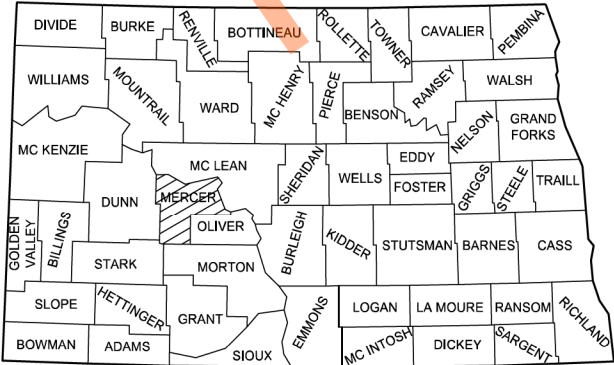
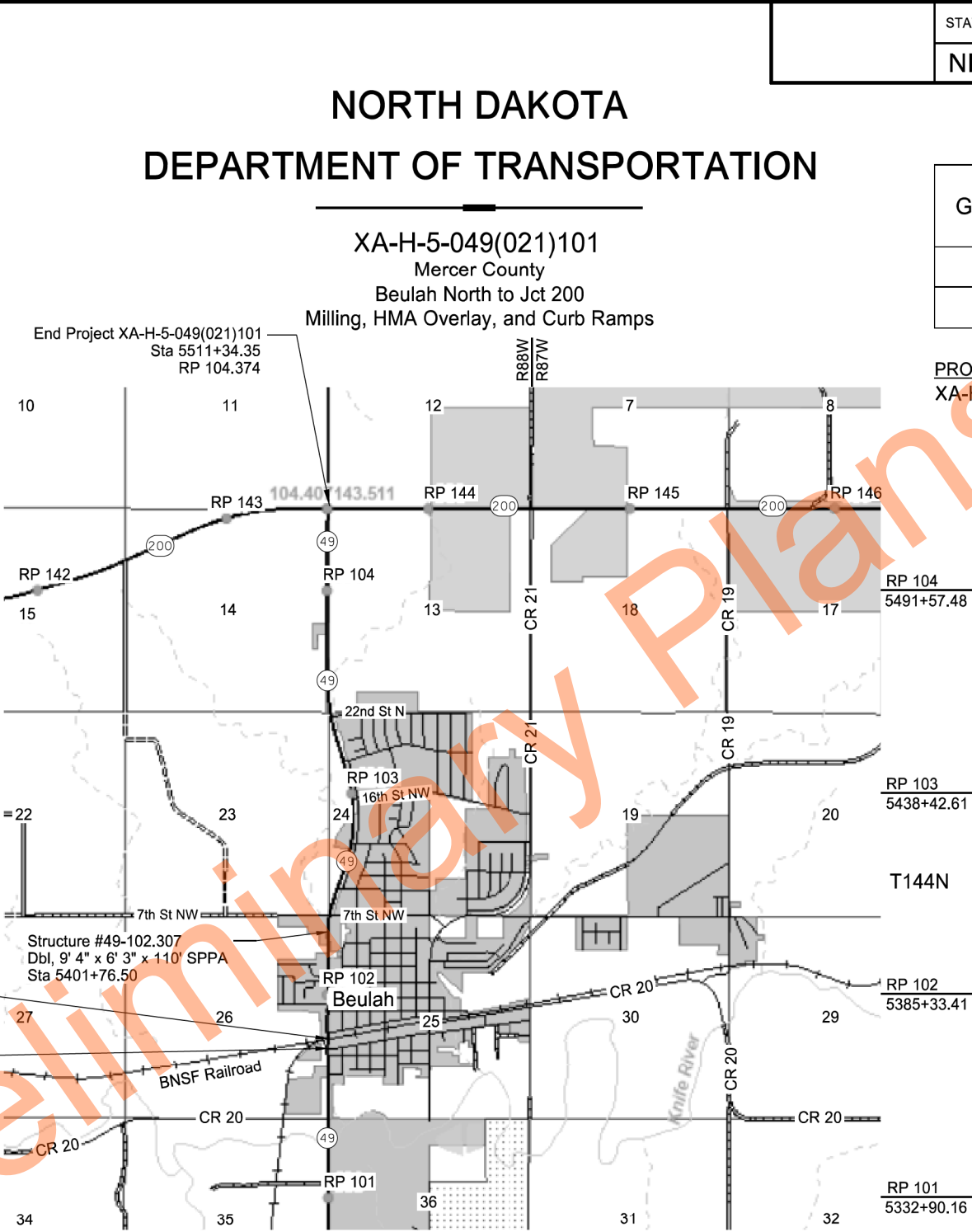


DESIGN DATA (RP 101.720 to 102.386)				
Traffic	Average Daily			
Current 2020	Pass: 3195	Trucks: 395	Total: 3590	
Forecast 2040	Pass: 3515	Trucks: 435	Total: 3950	
Clear Zone Distance: 16'		Design Speed: 25 mph		
Minimum Sight Dist. for Stopping: 155'		Bridges: N/A		
Sight Dist. for No Passing Zone: 450'				
Pavement Design Life 10 (years)				
Design Accumulated One-way Flexible ESALs: _____				
DESIGN DATA (RP 102.386 to RP 103.450, RP 104.151 to RP 104.374)				
Traffic	Average Daily			
Current 2020	Pass: 4220	Trucks: 470	Total: 4690	
Forecast 2040	Pass: 4645	Trucks: 520	Total: 5165	
Clear Zone Distance: 26'		Design Speed: 45 mph		
Minimum Sight Dist. for Stopping: 360'		Bridges: N/A		
Sight Dist. for No Passing Zone: 700'				
Pavement Design Life 10 (years)				
Design Accumulated One-way Flexible ESALs: _____				
DESIGN DATA (RP 103.450 to RP 104.151)				
Traffic	Average Daily			
Current 2020	Pass: 4220	Trucks: 470	Total: 4690	
Forecast 2040	Pass: 4645	Trucks: 520	Total: 5165	
Clear Zone Distance: 30'		Design Speed: 55 mph		
Minimum Sight Dist. for Stopping: 495'		Bridges: N/A		
Sight Dist. for No Passing Zone: 900'				
Pavement Design Life 10 (years)				
Design Accumulated One-way Flexible ESALs: _____				

DESIGNER Stacy Flaten
DESIGNER Austin Becker
DESIGNER



STATE COUNTY MAP



NORTH DAKOTA

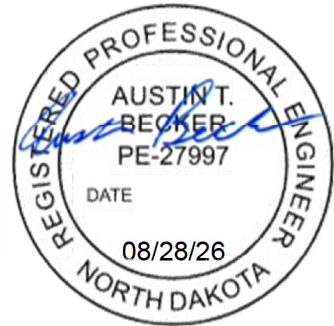
DEPARTMENT OF TRANSPORTATION

XA-H-5-049(021)101
Mercer County
Beulah North to Jct 200
Milling, HMA Overlay, and Curb Ramps

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	7/1/2025
Supplemental Specifications	NONE

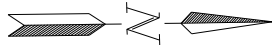
PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
XA-H-5-049(021)101	2.654	2.656

ACKERMAN-ESTVOLD

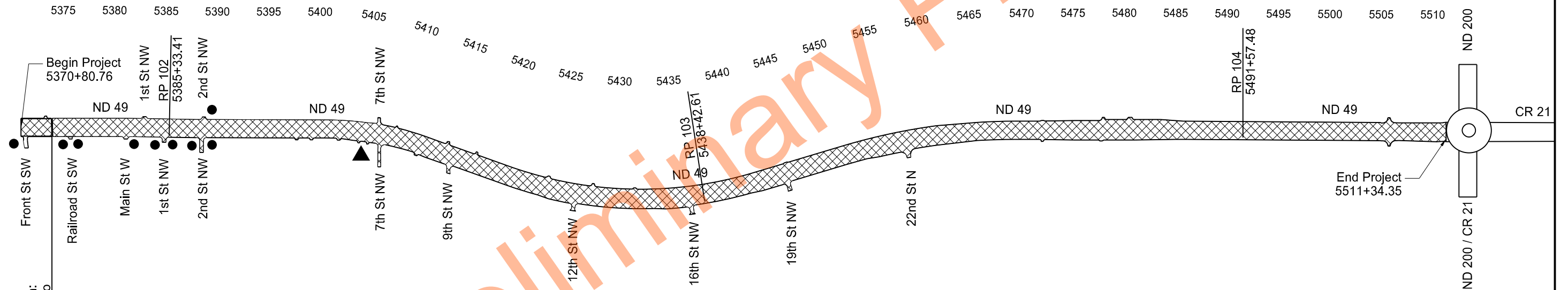


ND DEPARTMENT OF TRANSPORTATION
OFFICE OF PROJECT DEVELOPMENT
Kirk Hoff
08/28/26

TABLE OF CONTENTS						STATE	PROJECT NO.	SECTION NO.	SHEET NO.
						ND	XA-NH-5-049(021)101	2	1
PLAN SECTIONS			LIST OF STANDARD DRAWINGS						
Section	Page(s)	Description	Number	Description					
1	1	Title Sheet	D-101-1, 2, 3, 4	NDDOT Abbreviations					
2	1	Table of Contents	D-101-10	NDDOT Utility Company and Organization Abbreviations					
4	1	Scope of Work	D-101-20, 21	Line Styles					
6	1 - 2	Notes	D-101-30, 31, 32, 33	Symbols					
6	3	Environmental Notes	D-101-40	Cross Section Legend					
8	1 - 2	Quantities	D-261-1	Erosion Control - Fiber Roll Placement Details					
10	1	Basis of Estimate	D-704-2	Traffic Control For Coring Of Hot Bituminous Pavement					
11	1	Earthwork Summary	D-704-7	Breakaway Systems For Construction Zone Signs - Perforated Tube					
20	1 - 6	Details	D-704-8	Breakaway Systems For Construction Zone Signs - U-Channel Post					
30	1 - 10	Typical Sections	D-704-9	Construction Sign Details - Terminal And Guide Signs					
40	1 - 16	Removals	D-704-10	Construction Sign Details - Regulatory Signs					
51	1	Allowable Pipe List	D-704-11, 11A	Construction Sign Details - Warning Signs					
75	1 - 2	Wetland Impacts	D-704-12	Shoulder Closure Tapers					
76	1 - 7	Temporary Erosion Control	D-704-13	Barricade And Channelizing Device Details					
77	1 - 4	Permanent Erosion Control	D-704-14	Construction Sign Punching And Mounting Details					
80	1 - 4	Curb Ramp Layouts	D-704-15	Road Closure Layouts					
81	1	Survey Coordinate and Curve Data	D-704-19	Road Closure And Lane Closure On A Two Way Road Layouts					
82	1 - 4	Survey Data Layouts	D-704-20	Terminal And Seal Coat Sign Layouts					
90	1 - 12	Paving Layouts	D-704-22	Construction Truck And Temporary Detour Layouts					
100	1 - 9	Work Zone Traffic Control	D-704-24	Shoulder Closures And Bridge Painting Layouts					
110	1 - 14	Signing & Pavement Marking Layout	D-704-25	Lane Closures On Urban Streets Layouts					
200	1 - 3	Cross Sections	D-704-26	Miscellaneous Sign Layouts					
			D-704-27	Mobile Operation (Pavement Marking)					
			D-704-50	Portable Sign Support Assembly					
			D-706-1	Bituminous Laboratory					
			D-714-1	Reinforced Concrete Pipe Culverts And End Sections (Round Pipe)					
			D-714-22	Concrete Pipe, Cattle Pass, or Precast Concrete Box Culvert Ties					
			D-714-27	Pipe Installation Detail for Longitudinal Mainline Pipe or Pipe Not Under the Roadway					
			D-722-5	Manhole Details					
			D-748-1	Curb & Gutter And Valley Gutter					
			D-750-2	Sidewalk					
			D-750-3	Curb Ramp Retrofit Details					
			D-750-4	Curb Ramp Retrofit Transitional Area Details					
			D-754-19	(Conventional Use) Reference Markers					
			D-754-23	Perforated Tube Assembly Details					
			D-754-24, 25	Mounting Details Perforated Tube					
			D-754-24A	Breakaway Coupler System For Perforated Tubes					
			D-754-29, 31, 40	Sign Punching, Stringer and Support Location Details Regulatory, Warning and Guide Signs					
			D-754-46	Punching, Stringer and Support Location Details for Regulatory, Warning and Guide Bike Route Signs					
			D-754-81	Railroad Crossing Signs For Passive Grade Crossings					
			D-754-87	Sign Punching, Stringer And Support Location Details For Street Name Signs And 911 Signs					
			D-762-1	Pavement Marking Message Details					
			D-762-4	Pavement Marking					
			D-762-11	Short-Term Pavement Marking					
SPECIAL PROVISIONS									
Number	Description								
PSP 46(25)	Permits and Environmental Considerations								
SP 267(25)	Temporary Pedestrian Facilities								
SP 268(25)	Utility Coordination								
SP 269(25)	Railroad Requirements								
SP 270(25)	Commercial Grade Asphalt								
SP 271(25)	E Ticketing (Mandatory)								
SSP 4	Longitudinal Joint Density								



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	4	1



Legend

- Curb Ramp Improvements
- ▨ Milling Pavement Surface
RAP - Superpave FAA 45
- ▲ 7th St NW
Intersection Improvement

Scope of Work

ND 49
Beulah North to Jct 200

5370+80.76 to 5511+34.35



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-NH-5-049(021)101	6	1

NOTES

100-P01 ORDER OF OPERATION:

1. ADA Curb Ramp Revisions & 7th St NW Intersection Improvement
2. Milling
3. HMA (RAP – Superpave FAA 45)

107-115 RAILROAD PROTECTIVE LIABILITY INSURANCE: This project crosses the BNSF Railway Company at RP 101.78. The type of work that will be performed within the railroad right of way is milling, asphalt overlay, signing, and pavement marking. 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 087813E from the Federal Railroad Administration website: <http://safetydata.fra.dot.gov/Officeofsafety/>

107-500 PAVEMENT SWEEPING: Sweep the roadway adjacent to the construction area at the end of each day. Utilize a vacuum or pickup type sweeper.

107-P01 MAINTAINING TRAFFIC – UNEVEN SHOULDER: If a shoulder and the adjacent lane are uneven due to milling or paving operations, the requirements of Section 704.04 O, "Traffic Control for Uneven Pavement" apply. If the uneven shoulder and adjacent lane are due to other circumstances, the contents of this note apply. 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 G.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.

202-P01 REMOVAL OF CONCRETE: Concrete sidewalk, curb and gutter designated for removal may vary in thickness. There will be no additional compensation for the removal of extra thickness. Include the removal of aggregate or embankment beneath the sidewalk, curb and gutter in the costs of "Removal of Concrete Pavement" or "Removal of Curb & Gutter" bid items.

202-P02 REMOVAL OF BITUMINOUS SURFACING: Bituminous surfacing designated for full depth removal may vary in thickness. There will be no additional compensation for the removal of extra thickness. Include any costs for the removal of aggregate or embankment beneath the pavement in the "Removal of Bituminous Surfacing" bid item.

203-010 SHRINKAGE: 25 percent additional volume is included for shrinkage in earth embankment.

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

302-P01 WATER: The cost of water needed for compaction is incidental to Aggregate Base Course CL 5.

430-P01 COMMERCIAL GRADE HOT MIX ASPHALT: Use for replacing asphalt adjacent to the new curb and gutter areas.



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-NH-5-049(021)101	6	2

NOTES

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

1. Standard D-704-15, Type A; place layout A at north end of job, on the west, north, and east legs of the roundabout when milling and paving near the roundabout.
2. Standard D-704-19, Type F;
3. Standard D-704-20, Type G;
4. Standard D-704-22, Types K and L;
5. Standard D-704-25, Type X;
6. Standard D-704-26, Type CC, EE, and GG.

Place flaggers and traffic control devices as shown on Standard D-704-15, Type A or Wait for Pilot Car sign G20-4b-36 at the intersections when the ND 49 lane closure spans across them.

If all or portions of the lane closure are removed and uneven lanes exist, provide traffic control as specified in Section 704.04 O, "Traffic Control for Uneven Pavement".

Complete work in a manner such that lane closures can safely be removed if no work is to take place for more than 3 consecutive days. Remove lane closures if no work is to take place for more than 3 consecutive days.

The Department will pay for all necessary deployed devices, regardless of the number and length of the lane closures.

709-P01 GEOSYNTHETIC MATERIAL: Expose the existing geosynthetic material and overlap with proposed geosynthetic material a minimum of 18 inches.

709-P02 LOW GROUND PRESSURE EQUIPMENT: Replace Section 709.02 "Equipment", with the following:

Use equipment that applies less than 7.0 psi on the ground surface.

750-P01 SIDEWALK CONCRETE 4IN: There is an existing sprinkler system located in the NE quadrant of Railroad St SW. Exercise care in construction operations to ensure that no damage is done to the existing sprinkler system that is to remain in place. All costs to repair any damage will be at the Contractor's expense.

750-P02 DETECTABLE WARNING PANELS: Install yellow composite detectable warning panels that match the existing detectable warning panels.

970-P01 LANDSCAPE PREPARATION: Provide minimal grading and hydraulic mulch adjacent to the locations for sidewalk and curb & gutter replacement. Blend the

existing topsoil adjacent to the sidewalk and or curb & gutter to eliminate any steep slopes or vertical edges. Remove excess topsoil from the project site. Import topsoil if needed. Provide hydraulic mulch and seed mixture (NDDOT Class I).

Use hydraulic mulch material as specified in Sections 253.01 to 253.04 of the NDDOT Standard Specifications. Apply the hydraulic mulch after the seed is incorporated into the topsoil. Apply fertilizer at a rate of 100 pounds per acre with a mixture of 5-10-5. Include work necessary to restore landscaping, topsoil areas, seeding and mulching in unit price bid for "Landscape Preparation".



ENVIRONMENTAL NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-NH-5-049(021)101	6	3

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:

NOTIFICATIONS TO BE FILED BY CONTRACTOR:

EN-1 FAA Notice: Notification is required for work within 3 nautical miles of the airport. Complete the Federal Aviation Administration Notice of Proposed Construction or Alteration Form 7460-1 in accordance with 14 CFR 77.7 and 77.9 (at least 45 days before the start date of the proposed construction or alteration or the date an application for a construction permit is filed, whichever is earliest) (online at <http://oeaaa.faa.gov>).

Preliminary Plans



Estimated Quantities

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	8	1

SPEC	CODE	ITEM DESCRIPTION	UNIT	TOTAL
103	0100	CONTRACT BOND	L SUM	1
107	0100	RAILWAY PROTECTION INSURANCE	L SUM	1
107	0140	RAILROAD COORDINATION	L SUM	1
107	0145	RAILROAD FLAGGING	DAY	5
109	1000	E TICKETING	L SUM	1
201	0330	CLEARING & GRUBBING	L SUM	1
202	0114	REMOVAL OF CONCRETE PAVEMENT	SY	198
202	0130	REMOVAL OF CURB & GUTTER	LF	137
202	0132	REMOVAL OF BITUMINOUS SURFACING	SY	182
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES	EA	1
203	0140	BORROW-EXCAVATION	CY	22
255	0102	ECB TYPE 2	SY	22
261	0112	FIBER ROLLS 12IN	LF	560
261	0113	REMOVE FIBER ROLLS 12IN	LF	280
261	0200	WEIGHTED FIBER ROLLS	LF	225
261	0201	REMOVE WEIGHTED FIBER ROLLS	LF	225
302	0120	AGGREGATE BASE COURSE CL 5	TON	410
401	0050	TACK COAT	GAL	7945
411	0100	MILLING PAVEMENT SURFACE	TON	1663
430	0145	RAP - SUPERPAVE FAA 45	TON	12859
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT	TON	37
430	1000	CORED SAMPLE	EA	131
430	5818	PG 58H-34 ASPHALT CEMENT	TON	573
702	0100	MOBILIZATION	L SUM	1
704	0100	FLAGGING	MHR	700
704	1000	TRAFFIC CONTROL SIGNS	UNIT	4552
704	1052	TYPE III BARRICADE	EA	1
704	1054	SIDEWALK BARRICADE	EA	12
704	1058	PEDESTRIAN WALKWAY	LF	625
704	1060	DELINEATOR DRUMS	EA	10
704	1067	TUBULAR MARKERS	EA	211
704	1080	STACKABLE VERTICAL PANELS	EA	10
704	1185	PILOT CAR	HR	100
704	2108	TEMPORARY CURB RAMP	EA	9
706	0550	BITUMINOUS LABORATORY	EA	1
706	0600	CONTRACTOR'S LABORATORY	EA	1
708	1540	INLET PROTECTION-SPECIAL	EA	24
708	1541	REMOVE INLET PROTECTION-SPECIAL	EA	24
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	126
714	0310	PIPE CONC REINF 18IN CL III	LF	4
714	3010	END SECT-CONC REINF 18IN	EA	1
722	6140	ADJUST GATE VALVE BOX	EA	1
722	6200	ADJUST MANHOLE	EA	12
748	0140	CURB & GUTTER-TYPE I	LF	191
750	0115	SIDEWALK CONCRETE 4IN	SY	309
750	2115	DETECTABLE WARNING PANELS	SF	140
754	0110	FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING	SF	40

Estimated Quantities

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	8	2

SPEC	CODE	ITEM DESCRIPTION	UNIT		TOTAL
754	0112	FLAT SHEET FOR SIGNS-TYPE IV REFL SHEETING	SF	3	3
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	124	124
754	0563	REFERENCE MARKER-TYPE C	EA	1	1
754	0592	RESET SIGN PANEL	EA	2	2
762	0103	PVMT MK PAINTED-MESSAGE	SF	767	767
762	0434	SHORT TERM 8IN LINE-TYPE NR	LF	75500	75500
762	0436	SHORT TERM 24IN LINE-TYPE NR	LF	216	216
762	0437	SHORT TERM 12IN LINE-TYPE NR	LF	8858	8858
762	0442	SHORT TERM MESSAGE-TYPE NR	SF	1655	1655
762	1106	PVMT MK PAINTED 6IN LINE	LF	64003	64003
762	1112	PVMT MK PAINTED 12IN LINE	LF	4885	4885
762	1124	PVMT MK PAINTED 24IN LINE	LF	573	573
762	1140	PVMT MK PAINTED CURB TOP & FACE	LF	67	67
970	0008	LANDSCAPE PREPARATION	SY	473	473

BASIS OF ESTIMATE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-NH-5-049(021)101	10	1

Water (Incidental)
20 Gal/Ton for Aggregates

Pavement
Milling Pavement Surface @ 2 Ton/CY
Aggregate Base Course CL 5 @ 1.875 Ton/CY
Tack Coat @0.05 Gal/SY
RAP - Superpave FAA 45 @ 2 Ton/CY
PG 58H-34 Asphalt Cement @ 4.4%

Removal of Pavement
Aggregate Base @ 1.875 Ton/CY
Bituminous Pavement @ 2 Ton/CY
Concrete Pavement @ 2 Ton/CY

Subtotal Description						
Spec - Code	Item Description	Unit	Section 20 Sheet 6	Section 40	Section 80	Section 90
202 - 0114	REMOVAL OF CONCRETE PAVEMENT	SY		198		
202 - 0130	REMOVAL OF CURB & GUTTER	LF		137		
202 - 0132	REMOVAL OF BITUMINOUS SURFACING	SY		182		
302 - 0120	AGGREGATE BASE COURSE CL 5	TON	211		177	22
401 - 0050	TACK COAT	GAL				7,945
411 - 0100	MILLING PAVEMENT SURFACE	TON		1,663		
430 - 0145	RAP - SUPERPAVE FAA 45	TON				12,859
430 - 0500	COMMERCIAL GRADE HOT MIX ASPHALT	TON			37	
430 - 5818	PG 58H-34 ASPHALT CEMENT	TON				573
709 - 0100	GEOSYNTHETIC MATERIAL TYPE G	SY			126	
748 - 0140	CURB & GUTTER-TYPE I	LF			191	
750 - 0115	SIDEWALK CONCRETE 4IN	SY			309	
750 - 2115	DETECTABLE WARNING PANELS	SF			140	
TOTALS						

HMA Cored Samples							
	A	B		C			
Specification Section	Distance (Ft)÷1000	Lanes	Joints	Lifts	Quantity (A x B x C)	Quantity (1 per mile)	Unit
430.04 I.2.b(2), " Pavement Density Cores "							
ND 49	14,045 / 1000 = 14	2	N/A	2	56	N/A	EA
Lt Turn Lanes	7450 / 1000 = 8	1	N/A	2	16	N/A	EA
Rt Turn Lanes	2866 / 1000 = 3	1	N/A	2	6	N/A	EA
SSP 4 Longitudinal Joint Density for HMA Pavements (Centerline)							
ND 49	14,045 / 1000 = 14	N/A	1	2	28	N/A	EA
Lt Turn Lanes	7450 / 1000 = 8	N/A	1	2	16	N/A	EA
Rt Turn Lanes	2866 / 1000 = 3	N/A	1	2	6	N/A	EA
430.04 I.2.b(3), "Pavement Thickness Determination Cores"					N/A	3	EA
				Total	128	3	EA

Short Term Pavement Marking					
Type	Quantity	# of Applications	Quantity	Unit	
Short Term 8IN Line-Type NR					
Yellow Double Barrier	35,194	2	70,388	LF	
Yellow Double Barrier	1,704	3	5,112	LF	
			75,500	LF	Total
Short Term 12IN Line-Type NR					
White Channel Line	4,429	2	8,858	LF	Total
Short Term 24IN Line-Type NR					
Railroad Bands (12 LF x 6 EA)	72	3	216	LF	Total
Short Term Message-Type NR					
Railroad Cross and 2 R's (60.5 SF x 2 EA)	121	3	363	SF	
Arrows	646	2	1,292	SF	
			1,655	SF	Total

Note: # of Applications:
3 - (top of milling, top of 1st lift, top of 2nd lift)
2 - (top of 1st lift, top of 2nd lift)

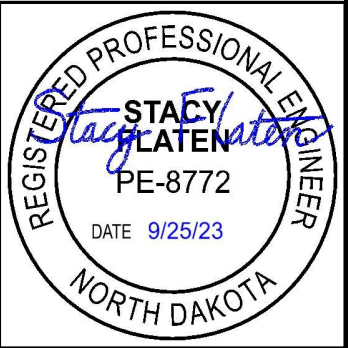


Earthwork Summary

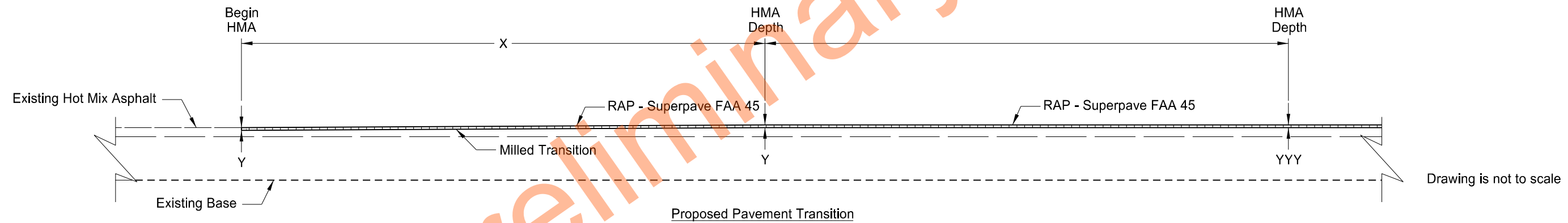
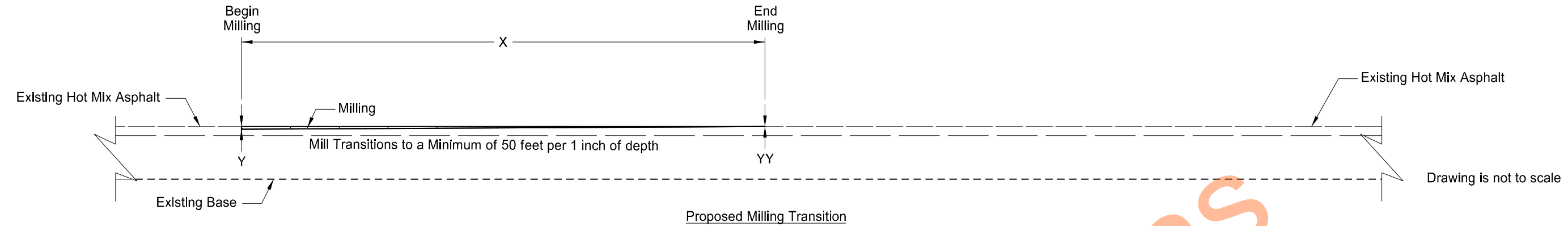
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-NH-5-049(021)101	11	1

Location	Embankment Volume	Compacted Volume	Borrow-Excavation (Pay Item)
	(CY)	(CY)	(CY)
	A	B = A * 1.25	D = B
ND 49 & 7th St NW, SE Quadrant	17.6	22	22

Preliminary Plans



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	20	1



Milling and Paving Transitions

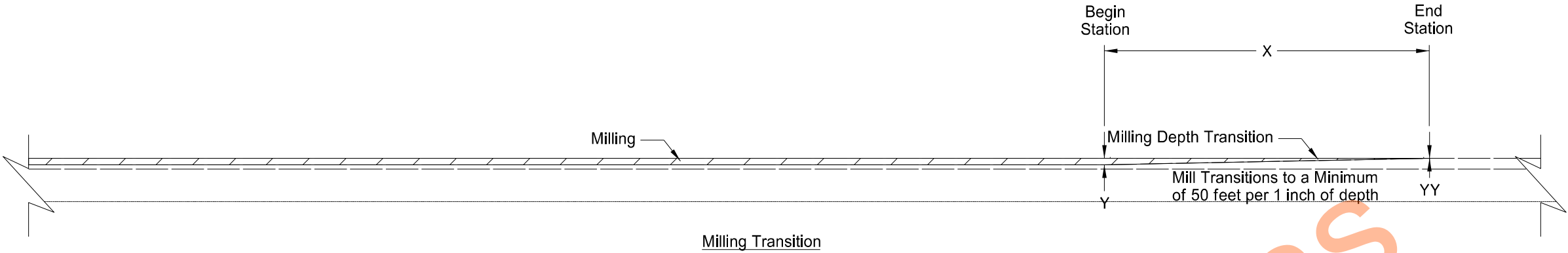
Location	X	Begin Milling/HMA Station	Y	YY	End Milling Station / HMA Station	YYY
RR (N. side)	150	5373+98	3"	3" @ C&G	5375+48	3"
				0" @ 12' Lt to 12' Rt		
End of Project	150	5511+34	3"	0"	5509+84	3"

Details

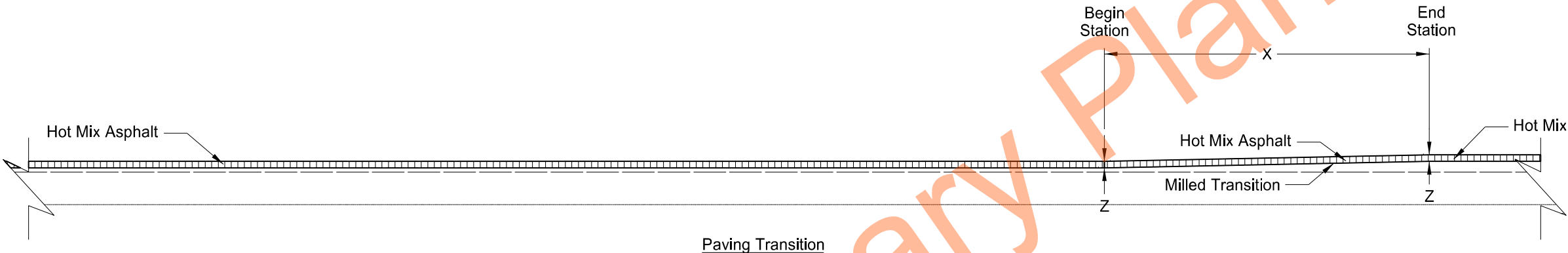
ND 49
Beulah North to Jct 200

Milling and Paving End Transitions





Drawing is not to scale



Drawing is not to scale

Milling & Paving Transitions					
		Milling Transition		Milling Transition	Paving Transition
X (ft)	Begin Station	Y (in)	End Station	YY (in)	Z (in)
133.49	5385+29.58	0" @ CL to 12' Rt	5386+63.07	0"	3"
		3" @ Rt Side			
133.49	5387+96.56	0" @ CL to 12' Rt	5386+63.07	0"	3"
		3" @ Rt Side			
150	5389+03.70	0" @ CL to 12' Rt	5390+53.70	0"	3"
		3" @ Rt Side			
150	5401+30.80	3" @ Lt Side	5402+80.80	3"	3"
		0" @ 12' Lt to CL & Rt Side			
150	5405+28.85	3" @ Lt Side	5403+78.85	3"	3"
		0" @ 12' Lt to CL & Rt Side			
150	5406+48	3" @ Lt Side	5407+98	0"	3"
		0" @ 12' Lt to CL			
48	5478+22.50	3" @ Lt Side	5477+74.68	0"	3"
		0" @ 30' Lt to CL			

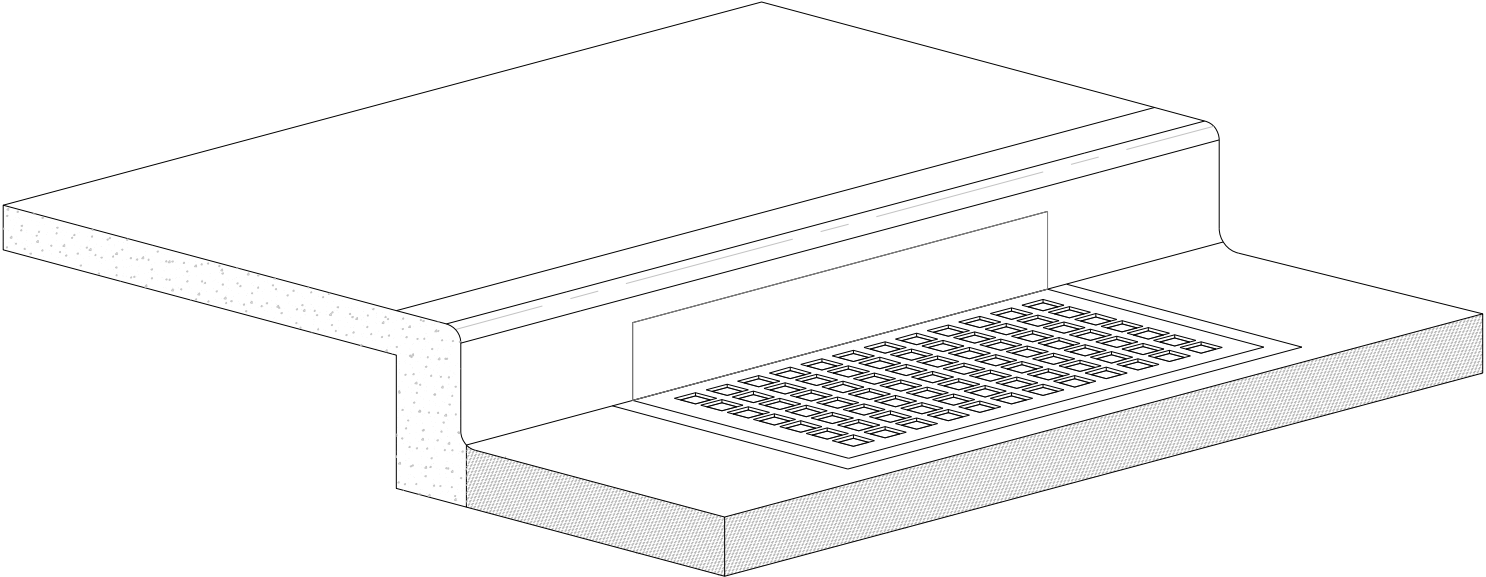


Details

ND 49
Beulah North to Jct 200

Milling and Paving Transitions

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	20	3



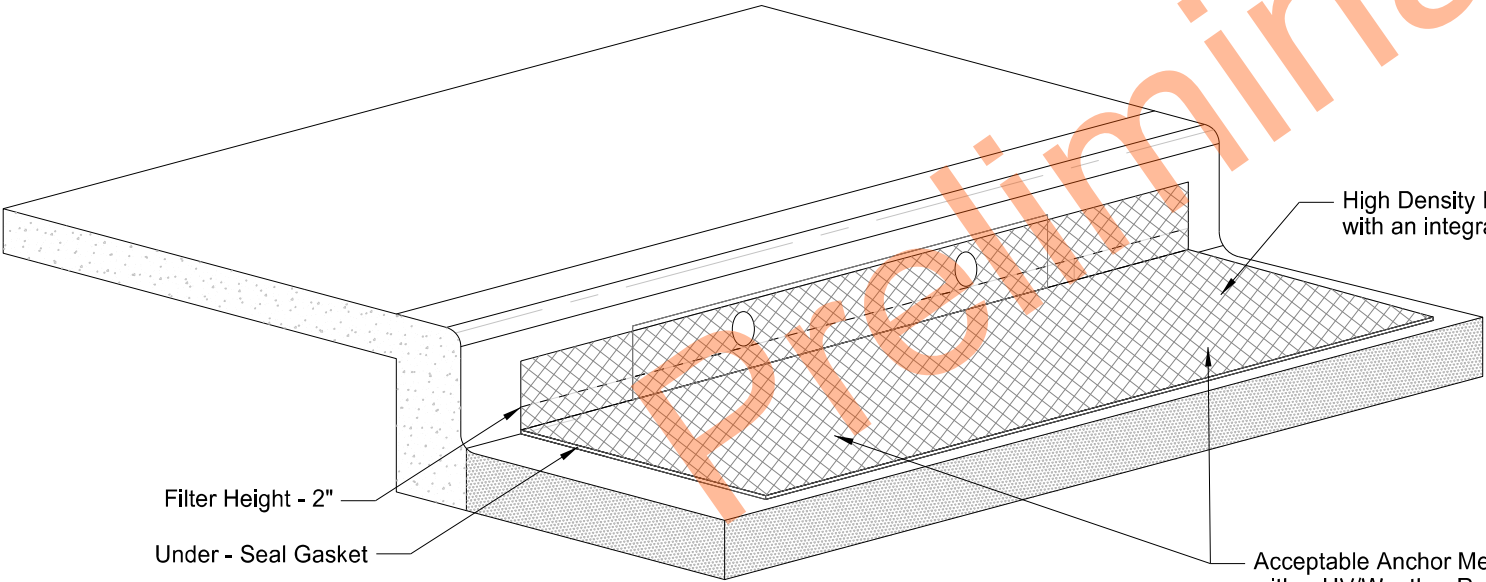
Inlet Protection Device

Installation Notes:

1. Place device **tightly** against drain opening and cover entire grate. Extend the device at **least** 2 inches past the grate toward the street.
2. Overlap the segments at longer openings.
3. Anchor the device so that water cannot flow behind it.

General Notes:

1. Remove material that falls into the inlet during maintenance or removal of the device.



High Density Polyethylene (HDPE) high flow jacket filter (8,000 opening per SY) with an integrated 425 um (micron meter) fine filter particle mesh

Acceptable Anchor Method: Fasten to inlet casting grate with a UV/Weather Resistant Plastic Cable Zip Ties - 16 to 24 in. Install zip ties at each corner of the inlet near the perimeter and two additional zip ties near the middle of the casting. Punch hole through filter and run cable tie downward around grate and back up to fasten.

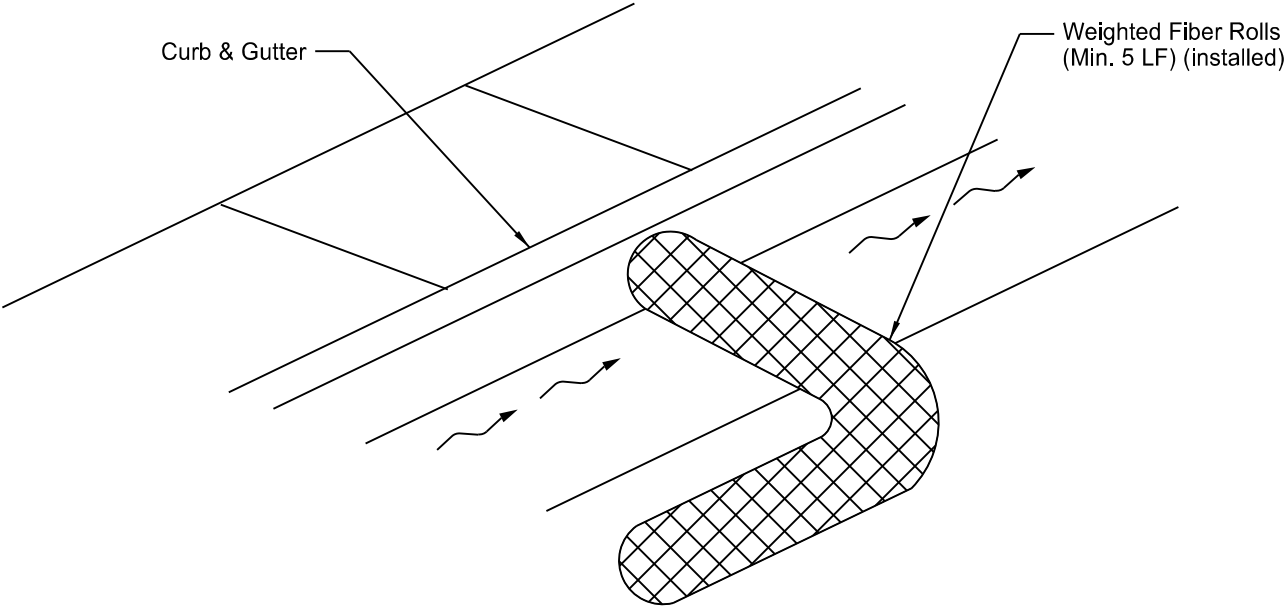
Details

ND 49
Beulah North to Jct 200

Inlet Protection Device



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	20	4



Weighted Fiber Roll Detail

Notes:

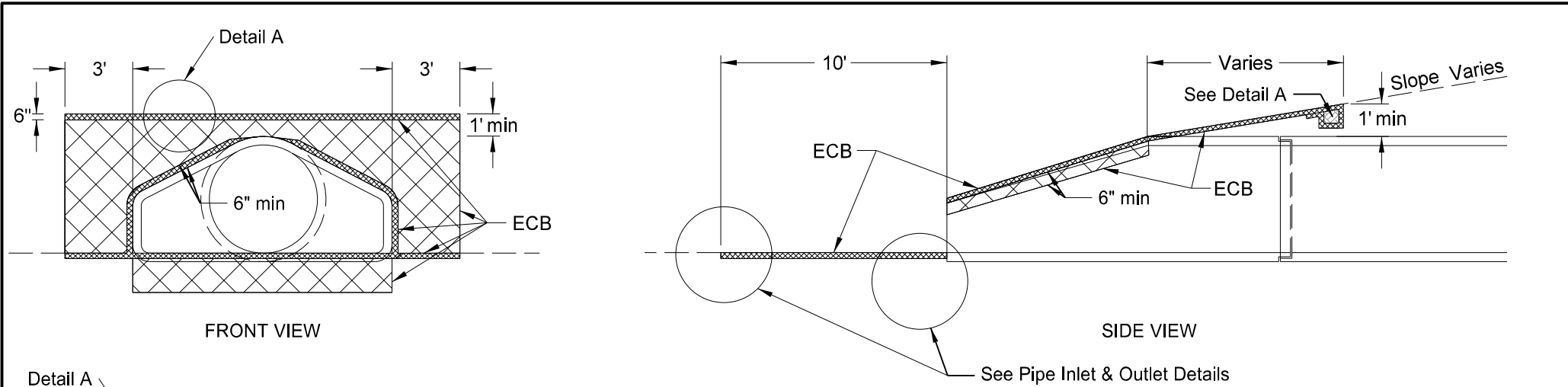
1. Provide materials that meet the following specifications:
Netting tube filled with wood curled excelsior and weighted inner core.
Roll Diameter: 6 inches
Weight: 8.33 Pounds per Linear Foot
2. Place weighted fiber rolls down slope from unprotected downstream areas, tight against and along the curb and gutters, to provide complete protection.
3. Remove and properly dispose of accumulated silt and debris to allow for proper function of device after every rain event, or as necessary for proper function.
4. Price includes weighted fiber roll, placement, and maintenance after each rain event. All costs related to this work shall be included in the price bid for "Weighted Fiber Rolls".
5. Removal of weighted fiber rolls shall be done after the up gradient surfaces are stabilized and surrounding streets and gutters are clean of debris.
6. Fiber Roll should be placed to avoid being in driving lane.

Details

ND 49
Beulah North to Jct 200

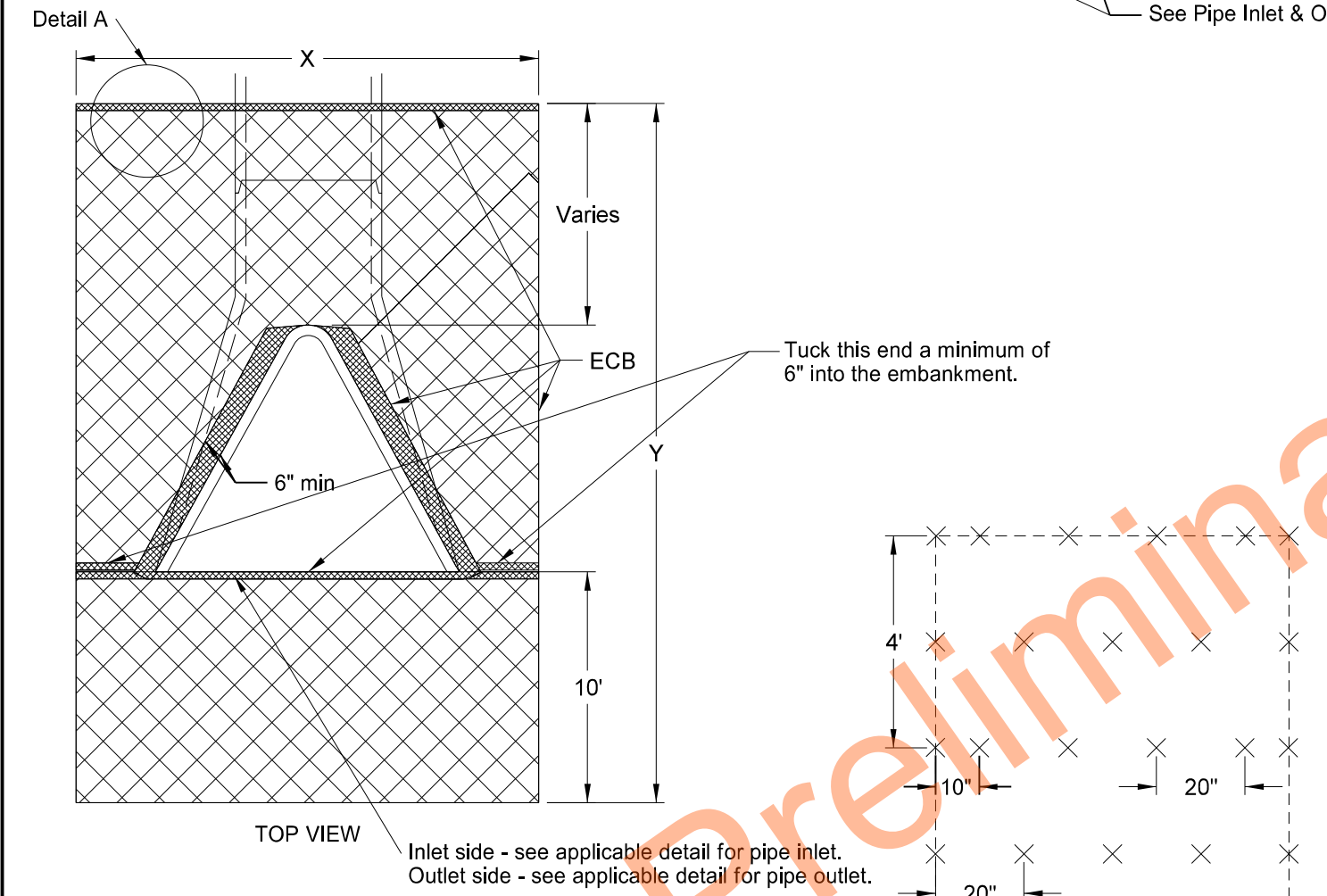
Weighted Fiber Rolls Detail





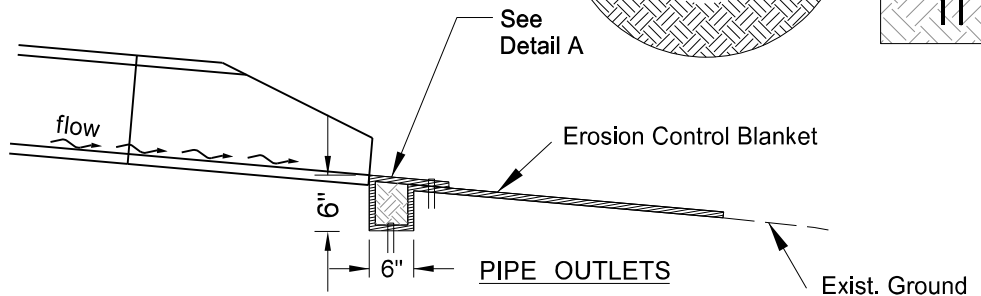
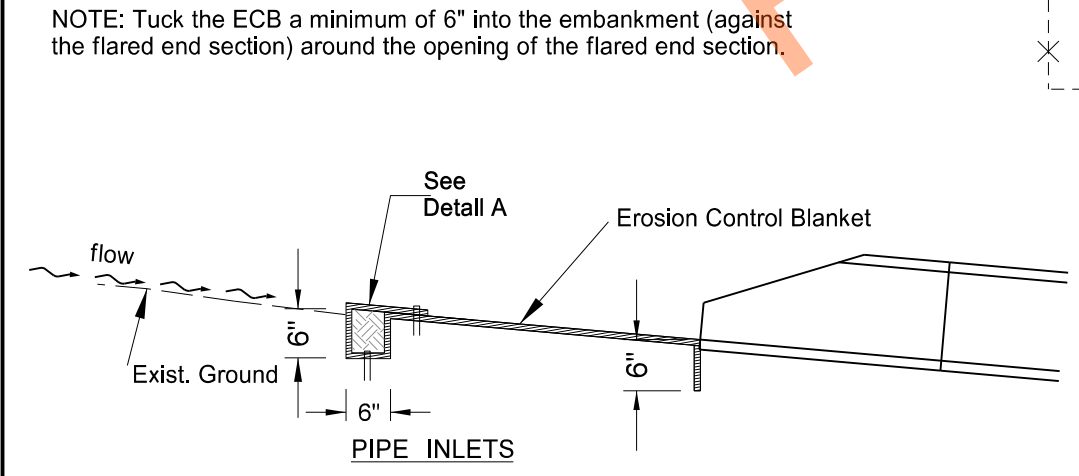
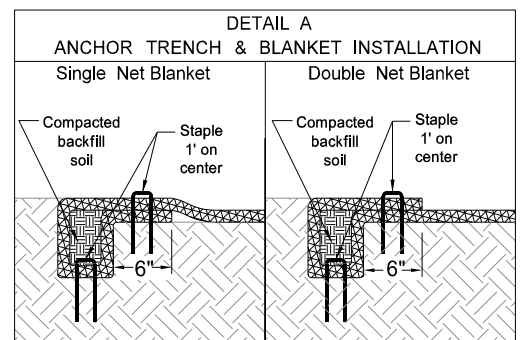
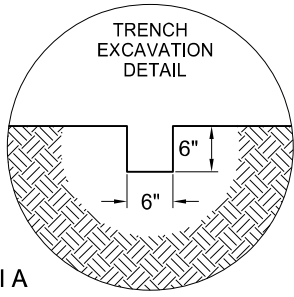
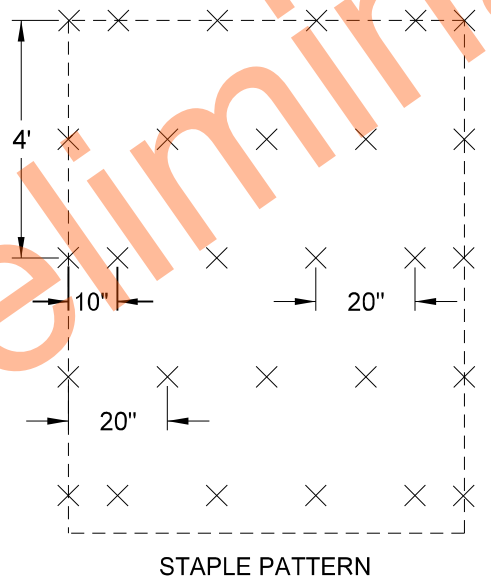
STATE	PROJECT NO.		SECTION NO.	SHEET NO.
	ND		20	5

Erosion Control Blanket (ECB)				
Location to be Protected	Culvert Type Appr/CL	Pipe Diam (inch)	No.	Unit Quantity (SY)
ND 49 & Front St SW - SE Quadrant	Appr	18	1	22



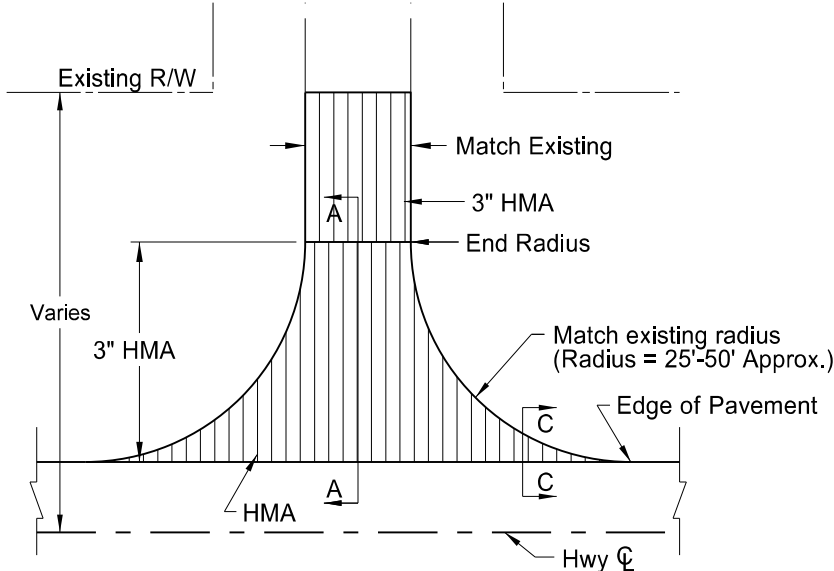
APPROACH CULVERTS				
DIA In	X Ft	Y Ft	Surface area to be protected SF	ECB SY
15	9.0	20.0	176.0	20
18	9.5	20.7	190.7	22
21	9.5	21.0	190.9	22
24	10.5	21.6	214.1	24
27	11.0	22.0	226.3	25
30	11.6	22.5	241.5	27
36	12.7	23.3	268.8	30
42	13.3	23.3	279.7	31
48	13.8	24.0	293.2	33
54	14.5	23.4	300.6	34
60	15.0	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.



Details
ND 49
Beulah North to Jct 200
Erosion Control at Culvert Flared End Sections

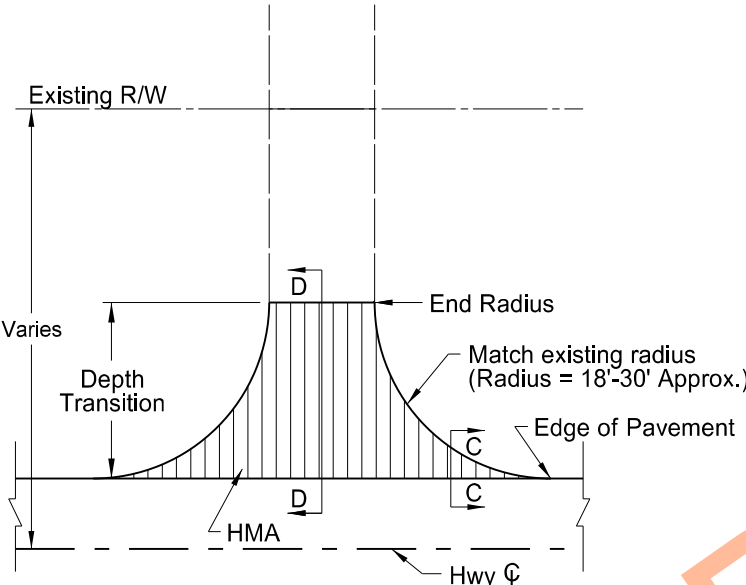
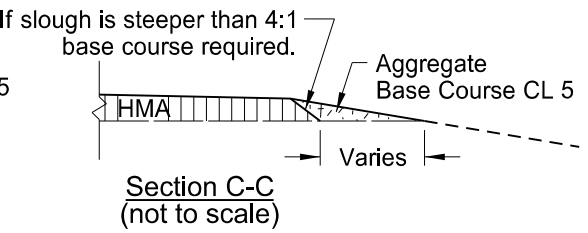
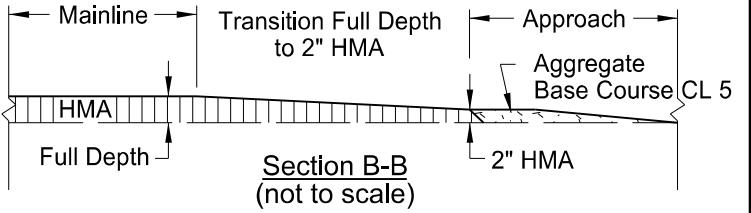
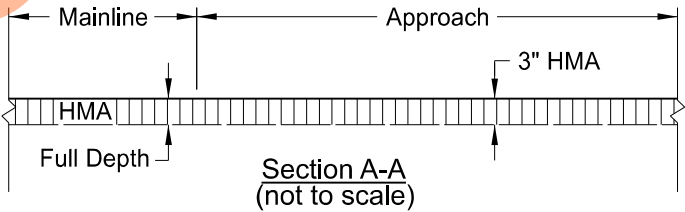
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-NH-4-005(041)125	20	6



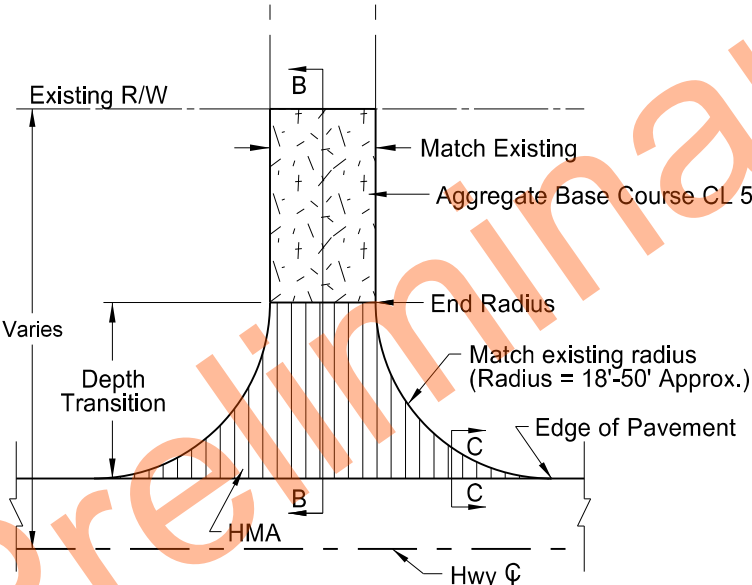
(1) Paved Section Line, County Road, or Street Approach

(1)	(2)	(3)	(4)
Paved Section Line	Paved Private Drive	Gravel Private Drive	Field Drive
5371+44 Rt	Front St SW	5373+30 Lt	5407+49 Lt
5375+74 Rt	Railroad St SW	5397+74 Rt	5409+60 Rt
5381+12 Rt	Main St	5399+17 Rt	5423+08 Lt
5382+93 Lt	1st St NW	5401+85 Rt	5431+59 Lt
5384+85 Rt	1st St NW	5403+83 Rt	5480+60 Lt
5388+49 Rt	2nd St NW	5404+71 Rt	5505+78 Lt
5388+71 Lt	2nd St NW	5412+66 Lt	5505+80 Rt
5405+64 Lt	7th St NW	5415+65 Lt	
5405+82 Rt	7th St NW	5427+50 Lt	
5413+21 Rt	9th St NW	5472+05 Rt	
5425+70 Rt	12th St NW	5477+99 Lt	
5437+09 Rt	16th St NW		
5446+70 Rt	19th St NW		
5458+83 Rt	22nd St N		

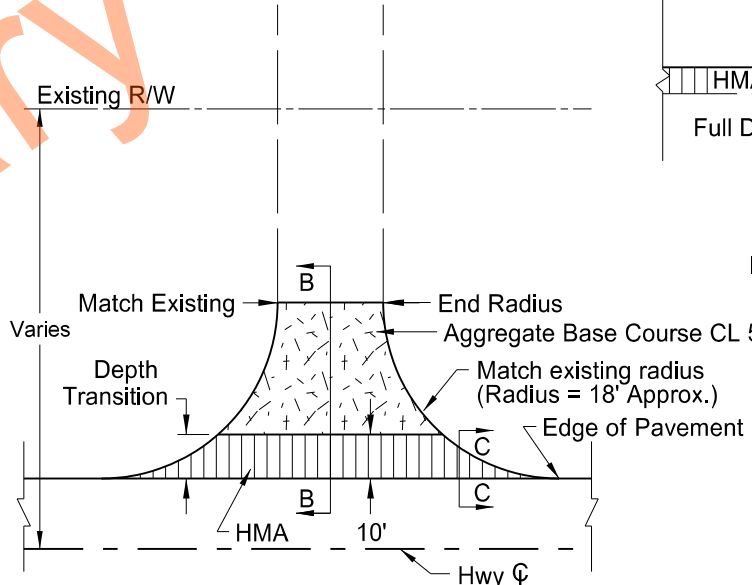
- Notes:
- Actual HMA paving and aggregate base course locations may vary in the field, as approved by the Engineer.
 - Quantity totals have been included in the bid items of the "Section 90" of the plans.
 - 100 TONS of Aggregate Base Course CL 5 has been provided in the quantities to fill in around the radii. This material will be required when sloughs are steeper than 4:1 (see section C-C)



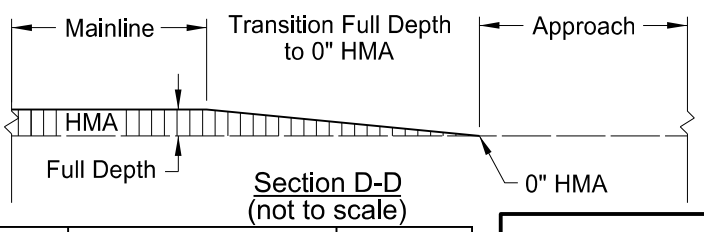
(2) Paved Private Drive Approach



(3) Gravel Private Drive Approach



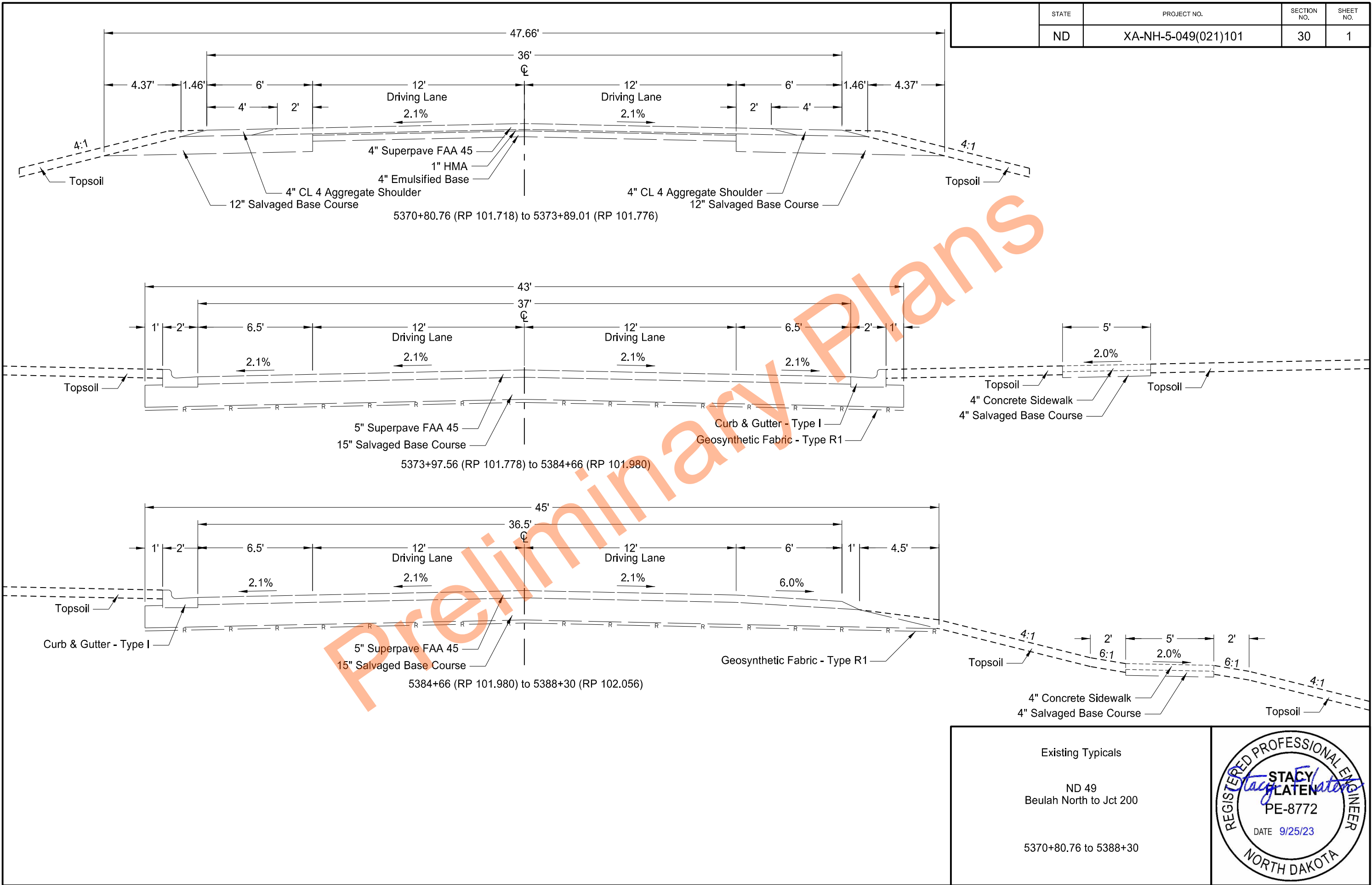
(4) Field Drive Approach



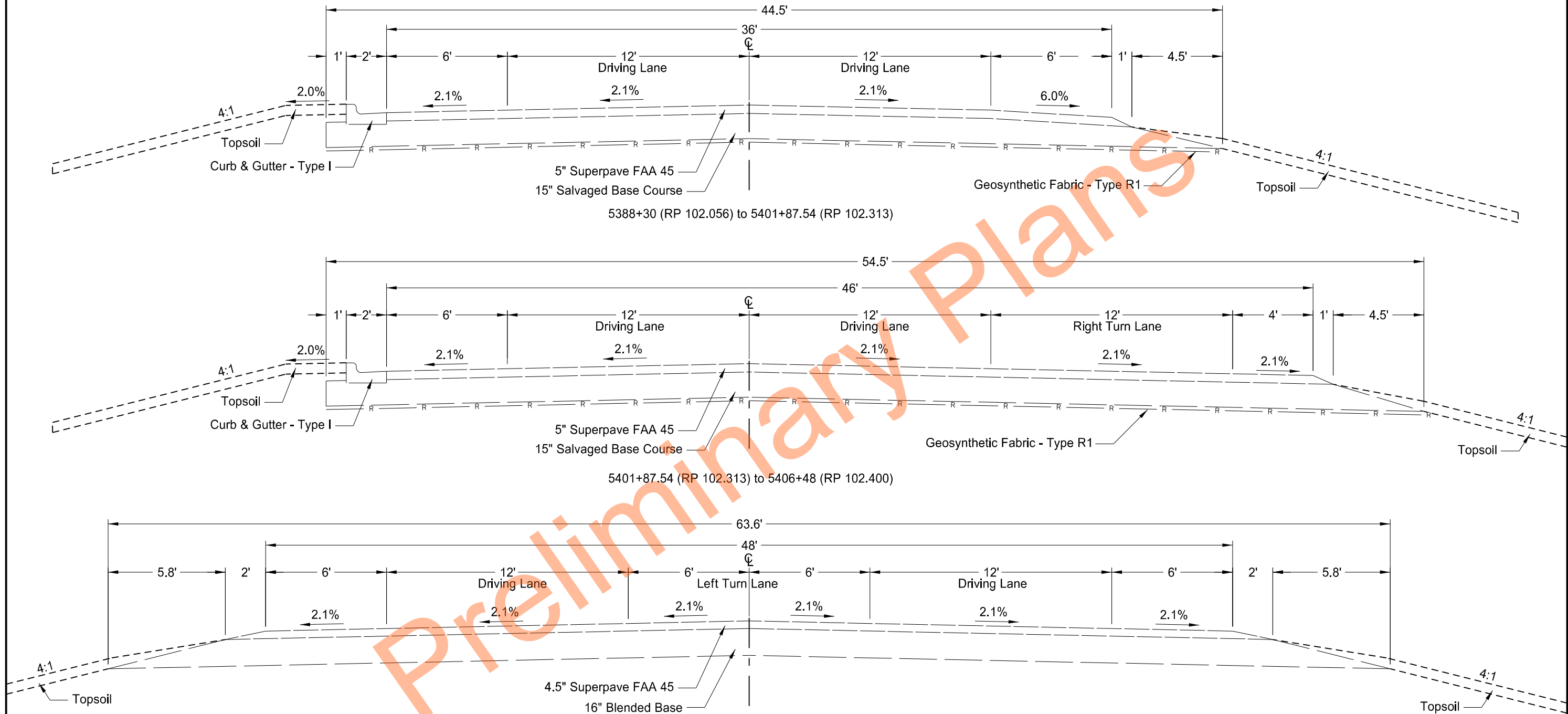
Basis of Estimate				(1)		(2)		(3)		(4)		Note 3		Totals
Spec	Code	Item	Unit	Paved Section Line		Paved Private Drive		Gravel Private Drive		Field Drive		(around radii)		
		Number of Locations	#	14		11		7		3		35		
				Total	Average	Total	Average	Total	Average	Total	Average	Total	Average	
302	120	Aggregate Base Course CL 5 @ 1.875 Ton/CY	TON					101	14.4	10	3.3	100	2.9	211

Note: Quantities Found in Section 90: Tack Coat, RAP - Superpave FAA 45, PG 58H-34 Asphalt Cement

Details
ND 49
Beulah North to Jct 200
Approach Paving Details for Existing Rural Approaches



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	30	2



5406+48.00 (RP 102.400) to 5409+26.28 (RP 102.453)
5413+01.08 (RP 102.524) to 5422+08.78 (RP 102.696)
5425+69.93 (RP 102.764) to 5433+46.89 (RP 102.912)
5437+09.14 (RP 102.980) to 5442+98.57 (RP 103.086)
5446+73.12 (RP 103.157) to 5454+80.04 (RP 103.310)
5458+68.97 (RP 103.384) to 5461+78.12 (RP 103.442)
5475+09.67 (RP 103.695) to 5478+22.50 (RP 103.754)

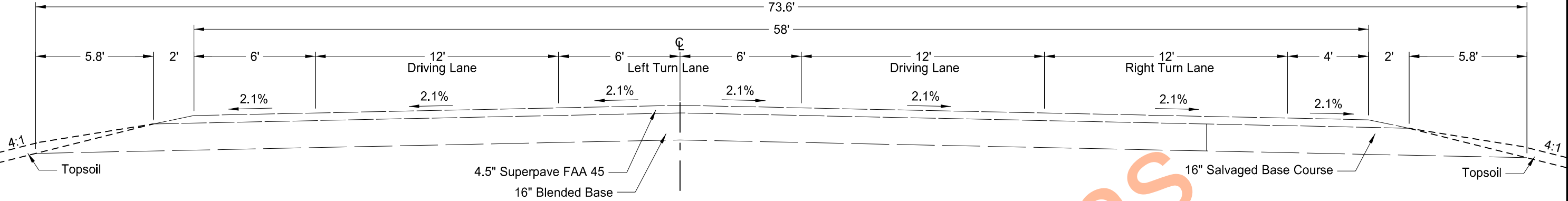
Existing Typicals

ND 49
Beulah North to Jct 200

ND 49

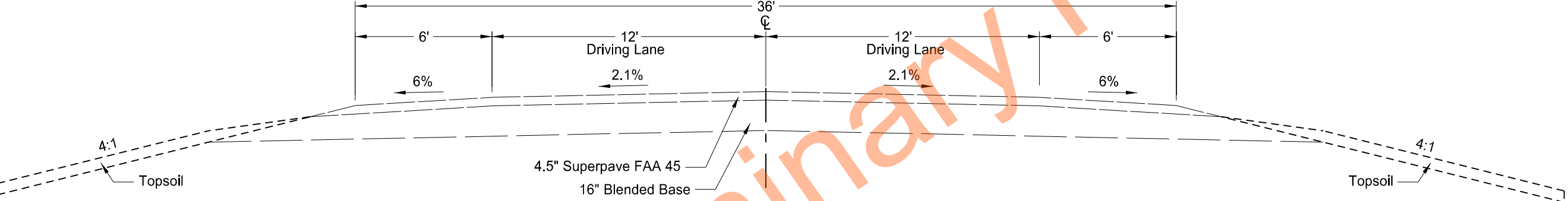


STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-NH-5-049(021)101	30	3

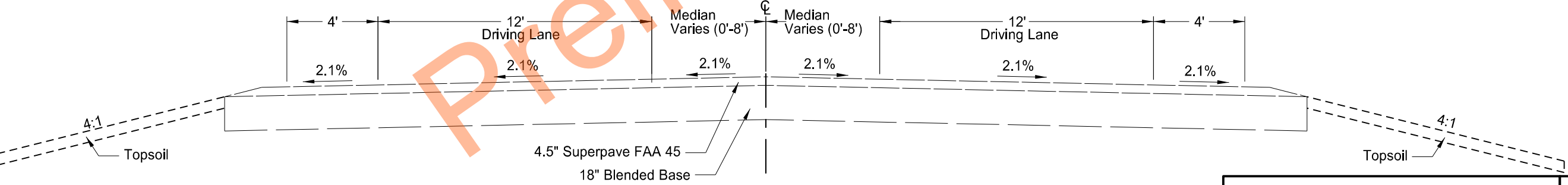


5409+26.28 (RP 102.453) to 5413+01.08 (RP 102.524)
5422+08.78 (RP 102.696) to 5425+69.93 (RP 102.764)
5433+46.89 (RP 102.912) to 5437+09.14 (RP 102.980)
5442+98.57 (RP 103.086) to 5446+73.12 (RP 103.157)
5454+80.04 (RP 103.310) to 5458+68.97 (RP 103.384)
5478+22.50 (RP 103.754) to 5483+55.90 (RP 103.855)*

* Note: Location is mirred about centerline



5461+78.12 (RP 103.442) to 5475+09.67 (RP 103.695)
5483+55.90 (RP 103.855) to 5504+97.30 (RP 104.254)



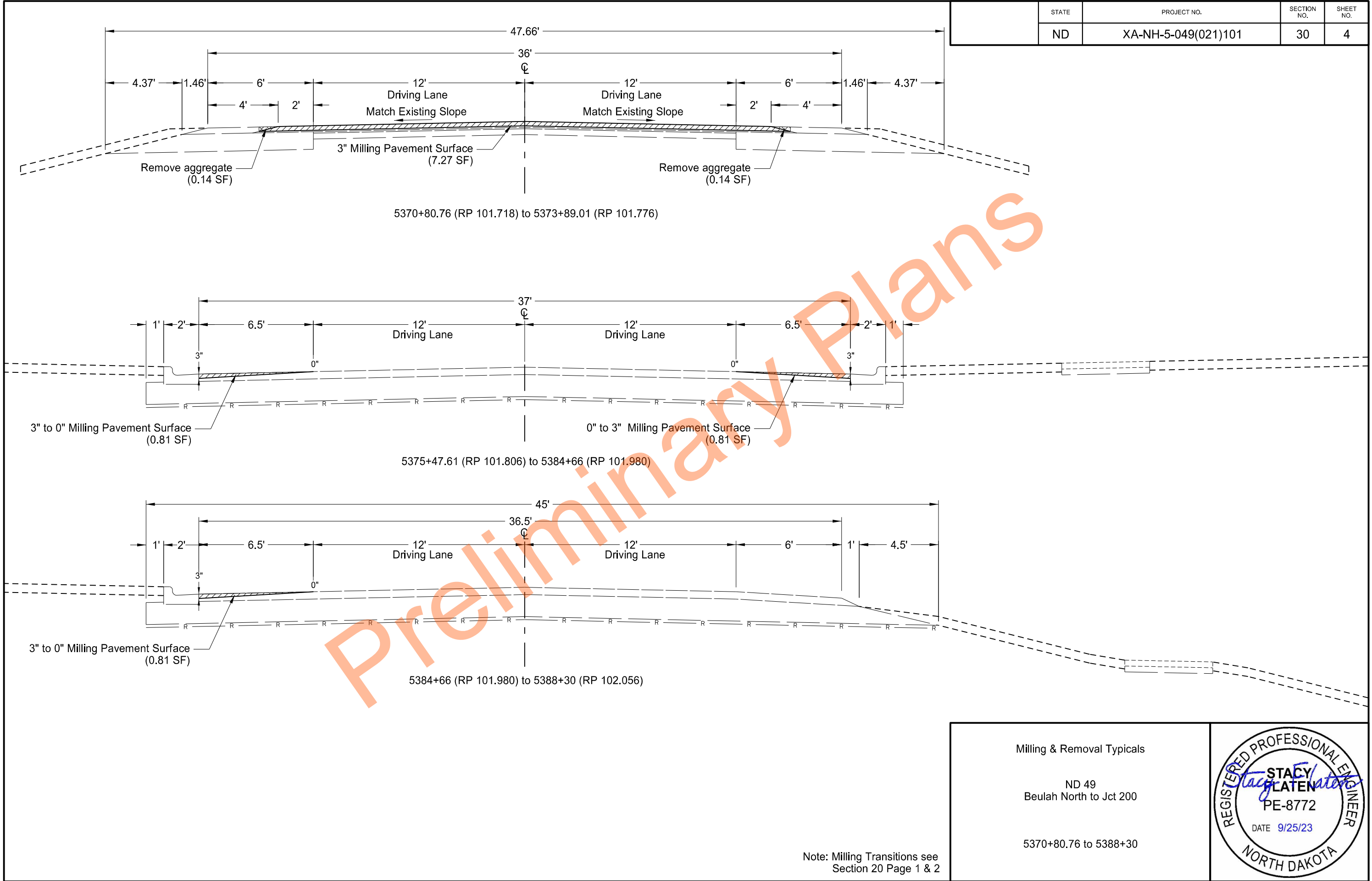
5504+97.30 (RP 104.254) to 5511+34.35 (RP 104.374)

Existing Typicals

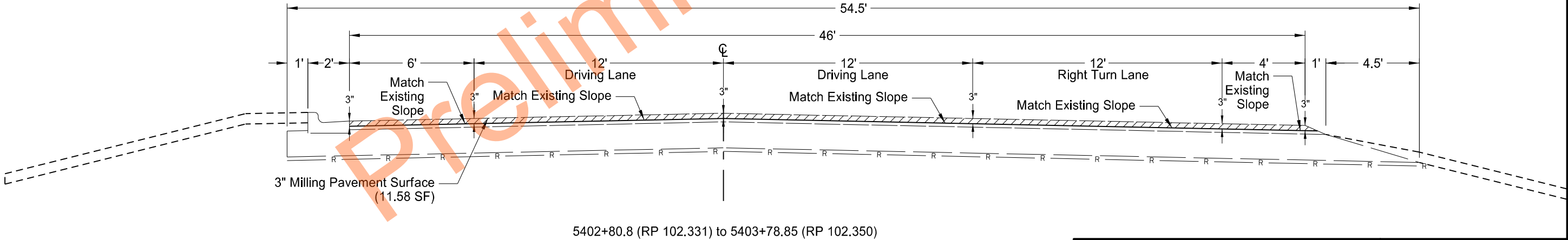
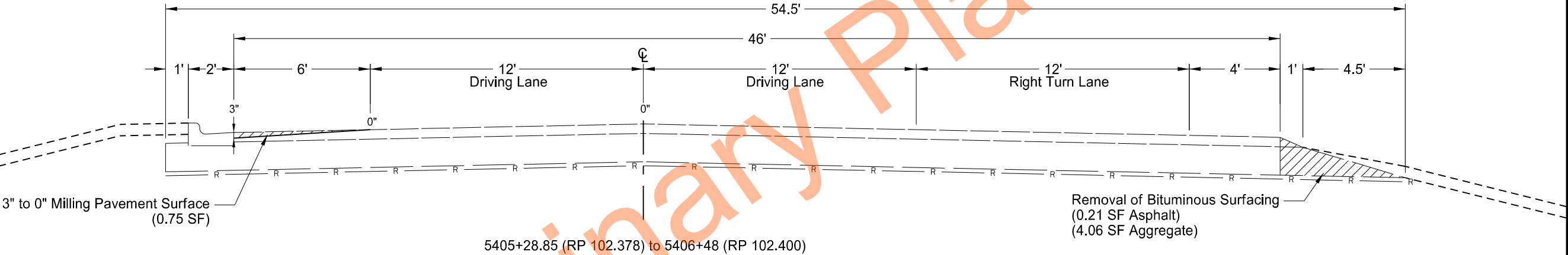
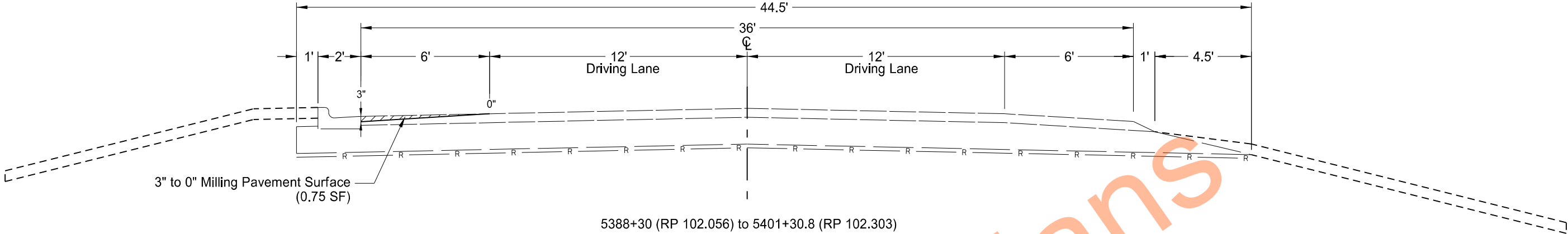
ND 49
Beulah North to Jct 200

ND 49





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	30	5



Milling & Removal Typicals

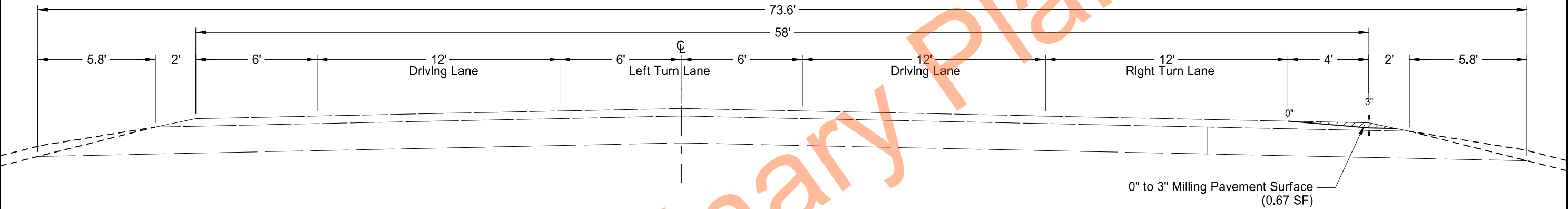
ND 49
Beulah North to Jct 200

5388+30 to 5406+48

Note: Milling Transitions see
Section 20 Page 1 & 2



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	30	6



5409+94.36 (RP 102.466) to 5413+01.08 (RP 102.524)
5422+08.78 (RP 102.696) to 5425+69.93 (RP 102.764)
5433+46.89 (RP 102.912) to 5437+09.14 (RP 102.980)
5442+98.57 (RP 103.086) to 5446+73.12 (RP 103.157)
5454+80.04 (RP 103.310) to 5458+68.97 (RP 103.384)
5478+22.50 (RP 103.754) to 5483+55.90 (RP 103.855)*

* Note: Location is mirred about centerline

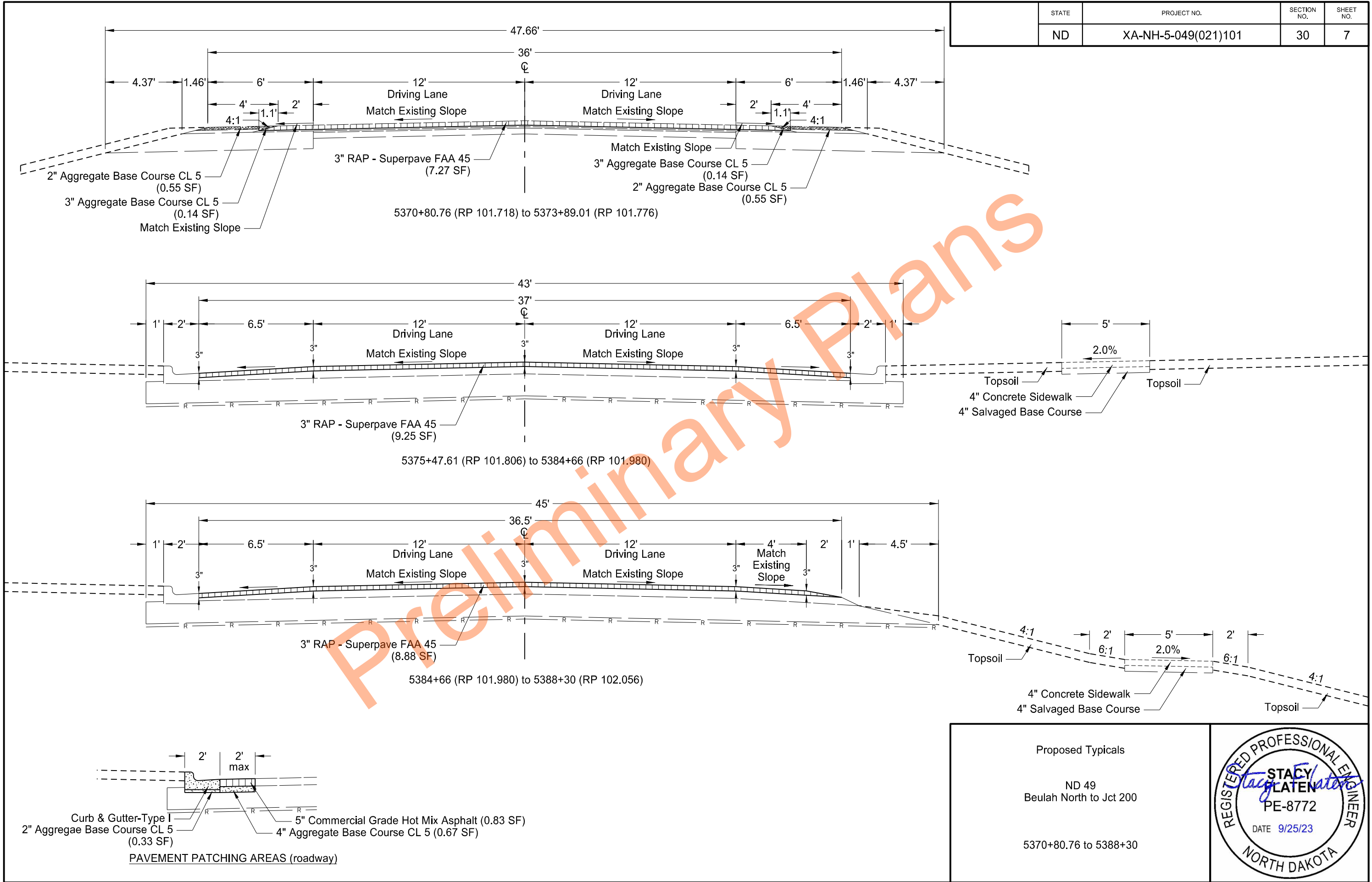
Milling & Removal Typicals

ND 49
Beulah North to Jct 200

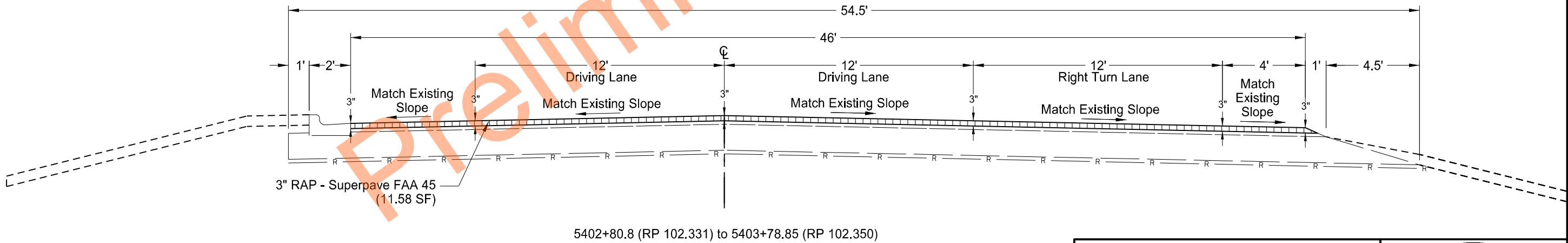
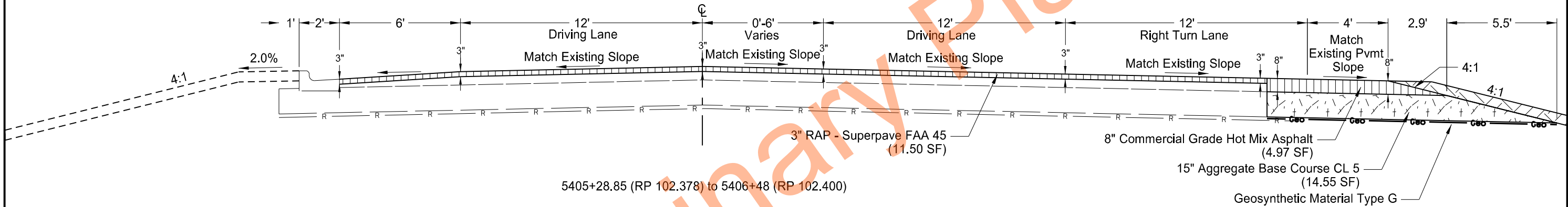
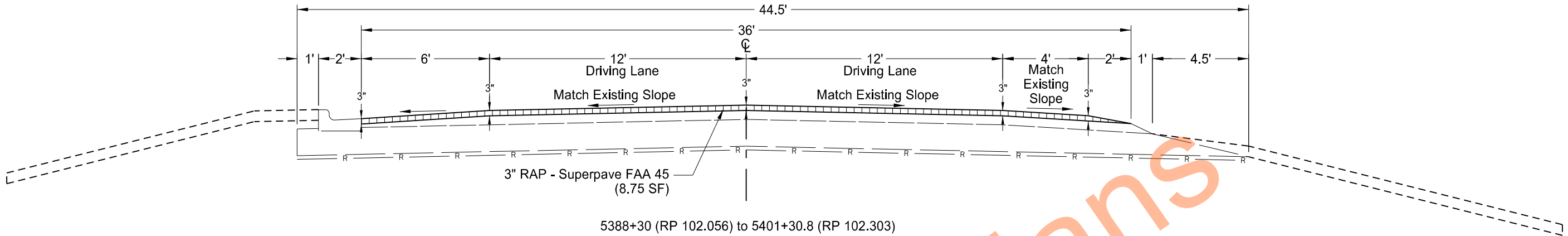
ND 49

