

DESIGN DATA - ND 42 (RP 0.000 to RP 23.176)			
Traffic		Average Daily	
Current 2016	Pass: 480	Trucks: 175	Total: 655
Forecast 2036	Pass: 715	Trucks: 240	Total: 955
Clear Zone Distance:		Design Speed: 65 mph	
Minimum Sight Dist. for Stopping:		Bridges:	
Sight Dist. for No Passing Zone:			
Pavement Design Life (years)			
Design Accumulated One-way		ESALs:	

**JOB # 31
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION**

SOIB-7-042(014)000
Williams County & Divide County
Jct ND 50 North to East Jct ND 5 - Crosby

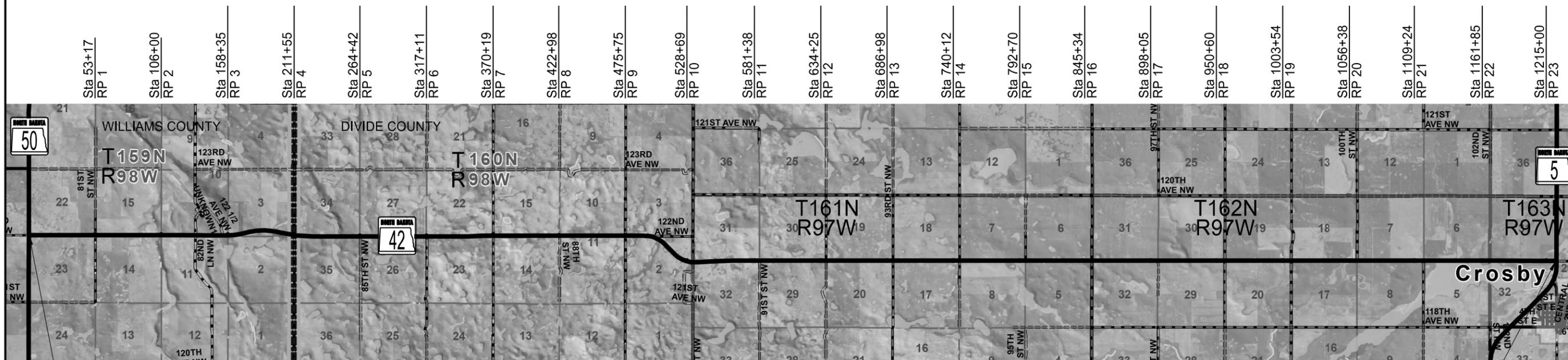
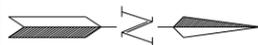
Hot Mix Asphalt Overlay, Subcut, and Incidentals

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SOIB-7-042(014)000	20996	1	1

GOVERNING SPECIFICATIONS:

2014 Standard Specifications adopted by the North Dakota Department of Transportation and the Supplemental Specifications effective on the date the project is advertised.

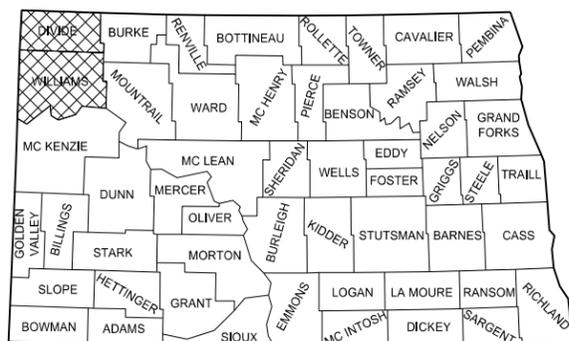
PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
Project SOIB-7-042(014)000	23.179 Miles	23.179 Miles



Begin Project SOIB-7-042(014)000
Sta 0+12.00 - RP 0.002 (ND 42)

Note: All stationing is based off of SCL42W (for Williams County) and off of SCL42D (for Divide County).

End Project SOIB-7-042(014)000
Sta 1223+96.00 - RP 23.169 (ND 42)



STATE COUNTY MAP

DESIGNERS

Darell Arne /s/

Douglas A. Schumaker /s/

I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.

APPROVED DATE 3-14-16

James Douglas Rath /s/
NDDOT DESIGN DIVISION

APPROVED DATE 3-14-16

Roger Weigel /s/
for OFFICE OF PROJECT DEVELOPMENT
ND DEPARTMENT OF TRANSPORTATION

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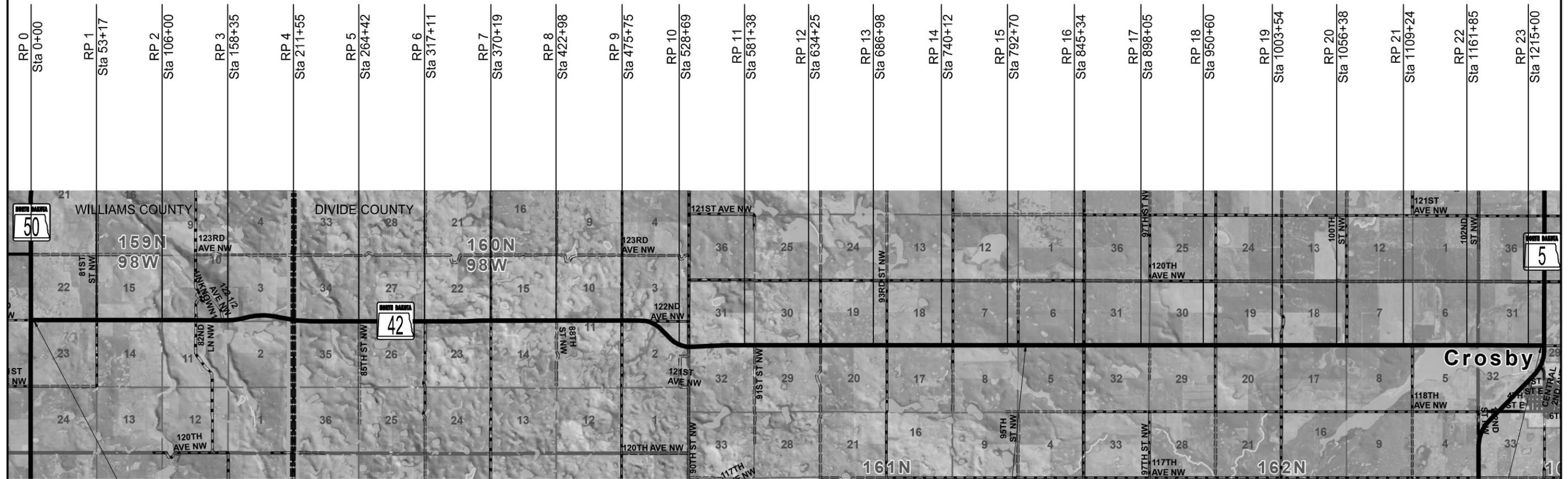
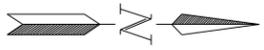
PLAN SECTIONS

Section	Page(s)	Description
1	1	Title Sheet
2	1	Table of Contents
4	1	Scope of Work
6	1	Notes
6	2	Environmental Commitments
8	1	Quantities
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110	1 - 2	Signing
180	1 - 20	Pit Plats

LIST OF STANDARD DRAWINGS

Number	Description
D-101-1, 2,3	NDDOT Abbreviations
D-101-10	NDDOT Utility Company and Organization Abbreviations
D-101-20, 21	Line Styles
D-101-30, 31, 32	Symbols
D-704-2	Traffic Control For Coring of Hot Bituminous Pavement
D-704-5	Construction Sign Detail
D-704-7	Breakaway Systems for Construction Zone Signs - Perforated Tube
D-704-8	Breakaway Systems for Construction Zone Signs - U-Channel Post
D-704-9	Construction Sign Details - Terminal and Guide Signs
D-704-10	Construction Sign Details - Regulatory Signs
D-704-11	Construction Sign Details - Warning Signs
D-704-13	Barricade and Channelizing Device Details
D-704-14	Construction Sign Punching and Mounting Details
D-704-15	Road Closure Layouts
D-704-20	Terminal and Seal Coat Sign Layouts
D-704-22	Construction Truck and Temporary Detour Layouts
D-704-24	Shoulder Closures and Bridge Painting Layouts
D-704-26	Miscellaneous Sign Layouts
D-704-27	Traffic Control Plan for Moving Operations
D-704-50	Portable Sign Support Assembly
D-704-56	Mobile Operation - Grinding Shoulder Rumble Strips
D-706-1	Bituminous Laboratory
D-760-4	Rumble Strips Undivided Highways (Shoulders Less Than 4')
D-760-5	Saw Slotted Rumble Strips at Intersections
D-762-4	Pavement Marking
D-762-6	Short-Term Pavement Marking

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Begin Project SOIB-7-042(014)000
Sta 0+12 (RP 0.002)

End Project SOIB-7-042(014)000
Sta 1223+96 (RP 23.169)

** Subcut Location

LEGEND:

Project SOIB-7-042(014)000 - 3" Superpave FAA 43 Overlay
**Subcut (Sta 859+84.00 to Sta 860+34.00 - plus 20:1 transitions on both ends)

OTHER WORK

1. Signing
2. Pavement Marking
3. Rumble Strips

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SCOPE OF WORK

JCT ND 50 NORTH to E JCT 5 - CROSBY

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-042(014)000	6	1

NOTES

100-P01 COORDINATION OF PROJECTS: Another project in the vicinity of this project is under contract during the 2016 construction season. This project is NH-7-005(023)034 and extends from Crosby east to Noonan.

107-700 HAUL ROADS: The Engineer will not designate paved roads off the state system as haul roads.

107-710 HAUL ROADS: Before submitting a proposal, contact the appropriate State, County, Township, or City officials to determine if there are any roadways that will be designated as "no haul routes".

107-P01 MAINTAINING TRAFFIC – EDGE DROP-OFFS: If public traffic is operating in an area with a drop-off greater than 2 inches, construct a temporary wedge composed of aggregate or embankment material with a foreslope of 4:1 or flatter.

Install stackable vertical panels along the edge of the driving lane that is adjacent to the drop off.

The Engineer will measure stackable vertical panels as specified in Section 704, "TemporaryTraffic Control".

The Engineer will not measure material used to construct the wedge. Include cost for the additional aggregate or embankment required for this operation in the price bid for aggregate or earthwork pay items.

If unable to complete a traversable taper wedge provide 24 hour flagging and traffic control at no additional cost to the department.

203-P01 TOPSOIL: Include all costs for removing and spreading topsoil, seeding, and mulching in subcut area in the contract unit price for "Topsoil".

704-P01 TRAFFIC CONTROL: Provide traffic control consisting of a lane closure, flagging, and a pilot car. Provide additional devices at no additional cost to the Department.

Traffic control devices are based on a 6 mile limitation and the list below.

D-704-15, Layout Type A for a temporary one lane closure with pilot car to perform placing of aggregate, subcut, milling, paving, and cutting in centerline rumble strips. Quantities are based on two lane closures happening simultaneously.

D-704-20, Layout Type G as the basis of the Construction Signing Sheet

D-704-22, Layouts Type K and L for trucks entering and exiting the roadway as needed.

D-704-24, Layout Type T for mobile operation on shoulder as needed.

D-704-26, Layouts Type BB, CC, EE, FF, and GG as needed.

D-704-27, for pavement marking.

D-704-56 for grinding shoulder rumble strips

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

1. Minimum total area of 440 square feet
2. Indoor bathroom facilities and supplies with weekly cleaning services
3. Hookups for heat, electricity, sewer, and potable water.
4. Minimum cabinet space of 32 cubic feet
5. Minimum counter space of 40 square feet
6. Air conditioner with a minimum of 20,000 BTUs
7. Lighting with a minimum of 110 foot-candles
8. Supply a photocopier with enough toner to last the length of the project and with the following capabilities:
 - a. Printing;
 - b. Scanning; and
 - c. Producing 11 x 17 photocopies and prints.

Place the field office on the project, or as close to the project as possible. The Contractor is responsible for the pay for the following:

- Rental fees;
- Heating;
- Electrical;
- Sewer; and
- Potable water.

Make the field office available for occupancy one week before the start of the project. The Engineer will approve the location and the condition of the office. Do not remove the field office until the Engineer releases the field office.

The Engineer is responsible for the following items:

- Furnishing office equipment;
- Supplying paper; and
- Supplying and paying for internet service.

All requirements of the Field Office are subject to approval by the Engineer. Include the costs for the field office in the bid item "Field Office".

Schedule for payments:

- 25% when set up on site.
- 50% when 30% of the work is complete.
- 75% when 60% of the work is complete.
- 100% when project is complete.

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

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ENVIRONMENTAL COMMITMENTS

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SOIB-7-042(014)000	6	2

ENVIRONMENTAL COMMITMENTS (EC): The North Dakota Department of Transportation has made environmental commitments to secure approval of this project. The environmental commitments are as follows:

EC-1: Unavoidable impacts to wetlands will be mitigated onsite, adjacent to the project, or at a NDDOT approved mitigation site or bank.

ACTION REQUIRED /TAKEN: 0.00 acres of permanent impacts to USACE jurisdictional waters and 0.00 acres of permanent impacts to EO 11990 wetlands will require mitigation.

Wetland Impact Table																					
Wetland Number	Location	Cowardin Class.	Wetland Type	Wetland Size (acres)	Wetland Feature	USACE Jurisdictional Wetlands ¹	Wetland Impacts (acres)		USFWS Easement Impacts (acres)		Wetland Mitigation										
							Temp.	Perm.	Temp.	Perm.	Mitigation Required			Bank		Onsite					
											EO 11990	USACE	USFWS	Location	acres	Mitigation Location; Ratio	acres	Constructed Site #	Constructed size (acres)		
There are a number of adjacent wetlands; however, no impacts are anticipated within the limits of construction.																					
				Totals	0.00			0.00	0.00	0.00	0.0				0.00			0.00			0.00

ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-042(014)000	8	1

SPEC CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
-----	-----	-----	-----	-----
103	0100 CONTRACT BOND	L SUM	1	1
202	0120 REMOVE AGGREGATE BASE & SURFACING	L SUM	1	1
203	0109 TOPSOIL	CY	42	42
203	0138 COMMON EXCAVATION-SUBCUT	CY	212	212
216	0100 WATER	M GAL	20	20
230	0125 SHOULDER PREPARATION	MILE	46.36	46.36
261	0112 FIBER ROLLS 12IN	LF	995	995
302	0120 AGGREGATE BASE COURSE CL 5	TON	967	967
401	0050 TACK COAT	GAL	34,166	34,166
411	0105 MILLING PAVEMENT SURFACE	SY	800	800
430	0043 SUPERPAVE FAA 43	TON	63,423	63,423
430	1000 CORED SAMPLE	EA	496	496
430	5828 PG 58-28 ASPHALT CEMENT	TON	3,841	3,841
702	0100 MOBILIZATION	L SUM	1	1
704	0100 FLAGGING	MHR	600	600
704	1000 TRAFFIC CONTROL SIGNS	UNIT	2,972	2,972
704	1067 TUBULAR MARKERS	EA	245	245
704	1080 STACKABLE VERTICAL PANELS	EA	2	2
704	1185 PILOT CAR	HR	300	300
706	0400 FIELD OFFICE	EA	1	1
706	0550 BITUMINOUS LABORATORY	EA	1	1
706	0600 CONTRACTOR'S LABORATORY	EA	1	1
709	0100 GEOSYNTHETIC MATERIAL TYPE G	SY	391	391
760	0005 RUMBLE STRIPS - ASPHALT SHOULDER	MILE	46.36	46.36
760	0007 RUMBLE STRIPS - ASPHALT CENTERLINE	MILE	23.18	23.18
760	0009 RUMBLE STRIPS - INTERSECTION	EA	2	2
762	0430 SHORT TERM 4IN LINE-TYPE NR	LF	228,945	228,945
762	1104 PVMT MK PAINTED 4IN LINE	LF	321,083	321,083
762	1124 PVMT MK PAINTED 24IN LINE	LF	36	36

MATERIALS

AGGREGATE BASE COURSE CL 5 @ 1.875 TON/CY
 TACK COAT @ 0.05 GAL/SY
 SUPERPAVE FAA 43 @ 2 TON/CY
 PG 58-28 ASPHALT CEMENT @ 6.0% of Superpave FAA 43

WATER

25 MGAL/MILE for Dust Palliative
 20 GAL/TON for AGGREGATE BASE COURSE CL 5

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-042(014)000	10	1

#1 Proposed Typical - Sheet 30-3 Sta 1+62.00 to Sta 156+72.17 Sta 197+81.10 to Sta 212+00.00 Sta 1171+50.00 to Sta 1222+46.00	#2 Proposed Typical - Sheet 30-3 Sta 212+00.00 to Sta 213+99.67 Sta 222+50.65 to Sta 476+12.00 Sta 487+55.00 to Sta 490+11.59 Sta 511+23.35 to Sta 518+78.40 Sta 541+16.14 to Sta 859+54.00 Sta 860+64.00 to Sta 1171+50.00	#3 Proposed Typical - Sheet 30-3 Sta 156+72.17 to Sta 172+00.17 Sta 172+00.17 to Sta 197+81.10
Total Stations = 220.25		

SPEC	CODE	BID ITEM	UNIT	#1 Proposed Typical - Sheet 30-3				#2 Proposed Typical - Sheet 30-3				#3 Proposed Typical - Sheet 30-3			
				Width (ft)	Depth (in)	Quantity per Station	SubTotal	Width (ft)	Depth (in)	Quantity per Station	SubTotal	Width (ft)	Depth (in)	Quantity per Station	SubTotal
401	0050	TACK COAT @ 0.05 GAL/SY (1st Lift)	GAL	26	-	14.4	3,172	26	-	14.4	12,888	26	-	14.4	592
401	0050	TACK COAT @ 0.05 GAL/SY (2nd Lift)	GAL	24	-	13.3	2,929	24	-	13.3	11,903	24	-	13.3	546
430	0043	SUPERPAVE FAA 43 @ 2 TON/CY	TON	24	3	51.2	11,277	24	3	51.2	45,822	24	3	50.7	2,083
430	5828	PG 58-28 ASPHALT CEMENT @ 6.0% Superpave FAA 43	TON	24	3	3.1	682.8	24	3	3.1	2,774.4	24	3	3.0	123.3

#4 Proposed Typical - Sheet 30-4 Sta 476+12.00 to Sta 487+55.00	#5 Proposed Typical - Sheet 30-4 Sta 213+99.67 to Sta 222+50.65	#6 Proposed Typical - Sheet 30-4 Sta 490+11.59 to Sta 511+23.35 Sta 518+78.40 to Sta 541+16.14
Total Stations = 11.43		

SPEC	CODE	BID ITEM	UNIT	#4 Proposed Typical - Sheet 30-4				#5 Proposed Typical - Sheet 30-4				#6 Proposed Typical - Sheet 30-4			
				Width (ft)	Depth (in)	Quantity per Station	SubTotal	Width (ft)	Depth (in)	Quantity per Station	SubTotal	Width (ft)	Depth (in)	Quantity per Station	SubTotal
401	0050	TACK COAT @ 0.05 GAL/SY (1st Lift)	GAL	26	-	14.4	165	26	-	14.4	123	26	-	14.4	626
401	0050	TACK COAT @ 0.05 GAL/SY (2nd Lift)	GAL	24	-	13.3	152	24	-	13.3	113	24	-	13.3	579
430	0043	SUPERPAVE FAA 43 @ 2 TON/CY	TON	24	3	46.5	531	24	3	50.7	431	24	3	50.8	2,210
430	5828	PG 58-28 ASPHALT CEMENT @ 6.0% Superpave FAA 43	TON	24	3	2.8	32.0	24	3	3.0	25.5	24	3	3.0	130.5

Accumulated Plan Total Quantities

SPEC	CODE	BID ITEM	UNIT	Sheet 10-1	Sheet 20-2	Sheet 20-4	Sheet 20-5	TOTALS
				Mainline	Approaches	Transitions	Subcut	
302	0120	AGGREGATE BASE COURSE CL 5 @ 1.875 TON/CY	TON	0	683	0	284	967
401	0050	TACK COAT @ 0.05 GAL/SY	GAL	33,788	250	84	44	34,166
411	0105	MILLING PAVEMENT SURFACE	SY	0	0	800	0	800
430	0043	SUPERPAVE FAA 43 @ 2 TON/CY	TON	62,354	799	154	116	63,423
430	5828	PG 58-28 ASPHALT CEMENT @ 6.0% Superpave FAA 43	TON	3,769	55	10	7	3,841

430-1000 CORED SAMPLE							
Specification Section	Distance (Ft) ÷ 2000	Lanes	Lifts	D		Unit	
				Sublots (A x B x C)	Quantity (D x 2)		
430.04 I.2.b(1). "General"							
ND 42 Mainline - Sta 0+12.00 to Sta 1223+96.00	62	2	2	248	496	N/A	EA
430.04 I.2.b(2)							
"Pavement Thickness Determination Cores"					N/A	0	EA
Total					496	0	EA

SPEC	CODE	BID ITEM	UNIT	QUANTITY
203	0109	TOPSOIL		
		ND 42 Subcut Area - Sta 859+54 to Sta 860+64	CY	42
		*SEEDING CLASS II		
		ND 42 Subcut Area - Sta 859+54 to Sta 860+64	Acre	0.06
		*TEMPORARY COVER CROP		
		ND 42 Subcut Area - Sta 859+54 to Sta 860+64	Acre	0.06
		*STRAW MULCH		
		ND 42 Subcut Area - Sta 859+54 to Sta 860+64	Acre	0.12
261	0112	FIBER ROLLS 12IN		
		Sta 856+92 to Sta 861+38 - Lt (Protecting Wetland)	LF	480
		Sta 856+98 to Sta 861+85 - Rt (Protecting Wetland)	LF	515
		*Not a pay item. Shown for informational purposes only.		

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SPEC	CODE	BID ITEM	UNIT	QUANTITY
760	0005	RUMBLE STRIPS - ASPHALT SHOULDER		
		ND 42 - 2 x (Sta 0+12.00 to Sta 1223+96.00)	MILE	46.36
760	0007	RUMBLE STRIPS - ASPHALT CENTERLINE		
		ND 42 - Sta 0+12.00 to Sta 1223+96.00	MILE	23.18
760	0009	RUMBLE STRIPS - INTERSECTION		
		On ND 42 at Intersection of ND 50 & ND 42	EA	1
		On ND 42 at Intersection of ND 5 & ND 42	EA	1

SPEC	CODE	BID ITEM	UNIT	QUANTITY
230	0125	SHOULDER PREPARATION		
		ND 42 - 2 x (Sta 0+12.00 to Sta 1223+96.00)	MILE	46.36

BASIS OF ESTIMATE

JCT ND 50 NORTH to E JCT 5 - CROSBY

PERMANENT PAVEMENT MARKING

762-1104 PVMT MK PAINTED 4IN LINE			
Location along ND 42	Type	Basis	Quantity
Mainline - Sta 0+12.00 to Sta 1223+96.00 (minus double barrier stripe locations)	Yellow Centerline Skips	1,320 LF/mile	28,111
Mainline - Sta 0+12.00 to Sta 1223+96.00	White Edge Lines	10,560 LF/mile	244,768
TOTAL QUANTITY			272,879

SHORT TERM PAVEMENT MARKING

762-0430 SHORT TERM 4IN LINE - TYPE NR			
Location	Basis		Quantity
Yellow Centerline	Center Skips	1,320 LF/mile	28,111 LF
Top of 1st Lift	Barrier Stripe	48,204 LF	48,204 LF
Yellow Centerline	Center Skips	1,320 LF/mile	28,111 LF
Top of 2nd Lift	Barrier Stripe	48,204 LF	48,204 LF
Yellow Centerline	Center Skips	1,320 LF/mile	28,111 LF
Top of Fog Coat	Barrier Stripe	48,204 LF	48,204 LF
TOTAL			228,945 LF

762-1104 PVMT MK PAINTED 4IN LINE - Yellow Northbound Centerline Barrier

Location along ND 42	Basis	Quantity	Unit
Mainline - Sta 210+60.00 to Sta 234+60.00	5,280 LF/mile	2,400	LF
Mainline - Sta 250+40.00 to Sta 294+30.00	5,280 LF/mile	4,390	LF
Mainline - Sta 307+10.00 to Sta 309+90.00	5,280 LF/mile	280	LF
Mainline - Sta 324+10.00 to Sta 327+40.00	5,280 LF/mile	330	LF
Mainline - Sta 341+20.00 to Sta 345+10.00	5,280 LF/mile	390	LF
Mainline - Sta 368+80.00 to Sta 386+80.00	5,280 LF/mile	1,800	LF
Mainline - Sta 410+40.00 to Sta 416+60.00	5,280 LF/mile	620	LF
Mainline - Sta 428+90.00 to Sta 455+50.00	5,280 LF/mile	2,660	LF
Mainline - Sta 483+20.00 to Sta 485+70.00	5,280 LF/mile	250	LF
Mainline - Sta 505+80.00 to Sta 510+80.00	5,280 LF/mile	500	LF
Mainline - Sta 535+30.00 to Sta 541+30.00	5,280 LF/mile	600	LF
Mainline - Sta 565+60.00 to Sta 574+10.00	5,280 LF/mile	850	LF
Mainline - Sta 589+30.00 to Sta 593+40.00	5,280 LF/mile	410	LF
Mainline - Sta 631+00.00 to Sta 653+20.00	5,280 LF/mile	2,220	LF
Mainline - Sta 682+20.00 to Sta 685+50.00	5,280 LF/mile	330	LF
Mainline - Sta 757+30.00 to Sta 761+70.00	5,280 LF/mile	440	LF
Mainline - Sta 804+80.00 to Sta 808+50.00	5,280 LF/mile	370	LF
Mainline - Sta 829+00.00 to Sta 837+20.00	5,280 LF/mile	820	LF
Mainline - Sta 857+50.00 to Sta 863+90.00	5,280 LF/mile	640	LF
Mainline - Sta 913+40.00 to Sta 917+20.00	5,280 LF/mile	380	LF
Mainline - Sta 930+00.00 to Sta 934+50.00	5,280 LF/mile	450	LF
Mainline - Sta 990+30.00 to Sta 994+80.00	5,280 LF/mile	450	LF
Mainline - Sta 1009+90.00 to Sta 1013+00.00	5,280 LF/mile	310	LF
Mainline - Sta 1098+70.00 to Sta 1100+10.00	5,280 LF/mile	140	LF
Mainline - Sta 1191+10.00 to Sta 1198+20.00	5,280 LF/mile	710	LF
Mainline - Sta 1215+60.00 to Sta 1223+96.00	5,280 LF/mile	836	LF
TOTAL QUANTITY			23,576 LF

762-1104 PVMT MK PAINTED 4IN LINE - Yellow Southbound Centerline Barrier

Location along ND 42	Basis	Quantity	Unit
Mainline - Sta 0+12.00 to Sta 8+50.00	5,280 LF/mile	838	LF
Mainline - Sta 212+00.00 to Sta 245+70.00	5,280 LF/mile	3,370	LF
Mainline - Sta 261+40.00 to Sta 305+40.00	5,280 LF/mile	4,400	LF
Mainline - Sta 318+10.00 to Sta 320+90.00	5,280 LF/mile	280	LF
Mainline - Sta 335+10.00 to Sta 338+50.00	5,280 LF/mile	340	LF
Mainline - Sta 353+20.00 to Sta 355+60.00	5,280 LF/mile	240	LF
Mainline - Sta 380+00.00 to Sta 397+80.00	5,280 LF/mile	1,780	LF
Mainline - Sta 421+40.00 to Sta 427+50.00	5,280 LF/mile	610	LF
Mainline - Sta 439+90.00 to Sta 466+40.00	5,280 LF/mile	2,650	LF
Mainline - Sta 494+00.00 to Sta 498+80.00	5,280 LF/mile	480	LF
Mainline - Sta 516+50.00 to Sta 521+60.00	5,280 LF/mile	510	LF
Mainline - Sta 545+90.00 to Sta 552+50.00	5,280 LF/mile	660	LF
Mainline - Sta 576+60.00 to Sta 585+00.00	5,280 LF/mile	840	LF
Mainline - Sta 600+20.00 to Sta 604+60.00	5,280 LF/mile	440	LF
Mainline - Sta 641+70.00 to Sta 664+20.00	5,280 LF/mile	2,250	LF
Mainline - Sta 693+20.00 to Sta 696+60.00	5,280 LF/mile	340	LF
Mainline - Sta 768+40.00 to Sta 772+90.00	5,280 LF/mile	450	LF
Mainline - Sta 815+90.00 to Sta 819+60.00	5,280 LF/mile	370	LF
Mainline - Sta 840+10.00 to Sta 847+70.00	5,280 LF/mile	760	LF
Mainline - Sta 868+50.00 to Sta 874+90.00	5,280 LF/mile	640	LF
Mainline - Sta 924+50.00 to Sta 928+10.00	5,280 LF/mile	360	LF
Mainline - Sta 941+10.00 to Sta 945+40.00	5,280 LF/mile	430	LF
Mainline - Sta 1001+30.00 to Sta 1005+80.00	5,280 LF/mile	450	LF
Mainline - Sta 1020+80.00 to Sta 1024+00.00	5,280 LF/mile	320	LF
Mainline - Sta 1109+90.00 to Sta 1110+90.00	5,280 LF/mile	100	LF
Mainline - Sta 1202+00.00 to Sta 1209+20.00	5,280 LF/mile	720	LF
TOTAL QUANTITY			24,628 LF

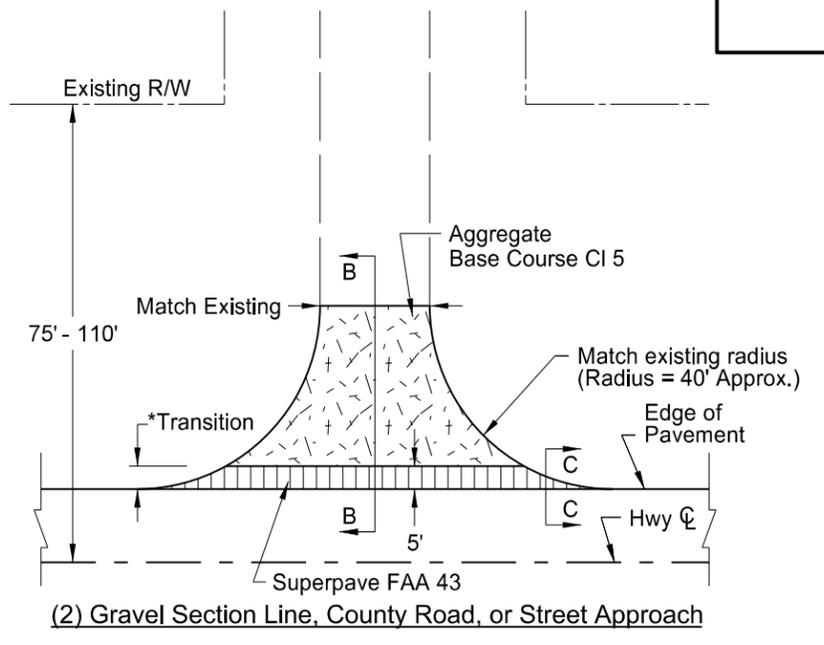
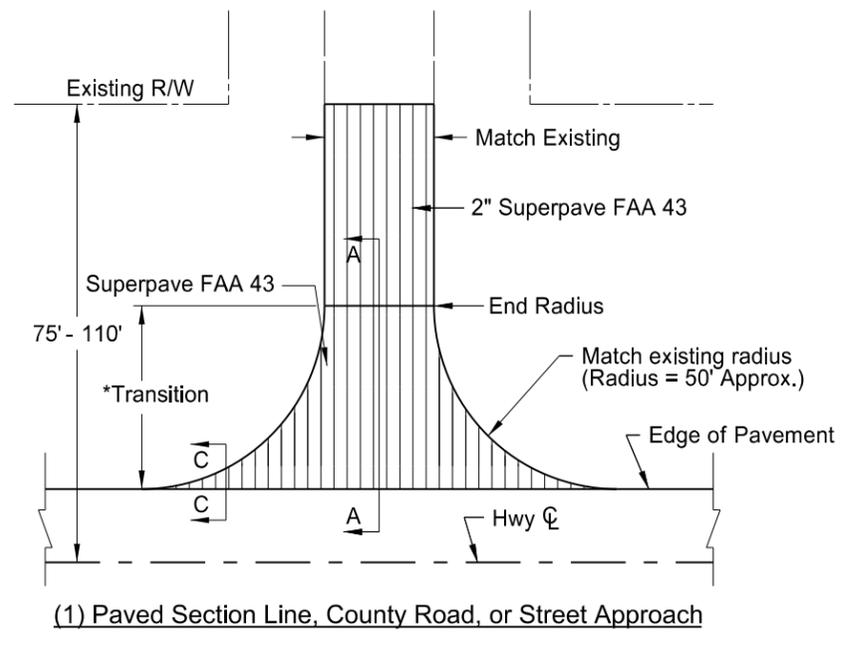
762-1124 PVMT MK PAINTED 24IN LINE

Location along ND 42	Type	Basis	Quantity
On ND 42 at Intersection of ND 50 & ND 42	Stop Bar		12
On ND 42 at Intersection of ND 5 & ND 42	Stop Bar		24
TOTAL QUANTITY			36

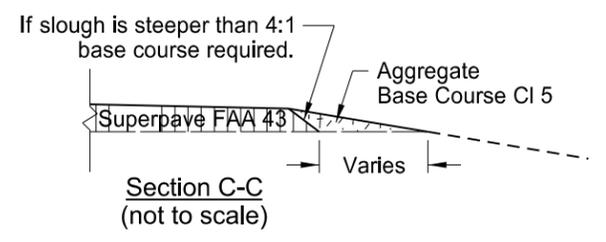
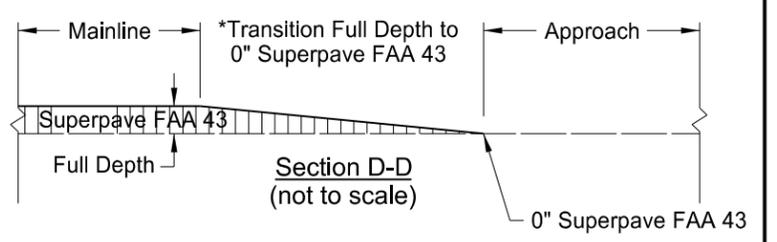
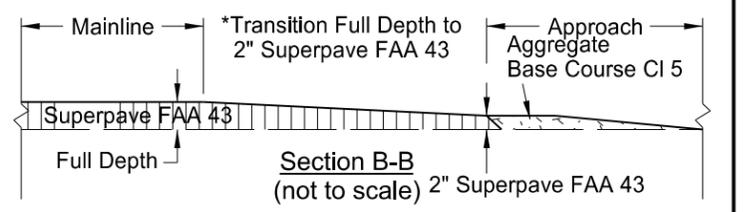
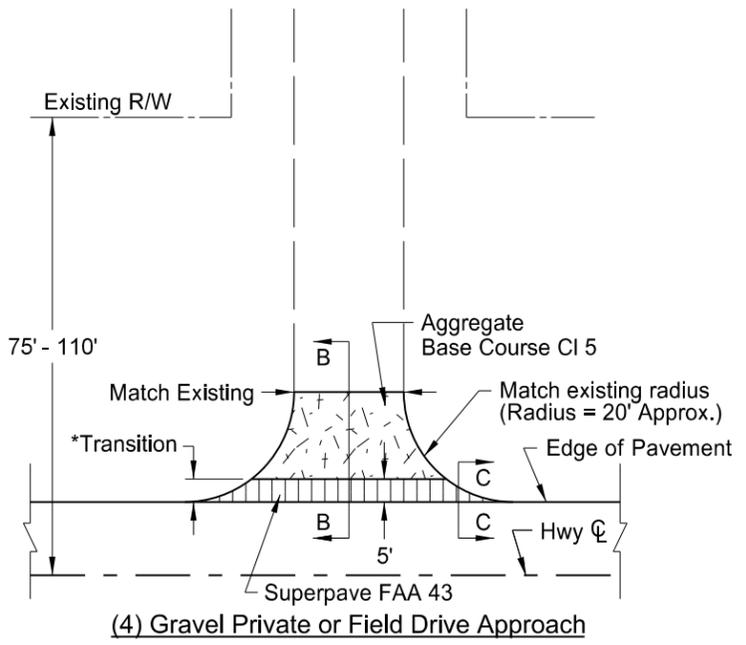
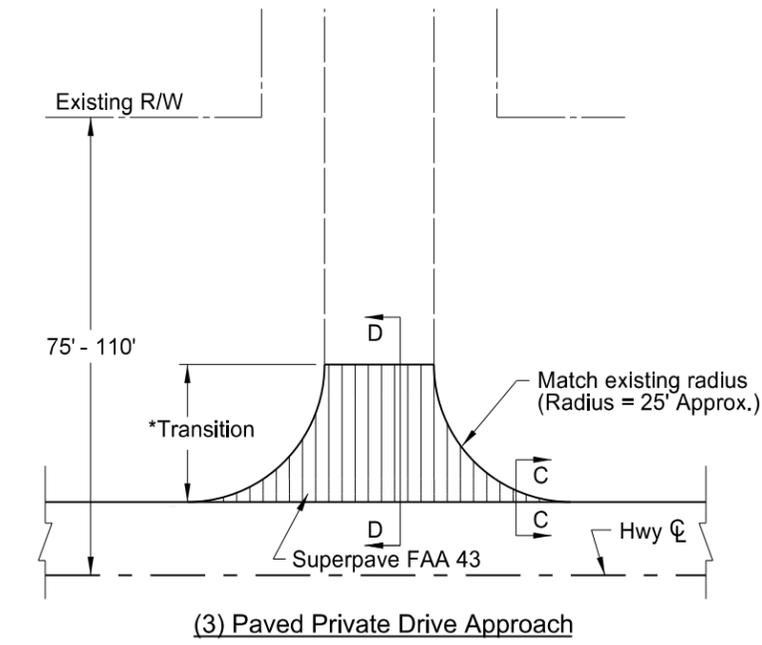
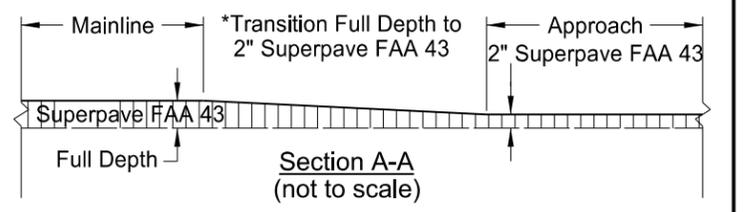
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BASIS OF ESTIMATE

JCT ND 50 NORTH to E JCT 5 - CROSBY



- Notes:
- Actual Superpave FAA 43 paving and Aggregate Base Course CL 5 locations may vary in the field, as approved by the Engineer.
 - Quantity totals have been included in the bid items of the "Estimate of Quantities" of the plans.
 - 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)



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BASIS OF ESTIMATE				(1)	(2)	(3)	(4)	TOTALS
SPEC	CODE	BID ITEM	UNIT	Paved Section Line	Gravel Section Line	Paved Private Drive	Gravel Field / Private Drive	
			#	0	37	3	129	
		Number of Locations						
302	0120	AGGREGATE BASE COURSE CL 5 @ 1.875 TON/CY	TON	N/A	8	N/A	3	683
401	0050	TACK COAT @ 0.05 GAL/SY	GAL	-	2.2	4.3	1.2	250
430	0043	SUPERPAVE FAA 43 @ 2 TON/CY	TON	-	7	8	4	799
430	5828	PG 58-28 ASPHALT CEMENT @ 6.0% Superpave FAA 43	TON	-	0.4	0.5	0.3	55

Approach Paving Details for Minor Rehabilitation Projects
JCT ND 50 NORTH to E JCT 5 - CROSBY

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-042(014)000	20	2

Approach Location	TYPE
Sta 8+17 (Approach Rt)	Field Drive
Sta 13+60 (Approach Lt)	Field Drive
Sta 29+29 (Approach Lt)	Field Drive
Sta 35+54 (Approach Rt)	Field Drive
Sta 52+78 (Approach Rt)	Gravel Section Line
Sta 52+80 (Approach Lt)	Gravel Section Line
Sta 65+97 (Approach Rt)	Field Drive
Sta 66+02 (Approach Lt)	Field Drive
Sta 76+00 (Approach Lt)	Field Drive
Sta 76+00 (Approach Rt)	Field Drive
Sta 88+56 (Approach Rt)	Gravel Private Drive
Sta 92+37 (Approach Lt)	Gravel Private Drive
Sta 92+46 (Approach Rt)	Gravel Private Drive
Sta 98+97 (Approach Rt)	Field Drive
Sta 105+61 (Approach Rt)	Field Drive
Sta 105+65 (Approach Lt)	Gravel Private Drive
Sta 117+37 (Approach Lt)	Field Drive
Sta 117+51 (Approach Rt)	Field Drive
Sta 126+72 (Approach Rt)	Field Drive
Sta 132+46 (Approach Lt)	Gravel Section Line
Sta 132+46 (Approach Rt)	Gravel Section Line
Sta 140+98 (Approach Rt)	Field Drive
Sta 141+07 (Approach Lt)	Field Drive
Sta 147+62 (Approach Rt)	Field Drive
Sta 151+59 (Approach Rt)	Field Drive
Sta 151+60 (Approach Lt)	Field Drive
Sta 154+21 (Skewed Approach Lt)	Gravel Private Drive
Sta 157+92 (Approach Rt)	Gravel Private Drive
Sta 158+41 (Approach Lt)	Field Drive
Sta 168+98 (Approach Lt)	Gravel Private Drive
Sta 182+25 (Approach Rt)	Gravel Private Drive
Sta 191+70 (Approach Lt)	Field Drive
Sta 191+80 (Approach Rt)	Field Drive
Sta 211+84 (Skewed Approach Lt)	Gravel Section Line
Sta 212+25 (Skewed Approach Rt)	Gravel Section Line
Sta 218+94 (Approach Lt)	Field Drive
Sta 218+97 (Approach Rt)	Field Drive
Sta 225+03 (Approach Lt)	Gravel Private Drive
Sta 233+42 (Approach Lt)	Gravel Private Drive
Sta 251+10 (Approach Lt)	Field Drive
Sta 251+17 (Approach Rt)	Field Drive
Sta 254+97 (Approach Lt)	Field Drive
Sta 264+75 (Approach Lt)	Field Drive
Sta 264+79 (Approach Rt)	Gravel Private Drive
Sta 275+24 (Approach Rt)	Field Drive
Sta 278+01 (Approach Lt)	Field Drive
Sta 288+98 (Approach Lt)	Gravel Private Drive
Sta 289+02 (Approach Rt)	Field Drive
Sta 302+15 (Approach Lt)	Gravel Private Drive
Sta 302+16 (Approach Rt)	Field Drive
Sta 317+75 (Approach Lt)	Gravel Section Line
Sta 317+77 (Approach Rt)	Gravel Section Line
Sta 334+24 (Approach Lt)	Field Drive
Sta 349+00 (Approach Rt)	Field Drive
Sta 349+02 (Approach Lt)	Field Drive
Sta 370+46 (Approach Lt)	Gravel Section Line
Sta 370+51 (Approach Rt)	Gravel Section Line
Sta 384+48 (Approach Lt)	Field Drive
Sta 384+85 (Skewed Approach Rt)	Gravel Private Drive
Sta 408+77 (Approach Rt)	Gravel Private Drive
Sta 408+98 (Approach Lt)	Field Drive
Sta 418+60 (Approach Lt)	Field Drive
Sta 423+29 (Approach Lt)	Field Drive
Sta 423+32 (Approach Rt)	Gravel Section Line
Sta 434+28 (Approach Rt)	Field Drive
Sta 434+31 (Approach Lt)	Field Drive
Sta 455+89 (Approach Lt)	Field Drive
Sta 455+90 (Approach Rt)	Field Drive
Sta 466+25 (Approach Lt)	Field Drive
Sta 468+35 (Approach Rt)	Field Drive

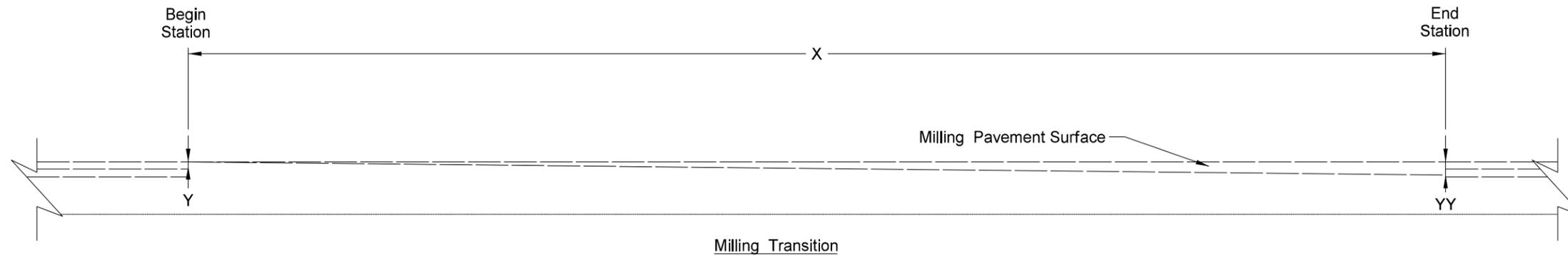
Approach Location	TYPE
Sta 476+07 (Approach Lt)	Gravel Section Line
Sta 476+07 (Approach Rt)	Gravel Section Line
Sta 492+08 (Approach Lt)	Field Drive
Sta 502+89 (Approach Lt)	Field Drive
Sta 502+98 (Approach Rt)	Field Drive
Sta 521+28 (Approach Lt)	Field Drive
Sta 521+33 (Approach Rt)	Field Drive
Sta 536+78 (Approach Lt)	Gravel Section Line
Sta 536+82 (Approach Rt)	Gravel Section Line
Sta 539+84 (Approach Lt)	Paved Private Drive
Sta 539+87 (Approach Rt)	Field Drive
Sta 547+09 (Approach Lt)	Gravel Private Drive
Sta 563+60 (Approach Lt)	Field Drive
Sta 574+17 (Approach Rt)	Field Drive
Sta 574+24 (Approach Lt)	Field Drive
Sta 585+25 (Approach Lt)	Field Drive
Sta 589+67 (Approach Rt)	Gravel Section Line
Sta 589+71 (Approach Lt)	Gravel Section Line
Sta 616+06 (Approach Rt)	Field Drive
Sta 616+11 (Approach Lt)	Field Drive
Sta 630+34 (Approach Rt)	Field Drive
Sta 637+59 (Approach Lt)	Paved Private Drive
Sta 642+59 (Approach Rt)	Gravel Section Line
Sta 642+61 (Approach Lt)	Gravel Section Line
Sta 654+35 (Approach Rt)	Field Drive
Sta 656+05 (Approach Lt)	Field Drive
Sta 661+16 (Approach Lt)	Field Drive
Sta 662+97 (Approach Rt)	Field Drive
Sta 675+36 (Approach Lt)	Field Drive
Sta 675+37 (Approach Rt)	Field Drive
Sta 695+49 (Approach Rt)	Gravel Section Line
Sta 695+51 (Approach Lt)	Gravel Section Line
Sta 696+88 (Approach Rt)	Field Drive
Sta 702+44 (Approach Lt)	Gravel Private Drive
Sta 704+56 (Approach Rt)	Field Drive
Sta 724+72 (Approach Lt)	Field Drive
Sta 724+75 (Approach Rt)	Field Drive
Sta 739+87 (Approach Rt)	Field Drive
Sta 748+32 (Approach Lt)	Gravel Section Line
Sta 748+32 (Approach Rt)	Gravel Section Line
Sta 759+83 (Approach Rt)	Field Drive
Sta 774+79 (Approach Rt)	Field Drive
Sta 774+80 (Approach Lt)	Field Drive
Sta 783+69 (Approach Rt)	Field Drive
Sta 801+27 (Approach Lt)	Gravel Section Line
Sta 801+27 (Approach Rt)	Gravel Section Line
Sta 813+32 (Approach Lt)	Field Drive
Sta 813+33 (Approach Rt)	Field Drive
Sta 837+29 (Approach Lt)	Field Drive
Sta 837+31 (Approach Rt)	Field Drive
Sta 854+04 (Approach Lt)	Gravel Section Line
Sta 854+05 (Approach Rt)	Gravel Section Line
Sta 864+87 (Approach Rt)	Field Drive
Sta 864+89 (Approach Lt)	Gravel Private Drive
Sta 868+30 (Approach Lt)	Gravel Private Drive
Sta 880+47 (Approach Rt)	Field Drive
Sta 880+53 (Approach Lt)	Gravel Private Drive
Sta 886+03 (Approach Lt)	Field Drive
Sta 886+11 (Approach Rt)	Field Drive
Sta 900+57 (Approach Lt)	Field Drive
Sta 906+92 (Approach Lt)	Field Drive
Sta 906+93 (Approach Rt)	Field Drive
Sta 918+52 (Approach Rt)	Gravel Private Drive
Sta 925+24 (Approach Lt)	Field Drive
Sta 933+30 (Approach Lt)	Field Drive
Sta 933+32 (Approach Rt)	Field Drive
Sta 946+54 (Approach Rt)	Field Drive
Sta 950+01 (Approach Lt)	Field Drive
Sta 959+73 (Approach Rt)	Gravel Section Line
Sta 959+74 (Approach Lt)	Gravel Section Line
Sta 986+20 (Approach Rt)	Field Drive
Sta 986+23 (Approach Lt)	Field Drive

Approach Location	TYPE
Sta 1003+27 (Approach Lt)	Field Drive
Sta 1012+60 (Approach Rt)	Gravel Section Line
Sta 1012+62 (Approach Lt)	Gravel Section Line
Sta 1027+28 (Approach Lt)	Field Drive
Sta 1027+35 (Approach Rt)	Field Drive
Sta 1038+80 (Approach Lt)	Field Drive
Sta 1039+29 (Approach Rt)	Field Drive
Sta 1053+33 (Approach Rt)	Field Drive
Sta 1054+62 (Approach Lt)	Field Drive
Sta 1059+33 (Approach Rt)	Field Drive
Sta 1065+46 (Approach Lt)	Gravel Section Line
Sta 1065+50 (Approach Rt)	Gravel Section Line
Sta 1091+90 (Approach Lt)	Gravel Section Line
Sta 1092+01 (Approach Rt)	Gravel Section Line
Sta 1101+58 (Approach Lt)	Field Drive
Sta 1118+31 (Approach Lt)	Gravel Section Line
Sta 1118+34 (Approach Rt)	Gravel Section Line
Sta 1128+96 (Approach Lt)	Gravel Private Drive
Sta 1144+79 (Approach Lt)	Field Drive
Sta 1171+50 (Approach Rt)	Field Drive
Sta 1171+51 (Approach Lt)	Field Drive
Sta 1190+01 (Approach Lt)	Field Drive
Sta 1197+31 (Approach Rt)	Field Drive
Sta 1199+79 (Approach Lt)	Field Drive
Sta 1211+07 (Approach Lt)	Field Drive
Sta 1215+94 (Approach Rt)	Field Drive
Sta 1221+08 (Approach Lt)	Paved Private Drive

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APPROACH PAVING LOCATIONS

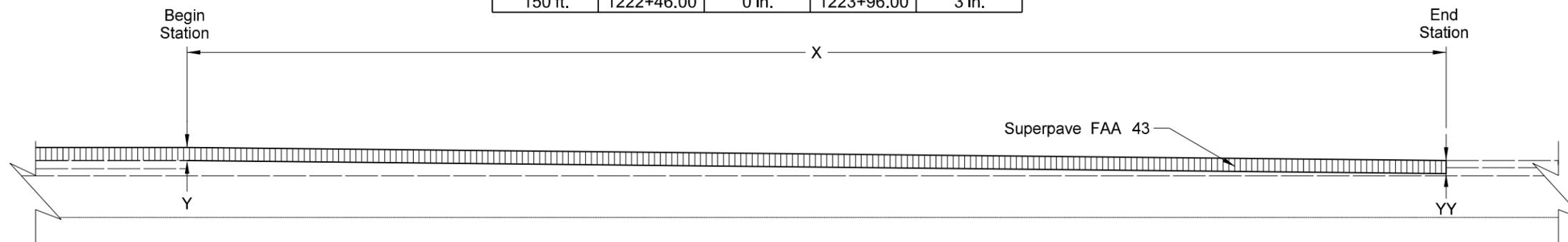
JCT ND 50 NORTH to E JCT 5 - CROSBY



Milling Transition

Milling Transitions

X	Begin Station	Y	End Station	YY
150 ft.	1+62.00	0 in.	0+12.00	3 in.
150 ft.	1222+46.00	0 in.	1223+96.00	3 in.



