DESIGN DATA				
Traffic	Average Daily			
Current 2021	Pass: 2,385	Trucks: 200	Total: 2,585	
Forecast 2041	Pass: 2,985	Trucks: 250	Total: 3,235	
Clear Zone Distance: 20 ft		Design Speed: 65		
Minimum Sight Dist. for Stopping: 645 ft		Bridges: N/A		
Sight Dist. for No Passing Zone: 1100 ft				
Pavement Design Life 20 (years)				
Design Accumulated One-way flexible ESALs: 548,609				

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	22616	1	1

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

NH-3-001(031)201

Cavalier County
Nekoma Spur to Jct 5 Langdon

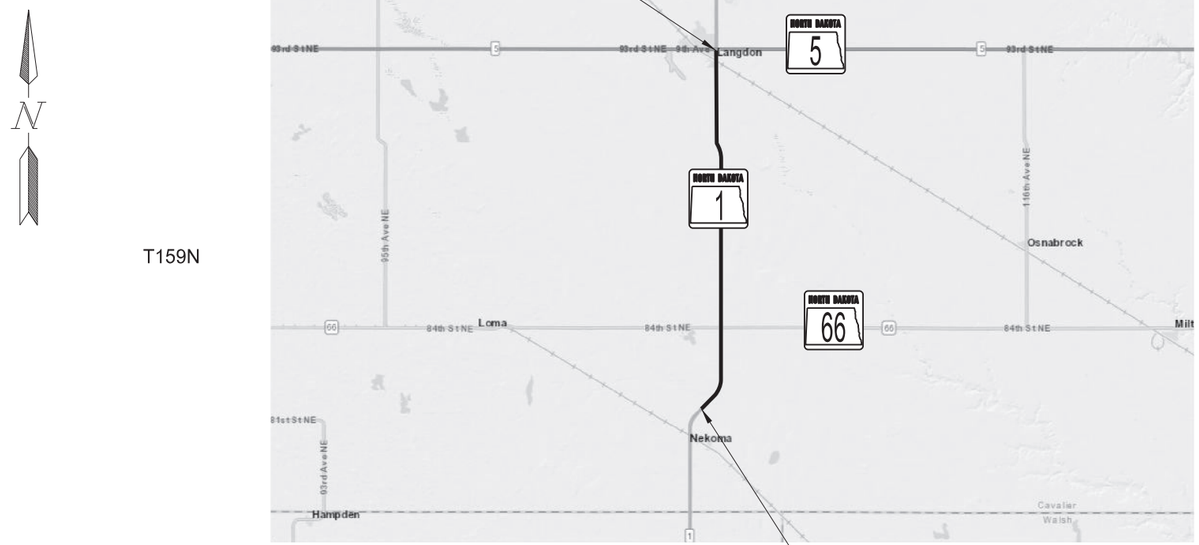
Structural Improvement & Preventative Maintenance
Full Depth Reclamation
Mill & Overlay

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	01/01/2022
Supplemental Specifications	NONE

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
NH-3-001(031)201	12.153	12.153

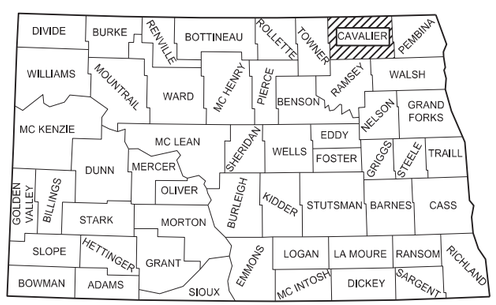
End Project
NH-3-001(31)201
RP 213.926
Station 21295+29.28

R60W



R60W

Begin Project
NH-3-001(031)201
RP 201.773
Station 20653+81.22



STATE COUNTY MAP

DESIGNER
Ryan Schuehle
DESIGNER Sam Westlund
DESIGNER Ryan Mlekoday
DESIGNER James Butler

ND DEPARTMENT OF TRANSPORTATION
OFFICE OF PROJECT DEVELOPMENT

Kirk Hoff
11/30/23

SRF CONSULTING GROUP INC.

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 11/30/23
NORTH DAKOTA

10/24/2023 2:13:52 PM rschuehle H:\Projects\14000\14451\3001201.031\Design\Plan\001TS.dgn

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PLAN SECTIONS

SPECIAL PROVISIONS

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LIST OF STANDARD DRAWINGS

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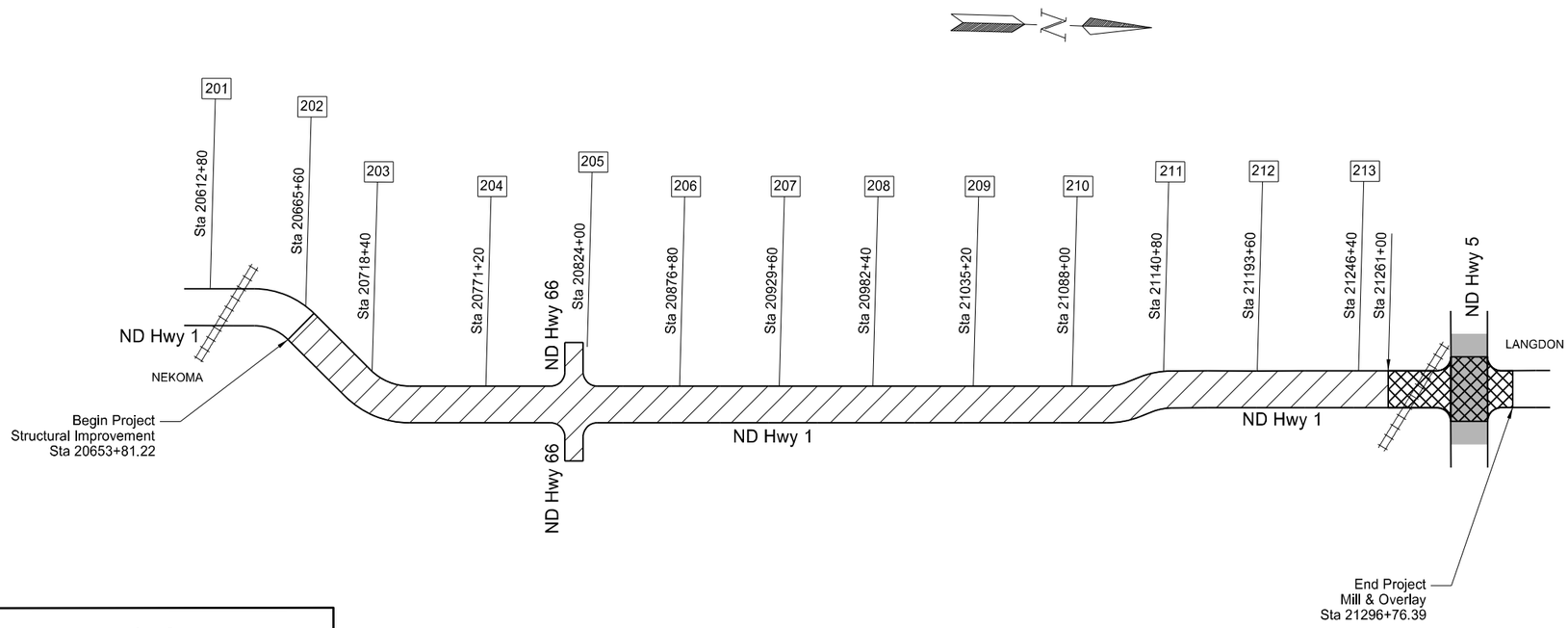

10" Full Depth Reclamation &
8" Asphalt Emulsified Stabilized Base Course

Rail Road Crossing

Mill & Overlay

Turn Lane Striping

Scope of Work

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

8/14/2025 10:00:25 AM JButler H:\Projects\14000\14451\3001201.031\Design\Plan\004SW.dgn

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NOTES

GENERAL NOTES

105-P01 PLAN STATIONING: All project stations and offsets are measured from the Design ND HWY 1 alignment (OCL_ND1) unless otherwise noted.

Right of Way limits are measured from ND HWY 1 alignment (EX_ND1).

105-P02 PROFILE: It is estimated the full depth reclamation operation will result in a net grade increase of 2 inches. This will result in the finished grade of pavement matching the existing profile.

If the full depth reclamation results in a depth increase of less than 2 inches, a quantity of 21,318 tons or one and a half inches of Aggregate Base Course Class 5 is included for the length of the full depth reclamation to establish the proposed base grade.

107-115 RAILROAD PROTECTIVE LIABILITY INSURANCE: This project crosses the BNSF Railway Company at RP 213.56. The type of work that will be performed within the railroad right of way is Mill & Overlay. Direct inquiries regarding protective liability insurance to:

Rosa Martinez
Marsh USA Inc.
4400 Comerica Bank Tower
1717 Main Street
Dallas, TX 75201-7357, USA
214-303-8519
Rosa.M.Martinez@marsh.com

Obtain information regarding crossing number 082280E from the Federal Railroad Administration website: http://safetydata.fra.dot.gov/Officeofsafety/

107-P01 MAINTAINING TRAFFIC_DROP OFFS: If, at the end of the work-day, drop-offs greater than 2 inches and less than 18 inches or slopes steeper than 4:1 exist between the edge of a traffic lane and the outside edge of the proposed roadway, perform one of the following actions:

- Construct a traversable wedge in the area of the drop-off or steep slope; or
- Close the lane adjacent to the drop-off or steep slope and provide 24-hour flagging or pilot car operations.

When constructing a wedge, construct a wedge composed of aggregate or earthen materials with a 4:1 or flatter slope along the entire length of the area. Compact materials using Type C compaction, as specified in 203.04 E.4, “Compaction Control Type C.”

Install stackable vertical panels that meet the requirements of Section 704.03 H, “Stackable Vertical Panels”, along the edge of the driving lane closest to the wedge.

The Engineer will measure stackable vertical panels as specified in Section 704.05, “Method of Measurement” and will pay for panels as specified in Section 704.06, “Basis of Payment.”

The Engineer will not measure material used to construct the wedge. Include the cost of materials, equipment, labor, and incidentals required for this operation in the price bid for “Aggregate Base Course Cl 5”.

If a 4:1 or flatter wedge is not installed, provide 24-hour flagging or pilot car operations and associated traffic control at no additional cost to the Department.

The requirements of Section 704.04 O, “Traffic Control for Uneven Pavement” apply to drop-offs created by milling or the placement of hot mix asphalt.

108-100 WEEKLY PLANNING & REPORTING MEETING: A weekly planning and reporting meeting is required.

203-385 AVERAGE HAUL: No average haul has been computed for this project.

203-P01 APPROACH FORESLOPE RECONSTRUCTION: Embankment for Approach Foreslope Reconstruction can be utilized from adjacent project NH-3-001(033)200, PCN 23109.

The Engineer will not measure material used for foreslope reconstruction. Include the cost of topsoil removal / replacement, embankment, equipment, labor, and incidentals required for this operation in the price bid for “Approach Foreslope Reconstruction.”

302-P01 TRAFFIC SERVICE AGGREGATE: Construct temporary traffic service aggregate wedges at both ends of the project and all approaches to provide a smooth transition from the existing pavement to the top of the new milled section, reclaimed section or aggregate base section.

Use material meeting requirements for Aggregate Base Course Class 5 for surfacing during Temporary Traffic Control Operations.

A quantity of 500 tons of traffic service aggregate has been provided for this use. Maintain transitions until paved. Include all costs to install, remove, and maintain these wedges in the unit price for “Traffic Service Aggregate”.

411-P01 MILLING PAVEMENT SURFACE – Cross sections and estimated quantities for the project have been developed in accordance with Section 30 “Typical Sections”. Mill the existing pavement surface using a 6-inch depth at Centerline and a 2.1% slope across surface. Estimated milling depths at the edge of pavement are provided in Section 11. The shoulder depths may change the final quantity for Milling Pavement Surface.

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

411-P02 MILLED MATERIAL: Deliver 9,000 tons of millings to the Langdon Section yard. Stockpile the 9,000 tons with a front-end loader at Langdon Section yard located at:

10424 Hwy 5
Langdon, ND 58249

Material will meet a maximum size of 1 ½", with 90% passing the 1" sieve. Upon stockpiling at the yard, the material becomes the property of the state.

Include costs to remove and deliver milled material in the contract unit price bid for "Milling Pavement Surface – TON".

430-P01 PAVING: Place a minimum 2" lift of Superpave FAA 42 within 21 calendar days of completing a section of asphalt emulsion stabilization. Time will begin on the day that the asphalt emulsion is incorporated into each section. A section is considered one days' worth of asphalt emulsion stabilizing. If the 2" lift is not placed within 21 calendar days, re-blend and asphalt emulsion stabilize each section that has gone beyond 21 days at the expense of the Contractor.

704-100 TRAFFIC CONTROL SUPERVISOR: Provide a Traffic Control Supervisor.

704-500 PORTABLE RUMBLE STRIPS (PRS): Use PRS made of rubber or engineered polymers.

Install PRS as part of the temporary traffic control when the following signs are also part of the required traffic control set up:

- "Be Prepared to Stop" (W3-4); and
- "Flagger" symbol (W20-7)

Install PRS that meet the following criteria:

- Have no adhesives or fasteners required for placement;
- Have a manufacture's speed rating that meets or exceeds the posted speed limit; and
- Each strip in the array must weigh a minimum of 100 pounds.

Use individual PRS constructed in one of the following manners:

- A single piece;
- Interlocking segments; or
- Two pieces hinged at the midpoint.

An installed array of PRS consists of a minimum of 3 individual strips.

Move rumble strips with the flagging operation. Do not place rumble strips on horizontal curves.

The Engineer will count and measure each array as one unit. Include the cost of providing, installing, maintaining, and relocating PRS in the unit price bid for "Portable Rumble Strips".

704-P01 TRAFFIC CONTROL FOR BITUMINOUS PAVEMENT: Provide traffic control consisting of a temporary road closure, flagging, and a pilot car.

Traffic control device quantities are estimated based on a 3-mile lane closure and the list below. The Department will pay for all necessary deployed devices, regardless of the length of the lane closure.

1. Standard D-704-19 Type F, Lane closure on a Two-Lane Road Using Flaggers
2. Standard D-704-20, layout G, basis of the Terminal Signing and Intersecting Routes – signing will be required at junctions: 82nd St NE, 83rd St NE, ND Hwy 66, County rd. 24, 87th St NE, 88th St NE, 89th St NE, 90th St NE, 91st St NE and 92nd St NE;
3. Standard D-704-22, layouts K and L;
4. Standard D-704-26, layouts Y, BB, CC, DD, EE, FF and GG as needed
5. Standard D-704-37, layout for reclaimed roadway two lane.

The required traffic control signs and devices are included in the "Traffic Control Devices List" and will be measured and paid at the contract unit price for each device.

REGISTERED PROFESSIONAL ENGINEER
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DATE: 8/18/2025
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

706-P01 FIELD OFFICE: Provide a field office which meets the following requirements:

1. Be completely insulated and weather tight.
2. Minimum total area of 450 square feet.
3. Indoor bathroom facilities, sewer and potable water.
4. Have a dependable source of electricity for power and lights with a minimum of 6 electrical outlets spaced throughout the building and light fixtures spaced to uniformly light the entire interior (lumens required 110 foot-candles).
5. Be wired for DSL Broadband internet with wireless Wi-Fi and have the capability to allow for hard wiring the computer. Include the cost of the installation and monthly fees.
6. A heating and cooling system that is capable of maintaining the temperature between 65°F and 78°F year around.
7. A minimum of 3 desks and 3 desk chairs, 3 extra chairs, a drawer file cabinet with at least two drawers, one table minimum of 2.5 ft x 5 ft.
8. Photocopy machine/Printer capable of 11x17 photocopies/prints and toner to last the duration of the project. Engineer will provide paper. Other features to include digital coping & scanning. (Fax capabilities can be included but not necessary).
9. The location of the field office will be on, or as close to the project as possible and approved by the Engineer. Any rental fees will be paid by the Contractor.
10. Make the field office available for occupancy one week before the start of the project and remain through project completion.
11. Heat, electric, internet service, sewer, and water hookups to be furnished by contractor, contractor to pay utility bill.

714-P01 PIPE EXTENSIONS: If the Contractor encounters silted-in pipes at locations where pipes are to be extended, remove the silted-in material from the ditch bottom to re-establish the flow line to the extended pipe invert elevation. Include the cost of removing the silt in the price bid for pipe pay items.

754-P01 STOP SIGNS - REFLETIVE STRIPS: Install 2 inch wide white reflective strips on all sides of the sign support, except the side that faces the same direction as the sign.

Use reflective material that meets the requirements of Section 894.02 C, “Type IV Retroreflective Sheeting”.

Install the strips on STOP signs at the following locations:
- STA 20817+76 LT (ND 66)
- STA 20819+49 Rt (ND 66)

Include the cost of furnishing and installing retroreflective strips in the contract unit Price for “Steel Galvanized Posts – Telescoping Perforated Tube”

754-P02 LIGHT EMITTING DIODE STOP SIGN: Furnish and install a solar-powered Light Emitting Diode (LED) stop sign at the following locations:

- STA 20817+76 LT (ND 66)
- STA 20819+49 Rt (ND 66)

Conform to Section 2A.07 and Section 2A.08 of the “Manual on Uniform Traffic Devices for Streets and Highways” (2009 Editions including Revisions 1, 2, and 3 dated July 2022) for specifications and requirements for the LED stop sign. Refer to manufacturer for mounting and installation details.

Include the cost of furnishing and installing the solar-powered LED stop sign in the price bid for “Flat Sheet for Signs – Type XI Refl Sheeting”.

762-050 PAVEMENT MARKING: If the Engineer and Contractor agree, plan quantity will be used as the measurement for payment for pavement marking items.

766-P01 MAILBOXES: Notify affected mailbox owners in advance of disturbing the existing mailboxes and supports. Provide written notification 30 days in advance to disturbance and provide copies of the notifications to the Engineer. Just prior to removing the existing mailbox and support, coordinate verbally with the mailbox owner to discuss resetting the existing, mailbox on a new support. Contact the U.S. Postal Service for the mailbox owners’ contact information.

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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ENVIRONMENTAL NOTES

ENVIRONMENTAL NOTES (EN): The North Dakota Department of Transportation and the Federal Highway Administration have made environmental commitments to secure approval of this project. The following environmental notes are requirements to comply with these commitments:

EN-1 AQUATIC NUISANCE SPECIES (ANS): Equipment that was last used outside of North Dakota or within a Class I infested waterbody (identified on the North Dakota Game and Fish Department (NDGFD) website) requires an inspection by NDGFD. Notify the NDGFD at least 10 business days prior to pumps, watercraft, or any equipment entering a public water to allow the NDGFD sufficient time to inspect any and all such equipment for ANS. Contact the NDGFD ANS Coordinator, Ben Holen by e-mail - bholen@nd.gov for equipment inspections. Supply one of the following to the engineer as proof of compliance prior to work taking place in the water: (1) the NDGFD inspection report, (2) documented NDGFD correspondence (email or signed letter).

EN-2 TEMPORARY WETLAND IMPACT: Temporary impact areas within wetlands and or other waters are incorporated into the plans for this project. Remove temporary fill placed and sedimentation in wetlands or other waters. Restore these wetlands to preconstruction contours.

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PE-10772
DATE: 8/18/2025
NORTH DAKOTA

Estimated Quantities

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SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline				TOTAL
103	0100	CONTRACT BOND	L SUM	0.5				0.5
107	0103	RAILWAY PROTECTION INSURANCE-SITE 1	EA	1				1
107	0141	RAILROAD COORDINATION - COMPANY A	LSUM	1				1
107	0145	RAILROAD FLAGGING	DAY	2				2
109	1000	E-TICKETING	L SUM	0.5				0.5
202	0114	REMOVAL OF CONCRETE PAVEMENT	SY	35				35
202	0129	REMOVAL OF CURB	LF	42				42
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES	EA	7				7
203	0215	APPROACH FORESLOPE RECONSTRUCTION	EA	36				36
216	0100	WATER	M GAL	1682				1682
251	0200	SEEDING CLASS II	ACRE	1.42				1.42
251	2000	TEMPORARY COVER CROP	ACRE	1.42				1.42
253	0101	STRAW MULCH	ACRE	2.84				2.84
255	0102	ECB TYPE 2	SY	314				314
261	0112	FIBER ROLLS 12IN	LF	4120				4120
261	0113	REMOVE FIBER ROLLS 12IN	LF	4120				4120
302	0050	TRAFFIC SERVICE AGGREGATE	TON	500				500
302	0120	AGGREGATE BASE COURSE CL 5	TON	23914				23914
306	0510	FULL DEPTH RECLAMATION	SY	271819				271819
320	0500	ASPHALT EMULSIFIED STABILIZED BASE COURSE	SY	271819				271819
320	0510	ASPHALT EMULSION	TON	4228				4228
401	0050	TACK COAT	GAL	27830				27830
401	0070	FOG SEAL	GAL	33668				33668
411	0100	MILLING PAVEMENT SURFACE	TON	91692				91692
430	0042	SUPERPAVE FAA 42	TON	62040				62040
430	1000	CORED SAMPLE	EA	388				388
430	5815	PG 58S-34 ASPHALT CEMENT	TON	3722				3722
702	0100	MOBILIZATION	L SUM	0.5				0.5
704	0100	FLAGGING	MHR	2500				2500
704	1000	TRAFFIC CONTROL SIGNS	UNIT	3230				3230
704	1048	PORTABLE RUMBLE STRIPS	EA	2				2
704	1060	DELINEATOR DRUMS	EA	318				318
704	1185	PILOT CAR	HR	850				850
704	1500	OBLITERATION OF PAVEMENT MARKING	SF	548				548
706	0400	FIELD OFFICE	EA	0.8				0.8
706	0500	AGGREGATE LABORATORY	EA	0.8				0.8
706	0550	BITUMINOUS LABORATORY	EA	0.8				0.8
706	0600	CONTRACTOR'S LABORATORY	EA	0.8				0.8
714	5000	PIPE CORR STEEL .064IN 12IN	LF	4				4
714	5015	PIPE CORR STEEL .064IN 18IN	LF	117				117
714	5035	PIPE CORR STEEL .064IN 24IN	LF	41				41
714	5810	END SECT CORR STEEL .064IN 18IN	EA	3				3
714	5820	END SECT CORR STEEL .064IN 24IN	EA	4				4
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES	EA	13				13
720	0125	ALIGNMENT MONUMENTS	EA	29				29
748	0140	CURB & GUTTER-TYPE I	LF	42				42
748	0520	CURB-TYPE I	LF	48				48

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline				TOTAL
750	0115	SIDEWALK CONCRETE 4IN	SY	31				31
750	2115	DETECTABLE WARNING PANELS	SF	20				20
754	0110	FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING	SF	230				230
754	0112	FLAT SHEET FOR SIGNS-TYPE IV REFL SHEETING	SF	282				282
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	1309				1309
754	0592	RESET SIGN PANEL	EA	22				22
760	0025	SINUSOIDAL RUMBLE STRIP - ASPHALT SHOULDER	MILE	21.67				21.67
760	0027	SINUSOIDAL RUMBLE STRIP - ASPHALT CENTERLINE	MILE	10.84				10.84
762	0103	PVMT MK PAINTED-MESSAGE	SF	194				194
762	0432	SHORT TERM 6IN LINE-TYPE NR	LF	61367				61367
762	1106	PVMT MK PAINTED 6IN LINE	LF	151971				151971
762	1112	PVMT MK PAINTED 12IN LINE	LF	470				470
762	1124	PVMT MK PAINTED 24IN LINE	LF	140				140
766	0100	MAILBOX-ALL TYPES	EA	17				17

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BASIS OF ESTIMATE

PAVING TABLE MAINLINE

		Full Depth Reclamation			Preventative Maintenance		
		Nekoma Spur to City of Langdon			City of Langon to Jct of ND 5		
		Sta 20653+81.22 to Sta 21261+00			Sta 21261+00 to Sta 21296+76.39		
		607.188 Sta.			35.764 Sta.		
Material	Unit	Width (ft)	Quantity per Station	Total	Width (ft)	Quantity Per Station	Total
Tack Coat @ 0.05 Gal/SY (1 Lift on Stabilized Base)	Gal	38.5	21.39	12987.00	See Section 90 for Quantities		
Tack Coat @ 0.05 Gal/SY (1 Lift Between Pavement Lifts)	Gal	38.5	21.39	12987.00			
Fog Seal @ 0.12 Gal/SY (1 Lift on Stabilized Base as Needed)	Gal	40	53.33	32383.00			
Superpave FAA 42 @ 2 Ton/CY (Base Lift)	Ton	40	49.38	29984.59			
Superpave FAA 42 @ 2 Ton/CY (Top Lift)	Ton	38.5	47.53	28860.17			
PG 58S-34 Asphalt Cement @ 6% - Superpave FAA 42	Ton	40	5.81	3530.69			
10” Full Depth Reclamation	SY	40	444.45	269862.00			
8” Asphalt Emulsified Stabilized Base Course	SY	40	444.45	269862.00			
Asphalt Emulsion (C)	Ton	40	6.91	4198.00			
Aggregate Base Course Cl 5 @ 1.875 Ton/CY (A)	Ton	40	35.11	21318.00			
Aggregate Base Course Cl 5 @ 1.875 Ton/CY (B)	Ton	Varies	4.27	2595.21			

(A) Aggregate Base Course Cl 5 to be used if the full depth reclamation results in a depth increase of less than 2 inches.
(B) Aggregate Base Course Cl 5 to be used as edge of pavement grade adjustment per Section 11 "Aggregate Base Tables"
(C) Asphalt Emulsion is incorporated at a rate of 3.5% of the estimated weight of the full depth reclamation

REMOVAL/MILLING

Bituminous Pavement @ 2.0 Ton/CY
Aggregate @ 1.875 Ton/CY

		Full Depth Reclamation			Preventative Maintenance		
		Nekoma Spur to City of Langdon			City of Langon to Jct of ND 5		
		Sta 20653+81.22 to Sta 21261+00			Sta 21261+00 to Sta 21296+76.39		
		607.188 Sta.			35.764 Sta.		
Material	Unit	Width (ft)	Quantity per Station	Total	Width (ft)	Quantity Per Station	Total
Milling Pavement Surface - 6"	Ton	40	148.15	89954	-	-	-
Milling Pavement Surface - 2" (A)	Ton	-	-	-	40	48.58	1737
Total Milling Pavement Surface	Ton	91691					
Deliver to Langdon Section Yard	Ton	9000					
Waste	Ton	82691					

(A) Preventative Maintenance Milling Pavement Surface – 2” is included in section 90

REGISTERED PROFESSIONAL ENGINEER
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DATE: 8/18/2025
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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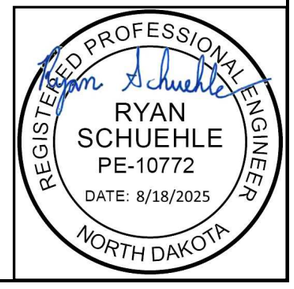
BASIS OF ESTIMATE

WATER TABLE

216 0100 Water				
Material	**Basis**	**Basis Quantity**		**Quantity (Mgal)**
Dust Palliative	25 Mgal/Mile	11.500	Mile	288
Compaction of Full Depth Reclamation	4gal/SY	271819	SY	1088
Aggregates	20 gal/Ton	14790	Ton	296
Embankment	-	-		10.00
		Total:		**1682.00**

MAILBOX TABLE

766 0100 Mailbox- All Types		
Station	Type	Work
21127+80 - RT	Single	Do Nothing
21137+34 - RT	Single	Replace Support
21169+14 -RT	Single	Do Nothing
21172+72 - RT	Single	Replace Support
21175+53 - RT	Single	Replace Support
21181+51 - RT	Single	Replace Support
21183+52 - RT	Single	Replace Support
21185+09 - RT	Single	Replace Support
21211+53 - RT	Single	Replace Support
21214+17 - RT	Single	Replace Support
21215+92 - RT	Single	Replace Support
21221+31 - RT	Single	Replace Support
21240+33 - RT	Single	Replace Support
21252+30 - RT	Single	Replace Support
21257+47 - RT	Single	Replace Support
21282+64 - LT	Single	Replace Support
21285+62 - LT	Single	Replace Support
21287+04 - LT	Single	Replace Support
21288+54 - LT	Single	Replace Support



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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BASIS OF ESTIMATE

CORED SAMPLES TABLE

HMA Cored Samples										
Specification Section	Location	Begin Station	End Station	A	B		C	Quantity (AxBxC)	Quantity (1 per mile)	Unit
				Distance (FT) ÷1000	Lanes	Joints	Lifts			
430.04 I.2b(1), "General"	ND 1 Mainline	20653+81.22	21261+00	61	2	N/A	2	244	N/A	EA
	ND 1 Mainline	21261+00	21295+29.28	3	2	N/A	1	6	N/A	EA
SSP 4 Longitudinal Joint Density in HMA Pavements (Centerline)	ND 1 Mainline	20653+81.22	21261+00	61	N/A	1	2	122	N/A	EA
	ND 1 Mainline	21261+00	21295+29.28	3	N/A	1	1	3	N/A	EA
430.04 I.2b(2), "Pavement Thickness Determination Cores"								N/A	13	EA
							Total	375	13	EA

OBLITERATION OF PAVEMENT MARKING TABLE

Obliteration of Pavement Marking	
Section 120 sheet 1	Total
Centerline - 4" Double Yellow Barrier	122 SF
Edge Line - 4" White	426 SF

TEMPORARY PAVEMENT MARKING TABLE

Short Term Pavement Marking (Short Term Line-Type NR)				
Mainline - Sta 20653+81.22 to Sta 21261+00.00	Basis	Amount	Applications (1)	Total
Centerline - 6" Yellow (10' Line, 30' Skip)	1320 LF/Mile	11.5 Miles	3 EA	45540 LF
Mainline - Sta 21261+00.00 to Sta 21270+40.00	Basis	Amount	Applications (2)	Total
Centerline - 6" Yellow (10' Line, 30' Skip)	1320 LF/Mile	0.179 Miles	2 EA	473 LF
Mainline - Sta 21270+40 to Sta 21295+05.24	Basis	Amount	Applications (2)	Total
Centerline - 6" Double Yellow Barrier	10560 LF/Mile	0.467 Miles	2 EA	9864 LF
Flared Intersection - ND 66 (D-762-5)	Basis	Amount	Applications (2)	Total
Mainline Centerline - 6" Yellow Barrier	1290 LF/EA	1 EA	3 EA	3870 LF
Sideroad Centerline - 6" Double Yellow Barrier	540 LF/EA	1 EA	3 EA	1620 LF

(1) Application of temporary pavement marking on primed surface, base lift, and top lift.
(2) Application of temporary pavement marking on milled surface, and top lift.

RUMLBE STRIP TABLES

760 0025 Rumble Strips – Sinusoidal Rumble Strip – Asphalt Shoulder			
Begin Station	End Station	Basis	Quantity (mi)
20653+81.22	21226+00	10560 LF/Mile	21.67

760 0027 Rumble Strips – Sinusoidal Rumble Strip – Asphalt Centerline			
Begin Station	End Station	Basis	Quantity (mi)
20653+81.22	21226+00	5280 LF/Mile	10.84

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	10	4

BASIS OF ESTIMATE

PAVMENT MARKING TABLE

Permanent Pavement Marking (Painted Pvmt Mk)					
Mainline - Sta 20653+81.22 to Sta 21270+40.00	Basis		Amount		Total
Centerline - 6" Yellow (10' Line, 30' Skip)	1320	LF/Mile	11.678	Miles	15415 LF
Edge Line - 6" White	10560	LF/Mile	11.678	Miles	123320 LF
Mainline - Sta 21270+40.00 to Sta 21282+66.00	Basis		Amount		Total
Centerline - 6" Double Yellow Barrier	10560	LF/Mile	0.233	Miles	2461 LF
Edge Line - 6" White	10560	LF/Mile	0.233	Miles	2461 LF
Mainline - Sta 21282+66.00 to Sta 21295+05.24	Basis		Amount		Total
Centerline - 6" Double Yellow Barrier	10560	LF/Mile	0.235	Miles	2482 LF
Edge Line - 6" White (RT ONLY)	5280	LF/Mile	0.235	Miles	1241 LF
Railroad Crossing (D-762-1)	Basis		Amount		Total
Railroad Cross & RR Message	65	SF/EA	2	EA	130 SF
24" White Line	36	LF/EA	2	EA	72 LF
Flared Intersection - ND 66 (D-762-5)	Basis		Amount		Total
Mainline Centerline - 6" Yellow Barrier	1290	LF/EA	1	EA	1290 LF
Sideroad Centerline - 6" Double Yellow Barrier	270	LF/EA	2	EA	540 LF
Sideroad Edge Line - 6” White	270	LF/EA	2	EA	540 LF
6" White Line (Around Cross Hatch)	90	LF/EA	2	EA	180 LF
12" White Cross Hatch Line	60	LF/EA	2	EA	120 LF
24" White Stop Bar	12	LF/EA	2	EA	24 LF
Section 120 sheet 1	Total				
Centerline - 6" Yellow (10' Line, 30' Skip)					20 LF
Centerline - 6" Double Yellow Barrier					1572 LF
Edge Line - 6” White					449 LF
Left Turn Arrow					64 SF
Channel Line - 12" White					350 LF
24" White Stop Bar					44 LF

SUMMARY OF PAVEMENT MARKING QUANTITIES

SPEC	CODE	BID ITEM	QTY	UNIT
704	1500	OBLITERATION OF PAVEMENT MARKING	548	SF
762	0103	PVMT MK PAINTED-MESSAGE	194	SF
762	1106	PVMT MK PAINTED 6IN LINE	151971	LF
762	1112	PVMT MK PAINTED 12IN LINE	470	LF
762	1124	PVMT MK PAINTED 24IN LINE	140	LF
762	0432	SHORT TERM 6IN LINE-TYPE NR	61367	LF

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	10	5

BASIS OF ESTIMATE

CORE DATA SHEET

Mile Point	RT. Or LT.	Depth (inches)
202	LT	14.25
202.25	RT	13.5
202.5	LT	14.75
202.75	RT	13
203	LT	16.5
203.25	RT	13
203.5	LT	13.5
203.75	RT	13.5
204	LT	14
204.25	RT	15.25
204.5	LT	15.5
204.75	RT	15
205	LT	15.25
205.25	RT	15.5
205.5	LT	15.25
205.75	RT	14
206	LT	14.5
206.25	RT	14.75
206.5	LT	15
206.75	RT	15
207	LT	14
207.25	RT	13.25
207.5	LT	13
207.75	RT	13.5
208	LT	13.75
208.25	RT	14.75
208.5	LT	13.5
208.75	RT	12.75
209	LT	13.5

Mile Point	RT. Or LT.	Depth (inches)
209.25	RT	13.75
209.5	LT	15.5
209.75	RT	13.75
210	LT	14
210.25	RT	13
210.5	LT	14
210.75	RT	13.5
211	LT	14.25
211	LT	14.25
211.25	RT	14
211.5	LT	13
211.75	RT	13.5
212	LT	15
212.25	RT	14.125
212.5	LT	13.5
212.75	RT	14
213	LT	14.5
213.25	RT	14.25
213.5	LT	11.5
213.75	RT	6

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	11	1

OCL ND1	CL Existing / Proposed	Milled CL 6"	18.54' LT of CL Elevevation at Proposed Crossslope	18.54' RT of CL Elevation at Proposed Crossslope	LT Existing	RT Existing	LT Milling Depth	RT Milling Depth	
	A	B	C = B - cross slope x 18.54'	D = B - cross slope x 18.54'	E	F	G = (E - C) x 12	H = (F - D) x 12	
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	
20655+00.00	1626.22	1625.72	1625.53	1625.33	1625.62	1625.36	1.1	0.4	*
20656+00.00	1626.25	1625.75	1625.38	1625.36	1625.52	1625.58	1.6	2.6	*
20657+00.00	1626.22	1625.72	1625.33	1625.33	1625.48	1625.57	1.7	2.8	
20658+00.00	1626.01	1625.51	1625.12	1625.12	1625.31	1625.30	2.3	2.2	
20659+00.00	1625.73	1625.23	1624.84	1624.84	1624.92	1624.98	1.0	1.6	
20660+00.00	1625.09	1624.59	1624.20	1624.20	1624.30	1624.34	1.1	1.6	
20661+00.00	1623.77	1623.27	1622.88	1622.88	1622.99	1623.02	1.3	1.7	
20662+00.00	1622.25	1621.75	1621.36	1621.36	1621.48	1621.45	1.3	1.0	
20663+00.00	1620.49	1619.99	1619.60	1619.60	1619.71	1619.75	1.3	1.7	
20664+00.00	1619.26	1618.76	1618.37	1618.37	1618.38	1618.38	0.2	0.1	
20665+00.00	1618.50	1618.00	1617.61	1617.61	1617.51	1617.65	-1.2	0.4	
20666+00.00	1618.24	1617.74	1617.35	1617.35	1617.21	1617.43	-1.7	1.0	
20667+00.00	1618.51	1618.01	1617.62	1617.62	1617.60	1617.72	-0.2	1.2	
20668+00.00	1619.38	1618.88	1618.49	1618.49	1618.49	1618.50	0.0	0.1	
20669+00.00	1620.61	1620.11	1619.72	1619.72	1619.82	1619.78	1.2	0.7	
20670+00.00	1621.86	1621.36	1620.97	1620.97	1621.03	1621.03	0.7	0.8	
20671+00.00	1623.15	1622.65	1622.26	1622.26	1622.31	1622.32	0.6	0.8	
20672+00.00	1624.46	1623.96	1623.57	1623.57	1623.64	1623.59	0.9	0.2	
20673+00.00	1625.72	1625.22	1624.83	1624.83	1624.90	1624.91	0.8	0.9	
20674+00.00	1626.90	1626.40	1626.01	1626.01	1626.02	1626.15	0.2	1.7	
20675+00.00	1627.76	1627.26	1626.87	1626.87	1626.88	1627.00	0.1	1.6	
20676+00.00	1628.22	1627.72	1627.33	1627.33	1627.39	1627.53	0.7	2.4	
20677+00.00	1628.52	1628.02	1627.63	1627.63	1627.68	1627.83	0.6	2.3	
20678+00.00	1628.80	1628.30	1627.91	1627.91	1627.99	1628.05	1.0	1.6	
20679+00.00	1628.91	1628.41	1628.02	1628.02	1628.20	1628.22	2.2	2.4	
20680+00.00	1628.84	1628.34	1627.95	1627.95	1628.10	1628.24	1.8	3.5	
20681+00.00	1629.03	1628.53	1628.14	1628.14	1628.18	1628.33	0.5	2.3	
20682+00.00	1629.28	1628.78	1628.39	1628.39	1628.38	1628.51	-0.1	1.5	
20683+00.00	1629.85	1629.35	1628.96	1628.96	1629.05	1629.05	1.1	1.1	
20684+00.00	1630.68	1630.18	1629.79	1629.79	1629.94	1629.89	1.8	1.2	
20685+00.00	1631.45	1630.95	1630.56	1630.56	1630.72	1630.73	2.0	2.1	
20686+00.00	1632.33	1631.83	1631.44	1631.44	1631.51	1631.60	0.8	1.9	
20687+00.00	1633.23	1632.73	1632.34	1632.34	1632.44	1632.49	1.3	1.8	
20688+00.00	1634.26	1633.76	1633.37	1633.37	1633.46	1633.50	1.1	1.6	
20689+00.00	1635.37	1634.87	1634.48	1634.48	1634.54	1634.56	0.7	0.9	
20690+00.00	1636.27	1635.77	1635.38	1635.38	1635.54	1635.49	1.9	1.4	
20691+00.00	1636.99	1636.49	1636.10	1636.10	1636.34	1636.32	2.8	2.6	
20692+00.00	1637.65	1637.15	1636.76	1636.76	1636.92	1636.89	1.9	1.6	
20693+00.00	1638.17	1637.67	1637.28	1637.28	1637.44	1637.44	1.9	1.9	
20694+00.00	1638.49	1637.99	1637.60	1637.60	1637.73	1637.73	1.6	1.6	
20695+00.00	1638.70	1638.20	1637.81	1637.81	1637.85	1637.99	0.4	2.2	
20696+00.00	1638.81	1638.31	1637.92	1637.92	1637.83	1638.28	-1.1	4.3	
20697+00.00	1638.86	1638.36	1637.97	1638.43	1637.78	1638.56	-2.3	1.6	*
20698+00.00	1639.02	1638.52	1637.91	1639.13	1637.89	1639.16	-0.3	0.3	*
20699+00.00	1639.13	1638.63	1637.88	1639.37	1637.88	1639.44	0.0	0.9	*
20700+00.00	1639.03	1638.53	1637.79	1639.28	1637.75	1639.38	-0.5	1.2	*
20701+00.00	1639.16	1638.66	1637.92	1639.40	1637.88	1639.48	-0.4	1.0	*
20702+00.00	1639.31	1638.81	1638.07	1639.55	1638.09	1639.71	0.2	1.9	*
20703+00.00	1639.54	1639.04	1638.30	1639.78	1638.49	1639.79	2.3	0.1	*
20704+00.00	1639.83	1639.33	1638.59	1640.07	1638.55	1640.18	-0.4	1.3	*
20705+00.00	1640.06	1639.56	1638.82	1640.30	1638.88	1640.45	0.8	1.7	*
20706+00.00	1640.42	1639.92	1639.18	1640.66	1639.27	1640.81	1.0	1.8	*
20707+00.00	1640.92	1640.42	1639.68	1641.16	1639.73	1641.25	0.6	1.0	*

OCL ND1	CL Existing / Proposed	Milled CL 6"	18.54' LT of CL Elevevation at Proposed Crossslope	18.54' RT of CL Elevation at Proposed Crossslope	LT Existing	RT Existing	LT Milling Depth	RT Milling Depth	
	A	B	C = B - cross slope x 18.54'	D = B - cross slope x 18.54'	E	F	G = (E - C) x 12	H = (F - D) x 12	
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	
20708+00.00	1641.52	1641.02	1640.28	1641.76	1640.41	1641.83	1.5	0.8	*
20709+00.00	1642.01	1641.51	1640.77	1642.26	1640.90	1642.50	1.5	2.9	*
20710+00.00	1642.20	1641.70	1640.96	1642.45	1641.05	1642.61	1.0	2.0	*
20711+00.00	1642.41	1641.91	1641.16	1642.65	1641.24	1642.81	1.0	2.0	*
20712+00.00	1642.55	1642.05	1641.31	1642.79	1641.63	1642.89	3.9	1.2	*
20713+00.00	1642.63	1642.13	1641.39	1642.87	1641.38	1643.07	-0.2	2.4	*
20714+00.00	1642.53	1642.03	1641.29	1642.77	1641.21	1642.99	-1.0	2.5	*
20715+00.00	1642.24	1641.74	1640.99	1642.48	1640.97	1642.62	-0.3	1.6	*
20716+00.00	1641.93	1641.43	1640.69	1642.17	1640.64	1642.31	-0.6	1.6	*
20717+00.00	1641.66	1641.16	1640.41	1641.90	1640.30	1642.16	-1.4	3.1	*
20718+00.00	1641.21	1640.71	1639.97	1641.45	1639.95	1641.69	-0.2	2.9	*
20719+00.00	1641.41	1640.91	1640.17	1641.65	1639.98	1641.75	-2.3	1.1	*
20720+00.00	1641.50	1641.00	1640.26	1641.75	1640.00	1641.71	-3.1	-0.4	*
20721+00.00	1641.43	1640.93	1640.18	1641.67	1639.99	1641.59	-2.3	-0.9	*
20722+00.00	1641.32	1640.82	1640.08	1641.56	1639.93	1641.46	-1.7	-1.2	*
20723+00.00	1641.34	1640.84	1640.10	1641.58	1640.10	1641.56	0.0	-0.2	*
20724+00.00	1641.32	1640.82	1640.08	1641.56	1640.04	1641.70	-0.4	1.6	*
20725+00.00	1641.07	1640.57	1639.83	1641.31	1639.93	1641.40	1.1	1.0	*
20726+00.00	1640.83	1640.33	1639.59	1641.08	1639.76	1641.14	2.0	0.8	*
20727+00.00	1640.99	1640.49	1639.75	1641.23	1639.99	1641.24	2.9	0.1	*
20728+00.00	1641.26	1640.76	1640.01	1641.50	1640.34	1641.35	3.9	-1.8	*
20729+00.00	1641.53	1641.03	1640.64	1641.38	1640.74	1641.30	1.2	-1.0	*
20730+00.00	1641.77	1641.27	1640.88	1641.06	1641.00	1641.20	1.5	1.6	*
20731+00.00	1641.71	1641.21	1640.82	1640.82	1640.94	1640.92	1.4	1.1	
20732+00.00	1641.69	1641.19	1640.80	1640.80	1640.88	1640.82	1.0	0.3	
20733+00.00	1641.63	1641.13	1640.74	1640.74	1640.83	1640.78	1.0	0.4	
20734+00.00	1641.63	1641.13	1640.74	1640.74	1640.85	1640.73	1.3	-0.1	
20735+00.00	1641.68	1641.18	1640.79	1640.79	1640.89	1640.80	1.1	0.1	
20736+00.00	1641.76	1641.26	1640.87	1640.87	1641.02	1640.87	1.8	0.0	
20737+00.00	1641.69	1641.19	1640.80	1640.80	1640.97	1640.81	2.0	0.0	
20738+00.00	1641.60	1641.10	1640.71	1640.71	1640.81	1640.65	1.2	-0.8	
20739+00.00	1641.60	1641.10	1640.71	1640.71	1640.88	1640.63	2.1	-1.0	
20740+00.00	1641.57	1641.07	1640.68	1640.68	1640.90	1640.68	2.7	0.1	
20741+00.00	1641.57	1641.07	1640.68	1640.68	1640.92	1640.76	2.8	0.9	
20742+00.00	1641.54	1641.04	1640.65	1640.65	1640.78	1640.71	1.6	0.7	
20743+00.00	1641.41	1640.91	1640.52	1640.52	1640.62	1640.64	1.2	1.5	
20744+00.00	1641.21	1640.71	1640.32	1640.32	1640.46	1640.44	1.7	1.4	
20745+00.00	1641.14	1640.64	1640.25	1640.25	1640.41	1640.27	1.8	0.2	
20746+00.00	1640.99	1640.49	1640.10	1640.10	1640.24	1640.13	1.6	0.4	
20747+00.00	1640.85	1640.35	1639.96	1639.96	1640.09	1640.03	1.6	0.8	
20748+00.00	1640.69	1640.19	1639.80	1639.80	1639.92	1639.89	1.5	1.1	
20749+00.00	1640.60	1640.10	1639.71	1639.71	1639.80	1639.83	1.0	1.4	
20750+00.00	1640.44	1639.94	1639.55	1639.55	1639.65	1639.70	1.1	1.7	
20751+00.00	1640.32	1639.82	1639.43	1639.43	1639.47	1639.54	0.4	1.2	
20752+00.00	1640.24	1639.74	1639.35	1639.35	1639.39	1639.44	0.5	1.1	

Notes:
* Milling occurs at superelevation location
** Match Exisiting Cross Slope in Langdon City Limits

Milling Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	11	2

OCL ND1	CL Existing / Proposed	Milled CL 6"	18.54' LT of CL Elevevation at Proposed Crossslope	18.54' RT of CL Elevation at Proposed Crossslope	LT Existing	RT Existing	LT Milling Depth	RT Milling Depth
	A	B	C = B - cross slope x 18.54'	D = B - cross slope x 18.54'	E	F	G = (E - C) x 12	H = (F - D) x 12
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches
20753+00.00	1640.22	1639.72	1639.33	1639.33	1639.38	1639.40	0.6	0.9
20754+00.00	1640.21	1639.71	1639.32	1639.32	1639.42	1639.35	1.1	0.3
20755+00.00	1640.07	1639.57	1639.18	1639.18	1639.32	1639.25	1.7	0.9
20756+00.00	1639.98	1639.48	1639.09	1639.09	1639.22	1639.14	1.6	0.6
20757+00.00	1639.92	1639.42	1639.03	1639.03	1639.19	1639.06	1.9	0.3
20758+00.00	1639.91	1639.41	1639.02	1639.02	1639.19	1639.09	2.0	0.9
20759+00.00	1639.97	1639.47	1639.08	1639.08	1639.26	1639.16	2.2	1.0
20760+00.00	1639.90	1639.40	1639.01	1639.01	1639.09	1639.20	1.0	2.3
20761+00.00	1639.73	1639.23	1638.84	1638.84	1638.93	1638.98	1.1	1.6
20762+00.00	1639.62	1639.12	1638.73	1638.73	1638.87	1638.79	1.7	0.8
20763+00.00	1639.55	1639.05	1638.66	1638.66	1638.80	1638.71	1.7	0.7
20764+00.00	1639.55	1639.05	1638.66	1638.66	1638.80	1638.74	1.7	1.0
20765+00.00	1639.57	1639.07	1638.68	1638.68	1638.88	1638.81	2.4	1.6
20766+00.00	1639.44	1638.94	1638.55	1638.55	1638.72	1638.69	2.0	1.7
20767+00.00	1639.18	1638.68	1638.29	1638.29	1638.46	1638.50	2.0	2.5
20768+00.00	1638.92	1638.42	1638.03	1638.03	1638.22	1638.21	2.3	2.2
20769+00.00	1638.64	1638.14	1637.75	1637.75	1637.88	1637.95	1.6	2.4
20770+00.00	1638.07	1637.57	1637.18	1637.18	1637.35	1637.29	2.0	1.3
20771+00.00	1637.50	1637.00	1636.61	1636.61	1636.85	1636.66	2.8	0.5
20772+00.00	1636.83	1636.33	1635.94	1635.94	1636.10	1636.04	1.9	1.1
20773+00.00	1636.04	1635.54	1635.15	1635.15	1635.32	1635.21	2.1	0.7
20774+00.00	1635.39	1634.89	1634.50	1634.50	1634.56	1634.54	0.7	0.5
20775+00.00	1635.06	1634.56	1634.17	1634.17	1634.12	1634.11	-0.5	-0.7
20776+00.00	1634.88	1634.38	1633.99	1633.99	1633.91	1633.95	-1.0	-0.6
20777+00.00	1634.78	1634.28	1633.89	1633.89	1633.83	1633.81	-0.7	-0.9
20778+00.00	1634.78	1634.28	1633.89	1633.89	1633.82	1633.81	-0.9	-1.0
20779+00.00	1634.89	1634.39	1634.00	1634.00	1633.80	1633.90	-2.4	-1.2
20780+00.00	1635.01	1634.51	1634.12	1634.12	1634.08	1634.00	-0.5	-1.5
20781+00.00	1634.96	1634.46	1634.07	1634.07	1634.09	1633.91	0.2	-2.0
20782+00.00	1634.97	1634.47	1634.08	1634.08	1634.15	1634.07	0.9	-0.1
20783+00.00	1634.81	1634.31	1633.92	1633.92	1633.96	1633.94	0.4	0.1
20784+00.00	1634.56	1634.06	1633.67	1633.67	1633.73	1633.68	0.8	0.2
20785+00.00	1634.30	1633.80	1633.41	1633.41	1633.40	1633.41	-0.2	0.0
20786+00.00	1634.06	1633.56	1633.17	1633.17	1633.12	1633.09	-0.6	-1.0
20787+00.00	1633.65	1633.15	1632.76	1632.76	1632.84	1632.66	0.9	-1.2
20788+00.00	1633.30	1632.80	1632.41	1632.41	1632.41	1632.29	0.0	-1.5
20789+00.00	1633.09	1632.59	1632.20	1632.20	1632.19	1632.08	-0.2	-1.5
20790+00.00	1632.96	1632.46	1632.07	1632.07	1631.99	1631.96	-0.9	-1.3
20791+00.00	1633.02	1632.52	1632.13	1632.13	1632.06	1632.04	-0.9	-1.1
20792+00.00	1633.38	1632.88	1632.49	1632.49	1632.42	1632.38	-0.8	-1.3
20793+00.00	1633.76	1633.26	1632.87	1632.87	1632.82	1632.78	-0.6	-1.1
20794+00.00	1634.16	1633.66	1633.27	1633.27	1633.26	1633.22	-0.1	-0.6
20795+00.00	1634.54	1634.04	1633.65	1633.65	1633.72	1633.66	0.8	0.2
20796+00.00	1634.95	1634.45	1634.06	1634.06	1633.98	1634.24	-0.9	2.2
20797+00.00	1635.22	1634.72	1634.33	1634.33	1634.18	1634.33	-1.9	-0.1
20798+00.00	1635.22	1634.72	1634.33	1634.33	1634.15	1634.30	-2.1	-0.4
20799+00.00	1634.98	1634.48	1634.09	1634.09	1633.97	1634.16	-1.4	0.8
20800+00.00	1634.67	1634.17	1633.78	1633.78	1633.72	1633.75	-0.7	-0.3
20801+00.00	1633.99	1633.49	1633.10	1633.10	1632.97	1633.13	-1.5	0.3
20802+00.00	1633.51	1633.01	1632.62	1632.62	1632.51	1632.61	-1.4	-0.1
20803+00.00	1632.97	1632.47	1632.08	1632.08	1632.03	1631.95	-0.6	-1.6
20804+00.00	1632.64	1632.14	1631.75	1631.75	1631.72	1631.64	-0.3	-1.3
20805+00.00	1632.59	1632.09	1631.70	1631.70	1631.64	1631.64	-0.8	-0.8

OCL ND1	CL Existing / Proposed	Milled CL 6"	18.54' LT of CL Elevevation at Proposed Crossslope	18.54' RT of CL Elevation at Proposed Crossslope	LT Existing	RT Existing	LT Milling Depth	RT Milling Depth
	A	B	C = B - cross slope x 18.54'	D = B - cross slope x 18.54'	E	F	G = (E - C) x 12	H = (F - D) x 12
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches
20806+00.00	1632.50	1632.00	1631.61	1631.61	1631.50	1631.83	-1.3	2.6
20807+00.00	1632.52	1632.02	1631.63	1631.63	1631.56	1631.56	-0.8	-0.8
20808+00.00	1632.76	1632.26	1631.87	1631.87	1631.89	1631.91	0.3	0.6
20809+00.00	1633.00	1632.50	1632.11	1632.11	1632.07	1632.13	-0.6	0.1
20810+00.00	1633.18	1632.68	1632.29	1632.29	1632.21	1632.22	-1.0	-0.8
20811+00.00	1633.32	1632.82	1632.43	1632.43	1632.40	1632.40	-0.5	-0.4
20812+00.00	1633.45	1632.95	1632.56	1632.56	1632.51	1632.43	-0.6	-1.6
20813+00.00	1633.45	1632.95	1632.56	1632.56	1632.46	1632.40	-1.2	-1.9
20814+00.00	1633.48	1632.98	1632.59	1632.59	1632.46	1632.48	-1.6	-1.3
20815+00.00	1633.34	1632.84	1632.45	1632.45	1632.27	1632.41	-2.1	-0.4
20816+00.00	1633.41	1632.91	1632.52	1632.52	1632.46	1632.45	-0.8	-0.9
20817+00.00	1633.53	1633.03	1632.64	1632.64	1632.64	1632.83	0.0	2.2
20818+00.00	1633.53	1633.03	1632.64	1632.64	1633.35	1633.34	8.6	8.4
20819+00.00	1633.50	1633.00	1632.61	1632.61	1633.11	1632.94	6.0	4.0
20820+00.00	1633.30	1632.80	1632.41	1632.41	1632.45	1632.60	0.4	2.2
20821+00.00	1632.91	1632.41	1632.02	1632.02	1632.03	1632.15	0.2	1.6
20822+00.00	1632.79	1632.29	1631.90	1631.90	1631.83	1632.11	-0.8	2.6
20823+00.00	1632.66	1632.16	1631.77	1631.77	1631.64	1631.98	-1.6	2.5
20824+00.00	1632.52	1632.02	1631.63	1631.63	1631.46	1631.78	-1.9	1.8
20825+00.00	1632.69	1632.19	1631.80	1631.80	1631.65	1631.87	-1.9	0.9
20826+00.00	1633.04	1632.54	1632.15	1632.15	1632.03	1632.29	-1.5	1.6
20827+00.00	1633.41	1632.91	1632.52	1632.52	1632.48	1632.71	-0.5	2.3
20828+00.00	1633.57	1633.07	1632.68	1632.68	1632.63	1632.83	-0.6	1.9
20829+00.00	1634.10	1633.60	1633.21	1633.21	1633.20	1633.31	-0.1	1.2
20830+00.00	1634.66	1634.16	1633.77	1633.77	1633.78	1633.94	0.1	2.0
20831+00.00	1635.00	1634.50	1634.11	1634.11	1634.12	1634.32	0.1	2.5
20832+00.00	1635.19	1634.69	1634.30	1634.30	1634.27	1634.39	-0.4	1.0
20833+00.00	1635.21	1634.71	1634.32	1634.32	1634.31	1634.42	-0.1	1.2
20834+00.00	1635.03	1634.53	1634.14	1634.14	1634.06	1634.29	-1.0	1.8
20835+00.00	1634.67	1634.17	1633.78	1633.78	1633.68	1634.15	-1.1	4.5
20836+00.00	1634.23	1633.73	1633.34	1633.34	1633.30	1633.61	-0.5	3.2
20837+00.00	1633.79	1633.29	1632.90	1632.90	1632.91	1633.14	0.1	2.9
20838+00.00	1633.58	1633.08	1632.69	1632.69	1632.64	1632.88	-0.6	2.3
20839+00.00	1633.59	1633.09	1632.70	1632.70	1632.65	1632.91	-0.7	2.5
20840+00.00	1633.59	1633.09	1632.70	1632.70	1632.66	1632.97	-0.5	3.2
20841+00.00	1633.81	1633.31	1632.92	1632.92	1632.88	1633.12	-0.4	2.5
20842+00.00	1634.28	1633.78	1633.39	1633.39	1633.42	1633.52	0.3	1.6
20843+00.00	1634.88	1634.38	1633.99	1633.99	1634.07	1634.09	0.9	1.2
20844+00.00	1635.34	1634.84	1634.45	1634.45	1634.58	1634.66	1.5	2.5
20845+00.00	1635.68	1635.18	1634.79	1634.79	1634.92	1635.01	1.5	2.6
20846+00.00	1635.87	1635.37	1634.98	1634.98	1635.03	1635.22	0.5	2.8
20847+00.00	1635.76	1635.26	1634.87	1634.87	1634.85	1635.03	-0.2	2.0
20848+00.00	1635.51	1635.01	1634.62	1634.62	1634.59	1634.65	-0.4	0.4
20849+00.00	1635.00	1634.50	1634.11	1634.11	1634.13	1634.22	0.2	1.2
20850+00.00	1634.41	1633.91	1633.52	1633.52	1633.55	1633.71	0.3	2.2

Notes:
* Milling occurs at superelevation location
** Match Exisiting Cross Slope in Langdon City Limits

Milling Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	11	3

OCL ND1	CL Existing / Proposed	Milled CL 6"	18.54' LT of CL Elevevation at Proposed Crossslope	18.54' RT of CL Elevation at Proposed Crossslope	LT Existing	RT Existing	LT Milling Depth	RT Milling Depth
	A	B	C = B - cross slope x 18.54'	D = B - cross slope x 18.54'	E	F	G = (E - C) x 12	H = (F - D) x 12
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches
20851+00.00	1634.01	1633.51	1633.12	1633.12	1633.12	1633.27	0.0	1.8
20852+00.00	1633.71	1633.21	1632.82	1632.82	1632.90	1632.95	0.9	1.5
20853+00.00	1633.46	1632.96	1632.57	1632.57	1632.64	1632.70	0.8	1.6
20854+00.00	1633.42	1632.92	1632.53	1632.53	1632.62	1632.61	1.1	1.0
20855+00.00	1633.47	1632.97	1632.58	1632.58	1632.63	1632.69	0.7	1.4
20856+00.00	1633.42	1632.92	1632.53	1632.53	1632.64	1632.62	1.4	1.1
20857+00.00	1633.48	1632.98	1632.59	1632.59	1632.65	1632.71	0.7	1.4
20858+00.00	1633.54	1633.04	1632.65	1632.65	1632.71	1632.81	0.7	2.0
20859+00.00	1633.54	1633.04	1632.65	1632.65	1632.75	1632.84	1.2	2.2
20860+00.00	1633.50	1633.00	1632.61	1632.61	1632.70	1632.82	1.1	2.5
20861+00.00	1633.40	1632.90	1632.51	1632.51	1632.58	1632.72	0.7	2.4
20862+00.00	1633.28	1632.78	1632.39	1632.39	1632.45	1632.53	0.7	1.7
20863+00.00	1633.05	1632.55	1632.16	1632.16	1632.26	1632.29	1.2	1.6
20864+00.00	1632.91	1632.41	1632.02	1632.02	1632.09	1632.08	0.9	0.8
20865+00.00	1632.75	1632.25	1631.86	1631.86	1631.88	1631.88	0.2	0.3
20866+00.00	1632.67	1632.17	1631.78	1631.78	1631.78	1631.83	0.0	0.6
20867+00.00	1632.73	1632.23	1631.84	1631.84	1631.86	1631.94	0.2	1.1
20868+00.00	1632.73	1632.23	1631.84	1631.84	1631.87	1631.92	0.3	0.9
20869+00.00	1632.66	1632.16	1631.77	1631.77	1631.76	1631.76	-0.1	0.0
20870+00.00	1632.60	1632.10	1631.71	1631.71	1631.73	1631.73	0.2	0.2
20871+00.00	1632.65	1632.15	1631.76	1631.76	1631.88	1631.90	1.4	1.7
20872+00.00	1632.73	1632.23	1631.84	1631.84	1631.85	1632.04	0.2	2.5
20873+00.00	1632.78	1632.28	1631.89	1631.89	1631.97	1632.14	1.0	3.0
20874+00.00	1632.74	1632.24	1631.85	1631.85	1631.88	1632.06	0.4	2.5
20875+00.00	1632.96	1632.46	1632.07	1632.07	1632.16	1632.13	1.1	0.7
20876+00.00	1633.23	1632.73	1632.34	1632.34	1632.41	1632.44	0.8	1.1
20877+00.00	1633.52	1633.02	1632.63	1632.63	1632.84	1632.87	2.5	2.8
20878+00.00	1633.71	1633.21	1632.82	1632.82	1633.06	1632.98	2.9	1.9
20879+00.00	1634.03	1633.53	1633.14	1633.14	1633.23	1633.32	1.1	2.1
20880+00.00	1634.66	1634.16	1633.77	1633.77	1633.87	1633.94	1.3	2.1
20881+00.00	1635.15	1634.65	1634.26	1634.26	1634.42	1634.38	1.9	1.4
20882+00.00	1635.70	1635.20	1634.81	1634.81	1634.99	1635.01	2.1	2.4
20883+00.00	1636.08	1635.58	1635.19	1635.19	1635.36	1635.26	2.0	0.8
20884+00.00	1636.33	1635.83	1635.44	1635.44	1635.56	1635.53	1.4	1.0
20885+00.00	1636.61	1636.11	1635.72	1635.72	1635.78	1635.79	0.7	0.8
20886+00.00	1636.89	1636.39	1636.00	1636.00	1636.07	1636.06	0.7	0.7
20887+00.00	1636.99	1636.49	1636.10	1636.10	1636.13	1636.15	0.3	0.6
20888+00.00	1637.00	1636.50	1636.11	1636.11	1636.12	1636.20	0.1	1.1
20889+00.00	1637.04	1636.54	1636.15	1636.15	1636.21	1636.27	0.6	1.4
20890+00.00	1637.22	1636.72	1636.33	1636.33	1636.32	1636.34	0.0	0.1
20891+00.00	1637.33	1636.83	1636.44	1636.44	1636.48	1636.55	0.4	1.3
20892+00.00	1637.19	1636.69	1636.30	1636.30	1636.38	1636.53	0.9	2.7
20893+00.00	1636.91	1636.41	1636.02	1636.02	1636.19	1636.26	2.0	2.8
20894+00.00	1636.63	1636.13	1635.74	1635.74	1635.75	1635.87	0.2	1.6
20895+00.00	1636.06	1635.56	1635.17	1635.17	1635.18	1635.31	0.2	1.6
20896+00.00	1635.53	1635.03	1634.64	1634.64	1634.75	1634.81	1.3	2.0
20897+00.00	1635.15	1634.65	1634.26	1634.26	1634.46	1634.59	2.3	3.8
20898+00.00	1634.83	1634.33	1633.94	1633.94	1634.13	1634.15	2.3	2.6
20899+00.00	1634.28	1633.78	1633.39	1633.39	1633.46	1633.41	0.7	0.2
20900+00.00	1633.92	1633.42	1633.03	1633.03	1633.07	1633.17	0.4	1.7
20901+00.00	1633.94	1633.44	1633.05	1633.05	1633.06	1633.13	0.1	1.0
20902+00.00	1634.12	1633.62	1633.23	1633.23	1633.17	1633.24	-0.8	0.0
20903+00.00	1634.47	1633.97	1633.58	1633.58	1633.52	1633.52	-0.7	-0.7

OCL ND1	CL Existing / Proposed	Milled CL 6"	18.54' LT of CL Elevevation at Proposed Crossslope	18.54' RT of CL Elevation at Proposed Crossslope	LT Existing	RT Existing	LT Milling Depth	RT Milling Depth
	A	B	C = B - cross slope x 18.54'	D = B - cross slope x 18.54'	E	F	G = (E - C) x 12	H = (F - D) x 12
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches
20904+00.00	1635.06	1634.56	1634.17	1634.17	1634.21	1634.12	0.5	-0.6
20905+00.00	1635.74	1635.24	1634.85	1634.85	1634.91	1634.84	0.7	-0.2
20906+00.00	1636.25	1635.75	1635.36	1635.36	1635.42	1635.35	0.6	-0.1
20907+00.00	1636.61	1636.11	1635.72	1635.72	1635.80	1635.70	1.0	-0.2
20908+00.00	1636.81	1636.31	1635.92	1635.92	1635.97	1635.86	0.6	-0.7
20909+00.00	1636.77	1636.27	1635.88	1635.88	1635.95	1635.81	0.8	-0.9
20910+00.00	1636.48	1635.98	1635.59	1635.59	1635.73	1635.59	1.7	0.0
20911+00.00	1635.90	1635.40	1635.01	1635.01	1635.13	1635.01	1.5	0.1
20912+00.00	1635.02	1634.52	1634.13	1634.13	1634.21	1634.08	1.0	-0.6
20913+00.00	1634.15	1633.65	1633.26	1633.26	1633.25	1633.18	-0.1	-1.0
20914+00.00	1633.50	1633.00	1632.61	1632.61	1632.53	1632.57	-1.0	-0.5
20915+00.00	1632.98	1632.48	1632.09	1632.09	1632.02	1632.10	-0.8	0.2
20916+00.00	1632.61	1632.11	1631.72	1631.72	1631.71	1631.77	-0.2	0.5
20917+00.00	1632.34	1631.84	1631.45	1631.45	1631.41	1631.52	-0.5	0.9
20918+00.00	1632.12	1631.62	1631.23	1631.23	1631.18	1631.35	-0.7	1.3
20919+00.00	1632.03	1631.53	1631.14	1631.14	1631.13	1631.27	-0.2	1.5
20920+00.00	1632.05	1631.55	1631.16	1631.16	1631.14	1631.30	-0.2	1.7
20921+00.00	1632.08	1631.58	1631.19	1631.19	1631.22	1631.33	0.3	1.6
20922+00.00	1632.04	1631.54	1631.15	1631.15	1631.21	1631.26	0.6	1.3
20923+00.00	1632.03	1631.53	1631.14	1631.14	1631.30	1631.26	2.0	1.5
20924+00.00	1632.03	1631.53	1631.14	1631.14	1631.48	1631.46	4.1	3.9
20925+00.00	1632.03	1631.53	1631.14	1631.14	1631.18	1631.38	0.4	2.8
20926+00.00	1632.08	1631.58	1631.19	1631.19	1631.10	1631.20	-1.0	0.1
20927+00.00	1632.18	1631.68	1631.29	1631.29	1631.40	1631.38	1.3	1.1
20928+00.00	1632.39	1631.89	1631.50	1631.50	1631.65	1631.56	1.8	0.7
20929+00.00	1632.60	1632.10	1631.71	1631.71	1631.85	1631.75	1.7	0.5
20930+00.00	1632.70	1632.20	1631.81	1631.81	1631.98	1631.82	2.0	0.1
20931+00.00	1632.79	1632.29	1631.90	1631.90	1632.02	1631.95	1.5	0.6
20932+00.00	1632.84	1632.34	1631.95	1631.95	1632.13	1632.01	2.1	0.8
20933+00.00	1632.84	1632.34	1631.95	1631.95	1632.12	1631.99	2.0	0.4
20934+00.00	1632.72	1632.22	1631.83	1631.83	1631.99	1631.86	1.9	0.4
20935+00.00	1632.38	1631.88	1631.49	1631.49	1631.63	1631.53	1.7	0.5
20936+00.00	1631.87	1631.37	1630.98	1630.98	1631.17	1631.00	2.2	0.2
20937+00.00	1631.35	1630.85	1630.46	1630.46	1630.66	1630.50	2.4	0.5
20938+00.00	1630.74	1630.24	1629.85	1629.85	1629.98	1629.90	1.6	0.6
20939+00.00	1630.38	1629.88	1629.49	1629.49	1629.63	1629.49	1.7	0.0
20940+00.00	1629.89	1629.39	1629.00	1629.00	1629.11	1629.18	1.3	2.1
20941+00.00	1629.78	1629.28	1628.89	1628.89	1628.99	1629.00	1.2	1.4
20942+00.00	1629.69	1629.19	1628.80	1628.80	1629.02	1628.88	2.6	0.9
20943+00.00	1629.74	1629.24	1628.85	1628.85	1629.08	1628.85	2.8	-0.1
20944+00.00	1629.83	1629.33	1628.94	1628.94	1629.13	1628.97	2.3	0.3
20945+00.00	1630.18	1629.68	1629.29	1629.29	1629.57	1629.35	3.3	0.7
20946+00.00	1630.53	1630.03	1629.64	1629.64	1629.90	1629.68	3.1	0.5
20947+00.00	1630.88	1630.38	1629.99	1629.99	1630.26	1630.01	3.2	0.2
20948+00.00	1631.16	1630.66	1630.27	1630.27	1630.51	1630.27	2.8	-0.1

Notes:
* Milling occurs at superelevation location
** Match Exisiting Cross Slope in Langdon City Limits

Milling Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	11	4

OCL ND1	CL Existing / Proposed	Milled CL 6"	18.54' LT of CL Elevevation at Proposed Crossslope	18.54' RT of CL Elevation at Proposed Crossslope	LT Existing	RT Existing	LT Milling Depth	RT Milling Depth
	A	B	C = B - cross slope x 18.54'	D = B - cross slope x 18.54'	E	F	G = (E - C) x 12	H = (F - D) x 12
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches
20949+00.00	1631.24	1630.74	1630.35	1630.35	1630.58	1630.36	2.8	0.1
20950+00.00	1631.07	1630.57	1630.18	1630.18	1630.48	1630.34	3.6	2.0
20951+00.00	1630.83	1630.33	1629.94	1629.94	1630.19	1630.11	3.0	2.1
20952+00.00	1630.27	1629.77	1629.38	1629.38	1629.57	1629.46	2.2	0.9
20953+00.00	1629.52	1629.02	1628.63	1628.63	1628.73	1628.81	1.2	2.2
20954+00.00	1628.60	1628.10	1627.71	1627.71	1627.72	1627.76	0.1	0.7
20955+00.00	1627.54	1627.04	1626.65	1626.65	1626.67	1626.76	0.2	1.2
20956+00.00	1626.59	1626.09	1625.70	1625.70	1625.79	1625.71	1.1	0.1
20957+00.00	1625.68	1625.18	1624.79	1624.79	1624.99	1624.90	2.4	1.3
20958+00.00	1624.92	1624.42	1624.03	1624.03	1624.07	1624.13	0.5	1.2
20959+00.00	1624.11	1623.61	1623.22	1623.22	1623.31	1623.30	1.1	1.0
20960+00.00	1623.61	1623.11	1622.72	1622.72	1622.83	1622.84	1.3	1.4
20961+00.00	1623.32	1622.82	1622.43	1622.43	1622.42	1622.41	-0.2	-0.2
20962+00.00	1623.02	1622.52	1622.13	1622.13	1622.12	1622.16	-0.1	0.4
20963+00.00	1622.70	1622.20	1621.81	1621.81	1621.82	1621.87	0.1	0.7
20964+00.00	1622.40	1621.90	1621.51	1621.51	1621.53	1621.53	0.3	0.3
20965+00.00	1622.00	1621.50	1621.11	1621.11	1621.13	1621.21	0.2	1.2
20966+00.00	1621.64	1621.14	1620.75	1620.75	1620.77	1620.93	0.2	2.1
20967+00.00	1621.38	1620.88	1620.49	1620.49	1620.47	1620.68	-0.3	2.3
20968+00.00	1621.22	1620.72	1620.33	1620.33	1620.33	1620.47	-0.1	1.7
20969+00.00	1621.10	1620.60	1620.21	1620.21	1620.31	1620.34	1.3	1.5
20970+00.00	1621.19	1620.69	1620.30	1620.30	1620.46	1620.43	2.0	1.6
20971+00.00	1621.40	1620.90	1620.51	1620.51	1620.65	1620.53	1.6	0.2
20972+00.00	1621.55	1621.05	1620.66	1620.66	1620.78	1620.69	1.4	0.3
20973+00.00	1621.77	1621.27	1620.88	1620.88	1621.02	1620.92	1.7	0.5
20974+00.00	1622.12	1621.62	1621.23	1621.23	1621.40	1621.27	2.0	0.4
20975+00.00	1622.57	1622.07	1621.68	1621.68	1621.82	1621.73	1.6	0.6
20976+00.00	1623.19	1622.69	1622.30	1622.30	1622.46	1622.38	1.9	1.0
20977+00.00	1623.93	1623.43	1623.04	1623.04	1623.23	1623.15	2.2	1.3
20978+00.00	1624.35	1623.85	1623.46	1623.46	1623.52	1623.55	0.7	1.1
20979+00.00	1624.34	1623.84	1623.45	1623.45	1623.50	1623.69	0.6	2.8
20980+00.00	1624.40	1623.90	1623.51	1623.51	1623.70	1623.67	2.4	2.0
20981+00.00	1624.54	1624.04	1623.65	1623.65	1623.85	1623.73	2.4	1.0
20982+00.00	1624.79	1624.29	1623.90	1623.90	1624.17	1623.92	3.3	0.2
20983+00.00	1624.80	1624.30	1623.91	1623.91	1623.99	1623.92	0.9	0.1
20984+00.00	1624.62	1624.12	1623.73	1623.73	1623.74	1623.79	0.1	0.7
20985+00.00	1624.51	1624.01	1623.62	1623.62	1623.65	1623.62	0.3	-0.1
20986+00.00	1624.38	1623.88	1623.49	1623.49	1623.59	1623.48	1.2	-0.2
20987+00.00	1624.20	1623.70	1623.31	1623.31	1623.45	1623.33	1.7	0.3
20988+00.00	1623.97	1623.47	1623.08	1623.08	1623.14	1623.12	0.7	0.4
20989+00.00	1623.80	1623.30	1622.91	1622.91	1622.93	1622.92	0.2	0.1
20990+00.00	1623.57	1623.07	1622.68	1622.68	1622.67	1622.64	-0.1	-0.5
20991+00.00	1623.38	1622.88	1622.49	1622.49	1622.43	1622.47	-0.7	-0.3
20992+00.00	1623.10	1622.60	1622.21	1622.21	1622.21	1622.25	0.0	0.5
20993+00.00	1623.04	1622.54	1622.15	1622.15	1622.23	1622.15	0.9	-0.1
20994+00.00	1623.06	1622.56	1622.17	1622.17	1622.25	1622.13	1.0	-0.5
20995+00.00	1623.23	1622.73	1622.34	1622.34	1622.50	1622.40	1.9	0.7
20996+00.00	1623.37	1622.87	1622.48	1622.48	1622.58	1622.55	1.3	0.9
20997+00.00	1623.65	1623.15	1622.76	1622.76	1622.75	1622.79	-0.2	0.4
20998+00.00	1623.92	1623.42	1623.03	1623.03	1623.00	1623.07	-0.5	0.4
20999+00.00	1624.32	1623.82	1623.43	1623.43	1623.38	1623.46	-0.6	0.5
21000+00.00	1624.84	1624.34	1623.95	1623.95	1624.05	1623.99	1.2	0.5
21001+00.00	1625.36	1624.86	1624.47	1624.47	1624.57	1624.51	1.2	0.5

OCL ND1	CL Existing / Proposed	Milled CL 6"	18.54' LT of CL Elevevation at Proposed Crossslope	18.54' RT of CL Elevation at Proposed Crossslope	LT Existing	RT Existing	LT Milling Depth	RT Milling Depth
	A	B	C = B - cross slope x 18.54'	D = B - cross slope x 18.54'	E	F	G = (E - C) x 12	H = (F - D) x 12
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches
21002+00.00	1625.88	1625.38	1624.99	1624.99	1625.12	1624.95	1.6	-0.5
21003+00.00	1626.53	1626.03	1625.64	1625.64	1625.74	1625.71	1.2	0.7
21004+00.00	1626.98	1626.48	1626.09	1626.09	1626.24	1626.20	1.7	1.4
21005+00.00	1627.24	1626.74	1626.35	1626.35	1626.66	1626.57	3.6	2.6
21006+00.00	1627.31	1626.81	1626.42	1626.42	1626.73	1626.76	3.7	4.1
21007+00.00	1627.23	1626.73	1626.34	1626.34	1626.38	1626.58	0.5	2.9
21008+00.00	1627.13	1626.63	1626.24	1626.24	1626.21	1626.39	-0.3	1.8
21009+00.00	1626.89	1626.39	1626.00	1626.00	1626.00	1626.16	0.0	1.8
21010+00.00	1626.45	1625.95	1625.56	1625.56	1625.62	1625.67	0.7	1.3
21011+00.00	1626.01	1625.51	1625.12	1625.12	1625.13	1625.24	0.1	1.5
21012+00.00	1625.60	1625.10	1624.71	1624.71	1624.67	1624.82	-0.4	1.3
21013+00.00	1625.25	1624.75	1624.36	1624.36	1624.31	1624.49	-0.7	1.5
21014+00.00	1624.97	1624.47	1624.08	1624.08	1624.03	1624.18	-0.6	1.2
21015+00.00	1624.70	1624.20	1623.81	1623.81	1623.82	1623.88	0.2	0.9
21016+00.00	1624.54	1624.04	1623.65	1623.65	1623.69	1623.76	0.4	1.3
21017+00.00	1624.33	1623.83	1623.44	1623.44	1623.47	1623.63	0.3	2.2
21018+00.00	1623.99	1623.49	1623.10	1623.10	1623.13	1623.30	0.3	2.3
21019+00.00	1623.74	1623.24	1622.85	1622.85	1622.88	1622.94	0.3	1.1
21020+00.00	1623.56	1623.06	1622.67	1622.67	1622.69	1622.72	0.2	0.6
21021+00.00	1623.41	1622.91	1622.52	1622.52	1622.50	1622.58	-0.2	0.7
21022+00.00	1623.22	1622.72	1622.33	1622.33	1622.36	1622.43	0.4	1.1
21023+00.00	1623.05	1622.55	1622.16	1622.16	1622.22	1622.27	0.7	1.3
21024+00.00	1622.88	1622.38	1621.99	1621.99	1622.05	1622.07	0.6	0.8
21025+00.00	1622.90	1622.40	1622.01	1622.01	1622.03	1622.17	0.3	2.0
21026+00.00	1622.97	1622.47	1622.08	1622.08	1622.15	1622.29	0.8	2.6
21027+00.00	1623.17	1622.67	1622.28	1622.28	1622.29	1622.37	0.1	1.1
21028+00.00	1623.47	1622.97	1622.58	1622.58	1622.60	1622.67	0.3	1.1
21029+00.00	1623.83	1623.33	1622.94	1622.94	1623.05	1623.21	1.3	3.3
21030+00.00	1624.18	1623.68	1623.29	1623.29	1623.39	1623.64	1.1	4.1
21031+00.00	1624.65	1624.15	1623.76	1623.76	1623.85	1624.02	1.0	3.1
21032+00.00	1625.11	1624.61	1624.22	1624.22	1624.32	1624.43	1.1	2.4
21033+00.00	1625.35	1624.85	1624.46	1624.46	1624.53	1624.70	0.9	2.9
21034+00.00	1625.63	1625.13	1624.74	1624.74	1624.88	1625.03	1.7	3.5
21035+00.00	1625.66	1625.16	1624.77	1624.77	1624.91	1625.04	1.7	3.2
21036+00.00	1625.43	1624.93	1624.54	1624.54	1624.60	1624.72	0.7	2.1
21037+00.00	1625.23	1624.73	1624.34	1624.34	1624.34	1624.46	0.0	1.4
21038+00.00	1624.96	1624.46	1624.07	1624.07	1624.13	1624.16	0.8	1.1
21039+00.00	1624.75	1624.25	1623.86	1623.86	1623.91	1623.87	0.7	0.1
21040+00.00	1624.59	1624.09	1623.70	1623.70	1623.77	1623.75	0.9	0.6
21041+00.00	1624.36	1623.86	1623.47	1623.47	1623.54	1623.51	0.8	0.5
21042+00.00	1624.14	1623.64	1623.25	1623.25	1623.33	1623.27	1.0	0.2
21043+00.00	1623.96	1623.46	1623.07	1623.07	1623.04	1623.09	-0.5	0.1
21044+00.00	1623.93	1623.43	1623.04	1623.04	1622.96	1623.14	-0.9	1.2
21045+00.00	1623.93	1623.43	1623.04	1623.04	1622.96	1623.05	-0.9	0.2
21046+00.00	1623.85	1623.35	1622.96	1622.96	1622.90	1622.99	-0.8	0.4

Notes:
* Milling occurs at superelevation location
** Match Exisiting Cross Slope in Langdon City Limits

Milling Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	11	5

OCL ND1	CL Existing / Proposed	Milled CL 6"	18.54' LT of CL Elevevation at Proposed Crossslope	18.54' RT of CL Elevation at Proposed Crossslope	LT Existing	RT Existing	LT Milling Depth	RT Milling Depth
	A	B	C = B - cross slope x 18.54'	D = B - cross slope x 18.54'	E	F	G = (E - C) x 12	H = (F - D) x 12
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches
21047+00.00	1623.62	1623.12	1622.73	1622.73	1622.72	1622.76	-0.2	0.3
21048+00.00	1623.44	1622.94	1622.55	1622.55	1622.53	1622.65	-0.4	1.1
21049+00.00	1623.43	1622.93	1622.54	1622.54	1622.49	1622.65	-0.7	1.3
21050+00.00	1623.49	1622.99	1622.60	1622.60	1622.55	1622.67	-0.6	0.8
21051+00.00	1623.56	1623.06	1622.67	1622.67	1622.65	1622.70	-0.2	0.4
21052+00.00	1623.47	1622.97	1622.58	1622.58	1622.60	1622.65	0.2	0.8
21053+00.00	1623.40	1622.90	1622.51	1622.51	1622.47	1622.56	-0.4	0.6
21054+00.00	1623.38	1622.88	1622.49	1622.49	1622.50	1622.55	0.1	0.7
21055+00.00	1623.32	1622.82	1622.43	1622.43	1622.65	1622.48	2.6	0.5
21056+00.00	1623.22	1622.72	1622.33	1622.33	1622.38	1622.37	0.5	0.4
21057+00.00	1623.33	1622.83	1622.44	1622.44	1622.38	1622.53	-0.7	1.1
21058+00.00	1623.26	1622.76	1622.37	1622.37	1622.32	1622.42	-0.7	0.5
21059+00.00	1623.40	1622.90	1622.51	1622.51	1622.71	1622.68	2.4	2.0
21060+00.00	1623.35	1622.85	1622.46	1622.46	1622.58	1622.62	1.4	1.9
21061+00.00	1623.16	1622.66	1622.27	1622.27	1622.27	1622.36	0.0	1.1
21062+00.00	1622.94	1622.44	1622.05	1622.05	1621.98	1622.18	-0.9	1.5
21063+00.00	1622.78	1622.28	1621.89	1621.89	1621.88	1622.04	-0.2	1.8
21064+00.00	1622.74	1622.24	1621.85	1621.85	1621.84	1622.01	-0.1	1.9
21065+00.00	1622.70	1622.20	1621.81	1621.81	1621.81	1621.88	0.0	0.9
21066+00.00	1622.52	1622.02	1621.63	1621.63	1621.70	1621.75	0.8	1.5
21067+00.00	1622.19	1621.69	1621.30	1621.30	1621.35	1621.41	0.6	1.4
21068+00.00	1621.95	1621.45	1621.06	1621.06	1621.10	1621.17	0.4	1.4
21069+00.00	1621.63	1621.13	1620.74	1620.74	1620.83	1620.92	1.2	2.3
21070+00.00	1621.37	1620.87	1620.48	1620.48	1620.60	1620.62	1.4	1.7
21071+00.00	1621.22	1620.72	1620.33	1620.33	1620.40	1620.46	0.9	1.6
21072+00.00	1621.15	1620.65	1620.26	1620.26	1620.39	1620.41	1.5	1.8
21073+00.00	1621.14	1620.64	1620.25	1620.25	1620.39	1620.41	1.7	1.9
21074+00.00	1621.22	1620.72	1620.33	1620.33	1620.48	1620.44	1.8	1.3
21075+00.00	1621.33	1620.83	1620.44	1620.44	1620.70	1620.63	3.1	2.3
21076+00.00	1621.39	1620.89	1620.50	1620.50	1620.58	1620.69	1.0	2.4
21077+00.00	1621.36	1620.86	1620.47	1620.47	1620.49	1620.62	0.2	1.9
21078+00.00	1621.32	1620.82	1620.43	1620.43	1620.44	1620.52	0.1	1.1
21079+00.00	1620.91	1620.41	1620.02	1620.02	1620.11	1620.14	1.0	1.4
21080+00.00	1620.35	1619.85	1619.46	1619.46	1619.63	1619.53	2.1	0.9
21081+00.00	1619.76	1619.26	1618.87	1618.87	1619.13	1618.97	3.1	1.2
21082+00.00	1619.30	1618.80	1618.41	1618.41	1618.70	1618.59	3.5	2.2
21083+00.00	1618.92	1618.42	1618.03	1618.03	1618.18	1618.25	1.7	2.6
21084+00.00	1618.43	1617.93	1617.54	1617.54	1617.55	1617.66	0.2	1.4
21085+00.00	1618.18	1617.68	1617.29	1617.29	1617.20	1617.37	-1.1	0.9
21086+00.00	1617.96	1617.46	1617.07	1617.07	1617.00	1617.19	-0.8	1.5
21087+00.00	1617.89	1617.39	1617.00	1617.00	1616.91	1617.08	-1.1	1.0
21088+00.00	1617.98	1617.48	1617.09	1617.09	1617.10	1617.17	0.1	0.9
21089+00.00	1617.95	1617.45	1617.06	1617.06	1616.96	1617.11	-1.2	0.6
21090+00.00	1617.75	1617.25	1616.86	1616.86	1616.87	1616.94	0.1	1.0
21091+00.00	1617.63	1617.13	1616.74	1616.74	1616.69	1616.82	-0.7	1.0
21092+00.00	1617.56	1617.06	1616.67	1616.67	1616.63	1616.76	-0.5	1.1
21093+00.00	1617.46	1616.96	1616.57	1616.57	1616.55	1616.73	-0.2	1.9
21094+00.00	1617.44	1616.94	1616.55	1616.55	1616.57	1616.74	0.2	2.3
21095+00.00	1617.52	1617.02	1616.63	1616.63	1616.63	1616.82	0.0	2.3
21096+00.00	1617.59	1617.09	1616.70	1616.70	1616.75	1616.94	0.6	2.8
21097+00.00	1617.61	1617.11	1616.72	1616.72	1616.76	1616.91	0.5	2.3
21098+00.00	1617.55	1617.05	1616.66	1616.66	1616.64	1616.80	-0.3	1.6
21099+00.00	1617.50	1617.00	1616.61	1616.61	1616.56	1616.80	-0.5	2.3

OCL ND1	CL Existing / Proposed	Milled CL 6"	18.54' LT of CL Elevevation at Proposed Crossslope	18.54' RT of CL Elevation at Proposed Crossslope	LT Existing	RT Existing	LT Milling Depth	RT Milling Depth	
	A	B	C = B - cross slope x 18.54'	D = B - cross slope x 18.54'	E	F	G = (E - C) x 12	H = (F - D) x 12	
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	
21100+00.00	1617.49	1616.99	1616.60	1616.60	1616.54	1617.04	-0.7	5.4	
21101+00.00	1617.47	1616.97	1616.58	1616.58	1616.51	1616.87	-0.9	3.4	
21102+00.00	1617.36	1616.86	1616.47	1616.47	1616.41	1616.85	-0.7	4.6	
21103+00.00	1617.24	1616.74	1616.35	1616.35	1616.30	1616.55	-0.7	2.3	
21104+00.00	1617.13	1616.63	1616.24	1616.24	1616.19	1616.42	-0.7	2.2	
21105+00.00	1617.02	1616.52	1616.13	1616.13	1616.15	1616.40	0.2	3.2	
21106+00.00	1617.04	1616.54	1616.15	1616.15	1616.22	1616.59	0.8	5.2	
21107+00.00	1617.09	1616.59	1616.20	1616.60	1616.08	1617.00	-1.5	4.7	*
21108+00.00	1617.10	1616.60	1616.04	1617.16	1615.92	1617.37	-1.4	2.5	*
21109+00.00	1617.04	1616.54	1615.76	1617.32	1615.85	1617.38	1.1	0.8	*
21110+00.00	1617.04	1616.54	1615.76	1617.31	1615.84	1617.43	0.9	1.3	*
21111+00.00	1617.13	1616.63	1615.85	1617.41	1615.88	1617.62	0.4	2.6	*
21112+00.00	1617.24	1616.74	1615.96	1617.52	1616.05	1617.87	1.0	4.2	*
21113+00.00	1617.44	1616.94	1616.16	1617.72	1616.25	1618.06	1.0	4.1	*
21114+00.00	1617.76	1617.26	1616.49	1618.04	1616.52	1618.37	0.4	4.0	*
21115+00.00	1618.15	1617.65	1616.87	1618.43	1616.91	1618.76	0.5	3.9	*
21116+00.00	1618.57	1618.07	1617.29	1618.85	1617.37	1619.23	0.9	4.6	*
21117+00.00	1619.10	1618.60	1617.82	1619.38	1617.77	1619.61	-0.7	2.8	*
21118+00.00	1619.29	1618.79	1618.01	1619.57	1617.99	1619.90	-0.3	3.9	*
21119+00.00	1619.39	1618.89	1618.11	1619.66	1618.11	1620.03	0.0	4.4	*
21120+00.00	1619.58	1619.08	1618.30	1619.86	1618.26	1620.16	-0.5	3.5	*
21121+00.00	1619.77	1619.27	1618.49	1620.05	1618.57	1620.34	0.9	3.5	*
21122+00.00	1619.92	1619.42	1618.92	1619.91	1618.74	1620.39	-2.2	5.7	*
21123+00.00	1619.91	1619.41	1619.02	1619.36	1618.92	1619.87	-1.3	6.2	*
21124+00.00	1619.89	1619.39	1619.00	1619.00	1619.16	1619.45	1.8	5.4	
21125+00.00	1619.95	1619.45	1619.06	1619.06	1619.15	1619.29	1.1	2.8	
21126+00.00	1620.08	1619.58	1619.19	1619.19	1619.32	1619.46	1.6	3.3	
21127+00.00	1620.27	1619.77	1619.38	1619.38	1619.67	1619.64	3.5	3.2	
21128+00.00	1620.59	1620.09	1619.70	1619.70	1620.03	1620.02	4.0	3.8	
21129+00.00	1620.76	1620.26	1620.46	1619.87	1620.52	1619.94	0.7	0.8	*
21130+00.00	1620.83	1620.33	1620.68	1619.94	1621.02	1619.83	4.1	-1.3	*
21131+00.00	1620.72	1620.22	1620.99	1619.44	1621.24	1619.61	3.0	2.1	*
21132+00.00	1620.60	1620.10	1620.88	1619.33	1621.25	1619.46	4.4	1.7	*
21133+00.00	1620.54	1620.04	1620.82	1619.26	1621.24	1619.37	5.1	1.3	*
21134+00.00	1620.36	1619.86	1620.64	1619.08	1621.02	1619.22	4.6	1.6	*
21135+00.00	1620.23	1619.73	1620.51	1618.95	1620.86	1619.09	4.2	1.6	*
21136+00.00	1620.14	1619.64	1620.42	1618.86	1620.69	1619.04	3.3	2.1	*
21137+00.00	1619.92	1619.42	1620.20	1618.64	1619.94	1619.12	-3.1	5.7	*
21138+00.00	1619.55	1619.05	1619.82	1618.27	1619.97	1618.55	1.8	3.4	*
21139+00.00	1619.10	1618.60	1619.38	1617.82	1619.74	1617.98	4.2	1.9	*
21140+00.00	1618.60	1618.10	1618.88	1617.32	1619.23	1617.53	4.2	2.5	*
21141+00.00	1617.99	1617.49	1618.27	1616.72	1618.61	1616.92	4.0	2.5	*
21142+00.00	1617.42	1616.92	1617.69	1616.14	1617.95	1616.30	3.1	2.0	*
21143+00.00	1616.91	1616.41	1617.19	1615.63	1617.34	1615.76	1.8	1.6	*
21144+00.00	1616.39	1615.89	1616.55	1615.23	1616.53	1615.28	-0.2	0.6	*

Notes:
* Milling occurs at superelevation location
** Match Exisiting Cross Slope in Langdon City Limits

Milling Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	11	6

OCL ND1	CL Existing / Proposed	Milled CL 6"	18.54' LT of CL Elevevation at Proposed Crossslope	18.54' RT of CL Elevation at Proposed Crossslope	LT Existing	RT Existing	LT Milling Depth	RT Milling Depth	
	A	B	C = B - cross slope x 18.54'	D = B - cross slope x 18.54'	E	F	G = (E - C) x 12	H = (F - D) x 12	
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	
21145+00.00	1615.75	1615.25	1615.35	1614.86	1615.45	1614.73	1.2	-1.5	*
21146+00.00	1615.33	1614.83	1614.44	1614.44	1614.73	1614.47	3.5	0.4	*
21147+00.00	1615.12	1614.62	1614.23	1614.23	1614.42	1614.39	2.2	1.9	
21148+00.00	1614.96	1614.46	1614.07	1614.07	1614.24	1614.24	2.0	2.0	
21149+00.00	1614.97	1614.47	1614.08	1614.08	1614.26	1614.23	2.2	1.9	
21150+00.00	1615.09	1614.59	1614.20	1614.20	1614.37	1614.36	2.1	2.0	
21151+00.00	1615.19	1614.69	1614.30	1614.30	1614.46	1614.46	1.9	1.9	
21152+00.00	1615.29	1614.79	1614.40	1614.40	1614.61	1614.56	2.6	1.9	
21153+00.00	1615.46	1614.96	1614.57	1614.57	1614.76	1614.73	2.4	2.0	
21154+00.00	1615.79	1615.29	1614.90	1614.90	1615.08	1615.09	2.2	2.3	
21155+00.00	1616.35	1615.85	1615.46	1615.46	1615.61	1615.68	1.7	2.5	
21156+00.00	1617.04	1616.54	1616.15	1616.15	1616.24	1616.34	1.0	2.2	
21157+00.00	1617.87	1617.37	1616.98	1616.98	1617.03	1617.14	0.6	1.9	
21158+00.00	1619.05	1618.55	1618.16	1618.16	1618.20	1618.34	0.5	2.2	
21159+00.00	1620.54	1620.04	1619.65	1619.65	1619.46	1619.85	-2.3	2.3	
21160+00.00	1622.17	1621.67	1621.28	1621.28	1621.31	1621.48	0.4	2.4	
21161+00.00	1624.02	1623.52	1623.13	1623.13	1623.17	1623.32	0.5	2.3	
21162+00.00	1625.72	1625.22	1624.83	1624.83	1624.91	1625.03	0.9	2.3	
21163+00.00	1627.05	1626.55	1626.16	1626.16	1626.30	1626.39	1.6	2.7	
21164+00.00	1628.15	1627.65	1627.26	1627.26	1627.34	1627.50	1.0	2.9	
21165+00.00	1629.00	1628.50	1628.11	1628.11	1628.20	1628.27	1.0	1.9	
21166+00.00	1629.58	1629.08	1628.69	1628.69	1628.75	1628.82	0.7	1.5	
21167+00.00	1629.84	1629.34	1628.95	1628.95	1629.09	1629.07	1.6	1.4	
21168+00.00	1629.90	1629.40	1629.01	1629.01	1629.15	1629.14	1.7	1.6	
21169+00.00	1629.86	1629.36	1628.97	1628.97	1629.02	1629.11	0.5	1.6	
21170+00.00	1629.75	1629.25	1628.86	1628.86	1628.96	1629.04	1.2	2.2	
21171+00.00	1629.60	1629.10	1628.71	1628.71	1628.74	1628.89	0.4	2.1	
21172+00.00	1629.46	1628.96	1628.57	1628.57	1628.72	1628.75	1.8	2.2	
21173+00.00	1629.42	1628.92	1628.53	1628.53	1628.87	1628.65	4.1	1.4	
21174+00.00	1629.20	1628.70	1628.31	1628.31	1628.41	1628.34	1.1	0.4	
21175+00.00	1628.79	1628.29	1627.90	1627.90	1628.19	1628.00	3.4	1.2	
21176+00.00	1628.38	1627.88	1627.49	1627.49	1627.75	1627.70	3.0	2.5	
21177+00.00	1627.89	1627.39	1627.00	1627.00	1627.14	1627.21	1.7	2.5	
21178+00.00	1627.45	1626.95	1626.56	1626.56	1626.66	1626.75	1.2	2.2	
21179+00.00	1626.92	1626.42	1626.03	1626.03	1626.14	1626.22	1.2	2.2	
21180+00.00	1626.45	1625.95	1625.56	1625.56	1625.61	1625.71	0.6	1.9	
21181+00.00	1625.95	1625.45	1625.06	1625.06	1625.40	1625.26	4.1	2.3	
21182+00.00	1625.47	1624.97	1624.58	1624.58	1624.80	1624.77	2.6	2.2	
21183+00.00	1625.11	1624.61	1624.22	1624.22	1624.50	1624.46	3.4	2.8	
21184+00.00	1624.78	1624.28	1623.89	1623.89	1624.18	1624.12	3.5	2.8	
21185+00.00	1624.54	1624.04	1623.65	1623.65	1624.13	1624.04	5.8	4.6	
21186+00.00	1624.33	1623.83	1623.44	1623.44	1623.63	1623.70	2.3	3.1	
21187+00.00	1624.05	1623.55	1623.16	1623.16	1623.27	1623.29	1.3	1.5	
21188+00.00	1623.99	1623.49	1623.10	1623.10	1623.17	1623.17	0.8	0.9	
21189+00.00	1623.83	1623.33	1622.94	1622.94	1623.01	1622.92	0.8	-0.2	
21190+00.00	1623.55	1623.05	1622.66	1622.66	1623.00	1622.99	4.1	4.0	
21191+00.00	1623.27	1622.77	1622.38	1622.38	1622.43	1622.57	0.6	2.3	
21192+00.00	1622.92	1622.42	1622.03	1622.03	1622.10	1622.16	0.8	1.6	
21193+00.00	1622.96	1622.46	1622.07	1622.07	1622.16	1622.24	1.1	2.0	
21194+00.00	1623.16	1622.66	1622.27	1622.27	1622.47	1622.46	2.4	2.2	
21195+00.00	1623.26	1622.76	1622.37	1622.37	1622.60	1622.70	2.7	3.9	
21196+00.00	1623.40	1622.90	1622.51	1622.51	1622.69	1622.69	2.0	2.2	
21197+00.00	1623.56	1623.06	1622.67	1622.67	1622.87	1622.76	2.4	1.1	

OCL ND1	CL Existing / Proposed	Milled CL 6"	18.54' LT of CL Elevevation at Proposed Crossslope	18.54' RT of CL Elevation at Proposed Crossslope	LT Existing	RT Existing	LT Milling Depth	RT Milling Depth
	A	B	C = B - cross slope x 18.54'	D = B - cross slope x 18.54'	E	F	G = (E - C) x 12	H = (F - D) x 12
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches
21198+00.00	1623.81	1623.31	1622.92	1622.92	1623.12	1623.02	2.5	1.3
21199+00.00	1624.28	1623.78	1623.39	1623.39	1623.62	1623.50	2.7	1.3
21200+00.00	1624.99	1624.49	1624.10	1624.10	1624.24	1624.20	1.7	1.2
21201+00.00	1625.89	1625.39	1625.00	1625.00	1625.11	1625.10	1.3	1.2
21202+00.00	1627.02	1626.52	1626.13	1626.13	1626.25	1626.24	1.3	1.3
21203+00.00	1628.25	1627.75	1627.36	1627.36	1627.46	1627.46	1.2	1.2
21204+00.00	1629.54	1629.04	1628.65	1628.65	1628.76	1628.73	1.4	1.0
21205+00.00	1630.87	1630.37	1629.98	1629.98	1630.09	1630.05	1.4	0.9
21206+00.00	1632.16	1631.66	1631.27	1631.27	1631.36	1631.34	1.0	0.8
21207+00.00	1633.22	1632.72	1632.33	1632.33	1632.46	1632.41	1.5	1.0
21208+00.00	1634.03	1633.53	1633.14	1633.14	1633.31	1633.22	2.1	1.0
21209+00.00	1634.75	1634.25	1633.86	1633.86	1634.07	1633.93	2.5	0.9
21210+00.00	1635.45	1634.95	1634.56	1634.56	1634.87	1634.69	3.7	1.6
21211+00.00	1636.07	1635.57	1635.18	1635.18	1635.51	1635.35	4.0	2.0
21212+00.00	1636.60	1636.10	1635.71	1635.71	1635.98	1635.84	3.3	1.6
21213+00.00	1637.08	1636.58	1636.19	1636.19	1636.46	1636.30	3.2	1.2
21214+00.00	1637.38	1636.88	1636.49	1636.49	1636.87	1636.63	4.6	1.6
21215+00.00	1637.48	1636.98	1636.59	1636.59	1636.88	1636.75	3.5	1.9
21216+00.00	1637.08	1636.58	1636.19	1636.19	1636.68	1636.34	5.8	1.7
21217+00.00	1636.41	1635.91	1635.52	1635.52	1635.79	1635.63	3.2	1.3
21218+00.00	1635.53	1635.03	1634.64	1634.64	1634.92	1634.72	3.4	1.0
21219+00.00	1634.45	1633.95	1633.56	1633.56	1633.95	1633.64	4.7	1.0
21220+00.00	1633.22	1632.72	1632.33	1632.33	1632.70	1632.48	4.4	1.7
21221+00.00	1631.98	1631.48	1631.09	1631.09	1631.29	1631.54	2.4	5.5
21222+00.00	1630.78	1630.28	1629.89	1629.89	1630.29	1630.08	4.8	2.3
21223+00.00	1629.66	1629.16	1628.77	1628.77	1628.95	1628.82	2.1	0.5
21224+00.00	1628.63	1628.13	1627.74	1627.74	1627.93	1627.80	2.3	0.7
21225+00.00	1627.81	1627.31	1626.92	1626.92	1627.09	1626.97	2.0	0.7
21226+00.00	1627.19	1626.69	1626.30	1626.30	1626.48	1626.39	2.2	1.1
21227+00.00	1626.87	1626.37	1625.98	1625.98	1626.16	1626.10	2.1	1.4
21228+00.00	1626.74	1626.24	1625.85	1625.85	1625.92	1625.93	0.8	0.9
21229+00.00	1626.67	1626.17	1625.78	1625.78	1625.93	1625.87	1.8	1.0
21230+00.00	1626.69	1626.19	1625.80	1625.80	1625.90	1625.83	1.2	0.4
21231+00.00	1626.76	1626.26	1625.87	1625.87	1626.07	1625.92	2.5	0.6
21232+00.00	1626.70	1626.20	1625.81	1625.81	1626.00	1625.95	2.2	1.6
21233+00.00	1626.62	1626.12	1625.73	1625.73	1625.89	1625.82	2.0	1.1
21234+00.00	1626.53	1626.03	1625.64	1625.64	1625.84	1625.70	2.4	0.8
21235+00.00	1626.53	1626.03	1625.64	1625.64	1625.82	1625.69	2.1	0.6
21236+00.00	1626.46	1625.96	1625.57	1625.57	1625.71	1625.73	1.7	1.9
21237+00.00	1626.42	1625.92	1625.53	1625.53	1625.67	1625.77	1.6	2.8
21238+00.00	1626.39	1625.89	1625.50	1625.50	1625.64	1625.63	1.7	1.6
21239+00.00	1626.29	1625.79	1625.40	1625.40	1625.59	1625.48	2.2	0.9
21240+00.00	1626.11	1625.61	1625.22	1625.22	1625.67	1625.72	5.4	6.0
21241+00.00	1625.81	1625.31	1624.92	1624.92	1625.03	1625.11	1.3	2.3

Notes:
* Milling occurs at superelevation location
** Match Exisiting Cross Slope in Langdon City Limits

Milling Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	11	7

OCL ND1	CL Existing / Proposed	Milled CL 6"	18.54' LT of CL Elevevation at Proposed Crossslope	18.54' RT of CL Elevation at Proposed Crossslope	LT Existing	RT Existing	LT Milling Depth	RT Milling Depth	
	A	B	C = B - cross slope x 18.54'	D = B - cross slope x 18.54'	E	F	G = (E - C) x 12	H = (F - D) x 12	
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	
21242+00.00									**
21243+00.00									**
21244+00.00									**
21245+00.00									**
21246+00.00									**
21247+00.00									**
21248+00.00									**
21249+00.00									**
21250+00.00									**
21251+00.00									**
21252+00.00	Match Existing Cross Slope in Langdon City Limits								**
21253+00.00									**
21254+00.00									**
21255+00.00									**
21256+00.00									**
21257+00.00									**
21258+00.00									**
21259+00.00									**
21260+00.00									**
21261+00.00									**

Notes:
* Milling occurs at superelevation location
** Match Exisiting Cross Slope in Langdon City Limits

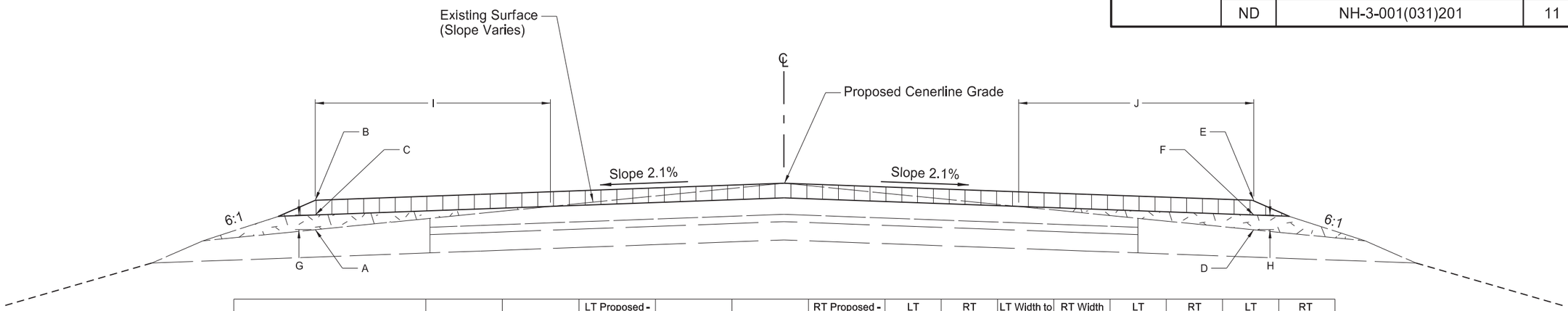
Milling Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	11	8



OCL ND1	LT Existing	LT Proposed	LT Proposed - Pavement Bottom	RT Existing	RT Proposed	RT Proposed - Pavement Bottom	LT Elevation Difference	RT Elevation Difference	LT Width to Edge Pavement	RT Width to Edge Pavement	LT Aggregate Area	RT Aggregate Area	LT Aggregate Adjustment	RT Aggregate Adjustment
	A	B	C = B - 4"	D	E	F = E - 4"	G = C - A	H = F - D	I	J				
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	FT	FT	SF	SF	TON	TON
20655+00.00	1625.624	1626.397	1626.06	1625.356	1625.826	1625.49	5.2	1.6	11.7	0	3.1	0.05		
20656+00.00	1625.515	1625.881	1625.55	1625.578	1625.862	1625.53	0.4	-0.6	10.4	6.8	0.18	-0.17	11.39	-0.42
20657+00.00	1625.476	1625.833	1625.5	1625.567	1625.833	1625.5	0.3	-0.8	2.7	0	0.04	0	0.76	-0.59
20658+00.00	1625.31	1625.615	1625.28	1625.298	1625.615	1625.28	-0.4	-0.2	2.3	0	-0.04	0	0	0
20659+00.00	1624.924	1625.34	1625.01	1624.975	1625.34	1625.01	1	0.4	0.6	0.5	0.05	0.01	0.03	0.03
20660+00.00	1624.297	1624.703	1624.37	1624.337	1624.703	1624.37	0.9	0.4	4.4	3.1	0.18	0.06	0.8	0.24
20661+00.00	1622.99	1623.379	1623.05	1623.02	1623.379	1623.05	0.7	0.4	4.1	3.1	0.13	0.06	1.08	0.42
20662+00.00	1621.475	1621.863	1621.53	1621.449	1621.863	1621.53	0.7	1	3.8	2.8	0.12	0.14	0.87	0.69
20663+00.00	1619.708	1620.101	1619.77	1619.745	1620.101	1619.77	0.7	0.3	3.8	5.1	0.12	0.07	0.83	0.73
20664+00.00	1618.384	1618.869	1618.54	1618.376	1618.869	1618.54	1.9	2	4.2	2.7	0.41	0.31	1.84	1.32
20665+00.00	1617.508	1618.11	1617.78	1617.647	1618.11	1617.78	3.3	1.6	7.2	7.4	1.22	0.55	5.66	2.99
20666+00.00	1617.206	1617.846	1617.51	1617.428	1617.846	1617.51	3.6	1	9.7	6.6	1.73	0.3	10.24	2.95
20667+00.00	1617.603	1618.123	1617.79	1617.721	1618.123	1617.79	2.2	0.8	10.4	5.2	1.05	0.19	9.65	1.7
20668+00.00	1618.486	1618.989	1618.66	1618.495	1618.989	1618.66	2.1	2	8.1	4.5	0.8	0.46	6.42	2.26
20669+00.00	1619.819	1620.222	1619.89	1619.783	1620.222	1619.89	0.9	1.3	7.5	7.5	0.3	0.44	3.82	3.13
20670+00.00	1621.029	1621.467	1621.13	1621.032	1621.467	1621.13	1.2	1.2	4.5	5.9	0.26	0.33	1.94	2.67
20671+00.00	1622.311	1622.758	1622.42	1622.324	1622.758	1622.42	1.3	1.2	5.5	5.8	0.33	0.32	2.05	2.26
20672+00.00	1623.644	1624.073	1623.74	1623.589	1624.073	1623.74	1.2	1.8	5.7	5.7	0.32	0.5	2.26	2.85
20673+00.00	1624.898	1625.332	1625	1624.907	1625.332	1625	1.2	1.1	4.8	7.2	0.27	0.36	2.05	2.99
20674+00.00	1626.022	1626.505	1626.17	1626.148	1626.505	1626.17	1.8	0.3	5	5.5	0.44	0.07	2.47	1.49
20675+00.00	1626.876	1627.367	1627.03	1627.004	1627.367	1627.03	1.8	0.3	6.5	2.7	0.56	0.04	3.47	0.38
20676+00.00	1627.388	1627.828	1627.49	1627.528	1627.828	1627.49	1.2	-0.5	6.5	3	0.36	-0.06	3.19	-0.07
20677+00.00	1627.684	1628.131	1627.8	1627.825	1628.131	1627.8	1.4	-0.3	5.2	0	0.34	0	2.43	-0.21
20678+00.00	1627.991	1628.409	1628.08	1628.046	1628.409	1628.08	1.1	0.4	5.4	0	0.27	0	2.12	0
20679+00.00	1628.199	1628.518	1628.18	1628.217	1628.518	1628.18	-0.2	-0.4	4.5	3	-0.04	-0.05	0.8	-0.17
20680+00.00	1628.1	1628.448	1628.11	1628.242	1628.448	1628.11	0.1	-1.6	0.9	0	0	0	-0.14	-0.17
20681+00.00	1628.176	1628.636	1628.3	1628.33	1628.636	1628.3	1.5	-0.4	2.1	0	0.18	0	0.63	0
20682+00.00	1628.376	1628.886	1628.55	1628.511	1628.886	1628.55	2.1	0.5	5.5	0	0.57	0.01	2.6	0.03
20683+00.00	1629.049	1629.457	1629.12	1629.046	1629.457	1629.12	0.9	0.9	6.5	3.5	0.26	0.15	2.88	0.56
20684+00.00	1629.935	1630.289	1629.96	1629.889	1630.289	1629.96	0.3	0.9	4.1	4.9	0.05	0.2	1.08	1.22

Aggregate Base Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	11	9

OCL ND1	LT Existing	LT Proposed	LT Proposed - Pavement Bottom	RT Existing	RT Proposed	RT Proposed - Pavement Bottom	LT Elevation Difference	RT Elevation Difference	LT Width to Edge Pavement	RT Width to Edge Pavement	LT Aggregate Area	RT Aggregate Area	LT Aggregate Adjustment	RT Aggregate Adjustment
	A	B	C = B - 4"	D	E	F = E - 4"	G = C - A	H = F - D	I	J				
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	FT	FT	SF	SF	TON	TON
20685+00.00	1630.723	1631.056	1630.72	1630.732	1631.056	1630.72	0	-0.1	2.2	4.5	0	-0.02	0.17	0.63
20686+00.00	1631.507	1631.94	1631.61	1631.596	1631.94	1631.61	1.2	0.2	1.4	1	0.1	0.01	0.35	-0.03
20687+00.00	1632.442	1632.837	1632.5	1632.486	1632.837	1632.5	0.7	0.2	4.6	2	0.14	0.02	0.83	0.1
20688+00.00	1633.456	1633.868	1633.53	1633.498	1633.868	1633.53	0.9	0.4	3.5	2.4	0.15	0.04	1.01	0.21
20689+00.00	1634.54	1634.978	1634.64	1634.555	1634.978	1634.64	1.2	1	3.8	3.3	0.22	0.16	1.28	0.69
20690+00.00	1635.535	1635.876	1635.54	1635.489	1635.876	1635.54	0.1	0.6	4.3	5.4	0.02	0.14	0.83	1.04
20691+00.00	1636.337	1636.601	1636.27	1636.318	1636.601	1636.27	-0.8	-0.6	1.7	4.1	-0.06	-0.1	-0.14	0.14
20692+00.00	1636.919	1637.264	1636.93	1636.894	1637.264	1636.93	0.1	0.4	0	0	0	0	-0.21	-0.35
20693+00.00	1637.439	1637.778	1637.44	1637.436	1637.778	1637.44	0	0	1.9	3.2	0	0	0	0
20694+00.00	1637.731	1638.095	1637.76	1637.73	1638.095	1637.76	0.3	0.4	1.7	2	0.02	0.04	0.07	0.14
20695+00.00	1637.846	1638.313	1637.98	1637.994	1638.313	1637.98	1.6	-0.2	2.8	3	0.24	-0.03	0.9	0.03
20696+00.00	1637.826	1638.419	1638.09	1638.28	1638.419	1638.09	3.2	-2.3	6.1	0.7	1.03	-0.07	4.41	-0.35
20697+00.00	1637.783	1638.475	1638.14	1638.557	1638.925	1638.59	4.3	0.4	9.1	0	2.02	0	10.59	-0.24
20698+00.00	1637.887	1638.397	1638.06	1639.158	1639.631	1639.3	2.1	1.7	10.6	3.2	1.02	0.29	10.56	1.01
20699+00.00	1637.883	1638.366	1638.03	1639.438	1639.863	1639.53	1.8	1.1	7.6	7.3	0.64	0.36	5.76	2.26
20700+00.00	1637.753	1638.279	1637.95	1639.376	1639.774	1639.44	2.4	0.8	7	5.5	0.82	0.2	5.07	1.94
20701+00.00	1637.879	1638.407	1638.07	1639.482	1639.898	1639.56	2.3	0.9	7.9	4.5	0.87	0.19	5.87	1.35
20702+00.00	1638.085	1638.568	1638.23	1639.71	1640.053	1639.72	1.7	0.1	7.7	5.2	0.61	0.02	5.14	0.73
20703+00.00	1638.492	1638.791	1638.46	1639.79	1640.28	1639.95	-0.4	1.9	6.7	2	-0.11	0.23	1.74	0.87
20704+00.00	1638.551	1639.073	1638.74	1640.175	1640.566	1640.23	2.3	0.7	0.2	7.3	0.13	0.22	0.07	1.56
20705+00.00	1638.883	1639.3	1638.97	1640.445	1640.797	1640.46	1	0.2	7.8	4.3	0.35	0.04	1.67	0.9
20706+00.00	1639.265	1639.662	1639.33	1640.809	1641.159	1640.83	0.8	0.3	5.2	2.5	0.19	0.03	1.88	0.24
20707+00.00	1639.731	1640.161	1639.83	1641.245	1641.658	1641.32	1.2	0.9	4.7	2.4	0.27	0.11	1.6	0.49
20708+00.00	1640.405	1640.765	1640.43	1641.826	1642.259	1641.93	0.3	1.2	5.5	5.1	0.07	0.29	1.18	1.39
20709+00.00	1640.897	1641.267	1640.93	1642.498	1642.755	1642.42	0.4	-0.9	3.1	5.7	0.06	-0.21	0.45	0.28
20710+00.00	1641.049	1641.46	1641.13	1642.614	1642.945	1642.61	1	0	3.4	0	0.16	0	0.76	-0.73
20711+00.00	1641.244	1641.654	1641.32	1642.813	1643.145	1642.81	0.9	0	5	1.4	0.2	0	1.25	0
20712+00.00	1641.634	1641.795	1641.46	1642.891	1643.291	1642.96	-2.1	0.8	7.7	1.4	-0.67	0.06	-1.63	0.21
20713+00.00	1641.376	1641.872	1641.54	1643.071	1643.37	1643.04	2	-0.4	0.8	5.2	0.15	-0.09	-1.81	-0.1
20714+00.00	1641.207	1641.774	1641.44	1642.985	1643.271	1642.94	2.8	-0.5	7.9	0	1.09	0	4.31	-0.31
20715+00.00	1640.967	1641.48	1641.15	1642.615	1642.976	1642.64	2.2	0.3	9.1	0	0.94	0	7.05	0
20716+00.00	1640.637	1641.179	1640.85	1642.308	1642.67	1642.34	2.6	0.4	8	2.9	1.01	0.05	6.77	0.17
20717+00.00	1640.295	1640.911	1640.58	1642.156	1642.396	1642.06	3.4	-1.2	8.3	2.9	1.42	-0.15	8.44	-0.35
20718+00.00	1639.952	1640.459	1640.13	1641.691	1641.947	1641.61	2.1	-1	9.6	0	0.93	0	8.16	-0.52
20719+00.00	1639.977	1640.659	1640.33	1641.748	1642.153	1641.82	4.2	0.9	7.4	0	1.66	0.02	8.99	0.07
20720+00.00	1640.001	1640.746	1640.41	1641.713	1642.243	1641.91	4.9	2.4	10.5	4.8	2.64	0.6	14.93	2.15
20721+00.00	1639.992	1640.666	1640.33	1641.59	1642.164	1641.83	4.1	2.9	11.4	8.4	2.3	1.19	17.15	6.22
20722+00.00	1639.93	1640.559	1640.23	1641.455	1642.056	1641.72	3.6	3.2	10.9	9.2	1.91	1.44	14.62	9.13
20723+00.00	1640.095	1640.584	1640.25	1641.562	1642.077	1641.74	1.9	2.1	10.2	9.3	0.88	0.91	9.69	8.16
20724+00.00	1640.041	1640.573	1640.24	1641.697	1642.061	1641.73	2.4	0.4	7.5	7.6	0.87	0.13	6.08	3.61
20725+00.00	1639.925	1640.33	1640	1641.397	1641.814	1641.48	0.9	1	8.5	3.1	0.34	0.15	4.2	0.97
20726+00.00	1639.763	1640.083	1639.75	1641.143	1641.574	1641.24	-0.2	1.2	4.8	5.2	-0.04	0.29	1.04	1.53
20727+00.00	1639.992	1640.234	1639.9	1641.24	1641.729	1641.4	-1.1	1.9	1.1	5.7	-0.05	0.53	-0.31	2.85
20728+00.00	1640.336	1640.497	1640.16	1641.35	1641.994	1641.66	-2.1	3.7	0	7.3	0	1.41	-0.17	6.74
20729+00.00	1640.736	1641.14	1640.81	1641.296	1641.879	1641.55	0.9	3	0	10.5	0.02	1.5	0.07	10.1
20730+00.00	1641	1641.375	1641.04	1641.198	1641.565	1641.23	0.5	0.4	4.5	9.5	0.1	0.16	0.42	5.76
20731+00.00	1640.94	1641.322	1640.99	1640.916	1641.322	1640.99	0.6	0.9	3.5	3.1	0.1	0.13	0.69	1.01
20732+00.00	1640.884	1641.296	1640.96	1640.822	1641.296	1640.96	0.9	1.7	3.8	4.6	0.16	0.39	0.9	1.81
20733+00.00	1640.832	1641.245	1640.91	1640.779	1641.245	1640.91	0.9	1.6	4.9	6.9	0.2	0.51	1.25	3.13
20734+00.00	1640.85	1641.241	1640.91	1640.732	1641.241	1640.91	0.7	2.1	4.9	6.8	0.15	0.69	1.22	4.17
20735+00.00	1640.888	1641.295	1640.96	1640.801	1641.295	1640.96	0.9	1.9	4.2	7.6	0.17	0.68	1.11	4.76
20736+00.00	1641.017	1641.37	1641.04	1640.866	1641.37	1641.04	0.3	2.1	4.7	7.5	0.06	0.75	0.8	4.97
20737+00.00	1640.97	1641.303	1640.97	1640.805	1641.303	1640.97	0	2	2.5	7.7	0	0.73	0.21	5.14
20738+00.00	1640.81	1641.209	1640.88	1640.647	1641.209	1640.88	0.8	2.8	1.5	7.5	0.06	1.04	0.21	6.15
20739+00.00	1640.883	1641.212	1640.88	1640.627	1641.212	1640.88	0	3	4.5	9	0	1.31	0.21	8.16
20740+00.00	1640.901	1641.176	1640.84	1640.683	1641.176	1640.84	-0.7	1.9	1.2	9.5	-0.04	0.83	-0.14	7.43
20741+00.00	1640.917	1641.184	1640.85	1640.756	1641.184	1640.85	-0.8	1.1	0	7.6	0	0.37	-0.14	4.17
20742+00.00	1640.78	1641.148	1640.81	1640.709	1641.148	1640.81	0.4	1.2	0	5.5	0	0.31	0	2.36
20743+00.00	1640.621	1641.023	1640.69	1640.644	1641.023	1640.69	0.8	0.6	2.9	5.9	0.11	0.16	0.38	1.63
20744+00.00	1640.463	1640.824	1640.49	1640.439	1640.824	1640.49	0.3	0.6	4	3.7	0.05	0.1	0.56	0.9
20745+00.00	1640.405	1640.753	1640.42	1640.271	1640.753	1640.42	0.2	1.8	2.6	3.9	0.02	0.36	0.24	1.6

