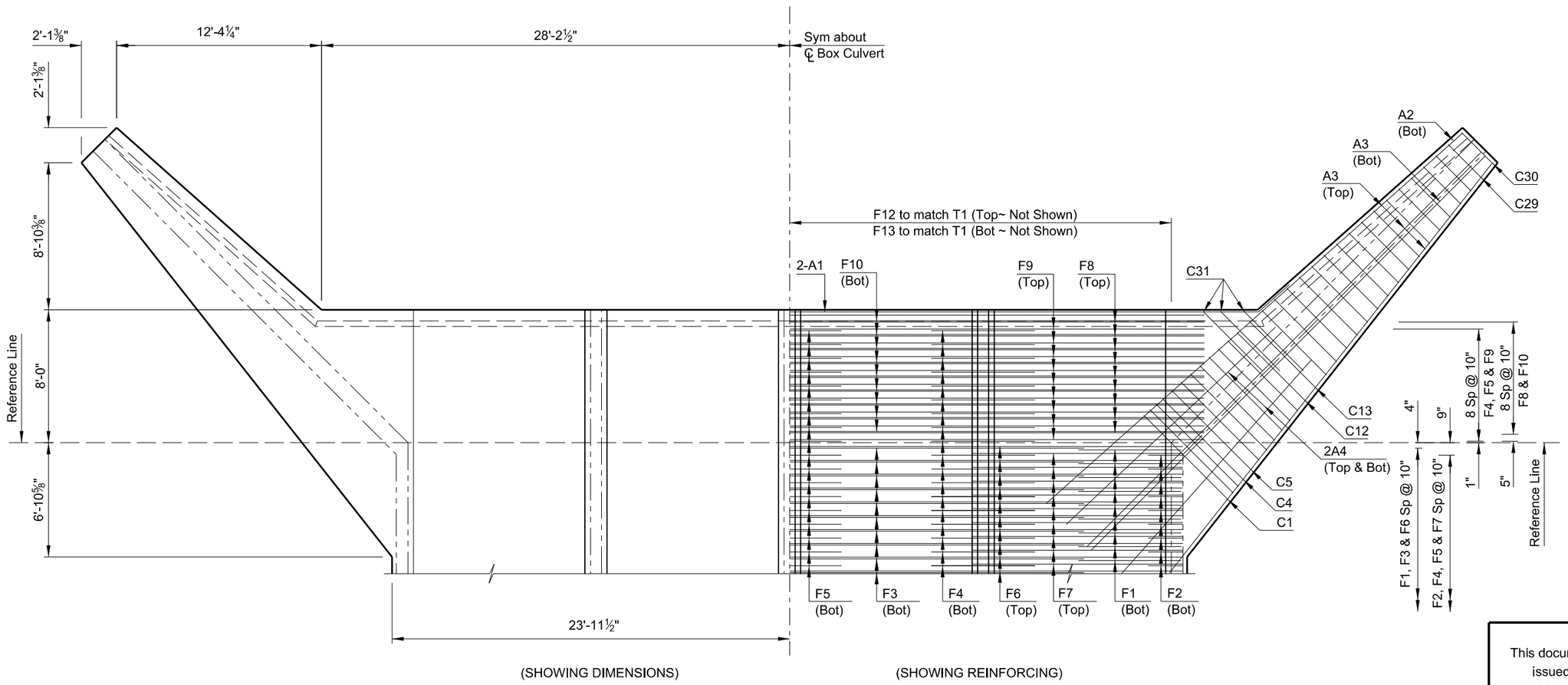
STONY CREEK
WILLIAMS COUNTY

STATION: 16664+22

BARREL SECTION & WING DETAILS

23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	170	5



(SHOWING DIMENSIONS) (SHOWING REINFORCING)

FLOOR PLAN

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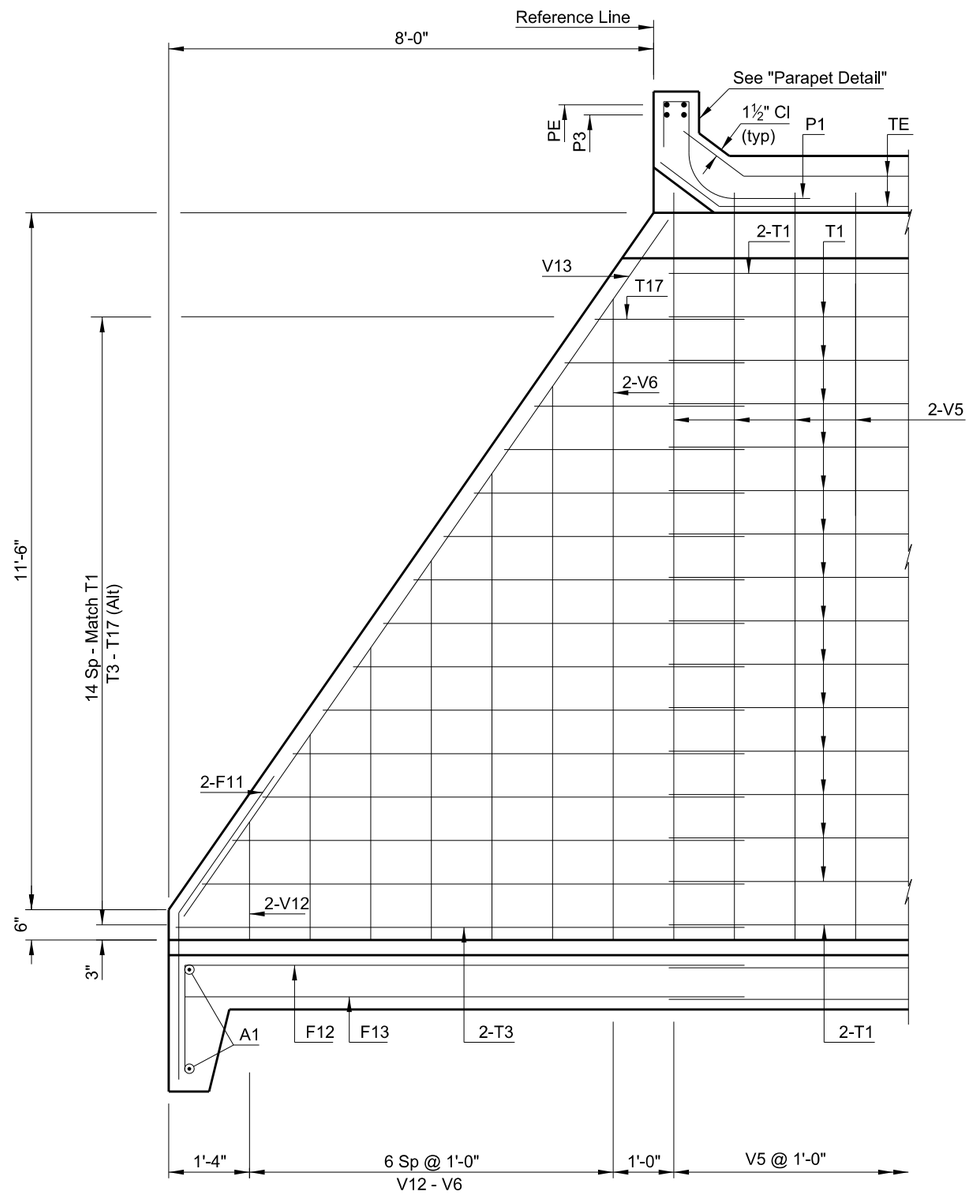
STONY CREEK
WILLIAMS COUNTY