Note: Milling Transitions see
Section 20 Page 1 & 2





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	30	8



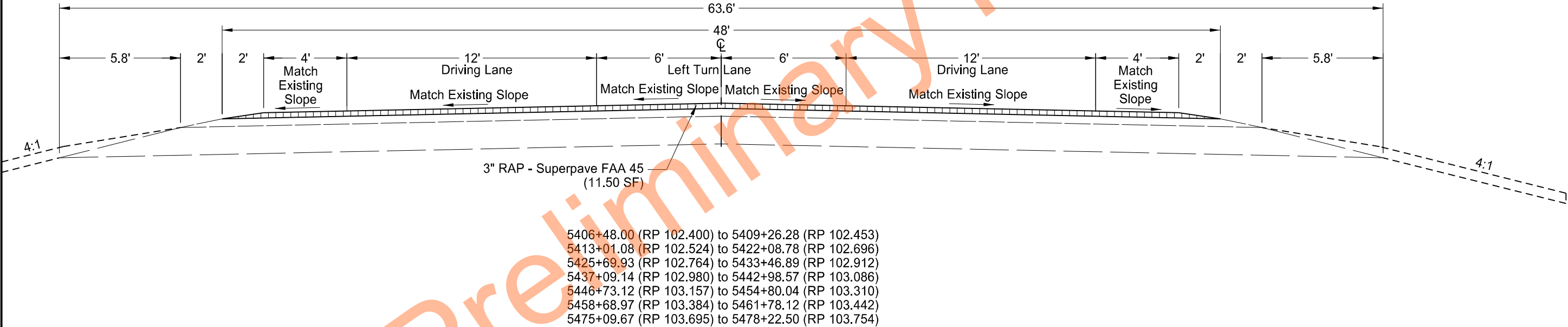
Proposed Typicals

ND 49
Beulah North to Jct 200

5388+30 to 5406+48



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	30	9



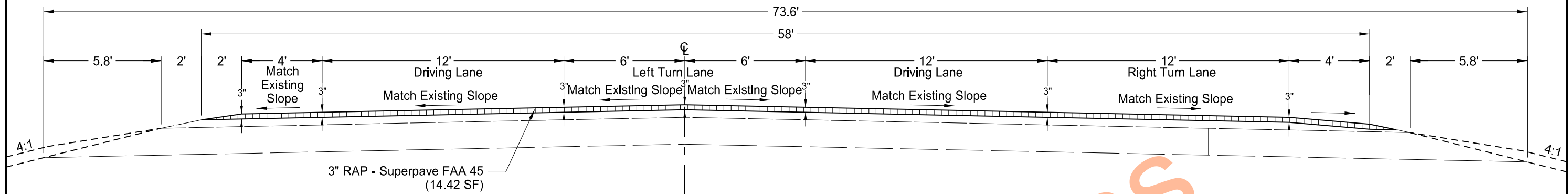
Proposed Typicals

ND 49
Beulah North to Jct 200

ND 49

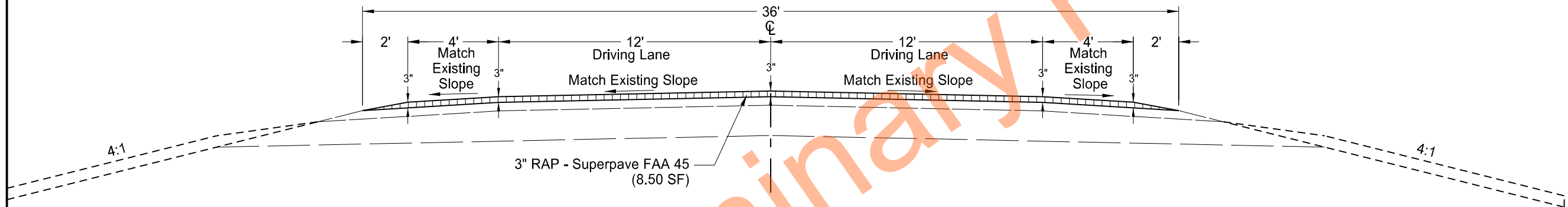


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	30	10

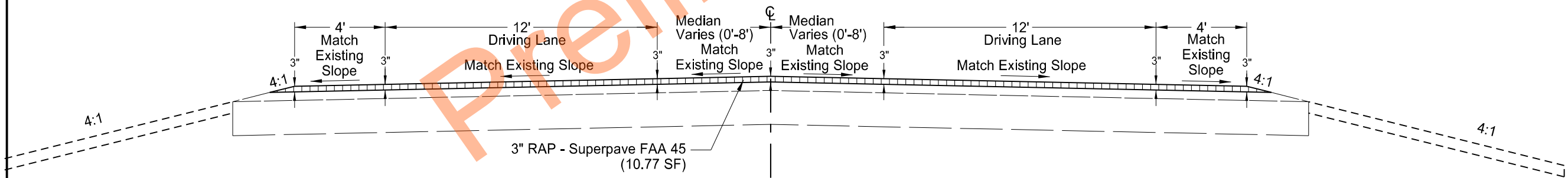


5409+26.28 (RP 102.453) to 5413+01.08 (RP 102.524)
5422+08.78 (RP 102.696) to 5425+69.93 (RP 102.764)
5433+46.89 (RP 102.912) to 5437+09.14 (RP 102.980)
5442+98.57 (RP 103.086) to 5446+73.12 (RP 103.157)
5454+80.04 (RP 103.310) to 5458+68.97 (RP 103.384)
5478+22.50 (RP 103.754) to 5483+55.90 (RP 103.855)*

* Note: Location is mirrored about centerline



5461+78.12 (RP 103.442) to 5475+09.67 (RP 103.695)
5483+55.90 (RP 103.855) to 5504+97.30 (RP 104.254)



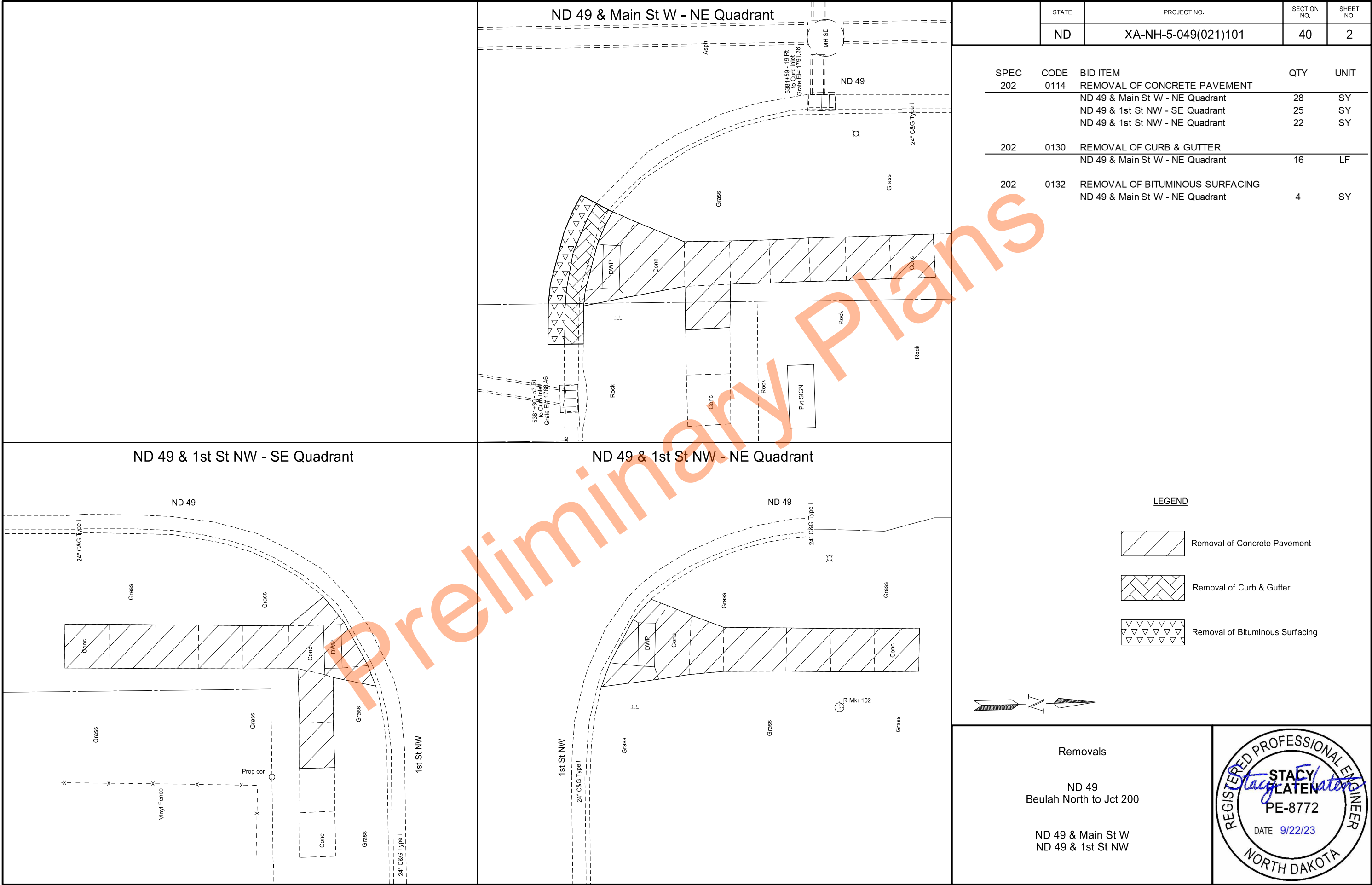
5504+97.30 (RP 104.254) to 5509+84.35 (RP 104.346)

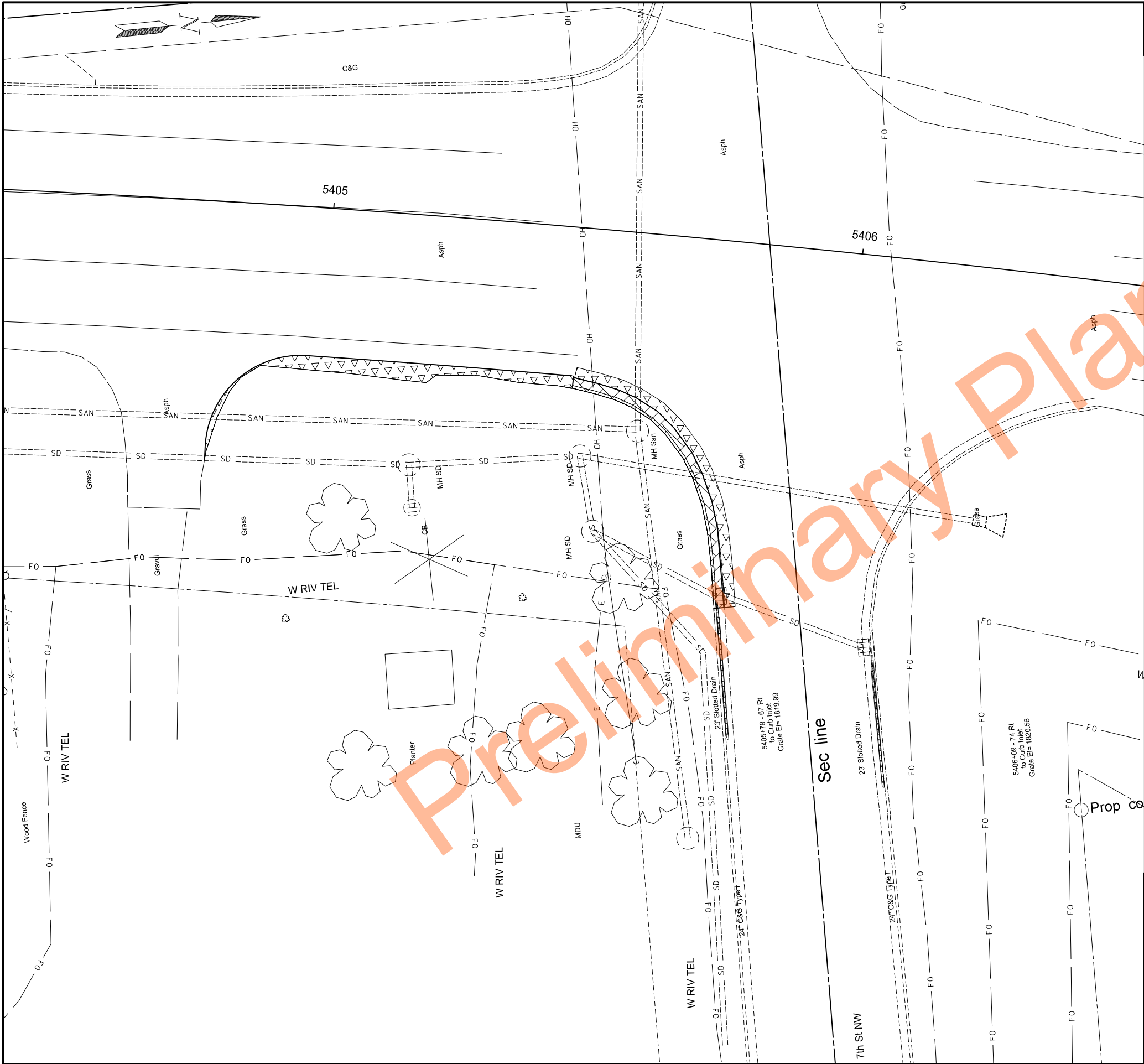
Proposed Typical

ND 49
Beulah North to Jct 200

ND 49







		STATE	PROJECT NO.	SECTION NO.	SHEET NO.
		ND	XA-NH-5-049(021)101	40	4
SPEC	CODE	BID ITEM		QTY	UNIT
202	0130	REMOVAL OF CURB & GUTTER			
		ND 49 & 7th St NW - SE Quadrant		56	LF
202	0132	REMOVAL OF BITUMINOUS SURFACING			
		ND 49 & 7th St NW - SE Quadrant		30	SY

LEGEND

Removal of Concrete Pavement

Removal of Curb & Gutter

Removal of Bituminous Surfacing

Removals

ND 49
Beulah North to Jct 200

ND 49 & 7th St NW

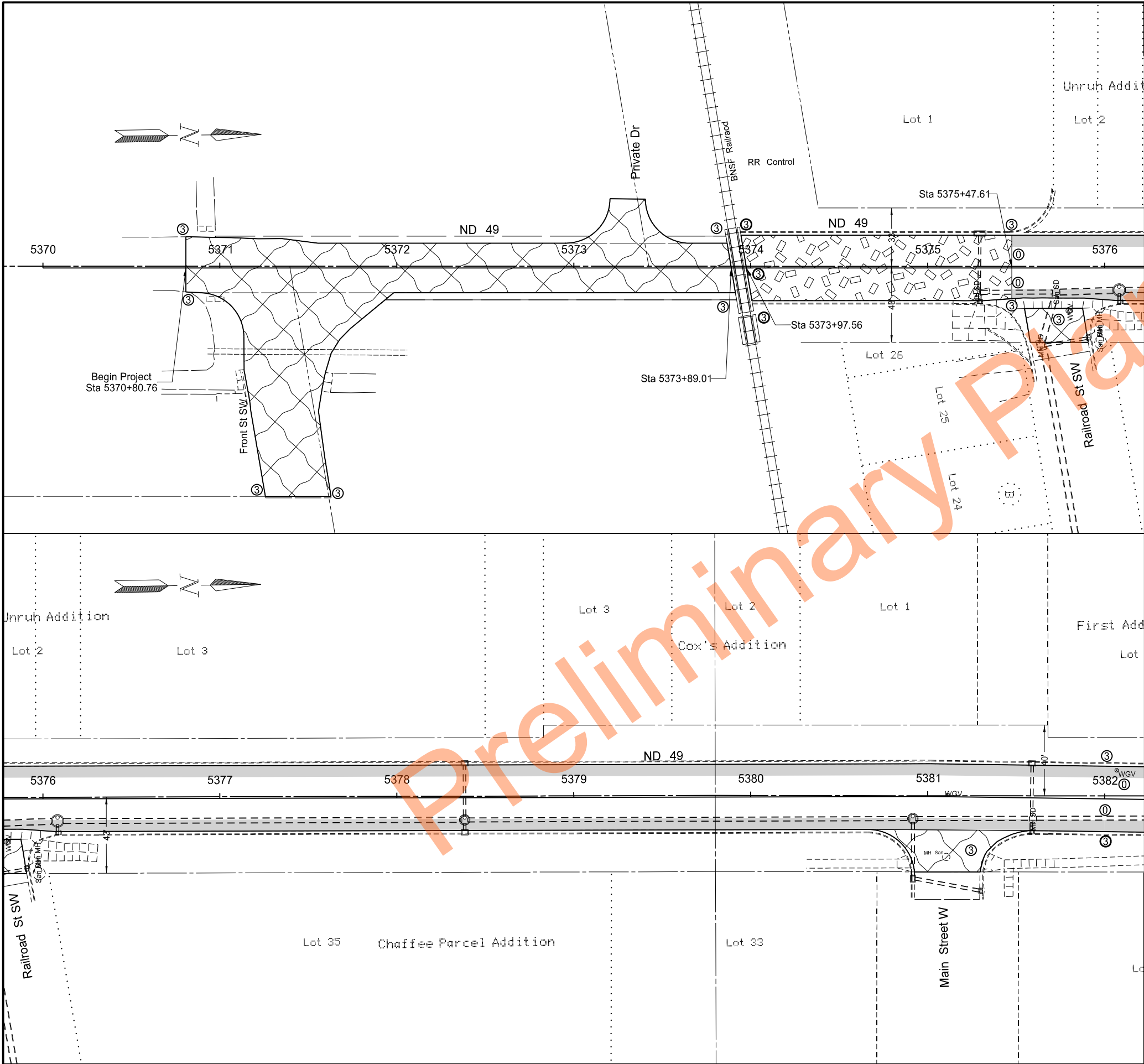
REGISTERED PROFESSIONAL ENGINEER

STACY LATEN

PE-8772

DATE 9/22/23

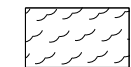
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	40	5

SPEC	CODE	BID ITEM	QTY	UNIT
411	0100	MILLING PAVEMENT SURFACE		
		5370+80.76 to 5373+89.01 (3")	289	TON
		5373+97.56 to 5375+47.61 (3" @ FR, N end: 3" @ C&G, 0" @ 12' Lt to 12' Rt)	61	TON
		5375+47.61 to 5382+00 (3" @ C&G, 0" @ 12' Lt to 12' Rt)	79	TON
		Railroad St SW (ND 49 Rt side) (3")	12	TON
		Main St W (ND 49 Rt side) (3")	22	TON

LEGEND

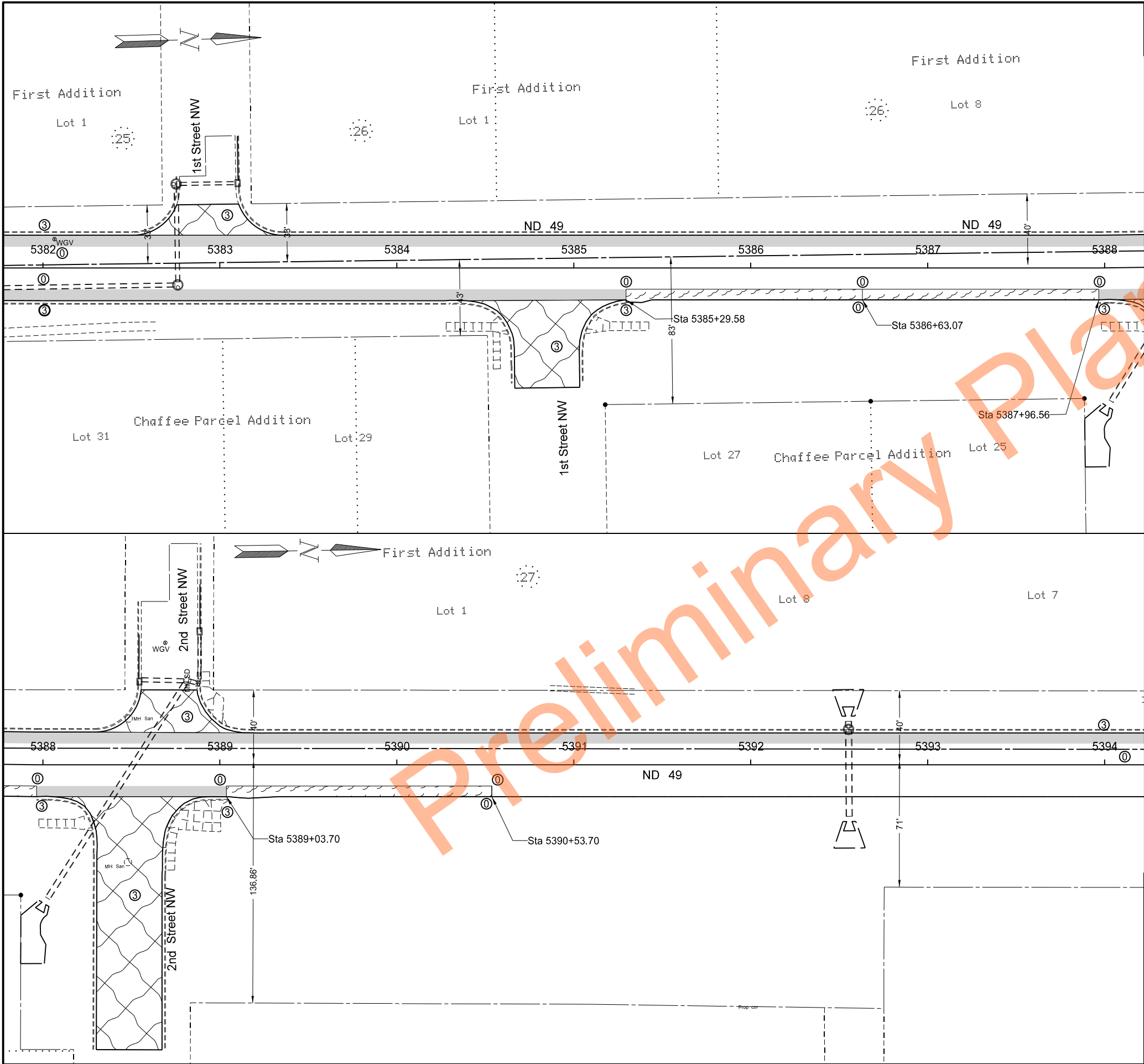
-  -Transition Mill 3" to 0"
-  -Milling 3"
-  -Milling 3" to 0" (Longitudinal)
(see sheet 20-1)
-  -Milling shoulder 3" to 0" (Transverse)
-  -Removal of Pavement (see sheet 40-4)
-  -Milling Depth (in)

Removals

ND 49
Beulah North to Jct 200

5370+80.76 to 5382+00





STATE		PROJECT NO.	SECTION NO.	SHEET NO.
ND		XA-NH-5-049(021)101	40	6

SPEC	CODE	BID ITEM	QTY	UNIT
411	0100	MILLING PAVEMENT SURFACE		
		5382+00 to 5394+00 Lt (3" @ C&G, 0" @ 12' Lt to CL)	70	TON
		5382+00 to 5385+29.58 Rt (3" @ C&G, 0" @ CL to 12' Rt)	20	TON
		1st St NW (ND 49 Lt side) (3")	16	TON
		1st St NW (ND 49 Rt side) (3")	40	TON
		5385+29.58 to 5387+96.56 Rt (S & N sides: 3" @ C&G, 0" @ CL to 12' Rt, middle: 0")	10	TON
		5387+96.56 to 5389+03.7 Rt (3" @ C&G, 0" @ CL to 12' Rt)	6	TON
		2nd St NW (ND 49 Lt side) (3")	20	TON
		2nd St NW (ND 49 Rt side) (3")	103	TON
		5389+03.70 to 5390+53.70 Rt (S side: 3" @ C&G, 0" @ CL to 12' Rt, N side: 0")	5	TON

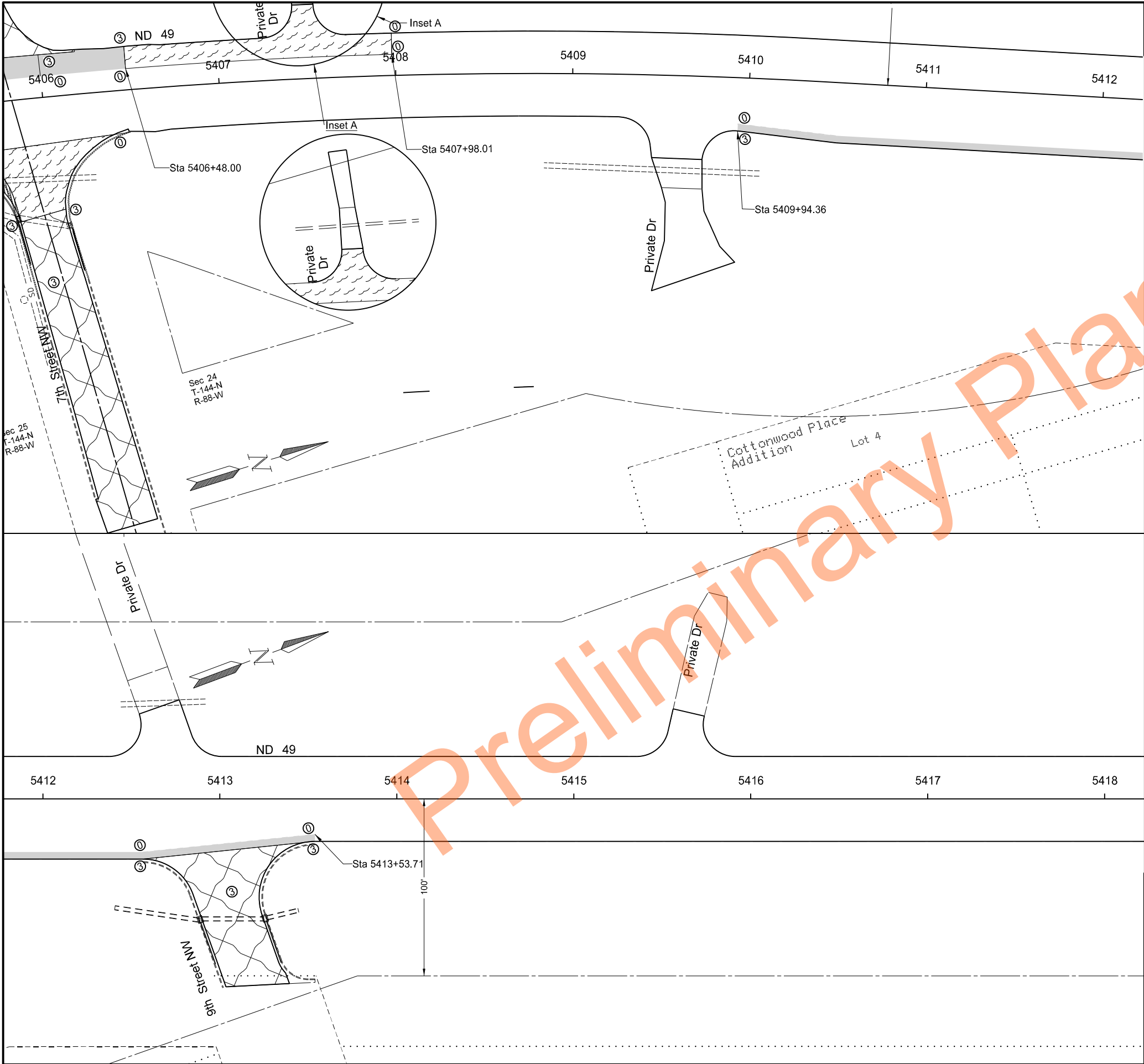
LEGEND

- Transition Mill 3" to 0"
- Milling 3"
- Milling 3" to 0" (Longitudinal) (see sheet 20-1)
- Milling shoulder 3" to 0" (Transverse)
- Removal of Pavement (see sheet 40-4)
- Milling Depth (in)

Removals

ND 49
Beulah North to Jct 200

5382+00 to 5394+00



		STATE	PROJECT NO.	SECTION NO.	SHEET NO.
		ND	XA-NH-5-049(021)101	40	8

SPEC	CODE	BID ITEM	QTY	UNIT
411	0100	MILLING PAVEMENT SURFACE		
		7th St NW (ND 49 Rt side) (3")	109	TON
		5406+00 to 5406+48 Lt (3" @ C&G 0" @ 12' Lt to CL)	6	TON
		5406+48 to 5407+98 Lt (S. side: 3" @ Lt side, 0" @ 12' Lt to CL, N side: 0")	11	TON
		5409+94.36 to 5413+53.71 Rt (3" @ Pmnt edge, 0" @ CL to 30' Rt)	14	TON
		9th St NW (ND 49 Rt side) (3")	58	TON

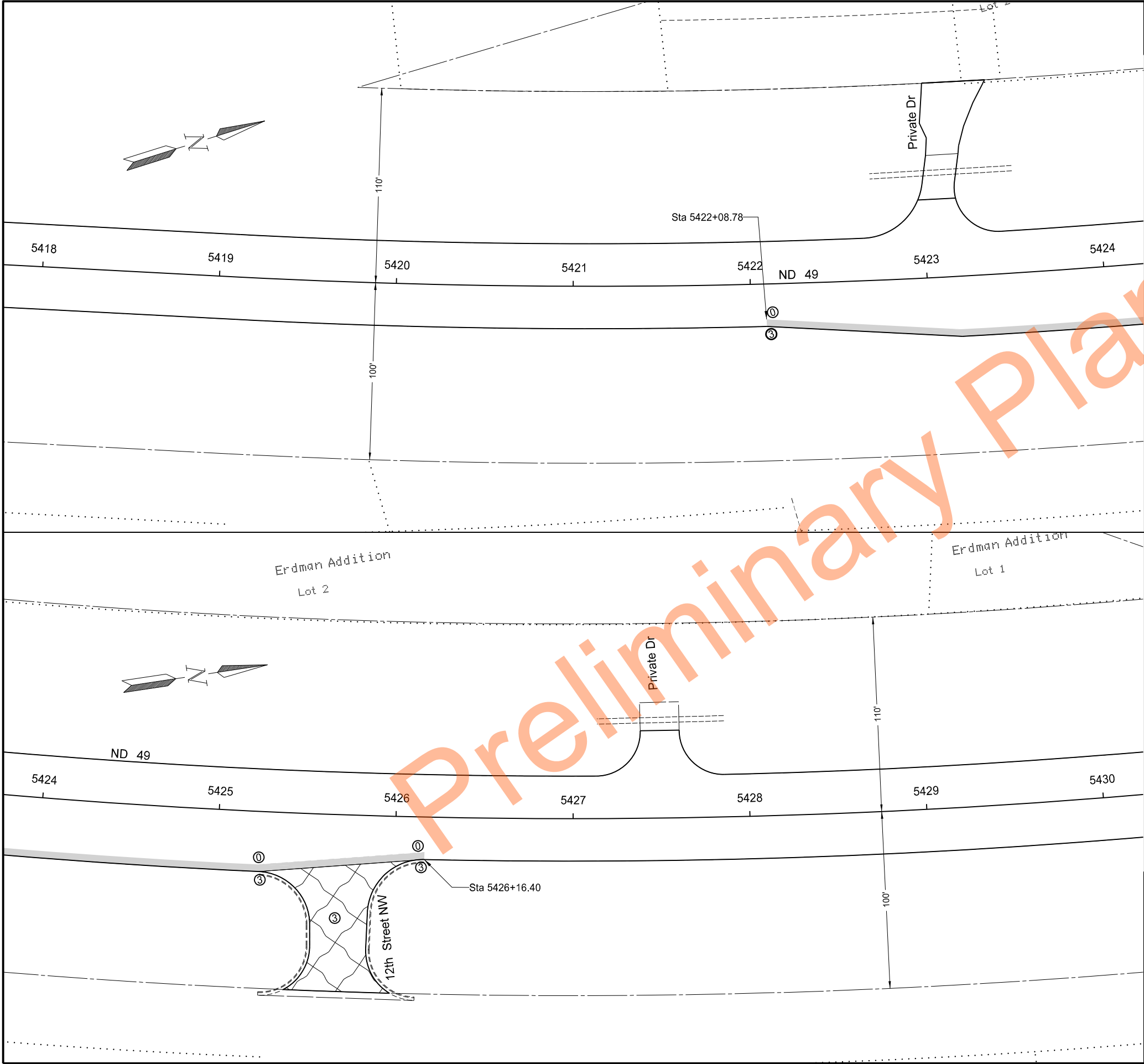
LEGEND

- Transition Mill 3" to 0"
- Milling 3"
- Milling 3" to 0" (Longitudinal) (see sheet 20-1)
- Milling shoulder 3" to 0" (Transverse)
- Removal of Pavement (see sheet 40-4)
- Milling Depth (in)

Removals

ND 49
Beulah North to Jct 200

5406+00 to 5418+00



STATE		PROJECT NO.	SECTION NO.	SHEET NO.
ND		XA-NH-5-049(021)101	40	9

SPEC	CODE	BID ITEM	QTY	UNIT
411	0100	MILLING PAVEMENT SURFACE		
		5422+08.78 to 5426+16.40 Rt (3" @ Pmnt edge, 0" @ 30' Rt to CL)	16	TON
		12th St NW (ND 49 Rt side) (3")	54	TON

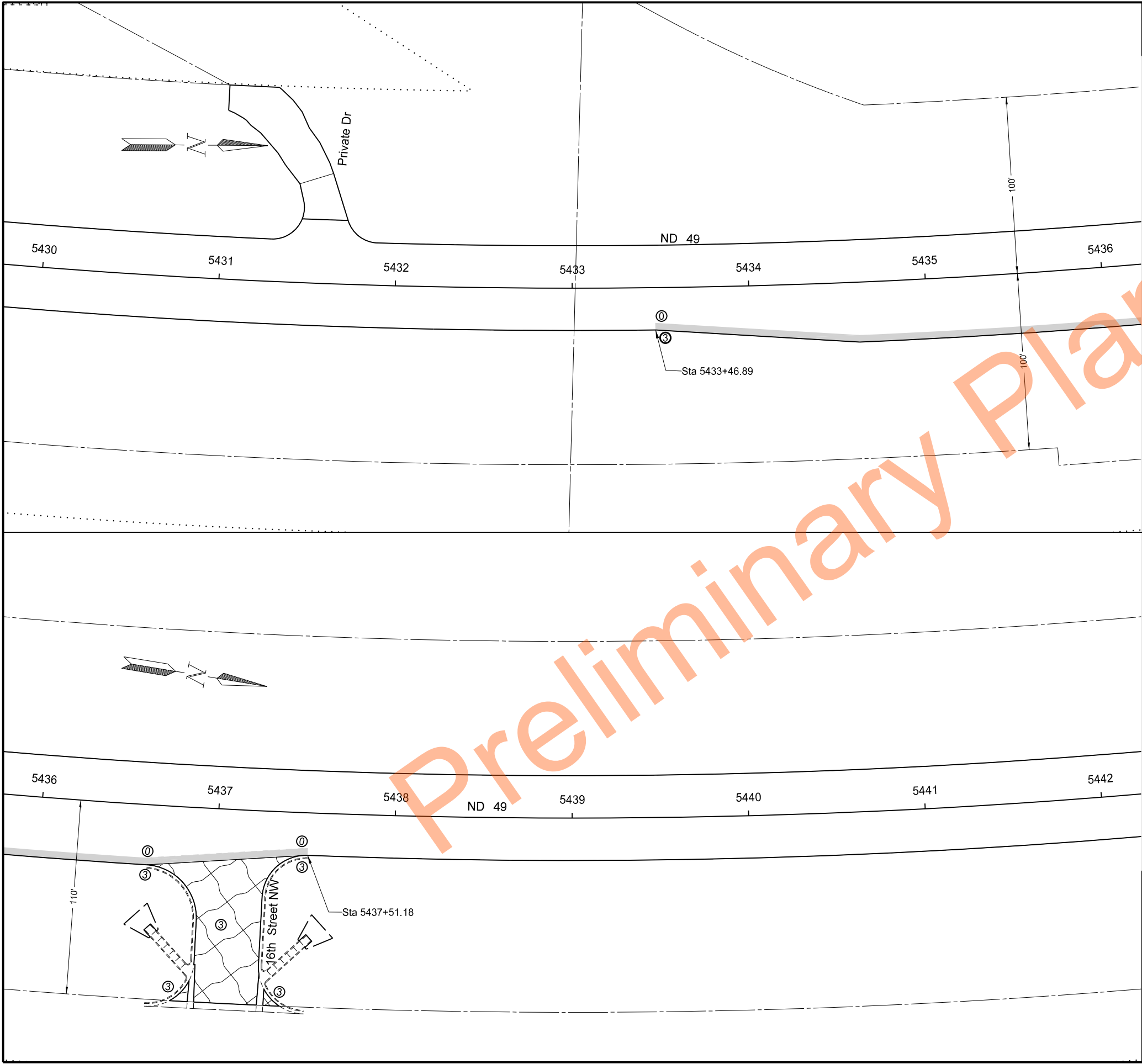
LEGEND

- Transition Mill 3" to 0"
- Milling 3"
- Milling 3" to 0" (Longitudinal) (see sheet 20-1)
- Milling shoulder 3" to 0" (Transverse)
- Removal of Pavement (see sheet 40-4)
- Milling Depth (in)

Removals

ND 49
Beulah North to Jct 200

5418+00 to 5430+00



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	40	10

SPEC	CODE	BID ITEM	QTY	UNIT
411	0100	MILLING PAVEMENT SURFACE		
		5433+46.89 to 5437+51.18 Rt (3" @ Pmnt edge, 0" @ 30' Rt to CL)	16	TON
		16th St NW (ND 49 Rt side) (3")	63	TON

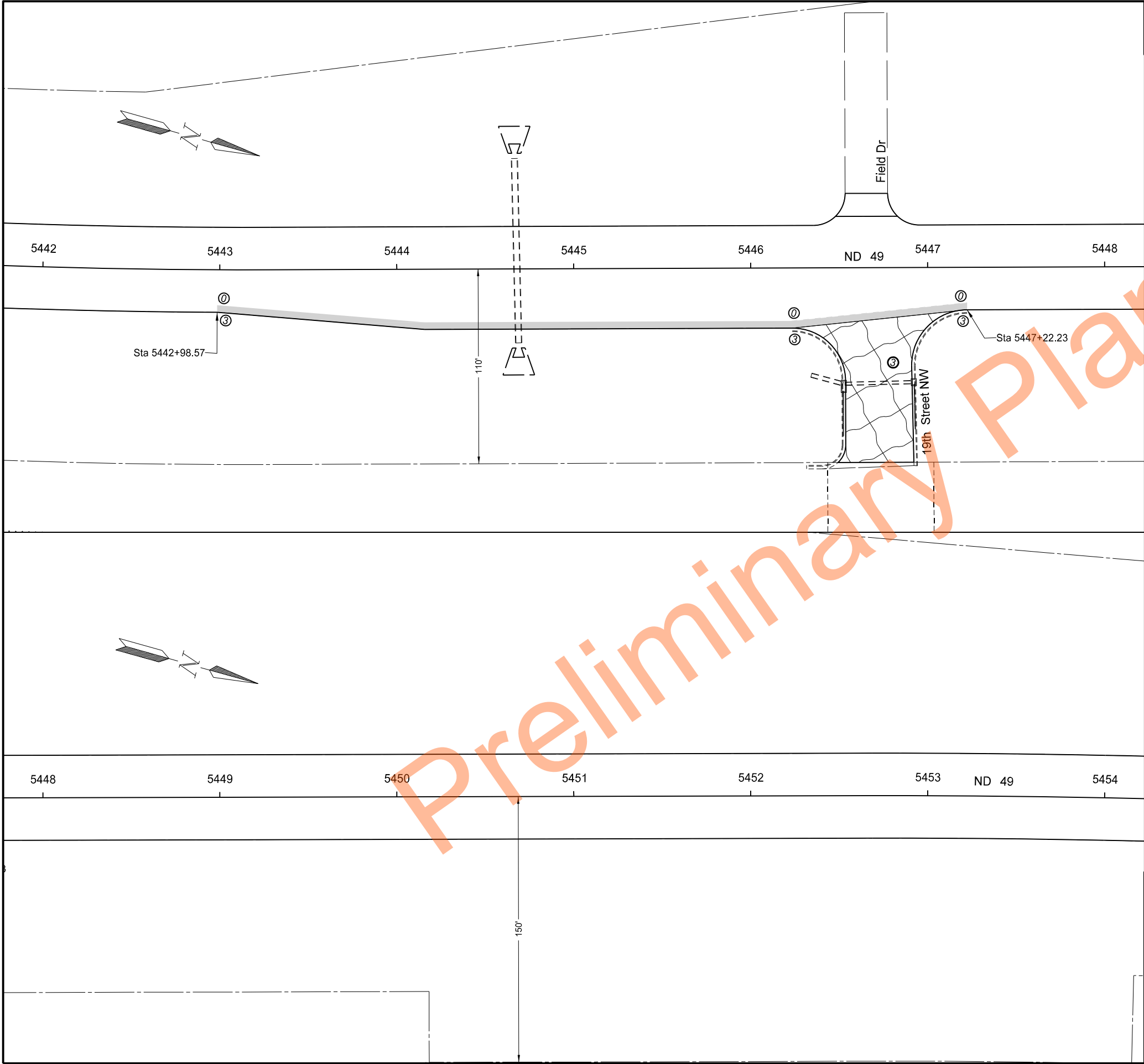
- LEGEND**
- Transition Mill 3" to 0"
 - Milling 3"
 - Milling 3" to 0" (Longitudinal) (see sheet 20-1)
 - Milling shoulder 3" to 0" (Transverse)
 - Removal of Pavement (see sheet 40-4)
 - Milling Depth (in)

Removals

ND 49
Beulah North to Jct 200

5430+00 to 5442+00





STATE		PROJECT NO.	SECTION NO.	SHEET NO.
ND		XA-NH-5-049(021)101	40	11

SPEC	CODE	BID ITEM	QTY	UNIT
411	0100	MILLING PAVEMENT SURFACE		
		5442+98.57 to 5447+22.23 Rt (3" @ Rt side, 0" @ 30' Rt to CL)	16	TON
		19th St NW (ND 49 Rt side) (3")	65	TON

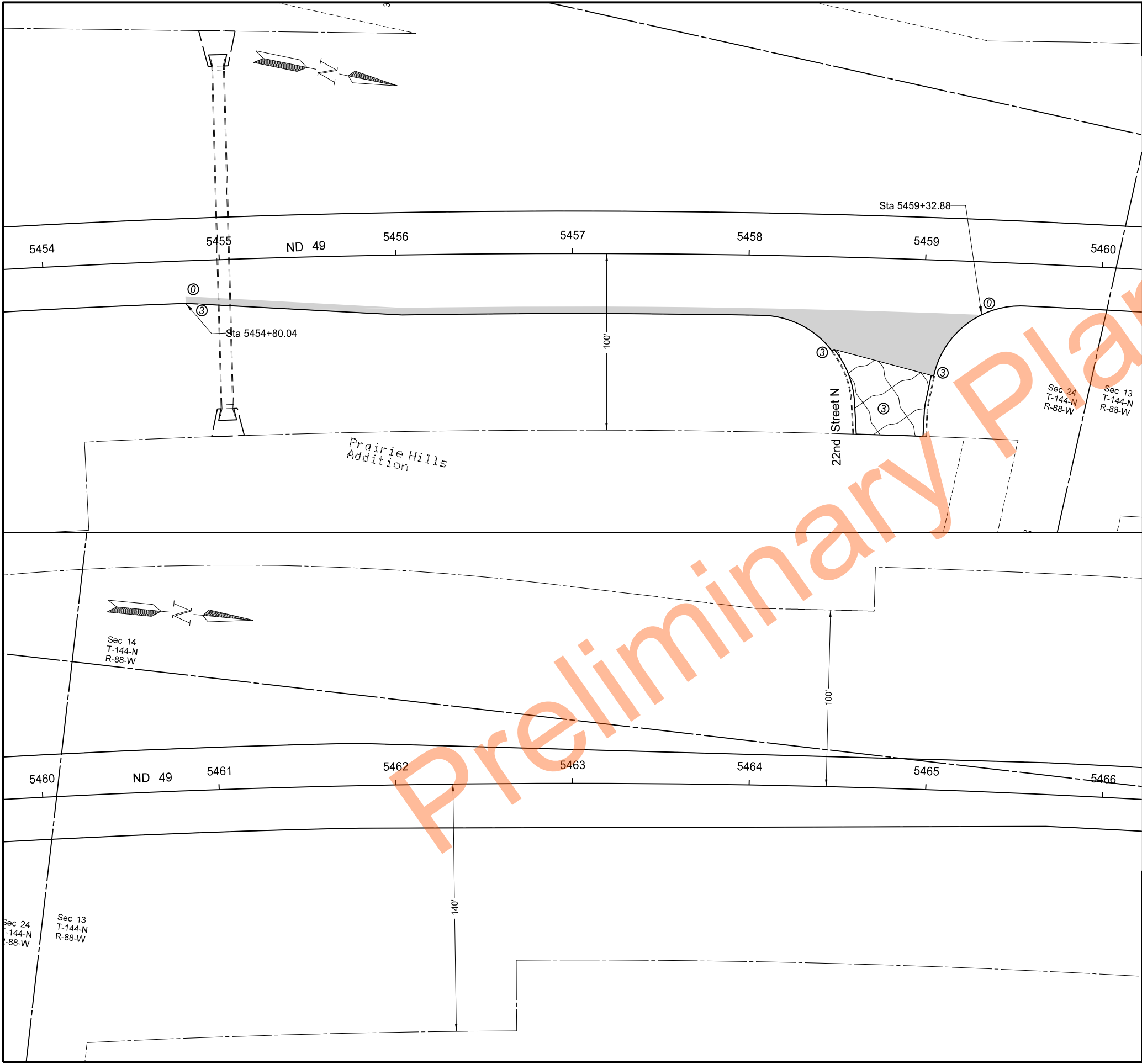
LEGEND

- Transition Mill 3" to 0"
- Milling 3"
- Milling 3" to 0" (Longitudinal) (see sheet 20-1)
- Milling shoulder 3" to 0" (Transverse)
- Removal of Pavement (see sheet 40-4)
- Milling Depth (in)

Removals

ND 49
Beulah North to Jct 200

5442+00 to 5454+00



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	40	12

SPEC	CODE	BID ITEM	QTY	UNIT
411	0100	MILLING PAVEMENT SURFACE		
		5454+80.04 to 5459+32.88 Rt (3" @ Rt side, 0" @ 30' Rt to CL)	35	TON
		22nd St N (ND 49 Rt side) (3")	32	TON

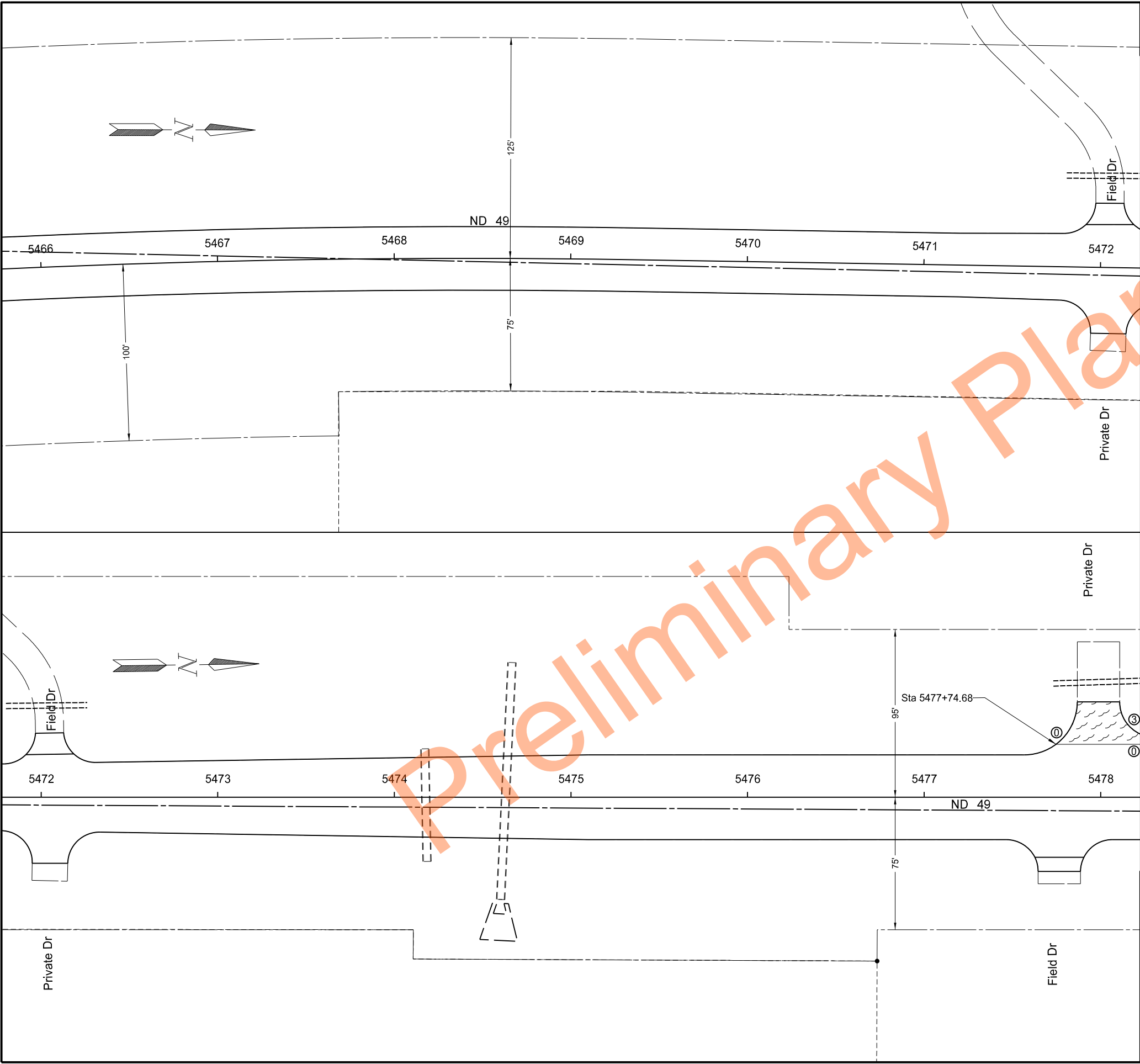
- LEGEND
- Transition Mill 3" to 0"
 - Milling 3"
 - Milling 3" to 0" (Longitudinal) (see sheet 20-1)
 - Milling shoulder 3" to 0" (Transverse)
 - Removal of Pavement (see sheet 40-4)
 - Milling Depth (in)

Removals

ND 49
Beulah North to Jct 200

5454+00 to 5466+00





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	40	13

SPEC	CODE	BID ITEM	QTY	UNIT
411	0100	MILLING PAVEMENT SURFACE		
5477+74.68 to 5478+22.5 Lt (S side: 0", N side: 3" @ Lt side, 0" @ 30' Lt to CL)			4	TON

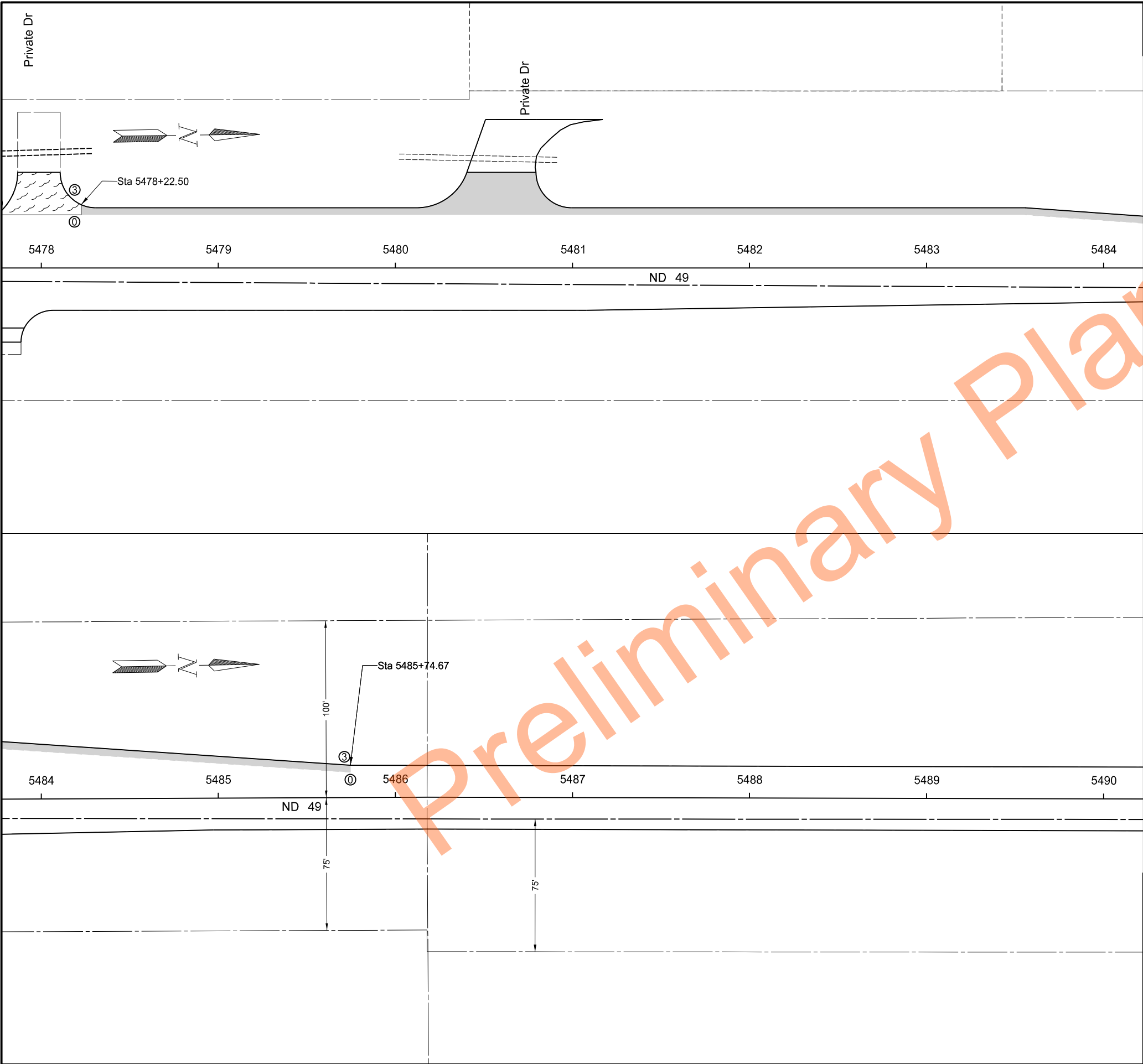
LEGEND

- Transition Mill 3" to 0"
- Milling 3"
- Milling 3" to 0" (Longitudinal) (see sheet 20-1)
- Milling shoulder 3" to 0" (Transverse)
- Removal of Pavement (see sheet 40-4)
- Milling Depth (in)

Removals

ND 49
Beulah North to Jct 200

5466+00 to 5478+00



STATE		PROJECT NO.	SECTION NO.	SHEET NO.
ND		XA-NH-5-049(021)101	40	14

SPEC	CODE	BID ITEM	QTY	UNIT
411	0100	MILLING PAVEMENT SURFACE		
5478+22.5 to 5485+74.67 Lt (3" @ Lt side, 0" @ 30' Lt to CL)			38	TON

LEGEND

- Transition Mill 3" to 0"
- Milling 3"
- Milling 3" to 0" (Longitudinal) (see sheet 20-1)
- Milling shoulder 3" to 0" (Transverse)
- Removal of Pavement (see sheet 40-4)
- Milling Depth (in)

Removals

ND 49
Beulah North to Jct 200

5478+00 to 5490+00

REGISTERED PROFESSIONAL ENGINEER

STACY LATEN
PE-8772

DATE 9/22/23

NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-NH-5-049(021)101	51	1

Begin Station / Location	Begin Offset	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	Geosynthetic Material - Type G (Pay Item)	(*) End Sections		Applicable Backfill
				In	Bid Item	LF							Begin	End	
				In	Bid Item	LF		In	Type		In	SY	EA	EA	
5370+89	47' Rt	5370+93	47' Rt	18	Pipe Conc. Reinf. CL III (Extension)	4'	Reinforced Concrete Pipe - Class III (barrell length = 4 LF)	18					FES		Specification 714.04 A

Corrugations:

2 = 2-2/3"x1/2"

3 = 3"x1"

5 = 5"x1"

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

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

(*) End sections are measured and paid for separately for pipe extensions.

FES = Flared End Section

TES = Traversable End Section



Allowable Pipe List

ND 49
Beulah North to Jct 200

Other Waters Impact Table																	
Number	Location	Type	Feature	USACE Jurisdictional ¹	Impacts to Other Waters						Other Water Mitigation						
					Acres			Linear Feet			Mitigation Proposed			USACE Mitigation Bank		Onsite Mitigation Method	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm. (Fill/Drain)	Perm. (Cut)	EO 11990	USACE	USFWS	Location	Acre(s)	Mitigation Location; ratio	Acre(s)
OW 1a & 1b	Sec. 25 & 26, T144N, R88W	Stream	Natural	Y	0.000	0.000	0.000	0.000	0.000	0.000	N	N	N				
Totals					0.000	0.000	0.000	0.000	0.000	0.000							

¹ A wetland Jurisdictional Determination was issued by the USACE on 12/2/2022; NWO-2009-1967-BIS.

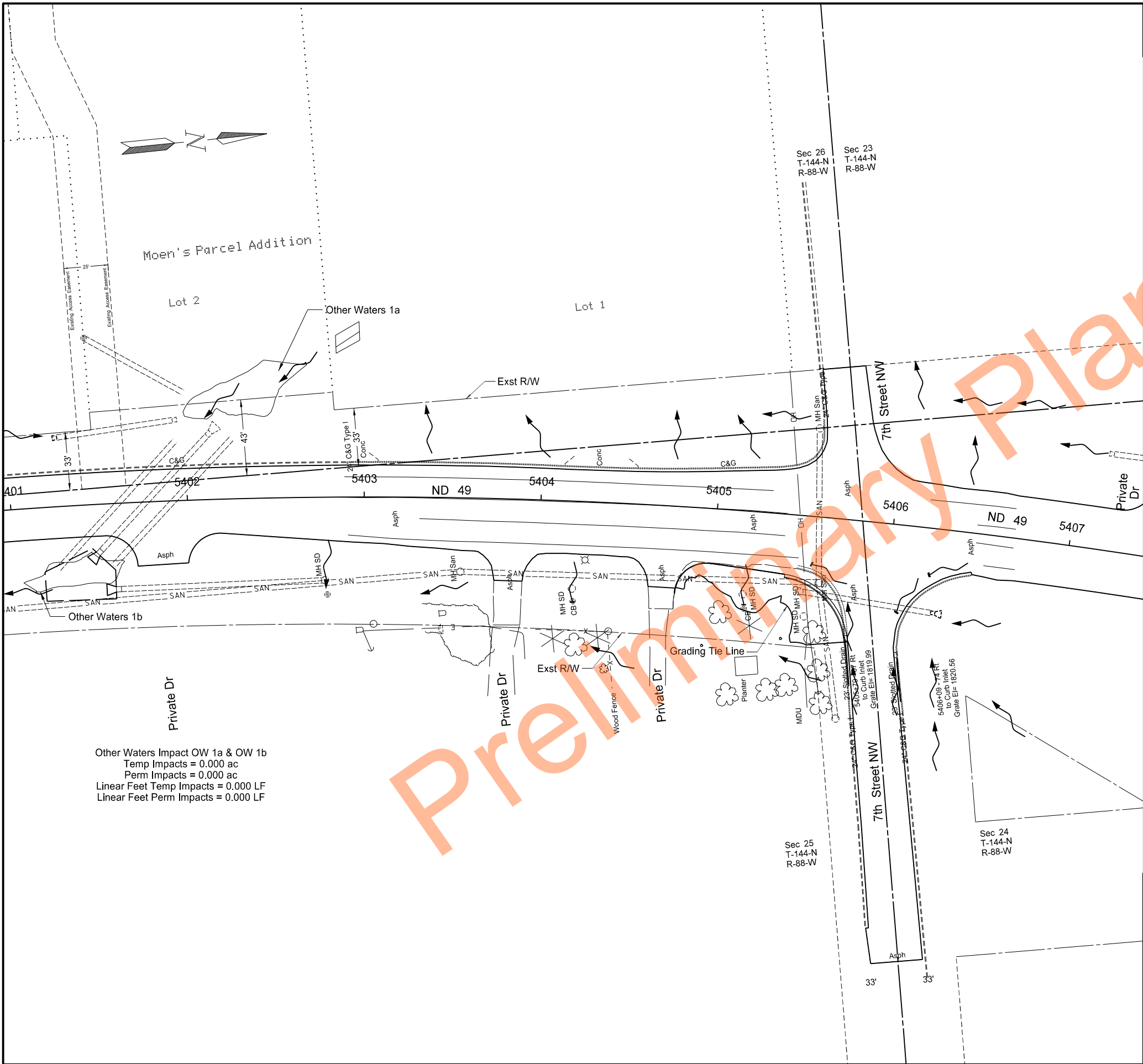
Impact Summary Table			
Permanent Impact Summary		Temporary Impacts and additional information	
Wetland Type	Total Acre(s)	Water Type	Total Acre(s)
Natural/JD (Fill/Drain)	0.000	Temporary Wetland JD	0.000
Natural/Non-JD (Fill/Drain)	0.000	Non-JD Wetland Temporary	0.000
Artificial/JD (Fill/Drain)	0.000		
Artificial /Non-JD (Fill/Drain))	0.000	Permanent OW	0.000
Total	0.000	Temporary OW	0.000
JD Natural (Cut)	0.000	Permanent OW-d	0.000
JD Artificial (Cut)	0.000	Temporary OW-d	0.000
Non-JD Natural (Cut)	0.000		
Non-JD Artificial (Cut)	0.000		
Total	0.000		

	Location	Ditch Shift Acre(s)	Onsite Acre(s)	11990 Bank Acre(s)	USACE/11990 Bank Acre(s)	USFWS Bank Acre(s)
USACE Only						
EO 11990 Only						
USACE/11990						
USFWS						
Total		0.000	0.000	0.000	0.000	0.000



Wetlands Mitigation and Environmental

ND 49
Beulah North to Jct 200



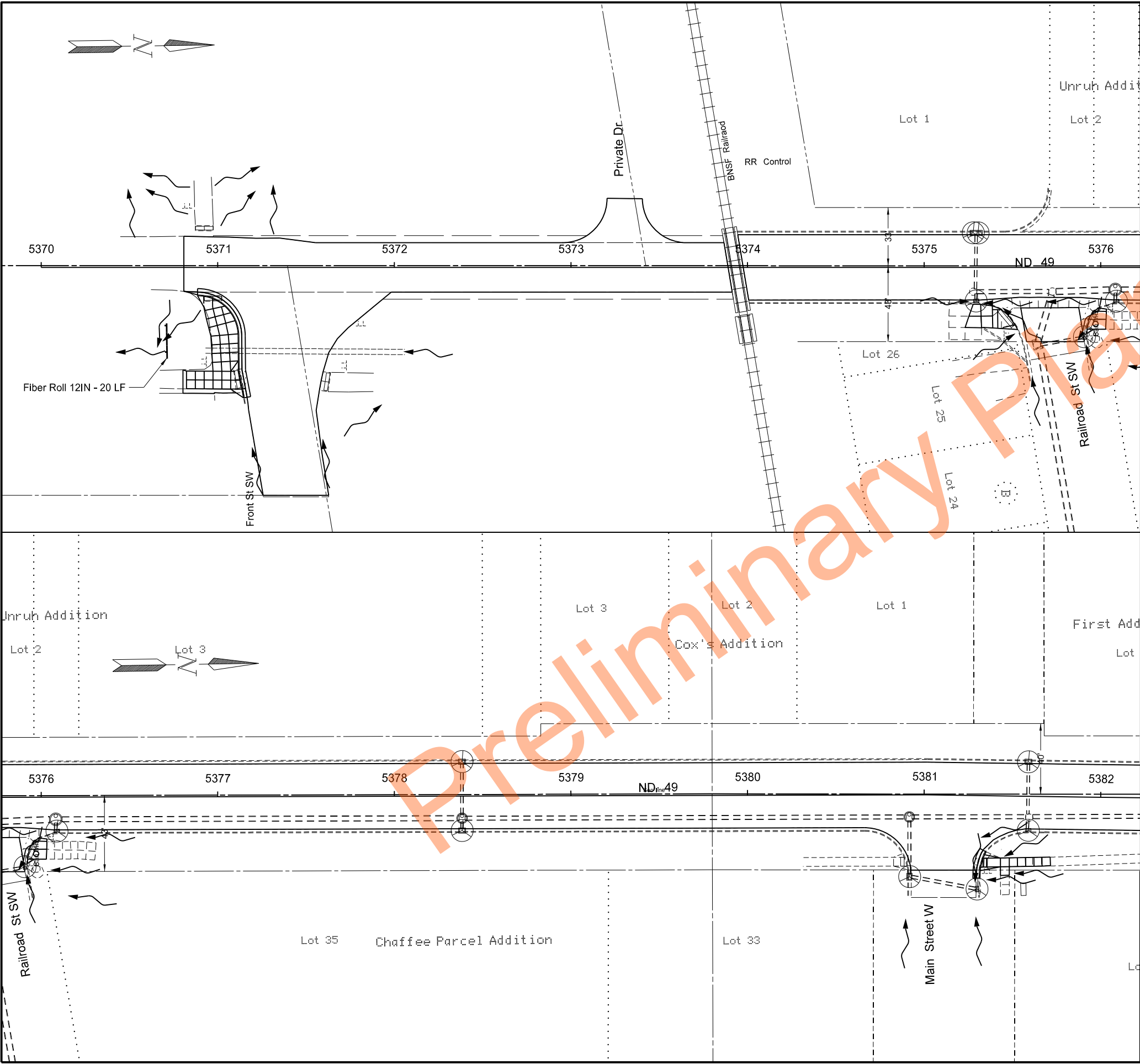
Other Waters Impact OW 1a & OW 1b
Temp Impacts = 0.000 ac
Perm Impacts = 0.000 ac
Linear Feet Temp Impacts = 0.000 LF
Linear Feet Perm Impacts = 0.000 LF

Wetland Impacts

ND 49
Beulah North to Jct 200

ND 49 & 7th St NW





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	76	1

SPEC	CODE	BID ITEM	QTY	UNIT
261	0112	FIBER ROLLS 12IN ND 49 & Front St SW - SE Quadrant	20	LF
261	0113	REMOVE FIBER ROLLS 12IN ND 49 & Front St SW - SE Quadrant	20	LF
708	1540	INLET PROTECTION-SPECIAL ND 49 & Railroad S: SW - SW Quadrant ND 49 & Railroad S: SW - SE Quadrant ND 49 & Railroad S: SW - NE Quadrant 5378+38 Lt & Rt ND 49 & Main St W - NW Quadrant ND 49 & Main St W - SE Quadrant ND 49 & Main St W - NE Quadrant	2 1 2 2 1 1 2	EA EA EA EA EA EA EA
708	1541	REMOVE INLET PROTECTION-SPECIAL ND 49 & Railroad S: SW - SW Quadrant ND 49 & Railroad S: SW - SE Quadrant ND 49 & Railroad S: SW - NE Quadrant 5378+38 Lt & Rt ND 49 & Main St W - NW Quadrant ND 49 & Main St W - SE Quadrant ND 49 & Main St W - NE Quadrant	2 1 2 2 1 1 2	EA EA EA EA EA EA EA

LEGEND

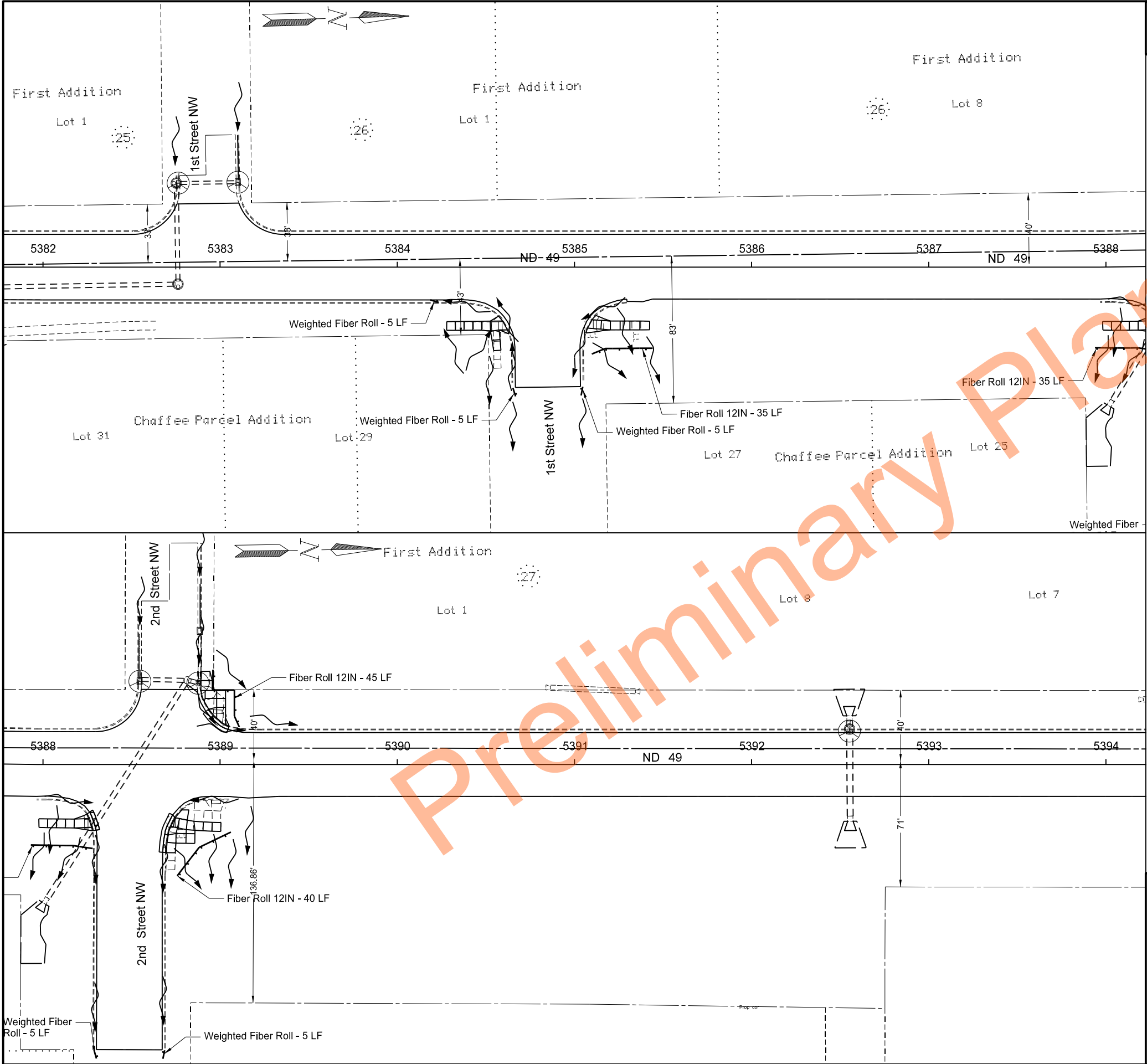
 Inlet Protection-Special

Temporary Erosion Control

ND 49
Beulah, North to Jct 200

5370+80.76 to 5382+00





		STATE	PROJECT NO.	SECTION NO.	SHEET NO.
		ND	XA-NH-5-049(021)101	76	2
SPEC	CODE	BID ITEM	QTY	UNIT	
261	0112	FIBER ROLLS 12IN			
		ND 5 & 1st Ave NW - NE Quadrant	35	LF	
		ND 49 & 2nd St NW - NW Quadrant	45	LF	
		ND 49 & 2nd St NW - SE Quadrant	35	LF	
		ND 49 & 2nd St NW - NE Quadrant	40	LF	
261	0113	REMOVE FIBER ROLLS 12IN			
		ND 5 & 1st Ave NW - NE Quadrant	35	LF	
		ND 49 & 2nd St NW - NW Quadrant	45	LF	
		ND 49 & 2nd St NW - SE Quadrant	35	LF	
		ND 49 & 2nd St NW - NE Quadrant	40	LF	
261	0200	WEIGHTED FIBER ROLLS			
		ND 5 & 1st Ave NW - SE Quadrant	10	LF	
		ND 5 & 1st Ave NW - NE Quadrant	5	LF	
		ND 5 & 2nd St NW - SE Quadrant	5	LF	
		ND 5 & 2nd St NW - NE Quadrant	5	LF	
261	0201	REMOVE WEIGHTED FIBER ROLLS			
		ND 5 & 1st Ave NW - SE Quadrant	10	LF	
		ND 5 & 1st Ave NW - NE Quadrant	5	LF	
		ND 5 & 2nd St NW - SE Quadrant	5	LF	
		ND 5 & 2nd St NW - NE Quadrant	5	LF	
708	1540	INLET PROTECTION-SPECIAL			
		ND 5 & 1st Ave NW - NW Quadrant	1	EA	
		ND 5 & 1st Ave NW - SW Quadrant	1	EA	
		ND 49 & 2nd St NW - NW Quadrant	1	EA	
		ND 49 & 2nd St NW - SW Quadrant	1	EA	
		5392+55 Lt	1	EA	
708	1541	REMOVE INLET PROTECTION-SPECIAL			
		ND 5 & 1st Ave NW - NW Quadrant	1	EA	
		ND 5 & 1st Ave NW - SW Quadrant	1	EA	
		ND 49 & 2nd St NW - NW Quadrant	1	EA	
		ND 49 & 2nd St NW - SW Quadrant	1	EA	
		5392+55 Lt	1	EA	

LEGEND



Inlet Protection-Special

Temporary Erosion Control

ND 49
Beulah, North to Jct 200

5382+00 to 5394+00

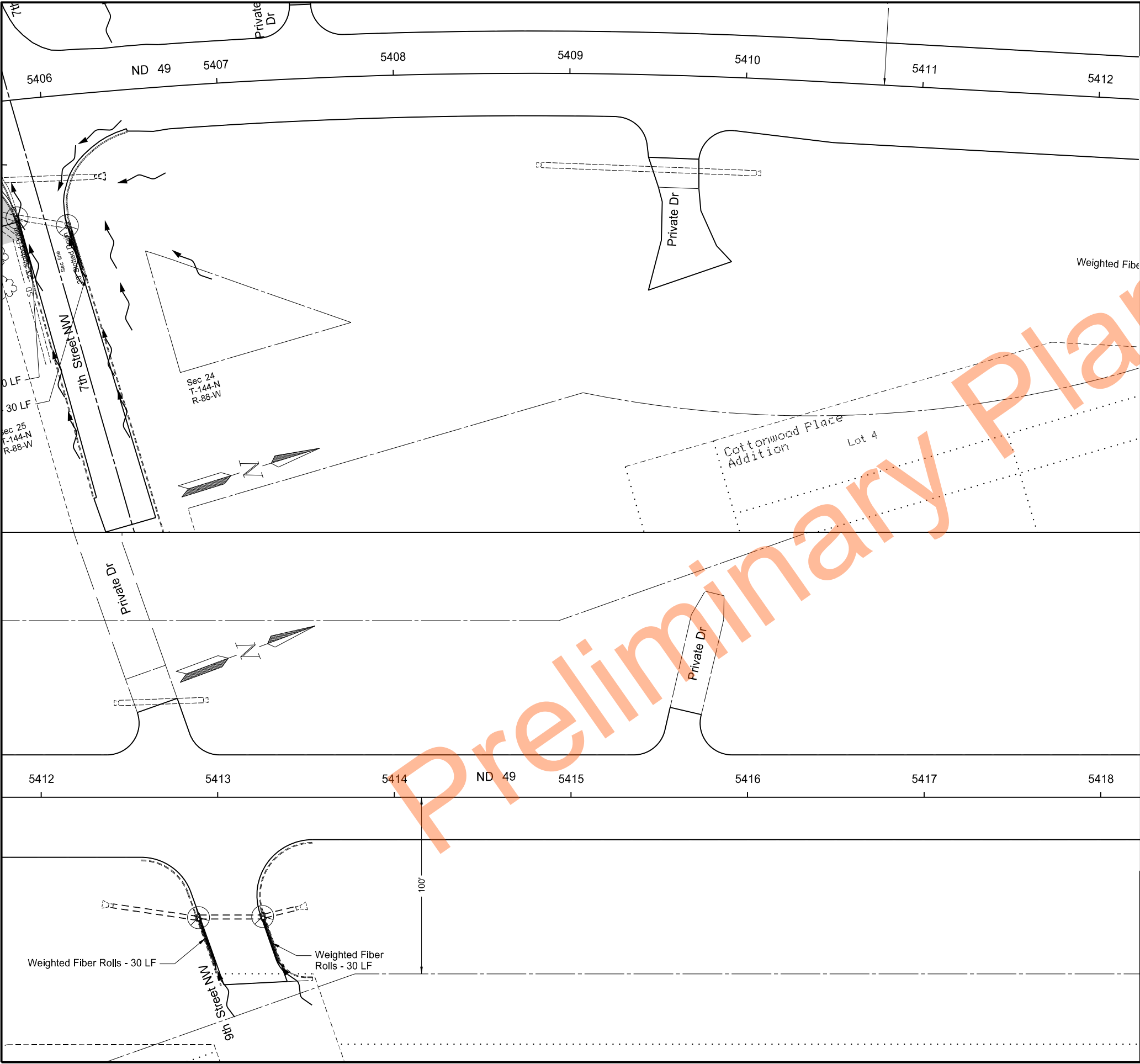
REGISTERED PROFESSIONAL ENGINEER

STACY FLATEN

PE-8772

DATE 9/28/23

NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	76	4

SPEC	CODE	BID ITEM	QTY	UNIT
261	0200	WEIGHTED FIBER ROLLS		
		ND 49 & 9th St NW - SE Quadrant	30	LF
		ND 49 & 9th St NW - NE Quadrant	30	LF
261	0201	REMOVE WEIGHTED FIBER ROLLS		
		ND 49 & 9th St NW - SE Quadrant	30	LF
		ND 49 & 9th St NW - NE Quadrant	30	LF
708	1540	INLET PROTECTION-SPECIAL		
		ND 49 & 9th St NW - SE Quadrant	1	EA
		ND 49 & 9th St NW - NE Quadrant	1	EA
708	1541	REMOVE INLET PROTECTION-SPECIAL		
		ND 49 & 9th St NW - SE Quadrant	1	EA
		ND 49 & 9th St NW - NE Quadrant	1	EA

LEGEND

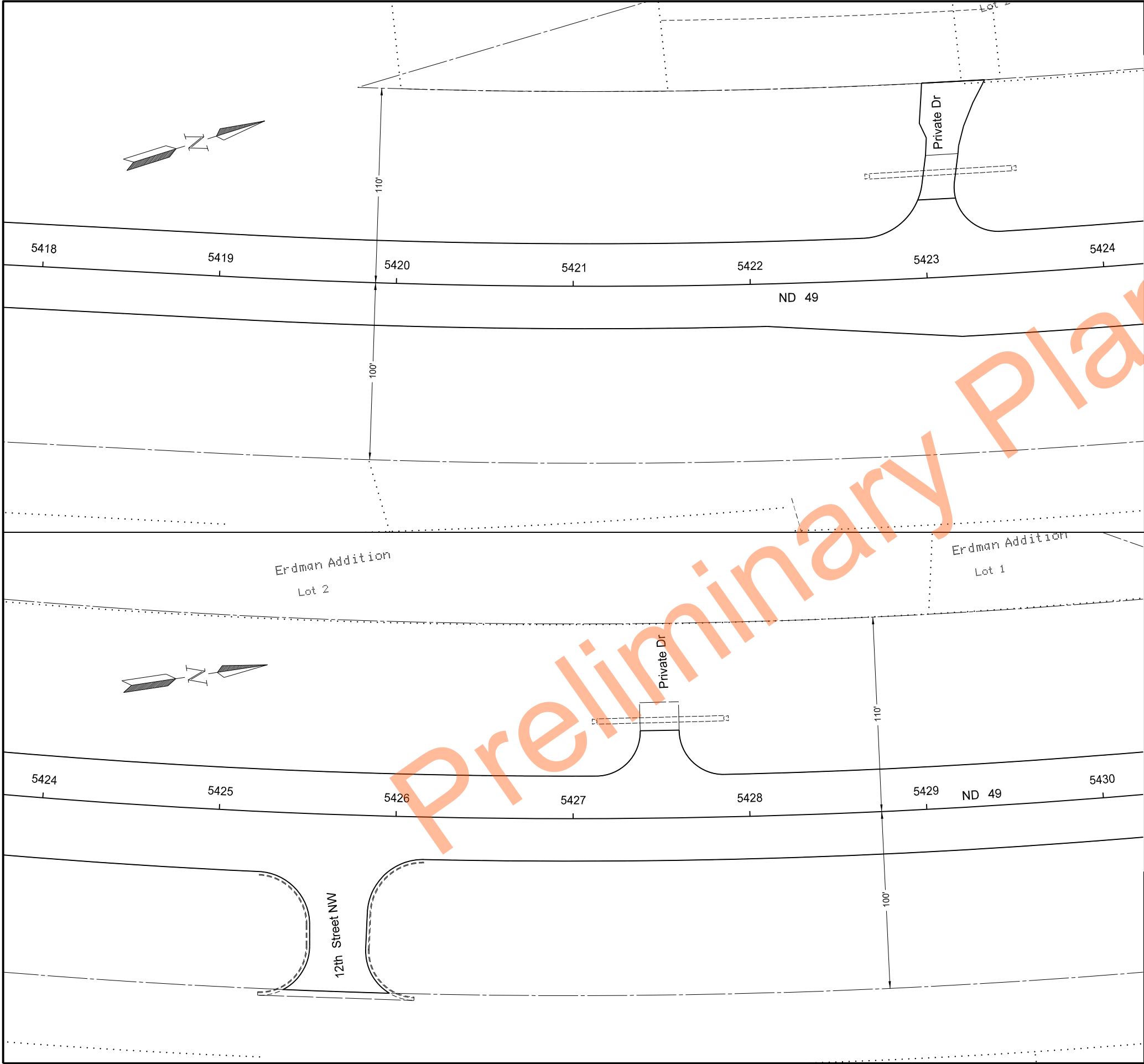
 Inlet Protection-Special

Temporary Erosion Control

ND 49
Beulah, North to Jct 200

5406+00 to 5418+00





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	76	5

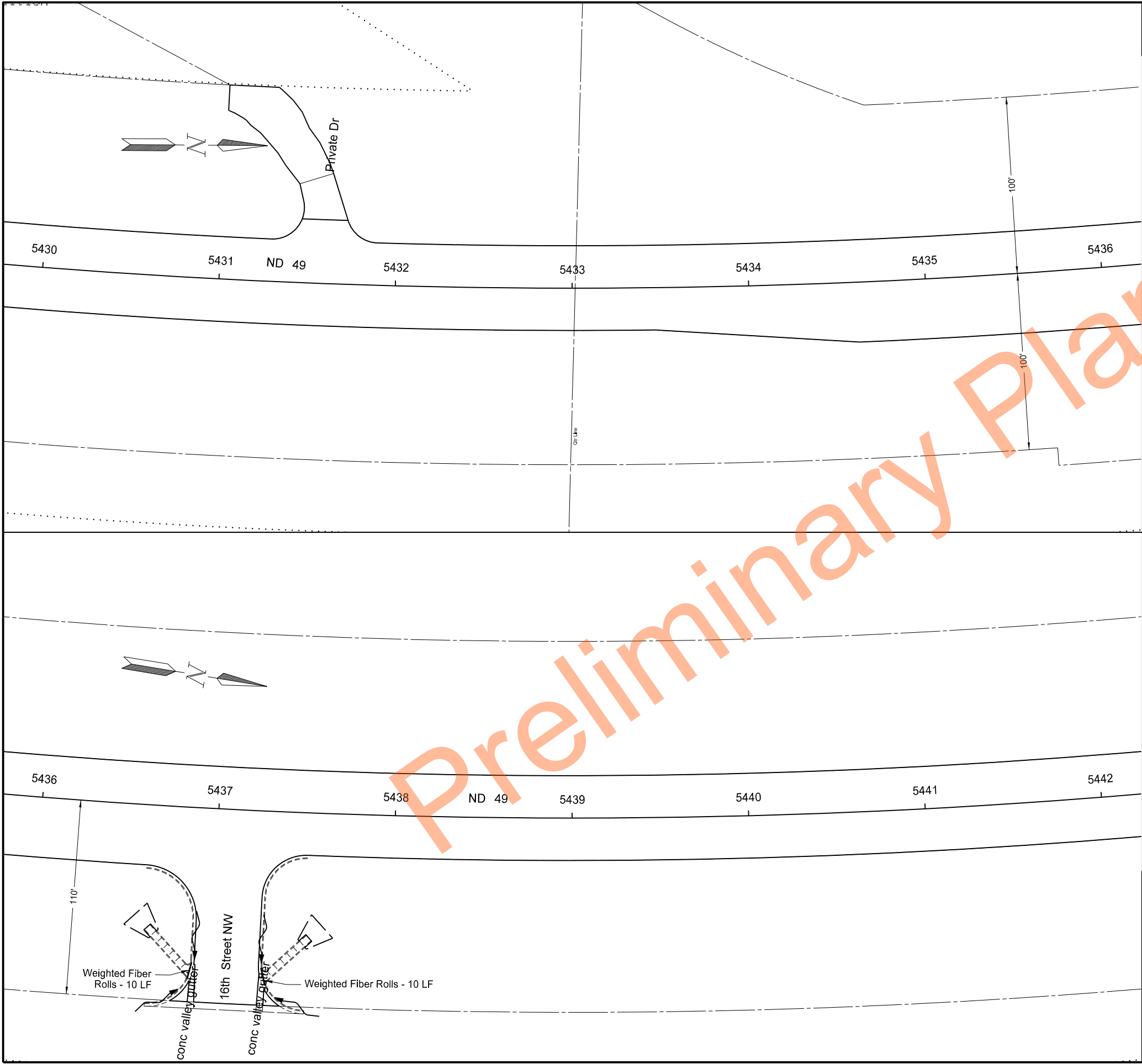
LEGEND

Inlet Protection-Special

Temporary Erosion Control

ND 49
Beulah, North to Jct 200

5418+00 to 5430+00



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	76	6

SPEC	CODE	BID ITEM	QTY	UNIT
261	0200	WEIGHTED FIBER ROLLS		
		ND 49 & 16th St NW - SE Quadrant	10	LF
		ND 49 & 16th St NW - NE Quadrant	10	LF
261	0201	REMOVE WEIGHTED FIBER ROLLS		
		ND 49 & 16th St NW - SE Quadrant	10	LF
		ND 49 & 16th St NW - NE Quadrant	10	LF