Paving Transition

*Drawing is not to scale.

Paving Transitions

X	Begin Station	Y	End Station	YY
150 ft.	1+62.00	3 in.	0+12.00	3 in.
150 ft.	1222+46.00	3 in.	1223+96.00	3 in.

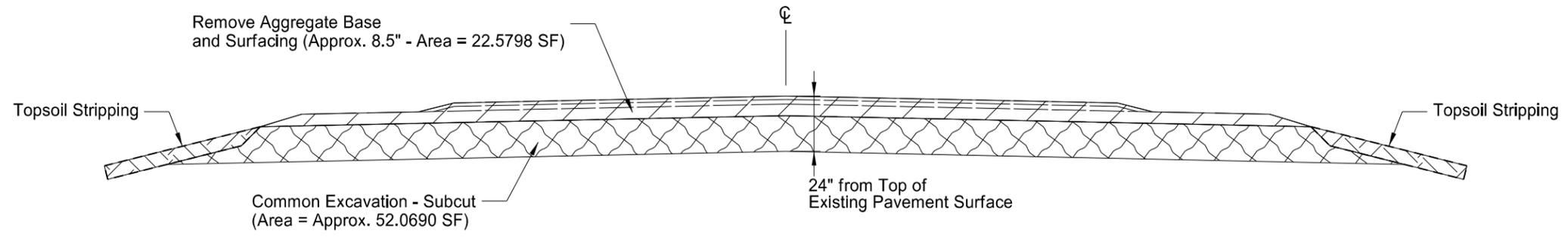
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MILLING AND PAVING TRANSITION QUANTITIES

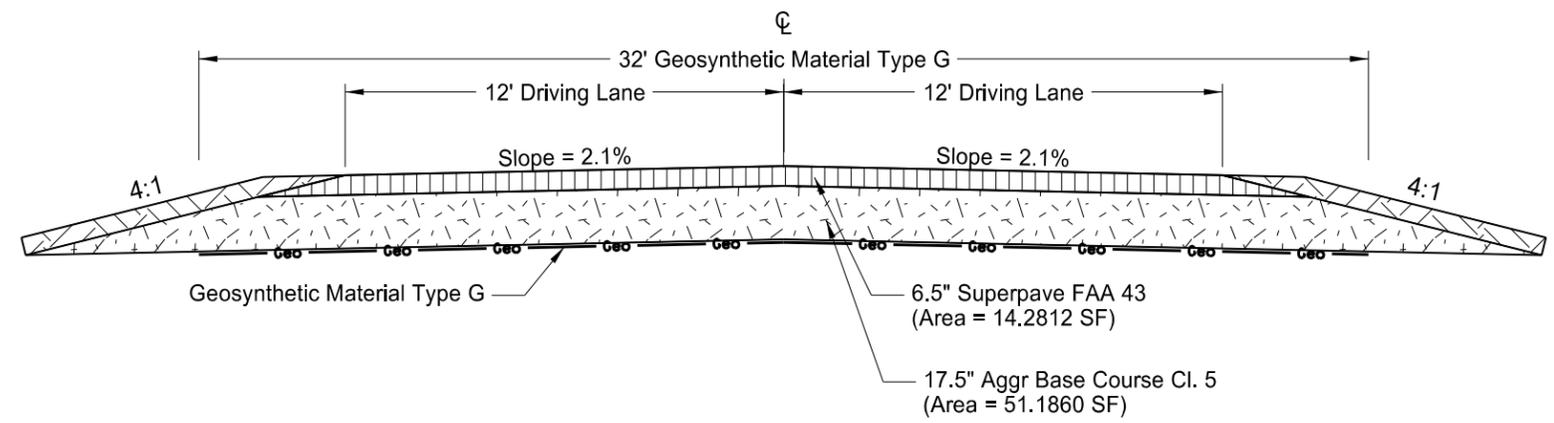
SPEC	CODE	BID ITEM	UNIT	Quantities for 2 Transitions
401	0050	TACK COAT @ 0.05 GAL/SY (1st Lift)	GAL	44
401	0050	TACK COAT @ 0.05 GAL/SY (2nd Lift)	GAL	40
411	0105	MILLING PAVEMENT SURFACE	SY	800
430	0043	SUPERPAVE FAA 43 @ 2 TON/CY	TON	154
430	5828	PG 58-28 ASPHALT CEMENT @ 6.0% Superpave FAA 43	TON	10

MILLING AND PAVING TRANSITIONS

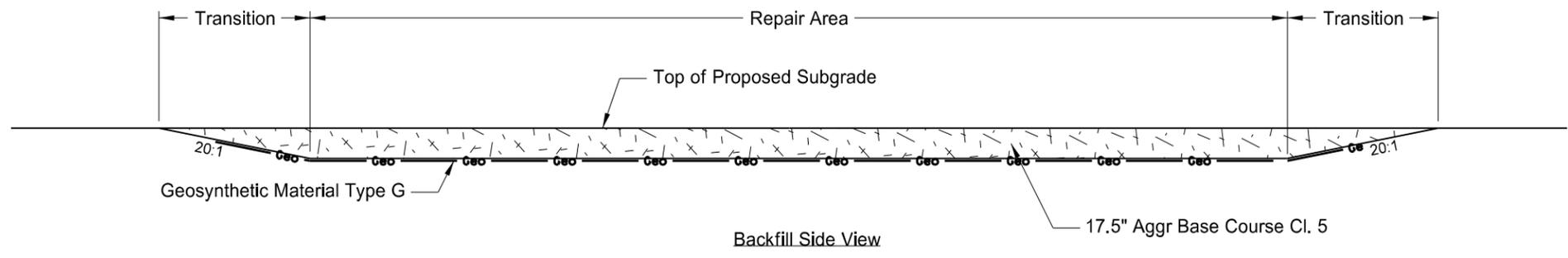
JCT ND 50 NORTH to E JCT 5 - CROSBY



Removal and Subcut Section
Sta 859+84.00 to Sta 860+34.00



Subgrade Repair Proposed Section
Sta 859+84.00 to Sta 860+34.00



Backfill Side View

Begin Transition (Sta to Sta)	Full Depth at 24" From Top of Pavement (Sta to Sta)	End Transition (Sta to Sta)	Depth (IN)	Remove Aggr. Base and Surfacing	Common Excavation - Subcut	Geosynthetic Material Type G	Aggregate Base Course CL 5	Superpave FAA 43	PG 58-28 Asphalt Cement	Tack Coat (3 lifts)
859+54 to 859+84	859+84 to 860+34	860+34 to 860+64	17.5"	*1 L SUM	212 CY	391 SY	284 TON	116 TON	7 TON	44 GAL

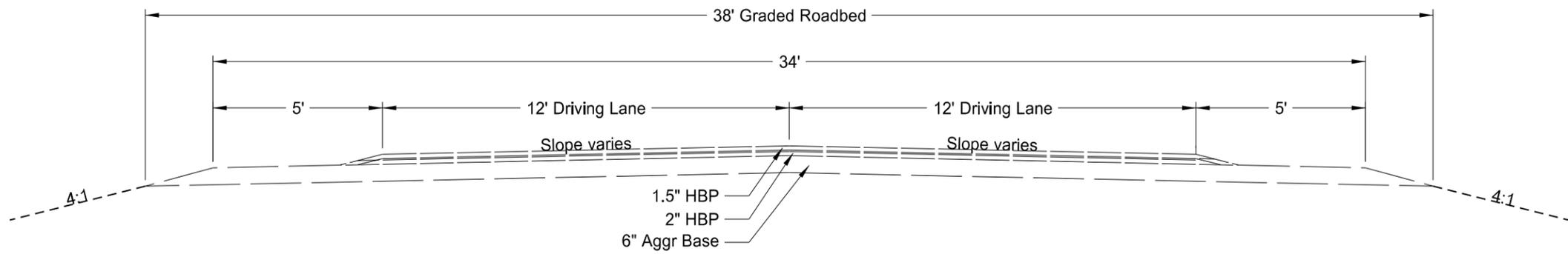
*Approximately 92 CY of aggregate base & existing surfacing to be removed.

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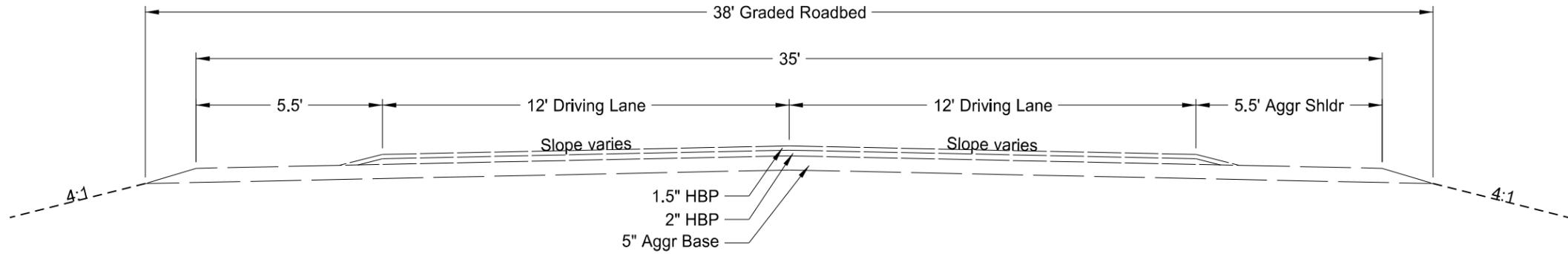
SUBCUT REPAIR

JCT ND 50 NORTH to E JCT 5 - CROSBY

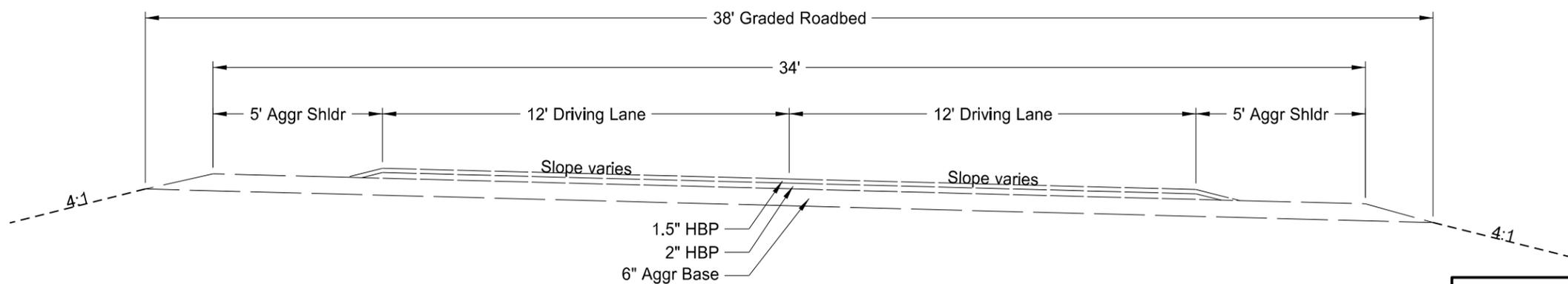
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-042(014)000	30	1



Existing Typical Section - Tangent
 Sta 0+12.00 to Sta 156+72.17
 Sta 197+81.10 to Sta 212+00.00
 Sta 1171+50.00 to Sta 1223+96.00



Existing Typical Section - Tangent & Curves without Superelevation
 Sta 212+00.00 to Sta 213+99.67
 Sta 222+50.65 to Sta 476+12.00
 Sta 487+55.00 to Sta 490+11.59
 Sta 511+23.35 to Sta 518+78.40
 Sta 541+16.14 to Sta 1171+50.00

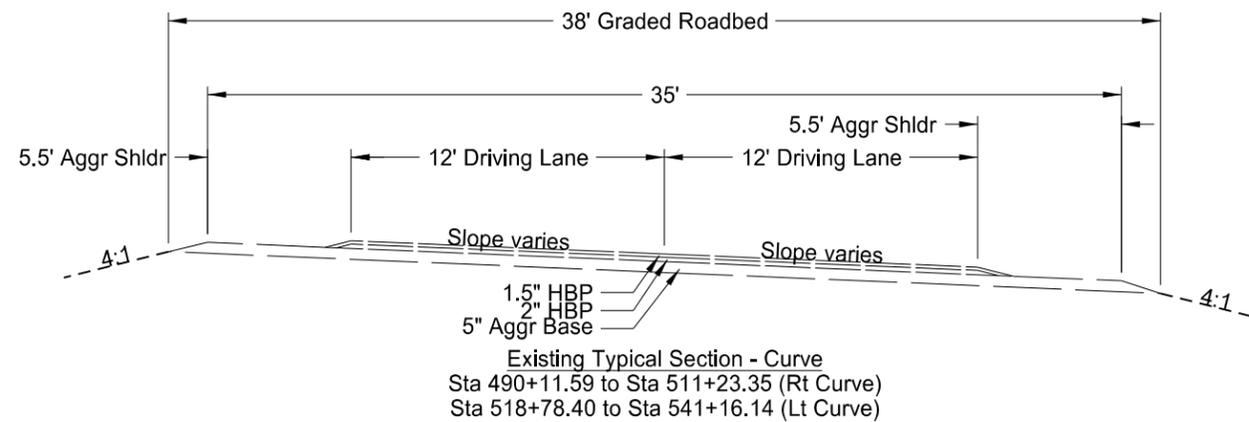
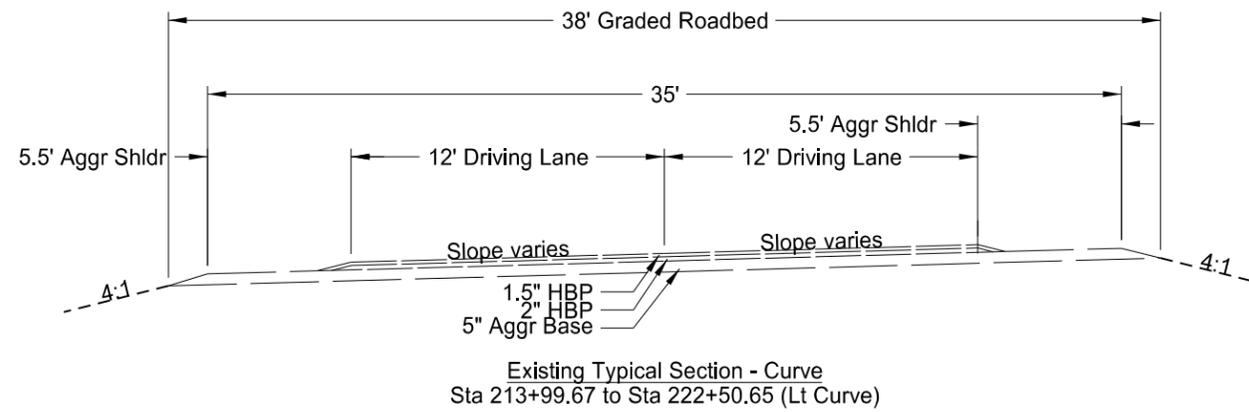
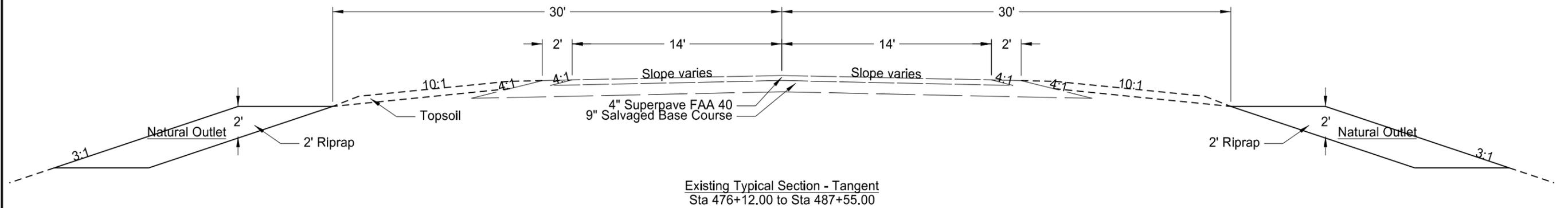


Existing Typical Section - Curve
 Sta 156+72.17 to Sta 172+00.17 (Lt Curve)
 Sta 172+00.17 to Sta 197+81.10 (Rt Curve)

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EXISTING TYPICAL SECTIONS
 JCT ND 50 NORTH to E JCT 5 - CROSBY

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-042(014)000	30	2

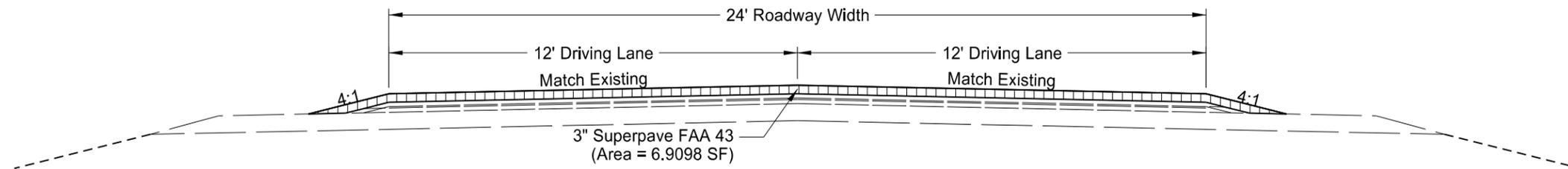


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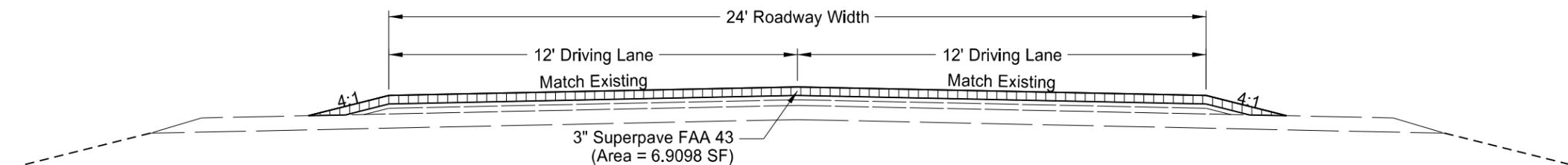
EXISTING TYPICAL SECTIONS

JCT ND 50 NORTH to E JCT 5 - CROSBY

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-042(014)000	30	3

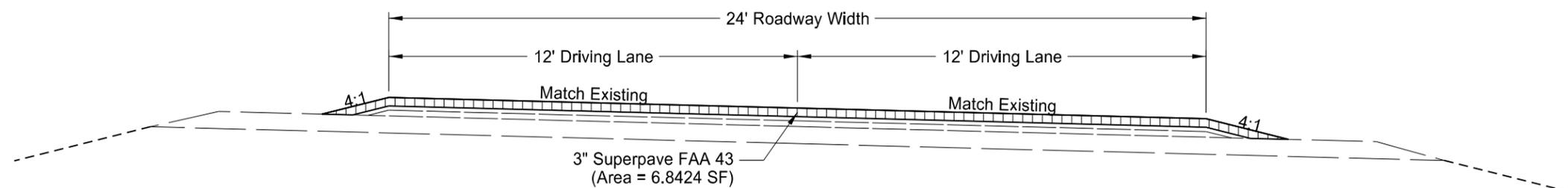


#1 Proposed Typical Section - Tangent
 Sta 1+62.00 to Sta 156+72.17
 Sta 197+81.10 to Sta 212+00.00
 Sta 1171+50.00 to Sta 1222+46.00



#2 Proposed Typical Section - Tangent & Curves without Superelevation
 Sta 212+00.00 to Sta 213+99.67
 Sta 222+50.65 to Sta 476+12.00
 Sta 487+55.00 to Sta 490+11.59
 Sta 511+23.35 to Sta 518+78.40
 Sta 541+16.14 to Sta 859+54.00*
 *Sta 860+64.00 to Sta 1171+50.00

*See Subcut Detail for Sta 859+54.00 to Sta 860+64.00

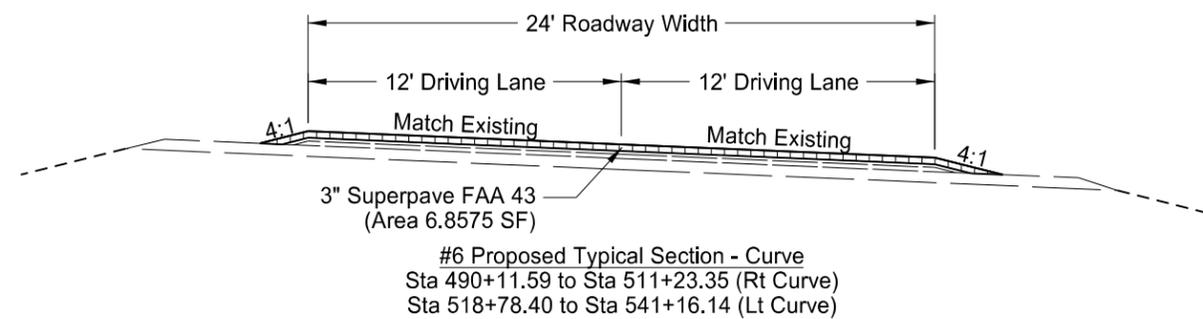
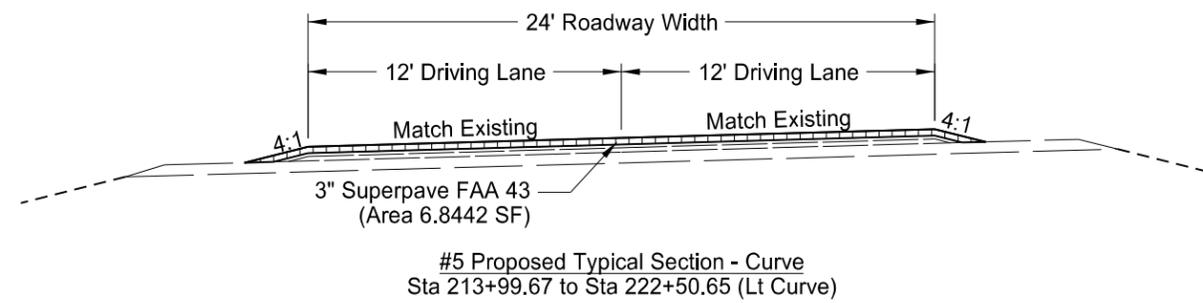
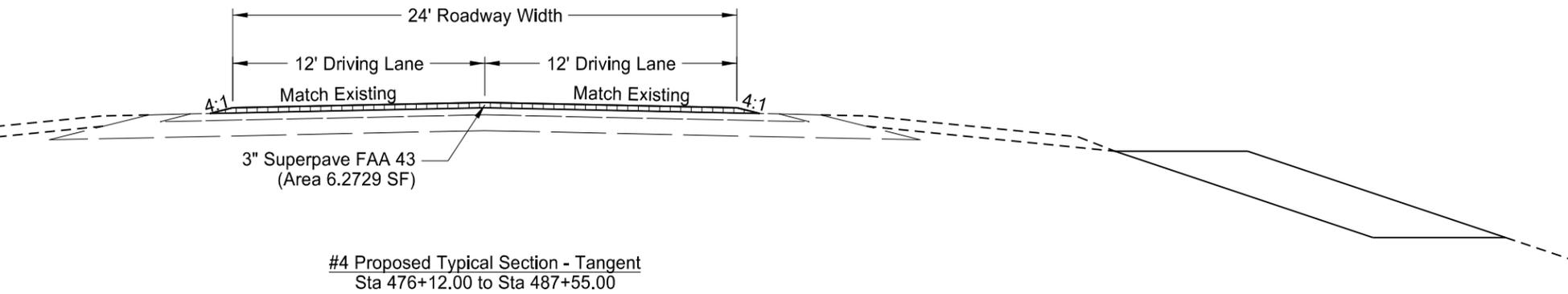


#3 Proposed Typical Section - Curve
 Sta 156+72.17 to Sta 172+00.17 (Lt Curve)
 Sta 172+00.17 to Sta 197+81.10 (Rt Curve)

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PROPOSED TYPICAL SECTIONS
 JCT ND 50 NORTH to E JCT 5 - CROSBY

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-042(014)000	30	4



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PROPOSED TYPICAL SECTIONS

JCT ND 50 NORTH to E JCT 5 - CROSBY

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - ND 42 from the Jct of ND 50 north to the Jct of ND 5 - Crosby

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-042(014)000	81	1

HORIZONTAL ALIGNMENT				CURVE DATA		US PUBLIC LAND SURVEY DATA				SURVEY CONTROL POINTS								
PNT	STATION	NORTHING	EASTING	ARC DEFINITION		DESC.	SEC-TWP-RGE	NORTHING	EASTING	PNT	NORTHING	EASTING	ELEV	STATION	OFFSET			
										CONTROL POINT DESCRIPTION								
ND 42 (Chain:SCL42W)								581983.88	1285914.70									
Station equation: ND 42 and ND 50				C401	C402			587067.01	1291395.60	PRIMARY CONTROL								
ND 50	1853+01.60	587267.43	1286113.35	PI STA =164+02.04	PI STA =218+26.41	NW Cor Sec 25 T-159-N R-98-W		587462.64	1280829.47	GPS 1	590210.22	1286120.37	2340.91	29+41	97' Lt			
ND 42	0+00.00	587267.43	1286113.35	Delta =14° 31' 08" LT	Delta =10° 44' 08" LT	W 1/4 Cor Sec 23 T-159-N R-98-W		589904.61	1286206.28	#6 Rebar w/ 1½" Alum Cap "LS 3047"								
Rec 1/4 Cor	26+38.82	589904.61	1286206.28	D _a =1° 00' 00"	D _a =1° 15' 42"	NW Cor Sec 23 T-159-N R-98-W		592542.18	1286298.75	GPS 2	606431.38	1286365.19	2297.10	191+88	87' Lt			
Rec Sec Cor	52+78.00	592542.18	1286298.75	R =5729.65'	R =4541.63'	NW Cor Sec 14 T-159-N R-98-W		597826.77	1286502.71	#6 Rebar w/ 1½" Alum Cap "LS 3047"								
Sec Cor	105+66.53	597826.77	1286502.71	T =729.87'	T =426.74'	NW Cor Sec 2 T-159-N R-98-W		608386.30	1286914.89									
PC	156+72.17	602928.55	1286701.20	L =1451.92'	L =850.98'	NW Cor Sec 3 T-159-N R-98-W		608582.29	1281631.64									
PI C401	164+02.04	603657.87	1286729.58			NW Cor Sec 35 T-160-N R-98-W		611024.35	1287008.01									
PT	171+24.08	604371.01	1286574.21	C50246														
PC	172+76.25	604519.69	1286541.82	PI STA =185+49.01														
PI C50246	185+49.01	605763.27	1286270.88	Delta =25° 02' 53" RT														
PT	197+81.10	607004.62	1286551.93	D _a =1° 00' 00"														
CO Line	211+99.65	608388.14	1286865.18	R =5729.65'														
PC	213+99.67	608583.23	1286909.35	T =1272.76'														
PI C402	218+26.41	608999.43	1287003.58	L =2504.85'														
PT	222+50.65	609425.91	1287018.63															
										REFERENCE MARKERS								
										R Mkr #	NORTHING	EASTING	STATION	OFFSET	ALIGNMENT			
										1	592579.98	1286338.12	53+17.29	38' Rt	SCL42W			
										2	597858.91	1286540.46	106+00.11	36' Rt	SCL42W			
										3	603091.32	1286741.61	158+35.37	36' Rt	SCL42W			
										4	608336.08	1286891.84	211+54.76	38' Rt	SCL42W			
ND 50 (Chain:SCL50)																		
Sec Cor	1800+14.12	587462.64	1280829.47															
Sec Cor & ND 42	1853+01.60	587267.43	1286113.35															
Sec Cor	1905+87.65	587067.01	1291395.60															
NOTES: Sheet 1 of 3				Date Survey Completed 10/20/2015		<input type="checkbox"/> Assumed Coordinates <input checked="" type="checkbox"/> All coordinates on this sheet are Williams County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota North Zone Combination Factor (cf) = 0.9998445				All coordinates and measurements on this document derived from the International Foot definition.			INITIALIZING BENCH MARK NDGPS Stations (OPUS) <input checked="" type="checkbox"/> NAVD-88 <input type="checkbox"/> NGVD-29 <input type="checkbox"/> GEOID 09 <input type="checkbox"/> _____ <input checked="" type="checkbox"/> GEOID 12A			This document was originally issued and sealed by Robert D. Zahn Registration Number LS- 3659 , on 10/20/15 and the original document is stored at the North Dakota Department of Transportation		

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - ND 42 from the Jct of ND 50 north to the Jct of ND 5 - Crosby

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-042(014)000	81	2

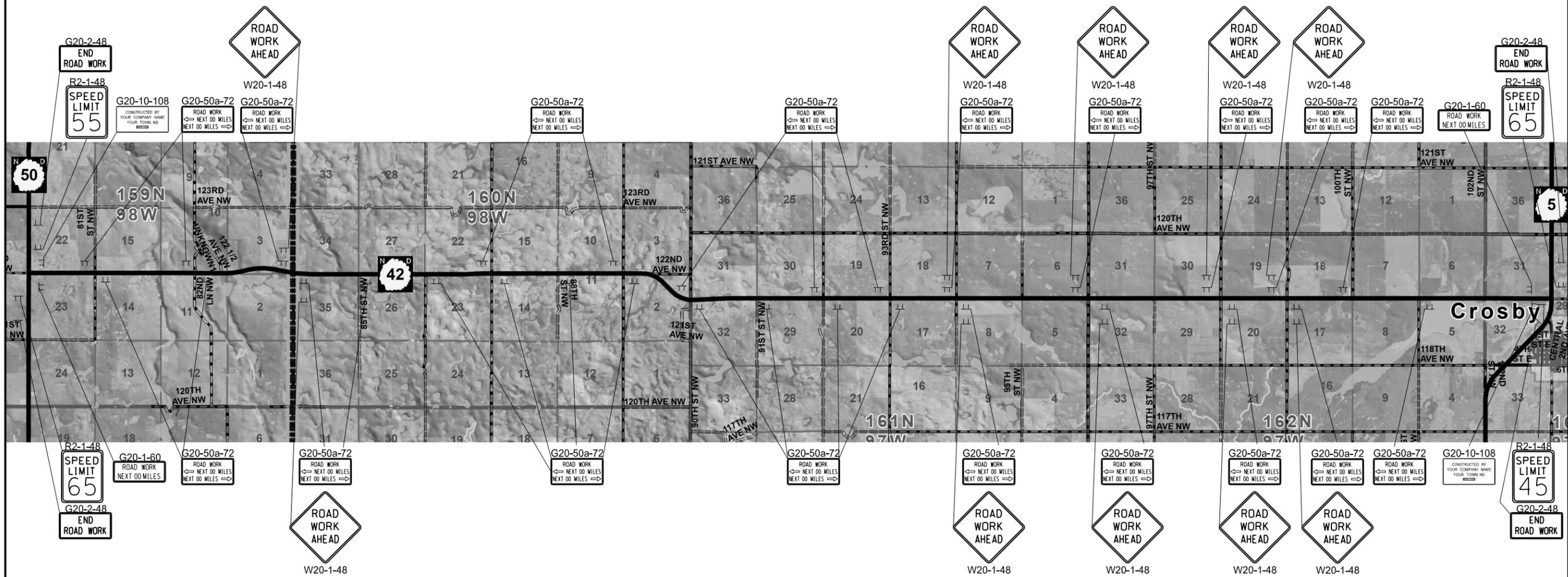
HORIZONTAL ALIGNMENT				CURVE DATA		US PUBLIC LAND SURVEY DATA				SURVEY CONTROL POINTS					
PNT	STATION	NORTHING	EASTING	ARC DEFINITION		DESC.	SEC-TWP-RGE	NORTHING	EASTING	PNT	NORTHING	EASTING	ELEV	STATION	OFFSET
										CONTROL POINT DESCRIPTION					
				C50246		NW Sec 2 T-159-N R-98-W		608344.62	1286826.73						
ND 42 (Chain:SCL42D)				PI STA = 185+49.20	SCS1120	W 1/4 Cor Sec 35 T-160-N R-98-W		610982.49	1286919.85						
PT	197+81.30	606963.13	1286463.82	Delta = 25° 02' 55" RT	PI STA = 501+18.45	NW Cor Sec 35 T-160-N R-98-W		613620.49	1287012.84	GPS 2	606389.84	1286277.06	2297.10	191+89	87' Lt
CO Line	211+99.65	608346.46	1286777.03	D _a = 1° 00' 00"	Delta = 45° 17' 26" RT	W 1/4 Cor Sec 26 T-160-N R-98-W		616258.27	1287108.12	#6 Rebar w/ 1½" Alum Cap LS 3047					
PC	213+99.55	608541.42	1286821.18	R = 5,729.65'	D _a = 2° 30' 00"	NW Cor Sec 26 T-160-N R-98-W		618896.05	1287203.39	GPS 3	622031.63	1287441.93	2298.66	349+07	62' Rt
PI C304	218+26.30	608957.64	1286915.41	T = 1,272.78'	R = 2,292.01'	NW Cor Sec 23 T-160-N R-98-W		624171.77	1287395.56	#6 Rebar w/ 1½" Alum Cap LS 3047					
PT	222+50.55	609384.13	1286930.47	L = 2,504.88'	L _s = 300.00'	W 1/4 Cor Sec 14 T-160-N R-98-W		626813.25	1287489.42	GPS 4	636774.62	1287838.15	2227.76	496+48	63' Lt
1/4 Line	238+47.55	610980.13	1286986.80		S _c = 3° 44' 59"	NW Cor Sec 14 T-160-N R-98-W		629454.47	1287583.10	#6 Rebar w/ 1½" Alum Cap LS 3047					
Sec line	264+87.12	613618.07	1287079.80	C304	T _s = 1,106.86'	NW Cor Sec 11 T-160-N R-98-W		634730.86	1287773.67	GPS 5	651797.74	1290420.37	2140.43	654+42	65' Rt
Sec line	317+68.54	618896.05	1287270.44	PI STA = 218+26.30	L = 1,511.77'	W 1/4 Cor Sec 32 T-161-N R-97-W		642689.90	1290034.87	#6 Rebar w/ 1½" Alum Cap LS 3047					
PC	345+09.71	621635.40	1287369.90	Delta = 10° 44' 10" LT		NW Cor Sec 32 T-161-N R-97-W		645331.75	1290127.30	GPS 6	667670.58	1290876.73	2081.47	813+21	42' Lt
PI C308	349+51.32	622076.73	1287385.93	D _a = 1° 15' 42"	SCS1111	W 1/4 Cor Sec 29 T-161-N R-97-W		647973.68	1290220.72	#5 Rebar w/ 1½" Alum Cap LS 3047					
PT	353+92.75	622518.30	1287379.27	R = 4,541.63'	PI STA = 530+60.14	NW Cor Sec 29 T-161-N R-97-W		650615.43	1290314.16	GPS 7	681330.21	1291363.80	2015.30	949+90	47' Lt
PC	358+03.26	622928.77	1287373.08	T = 426.75'	Delta = 48° 26' 23" LT	W 1/4 Cor Sec 20 T-161-N R-97-W		653258.23	1290406.82	#5 Rebar w/ 1½" Alum Cap LS 3047					
PI C309	362+45.86	623371.32	1287366.40	L = 851.00'	D _a = 2° 29' 59"	NW Cor Sec 20 T-161-N R-97-W		655900.95	1290499.47	GPS 8	695509.01	1291869.12	1987.66	1091+77	46' Lt
PT	366+88.27	623813.62	1287382.51		R = 2,292.01'	W 1/4 Cor Sec 17 T-161-N R-97-W		658540.89	1290593.96	#5 Rebar w/ 1½" Alum Cap LS 3047					
Rec Sec Cor	370+46.65	624171.77	1287395.56	C308	L _s = 300.00'	NW Cor Sec 17 T-161-N R-97-W		661181.55	1290688.15	GPS 9	709217.37	1292582.20	1958.02	N/A	N/A
Rec 1/4 Cor	396+89.80	626813.25	1287489.42	PI STA = 349+51.32	S _c = 3° 44' 59"	NW Cor Sec 8 T-161-N R-97-W		666467.71	1290875.91	#5 Rebar w/ 1½" Alum Cap LS 3047					
Rec Sec Cor	423+32.68	629454.47	1287583.10	Delta = 2° 56' 36" LT	T _s = 1,181.74'	NW Cor Sec 29 T-162-N R-97-W		682309.35	1291446.53						
Rec Sec Cor	476+12.51	634730.86	1287773.67	D _a = 0° 20' 00"	L = 1,637.74'	W 1/4 Cor Sec 20 T-162-N R-97-W		684951.04	1291540.39						
TS	490+11.59	636129.05	1287823.43	R = 17,188.76'		NW Cor Sec 20 T-162-N R-97-W		687592.84	1291634.50						
SC	493+11.59	636428.50	1287840.63	T = 441.62'	C1095	W 1/4 Cor Sec 17 T-162-N R-97-W		690234.39	1291727.40						
PI SCS1120	501+18.45	637235.21	1287862.80	L = 883.04'	PI STA = 563+26.77	NW Cor Sec 17 T-162-N R-97-W		692876.09	1291820.46						
CS	508+23.35	637777.37	1288460.57		Delta = 3° 06' 53" RT	W 1/4 Cor Sec 8 T-162-N R-97-W		695518.17	1291915.96						
ST	511+23.35	637985.43	1288676.62	C309	D _a = 0° 18' 00"	NW Cor Sec 8 T-162-N R-97-W		698160.48	1292011.59						
TS	518+78.40	638497.20	1289231.77	PI STA = 362+45.86	R = 19,098.60'	W 1/4 Cor Sec 5 T-162-N R-97-W		700802.38	1292107.66						
SC	521+78.40	638705.26	1289447.82	Delta = 2° 57' 00" RT	T = 519.23'	NW Cor Sec 5 T-162-N R-97-W		703470.69	1292204.82						
PI SCS1111	530+60.14	639298.17	1290100.65	D _a = 0° 20' 00"	L = 1,038.20'	NW Cor Sec 32 T-163-N R-97-W		708751.73	1292398.72						
CS	538+16.14	640179.75	1290077.01	R = 17,188.76'		S 1/4 Cor Sec 30 T-163-N R-97-W		708854.58	1289763.48						
ST	541+16.14	640479.69	1290077.74	T = 442.60'											
PC	558+07.54	642170.77	1290044.94	L = 885.00'											
PI C1095 Rec 1/4 Cor	563+26.77	642689.90	1290034.87												
PT	568+45.74	643208.81	1290053.03												
Continued on sheet 3															
NOTES: Sheet 2 of 3					Date Survey Completed 10/20/2015	<input type="checkbox"/> Assumed Coordinates <input checked="" type="checkbox"/> All coordinates on this sheet are Divide County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota North Zone Combination Factor (cf) = 0.9999130				All coordinates and measurements on this document derived from the International Foot definition.			This document was originally issued and sealed by Robert D. Zahn Registration Number LS- 3659 , on 10/20/15 and the original document is stored at the North Dakota Department of Transportation		
						<input type="checkbox"/> NAVD-88 <input type="checkbox"/> NGVD-29 <input type="checkbox"/> GEOID 09 <input type="checkbox"/> _____ <input checked="" type="checkbox"/> GEOID 12A									

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - ND 42 from the Jct of ND 50 north to the Jct of ND 5 - Crosby