STATION: 16664+22

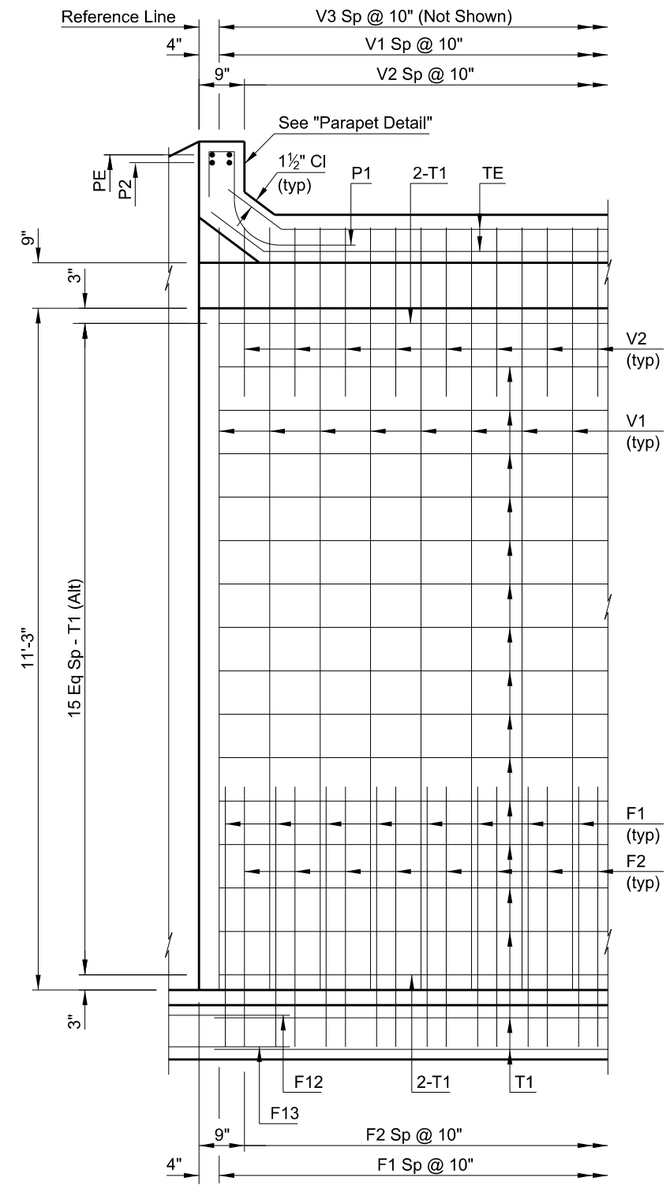
FLOOR DETAIL

23 U.S.C. 409
NDDOT Reserves All Objections

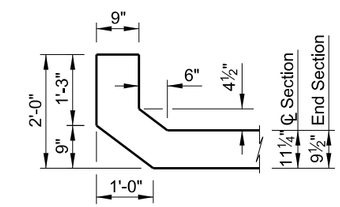
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	170	6



INNER WALL



OUTER WALL



PARAPET DETAIL

LONGITUDINAL SECTIONS

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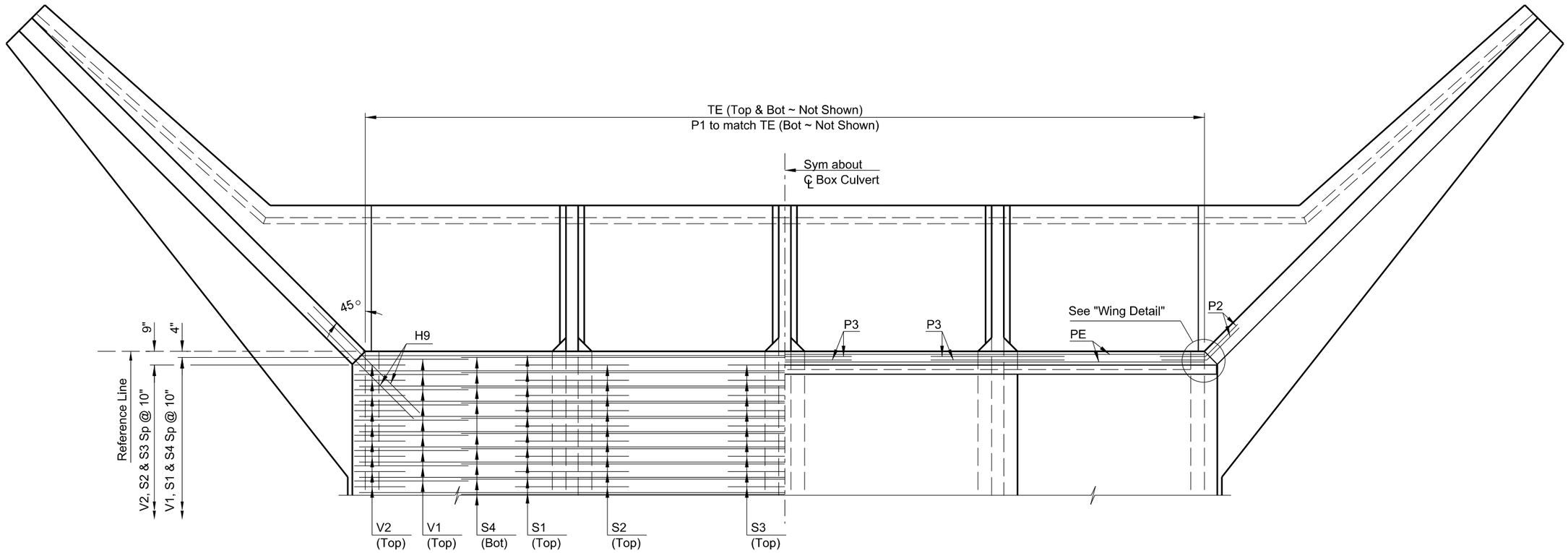
STONY CREEK
WILLIAMS COUNTY

STATION: 16664+22

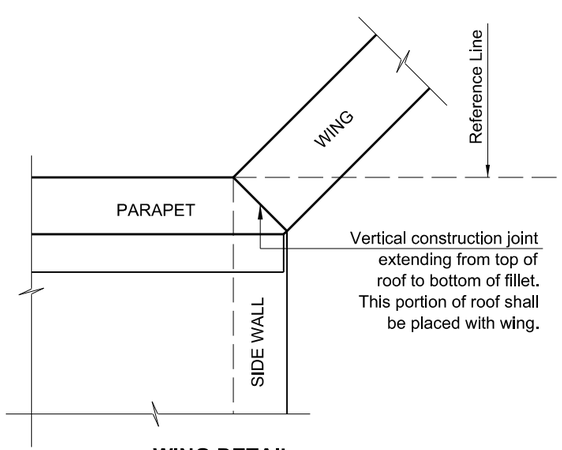
WALL DETAILS & PARAPET DETAIL

23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	170	7



ROOF PLAN



WING DETAIL

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STONY CREEK
WILLIAMS COUNTY

STATION: 16664+22

ROOF DETAILS

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	170	8

BAR LIST (CONSTANT)

MARK	SIZE	NO. STAGE 1	NO. STAGE 2	LENGTH	SHAPE
W1	7	6	6	6'-5"	BENT
W2	6	6	6	11'-1"	STR.
W3	7	16	16	5'-3"	BENT
W4	6	16	16	11'-1"	STR.
W5	7	2	2	12'-7"	BENT
W6	7	2	2	12'-2"	BENT
W7	7	2	2	11'-10"	BENT
W8	7	2	2	11'-6"	BENT
W9	7	2	2	11'-2"	BENT
W10	7	2	2	10'-9"	BENT
W11	6	2	2	10'-3"	BENT
W12	6	2	2	9'-11"	BENT
W13	5	2	2	9'-5"	BENT
W14	5	2	2	9'-1"	BENT
W15	5	2	2	8'-9"	BENT
W16	4	2	2	8'-4"	BENT
W17	4	2	2	7'-11"	BENT
W18	4	2	2	7'-7"	BENT
W19	4	2	2	7'-3"	BENT
W20	4	2	2	6'-11"	BENT
W21	4	2	2	6'-6"	BENT
W22	4	2	2	6'-2"	BENT
C1	6	8	8	16'-2"	BENT
C2	6	16	16	16'-0"	BENT
C3	5	2	2	15'-10"	BENT
C4	5	2	2	15'-8"	BENT
C5	5	2	2	15'-6"	BENT
C6	5	2	2	15'-2"	BENT
C7	5	2	2	14'-10"	BENT
C8	5	2	2	14'-8"	BENT
C9	5	2	2	14'-4"	BENT
C10	5	2	2	14'-2"	BENT
C11	5	2	2	13'-10"	BENT
C12	5	2	2	13'-6"	BENT
C13	5	2	2	13'-2"	BENT
C14	5	2	2	14'-1"	BENT
C15	5	2	2	13'-9"	BENT
C16	5	2	2	13'-5"	BENT
C17	5	2	2	13'-1"	BENT
C18	5	2	2	12'-9"	BENT
C19	5	2	2	12'-5"	BENT
C20	5	2	2	11'-11"	BENT
C21	4	2	2	11'-6"	BENT
C22	4	2	2	11'-2"	BENT
C23	4	2	2	10'-10"	BENT
C24	4	2	2	10'-6"	BENT
C25	4	2	2	10'-2"	BENT
C26	4	2	2	9'-10"	BENT
C27	4	2	2	9'-4"	BENT
C28	4	2	2	9'-0"	BENT
C29	4	2	2	8'-8"	BENT
C30	4	2	2	8'-4"	BENT
C31	4	6	6	7'-1"	BENT
H1	7	8	8	26'-11"	STR.
H2	4	12	12	25'-5"	STR.
H3	4	4	4	24'-7"	STR.
H4	4	4	4	20'-4"	STR.
H5	4	4	4	16'-1"	STR.
H6	4	4	4	11'-11"	STR.
H7	4	4	4	7'-8"	STR.
H8	4	90	90	6'-0"	BENT
H9	6	4	4	9'-8"	STR.
O1-O18	4	2 SETS	2 SETS	167'-3"	STR.