LEGEND

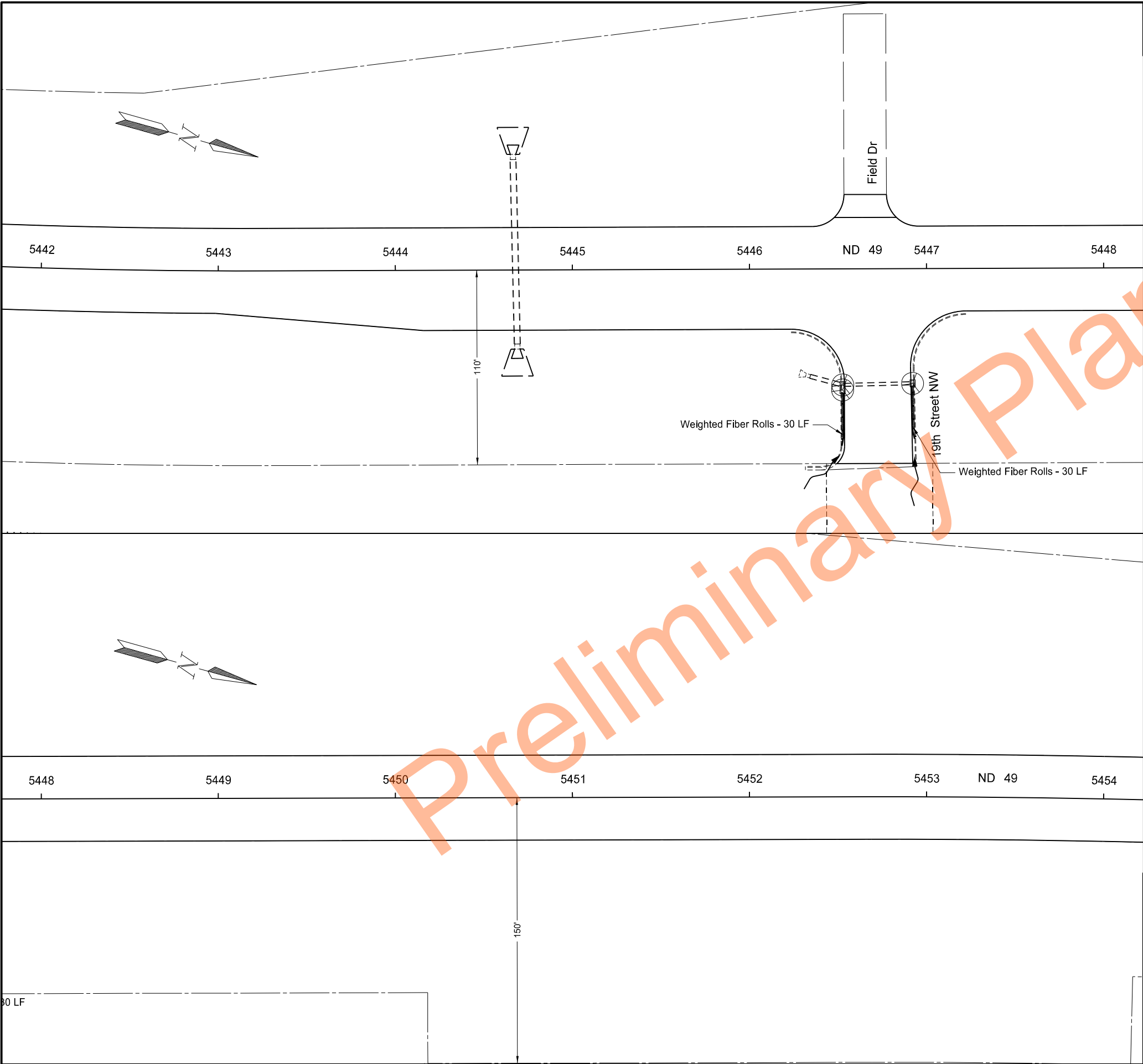
 Inlet Protection-Special

Temporary Erosion Control

ND 49
Beulah, North to Jct 200

5430+00 to 5442+00





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	76	7

SPEC	CODE	BID ITEM	QTY	UNIT
261	0200	WEIGHTED FIBER ROLLS		
		ND 49 & 19th St NW - SE Quadrant	30	LF
		ND 49 & 19th St NW - NE Quadrant	30	LF
261	0201	REMOVE WEIGHTED FIBER ROLLS		
		ND 49 & 19th St NW - SE Quadrant	30	LF
		ND 49 & 19th St NW - NE Quadrant	30	LF
708	1540	INLET PROTECTION-SPECIAL		
		ND 49 & 19th St NW - SE Quadrant	2	EA
		ND 49 & 19th St NW - NE Quadrant	1	EA
708	1541	REMOVE INLET PROTECTION-SPECIAL		
		ND 49 & 19th St NW - SE Quadrant	2	EA
		ND 49 & 19th St NW - NE Quadrant	1	EA

LEGEND

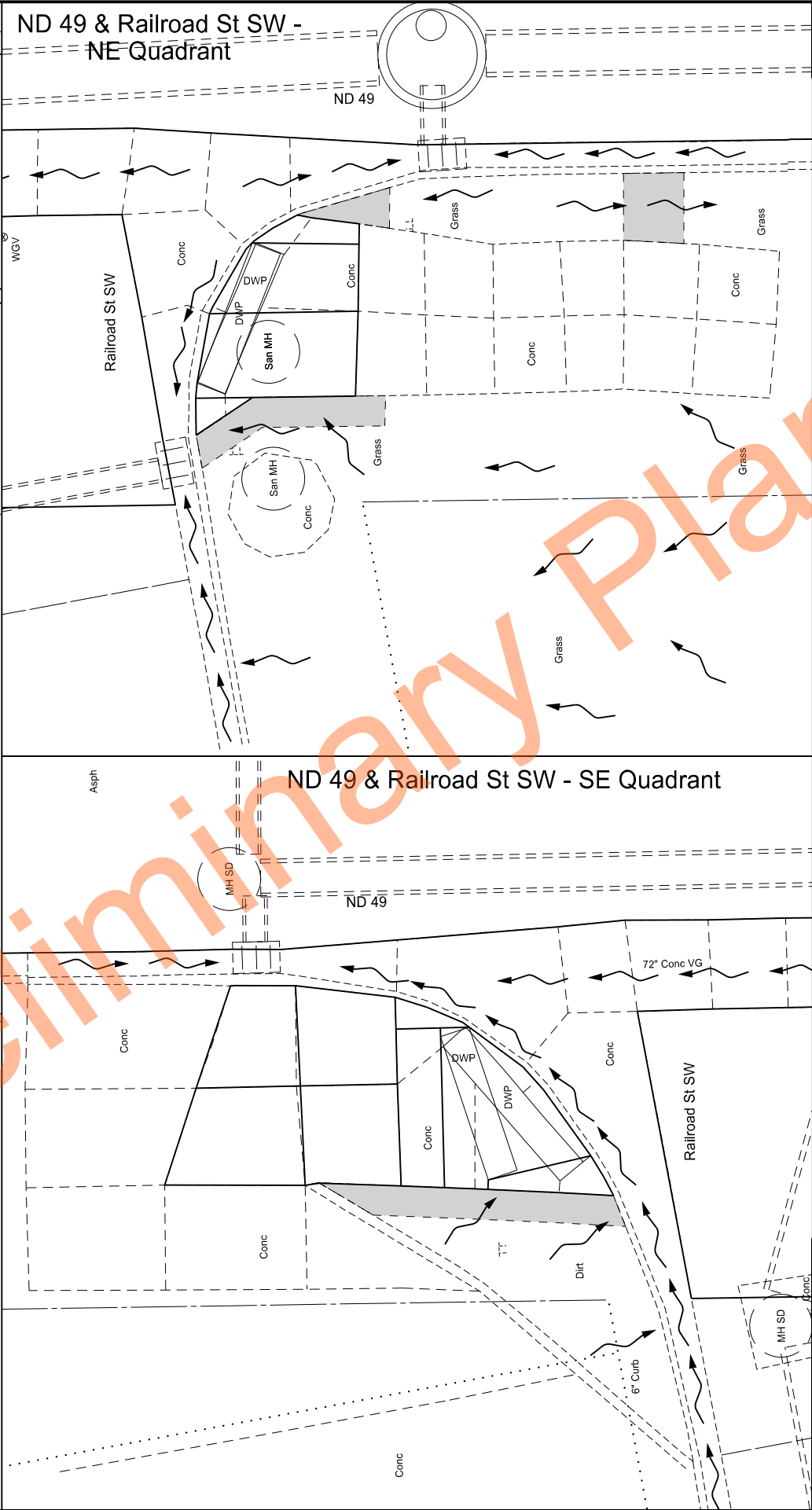
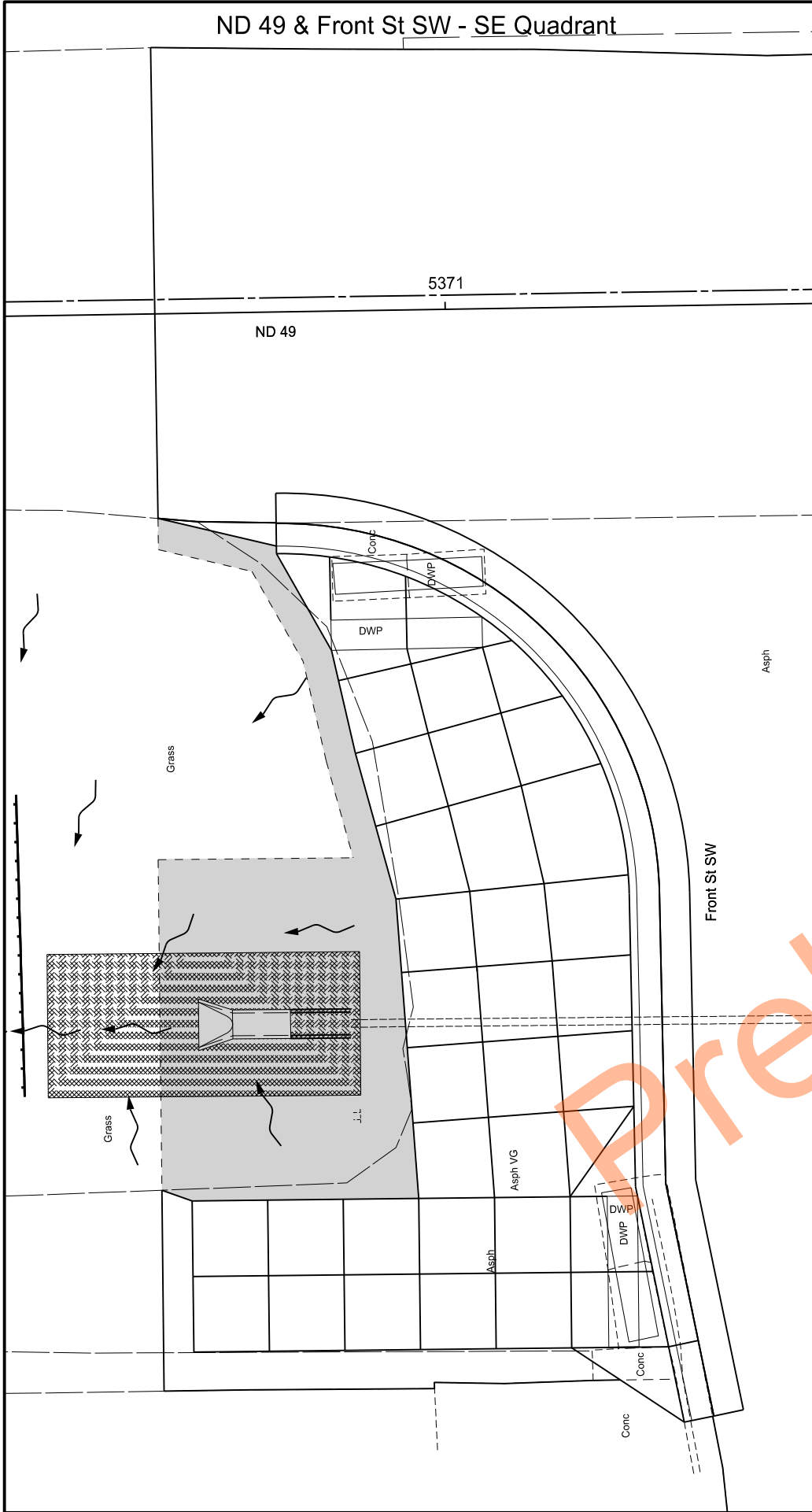
 Inlet Protection-Special

Temporary Erosion Control

ND 49
Beulah, North to Jct 200

5442+00 to 5454+00





STATE		PROJECT NO.	SECTION NO.	SHEET NO.
ND		XA-NH-5-049(021)101	77	1

SPEC	CODE	BID ITEM	QTY	UNIT
261	0112	FIBER ROLLS 12IN		
		ND 49 & Front St SW - SE Quadrant	20	LF
970	0008	LANDSCAPE PREPARATION		
		ND 49 & Front St SW - SE Quadrant	47	SY
		ND 49 & Railroad St SW - SE Quadrant	5	SY
		ND 49 & Railroad St SW - NE Quadrant	6	SY

LEGEND

Landscape Preparation

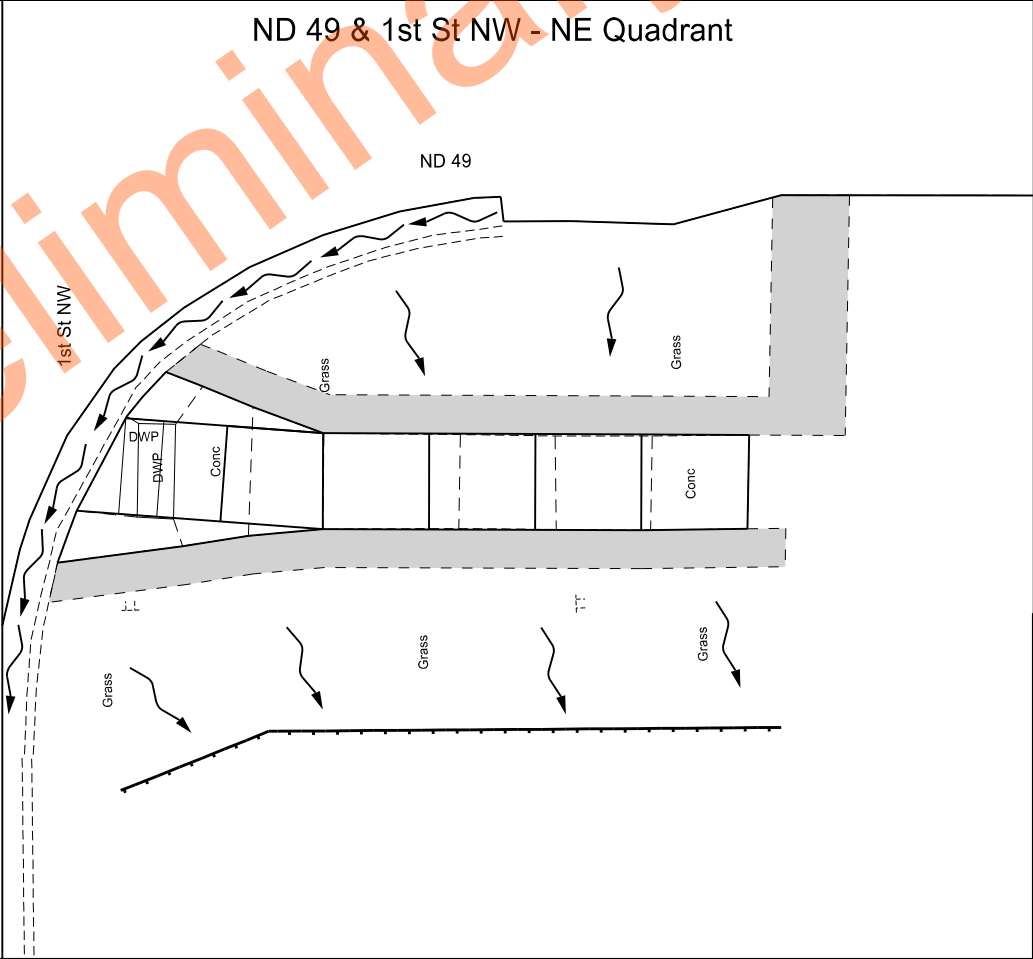
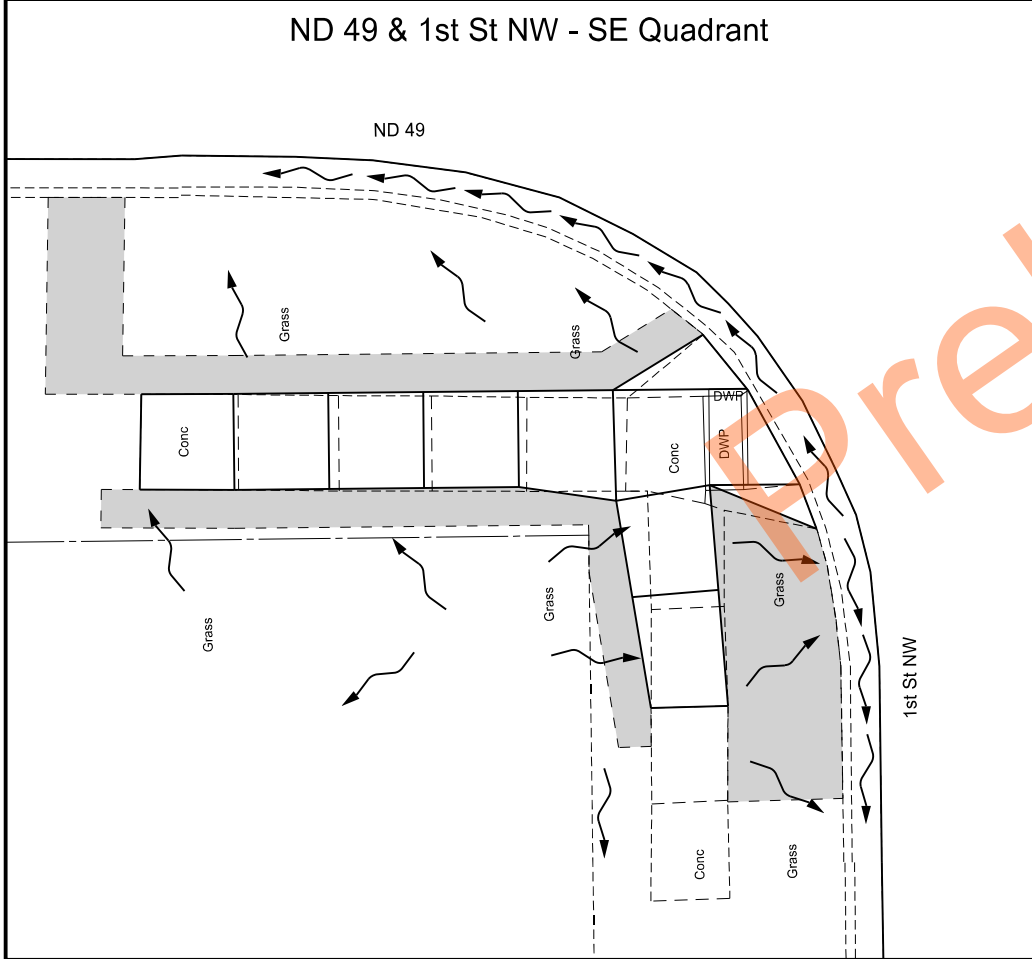
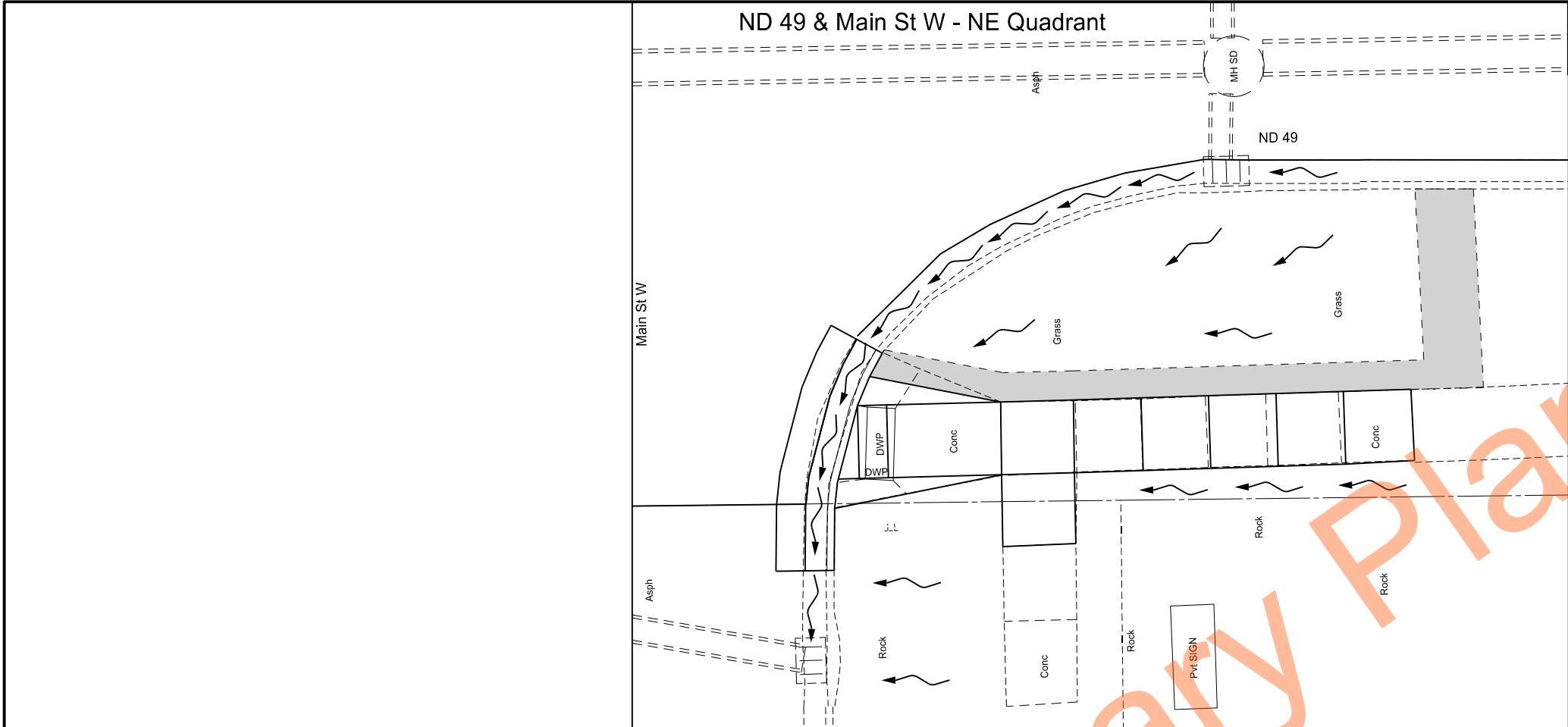
ECB Type 2

Permanent Erosion Control

ND 49
Beulah North to Jct 200

ND 49 & Front St SW
ND 49 & Railroad St SW

REGISTERED PROFESSIONAL ENGINEER
STACY LATEN
PE-8772
DATE 9/25/23
NORTH DAKOTA



STATE		PROJECT NO.	SECTION NO.	SHEET NO.
ND		XA-NH-5-049(021)101	77	2

SPEC	CODE	BID ITEM	QTY	UNIT
261	0112	FIBER ROLLS 12IN		
		ND 49 & 1st St NW - NE Quadrant	35	LF
970	0008	LANDSCAPE PREPARATION		
		ND 49 & Main St W - NE Quadrant	15	SY
		ND 49 & 1st St NW - SE Quadrant	30	SY
		ND 49 & 1st St NW - NE Quadrant	21	SY

LEGEND

Landscape Preparation

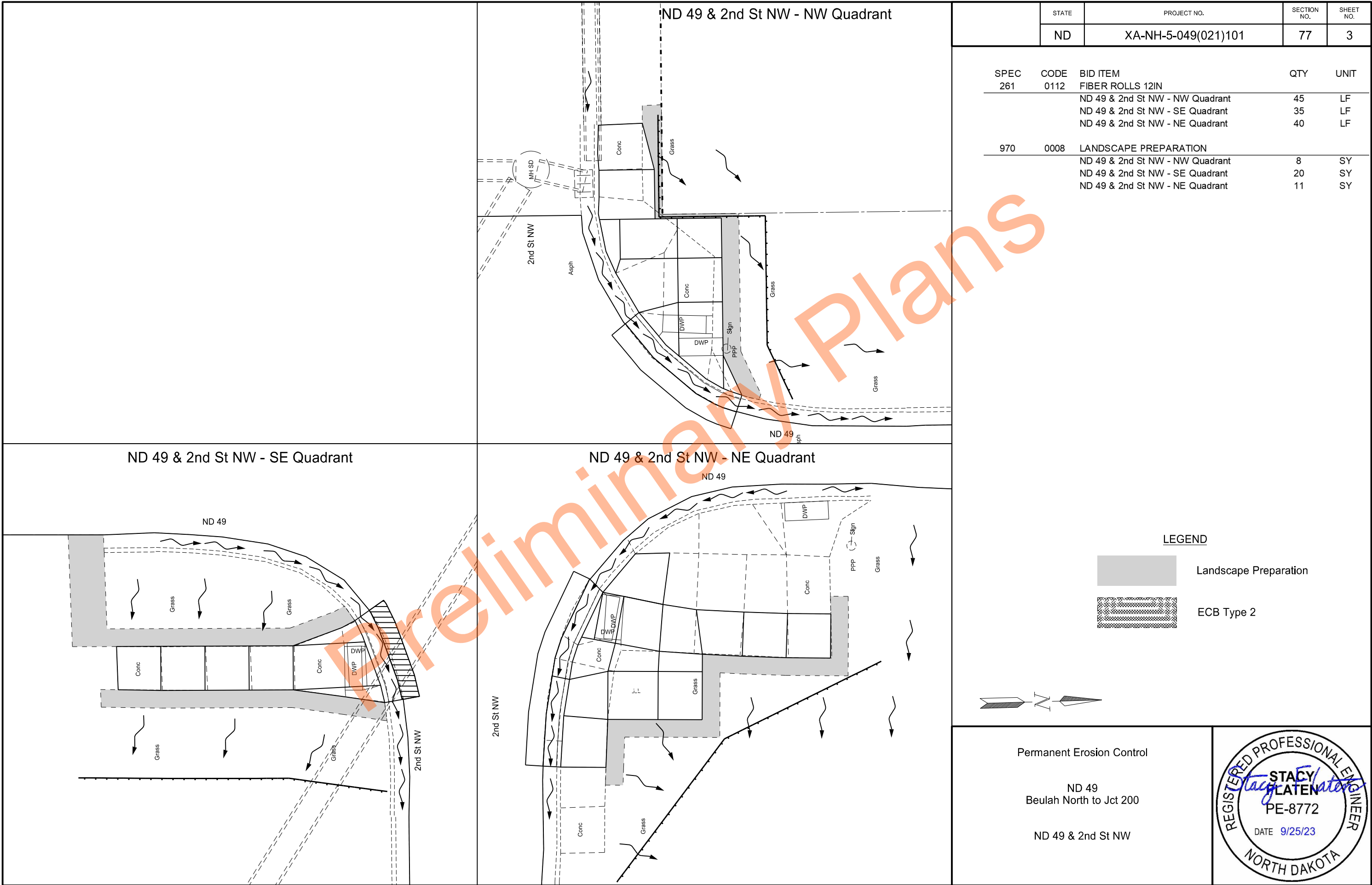
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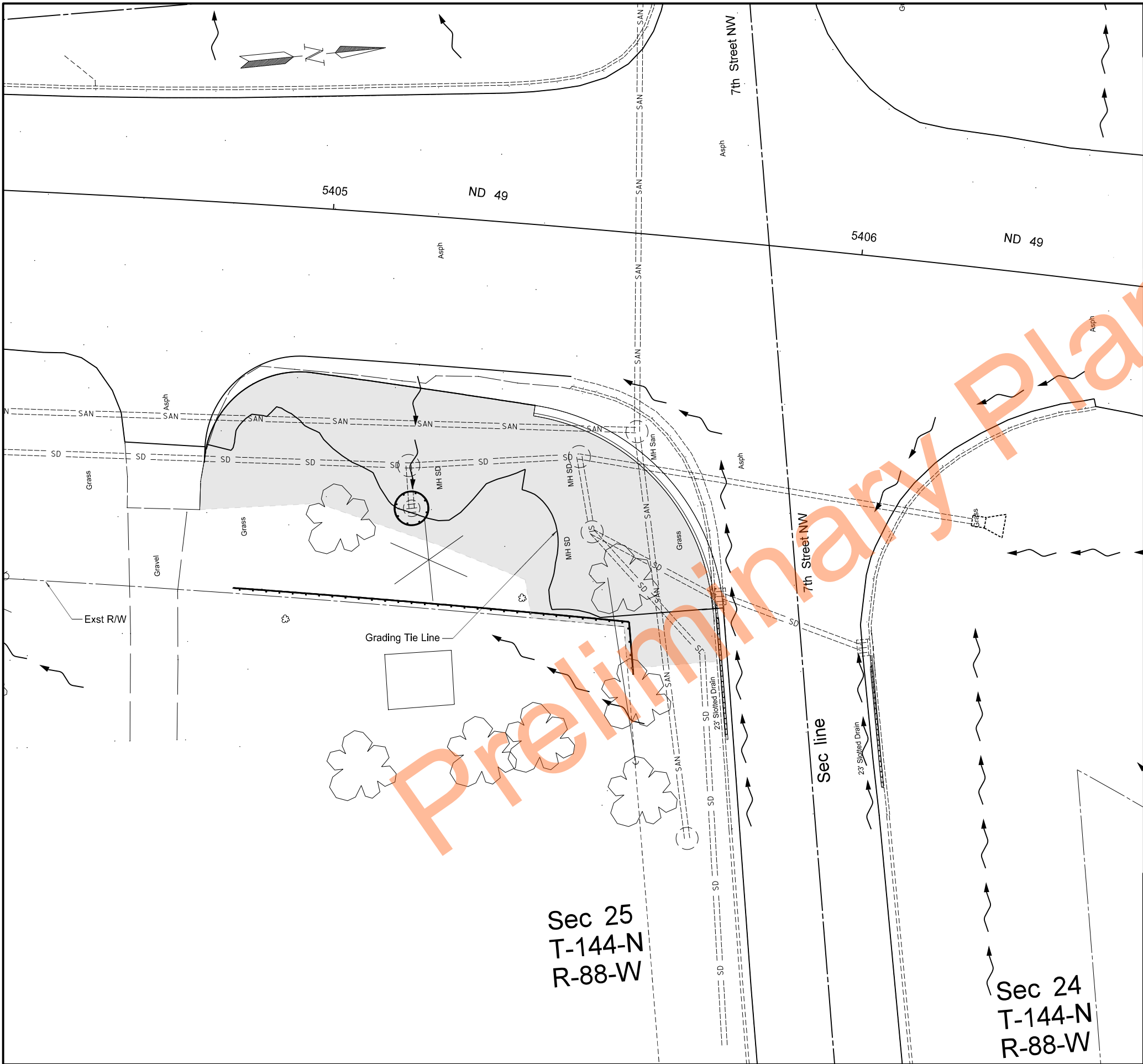
Permanent Erosion Control

ND 49
Beulah North to Jct 200

ND 49 & Main St W
ND 49 & 1st St NW

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STACY LATEN
PE-8772
DATE 9/25/23
NORTH DAKOTA

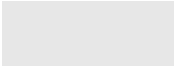




STATE		PROJECT NO.	SECTION NO.	SHEET NO.
ND		XA-NH-5-049(021)101	77	4

SPEC	CODE	BID ITEM	QTY	UNIT
261	0112	FIBER ROLLS 12IN		
		ND 49 & 7th St NW - SE Quadrant	105	LF
970	0008	LANDSCAPE PREPARATION		
		ND 49 & 7th St NW - SE Quadrant	310	SY

LEGEND

 Landscape Preparation

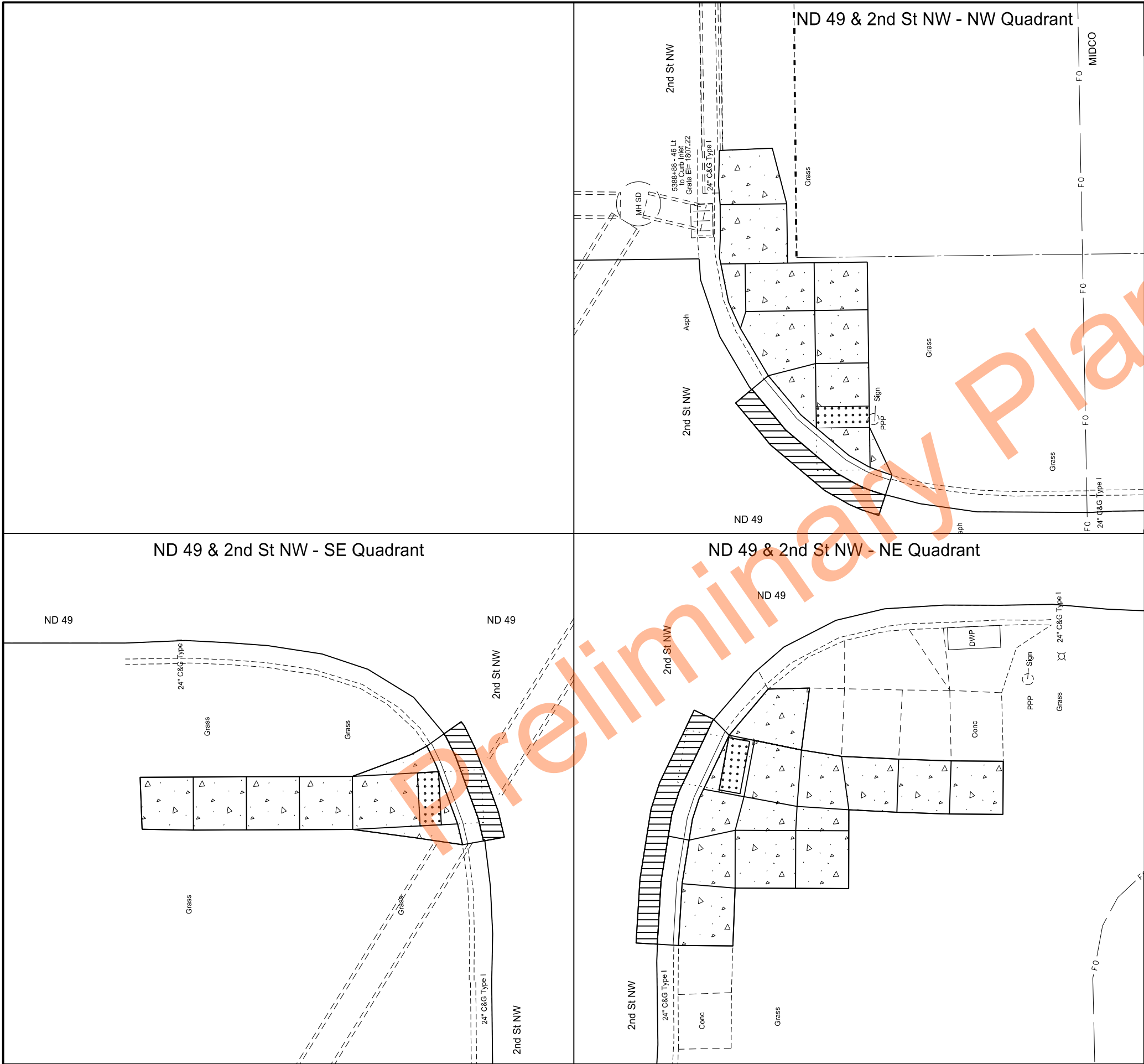
 ECB Type 2

Permanent Erosion Control

ND 49
Beulah North to Jct 200

ND 49 & 7th St NW





		STATE	PROJECT NO.	SECTION NO.	SHEET NO.
		ND	XA-NH-5-049(021)101	80	3
SPEC	CODE	BID ITEM		QTY	UNIT
302	0120	AGGREGATE BASE COURSE CL 5			
		ND 49 & 2nd St NW - NW Quadrant		8	TON
		ND 49 & 2nd St NW - SE Quadrant		6	TON
		ND 49 & 2nd St NW - NE Quadrant		10	TON
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT			
		ND 49 & 2nd St NW - NW Quadrant		2	TON
		ND 49 & 2nd St NW - SE Quadrant		1	TON
		ND 49 & 2nd St NW - NE Quadrant		2	TON
748	0140	CURB & GUTTER-TYPE 1			
		ND 49 & 2nd St NW - NW Quadrant		16	LF
		ND 49 & 2nd St NW - SE Quadrant		11	LF
		ND 49 & 2nd St NW - NE Quadrant		21	LF
750	0115	SIDEWALK CONCRETE 4IN			
		ND 49 & 2nd St NW - NW Quadrant		28	SY
		ND 49 & 2nd St NW - SE Quadrant		19	SY
		ND 49 & 2nd St NW - NE Quadrant		36	SY
750	2115	DETECTABLE WARNING PANELS			
		ND 49 & 2nd St NW - NW Quadrant		10	SF
		ND 49 & 2nd St NW - SE Quadrant		10	SF
		ND 49 & 2nd St NW - NE Quadrant		10	SF

LEGEND

Patching

Sidewalk Concrete 4IN

Detectable Warning Panels

Curb Ramp Layouts

ND 49
Beulah North to Jct 200

ND 49 & 2nd St NW

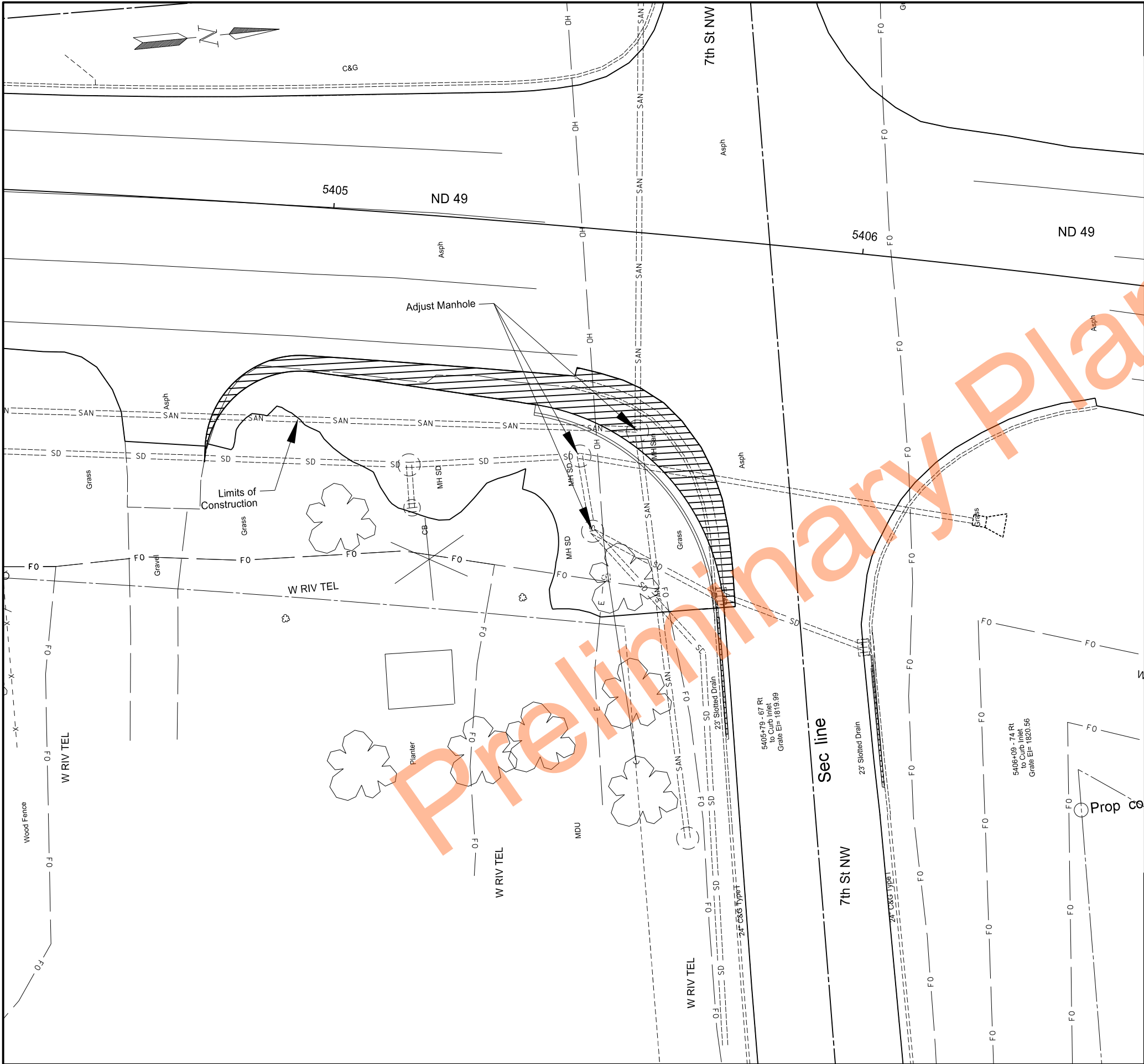
REGISTERED PROFESSIONAL ENGINEER

STACY LATEN
PE-8772

DATE 9/25/23

NORTH DAKOTA

9/22/2023 9:45:06 AM stacy.laten G:\Projects\122106_NDDOT_ND49M\Overlay\50049101.021\Design\Sheets\080LO_003.dgn



		STATE	PROJECT NO.	SECTION NO.	SHEET NO.
		ND	XA-NH-5-049(021)101	80	4
SPEC	CODE	BID ITEM		QTY	UNIT
302	0120	AGGREGATE BASE COURSE CL 5			
		ND 49 & 7th St NW - SE Quadrant		93	TON
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT			
		ND 49 & 7th St NW - SE Quadrant		22	TON
709	0100	GEOSYNTHETIC MATERIAL TYPE G			
		ND 49 & 7th St NW - SE Quadrant		126	SY
722	6200	ADJUST MANHOLE			
		ND 49 & 7th St NW - SE Quadrant		3	EA
748	0140	CURB & GUTTER-TYPE 1			
		ND 49 & 7th St NW - SE Quadrant		55	LF

LEGEND

Patching

Sidewalk Concrete 4IN

Detectable Warning Panels

Paving Layout

ND 49
Beulah North to Jct 200

ND 49 & 7th St NW

REGISTERED PROFESSIONAL ENGINEER

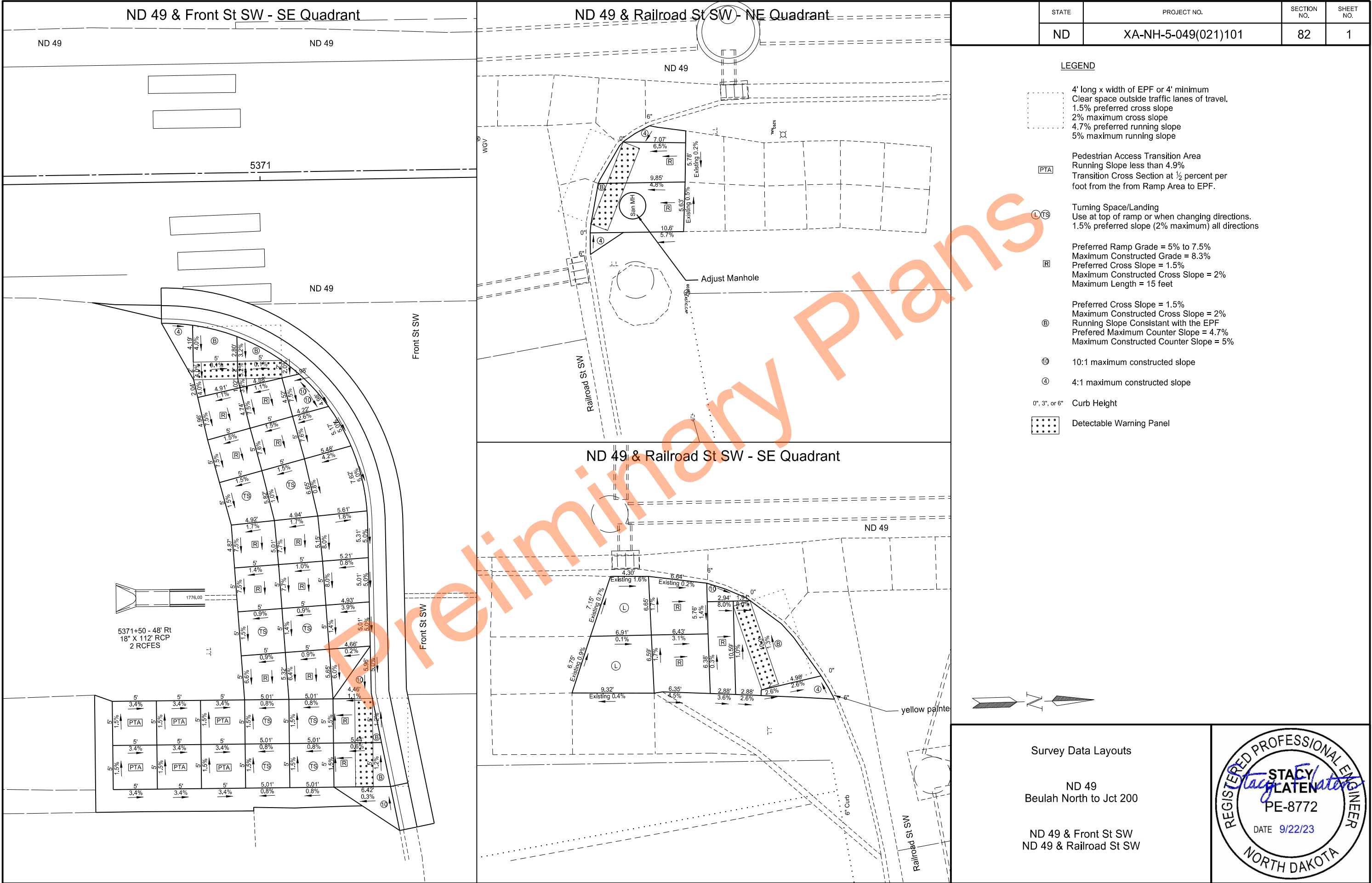
STACY LATEN

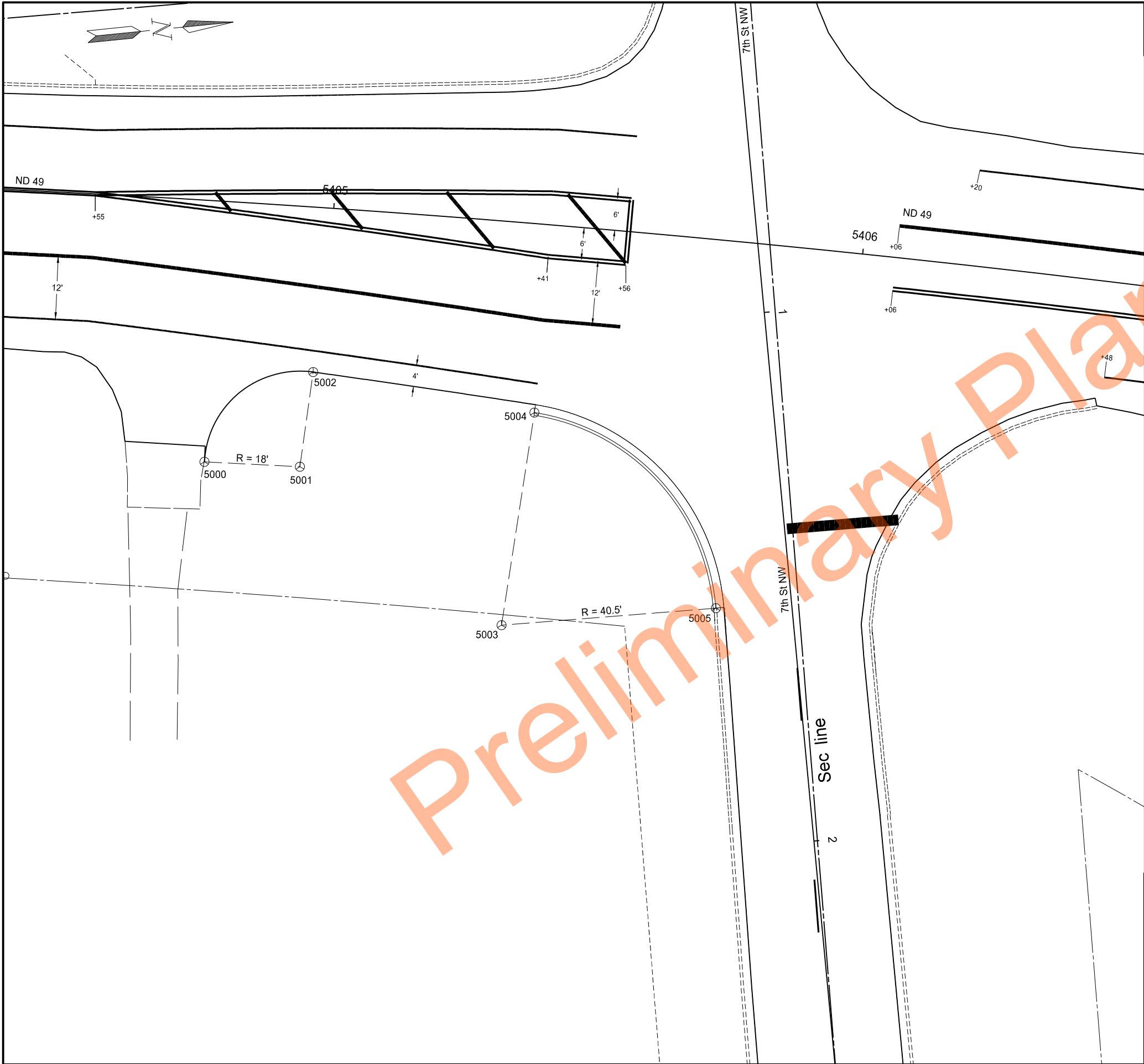
PE-8772

DATE 9/25/23

NORTH DAKOTA

SURVEY COORDINATE AND CURVE DATA - ND 49 from Beulah North to Jct 200										STATE	PROJECT NO.		SECTION NO.	SHEET NO.			
										ND	XA-ND-5-049(021)101		81	1			
HORIZONTAL ALIGNMENT				CURVE DATA		US PUBLIC LAND SURVEY DATA				SURVEY CONTROL POINTS							
PNT	STATION	NORTHING	EASTING	ARC DEFINITION		CORNER	IRN	NORTHING	EASTING	PNT	NORTHING	EASTING	ELEV	STATION	OFFSET		
ND 49 BEG Rec Sec Cor	5353+29.69	582,260.99	1,649,470.61	C22	C26	SW Cor Sec 13	11-G	592,768.67	1,649,638.44	MONUMENT DESCRIPTION							
Rec 1/4 Cor	5379+80.01	584,911.07	1,649,506.33	PI Sta = 5382+45.22	PI Sta = 5461+08.02	W ¼ Cor Sec 13	11-F	595,373.93	1,649,688.19	GPS 100	591,434.87	1,650,141.38	1,904.69	5446+07.65	93.25 Rt		
PC	5381+11.88	585,042.92	1,649,508.59	Delta = 1°20'00" (Rt)	Delta = 16°38'20" (Rt)	SE Cor Sec 23	11-J	587,510.43	1,649,550.92	Rebar with Aluminum Cap							
PI C22	5382+45.22	585,176.24	1,649,510.88	Da = 0°30'00"	Da = 0°59'55"	W ¼ Cor Sec 25	11-K	584,911.07	1,649,506.33	GPS 101	582,212.67	1,648,652.48	1,777.32	N/A	N/A		
PT	5383+78.56	585,309.48	1,649,516.27	R = 11,459.19'	R = 5,738.12'	NW ¼ Cor Sec 13	11-E	598,023.98	1,649,737.20	Rebar with Aluminum Cap, On approach south of County Road 20, 820FT west of intersection of Highway 49, and County Road 20							
PC	5384+12.69	585,343.59	1,649,517.65	T = 133.34'	T = 839.09'												
PI C23	5385+46.03	585,476.82	1,649,523.04	L = 266.68'	L = 1,666.37'												
PT	5386+79.37	585,610.15	1,649,525.32							RTK 200	583,831.89	1,649,576.03	1,779.87	N/A	N/A		
PC	5400+63.55	586,994.12	1,649,549.06	C23	C28					Rebar - 83' East and 298' South of Sta 5372+00							
PI C24	5405+53.74	587,484.24	1,649,557.47	PI Sta = 5385+46.03	PI Sta = 5506+54.96					RTK 201	584,034.03	1,649,435.80	1,779.60	N/A	N/A		
Sec Line Xing	5405+82.49	587,509.35	1,649,604.78	Delta = 1°20'00" (Lt)	Delta = 2°19'59" (Rt)					Rebar - 60' West and 98' South of Sta 5372+00							
PT	5410+34.53	587,943.68	1,649,728.35	Da = 0°30'00"	Da = 0°20'00"					RTK 202	584,546.23	1,649,547.97	1,783.67	5376+15.76	45.65 Rt		
PC	5419+10.64	588,764.84	1,650,033.76	R = 11,459.19'	R = 17,188.73'					Rebar							
PI C25	5431+61.73	589,937.46	1,650,469.88	T = 133.34'	T = 350.02'					RTK 203	548,999.11	1,649,536.42	1,787.96	5380+68.45	28.02 Rt		
1/4 Line Xing	5433+01.93	590,127.57	1,650,273.29	L = 266.68'	L = 699.95'					Rebar							
PT	5443+28.74	591,140.92	1,650,127.96							RTK 204	585,404.25	1,649,496.19	1,805.94	5384+72.66	23.80 Lt		
PC	5452+68.93	592,045.32	1,649,871.01	C24						Rebar							
Sec Line Xing	5460+08.07	592,767.35	1,649,715.29	PI Sta = 5405+53.74						RTK 205	585,767.81	1,649,495.43	1,806.97	5388+36.52	34.91 Lt		
PI C26	5461+08.02	592,852.46	1,649,641.69	Delta = 19°25'7" (Rt)						Rebar							
Sec Line Xing	5467+79.51	593,535.69	1,649,653.09	Da = 2°00'00"						RTK 206	586,063.80	1,649,558.93	1,803.81	5391+33.50	23.82 Rt		
PT	5469+35.30	593,691.48	1,649,653.09	R = 2,864.93'						Rebar							
1/4 Line Xing	5486+18.20	595,374.22	1,649,675.95	T = 490.19'						RTK 207	587,147.34	1,649,584.50	1,808.52	5402+18.89	27.75 Rt		
PC	5503+04.94	597,060.80	1,649,699.02	L = 970.98'						Rebar							
PI C28	5506+54.96	597,410.79	1,649,703.81			R MKR #	NORTHING	EASTING	ELEV	STATION	OFFSET	RTK 208	587,648.30	1,649,552.77	1,827.51	5407+04.97	81.41 Lt
PT	5510+04.89	597,760.29	1,649,722.84	C25		R Mkr 101	580,220.94	1,649,474.83	1,781.33	5353+30	32 Rt	Rebar					
ND 49 END Rec Sec Cor	5512+68.96	598,023.98	1,649,737.20	PI Sta = 5431+61.73		R Mkr 102	585,463.07	1,649,561.27	1,804.73	5385+33	39 Rt	RTK 209	587,555.91	1,649,876.29	1,839.88	5406+90.88	254.76 Rt
				Delta = 36°15'43" (Lt)		R Mkr 103	590,671.82	1,650,267.40	1,896.97	5438+43	37 Rt	Rebar					
				Da = 1°29'59"		R Mkr 104	595,912.88	1,649,720.72	1,994.67	5491+57	37 Rt						
				R = 3,820.72'													
				T = 1,251.09'													
				L = 2,418.10'													
							</										





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	82	4

Point	Northing	Easting	Station	Offset
5000	587399.28	1649635.36	5404+78.60	49.21
5001	587417.08	1649638.06	5404+96.91	48.97
5002	587421.34	1649620.57	5404+98.22	31.02
5003	587451.91	1649671.54	5405+37.92	75.89
5004	587462.05	1649632.33	5405+40.84	35.49
5005	587492.40	1649672.38	5405+78.88	69.12

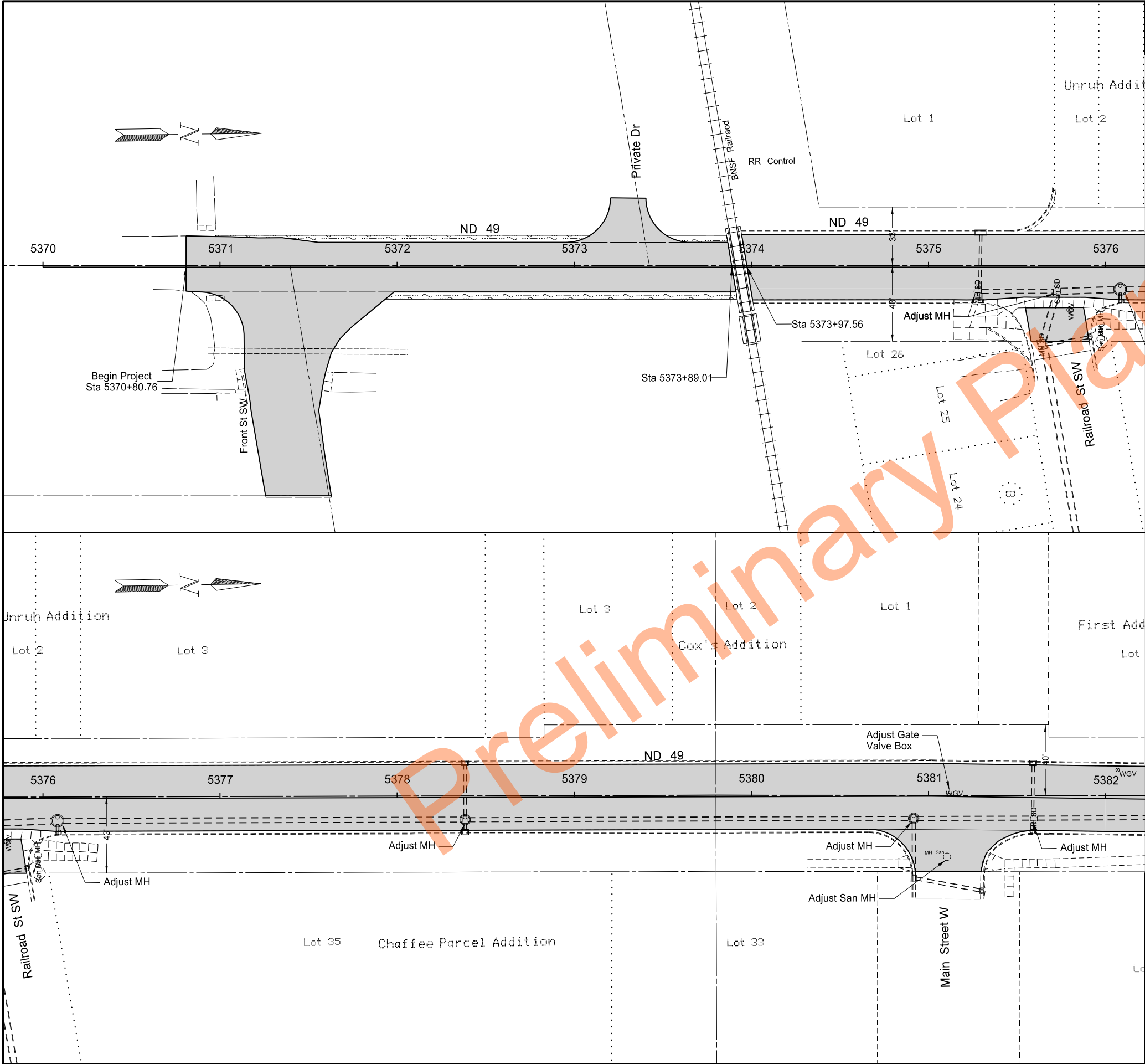
Note: Radius points given at curb & gutter - type I are measured from the face of the curb

Survey Data Layouts

ND 49
Beulah North to Jct 200

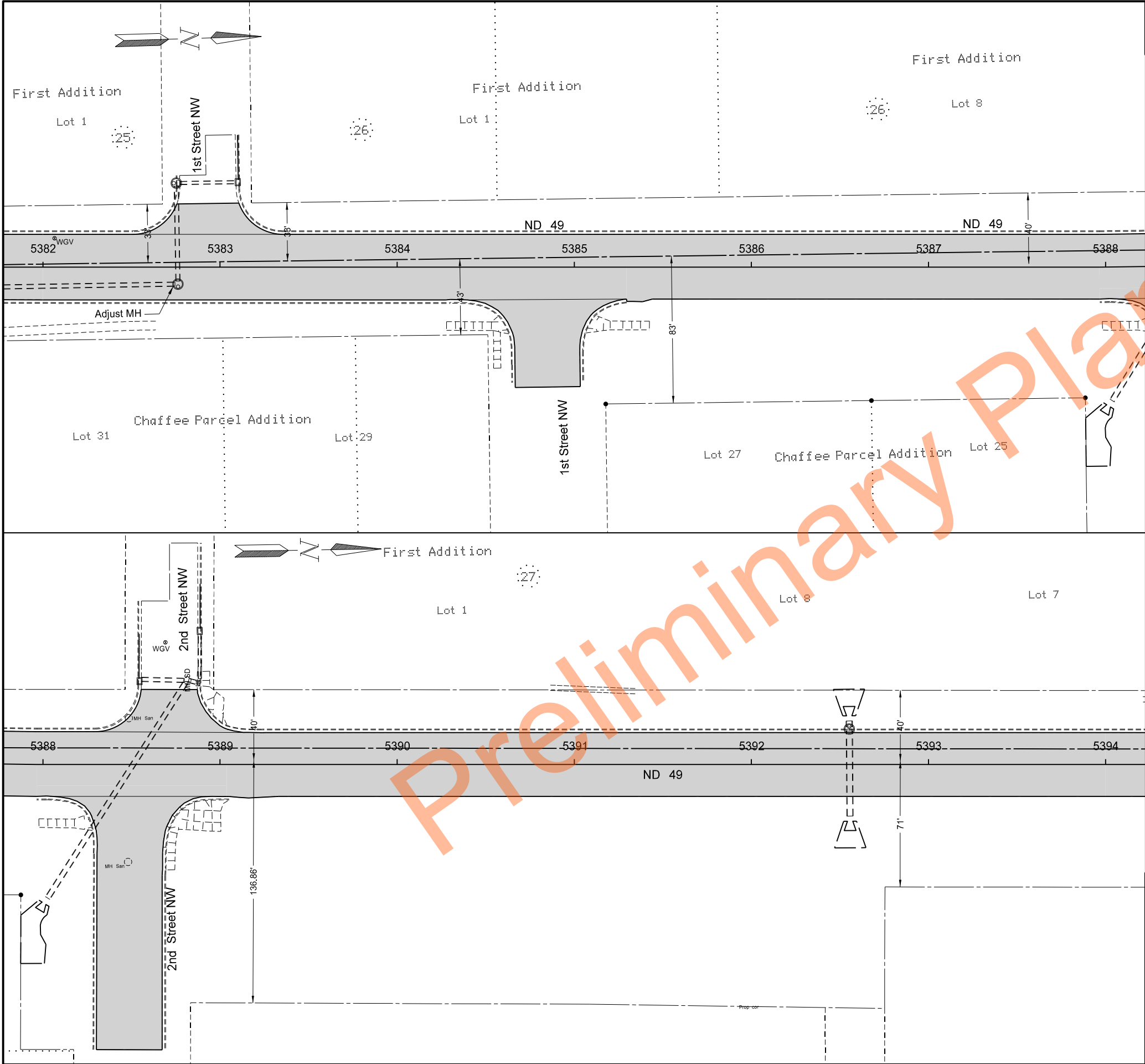
ND 49 & 7th St NW





		STATE	PROJECT NO.	SECTION NO.	SHEET NO.
		ND	XA-NH-5-049(021)101	90	1
SPEC	CODE	BID ITEM			QTY UNIT
302	0120	AGGREGATE BASE COURSE CL 5			
5370+80.76 to 5373+89.01 Lt & Rt shoulder				22 TON	
401	0050	TACK COAT			
5370+80.76 to 5373+89.01				178 GAL	
5373+97.56 to 5382+00				362 GAL	
430	0145	RAP - SUPERPAVE FAA 45			
5370+80.76 to 5373+89.01				289 TON	
5373+97.56 to 5382+00				549 TON	
Railroad St SW (ND 49 Rt side)				12 TON	
Main St W (ND 49 Rt side)				22 TON	
430	5818	PG 58H-34 ASPHALT CEMENT			
5370+80.76 to 5373+89.01				13 TON	
5373+97.56 to 5382+00				26 TON	
722	6140	ADJUST GATE VALVE BOX			
5381+11 - 1' Lt				1 EA	
722	6200	ADJUST MANHOLE			
5375+28 Rt				1 EA	
5375+73 Rt				1 EA	
5376+08 Rt				1 EA	
5378+38 Rt				1 EA	
5380+92 Rt				1 EA	
5381+11 Rt				1 EA	
5381+60 Rt				1 EA	
LEGEND -RAP-Superpave FAA 45: 3" -8" Commercial Grade Hot Mix Asphalt (see sheet 80-4) -Aggregate Base Course CL 5					

Paving Layouts ND 49 Beulah North to Jct 200 5370+80.76 to 5382+00	REGISTERED PROFESSIONAL ENGINEER STACY FLATEN PE-8772 DATE 9/22/23 NORTH DAKOTA
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	90	2

SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		5382+00 to 5394+00	616	GAL
430	0145	RAP - SUPERPAVE FAA 45		
		5382+00 to 5394+00	824	TON
		1st St NW (ND 49 Lt side)	16	TON
		1st St NW (ND 49 Rt side)	40	TON
		2nd St NW (ND 49 Lt side)	20	TON
		2nd St NW (ND 49 Rt side)	103	TON
430	5818	PG 58H-34 ASPHALT CEMENT		
		5382+00 to 5394+00	45	TON
722	6200	ADJUST MANHOLE		
		5382+76 Rt	1	EA

LEGEND

-RAP-Superpave FAA 45: 3"

-8" Commercial Grade Hot Mix Asphalt (see sheet 80-4)

-Aggregate Base Course CL 5

Paving Layouts

ND 49
Beulah North to Jct 200

5382+00 to 5394+00

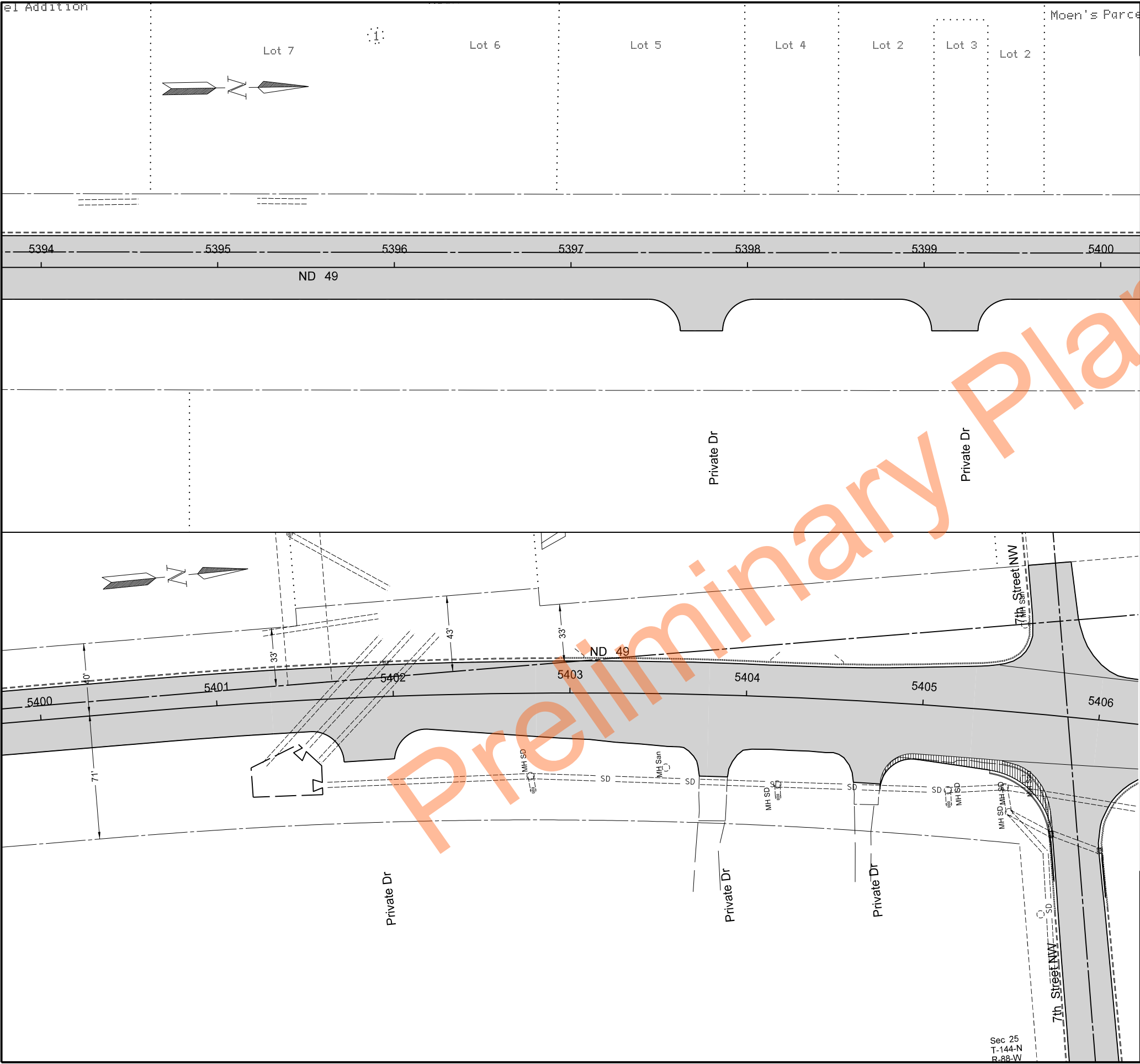
REGISTERED PROFESSIONAL ENGINEER

STACY FLATEN

PE-8772

DATE 9/22/23

NORTH DAKOTA



STATE		PROJECT NO.	SECTION NO.	SHEET NO.
ND		XA-NH-5-049(021)101	90	3

SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		5394+00 to 5406+00	604	GAL
430	0145	RAP - SUPERPAVE FAA 45		
		5394+00 to 5406+00	943	TON
		7th St NW (ND 49 Lt side)	36	TON
430	5818	PG 58H-34 ASPHALT CEMENT		
		5394+00 to 5406+00	44	TON

LEGEND

- RAP-Superpave FAA 45: 3"
- 8" Commercial Grade Hot Mix Asphalt (see sheet 80-4)
- Aggregate Base Course CL 5

Paving Layouts

ND 49
Beulah North to Jct 200

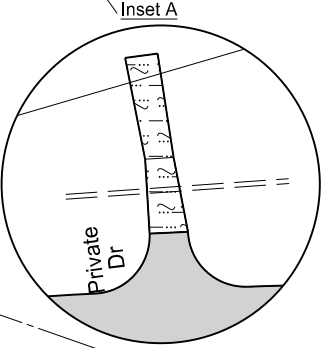
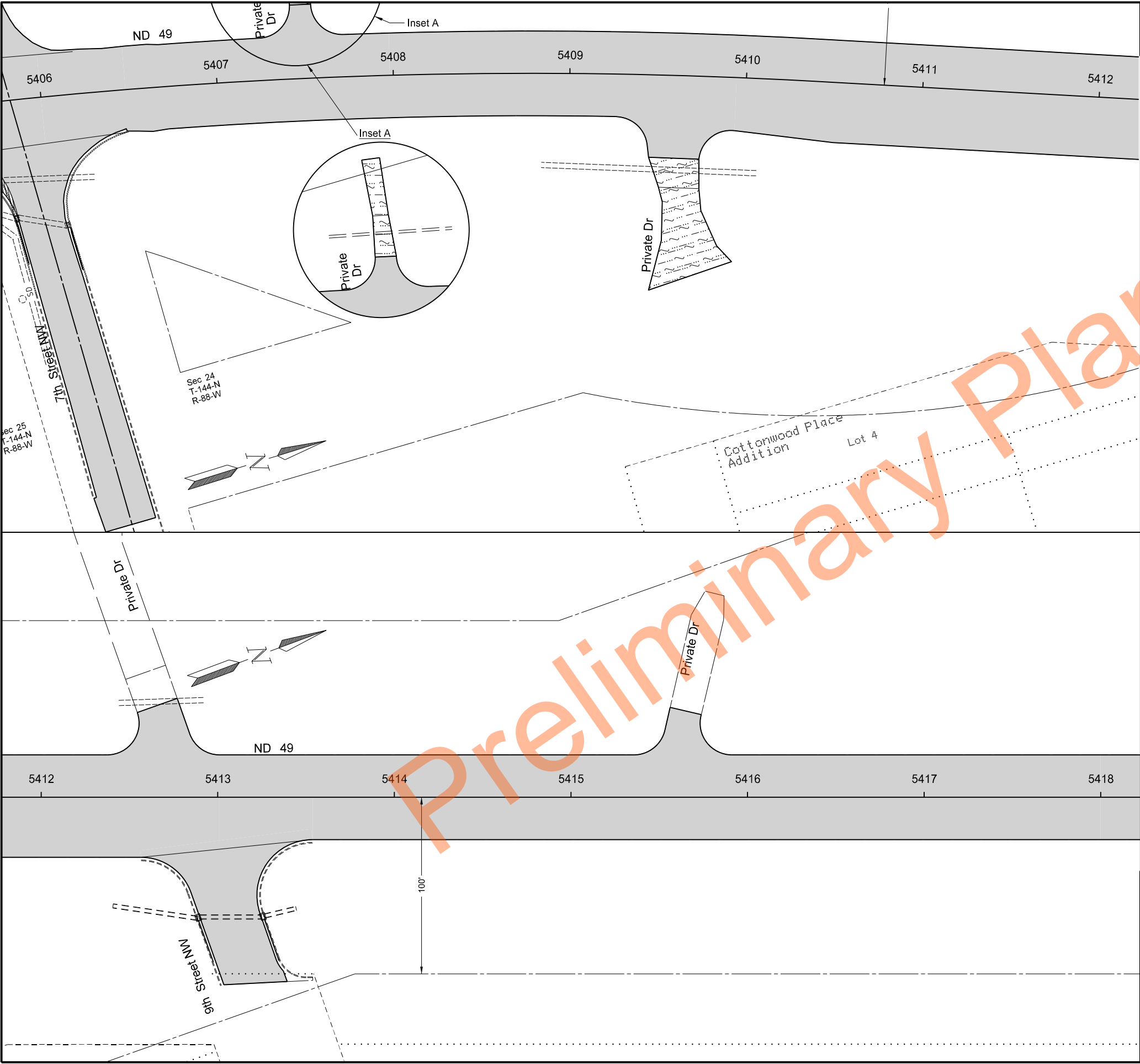
5394+00 to 5406+00

REGISTERED PROFESSIONAL ENGINEER

STACY LATEN
PE-8772

DATE 9/22/23

NORTH DAKOTA



		STATE	PROJECT NO.	SECTION NO.	SHEET NO.
		ND	XA-NH-5-049(021)101	90	4

SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
5406+00 to 5418+00			857	GAL
430	0145	RAP - SUPERPAVE FAA 45		
7th St NW (ND 49 Rt side)			124	TON
5406+00 to 5418+00			1217	TON
9th St NW (ND 49 Rt side)			58	TON
430	5818	PG 58H-34 ASPHALT CEMENT		
5406+00 to 5418+00			62	TON

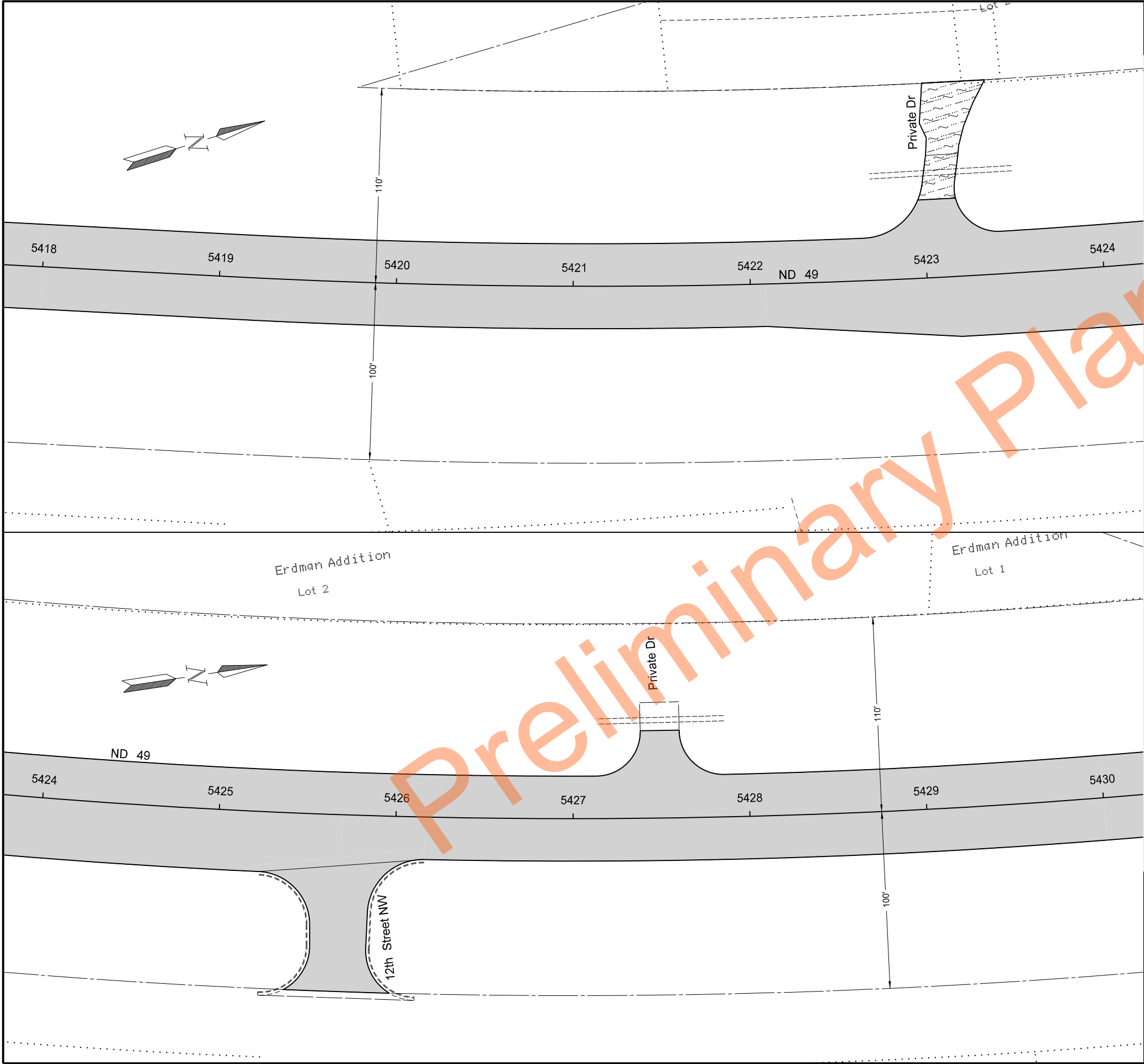
LEGEND

- RAP-Superpave FAA 45: 3"
- 8" Commercial Grade Hot Mix Asphalt (see sheet 80-4)
- Aggregate Base Course CL 5

Paving Layouts

ND 49
Beulah North to Jct 200

5406+00 to 5418+00



		STATE	PROJECT NO.	SECTION NO.	SHEET NO.
		ND	XA-NH-5-049(021)101	90	5
SPEC	CODE	BID ITEM		QTY	UNIT
401	0050	TACK COAT			
		5418+00 to 5430+00		770	GAL
430	0145	RAP - SUPERPAVE FAA 45			
		5418+00 to 5430+00		1194	TON
		12th St NW (ND 49 Rt side)		54	TON
430	5818	PG 58H-34 ASPHALT CEMENT			
		5418+00 to 5430+00		55	TON

LEGEND

-RAP-Superpave FAA 45: 3"

-8" Commercial Grade Hot Mix Asphalt (see sheet 80-4)

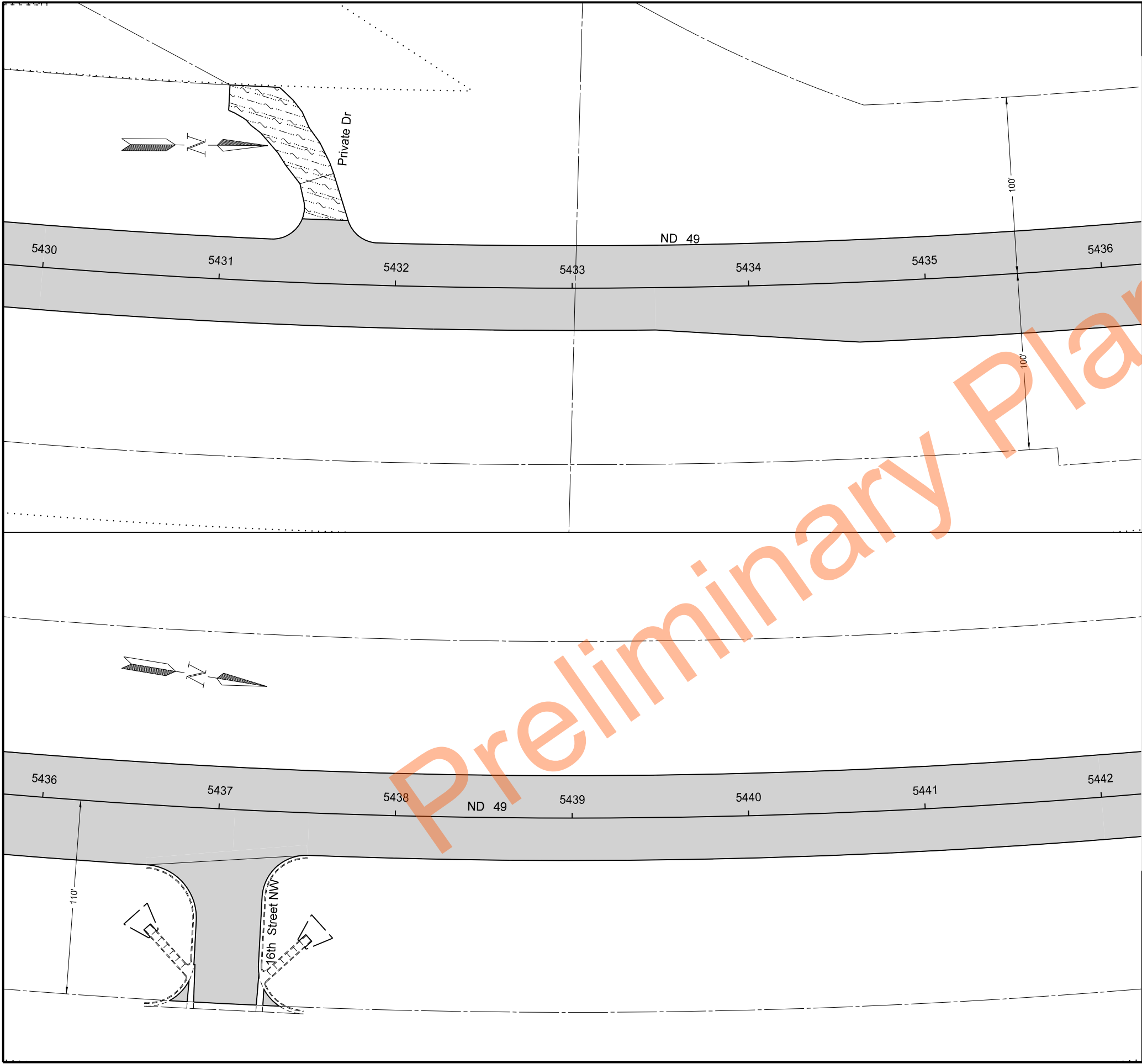
-Aggregate Base Course CL 5

Paving Layouts

ND 49
Beulah North to Jct 200

5418+00 to 5430+00

REGISTERED PROFESSIONAL ENGINEER
STACY LATEN
PE-8772
DATE 9/22/23
NORTH DAKOTA



		STATE	PROJECT NO.	SECTION NO.	SHEET NO.
		ND	XA-NH-5-049(021)101	90	6

SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		5430+00 to 5442+00	762	GAL
430	0145	RAP - SUPERPAVE FAA 45		
		5430+00 to 5442+00	1172	TON
		16th St NW (ND 49 Rt side)	63	TON
430	5818	PG 58H-34 ASPHALT CEMENT		
		5430+00 to 5442+00	55	TON

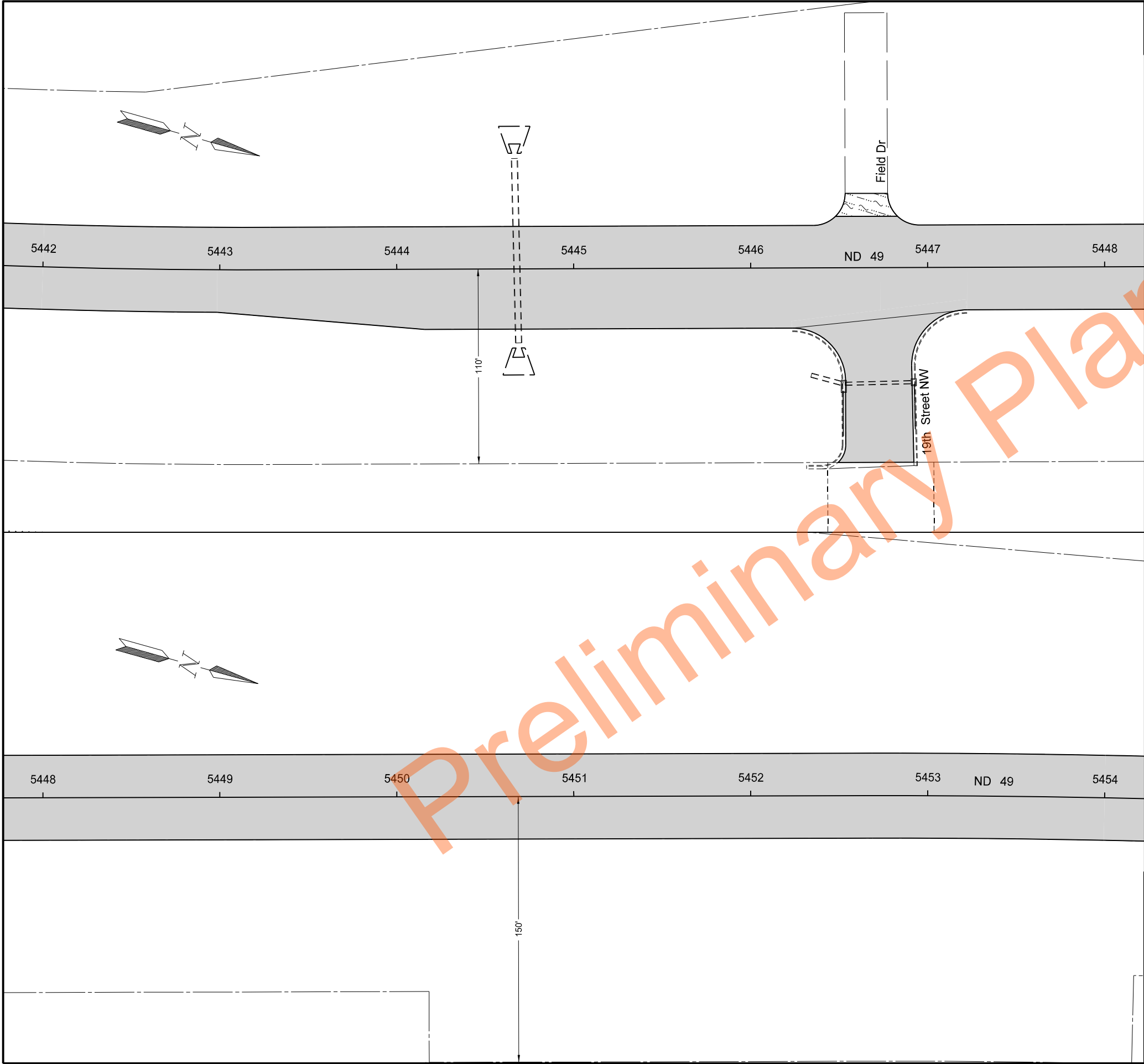
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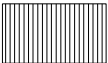
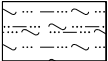
- RAP-Superpave FAA 45: 3"
- 8" Commercial Grade Hot Mix Asphalt (see sheet 80-4)
- Aggregate Base Course CL 5