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-042(014)000	81	3

HORIZONTAL ALIGNMENT				CURVE DATA		REFERENCE MARKERS					SURVEY CONTROL POINTS							
PNT	STATION	NORTHING	EASTING	ARC DEFINITION		R Mkr #	NORTHING	EASTING	STATION	OFFSET	ALIGNMENT	PNT	NORTHING	EASTING	ELEV	STATION	OFFSET	CONTROL POINT DESCRIPTION
Continued from sheet 2						4	608294.41	1286803.68	211+55	37' Rt	SCL42W							
Rec Sec Cor	589+69.98	645331.75	1290127.30			5	613572.25	1287110.61	264+42	32' Rt	SCL42W							
Rec 1/4 Cor	616+13.56	647973.68	1290220.72			6	618837.26	1287299.54	317+11	31' Rt	SCL42W							
Rec Sec Cor	642+56.97	650615.43	1290314.16			7	624143.02	1287428.64	370+19	34' Rt	SCL42W							
Rec 1/4 Cor	669+01.39	653258.23	1290406.82			8	629418.55	1287616.29	422+98	34' Rt	SCL42W							
Rec Sec Cor	695+45.73	655900.95	1290499.47			9	634692.17	1287802.13	475+75	30' Rt	SCL42W							
Rec 1/4 Cor	721+87.37	658540.89	1290593.96			10	639255.24	1289870.86	528+69	32' Rt	SCL42W							
Rec Sec Cor	748+29.70	661181.55	1290688.15			11	644499.28	1290130.62	581+38	32' Rt	SCL42W							
Rec Sec Cor	801+19.19	666467.71	1290875.91			12	649782.50	1290317.01	634+25	32' Rt	SCL42W							
Sec Cor	854+02.75	671747.90	1291064.47			13	655052.97	1290503.06	686+98	33' Rt	SCL42W							
Sec Cor	906+89.34	677031.10	1291253.65			14	660363.71	1290690.62	740+12	32' Rt	SCL42W							
Rec Sec Cor	959+71.11	682309.35	1291446.53			15	665617.91	1290878.76	792+70	33' Rt	SCL42W							
Rec 1/4 Cor	986+14.46	684951.04	1291540.39			16	670878.31	1291066.38	845+34	33' Rt	SCL42W							
Rec Sec Cor	1012+57.94	687592.84	1291634.50			17	676146.26	1291253.60	898+05	32' Rt	SCL42W							
Rec 1/4 Cor	1039+01.12	690234.39	1291727.40			18	681398.04	1291441.71	950+60	28' Rt	SCL42W							
Rec Sec Cor	1065+44.46	692876.09	1291820.46			19	686688.82	1291628.85	1003+54	27' Rt	SCL42W							
Rec 1/4 Cor	1091+88.27	695518.17	1291915.96			20	691968.72	1291820.95	1056+38	32' Rt	SCL42W							
Rec Sec Cor	1118+32.31	698160.48	1292011.59			21	697251.42	1292011.95	1109+24	33' Rt	SCL42W							
Rec 1/4 Cor	1144+75.95	700802.38	1292107.66			22	702509.37	1292202.95	1161+85	33' Rt	SCL42W							
Twp line Rec Sec Cor	1171+46.03	703470.69	1292204.82			23	707820.15	1292394.03	1215+00	29' Rt	SCL42W							
1/4 Cor	1197+88.27	706111.15	1292301.78															
Station equation: ND 42 & ND 5																		
ND 42 Rec Sec Cor	1224+30.63	708751.73	1292398.72															
ND 5	1812+46.56	708751.73	1292398.72															
ND 5 (Chain:SCL05)																		
Rec 1/4 Cor	1786+09.31	708854.58	1289763.48															
ND 42	1812+46.56	708751.73	1292398.72															
TS	1814+63.78	708743.95	1292615.81															
SC	1817+63.78	708727.97	1292915.34															
PI	1827+84.70	708696.64	1293935.88															
CS	1836+86.02	707952.48	1294634.95															
ST	1839+86.02	707738.55	1294845.21															
END	1901+74.02	703250.25	1299105.10															
NOTES: Sheet 3 of 3																		
					Date Survey Completed 10/20/2015													
						<input type="checkbox"/> Assumed Coordinates												
						<input checked="" type="checkbox"/> All coordinates on this sheet are Divide County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota North Zone Combination Factor (cf) = 0.9999130												
												All coordinates and measurements on this document derived from the International Foot definition.		This document was originally issued and sealed by Robert D. Zahn Registration Number LS- 3659 , on 10/20/15 and the original document is stored at the North Dakota Department of Transportation				
											INITIALIZING BENCH MARK NDGPS Stations (OPUS)							
											<input checked="" type="checkbox"/> NAVD-88							
											<input type="checkbox"/> NGVD-29							
											<input type="checkbox"/> GEOID 09	<input type="checkbox"/> _____						
											<input checked="" type="checkbox"/> GEOID 12A							

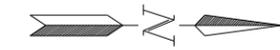
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-042(014)000	100	2



This document was originally issued and sealed by
 Darell Arne,
 Registration Number
 PE- 6523,
 on 3/14/16 and the original document is stored at the
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 of Transportation

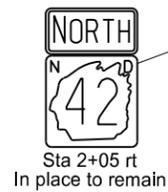
WORK ZONE TRAFFIC CONTROL LAYOUT
 JCT ND 50 NORTH to E JCT 5 - CROSBY

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SOIB-7-042(014)000	110	1



- Sta 53+17
RP 1
- Sta 106+00
RP 2
- Sta 158+35
RP 3
- Sta 211+55
RP 4
- Sta 264+42
RP 5
- Sta 317+11
RP 6
- Sta 370+19
RP 7
- Sta 422+98
RP 8
- Sta 475+75
RP 9
- Sta 528+69
RP 10
- Sta 581+38
RP 11
- Sta 634+25
RP 12
- Sta 686+98
RP 13
- Sta 740+12
RP 14

ND 42

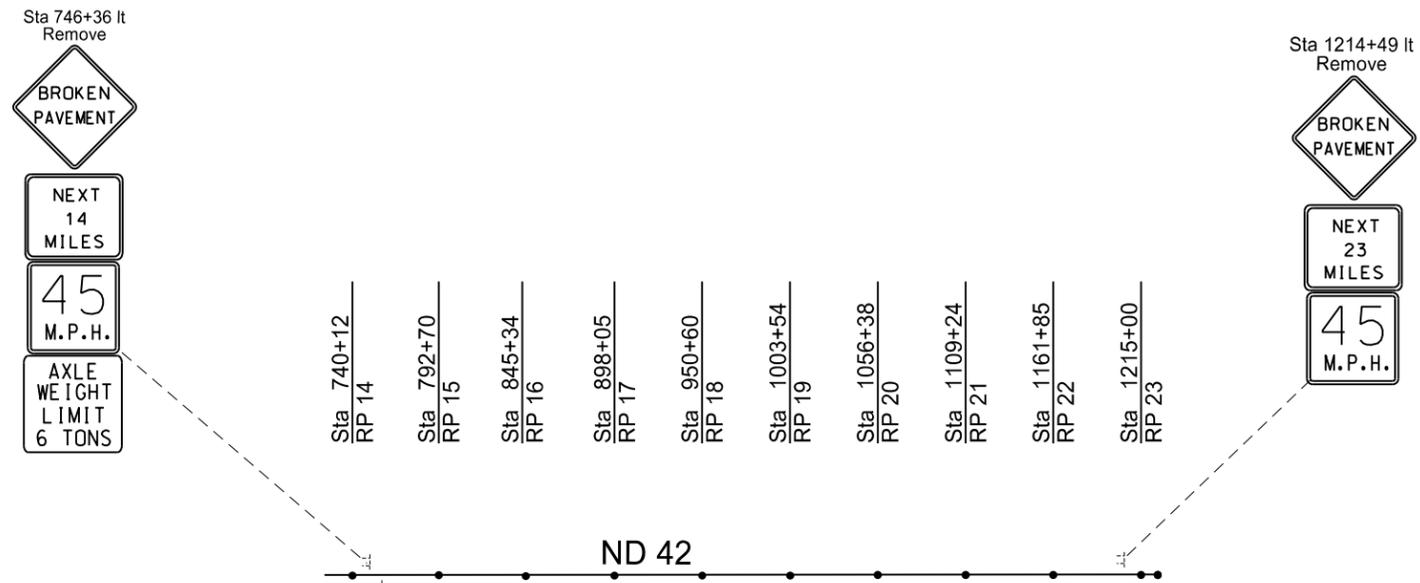
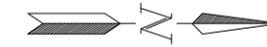


Sta 7+08 rt
Remove

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Sign Layout
 ND Hwy 42
 Jct ND 50 North to East Jct ND 5 - Crosby
 Divide and Williams Counties

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-042(014)000	110	2



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Sign Layout
 ND Hwy 42
 Jct ND 50 North to East Jct ND 5 - Crosby
 Divide and Williams Counties

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SOIB-7-042(014)000	180	1

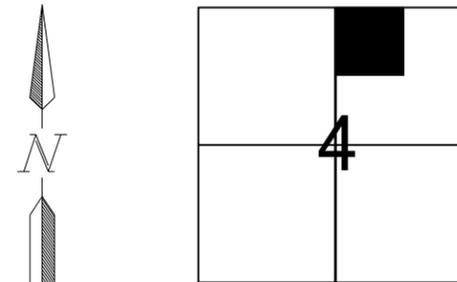
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

LOCATION OF PIT IN SECTION

TEST HOLE PLAT

Location: NW1/4NE1/4 4-162-102 County: Divide

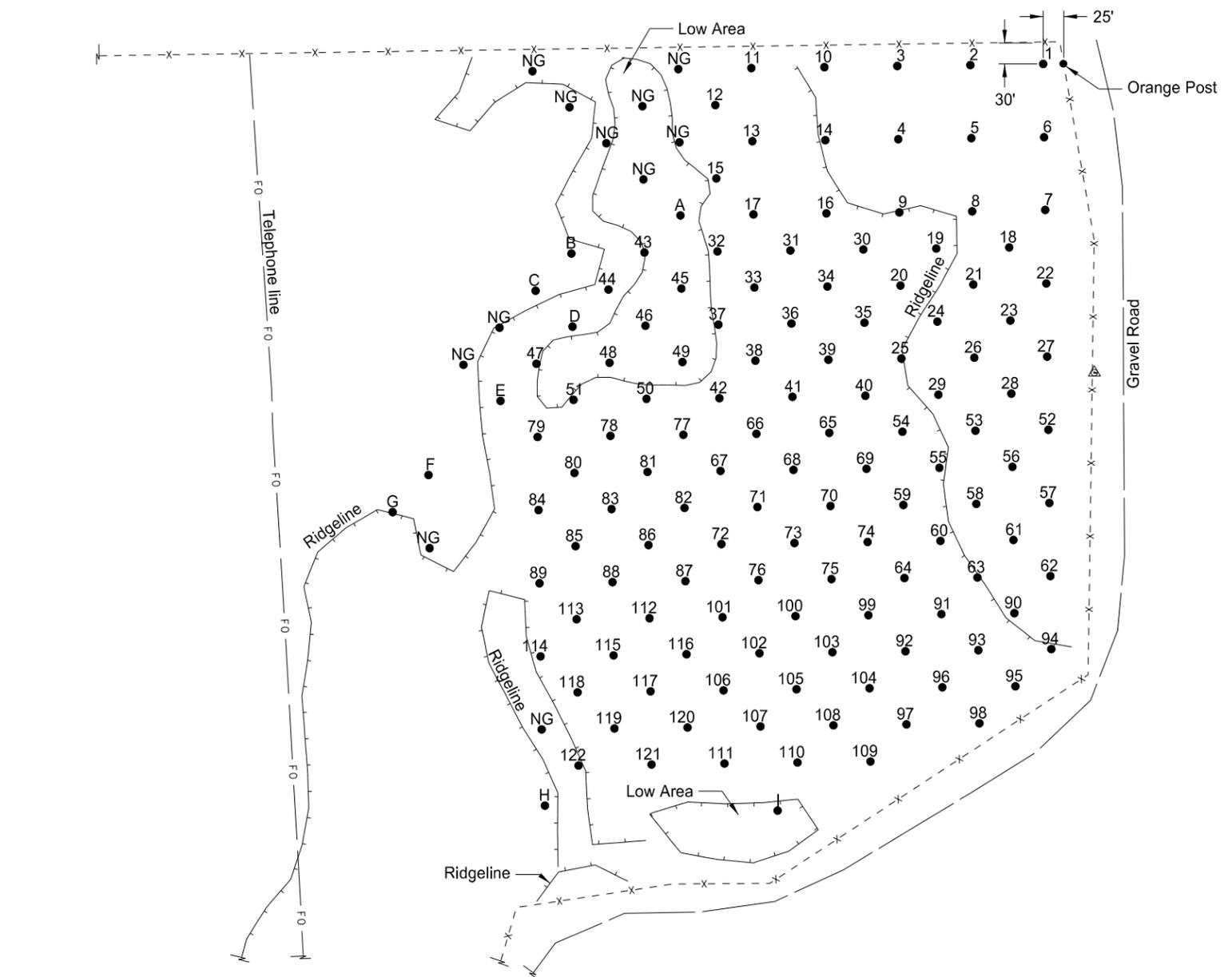
Ownership: Wayne and Arletta Herman



Highway 5

Area "A" consists of test holes 1 - 9
 Area "B" consists of test holes 10 - 17
 Area "C" consists of test holes 18 - 29
 Area "D" consists of test holes 30 - 42
 Area "E" consists of test holes 43 - 51
 Area "F" consists of test holes 52 - 64
 Area "G" consists of test holes 65 - 76
 Area "H" consists of test holes 77 - 89
 Area "I" consists of test holes 90 - 98
 Area "J" consists of test holes 99 - 111
 Area "K" consists of test holes 112 -122
 Test Holes A - I for information only

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



																						STATE	PROJECT NO.	SECTION NO.	SHEET NO.
																						ND	SOIB-7-042(014)000	180	2

PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES							
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	
1	1.5	1.5 Fgr Si Cl	0	5	18	31	Si Cl	9	1.0	1.0 gr Si Cl	0	10	23	34	Si Cl	20	1.5	0.5 gr	0	6	16	28	Si Cl	28	1.0	1.0 Fgr Si Cl	0	7	18	31	Si Cl
		2.0 gr								2.0 gr								1.0 sd								2.0 gr					
		0.5 Fgr								3.0 Fgr								2.0 gr								0.5 Fgr					
		1.5 sd								1.0 gr								1.0 sd								1.5 sd					
		1.0 Fgr								1.0 Fgr								1.0 gr								1.0 Fgr					
		0.5 Fgr Si Cl						10	1.0	1.5 gr	0	8	16	25	Si Cl			3.0 sd								1.0 gr					
2	2.0	1.0 sd	0	9	20	30	FS Si Cl			0.5 FS						21	1.0	1.0 Fgr Si Cl	0	5	16	26	Si Cl			1.0 Fgr					
		6.5 gr								2.0 gr								1.5 sd						29	1.0	5.0 gr	1	11	22	33	Si Cl
		0.5 FS Si Cl								3.0 sd								0.5 Fgr								1.0 sd					
3	1.0	2.0 Fgr Si Cl	0	10	21	30	Si Cl	11	1.0	2.0 Fgr Si Cl	0	3	11	21	+WL 9.0			1.0 gr								1.0 Fgr					
		2.0 gr								1.0 Fgr								0.5 Fgr								1.0 sd					
		1.0 sd								1.0 sd Si Cl								3.5 sd						30	1.0	1.5 gr Si Cl	0	6	18	33	Si Cl
		1.0 Fgr								4.0 sd								0.5 sd Si Cl								1.5 gr					
		1.0 sd						12	1.5	1.5 gr Si Cl	0	5	10	18	FS Si Cl	22	0.5	5.5 gr	0	7	15	24	FS Si Cl			1.0 Fgr					
4	0.5	0.5 gr Si Cl	0	10	20	31	Si Cl			1.0 sd Si Cl								1.0 Fgr								1.0 gr					
		2.0 gr								1.5 sd								2.0 sd								1.0 sd					
		1.5 sd						13	1.0	1.0 gr Si Cl	0	10	20	32	Si Cl			2.0 FS								0.5 gr					
		1.5 gr								2.0 gr						23	0.5	6.5 gr	1	15	28	41	FS Si Cl	31	1.0	1.0 sd Si Cl	0	2	22	35	Si Cl
		1.0 CS								0.5 Fgr								1.0 sd								8.0 gr					
		1.0 sd								3.0 sd								1.0 Fgr						32	2.0	1.0 Fgr Si Cl	0	10	22	32	+WL 7.0
5	1.0	1.0 gr Si Cl	0	9	19	30	Si Cl	14	1.0	1.0 gr Si Cl	0	6	15	28	Si Cl	24	0.5	0.5 sd Si Cl	0	9	19	31	Si Cl			2.0 gr					
		1.0 Fgr								3.0 gr								4.0 sd						33	1.5	5.5 gr	0	14	26	38	+WL 8.0
		1.0 gr								3.0 sd								1.5 Fgr								1.0 sd					
		1.0 Fgr						15	1.0	1.0 Fgr Si Cl	0	5	18	30	+WL 7.0	25	1.0	4.0 gr	1	15	28	38	FS Si Cl	34	1.5	1.5 gr Si Cl	0	11	23	36	Si Cl
		1.0 sd								2.0 gr								1.0 Fgr								1.0 gr					
		2.0 Fgr								2.0 sd								1.5 sd								1.0 Fgr					
		0.5 sd Co S						16	1.5	1.5 gr Si Cl	0	8	18	33	Si Cl	26	0.5	0.5 sd Si Cl	0	7	18	28	Si Cl			1.0 gr					
6	1.0	1.0 gr Si Cl	0	9	20	31	FS Si Cl			1.0 Fgr								1.0 gr Si Cl								1.5 sd					
		1.0 gr								2.0 Fgr								1.5 sd								1.5 gr					
		2.0 Fgr								2.0 sd								1.5 gr						35	0.5	1.5 gr Si Cl	0	6	17	30	Si Cl
		1.5 sd								1.5 gr								2.0 Fgr								3.0 gr					
		2.0 gr						17	2.0	1.0 sd	0	4	13	24	+WL 8.0			1.0 gr								1.0 Fgr					
		0.5 FS Si Cl								1.5 gr								0.5 sd Si Cl								2.5 sd					
7	1.0	1.0 gr Si Cl	0	9	20	31	Si Cl			0.5 Fgr								0.5 sd													
		1.0 Fgr								3.0 sd								1.0 Fgr													
		3.5 gr						18	1.5	5.5 gr	0	8	17	30	Si Cl			1.0 Fgr													
		0.5 sd								3.5 sd								1.0 FS													
		1.0 Fgr						19	1.5	0.5 sd Si Cl	1	8	18	31	Si Cl			1.0 sd Si Cl													
		1.0 sd Co S								1.0 Fgr Si Cl						27	0.5	1.5 gr	0	4	10	19	Si Cl								
		1.0 FS Si Cl																1.0 Fgr													
8	0.5	1.0 gr Si Cl	0	1	13	25	Si Cl			2.0 gr								1.0 gr													
		0.5 sd Si Cl								1.0 sd								1.0 sd													
		0.5 gr								1.0 gr								1.0 Fgr													
		1.5 sd								1.0 Fgr Co S								1.0 Fgr													
		1.0 Fgr								1.0 gr								2.5 sd													
		1.0 FS								1.0 Fgr								0.5 gr													
		1.0 Fgr								1.0 sd								1.0 sd													
		3.0 gr																2.0 FS													

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COUNTY Divide Jul-14
PROSPECTED BY Volk / Nelson
INSPECTED & APPROVED Jeffrey Swank Aug-14

																						STATE	PROJECT NO.	SECTION NO.	SHEET NO.
																						ND	SOIB-7-042(014)000	180	3

PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES							
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
36	1.0	1.0 Fgr Si Cl	0	10	20	32	+WL 10.0	50	1.0	1.0 gr Si Cl	0	6	15	25	+WL 6.0	58	1.0	1.0 Fgr Si Cl	0	5	14	27	Si Cl	66	1.5	1.5 gr Si Cl	0	10	23	35	+WL 8.0
		1.0 Fgr								1.0 gr								1.0 Fgr								2.0 gr					
		1.0 gr								2.0 sd								1.0 sd								3.0 sd					
		2.0 sd								1.0 FS								1.0 Fgr						67	0.5	1.5 gr Si Cl	0	4	15	28	+WL 8.0
		1.0 Fgr						51	1.0	0.5 sd Si Cl	0	4	15	26	+WL 6.0			1.0 sd								1.0 Fgr					
		1.0 gr								1.5 Fgr Si Cl								2.0 Fgr								1.0 gr					
		1.0 sd								1.0 sd								1.5 gr								0.5 Fgr					
		1.0 gr								1.0 Fgr								0.5 sd								1.5 sd					
37	4.0	3.0 gr	1	14	26	36	+WL 7.0			1.0 gr						59	2.0	1.0 gr Si Cl	0	12	23	36	Si Cl			2.0 Fgr					
38	1.0	1.0 gr Si Cl	0	4	15	29	+WL 8.0	52	0.5	0.5 gr Si Cl	1	12	23	37	Si Cl			3.0 gr						68	2.0	1.0 gr Si Cl	0	8	18	31	+WL 9.5
		1.0 Fgr								4.0 gr								2.0 sd								1.0 sd					
		2.0 gr								0.5 sd								1.0 Fgr								2.0 gr					
		1.0 sd Co S								0.5 Fgr								1.0 sd								2.0 Fgr					
		1.0 Fgr								2.0 gr						60	0.5	0.5 Fgr Si Cl	0	5	15	26	Si Cl			1.5 sd					
		1.0 gr								1.0 Fgr								2.0 gr						69	2.0	1.0 Fgr Si Cl	1	10	23	36	Si Cl
39	1.0	1.0 sd	0	3	9	18	Si Cl			0.5 sd								1.0 Fgr								1.0 Fgr					
		1.0 gr								0.5 FS								1.0 sd								3.0 gr					
		1.0 FS								0.5 sd Si Cl								0.5 Fgr								1.0 sd					
		4.5 sd						53	2.0	1.0 gr Si Cl	1	14	26	39	FS Si Cl			0.5 sd Co S								1.0 gr					
40	1.0	1.0 gr Si Cl	0	9	21	33	Si Cl			3.0 gr								1.0 Fgr								1.0 Fgr					
		3.0 gr								2.0 sd								1.0 sd						70	1.0	1.0 gr	0	9	21	34	Si Cl
		1.0 Fgr								2.0 gr								1.0 Fgr								1.0 sd					
		1.0 sd Co S						54	0.5	0.5 gr Si Cl	0	7	20	33	Si Cl	61	1.0	3.0 gr	0	9	23	41	Si Cl			2.0 gr					
		1.0 sd								1.0 sd Si Cl								0.5 sd								1.0 sd					
		0.5 Fgr Si Cl								4.0 gr								0.5 gr								2.0 Fgr					
41	1.0	3.0 gr	0	6	14	28	Si Cl			1.0 Fgr								1.0 sd								2.0 sd					
		1.0 sd								2.5 gr								4.0 gr						71	1.0	1.0 sd	0	6	19	32	Si Cl
		1.0 gr						55	1.0	1.0 gr Si Cl	1	11	23	36	Si Cl	62	1.0	2.0 Fgr	0	8	18	30	Si Cl			1.0 Fgr					
		3.0 sd								2.5 gr								1.0 FS								1.0 CS					
42	2.0	0.5 Fgr Si Cl	1	10	21	35	+WL 8.0			0.5 CS								1.0 gr								1.0 gr					
		0.5 sd								1.0 Fgr								3.0 sd								1.0 Fgr					
		1.0 gr								1.0 FS						63	1.0	1.0 Fgr Si Cl	0	7	16	29	Si Cl			1.0 gr					
		1.0 Fgr								2.0 gr Co S								0.5 gr Si Cl								1.0 Fgr					
		3.0 gr Si Cl						56	0.5	0.5 gr Si Cl	0	10	19	31	Si Cl			0.5 gr								1.0 gr					
43	3.0	2.0 gr	0	8	18	34	+WL 5.0			1.0 Fgr Si Cl								1.0 Fgr						72	1.0	3.5 gr	1	10	22	35	Si Cl
44	4.0	1.0 sd Si Cl	0	4	12	22	+WL 7.0			2.0 gr								2.0 sd								1.5 sd					
		1.0 Fgr								1.0 Fgr								1.0 Fgr								1.0 gr					
		1.0 gr								0.5 sd						64	3.0	2.0 sd	0	10	21	32	Si Cl			2.0 sd					
45	1.5	1.5 gr Si Cl	1	11	23	34	+WL 5.0			0.5 sd Co S								2.0 gr								1.0 sd					
		2.0 gr								1.0 sd								1.0 sd													
46	2.0	1.0 gr Si Cl	0	10	24	35	+WL 5.0			1.0 Fgr								2.0 gr								2.0 gr					
		2.0 gr								1.0 gr								1.0 Fgr								1.0 Fgr					
47	2.0	1.0 sd Si Cl	0	8	20	34	Si Cl	57	2.5	2.5 gr	0	8	19	31	Si Cl	65	1.0	1.0 Fgr Si Cl	0	7	18	29	Si Cl			1.0 Fgr Si Cl					
		1.0 Fgr Si Cl								2.0 sd								3.5 gr								1.5 sd Si Cl					
		1.0 gr								3.0 gr								1.0 sd								1.0 sd					
48	1.5	3.5 gr	0	10	22	34	+WL 5.0											1.0 sd								1.0 Fgr					
49	3.0	1.0 gr Si Cl	2	14	30	42	+WL 6.0											1.0 Fgr								0.5 sd Si Cl					
		2.0 gr																0.5 sd Si Cl													

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																						STATE	PROJECT NO.	SECTION NO.	SHEET NO.
																						ND	SOIB-7-042(014)000	180	4

PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES							
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
73	0.5	0.5 sd Si Cl	0	11	23	41	Si Cl	83	1.0	1.0 gr Si Cl	0	8	18	31	+WL 8.0	94	1.0	2.0 gr	0	4	12	23	Si Cl	104	1.0	1.0 gr Si Cl	0	5	14	25	Si Cl
		6.0 gr								1.0 gr								1.0 sd								2.0 gr					
		1.0 sd								1.0 Fgr								1.0 Fgr								1.0 FS Co S					
		1.0 Fgr								2.0 sd								1.0 sd								1.0 sd					
74	1.0	1.0 Fgr Si Cl	1	13	24	37	Si Cl			1.0 Fgr Co S								1.0 gr								1.0 Fgr					
		3.0 gr								1.0 sd								1.0 sd								2.0 sd					
		0.5 sd Co S						84	1.0	1.0 gr Si Cl	0	9	22	35	+WL 6.0	95	1.5	0.5 sd Si Cl	0	2	11	21	Si Cl	105	1.0	1.0 gr Si Cl	0	9	20	34	+WL 8.0
		0.5 Fgr								2.0 sd								2.0 sd								1.0 gr					
		1.0 sd								1.5 Fgr								1.0 gr								1.0 sd					
		1.0 gr								0.5 sd								2.0 Fgr								2.0 gr					
		1.0 sd						85	1.0	1.0 Fgr Si Cl	0	6	18	32	+WL 8.0			1.0 sd								2.0 Fgr					
		1.0 Fgr								2.5 gr						96	2.5	1.5 sd	0	4	13	22	Si Cl	106	3.0	1.0 sd Si Cl	0	4	13	25	+WL 7.0
75	1.5	1.5 Fgr Si Cl	0	3	12	24	Si Cl			0.5 Fgr								1.0 gr								1.0 sd					
		1.0 Fgr								2.0 sd								1.0 Fgr								2.0 gr					
		1.0 gr								1.0 sd Co S								5.0 sd						107	2.5	1.5 gr Si Cl	0	10	27	41	+WL 7.0
		1.0 FS						86	2.5	1.5 Fgr	0	7	19	32	+WL 7.5	97	2.0	1.0 gr Si Cl	0	5	16	29	+WL 10.0			2.0 gr					
		1.0 Fgr								1.0 gr								2.0 gr								1.0 gr Si Cl					
		2.0 sd								2.5 sd								1.0 sd						108	2.5	1.5 gr Si Cl	0	4	12	21	Si Cl
76	1.0	1.5 gr	0	7	16	27	Si Cl	87	1.0	1.0 gr Si Cl	0	5	14	27	+WL 9.0			1.0 Fgr								2.5 sd					
		1.5 sd								2.0 sd Si Cl								3.0 sd								0.5 FS					
		1.0 FS								3.0 sd						98	4.0	1.0 gr Si Cl	0	5	13	22	Si Cl	109	2.5	0.5 Fgr Si Cl	1	8	17	26	Si Cl
		4.0 Fgr								2.0 Fgr								3.5 Fgr								1.0 gr Si Cl					
		1.0 sd						88	1.0	1.0 sd	1	11	21	37	Si Cl			4.5 sd								1.0 Fgr					
77	2.0	1.0 Fgr Si Cl	0	6	14	27	+WL 8.0			3.0 gr						99	0.5	1.5 gr Si Cl	0	7	18	31	Si Cl			1.0 gr					
		1.0 Fgr								3.5 sd								4.0 gr								1.0 sd					
		1.0 gr						89	1.0	1.0 Fgr Si Cl	0	6	14	23	Si Cl			1.0 sd								1.0 sd Si Cl					
		1.0 Fgr Co S								1.0 gr Si Cl								1.0 Fgr						110	1.0	2.0 gr Si Cl	0	6	16	27	Si Cl
		1.0 Fgr								2.0 sd								1.0 sd						111	2.0	1.0 sd Si Cl	0	2	7	14	Si Cl
		1.0 sd								1.0 FS						100	1.5	1.5 Fgr Si Cl	0	7	18	33	+WL 9.5	112	1.0	1.0 gr Si Cl	0	9	21	34	+WL 8.0
78	1.0	1.0 Fgr	0	3	13	27	+WL 7.0			1.0 sd								2.0 sd								2.0 gr					
		1.0 gr						90	0.5	3.5 gr	0	8	20	32	Si Cl			2.5 gr								1.5 sd					
		4.0 sd								3.0 sd								2.0 sd								1.5 gr					
79	1.0	1.0 gr Si Cl	0	7	19	30	+WL 6.0	91	1.0	2.0 gr Si Cl	0	5	15	26	Si Cl	101	0.5	0.5 gr Si Cl	0	6	19	32	Si Cl			1.0 sd					
		1.0 Fgr Si Cl								2.0 sd								3.0 gr						113	0.5	2.5 sd	0	4	14	27	Si Cl
		2.0 sd								1.0 Fgr								1.0 Fgr								2.5 Fgr					
		1.0 Fgr Si Cl								1.5 sd								1.0 sd						114	1.0	1.0 gr Si Cl	0	5	11	20	Si Cl
80	1.0	1.0 gr Si Cl	0	8	20	33	+WL 6.0	92	0.5	1.5 gr Si Cl	0	12	25	37	Si Cl			2.0 Fgr								1.0 sd					
		2.0 gr								2.0 gr						102	1.0	1.0 gr Si Cl	0	7	19	32	Si Cl			1.0 Si Cl					
		1.0 Fgr								1.0 sd								1.0 sd								1.0 sd					
		1.0 sd								2.0 Fgr								1.0 gr													
81	1.0	1.0 gr Si Cl	1	8	19	32	+WL 9.0			2.0 sd								1.0 sd													
		2.0 gr						93	1.0	1.0 gr	0	4	13	26	Si Cl			2.0 Fgr													
		0.5 Fgr								1.0 sd						103	2.5	0.5 gr Si Cl	0	6	17	28	Si Cl								
		3.5 sd								1.0 Fgr								1.0 Fgr Si Cl													
		1.0 Fgr								1.0 sd Co S								1.0 gr													
82	1.0	2.0 gr Si Cl	0	8	21	34	Si Cl			1.0 sd								1.0 Fgr													
		2.0 gr								1.0 Fgr								1.0 gr													
		1.0 sd								2.0 sd								2.0 Fgr													
		1.0 gr																1.0 sd													
		2.0 sd																													

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PROSPECTED BY Volk / Nelson
INSPECTED & APPROVED Jeffrey Swank Aug-14

PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	
115	1.5	0.5 gr Si Cl	0	6	17	33	Si Cl	A	3.0	1.0 gr					+WL 4.0																	
		1.0 Fgr Si Cl						B	4.0	2.0 gr Si Cl					+WL 6.0																	
		1.0 Fgr						C	2.0	1.0 gr Si Cl	0	15	27	37	Si Cl																	
		1.0 gr								1.0 gr																						
		1.0 sd								1.0 sd Si Cl																						
		2.5 Fgr						D	5.5	1.5 gr					+WL 7.0																	
116	1.0	1.0 gr Si Cl	0	11	22	34	+WL 7.0	E	1.5	1.5 gr Si Cl	0	5	12	21	Si Cl																	
		1.0 sd								1.0 sd Si Cl																						
		3.0 gr						F	3.0	1.0 Fgr	0	7	18	34	Si Cl																	
		1.0 sd								1.0 gr																						
117	3.0	1.0 gr Si Cl	0	9	24	36	+WL 7.0			1.0 Fgr																						
		3.0 gr								2.0 gr																						
118	1.0	1.0 Fgr Si Cl	0	7	17	27	Si Cl			0.5 sd Si Cl																						
		2.0 Fgr						G	2.0	2.5 gr Si Cl	0	6	14	22	Si Cl																	
		1.0 sd						H	2.0	2.0 sd Si Cl	0	11	24	37	Si Cl																	
		1.0 Fgr								1.0 Fgr																						
119	1.0	2.0 gr Si Cl	0	11	22	34	+WL 8.0			4.0 gr																						
		1.0 Fgr Si Cl								1.0 Fgr																						
		2.0 Fgr								2.0 gr																						
		2.0 gr								1.0 gr Si Cl																						
120	3.5	2.5 gr	0	6	13	20	+WL 6.0	I	6.0	4.0 gr	0	8	23	35	+WL 17.0																	
121	1.5	1.5 Fgr Si Cl	1	9	21	34	Si Cl			2.0 Fgr																						
		1.0 gr								5.0 sd																						
		5.0 Fgr																														
122	1.0	1.0 gr	0	5	13	24	Si Cl																									
		6.0 sd																														

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COUNTY Divide Jul-14

PROSPECTED BY Volk / Nelson

INSPECTED & APPROVED Jeffrey Swank Aug-14

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SOIB-7-042(014)000	180	6

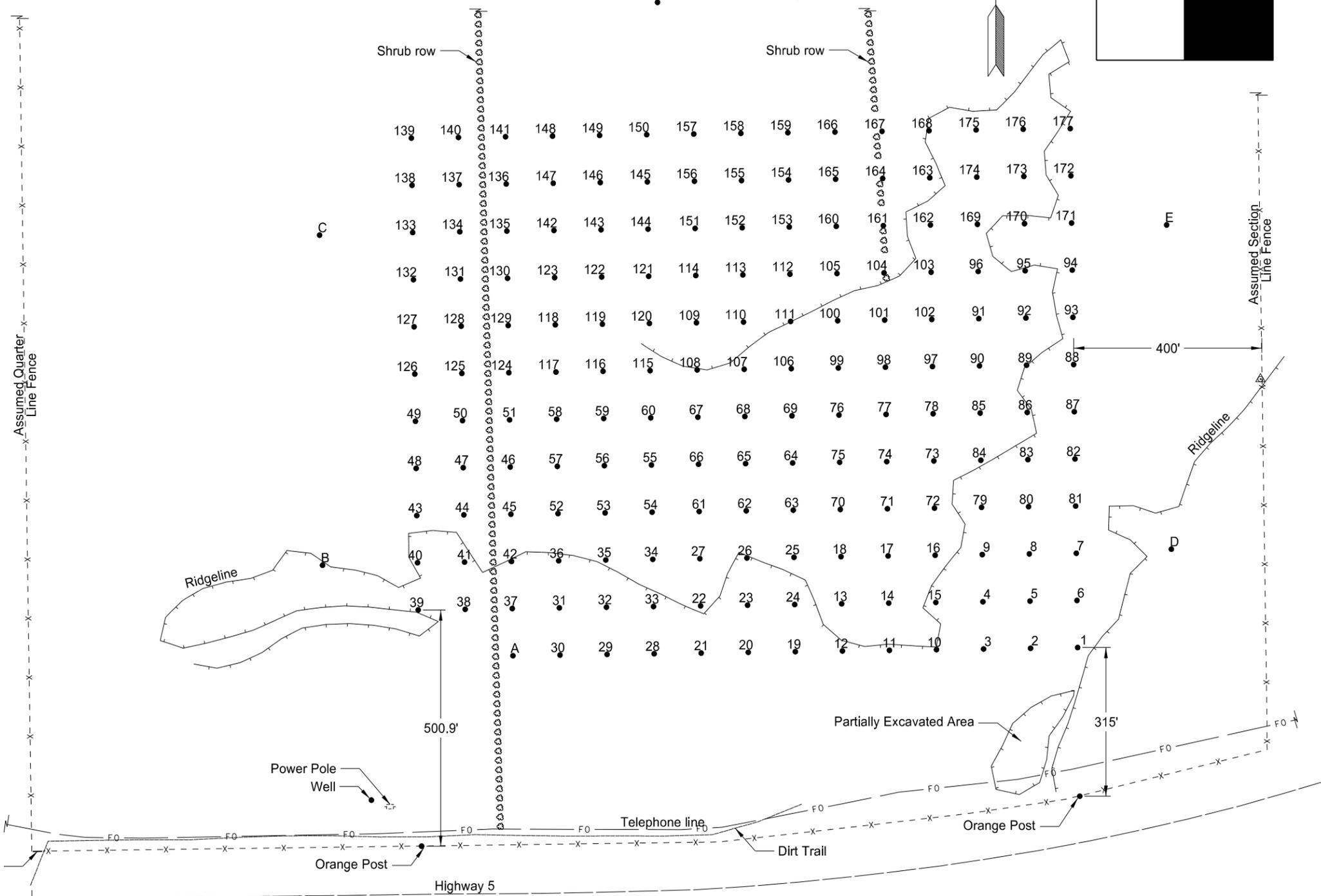
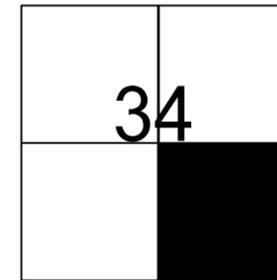
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

LOCATION OF PIT IN SECTION

TEST HOLE PLAT

Location: SE1/4 34-163-102 County: Divide

Ownership: Richard and Patricia Pulvermacher



- Area "A" consists of test holes 1 - 9
- Area "B" consists of test holes 10 - 18
- Area "C" consists of test holes 19 - 27
- Area "D" consists of test holes 28 - 36
- Area "E" consists of test holes 37 - 42
- Area "F" consists of test holes 43 - 51
- Area "G" consists of test holes 52 - 60
- Area "H" consists of test holes 61 - 69
- Area "I" consists of test holes 70 - 78
- Area "J" consists of test holes 79 - 87
- Area "K" consists of test holes 88 - 96
- Area "L" consists of test holes 97 - 105
- Area "M" consists of test holes 106 - 114
- Area "N" consists of test holes 115 - 123
- Area "O" consists of test holes 124 - 132
- Area "P" consists of test holes 133 - 141
- Area "Q" consists of test holes 142 - 150
- Area "R" consists of test holes 151 - 159
- Area "S" consists of test holes 160 - 168
- Test Holes A - H for information only

- Legend
- gr = gravel
 - sd = sand
 - FS = fine sand
 - Fgr = fine gravel
 - CGr = course gravel
 - sh = shale
 - SiCl = silt clay
 - rk = rock
 - FeO = Iron oxide
 - CoS = Coal Slack
 - WL = water line
 - NG = no gravel
 - DM = disturbed material

																						STATE	PROJECT NO.	SECTION NO.	SHEET NO.
																						ND	SOIB-7-042(014)000	180	7

PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES							
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	
1	0.5	0.5 gr Si Cl	0	8	17	28	Si Cl	8	1.5	2.5 gr Si Cl	0	11	23	31	Si Cl	15	4.0	2.0 gr Si Cl	0	11	22	33	+ Cave	22	0.5	1.5 gr Si Cl	0	8	18	29	Si Cl
		1.0 Fgr								5.5 gr								4.0 gr								5.0 gr					
		4.0 gr								2.5 FS								1.0 Fgr								1.0 FS Co S					
		4.0 sd								1.0 gr								1.0 gr								2.0 sd					
		1.0 gr								2.0 sd								2.5 sd								4.0 gr					
		1.0 Fgr						9	0.5	1.5 gr Si Cl	0	8	18	28	Si Cl			2.5 Fgr						23	1.5	1.5 gr Si Cl	0	11	21	33	Si Cl
2	2.5	1.5 gr Si Cl	1	12	22	35	Si Cl			3.0 gr								1.0 sd								2.5 gr					
		5.0 gr								1.5 sd						16	2.0	7.0 gr	1	12	21	30	Si Cl			1.5 Fgr					
		4.0 sd								0.5 Fgr								7.0 sd								2.0 sd					
		1.0 Fgr								1.0 sd								0.5 gr								1.0 Fgr					
		2.0 gr								1.0 Fgr						17	2.0	1.0 gr Si Cl	0	11	24	34	Si Cl			1.0 sd					
3	2.0	2.0 gr Si Cl	1	17	24	35	Si Cl			2.0 gr								5.0 gr								2.5 gr					
		3.0 gr								2.0 sd								1.0 Fgr						24	1.0	1.0 gr Si Cl	0	10	21	32	Si Cl
		1.0 Fgr								1.0 Fgr								1.0 gr								5.0 gr					
		2.0 gr								2.0 sd								0.5 sd								1.0 sd Co S					
		3.0 sd								1.0 Fgr								0.5 FS								1.0 gr					
		1.0 FS								1.0 gr								3.0 sd								5.0 sd					
		1.5 Fgr						10	1.5	1.5 gr Si Cl	0	12	25	38	Si Cl			1.0 gr								1.0 gr					
4	1.0	1.0 gr Si Cl	1	13	24	34	Si Cl			6.5 gr								1.0 gr Co S						25	1.0	1.0 gr Si Cl	0	4	14	23	+ Cave
		4.5 gr								2.5 FS								2.0 gr								1.0 sd					
		2.5 sd								1.0 gr						18	0.5	2.0 gr Si Cl	1	12	25	36	Si Cl			2.0 gr					
		2.0 gr								2.0 sd								1.0 FS								1.0 sd					
		4.0 sd								1.0 gr								7.5 gr								1.5 gr					
5	0.5	0.5 gr Si Cl	0	8	18	28	Si Cl	11	3.0	2.0 gr Si Cl	0	8	20	31	+ Cave			2.0 FS								0.5 sd					
		2.0 gr								4.0 gr								3.0 Fgr								1.5 Fgr					
		1.0 Fgr								1.0 Fgr								1.0 gr								3.5 sd					
		3.0 gr								1.0 gr						19	1.0	4.0 gr	0	11	22	33	Si Cl	26	3.0	2.0 sd Co S	0	8	18	27	Si Cl
		1.0 sd								3.0 sd								1.0 Fgr								4.5 gr					
		2.0 gr								3.0 Fgr								1.0 CS								1.5 sd					
		4.0 sd						12	0.5	4.5 gr	1	12	25	36	Si Cl			2.0 gr								1.0 gr					
		1.0 Fgr								1.0 FS								5.0 sd								1.0 sd Co S					
		2.0 sd								1.0 sd								3.0 gr								2.0 sd					
6	1.0	1.0 gr Si Cl	1	19	32	41	+			1.0 gr						20	0.5	1.5 gr Si Cl	0	9	20	33	+WL 14.0			1.0 sd Si Cl					
		10.0 gr								4.0 sd								6.0 gr								3.0 sd					
		6.5 sd								2.0 gr								1.0 FS													
		1.5 gr						13	3.0	1.0 gr Si Cl	0	10	21	32	Si Cl			1.0 sd													
7	2.0	1.0 gr Si Cl	0	12	24	35	Si Cl			4.0 gr								2.0 FS													
		1.5 gr								1.0 sd								2.0 sd Co S													
		0.5 Fgr								1.0 Fgr						21	1.0	2.0 gr Si Cl	0	9	19	28	+WL 15.0								
		2.0 gr								1.0 gr								2.0 gr													
		2.0 Fgr								1.0 sd								1.0 Fgr													
		1.0 sd								1.0 sd Co S								2.0 gr													
		1.0 Fgr								3.0 sd								1.0 sd													
		1.0 gr								1.0 gr								1.0 Fgr													
		2.0 sd						14	3.0	2.0 gr Si Cl	1	15	31	44	+ Cave			1.0 sd													
		2.0 gr								9.0 gr								1.0 sd Co S													
		1.0 Fgr								2.0 FS								2.0 sd													
		1.0 gr Si Cl																1.0 Fgr Co S													

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																						ND	SOIB-7-042(014)000	180	8

PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES							
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
27	2.0	2.0 Fgr Si Cl	1	10	21	30	Si Cl	34	0.5	1.5 gr Si Cl	1	11	23	34	Si Cl	43	2.0	1.0 sd	0	8	20	32	Si Cl	51	1.5	1.5 gr Si Cl	0	12	25	36	Si Cl
		3.0 gr								4.5 gr								1.0 Fgr								2.0 gr					
		1.0 Fgr								1.0 sd								4.0 gr								1.0 Fgr					
		2.0 gr								2.5 gr								2.0 Fgr								1.0 gr					
		1.0 sd								3.0 sd								2.0 gr								1.0 Fgr					
		2.0 gr								1.0 sd Si Cl						44	0.5	1.0 gr Si Cl	1	10	25	39	+ Cave			2.0 gr					
		1.0 sd								1.0 Fgr								2.5 gr								2.0 sd					
		1.0 Fgr								2.0 gr								3.0 Fgr								3.0 gr					
		0.5 Si Cl						35	0.5	7.5 gr	1	11	23	36	Si Cl			1.0 sd						52	0.5	10.0 gr	1	14	26	37	Si Cl
		1.5 sd Si Cl								2.0 sd								7.0 gr								6.5 sd					
		1.0 sd								4.0 FS						45	0.5	0.5 sd Si Cl	1	12	26	38	Si Cl	53	3.0	1.0 gr Si Cl	1	9	20	30	Si Cl
		2.0 gr								2.0 gr								10.0 gr								3.0 gr					
28	1.0	2.0 gr Si Cl	0	11	20	31	Si Cl	36	2.0	1.5 gr Si Cl	0	5	14	27	Si Cl			1.0 sd								1.0 Fgr					
		1.0 sd								0.5 gr								1.0 Fgr								2.0 gr					
		2.0 gr								1.5 sd								1.0 gr								5.0 sd					
		2.0 Fgr								1.0 Fgr								2.0 Fgr								2.0 gr					
		4.0 sd								1.5 sd						46	0.5	7.5 gr	0	11	23	34	Si Cl	54	1.0	1.0 sd	0	10	23	36	Si Cl
		3.0 gr								1.0 Fgr								2.0 FS								3.0 gr					
29	4.0	2.0 gr Si Cl	2	15	28	39	Si Cl	37	1.0	1.0 Fgr Si Cl	0	6	17	31	Si Cl	47	1.0	1.0 gr Si Cl	0	14	28	42	Si Cl			5.0 Fgr					
		1.0 gr								1.0 gr								4.0 gr								1.0 gr					
		1.0 Fgr								1.0 sd								2.0 Fgr								1.5 sd					
		2.0 sd								1.0 sd Si Cl								2.0 gr								2.5 FS					
		1.0 gr Si Cl								2.0 Fgr								1.5 sd								3.0 gr					
30	5.0	1.0 gr	0	6	17	30	+ WL 12.0			2.0 Fgr								1.0 gr Si Cl	0	11	21	32	Si Cl	55	4.0	1.0 Fgr Si Cl	1	12	23	34	Si Cl
		2.0 sd								2.0 sd								7.0 gr								1.0 gr Si Cl					
		3.0 gr								3.0 gr								1.0 FS								2.0 gr					
		1.0 sd								1.0 gr Si Cl								2.0 sd								1.0 Fgr					
31	4.0	1.0 Fgr Si Cl	1	9	20	31	Si Cl	38	7.0	6.0 gr	0	14	26	37	+WL 13.0			3.0 gr								6.0 gr					
		1.0 gr						39	0.5	1.5 gr Si Cl	0	12	22	32	Si Cl			1.0 Fgr								2.0 sd					
		2.0 Fgr								1.0 Fgr						49	1.0	3.0 gr Si Cl	1	14	26	37	Si Cl	56	1.0	1.0 gr	1	11	22	34	Si Cl
		1.0 sd								1.0 gr Si Cl								2.0 gr								3.0 Fgr					
		2.0 Fgr								1.0 Fgr								1.0 Fgr								3.5 gr					
		1.0 gr Si Cl								7.0 gr								2.0 gr								3.5 sd					
32	1.0	2.0 gr Si Cl	1	13	25	36	Si Cl			2.0 sd								1.0 Fgr								2.0 gr Si Cl					
		4.0 gr								1.0 gr Si Cl								1.0 gr Co S								2.0 gr					
		3.0 Fgr						40	1.5	3.5 gr Si Cl	1	12	23	33	Si Cl			1.0 gr													
		3.0 sd								2.0 gr								1.0 sd													
		3.0 gr								2.0 sd								3.0 Fgr													
33	1.0	1.0 sd Si Cl	0	10	20	31	Si Cl			3.0 gr								1.0 gr													
		1.0 Fgr Si Cl								2.0 FS						50	1.0	6.0 gr	0	10	23	34	rk								
		3.0 gr								0.5 gr Si Cl	0	10	22	34	Si Cl			3.0 sd													
		1.0 sd								6.0 gr								1.0 Fgr Si Cl													
		2.0 gr								1.0 sd								2.5 gr													
		4.5 sd								1.0 Fgr								1.0 Si Cl													
		1.5 gr								1.0 gr								3.5 sd Si Cl													
								42	2.0	6.0 gr	0	11	21	31	Si Cl																
										1.0 sd																					
										2.0 Fgr																					
										2.0 FS																					
										1.5 gr																					