Aggregate Base Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	11	10

OCL ND1	LT Existing	LT Proposed	LT Proposed - Pavement Bottom	RT Existing	RT Proposed	RT Proposed - Pavement Bottom	LT Elevation Difference	RT Elevation Difference	LT Width to Edge Pavement	RT Width to Edge Pavement	LT Aggregate Area	RT Aggregate Area	LT Aggregate Adjustment	RT Aggregate Adjustment
	A	B	C = B - 4"	D	E	F = E - 4"	G = C - A	H = F - D	I	J				
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	FT	FT	SF	SF	TON	TON
20746+00.00	1640.235	1640.598	1640.26	1640.132	1640.598	1640.26	0.3	1.5	2.1	7.2	0.03	0.5	0.17	2.99
20747+00.00	1640.091	1640.459	1640.13	1640.027	1640.459	1640.13	0.5	1.2	2.6	6.7	0.06	0.37	0.31	3.02
20748+00.00	1639.922	1640.3	1639.97	1639.888	1640.3	1639.97	0.6	1	2.9	5.7	0.08	0.26	0.49	2.19
20749+00.00	1639.8	1640.214	1639.88	1639.827	1640.214	1639.88	1	0.6	3.3	5	0.16	0.13	0.83	1.35
20750+00.00	1639.646	1640.053	1639.72	1639.695	1640.053	1639.72	0.9	0.3	4.5	4.1	0.19	0.05	1.22	0.63
20751+00.00	1639.47	1639.934	1639.6	1639.537	1639.934	1639.6	1.6	0.8	4.3	2.7	0.34	0.1	1.84	0.52
20752+00.00	1639.392	1639.847	1639.51	1639.442	1639.847	1639.51	1.4	0.8	6	4.4	0.39	0.16	2.53	0.9
20753+00.00	1639.375	1639.826	1639.49	1639.398	1639.826	1639.49	1.4	1.1	5.9	4.8	0.39	0.25	2.71	1.42
20754+00.00	1639.416	1639.821	1639.49	1639.349	1639.821	1639.49	0.9	1.7	5.7	5.6	0.23	0.46	2.15	2.47
20755+00.00	1639.318	1639.678	1639.34	1639.25	1639.678	1639.34	0.3	1.1	4.5	6.9	0.06	0.34	1.01	2.78
20756+00.00	1639.223	1639.588	1639.25	1639.135	1639.588	1639.25	0.3	1.4	2.8	5.5	0.04	0.36	0.35	2.43
20757+00.00	1639.188	1639.532	1639.2	1639.058	1639.532	1639.2	0.1	1.7	3	6.3	0.01	0.51	0.17	3.02
20758+00.00	1639.188	1639.52	1639.19	1639.094	1639.52	1639.19	0	1.2	2	7	0	0.38	0.03	3.09
20759+00.00	1639.26	1639.576	1639.24	1639.158	1639.576	1639.24	-0.2	1	1.4	5.5	-0.01	0.25	-0.03	2.19
20760+00.00	1639.093	1639.508	1639.17	1639.199	1639.508	1639.17	0.9	-0.3	0.6	5.2	0.04	-0.07	0.1	0.63
20761+00.00	1638.933	1639.344	1639.01	1638.976	1639.344	1639.01	0.9	0.4	5	0.2	0.2	0.01	0.83	-0.21
20762+00.00	1638.871	1639.226	1638.89	1638.794	1639.226	1638.89	0.2	1.2	4.8	3.2	0.04	0.19	0.83	0.69
20763+00.00	1638.797	1639.156	1638.82	1638.712	1639.156	1638.82	0.3	1.3	2.5	5.7	0.03	0.34	0.24	1.84
20764+00.00	1638.799	1639.156	1638.82	1638.743	1639.156	1638.82	0.3	0.9	2.8	6	0.04	0.24	0.24	2.01
20765+00.00	1638.878	1639.18	1638.85	1638.811	1639.18	1638.85	-0.3	0.5	2.7	5.1	-0.03	0.11	0.03	1.22
20766+00.00	1638.715	1639.047	1638.71	1638.685	1639.047	1638.71	-0.1	0.3	0	3.2	0	0.04	-0.1	0.52
20767+00.00	1638.458	1638.791	1638.46	1638.499	1638.791	1638.46	0	-0.5	1.4	2.9	0	-0.06	0	-0.07
20768+00.00	1638.216	1638.526	1638.19	1638.208	1638.526	1638.19	-0.3	-0.2	1.4	0	-0.02	0	-0.07	-0.21
20769+00.00	1637.882	1638.249	1637.92	1637.953	1638.249	1637.92	0.5	-0.4	0.2	0.6	0.01	-0.01	-0.03	-0.03
20770+00.00	1637.351	1637.681	1637.35	1637.287	1637.681	1637.35	0	0.8	3	0.4	0	0.03	0.03	0.07
20771+00.00	1636.848	1637.115	1636.78	1636.655	1637.115	1636.78	-0.8	1.5	1.3	4.3	-0.04	0.32	-0.14	1.22
20772+00.00	1636.1	1636.44	1636.11	1636.035	1636.44	1636.11	0.1	0.9	0	6.6	0	0.26	-0.14	2.01
20773+00.00	1635.324	1635.65	1635.32	1635.211	1635.65	1635.32	0	1.3	1.8	4.7	0	0.29	0	1.91
20774+00.00	1634.559	1634.998	1634.66	1634.541	1634.998	1634.66	1.2	1.4	1.1	5.9	0.09	0.39	0.31	2.36
20775+00.00	1634.123	1634.667	1634.33	1634.112	1634.667	1634.33	2.5	2.6	5.7	6.5	0.72	0.85	2.81	4.31
20776+00.00	1633.914	1634.495	1634.16	1633.948	1634.495	1634.16	3	2.5	8	8.9	1.19	1.06	6.63	6.63
20777+00.00	1633.828	1634.389	1634.06	1633.811	1634.389	1634.06	2.8	3	9.3	8.7	1.25	1.28	8.47	8.13
20778+00.00	1633.815	1634.393	1634.06	1633.812	1634.393	1634.06	2.9	3	9	9.2	1.26	1.34	8.72	9.1
20779+00.00	1633.803	1634.5	1634.17	1633.901	1634.5	1634.17	4.4	3.2	9.4	9.3	2.13	1.45	11.77	9.69
20780+00.00	1634.084	1634.623	1634.29	1633.996	1634.623	1634.29	2.5	3.5	10.7	9.7	1.24	1.67	11.7	10.83
20781+00.00	1634.091	1634.574	1634.24	1633.91	1634.574	1634.24	1.8	4	8.1	10.1	0.68	2.02	6.67	12.81
20782+00.00	1634.154	1634.58	1634.25	1634.072	1634.58	1634.25	1.2	2.1	6.6	10.7	0.36	1.03	3.61	10.59
20783+00.00	1633.961	1634.425	1634.09	1633.936	1634.425	1634.09	1.5	1.8	5.2	7.8	0.37	0.65	2.53	5.83
20784+00.00	1633.733	1634.166	1633.83	1633.68	1634.166	1633.83	1.2	1.8	6.4	7.4	0.35	0.62	2.5	4.41
20785+00.00	1633.396	1633.915	1633.58	1633.414	1633.915	1633.58	2.2	2	5.7	7.1	0.62	0.68	3.37	4.51
20786+00.00	1633.12	1633.667	1633.33	1633.085	1633.667	1633.33	2.5	2.9	8.1	7.6	0.97	1.09	5.52	6.15
20787+00.00	1632.839	1633.261	1632.93	1632.66	1633.261	1632.93	1.1	3.2	8.9	9.2	0.43	1.44	4.86	8.78
20788+00.00	1632.407	1632.911	1632.58	1632.287	1632.911	1632.58	2.1	3.5	4.5	8.1	0.49	1.44	3.19	10
20789+00.00	1632.186	1632.702	1632.37	1632.079	1632.702	1632.37	2.2	3.5	7.7	9.9	0.81	1.7	4.51	10.9
20790+00.00	1631.991	1632.566	1632.23	1631.961	1632.566	1632.23	2.9	3.2	8.1	9.7	1.15	1.51	6.81	11.15
20791+00.00	1632.057	1632.635	1632.3	1632.04	1632.635	1632.3	2.9	3.1	9.2	9.2	1.29	1.39	8.47	10.07
20792+00.00	1632.424	1632.987	1632.65	1632.378	1632.987	1632.65	2.7	3.3	9.3	9.1	1.2	1.48	8.65	9.97
20793+00.00	1632.818	1633.367	1633.03	1632.776	1633.367	1633.03	2.5	3	9	9.6	1.07	1.39	7.88	9.97
20794+00.00	1633.261	1633.771	1633.44	1633.218	1633.771	1633.44	2.1	2.7	8.7	9.2	0.85	1.19	6.67	8.96
20795+00.00	1633.72	1634.149	1633.82	1633.664	1634.149	1633.82	1.2	1.9	8	8.4	0.43	0.74	4.44	6.7
20796+00.00	1633.978	1634.555	1634.22	1634.243	1634.555	1634.22	2.9	-0.3	5.6	7.7	0.85	-0.1	4.44	2.22
20797+00.00	1634.179	1634.835	1634.5	1634.328	1634.835	1634.5	3.9	2.1	9.3	2.3	1.83	0.29	9.31	0.66
20798+00.00	1634.151	1634.827	1634.49	1634.296	1634.827	1634.49	4.1	2.3	10.6	7.7	2.16	0.85	13.85	3.96
20799+00.00	1633.97	1634.59	1634.26	1634.16	1634.59	1634.26	3.5	1.2	10.7	8.4	1.82	0.45	13.82	4.51
20800+00.00	1633.721	1634.28	1633.95	1633.752	1634.28	1633.95	2.7	2.4	10	5.7	1.28	0.69	10.76	3.96
20801+00.00	1632.974	1633.602	1633.27	1633.125	1633.602	1633.27	3.6	1.7	8.9	8.2	1.61	0.64	10.03	4.62
20802+00.00	1632.505	1633.122	1632.79	1632.611	1633.122	1632.79	3.4	2.1	10.2	6.6	1.69	0.67	11.46	4.55
20803+00.00	1632.031	1632.578	1632.24	1631.945	1632.578	1632.24	2.5	3.5	10	7.4	1.17	1.33	9.93	6.94
20804+00.00	1631.723	1632.25	1631.92	1631.64	1632.25	1631.92	2.4	3.4	8.7	9.8	0.99	1.63	7.5	10.28
20805+00.00	1631.636	1632.202	1631.87	1631.639	1632.202	1631.87	2.8	2.8	8.3	9.3	1.13	1.25	7.36	10
20806+00.00	1631.503	1632.112	1631.78	1631.831	1632.112	1631.78	3.3	-0.6	9.1	8.3	1.48	-0.21	9.06	3.61

Aggregate Base Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	11	11

OCL ND1	LT Existing	LT Proposed	LT Proposed - Pavement Bottom	RT Existing	RT Proposed	RT Proposed - Pavement Bottom	LT Elevation Difference	RT Elevation Difference	LT Width to Edge Pavement	RT Width to Edge Pavement	LT Aggregate Area	RT Aggregate Area	LT Aggregate Adjustment	RT Aggregate Adjustment
	A	B	C = B - 4"	D	E	F = E - 4"	G = C - A	H = F - D	I	J				
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	FT	FT	SF	SF	TON	TON
20807+00.00	1631.564	1632.128	1631.79	1631.559	1632.128	1631.79	2.7	2.8	9.9	0	1.27	0.16	9.55	-0.17
20808+00.00	1631.888	1632.366	1632.03	1631.914	1632.366	1632.03	1.7	1.4	9.1	9.1	0.7	0.57	6.84	2.53
20809+00.00	1632.067	1632.615	1632.28	1632.125	1632.615	1632.28	2.6	1.9	7.1	6	0.91	0.55	5.59	3.89
20810+00.00	1632.206	1632.791	1632.46	1632.221	1632.791	1632.46	3	2.9	8.7	6.8	1.28	1	7.6	5.38
20811+00.00	1632.397	1632.935	1632.6	1632.4	1632.935	1632.6	2.4	2.4	9.4	8.2	1.06	0.94	8.13	6.74
20812+00.00	1632.51	1633.062	1632.73	1632.426	1633.062	1632.73	2.6	3.6	8.5	7.4	1.06	1.38	7.36	8.06
20813+00.00	1632.464	1633.062	1632.73	1632.402	1633.062	1632.73	3.2	3.9	8.8	9.1	1.39	1.8	8.51	11.04
20814+00.00	1632.456	1633.09	1632.76	1632.479	1633.09	1632.76	3.6	3.4	9.7	9.6	1.73	1.6	10.83	11.81
20815+00.00	1632.271	1632.95	1632.62	1632.414	1632.95	1632.62	4.2	2.5	10.3	8.9	2.17	1.06	13.54	9.24
20816+00.00	1632.456	1633.021	1632.69	1632.449	1633.021	1632.69	2.8	2.9	10.9	7.5	1.44	1.08	12.53	7.43
20817+00.00	1632.64	1633.14	1632.81	1632.825	1633.14	1632.81	2	-0.2	9	8.4	0.83	-0.07	7.88	3.51
20818+00.00	1633.353	1633.139	1632.81	1633.339	1633.139	1632.81	-6.5	-6.3	7.9	0.6	-2.14	-0.16	-4.55	-0.8
20819+00.00	1633.111	1633.11	1632.78	1632.943	1633.11	1632.78	-4	-2	0	9.9	0	-0.83	-7.43	-3.44
20820+00.00	1632.445	1632.912	1632.58	1632.595	1632.912	1632.58	1.6	-0.2	0	0	0.05	0	0.17	-2.88
20821+00.00	1632.031	1632.518	1632.18	1632.147	1632.518	1632.18	1.8	0.4	6.6	0.5	0.56	0.01	2.12	0.03
20822+00.00	1631.831	1632.397	1632.06	1632.112	1632.397	1632.06	2.7	-0.6	7.3	3.3	0.97	-0.08	5.31	-0.24
20823+00.00	1631.635	1632.267	1631.93	1631.979	1632.267	1631.93	3.5	-0.6	9.2	0	1.6	0	8.92	-0.28
20824+00.00	1631.464	1632.126	1631.79	1631.779	1632.126	1631.79	3.9	0.1	10.1	0	1.96	0	12.36	0
20825+00.00	1631.646	1632.301	1631.97	1631.874	1632.301	1631.97	3.9	1.2	10.4	2.2	2.01	0.14	13.78	0.49
20826+00.00	1632.031	1632.653	1632.32	1632.287	1632.653	1632.32	3.5	0.4	9.9	5.6	1.7	0.1	12.88	0.83
20827+00.00	1632.478	1633.019	1632.69	1632.712	1633.019	1632.69	2.5	-0.3	9.6	3.1	1.13	-0.04	9.83	0.21
20828+00.00	1632.629	1633.176	1632.84	1632.834	1633.176	1632.84	2.5	0.1	8.1	0	0.97	0	7.29	-0.14
20829+00.00	1633.199	1633.706	1633.37	1633.306	1633.706	1633.37	2.1	0.8	8.7	1.9	0.85	0.08	6.32	0.28
20830+00.00	1633.78	1634.267	1633.93	1633.938	1634.267	1633.93	1.8	-0.1	7.8	4.6	0.65	-0.02	5.21	0.21
20831+00.00	1634.117	1634.607	1634.27	1634.316	1634.607	1634.27	1.8	-0.6	7.3	1.3	0.62	-0.03	4.41	-0.17
20832+00.00	1634.272	1634.804	1634.47	1634.385	1634.804	1634.47	2.4	1	7.4	0	0.86	0.02	5.14	-0.03
20833+00.00	1634.313	1634.82	1634.49	1634.417	1634.82	1634.49	2.1	0.9	8.4	5	0.83	0.2	5.87	0.76
20834+00.00	1634.056	1634.639	1634.31	1634.289	1634.639	1634.31	3	0.3	7.8	4.7	1.16	0.06	6.91	0.9
20835+00.00	1633.682	1634.276	1633.94	1634.15	1634.276	1633.94	3.1	-2.5	9.4	2.3	1.41	-0.24	8.92	-0.63
20836+00.00	1633.301	1633.842	1633.51	1633.606	1633.842	1633.51	2.5	-1.2	9.6	0	1.13	0	8.82	-0.83
20837+00.00	1632.905	1633.398	1633.06	1633.137	1633.398	1633.06	1.9	-0.9	8.6	0	0.76	0	6.56	0
20838+00.00	1632.643	1633.19	1632.86	1632.88	1633.19	1632.86	2.6	-0.2	7.5	0	0.95	0	5.94	0
20839+00.00	1632.645	1633.199	1632.87	1632.905	1633.199	1632.87	2.7	-0.4	8.7	0.1	1.13	0	7.22	0
20840+00.00	1632.66	1633.202	1632.87	1632.97	1633.202	1632.87	2.5	-1.2	8.9	0	1.06	0	7.6	0
20841+00.00	1632.881	1633.417	1633.08	1633.124	1633.417	1633.08	2.4	-0.5	8.6	0	0.98	0	7.08	0
20842+00.00	1633.418	1633.891	1633.56	1633.52	1633.891	1633.56	1.7	0.5	8.5	0	0.66	0.01	5.69	0.03
20843+00.00	1634.065	1634.492	1634.16	1634.092	1634.492	1634.16	1.1	0.8	6.9	3.2	0.34	0.12	3.47	0.45
20844+00.00	1634.576	1634.953	1634.62	1634.66	1634.953	1634.62	0.5	-0.5	5.5	4.3	0.12	-0.09	1.6	0.1
20845+00.00	1634.918	1635.294	1634.96	1635.012	1635.294	1634.96	0.5	-0.6	3.6	0	0.08	0	0.69	-0.31
20846+00.00	1635.03	1635.485	1635.15	1635.217	1635.485	1635.15	1.4	-0.8	3.6	0	0.25	0	1.15	0
20847+00.00	1634.849	1635.369	1635.04	1635.033	1635.369	1635.04	2.3	0.1	6.3	0	0.71	0	3.33	0
20848+00.00	1634.587	1635.12	1634.79	1634.652	1635.12	1634.79	2.4	1.7	8.1	1.7	0.93	0.18	5.69	0.63
20849+00.00	1634.133	1634.615	1634.28	1634.218	1634.615	1634.28	1.8	0.7	8.4	6.6	0.7	0.2	5.66	1.32
20850+00.00	1633.545	1634.019	1633.69	1633.705	1634.019	1633.69	1.7	-0.2	7.1	4.4	0.56	-0.04	4.38	0.56
20851+00.00	1633.123	1633.622	1633.29	1633.27	1633.622	1633.29	2	0.2	7	0.4	0.67	0	4.27	-0.14
20852+00.00	1632.896	1633.319	1632.99	1632.947	1633.319	1632.99	1.1	0.5	7.6	2.3	0.37	0.05	3.61	0.17
20853+00.00	1632.636	1633.066	1632.73	1632.701	1633.066	1632.73	1.1	0.3	5.4	3.2	0.27	0.04	2.22	0.31
20854+00.00	1632.618	1633.028	1632.69	1632.608	1633.028	1632.69	0.9	1	5.6	2.9	0.23	0.14	1.74	0.63
20855+00.00	1632.633	1633.077	1632.74	1632.693	1633.077	1632.74	1.3	0.6	4.9	5	0.3	0.13	1.84	0.94
20856+00.00	1632.642	1633.025	1632.69	1632.615	1633.025	1632.69	0.6	0.9	6.1	3.7	0.16	0.16	1.6	1.01
20857+00.00	1632.646	1633.09	1632.76	1632.71	1633.09	1632.76	1.4	0.6	3.9	4.6	0.27	0.12	1.49	0.97
20858+00.00	1632.707	1633.15	1632.82	1632.814	1633.149	1632.82	1.4	0.1	6.1	3.5	0.4	0.01	2.33	0.45
20859+00.00	1632.751	1633.152	1632.82	1632.837	1633.152	1632.82	0.8	-0.2	6	1.6	0.21	-0.01	2.12	0
20860+00.00	1632.702	1633.113	1632.78	1632.824	1633.113	1632.78	0.9	-0.5	4.6	0.4	0.19	-0.01	1.39	-0.07
20861+00.00	1632.575	1633.013	1632.68	1632.717	1633.013	1632.68	1.3	-0.4	5	0	0.31	0	1.74	-0.03
20862+00.00	1632.453	1632.892	1632.56	1632.532	1632.893	1632.56	1.3	0.3	5.9	0	0.35	0	2.29	0
20863+00.00	1632.256	1632.658	1632.32	1632.291	1632.658	1632.32	0.8	0.3	5.8	2.9	0.21	0.04	1.94	0.14
20864+00.00	1632.087	1632.516	1632.18	1632.079	1632.516	1632.18	1.1	1.2	4.4	3.2	0.23	0.19	1.53	0.8
20865+00.00	1631.877	1632.36	1632.03	1631.883	1632.36	1632.03	1.8	1.8	5.3	5.8	0.47	0.5	2.43	2.4
20866+00.00	1631.781	1632.282	1631.95	1631.834	1632.282	1631.95	2	1.4	6.9	7	0.66	0.45	3.92	3.3
20867+00.00	1631.858	1632.34	1632.01	1631.935	1632.34	1632.01	1.8	0.9	7.5	6.2	0.63	0.25	4.48	2.43

Aggregate Base Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	11	12

OCL ND1	LT Existing	LT Proposed	LT Proposed - Pavement Bottom	RT Existing	RT Proposed	RT Proposed - Pavement Bottom	LT Elevation Difference	RT Elevation Difference	LT Width to Edge Pavement	RT Width to Edge Pavement	LT Aggregate Area	RT Aggregate Area	LT Aggregate Adjustment	RT Aggregate Adjustment
	A	B	C = B - 4"	D	E	F = E - 4"	G = C - A	H = F - D	I	J				
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	FT	FT	SF	SF	TON	TON
20868+00.00	1631.865	1632.344	1632.01	1631.918	1632.344	1632.01	1.7	1.1	7.1	4.7	0.56	0.24	4.13	1.7
20869+00.00	1631.759	1632.266	1631.93	1631.764	1632.266	1631.93	2.1	2	7	5.3	0.7	0.53	4.38	2.67
20870+00.00	1631.73	1632.214	1631.88	1631.73	1632.214	1631.88	1.8	1.8	7.8	7.4	0.65	0.62	4.69	3.99
20871+00.00	1631.883	1632.263	1631.93	1631.902	1632.263	1631.93	0.6	0.3	7.2	6.9	0.19	0.09	2.92	2.47
20872+00.00	1631.853	1632.338	1632	1632.044	1632.338	1632	1.8	-0.5	3.8	3	0.35	-0.06	1.88	0.1
20873+00.00	1631.97	1632.389	1632.06	1632.136	1632.389	1632.06	1.1	-0.9	7.1	0	0.35	0	2.43	-0.21
20874+00.00	1631.877	1632.345	1632.01	1632.055	1632.345	1632.01	1.6	-0.5	5.2	0	0.4	0	2.6	0
20875+00.00	1632.164	1632.569	1632.24	1632.129	1632.569	1632.24	0.9	1.3	6.8	0	0.27	0.04	2.33	0.14
20876+00.00	1632.406	1632.843	1632.51	1632.438	1632.843	1632.51	1.2	0.9	4.7	5.3	0.27	0.22	1.88	0.9
20877+00.00	1632.842	1633.131	1632.8	1632.865	1633.131	1632.8	-0.5	-0.8	5.8	4.1	-0.12	-0.14	0.52	0.28
20878+00.00	1633.064	1633.322	1632.99	1632.982	1633.322	1632.99	-0.9	0.1	0.8	0.5	-0.03	0	-0.52	-0.49
20879+00.00	1633.232	1633.637	1633.3	1633.315	1633.637	1633.3	0.8	-0.2	0.6	1.8	0.03	-0.02	0	-0.07
20880+00.00	1633.871	1634.267	1633.93	1633.944	1634.267	1633.93	0.7	-0.2	4.7	1	0.15	-0.01	0.63	-0.1
20881+00.00	1634.421	1634.762	1634.43	1634.38	1634.762	1634.43	0.1	0.6	4.4	1	0.02	0.03	0.59	0.07
20882+00.00	1634.987	1635.312	1634.98	1635.014	1635.312	1634.98	-0.1	-0.4	1.9	3.4	-0.01	-0.06	0.03	-0.1
20883+00.00	1635.356	1635.692	1635.36	1635.262	1635.692	1635.36	0	1.2	1.3	0	0	0.03	-0.03	-0.1
20884+00.00	1635.563	1635.943	1635.61	1635.526	1635.943	1635.61	0.6	1	1.6	4.9	0.05	0.23	0.17	0.9
20885+00.00	1635.78	1636.224	1635.89	1635.792	1636.224	1635.89	1.3	1.2	3.8	4.8	0.24	0.27	1.01	1.74
20886+00.00	1636.065	1636.503	1636.17	1636.062	1636.503	1636.17	1.3	1.3	6.2	5.4	0.37	0.33	2.12	2.08
20887+00.00	1636.129	1636.601	1636.27	1636.147	1636.601	1636.27	1.7	1.5	5.9	5.9	0.48	0.42	2.95	2.6
20888+00.00	1636.115	1636.609	1636.28	1636.201	1636.609	1636.28	2	0.9	6.9	6.4	0.66	0.26	3.96	2.36
20889+00.00	1636.206	1636.655	1636.32	1636.273	1636.655	1636.32	1.4	0.6	7.5	4.9	0.48	0.13	3.96	1.35
20890+00.00	1636.324	1636.828	1636.49	1636.337	1636.828	1636.49	2	1.8	6.1	3.8	0.59	0.35	3.72	1.67
20891+00.00	1636.475	1636.94	1636.61	1636.546	1636.94	1636.61	1.6	0.8	7.4	7.4	0.55	0.26	3.96	2.12
20892+00.00	1636.376	1636.803	1636.47	1636.525	1636.803	1636.47	1.1	-0.7	6.5	4.3	0.32	-0.13	3.02	0.45
20893+00.00	1636.189	1636.521	1636.19	1636.256	1636.521	1636.19	0	-0.8	5.2	0	0	0	1.11	-0.45
20894+00.00	1635.754	1636.237	1635.9	1635.87	1636.237	1635.9	1.8	0.4	1.4	0	0.17	0	0.59	0
20895+00.00	1635.184	1635.67	1635.34	1635.306	1635.67	1635.34	1.9	0.4	7	3.2	0.63	0.06	2.78	0.21
20896+00.00	1634.747	1635.139	1634.81	1634.805	1635.139	1634.81	0.8	0.1	7	3	0.25	0.01	3.06	0.24
20897+00.00	1634.458	1634.765	1634.43	1634.585	1634.765	1634.43	-0.3	-1.9	4	1.5	-0.05	-0.12	0.69	-0.38
20898+00.00	1634.13	1634.435	1634.1	1634.152	1634.435	1634.1	-0.4	-0.6	0	0	0	0	-0.17	-0.42
20899+00.00	1633.455	1633.892	1633.56	1633.412	1633.892	1633.56	1.3	1.8	0	1.9	0.04	0.21	0.14	0.73
20900+00.00	1633.065	1633.528	1633.19	1633.17	1633.528	1633.19	1.5	0.2	5.6	7.2	0.4	0.06	1.53	0.94
20901+00.00	1633.06	1633.547	1633.21	1633.134	1633.547	1633.21	1.8	0.9	6.4	2.8	0.55	0.12	3.3	0.63
20902+00.00	1633.165	1633.735	1633.4	1633.237	1633.735	1633.4	2.8	2	7.1	5.1	0.99	0.51	5.35	2.19
20903+00.00	1633.522	1634.076	1633.74	1633.518	1634.076	1633.74	2.6	2.7	8.8	7.6	1.09	1.01	7.22	5.28
20904+00.00	1634.213	1634.673	1634.34	1634.12	1634.673	1634.34	1.5	2.6	8.4	8.9	0.57	1.11	5.76	7.36
20905+00.00	1634.909	1635.351	1635.02	1634.836	1635.351	1635.02	1.3	2.2	6.3	8.8	0.38	0.91	3.3	7.01
20906+00.00	1635.416	1635.864	1635.53	1635.352	1635.864	1635.53	1.4	2.1	6	8	0.39	0.79	2.67	5.9
20907+00.00	1635.801	1636.217	1635.88	1635.698	1636.217	1635.88	0.9	2.2	6.2	7.9	0.25	0.83	2.22	5.63
20908+00.00	1635.971	1636.418	1636.08	1635.863	1636.418	1636.08	1.3	2.6	5	8.1	0.31	1.02	1.94	6.42
20909+00.00	1635.949	1636.384	1636.05	1635.812	1636.384	1636.05	1.2	2.9	6.1	8.8	0.34	1.24	2.26	7.85
20910+00.00	1635.732	1636.09	1635.76	1635.587	1636.09	1635.76	0.3	2.1	5.7	9.1	0.07	0.89	1.42	7.4
20911+00.00	1635.131	1635.506	1635.17	1635.013	1635.506	1635.17	0.5	1.9	2.7	7.7	0.06	0.68	0.45	5.45
20912+00.00	1634.21	1634.63	1634.3	1634.082	1634.63	1634.3	1.1	2.6	3.5	7.3	0.19	0.93	0.87	5.59
20913+00.00	1633.253	1633.761	1633.43	1633.177	1633.761	1633.43	2.1	3	5.3	8.5	0.56	1.25	2.6	7.57
20914+00.00	1632.525	1633.111	1632.78	1632.569	1633.111	1632.78	3.1	2.5	7.9	9.5	1.22	1.12	6.18	8.23
20915+00.00	1632.02	1632.586	1632.25	1632.102	1632.586	1632.25	2.8	1.8	9.2	8.6	1.24	0.71	8.54	6.35
20916+00.00	1631.709	1632.225	1631.89	1631.767	1632.225	1631.89	2.2	1.5	9	7.2	0.93	0.5	7.53	4.2
20917+00.00	1631.405	1631.95	1631.62	1631.521	1631.95	1631.62	2.6	1.2	8.1	6.5	1.02	0.36	6.77	2.99
20918+00.00	1631.177	1631.733	1631.4	1631.346	1631.733	1631.4	2.7	0.6	8.4	5.7	1.1	0.15	7.36	1.77
20919+00.00	1631.129	1631.645	1631.31	1631.266	1631.645	1631.31	2.2	0.5	8.4	4	0.87	0.09	6.84	0.83
20920+00.00	1631.141	1631.656	1631.32	1631.3	1631.656	1631.32	2.1	0.2	7.6	3.7	0.76	0.03	5.66	0.42
20921+00.00	1631.22	1631.692	1631.36	1631.329	1631.692	1631.36	1.7	0.4	7.7	2.6	0.61	0.05	4.76	0.28
20922+00.00	1631.208	1631.655	1631.32	1631.261	1631.655	1631.32	1.3	0.7	6.7	3	0.4	0.1	3.51	0.52
20923+00.00	1631.301	1631.637	1631.3	1631.262	1631.637	1631.3	0	0.5	6.1	4.3	0	0.09	1.39	0.66
20924+00.00	1631.484	1631.639	1631.31	1631.461	1631.639	1631.31	-2.1	-1.8	1.6	3.5	-0.14	-0.26	-0.49	-0.59
20925+00.00	1631.176	1631.642	1631.31	1631.376	1631.642	1631.31	1.6	-0.8	0	13.9	0.05	-0.46	-0.31	-2.5
20926+00.00	1631.104	1631.688	1631.35	1631.196	1631.688	1631.35	3	1.8	6.8	0.5	1.04	0.11	3.78	-1.22
20927+00.00	1631.396	1631.785	1631.45	1631.381	1631.785	1631.45	0.6	0.8	9.4	7.5	0.24	0.26	4.44	1.28
20928+00.00	1631.648	1631.996	1631.66	1631.558	1631.996	1631.66	0.1	1.2	4.1	4.6	0.02	0.26	0.9	1.81

Aggregate Base Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	11	13

OCL ND1	LT Existing	LT Proposed	LT Proposed - Pavement Bottom	RT Existing	RT Proposed	RT Proposed - Pavement Bottom	LT Elevation Difference	RT Elevation Difference	LT Width to Edge Pavement	RT Width to Edge Pavement	LT Aggregate Area	RT Aggregate Area	LT Aggregate Adjustment	RT Aggregate Adjustment
	A	B	C = B - 4"	D	E	F = E - 4"	G = C - A	H = F - D	I	J				
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	FT	FT	SF	SF	TON	TON
20929+00.00	1631.851	1632.209	1631.88	1631.752	1632.209	1631.88	0.3	1.5	2.2	5.8	0.03	0.41	0.17	2.33
20930+00.00	1631.978	1632.314	1631.98	1631.821	1632.314	1631.98	0	1.9	2.7	6.4	0	0.58	0.1	3.44
20931+00.00	1632.021	1632.396	1632.06	1631.948	1632.396	1632.06	0.5	1.3	1.7	7.3	0.04	0.43	0.14	3.51
20932+00.00	1632.125	1632.45	1632.12	1632.014	1632.45	1632.12	-0.1	1.3	3.5	6.1	-0.01	0.37	0.1	2.78
20933+00.00	1632.121	1632.454	1632.12	1631.986	1632.454	1632.12	0	1.6	1	5.8	0	0.44	-0.03	2.81
20934+00.00	1631.992	1632.332	1632	1631.864	1632.332	1632	0.1	1.6	1.4	6.7	0.01	0.5	0.03	3.26
20935+00.00	1631.633	1631.995	1631.66	1631.534	1631.995	1631.66	0.3	1.5	1.8	6.8	0.02	0.47	0.1	3.37
20936+00.00	1631.169	1631.483	1631.15	1630.999	1631.483	1631.15	-0.2	1.8	2.8	6.6	-0.02	0.56	0	3.58
20937+00.00	1630.661	1630.96	1630.63	1630.5	1630.96	1630.63	-0.4	1.6	0.5	7.3	-0.01	0.54	-0.1	3.82
20938+00.00	1629.976	1630.345	1630.01	1629.899	1630.345	1630.01	0.4	1.3	0	6.6	0	0.39	-0.03	3.23
20939+00.00	1629.631	1629.985	1629.65	1629.485	1629.985	1629.65	0.2	2	3	6.2	0.03	0.6	0.1	3.44
20940+00.00	1629.114	1629.504	1629.17	1629.176	1629.504	1629.17	0.7	-0.1	2.5	7.8	0.08	-0.03	0.38	1.98
20941+00.00	1628.989	1629.387	1629.05	1629.004	1629.387	1629.05	0.7	0.6	3.7	1.2	0.12	0.04	0.69	0.03
20942+00.00	1629.016	1629.298	1628.96	1628.876	1629.298	1628.96	-0.7	1	3.9	3.9	-0.11	0.18	0.03	0.76
20943+00.00	1629.083	1629.354	1629.02	1628.847	1629.354	1629.02	-0.8	2.1	0	5.4	0	0.56	-0.38	2.57
20944+00.00	1629.132	1629.442	1629.11	1628.97	1629.442	1629.11	-0.3	1.7	0	7.8	0	0.61	0	4.06
20945+00.00	1629.565	1629.792	1629.46	1629.346	1629.792	1629.46	-1.3	1.4	0.4	6.9	-0.02	0.44	-0.07	3.65
20946+00.00	1629.904	1630.144	1629.81	1629.683	1630.144	1629.81	-1.1	1.5	0	6.2	0	0.43	-0.07	3.02
20947+00.00	1630.255	1630.491	1630.16	1630.005	1630.491	1630.16	-1.1	1.9	0	6.6	0	0.6	0	3.58
20948+00.00	1630.508	1630.772	1630.44	1630.266	1630.772	1630.44	-0.8	2.1	0	7.3	0	0.73	0	4.62
20949+00.00	1630.575	1630.846	1630.51	1630.356	1630.846	1630.51	-0.8	1.8	0	7.8	0	0.65	0	4.79
20950+00.00	1630.482	1630.68	1630.35	1630.344	1630.68	1630.35	-1.6	0.1	0	7.3	0	0.03	0	2.36
20951+00.00	1630.19	1630.441	1630.11	1630.114	1630.441	1630.11	-1	0	0	1.7	0	0	0	0.1
20952+00.00	1629.568	1629.883	1629.55	1629.457	1629.883	1629.55	-0.2	1.1	0	1.2	0	0.08	0	0.28
20953+00.00	1628.725	1629.127	1628.79	1628.807	1629.127	1628.79	0.8	-0.2	0.6	5.5	0.03	-0.05	0.1	0.1
20954+00.00	1627.716	1628.207	1627.87	1627.764	1628.207	1627.87	1.8	1.3	4.2	0.7	0.38	0.07	1.42	0.07
20955+00.00	1626.673	1627.155	1626.82	1626.755	1627.155	1626.82	1.8	0.8	6.7	6.1	0.57	0.22	3.3	1.01
20956+00.00	1625.79	1626.196	1625.86	1625.705	1626.196	1625.86	0.8	1.9	6.2	4.5	0.22	0.43	2.74	2.26
20957+00.00	1624.991	1625.29	1624.96	1624.901	1625.29	1624.96	-0.4	0.7	4.2	7.4	-0.07	0.23	0.52	2.29
20958+00.00	1624.071	1624.531	1624.2	1624.128	1624.531	1624.2	1.5	0.9	0	4.2	0.05	0.17	-0.07	1.39
20959+00.00	1623.311	1623.718	1623.38	1623.302	1623.718	1623.38	0.8	0.9	5.8	4.7	0.21	0.19	0.9	1.25
20960+00.00	1622.832	1623.219	1622.89	1622.837	1623.219	1622.89	0.7	0.6	4.3	5.1	0.14	0.14	1.22	1.15
20961+00.00	1622.419	1622.932	1622.6	1622.414	1622.932	1622.6	2.2	2.2	3.8	3.8	0.45	0.45	2.05	2.05
20962+00.00	1622.115	1622.627	1622.29	1622.159	1622.627	1622.29	2.1	1.6	7.7	8	0.77	0.59	4.24	3.61
20963+00.00	1621.819	1622.308	1621.97	1621.866	1622.308	1621.97	1.8	1.2	7.6	6.7	0.64	0.37	4.9	3.33
20964+00.00	1621.534	1622.006	1621.67	1621.531	1622.006	1621.67	1.6	1.7	7.1	6	0.53	0.49	4.06	2.99
20965+00.00	1621.13	1621.613	1621.28	1621.211	1621.613	1621.28	1.8	0.8	6.6	7	0.56	0.25	3.78	2.57
20966+00.00	1620.771	1621.253	1620.92	1620.93	1621.253	1620.92	1.8	-0.1	7	4.6	0.59	-0.02	3.99	0.8
20967+00.00	1620.471	1620.993	1620.66	1620.682	1620.993	1620.66	2.3	-0.3	6.8	0.9	0.76	-0.01	4.69	-0.1
20968+00.00	1620.325	1620.832	1620.5	1620.473	1620.832	1620.5	2.1	0.3	7.8	0.5	0.77	0.01	5.31	0
20969+00.00	1620.314	1620.708	1620.37	1620.337	1620.708	1620.37	0.7	0.4	7.6	2.8	0.23	0.05	3.47	0.21
20970+00.00	1620.461	1620.796	1620.46	1620.426	1620.796	1620.46	0	0.4	4.2	3.4	0	0.06	0.8	0.38
20971+00.00	1620.647	1621.011	1620.68	1620.526	1621.011	1620.68	0.4	1.8	1.6	3.3	0.03	0.32	0.1	1.32
20972+00.00	1620.781	1621.165	1620.83	1620.688	1621.165	1620.83	0.6	1.7	2.9	7.3	0.08	0.58	0.38	3.13
20973+00.00	1621.02	1621.38	1621.05	1620.924	1621.38	1621.05	0.4	1.5	3.8	7.1	0.07	0.49	0.52	3.72
20974+00.00	1621.395	1621.73	1621.4	1621.265	1621.73	1621.4	0.1	1.6	2.7	6.4	0.01	0.48	0.28	3.37
20975+00.00	1621.816	1622.18	1621.85	1621.73	1622.18	1621.85	0.4	1.4	1.5	6.7	0.03	0.43	0.14	3.16
20976+00.00	1622.456	1622.802	1622.47	1622.383	1622.802	1622.47	0.2	1	3	6.3	0.03	0.28	0.21	2.47
20977+00.00	1623.225	1623.54	1623.21	1623.15	1623.54	1623.21	-0.2	0.7	2.1	5.2	-0.02	0.16	0.03	1.53
20978+00.00	1623.522	1623.959	1623.63	1623.553	1623.959	1623.63	1.3	0.9	0.5	3.9	0.06	0.16	0.14	1.11
20979+00.00	1623.5	1623.95	1623.62	1623.685	1623.95	1623.62	1.4	-0.8	5.9	4.6	0.39	-0.15	1.56	0.03
20980+00.00	1623.704	1624.006	1623.67	1623.673	1624.006	1623.67	-0.4	0	6.3	0	-0.11	0	0.97	-0.52
20981+00.00	1623.854	1624.15	1623.82	1623.733	1624.15	1623.82	-0.4	1	0.1	1.5	0	0.08	-0.38	0.28
20982+00.00	1624.173	1624.401	1624.07	1623.917	1624.401	1624.07	-1.2	1.8	0	5.2	0	0.46	0	1.88
20983+00.00	1623.986	1624.411	1624.08	1623.917	1624.411	1624.08	1.1	2	0	7.3	0.03	0.69	0.1	3.99
20984+00.00	1623.74	1624.235	1623.9	1623.792	1624.235	1623.9	1.9	1.3	5.4	7.5	0.5	0.44	1.84	3.92
20985+00.00	1623.65	1624.122	1623.79	1623.617	1624.122	1623.79	1.7	2.1	7.4	6	0.58	0.62	3.75	3.68
20986+00.00	1623.59	1623.99	1623.66	1623.476	1623.99	1623.66	0.8	2.2	6.9	7.7	0.24	0.81	2.85	4.97
20987+00.00	1623.45	1623.812	1623.48	1623.334	1623.812	1623.48	0.4	1.8	4.4	8	0.08	0.67	1.11	5.14
20988+00.00	1623.14	1623.584	1623.25	1623.115	1623.584	1623.25	1.3	1.6	2.9	7	0.19	0.52	0.94	4.13
20989+00.00	1622.927	1623.408	1623.07	1622.919	1623.408	1623.07	1.7	1.8	6	6.8	0.49	0.58	2.36	3.82

Aggregate Base Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	11	14

OCL ND1	LT Existing	LT Proposed	LT Proposed - Pavement Bottom	RT Existing	RT Proposed	RT Proposed - Pavement Bottom	LT Elevation Difference	RT Elevation Difference	LT Width to Edge Pavement	RT Width to Edge Pavement	LT Aggregate Area	RT Aggregate Area	LT Aggregate Adjustment	RT Aggregate Adjustment
	A	B	C = B - 4"	D	E	F = E - 4"	G = C - A	H = F - D	I	J				
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	FT	FT	SF	SF	TON	TON
20990+00.00	1622.668	1623.178	1622.84	1622.635	1623.178	1622.84	2.1	2.5	7.1	7.3	0.71	0.89	4.17	5.1
20991+00.00	1622.431	1622.989	1622.66	1622.465	1622.989	1622.66	2.7	2.3	7.8	8.6	1.03	0.93	6.04	6.32
20992+00.00	1622.209	1622.713	1622.38	1622.252	1622.713	1622.38	2.1	1.5	8.9	8.1	0.87	0.55	6.6	5.14
20993+00.00	1622.231	1622.655	1622.32	1622.149	1622.655	1622.32	1.1	2.1	7.7	6.2	0.38	0.63	4.34	4.1
20994+00.00	1622.251	1622.67	1622.34	1622.129	1622.67	1622.34	1.1	2.5	5.4	7.7	0.27	0.93	2.26	5.42
20995+00.00	1622.502	1622.842	1622.51	1622.398	1622.842	1622.51	0.1	1.3	5.3	8.6	0.02	0.5	1.01	4.97
20996+00.00	1622.583	1622.979	1622.65	1622.554	1622.979	1622.65	0.8	1.2	1.8	5.8	0.07	0.32	0.31	2.85
20997+00.00	1622.746	1623.259	1622.93	1622.794	1623.259	1622.93	2.2	1.6	4.4	5.4	0.5	0.41	1.98	2.53
20998+00.00	1622.997	1623.535	1623.2	1623.071	1623.535	1623.2	2.4	1.5	7.9	6.7	0.91	0.47	4.9	3.06
20999+00.00	1623.377	1623.926	1623.59	1623.464	1623.926	1623.59	2.6	1.5	8.3	6.7	1.04	0.47	6.77	3.26
21000+00.00	1624.045	1624.446	1624.11	1623.989	1624.446	1624.11	0.8	1.5	8.7	6.5	0.3	0.45	4.65	3.19
21001+00.00	1624.569	1624.972	1624.64	1624.511	1624.972	1624.64	0.9	1.5	4.5	6.2	0.19	0.43	1.7	3.06
21002+00.00	1625.122	1625.488	1625.15	1624.945	1625.488	1625.15	0.3	2.5	4.7	6.3	0.06	0.79	0.87	4.24
21003+00.00	1625.74	1626.143	1625.81	1625.705	1626.143	1625.81	0.8	1.3	3.1	8.4	0.12	0.49	0.63	4.44
21004+00.00	1626.236	1626.591	1626.26	1626.204	1626.591	1626.26	0.3	0.7	4.7	5.7	0.06	0.18	0.63	2.33
21005+00.00	1626.658	1626.855	1626.52	1626.571	1626.855	1626.52	-1.7	-0.6	2.6	4	-0.18	-0.1	-0.42	0.28
21006+00.00	1626.728	1626.919	1626.59	1626.757	1626.919	1626.59	-1.7	-2	0	0	0	0	-0.63	-0.35
21007+00.00	1626.378	1626.84	1626.51	1626.578	1626.84	1626.51	1.6	-0.8	0	0	0.05	0	0.17	0
21008+00.00	1626.209	1626.738	1626.4	1626.389	1626.738	1626.4	2.3	0.1	6.6	0	0.74	0	2.74	0
21009+00.00	1626.003	1626.505	1626.17	1626.156	1626.505	1626.17	2	0.2	8.3	2.3	0.78	0.02	5.28	0.07
21010+00.00	1625.617	1626.062	1625.73	1625.674	1626.062	1625.73	1.4	0.7	7.7	2.3	0.49	0.08	4.41	0.35
21011+00.00	1625.127	1625.616	1625.28	1625.243	1625.616	1625.28	1.8	0.4	6.2	4.1	0.53	0.07	3.54	0.52
21012+00.00	1624.672	1625.209	1624.88	1624.821	1625.209	1624.88	2.5	0.7	7.3	3.3	0.89	0.11	4.93	0.63
21013+00.00	1624.306	1624.865	1624.53	1624.489	1624.865	1624.53	2.7	0.5	8.3	4	1.09	0.09	6.88	0.69
21014+00.00	1624.031	1624.58	1624.25	1624.177	1624.58	1624.25	2.6	0.9	8.6	3.6	1.07	0.15	7.5	0.83
21015+00.00	1623.82	1624.306	1623.97	1623.877	1624.306	1623.97	1.8	1.1	8.4	4.7	0.7	0.24	6.15	1.35
21016+00.00	1623.685	1624.147	1623.81	1623.757	1624.147	1623.81	1.5	0.6	6.9	5.6	0.48	0.15	4.1	1.35
21017+00.00	1623.471	1623.945	1623.61	1623.63	1623.945	1623.61	1.7	-0.2	6.1	4.2	0.49	-0.04	3.37	0.38
21018+00.00	1623.13	1623.605	1623.27	1623.295	1623.605	1623.27	1.7	-0.3	6.4	0.4	0.51	-0.01	3.47	-0.17
21019+00.00	1622.875	1623.348	1623.01	1622.939	1623.348	1623.01	1.6	0.9	6.5	0	0.49	0.02	3.47	0.03
21020+00.00	1622.685	1623.17	1622.84	1622.72	1623.17	1622.84	1.9	1.4	6.4	4.9	0.58	0.33	3.72	1.22
21021+00.00	1622.5	1623.018	1622.68	1622.577	1623.018	1622.68	2.2	1.2	6.6	6.3	0.71	0.35	4.48	2.36
21022+00.00	1622.363	1622.832	1622.5	1622.426	1622.832	1622.5	1.6	0.9	7.4	6	0.55	0.24	4.38	2.05
21023+00.00	1622.217	1622.657	1622.32	1622.266	1622.657	1622.32	1.2	0.6	6.3	4.9	0.35	0.13	3.13	1.28
21024+00.00	1622.046	1622.495	1622.16	1622.065	1622.495	1622.16	1.4	1.1	5.6	4.1	0.37	0.21	2.5	1.18
21025+00.00	1622.03	1622.507	1622.17	1622.172	1622.507	1622.17	1.7	0	5.9	5.6	0.48	0	2.95	0.73
21026+00.00	1622.146	1622.578	1622.24	1622.294	1622.578	1622.24	1.1	-0.6	6.7	1.6	0.33	-0.04	2.81	-0.14
21027+00.00	1622.288	1622.777	1622.44	1622.369	1622.777	1622.44	1.8	0.9	5.5	0	0.48	0.02	2.81	-0.07
21028+00.00	1622.602	1623.079	1622.75	1622.672	1623.079	1622.75	1.8	0.9	7.1	4.8	0.6	0.2	3.75	0.76
21029+00.00	1623.047	1623.437	1623.1	1623.213	1623.437	1623.1	0.6	-1.4	6.5	4.9	0.17	-0.29	2.67	-0.31
21030+00.00	1623.386	1623.795	1623.46	1623.638	1623.795	1623.46	0.9	-2.1	3.9	1.6	0.16	-0.14	1.15	-1.49
21031+00.00	1623.849	1624.262	1623.93	1624.021	1624.262	1623.93	1	-1.1	4.6	0	0.21	0	1.28	-0.49
21032+00.00	1624.318	1624.725	1624.39	1624.427	1624.725	1624.39	0.9	-0.4	4.9	0	0.2	0	1.42	0
21033+00.00	1624.529	1624.958	1624.62	1624.699	1624.958	1624.62	1.1	-0.9	4.7	0.3	0.24	-0.01	1.53	-0.03
21034+00.00	1624.881	1625.238	1624.9	1625.029	1625.238	1624.9	0.2	-1.5	5.3	0	0.05	0	1.01	-0.03
21035+00.00	1624.91	1625.271	1624.94	1625.042	1625.271	1624.94	0.4	-1.2	2.7	0	0.05	0	0.35	0
21036+00.00	1624.601	1625.04	1624.71	1624.716	1625.04	1624.71	1.3	-0.1	2.8	0	0.19	0	0.83	0
21037+00.00	1624.337	1624.841	1624.51	1624.456	1624.841	1624.51	2.1	0.6	5.8	1	0.6	0.03	2.74	0.1
21038+00.00	1624.133	1624.567	1624.23	1624.16	1624.567	1624.23	1.2	0.8	7.5	3.9	0.41	0.14	3.51	0.59
21039+00.00	1623.914	1624.359	1624.03	1623.871	1624.359	1624.03	1.4	1.9	5.5	4.8	0.36	0.46	2.67	2.08
21040+00.00	1623.769	1624.197	1623.86	1623.745	1624.197	1623.86	1.1	1.4	5.8	7.4	0.29	0.47	2.26	3.23
21041+00.00	1623.539	1623.97	1623.64	1623.513	1623.97	1623.64	1.2	1.5	5.4	6.4	0.3	0.45	2.05	3.19
21042+00.00	1623.33	1623.75	1623.42	1623.271	1623.75	1623.42	1.1	1.8	5.4	6.4	0.27	0.55	1.98	3.47
21043+00.00	1623.036	1623.575	1623.24	1623.085	1623.575	1623.24	2.4	1.9	5.3	7	0.65	0.63	3.19	4.1
21044+00.00	1622.958	1623.536	1623.2	1623.137	1623.536	1623.2	2.9	0.8	8.6	7.3	1.21	0.26	6.46	3.09
21045+00.00	1622.961	1623.536	1623.2	1623.051	1623.536	1623.2	2.9	1.8	9.1	4.5	1.27	0.41	8.61	2.33
21046+00.00	1622.895	1623.462	1623.13	1622.993	1623.462	1623.13	2.8	1.6	9.1	7.2	1.23	0.53	8.68	3.26
21047+00.00	1622.717	1623.229	1622.9	1622.755	1623.229	1622.9	2.2	1.7	9.1	6.8	0.94	0.54	7.53	3.72
21048+00.00	1622.525	1623.055	1622.72	1622.649	1623.055	1622.72	2.3	0.9	7.9	6.9	0.87	0.28	6.28	2.85
21049+00.00	1622.485	1623.044	1622.71	1622.652	1623.044	1622.71	2.7	0.7	8.3	4.7	1.09	0.15	6.81	1.49
21050+00.00	1622.551	1623.104	1622.77	1622.674	1623.104	1622.77	2.6	1.2	8.9	4.2	1.11	0.24	7.64	1.35

Aggregate Base Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	11	15

OCL ND1	LT Existing	LT Proposed	LT Proposed - Pavement Bottom	RT Existing	RT Proposed	RT Proposed - Pavement Bottom	LT Elevation Difference	RT Elevation Difference	LT Width to Edge Pavement	RT Width to Edge Pavement	LT Aggregate Area	RT Aggregate Area	LT Aggregate Adjustment	RT Aggregate Adjustment
	A	B	C = B - 4"	D	E	F = E - 4"	G = C - A	H = F - D	I	J				
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	FT	FT	SF	SF	TON	TON
21051+00.00	1622.654	1623.167	1622.83	1622.697	1623.167	1622.83	2.1	1.6	8.8	5.5	0.86	0.42	6.84	2.29
21052+00.00	1622.598	1623.081	1622.75	1622.651	1623.081	1622.75	1.8	1.2	7.9	6.8	0.66	0.37	5.28	2.74
21053+00.00	1622.473	1623.01	1622.68	1622.559	1623.01	1622.68	2.5	1.5	7.1	5.7	0.87	0.4	5.31	2.67
21054+00.00	1622.496	1622.985	1622.65	1622.548	1622.985	1622.65	1.8	1.2	8.5	6.3	0.71	0.35	5.49	2.6
21055+00.00	1622.648	1622.931	1622.6	1622.477	1622.931	1622.6	-0.6	1.5	7.4	5.8	-0.19	0.41	1.81	2.64
21056+00.00	1622.376	1622.835	1622.5	1622.371	1622.835	1622.5	1.5	1.5	0	6.4	0.05	0.45	-0.49	2.99
21057+00.00	1622.38	1622.941	1622.61	1622.533	1622.941	1622.61	2.8	0.9	6.3	6.7	0.9	0.27	3.3	2.5
21058+00.00	1622.316	1622.872	1622.54	1622.417	1622.872	1622.54	2.7	1.5	8.5	4.9	1.11	0.35	6.98	2.15
21059+00.00	1622.711	1623.008	1622.67	1622.679	1623.008	1622.67	-0.5	-0.1	8.6	6.4	-0.18	-0.03	3.23	1.11
21060+00.00	1622.576	1622.962	1622.63	1622.616	1622.962	1622.63	0.6	0.2	0	1.3	0.01	0.01	-0.59	-0.07
21061+00.00	1622.274	1622.771	1622.44	1622.364	1622.771	1622.44	2	0.9	3.7	2.1	0.39	0.1	1.39	0.38
21062+00.00	1621.977	1622.555	1622.22	1622.176	1622.555	1622.22	2.9	0.5	7.1	4.8	1.03	0.11	4.93	0.73
21063+00.00	1621.875	1622.391	1622.06	1622.038	1622.391	1622.06	2.2	0.3	9.2	3.8	0.94	0.05	6.84	0.56
21064+00.00	1621.839	1622.349	1622.02	1622.008	1622.349	1622.02	2.2	0.1	7.5	2.5	0.79	0.01	6.01	0.21
21065+00.00	1621.807	1622.306	1621.97	1621.881	1622.306	1621.97	2	1.1	7.9	1.9	0.74	0.11	5.31	0.42
21066+00.00	1621.697	1622.131	1621.8	1621.754	1622.131	1621.8	1.2	0.6	7.5	5.5	0.41	0.15	3.99	0.9
21067+00.00	1621.35	1621.801	1621.47	1621.414	1621.801	1621.47	1.4	0.7	5.6	3.6	0.37	0.12	2.71	0.94
21068+00.00	1621.097	1621.559	1621.23	1621.173	1621.559	1621.23	1.6	0.7	6.1	4.1	0.46	0.13	2.88	0.87
21069+00.00	1620.832	1621.236	1620.9	1620.924	1621.236	1620.9	0.8	-0.3	6.6	4	0.23	-0.05	2.4	0.28
21070+00.00	1620.601	1620.984	1620.65	1620.623	1620.984	1620.65	0.6	0.3	4.7	0.2	0.13	0	1.25	-0.17
21071+00.00	1620.402	1620.828	1620.49	1620.459	1620.828	1620.49	1.1	0.4	3.7	2.9	0.19	0.05	1.11	0.17
21072+00.00	1620.391	1620.765	1620.43	1620.412	1620.765	1620.43	0.5	0.2	5.3	3.3	0.12	0.03	1.08	0.28
21073+00.00	1620.387	1620.749	1620.42	1620.411	1620.749	1620.42	0.4	0.1	3.2	2.5	0.06	0.01	0.63	0.14
21074+00.00	1620.479	1620.832	1620.5	1620.442	1620.832	1620.5	0.3	0.7	2.9	1.7	0.04	0.06	0.35	0.24
21075+00.00	1620.695	1620.937	1620.6	1620.626	1620.937	1620.6	-1.1	-0.3	2.5	4.1	-0.11	-0.05	-0.24	0.03
21076+00.00	1620.584	1620.998	1620.66	1620.694	1620.998	1620.66	0.9	-0.4	0	0.2	0.02	0	-0.31	-0.17
21077+00.00	1620.487	1620.967	1620.63	1620.622	1620.967	1620.63	1.7	0.1	5.1	0.2	0.42	0	1.53	0
21078+00.00	1620.437	1620.928	1620.59	1620.516	1620.928	1620.59	1.8	0.9	7.1	2	0.6	0.09	3.54	0.31
21079+00.00	1620.107	1620.524	1620.19	1620.139	1620.524	1620.19	1	0.6	7.4	4.8	0.33	0.13	3.23	0.76
21080+00.00	1619.634	1619.958	1619.62	1619.53	1619.958	1619.62	-0.2	1.1	5.2	3.8	-0.04	0.2	1.01	1.15
21081+00.00	1619.13	1619.368	1619.03	1618.969	1619.368	1619.03	-1.2	0.7	1	5.4	-0.05	0.17	-0.31	1.28
21082+00.00	1618.702	1618.912	1618.58	1618.593	1618.912	1618.58	-1.5	-0.2	0	4.3	0	-0.04	-0.17	0.45
21083+00.00	1618.176	1618.533	1618.2	1618.253	1618.533	1618.2	0.3	-0.6	0.3	3.2	0.01	-0.08	0.03	-0.42
21084+00.00	1617.554	1618.04	1617.71	1617.656	1618.04	1617.71	1.9	0.6	4.6	1.3	0.44	0.04	1.56	-0.14
21085+00.00	1617.199	1617.791	1617.46	1617.365	1617.791	1617.46	3.1	1.1	7.3	3.9	1.14	0.2	5.49	0.83
21086+00.00	1617.003	1617.567	1617.23	1617.189	1617.567	1617.23	2.7	0.5	9.4	5.5	1.21	0.12	8.16	1.11
21087+00.00	1616.908	1617.499	1617.17	1617.08	1617.499	1617.17	3.1	1.1	8.9	3.6	1.35	0.19	8.89	1.08
21088+00.00	1617.1	1617.594	1617.26	1617.166	1617.594	1617.26	1.9	1.1	9.5	5.2	0.83	0.26	7.57	1.56
21089+00.00	1616.956	1617.56	1617.23	1617.111	1617.56	1617.23	3.3	1.4	7.5	5.5	1.26	0.36	7.26	2.15
21090+00.00	1616.872	1617.362	1617.03	1616.944	1617.362	1617.03	1.9	1	9.8	6.2	0.85	0.28	7.33	2.22
21091+00.00	1616.685	1617.241	1616.91	1616.822	1617.241	1616.91	2.7	1.1	7.4	5.1	0.98	0.26	6.35	1.88
21092+00.00	1616.628	1617.166	1616.83	1616.761	1617.166	1616.83	2.4	0.8	8.9	5	1.01	0.18	6.91	1.53
21093+00.00	1616.552	1617.072	1616.74	1616.734	1617.072	1616.74	2.3	0.1	8.5	4.6	0.92	0.02	6.7	0.69
21094+00.00	1616.57	1617.05	1616.72	1616.74	1617.05	1616.72	1.8	-0.2	8.1	1.8	0.68	-0.02	5.56	0
21095+00.00	1616.628	1617.129	1616.8	1616.817	1617.129	1616.8	2.1	-0.2	7.2	0.3	0.72	0	4.86	-0.07
21096+00.00	1616.746	1617.199	1616.87	1616.935	1617.199	1616.87	1.5	-0.8	7.7	0.4	0.53	-0.01	4.34	-0.03
21097+00.00	1616.763	1617.219	1616.89	1616.912	1617.219	1616.89	1.5	-0.3	6.3	0	0.44	0	3.37	-0.03
21098+00.00	1616.639	1617.161	1616.83	1616.797	1617.161	1616.83	2.3	0.4	6.5	0.3	0.73	0.01	4.06	0.03
21099+00.00	1616.564	1617.106	1616.77	1616.799	1617.106	1616.77	2.5	-0.3	8.2	3	0.98	-0.04	5.94	-0.1
21100+00.00	1616.535	1617.096	1616.76	1617.042	1617.096	1616.76	2.7	-3.4	8.6	0.3	1.12	-0.04	7.29	-0.28
21101+00.00	1616.51	1617.084	1616.75	1616.871	1617.084	1616.75	2.9	-1.5	9	0	1.26	0	8.26	-0.14
21102+00.00	1616.406	1616.966	1616.63	1616.846	1616.966	1616.63	2.7	-2.6	9.1	0	1.18	0	8.47	0
21103+00.00	1616.296	1616.854	1616.52	1616.545	1616.854	1616.52	2.7	-0.3	8.9	15.9	1.15	-0.2	8.09	-0.69
21104+00.00	1616.187	1616.741	1616.41	1616.421	1616.741	1616.41	2.7	-0.1	8.9	0.3	1.15	0	7.99	-0.69
21105+00.00	1616.151	1616.634	1616.3	1616.4	1616.634	1616.3	1.8	-1.2	8.8	0.7	0.73	-0.04	6.53	-0.14
21106+00.00	1616.219	1616.649	1616.32	1616.586	1616.649	1616.32	1.2	-3.2	7.1	0	0.39	0	3.89	-0.14
21107+00.00	1616.076	1616.704	1616.37	1616.996	1617.104	1616.77	3.5	-2.7	5.6	0	1.07	0	5.07	0
21108+00.00	1615.92	1616.529	1616.2	1617.367	1617.663	1617.33	3.4	-0.4	10.1	0	1.67	0	9.51	0
21109+00.00	1615.847	1616.242	1615.91	1617.381	1617.813	1617.48	0.8	1.2	9.9	0	0.34	0.03	6.98	0.1
21110+00.00	1615.835	1616.24	1615.91	1617.426	1617.811	1617.48	0.9	0.6	4.7	5.7	0.19	0.15	1.84	0.63
21111+00.00	1615.88	1616.34	1616.01	1617.623	1617.906	1617.57	1.6	-0.6	5.1	4	0.39	-0.1	2.01	0.17

Aggregate Base Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	11	16

OCL ND1	LT Existing	LT Proposed	LT Proposed - Pavement Bottom	RT Existing	RT Proposed	RT Proposed - Pavement Bottom	LT Elevation Difference	RT Elevation Difference	LT Width to Edge Pavement	RT Width to Edge Pavement	LT Aggregate Area	RT Aggregate Area	LT Aggregate Adjustment	RT Aggregate Adjustment
	A	B	C = B - 4"	D	E	F = E - 4"	G = C - A	H = F - D	I	J				
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	FT	FT	SF	SF	TON	TON
21112+00.00	1616.047	1616.464	1616.13	1617.871	1618.022	1617.69	1	-2.2	6.5	0.5	0.29	-0.05	2.36	-0.52
21113+00.00	1616.247	1616.649	1616.32	1618.058	1618.216	1617.88	0.9	-2.1	5.1	0	0.21	0	1.74	-0.17
21114+00.00	1616.518	1616.968	1616.63	1618.374	1618.539	1618.21	1.3	-2	4.8	0	0.3	0	1.77	0
21115+00.00	1616.911	1617.357	1617.02	1618.758	1618.927	1618.59	1.3	-2	6.3	0	0.38	0	2.36	0
21116+00.00	1617.367	1617.783	1617.45	1619.232	1619.348	1619.01	1	-2.7	6.3	0	0.28	0	2.29	0
21117+00.00	1617.766	1618.321	1617.99	1619.611	1619.881	1619.55	2.7	-0.7	5.4	0	0.76	0	3.61	0
21118+00.00	1617.988	1618.499	1618.17	1619.896	1620.067	1619.73	2.2	-2	8.9	0	0.92	0	5.83	0
21119+00.00	1618.109	1618.59	1618.26	1620.029	1620.162	1619.83	1.8	-2.4	8.1	0	0.68	0	5.56	0
21120+00.00	1618.264	1618.788	1618.45	1620.155	1620.357	1620.02	2.2	-1.6	7.4	0	0.78	0	5.07	0
21121+00.00	1618.566	1618.982	1618.65	1620.335	1620.545	1620.21	1	-1.5	8.3	0	0.37	0	3.99	0
21122+00.00	1618.737	1619.422	1619.09	1620.389	1620.413	1620.08	4.2	-3.7	5.2	0	1.28	0	5.73	0
21123+00.00	1618.918	1619.524	1619.19	1619.874	1619.857	1619.52	3.3	-4.2	10.8	0	1.71	0	10.38	0
21124+00.00	1619.155	1619.505	1619.17	1619.451	1619.505	1619.17	0.2	-3.4	9.8	0	0.08	0	6.22	0
21125+00.00	1619.148	1619.556	1619.22	1619.289	1619.556	1619.22	0.9	-0.8	2.4	0	0.11	0	0.66	0
21126+00.00	1619.315	1619.686	1619.35	1619.457	1619.686	1619.35	0.4	-1.3	4.9	0	0.09	0	0.69	0
21127+00.00	1619.672	1619.876	1619.54	1619.64	1619.876	1619.54	-1.6	-1.2	3.3	0	-0.22	0	-0.45	0
21128+00.00	1620.034	1620.203	1619.87	1620.02	1620.203	1619.87	-2	-1.8	0	1.3	0	-0.1	-0.76	-0.35
21129+00.00	1620.521	1620.553	1620.22	1619.937	1620.368	1620.03	-3.6	1.1	0	0.2	0	0.03	0	-0.24
21130+00.00	1621.02	1621.18	1620.85	1619.833	1620.443	1620.11	-2	3.3	0	5.7	0	1.01	0	3.61
21131+00.00	1621.244	1621.491	1621.16	1619.61	1619.92	1619.59	-1	-0.2	0	9.6	0	-0.08	0	3.23
21132+00.00	1621.249	1621.38	1621.05	1619.463	1619.813	1619.48	-2.4	0.2	0.2	0.9	-0.02	0.01	-0.07	-0.24
21133+00.00	1621.238	1621.317	1620.98	1619.365	1619.758	1619.42	-3.1	0.7	0	2.7	0	0.09	-0.07	0.35
21134+00.00	1621.021	1621.139	1620.81	1619.219	1619.573	1619.24	-2.5	0.3	0	4.2	0	0.05	0	0.49
21135+00.00	1620.859	1621.004	1620.67	1619.085	1619.433	1619.1	-2.3	0.2	0	2.9	0	0.03	0	0.28
21136+00.00	1620.691	1620.916	1620.58	1619.04	1619.346	1619.01	-1.3	-0.4	0	2.8	0	-0.05	0	-0.07
21137+00.00	1619.938	1620.698	1620.36	1619.12	1619.134	1618.8	5.1	-3.8	0	0.6	0.54	-0.1	1.88	-0.52
21138+00.00	1619.972	1620.323	1619.99	1618.552	1618.761	1618.43	0.2	-1.5	11.8	13.3	0.1	-0.83	2.22	-3.23
21139+00.00	1619.735	1619.879	1619.55	1617.982	1618.309	1617.98	-2.2	0	2.8	0	-0.26	0	-0.56	-2.88
21140+00.00	1619.232	1619.378	1619.04	1617.53	1617.806	1617.47	-2.3	-0.7	0	1.7	0	-0.05	-0.9	-0.17
21141+00.00	1618.608	1618.771	1618.44	1616.923	1617.204	1616.87	-2	-0.6	0	0	0	0	0	-0.17
21142+00.00	1617.948	1618.193	1617.86	1616.299	1616.636	1616.3	-1.1	0	0	0	0	0	0	0
21143+00.00	1617.34	1617.685	1617.35	1615.763	1616.118	1615.78	0.1	0.2	0	1.7	0	0.02	0	0.07
21144+00.00	1616.526	1617.043	1616.71	1615.283	1615.714	1615.38	2.2	1.2	2.1	2.9	0.29	0.18	1.01	0.69
21145+00.00	1615.451	1615.85	1615.52	1614.73	1615.355	1615.02	0.8	3.5	7.8	5.9	0.27	1.12	1.94	4.51
21146+00.00	1614.726	1614.937	1614.6	1614.469	1614.937	1614.6	-1.5	1.6	4.4	10.1	-0.28	0.73	-0.03	6.42
21147+00.00	1614.418	1614.735	1614.4	1614.391	1614.735	1614.4	-0.2	0.1	0	6.8	0	0.03	-0.97	2.64
21148+00.00	1614.242	1614.574	1614.24	1614.244	1614.574	1614.24	0	0	0.7	1.7	0	0	0	0.1
21149+00.00	1614.258	1614.577	1614.24	1614.233	1614.577	1614.24	-0.2	0.1	1.4	1.4	-0.01	0.01	-0.03	0.03
21150+00.00	1614.37	1614.697	1614.36	1614.363	1614.697	1614.36	-0.1	0	0.8	2	0	0	-0.03	0.03
21151+00.00	1614.462	1614.799	1614.47	1614.46	1614.799	1614.47	0.1	0.1	1.1	1.5	0	0.01	0	0.03
21152+00.00	1614.613	1614.897	1614.56	1614.556	1614.897	1614.56	-0.6	0	1.7	1.8	-0.04	0	-0.14	0.03
21153+00.00	1614.763	1615.067	1614.73	1614.73	1615.067	1614.73	-0.4	0	0	1.9	0	0	-0.14	0
21154+00.00	1615.082	1615.399	1615.07	1615.093	1615.399	1615.07	-0.1	-0.3	0	1.7	0	-0.02	0	-0.07
21155+00.00	1615.607	1615.963	1615.63	1615.675	1615.963	1615.63	0.3	-0.5	0.6	0.3	0.01	-0.01	0.03	-0.1
21156+00.00	1616.235	1616.653	1616.32	1616.335	1616.653	1616.32	1	-0.2	2.6	0	0.13	0	0.49	-0.03
21157+00.00	1617.028	1617.476	1617.14	1617.138	1617.476	1617.14	1.3	0	5.2	0.6	0.32	0	1.56	0
21158+00.00	1618.197	1618.656	1618.32	1618.34	1618.656	1618.32	1.5	-0.2	6	1.7	0.42	-0.01	2.57	-0.03
21159+00.00	1619.457	1620.152	1619.82	1619.846	1620.152	1619.82	4.4	-0.3	6.4	0.5	1.58	-0.01	6.94	-0.07
21160+00.00	1621.307	1621.777	1621.44	1621.479	1621.777	1621.44	1.6	-0.5	10.7	0	0.77	0	8.16	-0.03
21161+00.00	1623.167	1623.628	1623.29	1623.318	1623.628	1623.29	1.5	-0.3	6.7	0	0.47	0	4.31	0
21162+00.00	1624.909	1625.333	1625	1625.027	1625.333	1625	1.1	-0.3	6.6	0.3	0.33	0	2.78	0
21163+00.00	1626.299	1626.663	1626.33	1626.389	1626.663	1626.33	0.4	-0.7	5.4	0.3	0.09	-0.01	1.46	-0.03
21164+00.00	1627.342	1627.756	1627.42	1627.5	1627.756	1627.42	0.9	-1	3	0	0.13	0	0.76	-0.03
21165+00.00	1628.195	1628.611	1628.28	1628.271	1628.611	1628.28	1	0.1	5.1	0	0.23	0	1.25	0
21166+00.00	1628.751	1629.19	1628.86	1628.819	1629.19	1628.86	1.3	0.5	5.1	1.8	0.31	0.04	1.88	0.14
21167+00.00	1629.089	1629.454	1629.12	1629.07	1629.454	1629.12	0.4	0.6	5.9	3.3	0.1	0.09	1.42	0.45
21168+00.00	1629.152	1629.513	1629.18	1629.143	1629.513	1629.18	0.3	0.4	3.1	3.7	0.04	0.07	0.49	0.56
21169+00.00	1629.018	1629.474	1629.14	1629.111	1629.474	1629.14	1.5	0.3	2.9	3.3	0.23	0.04	0.94	0.38
21170+00.00	1628.959	1629.358	1629.02	1629.038	1629.358	1629.02	0.7	-0.2	6	2.7	0.19	-0.02	1.46	0.07
21171+00.00	1628.743	1629.21	1628.88	1628.887	1629.21	1628.88	1.6	-0.1	4.2	0	0.33	0	1.81	-0.07
21172+00.00	1628.718	1629.068	1628.73	1628.75	1629.068	1628.73	0.1	-0.2	6.1	0.6	0.03	-0.01	1.25	-0.03

Aggregate Base Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	11	17

OCL ND1	LT Existing	LT Proposed	LT Proposed - Pavement Bottom	RT Existing	RT Proposed	RT Proposed - Pavement Bottom	LT Elevation Difference	RT Elevation Difference	LT Width to Edge Pavement	RT Width to Edge Pavement	LT Aggregate Area	RT Aggregate Area	LT Aggregate Adjustment	RT Aggregate Adjustment
	A	B	C = B - 4"	D	E	F = E - 4"	G = C - A	H = F - D	I	J				
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	FT	FT	SF	SF	TON	TON
21173+00.00	1628.872	1629.029	1628.7	1628.648	1629.029	1628.7	-2.1	0.6	2.2	0.8	-0.19	0.03	-0.56	0.07
21174+00.00	1628.408	1628.814	1628.48	1628.343	1628.814	1628.48	0.9	1.6	0	3.8	0.02	0.31	-0.59	1.18
21175+00.00	1628.185	1628.402	1628.07	1628.002	1628.402	1628.07	-1.4	0.8	4.7	6.9	-0.27	0.24	-0.87	1.91
21176+00.00	1627.746	1627.994	1627.66	1627.703	1627.994	1627.66	-1	-0.5	0	4.4	0	-0.09	-0.94	0.52
21177+00.00	1627.137	1627.497	1627.16	1627.207	1627.497	1627.16	0.3	-0.6	1.3	0	0.02	0	0.07	-0.31
21178+00.00	1626.659	1627.061	1626.73	1626.745	1627.061	1626.73	0.9	-0.2	2.8	0	0.12	0	0.49	0
21179+00.00	1626.137	1626.535	1626.2	1626.218	1626.535	1626.2	0.8	-0.2	4.6	0.6	0.17	-0.01	1.01	-0.03
21180+00.00	1625.605	1626.055	1625.72	1625.714	1626.055	1625.72	1.4	0.1	4.4	0.7	0.3	0	1.63	-0.03
21181+00.00	1625.401	1625.563	1625.23	1625.258	1625.563	1625.23	-2.1	-0.3	6.2	1.8	-0.54	-0.02	-0.83	-0.07
21182+00.00	1624.802	1625.083	1624.75	1624.767	1625.083	1624.75	-0.6	-0.2	0	0	0	0	-1.88	-0.07
21183+00.00	1624.499	1624.718	1624.38	1624.455	1624.718	1624.38	-1.4	-0.9	0	0.6	0	-0.02	0	-0.07
21184+00.00	1624.181	1624.388	1624.05	1624.119	1624.388	1624.05	-1.6	-0.8	0.2	0	-0.01	0	-0.03	-0.07
21185+00.00	1624.134	1624.154	1623.82	1624.042	1624.154	1623.82	-3.8	-2.7	0.7	0	-0.11	0	-0.42	0
21186+00.00	1623.625	1623.936	1623.6	1623.695	1623.936	1623.6	-0.3	-1.1	0	0	0	0	-0.38	0
21187+00.00	1623.269	1623.665	1623.33	1623.289	1623.665	1623.33	0.7	0.5	2.4	0	0.08	0.01	0.28	0.03
21188+00.00	1623.168	1623.598	1623.26	1623.169	1623.598	1623.26	1.1	1.1	4.4	3.4	0.23	0.18	1.08	0.66
21189+00.00	1623.006	1623.443	1623.11	1622.923	1623.443	1623.11	1.2	2.2	5.6	5.5	0.31	0.61	1.88	2.74
21190+00.00	1623.001	1623.161	1622.83	1622.993	1623.161	1622.83	-2.1	-2	5.9	8.1	-0.52	-0.68	-0.73	-0.24
21191+00.00	1622.431	1622.878	1622.54	1622.567	1622.878	1622.54	1.3	-0.3	0	0	0.04	0	-1.67	-2.36
21192+00.00	1622.099	1622.53	1622.2	1622.16	1622.53	1622.2	1.2	0.5	6.2	0.1	0.34	0.01	1.32	0.03
21193+00.00	1622.162	1622.574	1622.24	1622.238	1622.574	1622.24	0.9	0	5.4	3.3	0.22	0	1.94	0.03
21194+00.00	1622.47	1622.773	1622.44	1622.455	1622.773	1622.44	-0.4	-0.2	4.8	1.6	-0.08	-0.01	0.49	-0.03
21195+00.00	1622.6	1622.873	1622.54	1622.697	1622.873	1622.54	-0.7	-1.9	0	0.6	0	-0.05	-0.28	-0.21
21196+00.00	1622.685	1623.015	1622.68	1622.694	1623.015	1622.68	-0.1	-0.2	0	0	0	0	0	-0.17
21197+00.00	1622.867	1623.169	1622.84	1622.764	1623.169	1622.84	-0.3	0.9	1.3	0.8	-0.02	0.05	-0.07	0.17
21198+00.00	1623.121	1623.415	1623.08	1623.023	1623.415	1623.08	-0.5	0.7	0	4.8	0	0.15	-0.07	0.69
21199+00.00	1623.615	1623.887	1623.55	1623.496	1623.887	1623.55	-0.8	0.6	0	4.2	0	0.11	0	0.9
21200+00.00	1624.244	1624.599	1624.27	1624.201	1624.599	1624.27	0.3	0.8	0	4.2	0	0.15	0	0.9
21201+00.00	1625.112	1625.5	1625.17	1625.104	1625.5	1625.17	0.7	0.8	2.4	4.5	0.08	0.16	0.28	1.08
21202+00.00	1626.245	1626.633	1626.3	1626.241	1626.633	1626.3	0.7	0.7	3.8	4.4	0.12	0.14	0.69	1.04
21203+00.00	1627.463	1627.86	1627.53	1627.457	1627.86	1627.53	0.8	0.9	3.8	4.3	0.14	0.18	0.9	1.11
21204+00.00	1628.761	1629.147	1628.81	1628.733	1629.147	1628.81	0.6	0.9	4.3	4.6	0.12	0.19	0.9	1.28
21205+00.00	1630.093	1630.477	1630.14	1630.051	1630.477	1630.14	0.6	1.1	4	5	0.11	0.25	0.8	1.53
21206+00.00	1631.36	1631.773	1631.44	1631.341	1631.773	1631.44	1	1.2	3.9	5.4	0.18	0.3	1.01	1.91
21207+00.00	1632.455	1632.833	1632.5	1632.413	1632.833	1632.5	0.5	1	5	5.6	0.11	0.25	1.01	1.91
21208+00.00	1633.312	1633.636	1633.3	1633.218	1633.636	1633.3	-0.1	1	3.6	5.2	-0.02	0.24	0.31	1.7
21209+00.00	1634.073	1634.36	1634.03	1633.934	1634.36	1634.03	-0.5	1.2	1	5	-0.02	0.28	-0.14	1.81
21210+00.00	1634.867	1635.057	1634.72	1634.688	1635.057	1634.72	-1.8	0.4	0	5.2	0	0.09	-0.07	1.28
21211+00.00	1635.507	1635.677	1635.34	1635.346	1635.677	1635.34	-2	-0.1	0	3.1	0	-0.01	0	0.28
21212+00.00	1635.982	1636.209	1635.88	1635.843	1636.209	1635.88	-1.2	0.4	0	1.4	0	0.03	0	0.07
21213+00.00	1636.459	1636.693	1636.36	1636.296	1636.693	1636.36	-1.2	0.8	0	3	0	0.11	0	0.49
21214+00.00	1636.873	1636.994	1636.66	1636.628	1636.994	1636.66	-2.6	0.4	0	4.3	0	0.08	0	0.66
21215+00.00	1636.879	1637.087	1636.75	1636.746	1637.087	1636.75	-1.5	0	0	3	0	0	0	0.28
21216+00.00	1636.679	1636.695	1636.36	1636.335	1636.695	1636.36	-3.8	0.3	0	1.9	0	0.03	0	0.1
21217+00.00	1635.789	1636.022	1635.69	1635.628	1636.022	1635.69	-1.2	0.7	0	2.6	0	0.09	0	0.42
21218+00.00	1634.918	1635.138	1634.8	1634.721	1635.138	1634.8	-1.4	0.9	0	4.3	0	0.18	0	0.94
21219+00.00	1633.951	1634.062	1633.73	1633.644	1634.062	1633.73	-2.7	1	0	5.1	0	0.23	0	1.42
21220+00.00	1632.701	1632.835	1632.5	1632.476	1632.835	1632.5	-2.4	0.3	0	5.2	0	0.07	0	1.04
21221+00.00	1631.292	1631.588	1631.25	1631.543	1631.588	1631.25	-0.5	-3.5	0	2.8	0	-0.41	0	-1.18
21222+00.00	1630.293	1630.394	1630.06	1630.084	1630.394	1630.06	-2.8	-0.3	0	14.7	0	-0.18	0	-2.05
21223+00.00	1628.945	1629.27	1628.94	1628.815	1629.27	1628.94	-0.1	1.5	0	0	0	0.05	0	-0.45
21224+00.00	1627.929	1628.241	1627.91	1627.797	1628.241	1627.91	-0.2	1.4	1	6.4	-0.01	0.41	-0.03	1.6
21225+00.00	1627.087	1627.416	1627.08	1626.972	1627.416	1627.08	-0.1	1.3	0.2	6.1	0	0.37	-0.03	2.71
21226+00.00	1626.48	1626.796	1626.46	1626.39	1626.796	1626.46	-0.2	0.8	1.2	6.1	-0.01	0.22	-0.03	2.05
21227+00.00	1626.156	1626.484	1626.15	1626.103	1626.484	1626.15	-0.1	0.6	0.5	4.8	0	0.13	-0.03	1.22
21228+00.00	1625.924	1626.355	1626.02	1625.933	1626.355	1626.02	1.2	1	1.3	3.8	0.1	0.18	0.35	1.08
21229+00.00	1625.93	1626.284	1625.95	1625.868	1626.284	1625.95	0.2	1	5.6	5.3	0.05	0.24	0.52	1.46
21230+00.00	1625.902	1626.301	1625.97	1625.833	1626.301	1625.97	0.8	1.6	2.5	5.1	0.1	0.39	0.52	2.19
21231+00.00	1626.074	1626.367	1626.03	1625.917	1626.367	1626.03	-0.5	1.4	4.4	6.8	-0.09	0.44	0.03	2.88
21232+00.00	1625.995	1626.315	1625.98	1625.95	1626.315	1625.98	-0.2	0.4	0	6.3	0	0.11	-0.31	1.91
21233+00.00	1625.894	1626.226	1625.89	1625.818	1626.226	1625.89	0	0.9	0.7	3	0	0.13	0	0.83

Aggregate Base Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	11	18

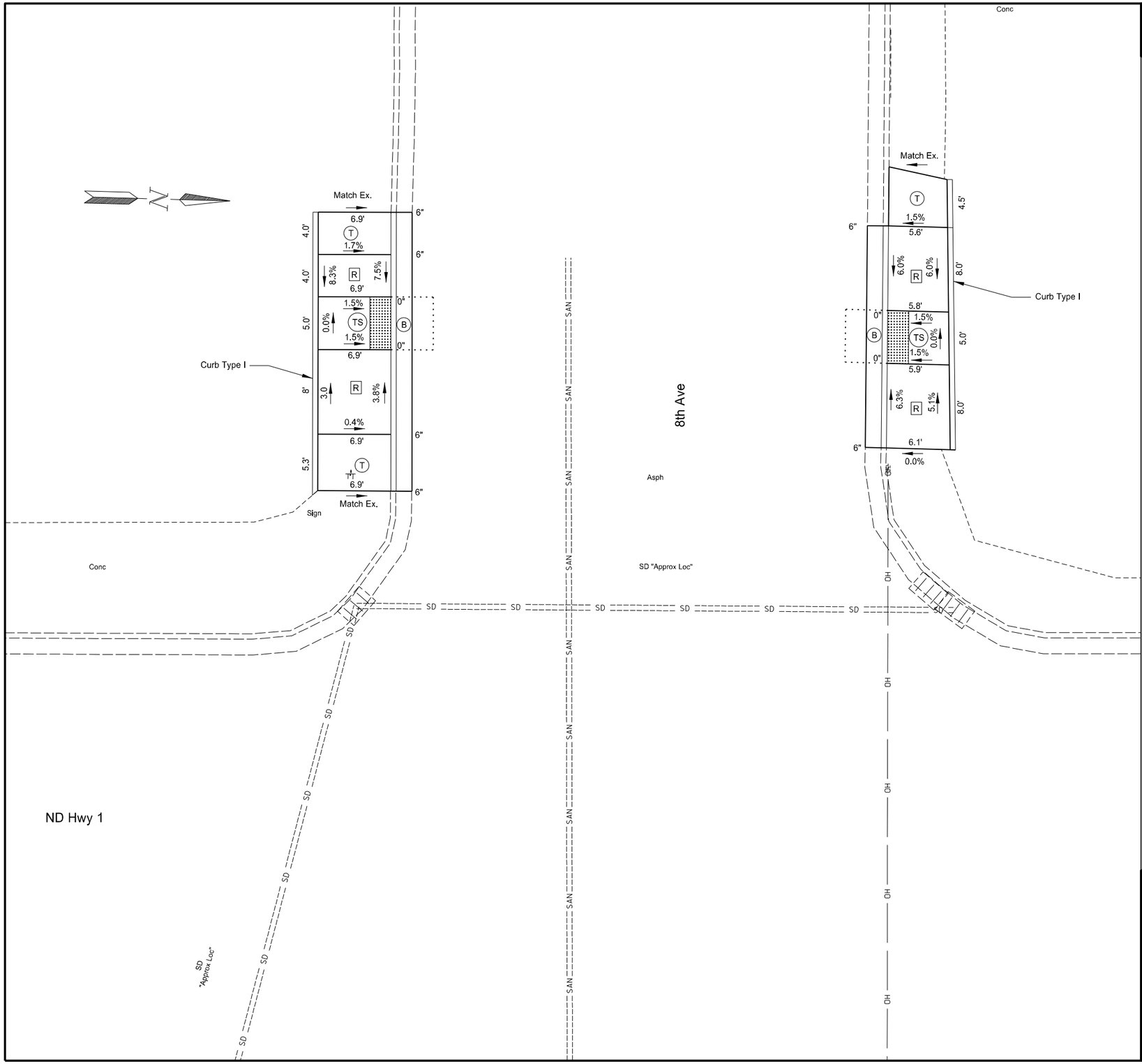
OCL ND1	LT Existing	LT Proposed	LT Proposed - Pavement Bottom	RT Existing	RT Proposed	RT Proposed - Pavement Bottom	LT Elevation Difference	RT Elevation Difference	LT Width to Edge Pavement	RT Width to Edge Pavement	LT Aggregate Area	RT Aggregate Area	LT Aggregate Adjustment	RT Aggregate Adjustment
	A	B	C = B - 4"	D	E	F = E - 4"	G = C - A	H = F - D	I	J				
Station	Elevation	Elevation	Elevation	Elevation	Elevation	Elevation	Inches	Inches	FT	FT	SF	SF	TON	TON
21234+00.00	1625.841	1626.14	1625.81	1625.704	1626.14	1625.81	-0.4	1.3	1.4	4.9	-0.02	0.3	-0.07	1.49
21235+00.00	1625.818	1626.14	1625.81	1625.693	1626.14	1625.81	-0.1	1.4	0	5.7	0	0.37	-0.07	2.33
21236+00.00	1625.708	1626.07	1625.74	1625.726	1626.07	1625.74	0.4	0.2	0.8	6.2	0.02	0.05	0.07	1.46
21237+00.00	1625.665	1626.031	1625.7	1625.768	1626.031	1625.7	0.4	-0.8	2.9	2	0.05	-0.07	0.24	-0.07
21238+00.00	1625.637	1625.998	1625.66	1625.628	1625.998	1625.66	0.3	0.4	3.1	0	0.04	0	0.31	-0.24
21239+00.00	1625.589	1625.904	1625.57	1625.475	1625.904	1625.57	-0.2	1.1	2.9	3.2	-0.02	0.17	0.07	0.59
21240+00.00	1625.672	1625.724	1625.39	1625.723	1625.724	1625.39	-3.4	-4	0.4	5.4	-0.06	-0.9	-0.28	-2.53
21241+00.00	1625.031	1625.418	1625.08	1625.11	1625.418	1625.08	0.6	-0.4	0	0	0.01	0	-0.17	-3.13
21242+00.00	1624.59	1624.224	1623.89	1624.637	1624.224	1623.89	-8.4	-9	4	0	-1.4	0	-4.83	0
21243+00.00	1624.563	1624.422	1624.09	1624.428	1624.422	1624.09	-5.7	-4.1	0	0	0	0	-4.86	0
21244+00.00	1623.897	1623.593	1623.26	1624.042	1623.593	1623.26	-7.6	-9.4	0	11.8	0	-4.62	0	-16.04
21245+00.00	1623.543	1623.164	1622.83	1623.563	1623.164	1622.83	-8.6	-8.8	0	0	0	0	0	-16.04
21246+00.00	1623.184	1622.783	1622.45	1623.185	1622.783	1622.45	-8.8	-8.8	0	0	0	0	0	0
21247+00.00	1622.53	1622.165	1621.83	1622.583	1622.165	1621.83	-8.4	-9	0	0	0	0	0	0
21248+00.00	1622.054	1621.678	1621.34	1622.082	1621.678	1621.34	-8.6	-8.9	0	0	0	0	0	0
21249+00.00	1621.605	1621.217	1620.88	1621.604	1621.217	1620.88	-8.7	-8.7	0	0	0	0	0	0
21250+00.00	1621.101	1620.719	1620.39	1621.118	1620.719	1620.39	-8.5	-8.7	0	0	0	0	0	0
21251+00.00	1620.632	1620.425	1620.09	1620.672	1620.425	1620.09	-6.5	-7	0	0	0	0	0	0
21252+00.00	1620.081	1619.817	1619.48	1620.114	1619.817	1619.48	-7.2	-7.6	0	0	0	0	0	0
21253+00.00	1619.575	1619.192	1618.86	1619.589	1619.192	1618.86	-8.6	-8.7	0	0	0	0	0	0
21254+00.00	1619.036	1618.633	1618.3	1619.008	1618.633	1618.3	-8.8	-8.5	0	0	0	0	0	0
21255+00.00	1618.413	1618.019	1617.69	1618.403	1618.019	1617.69	-8.7	-8.6	0	0	0	0	0	0
21256+00.00	1617.777	1617.653	1617.32	1617.927	1617.653	1617.32	-5.5	-7.3	0	0	0	0	0	0
21257+00.00	1617.209	1616.866	1616.53	1617.237	1616.866	1616.53	-8.1	-8.5	0	0	0	0	0	0
21258+00.00	1616.44	1616.093	1615.76	1616.517	1616.093	1615.76	-8.2	-9.1	0	0	0	0	0	0
21259+00.00	1615.525	1615.372	1615.04	1615.983	1615.372	1615.04	-5.8	-11.3	0	0	0	0	0	0
21260+00.00	1615.05	1614.814	1614.48	1615.35	1614.814	1614.48	-6.8	-10.4	0	0	0	0	0	0
21261+00.00	1614.657	1614.426	1614.09	1614.736	1614.426	1614.09	-6.8	-7.8	0	0	0	0	0	0
								302 0120 Aggregate Base Course Cl 5 Subtotal					1635.73	959.48
								302 0120 Aggregate Base Course Cl 5 Total					2595.21	

Aggregate Base Tables

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	20	1

: Detectable Warning Panel

: Pedestrian Access Route

: 4' long x width of Existing Pedestrian Facility (EPF) or
4' minimum Clear space outside the traffic lanes of travel
1.5% preferred cross slope
2% maximum cross slope
4.7% preferred running and counter slope
5% maximum running and counter slope

(TS) : Turning Space
Use at top of ramp or when changing directions
1.5% preferred slope (2% maximum) all directions.

[R] : Preferred Ramp Grade + 5% to 7.5%.
Maximum Constructed Grade = 8.3%.
Preferred Cross Slope = 1.5%.
Maximum Constructed Slope = 2%.

(B) : 1.5% preferred cross slope
2% maximum constructed cross slope
running slope consistent with the EPF
4.7% preferred max counter slope
5.0% max constructed counter slope

(T) : Transition Panel to EPF

0", 3", or 6": Curb Height

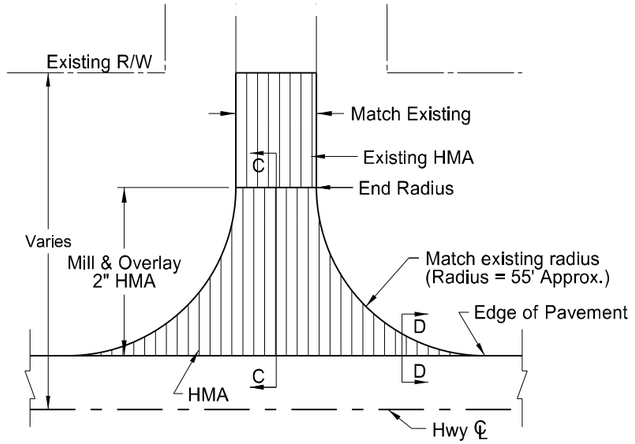
Curb Ramp Details

Structural Improvement
ND Hwy 1

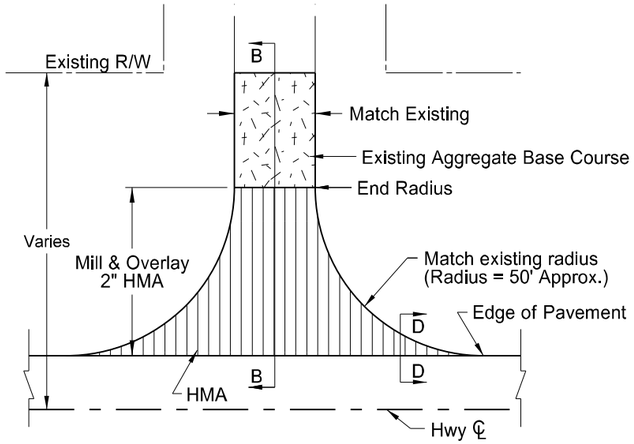
Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

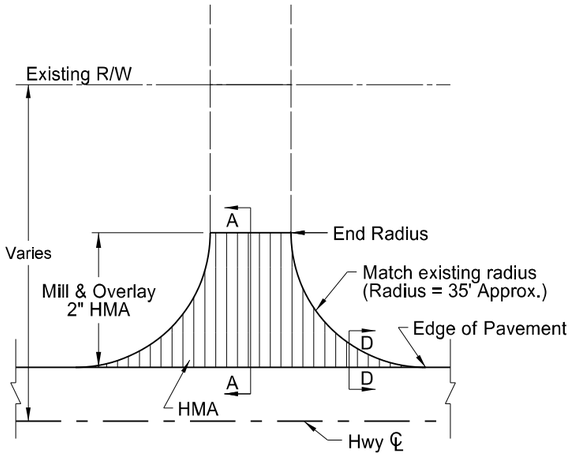
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	20	2



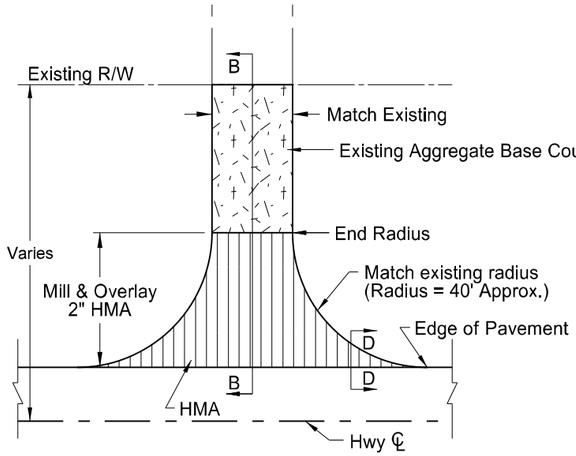
(1) Paved Section Line, County Road, or Street Approach



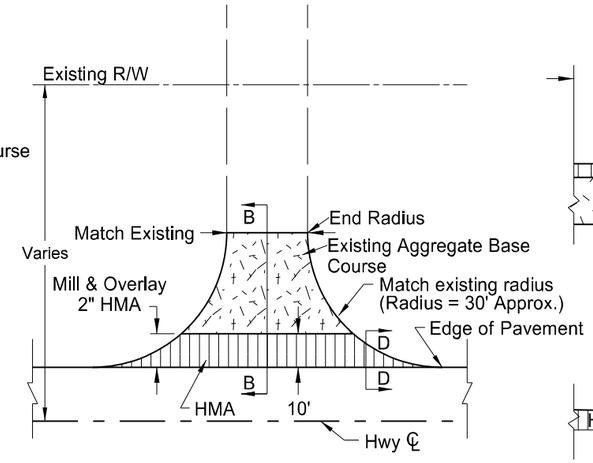
(2) Gravel Section Line, County Road, or Street Approach



(3) Paved Private Drive Approach



(4) Gravel Private Drive Approach

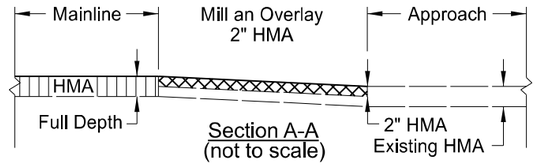


(5) Field Drive Approach

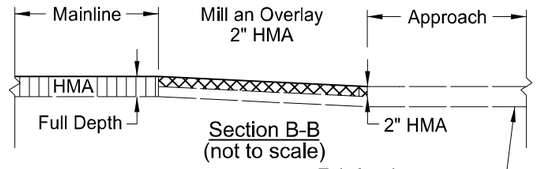
Basis of Estimate				(1) Paved Road		(2) Gravel Road		(3) Paved Private Drive		(4) Gravel Private Drive		(5) Field Drive		Total
Number of Locations				2		14		2		25		41		
Spec	Code	Description	Unit	Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	
306	0510	10" Full Depth Reclamation	SY	1957	978.6	-	-	-	-	-	-	-	-	1957
320	0500	8" Asphalt Emulsified Stabilized Base Course	SY	1957	978.6	-	-	-	-	-	-	-	-	1957
320	0510	Asphalt Emulsion	Ton	30	15.2	-	-	-	-	-	-	-	-	30
401	0050	Tack Coat @ 0.05 Gal/SY	Gal	196	97.9	279	19.9	25	12.6	335	13.4	236	5.8	1071
401	0070	Fog Coat @0.12 Gal/SY	Gal	235	117.4	334.3	23.9	30	15.1	403	16.1	283	6.9	1285
430	0042	Superpave FAA 42 @ 2 Ton/CY	Ton	441	220.5	321	25.6	30	14.9	390	15.6	275	6.7	1457
430	5803	PG 58S-34 Asphalt Cement @ 6.0% (both lifts)	Ton	26	13.2	19	1.5	2	0.9	23	0.9	17	0.4	87

Notes:

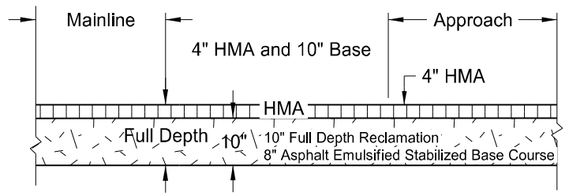
1. Actual HMA paving and aggregate base course locations may vary in the field, as approved by the Engineer.
2. Quantity totals have been included in the bid items of the "Estimate of Quantities" of the plans.
3. Aggregate base course has been provided in the quantities to fill in around the radii. This material will be required when sloughs are steeper than 4:1 (see section D-D)



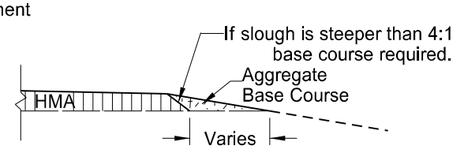
Section A-A
(not to scale)



Section B-B
(not to scale)



Section C-C
(not to scale)



Section D-D
(not to scale)

Approach Paving Details
for Existing Rural Approaches
(No Approach Grading)

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

8/14/2025 1:11:56 PM JButler H:\Projects\14000\14451\3001201.031\Design\Plan\020GD_002_DApproach_Existing.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	20	3

Approach Description	
Station	Type of Approach
20678+97 LT	Field Drive
20679+02 RT	Field Drive
20703+23 LT	Field Drive with 24" CSP
20703+45 RT	Field Drive with 18" CSP (outside 60')
20709+45 RT	Gravel Private Drive with 24" CSP (outside 60')
20711+67 LT	Field Drive
20712+26 RT	Gravel Section Line (82nd St NE)
20724+35 RT	Field Drive
20732+35 LT	Field Drive
20759+14 RT	Gravel Private Drive with 24" CSP (outside 60')
20759+16 LT	Gravel Private Drive with 24" CSP (outside 60')
20765+23 RT	Gravel Private Drive with 24" CSP (outside 60')
20765+23 LT	Gravel Section Line (83rd St NE) with 24" CSP (outside 60')
20787+06 LT	Field Drive with 24" CSP (outside 60')
20795+60 LT	Field Drive
20795+61 RT	Field Drive with 18" CSP
20799+45 RT	Field Drive
20805+90 RT	Field Drive
20822+09 RT	Field Drive
20834+78 RT	Gravel Private Drive with 24" CSP (outside 60')
20844+67 RT	Gravel Private Drive
20844+89 LT	Field Drive
20857+72 LT	Gravel Private Drive with 18" CSP (outside 60')
20871+28 RT	Field Drive with 24" CSP (outside 60')
20871+27 LT	Field Drive with 24" CSP (outside 60')
20897+52 RT	Gravel Private Drive
20898+08 RT	Field Drive with 18" CSP (outside 60')
20924+02 LT	Gravel Section Line (86th St NE) with 18" CSP (outside 60')
20924+05 RT	Gravel Section Line (86th St NE) with 30" CSP (outside 60')
20950+31 RT	Field Drive
20950+38 LT	Field Drive
20976+87 RT	Gravel Section Line (87th St NE) with 24" CSP (outside 60')
20976+88 LT	Gravel Section Line (87th St NE) with 24" CSP (outside 60')
20982+01 LT	Gravel Private Drive with 18" CSP (outside 60')
21005+52 RT	Field Drive
21005+68 LT	Field Drive
21029+58 RT	Gravel Section Line (88th St NE) with 18" CSP (outside 60')

Approach Description	
Station	Type of Approach
21029+59 LT	Field Drive with 18" CSP (outside 60')
21043+89 RT	Field Drive
21055+50 LT	Field Drive with 24" CSP (outside 60')
21059+35 LT	Gravel Private Drive with 24" CSP (outside 60')
21059+41 RT	Field Drive with 18" CSP (outside 60')
21075+68 LT	Field Drive
21082+51 RT	Gravel Section Line (89th St NE) with 24" CSP (outside 60')
21082+55 LT	Gravel Section Line (89th St NE) with 24" CSP (outside 60')
21088+73 LT	Field Drive
21100+30 RT	Field Drive with 24" CSP (outside 60')
21101+92 RT	Field Drive with 24" CSP (outside 60')
21127+60 LT	Field Drive
21127+62 RT	Gravel Private Drive
21137+04 RT	Gravel Private Drive
21137+27 LT	Gravel Section Line (90th St NE)
21158+76 LT	Field Drive with 24" CSP (outside 60')
21169+11 LT	Gravel Private Drive
21172+87 LT	Gravel Private Drive
21175+55 LT	Gravel Private Drive with 18" CSP (outside 60')
21181+50 LT	Gravel Private Drive with 18" CSP (outside 60')
21183+50 LT	Gravel Private Drive with 18" CSP (outside 60')
21185+43 RT	Field Drive with 24" CSP (outside 60')
21185+45 LT	Gravel Private Drive with 24" CSP (outside 60')
21190+10 RT	Gravel Section Line (91st St NE) with 24" CSP (outside 60')
21190+11 LT	Gravel Section Line (91st St NE) with 24" CSP (outside 60')
21194+60 RT	Field Drive with 18" CSP (outside 60')
21194+69 LT	Field Drive with 18" CSP (outside 60')
21211+60 LT	Gravel Private Drive with 24" CSP (outside 60')
21214+22 LT	Field Drive with 12" CSP (outside 60')
21215+99.30	Paved Private Drive
21219+70 LT	Gravel Private Drive with 18" CSP (outside 60')
21220+96 RT	Field Drive with 18" CSP (outside 60')
21222+07 LT	Field Drive with 18" CSP (outside 60')
21227+16 LT	Gravel Private Drive with 18" CSP (outside 60')
21236+60 RT	Field Drive with 18" CSP (outside 60')
21239+94 LT	Gravel Private Drive with 18" CSP (outside 60')
21240+00 RT	Gravel Private Drive with 18" CSP (outside 60')

Approach Description	
Station	Type of Approach
21242+92 LT	Gravel Section Line (92nd St NE) with 18" CSP (outside 60')
21242+93 RT	Gravel Section Line (92nd St NE) with 18" CSP (outside 60')
21245+80 RT	Field Drive with 18" CSP (outside 60')
21245+84 LT	Field Drive with 18" CSP (outside 60')
21252+21 RT	Paved Private Drive with 18" CSP (outside 60')
21256+20 RT	Gravel Private Drive with 18" CSP (outside 60')
21257+43 LT	Gravel Private Drive with 24" CSP (outside 60')
21259+43 LT	Gravel Private Drive with 24" CSP (outside 60')
21262+25 RT	Gravel Private Drive with 18" CSP (outside 60')
21262+27 LT	Gravel Private Drive with 18" CSP (outside 60')
21264+60 LT	Gravel Private Drive with 18" CSP
21265+67 LT	Paved Section Line (1st Ave) with 18" CSP
21266+41 LT	Gravel Private Drive with 18" CSP
21271+51 RT	Paved Private Drive with 18" CSP
21272+29 LT	Gravel Private Drive with 18" CSP
21279+16 RT	Paved Private Drive with 36" CSP (outside 60')
21279+16 RT	Paved Private Drive with 36" CSP
21279+16 RT	Paved Private Drive with 30" CSP
11280+20 LT	Gravel Private Drive
21280+68 RT	Paved Private Drive with 30" CSP
21280+69 RT	Paved Private Drive with 36" CSP
21281+74 LT	Gravel Private Drive with 36" CSP (outside 60')
21283+24 RT	Paved Private Drive with 30" CSP (outside 60')
21283+25 RT	Paved Private Drive with 30" CSP (outside 60')
21283+25 RT	Paved Private Drive with 30" CSP
21285+46 RT	Paved Private Drive with 36" CSP (outside 60')
21285+46 RT	Paved Private Drive with 24" CSP (outside 60')
21288+33 RT	Paved Private Drive with 36" CSP (outside 60')
21288+35 RT	Paved Private Drive with 24" CSP (outside 60')
21292+05 RT	Paved Private Drive with 24" CSP (outside 60')
21292+05 RT	Paved Private Drive with 36" CSP (outside 60')

Note: These approach Locations (stations) are approximate

Approach Description

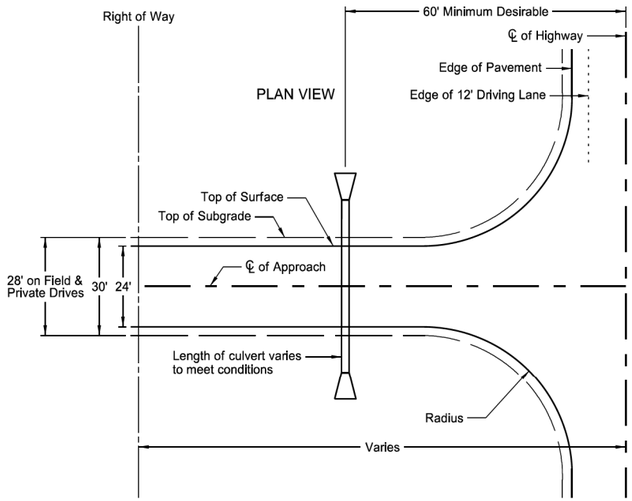
Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

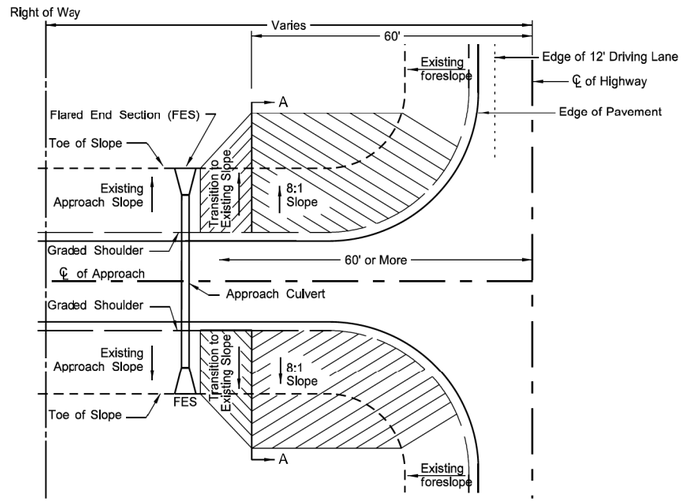
REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

STANDARD RURAL APPROACHES

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	20	4

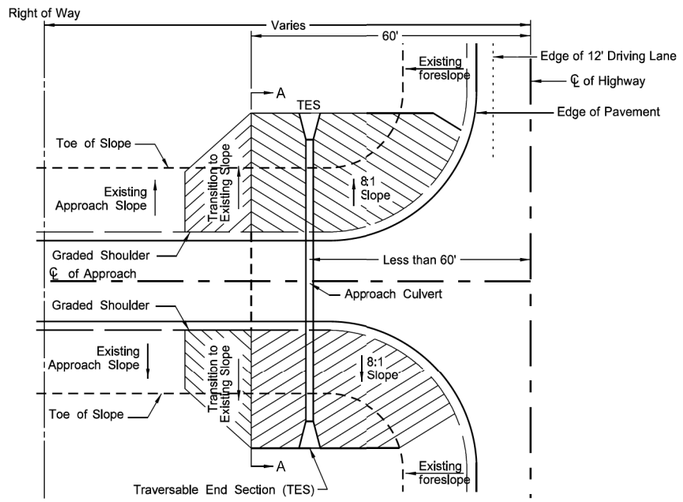


APPROACH INSLOPES



CASE 1

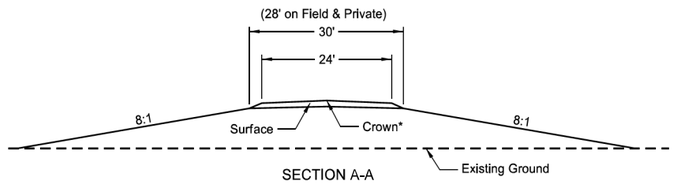
APPROACH PIPE LOCATED
60' OR MORE FROM ℄



CASE 2

APPROACH PIPE LOCATED
LESS THAN 60' FROM ℄

Approach Foreslope Reconstruction						
Station	Quantitiy		Existing Slope		Exend Culvert	
	BK (EA)	AHD (EA)	BK	AHD	BK (LF)	AHD (LF)
20678+97 LT	1	0	5.3	7.0		
20679+02 RT	0	1	7.9	5.8		
20703+23 LT	1	0	4.9	6.1	9	
20711+67 LT	1	0	5.4	6.9		
20759+16 LT	0	1	8.3	5.4		6
20795+61 RT	0	1	7.4	5.3		7
20857+72 LT	0	1	6.3	5.6		5
20871+28 RT	1	1	4.2	4.1	11	14
20898+08 RT	0	1	6.3	4.6		6
20982+01 LT	1	0	5.1	6.6	5	
21005+52 RT	0	1	7.2	5.8		
21029+58 RT	0	1	6.3	5.8		6
21059+35 LT	0	1	6.6	5.4		3
21082+51 RT	0	1	6.5	5.2		10
21082+55 LT	0	1	12.1	5.7		6
21175+55 LT	1	1	4.7	5.7	12	12
21214+22 LT	1	0	5.2	6.1	4	
21242+93 RT	0	1	7.6	5.5		13
21245+80 RT	1	0	5.6	7.2		
21245+84 LT	1	0	5.6	7.2	3	
21252+21 RT	1	1	4.9	4.9	8	11
21257+43 LT	1	0	5.8	6.9	11	
Totals	11	14			63	99



Note:

1. Culvert Extensions are Quantified in Section 51

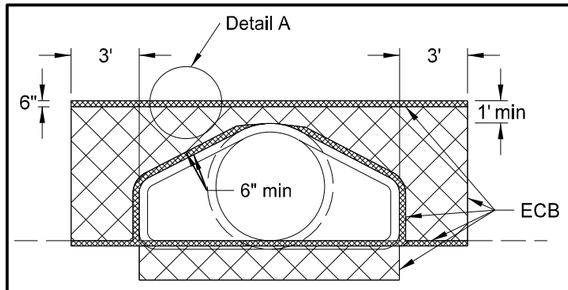
Approach Paving for Existing Rural Approaches
(No Approach Grading)

Structural Improvement
ND Hwy 1

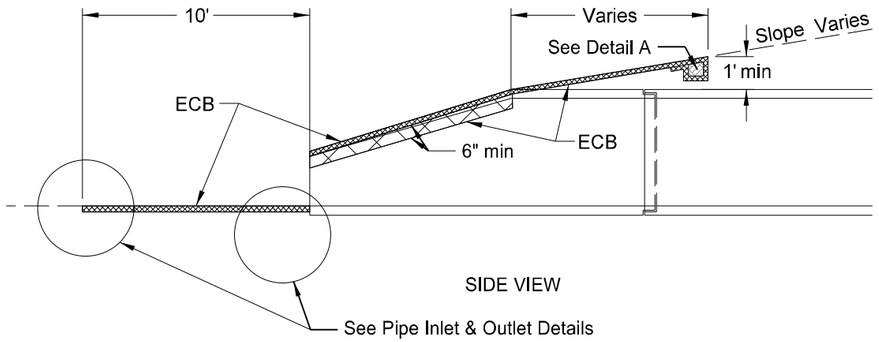
Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

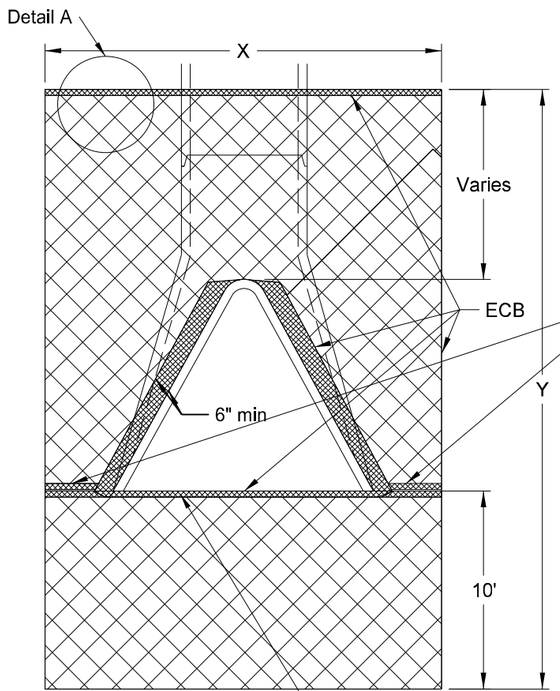
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	20	5



FRONT VIEW



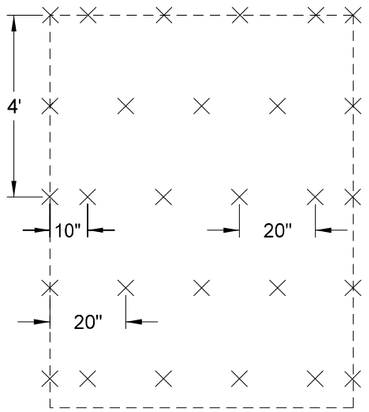
SIDE VIEW



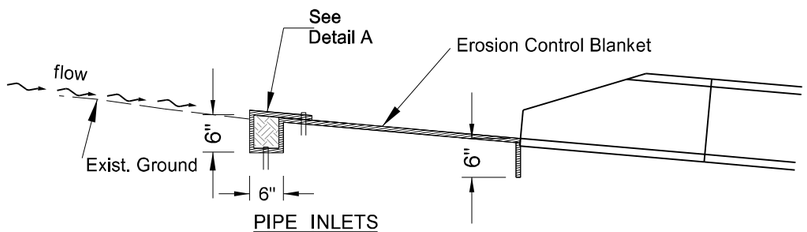
TOP VIEW

NOTE: Tuck the ECB a minimum of 6" into the embankment (against the flared end section) around the opening of the flared end section.

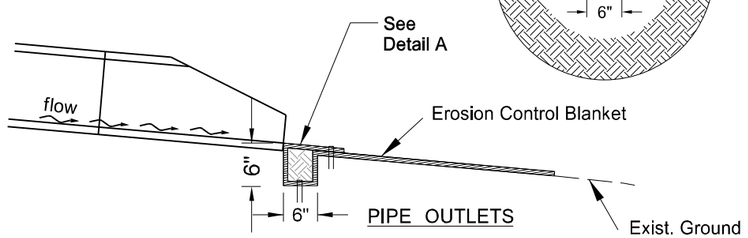
APPROACH CULVERTS				
DIA	X	Y	Surface area to be protected	ECB
In	Ft	Ft	SF	SY
15	9.0	20.0	176.0	20
18	9.5	20.7	190.7	22
21	9.5	21.0	190.9	22
24	10.5	21.6	214.1	24
27	11.0	22.0	226.3	25
30	11.6	22.5	241.5	27
36	12.7	23.3	268.8	30
42	13.3	23.3	279.7	31
48	13.8	24.0	293.2	33
54	14.5	23.4	300.6	34
60	15.0	23.0	307.5	35
66	15.6	24.0	325.6	37
72	16.2	24.5	340.6	38
Note: Quantities based on 8:1 slope.				



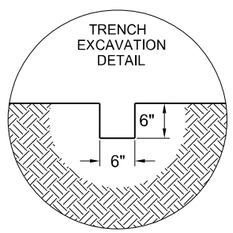
STAPLE PATTERN



PIPE INLETS

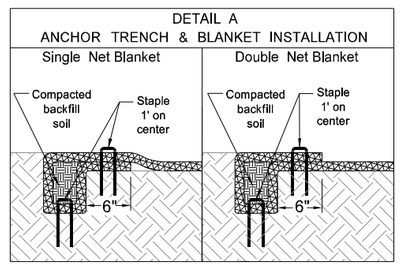


PIPE OUTLETS



Erosion Control Blanket (ECB)								
Location to be Protected	Culvert Type Appr/CL	Pipe Diam (Inch)	No	Unit Quantity	Total Quantity			
					Type 1	Type 2	Type 3	Type 4
Station				(SY)	(SY)	(SY)	(SY)	(SY)
20795+61 Rt	Appr	18	1	22		22		
21264+60 Lt	Appr	18	1	22		22		
21265+67 Lt	Appr	18	2	22		44		
21266+41 Lt	Appr	18	2	22		44		
21271+51 Rt	Appr	18	1	22		22		
21272+29 Lt	Appr	18	1	22		22		
21279+16 Rt	Appr	36	1	30		30		
21279+16 Rt	Appr	30	1	27		27		
21280+68 Rt	Appr	30	1	27		27		
21280+69 Rt	Appr	30	1	27		27		
21283+25 Rt	Appr	30	1	27		27		
Total (SYs)						314		

CENTERLINE CULVERTS									
DIA	X	Y	Surface area to be protected	ECB	DIA	X	Y	Surface area to be protected	ECB
In	Ft	Ft	SF	SY	In	Ft	Ft	SF	SY
24	10.5	19.6	193.1	22	24	10.5	17.6	172.1	20
27	11.0	20.0	204.3	23	27	11.0	18.0	182.3	21
30	11.6	20.5	218.3	25	30	11.6	18.5	195.1	22
36	12.7	21.2	242.1	27	36	12.7	19.2	216.7	24
42	13.3	21.2	251.8	28	42	13.3	19.2	225.2	25
48	13.8	22.0	265.6	30	48	13.8	20.0	238.0	27
54	14.5	21.5	273.7	31	54	14.5	19.5	244.7	28
60	15.0	21.0	278.3	31	60	15.0	19.0	248.3	28
66	15.6	22.0	295.7	33	66	15.6	20.0	264.5	30
72	16.2	22.5	309.2	35	72	16.2	20.5	276.8	31
Note: Quantities based on 6:1 slope.					Note: Quantities based on 4:1 slope.				



Erosion Control at Culvert Flared End Sections

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	20	6

P.C. Station	20625+66.27
P.I. Station	20640+80.27
Delta =	44° 43' 33.60" (RT)
Degree =	01° 33' 25.20"
Tangent =	1513.998
Length =	2872.651
Radius =	3680.000
External =	299.270
P.T. Station	20654+38.93

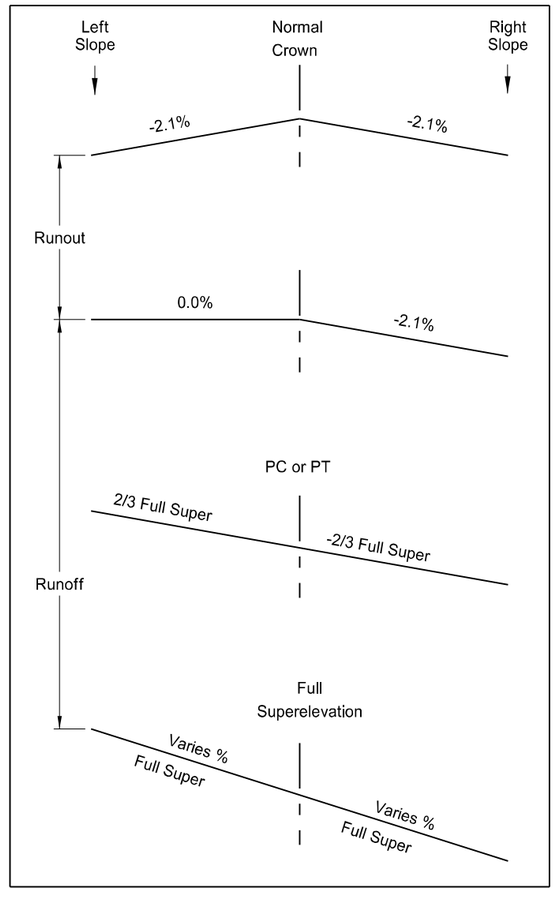
Station	Left Slope	Right Slope
PC - 165'	-2.1	-2.1
PC - 94'	0.0	-2.1
PC	2.8	-2.8
PC + 47'	4.2	-4.2
PT - 47'	4.2	-4.2
PT	2.8	-2.8
PT + 94'	0.0	-2.1
PT + 165'	-2.1	-2.1

Note: Calculations based on AASHTO method five. A design speed of 65 mph and maximum superelevation of 6% were used.

P.C. Station	21107+92.12
P.I. Station	21115+02.25
Delta =	21° 27' 46.80" (LT)
Degree =	01° 31' 44.40"
Tangent =	710.128
Length =	1403.609
Radius =	3747.002
External =	66.698
P.T. Station	21121+95.73

Station	Left Slope	Right Slope
PC - 165'	-2.1	-2.1
PC - 94'	-2.1	0.0
PC	-2.8	2.8
PC + 47'	-4.2	4.2
PT - 47'	-4.2	4.2
PT	-2.8	2.8
PT + 94'	-2.1	0.0
PT + 165'	-2.1	-2.1

Note: Calculations based on AASHTO method five. A design speed of 65 mph and maximum superelevation of 6% were used.



P.C. Station	20697+78.99
P.I. Station	20714+10.20
Delta =	44° 46' 33.60" (LT)
Degree =	01° 26' 49.20"
Tangent =	1631.208
Length =	3094.667
Radius =	3960.000
External =	322.807
P.T. Station	20728+73.66

Station	Left Slope	Right Slope
PC - 161'	-2.1	-2.1
PC - 90'	-2.1	0.0
PC	-2.7	2.7
PC + 45'	-4.0	4.0
PT - 45'	-4.0	4.0
PT	-2.7	2.7
PT + 90'	-2.1	0.0
PT + 161'	-2.1	-2.1

Note: Calculations based on AASHTO method five. A design speed of 65 mph and maximum superelevation of 6% were used.

P.C. Station	21130+31.02
P.I. Station	21137+36.25
Delta =	21° 23' 45.60" (RT)
Degree =	01° 32' 06.00"
Tangent =	705.237
Length =	1394.044
Radius =	3733.001
External =	66.033
P.T. Station	21144+25.06

Station	Left Slope	Right Slope
PC - 165'	-2.1	-2.1
PC - 94'	0.0	-2.1
PC	2.8	-2.8
PC + 47'	4.2	-4.2
PT - 47'	4.2	-4.2
PT	2.8	-2.8
PT + 94'	0.0	-2.1
PT + 165'	-2.1	-2.1

Note: Calculations based on AASHTO method five. A design speed of 65 mph and maximum superelevation of 6% were used.