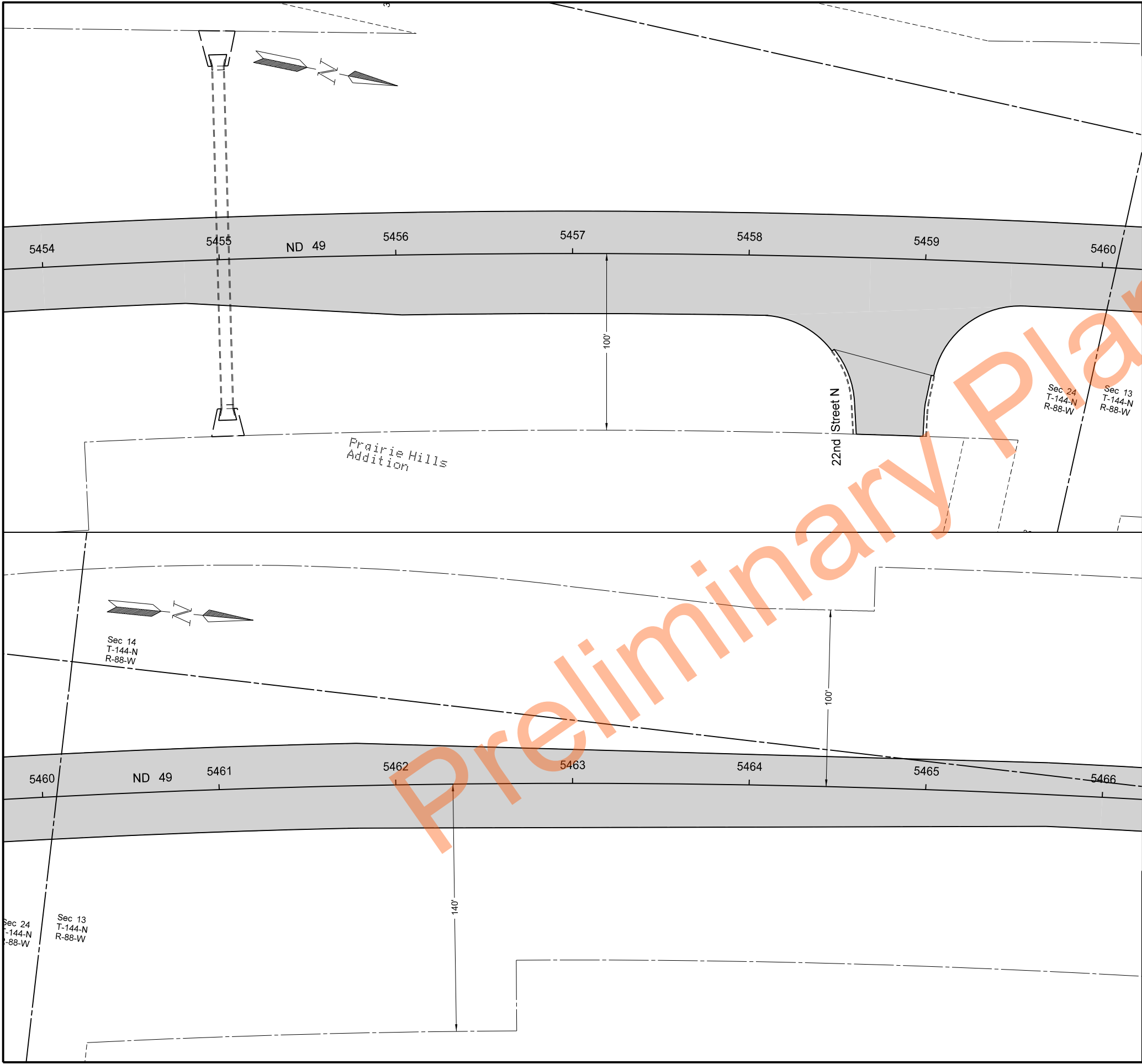
Paving Layouts

ND 49
Beulah North to Jct 200

5430+00 to 5442+00



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	90	7
SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		5442+00 to 5454+00	762	GAL
430	0145	RAP - SUPERPAVE FAA 45		
		5442+00 to 5454+00	1170	TON
		19th St NW (ND 49 Rt side)	65	TON
430	5818	PG 58H-34 ASPHALT CEMENT		
		5442+00 to 5454+00	55	TON
LEGEND				
	-RAP-Superpave FAA 45: 3"			
	-8" Commercial Grade Hot Mix Asphalt (see sheet 80-4)			
	-Aggregate Base Course CL 5			
Paving Layouts				
ND 49				
Beulah North to Jct 200				
5442+00 to 5454+00				



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	90	8

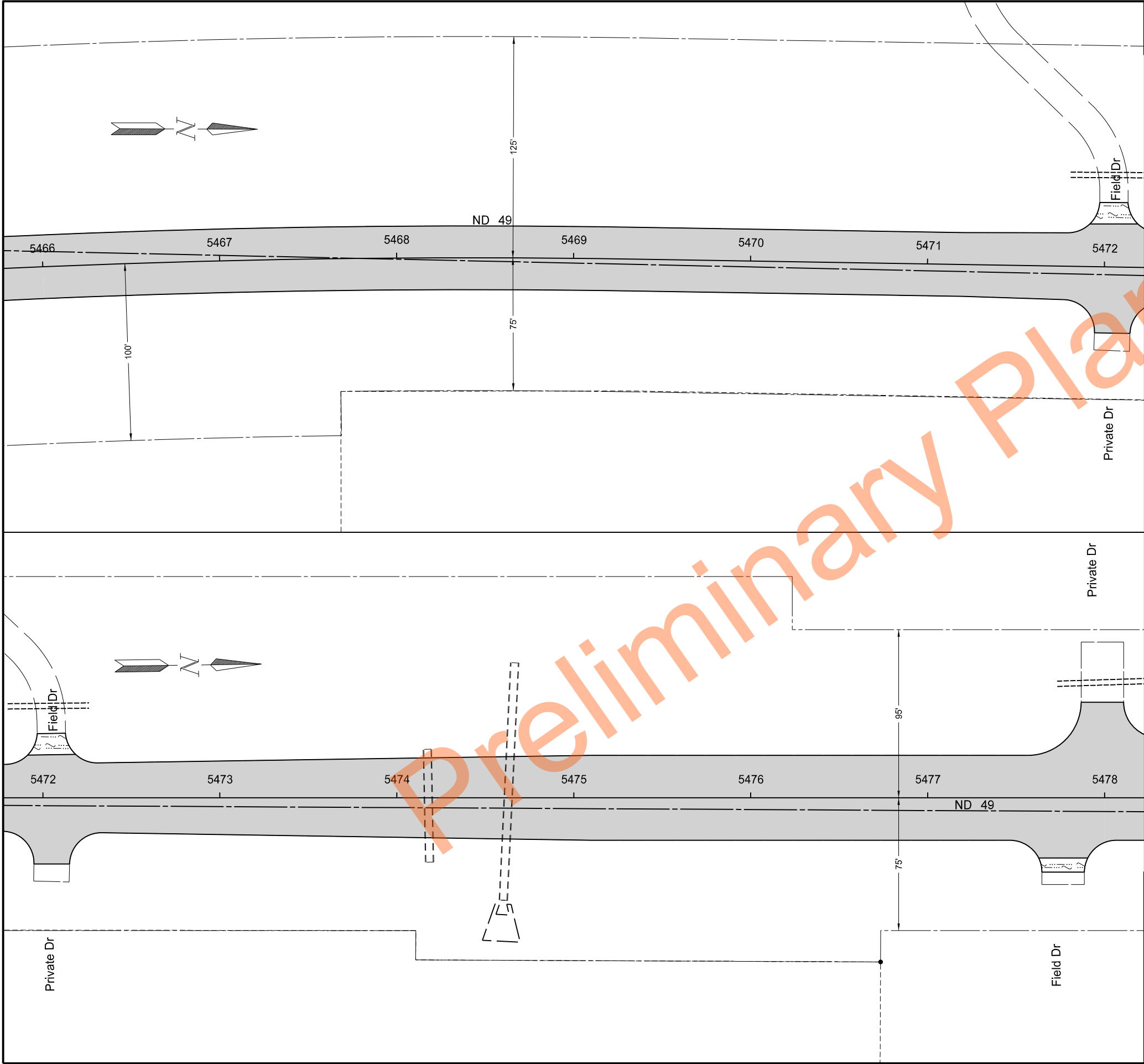
SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		5454+00 to 5466+00	740	GAL
430	0145	RAP - SUPERPAVE FAA 45		
		5454+00 to 5466+00	1166	TON
		22nd St N (ND 49 Rt side)	32	TON
430	5818	PG 58H-34 ASPHALT CEMENT		
		5454+00 to 5466+00	53	TON

LEGEND

- RAP-Superpave FAA 45: 3"
- 8" Commercial Grade Hot Mix Asphalt (see sheet 80-4)
- Aggregate Base Course CL 5

Paving Layouts
ND 49
Beulah North to Jct 200
5454+00 to 5466+00

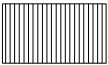
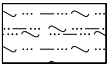




	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	90	9

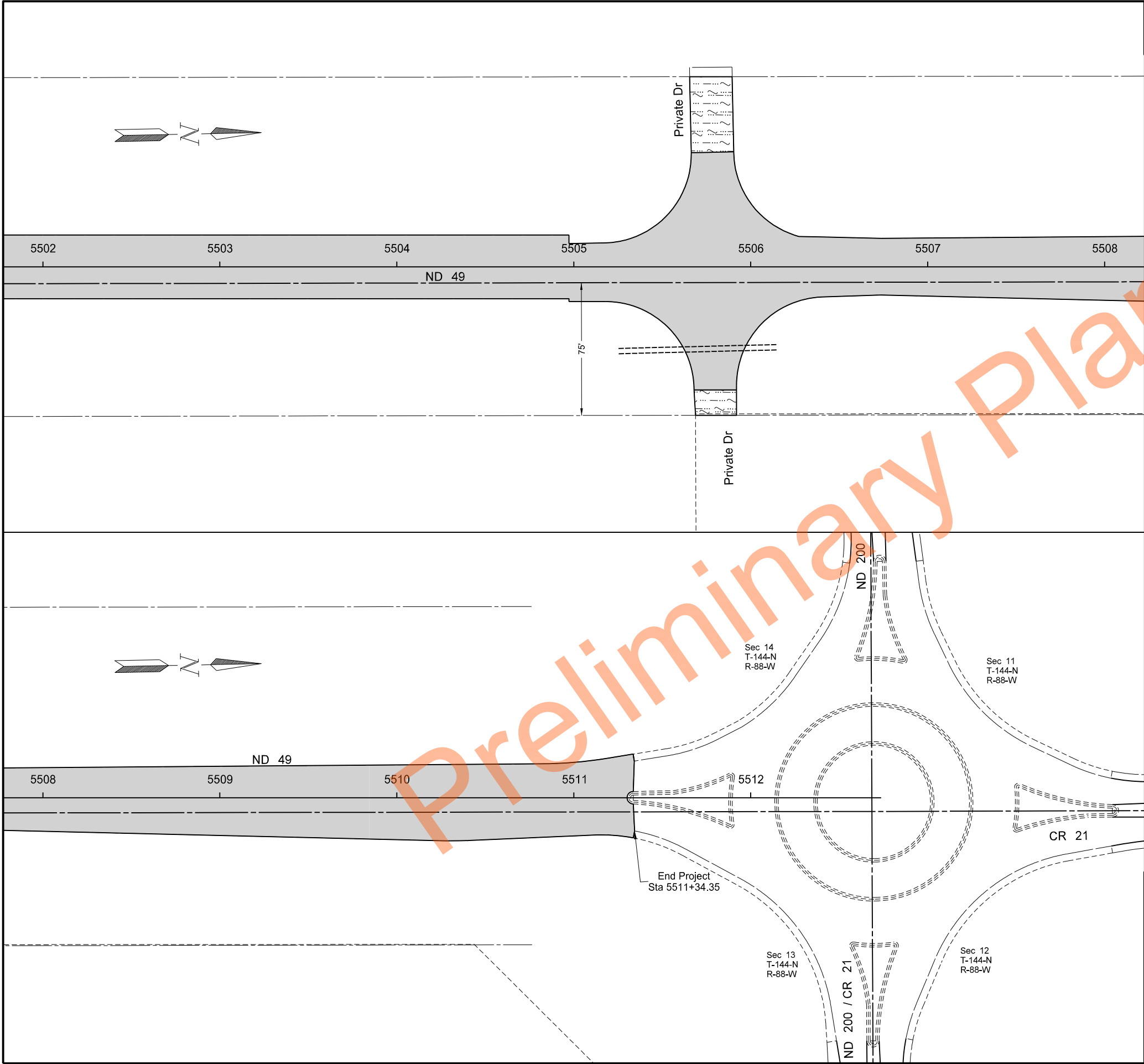
SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
		5466+00 to 5478+00	620	GAL
430	0145	RAP - SUPERPAVE FAA 45		
		5466+00 to 5478+00	1004	TON
430	5818	PG 58H-34 ASPHALT CEMENT		
		5466+00 to 5478+00	45	TON

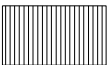
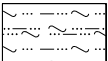
LEGEND

-  -RAP-Superpave FAA 45: 3"
-  -8" Commercial Grade Hot Mix Asphalt (see sheet 80-4)
-  -Aggregate Base Course CL 5

Paving Layouts
ND 49
Beulah North to Jct 200
5466+00 to 5478+00





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	90	12
SPEC	CODE	BID ITEM	QTY	UNIT
401	0050	TACK COAT		
5502+00 to 5511+33.59			476	GAL
430	0145	RAP - SUPERPAVE FAA 45		
5502+00 to 5511+33.59			752	TON
430	5818	PG 58H-34 ASPHALT CEMENT		
5502+00 to 5511+33.59			34	TON
ms				
LEGEND				
		-RAP-Superpave FAA 45: 3"		
		-8" Commercial Grade Hot Mix Asphalt (see sheet 80-4)		
		-Aggregate Base Course CL 5		
Paving Layouts				
ND 49				
Beulah North to Jct 200				
5502+00 to 5511+34.35				

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-NH-5-049(021)101	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)		18	
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
G20-4b-36	36"x30"	WAIT FOR PILOT CAR	2	18	36
G20-50a-72	72"x36"	ROAD WORK NEXT ___ MILES RT & LT ARROWS	13	43	559
G20-52a-72	72"x24"	ROAD WORK NEXT ___ MILES RT or LT ARROW	3	36	108
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE \$150 WHEN WORKERS PRESENT	2	59	118
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)		11	
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		32	
R1-2-60	60"x60"	YIELD		29	
R2-1-36	36"x48"	SPEED LIMIT ___ (Portable only)	8	30	240
R2-1-48	48"x60"	SPEED LIMIT ___	8	39	312
R2-1aP-24	24"x18"	MINIMUM FEE \$150 (Mounted on Speed Limit post)	6	10	60
R3-2-48	48"x48"	NO LEFT TURN		35	
R4-1-48	48"x60"	DO NOT PASS	2	39	78
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	
R9-9-24	24"x12"	SIDEWALK CLOSED (Mounted on barricade)	12	3	36
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	7	35	245
W3-5-48	48"x48"	SPEED REDUCTION AHEAD	6	35	210
W4-2-48	48"x48"	LANE ENDS RIGHT or LEFT		35	
W5-1-48	48"x48"	ROAD NARROWS		35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE		35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW		35	
W6-3-48	48"x48"	TWO WAY TRAFFIC		35	
W8-1-48	48"x48"	BUMP	34	35	1190
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-9a-48	48"x48"	SHOULDER DROP-OFF	2	35	70
W8-11-48	48"x48"	UNEVEN LANES	2	35	70
W8-12-48	48"x48"	NO CENTER LINE		35	
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	7	35	245
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	7	35	245
W20-8-18	18"x18"	STOP - SLOW PADDLE Back to Back	7	5	35
W20-52P-54	54"x12"	NEXT ___ MILES (Mounted on warning sign post)	2	12	24
W21-1-48	48"x48"	WORKERS	4	35	140
W21-2-48	48"x48"	FRESH OIL	2	35	70
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or ___ FT or ___ MILE		35	
W21-5-48	48"x48"	SHOULDER WORK	3	35	105

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SPEC & CODE			
704-1000	TRAFFIC CONTROL SIGNS	TOTAL UNITS	4552

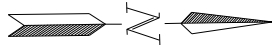
SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	FLAGGING	MHR	700
704-1048	PORTABLE RUMBLE STRIPS	EACH	
704-1050	TYPE I BARRICADES	EACH	
704-1052	TYPE III BARRICADES	EACH	1
704-1054	SIDEWALK BARRICADE	EA	12
704-1058	PEDESTRIAN WALKWAY	LF	625
704-1060	DELINEATOR DRUMS	EACH	10
704-1065	TRAFFIC CONES	EACH	
704-1067	TUBULAR MARKERS	EACH	211
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1080	STACKABLE VERTICAL PANELS	EACH	10
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	HR	100
704-1500	OBLITERATION OF PVMT MK	SF	
704-2108	TEMPORARY CURB RAMP	EA	9
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH	
762-0200	RAISED PAVEMENT MARKERS	EACH	
762-0420	SHORT TERM 4IN LINE - TYPE R	LF	
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF	
762-0434	SHORT TERM 8IN LINE-TYPE NR	LF	75500
762-0436	SHORT TERM 24IN LINE-TYPE NR	LF	216
762-0437	SHORT TERM 12IN LINE-TYPE NR	LF	8858
762-0442	SHORT TERM MESSAGE-TYPE NR	SF	1655

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/>

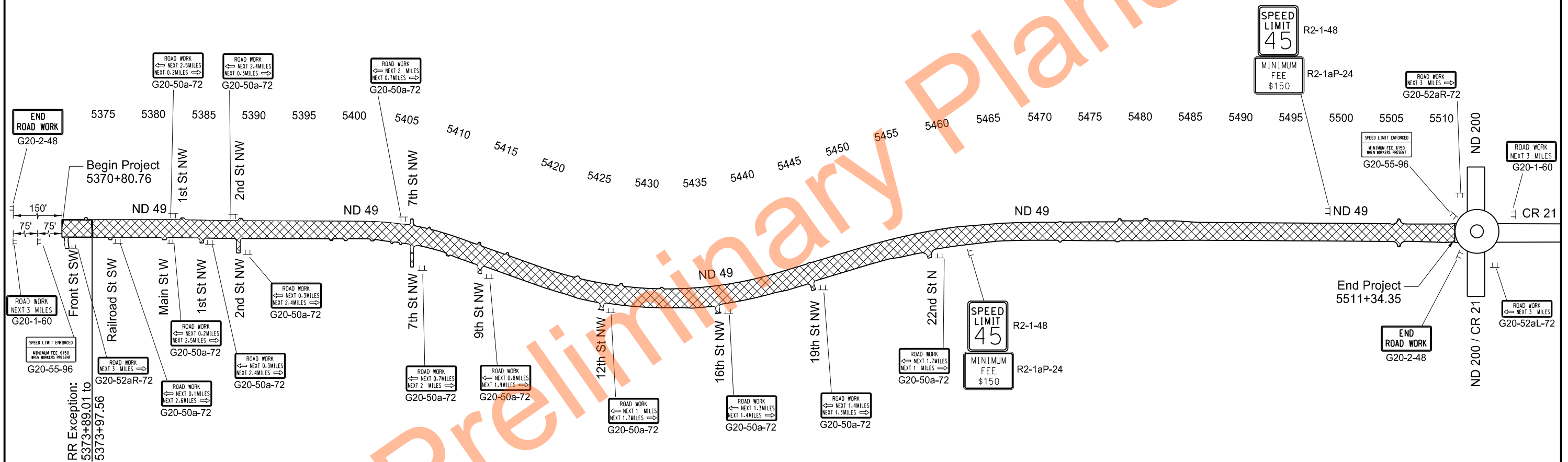


Traffic Control Devices List

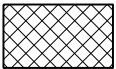
ND 49
Beulah North to Jct 200



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	100	2



Legend



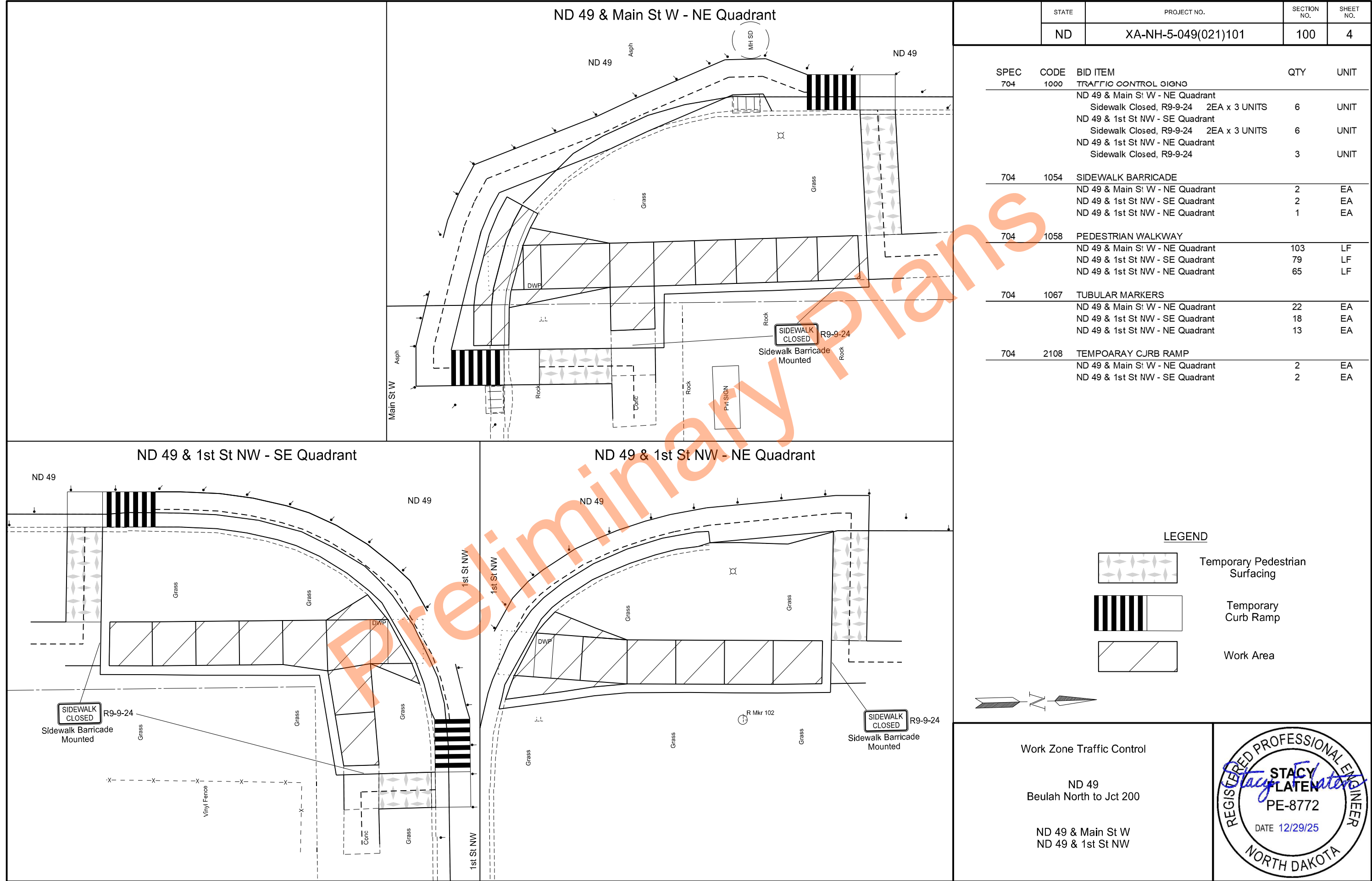
Work Zone

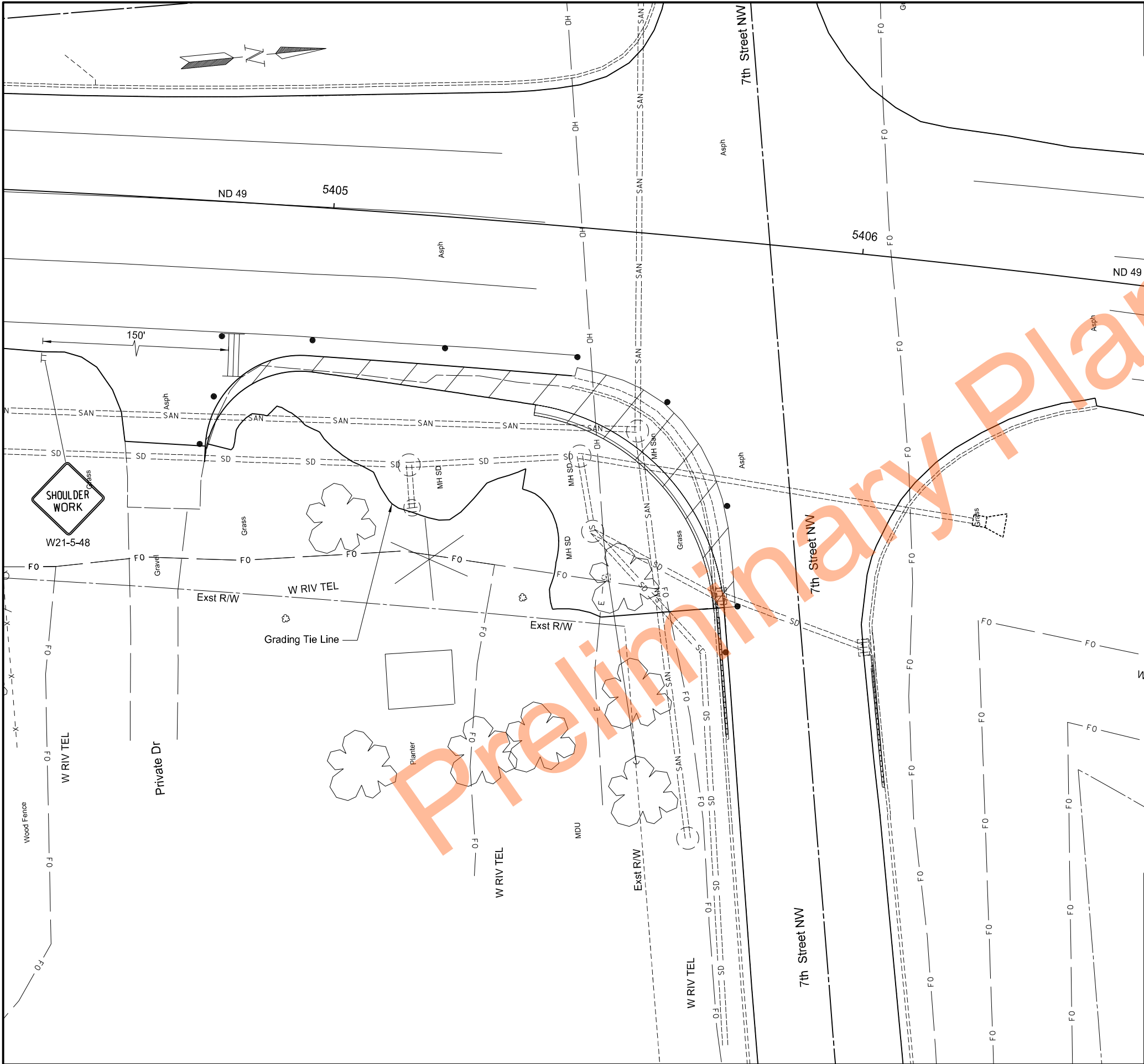
Work Zone Traffic Control

ND 49
Beulah North to Jct 200

ND 49
5370+80.76 to 5511+34.35







		STATE	PROJECT NO.	SECTION NO.	SHEET NO.
		ND	XA-NH-5-049(021)101	100	6
SPEC	CODE	BID ITEM		QTY	UNIT
704	1000	TRAFFIC CONTROL SIGNS			
		ND 49 & 7th St N/W - SE Quadrant Shoulder Work, W21-5-48		35	UNIT
704	1052	TYPE III BARRICADE			
		ND 49 & 7th St NW - SE Quadrant		1	EA
704	1060	DELINEATOR DRUMS			
		ND 49 & 7th St N/W - SE Quadrant		10	EA

LEGEND

Temporary Pedestrian Surfacing

Temporary Curb Ramp

Work Area

Work Zone Traffic Control

ND 49
Beulah North to Jct 200

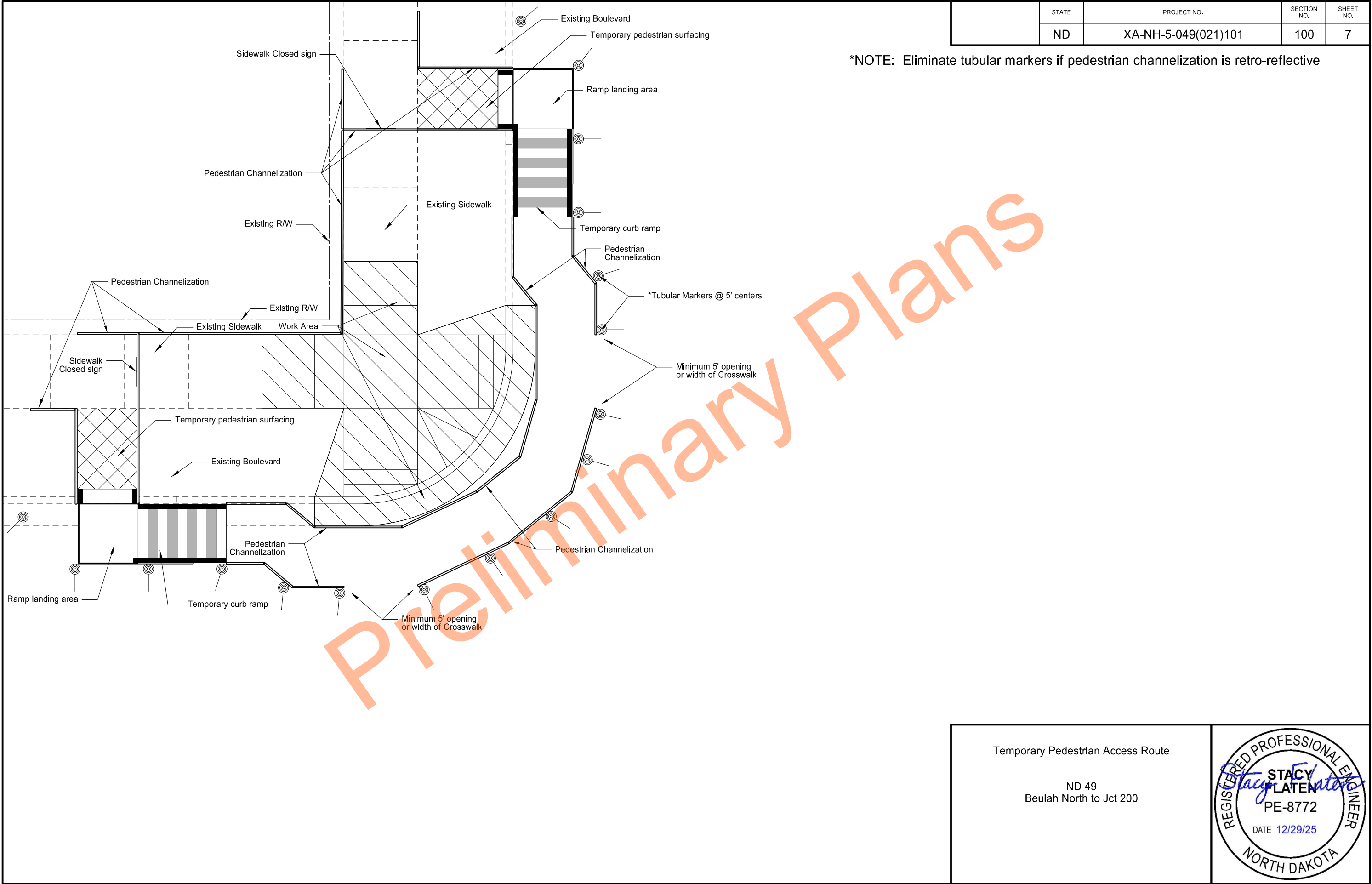
ND 49 & 7th St NW

REGISTERED PROFESSIONAL ENGINEER

STACY LATEN
PE-8772

DATE 12/29/25

NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	100	7

Temporary Pedestrian Access Route

ND 49
Beulah North to Jct 200

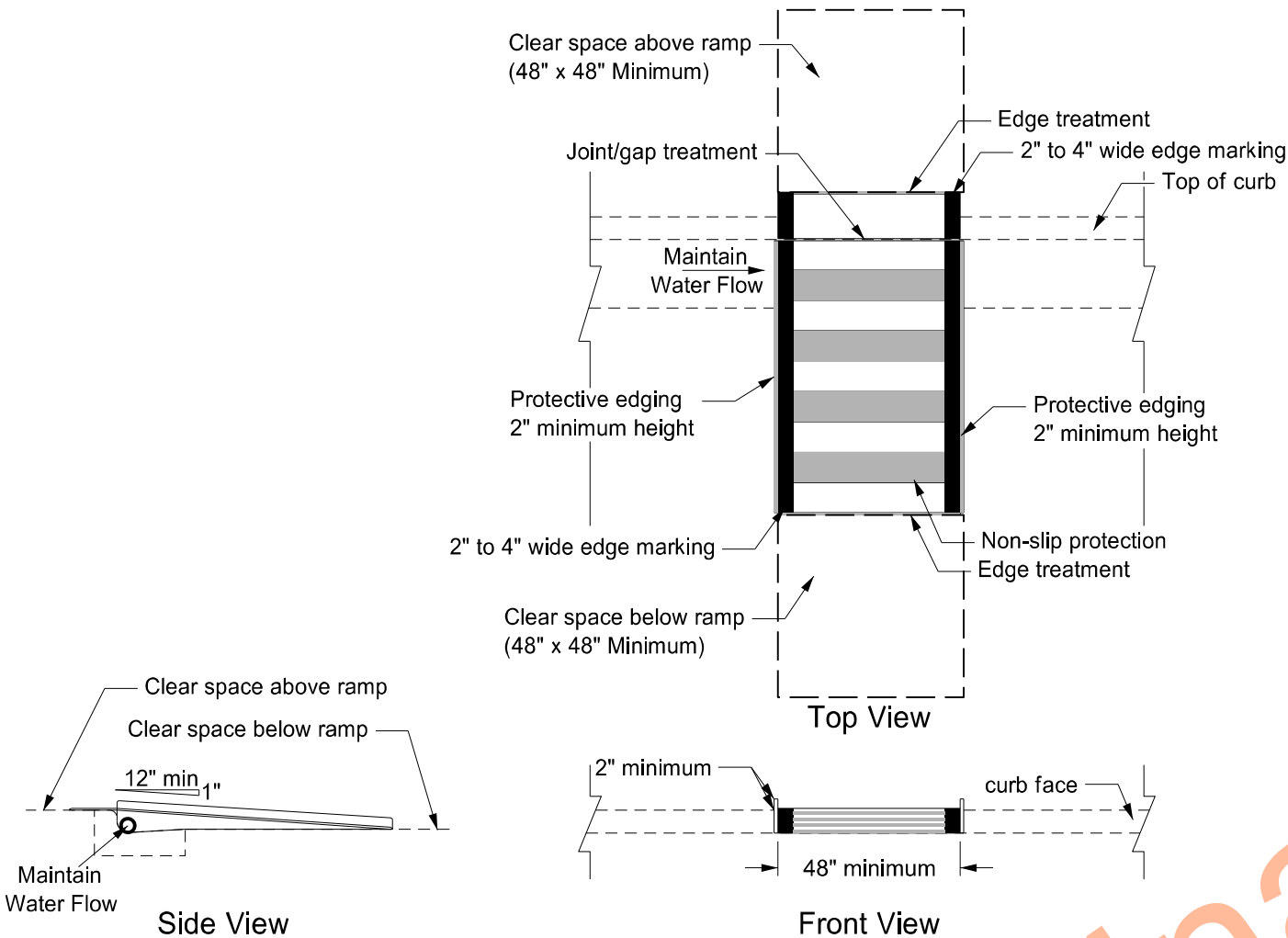
REGISTERED PROFESSIONAL ENGINEER

STACY FLATEN
PE-8772

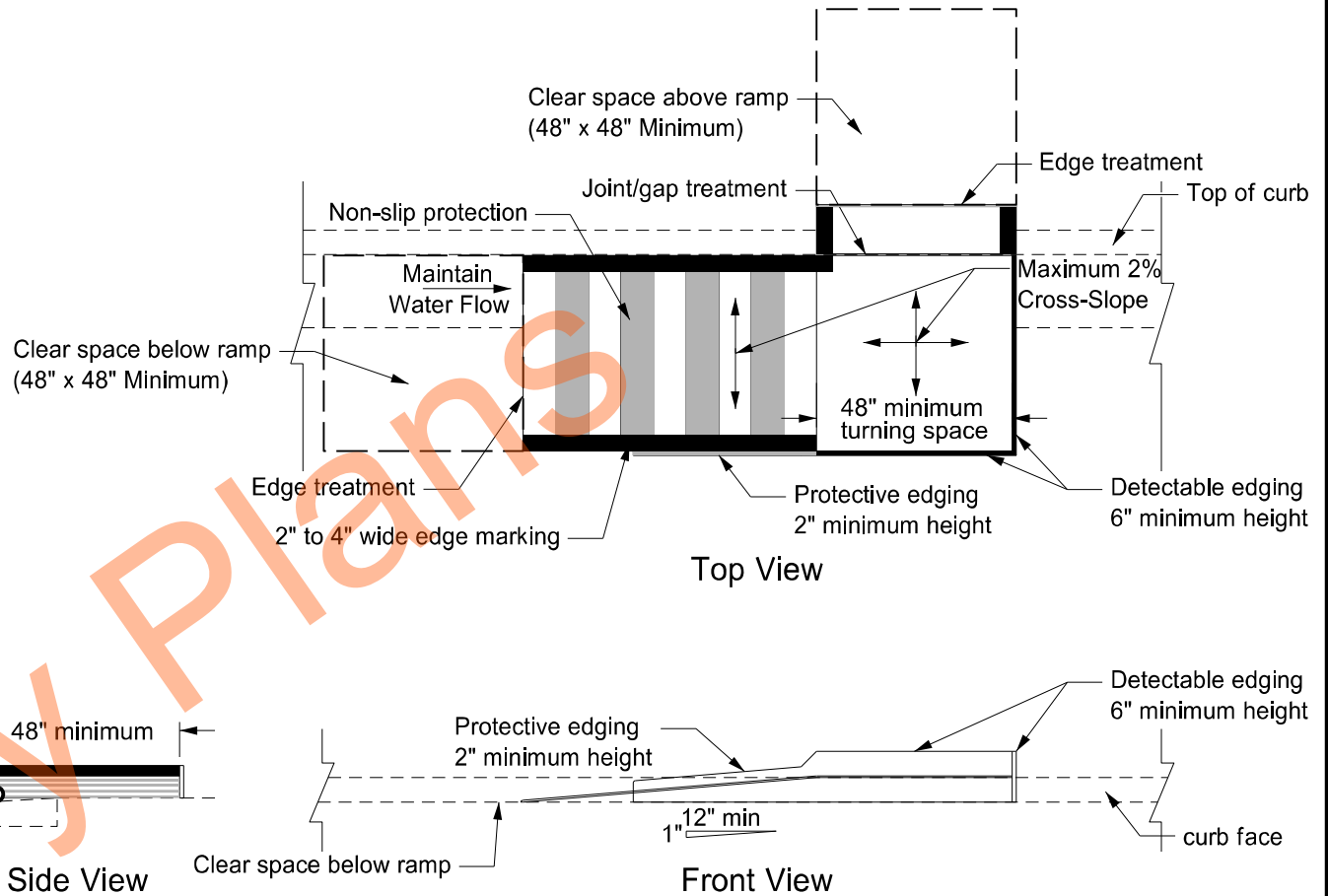
DATE 12/29/25

NORTH DAKOTA

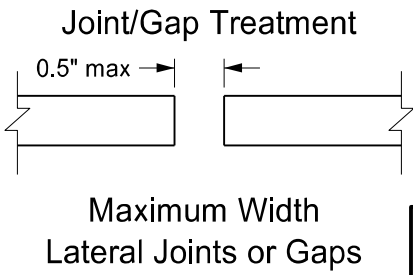
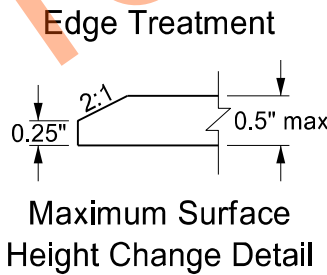
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-NH-5-049(021)101	100	8



Temporary Perpendicular Curb Ramp



Temporary Parallel Curb Ramp

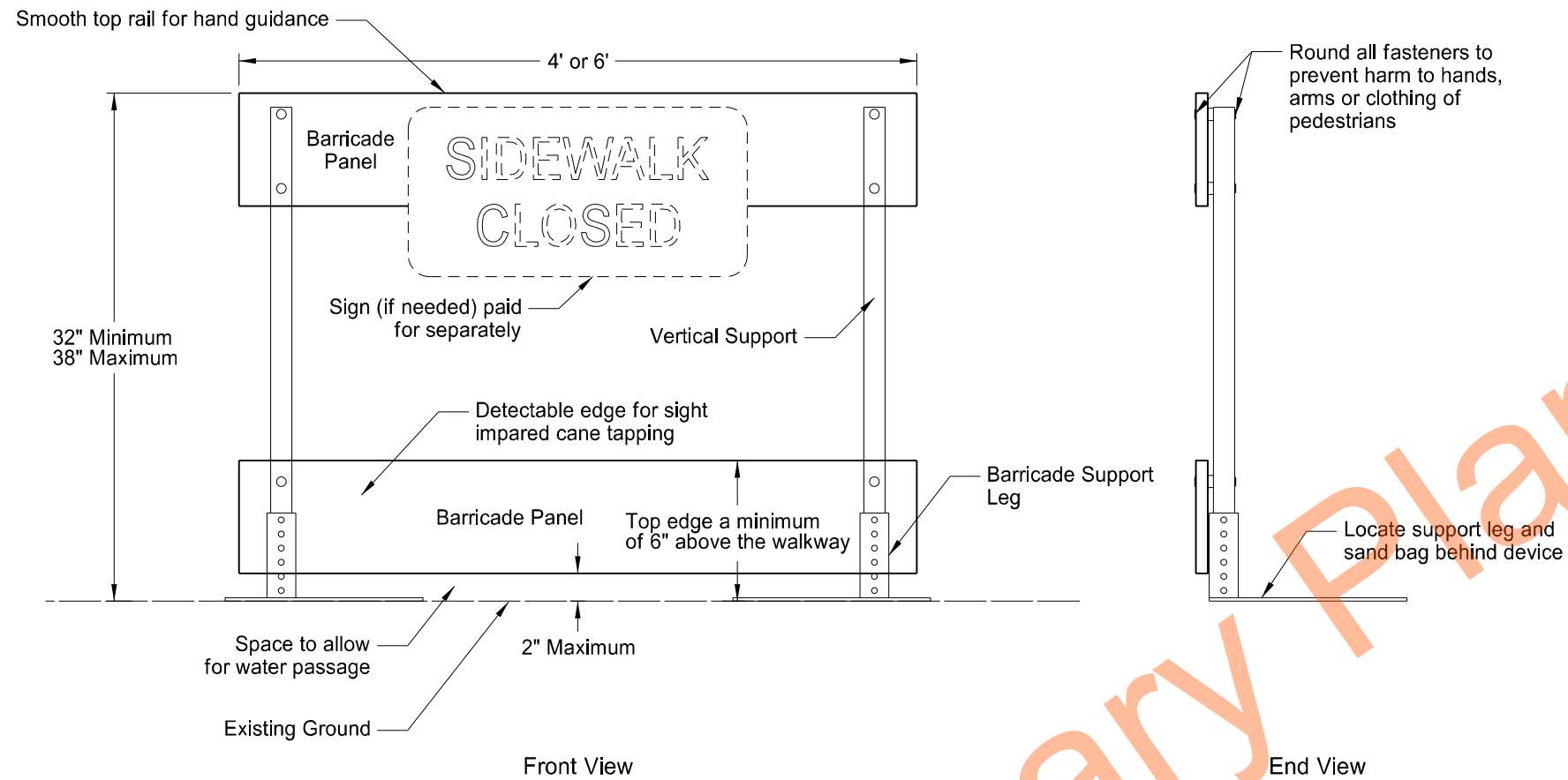


Temporary Pedestrian Curb Ramp Details

ND 49
Beulah North to Jct 200



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	100	9



NOTES:

Sidewalk Barricades

1. Provide self standing sidewalk barricade with no supports extending into the pedestrians path.
2. Use orange or orange and white diagonal striped barricade panels contrasting with the walkway surface.
3. Provide ADA compliant and NCHRP 350 or Mash Test Level 3 (TL3) approved sidewalk barricades.
4. Include all costs to furnish, maintain and remove sidewalk barricades in the price bid for "Sidewalk Barricade".

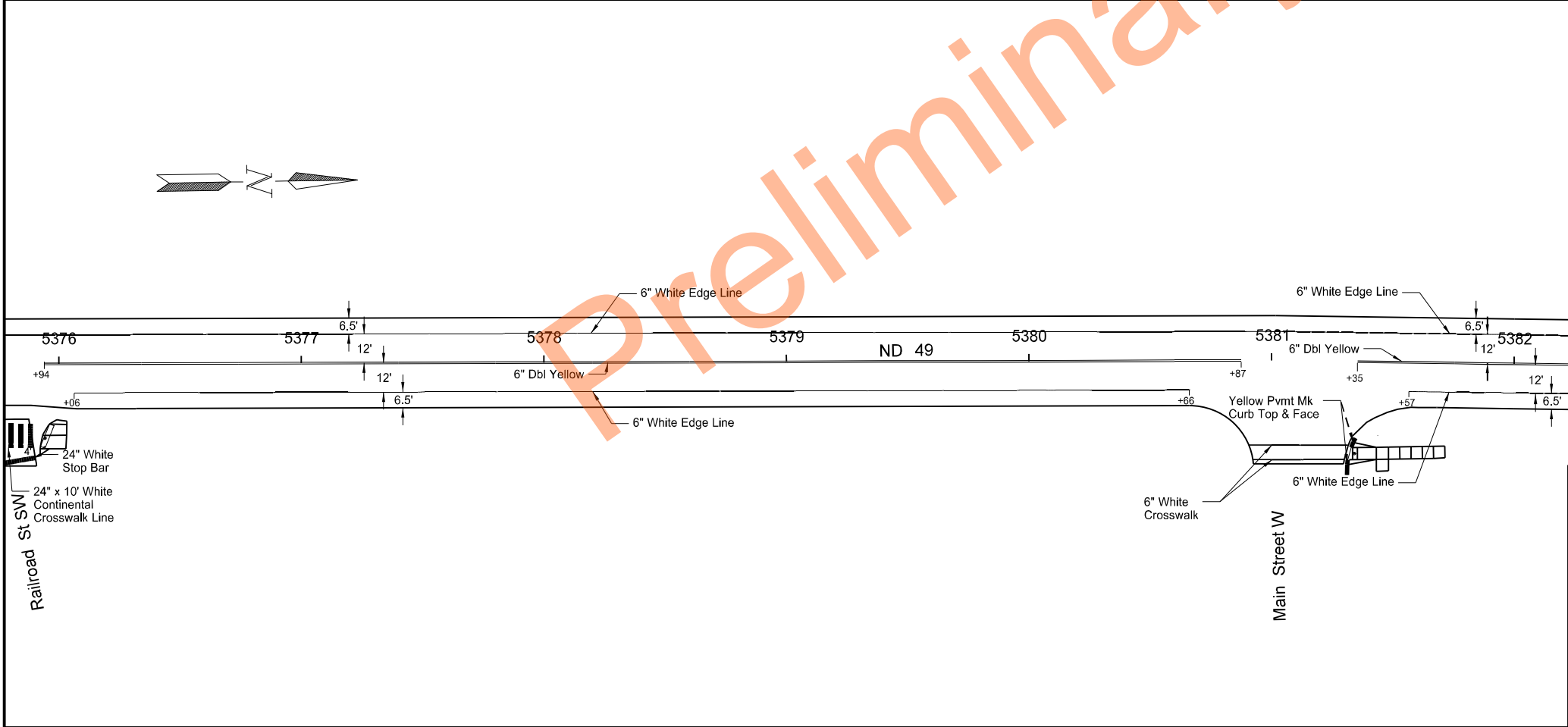
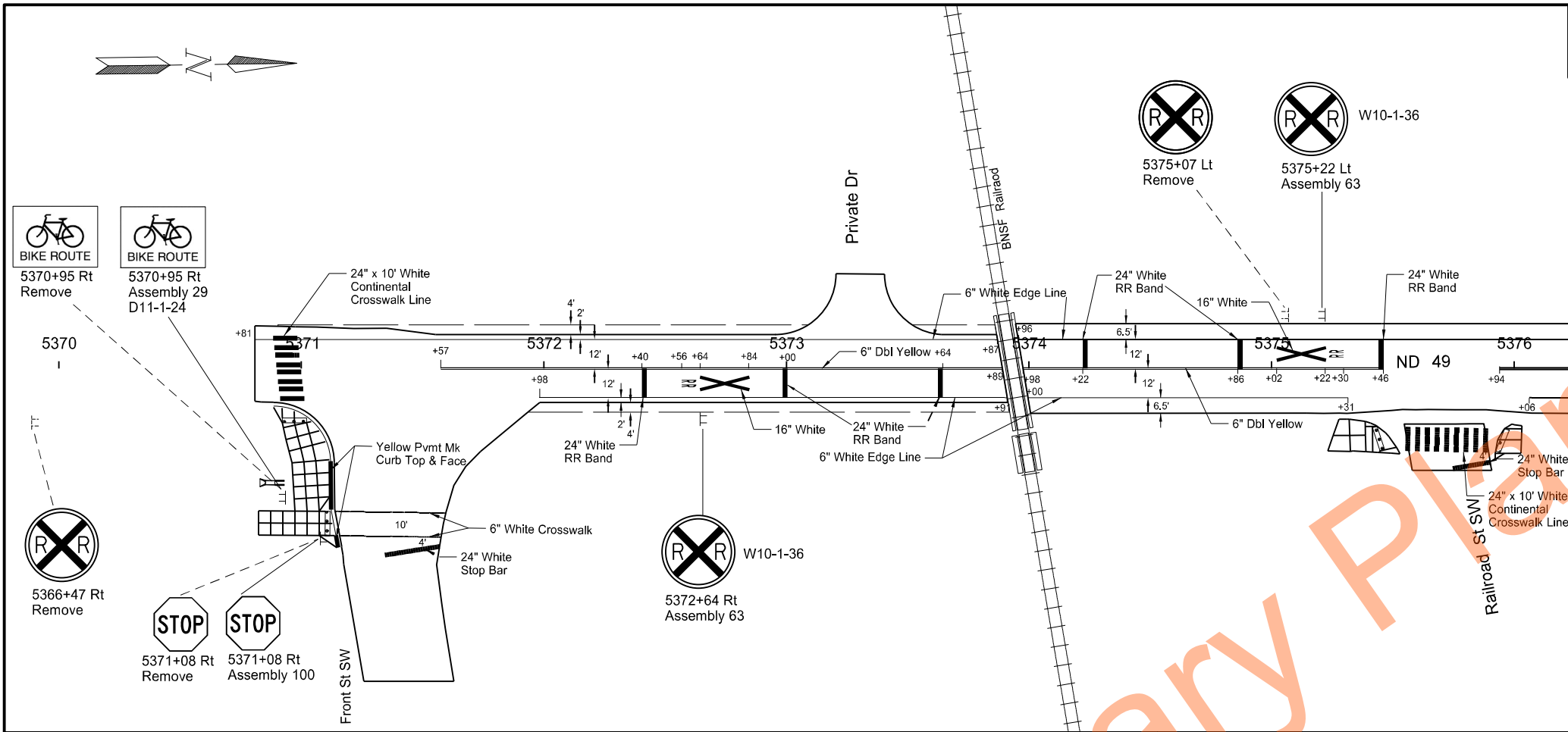
Perspective View

Sidewalk Barricade

ND 49
Beulah North to Jct 200



6/8/23 3:41:52PM
Page 1 of 1



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	110	2
SPEC	CODE	BID ITEM	QTY	UNIT
762	0103	PVMT MK PAINTED-MESSAGE		
		Railroad Cross and 2 R's (60.5 SF x 2 EA)	121	SF
762	1106	PVMT MK PAINTED 6IN LINE		
		White Crosswalk (Front St SW)	88	LF
		White Crosswalk (Main Street W)	79	LF
		Yellow Double Barrier	1876	LF
		White Edge Line	1937	LF
762	1124	PVMT MK PAINTED 24IN LINE		
		Railroad Bands	72	LF
		Stop Bar (Front St SW)	23	LF
		Stop Bar (Railroad St SW)	16	LF
		24"x10' Continertal Crosswalk Line (Front St)	80	LF
		24"x10' Continertal Crosswalk Line (Railroad St)	90	LF
762	1140	PVMT MK PAINTED CURB TOP & FACE		
		Front St SW, SE Quad	25	LF
		Main St W, NE Quad	11	LF

Signing & Pavement Marking Layout

ND 49
Beulah, North to Jct 200

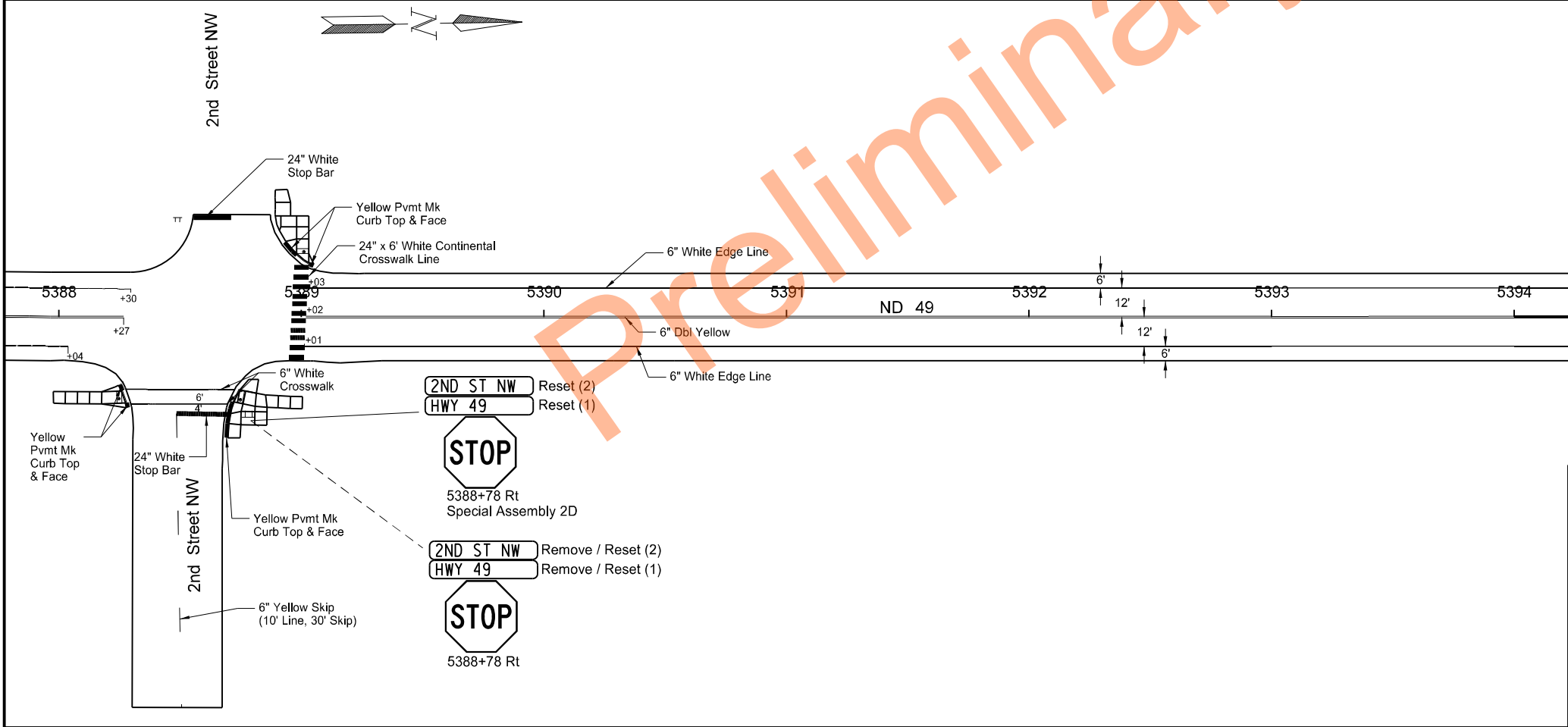
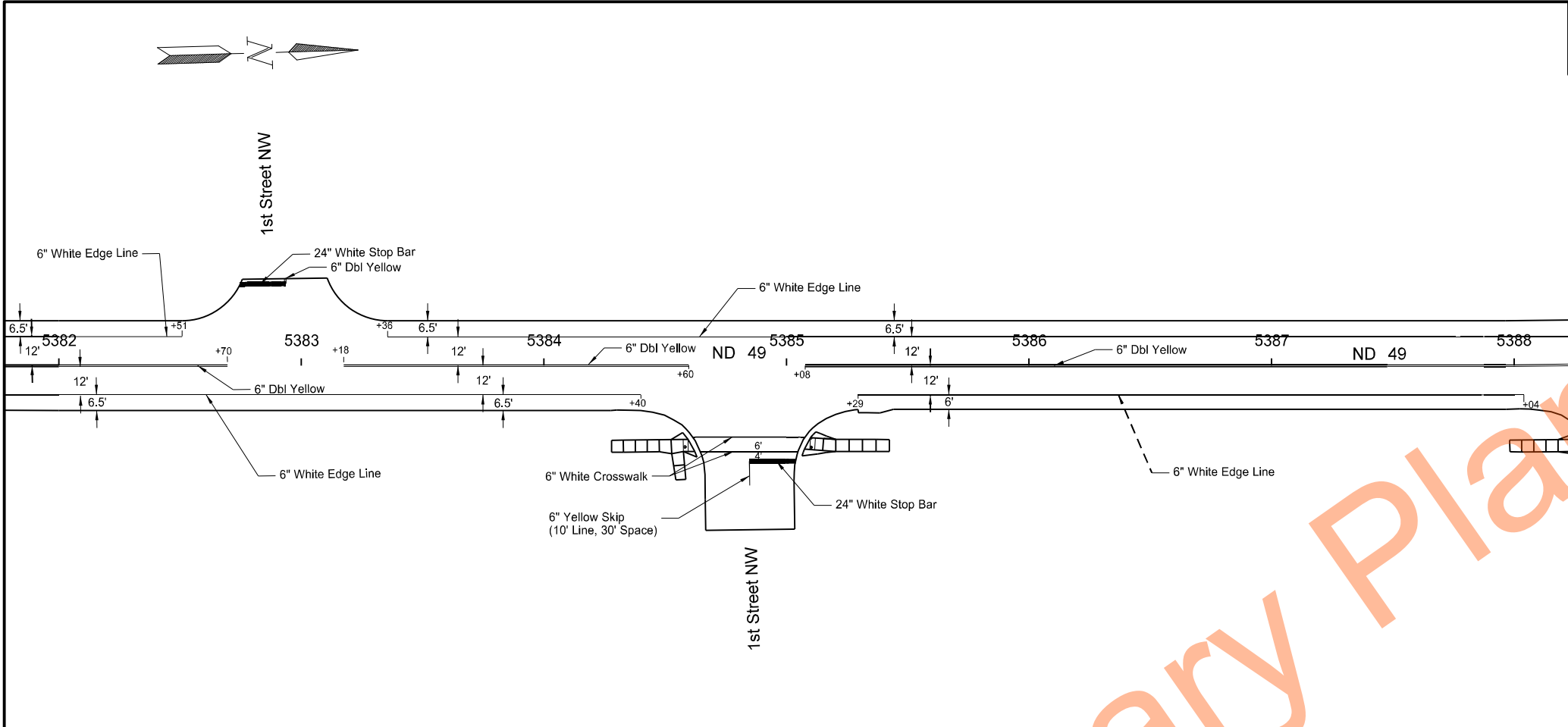
5370+80.76 to 5382+00

REGISTERED PROFESSIONAL ENGINEER

AUSTIN T.
BECKER
PE-27997

DATE 06/08/2026

NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	110	3
SPEC	CODE	BID ITEM	QTY	UNIT
762	1106	PVMT MK PAINTED 6IN LINE		
		White Crosswalk (1st St NW)	87	LF
		White Crosswalk (2nd St NW)	85	LF
		Yellow Double Barrier	2062	LF
		Yellow Skip Line	40	LF
		White Edge Line	2056	LF
762	1124	PVMT MK PAINTED 24IN LINE		
		Stop Bar (1st St NW)	38	LF
		Stop Bar (2nd St NW)	36	LF
		24"x6' Continental Crosswalk Line	66	LF
762	1140	PVMT MK PAINTED CURB TOP & FACE		
		2nd St NW, NW Quad	10	LF
		2nd St NW, SE Quad	5	LF
		2nd St NW, NE Quad	16	LF

Signing & Pavement Marking Layout

ND 49
Beulah, North to Jct 200

5382+00 to 5394+00

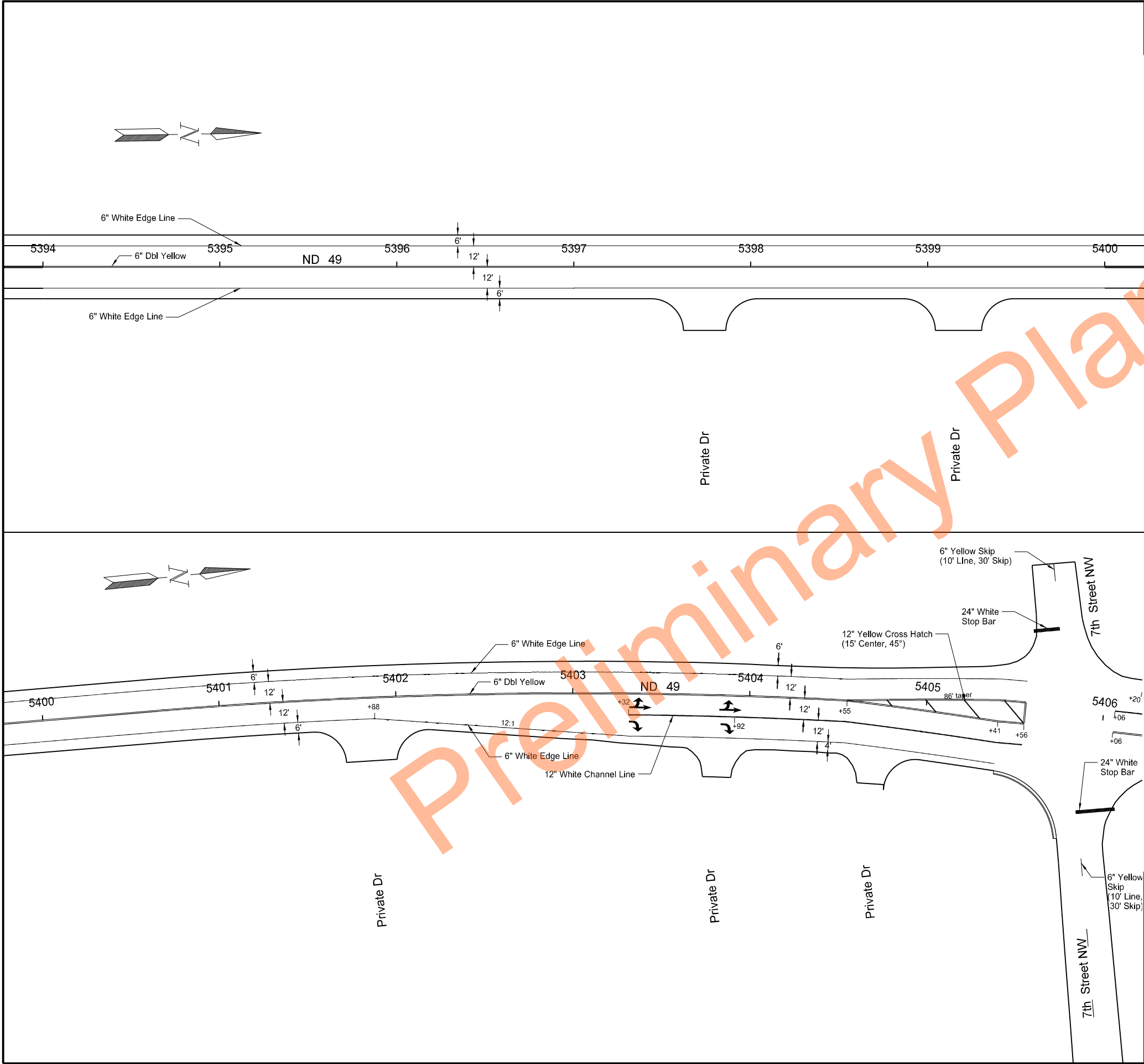
REGISTERED PROFESSIONAL ENGINEER

AUSTIN T. BECKER

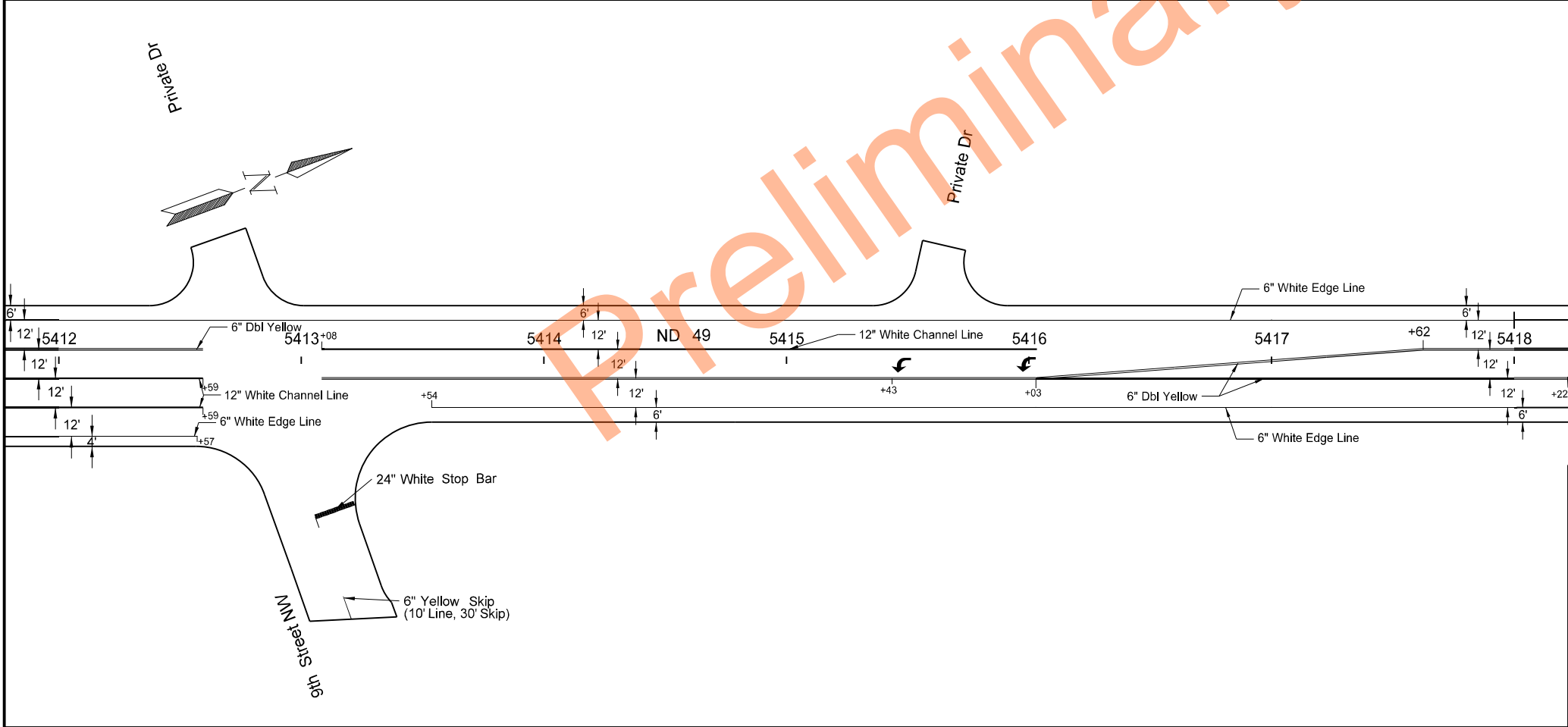
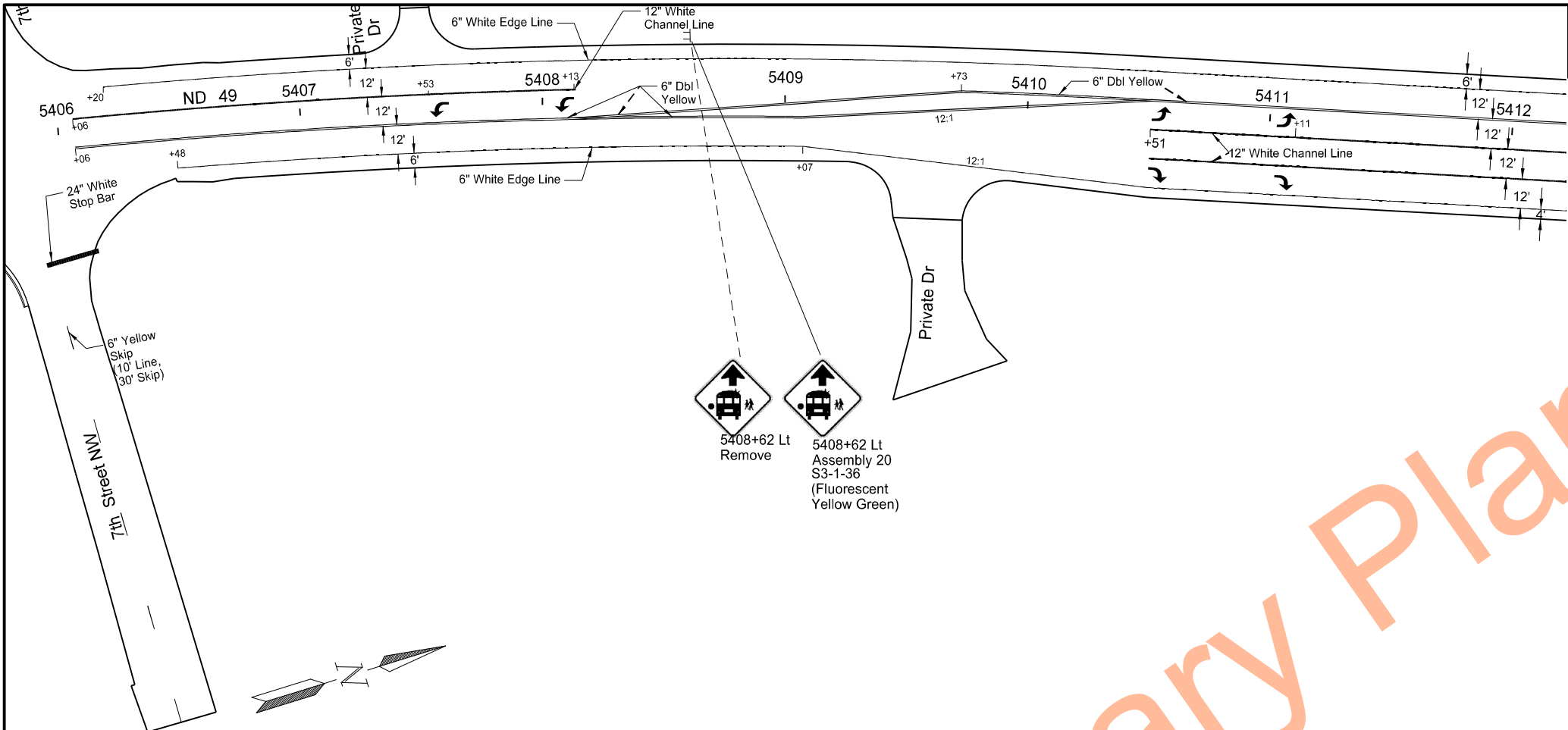
PE-27997

DATE 06/08/2026

NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	110	4
SPEC	CODE	BID ITEM	QTY	UNIT
762	0103	PVMT MK PAINTED-MESSAGE		
		Arrow (Rt)	16 SF x 2 EA	32 SF
		Arrow (Lt & Through Arrow)	27 SF x 2 EA	54 SF
762	1106	PVMT MK PAINTED 6IN LINE		
		Yellow Double Barrier	2538	LF
		Yellow Skip Line	60	LF
		White Edge Line	2297	LF
762	1112	PVMT MK PAINTED 12IN LINE		
		Yellow Cross Hatch	45	LF
		White Channel Line	224	LF
762	1124	PVMT MK PAINTED 24IN LINE		
		Stop Bar (7th St NW)	36	LF



		STATE	PROJECT NO.	SECTION NO.	SHEET NO.
		ND	XA-NH-5-049(021)101	110	5
SPEC	CODE	BID ITEM		QTY	UNIT
762	0103	PVMT MK PAINTED-MESSAGE			
		Arrow (Lt)		16 SF x 6 EA	96 SF
		Arrow (Rt)		16 SF x 2 EA	32 SF
762	1106	PVMT MK PAINTED 6IN LINE			
		Yellow Double Barrier		3162	LF
		White Edge Line		2235	LF
762	1112	PVMT MK PAINTED 12IN LINE			
		White Channel Line		918	LF
762	1124	PVMT MK PAINTED 24IN LINE			
		Stop Bar (9th St NW)		17	LF

Signing & Pavement Marking Layout

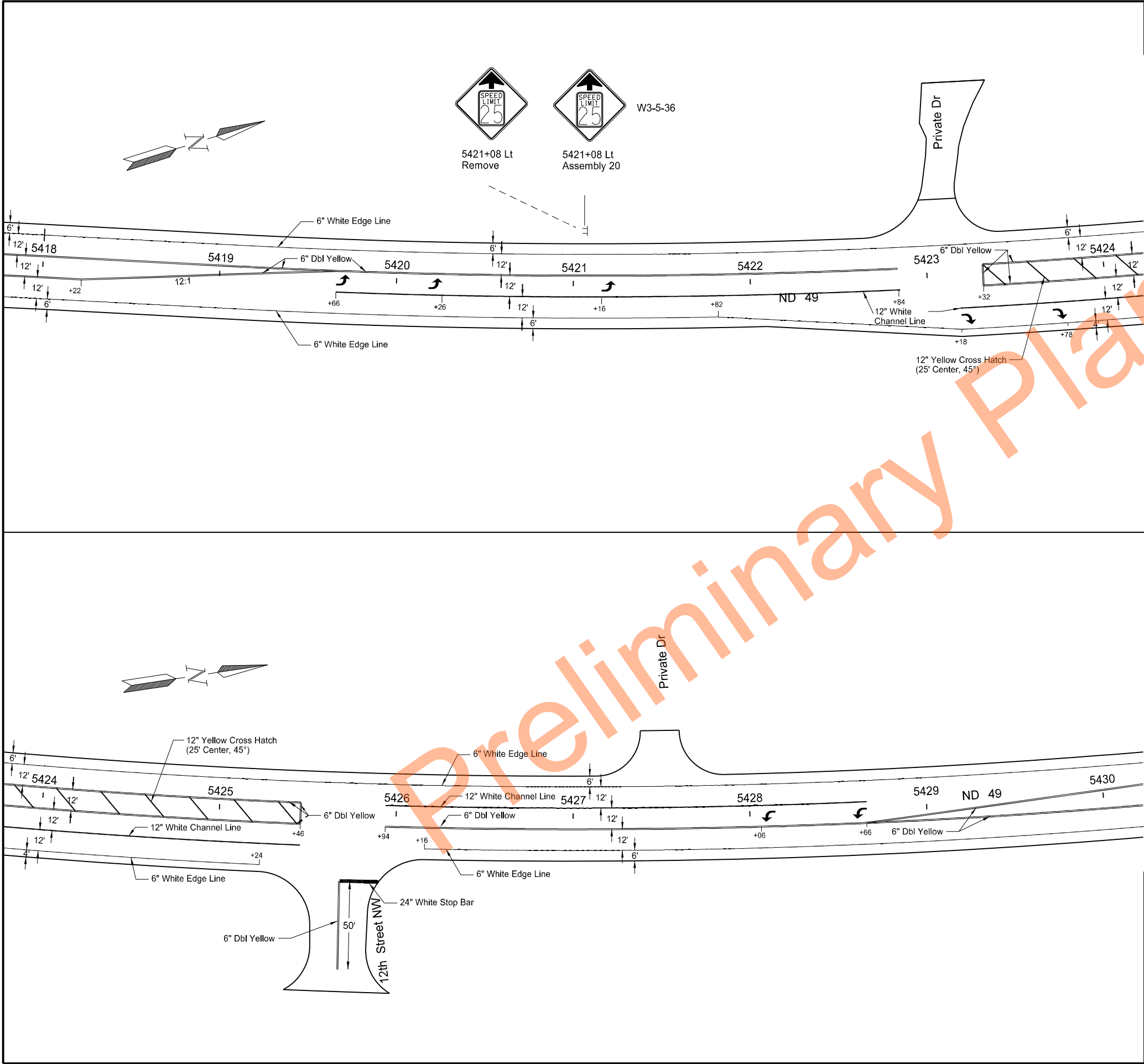
ND 49
Beulah, North to Jct 200

5406+00 to 5418+00

REGISTERED PROFESSIONAL ENGINEER

AUSTIN T. BECKER
PE-27997
DATE 06/08/2026

NORTH DAKOTA



		STATE	PROJECT NO.	SECTION NO.	SHEET NO.
		ND	XA-NH-5-049(021)101	110	6
SPEC	CODE	BID ITEM		QTY	UNIT
762	0103	PVMT MK PAINTED-MESSAGE			
		Arrow (Lt)		16 SF x 5 EA	80 SF
		Arrow (Rt)		16 SF x 2 EA	32 SF
762	1106	PVMT MK PAINTED 6IN LINE			
		Yellow Double Barrier		3386	LF
		White Edge Line		2308	LF
762	1112	PVMT MK PAINTED 12IN LINE			
		Yellow Cross Hatch		150	LF
		White Channel Line		818	LF
762	1124	PVMT MK PAINTED 24IN LINE			
		Stop Bar (12th St NW)		22	LF

Signing & Pavement Marking Layout

ND 49
Beulah, North to Jct 200

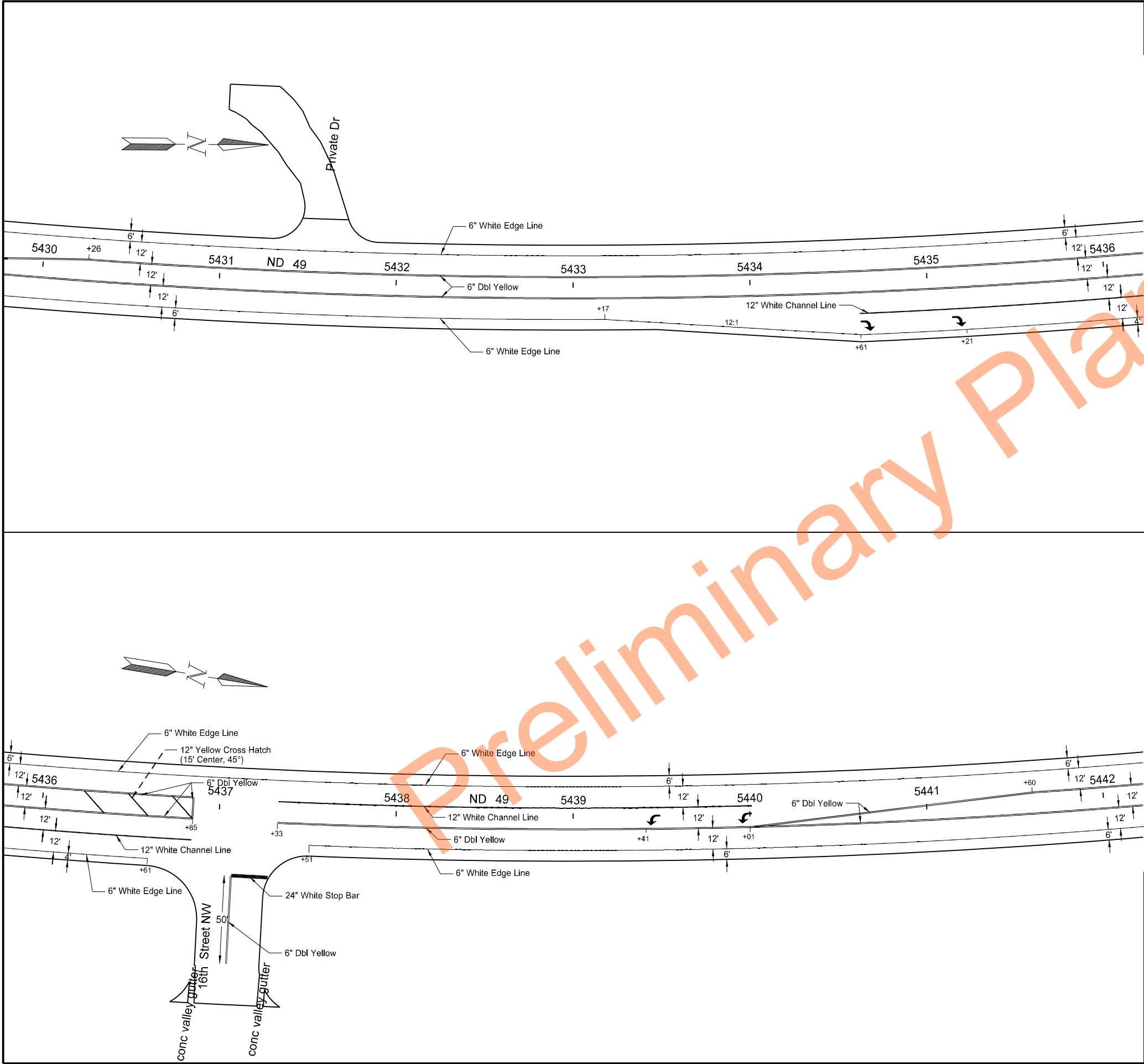
5418+00 to 5430+00

REGISTERED PROFESSIONAL ENGINEER

AUSTIN T. BECKER
PE-27997

DATE 06/08/2026

NORTH DAKOTA



		STATE	PROJECT NO.	SECTION NO.	SHEET NO.
		ND	XA-NH-5-049(021)101	110	7
SPEC	CODE	BID ITEM		QTY	UNIT
762	0103	PVMT MK PAINTED-MESSAGE			
		Arrow (Lt)	16 SF x 2 EA	32	SF
		Arrow (Rt)	16 SF x 2 EA	32	SF
762	1106	PVMT MK PAINTED 6IN LINE			
		Yellow Double Barrier		4198	LF
		White Edge Line		2310	LF
762	1112	PVMT MK PAINTED 12IN LINE			
		Yellow Cross Hatch		51	LF
		White Channel Line		492	LF
762	1124	PVMT MK PAINTED 24IN LINE			
		Stop Bar (16th St NW)		21	LF

Signing & Pavement Marking Layout

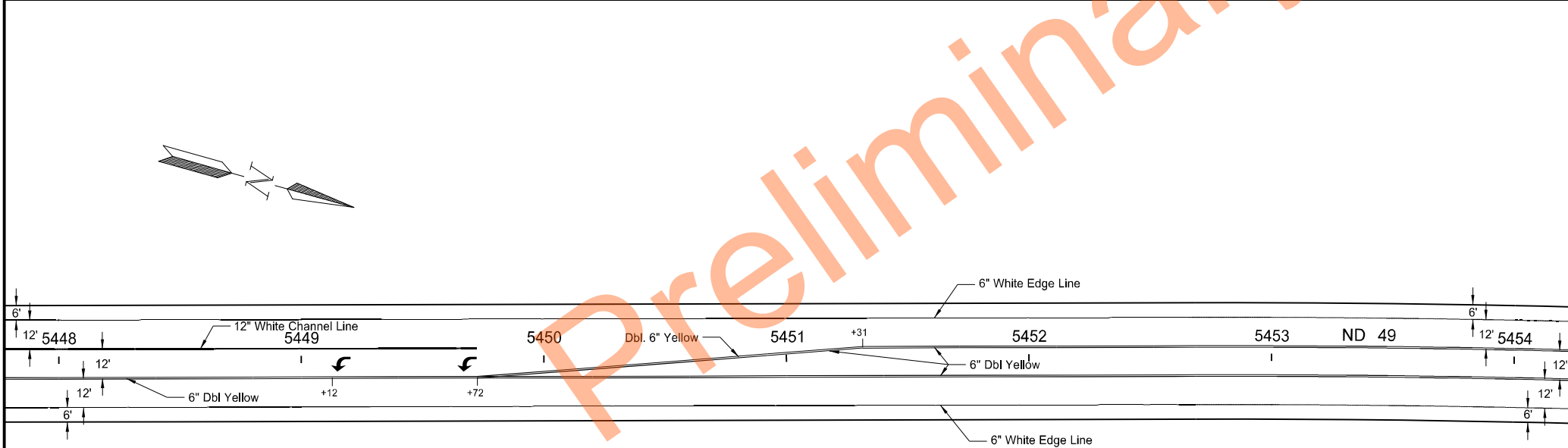
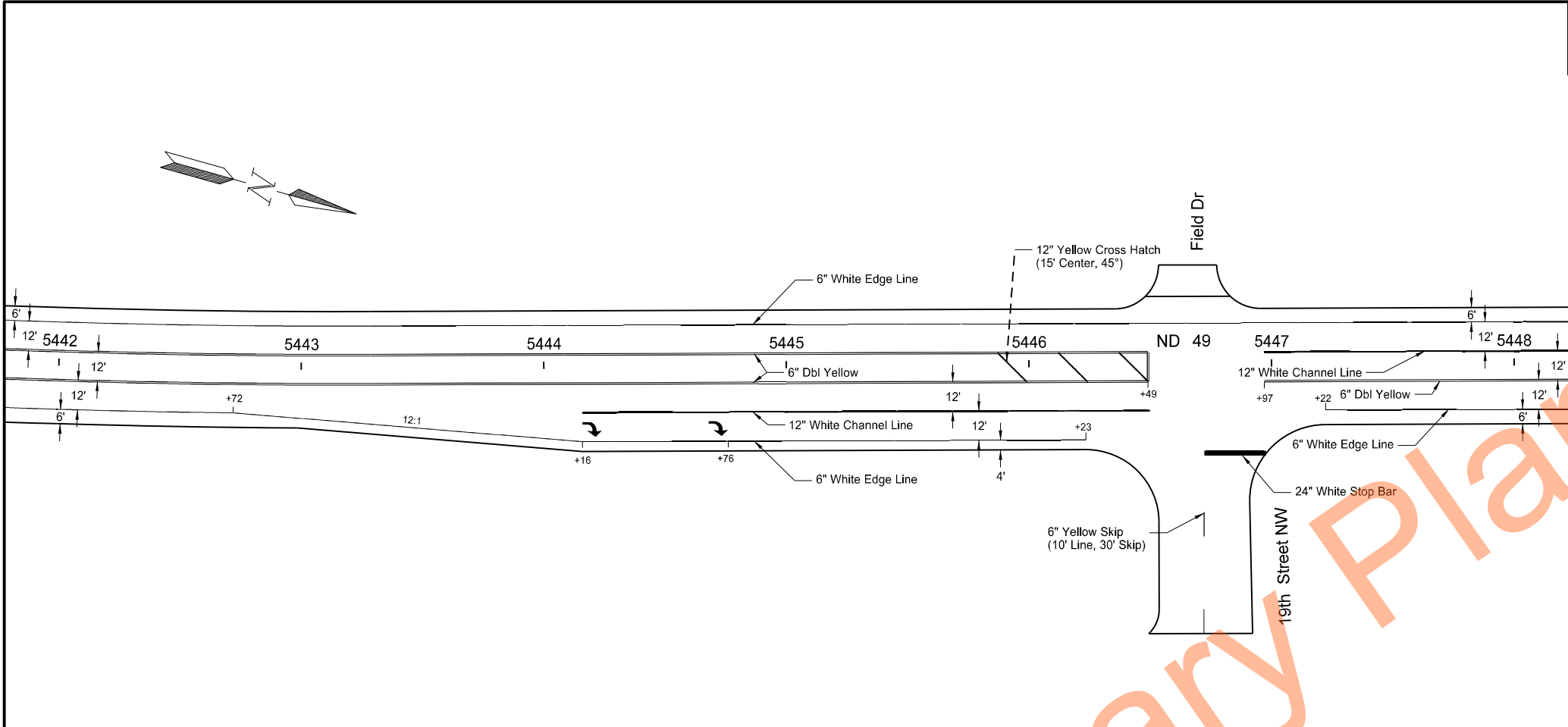
ND 49
Beulah, North to Jct 200

5430+00 to 5442+00

REGISTERED PROFESSIONAL ENGINEER

AUSTIN T. BECKER
PE-27997
DATE 06/08/2026

NORTH DAKOTA



		STATE	PROJECT NO.	SECTION NO.	SHEET NO.
		ND	XA-NH-5-049(021)101	110	8
SPEC	CODE	BID ITEM		QTY	UNIT
762	0103	PVMT MK PAINTED-MESSAGE			
		Arrow (Lt)		16 SF x 2 EA	32 SF
		Arrow (Rt)		16 SF x 2 EA	32 SF
762	1106	PVMT MK PAINTED 6IN LINE			
		Yellow Double Barrier		4082	LF
		Yellow Skip Line		20	LF
762	1112	PVMT MK PAINTED 12IN LINE			
		Yellow Cross Hatch		51	LF
		White Channel Line		508	LF
762	1124	PVMT MK PAINTED 24IN LINE			
		Stop Bar (19th St NW)		26	LF