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																						ND	SOIB-7-042(014)000	180	9

PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES							
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
57	0.5	1.5 gr Si Cl	0	13	26	38	Si Cl	64	2.0	4.0 gr Si Cl	0	13	27	38	Si Cl	72	0.5	1.5 sd	0	9	19	28	Si Cl	79	2.0	4.0 gr Si Cl	1	13	25	37	rk
		5.0 gr						65	2.0	9.0 gr								6.0 gr								3.5 gr					
		1.0 Fgr								2.0 gr Si Cl	1	13	26	38	+WL 16.0			2.0 FS								2.5 FS					
		1.0 gr								3.0 gr								1.0 sd								2.0 Fgr Sh					
		3.0 Fgr								1.0 Fgr								1.0 FS								1.0 sd					
		1.0 sd								2.0 gr								1.0 Fgr								3.0 gr					
		1.0 gr Si Cl								1.0 sd								3.0 sd						80	1.0	3.0 gr Si Cl	0	14	25	35	Si Cl
		1.0 gr								6.0 gr						73	0.5	0.5 gr Si Cl	1	12	23	33	Si Cl			2.0 gr					
		1.0 Fgr						66	2.0	2.0 gr	0	11	21	31	Si Cl			6.0 gr								1.0 Fgr					
58	1.5	2.5 gr Si Cl	1	11	25	37	Si Cl			1.0 sd								1.0 sd								3.0 gr					
		7.0 gr								4.0 gr								1.5 Fgr								1.0 sd					
		2.0 sd								2.0 sd								3.5 sd								2.0 sd Co S					
		3.0 gr								3.0 gr								1.0 Fgr								1.0 sd					
		1.0 sd								1.0 FS Si Cl								1.0 sd								1.0 Fgr					
59	0.5	0.5 Fgr Si Cl	0	16	30	41	Si Cl			2.0 FS								1.0 gr								1.0 FS					
		4.0 gr						67	3.5	1.5 gr Si Cl	0	13	26	36	+WL 14.0	74	2.0	3.0 gr Si Cl	0	11	23	35	Si Cl			1.0 sd					
		1.0 Fgr								3.0 gr								6.0 gr						81	1.0	3.0 gr Si Cl	1	10	20	31	Si Cl
		8.0 gr								1.0 gr Si Cl								3.0 sd								4.0 gr					
		0.5 sd								1.0 Fgr								1.0 gr								4.0 sd					
		2.0 gr								4.0 sd								2.0 sd								1.0 FS					
60	1.0	3.0 Fgr	1	12	25	37	Si Cl	68	1.0	1.0 gr Si Cl	0	14	27	39	+ Cave			1.0 gr								1.0 sd					
		8.0 gr								6.0 gr						75	4.0	1.5 Fgr Si Cl	0	13	26	37	+ WL 18.0			4.0 gr					
		1.0 sd								1.0 sd								4.5 gr						82	3.0	1.0 gr Si Cl	0	10	20	28	Si Cl
		2.0 gr								1.0 gr								1.0 Fgr								6.0 gr					
61	0.5	1.5 gr Si Cl	1	10	23	36	Si Cl			1.0 gr Si Cl								3.0 gr								1.0 Fgr					
		7.0 gr								3.0 gr								2.0 sd								4.0 sd					
		1.0 gr Co S						69	1.0	1.0 gr Si Cl	1	14	25	37	Si Cl			2.0 gr								2.0 gr					
		1.5 sd								2.0 gr						76	1.0	1.0 gr Si Cl	1	18	29	41	Si Cl			1.0 Fgr					
		0.5 gr								1.0 FS								3.0 gr						83	1.5	5.5 gr Si Cl	1	14	28	38	Si Cl
		2.0 sd								6.0 gr								1.0 sd								3.0 gr					
		3.0 gr								1.0 FS								2.0 gr								6.0 sd					
62	1.0	2.0 gr Si Cl	0	11	20	30	Si Cl			1.0 gr								1.5 sd								2.0 gr					
		1.0 gr						70	3.0	2.0 gr Si Cl	0	10	21	32	Si Cl			0.5 Fgr													
		1.0 FS								3.0 gr								3.0 gr													
		2.0 gr								2.0 Fgr								1.0 Fgr													
		1.5 sd								5.5 sd								1.0 gr													
		1.5 gr								1.5 gr						77	1.5	1.5 gr Si Cl	1	14	28	38	Si Cl								
		4.0 FS						71	0.5	0.5 sd Si Cl	0	10	20	32	Si Cl			8.0 gr													
		2.0 gr								1.0 Fgr Si Cl								1.0 FS													
63	0.5	0.5 gr Si Cl	0	11	22	32	+WL 17.0			1.0 sd								3.0 gr													
		8.0 gr								7.0 gr						78	0.5	0.5 sd Si Cl	0	14	28	39	Si Cl								
		1.0 sd								4.0 sd								1.0 Fgr Si Cl													
		1.0 gr								1.0 Fgr								1.0 gr Si Cl													
		1.0 Fgr								1.0 sd								6.0 gr													
		2.0 sd								1.0 Fgr								1.0 Fgr													
		3.0 Fgr								1.0 gr								1.0 sd													
																		1.0 gr													
																		3.0 Fgr													

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																						ND	SOIB-7-042(014)000	180	10

PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES							
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
84	0.5	0.5 sd Si Cl	0	10	20	30	+ Cave	90	2.0	2.0 gr Si Cl	1	17	31	42	Si Cl	97	0.5	0.5 gr Si Cl	0	10	23	36	Si Cl	103	2.0	1.0 sd	0	11	25	37	Si Cl
		1.0 Fgr Si Cl								2.0 gr							4.0 gr								3.0 gr						
		3.0 gr Si Cl								1.0 Fgr							1.0 Fgr								0.5 sd						
		1.0 gr								3.0 gr							2.0 gr								1.0 gr						
		2.0 Fgr								1.0 sd Co S							1.0 sd								1.0 Fgr						
		1.0 gr								1.0 gr Co S							2.0 gr								1.0 gr						
		1.0 FS								2.0 gr							1.0 sd Si Cl								1.0 sd						
		2.0 sd						91	0.5	7.5 gr	0	10	21	30	Si Cl	98	1.0	1.0 gr Si Cl	0	10	20	28	Si Cl			1.0 Fgr					
		1.0 sd Co S								2.5 FS							2.0 gr								2.0 gr						
		1.0 gr								2.0 gr							2.0 sd						104	0.5	2.5 gr Si Cl	1	12	26	38	Si Cl	
85	0.5	3.5 gr Si Cl	0	10	22	33	Si Cl	92	0.5	0.5 sd Si Cl	0	10	21	30	Si Cl			1.0 FS								6.0 gr					
		5.0 gr								1.0 gr							2.0 gr								1.5 sd						
		2.0 FS								1.0 sd							2.0 FS								2.5 gr						
		2.0 gr								1.0 Si Cl							1.0 gr						105	0.5	0.5 gr Si Cl	2	15	27	38	Si Cl	
86	1.0	1.0 Fgr Si Cl	0	10	22	32	Si Cl			1.0 gr Si Cl							1.5 FS Si Cl								8.0 gr						
		1.0 sd								2.0 gr					99	1.0	1.5 gr Si Cl	0	13	29	37	Si Cl			1.0 sd						
		6.0 gr								0.5 Fgr							0.5 sd Si Cl								2.0 gr						
		1.0 Fgr								2.5 sd							1.0 sd								1.0 gr Si Cl						
		1.0 sd								3.0 gr							1.0 Fgr						106	1.0	1.0 sd Si Cl	1	13	27	36	Si Cl	
		1.0 sd Co S								2.0 Fgr							1.0 gr								7.0 gr						
		2.0 sd						93	1.0	2.0 gr Si Cl	1	13	28	39	Si Cl			1.0 Fgr								1.0 sd Co S					
		2.0 gr								5.0 gr							1.0 gr								1.0 Fgr						
		1.0 Fgr								1.0 sd							1.0 Fgr								1.5 gr						
87	2.0	1.0 gr Si Cl	0	8	20	30	rk			1.5 gr							2.0 gr						107	1.0	1.0 gr	0	12	22	34	Si Cl	
		2.0 gr								2.0 FS							1.0 sd								2.0 sd						
		1.0 sd								0.5 gr							1.0 gr Si Cl								6.0 gr						
		2.0 gr								1.0 FS							1.0 gr								1.5 sd						
		1.0 sd								2.0 gr					100	2.0	1.0 sd	1	11	22	34	Si Cl			2.5 gr						
		2.0 gr						94	1.5	1.5 sd Si Cl	0	13	25	37	Si Cl			6.0 gr						108	0.5	1.5 gr Si Cl	0	11	24	36	Si Cl
		2.0 FS								3.0 gr							3.0 Fgr								2.0 gr						
		3.0 sd								0.5 Fgr							1.0 FS								1.0 Fgr						
		1.0 gr								0.5 FS							1.0 gr								1.0 gr						
		1.0 FS								4.0 gr					101	3.5	0.5 sd Si Cl	1	11	25	36	Si Cl			2.0 Fgr						
		1.0 sd								1.0 Fgr							1.0 gr Si Cl								3.0 gr						
88	3.0	1.0 gr Si Cl	1	12	25	37	rk			1.0 sd							3.0 gr								1.0 Fgr Si Cl						
		3.0 gr								2.0 Fgr							1.0 Fgr								1.0 sd Si Cl						
		1.0 Fgr								1.0 sd							2.0 gr														
		5.0 gr								1.0 gr							1.0 Fgr														
		2.0 sd						95	1.0	2.0 gr Si Cl	2	18	32	44	Si Cl			3.0 sd													
		1.0 Fgr								7.0 gr							1.0 Fgr														
		1.0 gr								2.0 FS					102	1.0	8.0 gr	0	11	21	32	Si Cl									
89	0.5	1.5 gr Si Cl	1	16	29	41	Si Cl			3.0 gr							1.0 sd						RANGE 102 TWP 163 SEC SE1/4 34								
		6.0 gr						96	0.5	3.5 gr	0	14	28	40	Si Cl			2.0 Fgr						COUNTY Divide Jul-14							
		3.0 sd								1.0 sd							1.0 sd						PROSPECTED BY Volk / Nelson								
		3.0 gr								4.0 gr							1.0 gr						INSPECTED & APPROVED Jeffrey Swank Jul-14								
										2.0 FS																					
										1.0 Si Cl																					
										1.0 sd																					
										2.0 gr																					

																						STATE	PROJECT NO.	SECTION NO.	SHEET NO.
																						ND	SOIB-7-042(014)000	180	11

PIT LOGGING BY TEST HOLES							PIT LOGGING BY TEST HOLES							PIT LOGGING BY TEST HOLES							PIT LOGGING BY TEST HOLES										
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
109	1.0	2.0 gr Si Cl	0	10	21	31	Si Cl	115	1.0	1.0 gr Si Cl	1	10	23	33	Si Cl	120	1.0	1.5 gr Si Cl	0	11	22	31	Si Cl	126	0.5	2.0 gr Si Cl	1	11	23	34	Si Cl
		2.5 gr								1.0 sd								1.5 sd								1.5 gr					
		1.5 sd								1.0 gr								1.5 Fgr								1.0 sd					
		4.0 gr								1.0 Fgr								2.5 FS								3.0 gr					
		2.0 FS								1.0 sd								1.0 gr								1.0 sd					
		1.0 gr								1.0 gr								2.0 sd Co S								2.0 gr					
		1.5 sd								1.0 sd Co S								5.0 gr								1.0 FS					
110	1.0	1.0 sd Si Cl	0	12	22	34	Si Cl			1.0 gr					121	1.5	0.5 sd Si Cl	0	9	23	33	Si Cl			4.0 gr						
		2.0 gr Si Cl								1.0 Fgr							1.0 Fgr								1.0 sd						
		1.0 gr								2.0 gr							3.5 gr						127	2.0	1.0 Fgr Si Cl	0	5	15	25	+WL 14.0	
		1.0 Fgr								1.0 gr Si Cl							0.5 sd								1.0 Fgr						
		1.0 gr								1.0 gr							2.0 Fgr								1.5 sd						
		1.0 sd						116	1.5	1.5 gr Si Cl	0	10	21	32	Si Cl			1.0 gr								0.5 Fgr					
		2.0 gr								4.5 gr								1.0 Fgr								1.0 sd					
		2.5 sd								1.0 FS								3.0 sd								1.0 FS					
		0.5 Fgr								1.5 gr						122	2.0	5.0 gr	0	11	20	30	Si Cl			5.0 sd					
		1.0 sd								1.0 FS								2.0 sd								1.0 gr					
		1.0 Fgr Si Cl								1.0 sd								2.5 gr						128	1.0	2.0 gr Si Cl	0	13	26	38	+WL 17.0
		1.0 sd								0.5 Si Cl								2.5 FS								1.0 Fgr					
		1.0 gr Si Cl								3.5 gr						123	1.0	1.0 gr Si Cl	0	9	20	32	+WL 15.0			1.0 sd					
111	1.0	1.0 gr Si Cl	1	16	26	41	Si Cl	117	1.0	1.0 sd Si Cl	0	10	20	32	Si Cl			1.0 sd Si Cl								4.0 gr					
		5.0 gr								1.5 gr								1.0 gr								1.0 Fgr					
		1.0 sd								0.5 sd								1.0 Fgr								1.0 gr					
		4.0 gr								1.0 Fgr								2.0 gr								1.5 sd					
112	3.0	2.0 gr Si Cl	0	9	20	32	Si Cl			2.0 gr								1.0 sd								0.5 gr					
		1.0 gr								2.0 Fgr								2.0 gr								3.0 Fgr					
		1.0 FS								1.5 sd								3.0 sd								1.0 gr					
		2.0 Fgr						118	0.5	2.0 gr	0	8	16	26	Si Cl			1.0 Fgr						129	0.5	6.5 gr	0	9	20	30	Si Cl
		3.0 gr								1.5 sd								1.0 gr								1.0 sd					
		1.0 sd								1.0 gr						124	1.5	4.5 gr	0	13	23	29	FS Si Cl			2.0 gr					
		1.0 gr								2.0 sd								1.0 sd								2.0 FS					
		1.0 gr Si Cl								1.0 gr								1.0 gr								2.0 sd					
113	3.0	1.0 sd Si Cl	0	6	16	25	Si Cl			2.0 FS						125	0.5	0.5 Fgr Si Cl	0	11	24	34	Si Cl			1.0 FS					
		2.0 gr								1.0 Si Cl								2.0 gr								2.0 gr Si Cl					
		1.0 sd								1.0 sd								1.0 Fgr													
		3.0 gr								3.0 gr								2.5 gr													
		2.0 sd						119	0.5	0.5 sd Si Cl	0	9	20	31	Si Cl			0.5 sd													
		2.0 gr								2.0 Fgr								4.0 gr													
		1.0 sd								1.0 gr								1.0 sd													
114	0.5	2.5 gr Si Cl	1	11	28	42	+WL 16.0			3.0 Fgr								1.0 sd													
		7.0 gr								2.0 sd								1.0 Si Cl													
		1.0 FS								2.0 Fgr								1.0 sd													
		2.0 gr								1.0 sd Co S								2.0 gr													
		1.0 Si Cl								1.0 sd								1.0 Fgr													
		2.0 gr								1.0 Fgr								1.0 gr													

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																				STATE	PROJECT NO.	SECTION NO.	SHEET NO.
																				ND	SOIB-7-042(014)000	180	12

PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES							
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
130	1.0	1.0 sd Si Cl	1	11	22	33	rk	139	5.0	1.0 sd	1	17	31	43	+Cave	148	2.0	1.0 gr Si Cl	0	10	22	32	+WL 11.0	156	1.0	2.0 gr Si Cl	0	13	26	37	+WL 11.0
		1.0 gr Si Cl								3.0 gr								1.0 sd								3.0 gr					
		2.0 Fgr								5.0 gr Si Cl								3.0 Fgr								1.0 Fgr					
		2.5 gr						140	2.0	2.0 gr Si Cl	0	7	18	25	+WL 11.0			1.0 sd								2.0 gr					
		0.5 sd								2.0 gr								1.0 gr								1.0 sd					
		5.0 gr								2.0 sd								2.0 sd Si Cl								1.0 gr					
		1.0 gr Si Cl								1.0 gr Si Cl						149	1.5	2.5 gr	0	10	19	28	+WL 13.0	157	3.0	2.0 sd Si Cl	0	14	24	35	+WL 9.0
131	1.0	1.0 gr Si Cl	0	10	21	32	+WL 14.0			2.0 sd								4.0 sd								3.0 gr Si Cl					
		7.0 gr						141	4.0	4.0 gr	0	7	21	32	+WL 9.0			3.0 gr								1.0 sd					
		3.0 Fgr								1.0 sd								2.0 sd						158	3.0	2.0 gr Si Cl	1	11	25	37	+WL 10.0
		1.0 sd						142	1.0	1.0 gr Si Cl	0	15	29	41	+WL 13.0	150	2.0	1.0 Fgr Si Cl	0	9	21	35	+WL 11.0			3.0 gr					
		1.0 FS								1.0 gr								1.0 gr								2.0 gr Si Cl					
132	1.0	2.0 gr Si Cl	0	14	27	40	+WL 12.0			2.0 Fgr								1.0 Fgr						159	0.5	4.5 gr	1	15	27	37	+WL 14.0
		6.0 gr								5.0 gr								3.0 gr								1.0 sd					
		1.0 Fgr								0.5 Fgr								1.0 Fgr								5.0 gr					
		2.0 gr								0.5 sd								1.0 FS								1.0 sd					
133	3.0	4.0 gr	0	6	17	28	+WL 12.0			1.0 Fgr								1.0 gr								2.0 gr					
		1.0 sd Si Cl								1.0 gr						151	1.0	3.0 gr Si Cl	1	10	21	32	Si Cl	160	1.0	2.0 gr Si Cl	0	12	25	38	Si Cl
		4.0 sd						143	1.0	4.0 gr	0	12	25	40	+WL 12.0			1.0 FS								8.0 gr					
134	1.0	2.0 gr Si Cl	1	9	20	31	+WL 15.0			1.0 gr Si Cl								5.5 gr								1.5 Fgr					
		3.0 gr								1.0 gr								3.5 FS								0.5 sd					
		2.0 Fgr								2.0 sd						152	1.5	2.5 gr Si Cl	2	13	26	37	+WL 14.0			1.5 Fgr					
		2.0 gr								3.0 gr								2.0 gr						161	0.5	1.5 gr Si Cl	0	10	23	35	Si Cl
		1.5 sd Co S						144	1.5	0.5 sd Si Cl	0	11	23	36	+WL 11.5			1.0 Fgr								3.0 gr					
		0.5 FS								1.0 gr Si Cl								3.0 gr								1.0 sd					
		3.0 sd								1.0 gr								2.5 Fgr								6.0 gr					
135	1.0	1.0 gr Si Cl	1	14	27	39	+WL 14.0			1.0 gr Si Cl								1.5 sd								1.0 FS					
		1.5 gr								1.0 Fgr						153	1.5	8.0 gr	1	11	24	38	Si Cl			2.0 sd					
		1.0 sd								1.0 gr								1.5 sd								1.0 gr					
		3.5 gr								2.0 Fgr								1.0 FS								1.0 sd					
		1.0 FS								1.0 sd								1.0 sd						162	1.0	2.0 gr Si Cl	1	13	26	36	Si Cl
		1.0 sd								1.5 Fgr								3.5 gr								6.0 gr					
		1.0 gr						145	1.5	6.5 gr	1	12	23	35	+WL 13.0	154	2.5	1.5 gr Si Cl	0	10	22	34	Si Cl			1.0 Fgr					
		2.0 FS								2.0 sd								3.0 gr								2.0 gr					
		1.0 gr								3.0 gr								1.0 FS								1.0 Fgr					
136	1.5	1.5 sd Si Cl	0	7	19	32	+WL 13.0	146	0.5	2.5 gr Si Cl	0	11	23	35	+WL 11.0			1.0 sd								1.0 sd Si Cl					
		4.0 gr								1.0 Fgr								1.0 Fgr								1.0 Si Cl					
		1.0 sd								2.0 gr								2.0 gr								1.0 gr					
		1.0 Fgr								1.0 sd Co S								2.0 Fgr								2.0 Fgr					
		1.0 gr Si Cl								1.5 gr								1.0 sd								1.0 gr Si Cl					
		1.0 sd								1.5 sd Co S								2.0 gr								1.0 gr Si Cl					
		2.0 gr								1.0 gr Si Cl						155	2.0	1.0 gr Si Cl	1	12	23	35	+WL 12.0			1.0 gr Si Cl					
137	1.0	2.0 gr Si Cl	1	15	26	37	+WL 13.0	147	1.0	2.0 gr	0	8	18	30	+WL 12.0			2.0 Fgr								2.0 Fgr					
		10.0 gr								1.0 sd								6.0 gr								1.0 FS					
138	0.5	1.5 gr Si Cl	0	7	15	23	Si Cl			1.0 gr								1.0 FS													
		3.0 sd								1.0 sd																					
		1.0 gr								1.0 gr																					
		5.0 sd								1.0 sd																					
		2.0 FS								4.0 gr																					

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																						STATE	PROJECT NO.	SECTION NO.	SHEET NO.
																						ND	SOIB-7-042(014)000	180	13

PIT LOGGING BY TEST HOLES							PIT LOGGING BY TEST HOLES							PIT LOGGING BY TEST HOLES							PIT LOGGING BY TEST HOLES												
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole		
163	2.0	2.0 gr Si Cl	1	11	24	34	Si Cl	170	1.0	2.0 gr Si Cl	0	9	21	30	Si Cl	A	1.0	1.0 Fgr Si Cl					Si Cl										
		2.0 gr								1.0 gr						B	1.0	1.0 sd Si Cl	0	12	25	36	Si Cl										
		1.0 FS								1.0 FS								1.0 gr Si Cl															
		1.0 gr								9.0 gr								9.0 gr															
		2.0 sd						171	0.5	1.5 gr Si Cl	0	13	24	32	Si Cl	C	3.0	0.5 sd Si Cl	0	10	21	32	+Cave										
		3.0 gr								1.0 Fgr								1.0 Fgr Si Cl															
		1.5 sd								6.0 gr								0.5 sd Si Cl															
		2.5 gr								0.5 Fgr								0.5 Si Cl															
164	1.0	2.0 gr Si Cl	1	15	26	37	Si Cl	172	2.0	5.0 gr	0	9	21	31	Si Cl			2.0 gr Si Cl															
		2.0 gr								3.5 sd								1.0 Fgr															
		1.0 Fgr								2.0 sd								1.0 sd Co S															
		4.5 gr								3.0 gr								2.0 gr															
		2.5 sd								1.0 sd								2.0 sd															
		1.0 Fgr								1.0 gr								2.0 Fgr															
		2.0 gr								1.0 sd								1.0 gr															
165	1.5	2.5 gr	0	9	21	35	+WL 19.0	173	1.0	1.0 gr Si Cl	0	9	21	33	Si Cl	D	1.5	4.5 gr Si Cl	1	14	28	39	+Cave										
		4.0 Fgr								2.0 Fgr								3.0 gr															
		1.0 gr								4.0 gr								1.0 FS															
		1.5 Fgr								2.0 Fgr								2.0 sd															
		1.5 sd								2.0 sd								0.5 sd Si Cl	0	3	12	21	Si Cl										
		2.0 gr								1.0 gr Si Cl								1.0 gr Si Cl															
		3.0 Fgr								1.0 gr Si Cl								1.0 Fgr															
		2.0 gr						174	2.0	3.0 gr Si Cl	1	10	22	33	Si Cl			1.0 gr															
166	0.5	1.5 gr Si Cl	1	14	26	38	Si Cl			2.0 Fgr								3.0 sd															
		3.0 gr								1.0 gr								1.0 Fgr															
		1.0 FS								1.0 FS								1.0 sd															
		2.0 gr								2.0 gr								1.0 FS															
		1.0 FS								1.0 FS								1.0 sd															
		3.0 gr								2.0 sd								1.0 Fgr															
		3.0 sd								3.0 gr																							
		2.0 gr						175	0.5	1.5 gr Si Cl	0	15	28	40	Si Cl																		
167	2.0	2.0 gr Si Cl	0	11	25	37	Si Cl			3.5 gr																							
		1.0 gr								1.5 Fgr																							
		1.0 Fgr								4.0 gr																							
		6.0 gr								1.0 sd																							
		1.0 sd								2.0 Fgr Si Cl																							
		3.0 gr								1.0 Fgr																							
168	1.0	5.5 gr	0	9	20	33	Si Cl	176	3.0	1.0 sd Si Cl	0	11	24	35	Si Cl																		
		1.5 sd								3.0 gr																							
		1.0 Fgr								3.0 Fgr																							
		1.0 sd								3.0 Fgr																							
		2.0 Fgr								3.0 gr																							
		1.0 sd								1.0 sd																							
		1.0 gr								1.0 Si Cl																							
169	1.0	3.0 gr Si Cl	0	9	22	34	Si Cl	177	0.5	2.5 gr	0	12	22	33	Si Cl																		
		1.5 Fgr								2.0 sd																							
		1.5 sd								5.0 gr																							
		4.0 gr								1.0 sd																							
		1.0 sd																															
		2.0 gr																															

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PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES							
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
1	2.0	2.0 sd Si Cl	0	1	7	17	Si Cl	7	2.0	1.0 sd Si Cl	2	12	20	29	Si Cl	13	2.0	4.0 gr Si Cl	0	5	18	30	+	18	2.5	1.5 gr Si Cl	0	8	19	33	+
		1.0 sd								2.0 gr Si Cl							1.0 Fgr								3.0 gr						
		1.0 Fgr						8	0.5	1.5 gr Si Cl	0	8	20	33	Si Cl			2.0 sd								3.0 sd					
		2.0 sd								2.0 Fgr sh							1.0 Fgr Si Cl								1.0 FS						
		1.0 CS								3.0 Fgr							1.0 sd Si Cl								2.0 gr						
		1.0 Fgr								1.0 sd							1.0 Fgr								1.0 sd						
		1.0 sd Si Cl								2.0 gr sh							2.0 gr								1.0 gr						
2	1.0	1.0 sd Si Cl	0	4	13	23	Si Cl			1.0 gr							2.0 sd								1.0 sd						
		1.0 Fgr Si Cl						9	0.5	0.5 sd Si Cl	0	7	16	30	Si Cl			4.0 Fgr								3.0 Fgr Co S					
		1.0 Fgr								1.0 Fgr Si Cl					14	1.0	1.0 gr Si Cl	1	9	21	35	+			1.0 sd Co S						
		1.0 sd								1.0 gr							1.0 sd						19	2.0	1.0 gr Si Cl	0	8	18	33	+	
		3.5 Fgr								1.0 Fgr							4.0 gr								1.0 Fgr Si Cl						
		2.5 FS Si Cl								1.0 sd							4.0 gr Si Cl								1.0 Fgr						
		1.5 FS								1.0 Fgr							1.5 gr								4.0 gr						
3	0.5	3.5 gr Si Cl	0	4	15	24	Si Cl			1.0 gr							3.5 sd								1.0 gr Si Cl						
		1.0 sd								1.0 Fgr							1.5 gr								2.0 gr						
		1.0 Fgr Si Cl								4.0 gr							2.5 sd								1.0 Fgr						
		2.0 Fgr								2.0 Fgr					15	1.5	0.5 Fgr Si Cl	0	9	20	37	+			1.0 sd						
		1.0 gr								1.0 sd							1.0 gr Si Cl								1.0 gr Si Cl						
		1.0 sd								1.0 sd Si Cl							1.0 Fgr Si Cl								2.0 Fgr						
		1.0 sd Si Cl								1.0 sd							1.0 gr Si Cl								1.0 sd						
		1.0 sd Co S								1.0 Fgr Si Cl							1.0 Fgr Si Cl								2.0 gr						
		1.0 sd						10	2.0	1.0 Fgr Si Cl	0	6	17	30	Si Cl			1.0 gr Si Cl						20	1.0	2.0 Fgr Si Cl	0	8	18	32	+
		1.0 FS								1.0 FS							1.0 Fgr								5.0 Fgr						
		1.0 sd								1.5 sd Co S							5.0 gr Si Cl								2.0 gr Si Cl						
		1.0 Fgr								2.5 gr							2.0 Fgr								1.0 gr						
		1.0 FS Si Cl						11	0.5	1.5 gr Si Cl	0	5	15	29	+			1.0 sd								4.0 sd					
		2.0 sd								1.0 FS							1.0 gr								2.0 gr						
4	1.0	2.0 gr Si Cl	1	7	16	27	Si Cl			1.0 Fgr							1.0 sd sh								1.0 Fgr						
		2.0 gr								9.0 gr							1.0 Fgr								1.0 sd						
		2.5 sd sh								1.0 CS							1.0 gr Si Cl								1.0 gr						
		0.5 FS								1.0 sd					16	1.5	1.5 gr Si Cl	0	8	18	30	+	21	0.5	1.5 gr Si Cl	0	4	15	28	+	
		2.0 gr Si Cl								1.0 Fgr							1.0 sd Si Cl								1.0 gr						
		1.0 Fgr								1.0 sd							1.0 gr								1.0 gr Si Cl						
		1.0 Si Cl								1.0 FS							2.0 sd								1.0 Fgr Co S						
		2.0 sd								2.0 sd							1.0 gr								1.0 sd						
		1.0 Fgr						12	1.5	1.5 gr Si Cl	1	9	18	32	+			3.0 sd								2.0 Fgr Si Cl					
		1.0 sd								2.0 sd							2.0 gr								2.0 Fgr Si Cl						
5	1.0	1.0 Fgr Si Cl	0	13	25	38	Si Cl			3.0 gr sh							3.0 FS Co S								3.0 gr						
		3.0 gr Si Cl								1.0 gr Si Cl							2.0 gr								7.0 Fgr						
		1.0 Fgr								5.0 gr							2.0 sd														
		1.0 sd								1.0 sd Co S					17	1.0	2.0 gr Si Cl	0	7	18	31	+									
		1.0 Fgr								1.0 sd							1.0 Fgr Si Cl														
		1.0 gr								1.0 gr							3.0 gr														
		1.0 gr Si Cl								3.0 sd							1.0 sd														
6	1.5	1.5 gr Si Cl	1	10	21	32	Si Cl										1.0 Fgr														
		1.0 gr															4.0 gr														
		4.0 sd															1.0 Fgr														
		1.0 gr															2.0 sd														
																	4.0 gr														

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PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES							
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
22	1.0	2.0 gr Si Cl	0	8	16	27	+	26	1.0	2.0 sd Si Cl	0	4	13	26	+	30	0.5	1.5 gr Si Cl	1	7	16	36	+	34	0.5	4.5 gr Si Cl	1	8	18	30	+
		1.0 gr								1.0 sd								4.0 gr								1.0 gr					
		2.0 Fgr Si Cl								1.0 gr								2.0 FS								1.0 FS					
		1.0 sd								2.0 sd								1.0 sd								1.0 sd					
		1.0 Fgr								1.0 gr								2.0 Fgr								1.0 gr					
		1.0 sd								2.0 Fgr								1.0 sd								1.0 sd					
		1.0 FS								1.0 Fgr Si Cl								4.0 gr								1.0 gr					
		2.0 gr								1.0 gr								1.0 FS								1.0 Fgr Si Cl					
		1.0 sd								2.0 sd								1.0 sd								1.0 gr					
		2.0 gr								1.0 Fgr								1.0 gr								1.0 Fgr Co S					
		2.0 FS Co S								4.0 sd								1.0 sd								1.0 sd					
		2.0 sd								1.0 FS						31	1.5	1.5 gr Si Cl	0	7	18	28	+			3.0 Fgr					
		1.0 Fgr						27	2.5	2.5 gr Si Cl	0	8	15	25	+			1.0 gr								1.0 sd					
23	1.0	2.0 Fgr Si Cl	0	2	8	17	+			1.0 Fgr								1.0 sd						35	1.5	0.5 sd Si Cl	0	8	21	35	+
		3.0 sd								1.0 Fgr Si Cl								3.0 Fgr								1.0 gr Si Cl					
		1.0 Fgr								3.0 sd								3.0 gr								1.0 gr					
		2.0 sd								1.0 Fgr								1.0 sd								1.0 gr Si Cl					
		1.0 gr								1.0 gr								1.0 Fgr								3.0 Fgr					
		2.0 Fgr								2.0 sd								6.0 sd								4.5 gr					
		2.0 sd								1.0 Fgr								1.0 Fgr								0.5 FS					
		1.0 sd Co S								1.0 sd						32	2.0	1.0 sd Si Cl	0	3	10	21	+			1.0 Fgr					
		2.0 Fgr								1.0 Fgr								2.0 gr								1.0 Fgr					
		3.0 sd								1.0 sd								4.0 sd								1.0 gr					
24	2.0	1.0 gr Si Cl	0	3	10	19	+			1.0 FS								1.0 gr								2.0 Fgr					
		1.0 gr								1.0 sd								1.0 sd								1.0 gr					
		1.0 sd						28	1.0	1.0 gr Si Cl	0	4	16	24	+			2.0 Fgr								1.0 sd					
		1.0 gr								1.0 sd								4.0 sd								1.0 Fgr					
		1.0 FS								1.0 gr								1.0 Fgr						36	2.0	1.0 sd Si Cl	0	8	19	32	+
		4.0 sd								4.0 sd								1.0 sd sh								3.0 gr Si Cl					
		1.0 gr								2.0 gr								1.0 Fgr								3.0 gr					
		1.0 sd								3.0 sd						33	1.5	0.5 sd Si Cl	0	5	13	25	+			1.0 sd Co S					
		2.0 gr								1.0 gr								1.0 Fgr Si Cl								2.0 Fgr					
		1.0 sd Co S								6.0 sd								2.0 sd								1.0 gr					
		1.0 gr						29	1.0	1.0 Fgr Si Cl	0	6	15	28	+			3.0 gr								2.0 sd					
		3.0 sd								1.0 Fgr								1.0 Fgr								1.0 FS					
25	1.0	1.0 sd	0	4	11	22	+			2.0 gr								1.0 gr								2.0 Fgr					
		3.0 gr								2.0 Fgr								1.0 Fgr								2.0 Fgr					
		1.0 sd								1.0 sd								1.0 sd													
		1.0 Fgr								1.0 Fgr								2.0 Fgr													
		1.0 CS								1.0 gr								1.0 sd													
		2.0 Fgr								2.0 sd								3.0 FS													
		1.0 FS								1.0 Fgr								2.0 sd													
		2.0 gr								5.0 sd																					
		1.0 sd								1.0 Fgr																					
		1.0 sd Co S								1.0 gr																					
		3.0 Fgr																													
		1.0 gr																													
		1.0 sd																													

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PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES							
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
37	1.0	3.0 gr Si Cl	0	3	13	25	+	41	1.0	4.0 gr Si Cl	0	2	10	23	+	46	1.0	2.0 gr Si Cl	0	5	12	21	+	51	2.5	1.5 sd Si Cl	0	4	13	22	+
		1.0 gr								1.0 gr								4.0 sd								6.0 gr					
		1.0 sd Si Cl								2.0 sd								3.0 gr								1.0 Fgr					
		1.0 sd								1.0 sd Si Cl								2.0 gr Si Cl								2.0 sd					
		4.0 gr								2.0 sd								2.0 sd								0.5 Si Cl					
		1.0 Fgr								1.0 sd Si Cl								2.0 FS								0.5 sd Si Cl					
		7.0 sd								1.0 FS								4.0 sd								1.0 FS					
		1.0 sd Co S								1.0 sd						47	2.0	1.0 Fgr Si Cl	0	5	14	26	+			1.0 sd Co S					
38	1.0	1.0 gr Si Cl	1	10	22	33	+			2.0 sd Co S								1.0 gr Si Cl								1.0 sd					
		3.0 gr								1.0 Fgr								1.0 Fgr								1.0 Fgr					
		2.0 gr Si Cl								1.0 FS								1.0 gr								2.0 sd					
		3.0 gr								2.0 sd								1.0 sd						52	1.0	1.0 gr Si Cl	0	6	16	29	+
		3.0 sd						42	1.5	2.5 gr Si Cl	0	10	18	30	+			4.0 gr								2.0 sd					
		2.0 gr								7.0 gr								2.0 Fgr								6.0 gr					
		2.0 sd								3.0 sd								1.0 sd								1.0 gr Si Cl					
		1.0 Fgr Co S								1.0 sd Si Cl								1.0 FS								1.0 sd					
		1.0 sd								5.0 sd								5.0 sd								1.0 gr					
		1.0 gr						43	3.0	2.0 gr Si Cl	0	9	20	31		48	1.5	2.5 gr Si Cl	1	6	16	28	+			4.0 sd					
39	1.5	1.5 gr Si Cl	1	7	27	28	+			2.0 sd								1.0 sd								1.0 Fgr Co S					
		1.0 gr								1.0 gr Si Cl								1.0 gr Si Cl								2.0 sd					
		1.0 Fgr								1.0 gr								2.0 gr						53	1.0	1.0 gr Si Cl	0	8	16	27	+
		1.0 sd								1.0 sd								2.0 Fgr Si Cl								1.0 sd Si Cl					
		1.0 gr								1.0 Fgr								2.0 gr								2.0 gr Si Cl					
		1.0 CS								1.0 gr								1.0 gr Si Cl								6.0 gr					
		1.0 gr								2.0 Fgr								5.0 sd								4.0 sd					
		1.0 Fgr								2.0 sd								1.0 Fgr Co S								1.0 Fgr					
		1.0 sd								2.0 gr								1.0 FS								4.0 sd					
		1.0 Fgr								2.0 Fgr						49	0.5	6.5 gr Si Cl	0	12	25	37	+	54	1.0	1.0 gr Si Cl	1	5	14	25	+
		1.0 FS						44	1.5	3.5 gr Si Cl	0	6	13	23	+			6.0 gr								1.0 Fgr					
		2.0 sd								3.0 gr								1.0 gr Si Cl								1.0 gr Si Cl					
		1.0 Fgr								1.0 FS								1.0 sd								5.0 gr					
		1.0 sd								1.0 sd sh								1.0 sd Co S								1.0 sd					
		2.0 Fgr								1.0 sd								1.0 sd								2.0 Fgr sh					
		1.0 sd								1.0 gr								2.0 FS								2.0 sd					
40	0.5	1.5 gr Si Cl	0	6	16	27	+			7.0 sd								1.0 sd								1.0 gr					
		5.0 gr								1.0 Fgr Co S						50	1.5	1.5 gr Si Cl	1	7	15	25	+			1.0 FS					
		1.0 sd sh						45	0.5	0.5 gr Si Cl	1	8	18	28	+			4.0 gr								3.0 sd Co S					
		1.0 FS								1.0 sd								1.0 FS								1.0 sd					
		3.0 Fgr								1.0 Fgr								1.0 gr													
		2.0 sd								10.0 gr								1.0 FS Si Cl													
		1.0 Fgr Si Cl								1.0 Fgr								1.0 gr Si Cl													
		1.0 sd sh								4.0 sd								2.0 FS													
		3.0 sd Co S								1.0 sd Co S								0.5 Si Cl													
		1.0 sd sh								1.0 sd								2.5 FS													
																		2.5 sd													
																		1.5 FS													

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PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES							
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
55	1.0	2.0 gr Si Cl	0	7	15	26	+	59	2.0	1.0 sd Si Cl	0	4	12	23	+	63	2.0	1.0 gr Si Cl	0	4	14	25	+	67	0.5	2.5 gr Si Cl	0	6	15	26	+
		2.0 gr								3.0 gr								2.0 sd Si Cl								1.0 gr					
		1.0 sd								1.0 Fgr								1.0 sd								1.0 gr Si Cl					
		2.0 Fgr								2.0 sd								2.0 gr								1.0 Fgr					
		1.0 FS								1.0 FS								2.0 sd								1.0 gr					
		1.0 gr								1.5 gr								1.0 Fgr								4.0 sd					
		1.0 Fgr								0.5 Si Cl								2.0 sd								1.0 gr					
		1.0 sd								1.0 sd Si Cl								2.0 Fgr								1.0 sd					
		1.0 Si Cl								1.0 FS								1.0 gr								2.0 gr					
		2.0 FS								4.0 sd								1.0 sd								1.0 sd Si Cl					
		3.0 sd								2.0 Fgr								2.0 gr								3.0 Fgr					
		2.0 Fgr						60	1.0	2.0 gr Si Cl	1	9	18	29	+			1.0 Fgr								1.0 sd					
56	1.5	1.0 gr Si Cl	0	8	17	27	+			6.0 gr						64	1.0	1.0 gr Si Cl	0	5	14	23	+	68	1.0	2.0 gr Si Cl	0	4	12	21	+
		0.5 sd								1.0 sd								7.0 gr								2.0 sd					
		3.0 gr								3.0 gr								2.0 sd								1.0 gr					
		3.0 sd								1.0 Si Cl								1.0 Fgr sh								2.0 FS					
		2.0 gr								2.0 FS								1.0 sd								1.0 gr					
		1.0 Si Cl								1.0 sd								2.0 Si Cl								3.0 Fgr					
		1.0 sd								1.0 gr								5.0 sd								7.0 sd					
		1.0 FS								1.0 sd						65	1.0	1.0 gr Si Cl	0	3	12	23	+			1.0 FS					
		1.0 sd								1.0 gr								1.0 sd Si Cl						69	1.0	1.0 sd Si Cl	0	2	8	17	+
		1.0 gr Co S						61	1.0	1.0 sd Si Cl	0	8	11	25	+			1.0 sd								2.0 Fgr					
		2.0 sd								1.0 Fgr Si Cl								1.0 Fgr								1.0 gr					
		1.0 gr Co S								1.0 gr Si Cl								1.0 sd								7.0 sd					
		1.0 sd								2.0 gr								1.0 Fgr								2.0 gr					
57	2.0	2.0 gr Si Cl	0	11	20	32	+			1.0 Fgr								1.0 sd								1.0 Si Cl					
		1.0 Fgr								1.0 gr								1.0 Fgr								5.0 sd					
		1.0 sd								1.0 sd								4.0 gr						70	1.5	1.5 gr	0	5	13	22	+
		2.0 gr								3.0 gr								1.0 Si Cl								1.0 sd					
		1.0 Fgr								1.0 Fgr								1.0 sd Si Cl								2.0 gr					
		3.0 gr								1.0 sd								3.0 sd								1.0 sd Si Cl					
		4.0 sd								1.0 Si Cl								1.0 Fgr								1.0 gr					
		1.0 gr								1.0 FS								1.0 sd								1.0 FS					
		1.0 Fgr								2.0 sd						66	2.0	2.0 gr Si Cl	0	8	16	27	+			1.0 Si Cl					
		2.0 sd								1.0 FS								4.0 gr								2.0 sd					
										1.0 sd								2.0 sd								1.0 gr					
58	1.5	3.5 gr Si Cl	1	7	13	22	+	62	1.0	2.0 sd Si Cl	0	6	16	28	+			3.0 gr								5.0 sd					
		2.0 sd								5.0 gr								1.0 sd								2.0 Fgr					
		1.0 gr								1.0 sd								1.0 gr sh													
		1.0 Si Cl								1.0 Fgr								1.0 Fgr													
		1.0 Fgr								1.0 FS								2.0 FS													
		2.0 sd								2.0 sd								2.0 sd													
		1.0 gr								2.0 Fgr																					
		3.0 FS								2.0 sd																					
		1.0 sd								1.0 sd Co S																					
		2.0 Fgr								2.0 Fgr																					
		1.0 gr																													

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PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES									
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole		
71	1.0	1.0 gr Si Cl	0	4	11	21	+	75	1.0	1.0 gr Si Cl	0	6	13	21	+	79	2.0	2.0 gr Si Cl	0	7	18	29	+	84	2.0	2.0 sd Si Cl	0	4	10	18	+		
		1.0 sd Si Cl								1.0 sd								2.0 sd								4.0 sd							
		1.0 gr Si Cl								3.0 gr								5.0 gr								2.0 gr							
		2.0 gr								1.0 sd								1.0 gr Si Cl								1.0 sd							
		1.0 sd								1.0 gr								1.0 gr								1.0 Fgr							
		1.0 Fgr								1.0 sd								1.0 sd Co S								0.5 FS Si Cl							
		1.0 sd								1.0 sd Si Cl								1.0 sd Si Cl								0.5 CS							
		1.0 gr Si Cl								1.0 FS								1.0 sd								1.0 gr							
		1.0 sd								3.0 gr								1.0 sd Co S								2.0 Fgr							
		2.0 gr								1.0 Si Cl								2.0 sd								4.0 sd							
		1.0 sd								1.0 sd								1.0 FS								85	1.5	0.5 sd Si Cl	0	6	13	22	+
		2.0 Si Cl								1.0 Fgr						80	1.5	1.5 gr Si Cl	1	8	17	30	+			1.0 sd							
		1.0 FS								2.0 sd								1.0 sd								2.0 Fgr							
		3.0 sd								1.0 Fgr								3.0 Fgr								1.0 sd							
72	2.0	1.0 sd Si Cl	0	5	13	25	+	76	1.0	1.5 gr Si Cl	1	11	21	32	+			5.0 gr								1.0 gr							
		4.0 gr								1.5 FS								1.0 FS								1.0 Fgr							
		2.0 Fgr								1.0 gr								2.0 Si Cl								2.0 gr							
		3.0 FS								1.0 FS								1.0 sd								2.0 sd							
		1.5 gr								4.0 gr								3.0 sd Co S								2.0 Fgr							
		0.5 Si Cl								1.0 sd								1.0 Fgr								3.0 sd							
		2.0 sd								3.0 gr						81	2.5	2.5 gr Si Cl	0	6	14	25	+			2.0 sd Co S							
		1.0 Fgr								1.0 Si Cl								1.0 Fgr								1.0 sd							
		3.0 sd								1.0 FS								2.0 gr						86	1.0	2.0 gr Si Cl	0	11	21	31	+		
73	1.0	1.0 gr Si Cl	0	6	14	22	+			2.0 sd								2.0 sd								2.0 gr							
		1.0 sd Si Cl								1.0 FS Co S								1.0 Fgr								1.0 sd							
		2.0 Fgr								1.0 sd								1.0 sd								1.0 gr							
		1.0 sd						77	1.0	1.0 sd Si Cl	0	9	16	23	+			1.0 Si Cl								1.0 FS Si Cl							
		3.0 gr								1.0 sd								1.0 FS								2.0 Fgr							
		2.0 Fgr								3.0 gr								6.0 sd								1.0 sd							
		1.0 sd								1.0 sd						82	3.0	3.0 Fgr	0	5	12	22	+			2.0 gr							
		2.0 Fgr								1.0 Fgr								1.0 sd								1.0 FS Si Cl							
		6.0 sd								1.0 sd								2.0 gr								1.0 sd							
74	1.0	4.0 gr Si Cl	1	8	18	28	+			1.0 Fgr								2.0 sd								1.0 gr							
		2.0 gr								1.0 sd Si Cl								2.0 Si Cl								2.0 sd							
		2.0 sd								2.0 sd								3.0 FS								1.0 gr							
		1.5 FS Si Cl								0.5 gr								2.0 sd Co S								1.0 sd							
		1.5 sd								1.0 Si Cl								2.0 Fgr															
		1.0 Fgr								0.5 FS						83	1.0	2.0 gr Si Cl	1	7	15	27	+										
		4.0 sd								5.0 sd								1.0 sd															
		1.0 Fgr						78	1.0	2.0 gr Si Cl	0	6	13	22	+			1.0 Fgr															
		1.0 sd								2.0 sd								1.0 gr															
		1.0 Fgr								1.0 gr								1.0 sd															
		1.0 Fgr								2.0 sd								3.0 gr															
										2.0 gr								1.0 gr Si Cl															
										3.5 FS								1.0 FS															
										1.0 gr								1.0 sd															
										1.5 FS								1.0 Si Cl															
										1.0 Fgr								3.0 sd															
										2.0 sd								1.0 sd Co S															
										1.0 FS Co S								2.0 Fgr															

RANGE 100 TWP 159 SEC NE1/4 16
COUNTY Williams Aug-14
PROSPECTED BY Volk / Nelson
INSPECTED & APPROVED Jeffrey Swank Aug-14

PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES							
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole
87	0.5	2.5 gr Si Cl	0	7	18	28	+	91	1.0	2.0 gr Si Cl	0	11	27	41	+	96	1.0	1.0 gr Si Cl	0	9	17	28	+	A	0.5	0.5 gr Si Cl	0	5	14	26	+
		3.0 sd								2.0 sd								4.0 gr								2.0 Fgr					
		2.0 gr Si Cl								6.0 gr								4.0 sd								2.0 gr					
		1.0 gr								1.0 gr Si Cl								3.0 gr								2.0 Fgr					
		1.0 gr Si Cl								1.0 gr								2.0 FS								2.0 gr					
		2.0 Fgr								2.0 sd								1.0 gr								1.0 Fgr					
		1.0 Si Cl								2.0 Fgr								1.0 FS								1.0 FS					
		1.0 FS								2.0 gr								2.0 sd								2.0 Fgr					
		2.0 sd								1.0 Fgr								1.0 gr								1.5 Si Cl					
		1.0 Fgr						92	1.5	2.5 gr Si Cl	1	12	22	33	+											1.5 sd					
		1.0 gr								4.0 gr																1.0 Fgr					
		1.0 Fgr								1.0 sd																1.0 sd					
		1.0 gr								4.0 gr																2.0 Fgr					
88	2.0	2.0 gr Si Cl	0	6	16	30	+			1.0 sd														B	0.5	5.5 gr	0	10	21	37	+
		2.0 gr								1.0 Si Cl																1.0 gr Si Cl					
		2.0 Fgr								2.0 sd																1.5 gr					
		2.5 gr								1.0 FS																0.5 FS					
		4.5 sd								2.0 Fgr																1.0 gr					
		3.0 Fgr						93	3.0	1.0 sd Si Cl	0	8	18	27	+											2.0 gr Si Cl					
		1.0 FS								1.0 sd																1.5 sd					
		1.0 sd								6.0 gr																2.5 Fgr					
89	1.0	1.0 Fgr Si Cl	0	9	20	31	+			1.0 gr Si Cl																2.0 sd					
		1.0 gr Si Cl								1.0 gr																1.0 FS					
		2.0 sd								1.0 sd																1.0 sd					
		2.0 Fgr								2.0 Si Cl														C	2.0	2.0 gr Si Cl	0	5	14	25	+
		2.0 gr								1.0 sd																2.0 gr					
		3.0 gr Si Cl								1.0 sd Co S																1.5 Fgr					
		2.0 sd								2.0 sd																0.5 FS					
		1.0 gr Co S						94	1.0	3.0 gr Si Cl	0	4	12	21	+											1.0 Fgr					
		2.0 sd								1.0 gr																1.0 gr					
		1.0 sd Co S								2.0 FS																1.0 sd Co S					
		1.0 sd								3.0 sd																1.0 Fgr					
		1.0 Fgr								4.5 Fgr																2.0 sd Co S					
90	2.0	1.0 gr Si Cl	0	10	20	33	+			1.0 Si Cl																1.0 FS					
		1.5 gr								1.5 sd																1.0 Fgr					
		1.5 CS								1.0 FS																2.0 sd					
		2.0 gr								2.0 gr																1.0 FS					
		2.0 CS						95	3.0	1.0 sd Si Cl	0	5	14	26	+											1.0 sd					
		2.5 Fgr								1.0 sd																					
		1.0 FS								1.0 gr																					
		0.5 Si Cl								1.0 sd																					
		2.0 sd								1.0 Fgr																					
		2.0 sd Co S								6.0 gr																					
		2.0 Fgr Co S								1.0 Fgr Si Cl																					
										1.0 Si Cl																					
										1.0 FS																					
										1.0 sd Co S																					
										1.0 Fgr																					
										1.0 gr																					

RANGE 100 TWP 159 SEC NE1/4 16
COUNTY Williams
PROSPECTED BY Volk / Nelson
INSPECTED & APPROVED _____

PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								PIT LOGGING BY TEST HOLES								
Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	Test Hole No.	Depth of Stripping (Ft)	Depth of Material (Ft)	% Retained on 1/2" Screen	% Retained on 3/4" Screen	% Retained on 3/8" Screen	% Retained on #4 Screen	Bottom of Test Hole	
D	1.0	1.0 gr Si Cl	0	10	19	30	+																									
		3.0 sd																														
		2.0 gr																														
		2.0 Fgr																														
		2.0 gr Si Cl																														
		4.0 gr																														
		3.0 sd																														
		1.0 gr																														
		1.0 sd																														
E	2.0	2.0 gr Si Cl	0	8	20	34	+																									
		4.0 gr																														
		1.0 gr Si Cl																														
		1.0 sd Si Cl																														
		1.0 sd																														
		2.0 Fgr																														
		1.0 gr																														
		1.0 sd																														
		1.0 sd Si Cl																														
		1.0 sd																														
		3.0 Fgr																														

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 COUNTY Williams Aug-14
 PROSPECTED BY Volk / Nelson
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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.