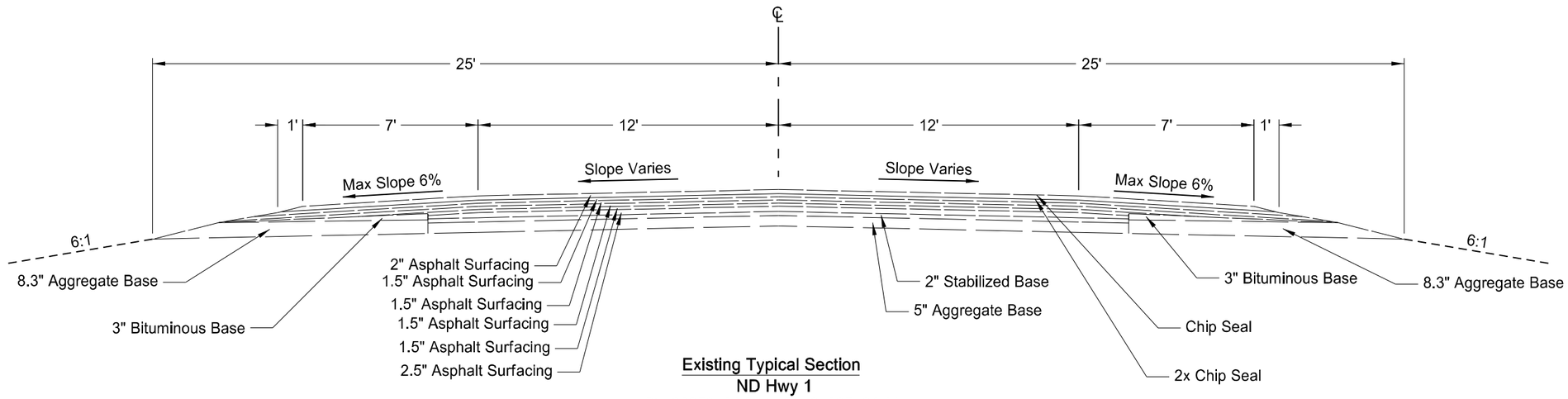
Superelevation Table

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	30	1



Existing Typical Section
ND Hwy 1
Sta 20653+81.22 to Sta 21295+64.11
See Sec 10 - Core Data Sheet on information on existing bituminous pavement thickness

Note:
Existing pavement depth varies. Average pavement depths are as follows:
14.15" from Sta 20653+61.59 to Sta 21262+00 with a standard deviations of 0.84"

8.75" from Sta 21262+00 to Sta 21295+64.11 with a standard deviation of 3.89"

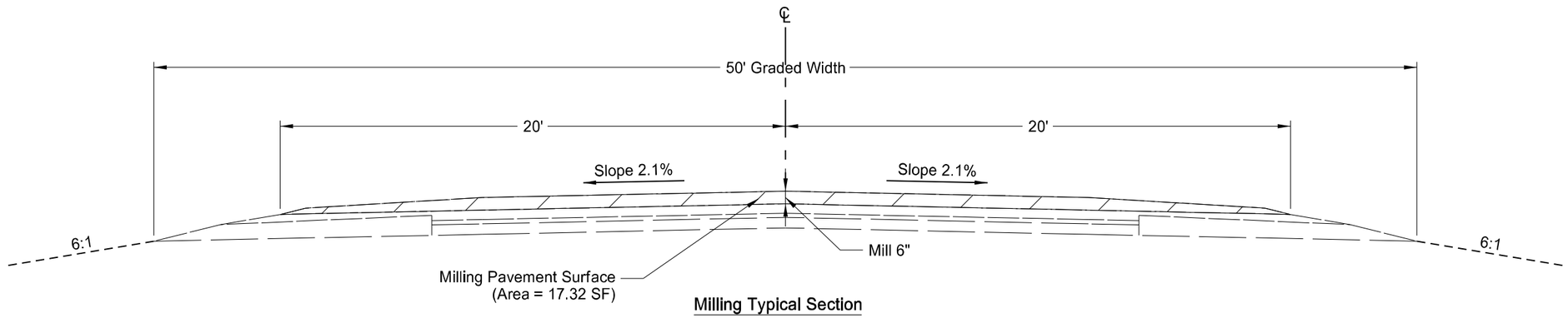
Existing Typical Sections

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	30	2



Milling Typical Section
ND Hwy 1
Sta 20653+81.22 to Sta 21261+00.00

Milling Typical Section

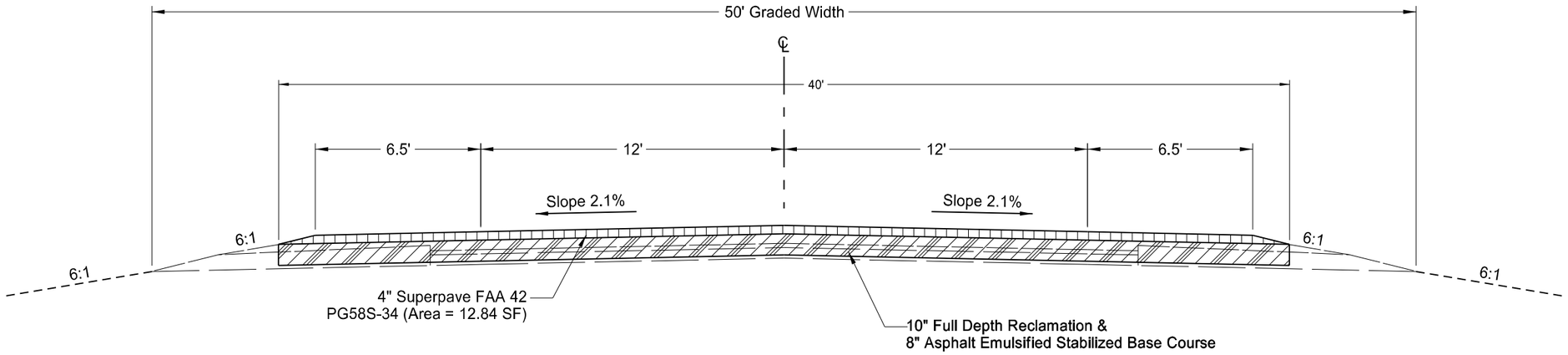
Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

10/24/2023 2:19:44 PM rschuehle H:\Projects\14000\14451\3001201.031\Design\Plan\030TP__002_Milling_Typ.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	30	3



Proposed Typical Section

ND Hwy 1

Sta 20653+61.59 to Sta 21261+00.00

Proposed Typical Section

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN
SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

8/14/2025 8:28:21 AM JButler H:\Projects\14000\14451\3001201.031\Design\Plan\030TP__003_Proposed_Typ.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	51	1

Begin Alignment	Begin Station/ Location	Begin Offset	End Alignment	End Station/ Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	(*) End Treatments		Geogrid Type G (Pay Item)	Applicable Backfill Detail	Notes
						IN	Bid Item	LF		IN	Type	Type	IN	Begin EA	End EA	SY		
ND 1	20702+96	61.3' LT	ND 1	20702+87	61.5' LT	24	Pipe Corr. Steel (Extension)	9	Corrugated Steel Pipe	24	Z, A, P	2	0.0640		FES		Spec. 714.04.A	
ND 1	20759+46	65.3' RT	ND 1	20759+40	65.2' RT	24	Pipe Corr. Steel (Extension)	6	Corrugated Steel Pipe	24	Z, A, P	2	0.0640	FES			Spec. 714.04.A	
ND 1	20796+00	61.4' RT	ND 1	20795+93	61.1' RT	24	Pipe Corr. Steel (Extension)	7	Corrugated Steel Pipe	24	Z, A, P	2	0.0640	FES			Spec. 714.04.A	
ND 1	20857+96	62.4' LT	ND 1	20857+91	62.5' LT	18	Pipe Corr. Steel (Extension)	5	Corrugated Steel Pipe	18	Z, A, P	2	0.0640	Remove & Relay			Spec. 714.04.A	
ND 1	20870+92	68.6' LT	ND 1	20871+03	68.4' LT	18	Pipe Corr. Steel (Extension)	11	Corrugated Steel Pipe	18	Z, A, P	2	0.0640	FES			Spec. 714.04.A	
ND 1	20871+47	67.8' LT	ND 1	20871+61	67.5' LT	18	Pipe Corr. Steel (Extension)	14	Corrugated Steel Pipe	18	Z, A, P	2	0.0640		FES		Spec. 714.04.A	
ND 1	20898+31	62.7' LT	ND 1	20898+37	62.7' LT	18	Pipe Corr. Steel (Extension)	6	Corrugated Steel Pipe	18	Z, A, P	2	0.0640		Remove & Relay		Spec. 714.04.A	
ND 1	20981+60	66.5' LT	ND 1	20981+65	66.5' LT	18	Pipe Corr. Steel (Extension)	5	Corrugated Steel Pipe	18	Z, A, P	2	0.0640	Remove & Relay			Spec. 714.04.A	
ND 1	21029+88	64.4' LT	ND 1	21029+82	64.3' LT	18	Pipe Corr. Steel (Extension)	6	Corrugated Steel Pipe	18	Z, A, P	2	0.0640	Remove & Relay			Spec. 714.04.A	
ND 1	21059+59	63.1' LT	ND 1	21059+56	63.2' LT	24	Pipe Corr. Steel (Extension)	3	Corrugated Steel Pipe	24	Z, A, P	2	0.0640	Remove & Relay			Spec. 714.04.A	

Coatings: Z = Zinc
A = Aluminum
P = Polymeric (over Zinc or Aluminum)

Corrugati 2 = 2-2/3"x1/2"
3 = 3"x1"
5 = 5"x1"

Spiral Ribs: 3/4 = 3/4"x3/4"@7-1/2"
1 = 3/4"x1"@11-1/2"

FES = Flared End Section

Allowable Pipe List
Approaches

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
SAMUEL NOAH WESTLUND
PE-10795
DATE: 10-27-23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	51	2

Begin Alignment	Begin Station/ Location	Begin Offset	End Alignment	End Station/ Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	(*) End Treatments		Geogrid Type G (Pay Item)	Applicable Backfill Detail	Notes
						IN	Bid Item	LF		IN	Type	Type	IN	Begin EA	End EA	SY		
ND 1	21082+88	64.1' RT	ND 1	21082+78	63.8' RT	24	Pipe Corr. Steel (Extension)	10	Corrugated Steel Pipe	24	Z, A, P	2	0.0640	FES			Spec. 714.04.A	
ND 1	21082+83	68.6' LT	ND 1	21082+77	68.7' LT	24	Pipe Corr. Steel (Extension)	6	Corrugated Steel Pipe	24	Z, A, P	2	0.0640	Remove & Relay			Spec. 714.04.A	
ND 1	21175+25	68.9' LT	ND 1	21175+37	69.6' LT	18	Pipe Corr. Steel (Extension)	12	Corrugated Steel Pipe	18	Z, A, P	2	0.0640	Remove & Relay			Spec. 714.04.A	
ND 1	21175+71	71.7' LT	ND 1	21175+83	72.4' LT	18	Pipe Corr. Steel (Extension)	12	Corrugated Steel Pipe	18	Z, A, P	2	0.0640		Remove & Relay		Spec. 714.04.A	
ND 1	21213+94	65.4' LT	ND 1	21213+98	65.4' LT	12	Pipe Corr. Steel (Extension)	4	Corrugated Steel Pipe	12	Z, A, P	2	0.0640	Remove & Relay			Spec. 714.04.A	
ND 1	21243+20	68.0' RT	ND 1	21243+33	68.0' RT	18	Pipe Corr. Steel (Extension)	13	Corrugated Steel Pipe	18	Z, A, P	2	0.0640		FES		Spec. 714.04.A	
ND 1	21245+50	68.2' LT	ND 1	21245+53	68.2' LT	18	Pipe Corr. Steel (Extension)	3	Corrugated Steel Pipe	18	Z, A, P	2	0.0640	Remove & Relay			Spec. 714.04.A	
ND 1	21251+85	67.4' RT	ND 1	21251+93	67.2' RT	18	Pipe Corr. Steel (Extension)	8	Corrugated Steel Pipe	18	Z, A, P	2	0.0640	Remove & Relay			Spec. 714.04.A	
ND 1	21252+40	66.3' RT	ND 1	21252+51	66.0' RT	18	Pipe Corr. Steel (Extension)	11	Corrugated Steel Pipe	18	Z, A, P	2	0.0640		Remove & Relay		Spec. 714.04.A	
ND 1	21257+19	69.3' LT	ND 1	21257+08	69.1' LT	18	Pipe Corr. Steel (Extension)	11	Corrugated Steel Pipe	18	Z, A, P	2	0.0640		Remove & Relay		Spec. 714.04.A	

Coatings: Z = Zinc, A = Aluminum, P = Polymeric (over Zinc or Aluminum)

Corrugations: 2 = 2-2/3"x1/2", 3 = 3"x1", 5 = 5"x1"

Spiral Ribs: 3/4 = 3/4"x3/4"@7-1/2", 1 = 3/4"x1"@11-1/2"

FES = Flared End Section

Allowable Pipe List
Approaches

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
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DATE: 10-27-23
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-001(031)201	75	1

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands[1]	Wetland Impact					Wetland Mitigation				
					Wetland Impacts Acre(s)			USFWS Easement Impacts Acre(s)		Mitigation Proposed			11990 Bank	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm.	EO 11990	USACE	USFWS	Mitigation Location; Ratio	Acre(s)
15	Sec.15, T159N, R60W	Ditch	Created	YES	-	-								
16a	Sec.15, T159N, R60W	Ditch	Created	YES	-	-								
16b	Sec.15, T159N, R60W	Slope	Natural	YES	-	-								
16c	Sec.15, T159N, R60W	Slope	Natural	YES	-	-								
16d	Sec.15, T159N, R60W	Ditch	Created	YES	-	-								
17a	Sec.15, T159N, R60W	Ditch	Created	YES	-	-								
17b	Sec.15, T159N, R60W	Ditch	Created	YES	-	-								
18	Sec.15, T159N, R60W	Ditch	Created	YES	-	-								
19a	Sec.15, T159N, R60W	Ditch	Created	YES	-	-								
19b	Sec.15, T159N, R60W	Ditch	Created	YES	0.005	0.006				N	N	N		
19c	Sec.15, T159N, R60W	Ditch	Created	YES	-	-								
19d	Sec.15, T159N, R60W	Ditch	Created	YES	-	-								
20	Sec.10, T159N, R60W	Ditch	Created	YES	-	-								
21a	Sec.10, T159N, R60W	Basin	Natural	YES	-	-								
21b	Sec.10, 11, T159N, R60W	Basin	Natural	YES	-	-								
22	Sec.11, T159N, R60W	Ditch	Created	YES	-	-								
23	Sec.11, T159N, R60W	Ditch	Created	YES	-	-								

REGISTERED PROFESSIONAL ENGINEER
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Wetlands Mitigation and Environmental

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-001(031)201	75	2

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands[1]	Wetland Impact					Wetland Mitigation				
					Wetland Impacts Acre(s)			USFWS Easement Impacts Acre(s)		Mitigation Proposed			11990 Bank	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm.	EO 11990	USACE	USFWS	Mitigation Location; Ratio	Acre(s)
24	Sec.10, T159N, R60W	Ditch	Created	YES	-	-								
25a	Sec.11, T159N, R60W	Ditch	Created	YES	-	-								
25b	Sec.10, T159N, R60W	Basin	Natural	YES	-	-								
25c	Sec.10, T159N, R60W	Basin	Natural	YES	-	-								
25d	Sec.11, T159N, R60W	Basin	Natural	YES	-	-								
25e	Sec.10, T159N, R60W	Ditch	Created	YES	-	-								
25f	Sec.10, T159N, R60W	Basin	Natural	YES	-	-								
25g	Sec.10, T159N, R60W	Ditch	Created	YES	-	-								
25h	Sec.10, T159N, R60W	Ditch	Created	YES	-	-								
25i	Sec.11, T159N, R60W	Ditch	Created	YES	0.007	0.005				N	N	N		
25j	Sec.3, T159N, R60W	Ditch	Created	YES	-	-								
26a	Sec.2, T159N, R60W	Ditch	Created	YES	-	-								
26b	Sec.2, T159N, R60W	Basin	Natural	YES	-	-								
26c	Sec.3, T159N, R60W	Ditch	Created	YES	-	-								
26d	Sec.2, T159N, R60W	Ditch	Created	YES	-	-								
26e	Sec.2, T159N, R60W	Basin	Natural	YES	-	-								

REGISTERED PROFESSIONAL ENGINEER
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Wetlands Mitigation and Environmental

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-001(031)201	75	3

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands[1]	Wetland Impact					Wetland Mitigation				
					Wetland Impacts Acre(s)			USFWS Easement Impacts Acre(s)		Mitigation Proposed			11990 Bank	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm.	EO 11990	USACE	USFWS	Mitigation Location; Ratio	Acre(s)
26f	Sec.3, T159N, R60W	Basin	Natural	YES	-	-								
26g	Sec.3, T159N, R60W	Ditch	Created	YES	-	-								
26h	Sec.2, T159N, R60W	Ditch	Created	YES	-	-								
26i	Sec.2, T159N, R60W	Ditch	Created	YES	0.006	0.002				N	N	N		
27a	Sec.2, T159N, R60W	Ditch	Natural	YES	-	-								
27b	Sec.3, T159N, R60W	Ditch	Created	YES	-	-								
27c	Sec.2, T159N, R60W	Basin	Natural	YES	0.031	0.011				Y	N	N	Anderson 1:1 11990	0.011
27d	Sec.35, T160N, R60W	Basin	Natural	YES	0.019	0.004				Y	N	N	Anderson 1:1 11990	0.004
27e	Sec.3, T159N, R60W	Ditch	Natural	YES	-	-								
27f	Sec.3, T159N, R60W	Ditch	Created	YES	-	-								
27g	Sec.34, T160N, R60W	Basin	Natural	YES	-	-								
27h	Sec.34, T160N, R60W	Basin	Natural	YES	-	-								
27i	Sec.34, T160N, R60W	Ditch	Created	YES	-	-								
27j	Sec.35, T160N, R60W	Basin	Natural	YES	-	-								
27k	Sec.35, T160N, R60W	Ditch	Created	YES	-	-								
31	Sec.35, T160N, R60W	Ditch	Created	YES	-	-								

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NORTH DAKOTA

Wetlands Mitigation and Environmental

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands[1]	Wetland Impact					Wetland Mitigation				
					Wetland Impacts Acre(s)			USFWS Easement Impacts Acre(s)		Mitigation Proposed			11990 Bank	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm.	EO 11990	USACE	USFWS	Mitigation Location; Ratio	Acre(s)
32a	Sec.35, T160N, R60W	Ditch	Created	YES	-	-								
32b	Sec.34, T160N, R60W	Ditch	Created	YES	-	-								
33	Sec.35, T160N, R60W	Ditch	Created	YES	-	-								
34	Sec.34, T160N, R60W	Ditch	Created	YES	-	-								
35a	Sec.34, T160N, R60W	Ditch	Created	YES	0.009	0.010				N	N	N		
35b	Sec.27, T160N, R60W	Basin	Natural	YES	0.006	0.002				Y	N	N	Anderson 1:1 11990	0.002
35c	Sec.26, T160N, R60W	Ditch	Created	YES	-	-								
35d	Sec.27, T160N, R60W	Ditch	Created	YES	-	-								
35e	Sec.35, T160N, R60W	Ditch	Created	YES	-	-								
37	Sec.27, T160N, R60W	Ditch	Created	YES	-	-								
38a	Sec.26, T160N, R60W	Ditch	Created	YES	-	-								
38b	Sec.27, T160N, R60W	Basin	Natural	YES	-	-								
38c	Sec.27, T160N, R60W	Ditch	Created	YES	0.008	0.005				N	N	N		
38d	Sec.26, T160N, R60W	Ditch	Created	YES	-	-								
38e	Sec.27, T160N, R60W	Basin	Natural	YES	-	-								
39a	Sec.26, T160N, R60W	Ditch	Created	YES	-	-								

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NORTH DAKOTA

Wetlands Mitigation and Environmental

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-001(031)201	75	5

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands[1]	Wetland Impact					Wetland Mitigation				
					Wetland Impacts Acre(s)			USFWS Easement Impacts Acre(s)		Mitigation Proposed			11990 Bank	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm.	EO 11990	USACE	USFWS	Mitigation Location; Ratio	Acre(s)
39b	Sec.27, T160N, R60W	Basin	Natural	YES	-	-								
39c	Sec.23, T160N, R60W	Slope	Natural/Manipulated	YES	-	-								
39d	Sec.22, T160N, R60W	Basin	Natural/Manipulated	YES	-	-								
39e	Sec.22, T160N, R60W	Ditch	Created	YES	-	-								
40	Sec.23, T160N, R60W	Slope	Natural/Manipulated	YES	-	-								
41	Sec.23, T160N, R60W	Ditch	Created	YES	-	-								
42a	Sec.23, T160N, R60W	Slope	Natural/Manipulated	YES	-	-								
42b	Sec.22, T160N, R60W	Slope	Natural/Manipulated	YES	-	-								
43a	Sec.23, T160N, R60W	Slope	Natural/Manipulated	YES	-	-								
43b	Sec.22, T160N, R60W	Slope	Natural/Manipulated	YES	-	-								
44a	Sec.15, T160N, R60W	Ditch	Created	YES	-	-								
44b	Sec.14, T160N, R60W	Basin	Natural	YES	-	-								
44c	Sec.15, T160N, R60W	Basin	Natural	YES	-	-								
45	Sec.14, T160N, R60W	Ditch	Created	YES	-	-								
46	Sec.15, T160N, R60W	Ditch	Created	YES	-	-								
47	Sec.14, T160N, R60W	Ditch	Created	YES	-	-								

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Wetlands Mitigation and Environmental

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-001(031)201	75	6

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands[1]	Wetland Impact					Wetland Mitigation				
					Wetland Impacts Acre(s)			USFWS Easement Impacts Acre(s)		Mitigation Proposed			11990 Bank	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm.	EO 11990	USACE	USFWS	Mitigation Location; Ratio	Acre(s)
48a	Sec.14, T160N, R60W	Ditch	Created	YES	-	-								
48b	Sec.15, T160N, R60W	Ditch	Created	YES	-	-								
49a	Sec.14, T160N, R60W	Ditch	Created	YES	-	-								
49b	Sec.15, T160N, R60W	Basin	Natural	YES	-	-								
49c	Sec.15, T160N, R60W	Ditch	Created	YES	-	-								
50a	Sec.10, T160N, R60W	Ditch	Created	YES	-	-								
50b	Sec.11, T160N, R60W	Basin	Natural	YES	-	-								
50c	Sec.11, T160N, R60W	Ditch	Created	YES	-	-								
51	Sec.11, T160N, R60W	Ditch	Created	YES	-	-								
52a	Sec.10, T160N, R60W	Ditch	Created	YES	-	-								
52b	Sec.10, T160N, R60W	Ditch	Created	YES	-	-								
52c	Sec.10, T160N, R60W	Ditch	Created	YES	0.005	0.002				N	N	N		
52d	Sec.11, T160N, R60W	Ditch	Created	YES	-	-								
53	Sec.10, T160N, R60W	Ditch	Created	YES	-	-								
54	Sec.11, T160N, R60W	Ditch	Created	YES	-	-								
55a	Sec.11, T160N, R60W	Ditch	Created	YES	-	-								

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NORTH DAKOTA

Wetlands Mitigation and Environmental

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-001(031)201	75	7

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands[1]	Wetland Impact					Wetland Mitigation				
					Wetland Impacts Acre(s)			USFWS Easement Impacts Acre(s)		Mitigation Proposed			11990 Bank	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm.	EO 11990	USACE	USFWS	Mitigation Location; Ratio	Acre(s)
55b	Sec.10, T160N, R60W	Ditch	Created	YES	-	-								
56	Sec.10, T160N, R60W	Ditch	Created	YES	-	-								
57a	Sec.11, T160N, R60W	Ditch	Created	YES	-	-								
57b	Sec.10, T160N, R60W	Ditch	Created	YES	-	-								
57c	Sec.2, T160N, R60W	Ditch	Created	YES	0.013	0.010				N	N	N		
57d	Sec.3, T160N, R60W	Ditch	Created	YES	0.010	0.006				N	N	N		
57e	Sec.3, T160N, R60W	Basin	Natural	YES	-	-								
57f	Sec.3, T160N, R60W	Basin	Natural	YES	-	-								
57g	Sec.3, T160N, R60W	Ditch	Created	YES	-	-								
57h	Sec.3, T160N, R60W	Ditch	Created	YES	-	-								
57i	Sec.2, T160N, R60W	Ditch	Created	YES	-	-								
57j	Sec.2, T160N, R60W	Ditch	Created	YES	-	-								
57k	Sec.3, T160N, R60W	Basin	Natural	YES	-	-								
57l	Sec.3, T160N, R60W	Ditch	Created	YES	-	-								
57m	Sec.3, T160N, R60W	Basin	Natural/Manipulated	YES	-	-								
57n	Sec.3, T160N, R60W	Ditch	Created	YES	-	-								

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NORTH DAKOTA

Wetlands Mitigation and Environmental

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-001(031)201	75	8

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands[1]	Wetland Impact					Wetland Mitigation				
					Wetland Impacts Acre(s)			USFWS Easement Impacts Acre(s)		Mitigation Proposed			11990 Bank	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm.	EO 11990	USACE	USFWS	Mitigation Location; Ratio	Acre(s)
58	Sec.3, T160N, R60W	Ditch	Created	YES	-	-								
59	Sec.3, T160N, R60W	Ditch	Created	YES	-	-								
60a	Sec.36, T161N, R60W	Ditch	Created	YES	-	-								
60b	Sec.36, T161N, R60W	Slope	Natural	YES	-	-								
60c	Sec.35, T161N, R60W	Slope	Natural	YES	-	-								
60d	Sec.36, T161N, R60W	Ditch	Created	YES	-	-								
60e	Sec.35, T161N, R60W	Ditch	Created	YES	-	-								
61	Sec.35, T161N, R60W	Slope	Natural/Manipulated	YES	-	-								
62a	Sec.36, T161N, R60W	Ditch	Created	YES	-	-								
62b	Sec.36, T161N, R60W	Ditch	Created	YES	-	-								
63a	Sec.35, T161N, R60W	Ditch	Created	YES	-	-								
63b	Sec.35, T161N, R60W	Ditch	Created	YES	-	-								
64a	Sec.35, T161N, R60W	Ditch	Created	YES	-	-								
64b	Sec.26, T161N, R60W	Ditch	Created	YES	-	-								
64c	Sec.36, T161N, R60W	Basin	Created	YES	-	-								
64d	Sec.36, T161N, R60W	Ditch	Created	YES	-	-								

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NORTH DAKOTA

Wetlands Mitigation and Environmental

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands[1]	Wetland Impact					Wetland Mitigation				
					Wetland Impacts Acre(s)			USFWS Easement Impacts Acre(s)		Mitigation Proposed			11990 Bank	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm.	EO 11990	USACE	USFWS	Mitigation Location; Ratio	Acre(s)
64e	Sec.25, T161N, R60W	Ditch	Created	YES	-	-								
66	Sec.26, T161N, R60W	Ditch	Created	YES	-	-								
67	Sec.26, T161N, R60W	Ditch	Created	YES	-	-								
68a	Sec.25, T161N, R60W	Ditch	Created	YES	-	-								
68b	Sec.26, T161N, R60W	Ditch	Created	YES	-	-								
69	Sec.25, T161N, R60W	Ditch	Created	YES	-	-								
70	Sec.26, T161N, R60W	Ditch	Created	YES	-	-								
71	Sec.25, T161N, R60W	Ditch	Created	YES	-	-								
72a	Sec.26, T161N, R60W	Ditch	Created	YES	-	-								
72b	Sec.23, T161N, R60W	Ditch	Created	YES	-	-								
73a	Sec.25, T161N, R60W	Ditch	Created	YES	-	-								
73b	Sec.24, T161N, R60W	Ditch	Created	YES	0.010	0.007				N	N	N		
74a	Sec.23, T161N, R60W	Ditch	Created	YES	0.003	0.002				N	N	N		
74b	Sec.23, T161N, R60W	Ditch	Created	YES	-	-								
74c	Sec.23, T161N, R60W	Ditch	Created	YES	-	-								
74d	Sec.23, T161N, R60W	Ditch	Created	YES	-	-								

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Wetlands Mitigation and Environmental

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-001(031)201	75	10

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands[1]	Wetland Impact					Wetland Mitigation				
					Wetland Impacts Acre(s)			USFWS Easement Impacts Acre(s)		Mitigation Proposed			11990 Bank	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm.	EO 11990	USACE	USFWS	Mitigation Location; Ratio	Acre(s)
75a	Sec.24, T161N, R60W	Slope	Natural/Manipulated	YES	-	-								
75b	Sec.23, T161N, R60W	Slope	Natural/Manipulated	YES	-	-								
76a	Sec.24, T161N, R60W	Ditch	Created	YES	-	-								
76b	Sec.24, T161N, R60W	Ditch	Created	YES	-	-								
76c	Sec.24, T161N, R60W	Ditch	Created	YES	-	-								
76d	Sec.24, T161N, R60W	Ditch	Created	YES	-	-								
76e	Sec.24, T161N, R60W	Ditch	Created	YES	-	-								
76f	Sec.24, T161N, R60W	Ditch	Created	YES	-	-								
76g	Sec.24, T161N, R60W	Ditch	Created	YES	-	-								
76h	Sec.13, T161N, R60W	Ditch	Created	YES	-	-								
76i	Sec.13, T161N, R60W	Ditch	Created	YES	-	-								
76j	Sec.14, T161N, R60W	Ditch	Created	YES	-	-								
				Totals	**0.132**	**0.072**								**0.017**

[1] A wetland Jurisdictional Determination was issued by the USACE on 04/15/2022; NWO-2021-02025-BIS.

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Wetlands Mitigation and Environmental

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Nekoma Spur to Jct 5 Langdon

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-001(031)201	75	11

Impact Summary Table

Permanent Impact Summary		Temporary Impacts and additional information	
Wetland Type	**Total Acre(s)**	**WaterType**	**Total Acre(s)**
Natural/JD (Fill/Drain)	0.017	**Temporary Wetland JD**	0.132
Natural/Non-JD (Fill/Drain)	-	**Non-JD Wetland Temporary**	-
Artificial/JD (Fill/Drain)	0.055		
Artificial /Non-JD (Fill/Drain))	-	**Permanent OW**	-
Total	**0.072**	**Temporary OW**	-
JD Natural (Cut)	-	**Permanent OW-d**	-
JD Artificial (Cut)	-	**Temporary OW-d**	-
Non-JD Natural (Cut)	-		
Non-JD Artificial (Cut)	-		
Total	**0.000**		

Mitigation Summary Table

	Location	11990 Bank Acre(s)	
USACE Only	-	-	
EO 11990 Only	Anderson	0.017	
USACE/11990	-	-	
USFWS	-	-	
		Total	**0.017**

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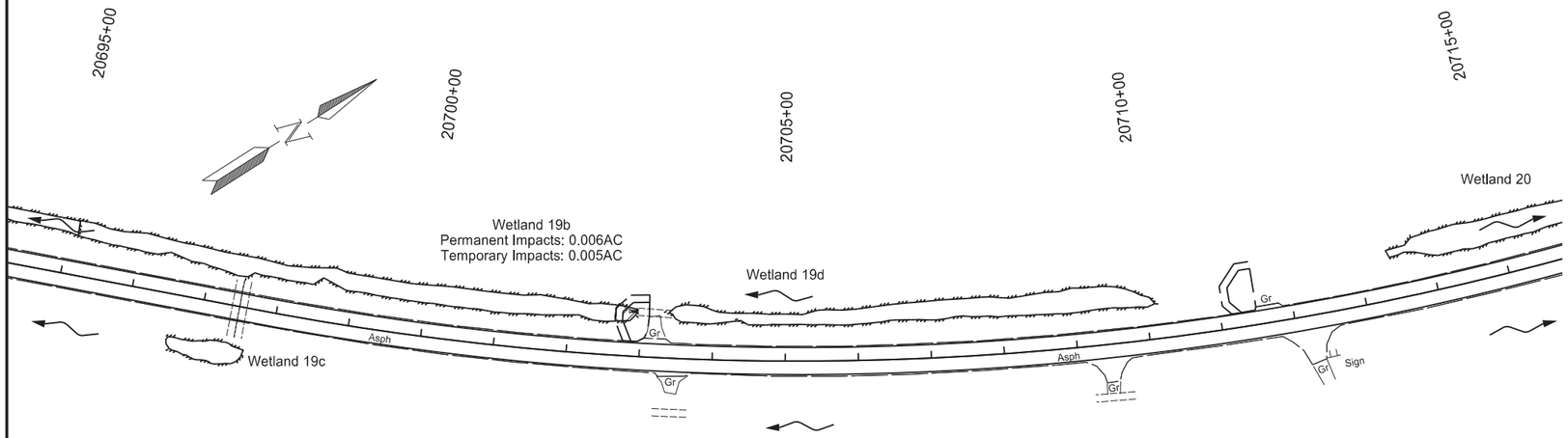
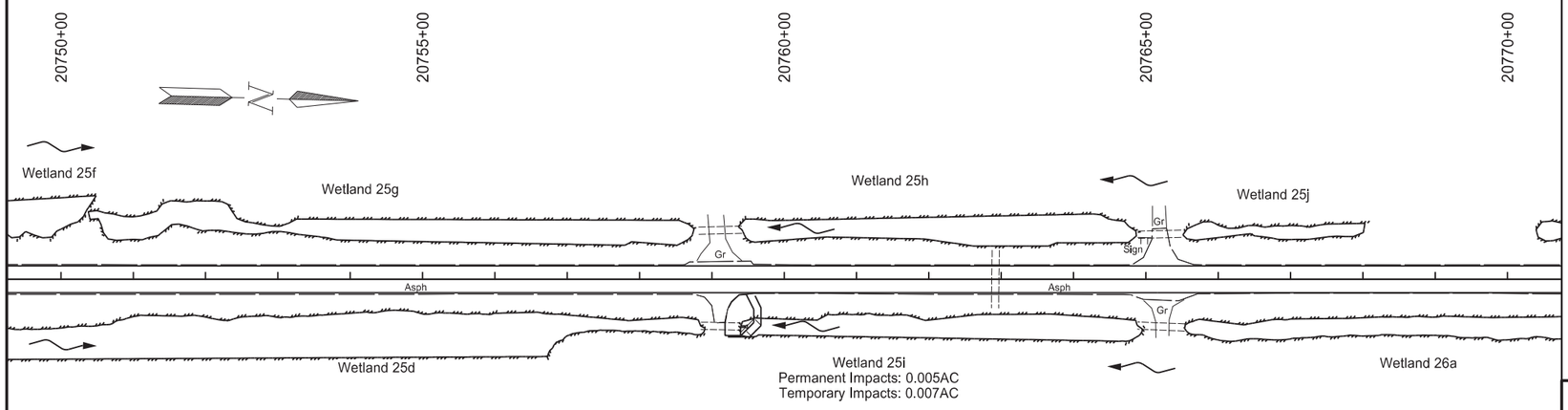
Nekoma Spur to Jct 5 Langdon

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	75	12





Legend

- Temporary Wetland Impact
- Permanent Wetland Impact
- Exst Delineated Wetland

Wetland Impacts

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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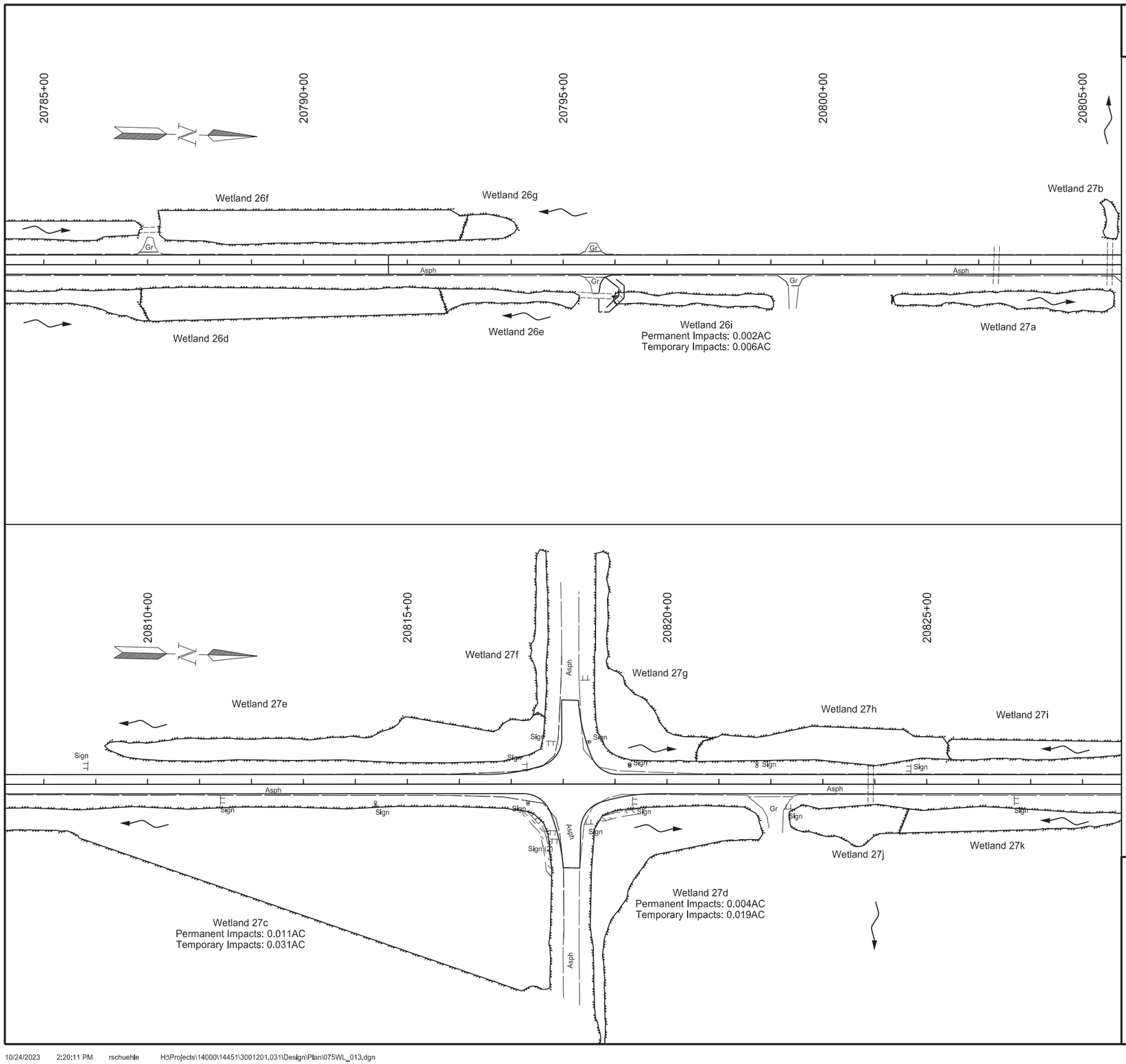
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	75	13



Legend

- Temporary Wetland Impact
- Permanent Wetland Impact
- Exst Delineated Wetland

Wetland Impacts

Structural Improvement
ND Hwy 1

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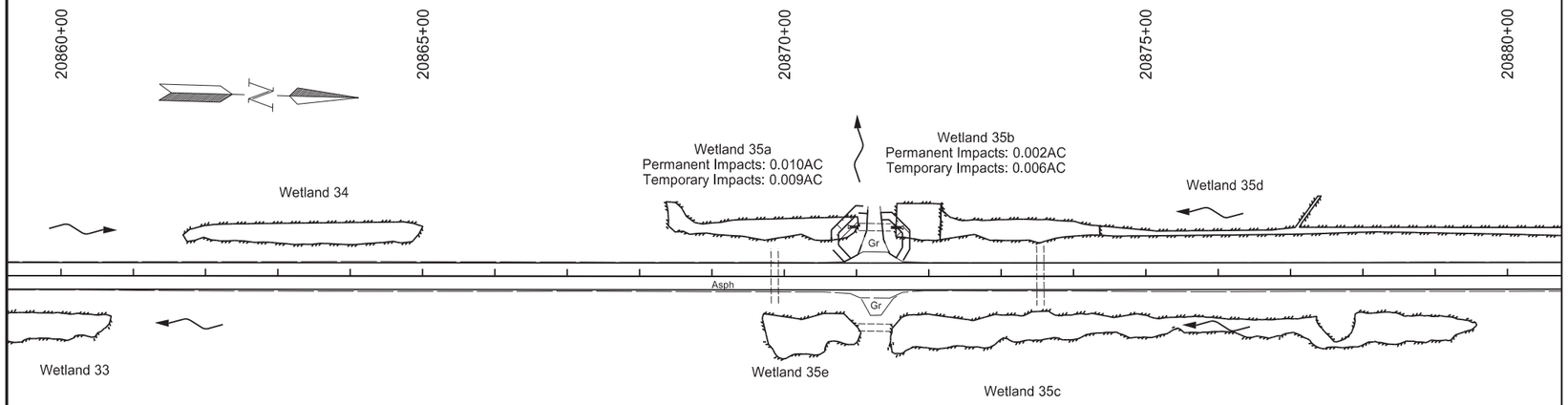
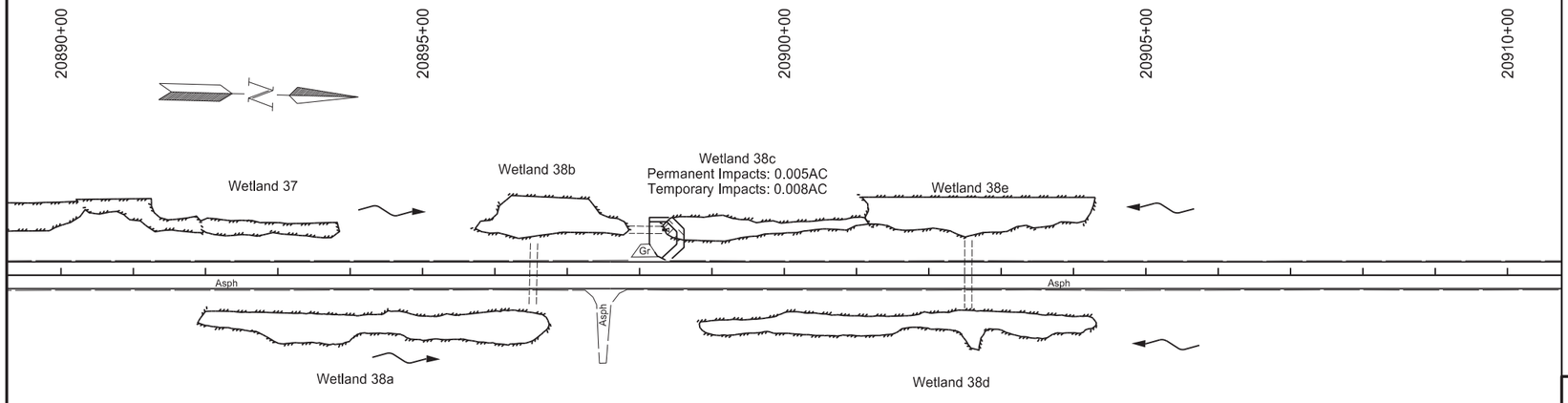
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	75	14





Legend

- Temporary Wetland Impact
- Permanent Wetland Impact
- Exst Delineated Wetland

Wetland Impacts

Structural Improvement
ND Hwy 1

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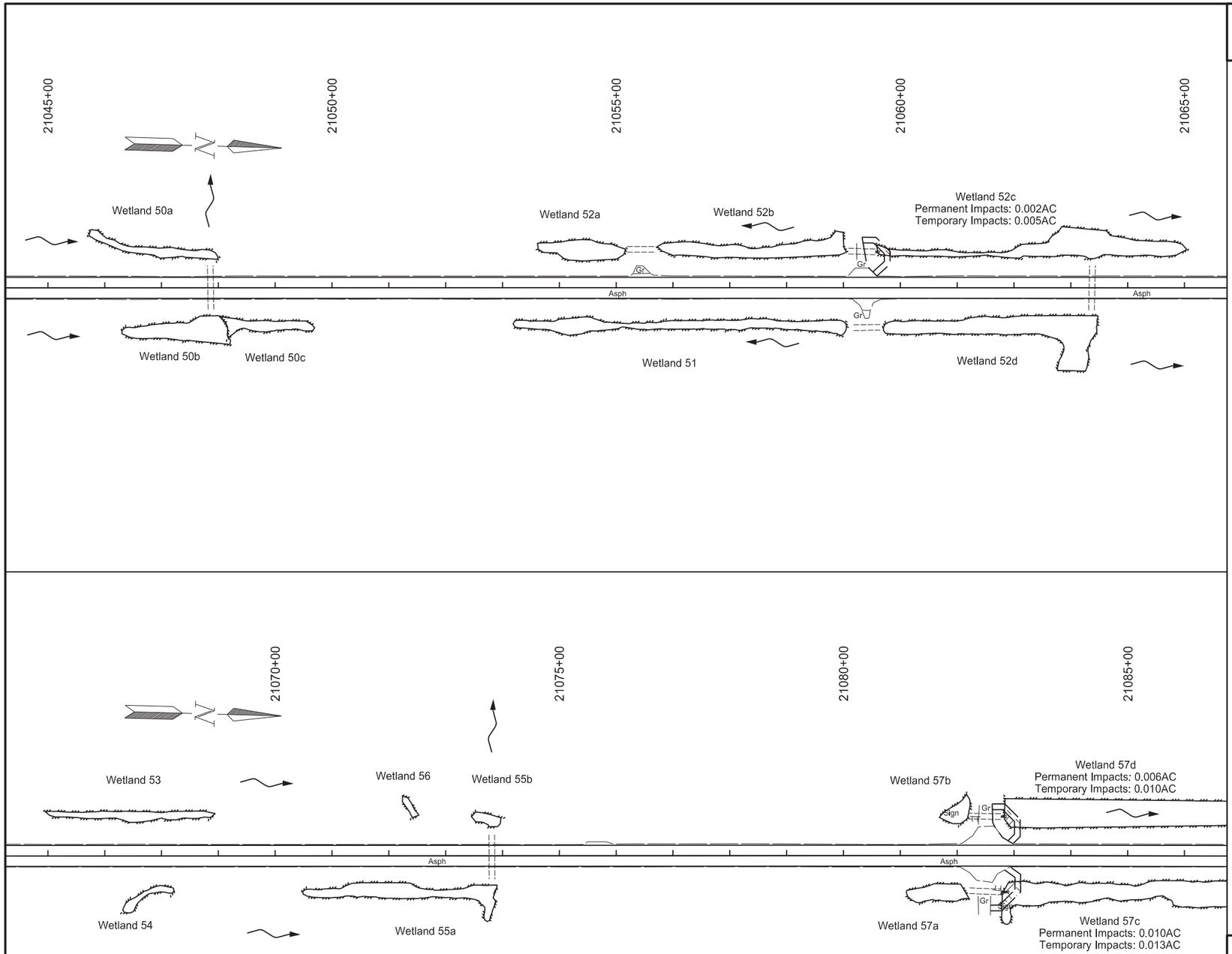
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	75	15



Legend

- Temporary Wetland Impact
- Permanent Wetland Impact
- Exst Delineated Wetland

Wetland Impacts

Structural Improvement
ND Hwy 1

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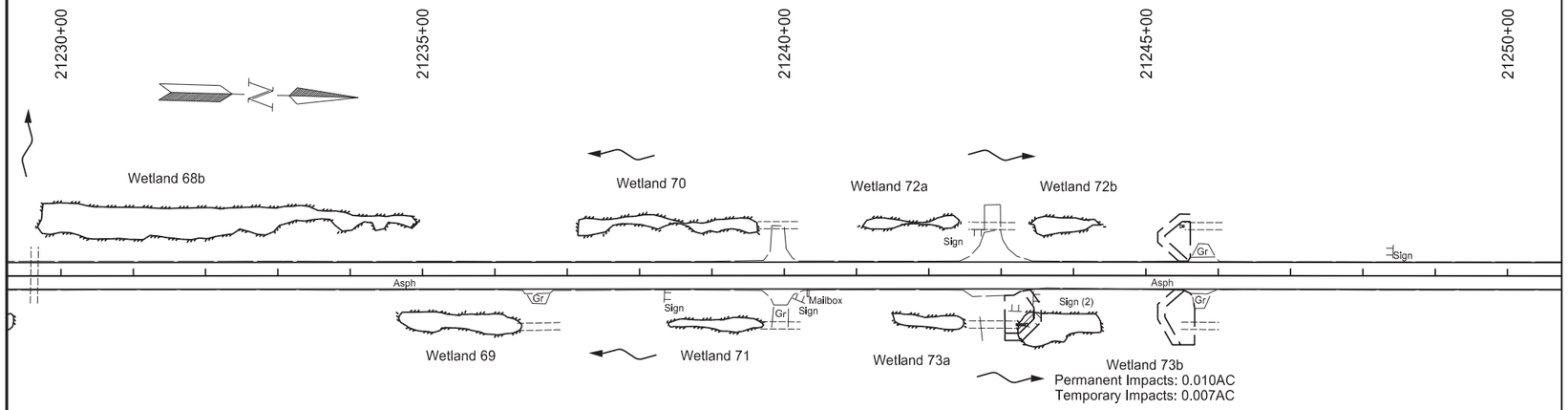
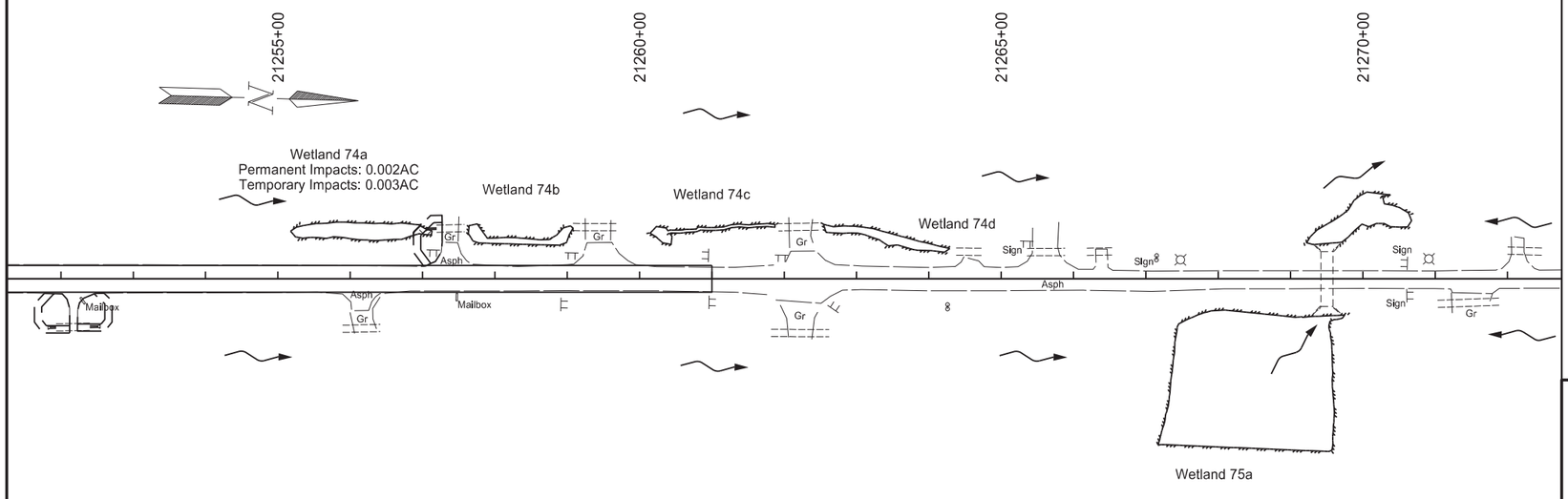
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	75	16





Str# 0001-213.431
Str Type, Double, 8'x6'x76' RCB
Guard Rail, None
Rdwy Width, 24'
West Point, N 647010.51 E 2483582.84
East Point, N 647012.64 E 2483658.73

Legend

- Temporary Wetland Impact
- Permanent Wetland Impact
- Exst Delineated Wetland

Wetland Impacts

Structural Improvement
ND Hwy 1

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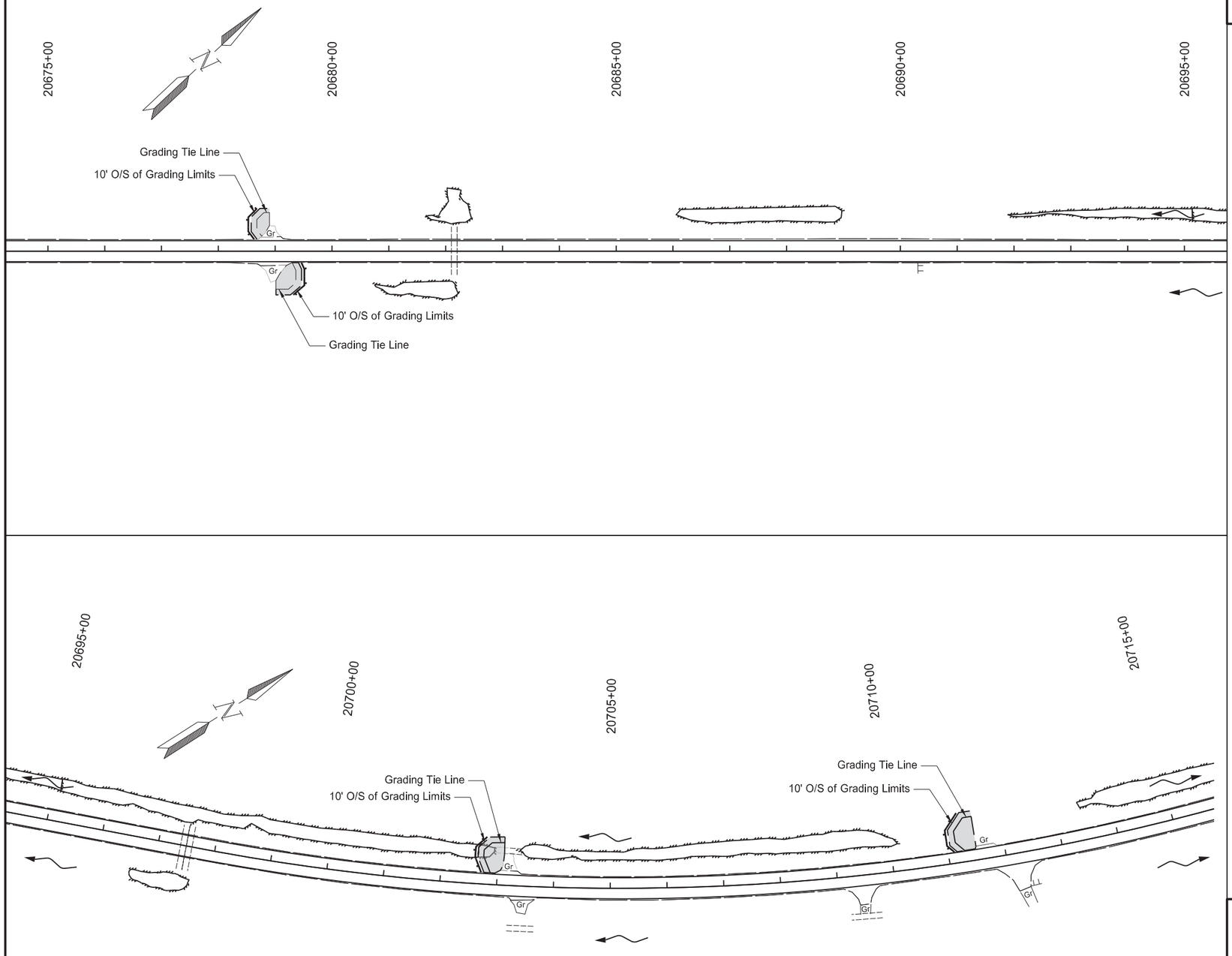
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	76	1



Spec	Code	Item Description	QTY	Unit
251	2000	Temporary Cover Crop		
		Sta 20575+00 to Sta 20715+00	0.19	Acre
253	0101	Straw Mulch		
		Sta 20575+00 to Sta 20715+00	0.19	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 20678+97 LT - Approach Slope	64	LF
		Sta 20679+02 RT - Approach Slope	67	LF
		Sta 20703+23 LT - Approach Slope	74	LF
		Sta 20711+66 LT - Approach Slope	81	LF
		Total	286	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 20678+97 LT - Approach Slope	64	LF
		Sta 20679+02 RT - Approach Slope	67	LF
		Sta 20703+23 LT - Approach Slope	74	LF
		Sta 20711+66 LT - Approach Slope	81	LF
		Total	286	LF

Legend

- Temporary Cover Crop / Mulch
- Fiber Rolls 12IN
- Exst Delineated Wetland

Temporary Erosion Control

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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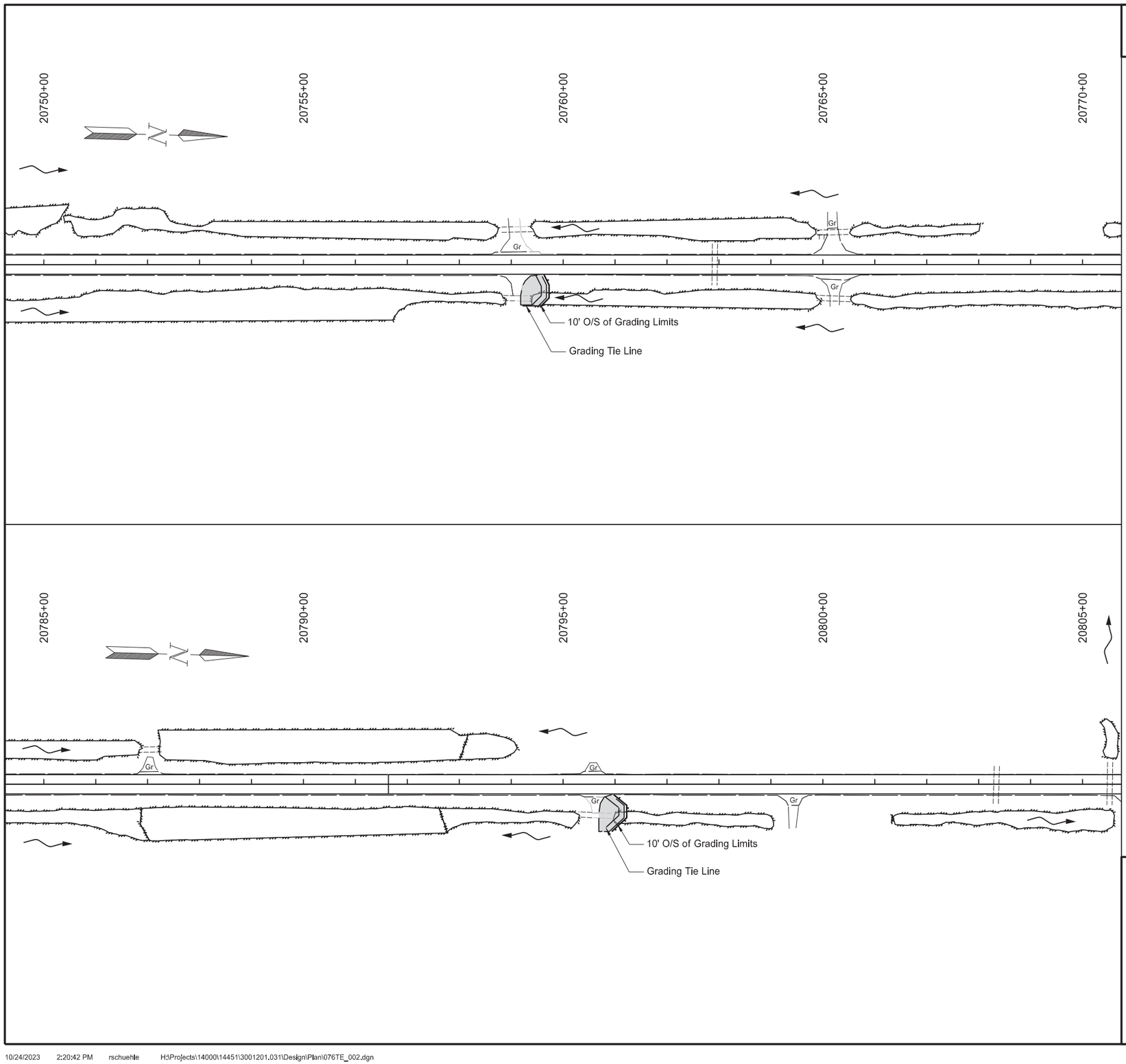
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	76	2



Spec	Code	Item Description	QTY	Unit
251	2000	Temporary Cover Crop		
		Sta 20750+00 to Sta 20805+00	0.12	Acre
253	0101	Straw Mulch		
		Sta 20750+00 to Sta 20805+00	0.12	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 20659+18 RT - Approach Slope	69	LF
		Sta 20695+67 RT - Approach Slope	96	LF
		Total	165	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 20659+18 RT - Approach Slope	69	LF
		Sta 20695+67 RT - Approach Slope	96	LF
		Total	165	LF

Legend

- Temporary Cover Crop / Mulch
- Fiber Rolls 12IN
- Exst Delineated Wetland

Temporary Erosion Control

Structural Improvement
ND Hwy 1

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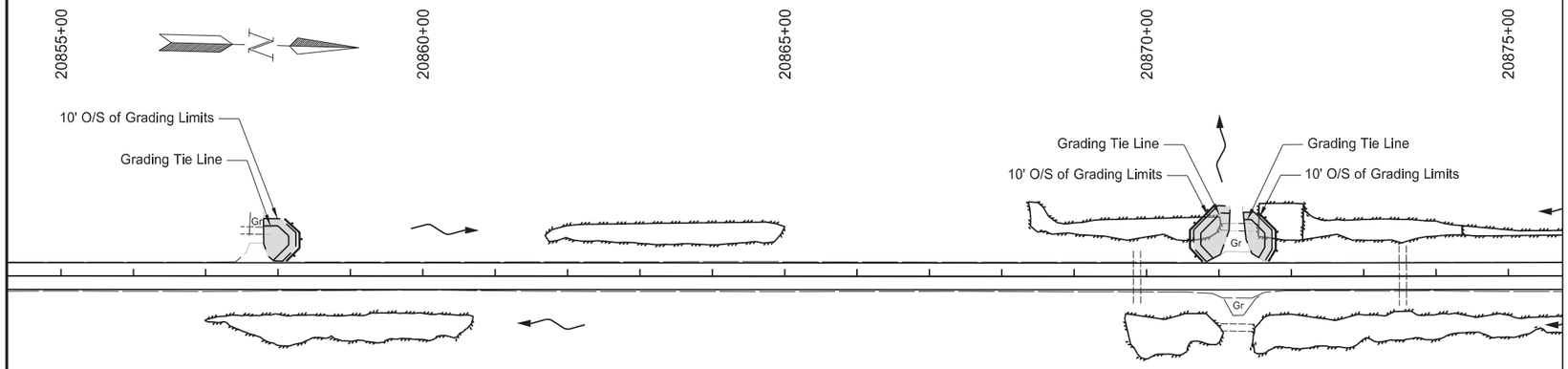
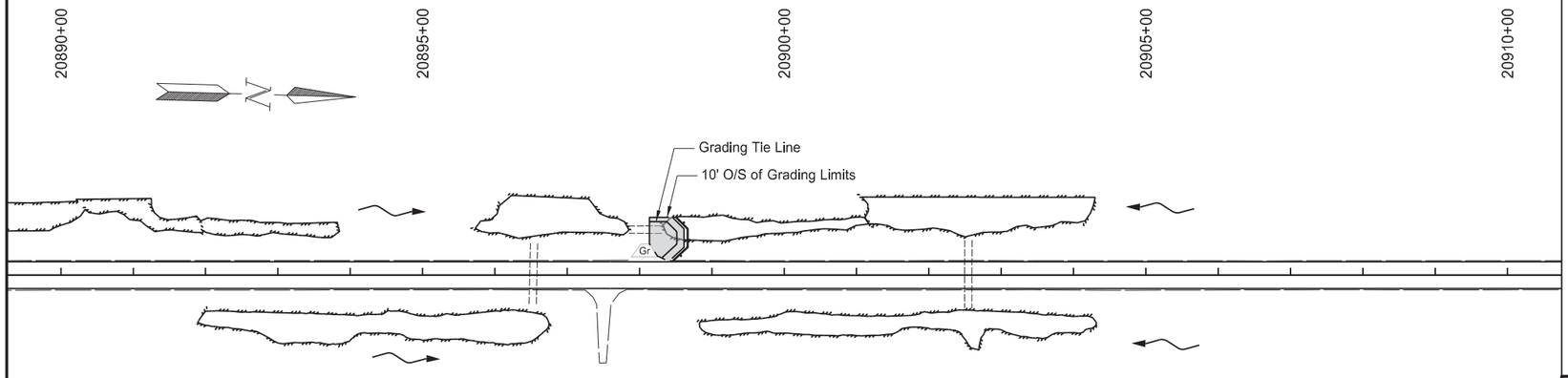
	ND	NH-3-001(031)201	76	3





Spec	Code	Item Description	QTY	Unit
251	2000	Temporary Cover Crop		
		Sta 20855+00 to Sta 20910+00	0.21	Acre
253	0101	Straw Mulch		
		Sta 20855+00 to Sta 20910+00	0.21	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 20857+75 LT - Approach Slope	76	LF
		Sta 20871+31 LT - Approach Slope	180	LF
		Sta 20898+14 LT - Approach Slope	75	LF
		Total	331	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 20857+75 LT - Approach Slope	76	LF
		Sta 20871+31 LT - Approach Slope	180	LF
		Sta 20898+14 LT - Approach Slope	75	LF
		Total	331	LF

Legend

- Temporary Cover Crop / Mulch
- Fiber Rolls 12IN
- Exst Delineated Wetland

Temporary Erosion Control

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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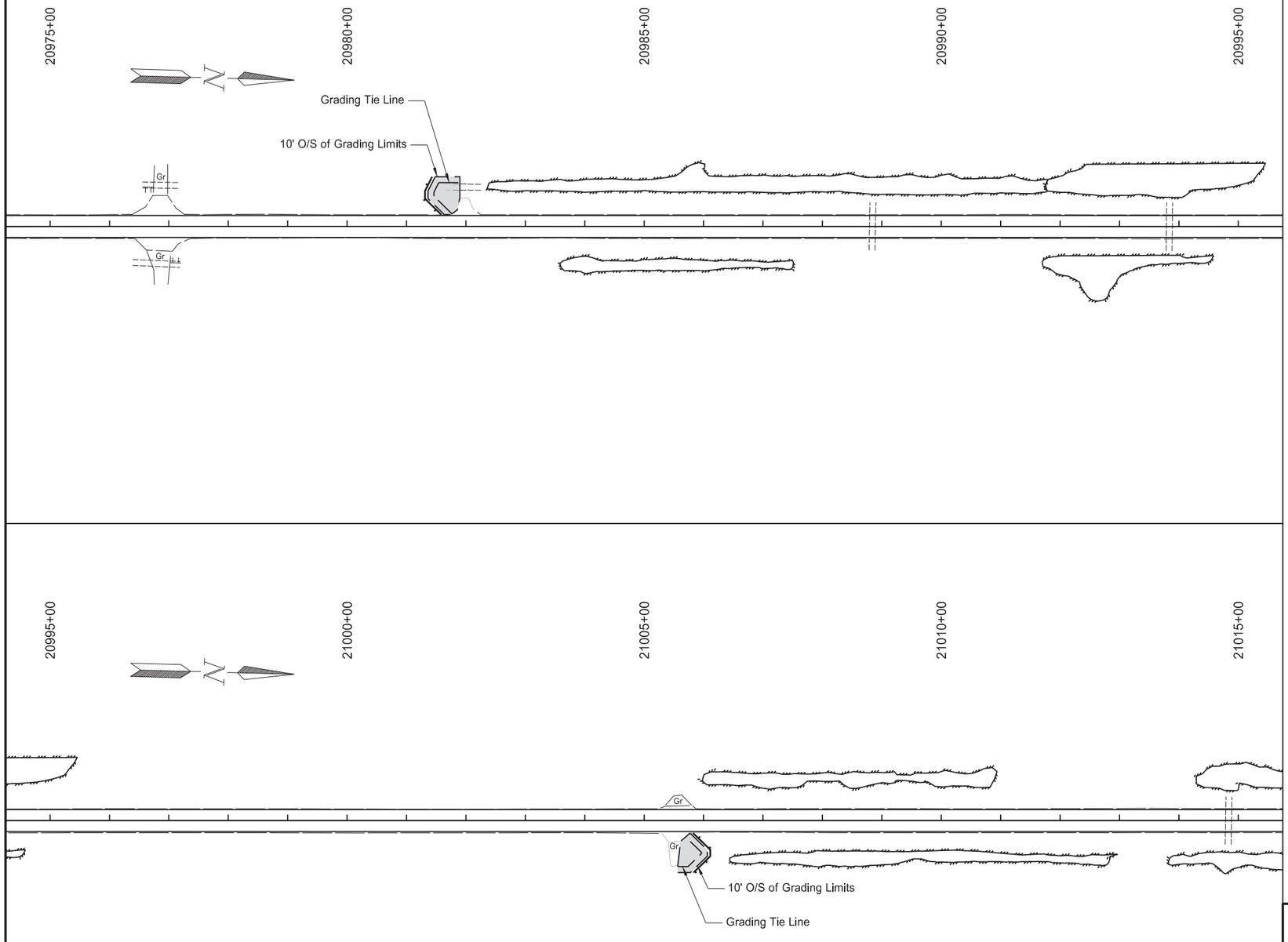
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	76	4



Spec	Code	Item Description	QTY	Unit
251	2000	Temporary Cover Crop		
		Sta 20975+00 to Sta 21015+00	0.12	Acre
253	0101	Straw Mulch		
		Sta 20975+00 to Sta 21015+00	0.12	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 20982+01 LT - Approach Slope	78	LF
		Sta 21005+58 RT - Approach Slope	91	LF
		Total	169	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 20982+01 LT - Approach Slope	78	LF
		Sta 21005+58 RT - Approach Slope	91	LF
		Total	169	LF

Legend

- Temporary Cover Crop / Mulch
- Fiber Rolls 12IN
- Exst Delineated Wetland

Temporary Erosion Control

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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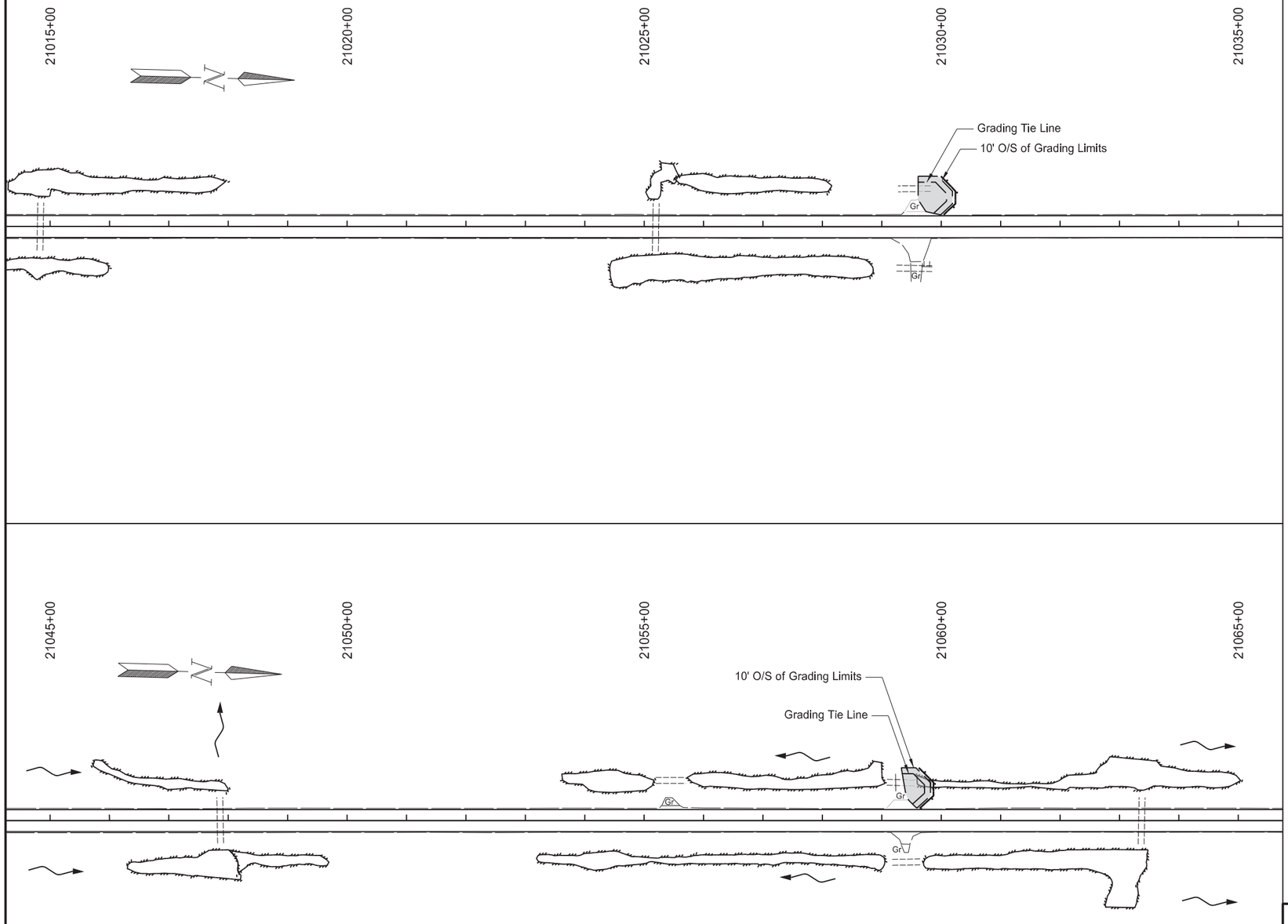
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	76	5



Spec	Code	Item Description	QTY	Unit
251	2000	Temporary Cover Crop		
		Sta 21015+00 to Sta 21065+00	0.12	Acre
253	0101	Straw Mulch		
		Sta 21015+00 to Sta 21065+00	0.12	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 21029+60 LT - Approach Slope	84	LF
		Sta 21059+37 LT - Approach Slope	89	LF
		Total	173	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 21029+60 LT - Approach Slope	84	LF
		Sta 21059+37 LT - Approach Slope	89	LF
		Total	173	LF

Legend

- Temporary Cover Crop / Mulch
- Fiber Rolls 12IN
- Exst Delineated Wetland

Temporary Erosion Control

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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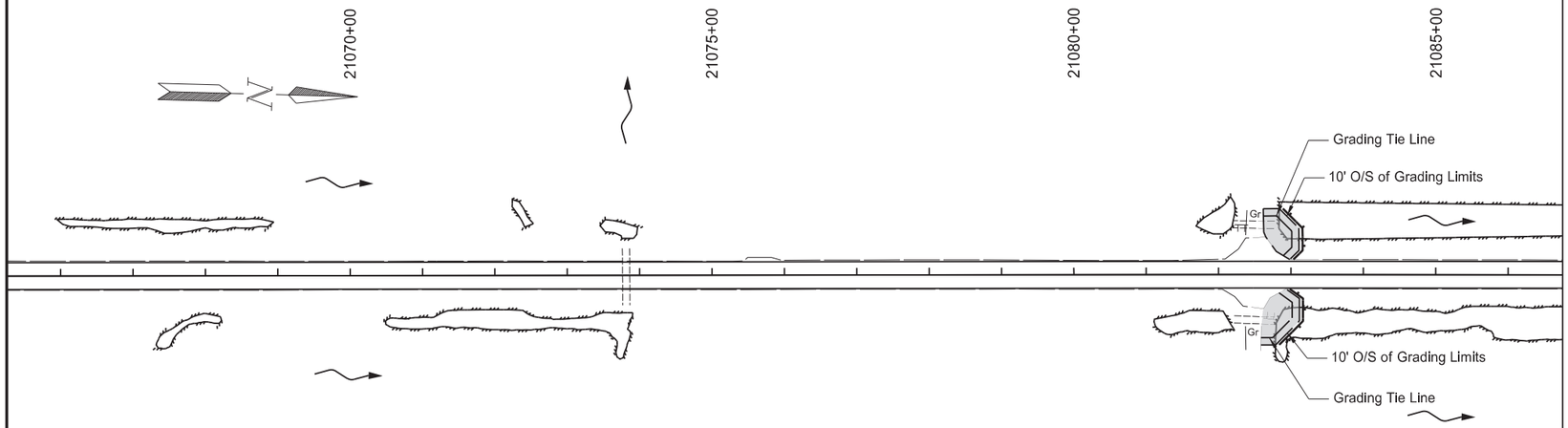
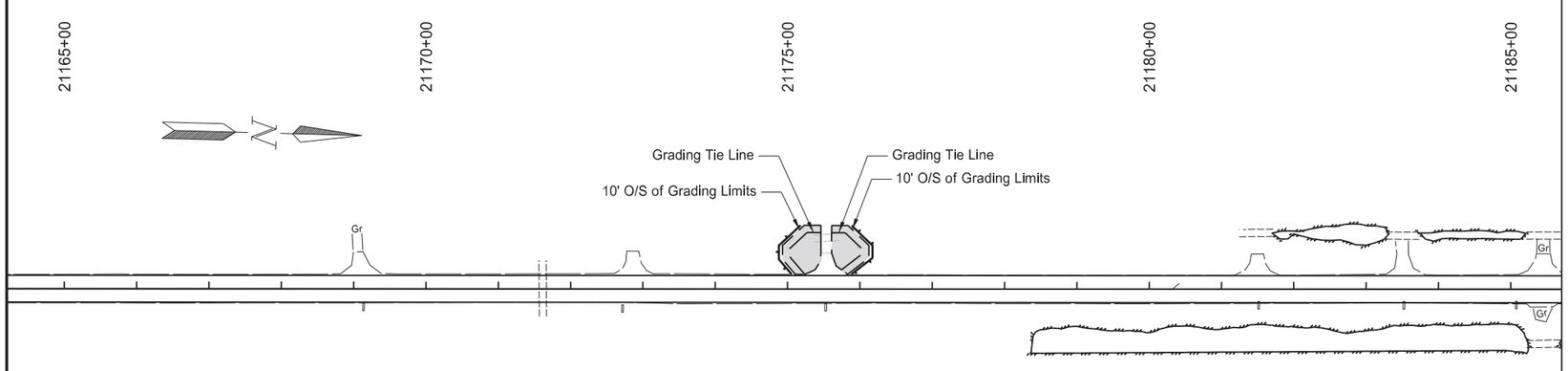
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	76	6





Spec	Code	Item Description	QTY	Unit
251	2000	Temporary Cover Crop		
		Sta 21065+00+00 to Sta 21185+00	0.25	Acre
253	0101	Straw Mulch		
		Sta 21065+00+00 to Sta 21185+00	0.25	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 21082+54 LT - Approach Slope	87	LF
		Sta 21082+55 RT - Approach Slope	100	LF
		Sta 21175+59 LT - Approach Slope	181	LF
		Total	368	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 21082+54 LT - Approach Slope	87	LF
		Sta 21082+55 RT - Approach Slope	100	LF
		Sta 21175+59 LT - Approach Slope	181	LF
		Total	368	LF

Legend

- Temporary Cover Crop / Mulch
- Fiber Rolls 12IN
- Exst Delineated Wetland

Temporary Erosion Control

Structural Improvement
ND Hwy 1

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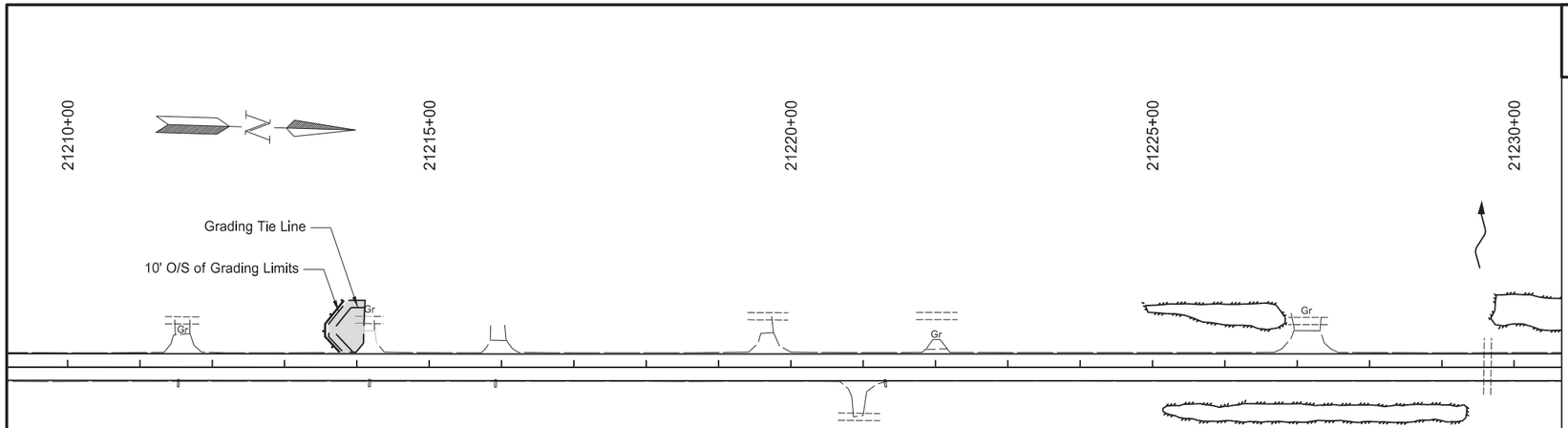
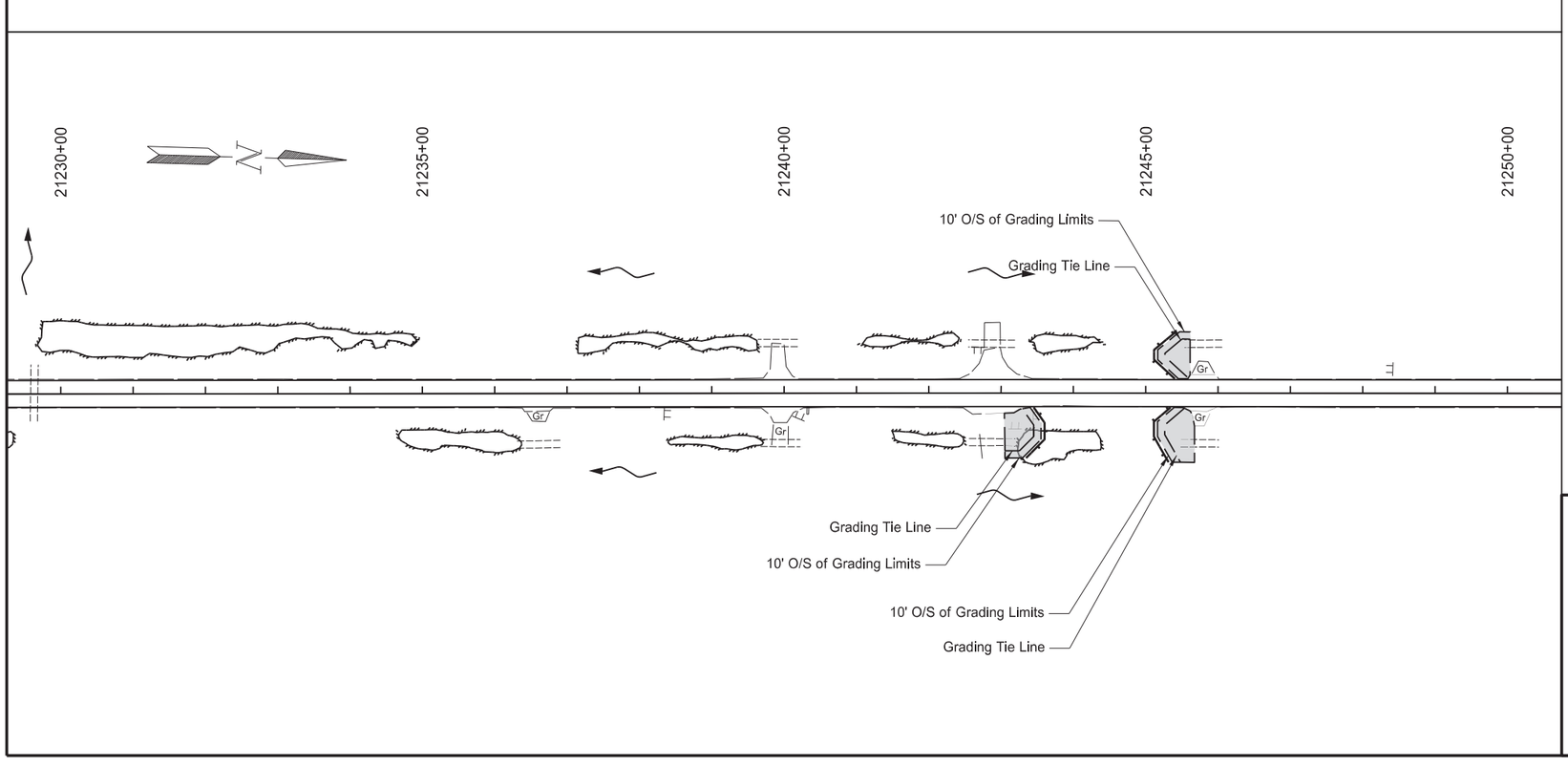
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	76	7





Spec	Code	Item Description	QTY	Unit
251	2000	Temporary Cover Crop		
		Sta 21210+00 to Sta 21250+00	0.25	Acre
253	0101	Straw Mulch		
		Sta 21210+00 to Sta 21250+00	0.25	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 21214+22 LT - Approach Slope	89	LF
		Sta 21242+93 RT - Approach Slope	85	LF
		Sta 212245+80 RT - Approach	92	LF
		Sta 212245+84 LT - Approach Slope	92	LF
		Total	358	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 21214+22 LT - Approach Slope	89	LF
		Sta 21242+93 RT - Approach Slope	85	LF
		Sta 212245+80 RT - Approach	92	LF
		Sta 212245+84 LT - Approach Slope	92	LF
		Total	358	LF

Legend

- Temporary Cover Crop / Mulch
- Fiber Rolls 12IN
- Exst Delineated Wetland

Temporary Erosion Control

Structural Improvement
ND Hwy 1

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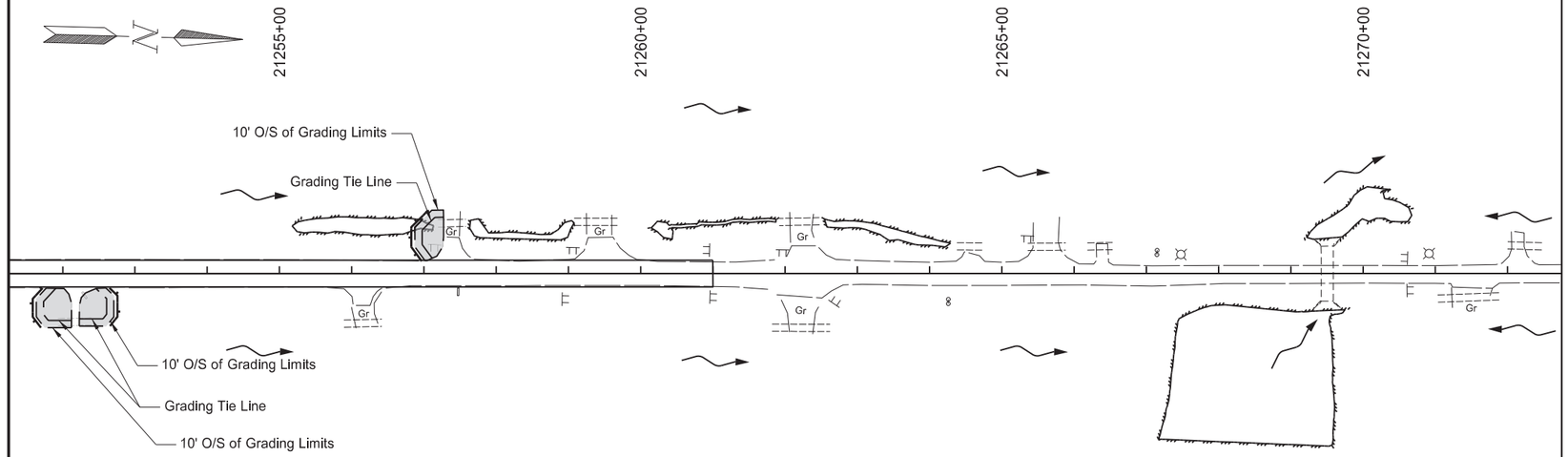

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	76	8

Spec	Code	Item Description	QTY	Unit
251	2000	Temporary Cover Crop		
		Sta 21250+00 to Sta 21270+00	0.16	Acre
253	0101	Straw Mulch		
		Sta 21250+00 to Sta 21270+00	0.16	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 21252+21 RT - Approach Slope	125	LF
		Sta 21257+43 LT - Approach Slope	85	LF
		Total	210	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 21252+21 RT - Approach Slope	125	LF
		Sta 21257+43 LT - Approach Slope	85	LF
		Total	210	LF

Legend

- Temporary Cover Crop / Mulch
- Fiber Rolls 12IN
- Exst Delineated Wetland

Temporary Erosion Control

Structural Improvement
ND Hwy 1

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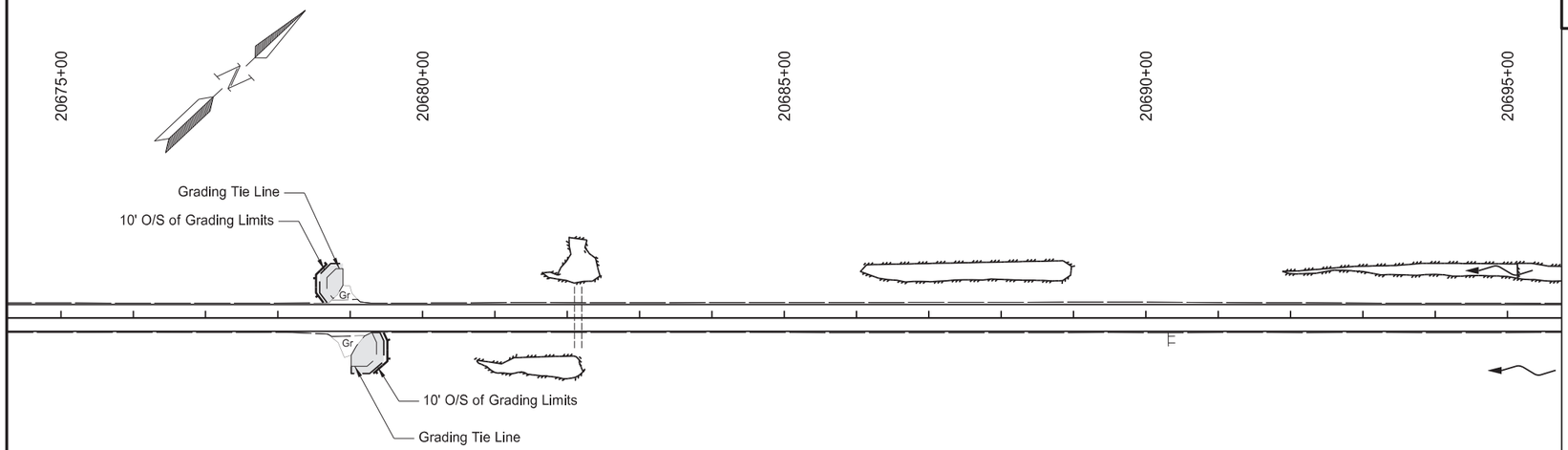
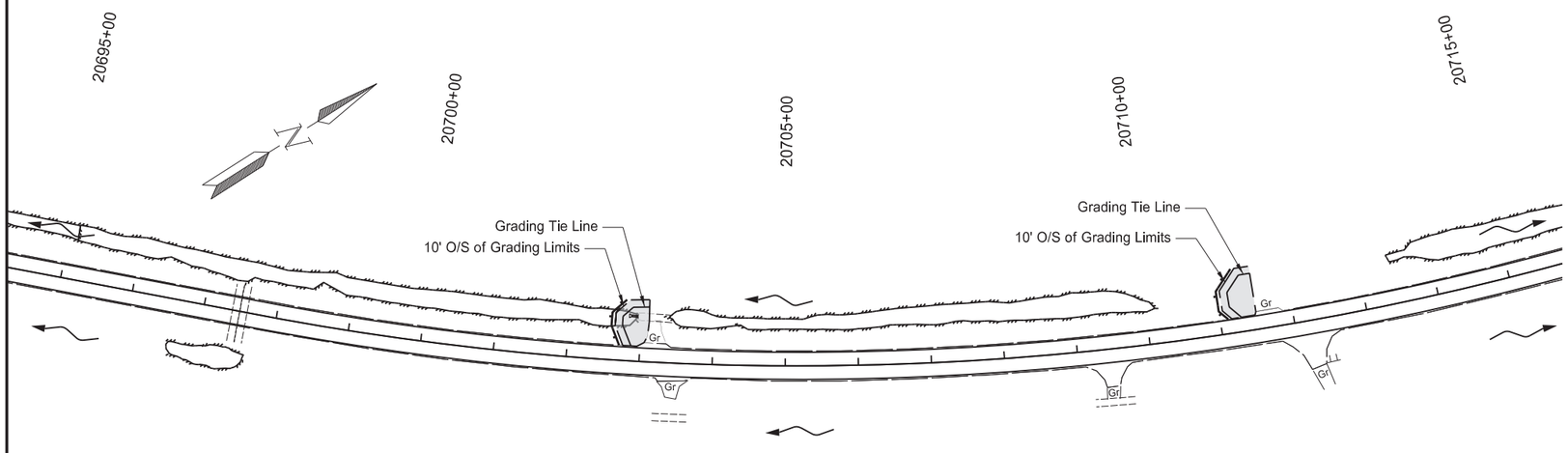
ND	NH-3-001(031)201	77	1





Spec	Code	Item Description	QTY	Unit
251	0200	Seeding Class II		
		Sta 20575+00 to Sta 20715+00	0.19	Acre
253	0101	Straw Mulch		
		Sta 20575+00 to Sta 20715+00	0.19	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 20678+97 LT - Approach Slope	64	LF
		Sta 20679+02 RT - Approach Slope	67	LF
		Sta 20703+23 LT - Approach Slope	74	LF
		Sta 20711+66 LT - Approach Slope	81	LF
		Total	286	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 20678+97 LT - Approach Slope	64	LF
		Sta 20679+02 RT - Approach Slope	67	LF
		Sta 20703+23 LT - Approach Slope	74	LF
		Sta 20711+66 LT - Approach Slope	81	LF
		Total	286	LF

Legend

- Seeding Class II / Mulch
- Fiber Rolls 12IN
- Exst Delineated Wetland

Permanent Erosion Control

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

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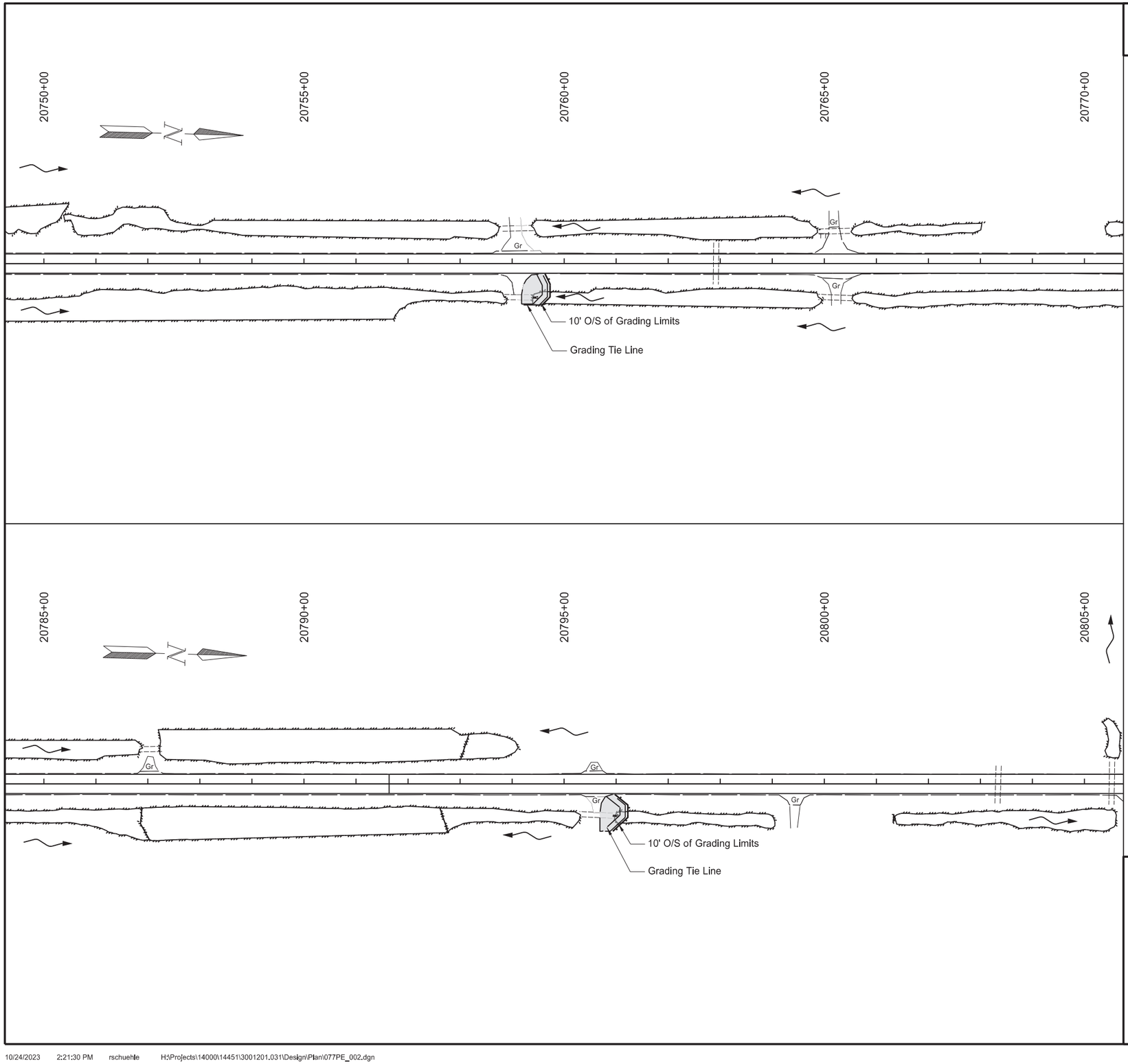
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	77	2



Spec	Code	Item Description	QTY	Unit
251	0200	Seeding Class II		
		Sta 20750+00 to Sta 20805+00	0.12	Acre
253	0101	Straw Mulch		
		Sta 20750+00 to Sta 20805+00	0.12	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 20659+18 RT - Approach Slope	69	LF
		Sta 20695+67 RT - Approach Slope	96	LF
		Total	165	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 20659+18 RT - Approach Slope	69	LF
		Sta 20695+67 RT - Approach Slope	96	LF
		Total	165	LF

Legend

Seeding Class II / Mulch

Fiber Rolls 12IN

Exst Delineated Wetland

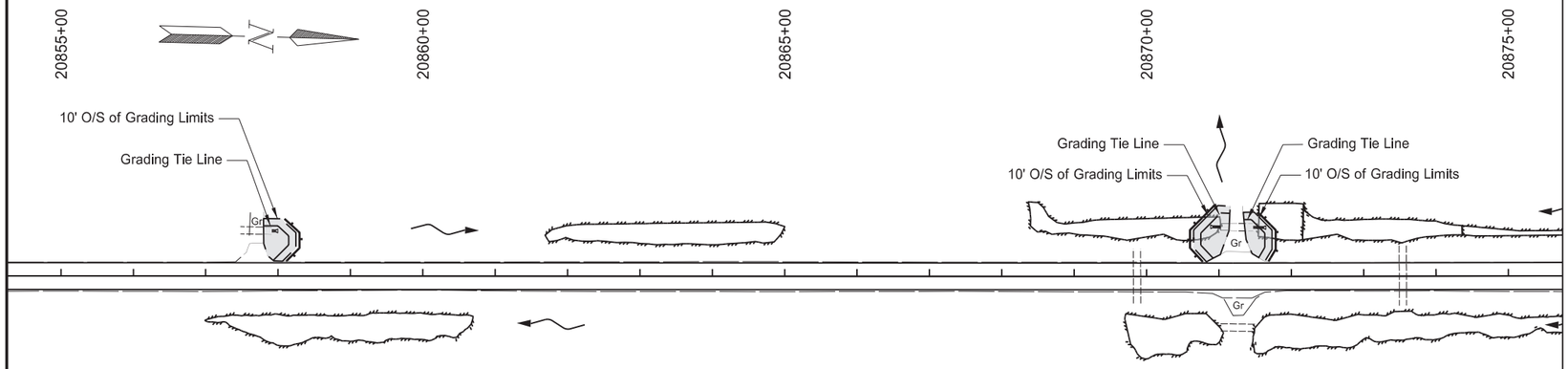
Permanent Erosion Control

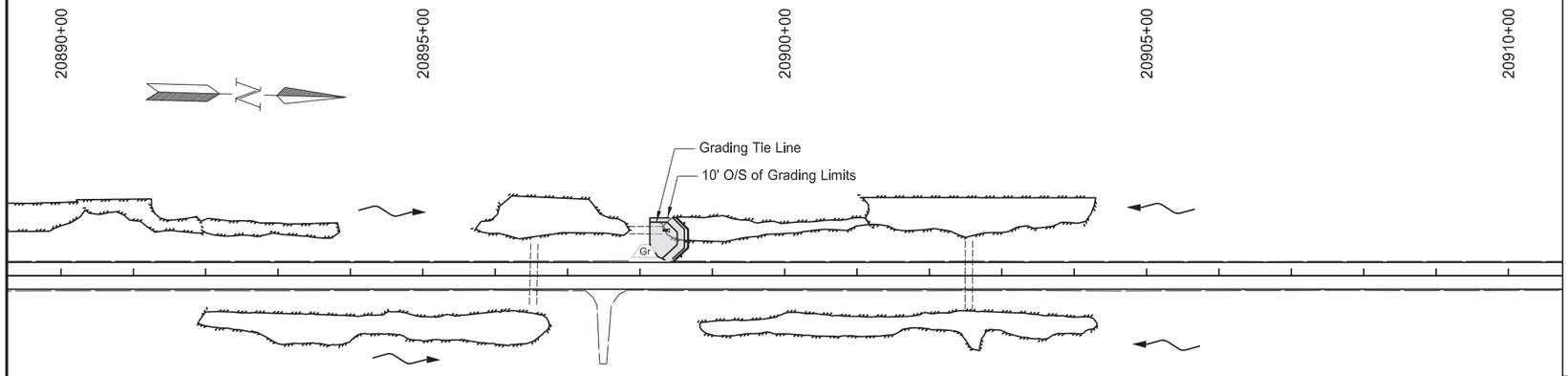
Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	77	3





Spec	Code	Item Description	QTY	Unit
251	0200	Seeding Class II		
		Sta 20855+00 to Sta 20910+00	0.21	Acre
253	0101	Straw Mulch		
		Sta 20855+00 to Sta 20910+00	0.21	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 20857+75 LT - Approach Slope	76	LF
		Sta 20871+31 LT - Approach Slope	180	LF
		Sta 20898+14 LT - Approach Slope	75	LF
		Total	331	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 20857+75 LT - Approach Slope	76	LF
		Sta 20871+31 LT - Approach Slope	180	LF
		Sta 20898+14 LT - Approach Slope	75	LF
		Total	331	LF

Legend

- Seeding Class II / Mulch
- Fiber Rolls 12IN
- Exst Delineated Wetland

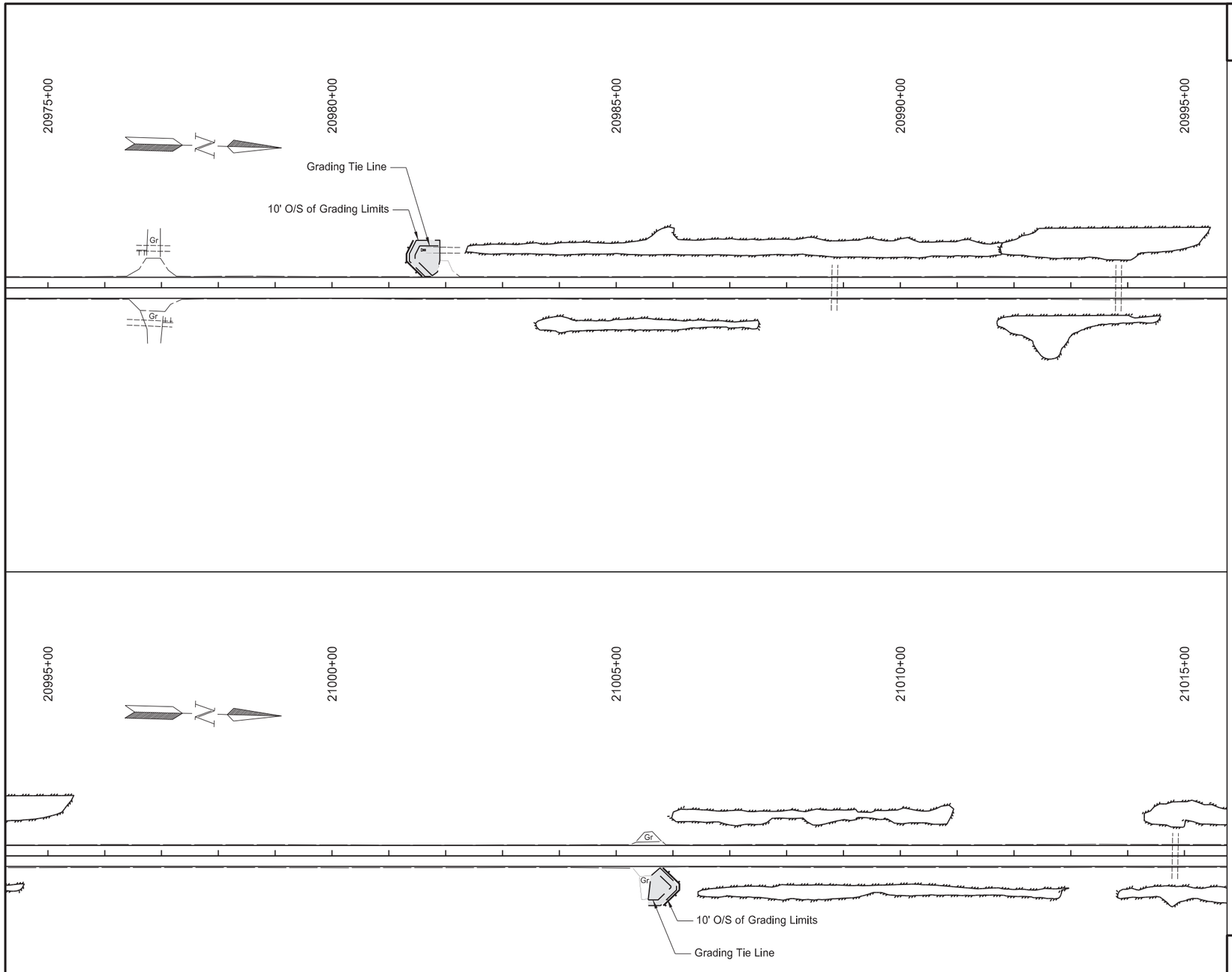
Permanent Erosion Control

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	77	4



Spec	Code	Item Description	QTY	Unit
251	0200	Seeding Class II		
		Sta 20975+00 to Sta 21015+00	0.12	Acre
253	0101	Straw Mulch		
		Sta 20975+00 to Sta 21015+00	0.12	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 20982+01 LT - Approach Slope	78	LF
		Sta 21005+58 RT - Approach Slope	91	LF
		Total	169	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 20982+01 LT - Approach Slope	78	LF
		Sta 21005+58 RT - Approach Slope	91	LF
		Total	169	LF

Legend

- Seeding Class II / Mulch
- Fiber Rolls 12IN
- Exst Delineated Wetland

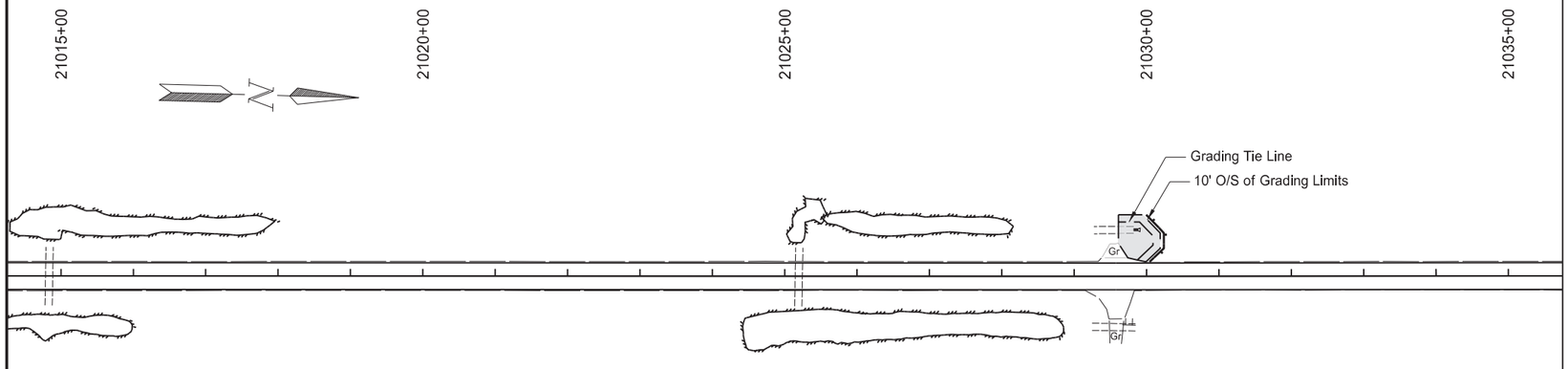
Permanent Erosion Control

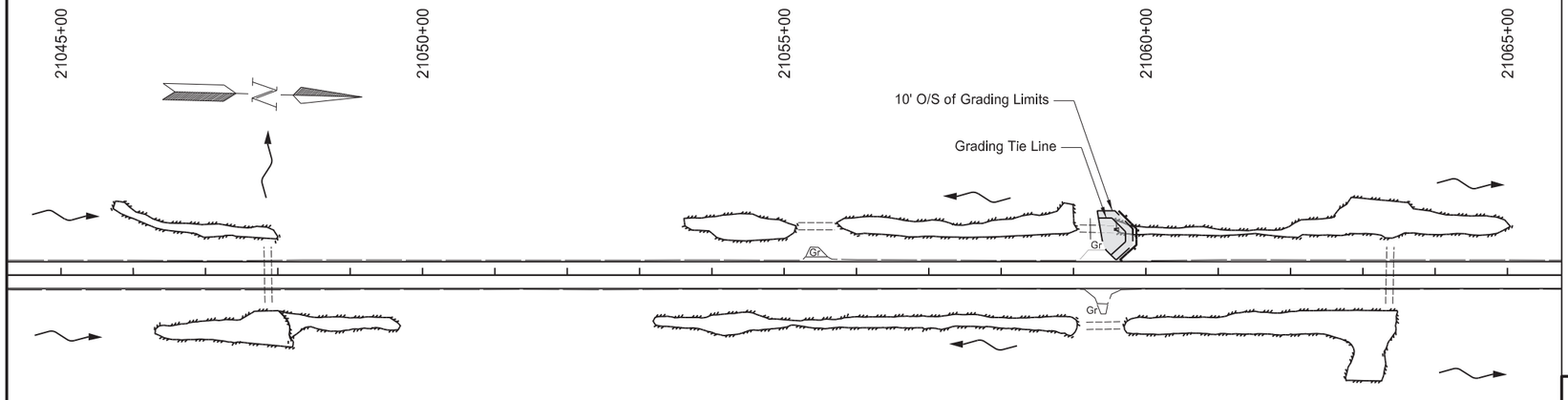
Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	77	5





Spec	Code	Item Description	QTY	Unit
251	0200	Seeding Class II		
		Sta 21015+00 to Sta 21065+00	0.12	Acre
253	0101	Straw Mulch		
		Sta 21015+00 to Sta 21065+00	0.12	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 21029+60 LT - Approach Slope	84	LF
		Sta 21059+37 LT - Approach Slope	89	LF
		Total	173	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 21029+60 LT - Approach Slope	84	LF
		Sta 21059+37 LT - Approach Slope	89	LF
		Total	173	LF

Legend

- Seeding Class II / Mulch
- Fiber Rolls 12IN
- Exst Delineated Wetland

Permanent Erosion Control

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

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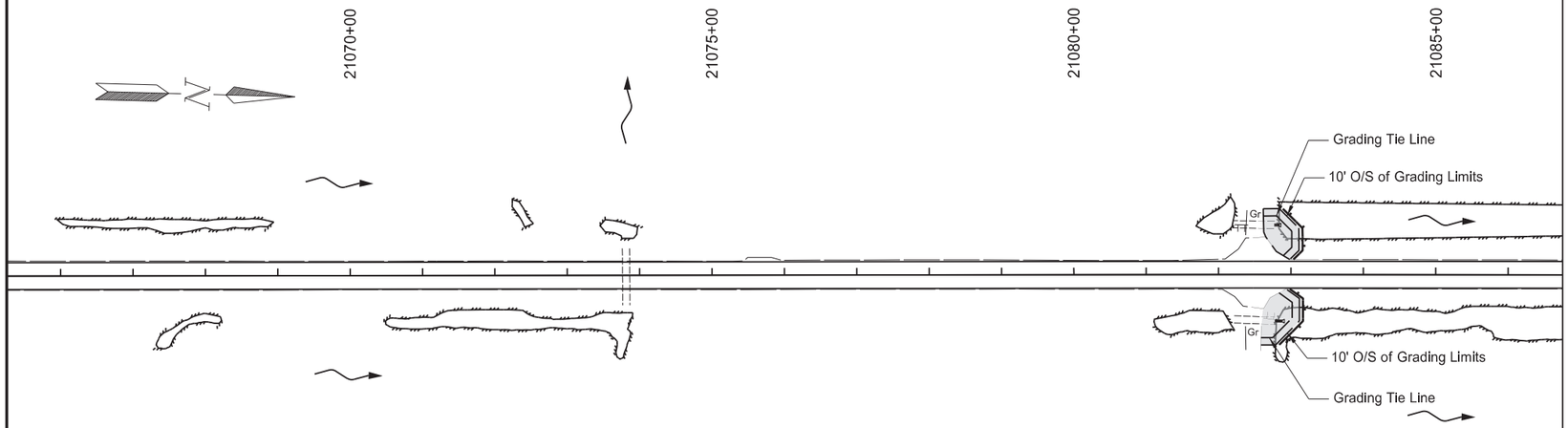
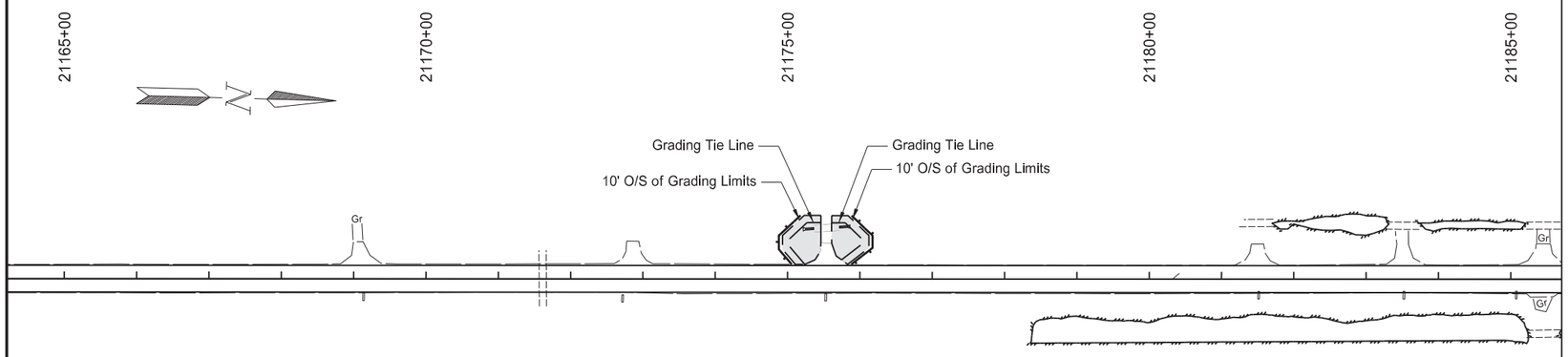
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	77	6





Spec	Code	Item Description	QTY	Unit
251	0200	Seeding Class II		
		Sta 21065+00+00 to Sta 21185+00	0.25	Acre
253	0101	Straw Mulch		
		Sta 21065+00+00 to Sta 21185+00	0.25	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 21082+54 LT - Approach Slope	87	LF
		Sta 21082+55 RT - Approach Slope	100	LF
		Sta 21175+59 LT - Approach Slope	181	LF
		Total	368	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 21082+54 LT - Approach Slope	87	LF
		Sta 21082+55 RT - Approach Slope	100	LF
		Sta 21175+59 LT - Approach Slope	181	LF
		Total	368	LF

Legend

- Seeding Class II / Mulch
- Fiber Rolls 12IN
- Exst Delineated Wetland

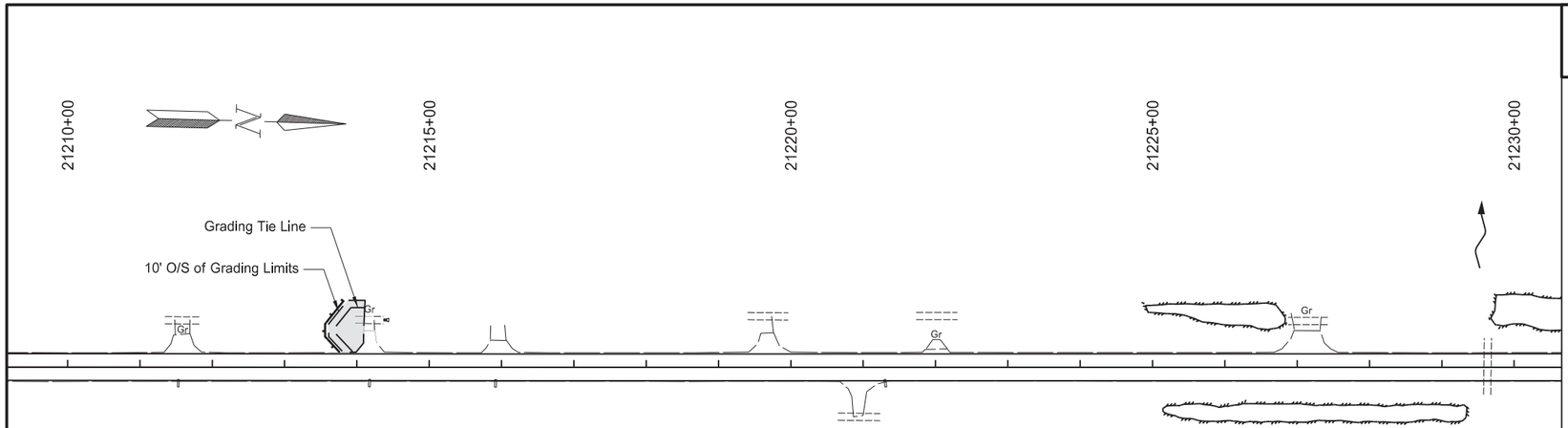
Permanent Erosion Control

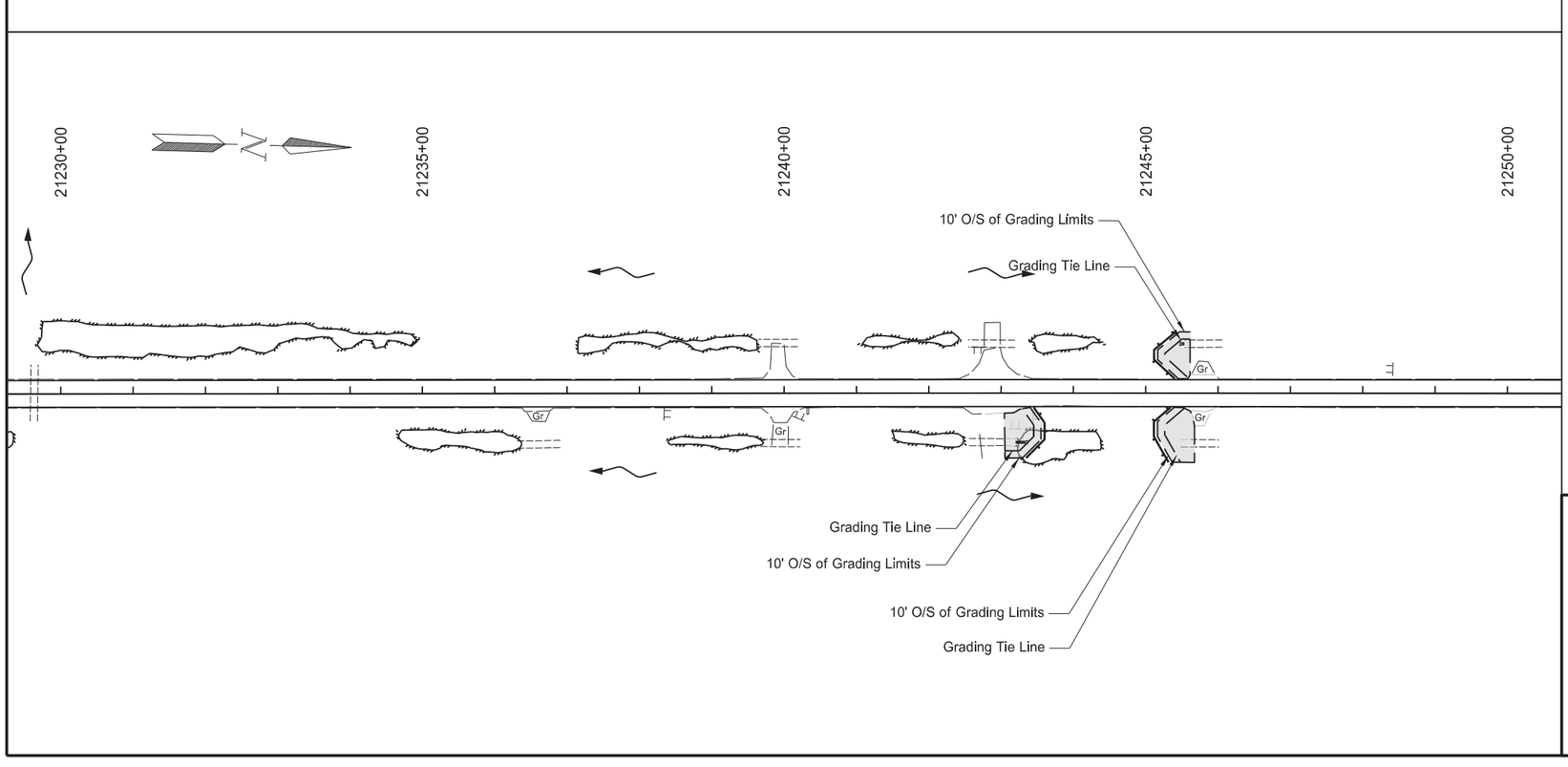
Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	77	7





Spec	Code	Item Description	QTY	Unit
251	0200	Seeding Class II		
		Sta 21210+00 to Sta 21250+00	0.25	Acre
253	0101	Straw Mulch		
		Sta 21210+00 to Sta 21250+00	0.25	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 21214+22 LT - Approach Slope	89	LF
		Sta 21242+93 RT - Approach Slope	85	LF
		Sta 2245+80 RT - Approach Slope	92	LF
		Sta 2245+84 LT - Approach Slope	92	LF
		Total	358	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 21214+22 LT - Approach Slope	89	LF
		Sta 21242+93 RT - Approach Slope	85	LF
		Sta 2245+80 RT - Approach Slope	92	LF
		Sta 2245+84 LT - Approach Slope	92	LF
		Total	358	LF