Signing & Pavement Marking Layout

ND 49
Beulah, North to Jct 200

5442+00 to 5454+00

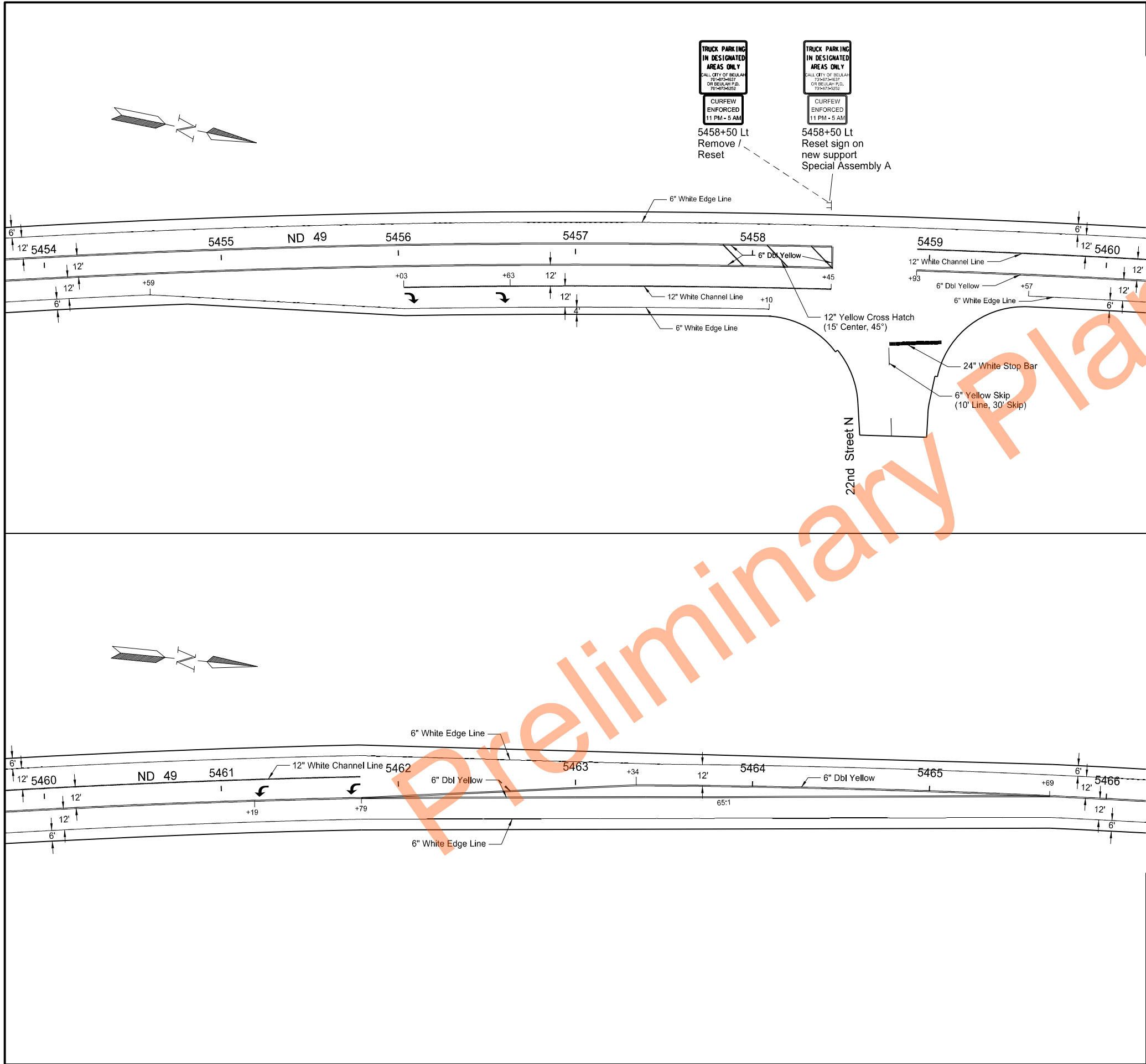
REGISTERED PROFESSIONAL ENGINEER

AUSTIN T. BECKER

PE-27997

DATE 06/08/2026

NORTH DAKOTA



	STATE	PROJECT NO.		SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101		110	9

SPEC	CODE	BID ITEM	QTY	UNIT
762	0103	PVMT MK PAINTED-MESSAGE		
		Arrow (Lt)	16 SF x 2 EA	32 SF
		Arrow (Rt)	16 SF x 2 EA	32 SF
762	1106	PVMT MK PAINTED 6IN LINE		
		Yellow Double Barrier	3996	LF
		Yellow Skip Line	20	LF
		White Edge Line	2253	LF
762	1112	PVMT MK PAINTED 12IN LINE		
		Yellow Cross Hatch	51	LF
		White Channel Line	528	LF
762	1124	PVMT MK PAINTED 24IN LINE		
		Stop Bar (22nd St N)	30	LF

Signing & Pavement Marking Layout

ND 49
Beulah, North to Jct 200

5454+00 to 5466+00

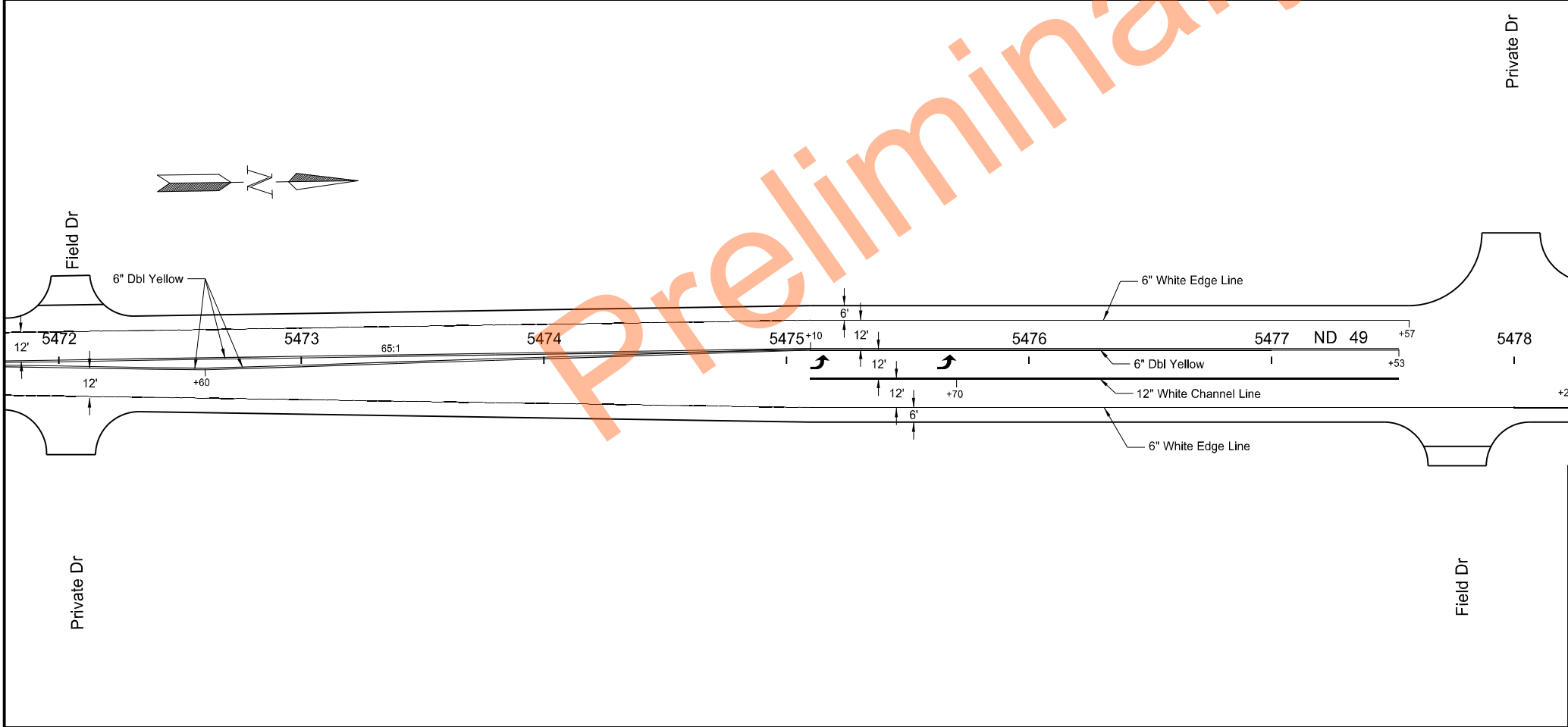
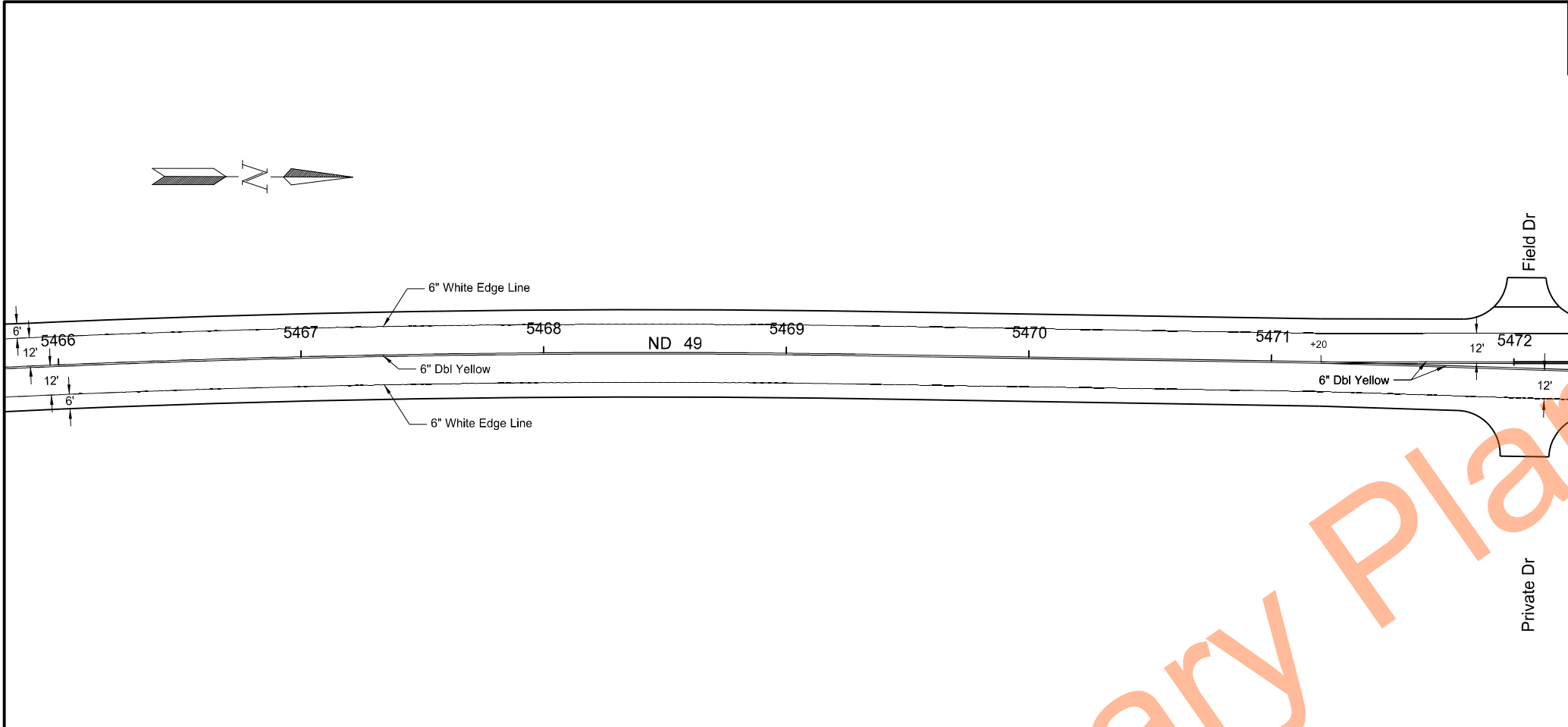
REGISTERED PROFESSIONAL ENGINEER

AUSTIN T. BECKER

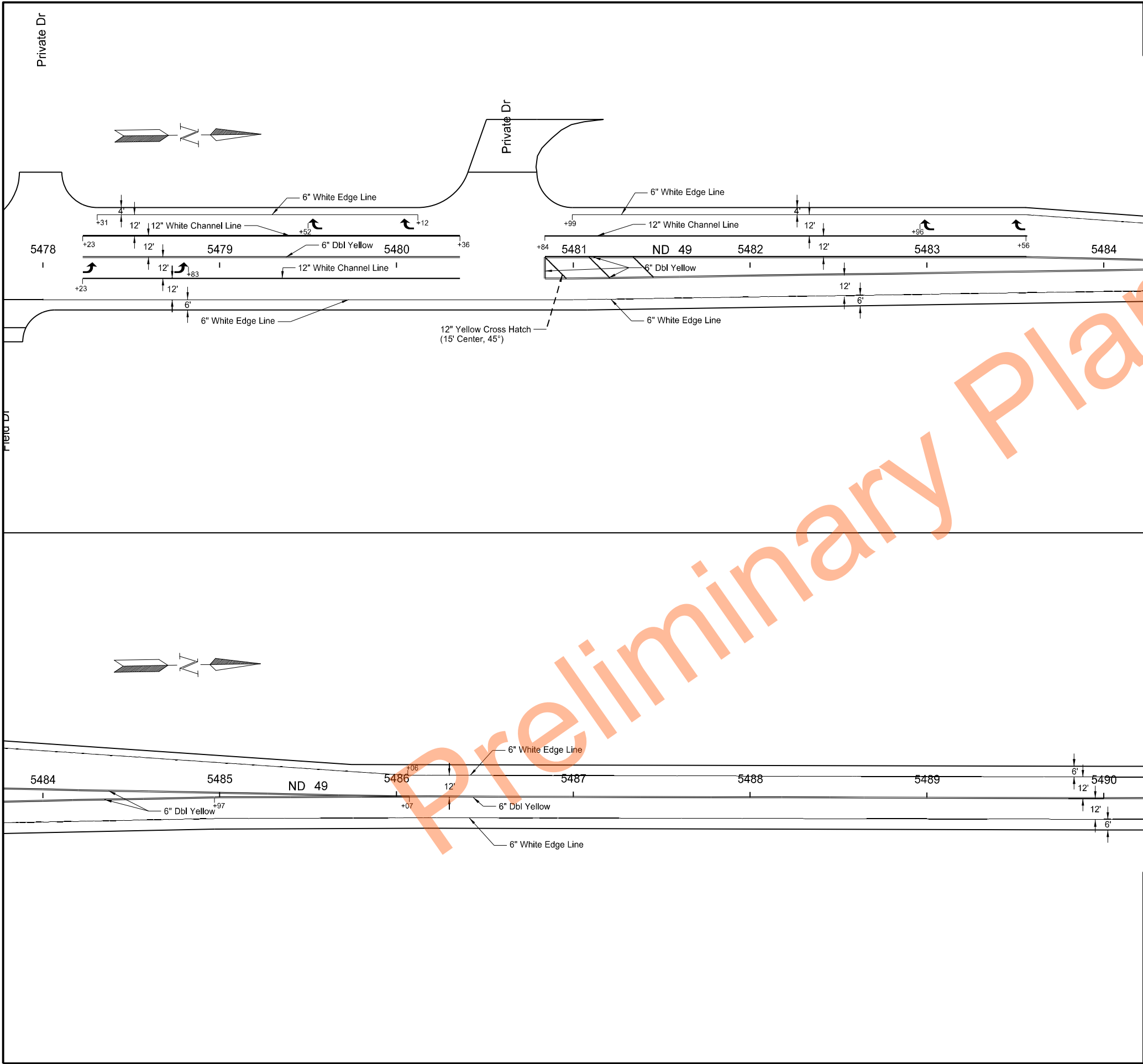
PE-27997

DATE 06/08/2026

NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	110	10
SPEC	CODE	BID ITEM	QTY	UNIT
762	0103	PVMT MK PAINTED-MESSAGE		
		Arrow (Lt)	16 SF x 2 EA	32 SF
762	1106	PVMT MK PAINTED 6IN LINE		
		Yellow Double Barrier	3086	LF
		White Edge Line	2357	LF
762	1112	PVMT MK PAINTED 12IN LINE		
		White Channel Line	243	LF



	STATE	PROJECT NO.		SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101		110	11

SPEC	CODE	BID ITEM	QTY	UNIT
762	0103	PVMT MK PAINTED-MESSAGE		
		Arrow (Lt)	16 SF x 2 EA	32 SF
		Arrow (Rt)	16 SF x 4 EA	64 SF
762	1106	PVMT MK PAINTED 6IN LINE		
		Yellow Double Barrier	3324	LF
		White Edge Line	2282	LF
762	1112	PVMT MK PAINTED 12IN LINE		
		Yellow Cross Hatch	50	LF
		White Channel Line	698	LF

Signing & Pavement Marking Layout

ND 49
Beulah, North to Jct 200

5478+00 to 5490+00

REGISTERED PROFESSIONAL ENGINEER

AUSTIN T. BECKER
PE-27997

DATE 06/08/2026

NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	110	12

SPEC	CODE	BID ITEM	QTY	UNIT
754	0563	REFERENCE MARKER-TYPE C		
		5491+57 Rt	1	EA
762	1106	PVMT MK PAINTED 6IN LINE		
		Yellow Double Barrier	2400	LF
		White Edge Line	2400	LF

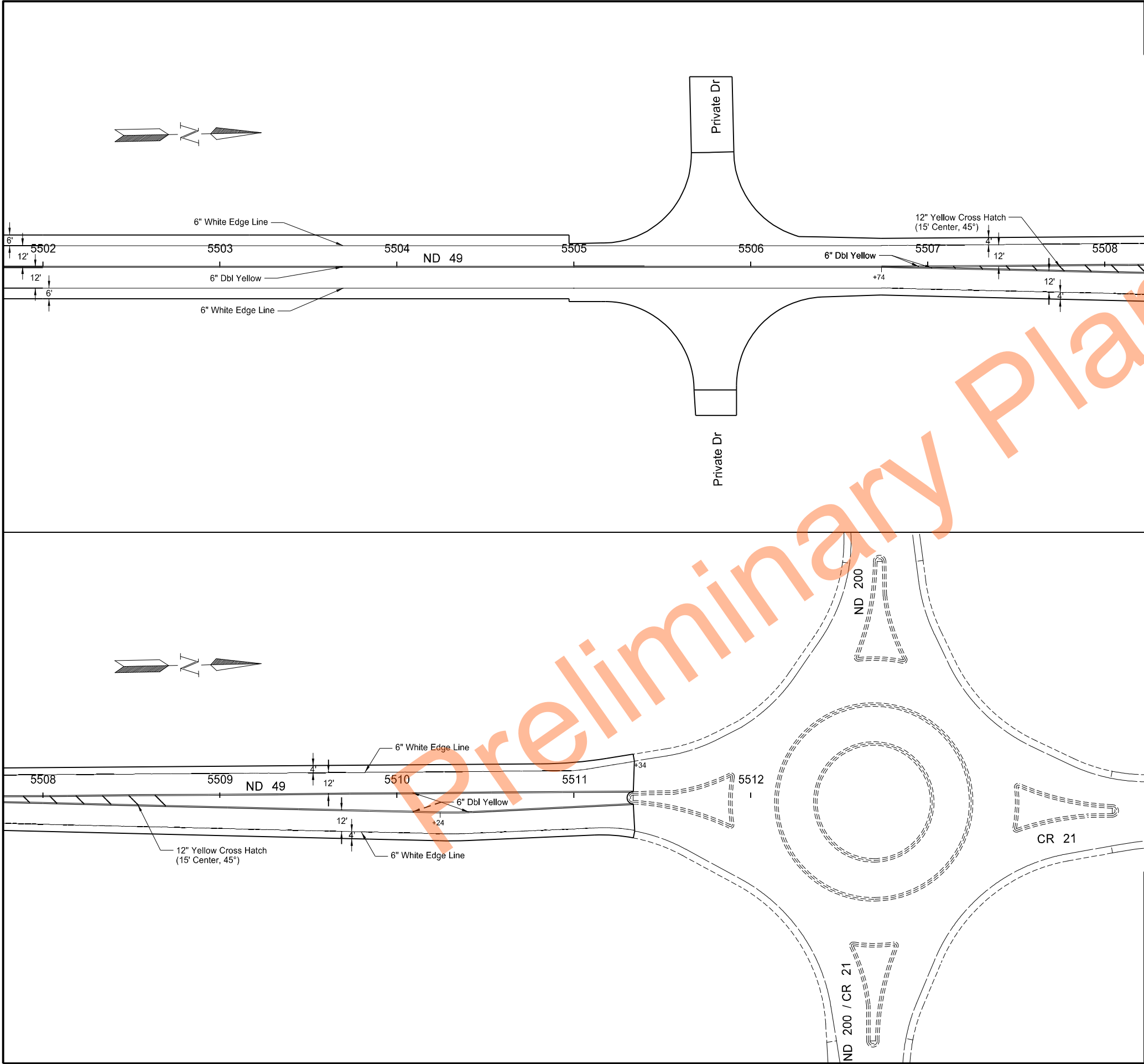
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Signing & Pavement Marking Layout

ND 49
Beulah, North to Jct 200

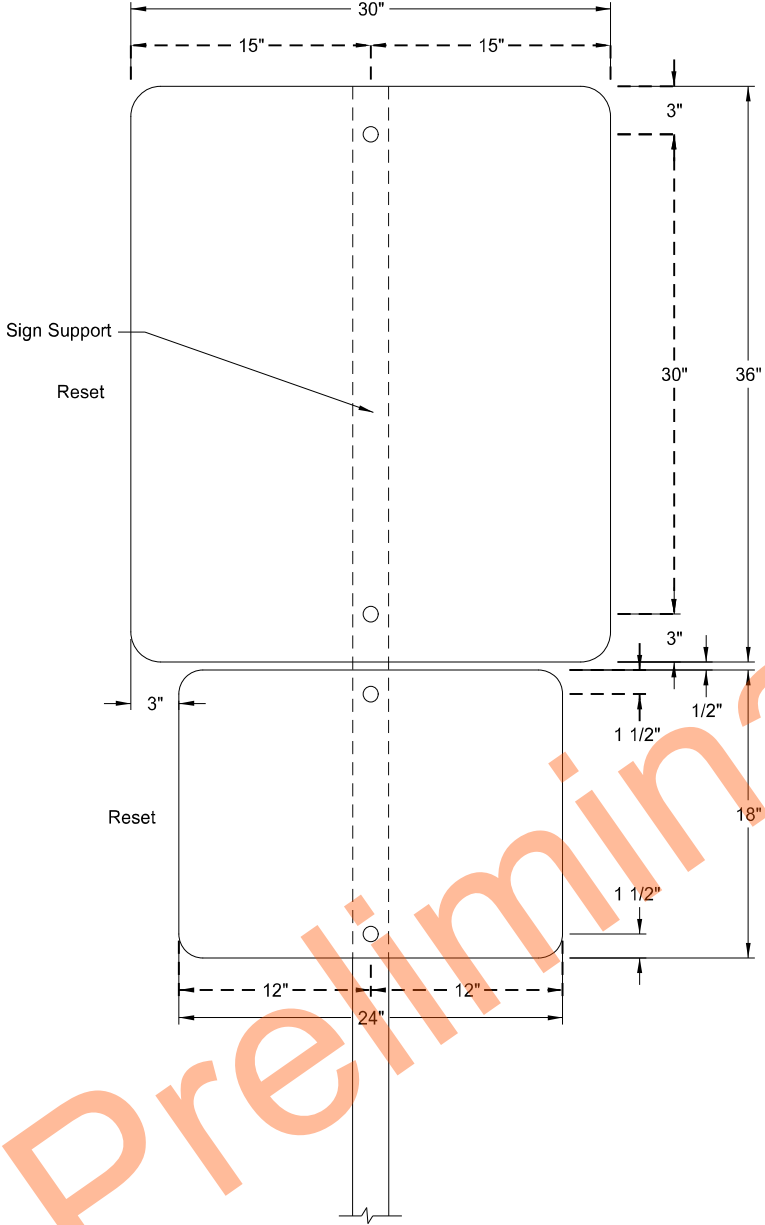
5490+00 to 5502+00





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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762	1106	PVMT MK PAINTED 6IN LINE		
		Yellow Double Barrier	2788	LF
		White Edge Line	1870	LF
762	1112	PVMT MK PAINTED 12IN LINE		
		Yellow Cross Hatch	58	LF

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	110	14

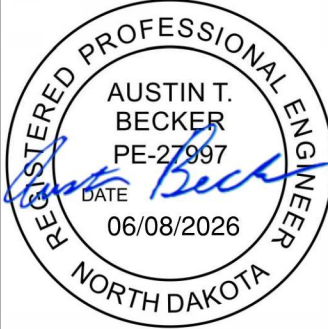


Special Assembly A
5458+50 Lt
Design Area 10.5 SF
Reset Sign

Signing Details

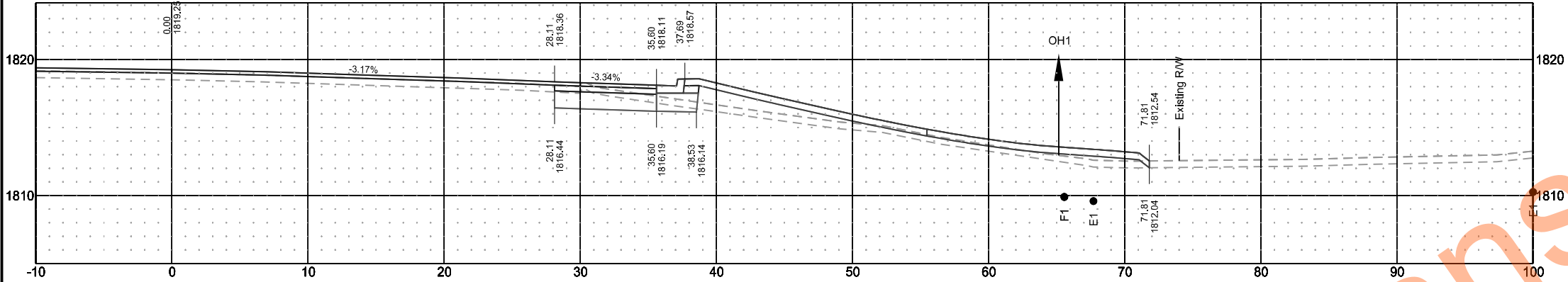
ND 49
Beulah North to Jct 200

Special Assembly A
5458+50 Lt

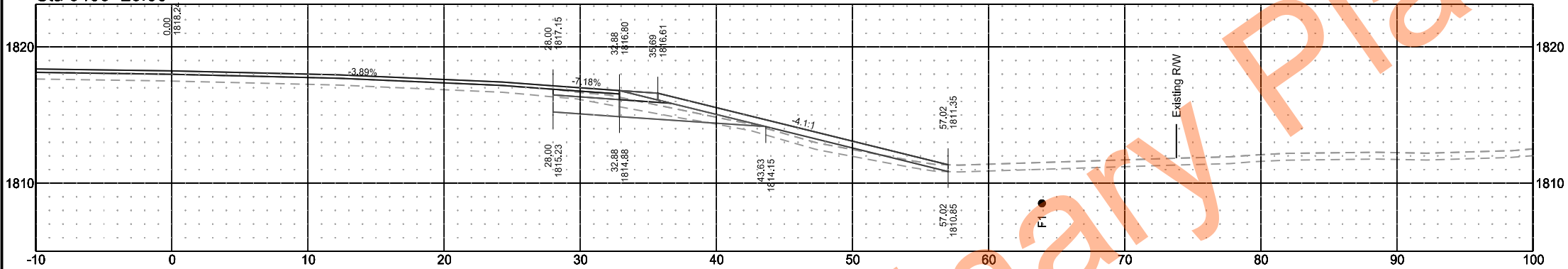


STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	XA-NH-5-049(021)101	200	1

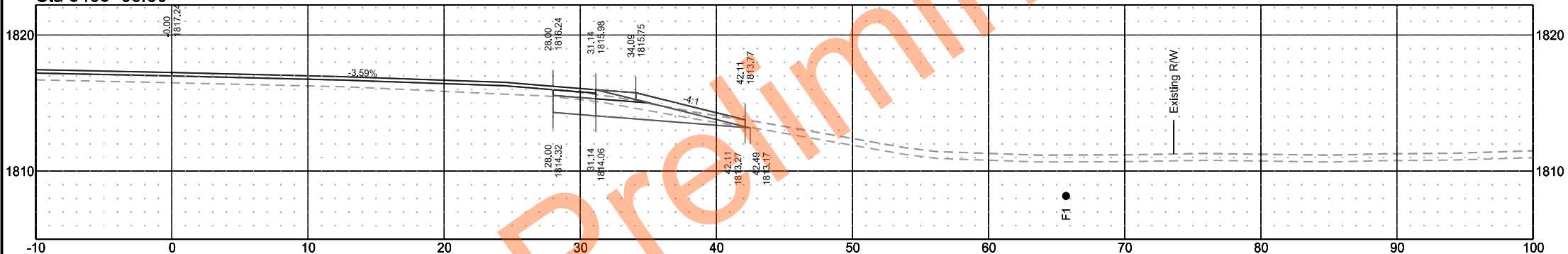
Sta 5405+50.00



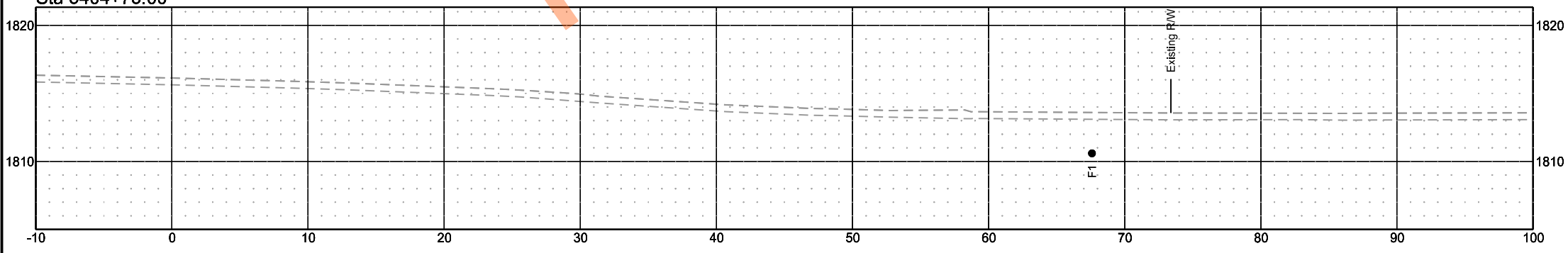
Sta 5405+25.00



Sta 5405+00.00

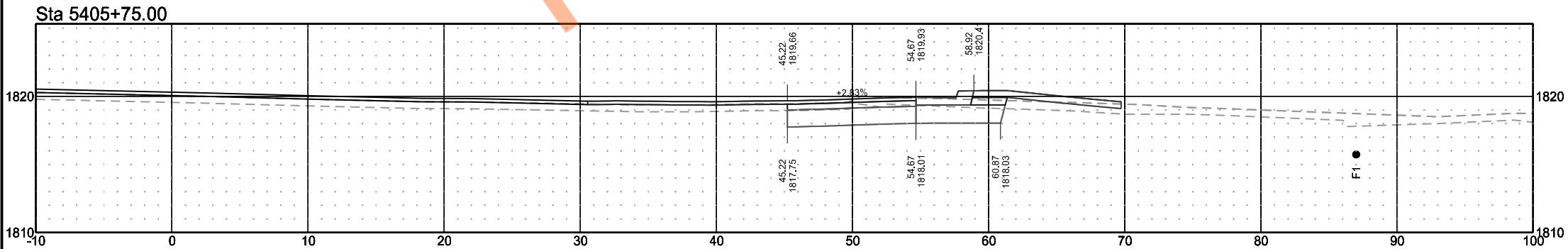


Sta 5404+75.00



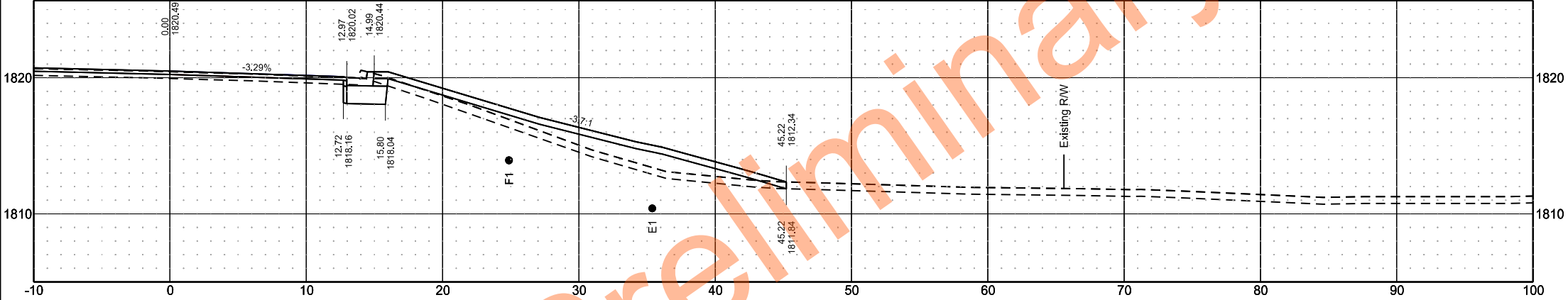
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	200	2

Preliminary Plans

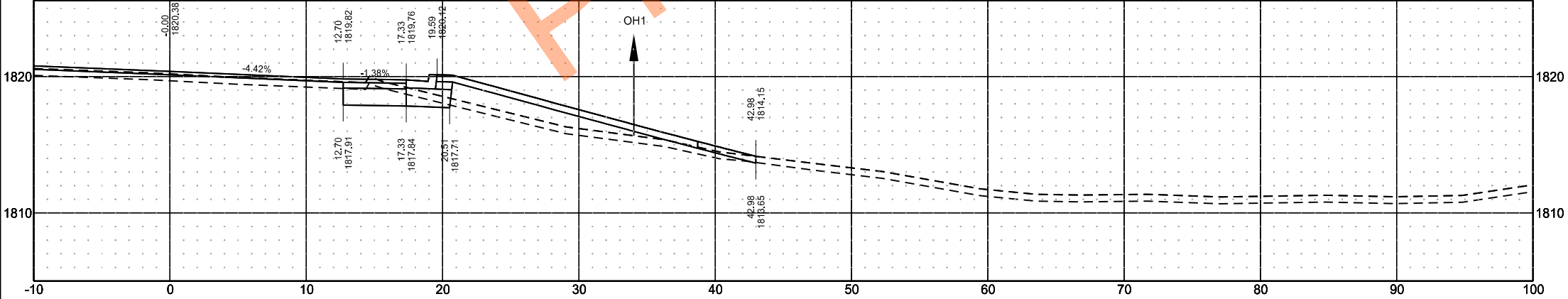


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-NH-5-049(021)101	200	3

Sta 1+50.00



Sta 1+35.00



NDDOT ABBREVIATIONS

D-101-1

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

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



NDDOT ABBREVIATIONS

D-101-2

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

Ln lane
Lg large
Lat latitude
Lt left
Lens lenses
Lvl level
Lvng 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 P 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	
07-01-14	
REVISIONS	
DATE	CHANGE
09-03-15	General Revisions
04-23-18	General Revisions
12-18-20	General Revisions
08-16-22	General Revisions
04-14-25	General Revisions



NDDOT ABBREVIATIONS

D-101-3

Salv	salvage(d)	Tel	telephone
San	sanitary sewer line	Tel B	Telephone Booth
Sec	section	Tel P	telephone pole
SL	section line	Tv	television
Sep	separation	Temp	temperature
Seq	sequence	Temp	temporary
Serv	service	TBM	temporary bench mark
Sht	sheet	T	thinwall tube sample
Shtng	sheeting	Ts	topsoil
Shldr	shoulder	Traf	traffic
Sw or Sdwk	sidewalk	TSCB	traffic signal control box
SD	sight distance	Tr	trail
SN	sign number	Transf	transformer
Sig	signal	Trans	transition
Sgl	single	TT	transmission tower
SRCP	slotted reinforced concrete pipe	TES	traversable end section
SC	slow curing	Trans	transverse
SS	slow setting	Trtd	treated
Sm	small	Trmt	treatment
S	South	Qc	triaxial compression
SE	Southeast	TERO	tribal employment rights ordinance
SW	Southwest	Tpl	triple
SB	Southbound	Typ	typical
Sp	spaces		
Spcl	special	Qu	unconfined compressive strength
SA	special assembly	Ugrnd	underground
SP	special provisions	Util	utility
G	specific gravity		
Spk	spike		
SB	split barrel sample	VG	valley gutter
SH	sprinkler head	Vap	vapor
SV	sprinkler valve	Vert	vertical
Sq	square	VCP	vitrified clay pipe
Stk	stake	Vol	volume
Std	standard	VSFS	vehicle speed feedback sign
N	standard penetration test		
Std Specs	standard specifications	Wkwy	walkway
Stm L	steam line	W	water content
SEC	steel encased concrete	WGV	water gate valve
SMA	stone matrix asphalt	WL	water line
SSD	stopping sight distance	WM	water main
SD	storm drain	WMV	water main valve
St	street	W Mtr	water meter
SPP	structural plate pipe	WSV	water service valve
SPPA	structural plate pipe arch	WW	water well
Str	structure	Wrng	wearing
Subd	subdivision	WIM	weigh in motion
Sub	subgrade	W	west
Sub Prep	subgrade preperation	WB	westbound
Ss	subsoil	Wrng	wiring
SS	supplement specification	W/	with
Supp	supplemental	W/o	without
Surf	surfacing		
Surv	survey		
Sym	symmetrical		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
09-03-15 04-23-18 12-18-20 08-16-22 04-14-25	General Revisions General Revisions General Revisions General Revisions General Revisions

NDDOT ABBREVIATIONS

D-101-4

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	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	Sheet Added
4-14-25	- Continued from D-101-3 General Revisions



NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

702COM
ACCENT
AGASSIZ WU
AGC
ALL PL
ALL SEAS WU
AMOCO PI
AMRDA HESS
AT&T
B PAW
BAKER ELEC
BASIN ELEC
BEK TEL
BELLE PL
BLM
BNSF
BOEING
BRNS RWD
BURK-DIV ELEC
BURL WRD
CABLE ONE
CABLE SERV
CAP ELEC
CASS CO ELEC
CASS RWU
CAV ELEC
CBLCOM
CENEX PL
CENT PL WATER DIST
CENT PWR ELEC
CENTURYLINK
COE
CONS COMM
CONS TELCOM
CONT RES
CPR
D O E
DAK CARR
DAK CENT TEL
DAK RWD
DGC
DICKY R NET
DICKY WRD
DICKY TEL
DNRR
DOME PL
DVELEC
DVMW
E CENT REG WD
ENBRDG
ENVENTIS
EQUINOR
FALK MNG
FHWA
G FKS-TRL WD
GETTY TRD & TRAN
GLDN W ELEC

702 Communications
Accent Communications
Agassiz Water Users District
Associated General Contractors of America
Alliance Pipeline
All Seasons Water Users District
Amoco Pipeline Company
Amerada Hess Corporation
AT&T Corporation
Bear Paw Energy Incorporated
Baker Electric
Basin Electric Cooperative Incorporated
Bek Communications Cooperative
Belle Fourche Pipeline Company
Bureau of Land Management
Burlington Northern Santa Fe Railway
Boeing
Barnes Rural Water District
Burke-Divide Electric Cooperative
Burleigh County Water Resource District
Cable One
Cable Services
Capital Electric Cooperative Incorporated
Cass County Electric Cooperative
Cass Rural Water Users District
Cavalier Rural Electric Cooperative
Cablecom Of Fargo
Cenex Pipeline
Central Pipe Line Water District
Central Power Electric Cooperative
CenturyLink
Corps of Engineers
Consolidated Communications
Consolidated Telcom
Continental Resource Inc
Canadian Pacific Railway
Department Of Energy
Dakota Carrier Network
Dakota Central Telephone
Dakota Rural Water District
Dakota Gasification Company
Dickey Rural Networks
Dickey County Water Resource District
Dickey Telephone
Dakota Northern Railroad
Dome Pipeline Company
Dakota Valley Electric Cooperative
Dakota, Missouri Valley & Western
East Central Water District
Enbridge Pipelines Incorporated
Enventis Telephone
Equinor Pipeline
Falkirk Mining Company
Federal Highway Administration
Grand Forks-traill Water District
Getty Trading & Transportation
Golden West Electric Cooperative

GTR RAMSEY WD
GT PLNS NAT GAS
HALS TEL
IDEA1
INT-COMM TEL
KANEB PL
KEM ELEC
KOCH GATH SYS
LKHD PL
LWR YELL R ELEC
LUMEN
MCKNZ CON
MCKNZ ELEC
MCKNZ WRD
MCLEOD
MCLN ELEC
MCLN-SHRDN R WAT
MDU
MIDCO
MIDSTATE TEL
MINOT CABLE
MINOT TEL
MISS VALL COMM
MISS W W S
MINKOTA PWR
MOR-GRAN-SOU ELEC
MOUNT-WILLI ELEC
MLGC
MUNICIPAL
MUNICIPAL
N CENT ELEC
N PRAIR REG WD
ND PKS & REC
ND TEL
NDDOT
NE REG WD
NDSU SOIL SCI DEPT
NEMONT TEL
NODAK R ELEC
NOON FRMS TEL
NPR
NSP
NTHN BRDR PL
NTHN PLNS ELEC
NTHWSTRN REF
NW COMM
NWRWD
ONEOK
OSHA
OTTR TL PWR
PAAP
P L E M
POLAR COM
PVT ELEC
QWEST
R&T REG WD

Greater Ramsey Water District
Great Plains Natural Gas Company
Halstad Telephone Company
Idea1
Inter-Community Telephone Company
Kaneb Pipeline Company
Kem Electric Cooperative Incorporated
Koch Gathering Systems Incorporated
Lakehead Pipeline Company
Lower Yellowstone Rural Electric
Lumen Technologies Incorporated
McKenzie Consolidated Telcom
McKenzie Electric Cooperative
McKenzie County Water Resource District
McLeod USA
McLean Electric Cooperative
McLean-Sheridan Rural Water District
Montana-dakota Utilities
MidContinent Communications
Midstate Telephone Company
Minot Cable Television
Minot Telephone Company
Missouri Valley Communications Incorporated
Missouri West Water System
Minnkota Power
Mor-gran-sou Electric Cooperative
Mountrail-williams Electric Cooperative
Moore & Liberty - Griggs County
City Water And Sewer
City Of '.....'
North Central Electric Cooperative
North Prairie Regional Water District
North Dakota Parks And Recreation
North Dakota Telephone Company
North Dakota Department of Transportation
Northeast Regional Water District
NDSU Soil Science Department
Nemont Telephone
Nodak Rural Electric Cooperative
Noonan Farmers Telephone Company
Northern Plains Railroad
Northern States Power
Northern Border Pipeline
Northern Plains Electric Cooperative Incorporated
Northwestern Refinery Company
Northwest Communication Cooperation
Northwest Rural Water District
Oneok gas
Occupational Safety and Health Administration
Otter Tail Power Company
Plains All American Pipeline
Praeliands Energy Marketing
Polar Communications
Private Electric
Qwest Communications
R & T Water District

RED RIV COMM
RESVTN TEL
ROBRTS TEL
R-RIDER ELEC
RRVW
S CENT REG WD
SE W U
SCOTT CABLE
SHERDN ELEC
SHEYN VLY ELEC
SKYTECH
SLOPE ELEC
SOURIS RIV TELCOM
ST WAT COMM
STATE LN WATER
STER ENG
STUT RWD
SW PL PRJ
SWWA
SUNOCO
T M C
TCI
TESORO GHG PLNS PL
TRI-CNTY WU
TRL CO WRD
UNTD TEL
UPPR SOUR WD
US SPRINT
USAF MSL CABLE
USFWS
USW COMM
VRNDRY ELEC
W RIV TEL
WAPA
WAWSA
WEB
WILLI WRD
WILSTN BAS PL
WLSH RWD
WOLVRTN TEL
XLENER
YSVR

Red River Communications
Reservation Telephone
Roberts Company Telephone
Roughrider Electric Cooperative
Red River Valley & Western Railroad
South Central Regional Water District
Southeast Water Users Incorporated
Scott Cable Television Dickinson
Sheridan Electric Cooperative
Sheyenne Valley Electric Cooperative
Skyland Technologies Incorporated
Slope Electric Cooperative Incorporated
Souris River Telecommunications
State Water Commission
State Line Water Cooperative
Sterling Energy
Stutsman Rural Water District
Southwest Pipeline Project
Southwest Water Authority
Sunoco LP
Turtle Mountain Communications
TCI of North Dakota
Tesoro High Plains Pipeline
Tri-County Water Users Incorporated
Traill County Water Resource District
United Telephone
Upper Souris Water District
U.S. Sprint
U.S.A.F. Missile Cable
US Fish and Wildlife Service
U.S. West Communications
Verendrye Electric Cooperative
West River Telephone Incorporated
Western Area Power Administration
Western Area Water Supply Authority
W. E. B. Water Development Association
Williams County Water Resource District
Williston Basin Interstate Pipeline Company
Walsh Water Rural Water District
Wolverton Telephone
Xcel Energy
Yellowstone Valley Railroad

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



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

KIRK J. HOFF

REGISTERED

PROFESSIONAL

PE-4683

ENGINEER

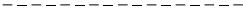
NORTH DAKOTA

12 18 2020

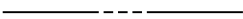
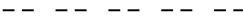
LINE STYLES

D-101-21

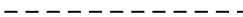
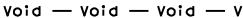
Right Of Way

	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)
	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
	Geogrid
	Geotextile Fabric Type R
	Geotextile Fabric Type R1
	Geotextile Fabric Type RR
	Geotextile Fabric Type S
	Subgrade Reinforcement

Countours

	Depression Contours
	Supplemental Contour

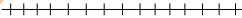
Profile

	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

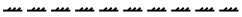
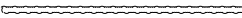
Bridge Details

	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
	Silt Fence
	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	Added and Revised Items, Organized by Functional Groups
12-18-20	General Revisions

KIRK J. HOFF

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PE-4683

ENGINEER

NORTH DAKOTA

12 18 2020

SYMBOLS

D-101-30

	North Arrow (Half Scale)		Existing Bush or Shrub		Continuous Split Barrel Sample
	Alignment Data Point		Existing Large Evergreen Tree		Flight Auger Sample
	Alignment Monument		Existing Small Evergreen Tree		Split Barrel Sample
	Spot Elevation		Existing Large Tree		Thinwall Tube Sample
	Existing Miscellaneous Spot		Existing Small Tree		Standard Penetration Test
	Existing Access Control Arrow		Existing Tree Trunk		Inclinometer Tube
	Existing Benchmark		Cairn or Stone Circle		Excavation Unit
	Reset USGS Marker		Existing Artifact		Existing Ground Water Well Bore Hole
	Iron Monument Found		Existing Satellite Dish		
	Iron Pin R/W Monument		Existing Weather Station		
	Property Corner		Existing Windmill or Tower		
	Iron Pin Reference Monument		Reinforced Pavement		
	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				

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

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ENGINEER
NORTH DAKOTA
12 18 2020

SYMBOLS

D-101-31

	Flexible Delineator		Highway Sign (Exst, Ppsd)
	Flexible Delineator Type A (Exst, Ppsd)		Mile Post Type A (Exst-Ppsd-Reset)
	Flexible Delineator Type B (Exst, Ppsd)		Mile Post Type B (Exst, Ppsd)
	Flexible Delineator Type C (Exst, Ppsd)		Mile Post Type C (Exst, Ppsd)
	Flexible Delineator Type D (Exst, Ppsd)		Object Marker Type I (Exst, Ppsd)
	Flexible Delineator Type E (Exst, Ppsd)		Object Marker Type II (Exst, Ppsd)
	Delineator Type A (Exst, Ppsd, Diamond Grade-Reset)		Object Marker Type III (Exst, Ppsd)
	Delineator Type B (Exst, Ppsd, Diamond Grade-Reset)		Existing Reference Marker
	Delineator Type C (Exst, Ppsd, Diamond Grade)		Road Closure Gate 18 Ft (Exst, Ppsd)
	Delineator Type D (Exst, Ppsd, Diamond Grade)		Road Closure Gate 28 Ft (Exst, Ppsd)
	Delineator Type E (Exst, Ppsd, Diamond Grade)		Road Closure Gate 40 Ft (Exst, Ppsd)
	Barricade (Type I, Type II, Type III)		Existing Railroad Battery Box
	Arrow Panel (Caution Mode, Double Direction, Left Directional, Right Directional, Sequencing, Truck Mounted)		Existing RR Profile Spot
	Attenuation Device		Existing Railroad Crossbuck
	Truck Mounted Attenuator		Existing Railroad Frog
	Delineator Drums		Existing Mailbox (Private, Federal)
	Flagger		
	Tubular Marker		
	Traffic Cone		
	Back to Back Vertical Panel Sign		

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

12 18 2020

SYMBOLS

D-101-32

	Existing Luminaire			High Mast Light Standard 3 Luminaire (Exst, Ppsd)		Existing Traffic Signal Standard
	Luminaire LED			High Mast Light Standard 4 Luminaire (Exst, Ppsd)		Pull Box (Exst-Ppsd-Undefined)
	Existing Light Standard Luminaire			High Mast Light Standard 5 Luminaire (Exst, Ppsd)		Intelligent Transportation Pull Box (Exst, Ppsd)
	Relocate Light Standard			High Mast Light Standard 6 Luminaire (Exst, Ppsd)		Transformer (Exst, Ppsd)
	Light Standard Light LED Luminaire			High Mast Light Standard 7 Luminaire (Exst, Ppsd)		Power Pole (Exst-Ppsd-with Transformer)
	Light Standard 35 Watt High Pressure Sodium Vapor Luminaire			High Mast Light Standard 8 Luminaire (Exst, Ppsd)		Wood Pole (Exst, Ppsd)
	Light Standard 50 Watt High Pressure Sodium Vapor Luminaire			High Mast Light Standard 9 Luminaire (Exst, Ppsd)		Pedestrian Push Button Post (Exst, Ppsd)
	Light Standard 70 Watt High Pressure Sodium Vapor Luminaire			High Mast Light Standard 10 Luminaire (Exst, Ppsd)		Existing Pole
	Light Standard 100 Watt High Pressure Sodium Vapor Luminaire			Overhead Sign Structure Load Center (Exst, Ppsd)		Existing Telephone Pole
	Light Standard 150 Watt High Pressure Sodium Vapor Luminaire			Traffic Signal Controller (Exst, Ppsd)		Existing Post
	Light Standard 200 Watt High Pressure Sodium Vapor Luminaire			Pad Mounted Traffic Signal Controller (Exst, Ppsd)		Connection Conductor (Ground, Neutral, Phase 1, Phase 2)
	Light Standard 250 Watt High Pressure Sodium Vapor Luminaire			Flashing Beacon (Exst, Ppsd)		
	Light Standard 310 Watt High Pressure Sodium Vapor Luminaire			Concrete Foundation (Exst, Ppsd)		
	Light Standard 400 Watt High Pressure Sodium Vapor Luminaire			Pipe Mounted Flasher (Exst, Ppsd)		
	Light Standard 700 Watt High Pressure Sodium Vapor Luminaire			Pad Mounted Feed Point (Exst, Ppsd)		
	Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire			Pipe Mounted Feed Point with Pad (Exst, Ppsd)		
	Emergency Vehicle Detector			Pole Mounted Feed Point (Exst, Ppsd)		
	Video Detection Camera			Junction Box (Exst, Ppsd)		
				Existing Pedestrian Head with Number		
				Existing Signal Head		
				Pole Mounted Head		
				Existing Lighting Standard Pole		

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



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



12 18 2020

SYMBOLS

D-101-33

			Existing Manhole (Electrical, Gas, Telephone)		Cap or Stub Exst Gas, Exst Sanitary, Exst Storm Drain, Ppsd Storm Drain, Exst Water
			Water Manhole (Exst, Exst with Valve)		Existing Pedestal Electrical, Telephone, Fiber Optic Telephone, TV, Fiber Optic TV, Undefined
			Sanitary Sewer Manhole (Exst, Ppsd, Exst with Valve)		Existing Pipe Vent Gas, Fuel, Sanitary, Storm Drain, Water, Undefined
			Sanitary Force Main Manhole (Exst, Ppsd, Exst with Valve)		Valve Exst Gas, Exst Water, Ppsd Water, Exst Undefined
			Storm Drain Manhole (Exst, Ppsd, Exst with Inlet, Ppsd with Inlet)		Pump Sanitary, Storm Drain, Exst Water
			Force Main Storm Drain Manhole (Exst, Exst with Valve)		Corrugated Metal End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)
			Manhole (Ppsd, Ppsd 48 Inch, Exst Undefined)		Reinforced Concrete End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)
			Existing Water Appurtenance		Existing Utility Marker
			Sprinkler Head (Exst, Ppsd)		Existing Meter
			Fire Hydrant (Exst, Ppsd)		Existing Fuel Dispensers
			Cleanout (Exst Sanitary, Underdrain)		Existing Fuel Filler Pipes
			Existing Catch Basin Inlet (Round, Square)		Existing Fuel Leak Sensors
			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 Vegetation Barrier, Ppsd Double with Vegetation Barrier)		

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

KIRK J. HOFF
REGISTERED
PROFESSIONAL
ENGINEER
NORTH DAKOTA
12 18 2020

Cross Section Legend

D-101-40

Description

Longitudinal
Parallel to Roadway

Transverse
Perpendicular to Roadway*

Cable Line

●

CBL1

●

CBL2

Conduit Line

●

CDU1

●

CDU2

Electric Line

●

E1

●

E2

Fiber Optic Line

●

F1

●

F2

Gas Main Line

●

GM1

●

GM2

Gas Service Line

●

GS1

●

GS2

Gas Transmission Line

●

GT1

●

GT2

Fuel Pipeline

●

PL1

●

PL2

Sanitary Sewer
Force Main

●

SSF1

●

SSF2

Sanitary Sewer

●

SS1

●

SS2

Steam Line

●

STE1

●

STE2

Storm Drain
(Assumed Depth)

●

SD1

●

SD2

Telephone Line

●

T1

●

T2

TV Line

●

TV1

●

TV2

Water Main Line

●

WM1

●

WM2

Water Service Line

●

WS1

●

WS2

Description

Longitudinal
Parallel to Roadway

Transverse
Perpendicular to Roadway*

Overhead Power
Transmission Line

↑

OHT1

↑

OHT2

Overhead Line

↑

OH1

↑

OH2

Manhole - Multiple Variations

Electric

Fiber Optic

Gas

Inlet

Sanitary Force Main

Sanitary

Sanitary with Valve

Steam

Storm

Storm Force Main

Storm with Valve

Telephone

Water

Water with Meter

Water with Valve

Water with Air Release Valve

Light Standard - Multiple Variations

Concrete

Steel

Wood

with Traffic Signal

Pole - Multiple Variations

Utility

Brace

Feed Point

Guy

Power

Power Structure

Power with Light

Power with Transformer

Anchor

High Tension Cable Guardrail

Connection to infer that
probably will not be displayed

E2

E2

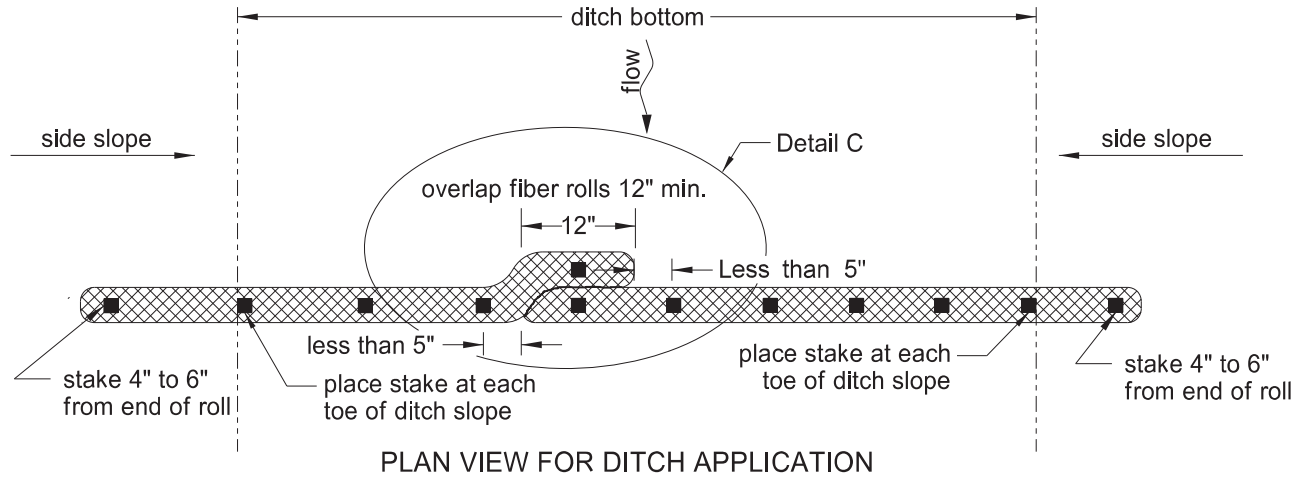
When storm drain invert elevations are NOT used to draw pipe, they will
appear as shown to the left. When invert elevations are used to draw
pipe, they will be a cross section similar to the graphics shown below.

○

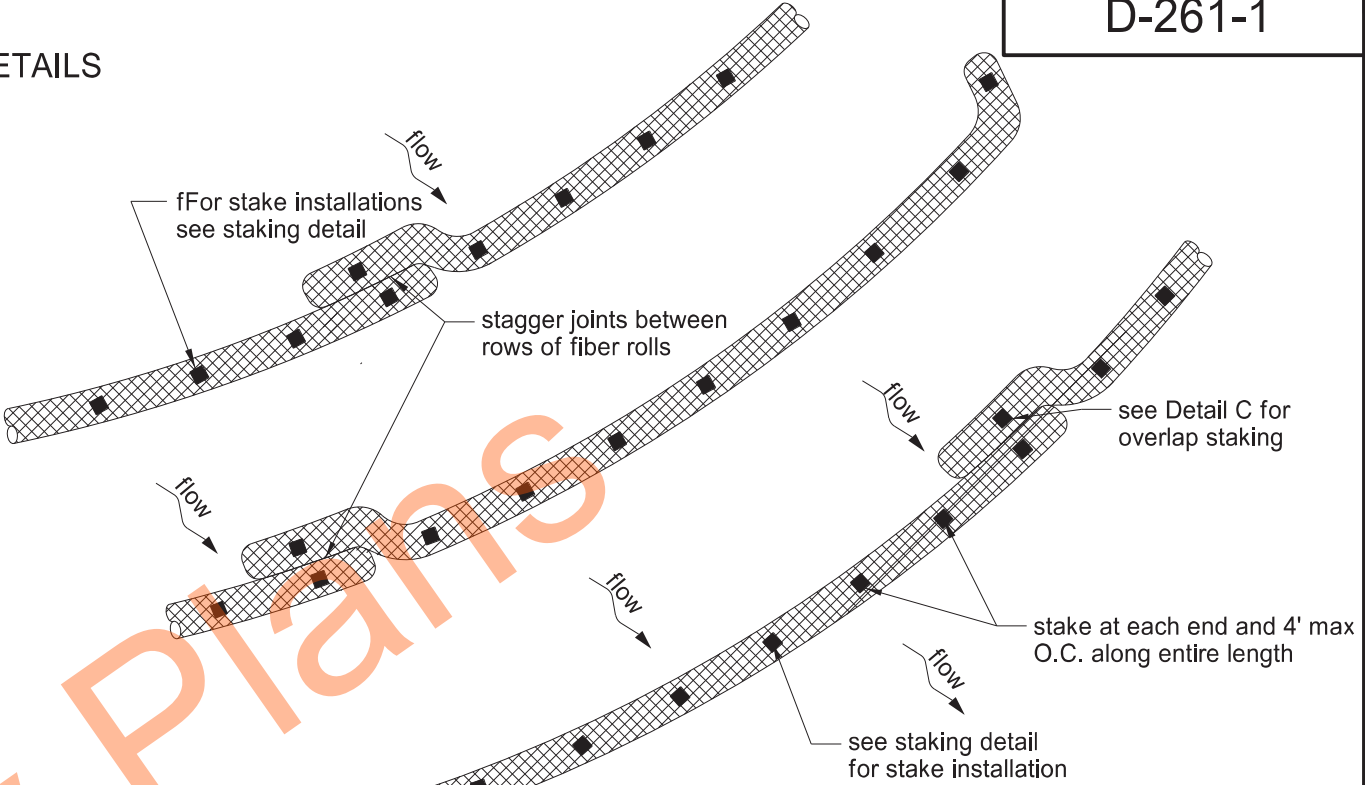
○

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION		KIRK J. HOFF REGISTERED PROFESSIONAL PE-4683 ENGINEER NORTH DAKOTA 06/14/23
9-20-18		
REVISIONS		
DATE	CHANGE	
6/14/2023	CADD Standards Update	

EROSION CONTROL
FIBER ROLL PLACEMENT DETAILS

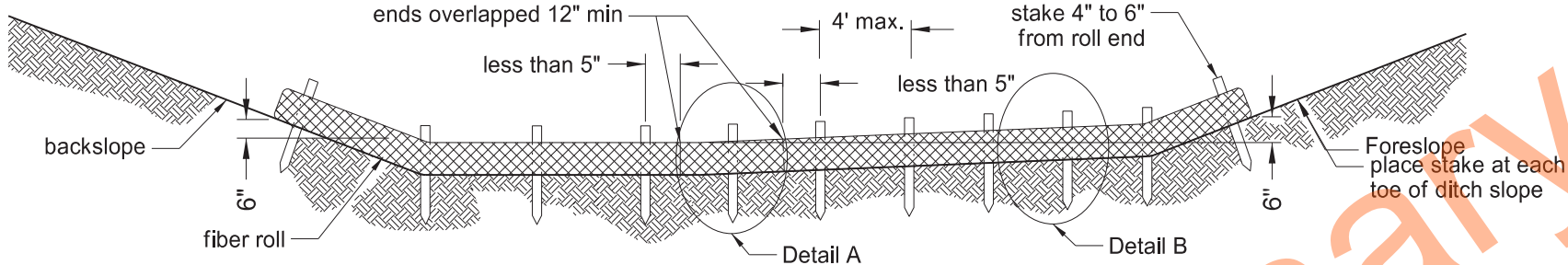


PLAN VIEW FOR DITCH APPLICATION

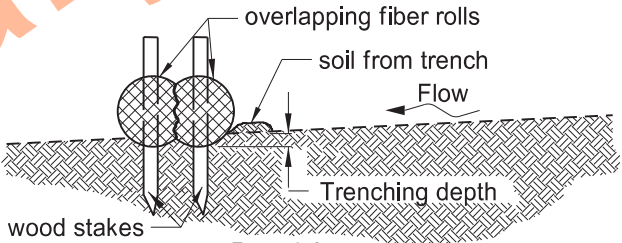


PLAN VIEW FOR SLOPE APPLICATION

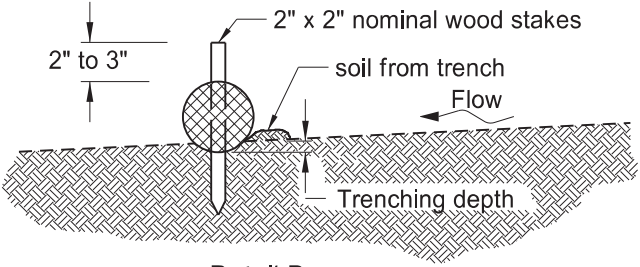
Ensure fiber rolls are placed along the contours of the slope.



12 OR 20 INCH FIBER ROLL - DITCH BOTTOM

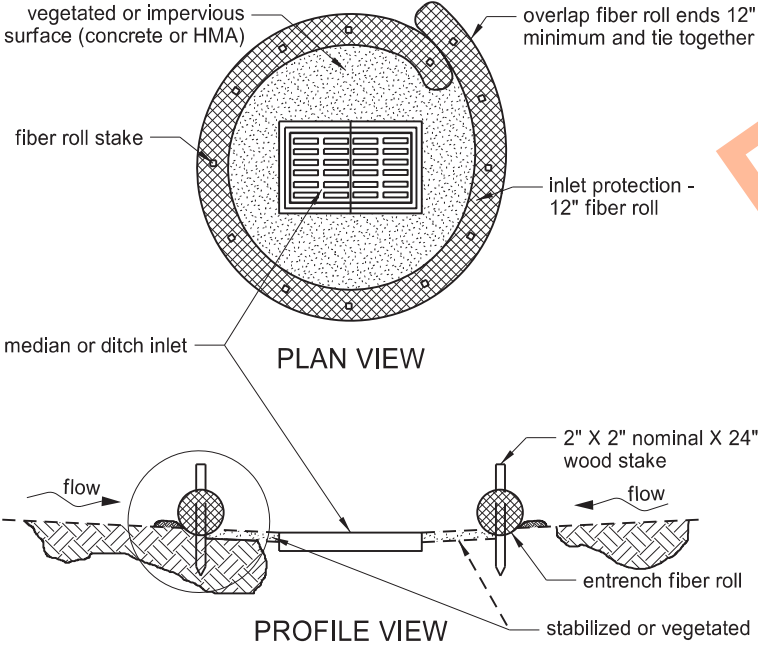


Detail A
FIBER ROLL OVERLAPPING STAKING DETAIL



Detail B
FIBER ROLL STAKING DETAIL

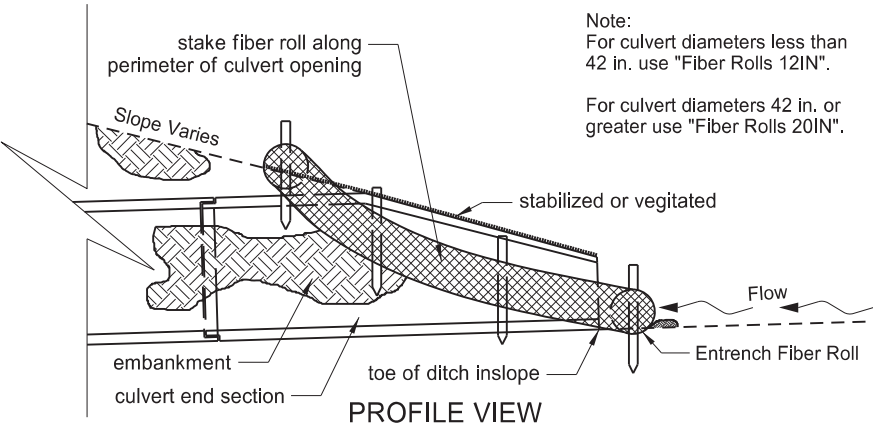
NOTE: Do not allow runoff to run under or around roll.



PLAN VIEW

PROFILE VIEW

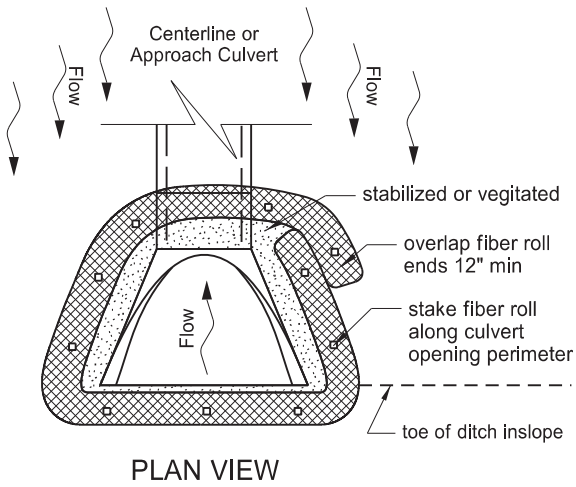
FIBER ROLL PROTECTION (MEDIAN OR DITCH INLET)



PROFILE VIEW

FIBER ROLL PROTECTION (INLET OF CULVERT)

Note:
For culvert diameters less than 42 in. use "Fiber Rolls 12IN".
For culvert diameters 42 in. or greater use "Fiber Rolls 20IN".



PLAN VIEW

FIBER ROLL DIAMETER	NOMINAL STAKE SIZE	MINIMUM STAKE LENGTH	TRENCH DEPTH	
			MINIMUM	MAXIMUM
12"	2" x 2"	24"	2"	3"
20"	2" x 2"	36"	3"	5"

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-18-10	
REVISIONS	
DATE	CHANGE
06-10-13	Added plan view for ditch and slope application. Added table with values for stake and trench dimensions.
10-04-13	Revised fiber roll overlap detail.
06-26-14	Changed standard drawing number from D-708-7 to D-261-1.
08-27-19	New Design Engineer PE Stamp.
04-22-24	Slope Plan View-overlap change.
03-13-25	Added D-708-6 Culvert Inlet detail.
09-02-25	Added D-708-6 Inlet detail.

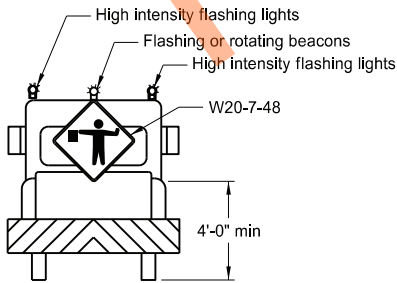
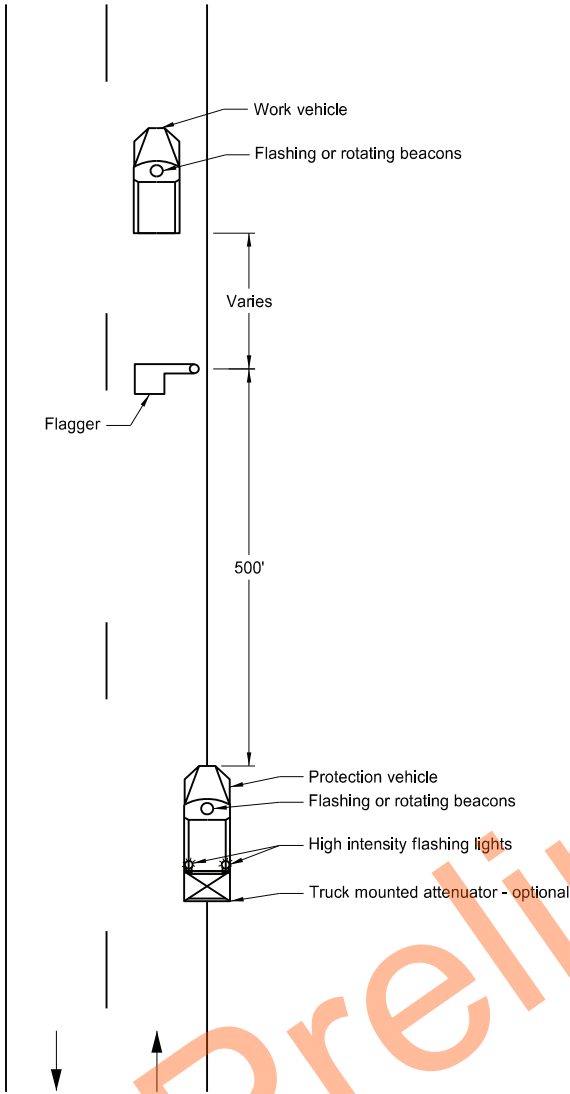


09/02/25

TRAFFIC CONTROL FOR CORING OF HOT BITUMINOUS PAVEMENT

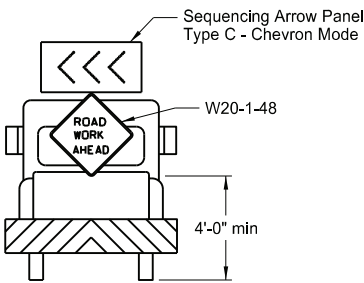
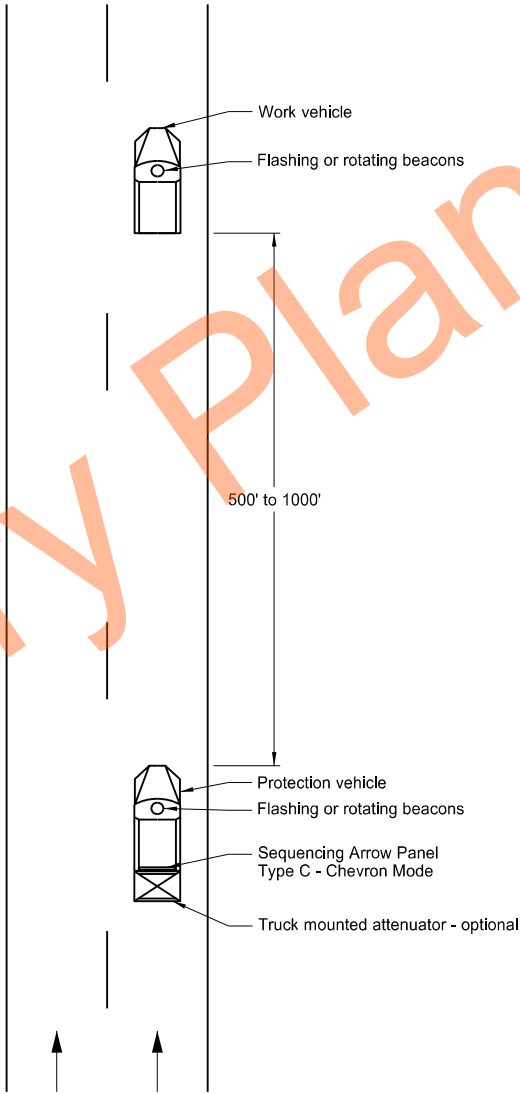
D-704-2

Two Lane, Two Way Roadways



Typical Protection Vehicle

Multilane Roadways



Typical Protection Vehicle

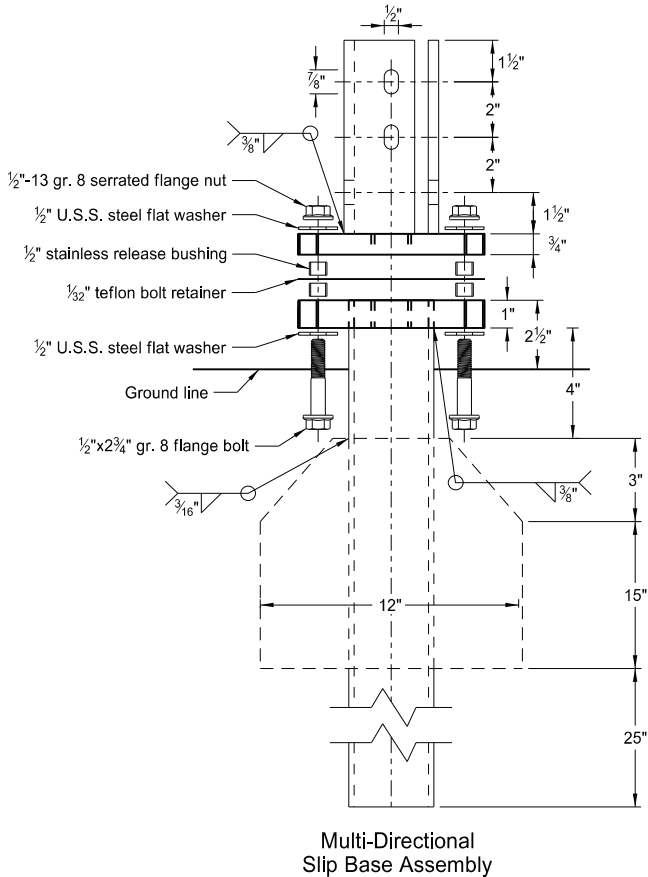
- Notes:
1. Display a 360 degree rotating, flashing, oscillating or strobe light on the working vehicle.
 2. Display a 360 degree rotating, flashing, oscillating or strobe light on the shadow vehicle. Operate a sequencing arrow panel Type C in chevron mode on the shadow vehicle for Multilane Roadway.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

08/01/24

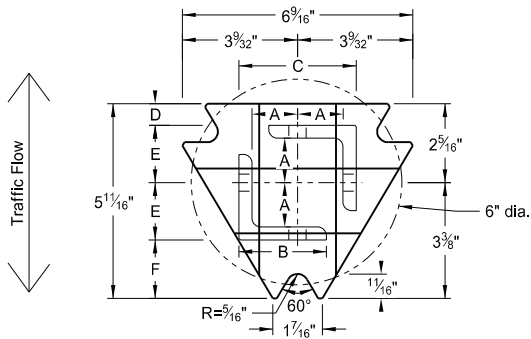
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-7

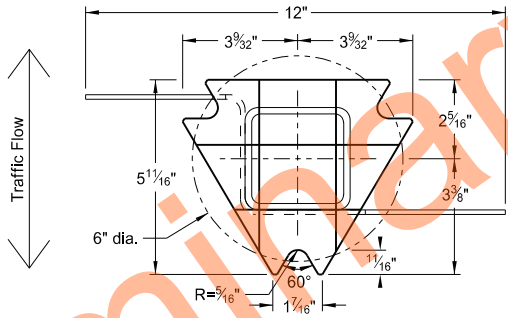


Multi-Directional Slip Base Assembly

Perforated Tube



Top Post Receiver
Plate - ASTM A572 grade 50
Angle Receiver - 2 1/2"x2 1/2"x3/8" 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

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 Thickness Gauge	Sleeve Size in.	Wall Thickness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			(A)	3
1	2 1/2	10			Yes	
1	2 1/4	12	2	12	Yes	
1	2 1/2	12	2 1/4	12	Yes	
2	2	12			No	2 1/4
2	2 1/4	12			No	2 1/2
2	2 1/2	12			Yes	
2	2 1/2	12			Yes	
2	2 1/4	10	2	12	Yes	
2	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/2	12			Yes	
3 & 4	2 1/2	10			Yes	
3 & 4	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/4	12	2	12	Yes	
3 & 4	2 1/2	10	2 3/16	10	Yes	

Properties of Telescoping Perforated Tube

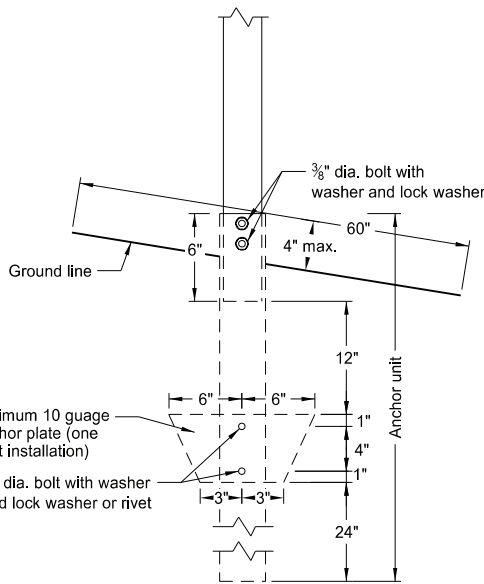
Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in. ⁴	Cross Sec. Area in. ²	Section Modulus in. ³
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.785

Top Post Receiver Data Table

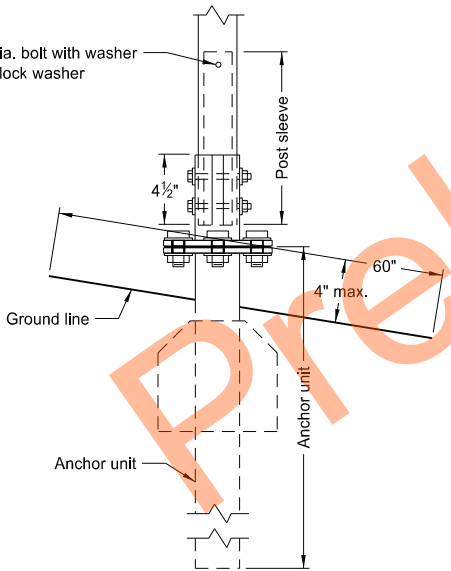
Square Post Sizes (B)	A	B	C	D	E	F
2 3/16"x10 ga.	1 5/64"	2 1/2"	3 1/32"	2 5/32"	1 33/64"	1 7/8"
2 1/2"x10 ga.	1 1/32"	2 1/2"	3 5/16"	5/8"	1 21/32"	1 3/4"

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

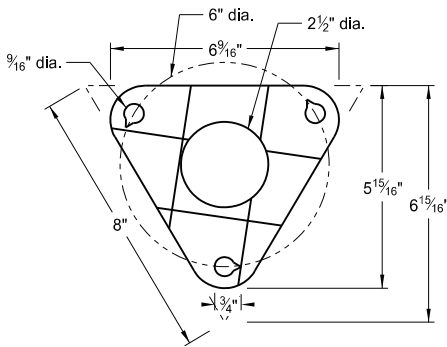
(B) For additional wind load, insert the 2 3/16"x10 ga. into 2 1/2"x10 ga.



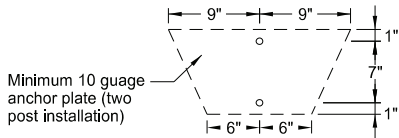
Anchor Unit and Post Assembly



Multi-Directional Slip Base Anchor Unit and Post Sleeve Assembly



Bolt Retainer for Base Connection
Bolt Retainer- 1/2" Reprocessed Teflon



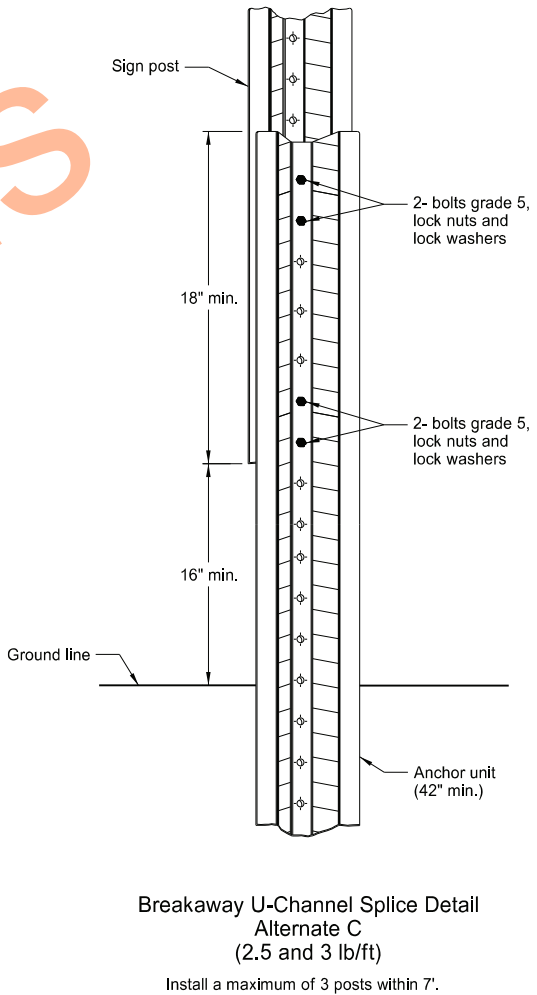
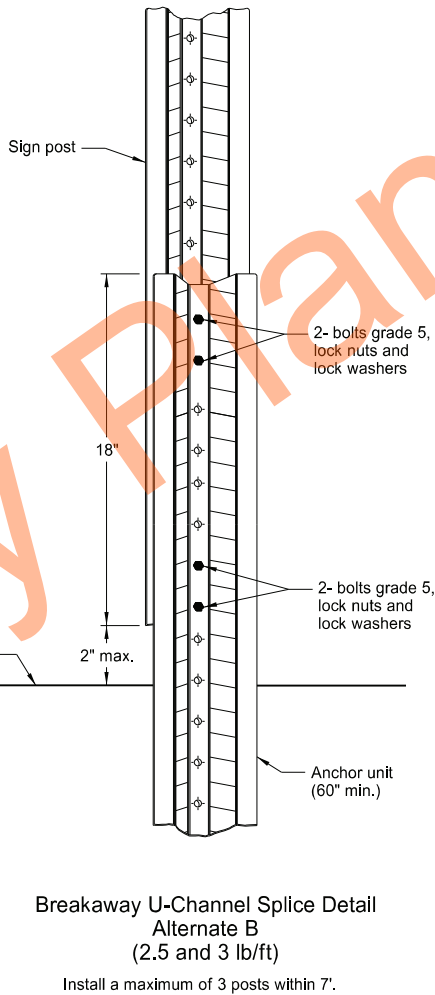
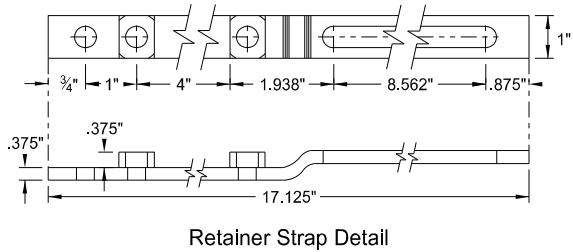
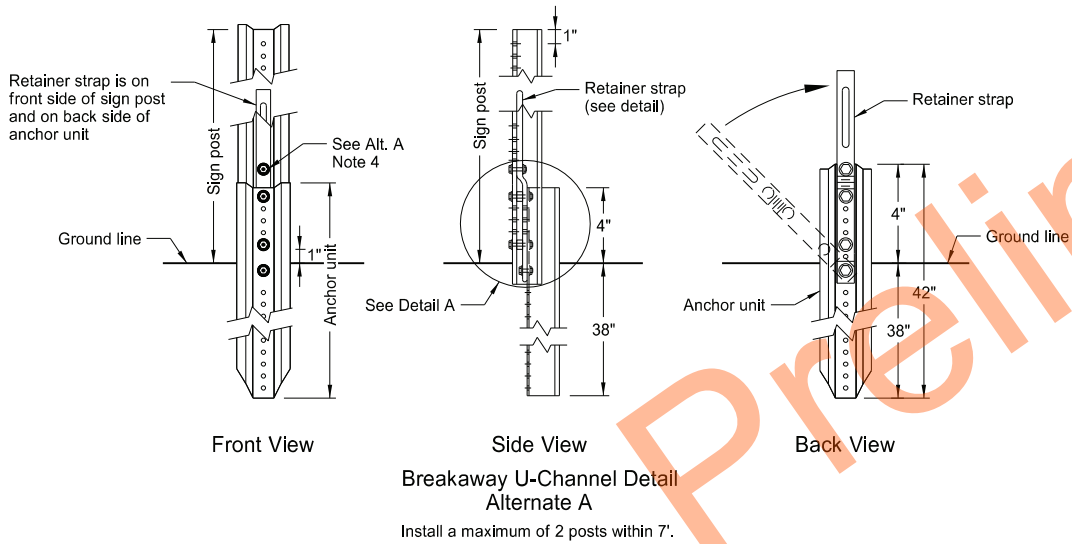
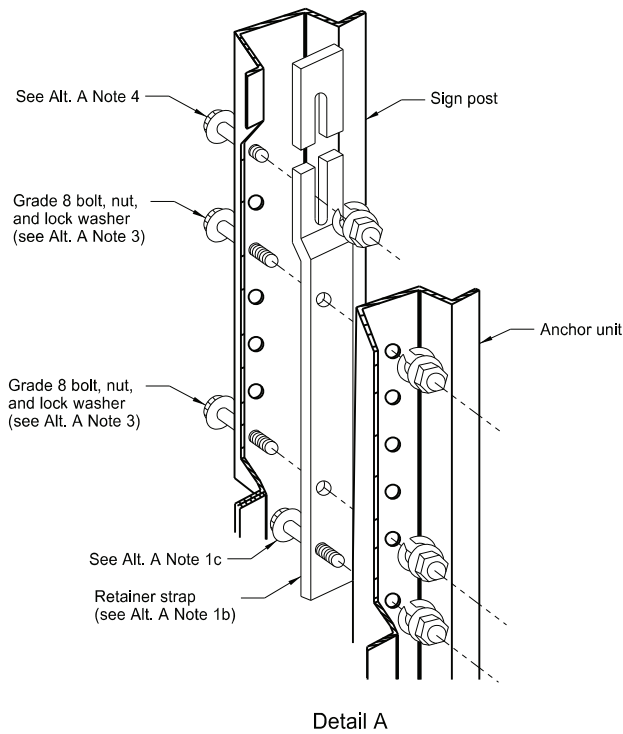
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature



BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

U-Channel Post



Alternate A Steps of Installation:

- a) Drive anchor unit to within 12" of ground level.
b) Establish proper assembly by lining up bottom hole of retainer strap with 6th hole from the top of the anchor unit.
c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
d) Rotate strap 90° to left.
- a) Drive anchor unit to 4" above ground.
b) Rotate strap to vertical position.
- a) Place 5/16"x2" bolt, lock washer and nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit.
b) Alternately tighten two connector bolts.
- Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
- Properly nest base post, strap, and sign post. Proper nesting occurs when all flat surfaces of the base post, strap, and sign post at the bolts have full contact across the entire width.