Abn abandoned
 Abut abutment
 Ac acres
 Adj adjusted
 Aggr aggregate
 Ahd ahead
 ARV air release valve
 Align alignment
 Al alley
 Alt alternate
 Alum aluminum
 ADA Americans with Disabilities Act
 A ampere
 & and
 Appr approach
 Approx approximate
 ACP asbestos cement pipe
 Asph asphalt
 AC asphalt cement
 Assmd assumed
 @ at
 Atten attenuation
 ATR automatic traffic recorder
 Ave Avenue
 Avg average
 ADT average daily traffic
 Az azimuth
 Bk back
 BF back face
 Bs backsight
 Balc balcony
 B Wire barbed wire
 Barr barricade
 Btry battery
 Brg bearing
 BI beehive inlet
 Beg begin
 BM bench mark
 Bkwy bikeway
 Bit bituminous
 Blk block
 Bd Ft board feet
 BH bore hole
 BS both sides
 Bot bottom
 Blvd Boulevard
 Bndry boundary
 BC brass cap
 Brkwy breakaway
 Br bridge
 Bldg building

BV butterfly valve
 Byp bypass
 C Gdrl cable guardrail
 Calc calculate
 Cd candela
 CIP cast iron pipe
 CB catch basin
 CRS cationic rapid setting
 C Gd cattle guard
 C To C center to center
 Cl or C centerline
 Cm centimeter
 Ch chain
 Chnlk chain-link
 Ch Blk channel block
 Ch Ch channel change
 Chk check
 Chsld chiseled
 Cir circle
 Cl class
 Cl clay
 Cl F clay fill
 Cl Hvy clay heavy
 Cl Lm clay loam
 Clnt clean-out
 Clr clear
 Cl&gr clearing & grubbing
 Co S coal slack
 Comb. combination
 Coml commercial
 Compr compression
 CADD computer aided drafting & design
 Conc concrete
 Cond conductor
 Const construction
 Cont continuous
 CSB continuous split barrel sample
 Contr contraction
 Contr contractor
 CP control point
 Coord coordinate
 Cor corner
 Corr corrected
 CAES corrugated aluminum end section
 CAP corrugated aluminum pipe
 CMES corrugated metal end section
 CMP corrugated metal pipe
 CPVCP corrugated poly-vinyl chloride pipe
 CSES corrugated steel end section
 CSP corrugated steel pipe
 C coulomb
 Co County
 Crse course
 C Gr course gravel
 CS course sand

Ct Court
 Xarm cross arm
 Xbuck cross buck
 Xsec cross sections
 Xing crossing
 Xrd Crossroad
 Crn crown
 CF cubic feet
 M3 cubic meter
 M3/s cubic meters per second
 CY cubic yard
 Cy/mi cubic yards per mile
 Culv culvert
 C&G curb & gutter
 CI curb inlet
 CR curb ramp
 CS curve to spiral
 C cut
 Dd Ld dead load
 Defl deflection
 Defm deformed
 Deg or D degree
 DInt delineate
 DIntr delineator
 Depr depression
 Desc description
 Det detail
 DWP detectable warning panel
 Dtr detour
 Dia diameter
 Dir direction
 Dist distance
 DM disturbed material
 DB ditch block
 DG ditch grade
 Dbl double
 Dn down
 Dwg drawing
 Dr drive
 Drwy driveway
 DI drop inlet
 D dry density
 Ea each
 Esmt easement
 E East
 EB Eastbound
 Elast elastomeric
 EL electric locker
 E Mtr electric meter
 Elec electric/al
 EDM electronic distance meter
 Elev or El elevation
 Ellipt elliptical
 Emb embankment
 Emuls emulsion/emulsified

ES end section
 Engr engineer
 ESS environmental sensor station
 Eq equal
 Eq equation
 Evgr evergreen
 Exc excavation
 Exst existing
 Exp expansion
 Expy Expressway
 E external of curve
 Extru extruded
 FOS factor of safety
 F Fahrenheit
 FS far side
 F farad
 Fed Federal
 FP feed point
 Ft feet/foot
 Fn fence
 Fn P fence post
 FO fiber optic
 FB field book
 FD field drive
 F fill
 FAA fine aggregate angularity
 FS fine sand
 FH fire hydrant
 Fl flange
 Flrd flared
 FES flared end section
 F Bcn flashing beacon
 FA flight auger sample
 FL flow line
 Ftg footing
 FM force main
 Fs foresight
 Fnd found
 Fdn foundation
 Frac fractional
 Frwy freeway
 Frt front
 FF front face
 F Disp fuel dispenser

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 07/01/14 and the original document is stored at the North Dakota Department of Transportation

NDDOT ABBREVIATIONS

D-101-2

FFP	fuel filler pipes	IPn	Iron Pin	MC	medium curing	Ped	pedestal
FLS	fuel leak sensor	IP	iron Pipe	M	mega	Ped	pedestrian
Furn	furnish/ed	Jt	joint	Mer	meridian	PPP	pedestrian pushbutton post
Gal	gallon	J	joule	M	meter	Pen.	penetration
Galv	galvanized	Jct	junction	M/s	meters per second	Perf	perforated
Gar	garage	K	kelvin	M	mid ordinate of curve	Per.	perimeter
Gs L	gas line	Kn	kilo newton	Mi	mile	PL	pipeline
G Reg	gas line regulator	Kpa	kilo pascal	MM	mile marker	PI	place
GMV	gas main valve	Kg	kilogram	MP	mile post	P&P	plan & profile
G Mtr	gas meter	Kg/m3	kilogram per cubic meter	MI	milliliter	PL	plastic limit
GSV	gas service valve	Km	kilometer	Mm	millimeter	PI	plate
GVP	gas vent pipe	K	Kip(s)	Mm/hr	millimeters per hour	Pt	point
GV	gate valve	LS	Land Surveyor (licensed)	Min	minimum	PCC	point of compound curve
Ga	gauge	LSIT	Land Surveyor In Training	Misc	miscellaneous	PC	point of curve
Geod	geodetic	Ln	lane	Mon	monument	PI	point of intersection
GIS	Geographical Information System	Lg	large	Mnd	mound	PRC	point of reverse curvature
G	giga	Lat	latitude	Mtbl	mountable	PT	point of tangent
GPS	Global Positioning System	Lt	left	Mtd	mounted	POC	point on curve
Gov	government	L	length of curve	Mtg	mounting	POT	point on tangent
Grd	graded/grade	Lens	lenses	Mk	muck	PE	polyethylene
Gr	gravel	Lvl	level	Mun	municipal	PVC	polyvinyl chloride
Grnd	ground	LB	level book	N	nano	PCC	Portland Cement concrete
GWM	ground water monitor	Lvng	leveling	NGS	National Geodetic Survey	Lb or #	pounds
Gdrl	guardrail	Lht	light	NS	near side	PP	power pole
Gtr	gutter	LP	light pole	Neop	neoprene	Preempt	preemption
H Plg	H piling	Ltg	lighting	Ntwk	network	Prefab	prefabricated
Hdwl	headwall	Lig Co	lignite coal	N	newton	Prfmd	performed
Ha	hectare	Lig Sl	lignite slack	N	North	Prep	preparation
Ht	height	LF	linear foot	NE	North East	Press.	pressure
HI	height of instrument	Liq	liquid	NW	North West	PRV	pressure relief valve
Hel	helical	LL	liquid limit	NB	Northbound	Prestr	prestressed
H	henry	L	litre	No. or #	number	Pvt	private
HZ	hertz	Lm	loam	Obsc	obscure(d)	PD	private drive
HDPE	high density polyethylene	Loc	location	Obsn	observation	Prod.	production/produce
HM	high mast	LC	long chord	Ocpd	occupied	Prog	programmed
HP	high pressure	Long.	longitude	Ocpy	occupy	Prop.	property
HPS	high pressure sodium	Lp	loop	Off Loc	office location	Prop Ln	property line
Hwy	highway	LD	loop detector	O/s	offset	Ppsd	proposed
Hor	horizontal	Lm	lumen	OC	on center	PB	pull box
HBP	hot bituminous pavement	Lum	luminaire	C	one dimensional consolidation		
HMA	hot mix asphalt	L Sum	lump sum	OC	organic content		
Hr	hour(s)	Lx	lux	Orig	original		
Hyd	hydrant	ML	main line	O To O	out to out		
Ph	hydrogen ion content	M Hr	man hour	OD	outside diameter		
Id	identification	MH	manhole	OH	overhead		
In or "	inch	Mkd	marked	PMT	pad mounted transformer		
Incl	inclinometer tube	Mkr	marker	Pg	pages		
IMH	inlet manhole	Mkg	marking	Pntd	painted		
ID	inside diameter	MA	mast arm	Pr	pair		
Inst	instrument	Matl	material	Pnl	panel		
Intchg	interchange	Max	maximum	Pk	park		
Intmdt	intermediate	MC	meander corner	PK	Parker-Kalon nail		
Intscn	intersection	Meas	measure	Pa	pascal		
Inv	invert	Mdn	median	PSD	passing sight distance		
IM	iron monument	MD	median drain	Pvmt	pavement		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
08-03-15	General Revisions

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NDDOT ABBREVIATIONS

D-101-3

Qty	quantity	SN	sign number	Tan	tangent	Wb	weber
Qtr	quarter	Sig	signal	T	tangent (semi)	WIM	weigh in motion
Rad or R	radius	Si Cl	silt clay	TS	tangent to spiral	W	west
RR	railroad	Si Cl Lm	silty clay loam	Tel	telephone	WB	westbound
Rlwy	railway	Si Lm	silty loam	Tel B	Telephone Booth	Wrng	wiring
Rsd	raised	Sgl	single	Tel P	telephone pole	W/	with
RTP	random traverse point	SC	slow curing	Tv	television	W/o	without
Rge or R	range	SS	slow setting	Temp	temperature	WC	witness corner
RC	rapid curing	Sm	small	Temp	temporary	WGS	world geodetic system
Rec	record	S	South	TBM	temporary bench mark	Z	zenith
Rcy	recycle	SE	South East	T	tesla		
RAP	recycled asphalt pavement	SW	South West	T	thinwall tube sample		
RPCC	recycled portland cement concrete	SB	Southbound	T/mi	tons per mile		
Ref	reference	Sp	spaces	Ts	topsoil		
R Mkr	reference marker	Spcl	special	Twp or T	township		
RM	reference monument	SA	special assembly	Traf	traffic		
Refl	reflectorized	SP	special provisions	TSCB	traffic signal control box		
RCB	reinforced concrete box	G	specific gravity	Tr	trail		
RCES	reinforced concrete end section	Spk	spike	Transf	transformer		
RCP	reinforced concrete pipe	SC	spiral to curve	TB	transit book		
RCPS	reinforced concrete pipe sewer	ST	spiral to tangent	Trans	transition		
Reinf	reinforcement	SB	split barrel sample	TT	transmission tower		
Res	reservation	SH	sprinkler head	Trans	transverse		
Ret	retaining	SV	sprinkler valve	Trav	traverse		
Rev	reverse	Sq	square	TP	traverse point		
Rt	right	SF	square feet	Trtd	treated		
R/W	right of way	Km2	square kilometer	Trmt	treatment		
Riv	river	M2	square meter	Qc	triaxial compression		
Rd	road	SY	square yard	TERO	tribal employment rights ordinance		
Rdbd	road bed	Stk	stake	Tpl	triple		
Rdwy	roadway	Std	standard	TP	turning point		
RWIS	roadway weather information system	N	standard penetration test	Typ	typical		
Rk	rock	Std Specs	standard specifications	Qu	unconfined compressive strength		
Rt	route	Sta	station	Ugrnd	underground		
Salv	salvage(d)	Sta Yd	station yards	USC&G	US Coast & Geodetic Survey		
Sd	sand	Stm L	steam line	USGS	US Geologic Survey		
Sdy Cl	sandy clay	SEC	steel encased concrete	Util	utility		
Sdy Cl Lm	sandy clay loam	SMA	stone matrix asphalt	VG	valley gutter		
Sdy Fl	sandy fill	SSD	stopping sight distance	Vap	vapor		
Sdy Lm	sandy loam	SD	storm drain	Vert	vertical		
San	sanitary sewer line	St	street	VC	vertical curve		
Sc	scoria	SPP	structural plate pipe	VCP	vitrified clay pipe		
Sec	seconds	SPPA	structural plate pipe arch	V	volt		
Sec	section	Str	structure	Vol	volume		
SL	section line	Subd	subdivision	Wkwy	walkway		
Sep	separation	Sub	subgrade	W	water content		
Seq	sequence	Sub Prep	subgrade preperation	WGV	water gate valve		
Serv	service	Ss	subsoil	WL	water line		
Sh	shale	SE	superelevation	WM	water main		
Sht	sheet	SS	supplement specification	WMV	water main valve		
Shtng	sheeting	Supp	supplemental	W Mtr	water meter		
Shldr	shoulder	Surf	surfacing	WSV	water service valve		
Sw	sidewalk	Surv	survey	WW	water well		
S	siemens	Sym	symmetrical	W	watt		
SD	sight distance	SI	systems international	Wrng	wearing		

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NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

702COM 702 Communications
 ACCENT Accent Communications
 AGASSIZ WU Agassiz Water Users Incorporated
 AGC Associated General Contractors of America
 AII PI Alliance Pipeline
 ALL SEAS WU All Seasons Water Users Association
 AMOCO PI Amoco Pipeline Company
 AMRDA HESS Amerada Hess Corporation
 AT&T AT&T Corporation
 B PAW Bear Paw Energy Incorporated
 BAKER ELEC Baker Electric
 BASIN ELEC Basin Electric Cooperative Incorporated
 BEK TEL Bek Communications Cooperative
 BELLE PL Belle Fourche Pipeline Company
 BLM Bureau of Land Management
 BNSF Burlington Northern Santa Fe Railway
 BOEING Boeing
 BRNS RWD Barnes Rural Water District
 BURK-DIV ELEC Burke-Divide Electric Cooperative
 BURL WU Burleigh Water Users
 Cable One Cable One
 CABLE SERV Cable Services
 CAP ELEC Capital Electric Cooperative Incorporat
 CASS CO ELEC Cass County Electric Cooperative
 CASS RWU Cass Rural Water Users Incorporated
 CAV ELEC Cavalier Rural Electric Cooperative
 CBLCOM Cablecom Of Fargo
 CENEX PL Cenex Pipeline
 CENT PL WATER DIST Central Pipe Line Water District
 CENT PWR ELEC Central Power Electric Cooperative
 COE Corps of Engineers
 CONS TEL Consolidated Telephone
 CONT RES Continental Resource Inc
 CPR Canadian Pacific Railway
 D O E Department Of Energy
 DAK CARR Dakota Carrier Network
 DAK CENT TEL Dakota Central Telephone
 DAK RWD Dakota Rural Water District
 DGC Dakota Gasification Company
 DICKEY R NET Dickey Rural Networks
 DICKEY RWU Dickey Rural Water Users Association
 DICKEY TEL Dickey Telephone
 DNRR Dakota Northern Railroad
 DOME PL Dome Pipeline Company
 DVELEC Dakota Valley Electric Cooperative
 DVMW Dakota, Missouri Valley & Western
 ENBRDG Enbridge Pipelines Incorporated
 ENVENTIS Enventis Telephone
 FALK MNG Falkirk Mining Company
 FHWA Federal Highway Administration
 G FKS-TRL WD Grand Forks-traill Water District
 GETTY TRD & TRAN Getty Trading & Transportation
 GLDN W ELEC Golden West Electric Cooperative
 GRGS CO TEL Griggs County Telephone

GT PLNS NAT GAS Great Plains Natural Gas Company
 HALS TEL Halstad Telephone Company
 IDEA1 Idea1
 INT-COMM TEL Inter-Community Telephone Company
 KANEB PL Kaneb Pipeline Company
 KEM ELEC Kem Electric Cooperative Incorporated
 KOCH GATH SYS Koch Gathering Systems Incorporated
 LKHD PL Lakehead Pipeline Company
 LNGDN RWU Langdon Rural Water Users Incorporated
 LWR YELL R ELEC Lower Yellowstone Rural Electric
 MCKNZ CON McKenzie Consolidated Telcom
 MCKENZIE ELEC McKenzie Electric Cooperative
 MCKNZ WRD McKenzie County Water Resource District
 MCLEOD McLeod USA
 MCLN ELEC McLean Electric Cooperative
 MCLN-SHRDN R WAT McLean-Sheridan Rural Water
 MDU Montana-dakota Utilities
 MID-CONT CABLE Mid-Continent Cable
 MIDSTATE TEL Midstate Telephone Company
 MINOT CABLE Minot Cable Television
 MINOT TEL Minot Telephone Company
 MISS W W S Missouri West Water System
 MNKOTA PWR Minnkota Power
 MOR-GRAN-SOU ELEC Mor-gran-sou Electric Cooperative
 MOUNT-WILLI ELEC Mountrail-williams Electric Cooperative
 MRE LBTY TEL Moore & Liberty Telephone
 MUNICIPAL City Water And Sewer
 MUNICIPAL City Of '.....'
 N CENT ELEC North Central Electric Cooperative
 N VALL W DIST North Valley Water District
 ND PKS & REC North Dakota Parks And Recreation
 ND TEL North Dakota Telephone Company
 NDDOT North Dakota Department of Transportation
 NDSU SOIL SCI DEPT NDSU Soil Science Department
 NEMONT TEL Nemont Telephone
 NODAK R ELEC Nodak Rural Electric Cooperative
 NOON FRMS TEL Noonan Farmers Telephone Company
 NPR Northern Plains Railroad
 NSP Northern States Power
 NTH PRAIR RW Northern Prairie Rural Water Association
 NTHN BRDR PL Northern Border Pipeline
 NTHN PLNS ELEC Northern Plains Electric Cooperative Incorporated
 NTHWSTRN REF Northwestern Refinery Company
 NW COMM Northwest Communication Cooperation
 ONEOK Oneok gas
 OSHA Occupational Safety and Health Administration
 OTTR TL PWR Otter Tail Power Company
 P L E M Prairielands Energy Marketing
 POLAR COM Polar Communications
 PVT ELEC Private Electric
 QWEST Qwest Communications
 R & T W SUPPLY R & T Water Supply Association
 RAMSEY R SEW Ramsey Rural Sewer Association
 RAMSEY RW Ramsey Rural Water Association
 RAMSEY UTIL Ramsey County Rural Utilities

RED RIV TEL Red River Rural Telephone
 RESVTN TEL Reservation Telephone
 ROBRTS TEL Roberts Company Telephone
 R-RIDER ELEC Roughrider Electric Coop
 RRVW Red River Valley & Western Railroad
 RSR ELEC R.S.R. Electric Cooperative
 S E W U South East Water Users Incorporated
 SCOTT CABLE Scott Cable Television Dickinson
 SHERDN ELEC Sheridan Electric Cooperative
 SHEYN VLY ELEC Sheyenne Valley Electric Cooperative
 SKYTECH Skyland Technologies Incorporated
 SLOPE ELEC Slope Electric Cooperative Incorporated
 SOURIS RIV TELCOM Souris River Telecommunications
 ST WAT COMM State Water Commission
 STATE LN WATER State Line Water Cooperative
 STER ENG Sterling Energy
 STUT RWU Stutsman Rural Water Users
 SW PL PRJ Southwest Pipeline Project
 T M C Turtle Mountain Communications
 TCI TCI of North Dakota
 TESORO GHG PLNS PL Tesoro High Plains Pipeline
 TRI-CNTY WU Tri-County Water Users Incorporated
 TRL CO RWU Traill County Rural Water Users
 UNTD TEL United Telephone
 UPPR SOUR WUA Upper Souris Water Users Association
 US SPRINT U.S. Sprint
 USAF MSL CABLE U.S.A.F. Missile Cable
 USFWS US Fish and Wildlife Service
 USW COMM U.S. West Communications
 VRNDRY ELEC Verendrye Electric Cooperative
 W RIV TEL West River Telephone Incorporated
 WEB W. E. B. Water Development Association
 WILLI RWA Williams Rural Water Association
 WILSTN BAS PL Williston Basin Interstate Pipeline Company
 WLSH RWD Walsh Water Rural Water District
 WOLVRTN TEL Wolverton Telephone
 XLENER Xcel Energy
 YSVR Yellowstone Valley Railroad

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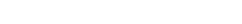
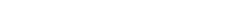
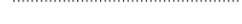
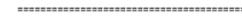
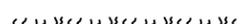
Line Styles

.....	Limits of Const Transition Line	—— s —— s ——	Floating Silt Curtain	—— ——— ———	Existing Aggregate (Cross Section View)	- - - - -	Existing Centerline
.....	Bale Check	—— ——— T ——	Existing Telephone Line	—— ——— ———	Existing Curb and Gutter (Cross Section View)	- - - - -	Supplemental Contour
.....	Rock Check	—— ——— TV ——	Existing TV Line	—— ——— ———	Existing Riprap	—— - - - - -	Right of Way
.....	Sight Distance Triangle Line	Void — void — void — v	Existing Assumed Ground (Not Surveyed)	—— ——— ———	Existing Underground Vault or Lift Station	—— - - - - -	Existing Right of Way
- - - - -	Small Hidden Object	Void — void — void — v	Tentative Ground Line	—— ——— ———	Tangent Line	—— - - - - -	Existing Right of Way Railroad
- - - - -	Dimension Leader	—— ——— w ——	Existing Water or Steam Line	- - - - -	Hidden Object	- - - - -	Failure Line
- - - - -	Existing Ground	=====	Existing Under Drain	—— ——— ———	Existing Dirt Surface	- - - - -	Existing Conditions
- - - - -	Existing Topsoil (Cross Section View)	=====	Under Drain	—— ——— ———	Existing Conduit	- - - - -	Existing Ground (Details)
—— ——— ———	Large Hidden Object	=====	Wall	—— ——— ———	Topsoil Profile	—— - - - - -	Existing Sixteenth Section Line
—— ——— ———	Edge Drain	=====	Existing Slotted Drain	- - - - -	Existing Conductor	- - - - -	Existing Right of Way Not State Owned
—— D —— D ——	Geotextile Fabric Type D	—— + —— + ——	Existing Cemetary Boundary	- - - - -	Conductor	- - - - -	Phantom Object
—— ——— E ——	Existing Electrical	—— ——— ———	Centerline Pavement Marking	- - - - -	Fiber Optic	- - - - -	Centerline Main
—— ——— FO ——	Existing Fiber Optic Line	=====	Barrier with Centerline Pavement Marking	- - - - -	Existing Loop Detector	-	Existing Guardrail Cable
—— ——— FO ——	Existing TV Fiber Optic	=====	Barrier Pavement Marking	- - - - -	Subgrade, Subcut or Ditch Grade	— • — • — • — •	Existing Guardrail Metal
—— ——— G ——	Existing Gas Pipe	- - - - -	Stripe 4 IN Dotted Extension White	—— ——— ———	Existing Asphalt Surface	—— . ——— . ——— . ——— .	Existing Edge of Water
—— Geo —— Geo ——	Geogrid	- - - - -	Stripe 8 IN Dotted Extension White	—— ——— ———	Existing Asphalt (Cross Section View)	- - - - -	Excavation Limits
—— ——— OH ——	Existing Overhead Utility Line	- - - - -	Stripe 8 IN Lane Drop	—— ——— ———	Existing Reinforcement Rebar	——	Existing Government Lot Line
—— ——— P ——	Existing Power	—— v v v v ——	Wetland Mitigation	—— ——— ———	Existing Tie Point Line	Existing Adjacent Block Lines
—— ——— PL ——	Existing Fuel Pipeline	- - - - -	Existing Box Culvert Bridge	—— ——— ———	Existing State or International Line	Existing Adjacent Lot Lines
—— ——— PL ——	Existing Undefined Above Ground Pipe Line	- - - - -	Existing Concrete Surface	—— ——— ———	Existing Quarter Section Line	Existing Adjacent Property Line
—— ——— R —— R ——	Geotextile Fabric Type R	- - - - -	Existing Drainage Structure	—— ——— ———	Existing County	Existing Adjacent Subdivision Lines
—— ——— R —— R ——	Geotextile Fabric Type R1	- - - - -	Easement	—— ——— ———	Existing Section Line		
—— REMOVE —— REMOVE ——	Remove Line	- - - - -	Existing Concrete	—— ——— ———	Existing Township		
—— RR —— RR ——	Geotextile Fabric Type RR	- - - - -	Existing Easement	—— ——— ———	Existing Railroad Centerline		
—— S —— S ——	Geotextile Fabric Type S	—— ——— ———	Existing Gravel Surface	—— - - - - -	Centerline		

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Line Styles

	Subgrade Reinforcement		Existing Railroad Switch		Sheet Piling
	Existing Down Guy Wire Down Guy		Overhead Sign Structure Cantilever		W-Beam w Posts
	Existing Fence		24 Inch Pipe		Existing W-Beam Guardrail with Posts
	Existing Railroad		Reinforced Concrete Pipe		Exst Wet Area-Vegetation Break
	Existing Sanitary Sewer		Signal Head with Mast Arm		Existing Wetland Delineated
	Existing Sanitary Force Main		Existing Signal Head with Mast Arm		
	Existing Storm Drain		Tie Bar at Random Spacing		
	Existing Storm Drain Force Main		3-Cable w Posts		
	Fence		Existing 3-Cable w Posts		
	Silt Fence		Site Boundary		
	Existing Field Line		Fiber Rolls		
	Exst Flow		Doweled Joint		
	Flow		Tie Bar 30 Inch 4 Foot Center to Center		
	Existing Culvert		Tie Bar 18 Inch 3 Foot Center to Center		
	Existing Curb		Existing Berm, Dike, Pit, or Earth Dam		
	Existing Valley Gutter		Existing Ditch Block		
	Existing Driveway Gutter		Depression Contours		
	Existing Curb and Gutter		Existing City Corporate Limits or Reservation Boundary		
	Existing Mountable Curb and Gutter		Gravel Pit - Borrow Area		
	Existing Double Micro Loop Detector		Existing Tree Boundary		
	Micro Loop Detector Double		Tree Row		
	Existing Overhead Sign Structure		Existing Brush or Shrub Boundary		
	Existing Micro Loop Detector		Existing Retaining Wall		
	Micro Loop Detector		Existing Planter or Wall		
	Existing Overhead Sign Structure Cantilever		Retaining Wall (Plan View)		

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Symbols

	North Arrow (Half Scale)		Attenuation Device		Existing Railroad Battery Box		Existing Delineator Type E
	Truck Mounted Attenuator		Diamond Grade Delineator Type A		Existing Bush or Shrub		Existing EFB Misc
	Type I Barricade		Diamond Grade Delineator Type B		Existing Gas Cap or Stub		Existing Flashing Beacon
	Type II Barricade		Diamond Grade Delineator Type C		Existing Sanitary Cap or Stub		Existing Pipe Mounted Flasher
	Type III Barricade		Diamond Grade Delineator Type D		Existing Storm Drain Cap or Stub		Existing Pad Mounted Feed Point
	Catch Basin		Diamond Grade Delineator Type E		Existing Water Cap or Stub		Existing Pipe Mounted Feed Point with Pad
	Cairn or Stone Circle		Flexible Delineator		Existing Sanitary Cleanout		Existing Pole Mounted Feed Point
	Video Detection Camera		Flexible Delineator Type A		Existing Concrete Foundation		Existing Railroad Frog
	Storm Drain Cap or Stub		Flexible Delineator Type B		Existing Traffic Signal Controller		Existing Snow Gate 18
	Corrugated Metal End Section 18 Inch		Flexible Delineator Type C		Existing Pad Mounted Signal Controller		Existing Snow Gate 28
	Corrugated Metal End Section 24 Inch		Flexible Delineator Type D		Existing Sixteenth Section Corner		Existing Snow Gate 40
	Corrugated Metal End Section 30 Inch		Flexible Delineator Type E		Existing Quarter Section Corner		Existing Headwall
	Corrugated Metal End Section 36 Inch		Delineator Type A		Existing Section Corner		Existing Pedestrian Head with Number
	Corrugated Metal End Section 42 Inch		Delineator Type A Reset		Existing Railroad Crossbuck		Existing Signal Head
	Corrugated Metal End Section 48 Inch		Delineator Type B		Existing Satellite Dish		Existing Sprinkler Head
	Concrete Foundation		Delineator Type B Reset		Existing Fuel Dispensers		Existing Fire Hydrant
	Ground Connection Conductor		Delineator Type C		Existing Flexible Delineator Type A		Existing Catch Basin Drop Inlet
	Neutral Connection Conductor		Delineator Type D		Existing Flexible Delineator Type B		Existing Curb Inlet
	Phase 1 Connection Conductor		Delineator Type E		Existing Flexible Delineator Type C		Existing Manhole Inlet
	Phase 2 Connection Conductor		Delineator Drums		Existing Flexible Delineator Type D		Existing Junction Box
	Traffic Cone		Spot Elevation		Existing Flexible Delineator Type E		
	Signal Controller		Existing Access Control Arrow		Existing Delineator Type A		
	Pad Mounted Signal Controller		Existing Artifact		Existing Delineator Type B		
	Alignment Data Point		Existing Flashing Beacon		Existing Delineator Type C		
	Emergency Vehicle Detector		Existing Benchmark		Existing Delineator Type D		

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Symbols

	Existing Light Standard		Existing Manhole with Valve Water		Existing Telephone Pole		Existing Undefined Manhole
	Existing High Mast Light Standard 10 Luminaire		Existing Water Manhole		Existing Wood Pole		Existing Undefined Pull Box
	Existing High Mast Light Standard 3 Luminaire		Existing Mile Post Type A		Existing Post		Existing Undefined Pedestal
	Existing High Mast Light Standard 4 Luminaire		Existing Mile Post Type B		Existing Pedestrian Push Button Post		Existing Undefined Valve
	Existing High Mast Light Standard 5 Luminaire		Existing Mile Post Type C		Existing Control Point CP		Existing Undefined Pipe Vent
	Existing High Mast Light Standard 6 Luminaire		Existing Reference Marker		Existing Control Point GPS-RTK		Existing Gas Valve
	Existing High Mast Light Standard 7 Luminaire		Existing RW Marker		Existing Control Point TRI		Existing Water Valve
	Existing High Mast Light Standard 8 Luminaire		Existing Utility Marker		Existing Reference Marker Point NGS		Existing Fuel Pipe Vent
	Existing High Mast Light Standard 9 Luminaire		Iron Monument Found		Existing Pull Box		Existing Gas Pipe Vent
	Existing Overhead Sign Structure Load Center		Iron Pin R/W Monument		Existing Intelligent Transportation Pull Box		Existing Sanitary Pipe Vent
	Existing Luminaire		Existing Object Marker Type I		Existing Water Pump		Existing Storm Drain Pipe Vent
	Existing Light Standard Luminaire		Existing Object Marker Type II		Existing Slotted Reinforced Concrete Pipe		Existing Water Pipe Vent
	Existing Federal Mailbox		Existing Object Marker Type III		Existing RR Profile Spot		Existing Weather Station
	Existing Private Mailbox		Existing Electrical Pedestal		Existing Fuel Leak Sensors		Existing Ground Water Well Bore Hole
	Existing Meander Section Corner		Existing Telephone Pedestal		Existing Highway Sign		Existing Windmill or Tower
	Existing Meter		Existing Fiber Optic Telephone Pedestal		Existing Miscellaneous Spot		Existing Witness Corner
	Existing Electrical Manhole		Existing TV Pedestal		Existing Lighting Standard Pole		Flashing Beacon
	Existing Gas Manhole		Existing Fiber Optic TV Pedestal		Existing Traffic Signal Standard		Flagger
	Existing Sanitary Manhole		Existing Fuel Filler Pipes		Existing Transformer		Pipe Mounted Flasher
	Existing Sanitary Force Main Manhole		Existing Traverse PI Aerial Panel		Existing Large Evergreen Tree		Sanitary Force Main with Valve
	Existing Sanitary Manhole with Valve		Existing Pole		Existing Small Evergreen Tree		
	Existing Storm Drain Manhole		Existing Power Pole		Existing Large Tree		
	Existing Force Main Storm Drain Manhole		Existing Power Pole with Transformer		Existing Small Tree		
	Existing Force Main Storm Drain Manhole with Valve				Existing Tree Trunk		
	Existing Telephone Manhole				Existing Pad Mounted Traffic Signal Control Box		

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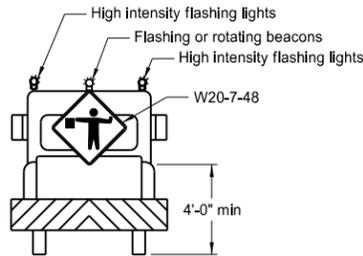
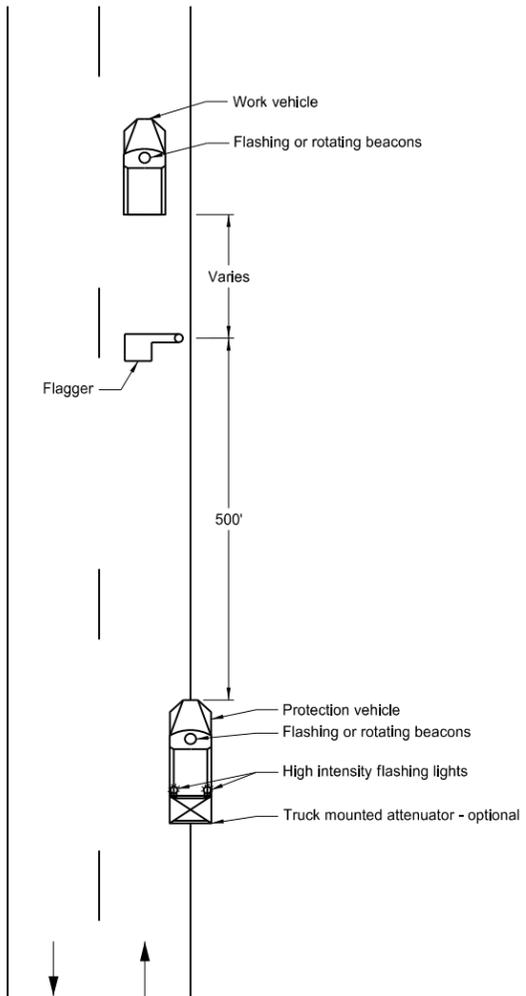
D-101-32

 Pad Mounted Feed Point  Pipe Mounted Feed Point with Pad  Pole Mounted Feed Point  Headwall  Double Headwall with Vegetation Barrier  Single Headwall with Vegetation Barrier  Pole Mounted Head  Sprinkler Head  Fire Hydrant  Inlet Type 1  Inlet Type 2  Double Inlet Type 2  Inlet Gate Type 2  Junction Box  High Mast Light Standard 10 Luminaire  High Mast Light Standard 3 Luminaire  High Mast Light Standard 4 Luminaire  High Mast Light Standard 5 Luminaire  High Mast Light Standard 6 Luminaire  High Mast Light Standard 7 Luminaire  High Mast Light Standard 8 Luminaire  High Mast Light Standard 9 Luminaire  Relocate Light Standard  Overhead Sign Structure Load Center  Light Standard 100 Watt High Pressure Sodium Vapor Luminaire	 Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire  Light Standard 150 Watt High Pressure Sodium Vapor Luminaire  Light Standard 175 Watt High Pressure Sodium Vapor Luminaire  Light Standard 200 Watt High Pressure Sodium Vapor Luminaire  Light Standard 250 Watt High Pressure Sodium Vapor Luminaire  Light Standard 310 Watt High Pressure Sodium Vapor Luminaire  Light Standard 35 Watt High Pressure Sodium Vapor Luminaire  Light Standard 400 Watt High Pressure Sodium Vapor Luminaire  Light Standard 50 Watt High Pressure Sodium Vapor Luminaire  Light Standard 70 Watt High Pressure Sodium Vapor Luminaire  Light Standard 700 Watt High Pressure Sodium Vapor Luminaire  Manhole  Manhole 48 Inch  Sanitary Force Main Manhole  Sanitary Sewer Manhole  Storm Drain Manhole  Storm Drain Manhole with Inlet  Reset Mile Post  Mile Post Type A  Mile Post Type B  Mile Post Type C  Right of Way Marker  Tubular Marker  Alignment Monument  Iron Pin Reference Monument	 Object Marker Type I  Object Marker Type II  Object Marker Type III  Caution Mode Arrow Panel  Back to Back Vertical Panel Sign  Double Direction Arrow Panel  Left Directional Arrow Panel  Right Directional Arrow Panel  Sequencing Arrow Panel  Truck Mounted Arrow Panel  Power Pole  Wood Pole  Pedestrian Push Button Post  Property Corner  Pull Box  Intelligent Transportation Pull Box  Sanitary Pump  Storm Drain Pump  Reinforced Pavement  Reinforced Concrete End Section 15 Inch  Reinforced Concrete End Section 18 Inch  Reinforced Concrete End Section 24 Inch  Reinforced Concrete End Section 30 Inch  Reinforced Concrete End Section 36 Inch  Reinforced Concrete End Section 42 Inch	 Reinforced Concrete End Section 48 Inch  Reinforced Concrete End Section 54 Inch  Reset Right of Way Marker  Reset USGS Marker  Right of Way Markers  Riser 30 Inch  Continuous Split Barrel Sample  Flight Auger Sample  Split Barrel Sample  Thinwall Tube Sample  Highway Sign  SNOW GATE 18 FT  SNOW GATE 28 FT  SNOW GATE 40 FT  Standard Penetration Test  Transformer  Inclinometer Tube  Underdrain Cleanout  Excavation Unit  Water Valve
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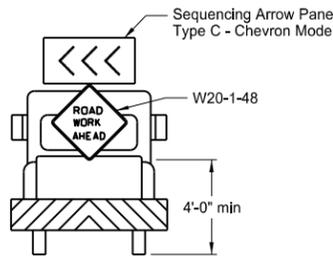
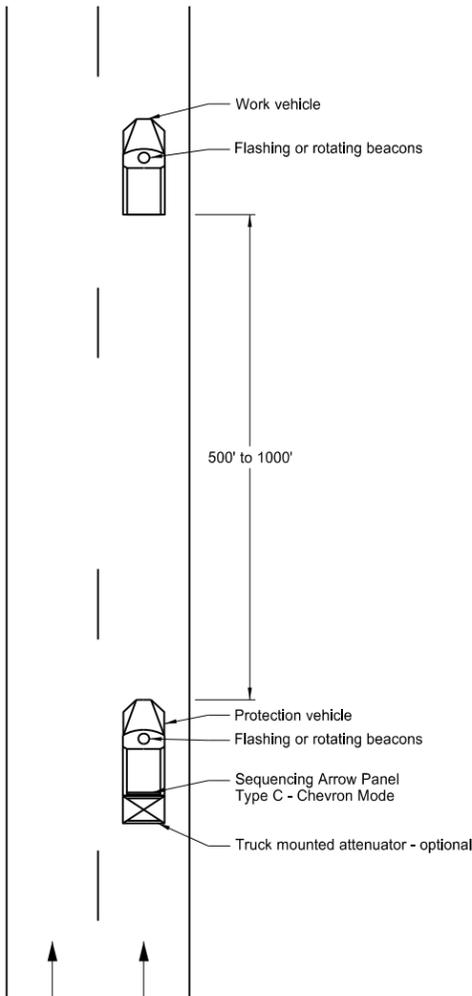
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Two Lane, Two Way Roadways



Typical Protection Vehicle

Multilane Roadways

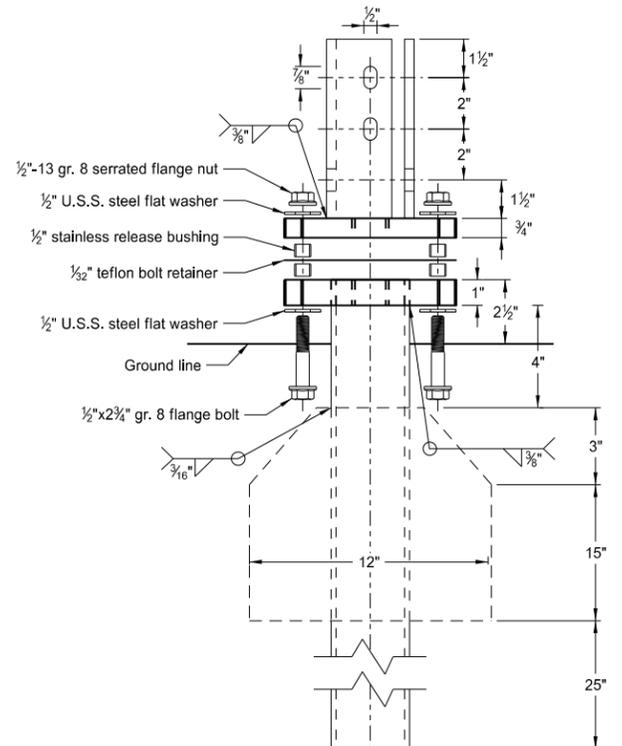


Typical Protection Vehicle

- Notes:
1. The working vehicle shall display a 360 degree rotating, flashing, oscillating or strobe light.
 2. The shadow vehicle shall display a 360 degree rotating, flashing, oscillating or strobe light. The shadow vehicle for Multilane Roadway shall also have a sequencing arrow panel Type C operated in the chevron mode.
 3. This application is for use during daylight hours and in areas of good visibility only.
 4. Two lane, two way roadway, a flagger shall be used to protect the work area and warn oncoming traffic.