BAR LIST (CONSTANT) CONTINUED

MARK	SIZE	NO. STAGE 1	NO. STAGE 2	LENGTH	SHAPE
A1	6	4	4	31'-9"	BENT
A2	6	2	2	16'-6"	STR.
A3	6	8	8	33'-7"	STR.
A4	6	8	8	17'-4"	STR.
P1	4	48	48	4'-7"	BENT
P2	6	4	4	5'-0"	BENT
P3	6	6	6	7'-4"	STR.
PE	6	4	4	24'-0"	STR.
V6	4	6	6	10'-9"	STR.
V7	4	6	6	9'-3"	STR.
V8	4	6	6	7'-10"	STR.
V9	4	6	6	6'-5"	STR.
V10	4	6	6	5'-0"	STR.
V11	4	6	6	3'-6"	STR.
V12	4	6	6	2'-1"	STR.
V13	6	6	6	14'-0"	STR.
F8	5	9	9	50'-0"	STR.
F9	4	9	9	50'-0"	STR.
F10	5	9	9	50'-0"	STR.
F11	6	6	6	5'-6"	BENT
F12	4	32	32	11'-0"	BENT
F13	4	32	32	9'-3"	STR.
T3	4	6	6	9'-6"	STR.
T4 - T17	4	3 SETS	3 SETS	79'-4"	STR.

BAR LIST (VARIABLE)

MARK	SIZE	LENGTH	SHAPE	NO. STAGE 1	NO. STAGE 2
V1	5	19'-3"	BENT	120	220
V2	5	6'-0"	BENT	118	220
V3	4	12'-4"	STR.	120	220
V5	4	12'-4"	STR.	300	558
F1	5	11'-0"	BENT	120	220
F2	6	7'-6"	BENT	118	220
F3	5	35'-6"	STR.	60	110
F4	6	6'-3"	STR.	136	238
F5	5	6'-3"	STR.	68	119
F6	5	47'-6"	STR.	60	110
F7	4	12'-8"	STR.	118	220
S1	5	35'-6"	STR.	60	110
S2	6	6'-3"	STR.	118	220
S3	5	6'-3"	STR.	59	110
S4	7	46'-8"	STR.	60	110

MARK	SIZE	NO.	SHAPE	LENGTH STAGE 1	LENGTH STAGE 2
T1	4	154	STR.	51'-3"	92'-9"
TE	4	80	BENT	51'-7"	93'-1"

NOTE:

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

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STAGE 1 CONCRETE FORMULAS

STAGE 1 FLOOR	"L" x	1.77824	+	30.0554	=	119.0 CY
TWO OUTSIDE WALLS & TWO WINGS	"L" x	0.59028	+	17.8105	=	47.3 CY
INSIDE WALLS	"L" x	0.83333	+	3.7037	=	45.4 CY
STAGE 1 ROOF	"L" x	1.76546	+	0.9623	=	89.2 CY
TOTAL	"L" x	4.96731	+	52.5319	=	300.9 CY

STAGE 2 CONCRETE FORMULAS

STAGE 2 FLOOR	"L" x	1.77824	+	30.0554	=	193.6 CY
TWO OUTSIDE WALLS & TWO WINGS	"L" x	0.59028	+	17.8105	=	72.1 CY
INSIDE WALLS	"L" x	0.83333	+	3.7037	=	80.4 CY
STAGE 2 ROOF	"L" x	1.76546	+	0.9623	=	163.4 CY
TOTAL	"L" x	4.96731	+	52.5319	=	509.5 CY

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QUANTITIES

CLASS AE-3 CONCRETE	810.4 CY
REINFORCING STEEL	108,494 LBS

STONY CREEK
WILLIAMS COUNTY

STATION: 16664+22

REINFORCING BAR LIST

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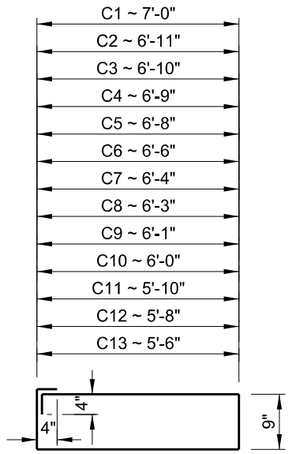
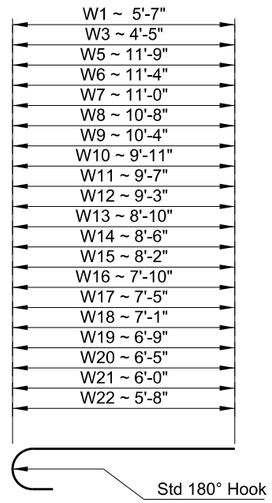
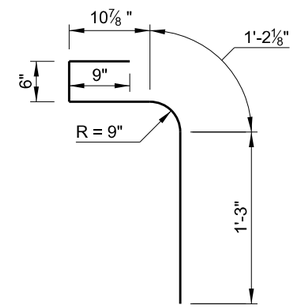
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	170	9



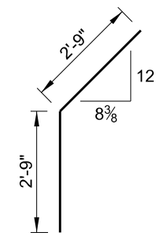
C1 - C13



W1 - W22



P1



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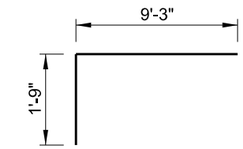

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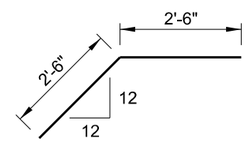

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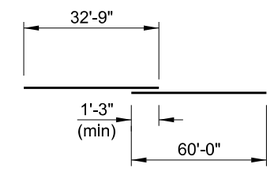
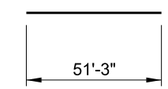
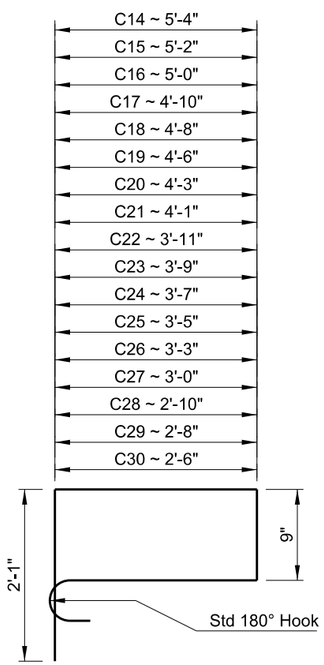


T1
(Stage 2)

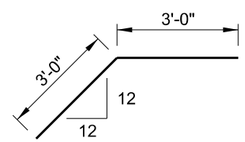


T1
(Stage 1)

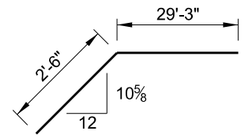
Note: Splice T1 (Stage 2) to T1 (Stage 1) at construction joint with 1'-3" minimum lap