Legend

- Seeding Class II / Mulch
- Fiber Rolls 12IN
- Exst Delineated Wetland

Permanent Erosion Control

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

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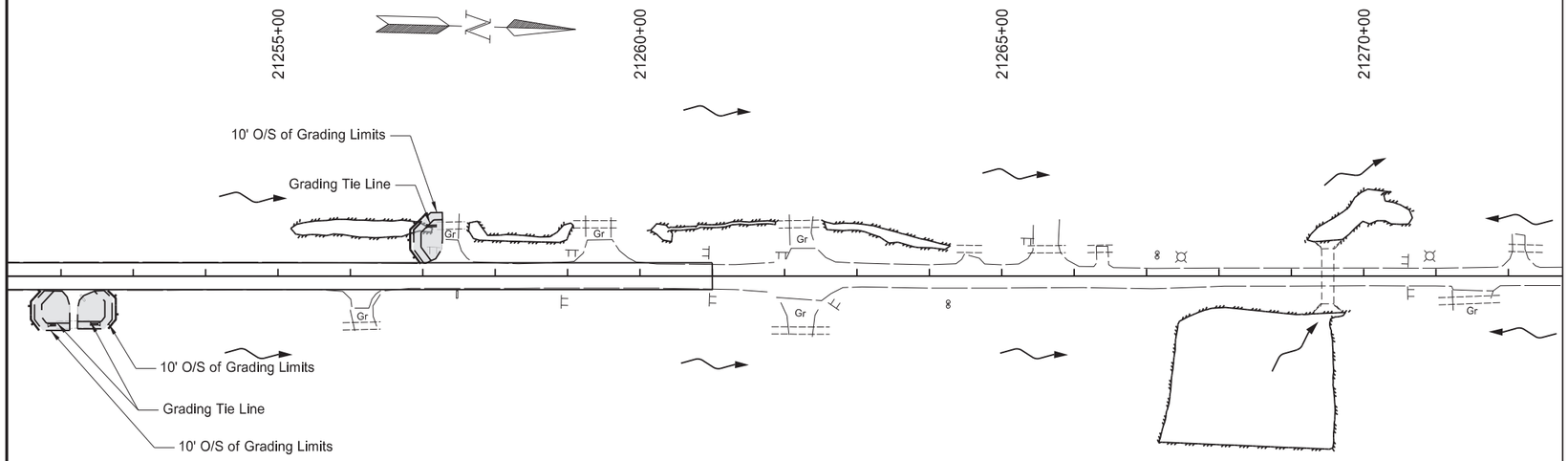

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	77	8

Spec	Code	Item Description	QTY	Unit
251	0200	Seeding Class II		
		Sta 21250+00 to Sta 21270+00	0.16	Acre
253	0101	Straw Mulch		
		Sta 21250+00 to Sta 21270+00	0.16	Acre
261	0112	Fiber Rolls 12 IN		
		Sta 21252+21 RT - Approach Slope	125	LF
		Sta 257+43 LT - Approach Slope	85	LF
		Total	210	LF
261	0113	Remove Fiber Rolls 12 IN		
		Sta 21252+21 RT - Approach Slope	125	LF
		Sta 257+43 LT - Approach Slope	85	LF
		Total	210	LF

Legend

Seeding Class II / Mulch

Fiber Rolls 12IN

Exst Delineated Wetland

Permanent Erosion Control

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - ND1 NEKOMA TO JCT 5 LANGDON

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	81	1

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
Chain EX_ND1			
Begin/Sec Line	10587+93.59	580728.4431	2480981.9539
1/4 SC	10614+34.09	583368.0333	2480912.8034
PC C10	10626+17.76	584551.3015	2480881.9742
PI C10	10640+92.56	586025.6039	2480843.5623
PT C10	10654+15.76	587099.3809	2481854.5262
PC C20	10697+82.30	590278.5811	2484847.7519
PI C20	10714+12.76	591465.6834	2485965.4119
PT C20	10728+75.02	593095.5233	2485920.7674
1/4 SC	10738+85.13	594105.2460	2485893.1091
Sec Line	10765+21.60	596740.7369	2485821.1263
1/4 SC	10791+69.15	599387.3006	2485749.0245
PI	10810+18.31	602035.4797	2485676.7164
PI	10818+19.20	602036.3694	2485676.6921
Sec Line	10818+44.20	602061.3601	2485676.0097
1/4 SC	10844+84.27	604700.5243	2485606.7532
Sec Line	10871+24.60	607339.9375	2485537.1996
1/4 SC	10897+65.29	609979.5697	2485462.4896
Sec Line	10924+05.71	612618.9289	2485387.8127
1/4 SC	10950+49.71	615261.9403	2485315.5769
Sec Line	10976+92.87	617904.1107	2485243.2512
1/4 SC	11003+28.78	620539.0596	2485172.0035
Sec Line	11029+63.77	623173.0915	2485100.9718
1/4 SC	11056+09.11	625817.3720	2485026.0928
Sec Line	11082+53.94	628461.1465	2484951.4309
PC C30	11107+75.65	630982.0347	2484887.1237
PI C30	11115+03.88	631710.0284	2484868.5528
PT C30	11122+14.84	632380.1253	2484583.4436
PC C40	11130+02.21	633104.6464	2484275.1784
PI C40	11137+22.78	633767.6993	2483993.0663
PT C40	11144+26.62	634487.9611	2483971.9032
1/4 SC	11163+75.55	636436.0548	2483914.6635
Sec Line	11190+14.28	639073.8189	2483843.4398
1/4 SC	11216+54.23	641712.7021	2483768.4438

NOTES: Sheet 1 of 2

This is part of project #3-001(031)201 and 3-001(033)200

CURVE DATA

ARC DEFINITION

C10

PI Sta = 10640+92.56

Delta = 44° 00' 00" (RT)

Da = 1° 36' 00"

R = 3,581.0959

T = 1,474.8027

L = 2,798.0024

C20

PI Sta = 10714+12.76

Delta = 44° 50' 36" (LT)

Da = 1° 27' 00"

R = 3,951.5401

T = 1,630.4526

L = 3,092.7221

C30

PI Sta = 11115+03.88

Delta = 21° 35' 14" (LT)

Da = 1° 30' 00"

R = 3,819.8292

T = 728.2305

L = 1,439.1909

C40

PI Sta = 11137+22.78

Delta = 21° 21' 56" (RT)

Da = 1° 30' 00"

R = 3,819.8305

T = 720.5737

L = 1,424.4088

Date Survey Completed 9 /29/21

US PUBLIC LAND SURVEY DATA

CORNER	IRN	NORTHING	EASTING
T-159-N R-60-W			
SE Cor Sec 21	7-J	580728.44	2480981.95
E 1/4 Cor Sec 21	7-H	583368.03	2480912.80
SW Cor Sec 15	7-G	586013.80	2480843.87
S 1/4 Cor Sec 15	8-G	586095.51	2483475.04
SE Cor Sec 15	9-G	586177.52	2486106.31
E 1/4 Cor Sec 15	9-F	588823.48	2486035.81
SE Cor Sec 10	9-E	591469.45	2485965.31
E 1/4 Cor Sec 10	9-D	594105.25	2485893.11
SE Cor Sec 3	9-C	596740.74	2485821.13
E 1/4 Cor Sec 3	9-B	599387.30	2485749.02
T-160-N R-60-W			
SE Cor Sec 34	9-N	602061.36	2485676.01
E 1/4 Cor Sec 34	9-M	604700.52	2485606.75
SE Cor Sec 27	9-L	607339.94	2485537.20
E 1/4 Cor Sec 27	9-K	609979.57	2485462.49
SE Cor Sec 22	9-J	612618.93	2485387.81
E 1/4 Cor Sec 22	9-H	615261.94	2485315.58
SE Cor Sec 15	9-G	617904.11	2485243.25
E 1/4 Cor Sec 15	9-F	620539.06	2485172.00
SE Cor Sec 10	9-E	623173.09	2485100.97
E 1/4 Cor Sec 10	9-D	625817.37	2485026.09
SE Cor Sec 3	9-C	628461.15	2484951.43
E 1/4 Cor Sec 3	9-B	631101.88	2484884.07
NE Cor Sec 3	9-A	633807.95	2484813.89

☐ Assumed Coordinates

☒ All coordinates on this sheet are Cavalier County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota North Zone Combination Factor (cf) = 0.9999340

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET
MONUMENT DESCRIPTION					

PRIMARY CONTROL

GPS 100	578628.05	2480981.16	1609.69	Outside of alignment	
#5 Rebar W / Pink Cap Stamped "WSN Control"					
GPS 101	593449.52	2485841.37	1638.81	10732+31.06	69.68 Lt
#5 Rebar W / Pink Cap Stamped "WSN Control"					
GPS 102	610015.35	2485384.09	1632.03	10898+03.27	77.36 Lt
#5 Rebar W / Pink Cap Stamped "WSN Control"					
GPS 103	625752.74	2484950.03	1620.86	11055+46.65	77.86 Lt
#5 Rebar W / Pink Cap Stamped "WSN Control"					
GPS 104	642162.57	2483830.40	1630.57	11221+02.14	74.73 Rt
#5 Rebar W / Pink Cap Stamped "WSN Control"					
GPS 105	650503.05	2483607.34	1611.13	Outside of alignment	
#5 Rebar W / Pink Cap Stamped "WSN Control"					

REFERENCE MARKERS

R Mkr #	NORTHING	EASTING	STATION	O/S	ALIGNMENT
R MKR 201	583239.33	2480941.32	10613+04.68	25' RT	EX_ND1
R MKR 202	587919.79	2482677.41	10665+77.16	37' RT	EX_ND1
R MKR 203	592095.86	2485856.60	10718+75.71	35' RT	EX_ND1
R MKR 204	597371.71	2485837.51	10771+51.89	34' RT	EX_ND1
R MKR 205	602635.92	2485694.48	10824+18.08	34' RT	EX_ND1
R MKR 206	607926.34	2485556.43	10877+10.22	36' RT	EX_ND1
R MKR 207	613186.82	2485405.59	10929+72.90	33' RT	EX_ND1
R MKR 208	618463.22	2485261.44	10982+51.28	33' RT	EX_ND1
R MKR 209	623742.02	2485117.37	11035+32.00	32' RT	EX_ND1
R MKR 210	629014.56	2484970.18	11088+06.69	33' RT	EX_ND1
R MKR 211	634147.05	2484027.34	11140+81.05	30' RT	EX_ND1
R MKR 213	644705.78	2483716.69	11246+47.60	33' RT	EX_ND1

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

INITIALIZING BENCH MARK
NDGPS Stations (VRS)

☒ NAVD-88

☐ _____

☐ GEOID12B ☐ _____

☒ GEOID18

Christopher D. Jordheim, PLS, VP

Digitally signed by Christopher D. Jordheim, PLS, VP
DN: C=US, E=chris.jordheim@widseth.com, O=Widseth, CN="Christopher D. Jordheim, PLS, VP"
Reason: I attest to the accuracy and integrity of this document
Date: 2023.02.22 09:37:34-06'00'

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - ND1 NEKOMA TO JCT 5 LANGDON

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	81	2

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
Sec Line	11242+94.09	644351.4942	2483693.3249
1/4 SC	11269+31.50	646987.9122	2483621.1281
End / Sec Line (Calc)	11295+68.93	649624.3732	2483549.6393

CURVE DATA

ARC DEFINITION

US PUBLIC LAND SURVEY DATA

CORNER	IRN	NORTHING	EASTING
T-161-N R-60-W			
SE Cor Sec 35	11-N	633786.61	2483992.51
E 1/4 Cor Sec 35	11-M	636436.05	2483914.66
SE Cor Sec 26	11-L	639073.82	2483843.44
E 1/4 Cor Sec 26	11-K	641712.70	2483768.44
SE Cor Sec 23	11-J	644351.49	2483693.32
E 1/4 Cor Sec 23	11-H	646987.91	2483621.13
NE Cor Sec 23	11-G	649624.37	2483549.64

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET	MONUMENT DESCRIPTION

NOTES: Sheet 2 of 2

This is part of project #3-001(031)201 and 3-001(033)200

Date Survey Completed 9 /29/21

☐ Assumed Coordinates

☒ All coordinates on this sheet are Cavalier County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota North Zone Combination Factor (cf) = 0.9999340

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

INITIALIZING BENCH MARK
NDGPS Stations (VRS)

☒ NAVD-88

☐ _____

☐ GEOID12B ☐ _____

☒ GEOID18

Christopher D. Jordheim, PLS, VP

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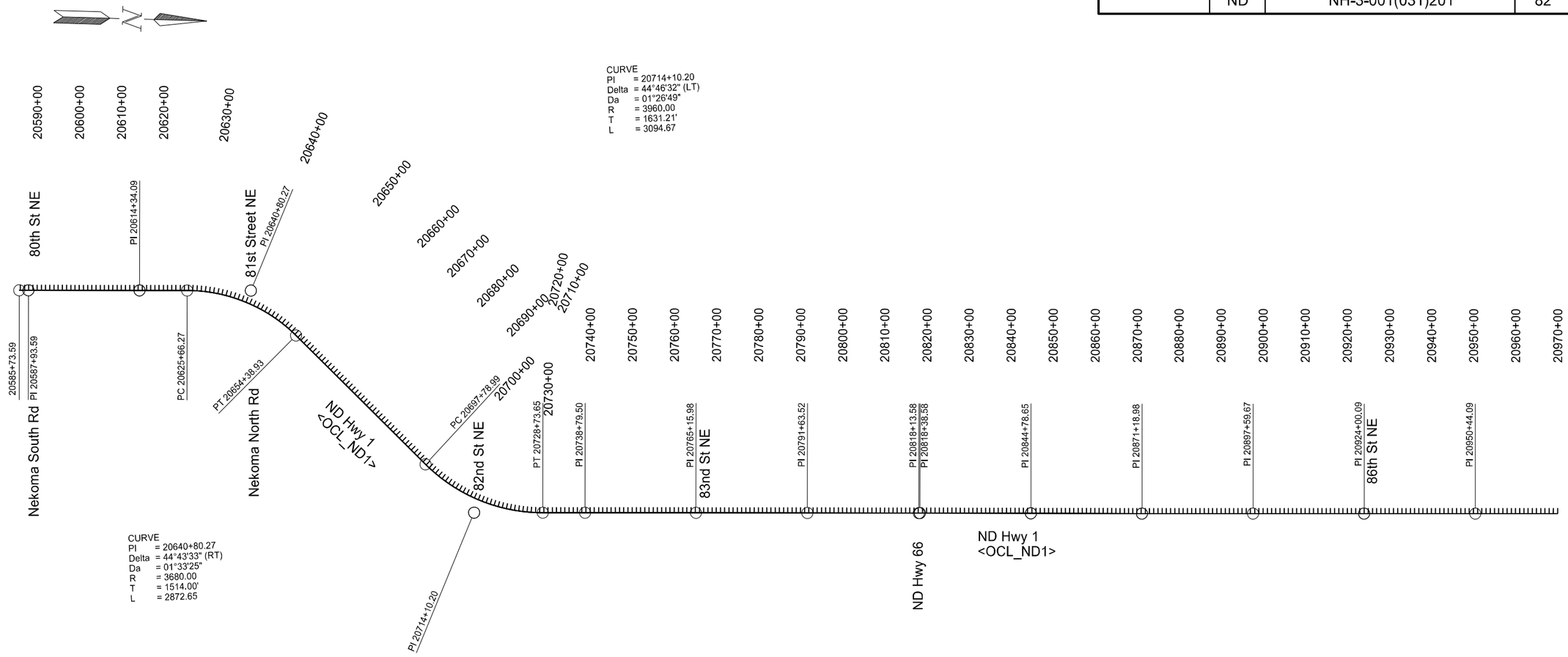
DN: C=US, E=chris.jordheim@widseth.com, O=Widseth, CN="Christopher D. Jordheim, PLS, VP"
Reason: I attest to the accuracy and integrity of this document
Date: 2023.02.22 09:37:52-06'00'

2/20/2023 10:30:45 AM JButler H:\Projects\14000\14451\3001201.031\Design\Plan\081CD_002.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	82	1



Design Alignment Description
OCL_ND1

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

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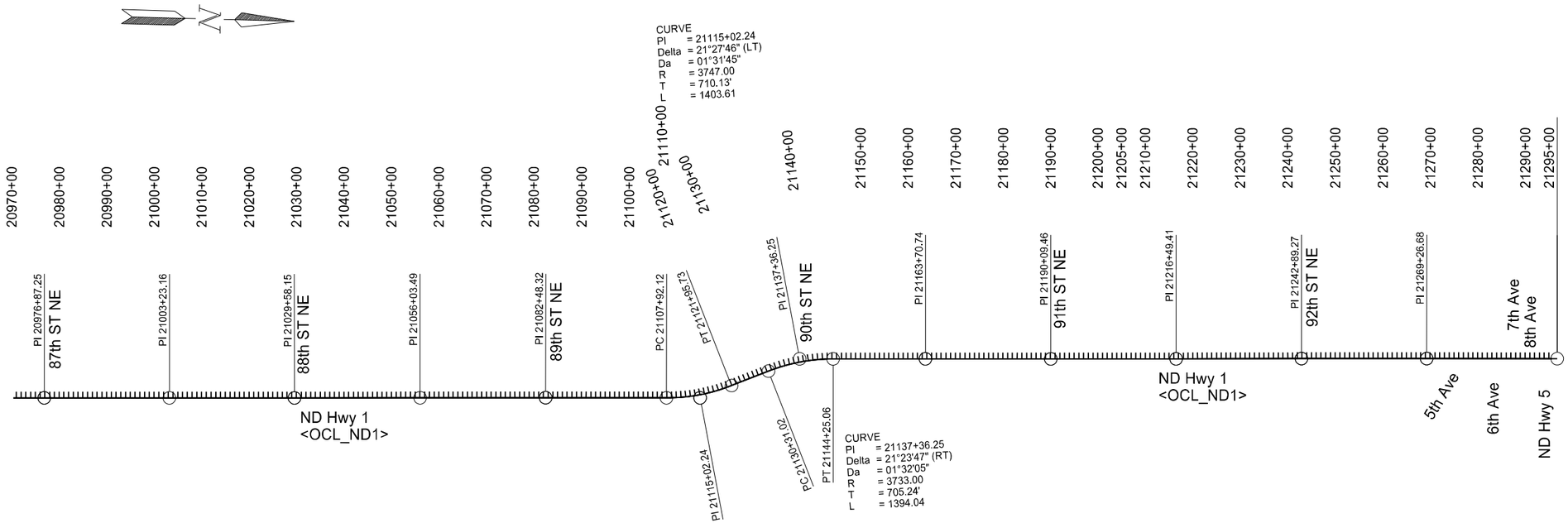
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	82	2



Alignment OCL_ND1

Element	Point	Station	Northing	Easting
Line	POB	2058573.590	580508.516	2480987.617
	CPI	2058793.590	580728.443	2480981.954
Line	CPI	2058793.590	580728.443	2480981.954
	CPI	2061434.087	583367.982	2480910.829
LIne	CPI	2061434.087	583367.982	2480910.829
	PC	2062566.275	584499.772	2480880.813
Curve	PC	2062566.275	584499.772	2480880.813
	CPI	2064080.273	586013.238	2480840.674
	PT	2065438.926	587116.776	2481877.203
Line	PT	2065438.923	587116.776	2481877.203
	PC	2069778.988	590280.205	2484848.541
Curve	PC	2069778.988	590280.205	2484848.541
	CPI	2071410.195	591469.177	2485965.316
	PT	2072873.655	593099.773	2485920.651
Line	PT	2072873.665	593099.773	2485920.651
	CPI	2073879.504	594105.246	2485893.109
Line	CPI	2073879.504	594105.246	2485893.109
	CPI	2076515.978	596740.737	2485821.126
LIne	CPI	2076515.978	596740.737	2485821.126
	CPI	2079163.524	599387.301	2485749.024
Line	CPI	2079163.524	599387.301	2485749.024
	CPI	2081813.580	602036.369	2485676.692
Line	CPI	2081813.580	602036.369	2485676.692
	CPI	2081838.580	602061.360	2485676.010
Line	CPI	2081838.580	602061.360	2485676.010
	CPI	2084478.653	604700.524	2485606.753
Line	CPI	2084478.653	604700.524	2485606.753
	CPI	2087118.982	607339.938	2485537.200
Line	CPI	2087118.982	607339.938	2485537.200
	CPI	2089759.672	609979.570	2485462.490
Line	CPI	2089759.672	609979.570	2485462.490
	CPI	2092400.087	612618.929	2485387.813
Line	CPI	2092400.087	612618.929	2485387.813
	CPI	2095044.085	615261.940	2485315.577

Alignment OCL_ND1

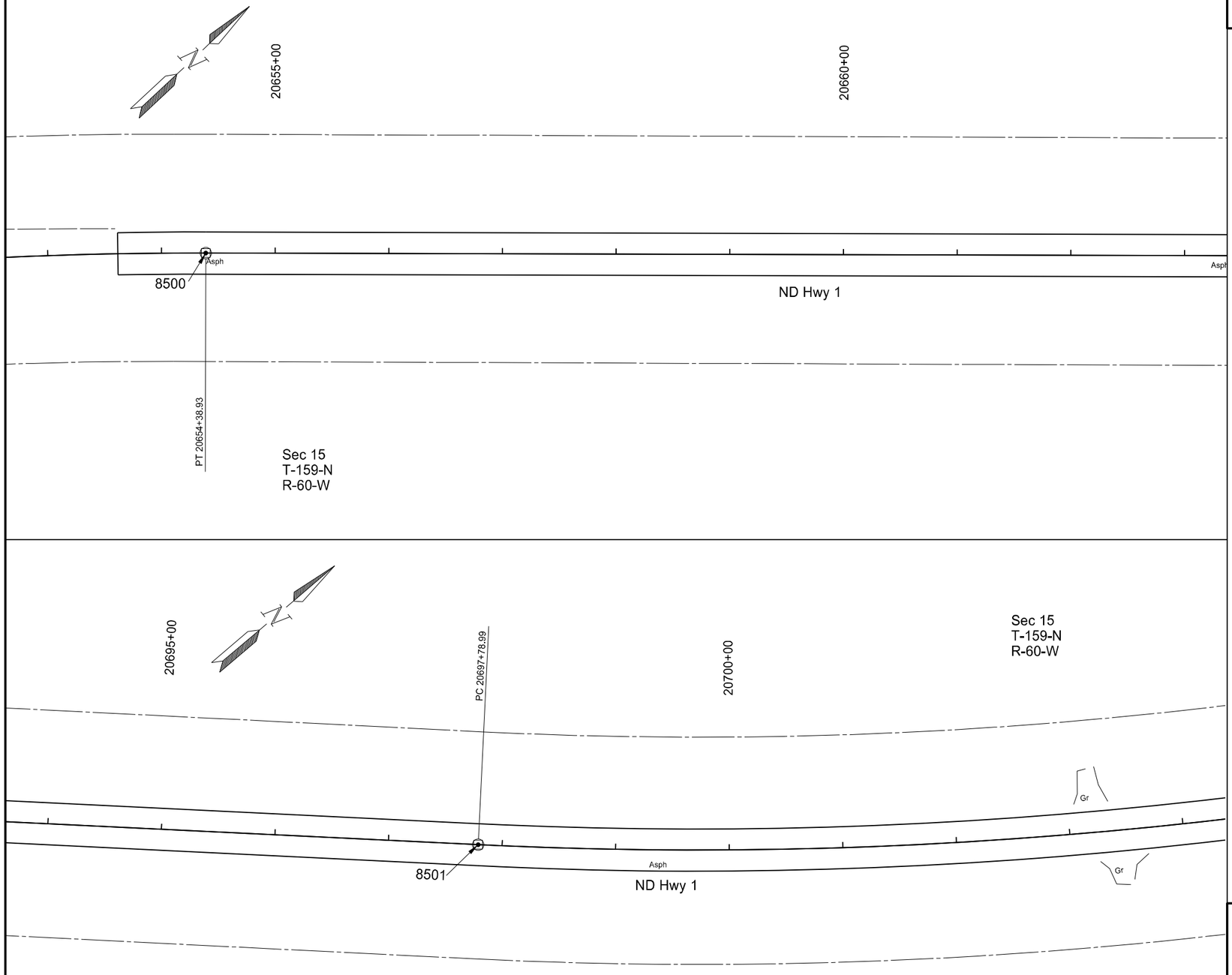
Element	Point	Station	Northing	Easting
Line	CPI	2095044.085	615261.940	2485315.577
	CPI	2097687.245	617904.111	2485243.251
Line	CPI	2097687.245	617904.111	2485243.251
	CPI	2100323.157	620539.060	2485172.004
Line	CPI	2100323.157	625039.060	2485172.004
	CPI	2102958.147	623173.092	2485100.972
Line	CPI	2102958.147	623173.092	2485100.972
	CPI	2105603.487	625817.372	2485026.093
Line	CPI	2105603.487	625817.372	2485026.093
	CPI	2108248.316	628461.147	2484951.431
Line	CPI	2108248.316	628461.147	2484951.431
	PC	2110792.117	631004.067	2484884.498
Curve	PC	2110792.117	631004.067	2484884.498
	CPI	2111502.245	631713.949	2484865.813
	PT	2112195.726	632367.768	2484588.682
Line	PT	2112195.726	632367.768	2484588.682
	PC	2113031.015	633136.824	2484262.704
Curve	PC	2113031.015	633136.824	2484262.704
	CPI	2113736.252	633786.140	2483987.481
	PT	2114425.060	634491.111	2483968.109
Line	PT	2114425.060	634491.111	2483968.109
	CPI	2116370.738	636436.055	2483914.663
Line	CPI	2116370.738	636436.055	2483914.663
	CPI	2119009.465	639073.848	2483844.475
Line	CPI	2119009.465	639073.848	2483844.475
	CPI	2121649.413	641712.740	2483769.783
Line	CPI	2121649.413	641712.740	2483769.783
	CPI	2124289.275	644351.494	2483693.325
Line	CPI	2124289.275	644351.494	2483693.325
	CPI	2126926.681	646987.912	2483621.128
Line	CPI	2126926.681	646987.912	2483621.128
	CPI	2129564.111	649624.373	2483549.639
Line	CPI	2129564.111	649624.373	2483549.639
	POE	2129676.393	649736.613	2483546.596

Design Alignment Description
OCL_ND1

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	82	3

SPEC	CODE	BID ITEM	QTY	UNIT
720	0125	ALIGNMENT MONUMENTS	2	EA

Point	Northing	Easting	Station	Offset	Description
8500	587116.7762	2481877.203	20654+38.93	0.00	ALIGN MON
8501	590280.2053	2484848.541	20697+78.99	0.00	ALIGN MON

Note:
Coordinate data and Station/Offset on this sheet are based off of Design Alignment "OCL_ND1" as shown in Section 82 Sheet 1 and 2.

Legend

⊙ Alignment Monument

Design Alignment Monuments

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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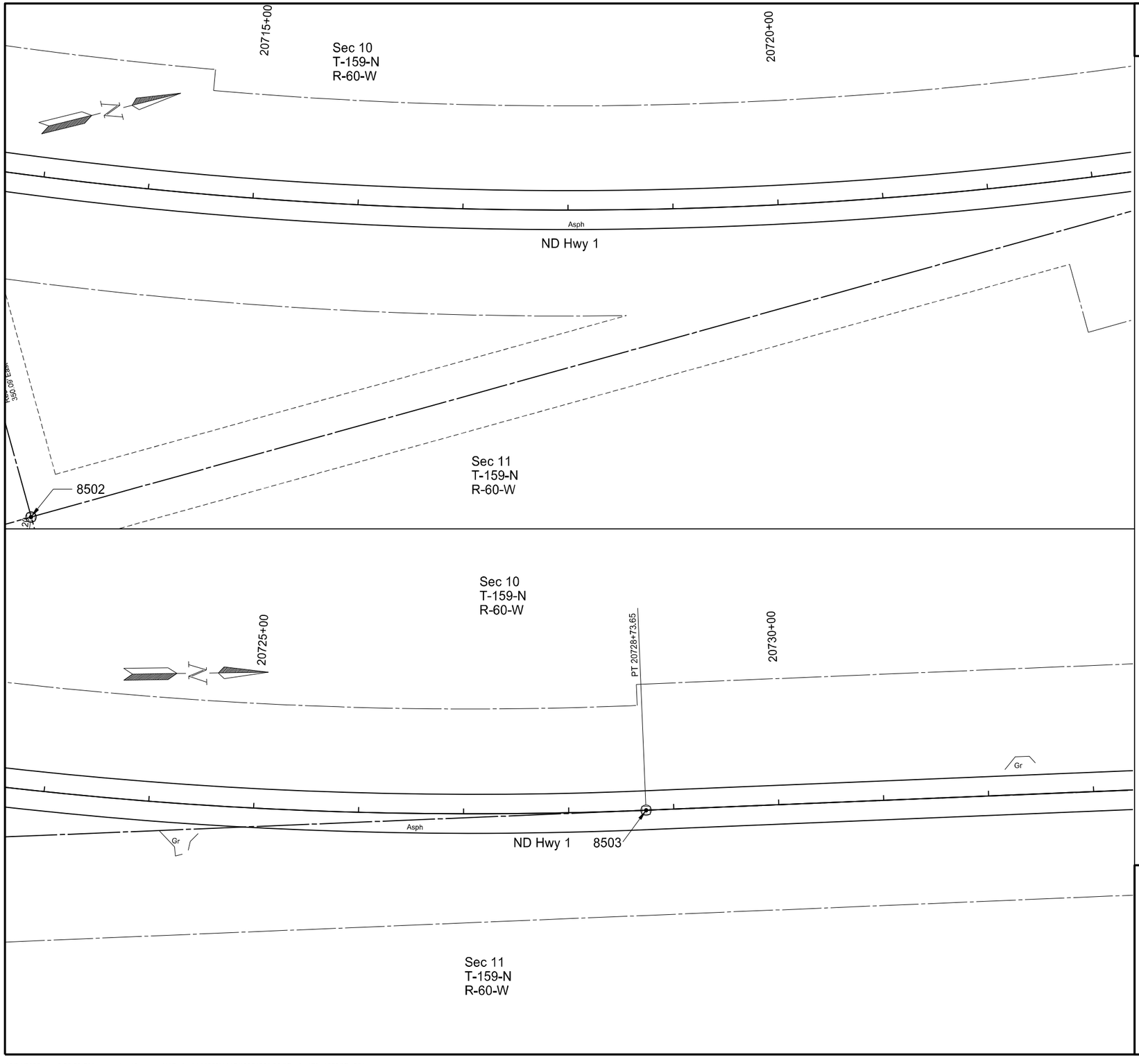
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	82	4

SPEC	CODE	BID ITEM	QTY	UNIT
720	0125	ALIGNMENT MONUMENTS	2	EA

Point	Northing	Easting	Station	Offset	Description
8502	591469.1769	2485965.316	20713+26.32	322.81	ALIGN MON
8503	593099.7735	2485920.651	20728+73.65	0.00	ALIGN MON

Note:
Coordinate data and Station/Offset on this sheet are based off of Design Alignment "OCL_ND1" as shown in Section 82 Sheet 1 and 2.

Legend

⊙ Alignment Monument

Design Alignment Monuments

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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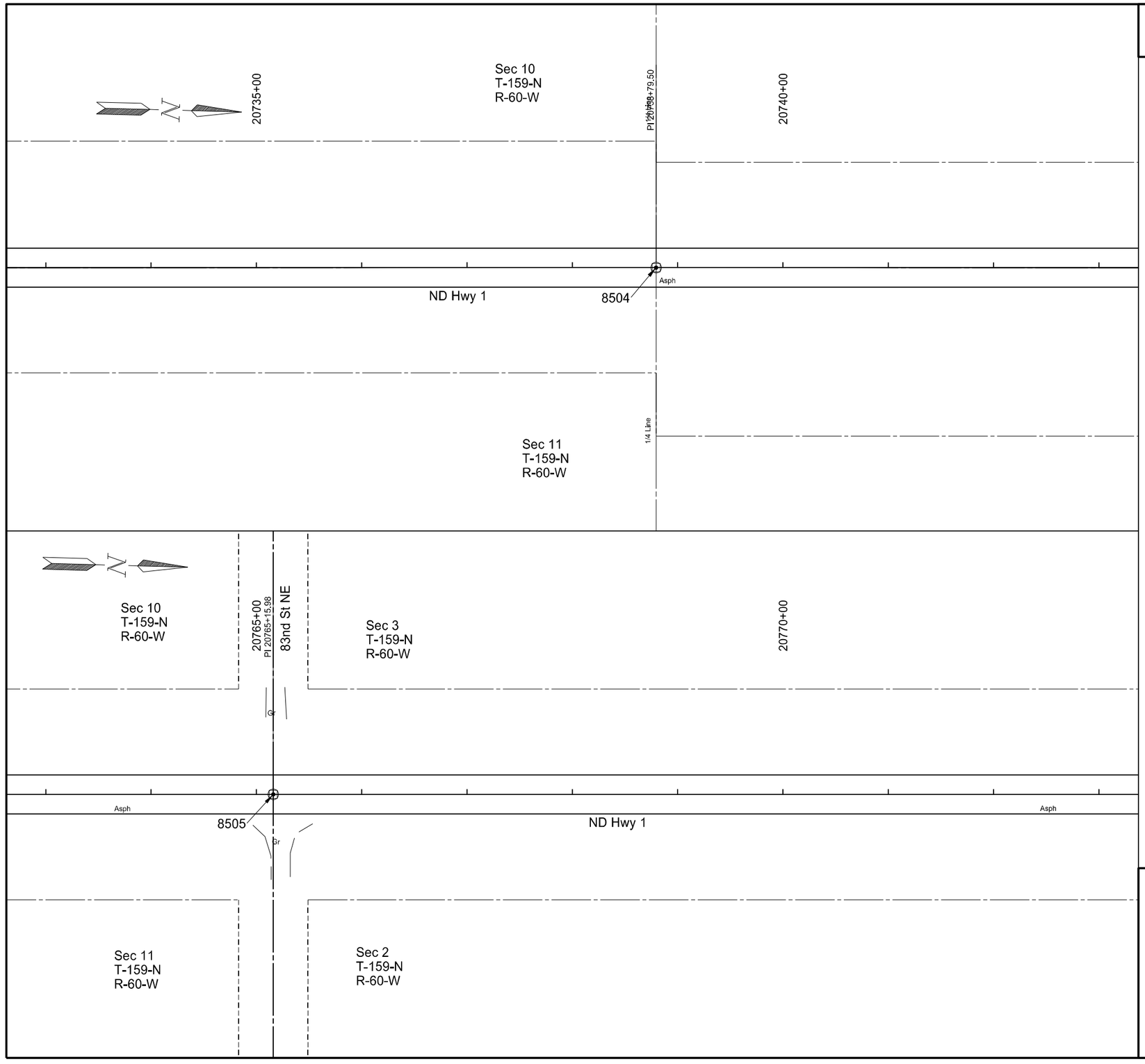
DATE: 8/18/2025
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	82	5



SPEC	CODE	BID ITEM	QTY	UNIT
720	0125	ALIGNMENT MONUMENTS	2	EA

Point	Northing	Easting	Station	Offset	Description
8504	594105.2460	2485893.109	20738+79.50	0.00	ALIGN MON
8505	596740.7369	2485821.126	20765+15.98	0.00	ALIGN MON

Note:
Coordinate data and Station/Offset on this sheet are based off of Design Alignment "OCL_ND1" as shown in Section 82 Sheet 1 and 2.

Legend

⊙ Alignment Monument

Design Alignment Monuments

Structural Improvements
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

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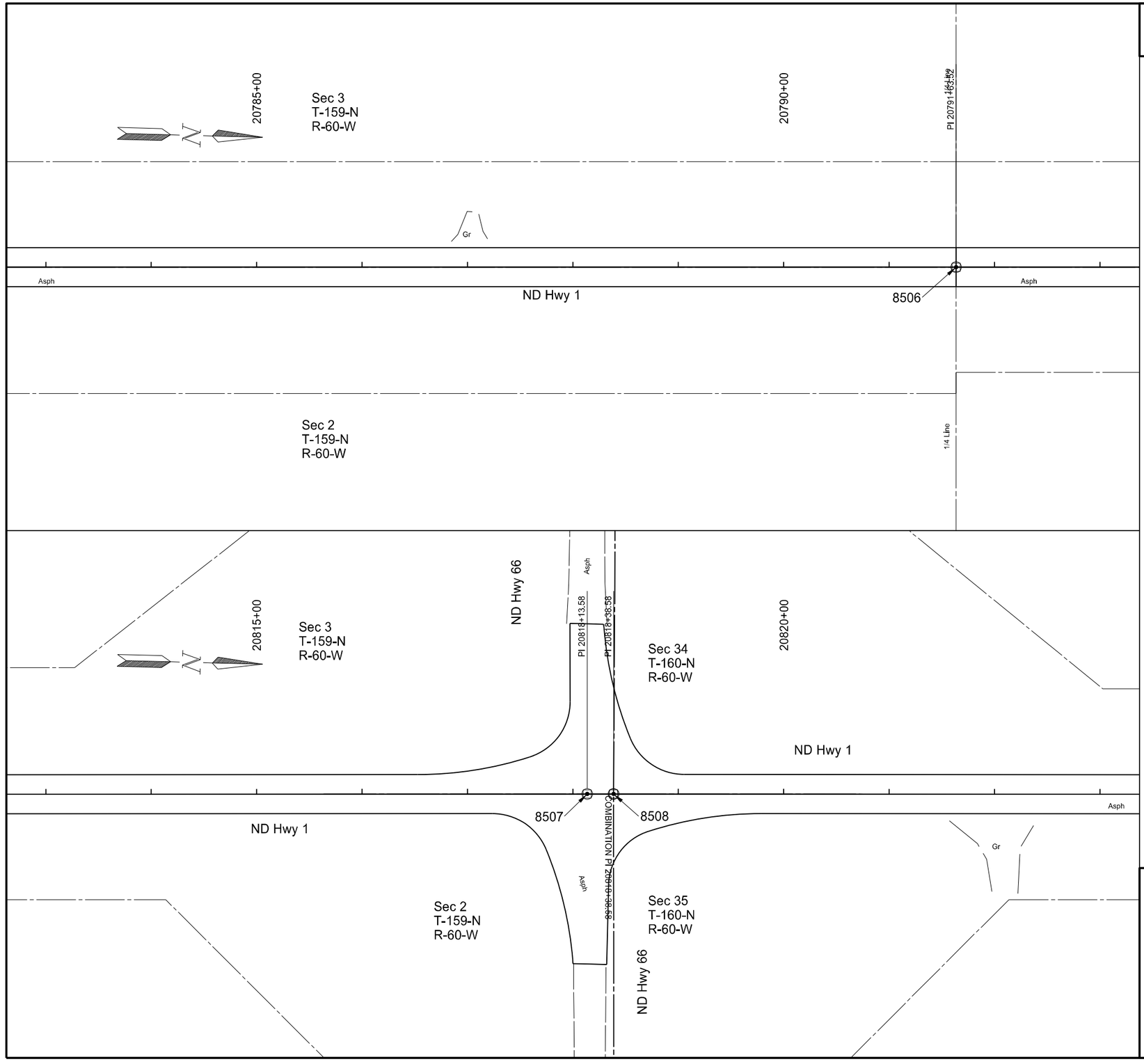

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	82	6

SPEC	CODE	BID ITEM	QTY	UNIT
720	0125	ALIGNMENT MONUMENTS	3	EA

Point	Northing	Easting	Station	Offset	Description
8506	599387.3006	2485749.025	20791+63.52	0.00	ALIGN MON
8507	602036.3692	2485676.692	20818+13.58	0.00	ALIGN MON
8508	602061.3599	2485676.009	20818+38.58	0.00	ALIGN MON

Note:
Coordinate data and Station/Offset on this sheet are based off of Design Alignment "OCL_ND1" as shown in Section 82 Sheet 1 and 2.

Legend

⊙ Alignment Monument

Design Alignment Monument

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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PE-10772
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NORTH DAKOTA

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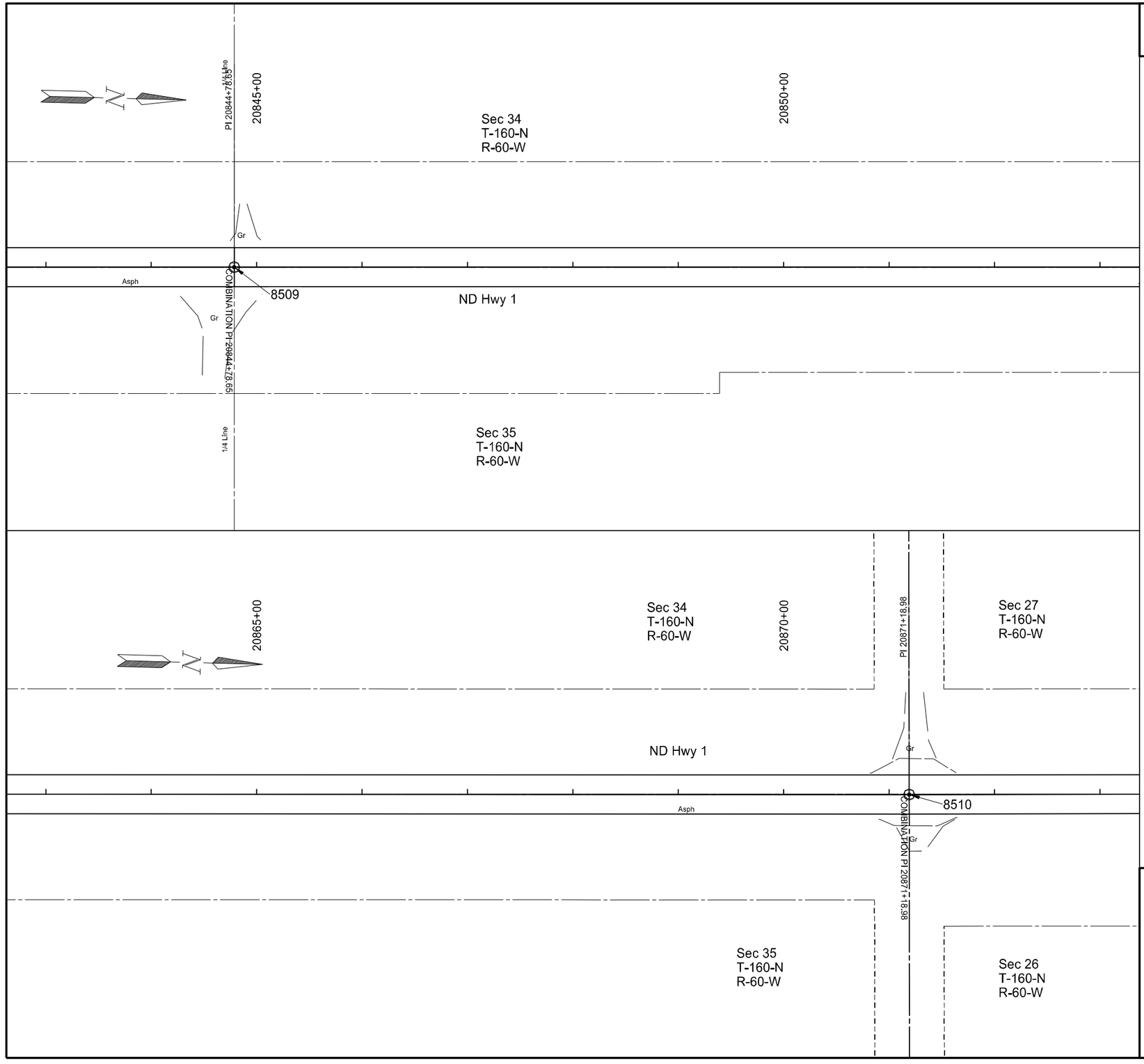

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	82	7

SPEC	CODE	BID ITEM	QTY	UNIT
720	0125	ALIGNMENT MONUMENTS	2	EA

Point	Northing	Easting	Station	Offset	Description
8509	604700.5256	2485606.753	20844+78.65	0.00	ALIGN MON
8510	607339.9375	2485537.200	20871+18.98	0.00	ALIGN MON

Note:
Coordinate data and Station/Offset on this sheet are based off of Design Alignment "OCL_ND1" as shown in Section 82 Sheet 1 and 2.

Legend

⊙ Alignment Monument

Design Alignment Monuments

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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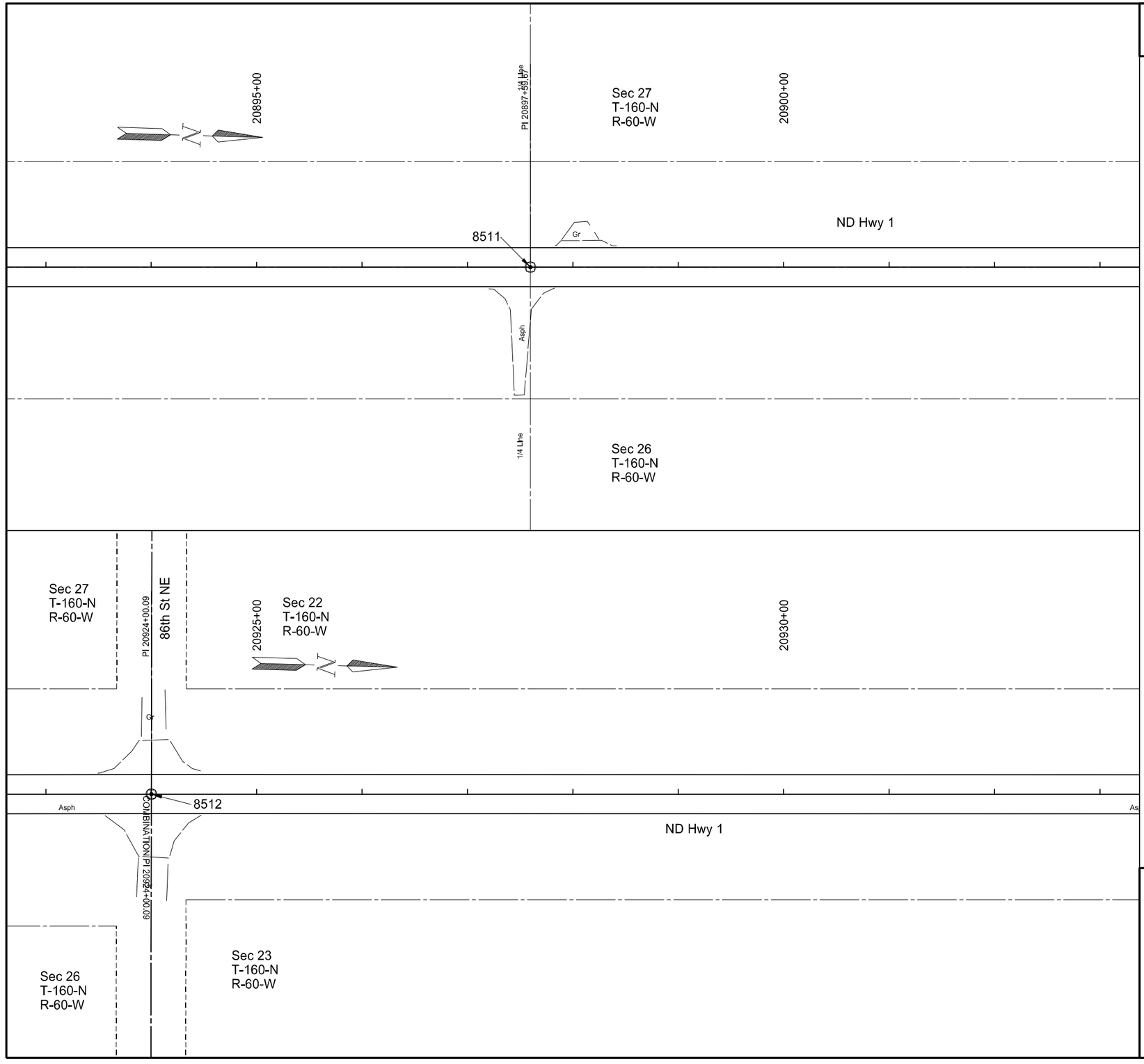
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	82	8



SPEC	CODE	BID ITEM	QTY	UNIT
720	0125	ALIGNMENT MONUMENTS	2	EA

Point	Northing	Easting	Station	Offset	Description
8511	609979.5697	2485462.490	20897+59.67	0.00	ALIGN MON
8512	612618.9289	2485387.813	20924+00.00	0.00	ALIGN MON

Note:
Coordinate data and Station/Offset on this sheet are based off of Design Alignment "OCL_ND1" as shown in Section 82 Sheet 1 and 2.

Legend

⊙ Alignment Monument

Design Alignment Monuments

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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RYAN SCHUEHLE
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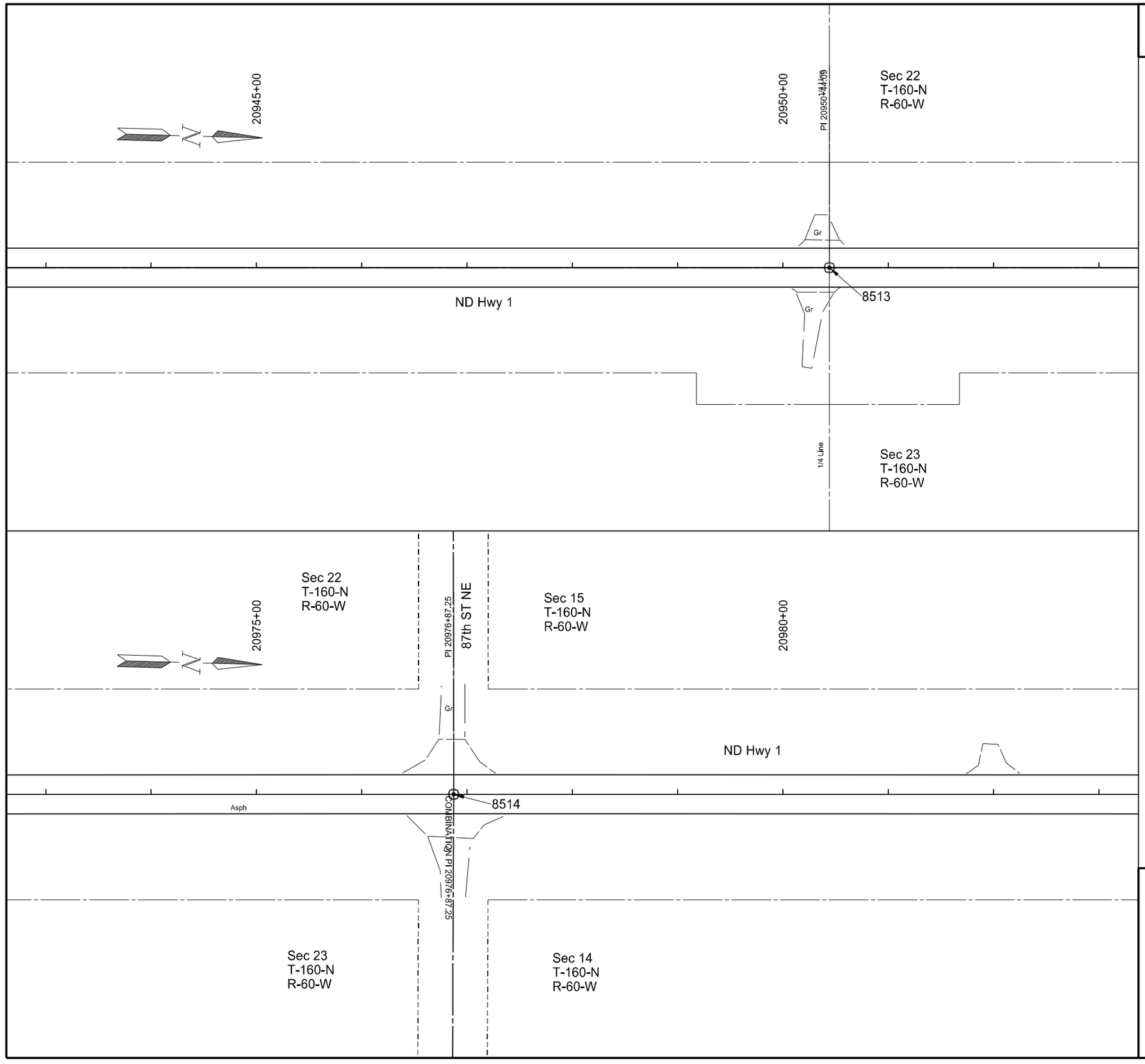
DATE: 8/18/2025
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	82	9

SPEC	CODE	BID ITEM	QTY	UNIT
720	0125	ALIGNMENT MONUMENTS	2	EA

Point	Northing	Easting	Station	Offset	Description
8513	615261.9403	2485315.577	20950+44.09	0.00	ALIGN MON
8514	617904.1108	2485243.251	20976+87.25	0.00	ALIGN MON

Note:
Coordinate data and Station/Offset on this sheet are based off of Design Alignment "OCL_ND1" as shown in Section 82 Sheet 1 and 2.

Legend

⊙ Alignment Monument

Design Alignment Monuments

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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RYAN SCHUEHLE
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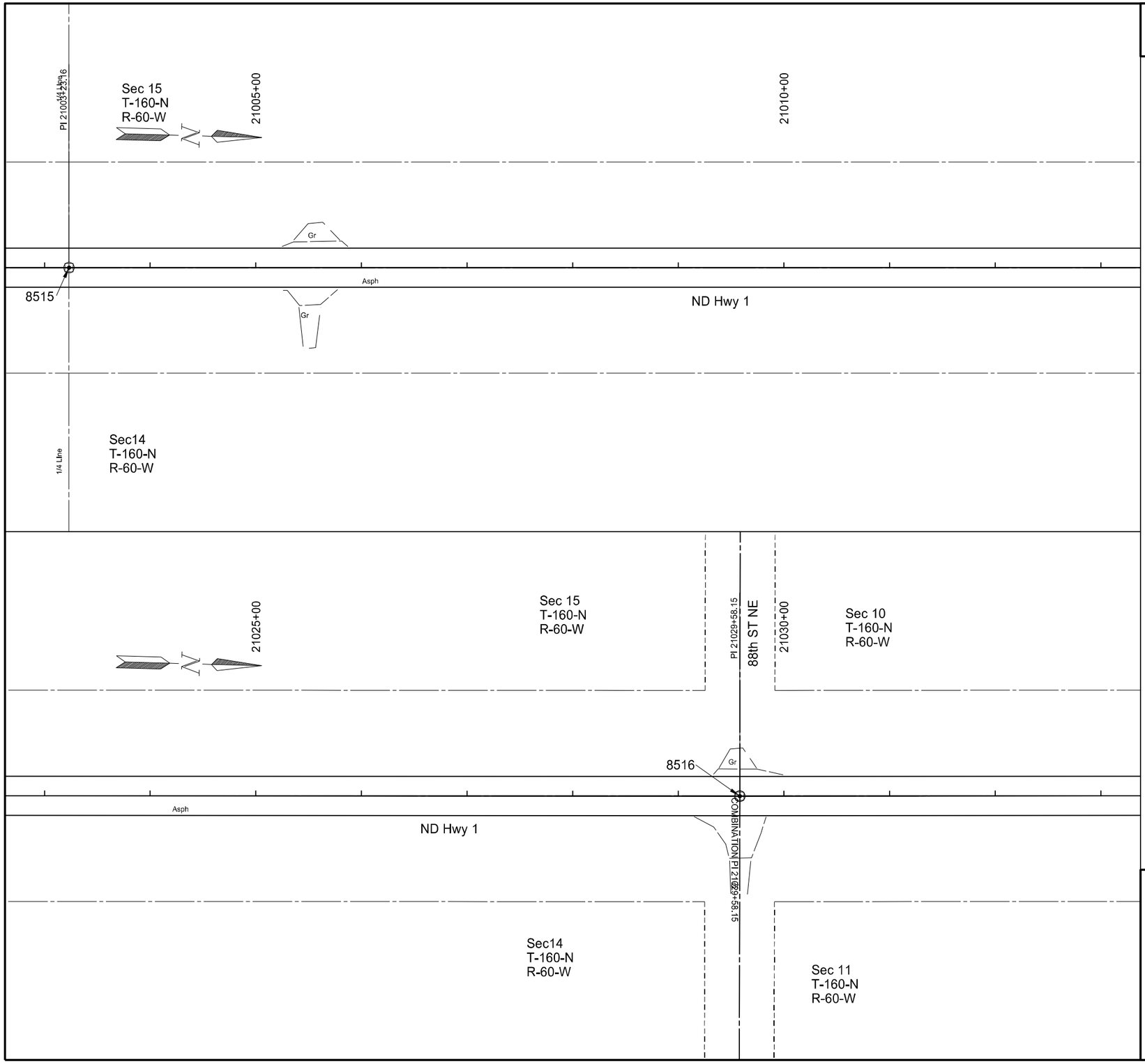
DATE: 8/18/2025
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	82	10



SPEC	CODE	BID ITEM	QTY	UNIT
720	0125	ALIGNMENT MONUMENTS	2	EA

Point	Northing	Easting	Station	Offset	Description
8515	620539.0596	2485172.004	21003+23.16	0.00	ALIGN MON
8516	623173.0914	2485100.972	21029+58.15	0.00	ALIGN MON

Note:
Coordinate data and Station/Offset on this sheet are based off of Design Alignment "OCL_ND1" as shown in Section 82 Sheet 1 and 2.

Legend

⊙ Alignment Monument

Design Alignment Monument

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

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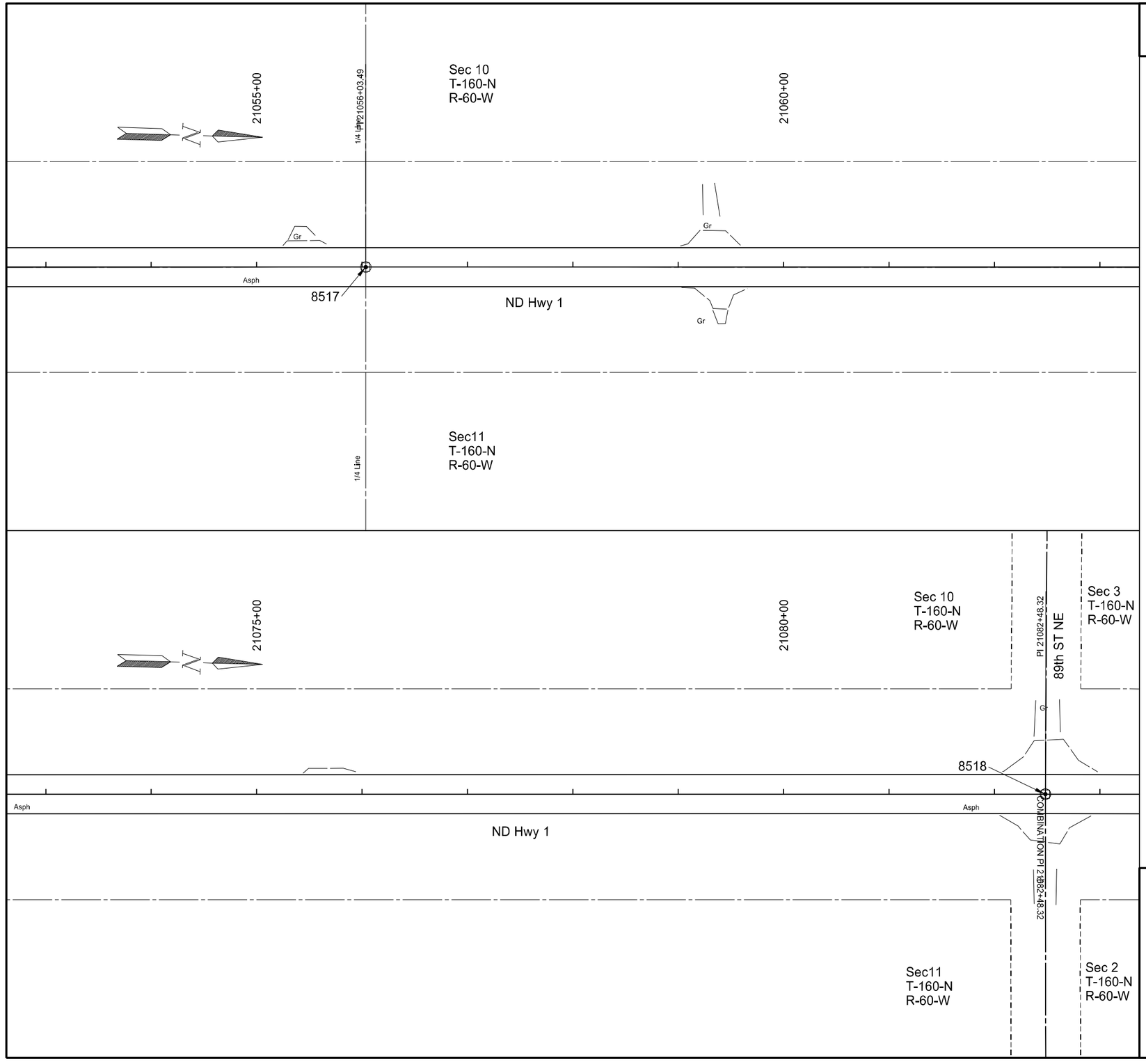


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	82	11

SPEC	CODE	BID ITEM	QTY	UNIT
720	0125	ALIGNMENT MONUMENTS	2	EA

Point	Northing	Easting	Station	Offset	Description
8517	625817.3718	2485026.093	21056+03.49	0.00	ALIGN MON
8518	628461.1465	2484951.431	21082+48.32	0.00	ALIGN MON

Note:
Coordinate data and Station/Offset on this sheet are based off of Design Alignment "OCL_ND1" as shown in Section 82 Sheet 1 and 2.

Legend

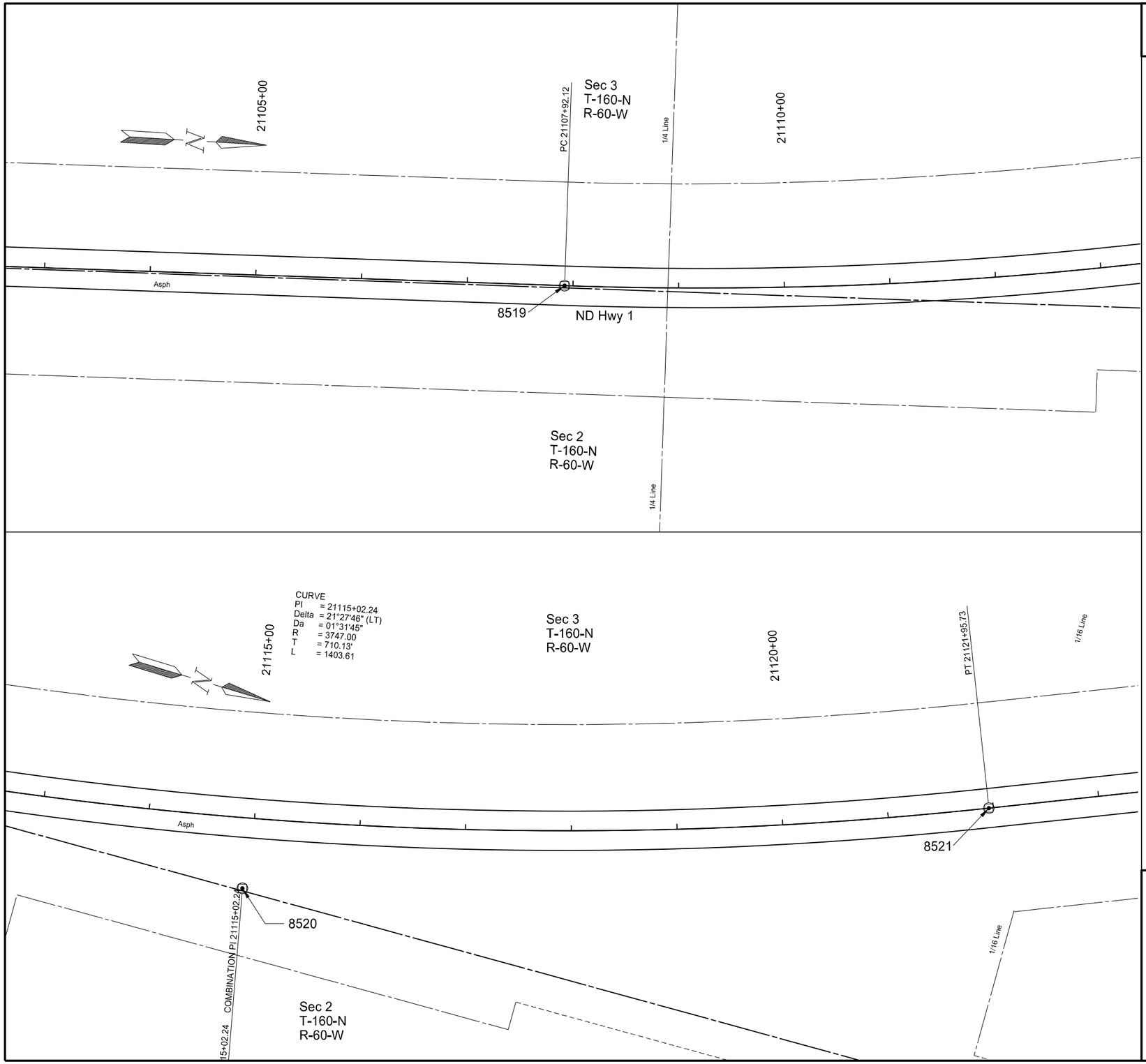
⊙ Alignment Monument

Design Alignment Monuments

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	82	12

SPEC	CODE	BID ITEM	QTY	UNIT
720	0125	ALIGNMENT MONUMENTS	3	EA

Point	Northing	Easting	Station	Offset
8519	631004.0672	2484884.498	21107+92.12	0.00
8520	631713.9487	2484865.813	21114+93.32	66.70
8521	632367.7678	2484588.682	21121+95.73	0.00

Note:
Coordinate data and Station/Offset on this sheet are based off of Design Alignment "OCL_ND1" as shown in Section 82 Sheet 1 and 2.

Legend

⊙ Alignment Monument

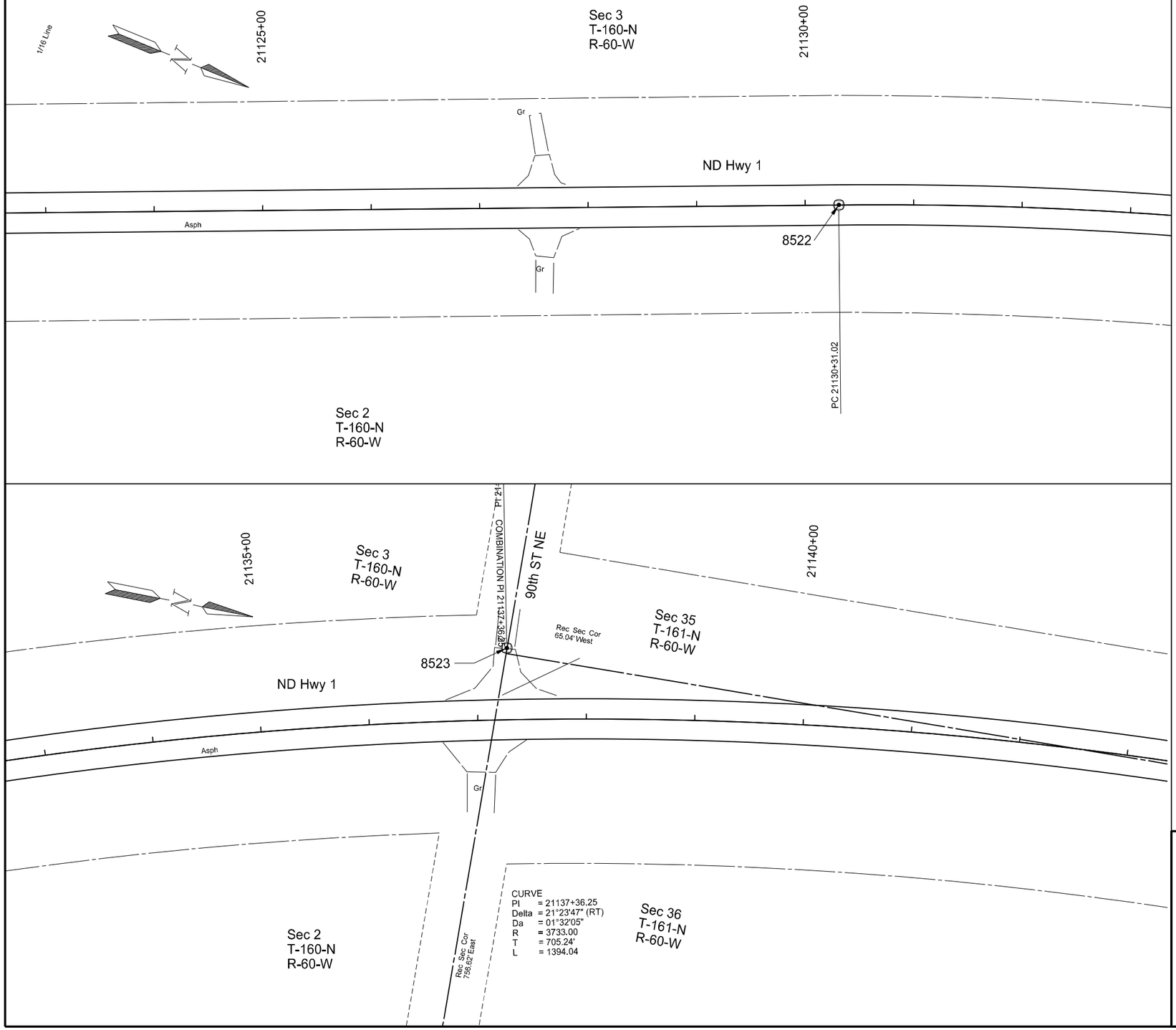
Design Alignment Monuments

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	82	13



SPEC	CODE	BID ITEM	QTY	UNIT
720	0125	ALIGNMENT MONUMENTS	2	EA

Point	Northing	Easting	Station	Offset	Description
8522	633136.8241	2484262.704	21130+31.02	0.00	ALIGN MON
8523	633786.1401	2483987.481	21137+28.04	-66.03	ALIGN MON

Note:
Coordinate data and Station/Offset on this sheet are based off of Design Alignment "OCL_ND1" as shown in Section 82 Sheet 1 and 2.

Legend

⊙ Alignment Monument

Design Alignment Monuments

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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RYAN
SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

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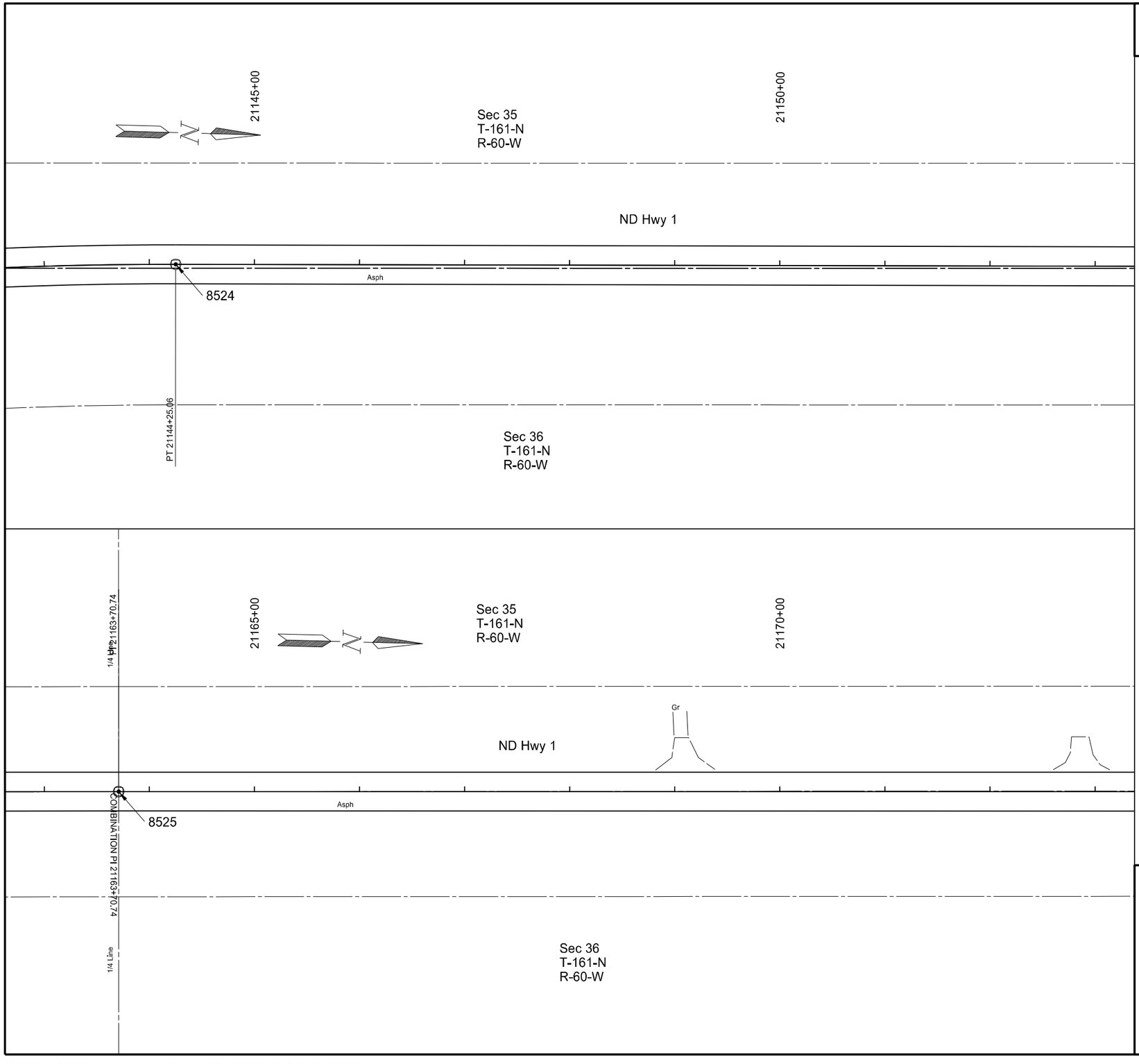
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	82	14



SPEC	CODE	BID ITEM	QTY	UNIT
720	0125	ALIGNMENT MONUMENTS	2	EA

Point	Northing	Easting	Station	Offset	Description
8524	634491.1110	2483968.109	21144+25.06	0.00	ALIGN MON
8525	636436.0548	2483914.664	21163+70.74	0.00	ALIGN MON

Note:
Coordinate data and Station/Offset on this sheet are based off of Design Alignment "OCL_ND1" as shown in Section 82 Sheet 1 and 2.

Legend

⊙ Alignment Monument

Design Alignment Monuments

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
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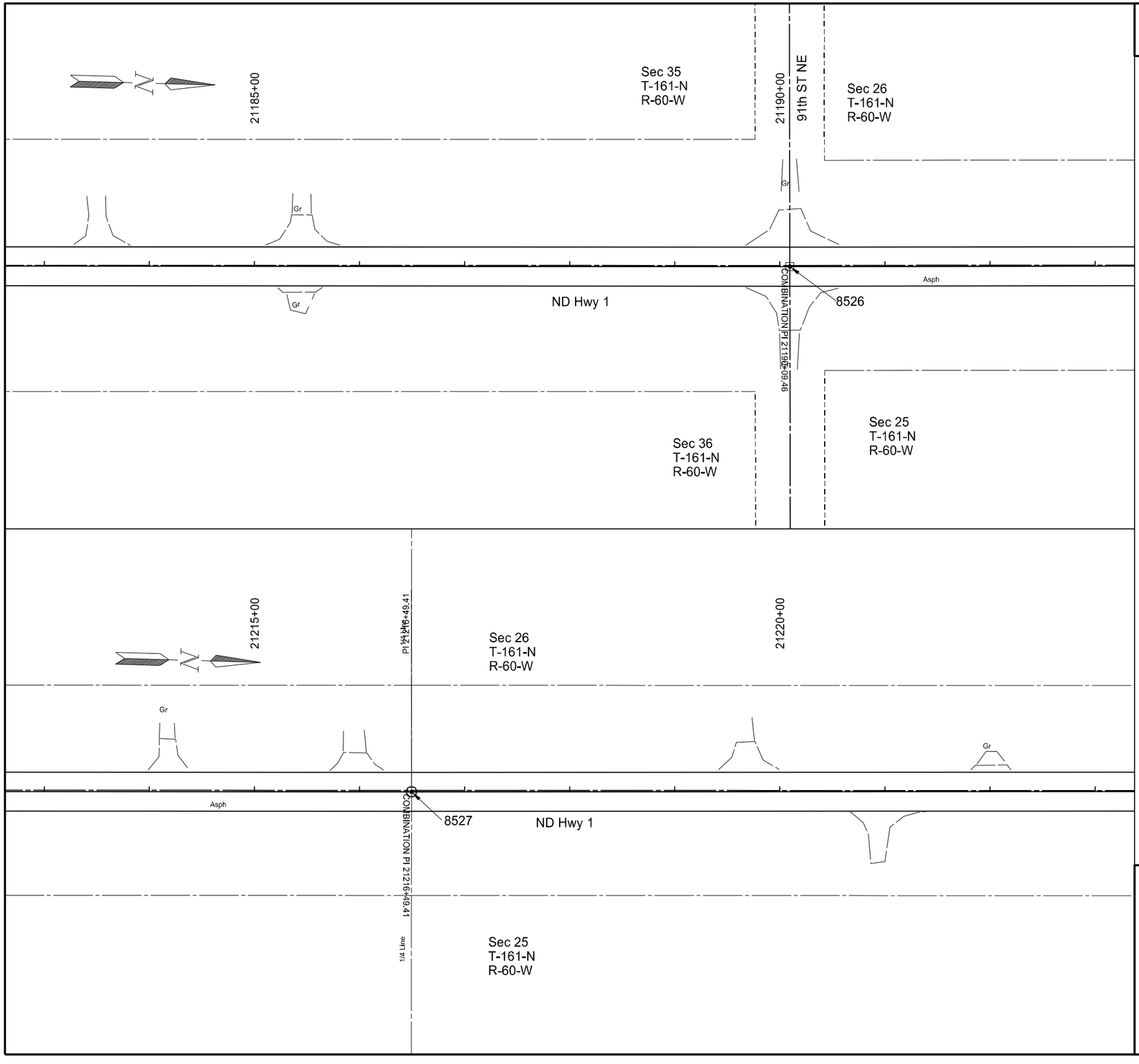
DATE: 8/18/2025
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	82	15

SPEC	CODE	BID ITEM	QTY	UNIT
720	0125	ALIGNMENT MONUMENTS	2	EA

Point	Northing	Easting	Station	Offset	Description
8526	639073.8483	2483844.475	21190+09.46	0.00	ALIGN MON
8527	641712.7402	2483769.783	21216+49.41	0.00	ALIGN MON

Note:
Coordinate data and Station/Offset on this sheet are based off of Design Alignment "OCL_ND1" as shown in Section 82 Sheet 1 and 2.

Legend

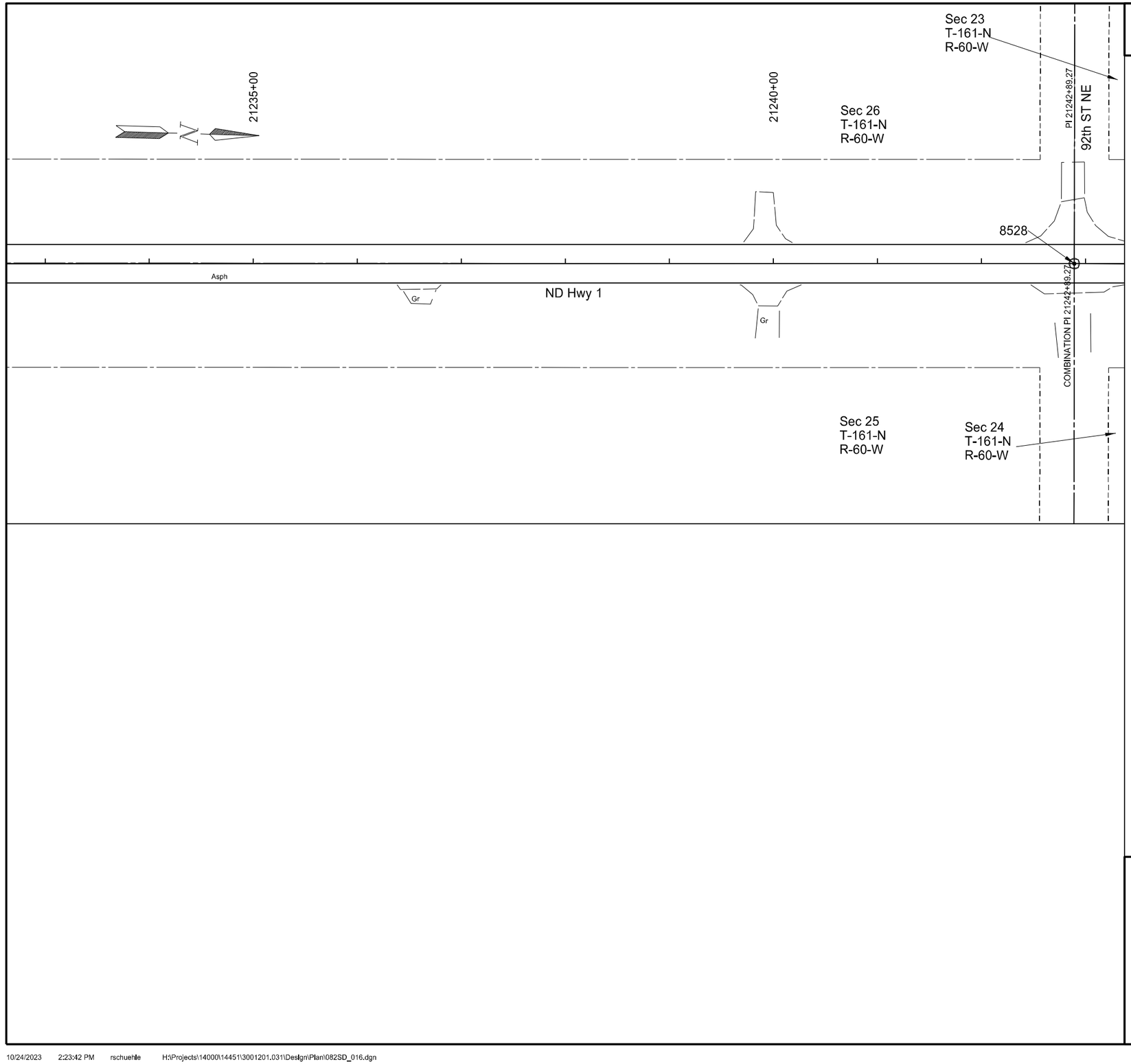
⊙ Alignment Monument

Design Alignment Monuments

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	82	16

SPEC	CODE	BID ITEM	QTY	UNIT
720	0125	ALIGNMENT MONUMENTS	1	EA

Point	Northing	Easting	Station	Offset	Description
8528	644351.4942	2483693.325	21242+89.27	0.00	ALIGN MON

Note:
Coordinate data and Station/Offset on this sheet are based off of Design Alignment "OCL_ND1" as shown in Section 82 Sheet 1 and 2.

Legend

⊙ Alignment Monument

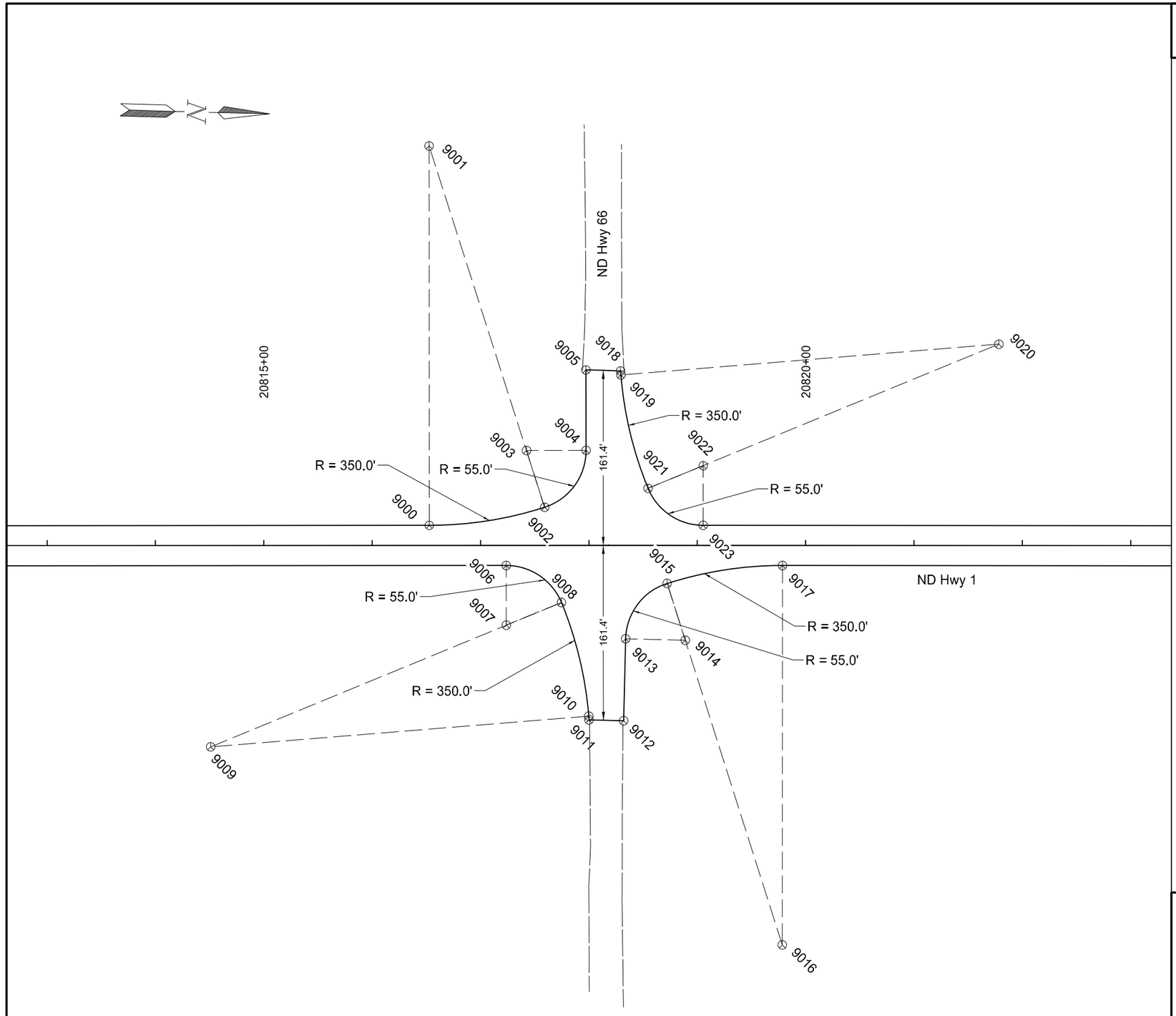
Design Alignment Monuments

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	82	17



Point	Northing	Easting	Station	Offset	Description
9000	601874.9732	2485662.552	20816+52.63	-18.54	RAD PC
9001	601865.4201	2485312.683	20816+52.63	-368.54	CENTER OF RADIUS
9002	601981.0031	2485643.047	20817+59.15	-35.14	RAD PT/PC
9003	601962.8400	2485591.132	20817+42.41	-87.53	CENTER OF RADIUS
9004	602017.8178	2485589.516	20817+97.41	-87.65	RAD PT
9005	602015.6369	2485515.351	20817+97.26	-161.85	TAPER
9006	601947.0077	2485697.681	20817+23.68	18.54	RAD PT/PC
9007	601948.5088	2485752.661	20817+23.68	73.54	CENTER OF RADIUS
9008	601998.7863	2485730.363	20817+74.55	52.63	RAD PT
9009	601678.8388	2485872.256	20814+50.84	185.73	CENTER OF RADIUS
9010	602026.7954	2485834.491	20817+99.70	157.48	RAD PT
9011	602027.1739	2485837.978	20817+99.99	160.98	TAPER
9012	602059.1733	2485837.978	20818+31.97	161.85	TAPER
9013	602058.9194	2485762.381	20818+33.78	86.27	RAD PC
9014	602113.9191	2485762.196	20818+88.86	87.54	CENTER OF RADIUS
9015	602095.8110	2485710.262	20818+72.12	35.14	RAD PT/PC
9016	602211.0445	2486040.749	20819+78.64	368.54	CENTER OF RADIUS
9017	602201.8630	2485690.869	20819+78.64	18.54	RAD PT
9018	602047.6380	2485515.352	20818+29.25	-160.97	TAPER
9019	602048.0512	2485519.156	20818+29.56	-157.16	RAD PC
9020	602396.0087	2485481.398	20821+78.22	-185.77	CENTER OF RADIUS
9021	602075.9284	2485622.991	20818+54.53	-52.62	RAD PT/PC
9022	602126.2273	2485600.742	20819+05.40	-73.54	CENTER OF RADIUS
9023	602127.6701	2485655.723	20819+05.40	-18.54	RAD PT

Design Survey Data Layout

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

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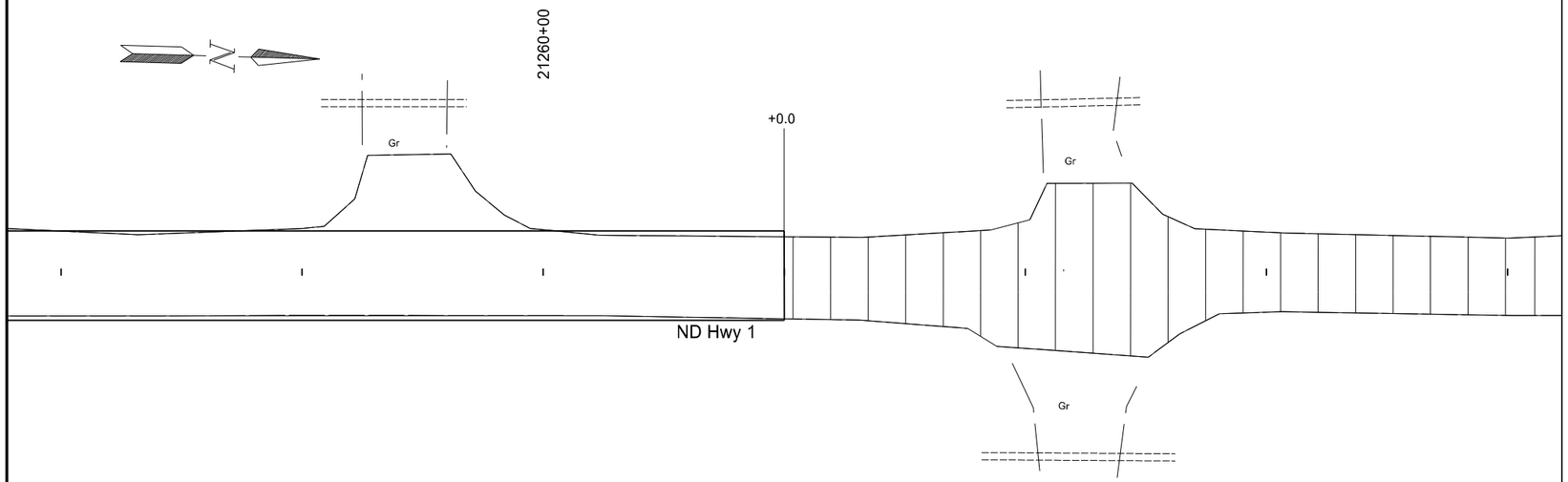

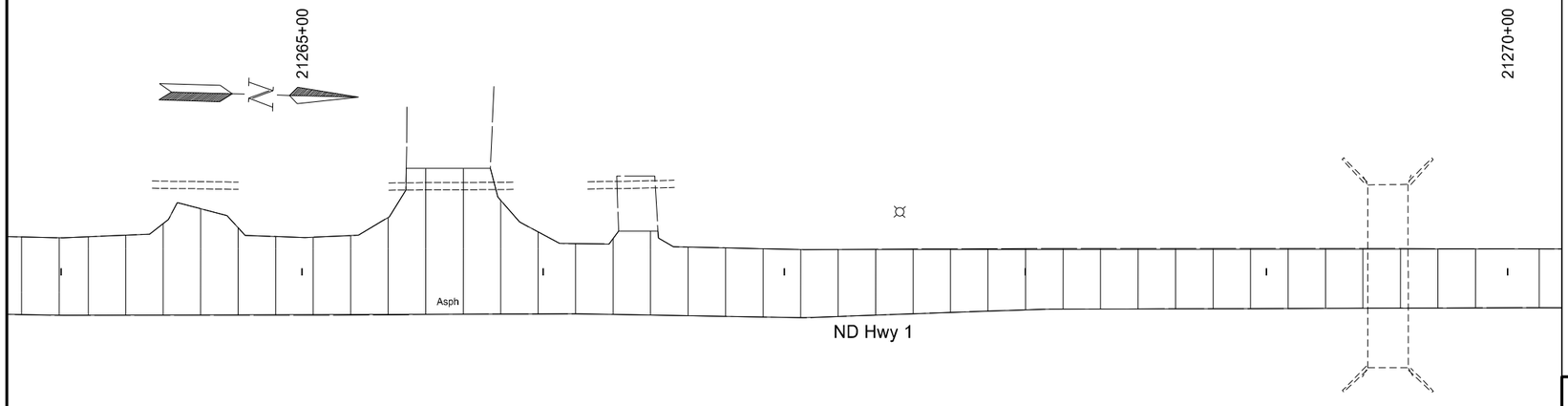

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	90	1

SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		21261+00 to 21270+00	176	GAL
411	0100	MILLING PAVEMENT SURFACE		
		21261+00 to 21270+00	389	TON
430	0042	SUPERPAVE FAA 42		
		21261+00 to 21270+00	389	TON
430	5815	PG 58S-34 ASPHALT CEMENT		
		21261+00 to 21270+00	23	TON

Legend

- 2" Superpave FAA 42 (Bituminous Surface)
- Sidewalk Concrete 4IN
- 2" Superpave FAA 42 (Concrete Surface)

Paving Layout

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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PE-10772
DATE: 8/18/2025
NORTH DAKOTA

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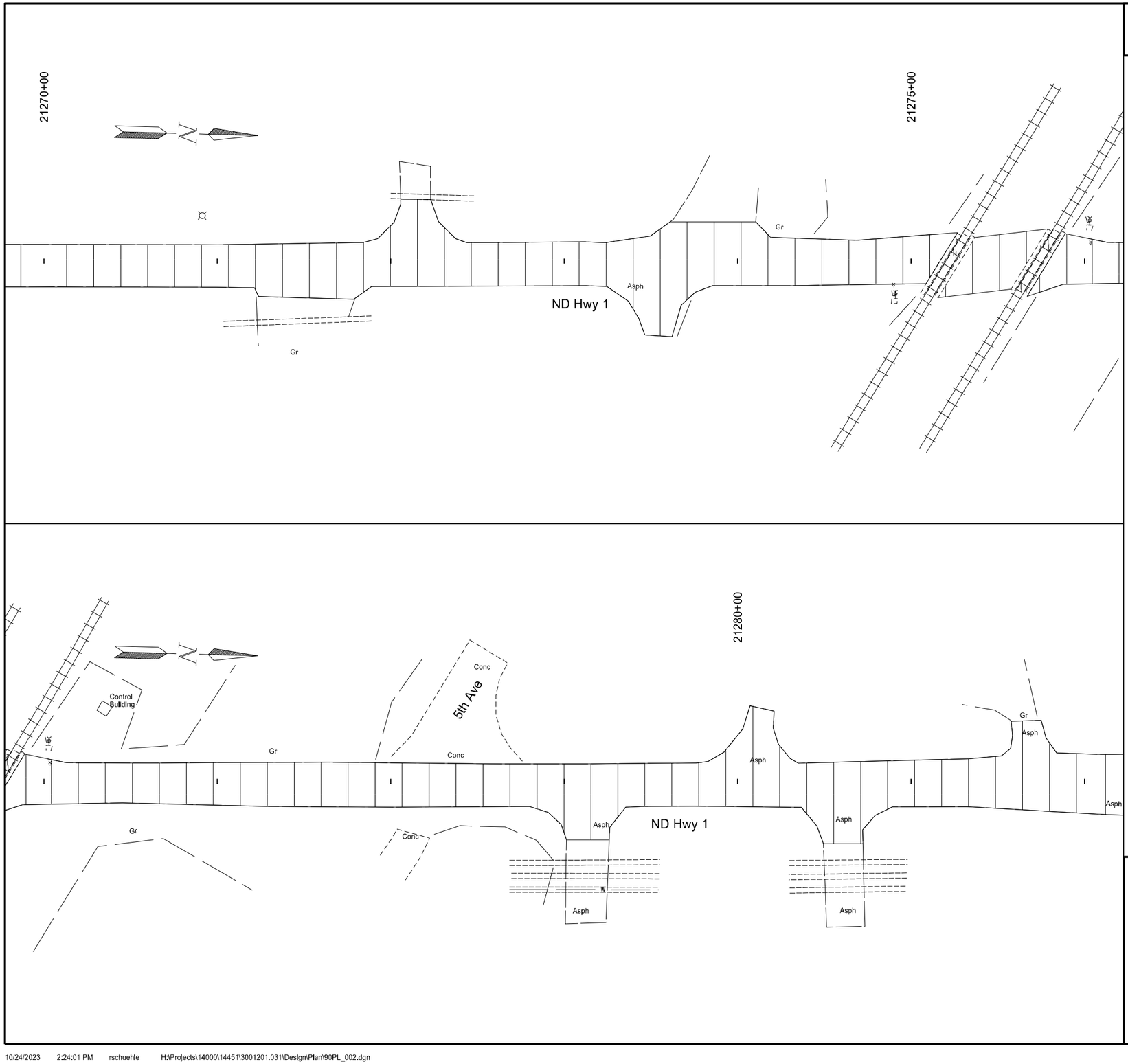

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	90	2

SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		21270+00 to 21282+00		202 GAL
411	0100	MILLING PAVEMENT SURFACE		
		21270+00 to 21282+00		448 TON
430	0042	SUPERPAVE FAA 42		
		21270+00 to 21282+00		448 TON
430	5815	PG 58S-34 ASPHALT CEMENT		
		21270+00 to 21282+00		27 TON

Legend

- 2" Superpave FAA 42 (Bituminous Surface)
- Sidewalk Concrete 4IN
- 2" Superpave FAA 42 (Concrete Surface)

Paving Layout

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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PE-10772
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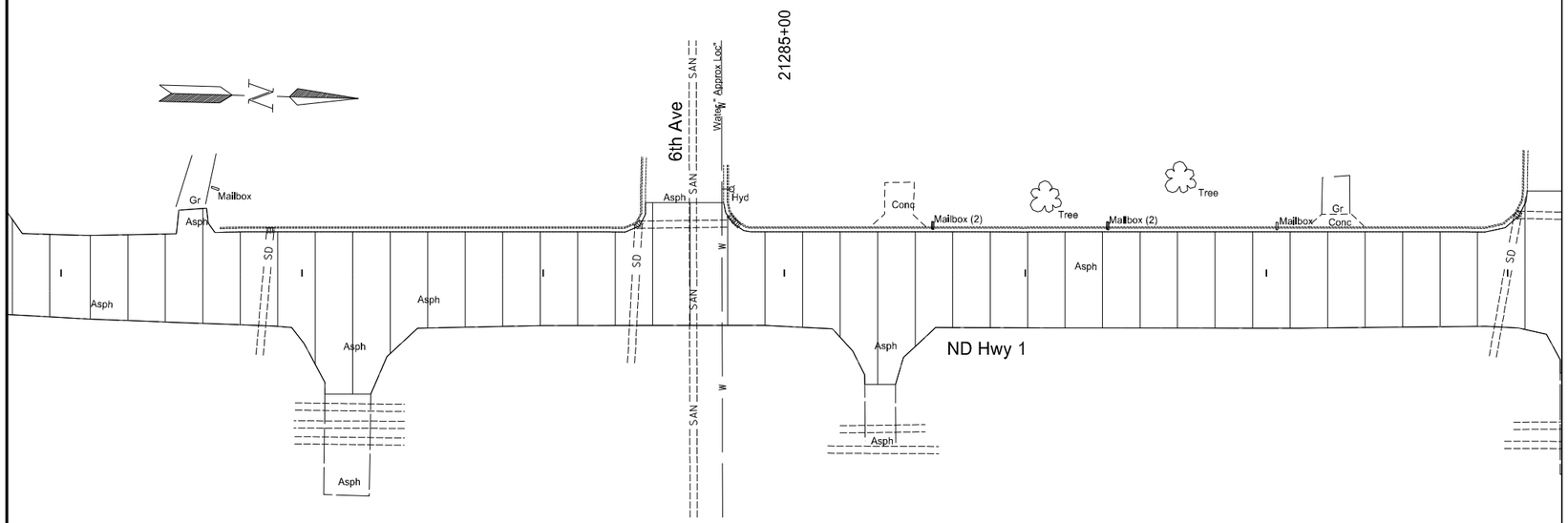
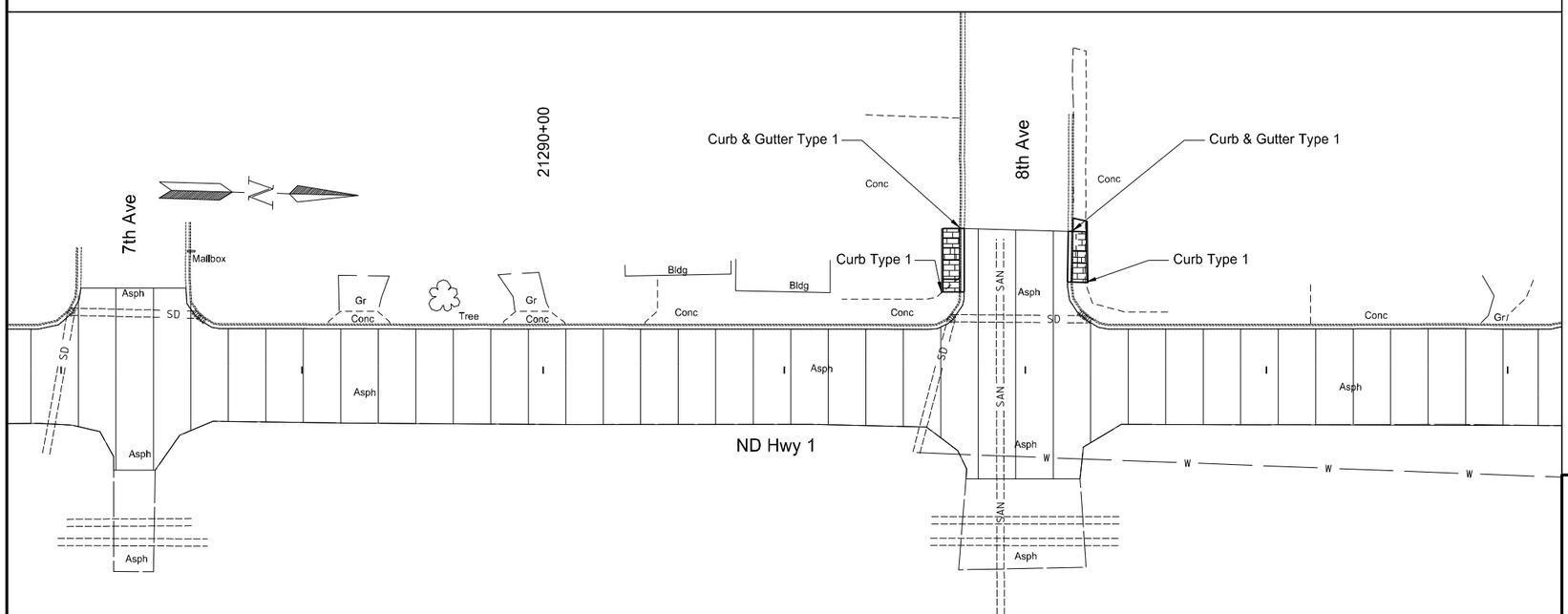
NORTH DAKOTA





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	90	3

SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		21282+00 to 21294+00	300	GAL
202	0130	REMOVAL OF CURB & GUTTER		
		8th AVE SW Quadrant	21	LF
		8th AVE NW Quadrant	21	LF
		Total	42	LF
202	0114	REMOVAL OF CONCRETE PAVEMENT		
		8th AVE SW Quadrant	21	SY
		8th AVE NW Quadrant	14	SY
		Total	35	SY
411	0100	MILLING PAVEMENT SURFACE		
		21282+00 to 21294+00	665	TON
430	0042	SUPERPAVE FAA 42		
		21282+00 to 21294+00	665	TON
430	5815	PG 58S-34 ASPHALT CEMENT		
		21282+00 to 21294+00	40	TON
748	0140	CURB & GUTTER-TYPE I		
		8th AVE SW Quadrant	21	LF
		8th AVE NW Quadrant	21	LF
		Total	42	LF
748	0520	CURB-TYPE I		
		8th AVE SW Quadrant	27	LF
		8th AVE NW Quadrant	21	LF
		Total	48	LF
750	0115	SIDEWALK CONCRETE 4IN		
		8th AVE SW Quadrant	18	SY
		8th AVE NW Quadrant	13	SY
		Total	31	SY
750	2115	DETECTABLE WARNING PANELS		
		8th AVE SW Quadrant	10	SF
		8th AVE NW Quadrant	10	SF
		Total	20	SF

Legend

2" Superpave FAA 42 (Bituminous Surface)

Sidewalk Concrete 4IN

2" Superpave FAA 42 (Concrete Surface)

Paving Layout

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

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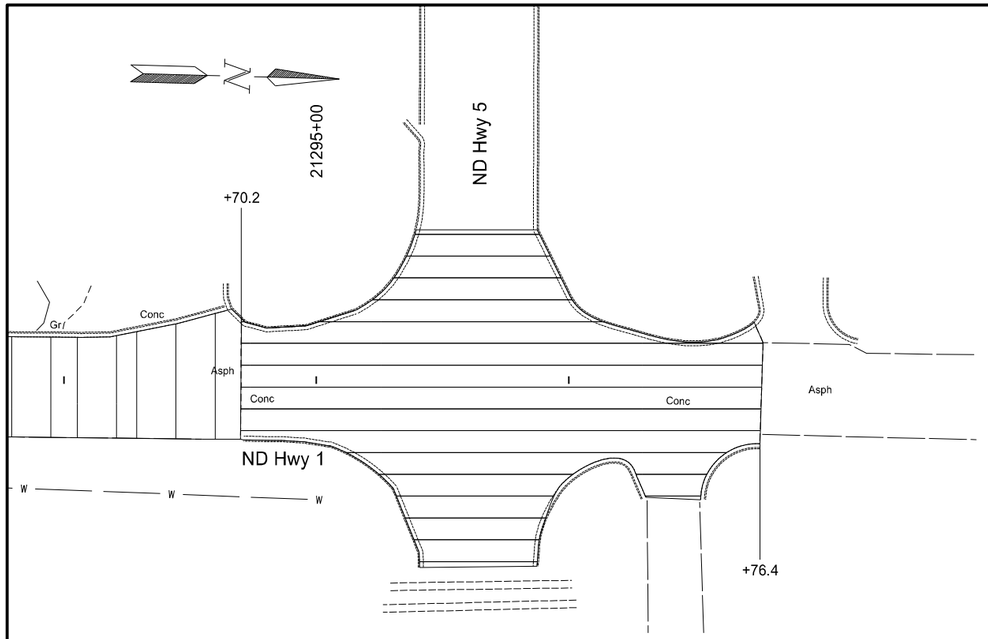

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	90	4

SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		21294+00 to 21296+76		107 GAL
411	0100	MILLING PAVEMENT SURFACE		
		21294+00 to 21294+70 (Bituminous Surface)		38 TON
		21295+96 to 21296+76 (Concrete Surface)		198 TON
			Total	236 TON
430	0042	SUPERPAVE FAA 42		
		21294+00 to 21294+70 (Bituminous Surface)		38 TON
		21295+96 to 21296+76 (Concrete Surface)		198 TON
			Total	236 TON
430	5815	PG 58S-34 ASPHALT CEMENT		
		21294+00 to 21294+70 (Bituminous Surface)		2 TON
		21295+96 to 21296+76 (Concrete Surface)		12 TON
			Total	14 TON

Legend

2" Superpave FAA 42 (Bituminous Surface)

Sidewalk Concrete 4IN

2" Superpave FAA 42 (Concrete Surface)

Paving Layout

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/18/2025
NORTH DAKOTA

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
E5-1-48	48"x48"	EXIT GORE		35	
G20-1-60	**60"x24"**	**ROAD WORK NEXT __ MILES**	**2**	**28**	**56**
G20-1b-60	**60"x24"**	**NO WORK IN PROGRESS (Sign and installation only)**	**2**	**18**	**36**
G20-2-48	**48"x24"**	**END ROAD WORK**	**2**	**26**	**52**
G20-4-36	**36"x18"**	**PILOT CAR FOLLOW ME (Mounted to back of pilot car)**	**1**	**18**	**18**
G20-10-108	108"x48"	CONTRACTOR SIGN		70	
G20-50a-72	**72"x36"**	**ROAD WORK NEXT __ MILES RT & LT ARROWS**	**19**	**43**	**817**
G20-52a-72	72"x24"	ROAD WORK NEXT ___ MILES RT or LT ARROW		36	
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT		59	
G20-55-96	**96"x48"**	**SPEED LIMIT ENFORCED - MINIMUM FEE $150 WHEN WORKERS PRESENT**	**2**	**59**	**118**
I2-5-96	96"x48"	YOUR HIGHWAY DOLLARS AT WORK		59	
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)		10	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)		7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)		7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)		7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT		15	
M4-10-48	48"x18"	DETOUR (INSIDE ARROW) RIGHT or LEFT (Mounted on barricade)		7	
M5-1-21	21"x15"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)		7	
M5-1-30	30"x21"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)		9	
M6-1-21	21"x15"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)		7	
M6-1-30	30"x21"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)		9	
M6-3-21	21"x15"	DIRECTIONAL ARROW UP (Mounted on route marker post)		7	
R1-1-48	**48"x48"**	**STOP**	**2**	**32**	**64**
R1-2-60	60"x60"	YIELD		29	
R2-1-36	36"x48"	SPEED LIMIT __ (Portable only)		30	
R2-1-48	**48"x60"**	**SPEED LIMIT __**	**4**	**39**	**156**
R2-1aP-24	24"x18"	MINIMUM FEE $80 (Mounted on Speed Limit post)		10	
R2-1aP-24	**24"x18"**	**MINIMUM FEE $150 (Mounted on Speed Limit post)**	**2**	**10**	**20**
R3-2-48	48"x48"	NO LEFT TURN		35	
R4-1-36	**36"x48"**	**DO NOT PASS (Portable only)**	**2**	**30**	**60**
R4-1-48	**48"x60"**	**DO NOT PASS**	**6**	**39**	**234**
R4-7-48	48"x60"	KEEP RIGHT		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)		14	
R7-1-12	12"x18"	NO PARKING ANY TIME		11	
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	48"x30"	ROAD CLOSED (Mounted on barricade)		12	
R11-2a-48	48"x30"	STREET CLOSED (Mounted on barricade)		12	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC (Mounted on barricade)		15	
W1-3-48	48"x48"	REVERSE TURN RIGHT or LEFT		35	
W1-4-48	48"x48"	REVERSE CURVE RIGHT or LEFT		35	
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT		35	
W1-6-48	48"x24"	ONE DIRECTION LARGE ARROW		26	
W3-1-48	48"x48"	STOP AHEAD		35	
W3-3-48	48"x48"	SIGNAL AHEAD		35	
W3-4-48	**48"x48"**	**BE PREPARED TO STOP**	**2**	**35**	**70**
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**2**	**35**	**70**
W4-2-48	48"x48"	LANE ENDS RIGHT or LEFT		35	
W5-1-48	**48"x48"**	**ROAD NARROWS**	**1**	**35**	**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		35	
W8-1-48	**48"x48"**	**BUMP**	**1**	**35**	**35**
W8-3-48	**48"x48"**	**PAVEMENT ENDS**	**1**	**35**	**35**
W8-7-48	**48"x48"**	**LOOSE GRAVEL**	**6**	**35**	**210**
W8-11-48	**48"x48"**	**UNEVEN LANES**	**2**	**35**	**70**
W8-12-48	**48"x48"**	**NO CENTER LINE**	**6**	**35**	**210**
W8-17-48	48"x48"	SHOULDER DROP-OFF SYMBOL		35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY		35	
W8-54-48	**48"x48"**	**TRUCKS ENTERING AHEAD or __ FT or _ MILE**	**2**	**35**	**70**
W8-55-48	**48"x48"**	**TRUCKS CROSSING AHEAD or __ FT or _ MILE**	**2**	**35**	**70**
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL		35	
W13-1P-30	30"x30"	__ MPH ADVISORY SPEED PLAQUE (Mounted on warning sign post)		14	
W14-3-64	64"x48"	NO PASSING ZONE		28	
W16-2P-30	**30"x24"**	**__ FEET PLAQUE (Mounted on warning sign post)**	**2**	**10**	**20**
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**5**	**35**	**175**
W20-2-48	48"x48"	DETOUR AHEAD or __FT or _ MILE		35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT or _ MILE		35	
W20-4-48	**48"x48"**	**ONE LANE ROAD AHEAD or __ FT or _ MILE**	**2**	**35**	**70**
W20-5-48	48"x48"	RIGHT or CENTER or LEFT LANE CLOSED AHEAD or __ FT or _ MILE		35	
W20-7-48	**48"x48"**	**FLAGGER**	**2**	**35**	**70**
W20-8-18	**18"x18"**	**STOP - SLOW PADDLE Back to Back**	**2**	**5**	**10**
W20-52P-54	**54"x12"**	**NEXT __ MILES (Mounted on warning sign post)**	**6**	**12**	**72**
W21-1-48	48"x48"	WORKERS		35	
W21-2-48	**48"x48"**	**FRESH OIL**	**2**	**35**	**70**

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
W21-3-48	**48"x48"**	**ROAD MACHINERY AHEAD or __ FT or _ MILE**	**4**	**35**	**140**
W21-5-48	**48"x48"**	**SHOULDER WORK**	**1**	**35**	**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 or _ MILE		35	
W21-6-48	48"x48"	SURVEY CREW		35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT		35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY		35	
W21-52-48	48"x48"	PAVEMENT BREAKS		35	
W21-53-48	**48"x48"**	**RUMBLE STRIPS AHEAD**	**2**	**35**	**70**
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK		35	

SPECIAL SIGNS

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS**	**3238**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	**FLAGGING**	**MHR**	**2500**
704-1018	LANE CLOSURE-SIGNAL CONTROL/FLAGGING CONTROL	EACH	
704-1035	ATTENUATION DEVICE-TYPE B-25	EACH	
704-1043	ATTENUATION DEVICE-TYPE B-65	EACH	
704-1048	**PORTABLE RUMBLE STRIPS**	**EACH**	**2**
704-1050	TYPE I BARRICADES	EACH	
704-1052	TYPE III BARRICADES	EACH	
704-1060	**DELINEATOR DRUMS**	**EACH**	**318**
704-1065	TRAFFIC CONES	EACH	
704-1067	TUBULAR MARKERS	EACH	
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1080	STACKABLE VERTICAL PANELS	EACH	
704-1081	VERTICAL PANELS - BACK TO BACK	EACH	
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH	
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH	
704-1087	SEQUENCING ARROW PANEL - TYPE C	EACH	
704-1185	**PILOT CAR**		**850**
704-1500	OBLITERATION OF PVMT MK	SF	
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH	
762-0200	RAISED PAVEMENT MARKERS	EACH	
762-0420	SHORT TERM 4IN LINE - TYPE R	LF	
762-0426	SHORT TERM 24IN LINE-TYPE R	LF	
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF	

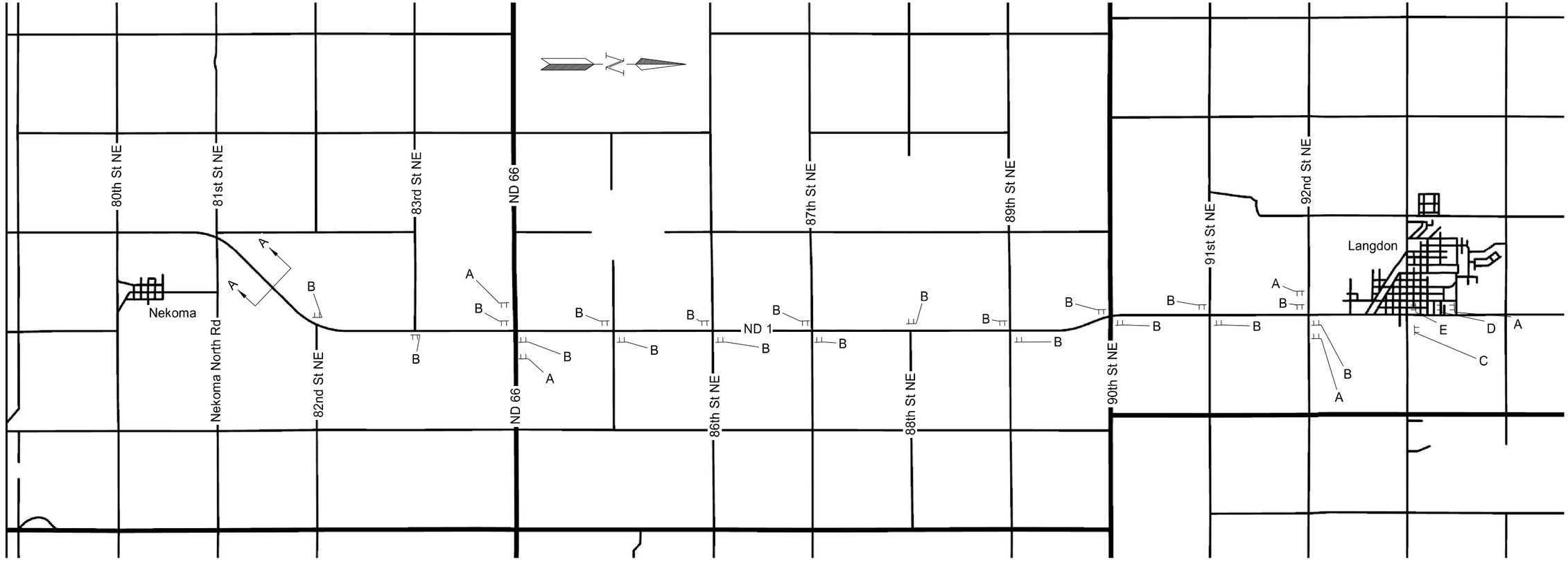
NOTE:
If additional signs are required, units will be calculated using the formula from Section III-18.06 of the Design Manual.
http://www.dot.nd.gov/

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 8/20/2025
NORTH DAKOTA

Traffic Control Devices List
Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	100	2



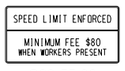
A

W20-1-48

C

G20-2a-48

E



G20-55-96

B

G20-50a-72

D

G20-1-60

NOTE: South of Section A-A refer to project number NH-3-001(033)200

Construction Sign Layout

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
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DATE: 8/20/2025
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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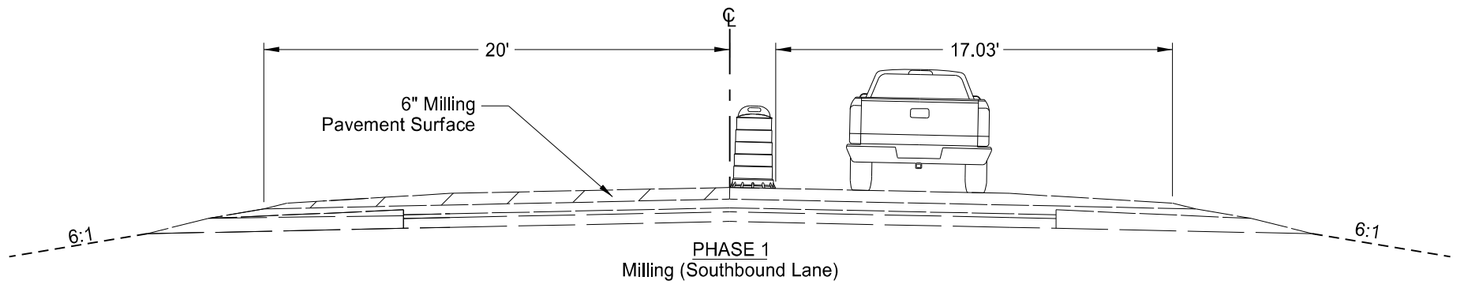
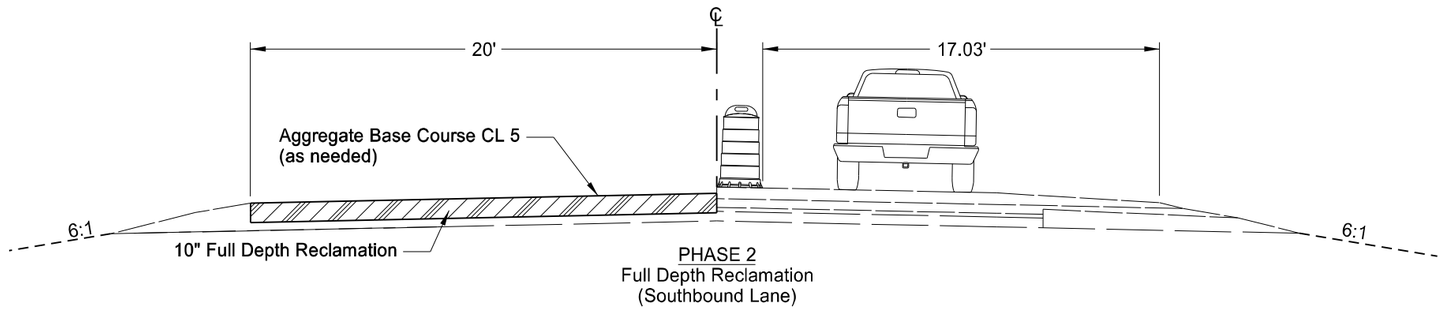
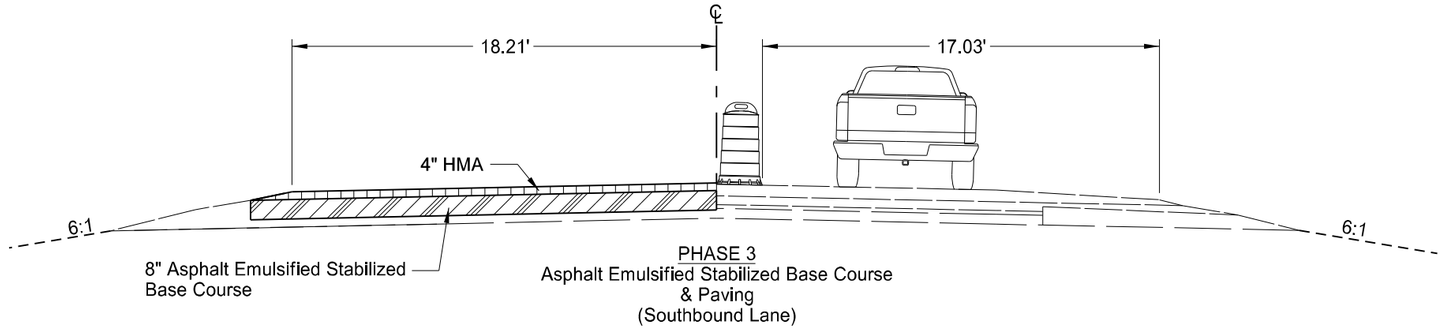


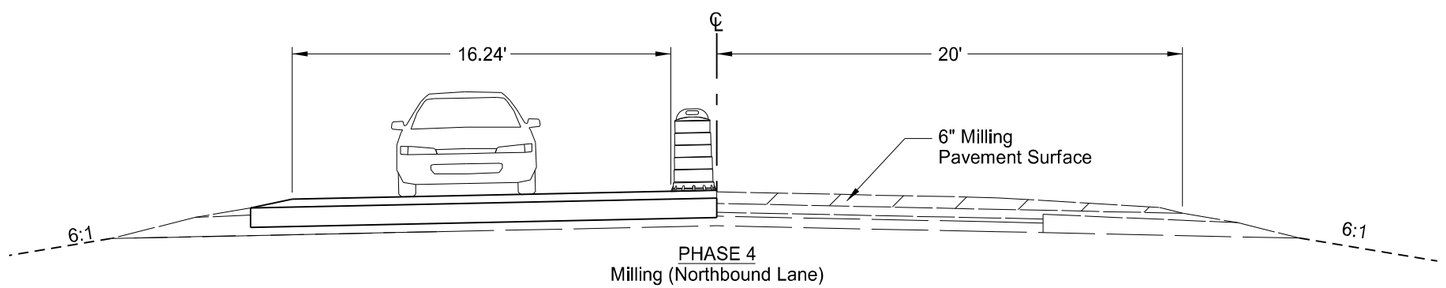
PHASE 1
Milling (Southbound Lane)



PHASE 2
Full Depth Reclamation
(Southbound Lane)



PHASE 3
Asphalt Emulsified Stabilized Base Course
& Paving
(Southbound Lane)



PHASE 4
Milling (Northbound Lane)

Drawing Not to Scale

Notes:

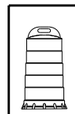
Contractor needs to maintain
2 lanes of traffic through the
reconstruction area at night
or a plan on night time flagging
will be required.

Phase 1
Move traffic to the Northbound lane using
flaggers and pilot car.
Mill the pavement on the Southbound side.

Phase 2
Complete full depth reclamation on the Southbound lane.
Following completion of full depth reclamation place
aggregate base course CL 5, as needed, to
establish profile grade.