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

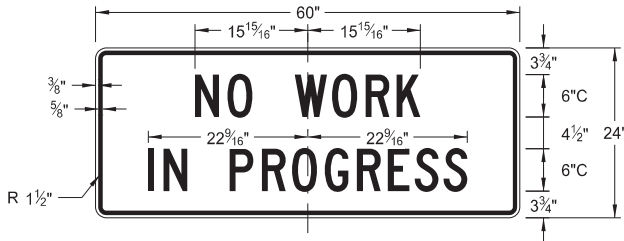


08/01/24

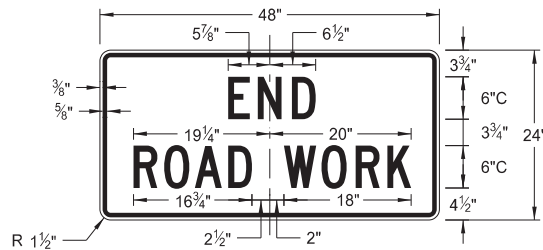
CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS



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



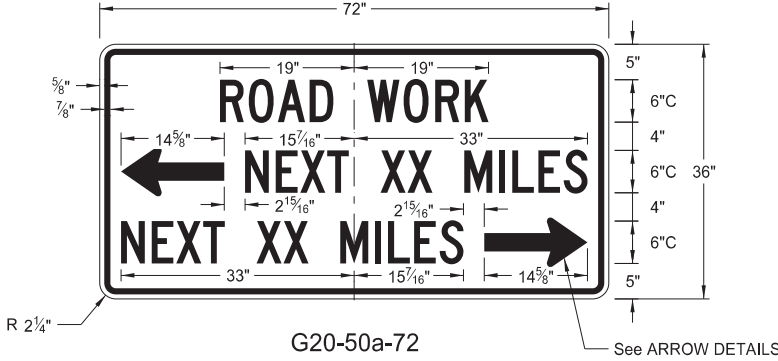
G20-1b-60
Legend: black (non-refl)
Background: orange



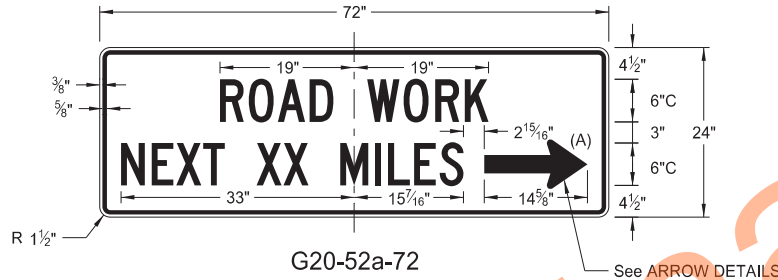
G20-2-48
Legend: black (non-refl)
Background: orange



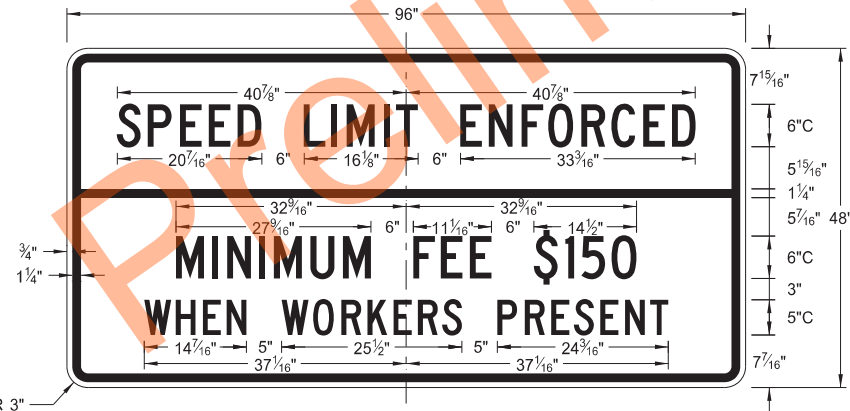
G20-4b-36
Legend: black (non-refl)
Background: orange



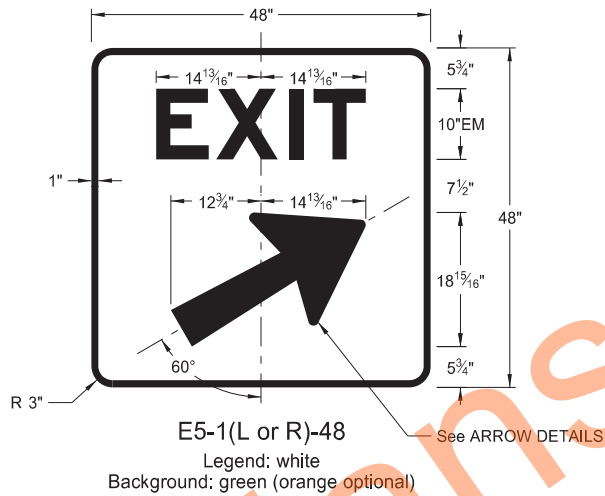
G20-50a-72
Legend: black (non-refl)
Background: orange



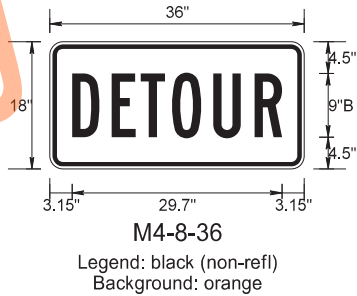
G20-52a-72
Legend: black (non-refl)
Background: orange



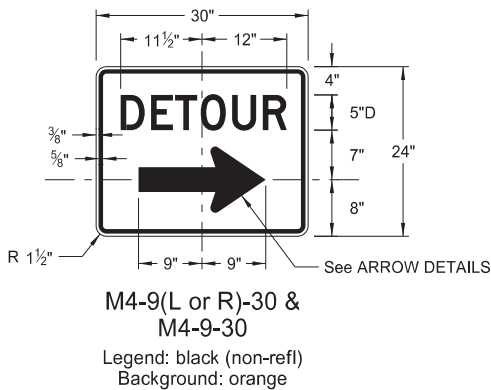
G20-55-96
Legend: black (non-refl)
Background: orange



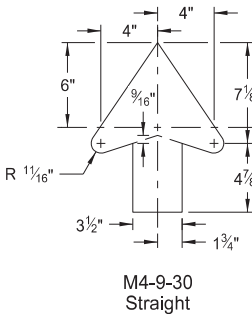
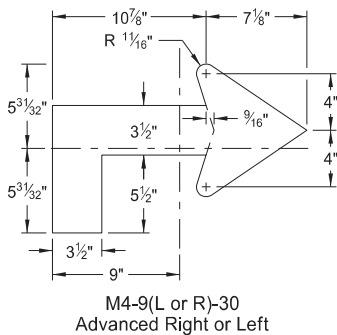
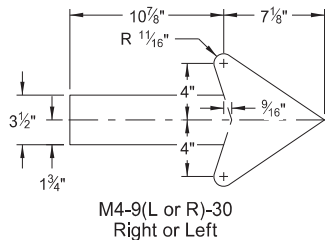
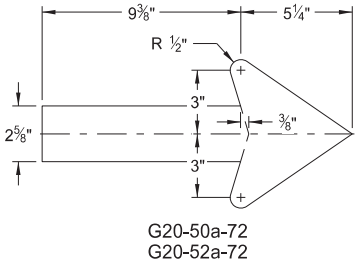
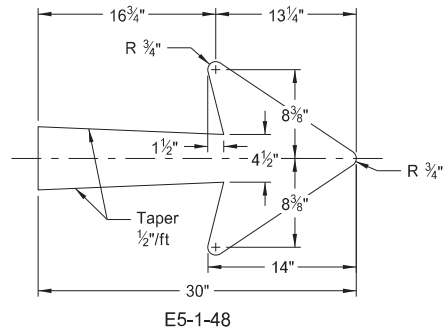
E5-1(L or R)-48
Legend: white
Background: green (orange optional)



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



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



ARROW DETAILS

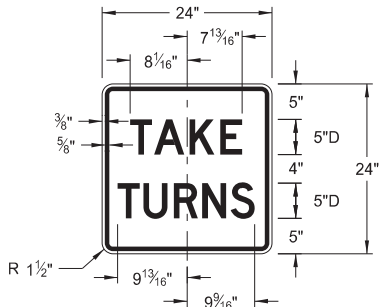
NOTES:

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

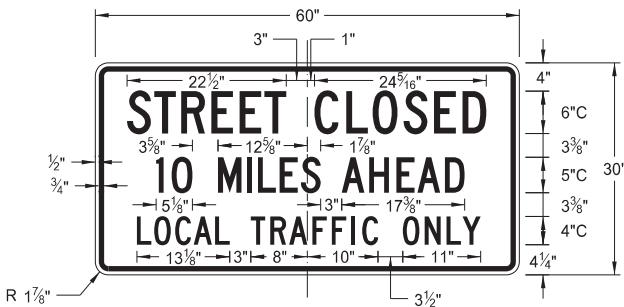
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Added sign & background color
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes



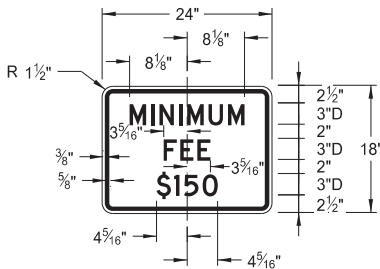
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS



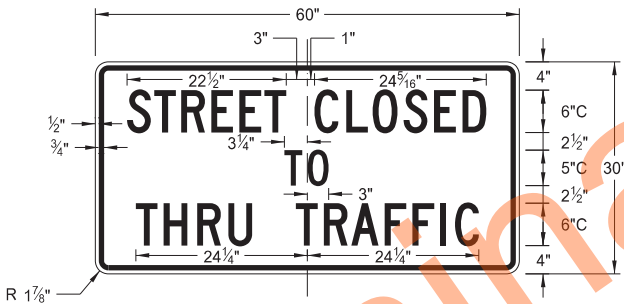
R1-50P-24
Legend: black (non-refl)
Background: white



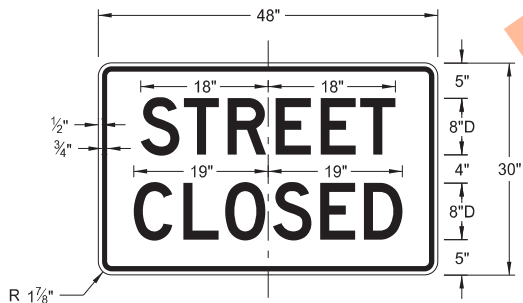
R11-3c-60
Legend: black (non-refl)
Background: white



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

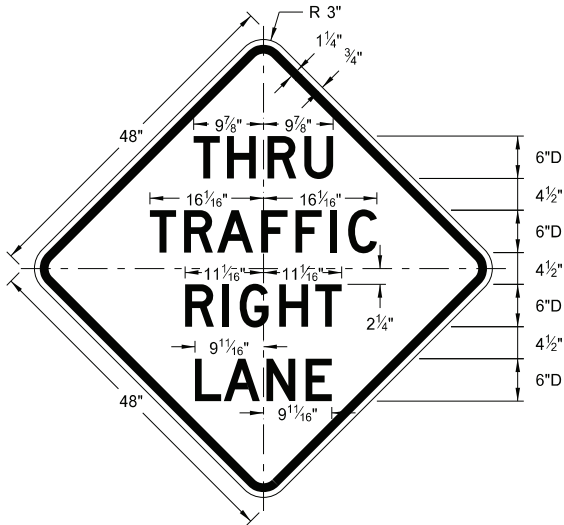
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Revised sign number
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes



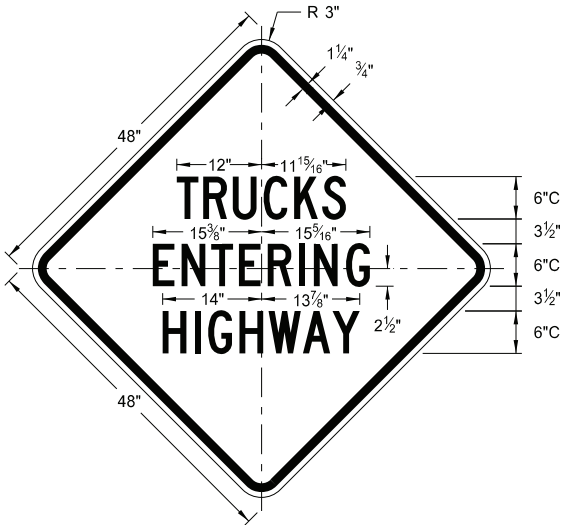
CONSTRUCTION SIGN DETAILS
WARNING SIGNS

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

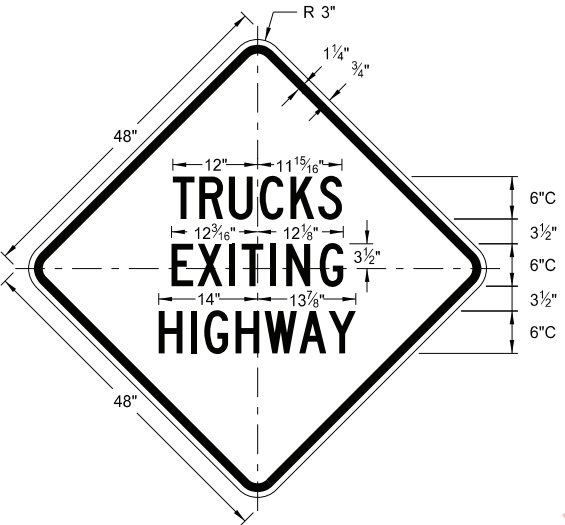
* DISTANCE MESSAGES



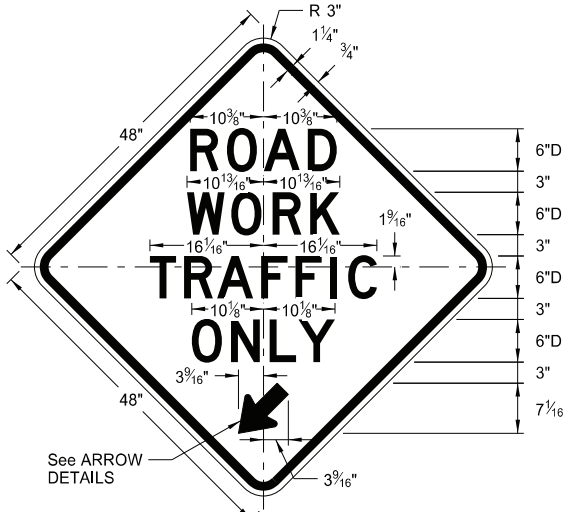
W5-8-48
Legend: black (non-refl)
Background: orange



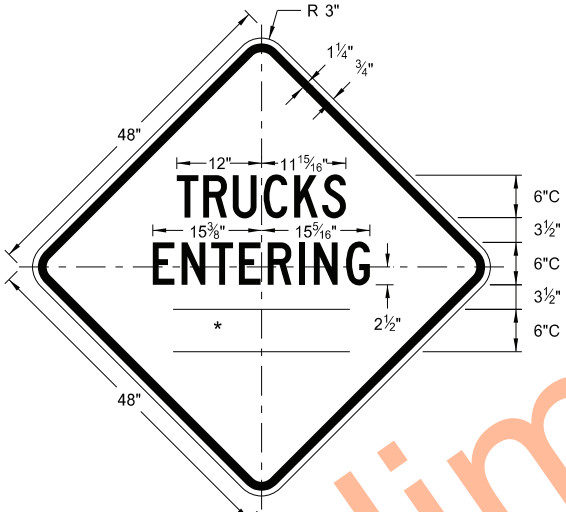
W8-53-48
Legend: black (non-refl)
Background: orange



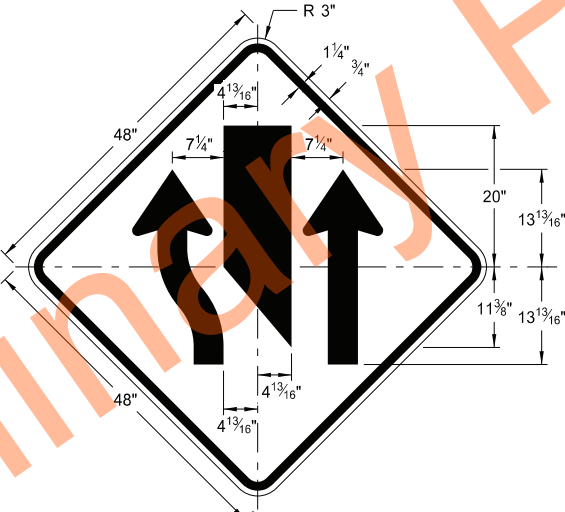
W8-56-48
Legend: black (non-refl)
Background: orange



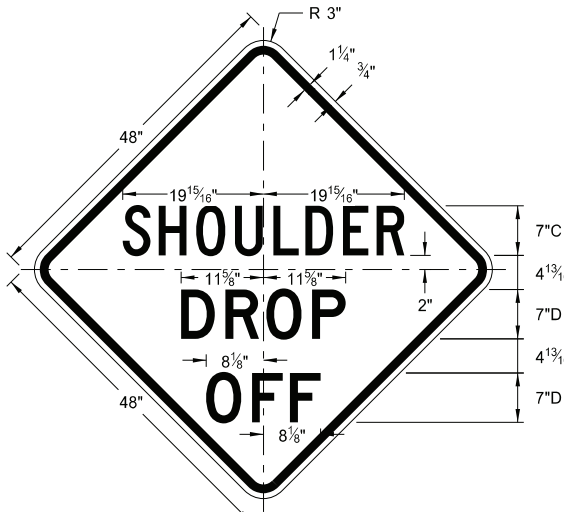
W5-9-48
Legend: black (non-refl)
Background: orange



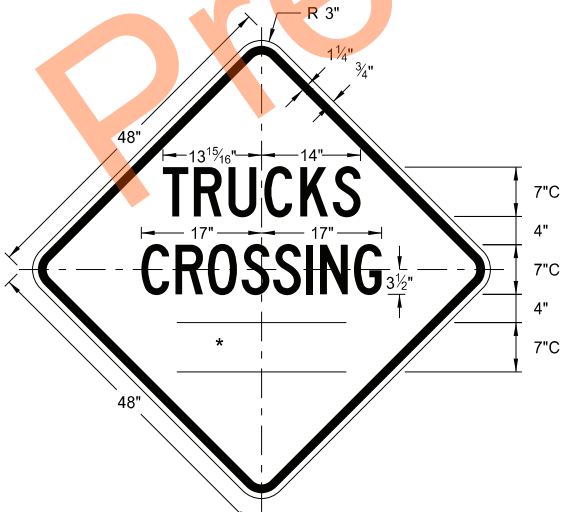
W8-54-48
Legend: black (non-refl)
Background: orange



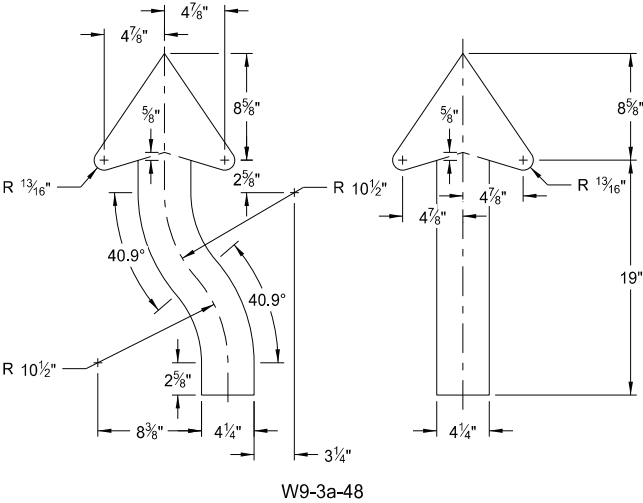
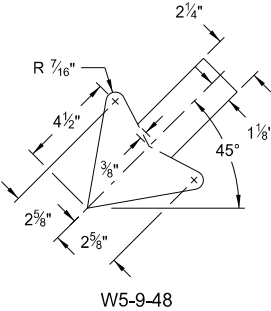
W9-3a-48
Legend: black (non-refl)
Background: orange



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



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



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

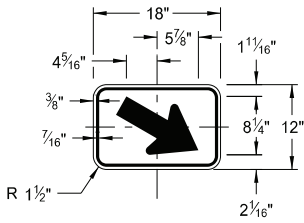


08/01/24

CONSTRUCTION SIGN DETAILS
WARNING SIGNS

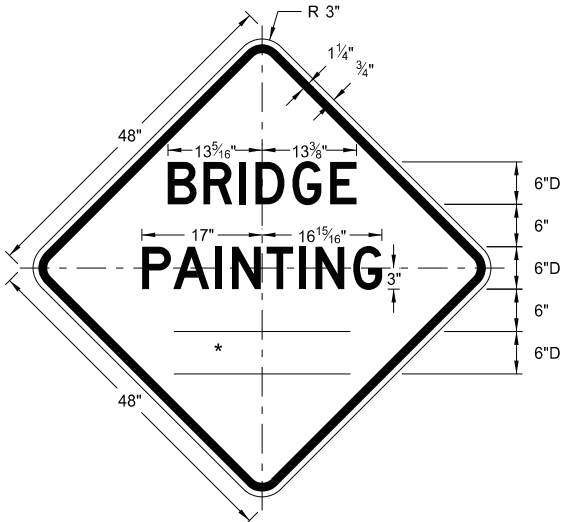
WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

* DISTANCE MESSAGES



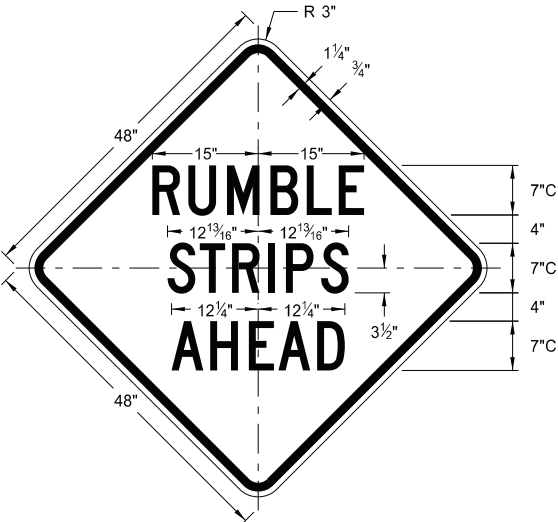
W16-7aP-18

Legend: black (non-refl)
Background: orange



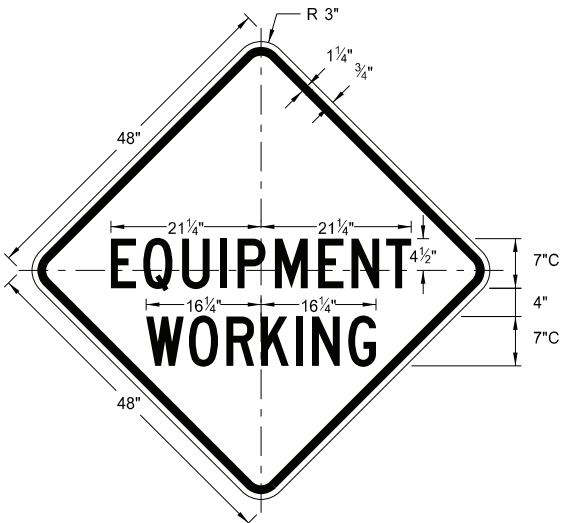
W21-50-48

Legend: black (non-refl)
Background: orange



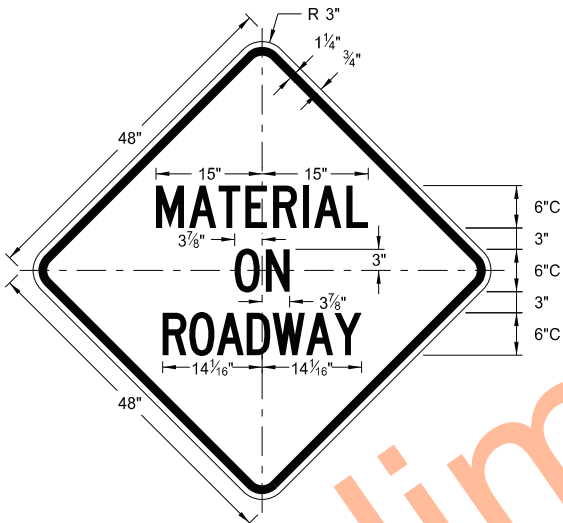
W21-53-48

Legend: black (non-refl)
Background: orange



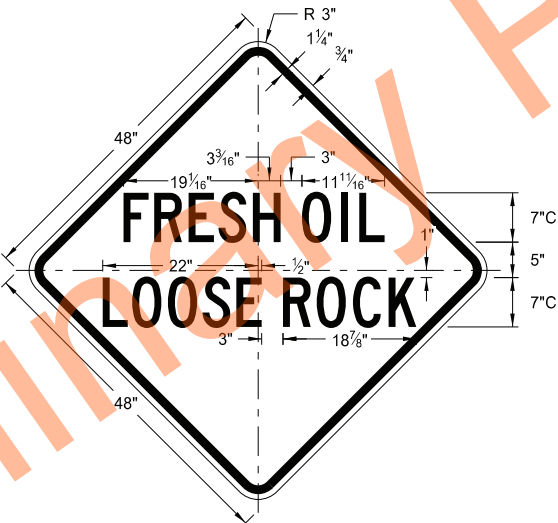
W20-51-48

Legend: black (non-refl)
Background: orange



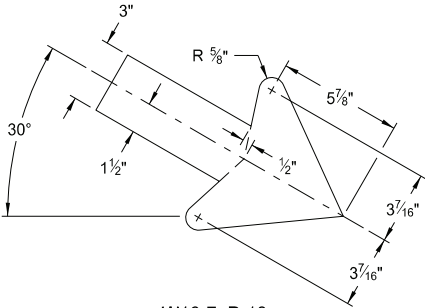
W21-51-48

Legend: black (non-refl)
Background: orange

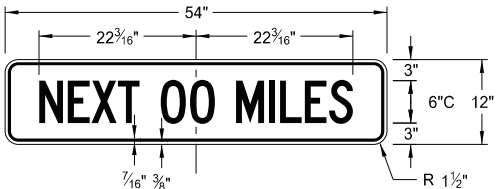


W22-8-48

Legend: black (non-refl)
Background: orange

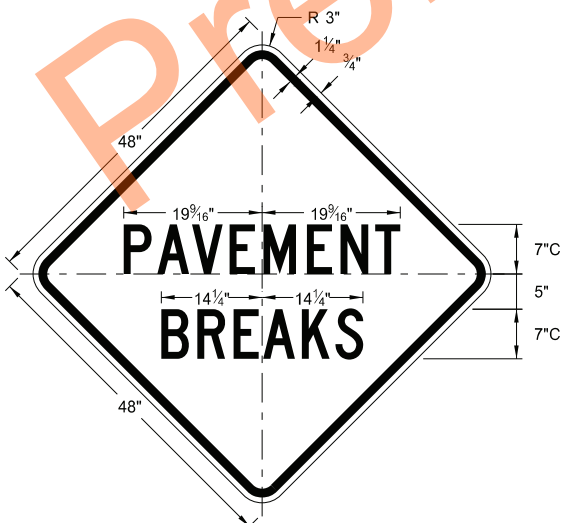


W16-7aP-18



W20-52P-54

Legend: black (non-refl)
Background: orange



W21-52-48

Legend: black (non-refl)
Background: orange

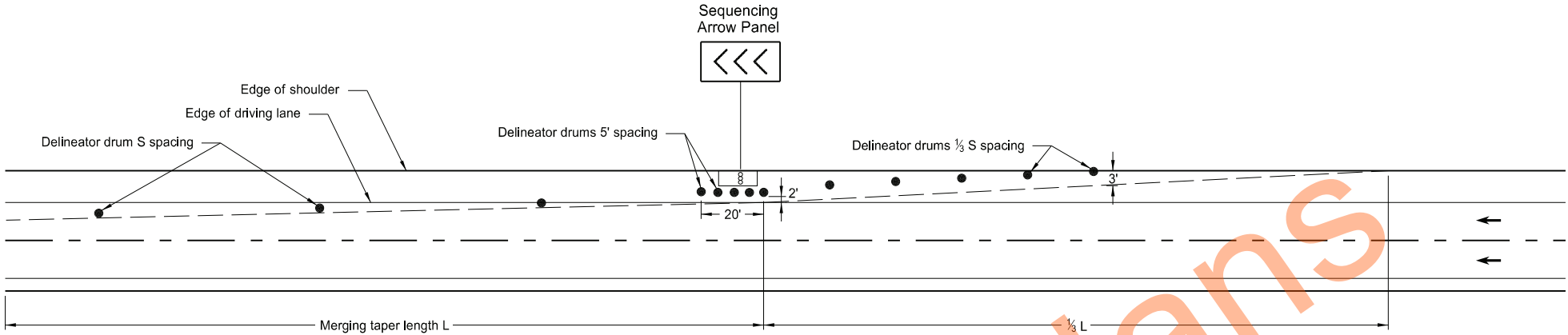
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
5-31-18	
REVISIONS	
DATE	CHANGE
11-01-19	Added details for sign W16-7aP-18.
8-01-24	Electronic Stamp/Signature.



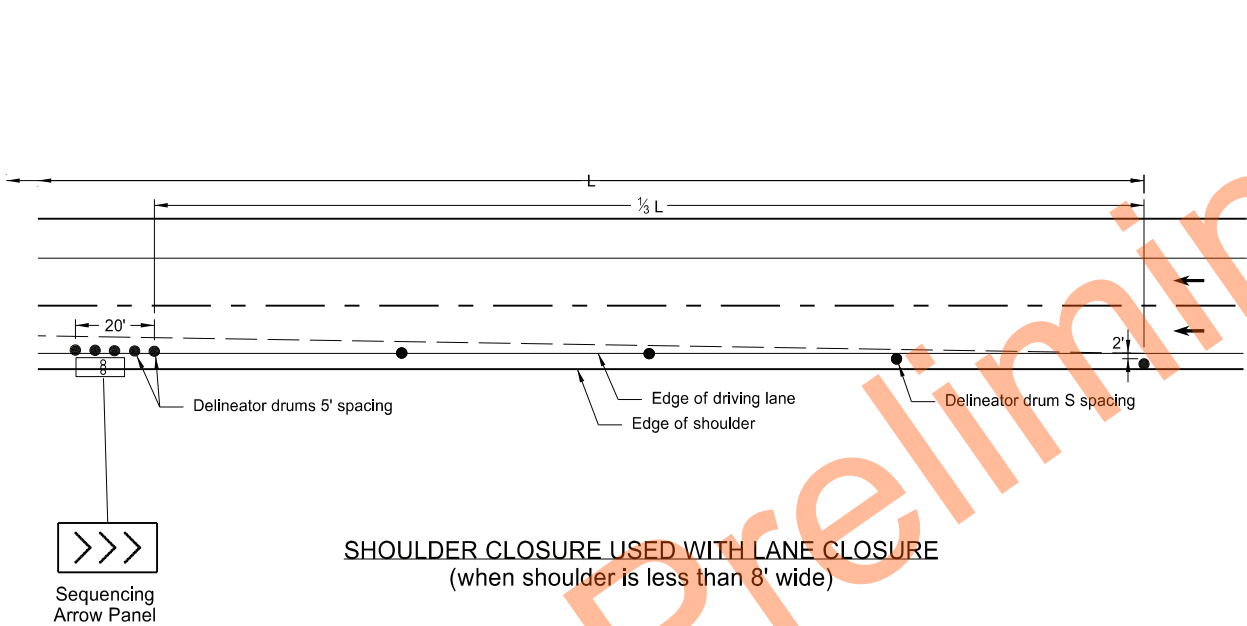
08/01/24

SHOULDER CLOSURE TAPERS

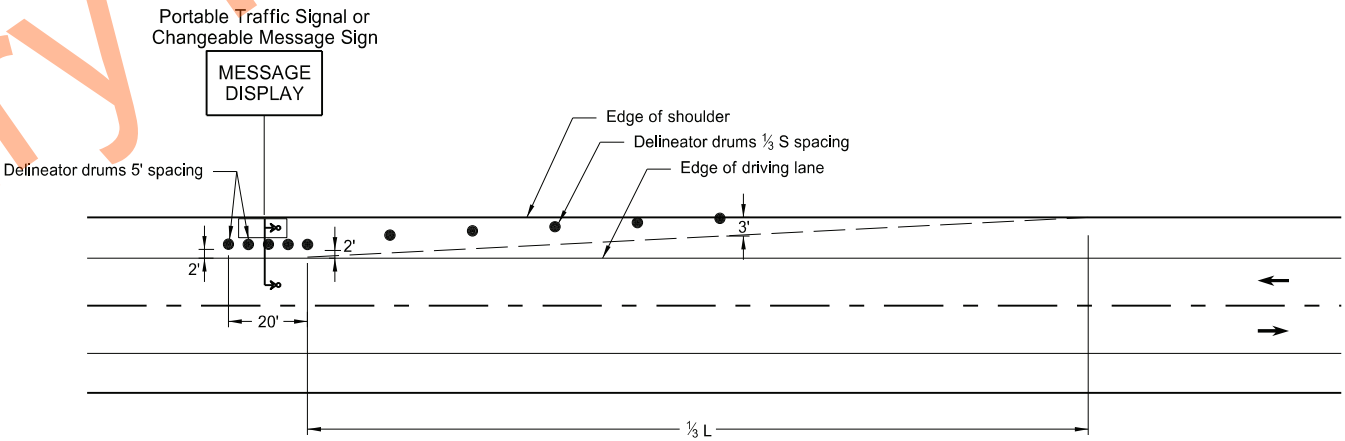
D-704-12



SHOULDER CLOSURE WITH LANE CLOSURE
(when shoulder is 8' or wider)



SHOULDER CLOSURE USED WITH LANE CLOSURE
(when shoulder is less than 8' wide)



PORTABLE TRAFFIC SIGNAL OR CHANGEABLE MESSAGE SIGN ON SHOULDER

KEY

- Delineator Drum
- Message Display
- ∞ Sequencing Arrow Panel
- ↳ Portable Traffic Signal

Notes:

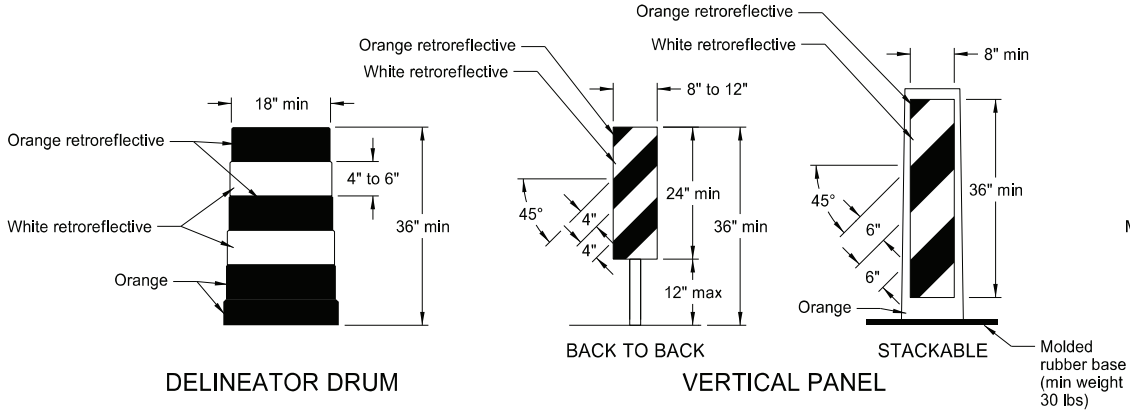
- S = Posted Speed Limit in mph
W = Width of offset in feet
L = Taper length in feet
L = WS²/60 (40mph or less)
L = WS (45mph or more)
- If a shoulder taper is used, use a length of approximately 1/3 L. If a shoulder is used as a travel lane, use a normal merging or shifting taper.
- When paved shoulders of 8 foot width or more are closed, use channelizing devices to close shoulder in advance, to delineate beginning of work space, and to direct vehicular traffic to remain within the traveled way.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-25-19	Added L dimension to detail
8-01-24	Electronic Stamp/Signature



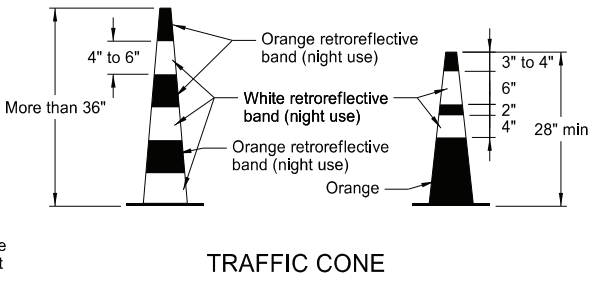
08/01/24

BARRICADE AND CHANNELIZING DEVICE DETAILS

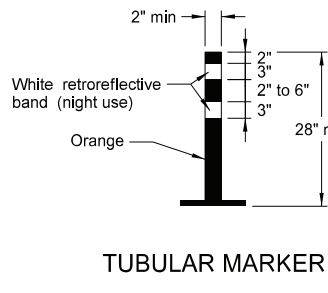


Provide horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide for drum markings. Use a minimum of two orange and two white stripes with the top stripe being orange for each drum. Do not exceed 3" nonretroreflective spaces between the horizontal orange and white 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.

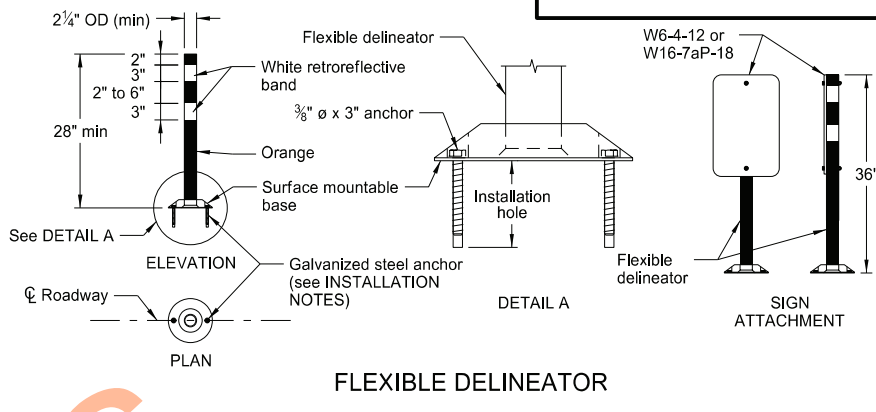
Provide alternating orange and white retroreflective stripes, sloping downward in direction vehicular traffic is to pass. Place retroreflective sheeting on both sides of panel with a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective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



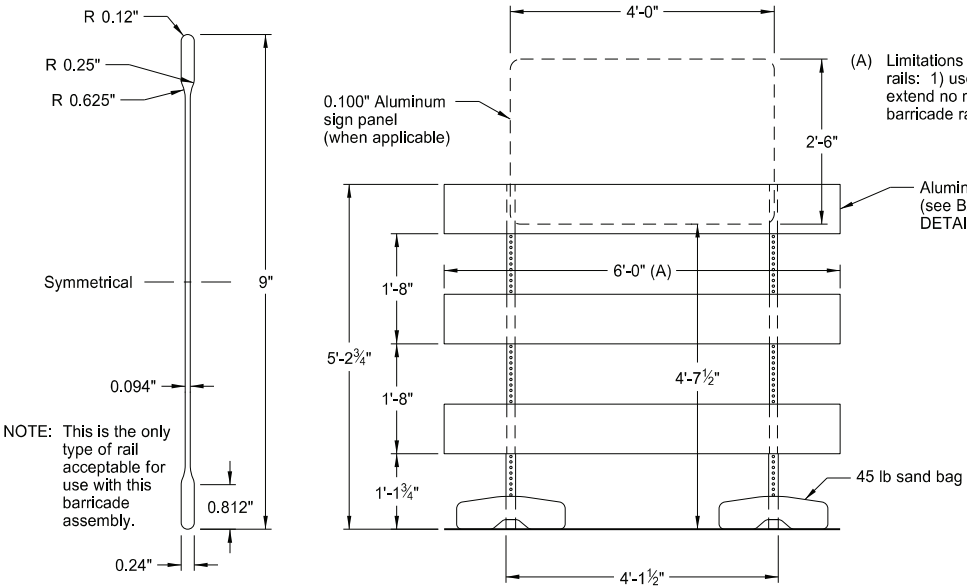
Provide retroreflectorization of cones more than 36" in height by alternating orange and white retroreflective stripes. Use a minimum of two orange and two white stripes for each cone with the top stripe being orange. Use maximum 3" nonretroreflective space between the orange and white stripes.



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.



- 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.



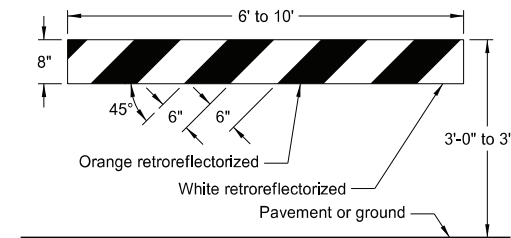
BARRICADE BLADE DETAIL

ELEVATION VIEW

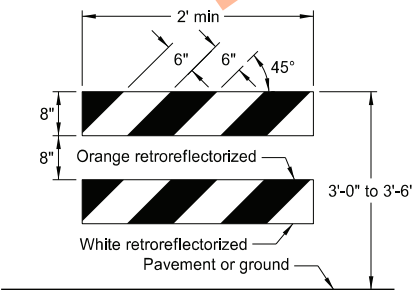
SIDE VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade 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".

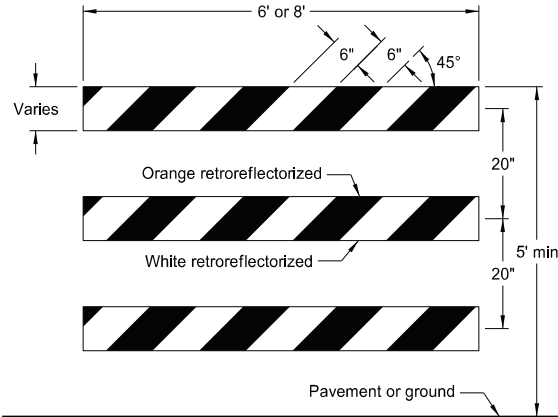


TYPE I BARRICADE

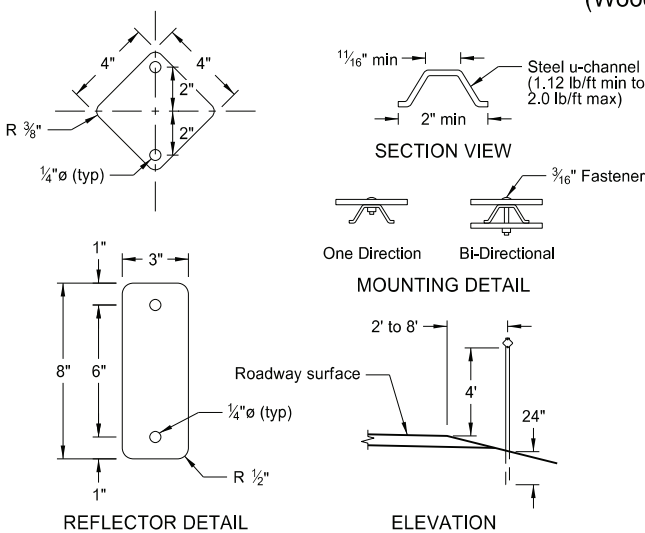


TYPE II BARRICADE

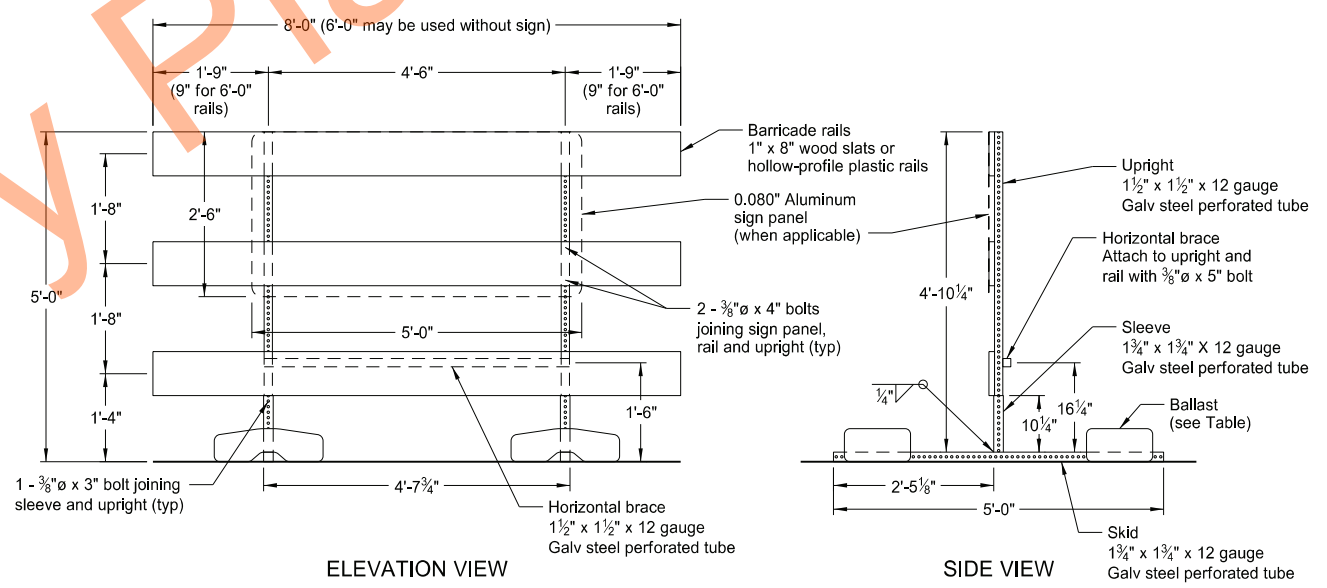
BARRICADE RAIL DETAILS



TYPE III BARRICADE



DELINEATORS



ELEVATION VIEW

SIDE VIEW

BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

MINIMUM BALLAST (For each side of barricade support)

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

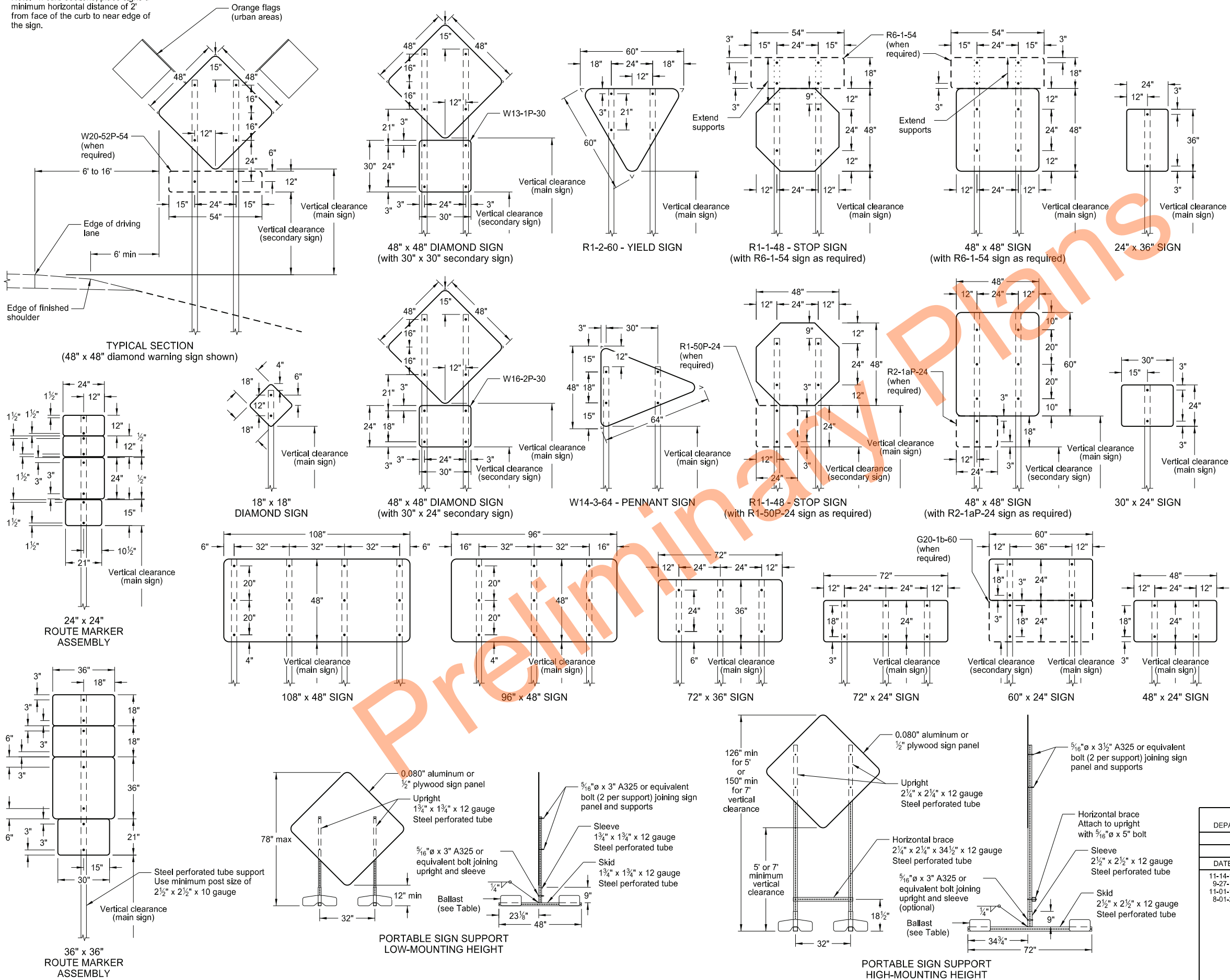
Note: Number of sandbags based on a wind speed of 55 MPH. Sandbags assumed to be placed at or near the ends of the skids.

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



CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

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



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.

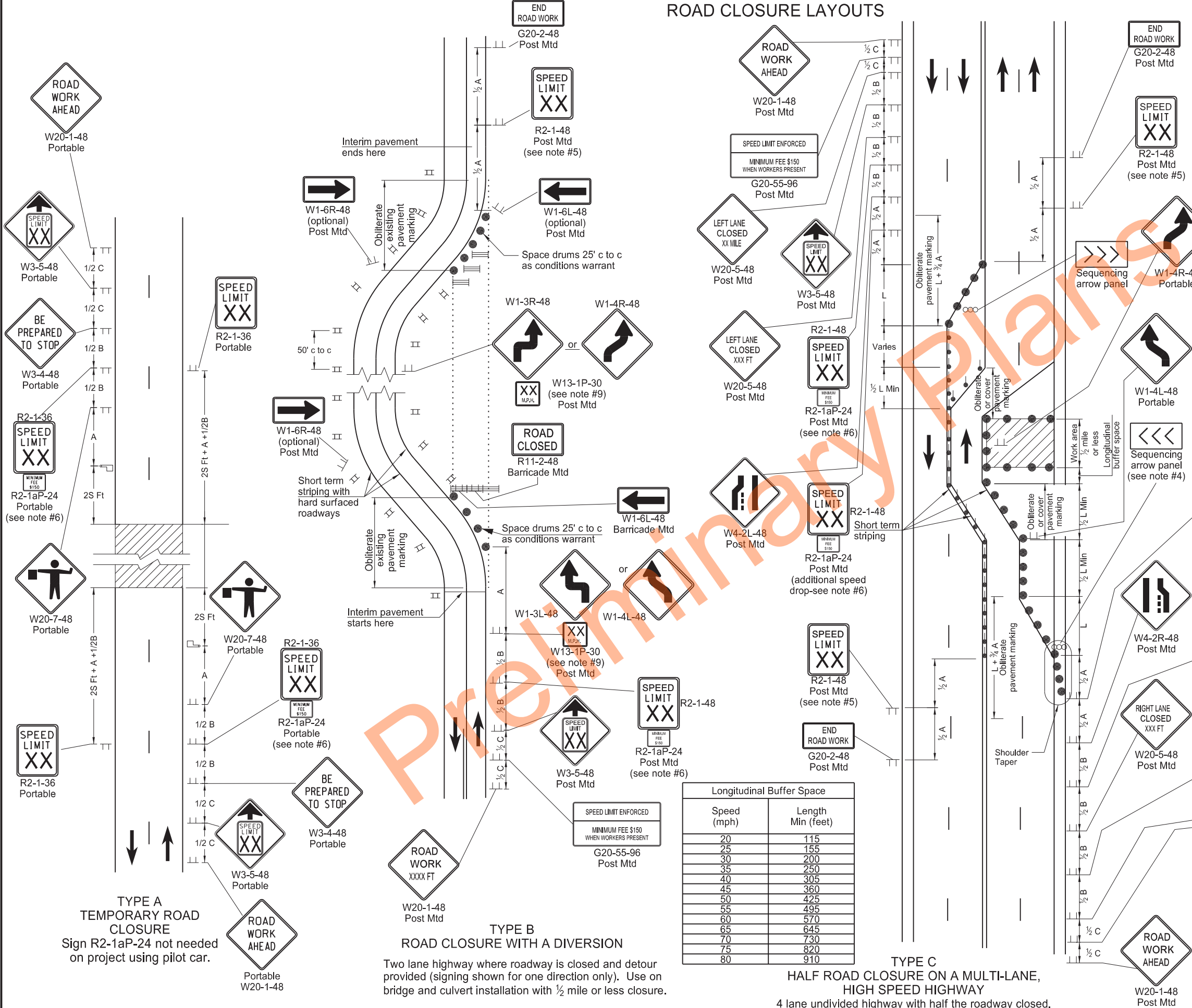
Provide a minimum clearance of 7'-0" from the ground at the post for signs with an area exceeding 50 square feet.

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 unforeseen 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.

ROAD CLOSURE LAYOUTS



- Notes:
- Variables
 - S = Numerical value of speed limit or 85th percentile.
 - W = The width of taper in feet.
 - L = Minimum length of taper, S x W for freeways, expressways, and other roads with speeds of 45 mph or greater, or W x S²/60 for urban, residential, and other streets with speeds of 40 mph or less.
 - Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
 - Place delineator drums, barricades or cones for tapering traffic at dimension "S" and for tangents space at 2 times dimension "S".
 - Place Sequencing Arrow Panels at the beginning of the taper when possible. Where shoulder width does not provide sufficient room, move the panel closer to the work area and place on roadway surface. See Shoulder Closure Standard Drawing.
 - Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
 - Use Type B on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
 - Use Type C on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
 - Re-establish speed. Determine exact speed limit in the field, dependent on location and conditions.
 - 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 1/2 B.
 - 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.
 - Cover existing speed limit signs within reduced speed zones.
 - Where necessary, engineer will determine safe speed.
 - As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
 - 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.
 - 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

KEY

Type III barricade

Sign

Delineator drum

Tubular markers

Work area

Flagger

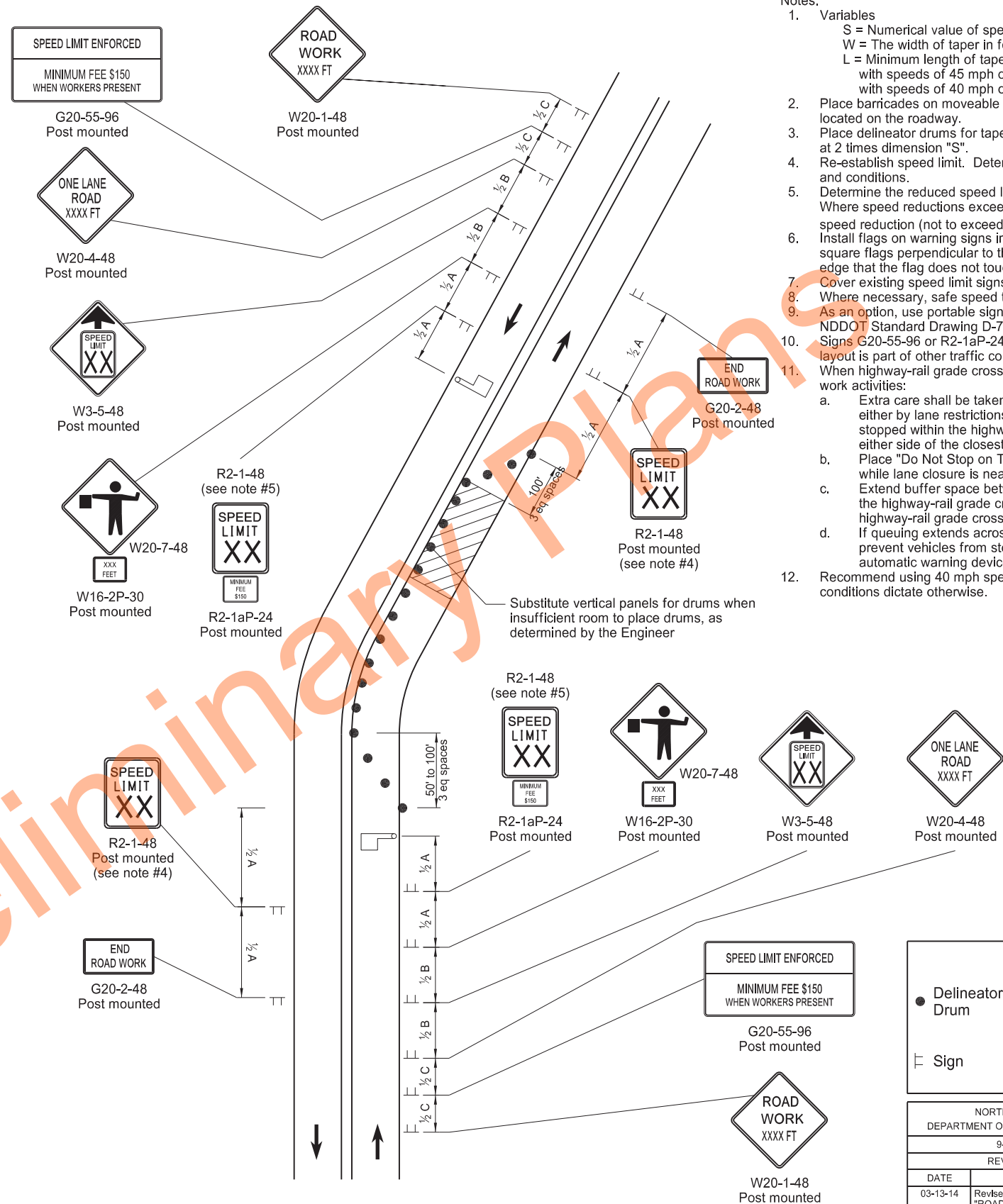
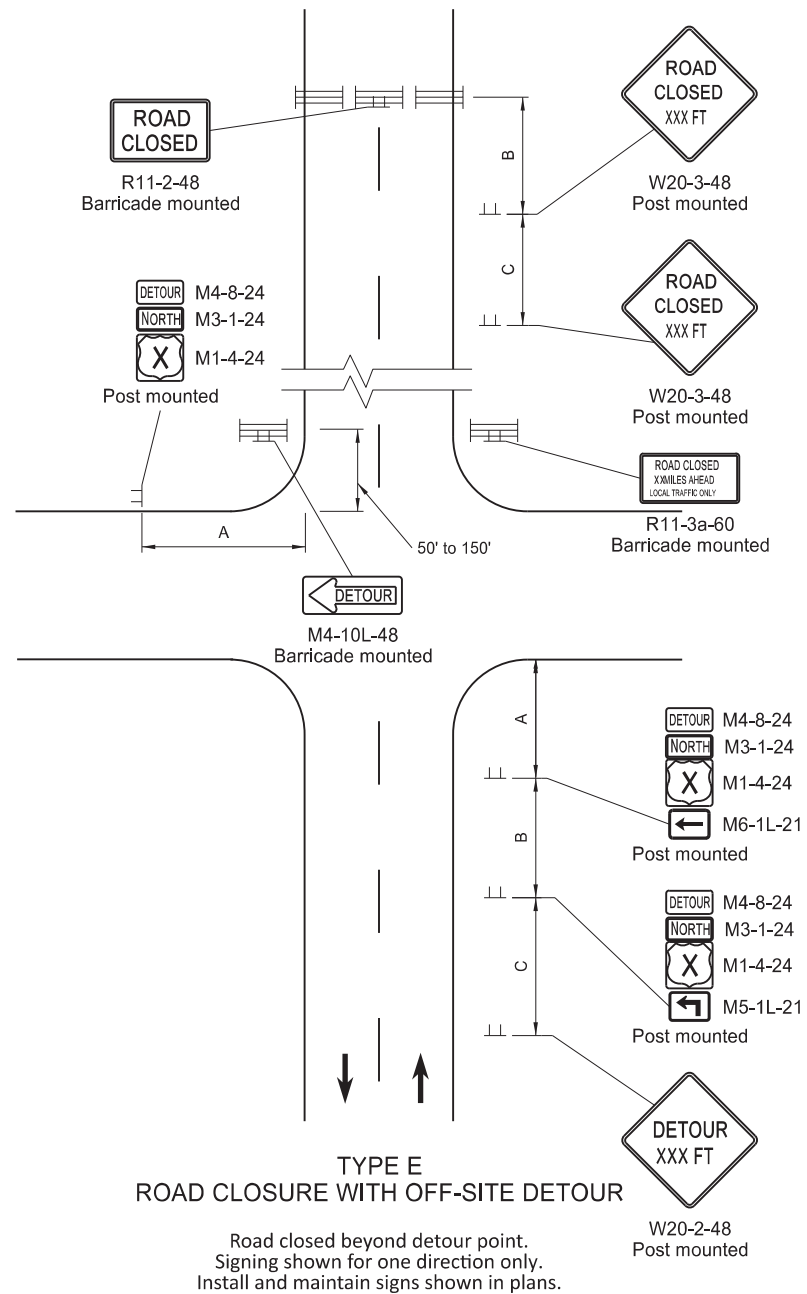
Sequencing arrow panel

Vertical panels back to back

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Updated Notes & Spd Limit signs
11-01-19	Sign, Notes, & Pmnt Mk updates
12-08-21	Switched order of Road Work Ahead and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes



ROAD CLOSURE AND LANE CLOSURE ON A TWO WAY ROAD LAYOUTS



- 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 S²/60 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 1/2B.
 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.

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

KEY

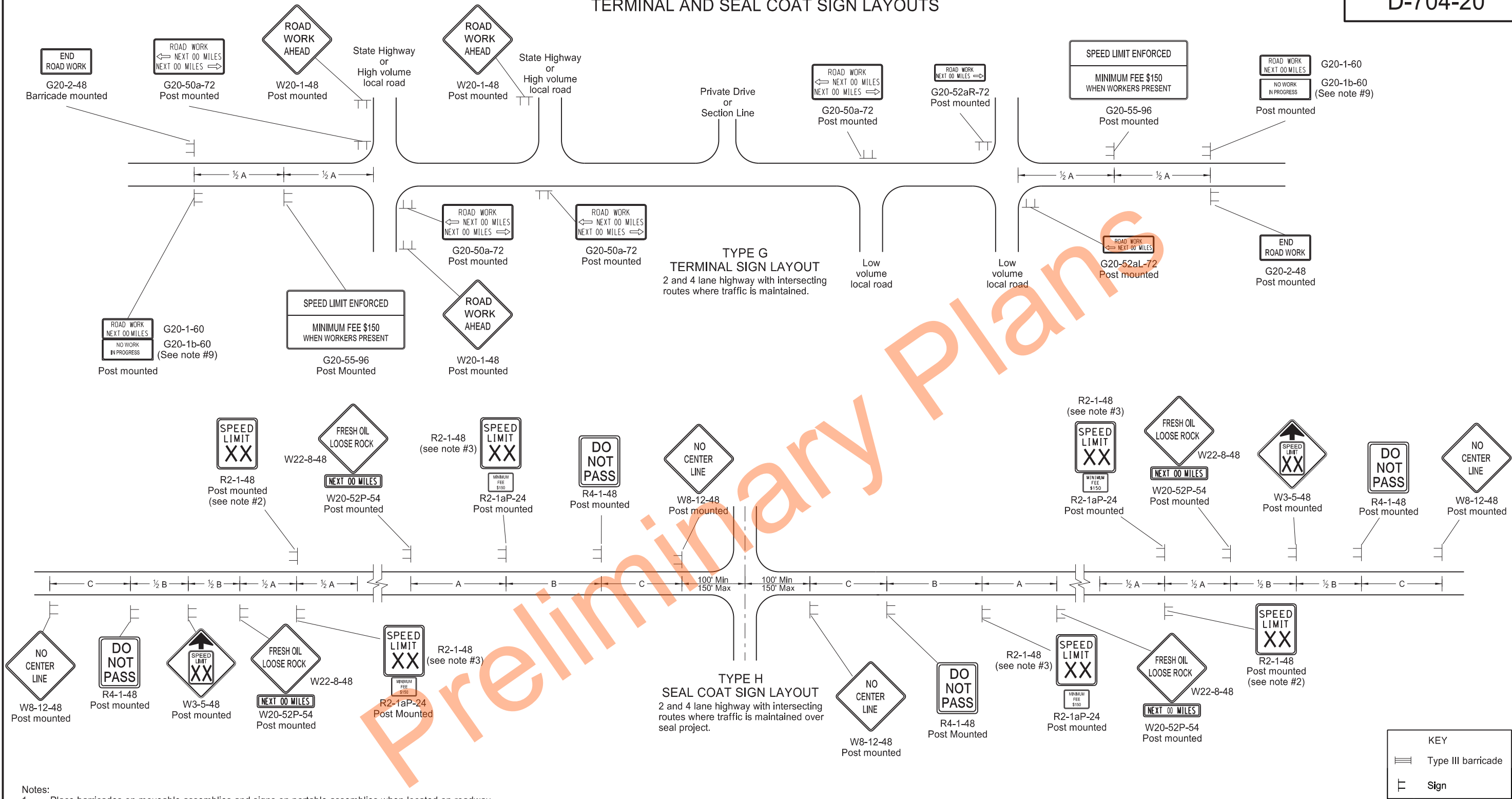
 Delineator Drum	 Type III Barricade	 Flagger
 Sign	 Work/Hazard Area	

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 Sqd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes



TERMINAL AND SEAL COAT SIGN LAYOUTS

D-704-20



Notes:

- Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
- Determine the exact speed limit in the field, based on location and conditions.
- 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 1/2 B.
- 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.
- Cover existing speed limit signs within a reduced speed zone.
- 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.
- As an option, use portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Drawing D-704-14.
- Cover or remove speed limit signs from layout Type H when loose aggregate is removed.
- Install sign G20-1b-60 when work is suspended for winter.
- Use other traffic control layouts in immediate work areas. Place sign R2-1aP-24 below speed limit signs in reduced speed limit work areas.
- 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.
- Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

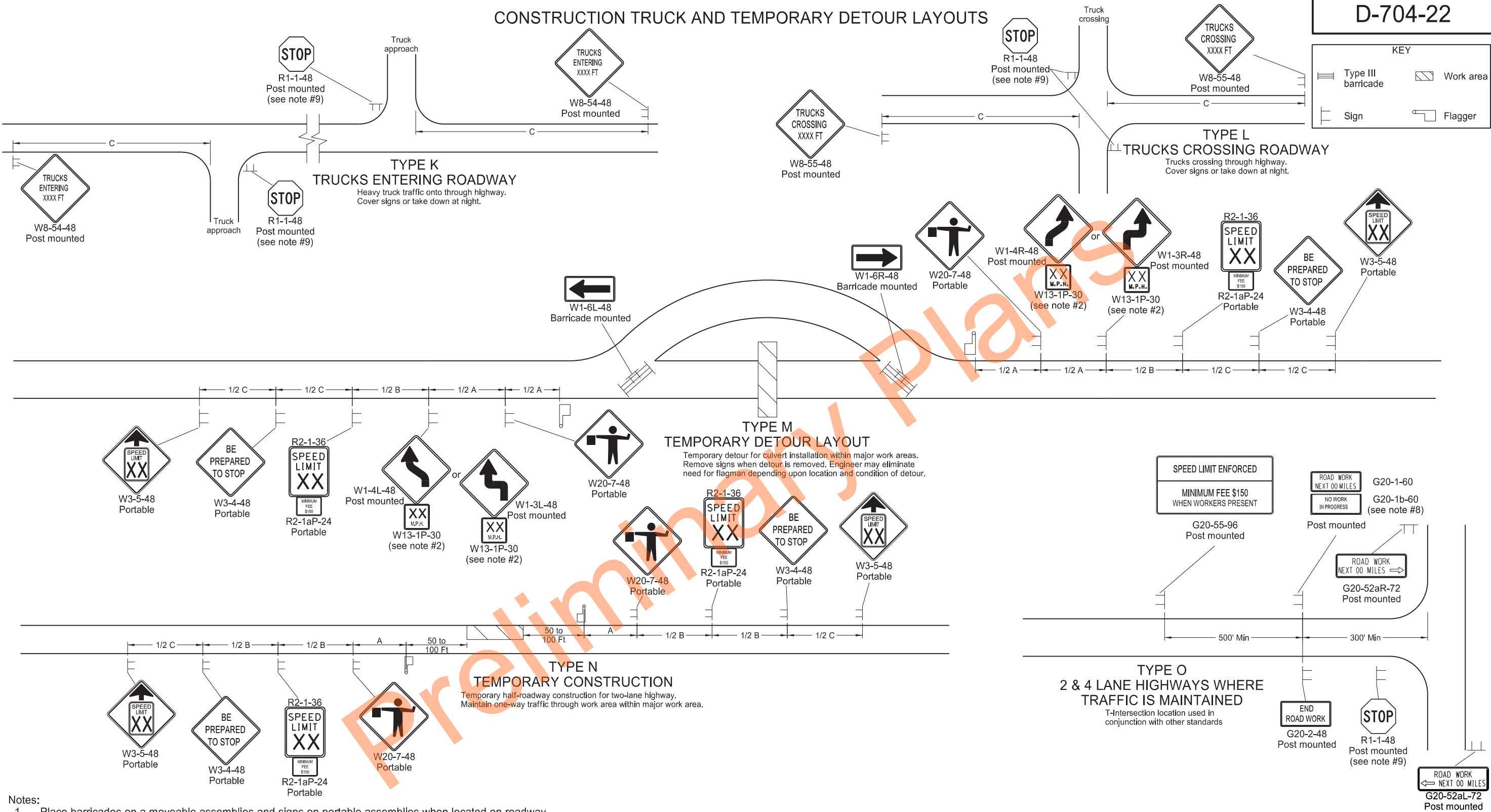
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs		
	Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway 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



CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

D-704-22



Notes:

- Place barricades on a moveable assemblies and signs on portable assemblies when located on roadway.
- Where necessary, safe speed to be determined by the Engineer.
- 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 1/2 B.
- 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.
- Cover existing speed limit signs within a reduced speed zone.
- Covered (when approved by engineer) or obliterated pavement marking measured as Obliteration of Pavement Marking.
- As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
- Install sign G20-1b-60 when work is suspended for winter.
- If existing stop sign is in place, a 48" stop sign is not required.
- 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.
- Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

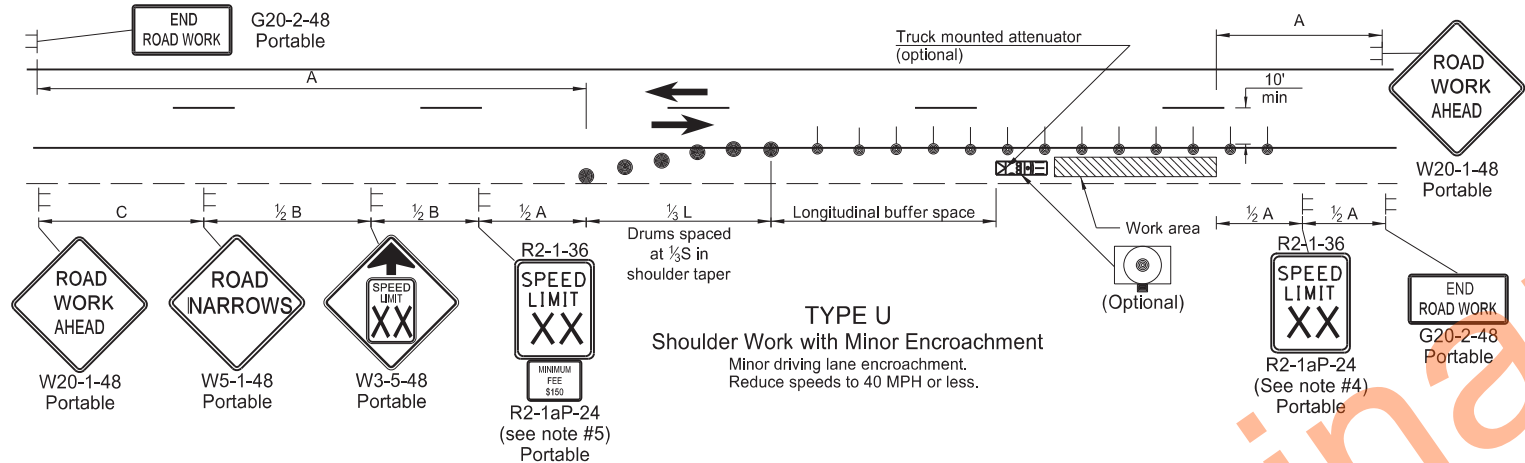
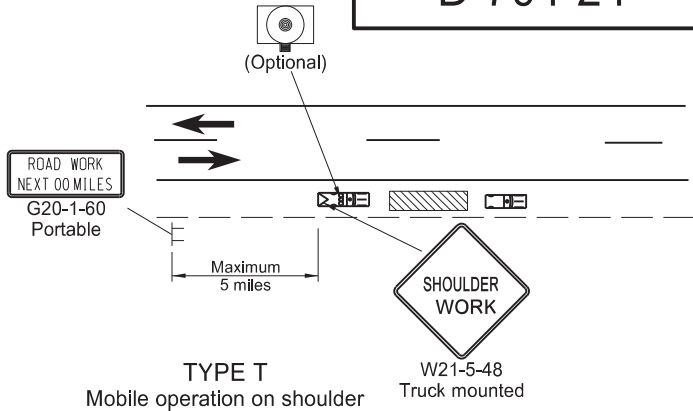
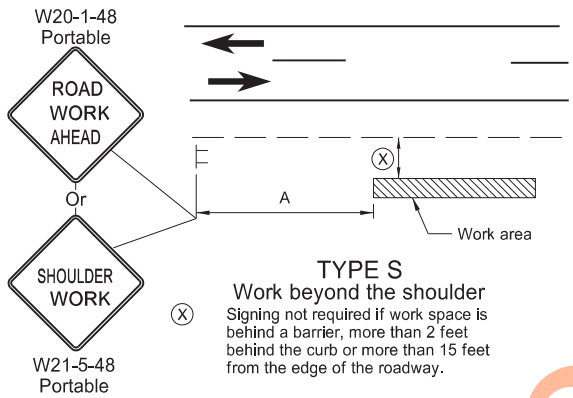
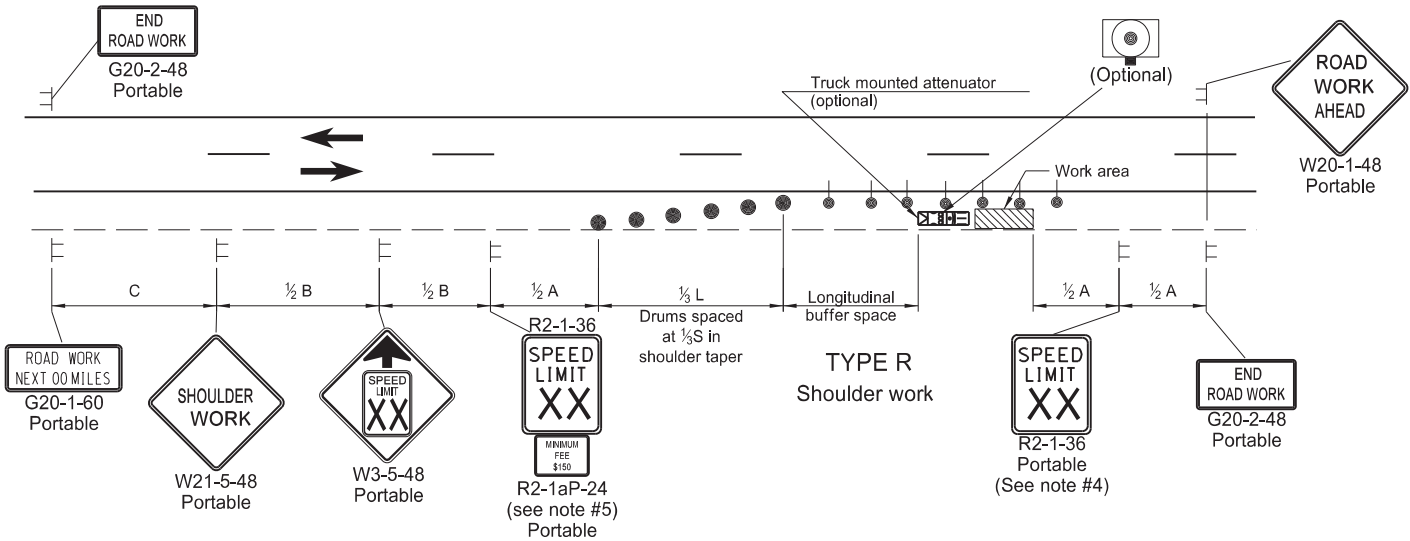
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway 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

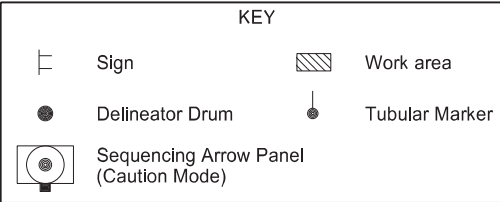
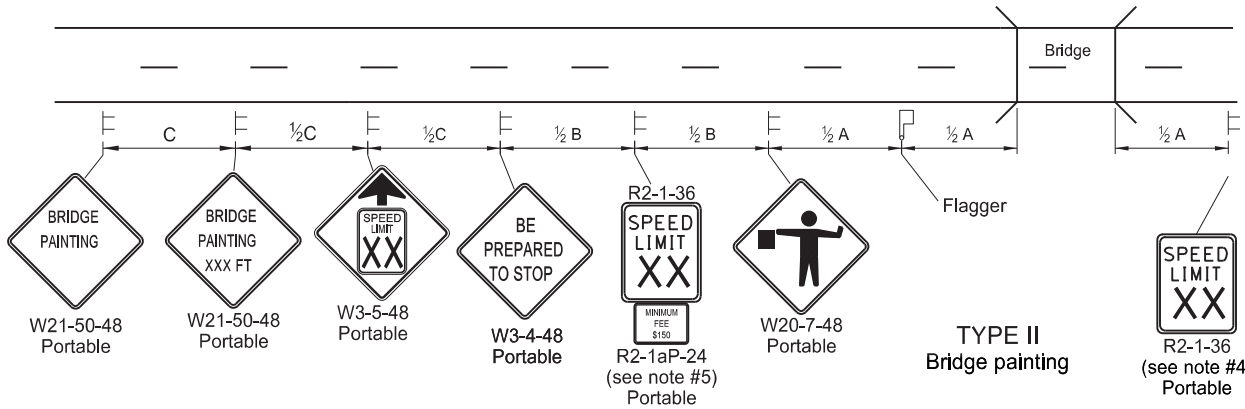
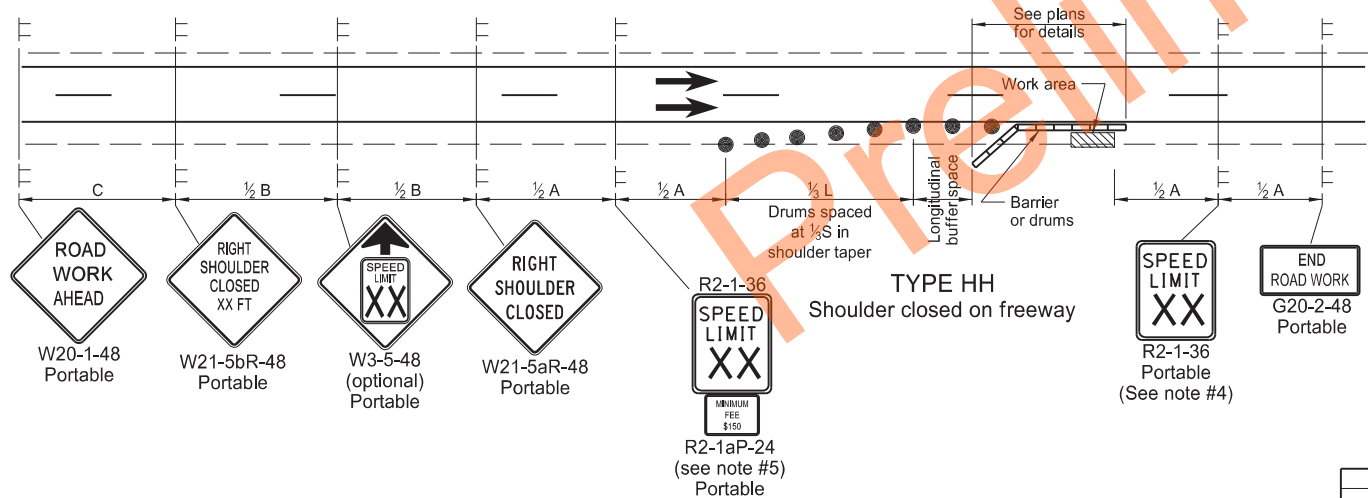


SHOULDER CLOSURES AND BRIDGE PAINTING LAYOUTS

D-704-24



- Notes
- Variables
 - S = Numerical value of speed limit or 85th percentile.
 - W = The width of the taper in feet.
 - L = Minimum length of taper, $S \times W$ for freeways, expressways, and all other roads with speeds of 45 mph or greater, or $W \times S^2 / 60$ for urban, residential, and other streets with speeds of 40 mph or less.
 - Space delineator drums for tapering traffic at dimension "S". Space delineator drums or tubular markers for tangents at 2 times "S".
 - Sequencing Arrow Panels
 - Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
 - Use Type B on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
 - Use Type C on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
 - Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
 - 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 1/2 B.
 - 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.
 - Cover existing speed limit signs within a reduced speed zone.
 - As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
 - Recommend 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

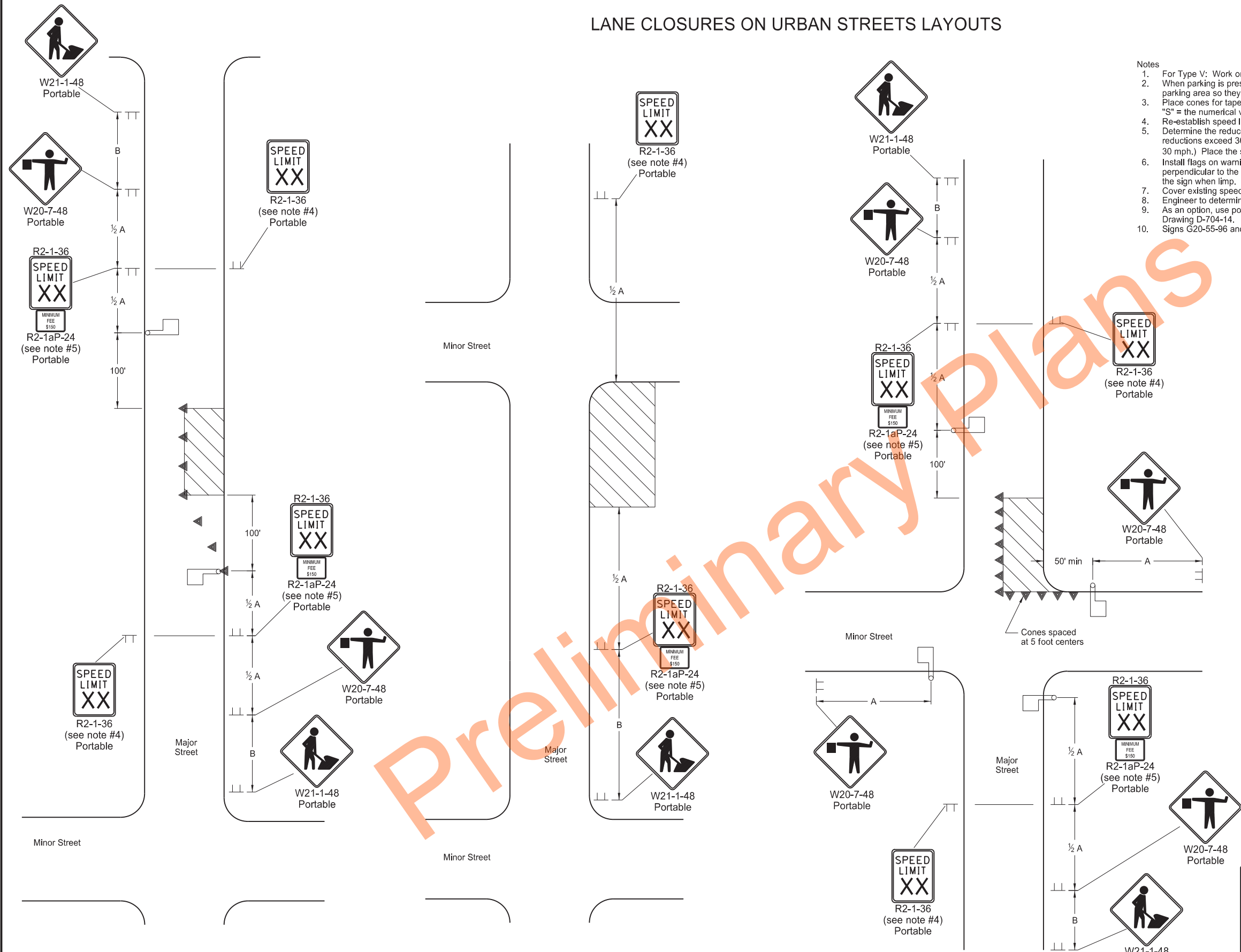
Longitudinal Buffer Space	
Speed (mph)	Length Min. (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Updated notes & revised signs
11-01-19	Revised drum spacing & signs nos
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes



LANE CLOSURES ON URBAN STREETS LAYOUTS

D-704-25



- Notes
- For Type V: Work on one side of roadway at a time so as not to block off more than one lane of traffic.
 - When parking is present, place signs so they are entirely visible above parked vehicles or at the edge of the parking area so they are visible to oncoming traffic. Place signs on portable mounts when located on roadway.
 - Place cones for tapering traffic at 3 equal spaces and cones for tangents at dimension "S". "S" = the numerical value of speed limit.
 - Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
 - 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 1/2 B.
 - Install flags on warning signs in urban areas when signs are not portable. Mount 24 inches 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.
 - Cover existing speed limit signs within reduced speed zones.
 - Engineer to determine safe speed, when necessary.
 - As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
 - Signs G20-55-96 and R2-1aP-24 are not required for urban projects.