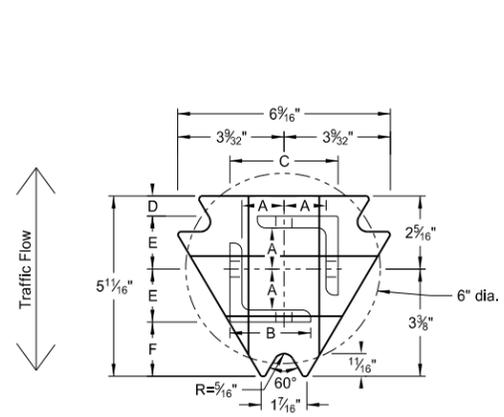
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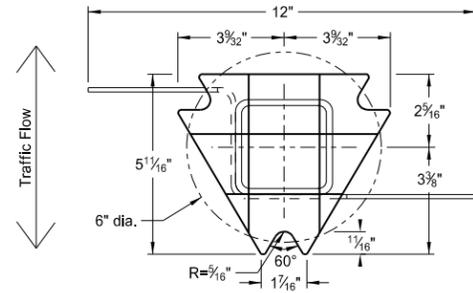


Multi-Directional Slip Base Assembly

Perforated Tube



Top Post Receiver
Plate - ASTM A572 grade 50
Angle Receiver - 2 1/2" x 2 1/2" x 3/8" 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

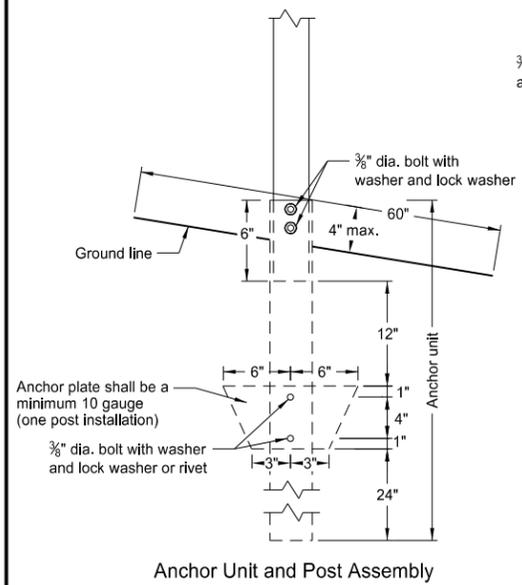
Notes:

1. Slip base bolts shall be torqued as specified by the manufacturer.
2. Anchor shall have a yield strength of 43.9 KSI and tensile strength of 59.3 KSI.
3. The 4" vertical clearance is required for the anchor or breakaway base. The 4"x60" measurement shall be made above and below post location and also back and ahead of the post.
4. When used in concrete sidewalk, anchor shall be same except without the wings.
5. Four post signs shall have over 7' between the first and the fourth posts.

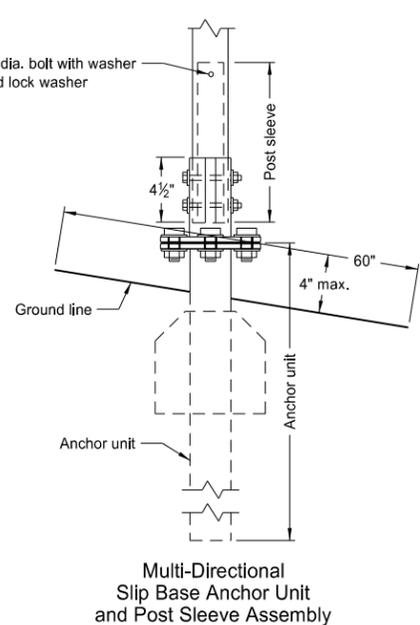
Telescoping Perforated Tube						
Number of Posts	Post Size in.	Wall Thickness Gauge	Sleeve Size in.	Wall Thickness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			(A)	3
1	2 1/2	10			Yes	
1	2 1/4	12	2	12	Yes	
1	2 1/2	12	2 1/4	12	Yes	
2	2	12			No	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

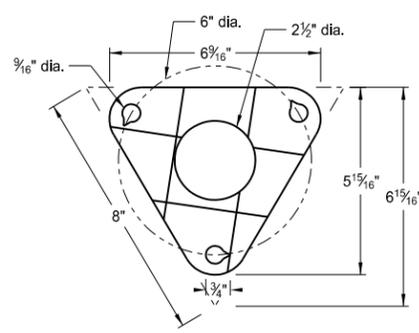
Top Post Receiver Data Table						
Square Post Sizes (B)	A	B	C	D	E	F
2 3/16" x 10 ga.	1 9/64"	2 1/2"	3 1/32"	2 5/32"	1 33/64"	1 1/8"
2 1/2" x 10 ga.	1 9/32"	2 1/2"	3 5/16"	5/8"	1 21/32"	1 3/4"



Anchor Unit and Post Assembly



Multi-Directional Slip Base Anchor Unit and Post Sleeve Assembly



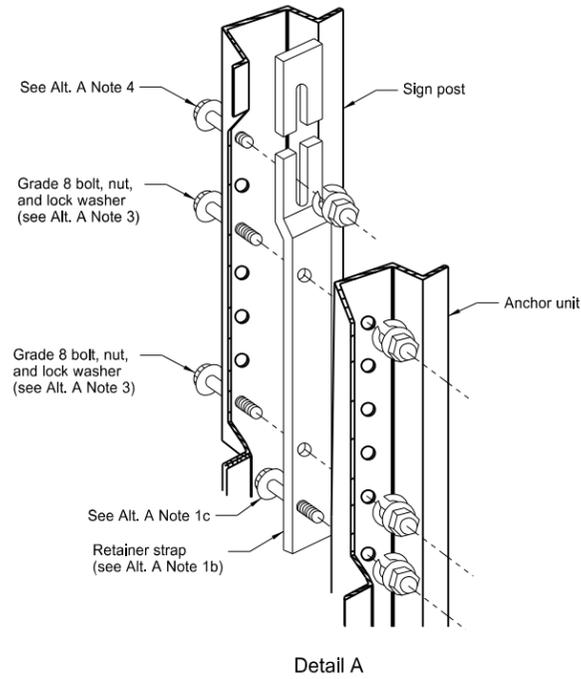
Bolt Retainer for Base Connection
Bolt Retainer - 1/32" Reprocessed Teflon

- (A) The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak.
(B) The 2 3/16" x 10 ga. may be inserted into 2 1/2" x 10 ga. for additional wind load.

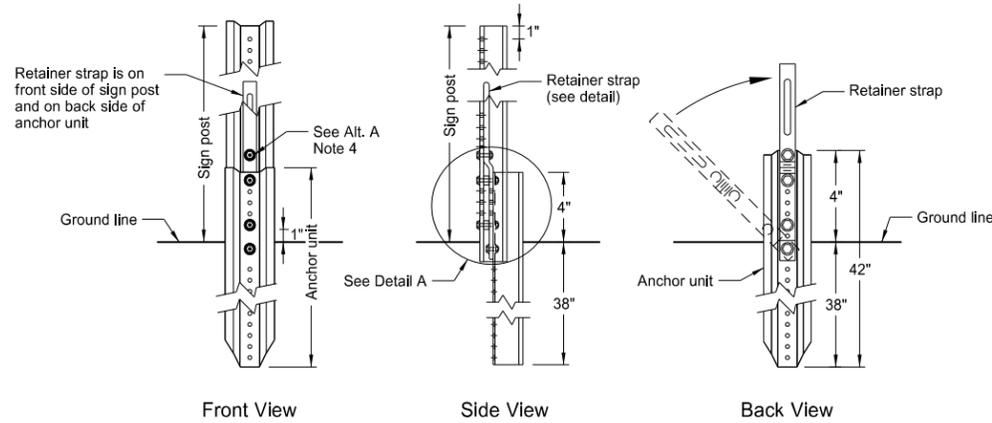
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE

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U-Channel Post



Detail A



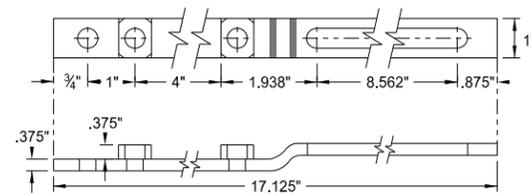
Front View

Side View

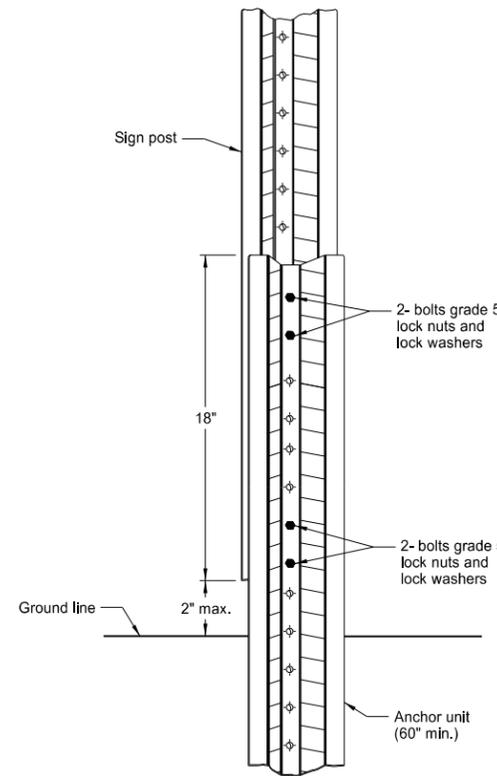
Back View

Breakaway U-Channel Detail Alternate A

A maximum of 2 posts shall be installed within 7'.

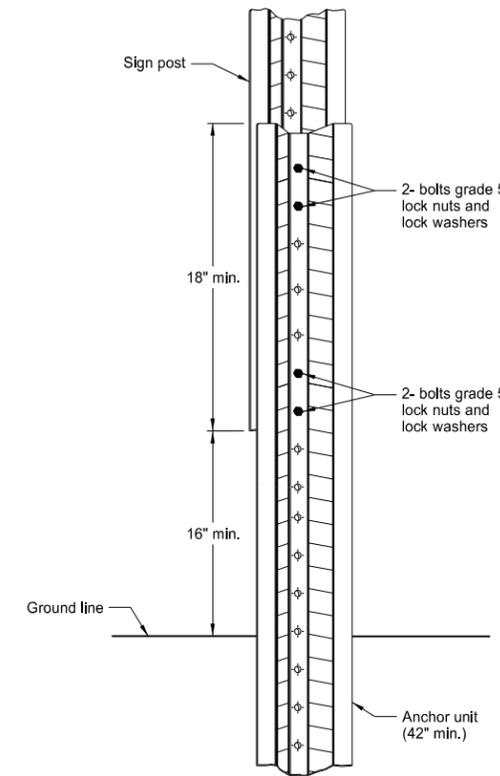


Retainer Strap Detail



Breakaway U-Channel Splice Detail Alternate B (2.5 and 3 lb/ft)

A maximum of 3 posts shall be installed within 7'.



Breakaway U-Channel Splice Detail Alternate C (2.5 and 3 lb/ft)

A maximum of 3 posts shall be installed within 7'.

Alternate A Steps of Installation:

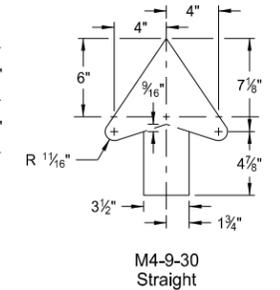
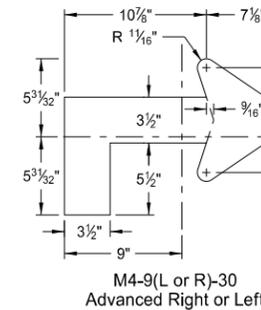
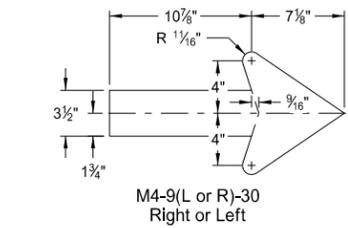
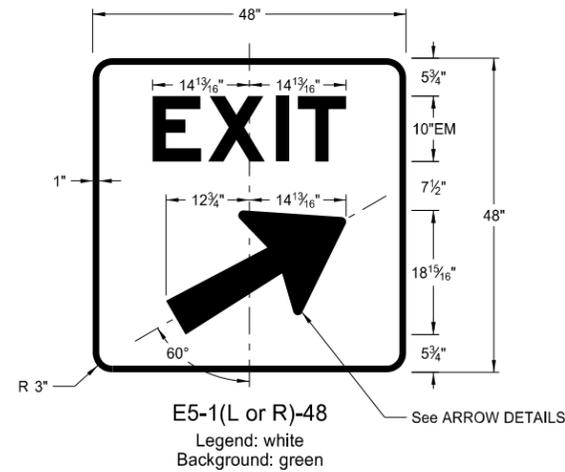
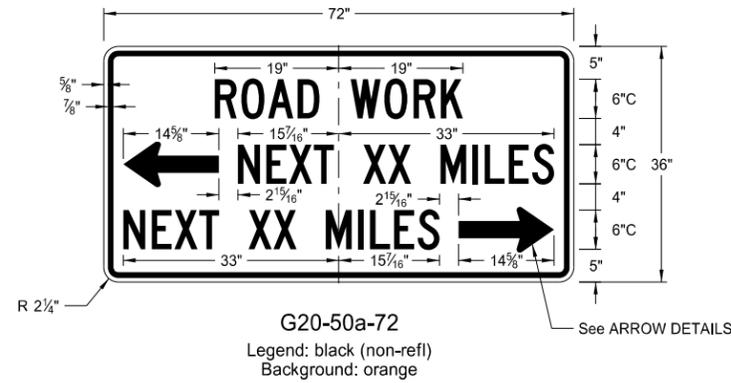
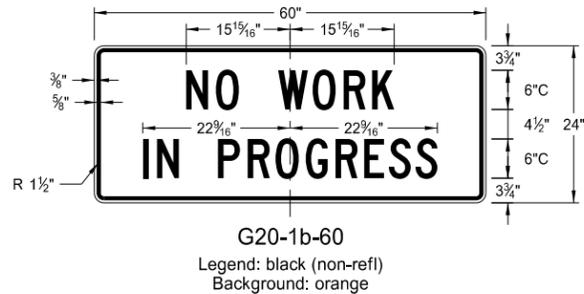
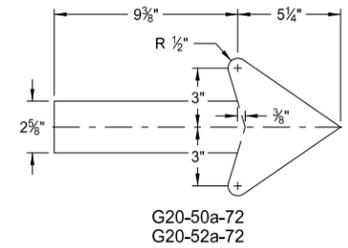
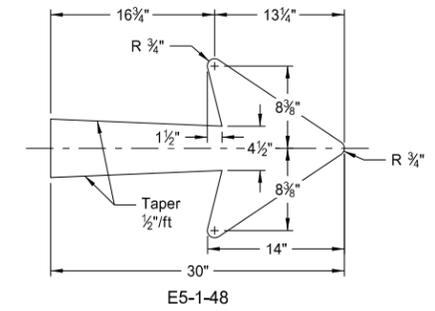
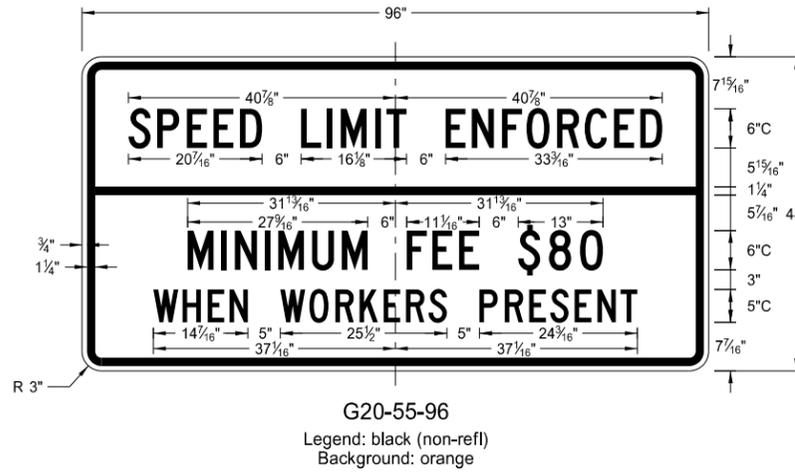
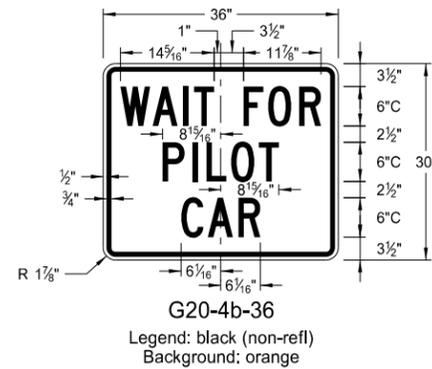
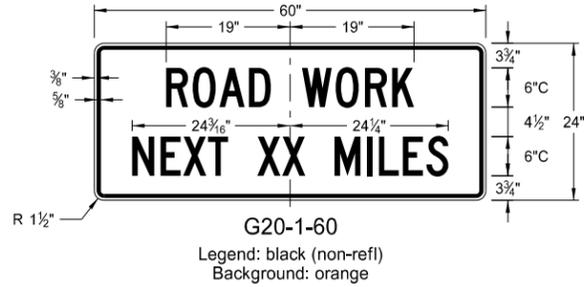
1. a) Drive anchor unit to within 12" of ground level.
b) Proper assembly established by lining up the bottom hole of retainer strap with the 6th hole from the top of the anchor unit.
c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
d) Rotate strap 90° to left.
2. a) Drive anchor unit to 4" above ground.
b) Rotate strap to vertical position.
3. 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.
4. Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
5. The base post, strap and sign post shall be properly nested. 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.

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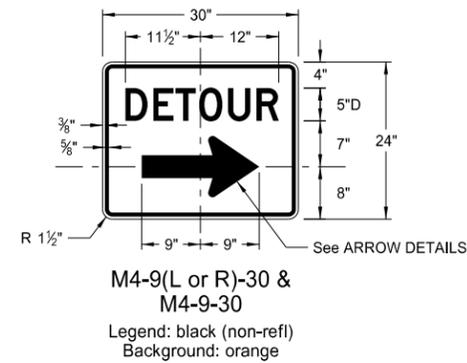
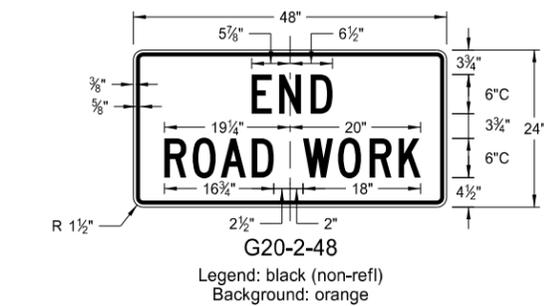
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CONSTRUCTION SIGN DETAILS
 TERMINAL AND GUIDE SIGNS

D-704-9



ARROW DETAILS



NOTES:

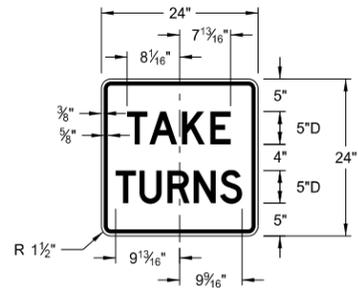
(A) Arrow may be right or left of the legend to indicate construction to the right or left.

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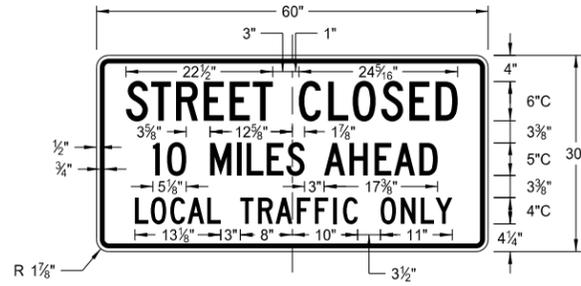
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS

D-704-10



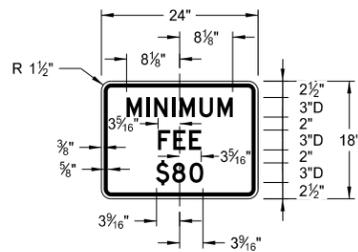
R1-50-24

Legend: black (non-refl)
Background: white



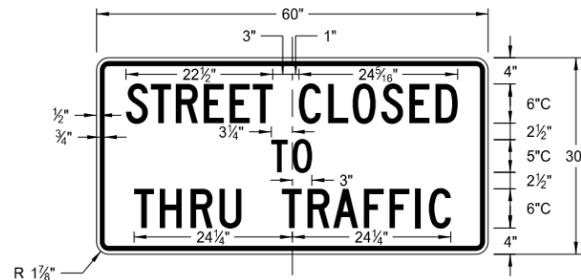
R11-3c-60

Legend: black (non-refl)
Background: white



R2-1a-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

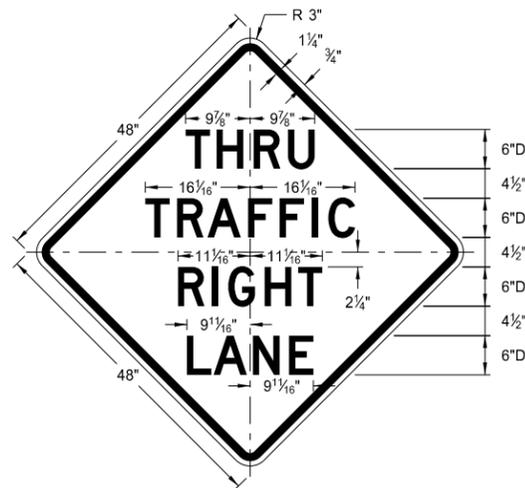
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8-13-13	
REVISIONS	
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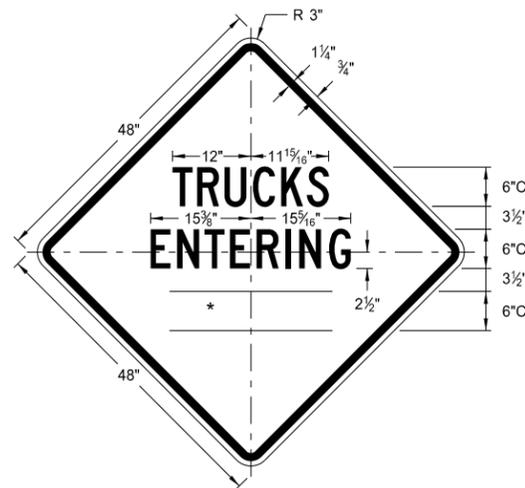
CONSTRUCTION SIGN DETAILS
WARNING SIGNS

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

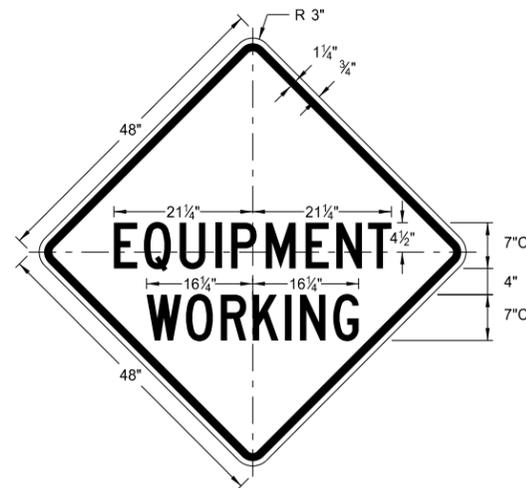
* DISTANCE MESSAGES



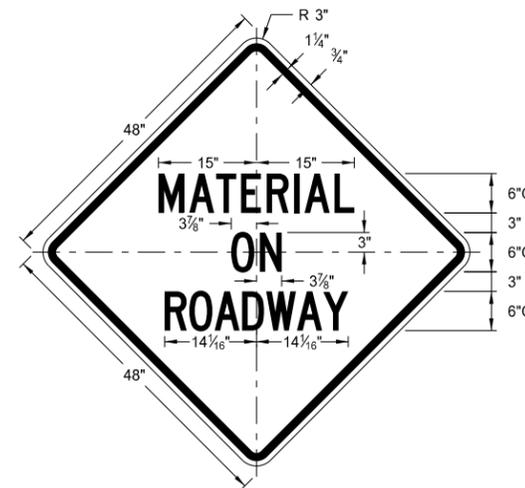
W5-8-48
Legend: black (non-refl)
Background: orange



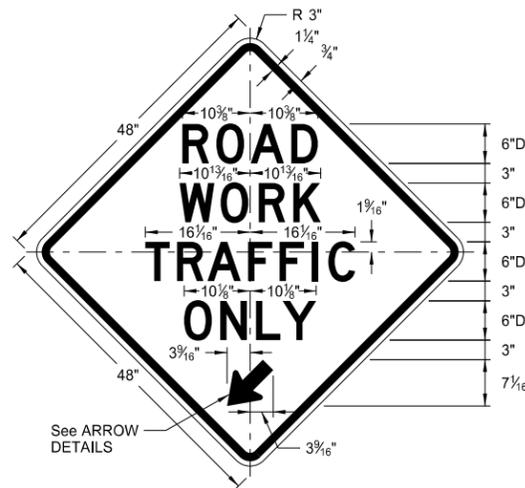
W8-54-48
Legend: black (non-refl)
Background: orange



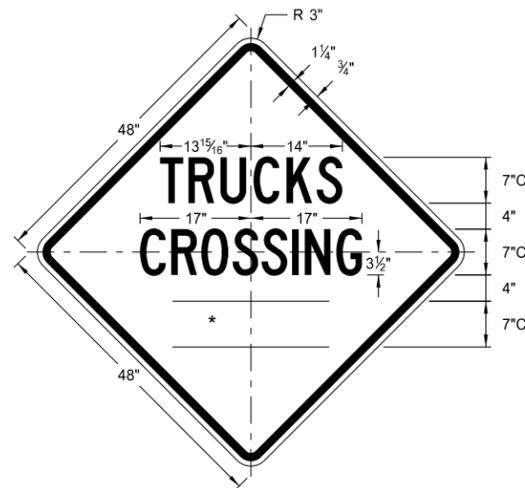
W20-51-48
Legend: black (non-refl)
Background: orange



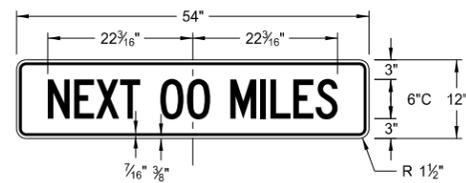
W21-51-48
Legend: black (non-refl)
Background: orange



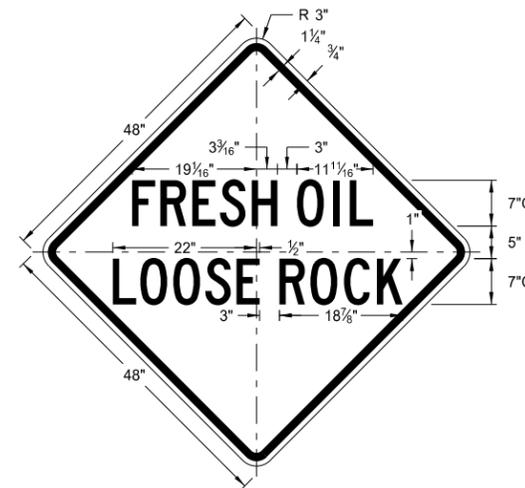
W5-9-48
Legend: black (non-refl)
Background: orange



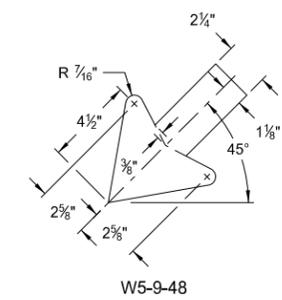
W8-55-48
Legend: black (non-refl)
Background: orange



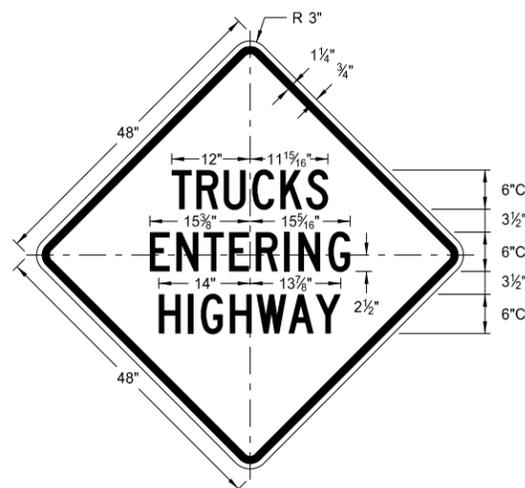
W20-52-54
Legend: black (non-refl)
Background: orange



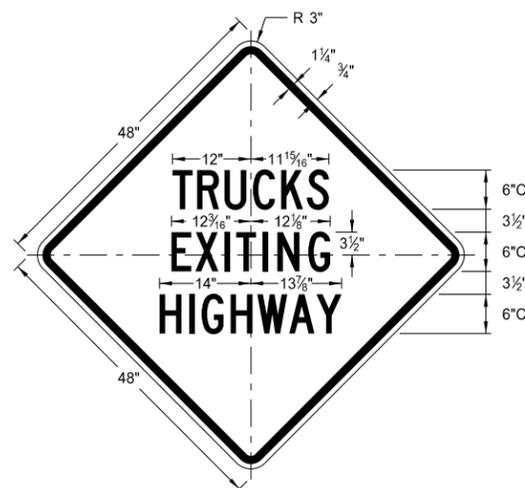
W22-8-48
Legend: black (non-refl)
Background: orange



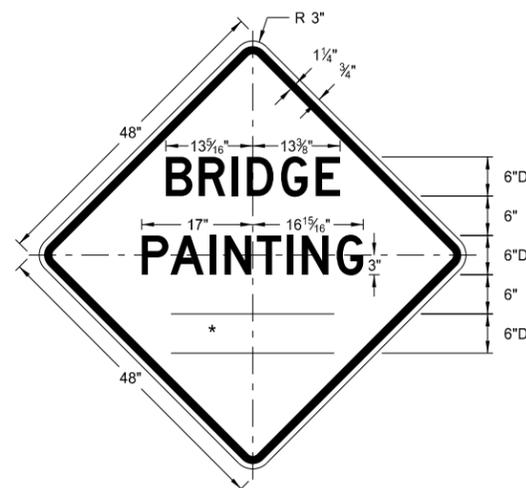
W5-9-48
ARROW DETAILS



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



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

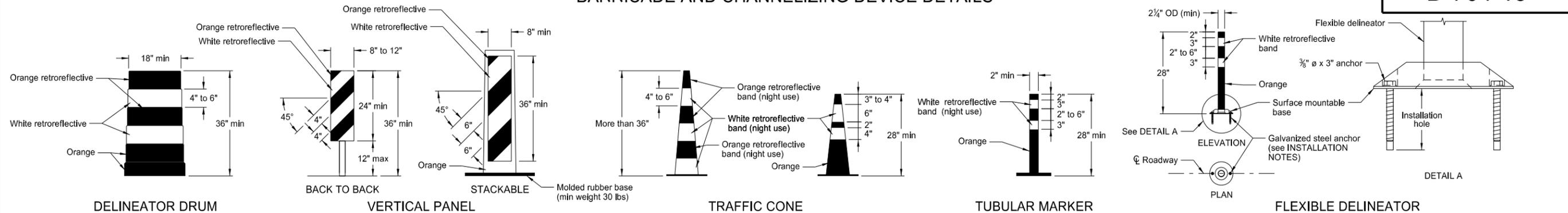


W21-50-48
Legend: black (non-refl)
Background: orange

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BARRICADE AND CHANNELIZING DEVICE DETAILS



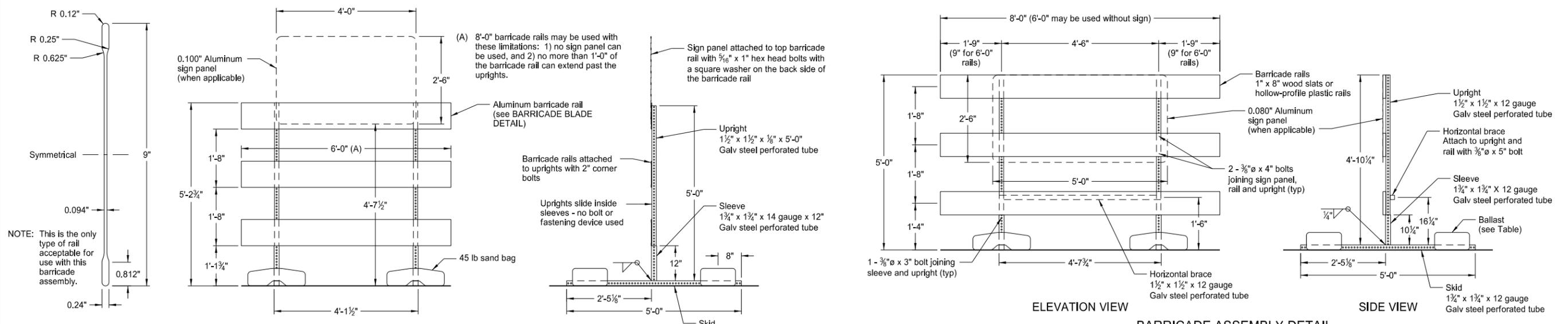
- INSTALLATION NOTES:**
1. Drill installation holes to diameter and depth as required by manufacturer's specifications.
 2. For removal, remove anchors and fill installation hole with an epoxy designed to bond to pavement surface.
 3. In lieu of bolted down base, the contractor may use an 8" x 8" butyl pad or hot melt butyl. Butyl shall be removed as close as possible to pavement surface.

The markings on drums shall be horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide. Each drum shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflectORIZED spaces between the horizontal orange and white stripes shall not exceed 3" wide. Stripes shall not be placed on ribs or indentations in the drum. Drums shall have closed tops that will not allow collection of construction debris or other debris. Ballast shall not be placed on the top of a drum.

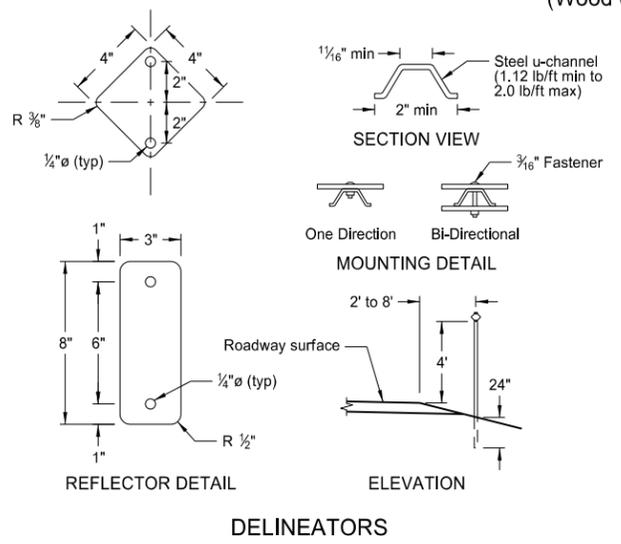
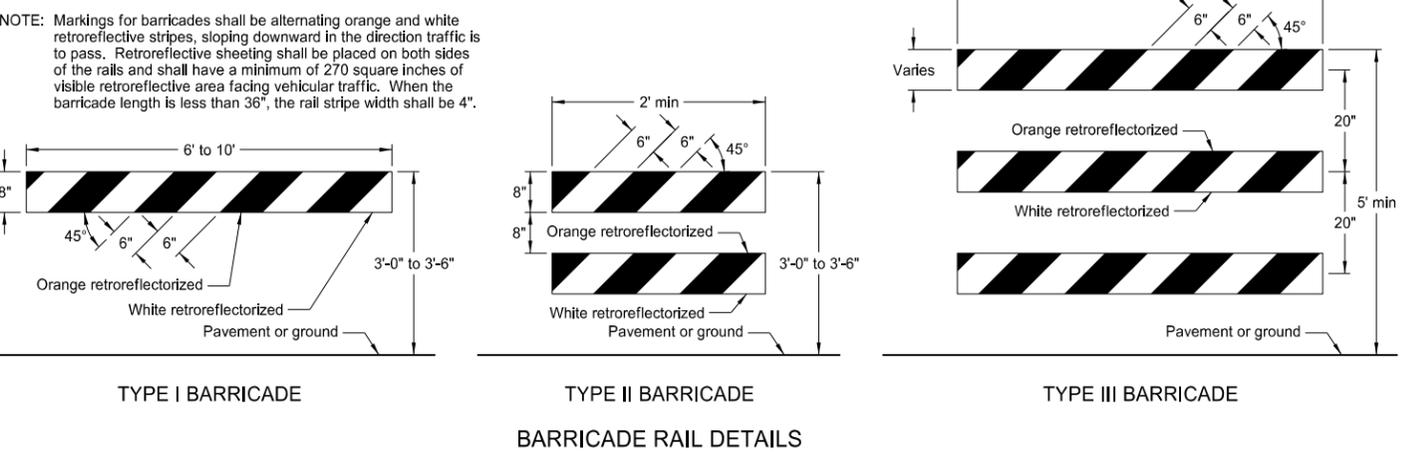
Markings for vertical panels shall be alternating orange and white retroreflective stripes, sloping downward in the direction vehicular traffic is to pass. Retroreflective sheeting shall be placed on both sides of panel and shall have a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective material on the vertical panel is 36 inches or more, a stripe width of 6 inches shall be used.

RetroreflectORIZATION of cones more than 36" in height shall be provided by alternating orange and white retroreflective stripes. Each cone shall have a minimum of two orange and two white stripes with the top stripe being orange. Any nonretroreflectORIZED space between the orange and white stripes shall not exceed 3" wide.

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



NOTE: Markings for barricades shall be alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Retroreflective sheeting shall be placed on both sides of the rails and shall have a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the barricade length is less than 36", the rail stripe width shall be 4".



MINIMUM BALLAST
 (For each side of barricade support)

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

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

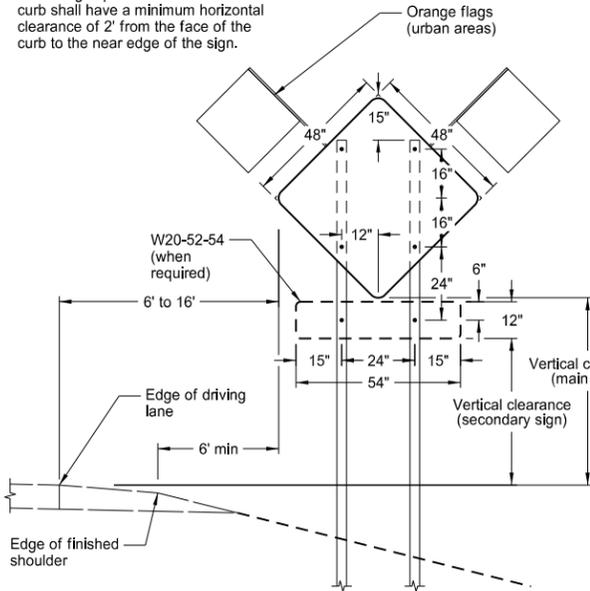
NORTH DAKOTA
 DEPARTMENT OF TRANSPORTATION
 10-3-13
 REVISIONS

DATE	CHANGE

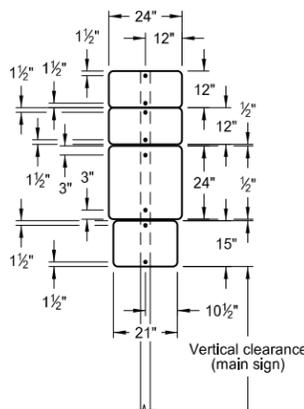
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CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

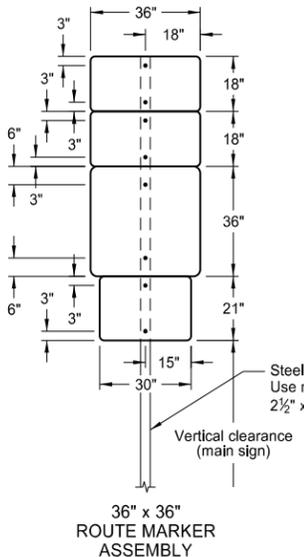
Note: Signs placed in sections with curb shall have a minimum horizontal clearance of 2' from the face of the curb to the near edge of the sign.



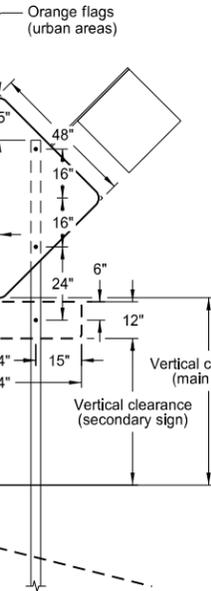
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



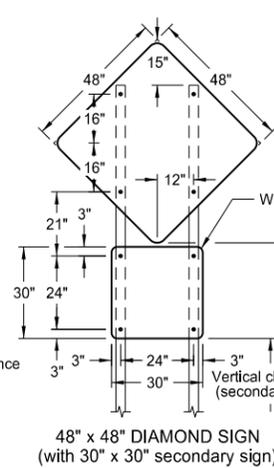
24" x 24" ROUTE MARKER ASSEMBLY



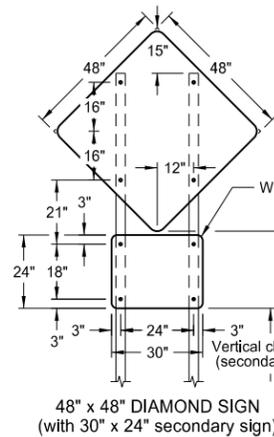
36" x 36" ROUTE MARKER ASSEMBLY



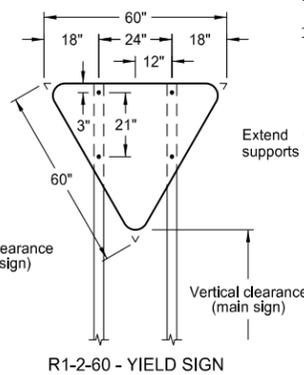
18" x 18" DIAMOND SIGN



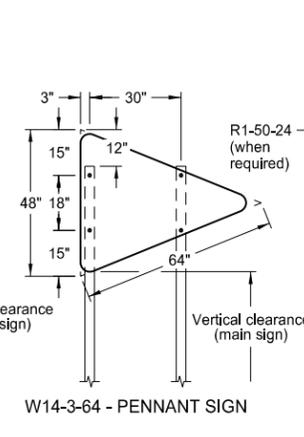
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



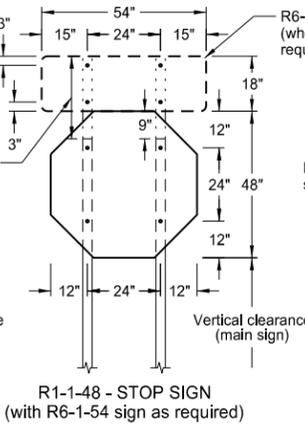
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



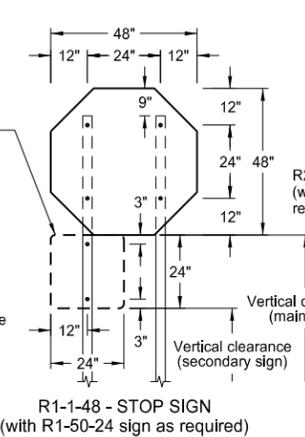
R1-2-60 - YIELD SIGN



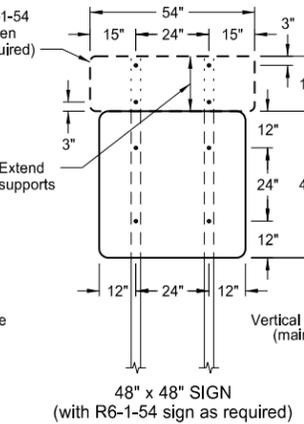
W14-3-64 - PENNANT SIGN



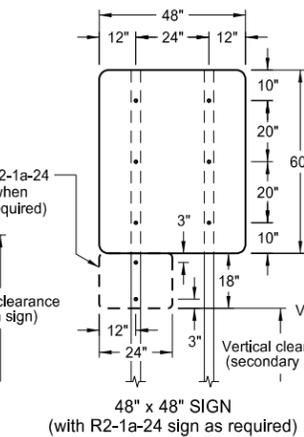
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



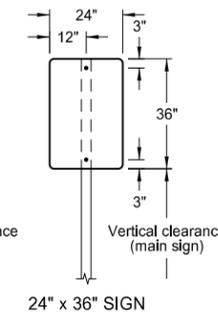
R1-1-48 - STOP SIGN
(with R1-50-24 sign as required)



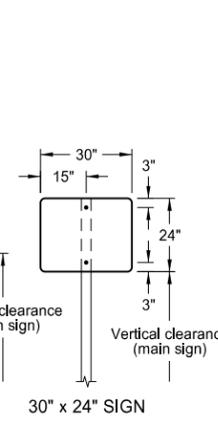
48" x 48" SIGN
(with R6-1-54 sign as required)



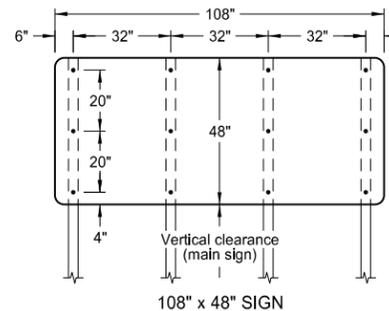
48" x 48" SIGN
(with R2-1a-24 sign as required)



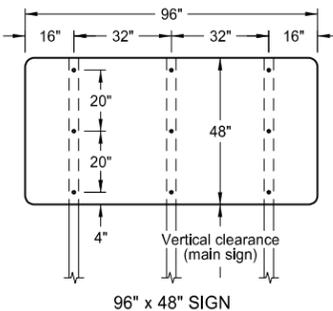
24" x 36" SIGN



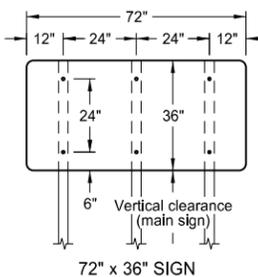
30" x 24" SIGN



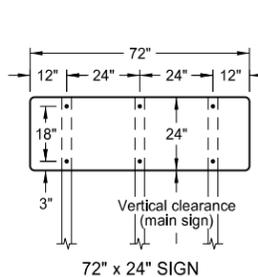
108" x 48" SIGN



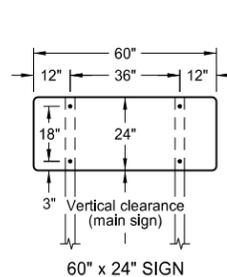
96" x 48" SIGN



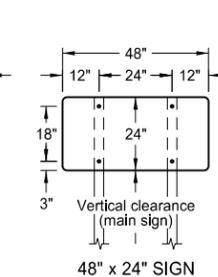
72" x 36" SIGN



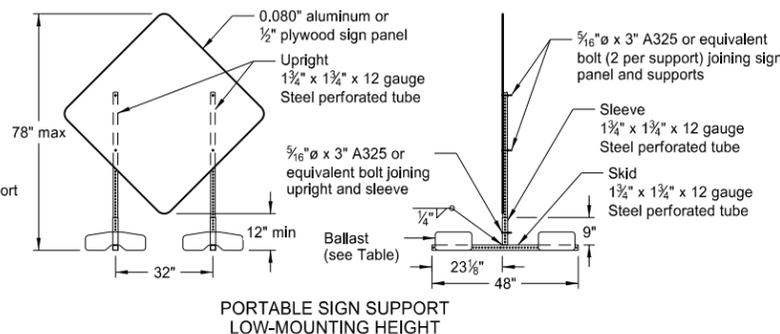
72" x 24" SIGN



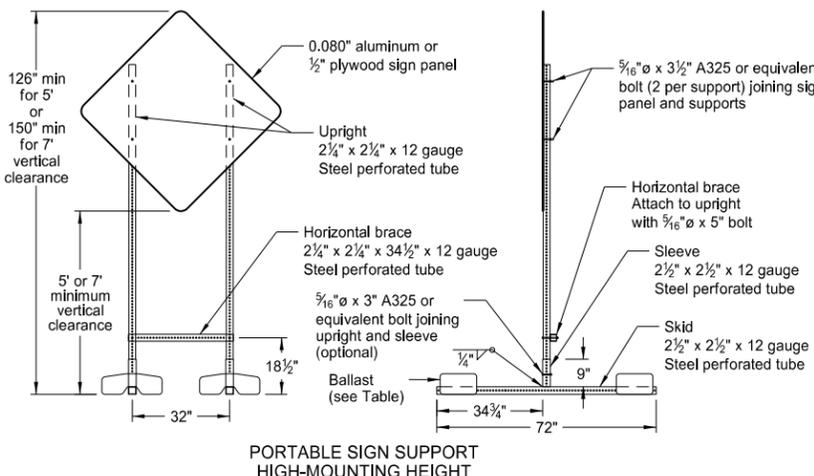
60" x 24" SIGN



48" x 24" SIGN



PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

1. Sign Supports: Supports shall be galvanized or painted. 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, the minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes are based on a wind speed of 55 MPH.