Phase 3
Complete asphalt emulsified stablization on the Southbound lane.
Pave the Southbound lane.

Phase 4
Move traffic to the Southbound lane
using flaggers and pilot car.
Mill the pavement on the Northbound side.



Delinator Drums
(spaced @ 2 x speed limit)

Work Zone Traffic Control
Full Depth Reclamation

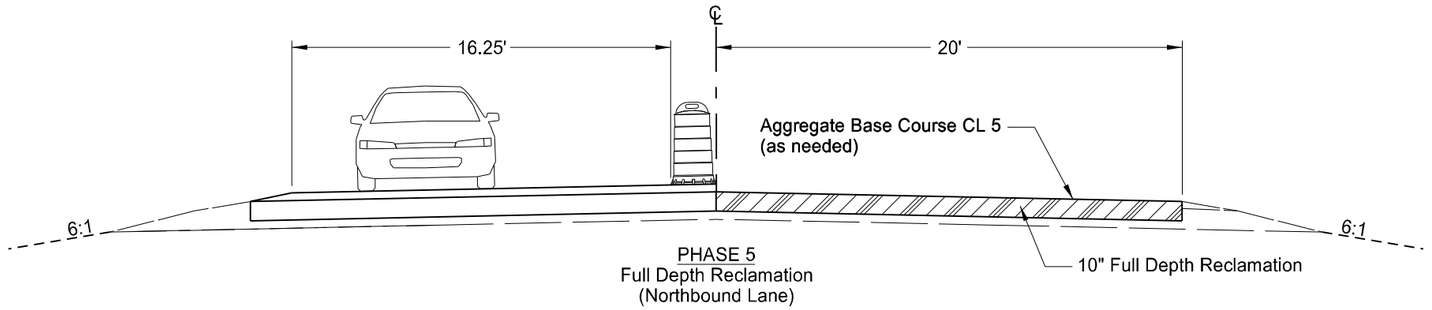
Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

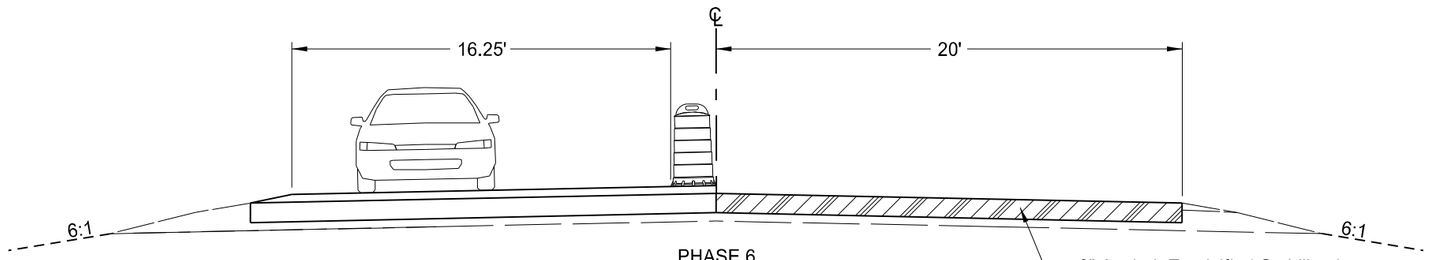
REGISTERED PROFESSIONAL ENGINEER
RYAN
SCHUEHLE
PE-10772
DATE: 8/20/2025
NORTH DAKOTA

8/14/2025 8:25:19 AM JButler H:\Projects\14000\14451\3001201.031\Design\Plan\100WZ_003_FDR_Phasing.dgn

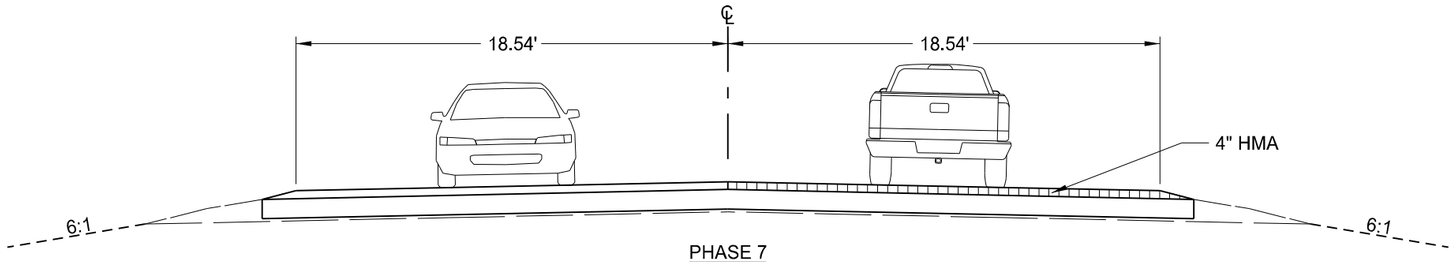
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	100	4



PHASE 5
Full Depth Reclamation
(Northbound Lane)



PHASE 6
Asphalt Emulsified Stabilized Base Course
& Paving
(Northbound Lane)



PHASE 7
Paving
(Northbound Lane)

Drawing Not to Scale

Notes:

Contractor needs to maintain
2 lanes of traffic through the
reconstruction area at night
or a plan on night time flagging
will be required.

Phase 5
Complete full depth reclamation on the Northbound lane.
Following completion of full depth reclamation place
aggregate base course CL 5, as needed, to
establish profile grade.

Phase 6
Complete asphalt emulsified stablization on
the Northbound lane.

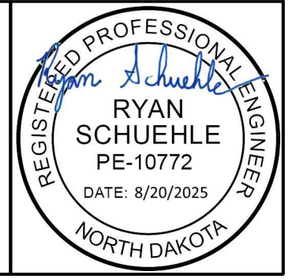
Phase 7
Pave the Northbound lane.

Delinator Drums
(spaced @ 2 x speed limit)

Work Zone Traffic Control
Full Depth Reclamation

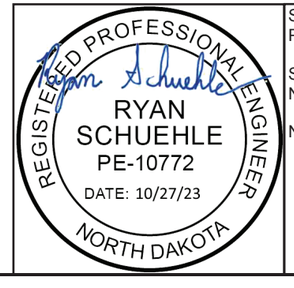
Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	NH-3-001(031)201	110	1

Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	2nd LF	3rd LF	4th LF	Vert Clear-ance FT	Support Size	Max Post Len LF	Sleeve Length 1st LF	2nd LF	3rd LF	4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
ND 1																							
20690+31 Rt		20		9.0					5.0							2.5 x 2.5 12 ga							Mount on Existing Supports
20712+44 Rt	SA2B				12.2				5.0	2.25 x 2.25 12 ga	14.7						1	4	2.5 x 2.5 12 ga	1			
20736+13 Lt		20		9.0	12.8				5.0	2.25 x 2.25 12 ga	14.7	3.8				2.5 x 2.5 12 ga	1	4	3 x 3 7 ga			1	
20764+99 Lt		1			11.2				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga	1			
20808+85 Lt		9			11.9				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga	1			
20811+40 Rt		391	6.2		12.7				5.0	2.5 x 2.5 12 ga	15.9						1	4	3 x 3 7 ga				
20814+39 Rt	SN-1		22.8						5.0														Mount on Existing Supports
20817+30 Lt		371	6.0		12.4				5.0	2.25 x 2.25 12 ga	12.9						1	4	2.5 x 2.5 12 ga				
20817+32 Rt		405	12.4						5.0														Mount on Existing Supports
20819+28 Lt		405	12.4						5.0														Mount on Existing Supports
20819+33 Rt		371	6.0		12.4				5.0	2.25 x 2.25 12 ga	12.9						1	4	2.5 x 2.5 12 ga				
20821+73 Lt	SN-2		32.5		12.9	13.3	13.6		5.0	2.25 x 2.25 12 ga	15.1	3.7	4.1	4.4		2.5 x 2.5 12 ga	3	4	3 x 3 7 ga			3	
20822+33 Rt		1		5.2	11.9				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
20824+70 Lt		391	6.2		12.7				5.0	2.5 x 2.5 12 ga	15.9						1	4	3 x 3 7 ga				
20826+69 Rt		9		5.0	11.9				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
20834+99 Rt		1		5.2	11.2				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
20844+98 Rt		1		5.2	11.9				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
20921+32 Rt	SN-3		11.3		10.5	11.2			5.0	2.25 x 2.25 12 ga	11.3						2	4	2.5 x 2.5 12 ga				
20922+03 Rt		437	8.4		13.5				5.0	2.5 x 2.5 10 ga	15.2						1	4	3 x 3 7 ga			1	Yellow Legend on Blue Background
20922+95 Lt		371	6.0		12.4				5.0	2.25 x 2.25 12 ga	12.9						1	4	2.5 x 2.5 12 ga				
20923+82 Lt	SA2B				12.2				5.0	2.25 x 2.25 12 ga	14.7						1	4	2.5 x 2.5 12 ga	1			
20924+91 Rt		371	6.0		12.4				5.0	2.25 x 2.25 12 ga	12.9						1	4	2.5 x 2.5 12 ga				
20927+42 Lt	SN-4		11.3		10.5	11.2			5.0	2.25 x 2.25 12 ga	11.3						2	4	2.5 x 2.5 12 ga				
20929+41 Lt		437	8.4		13.5				5.0	2.5 x 2.5 10 ga	15.2						1	4	3 x 3 7 ga			1	Yellow Legend on Blue Background
20976+65 Lt	SA2B				12.2				5.0	2.25 x 2.25 12 ga	14.7						1	4	2.5 x 2.5 12 ga	1			
20977+11 Rt		1		5.2	11.2				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
21029+75 Rt	SA2B			5.2	12.2				5.0	2.25 x 2.25 12 ga	14.7						1	4	2.5 x 2.5 12 ga	1			
21082+32 Lt	SA2B				12.2				5.0	2.25 x 2.25 12 ga	14.7						1	4	2.5 x 2.5 12 ga	1			
21082+71 Rt		1		5.2	11.2				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
21100+78 Rt		20		9.0	12.8				5.0	2.25 x 2.25 12 ga	14.7	3.8				2.5 x 2.5 12 ga	1	4	3 x 3 7 ga			1	
21122+66 Rt		20		9.0	12.8				5.0	2.25 x 2.25 12 ga	14.7	3.8				2.5 x 2.5 12 ga	1	4	3 x 3 7 ga			1	
21129+56 Lt		20		9.0	12.8				5.0	2.25 x 2.25 12 ga	14.7	3.8				2.5 x 2.5 12 ga	1	4	3 x 3 7 ga			1	
21137+01 Lt	SA2B			5.2	12.2				5.0	2.25 x 2.25 12 ga	14.7						1	4	2.5 x 2.5 12 ga	1			



Sign Summary
Perforated Tube

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	NH-3-001(031)201	110	2

Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	2nd LF	3rd LF	4th LF	Vert Clear-ance FT	Support Size	Max Post Len LF	Sleeve Length 1st LF	2nd LF	3rd LF	4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
21137+28 Rt		1			11.2				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga	1			
21189+90 Lt		1			11.2				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga	1			
21238+34 Rt		21			13.4	13.8			5.0	2.5 x 2.5 10 ga	14.3						2	4	3 x 3 7 ga	1		2	
21240+20 Rt		1			11.2				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga	1			
21242+68 Lt		1			11.2				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga	1			
21243+19 Rt		1		5.2	11.2				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
21243+45 Rt	SN-5	9		5.0	11.9				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
21248+42 Lt	SN-6	9		5.0	11.9				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
21250+93 Lt		9		5.0	11.9				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
21250+95 Rt		9		5.0	11.9				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
21257+15 Lt		1			11.2				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga	1			
21258+92 Rt	SN-7		6.0		10.5				5.0	2.25 x 2.25 12 ga	10.9						1	4	2.5 x 2.5 12 ga	1			
21259+04 Lt		1		5.2	11.2				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
21259+06 Lt		9		5.0	11.9				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
21260+96 Rt		9		5.0	11.9				5.0	2.25 x 2.25 12 ga	15.0						1	4	2.5 x 2.5 12 ga				
21261+96 Lt		1		5.2	11.2				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
21262+68 Rt		1			11.2				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga	1			
21264+26 Rt	SN-8		15.0		11.5				5.0	2.5 x 2.5 10 ga	12.7	3.8				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga			1	
21265+36 Lt		1		5.2	11.2				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
21267+15 Lt	SN-9		15.0		11.5				5.0	2.5 x 2.5 10 ga	12.7	3.8				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga			1	
21270+61 Lt		371		6.0	12.4				5.0	2.25 x 2.25 12 ga	12.9						1	4	2.5 x 2.5 12 ga				
21270+61 Rt				7.1					5.0														
21273+62 Lt		1		5.2	11.9				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
21278+21 Lt		1		5.2	11.9				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				Reset Street Signs Using Existing Support System
21279+32 Rt		1		5.2	12.0				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
21279+95 Lt		1		5.2	11.0				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
21280+59 Lt		63		7.1	11.6				5.0	2.5 x 2.5 12 ga	12.7						1	4	3 x 3 7 ga				
21280+78 Rt		1		5.2	12.0				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
21281+51 Lt		1		5.2	11.3				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
21284+39 Lt		1		5.2	11.3				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
21285+54 Rt		1			11.3				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga	1			
21288+05 Lt		1		5.2	12.0				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
21288+47 Rt		1			12.0				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga	1			
21289+68 Rt		391			14.1				5.0	2.5 x 2.5 12 ga	15.9						1	4	3 x 3 7 ga	1			

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

Sign Summary
Perforated Tube

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	NH-3-001(031)201	110	3

Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	2nd LF	3rd LF	4th LF	Vert Clear-ance FT	Support Size	Max Post Len LF	Sleeve Length 1st LF	2nd LF	3rd LF	4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
21291+18 Rt	SN-10		29.8		13.6	14.1	14.7		5.0	2.25 x 2.25 12 ga	16.0	4.0	4.6	5.1			3	4	3 x 3 7 ga			3	
21291+57 Lt		1		5.2	14.0				7.0	2.5 x 2.5 12 ga	14.1						1	4	3 x 3 7 ga	1			Reset Street Signs Using Existing Support System
21292+37 Rt		1		5.2	13.2				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
21293+72 Rt		399	6.2		14.1				5.0	2.5 x 2.5 12 ga	15.9						1	4	3 x 3 7 ga				
21293+74 Lt		371	6.0		12.5				5.0	2.25 x 2.25 12 ga	12.9						1	4	2.5 x 2.5 12 ga				
21293+90 Lt		1		5.2	12.0				5.0	2.25 x 2.25 12 ga	13.7						1	4	2.5 x 2.5 12 ga				
21294+79 Lt		431	14.4		13.4				5.0	2.5 x 2.5 10 ga	15.3	3.8				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga			1	
21295+01 Rt		3			13.8				5.0	2.5 x 2.5 10 ga	14.6	4.9				2.19 x 2.19 10 ga	1	4	3 x 3 7 ga	1		1	
Sub Total			248.3	214.6		**Total**	936.3										**Total**	308.0		21	0	18	
ND 66																							
20817+76 Lt		2		7.5	11.3				5.0	2.5 x 2.5 12 ga	12.1						1	4	3 x 3 7 ga	1			See Notes 754-P01 and 754-P02
20817+84 Rt		405	12.4		12.4				5.0	2.5 x 2.5 12 ga	13.5	4.0				2.25 x 2.25 12 ga	1	4	3 x 3 7 ga			1	
20818+43 Lt		371	6.0						5.0														Mount on Existing Supports
20818+49 Lt		430	14.4		12.7				5.0	2.25 x 2.25 12 ga	13.0	4.4				2.5 x 2.5 12 ga	1	4	3 x 3 7 ga			1	
20818+49 Rt		2		7.5	12.0				5.0	2.5 x 2.5 12 ga	12.1						1	4	3 x 3 7 ga				See Notes 754-P01 and 754-P02
Sub Total			32.8	15.0		**Total**	48.4										**Total**	16.0		1	0	2	
Grand Total			**281.1**	**229.6**		**Total**	**984.7**										**Total**	**324**	**0**	**22**	**0**	**20**	

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
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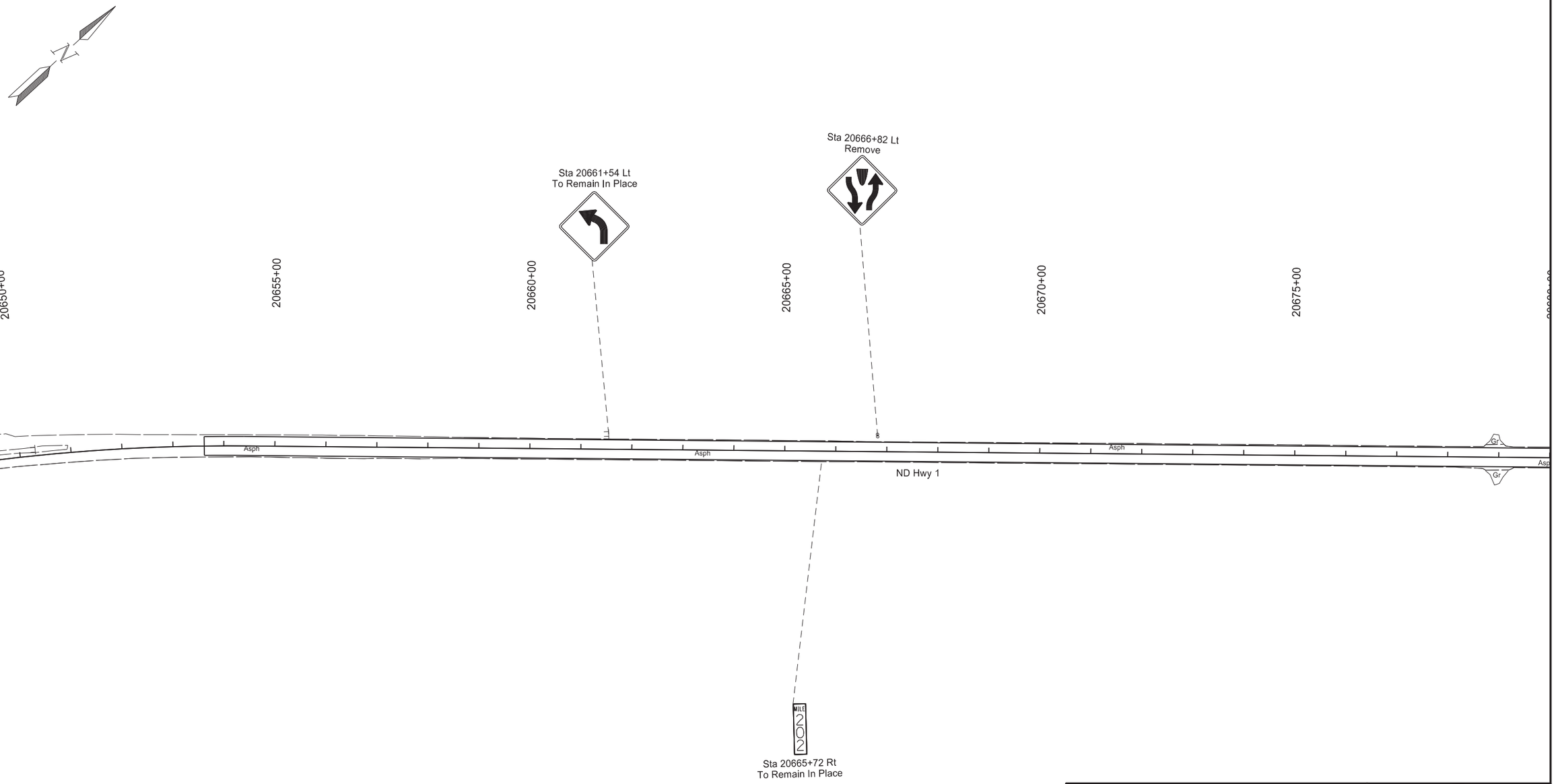
Sign Summary
Perforated Tube

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	4



Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN
SCHUEHLE
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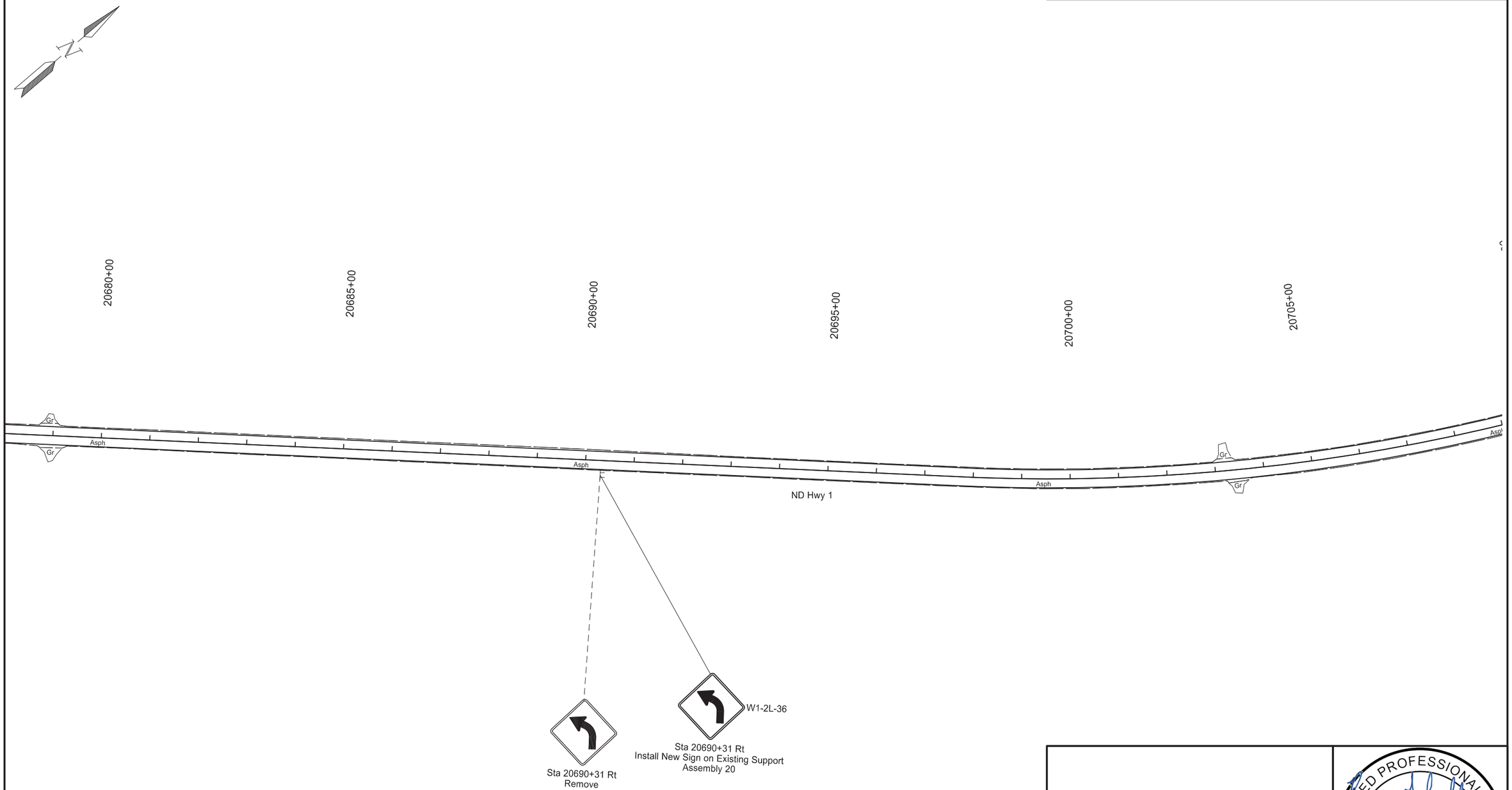
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	5



Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

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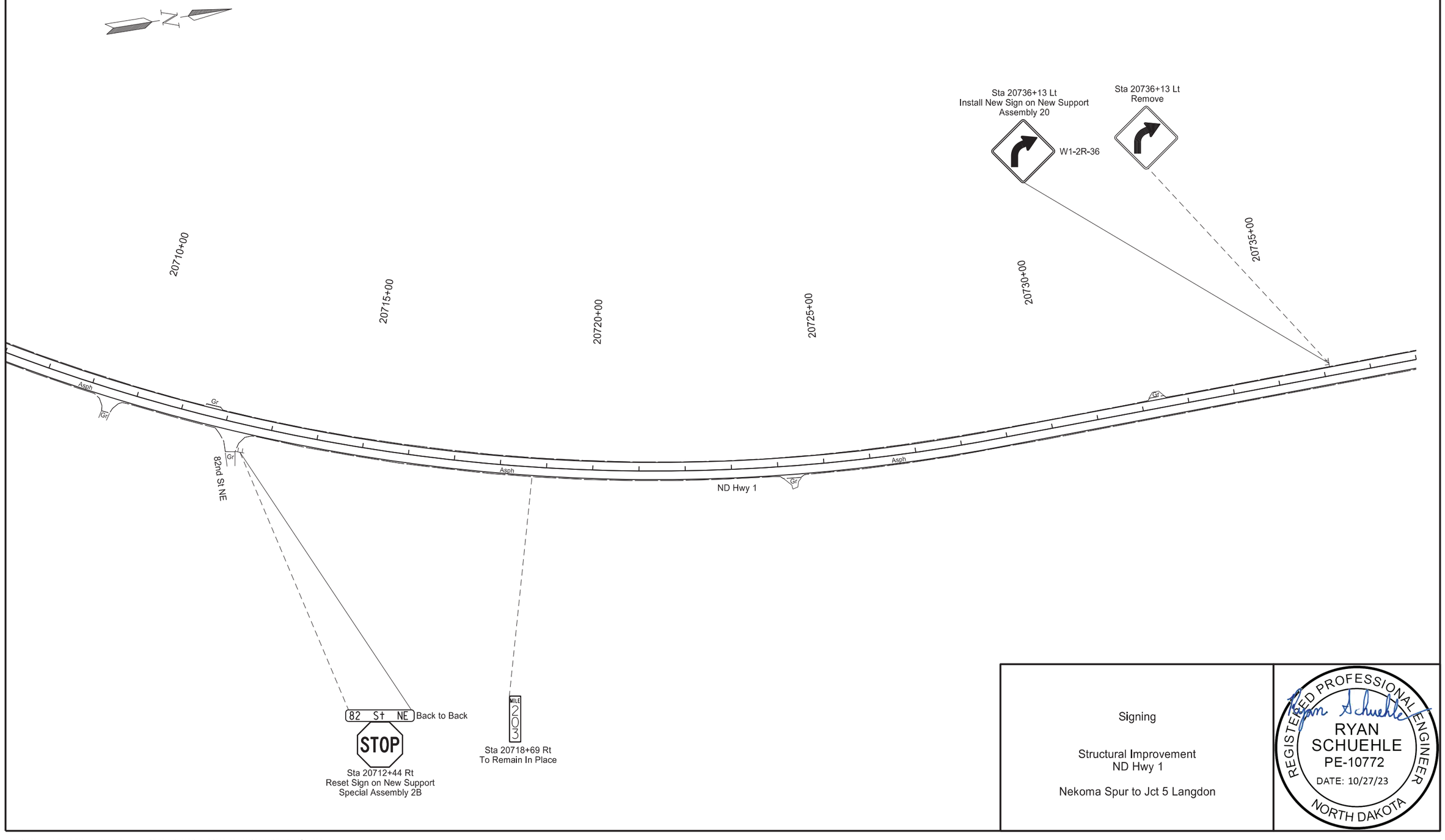
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	6



Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

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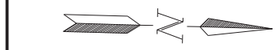
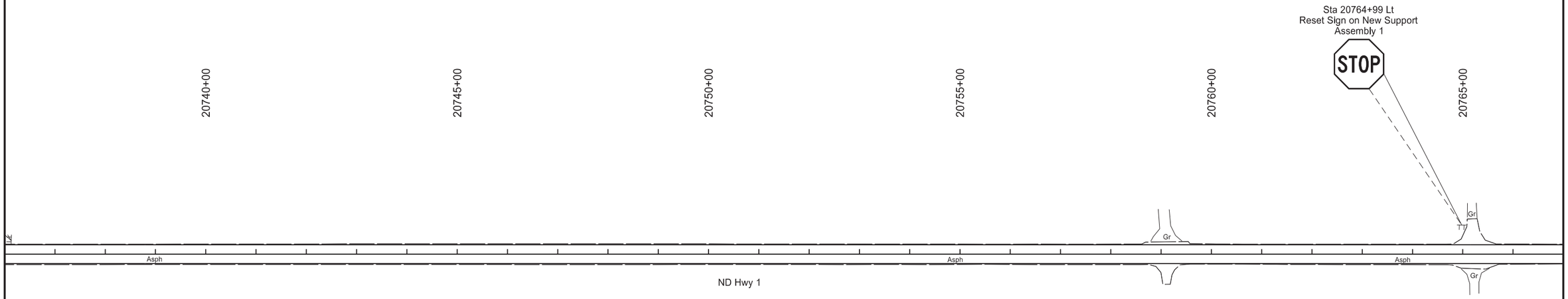
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	7





Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

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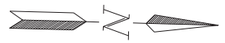
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	8



20765+00
20770+00
20775+00
20780+00
20785+00
20790+00
20795+00

Gr
Asph
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Asph
Gr
Asph
Gr

ND Hwy 1

MILE 204

Sta 20771+46 Rt
To Remain In Place

Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	9

Sta 20817+30 Lt
Install New Sign on New Support
Assembly 371

SOUTH M3-3-24
NORTH DAKOTA 1 M1-5-24

Sta 20817+30 Lt
Remove

SOUTH
NORTH DAKOTA 1

Sta 20817+76 Lt
Remove

STOP

Sta 20817+76 Lt
Install New Sign on New Support
(Solar-powered LED)
Assembly 2

STOP R1-1-36

Sta 20818+49 Lt
Remove

WEST
NORTH DAKOTA 66 | NORTH DAKOTA 1
M1-5-24 | M6-3-21

Sta 20818+49 Lt
Install New Sign on New Support
Assembly 430

M3-4-24 WEST
M1-5-24 NORTH DAKOTA 66 | NORTH DAKOTA 1 M1-5-24
M6-3-21 M6-4-21

Sta 20818+43 Lt
Remove

WEST
NORTH DAKOTA 66

Sta 20818+43 Lt
Install New Sign on Existing Support
Assembly 371

M3-4-21 WEST
M1-5-24 NORTH DAKOTA 66

Sta 20819+28 Lt
Remove

NORTH DAKOTA 66 | NORTH DAKOTA 1

Sta 20819+28 Lt
Install New Sign on Existing Support
Assembly 405

M1-5-24 NORTH DAKOTA 66 | NORTH DAKOTA 1 M1-5-24
M6-4-21 M6-3-21

Sta 20821+73 Lt
Remove

↑ Nekoma	4
↑ Lakota	42
← Milton	14
Loma	8 →

Sta 20821+73 Lt
Install New Sign on New Support
Variable Length Assembly

SN-2

↑ Nekoma	4
↑ Lakota	42
← Milton	14
Loma	8 →

Sta 20808+85 Lt
Reset Sign on New Support
Assembly 9

SPEED LIMIT 65

20795+00 20800+00 20805+00 20810+00 20815+00 20820+00 20825+00

ND Hwy 66

Gr Asph

ND Hwy 1

JCT
NORTH DAKOTA 66
Sta 20811+40 Rt
Remove

JCT M2-1-21
NORTH DAKOTA 66 M1-5-24
Sta 20811+40 Rt
Install New Sign on New Support
Assembly 391

↑ Langdon	9
← Loma	8
Milton	14 →

Sta 20814+39 Rt
Remove

↑ Langdon	9
← Loma	8
Milton	14 →

SN-1
Sta 20814+39 Rt
Install New Sign on Existing Support
Variable Length Assembly

NORTH DAKOTA 66 | NORTH DAKOTA 1
Sta 20817+32 Rt
Remove

M1-5-24 NORTH DAKOTA 66 | NORTH DAKOTA 1 M1-5-24
M6-4-21 M6-3-21
Sta 20817+32 Rt
Install New Sign on Existing Support
Assembly 405

MILE 7 9
Sta 20817+79 Rt
To Remain In Place

NORTH DAKOTA 66 | NORTH DAKOTA 1
Sta 20817+84 Rt
Remove

M1-5-24 NORTH DAKOTA 66 | NORTH DAKOTA 1 M1-5-24
M6-3-21 M6-4-21
Sta 20817+84 Rt
Install New Sign on New Support
Assembly 405

STOP
Sta 20818+49 Rt
Remove

STOP R1-1-36
Sta 20818+49 Rt
Install New Sign on New Support
(Solar-powered LED)
Assembly 2

NORTH
NORTH DAKOTA 1
Sta 20819+33 Rt
Remove

M3-1-24 NORTH
M1-5-24 NORTH DAKOTA 1
Sta 20819+33 Rt
Install New Sign on New Support
Assembly 371

STOP
Sta 20822+33 Rt
Remove

STOP R1-1-30
Sta 20822+33 Rt
Install New Sign on New Support
Assembly 1

Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

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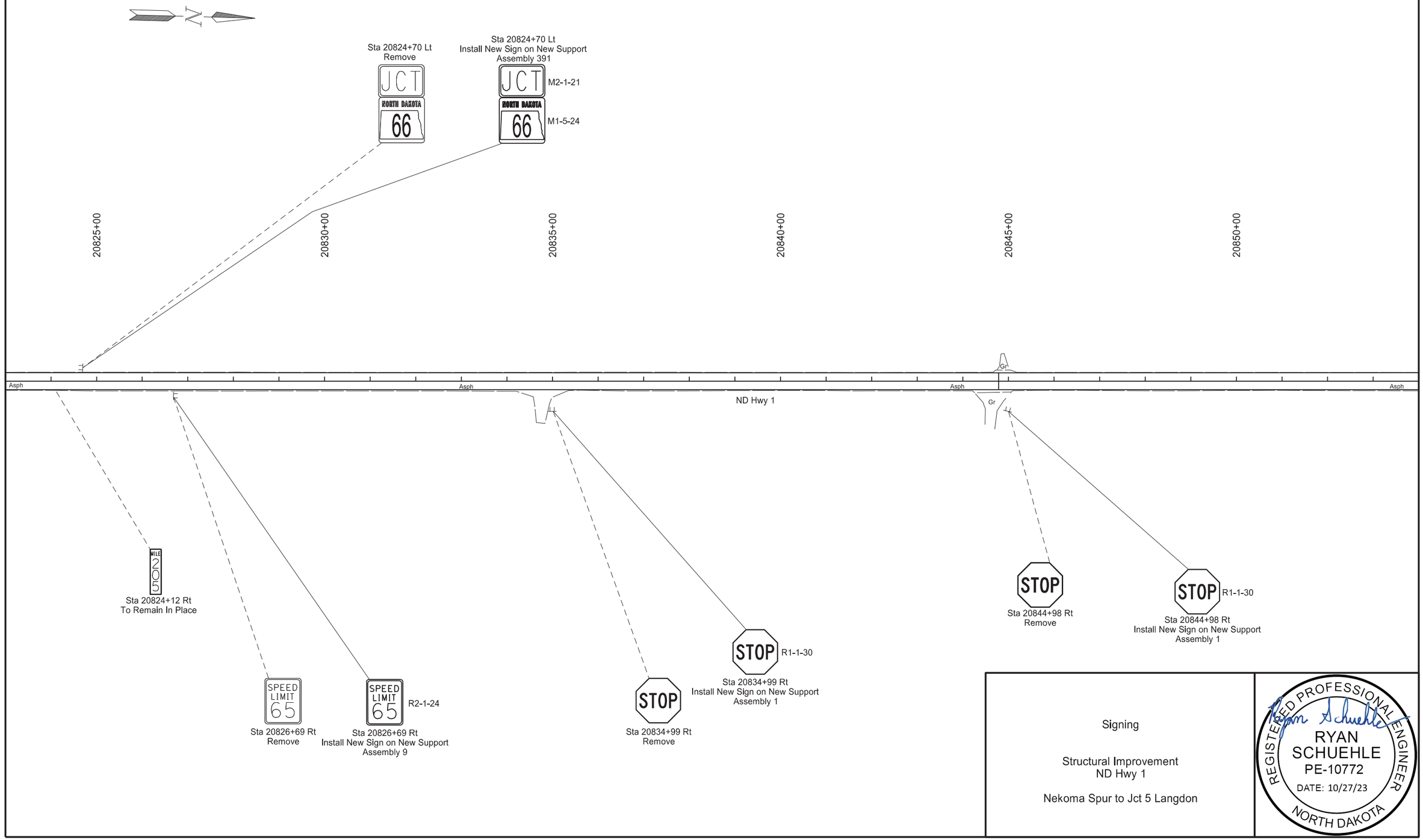
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	10



Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
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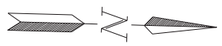
	ND	NH-3-001(031)201	110	11



20855+00

20860+00

20865+00

20870+00

20875+00

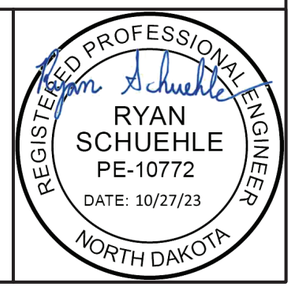
20880+00

Sta 20877+04 Rt
To Remain In Place

Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	12

Sta 20922+95 Lt
Remove

SOUTH
NORTH DAKOTA
1

Sta 20922+95 Lt
Install New Sign on New Support
Assembly 371

M3-3-24 SOUTH
NORTH DAKOTA
M1-5-24 1

Sta 20923+82 Lt
Reset Sign on New Support
Special Assembly 2B

86 ST NE Back to Back

STOP

Sta 20927+42 Lt
Install New Sign on New Support
Variable Length Assembly

Osnabrock 10 SN-4

Sta 20927+42 Lt
Remove

Osnabrock 10

Sta 20929+41 Lt
Remove

JCT
CAVALIER
24
COUNTY

Sta 20929+41 Lt
Install New Sign on New Support
Assembly 437

JCT M2-1-21
CAVALIER
24
COUNTY M1-6-24
M6-1L-21

20910+00 20915+00 20920+00 20925+00 20930+00 20935+00 20940+00

86th St NE

Gr

Asph Asph Asph

ND Hwy 1

Gr

Osnabrock 10 SN-3

Sta 20921+32 Rt
Install New Sign on New Support
Variable Length Assembly

Osnabrock 10

Sta 20921+32 Rt
Remove

JCT M2-1-21
CAVALIER
24
COUNTY M1-6-24
M6-1R-21

Sta 20922+03 Rt
Install New Sign on New Support
Assembly 437

JCT
CAVALIER
24
COUNTY

Sta 20922+03 Rt
Remove

STOP

Sta 20924+25 Rt
To Remain In Place

NORTH
NORTH DAKOTA
1

Sta 20924+91 Rt
Remove

NORTH M3-1-24
NORTH DAKOTA
1 M1-5-24

Sta 20924+91 Rt
Install New Sign on New Support
Assembly 371

MILE
207

Sta 20929+67 Rt
To Remain In Place

Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

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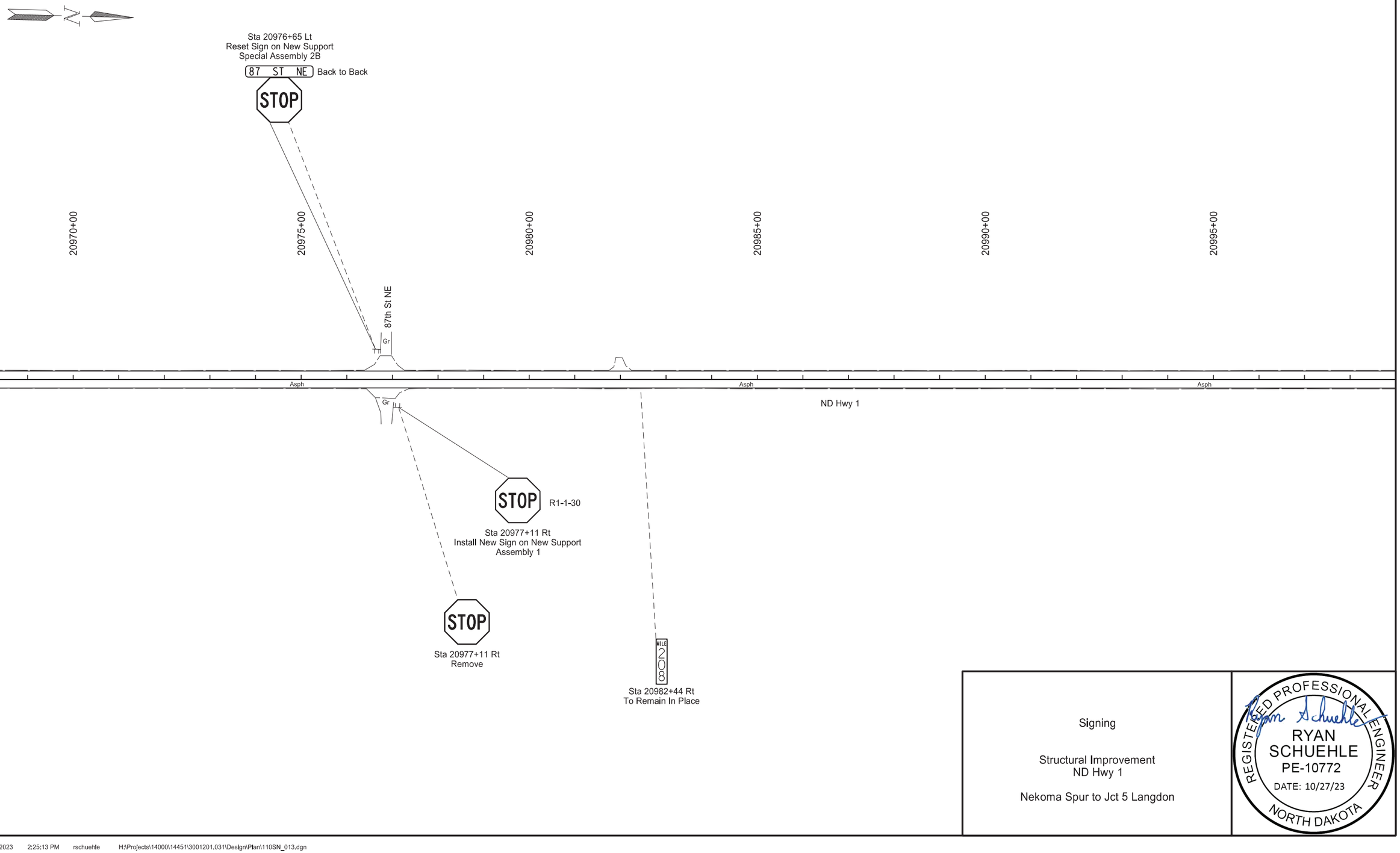
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	13



Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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PE-10772
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	14

21030+00 21035+00 21040+00 21045+00 21050+00 21055+00

Gr Asph Gr Asph Gr Asph

ND Hwy 1

88th St NE

88 St NE Back to Back

STOP R1-1-30

Sta 21029+75 Rt
Install New Sign on New Support
Special Assembly 2B

88 St NE Reset

STOP

Sta 21029+75 Rt
Remove

MILE 2006

Sta 21035+26 Rt
To Remain In Place

Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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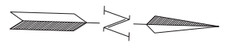
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	15



21055+00
21060+00
21065+00
21070+00
21075+00
21080+00
21085+00

Sta 21082+32 Lt
Reset Sign on New Support
Special Assembly 2B
89 ST NE Back to Back
STOP

89th St NE

Gr
Gr
Gr
Gr
Gr

Asph
Asph
Asph
Asph

ND Hwy 1

STOP R1-1-30

Sta 21082+71 Rt
Install New Sign on New Support
Assembly 1

STOP

Sta 21082+71 Rt
Remove

Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

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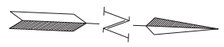
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	16



21085+00 21090+00 21095+00 21100+00 21105+00 21110+00 21115+00

Gr
Asph
Asph
Gr
Asph

ND Hwy 1

MILE 210

Sta 21088+03 Rt
To Remain In Place

Sta 21100+78 Rt
Remove

W1-2L-36

Sta 21100+78 Rt
Install New Sign on New Support
Assembly 20

Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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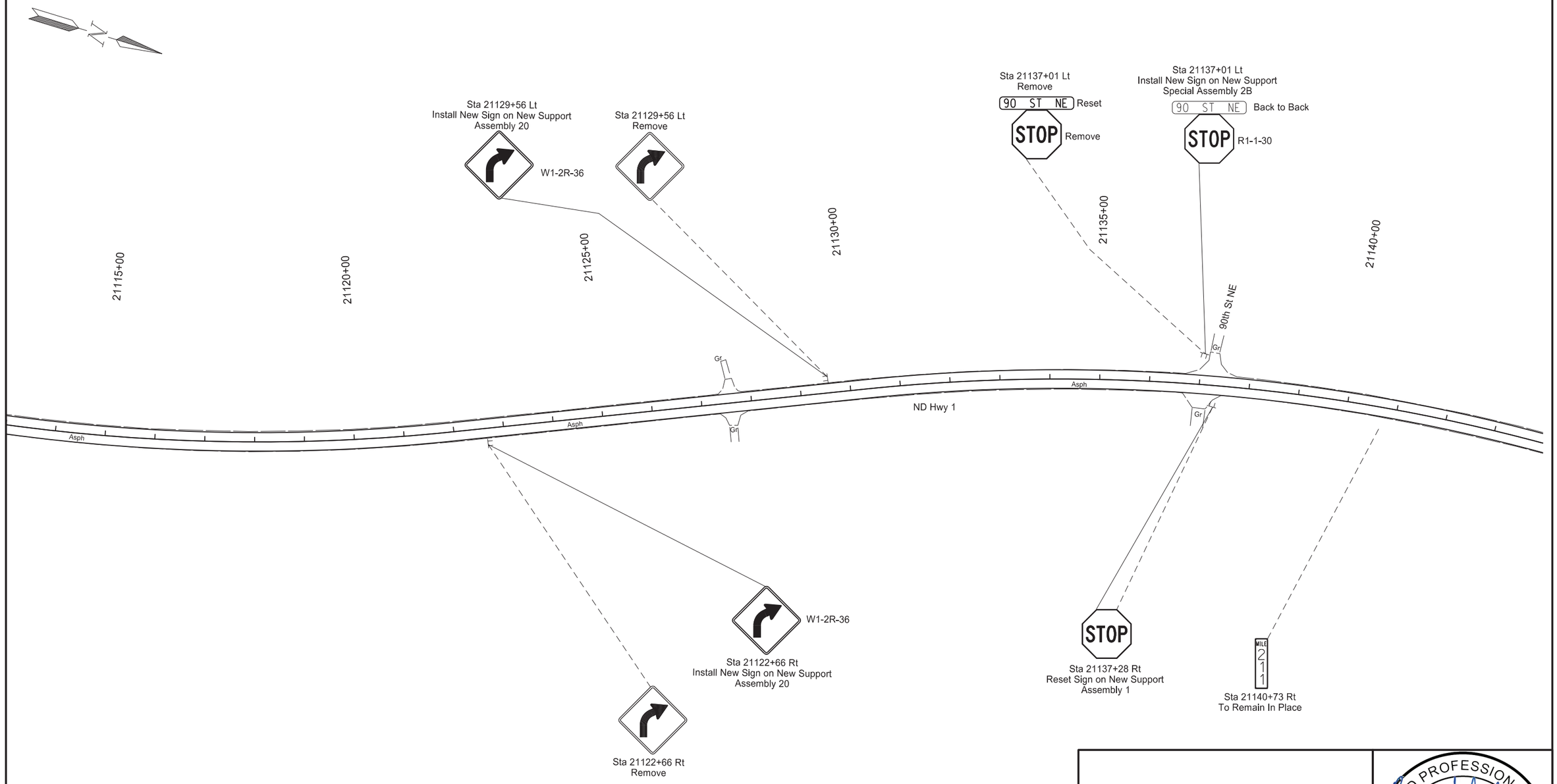
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	17



Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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DATE: 10/27/23
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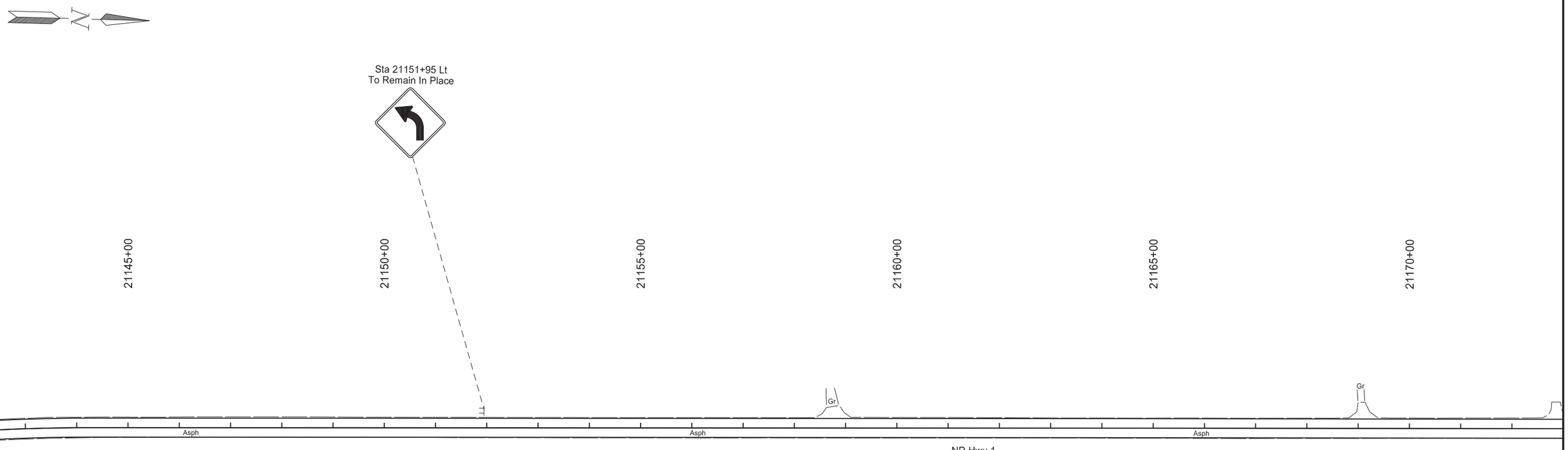
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	18



Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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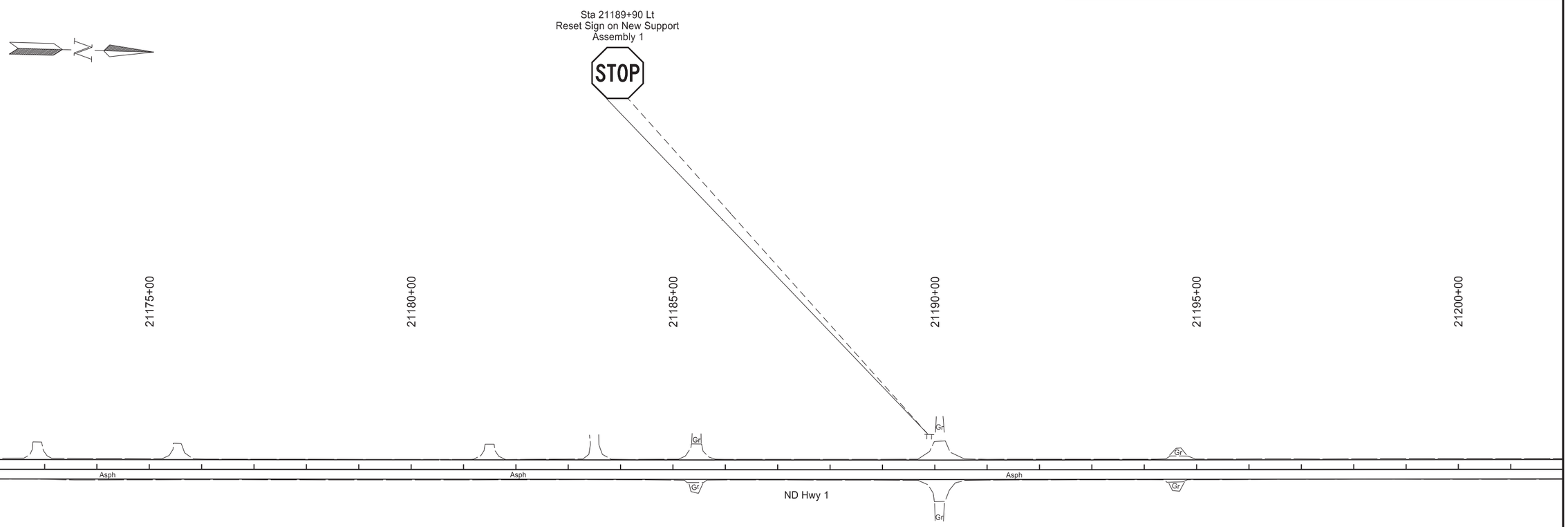
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	19



Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

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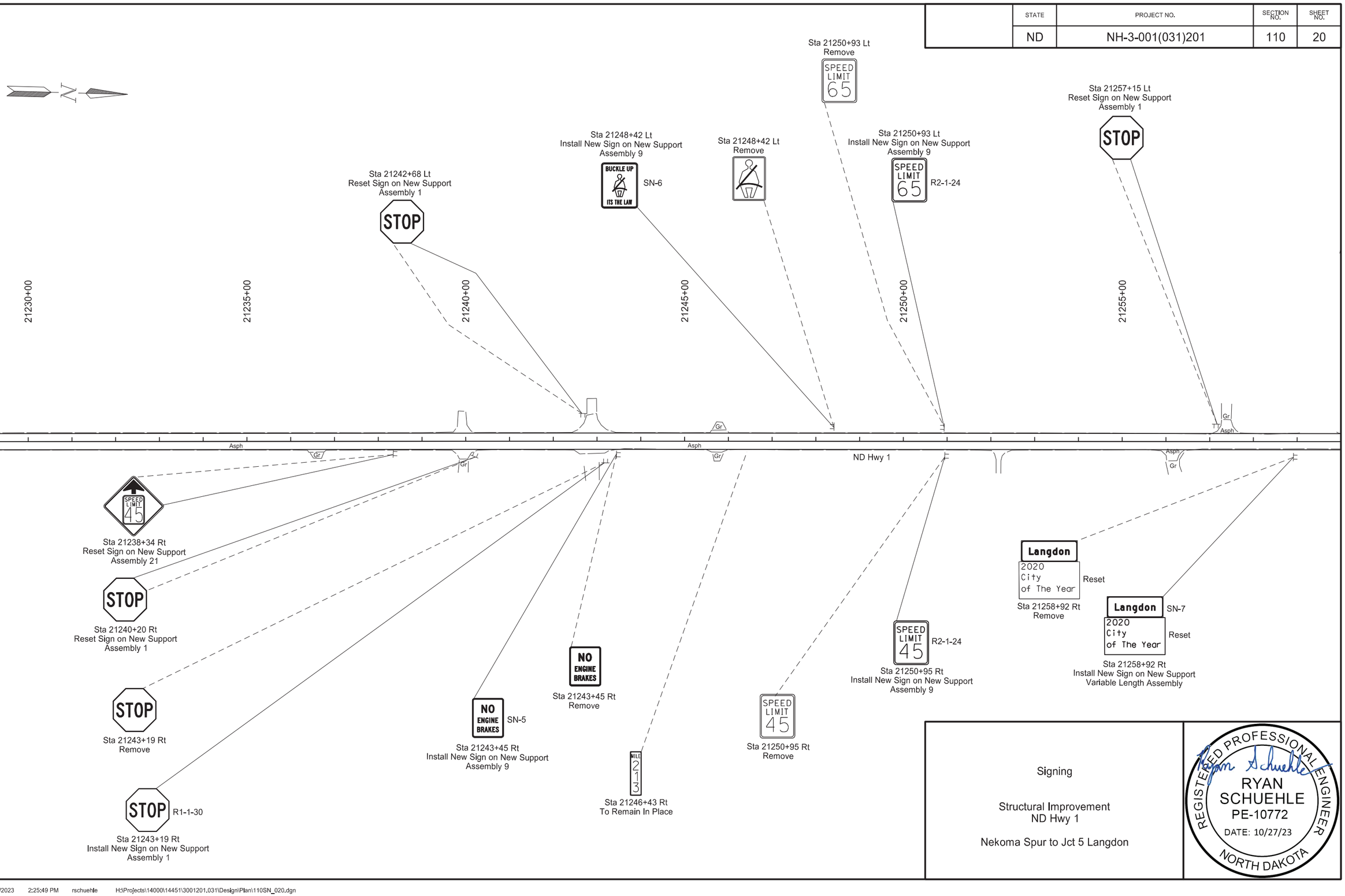
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	20



Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	21

Sta 21259+04 LT
Install New Sign on New Support
Assembly 1
STOP R1-1-30

Sta 21259+04 LT
Remove
STOP

Sta 21259+06 Lt
Install New Sign on New Support
Assembly 9
SPEED LIMIT 45 R2-1-24

Sta 21259+06 Lt
Remove
SPEED LIMIT 45

Sta 21260+96 Rt
Install New Sign on New Support
Assembly 9
SPEED LIMIT 25 R2-1-24

Sta 21260+96 Rt
Remove
SPEED LIMIT 25

Sta 21261+96 Lt
Remove
STOP

Sta 21261+96 Lt
Install New Sign on New Support
Assembly 1
STOP R1-1-30

Sta 21262+68 Rt
Reset Sign on New Support
Assembly 1
STOP

Sta 21264+26 Rt
Remove
Langdon
City Pond

Sta 21264+26 Rt
Install New Sign on New Support
Variable Length Assembly
Langdon
City Pond SN-8

Sta 21265+36 Lt
Remove
STOP

Sta 21265+36 Lt
Install New Sign on New Support
Assembly 1
STOP R1-1-30

Sta 21267+15 Lt
Remove
Langdon
City Pond

Sta 21267+15 Lt
Install New Sign on New Support
Variable Length Assembly
Langdon
City Pond SN-9

Sta 21270+61 Lt
Install New Sign on New Support
Assembly 371
SOUTH
NORTH DAKOTA
1 M3-3-21 M1-5-24

Sta 21270+61 Rt
Remove
R R

Sta 21270+61 Rt
Install New Sign on Existing Support
Assembly 63
R R W10-1-36

Sta 21270+61 Lt
Remove
SOUTH
N 1 D

Sta 21273+54 Lt
To Remain In Place
4TH AVE
1ST ST

Sta 21273+62 Lt
Remove
STOP

Sta 21273+62 Lt
Install New Sign on New Support
Assembly 1
STOP R1-1-30

Sta 21278+21 Lt
Remove
5TH AVE Reset
1ST ST Reset
STOP

Sta 21278+21 Lt
Install New Sign on New Support
Assembly 1
5TH AVE Reset
1ST ST Reset
STOP R1-1-30

Sta 21279+32 Rt
Remove
STOP

Sta 21279+32 Rt
Install New Sign on New Support
Assembly 1
STOP R1-1-30

Sta 21279+95 Lt
Remove
STOP

Sta 21279+95 Lt
Install New Sign on New Support
Assembly 1
STOP R1-1-30

Sta 21280+59 Lt
Install New Sign on New Support
Assembly 63
R R W10-1-36

Sta 21280+59 Lt
Remove
R R

Sta 21280+78 Rt
Remove
STOP

Sta 21280+78 Rt
Install New Sign on New Support
Assembly1
STOP R1-1-30

Sta 21281+51 Lt
Remove
STOP

Sta 21281+51 Lt
Install New Sign on New Support
Assembly 1
STOP R1-1-30

Sta 21284+39 Lt
Remove
STOP

Sta 21284+39 Lt
Install New Sign on New Support
Assembly 1
STOP R1-1-30

Sta 21284+37 Lt
To Remain In Place
6TH AVE
1ST ST

Sta 21285+54 Rt
Reset Sign on New Support
Assembly 1
STOP

Sta 21286+79 Rt
To Remain In Place
STOP AHEAD

Sta 21287+97 Lt
To Remain In Place
7TH AVE
1ST ST

21260+00
21265+00
21270+00
21275+00
21280+00
21285+00

LANGDON
ND Hwy 1
BNSF
Gr
Asph
Conc

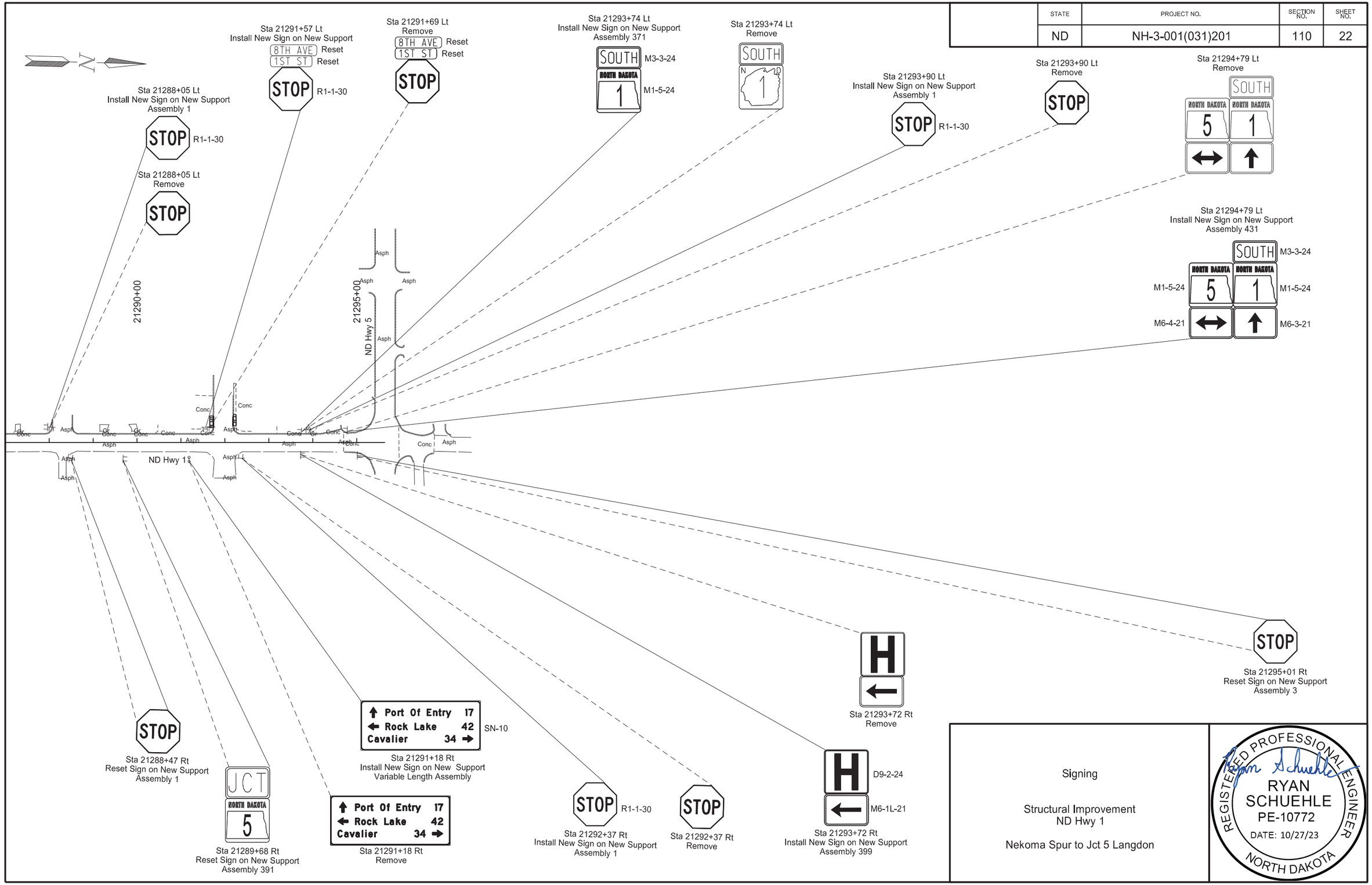
Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	22



Signing

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

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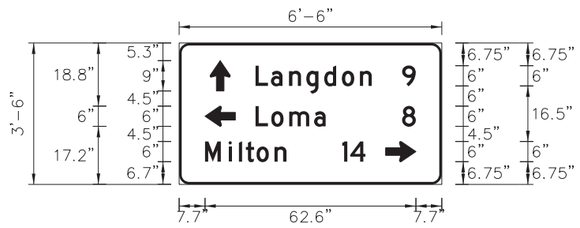
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	23

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

SYMBOL	X	Y	WID	HT	ANGLE
ND_6IN_TYPE D	9.2	27.8	6	9	0
ND_6IN_TYPE D	7.7	17.3	6	9	90
ND_6IN_TYPE D	61.3	6.8	6	9	270

STATION(S):
20814+39 Rt

AREA: 22.8 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Destination.ssl

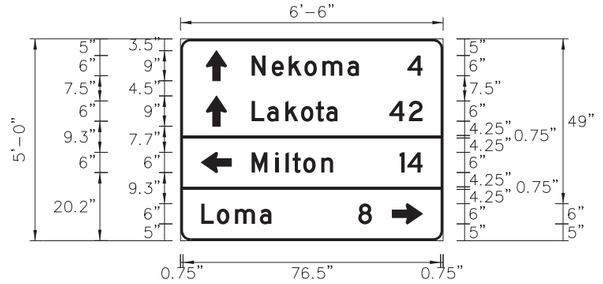
LETTER POSITION (X)																					LENGTH	SIZE	SERIES
L	a	n	g	d	o	n															34.5	6\4.5	D 2000
22.7	27.3	32.7	37.8	43.1	48.3	53.7																	
9																					4.1	6	D 2000
66.2																							
L	o	m	a																		20.8	6\4.5	D 2000
22.7	27.4	32.7	40.1																				
8																					4.1	6	D 2000
66.2																							
M	i	l	t	o	n																24.2	6\4.5	D 2000
7.7	14.7	17.7	19.9	23	28.3																		
1	4																				6.8	6	D 2000
48.5	50.8																						

SIGN NUMBER	SN-2
WIDTH X HEIGHT	6'-6" x 5'-0"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_6IN_TYPE D	7.6	47.5	6	9	0
ND_6IN_TYPE D	7.6	34	6	9	0
ND_6IN_TYPE D	6.1	20.3	6	9	90
ND_6IN_TYPE D	62.9	5	6	9	270

STATION(S):
20821+73 Lt

AREA: 32.5 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Destination_Divided.ssl

LETTER POSITION (X)																					LENGTH	SIZE	SERIES
N	e	k	o	m	a																31.8	6\4.5	D 2000
21.1	27.1	32.1	36.8	42.1	49.5																		
4																					4.5	6	D 2000
67.4																							
L	a	k	o	t	a																25.5	6\4.5	D 2000
21.1	25.7	31.1	35.8	40.2	43.2																		
4	2																				9.9	6	D 2000
62	67.8																						
M	i	l	t	o	n																24.2	6\4.5	D 2000
21.1	28.1	31.2	33.3	36.4	41.8																		
1	4																				6.8	6	D 2000
65	67.4																						
L	o	m	a																		20.8	6\4.5	D 2000
6.1	10.8	16.1	23.5																				
8																					4.1	6	D 2000
52.8																							

Signing Details

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

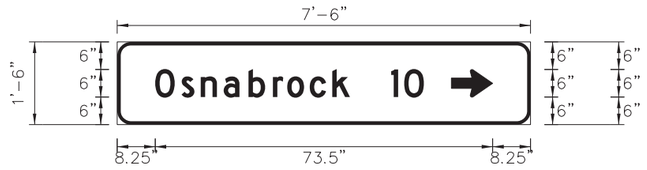
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	24

SIGN NUMBER	SN-3
WIDTH X HEIGHT	7'-6" x 1'-6"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_6IN_TYPE D	72.7	6	6	9	270

STATION(S): 20921+32 Rt

AREA: 11.3 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Destination.ssl

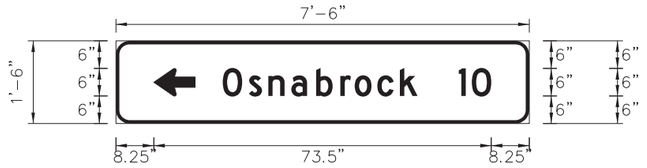
LETTER POSITION (X)																		LENGTH	SIZE	SERIES
O	s	n	a	b	r	o	c	k										42.4	6/4.5	D 2000
8.3	14	18.2	23.2	28.6	33.9	37	41.9	46.8												
1	0																	7.1	6	D 2000
59.7	62.5																			

SIGN NUMBER	SN-4
WIDTH X HEIGHT	7'-6" x 1'-6"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_6IN_TYPE D	8.3	6	6	9	90

STATION(S): 20927+42 Lt

AREA: 11.3 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Destination.ssl

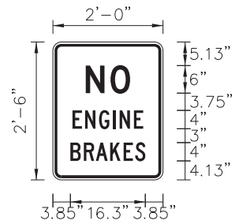
LETTER POSITION (X)																		LENGTH	SIZE	SERIES
O	s	n	a	b	r	o	c	k										42.4	6/4.5	D 2000
23.3	29	33.2	38.2	43.6	48.9	52	56.9	61.8												
1	0																	7.1	6	D 2000
74.7	77.5																			

SIGN NUMBER	SN-5
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: XI Non-reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S): 21243+45 Rt

AREA: 5.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Reg_24_Small.ssl

LETTER POSITION (X)																		LENGTH	SIZE	SERIES
N	O																	9.7	6	D 2000
7.2	12.6																			
E	N	G	I	N	E													15.4	4	C 2000
4.3	7	10.1	13.1	14.5	17.7															
B	R	A	K	E	S													16.3	4	C 2000
3.8	6.8	9.4	12.5	15.4	17.9															

Signing Details

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

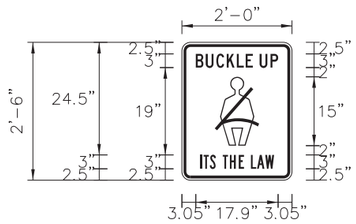
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	25

SIGN NUMBER	SN-6
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: XI Non-reflective
	COLOR: Black

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

STATION(S): 21248+42 Lt

AREA: 5.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Reg_24_Small.ssl

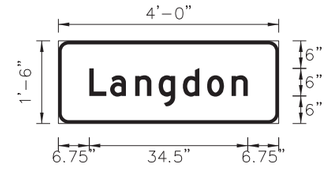
LETTER POSITION (X)																		LENGTH	SIZE	SERIES
B	U	C	K	L	E	U	P											17.9	3	C 2000
3	5.2	7.5	9.8	12	13.9	17	19.3													
I	T	S	T	H	E	L	A	W										16.2	3	B 2000
3.9	4.7	6.1	8.9	10.5	12.4	15	16.4	18.2												

SIGN NUMBER	SN-7
WIDTH X HEIGHT	4'-0" x 1'-6"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	2.25"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S): 21258+92 Rt

AREA: 6.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Boundary.ssl

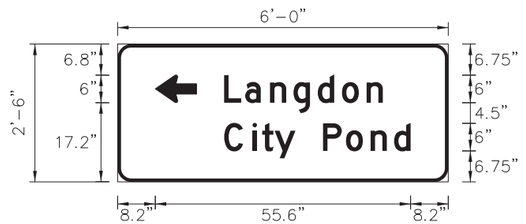
LETTER POSITION (X)																		LENGTH	SIZE	SERIES
L	a	n	g	d	o	n												34.5	6/4.5	D 2000
6.7	11.3	16.7	21.8	27.1	32.4	37.7														

SIGN NUMBER	SN-8
WIDTH X HEIGHT	6'-0" x 2'-6"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_GN_TYPE D	8.2	17.3	6	9	90

STATION(S): 21264+26 Rt

AREA: 15.0 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
L	a	n	g	d	o	n												34.5	6/4.5	D 2000
23.2	27.8	33.2	38.3	43.6	48.9	54.2														
C	i	t	y		P	o	n	d										40.6	6/4.5	D 2000
23.2	29.4	31.5	34.2	38.7	44.7	49.7	55.1	60.2												

Signing Details

Structural Improvement
ND Hwy 1

Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

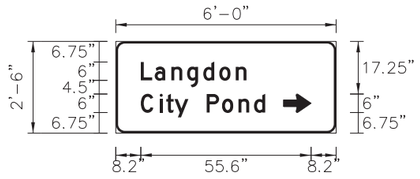
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	110	26

SIGN NUMBER	SN-9
WIDTH X HEIGHT	6'-0" x 2'-6"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_6IN_TYPE D	54.8	6.8	6	9	270

STATION(S):
21267+15 Lt

AREA: 15.0 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Destination.ssf

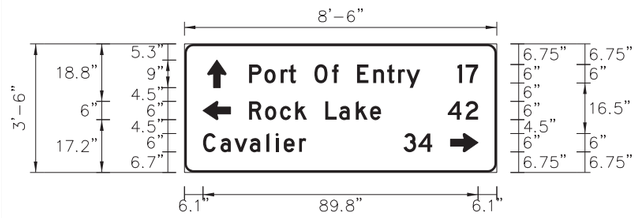
LETTER POSITION (X)																			LENGTH	SIZE	SERIES
L	a	n	g	d	o	n													34.5	6/4.5	D 2000
8.2	12.8	18.2	23.3	28.6	33.9	39.2															
C	i	t	y		P	o	n	d											40.6	6/4.5	D 2000
8.2	14.4	16.5	19.2	23.7	29.7	34.7	40.1	45.2													

SIGN NUMBER	SN-10
WIDTH X HEIGHT	8'-6" x 3'-6"
BORDER WIDTH	0.75" (inset 0")
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE
ND_6IN_TYPE D	7.6	27.8	6	9	0
ND_6IN_TYPE D	6.1	17.3	6	9	90
ND_6IN_TYPE D	86.9	6.8	6	9	270

STATION(S):
21291+18 Rt

AREA: 29.8 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Conv_Destination.ssf

LETTER POSITION (X)																			LENGTH	SIZE	SERIES
P	o	r	t		O	f		E	n	t	r	y							55.9	6/4.5	D 2000
21.1	26.1	31.5	34.1	36.5	42.5	48.2	50.4	56.4	61.6	66.2	69.8	72.5									
1	7																		6.7	6	D 2000
89.2	91.8																				
R	o	c	k		L	a	k	e											43.1	6/4.5	D 2000
21.1	26.3	31.3	36.2	40	46	50.6	56	60.7													
4	2																		9.9	6	D 2000
86	91.8																				
C	a	v	a	l	i	e	r												33.6	6/4.5	D 2000
6.1	11.8	16.3	21.3	26.7	29.8	32.4	37.4														
3	4																		9.3	6	D 2000
71.6	76.4																				

Signing Details

Structural Improvement
ND Hwy 1

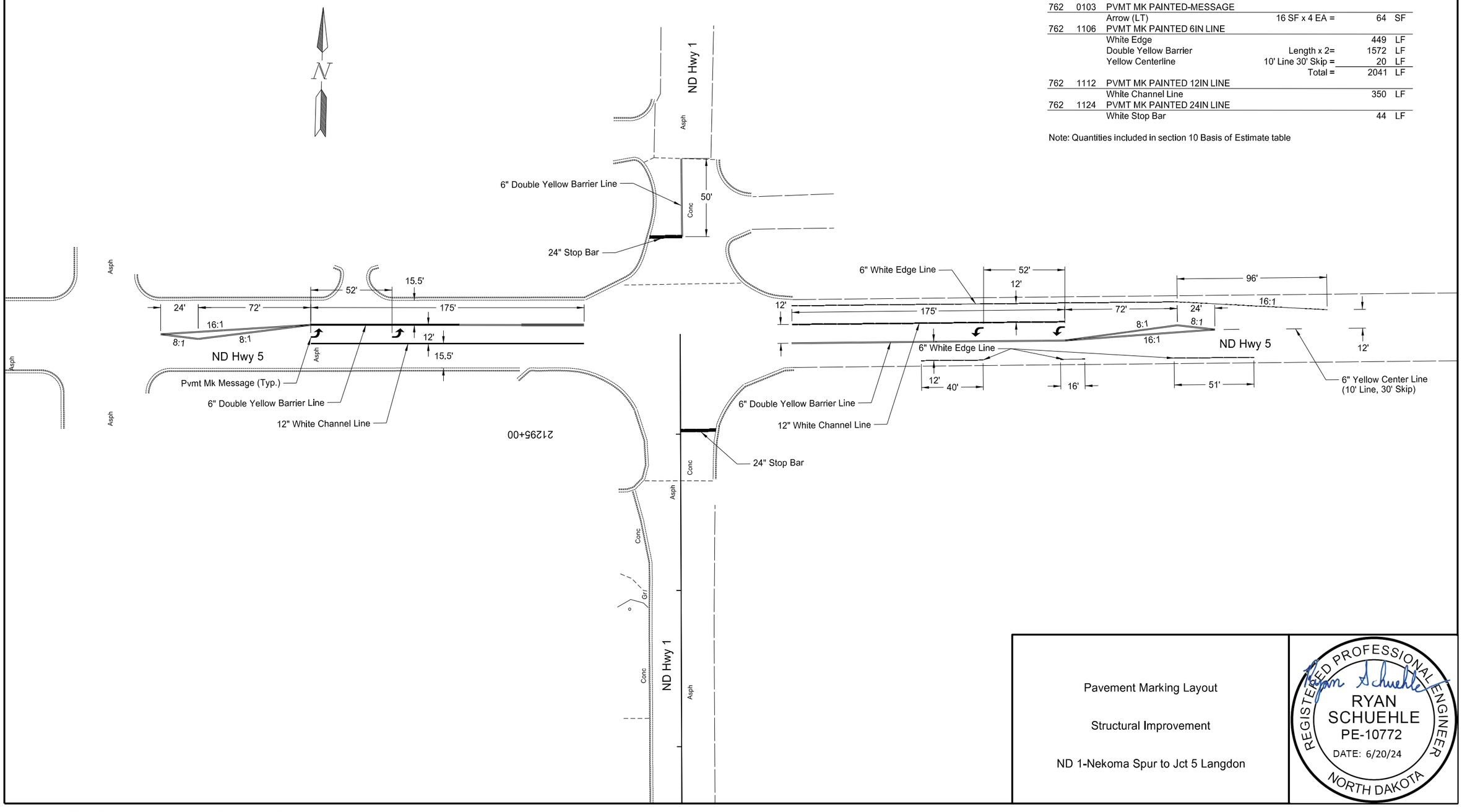
Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 10/27/23
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-3-001(031)201	120	1

SPEC	CODE	BID ITEM		QTY	UNIT
704	1500	OBLITERATION OF PAVEMENT			
		White Edge		122	SF
		Double Yellow Barrier	Length x 2=	426	SF
			Total =	548	SF
762	0103	PVMT MK PAINTED-MESSAGE			
		Arrow (LT)	16 SF x 4 EA =	64	SF
762	1106	PVMT MK PAINTED 6IN LINE			
		White Edge		449	LF
		Double Yellow Barrier	Length x 2=	1572	LF
		Yellow Centerline	10' Line 30' Skip =	20	LF
			Total =	2041	LF
762	1112	PVMT MK PAINTED 12IN LINE			
		White Channel Line		350	LF
762	1124	PVMT MK PAINTED 24IN LINE			
		White Stop Bar		44	LF

Note: Quantities included in section 10 Basis of Estimate table



Pavement Marking Layout

Structural Improvement

ND 1-Nekoma Spur to Jct 5 Langdon

REGISTERED PROFESSIONAL ENGINEER
RYAN SCHUEHLE
PE-10772
DATE: 6/20/24
NORTH DAKOTA

6/18/2024 2:08:17 PM JButler H:\Projects\14000\14451\3001201.031\Design\Plan\120MK_001.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	180	1

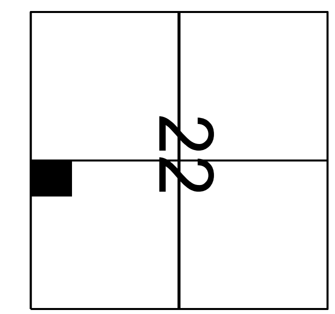
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

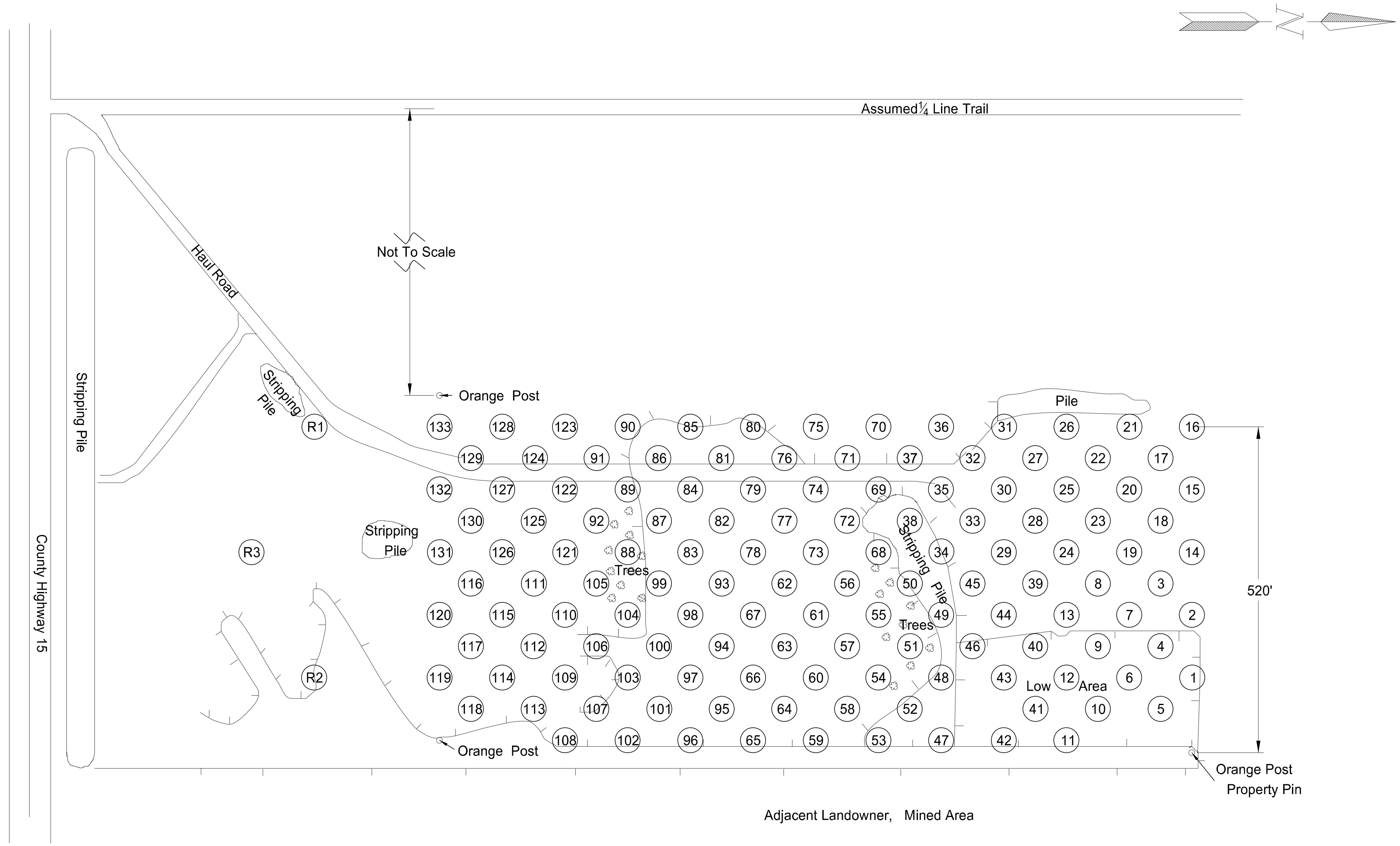
TEST HOLE PLAT

Location: SW1/4SE1/4 22-156-56 County: Walsh

Ownership: State Owned

LOCATION OF PIT IN SECTION





Scale 1" = 200'

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

Area "A" consists of Test Holes 1 - 13
Area "B" consists of Test Holes 14 - 26
Area "C" consists of Test Holes 27 - 38
Area "D" consists of Test Holes 39 - 52
Area "E" consists of Test Holes 53 - 67
Area "F" consists of Test Holes 68 - 80
Area "G" consists of Test Holes 81 - 92
Area "H" consists of Test Holes 93 - 107
Area "I" consists of Test Holes 108 -120
Area "J" consists of Test Holes 121- 133

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	180	2

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
1	0.0	4.0 FS	0	2	6	13	+WL 7.0
		3.0 Fgr					
2	0.0	19.5 gr sh	1	13	29	43	+WL 19.5
3	0.0	8.0 gr sh	0	11	26	39	+
		1.0 sd sh					
		7.0 gr sh					
		4.0 CS sh					
4	0.0	3.0 gr Si Cl	0	7	18	29	+WL 16.0
		1.0 gr					
		4.0 sd sh					
		3.0 gr					
		3.0 gr sh					
		2.0 Fgr sh					
5	0.0	1.0 FS	0	0	4	17	+WL 3.0
		1.0 gr sh					
		1.0 sd					
6	0.0	1.5 gr	0	5	13	24	+WL 9.5
		1.5 FS sh					
		2.0 gr					
		3.0 CS					
		1.5 Fgr					
7	0.0	8.0 gr	0	9	22	36	+WL 19.5
		5.0 gr sh					
		1.0 sd					
		3.0 gr					
		2.5 Fgr sh					
8	0.5	7.5 gr	1	10	22	39	+WL 17.5
		3.0 gr sh					
		2.0 sd sh					
		4.5 gr					
9	0.0	8.0 gr sh	0	6	17	28	+WL 17.0
		9.0 sd sh					
10	0.0	3.0 sd sh	0	5	13	23	+WL 7.0
		1.0 gr					
		3.0 gr sh					
11	0.0	2.5 Fgr sh	0	2	11	23	+WL 12.0
		2.0 sd					
		7.5 Fgr sh					
12	0.0	9.5 Fgr sh	0	1	9	22	+WL 9.5
13	0.0	7.0 gr sh	0	3	20	34	+WL 18.5
		3.0 Fgr sh					
		3.0 sd sh					
		2.0 Fgr sh					
		3.5 sd sh					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
14	1.0	7.0 gr	0	8	20	30	+
		2.0 gr sh					
		3.0 sd sh					
		1.5 Fgr					
		1.5 sd sh					
		1.0 Fgr sh					
		1.0 Si Cl					
		2.0 sd sh					
15	1.0	3.0 gr sh	1	14	29	40	+
		3.0 gr Si Cl					
		5.0 gr					
		1.0 gr sh					
		3.0 sd sh					
		1.0 gr					
		2.0 sd sh					
		1.0 Fgr					
		2.5 gr Si Cl	0	7	18	31	+
		3.0 gr sh					
		1.5 sd sh					
		3.5 CS sh					
		2.0 gr sh					
		2.0 Fgr sh					
		3.5 CS					
17	0.5	2.5 gr sh	1	11	24	39	+
		2.0 gr Si Cl					
		3.0 gr					
		3.0 Fgr sh					
		1.0 FS					
		1.0 gr Si Cl					
		4.0 Fgr sh					
		3.0 sd sh					
18	0.0	7.0 gr sh	0	7	18	30	+
		2.5 Fgr sh					
		5.5 sd sh					
		2.0 Fgr sh					
		3.0 sd sh					
19	0.0	10.0 gr sh	1	17	29	42	+
		5.0 sd sh					
		2.0 gr sh					
20	0.0	1.5 gr sh	0	7	17	27	+
		1.5 sd sh					
		2.0 gr sh					
		1.0 CS					
		3.0 Fgr sh					
		2.0 CS sh					
		1.0 Fgr					
		4.0 CS sh					
		4.0 sd sh					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
21	0.5	1.5 gr	1	11	21	33	+
		1.0 gr Si Cl					
		4.0 gr					
		4.0 CS sh					
		1.0 gr Si Cl					
		3.0 gr Si Cl					
		5.0 sd sh					
22	0.5	3.0 gr	0	5	14	25	+ Cave
		2.5 CS sh					
		3.0 sd sh					
		3.0 Fgr sh					
		1.5 CS sh					
		1.0 Fgr sh					
		3.5 CS sh					
23	0.0	3.0 gr sh	1	16	30	40	+
		4.0 gr					
		1.0 sd sh					
		3.0 gr Si Cl					
		4.0 Fgr sh					
		2.0 sd sh					
		2.0 CS sh					
		1.0 Fgr					
		2.0 gr sh					
		3.0 sd sh					
24	0.5	9.5 gr sh	0	8	18	30	+WL 19.0
		2.0 sd sh					
		4.0 gr sh					
		3.0 sd sh					
25	0.0	3.0 gr	0	6	13	24	+WL 19.0
		2.0 gr sh					
		1.0 sd					
		2.0 gr					
		2.0 sd sh					
		1.0 gr					
		2.0 sd sh					
		3.0 Fgr					
		3.0 sd sh					
26	0.5	2.5 gr Si Cl	0	7	19	32	rk
		3.0 gr sh					
		2.0 sd sh					
		6.0 gr sh					
27	0.5	1.5 gr	0	14	24	37	rk
		1.0 sd sh					
		6.0 gr					
		1.0 Si Cl					
		4.0 Fgr sh					
		2.0 gr sh					
28	0.0	5.0 gr	0	6	18	31	+WL 18.5
		5.0 CS sh					
		3.0 Fgr sh					
		5.5 CS sh					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
29	0.5	2.5 gr Si Cl	0	12	25	36	+WL 17.0
		2.0 gr					
		2.0 sd					
		1.0 sd sh					
		6.0 gr sh					
		2.0 gr					
		1.0 Fgr sh					
30	0.5	3.5 gr	0	3	13	26	+WL 17.5
		6.0 CS sh					
		3.0 Fgr sh					
		4.5 CS sh					
31	2.0	8.0 gr	0	9	23	37	+WL 19.5
		6.0 Fgr sh					
		3.5 sd sh					
32	0.5	0.5 gr	0	9	23	37	rk
		1.0 sd					
		8.5 gr					
		0.5 CS					
33	0.5	4.5 gr	0	6	16	29	+WL 17.5
		5.0 CS sh					
		3.0 Fgr sh					
		4.5 CS sh					
34	10.0	1.0 gr Si Cl	1	7	19	33	+
		1.0 sd sh					
		2.0 gr					
		2.0 Fgr sh					
		2.0 gr					
		2.0 sd					
35	0.0	10.0 gr	0	12	22	34	+WL 18.0
		6.0 Fgr sh					
		2.0 sd					
36	0.0	1.0 gr	0	1	7	15	+WL 13.5
		4.0 sd sh					
		3.5 CS sh					
		5.0 sd sh					
37	0.5	7.5 gr	1	15	26	38	+
		1.0 sd					
		4.0 Fgr sh					
		2.0 Fgr					
		5.0 sd					

RANGE 56 **TWP** 156 **SEC.** SW1/4SE1/4 22

COUNTY Walsh Oct-05

PROSPECTED BY Volk & Nelson

INSPECTED & APPROVED Carter Nov-05

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	180	3

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
38	10.0	3.0 gr Si Cl	2	15	29	42	+
		3.5 gr sh					
		1.5 sd					
		2.0 gr					
39	0.5	11.5 gr sh	0	10	23	35	+WL 16.5
		4.5 sd sh					
40	0.0	3.0 gr Si Cl	0	4	15	27	+WL 14.0
		2.0 sd					
		3.0 gr					
		2.0 sd sh					
		2.0 gr					
		2.0 sd sh					
41	0.0	4.0 Fgr sh	0	0	9	22	+WL 6.5
		2.5 CS					
42	0.0	8.0 Fgr sh	0	1	11	24	+WL 8.0
43	0.0	4.0 gr sh	0	0	7	22	+WL 9.0
		1.0 sd sh					
		2.0 CS					
		2.0 Fgr sh					
44	0.0	2.5 gr Si Cl	0	9	18	27	+WL 16.5
		2.5 sd sh					
		2.0 Fgr Si Cl					
		2.0 sd sh					
		1.0 gr					
		5.0 sd sh					
		1.5 Fgr					
45	2.0	4.0 gr sh	0	8	21	36	+WL 17.5
		4.0 Fgr sh					
		1.0 CS sh					
		3.0 gr sh					
		3.5 sd sh					
46	0.5	5.5 gr Si Cl	0	9	20	31	+WL 17.0
		1.5 gr sh					
		1.5 sd sh					
		3.0 gr					
		4.0 sd sh					
		1.0 sd					
47	8.0	1.0 sd Si Cl	0	6	18	32	+
		2.0 gr Si Cl					
		4.0 gr sh					
		1.5 sd sh					
		1.0 CS sh					
		2.0 Fgr sh					
		0.5 CS sh					
48	11.0	6.0 gr Si Cl	0	8	20	33	+
		2.0 sd sh					
		1.0 gr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
49	10.0	3.0 gr Si Cl	0	14	27	40	+
		1.0 gr					
		2.0 sd					
		3.5 gr					
		0.5 CS					
50	13.0	4.0 gr	0	13	24	33	+
		1.0 sd					
		2.0 gr sh					
51	3.0	3.0 gr	0	9	16	23	rk
		2.0 gr Si Cl					
		2.0 Fgr sh					
		2.0 gr sh					
		1.0 Fgr sh					
		2.5 gr sh					
		2.5 Fgr sh					
52	11.0	2.0 gr	0	13	26	40	+
		1.0 gr sh					
		3.0 gr Si Cl					
		2.0 sd sh					
		1.0 gr					
53	10.0	5.0 gr Si Cl	2	26	41	54	rk
		4.0 gr					
54	2.0	2.0 gr Si Cl	1	8	17	29	+WL 19.5
		1.0 gr					
		5.0 Fgr					
		1.0 sd sh					
		4.0 Fgr sh					
		2.0 Fgr					
		1.0 sh					
		1.5 sd					
55	4.0	1.0 gr	0	8	21	34	+
		4.0 gr Si Cl					
		3.0 gr sh					
		2.5 Fgr sh					
		1.5 sd					
		4.0 gr sh					
56	3.0	2.0 gr	0	8	18	29	+
		1.0 Fgr					
		1.5 gr					
		1.5 gr Si Cl					
		2.0 Fgr sh					
		1.0 gr sh					
		2.0 Fgr sh					
		1.0 gr sh					
		5.0 Fgr sh					
57	3.0	1.0 gr Si Cl	1	10	21	35	+
		1.0 sd					
		7.0 gr					
		3.0 Fgr sh					
		5.0 Fgr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
58	2.0	2.0 gr Si Cl	0	9	20	30	+
		2.0 gr					
		4.0 gr sh					
		3.0 Fgr					
		2.0 Fgr sh					
		1.5 sd					
		3.5 sd sh					
59	1.5	4.5 gr	0	4	13	27	+
		1.0 gr sh					
		3.0 Fgr sh					
		3.0 gr sh					
		3.5 Fgr sh					
		3.5 CS					
60	3.0	5.0 gr	1	14	25	37	+
		2.0 sd					
		2.0 Fgr sh					
		5.0 gr sh					
		3.0 sd sh					
61	2.0	5.0 gr Si Cl	0	9	20	30	+
		4.0 CS sh					
		1.0 Fgr sh					
		3.0 sd sh					
		4.0 gr Si Cl					
62	2.0	4.0 gr Si Cl	0	10	28	42	+
		2.0 gr sh					
		2.0 Fgr sh					
		4.0 gr sh					
		2.0 gr					
		1.0 Fgr sh					
63	1.5	4.5 gr Si Cl	0	8	18	29	+
		1.0 Fgr					
		4.0 sd sh					
		3.0 Fgr					
		6.0 CS					
64	1.0	7.5 gr Si Cl	0	9	19	31	+
		0.5 Fgr sh					
		1.0 gr Si Cl					
		2.0 sd					
		2.0 Fgr sh					
		1.0 gr sh					
		1.5 Fgr sh					
		3.5 sd sh					
65	2.0	3.0 gr Si Cl	0	10	29	47	+ CAVE
		3.0 gr					
		2.0 sd					
		1.0 Fgr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
66	1.0	9.0 gr	1	18	31	41	+
		1.0 sd sh					
		2.0 gr					
		5.0 Fgr sh					
		2.0 gr					
67	2.0	1.0 gr	0	6	15	26	+
		2.5 gr Si Cl					
		1.0 Fgr					
		2.0 gr sh					
		7.0 sd sh					
		0.5 gr Si Cl					
		4.0 sd sh					
68	11.0	7.0 gr Si Cl	1	18	33	45	+
		2.0 Fgr					
69	3.0	4.0 gr sh	0	14	28	41	+
		4.0 gr					
		3.0 sd					
		5.0 gr					
		1.0 CS					
70	0.5	2.5 gr	0	2	11	23	+WL 14.5
		4.0 sd sh					
		4.0 Fgr					
		3.5 sd sh					
71	3.0	1.0 gr	0	8	21	35	+
		6.0 gr Si Cl					
		2.0 Fgr					
		1.0 sd					
		1.0 Fgr					
		1.5 sd					
		4.5 gr sh					
72	1.5	5.5 gr	1	13	27	40	+
		2.0 gr Si Cl					
		1.0 gr sh					
		2.0 CS					
		4.0 Fgr					
		1.0 sd sh					
		1.0 gr sh					
		2.0 sd sh					

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COUNTY Walsh Oct-05

PROSPECTED BY Volk & Nelson

INSPECTED & APPROVED Carter Nov-05

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	180	4

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
73	1.0	5.0 gr Si Cl	1	9	22	36	+
		3.0 gr					
		3.0 gr sh					
		3.0 sd					
		1.0 Fgr sh					
		4.0 CS sh					
74	2.0	3.0 gr Si Cl	0	7	16	26	+
		2.0 Fgr					
		2.0 gr					
		3.0 sd sh					
		1.0 sd					
		1.0 gr					
		1.0 CS					
		1.0 gr Si Cl					
		3.0 Fgr					
		1.0 sd sh					
75	0.0	2.0 sd sh	1	8	18	28	+WL 17.5
		2.0 gr sh					
		1.5 sd sh					
		2.5 Fgr sh					
		5.0 CS sh					
		3.0 sd sh					
		1.5 gr sh					
76	1.0	3.0 gr Si Cl	0	8	20	31	+
		2.0 gr sh					
		4.0 gr Si Cl					
		1.0 gr sh					
		1.0 Fgr sh					
		1.0 CS sh					
		4.0 sd					
		1.0 Fgr sh					
		1.0 gr sh					
		1.0 Fgr sh					
77	2.0	2.0 gr Si Cl	0	11	24	35	+
		3.0 gr sh					
		2.0 sd sh					
		1.0 Fgr sh					
		2.0 FS sh					
		6.0 gr					
		2.0 CS					
78	2.0	4.0 gr Si Cl	0	8	20	32	+
		1.0 gr sh					
		1.0 Fgr sh					
		1.0 gr sh					
		1.0 sd sh					
		2.0 Fgr sh					
		2.0 gr Si Cl					
		1.0 gr sh					
		2.0 Fgr sh					
		3.0 sd sh					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
79	1.0	2.0 Fgr sh	0	10	20	30	+
		4.0 gr					
		6.0 sd					
		2.0 sd sh					
		4.0 gr					
		1.0 sd sh					
80	1.0	5.0 gr sh	0	6	14	24	+
		4.5 Fgr sh					
		5.0 sd sh					
		0.5 Fgr sh					
		2.0 sd sh					
		2.0 Fgr sh					
81	1.5	1.5 sd sh	0	5	15	26	+
		1.0 Fgr					
		2.0 gr					
		3.0 sd					
		3.0 Fgr					
		3.0 sd					
		1.5 Fgr sh					
		1.0 sd					
		3.0 Fgr sh					
82	2.0	4.0 gr	0	2	11	21	+
		1.0 Fgr					
		1.5 Fgr sh					
		7.0 sd sh					
		3.5 Fgr sh					
		1.0 sd sh					
83	0.5	1.5 gr	0	12	22	33	+
		1.0 Fgr					
		2.0 gr					
		3.0 sd sh					
		3.0 gr					
		1.0 FS					
		3.0 Fgr					
		5.0 Fgr sh					
84	1.0	1.0 gr Si Cl	0	11	25	39	+
		4.5 gr					
		1.5 Fgr					
		1.0 sd sh					
		1.0 gr					
		2.0 sd sh					
		2.0 gr					
		2.0 gr sh					
		2.0 gr					
		2.0 Fgr					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
85	0.5	4.5 gr	0	9	17	26	+
		1.0 sd sh					
		2.0 gr					
		1.0 gr sh					
		7.0 sd sh					
		4.0 Fgr sh					
86	0.5	3.0 gr	0	4	11	20	+
		2.5 Fgr					
		2.0 gr					
		8.5 sd					
		1.0 CS					
		0.5 Fgr					
		2.0 sd					
87	2.0	3.0 gr	0	9	21	33	+
		3.0 sd sh					
		1.0 Fgr sh					
		3.0 Fgr					
		2.0 sd sh					
		4.0 Fgr sh					
		1.0 sd sh					
		1.0 gr					
88	7.0	1.0 CS	0	8	17	32	+
		1.0 Fgr					
		1.0 gr					
		2.0 Fgr sh					
		5.0 Fgr sh					
		3.0 gr sh					
89	2.0	2.0 Fgr sh	0	3	10	20	+WL 19.0
		4.0 sd sh					
		6.0 Fgr					
		4.0 Fgr sh					
		1.0 sd					
90	2.5	0.5	0	8	16	26	+WL 19.0
		3.5					
		1.0					
		1.0					
		5.0					
		2.0					
		3.5					
91	6.0	2.0 sd sh	0	5	17	30	+WL 18.5
		2.0 sd					
		1.0 gr sh					
		3.0 gr					
		1.0 gr sh					
		3.5 Fgr					
92	4.0	3.5 gr	0	6	17	29	+WL 15.5
		2.5 sd sh					
		3.5 gr sh					
		2.0 CS sh					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
93	1.0	6.0 gr Si Cl	1	14	27	37	+ CAVE
		2.0 sd					
		2.0 gr					
		3.0 sd					
		2.0 Fgr					
94	2.0	6.0 gr Si Cl	2	15	30	45	+
		8.0 gr sh					
		4.0 Fgr sh					
95	1.0	6.0 gr Si Cl	1	9	23	38	+
		2.0 gr					
		3.0 CS sh					
		5.0 Fgr					
		3.0 gr					
96	1.0	2.0 gr sh	0	8	20	35	+WL 18.0
		0.5 gr Si Cl					
		1.5 gr sh					
		1.0 Fgr sh					
		1.0 sd sh					
		0.5 gr Si Cl					
		0.5 Fgr sh					
		2.0 gr sh					
97	1.0	6.0 gr Si Cl	0	8	20	30	+
		1.0 gr sh					
		3.0 sd sh					
		6.0 Fgr					
		2.0 sd sh					
		1.0 Fgr sh					
98	2.0	2.5 gr	0	10	20	30	+
		0.5 gr Si Cl					
		1.0 sd					
		0.5 gr					
		3.5 sd					
		5.0 gr					
		3.0 Fgr					
		2.0 gr sh					

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COUNTY Walsh Oct-05

PROSPECTED BY Volk & Nelson

INSPECTED & APPROVED Carter Nov-05

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	180	5

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
99	3.0	2.0 gr Si Cl	0	5	18	28	+
		1.0 sd					
		1.0 gr					
		3.0 CS					
		2.0 gr sh					
		3.0 sd					
		1.0 gr					
		4.0 gr sh					
100	2.0	3.0 gr	0	9	23	37	+
		1.5 gr Si Cl					
		0.5 gr					
		1.0 sd sh					
		7.0 Fgr					
		2.0 gr sh					
		2.0 sd sh					
		1.0 Fgr sh					
101	1.0	4.0 gr Si Cl	0	8	21	35	+
		2.0 gr					
		2.0 Fgr sh					
		2.0 CS					
		2.0 sd sh					
102	0.5	1.5 gr	0	9	21	37	+WL 18.0
		1.5 Fgr					
		6.5 gr					
		8.0 CS sh					
103	0.5	3.5 gr	0	7	15	23	+
		4.0 CS					
		3.0 Fgr sh					
		2.0 CS					
		2.0 Fgr					
		3.0 sd sh					
		2.0 Fgr sh					
104	1.0	3.0 gr	0	7	15	28	+WL 15.5
		4.5 sd					
		0.5 sd sh					
		1.0 Fgr					
		5.5 sd					
105	2.0	10.5 Fgr sh	0	6	17	32	+WL 12.5
106	6.0	2.5 sd	0	4	14	31	+WL 16.5
		1.5 Fgr					
		2.0 CS					
		1.0 Fgr					
		1.0 gr sh					
		1.0 Fgr					
		1.0 gr Si Cl					
		0.5 sd					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
107	6.0	2.0 FS	0	2	6	14	+WL 19.0
		2.0 sd					
		4.5 Fgr					
		1.5 sd sh					
		1.0 FS					
		2.0 sd sh					
108	1.5	4.5 gr	0	5	12	20	+
		1.0 FS					
		4.0 sd sh					
		6.0 sd					
		3.0 gr					
109	1.0	4.0 sd sh	0	0	5	13	+WL 9.0
		2.5 Fgr					
		1.5 sd sh					
110	1.0	1.0 sd sh	0	1	6	14	+WL 11.0
		1.5 Fgr					
		3.5 sd sh					
		1.0 Fgr sh					
		3.0 sd sh					
111	0.5	1.5 sd	0	6	18	31	+WL 13.0
		4.0 gr sh					
		1.0 sd					
		2.0 Fgr sh					
		1.0 gr sh					
112	6.5	4.5 sd sh	0	7	11	28	+WL 12.5
		1.0 gr					
		0.5 sd sh					
113	1.0	3.5 gr	0	5	15	27	+
		1.5 gr Si Cl					
		1.0 Fgr					
		8.5 sd					
		3.0 Fgr					
		1.0 gr					
		0.5 sd					
114	1.0	3.0 gr	0	8	16	25	+
		2.0 Fgr sh					
		1.0 sd					
		4.0 Fgr sh					
		1.0 CS					
		8.0 sd sh					
115	0.5	4.0 gr	0	8	22	40	+WL 16.5
		2.0 Fgr					
		3.0 gr sh					
		2.0 Fgr					
		1.0 sd					
		1.5 Fgr					
		1.0 sd					
		1.5 sd sh					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
116	0.5	1.5 gr	0	4	8	16	+WL 17.5
		1.0 sd sh					
		6.0 Fgr sh					
		3.0 sd					
		1.0 Fgr					
		1.0 sd sh					
		2.0 Fgr sh					
		1.5 sd					
117	0.5	1.5 gr	0	5	17	37	+CAVE
		3.0 Fgr					
		6.0 Fgr sh					
		3.0 sd					
		4.0 Fgr					
118	2.0	2.0 gr Si Cl	0	6	12	19	+
		5.0 Fgr					
		5.0 CS					
		1.0 sd sh					
		5.0 CS					
119	1.0	3.0 CS sh	0	2	7	15	+WL 14.5
		3.0 CS					
		3.0 Fgr sh					
		4.5 sd sh					
120	1.0	2.5 sd	0	3	10	21	+WL 16.0
		2.0 Fgr sh					
		1.0 sd					
		1.0 gr sh					
		2.0 Fgr					
		4.5 sd					
		1.0 Fgr sh					
		1.0 sd					
121	1.0	4.5 gr sh	0	4	15	30	+WL 13.0
		1.5 gr					
		1.0 Fgr					
		0.5 sd					
		1.5 Fgr sh					
		3.0 sd sh					
122	3.0	5.0 gr	0	6	16	26	+WL 14.0
		2.0 Fgr					
		4.0 CS sh					
123	2.0	1.0 gr Si Cl	0	7	20	36	+WL 12.0
		5.0 gr					
		3.0 sd					
		1.0 sd sh					
124	4.0	5.0 gr sh Si Cl	1	8	22	34	+WL 16.5
		1.0 gr sh					
		2.0 CS					
		1.0 gr sh					
		3.5 sd					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
125	0.5	3.5 gr	0	7	19	35	+WL 13.5
		2.0 gr Si Cl					
		2.0 sd					
		1.0 Fgr					
		1.0 sd sh					
		1.5 gr					
		0.5 CS					
		1.5 sd					
126	1.0	5.0 sd sh	0	2	9	16	+WL 17.0
		2.0 Fgr sh					
		2.0 CS					
		1.0 Fgr					
		2.0 sd sh					
		2.0 Fgr					
		2.0 sd					
127	2.0	5.5 sd	0	5	16	31	+WL 15.5
		0.5 sd sh					
		4.5 gr					
		3.0 gr sh					
128	0.5	1.5 Fgr	0	3	13	25	+WL17.0
		1.0 FS					
		2.0 gr Si Cl					
		2.0 CS					
		6.0 Fgr sh					
		4.0 sd sh					
129	0.5	1.5 sd	0	3	12	25	+WL 15.0
		3.0 gr					
		2.0 gr Si Cl					
		2.0 Fgr					
		1.0 CS sh					
		2.0 Fgr sh					
		3.0 sd sh					
130	0.5	1.5 Fgr sh	0	2	8	15	+WL 18.0
		2.0 Fgr					
		3.0 sd sh					
		8.0 sd					
		1.5 Fgr					
		1.5 sd sh					

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COUNTY Walsh Oct-05

PROSPECTED BY Volk & Nelson

INSPECTED & APPROVED Carter Nov-05

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-3-001(031)201	180	6

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)		% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
131	0.5	0.5	sd	0	5	14	26	+WL 17.5
		2.0	CS sh					
		0.5	gr					
		4.0	sd sh					
		0.5	Fgr sh					
		3.0	sd sh					
		1.0	Fgr sh					
		2.0	gr					
		3.5	Fgr					
132	0.5	7.5	gr sh	0	7	16	29	+WL 16.5
		3.0	Fgr sh					
		2.0	Fgr					
		3.5	sd sh					
133	1.0	2.0	gr	0	3	8	17	+WL 15.0
		12.0	sd					

PIT LOGGING BY TEST HOLES

Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)		% Retained on 1½" Screen	% Retained on ¾" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
R1	1.0	2.0	Fgr	0	1	5	15	+WL 10.0
		7.0	sd sh					
R2	0.5	1.5	Fgr	0	4	9	17	+WL14.0
		3.0	sd					
		2.0	sd sh					
		1.0	sd					
		6.0	sd sh					
R3	0.5	1.5	Fgr	0	2	10	21	+WL 8.0
		2.0	gr					
		4.0	sd sh					

PIT LOGGING BY TEST HOLES

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

PIT LOGGING BY TEST HOLES

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

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COUNTY Walsh Oct-05

PROSPECTED BY Volk & Nelson

INSPECTED & APPROVED Carter Nov-05

NDDOT ABBREVIATIONS

?	This is a special text character used in the labeling of existing features. It indicates a feature that has an unknown characteristic, potentially based on: lack of description, location accuracy or purpose.
Abn	abandoned
Abut	abutment
Adj	adjusted
Aggr	aggregate
Ahd	ahead
ARV	air release valve
Align	alignment
Al	alley
Alt	alternate
Alum	aluminum
ADA	Americans with Disabilities Act
&	and
Appr	approach
Approx	approximate
ACP	asbestos cement pipe
Asph	asphalt
AC	asphalt cement
Assmd	assumed
@	at
Atten	attenuation
ATR	automatic traffic recorder
Ave	Avenue
Avg	average
ADT	average daily traffic
Bk	back
BF	back face
Balc	balcony
B Wire	barbed wire
Barr	barricade
Btry	battery
BI	beehive inlet
Beg	begin
BG	below grade
BM	bench mark
Bkwy	bikeway
Bit	bituminous
Blk	block
BH	bore hole
Bot	bottom
Blvd	Boulevard
Bndry	boundary
Brkwy	breakaway
Br	bridge
Bldg	building
Bus.	business
BV	butterfly valve
Byp	bypass
C Gdrl	cable guardrail
Calc	calculate
CIP	cast iron pipe
CB	catch basin
CRS	cationic rapid setting
C Gd	cattle guard
C To C	center to center
CL or ℄	centerline
Ch	chain
Chnlk	chain-link
Ch Blk	channel block
Ch Ch	channel change
Chk	check
Chsld	chiseled
Cir	circle
Cl	class
Clnt	clean-out
Clr	clear
Cl&gr	clearing & grubbing
Comb.	combination
Coml	commercial
Compr	compression
CADD	computer aided drafting & design
Conc	concrete
CECB	concrete erosion control blanket
Cond	conductor
Const	construction
Cont	continuous
CSB	continuous split barrel sample
Contr	contraction
Contr	contractor
CP	control point
Coord	coordinate
Cor	corner
Corr	corrected
CAES	corrugated aluminum end section
CAP	corrugated aluminum pipe
CMES	corrugated metal end section
CMP	corrugated metal pipe
CPVCP	corrugated poly-vinyl chloride pipe
CSES	corrugated steel end section
CSFES	corrugated steel flared end section
CSP	corrugated steel pipe
CSTES	corrugated steel traversable end section
Co	County
Crse	course
Ct	Court
Xarm	cross arm
Xbuck	cross buck
Xsec	cross sections
Xing	crossing
Xrd	crossroad
Crn	crown
Culv	culvert
C&G	curb & gutter
CI	curb inlet
CR	curb ramp
C	cut
Dd Ld	dead load
Defl	deflection
Defm	deformed
Dlnt	delineate
Dlntr	delineator
Depr	depression
Desc	description
Det	detail
DWP	detectable warning panel
Dtr	detour
Dia or ø	diameter
Dir	direction
Dist	distance
DM	disturbed material
DB	ditch block
DG	ditch grade
Dbl	double
Dn	down
Dwg	drawing
Dr	drive
Drwy	driveway
DI	drop inlet
D	dry density
Ea	each
Esmt	easement
E	East
EB	Eastbound
Elast	elastomeric
EL	electric locker
E Mtr	electric meter
EVSE	electric vehicle supply equipment
Elec	electric/al
EDM	electronic distance meter
Elev or El	elevation
Ellipt	elliptical
Emb	embankment
Emuls	emulsion/emulsified
ES	end section
Engr	engineer
ESS	environmental sensor station
Eq	equal
Evgr	evergreen
Exc	excavation
Exst	existing
Exp	expansion
Expy	Expressway
E	external of curve
Extru	extruded
FOS	factor of safety
Fed	Federal
FP	feed point
Fn	fence
Fn P	fence post
FO	fiber optic
FD	field drive
F	fill
FAA	fine aggregate angularity
FH	fire hydrant
Fl	flange
Flrd	flared
FES	flared end section
F Bcn	flashing beacon
FA	flight auger sample
FL	flow line
Ftg	footing
FM	force main
Fnd	found
Fdn	foundation
Frac	fractional
Frwy	freeway
Frt	front
FF	front face
F Disp	fuel dispenser
FFP	fuel filler pipes
FLS	fuel leak sensor
Furn	furnish/ed

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
04-23-18	General Revisions
09-20-18	General Revisions
12-18-20	General Revisions
08-16-22	General Revisions
04-14-25	General Revisions

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NDDOT ABBREVIATIONS

Galv	galvanized
Gar	garage
Gs L	gas line
G Reg	gas line regulator
GMV	gas main valve
G Mtr	gas meter
GSV	gas service valve
GVP	gas vent pipe
GV	gate valve
Ga	gauge
Gov	government
Grd	graded/grade
Grnd	ground
GWM	ground water monitor
Gdrl	guardrail
Gtr	gutter
H Plg	H piling
Hdwl	headwall
Ht	height
Hel	helical
HDPE	high density polyethylene
HM	high mast
HP	high pressure
HPS	high pressure sodium
HTCG	high tension cable guardrail
Hwy	highway
Hor	horizontal
HBP	hot bituminous pavement
HMA	hot mix asphalt
Hyd	hydrant
Ph	hydrogen ion content
Id	identification
Incl	inclinometer tube
IMH	inlet manhole
ID	inside diameter
Inst	instrument
Intchg	interchange
Intmdt	intermediate
Intscn	intersection
Inv	invert
IP	iron pipe
Jt	joint
Jct	junction
Ln	lane
Lg	large
Lat	latitude
Lt	left
Lens	lenses
Lvl	level
Lvlng	leveling
Lht	light
LP	light pole
Ltg	lighting
Liq	liquid
LL	liquid limit
Loc	location
Long.	longitude
Lp	loop
LD	loop detector
Lum	luminaire
Mb	mailbox
ML	main line
MH	manhole
Mkd	marked
Mkr	marker
Mkg	marking
MA	mast arm
Matl	material
Max	maximum
Meas	measure
Mdn	median
MD	median drain
MC	medium curing
MGS	Midwest Guardrail System
MM	mile marker
MP	mile post
Min	minimum
Misc	miscellaneous
Mon	monument
Mnd	mound
Mtbl	mountable
Mtd	mounted
Mtg	mounting
Mk	muck
Neop	neoprene
Ntwk	network
N	North
NE	Northeast
NW	Northwest
NB	Northbound
No. or #	number
Obsc	obscure(d)
Ocpd	occupied
Ocpy	occupy
O/s	offset
OC	on center
C	one dimensional consolidation
OC	organic content
Orig	original
O To O	out to out
OD	outside diameter
OH	overhead
PMT	pad mounted transformer
Pg	pages
Pntd	painted
Pr	pair
Pnl	panel
Pk	park
PSD	passing sight distance
Pvmt	pavement
Ped	pedestal
Ped	pedestrian
PPP	pedestrian pushbutton post
Pen.	penetration
Perf	perforated
Per.	perimeter
Perm	permanent
PL	pipeline
Pl	place
P&P	plan & profile
PL	plastic limit
Pl or ℄	plate
Pt	point
PE	polyethylene
PVC	polyvinyl chloride
PCC	Portland Cement concrete
PP	power pole
Preempt	preemption
Prefab	prefabricated
Prfmd or Pref	preformed
Prep	preperation
Press.	pressure
PRV	pressure relief valve
Prestr	prestressed
Pvt	private
PD	private drive
Prod.	production/produce
Prog	programmed
Prop.	property
Ppsd	proposed
PB	pull box
Qty	quantity
Qtr	quarter
Rad or R	radius
RR	railroad
Rlwy	railway
Rsd	raised
RC	rapid curing
Rec	record
Rcy	recycle
RAP	recycled asphalt pavement
RPCC	recycled portland cement concrete
Ref	reference
R Mkr	reference marker
RM	reference monument
RP	reference point
Refl	reflectorized
RCB	reinforced concrete box
RCES	reinforced concrete end section
RCFES	reinforced concrete flared end section
RCP	reinforced concrete pipe
RCPS	reinforced concrete pipe sewer
RCTES	reinforced concrete traversable end section
Reinf	reinforcement
Res	reservation
Res	residence
Ret	retaining
Rev	reverse
Rt	right
R/W	right of way
Riv	river
Rd	road
Rdbd	road bed
Rdwy	roadway
RWIS	roadway weather information system
Rk	rock
Rt	route

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

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NDDOT ABBREVIATIONS

D-101-3

Salv	salvage(d)
San	sanitary sewer line
Sec	section
SL	section line
Sep	separation
Seq	sequence
Serv	service
Sht	sheet
Shtng	sheeting
Shldr	shoulder
Sw or Sdwk	sidewalk
SD	sight distance
SN	sign number
Sig	signal
Sgl	single
SRCP	slotted reinforced concrete pipe
SC	slow curing
SS	slow setting
Sm	small
S	South
SE	Southeast
SW	Southwest
SB	Southbound
Sp	spaces
Spcl	special
SA	special assembly
SP	special provisions
G	specific gravity
Spk	spike
SB	split barrel sample
SH	sprinkler head
SV	sprinkler valve
Sq	square
Stk	stake
Std	standard
N	standard penetration test
Std Specs	standard specifications
Stm L	steam line
SEC	steel encased concrete
SMA	stone matrix asphalt
SSD	stopping sight distance
SD	storm drain
St	street
SPP	structural plate pipe
SPPA	structural plate pipe arch
Str	structure
Subd	subdivision
Sub	subgrade
Sub Prep	subgrade preperation
Ss	subsoil
SS	supplement specification
Supp	supplemental
Surf	surfacing
Surv	survey
Sym	symmetrical

Tel	telephone
Tel B	Telephone Booth
Tel P	telephone pole
Tv	television
Temp	temperature
Temp	temporary
TBM	temporary bench mark
T	thinwall tube sample
Ts	topsoil
Traf	traffic
TSCB	traffic signal control box
Tr	trail
Transf	transformer
Trans	transition
TT	transmission tower
TES	traversable end section
Trans	transverse
Trtd	treated
Trmt	treatment
Qc	triaxial compression
TERO	tribal employment rights ordinance
Tpl	triple
Typ	typical
Qu	unconfined compressive strength
Ugrnd	underground
Util	utility
VG	valley gutter
Vap	vapor
Vert	vertical
VCP	vitrified clay pipe
Vol	volume
VSFS	vehicle speed feedback sign
Wkwy	walkway
W	water content
WGV	water gate valve
WL	water line
WM	water main
WMV	water main valve
W Mtr	water meter
WSV	water service valve
WW	water well
Wrng	wearing
WIM	weigh in motion
W	west
WB	westbound
Wrng	wiring
W/	with
W/o	without

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NDDOT ABBREVIATIONS

MEASUREMENTS

ac	acres
A	ampere
Bd Ft	board feet
Cd	candela
cm	centimeter
C	coulomb
CF	cubic feet
m3	cubic meter
m3/s	cubic meters per second
CY	cubic yard
CY/mi	cubic yards per mile
D or Deg	degree
F	Fahrenheit
F	farad
ft	feet/foot
Gal	gallon
G	giga
Ha	hectare
H	henry
Hz	hertz
hr	hour(s)
in.	inch
J	joule
K	kelvin
kN	kilo newton
kPa	kilo pascal
kg	kilogram
kg/m3	kilogram per cubic meter
km	kilometer
K	Kip(s)
LF	linear foot
L	litre
Lm	lumen
L sum	lump sum
Lx	lux
M Hr	man hour
M	mega
m	meter
m/s	meters per second
mi	mile
mL	milliliter
mm	millimeter
mm/hr	millimeters per hour
n	nano
N	newton
Pa	pascal
lb	pounds
sec	seconds
S	siemens
SF	square feet
km2	square kilometer
m2	square meter
SY	square yard
Sta Yd	station yards
SI	Systems International
T	tesla
T/mi	tons per mile
V	volt
W	watt
Wb	weber

SURVEY DESCRIPTIONS

Az	azimuth
Bs	backsight
Brg	bearing
BP Cap	blue plastic cap
BS	both sides
BC	brass cap
CC	closing corner
CS	curve to spiral
Eq	equation
E	external of curve
FS	far side
FB	field book
Fs	foresight
Geod	geodetic
GIS	Geographical Information System
GPS	Global Positioning System
HI	height of instrument
IM	iron monument
I Pn	iron pin
LS	Land Surveyor (licensed)
LSIT	Land Surveyor In Training
L	length of curve
LC	long chord
LB	level book
MC	meander corner
Mer	meridian
M	mid ordinate of curve
NGS	National Geodetic Survey
NS	near side
Obsn	observation
Off Loc	office location
OP Cap	orange plastic cap
PK	Parker-Kalon nail
P Cap	plastic cap
PP Cap	pink plastic cap
PCC	point of compound curve
PC	point of curve
PI	point of intersection
PRC	point of reverse curvature
PT	point of tangent
POC	point on curve
POT	point on tangent
RTP	random traverse point
Rge	range
RP Cap	red plastic cap
SC	spiral to curve
SC	standard corner
ST	spiral to tangent
Sta	station
SE	superelevation
Tan	tangent
T	tangent (semi)
TS	tangent to spiral
Twp	township
TB	transit book
TP	traverse point
TP	turning point
USC&G	US Coast & Geodetic Survey
USGS	US Geologic Survey
VC	vertical curve
WC	witness corner
WGS	World Geodetic System
YP Cap	yellow plastic cap
Z	zenith

SOIL TYPES

Cl	clay
Cl F	clay fill
Cl Hvy	clay heavy
Cl Lm	clay loam
Co S	coal slack
C Gr	coarse gravel
CS	coarse sand
FS	fine sand
Gr	gravel
Lig Co	lignite coal
Lig Sl	lignite slack
Lm	loam
Rk	rock
Sd	sand
Sdy Cl	sandy clay
Sdy Cl Lm	sandy clay loam
Sdy Fl	sandy fill
Sdy Lm	sandy loam
Sc	scoria
Sh	shale
Si Cl	silt clay
Si Cl Lm	silty clay loam
Si Lm	silty loam

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

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12-18-20	Sheet Added - Continued from D-101-3
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NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