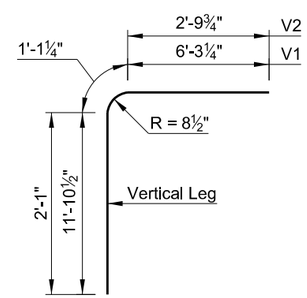
C14 - C30



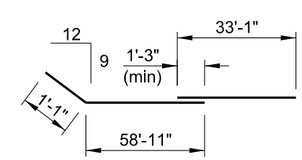
H8



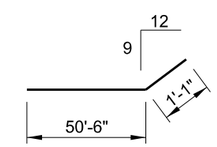
A1



V1 & V2

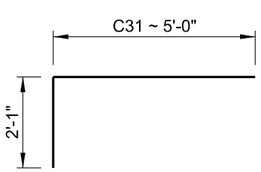


TE
(Stage 2)



TE
(Stage 1)

Note: Splice TE (Stage 2) to TE (Stage 1) at construction joint with 1'-3" minimum lap



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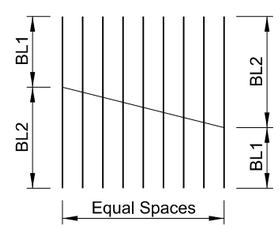
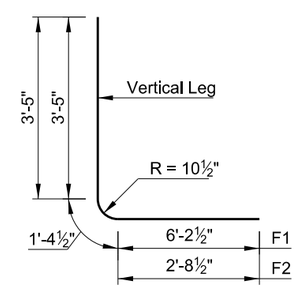


2 SETS SHOWN

MARK	LENGTH 1 SET	BL1	BL2	SPACES
O1-O18	167'-3"	4'-9"	13'-10"	17
T4-T17	79'-4"	2'-5"	8'-11"	13

BAR CUTTING DETAILS



F1 & F2

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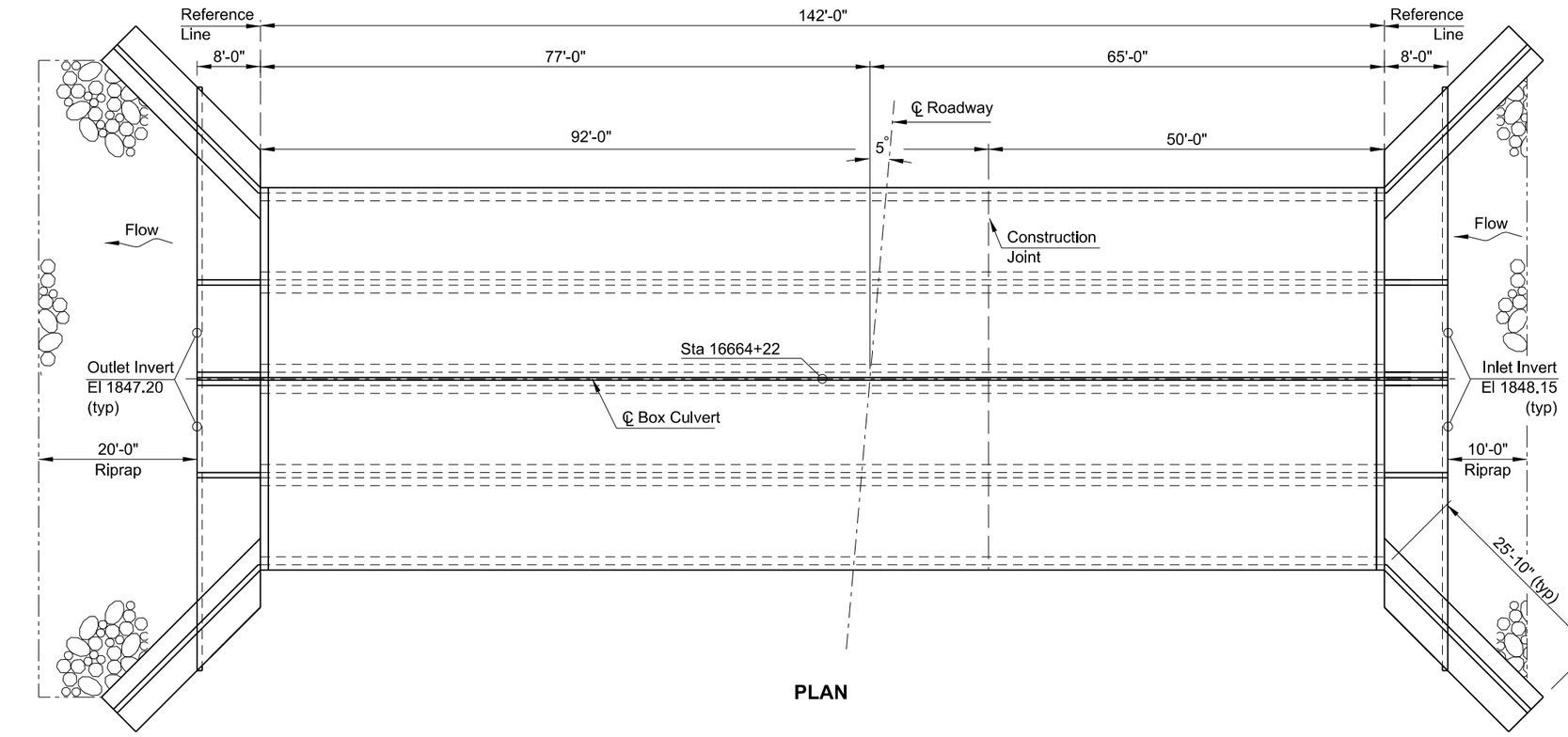
STONY CREEK
WILLIAMS COUNTY

STATION: 16664+22

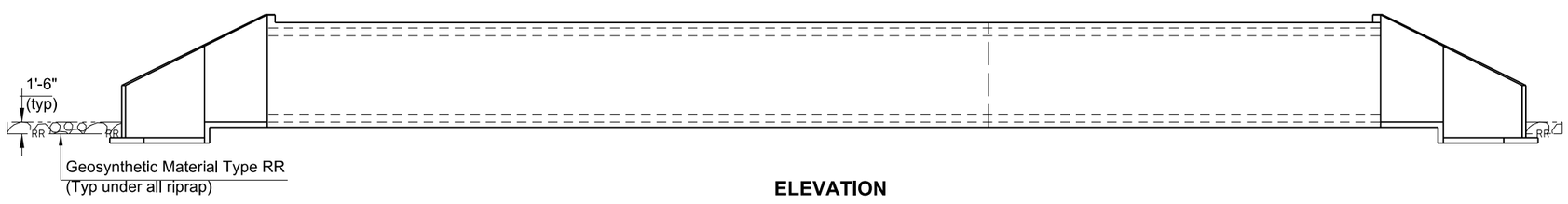
BAR DETAILS

23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	170	10



PLAN



ELEVATION

For a single barrel box culvert with 8" thick roof, 8" floor and 8" walls, the following total factored moments and shears would result from the application of the required loads:

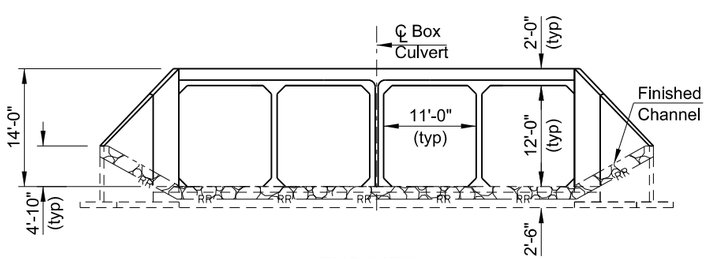
FACTORED DESIGN MOMENTS (SINGLE)		FACTORED DESIGN SHEARS (SINGLE)	
WALL MOMENT	3,851 ft-lbs	WALL SHEAR	6,972 lbs
ROOF MOMENTS		ROOF SHEARS	
CORNER	18,371 ft-lbs	CORNER	10,511 lbs
BOTTOM	23,146 ft-lbs	FLOOR SHEARS	
FLOOR MOMENTS		CORNER	14,006 lbs
CORNER	23,894 ft-lbs		
TOP	25,175 ft-lbs		

For a double barrel box culvert with 8" thick roof, 8" floor and 8" walls, the following total factored moments and shears would result from the application of the required loads:

FACTORED DESIGN MOMENTS (DOUBLE)		FACTORED DESIGN SHEARS (DOUBLE)	
WALL MOMENT	5,200 ft-lbs	WALL SHEAR	6,869 lbs
ROOF MOMENTS		ROOF SHEARS	
CORNER	16,687 ft-lbs	CORNER	9,132 lbs
BOTTOM	21,479 ft-lbs	WALL	11,891 lbs
TOP	32,777 ft-lbs	FLOOR SHEARS	
FLOOR MOMENTS		CORNER	12,408 lbs
CORNER	20,902 ft-lbs	WALL	14,880 lbs
TOP	18,428 ft-lbs		
BOTTOM	35,320 ft-lbs		

HYDRAULIC DATA:

Drainage Area	146	sq mi
Stream Gradient	0.004	ft/ft
Design Frequency	50	yr
Design Discharge	4,208	cfs
Design Headwater Stage	1862.0	ft
Design Tailwater Stage	1859.9	ft
Velocity Through Culvert	9.4	fps
100-Year Frequency Discharge	5,212	cfs
100-Year Frequency Headwater	1863.1	ft
Overtopping Stage	1867.6	ft
Overtopping Discharge	7,100	cfs



END VIEW

BOX CULVERT BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0105	REMOVAL OF STRUCTURE	L SUM	1
210	0050	BOX CULVERT EXCAVATION	EA	1
210	0210	FOUNDATION FILL	CY	962.5
210	0225	FOUNDATION FILL - TYPE 1	CY	888.8
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1
256	0200	RIPRAP GRADE II	CY	132
606	3112	DBL 11FT X 12FT PRECAST RCB CULVERT	LF	284
606	7112	DBL 11FT X 12FT PRECAST RCB END SECTION	EA	2
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	2,923
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	554
709	0162	GEOSYNTHETIC SEPARATION MATERIAL TYPE S1	SY	1,361
930	8230	SHORING	EA	4

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SPECIAL PROVISIONS	
SP 4(14)	FED. MIGRATORY BIRD TREATY ACT
HL-93 DESIGN LOADING	

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
STONY CREEK
WILLISTON, ND

PRECAST CONCRETE
QUADRUPLE BOX CULVERT LAYOUT

CLEAR SPAN 4 x 11' CLEAR HEIGHT 12'
MAXIMUM FILL 10'

PROJECT: SOIB-7-804(054)312
STATION: 16664+22
WILLIAMS COUNTY

7/12/2016 — DATE
Terrence R. Udland /s/ — BRIDGE ENGINEER

NOTES

100 SCOPE OF WORK: Work Consists of removing an existing structure and building a new quadruple barrel 11' x 12' x 142'-0" precast concrete box culvert.

105 WORK DRAWINGS: Submit work drawings for the precast concrete box culvert to the Engineer for review. Use the following minimum text sizes on all work drawing sheets.

Dimensions and Notes =	0.08"
Detail Subtitles =	0.09"
Detail Titles =	0.10"

202 REMOVAL OF STRUCTURE: The existing structure is a 3-span concrete box girder bridge, 72'-0" long with a clear roadway width of 44'-0". Include the cost for all of the work required to remove the bridge in the contract unit price for "Removal of Structure".

Complete and submit SFN 17987 Asbestos Notification of Demolition and Renovation to the North Dakota Department of Health 10 days prior to beginning the removal of concrete.

210 ORDINARY BACKFILL: Compact material as specified in Section 203.04 E.2.a.

210 FOUNDATION FILL-TYPE 1: Meet the gradation requirements of Aggregate Class 7 in table 816-01 in the standard specifications for road and bridge construction.

606 PRECAST SECTION: Tie the barrel sections together with prestressing strands or 1"ϕ tie bolts as shown on Standard Drawing D-714-22. Use a minimum of 6 - 0.5" diameter 270K strands for double box sections and 4 - 0.5" diameter 270K strands for single box sections, with one strand in each corner. Stress prestressing strands from opposite ends to a force of 20 kips. Use corrosion protected prestressing cables with their ends grouted. If tie bolts are used, place two ties per exterior wall at each joint located at third points of the wall clear height.

Include the cost for the apron, cutoff wall, parapet, and wingwalls in the contract unit price for Payment for "DBL 11Ft x12Ft Precast RCB End Section" . Attach the apron to the last barrel section, the wingwalls and the cutoff wall.. Provide a welded tie type system for the connections of the apron to the box and wingwalls. Connect the wingwalls to the last barrel section by the use of tie bolts, steel-bolted plates or other approved method so the inside corner surface is smooth.

Use ASTM A36 steel for bolts, plates, angles, and studs. Use heavy hex nuts meeting the requirements of ASTM A563 and washers meeting ASTM F436, Type 1. Provide welded pipe sleeves meeting the requirements of ASTM A53, Grade B. Galvanize hardware and structural steel according to Section 854.

Welders are to meet the requirements of Section 105.06 D. Galvanize field welds according to Section 854.02.

Cast holes at 3'-0" centers through the apron and into the cutoff wall to receive ¾" diameter reinforcing bars. Cast holes in the last barrel section at 1'-0" centers for ½" diameter reinforcing bars to attach the parapet. Cast parapet against the section. Install the bars according to the manufacturer's recommendations, with a high strength adhesive specifically intended for concrete anchorage, in accordance with Section 806.02.

Separate single or double cell precast units may be used as alternates to a multi cell culvert. Provide a minimum distance of 3" between separate precast units and a maximum distance of 1'-0". Fill this gap with a controlled density backfill. Use a controlled density backfill consisting of cement, water, pozzolanic materials, and fillers. Use a material that is fluid on placement to flow around and fill voids in the backfill area. Use a material that is able to support normal loads after 6 hours and have a compressive strength in the range of 75 psi to 125 psi at 28 days. If the mix design shown is used, no further testing will be required. The mix design yields approximately one cubic yard of flowable mortar.

MIX DESIGN

Cement	100 lbs
Fly Ash	300 lbs
Fine Aggregate	2600 lbs
Water	70 gals

For the 12" cap, use a weatherproof and freeze/thaw resistant, non-shrink cement grout material such as SikaGrout® 212, BASF Masterflow® 928, Euclid NS Grout, or an approved equal which complies with ASTM C1107.

Include the cost for the controlled density backfill in the contract unit price for "DBL 11Ft x12Ft Precast RCB Culvert".

606 DESIGN REQUIREMENTS: Reinforcing clear cover to meet the requirements of Section 12.11.4.4 of the AASHTO LRFD Bridge Design Specifications, Seventh Edition.

930 SHORING: Temporary shoring is required as shown on the plans for construction of both segments of the box culvert. Design, construct, maintain, and remove temporary shoring. Include all of the labor, equipment and material needed for this work in the contract unit price for "Shoring", with a quantity of 2 EA per segment of box culvert construction.

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23 U.S.C. 409
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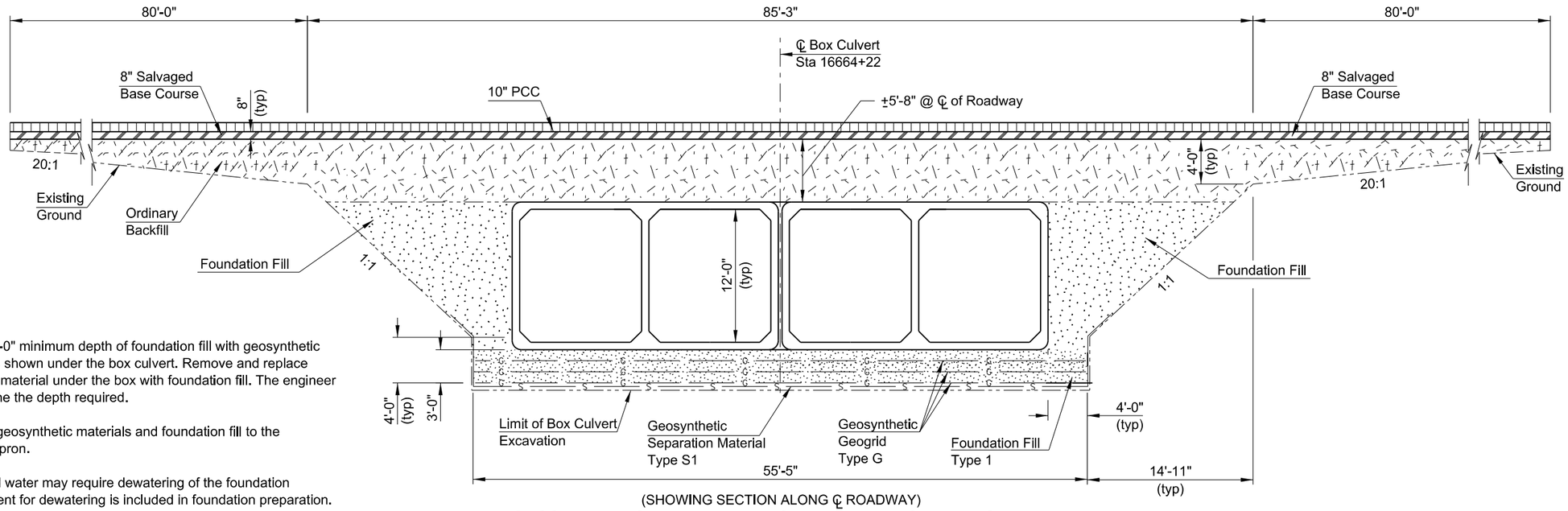
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	170	12