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

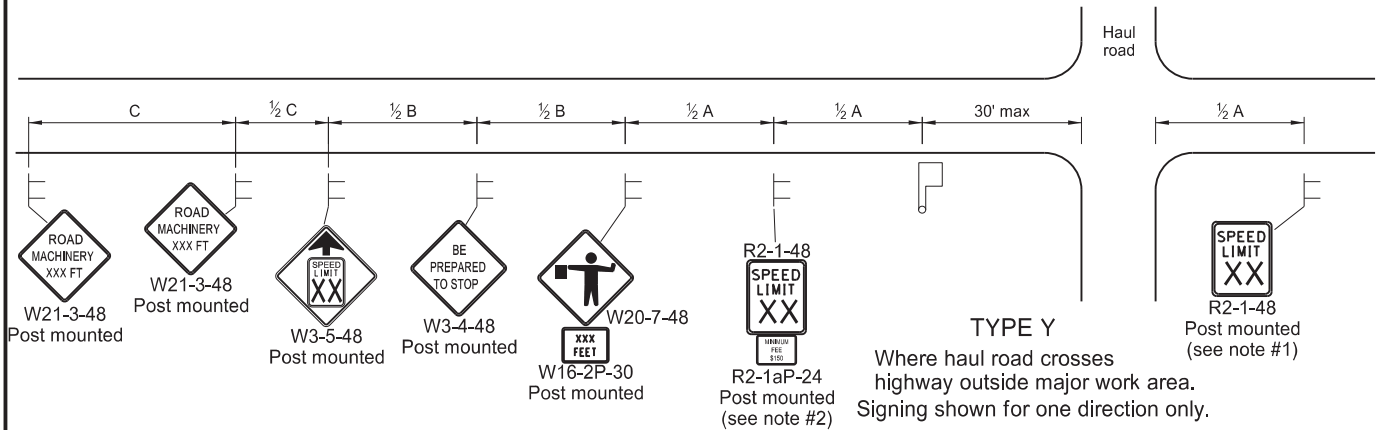
KEY	
	Sign
	Cones
	Work area
	Flagger

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Updated notes & removed signs
11-01-19	Revised note & added Min Fee sign
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes

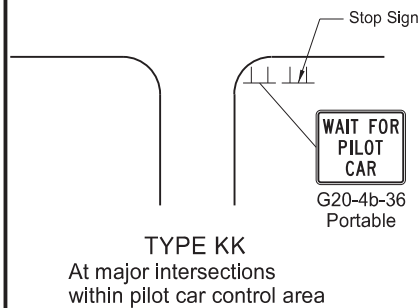
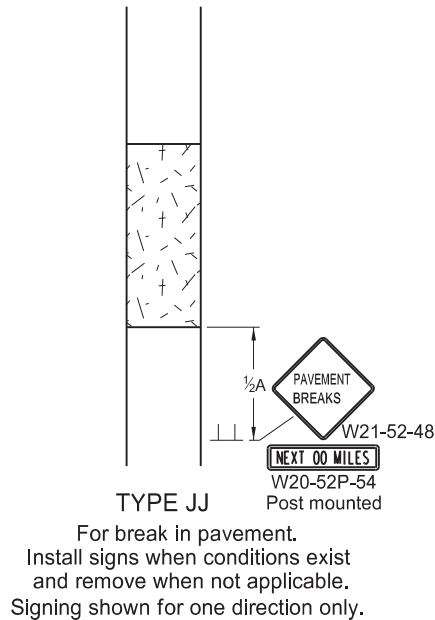
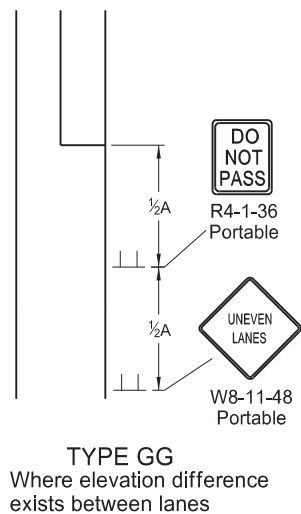
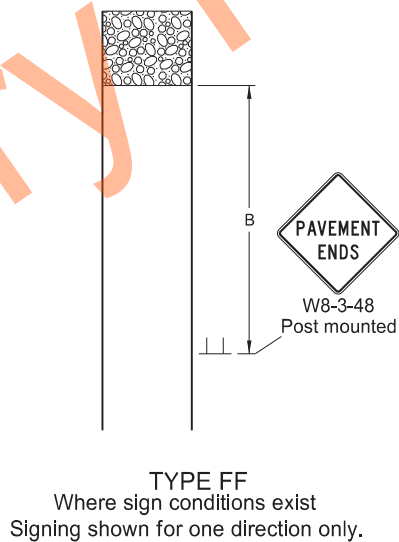
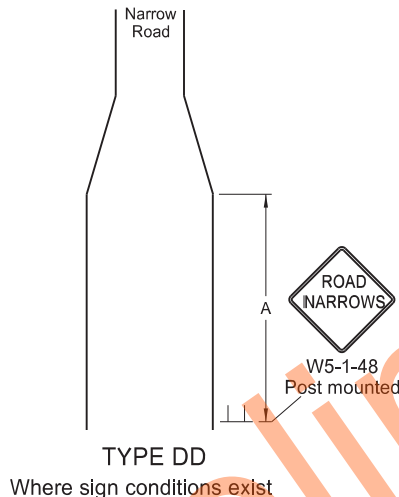
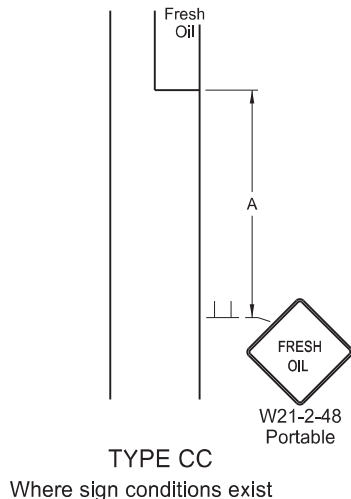
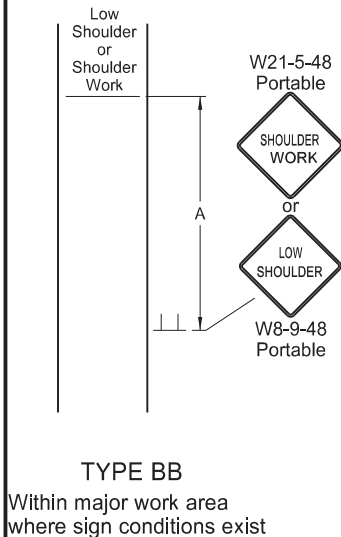
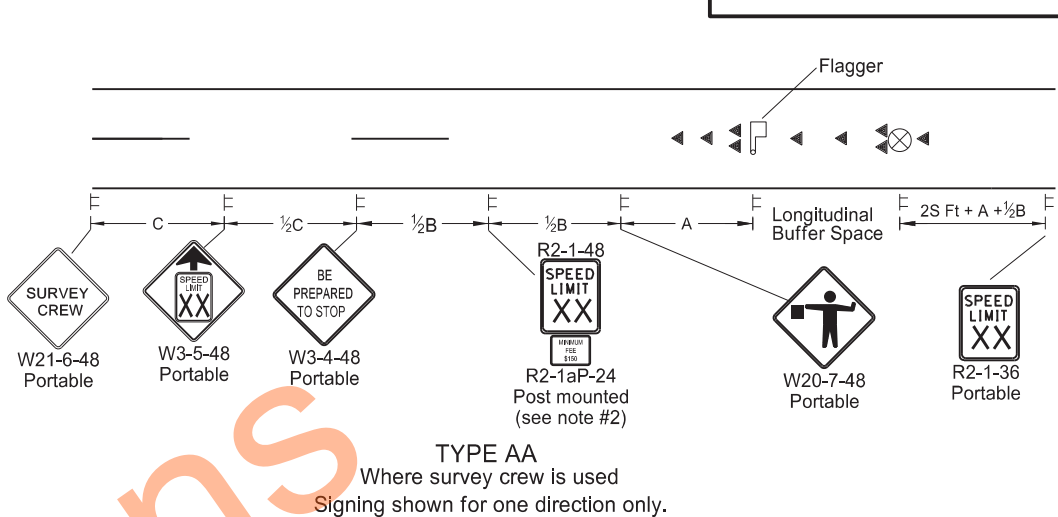


MISCELLANEOUS SIGN LAYOUTS

D-704-26



TYPE Z
Where speed zone is needed
Signing shown for one direction only.



- 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 1/2 B.
 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.

KEY

Flagger

Sign

Cones

Survey Equipment

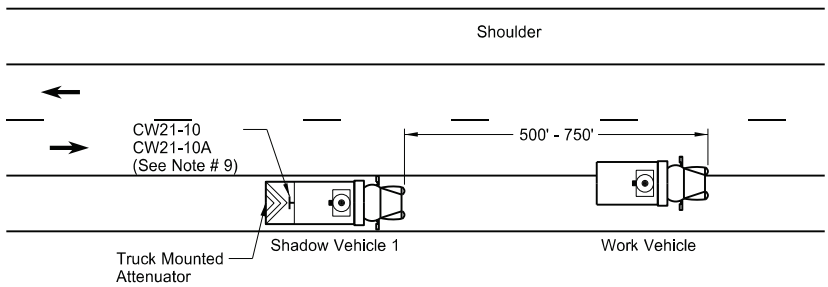
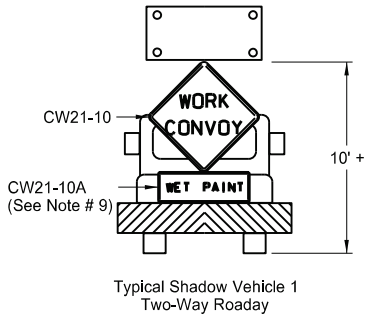
S = Numerical value of speed limit or 85th percentile.

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

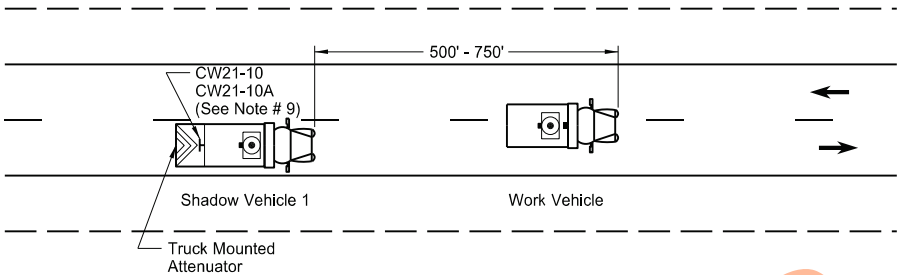


MOBILE OPERATION
(PAVEMENT MARKING)

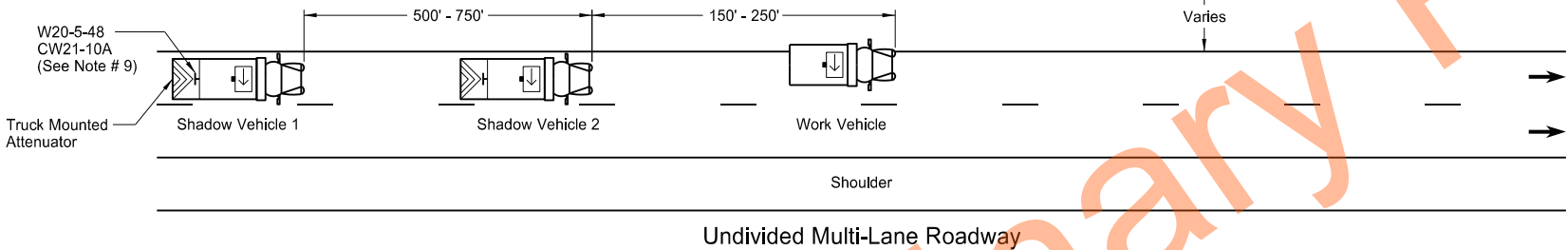
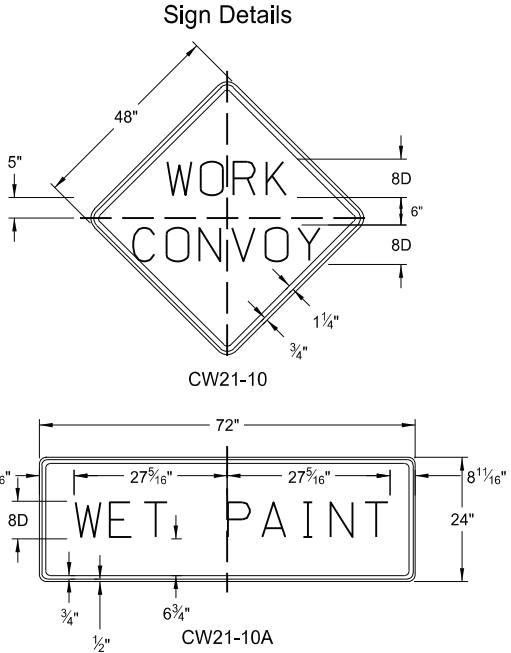
D-704-27



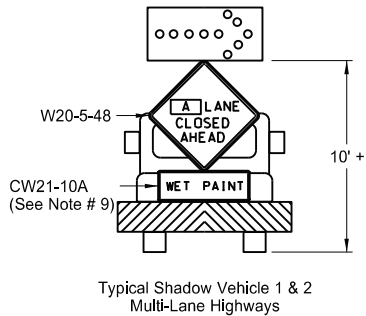
Two-Way Roadway with Paved Shoulders



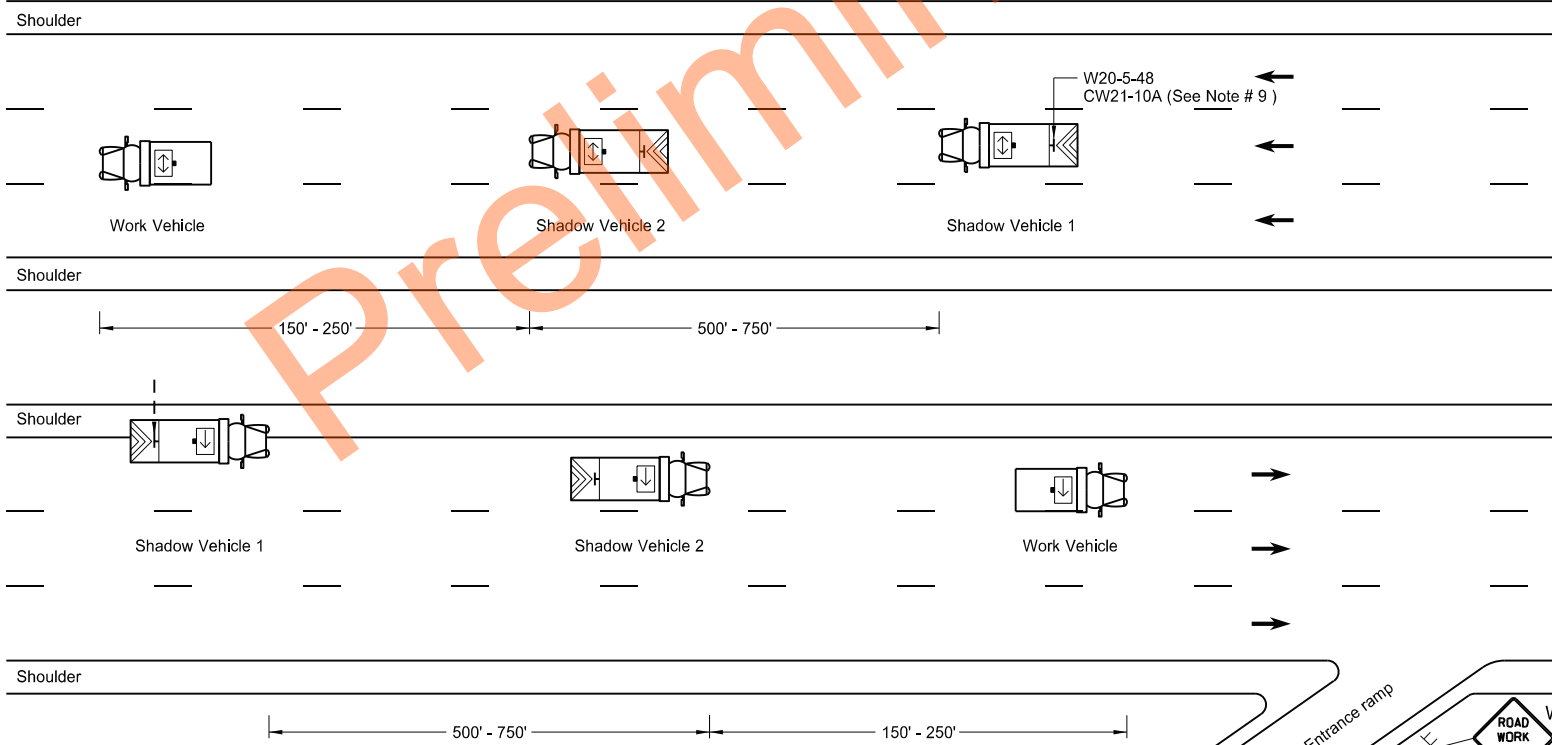
Two-Way Roadway without Paved Shoulders



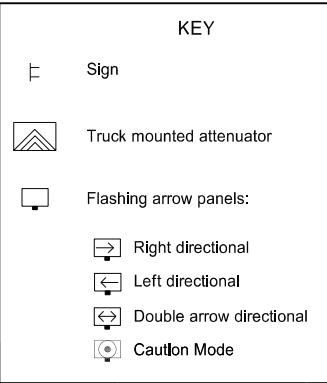
- Notes
1. Use additional vehicles you choose to be in the convoy with truck mounted attenuators, at your own expense.
 2. Display yellow rotating beacons or strobe lights on shadow and work vehicles, unless otherwise stated in the plans.
 3. Use Type B or Type C flashing arrow panels controlled from inside the vehicle.
 4. Provide each vehicle with two-way electronic communication capability.
 5. Move shadow vehicle 1 first to shadow other convoy vehicles when convoy changes lane.
 6. Vary vehicle spacing between shadow vehicle 1 and shadow vehicle 2 based on sight distance restrictions. Motorists approaching the work convoy need to see trail vehicle in time to slow down and/or change lanes as they approach shadow vehicle.
 7. Sign Colors
Letters = Black
Border = Black
Background = Orange
 8. As an option, use shadow vehicle 2 the paint tender vehicle.
 9. Use sign CW21-10A only during painting operation.
 10. Pull over work and shadow vehicles periodically to allow motor vehicle traffic to pass on two lane - two way roadways.



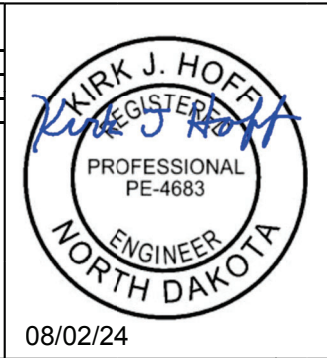
A = ☐ Left ☐ Right ☐ Center



Divided Multi-Lane Highway

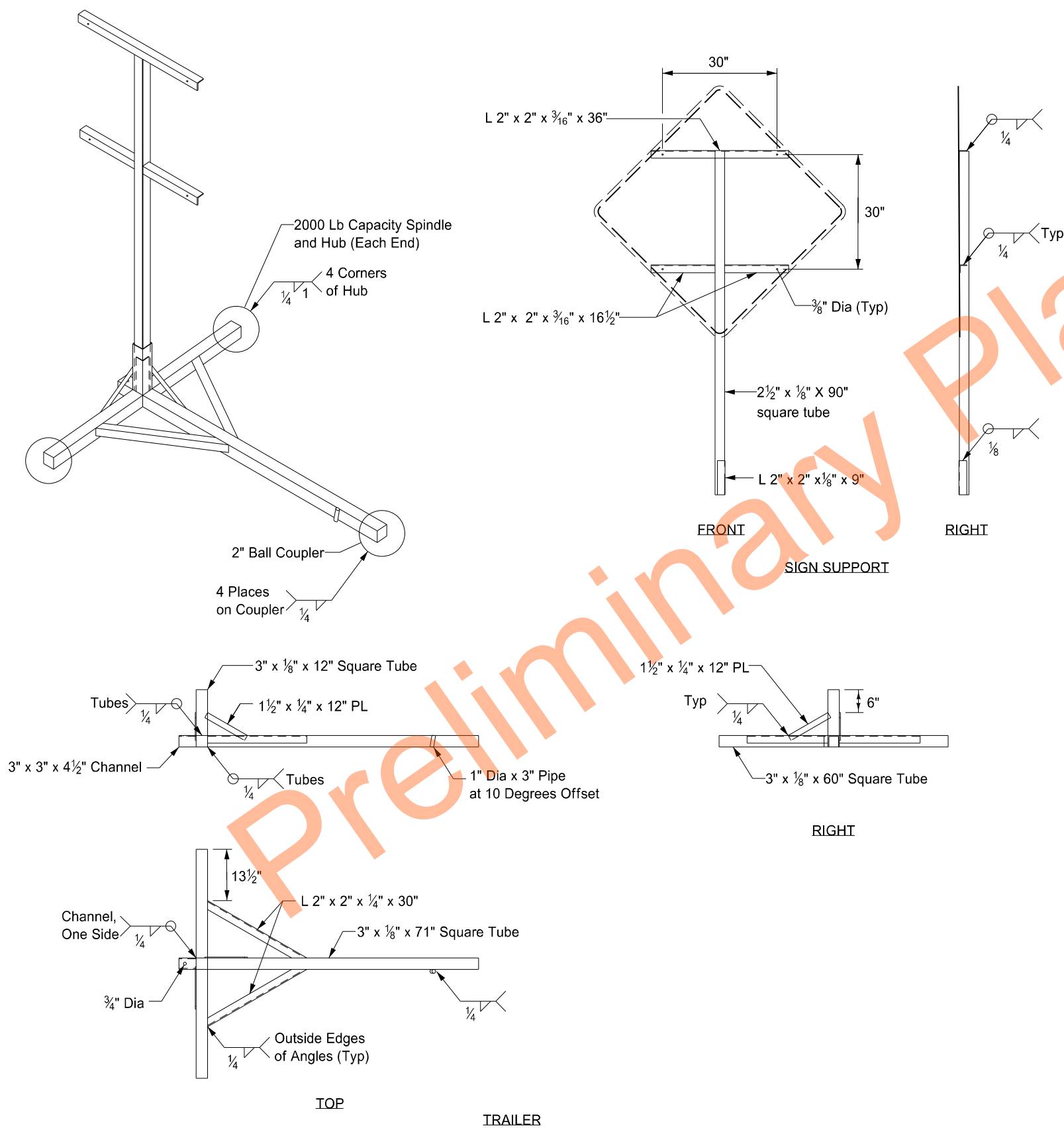


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
6-18-14	Removed shadow vehicle 2 on two lane roadways
9-27-17	Updated to active voice
11-08-19	Changed Standard Heading
6-02-24	Electronic Stamp/Signature.



PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50

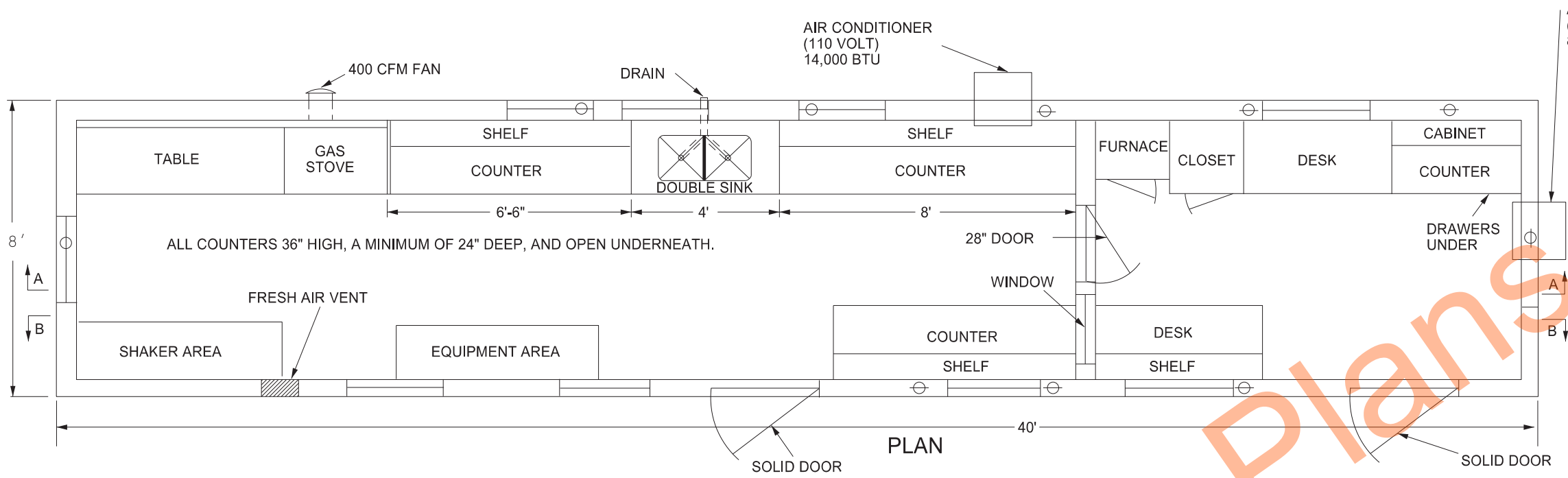


Notes:

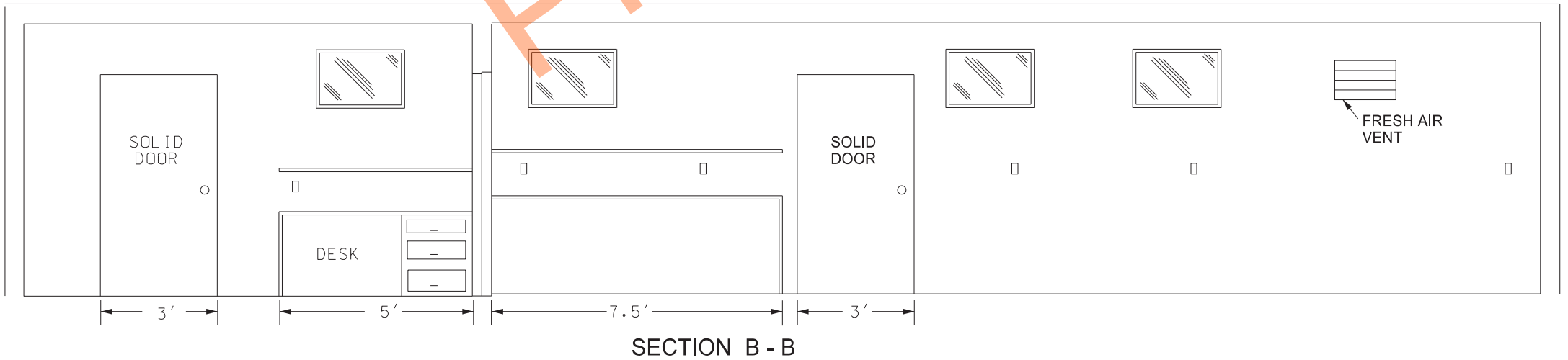
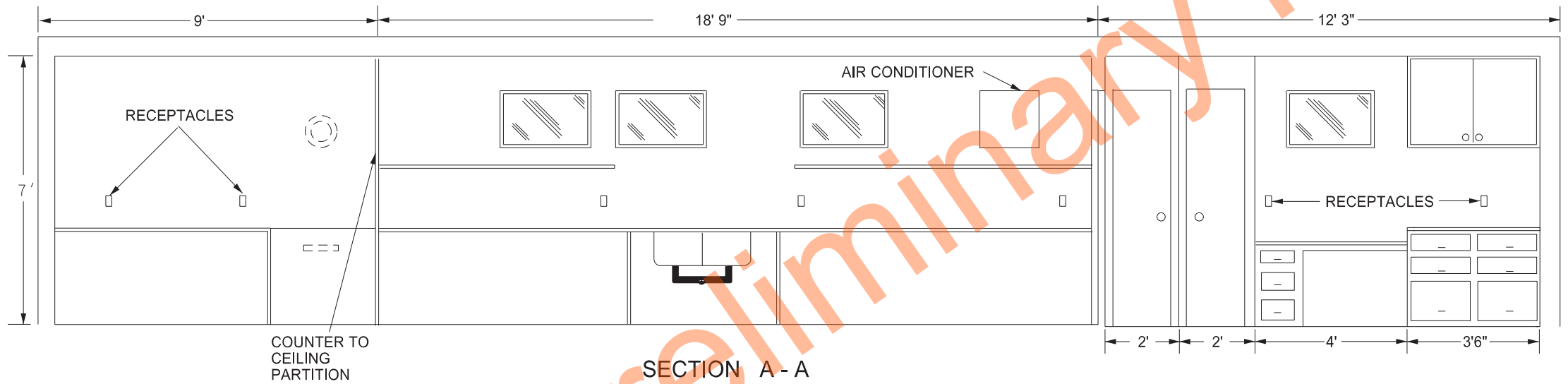
1. Maximum 250 pound weight of assembly.
2. Use a 14" wheel and tire.
3. Use no automotive and equipment axle assemblies for trailer-mounted sign supports.
4. Other NCHRP 350 or MASH crash tested assemblies are acceptable.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-23-10	
REVISIONS	
DATE	CHANGE
12/02/2020	Updated Note to active voice.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
12 02 2020



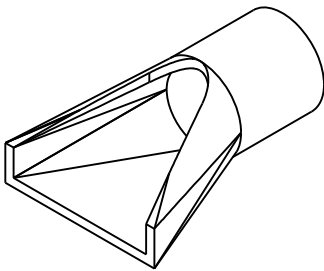
- Provide a laboratory with the following:
1. A 1'x1' shelf at 36" above the regular countertop.
 2. Double compartment stainless steel sink, with each compartment a minimum of 16"x14"x10" deep. Provide water service lines made of copper or plastic and a diameter of ½ inch.
 3. An exhaust fan capable of removing inside air at a rate of 400 CFM.
 4. Fresh air vent hinged to open or close manually.
 5. 24" x 48" table capable of holding a 200 lb masonry saw with a minimum clearance of 36" above the table.
 6. A water supply tank with a capacity of 500 gallons and a 20 gallon capacity pressure tank on the pump.
 7. Heavy duty type locks, latches, and hinges for doors made to withstand the intense use in service.
 8. A wall between the office and the work area properly insulated to prevent the transmission of heat and noise.
 9. The steel cable tie downs and ground anchors at each corner of the lab.
 10. Electrical service entrance wired for 100 amps and separate circuits for air conditioners. Space convenience outlets in counter areas a minimum of four feet apart.



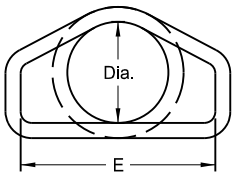
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
07-30-14	Changed standard's title and revised notes.
01-11-16	Revised notes.
08-27-19	New Design Engineer PE Stamp
08-09-24	Electronic Stamp/Signature.



FLARED END SECTION						
TERMINAL DIMENSIONS						
DIA	A	B	C	D	E	U
12	0'-4"	2'-0"	4'-0 ⁷ / ₈ "	6'-0 ⁷ / ₈ "	2'-0"	2"
15	0'-6"	2'-3"	3'-10"	6'-1"	2'-6"	2 ¹ / ₂ "
18	0'-9"	2'-3"	3'-10"	6'-1"	3'-0"	2 ¹ / ₂ "
21	0'-9"	3'-0"	3'-1"	6'-1"	3'-6"	2 ¹ / ₂ "
24	0'-9 ¹ / ₂ "	3'-7 ¹ / ₂ "	2'-6"	6'-1 ¹ / ₂ "	4'-0"	3"
27	0'-10 ¹ / ₂ "	4'-0"	2'-1 ¹ / ₂ "	6'-1 ¹ / ₂ "	4'-6"	3 ¹ / ₂ "
30	1'-0"	4'-6"	1'-7 ³ / ₄ "	6'-1 ³ / ₄ "	5'-0"	3 ¹ / ₂ "
36	1'-3"	5'-3"	2'-9"	8'-0"	6'-0"	4"
42	1'-9"	5'-3"	2'-9"	8'-0"	6'-6"	4 ¹ / ₂ "
48	2'-0"	6'-0"	2'-0"	8'-0"	7'-0"	5"
54	2'-3"	5'-5"	2'-9 ¹ / ₂ "	8'-2 ¹ / ₄ "	7'-6"	5 ¹ / ₂ "
60	2'-11"	5'-0"	3'-3"	8'-3"	8'-0"	5"
66	2'-6"	6'-0"	2'-3"	8'-3"	8'-6"	5 ¹ / ₂ "
72	3'-0"	6'-6"	1'-9"	8'-3"	9'-0"	6"
78	3'-0"	7'-6"	1'-9"	9'-3"	9'-6"	6 ¹ / ₂ "
84	3'-0"	7'-6 ¹ / ₂ "	1'-9"	9'-3 ¹ / ₂ "	10'-0"	6 ¹ / ₂ "
90	3'-5"	7'-3 ¹ / ₂ "	2'-0"	9'-3 ¹ / ₄ "	11'-0"	6 ¹ / ₂ "

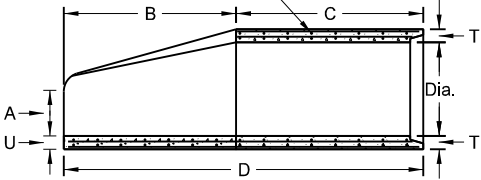


PERSPECTIVE

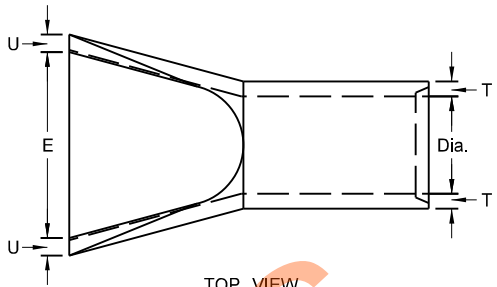


END VIEW

Standard Reinforcement for Class III pipe reinforced as per AASHTO M170



SIDE VIEW



TOP VIEW

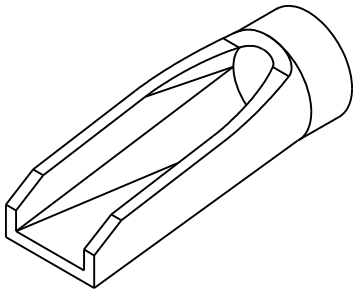
NOTES:

- All reinforcing steel shall meet AASHTO M170 requirements.
- 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.
- Laying length of pipe: 12" to 66" (incl.) = not less than 4 feet
66" to 108" (incl.) = not less than 6 feet
- Joints shall be sealed with rubber gaskets or with sealer approved by the engineer whenever pipe are specified for storm drain or sanitary sewers.
- 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.

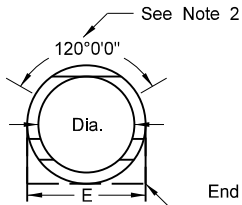
REINFORCED CONCRETE PIPE - FLARED END SECTION

Reinforcement to be equivalent to Class III RCP

TRAVERSABLE END SECTION						
DIA	B	C	D	E	R	S
15"	4'	9"	4'-9"	1'-7 ¹ / ₂ "	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"	3 ¹ / ₂ "	4
36"	7'-3"	15"	8'-6"	3'-8"	3"	4

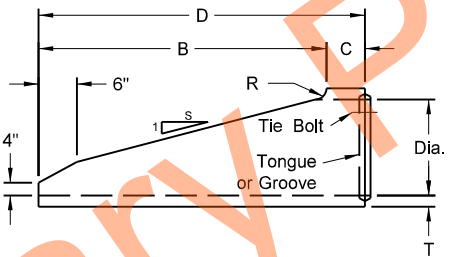


PERSPECTIVE

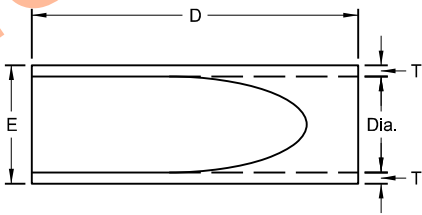


END VIEW

See Note 2
End may be supplied with flat bottom



SIDE VIEW



TOP VIEW

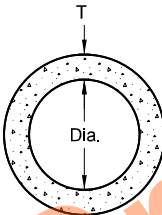
NOTES (Traversable End Section):

- Manufactured in accordance with applicable portions of ASTM C76/AASHTO M170.
- Reinforcement per Class III RCP with double reinforcement in the upper 120° of the full barrel portion.

REINFORCED CONCRETE PIPE - TRAVERSABLE END SECTION

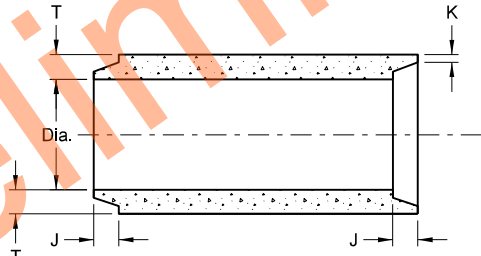
Reinforcement to be equivalent to Class III RCP

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 Min.	Minimum Wall Thickness (T)	
Dia	Sq. ft.	Lbs.	In.	In.	In.	
12	0.79	92	1 ⁵ / ₈ -2 ³ / ₈	3/4	2	
15	1.23	127	1 ³ / ₄ -2 ¹ / ₄	7/8	2 ¹ / ₂	
18	1.77	168	1 ¹ / ₂ -2 ¹ / ₂	1	2 ¹ / ₂	
21	2.40	214	1 ¹ / ₂ -3 ¹ / ₈	1 ¹ / ₈	2 ¹ / ₂	
24	3.14	265	2 ³ / ₄ -3 ¹ / ₄	1 ¹ / ₈	3	
27	3.98	322	2 ³ / ₄ -4	1 ¹ / ₄	3 ¹ / ₄	
30	4.91	384	3 ¹ / ₄ -4 ¹ / ₄	1 ¹ / ₄	3 ¹ / ₂	
33	5.94	452	3 ¹ / ₄ -4 ¹ / ₄	1 ¹ / ₂	3 ¹ / ₄	
36	7.07	524	3 ¹ / ₄ -4 ¹ / ₄	1 ¹ / ₂	4	
42	9.62	685	3 ¹ / ₄ -4 ¹ / ₄	1 ³ / ₄	4 ¹ / ₂	
48	12.57	685	3 ¹ / ₄ -4 ¹ / ₄	1 ¹ / ₂	5	
54	15.90	1070	4 ¹ / ₈ -5 ¹ / ₄	2	5 ¹ / ₂	
60	19.63	1296	4 ¹ / ₂ -5 ¹ / ₂	2 ¹ / ₄	6	
66	23.76	1542	5-6	2 ³ / ₈	6 ¹ / ₂	
72	28.27	1810	5 ⁵ / ₈ -6 ³ / ₄	2 ³ / ₈	7	
78	33.18	2098	6 ¹ / ₄ -7 ¹ / ₄	2 ³ / ₈	7 ¹ / ₂	
84	38.48	2410	5 ⁵ / ₈ -7 ¹ / ₄	3 ³ / ₈	8	
90	44.18	2793	6 ³ / ₄ -8 ¹ / ₂	3 ³ / ₈	8 ¹ / ₂	
96	50.27	3092	7-8 ¹ / ₄	3 ¹ / ₂	9	
102	56.75	3466	7-8 ¹ / ₄	3 ¹ / ₂	9 ¹ / ₂	
108	63.62	3864	7 ¹ / ₄ -8 ¹ / ₂	3 ³ / ₄	10	

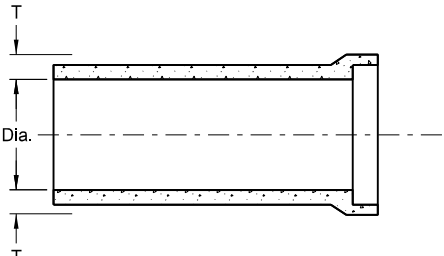


END VIEW

CIRCULAR PIPE

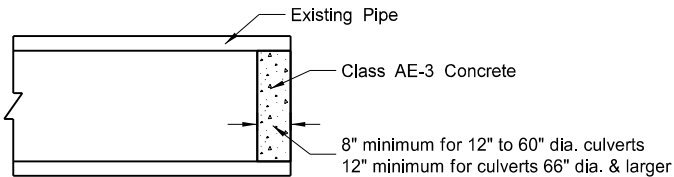


TONGUE & GROOVE JOINT



BELL & SPIGOT JOINT

JOINTS FOR REINFORCED CONCRETE PIPE



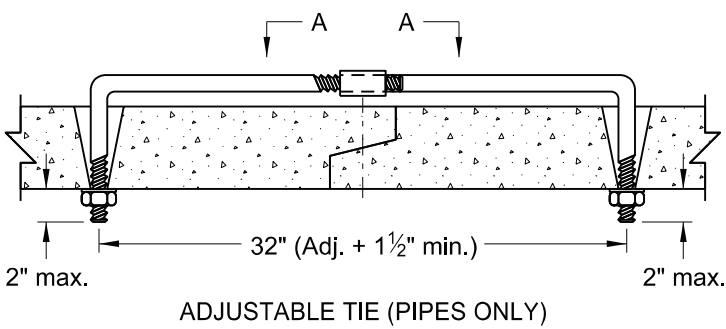
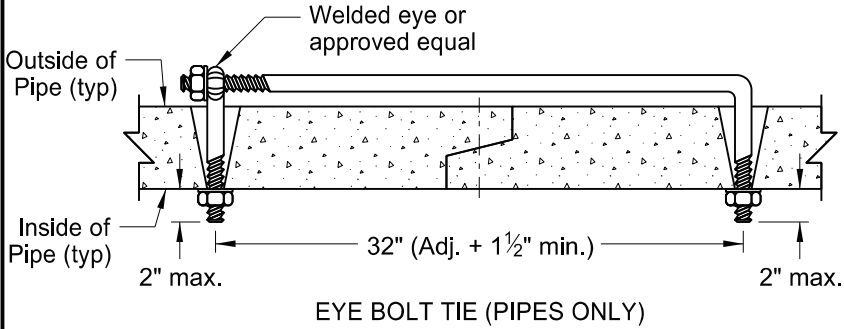
CONCRETE PIPE PLUG

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

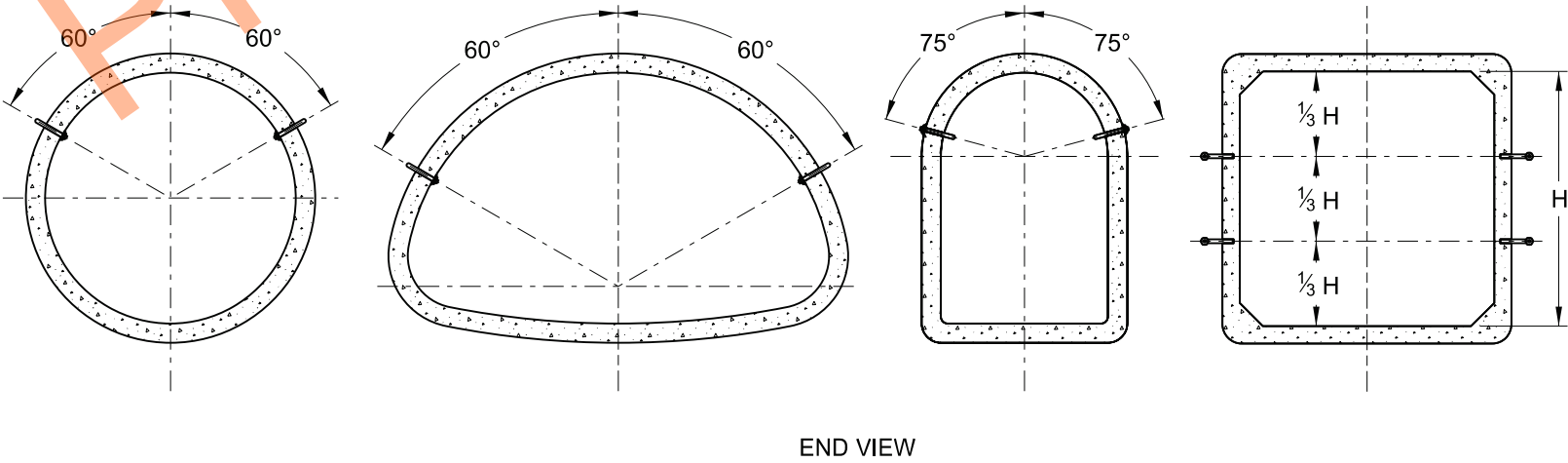
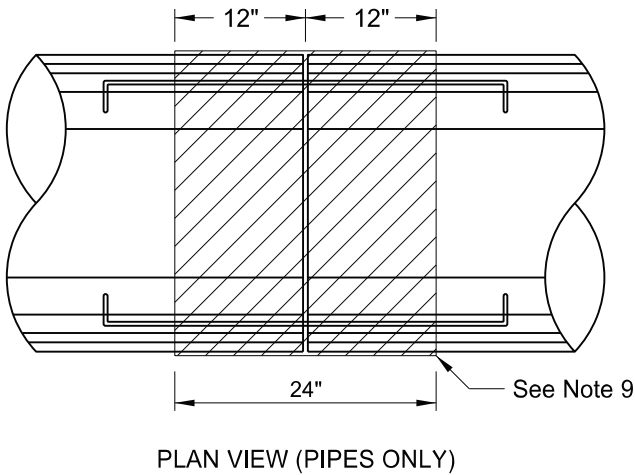
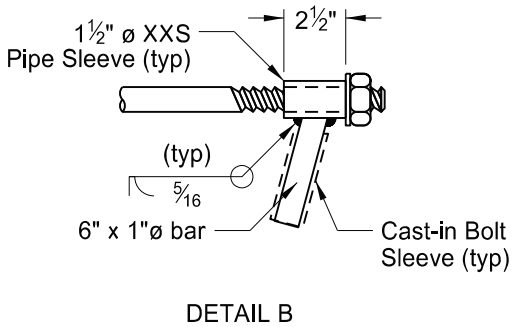
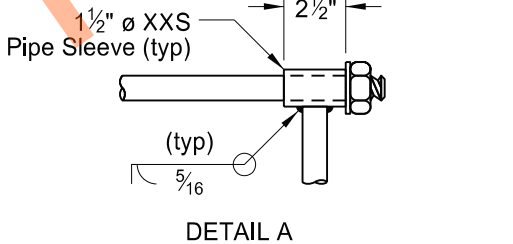
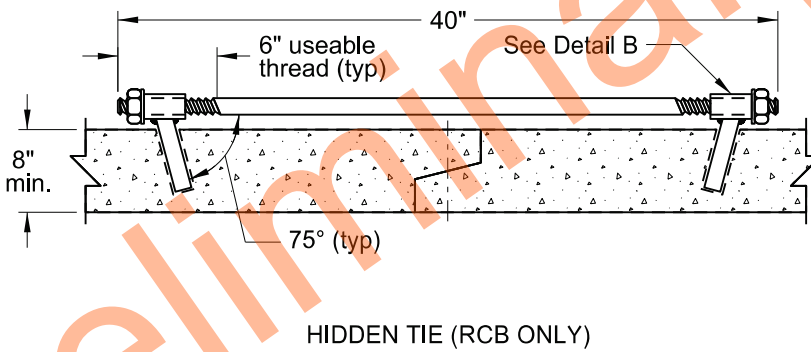
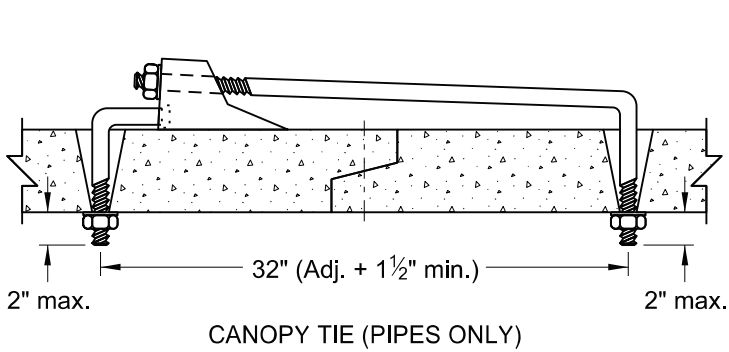
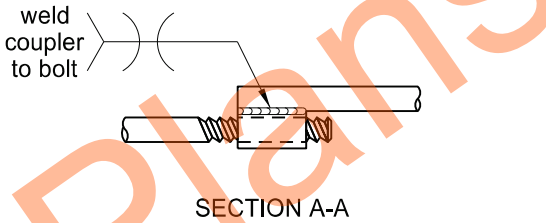
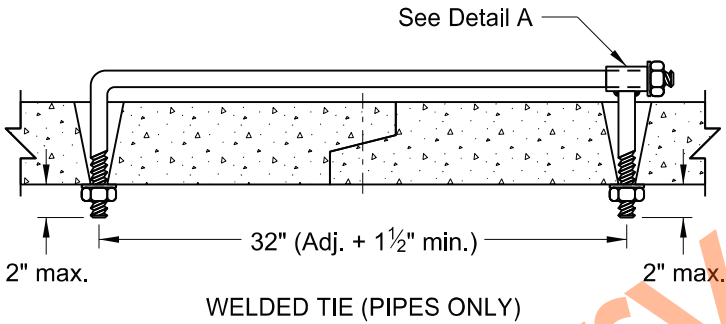
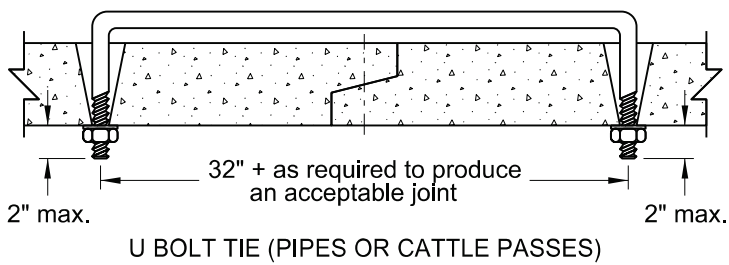
This document was originally issued and sealed by
Jon Ketterling
Registration Number
PE- 4684,
on 9/18/19 and the original document is stored at the
North Dakota Department
of Transportation

CONCRETE PIPE, CATTLE PASS, OR
PRECAST CONCRETE BOX CULVERT TIES



REQUIRED SIZE OF TIE BOLTS		
PIPE SIZE	THREAD Ø	XXS PIPE SLEEVE INNER Ø
18" - 24"	5/8"	3/4"
30" - 66"	3/4"	1"
72" - 120"	1"	1 1/4"
RCB/CATTLE PASS	1"	1 1/4"

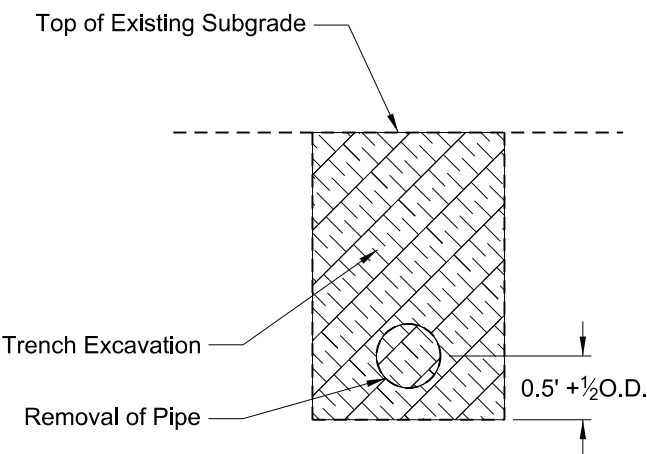
- NOTES:
- The pipe size listed is the inside diameter of round pipe or the equivalent diameter of pipe arch.
 - Insert pipe ties from the inside of the pipes and grout into place for Cattle Pass and Jacked and Bored pipes. Jacked and bored pipes with a diameter of 24" or less do not require pipe ties.
 - Nuts and washers are not required on Jacked and Bored pipes or pipes with a 24" diameter or less. Insert and grout tie bars into place where nuts and washers are not used.
 - Do not use pipe ties to pull the pipe or RCB sections tight. The ties are only for holding sections together.
 - Use only tie bolt assemblies that have been hot dip galvanized in accordance with ASTM A 153.
 - Holes in pipes to accommodate tie bolts will be precast. Tapered holes are permitted. Use holes that have a diameter 1/4" larger than the diameter of the thread. In precast RCB's, use holes that contain cast-in bolt sleeves with an inside diameter of 1 1/4".
 - Include the cost of precasting the required holes and furnishing and installing the tie bolts in the price bid for the appropriate conduit or RCB pay item.
 - Tie all centerline and approach RCP culvert joints. Tie all joints including the end sections of all free ends of storm drain systems. Free ends are defined as any storm drain end which does not terminate at an inlet or manhole. Outfall culverts with end sections which drain adjacent ditches are examples of free ends.
 - Place joint wrap prior to installing ties. Firmly secure the wrap around the full perimeter. For concrete pipes, use Type S2 geotextile fabric and overlap the joint by 12" in both directions. For box culverts, use a waterproof membrane that meets ASTM C990. Provide a membrane that is a minimum of 12" wide and center it at the joint. Provide a minimum overlap of 2.5" at the seams.
 - Use tie bolts that conform to ASTM A 36. Use heavy hex nuts that conform to ASTM A 563. Use washers that conform to ASTM F 436, Type 1. Use welded pipe sleeves and cast-in bolt sleeves that conform to ASTM A 53, Grade B.
 - Provide lock washers or burr threads of concrete box ties after installation and tightening to prevent nut rotation.
 - Tie RCB's as noted in the plans.



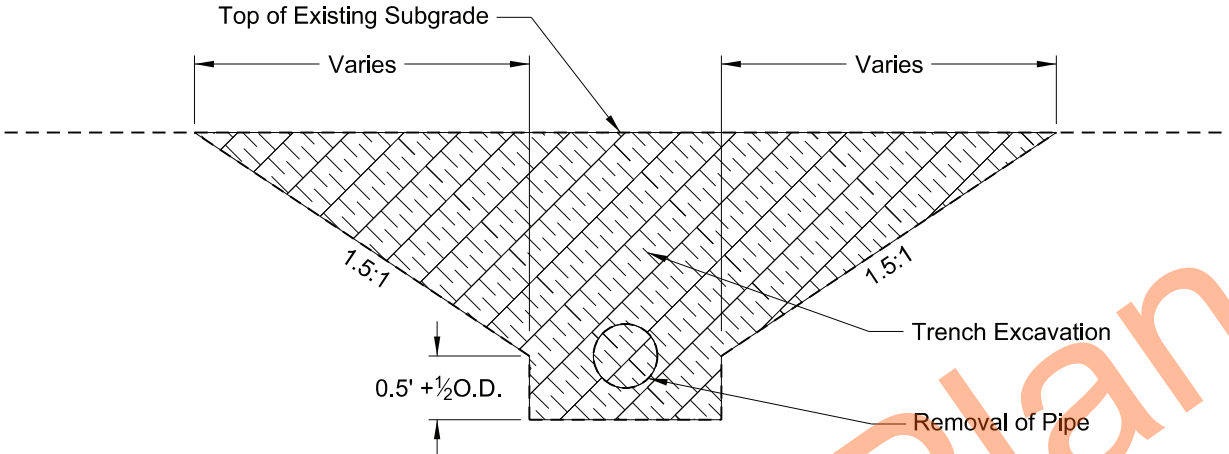
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
3-18-14	
REVISIONS	
DATE	CHANGE
7-21-15	Note 8
6-6-17	Notes 2-11 Table, Title, Labels
8-11-21	Notes 2-12 Table, Label
01-17-25	Notes 9-13 Table, Labels Section A-A, End View



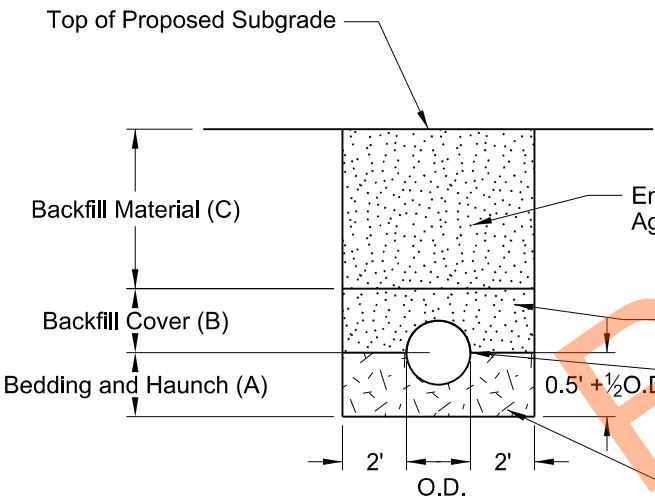
PIPE INSTALLATION DETAIL FOR LONGITUDINAL MAINLINE PIPE
OR PIPE NOT UNDER THE ROADWAY



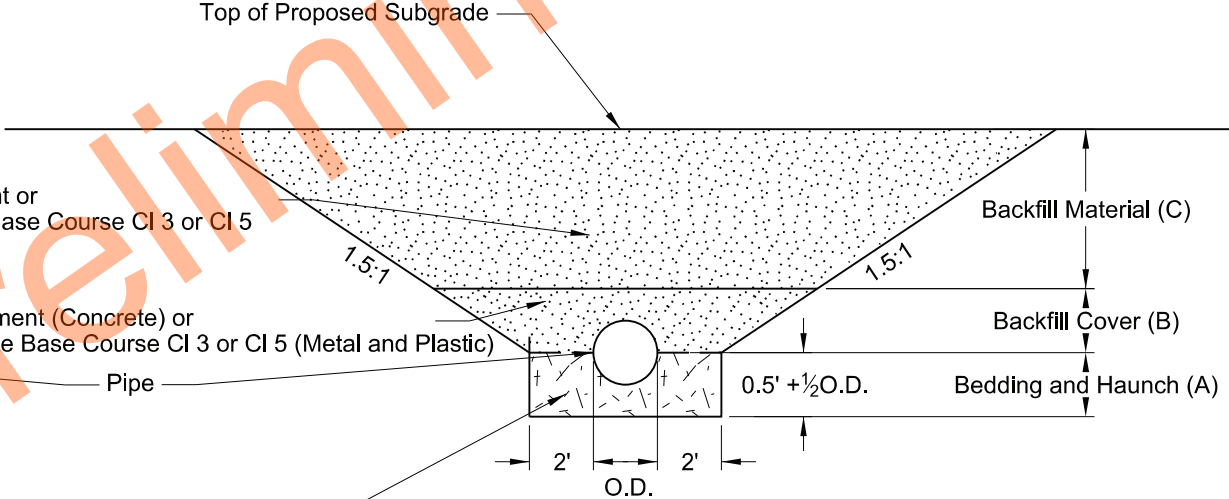
EXCAVATION DETAIL A



EXCAVATION DETAIL B



BACKFILL DETAIL A



BACKFILL DETAIL B

Pay Items
1) Pipe*
2) Removal of Pipe (if required)

*Included in Pipe Pay Item
1) Pipe
2) Trench excavation
3) Aggregate base course CI 3 or CI 5
4) Embankment

NOTES:
1) This drawing does not apply to pipes in approaches.
2) It is the contractor's option to select Detail A or B.
3) Embankment may be either Borrow Excavation or Common Excavation - Type A

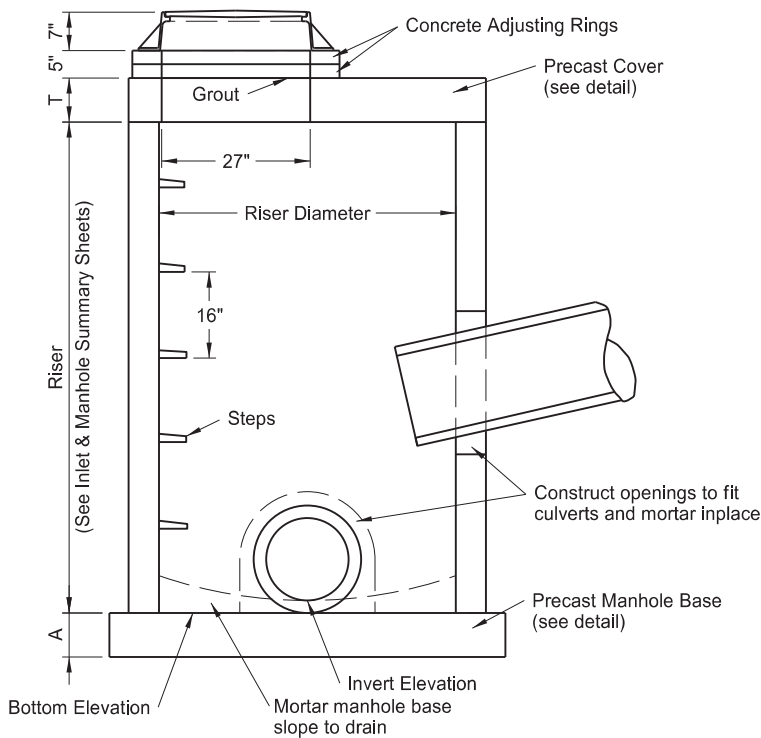
Bedding and Haunch (A)
Pipes Not Under Roadway = 0.5 O.D. + 0.5 Feet
Pipes Under the Roadway = 0.5 O.D. + 0.5 Feet
Backfill Cover (B)
Concrete Pipe = 0.5 O.D.
Metal and Plastic = 0.5 O.D. + 1 Foot
Backfill Material (C)
Top of Pipe 4 Feet or Less Below the Top of Proposed Subgrade = Aggregate Base Course CI3 or CI 5
Top of Pipe Greater than 4 Feet Below the Top of Proposed Subgrade = Common Excavation - Type A
Pipe Not Under Roadway = Common Excavation - Type B

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
7-26-13	
REVISIONS	
DATE	CHANGE
10-15-13	Label Formatting
1-21-15	Nomenclature
12-10-15	Added Plastic Pipe
5-27-20	Changed bedding depth and updated table

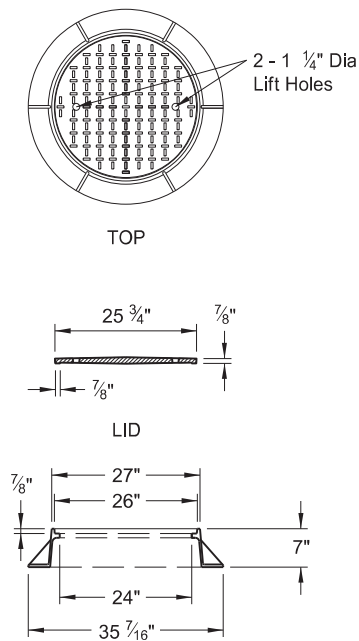


MANHOLE DETAILS

D-722-5

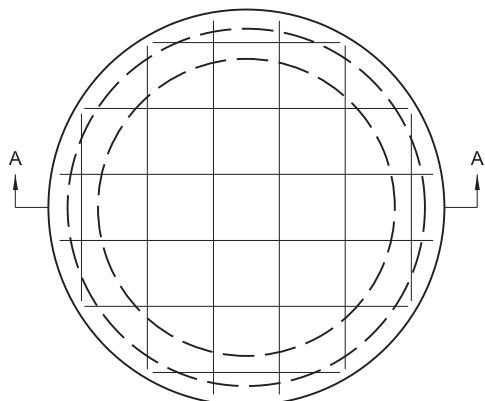


ELEVATION

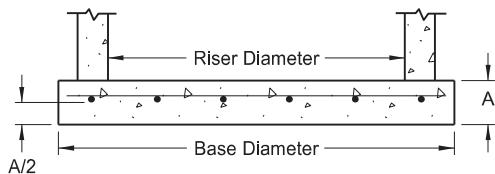


FRAME

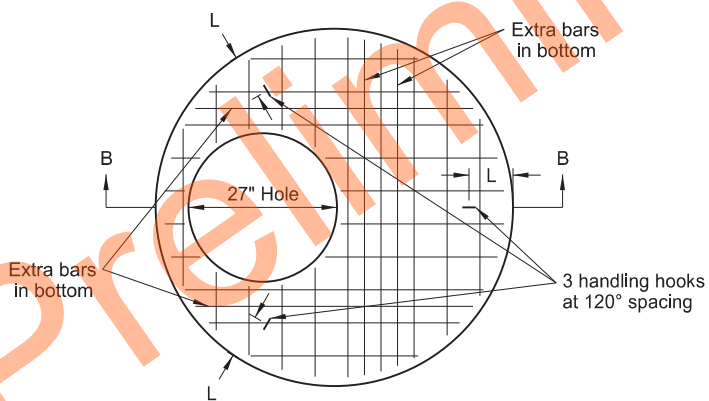
MANHOLE CAST IRON RING & COVER



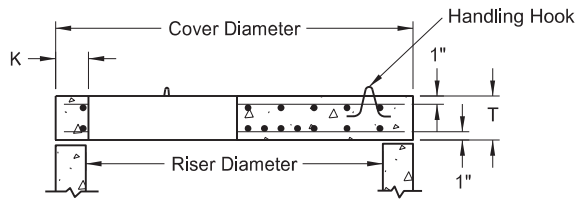
TOP VIEW



SECTION A-A
PRECAST MANHOLE BASE



TOP VIEW



SECTION B-B
PRECAST COVER

PRECAST MANHOLE COVERS

RISER DIAMETER	COVER DIAMETER	WEIGHT OF SECTION	T	K	L	BOTTOM * BARS	TOP * BARS
48"	58"	1,080 Lb	6"	6"	8"	#4 at 6"	---
54"	65"	1,910 Lb	8"	6"	8"	#4 at 6"	---
60"	72"	2,430 Lb	8"	7"	9"	#4 at 6"	#4 at 11"
66"	79"	3,010 Lb	8"	7"	9"	#4 at 6"	#4 at 11"
72"	86"	3,640 Lb	8"	8"	10"	#4 at 6"	#4 at 11"
84"	100"	5,060 Lb	8"	9"	11"	#5 at 6"	#5 at 11"
96"	114"	6,695 Lb	8"	9"	11"	#5 at 6"	#5 at 11"
108"	128"	12,810 Lb	12"	10"	12"	#5 at 6"	#5 at 11"
120"	142"	15,900 Lb	12"	11"	13"	#5 at 6"	#5 at 11"

* - Place reinforcement listed in each direction.

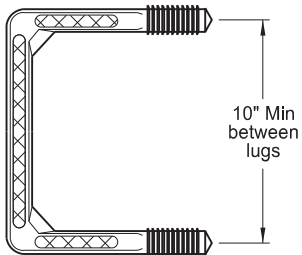
MANHOLE BASES

RISER DIAMETER	BASE DIAMETER	WEIGHT OF SECTION	A	BARS *
48"	66"	1,785 Lb	6"	#4 at 12"
54"	72"	2,830 Lb	8"	#4 at 12"
60"	78"	3,320 Lb	8"	#4 at 12"
66"	86"	4,035 Lb	8"	#4 at 12"
72"	92"	4,620 Lb	8"	#4 at 12"
84"	107"	6,245 Lb	8"	#4 at 12"
96"	120"	7,855 Lb	8"	#4 at 12"
108"	132"	14,255 Lb	12"	#4 at 8"
120"	148"	17,925 Lb	12"	#4 at 8"

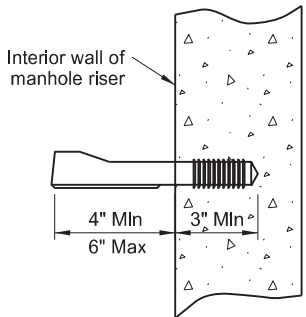
* - Place reinforcement listed in each direction.

NOTES:

1. Use class AE concrete precast or cast-in-place bases constructed in accordance with NDDOT Standard Specifications. Use aggregate size approved by the engineer.
2. Use precast concrete manholes, risers and steps conforming to AASHTO M199.
3. Reinforce precast concrete bases and covers as shown in the table for the corresponding riser diameter.
4. Use Grade 60 reinforcing steel.
5. Cut or Precast manhole riser bottoms square to fit the manhole base. Grout joint between base and riser with cement mortar.
6. The manhole riser length listed in the plans is based on a 7" manhole casting, plus 2 concrete adjusting rings (5"), plus the "T" dimension shown in the Precast Manhole Covers table.
7. Use corrosion resistant manhole steps with a minimum 800 pound vertical load resistance and a minimum 400 pound horizontal pull-out resistance. Use configuration of steps approved by the Engineer.
8. Precast concrete manhole covers shown are designed for an HS-20 wheel load and maximum fill height of 15'-0". Special design is required for heavier wheel loads and/or greater fill heights.
9. Use of other castings, similar in dimension, is allowed if the casting conforms to the manhole cover and has a lid style specified in the plans. Modifications to the manhole cover to facilitate similar castings are only allowed with written approval from the Engineer.
10. Use castings manufactured in accordance with AASHTO M306-09. Use metal conforming to AASHTO M105 Class 35B in the manufacture of castings.
11. Pipe shall be installed to extend a minimum of 2 inches beyond the inside face of the structure wall at each end. Payment will be based on the actual installed length of pipe between structures, measured end-to-end and rounded to the nearest whole foot.



TOP VIEW



STEP DETAIL

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-14-2013	
REVISIONS	
DATE	CHANGE
6-24-14	Revised notes 1 & 6, added dimensions to Elev. drawing.
10-17-17	Updated to active voice.
12-02-20	Updated PE stamp and signature.
07-24-25	Note Revisions



10/30/24

SIDEWALK

D-750-2

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.

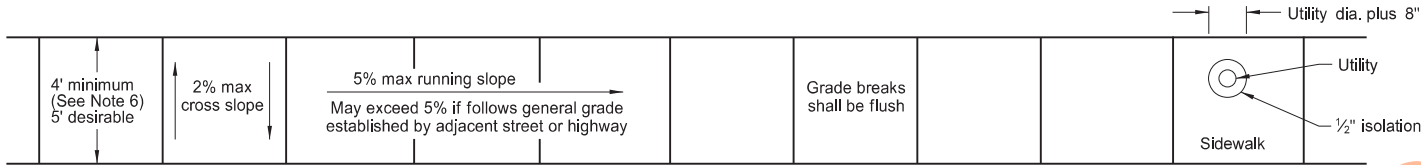
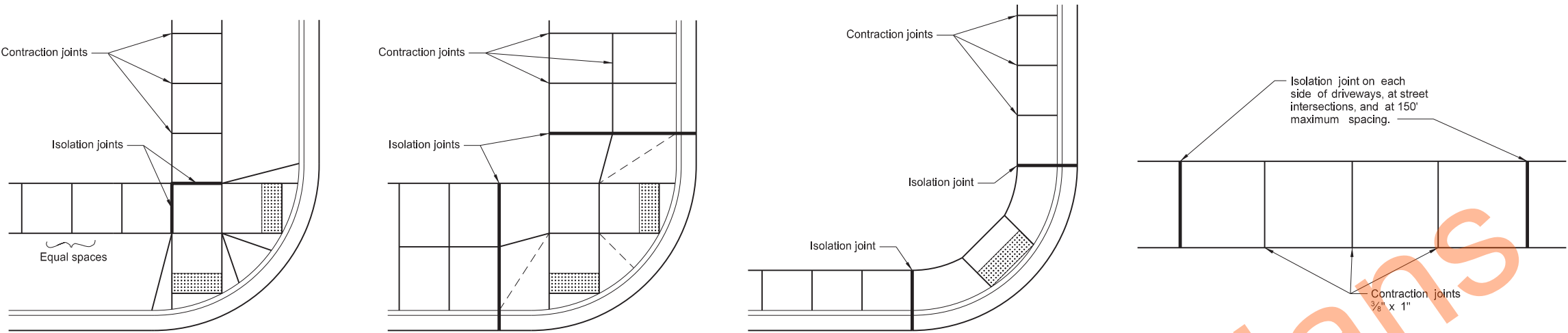
Saw or groove contraction joints to a minimum depth of 1/3 the depth of the concrete.

When sidewalk is adjacent to curb & gutter, vary the sidewalk joint spacing to match curb & gutter joints.

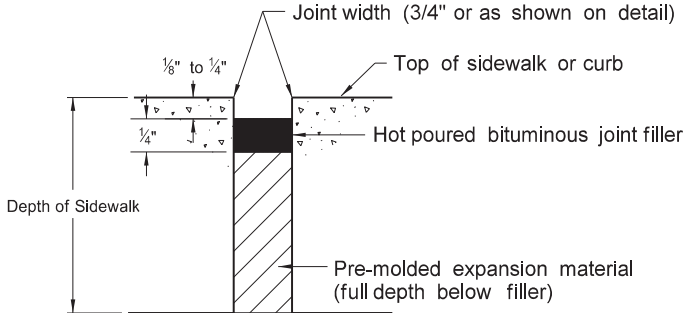
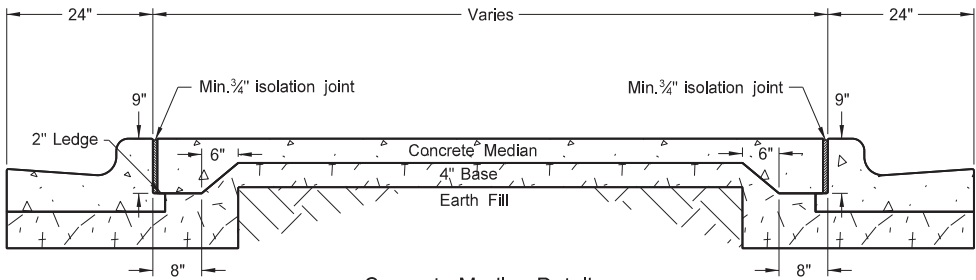
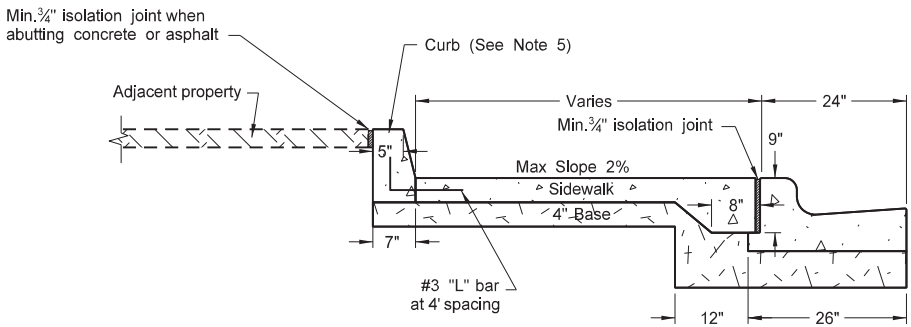
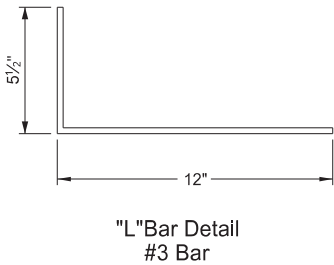
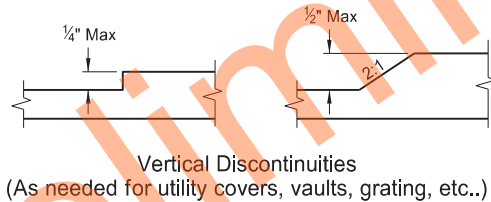
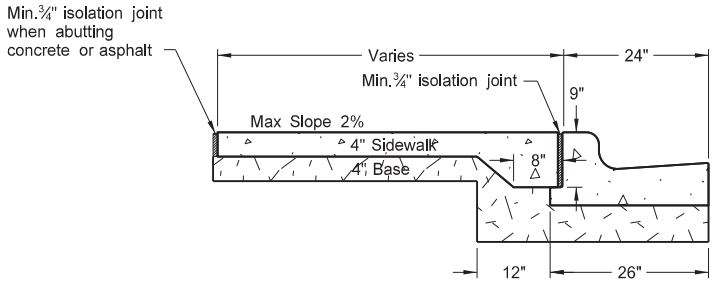
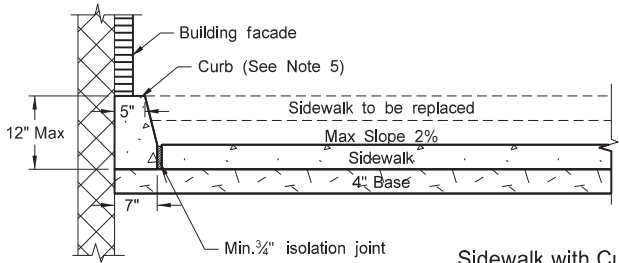
Use isolation joints between separate concrete pours, or between old and new concrete.
3. Include all costs for labor, equipment, and material necessary to construct contraction and isolation joints in the price bid for sidewalk concrete.
4. Use 4" sidewalk concrete thickness unless otherwise specified.
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'.



Utility Blockout



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.



08/09/24

CURB RAMP RETROFIT DETAILS

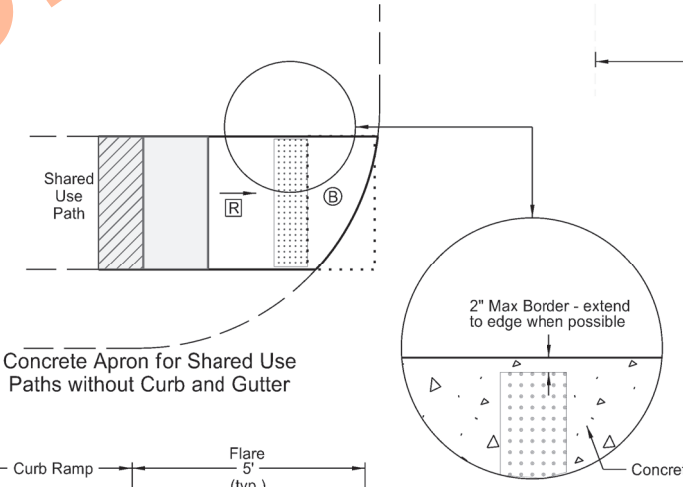
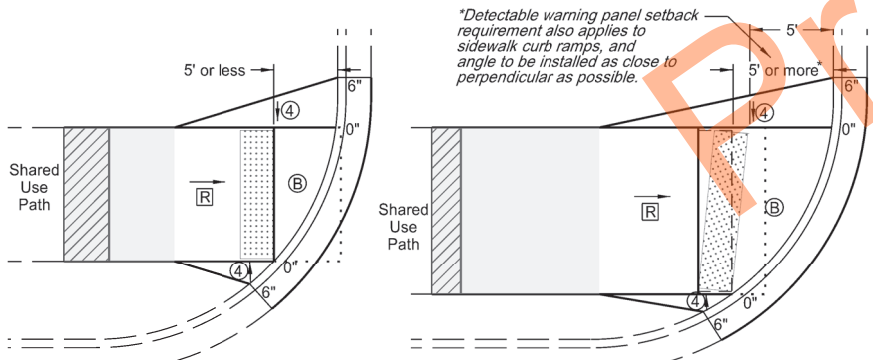
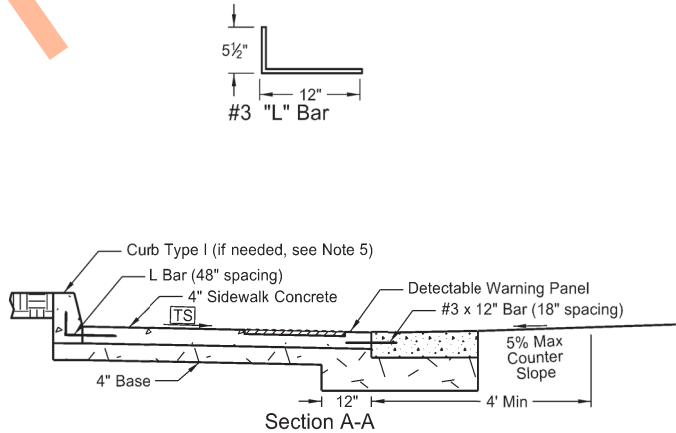
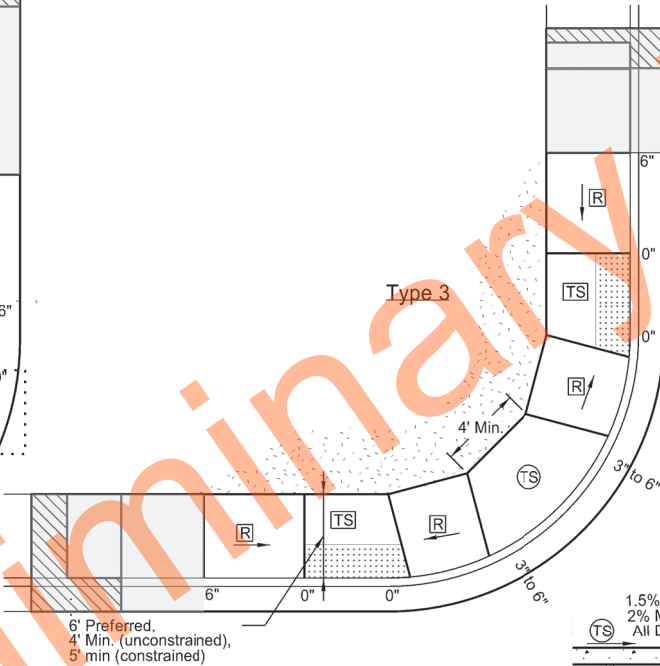
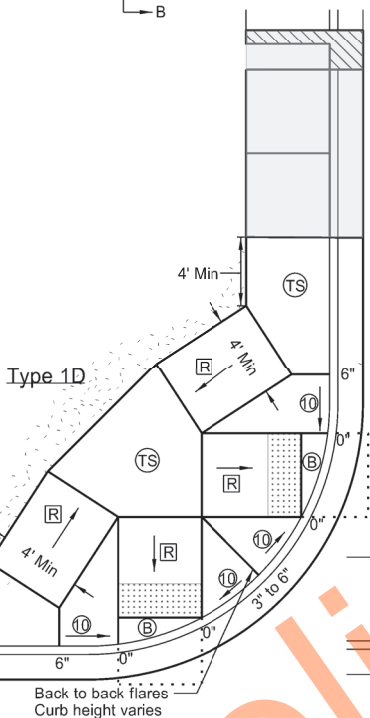
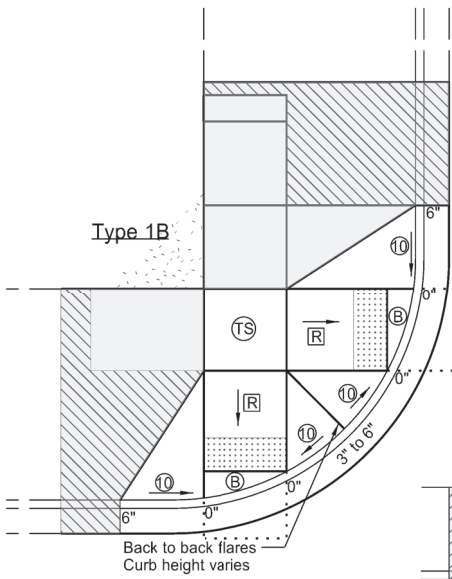
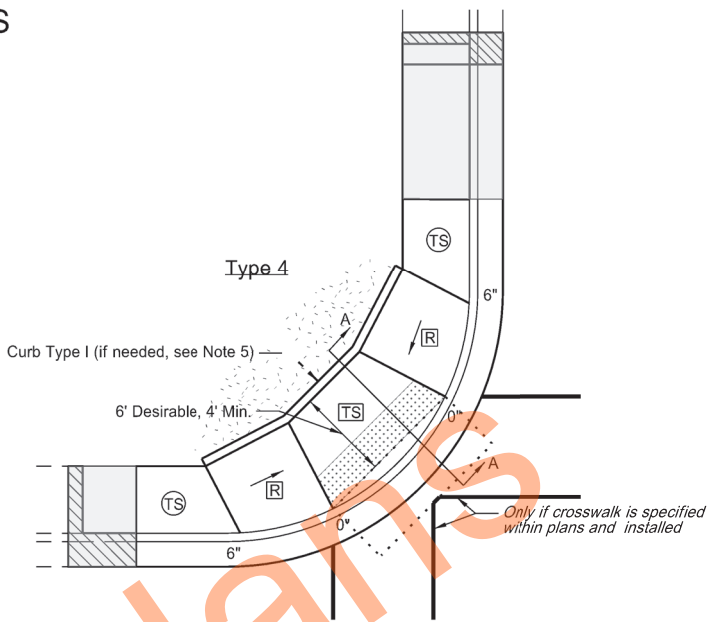
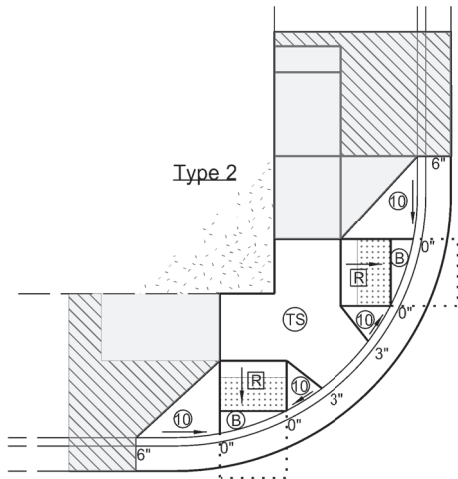
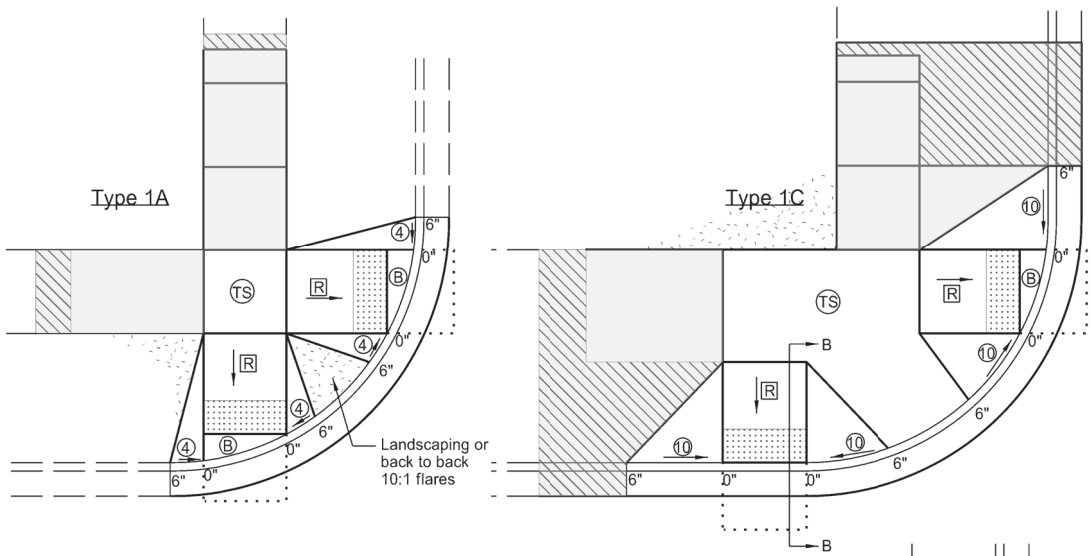
D-750-3

NOTES:

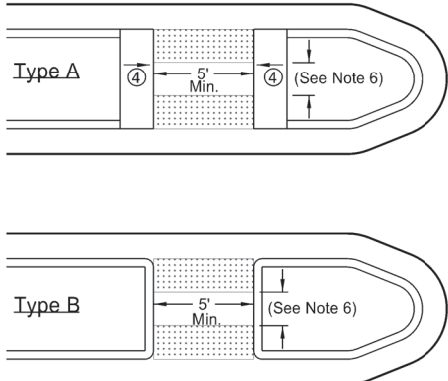
1. Ramp width is the useable portion of the ramp, excluding flares. Match curb ramp width to Existing Pedestrian Facility (EPF) width (4' minimum or 5' for island ramps.) Match ramp width to existing shared use path width. Maximum ramp length is 15'.
2. Provide turning space with desirable 5' x 5' size 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 1" 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:

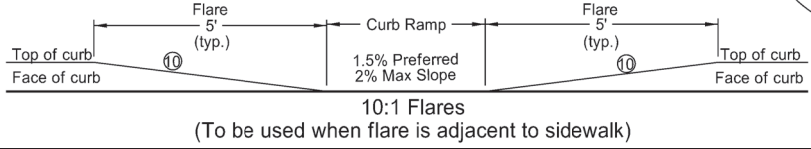
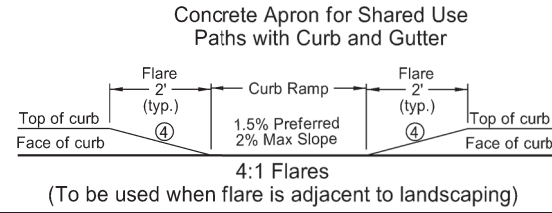
- Detectable Warning Panel.
- Landscaping.
- Transitional tie-in to nearest joint, if needed.
- Curb Ramp Retrofit Transitional Area (See Standard Drawing D750-4)
- 4' long x width of EPF or 4' minimum Clear space outside traffic lanes of travel. 1.5% preferred cross slope 2% maximum cross slope 4.7% 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.



Median Refuge Islands (Cut-Through)

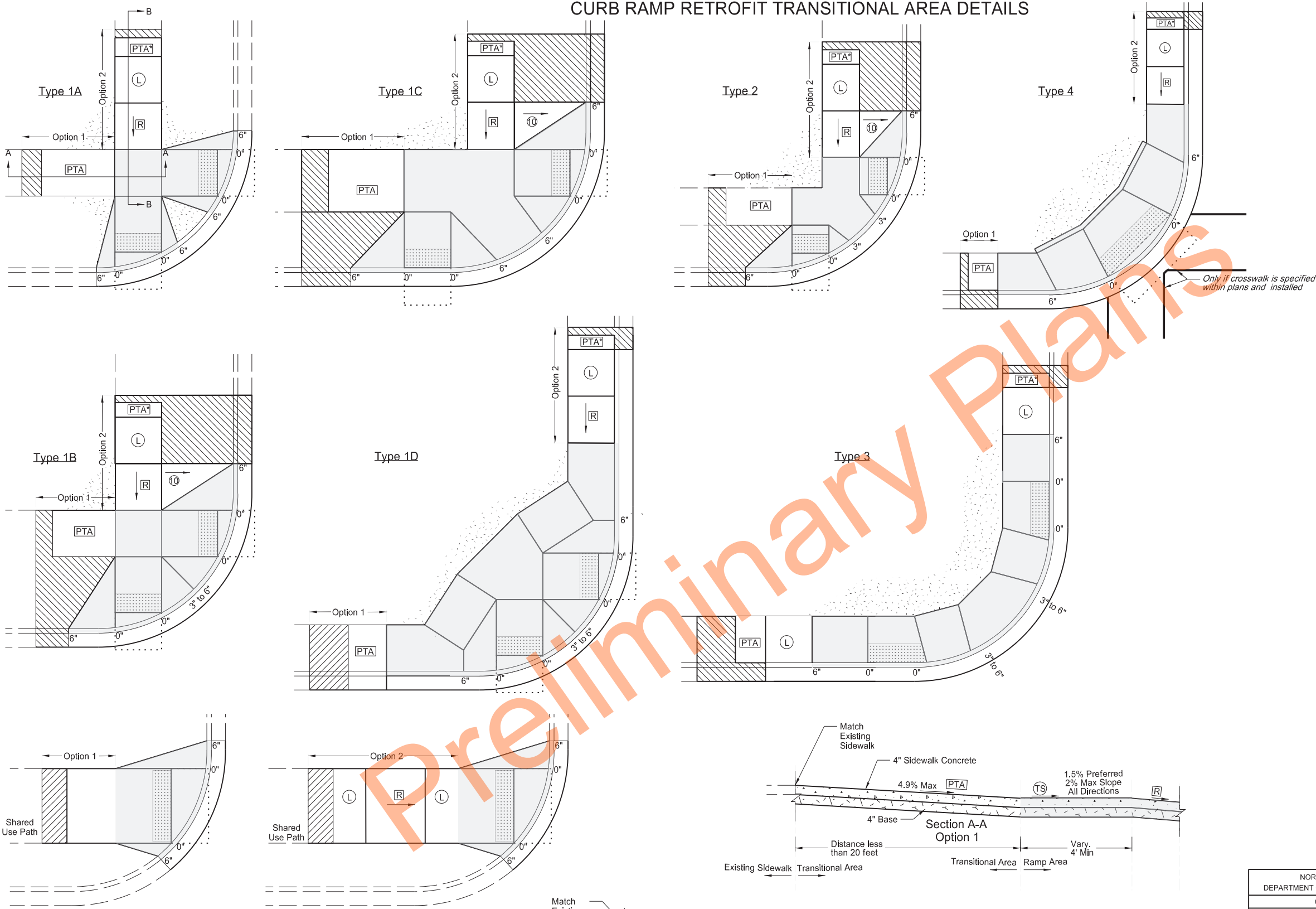


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-26-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
09-05-18	Revised Notes, Revision for Turning Space, Added Passing Space Requirements, Turned Detectable Warning Panel
03-15-21	Slope & other clarifications.
05-19-21	Separate Curb Ramp Transition Area from Curb Ramp area



CURB RAMP RETROFIT TRANSITIONAL AREA DETAILS

D-750-4



- 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.