702COM	702 Communications
ACCENT	Accent Communications
AGASSIZ WU	Agassiz Water Users District
AGC	Associated General Contractors of America
ALL PL	Alliance Pipeline
ALL SEAS WU	All Seasons Water Users District
AMOCO PI	Amoco Pipeline Company
AMRDA HESS	Amerada Hess Corporation
AT&T	AT&T Corporation
B PAW	Bear Paw Energy Incorporated
BAKER ELEC	Baker Electric
BASIN ELEC	Basin Electric Cooperative Incorporated
BEK TEL	Bek Communications Cooperative
BELLE PL	Belle Fourche Pipeline Company
BLM	Bureau of Land Management
BNSF	Burlington Northern Santa Fe Railway
BOEING	Boeing
BRNS RWD	Barnes Rural Water District
BURK-DIV ELEC	Burke-Divide Electric Cooperative
BURL WRD	Burleigh County Water Resource District
CABLE ONE	Cable One
CABLE SERV	Cable Services
CAP ELEC	Capital Electric Cooperative Incorporated
CASS CO ELEC	Cass County Electric Cooperative
CASS RWU	Cass Rural Water Users District
CAV ELEC	Cavalier Rural Electric Cooperative
CBLCOM	Cablecom Of Fargo
CENEX PL	Cenex Pipeline
CENT PL WATER DIST	Central Pipe Line Water District
CENT PWR ELEC	Central Power Electric Cooperative
CENTURYLINK	CenturyLink
COE	Corps of Engineers
CONS COMM	Consolidated Communications
CONS TELCOM	Consolidated Telcom
CONT RES	Continental Resource Inc
CPR	Canadian Pacific Railway
D O E	Department Of Energy
DAK CARR	Dakota Carrier Network
DAK CENT TEL	Dakota Central Telephone
DAK RWD	Dakota Rural Water District
DGC	Dakota Gasification Company
DICKEY R NET	Dickey Rural Networks
DICKEY WRD	Dickey County Water Resource District
DICKEY TEL	Dickey Telephone
DNRR	Dakota Northern Railroad
DOME PL	Dome Pipeline Company
DVELEC	Dakota Valley Electric Cooperative
DVMW	Dakota, Missouri Valley & Western
E CENT REG WD	East Central Water District
ENBRDG	Enbridge Pipelines Incorporated
ENVENTIS	Enventis Telephone
EQUINOR	Equinor Pipeline
FALK MNG	Falkirk Mining Company
FHWA	Federal Highway Administration
G FKS-TRL WD	Grand Forks-traill Water District
GETTY TRD & TRAN	Getty Trading & Transportation
GLDN W ELEC	Golden West Electric Cooperative
GTR RAMSEY WD	Greater Ramsey Water District
GT PLNS NAT GAS	Great Plains Natural Gas Company
HALS TEL	Halstad Telephone Company
IDEA1	Idea1
INT-COMM TEL	Inter-Community Telephone Company
KANEB PL	Kaneb Pipeline Company
KEM ELEC	Kem Electric Cooperative Incorporated
KOCH GATH SYS	Koch Gathering Systems Incorporated
LKHD PL	Lakehead Pipeline Company
LWR YELL R ELEC	Lower Yellowstone Rural Electric
LUMEN	Lumen Technologies Incorporated
MCKNZ CON	McKenzie Consolidated Telcom
MCKNZ ELEC	McKenzie Electric Cooperative
MCKNZ WRD	McKenzie County Water Resource District
MCLEOD	McLeod USA
MCLN ELEC	McLean Electric Cooperative
MCLN-SHRDN R WAT	McLean-Sheridan Rural Water District
MDU	Montana-dakota Utilities
MIDCO	MidContinent Communications
MIDSTATE TEL	Midstate Telephone Company
MINOT CABLE	Minot Cable Television
MINOT TEL	Minot Telephone Company
MISS VALL COMM	Missouri Valley Communications Incorporated
MISS W W S	Missouri West Water System
MNKOTA PWR	Minnkota Power
MOR-GRAN-SOU ELEC	Mor-gran-sou Electric Cooperative
MOUNT-WILLI ELEC	Mountrail-williams Electric Cooperative
MLGC	Moore & Liberty - Griggs County
MUNICIPAL	City Water And Sewer
MUNICIPAL	City Of '.....'
N CENT ELEC	North Central Electric Cooperative
N PRAIR REG WD	North Prairie Regional Water District
ND PKS & REC	North Dakota Parks And Recreation
ND TEL	North Dakota Telephone Company
NDDOT	North Dakota Department of Transportation
NE REG WD	Northeast Regional Water District
NDSU SOIL SCI DEPT	NDSU Soil Science Department
NEMONT TEL	Nemont Telephone
NODAK R ELEC	Nodak Rural Electric Cooperative
NOON FRMS TEL	Noonan Farmers Telephone Company
NPR	Northern Plains Railroad
NSP	Northern States Power
NTHN BRDR PL	Northern Border Pipeline
NTHN PLNS ELEC	Northern Plains Electric Cooperative Incorporated
NTHWSTRN REF	Northwestern Refinery Company
NW COMM	Northwest Communication Cooperation
NWRWD	Northwest Rural Water District
ONEOK	Oneok gas
OSHA	Occupational Safety and Health Administration
OTTR TL PWR	Otter Tail Power Company
PAAP	Plains All American Pipeline
P L E M	Prairielands Energy Marketing
POLAR COM	Polar Communications
PVT ELEC	Private Electric
QWEST	Qwest Communications
R&T REG WD	R & T Water District
RED RIV COMM	Red River Communications
RESVTN TEL	Reservation Telephone
ROBRTS TEL	Roberts Company Telephone
R-RIDER ELEC	Roughrider Electric Cooperative
RRVW	Red River Valley & Western Railroad
S CENT REG WD	South Central Regional Water District
SE W U	Southeast Water Users Incorporated
SCOTT CABLE	Scott Cable Television Dickinson
SHERDN ELEC	Sheridan Electric Cooperative
SHEYN VLY ELEC	Sheyenne Valley Electric Cooperative
SKYTECH	Skyland Technologies Incorporated
SLOPE ELEC	Slope Electric Cooperative Incorporated
SOURIS RIV TELCOM	Souris River Telecommunications
ST WAT COMM	State Water Commission
STATE LN WATER	State Line Water Cooperative
STER ENG	Sterling Energy
STUT RWD	Stutsman Rural Water District
SW PL PRJ	Southwest Pipeline Project
SWWA	Southwest Water Authority
SUNOCO	Sunoco LP
T M C	Turtle Mountain Communications
TCI	TCI of North Dakota
TESORO HGH PLNS PL	Tesoro High Plains Pipeline
TRI-CNTY WU	Tri-County Water Users Incorporated
TRL CO WRD	Traill County Water Resource District
UNTD TEL	United Telephone
UPPR SOUR WD	Upper Souris Water District
US SPRINT	U.S. Sprint
USAF MSL CABLE	U.S.A.F. Missile Cable
USFWS	US Fish and Wildlife Service
USW COMM	U.S. West Communications
VRNDRY ELEC	Verendrye Electric Cooperative
W RIV TEL	West River Telephone Incorporated
WAPA	Western Area Power Administration
WAWSA	Western Area Water Supply Authority
WEB	W. E. B. Water Development Association
WILLI WRD	Williams County Water Resource District
WILSTN BAS PL	Williston Basin Interstate Pipeline Company
WLSH RWD	Walsh Water Rural Water District
WOLVRTN TEL	Wolverton Telephone
XLENER	Xcel Energy
YSVR	Yellowstone Valley Railroad

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LINE STYLES

D-101-20

Existing Topography

- Existing Ground Void
- Existing Cemetary Boundary
- Existing Box Culvert Bridge
- Existing Concrete Surface
- Existing Drainage Structure
- Existing Gravel Surface
- Existing Riprap
- Existing Dirt Surface
- Existing Asphalt Surface
- Existing Tie Point Line
- Existing Railroad Centerline
- Existing Guardrail Cable
- Existing Guardrail Metal
- Existing Edge of Water
- Existing Fence
- Existing Railroad
- Existing Field Line
- Exst Flow
- Existing Curb
- Existing Valley Gutter
- Existing Driveway Gutter
- Existing Curb and Gutter
- Existing Mountable Curb and Gutter
- Existing 3-Cable w Posts
- Site Boundary
- Existing Berm, Dike, Pit, or Earth Dam
- Existing Ditch Block
- Existing Tree Boundary
- Existing Brush or Shrub Boundary
- Existing Retaining Wall
- Existing Planter or Wall
- Existing W-Beam Guardrail with Posts
- Existing Railroad Switch
- Gravel Pit - Borrow Area
- Existing Wet Area-Vegetation Break
- Existing High Tension Cable Guardrail
- Existing High Tension Cable Guardrail with Posts

Proposed Topography

- 3-Cable w Posts
- Flow
- Fence
- Remove Line
- Wall
- Retaining Wall (Plan View)
- W-Beam w Posts
- High Tension Cable Guardrail with Posts

Existing Utilities

- Existing Electrical
- Existing Fiber Optic Line
- Existing TV Fiber Optic
- Existing Gas Pipe
- Existing Overhead Utility Line
- Existing Power
- Existing Fuel Pipeline
- Existing Undefined Above Ground Pipe Line
- Existing Sanitary Sewer
- Existing Sanitary Force Main
- Existing Storm Drain
- Existing Storm Drain Force Main
- Existing Culvert
- Existing Telephone Line
- Existing TV Line
- Existing Water or Steam Line
- Existing Under Drain
- Existing Slotted Drain
- Existing Conduit
- Existing Conductor
- Existing Down Guy Wire Down Guy
- Existing Underground Vault or Lift Station

Proposed Utilities

- 24 Inch Pipe
- Reinforced Concrete Pipe
- Under Drain
- Edge Drain

Traffic Utilities

- Conductor
- Fiber Optic
- Existing Loop Detector
- Existing Double Micro Loop Detector
- Micro Loop Detector Double
- Existing Micro Loop Detector
- Micro Loop Detector
- Signal Head with Mast Arm
- Existing Signal Head with Mast Arm

Sign Structures

- Existing Overhead Sign Structure
- Existing Overhead Sign Structure Cantilever
- Overhead Sign Structure Cantilever

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

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09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions

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LINE STYLES

D-101-21

Right Of Way

- Easement
- Existing Easement
- Right of Way
- Existing Right of Way
- Existing Right of Way Railroad
- Existing Right of Way Not State Owned
- Existing Government Lot Line
- Existing Adjacent Block Lines
- Existing Adjacent Lot Lines
- Existing Adjacent Property Line
- Existing Adjacent Subdivision Lines
- Sight Distance Triangle Line
- Dimension Leader

Boundary Control

- Existing City Corporate Limits or Reservation Boundary
- Existing State or International Line
- Existing Township
- Existing County
- Existing Section Line
- Existing Quarter Section Line
- Existing Sixteenth Section Line
- Existing Centerline
- Tangent Line

Cross Sections and Typicals

- Existing Ground
- Existing Topsoil (Cross Section View)
- Existing Ground Void (Not Surveyed) (void — void — void — v)
- Existing Concrete
- Existing Aggregate (Cross Section View)
- Existing Curb and Gutter (Cross Section View)
- Existing Asphalt (Cross Section View)
- Existing Reinforcement Rebar

Geotechnical

- Geotextile Fabric Type D (D — D)
- Geogrid (Geo — Geo)
- Geotextile Fabric Type R (R — R)
- Geotextile Fabric Type R1 (R — R)
- Geotextile Fabric Type RR (RR — RR)
- Geotextile Fabric Type S (S — S)
- Subgrade Reinforcement
- Failure Line

Countours

- Depression Contours
- Supplemental Contour

Profile

- Subgrade, Subcut or Ditch Grade
- Topsoil Profile

Striping

- Centerline Pavement Marking
- Barrier with Centerline Pavement Marking
- Barrier Pavement Marking
- Stripe 4 IN Dotted Extension White
- Stripe 8 IN Dotted Extension White
- Stripe 8 IN Lane Drop

Pavement Joints

- Doweled Joint
- Tie Bar 30 Inch 4 Foot Center to Center
- Tie Bar 18 Inch 3 Foot Center to Center
- Tie Bar at Random Spacing

Bridge Details

- Small Hidden Object
- Large Hidden Object
- Phantom Object
- Existing Conditions Object
- Centerline Main
- Centerline Secondary
- Excavation Limits
- Proposed Ground
- Sheet Piling

Erosion Control

- Limits of Const Transition Line
- Bale Check
- Rock Check
- Floating Silt Curtain (S — S)
- Silt Fence (SF — SF)
- Excavation Limits
- Fiber Rolls

Environmental

- Wetland Mitigation
- Existing Wetland Easement USFWS
- Existing Wetland Jurisdictional
- Existing Wetland
- Tree Row

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions

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12 18 2020

SYMBOLS

D-101-30

North Arrow (Half Scale)

Alignment Data Point

Alignment Monument

Spot Elevation

Existing Miscellaneous Spot

Existing Access Control Arrow

Existing Benchmark

Reset USGS Marker

Iron Monument Found

Iron Pin R/W Monument

Property Corner

Iron Pin Reference Monument

Right of Way Marker (Exst, Ppsd, Reset)

Existing Federal Reference Corner

Existing Section Corner (Full, Quarter, Sixteenth, Meander)

Existing Witness Corner

Existing Control Point (CP, GPS-RTK, TRI)

Existing Traverse PI Aerial Panel

Existing Reference Marker Point NGS

Existing EFB Misc

Existing Bush or Shrub

Existing Large Evergreen Tree

Existing Small Evergreen Tree

Existing Large Tree

Existing Small Tree

Existing Tree Trunk

Cairn or Stone Circle

Existing Artifact

Existing Satellite Dish

Existing Weather Station

Existing Windmill or Tower

Reinforced Pavement

CSB Continuous Split Barrel Sample

FA Flight Auger Sample

SB Split Barrel Sample

T Thinwall Tube Sample

N Standard Penetration Test

Incl Inclinometer Tube

Excavation Unit

Existing Ground Water Well Bore Hole

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions

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SYMBOLS

D-101-31

- Flexible Delineator
- Flexible Delineator Type A (Exst, Ppsd)
- Flexible Delineator Type B (Exst, Ppsd)
- Flexible Delineator Type C (Exst, Ppsd)
- Flexible Delineator Type D (Exst, Ppsd)
- Flexible Delineator Type E (Exst, Ppsd)
- Delineator Type A (Exst, Ppsd, Diamond Grade-Reset)
- Delineator Type B (Exst, Ppsd, Diamond Grade-Reset)
- Delineator Type C (Exst, Ppsd, Diamond Grade)
- Delineator Type D (Exst, Ppsd, Diamond Grade)
- Delineator Type E (Exst, Ppsd, Diamond Grade)
- Barricade (Type I, Type II, Type III}
- Arrow Panel (Caution Mode, Double Direction, Left Directional, Right Directional, Sequencing, Truck Mounted)
- Attenuation Device
- Truck Mounted Attenuator
- Delineator Drums
- Flagger
- Tubular Marker
- Traffic Cone
- Back to Back Vertical Panel Sign

- Highway Sign (Exst, Ppsd)
- Mile Post Type A (Exst-Ppsd-Reset)
- Mile Post Type B (Exst, Ppsd)
- Mile Post Type C (Exst, Ppsd)
- Object Marker Type I (Exst, Ppsd)
- Object Marker Type II (Exst, Ppsd)
- Object Marker Type III (Exst, Ppsd)
- Existing Reference Marker
- Road Closure Gate 18 Ft (Exst, Ppsd)
- Road Closure Gate 28 Ft (Exst, Ppsd)
- Road Closure Gate 40 Ft (Exst, Ppsd)
- Existing Railroad Battery Box
- Existing RR Profile Spot
- Existing Railroad Crossbuck
- Existing Railroad Frog
- Existing Mailbox (Private, Federal)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions

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12 18 2020

SYMBOLS

D-101-32

- Existing Luminaire
- Luminaire LED
- Existing Light Standard Luminaire
- Relocate Light Standard
- Light Standard Light LED Luminaire
- Light Standard 35 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 50 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 70 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 100 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 150 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 200 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 250 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 310 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 400 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 700 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire
- Emergency Vehicle Detector
- Video Detection Camera

- High Mast Light Standard 3 Luminaire (Exst, Ppsd)
- High Mast Light Standard 4 Luminaire (Exst, Ppsd)
- High Mast Light Standard 5 Luminaire (Exst, Ppsd)
- High Mast Light Standard 6 Luminaire (Exst, Ppsd)
- High Mast Light Standard 7 Luminaire (Exst, Ppsd)
- High Mast Light Standard 8 Luminaire (Exst, Ppsd)
- High Mast Light Standard 9 Luminaire (Exst, Ppsd)
- High Mast Light Standard 10 Luminaire (Exst, Ppsd)
- Overhead Sign Structure Load Center (Exst, Ppsd)
- Traffic Signal Controller (Exst, Ppsd)
- Pad Mounted Traffic Signal Controller (Exst, Ppsd)
- Flashing Beacon (Exst, Ppsd)
- Concrete Foundation (Exst, Ppsd)
- Pipe Mounted Flasher (Exst, Ppsd)
- Pad Mounted Feed Point (Exst, Ppsd)
- Pipe Mounted Feed Point with Pad (Exst, Ppsd)
- Pole Mounted Feed Point (Exst, Ppsd)
- Junction Box (Exst, Ppsd)
- Existing Pedestrian Head with Number
- Existing Signal Head
- Pole Mounted Head
- Existing Lighting Standard Pole

- Existing Traffic Signal Standard
- Pull Box (Exst-Ppsd-Undefined)
- Intelligent Transportation Pull Box (Exst, Ppsd)
- Transformer (Exst, Ppsd)
- Power Pole (Exst-Ppsd-with Transformer)
- Wood Pole (Exst, Ppsd)
- Pedestrian Push Button Post (Exst, Ppsd)
- Existing Pole
- Existing Telephone Pole
- Existing Post
- Connection Conductor (Ground, Neutral, Phase 1, Phase 2)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions

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SYMBOLS

D-101-33

Existing Manhole (Electrical, Gas, Telephone)

Water Manhole (Exst, Exst with Valve)

Sanitary Sewer Manhole (Exst, Ppsd, Exst with Valve)

Sanitary Force Main Manhole (Exst, Ppsd, Exst with Valve)

Storm Drain Manhole (Exst, Ppsd, Exst with Inlet, Ppsd with Inlet)

Force Main Storm Drain Manhole (Exst, Exst with Valve)

Manhole (Ppsd, Ppsd 48 Inch, Exst Undefined)

Existing Water Appurtenance

Sprinkler Head (Exst, Ppsd)

Fire Hydrant (Exst, Ppsd)

Cleanout (Exst Sanitary, Underdrain)

Existing Catch Basin Inlet (Round, Square)

Existing Curb Inlet (Round, Square)

Existing Slotted Reinforced Concrete Pipe

Catch Basin (Riser 30 Inch, Beehive, Type A)

Inlet Mountable Curb (Type A, Type B)

Inlet Saddle Base (Type 1, Type 2)

Inlet Special (Catch Basin, Type 1, Type A)

Inlet (Tee, Type 1, Type 2, Type 2 Double)

Median Drain

Headwall (Exst, Ppsd, Ppsd Single with Vegitation Barrier, Ppsd Double with Vegitation Barrier)

Cap or Stub
Exst Gas, Exst Sanitary, Exst Storm Drain, Ppsd Storm Drain, Exst Water

Existing Pedestal
Electrical, Telephone, Fiber Optic Telephone, TV, Fiber Optic TV, Undefined

Existing Pipe Vent
Gas, Fuel, Sanitary, Storm Drain, Water, Undefined

Valve
Exst Gas, Exst Water, Ppsd Water, Exst Undefined

Pump
Sanitary, Storm Drain, Exst Water

Corrugated Metal End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)

Reinforced Concrete End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)

Existing Utility Marker

Existing Meter

Existing Fuel Dispensers

Existing Fuel Filler Pipes

Existing Fuel Leak Sensors

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions Sheet added - Continued from D-101-32

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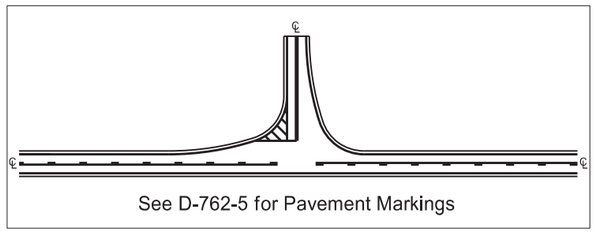
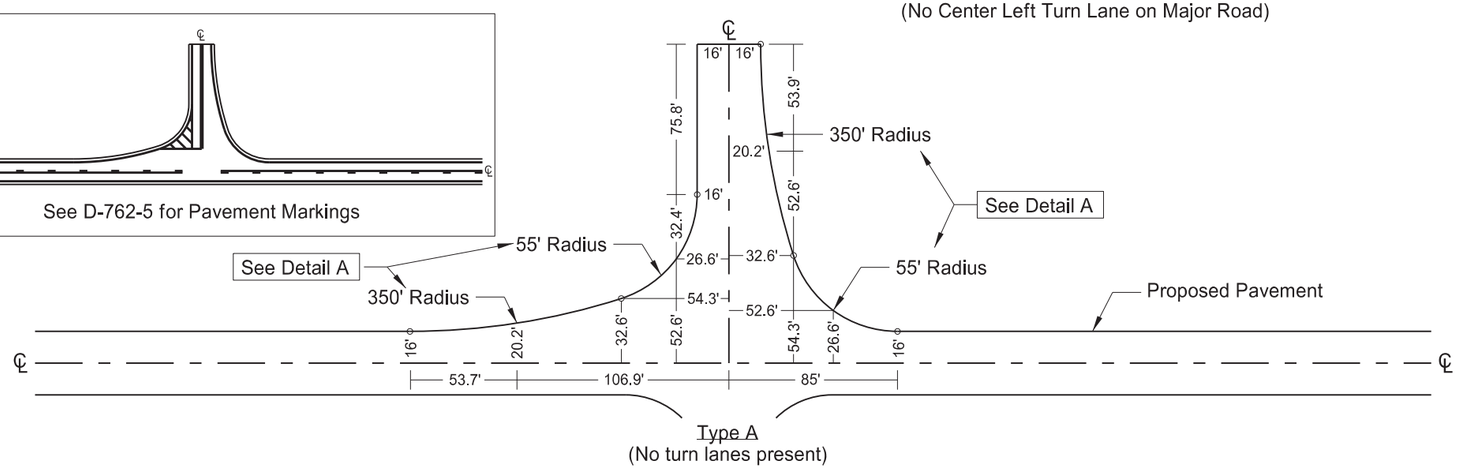
12 18 2020

STANDARD 90 DEGREE FLARED INTERSECTION

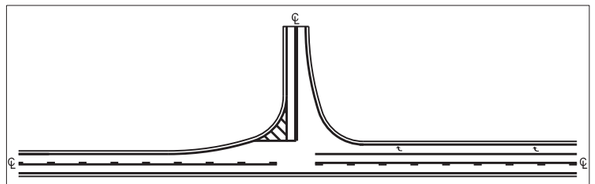
(No Center Left Turn Lane on Major Road)

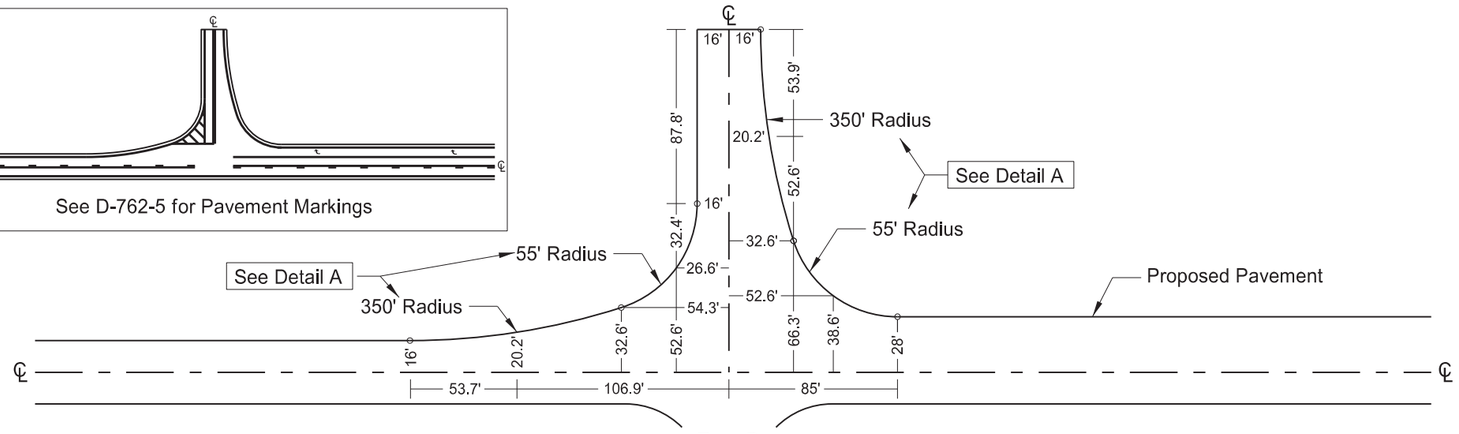
D-203-5



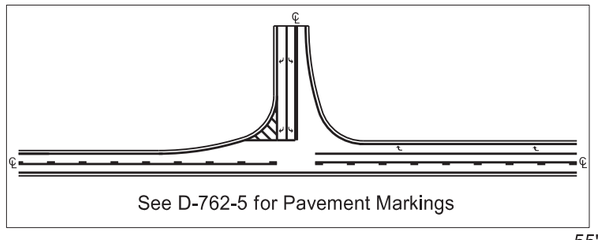


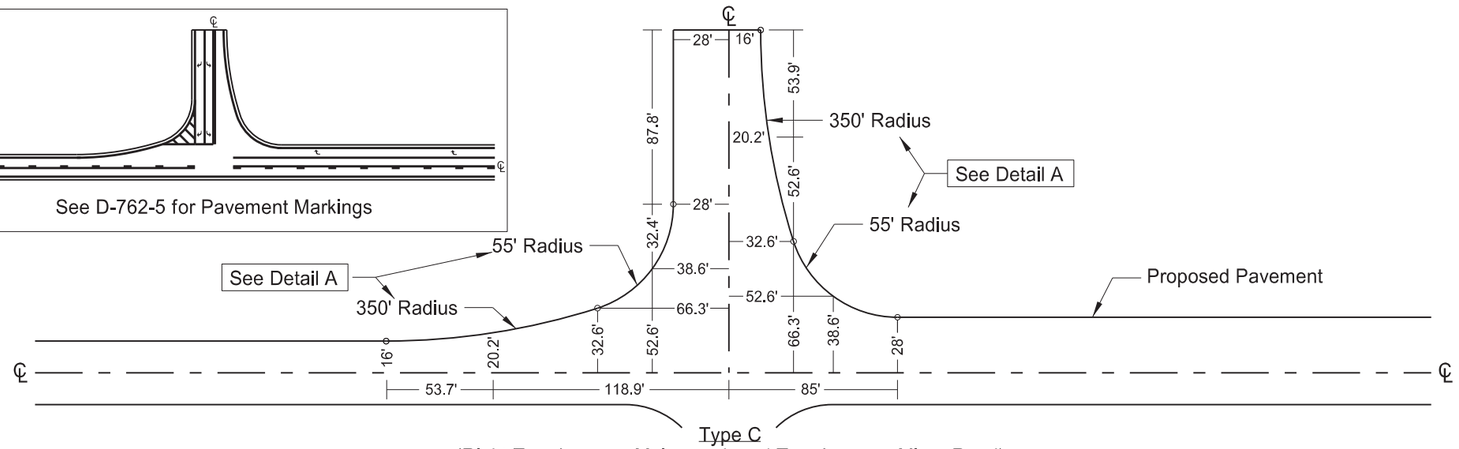
Type A
(No turn lanes present)





Type B
(Right Turn Lane on Major Road)

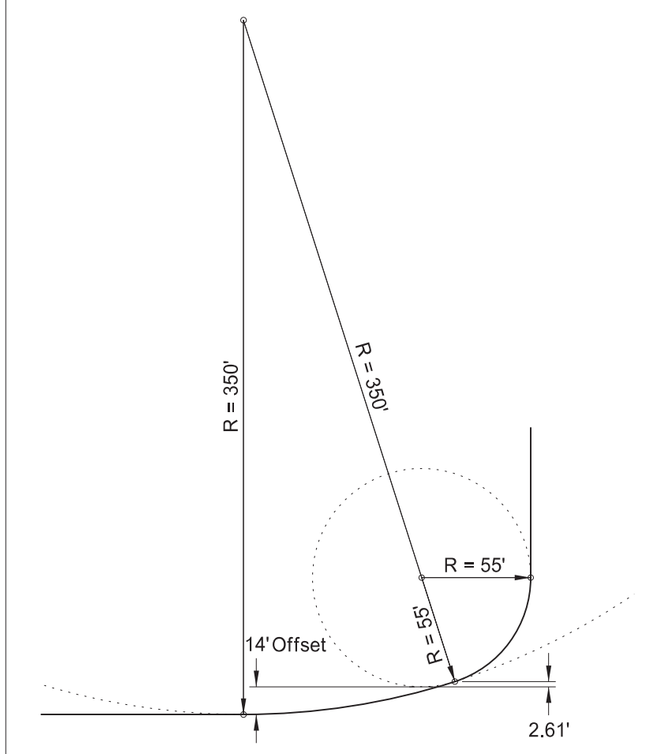




Type C
(Right Turn Lane on Major road, and Turn Lane on Minor Road)

Detail A

Compound Curve (350' Radius, 55' Radius, 14' Offset)



- ◦ Radius Tangent Point
- ⊢ xx.x' ⊣ Pavement widths
- ——— Proposed Pavement

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
3-29-16	
REVISIONS	
DATE	CHANGE
8-17-17	Corrected Pvmt Mkg Std reference.
8-30-18	Corrected pvmt mkg layouts.
10-25-19	Added Detail A ref to appr left side
8-09-24	Electronic Stamp/Signature.

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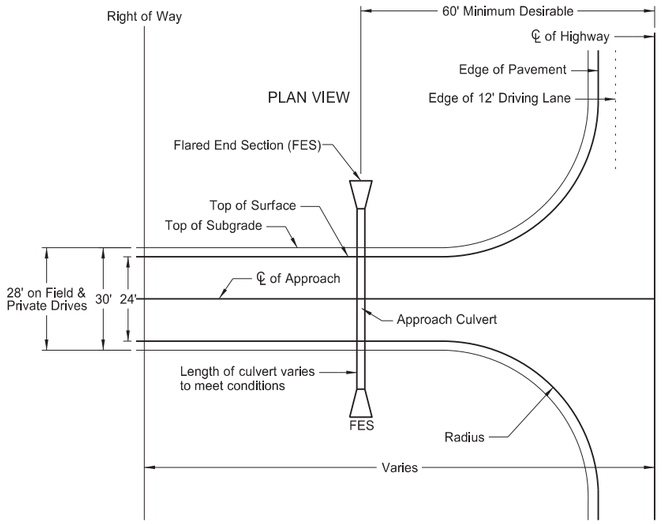
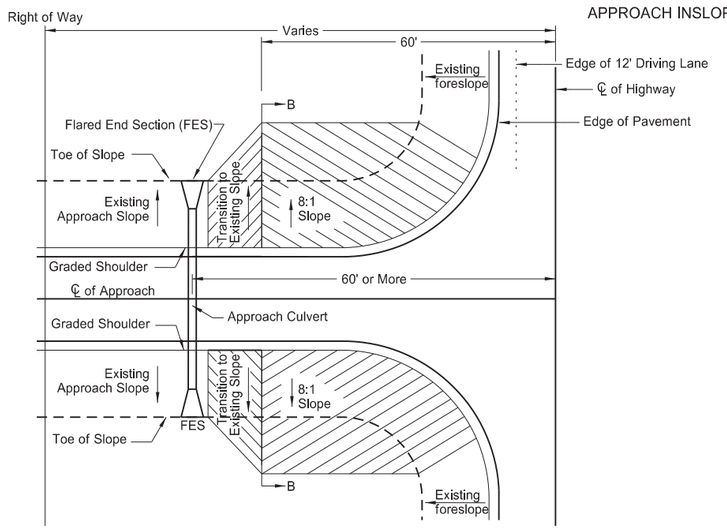
08/09/24

STANDARD RURAL APPROACHES

D-203-8

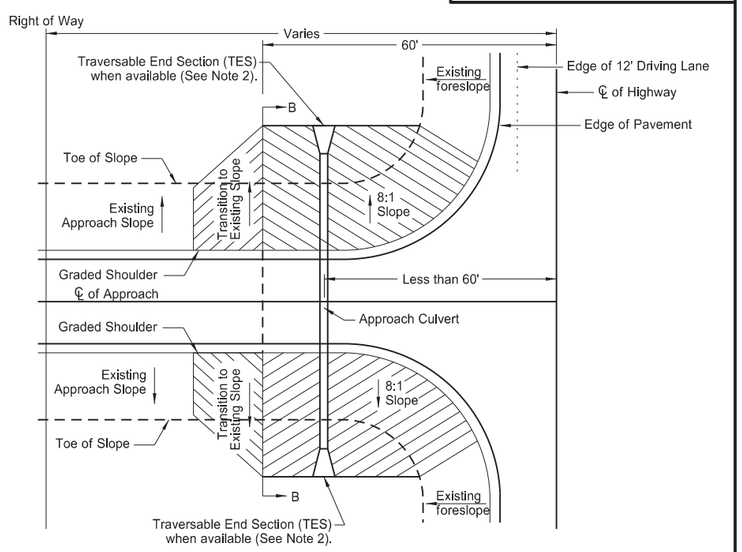


APPROACH INSLOPES



CASE 1

APPROACH PIPE LOCATED
60' OR MORE FROM ℄



CASE 2

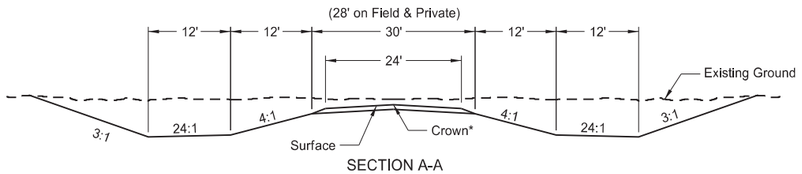
APPROACH PIPE LOCATED
LESS THAN 60' FROM ℄

Approach Pipe Traversable End Sections (TES)

RCP	CSP	CSP Arch
15"	15"	
18"	18"	21"x15"
		24"x18"
24"	24"	28"x20"

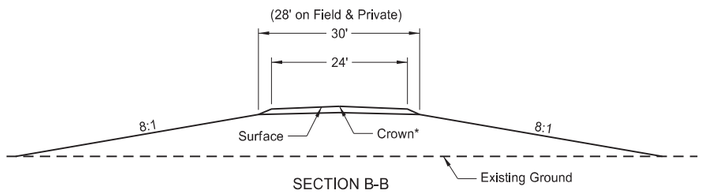
CRITERIA FOR RURAL APPROACH TYPES

	Field Drives	Private Drives	Low Volume Public Roads
Radius	R=40 ft	R=40 ft	R=50 ft
Maximum Grade	10%	7%	7%
Storage Platform	24 ft	24 ft	50 ft
Vertical Curve Length	10 ft	10 ft	Varies (Min. 20 mph)

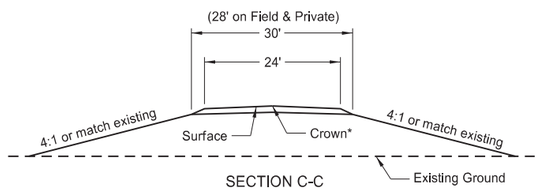


SECTION A-A

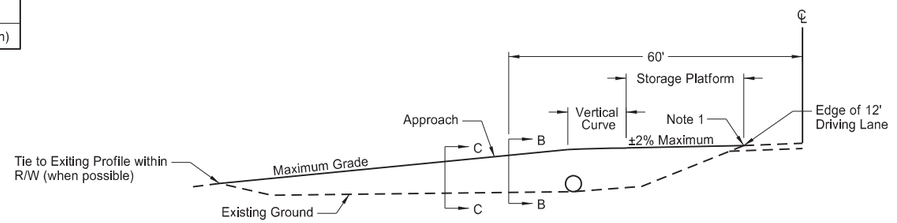
*2.1% crown for paved surface
*3.0% crown for gravel surface



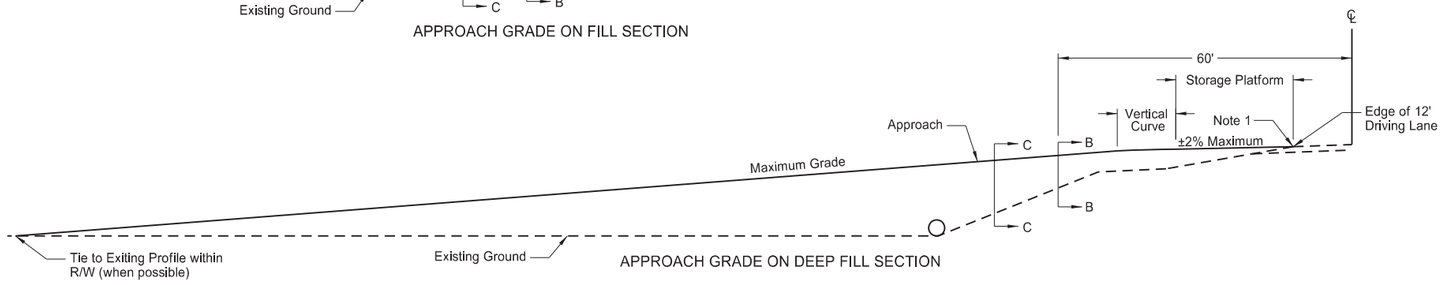
SECTION B-B



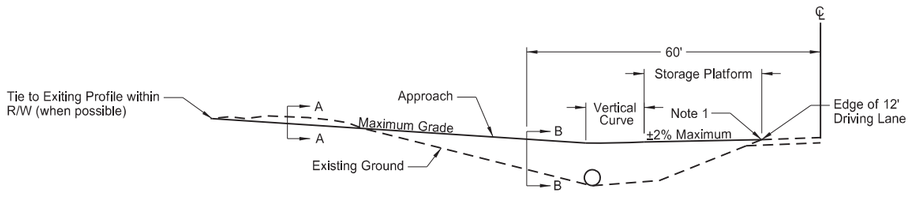
SECTION C-C



APPROACH GRADE ON FILL SECTION



APPROACH GRADE ON DEEP FILL SECTION



APPROACH GRADE ON CUT SECTION

NOTES:

1. 5% Max Rollover between approach storage platform and highway.
2. Approach pipes up to 24" diameter are acceptable (with traversable end sections) for Case 2. Install approach pipes larger than 24" diameter in accordance with Case 1.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-25-14	
REVISIONS	
DATE	CHANGE
06-30-17	Revised Radius, Storage Platform, Inslope dimensions, and Note 1
10-25-19	Changed "Inslope" to "Foreslope"
06-29-22	Added "TES", Table, and Note 2

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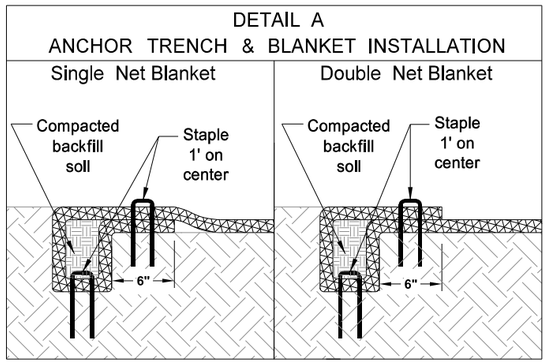
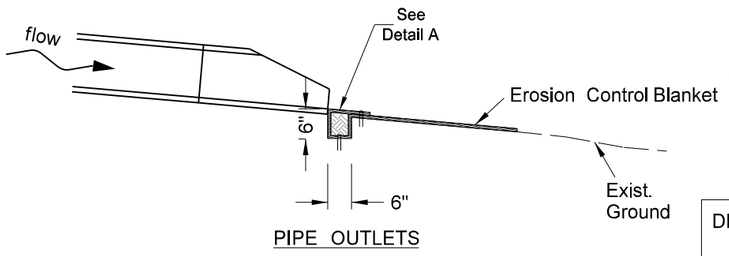
06/29/22

D-255-2

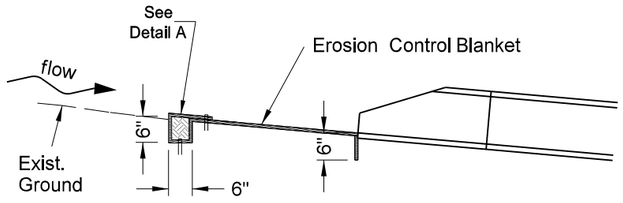
EROSION AND SILTATION CONTROL
EROSION CONTROL BLANKET INSTALLATION



NOTE:
If a Single Net Blanket is used the side with the netting should be on the top once the blanket is installed.

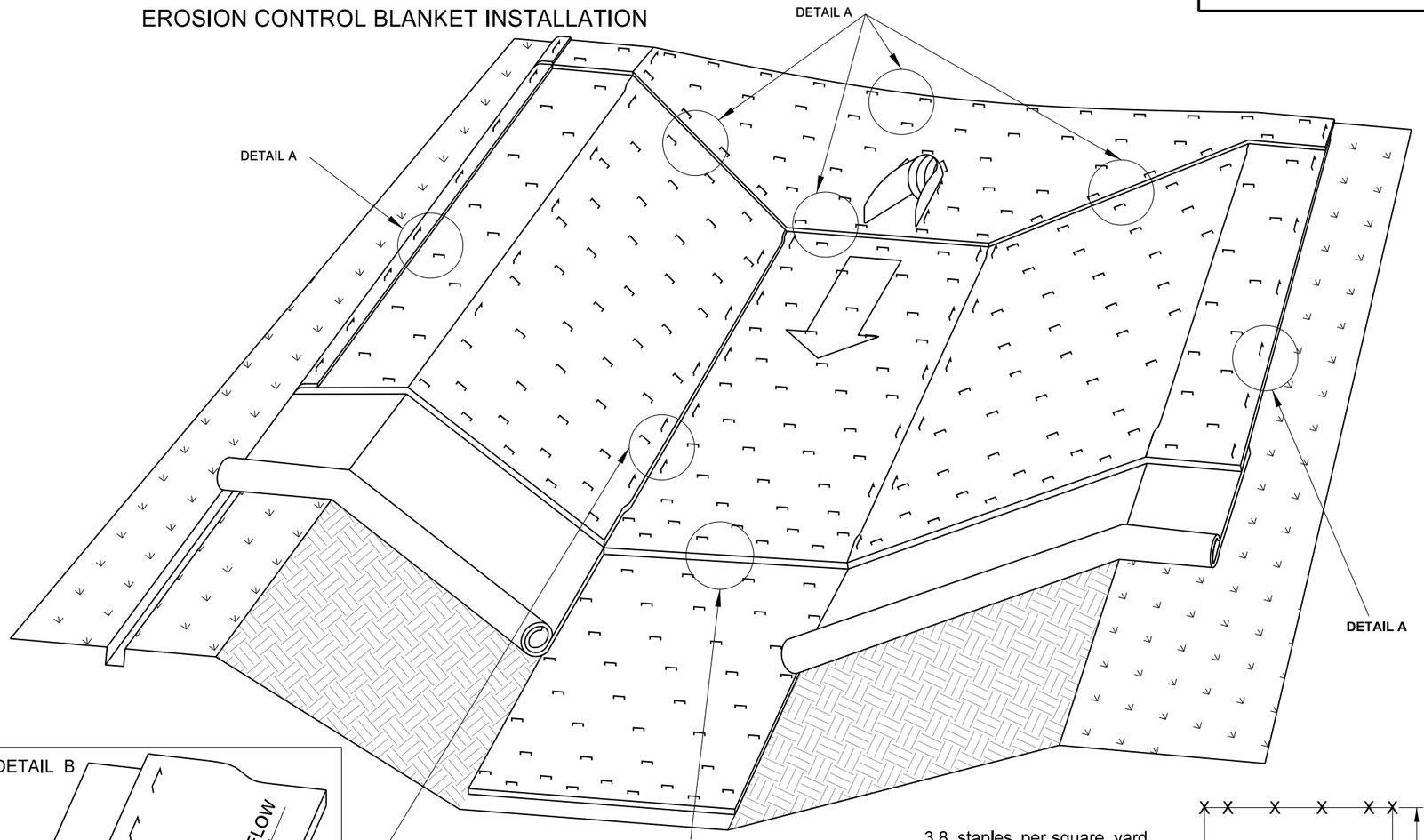


PIPE OUTLETS

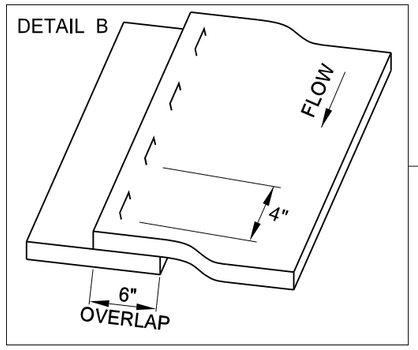


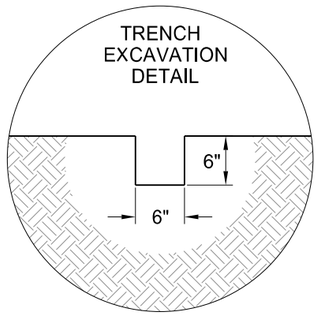
PIPE INLETS

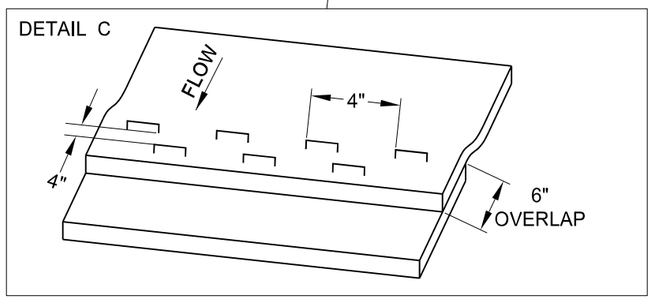
INSTALLATION AT PIPE ENDS



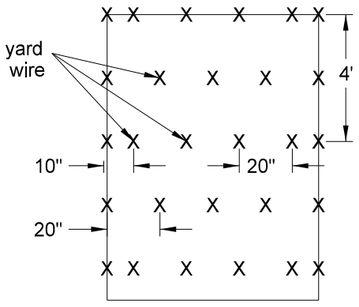
BLANKET LAYOUT
CHANNEL OR SLOPE INSTALLATION







3.8 staples per square yard using 8-inch 11 gauge wire "u" staples.



STAPLE PATTERN

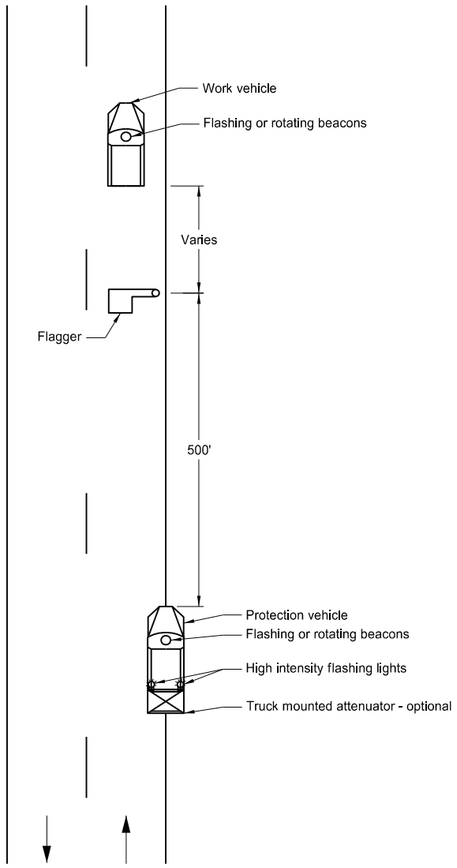
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Changed standard drawing number from D-708-5 to D-255-2.
07-27-15	Changed Installation details such as trench depth and overlap dimensions.
08-27-19	New Design Engineer PE Stamp.

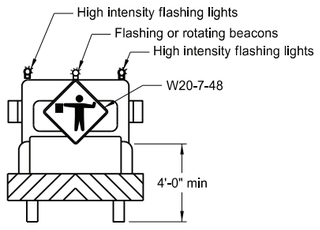
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 08/27/19 and the original document is stored at the North Dakota Department of Transportation

TRAFFIC CONTROL FOR CORING OF HOT BITUMINOUS PAVEMENT

D-704-2

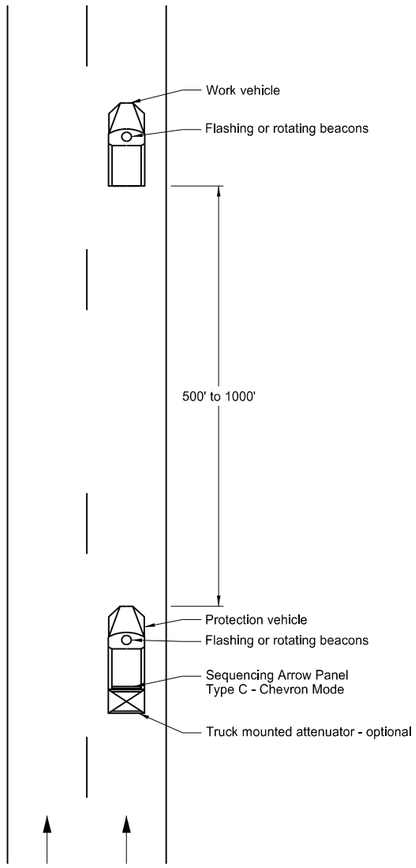
Two Lane, Two Way Roadways

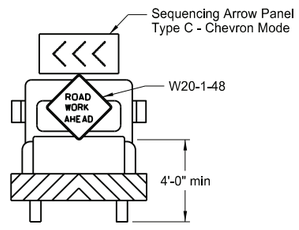




Typical Protection Vehicle

Multilane Roadways





Typical Protection Vehicle

Notes:

1. Display a 360 degree rotating, flashing, oscillating or strobe light on the working vehicle.

2. Display a 360 degree rotating, flashing, oscillating or strobe light on the shadow vehicle. Operate a sequencing arrow panel Type C in chevron mode on the shadow vehicle for Multilane Roadway.

3. Use these layouts during daylight hours and in areas of good visibility only.

4. Use flagger to protect the work area and warn oncoming traffic for two lane, two way roadway.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-25-12	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature

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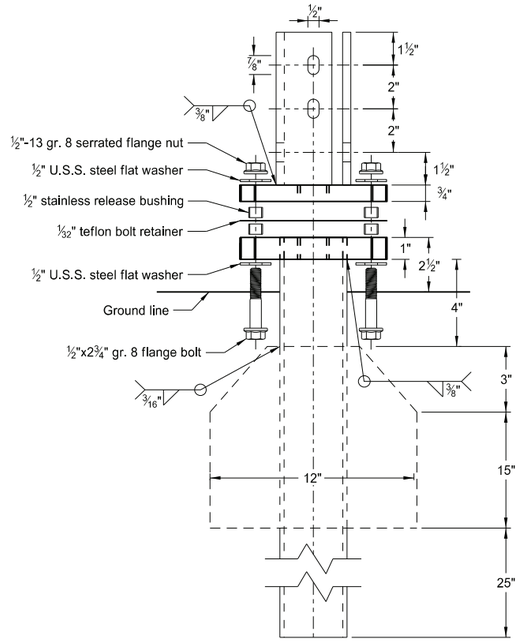
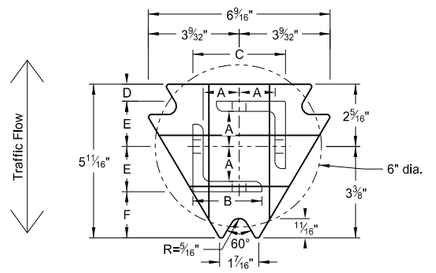
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-7

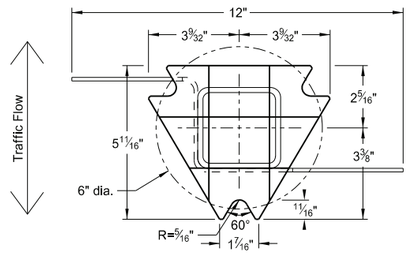


Multi-Directional
Slip Base Assembly

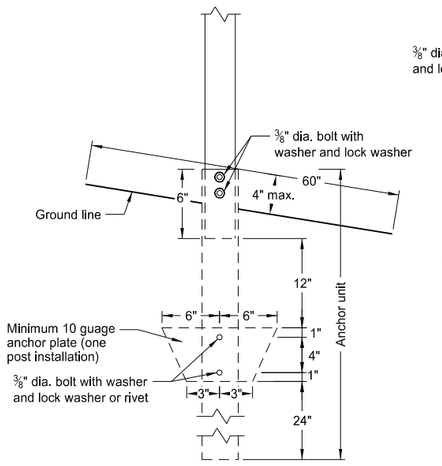
Perforated Tube



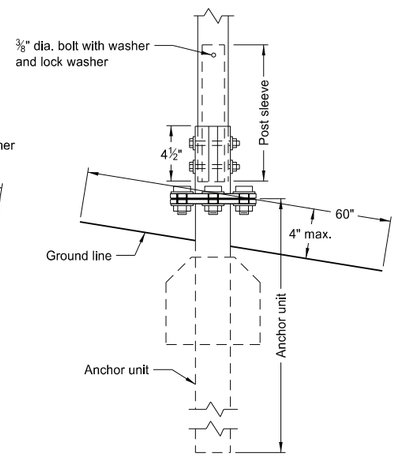
Top Post Receiver
Plate - ASTM A572 grade 50
Angle Receiver - 2½"x2½"x⅜" ASTM A36 structural angle



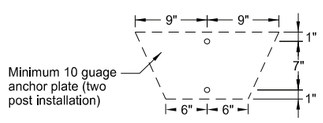
Bottom Soil Stub
Tube - 3"x3"x7 gauge ASTM A500 grade B tube
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A1011
Plate - ASTM A572 grade 50

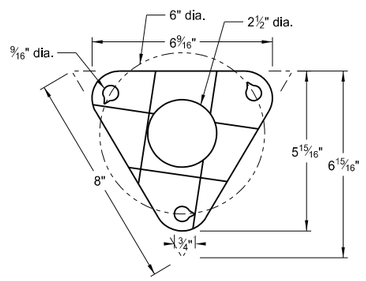


Anchor Unit and Post Assembly



Multi-Directional
Slip Base Anchor Unit
and Post Sleeve Assembly





Bolt Retainer for Base Connection
Bolt Retainer- 1/32" Reprocessed Teflon

Notes:

1. Torque slip base bolts as specified by manufacturer.
2. Use anchor with 43.9 KSI yield strength and 59.3 KSI tensile strength.
3. Provide 4" vertical clearance for anchor or breakaway base. Measure the 4"x60" measurement above and below post location and back and ahead of post.
4. In concrete sidewalk, use same anchor without wings.
5. Provide more than 7' between the first and fourth posts of a four post sign.

Telescoping Perforated Tube						
Number of Posts	Post Size in.	Wall Thick-ness Gauge	Sleeve Size in.	Wall Thick-ness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2¼
1	2¼	12			No	2½
1	2½	12			(A)	3
1	2½	10			Yes	
1	2¼	12	2	12	Yes	
1	2½	12	2¼	12	Yes	
2	2	12			No	2¼
2	2¼	12			No	2½
2	2½	12			Yes	
2	2½	12			Yes	
2	2¼	10	2	12	Yes	
2	2½	12	2¼	12	Yes	
3 & 4	2½	12			Yes	
3 & 4	2½	10			Yes	
3 & 4	2½	12	2¼	12	Yes	
3 & 4	2¼	12	2	12	Yes	
3 & 4	2½	10	2 3/16	10	Yes	

Properties of Telescoping Perforated Tube						
Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in.⁴	Cross Sec. Area in.²	Section Modulus in.³
1½ x 1½	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.785

Top Post Receiver Data Table						
Square Post Sizes (B)	A	B	C	D	E	F
2 3/16"x10 ga.	1 9/64"	2½"	3 1/32"	25/32"	1 33/64"	1 7/8"
2½"x10 ga.	1 9/32"	2½"	3 5/16"	⅝"	1 21/32"	1¾"

(A) Use breakaway base when support is placed in weak soils. Engineer determines if soils are weak.

(B) For additional wind load, insert the 2 3/16"x10 ga. into 2½"x10 ga.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature

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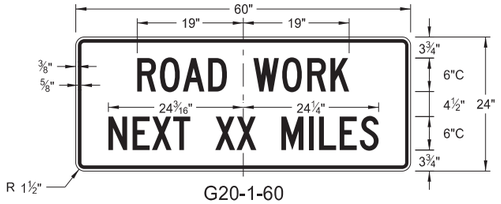
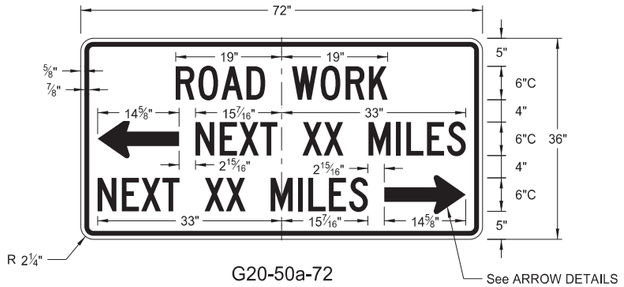
08/01/24

CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS

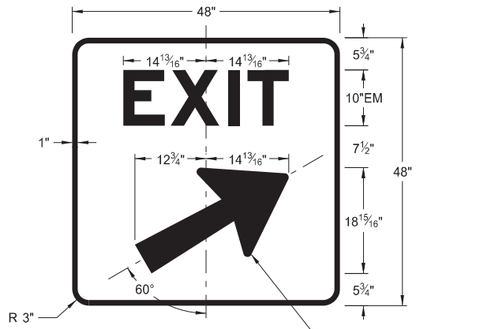
D-704-9



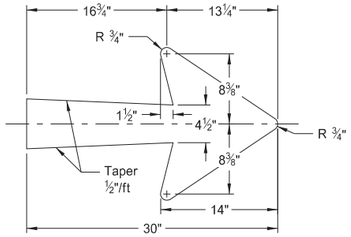
G20-1-60
Legend: black (non-refl)
Background: orange



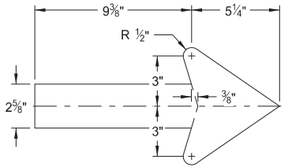
G20-50a-72
Legend: black (non-refl)
Background: orange



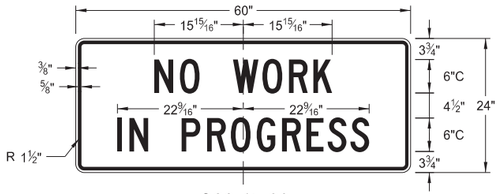
E5-1(L or R)-48
Legend: white
Background: green (orange optional)



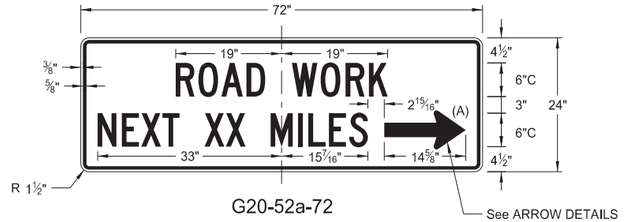
E5-1-48



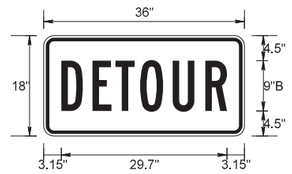
G20-50a-72
G20-52a-72



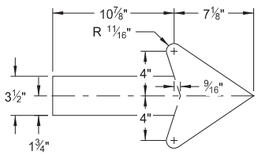
G20-1b-60
Legend: black (non-refl)
Background: orange



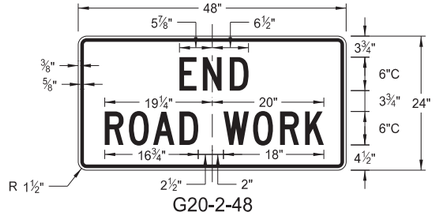
G20-52a-72
Legend: black (non-refl)
Background: orange



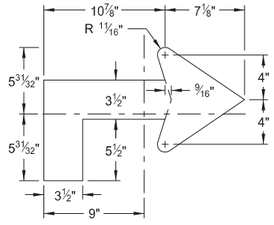
M4-8-36
Legend: black (non-refl)
Background: orange



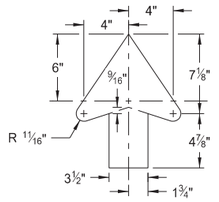
M4-9(L or R)-30
Right or Left



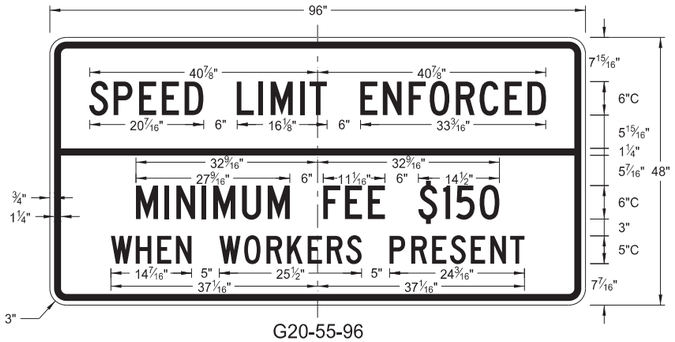
G20-2-48
Legend: black (non-refl)
Background: orange



M4-9(L or R)-30
Advanced Right or Left

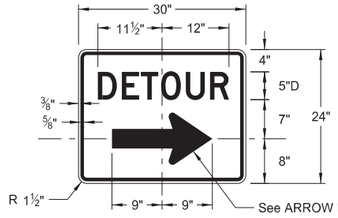


M4-9-30
Straight



G20-55-96
Legend: black (non-refl)
Background: orange

G20-4b-36
Legend: black (non-refl)
Background: orange



M4-9(L or R)-30 &
M4-9-30
Legend: black (non-refl)
Background: orange

ARROW DETAILS

NOTES:

(A) Arrow may be right or left of the legend to indicate construction to the right or left.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Added sign & background color
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes

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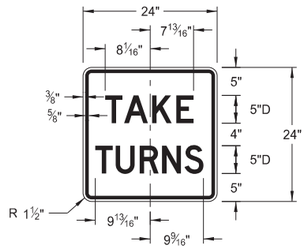
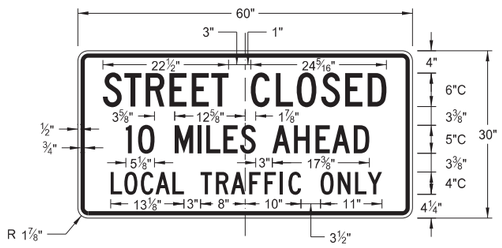
NORTH DAKOTA

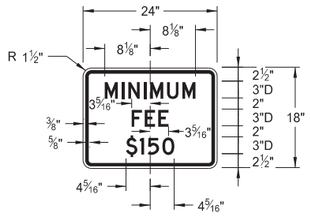
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS



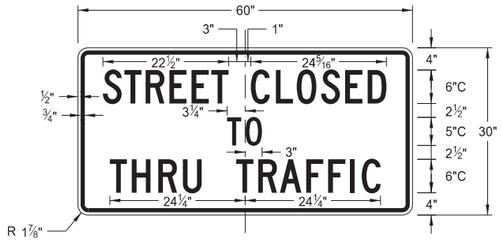
R1-50P-24
Legend: black (non-refl)
Background: white



R11-3c-60
Legend: black (non-refl)
Background: white



R2-1aP-24
Legend: black (non-refl)
Background: white



R11-4a-60
Legend: black (non-refl)
Background: white

R11-2a-48
Legend: black (non-refl)
Background: white

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Revised sign number
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes

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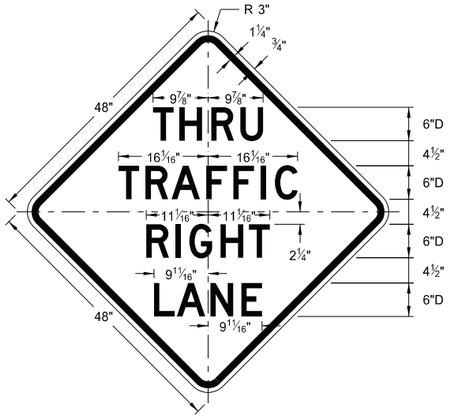
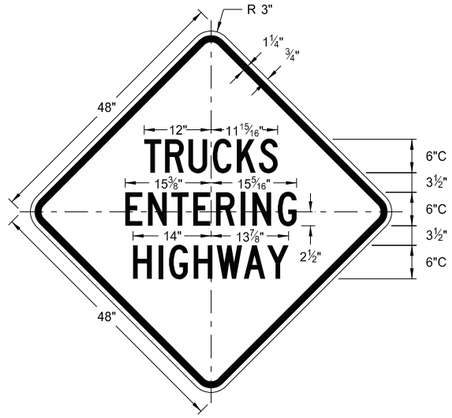
CONSTRUCTION SIGN DETAILS
WARNING SIGNS

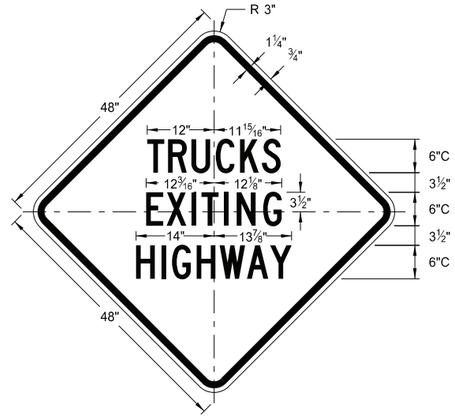
D-704-11



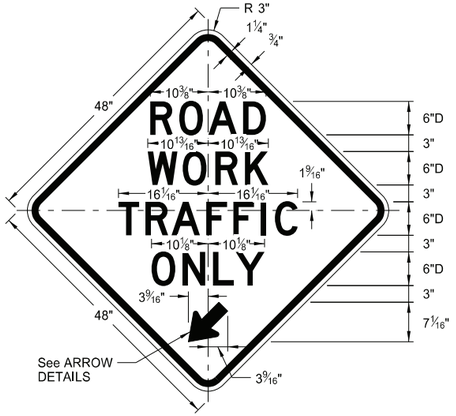
W5-8-48
Legend: black (non-refl)
Background: orange



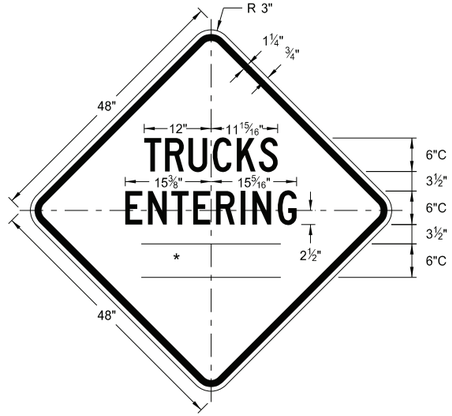
W8-53-48
Legend: black (non-refl)
Background: orange



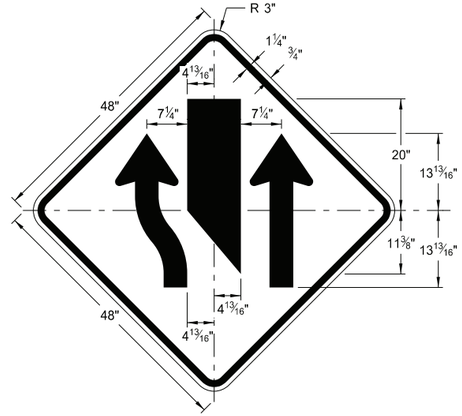
W8-56-48
Legend: black (non-refl)
Background: orange



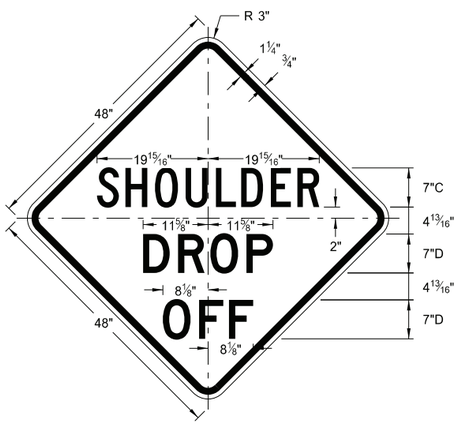
W5-9-48
Legend; black (non-refl)
Background: orange



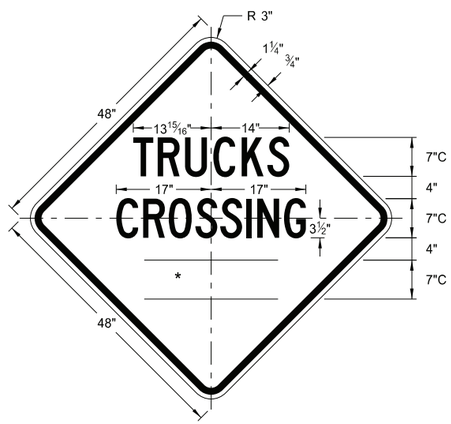
W8-54-48
Legend; black (non-refl)
Background: orange



W9-3a-48
Legend; black (non-refl)
Background: orange



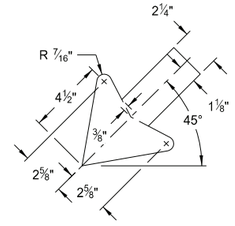
W8-9a-48
Legend: black (non-refl)
Background: orange



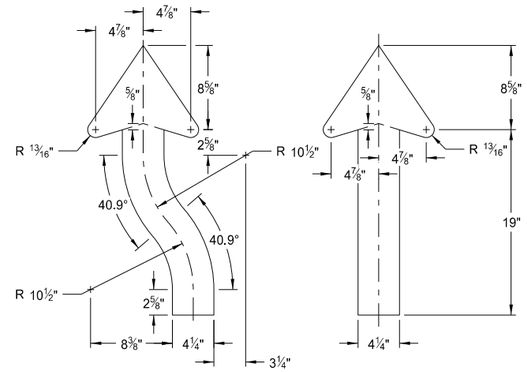
W8-55-48
Legend: black (non-refl)
Background: orange

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

* DISTANCE MESSAGES



W5-9-48



W9-3a-48

ARROW DETAILS

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated sign number
5-31-18	Revised sign and arrow details
10-03-19	New Design Engineer PE Stamp
8-01-24	Electronic Stamp/Signature

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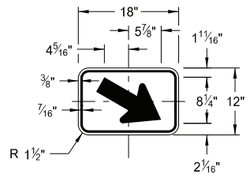
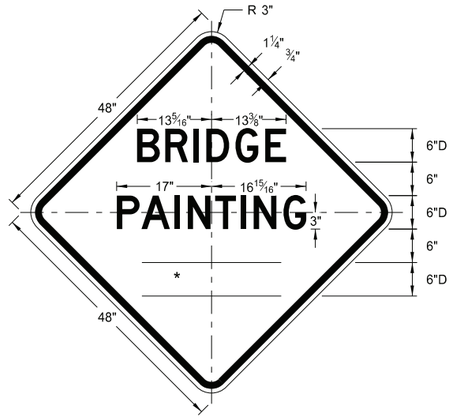
08/01/24

CONSTRUCTION SIGN DETAILS
WARNING SIGNS

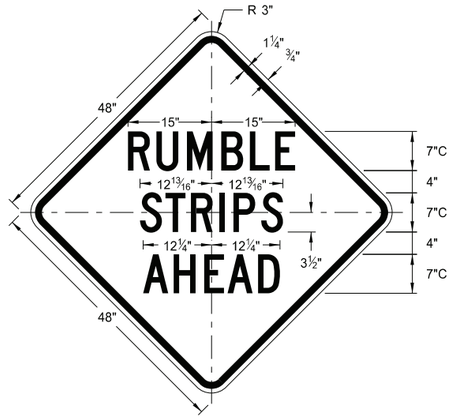
D-704-11A



W16-7aP-18
Legend: black (non-refl)
Background: orange



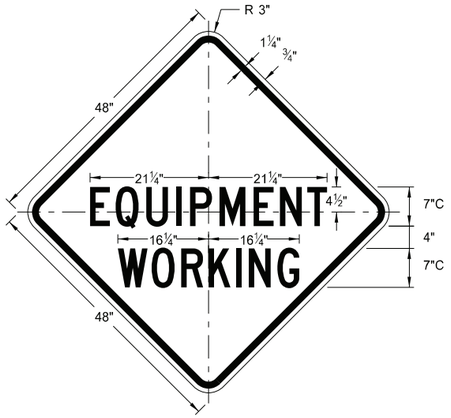
W21-50-48
Legend: black (non-refl)
Background: orange



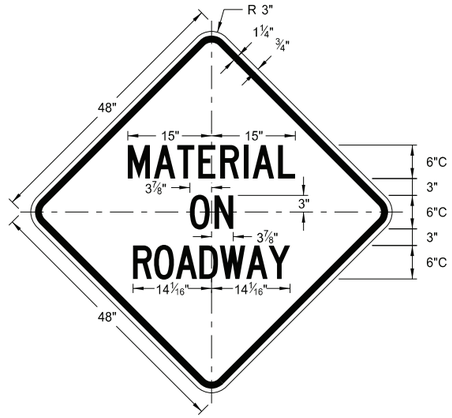
W21-53-48
Legend: black (non-refl)
Background: orange

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

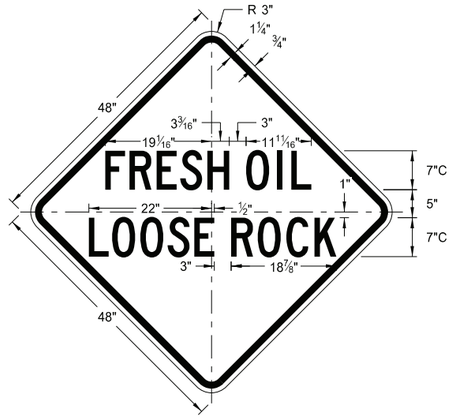
* DISTANCE MESSAGES



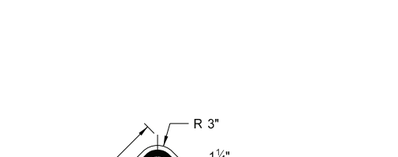
W20-51-48
Legend: black (non-refl)
Background: orange



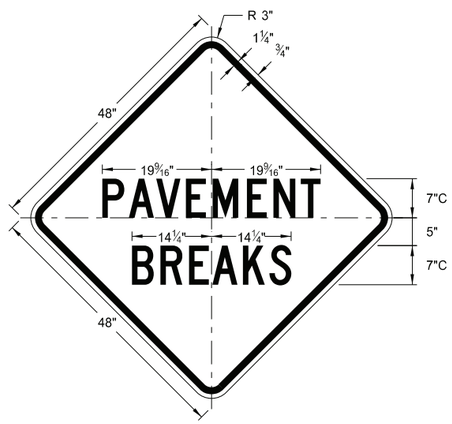
W21-51-48
Legend: black (non-refl)
Background: orange



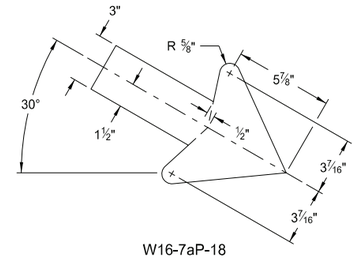
W22-8-48
Legend: black (non-refl)
Background: orange



W20-52P-54
Legend: black (non-refl)
Background: orange



W21-52-48
Legend: black (non-refl)
Background: orange



W16-7aP-18

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
5-31-18	
REVISIONS	
DATE	CHANGE
11-01-19	Added details for sign W16-7aP-18.
8-01-24	Electronic Stamp/Signature.

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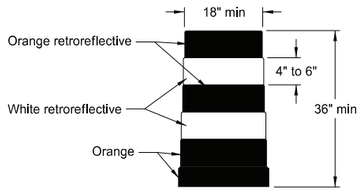
ENGINEER
NORTH DAKOTA

08/01/24

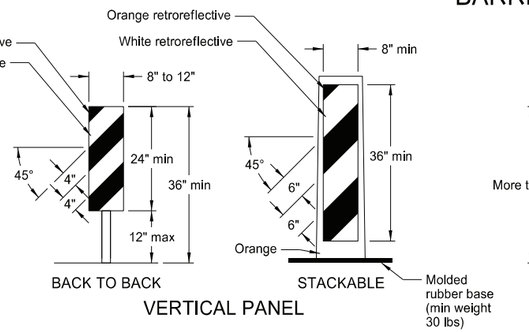
BARRICADE AND CHANNELIZING DEVICE DETAILS

D-704-13



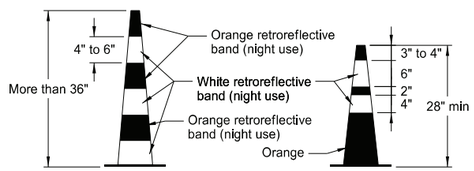
DELINEATOR DRUM

Provide horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide for drum markings. Use a minimum of two orange and two white stripes with the top stripe being orange for each drum. Do not exceed 3" nonretroreflectorized spaces between the horizontal orange and white stripes. Avoid placement of stripes on drum ribs or indentations. Use closed top drums that will not allow collection of debris. Do not place ballast on the top of drum.



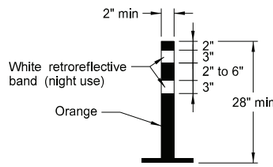
VERTICAL PANEL

Provide alternating orange and white retroreflective stripes, sloping downward in direction vehicular traffic is to pass. Place retroreflective sheeting on both sides of panel with a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective material on the vertical panel is 36 inches or more, use a stripe width of 6 inches.



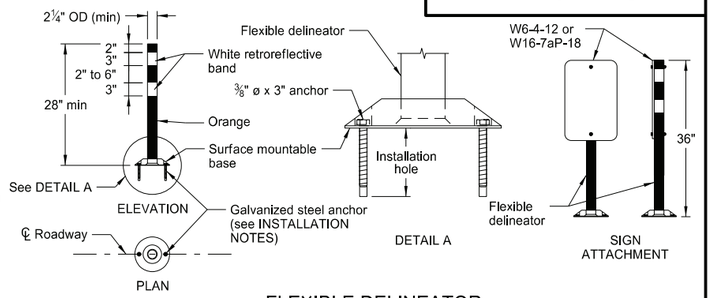
TRAFFIC CONE

Provide retroreflectorization of cones more than 36" in height by alternating orange and white retroreflective stripes. Use a minimum of two orange and two white stripes for each cone with the top stripe being orange. Use maximum 3" nonretroreflectorized space between the orange and white stripes.



TUBULAR MARKER

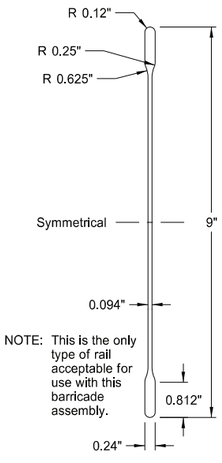
Provide retroreflectorization of tubular markers more than 42" in height by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



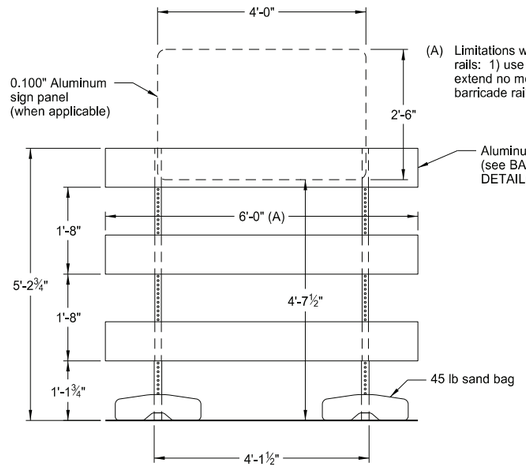
FLEXIBLE DELINEATOR

INSTALLATION NOTES:

1. Drill installation holes to diameter and depth required by manufacturer's specifications.
2. For removal, remove anchors and fill installation hole with an epoxy designed to bond to pavement surface.
3. In lieu of bolted down base, use an 8" x 8" butyl pad or hot melt butyl. Remove butyl as close as possible to pavement surface.

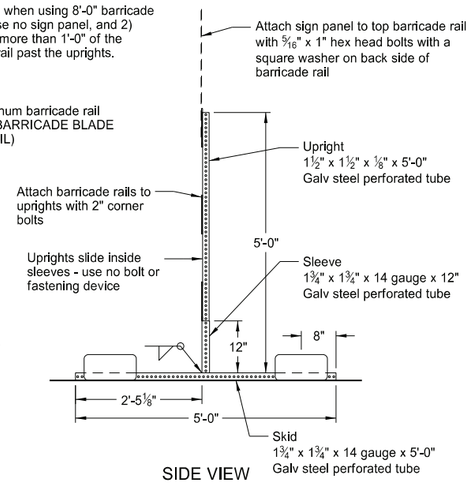


BARRICADE BLADE DETAIL



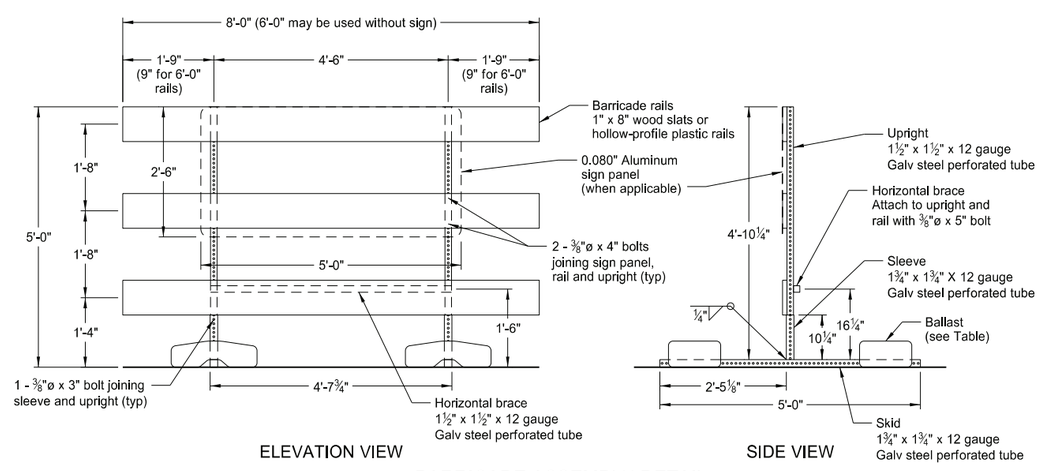
ELEVATION VIEW

(A) Limitations when using 8'-0" barricade rails: 1) use no sign panel, and 2) extend no more than 1'-0" of the barricade rail past the uprights.



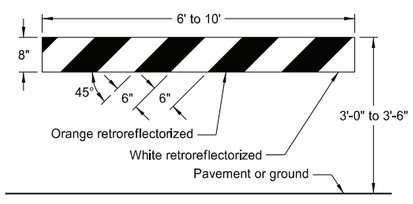
SIDE VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

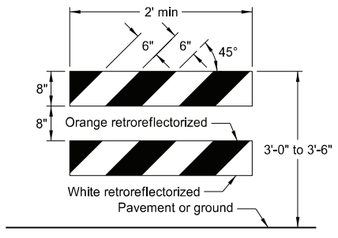


BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

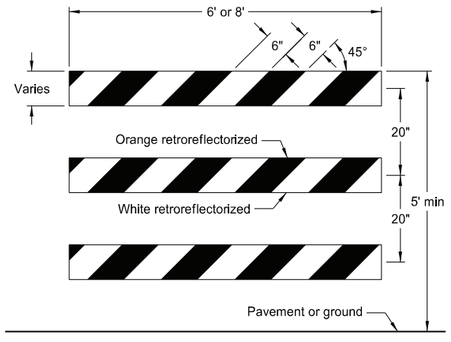
NOTE: For barricade markings use alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Place retroreflective sheeting on both sides of the rails with a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the barricade length is less than 36", use a rail stripe width of 4".



TYPE I BARRICADE

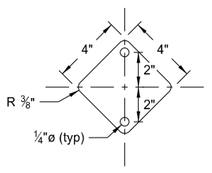


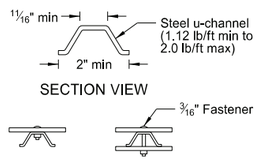
TYPE II BARRICADE

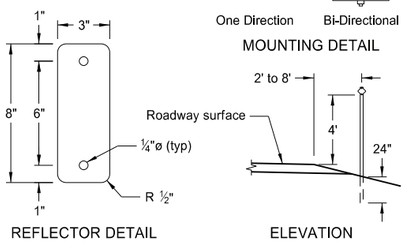


TYPE III BARRICADE

BARRICADE RAIL DETAILS







DELINEATORS

MINIMUM BALLAST
(For each side of barricade support)

Without Sign	4 - 25 lb sandbags
With Sign	6 - 25 lb sandbags

Note: Number of sandbags based on a wind speed of 55 MPH. Sandbags assumed to be placed at or near the ends of the skids.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
11-01-19	Revised details for Flexible Delineator
8-01-24	Electronic Stamp/Signature

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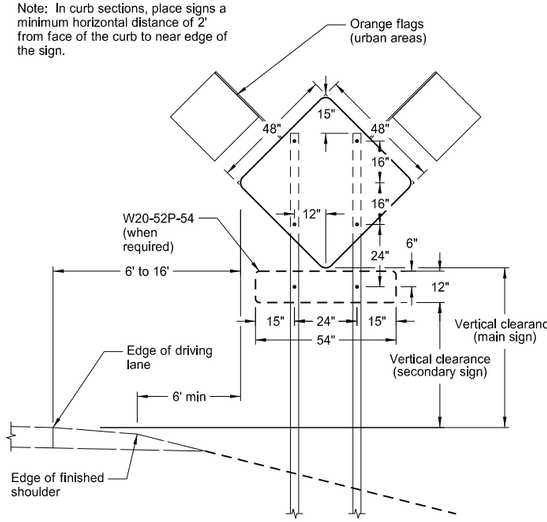
08/01/24

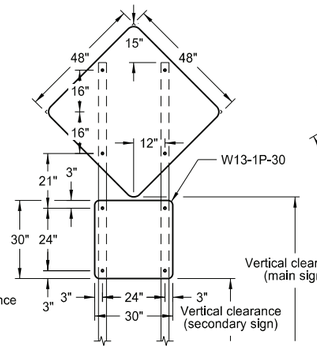
CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

D-704-14

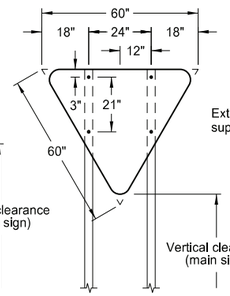
Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



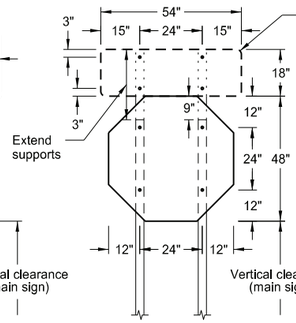
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



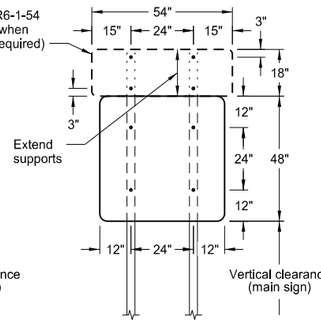
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



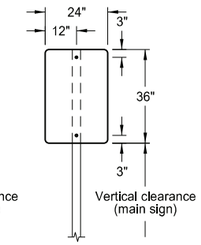
R1-2-60 - YIELD SIGN



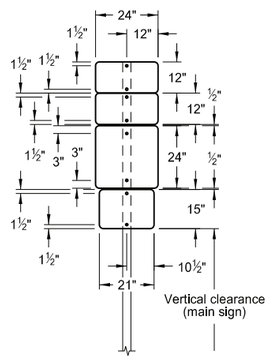
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



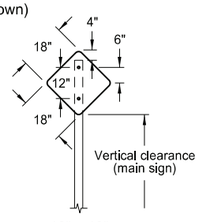
48" x 48" SIGN
(with R6-1-54 sign as required)



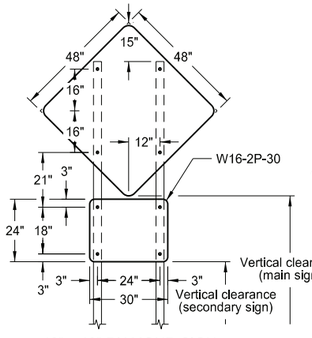
24" x 36" SIGN



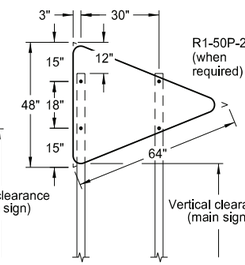
24" x 24"
ROUTE MARKER
ASSEMBLY



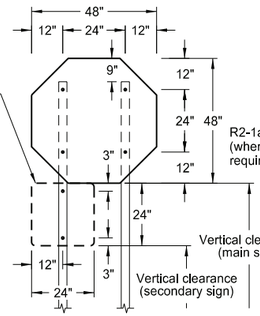
18" x 18"
DIAMOND SIGN



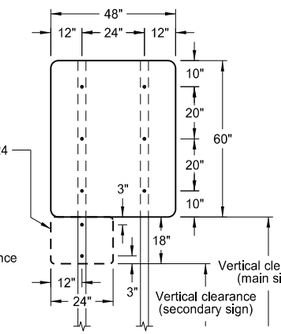
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



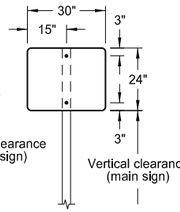
W14-3-64 - PENNANT SIGN



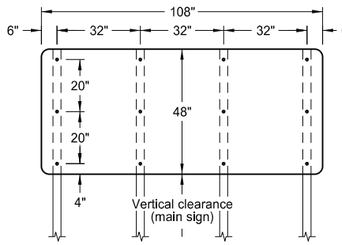
R1-1-48 - STOP SIGN
(with R1-50P-24 sign as required)



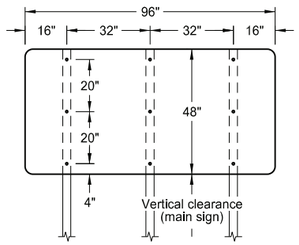
48" x 48" SIGN
(with R2-1aP-24 sign as required)



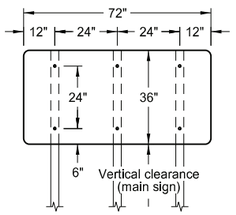
30" x 24" SIGN



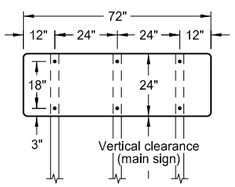
108" x 48" SIGN



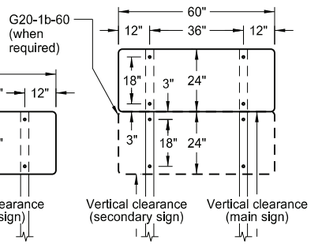
96" x 48" SIGN



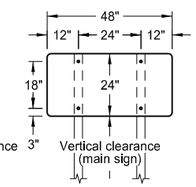
72" x 36" SIGN



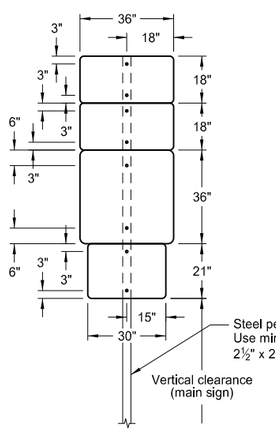
72" x 24" SIGN



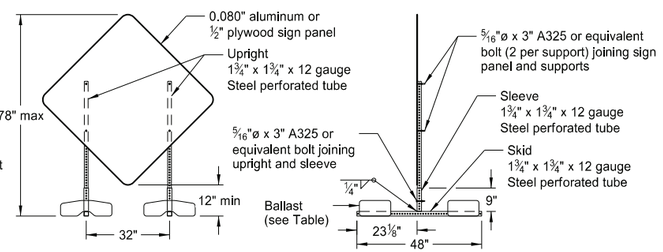
60" x 24" SIGN



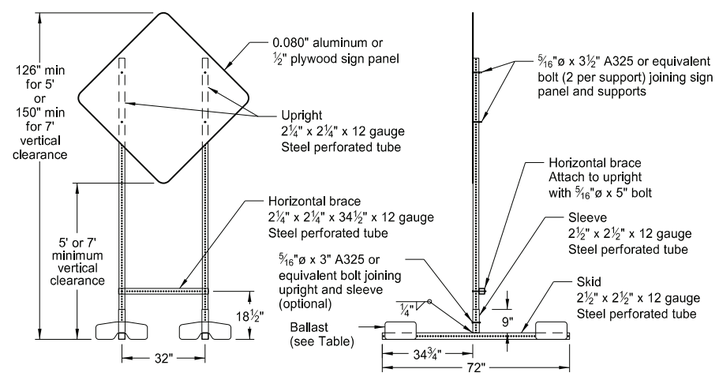
48" x 24" SIGN



36" x 36"
ROUTE MARKER
ASSEMBLY



PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

1. Sign Supports: Galvanize or paint supports. Minimum post sizes are 2.5 lb/ft u-channel or 2" x 2" x 12 gauge steel perforated tube, except where noted. When installing signs on u-channel, minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes based on a wind speed of 55 MPH.

   Place signs over 50 square feet on 2½" x 2½" perforated tube supports as a minimum.

   Do not attach guy wires to sign supports. Attach wind beams behind sign panels when used with u-posts.

2. Sign Panels: Provide sign panels made of 0.100" aluminum, ½" plywood, or other approved material, except where noted. Punch all holes round for ⅜" bolts.

3. Alternate Messages: Install and remove alternate message signs on reflectorized plate (without borders) as required. (i.e. "Left" and "Right" message on lane closure sign)

4. Route Marker Auxiliary Signs: Provide route marker auxiliary signs, such as the cardinal direction and directional arrows, with a background and legend that match the route marker they are used with:

   Interstate - white legend on blue background
   Interstate Business Loop - white legend on green background
   US and State - black legend on white background
   County - yellow legend on blue background

5. Vertical Clearance: Install signs with a vertical clearance of 5'-0" (see TYPICAL SECTION.) In areas where parking or pedestrian movements are likely or the view of the sign may be obstructed, install signs with a vertical clearance of 7'-0" from the top of the curb or from the near edge of the driving lane in absence of a curb.

   The vertical clearance to secondary signs is 1'-0" less than the vertical clearance stated above.

   Provide a minimum clearance of 7'-0" from the ground at the post for signs with an area exceeding 50 square feet.

6. Portable Signs: Provide portable signs that meet the vertical clearance stated above when it is necessary to place signs within the pavement surface.

   Use of low-mounting height (minimum 12" vertical clearance) portable signs for 5 days or less, is allowed as long as the view of the sign is not obstructed. Time delays caused by unforseen circumstances, such as equipment breakdown, rain, subgrade failures, etc., will not accrue towards the 5 day period. Use of R9-8 through R9-11a series, W1-6 through W1-8 series, M4-10, and E5-1 is allowed for longer than 5 days.

   Restrict signs mounted on portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT details to a maximum surface area of 16 square feet.

MINIMUM BALLAST
(For each side of sign support base)

Sign Panel Mounting Height (ft)	Number of 25 lb sandbags for 4' x 4' sign panel
1'	6
5'	8
7'	10

Note: The number of sandbags are based on a wind speed of 55 MPH. Place sandbags at or near the ends of skids.

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

10-4-13

REVISIONS

DATE	CHANGE
11-14-13	Revised Note 6
9-27-17	Updated to active voice
11-01-19	Revised 60"x24" sign detail
8-01-24	Electronic Stamp/Signature

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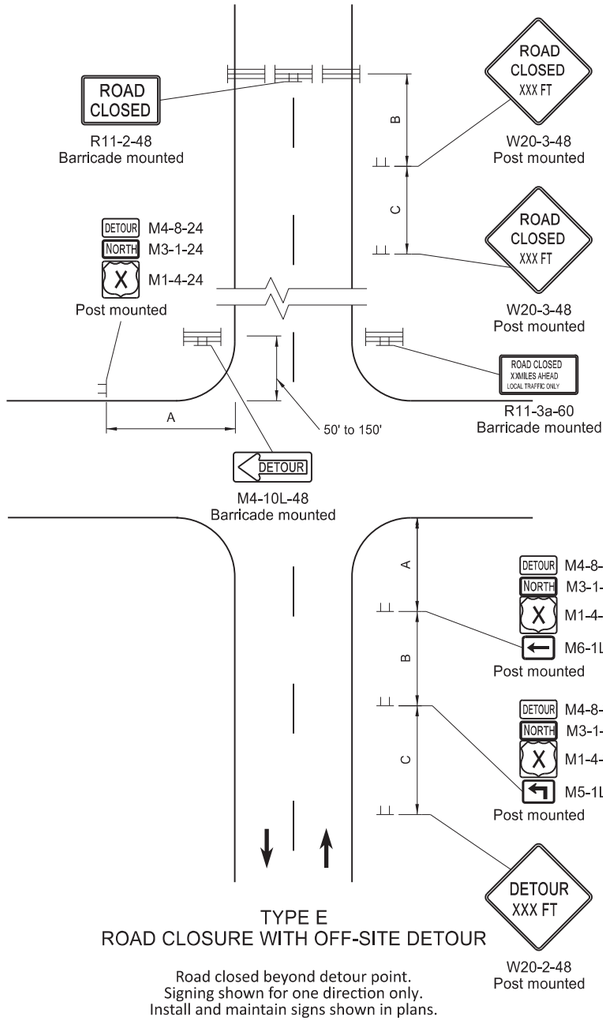
ENGINEER
NORTH DAKOTA

08/01/24

ROAD CLOSURE AND LANE CLOSURE ON A TWO WAY ROAD LAYOUTS

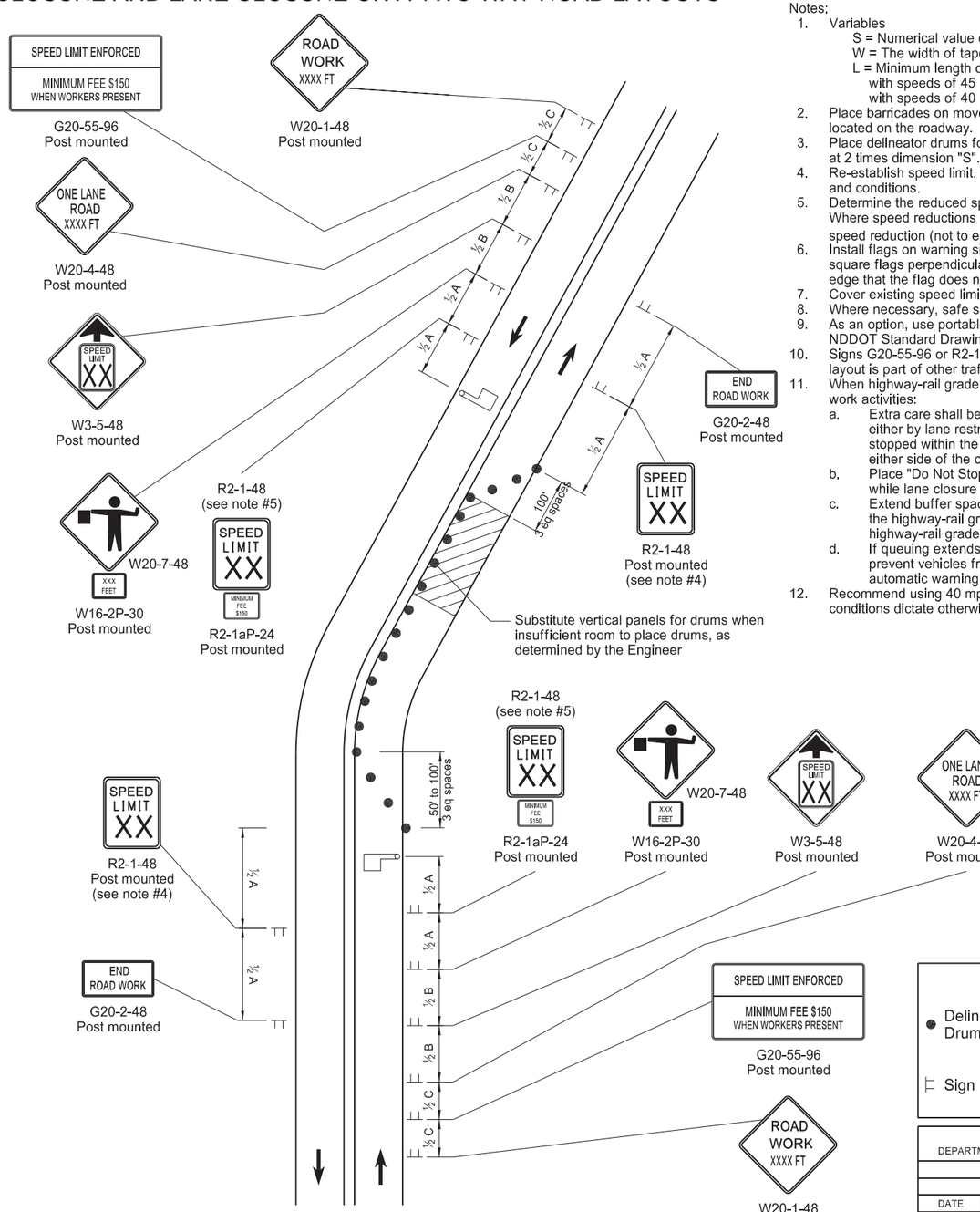
D-704-19



TYPE E
ROAD CLOSURE WITH OFF-SITE DETOUR

Road closed beyond detour point.
Signing shown for one direction only.
Install and maintain signs shown in plans.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500



TYPE F
LANE CLOSURE ON A TWO LANE ROAD USING FLAGGERS

Two lane highway with one lane closed.
Flagger at point visible to approaching traffic.

Notes:

1. Variables
   S = Numerical value of speed limit or 85th percentile.
   W = The width of taper in feet
   L = Minimum length of taper in feet. S x W for freeways, expressways, and roads with speeds of 45 mph or greater, or W x $S^2/60$ for urban, residential, and streets with speeds of 40 mph or less.
2. Place barricades on moveable assemblies and signs on portable assemblies when located on the roadway.
3. Place delineator drums for tapering traffic at 3 equal spaces and for tangents space them at 2 times dimension "S".
4. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
5. Determine the reduced speed limit based on the in place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place second speed limit sign at ½B.
6. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
7. Cover existing speed limit signs within a reduced speed zone.
8. Where necessary, safe speed to be determined by the Engineer.
9. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
10. Signs G20-55-96 or R2-1aP-24 are not required when pilot car operation is used, if this layout is part of other traffic control that contains this sign, or if work is less than 15 days.
11. When highway-rail grade crossings exist either within or in the vicinity of the roadway work activities:
    a. Extra care shall be taken to minimize the probability of conditions being created, either by lane restrictions, flagging or other operations, where vehicles might be stopped within the highway-rail grade crossing (considered as being 15 feet on either side of the closest and farthest rail.)
    b. Place "Do Not Stop on Tracks" sign (R8-8-24) near cross buck in each direction while lane closure is near tracks.
    c. Extend buffer space between work zone and lane closure transition upstream of the highway-rail grade crossing to prevent flagging queue from extending across highway-rail grade crossing.
    d. If queuing extends across highway-rail crossing, provide flagger at crossing to prevent vehicles from stopping within the crossing (even when automatic warning devices are in place.)
12. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

KEY

- Delineator Drum
- Type III Barricade
- Flagger
- Sign
- Work/Hazard Area

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
03-13-14	Revised Sign Cell "ROAD WORK XXX FT"
08-17-17	Update notes & sign numbers
11-01-19	Revised signs, sign #s, & notes
12-08-21	Switched order of Road Work XXX and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
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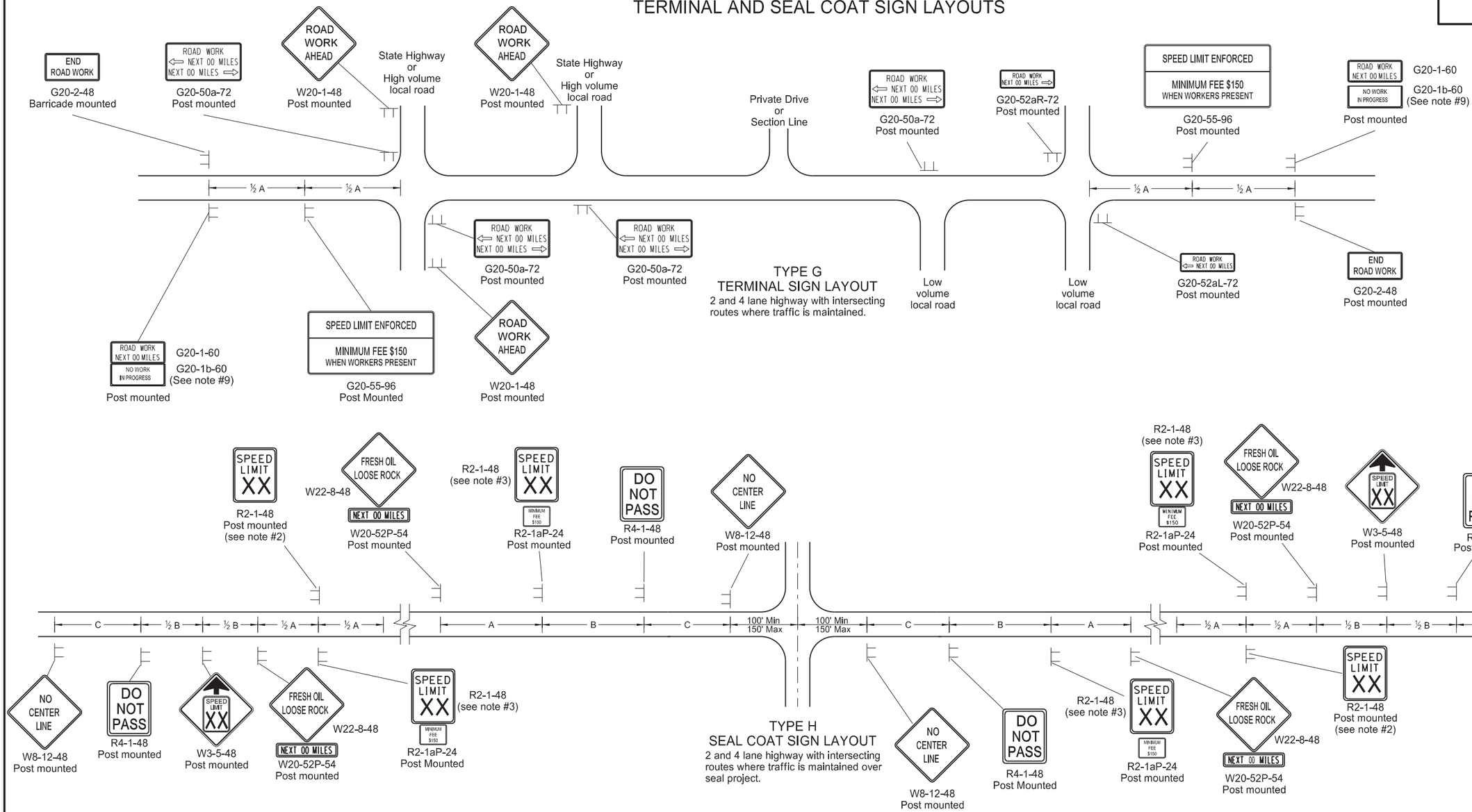
ENGINEER
NORTH DAKOTA

TERMINAL AND SEAL COAT SIGN LAYOUTS

D-704-20



Notes:

1. Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
2. Determine the exact speed limit in the field, based on location and conditions.
3. Determine the reduced speed limit based on the in place speed limit before construction. Where speed limit reductions exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 MPH.) Place the second speed limit sign at ½ B.
4. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
5. Cover existing speed limit signs within a reduced speed zone.
6. On seal coat projects, place signs R2-1-48, R2-1aP-24, R4-1-48, W22-8-48 and W20-52P-54 after all important intersections and at five mile intervals. Place sign W8-12-48 after all important intersections and at 2 mile intervals until short term center line pavement marking is placed.
7. As an option, use portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Drawing D-704-14.
8. Cover or remove speed limit signs from layout Type H when loose aggregate is removed.
9. Install sign G20-1b-60 when work is suspended for winter.
10. Use other traffic control layouts in immediate work areas. Place sign R2-1aP-24 below speed limit signs in reduced speed limit work areas.
11. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.
12. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

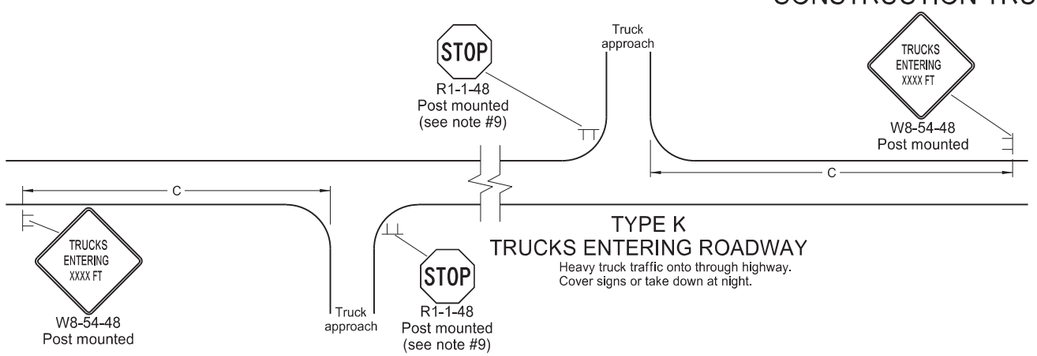
DATE	CHANGE
08-17-17	Updated notes & sign numbers
11-01-19	Updated note & sign
12-08-21	Switched order of Road Work and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

KIRK J. HOFF REGISTERED PROFESSIONAL PE-4683 06/30/25 ENGINEER NORTH DAKOTA

CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

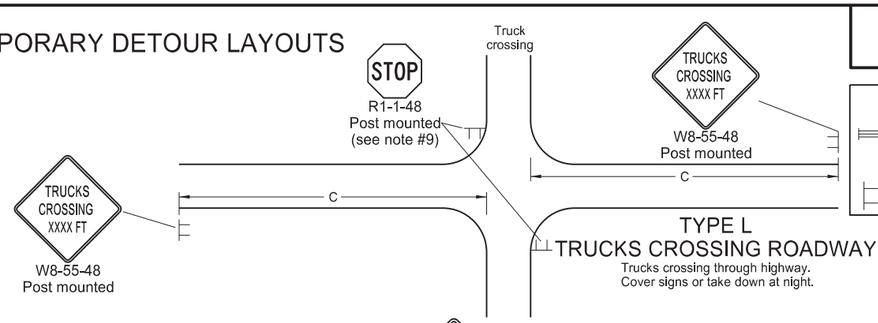
D-704-22

KEY: Type III barricade; Work area; Sign; Flagger



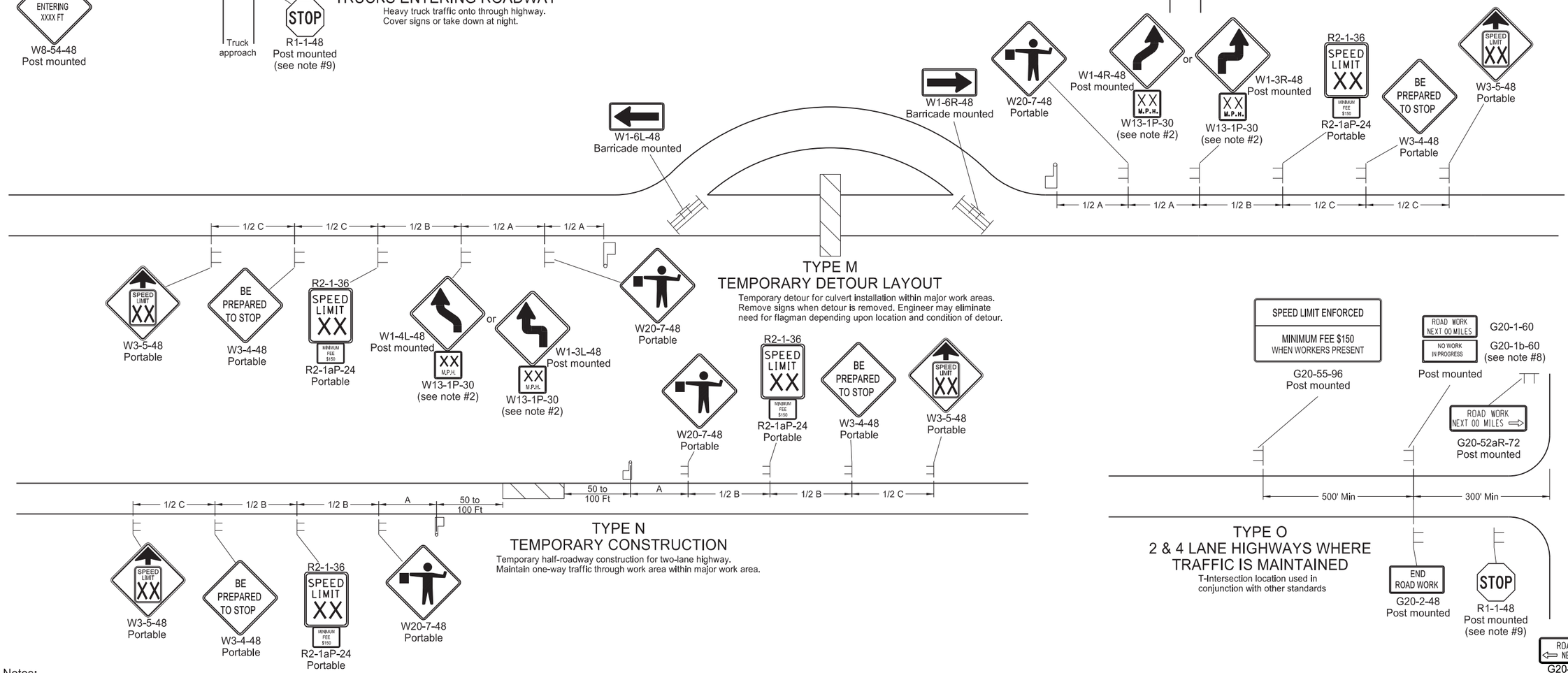
TYPE K
TRUCKS ENTERING ROADWAY

Heavy truck traffic onto through highway.
Cover signs or take down at night.



TYPE L
TRUCKS CROSSING ROADWAY

Trucks crossing through highway.
Cover signs or take down at night.



TYPE M
TEMPORARY DETOUR LAYOUT

Temporary detour for culvert installation within major work areas.
Remove signs when detour is removed. Engineer may eliminate need for flagman depending upon location and condition of detour.

TYPE N
TEMPORARY CONSTRUCTION

Temporary half-roadway construction for two-lane highway.
Maintain one-way traffic through work area within major work areas.

TYPE O
2 & 4 LANE HIGHWAYS WHERE TRAFFIC IS MAINTAINED

T-Intersection location used in conjunction with other standards

Notes:

1. Place barricades on a moveable assemblies and signs on portable assemblies when located on roadway.
2. Where necessary, safe speed to be determined by the Engineer.
3. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½ B.
4. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
5. Cover existing speed limit signs within a reduced speed zone.
6. Covered (when approved by engineer) or obliterated pavement marking measured as Obliteration of Pavement Marking.
7. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
8. Install sign G20-1b-60 when work is suspended for winter.
9. If existing stop sign is in place, a 48" stop sign is not required.
10. Sign G20-55-96 is not required if layout is part of other traffic control that contains this sign, or if work is less than 15 days.
11. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

ADVANCE WARNING SIGN SPACING

Road Type	Distance Between Signs Min. (ft) A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
08-17-17	Update notes & sign numbers
11-01-19	Revised sign numbers & note 7
12-09-21	Added Speed Limit Enforced and Dollars At Work signs
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

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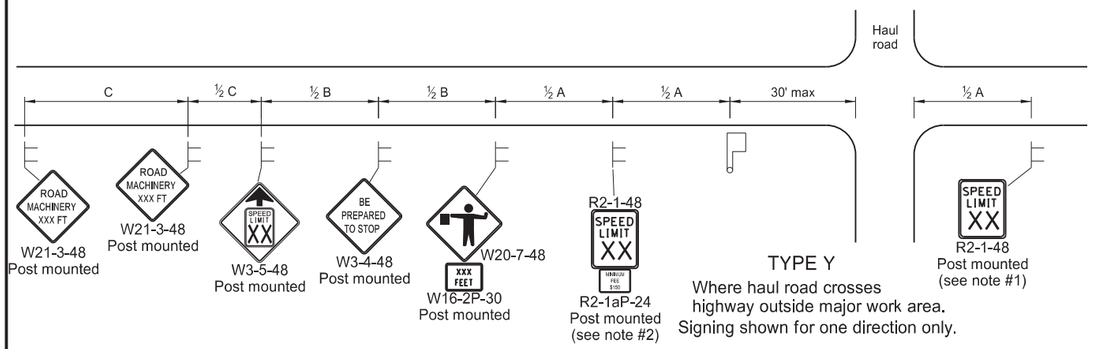
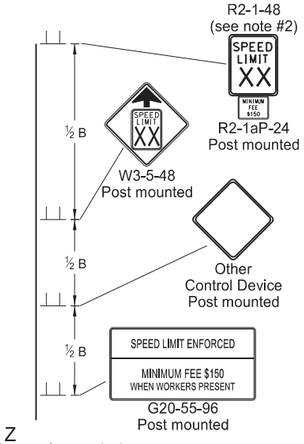
MISCELLANEOUS SIGN LAYOUTS

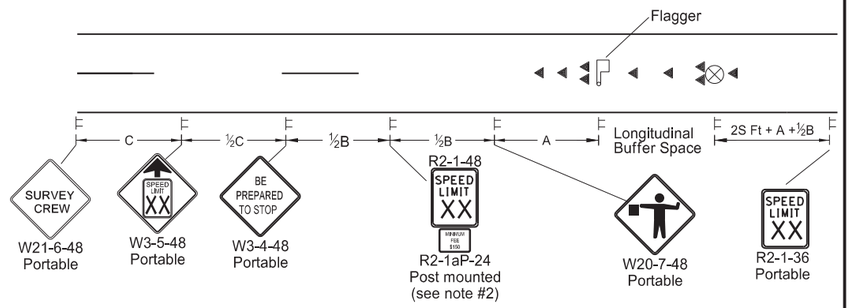
D-704-26



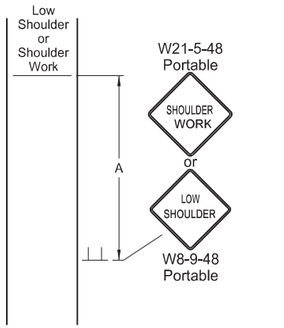
TYPE Y
Where haul road crosses highway outside major work area.
Signing shown for one direction only.



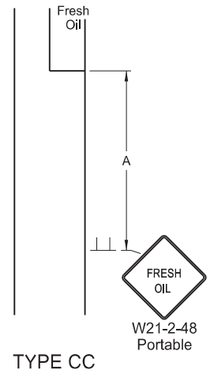
TYPE Z
Where speed zone is needed
Signing shown for one direction only.



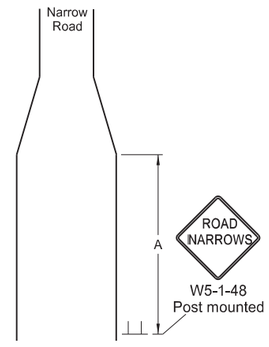
TYPE AA
Where survey crew is used
Signing shown for one direction only.



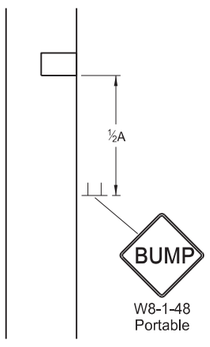
TYPE BB
Within major work area where sign conditions exist



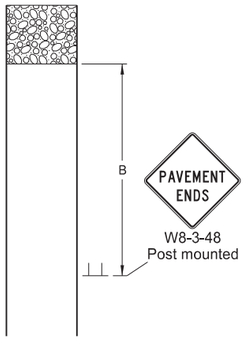
TYPE CC
Where sign conditions exist



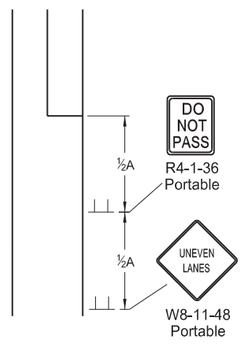
TYPE DD
Where sign conditions exist



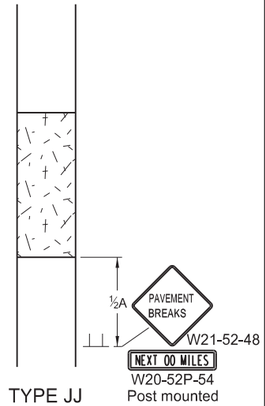
TYPE EE
Where sign conditions exist



TYPE FF
Where sign conditions exist
Signing shown for one direction only.

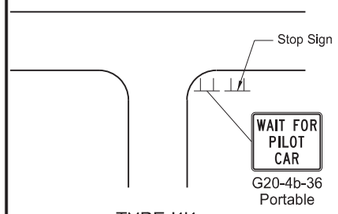


TYPE GG
Where elevation difference exists between lanes



TYPE JJ
For break in pavement.
Install signs when conditions exist and remove when not applicable.
Signing shown for one direction only.

KEY
Flagger
Sign
Cones
Survey Equipment
S = Numerical value of speed limit or 85th percentile.



TYPE KK
At major intersections within pilot car control area

Notes
1. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
2. Determine reduced speed limit based on in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½B.
3. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
4. Cover existing speed limit signs within reduced speed zones.
5. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
6. Sign G20-55-96 is not required if this standard is part of other traffic control layouts, or work is less than 15 days.
7. When pilot car operation is used, place sign G20-4b-36 "Wait For Pilot Car" at major intersections within pilot car control area.
8. Recommend 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
9. Layouts shown for one direction only.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

Longitudinal Buffer Space	
*Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

* Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
08-17-17	Added speed limit signs. Updated notes & sign numbers
11-01-19	Revised note 5 & sign numbers
02-23-23	Revised distance & removed signs
06-30-25	Legislative Changes

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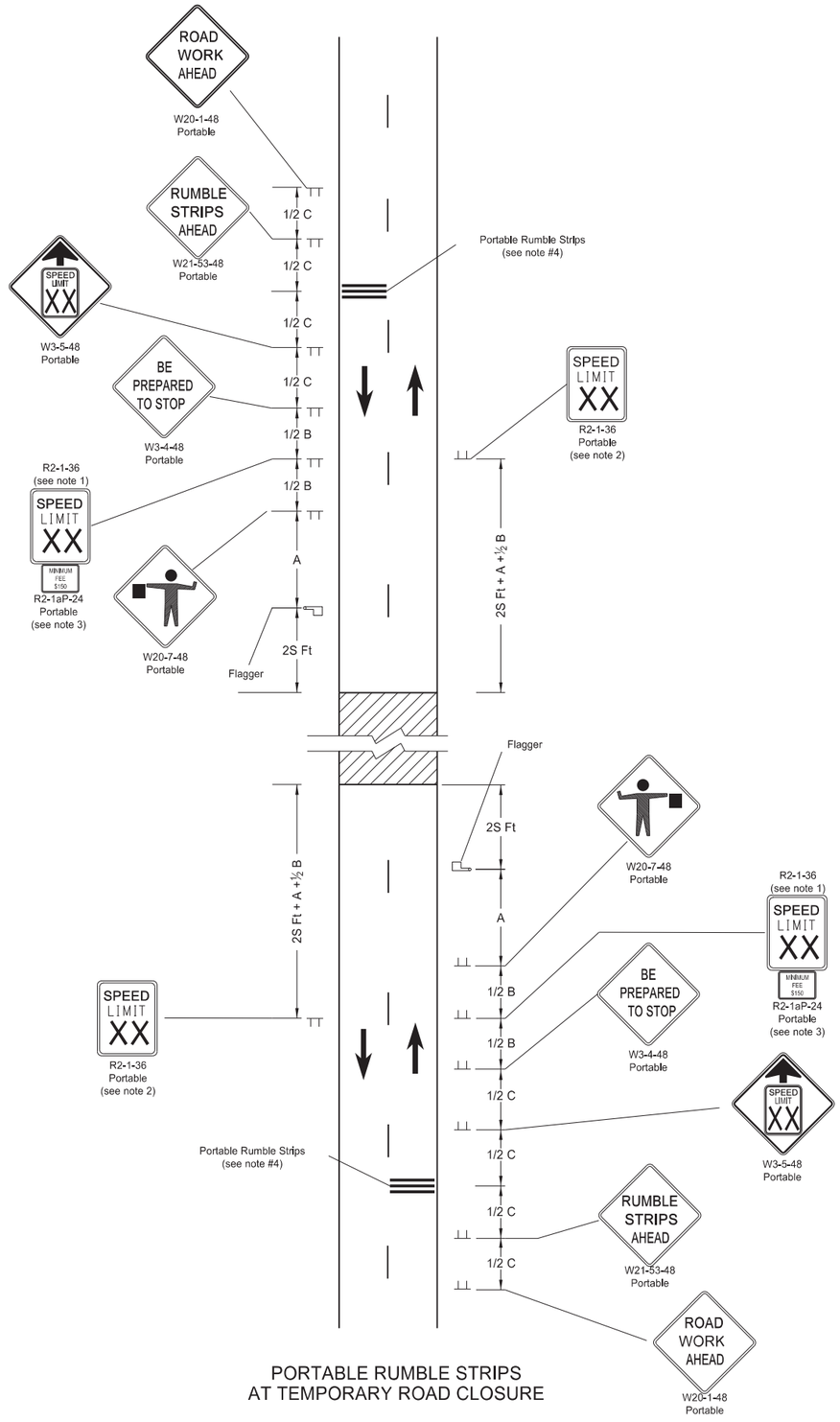
Two-Lane Roadway Portable Rumble Strips

KEY

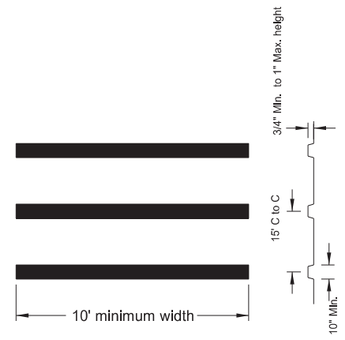
- Work area
- Flagger
- Sign

S = Numerical value of speed limit or 85th percentile.