(SHOWING SECTION ALONG ℄ ROADWAY)

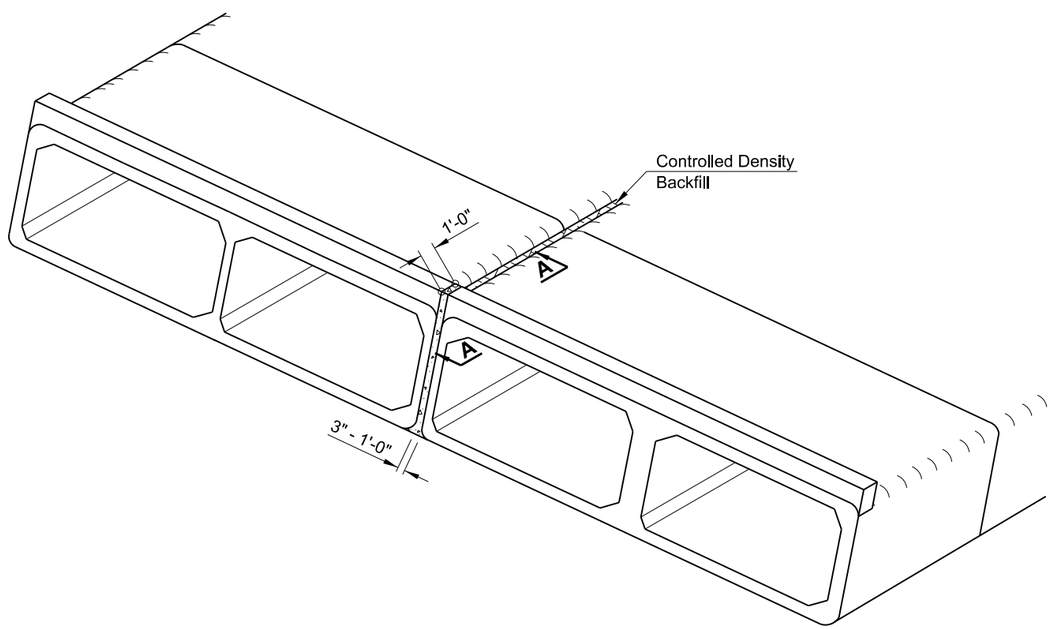
GEOSYNTHETIC MATERIAL PLACEMENT AND FOUNDATION FILL THROUGH EXISTING EMBANKMENT

NOTES:

Provide a 3'-0" minimum depth of foundation fill with geosynthetic materials as shown under the box culvert. Remove and replace all unsound material under the box with foundation fill. The engineer will determine the depth required.

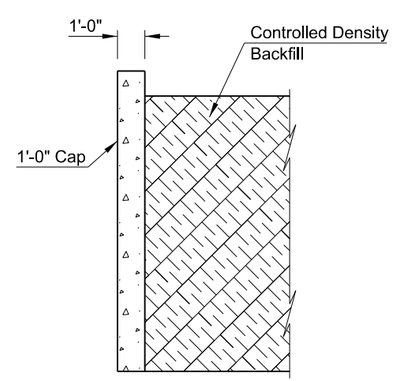
Extend the geosynthetic materials and foundation fill to the end of the apron.

High ground water may require dewatering of the foundation soils. Payment for dewatering is included in foundation preparation.



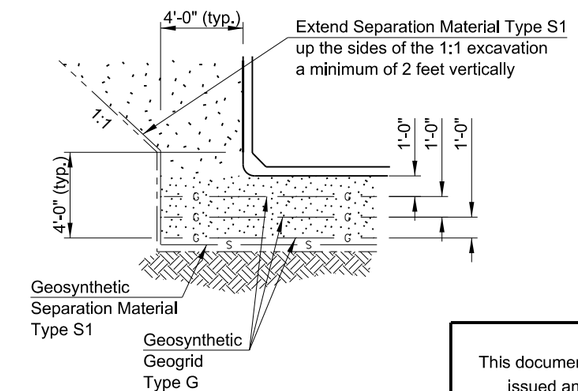
(WINGS & APRON NOT SHOWN)

MULTIPLE CELL INSTALLATION



SECTION A-A

The intent of this drawing is to show only the placement of the controlled density backfill between adjacent barrels. The representation of the number of barrels is arbitrary.



GEOSYNTHETIC UNDER BOX CULVERT

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STONY CREEK
WILLIAMS COUNTY

STATION: 16664+22

EXCAVATION & FOUNDATION FILL DETAIL

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	170	13

23 U.S.C. 409
NDDOT Reserves All Objections

Legend

Hatched area indicates concrete to be removed.

Stage 1 Notes:

(1) Install the temporary sheet piles behind the existing bridge abutment to retain the road embankment beyond the bridge in each direction.

(2) Remove the barrier, deck, girders, end wall and wing wall as indicated.

(3) Install the remaining temporary sheet piles in front of each abutment.

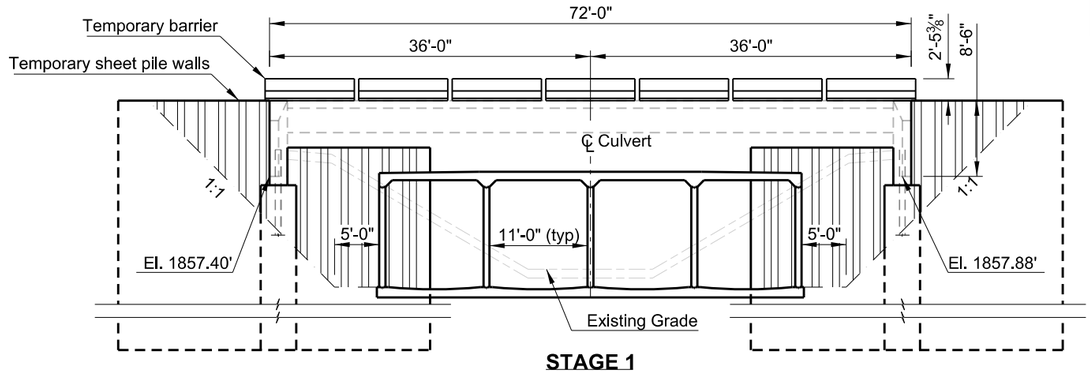
(4) Remove the abutment as indicated and install one or two sections of sheet piling to bridge the gap between previously installed sheet pile sections.

(5) Cut off the existing bridge foundation piling at elevation 1857.40.

(6) Construct a portion of the new culvert and wing walls.

(7) Prior to backfilling and constructing temporary road way, install sheet piling near the end of the new culvert as shown.

(8) Move traffic onto the newly constructed culvert section.