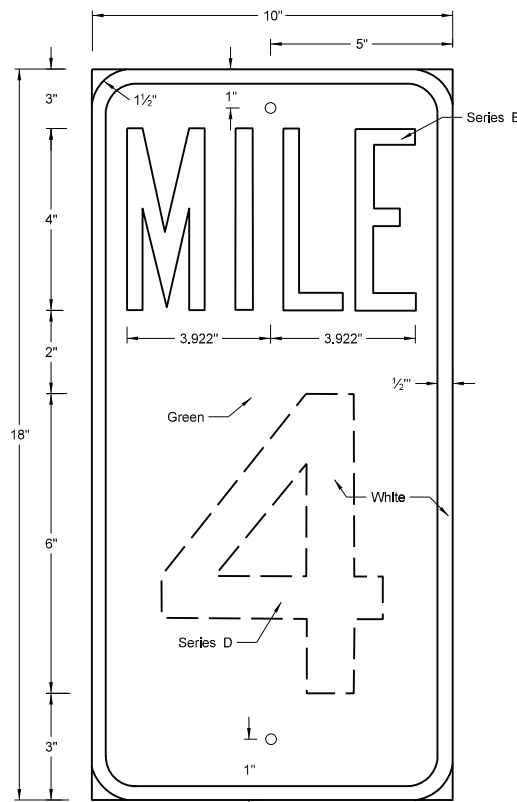
- LEGEND:
- [Pattern] : Detectable Warning Panel.
 - [Pattern] : Landscaping.
 - [Pattern] : Transitional tie-in to nearest joint, if needed.
 - [Pattern] : Curb Ramp Retrofit Area (See Standard Drawing D750-3)
 - [Pattern] : 4' long x width of EPF or 4' minimum Clear space outside traffic lanes of travel. 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

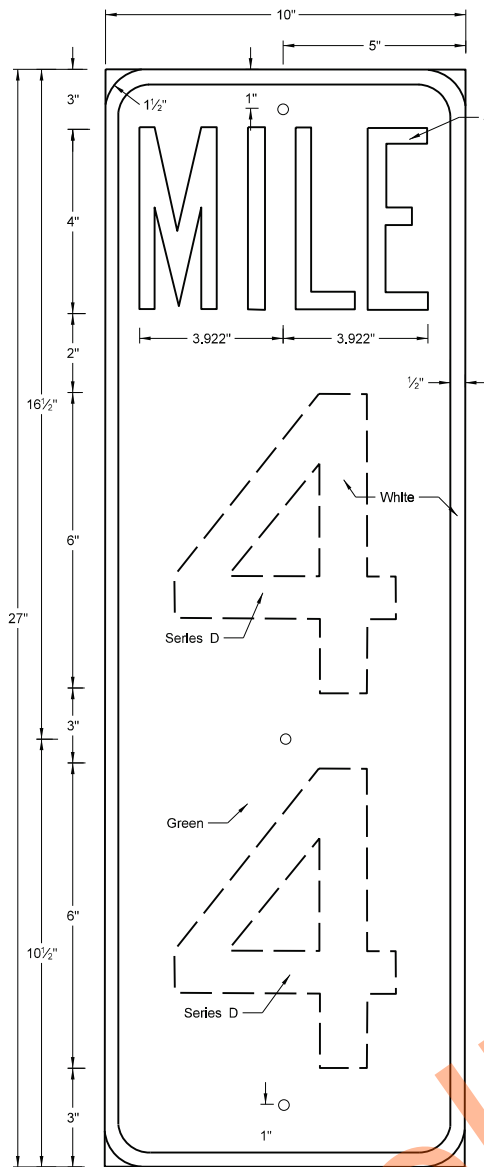
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
05 19 2021

(CONVENTIONAL USE) REFERENCE MARKERS

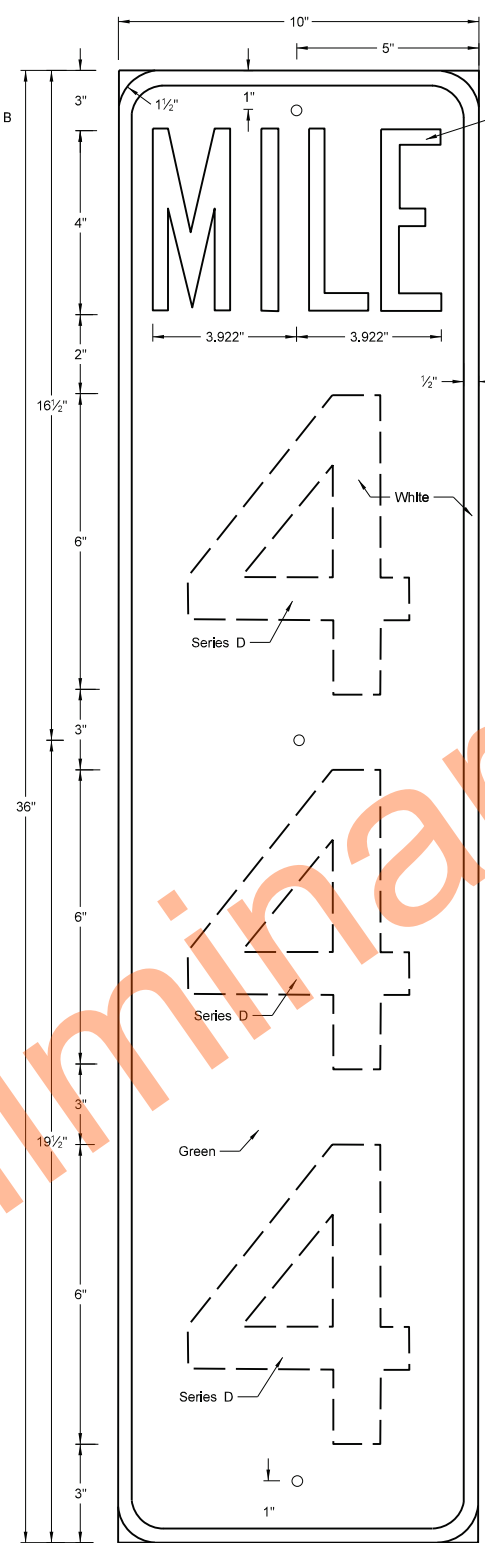
D-754-19



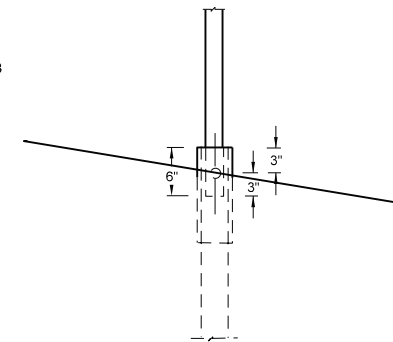
TYPE A
Area = 1.25 S.F.



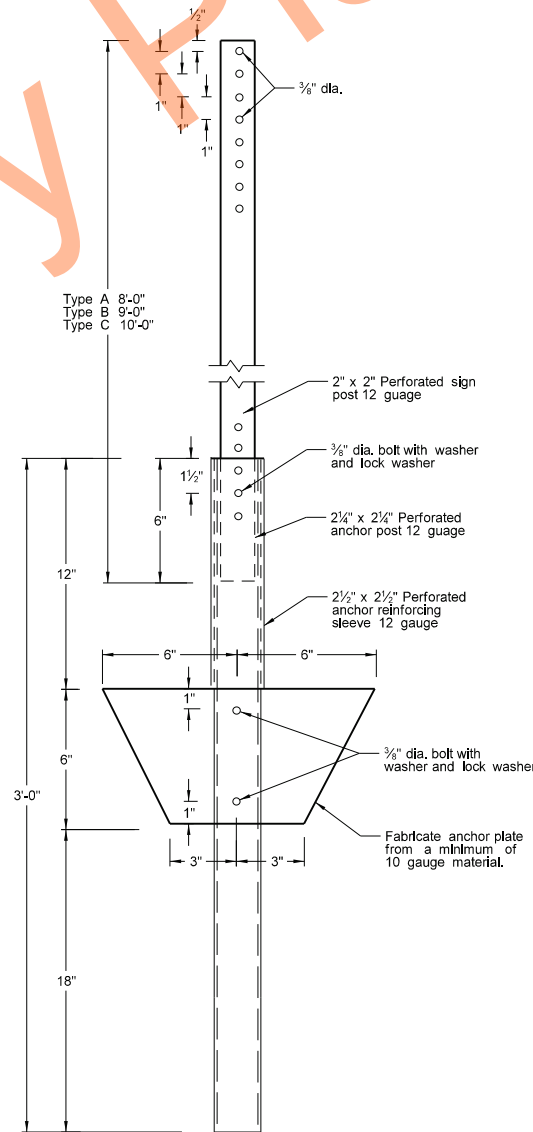
TYPE B
Area = 1.88 S.F.



TYPE C
Area = 2.50 S.F.

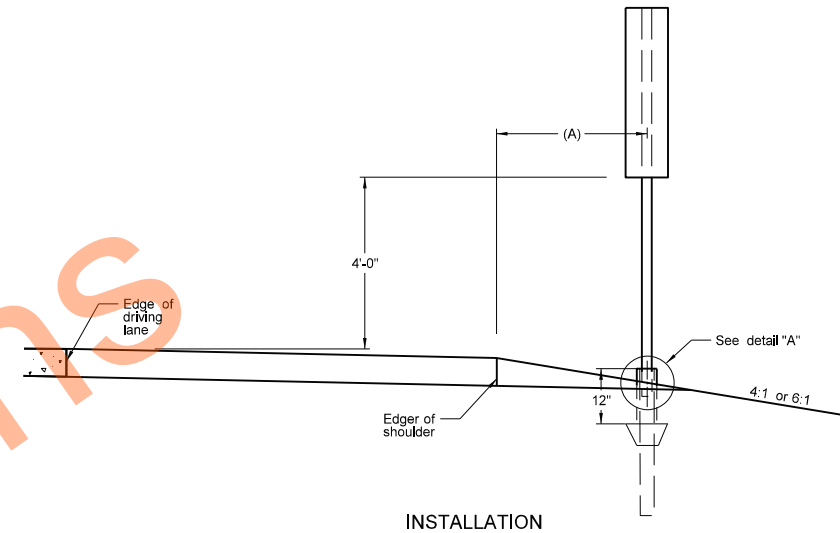


DETAIL "A"

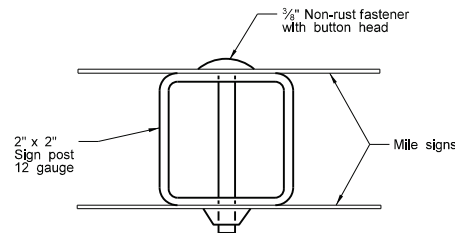


POST AND ANCHOR PLATE DETAIL

(A) 8' Clearance to finished shoulder or in line with existing delineator posts.



- NOTES:
- Installation: Install posts along right shoulder.
 - Sign: Fabricate backing of 0.080 aluminum.
 - Fasteners: Attach signs to post with tension pin type fastener or other suitable vandal resistant non-rust fastener.
 - Reflective Sheeting: Use Type IV sheeting.
 - Numbers: Use screened or applied copy numbers of the series shown.



ASSEMBLY DETAIL
(back to back)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
7-8-14	Revised post and reflective sheeting notes
8-30-18	Updated to active voice.
8-29-19	New Design Engineer PE Stamp.
8-05-24	Electronic Stamp/Signature.

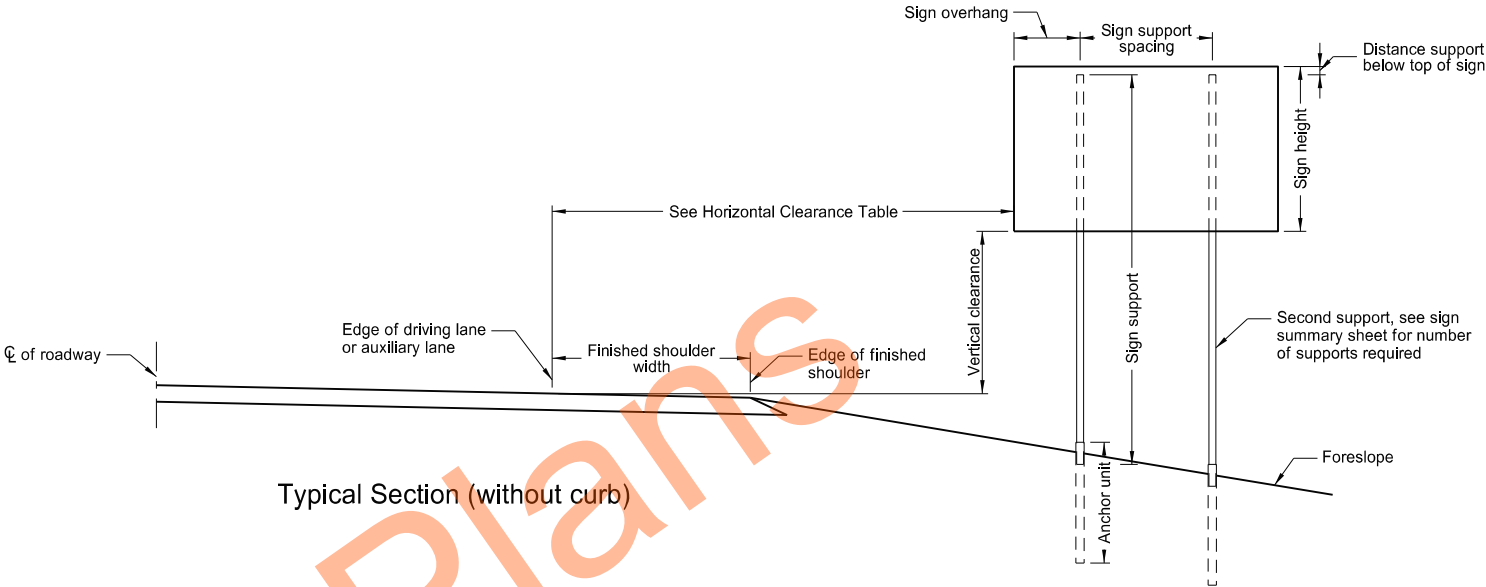


PERFORATED TUBE ASSEMBLY DETAILS

D-754-23

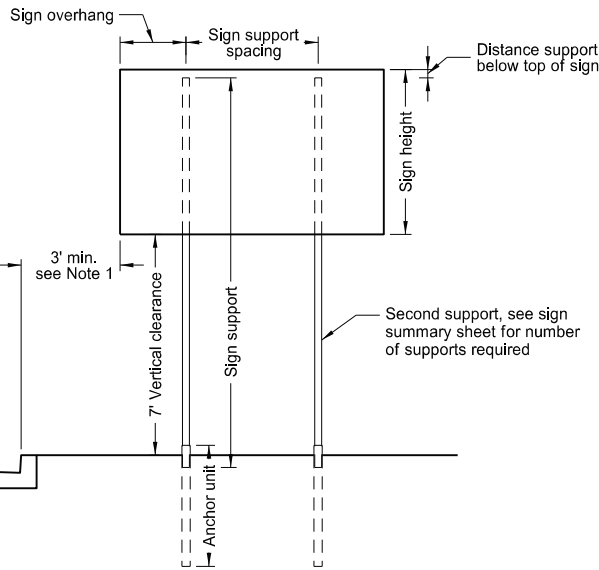
Notes:

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'.

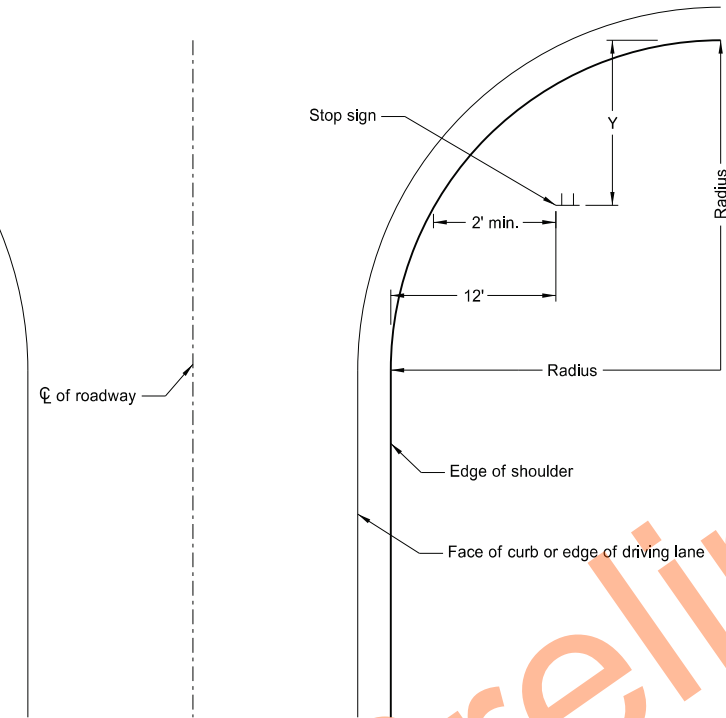


Typical Section (without curb)

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

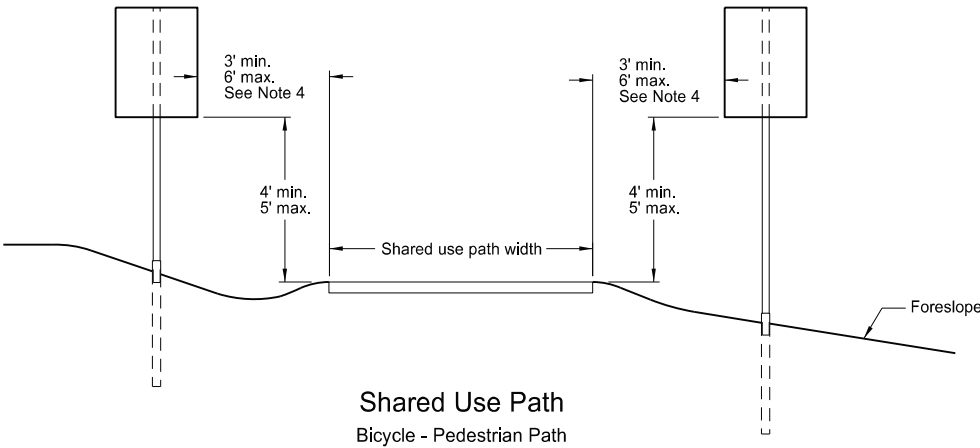


Typical Section (with curb)
Residential or Business District



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



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.



Breakaway Coupler System
for Perforated Tubes

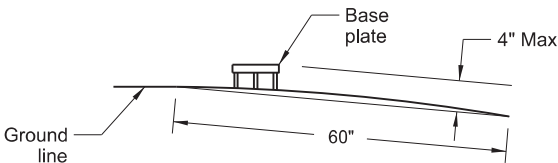
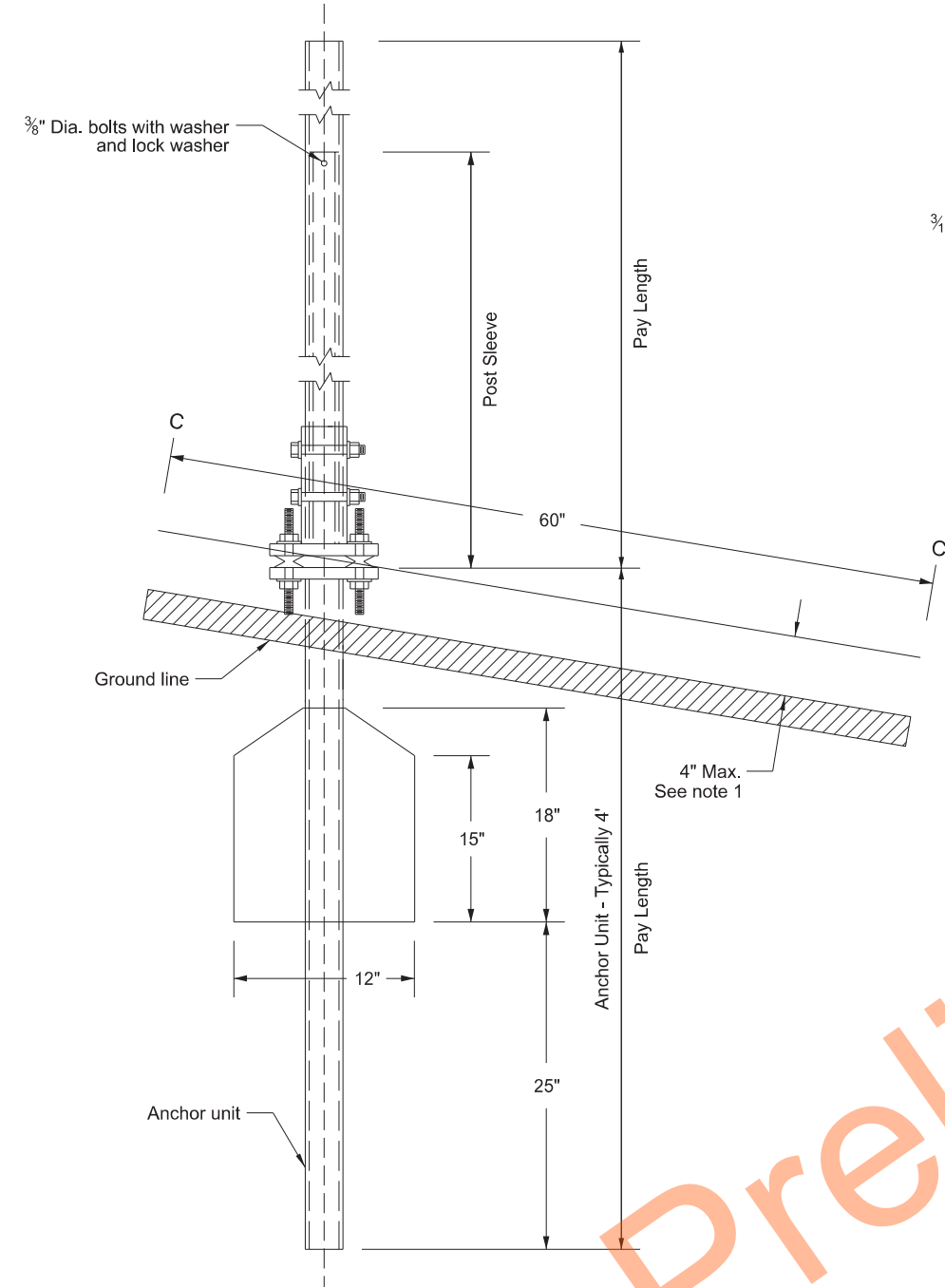
Notes:

- 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.
- Use anchor unit of the same size and specification as the post.
- Provide a minimum 8' distance between the first and fourth post on four post signs.
- 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 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	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	2¾	10	Yes		7

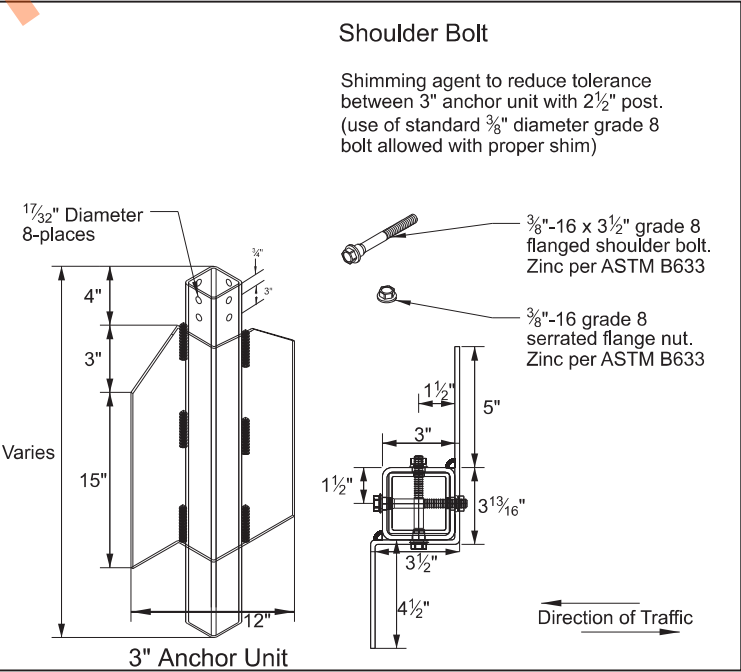
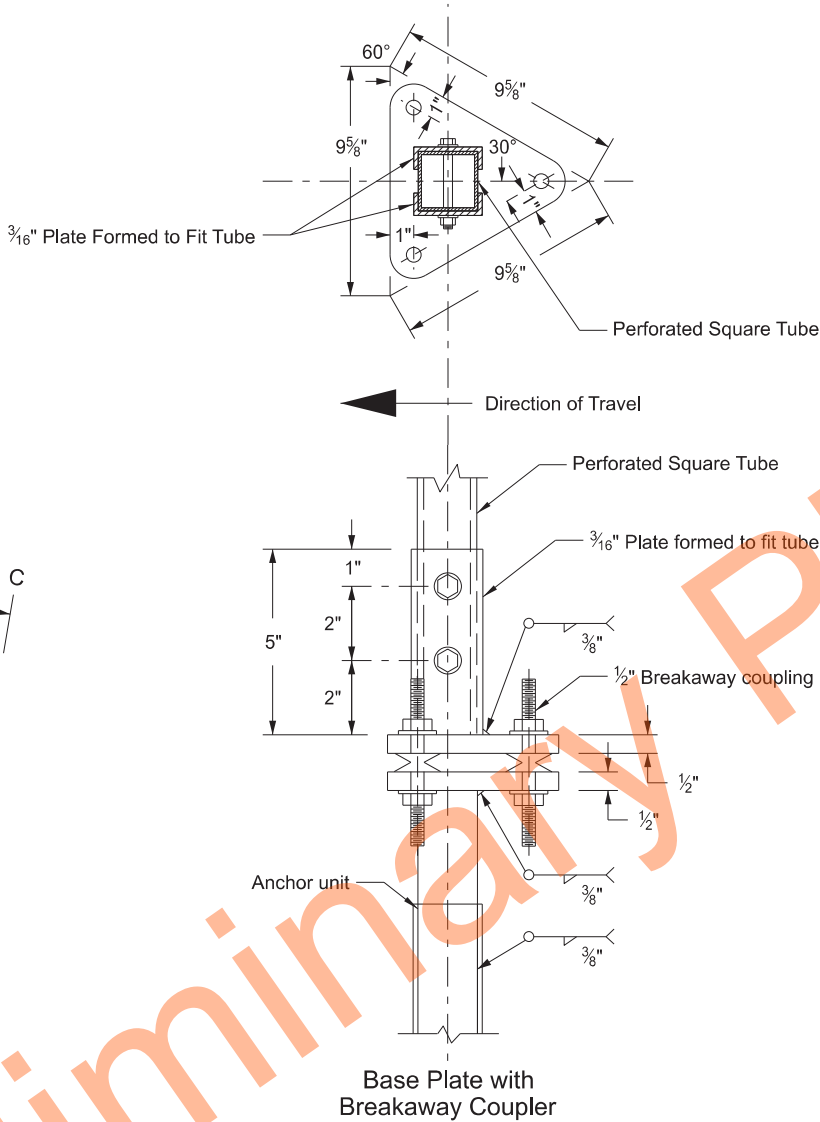
(B) - 2½" 12 gauge posts do not need breakaway bases unless support is placed in boggy, wet, or loose soil areas.

(C) - 3" anchor unit



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.

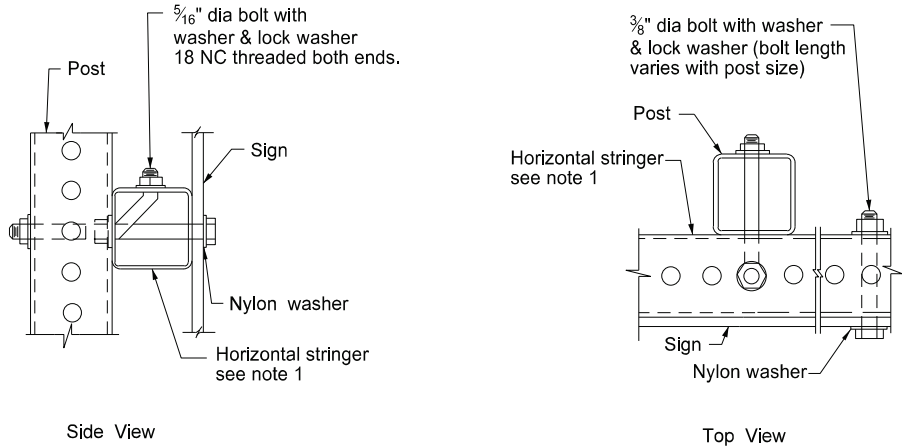


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-2013	
REVISIONS	
DATE	CHANGE
08-30-18	Updated notes to active voice.
08-30-19	New Design Engr PE Stamp.
08-05-24	Electronic Stamp/Signature.
07-22-25	Corrected "typo" in C-C note.

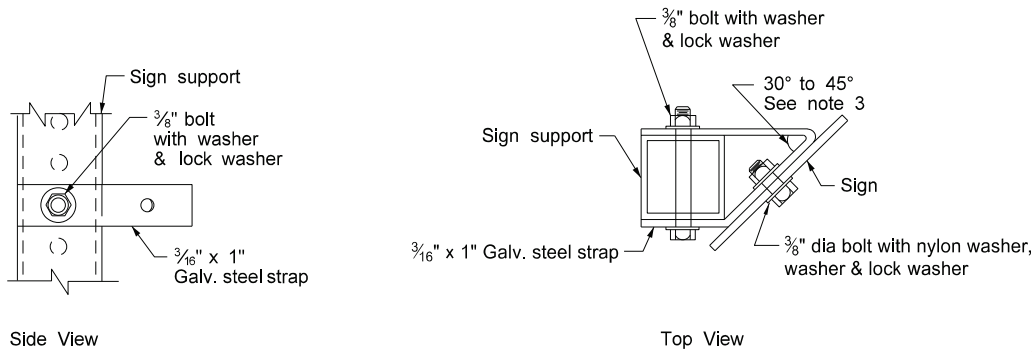


07/22/25

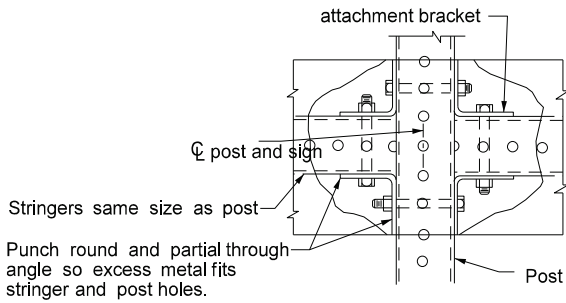
Mounting Details Perforated Tube



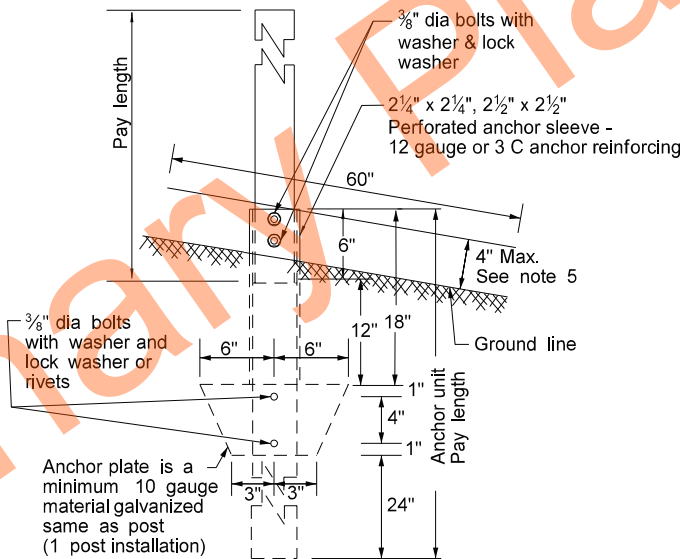
STRINGER MOUNTING
(WITH STRINGER IN FRONT OF POST)



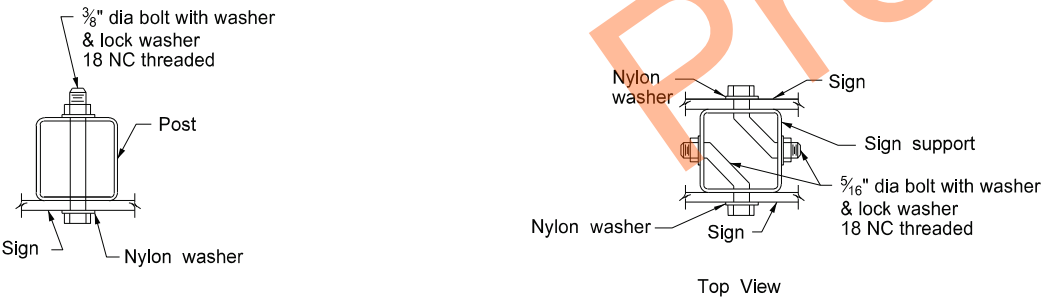
STRAP DETAIL



STREET NAME SIGNS AND ONE WAY SIGNS
SINGLE POST ASSEMBLY
ONE STRINGER OR BACK TO BACK MOUNTING

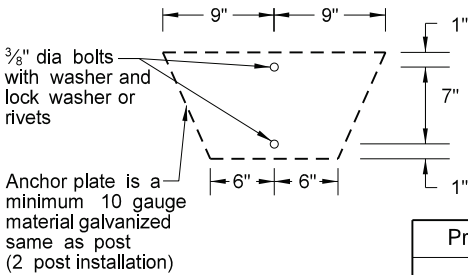


ANCHOR UNIT AND POST ASSEMBLY



BOLT MOUNTING

BACK TO BACK MOUNTING



Note:

1. Horizontal stringers - Use perforated tubes or 1 3/4" x 3/16" thick, 1.08 lbs./ft aluminum or 3.16 lbs./ft steel z bar stringers.
2. Use minimum outside diameter 1 5/16" ± 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.

Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thickness Gauge	Sleeve Size In.	Wall Thickness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thickness Gauge
1	2	12			No	2 1/4	12
1	2 1/4	12			No	2 1/2	12
1	2 1/2	12			(B)	3(C)	7
1	2 1/2	10			Yes		7
1	2 1/4	12	2 1/2(D)	12	Yes		7
1	2 1/2	12	2 1/4	12	Yes		7
2	2 1/2	10			Yes		7
2	2 1/4	12	2 1/2(D)	12	Yes		7
2	2 1/2	12	2 1/4	12	Yes		7
3 & 4	2 1/2	12			Yes		7
3 & 4	2 1/2	10			Yes		7
3 & 4	2 1/2	12	2 1/4	12	Yes		7
3 & 4	2 1/4	12	2 1/2(D)	12	Yes		7
3 & 4	2 1/2	10	2 3/16	10	Yes		7

(B) - When placing 2 1/2", 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) - 2 1/2" x 12 ga. x 18" minimum length external sleeve required.

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	
1 1/2 x 1 1/2	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	
2 1/4 x 2 1/4	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	
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643	
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.783	

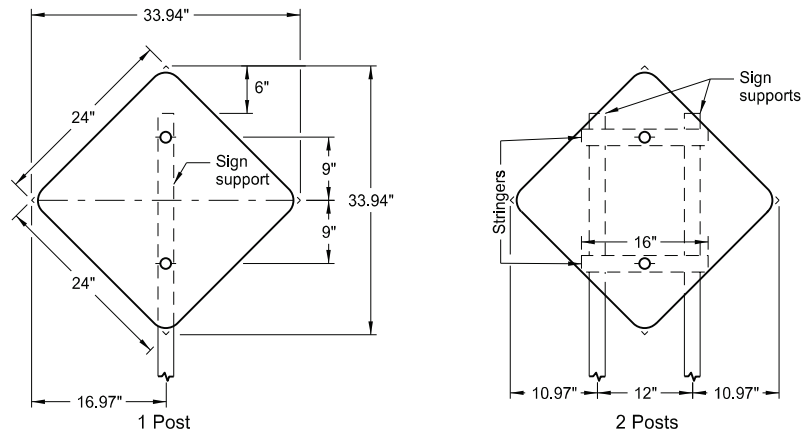
The 2 3/16" size 10 gauge is shown as 2.19" size on the plans.
The 2 1/2" size is shown as 2.51" size on the plans.

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.

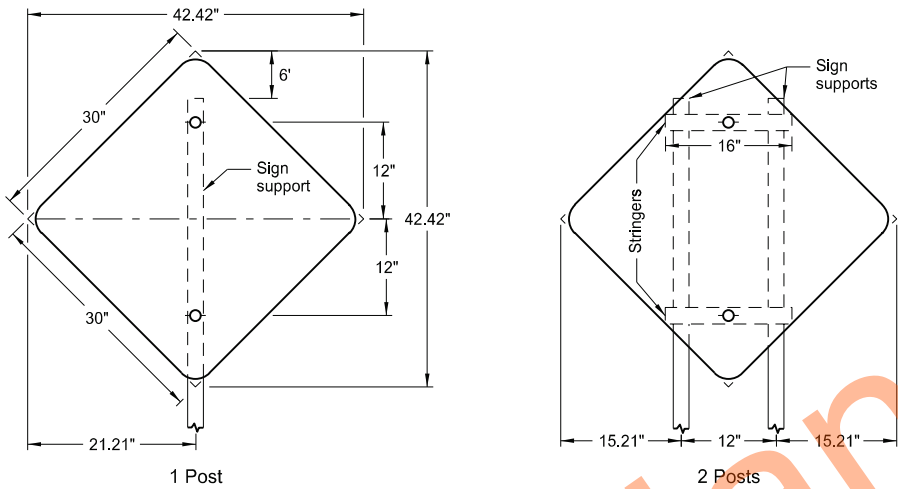


08/05/24

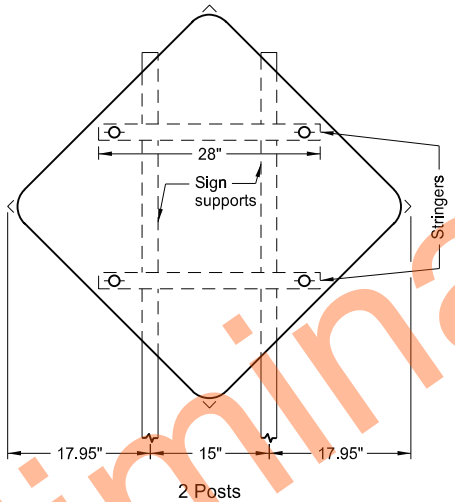
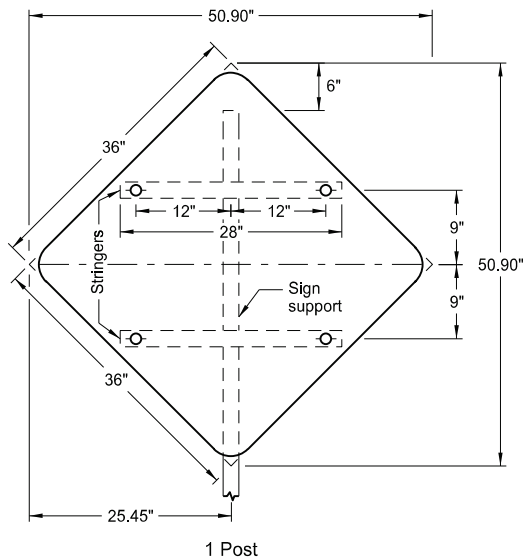
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION
DETAILS REGULATORY, WARNING AND GUIDE SIGNS



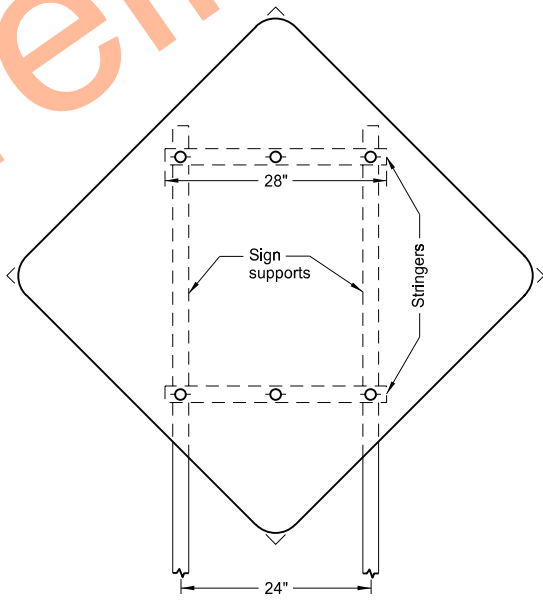
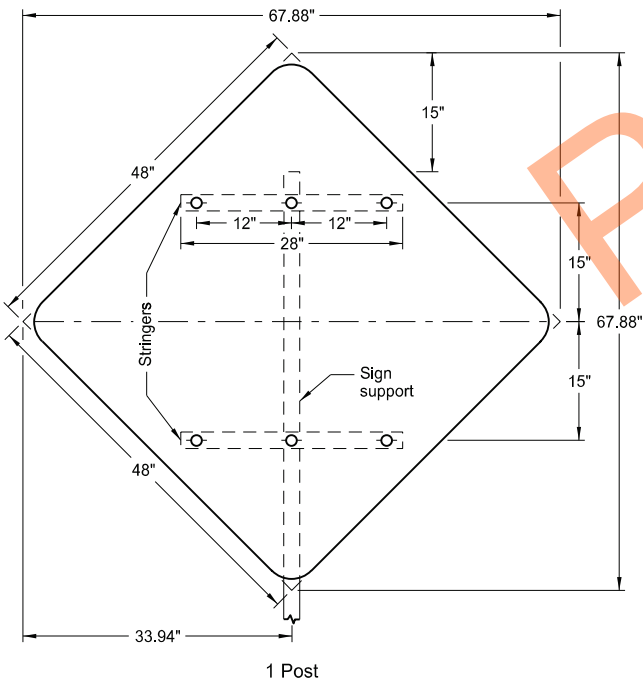
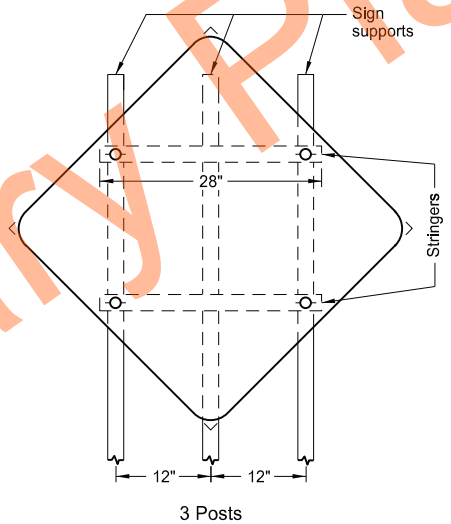
Assembly No. 18



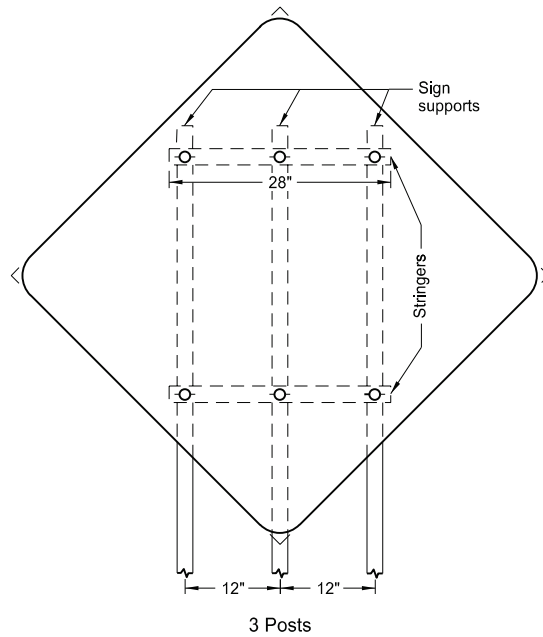
Assembly No. 19



Assembly No. 20



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.

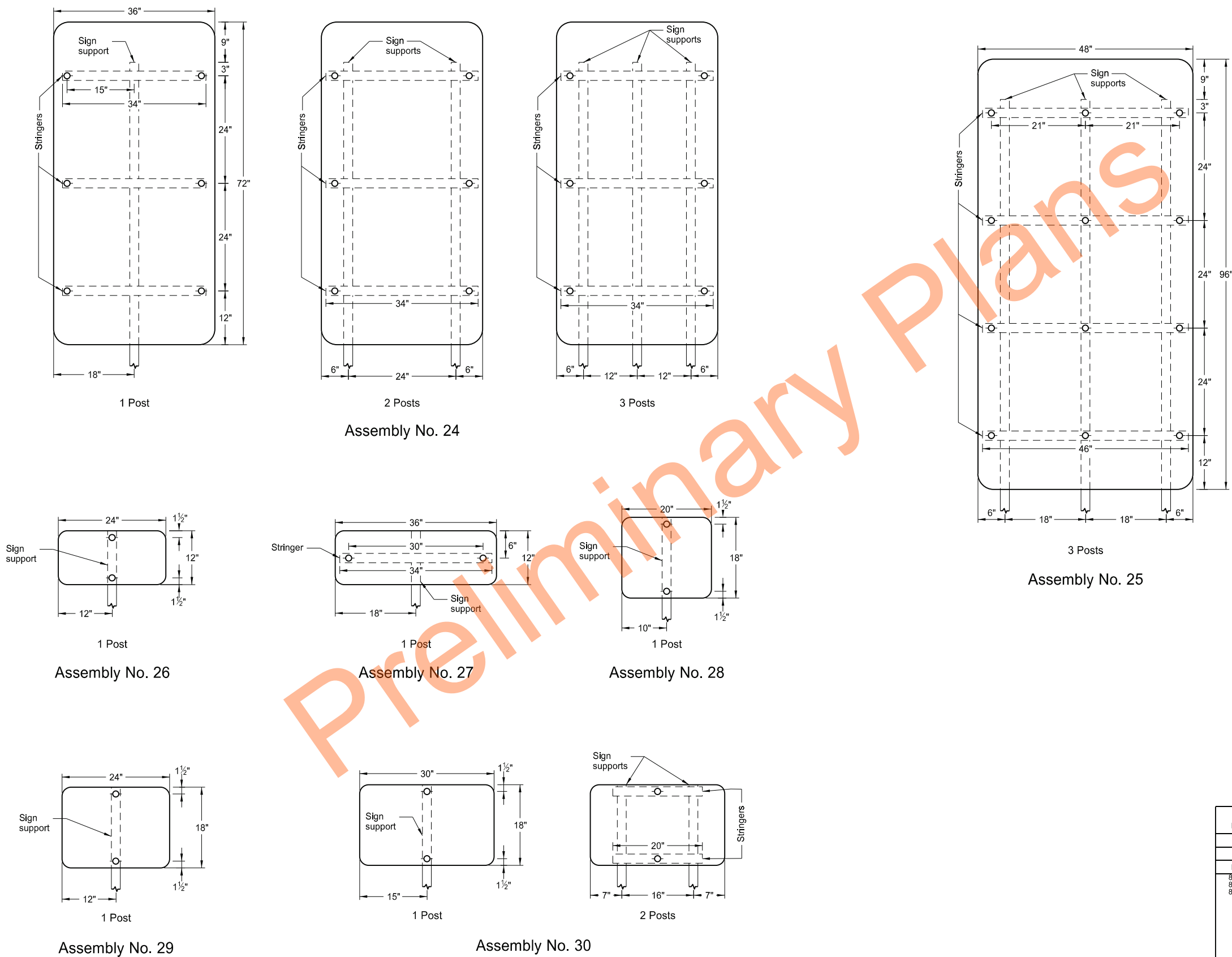
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
8-30-19	New Design Engineer PE Stamp.
8-06-24	Electronic Stamp/Signature.



08/06/24

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION
DETAILS REGULATORY, WARNING AND GUIDE SIGNS

D-754-31

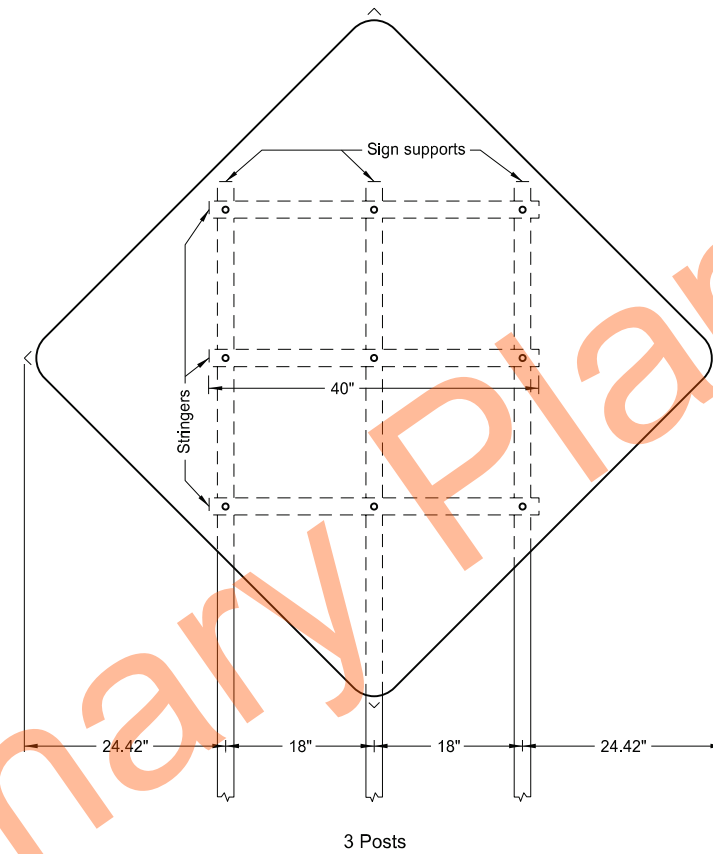


- Notes:
- 1. Use 0.100 inch minimum thickness sign backing material.
 - 2. Use 1 1/2" x 1 1/2" perforated square tube stringers.
 - 3. Punch holes round for 3/8" bolt.

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.

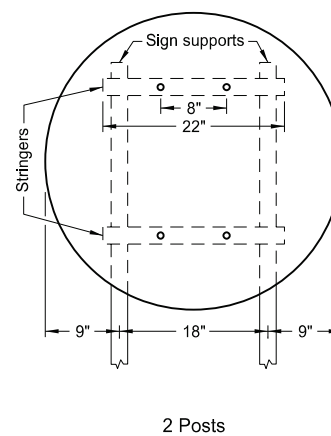


D-754-40



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.

ASSEMBLY NO. 62



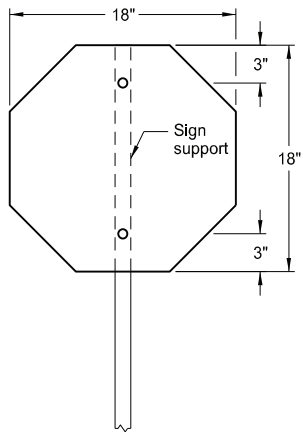
ASSEMBLY NO. 63

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.

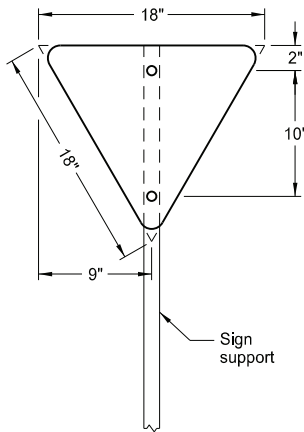


08/06/24

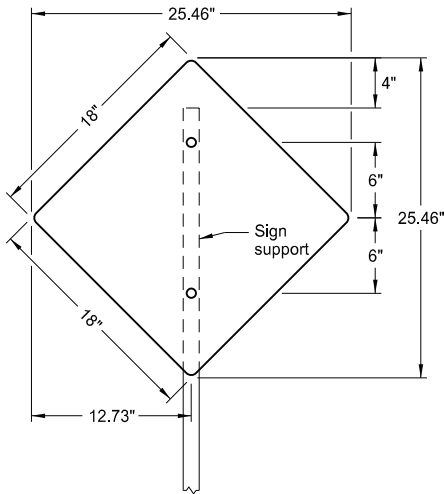
PUNCHING, STRINGER, AND SUPPORT LOCATION DETAILS
FOR REGULATORY, WARNING AND GUIDE BIKE ROUTE SIGNS



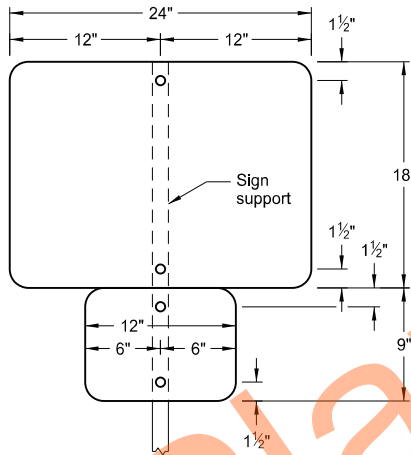
1 Post
Assembly No. 100



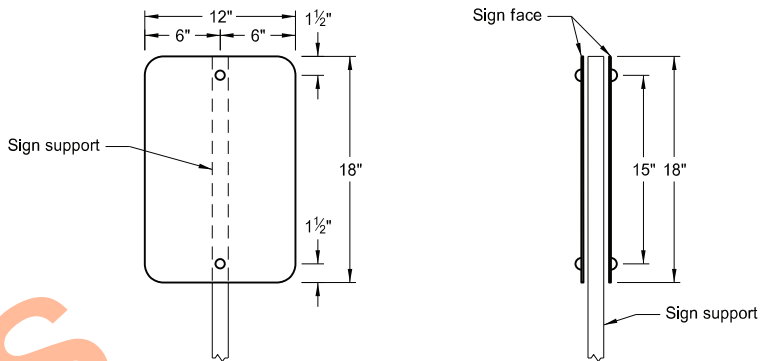
1 Post
Assembly No. 101



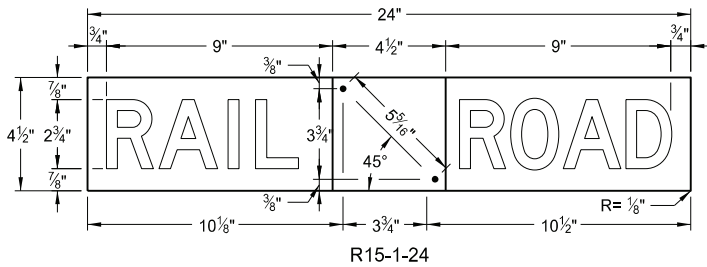
1 Post
Assembly No. 102



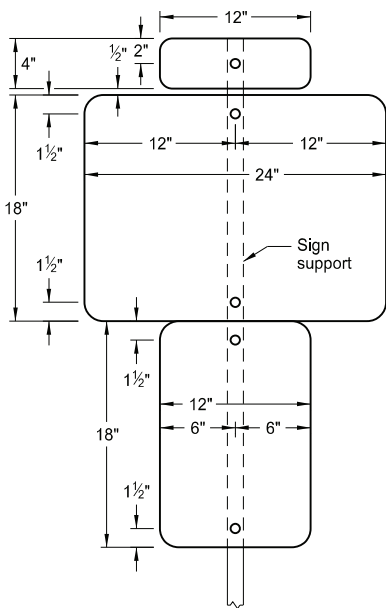
1 Post
Assembly No. 103



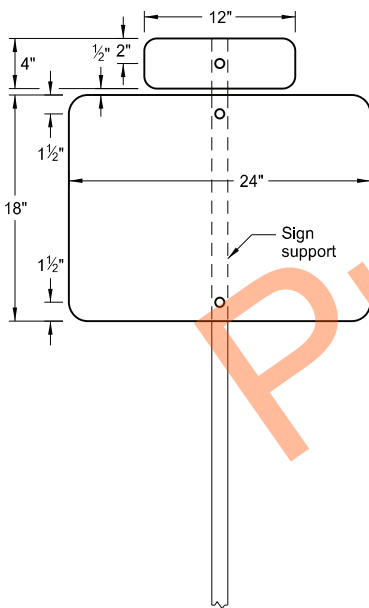
1 Post
back to back
Assembly No. 104



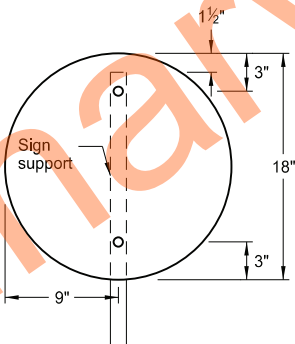
R15-1-24



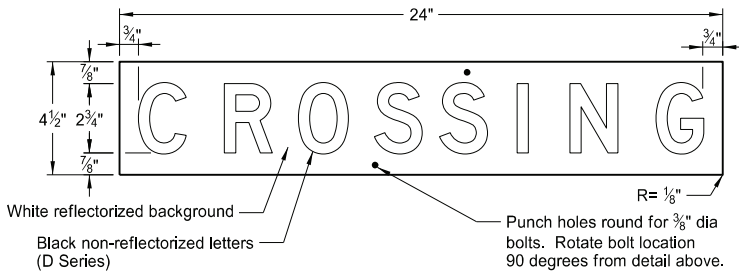
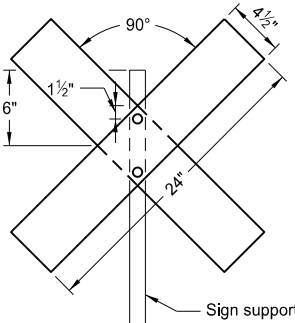
1 Post
back to back
Assembly No. 105



1 Post
Assembly No. 106



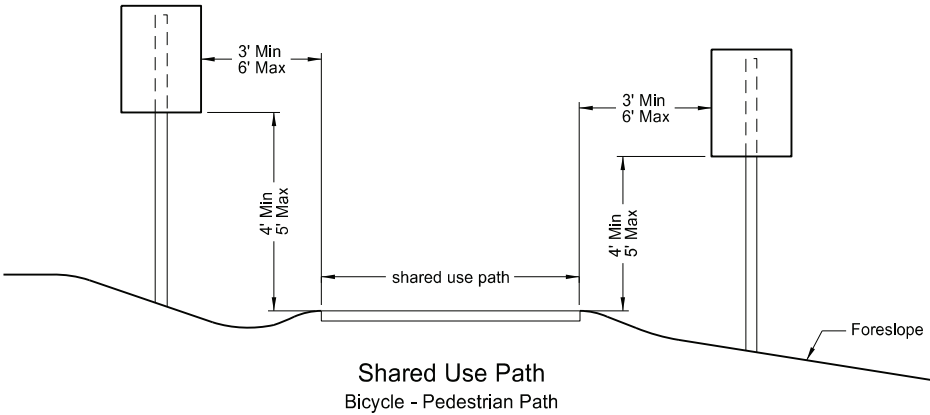
1 Post
Assembly No. 107



R15-1-24

Railroad Crossing Sign Details

- Notes:
1. Use 0.100 inch minimum thickness sign backing material.
 2. Punch holes round for 3/8" bolt.



Shared Use Path
Bicycle - Pedestrian Path

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE
9-18-15	Revised Title Name.
8-30-18	Updated notes to active voice.
9-04-19	New Design Engineer PE Stamp.
8-07-24	Electronic Stamp/Signature.



08/07/24



Rotate bolt location 90° as shown in the Crossing Sign Detail.

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

Nylon washers
and metal washers

Sign

$\frac{3}{8}$ " dia. bolt 18 N.C.
threaded both ends

Section A-A

Layout for Obtuse Angle Intersection

Layout for Acute Angle Intersection

Crossing Sign Detail
R15-1-48

Railroad Advance Warning Sign Assembly

Layout for Right Angle Intersection

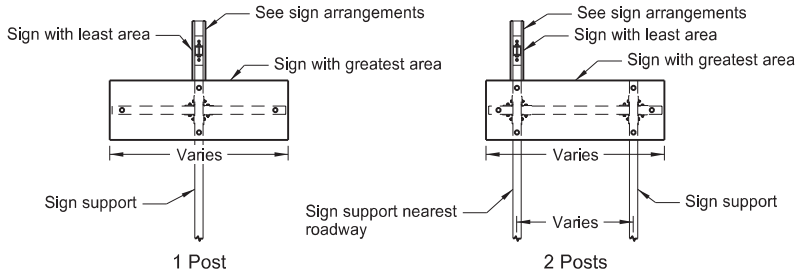
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-10-13	
REVISIONS	
DATE	CHANGE
11-4-13 10-25-19 8-8-24	Anchor Unit detail was removed. Updated notes to active voice. Electronic Stamp/Signature.



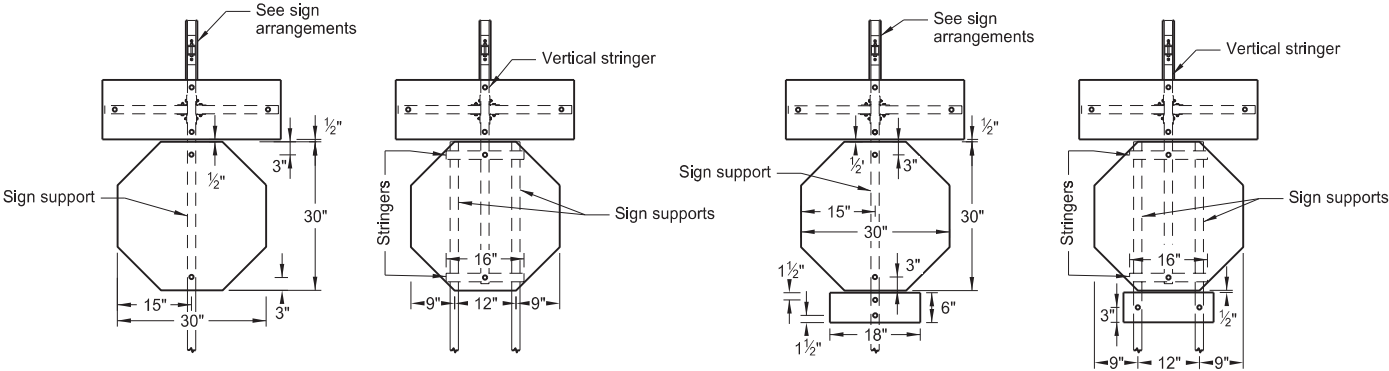
08/08/24

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS
FOR STREET NAME SIGNS AND 911 SIGNS

- 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

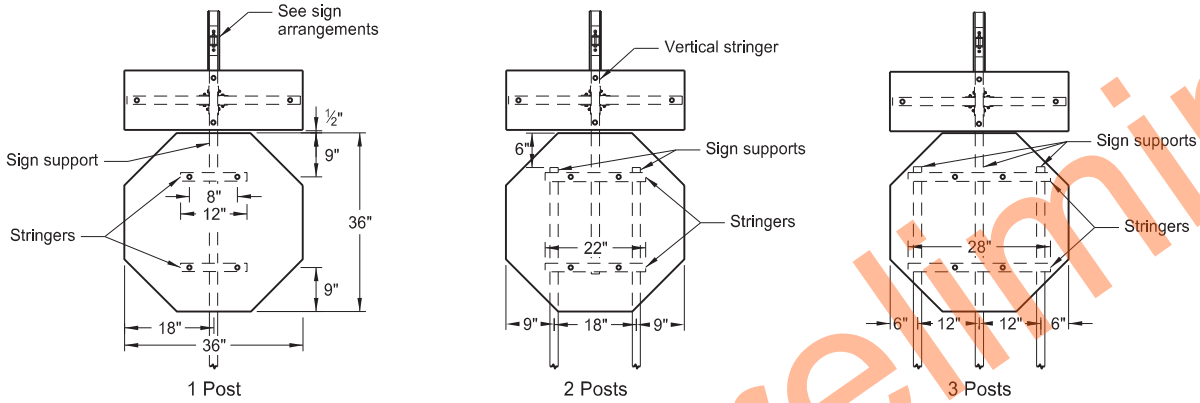


Special Assembly 1 (A, B, C, D or E)

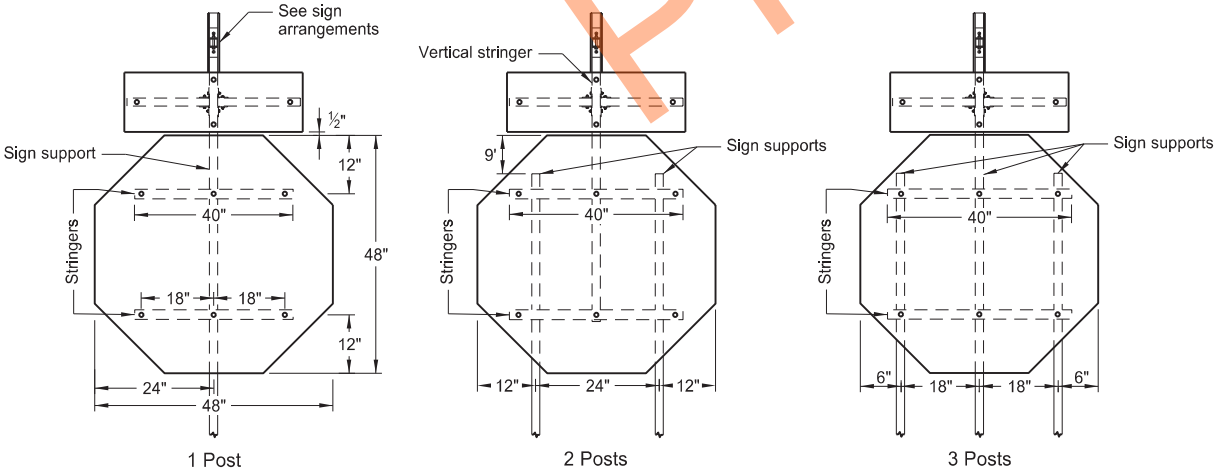


Special Assembly 2 (A, B, C, D or E)

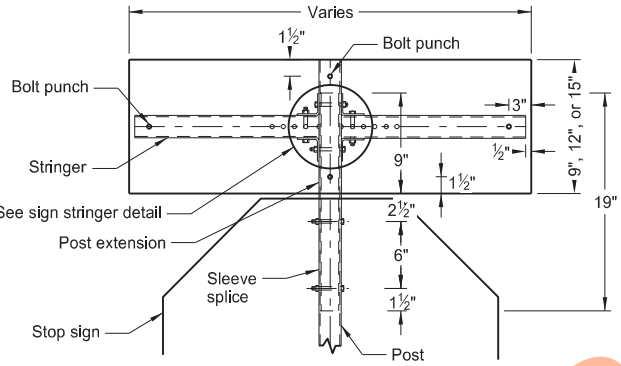
Special Assembly 3 (A, B, C, D or E)



Special Assembly 4 (A, B, C, D or E)

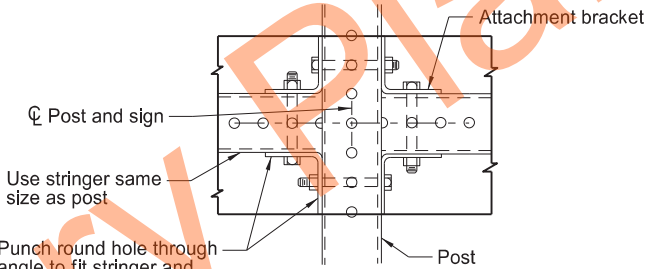


Special Assembly 5 (A, B, C, D or E)

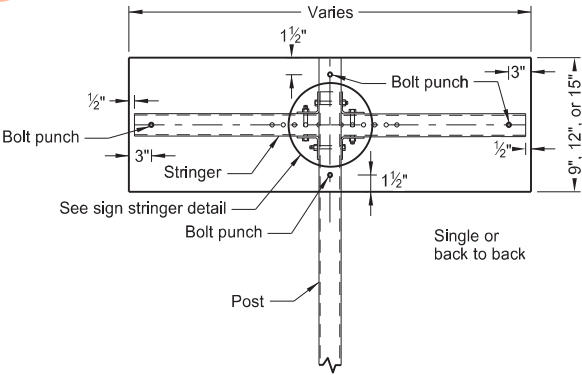


Front View
Sleeve Splice Detail

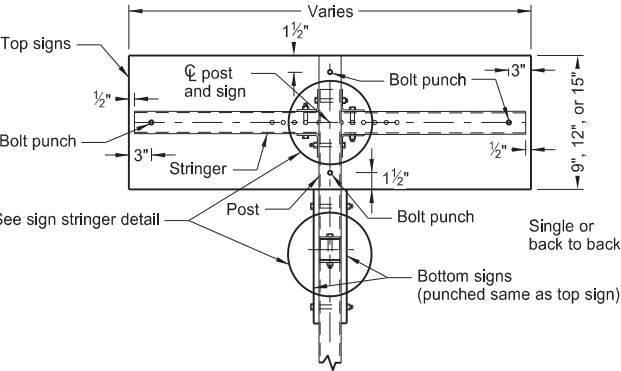
Note: Only use splice method with approval of engineer.



Sign Stringer Detail

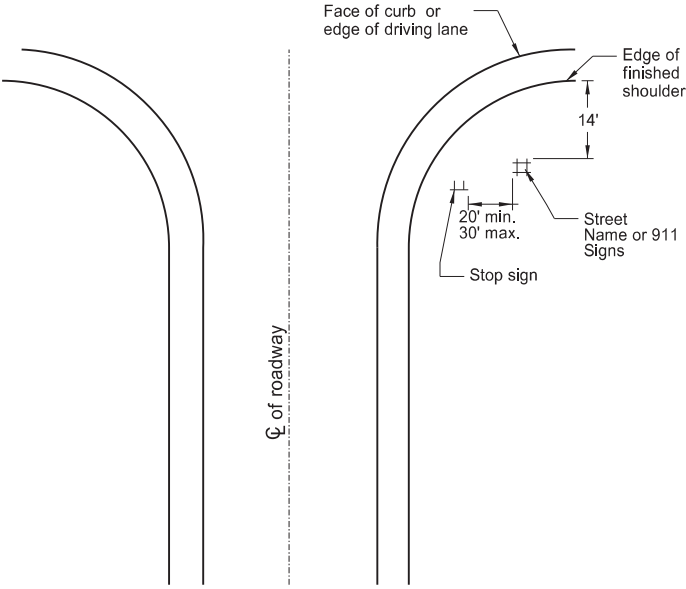


Detail A or B



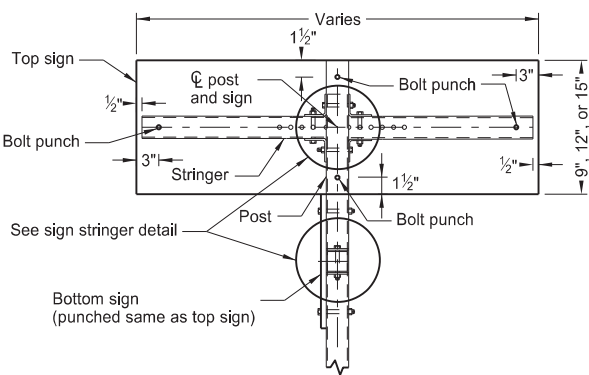
Detail D or E

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 C

Sign Arrangements

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.



[illegible]

Technical drawing of a complex shape with dimensions and radii. The overall width is 11'-8". The overall height is 8'-4". The shape features several internal dimensions and radii:

- Top horizontal dimension: 11'-8"
- Left vertical dimension: 8'-4"
- Top-left horizontal dimension: 3'-0"
- Top-left horizontal dimension: 8"
- Top-left vertical dimension: 2'-8"
- Top-right vertical dimension: 2'-4"
- Right vertical dimension: 1'-8"
- Right vertical dimension: 2'-4"
- Bottom-right vertical dimension: 2'-0"
- Bottom horizontal dimension: 5'-4"
- Bottom horizontal dimension: 1'-0"
- Bottom horizontal dimension: 5'-4"
- Internal horizontal dimension: 2'-8"
- Internal horizontal dimension: 4"
- Internal horizontal dimension: 4"
- Internal vertical dimension: 1'-8"
- Internal vertical dimension: 8"
- Internal vertical dimension: 4"
- Radius: $R \approx 3'-4"$
- Radius: $R \approx 2'-4"$

The technical drawing shows two views of a mechanical component:

- Top View (Left):** A triangular shape with a base of 6'-4". The left side has a vertical dimension of 5'-4". Internal features include a horizontal slot 3'-0" wide from the left edge, a vertical slot 8" wide, and a small rectangular feature 2'-4" long and 1'-8" high.
- Front View (Right):** A profile view showing a curved surface with two radii: R = 3'-4" and R = 2'-4". The total height is 5'-4". Horizontal dimensions at the bottom are 1'-0" and 8". Vertical dimensions on the left are 1'-8" and 3'-8". A central vertical feature has a width of 4".

Technical drawing of a stylized 'SOP' logo. The drawing includes the following dimensions:

- Overall width: 16" + 4" + 16" + 2" + 16" + 5" + 16" = 75"
- Overall height: 8'-0"
- Letter 'S' dimensions:
 - Top curve width: 6"
 - Bottom curve width: 4"
 - Vertical stem width: 4"
- Letter 'O' dimensions:
 - Top curve width: 4"
 - Bottom curve width: 4"
 - Vertical stem width: 4"
- Letter 'P' dimensions:
 - Top curve width: 4"
 - Bottom curve width: 4"
 - Vertical stem width: 4"
- Spacing dimensions:
 - Between 'S' and 'O': 16"
 - Between 'O' and 'P': 16"
- Bottom dimensions:
 - From 'S' to 'O': 6'-3"
 - From 'O' to 'P': 16"

Technical drawing of a wooden sign for the word "SAND". The sign is 9'-8" wide and 8'-0" high. The letters are made of wood and have the following dimensions:

- S:** 16" wide, 4" high, 4" thick.
- A:** 16" wide, 4" high, 4" thick.
- N:** 16" wide, 4" high, 4" thick.
- D:** 16" wide, 4" high, 4" thick.

The sign is mounted on a wooden board that is 16" wide and 4" high. The letters are spaced 4" apart. The sign is made of wood and has a natural finish.

Technical drawing of a stylized 'B' logo. The logo is composed of thick black outlines. Dimensions are provided in inches and feet. The overall width is 12'-0" and the overall height is 8'-0". The logo features a central vertical stem and two large, rounded, bowl-like shapes on either side. The drawing includes numerous dimension lines and arrows indicating specific measurements for the logo's construction.

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'

A diagram of a road cross-section. It shows a central travel lane and a shoulder. The total width of the road is indicated as 30' with a dimension line. The shoulder width on the right side is indicated as 10' with a dimension line. Two horizontal lines represent the 'Edge line' on both sides of the road, with labels and arrows pointing to them.

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

4 S. F.

22 S. F.

34.5 S. F.

Shldr, if present

6" yellow barrier stripe (See Notes)

4" space between lines

Bands at right angles to pavement

6" yellow center line (See Notes)

2'

3.3'

6.6'

16"

6'

1.6'

2'

2'

Stop line 8' from gate, if present

26' to nearest rail

See Advanced Placement Distance table at right

W10-1 

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.

R15-1

RAILROAD CROSSING ROAD

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

Diagram illustrating the dimensions and markings for a 12-foot wide roadway:

- 12" min to 30" max**: Dimension for the top section of the roadway.
- Curb face**: Indicated by an arrow pointing to the left edge of the roadway.
- 24"**: Dimension for the first blacked-out section.
- 2'x6', 2'x8', 2'x10' or 2'x12' white line**: Dimension for the white line section.
- 24"**: Dimension for the second blacked-out section.
- 24"**: Dimension for the third blacked-out section.
- 24"**: Dimension for the fourth blacked-out section.
- Wheel track**: Indicated by an arrow pointing to the center of the fourth blacked-out section.
- 30"**: Dimension for the fifth blacked-out section.
- 24"**: Dimension for the sixth blacked-out section.
- 12" min to 30" max**: Dimension for the seventh blacked-out section.
- 24"**: Dimension for the eighth blacked-out section.
- Wheel track**: Indicated by an arrow pointing to the center of the eighth blacked-out section.
- 30" max**: Dimension for the ninth blacked-out section.
- 24"**: Dimension for the tenth blacked-out section.
- 6" min to 15" max**: Dimension for the bottom section of the roadway.
- ℄ of Roadway**: Indicated by an arrow pointing to the center of the bottom section.

NOTES:

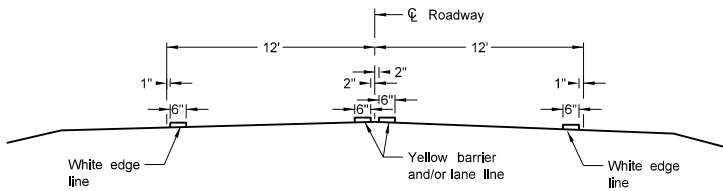
1. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph,
2. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph,

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.

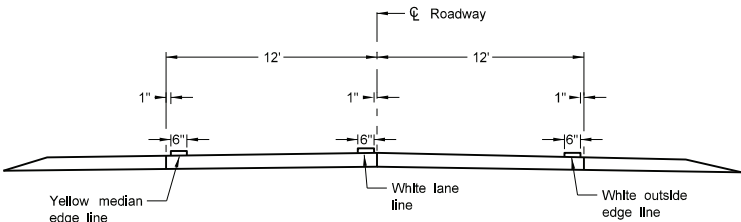


PAVEMENT MARKING

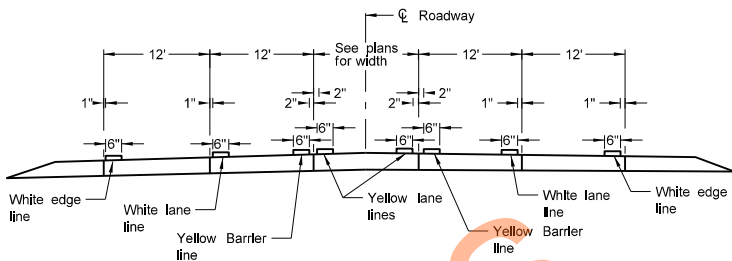
D-762-4



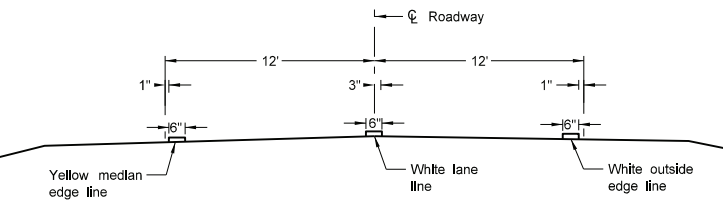
Two Lane Two Way
RURAL ROADWAY



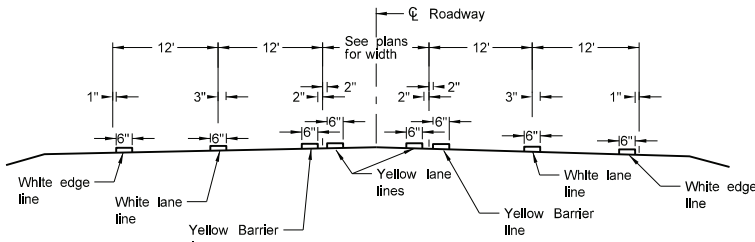
Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



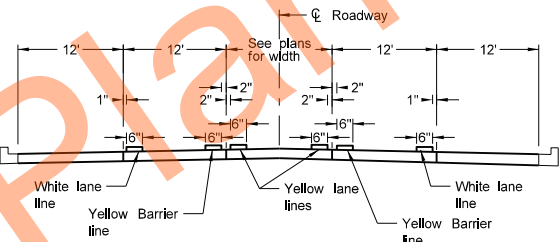
RURAL FIVE LANE ROADWAY
Concrete Section



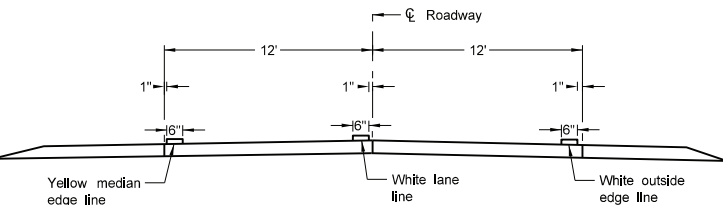
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



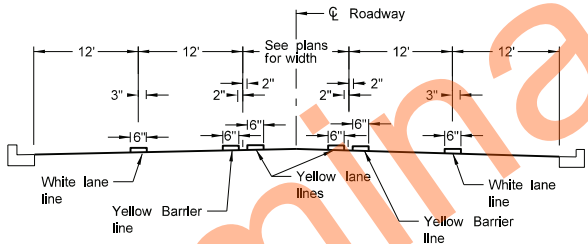
RURAL FIVE LANE ROADWAY
Asphalt Section



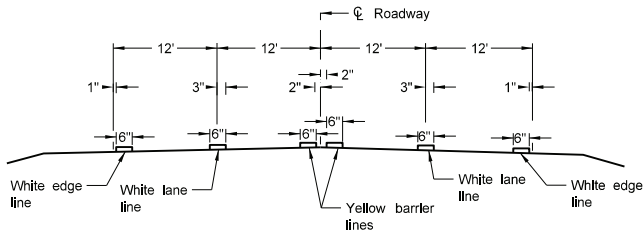
URBAN FIVE LANE SECTION
Concrete Section



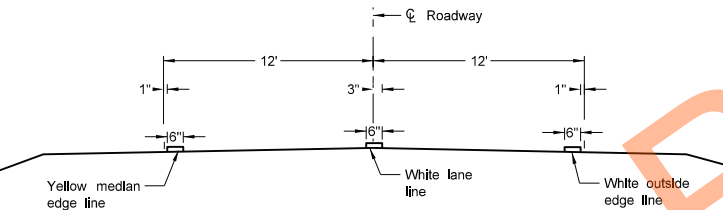
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Concrete Section



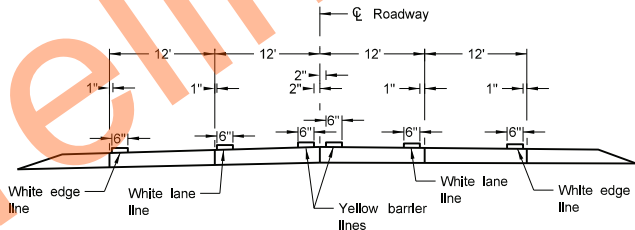
URBAN FIVE LANE SECTION
Asphalt Section



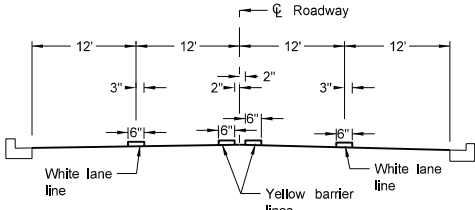
RURAL FOUR LANE ROADWAY
Asphalt Section



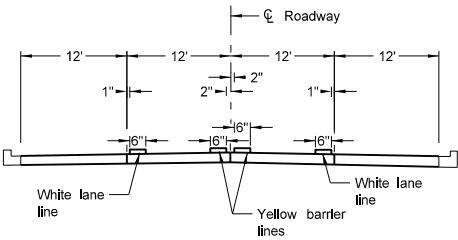
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



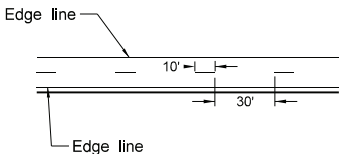
RURAL FOUR LANE ROADWAY
Concrete Section



URBAN FOUR LANE SECTION
Asphalt Section



URBAN FOUR LANE SECTION
Concrete Section



CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

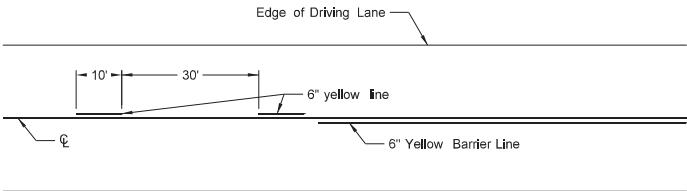
- NOTES:
1. Continue edge lines through private drives and field drives. Break edge lines for intersections.
For section lines, county roads, and street approaches, stripe the radii and edge lines of the paved surface within the right of way except where curb and gutter is present.
 2. Normal width line - 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.

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.

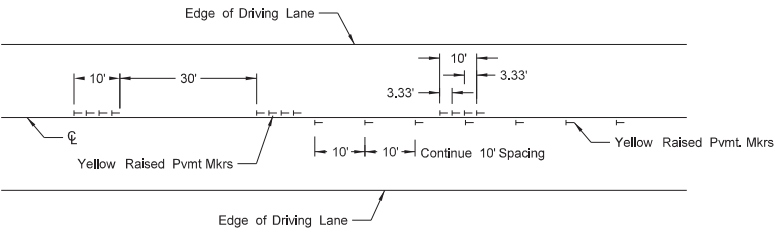


SHORT-TERM PAVEMENT MARKING

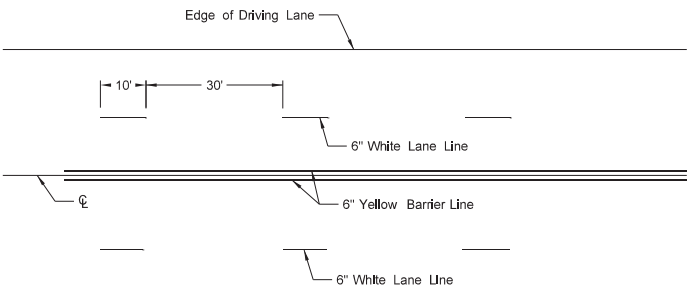
D-762-11



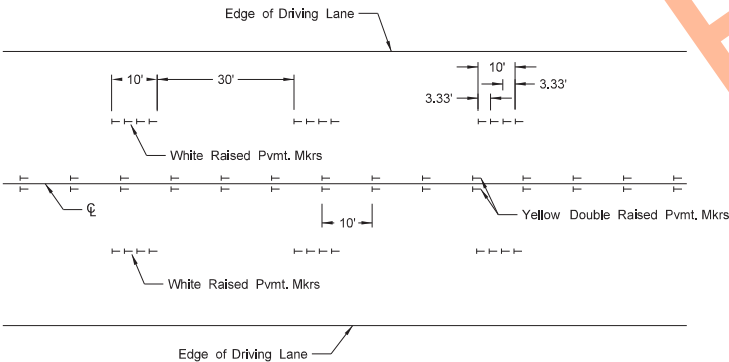
Painted or Tape Lines



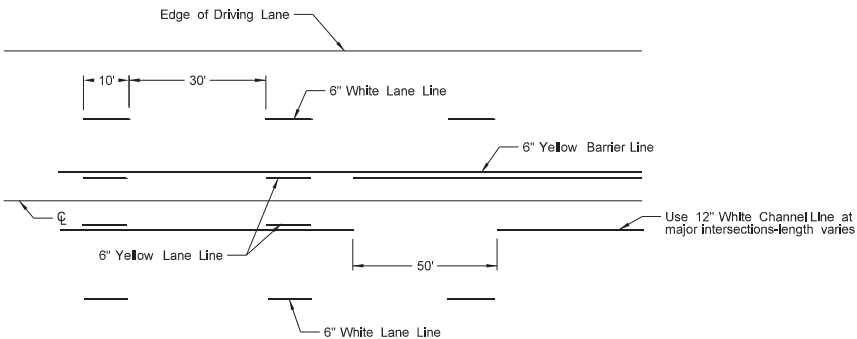
Raised Pavement Markers
TWO-LANE TWO-WAY ROADWAY



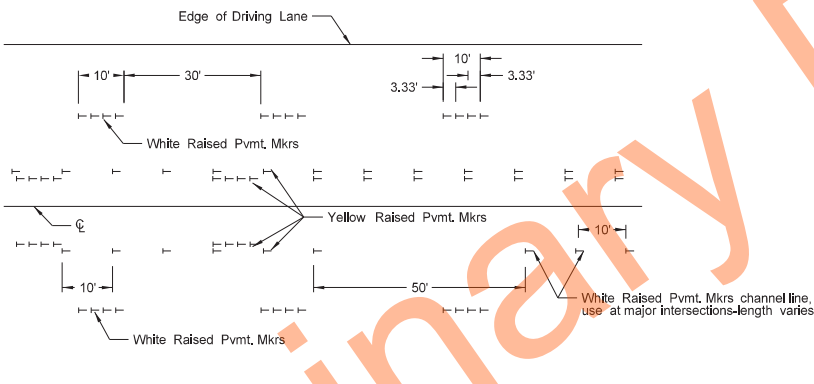
Painted or Tape Lines



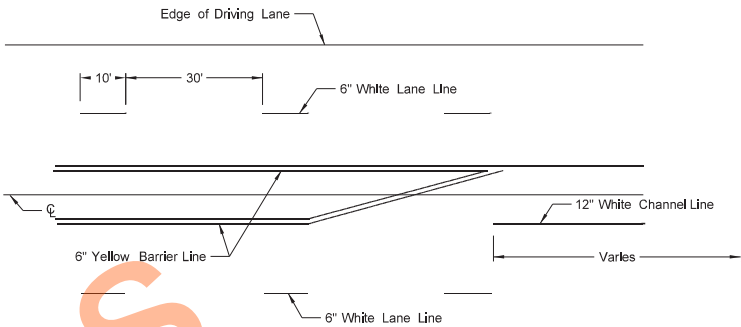
Raised Pavement Markers
FOUR LANE ROADWAY



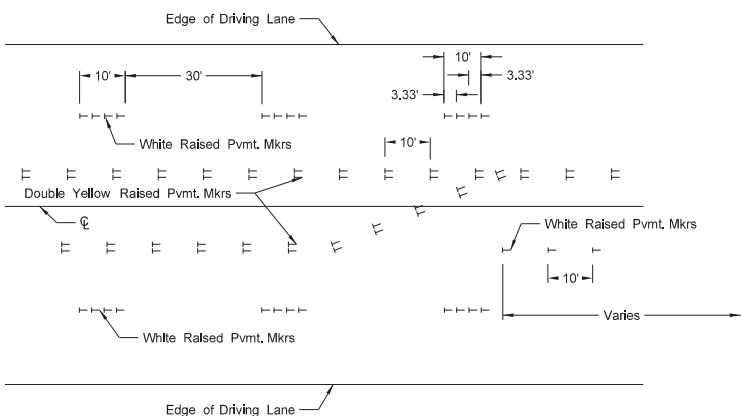
Painted or Tape Lines



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.