Signs over 50 square feet should be installed on 2 1/2" x 2 1/2" perforated tube supports as a minimum.

Guy wires shall not be attached to sign supports. Wind beams may be attached to u-posts behind the sign panels.

2. Sign Panels: Provide sign panels made of 0.100" aluminum, 1/2" plywood, or other approved material, except where noted. All holes to be punched round for 3/8" bolts.

3. Alternate Messages: The signs that have alternate messages may have these alternate messages placed on a reflectorized plate (without a border) and installed and removed as required. (i.e. "Left" and "Right" message on a 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 as stated above.

Large signs having an area exceeding 50 square feet shall have a minimum clearance of 7'-0" from the ground at the post.

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

When portable signs are used for 5 days or less, low-mounting height (minimum 12" vertical clearance) sign supports may be used 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. The R9-8 through R9-11a series, W1-5 through W1-8 series, M4-10, and E5-1 may be used for longer than 5 days.

Signs mounted to the portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT Details shall have a maximum surface area of 16 square feet.

MINIMUM BALLAST
(For each side of sign support base)

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

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-4-13	
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DATE	CHANGE
11-14-13	Revised Note 6.

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ROAD CLOSURE LAYOUTS

Notes

- Variables
 - S = Numerical value of speed limit or 85th percentile.
 - W = The width of taper.
 - L = Minimum length of taper, or $S \times W$ 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.
- Barricades placed on roadway shall be on a moveable assembly. Signs placed on roadway shall be placed on skid mounted assemblies.
- Delineator drums, barricades or cones used for tapering traffic shall be spaced at the dimension "S". Delineator drums or cones used for tangents shall be spaced at 2 times dimension "S".
- Sequencing Arrow Panels
 - Panels should normally be placed at the beginning of the taper. Where shoulder width does not provide sufficient room, the panel should be moved closer to the work area so that it can be placed on the roadway surface. See Shoulder Closure Standard Drawing.
 - Type A shall be used on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
 - Type B shall be used on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
 - Type C shall be used on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
- The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
- The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at $\frac{1}{2}$ B.
- Use when work area is 1 mile or longer.
- When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
- Existing speed limit signs within a reduced speed zone shall be covered.
- Where necessary, safe speed to be determined by the Engineer.
- The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications. G20-55-96 sign is not required if this standard is part of other traffic control layouts, or the work is less than 15 days.

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 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

KEY

	Type III barricade		Work area
	Sign		Flagger
	Delineator drum		Sequencing arrow panel
	Tubular markers		Vertical panels back to back

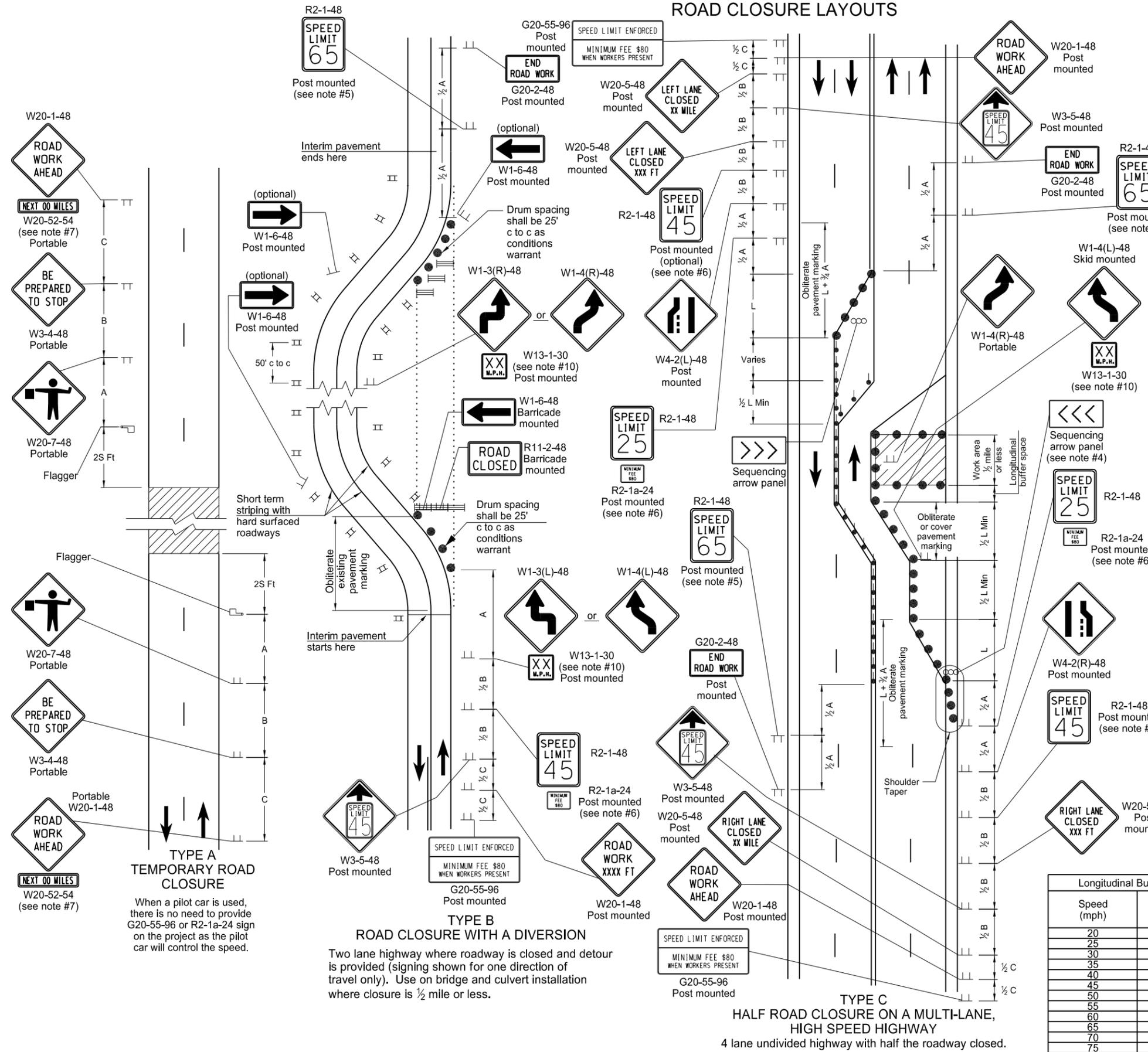
Longitudinal Buffer Space

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

NORTH DAKOTA
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9-27-13

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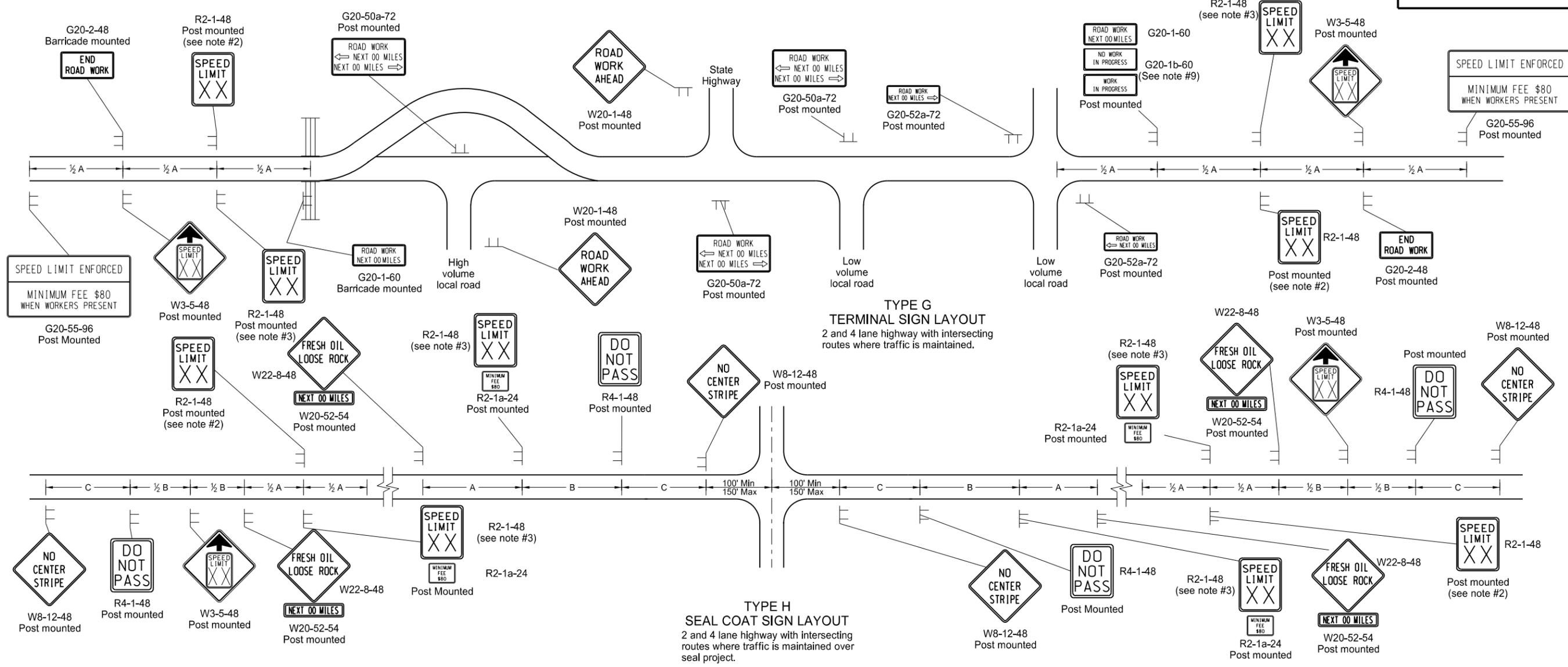
TYPE A TEMPORARY ROAD CLOSURE
When a pilot car is used, there is no need to provide G20-55-96 or R2-1a-24 sign on the project as the pilot car will control the speed.

TYPE B ROAD CLOSURE WITH A DIVERSION
Two lane highway where roadway is closed and detour is provided (signing shown for one direction of travel only). Use on bridge and culvert installation where closure is $\frac{1}{2}$ mile or less.

TYPE C HALF ROAD CLOSURE ON A MULTI-LANE, HIGH SPEED HIGHWAY
4 lane undivided highway with half the roadway closed.

TERMINAL AND SEAL COAT SIGN LAYOUTS

D-704-20



- Barricades placed on roadway shall be on a moveable assembly. Signs placed on the roadway shall be placed on skid mounted assemblies.
- The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
- The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 MPH below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 MPH. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at 1/2 B.
- When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
- Existing speed limit signs within a reduced speed zone shall be covered.
- On seal projects, signs R2-1-48, R2-1a-24, R4-1-48, W22-8-48 and W20-52-54 shall be placed just after all important intersections and at five mile intervals thereafter. Sign W8-12-48 shall be placed just after all important intersections and at 2 mile intervals thereafter until the short term center line pavement marking is in place. No short term pavement markings are placed when traffic volumes are 750 ADT or less.
- The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
- Type H construction sign traffic control shall have the speed limit signs covered or removed once the loose aggregate has been removed.
- The contractor shall install the G20-1b-60 sign when work is suspended for winter.
- Other traffic control layouts will be required in the immediate work areas. If the speed limit is reduced in the work area, speed limit signs shall have the R2-1a-24 sign placed below.
- G20-55-96 sign is not required if work is less than 15 days.

KEY

≡ Type III barricade

⊥ Sign

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 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

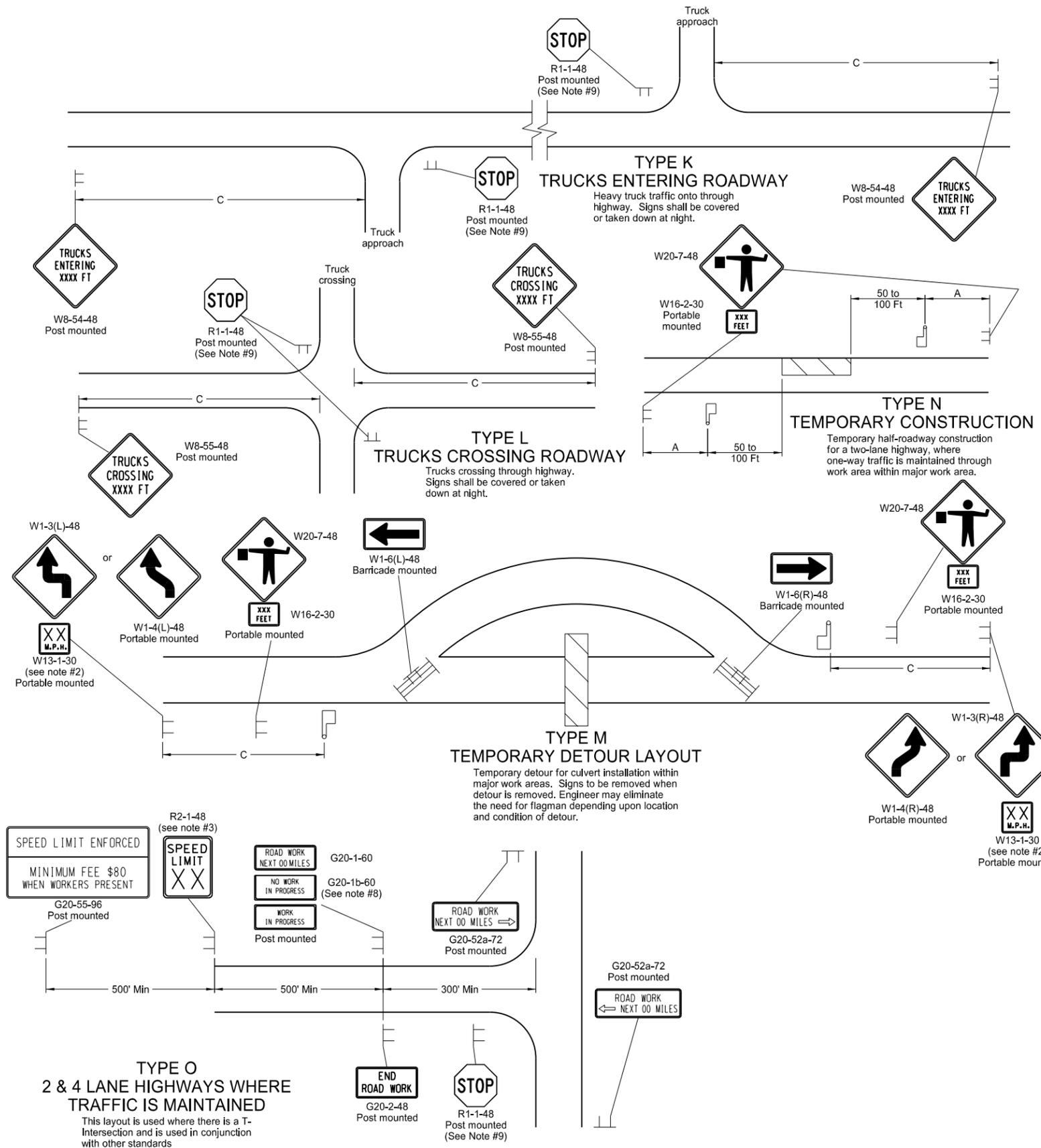
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9-27-13

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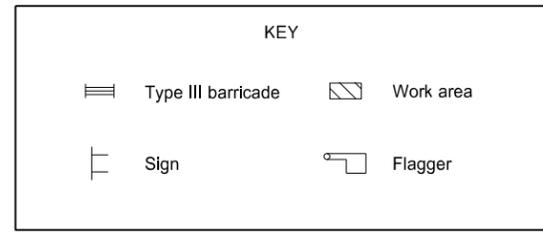
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CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

D-704-22



- Notes
- Barricades placed on roadway shall be on a moveable assembly. Signs placed on the roadway shall be placed on skid mounted assemblies. Where necessary, safe speed to be determined by the Engineer.
 - The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at 1/2 B.
 - When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
 - Existing speed limit signs within a reduced speed zone shall be covered. Obliterated or covered pavement marking shall be paid for as Obliteration of Pavement Marking. The covering shall be approved by the engineer.
 - The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
 - The contractor shall install the G20-1b-60 sign when work is suspended for winter.
 - If existing stop sign is in place, a 48" stop sign is not required.
 - G20-55-96 sign is not required if this standard is part of other traffic control layouts with this sign or the work is less than 15 days.



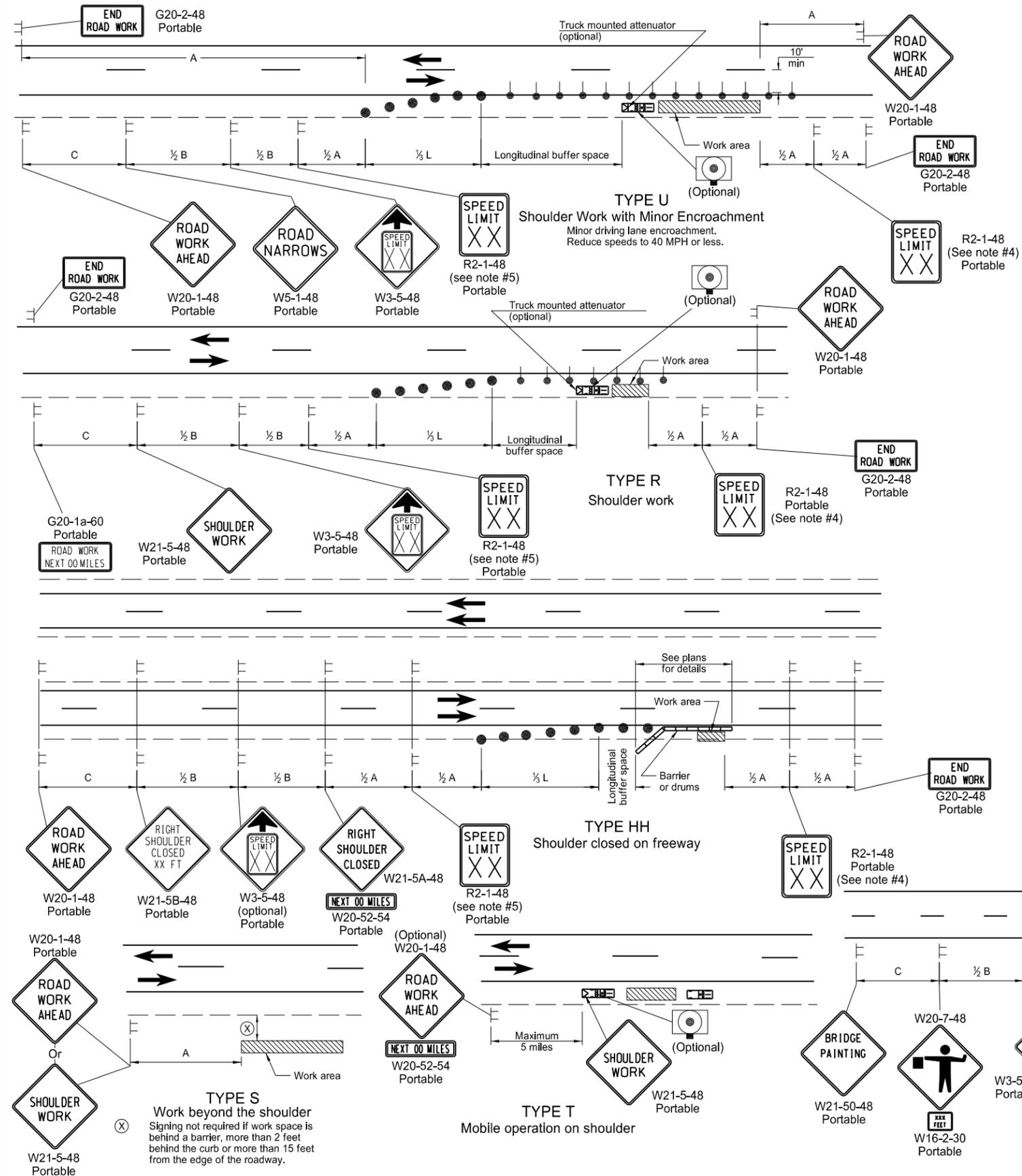
Road Type	ADVANCE WARNING SIGN SPACING		
	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

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SHOULDER CLOSURES AND BRIDGE PAINTING LAYOUTS

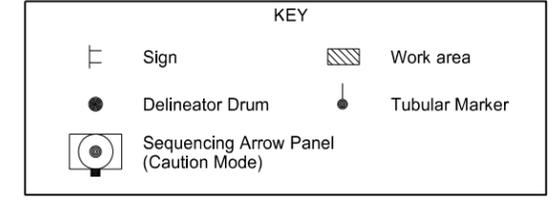
D-704-24



- Notes
- Variables
S = Numerical value of speed limit or 85th percentile.
W = The width of the taper.
L = Minimum length of taper, or $S \times W$ 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.
 - Delineator drums used for tapering traffic shall be spaced at dimension "S".
Delineator drums or tubular markers used for tangents shall be spaced at 2 times "S".
 - Sequencing Arrow Panels
Type A shall be used on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
Type B shall be used on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
Type C shall be used on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
 - The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
 - The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at $\frac{1}{2}B$.
 - When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
 - Existing speed limit signs within a reduced speed zone shall be covered.
 - The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.

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

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 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

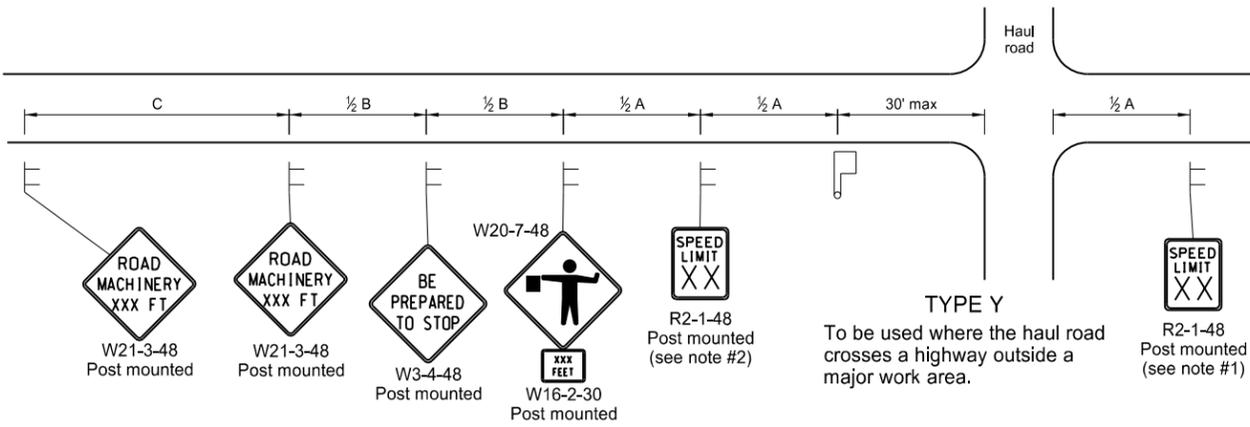


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9-27-13	
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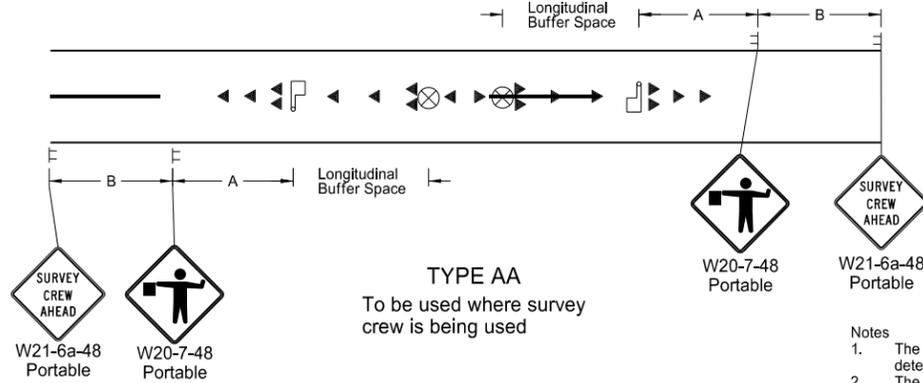
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MISCELLANEOUS SIGN LAYOUTS

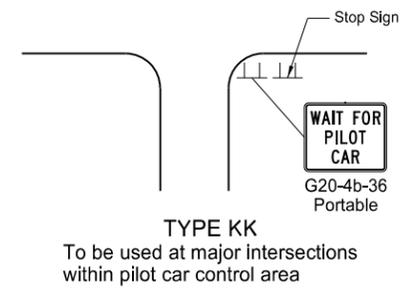
D-704-26



TYPE Y
To be used where the haul road crosses a highway outside a major work area.

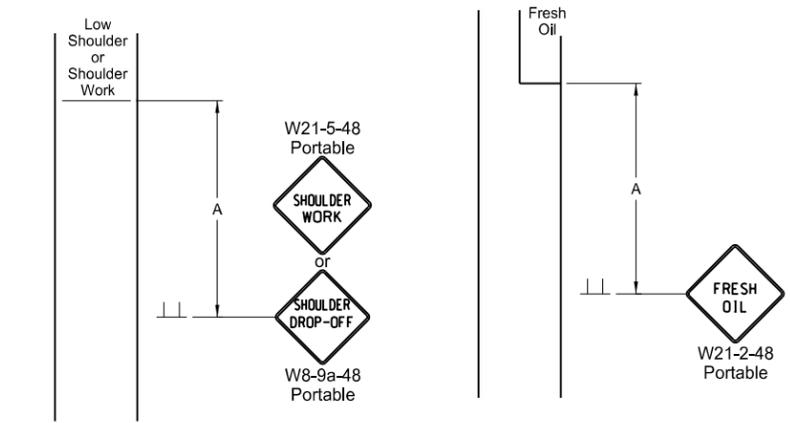


TYPE AA
To be used where survey crew is being used



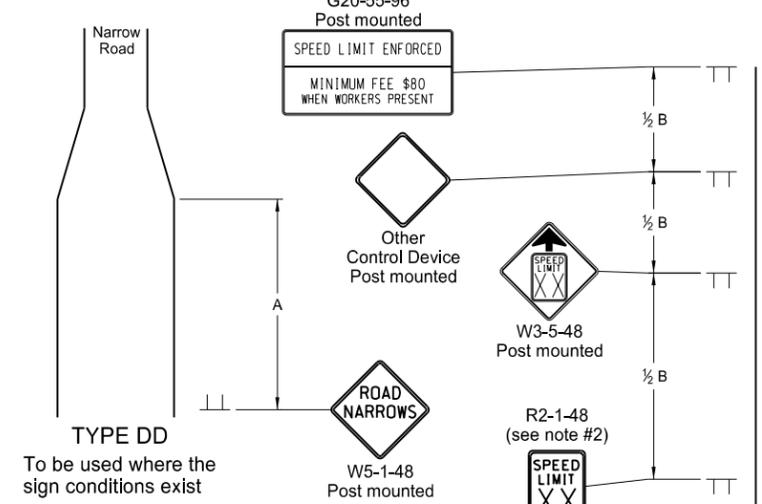
TYPE KK
To be used at major intersections within pilot car control area

- Notes
- The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions.
 - The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction should not exceed 10 mph below the existing speed limit, unless the design speed of the work zone feature has been reduced below the 10 mph. In this case, the speed limit reduction shall not exceed 30 MPH. Where speed limits are to be reduced more than 30 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 30 MPH. The second speed limit sign shall be placed at 1/2 B.
 - When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign. Rural areas will not require flags.
 - Existing speed limit signs within a reduced speed zone shall be covered.
 - The contractor has the option of using portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.
 - G20-55-96 signs are not required if this standard is part of other traffic control layouts, or the work is less than 15 days.
 - When a pilot car operation is used, place a G20-4b-36 "Wait For Pilot Car" sign at major intersections within pilot car control area.

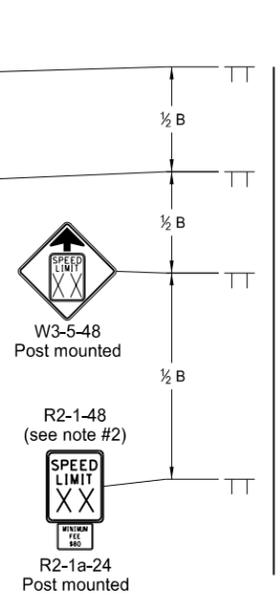


TYPE BB
To be used within a major work area where the sign conditions exist

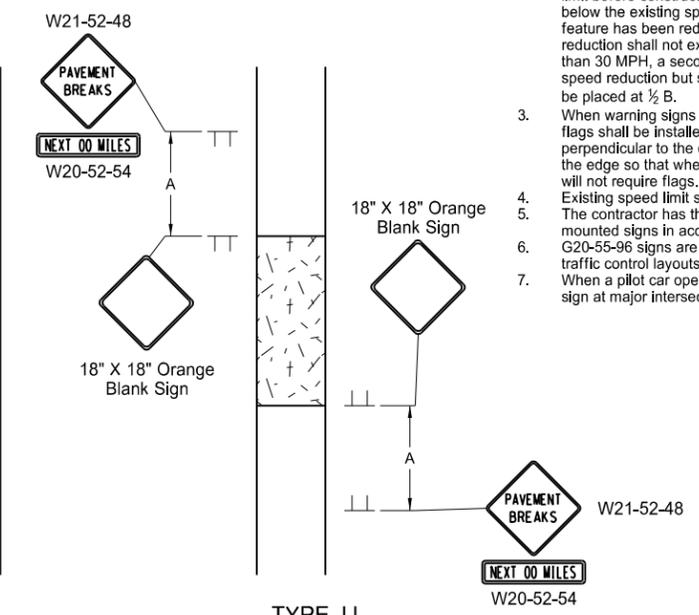
TYPE CC
To be used where the sign conditions exist



TYPE DD
To be used where the sign conditions exist



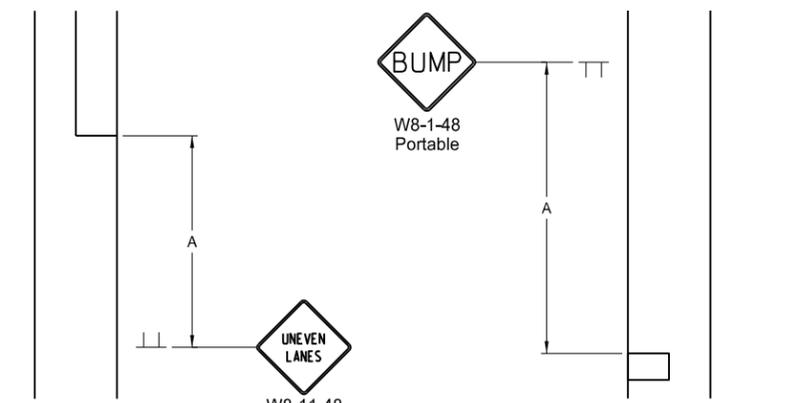
TYPE Z
To be used where speed zone is needed



TYPE JJ
To be used where there is a break in the pavement. These signs may be skid mounted or post mounted and shall be installed when conditions exist and removed when not applicable.

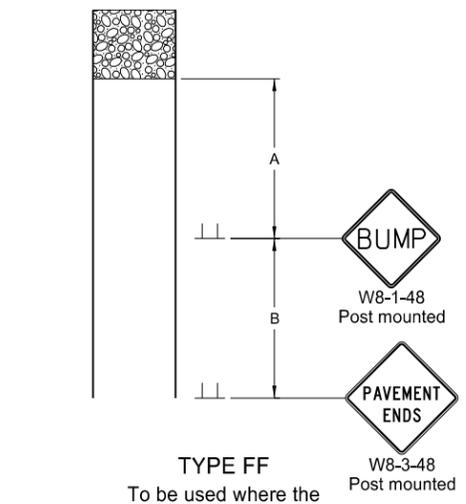
Longitudinal Buffer Space	
*Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

* Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.



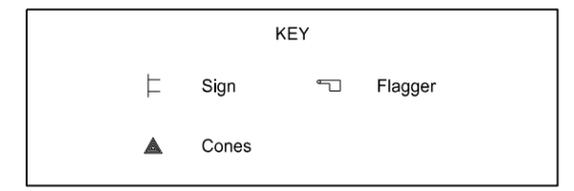
TYPE GG
To be used where a difference of elevation between lanes exist

TYPE EE
To be used where the sign conditions exist



TYPE FF
To be used where the sign conditions exist

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 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

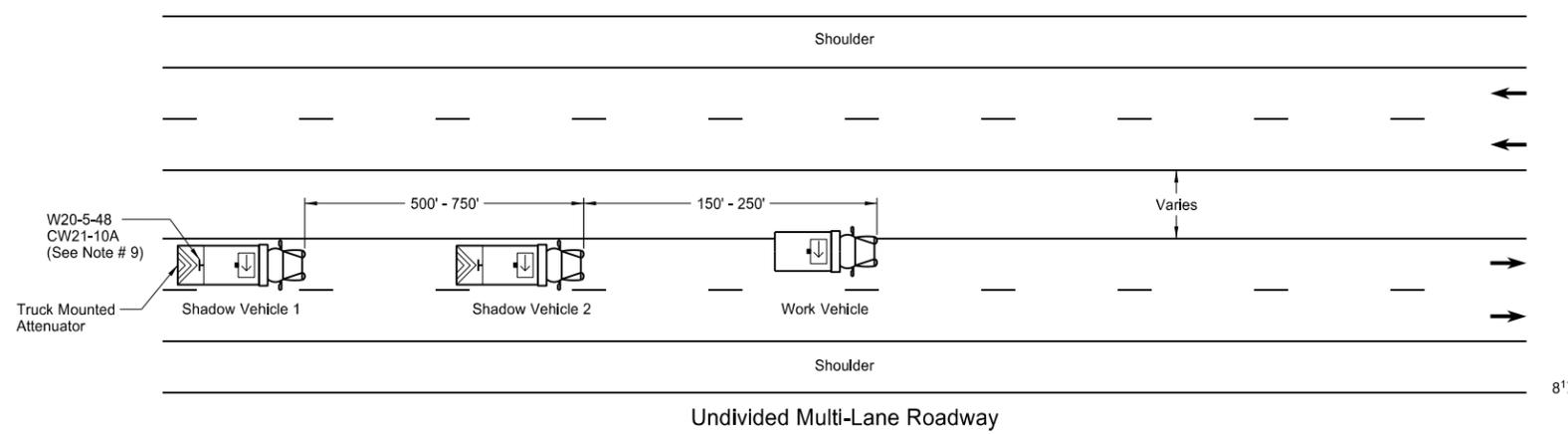
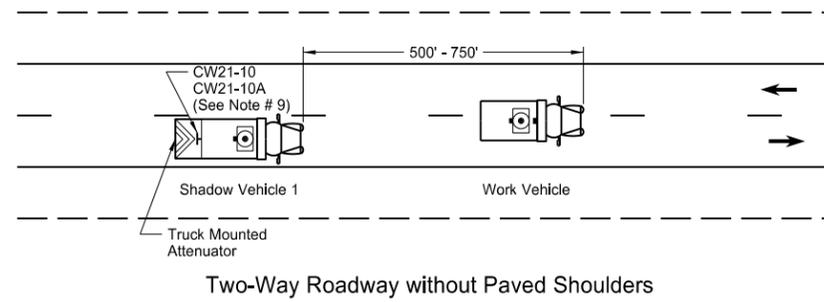
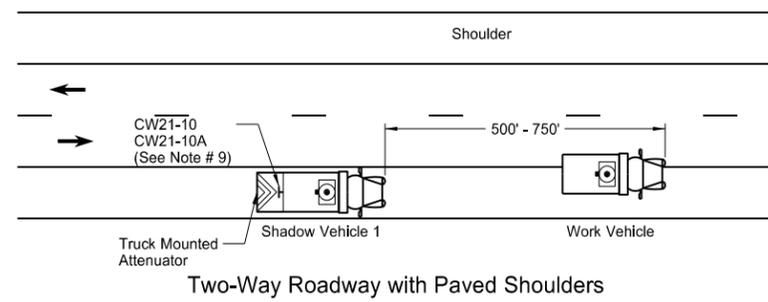
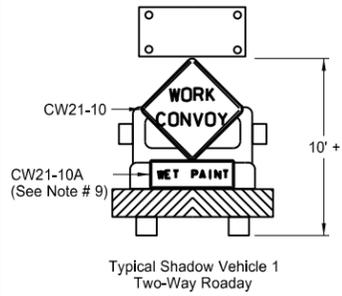


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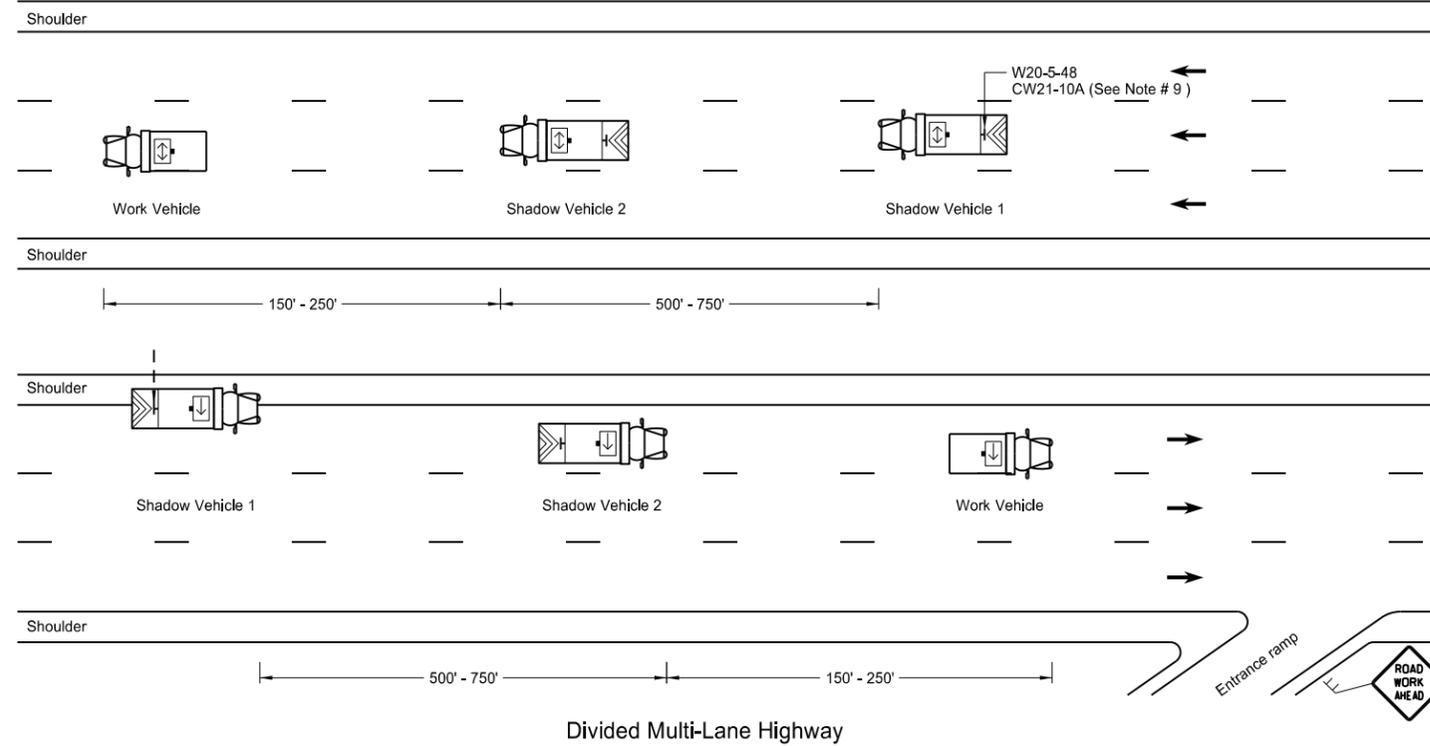
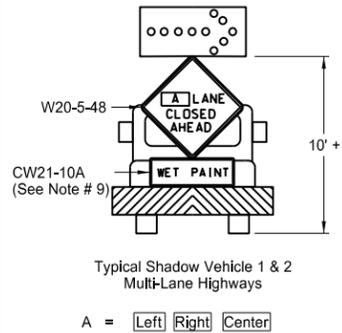
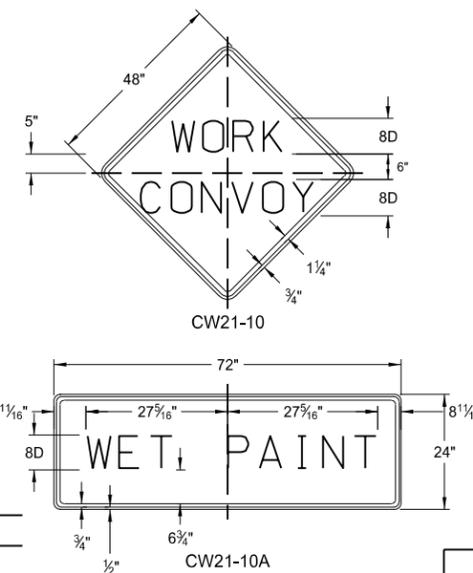
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TRAFFIC CONTROL PLAN FOR MOVING OPERATIONS

D-704-27



Sign Details



Notes

- If the contractor chooses to place more vehicles in the convoy than are shown, these vehicles shall have the truck mounted attenuator and shall be at the contractor's expense.
- Shadow and work vehicles shall display yellow rotating beacons or strobe lights unless otherwise stated elsewhere in the plans.
- Flashing arrow panels shall be Type B or Type C. The panel operation shall be controlled from inside the vehicle.
- Each vehicle shall have two-way electronic communication capability.
- When work convoys must change lanes, shadow vehicle 1 should change lanes first to shadow other convoy vehicles.
- Vehicle spacing between the shadow vehicle 1 and shadow vehicle 2 will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the trail vehicle in time to slow down and/or change lanes as they approach the shadow vehicle.
- Sign Colors
Letters = Black
Border = Black
Background = Orange
- Shadow vehicle 2 may be used as the paint tender vehicle.
- Sign CW21-10A shall only be used during a painting operation.
- On two lane - two way roadways, the work and shadow vehicles should pull over periodically to allow motor vehicle traffic to pass.