STAGE 1
Section A-A

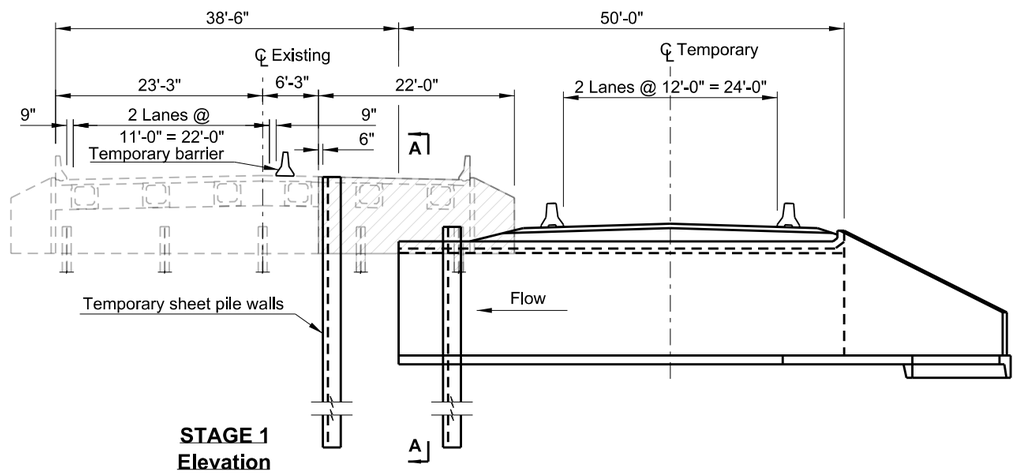
Stage 2 Notes:

(1) Remove remaining barrier, deck, girders, end wall, wing wall and abutments.

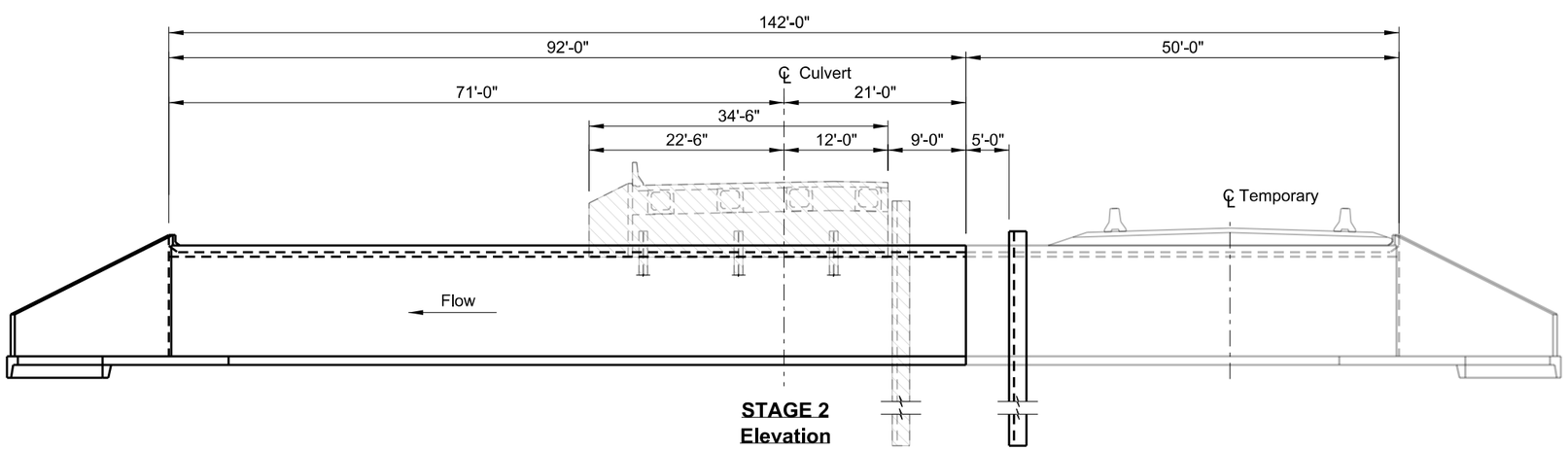
(2) Cut off the remaining bridge foundation piling at elevation 1857.40

(3) Remove the sheet pile adjacent the old bridge walls as shown.

(4) Construct the remaining portion of the culvert and wing walls.



STAGE 1
Elevation



STAGE 2
Elevation

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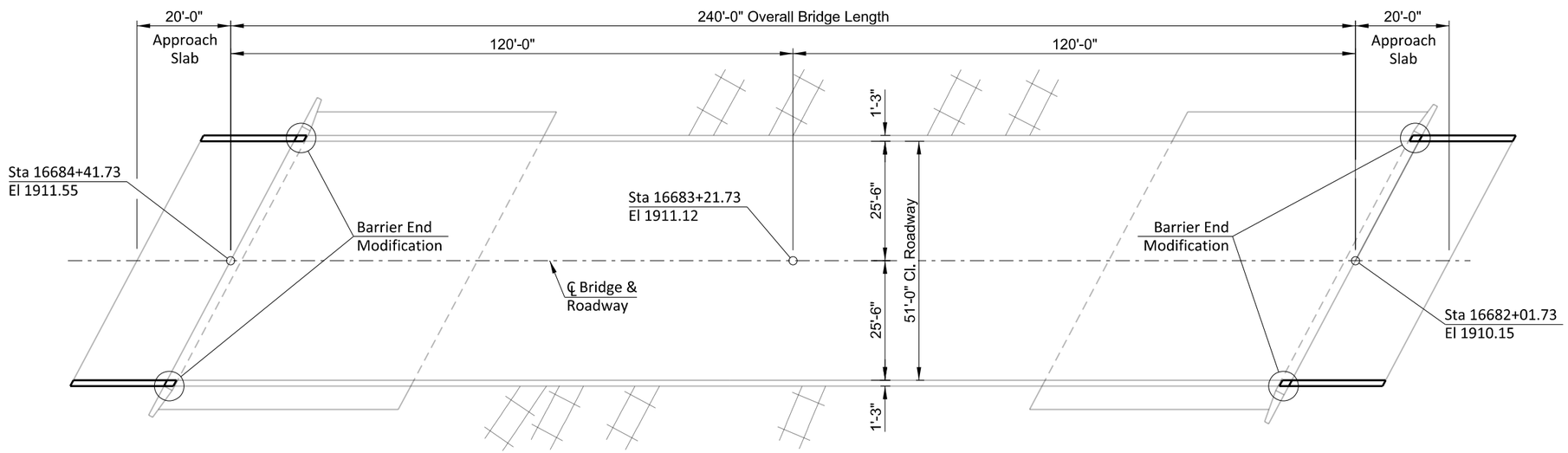
STONY CREEK
WILLIAMS COUNTY

STATION: 16664+22

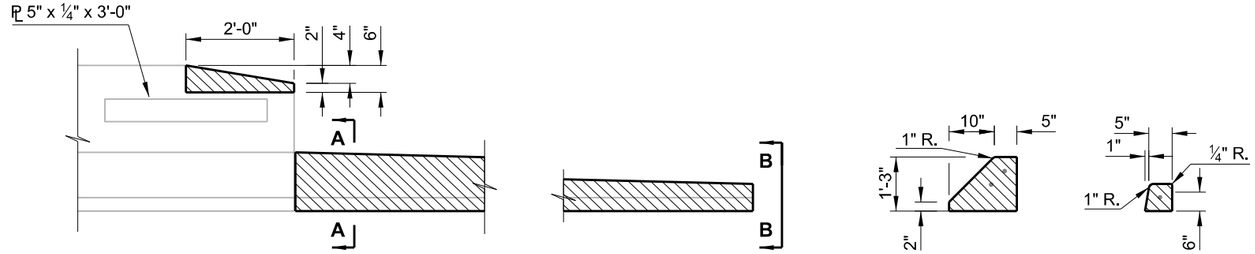
STAGED CONSTRUCTION

23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	170	14



PLAN



SHOWING REMOVAL LIMITS **A-A** **B-B**

(SHOWING FRONT FACE)
BARRIER END MODIFICATION DETAIL

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The hatched areas indicate concrete to be removed and modified. Sawcut concrete to provide a neat line prior to being removed. Exercise care to ensure no damage is done to the existing reinforcing steel that is to remain in place.

Scope of work: The work consists of a barrier end modification at all corners of the bridge and removal of the curb on the approach slabs and replace with jersey barriers.