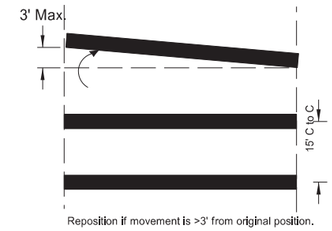
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - High Speed (over 45 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720



PORTABLE RUMBLE STRIPS
AT TEMPORARY ROAD CLOSURE

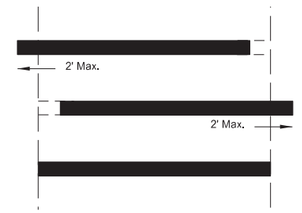


PORTABLE RUMBLE STRIPS ARRAY DETAIL



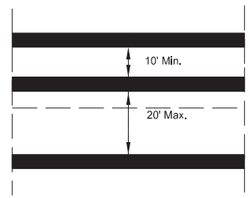
Reposition if movement is >3' from original position.

Skewing



Reposition if movement is >2' from original position.

Lateral



Reposition if distance between strips is <10' or >20'.

Perpendicular to Travel with or against traffic

PORTABLE RUMBLE STRIPS ARRAY TYPES OF MOVEMENT AND MAXIMUM ALLOWANCES

Notes:

1. Determine speed in the field based on location and conditions.
2. Re-establish the speed limit. Determine the exact speed limit in the field, dependent on location and conditions.
3. Sign R2-1aP-24 is not required when pilot car operation is used.
4. Do not use rumble strips on a non paved surface or in a pre-construction speed zone of 45 mph or less.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
02-22-22	
REVISIONS	
DATE	CHANGE
03-07-23	Use changed to min 45 mph
06-30-25	Legislative Changes

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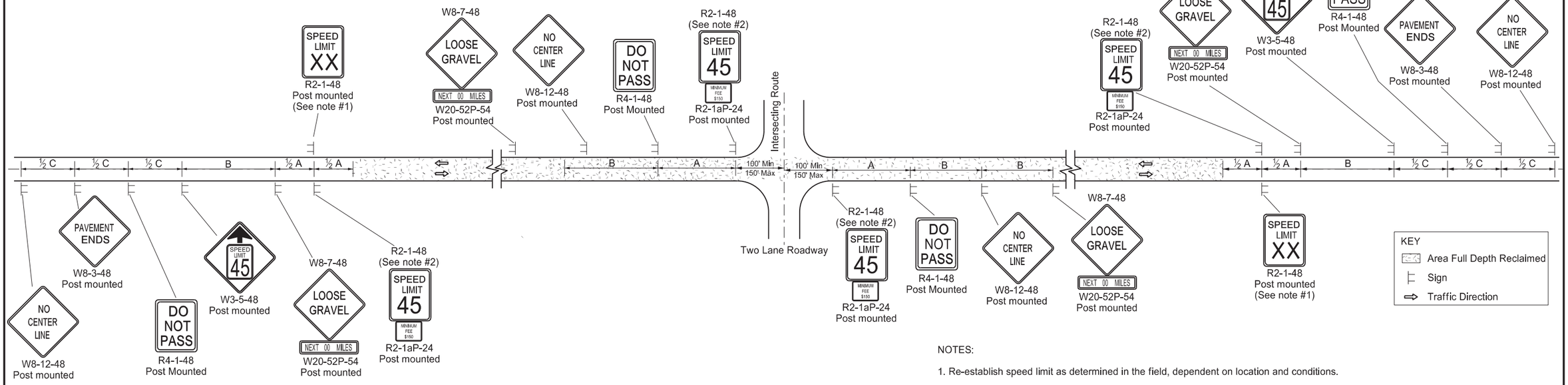
NORTH DAKOTA

MAINTAINING TRAFFIC THROUGH AREA ALREADY FULL DEPTH RECLAIMED

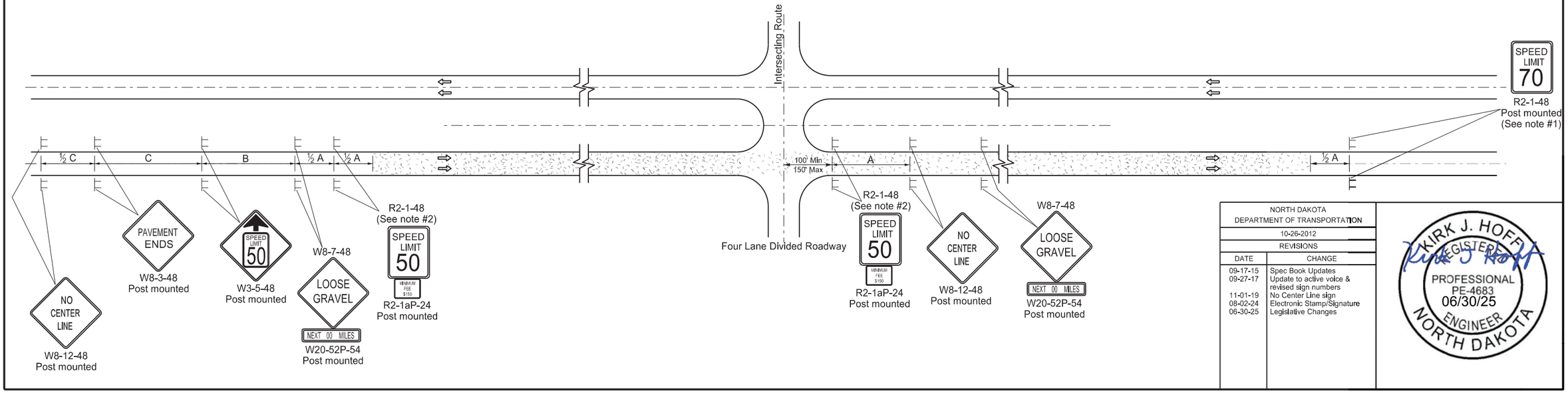
D-704-37



ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NOTES:

1. Re-establish speed limit as determined in the field, dependent on location and conditions.
2. Determine the reduced speed limit based on the in-place speed limit before construction. When speed limits are reduced more than 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½ B after the first speed limit sign and ½A before the end of the pavement.
3. Install flags on non-portable warning signs in urban areas. Mount the 24 inch square flags, perpendicular to the edges of the diamond sign, above the edge so the limp flag will not touch the sign. Rural areas will not require flags.
4. Cover existing speed limit signs within reduced speed zone.
5. Place signs R2-1-48, R2-1aP-24, W8-7-48, W20-52P-54 and R4-1-48 for two lane, two way operation just after all important intersections and at 5 mile intervals thereafter. Place sign W8-12-48 just after all important intersections and at 2 mile intervals thereafter until the short term center line pavement marking is in place. Place no short term pavement markings after the mine and blend operation until after the prime operation.
6. As an option use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
7. Use other traffic control layouts as required in immediate work areas. Install sign R2-1aP-24 below speed limit signs when the speed limit is reduced in the work area.



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-26-2012	
REVISIONS	
DATE	CHANGE
09-17-15	Spec Book Updates
09-27-17	Update to active voice & revised sign numbers
11-01-19	No Center Line sign
08-02-24	Electronic Stamp/Signature
06-30-25	Legislative Changes

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06/30/25
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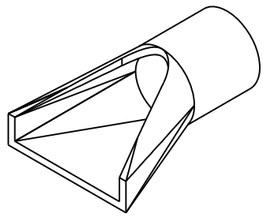
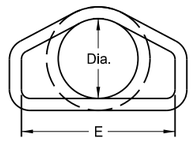
REINFORCED CONCRETE PIPE CULVERTS AND END SECTIONS
(Round Pipe)

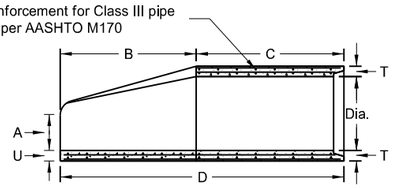
FLARED END SECTION						
TERMINAL DIMENSIONS						
DIA	A	B	C	D	E	U
12	0'-4"	2'-0"	4'-0⅞"	6'-0⅞"	2'-0"	2"
15	0'-6"	2'-3"	3'-10"	6'-1"	2'-6"	2¼"
18	0'-9"	2'-3"	3'-10"	6'-1"	3'-0"	2½"
21	0'-9"	3'-0"	3'-1"	6'-1"	3'-6"	2¾"
24	0'-9½"	3'-7½"	2'-6"	6'-1½"	4'-0"	3"
27	0'-10½"	4'-0"	2'-1½"	6'-1½"	4'-6"	3¼"
30	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"	3½"
36	1'-3"	5'-3"	2'-9"	8'-0"	6'-0"	4"
42	1'-9"	5'-3"	2'-9"	8'-0"	6'-6"	4½"
48	2'-0"	6'-0"	2'-0"	8'-0"	7'-0"	5"
54	2'-3"	5'-5"	2'-9¼"	8'-2¼"	7'-6"	5½"
60	2'-11"	5'-0"	3'-3"	8'-3"	8'-0"	5"
66	2'-6"	6'-0"	2'-3"	8'-3"	8'-6"	5½"
72	3'-0"	6'-6"	1'-9"	8'-3"	9'-0"	6"
78	3'-0"	7'-6"	1'-9"	9'-3"	9'-6"	6½"
84	3'-0"	7'-6½"	1'-9"	9'-3½"	10'-0"	6½"
90	3'-5"	7'-3½"	2'-0"	9'-3½"	11'-0"	6½"



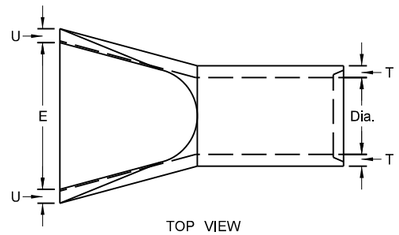
PERSPECTIVE



END VIEW



SIDE VIEW



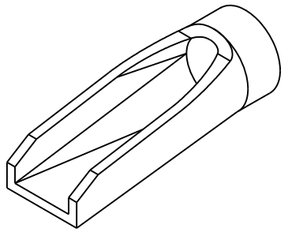
TOP VIEW

REINFORCED CONCRETE PIPE - FLARED END SECTION
Reinforcement to be equivalent to Class III RCP

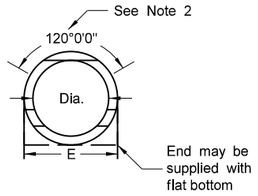
NOTES:

1. All reinforcing steel shall meet AASHTO M170 requirements.
2. All circular, longitudinal, and elliptical reinforcement shall be assembled and securely fastened in cage fashion so as to maintain reinforcement in exact shape and correct positions within the forms.
3. Laying length of pipe: 12" to 66" (incl.) = not less than 4 feet
   66" to 108" (incl.) = not less than 6 feet
4. Joints shall be sealed with rubber gaskets or with sealer approved by the engineer whenever pipe are specified for storm drain or sanitary sewers.
5. For Class IV and Class V reinforced concrete pipe and end section sizes which do not have reinforcement specified by AASHTO M170, shop drawings and design calculations shall be prepared and sealed by a Professional Engineer and submitted for the Engineer's review.

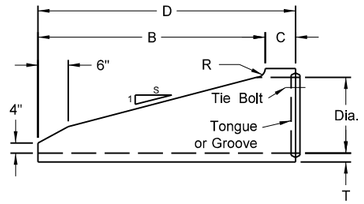
TRAVERSABLE END SECTION						
DIA	B	C	D	E	R	S
15"	4'	9"	4'-9"	1'-7½"	3"	6
18"	5'-9"	9"	6'-6"	1'-11"	3"	6
24"	6'	1'	7'	2'-6"	3"	4
30"	7'-6"	1'	8'-6"	3'-1"	3½"	4
36"	7'-3"	15"	8'-6"	3'-8"	3"	4



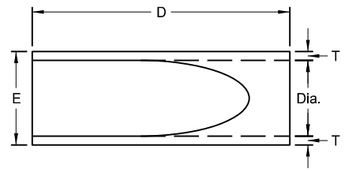
PERSPECTIVE



END VIEW



SIDE VIEW



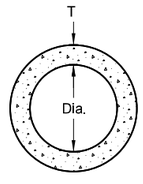
TOP VIEW

REINFORCED CONCRETE PIPE - TRAVERSABLE END SECTION
Reinforcement to be equivalent to Class III RCP

NOTES (Traversable End Section):

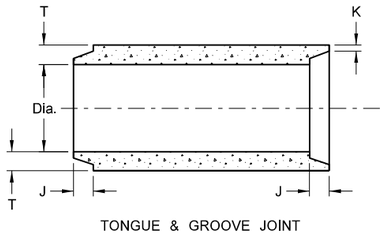
1. Manufactured in accordance with applicable portions of ASTM C76/AASHTO M170.
2. Reinforcement per Class III RCP with double reinforcement in the upper 120° of the full barrel portion.

All Classifications of Round Concrete Pipe					
Internal Dia. of pipe in Inches	Cross-Sectional Water Area	Weight per lin. foot of Pipe Std. Wall	Joint J Groove End Min./Max.	Joint K Tongue End Min.	Minimum Wall Thickness (T)
Dia	Sq. ft.	Lbs.	In.	In.	In.
12	0.79	92	1⅛-2⅛	¾	2
15	1.23	127	1⅛-2¼	⅞	2¼
18	1.77	168	1⅛-2⅛	1	2½
21	2.40	214	1⅛-3⅛	1⅛	2¾
24	3.14	265	2¾-3¾	1⅛	3
27	3.98	322	2¾-4	1¼	3¼
30	4.91	384	3¼-4¼	1¼	3½
33	5.94	452	3¼-4¼	1½	3¾
36	7.07	524	3¼-4¼	1½	4
42	9.62	685	3¾-4¾	1¾	4½
48	12.57	685	3⅞-4¾	1⅞	5
54	15.90	1070	4⅛-5¼	2	5½
60	19.63	1296	4½-5½	2¼	6
66	23.76	1542	5-6	2⅝	6½
72	28.27	1810	5⅛-6¾	2⅞	7
78	33.18	2098	6¼-7¼	2⅞	7½
84	38.48	2410	5⅛-7¾	3⅜	8
90	44.18	2793	6¾-8½	3⅛	8½
96	50.27	3092	7-8¼	3½	9
102	56.75	3466	7-8¼	3½	9½
108	63.62	3864	7¼-8½	3¾	10

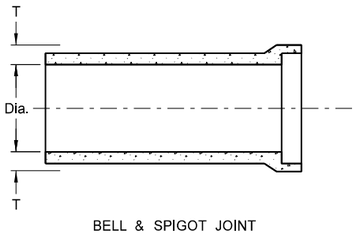


END VIEW

CIRCULAR PIPE

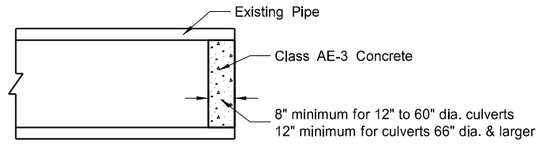


TONGUE & GROOVE JOINT



BELL & SPIGOT JOINT

JOINTS FOR REINFORCED CONCRETE PIPE



CONCRETE PIPE PLUG

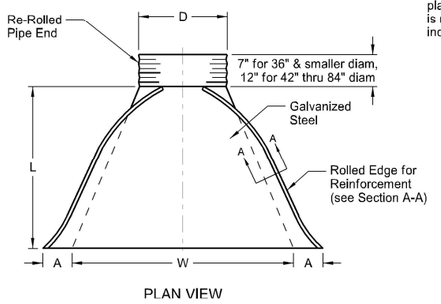
SEE STANDARD DRAWING D-714-22 FOR DETAILS OF CONCRETE PIPE TIES (TIE BOLTS).

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-12-14	
REVISIONS	
DATE	CHANGE
01-21-15	Revised Note 5
11-21-16	Revised End Section Dimensions
09-18-19	Updated Perspective View Details

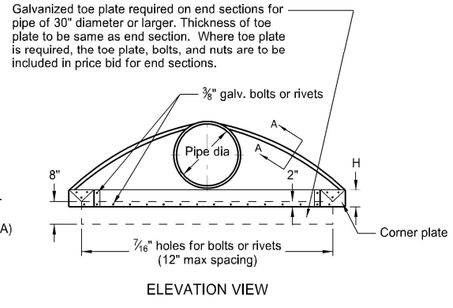
This document was originally issued and sealed by Jon Ketterling Registration Number PE-4684, on 9/18/19 and the original document is stored at the North Dakota Department of Transportation

ROUND CORRUGATED STEEL PIPE CULVERTS AND END SECTIONS

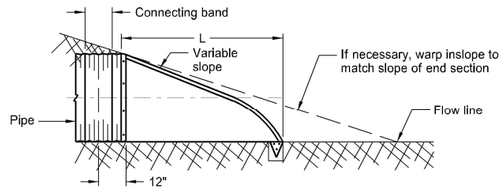
D-714-4



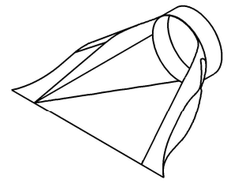
PLAN VIEW



ELEVATION VIEW



TYPICAL CROSS SECTION
(showing connector section)



PERSPECTIVE VIEW

** PIPE DIA.	GALVANIZED THICKNESS	END SECTION DIMENSIONS A	B	H	L	W	APPROX. SLOPE	BODY
IN	IN	IN	IN	IN	IN	IN	RATE	PIECE
15	0.064 - 0.079	7	8	6	26	30	2½:1	1
18	0.064 - 0.109	8	10	6	31	36	2½:1	1
24	0.064 - 0.109	10	13	6	41	48	2½:1	1
30	0.064 - 0.109	12	16	8	51	60	2½:1	1 or 2
36	0.064 - 0.109	14	19	9	60	72	2½:1	2
42	0.064 - 0.138	16	22	11	69	84	2½:1	2
48	0.064 - 0.168	18	27	12	78	90	2¼:1	2
54	0.064 - 0.168	18	30	12	84	102	2:1	2
*60	0.064 - 0.168	18	33	12	87	114	1¾:1	3
*66	0.064 - 0.168	18	36	12	87	120	1½:1	3
*72	0.064 - 0.168	18	39	12	87	126	1½:1	3
*78	0.064 - 0.168	18	42	12	87	132	1¼:1	3
*84	0.064 - 0.168	18	45	12	87	138	1⅛:1	3

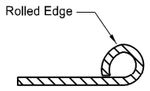
* These sizes have 0.109" sides and 0.138" center panels.

** Pipe diameter is equal to dimension "D" of end section.

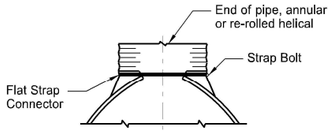
Manufacturers tolerances of above dimensions will be allowed.

Splices to be the lap riveted type.

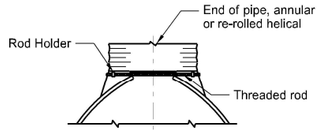
Multiple panel bodies shall have lap seams which are to be tightly joined with ⅜" dia. galv. bolts or rivets. Nuts to be torqued to 25 foot-lbs ±.



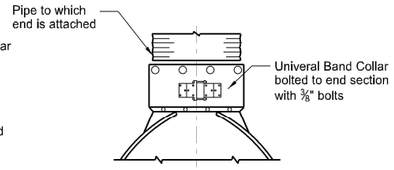
SECTION A-A



TYPE #1
For circular pipes with diameter 24" & smaller



TYPE #2
For circular pipes with diameter 30" through 36"

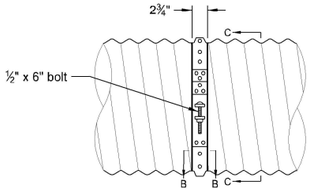


TYPE #3
For all pipe sizes

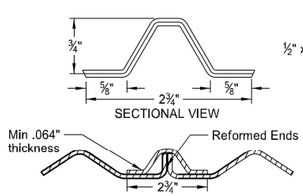
COUPLING BAND DIMENSIONS				
COUPLING TYPE	CORRUGATION PITCH x DEPTH	PIPE SIZE	COUPLING BAND LENGTH	MIN. BAND THICKNESS
Hat Band	2⅔" x ½"	12" - 48"	2¾"	.064"
Annular Band	2⅔" x ½"	12" - 72"	12"	.052"
		78" - 84"	12"	.079"
	3" x 1"	48" - 120"	14"	.052"
Hugger Band	2⅔" x ½" Rerolled End	12" - 72"	10½"	.052"
		78" - 84"	10½"	.079"
	3" x 1" Rerolled End	48" - 120"	10½"	.052"
	5" x 1" Rerolled End	48" - 120"	12"	.064"

NOTES:

1. Pipes and connecting bands shall conform to applicable sections of NDDOT Standard Specifications and to AASHTO M-36.
2. Top edge of all end sections to have rolled edges for reinforcement (see Section A-A). The reinforced edges are to be supplemented with 2" x 2" x ¼" galv. angle for 60" through 72" dia. and 2½" x 2½" x ¼" galv. angle for 78" and 84" dia.. Angles to be attached by galv. ⅜" dia. bolts and nuts. Angles are to extend from pipe to the corner wing bend.
3. Elongated pipes shall be factory preformed so that the vertical diameter shall be 5% greater and the horizontal diameter 5% less than a circular pipe.
4. Coupling bands shall be two-piece for pipes larger than 36" as shown in Section C-C & D-D details. For pipes 36" and smaller, a one-piece band is acceptable.
5. ½" x 8" bolts may be used as a substitute for the ½" x 6" bolts shown in the details.
6. Coupling bands wider than 14" may be used if a minimum of four ½" bolts with maximum spacing of 5½" are used for the connection.
7. Length of spot welds shall be minimum ½".



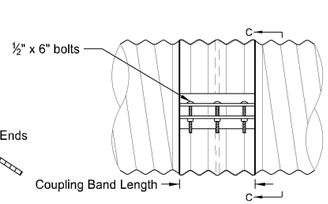
SIDE VIEW



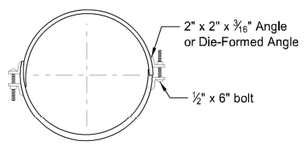
SECTIONAL VIEW

SECTION B-B

HAT BAND FOR FLANGED END PIPE

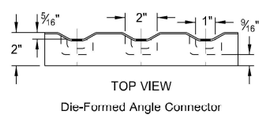


SIDE VIEW

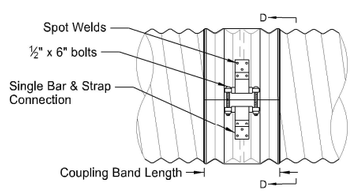


SECTION C-C
Angle Connection

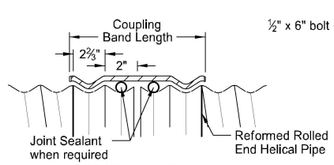
ANNULAR BAND



TOP VIEW
Die-Formed Angle Connector

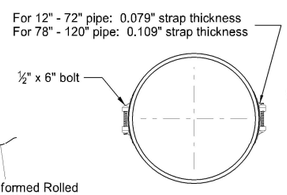


SIDE VIEW

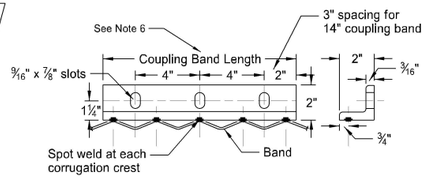


SECTIONAL VIEW

HUGGER COUPLING BAND



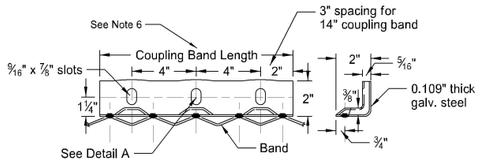
SECTION D-D
Bar & Strap Connection



SIDE VIEW

END VIEW

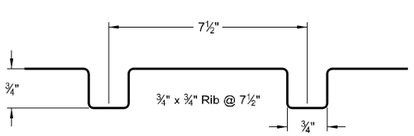
2" x 2" x 3/16" Angle Connector

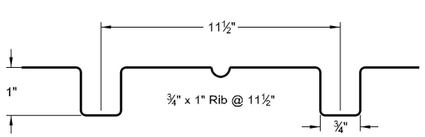


SIDE VIEW

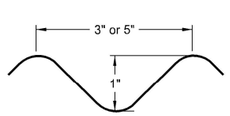
END VIEW

Die-Formed Angle Connector

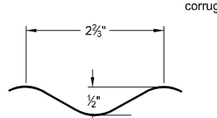




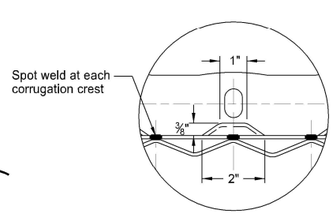
SPIRAL RIB CORRUGATIONS



3" x 1" CORRUGATIONS or
5" x 1" CORRUGATIONS



2⅔" x ½" CORRUGATIONS



Detail A

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
08-16-13	
REVISIONS	
DATE	CHANGE
01-07-14	End Section Plan View
02-27-14	3" x 1" Corrugation Detail
09-18-19	Added Perspective View Detail
09-23-22	Galvanized Thickness Table

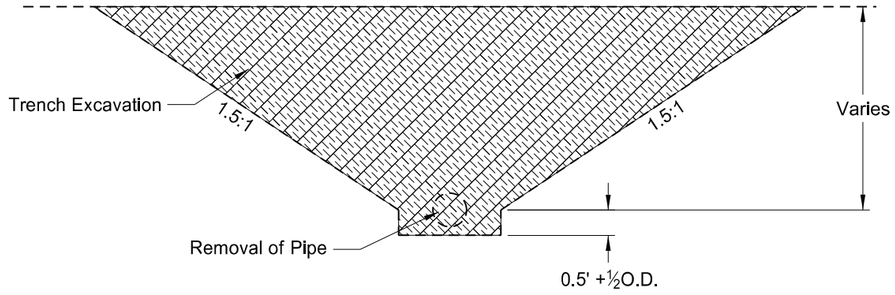
JONATHAN D KETTERLING
REGISTERED
PROFESSIONAL
PE-4684
ENGINEER
NORTH DAKOTA

09/23/22

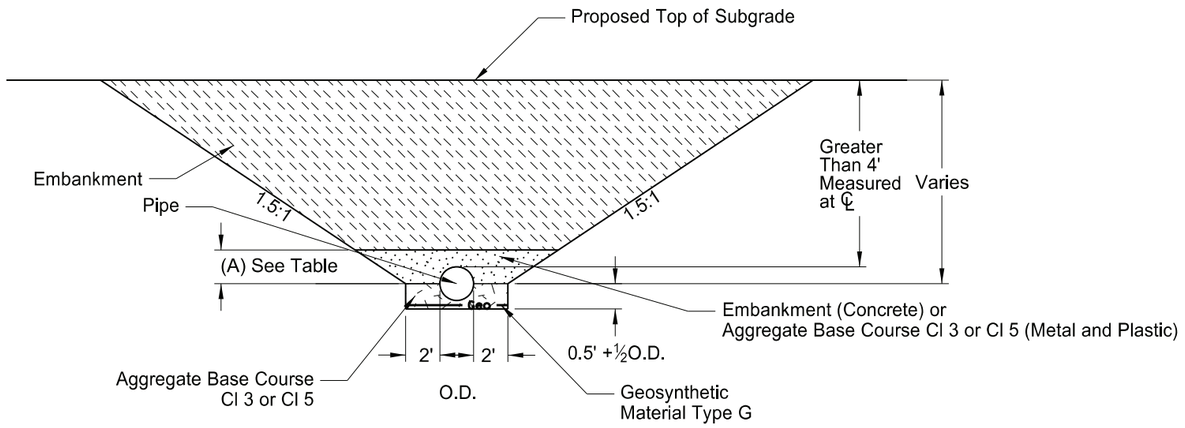
DocuSign

TRANSVERSE MAINLINE PIPE INSTALLATION DETAIL
PIPES MORE THAN 4 FEET BELOW TOP OF SUBGRADE

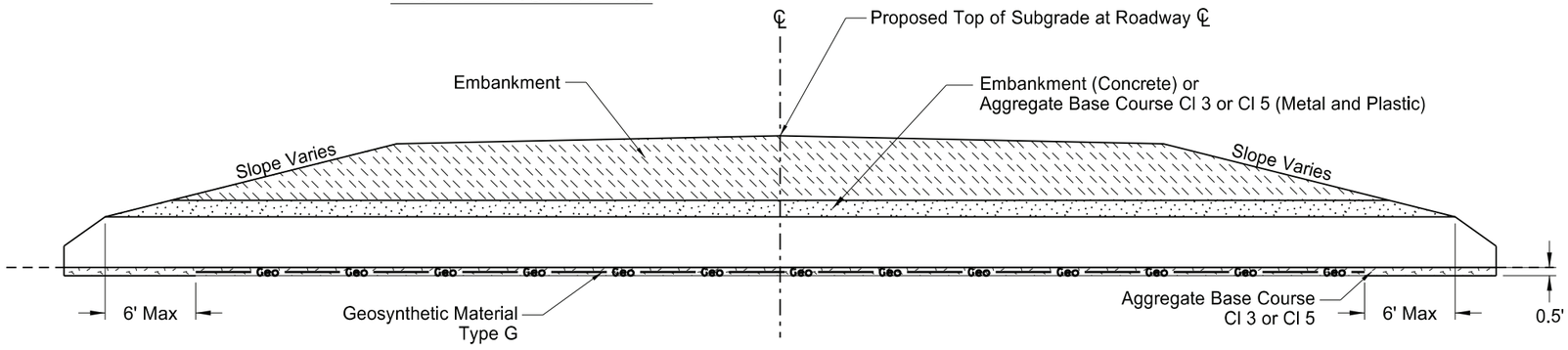
D-714-25



EXCAVATION DETAIL



INSTALLATION DETAIL



CROSS SECTION

Pay Items
1) Pipe*
2) Geosynthetic Material Type G
3) Removal of Pipe (if required)

*Included in Pipe Pay Item
1) Pipe
2) Trench excavation
3) Aggregate Base Course Cl 3 or Cl 5
4) Embankment

NOTES:

1) This drawing applies to new/replaced mainline and paved intersection roadways (including ramps). It does not include pipes in approaches.

2) Embankment may be either Borrow Excavation or Common Excavation - Type A.

Backfill Dimensions	
Pipe Materials	Dimension (A)
Concrete	0.5 O.D.
Metal and Plastic	0.5 O.D. + 1 Foot

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

7-26-13

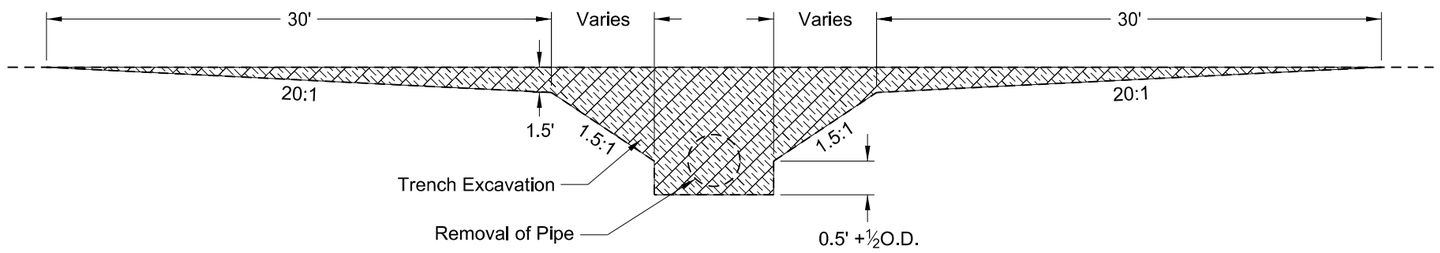
REVISIONS

DATE	CHANGE
10-15-13	Label Formatting
1-21-14	Nomenclature
9-18-15	Title Rewording
12-10-15	Added Plastic Pipe
5-27-20	Replaced R1 Fabric with Geogrid Changed bedding depth

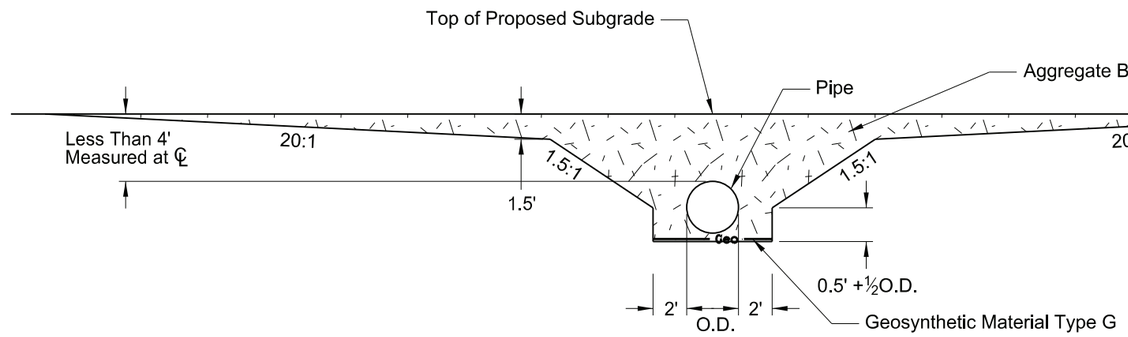
REGISTERED PROFESSIONAL ENGINEER
MATTHEW C KURLE
PE-8777
DATE
05/27/20
NORTH DAKOTA
DocuSign

TRANSVERSE MAINLINE PIPE INSTALLATION DETAIL
PIPES 4 FEET OR LESS BELOW TOP OF SUBGRADE

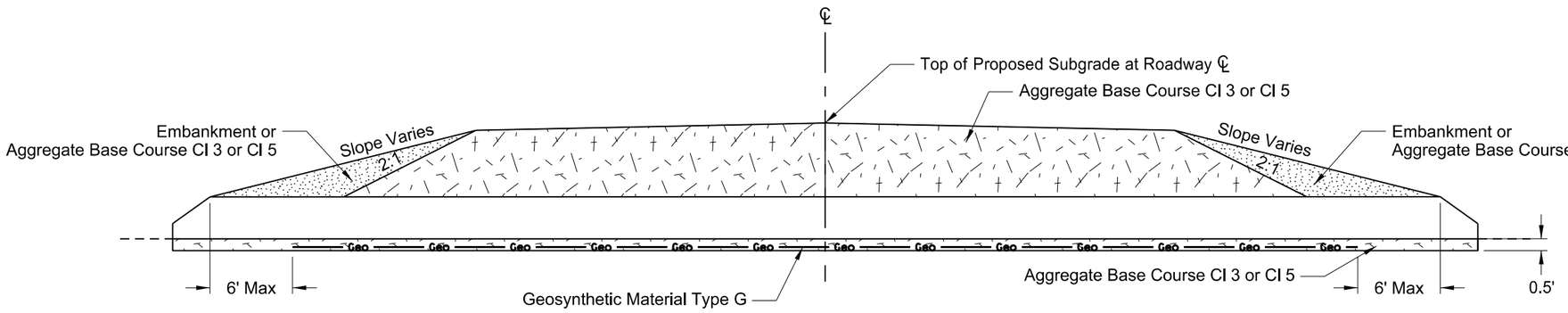
D-714-26



EXCAVATION DETAIL



INSTALLATION DETAIL



CROSS SECTION

Pay Items
1) Pipe*
2) Geosynthetic Material Type G
3) Removal of Pipe (if required)

*Included in Pipe Pay Item
1) Pipe
2) Trench Excavation
3) Aggregate Base Course Cl 3 or Cl 5
4) Embankment

NOTES:

1) This drawing applies to new/replaced mainline and paved intersection roadway pipes only (including ramps). It does not include pipes in approaches.

2) Embankment may be either borrow Excavation or Common Excavation - Type A

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

7-26-13

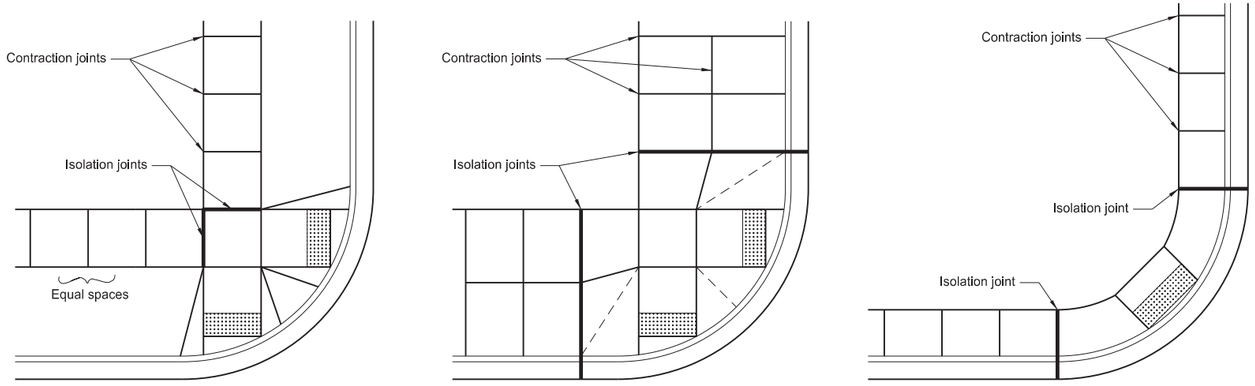
REVISIONS

DATE	CHANGE
10-15-13	Label Formatting
1-21-15	Nomenclature
9-18-15	Title Rewording
5-27-20	Replaced R1 Fabric with Geogrid Changed bedding depth

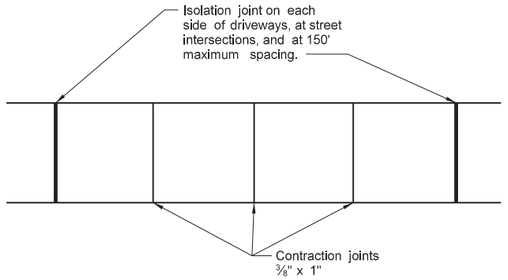
REGISTERED PROFESSIONAL ENGINEER
MATTHEW C KURLE
PE-8777
DATE
05/27/20
NORTH DAKOTA
DocuSign

SIDEWALK

D-750-2



Typical Joint Layouts



NOTES:

1. Curb ramp and detectable warning panel layouts for informational purposes only. See Standard Drawing D-750-3 for curb ramp and detectable warning panel details.
2. Joint Spacing: Vary transverse contraction joint spacing from 4' to 6' to create approximate square panels.

   Use longitudinal contraction joints when sidewalk width is 8' or greater, and space at half the sidewalk width.

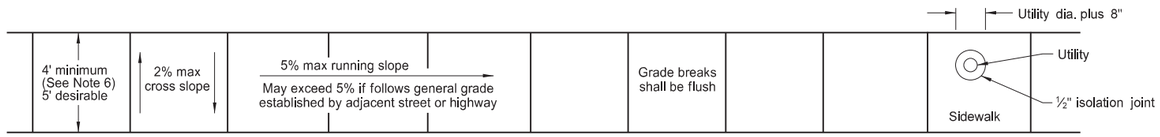
   Saw or groove contraction joints to a minimum depth of 1/3 the depth of the concrete.

   When sidewalk is adjacent to curb & gutter, vary the sidewalk joint spacing to match curb & gutter joints.

   Use isolation joints between separate concrete pours, or between old and new concrete.
3. Include all costs for labor, equipment, and material necessary to construct contraction and isolation joints in the price bid for sidewalk concrete.
4. Use 4" sidewalk concrete thickness unless otherwise specified.
5. Use 4" base material thickness unless otherwise specified. Include all costs for labor and materials necessary to place the base material in the price bid for "Salvage Base Course" or "Aggregate Base Course CL 5."

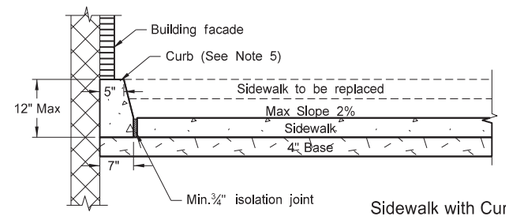
   Modify existing ground slope with landscaping as needed. If not possible, such as adjacent buildings, use a vertical curb as shown in the detail below. The Engineer will measure curb at the unit price bid for "Curb - Type I" per lineal foot.
6. Sidewalk Width & Grade: Provide a continuous 4' min clear width pedestrian access route with max 2% concrete cross slope, excluding flares. The width of the curb cannot be counted as part of the pedestrian access route.

   When clear width of pedestrian access routes is less than 5.0', provide passing spaces at a maximum of 200' with a minimum size of 5.0' by 5.0'.

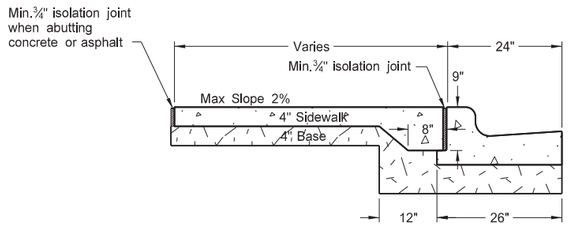


Sidewalk Width and Grade

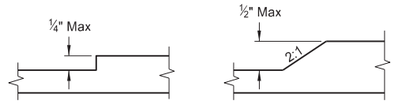
Utility Blockout



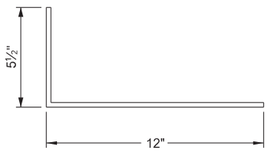
Sidewalk with Curb Detail
(Building face application)



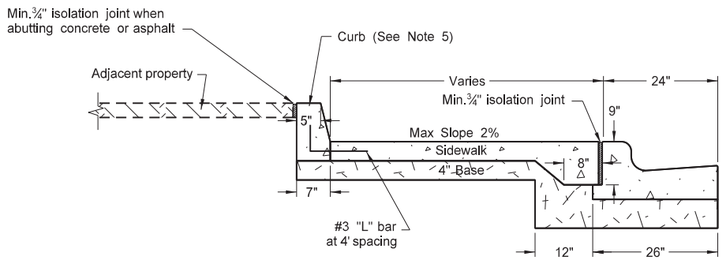
Sidewalk Detail
(Installed adjacent to curb and gutter)



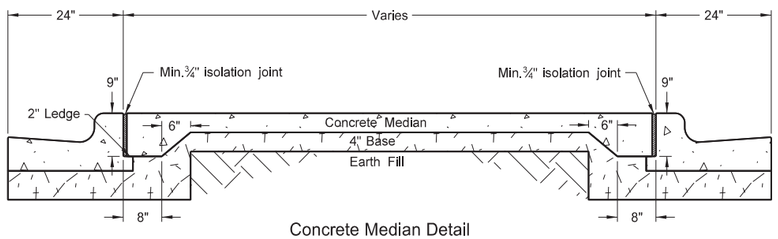
Vertical Discontinuities
(As needed for utility covers, vaults, grating, etc..)



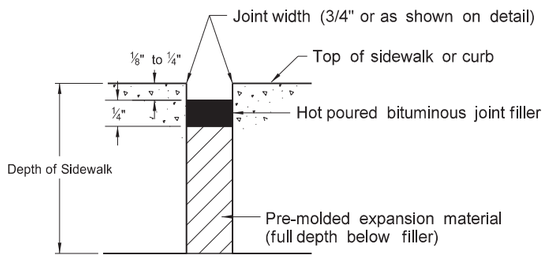
"L"Bar Detail
#3 Bar



Sidewalk with Curb Detail
(Adjacent property application)



Concrete Median Detail



Typical Isolation Joint Seal
(longitudinal and transverse)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-26-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
09-05-18	Added sidewalk details for width & grade & passing lane requirements.
08-27-19	New Design Engineer PE Stamp.
08-09-24	Electronic Stamp/Signature.

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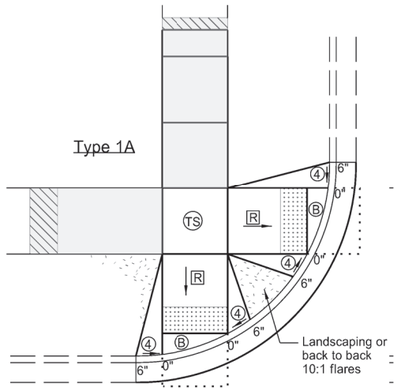
ENGINEER
NORTH DAKOTA

08/09/24

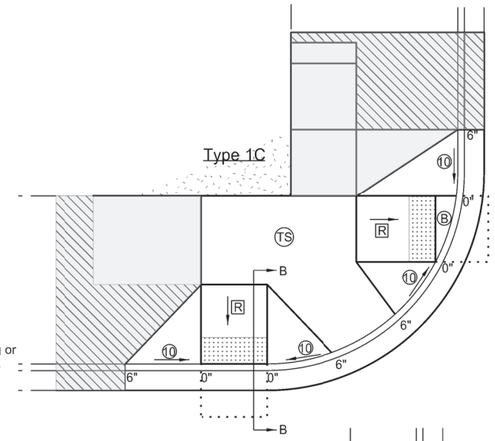
CURB RAMP RETROFIT DETAILS

D-750-3

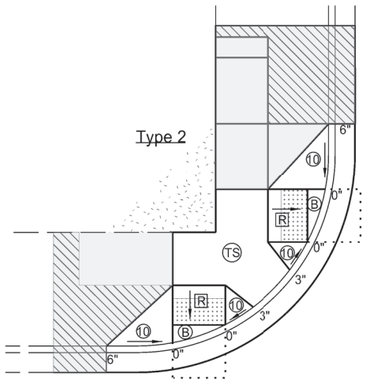
Type 1A



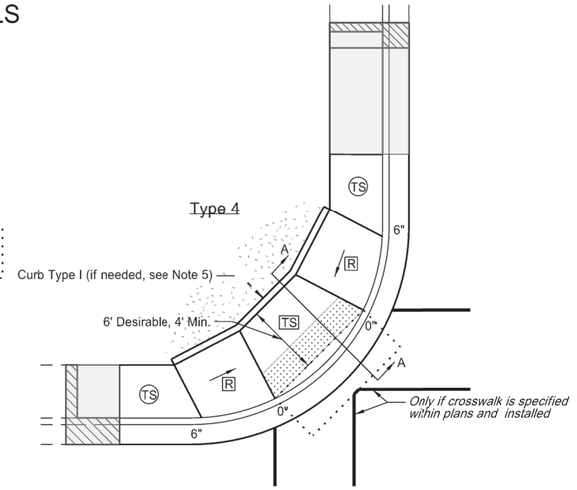
Type 1C



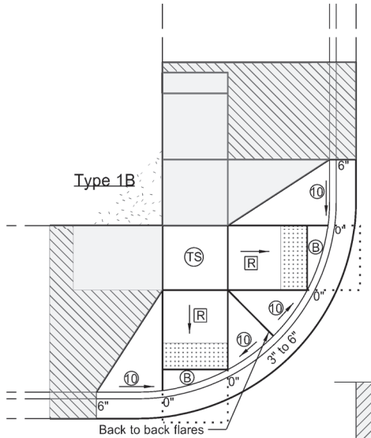
Type 2



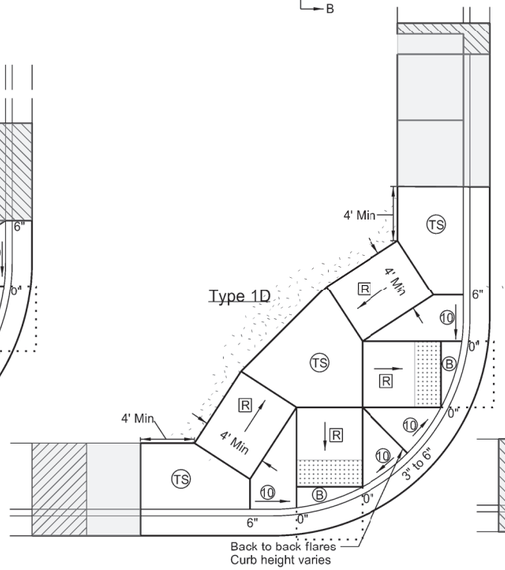
Type 4



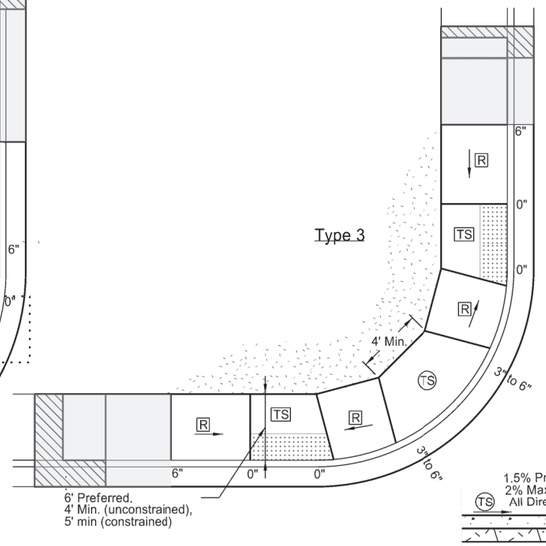
Type 1B



Type 1D



Type 3



5½"
12"
#3 "L" Bar

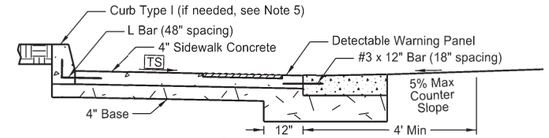
NOTES:

1. Ramp width is the useable portion of the ramp, excluding flares. Match curb ramp width to Existing Pedestrian Facility (EPF) width (4' minimum or 5' for island ramps.) Match ramp width to existing shared use path width. Maximum ramp length is 15'.
2. Provide turning space with desirable 5' x 5' size or larger and minimum 4' x 4' unconstrained size, for any change of direction. Provide landing 5' long x width of path at the bottom and top of parallel ramps and at the top of perpendicular ramps. Turning spaces and Landings may overlap.
3. Match detectable warning panel width to ramp width. Radial panels are allowed. Place detectable warning panel within the lower turning space.
4. Provide a continuous 4' minimum width EPF with 1.5% preferred cross slope and max 2% constructed cross slope.
5. Modify existing ground slope with landscaping, as needed. If not possible, use a vertical curb as detailed on Standard D-750-2. The Engineer will measure curb at the unit price bid for "Curb - Type I" per lineal foot.
6. Islands: If the profile of the island curb ramp is 2% or less, provide a minimum distance of 2' between warning panels. If the profile of the island curb ramp is steeper than 2%, provide a turning space between the ramps.
7. Provide generally planar vertical alignments. Provide grade breaks, perpendicular to the direction of the pedestrian travel, at the top and bottom of curb ramps (1.5% preferred, 2% max constructed cross slope).
8. See Curb Ramp Retrofit Transition Details Standard D-750-4 for additional information. Also See PROWAG for full compliance in the curb ramp area.
9. Grade transitions shall be flush.

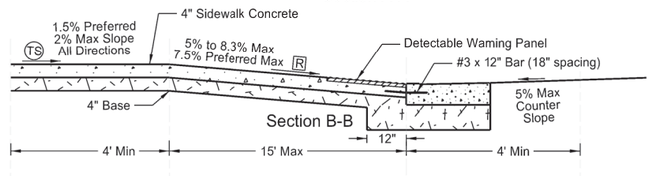
LEGEND:

- : Detectable Warning Panel.
- : Landscaping.
- : Transitional tie-in to nearest joint, if needed.
- : Curb Ramp Retrofit Transitional Area (See Standard Drawing D750-4)
- : 4' long x width of EPF or 4' minimum Clear space outside traffic lanes of travel. 1.5% preferred cross slope 2% maximum cross slope 4.7% preferred running and counter slope 5% maximum running and counter slope
- TS : Turning Space Use at top of ramp or when changing directions. 1.5% preferred slope (2% maximum) all directions.
- R : Preferred Ramp Grade = 5% to 7.5%. Maximum Constructed Grade = 8.3%. Preferred Cross Slope = 1.5%. Maximum Constructed Cross Slope = 2%.
- B : 1.5% preferred cross slope 2% maximum constructed cross slope running slope consistent with the EPF 4.7% preferred max counter slope 5.0% max constructed counter slope
- 10 : 10:1 maximum constructed slope.
- 4 : 4:1 maximum constructed slope.

0", 3", or 6" : Curb Height.

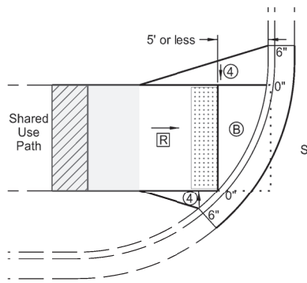


Section A-A



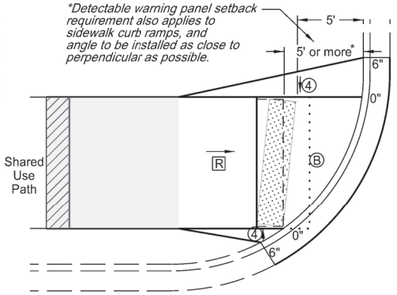
Section B-B

5' or less

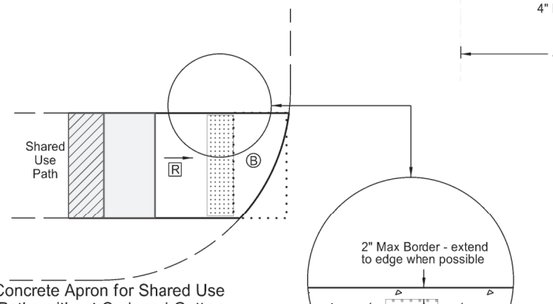


*Detectable warning panel setback requirement also applies to sidewalk curb ramps, and angle to be installed as close to perpendicular as possible.

5' or more*

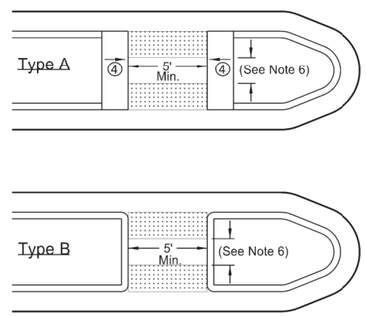


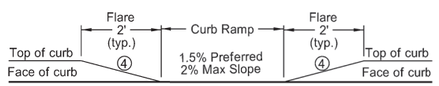
Concrete Apron for Shared Use Paths with Curb and Gutter



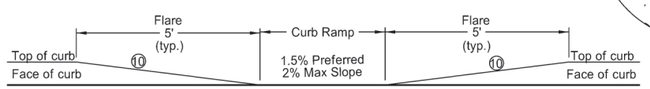
Concrete Apron for Shared Use Paths without Curb and Gutter

Median Refuge Islands (Cut-Through)





4:1 Flares
(To be used when flare is adjacent to landscaping)



10:1 Flares
(To be used when flare is adjacent to sidewalk)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-26-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
09-05-18	Revised Notes, Revision for Turning Space, Added Passing Space Requirements, Turned Detectable Warning Panel
03-15-21	Slope & other clarifications.
05-19-21	Separate Curb Ramp Transition Area from Curb Ramp area

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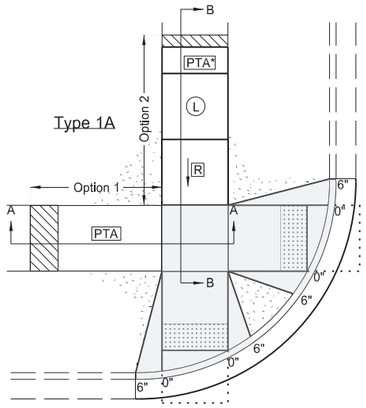
NORTH DAKOTA
05 19 2021

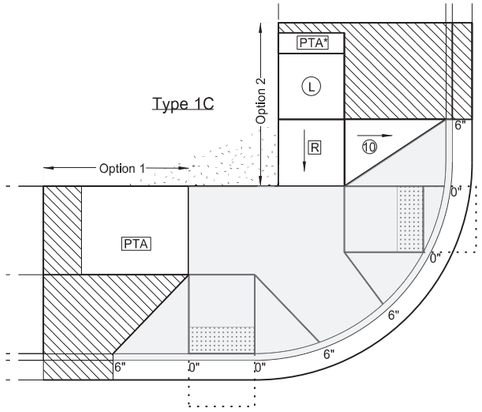
CURB RAMP RETROFIT TRANSITIONAL AREA DETAILS

D-750-4

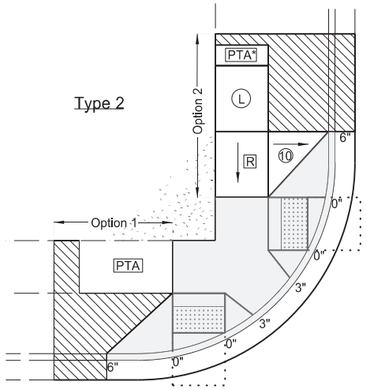
Type 1A



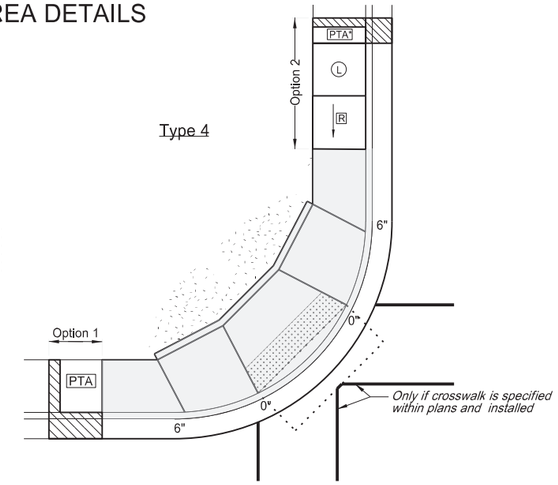
Type 1C



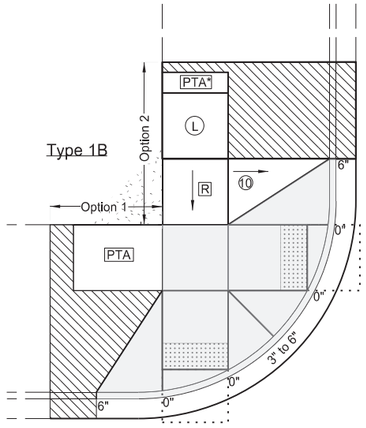
Type 2



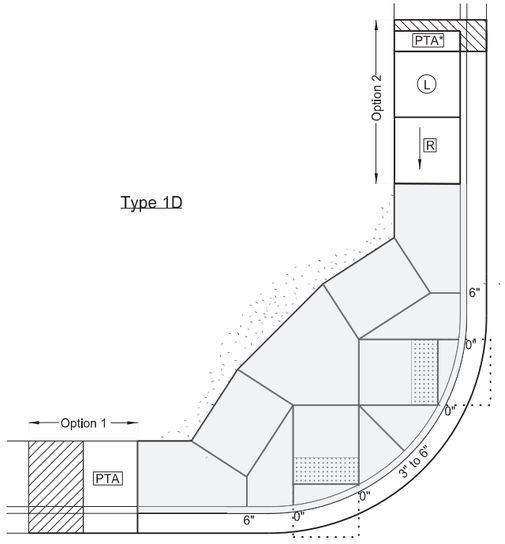
Type 4



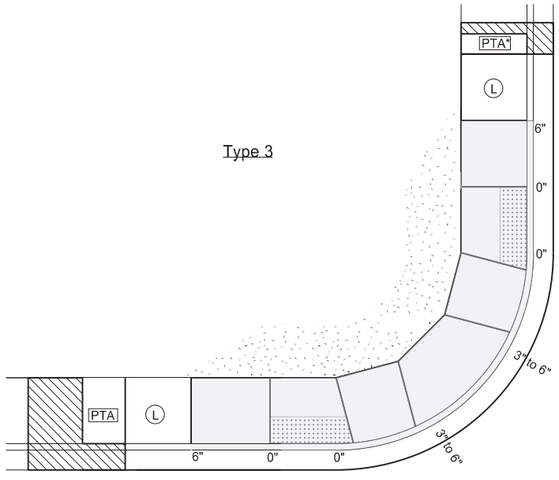
Type 1B

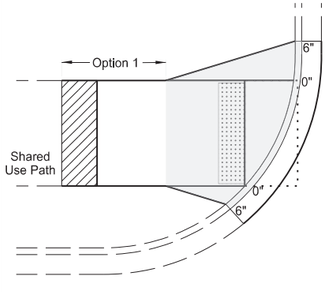


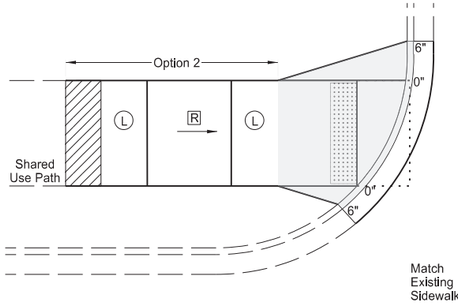
Type 1D



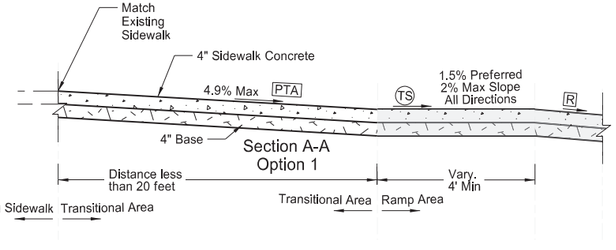
Type 3

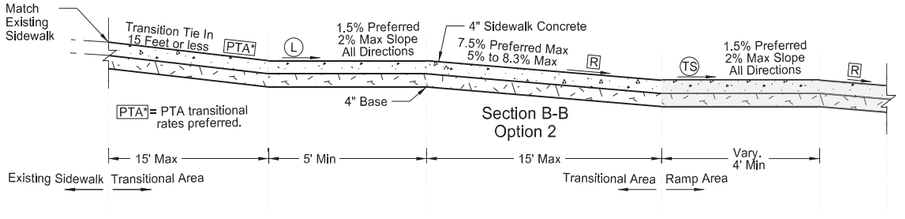






Transition Areas for Shared Use Paths





NOTES:

1. Curb Ramp Transitional Areas are to transition from the Curb Ramp area into the Existing Pedestrian Facility (EPF). Each layout shows example transitions. Use any combination for transitions from the Ramp Area into the EPF that allows for similar or gentler slopes to that of the existing condition, yet transitions in the shortest distance possible. In some cases, if grades allow, the Ramp area can immediately transition into the EPF and no transitional area is needed.
2. Option 1: Use this transition when existing running slope grades are less than 5%. Transition from the ramp area to the EPF using the Pedestrian Access Transition Area (PTA) transition rates and in less than 20 feet.
3. Option 2: Use this transition when existing running slopes are greater than 5% and option 1 is not able to be met.

   Add a ramp and a landing immediately after the ramp area. Then transition from the compliant landing into the EPF using the PTA rates (preferred), or in less than 15 feet (which ever is shorter).
4. Transitional Areas for Shared Use Paths can be concrete or asphalt.
5. See Curb Ramp Retrofit Details Standard D-750-3 for additional information.

LEGEND:

- : Detectable Warning Panel.
- : Landscaping.
- : Transitional tie-in to nearest joint, if needed.
- : Curb Ramp Retrofit Area (See Standard Drawing D750-3)
- : 4' long x width of EPF or 4' minimum Clear space outside traffic lanes of travel. 1.5% preferred cross slope 2% maximum cross slope 4.7% preferred running slope 5% maximum running slope
- PTA : Pedestrian Access Transition Area Running Slope less than 4.9%. Transition Cross Section at 1/2 percent per foot from the from Ramp Area to EPF.
- (L) (TS) : Turning Space/Landing Use at top of ramp or when changing directions. 1.5% preferred slope (2% maximum) all directions.
- R :Preferred Ramp Grade = 5% to 7.5%. Maximum Constructed Grade = 8.3%. Preferred Cross Slope = 1.5%. Maximum Constructed Cross Slope = 2% Maximum Length = 15 feet
- (10) : 10:1 maximum constructed slope.
- (4) : 4:1 maximum constructed slope.

0", 3", or 6" : Curb Height.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-19-21	
REVISIONS	
DATE	CHANGE

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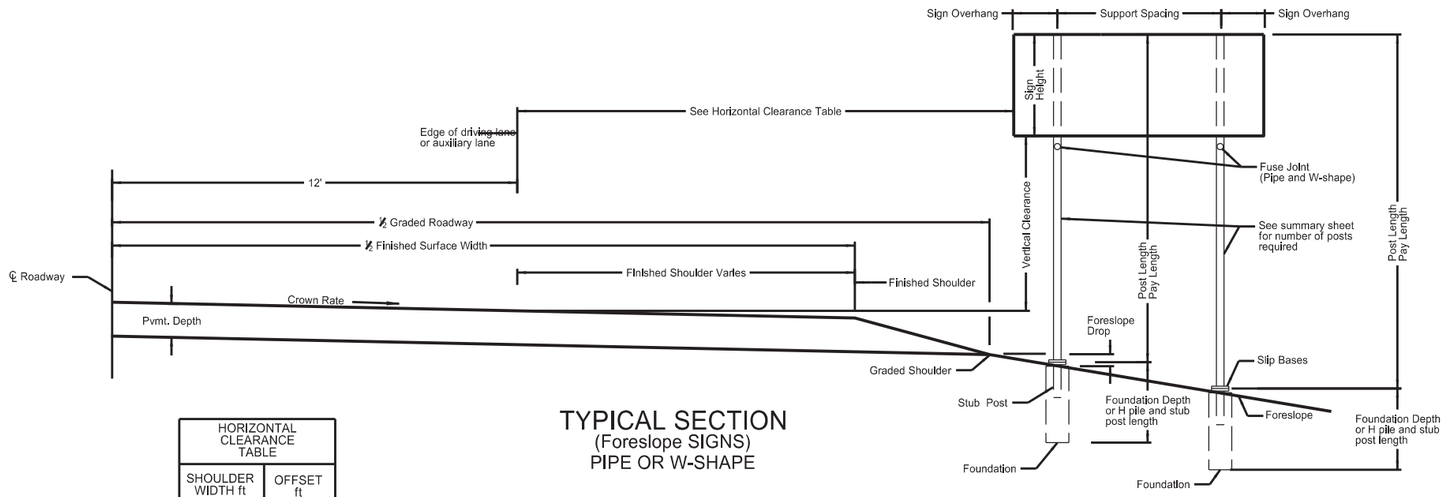
NORTH DAKOTA
05 19 2021

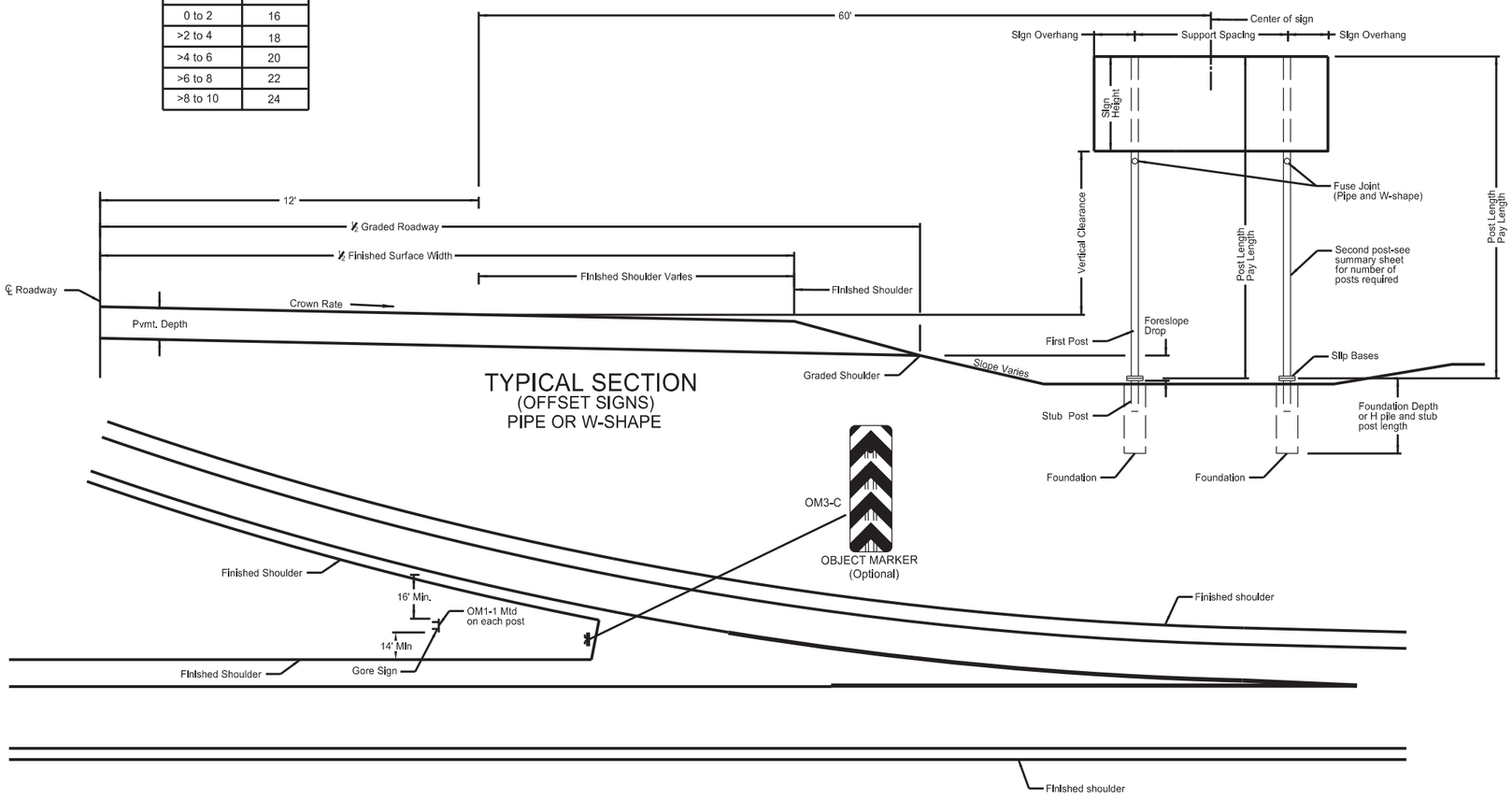
PIPE OR W-SHAPE ASSEMBLY DETAILS

D-754-1



TYPICAL SECTION
(Foreslope SIGNS)
PIPE OR W-SHAPE

HORIZONTAL CLEARANCE TABLE	
SHOULDER WIDTH ft	OFFSET ft
0 to 2	16
>2 to 4	18
>4 to 6	20
>6 to 8	22
>8 to 10	24



TYPICAL SECTION
(OFFSET SIGNS)
PIPE OR W-SHAPE

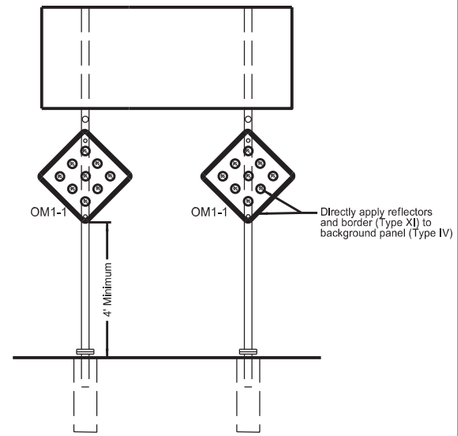
EXIT RAMP
GORE SIGN PLACEMENT

NOTES:

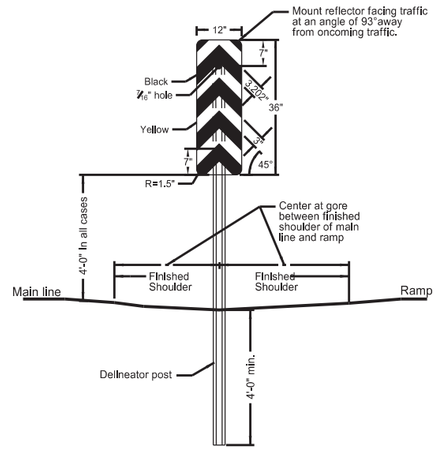
MINIMUM VERTICAL CLEARANCE:
Install signs with a minimum 5 foot vertical clearance from bottom of sign to top edge of the driving lane or auxiliary lane in rural locations. Provide a minimum 7 foot vertical clearance where parking or pedestrian movements occur. Install signs with a minimum 7 foot vertical clearance on freeways, expressways, and multi-lane conventional roadways.

A vertical clearance of 5 feet is acceptable where signs are placed a minimum of 30 feet from the edge of the traveled way.

Place signs a maximum of 6" above the vertical clearance specified above.



GORE SIGN OBJECT MARKER INSTALLATION



OBJECT MARKER INSTALLATION

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
7-18-14	Modify notes and update reflective sheeting for object marker. Add correct section number for object marker post.
8-30-18	Updated notes to active voice.
11-26-21	Revised Object Marker signs.

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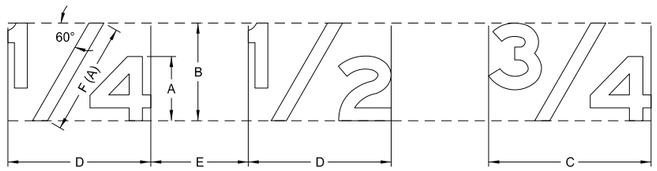
11/26/21

LETTER AND ARROW DETAILS

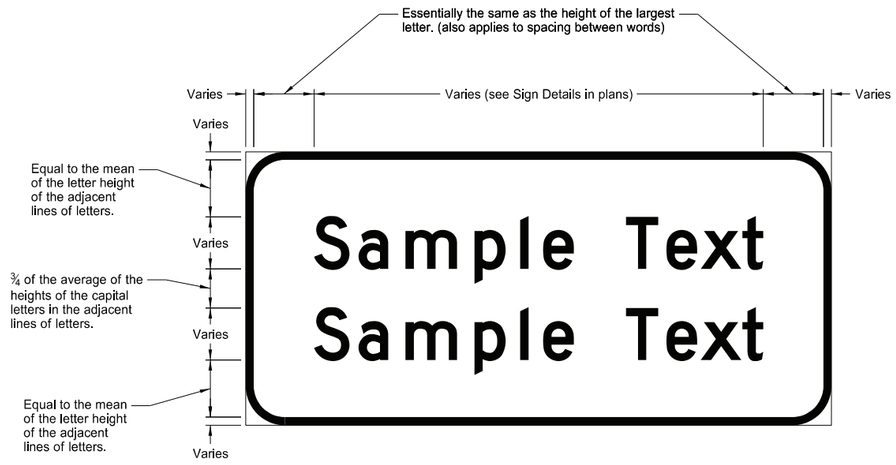
D-754-9



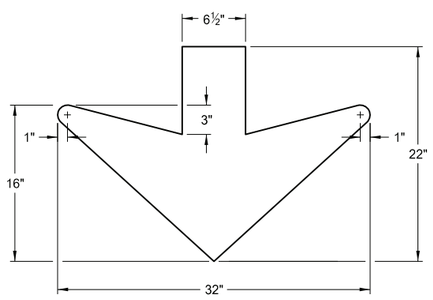
DETERMINE SIZE OF THE FRACTION AS FOLLOWS:

SYMBOL	TITLE	RATIO TO HEIGHT OF CAPITAL OR UPPER CASE
A	Letter height	1.0 of capital or upper case
B	Fraction height	1.5 X A
C	Fraction width	2.5 X A
D	Fraction width	2 X A
E	Space to next character	1 to 1.5 X A
F(A)	Length of diagonal	1.75 X A

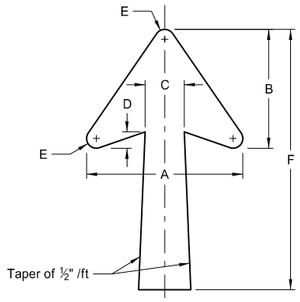
(A) Center diagonal stroke of fraction optically.



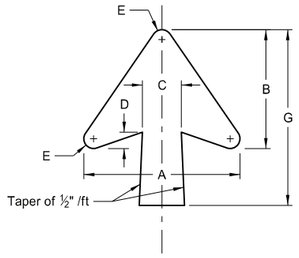
TYPICAL SPACING



DOWN ARROW



TYPE A

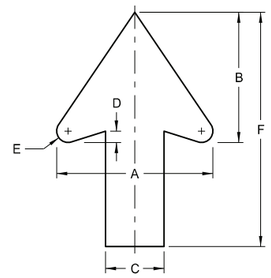


TYPE B

DESIGNATION	LETTER SIZE (Upper Case)	A	B	C	D	E	F	G
ND_6IN	6"	12"	9.125"	3"	1"	0.625"	20"	13.5"
ND_8IN	8"	15.125"	11.563"	3.75"	1.313"	0.813"	25"	17"
ND_10IN	10"	18.25"	14"	4.5"	1.5"	0.75"	30"	20"
ND_12IN	12"							
ND_13IN	13.3"							
ND_16IN	16"	22.25"	17"	5.375"	1.75"	1"	35"	25"
ND_20IN	20"							

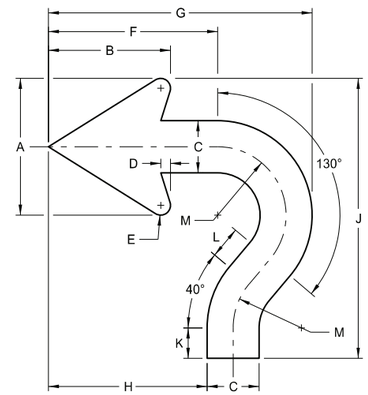
NOTE: Arrow size on gore signs is based on the letter size of "EXIT".

NOTE: Measure rotation angle of arrows counterclockwise from positions shown in details.



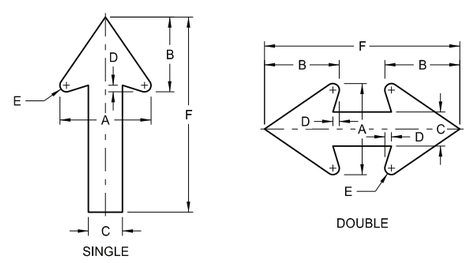
TYPE D

DESIGNATION	LETTER SIZE (Upper Case)	A	B	C	D	E	F
ND_2IN	2"	2"	1.625"	0.75"	0.125"	0.125"	3"
ND_4IN	4"	4"	3.313"	1.5"	0.25"	0.25"	6"
ND_6IN	6"	6"	4.875"	2.25"	0.375"	0.375"	9"
ND_8IN	8"	8"	6.625"	3"	0.5"	0.5"	12"
ND_10IN	10"	10"	8.375"	3.75"	0.75"	0.75"	15"
ND_12IN	12"	12"	10"	4.5"	0.875"	0.875"	18"



ROUNDABOUT

DESIGNATION	LETTER SIZE (Upper Case)	A	B	C	D	E	F	G	H	J	K	L	M
ND_6IN	6"	5.25"	4.688"	2"	0.375"	0.375"	6.5"	10.125"	6.094"	10.75"	1.168"	1.25"	2.625"
ND_8IN	8"	7"	5.75"	2.625"	0.5"	0.5"	8.688"	13.5"	8.166"	14.333"	1.557"	1.667"	3.5"



SPECIAL

DESIGNATION	A	B	C	D	E	F	USES
ND_0.75IN	2"	1.625"	0.75"	0.125"	0.125"	7.75"	Parking Signs (Regulatory)
ND_2.625IN	7"	5.75"	2.625"	0.5"	0.5"	15"	Frontage Road Signs

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

8-3-11

REVISIONS

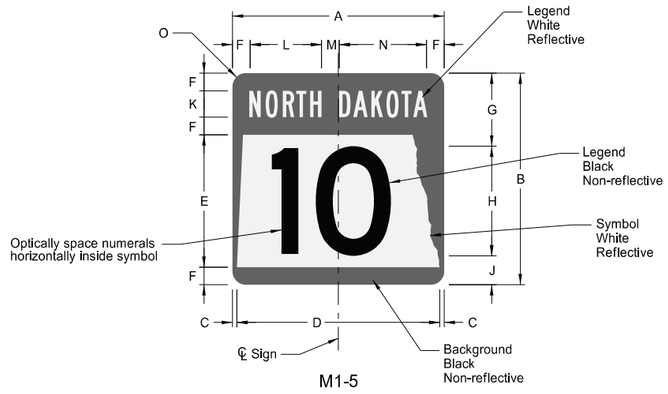
DATE	CHANGE
7-8-14	Revised gore sign and added 4" D & D arrow
5-4-16	Revised Distance & Destination and Typical Spacing details
4-23-18	Revised arrow details
8-30-18	Updated notes to active voice.
8-29-19	New Design Engr PE Stamp.
8-05-24	Electronic Stamp/Signature.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/05/24

STATE HIGHWAY ROUTE SHIELD DETAIL

D-754-11

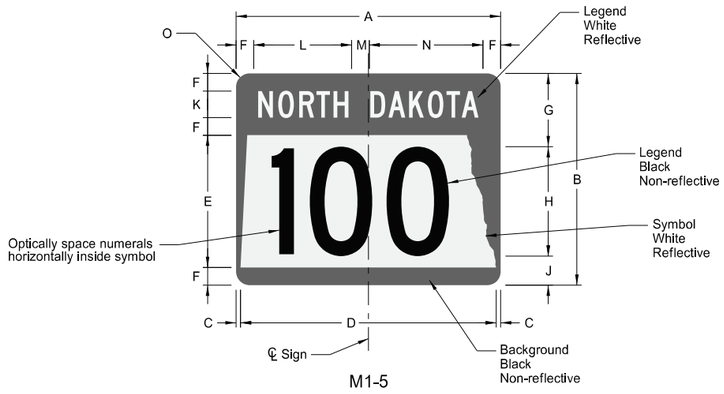


M1-5

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%

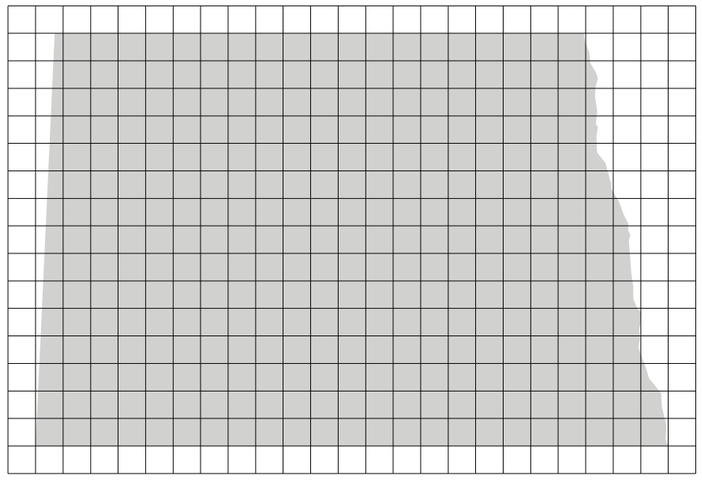


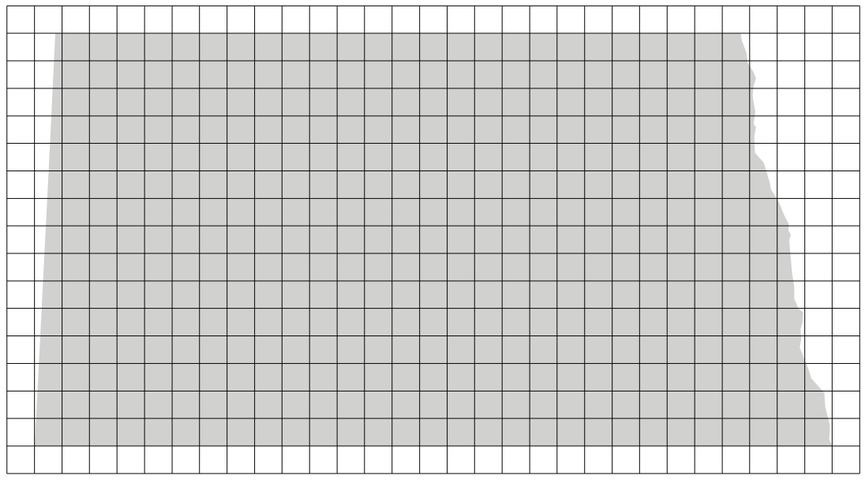
M1-5

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 may be obtained from the Design Division of North Dakota Department of Transportation.

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

4-23-18

REVISIONS

DATE	CHANGE
8-29-19	New Design Engineer PE Stamp.
8-05-24	Electronic Stamp/Signature.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/05/24

PERFORATED TUBE ASSEMBLY DETAILS

D-754-23

Notes:

1. Curbed Roadways: Use a 3' clearance from face of the curb except where right of way or sidewalk width is limited; Use a minimum 2' clearance. Increase the horizontal clearance if required to maintain a minimum sidewalk clear width of 4' from the sign support, not including any attached curb.

2. Minimum vertical clearance: Provide at least 5' measured from the bottom of the sign to the edge of the driving lane or auxiliary lane at the side of the road in rural districts. Provide at least 7' clearance to the bottom of the sign, where parking or pedestrian movements occur.

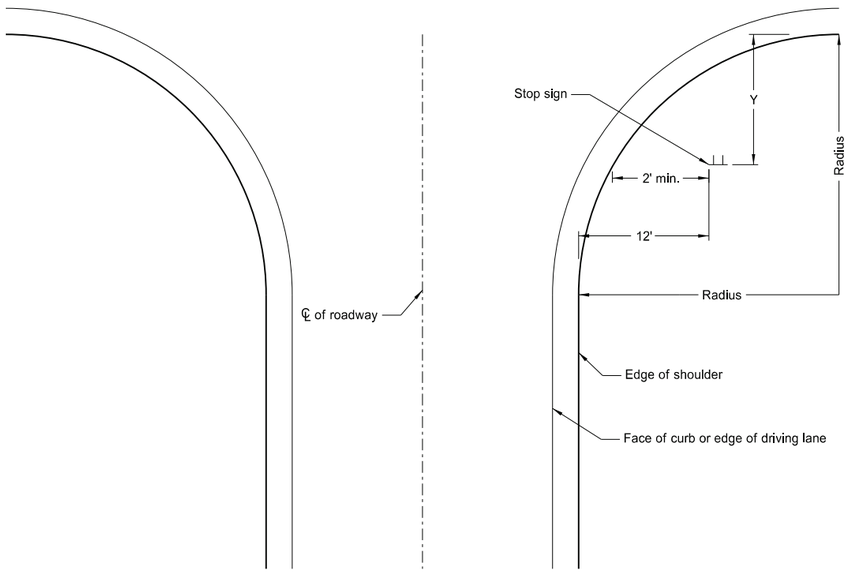
   Install signs on expressways a minimum height of 7'.

   Install adopt-a-highway signs on Freeways at least 7' above the edge of the driving lane.

   Maximum vertical clearance is 6" greater than the minimum vertical clearance.

3. Offset signs: Use a vertical clearance of 5' above the edge of the driving lane for signs placed 30 feet or more from the edge of the traveled way.

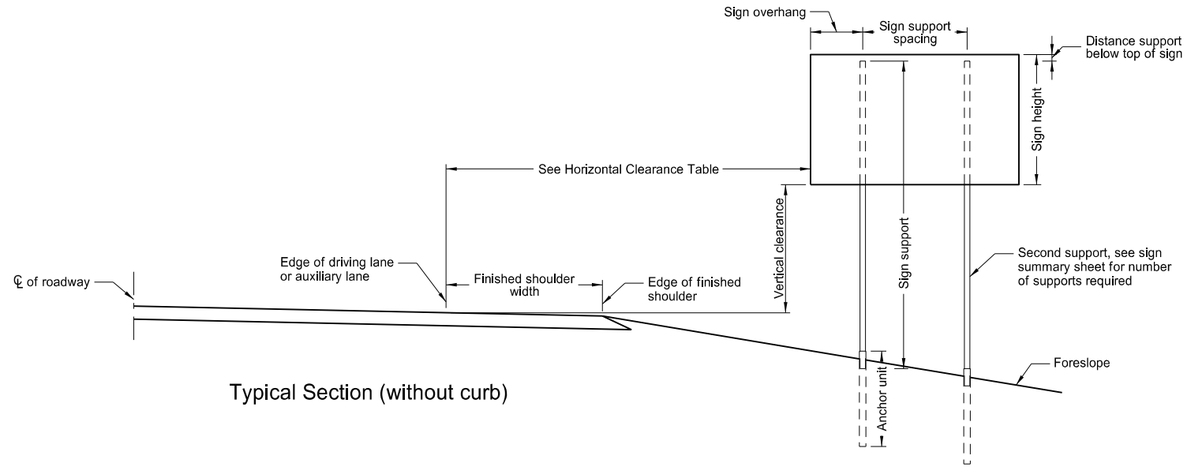
4. Provide a horizontal clearance from edge of shared use path to edge of sign of 3', except where width is limited. Provide a minimum clearance of 2'.



Stop Sign Location
Wide Throat Intersection

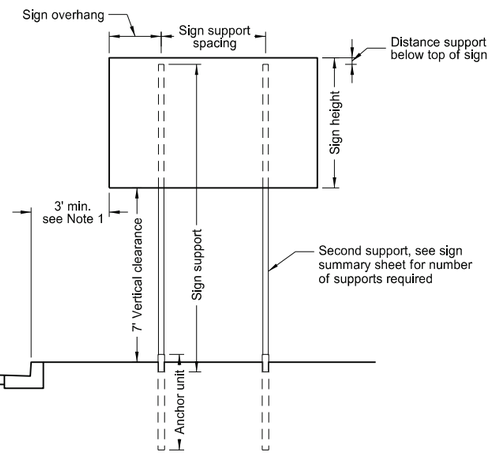
Use layout for the placement of "Stop" signs.

Radius ft.	Y-max. ft.	Y-min. ft.
40	50	15
45	50	18
50	50	21
55	50	25
60	50	28
65	50	32
70	50	35
75	50	39
80	50	43



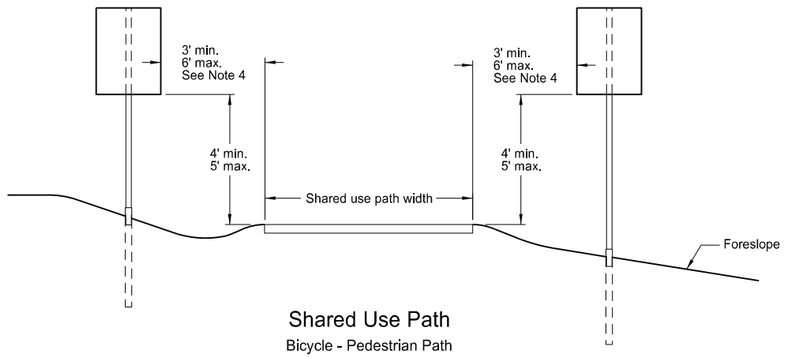
Typical Section (without curb)

Horizontal Clearance Table	
Shoulder Width ft	Offset ft
0 to 2	16
>2 to 4	18
>4 to 6	20
>6 to 8	22
>8 to 10	24



Typical Section (with curb)

Residential or Business District



Shared Use Path

Bicycle - Pedestrian Path

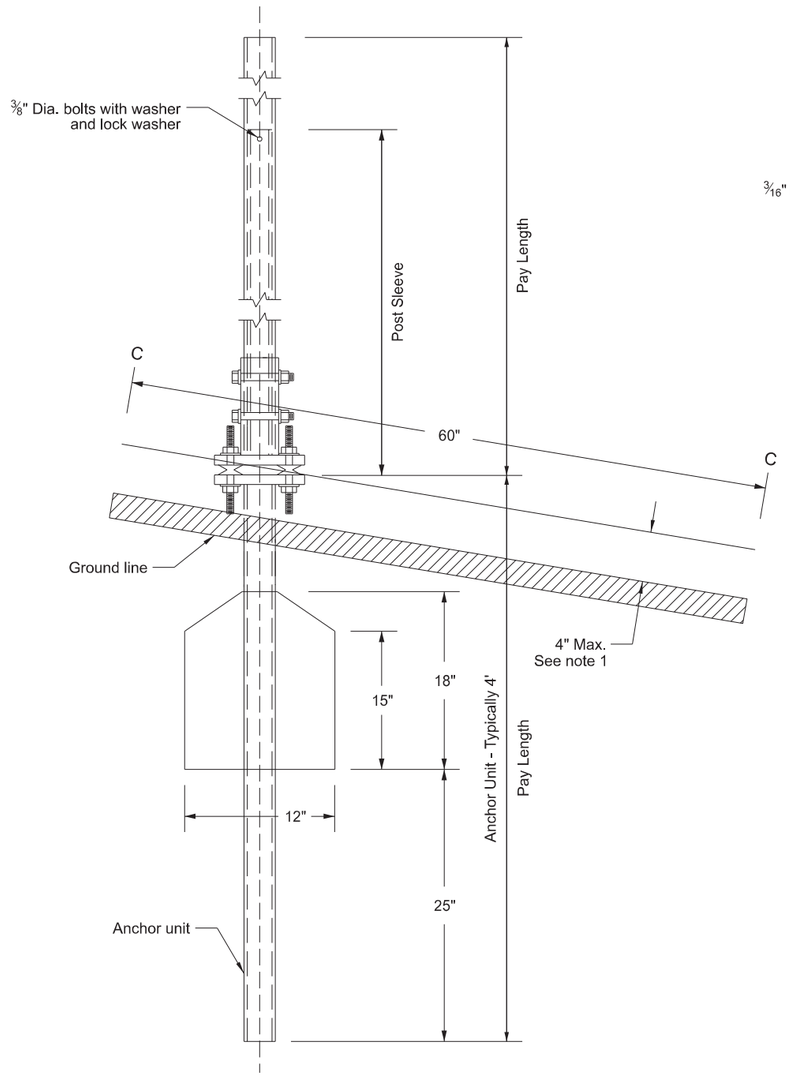
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
7-8-14	Revised note 2, added note 4.
8-30-18	Updated notes to active voice.
8-29-19	New Design Engineer PE Stamp.
8-05-24	Electronic Stamp/Signature.

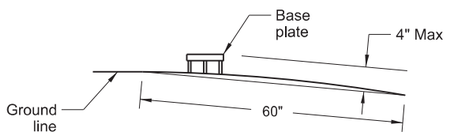
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

Kirk J. Hoff

08/05/24

D-754-24A

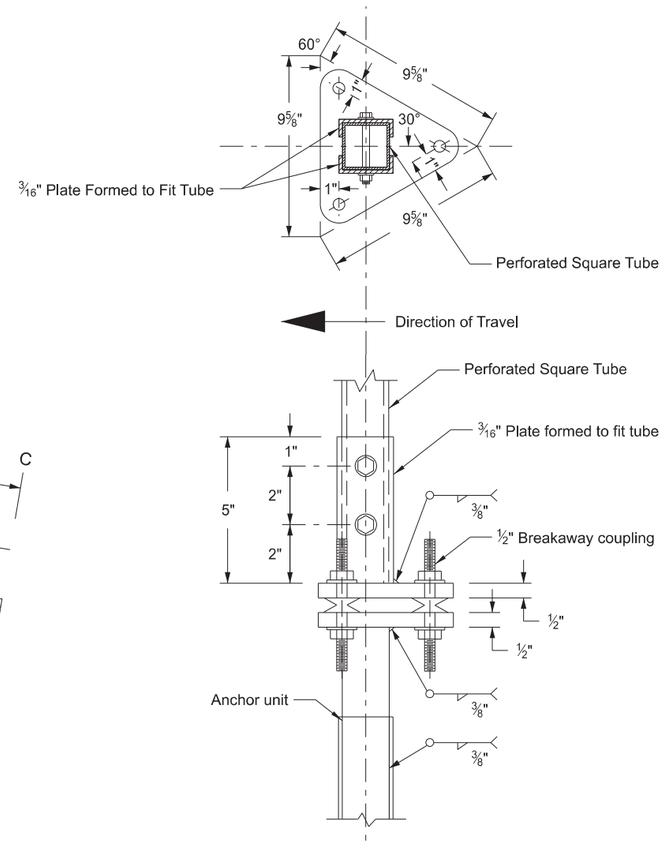




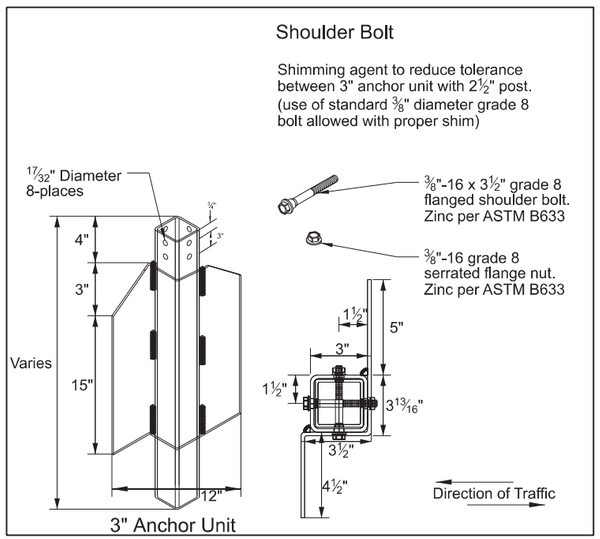
Section C-C

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

Breakaway Coupler System for Perforated Tubes



Base Plate with Breakaway Coupler



3" Anchor Unit

Notes:

1. 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement is above and below post location and also back and ahead of post.
2. Use anchor unit of the same size and specification as the post.
3. Provide a minimum 8' distance between the first and fourth post on four post signs.
4. Use the breakaway base system on standard D-754-24 or the breakaway coupling system manufactured from material meeting the requirements of ASTM A325 fasteners with the special requirements specified by DENT BREAKAWAY IND., INC. which meets the test requirements of NCHRP Report 350.

Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thickness Guage
1	2	12			No	2¼	12
1	2¼	12			No	2½	12
1	2½	12			(B)	3(C)	7
1	2½	10			Yes		7
1	2¼	12	2	12	Yes		7
1	2½	12	2¼	12	Yes		7
2	2½	10			Yes		7
2	2¼	12	2	12	Yes		7
2	2½	12	2¼	12	Yes		7
3 & 4	2½	12			Yes		7
3 & 4	2½	10			Yes		7
3 & 4	2½	12	2¼	12	Yes		7
3 & 4	2¼	12	2	12	Yes		7
3 & 4	2½	10	2 3/16	10	Yes		7

(B) - 2½" 12 gauge posts do not need breakaway bases unless support is placed in boggy, wet, or loose soil areas.

(C) - 3" anchor unit

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

10-3-2013

REVISIONS

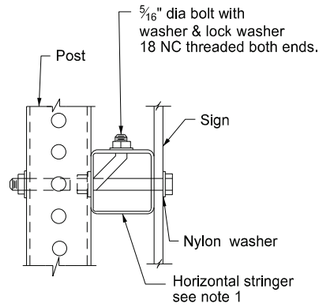
DATE	CHANGE
08-30-18	Updated notes to active voice.
08-30-19	New Design Engr PE Stamp.
08-05-24	Electronic Stamp/Signature.
07-22-25	Corrected "typo" in C-C note.

KIRK J. HOFFT REGISTERED PROFESSIONAL PE-4683 ENGINEER NORTH DAKOTA

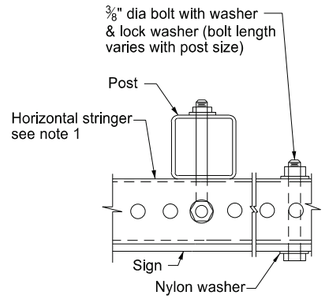
07/22/25

Mounting Details Perforated Tube

D-754-25

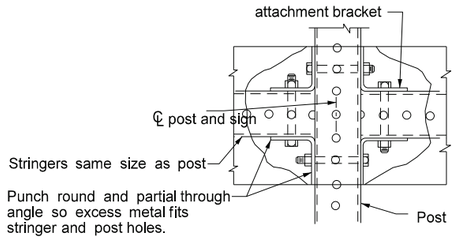


Side View



Top View

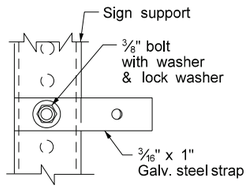
STRINGER MOUNTING
(WITH STRINGER IN FRONT OF POST)



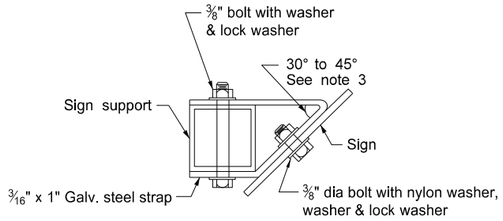
STREET NAME SIGNS AND ONE WAY SIGNS
SINGLE POST ASSEMBLY
ONE STRINGER OR BACK TO BACK MOUNTING

Note:

1. Horizontal stringers - Use perforated tubes or 1¾" x 3/16" thick, 1.08 lbs./ft aluminum or 3.16 lbs./ft steel z bar stringers.
2. Use minimum outside diameter 15/16" ±1/16" and 10 gauge thick metal washers on sign face.
3. Place No Parking signs with directional arrows at a 30 to 45 degree angle with the line of traffic flow. Turning the support to the correct angle for No Parking signs requiring the above angles is allowed. If the No Parking sign is placed with another sign that requires placement at a 90 degree angle with the line of traffic flow, use the detailed angle strap to mount the No Parking sign. Use flat washers and lock washers with all nylon washers.
4. Punching the sign backing and placing the bolt through the sign, the stringer and the post is allowed in lieu of using the bent bolt to attach the post to the stringer.
5. 4" vertical clearance of anchor or breakaway base. The 4" x 60" measurement is above and below post location and also back and ahead of post.

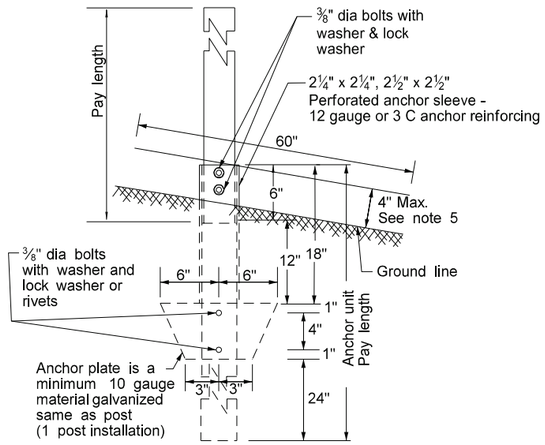


Side View



Top View

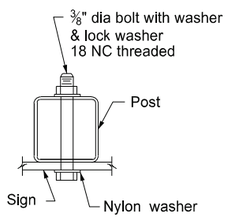
STRAP DETAIL



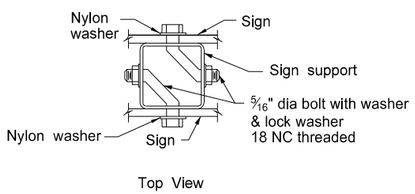
ANCHOR UNIT AND POST ASSEMBLY

Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thick-ness Gauge
1	2	12			No	2¼	12
1	2¼	12			No	2½	12
1	2½	12			(B)	3(C)	7
1	2½	10			Yes		7
1	2¼	12	2½(D)	12	Yes		7
1	2½	12	2¼	12	Yes		7
2	2½	10			Yes		7
2	2¼	12	2½(D)	12	Yes		7
2	2½	12	2¼	12	Yes		7
3 & 4	2½	12			Yes		7
3 & 4	2½	10			Yes		7
3 & 4	2½	12	2¼	12	Yes		7
3 & 4	2¼	12	2½(D)	12	Yes		7
3 & 4	2½	10	2 3/16	10	Yes		7

(B) - When placing 2½", 12 gauge posts in standard soils without breakaway bases, provide a shim as specified by the manufacturer. Provide breakaway base when placing the support in weak soils. Engineer will determine if soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.
(C) - 3" anchor unit
(D) - 2½" x 12 ga. x 18" minimum length external sleeve required.

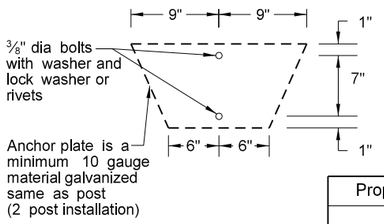


BOLT MOUNTING



Top View

BACK TO BACK MOUNTING



Properties of Telescoping Perforated Tubes							
Tube Size In.	Wall Thickness In.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia $In.^4$	Cross Sect. area $In.^2$	Section Modulus $In.^3$
1½ x 1½	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.783

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

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

8-6-09

REVISIONS

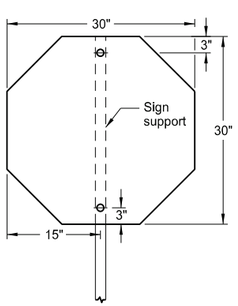
DATE	CHANGE
7-8-14	Revised Note 3.
8-30-18	Updated notes to active voice.
8-30-19	New Design Engr PE Stamp.
8-05-24	Electronic Stamp/Signature.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

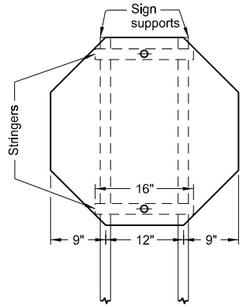
08/05/24

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS REGULATORY, WARNING AND GUIDE SIGNS

D-754-26

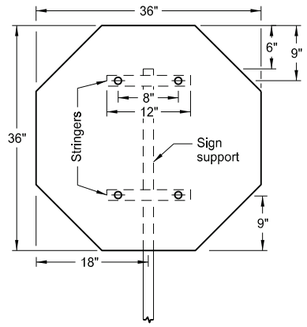


1 Post

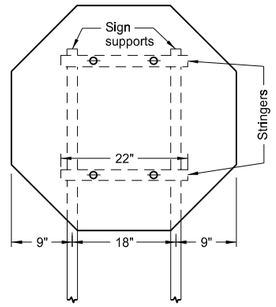


2 Posts

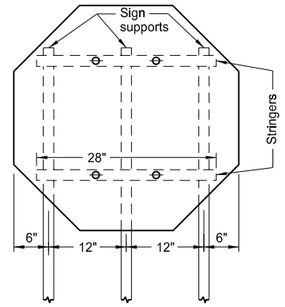
Assembly No. 1



1 Post



2 Posts

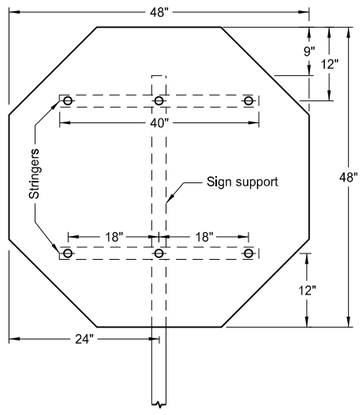


3 Posts

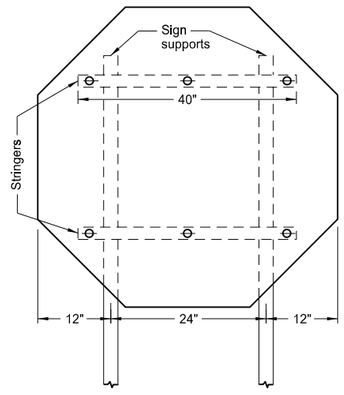
Assembly No. 2

Notes:

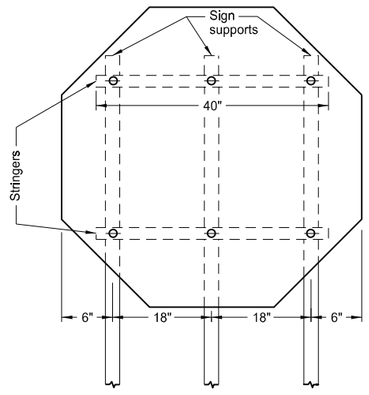
1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½" x 1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.



1 Post

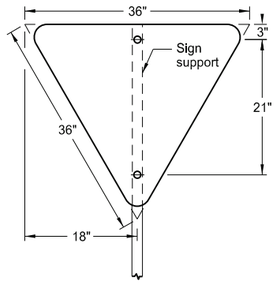


2 Posts

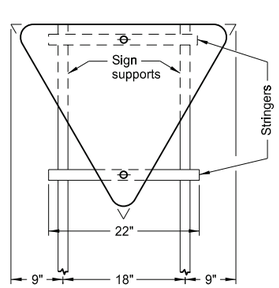


3 Posts

Assembly No. 3

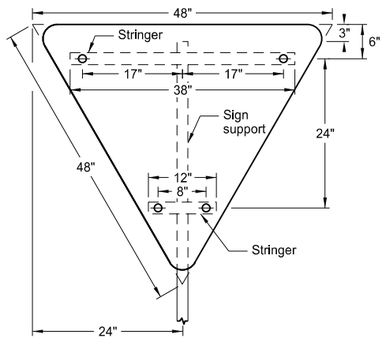


1 Post

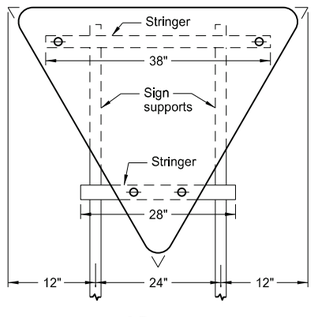


2 Posts

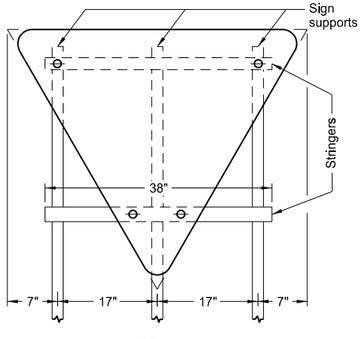
Assembly No. 4



1 Post



2 Posts



3 Posts

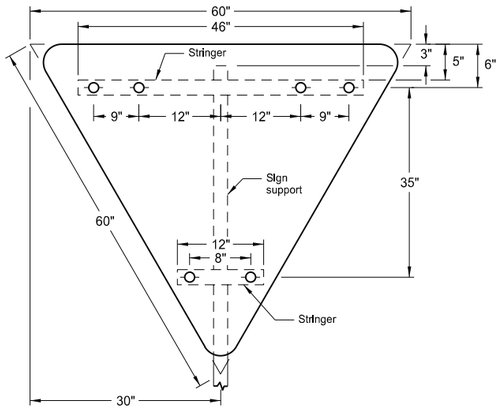
Assembly No. 5

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
8-30-18 8-30-19 8-05-24	Updated notes to active voice. New Design Engineer PE Stamp. Electronic Stamp/Signature.

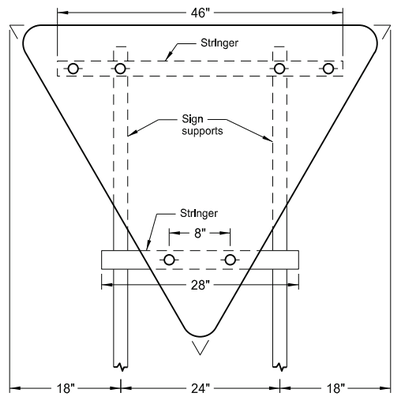
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
08/05/24

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS REGULATORY, WARNING AND GUIDE SIGNS

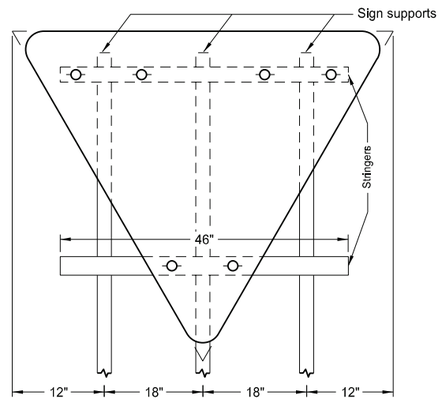
D-754-27



1 Post



2 Posts

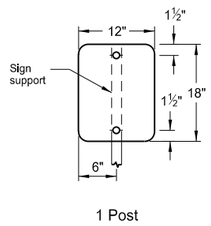


3 Posts

Assembly No. 6

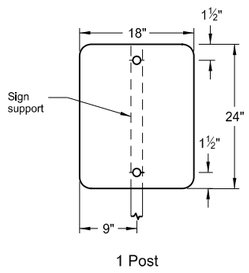
Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½" x 1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.



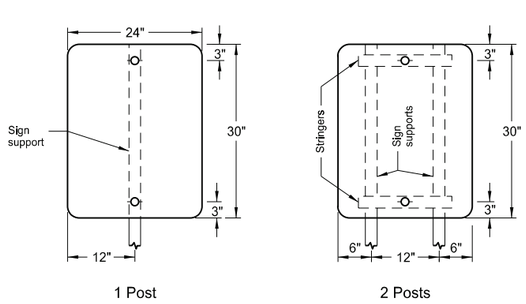
1 Post

Assembly No. 7



1 Post

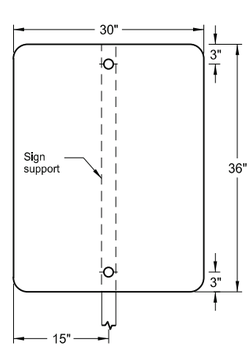
Assembly No. 8



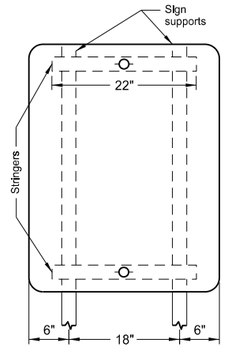
1 Post

2 Posts

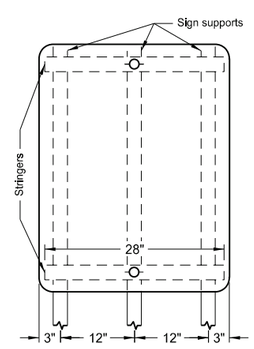
Assembly No. 9



1 Post

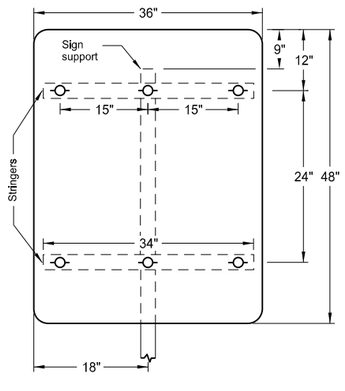


2 Posts

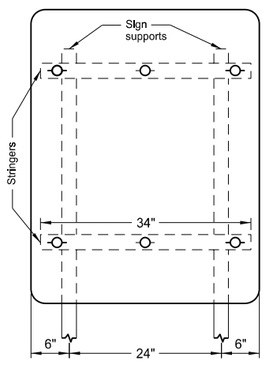


3 Posts

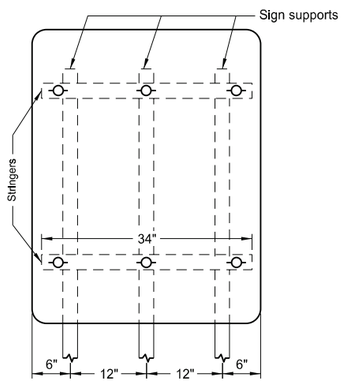
Assembly No. 10



1 Post



2 Posts



3 Posts

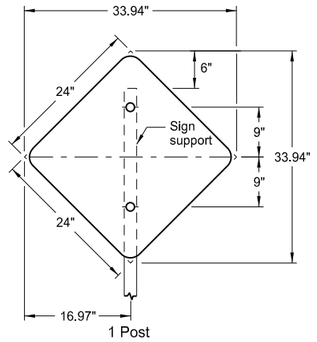
Assembly No. 11

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
8-30-19	New Design Engineer PE Stamp.
8-06-24	Electronic Stamp/Signature.

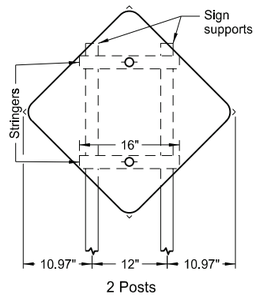
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/06/24

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS REGULATORY, WARNING AND GUIDE SIGNS

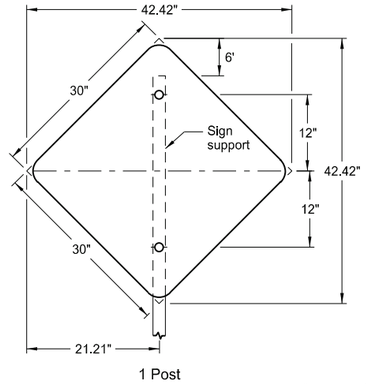


1 Post

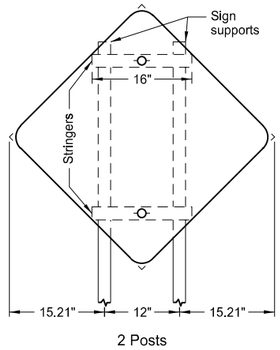


2 Posts

Assembly No. 18

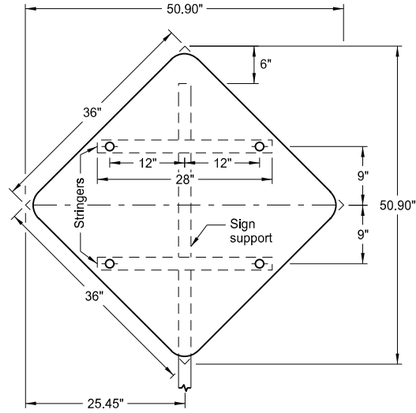


1 Post

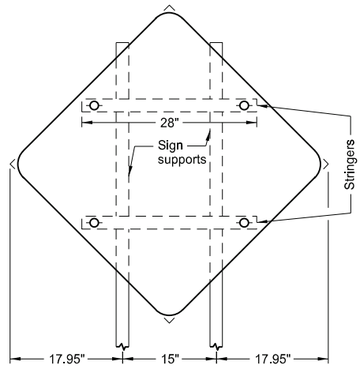


2 Posts

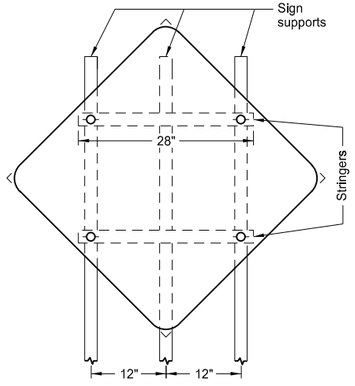
Assembly No. 19



1 Post

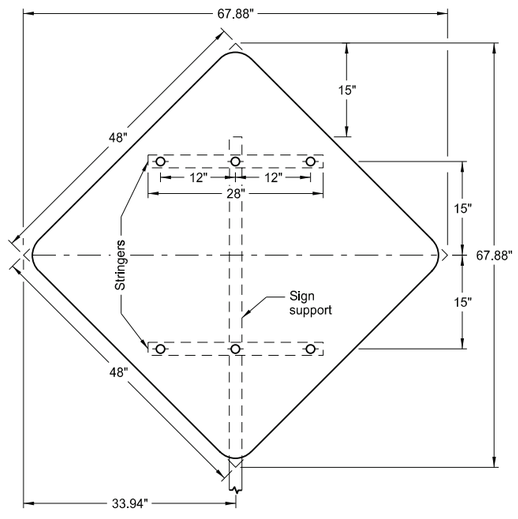


2 Posts

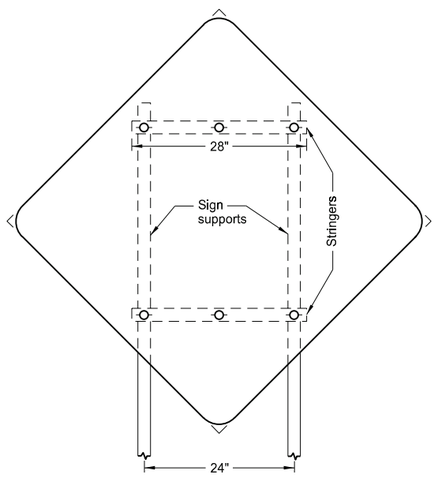


3 Posts

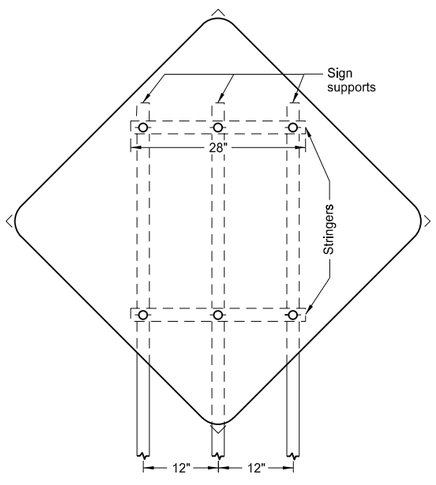
Assembly No. 20



1 Post



2 Posts



3 Posts

Assembly No. 21

Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½" x 1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
8-30-19	New Design Engineer PE Stamp.
8-06-24	Electronic Stamp/Signature.

KIRK J. HOFF
REGISTERED
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PE-4683
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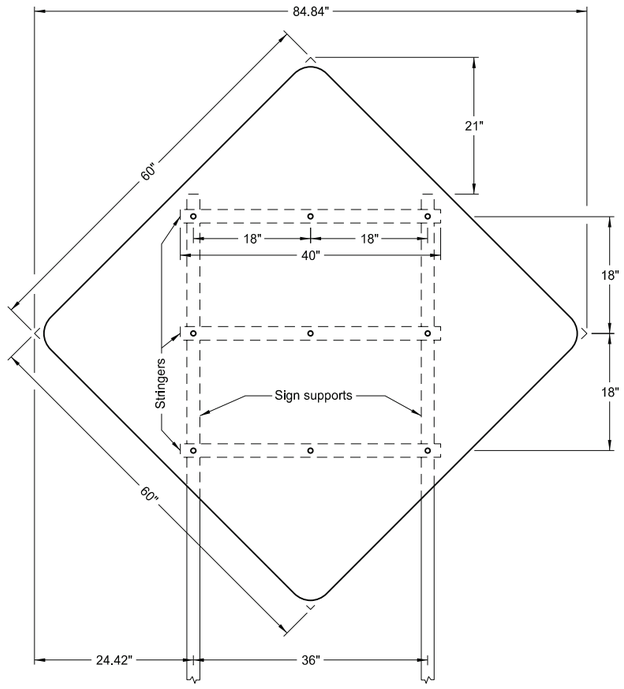
NORTH DAKOTA

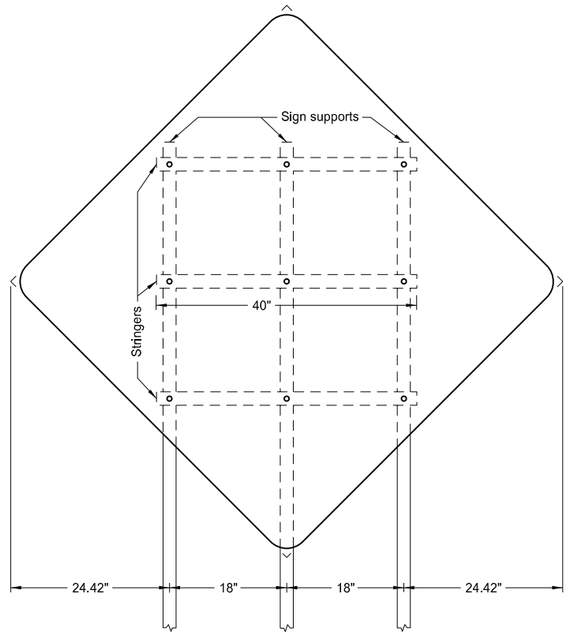
08/06/24

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS
REGULATORY, WARNING AND GUIDE SIGNS

D-754-40



2 Posts

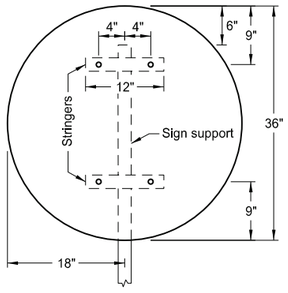


3 Posts

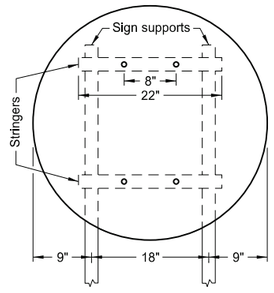
ASSEMBLY NO. 62

Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½"x1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.