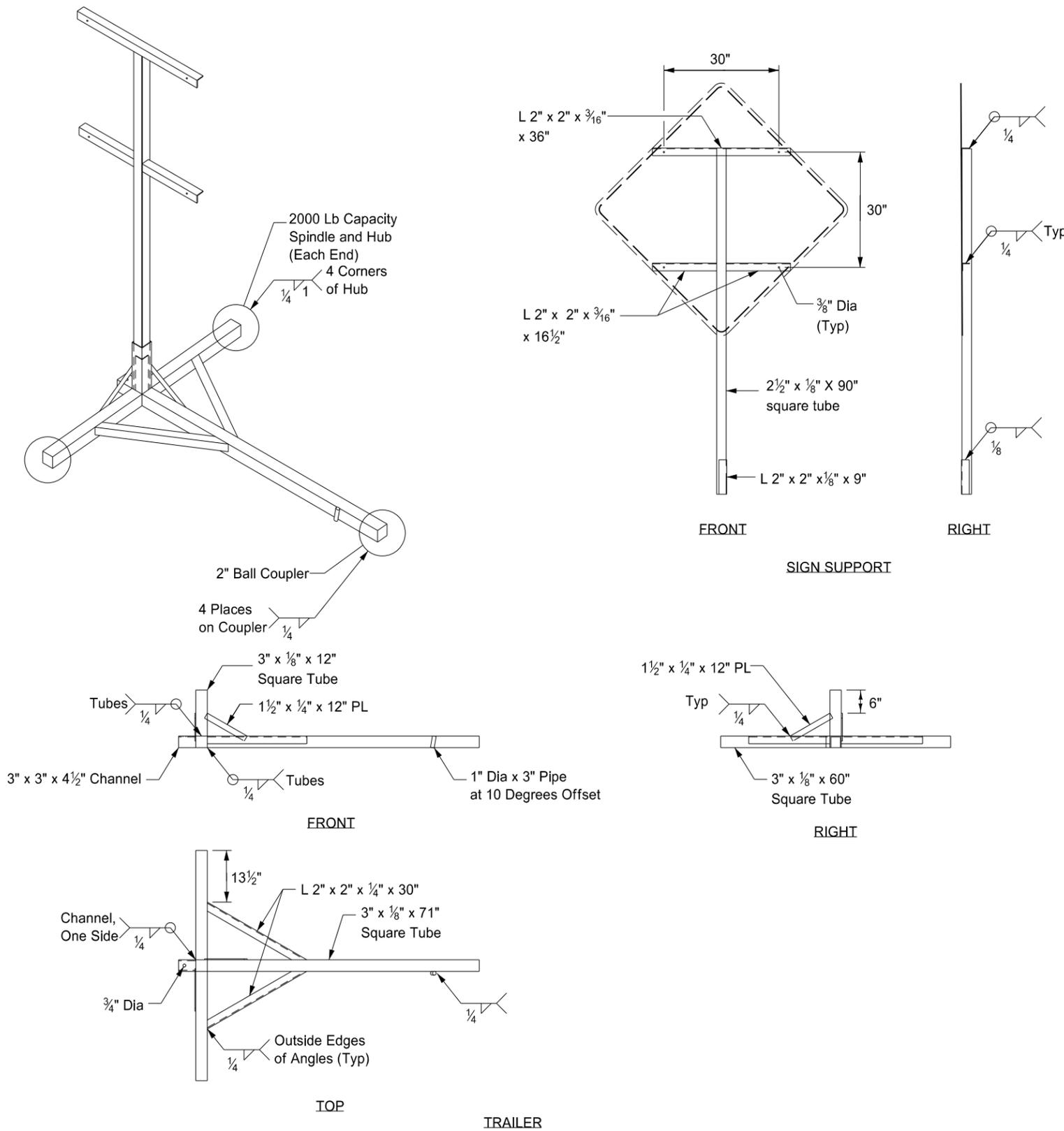
KEY	
	Sign
	Truck mounted attenuator
	Flashing arrow panels:
	Right directional
	Left directional
	Double arrow directional
	Caution Mode

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
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6-18-14	Removed shadow vehicle 2 on two lane roadways

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PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50



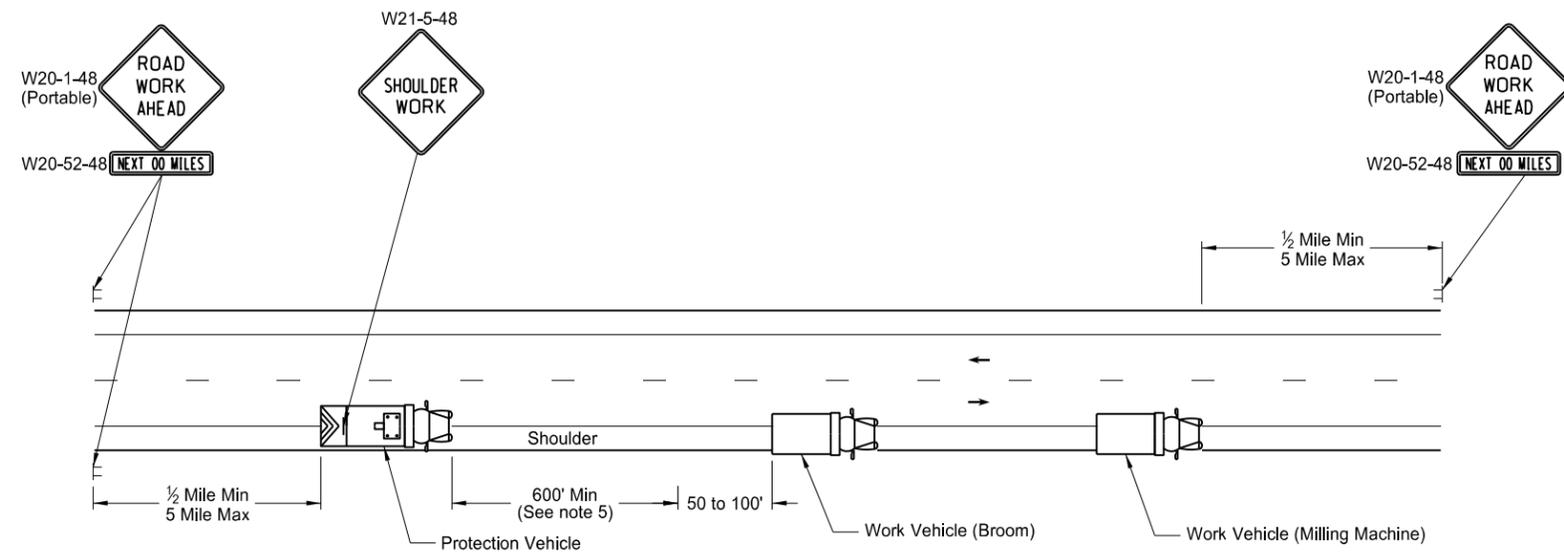
Notes:

- ① The maximum weight of the assembly is 250 pounds.
- ② Use a 14" wheel and tire.
- ③ Automotive and equipment axle assemblies may not be used for trailer-mounted sign supports.
- ④ Other NCHRP 350 crash tested assemblies are acceptable.

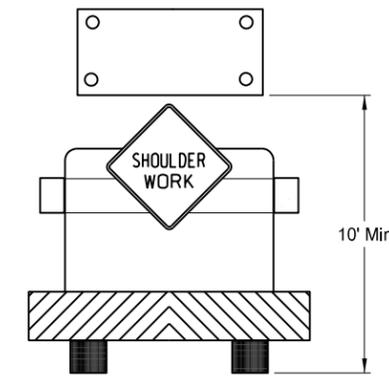
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MOBILE OPERATION
Grinding Shoulder Rumble Strips



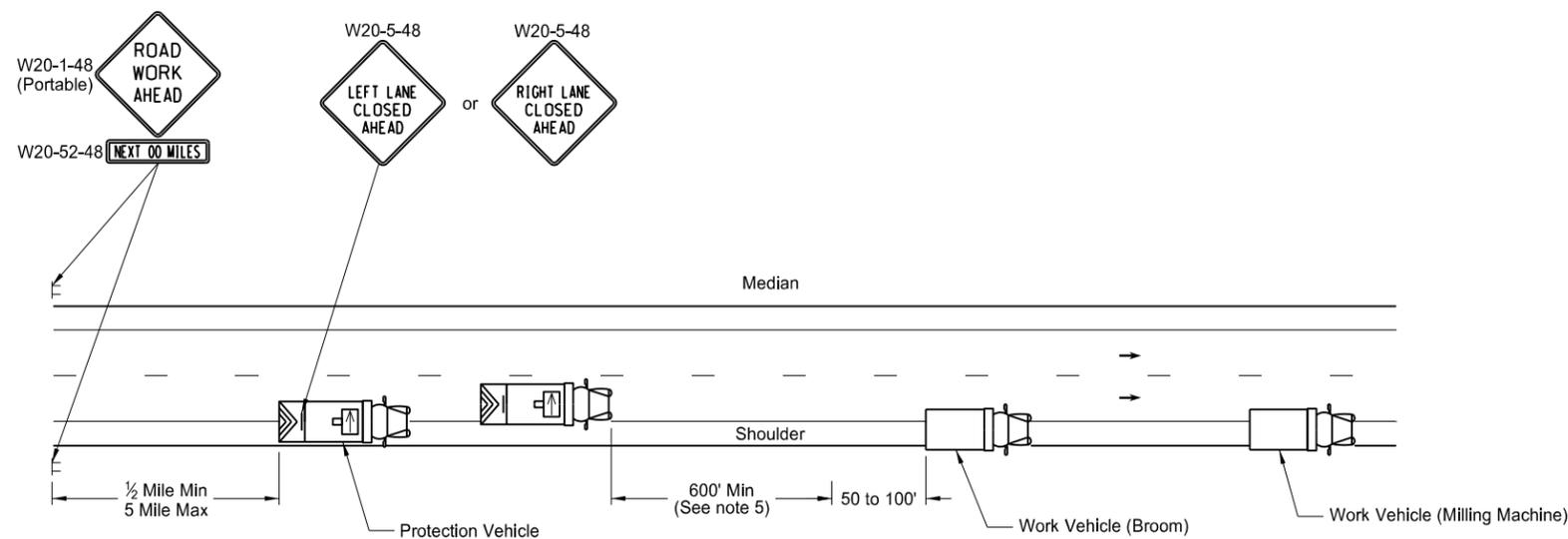
TWO LANE - TWO WAY ROADWAY



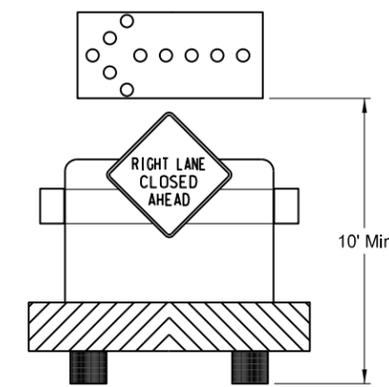
TWO LANE - TWO WAY ROADWAY
Typical Protection Vehicle with
Flashing Arrow Panel In Caution Mode

Notes:

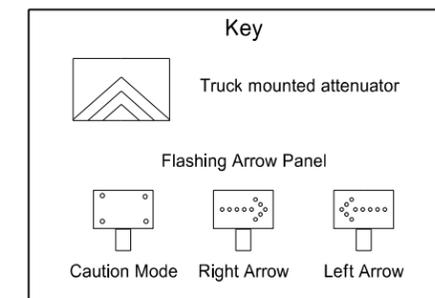
1. If the contractor chooses to place more vehicles in the convoy than are shown, these vehicles shall have the truck mounted attenuator and shall be at the contractors expense.
2. Vehicles shall have a rotating, flashing, oscillating or strobe lights.
3. Flashing arrow panels shall be Type B or Type C. The panel operation shall be controlled from inside the vehicle.
4. Each vehicle shall have two - way electronic communication capability.
5. Vehicle spacing between the protection vehicle and work vehicle will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the protection vehicle in time to slow down and safely pass the work vehicles.
6. ROAD WORK AHEAD SIGN: Advance Road Work Ahead signs shall be moved as the work area moves through the construction zone.
7. Next XX Miles sign required when the distance from Road Work Ahead sign to the work location is two miles or greater.



INTERSTATE & 4 LANE DIVIDED HIGHWAY



INTERSTATE & 4 LANE DIVIDED HIGHWAY
Typical Protection Vehicle with Flashing Arrow
Panel In Flashing Arrow Mode

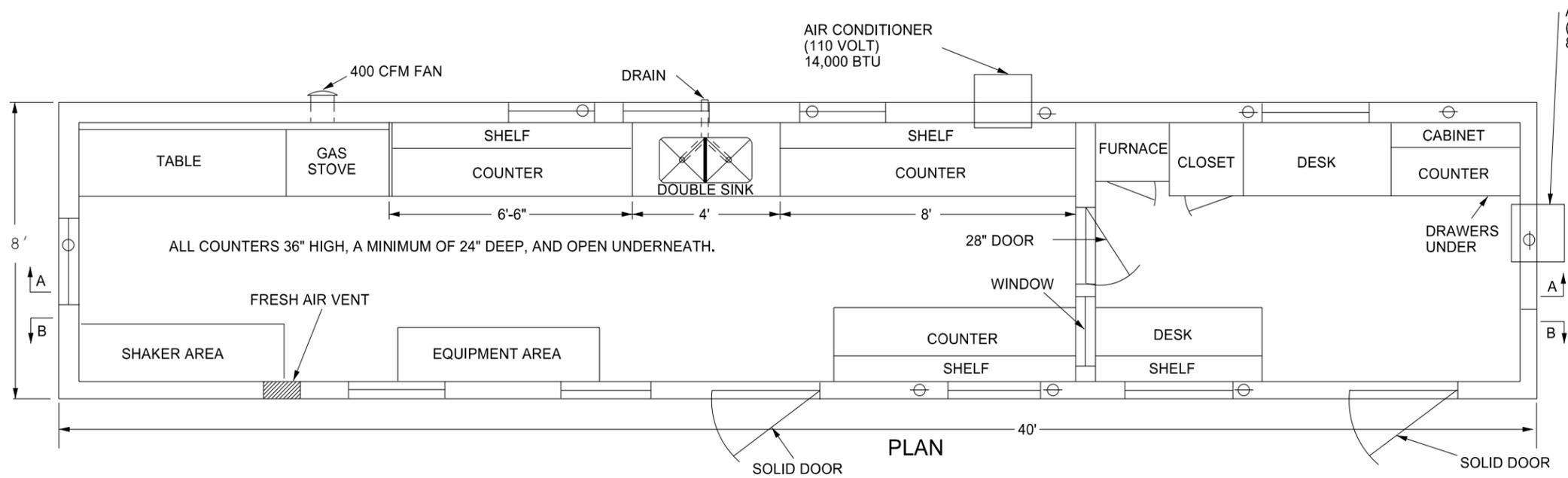


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-15-12	
REVISIONS	
DATE	CHANGE

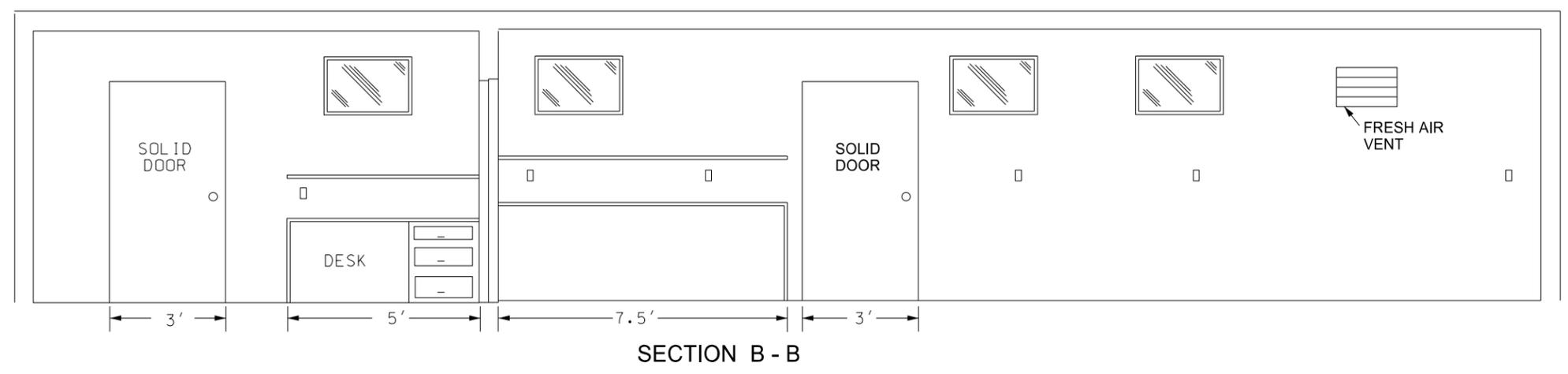
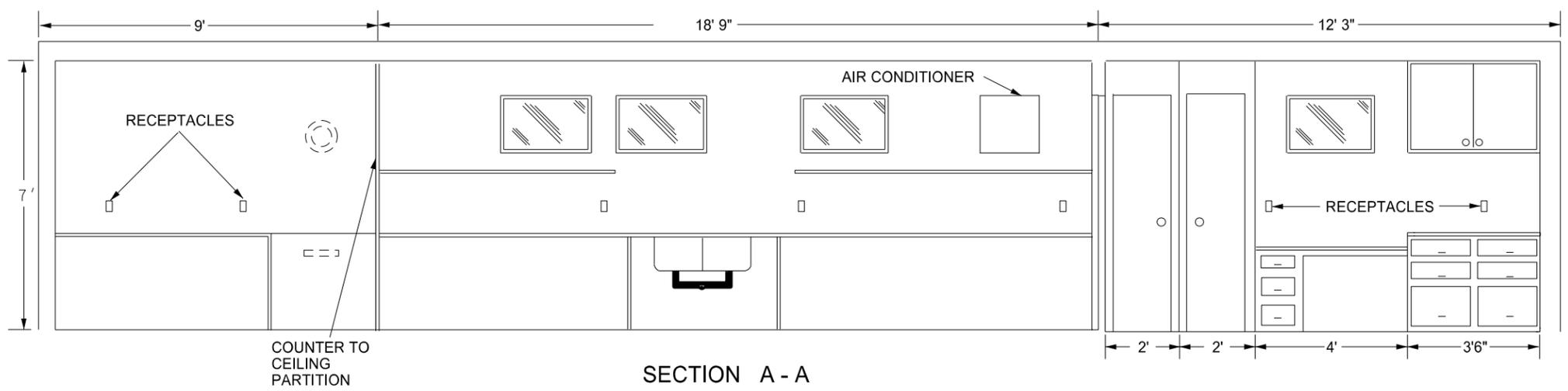
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BITUMINOUS LABORATORY

D-706-1



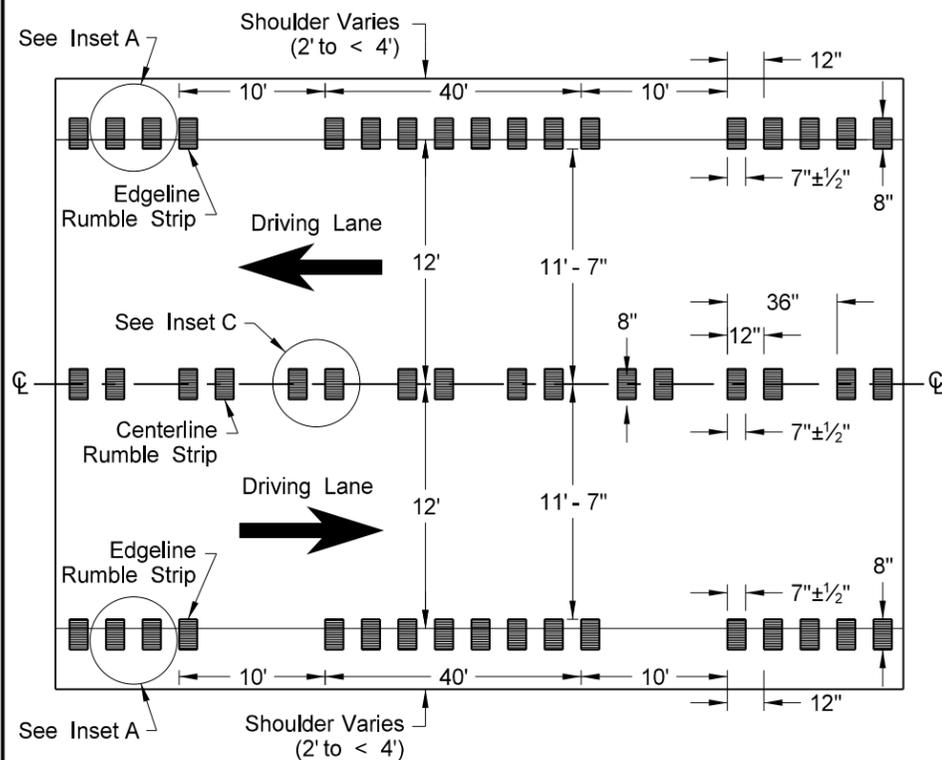
- Provide a laboratory with the following:
1. A 1'x1' shelf at 36" above the regular countertop.
 2. Double compartment stainless steel sink, with each compartment a minimum of 16"x14"x10" deep. Provide water service lines made of copper or plastic and a diameter of 1/2 inch.
 3. An exhaust fan capable 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.



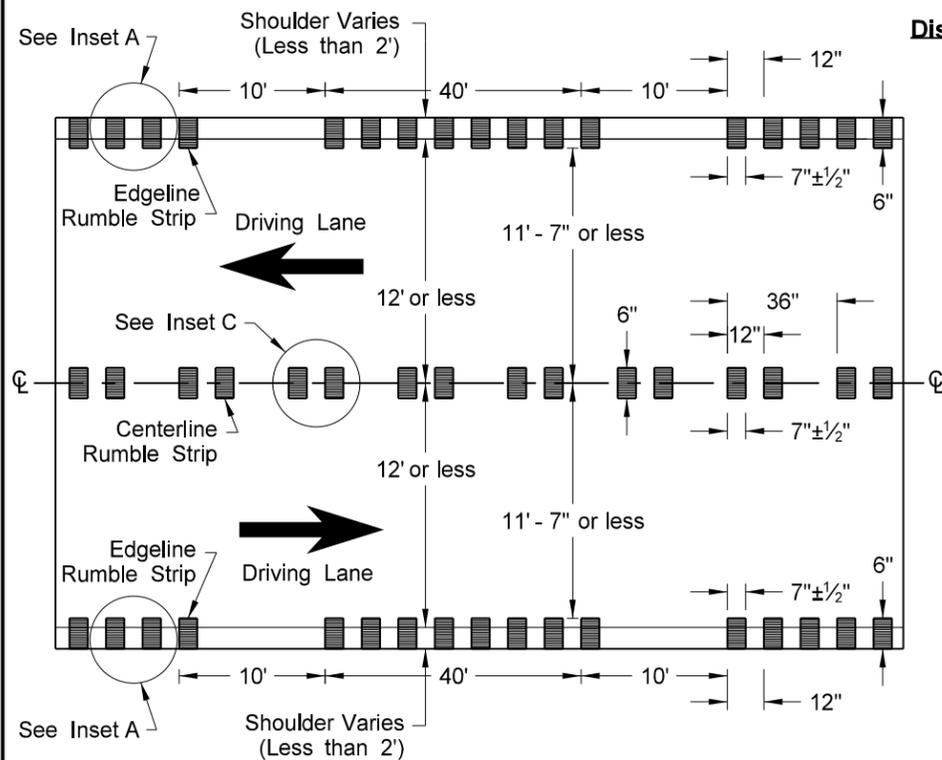
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
07-30-14	Changed standard's title and revised notes.
01-11-16	Revised notes.

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 Registration Number
PE- 2930,
 on 01/11/16 and the original document is stored at the
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 of Transportation

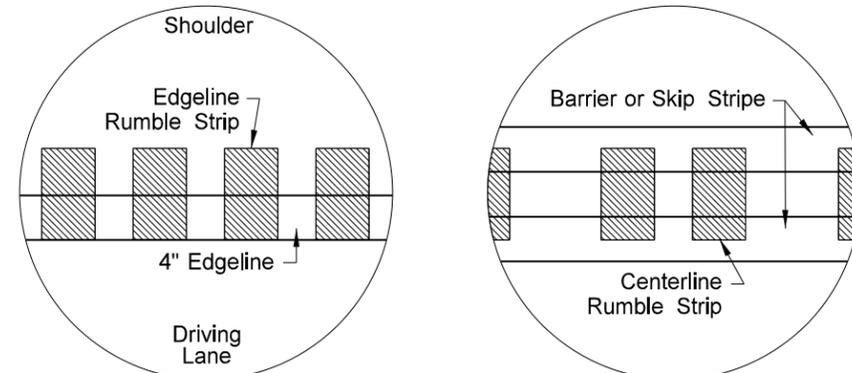
RUMBLE STRIPS
UNDIVIDED HIGHWAYS (SHOULDERS LESS THAN 4')



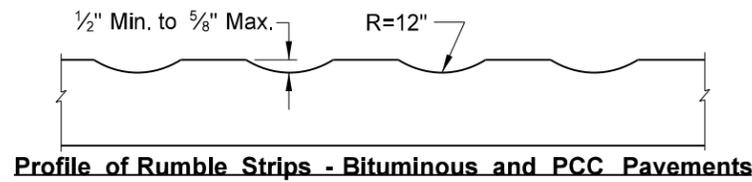
Undivided Highways (12' Driving Lanes & Shoulders 2' to < 4')



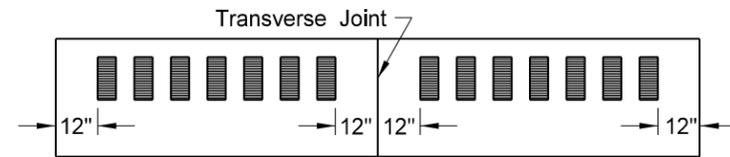
Undivided Highways (12' Driving Lanes or less & Shoulders Less than 2')



Inset A - Edgeline Rumble Strip Inset C - Centerline Rumble Strip



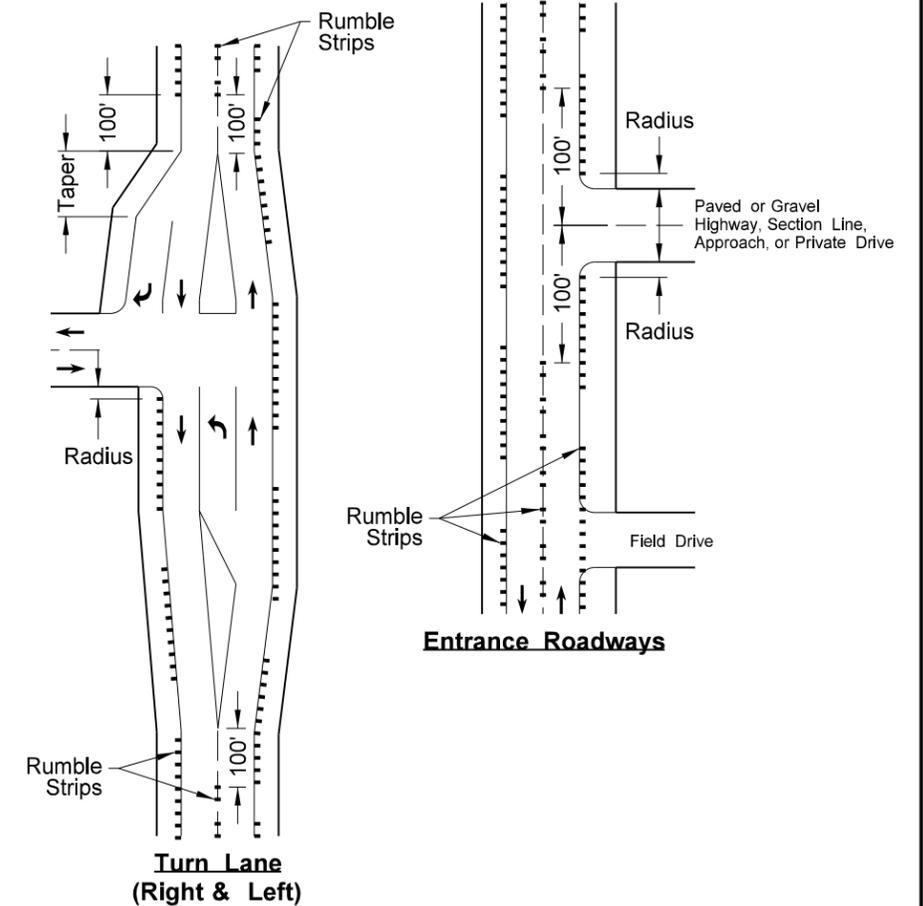
Profile of Rumble Strips - Bituminous and PCC Pavements



Discontinue rumble strip approx. 12" on both sides of PCC transverse joint

NOTES:

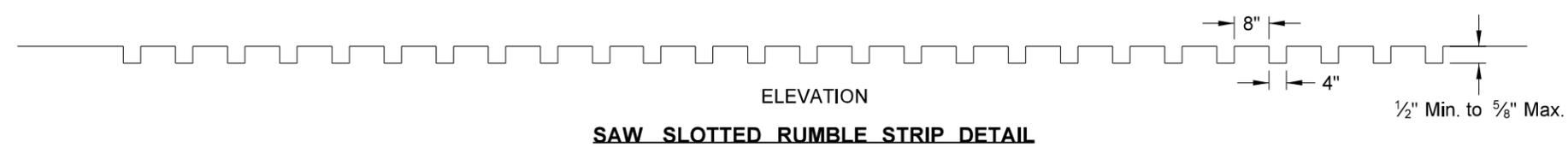
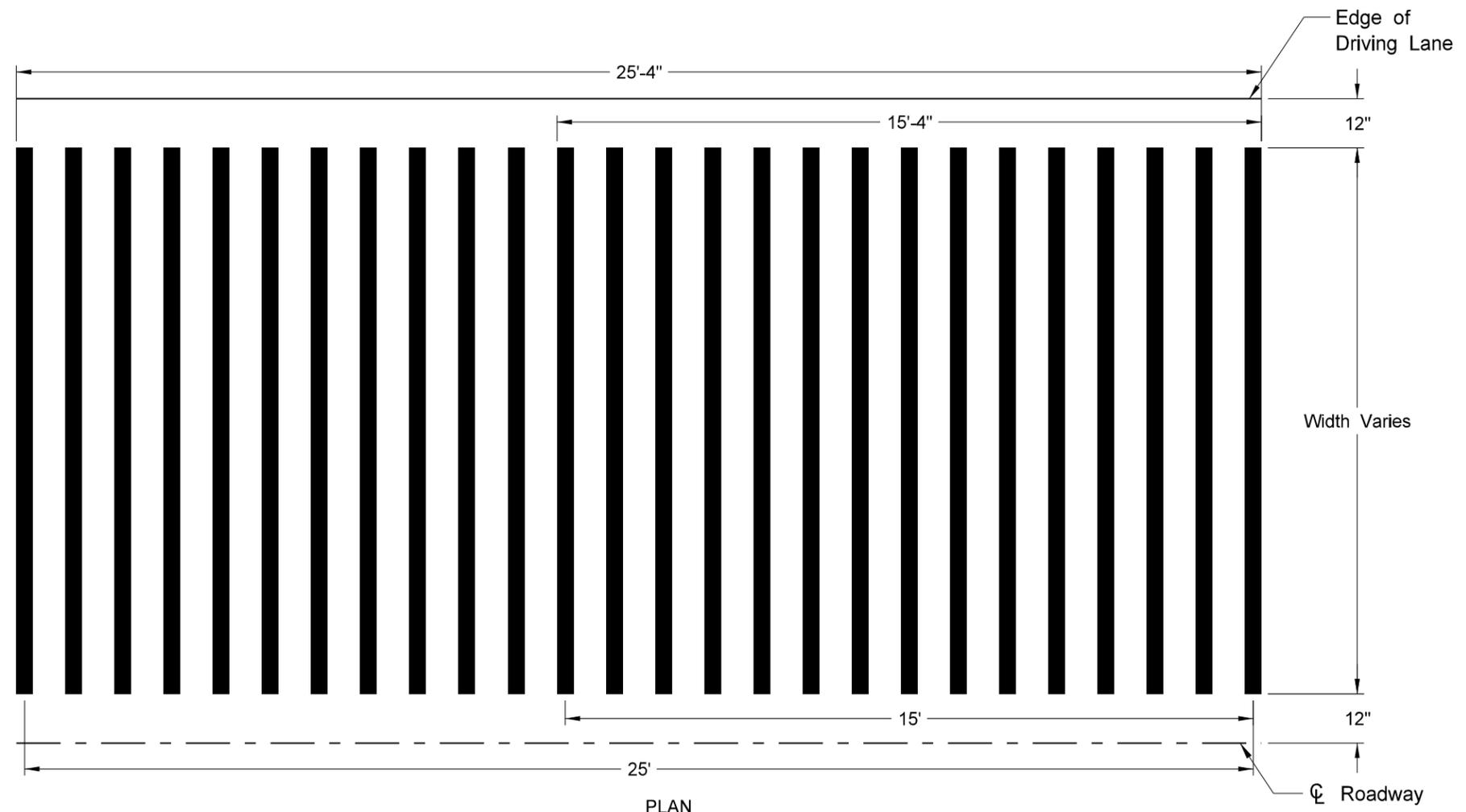
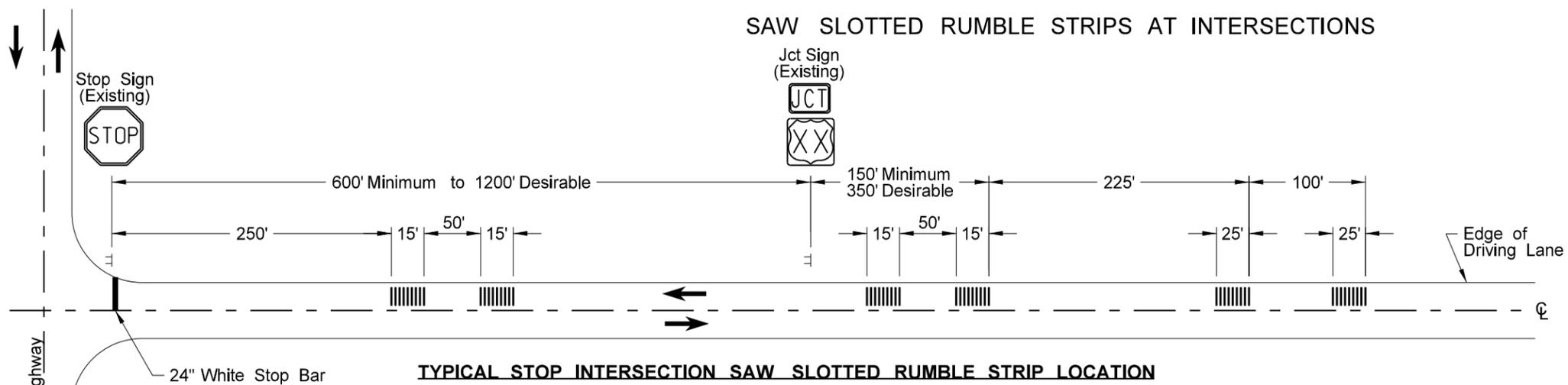
- 1) Discontinue edgeline rumble strips through the entire length of right turn lanes, 100' before right turn lane tapers, and at the radius of a paved or gravel highway, section line, approach, or private drive.
- 2) Discontinue centerline rumble strips through the entire length of left turn lanes, 100' before left turn lane tapers and median islands, 100' before and after a paved or gravel highway, section line, approach, or private drive.



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-29-09	
REVISIONS	
DATE	CHANGE
2-25-10	Note 4 was added.
4-19-10	Revised Note 5, Note 6, and Turn Lane (Right & Left).
9-8-11	Revised Notes and D-760-4.
1-26-12	Revised details for rumble strip widths and dimensions.

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SAW SLOTTED RUMBLE STRIPS AT INTERSECTIONS

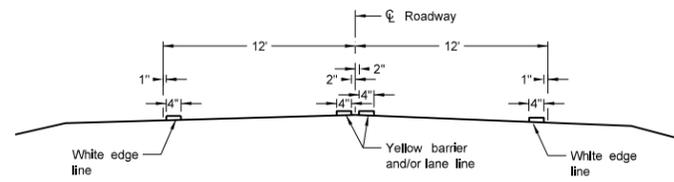


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-29-09	
REVISIONS	
DATE	CHANGE
2-22-10	Saw Slotted width revised.
2-25-10	Note 7 was added.
9-8-11	Revised Notes and D-760-5.
7-7-14	Deleted Notes.

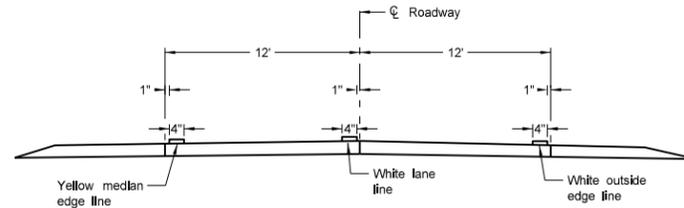
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PAVEMENT MARKING

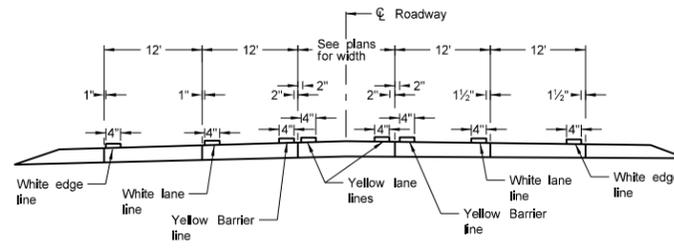
D-762-4



Two Lane Two Way
RURAL ROADWAY

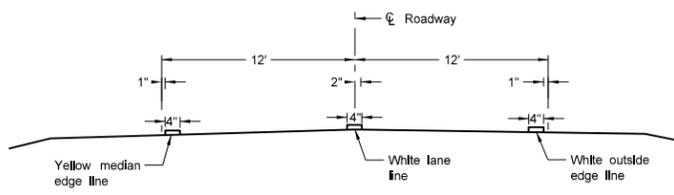


Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section

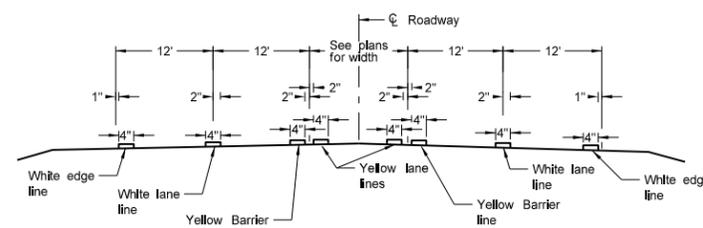


RURAL FIVE LANE ROADWAY
Concrete Section

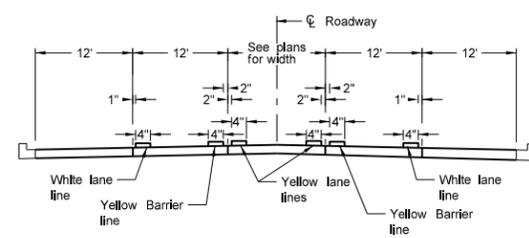
NOTES:
1. Edge lines shall be continued through private drives and field drives and broken for intersections.



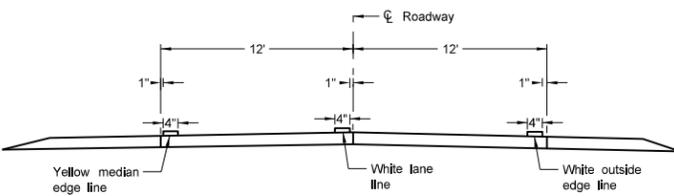
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



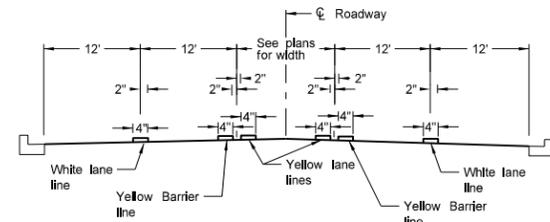
RURAL FIVE LANE ROADWAY
Asphalt Section



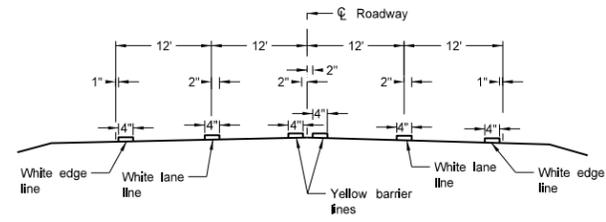
URBAN FIVE LANE SECTION
Concrete Section



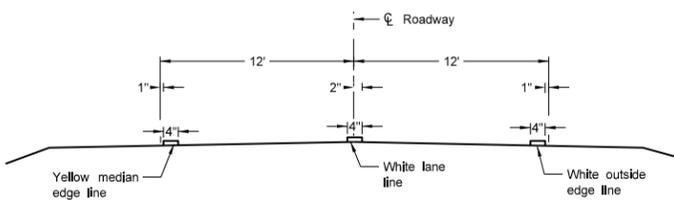
Two Lane Roadway
PRIMARY HIGHWAY
Concrete Section



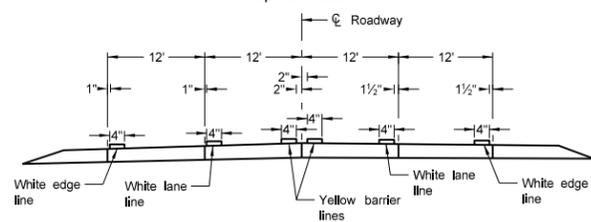
URBAN FIVE LANE SECTION
Asphalt Section



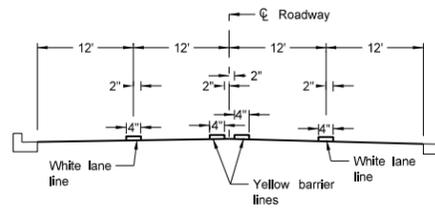
RURAL FOUR LANE ROADWAY
Asphalt Section



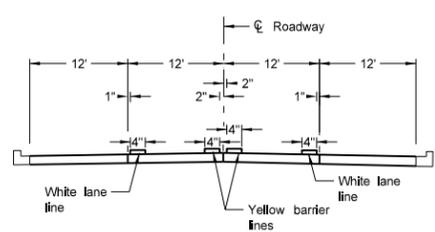
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



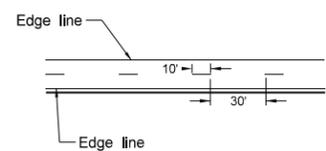
RURAL FOUR LANE ROADWAY
Concrete Section



URBAN FOUR LANE SECTION
Asphalt Section



URBAN FOUR LANE SECTION
Concrete Section

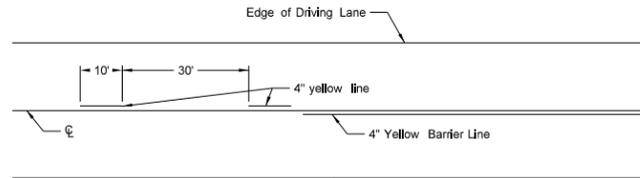


CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

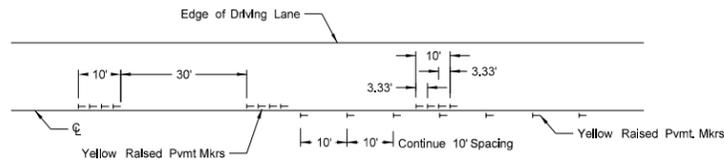
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

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SHORT-TERM PAVEMENT MARKING

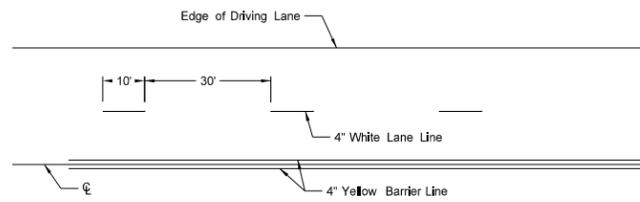


Painted or Tape Lines

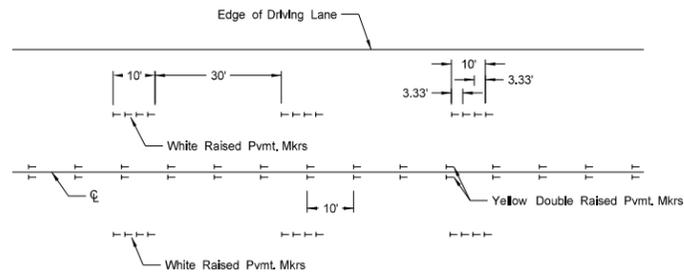


Raised Pavement Markers

TWO-LANE TWO-WAY ROADWAY

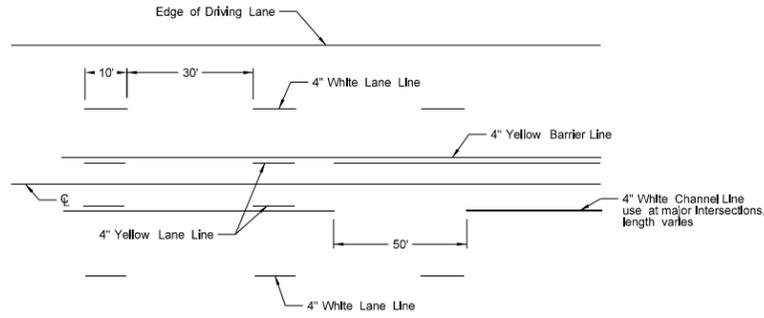


Painted or Tape Lines

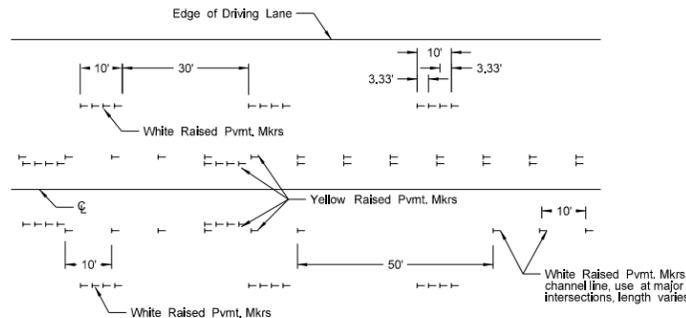


Raised Pavement Markers

FOUR LANE ROADWAY

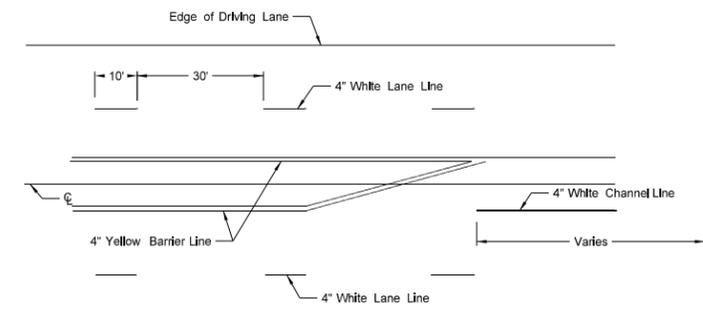


Painted or Tape Lines

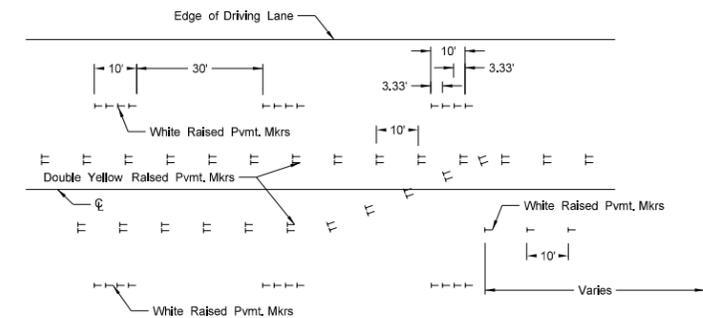


Raised Pavement Markers

FIVE LANE ROADWAY TWO WAY LEFT TURN



Painted or Tape Lines



Raised Pavement Markers

FIVE LANE ROADWAY WITH MARKED ISLANDS

NOTES:

- Two-lane two-way roadways shall have no passing zones placed as shown. No passing zone signs may be placed in lieu of short term no passing zone pavement markings. These signs will be allowed to remain in place for three days, at which time the short term no passing zone pavement marking shall be placed.
- Short term center line stripe (paint) on top lift shall be carefully placed with exact spacing so that the permanent stripe will match when applied.
- Raised markers and tape markings shall be removed after permanent pavement marking has been installed. Removed markings shall become the property of the contractor.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

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