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0152	REMOVE OF BRIDGE RAIL	LS	1
602	1208	CONCRETE BRIDGE BARRIER	LF	80
930	9647	BARRIER END MODIFICATION	EA	4

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
BNRR OVERHEAD
WILLISTON, ND

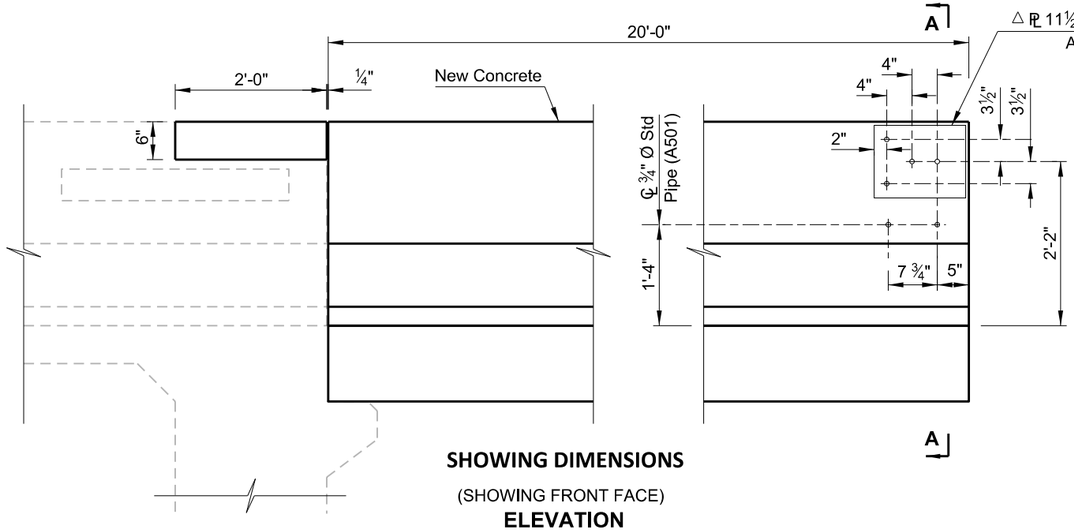
BRIDGE LAYOUT

PROJECT: SOIB-7-804(054)312
STATION: 16683+21.73
WILLIAMS COUNTY

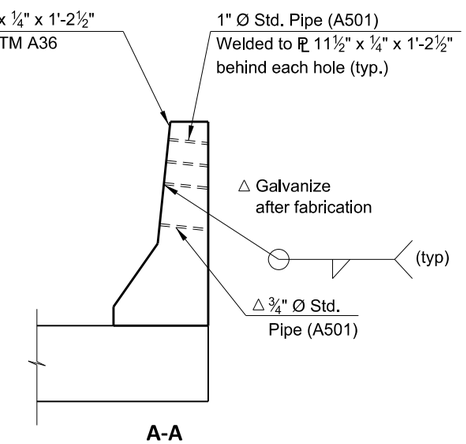
7/12/2016 — Terrence R. Udland /s/
DATE — BRIDGE ENGINEER

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	SOIB-7-804(054)312	170	15

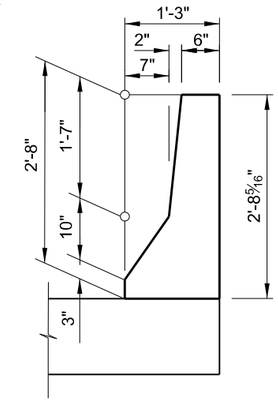
23 U.S.C. 409
NDDOT Reserves All Objections



SHOWING DIMENSIONS
(SHOWING FRONT FACE)
ELEVATION

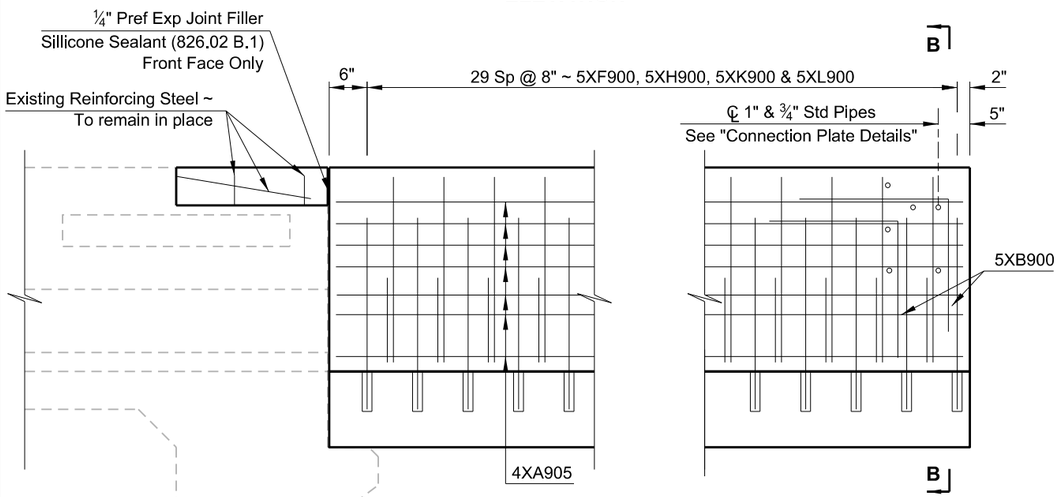


A-A

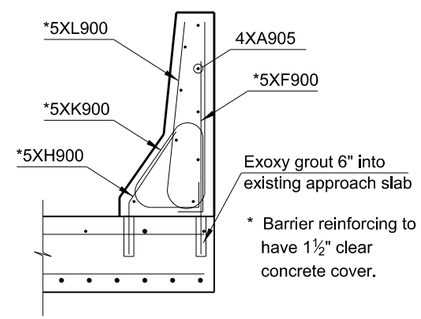


(SHOWING DIMENSIONS)
A-A

Use special surface treatment on approach slab barrier and barrier end modifications that match the existing barriers in texture and color.



SHOWING REINFORCING
(SHOWING FRONT FACE)
ELEVATION

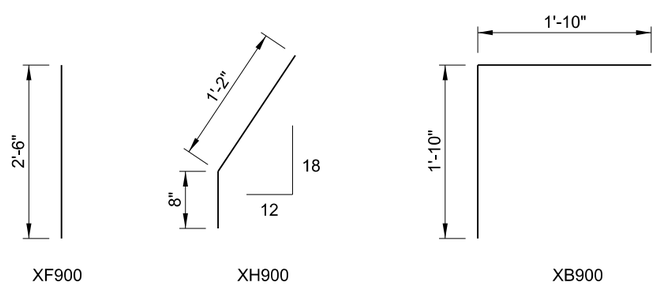


B-B

SKEW ANGLE = 28°			
BAR LIST - ONE END			
SIZE	MARK	NO.	LENGTH
4	XA905	18	19'-8"
5	XK900	60	4'-1"
5	XL900	60	5'-0"
5	XB900	4	3'-8"
5	XF900	60	2'-6"
5	XH900	60	1'-10"
ESTIMATED MATERIAL QUANTITIES			
REINFORCING STEEL (LBS)		CONCRETE (CY)	
1,076		3.50	

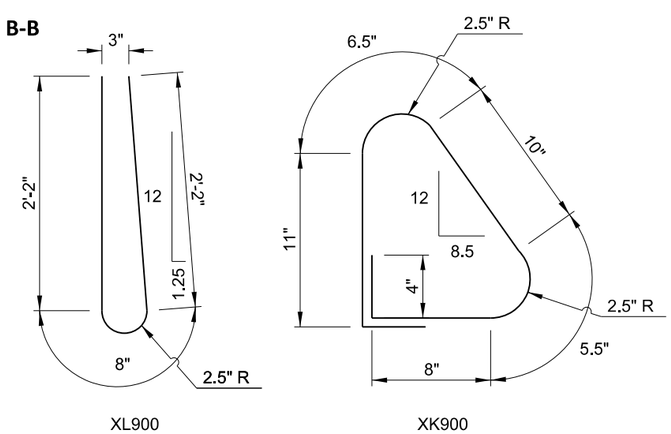
The estimated material quantities shown are for information purposes only. All materials including conrete, reinforcing bars, polyethylene film, preformed joint filler, rebar couplers, polystyrene, silicone sealant, connection plates and pipes, and all labor required to build the approach slabs, barriers and walls is to be included in the pay items "Concrete Bridge Barrier." The concrete is Class AE-3 and the reinforcing steel is Grade 60. The reinforcing steel is required to meet the requirements of Section 612.

The bar marks beginning with an "X" indicate an epoxy coated bar. The dimensions shown in the "Bent Bar Details" are out to out



XF900 XH900 XB900

STRAIGHT BAR DETAILS



XL900 XK900

BENT BAR DETAILS

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BNRR OVERHEAD
WILLIAMS COUNTY

STATION: 16683+21.73

BRIDGE DETAILS