1 Post



2 Posts

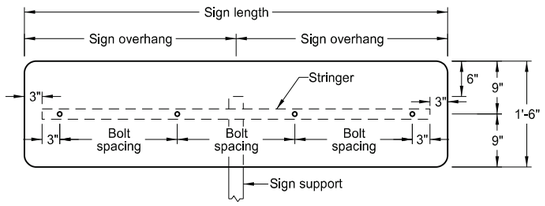
ASSEMBLY NO. 63

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
8-30-19	New Design Engineer PE Stamp.
8-06-24	Electronic Stamp/Signature.

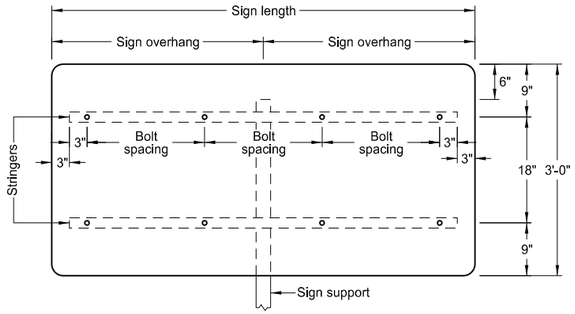
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
08/06/24

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS FOR VARIABLE LENGTH SIGNS

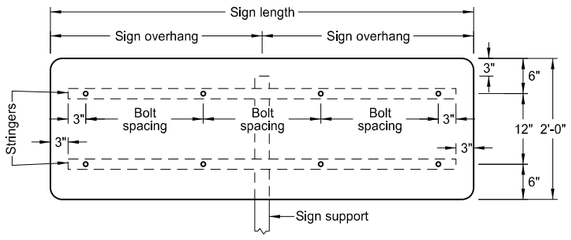
D-754-47



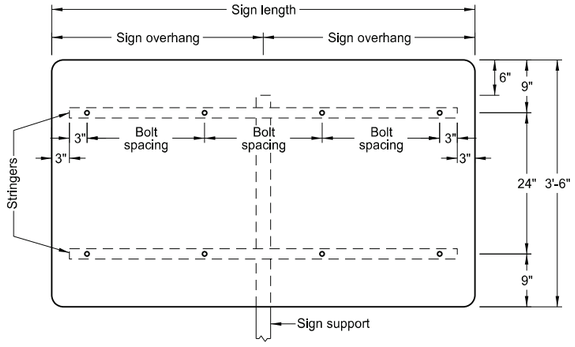
VARIES X 1'-6"



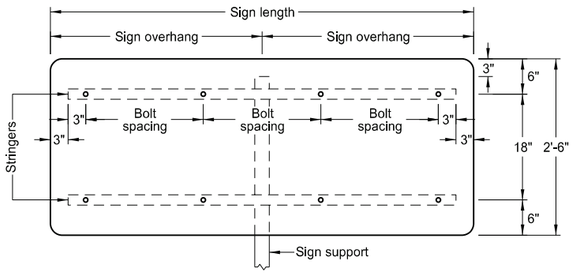
VARIES X 3'-0"



VARIES X 2'-0"



VARIES X 3'-6"



VARIES X 2'-6"

1 POST		
Sign Length	Sign Overhang	Bolt Spacing
4'-0"	2'-0"	18"
4'-6"	2'-3"	21"
5'-0"	2'-6"	24"
5'-6"	2'-9"	18"
6'-0"	3'-0"	20"
6'-6"	3'-3"	22"
7'-0"	3'-6"	24"
7'-6"	3'-9"	2-20" & 2-19"
8'-0"	4'-0"	21"
8'-6"	4'-3"	2-22" & 2-23"
9'-0"	4'-6"	24"
9'-6"	4'-9"	4-20" & 1-22"
10'-0"	5'-0"	2-21" & 3-22"
10'-6"	5'-3"	4-23" & 1-22"
11'-0"	5'-6"	24"
11'-6"	5'-9"	21"
12'-0'	6'-0"	22"

Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½" x 1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.
4. Attach single stringer to single post signs with special stringer angle, shown on "Mounting Details Perforated Tube" standard drawing.

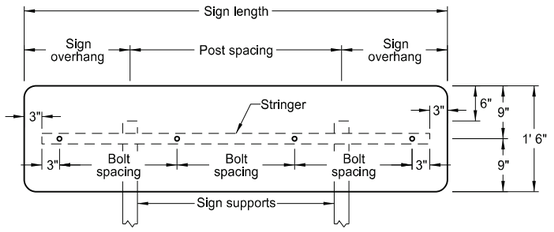
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-25-12	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
9-04-19	New Design Engr PE Stamp.
8-07-24	Electronic Stamp/Signature.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

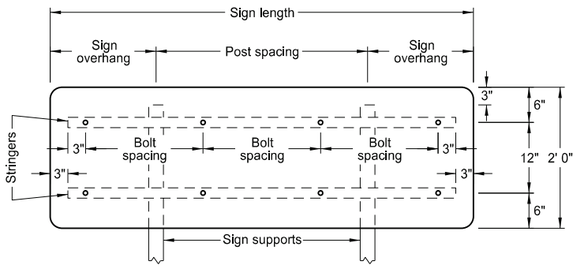
08/07/24

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS FOR VARIABLE LENGTH SIGNS

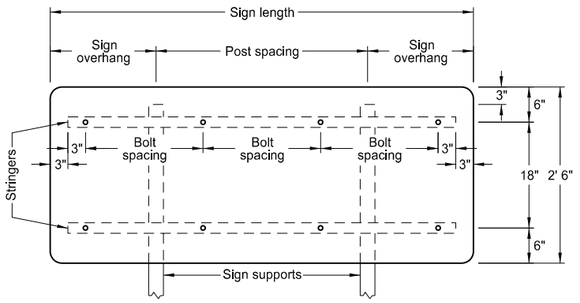
D-754-48



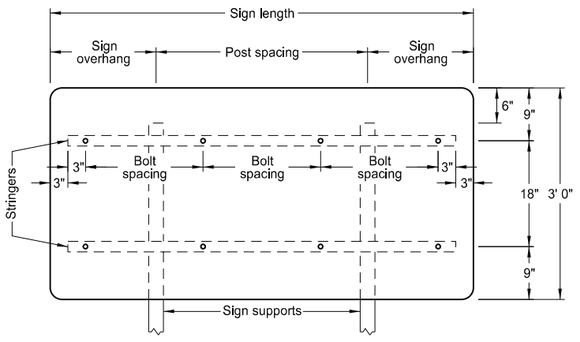
VARIES X 1'-6"



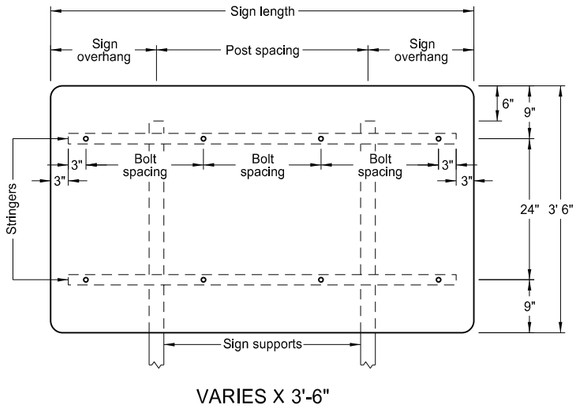
VARIES X 2'-0"



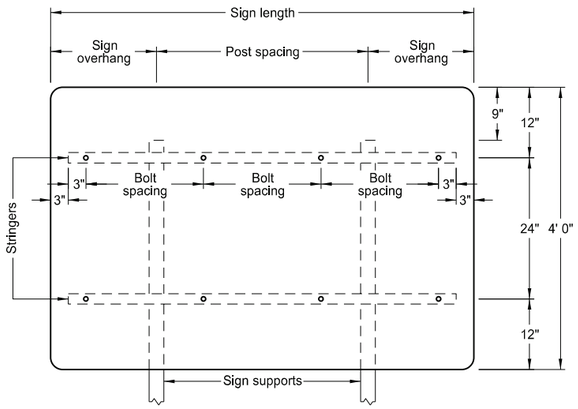
VARIES X 2'-6"



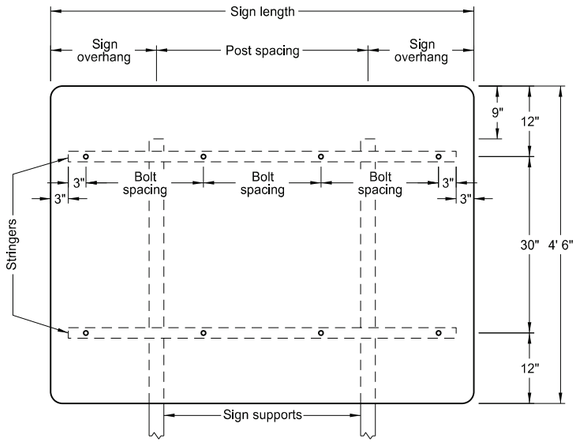
VARIES X 3'-0"



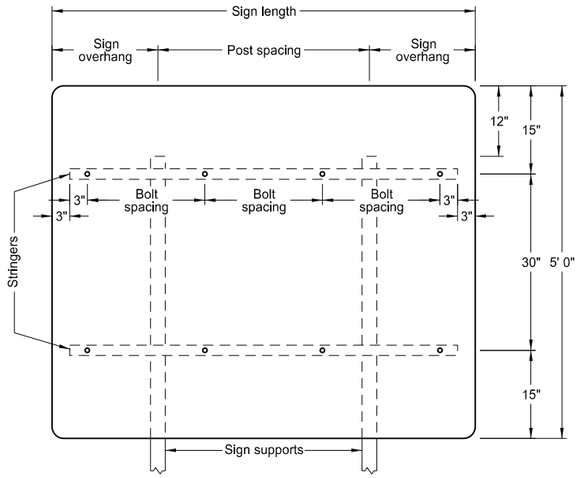
VARIES X 3'-6"



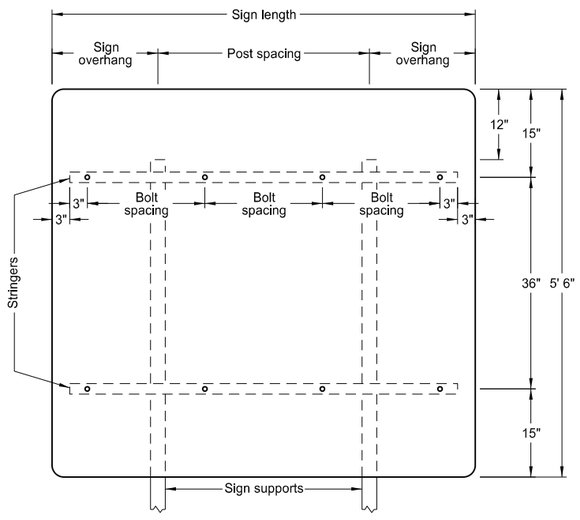
VARIES X 4'-0"



VARIES X 4'-6"



VARIES X 5'-0"



VARIES X 5'-6"

2 POSTS			
Sign Length	Sign Overhang	Post Spacing	Bolt Spacing
4'-0"	1'-0"	2'-0"	18"
4'-6"	1'-3"	2'-0"	21"
5'-0"	1'-0"	3'-0"	24"
5'-6"	1'-3"	3'-0"	18"
6'-0"	1'-6"	3'-0"	20"
6'-6"	1'-3"	4'-0"	22"
7'-0"	1'-6"	4'-0"	24"
7'-6"	1'-9"	4'-0"	2-20" & 2-19"
8'-0"	2'-0"	4'-0"	21"
8'-6"	1'-9"	5'-0"	2-22" & 2-23"
9'-0"	2'-0"	5'-0"	24"
9'-6"	1'-9"	6'-0"	4-20" & 1-22"
10'-0"	2'-0"	6'-0"	2-21" & 3-22"
10'-6"	2'-3"	6'-0"	4-23" & 1-22"
11'-0"	2'-6"	6'-0"	24"
11'-6"	2'-9"	6'-0"	21"
12'-0"	2'-0"	8'-0"	22"
12'-6"	2'-3"	8'-0"	23"
13'-0"	2'-6"	8'-0"	24"
13'-6"	2'-9"	8'-0"	3-22" & 4-21"
14'-0'	3'-0"	8'-0"	2-23" & 5-22"
14'-6"	3'-3"	8'-0"	6-23" & 1-24"
15'-0"	3'-6"	8'-0"	24"
15'-6"	2'-9"	10'-0"	6-22" & 2-21"
16'-0"	3'-0"	10'-0"	4-23" & 4-22"
16'-6"	3'-3"	10'-0"	6-23" & 2-24"
17'-0"	3'-6"	10'-0"	24"
17'-6"	3'-9"	10'-0"	22"
18'-0"	3'-0"	12'-0"	6-23" & 3-22"
18'-6"	3'-3"	12'-0"	6-23" & 3-24"
19'-0"	3'-6"	12'-0"	24"
19'-6"	3'-9"	12'-0"	8-22" & 2-23"
20'-0"	4'-0"	12'-0"	8-23" & 2-22"

Notes:

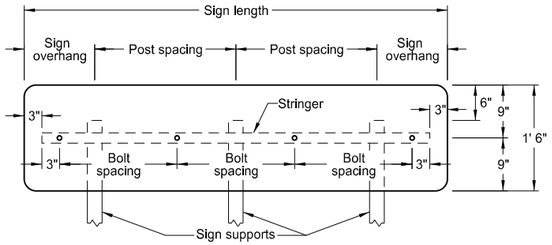
1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½" x 1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-25-12	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
9-04-19	New Design Engineer PE Stamp.
8-07-24	Electronic Stamp/Signature.

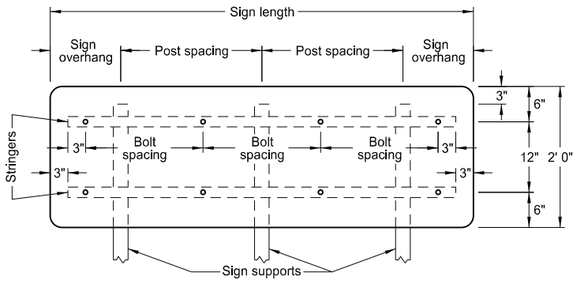
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
08/07/24

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS FOR VARIABLE LENGTH SIGNS

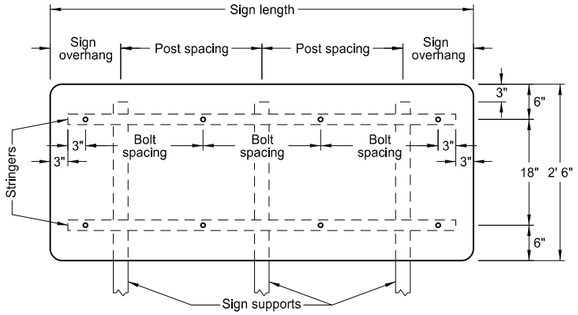
D-754-49



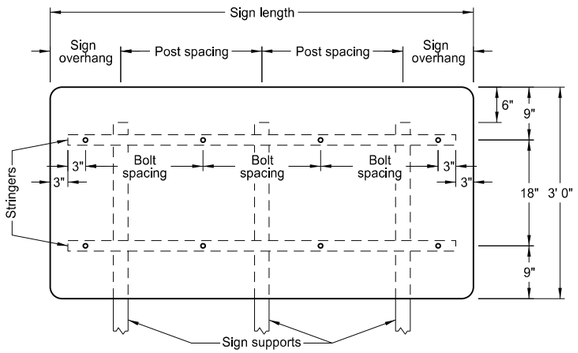
VARIES X 1'-6"



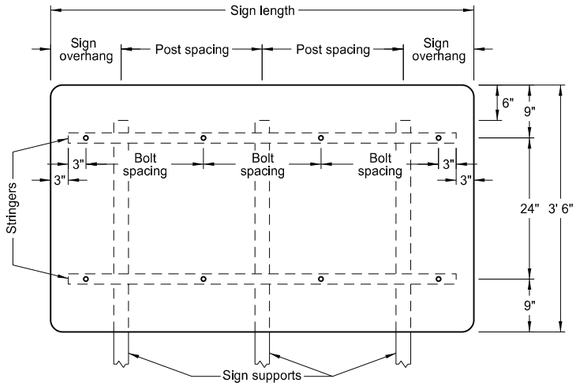
VARIES X 2'-0"



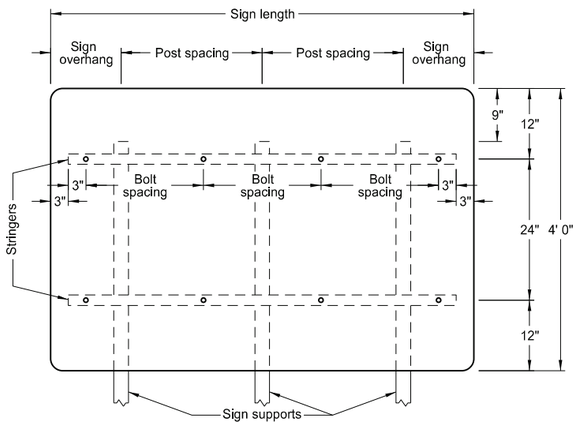
VARIES X 2'-6"



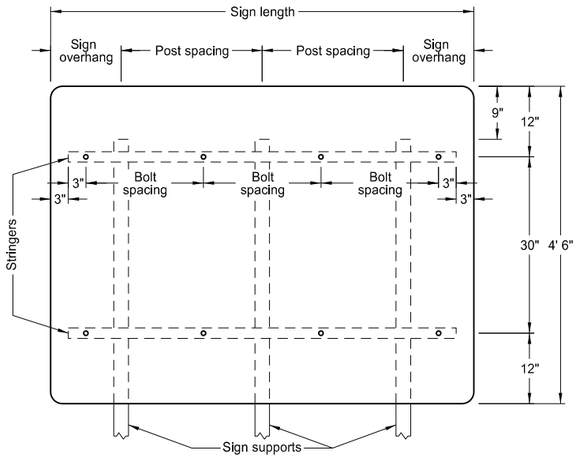
VARIES X 3'-0"



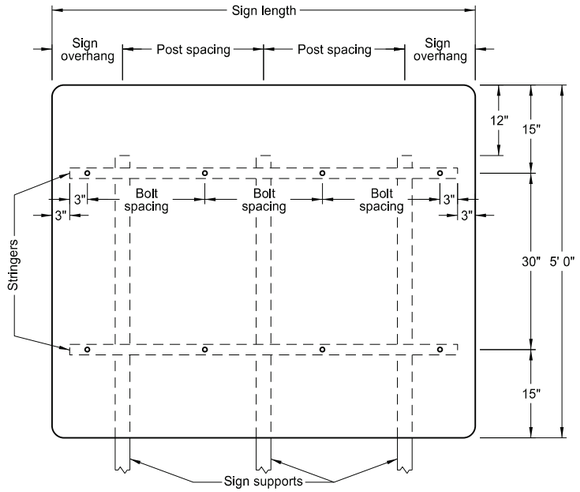
VARIES X 3'-6"



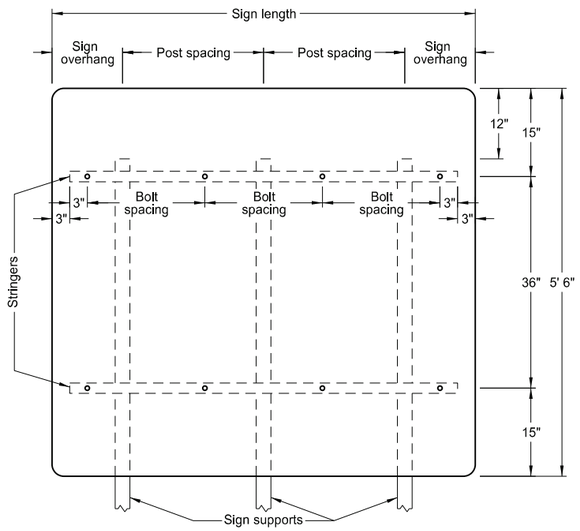
VARIES X 4'-0"



VARIES X 4'-6"



VARIES X 5'-0"



VARIES X 5'-6"

3 POSTS			
Sign Length	Sign Overhang	Post Spacing	Bolt Spacing
4'-0"	0'-6"	1'-6"	18"
4'-6"	0'-6"	1'-9"	21"
5'-0"	0'-6"	2'-0"	24"
5'-6"	1'-3"	1'-6"	18"
6'-0"	1'-0"	2'-0"	20"
6'-6"	1'-3"	2'-0"	22"
7'-0"	1'-6"	2'-0"	24"
7'-6"	1'-6"	2'-3"	2-20" & 2-19"
8'-0"	1'-9"	2'-3"	21"
8'-6"	2'-0"	2'-3"	2-22" & 2-23"
9'-0"	1'-6"	3'-0"	24"
9'-6"	1'-9"	3'-0"	4-20" & 1-22"
10'-0"	1'-9"	3'-3"	2-21" & 3-22"
10'-6"	1'-9"	3'-6"	4-23" & 1-22"
11'-0"	2'-0"	3'-6"	24"
11'-6"	2'-3"	3'-6"	21"
12'-0"	2'-4"	3'-8"	22"
12'-6"	2'-5"	3'-10"	23"
13'-0"	2'-6"	4'-0"	24"
13'-6"	2'-9"	4'-0"	3-22" & 4-21"
14'-0'	3'-0"	4'-0"	2-23" & 5-22"
14'-6"	3'-3"	4'-0"	6-23" & 1-24"
15'-0"	3'-6"	4'-0"	24"
15'-6"	2'-4"	5'-5"	6-22" & 2-21"
16'-0"	2'-5"	5'-7"	4-23" & 4-22"
16'-6"	2'-5"	5'-10"	6-23" & 2-24"
17'-0"	2'-6"	6'-0"	24"
17'-6"	3'-3"	5'-6"	22"
18'-0"	3'-6"	5'-6"	6-23" & 3-22"
18'-6"	3'-9"	5'-6"	6-23" & 3-24"
19'-0"	3'-6"	6'-0"	24"
19'-6"	4'-3"	5'-6"	8-22" & 2-23"
20'-0"	4'-4"	5'-8"	8-23" & 2-22"

Notes:

1. Use 0.100 minimum thickness sign backing material.
2. Use 1½" x 1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-25-12

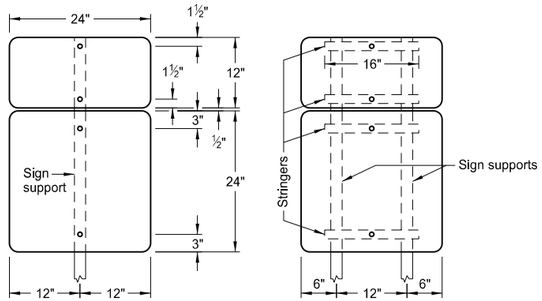
REVISIONS

DATE	CHANGE
8-30-18	Updated notes to active voice.
9-04-19	New Design Engineer PE Stamp.
8-07-24	Electronic Stamp/Signature.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
08/07/24

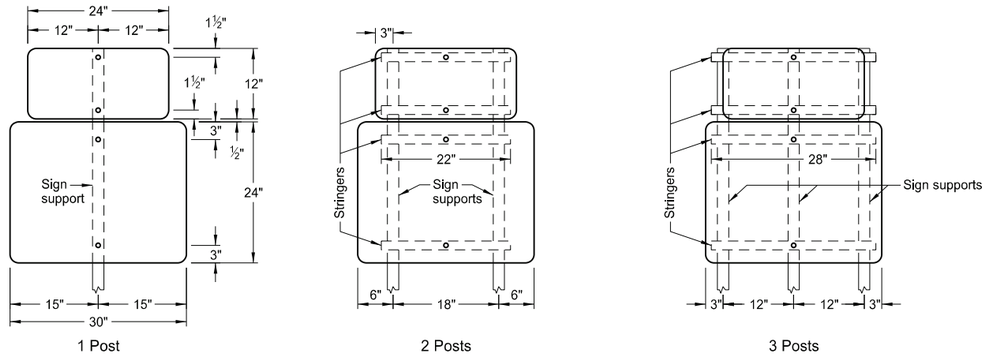
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

D-754-51



1 Post 2 Posts

ASSEMBLY NO. 371

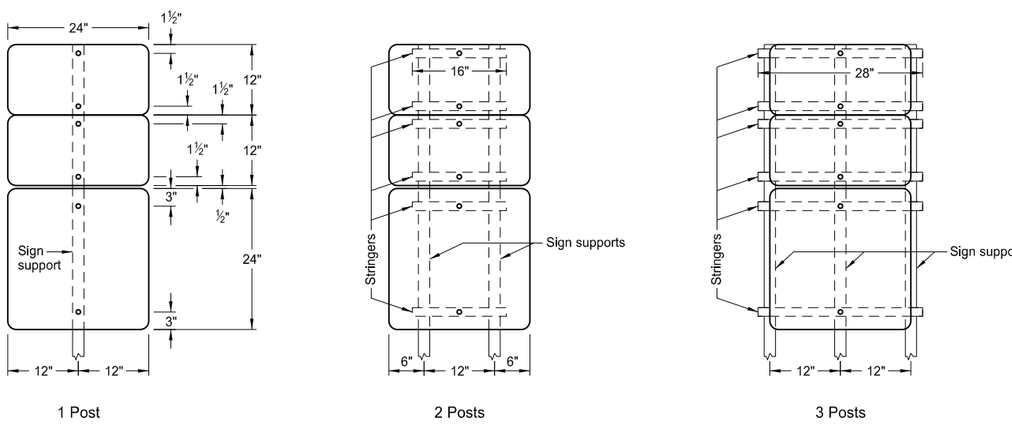


1 Post 2 Posts 3 Posts

ASSEMBLY NO. 372

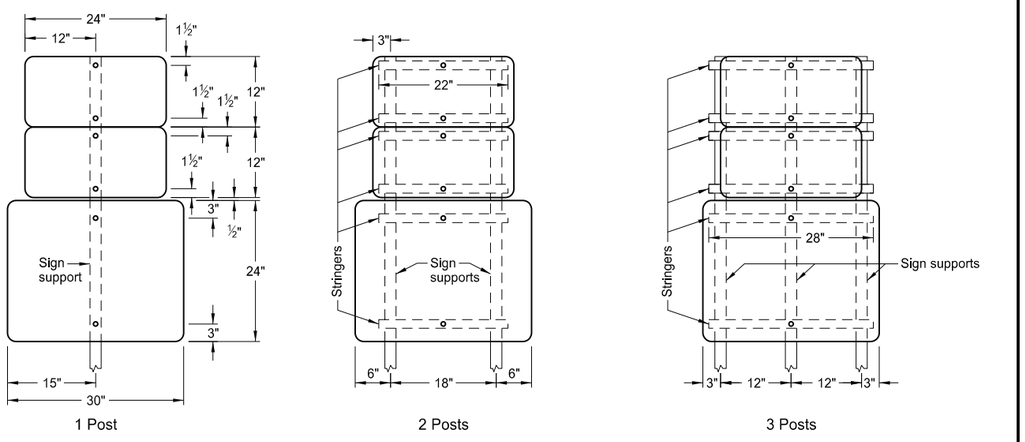
Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½"x1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.



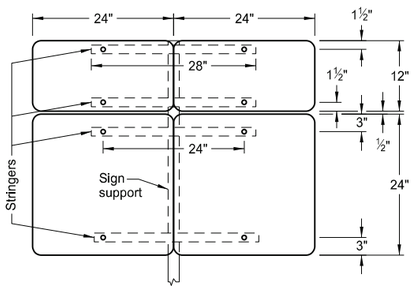
1 Post 2 Posts 3 Posts

ASSEMBLY NO. 373

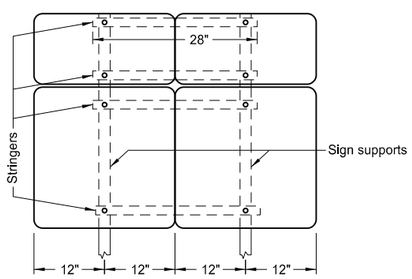


1 Post 2 Posts 3 Posts

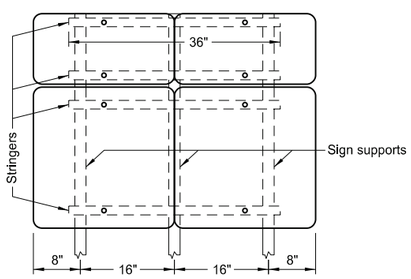
ASSEMBLY NO. 374



1 Post



2 Posts



3 Posts

ASSEMBLY NO. 375

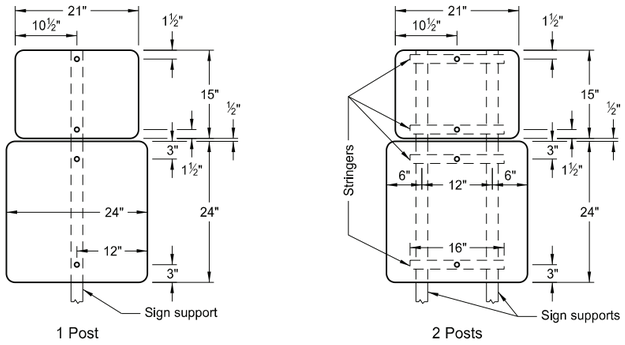
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
9-04-19	New Design Engineer PE Stamp.
8-07-24	Electronic Stamp/Signature.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

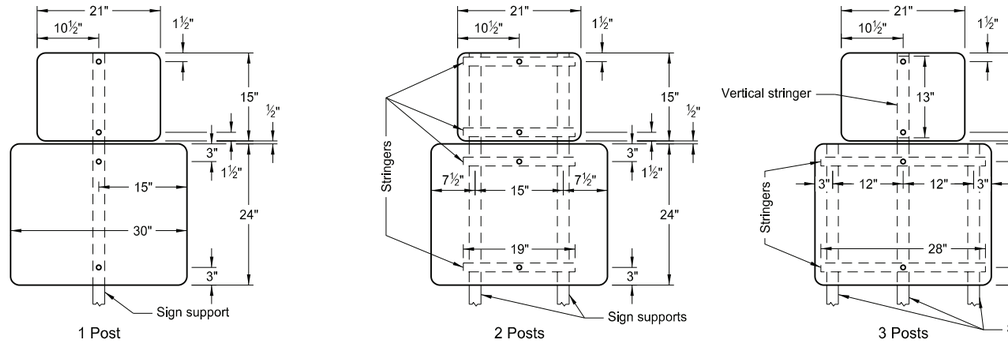
08/07/24

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

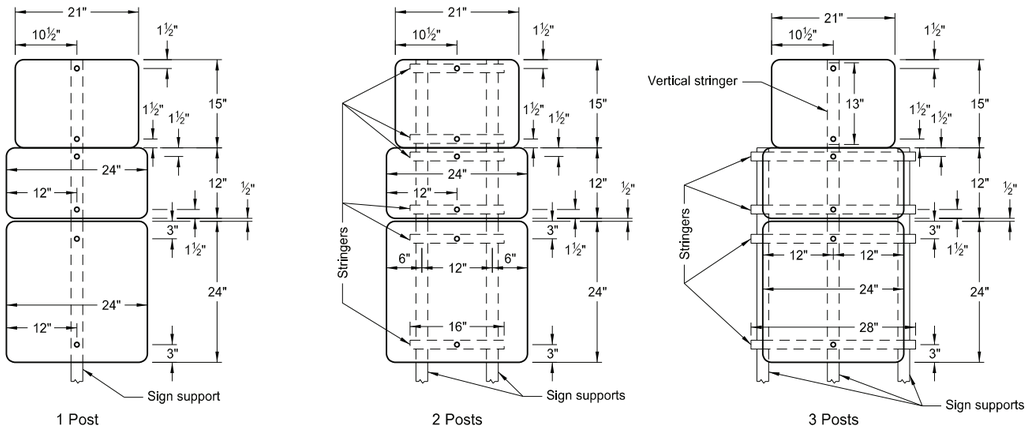
D-754-57



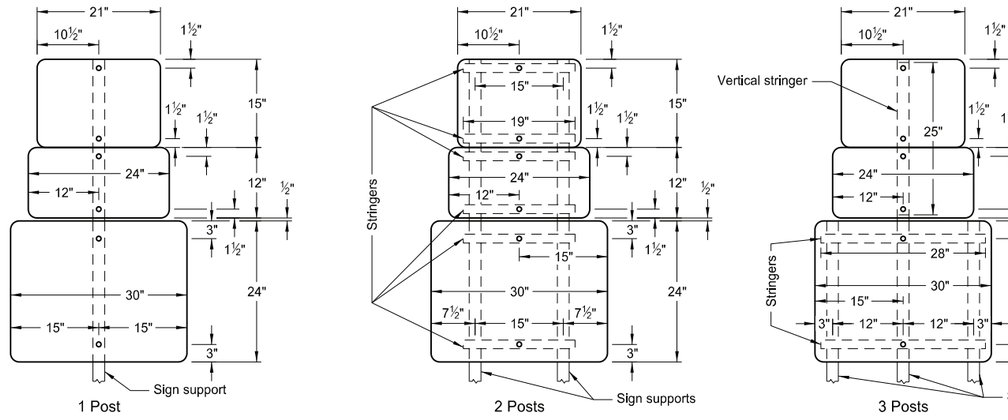
ASSEMBLY 391



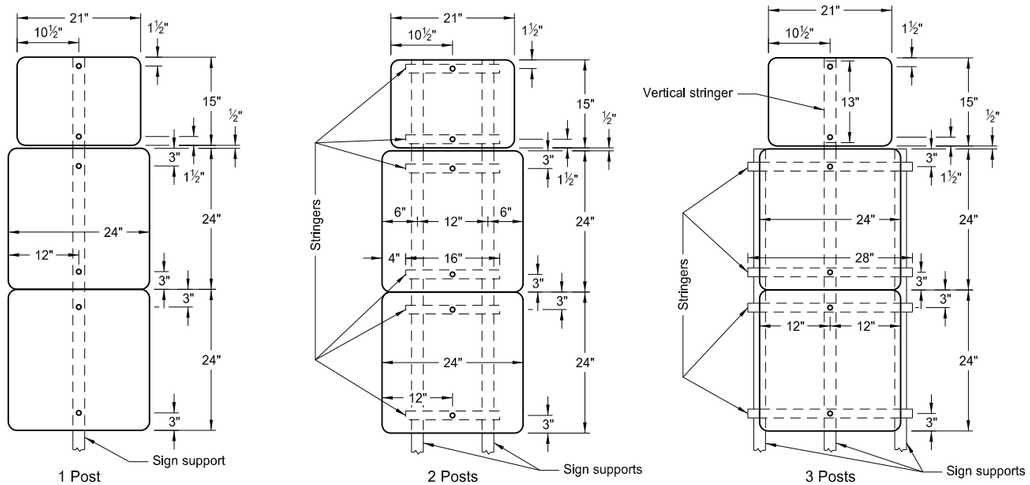
ASSEMBLY 392



ASSEMBLY 393



ASSEMBLY 394



ASSEMBLY 395

Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½"x1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.

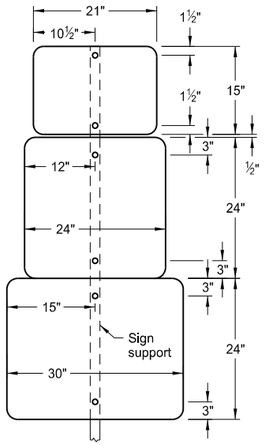
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE
8-30-18	Updated to active voice & added dimension to Assembly 393 & 394.
9-04-19	New Design Engineer PE Stamp.
8-07-24	Electronic Stamp/Signature.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

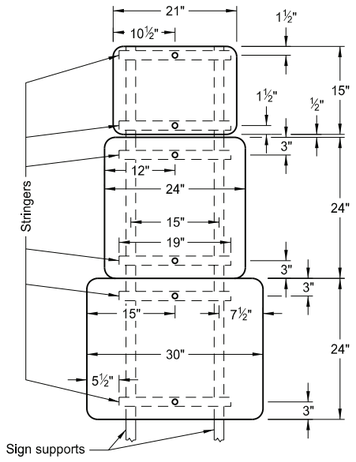
08/07/24

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

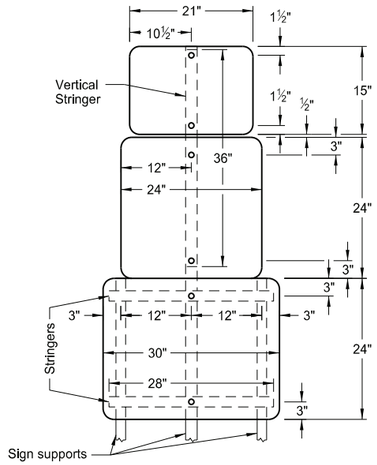
D-754-58



1 Post

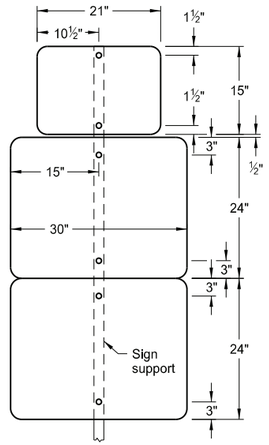


2 Posts

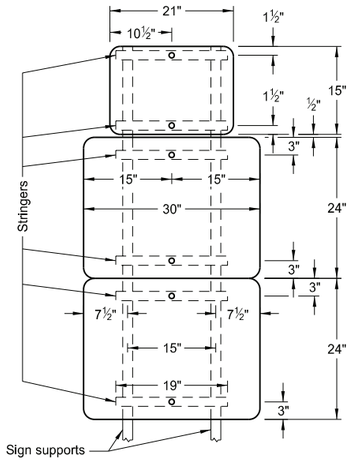


3 Posts

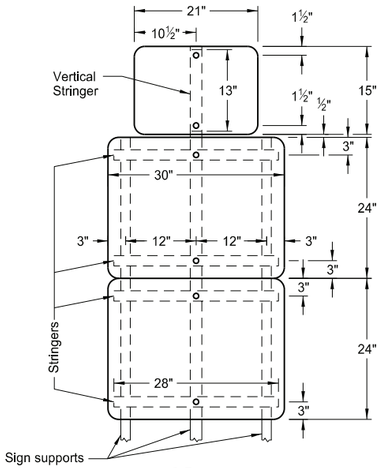
ASSEMBLY 396



1 Post

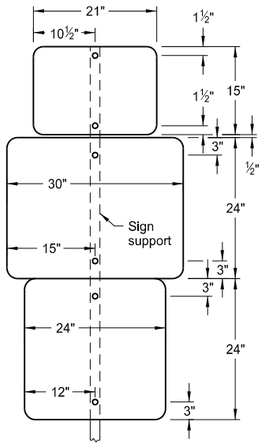


2 Posts

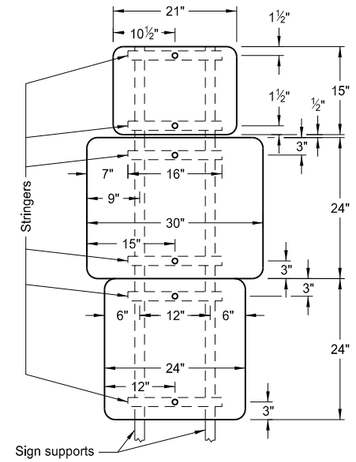


3 Posts

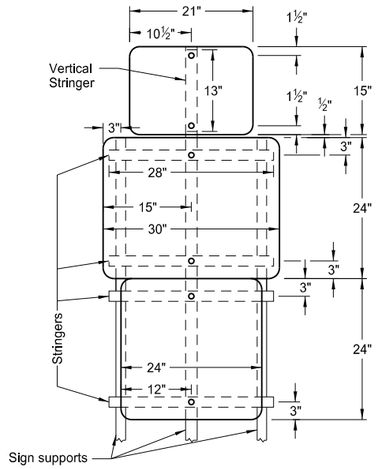
ASSEMBLY 397



1 Post

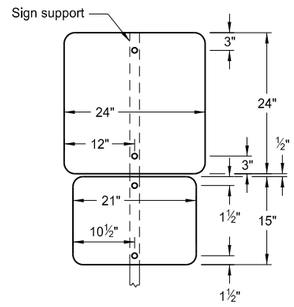


2 Posts

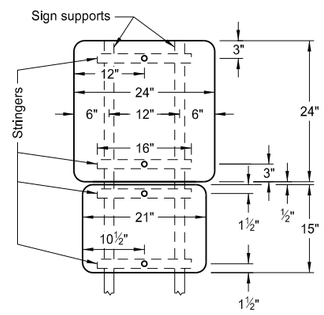


3 Posts

ASSEMBLY 398



1 Post



2 Posts

ASSEMBLY 399

Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½"x1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.

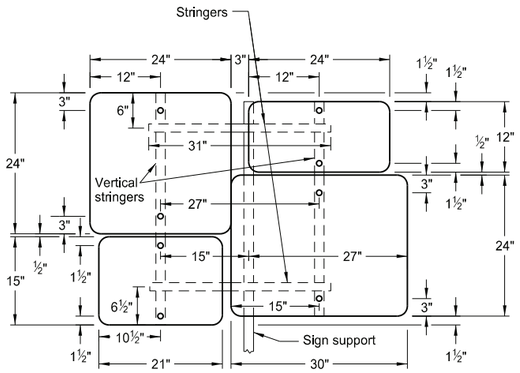
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE
8-30-18	Updated to active voice & added Assembly 398 dimension.
9-04-19	New Design Engineer PE Stamp.
8-07-24	Electronic Stamp/Signature.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

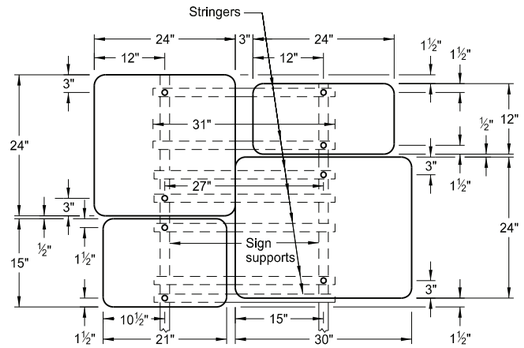
08/07/24

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

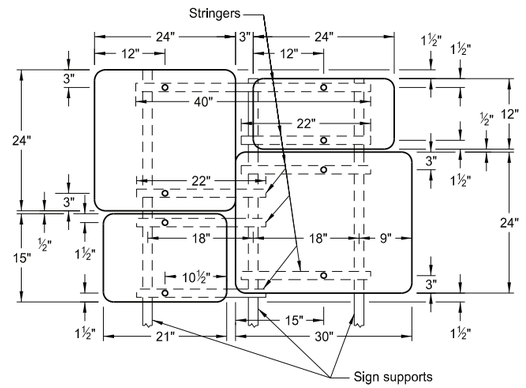
D-754-60



1 Post



2 Posts



3 Posts

ASSEMBLY NO. 403

Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½"x1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.

1 Post

2 Posts

3 Posts

ASSEMBLY NO. 404

1 Post

2 Posts

3 Posts

ASSEMBLY NO. 405

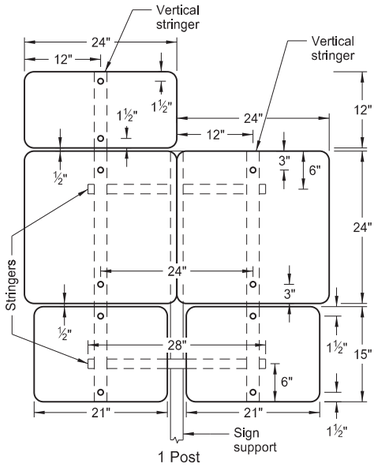
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
9-04-19	New Design Engineer PE Stamp.
8-07-24	Electronic Stamp/Signature.

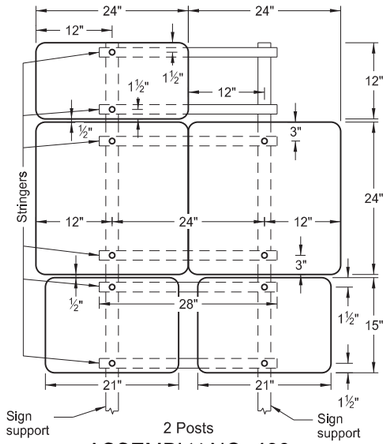
KIRK J. HOFF REGISTERED PROFESSIONAL PE-4683 ENGINEER NORTH DAKOTA

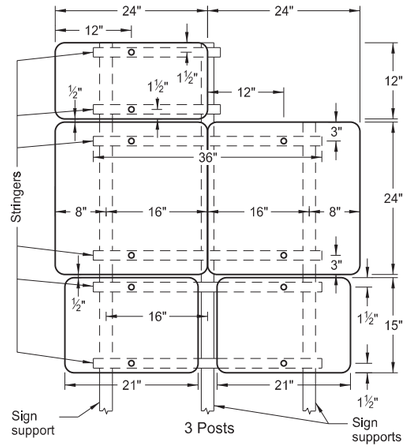
08/07/24

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

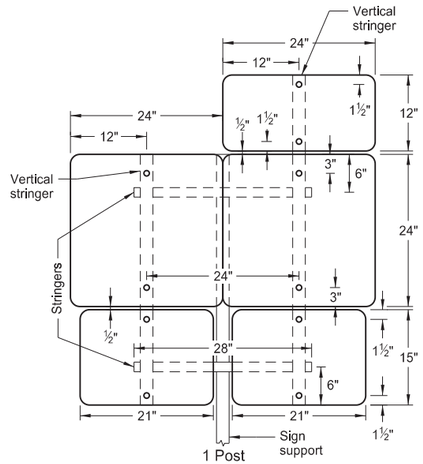
D-754-72

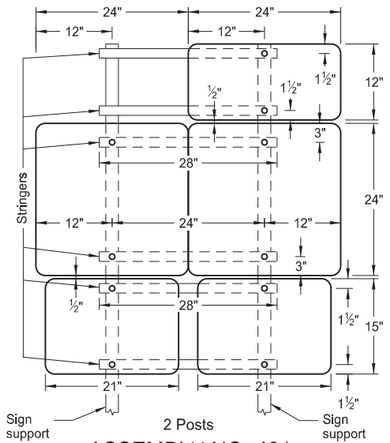


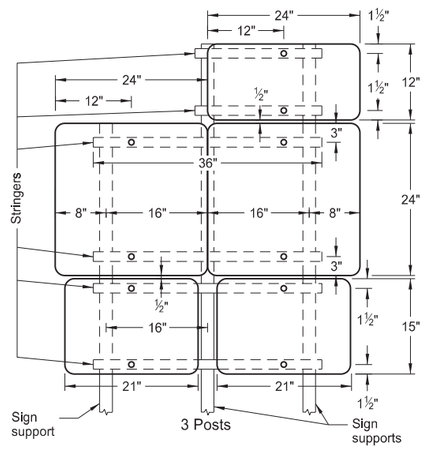




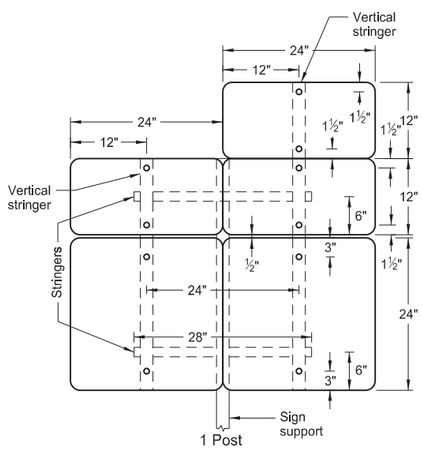
ASSEMBLY NO. 430

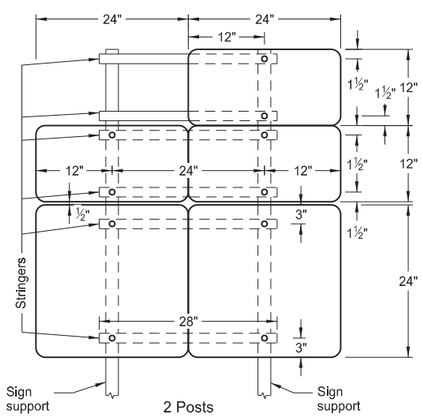


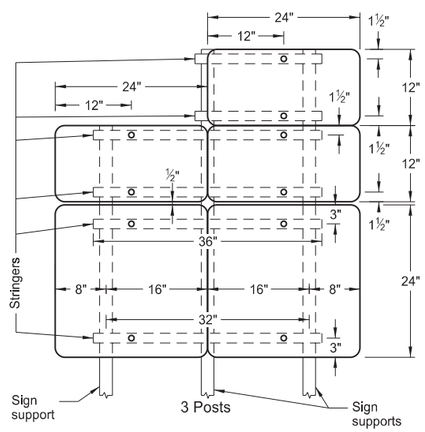




ASSEMBLY NO. 431







ASSEMBLY NO. 432

Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½"x1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE
8-30-18	Updated to active voice & revised Assembly 432 sign spacing.
9-05-19	New Design Engineer PE Stamp.
8-08-24	Electronic Stamp/Signature.

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PROFESSIONAL
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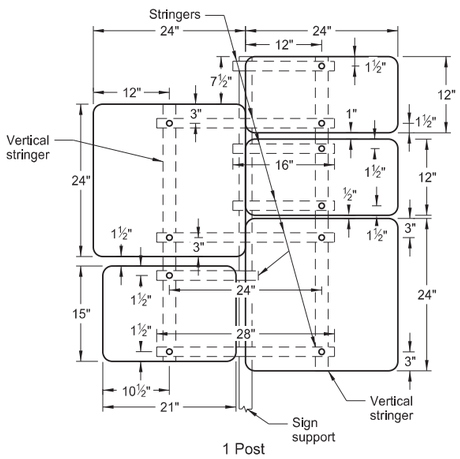
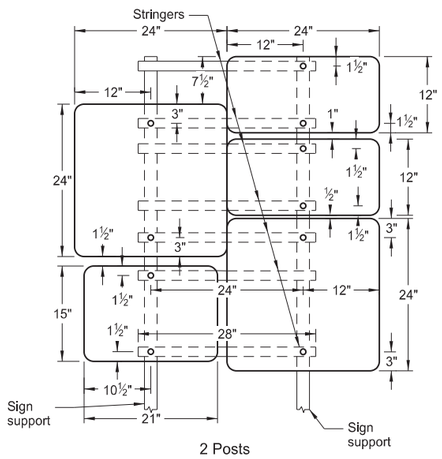
ENGINEER
NORTH DAKOTA
08/08/24

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

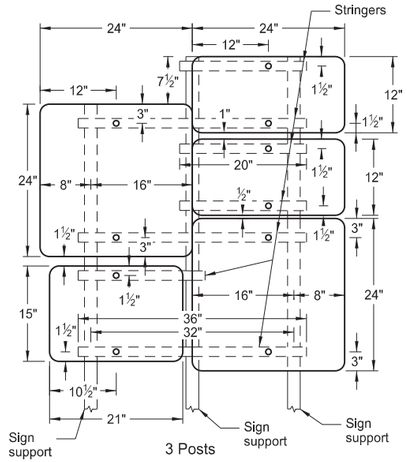
D-754-74



1 Post



2 Posts

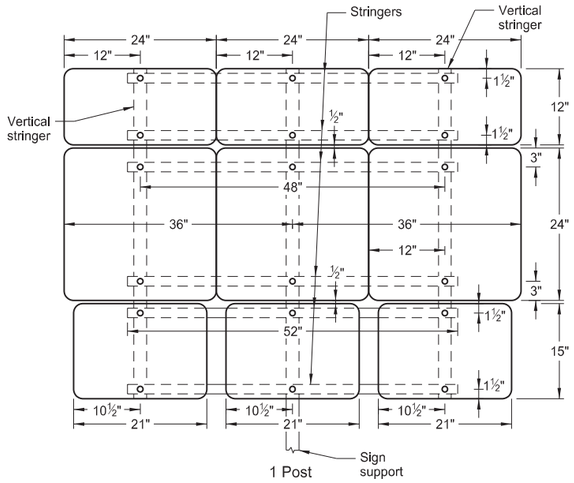


3 Posts

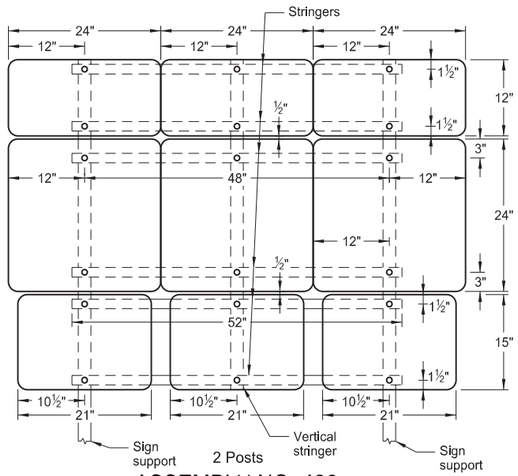
ASSEMBLY NO. 435

Notes:

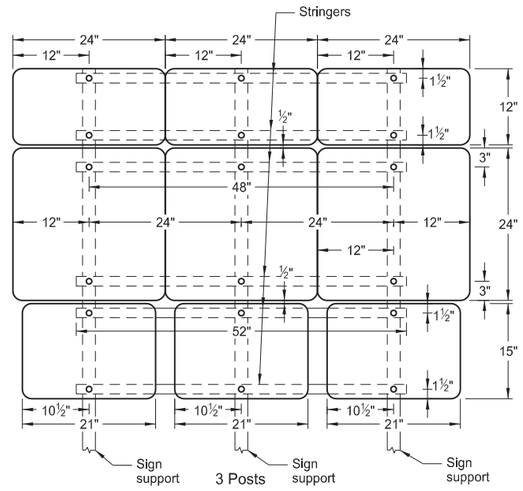
1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½"x1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.



1 Post

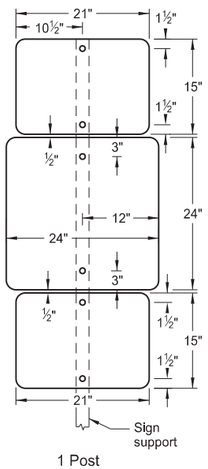


2 Posts

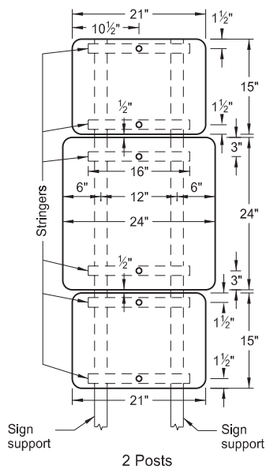


3 Posts

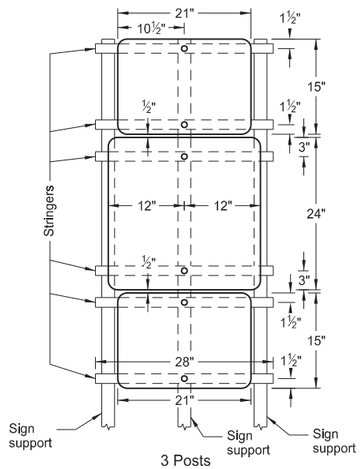
ASSEMBLY NO. 436



1 Post



2 Posts



3 Posts

ASSEMBLY NO. 437

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-25-12	
REVISIONS	
DATE	CHANGE
~~8-30-18~~	~~Updated notes to active voice.~~
~~9-05-19~~	~~New Design Engineer PE Stamp.~~
8-08-24	Electronic Stamp/Signature.

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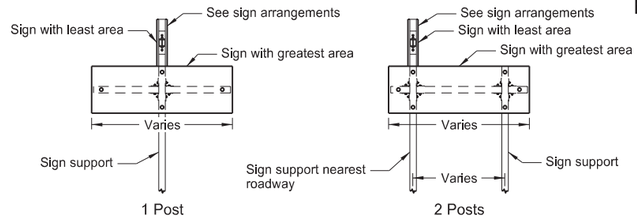
ENGINEER
NORTH DAKOTA

08/08/24

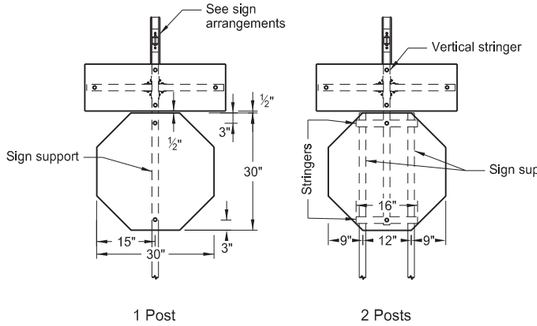
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS FOR STREET NAME SIGNS AND 911 SIGNS

D-754-87

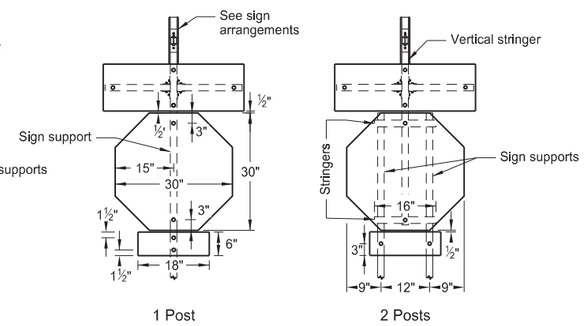
A - Single sign
B - Single sign back to back
C - Single sign each direction
D - Single sign one direction, back to back other direction
E - Back to back both directions



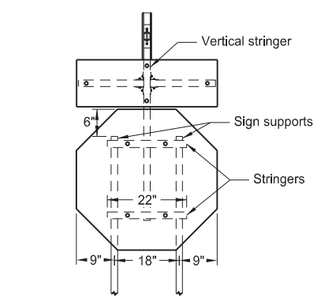
Special Assembly 1 (A, B, C, D or E)

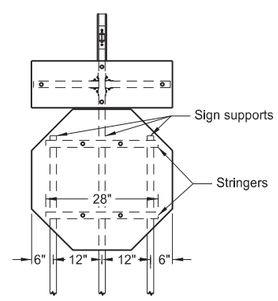


Special Assembly 2 (A, B, C, D or E)

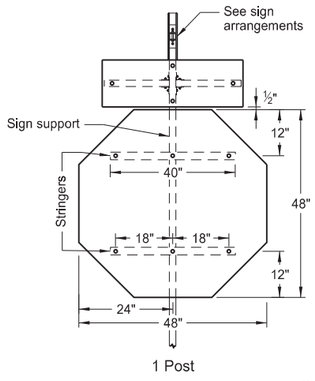


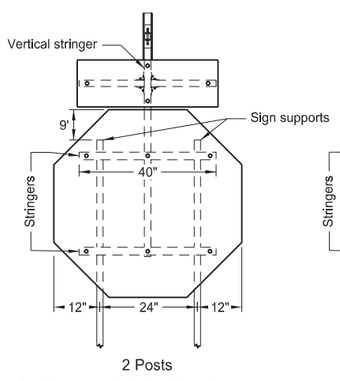
Special Assembly 3 (A, B, C, D or E)

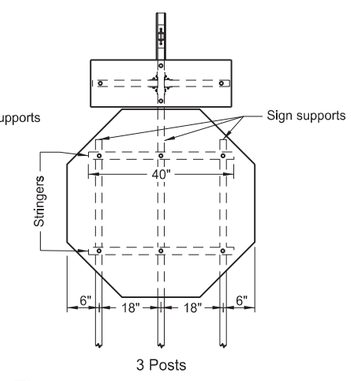




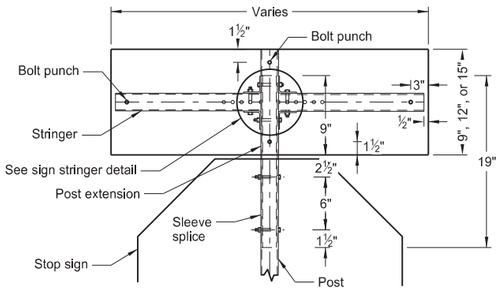
Special Assembly 4 (A, B, C, D or E)





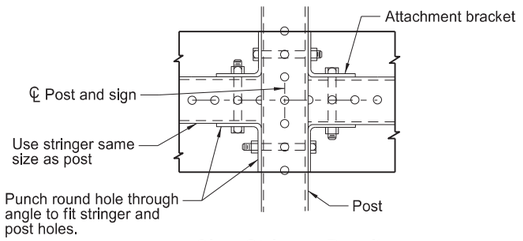


Special Assembly 5 (A, B, C, D or E)



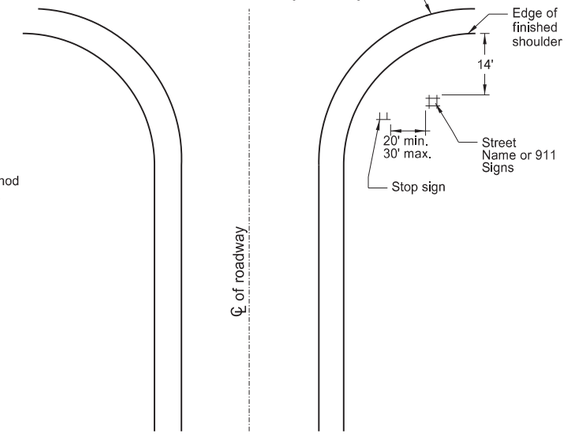
Sleeve Splice Detail

Note: Only use splice method with approval of engineer.



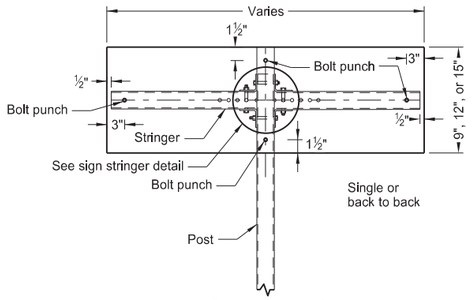
Sign Stringer Detail

Note: See Standard Drawing D-754-86 for 911 support information and sign layout details.

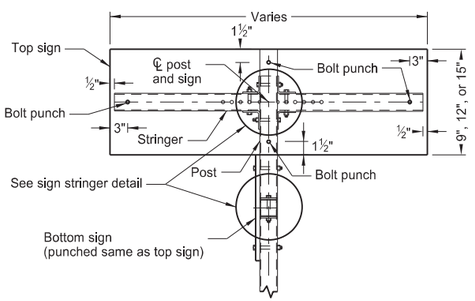


Intersection Layout

Note: Use layout for street name signs or 911 signs with Special Assembly 1 .

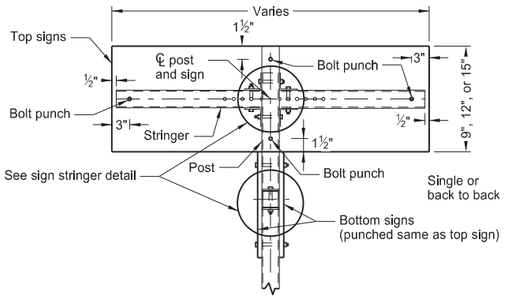


Detail A or B



Detail C

Sign Arrangements



Detail D or E

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
8-30-18	Added 2 post layout for SA1 and Updated notes to active voice.
9-05-19	New Design Engineer PE Stamp.
8-08-24	Electronic Stamp/Signature.

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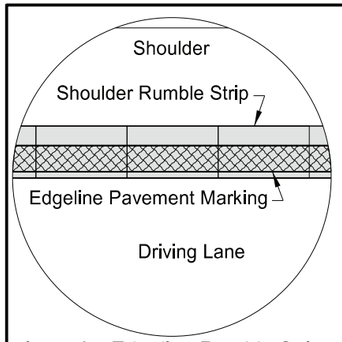
NORTH DAKOTA

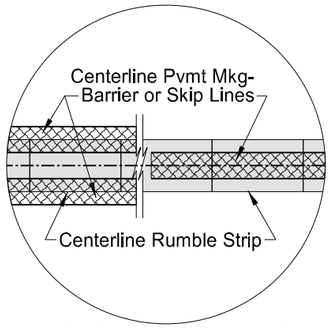
08/08/24

RUMBLE STRIPS
UNDIVIDED HIGHWAYS (SHOULDERS LESS THAN 4')

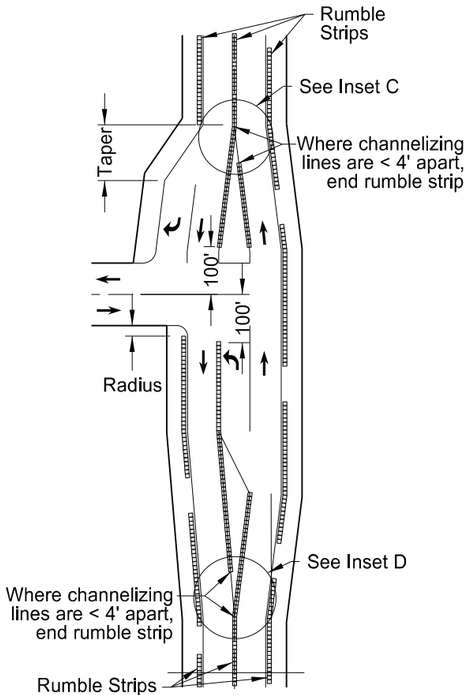
D-760-4



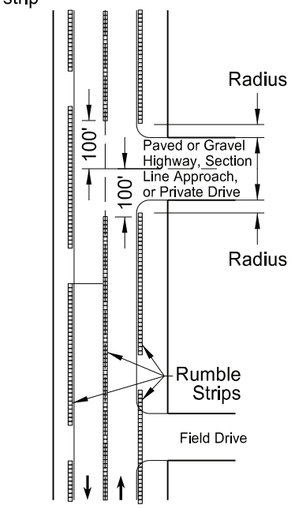
Inset A - Edgeline Rumble Strip
(Layout for opposite shoulder reversed)



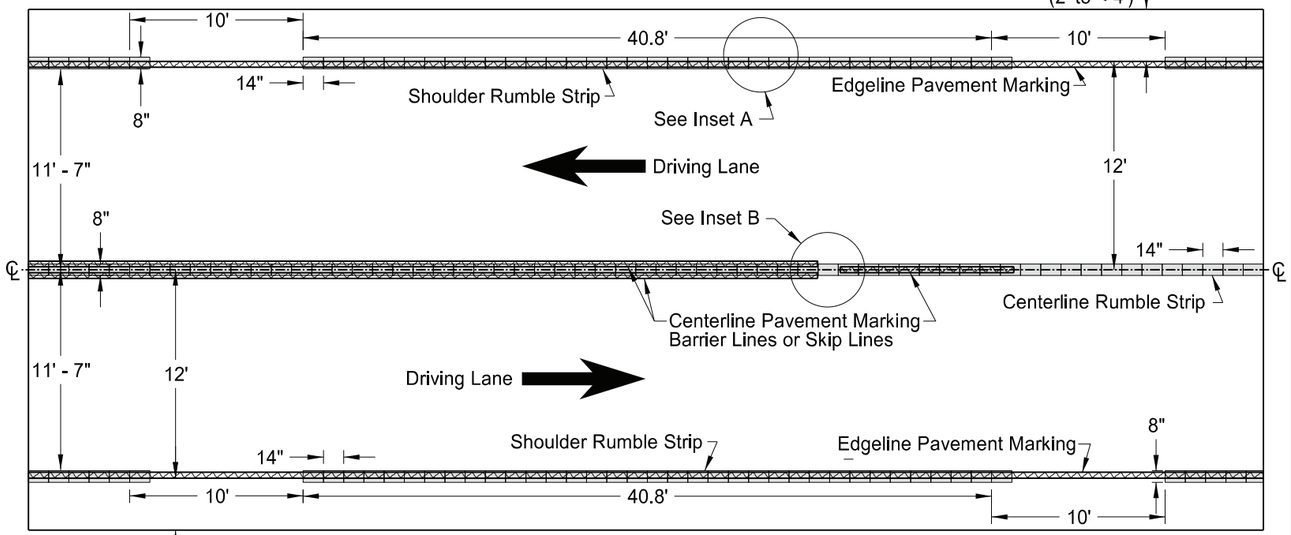
Inset B - Centerline Rumble Strip



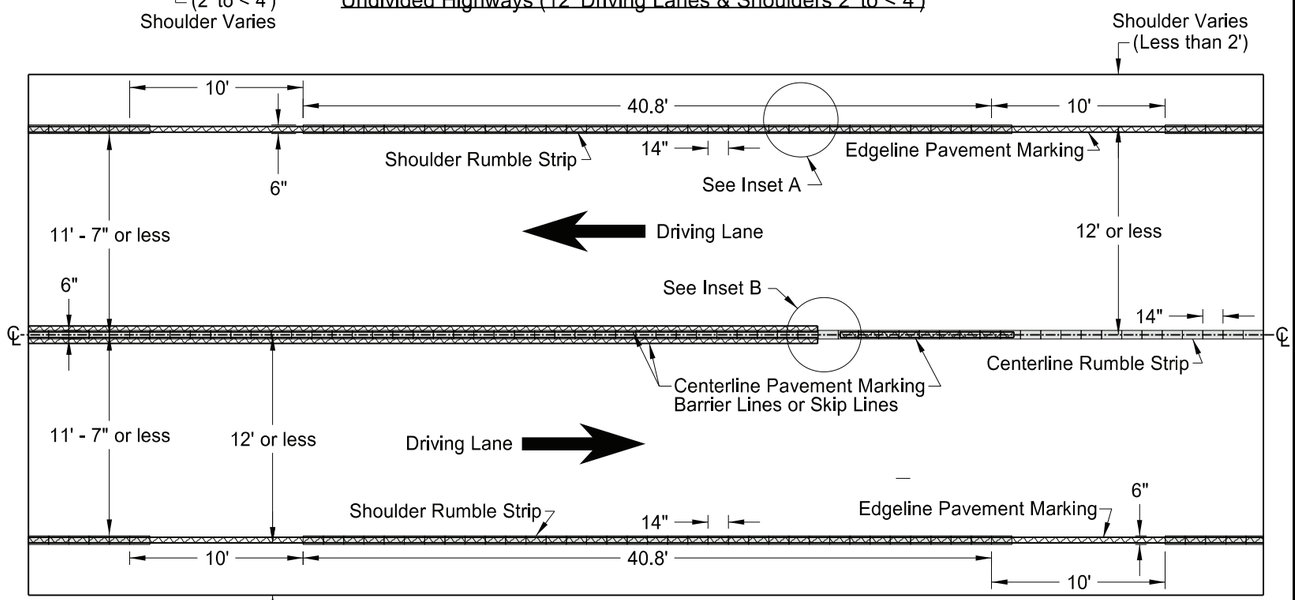
Turn Lane
(Right & Left)



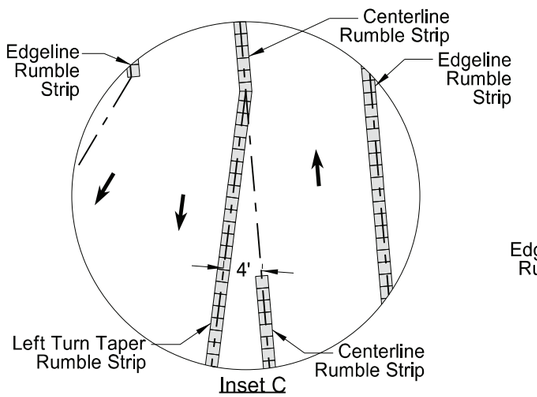
Entrance Roadways



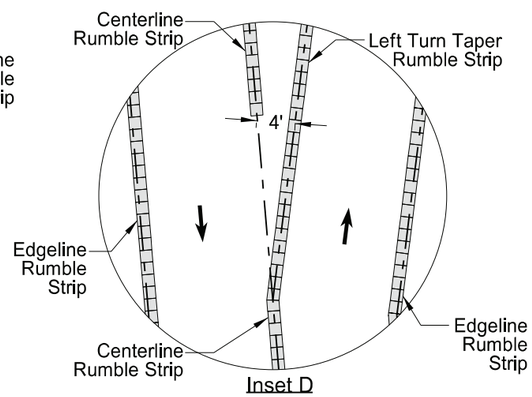
Undivided Highways (12' Driving Lanes & Shoulders 2' to < 4')



Undivided Highways (12' Driving Lanes or less & Shoulders Less than 2')



Inset C



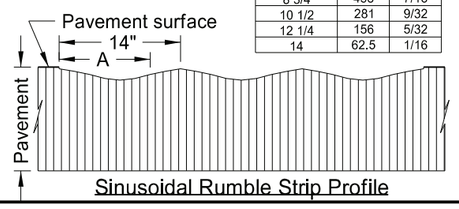
Inset D

NOTES:
1) Discontinue shoulder rumble strips through the entire length of right turn lanes and tapers, and at the radius of paved or gravel highways, section line approaches, or private drives.

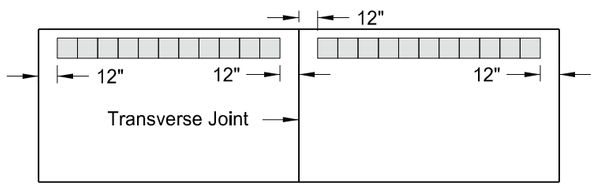
2) Discontinue centerline rumble strips 100' before and after paved or gravel highways, section line approaches, or private drives. Place rumble strips at left turn lanes as shown below.

3) No additional quantity provided for centerline rumble strips on left turn tapers. Include all costs for centerline rumble strips on left turn tapers in the price bid for "Sinusoidal Rumble Strip - Asphalt Centerline" or "Sinusoidal Rumble Strip - Concrete Centerline".

Milling Depths		
Location A (in)	Depth	
	MIL	in
0	62.5	1/16
1 3/4	156	5/32
3 1/2	281	9/32
5 1/4	438	7/16
7	500	1/2
8 3/4	438	7/16
10 1/2	281	9/32
12 1/4	156	5/32
14	62.5	1/16



Sinusoidal Rumble Strip Profile



Discontinue rumble strip approx. 12" on both sides of PCC transverse joint

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-29-09	
REVISIONS	
DATE	CHANGE
2-25-10	Note 4 was added.
4-19-10	Revised Note 5, Note 6, and Turn Lane (Right & Left).
9-08-11	Revised Notes and D-760-4.
1-26-12	Revised details for rumble strip widths and dimensions.
10-25-19	Added missing dimensions.
11-16-21	Revised turn lane rumble layout.
3-07-23	Added Note 3.
5-26-23	Rumble Strips made Sinusoidal.

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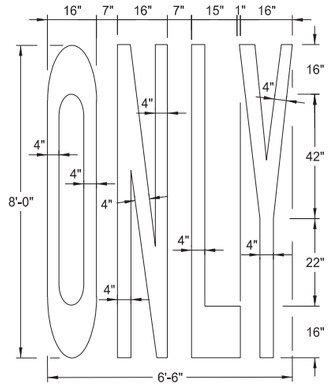
NORTH DAKOTA

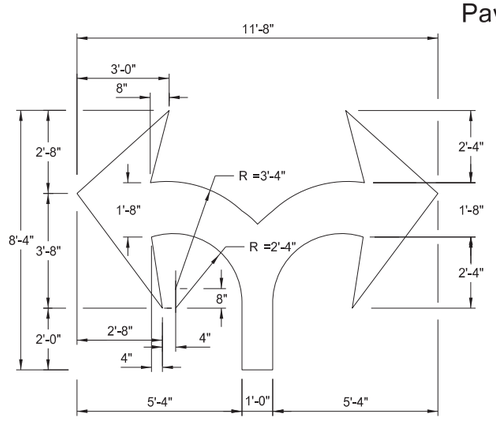
05/26/23

Pavement Marking Message Details

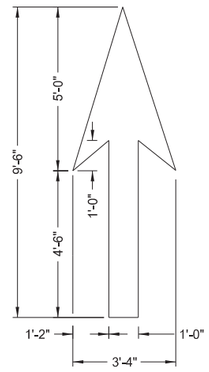
D-762-1



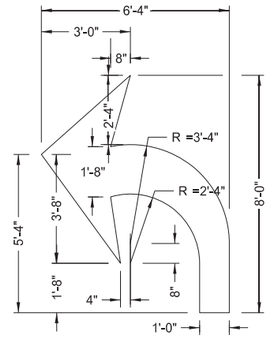
22 S. F.



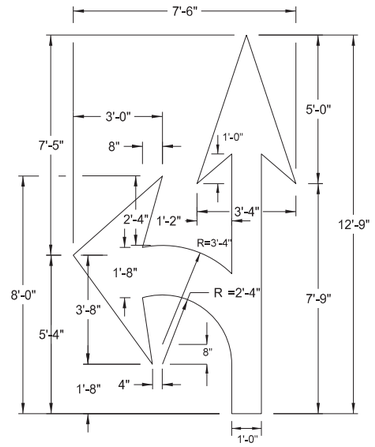
29 S. F.



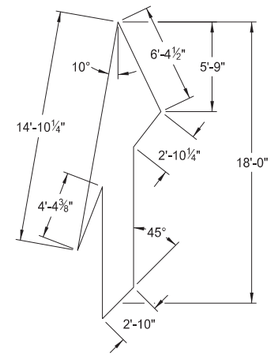
12 S. F.



16 S. F.

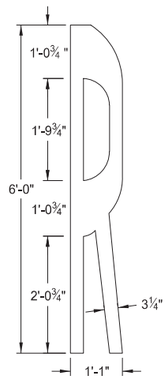


27 S. F.

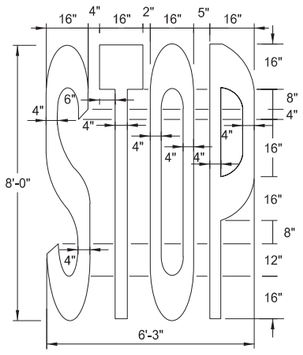


41 S. F.

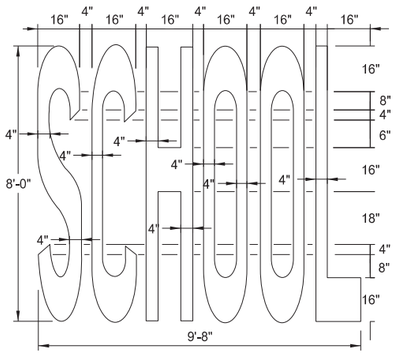
Note: Rotate merge arrow 20° from edge of roadway.



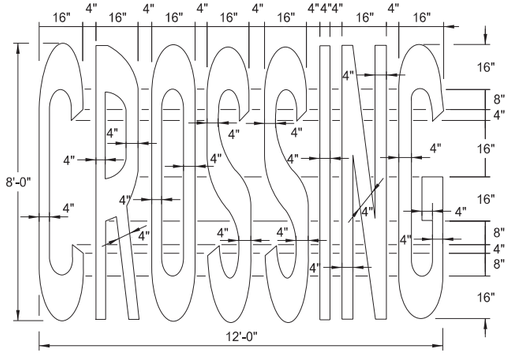
4 S. F.



22 S. F.



34.5 S. F.

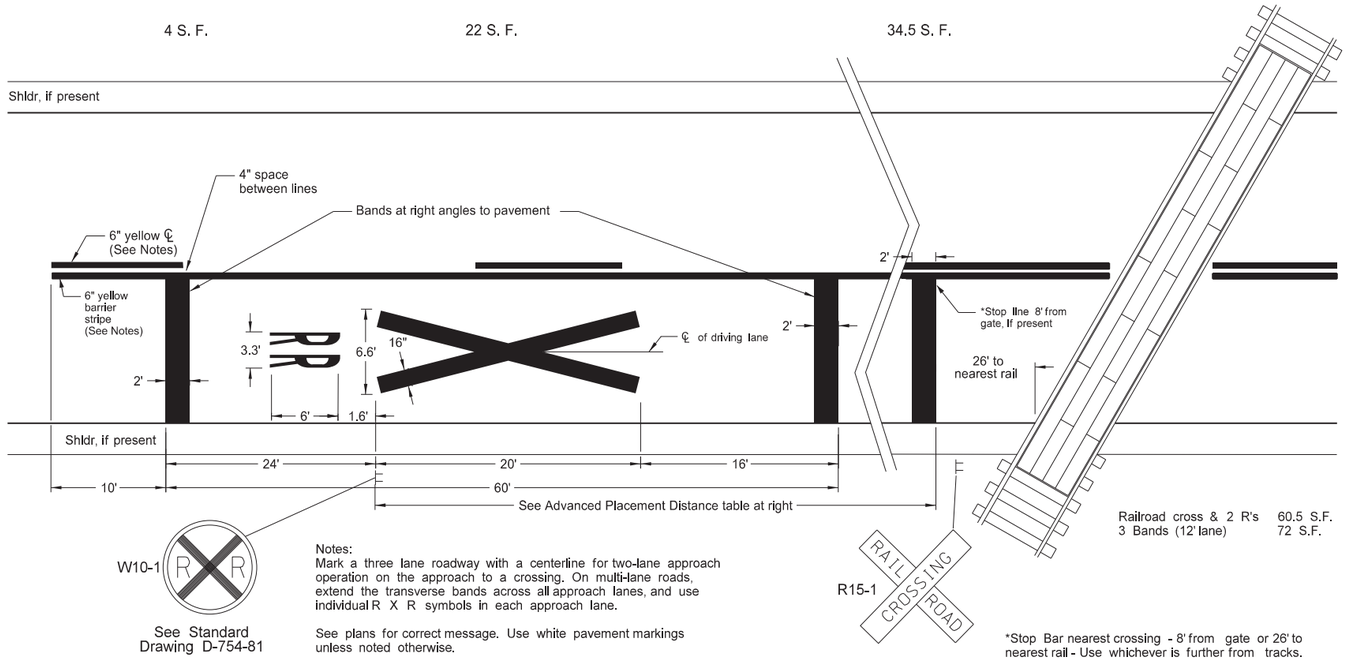


46 S. F.

Speed Limit	Chevron Width	Chevron Spacing 45° to Traffic
0-25 mph	8"	5'
30-40 mph	8"	15'
45 mph and above	12"	25'

Chevron Crosshatching Table

Centerline Pavement Marking Skip Spacing Detail



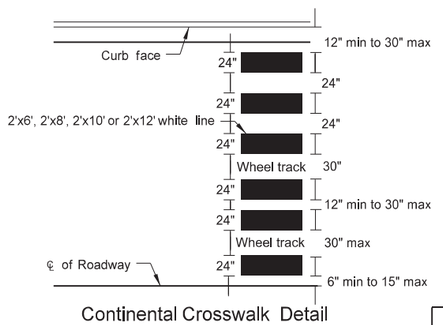
Notes:
Mark a three lane roadway with a centerline for two-lane approach operation on the approach to a crossing. On multi-lane roads, extend the transverse bands across all approach lanes, and use individual R X R symbols in each approach lane.

See plans for correct message. Use white pavement markings unless noted otherwise.

Railroad cross & 2 R's 60.5 S.F.
3 Bands (12' lane) 72 S.F.

*Stop Bar nearest crossing - 8' from gate or 26' to nearest rail - Use whichever is further from tracks.

Advance Placement Distance for Railroad Warning Signs	
Posted or 85th Percentile Speed	Advance Distance
20 mph	min. 100 ft
25 mph	min. 100 ft
30 mph	min. 100 ft
35 mph	min. 100 ft
40 mph	125 ft
45 mph	175 ft
50 mph	250 ft
55 mph	325 ft
60 mph	400 ft
65 mph	475 ft
70 mph	550 ft



Continental Crosswalk Detail

NOTES:

1. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
2. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

12-6-11

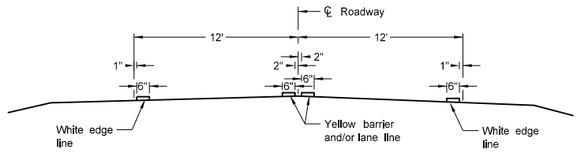
REVISIONS

DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.
01-28-2020	Revised min Stop Bar distance to rail.
11-22-2023	Revised pavement marking widths.

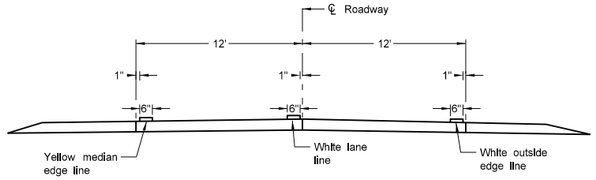
KIRK J. HOFF REGISTERED PROFESSIONAL PE-4683 11/22/23 ENGINEER NORTH DAKOTA

PAVEMENT MARKING

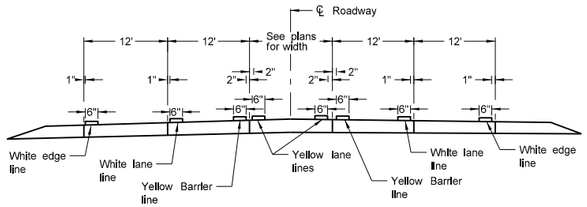
D-762-4



Two Lane Two Way
RURAL ROADWAY



Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



RURAL FIVE LANE ROADWAY
Concrete Section

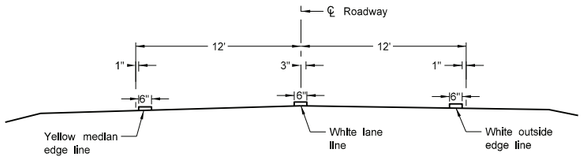
NOTES:

1. Continue edge lines through private drives and field drives. Break edge lines for intersections.

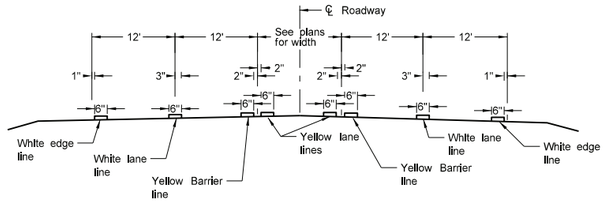
   For section lines, county roads, and street approaches, stripe the radii and edge lines of the paved surface within the right of way except where curb and gutter is present.

2. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph,

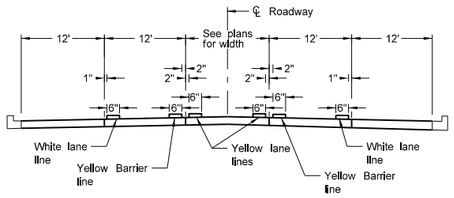
3. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits < 40 mph.



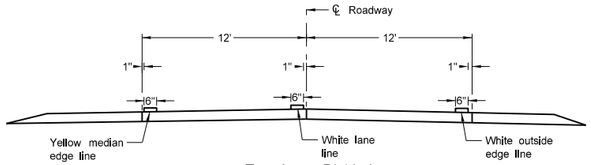
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



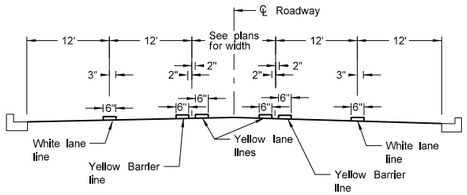
RURAL FIVE LANE ROADWAY
Asphalt Section



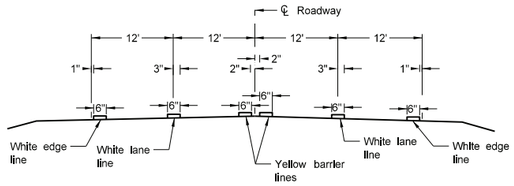
URBAN FIVE LANE SECTION
Concrete Section



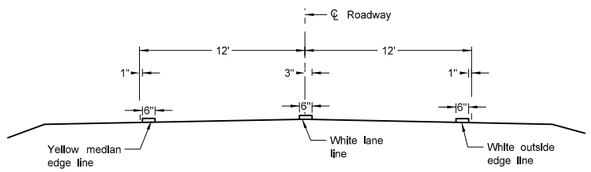
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Concrete Section



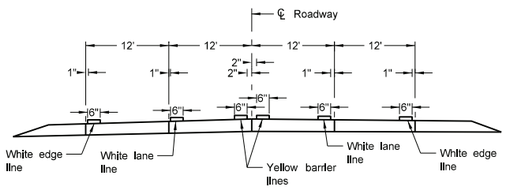
URBAN FIVE LANE SECTION
Asphalt Section



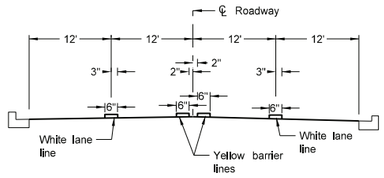
RURAL FOUR LANE ROADWAY
Asphalt Section



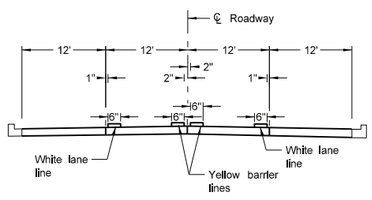
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



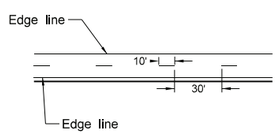
RURAL FOUR LANE ROADWAY
Concrete Section



URBAN FOUR LANE SECTION
Asphalt Section



URBAN FOUR LANE SECTION
Concrete Section



CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

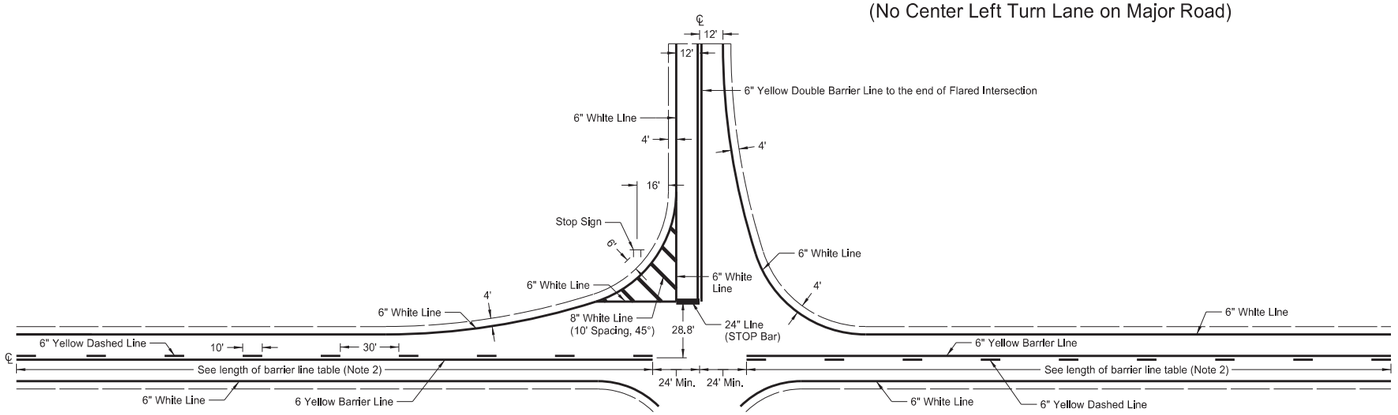
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.
11-22-23	Revised pavement marking widths.
07-09-24	Modified Note 1.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
07/09/24
ENGINEER
NORTH DAKOTA

PAVEMENT MARKING FOR STANDARD 90 DEGREE FLARED INTERSECTION

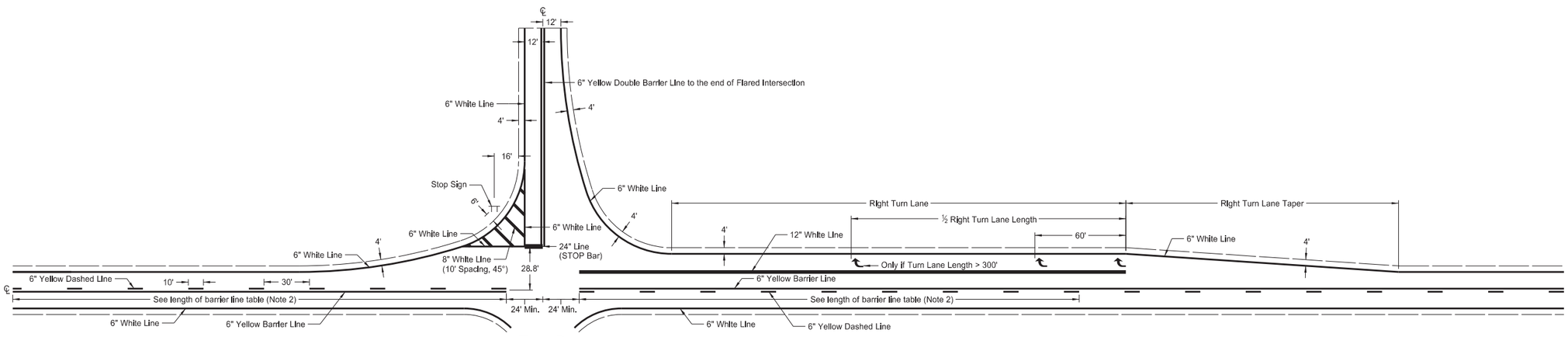
D-762-5

(No Center Left Turn Lane on Major Road)



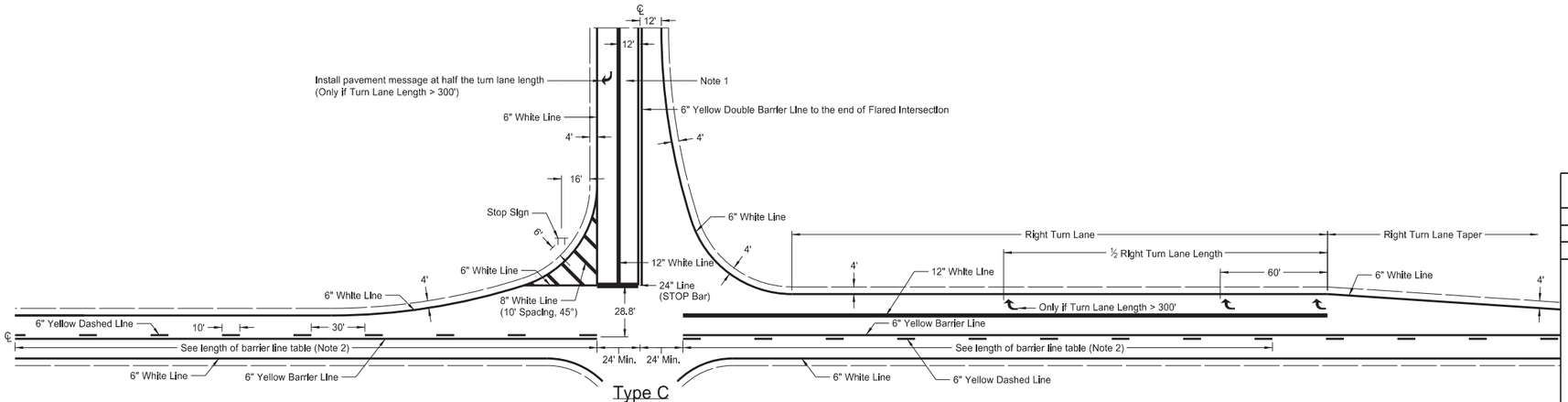
Type A

(No turn lanes present)



Type B

(Right Turn Lane on Major Road)



Type C

(Right Turn Lane on Major Road, and Turn Lane on Minor Road)

Notes

1. At "T" intersections (3-leg), additionally install left turn pavement marking message arrow.
2. The barrier lines have variable distances dependent on speed limit. Obtain barrier line length from table below (stopping sight distance.)
3. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
4. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40.
5. Wide line - 8 inches wide if 4 inch normal width lines are used and 12 inches wide if 6 inch normal width lines are used.

Table for Length of Barrier Line									
Speed Limit (mph)	30	35	40	45	50	55	60	65	70
Minimum Length	200'	250'	305'	360'	425'	495'	570'	645'	730'

6" Marking

8" Marking

12" Marking

24" Marking

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

3-29-16

REVISIONS

DATE	CHANGE
8-17-17	Updated note & dimensioning.
8-30-18	Corrected pvmt mkg placement.
8-27-19	New Design Engineer PE Stamp.
11-22-23	Revised pavement marking widths.
1-17-24	Revised wide pvmt mkg width.

KIRK J. HOFF
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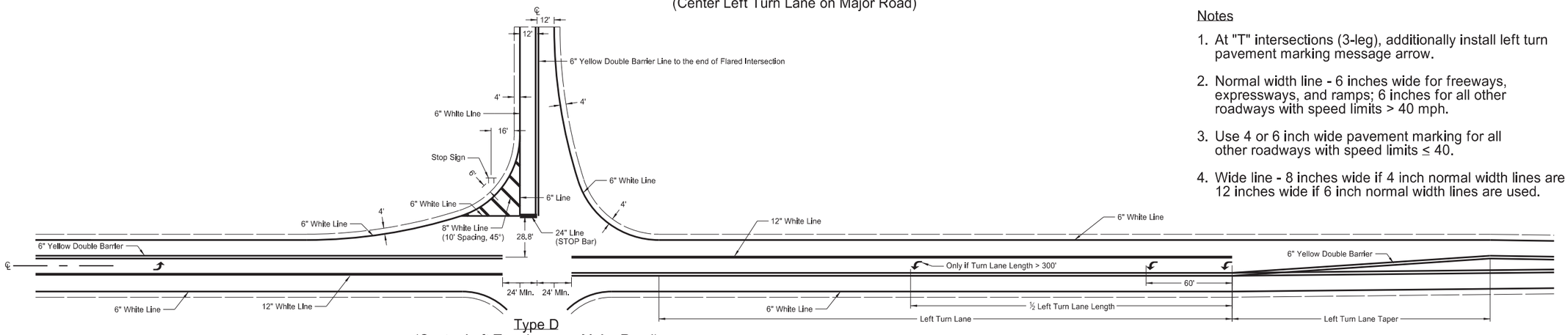
01/17/24
ENGINEER
NORTH DAKOTA

PAVEMENT MARKING FOR STANDARD 90 DEGREE FLARED INTERSECTION

D-762-6

(Center Left Turn Lane on Major Road)

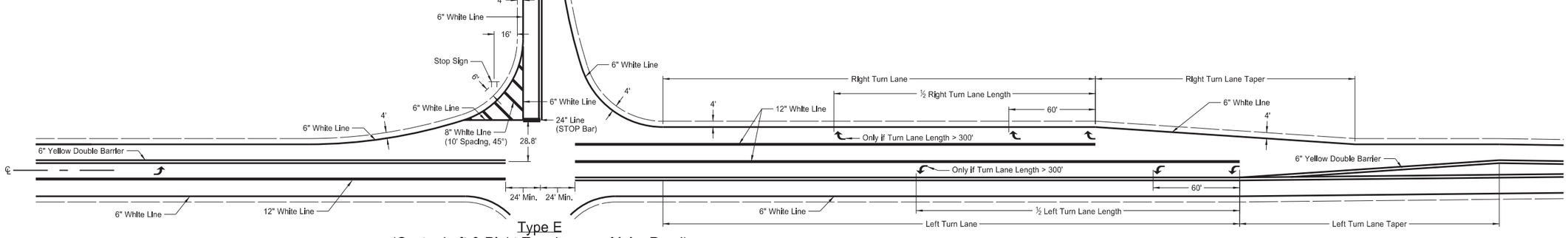


Type D

(Center Left Turn Lane on Major Road)

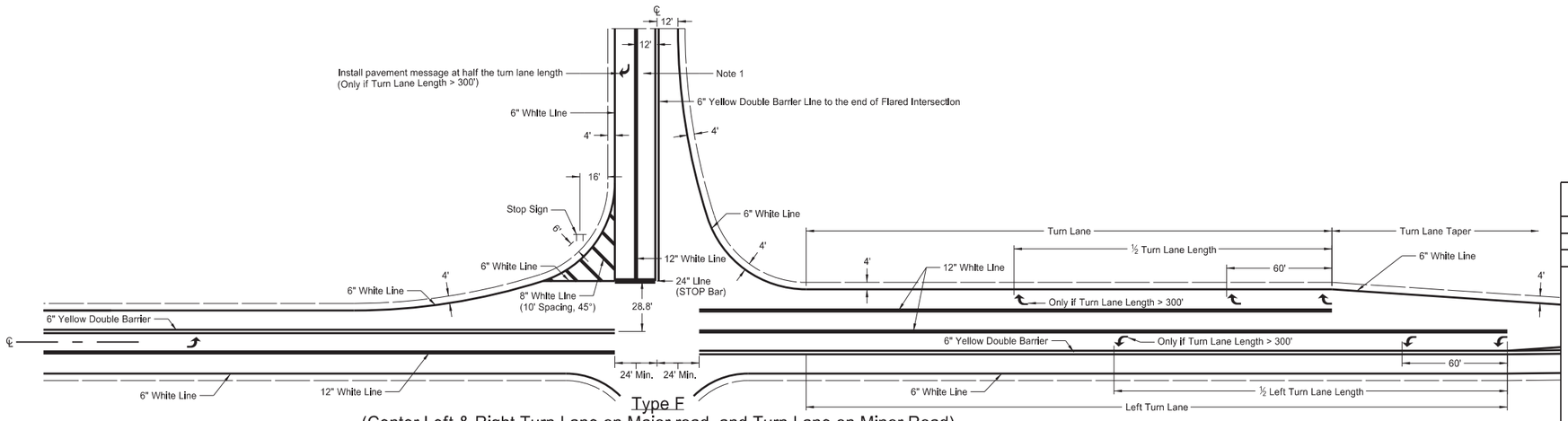
Notes

1. At "T" intersections (3-leg), additionally install left turn pavement marking message arrow.
2. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
3. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40.
4. Wide line - 8 inches wide if 4 inch normal width lines are used and 12 inches wide if 6 inch normal width lines are used.



Type E

(Center Left & Right Turn Lane on Major Road)



Type F

(Center Left & Right Turn Lane on Major road, and Turn Lane on Minor Road)

6" Marking

8" Marking

12" Marking

24" Marking

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
3-29-16	
REVISIONS	
DATE	CHANGE
8-17-17	Updated dimensioning.
8-27-19	New Design Engineer PE Stamp.
11-22-23	Revised pavement marking widths.
1-17-24	Revised wide pvmt mkg width.

KIRK J. HOFF
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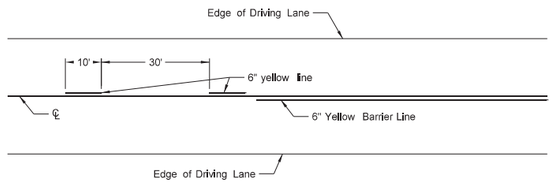
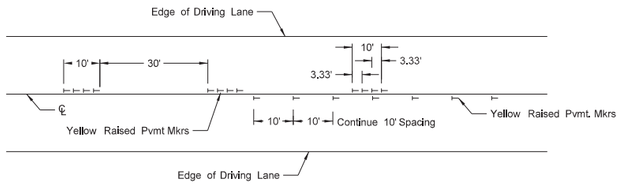
PROFESSIONAL
PE-4683
01/17/24
ENGINEER
NORTH DAKOTA

SHORT-TERM PAVEMENT MARKING

D-762-11

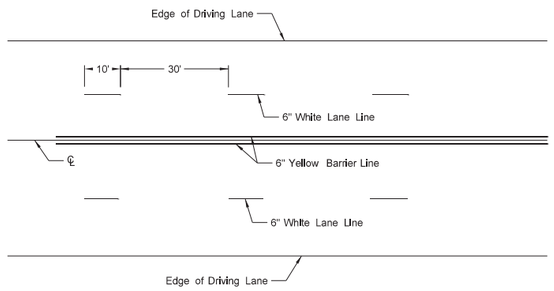


Painted or Tape Lines

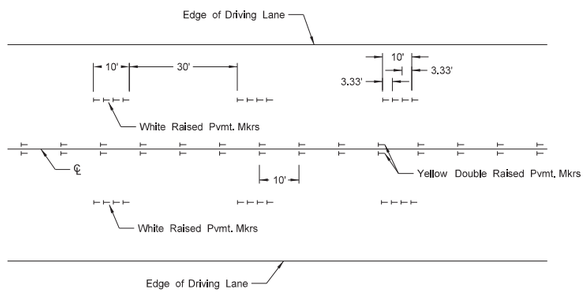


Raised Pavement Markers

TWO-LANE TWO-WAY ROADWAY

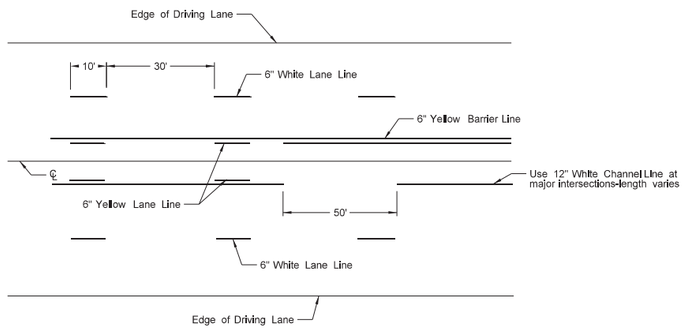


Painted or Tape Lines

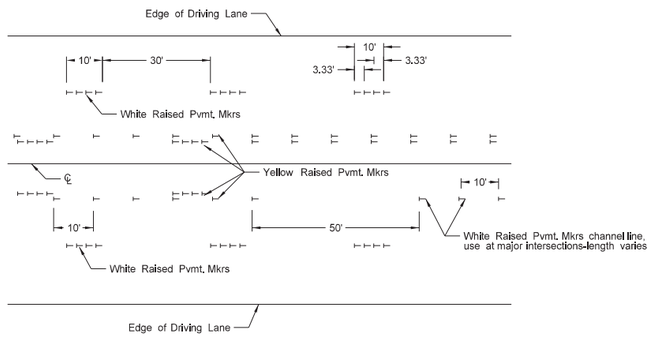


Raised Pavement Markers

FOUR LANE ROADWAY

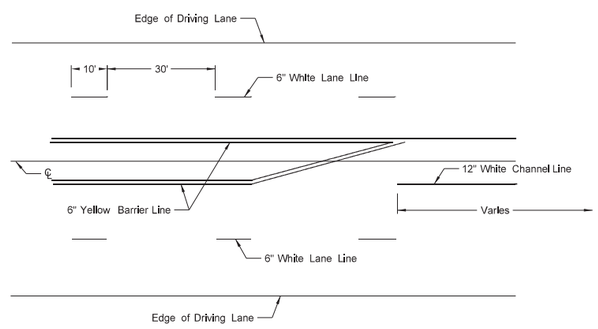


Painted or Tape Lines

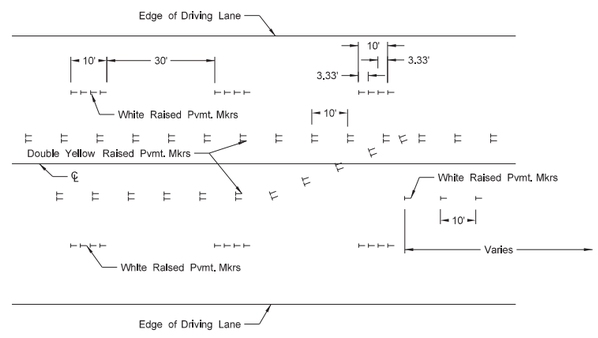


Raised Pavement Markers

FIVE LANE ROADWAY TWO WAY LEFT TURN



Painted or Tape Lines



Raised Pavement Markers

FIVE LANE ROADWAY WITH MARKED ISLANDS

NOTES:

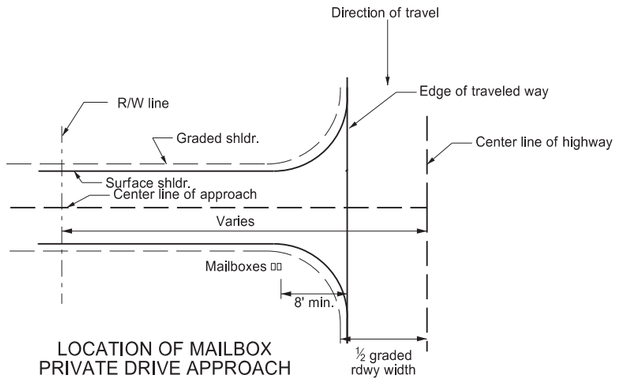
1. Place no passing zones on two-lane two-way roadways as shown. In lieu of short term no passing zone pavement markings, place no passing zone signs. Replace no passing zone signs with short term no passing zone pavement marking within three days.
2. Place short term center line stripe (paint) on top lift to match exact placement of permanent stripe.
3. Remove raised markers and tape markings after permanent pavement marking is installed.
4. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
5. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph.
6. Wide lines - 8 inches wide if 4 inch normal width lines are used and 12 inches wide if 6 inch normal width lines are used.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
3-29-16	Re-numbered to be D-762-11 (previously was D-762-6)
10-17-17	Updated to active voice.
8-27-19	New Design Engineer PE Stamp.
11-22-23	Revised pavement marking widths.
1-17-24	Revised wide pvmt marking width.

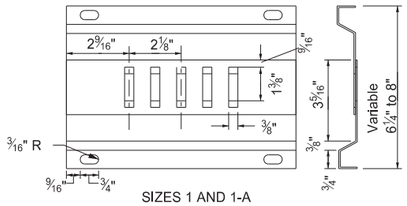
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
01/17/24
ENGINEER
NORTH DAKOTA

MAILBOX LOCATION DETAILS

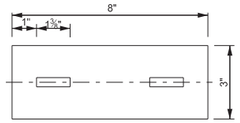
D-766-1



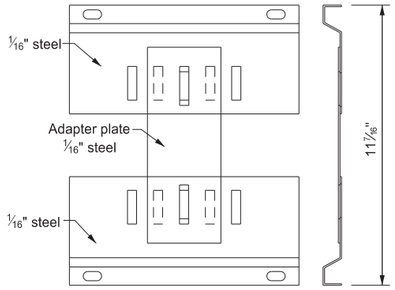
LOCATION OF MAILBOX
PRIVATE DRIVE APPROACH
ALTERNATE "A" LOCATION



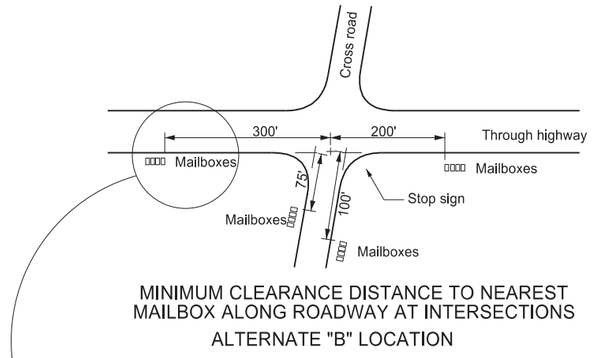
SIZES 1 AND 1-A
MOUNTING BRACKET



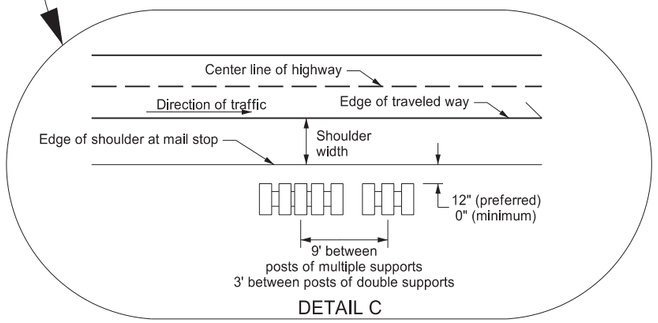
ADAPTOR PLATE



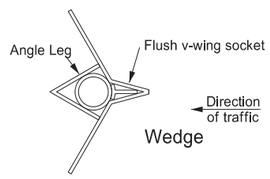
SIZE 2 WITH ADAPTOR PLATE
MOUNTING BRACKET



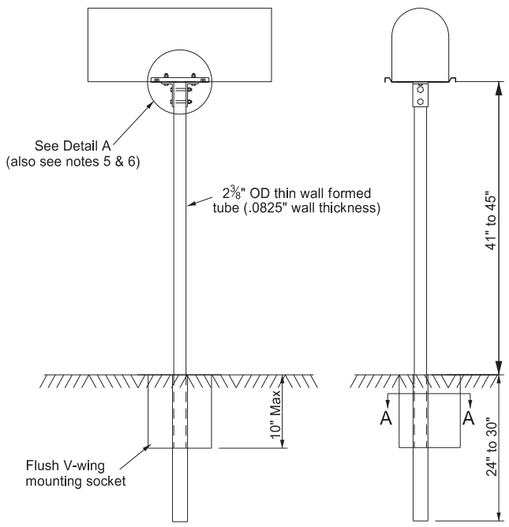
MINIMUM CLEARANCE DISTANCE TO NEAREST
MAILBOX ALONG ROADWAY AT INTERSECTIONS
ALTERNATE "B" LOCATION



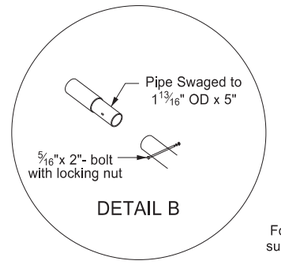
DETAIL C



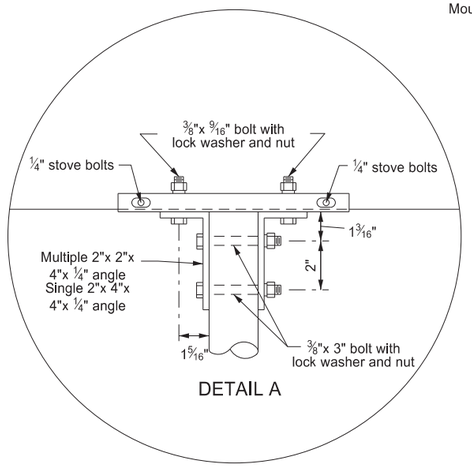
FLUSH V-WING
POST MOUNTING SOCKET
SECTION A-A



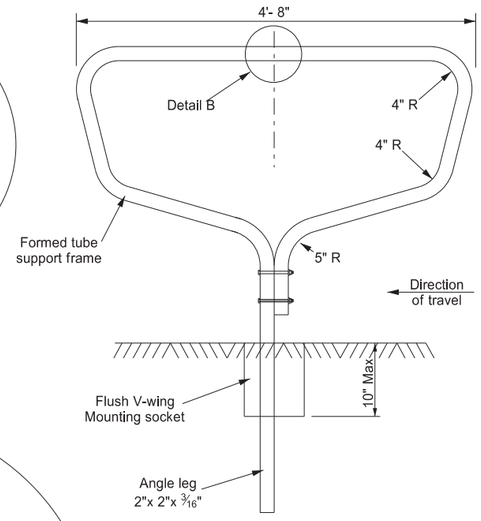
SIDE FRONT
SINGLE SUPPORT



DETAIL B



DETAIL A



FRONT

Notes:

1. The mailbox support and hardware details consist of the "V-Loc Mailbox Support System" manufactured by:

   Tapco Traffic & Parking Control Co. Inc.

   Use any equal crash tested and Federal Highway Administration approved support system meeting the requirements of NCHRP Report 350 or MASH. Install approved alternate mailbox assemblies in the manner and arrangement crash tested.

2. Install mailboxes in Alternate "A" locations when possible. Install mailboxes in Alternate "B" locations when warranted by existing field conditions.

3. Locate mailboxes on the right-hand side of the road in the direction traveled by the carrier. The Engineer will verify the correct direction with the postmaster before installion.

4. Install mailboxes on private drive approaches on the downstream side of the approach.

5. Install angle connection parallel to traffic flow for size 2 mailbox mounted on single posts.

6. For Size 2 mailbox mounted on multiple supports, attach the adapter plate to mounting bracket with 2 each, 3/8" by 9/16" bolts with lock washers and nuts. Then attach the unit to the formed tube support frame using 4 angle connections as shown in Detail A.

7. Space multiple support frames a minimum of 4 feet apart. Space single support frames a minimum of 3 ft apart. Do not place more than five No. 1 mailboxes, three No. 2 mailboxes, or any combination of four No. 1-A and No. 2 mailboxes on multiple support frames.

TABLE A

TYPICAL MAILBOX DIMENSIONS			
Size	Width	Height	Length
1	6½"	8½"	19"
1-A	8"	10½"	21"
2	11½"	13½"	23½"

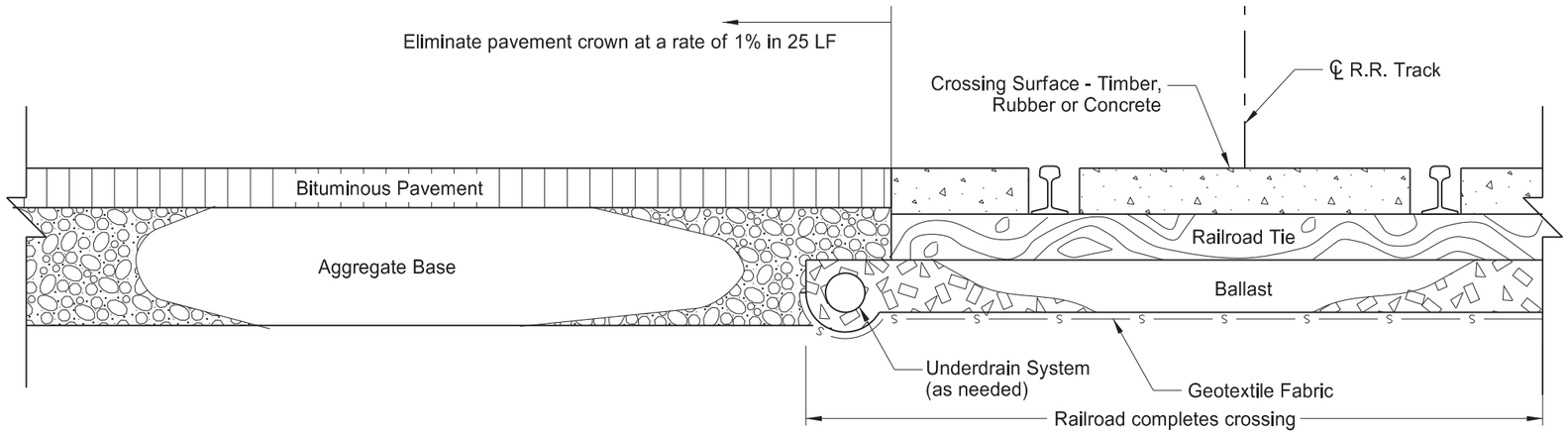
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-15-2010	
REVISIONS	
DATE	CHANGE
08-25-2023	Dsn Engr stamp/signature update

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/25/23

Pavement Details at Railroad Crossing

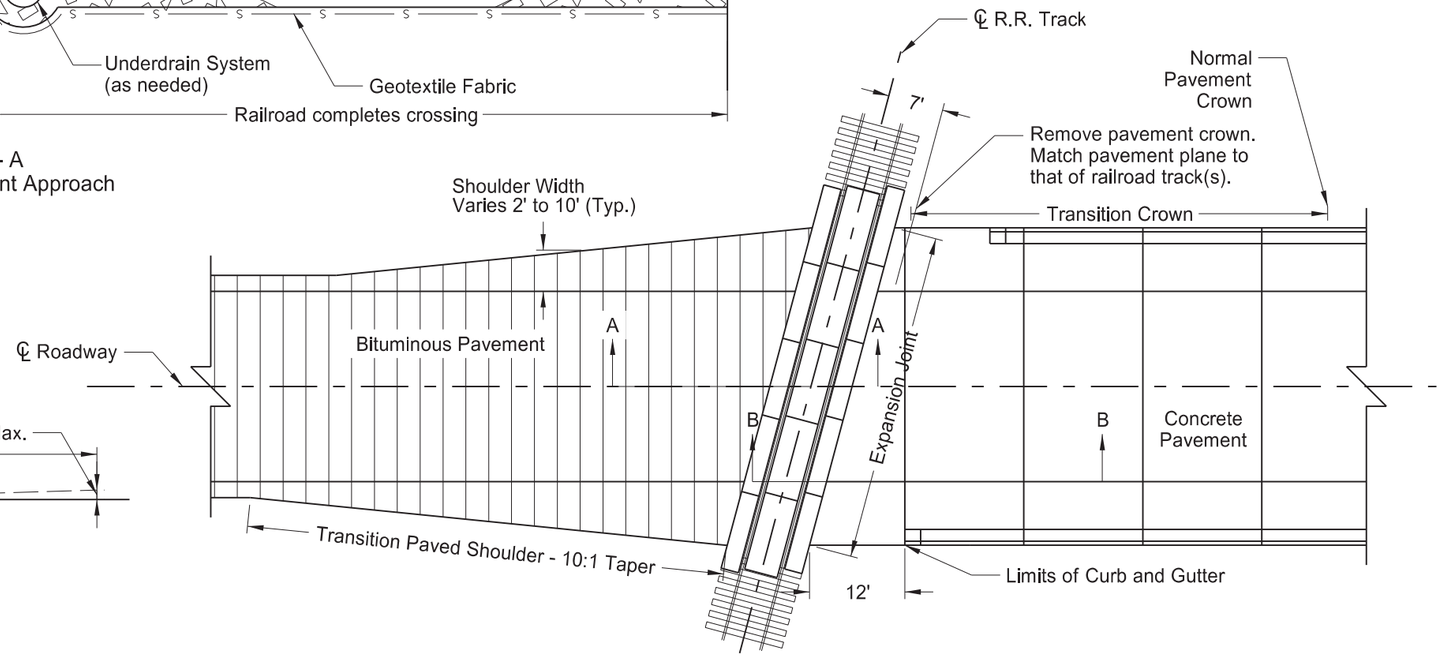
D-900-2



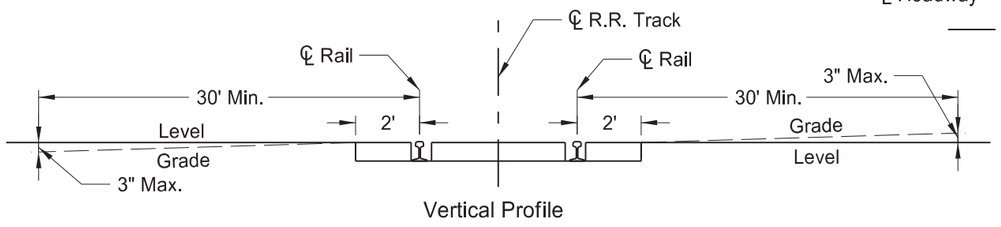
Section A - A
Bituminous Pavement Approach

Notes:

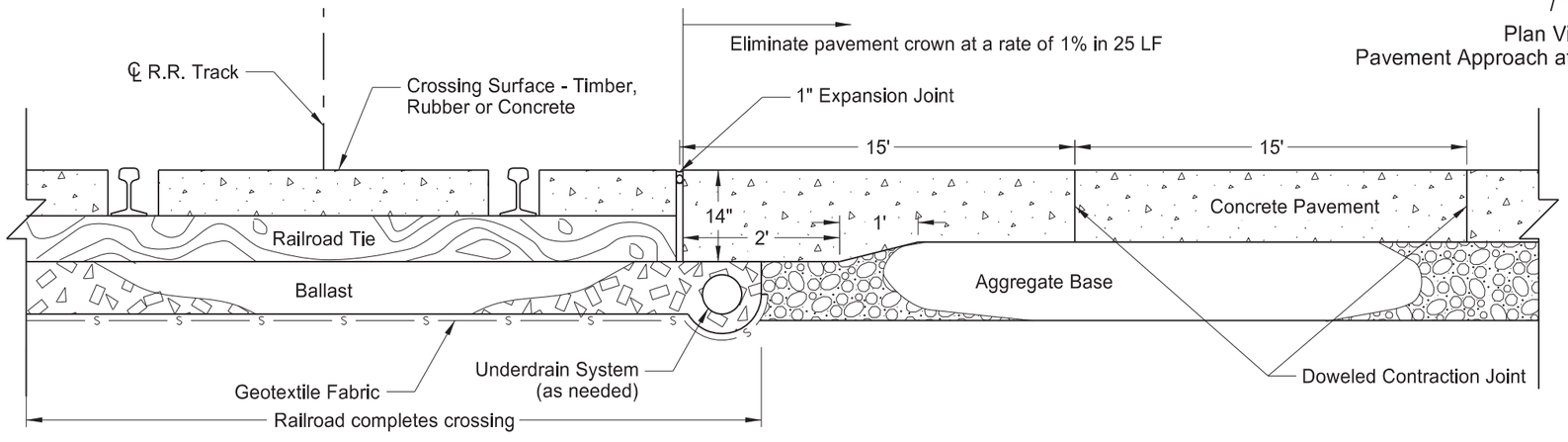
1. See typical section on plans for thickness of aggregate base, pavements and finished shoulder widths.
2. Basis of Estimate: Include all costs for the preformed expansion joint and additional concrete slab thickness in the price bid for concrete pavement pay items.



Plan View
Pavement Approach at Railroad Crossing



Vertical Profile



Section B - B
Concrete Pavement Approach and Joint Treatment

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
8-28-19	New Design Engineer PE Stamp.
8-09-24	Electronic Stamp/Signature.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/09/24